

PART 96 C2PC TEST REPORT NR Band n48

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

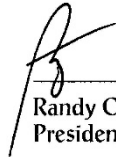
Date of Testing:
2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022
Test Report Issue Date:
06/20/2022
Test Site/Location:
PCTEST Lab. Columbia, MD, USA
Test Report Serial No.:
1M2009140143-05.A3L

FCC ID:	A3LSMG996U
APPLICANT:	Samsung Electronics Co., Ltd.

Application Type: Class II Permissive Change
Model: SM-G996U
Additional Models: SM-G996U1
EUT Type: Portable Handset
FCC Classification: Citizens Band End User Devices (CBE)
FCC Rule Part(s): 96
Test Procedure(s): ANSI C63.26-2015, KDB 940660 D01 v03, WINNF-18-IN-00178 v1.0.0.00,
KDB 648474 D03 v01r04
Class II Permissive Change: Please see FCC change document
Original Grant Date: 12/18/2020

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.



Randy Ortanez
President








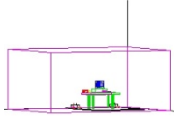
FCC ID: A3LSMG996U	 <small>Proud to be part of  element</small>	PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset	Page 1 of 46	

TABLE OF CONTENTS

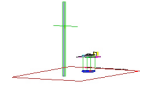
1.0	INTRODUCTION	4
1.1	Scope	4
1.2	PCTEST Test Location	4
1.3	Test Facility / Accreditations	4
2.0	PRODUCT INFORMATION	5
2.1	Equipment Description	5
2.2	Device Capabilities	5
2.3	Test Configuration	5
2.4	EMI Suppression Device(s)/Modifications	5
3.0	DESCRIPTION OF TESTS	6
3.1	Measurement Procedure	6
3.2	Radiated Power and Radiated Spurious Emissions	6
4.0	MEASUREMENT UNCERTAINTY	7
5.0	TEST EQUIPMENT CALIBRATION DATA	8
6.0	SAMPLE CALCULATIONS	9
7.0	TEST RESULTS	10
7.1	Summary	10
7.2	Conducted Power Output Data	11
7.3	Occupied Bandwidth	13
7.4	Spurious and Harmonic Emissions at Antenna Terminal	19
7.5	Band Edge Emissions at Antenna Terminal	26
7.6	Radiated Power (EIRP)	32
7.7	Radiated Spurious Emissions Measurements	35
7.8	Frequency Stability / Temperature Variation	41
7.9	End User Device Additional Requirement (CBSD Protocol)	43
8.0	CONCLUSION	46

FCC ID: A3LSMG996U	 <small>Proud to be part of element</small>	PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset	Page 2 of 46	



MEASUREMENT REPORT



FCC Part 96



Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
NR Band n48	40 MHz	π/2 BPSK	3570.0 - 3680.0	0.083	19.19	35M8G7D
		QPSK	3570.0 - 3680.0	0.083	19.18	37M8G7D
		16QAM	3570.0 - 3680.0	0.065	18.16	38M0W7D
	20 MHz	π/2 BPSK	3560.0 - 3690.0	0.080	19.05	18M0G7D
		QPSK	3560.0 - 3690.0	0.079	18.98	18M3G7D
		16QAM	3560.0 - 3690.0	0.061	17.88	18M4W7D
	10 MHz	π/2 BPSK	3555.0 - 3695.0	0.080	19.03	8M65G7D
		QPSK	3555.0 - 3695.0	0.079	18.97	8M65G7D
		16QAM	3555.0 - 3695.0	0.062	17.92	8M62W7D

EUT Overview

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

FCC ID: A3LSMG996U		PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset	Page 3 of 46	

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 PCTEST Test Location

These measurement tests were conducted at the PCTEST facility 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 PCTEST located in Columbia, MD 21046, U.S.A.

