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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:
11/30/2023 - 12/12/2023
Test Report Issue Date:
1/3/2024
Test Site/Location:
Element lab., Columbia, MD, USA
Test Report Serial No.:
1M2310260110-05.A3L

FCC ID:	A3LSMA356E
Applicant Name:	Samsung Electronics Co., Ltd.

Application Type:	Certification
Model:	SM-A356E/DS
Additional Model(s):	SM-A356E
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: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 1 of 98



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	15
7.4	Spurious and Harmonic Emissions at Antenna Terminal	43
7.5	Band Edge Emissions at Antenna Terminal	60
7.6	Radiated Power (EIRP)	72
7.7	Radiated Spurious Emissions Measurements.....	77
7.8	Frequency Stability / Temperature Variation	95
8.0	CONCLUSION.....	98

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 2 of 98

PART 27 MEASUREMENT REPORT

Antenna-1						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
LTE Band 41(PC3)	20 MHz	QPSK	2506.0 - 2680.0	0.157	21.95	18M0G7D
		16QAM	2506.0 - 2680.0	0.136	21.35	18M0W7D
	15 MHz	QPSK	2503.5 - 2682.5	0.160	22.05	13M5G7D
		16QAM	2503.5 - 2682.5	0.133	21.25	13M5W7D
	10 MHz	QPSK	2501.0 - 2685.0	0.154	21.88	9M06G7D
		16QAM	2501.0 - 2685.0	0.139	21.42	9M01W7D
5 MHz	QPSK	2498.5 - 2687.5	0.162	22.10	4M55G7D	
	16QAM	2498.5 - 2687.5	0.128	21.08	4M53W7D	
NR Band n41(PC3)	100 MHz	π/2 BPSK	2546.0 - 2640.0	0.152	21.83	97M0G7D
		QPSK	2546.0 - 2640.0	0.159	22.01	97M8G7D
		16QAM	2546.0 - 2640.0	0.133	21.24	97M8W7D
	90 MHz	π/2 BPSK	2541.0 - 2645.0	0.154	21.88	87M4G7D
		QPSK	2541.0 - 2645.0	0.158	21.98	87M8G7D
		16QAM	2541.0 - 2645.0	0.128	21.08	88M0W7D
	80 MHz	π/2 BPSK	2536.0 - 2650.0	0.154	21.89	77M6G7D
		QPSK	2536.0 - 2650.0	0.152	21.82	77M8G7D
		16QAM	2536.0 - 2650.0	0.127	21.03	77M9W7D
	70 MHz	π/2 BPSK	2531.0 - 2655.0	0.156	21.92	64M6G7D
		QPSK	2531.0 - 2655.0	0.156	21.93	67M7G7D
		16QAM	2531.0 - 2655.0	0.127	21.03	67M6W7D
	60 MHz	π/2 BPSK	2526.0 - 2660.0	0.155	21.91	58M3G7D
		QPSK	2526.0 - 2660.0	0.152	21.82	58M3G7D
		16QAM	2526.0 - 2660.0	0.123	20.91	58M1W7D
	50 MHz	π/2 BPSK	2521.0 - 2665.0	0.154	21.89	46M0G7D
		QPSK	2521.0 - 2665.0	0.151	21.79	47M8G7D
		16QAM	2521.0 - 2665.0	0.126	20.99	47M7W7D
	40 MHz	π/2 BPSK	2516.0 - 2670.0	0.155	21.91	35M9G7D
		QPSK	2516.0 - 2670.0	0.152	21.82	38M2G7D
		16QAM	2516.0 - 2670.0	0.124	20.94	38M1W7D
	30 MHz	π/2 BPSK	2511.0 - 2675.0	0.155	21.90	27M0G7D
		QPSK	2511.0 - 2675.0	0.150	21.77	28M0G7D
		16QAM	2511.0 - 2675.0	0.121	20.84	28M0W7D
20 MHz	π/2 BPSK	2506.0 - 2680.0	0.152	21.81	18M0G7D	
	QPSK	2506.0 - 2680.0	0.148	21.70	18M3G7D	
	16QAM	2506.0 - 2680.0	0.117	20.69	18M4W7D	
15 MHz	π/2 BPSK	2503.5 - 2682.5	0.151	21.80	13M0G7D	
	QPSK	2503.5 - 2682.5	0.148	21.70	13M7G7D	
	16QAM	2503.5 - 2682.5	0.118	20.73	13M7W7D	
10 MHz	π/2 BPSK	2501.0 - 2685.0	0.151	21.80	8M68G7D	
	QPSK	2501.0 - 2685.0	0.147	21.67	8M69G7D	
	16QAM	2501.0 - 2685.0	0.116	20.64	8M69W7D	

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 3 of 98

Antenna-2						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
LTE Band 41(PC3)	20 MHz	QPSK	2506.0 - 2680.0	0.069	18.38	18M0G7D
		16QAM	2506.0 - 2680.0	0.055	17.38	18M1W7D
	15 MHz	QPSK	2503.5 - 2682.5	0.075	18.76	13M5G7D
		16QAM	2503.5 - 2682.5	0.055	17.41	13M5W7D
	10 MHz	QPSK	2501.0 - 2685.0	0.073	18.65	9M04G7D
		16QAM	2501.0 - 2685.0	0.057	17.55	9M05W7D
5 MHz	QPSK	2498.5 - 2687.5	0.073	18.63	4M54G7D	
	16QAM	2498.5 - 2687.5	0.058	17.60	4M54W7D	
NR Band n41(PC3)	100 MHz	π/2 BPSK	2546.0 - 2640.0	0.039	15.90	96M7G7D
		QPSK	2546.0 - 2640.0	0.040	16.05	98M0G7D
		16QAM	2546.0 - 2640.0	0.034	15.30	97M7W7D

Antenna-3						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
NR Band n41(PC3)	100 MHz	π/2 BPSK	2546.0 - 2640.0	0.028	14.50	97M0G7D
		QPSK	2546.0 - 2640.0	0.028	14.51	98M3G7D
		16QAM	2546.0 - 2640.0	0.025	14.04	97M9W7D

Antenna-4						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
NR Band n41(PC3)	100 MHz	π/2 BPSK	2546.0 - 2640.0	0.014	11.50	97M0G7D
		QPSK	2546.0 - 2640.0	0.014	11.33	98M1G7D
		16QAM	2546.0 - 2640.0	0.012	10.91	97M8W7D

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 4 of 98

1.0 INTRODUCTION

1.1 Scope

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

1.2 Element Test Location

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

1.3 Test Facility / Accreditations

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

- Element Washington DC LLC is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- Element Washington DC LLC TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- Element Washington DC LLC facility is a registered (2451B) test laboratory with the site description on file with ISED.
- Element Washington DC LLC is a Recognized U.S. Certification Assessment Body (CAB # US0110) for ISED Canada as designated by NIST under the U.S. and Canada Mutual Recognition Agreement.

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 5 of 98

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMA356E**. 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.: 1184M, 1193M, 1200M, 1146M

2.2 Device Capabilities

This device contains the following capabilities:

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

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.

Band	Ant1	Ant2	Ant3	Ant4
B41	Ant B	Ant F	N/A	N/A
n41	Ant B	Ant F	Ant I	Ant E

Table 2-1. Antenna Naming Convention

2.4 Software and Firmware

Testing was performed on device(s) using software/firmware version A356BXXU0AWJ3 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: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 6 of 98

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:

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

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

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

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

And

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

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

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

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 7 of 98

4.0 MEASUREMENT UNCERTAINTY

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

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

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 8 of 98

5.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	AP2-001	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	AP2-001
-	AP2-002	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	AP2-002
-	ETS-001	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	ETS-001
-	ETS-002	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	ETS-002
-	LTX4	Licensed Transmitter Cable Set	1/12/2023	Annual	1/12/2024	LTX4
-	LTX5	Licensed Transmitter Cable Set	1/12/2023	Annual	1/12/2024	LTX5
Anritsu	MT8821C	Radio Communication Analyzer	N/A			620152694
Com-Power	AL-130R	9kHz - 30MHz Loop Antenna	1/18/2022	Biennial	1/19/2024	121085
EMCO	3115	Horn Antenna (1-18GHz)	8/8/2022	Biennial	8/8/2024	9704-5182
EMCO	3116	Horn Antenna (18-40GHz)	7/5/2023	Biennial	7/5/2025	9203-2178
Keysight Technologies	N9030A	PXA Signal Analyzer (3Hz-26.5GHz)	8/7/2023	Annual	8/7/2024	MY54490576
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	3/15/2023	Annual	3/15/2024	MY52350166
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			112347
Rohde & Schwarz	TC-TA18	Cross Polarized Vivaldi Test Antenna	9/28/2022	Biennial	9/28/2024	101058
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	9/25/2023	Annual	9/25/2024	100342
Rohde & Schwarz	ESW44	EMI Test Receiver (2Hz-44GHz)	3/1/2023	Annual	3/1/2024	101716
Rohde & Schwarz	VULB9162	Bi-Log Antenna	2/21/2023	Biennial	2/21/2025	00301
Sunol	DRH-118	Horn Antenna (1-18GHz)	2/14/2022	Biennial	2/14/2024	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	8/30/2022	Biennial	8/30/2024	A051107

Table 5-1. Test Equipment

Notes:

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

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 9 of 98

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: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 10 of 98

7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LSMA356E
 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
CONDUCTED	Transmitter Conducted Output Power*	2.1046(a), 2.1046(c)	N/A	PASS	Section 7.2
	Occupied Bandwidth	2.1049(h)	N/A	PASS	Section 7.3
	Conducted Band Edge / Spurious Emissions (LTE Band 41; NR Band n41)	2.1051, 27.53(m)(4)	Undesirable emissions must meet the limits detailed in 27.53(m)(4)	PASS	Sections 7.4, 7.5
	Frequency Stability	2.1055, 27.54	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8
RADIATED	Equivalent Isotropic Radiated Power (LTE Band 41; NR Band n41)	27.50(h)(2)	≤ 2 Watts max. EIRP	PASS	Section 7.6
	Radiated Spurious Emissions (LTE Band 41; NR Band n41)	2.1053, 27.53(m)	Undesirable emissions must meet the limits detailed in 27.53(m)	PASS	Section 7.7

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

Table 7-1. Summary of Test Results

Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) All conducted emissions measurements are performed with automated test software to capture the corresponding plots necessary to show compliance. The measurement software utilized is EMC Software Tool v1.2.2.

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 11 of 98

7.2 Conducted Output Power Data

Test Overview

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

Test Procedure Used

ANSI C63.26-2015 – Section 5.2

Test Settings

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

Test Setup

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

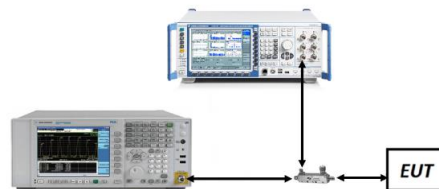


Figure 7-1. Test Instrument & Measurement Setup

Test Notes

1. Conducted power measurements were evaluated using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device.
2. 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: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 12 of 98

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
20 MHz	QPSK	39750	2506.0	1 / 0	21.77
		40620	2593.0	1 / 50	22.71
		41490	2680.0	1 / 0	22.80
	16-QAM	39750	2506.0	1 / 0	20.74
15 MHz	QPSK	39725	2503.5	1 / 37	22.28
		40620	2593.0	1 / 37	21.89
		41515	2682.5	1 / 37	22.67
	16-QAM	39725	2503.5	1 / 37	20.77
10 MHz	QPSK	39700	2501.0	1 / 0	22.17
		40620	2593.0	1 / 0	21.78
		41540	2685.0	1 / 0	22.62
	16-QAM	39700	2501.0	1 / 0	20.91
5 MHz	QPSK	39675	2498.5	1 / 24	22.15
		40620	2593.0	1 / 12	21.76
		41565	2687.5	1 / 12	22.60
	16-QAM	39675	2498.5	1 / 24	20.96

Table 7-2. Conducted Powers - LTE Band 41(PC3) – Ant2

Test Case	NS	MCC	MNC	Channel BW [MHz]	Channel Number	Channel Frequency [MHz]	RB Size	RB Offset	A-MPR [dB]	Modulation	MPR [dB]	Measured Power [dBm]
1	04	001	01	5	39675	2498.5	1	0	3	QPSK	0	19.88
2										16-QAM	1	18.76
3				10	39700	2501	1	0	5	QPSK	0	21.95
4										16-QAM	1	20.87
5				10	39700	2501	20	0	2	QPSK	0	19.03
6										16-QAM	1	17.93
7				10	39700	2501	50	0	3	QPSK	0	20.06
8										16-QAM	1	18.91
9				10	39700	2501	25	20	1	QPSK	0	19.16
10										16-QAM	1	18.00
11				10	39700	2501	1	36	0	QPSK	0	20.12
12										16-QAM	1	19.05
13				15	39725	2503.5	1	0	5	QPSK	0	21.97
14										16-QAM	1	20.93
15				15	39725	2503.5	20	0	2	QPSK	0	18.97
16										16-QAM	1	17.85
17				15	39725	2503.5	75	0	4	QPSK	0	20.01
18	16-QAM	1	18.98									
19	15	39725	2503.5	50	15	3	QPSK	0	18.13			
20							16-QAM	1	17.00			
21	15	39725	2503.5	1	60	0	QPSK	0	20.15			
22							16-QAM	1	19.05			
23	20	39750	2506	1	0	5	QPSK	0	22.03			
24							16-QAM	1	20.88			
25	20	39750	2506	1	0	5	QPSK	0	18.98			
26							16-QAM	1	17.56			
27	20	39750	2506	20	0	2	QPSK	0	20.04			
28							16-QAM	1	18.86			
29	20	39750	2506	100	0	4	QPSK	0	18.13			
30							16-QAM	1	17.01			
31	20	39750	2506	75	24	3	QPSK	0	20.17			
32							16-QAM	1	19.00			
33	20	39750	2506	1	77	0	QPSK	0	21.96			
34							16-QAM	1	20.44			

Table 7-3. Conducted Powers –LTE Band 41(PC3) A-MPR – Ant2

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 13 of 98

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	509202	2546.01	1 / 271	20.30
		518598	2592.99	1 / 136	20.54
		528000	2640.00	1 / 1	20.93
	QPSK	509202	2546.01	1 / 271	20.01
		518598	2592.99	1 / 136	20.87
		528000	2640.00	1 / 1	20.29
	16-QAM	509202	2546.01	1 / 271	19.74

Table 7-4. Conducted Powers - NR Band n41 – Ant2

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	509202	2546.01	1 / 271	19.96
		518598	2592.99	1 / 136	20.20
		528000	2640.00	1 / 136	20.13
	QPSK	509202	2546.01	1 / 271	19.96
		518598	2592.99	1 / 136	20.05
		528000	2640.00	1 / 136	19.96
	16-QAM	509202	2546.01	1 / 271	19.54

Table 7-5. Conducted Powers - NR Band n41 – Ant3

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	509202	2546.01	1 / 136	17.53
		518598	2592.99	1 / 136	17.81
		528000	2640.00	1 / 1	17.39
	QPSK	509202	2546.01	1 / 136	17.79
		518598	2592.99	1 / 136	17.61
		528000	2640.00	1 / 1	17.45
	16-QAM	509202	2546.01	1 / 136	17.18

Table 7-6. Conducted Powers - NR Band n41 – Ant4

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 14 of 98

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.

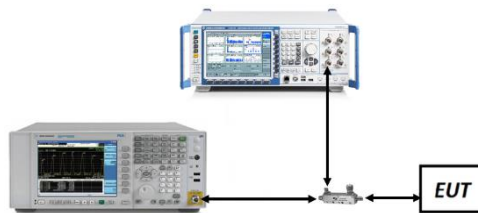


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

None.

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 15 of 98

Mode	Bandwidth	Modulation	OBW [MHz]
LTE Band 41(PC3)	20 MHz	QPSK	18.01
		16QAM	18.05
	15 MHz	QPSK	13.54
		16QAM	13.49
	10 MHz	QPSK	9.06
		16QAM	9.01
	5 MHz	QPSK	4.55
		16QAM	4.53

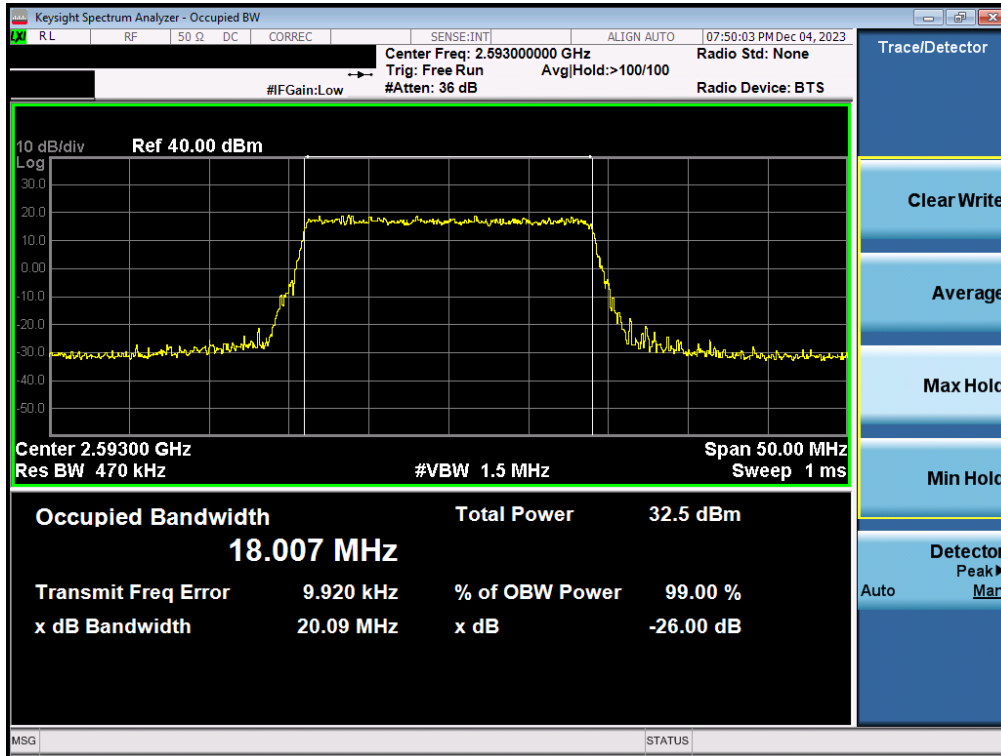
Table 7-7. Occupied Bandwidth Result – LTE – Ant1

Mode	Bandwidth	Modulation	OBW [MHz]
NR-n41PC3	100MHz	BPSK	97.00
		QPSK	97.84
		16QAM	97.79
	90MHz	BPSK	87.40
		QPSK	87.79
		16QAM	88.04
	80MHz	BPSK	77.63
		QPSK	77.79
		16QAM	77.88
	70MHz	BPSK	64.64
		QPSK	67.73
		16QAM	67.60
	60MHz	BPSK	58.31
		QPSK	58.28
		16QAM	58.14
	50MHz	BPSK	45.95
		QPSK	47.78
		16QAM	47.72
	40MHz	BPSK	35.92
		QPSK	38.17
		16QAM	38.11
	30MHz	BPSK	27.00
		QPSK	28.03
		16QAM	28.02
	20MHz	BPSK	18.04
		QPSK	18.30
		16QAM	18.36
	15MHz	BPSK	12.99
		QPSK	13.69
		16QAM	13.69
10MHz	BPSK	8.68	
	QPSK	8.69	
	16QAM	8.69	

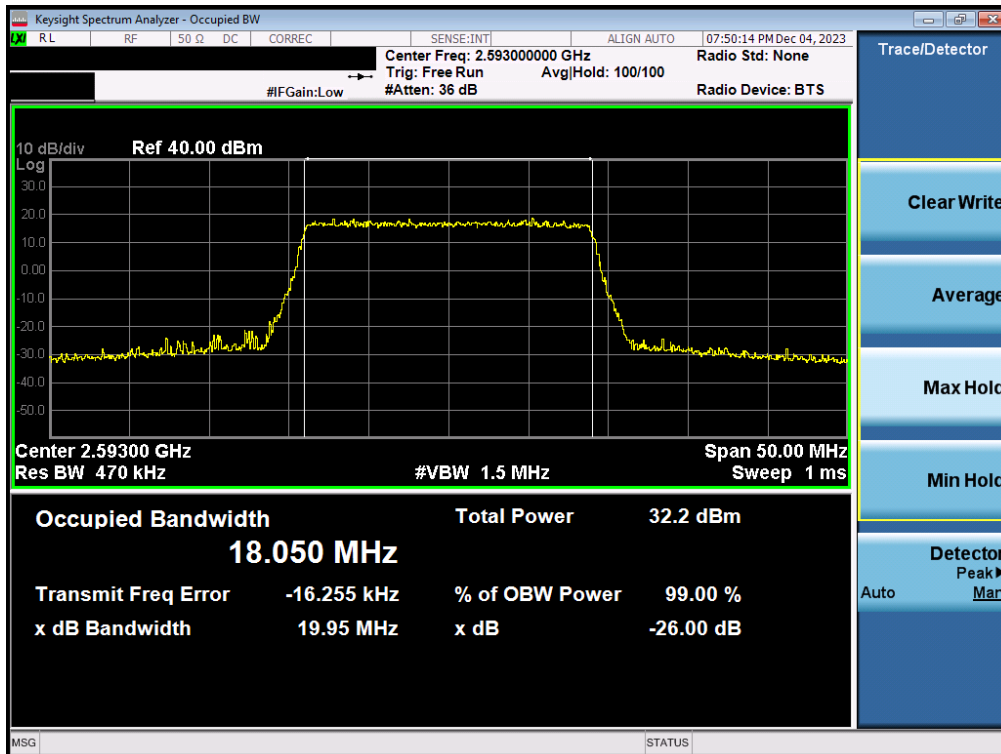
Table 7-8. Occupied Bandwidth Result – NR – Ant1

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 16 of 98

LTE Band 41 – Ant1

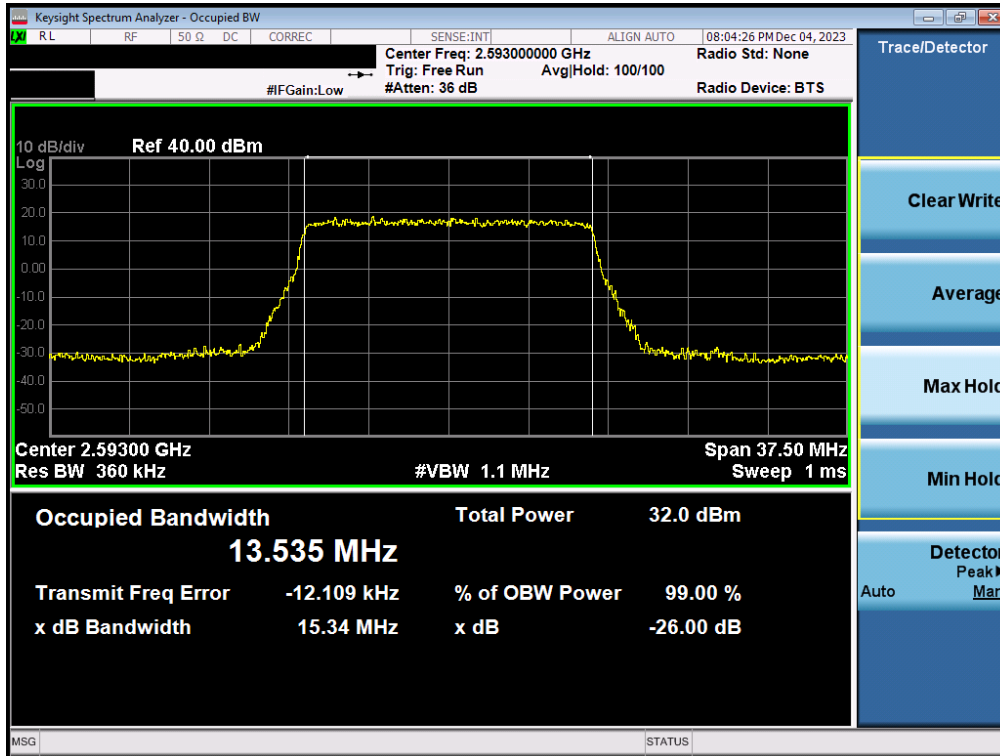


Plot 7-1. Occupied Bandwidth Plot (LTE Band 41 - 20MHz QPSK - Full RB - Ant1)

