

MEASUREMENT REPORT

FCC Part 30 5G mmWave

Applicant Name:

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

Dates of Testing:

05/11/2022 – 06/16/2022

Test Report Issue Date:

06/29/2022

Test Site/Location:

Element Lab., Columbia, MD, USA

Test Report Serial No.:

1M2204080051-01.A3L

FCC ID:

A3LSMF721U

APPLICANT:

Samsung Electronics Co., Ltd.

Application Type:

Certification

Model:

SM-F721U

Additional Models:

SM-F721U1

EUT Type:

Portable Handset

FCC Classification:

Part 30 Mobile Transmitter (5GM)

FCC Rule Part(s):

30

Test Procedure(s):

ANSI C63.26-2015, KDB 842590 D01 v01r02

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: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 1 of 142

V1.0

T A B L E O F C O N T E N T S

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	Measurement Procedure.....	7
3.2	Radiated Power and Radiated Spurious Emissions	7
4.0	MEASUREMENT UNCERTAINTY	9
5.0	TEST EQUIPMENT CALIBRATION DATA	10
6.0	SAMPLE CALCULATIONS	11
7.0	TEST RESULTS	12
7.1	Summary.....	12
7.2	Occupied Bandwidth	14
7.3	Equivalent Isotropic Radiated Power.....	51
7.4	Radiated Spurious and Harmonic Emissions	69
7.5	Band Edge Emissions	100
7.6	Frequency Stability / Temperature Variation	118
8.0	CONCLUSION.....	125
9.0	APPENDIX A	126
9.1	VDI Mixer Verification Certificate.....	126
9.2	Test Scope Accreditation	130

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 2 of 142

PART 30 MEASUREMENT REPORT

Band	Bandwidth [MHz]	Tx Frequency [MHz]	CCs Active	Mode	Modulation	EIRP		Emission Designator
						Max Power [W]	Max Power [dBm]	
n258 (24.25 – 24.45GHz)	100	24250 - 24450	1	SISO	QPSK	0.492	26.92	94M9G7D
				2Tx	QPSK	0.916	29.62	94M9G7D
				2Tx	$\pi/2$ BPSK	0.892	29.50	92M0G7D
				2Tx	16QAM	0.514	27.11	94M6W7D
				2Tx	64QAM	0.367	25.65	94M8W7D
			2	2Tx	QPSK	0.168	22.25	194MG7D
				2Tx	$\pi/2$ BPSK	0.167	22.24	192MG7D
				2Tx	16QAM	0.159	22.01	194MW7D
	50	24250 - 24450	1	2Tx	64QAM	0.135	21.29	194MW7D
				SISO	QPSK	0.506	27.04	45M9G7D
				2Tx	QPSK	0.926	29.67	45M9G7D
				2Tx	$\pi/2$ BPSK	0.917	29.62	46M2G7D
				2Tx	16QAM	0.558	27.46	45M9W7D
				2Tx	64QAM	0.357	25.52	45M7W7D
			2	2Tx	QPSK	0.175	22.42	95M7G7D
				2Tx	$\pi/2$ BPSK	0.175	22.43	95M8G7D
				2Tx	16QAM	0.159	22.00	95M5W7D
				2Tx	64QAM	0.133	21.25	95M5W7D

EUT Overview (Ant1/K-Patch – Band n258, 24.25-24.45GHz)

Band	Bandwidth [MHz]	Tx Frequency [MHz]	CCs Active	Mode	Modulation	EIRP		Emission Designator
						Max Power [W]	Max Power [dBm]	
n258 (24.75 – 25.25GHz)	100	24750 - 25250	1	SISO	QPSK	0.537	27.30	94M7G7D
				2Tx	QPSK	0.722	28.59	94M7G7D
				2Tx	$\pi/2$ BPSK	0.707	28.49	91M2G7D
				2Tx	16QAM	0.410	26.13	94M4W7D
				2Tx	64QAM	0.285	24.55	94M6W7D
			2	2Tx	QPSK	0.212	23.27	194MG7D
				2Tx	$\pi/2$ BPSK	0.211	23.23	191MG7D
				2Tx	16QAM	0.132	21.21	194MW7D
	50	24750 - 25250	1	2Tx	64QAM	0.112	20.50	194MW7D
				SISO	QPSK	0.553	27.43	45M8G7D
				2Tx	QPSK	0.725	28.61	45M8G7D
				2Tx	$\pi/2$ BPSK	0.717	28.55	45M7G7D
				2Tx	16QAM	0.416	26.19	45M8W7D
				2Tx	64QAM	0.287	24.58	46M0W7D
			2	2Tx	QPSK	0.212	23.27	95M4G7D
				2Tx	$\pi/2$ BPSK	0.211	23.25	95M2G7D
				2Tx	16QAM	0.132	21.20	95M5W7D
				2Tx	64QAM	0.106	20.24	95M6W7D

EUT Overview (Ant1/K-Patch – Band n258, 24.75-25.25GHz)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 3 of 142

Band	Bandwidth [MHz]	Tx Frequency [MHz]	CCs Active	Mode	Modulation	EIRP		Emission Designator
						Max Power [W]	Max Power [dBm]	
n261	100	27550 - 28300	1	SISO	QPSK	0.431	26.34	95M1G7D
				2Tx	QPSK	0.807	29.07	95M1G7D
				2Tx	$\pi/2$ BPSK	0.800	29.03	91M6G7D
				2Tx	16QAM	0.481	26.83	94M8W7D
			2Tx	64QAM	0.328	25.16	95M1W7D	
			2	2Tx	QPSK	0.177	22.49	194MG7D
				2Tx	$\pi/2$ BPSK	0.177	22.48	191MG7D
				2Tx	16QAM	0.145	21.61	194MW7D
	2Tx	64QAM		0.122	20.85	194MW7D		
	50	27525 - 28325	1	SISO	QPSK	0.525	27.20	46M1G7D
				2Tx	QPSK	0.818	29.13	46M1G7D
				2Tx	$\pi/2$ BPSK	0.789	28.97	45M9G7D
				2Tx	16QAM	0.459	26.62	46M0W7D
				2Tx	64QAM	0.321	25.07	46M1W7D
			2	2Tx	QPSK	0.173	22.39	95M6G7D
				2Tx	$\pi/2$ BPSK	0.173	22.37	95M3G7D
2Tx				16QAM	0.145	21.61	95M7W7D	
			2Tx	64QAM	0.117	20.68	95M7W7D	

Band	Bandwidth [MHz]	Tx Frequency [MHz]	CCs Active	Mode	Modulation	EIRP		Emission Designator
						Max Power [W]	Max Power [dBm]	
n260	100	37050 - 39950	1	SISO	QPSK	0.414	26.17	94M9G7D
				2Tx	QPSK	1.025	30.11	94M9G7D
				2Tx	$\pi/2$ BPSK	0.996	29.98	92M3G7D
				2Tx	16QAM	0.580	27.64	94M8W7D
			2Tx	64QAM	0.394	25.95	94M8W7D	
			2	2Tx	QPSK	0.182	22.59	194MG7D
				2Tx	$\pi/2$ BPSK	0.179	22.53	193MG7D
				2Tx	16QAM	0.165	22.18	195MW7D
	2Tx	64QAM		0.138	21.39	196MW7D		
	50	37025 - 39975	1	SISO	QPSK	0.417	26.20	46M1G7D
				2Tx	QPSK	1.030	30.13	46M1G7D
				2Tx	$\pi/2$ BPSK	1.017	30.07	46M3G7D
				2Tx	16QAM	0.581	27.64	46M0W7D
				2Tx	64QAM	0.396	25.98	46M1W7D
			2	2Tx	QPSK	0.186	22.69	95M9G7D
				2Tx	$\pi/2$ BPSK	0.184	22.64	95M9G7D
2Tx				16QAM	0.168	22.26	95M7W7D	
			2Tx	64QAM	0.134	21.26	96M1W7D	

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 4 of 142

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 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: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 5 of 142

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMF721U**. The test data contained in this report pertains only to the emissions due to the EUT's 5G mmWave function.

The EUT contains one patch antenna, referred to herein as Ant1 (K-patch). The patch antenna is comprised of two separate antenna feeds - one for horizontal and one for vertical polarization.

The EUT supports up to 2CC for UL. For each CC, the EUT supports both 50MHz bandwidth and 100MHz bandwidth. The EUT supports a subcarrier spacing (SCS) of 120kHz with two transmission schemes, CP-OFDM and DFT-s-OFDM, with $\pi/2$ -BPSK, QPSK, 16-QAM, and 64-QAM modulations. Different Beam IDs are supported, each corresponding to a different position in space for the antenna. During testing, FTM (Factory Test Mode) was used to operate the transmitter. MIMO/2Tx operation was achieved by enabling two Beam IDs at the same time: one is from the list of H Beam IDs and other is from the list of V Beam IDs.

Test Device Serial No.: 0657M, 1400M, 1406M

2.2 Device Capabilities

This device contains the following capabilities:

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

2.3 Test Configuration

The EUT was configured for testing per the guidance of the following procedures: ANSI C63.26-2015, KDB 842590 D01 v01r02. See Section 7.0 of this test report for a description of the radiated tests.

EIRP Simulation data for all Beam IDs was used to help determine the worst case Beam ID for SISO operation and Beam ID pair for 2Tx (DFT-s-OFDM) and MIMO (CP-OFDM) operation. Several additional Beam ID's were also investigated to determine the Beam ID's producing the highest measured EIRP.

All testing was performed using FTM (Factory Test Mode) software at continuous Tx operation. When implemented out in the field, the EUT will operate with a maximum uplink configuration as allowed by the 5G network/carrier. The FTM software was also used for the EUT operation in the EN-DC mode.

While operating in the FR2 band, this device supports anchor band operation with either an LTE carrier or an NR FR1 carrier. Both were investigated during FR2 measurements.

This device supports two configurations: one is with screen open and one is with screen closed. Open, half-opened, and closed configurations are tested, and the worst case radiated emissions data is shown in this report.

2.4 Software and Firmware

The test was conducted with firmware version F721USQU0AVE3 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: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 6 of 142

3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

The measurement procedures described in the document titled "American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services" (ANSI C63.26-2015) and the guidance provided in KDB 842590 D01 v01r02 were used in the measurement of the EUT.

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 for radiated emissions measurements in the spurious domain. 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 for measurements above 1GHz.

Radiated power (EIRP) measurements were performed in a full anechoic chamber (FAC) conforming to the site validation requirements of CISPR 16-1-4. Radiated spurious emission measurements from 30MHz - 18GHz were performed in a semi anechoic chamber (SAC) conforming to the site validation requirements of CISPR 16-1-4. A positioner was used to manipulate the EUT through several positions in space by rotating about the roll axis as shown in the figure below. The positioner was mounted on top of a turntable bringing the total EUT height to 1.5m.

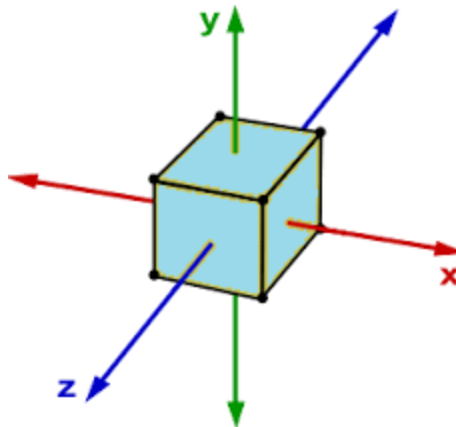


Figure 3-1. Rotation of the EUT Through Three Orthogonal Planes

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 7 of 142

V1.0

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable. The measurement antenna is in the far field of the EUT per formula $2D^2/\lambda$ where D is the larger between the dimension of the measurement antenna and the transmitting antenna of the EUT. In this case, "D" is the largest dimension of the measurement antenna. The EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer.

Frequency Range (GHz)	Wavelength(cm)	Far Field Distance (m)	Measurement Distance (m)
18-40	0.749	0.54	1.00
40-60	0.500	1.39	1.50
60-90	0.333	0.91	1.00
90-140	0.214	0.58	1.00
140-200	0.150	0.39	1.00

Table 3-1. Far-Field Distance & Measurement Distance per Frequency Range

Radiated power levels are investigated while the receive antenna was rotated through all angles to determine the worst case polarization/positioning. It was determined that H=0 degree and V=90 degree are the worst case positions when the EUT was transmitting horizontally and vertically polarized beams, respectively.

The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration bandwidth set to at least the emissions' occupied bandwidth. The EIRP is calculated from the raw power level measured with the spectrum analyzer using the formulas shown below.

Effective Isotropic Radiated Power Sample Calculation

The measured e.i.r.p is converted to E-field in V/m. Then, the distance correction is applied before converting back to calculated e.i.r.p, as explained in ANSI C63.26-2015.

$$\begin{aligned}
 \text{Field Strength [dB}\mu\text{V/m]} &= \text{Measured Value [dBm]} + \text{AFCL [dB/m]} + 107 \\
 &= -32.74 \text{ dBm} + (40.7 \text{ dB/m} + 8.78 \text{ dB}) + 107 = 123.74 \text{ dB}\mu\text{V/m} \\
 &= 10^{(123.74/20)/1000000} = 1.54 \text{ V/m} \\
 \text{e.i.r.p. [dBm]} &= 10 * \log((\text{E-Field} * D_m)^2/30) + 30 \text{ dB} \\
 &= 10 * \log((1.54 \text{ V/m} * 1.00 \text{ m})^2/30) + 30 \text{ dB} \\
 &= 18.98 \text{ dBm e.i.r.p.}
 \end{aligned}$$

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 8 of 142

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: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 9 of 142

5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to an accredited ISO/IEC 17025 calibration facility. 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
-	ETS-001	EMC Cable and Switch System	12/9/2021	Annual	12/9/2022	ETS
-	ETS-002	EMC Cable and Switch System	3/10/2022	Annual	3/10/2023	ETS
EMCO	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
ESPEC	SH-241	Temperature Chamber	7/2/2020	Biennial	7/2/2022	92002873
ETS-Lindgren	3116C	DRG Horn Antenna	5/11/2021	Biennial	5/11/2023	218893
ETS-Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/20/2021	Biennial	4/20/2023	00125518
Keysight Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	7/21/2021	Annual	7/21/2022	MY49430494
MEGAPHASE	FAC mmWave	AP FAC mmWave 40GHz	8/18/2021	Annual	8/18/2022	20033003
Narda	180-442-KF	Wide Band Horn Antenna	9/14/2020	Biennial	9/14/2022	2172481
Narda	180-422-KF	Horn (Small)	11/5/2020	Biennial	11/5/2022	U157403-01
OML, Inc.	M05RH	WR-05 Horn Antenna, 24dBi, 140 to 220 GHz	9/24/2020	Biennial	9/24/2022	18073001
OML, Inc.	M08RH	WR-08 Horn Antenna, 24dBi, 90 to 140 GHz	10/22/2020	Biennial	10/22/2022	18073001
OML, Inc.	M12RH	WR-12 Horn Antenna, 24dBi, 60 to 90 GHz	8/12/2020	Biennial	8/12/2022	18073001
OML, Inc.	M19RH	WR-19 Horn Antenna, 24dBi, 40 to 60 GHz	8/28/2020	Biennial	8/28/2022	18073001
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	8/25/2021	Annual	8/25/2022	1312.8000K67
Rohde & Schwarz	FSW26	Signal Analyzer	2/2/2022	Annual	2/2/2023	101604
Rohde & Schwarz	FSW26	2Hz-26.5GHz Signal and spectrum analyzer	4/14/2022	Annual	4/14/2023	103187
Sunol Sciences	JB5	Bi-Log Antenna (30M-5GHz)	7/27/2020	Biennial	7/27/2022	A051107
UTiFlex	UTiFlex	FAC mmWave UTiFlex 40GHz	3/9/2022	Annual	3/9/2023	232062-001
UTiFlex	UTiFlex	FAC mmWave UTiFlex 40GHz	3/9/2022	Annual	3/9/2023	234142-001
Virginia Diodes, Inc.	SAX679	SAX Module (40 - 60GHz)	8/28/2020	Biennial	8/28/2022	SAX679
Virginia Diodes, Inc.	SAX680	SAX Module (60 - 90GHz)	8/14/2020	Biennial	8/14/2022	SAX680
Virginia Diodes, Inc.	SAX681	SAX Module (90 - 140GHz)	10/22/2020	Biennial	10/22/2022	SAX681
Virginia Diodes, Inc.	SAX682	SAX Module (140 - 220GHz)	9/24/2020	Biennial	9/24/2022	SAX682

Table 5-1. Test Equipment

Notes:

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

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 10 of 142

6.0 SAMPLE CALCULATIONS

Emission Designator

$\pi/2$ BPSK/ QPSK Modulation

Emission Designator = 800MG7D

BW = 800 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 802MW7D

BW = 802 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 11 of 142

V1.0

7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LSMF721U
 FCC Classification: Part 30 Mobile Transmitter (5GM)
 Mode(s): 5G NR - FR2 (TDD)

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A	RADIATED	PASS	Section 7.2
2.1046, 30.202	Equivalent Isotropic Radiated Power	43dBm		PASS	Section 7.3
2.1051, 30.203	Spurious Emissions	-13dBm/MHz for all out-of-band emissions		PASS	Section 7.4
2.1051, 30.203	Out-of-Band Emissions at the Band Edge	-13dBm/MHz for all out-of-band emissions, -5dBm/MHz from the band edge up to 10% of the channel BW		PASS	Section 7.5
2.1055	Frequency Stability	Fundamental emissions stay within authorized frequency block		PASS	Section 7.6

Table 7-1. Summary of Radiated Test Results

Notes:

- 1) All modes of operation and modulations were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) This report contains references to "n258-R1" and "n258-R2". These correspond to n258 Range 1, operating from 24.25 – 24.45GHz, and n258 Range 2, operating from 24.75 – 25.25GHz, respectively, as defined in Part 30.4(a).
- 3) Per 2.1057(a)(2), spurious emissions were investigated up to 100GHz for n258-R1, n258-R2 and n261. Per 2.1057(a)(3), spurious emissions were investigated up to 200GHz for n260.
- 4) The radiated RF output power and all out-of-band emissions in the spurious domain are evaluated to the limits first as EIRP measurements to determine if the "early-exit" condition of KDB 842590 D01 v01r02 applies. If not, then additional TRP measurements are performed.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 12 of 142

- 5) "CC" refers to "Component Carriers".
- 6) Beam IDs were chosen based on which Beam ID produces the highest EIRP during EIRP simulation.
- 7) All testing was performed using FTM (Factory Test Mode) software at continuous Tx operation (100% duty cycle).
- 8) The CP-OFDM and DFT-s-OFDM transmission schemes were investigated fully for each test type and only the worst case data is included.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 13 of 142

V1.0

7.2 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 5.4.3

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied 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 Note

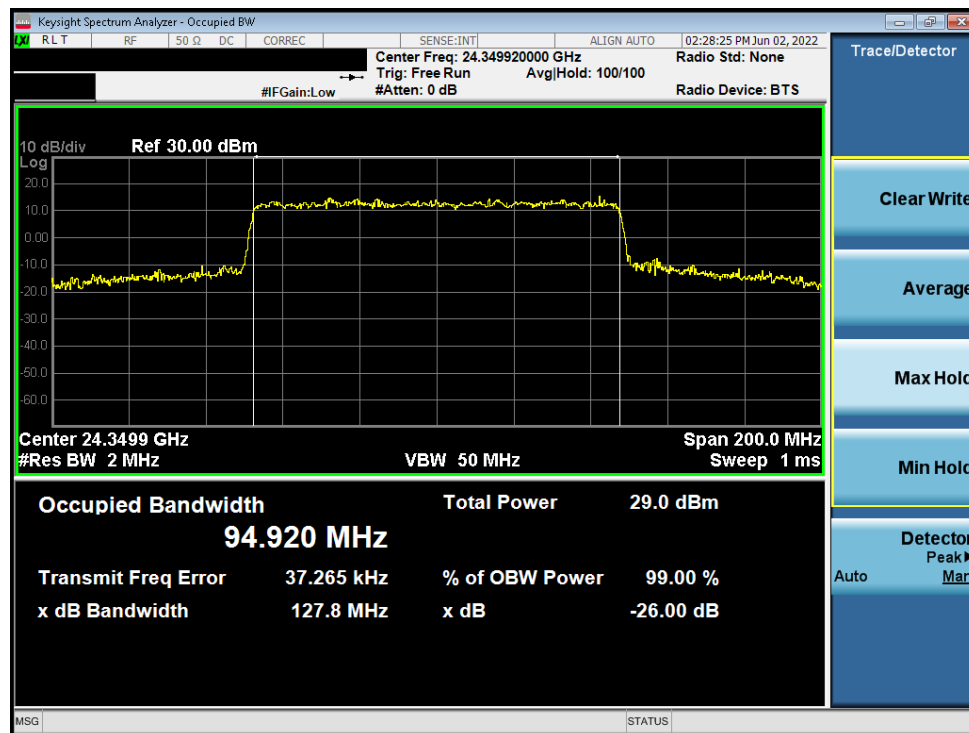
The EUT supports CP-OFDM and DFT-s-OFDM. OBW was measured for both waveforms and the worst case has been included in the report.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 14 of 142

Band n258-R1

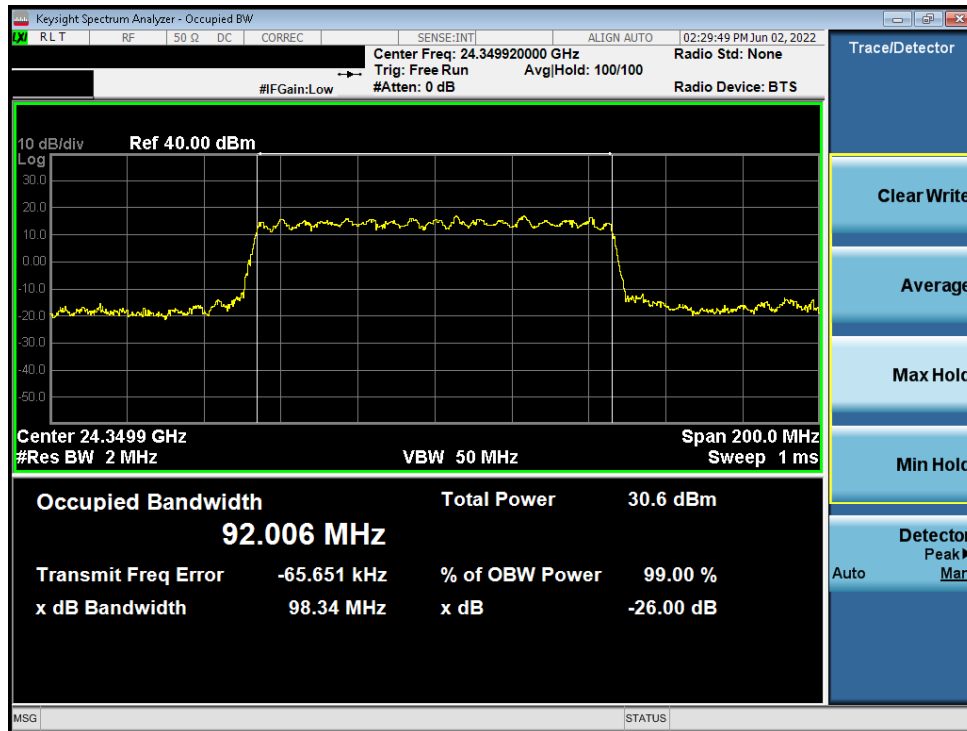
Channel	Bandwidth [MHz]	CCs Active	Transmission Scheme	Modulation	OBW [MHz]
Mid	100	1	CP-OFDM	QPSK	94.92
			DFT-s-OFDM	$\pi/2$ BPSK	92.01
			CP-OFDM	16QAM	94.63
			CP-OFDM	64QAM	94.77
		2	CP-OFDM	QPSK	194.08
			DFT-s-OFDM	$\pi/2$ BPSK	192.34
			CP-OFDM	16QAM	194.01
			CP-OFDM	64QAM	193.69
	50	1	CP-OFDM	QPSK	45.89
			DFT-s-OFDM	$\pi/2$ BPSK	46.21
			CP-OFDM	16QAM	45.92
			CP-OFDM	64QAM	45.70
		2	CP-OFDM	QPSK	95.69
			DFT-s-OFDM	$\pi/2$ BPSK	95.81
			CP-OFDM	16QAM	95.50
			CP-OFDM	64QAM	95.55

Table 7-2. Summary of Ant1 Occupied Bandwidths (n258-R1)

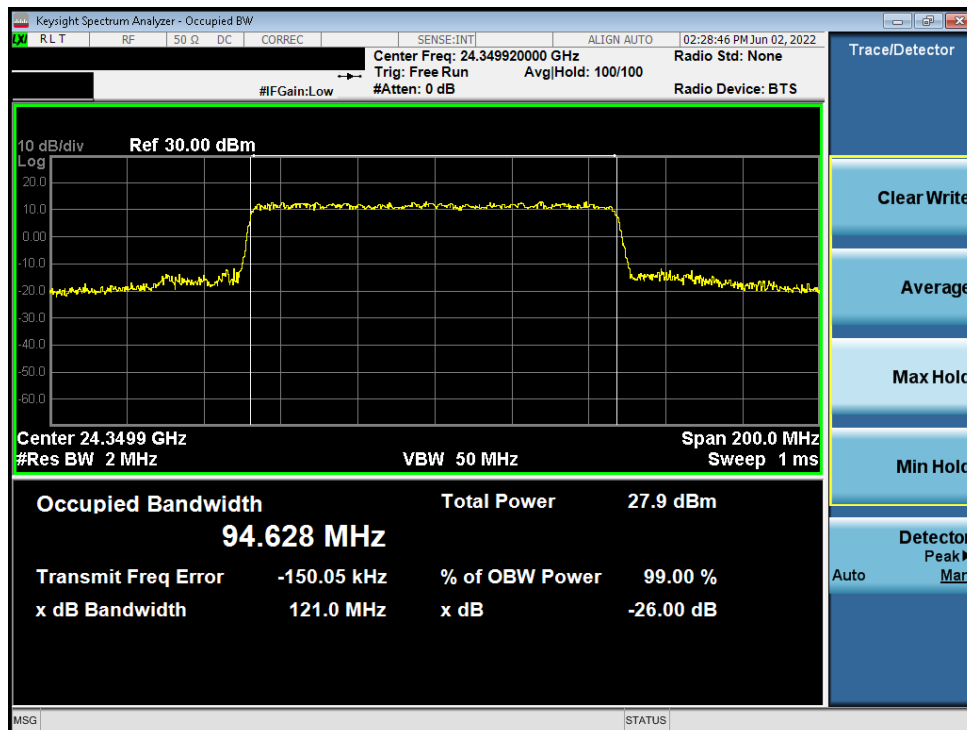


Plot 7-1. Ant1 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 15 of 142



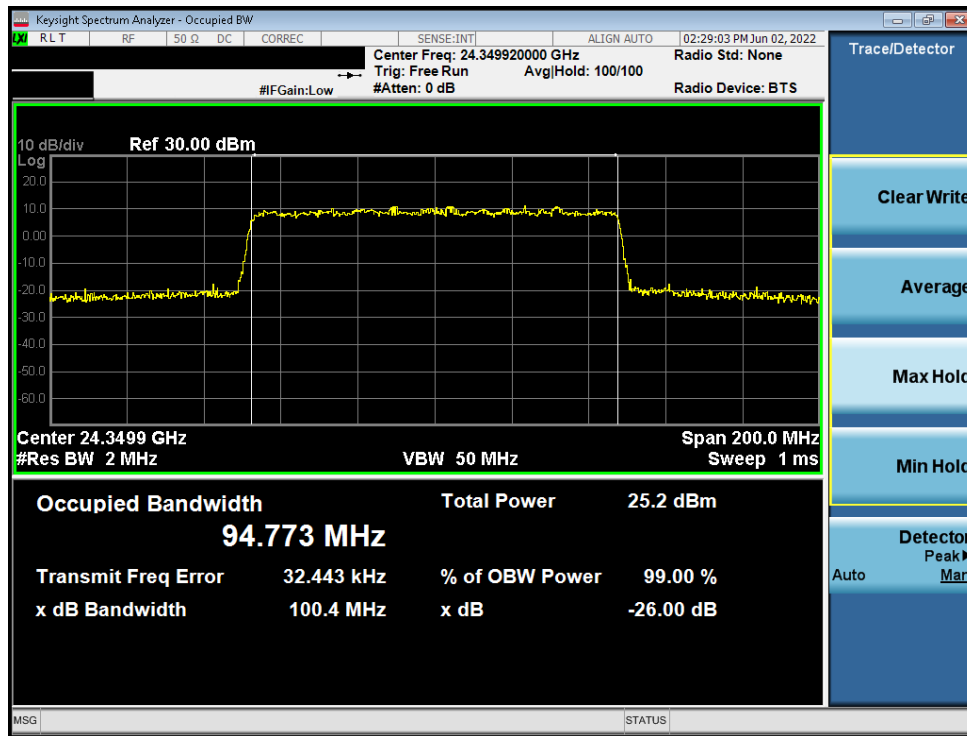
Plot 7-2. Ant1 Occupied Bandwidth Plot (100MHz-1CC – $\pi/2$ -BPSK – Mid Channel)



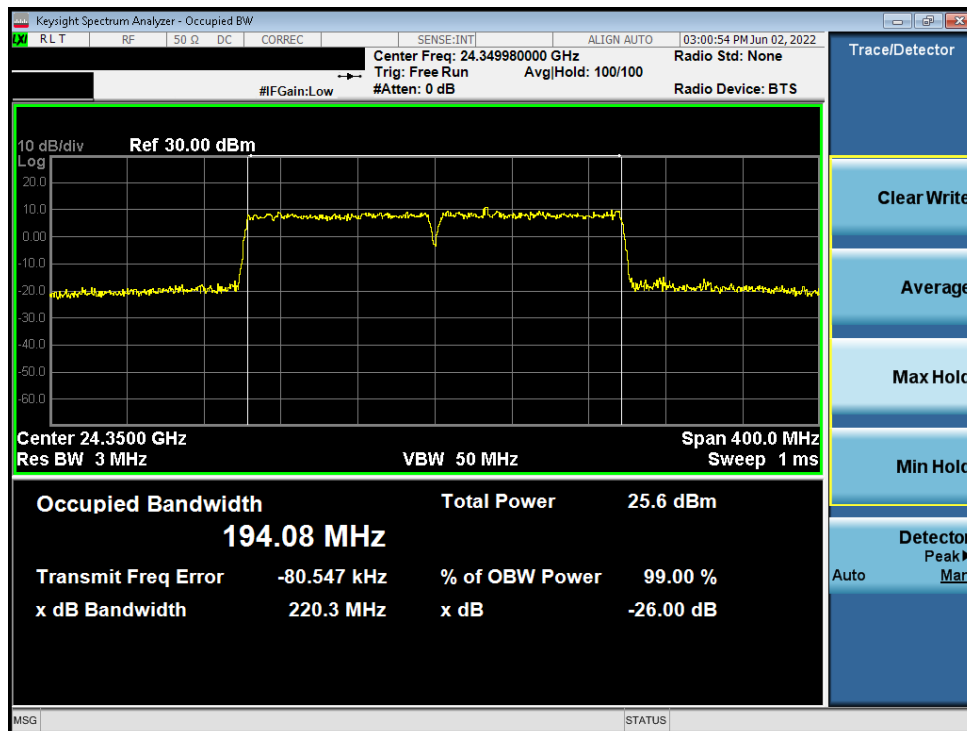
Plot 7-3. Ant1 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 16 of 142

V1.0

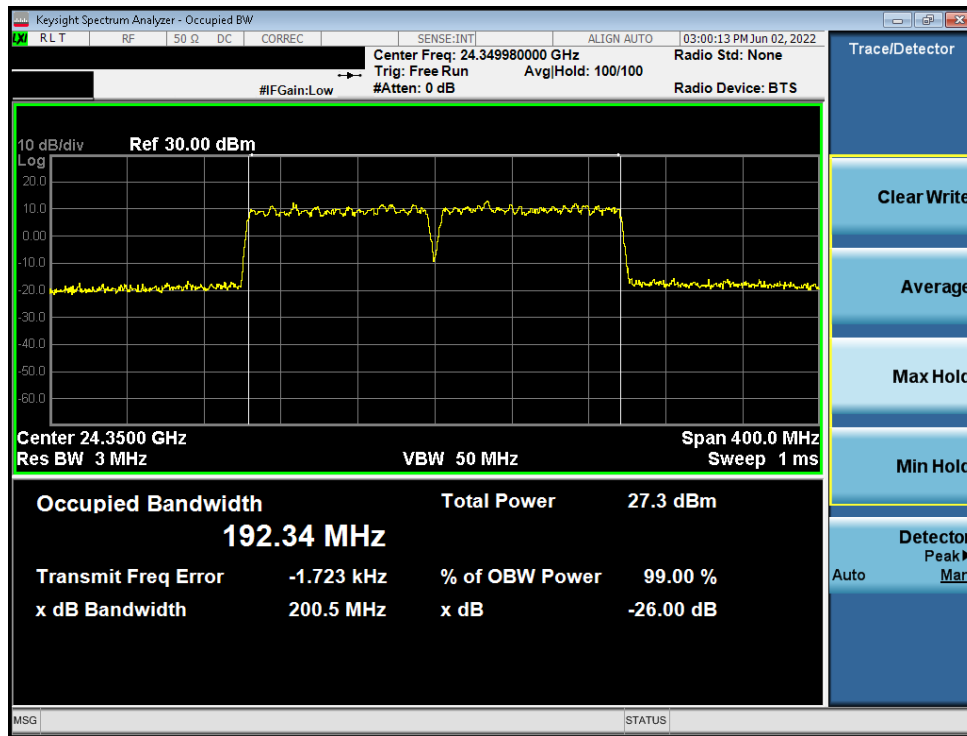


Plot 7-4. Ant1 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)

