

ELEMENT WASHINGTON DC LLC

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PART 27 MEASUREMENT REPORT

Applicant Name:

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

Date of Testing:

9/9/2022 - 2/6/2023 **Test Report Issue Date:** 2/24/2023 **Test Site/Location:** Element lab., Columbia, MD, USA **Test Report Serial No.:** 1M2212080136-04-R1.A3L

FCC ID:

A3LSMS911JPN

Applicant Name:

Samsung Electronics Co., Ltd.

Application Type: Model(s): EUT Type: FCC Classification: FCC Rule Part: Test Procedure(s):

Certification SC-51D, SCG19 Portable Handset PCS Licensed Transmitter Held to Ear (PCE) 27 ANSI C63.26-2015, KDB 648474 D03 v01r04

Note: This revised Test Report (S/N: 1M2212080136-04-R1.A3L) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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: A3LSMS911JPN	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N:	Test Dates:	Test Dates: EUT Type:	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 1 of 94
© 2023 ELEMENT			V11.0 9/14/2022



TABLE OF CONTENTS

INTRO	DDUCTION	4
1.1	Scope	4
1.2	Element Test Location	4
1.3	Test Facility / Accreditations	4
PROD	DUCT INFORMATION	5
2.1	Equipment Description	5
2.2	Device Capabilities	5
2.3	Test Configuration	5
2.4	Software and Firmware	5
2.5	EMI Suppression Device(s)/Modifications	5
DESC	RIPTION OF TESTS	6
3.1	Evaluation Procedure	6
3.2	Radiated Power and Radiated Spurious Emissions	6
MEAS		7
TEST	EQUIPMENT CALIBRATION DATA	8
SAMF	PLE CALCULATIONS	9
TEST	RESULTS	.10
7.1	Summary	10
7.2	Conducted Output Power Data	11
7.3	Occupied Bandwidth	15
7.4	Spurious and Harmonic Emissions at Antenna Terminal	37
7.5	Band Edge Emissions at Antenna Terminal	54
7.6	Radiated Power (EIRP)	72
7.7	Radiated Spurious Emissions Measurements	77
7.8	Frequency Stability / Temperature Variation	91
CON	CLUSION	.94
	1.1 1.2 1.3 PROE 2.1 2.2 2.3 2.4 2.5 DESC 3.1 3.2 MEAS TEST 7.1 7.2 7.3 7.4 7.5 7.6 7.7 7.8	1.2 Element Test Location 1.3 Test Facility / Accreditations PRODUCT INFORMATION

FCC ID: A3LSMS911JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 2 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 2 01 94
© 2023 ELEMENT	•		V11.0 9/14/2022