- PCTEST is a OnGo Alliance Approved Test Lab (ATL)
- PCTEST is a WinnForum Approved Test Lab
- PCTEST is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for CBRS Alliance Certification Test Plan and WinnForum Conformance and Performance Test Technical Standard.
- PCTEST 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.
- PCTEST 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).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

FCC ID: A3LSMG996U	 Proud to be part of  element	PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset		Page 4 of 46

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID : A3LSMG996U**. The test data contained in this report pertains only to the emissions due to the EUT's LTE Band 48 operation in the CBRS band. Per FCC Part 96, this device is evaluated under Citizens Band End User Devices (CBE).

Test Device Serial No.: 0835M, 0863M, 0418M

2.2 Device Capabilities

This device contains the following capabilities:

800/850/1900 CDMA/EVDO Rev. 0/A (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 5G NR (FR1/FR2), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE), NFC, UWB, Wireless Power Transfer

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



2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with the EUT lying flat on an authorized wireless charging pad (WCP) Model: EP-N5100 while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

2.4 EMI Suppression Device(s)/Modifications

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

FCC ID: A3LSMG996U	 PCTEST® Proud to be part of element	PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset		Page 5 of 46

3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

The measurement procedures described in the document titled “Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards” (ANSI/TIA-603-E-2016) and “Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems” (KDB 971168 D01 v03r01) 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. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm tall test table made of Styrodur is placed on top of the turn table. A Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer “Channel Power” function with the integration band set to the emissions’ occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168 D01 v03r01.



Per the guidance of ANSI/TIA-603-E-2016, a half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

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

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

The calculated P_d levels are then compared to the absolute spurious emission limit of -40dBm/MHz for End User Devices.




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

FCC ID: A3LSMG996U		PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset		Page 6 of 46

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: A3LSMG996U	 PCTEST [®] Proud to be part of  element	PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset		Page 7 of 46

5.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	AP1	EMC Cable and Switch System	3/9/2021	Annual	3/9/2022	AP1
-	LTx1	Licensed Transmitter Cable Set	3/12/2021	Annual	3/12/2022	LTx1
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Espec	ESX-2CA	Environmental Chamber	8/27/2020	Annual	8/27/2022	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/20/2021	Biennial	4/20/2023	00125518
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	7/21/2021	Annual	7/21/2022	MY49430494
Keysight Technologies	N9038A	MXE EMI Receiver	1/21/2022	Annual	1/22/2023	MY51210133
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			100976
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			112347
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	8/3/2021	Annual	8/3/2022	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	5/25/2021	Annual	5/25/2022	100348
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	8/25/2021	Annual	8/25/2022	103200
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	7/27/2020	Biennial	7/27/2022	A051107

Table 5-1. Test Equipment (02/23 – 03/16/2022)

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Keysight Technologies	N9020A	PXA Signal Analyzer	3/4/2022	Annual	3/4/2023	US46470561



Table 5-2. Test Equipment (05/31/2022)

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	7/21/2021	Annual	7/21/2022	MY49430494
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	8/3/2021	Annual	8/3/2022	100342

Table 5-3. Test Equipment Table (06/15 – 06/18/2022)

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.
- Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

FCC ID: A3LSMG996U		PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset	Page 8 of 46	

6.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz

W = Amplitude/Angle Modulated




7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

Spurious Radiated Emission – LTE Band

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

The average spectrum analyzer reading at 3 meters with the EUT on the turntable was -81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of -81.0 dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 1564 MHz. So 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80).

FCC ID: A3LSMG996U	 Proud to be part of  element	PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset		Page 9 of 46

7.0 TEST RESULTS

7.1 Summary



Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LSMG996U
 FCC Classification: Citizens Band End User Devices (CBE)
 Mode(s): NR