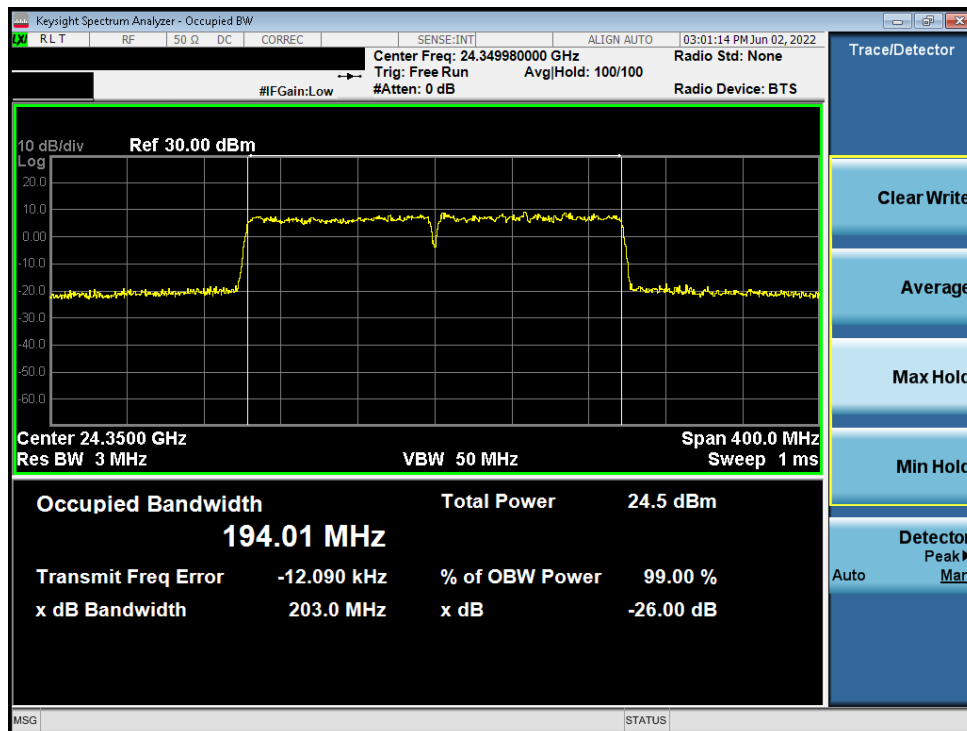


Plot 7-5. Ant1 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 17 of 142

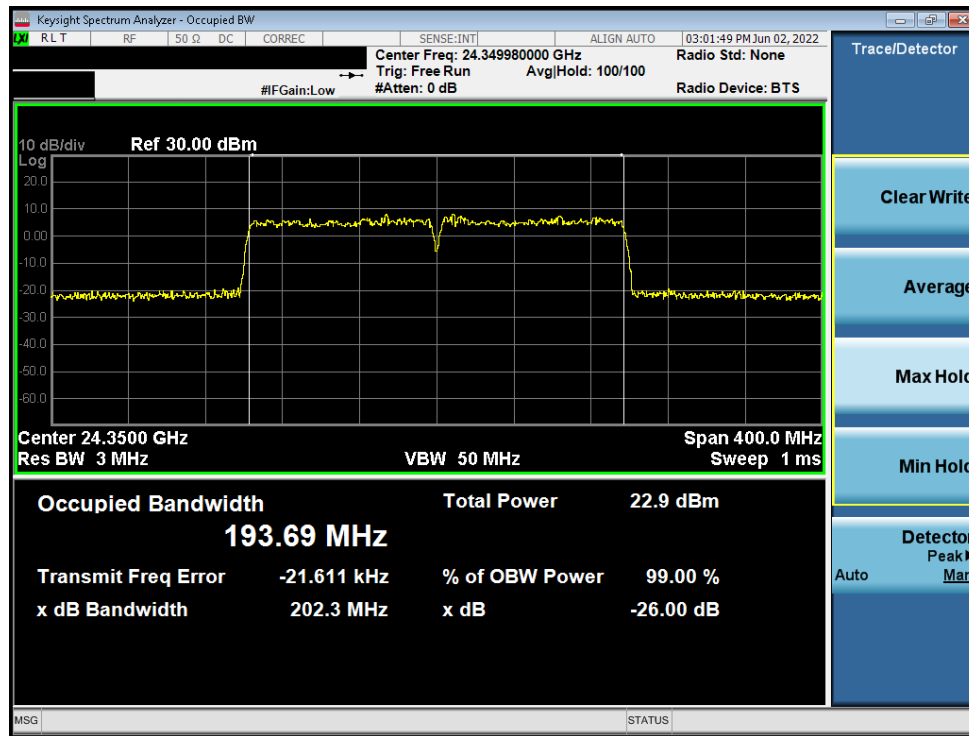


Plot 7-6. Ant1 Occupied Bandwidth Plot (100MHz-2CC – $\pi/2$ -BPSK – Mid Channel)

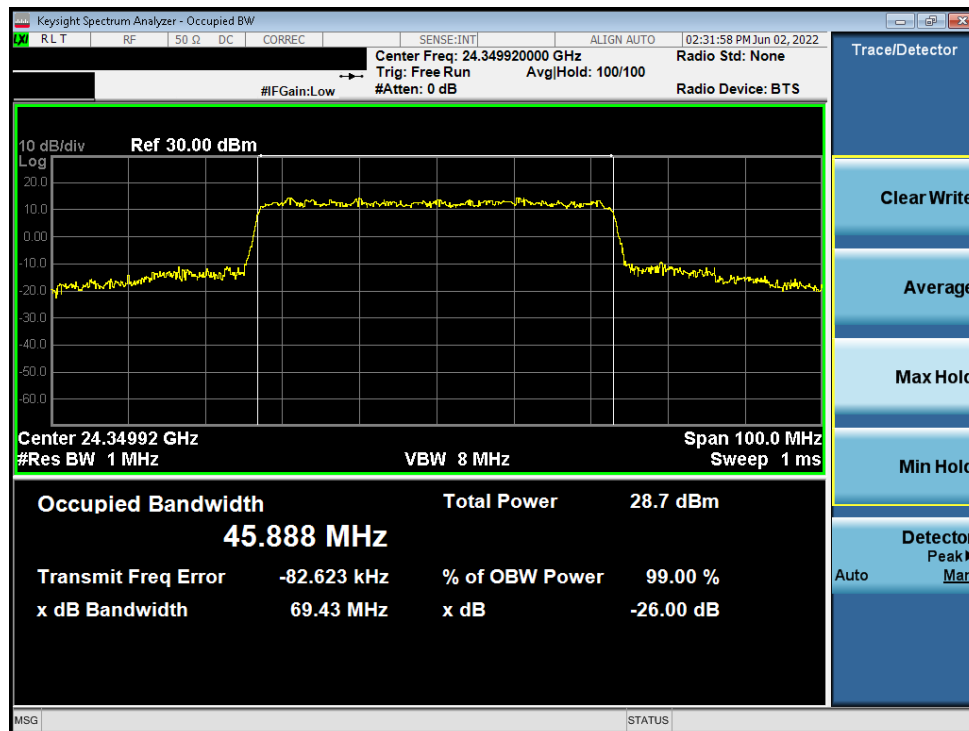


Plot 7-7. Ant1 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 18 of 142

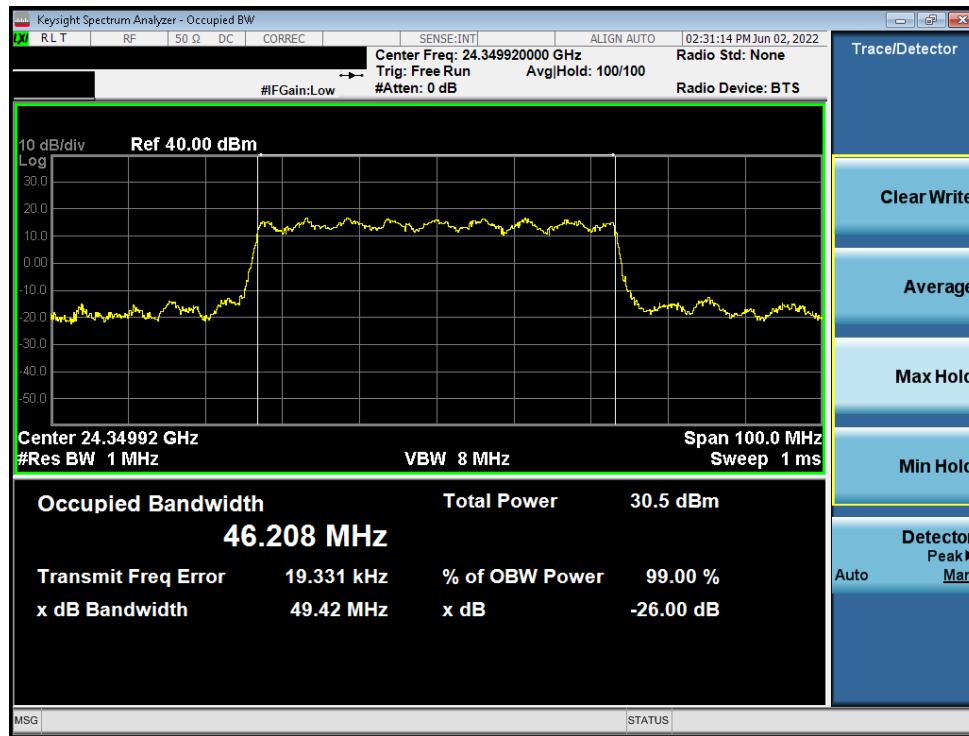


Plot 7-8. Ant1 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

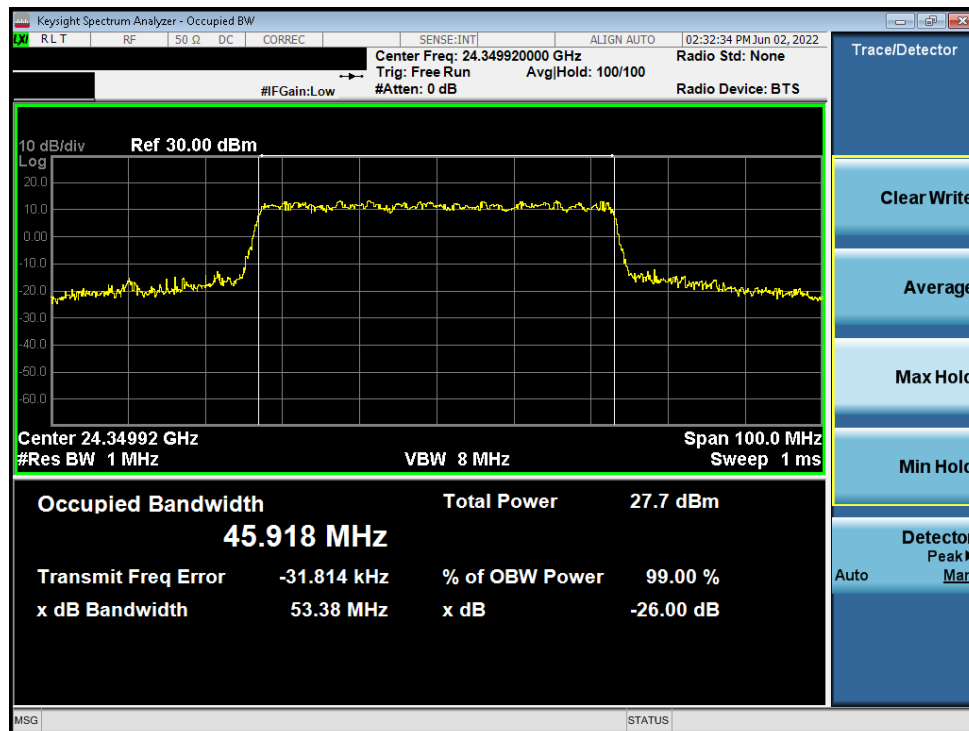


Plot 7-9. Ant1 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 19 of 142

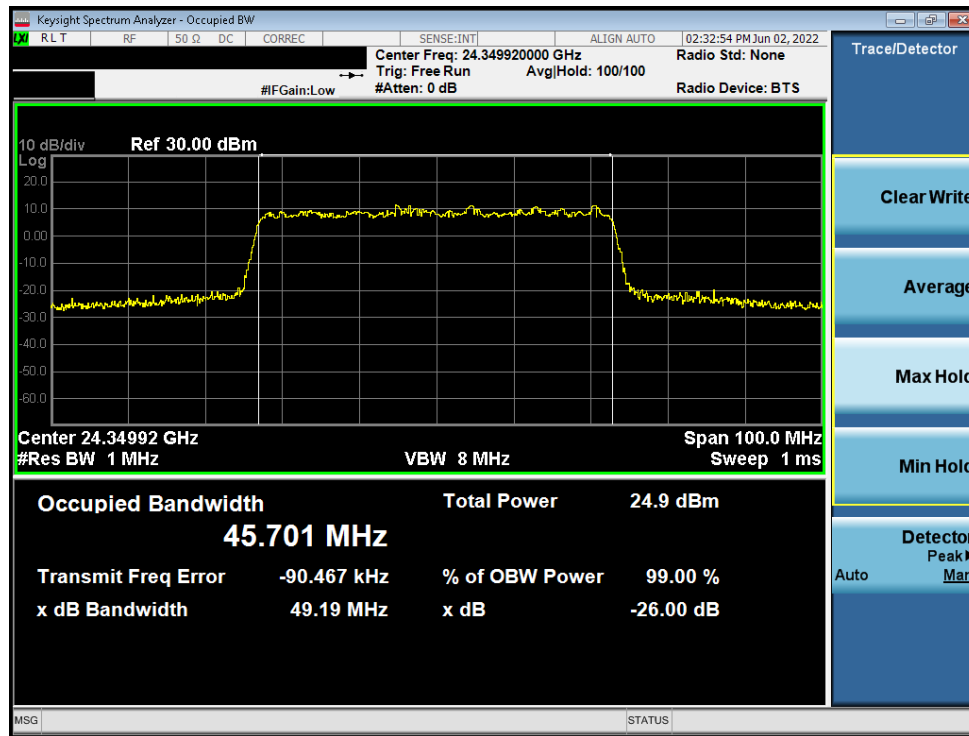


Plot 7-10. Ant1 Occupied Bandwidth Plot (50MHz-1CC – $\pi/2$ -BPSK – Mid Channel)

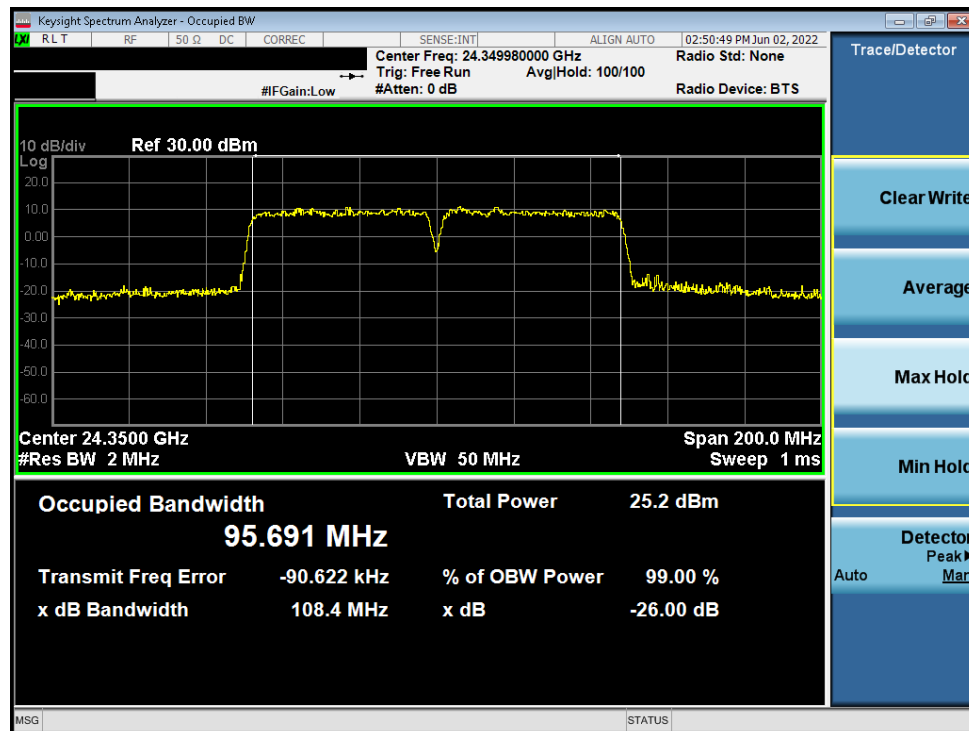


Plot 7-11. Ant1 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 20 of 142

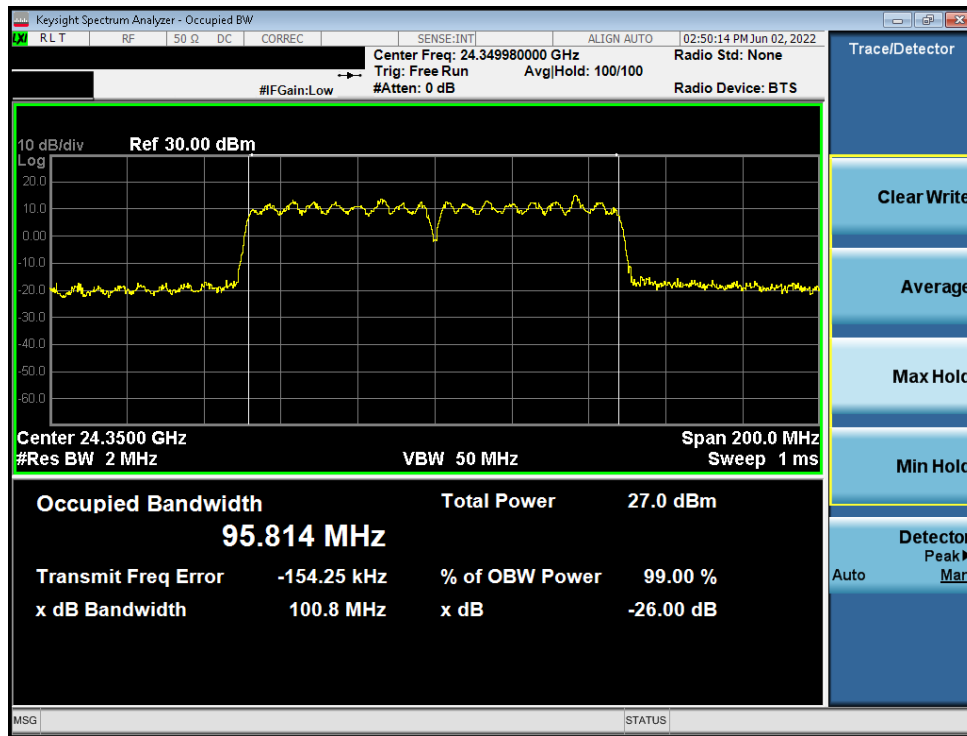


Plot 7-12. Ant1 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)

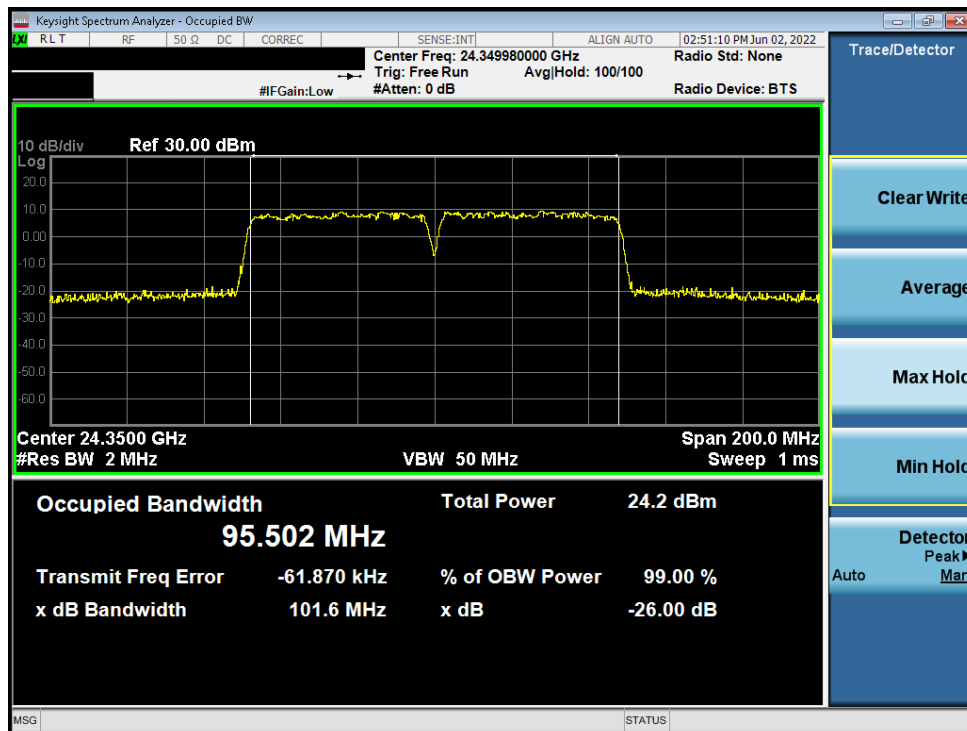


Plot 7-13. Ant1 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 21 of 142

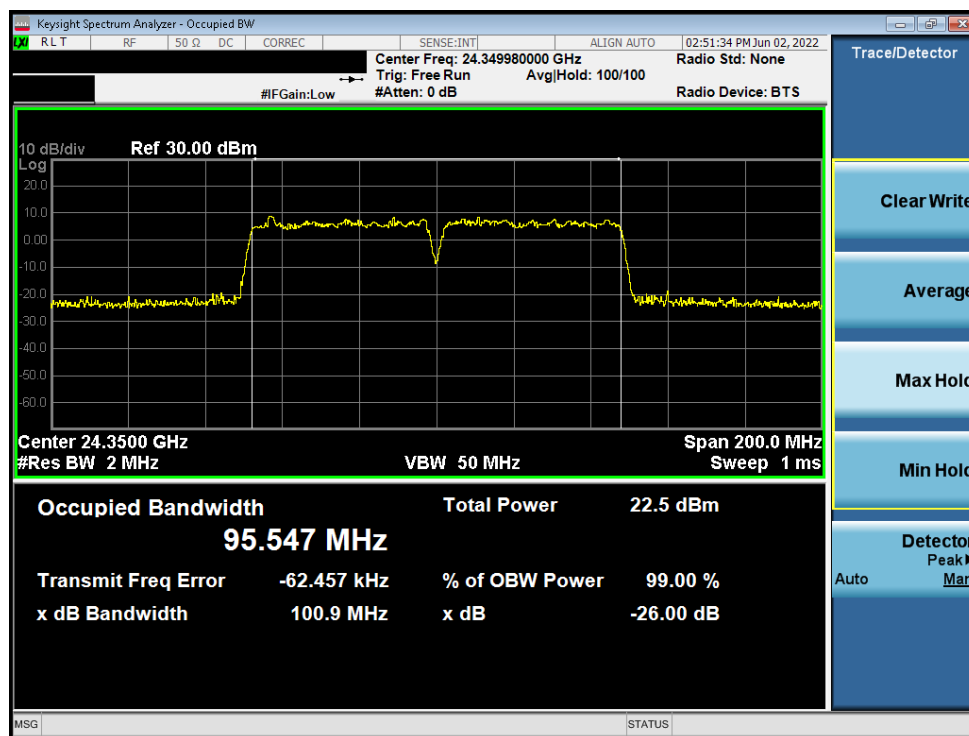


Plot 7-14. Ant1 Occupied Bandwidth Plot (50MHz-2CC – $\pi/2$ -BPSK – Mid Channel)



Plot 7-15. Ant1 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 22 of 142



Plot 7-16. Ant1 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)

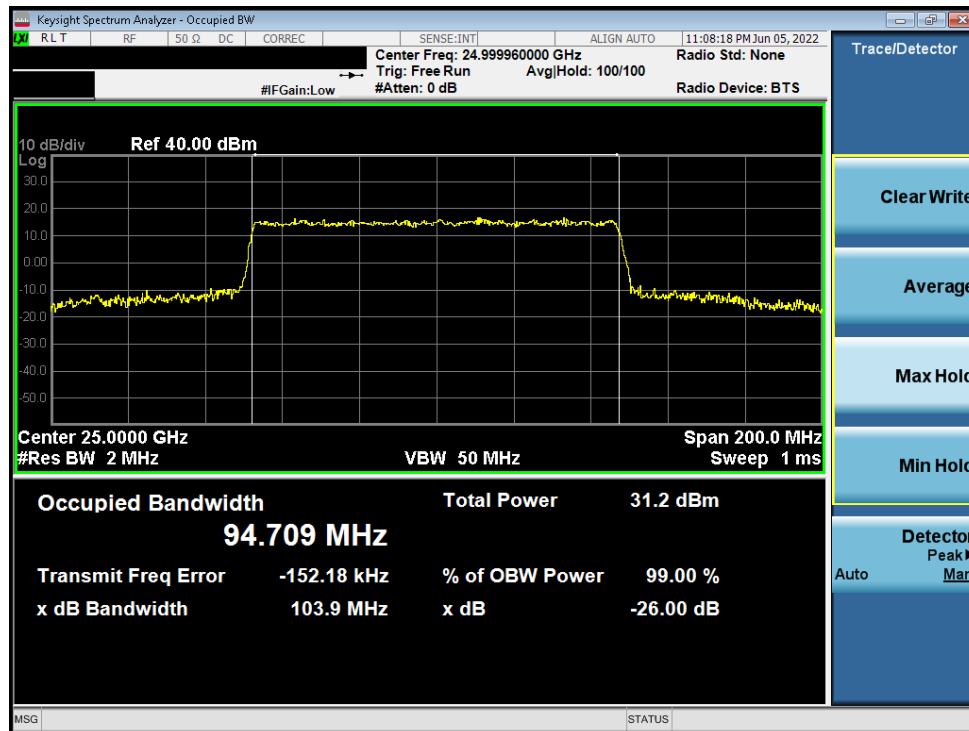
FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 23 of 142

V1.0

Band n258-R2

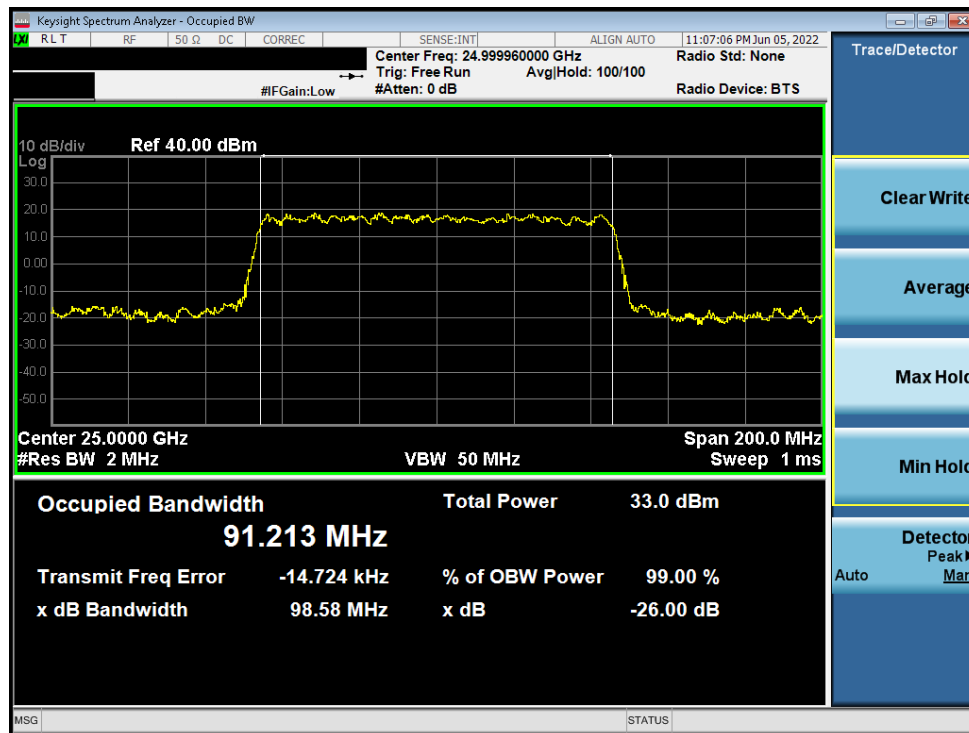
Channel	Bandwidth [MHz]	CCs Active	Transmission Scheme	Modulation	OBW [MHz]
Mid	100	1	CP-OFDM	QPSK	94.71
			DFT-s-OFDM	$\pi/2$ BPSK	91.21
			CP-OFDM	16QAM	94.35
			CP-OFDM	64QAM	94.59
		2	CP-OFDM	QPSK	194.09
			DFT-s-OFDM	$\pi/2$ BPSK	190.68
			CP-OFDM	16QAM	193.83
			CP-OFDM	64QAM	194.00
	50	1	CP-OFDM	QPSK	45.76
			DFT-s-OFDM	$\pi/2$ BPSK	45.68
			CP-OFDM	16QAM	45.79
			CP-OFDM	64QAM	45.97
		2	CP-OFDM	QPSK	95.45
			DFT-s-OFDM	$\pi/2$ BPSK	95.22
			CP-OFDM	16QAM	95.55
			CP-OFDM	64QAM	95.55

Table 7-3. Summary of Ant1 Occupied Bandwidths (n258-R2)

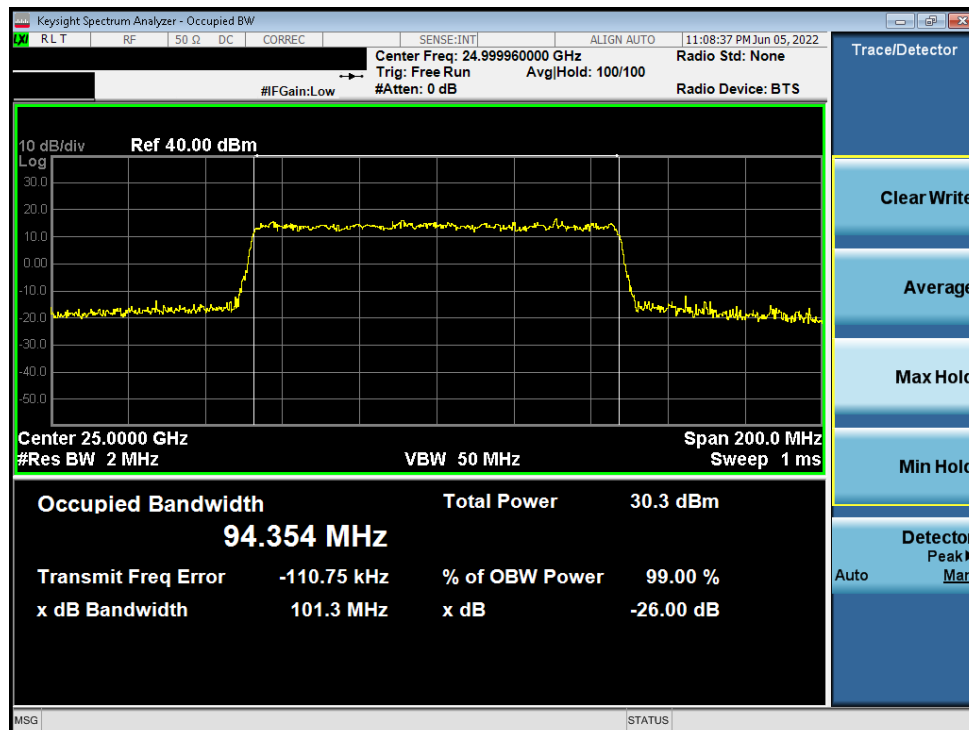


Plot 7-17. Ant1 Occupied Bandwidth Plot (100MHz-1CC - QPSK - Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022-06/16/2022	EUT Type: Portable Handset	Page 24 of 142

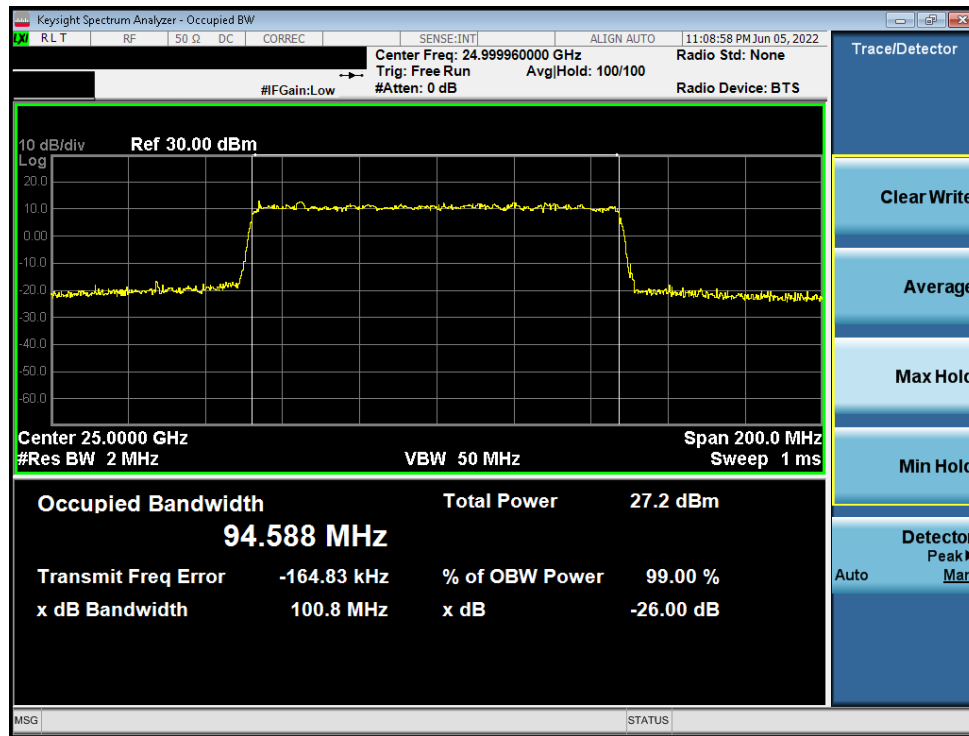


Plot 7-18. Ant1 Occupied Bandwidth Plot (100MHz-1CC – $\pi/2$ -BPSK – Mid Channel)