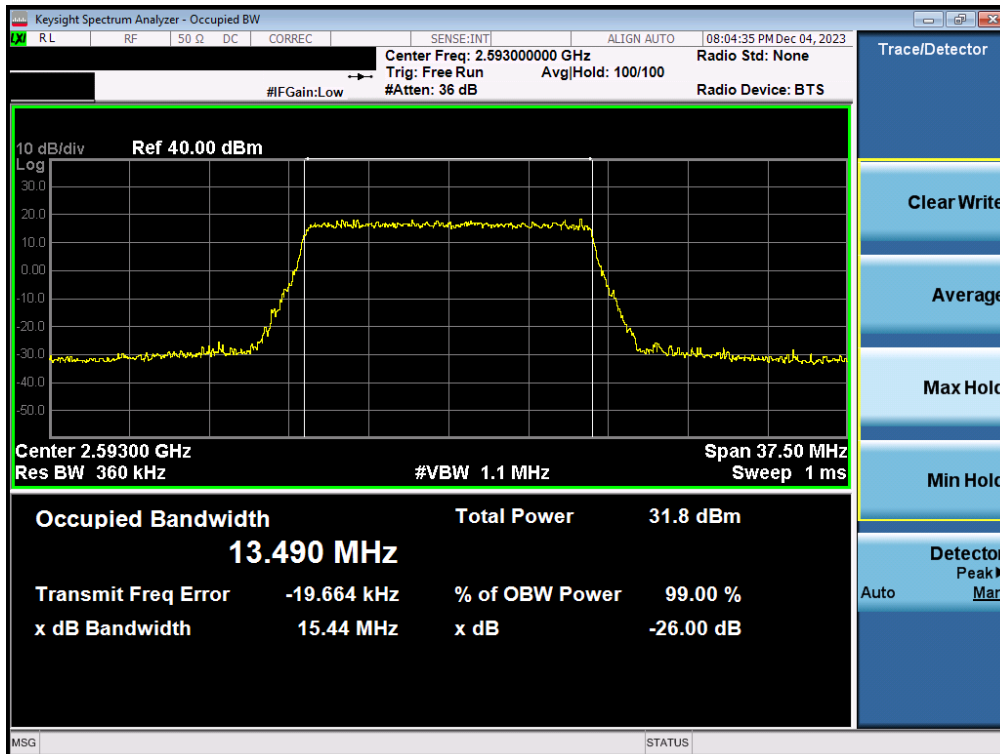


Plot 7-2. Occupied Bandwidth Plot (LTE Band 41 - 20MHz 16-QAM - Full RB - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 17 of 98

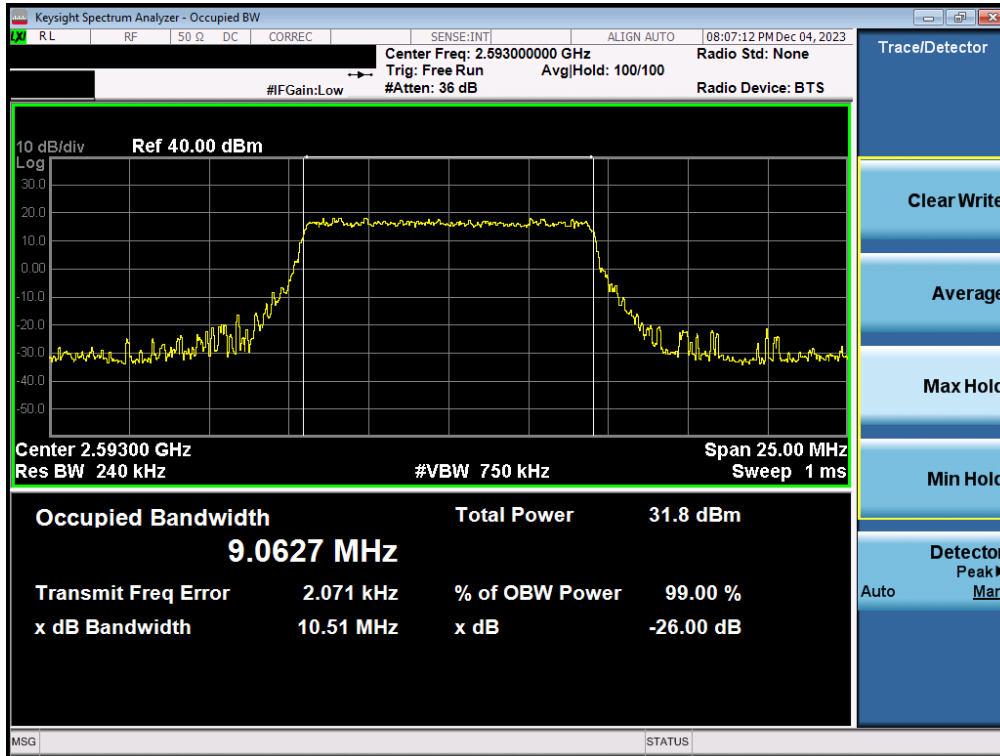


Plot 7-3. Occupied Bandwidth Plot (LTE Band 41 - 15MHz QPSK - Full RB - Ant1)



Plot 7-4. Occupied Bandwidth Plot (LTE Band 41 - 15MHz 16-QAM - Full RB - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 18 of 98

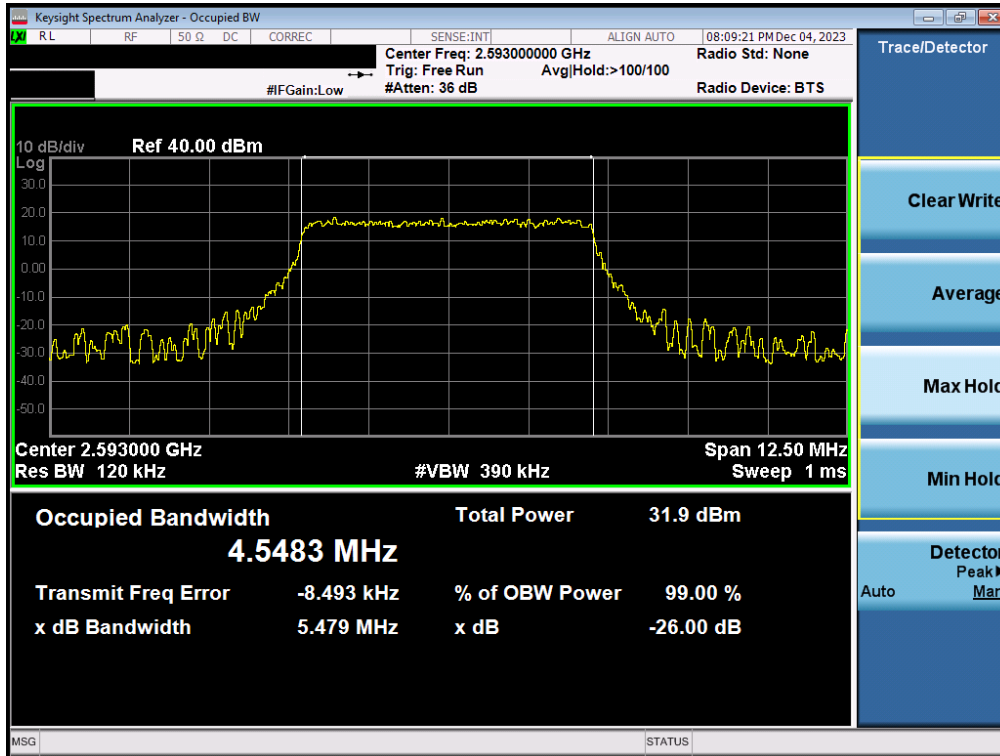


Plot 7-5. Occupied Bandwidth Plot (LTE Band 41 - 10MHz QPSK - Full RB - Ant1)

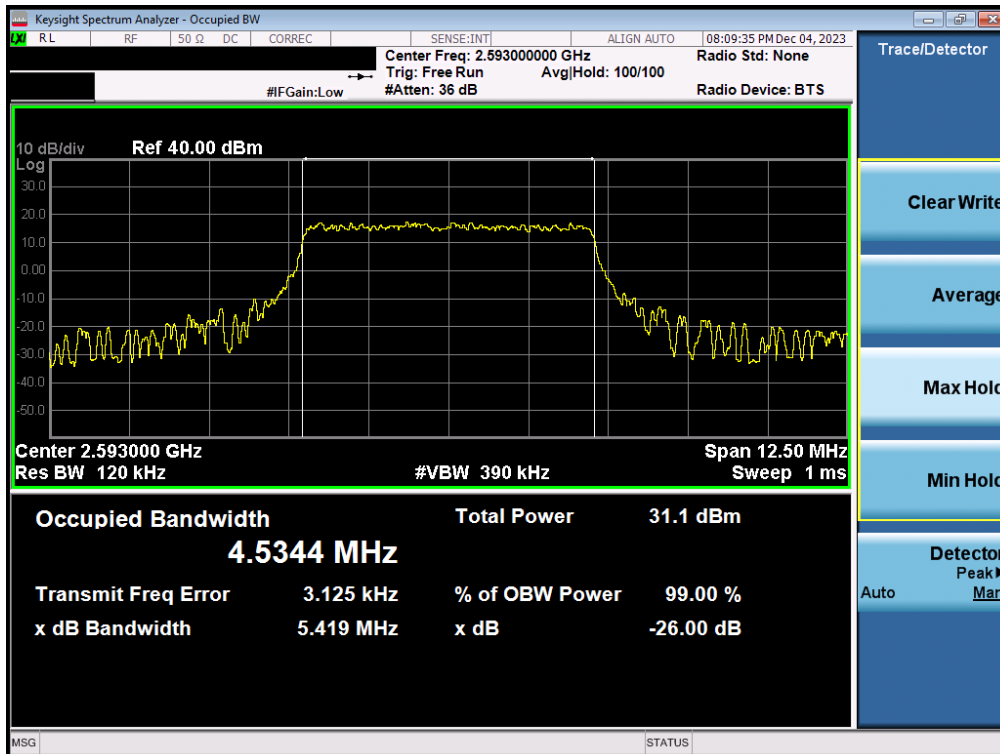


Plot 7-6. Occupied Bandwidth Plot (LTE Band 41 - 10MHz 16-QAM - Full RB - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 19 of 98



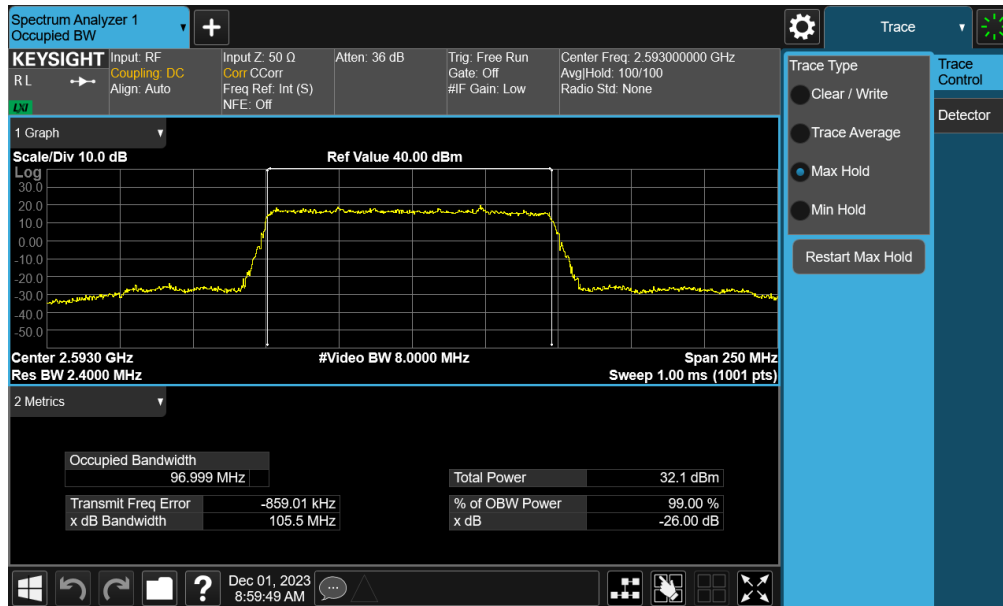
Plot 7-7. Occupied Bandwidth Plot (LTE Band 41 - 5MHz QPSK - Full RB - Ant1)



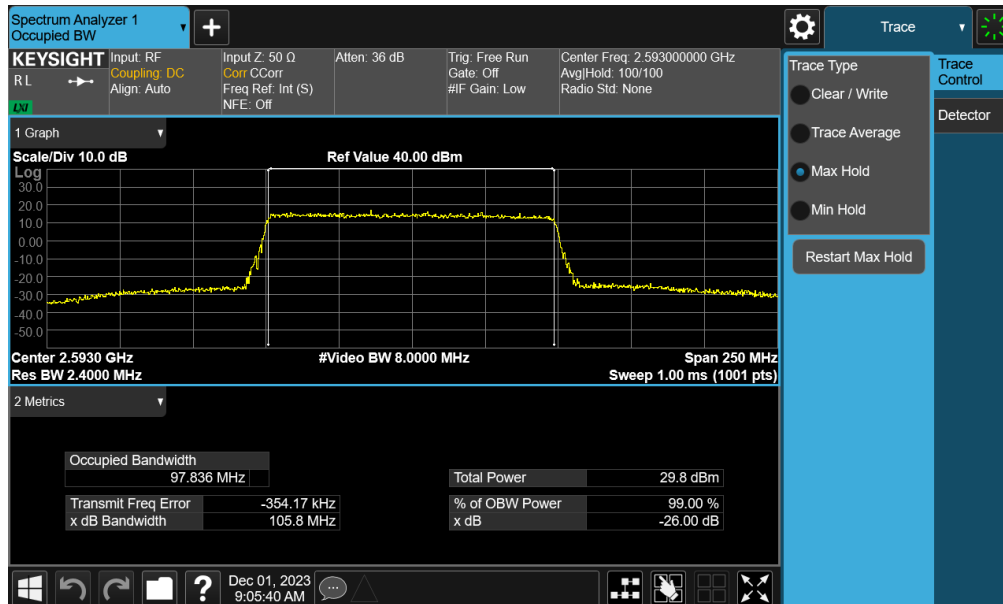
Plot 7-8. Occupied Bandwidth Plot (LTE Band 41 - 5MHz 16-QAM - Full RB - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 20 of 98

NR Band n41 – Ant1

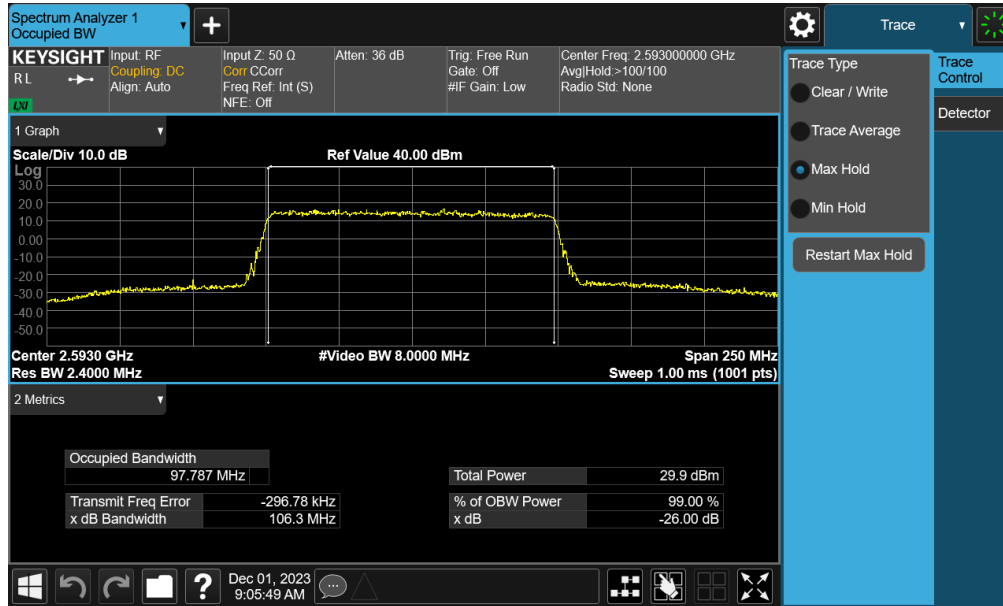


Plot 7-9. Occupied Bandwidth Plot (NR Band n41 - 100MHz $\pi/2$ BPSK - Full RB Configuration - Ant1)

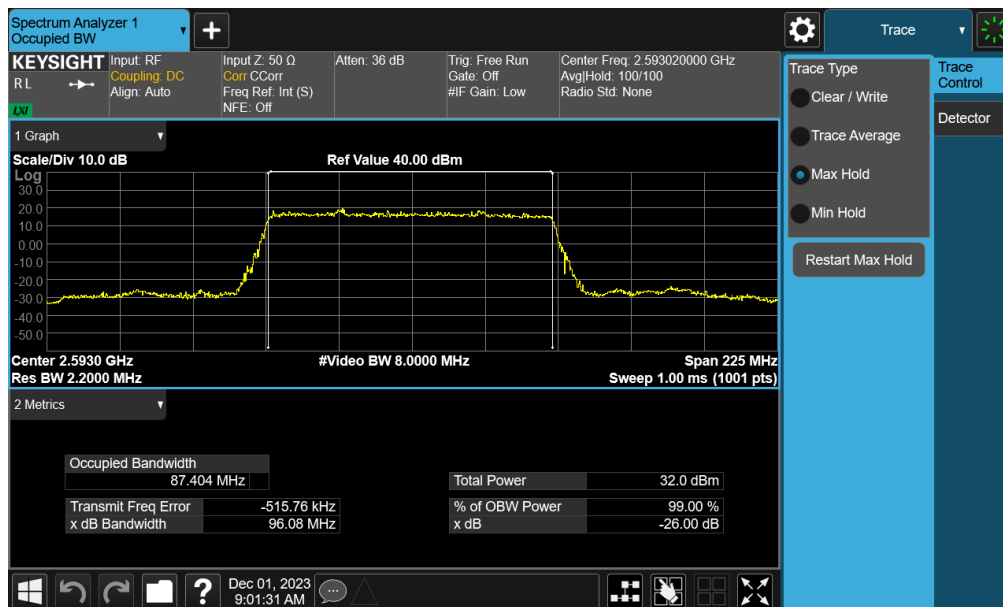


Plot 7-10. Occupied Bandwidth Plot (NR Band n41 - 100MHz QPSK - Full RB Configuration - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 21 of 98

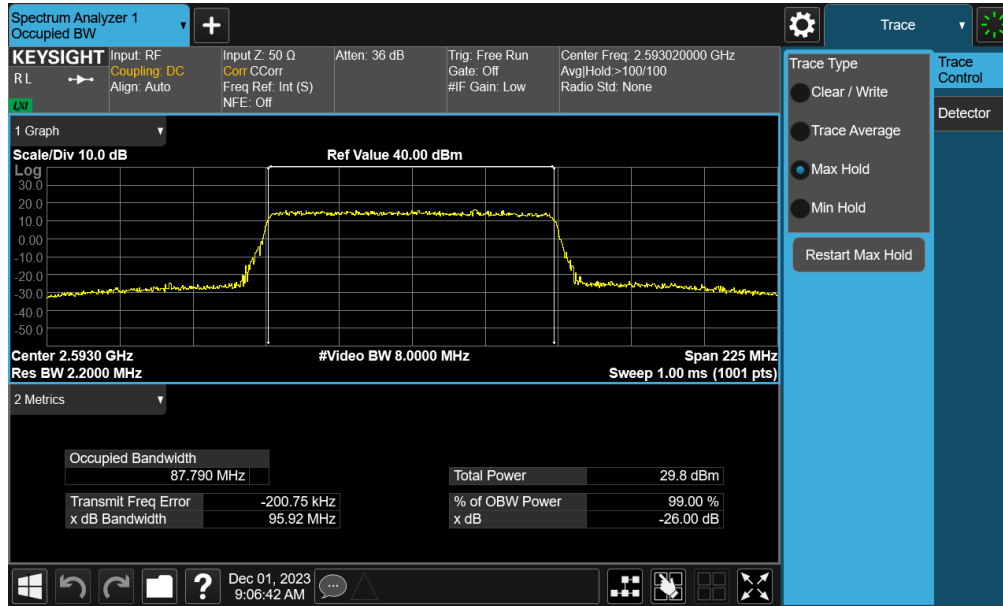


Plot 7-11. Occupied Bandwidth Plot (NR Band n41 - 100MHz 16-QAM - Full RB Configuration - Ant1)

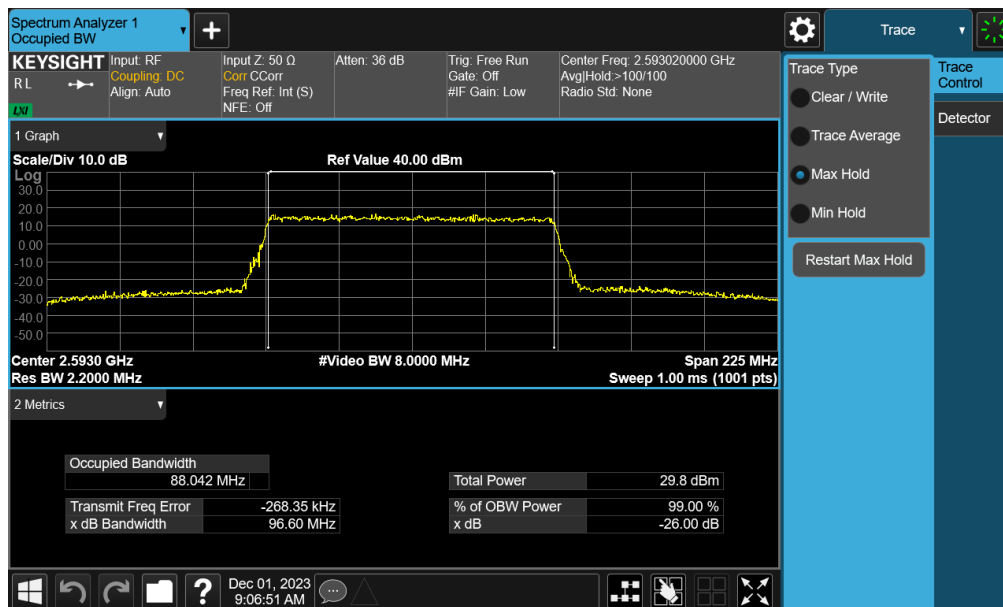


Plot 7-12. Occupied Bandwidth Plot (NR Band n41 - 90MHz $\pi/2$ BPSK - Full RB Configuration - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 22 of 98