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
CONDUCTED	Conducted Power	2.1046	N/A	PASS	Section 7.2
	Occupied Bandwidth	2.1049	N/A	PASS	Section 7.3
	Conducted Band Edge / Spurious Emissions	2.1051, 96.41(e)(1)(ii), 96.41(e)(2)	-13 dBm/MHz at frequencies within 0-B MHz of channel edge (where B is the bandwidth of the assigned channel) -25 dBm/MHz at frequencies greater than B MHz above and below channel edge -40 dBm/MHz at frequencies below 3530 MHz and above 3720 MHz	PASS	Sections 7.4, 7.5
	Frequency Stability	2.1055	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8
	End User Device Additional Requirements (CBSD Protocol)	96.47	End User Devices may operate only if they can positively receive and decode an authorization signal transmitted by a CBSD, including the frequencies and power limits for their operation. An End User Device must discontinue operations, change frequencies, or change its operational power level within 10 seconds of receiving instructions from its associated CBSD.	PASS	Section 7.9
RADIATED	Equivalent Isotropic Radiated Power (EIRP)	96.41(b)	23 dBm/10MHz	PASS	Section 7.6
	Radiated Spurious Emissions	2.1053, 96.41(e)(1)(ii), 96.47(e)(2)	-40 dBm/MHz	PASS	Section 7.7

Table 7-1. Summary of Test Results

Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST EMC Software Tool v1.1, Chamber Control v1.3.1.

FCC ID: A3LSMG996U	 PCTEST® Proud to be part of element	PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset		Page 10 of 46

7.2 Conducted Power Output Data

Test Overview

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

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

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

Test Setup

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

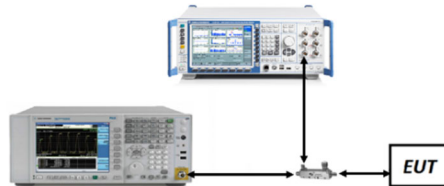




Figure 7-1. Test Instrument & Measurement Setup

Test Notes

1. Conducted power measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device.
2. All other conducted power measurements are contained in the RF exposure report for this filing.



FCC ID: A3LSMG996U	 PCTEST® Proud to be part of element	PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset		Page 11 of 46

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
40 MHz	π/2 BPSK	638000	3570.0	1 / 79	22.06
		641666	3625.0	1 / 79	22.45
		645332	3680.0	1 / 26	22.40
	QPSK	638000	3570.0	1 / 79	22.06
		641666	3625.0	1 / 79	22.53
		645332	3680.0	1 / 26	22.43
	16-QAM	638000	3570.0	1 / 79	21.87
		641666	3625.0	1 / 79	22.39
		645332	3680.0	1 / 26	22.20
20 MHz	π/2 BPSK	637334	3560.0	1 / 38	22.17
		641666	3625.0	1 / 38	22.25
		646000	3690.0	1 / 13	22.19
	QPSK	637334	3560.0	1 / 38	22.23
		641666	3625.0	1 / 38	22.31
		646000	3690.0	1 / 13	22.20
	16-QAM	637334	3560.0	1 / 38	22.29
		641666	3625.0	1 / 38	22.12
		646000	3690.0	1 / 13	21.98
10 MHz	π/2 BPSK	637000	3555.0	1 / 17	22.31
		641666	3625.0	1 / 17	22.27
		646332	3695.0	1 / 6	22.18
	QPSK	637000	3555.0	1 / 17	22.32
		641666	3625.0	1 / 17	22.34
		646332	3695.0	1 / 6	22.10
	16-QAM	637000	3555.0	1 / 17	21.97
		641666	3625.0	1 / 17	22.15
		646332	3695.0	1 / 6	21.87

Table 7-2. Conducted Power Output Data (NR Band n48)

NR						Anchor							NR Conducted Power [dBm]	Anchor Conducted Power [dBm]	ENDC Total Tx. Power (dBm)
NR Band	NR Bandwidth [MHz]	NR Frequency	NR channel	Mod.	NR RB#/Offset	Anchor Band	Anchor Bandwidth [MHz]	Anchor channel	Anchor Frequency	Anchor channel	Mod.	Anchor RB#/Offset			
n48	40	3625	641666	π/2 BPSK	1/53	B2	20	Mid	1880	18900 (900)	QPSK	1/99	24.37	23.85	27.13
				QPSK	100/0						23.07	22.86	25.98		
				QPSK	1/26						24.10	23.38	26.76		
				QPSK	1/53						24.11	23.83	26.98		
				QPSK	1/79						24.26	23.72	27.01		
				16Q	1/53						23.53	22.78	26.18		