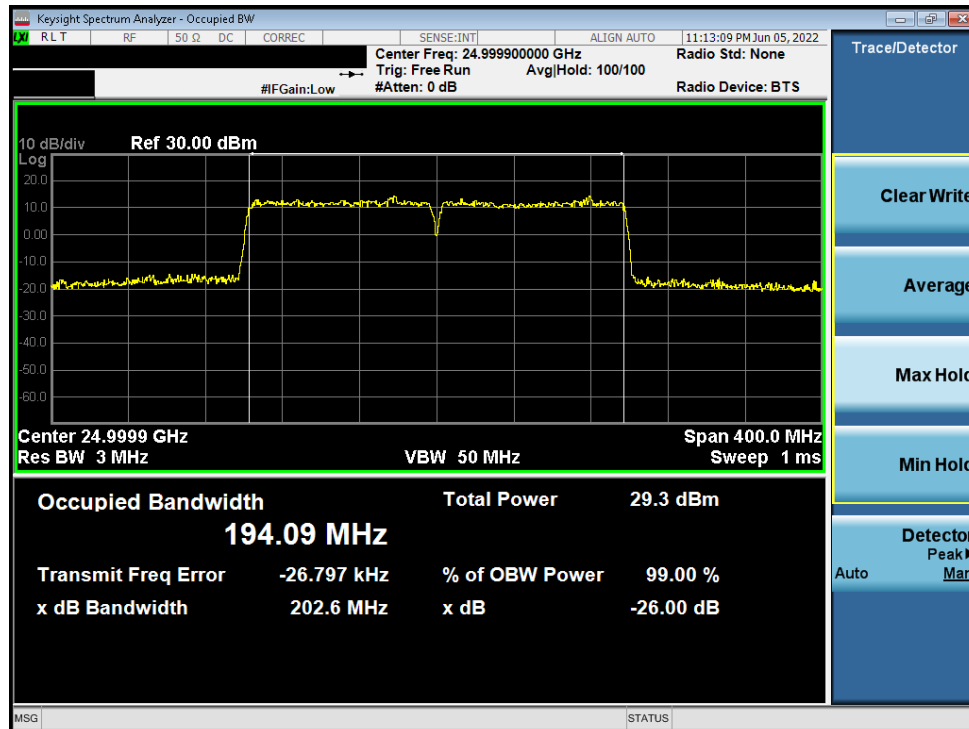


Plot 7-19. Ant1 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 25 of 142

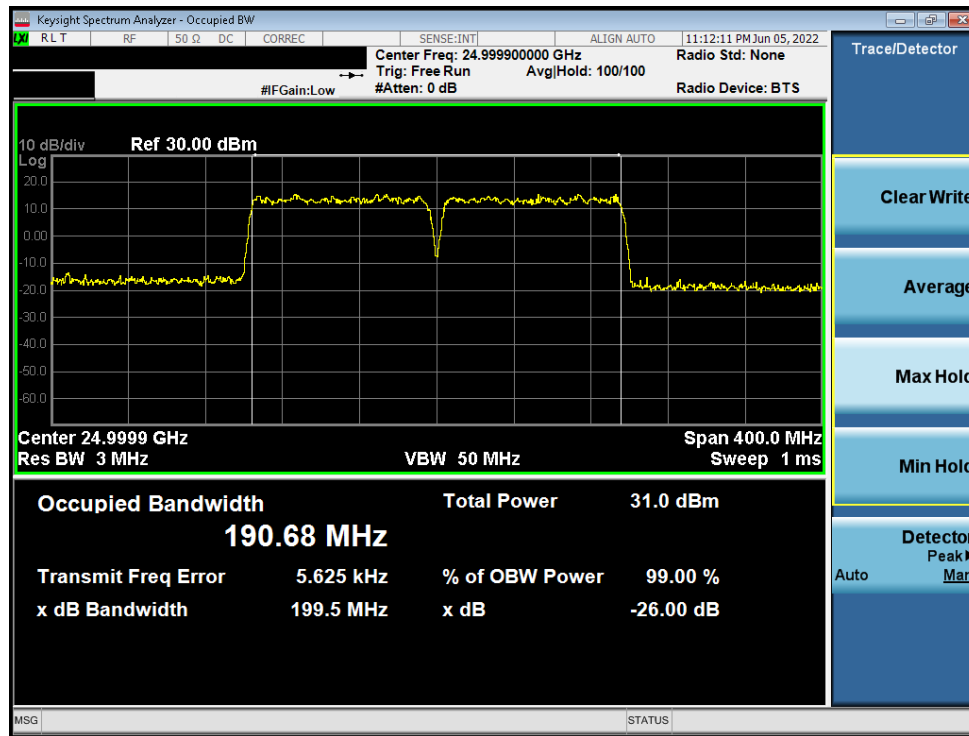


Plot 7-20. Ant1 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)

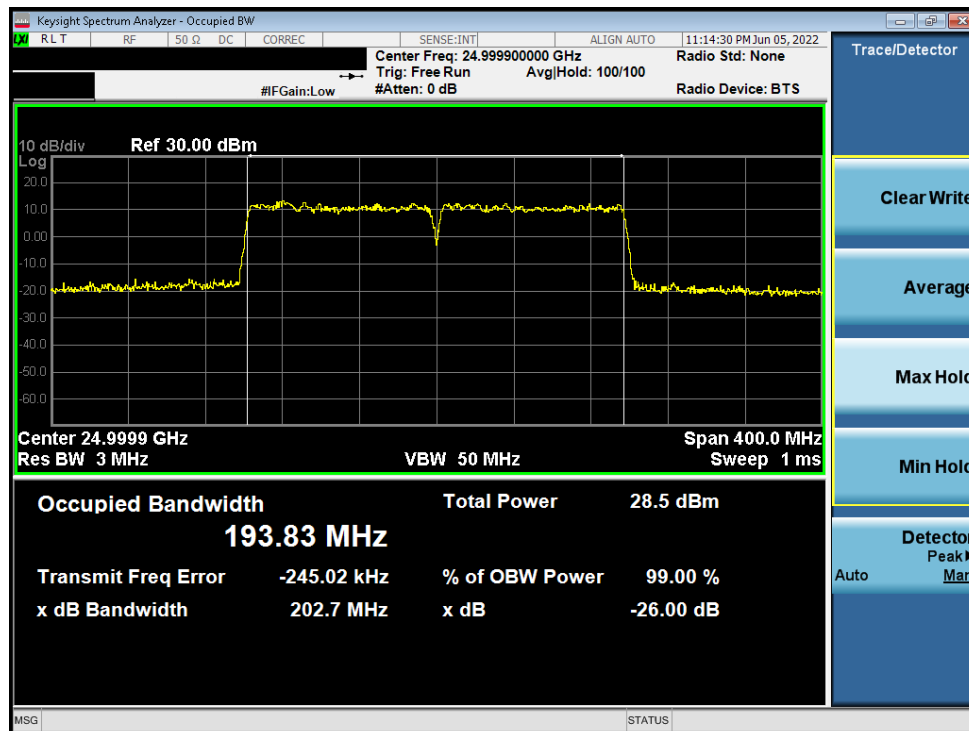


Plot 7-21. Ant1 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 26 of 142

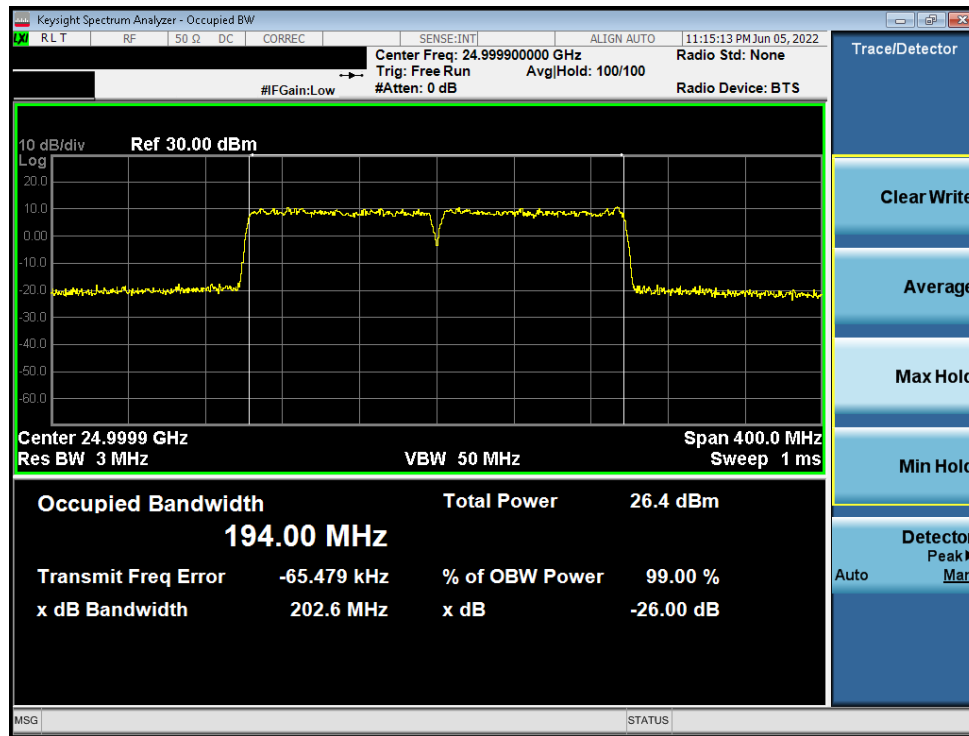


Plot 7-22. Ant1 Occupied Bandwidth Plot (100MHz-2CC – $\pi/2$ -BPSK – Mid Channel)

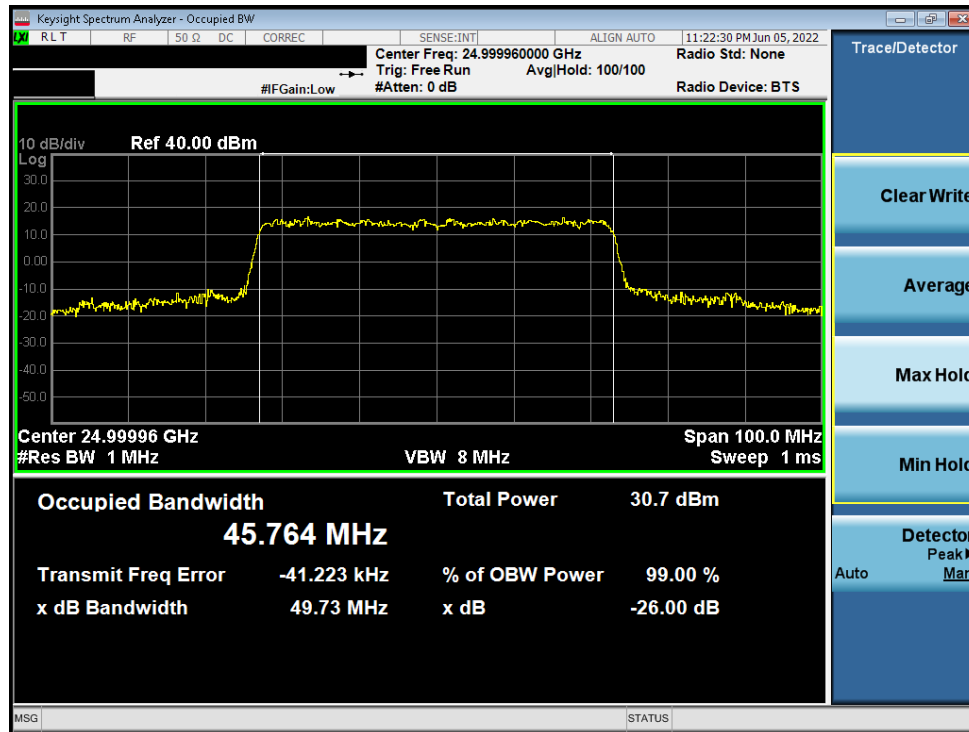


Plot 7-23. Ant1 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 27 of 142

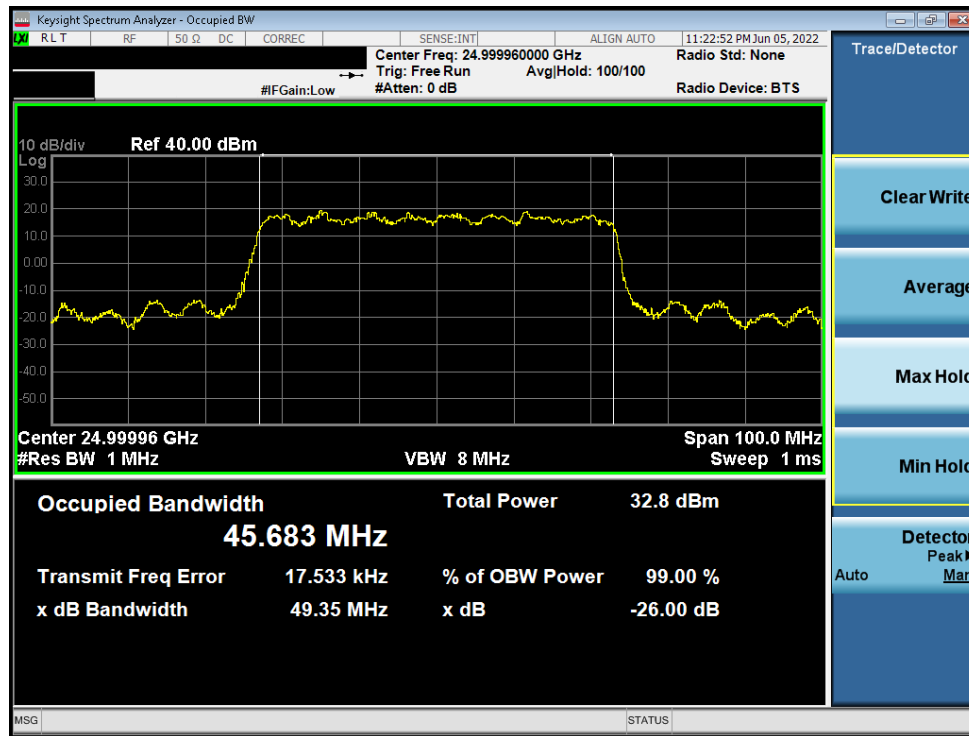


Plot 7-24. Ant1 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

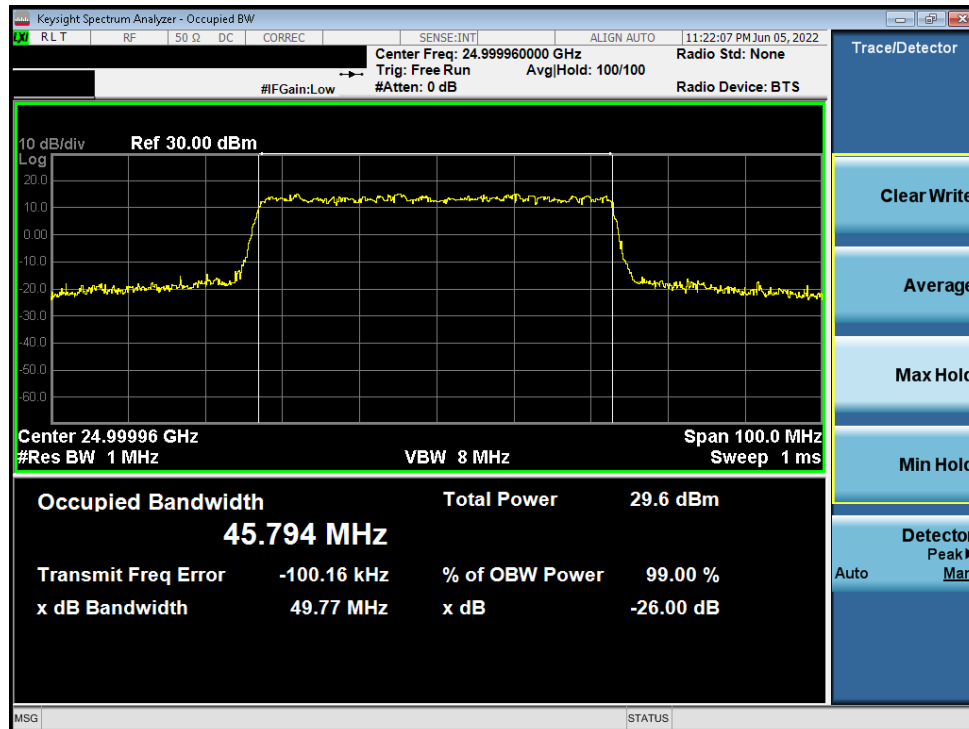


Plot 7-25. Ant1 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 28 of 142

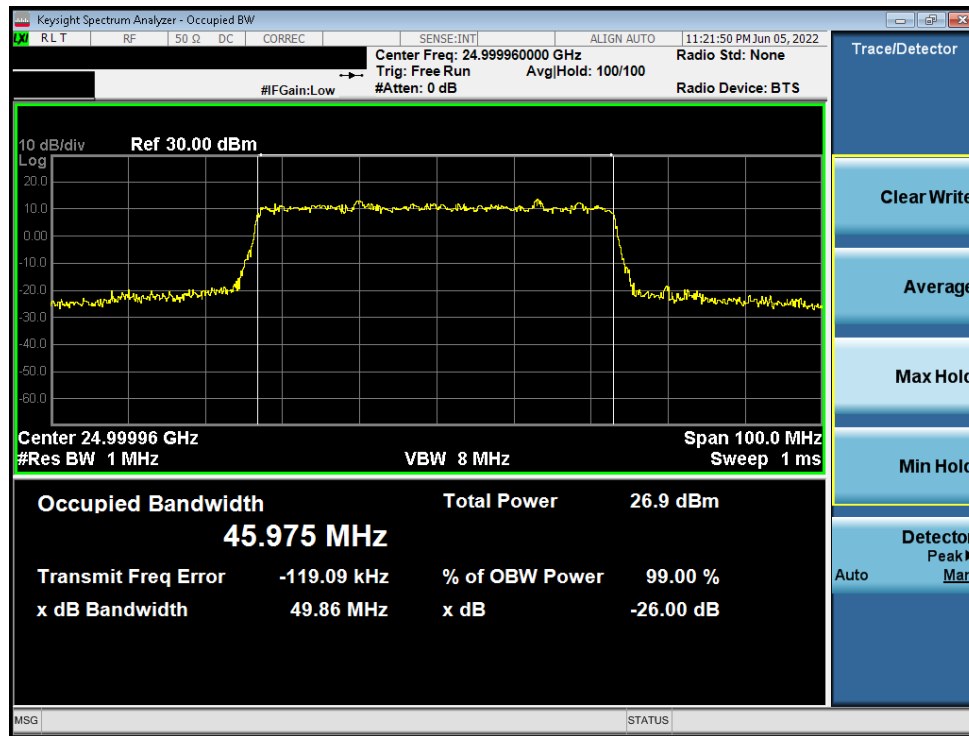


Plot 7-26. Ant1 Occupied Bandwidth Plot (50MHz-1CC – $\pi/2$ -BPSK – Mid Channel)

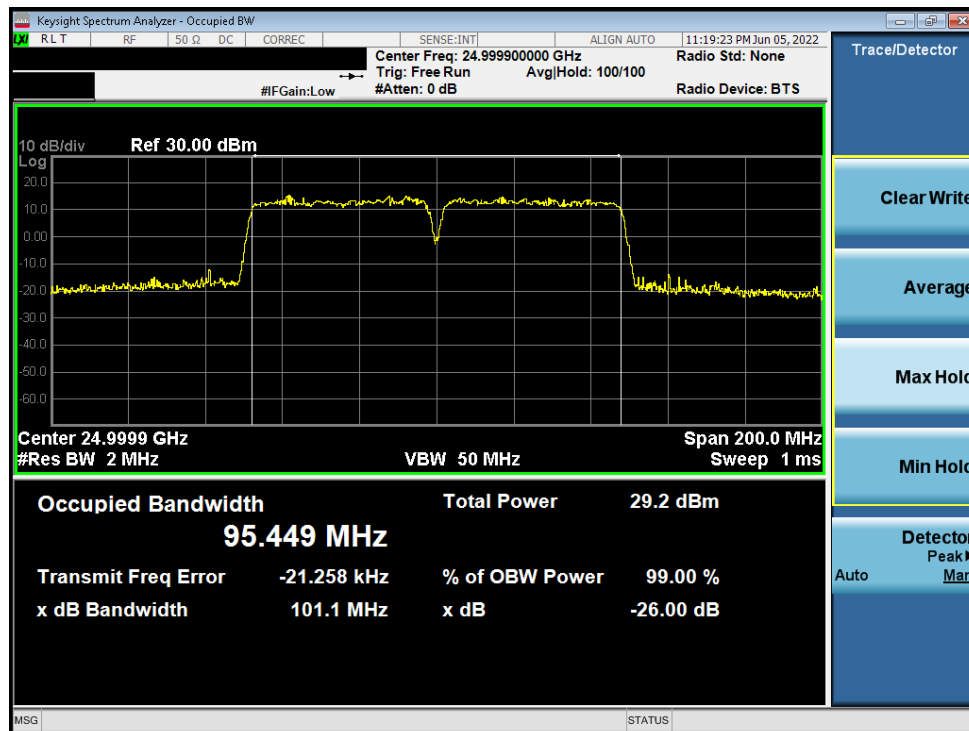


Plot 7-27. Ant1 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 29 of 142

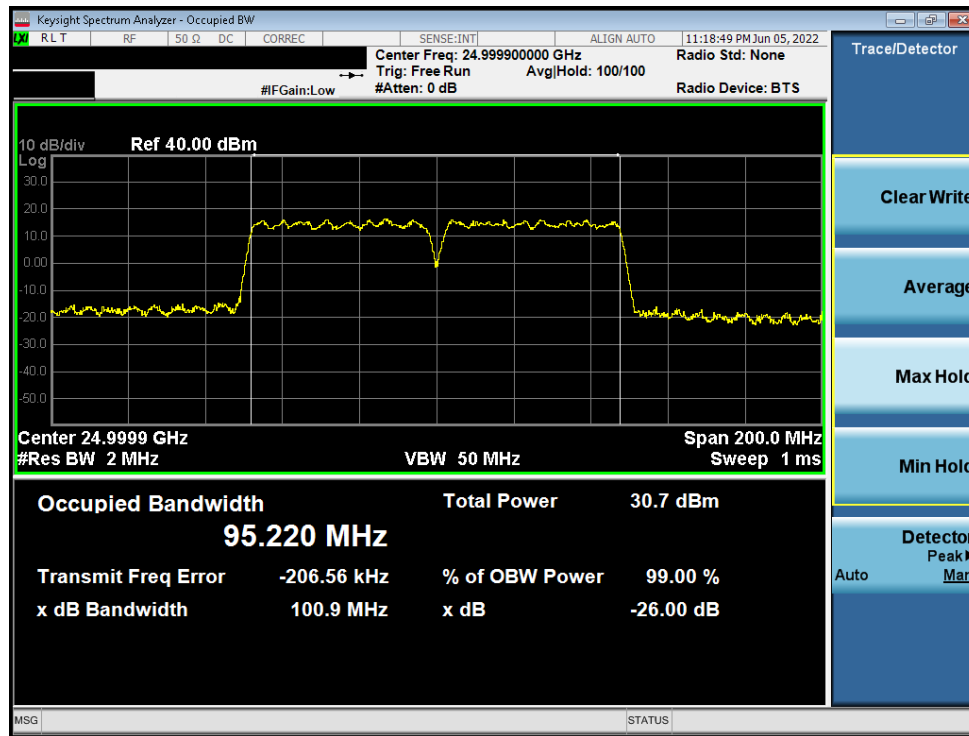


Plot 7-28. Ant1 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)

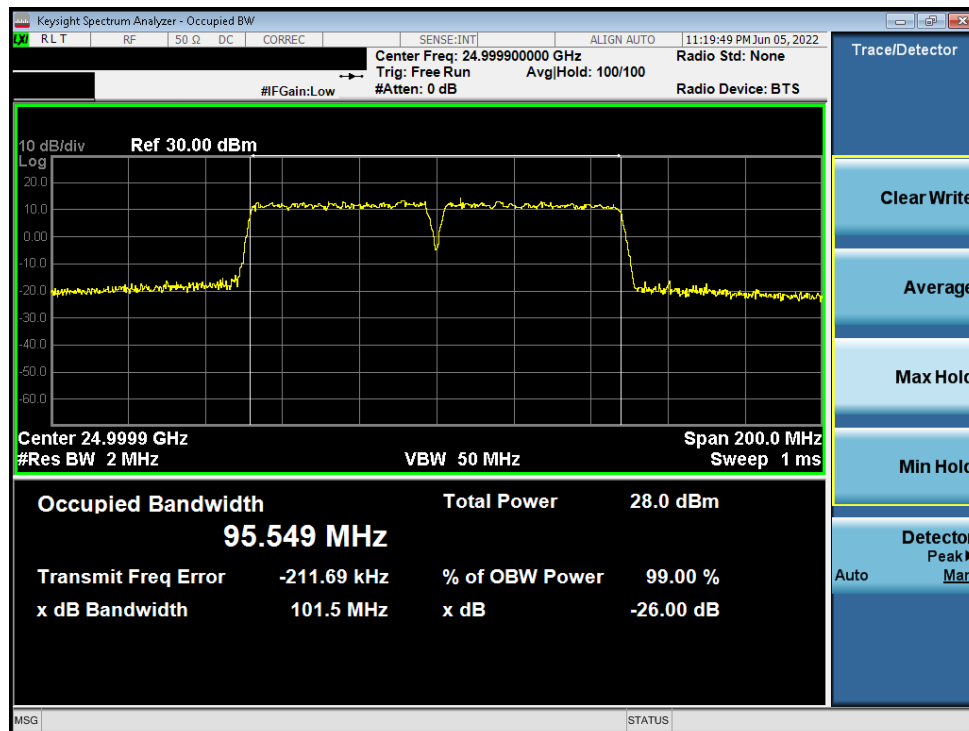


Plot 7-29. Ant1 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 30 of 142

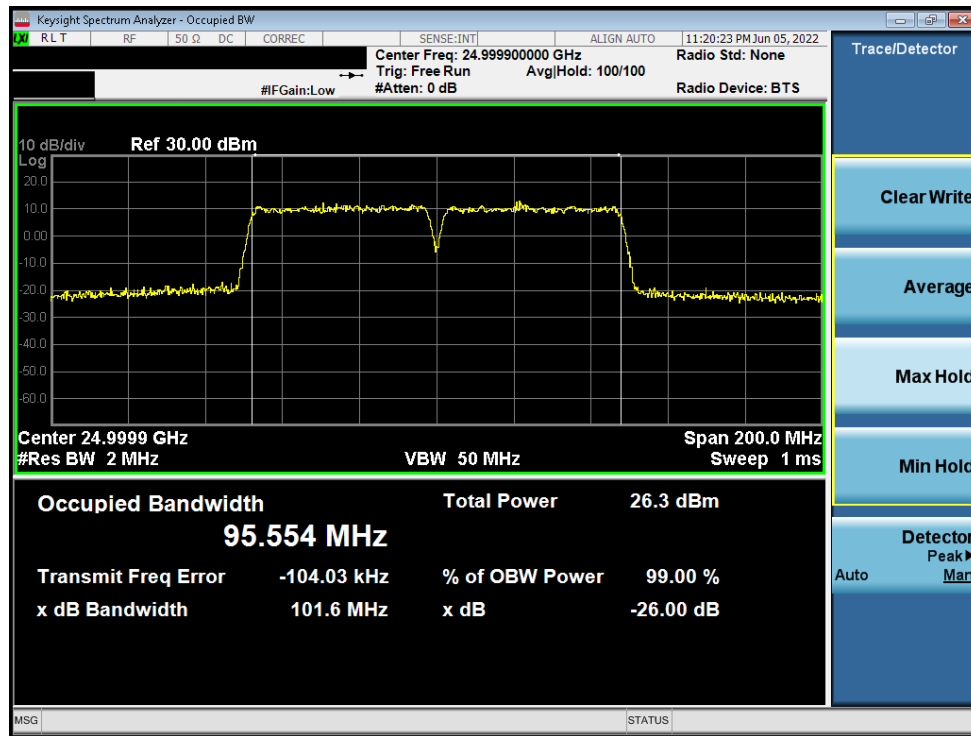


Plot 7-30. Ant1 Occupied Bandwidth Plot (50MHz-2CC – $\pi/2$ -BPSK – Mid Channel)



Plot 7-31. Ant1 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 31 of 142



Plot 7-32. Ant1 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)

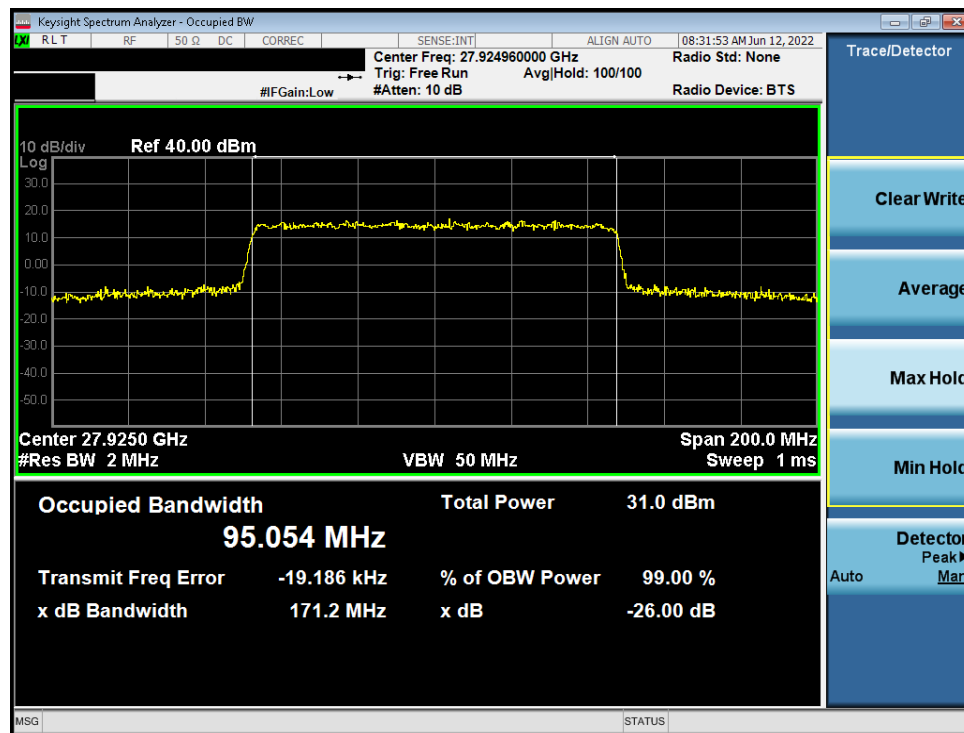
FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 32 of 142

V1.0

Band n261

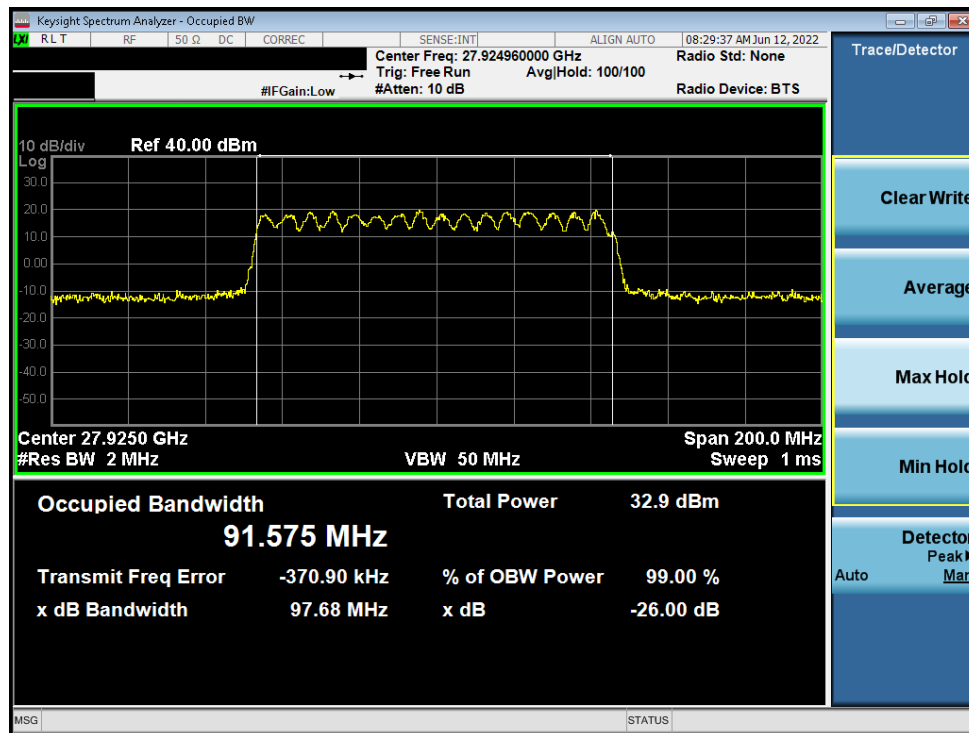
Channel	Bandwidth [MHz]	CCs Active	Transmission Scheme	Modulation	OBW [MHz]
Mid	100	1	CP-OFDM	QPSK	95.05
			DFT-s-OFDM	$\pi/2$ BPSK	91.57
			CP-OFDM	16QAM	94.84
			CP-OFDM	64QAM	95.14
		2	CP-OFDM	QPSK	193.87
			DFT-s-OFDM	$\pi/2$ BPSK	190.82
			CP-OFDM	16QAM	193.87
			CP-OFDM	64QAM	194.33
	50	1	CP-OFDM	QPSK	46.06
			DFT-s-OFDM	$\pi/2$ BPSK	45.85
			CP-OFDM	16QAM	46.02
			CP-OFDM	64QAM	46.05
		2	CP-OFDM	QPSK	95.58
			DFT-s-OFDM	$\pi/2$ BPSK	95.26
			CP-OFDM	16QAM	95.70
			CP-OFDM	64QAM	95.68

Table 7-4. Summary of Ant1 Occupied Bandwidths (n261)

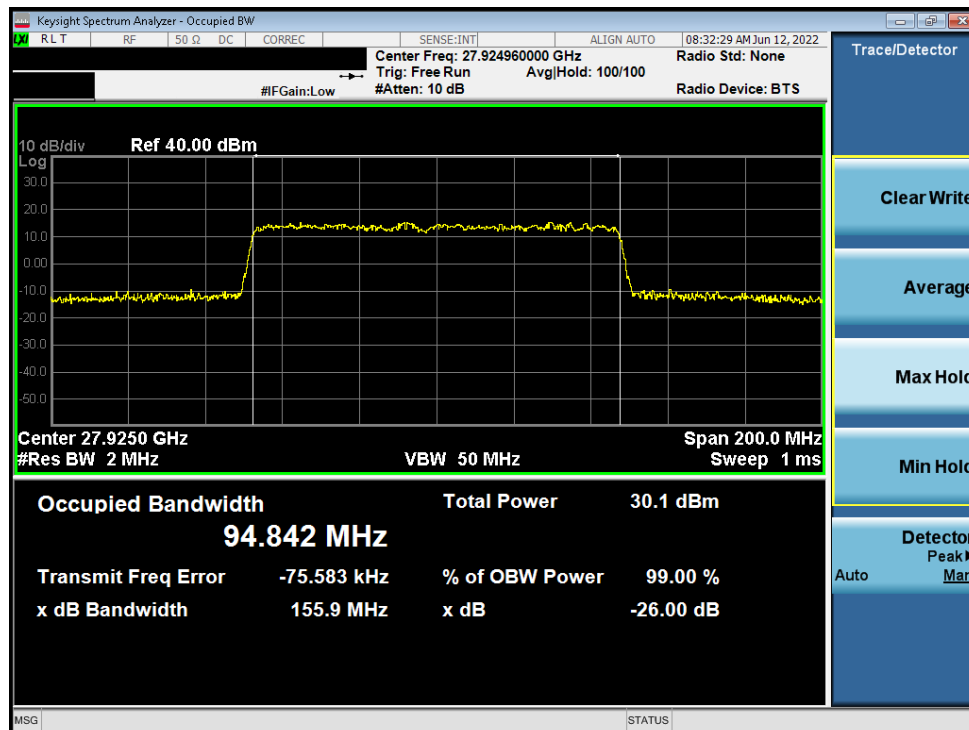


Plot 7-33. Ant1 Occupied Bandwidth Plot (100MHz-1CC - QPSK - Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022-06/16/2022	EUT Type: Portable Handset	Page 33 of 142