PART 27 MEASUREMENT REPORT

				EIRP		
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	Max. Power [W]	Max. Power [dBm]	Emission Designator
	20 MHz	QPSK	2506.0 - 2680.0	0.300	24.77	18M0G7D
	20 MHZ	16QAM	2506.0 - 2680.0	0.247	23.93	18M0W7D
	15 MHz	QPSK	2503.5 - 2682.5	0.298	24.74	13M5G7D
LTE Band 41(PC3)	13 10112	16QAM	2503.5 - 2682.5	0.248	23.95	13M5W7D
	10 MHz	QPSK	2501.0 - 2685.0	0.338	25.29	9M04G7D
	10 10112	16QAM	2501.0 - 2685.0	0.290	24.62	9M05W7D
	5 MHz	QPSK	2498.5 - 2687.5	0.322	25.08	4M53G7D
	0 11112	16QAM	2498.5 - 2687.5	0.261	24.17	4M54W7D
		π/2 BPSK	2546.0 - 2640.0	0.341	25.33	97M2G7D
	100 MHz	QPSK	2546.0 - 2640.0	0.334	25.23	98M0G7D
		16QAM	2546.0 - 2640.0	0.261	24.16	98M0W7D
		π/2 BPSK	2541.0 - 2645.0	0.347	25.40	87M5G7D
	90 MHz	QPSK	2541.0 - 2645.0	0.337	25.27	87M8G7D
		16QAM	2541.0 - 2645.0	0.267	24.26	88M1W7D
		π/2 BPSK	2536.0 - 2650.0	0.346	25.39	77M5G7D
	80 MHz	QPSK	2536.0 - 2650.0	0.336	25.26	78M0G7D
		16QAM	2536.0 - 2650.0	0.266	24.24	77M8W7D
	70 MHz	π/2 BPSK	2531.0 - 2655.0	0.341	25.33	64M6G7D
		QPSK	2531.0 - 2655.0	0.332	25.21	67M8G7D
		16QAM	2531.0 - 2655.0	0.256	24.08	67M8W7D
	60 MHz	π/2 BPSK	2526.0 - 2660.0	0.353	25.48	58M2G7D
		QPSK	2526.0 - 2660.0	0.341	25.32	58M2G7D
		16QAM	2526.0 - 2660.0	0.269	24.30	58M2W7D
		π/2 BPSK	2521.0 - 2665.0	0.351	25.45	46M0G7D
NR Band n41(PC3)	50 MHz	QPSK	2521.0 - 2665.0	0.346	25.39	47M8G7D
	00 11112	16QAM	2521.0 - 2665.0	0.270	24.32	47M8W7D
		π/2 BPSK	2516.0 - 2670.0	0.359	25.55	35M9G7D
	40 MHz	QPSK	2516.0 - 2670.0	0.346	25.39	38M1G7D
	40 10112	16QAM	2516.0 - 2670.0	0.340	24.39	38M0W7D
		π/2 BPSK	2511.0 - 2675.0	0.273	24.39	27M0G7D
	30 MHz					
		QPSK 460 AM	2511.0 - 2675.0	0.343	25.35	28M0G7D
		16QAM	2511.0 - 2675.0	0.269	24.30	28M0W7D
		π/2 BPSK	2506.0 - 2680.0	0.351	25.45	18M0G7D
	20 MHz	QPSK	2506.0 - 2680.0	0.338	25.29	18M3G7D
		16QAM	2506.0 - 2680.0	0.275	24.39	18M3W7D
		π/2 BPSK	2503.5 - 2682.5	0.359	25.55	13M0G7D
	15 MHz	QPSK	2503.5 - 2682.5	0.348	25.41	13M7G7D
		16QAM	2503.5 - 2682.5	0.276	24.40	13M7W7D
		π/2 BPSK	2501.0 - 2685.0	0.336	25.26	8M69G7D
	10 MHz	QPSK	2501.0 - 2685.0	0.330	25.19	8M66G7D
		16QAM	2501.0 - 2685.0	0.257	24.09	8M69W7D

EUT Overview (LTE Band)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Daga 2 of 04
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 3 of 94
© 2023 ELEMENT	·		V11.0 9/14/2022



1.0 INTRODUCTION

1.1 Scope

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

1.2 Element Test Location

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

1.3 Test Facility / Accreditations

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

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

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	Test Dates: EUT Type:		
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 4 of 94	
© 2023 ELEMENT	· · · ·		V11.0 9/14/2022	

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMS911JPN**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitters that operate under the provisions of Part 27.

Test Device Serial No.: 1066M, 1050M, 0227M, 0179M, 0275M, 0136M, 0227M, 0274M

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850 WCDMA/HSPA, Multi-band LTE, Multi-band 5G NR (FR1), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII (5GHz and 6GHz), Bluetooth (1x, EDR, LE), NFC, 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 C63.26-2015. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with the EUT lying flat on an authorized wireless charging pad (WCP) Model: EP-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 Software and Firmware

Testing was performed on device(s) using software/firmware version S911USQU0AVJM 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: A3LSMS911JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates: EUT Type:		Daga E of 04
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 5 of 94
© 2023 ELEMENT	•	·	V11.0 9/14/2022



3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

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

Deviation from Measurement Procedure......None

3.2 Radiated Power and Radiated Spurious Emissions

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

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

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

 $P_{d [dBm]} = P_{g [dBm]} - cable loss [dB] + antenna gain [dBd/dBi];$

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 $P_{g \text{ [dBm]}}$ – cable loss [dB].