Table 7-3. Conducted Power Output Data (ENDC NR Band n48 – Anchor Band 2)

FCC ID: A3LSMG996U		PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset		Page 12 of 46

7.3 Occupied Bandwidth

\$2.1049

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

KDB 971168 D01 v03r01 – Section 4.2

Test Settings

1. The signal analyzer’s automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

Test Setup

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

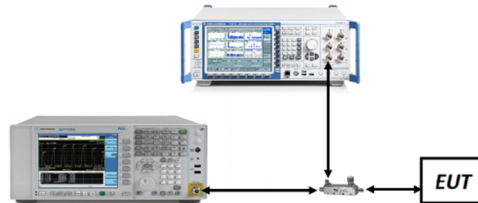




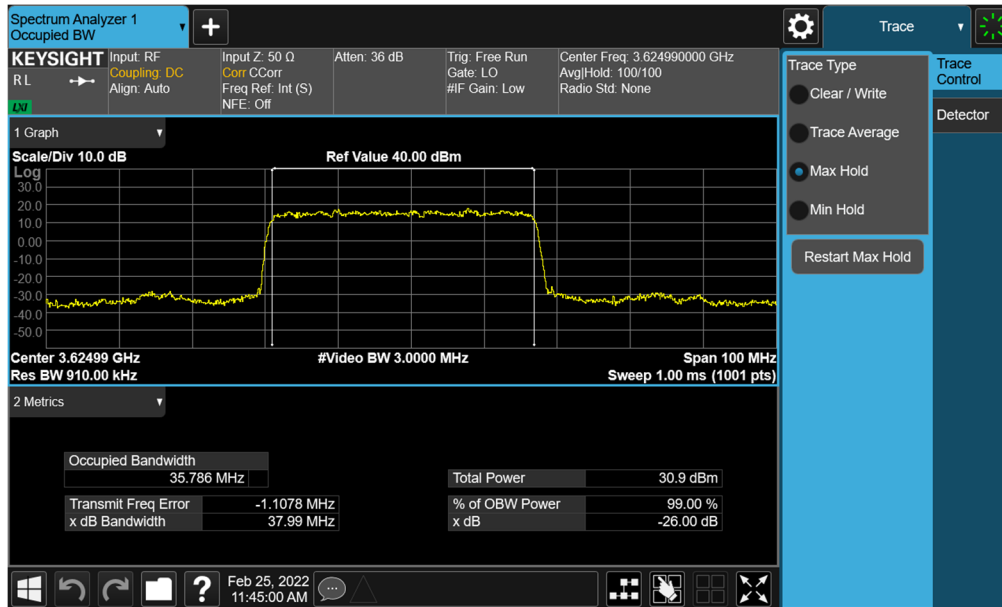
Figure 7-2. Test Instrument & Measurement Setup

Test Notes

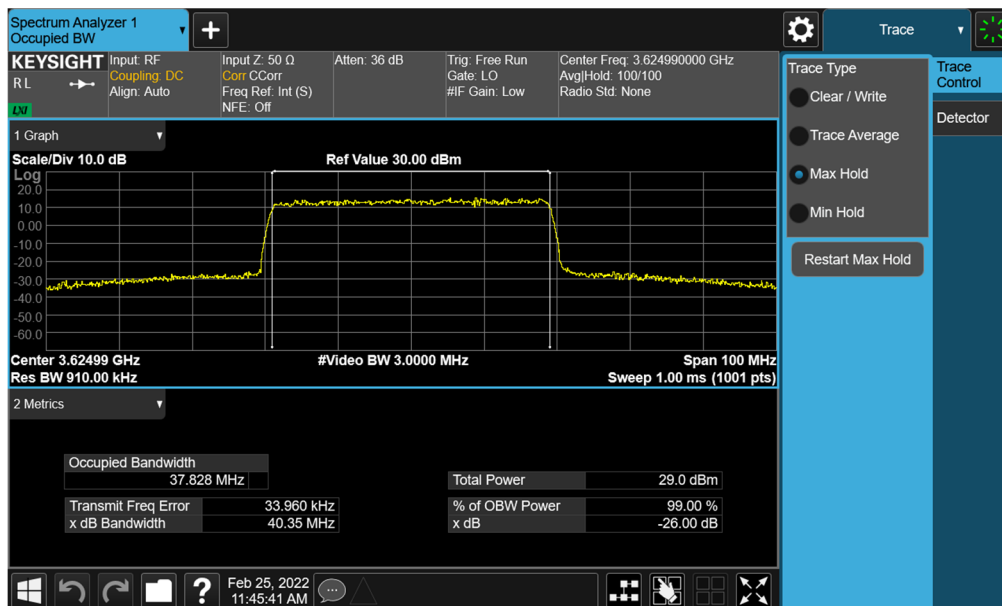
None.