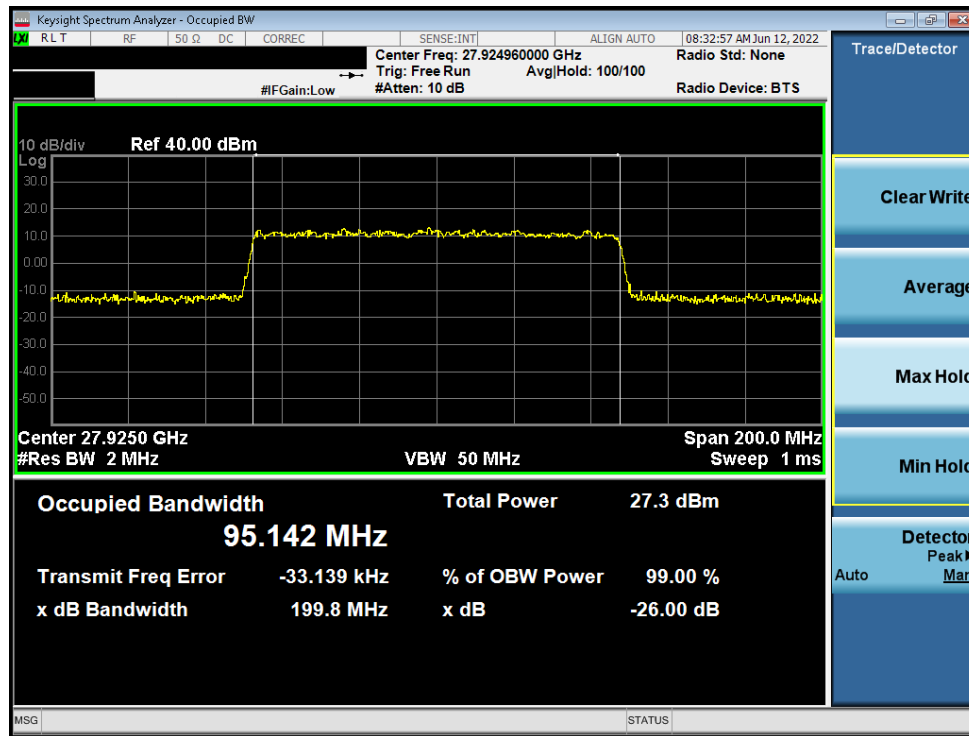


Plot 7-34. Ant1 Occupied Bandwidth Plot (100MHz-1CC – $\pi/2$ -BPSK – Mid Channel)

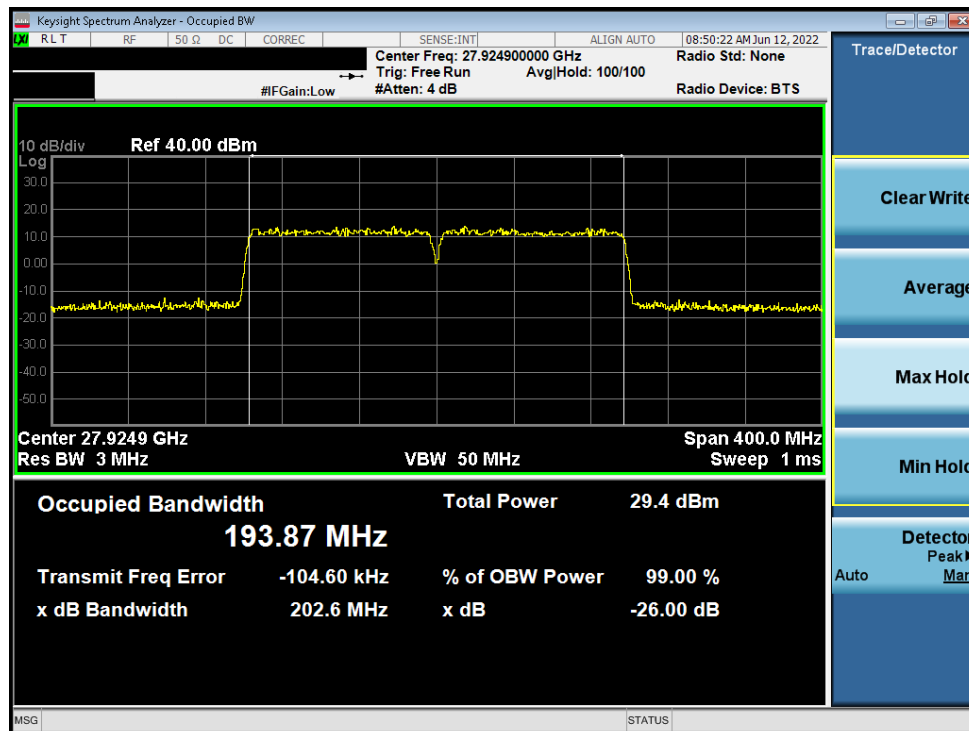


Plot 7-35. Ant1 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 34 of 142

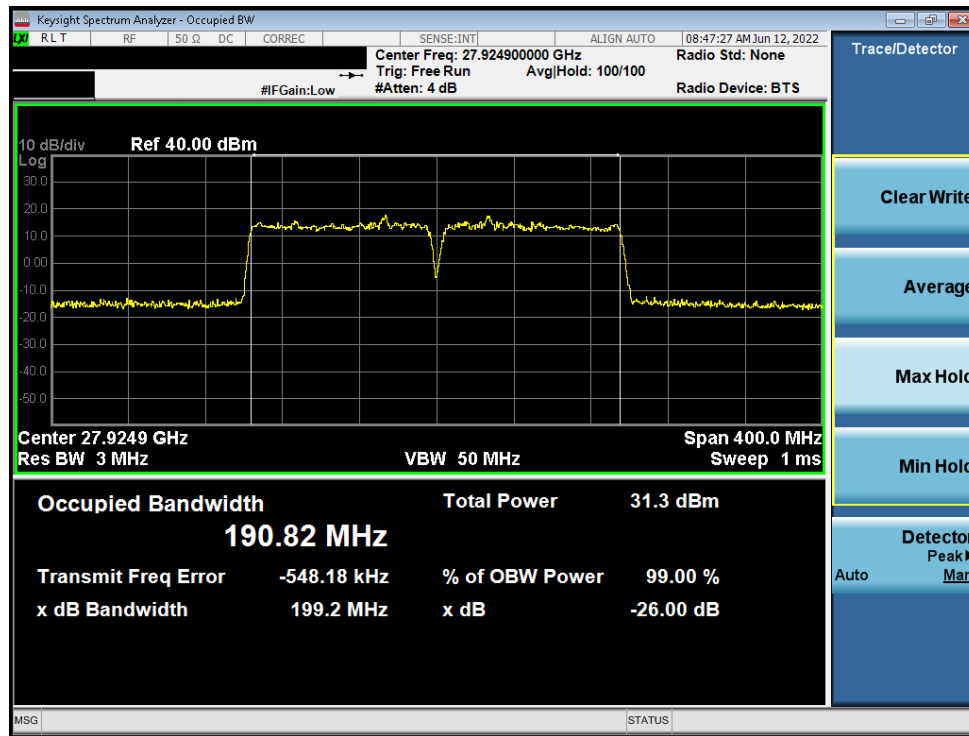


Plot 7-36. Ant1 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)

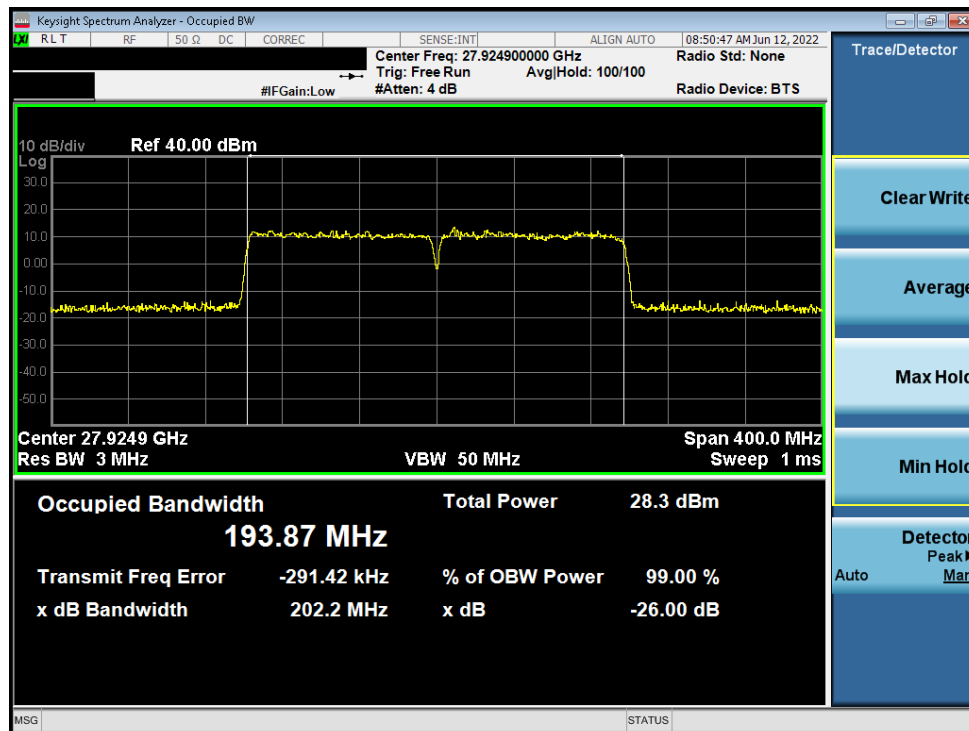


Plot 7-37. Ant1 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 35 of 142

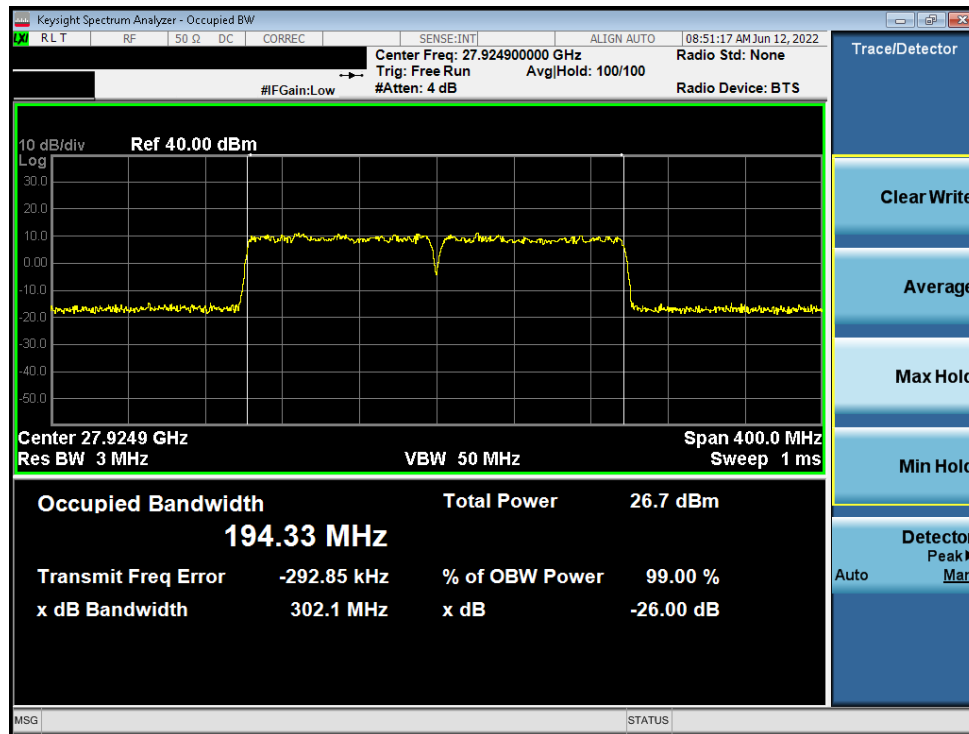


Plot 7-38. Ant1 Occupied Bandwidth Plot (100MHz-2CC – $\pi/2$ -BPSK – Mid Channel)

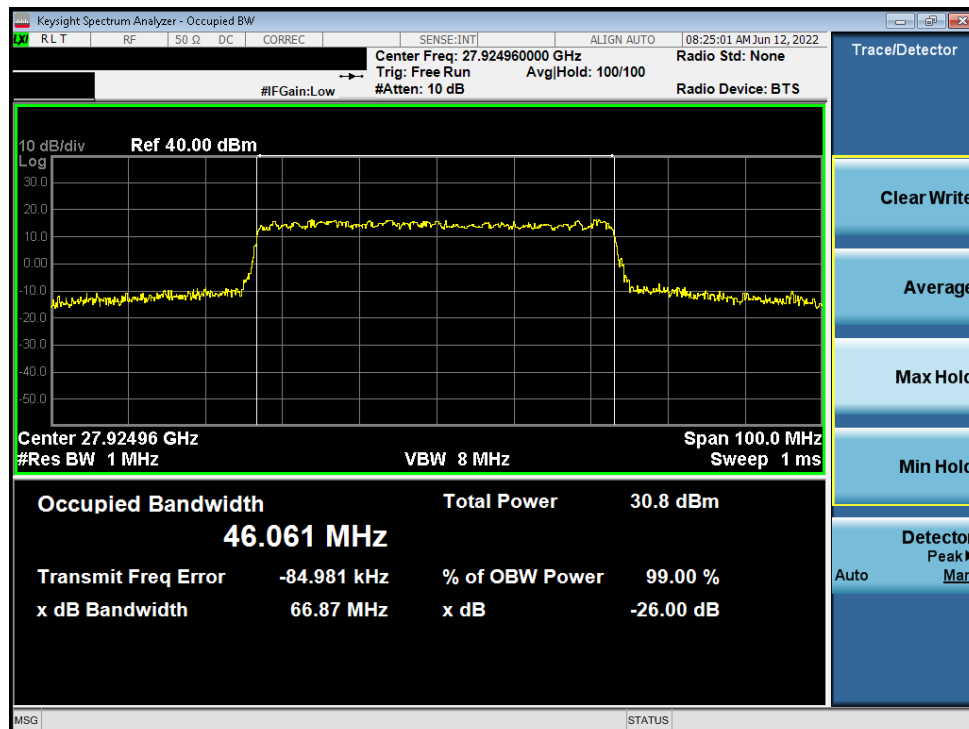


Plot 7-39. Ant1 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 36 of 142

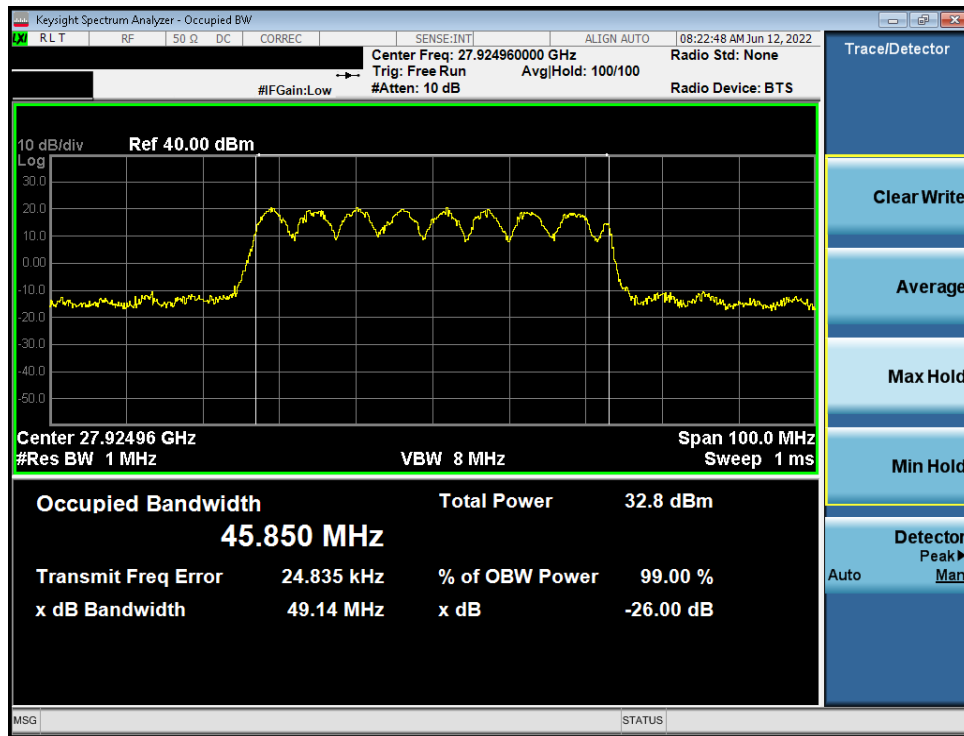


Plot 7-40. Ant1 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

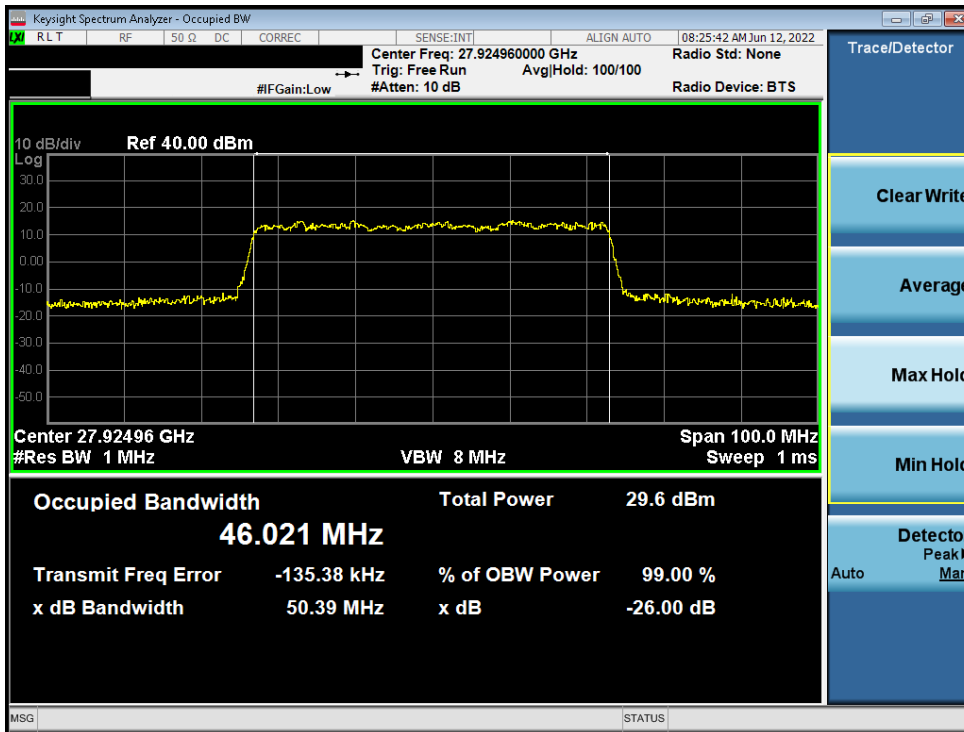


Plot 7-41. Ant1 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 37 of 142



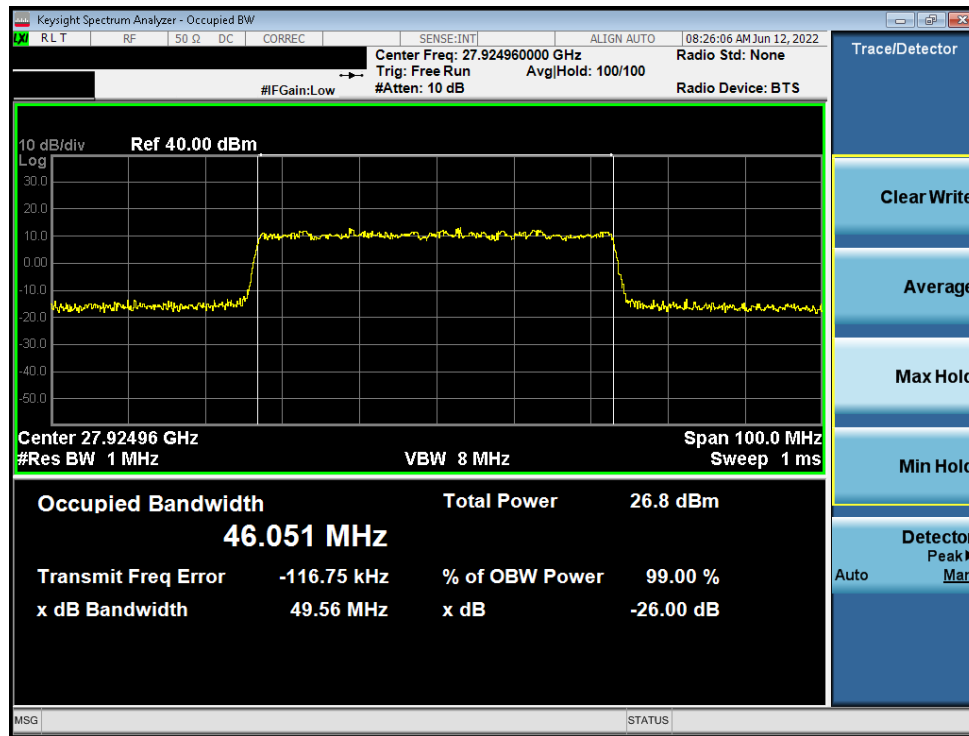
Plot 7-42. Ant1 Occupied Bandwidth Plot (50MHz-1CC – $\pi/2$ -BPSK – Mid Channel)



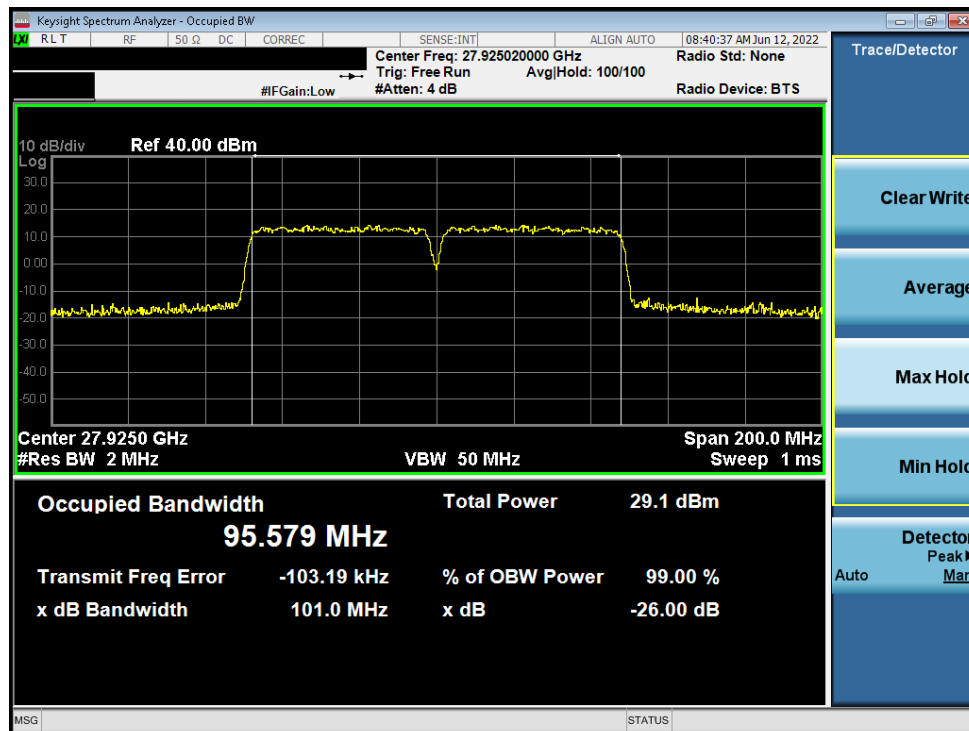
Plot 7-43. Ant1 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 38 of 142

V1.0

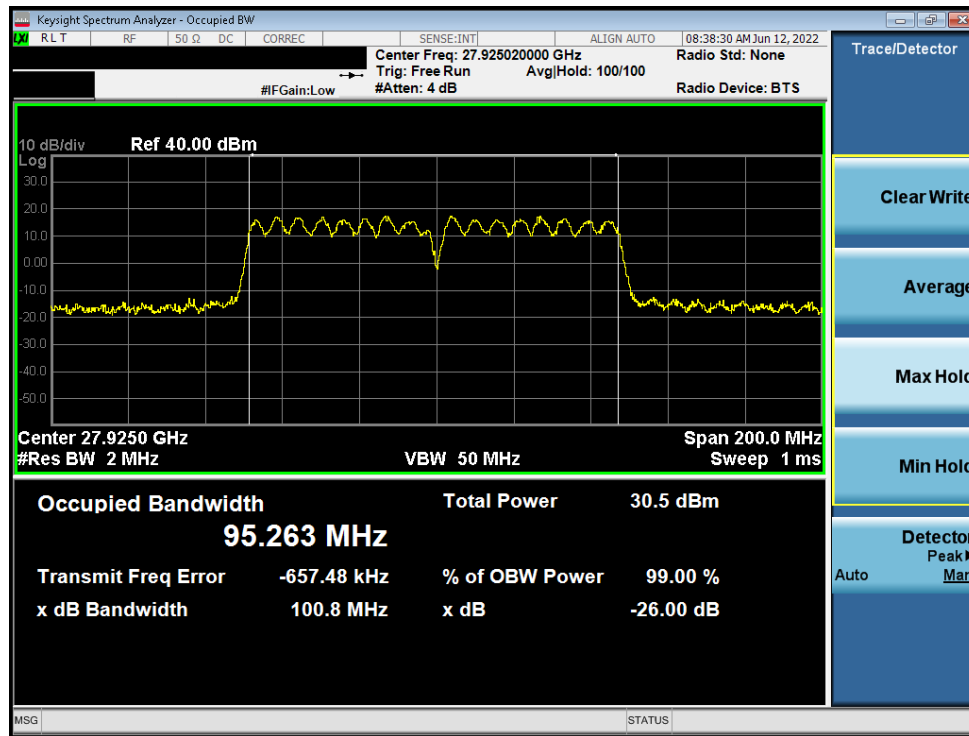


Plot 7-44. Ant1 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)

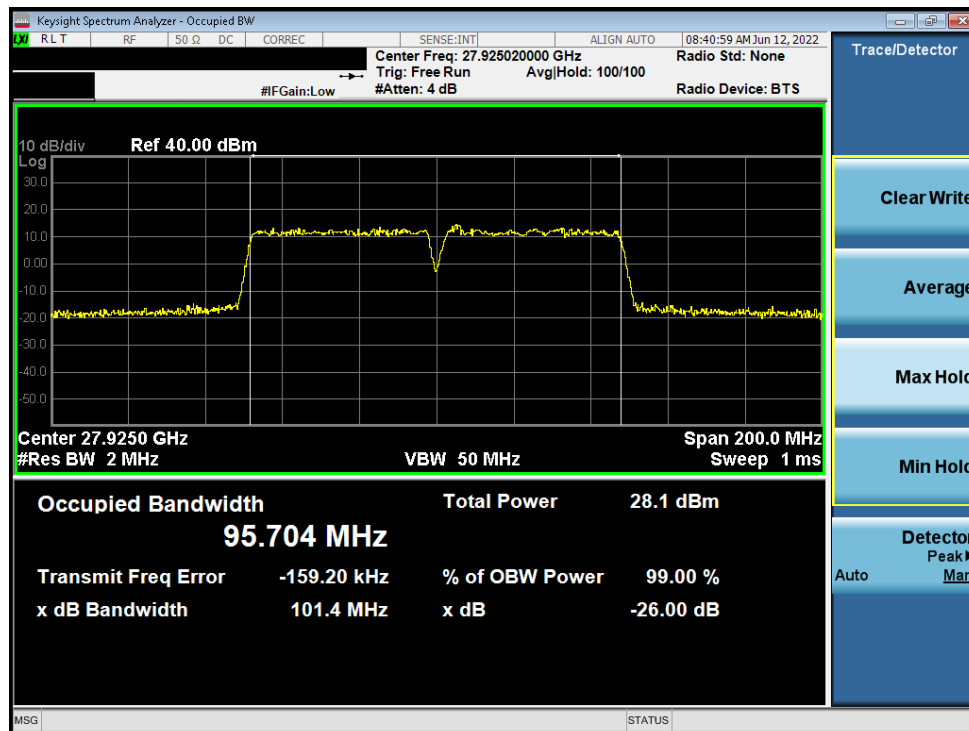


Plot 7-45. Ant1 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 39 of 142

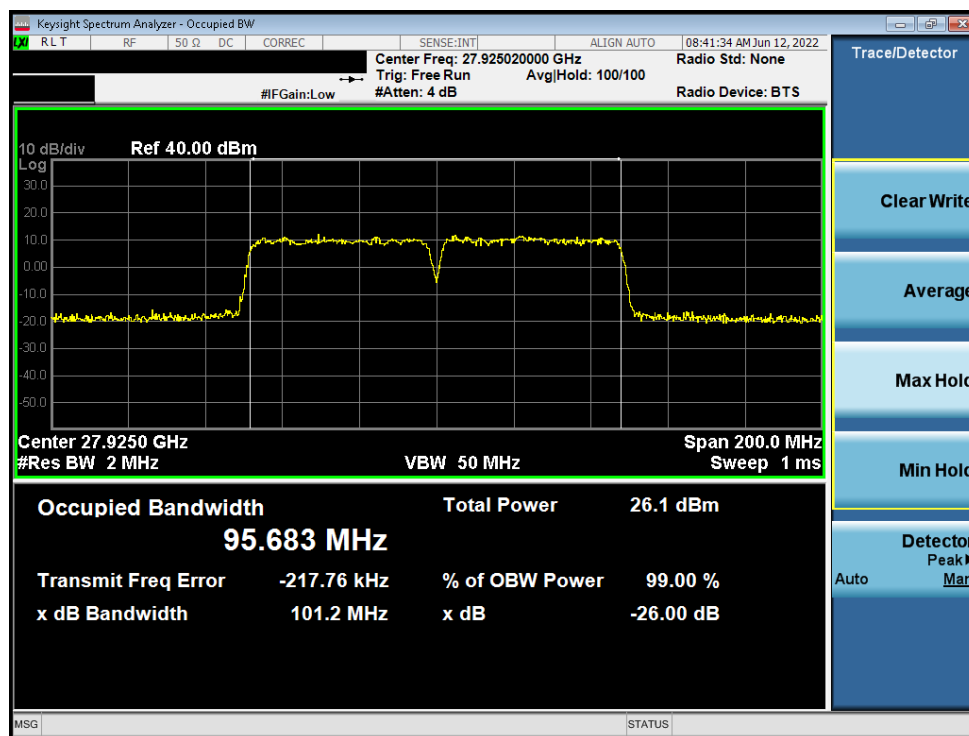


Plot 7-46. Ant1 Occupied Bandwidth Plot (50MHz-2CC – $\pi/2$ -BPSK – Mid Channel)



Plot 7-47. Ant1 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 40 of 142



Plot 7-48. Ant1 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)

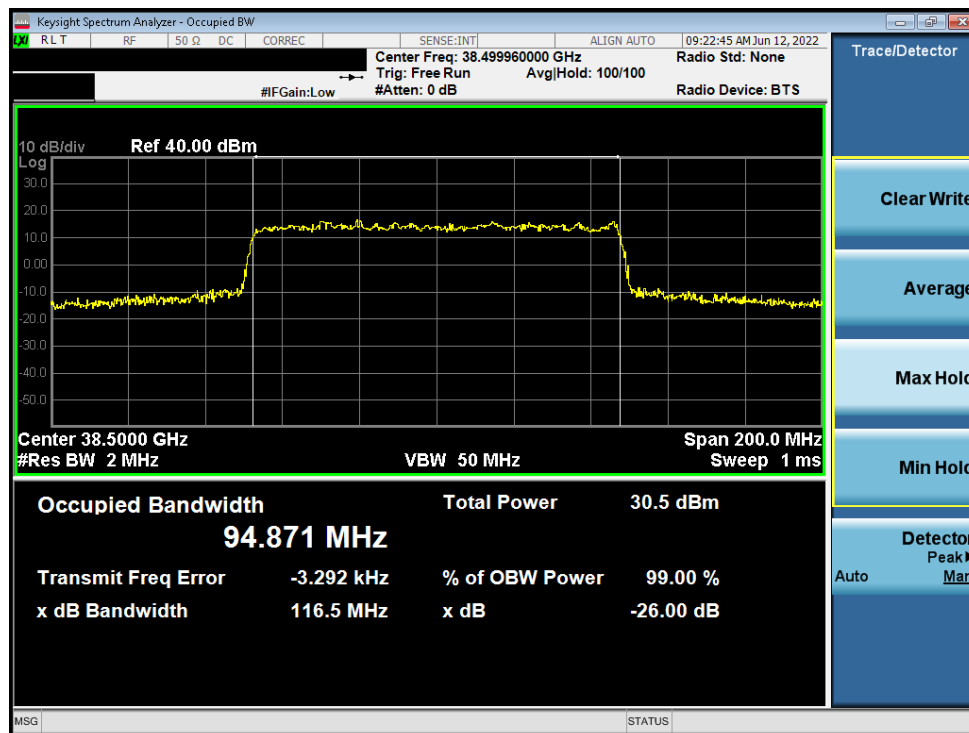
FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 41 of 142