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

$$\begin{split} E_{[dB\mu V/m]} &= Measured \ amplitude \ level_{[dBm]} + 107 + Cable \ Loss_{[dB]} + Antenna \ Factor_{[dB/m]} \\ And \\ EIRP_{[dBm]} &= E_{[dB\mu V/m]} + 20logD - 104.8; \ where \ D \ is the measurement \ distance \ in \ meters. \end{split}$$

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

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

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	Test Dates: EUT Type:	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 6 of 94
© 2023 ELEMENT			V11.0 9/14/2022



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 (±dB)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

FCC ID: A3LSMS911JPN	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N:	Test Dates: EUT Type:		Page 7 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 7 01 94
© 2023 ELEMENT			V11.0 9/14/2022



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
-	AP1-002	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	AP1-002
-	AP2-001	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	AP2-001
-	AP2-002	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	AP2-002
-	ETS-001	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	ETS-001
-	ETS-002	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	ETS-002
-	LTx1	Licensed Transmitter Cable Set	1/12/2023	Annual	1/12/2024	LTx1
-	LTx2	Licensed Transmitter Cable Set	1/12/2023	Annual	1/12/2024	LTx2
-	LTx3	Licensed Transmitter Cable Set	1/12/2023	Annual	1/12/2024	LTx3
-	LTx4	Licensed Transmitter Cable Set	1/12/2023	Annual	1/12/2024	LTx4
-	LTx5	Licensed Transmitter Cable Set	1/12/2023	Annual	1/12/2024	LTx5
-	LTx6-40	Licensed Transmitter Cable Set	1/12/2023	Annual	1/12/2024	LTx6-40
Agilent	N9020A	MXA Signal Analyzer	4/26/2022	Annual	4/26/2023	MY56470202
Agilent	N9030A	PXA Signal Analyzer (44GHz)	8/18/2022	Annual	8/18/2023	MY49430494
Anritsu	MT8821C	Radio Communication Analyzer	5/24/2022	Annual	5/24/2023	6201144418
Anritsu	MT8821C	Radio Communication Analyzer	6/27/2022	Annual	6/27/2023	6261895213
Anritsu	MT8821C	Radio Communication Analyzer	5/11/2022	Annual	5/11/2023	6262044715
Anritsu	MT8821C	Radio Communication Analyzer	1/10/2023	Annual	1/10/2024	6201524637
Anritsu	MT8821C	Radio Communication Analyzer	11/28/2022	Annual	11/28/2023	6262150047
Com-Power	AL-130R	9kHz - 30MHz Loop Antenna	1/19/2022	Biennial	1/19/2024	121085
Emco	3115	Horn Antenna (1-18GHz)	8/8/2022	Biennial	8/8/2024	9704-5182
ESPEC	SU-241	Temperature Chamber	11/10/2022	Annual	11/10/2023	93011064
ETS-Lindgren	3816/2NM	Line Impedance Stabilization Network	8/11/2022	Biennial	8/11/2024	00114451
Keysight Technologies	N9038A	MXE EMI Receiver	1/21/2022	Annual	1/21/2023	US46470561
Pasternack	NMLC-2	Line Conducted Emissions Cable (NM)	1/11/2023	Annual	1/11/2024	NMLC-2
Rohde & Schwarz	CMW500	Radio Communication Analyzer	10/10/2022	Annual	10/10/2023	101072
Rohde & Schwarz	CMW500	Radio Communication Analyzer	4/12/2022	Annual	4/12/2023	100059
Rohde & Schwarz	CMW500	Radio Communication Analyzer	5/17/2022	Annual	5/17/2023	100854
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	8/29/2022	Annual	8/29/2023	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	8/25/2022	Annual	8/25/2023	100348
Sunol Sciences	DRH-118	Horn Antenna (1-18GHz)	1/14/2022	Biennial	1/14/2024	A042511
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	8/30/2022	Biennial	8/30/2024	A051107

Table 5-1. Test Equipment

Notes:

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

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	Test Dates: EUT Type:		
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 8 of 94	
© 2023 ELEMENT	-	·	V11.0 9/14/2022	



6.0 SAMPLE CALCULATIONS

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz G = Phase Modulation 7 = Quantized/Digital Info D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz W = Amplitude/Angle Modulated 7 = Quantized/Digital Info D = Data transmission, telemetry, telecommand

Spurious Radiated Emission

Example: Spurious emission at 3700.40 MHz

The receive spectrum analyzer reading at 3 meters with the EUT on the turntable was -81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of -81.0 dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 3700.40 MHz. So 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.50 dBm so this harmonic was 25.50 dBm -(-24.80) = 50.3 dBc.