FCC ID: A3LSMG996U	 PCTEST® Proud to be part of element	PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset		Page 13 of 46




NR Band n48

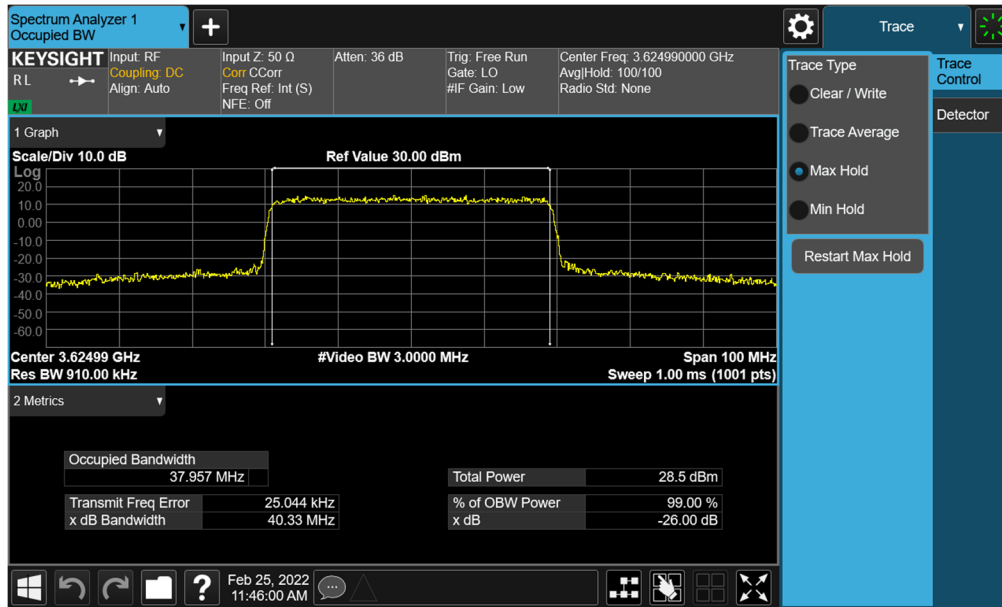


Plot 7-1. Occupied Bandwidth Plot (NR Band n48 - 40MHz $\pi/2$ BPSK - Full RB Configuration)