V1.0

Band n260

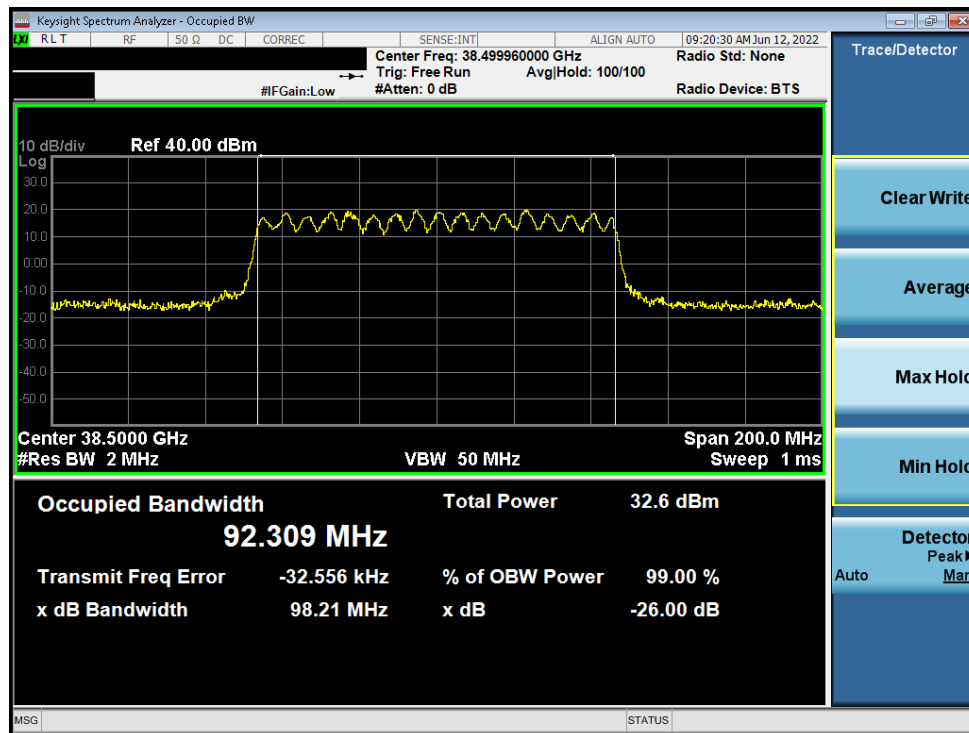
Channel	Bandwidth [MHz]	CCs Active	Transmission Scheme	Modulation	OBW [MHz]
Mid	100	1	CP-OFDM	QPSK	94.87
			DFT-s-OFDM	$\pi/2$ BPSK	92.31
			CP-OFDM	16QAM	94.82
			CP-OFDM	64QAM	94.82
		2	CP-OFDM	QPSK	194.41
			DFT-s-OFDM	$\pi/2$ BPSK	192.68
			CP-OFDM	16QAM	194.59
			CP-OFDM	64QAM	195.66
	50	1	CP-OFDM	QPSK	46.12
			DFT-s-OFDM	$\pi/2$ BPSK	46.32
			CP-OFDM	16QAM	45.97
			CP-OFDM	64QAM	46.12
		2	CP-OFDM	QPSK	95.89
			DFT-s-OFDM	$\pi/2$ BPSK	95.92
			CP-OFDM	16QAM	95.68
			CP-OFDM	64QAM	96.10

Table 7-5. Summary of Ant1 Occupied Bandwidths (n260)

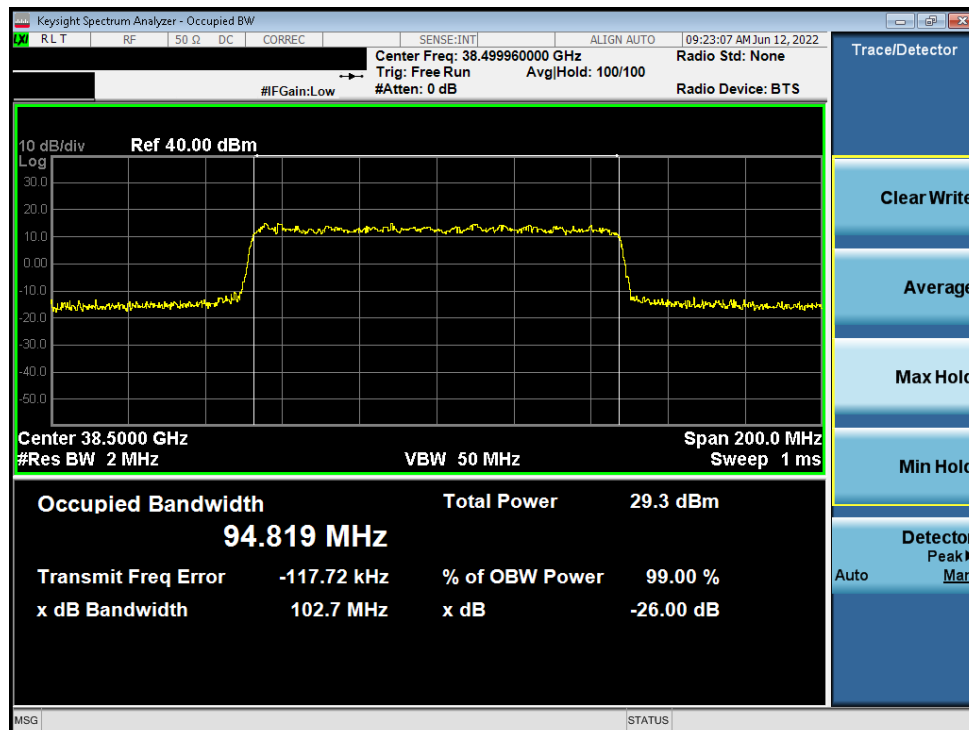


Plot 7-49. Ant1 Occupied Bandwidth Plot (100MHz-1CC - QPSK - Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022-06/16/2022	EUT Type: Portable Handset	Page 42 of 142

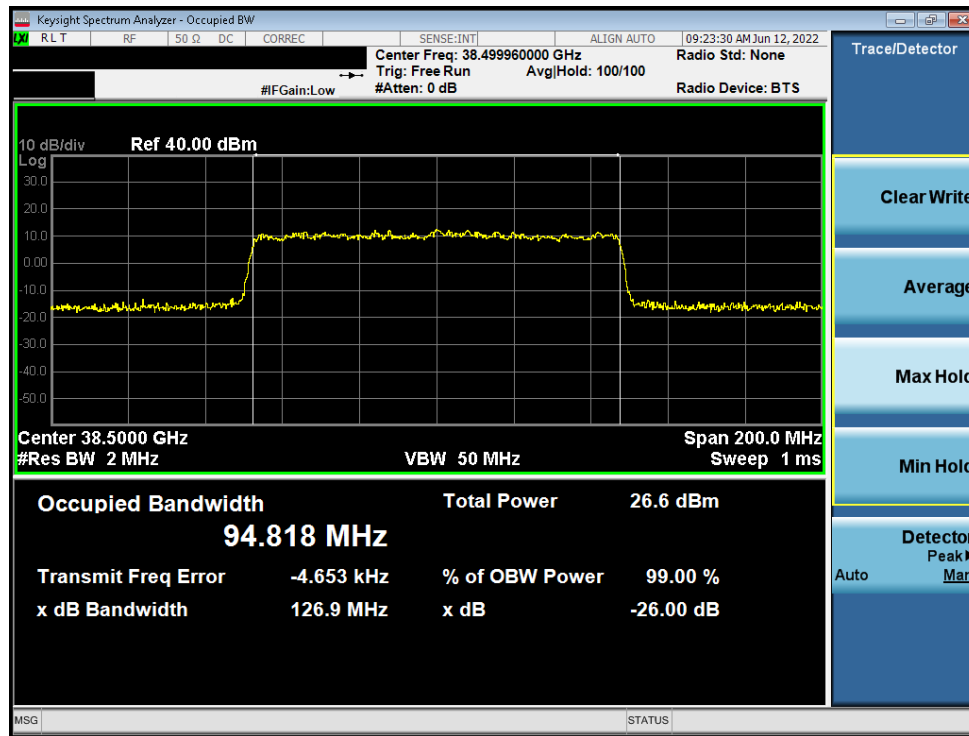


Plot 7-50. Ant1 Occupied Bandwidth Plot (100MHz-1CC – $\pi/2$ -BPSK – Mid Channel)

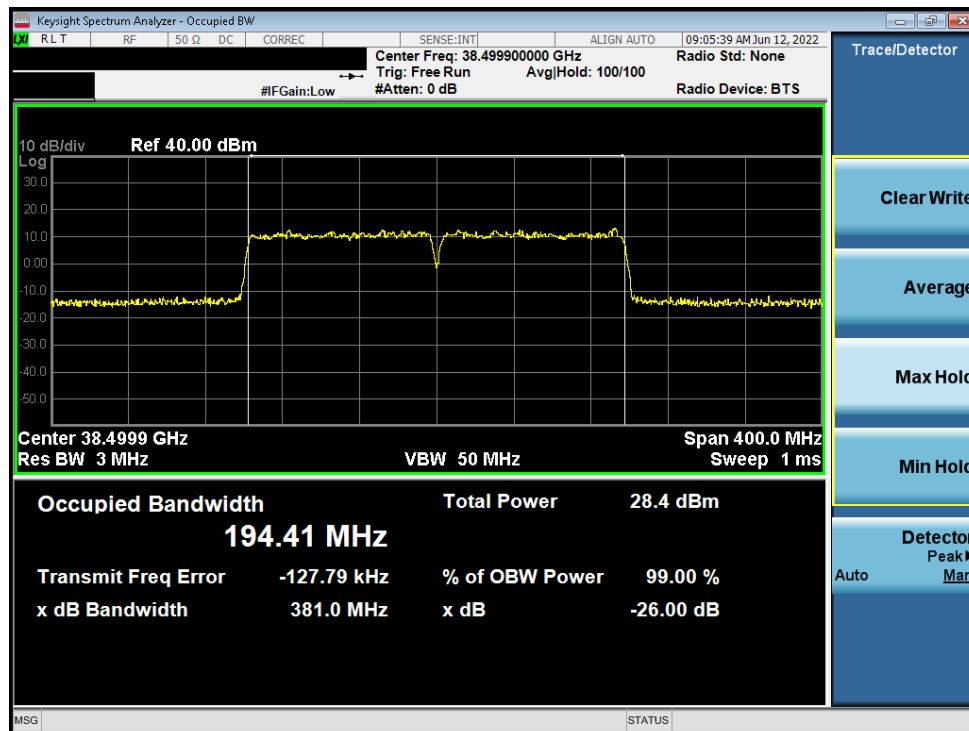


Plot 7-51. Ant1 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 43 of 142

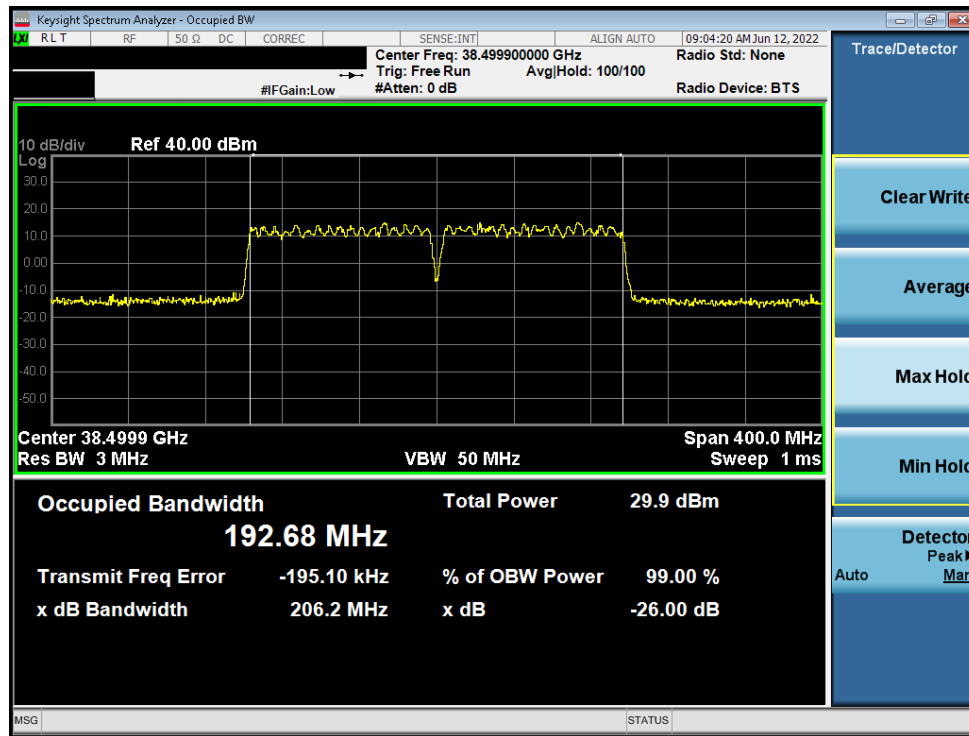


Plot 7-52. Ant1 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)

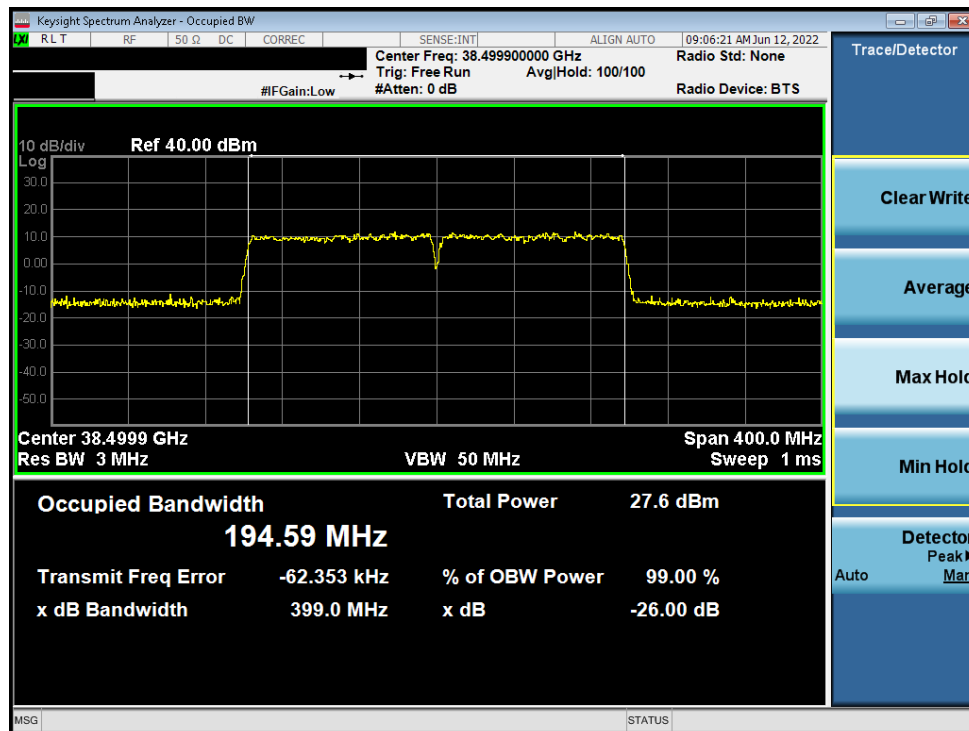


Plot 7-53. Ant1 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 44 of 142

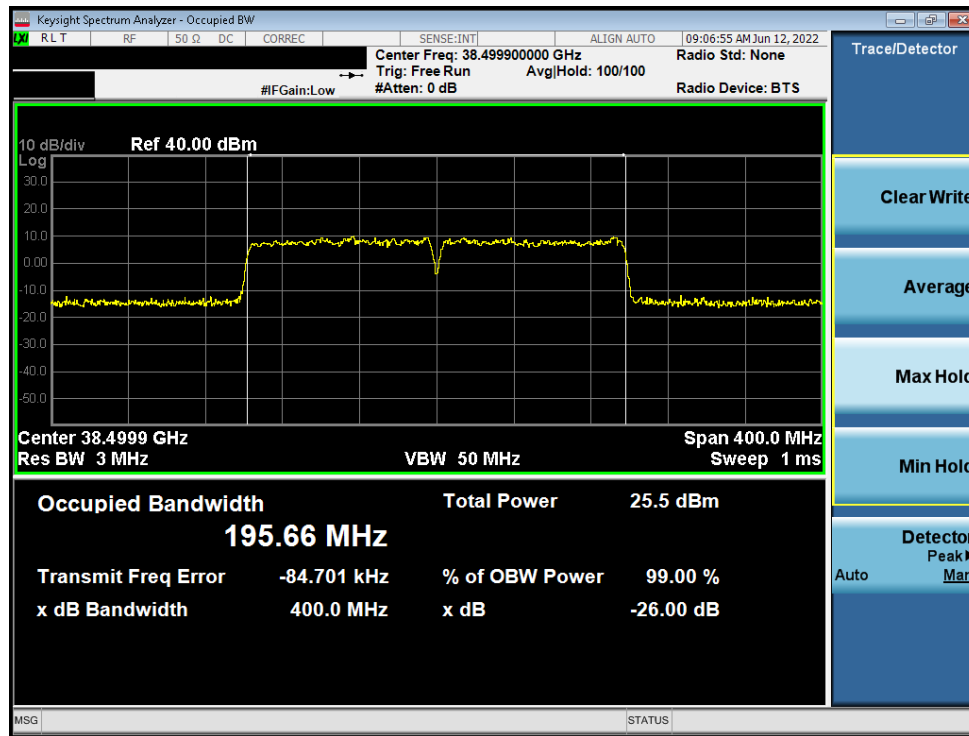


Plot 7-54. Ant1 Occupied Bandwidth Plot (100MHz-2CC – $\pi/2$ -BPSK – Mid Channel)

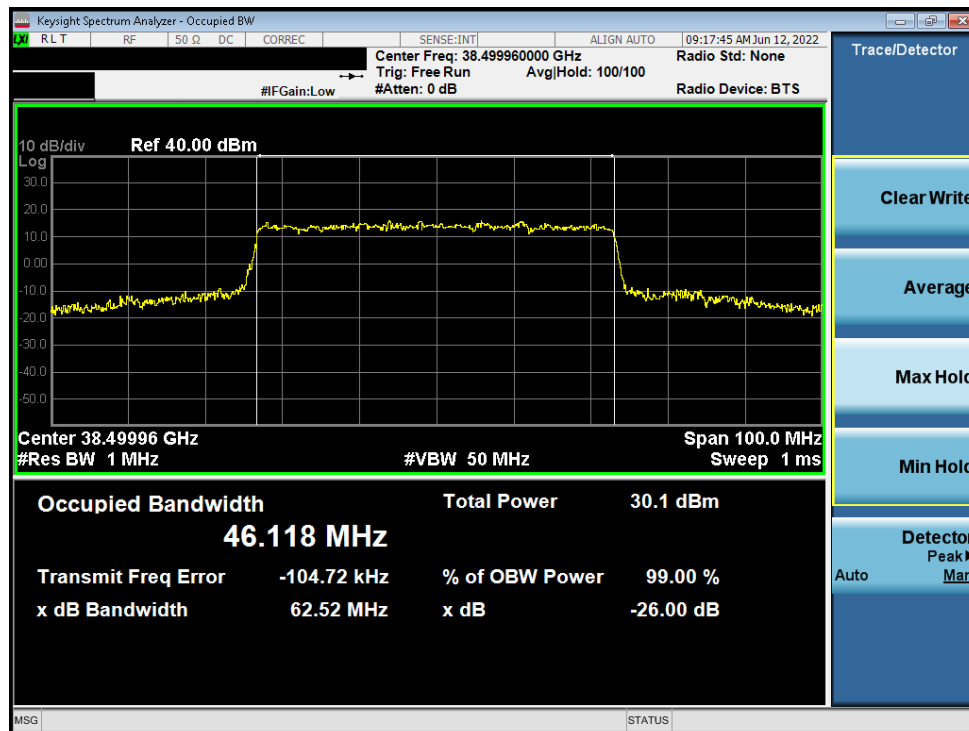


Plot 7-55. Ant1 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 45 of 142

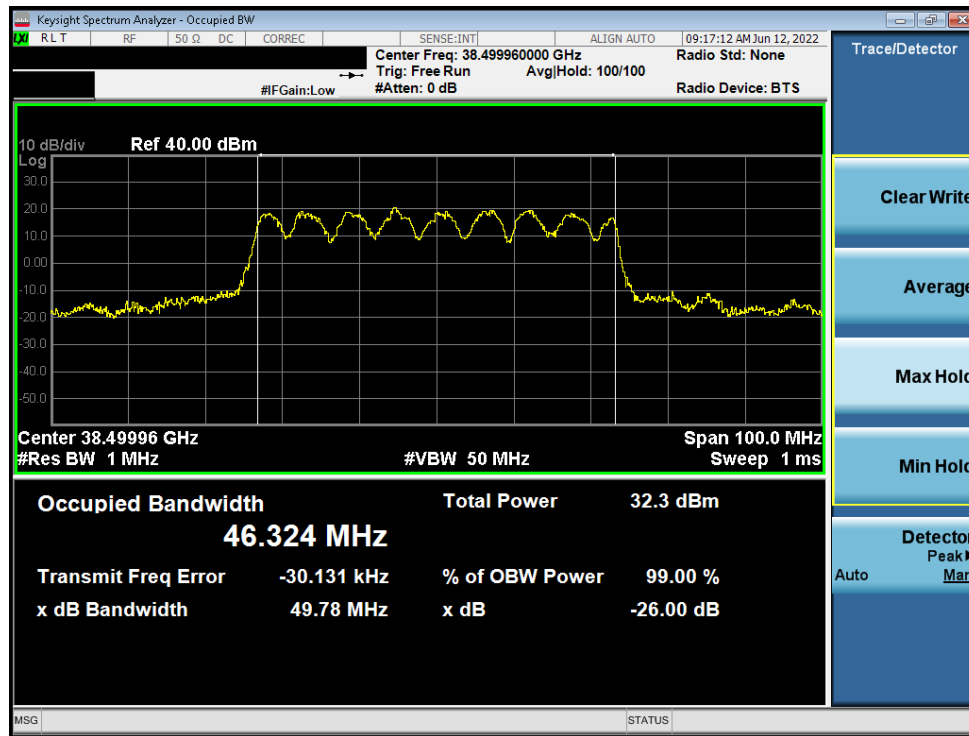


Plot 7-56. Ant1 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

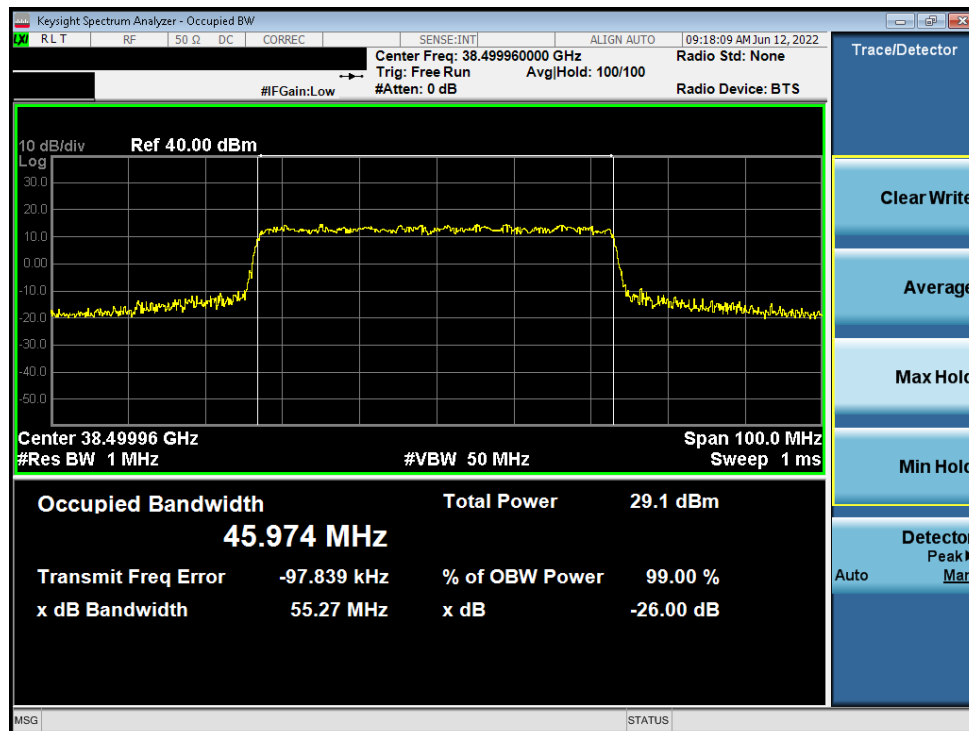


Plot 7-57. Ant1 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 46 of 142

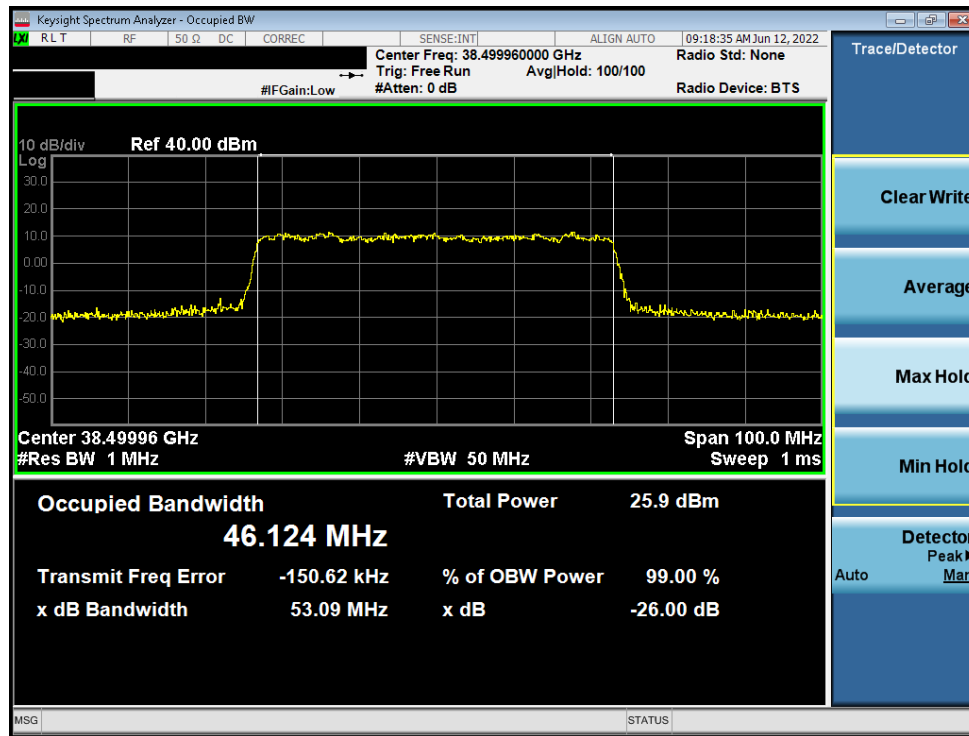


Plot 7-58. Ant1 Occupied Bandwidth Plot (50MHz-1CC – $\pi/2$ -BPSK – Mid Channel)

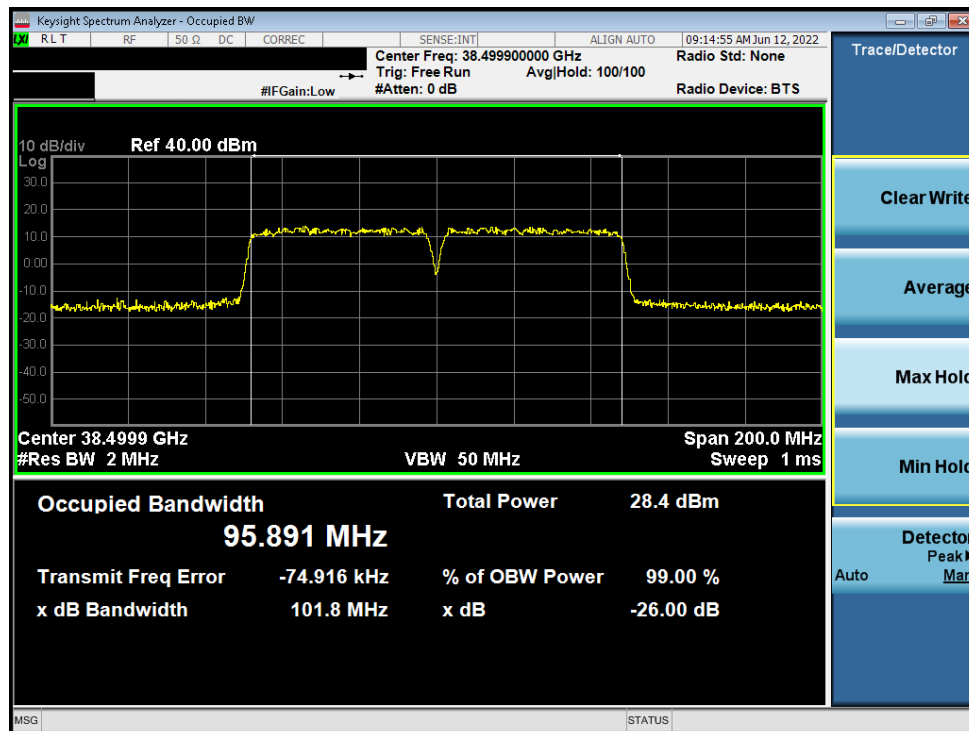


Plot 7-59. Ant1 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 47 of 142

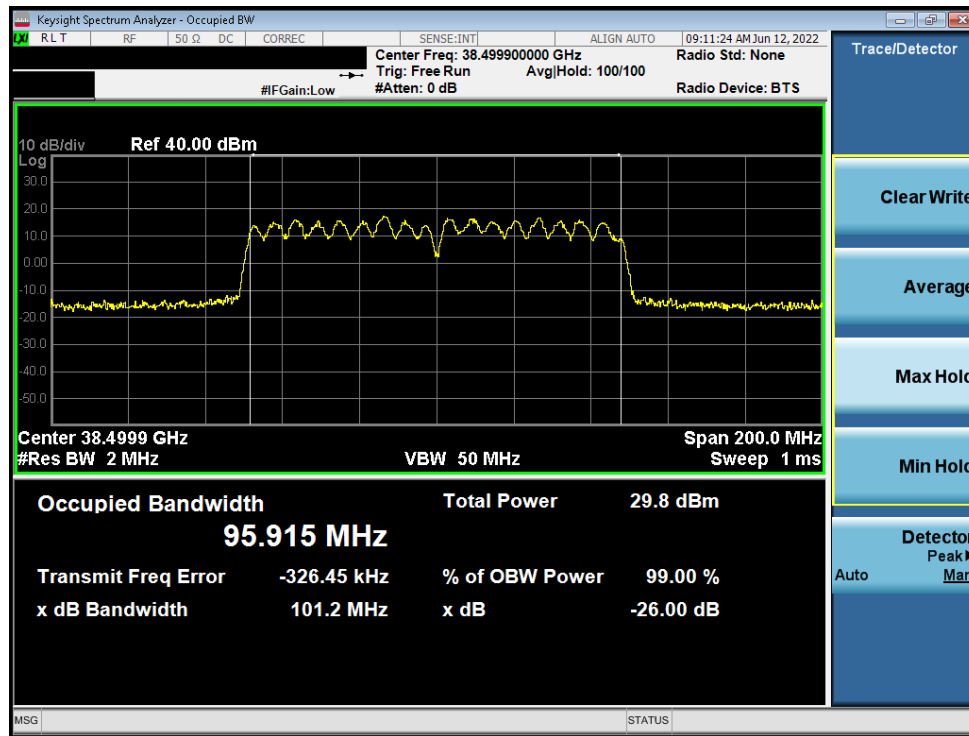


Plot 7-60. Ant1 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)

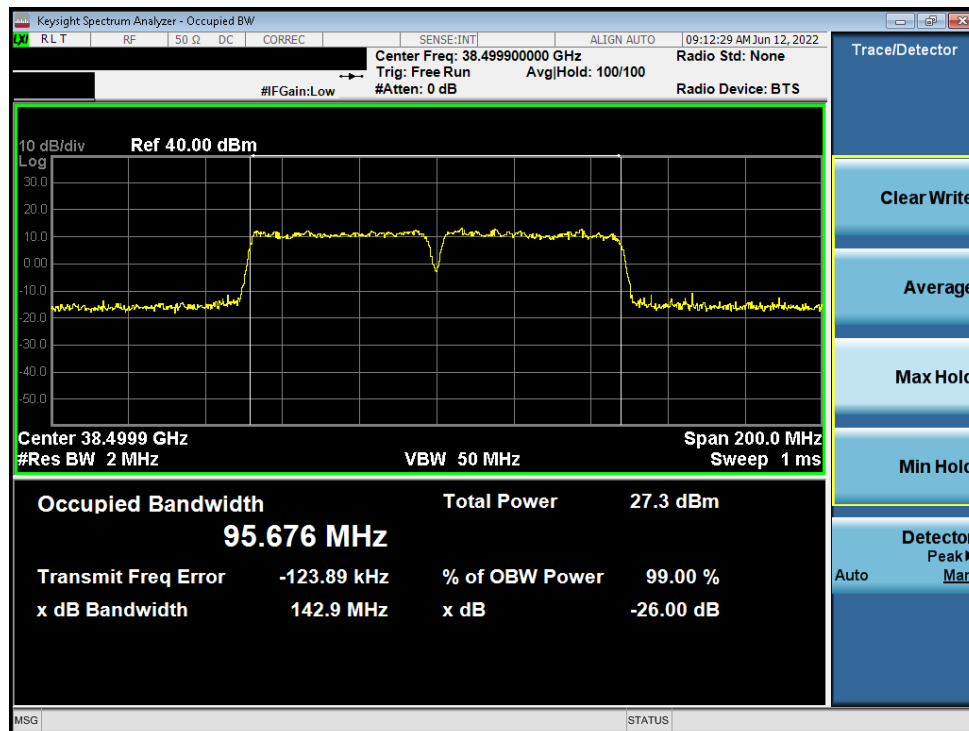


Plot 7-61. Ant1 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 48 of 142

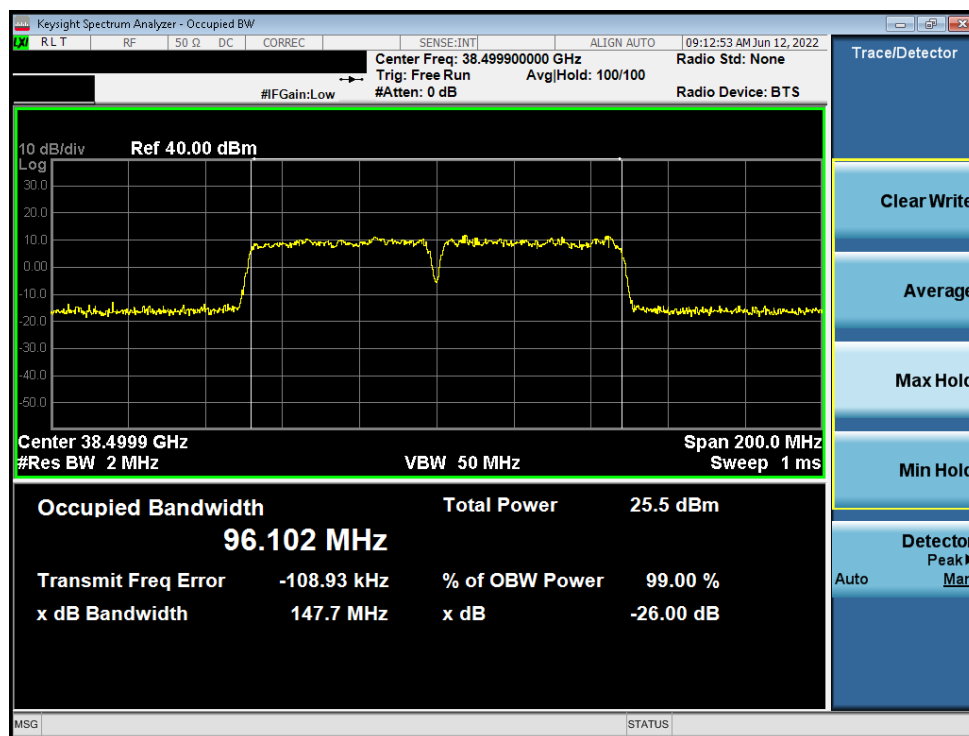


Plot 7-62. Ant1 Occupied Bandwidth Plot (50MHz-2CC – $\pi/2$ -BPSK – Mid Channel)



Plot 7-63. Ant1 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 49 of 142



Plot 7-64. Ant1 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 50 of 142

V1.0

7.3 Equivalent Isotropic Radiated Power

Test Overview

Equivalent Isotropic Radiated Power (EIRP) measurements are performed using broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

The average power of the sum of all antenna elements is limited to a maximum EIRP of +43 dBm.