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dago 0 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 9 of 94	
© 2023 ELEMENT	·		V11.0 9/14/2022	



7.0 TEST RESULTS

7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.
FCC ID:	A3LSMS911JPN
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	LTE/NR

Test Condition	n Test Description FCC Part Section(s)		Test Limit	Test Result	Reference
	Transmitter Conducted Output Power*	2.1046(a), 2.1046(c)	N/A	PASS	Section 7.2
CONDUCTED	Occupied Bandwidth 2.1049(h)		N/A	PASS	Section 7.3
CONDI	Conducted Band Edge / Spurious Emissions	2 1051 27 53(m)(4)	Undesirable emissions must meet the limits detailed in 27.53(m)(4)	PASS	Sections 7.4, 7.5
	Frequency Stability	2 1055 27 54	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8
RADIATED	Equivalent Isotropic Radiated Power	27.50(h)(2)	≤ 2 Watts max. EIRP	PASS	Section 7.6
RADI	Radiated Spurious Emissions	2 1053 27 53(m)	Undesirable emissions must meet the limits detailed in 27.53(m)	PASS	Section 7.7

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

Table 7-1. Summary of Test Results

Notes:

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

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 10 of 01	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 10 of 94	
© 2023 ELEMENT	-		V11.0 9/14/2022	



7.2 Conducted Output Power Data

Test Overview

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

Test Procedure Used

ANSI C63.26-2015 - Section 5.2

Test Settings

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

Test Setup

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



Figure 7-1. Test Instrument & Measurement Setup

Test Notes

- 1. Uplink carrier aggregation is only supported in this EUT while operating in Power Class 3.
- 2. Conducted power measurements were evaluated using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device.
- 3. All other conducted power measurements are contained in the RF exposure report for this filing.

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 11 of 04
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 11 of 94
© 2023 ELEMENT			V11.0 9/14/2022



Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
N		39750	2506.0	1 / 0	24.36
MHz	QPSK	40620	2593.0	1 / 50	24.26
20 1		41490	2680.0	1 / 50	24.28
7	16-QAM	41490	2680.0	1 / 50	23.18
N		39725	2503.5	1 / 0	24.42
MHz	QPSK	40620	2593.0	1 / 37	24.43
15 1		41515	2682.5	1 / 37	24.21
~	16-QAM	41515	2682.5	1 / 37	23.20
N		39700	2501.0	1 / 49	24.98
MHz	QPSK	40620	2593.0	1 / 49	24.98
10 1		41540	2685.0	1 / 49	24.62
-	16-QAM	40620	2593.0	1 / 49	24.08
N		39675	2498.5	1 / 12	24.73
MHz	QPSK	40620	2593.0	1 / 0	24.50
2 2		41565	2687.5	1 / 12	24.59
	16-QAM	39675	2498.5	1 / 12	24.14

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

Power State Band	Bandwidth (PCC + SCC)	PCC					scc				ULCA Tx.																	
		Modulation	UL Channel	UL Frequency	UL # RB	UL RB Offset	Modulation	UL Channel	UL Frequency	UL # RB	UL RB Offset	Power [dBm]																
					39750	2506.0	1	99		39948	2525.8	1	0	24.26														
			QPSK	40620	2593.0	1	99	QPSK	40818	2612.8	1	0	24.08															
				41490	2680.0	1	0]	41292	2660.2	1	99	23.78															
Max	LTE B41 (PC3)	20MHz + 20MHz	20MHz + 20MHz	20MHz + 20MHz	20MHz + 20MHz	20MHz + 20MHz	20MHz + 20MHz	20MHz + 20MHz	20MHz + 20MHz	20MHz + 20MHz	20MHz + 20MHz	20MHz + 20MHz	20MHz + 20MHz	20MHz + 20MHz	20MHz + 20MHz	20MHz + 20MHz	20MHz + 20MHz	QPSK	39750	2506.0	100	0	QPSK	39948	2525.8	100	0	22.12
			16-QAM	39750	2506.0	100	0	16-QAM	39948	2525.8	100	0	21.10															
	64-Q/	64-QAM	39750	2506.0	100	0	64-QAM	39948	2525.8	100	0	20.98																
		256-QAM	39750	2506.0	100	0	256-QAM	39948	2525.8	100	0	19.08																

Table 7-3. Conducted Power Data (ULCA LTE B41(PC3))

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 12 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 12 01 94
© 2023 ELEMENT	-		V11.0 9/14/2022



Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
		509202	2546.01	1 / 136	23.98
웃	π/2 BPSK	518598	2592.99	1 / 68	24.12
100 MHz		528000	2640.00	1 / 68	23.89
0 1		509202	2546.01	1 / 136	23.99
10	QPSK	518598	2592.99	1 / 68	24.14
		528000	2640.00	1 / 68	23.90
	16-QAM	528000	2640.00	1 / 68	22.71
		508200	2541.00	1 / 183	24.16
N	π/2 BPSK	518598 528996	2592.99 2644.98	1/61	24.15
НИ				1 / 183	23.96
90 MHz	QPSK	508200 518598	2541.00 2592.99	1 / 183 1 / 61	24.16 24.12
67	QION	528996	2644.98	1 / 183	23.94
	16-QAM	528996	2644.98	1 / 183	22.81
		507204	2536.02	1 / 162	24.07
	π/2 BPSK	518598	2592.99	1 / 54	24.19
주		529998	2649.99	1 / 162	23.95
MF		507204	2536.02	1 / 162	24.14
80 MHz	QPSK	518598	2592.99	1 / 54	24.13
		529998	2649.99	1 / 162	23.93
	16-QAM	529998	2649.99	1 / 162	22.79
		506202	2531.01	1 / 141	24.14
	π/2 BPSK	518598	2592.99	1 / 47	24.13
Hz		531000	2655.00	1 / 47	23.89
70 MHz		506202	2531.01	1 / 141	24.08
70	QPSK	518598	2592.99	1 / 47	24.15
		531000	2655.00	1 / 47	23.88
	16-QAM	531000	2655.00	1 / 47	22.63
		505200	2526.00	1 / 121	24.15
	π/2 BPSK	518598	2592.99	1 / 40	24.25
N		531996	2659.98	1 / 121	24.04
ΗI	ODEK	505200	2526.00	1 / 121	24.11
60 N	QPSK	518598 531996	2592.99 2659.98	1 / 40	24.25 23.99
9		505200	2526.00	1 / 121 1 / 121	23.99
	16-QAM	518598	2592.99	1 / 40	23.14
		531996	2659.98	1 / 121	23.14
		504204	2521.02	1 / 99	24.14
	π/2 BPSK	518598	2592.99	1 / 33	24.27
4		532998	2664.99	1 / 99	24.01
50 MHz		504204	2521.02	1 / 99	24.12
50	QPSK	518598	2592.99	1 / 33	24.27
		532998	2664.99	1 / 99	24.06
	16-QAM	532998	2664.99	1 / 99	22.87

Table 7-4. Conducted Power Data (NR Band n41 (PC3))

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 12 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 13 of 94	
© 2023 ELEMENT	•		V11.0 9/14/2022	



Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
		503202	2516.01	1 / 79	24.15
	π/2 BPSK	518598	2592.99	1 / 79	24.26
F		534000	2670.00	1 / 79	24.11
40 MHz		503202	2516.01	1 / 79	24.19
40	QPSK	518598	2592.99	1 / 79	24.31
		534000	2670.00	1 / 79	24.06
	16-QAM	534000	2670.00	1 / 79	22.94
		502200	2511.00	1 / 58	24.03
	π/2 BPSK	518598	2592.99	1 / 58	24.20
Hz		534996	2674.98	1 / 58	24.05
30 MHz		502200	2511.00	1 / 58	24.02
30	QPSK	518598	2592.99	1 / 58	24.26
		534996	2674.98	1 / 58	24.02
	16-QAM	534996	2674.98	1 / 58	22.85
		501204	2506.02	1 / 37	23.87
Ł	π/2 BPSK	518598	2592.99	1 / 13	24.18
		535998	2679.99	1 / 37	24.01
20 MHz		501204	2506.02	1 / 37	23.85
20	QPSK	518598	2592.99	1 / 13	24.17
		535998	2679.99	1 / 37	23.96
	16-QAM	535998	2679.99	1 / 37	22.94
		500700	2503.50	1 / 28	23.78
	π/2 BPSK	518598	2592.99	1 / 28	24.23
F		536496	2682.48	1/9	24.11
15 MHz		500700	2503.50	1 / 28	23.74
15	QPSK	518598	2592.99	1 / 28	24.18
		536496	2682.48	1/9	24.08
	16-QAM	536496	2682.48	1/9	22.95
		500200	2501.00	1 / 17	23.88
	π/2 BPSK	518598	2592.99	1 / 17	24.10
H		537000	2685.00	1 / 17	23.82
10 MHz		500200	2501.00	1 / 17	23.89
10	QPSK	518598	2592.99	1 / 17	24.12
		537000	2685.00	1 / 17	23.86
	16-QAM	537000	2685.00	1 / 17	22.64