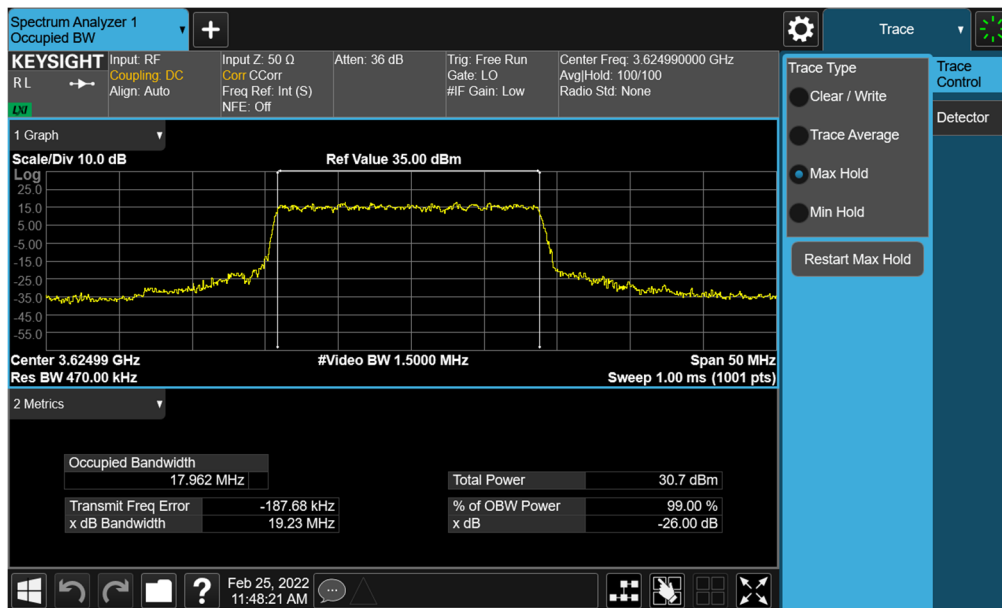


Plot 7-2. Occupied Bandwidth Plot (NR Band n48 - 40MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG996U	 Proud to be part of 	PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset		Page 14 of 46

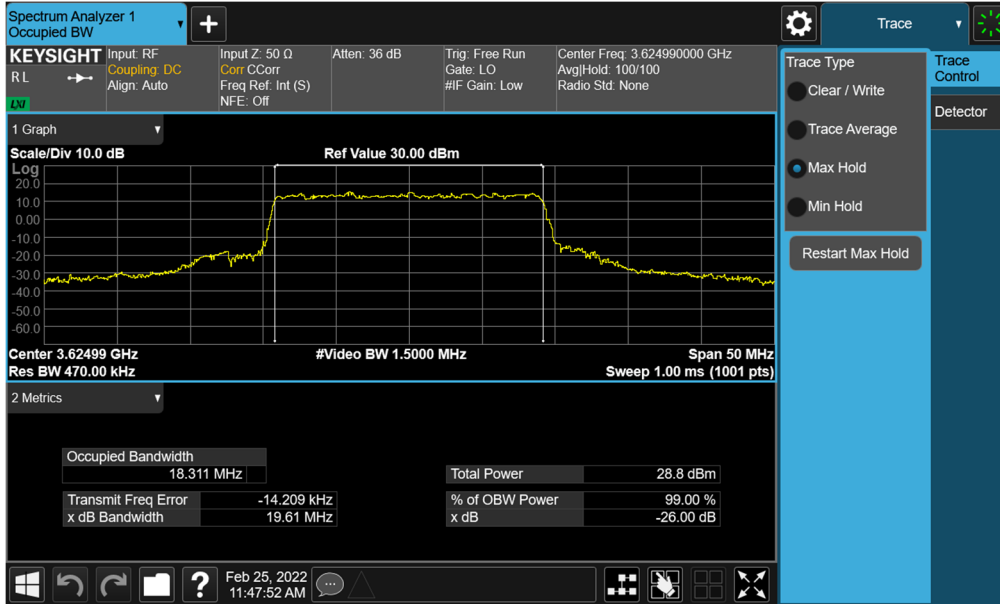


Plot 7-3. Occupied Bandwidth Plot (NR Band n48 - 40MHz 16-QAM - Full RB Configuration)



Plot 7-4. Occupied Bandwidth Plot (NR Band n48 - 20MHz $\pi/2$ BPSK - Full RB Configuration)




FCC ID: A3LSMG996U	PCTEST Proud to be part of element	PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset		Page 15 of 46