Test Procedures Used

ANSI C63.26-2015 – Section 5.2.4.4.1
KDB 842590 D01 – Section 4.2

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW
3. VBW $\geq 3 \times$ RBW
4. Span = 2x to 3x the OBW
5. No. of sweep points $\geq 2 \times$ span / RBW
6. Sweep time = Auto
7. Detector = RMS
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 51 of 142

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below. Both H-Beam and V-Beam were investigated and the worst-case measurements were reported below.
- 2) Elements within the same antenna array are correlated to produce beamforming array gain. Antenna arrays cannot be correlated with another antenna array. During testing, only one antenna array was active.
- 3) EIRP measurements for all bands were taken at 1m test distance as was required for far-field conditions (see Table 3-1).
- 4) The average EIRP reported below is calculated per section 5.2.7 of ANSI C63.26-2015 which states: $EIRP (dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m. The field strength at the antenna terminals E is calculated as: $E (dB\mu V/m) = \text{Spectrum Analyzer Channel Power Level (dBm)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107$.
- 5) All EIRP measurements were made with the appropriate offset levels loaded into the spectrum analyzer as determined from the measurement distance, antenna factor, cable loss, and the equations in Note 4 above.
- 6) Radiated power levels are investigated while the receive antenna was rotated through all angles to determine the worst case polarization/positioning.
- 7) This device supports transmission of H-polarized and V-polarized beams from the antenna array in both CP-OFDM and DFT-s-OFDM transmission schemes. SISO and MIMO operation is also supported for some configurations. As part of the testing, all modes are investigated fully on the channel showing the highest simulated EIRP using QPSK modulation. The configuration that shows the highest measured EIRP was then used to determine the EIRP for the low and high channels and for the additional modulations.
- 8) Several BeamID's are investigated based on the provided simulated data to determine the worst-case BeamID.
- 9) For each band and antenna array configuration tested, worst case EIRP plots are displayed for all total bandwidths tested (50MHz, 100MHz, 200MHz). Since these EIRP plots were measured separately from the data in the EIRP tables, results displayed in the plots may marginally differ from the corresponding results displayed in EIRP data tables. However, any differences are negligible and well within the stated measurement uncertainty.

Sample Calculation

The offset level loaded into the spectrum analyzer allows for a direct conversion of the raw channel power level measured by the analyzer into an EIRP. This offset level is frequency dependent and is calculated as follows:

$$\text{Offset Level [dB]} = \text{Antenna Factor [dB/m]} + \text{Cable Loss [dB]} + 20 \log(\text{Distance [m]}) + 107 - 104.8$$

For example, to measure an EIRP at a frequency of 24400MHz with an antenna factor of 40.40dB/m, a cable loss of 7.68dB, and a measurement distance of 1 meter, an offset level of:

$$\text{Offset Level} = 40.40\text{dB/m} + 7.68\text{dB} + 20 \log(1 \text{ meter}) + 107 - 104.8 = 50.28 \text{ dB}$$

shall be loaded into the spectrum analyzer.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 52 of 142

Band n258-R1 Beam ID Configurations

Mode	Channel	Beam Polarization	Beam ID	Screen Configuration
SISO	Low	V	18	Closed
		H	146	Closed
	Mid	V	18	Closed
		H	146	Closed
	High	V	18	Closed
		H	146	Closed
2Tx / MIMO	Low	H + V	17 + 145	Closed
	Mid	H + V	17 + 145	Closed
	High	H + V	17 + 145	Closed

Table 7-6. Ant1 Worst Case Beam ID

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 53 of 142

V1.0

Band n258-R1

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	24424.92	DFT-s-OFDM	QPSK	146	H	SISO	H	98	286	1/17	24.96
High	24424.92	DFT-s-OFDM	QPSK	18	V	SISO	H	149	87	1/13	27.04
High	24424.92	DFT-s-OFDM	QPSK	17 + 145	H + V	2Tx	V	66	320	1/17	29.67
High	24424.92	CP-OFDM	QPSK	146	H	SISO	H	98	286	1/17	21.88
High	24424.92	CP-OFDM	QPSK	18	V	SISO	H	149	87	1/13	23.93
High	24424.92	CP-OFDM	QPSK	17 + 145	H + V	MIMO	V	66	320	1/17	26.48
Low	24275.04	DFT-s-OFDM	QPSK	17 + 145	H + V	2Tx	V	68	319	1/17	29.19
Mid	24349.92	DFT-s-OFDM	QPSK	17 + 145	H + V	2Tx	V	67	319	1/17	29.47
High	24424.92	DFT-s-OFDM	$\pi/2$ BPSK	17 + 145	H + V	2Tx	V	66	320	1/17	29.62
High	24424.92	DFT-s-OFDM	16QAM	17 + 145	H + V	2Tx	V	66	320	1/17	27.46
High	24424.92	DFT-s-OFDM	64QAM	17 + 145	H + V	2Tx	V	66	320	1/13	25.52

Table 7-7. Ant1 EIRP Data (Band n258-R1 – 50MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	24424.92	DFT-s-OFDM	QPSK	17 + 145	H + V	2Tx	V	67	321	32 / 0	22.42
High	24424.92	DFT-s-OFDM	$\pi/2$ BPSK	17 + 145	H + V	2Tx	V	67	321	32 / 0	22.43
High	24424.92	DFT-s-OFDM	16QAM	17 + 145	H + V	2Tx	V	67	321	1/13	22.00
High	24424.92	DFT-s-OFDM	64QAM	17 + 145	H + V	2Tx	V	67	321	1/17	21.25

Table 7-8. Ant1 EIRP Data (Band n258-R1 – 50MHz-2CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	24399.96	DFT-s-OFDM	QPSK	146	H	SISO	H	97	287	1 / 22	24.98
High	24399.96	DFT-s-OFDM	QPSK	18	V	SISO	H	150	85	1 / 42	26.92
High	24399.96	DFT-s-OFDM	QPSK	17 + 145	H + V	2Tx	V	67	320	1 / 22	29.62
High	24399.96	CP-OFDM	QPSK	146	H	SISO	H	97	287	1 / 22	21.95
High	24399.96	CP-OFDM	QPSK	18	V	SISO	H	150	85	1 / 42	23.80
High	24399.96	CP-OFDM	QPSK	17 + 145	H + V	MIMO	V	67	320	1 / 22	26.49
Low	24300.00	DFT-s-OFDM	QPSK	17 + 145	H + V	2Tx	V	67	318	1 / 42	29.21
Mid	24349.92	DFT-s-OFDM	QPSK	17 + 145	H + V	2Tx	V	67	323	1 / 34	29.39
High	24399.96	DFT-s-OFDM	$\pi/2$ BPSK	17 + 145	H + V	2Tx	V	67	320	1 / 22	29.50
High	24399.96	DFT-s-OFDM	16QAM	17 + 145	H + V	2Tx	V	67	320	1 / 22	27.11
High	24399.96	DFT-s-OFDM	64QAM	17 + 145	H + V	2Tx	V	67	320	1 / 22	25.65

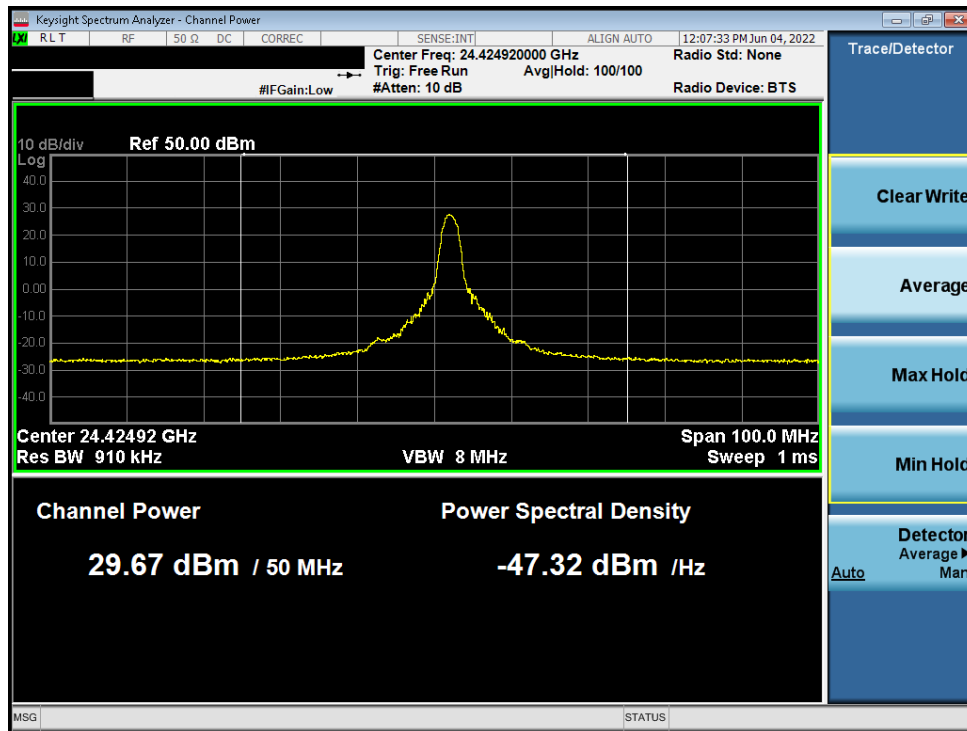
Table 7-9. Ant1 EIRP Data (Band n258-R1 – 100MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Mid	24349.92	DFT-s-OFDM	QPSK	17 + 145	H + V	2Tx	V	66	320	64 / 1	22.25
Mid	24349.92	DFT-s-OFDM	$\pi/2$ BPSK	17 + 145	H + V	2Tx	V	66	320	64 / 1	22.24
Mid	24349.92	DFT-s-OFDM	16QAM	17 + 145	H + V	2Tx	V	66	320	1 / 34	22.01
Mid	24349.92	DFT-s-OFDM	64QAM	17 + 145	H + V	2Tx	V	66	320	1 / 34	21.29

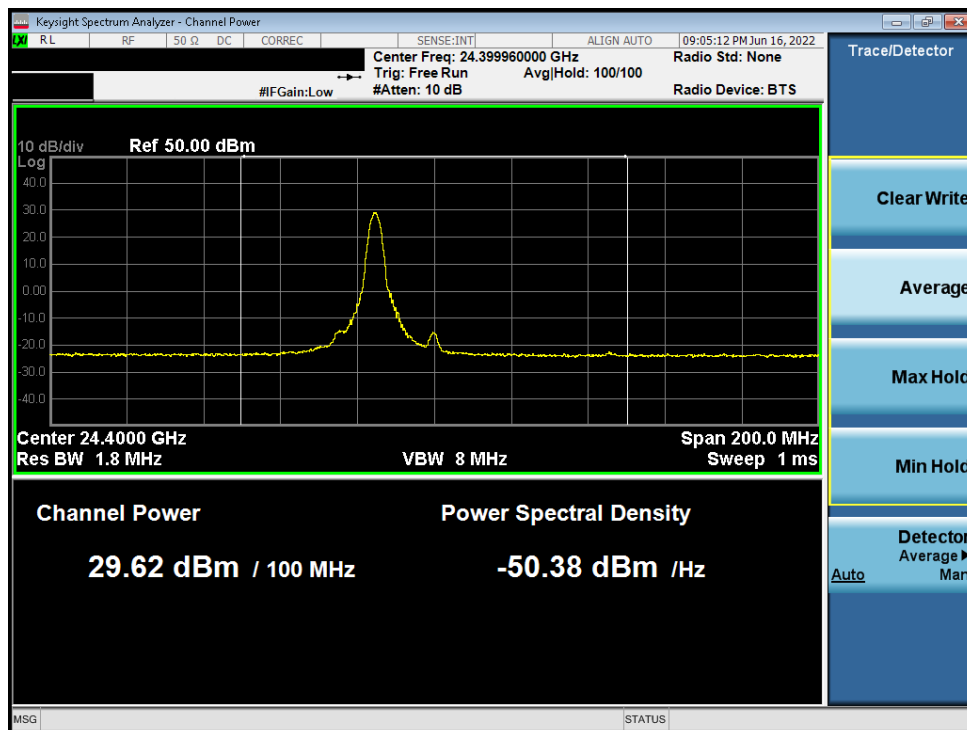
Table 7-10. Ant1 EIRP Data (Band n258-R1 – 100MHz-2CC)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)				Approved by: Technical Manager	
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset			Page 54 of 142	

Worst-Case EIRP Plots (n258-R1)



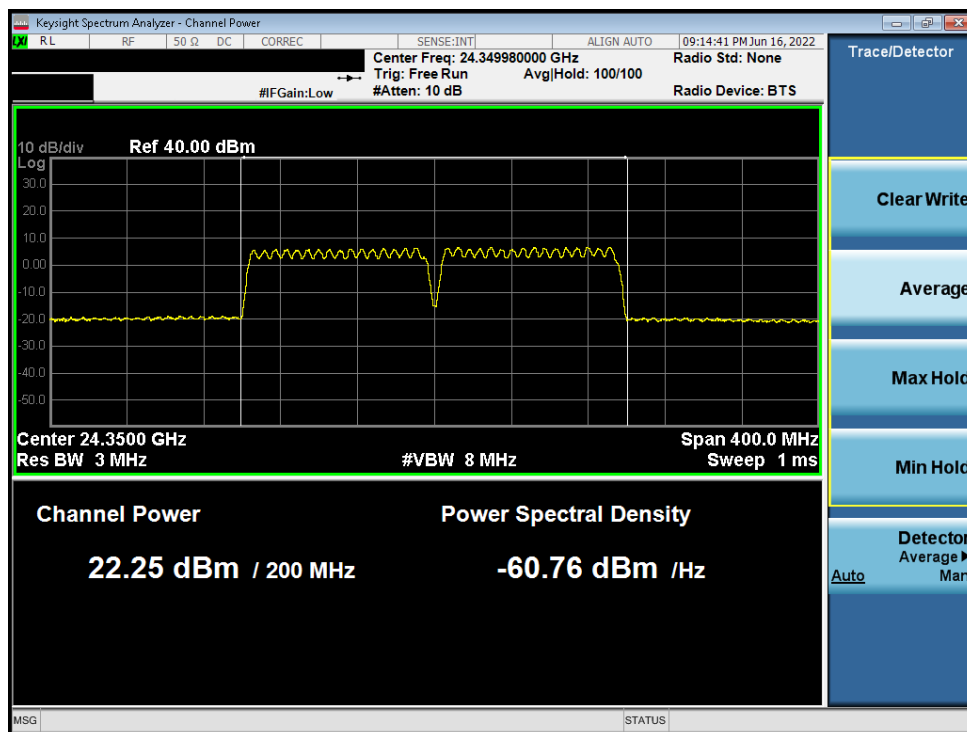
Plot 7-65. Ant1 EIRP Plot (Band n258-R1 – 50MHz-1CC – QPSK – High Channel)



Plot 7-66. Ant1 EIRP Plot (Band n258-R1 – 100MHz-1CC – QPSK – High Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 55 of 142

V1.0



Plot 7-67. Ant1 EIRP Plot (Band n258-R1 – 100MHz-2CC – QPSK – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 56 of 142

Band n258-R2 Beam ID Configurations

Mode	Channel	Beam Polarization	Beam ID	Screen Configuration
SISO	Low	V	18	Open
		H	145	Open
	Mid	V	18	Open
		H	145	Open
	High	V	18	Open
		H	145	Open
2Tx / MIMO	Low	H + V	14 + 142	Open
	Mid	H + V	14 + 142	Open
	High	H + V	14 + 142	Open

Table 7-11. Ant1 Worst Case Beam ID

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 57 of 142

Band n258-R2

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	25224.96	DFT-s-OFDM	QPSK	145	H	SISO	V	69.9	316.0	1 / 13	24.57
High	25224.96	DFT-s-OFDM	QPSK	18	V	SISO	V	95.7	347.0	1 / 17	27.43
High	25224.96	DFT-s-OFDM	QPSK	14 + 142	H + V	2Tx	V	194.1	178.0	1 / 13	28.61
High	25224.96	CP-OFDM	QPSK	145	H	SISO	V	69.9	316.0	1 / 13	21.44
High	25224.96	CP-OFDM	QPSK	18	V	SISO	V	95.7	347.0	1 / 17	24.30
High	25224.96	CP-OFDM	QPSK	14 + 142	H + V	MIMO	V	194.1	178.0	1 / 13	25.44
Low	24775.08	DFT-s-OFDM	QPSK	14 + 142	H + V	2Tx	V	195.0	170.0	1 / 10	28.04
Mid	24999.96	DFT-s-OFDM	QPSK	14 + 142	H + V	2Tx	V	196.2	180.0	1 / 17	28.42
High	25224.96	DFT-s-OFDM	$\pi/2$ BPSK	14 + 142	H + V	2Tx	V	194.1	178.0	1 / 13	28.55
High	25224.96	DFT-s-OFDM	16QAM	14 + 142	H + V	2Tx	V	194.1	178.0	1 / 13	26.19
High	25224.96	DFT-s-OFDM	64QAM	14 + 142	H + V	2Tx	V	194.1	178.0	1 / 13	24.58

Table 7-12. Ant1 EIRP Data (Band n258-R2 – 50MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	25199.94	DFT-s-OFDM	QPSK	14 + 142	H + V	2Tx	V	193.6	178.0	32 / 0	23.27
High	25199.94	DFT-s-OFDM	$\pi/2$ BPSK	14 + 142	H + V	2Tx	V	193.6	178.0	32 / 0	23.25
High	25199.94	DFT-s-OFDM	16QAM	14 + 142	H + V	2Tx	V	193.6	178.0	32 / 0	21.20
High	25199.94	DFT-s-OFDM	64QAM	14 + 142	H + V	2Tx	V	193.6	178.0	1 / 17	20.24

Table 7-13. Ant1 EIRP Data (Band n258-R2 – 50MHz-2CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	25200.00	DFT-s-OFDM	QPSK	145	H	SISO	V	70.1	312.0	1 / 22	24.52
High	25200.00	DFT-s-OFDM	QPSK	18	V	SISO	V	95.3	347.0	1 / 22	27.30
High	25200.00	DFT-s-OFDM	QPSK	14 + 142	H + V	2Tx	V	195.1	181.0	1 / 22	28.59
High	25200.00	CP-OFDM	QPSK	145	H	SISO	V	70.1	312.0	1 / 22	21.57
High	25200.00	CP-OFDM	QPSK	18	V	SISO	V	95.3	347.0	1 / 22	24.27
High	25200.00	CP-OFDM	QPSK	14 + 142	H + V	MIMO	V	195.1	181.0	1 / 22	25.38
Low	24800.04	DFT-s-OFDM	QPSK	14 + 142	H + V	2Tx	V	195.7	177.0	1 / 42	27.80
Mid	24999.96	DFT-s-OFDM	QPSK	14 + 142	H + V	2Tx	V	197.2	179.0	1 / 34	28.37
High	25200.00	DFT-s-OFDM	$\pi/2$ BPSK	14 + 142	H + V	2Tx	V	195.1	181.0	1 / 22	28.49
High	25200.00	DFT-s-OFDM	16QAM	14 + 142	H + V	2Tx	V	195.1	181.0	1 / 22	26.13
High	25200.00	DFT-s-OFDM	64QAM	14 + 142	H + V	2Tx	V	195.1	181.0	1 / 22	24.55

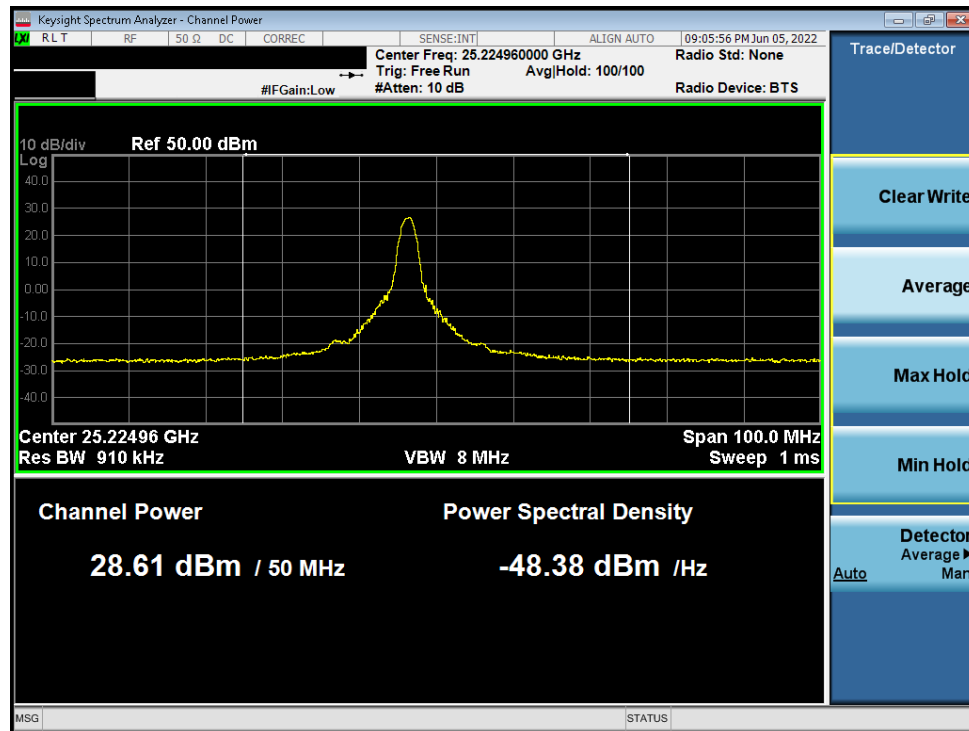
Table 7-14. Ant1 EIRP Data (Band n258-R2 – 100MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	25150.02	DFT-s-OFDM	QPSK	14 + 142	H + V	2Tx	V	194.0	179.0	64 / 1	23.27
High	25150.02	DFT-s-OFDM	$\pi/2$ BPSK	14 + 142	H + V	2Tx	V	194.0	179.0	64 / 1	23.23
High	25150.02	DFT-s-OFDM	16QAM	14 + 142	H + V	2Tx	V	194.0	179.0	1 / 42	21.21
High	25150.02	DFT-s-OFDM	64QAM	14 + 142	H + V	2Tx	V	194.0	179.0	1 / 42	20.50

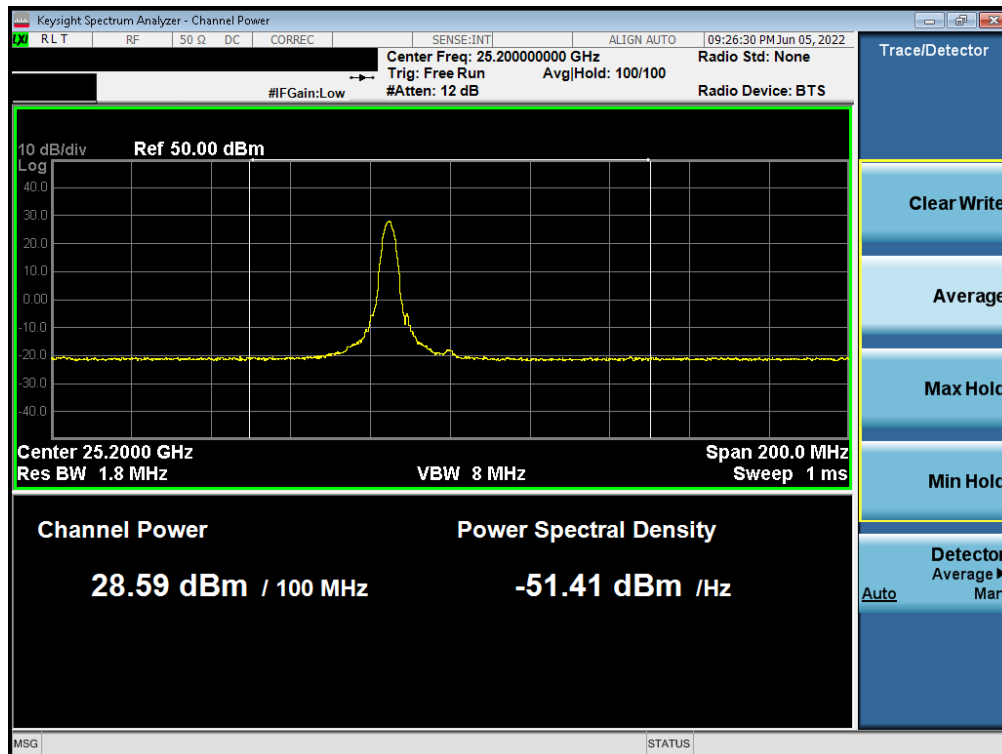
Table 7-15. Ant1 EIRP Data (Band n258-R2 – 100MHz-2CC)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)				Approved by: Technical Manager	
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset			Page 58 of 142	

Worst-Case EIRP Plots (n258-R2)

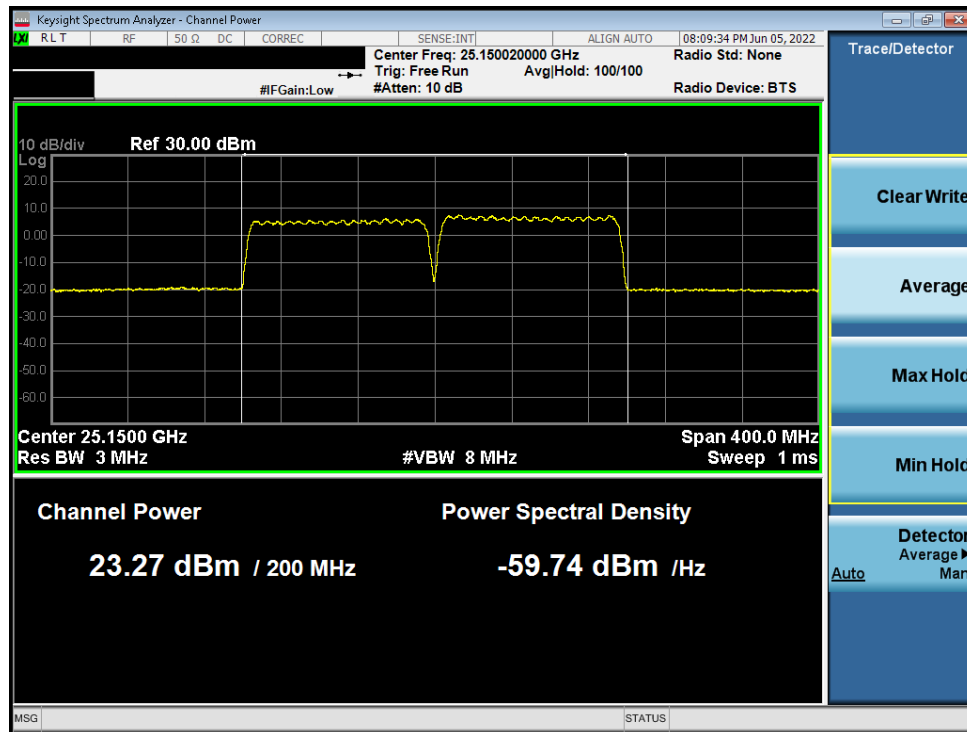


Plot 7-68. Ant1 EIRP Plot (Band n258-R2 - 50MHz-1CC - QPSK - High Channel)



Plot 7-69. Ant1 EIRP Plot (Band n258-R2 - 100MHz-1CC - QPSK - High Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022-06/16/2022	EUT Type: Portable Handset	Page 59 of 142



Plot 7-70. Ant1 EIRP Plot (Band n258-R2 – 100MHz-2CC – QPSK – High Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 60 of 142

V1.0

Band n261 Beam ID Configurations

Mode	Channel	Beam Polarization	Beam ID	Screen Configuration
SISO	Low	V	14	Open
		H	146	Open
	Mid	V	14	Open
		H	146	Open
	High	V	14	Open
		H	146	Open
2Tx / MIMO	Low	H + V	18 + 146	Open
	Mid	H + V	18 + 146	Open
	High	H + V	18 + 146	Open

Table 7-16. Ant1 Worst Case Beam ID

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 61 of 142

V1.0

Band n261

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Low	27525.00	DFT-s-OFDM	QPSK	146	H	SISO	H	183	0	1 / 13	25.44
Low	27525.00	DFT-s-OFDM	QPSK	14	V	SISO	V	201	2	1 / 13	27.20
Low	27525.00	DFT-s-OFDM	QPSK	18 + 146	H + V	2Tx	V	169	37	1 / 13	29.13
Low	27525.00	CP-OFDM	QPSK	146	H	SISO	H	183	0	1 / 13	22.38
Low	27525.00	CP-OFDM	QPSK	14	V	SISO	V	201	2	1 / 13	24.14
Low	27525.00	CP-OFDM	QPSK	18 + 146	H + V	MIMO	V	169	37	1 / 13	26.06
Mid	27924.96	DFT-s-OFDM	QPSK	18 + 146	H + V	2Tx	V	173	34	1 / 13	28.91
High	28324.92	DFT-s-OFDM	QPSK	18 + 146	H + V	2Tx	V	170	36	1 / 13	28.94
Low	27525.00	DFT-s-OFDM	$\pi/2$ BPSK	18 + 146	H + V	2Tx	V	169	37	1 / 13	28.97
Low	27525.00	DFT-s-OFDM	16QAM	18 + 146	H + V	2Tx	V	169	37	1 / 13	26.62
Low	27525.00	DFT-s-OFDM	64QAM	18 + 146	H + V	2Tx	V	169	37	1 / 13	25.07

Table 7-17. Ant1 EIRP Data (Band n261 – 50MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Low	27525.00	DFT-s-OFDM	QPSK	18 + 146	H + V	2Tx	V	174	43	32 / 0	22.39
Low	27525.00	DFT-s-OFDM	$\pi/2$ BPSK	18 + 146	H + V	2Tx	V	174	43	32 / 0	22.37
Low	27525.00	DFT-s-OFDM	16QAM	18 + 146	H + V	2Tx	V	174	43	1 / 16	21.61
Low	27525.00	DFT-s-OFDM	64QAM	18 + 146	H + V	2Tx	V	174	43	1 / 20	20.68

Table 7-18. Ant1 EIRP Data (Band n261 – 50MHz-2CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	28299.96	DFT-s-OFDM	QPSK	146	H	SISO	H	185	348	1 / 42	25.73
High	28299.96	DFT-s-OFDM	QPSK	14	V	SISO	V	200	244	1 / 22	26.34
High	28299.96	DFT-s-OFDM	QPSK	18 + 146	H + V	2Tx	V	173	30	1 / 22	29.07
High	28299.96	CP-OFDM	QPSK	146	H	SISO	H	185	348	1 / 42	22.79
High	28299.96	CP-OFDM	QPSK	14	V	SISO	V	200	244	1 / 22	23.28
High	28299.96	CP-OFDM	QPSK	18 + 146	H + V	MIMO	V	173	30	1 / 22	25.94
Low	27550.08	DFT-s-OFDM	QPSK	18 + 146	H + V	2Tx	V	172	34	1 / 22	28.73
Mid	27924.96	DFT-s-OFDM	QPSK	18 + 146	H + V	2Tx	V	172	30	1 / 22	28.72
High	28324.92	DFT-s-OFDM	$\pi/2$ BPSK	18 + 146	H + V	2Tx	V	173	30	1 / 22	29.03
High	28324.92	DFT-s-OFDM	16QAM	18 + 146	H + V	2Tx	V	173	30	1 / 22	26.83
High	28324.92	DFT-s-OFDM	64QAM	18 + 146	H + V	2Tx	V	173	30	1 / 22	25.16

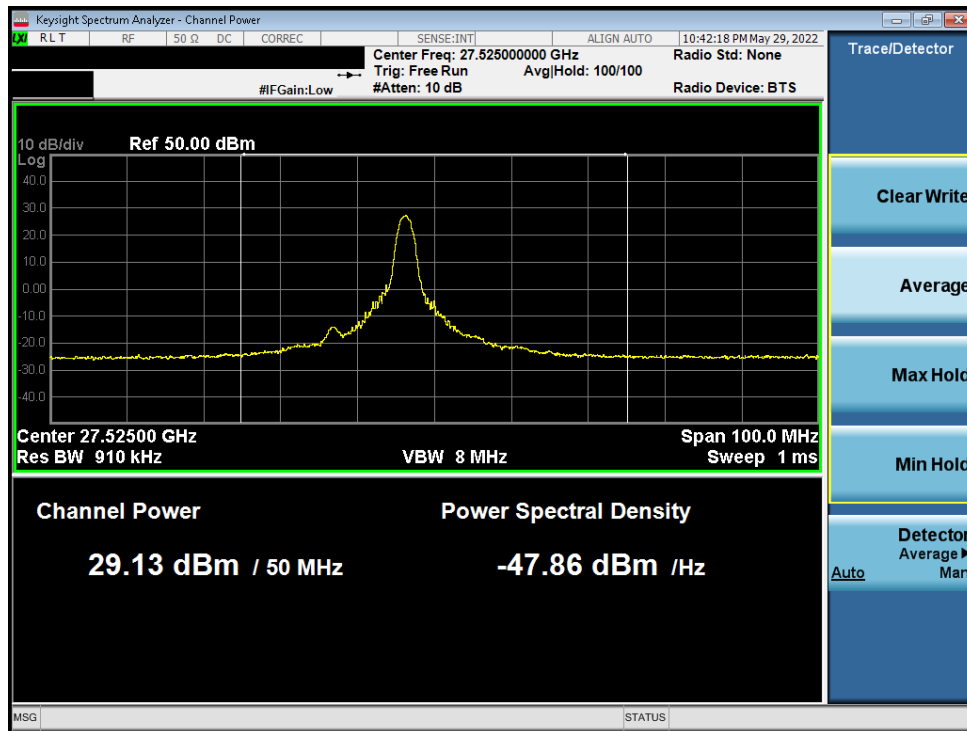
Table 7-19. Ant1 EIRP Data (Band n261 – 100MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
High	28324.92	DFT-s-OFDM	QPSK	18 + 146	H + V	2Tx	V	172	35	64 / 1	22.49
High	28324.92	DFT-s-OFDM	$\pi/2$ BPSK	18 + 146	H + V	2Tx	V	172	35	64 / 1	22.48
High	28324.92	DFT-s-OFDM	16QAM	18 + 146	H + V	2Tx	V	172	35	1 / 22	21.61
High	28324.92	DFT-s-OFDM	64QAM	18 + 146	H + V	2Tx	V	172	35	1 / 22	20.85