Table 7-5. Conducted Power Data (NR Band n41 (PC3))

NR (SCS 30kHz)					LTE						NR	LTE	EN-DC	
NR Band	NR Bandwidth [MHz]	NR Channel	NR Frequency [MHz]	Mod.	NR RB#/Offset	LTE Band	LTE Bandwidth [MHz]	LTE Channel	LTE Frequency [MHz]	Mod.	LTE RB#/Offset	Conducted Power [dBm]	Conducted Power [dBm]	Total Tx. Power [dBm]
				QPSK	270/0					QPSK	100/0	19.47	22.35	24.15
				QPSK	270/0					QPSK	1/50	18.52	23.00	24.32
n41	100	Mid	2593	QPSK	1/136	B66	20	Mid	1745	QPSK	100/0	19.34	22.36	24.12
				QPSK	1/136					QPSK	1/50	18.38	22.36	23.82
				16Q	270/0					16Q	1/50	19.49	22.62	24.34

Table 7-6. Conducted Power Data (EN-DC Combo n41 – B66)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Dage 11 of 04
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 14 of 94
© 2023 ELEMENT	·	·	V11.0 9/14/2022



7.3 Occupied Bandwidth

Test Overview

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Procedure Used

ANSI C63.26-2015 - Section 5.4.4

Test Settings

- 1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 1 5% of the expected OBW
- 3. VBW \geq 3 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: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Dage 15 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 15 of 94	
© 2023 ELEMENT	•		V11.0 9/14/2022	



LTE Band 41(PC3)

68:25:31 AM Oct 18, 2022 ALION AUTO Trace/Detector Center Freq: 2.593000000 GHz Radio Std: None Avg/Hold:>100/100 Trig: Free Run #Atten: 36 dB #FGain:Low Radio Device: BTS Ref 40.00 dBm 10 dBidie **Clear Write** Average Variation us parte Max Hold Center 2.593 GHz Res BW 470 kHz Span 50 MHz Sweep 1 ms #VBW 1.5 MHz **Min Hold** Total Power 32.3 dBm Occupied Bandwidth 18.011 MHz Detector Peak Man **Transmit Freq Error** 10.182 kHz % of OBW Power 99.00 % Auto x dB Bandwidth 20.00 MHz -26.00 dB x dB STATUS

Plot 7-1. Occupied Bandwidth Plot (LTE Band 41(PC3) - 20MHz QPSK - Full RB)



Plot 7-2. Occupied Bandwidth Plot (LTE Band 41(PC3) - 20MHz 16-QAM - Full RB)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Page 16 of 94	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 10 01 94	
© 2023 ELEMENT	•	·	V11.0 9/14/2022	









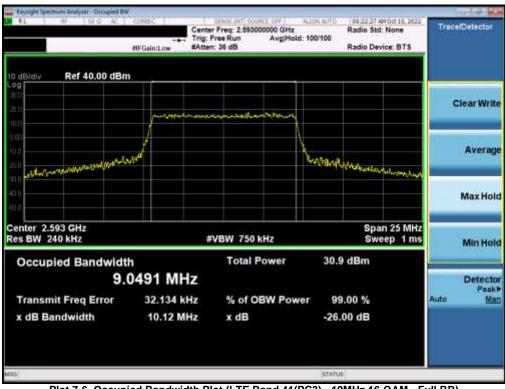
Plot 7-4. Occupied Bandwidth Plot (LTE Band 41(PC3) - 15MHz 16-QAM - Full RB)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Dage 17 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 17 of 94	
© 2023 ELEMENT			V11.0 9/14/2022	





Plot 7-5. Occupied Bandwidth Plot (LTE Band 41(PC3) - 10MHz QPSK - Full RB)