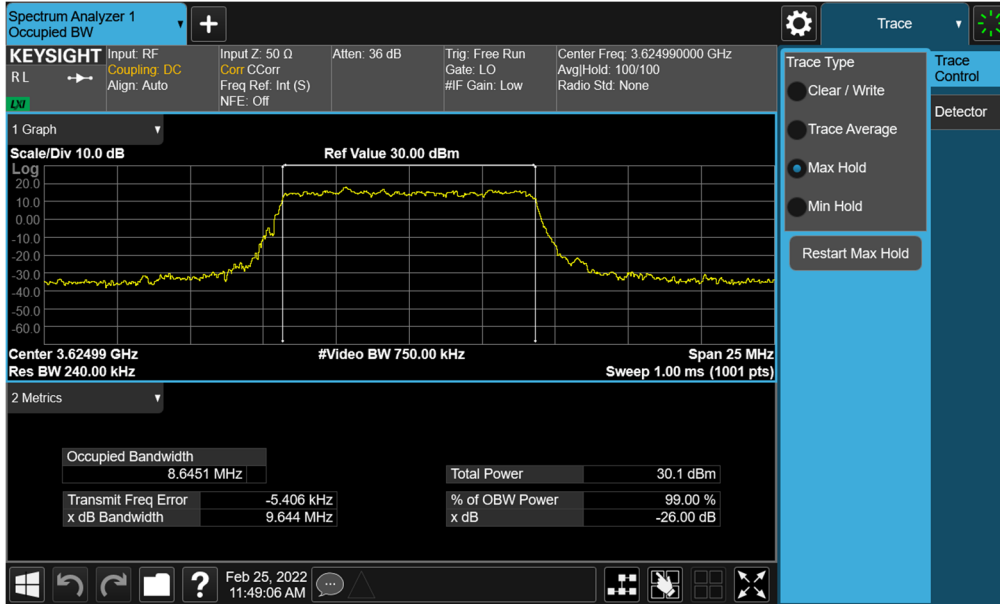


Plot 7-5. Occupied Bandwidth Plot (NR Band n48 - 20MHz QPSK - Full RB Configuration)



Plot 7-6. Occupied Bandwidth Plot (NR Band n48 - 20MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG996U	 PCTEST Proud to be part of 	PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset		Page 16 of 46



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



Plot 7-8. Occupied Bandwidth Plot (NR Band n48 - 10MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG996U	PCTEST Proud to be part of element	PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset		Page 17 of 46

7.4 Spurious and Harmonic Emissions at Antenna Terminal

\$2.1051 §96.41(e)

Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/Mhz.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = Max Hold
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

Test Setup

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

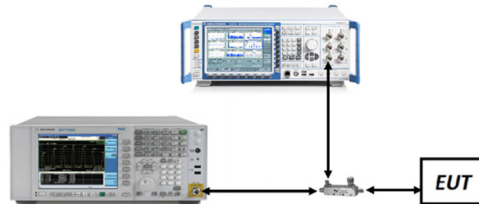




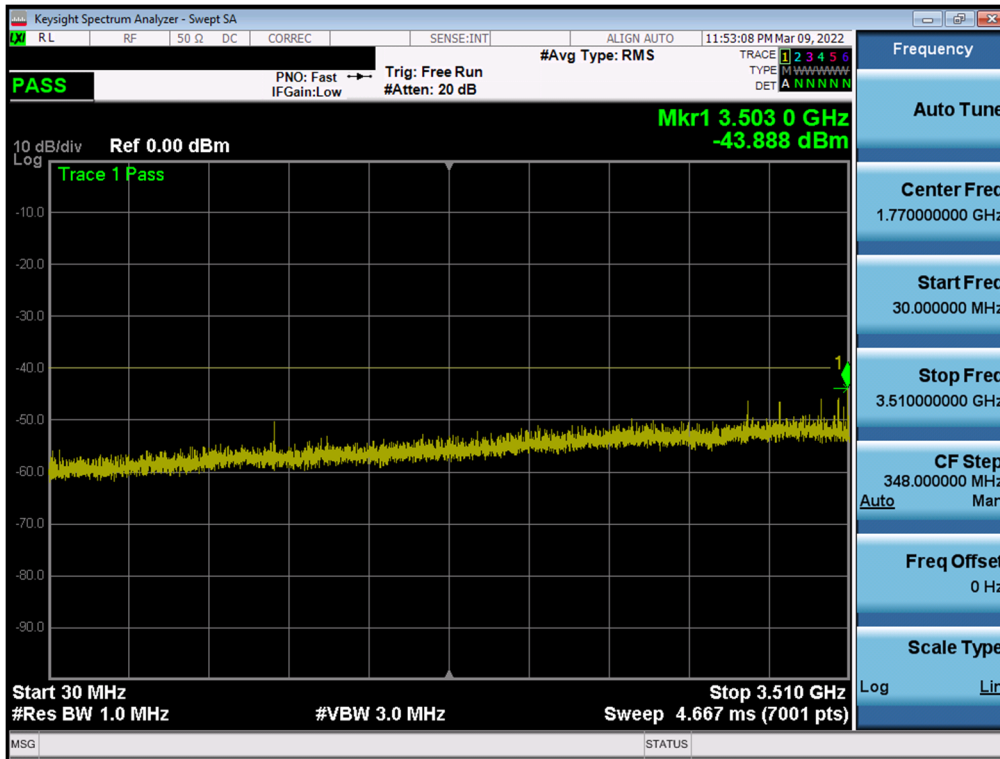
Figure 7-3. Test Instrument & Measurement Setup