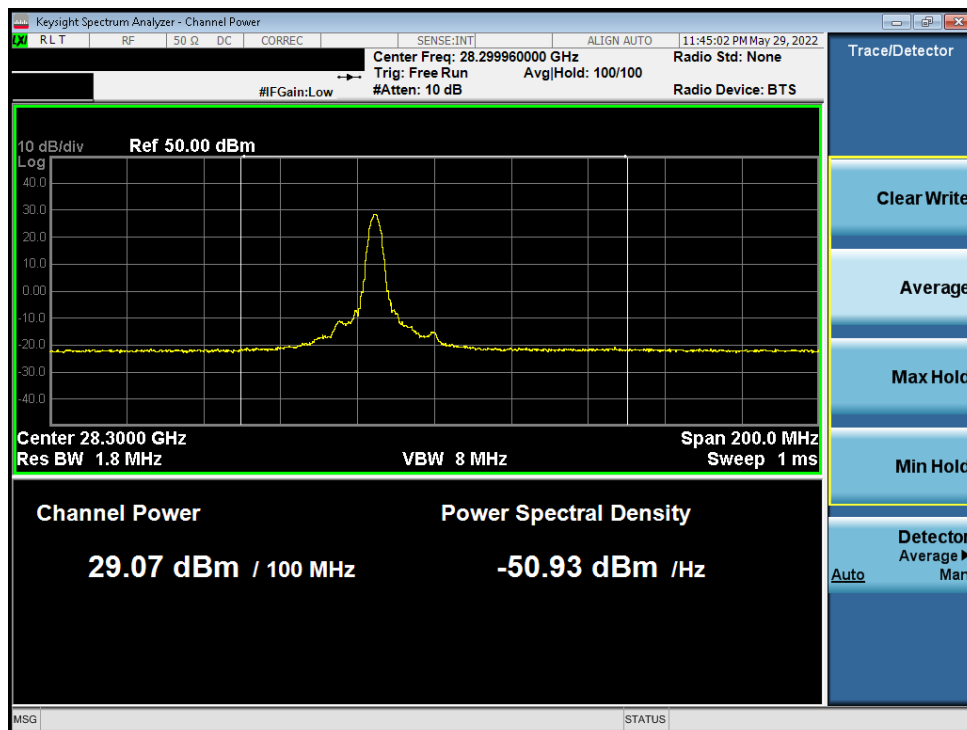
Table 7-20. Ant1 EIRP Data (Band n261 – 100MHz-2CC)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)				Approved by: Technical Manager	
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset			Page 62 of 142	

Worst-Case EIRP Plots (n261)



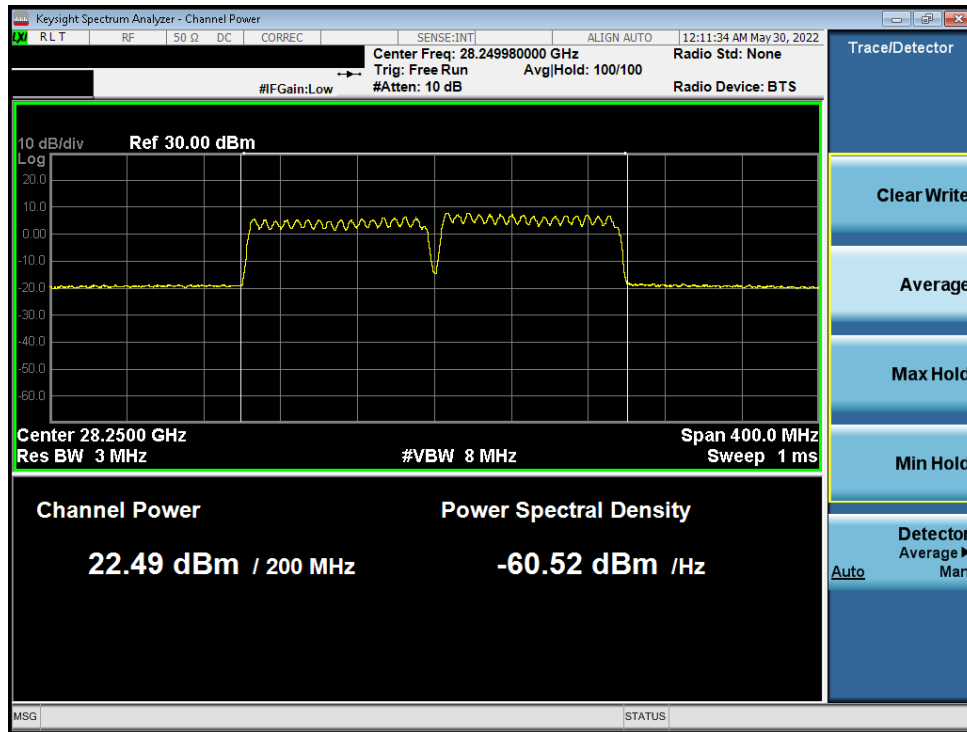
Plot 7-71. Ant1 EIRP Plot (Band n261 – 50MHz-1CC – QPSK – Low Channel)



Plot 7-72. Ant1 EIRP Plot (Band n261 – 100MHz-1CC – QPSK – High Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 63 of 142

V1.0



Plot 7-73. Ant1 EIRP Plot (Band n261 – 100MHz-2CC – QPSK – High Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 64 of 142

V1.0

Band n260 Beam ID Configurations

Mode	Channel	Beam Polarization	Beam ID	Screen Configuration
SISO	Low	V	18	Open
		H	146	Open
	Mid	V	18	Open
		H	146	Open
	High	V	14	Open
		H	142	Closed
2Tx / MIMO	Low	H + V	14 + 142	Open
	Mid	H + V	14 + 142	Open
	High	H + V	17 + 145	Closed

Table 7-21. Ant1 Worst Case Beam ID

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 65 of 142

Band n260

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Mid	38499.96	DFT-s-OFDM	QPSK	146	H	SISO	H	162	259	1 / 16	26.20
Mid	38499.96	DFT-s-OFDM	QPSK	18	V	SISO	V	158	266	1 / 12	25.45
Mid	38499.96	DFT-s-OFDM	QPSK	14 + 142	H + V	2Tx	H	200	38	1 / 12	30.13
Mid	38499.96	CP-OFDM	QPSK	146	H	SISO	H	162	259	1 / 16	23.03
Mid	38499.96	CP-OFDM	QPSK	18	V	SISO	V	158	266	1 / 12	22.25
Mid	38499.96	CP-OFDM	QPSK	14 + 142	H + V	MIMO	H	200	38	1 / 12	26.92
Low	37025.04	DFT-s-OFDM	QPSK	14 + 142	H + V	2Tx	H	199	37	1 / 12	29.45
High	39975.00	DFT-s-OFDM	QPSK	17 + 145	H + V	2Tx	H	211	307	1 / 10	29.45
Mid	38499.96	DFT-s-OFDM	$\pi/2$ BPSK	14 + 142	H + V	2Tx	H	200	38	1 / 12	30.07
Mid	38499.96	DFT-s-OFDM	16QAM	14 + 142	H + V	2Tx	H	200	38	1 / 12	27.64
Mid	38499.96	DFT-s-OFDM	64QAM	14 + 142	H + V	2Tx	H	200	38	1 / 12	25.98

Table 7-22. Ant1 EIRP Data (Band n260 – 50MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Mid	38499.96	DFT-s-OFDM	QPSK	14 + 142	H + V	2Tx	H	194	41	1 / 12	22.69
Mid	38499.96	DFT-s-OFDM	$\pi/2$ BPSK	14 + 142	H + V	2Tx	H	194	41	1 / 12	22.64
Mid	38499.96	DFT-s-OFDM	16QAM	14 + 142	H + V	2Tx	H	194	41	1 / 12	22.26
Mid	38499.96	DFT-s-OFDM	64QAM	14 + 142	H + V	2Tx	H	194	41	1 / 12	21.26

Table 7-23. Ant1 EIRP Data (Band n260 – 50MHz-2CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Mid	38499.96	DFT-s-OFDM	QPSK	146	H	SISO	H	165	262	1 / 25	26.17
Mid	38499.96	DFT-s-OFDM	QPSK	18	V	SISO	V	157	265	1 / 25	25.41
Mid	38499.96	DFT-s-OFDM	QPSK	14 + 142	H + V	2Tx	H	200	38	1 / 25	30.11
Mid	38499.96	CP-OFDM	QPSK	146	H	SISO	H	165	262	1 / 25	23.02
Mid	38499.96	CP-OFDM	QPSK	18	V	SISO	V	157	265	1 / 25	22.22
Mid	38499.96	CP-OFDM	QPSK	14 + 142	H + V	MIMO	H	200	38	1 / 25	26.94
Low	37050.00	DFT-s-OFDM	QPSK	14 + 142	H + V	2Tx	H	201	42	1 / 25	29.49
High	39949.92	DFT-s-OFDM	QPSK	17 + 145	H + V	2Tx	H	211	306	1 / 39	29.18
Mid	38499.96	DFT-s-OFDM	$\pi/2$ BPSK	14 + 142	H + V	2Tx	H	200	38	1 / 25	29.98
Mid	38499.96	DFT-s-OFDM	16QAM	14 + 142	H + V	2Tx	H	200	38	1 / 25	27.64
Mid	38499.96	DFT-s-OFDM	64QAM	14 + 142	H + V	2Tx	H	200	38	1 / 25	25.95

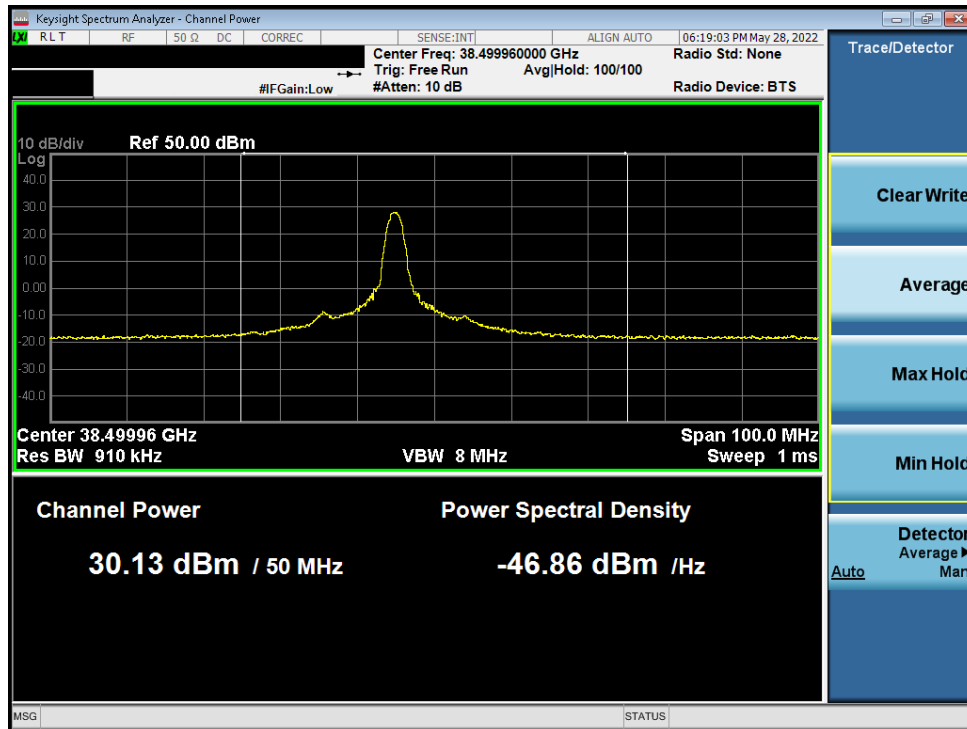
Table 7-24. Ant1 EIRP Data (Band n260 – 100MHz-1CC)

Channel	Frequency [MHz]	Transmission Scheme	Modulation	BeamID	Beam Pol.	Ant. Div.	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
Mid	38499.96	DFT-s-OFDM	QPSK	14 + 142	H + V	2Tx	H	199	39	1 / 25	22.59
Mid	38499.96	DFT-s-OFDM	$\pi/2$ BPSK	14 + 142	H + V	2Tx	H	199	39	1 / 25	22.53
Mid	38499.96	DFT-s-OFDM	16QAM	14 + 142	H + V	2Tx	H	199	39	1 / 25	22.18
Mid	38499.96	DFT-s-OFDM	64QAM	14 + 142	H + V	2Tx	H	199	39	1 / 25	21.39

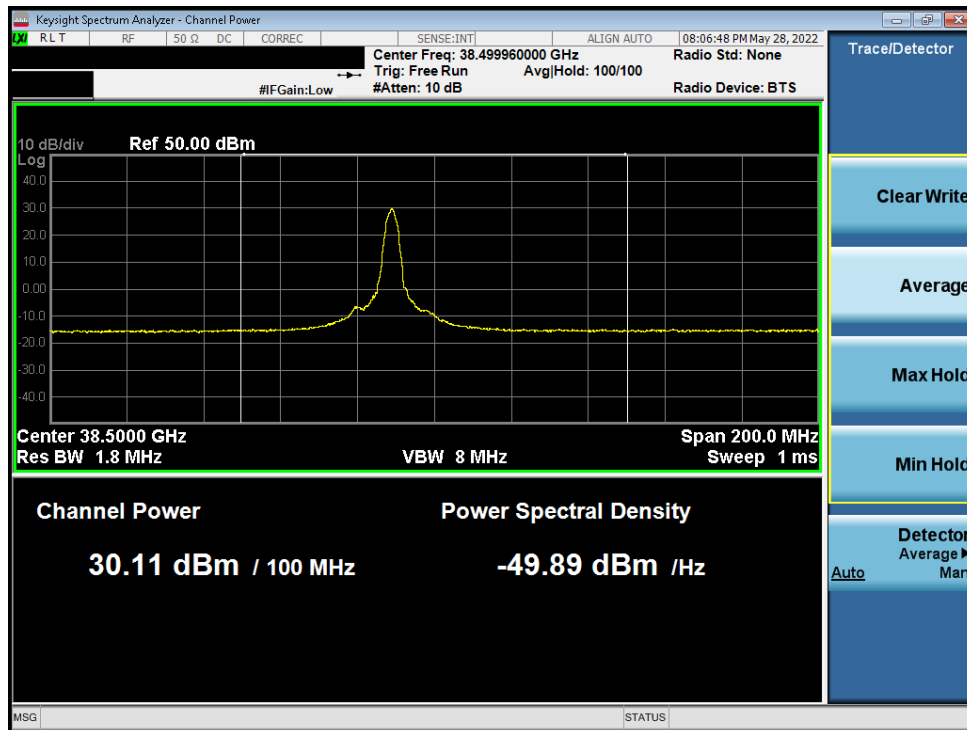
Table 7-25. Ant1 EIRP Data (Band n260 – 100MHz-2CC)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)				Approved by: Technical Manager	
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset			Page 66 of 142	

Worst-Case EIRP Plots (n260)



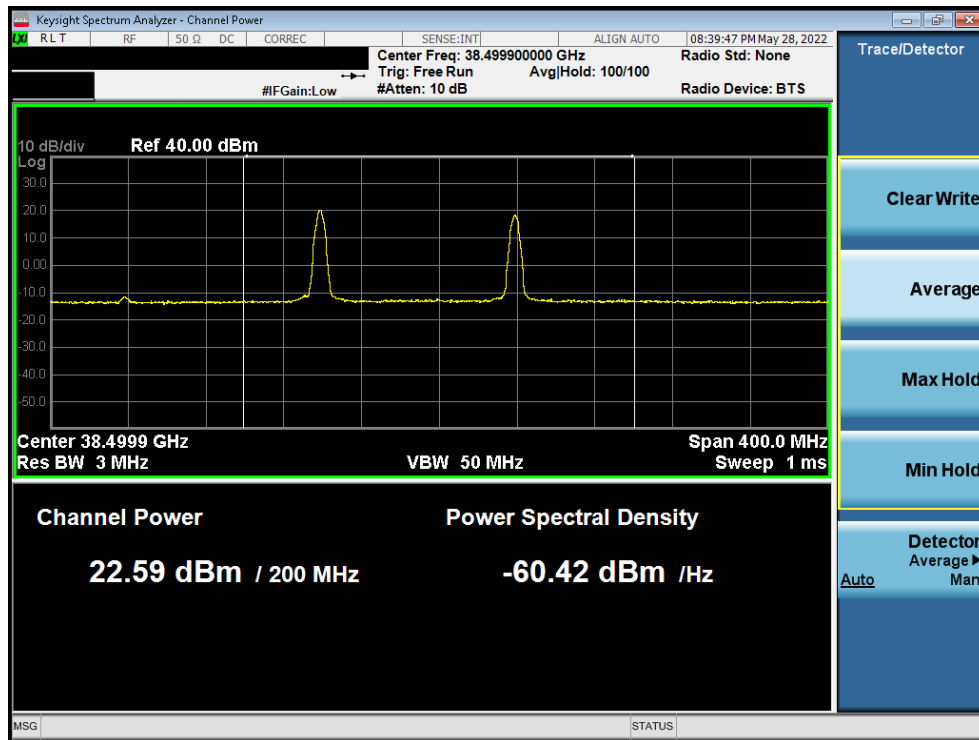
Plot 7-74. Ant1 EIRP Plot (Band n260 – 50MHz-1CC – QPSK – Mid Channel)



Plot 7-75. Ant1 EIRP Plot (Band n260 – 100MHz-1CC – QPSK – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 67 of 142

V1.0



Plot 7-76. Ant1 EIRP Plot (Band n260 – 100MHz-2CC – QPSK – Mid Channel)

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 68 of 142

V1.0

7.4 Radiated Spurious and Harmonic Emissions

Test Overview

Radiated spurious emissions measurements are performed using the field strength conversion method described in ANSI C63.26-2015 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using hybrid (biconical/log) antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

The conductive power or total radiated power of any emissions outside a licensee's frequency block shall be -13dBm/1MHz.

Test Procedure Used

ANSI C63.26-2015 – Section 5.5.4
KDB 842590 D01 – Section 4.4.3

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 100 GHz for n261 and 200GHz for n260. Several plots are used to show investigations in this entire span.
2. Detector = RMS
3. Trace mode = trace average
4. Sweep time = auto couple
5. Number of sweep points $\geq 2 \times \text{Span/RBW}$
6. The trace was allowed to stabilize
7. RBW = 1MHz, VBW = 3MHz

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst-case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) All radiated spurious emissions were measured as EIRP to compare with the §30.203 TRP limits. Emissions that were found to be non-compliant using the EIRP method were re-measured using the Spherical Grid TRP Method per KDB 842590 D01 Section 4.4.3.3.4.
- 3) The plots in this section were taken with the analyzer set to max hold. All final measurements shown in the tables that accompany the plots were taken with trace averaging performed over 100 sweeps while the analyzer was triggering on a specific emission of interest.
- 4) The screen-open configuration was found to generate the worst case spurious emissions, so the full "open" screen configuration test results are shown in this section.
- 5) Elements within the same antenna array are correlated to produce beamforming array gain. Antenna arrays cannot be correlated with another antenna array. During testing, only one antenna array was active.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 69 of 142

- 6) The plots from 1 – 200GHz show corrected average EIRP levels. The average EIRP reported below is calculated per section 5.2.7 of ANSI C63.26-2015 which states: $EIRP (dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m. The field strength E is calculated $E (dB\mu V/m) = \text{Spectrum Analyzer Level (dBm)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + \text{Harmonic Mixer Conversion Loss (dB)} + 107$. All appropriate Antenna Factors and Cable Losses have been applied in the spectrum analyzer for each measurement. For measurements > 40GHz, a Harmonic Mixer Conversion Loss was also applied to the spectrum analyzer.
- 7) Emissions below 18GHz were measured at a 3 meter test distance, while emissions above 18GHz were measured at the appropriate far field distance. The far field of the mmWave signal is based on formula: $R > 2D^2/\text{wavelength}$, where D is the larger between the dimension of the measurement antenna and the transmitting antenna of the EUT. In this case, D is the largest dimension of the measurement antenna.

Frequency Range (GHz)	Wavelength(cm)	Far Field Distance (m)	Measurement Distance (m)
18-40	0.749	0.54	1.00
40-60	0.500	1.39	1.50
60-90	0.333	0.91	1.00
90-140	0.214	0.58	1.00
140-200	0.150	0.39	1.00

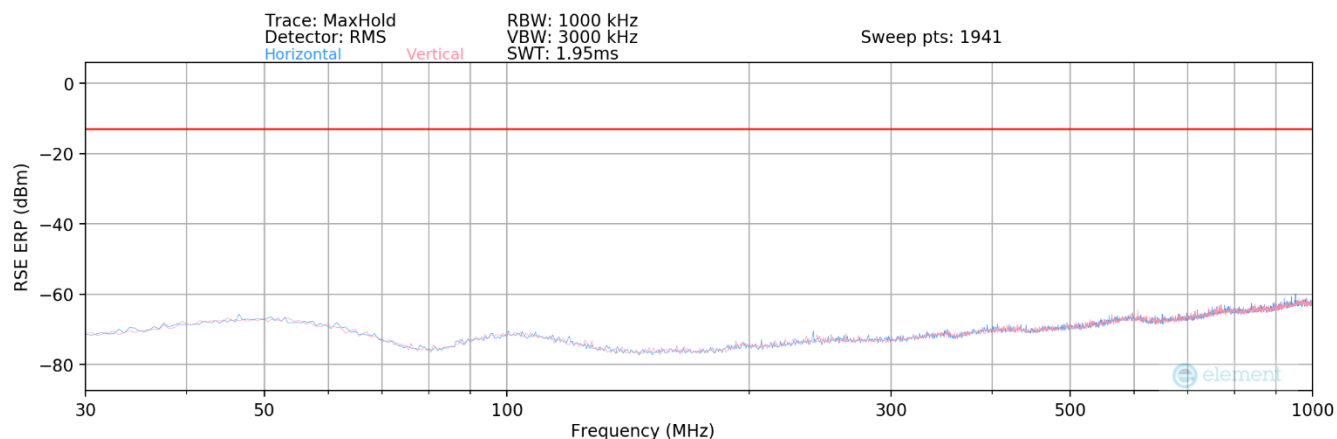
Table 7-26. Far-Field Distance & Measurement Distance per Frequency Range

- 8) All emissions from 30MHz - 40GHz were measured using a spectrum analyzer with an internal preamplifier. Emissions >40GHz were measured using a harmonic mixer with the spectrum analyzer.
- 9) All RSE's were measured with 1CC. It was determined that adding more CC's causes the overall amplitude of just 1CC to decrease, therefore, 1CC is the worst case for the purposes of spurious emissions measurements.
- 10) The "-" shown in the following RSE tables are used to denote a noise floor measurement.
- 11) All RSE's were investigated in EN-DC mode and with 802.11 chipset active. It was determined that there is no new emission introduced by EN-DC mode, or the 802.11 chipset. For EN-DC mode, each supported FR2 band can utilize LTE anchor bands as listed below:
- NR-Band n258 uses LTE B2, B5, B12, B14, B30, and B66 as anchor bands.
 - NR-Band n261 uses LTE B2, B5, B12, B13, B48, and B66 as anchor bands.
 - NR-Band n260 uses LTE B2, B5, B12, B13, B14, B30, B48, and B66 as anchor bands.
- 12) Additionally, this device supports anchor bands operating in FR1 spectrum. For NR-DC mode, each supported FR2 band can utilize FR1 anchor bands as listed below:
- NR-Band n258 uses FR1 bands n2, n5, n12, n25, n30, n41, and n66 as anchor bands.
 - NR-Band n261 uses FR1 bands n2, n5, n25, n41, n48, n66, and n77 as anchor bands.
 - NR-Band n260 uses FR1 bands n2, n5, n12, n25, n30, n41, n48, n66, and n77 as anchor bands.
- 13) There was no discernible difference in the spurious emission levels when using different LTE and NR FR1 anchor bands. Thus, LTE Band 2 was used as a representative anchor band of both NR-DC and EN-DC investigations.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 70 of 142

Band n258-R1 – Ant1

30MHz - 1GHz



Plot 7-77. Ant1 - n258-R1 Radiated Spurious Plot (1CC QPSK High Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions ERP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE ERP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE ERP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8 - 2.15 \text{ (dB)}$$

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
58.23	Low	50	2Tx	QPSK	V	-	-	-76.38	-13.00	-63.38
574.17	Mid	50	2Tx	QPSK	V	-	-	-76.09	-13.00	-63.09
825.37	High	50	2Tx	QPSK	V	-	-	-73.95	-13.00	-60.95

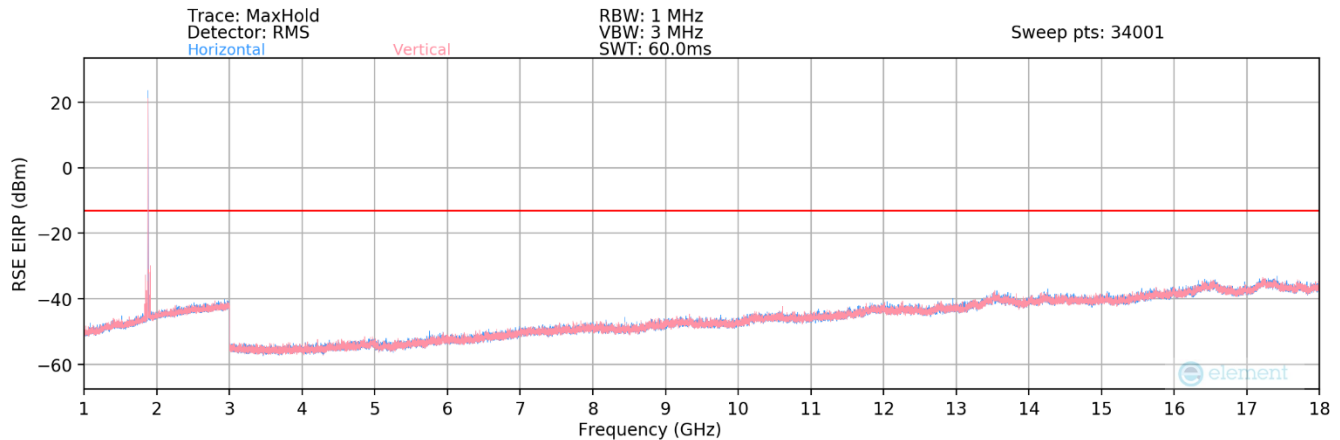
Table 7-27. Ant1 - n258-R1 Radiated Spurious Emissions Table (30MHz - 1GHz)

Notes

The RSE ERP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 71 of 142

1GHz - 18GHz



Plot 7-78. Ant1 - n258-R1 Radiated Spurious Plot (1CC QPSK High Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3574.09	Low	50	2Tx	QPSK	V	-	-	-58.65	-13.00	-45.65
11059.22	Mid	50	2Tx	QPSK	V	-	-	-46.01	-13.00	-33.01
17738.01	High	50	2Tx	QPSK	V	-	-	-35.47	-13.00	-22.47

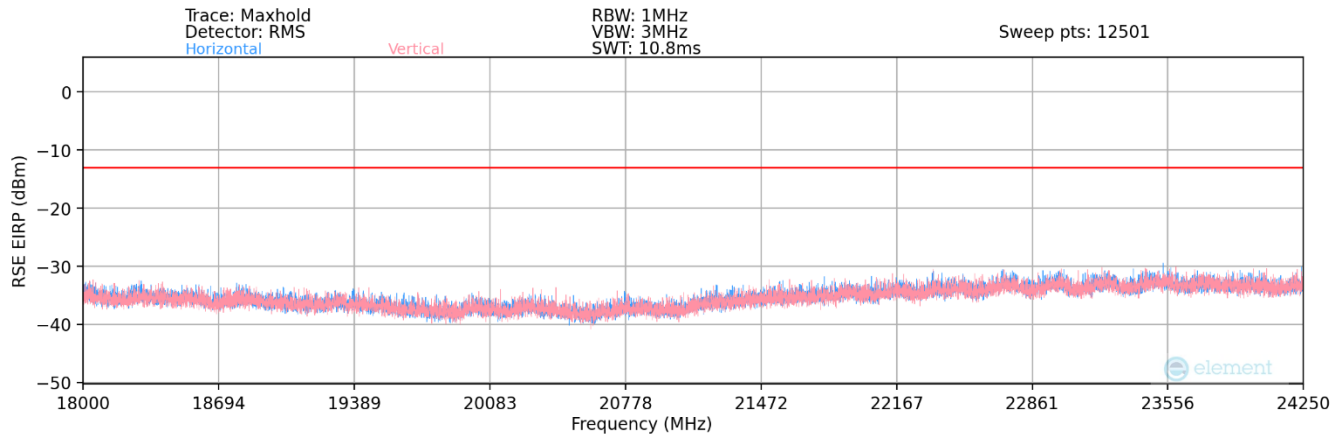
Table 7-28. Ant1 - n258-R1 Radiated Spurious Emissions Table (1GHz - 18GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 72 of 142

18GHz - 24.25GHz



Plot 7-79. Ant1 - n258-R1 Radiated Spurious Plot (1CC QPSK High Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
19263.89	Low	50	2Tx	QPSK	V	-	-	-34.60	-13.00	-21.60
21554.67	Mid	50	2Tx	QPSK	V	-	-	-34.11	-13.00	-21.11
23415.62	High	50	2Tx	QPSK	V	-	-	-33.70	-13.00	-20.70

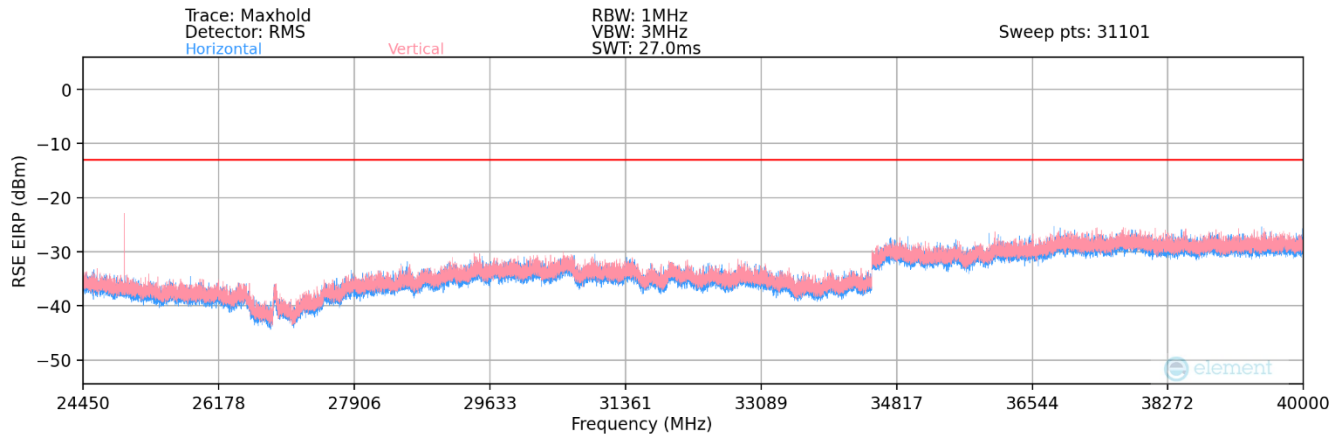
Table 7-29. Ant1 - n258-R1 Radiated Spurious Emissions Table (18GHz - 24.25GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 73 of 142

24.45GHz - 40GHz



Plot 7-80. Ant1 - n258-R1 Radiated Spurious Plot (1CC QPSK High Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
24825.72	Low	50	2Tx	QPSK	V	70	331	-24.01	-13.00	-11.01
24900.63	Mid	50	2Tx	QPSK	V	70	335	-24.08	-13.00	-11.08
24975.51	High	50	2Tx	QPSK	V	69	331	-24.94	-13.00	-11.94

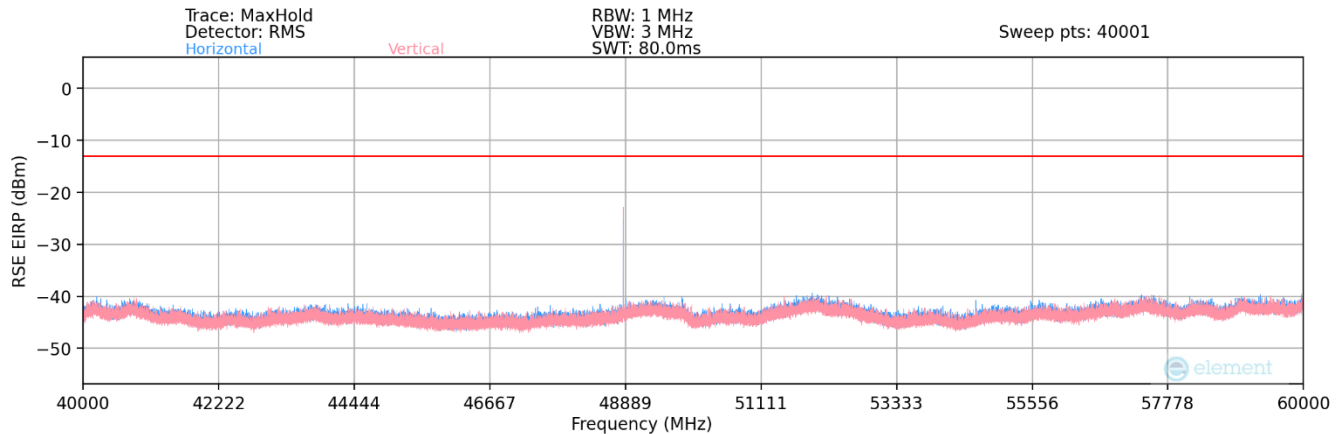
Table 7-30. Ant1 - n258-R1 Radiated Spurious Emissions Table (24.45GHz - 40GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 74 of 142

40GHz - 60GHz



Plot 7-81. Ant1 - n258-R1 Radiated Spurious Plot (1CC QPSK High Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1.5 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
48550.08	Low	50	2Tx	QPSK	V	150	342	-21.76	-13.00	-8.76
48699.84	Mid	50	2Tx	QPSK	V	149	342	-21.76	-13.00	-8.76
48849.84	High	50	2Tx	QPSK	V	151	335	-20.98	-13.00	-7.98