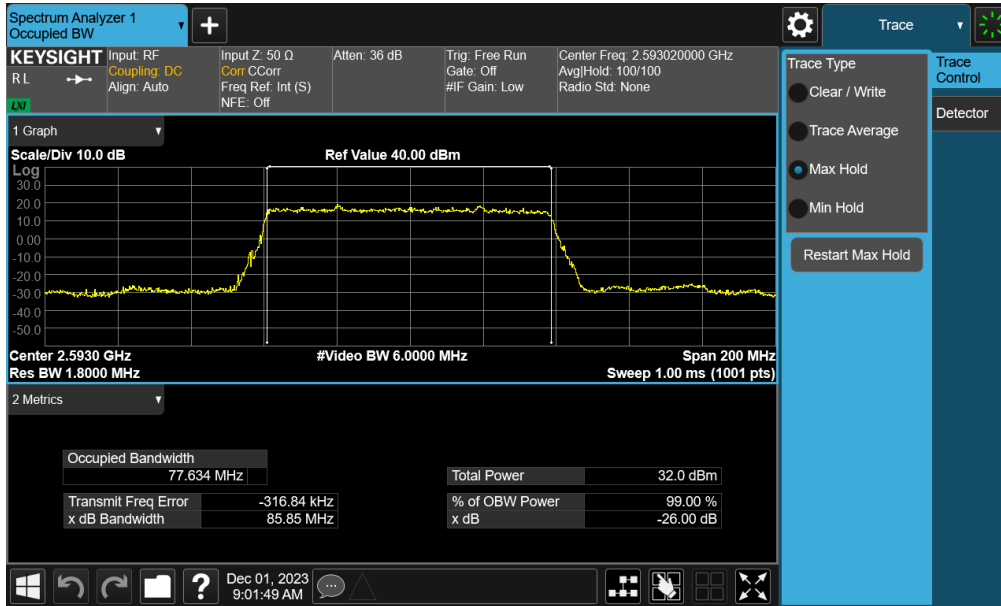


Plot 7-13. Occupied Bandwidth Plot (NR Band n41 - 90MHz QPSK - Full RB Configuration - Ant1)

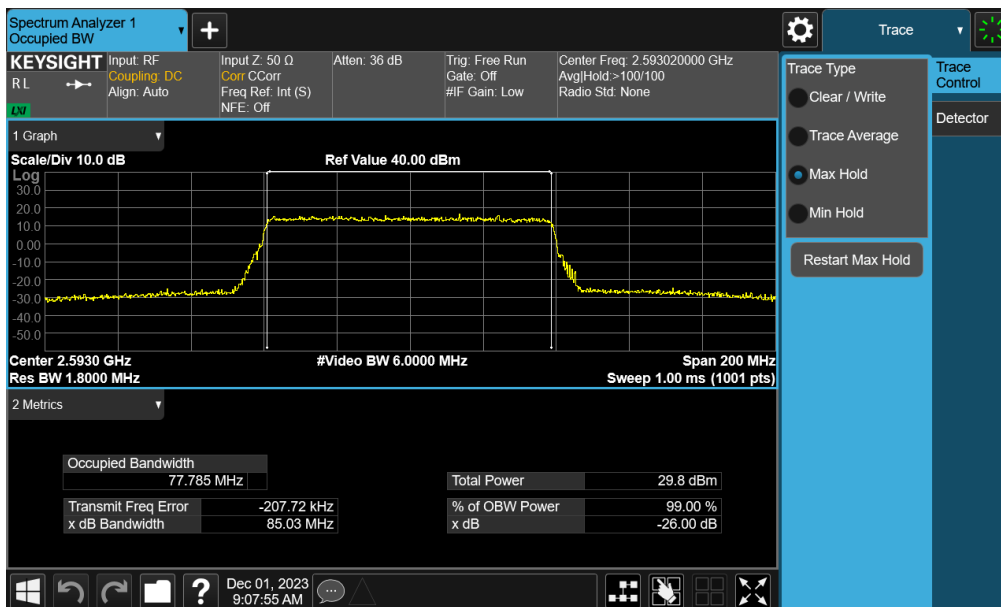


Plot 7-14. Occupied Bandwidth Plot (NR Band n41 - 90MHz 16-QAM - Full RB Configuration - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 23 of 98

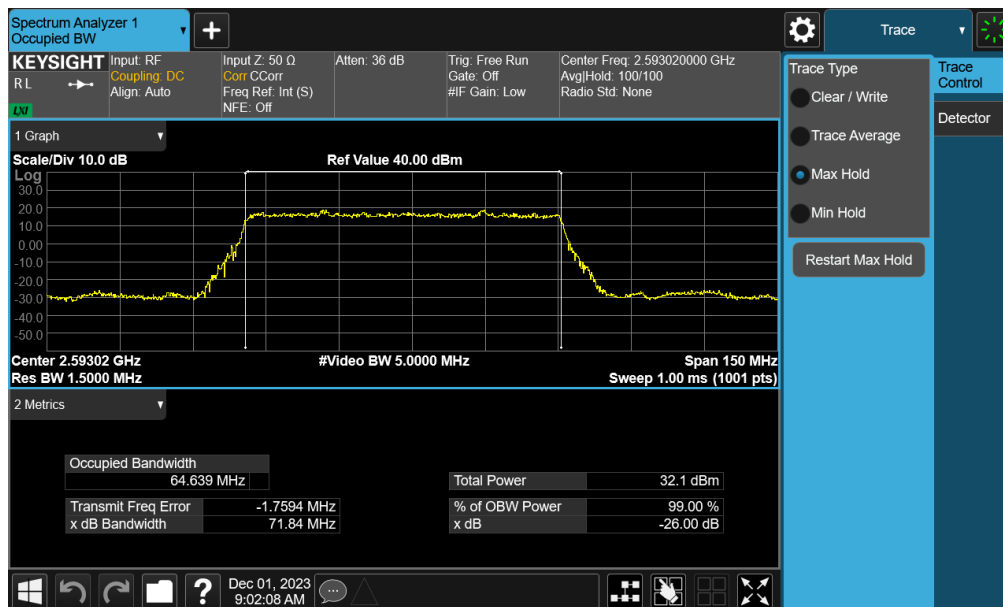
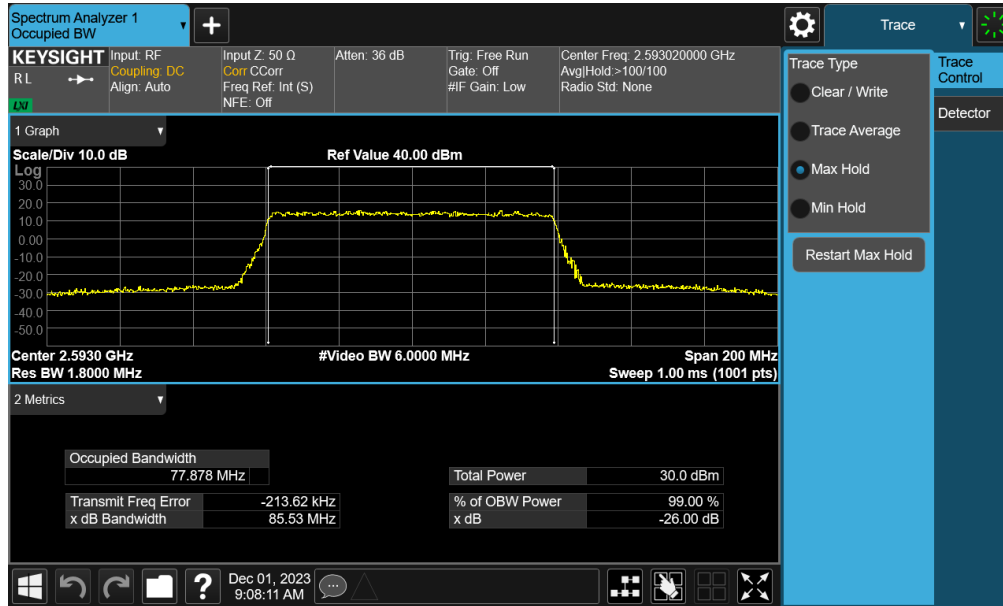


Plot 7-15. Occupied Bandwidth Plot (NR Band n41 - 80MHz $\pi/2$ BPSK - Full RB Configuration - Ant1)

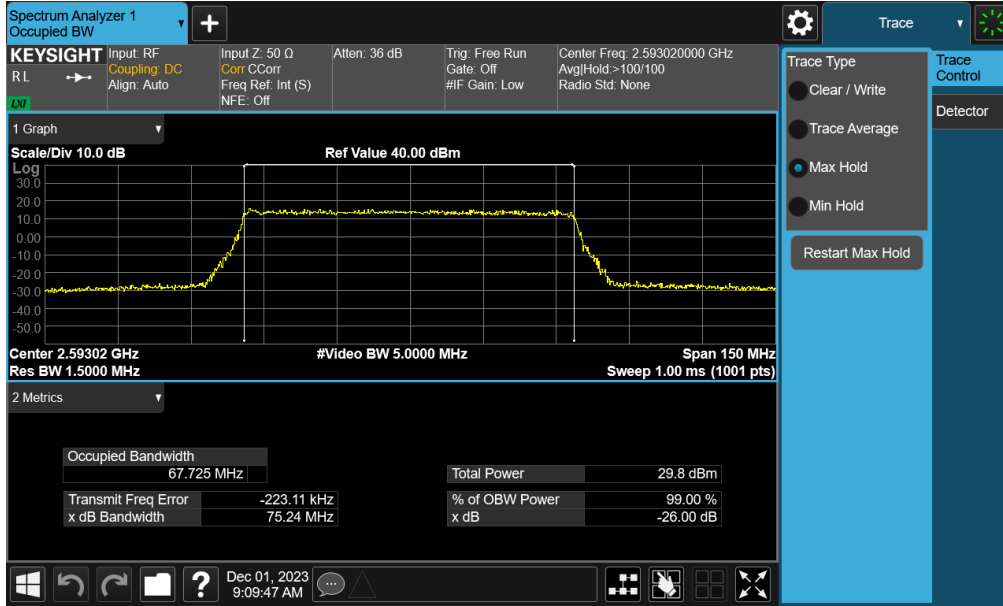


Plot 7-16. Occupied Bandwidth Plot (NR Band n41 - 80MHz QPSK - Full RB Configuration - Ant1)

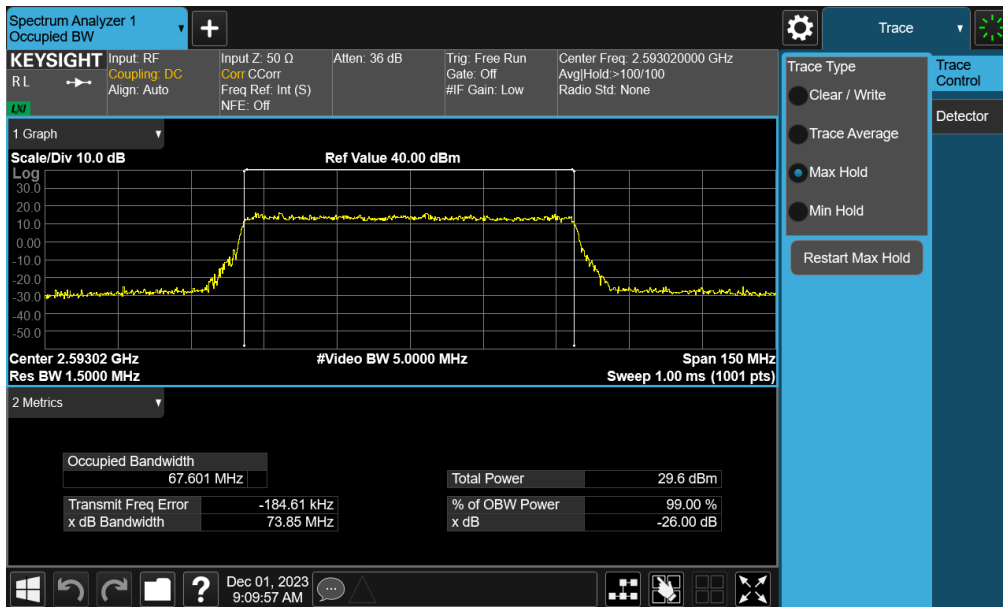
FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 24 of 98



FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 25 of 98

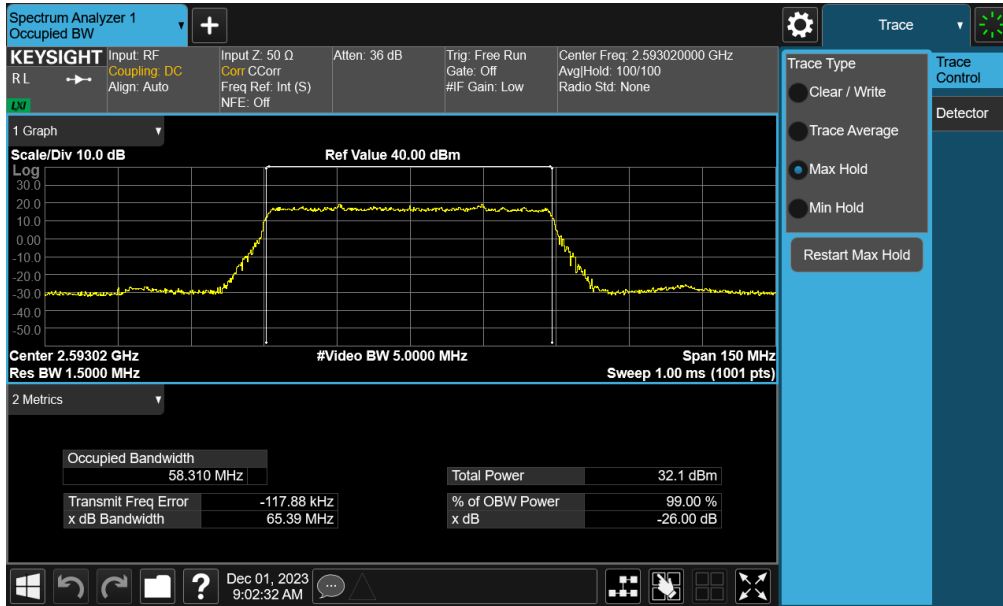


Plot 7-19. Occupied Bandwidth Plot (NR Band n41 - 70MHz QPSK - Full RB Configuration - Ant1)

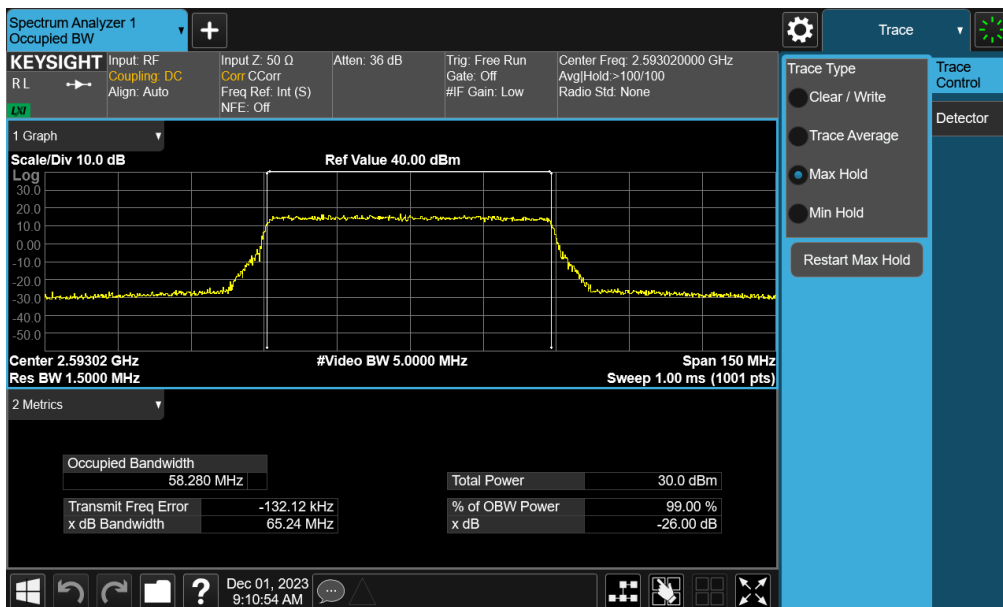


Plot 7-20. Occupied Bandwidth Plot (NR Band n41 - 70MHz 16-QAM - Full RB Configuration - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 26 of 98

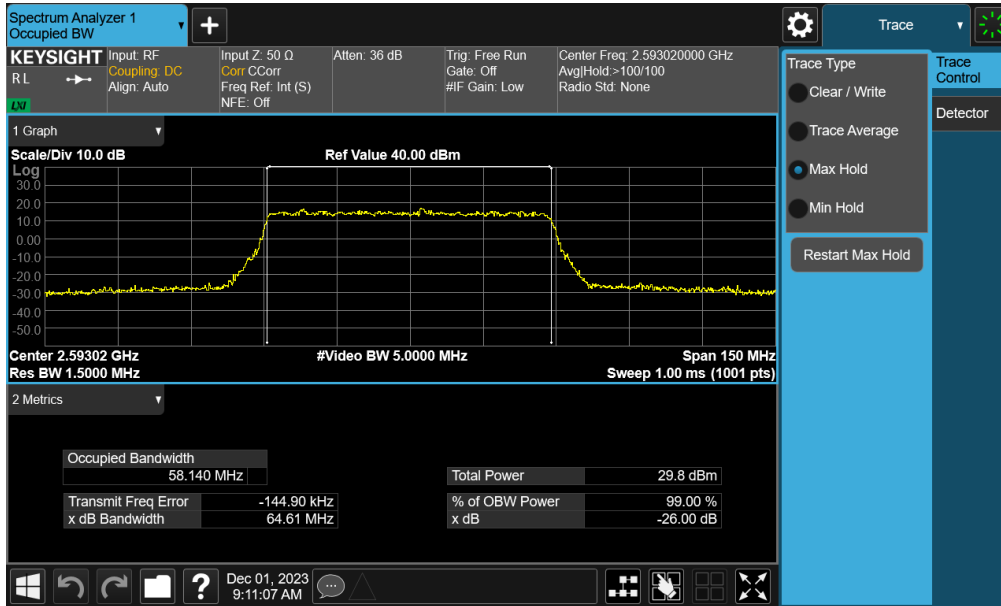


Plot 7-21. Occupied Bandwidth Plot (NR Band n41 - 60MHz $\pi/2$ BPSK - Full RB Configuration - Ant1)

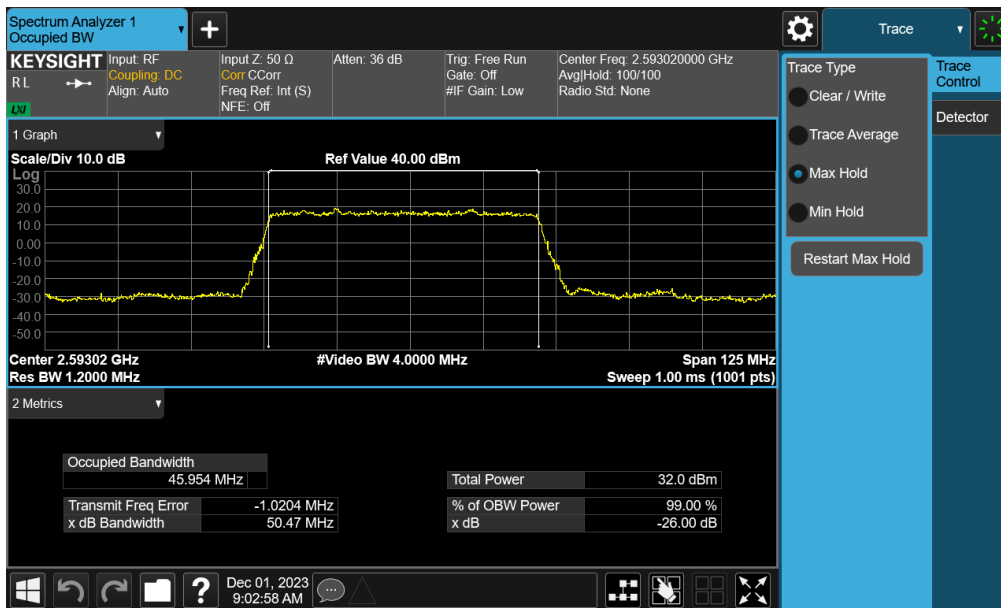


Plot 7-22. Occupied Bandwidth Plot (NR Band n41 - 60MHz QPSK - Full RB Configuration - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 27 of 98

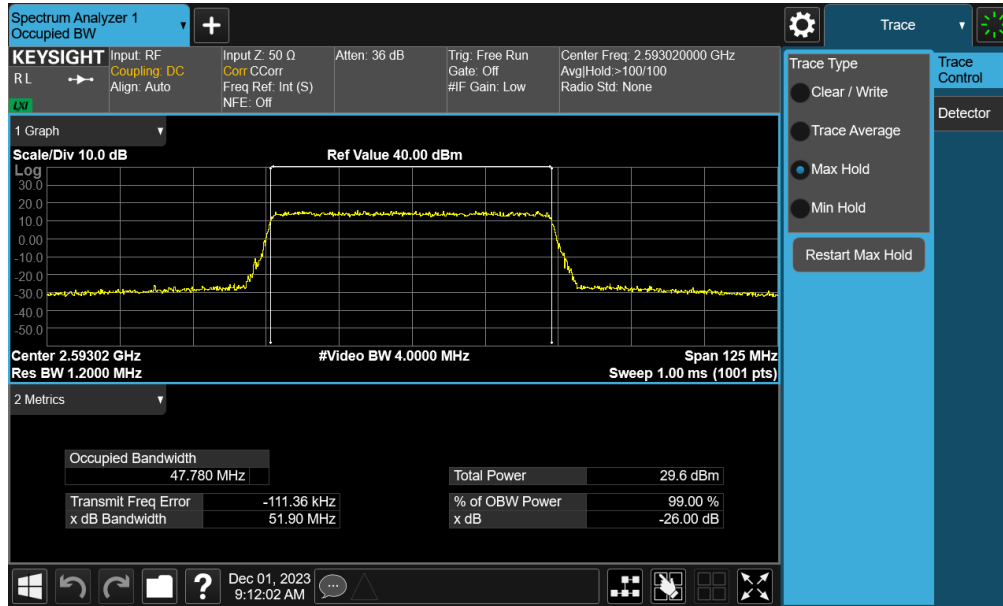


Plot 7-23. Occupied Bandwidth Plot (NR Band n41 - 60MHz 16-QAM - Full RB Configuration - Ant1)

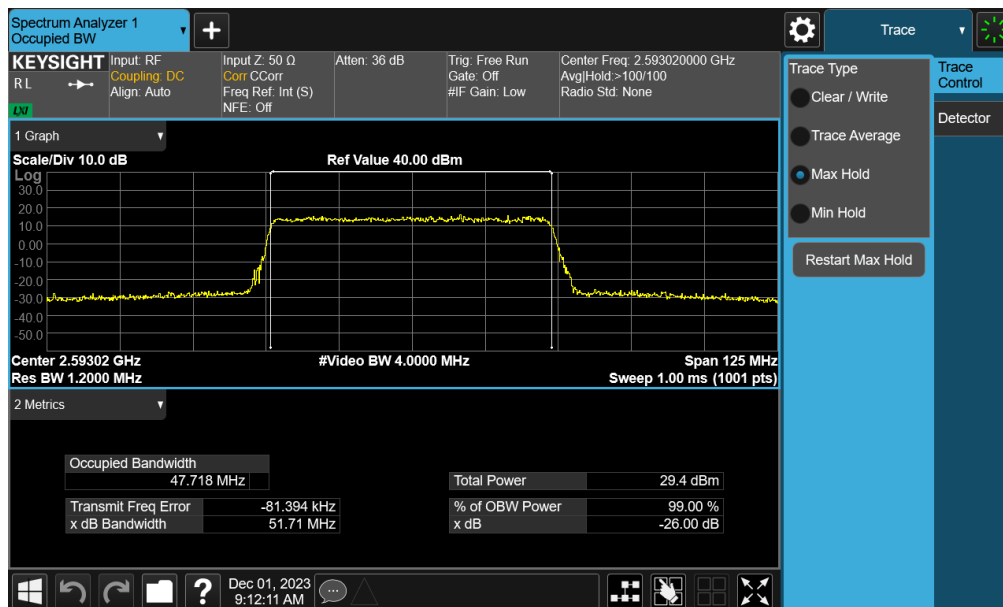


Plot 7-24. Occupied Bandwidth Plot (NR Band n41 - 50MHz $\pi/2$ BPSK - Full RB Configuration - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 28 of 98