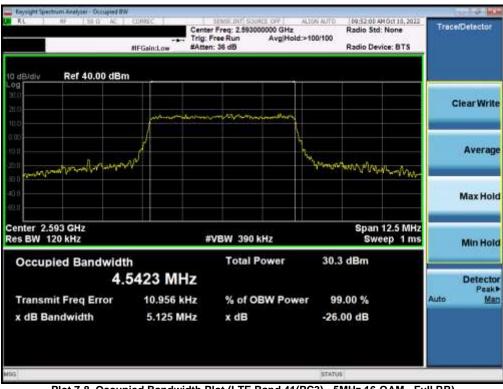
Plot 7-6. Occupied Bandwidth Plot (LTE Band 41(PC3) - 10MHz 16-QAM - Full RB)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT				
Test Report S/N:	Test Dates:	EUT Type:	Dage 18 of 04			
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 18 of 94			
© 2023 ELEMENT V11.0 9/14/2022						





Plot 7-7. Occupied Bandwidth Plot (LTE Band 41(PC3) - 5MHz QPSK - Full RB)



Plot 7-8. Occupied Bandwidth Plot (LTE Band 41(PC3) - 5MHz 16-QAM - Full RB)

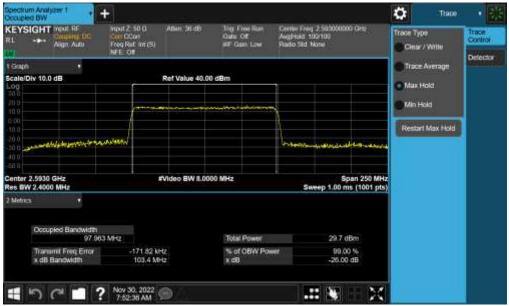
FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Page 19 of 94	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 19 01 94	
© 2023 ELEMENT	•	· · · · · · · · · · · · · · · · · · ·	V11.0 9/14/2022	



NR Band n41(PC3)

	Auto	input Z 50 0 Gen CCorr Freq Ref. int (S) NFE: Off	Allen 36.dB	Trig Free Run Gate: Off #F Gain Low	Center Fre Avgihold Radio Std) OH2	Trace Typ Clear		Trace Control
Graph cale/Div 10.0 dB	•		Ref Value 40.00					Trace	Average	NOTING IN COL
.00 10.0 10.0								Max H		
100 10.0 200 300 400		, d			luner		ulum ne	Restar	Max Hold	
enter 2.5930 GHz es BW 2.4000 MHz			Video BW 8.000	00 MHz	5	Sp weep 1.00 me	an 250 MHz (1001 pts)			
Metrica					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					
Occupied B	landwidih 97 203 1	WH2		Total Power		30.6 dE	801			
Transmit Fi x dB Bandy		-645.33 ki 102.1 Mi		% of OBW Pow x dB	er) -	99,00 -25.00				

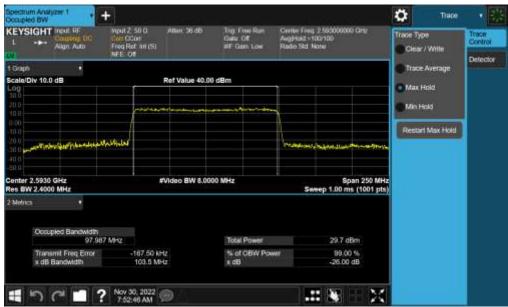
Plot 7-9. Occupied Bandwidth Plot (NR Band n41(PC3) - 100MHz π/2 BPSK - Full RB)



Plot 7-10. Occupied Bandwidth Plot (NR Band n41(PC3) - 100MHz QPSK - Full RB)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 20 of 94	
© 2023 ELEMENT			V11.0 9/14/2022	





Plot 7-11. Occupied Bandwidth Plot (NR Band n41(PC3) - 100MHz 16-QAM - Full RB)

KEYSIGHT	Tinput RF Coupling DC Align Auto	input 2, 50 0 data CCorr Freq Ref. Im (S) NFE: Off	Allen 36.dB	Trig Free Run Gate: Off #F Gain Low	Center Freq. 2 595020000 Avg9told - 100/100 Riadio Std. None	GH2	Trace Type Clear / Wi	ne 🕴	Trace Control
Graph							Trace Ave		MANAGE ST
cale/Div 10.	0.dB	e	Ref Value 40.00) dBm			Max Hold		
10 0 10 0			. Anone and the second	martanno			Min Hold		
10.0		_1_					Restart Ma	ix Hold	
0.0	served	- Junit			horn		-		
40 0 20 0									
Center 2.5930 Res BW 2.200			Video BW 8.000	00 MHz	Sweep 1.00 ms	an 225 MHz (1001 pts)			
Metrics	•								
Occa	pied Bandwidth								
		54 MHz		Total Power	32.1 dE				
	smit Freq Error Bandwidth	-383.98 k 92.21 M		% of OBW Pow x dB	wr 99.00 -26.00 (
2	2 - 1	Nov 30, 2022	@			X			