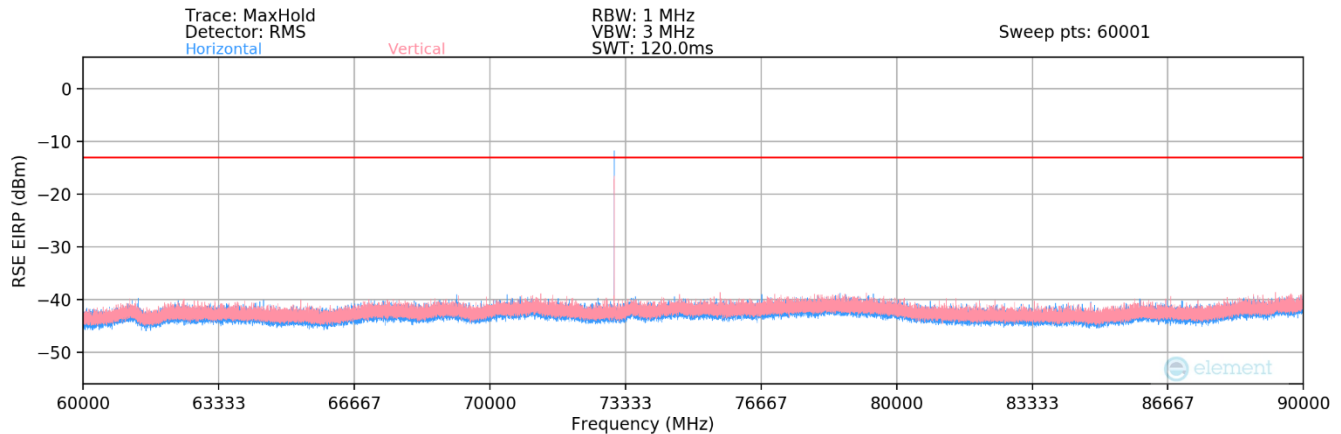
Table 7-31. Ant1 - n258-R1 Radiated Spurious Emissions Table (40GHz - 60GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1.5 meter.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 75 of 142

60GHz - 90GHz



Plot 7-82. Ant1 - n258-R1 Radiated Spurious Plot (1CC QPSK High Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
* 72831.30	Low	50	2Tx	QPSK	V	*	*	-22.18	-13.00	-9.18
* 73055.50	Mid	50	2Tx	QPSK	V	*	*	-21.61	-13.00	-8.61
* 73280.50	High	50	2Tx	QPSK	V	*	*	-22.73	-13.00	-9.73

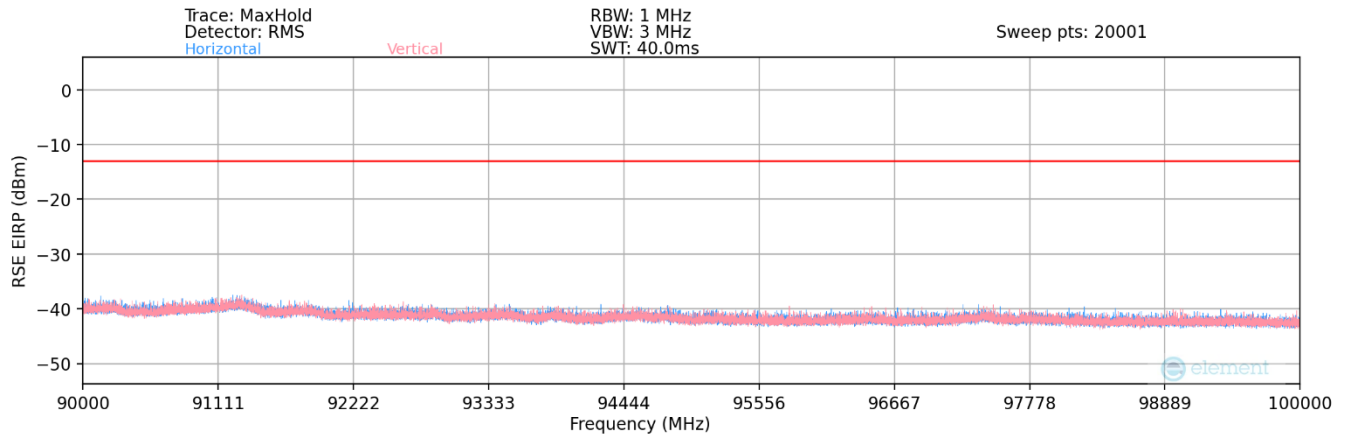
Table 7-32. Ant1 - n258-R1 Radiated Spurious Emissions Table (60GHz - 90GHz)

Notes

- 1) The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
- 2) Rows marked with * indicate a spurious emission level that was measured using the Spherical Grid TRP Method per KDB 842590.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 76 of 142

90GHz - 100GHz



Plot 7-83. Ant1 - n258-R1 Radiated Spurious Plot (1CC QPSK High Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R1)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
97100.16	Low	50	2Tx	QPSK	V	-	-	-47.30	-13.00	-34.30
97399.68	Mid	50	2Tx	QPSK	V	-	-	-46.79	-13.00	-33.79
97699.68	High	50	2Tx	QPSK	V	-	-	-47.21	-13.00	-34.21

Table 7-33. Ant1 - n258-R1 Radiated Spurious Emissions Table (90GHz - 100GHz)

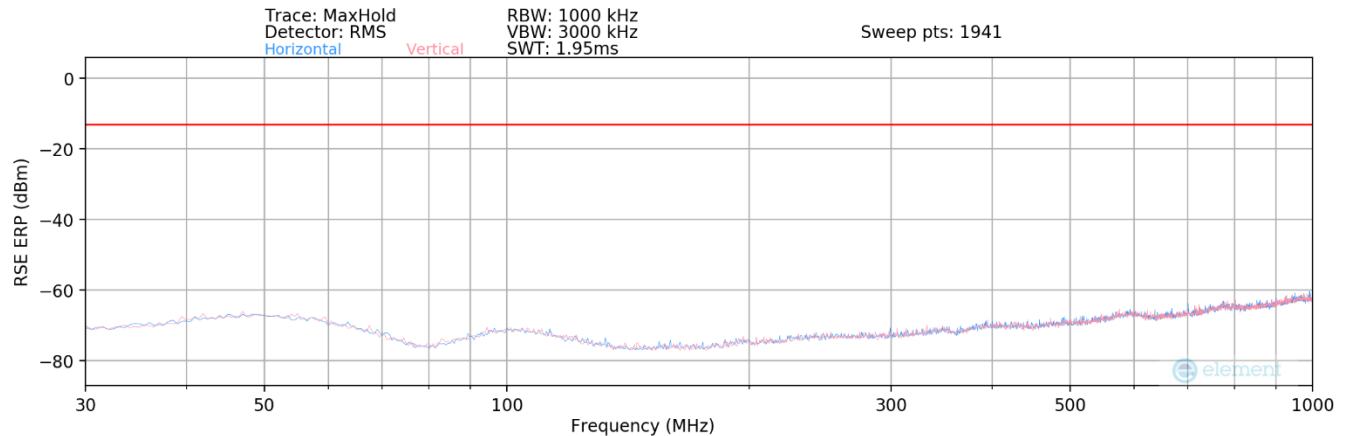
Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 77 of 142

Band n258-R2 – Ant1

30MHz - 1GHz



Plot 7-84. Ant1 - n258-R2 Radiated Spurious Plot (1CC QPSK High Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions ERP Sample Calculation (n258-R2)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE ERP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE ERP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8 - 2.15 \text{ (dB)}$$

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
70.55	Low	50	2Tx	QPSK	V	-	-	-80.64	-13.00	-67.64
271.55	Mid	50	2Tx	QPSK	V	-	-	-81.26	-13.00	-68.26
710.18	High	50	2Tx	QPSK	V	-	-	-75.16	-13.00	-62.16

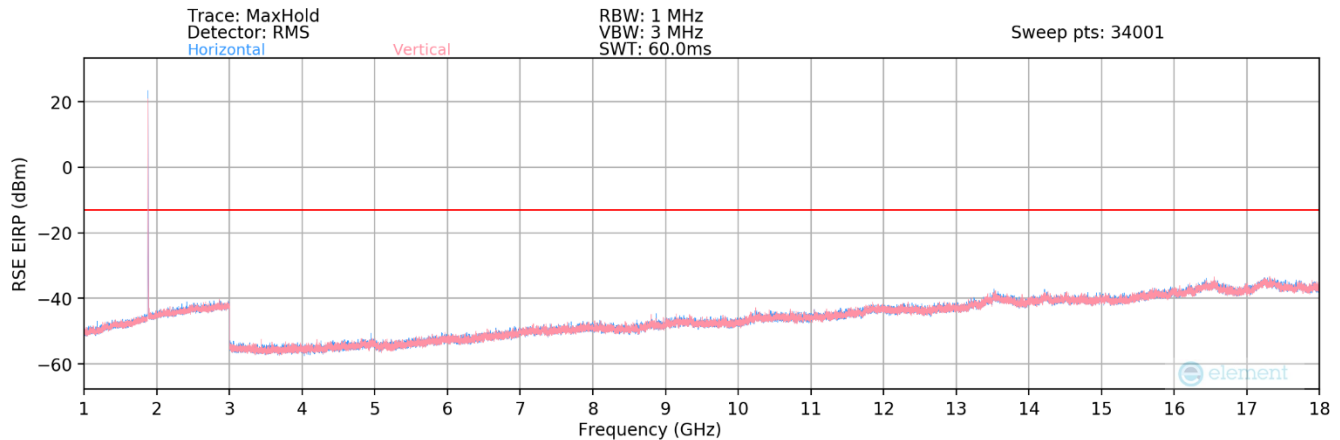
Table 7-34. Ant1 - n258-R2 Radiated Spurious Emissions Table (30MHz - 1GHz)

Notes

The RSE ERP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 78 of 142

1GHz - 18GHz



Plot 7-85. Ant1 - n258-R2 Radiated Spurious Plot (1CC QPSK High Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R2)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5622.30	Low	50	2Tx	QPSK	V	-	-	-56.21	-13.00	-43.21
10593.09	Mid	50	2Tx	QPSK	V	-	-	-46.94	-13.00	-33.94
17277.86	High	50	2Tx	QPSK	V	-	-	-35.24	-13.00	-22.24

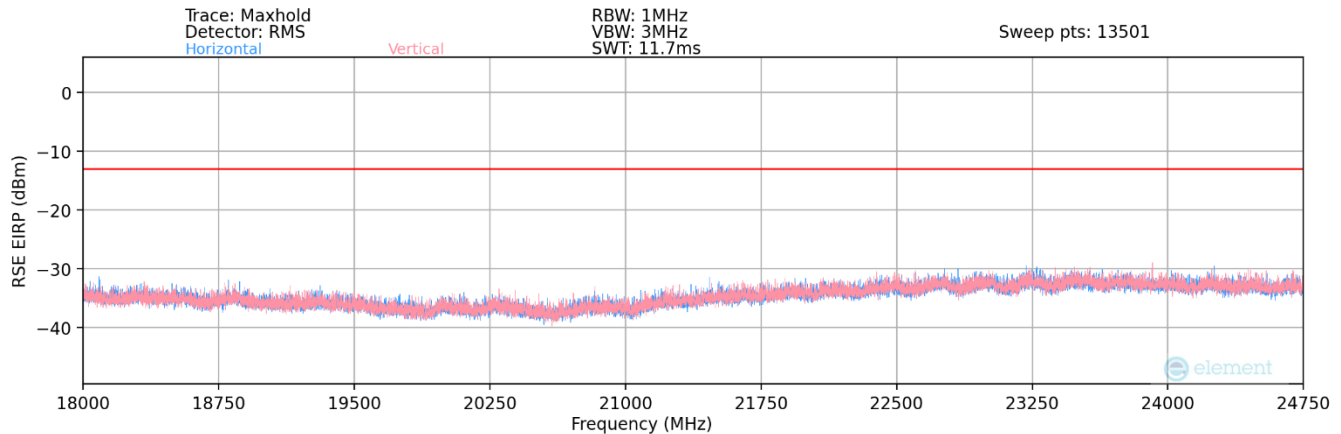
Table 7-35. Ant1 - n258-R2 Radiated Spurious Emissions Table (1GHz - 18GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 79 of 142

18GHz - 24.75GHz



Plot 7-86. Ant1 - n258-R2 Radiated Spurious Plot (1CC QPSK High Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R2)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
18931.65	Low	50	2Tx	QPSK	V	-	-	-35.84	-13.00	-22.84
21376.34	Mid	50	2Tx	QPSK	V	-	-	-34.64	-13.00	-21.64
24108.07	High	50	2Tx	QPSK	V	-	-	-33.97	-13.00	-20.97

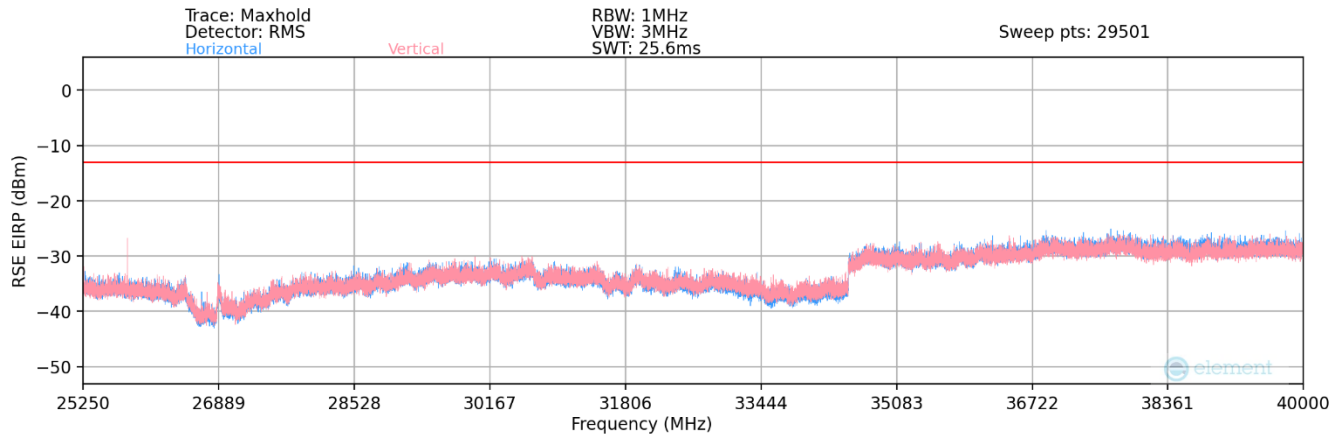
Table 7-36. Ant1 - n258-R2 Radiated Spurious Emissions Table (18GHz - 24.75GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 80 of 142

25.25GHz - 40GHz



Plot 7-87. Ant1 - n258-R2 Radiated Spurious Plot (1CC QPSK High Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R2)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
25335.95	Low	50	2Tx	QPSK	V	106	23	-25.63	-13.00	-12.63
25539.45	Mid	50	2Tx	QPSK	V	102	24	-28.57	-13.00	-15.57
25784.25	High	50	2Tx	QPSK	V	100	35	-29.07	-13.00	-16.07

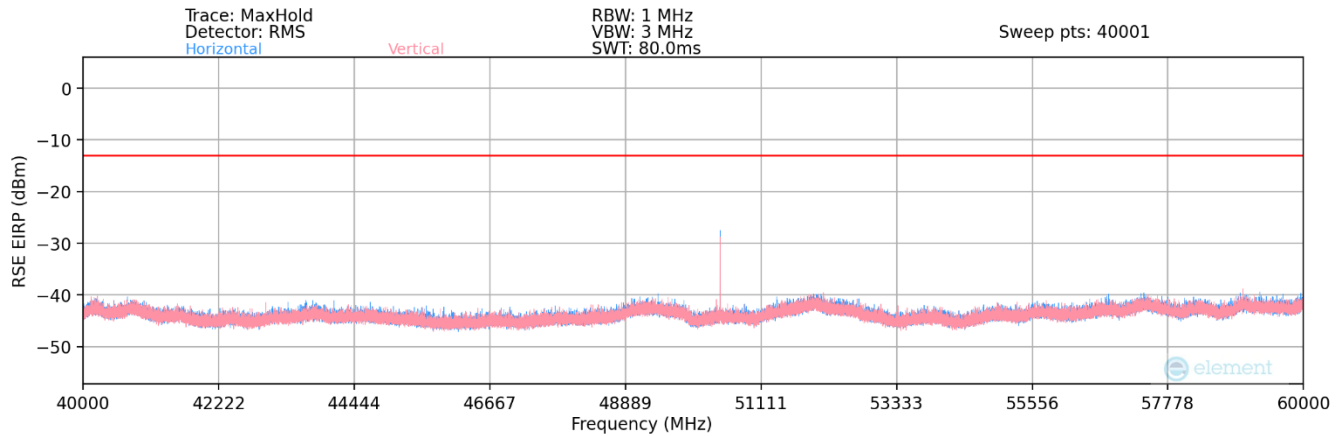
Table 7-37. Ant1 - n258-R2 Radiated Spurious Emissions Table (25.25GHz - 40GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 81 of 142

40GHz - 60GHz



Plot 7-88. Ant1 - n258-R2 Radiated Spurious Plot (1CC QPSK High Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R2)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1.5 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
49550.16	Low	50	2Tx	QPSK	V	251	337	-21.22	-13.00	-8.22
49999.92	Mid	50	2Tx	QPSK	V	253	328	-21.42	-13.00	-8.42
50449.92	High	50	2Tx	QPSK	V	254	323	-21.25	-13.00	-8.25

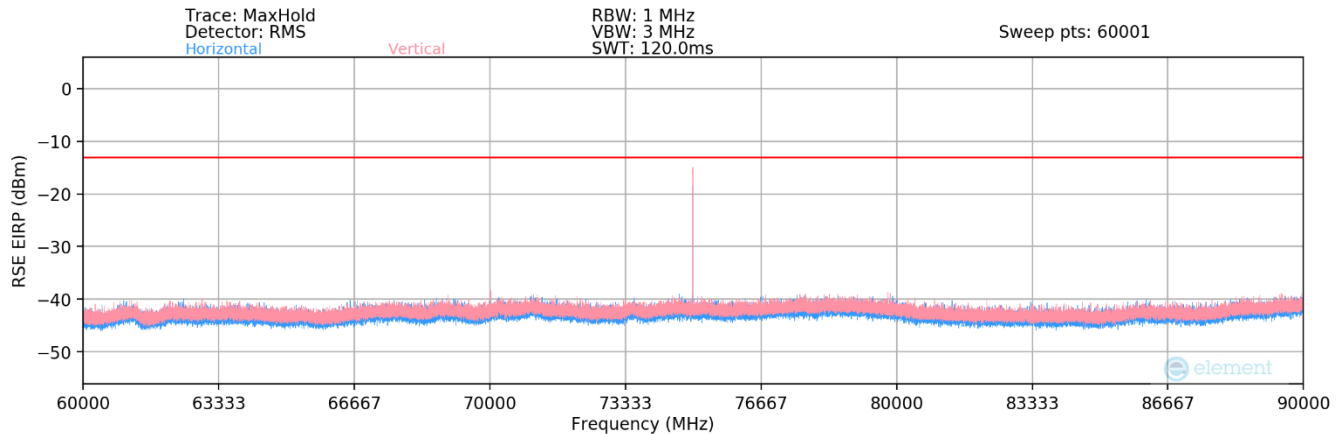
Table 7-38. Ant1 - n258-R2 Radiated Spurious Emissions Table (40GHz - 60GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1.5 meter.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 82 of 142

60GHz - 90GHz



Plot 7-89. Ant1 - n258-R2 Radiated Spurious Plot (1CC QPSK High Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R2)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8 + \text{Harmonic Mixer Conversion Loss [dB]}$$

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
* 74313.40	Low	50	2Tx	QPSK	H	*	*	-20.70	-13.00	-7.70
* 74988.50	Mid	50	2Tx	QPSK	H	*	*	-22.24	-13.00	-9.24
* 75663.10	High	50	2Tx	QPSK	H	*	*	-19.34	-13.00	-6.34

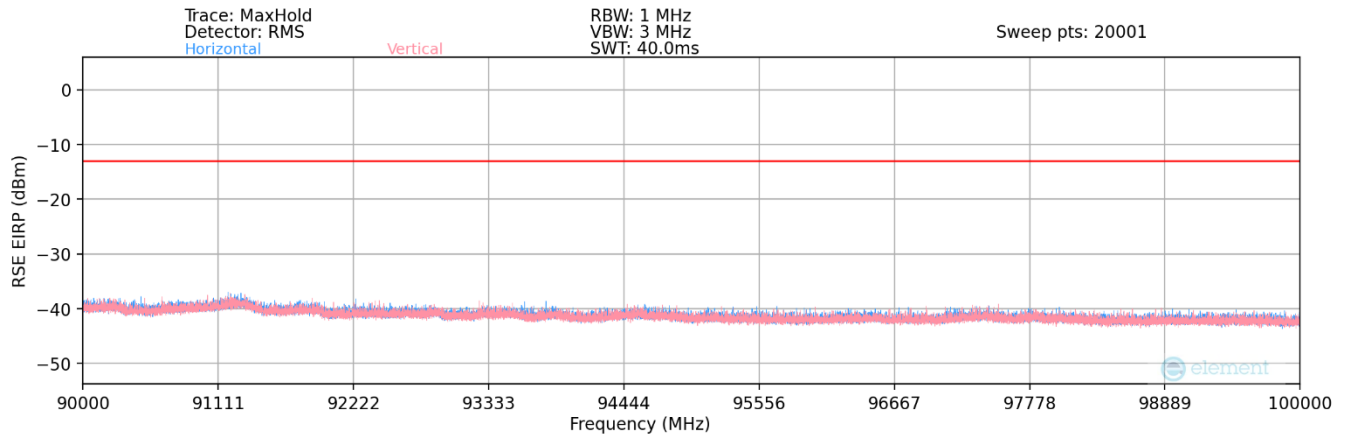
Table 7-39. Ant1 - n258-R2 Radiated Spurious Emissions Table (60GHz - 90GHz)

Notes

- 1) The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
- 2) Rows marked with * indicate a spurious emission level that was measured using the Spherical Grid TRP Method per KDB 842590.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 83 of 142

90GHz - 100GHz



Plot 7-90. Ant1 - n258-R2 Radiated Spurious Plot (1CC QPSK High Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n258-R2)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
97100.16	Low	50	2Tx	QPSK	V	-	-	-47.30	-13.00	-34.30
97399.68	Mid	50	2Tx	QPSK	V	-	-	-46.79	-13.00	-33.79
97699.68	High	50	2Tx	QPSK	V	-	-	-47.21	-13.00	-34.21

Table 7-40. Ant1 - n258-R2 Radiated Spurious Emissions Table (90GHz - 100GHz)

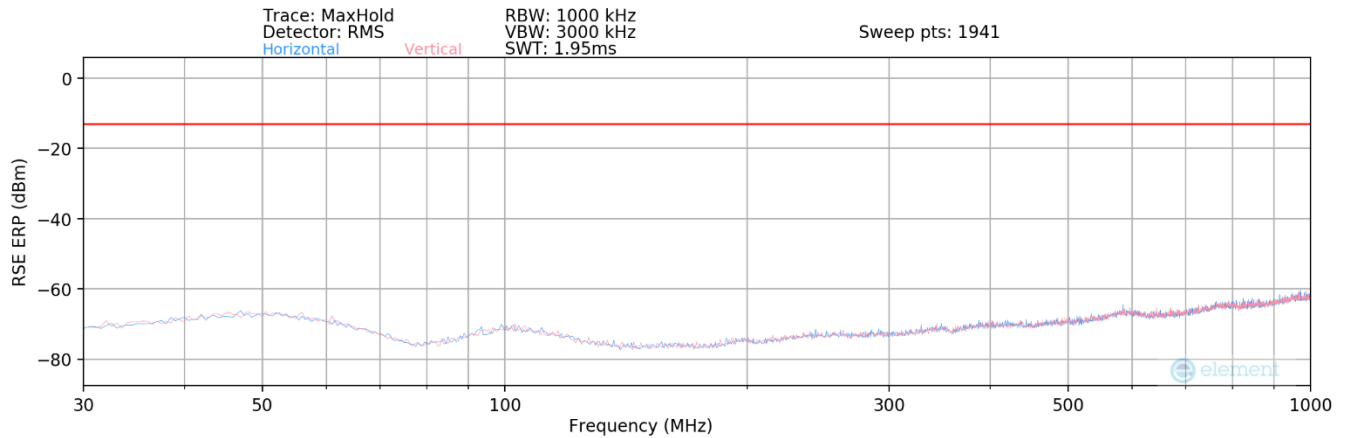
Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 84 of 142

Band n261 – Ant1

30MHz - 1GHz



Plot 7-91. Ant1 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions ERP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE ERP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE ERP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8 - 2.15 \text{ (dB)}$$

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
102.54	Low	50	2Tx	QPSK	H	-	-	-78.86	-13.00	-65.86
587.41	Mid	50	2Tx	QPSK	H	-	-	-74.32	-13.00	-61.32
868.50	High	50	2Tx	QPSK	H	-	-	-72.12	-13.00	-59.12

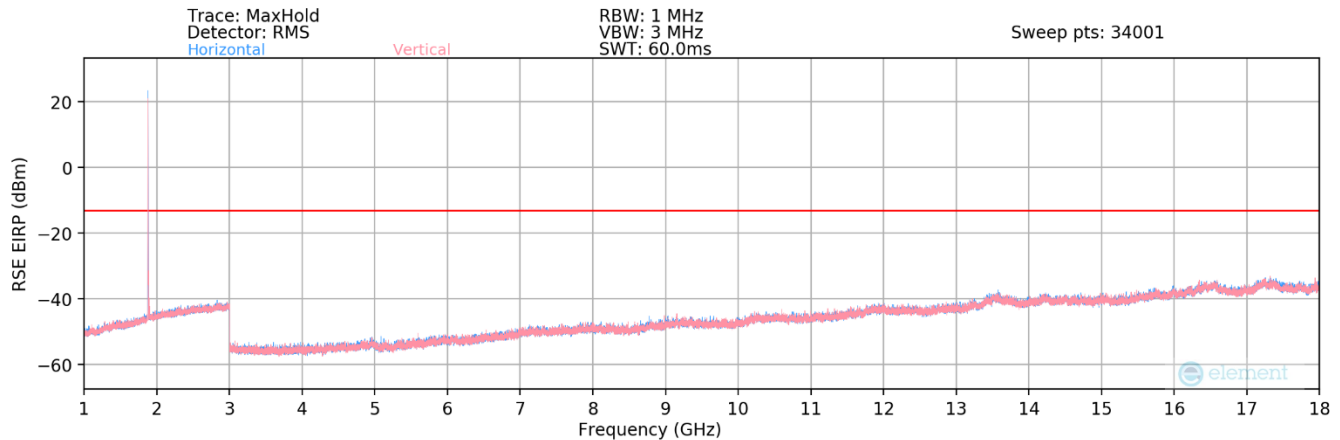
Table 7-41. Ant1 - n261 Radiated Spurious Emissions Table (30MHz - 1GHz)

Notes

The RSE ERP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 85 of 142

1GHz - 18GHz



Plot 7-92. Ant1 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
4931.80	Low	50	2Tx	QPSK	H	-	-	-56.42	-13.00	-43.42
9857.22	Mid	50	2Tx	QPSK	H	-	-	-49.63	-13.00	-36.63
16603.72	High	50	2Tx	QPSK	H	-	-	-36.88	-13.00	-23.88

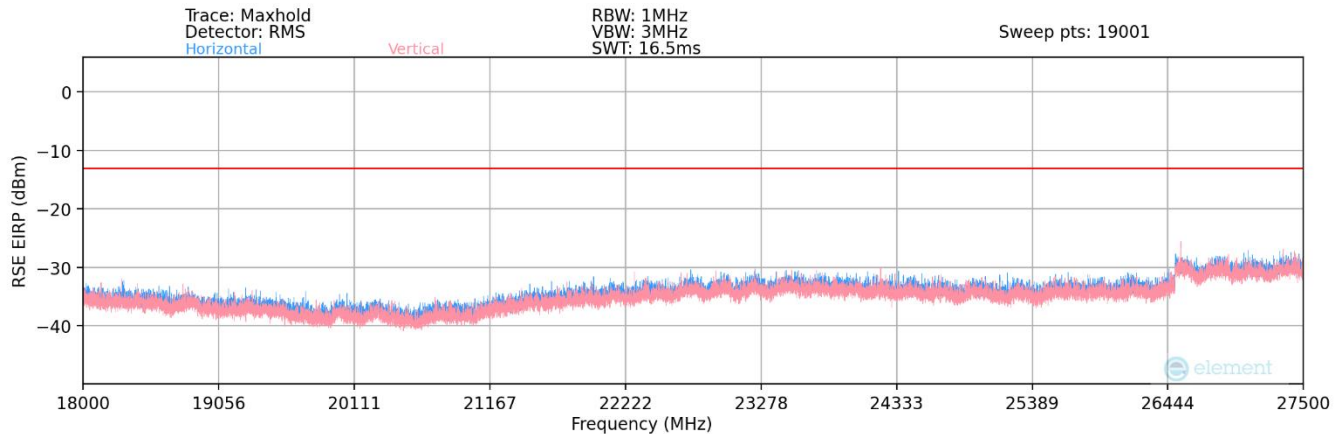
Table 7-42. Ant1 - n261 Radiated Spurious Emissions Table (1GHz - 18GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 86 of 142

18GHz - 27.5GHz



Plot 7-93. Ant1 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
21366.02	Low	50	2Tx	QPSK	H	-	-	-35.52	-13.00	-22.52
23947.20	Mid	50	2Tx	QPSK	H	-	-	-34.20	-13.00	-21.20
26764.76	High	50	2Tx	QPSK	H	-	-	-33.79	-13.00	-20.79

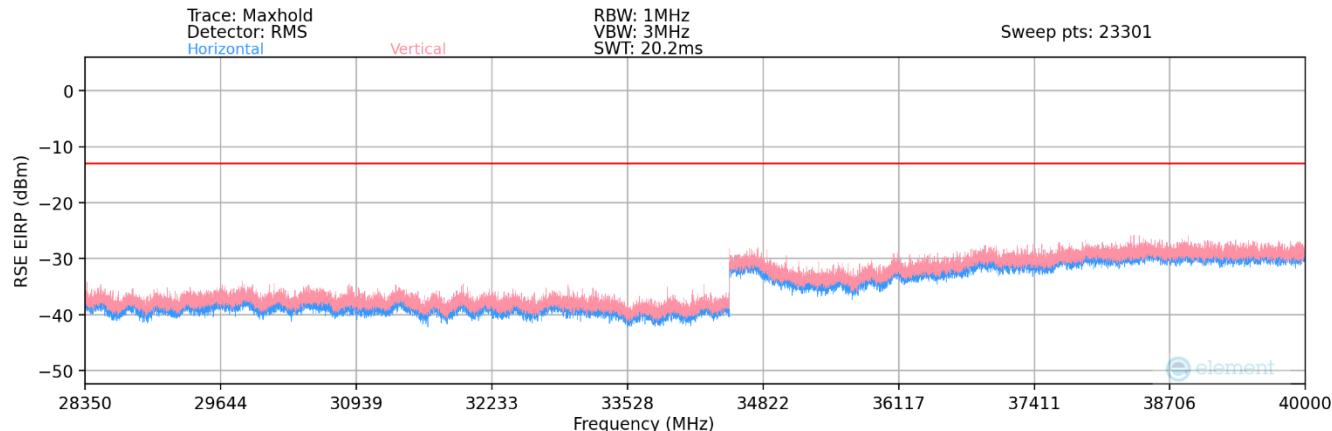
Table 7-43. Ant1 - n261 Radiated Spurious Emissions Table (18GHz - 27.5GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 87 of 142

28.35GHz - 40GHz



Plot 7-94. Ant1 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
30150.63	Low	50	2Tx	QPSK	H	-	-	-36.30	-13.00	-23.30
34958.28	Mid	50	2Tx	QPSK	H	-	-	-33.18	-13.00	-20.18
38647.33	High	50	2Tx	QPSK	H	-	-	-31.84	-13.00	-18.84

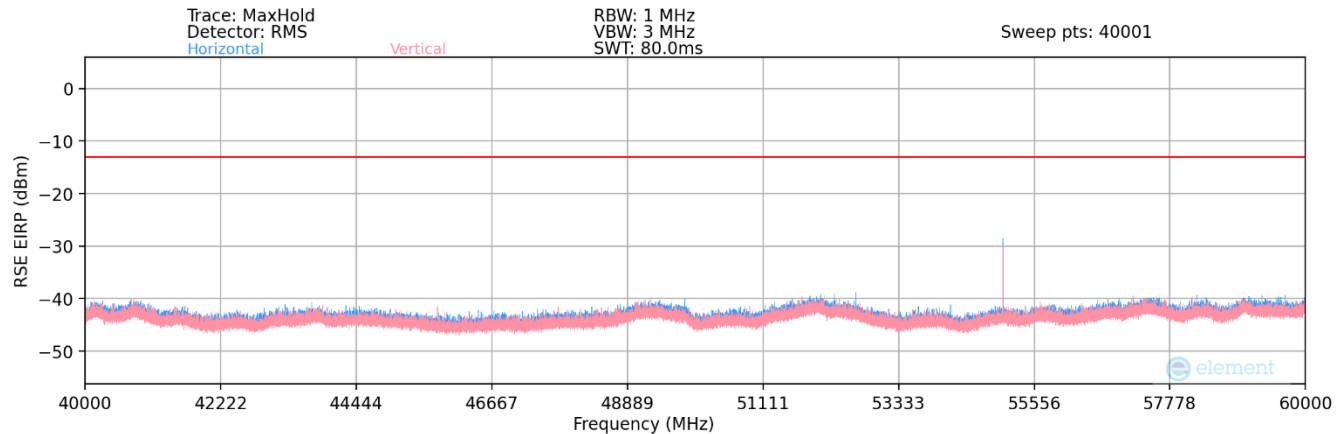
Table 7-44. Ant1 - n261 Radiated Spurious Emissions Table (28.35GHz - 40GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 88 of 142

40GHz - 60GHz



Plot 7-95. Ant1 - n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1.5 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
55050.00	Low	50	2Tx	QPSK	H	170	32	-27.07	-13.00	-14.07
55849.92	Mid	50	2Tx	QPSK	H	168	40	-32.76	-13.00	-19.76
56649.84	High	50	2Tx	QPSK	H	164	23	-33.73	-13.00	-20.73

Table 7-45. Ant1 - n261 Radiated Spurious Emissions Table (40GHz - 60GHz)

Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1.5 meter.

FCC ID: A3LSMF721U	PART 30 MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2204080051-01.A3L	Test Dates: 05/11/2022–06/16/2022	EUT Type: Portable Handset	Page 89 of 142