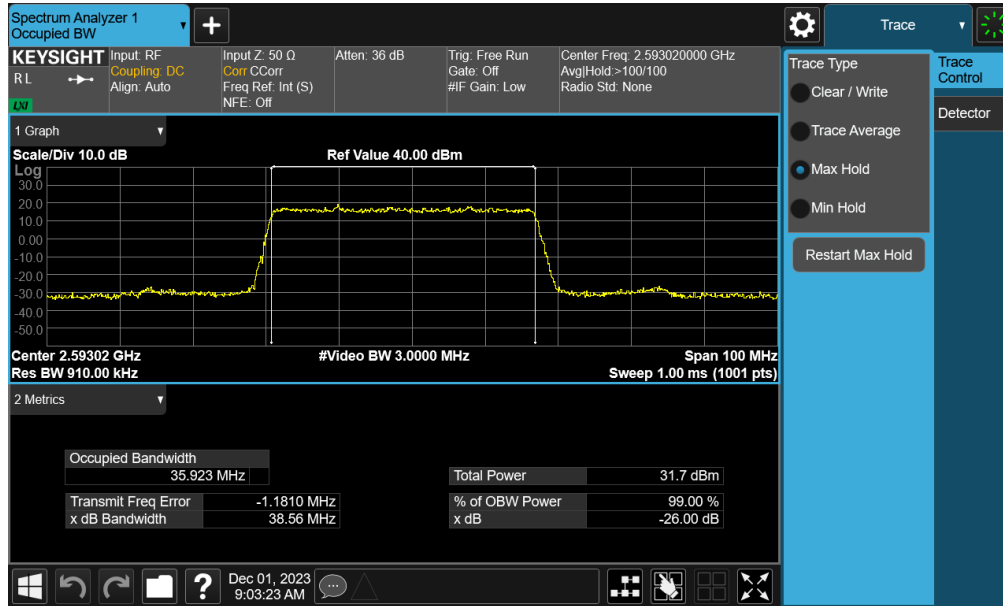


Plot 7-25. Occupied Bandwidth Plot (NR Band n41 - 50MHz QPSK - Full RB Configuration - Ant1)

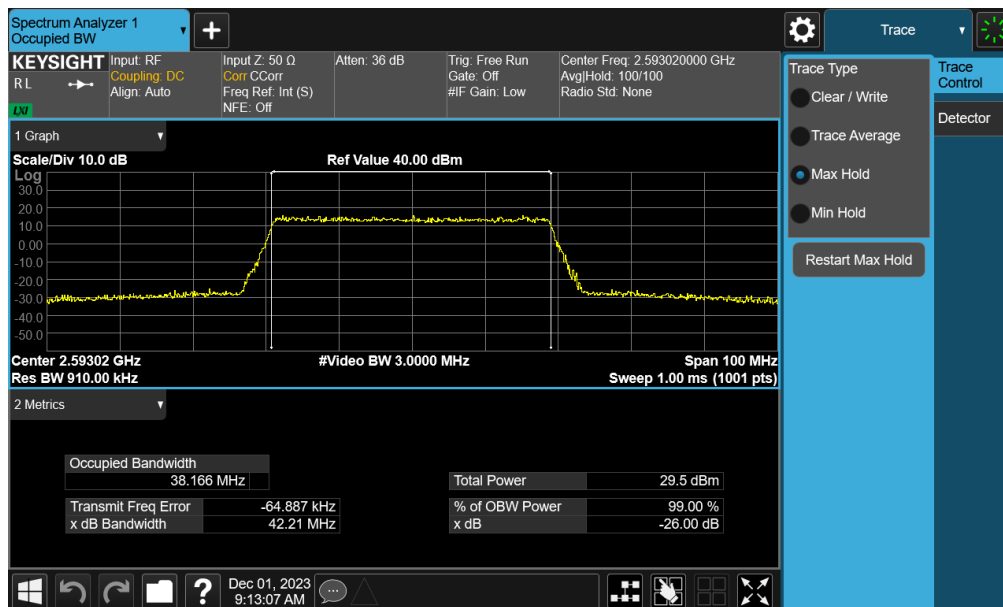


Plot 7-26. Occupied Bandwidth Plot (NR Band n41 - 50MHz 16-QAM - Full RB Configuration - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 29 of 98

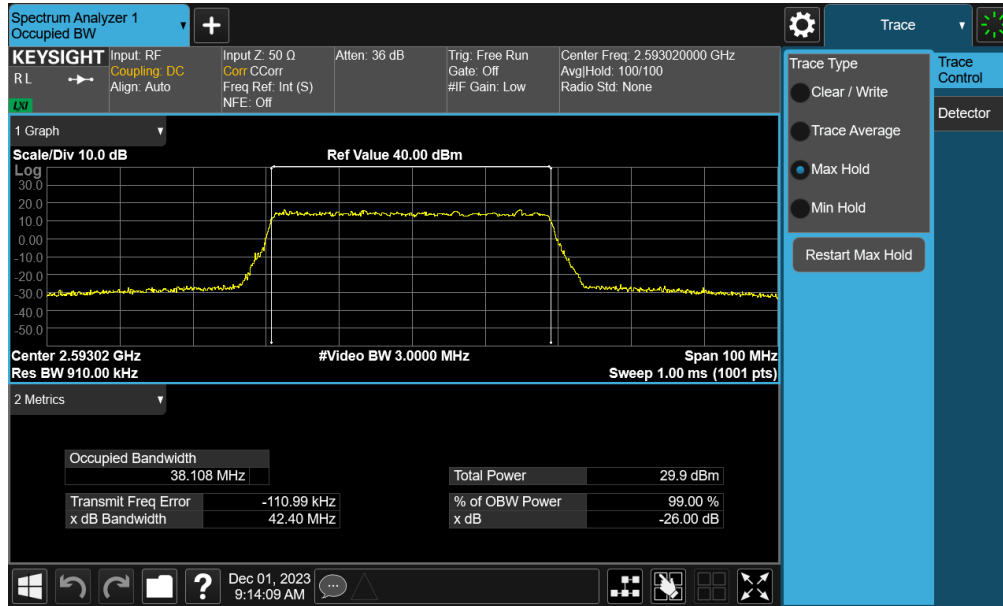


Plot 7-27. Occupied Bandwidth Plot (NR Band n41 - 40MHz $\pi/2$ BPSK - Full RB Configuration - Ant1)

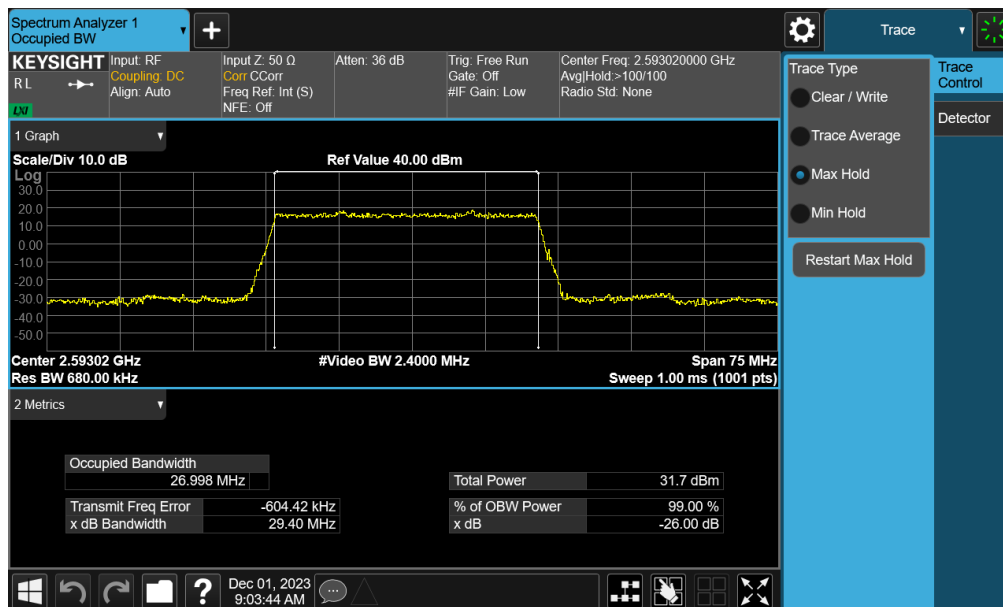


Plot 7-28. Occupied Bandwidth Plot (NR Band n41 - 40MHz QPSK - Full RB Configuration - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 30 of 98

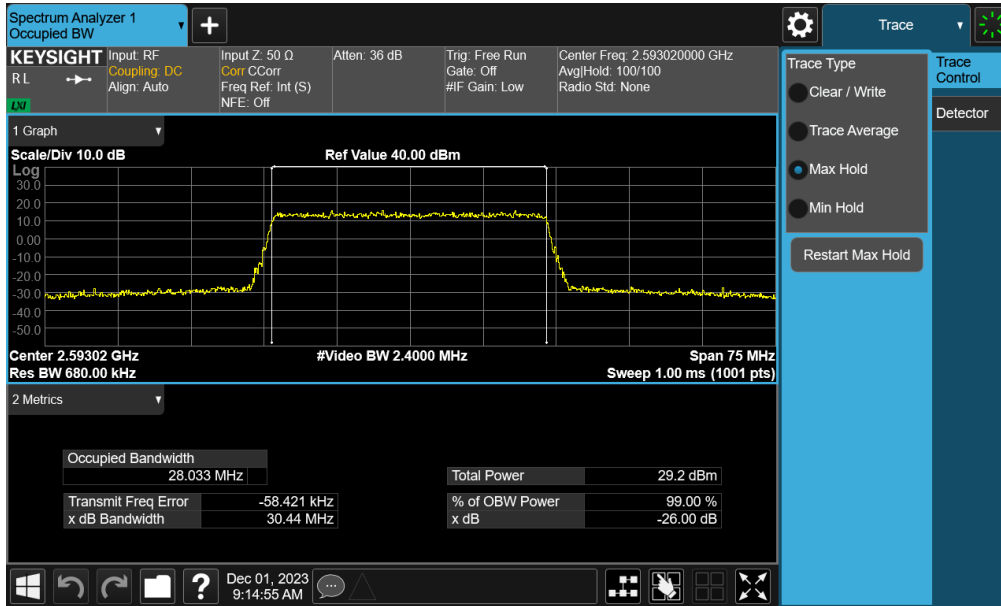


Plot 7-29. Occupied Bandwidth Plot (NR Band n41 - 40MHz 16-QAM - Full RB Configuration - Ant1)

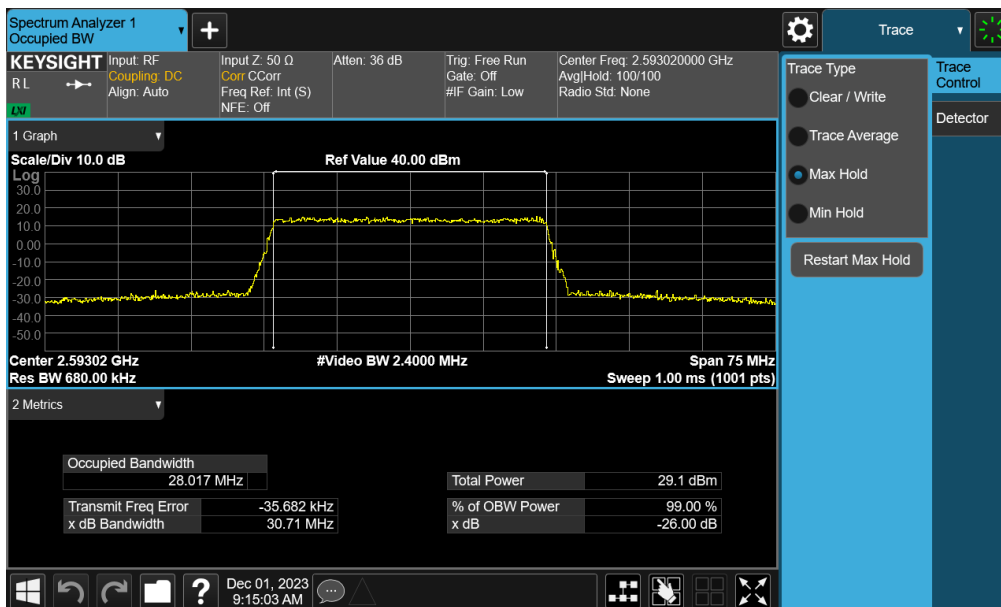


Plot 7-30. Occupied Bandwidth Plot (NR Band n41 - 30MHz $\pi/2$ BPSK - Full RB Configuration - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 31 of 98

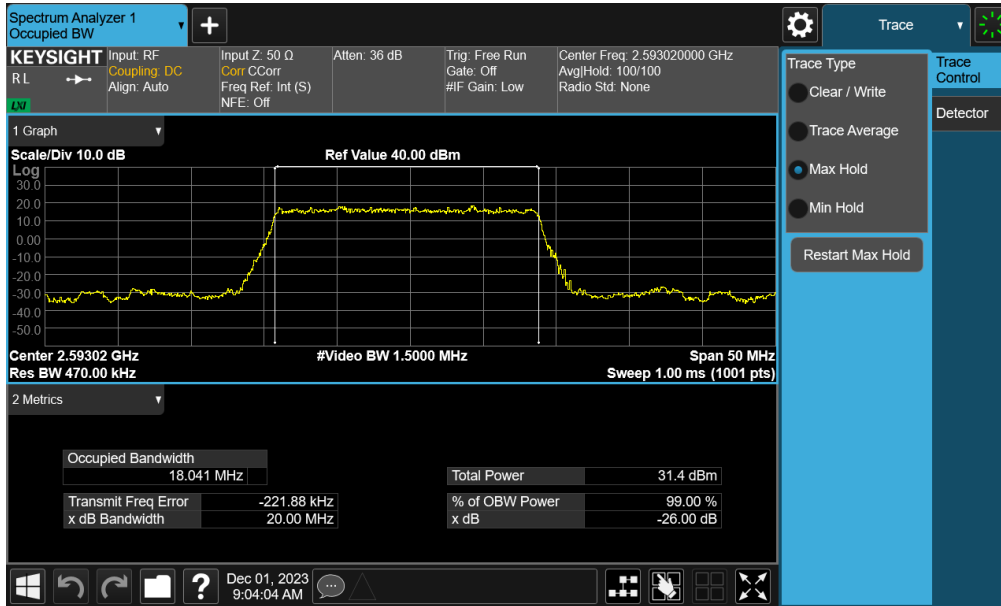


Plot 7-31. Occupied Bandwidth Plot (NR Band n41 - 30MHz QPSK - Full RB Configuration - Ant1)

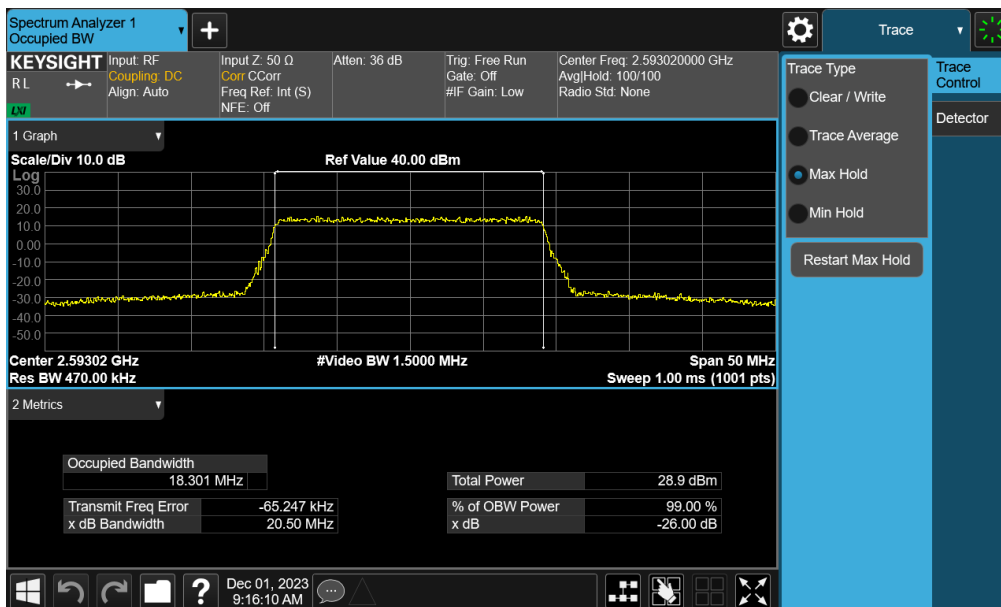


Plot 7-32. Occupied Bandwidth Plot (NR Band n41 - 30MHz 16-QAM - Full RB Configuration - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 32 of 98

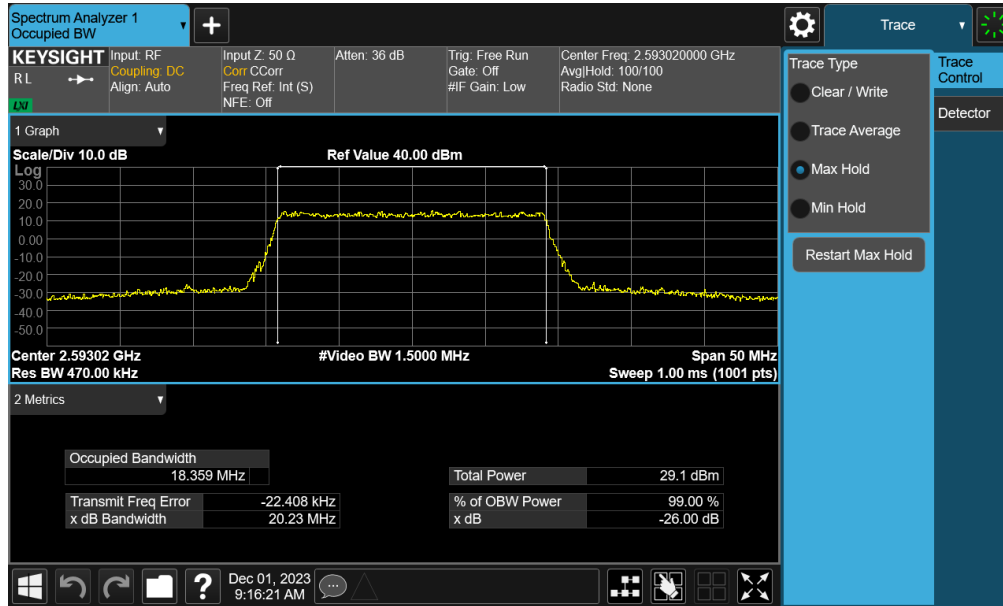


Plot 7-33. Occupied Bandwidth Plot (NR Band n41 - 20MHz $\pi/2$ BPSK - Full RB Configuration - Ant1)

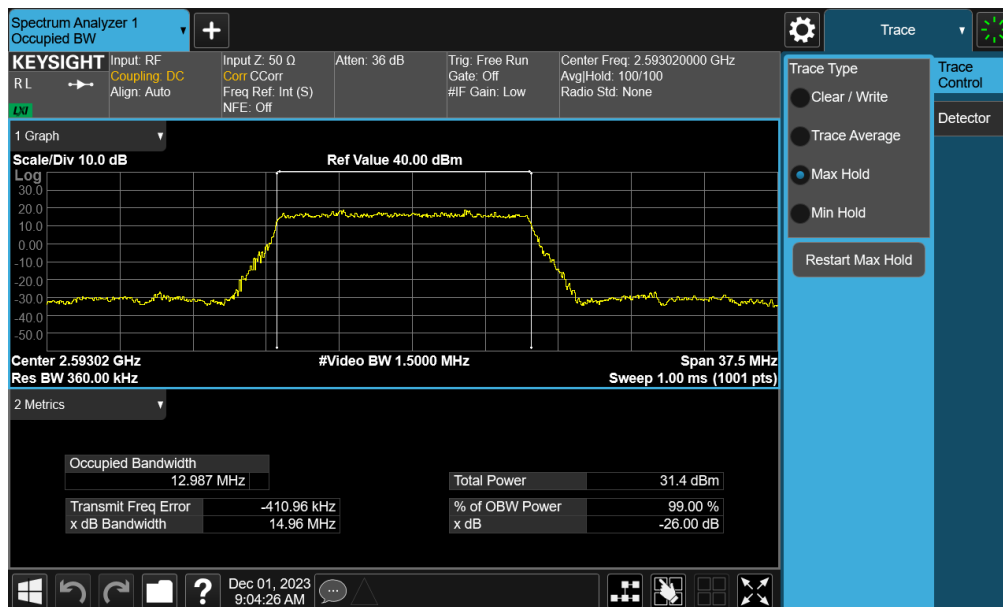


Plot 7-34. Occupied Bandwidth Plot (NR Band n41 - 20MHz QPSK - Full RB Configuration - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 33 of 98

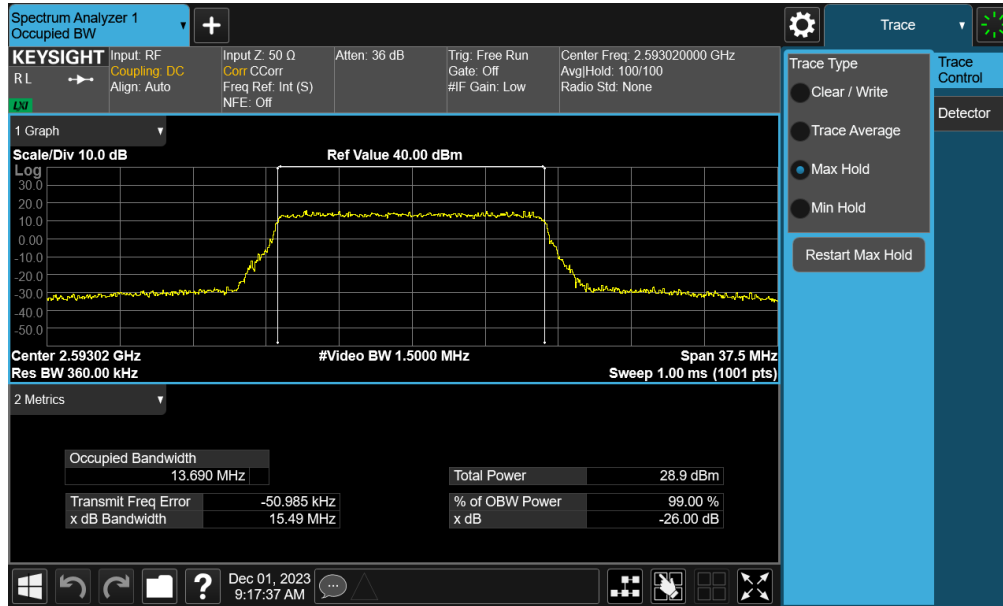


Plot 7-35. Occupied Bandwidth Plot (NR Band n41 - 20MHz 16-QAM - Full RB Configuration - Ant1)