Test Notes

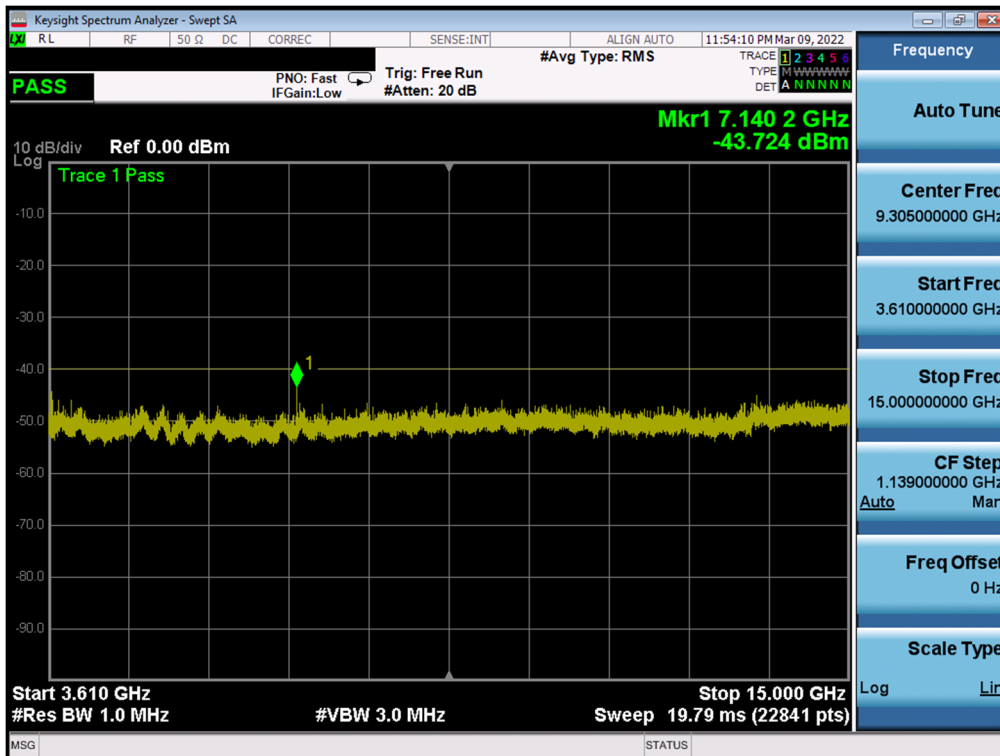
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz.

FCC ID: A3LSMG996U	 PCTEST® Proud to be part of element	PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset		Page 19 of 46

NR Band n48



Plot 7-10. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - Low Channel)



Plot 7-11. Conducted Spurious Plot (NR Band n48 - 40MHz QPSK - Low Channel)

FCC ID: A3LSMG996U	PCTEST Proud to be part of element	PART 96 MEASUREMENT REPORT CLASS II PERMISSIVE CHANGE		Approved by: Technical Manager
Test Report S/N: 1M2009140143-05.A3L	Test Dates: 2/23/2022 - 3/16/2022, 6/15/2022 - 6/18/2022	EUT Type: Portable Handset		Page 20 of 46