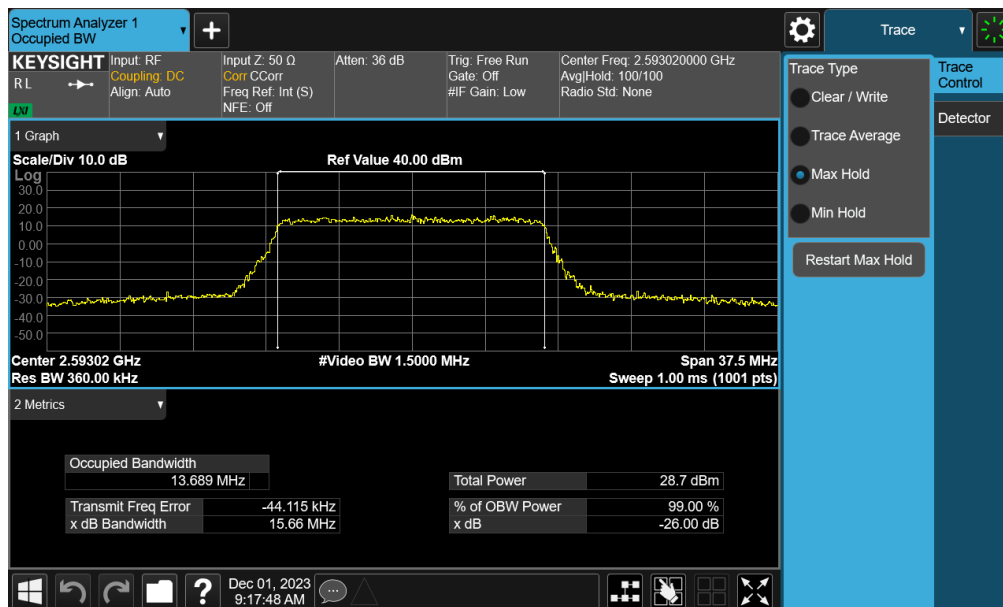


Plot 7-36. Occupied Bandwidth Plot (NR Band n41 - 15MHz $\pi/2$ BPSK - Full RB Configuration - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 34 of 98

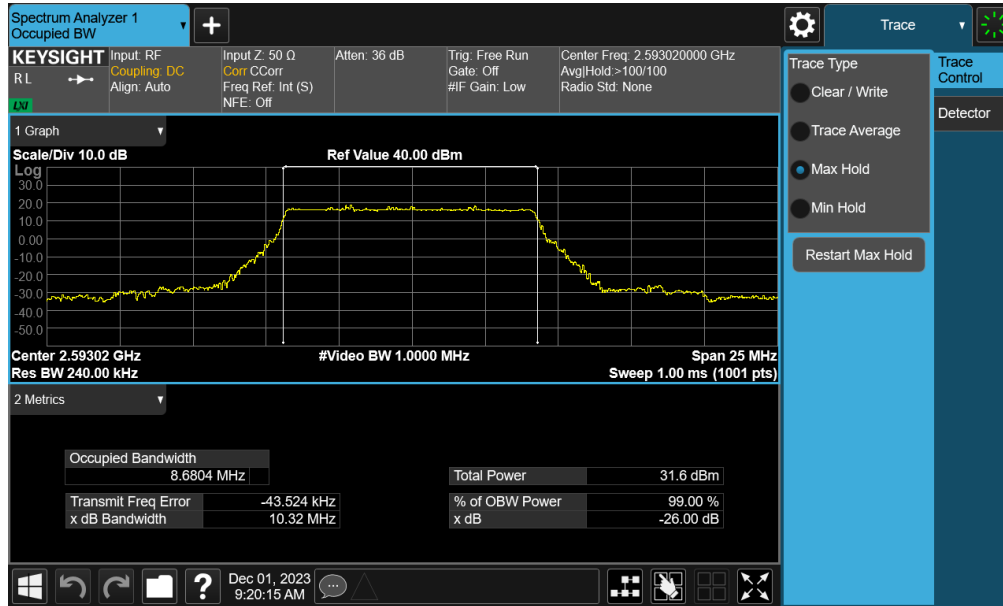


Plot 7-37. Occupied Bandwidth Plot (NR Band n41 - 15MHz QPSK - Full RB Configuration - Ant1)

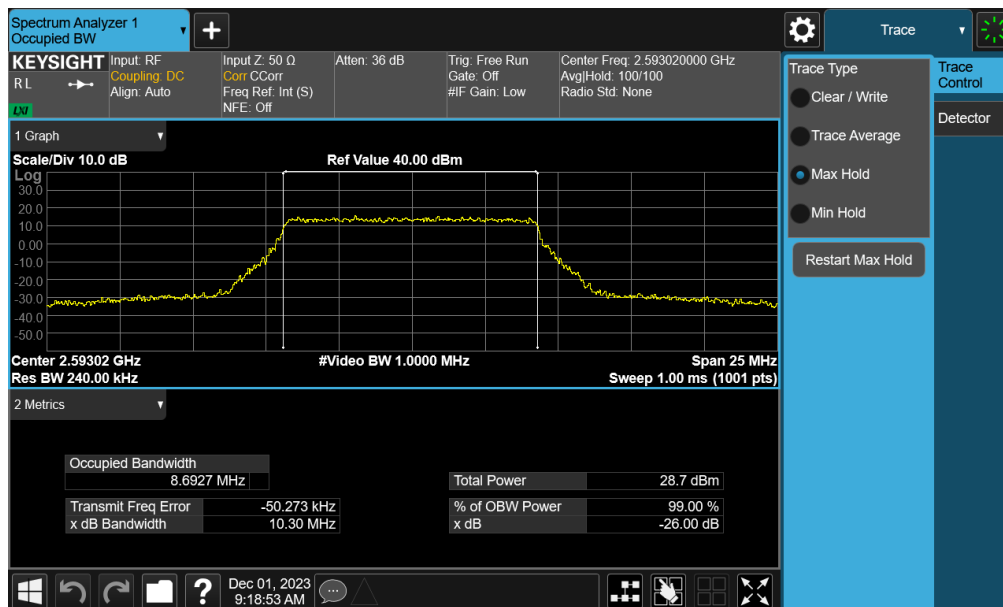


Plot 7-38. Occupied Bandwidth Plot (NR Band n41 - 15MHz 16-QAM - Full RB Configuration - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 35 of 98

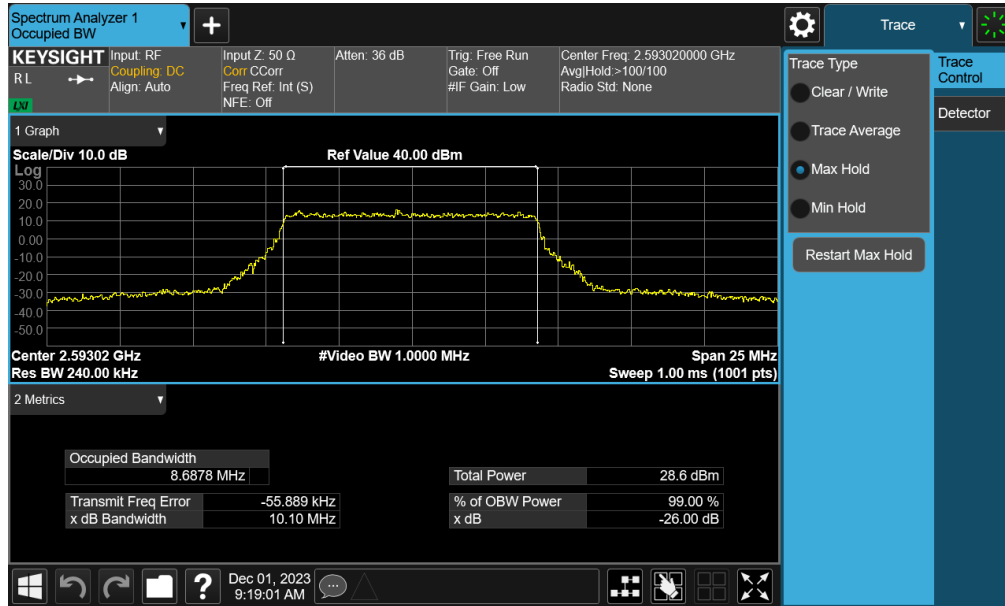


Plot 7-39. Occupied Bandwidth Plot (NR Band n41 - 10MHz $\pi/2$ BPSK - Full RB Configuration - Ant1)



Plot 7-40. Occupied Bandwidth Plot (NR Band n41 - 10MHz QPSK - Full RB Configuration - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 36 of 98



Plot 7-41. Occupied Bandwidth Plot (NR Band n41 - 10MHz 16-QAM - Full RB Configuration - Ant1)

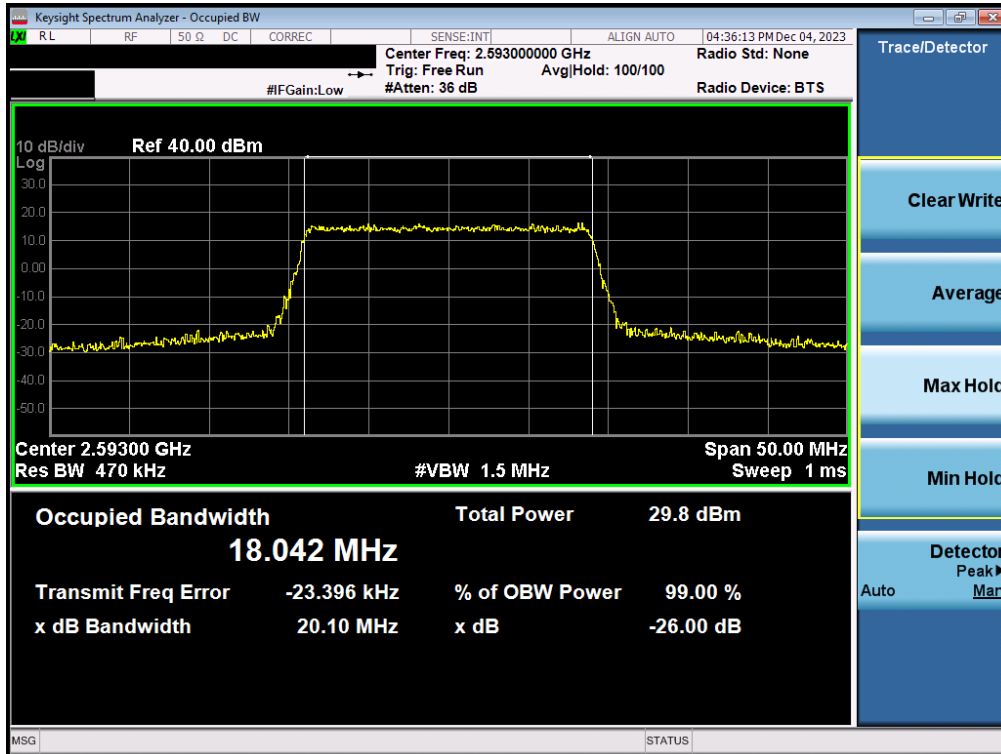
FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 37 of 98

Mode	Bandwidth	Modulation	OBW [MHz]
LTE Band 41(PC3)	20 MHz	QPSK	18.04
		16QAM	18.06
	15 MHz	QPSK	13.52
		16QAM	13.51
	10 MHz	QPSK	9.04
		16QAM	9.05
	5 MHz	QPSK	4.54
		16QAM	4.54

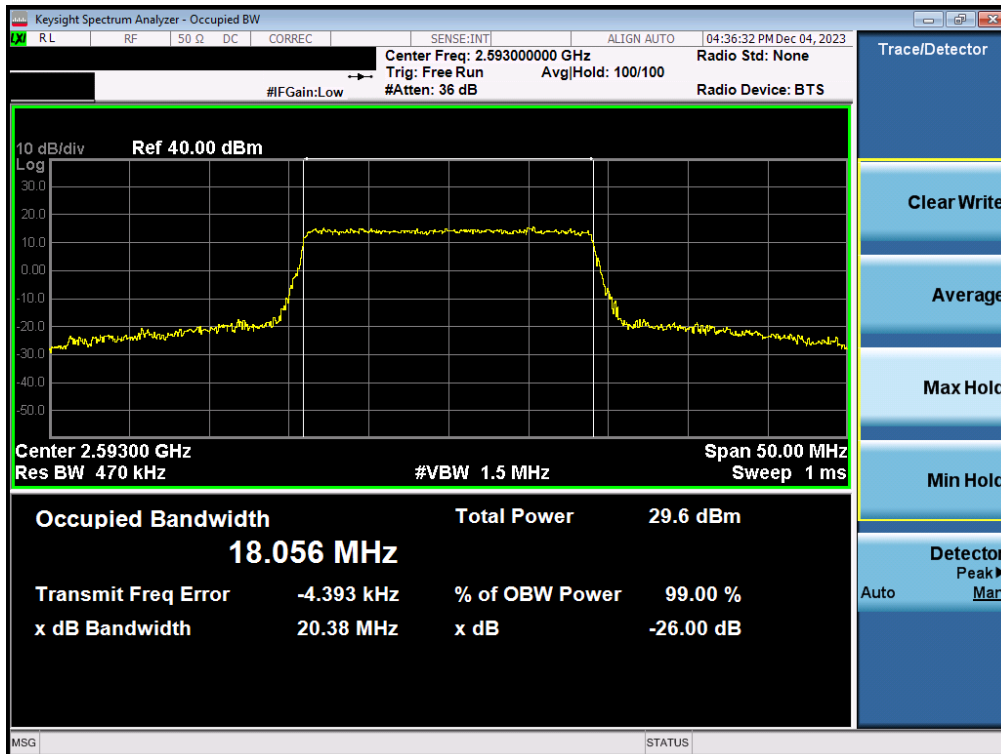
Table 7-9. Occupied Bandwidth Result – LTE – Ant2

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 38 of 98

LTE Band 41 – Ant2

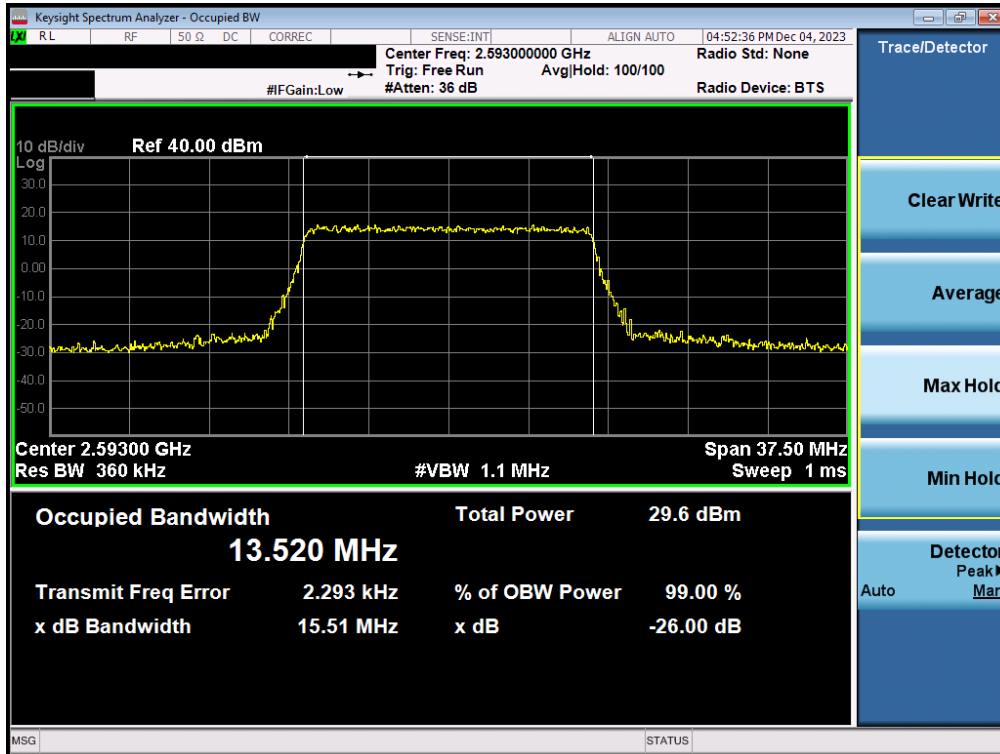


Plot 7-42. Occupied Bandwidth Plot (LTE Band 41 - 20MHz QPSK - Full RB - Ant2)

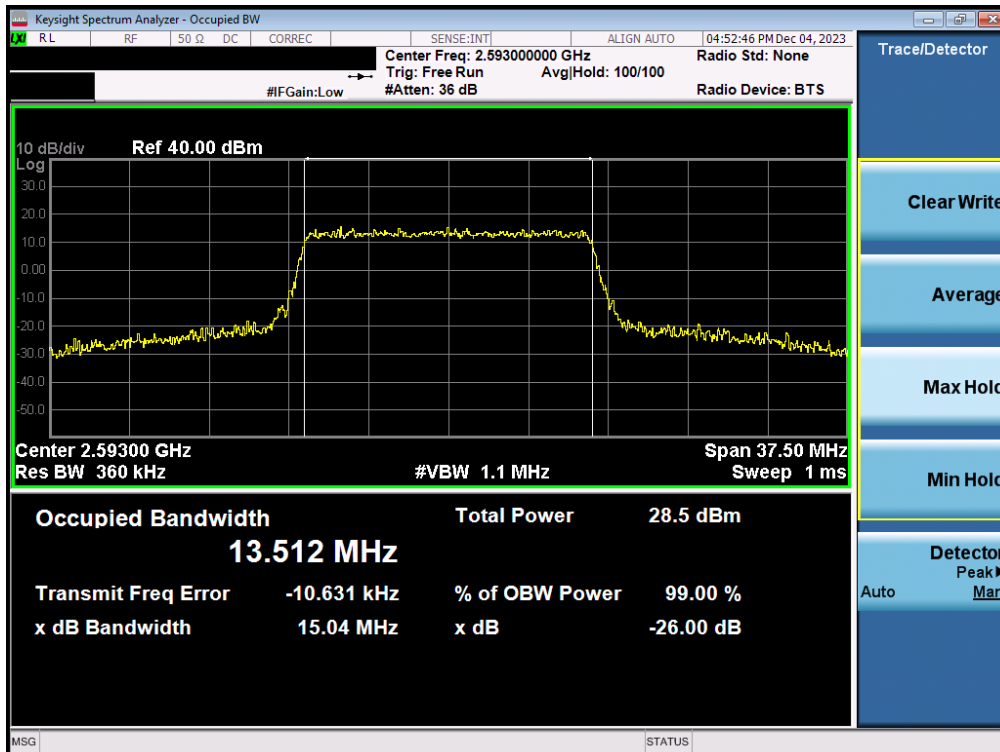


Plot 7-43. Occupied Bandwidth Plot (LTE Band 41 - 20MHz 16-QAM - Full RB - Ant2)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 39 of 98

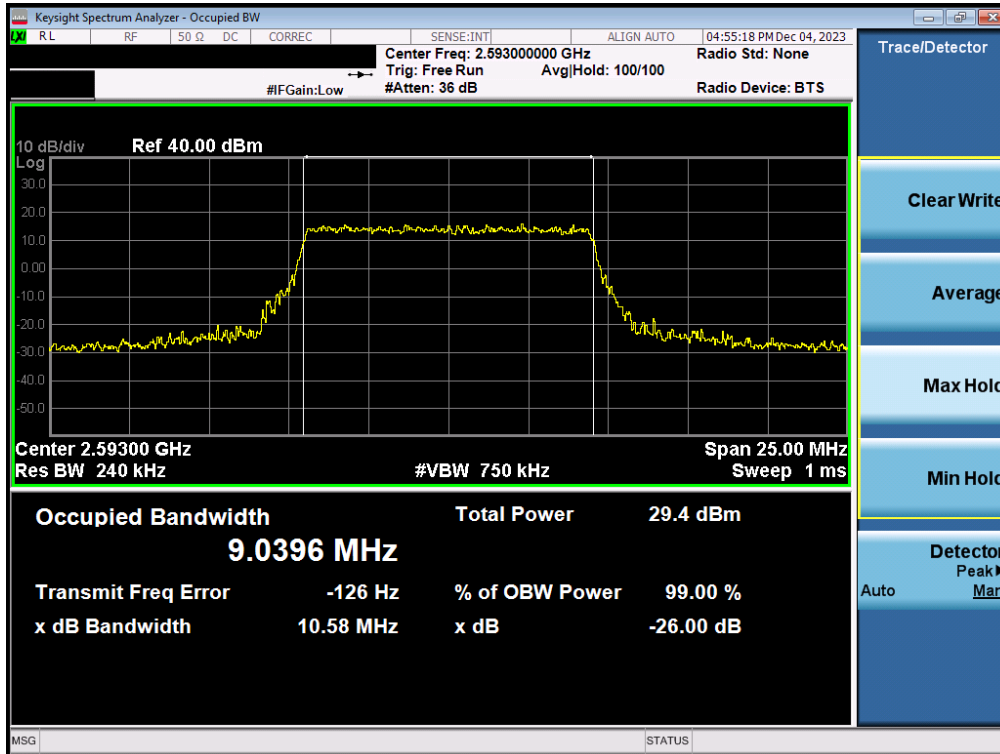


Plot 7-44. Occupied Bandwidth Plot (LTE Band 41 - 15MHz QPSK - Full RB - Ant2)

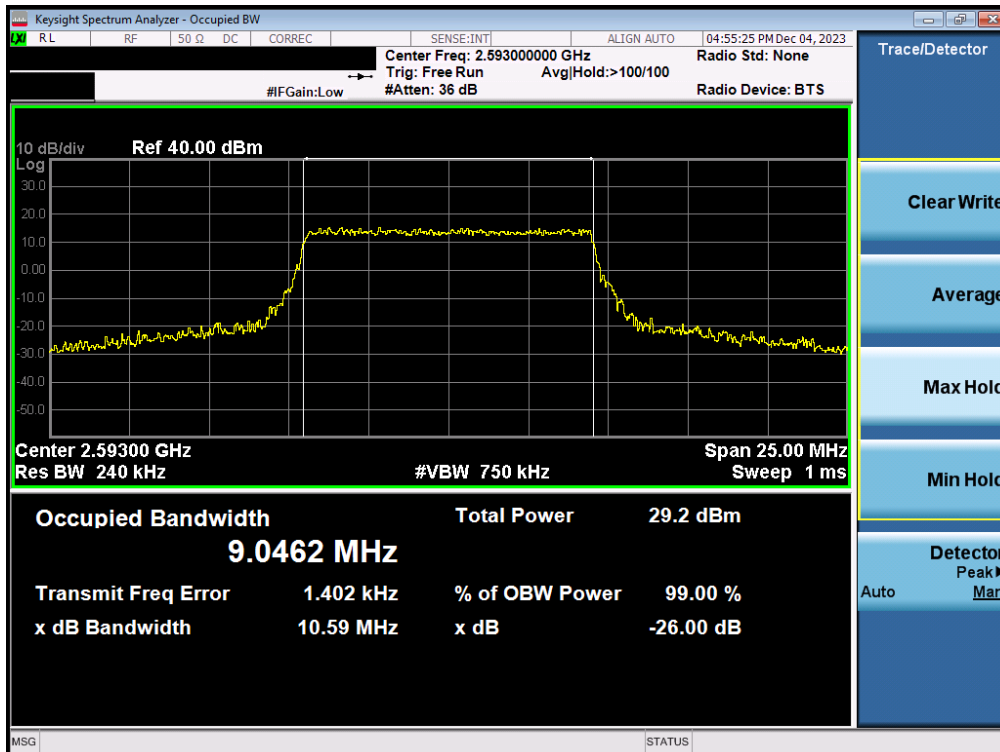


Plot 7-45. Occupied Bandwidth Plot (LTE Band 41 - 15MHz 16-QAM - Full RB - Ant2)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 40 of 98

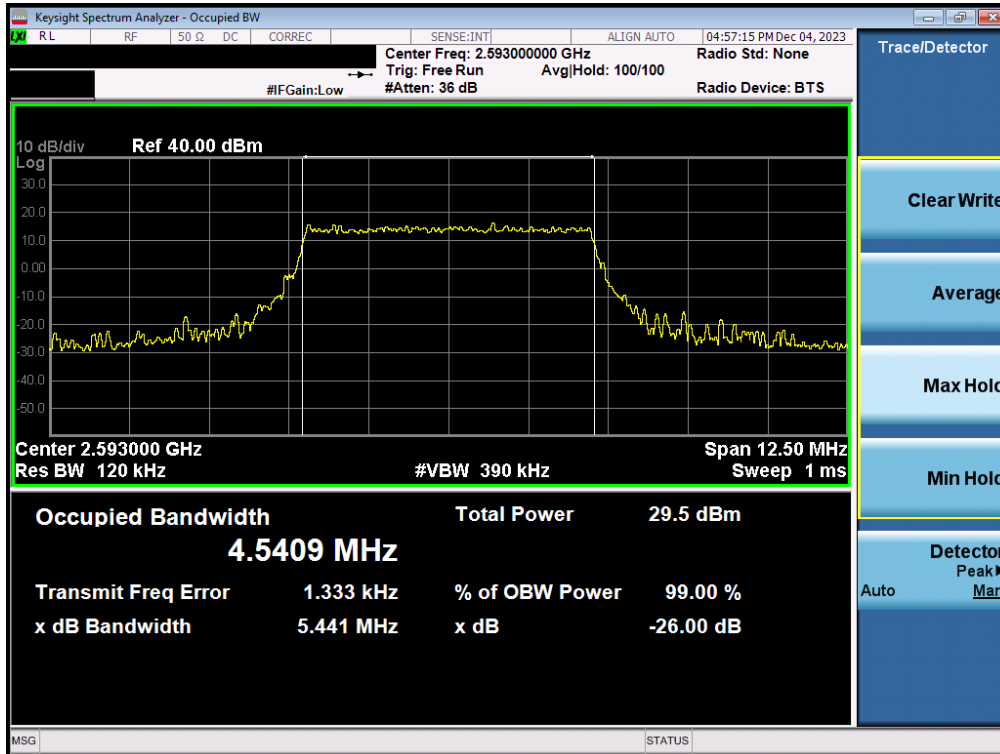


Plot 7-46. Occupied Bandwidth Plot (LTE Band 41 - 10MHz QPSK - Full RB - Ant2)

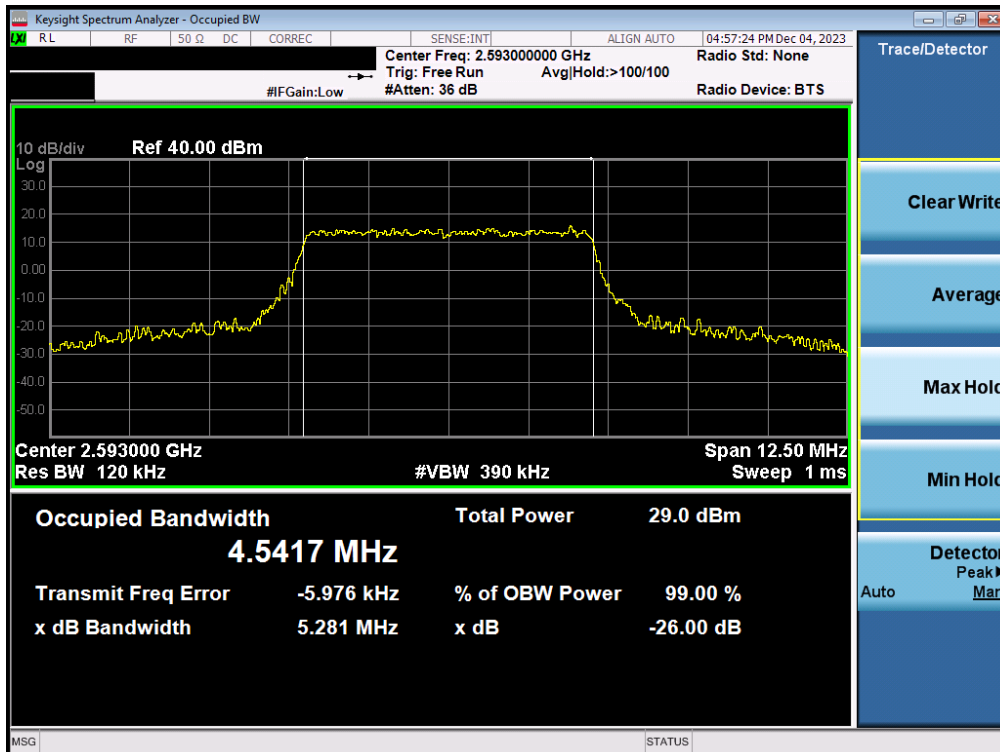


Plot 7-47. Occupied Bandwidth Plot (LTE Band 41 - 10MHz 16-QAM - Full RB - Ant2)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 41 of 98



Plot 7-48. Occupied Bandwidth Plot (LTE Band 41 - 5MHz QPSK - Full RB - Ant2)



Plot 7-49. Occupied Bandwidth Plot (LTE Band 41 - 5MHz 16-QAM - Full RB - Ant2)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 42 of 98

7.4 Spurious and Harmonic Emissions at Antenna Terminal

Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating 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.

The minimum permissible attenuation level of any spurious emission is $43 + 10 \log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

For Band 41, the minimum permissible attenuation level of any spurious emission is $55 + 10 \log_{10}(P_{[Watts]})$.

Test Procedure Used

ANSI C63.26-2015 – Section 5.7.4

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 10GHz (separated into at least two plots per channel)
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.

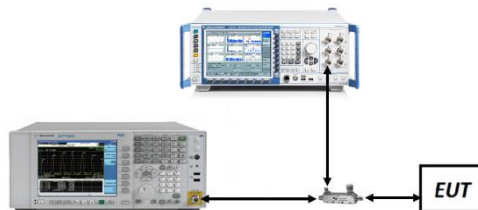


Figure 7-3. Test Instrument & Measurement Setup

Test Notes

1. Per Part 27, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz.
2. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) 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.

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 43 of 98

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
LTE-B41 PC3	20MHz	Low	30.0 - 2475.0	-43.29	-25	-18.29
		Low	2690.0 - 15000.0	-37.18	-25	-12.18
		Low	15000.0 - 27000.0	-51.45	-25	-26.45
		Mid	30.0 - 2500.0	-43.16	-25	-18.16
		Mid	2690.0 - 15000.0	-36.77	-25	-11.77
		Mid	15000.0 - 27000.0	-50.59	-25	-25.59
		High	30.0 - 2500.0	-42.89	-25	-17.89
		High	2690.0 - 15000.0	-36.85	-25	-11.85
		High	15000.0 - 27000.0	-51.11	-25	-26.11

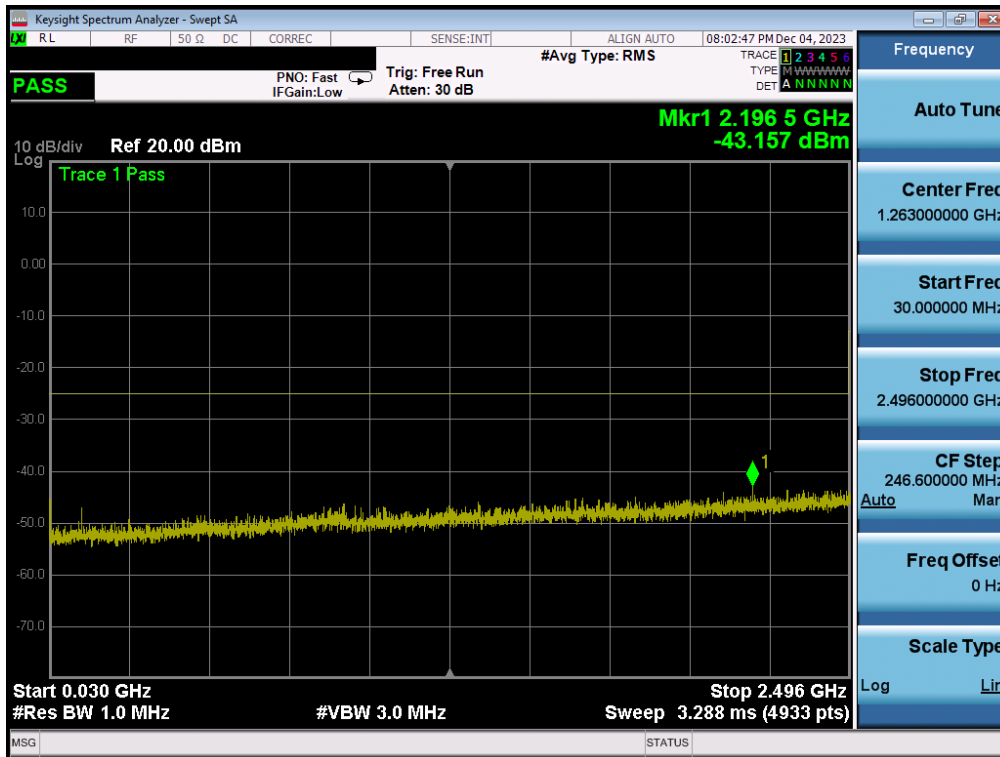
Table 7-10. Conducted Spurious Emission Results – LTE – Ant1

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n41PC3	100MHz	Low	30.0 - 2475.0	-43.61	-25	-18.61
		Low	2690.0 - 15000.0	-37.95	-25	-12.95
		Low	15000.0 - 27000.0	-51.56	-25	-26.56
		Mid	30.0 - 2500.0	-38.39	-25	-13.39
		Mid	2690.0 - 15000.0	-37.60	-25	-12.60
		Mid	15000.0 - 27000.0	-51.32	-25	-26.32
		High	30.0 - 2500.0	-43.51	-25	-18.51
		High	2690.0 - 15000.0	-37.89	-25	-12.89
		High	15000.0 - 27000.0	-52.38	-25	-27.37

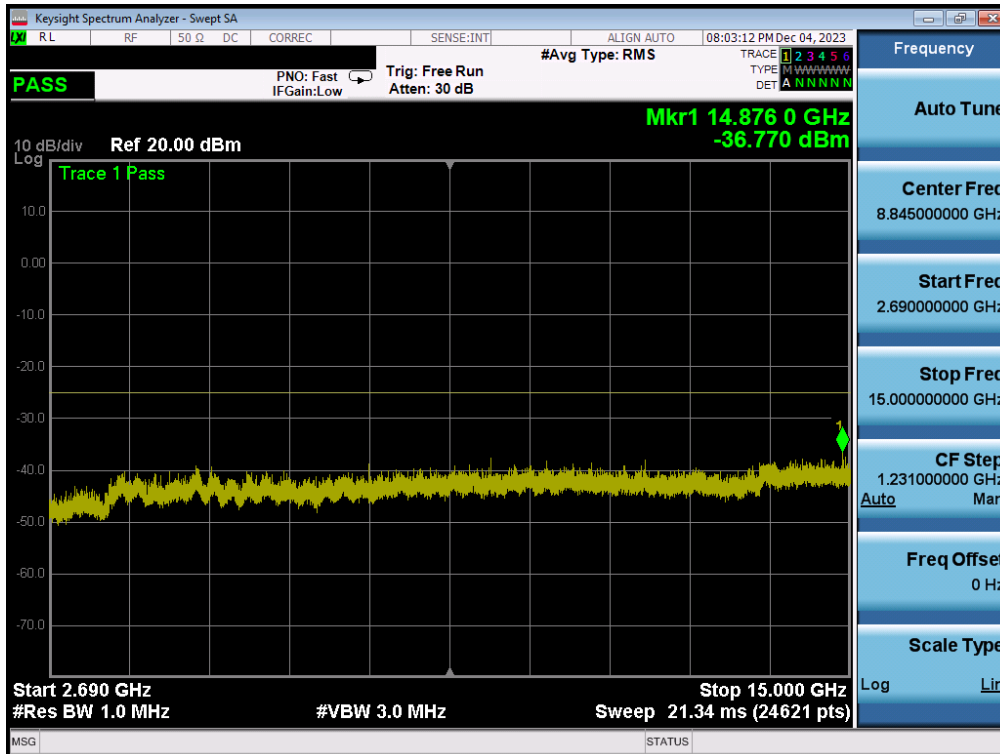
Table 7-11. Conducted Spurious Emission Results – NR – Ant1

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 44 of 98

LTE Band 41 – Ant1

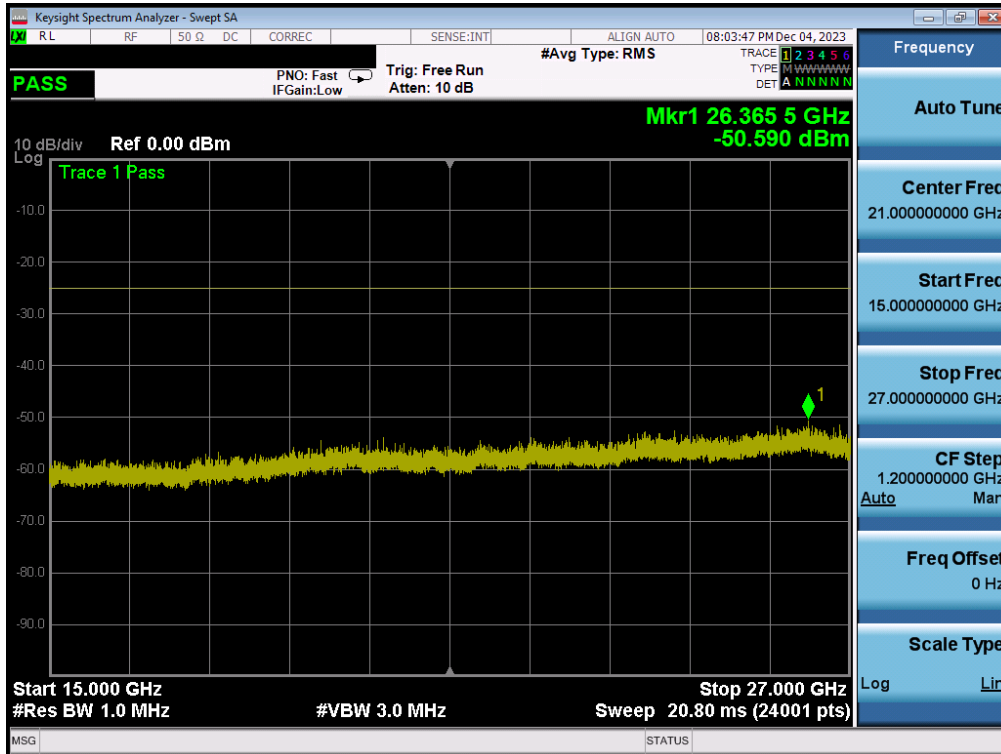


Plot 7-50. Conducted Spurious Plot (LTE Band 41 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant1)



Plot 7-51. Conducted Spurious Plot (LTE Band 41 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant1)

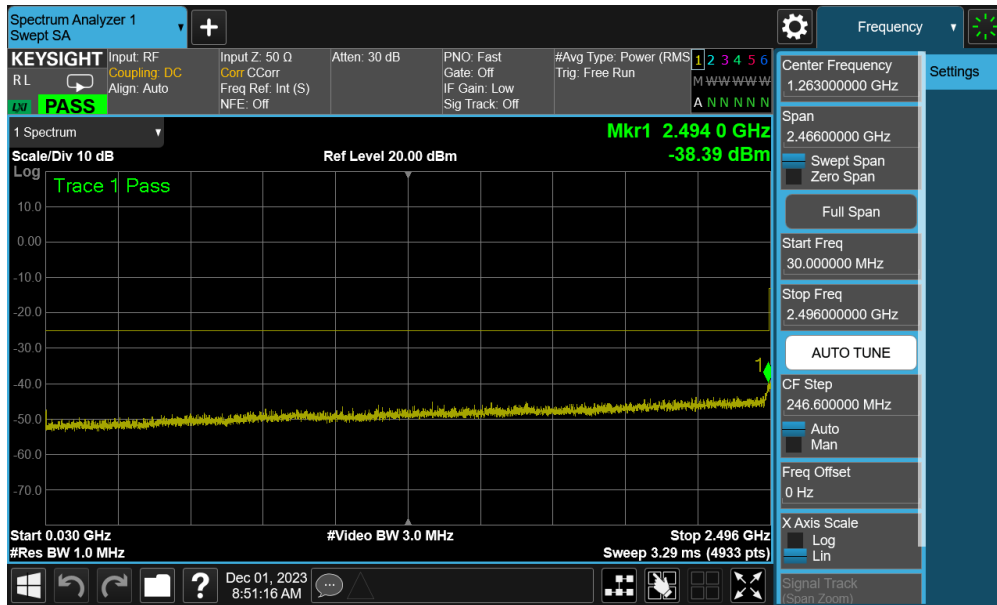
FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 45 of 98



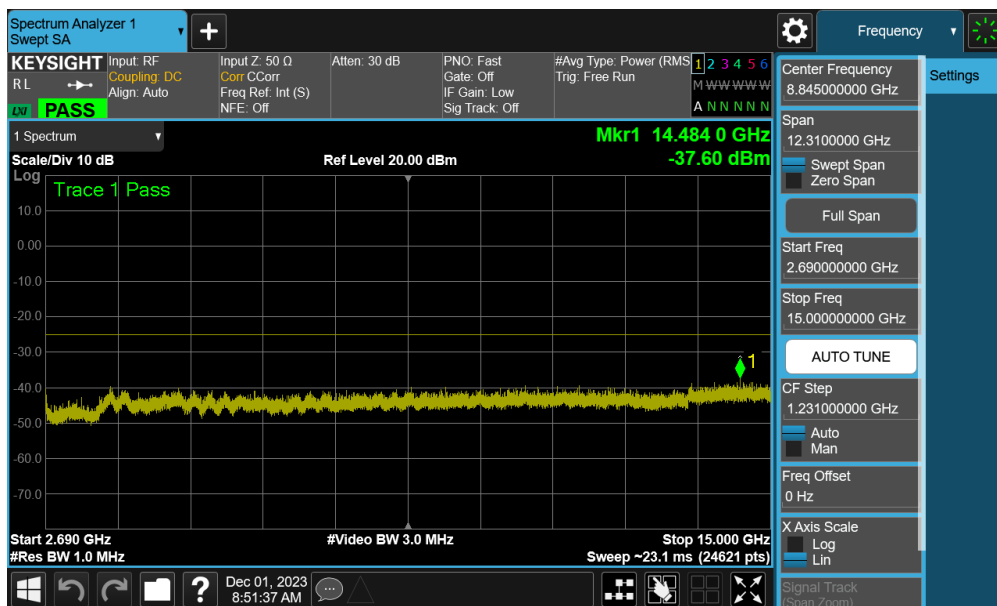
Plot 7-52. Conducted Spurious Plot (LTE Band 41 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 46 of 98

NR Band n41 – Ant1

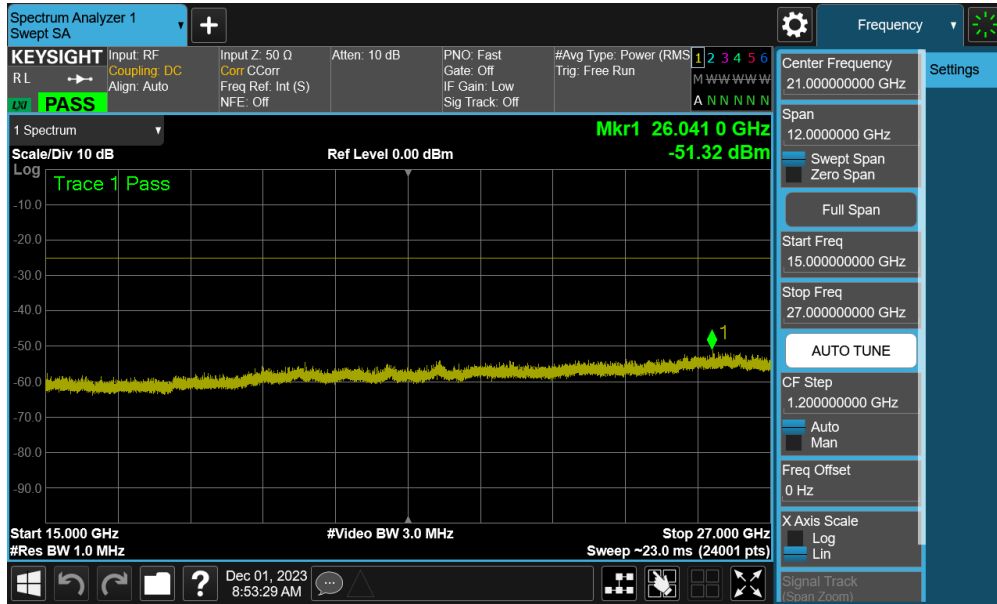


Plot 7-53. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel – Ant1)



Plot 7-54. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel – Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 47 of 98



Plot 7-55. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel – Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 48 of 98

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
LTE-B41 PC3	20MHz	Low	30.0 - 2475.0	-42.38	-25	-17.38
		Low	2690.0 - 15000.0	-37.53	-25	-12.53
		Low	15000.0 - 27000.0	-51.26	-25	-26.26
		Mid	30.0 - 2500.0	-42.12	-25	-17.12
		Mid	2690.0 - 15000.0	-37.42	-25	-12.42
		Mid	15000.0 - 27000.0	-51.47	-25	-26.47
		High	30.0 - 2500.0	-42.53	-25	-17.53
		High	2690.0 - 15000.0	-37.71	-25	-12.71
		High	15000.0 - 27000.0	-50.80	-25	-25.80

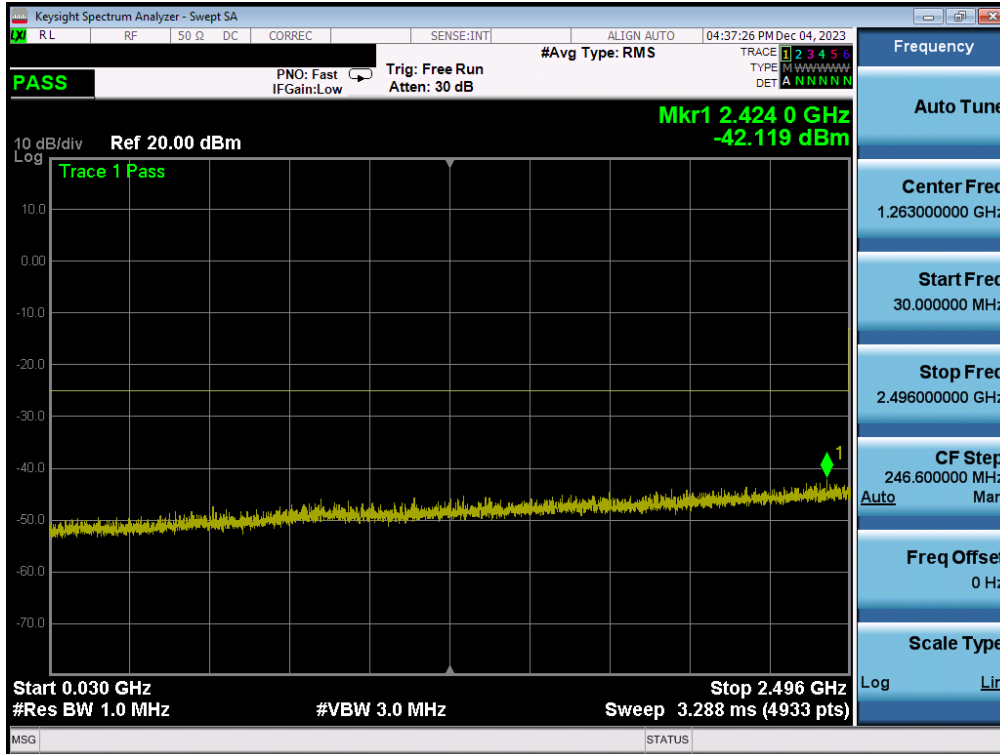
Table 7-12. Conducted Spurious Emission Results – LTE – Ant2

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n41PC3	100MHz	Low	30.0 - 2475.0	-39.60	-25	-14.60
		Low	2690.0 - 15000.0	-44.83	-25	-19.83
		Low	15000.0 - 27000.0	-48.58	-25	-23.58
		Mid	30.0 - 2500.0	-39.77	-25	-14.76
		Mid	2690.0 - 15000.0	-43.94	-25	-18.94
		Mid	15000.0 - 27000.0	-48.55	-25	-23.55
		High	30.0 - 2500.0	-39.97	-25	-14.96
		High	2690.0 - 15000.0	-45.34	-25	-20.34
		High	15000.0 - 27000.0	-48.62	-25	-23.62

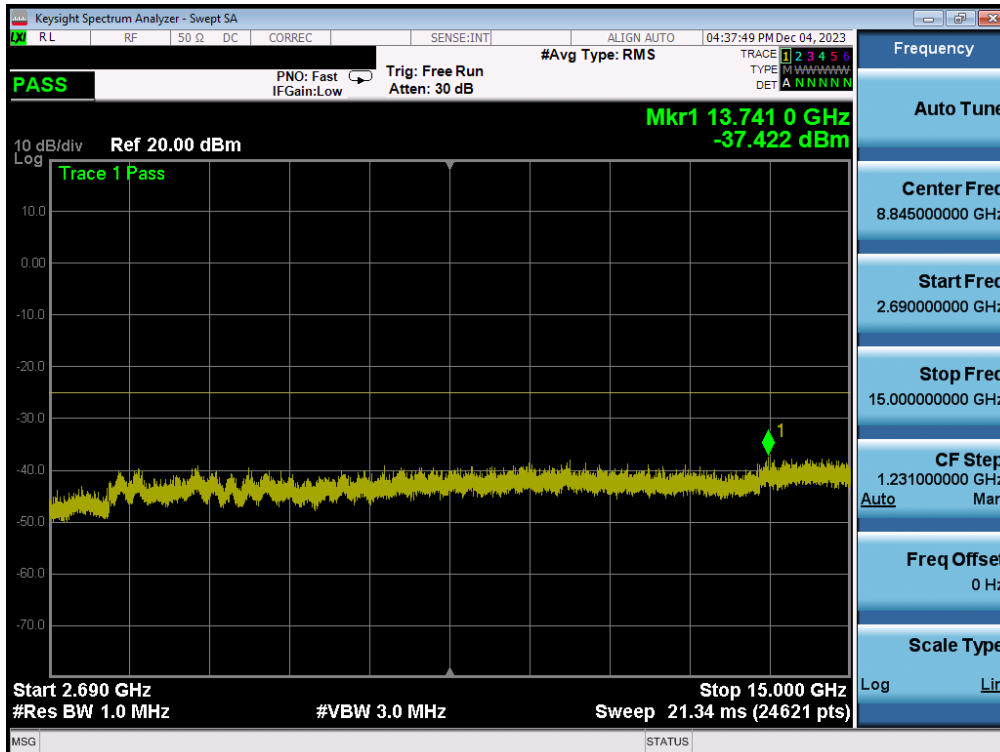
Table 7-13. Conducted Spurious Emission Results – NR – Ant2

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 49 of 98

LTE Band 41 – Ant2

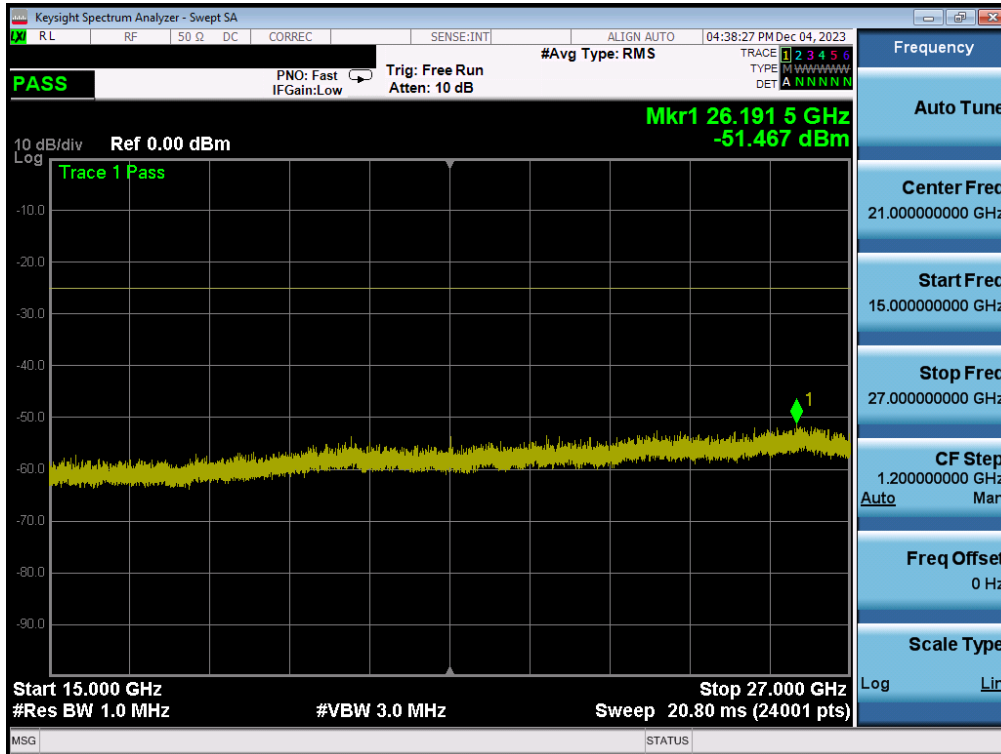


Plot 7-56. Conducted Spurious Plot (LTE Band 41 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant2)



Plot 7-57. Conducted Spurious Plot (LTE Band 41 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant2)

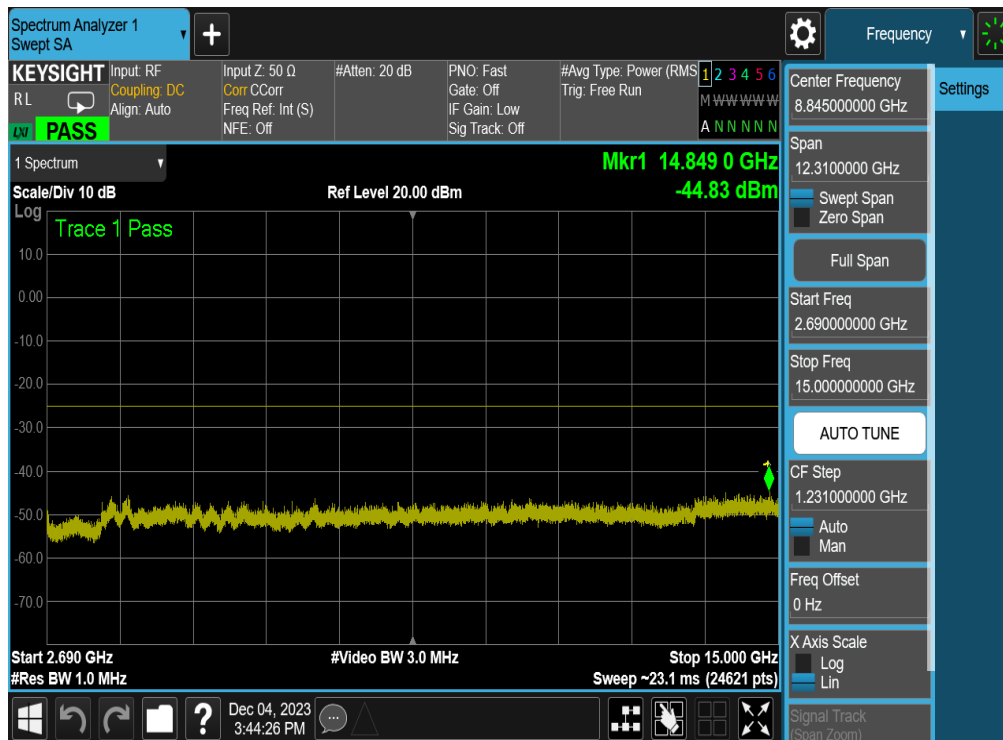
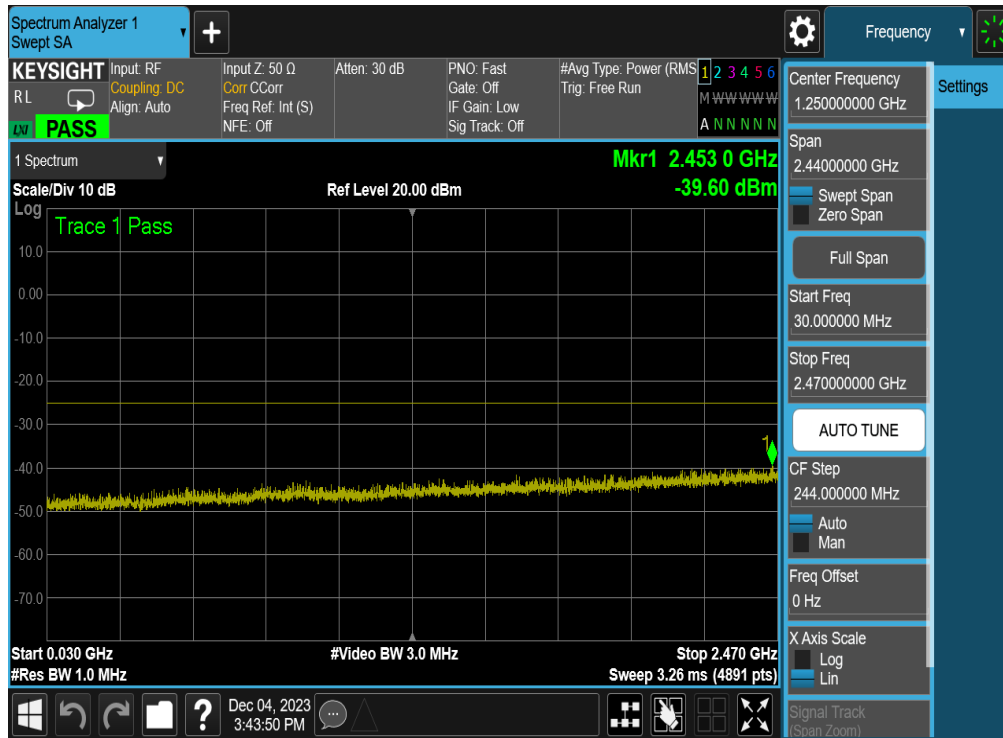
FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 50 of 98



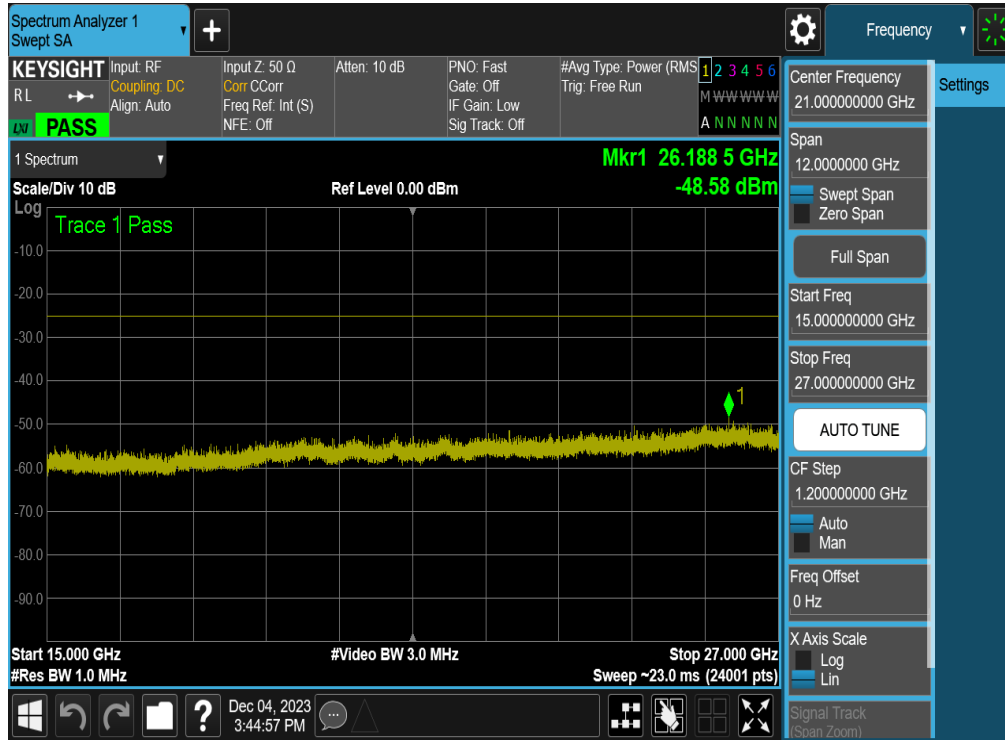
Plot 7-58. Conducted Spurious Plot (LTE Band 41 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant2)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 51 of 98

NR Band n41 – Ant2



FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 52 of 98



Plot 7-61. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel – Ant2)

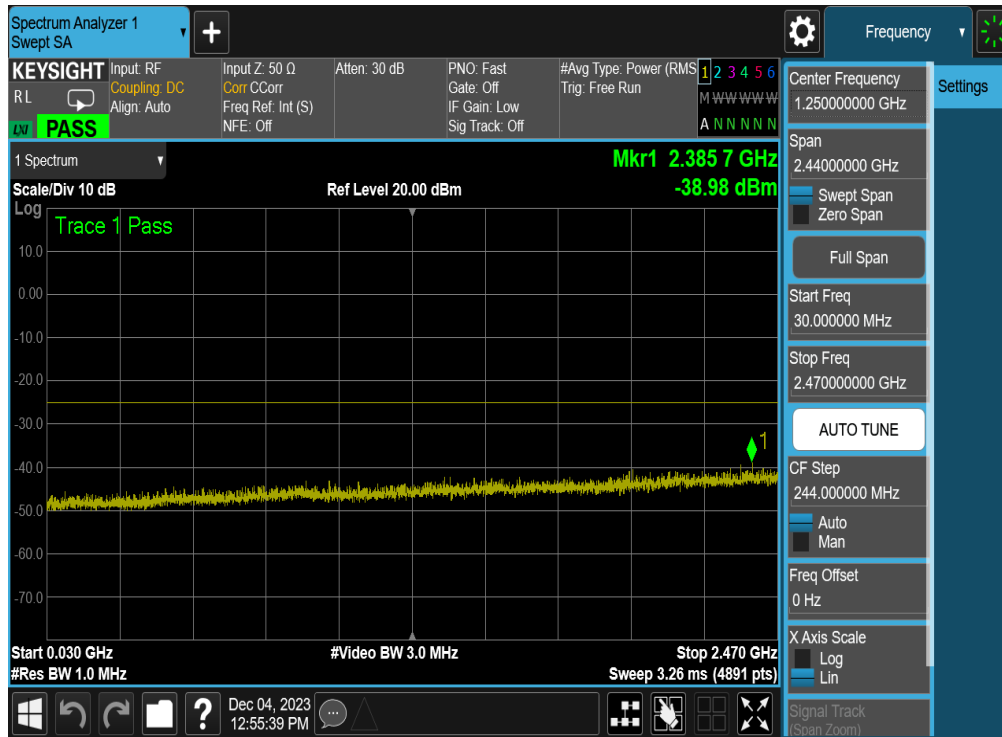
FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 53 of 98

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n41PC3	100MHz	Low	30.0 - 2475.0	-38.98	-25	-13.98
		Low	2690.0 - 15000.0	-45.32	-25	-20.32
		Low	15000.0 - 27000.0	-49.79	-25	-24.79
		Mid	30.0 - 2500.0	-39.55	-25	-14.55
		Mid	2690.0 - 15000.0	-43.59	-25	-18.59
		Mid	15000.0 - 27000.0	-48.73	-25	-23.73
		High	30.0 - 2500.0	-39.45	-25	-14.45
		High	2690.0 - 15000.0	-44.85	-25	-19.85
		High	15000.0 - 27000.0	-48.14	-25	-23.14

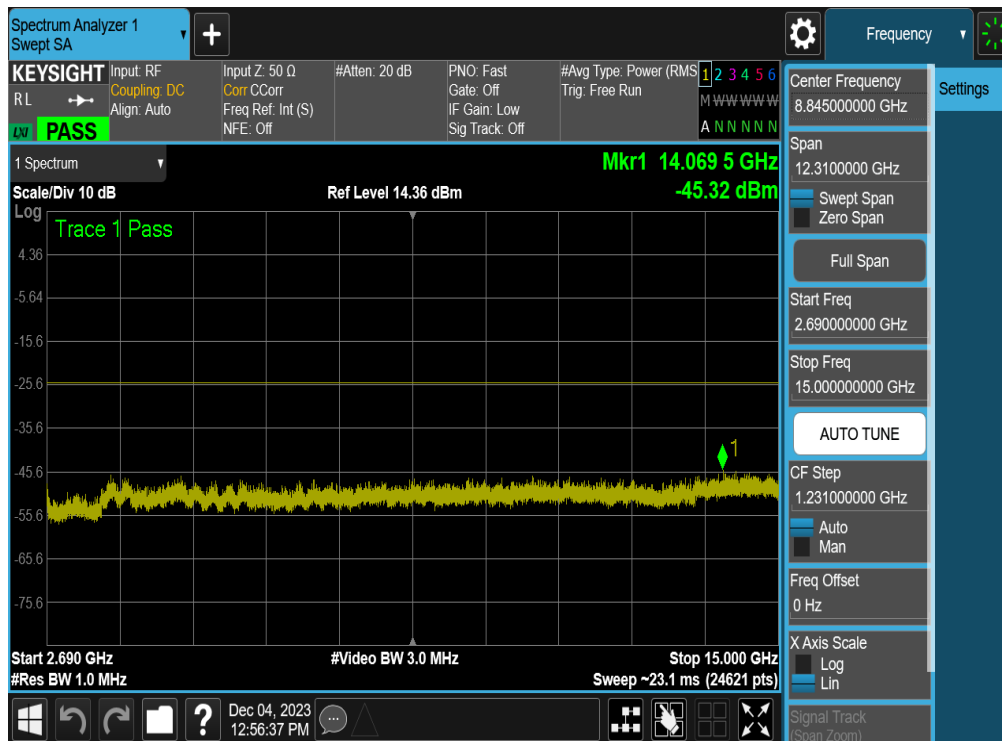
Table 7-14. Conducted Spurious Emission Results – NR – Ant3

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 54 of 98

NR Band n41 – Ant3

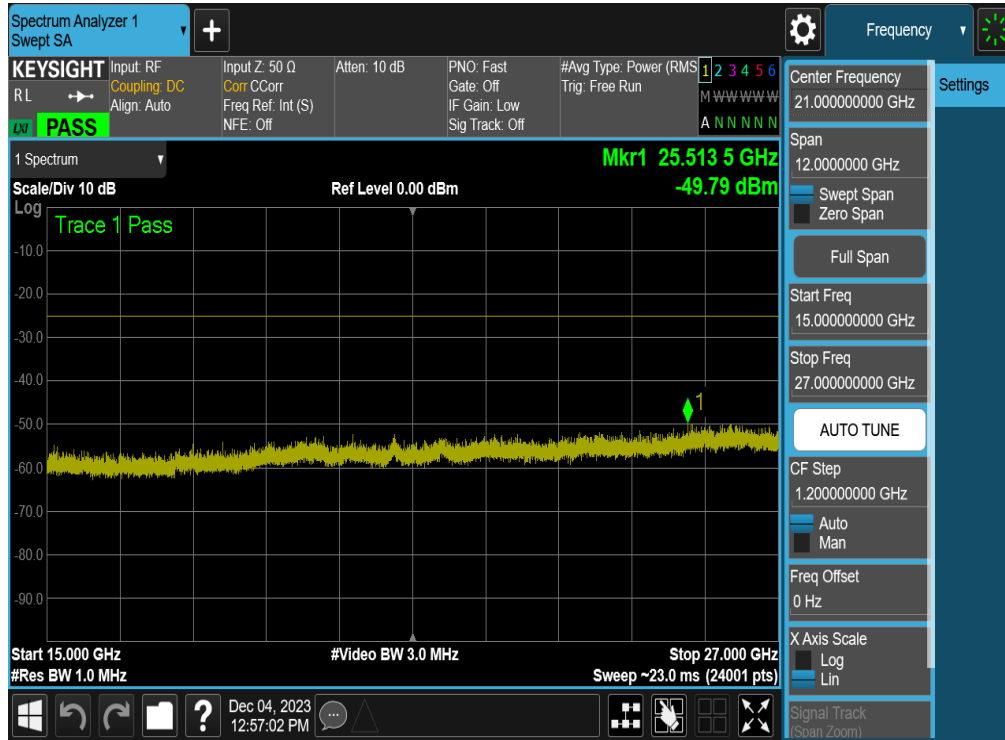


Plot 7-62. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel – Ant3)



Plot 7-63. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel – Ant3)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 55 of 98



Plot 7-64. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel – Ant3)

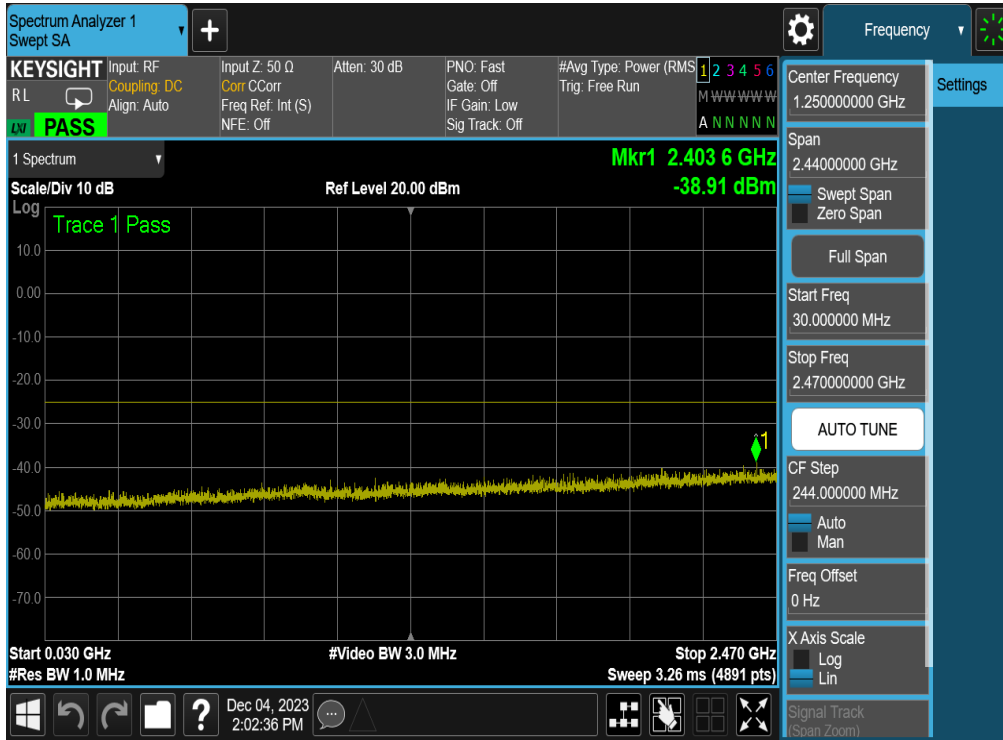
FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 56 of 98

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n41PC3	100MHz	Low	30.0 - 2475.0	-38.91	-25	-13.91
		Low	2690.0 - 15000.0	-45.28	-25	-20.28
		Low	15000.0 - 27000.0	-49.58	-25	-24.58
		Mid	30.0 - 2500.0	-39.09	-25	-14.09
		Mid	2690.0 - 15000.0	-44.73	-25	-19.73
		Mid	15000.0 - 27000.0	-48.44	-25	-23.44
		High	30.0 - 2500.0	-39.19	-25	-14.19
		High	2690.0 - 15000.0	-44.67	-25	-19.67
		High	15000.0 - 27000.0	-49.39	-25	-24.39

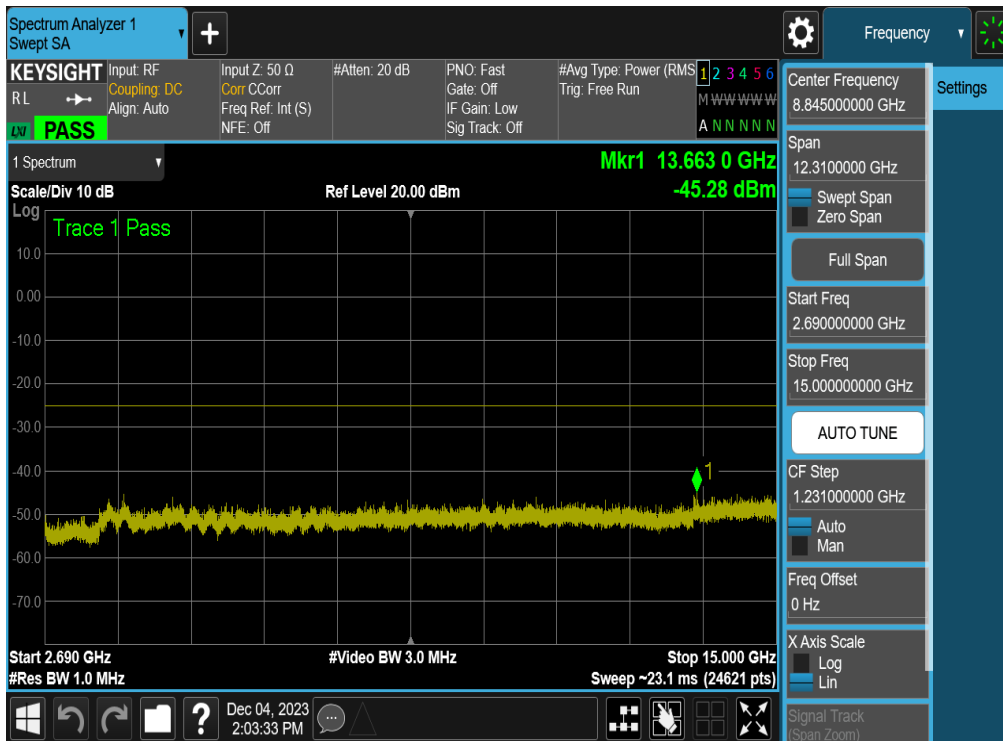
Table 7-15. Conducted Spurious Emission Results – NR – Ant4

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 57 of 98

NR Band n41 – Ant4

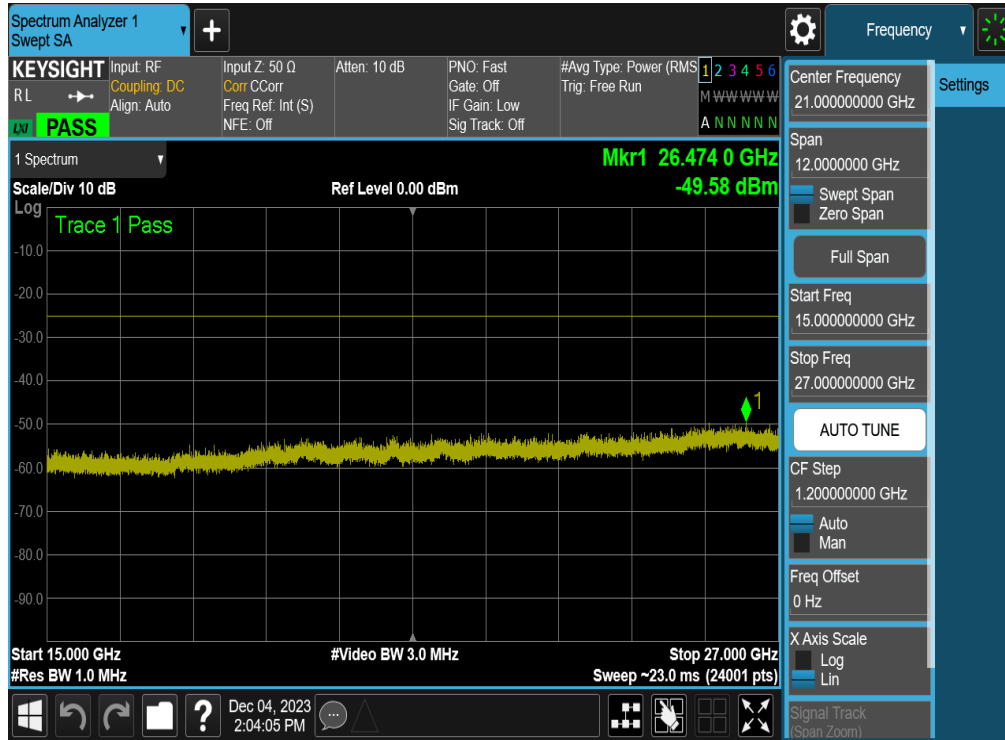


Plot 7-65. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel – Ant4)



Plot 7-66. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel – Ant4)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 58 of 98



Plot 7-67. Conducted Spurious Plot (NR Band n41 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel – Ant4)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 59 of 98

7.5 Band Edge Emissions at Antenna Terminal

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating 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.

The minimum permissible attenuation level for Band 41 is as noted in the Test Notes on the following page.

Test Procedure Used

ANSI C63.26-2015 – Section 5.7.3

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW \geq 1% of the emission bandwidth
4. VBW \geq 3 x RBW
5. Detector = RMS
6. Number of sweep points \geq 2 x Span/RBW
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Setup

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

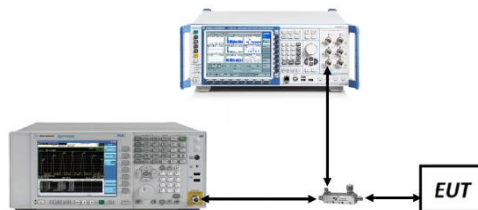


Figure 7-4. Test Instrument & Measurement Setup

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 60 of 98

Test Notes

1. Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz.

2. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) 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.

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 61 of 98

Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
LTE B41 PC3	20 MHz	Low	Band Edge	-40.10	-25	-15.10
		High	Band Edge	-46.60	-25	-21.60
	15 MHz	Low	Band Edge	-39.75	-25	-14.75
		High	Band Edge	-44.79	-25	-19.79
	10 MHz	Low	Band Edge	-38.64	-25	-13.64
		High	Band Edge	-43.20	-25	-18.20
	5 MHz	Low	Band Edge	-41.51	-25	-16.51
		High	Band Edge	-40.17	-25	-15.17

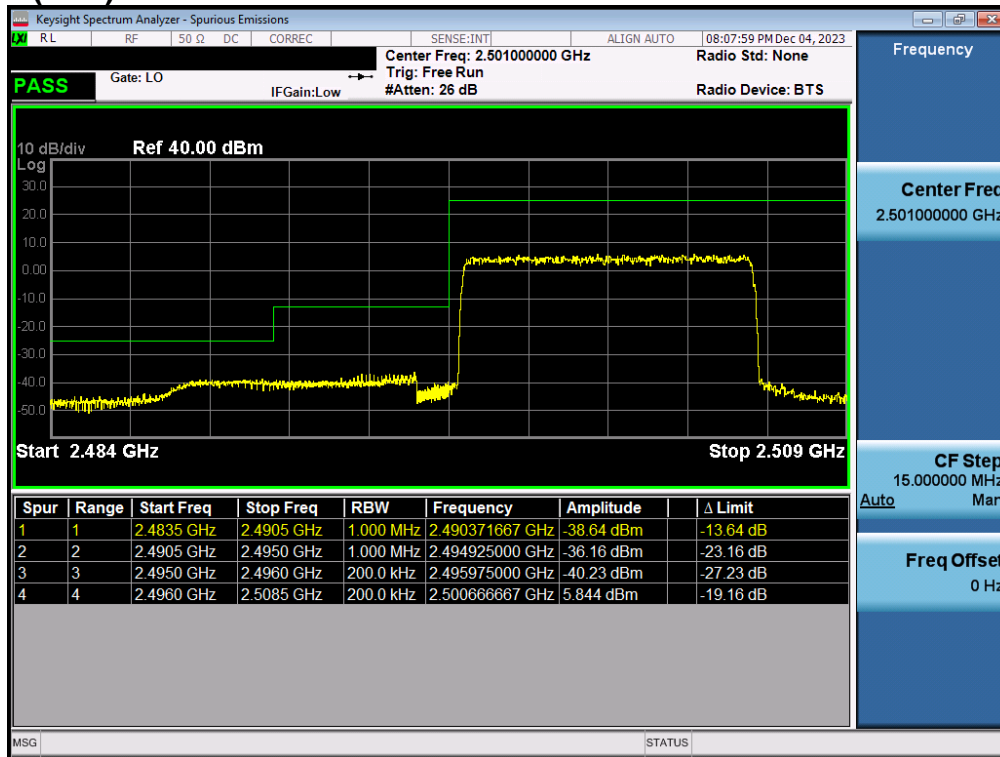
Table 7-16. Conducted Band Edge Test Results – LTE – Ant1

Mode	Bandwidth	Channel	Level [dBm]	Limit [dBm]	Margin [dB]
NR n41	100 MHz	Low	-27.91	-13	-14.91
		High	-30.29	-10	-20.29
	90 MHz	Low	-28.70	-13	-15.70
		High	-34.60	-10	-24.60
	80 MHz	Low	-43.99	-25	-18.99
		High	-35.66	-10	-25.66
	70 MHz	Low	-43.01	-25	-18.01
		High	-36.76	-10	-26.76
	60 MHz	Low	-42.64	-25	-17.64
		High	-27.39	-10	-17.39
	50 MHz	Low	-42.31	-25	-17.31
		High	-51.45	-25	-26.45
	40 MHz	Low	-41.38	-25	-16.38
		High	-51.84	-25	-26.84
	30 MHz	Low	-40.59	-25	-15.59
		High	-47.96	-25	-22.96
	20 MHz	Low	-39.68	-25	-14.68
		High	-47.06	-25	-22.06
	15 MHz	Low	-39.62	-25	-14.62
		High	-47.41	-25	-22.41
10 MHz	Low	-38.20	-25	-13.20	
	High	-34.23	-10	-24.23	

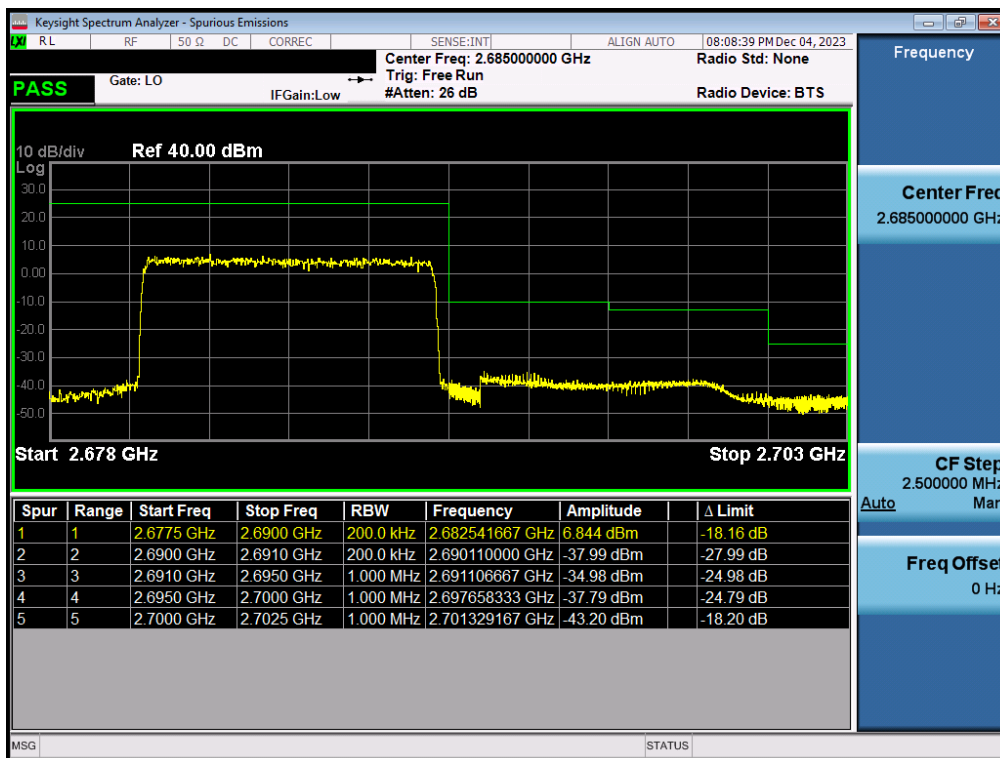
Table 7-17. Conducted Band Edge Test Results – NR – Ant1

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 62 of 98

LTE Band 41(PC3) – Ant1



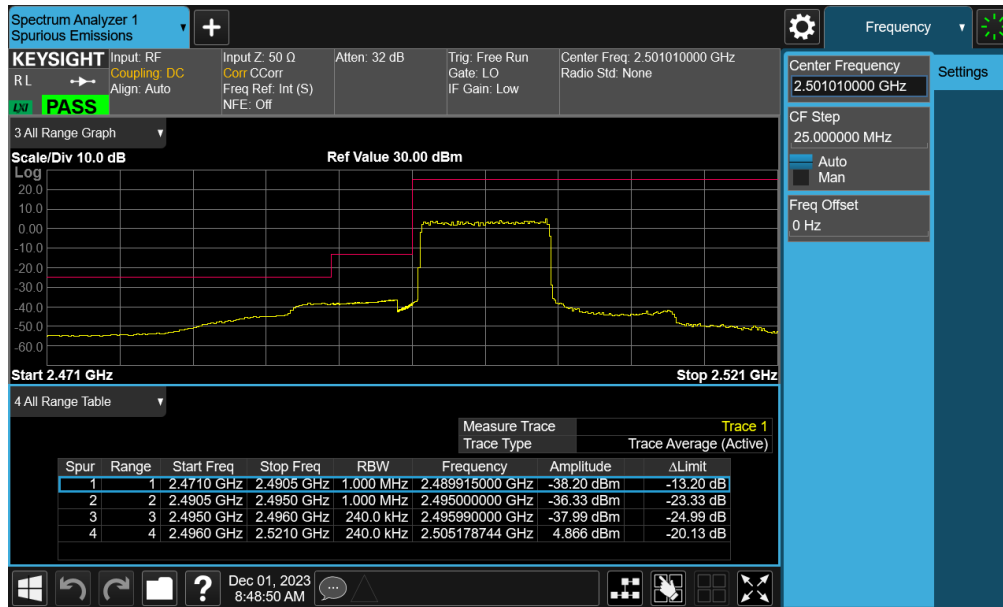
Plot 7-68. Lower ACP Plot (LTE Band 41(PC3) - 10MHz QPSK – Full RB - Ant1)



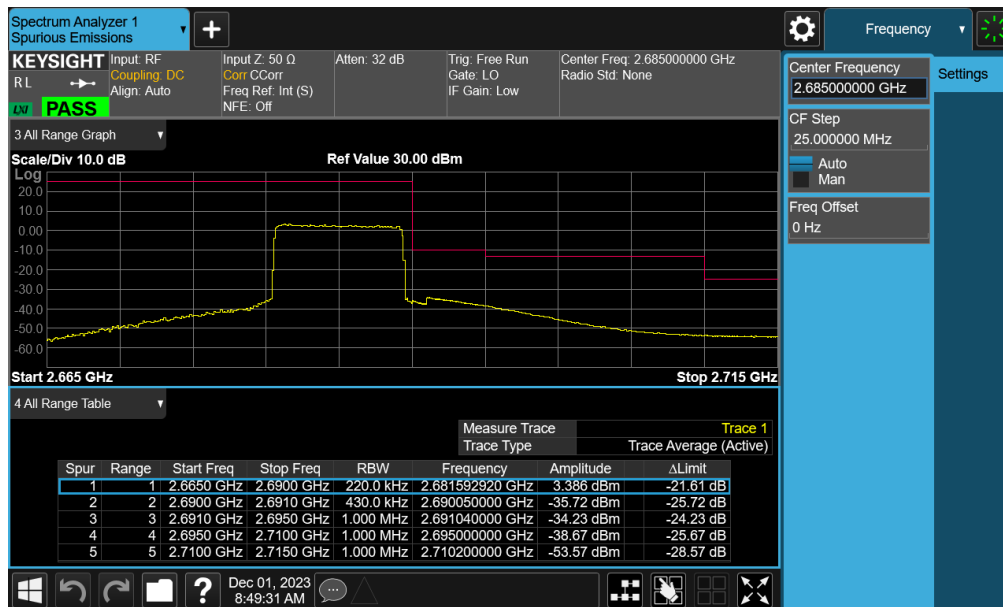
Plot 7-69. Upper ACP Plot (LTE Band 41(PC3) - 10MHz QPSK – Full RB - Ant1)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 63 of 98

NR Band n41 – ANT 1



Plot 7-70. Lower ACP Plot (NR Band n41 - 10MHz DFT-s-QPSK – Full RB Configuration)



Plot 7-71. Upper ACP Plot (NR Band n41 - 10MHz DFT-s-QPSK – Full RB Configuration)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 64 of 98

Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
LTE B41 PC3	20 MHz	Low	Band Edge	-28.11	-25	-3.11
		High	Band Edge	-42.19	-25	-17.19
	15 MHz	Low	Band Edge	-26.48	-25	-1.48
		High	Band Edge	-41.37	-25	-16.37
	10 MHz	Low	Band Edge	-26.51	-25	-1.51
		High	Band Edge	-39.88	-25	-14.88
	5 MHz	Low	Band Edge	-17.10	-13	-4.10
		High	Band Edge	-38.16	-25	-13.16

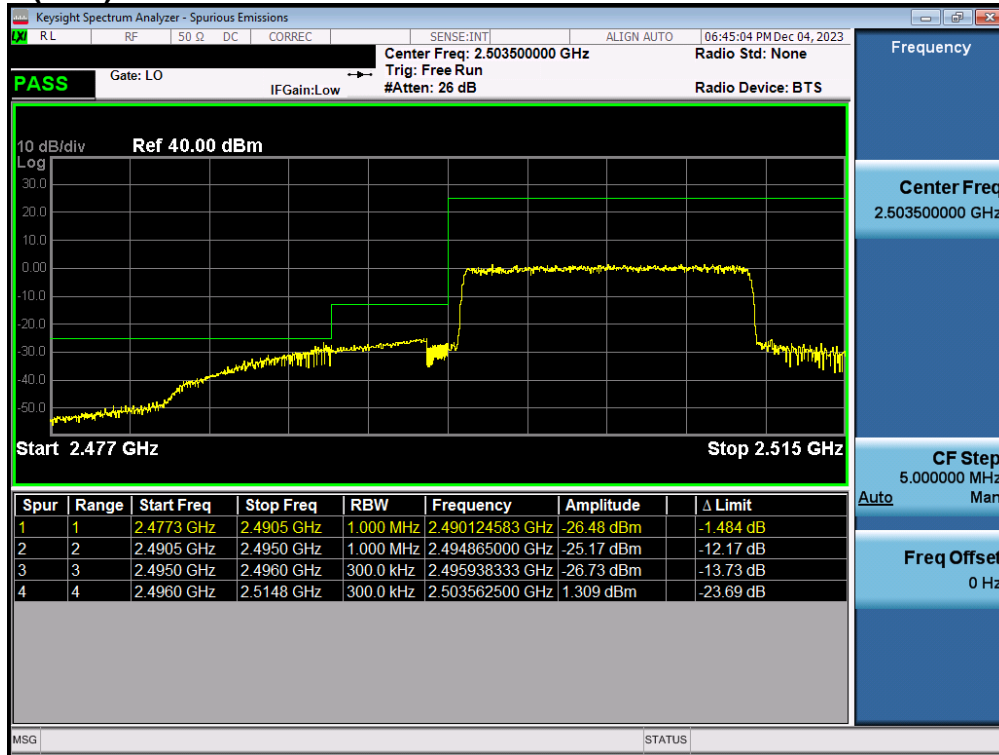
Table 7-18. Conducted Band Edge Test Results – LTE – Ant2

Mode	Bandwidth	Channel	Level [dBm]	Limit [dBm]	Margin [dB]
NR n41	100 MHz	Low	-34.65	-25	-9.65
		High	-32.83	-13	-19.83

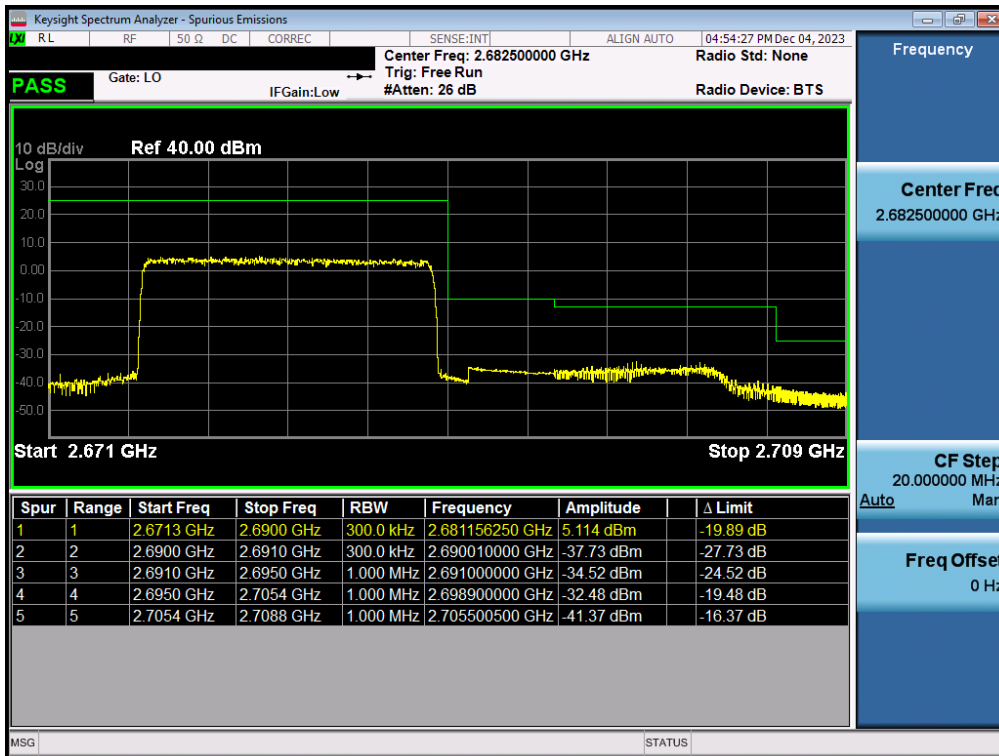
Table 7-19. Conducted Band Edge Test Results – NR – Ant2

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 65 of 98

LTE Band 41(PC3) – Ant2



Plot 7-72. Lower ACP Plot (LTE Band 41(PC3) - 15MHz QPSK – Full RB - Ant2)



Plot 7-73. Upper ACP Plot (LTE Band 41(PC3) - 15MHz QPSK – Full RB - Ant2)

FCC ID: A3LSMA356E	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2310260110-05.A3L	Test Dates: 11/30/2023 - 12/12/2023	EUT Type: Portable Handset	Page 66 of 98