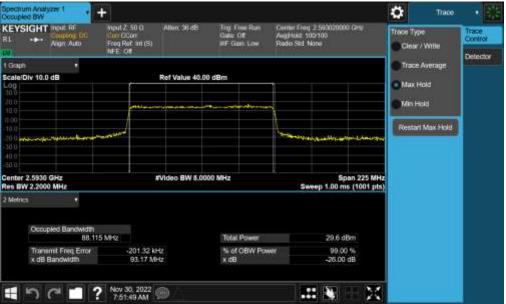
Plot 7-12. Occupied Bandwidth Plot (NR Band n41(PC3) - 90MHz π/2 BPSK - Full RB)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 21 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 21 01 94
© 2023 ELEMENT	•		V11.0 9/14/2022





Plot 7-13. Occupied Bandwidth Plot (NR Band n41(PC3) - 90MHz QPSK - Full RB)



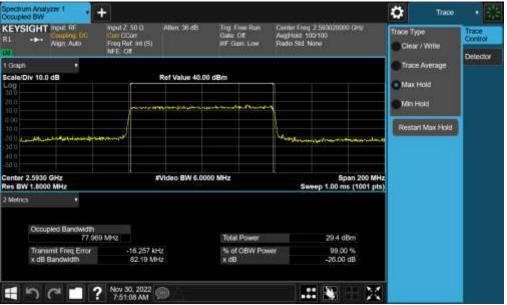
Plot 7-14. Occupied Bandwidth Plot (NR Band n41(PC3) - 90MHz 16-QAM - Full RB)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 22 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 22 01 94
© 2023 ELEMENT	•		V11.0 9/14/2022





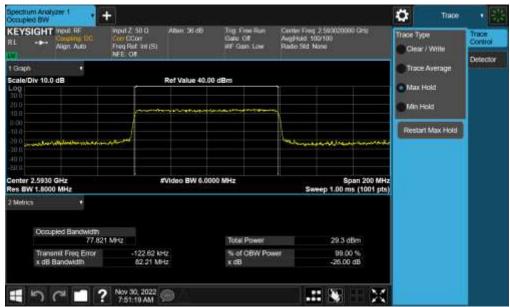
Plot 7-15. Occupied Bandwidth Plot (NR Band n41(PC3) - 80MHz π/2 BPSK - Full RB)



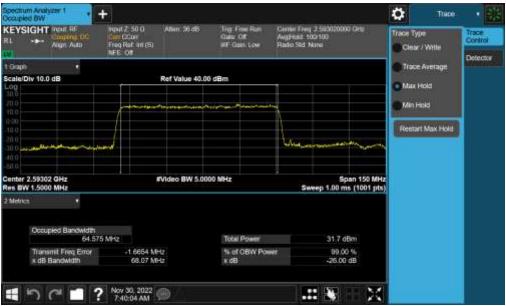
Plot 7-16. Occupied Bandwidth Plot (NR Band n41(PC3) - 80MHz QPSK - Full RB)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 23 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 23 01 94
© 2023 ELEMENT	•		V11.0 9/14/2022





Plot 7-17. Occupied Bandwidth Plot (NR Band n41(PC3) - 80MHz 16-QAM - Full RB)



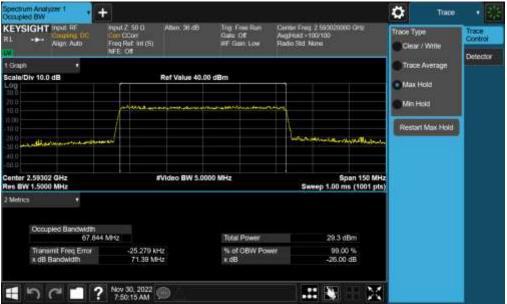
Plot 7-18. Occupied Bandwidth Plot (NR Band n41(PC3) - 70MHz π/2 BPSK - Full RB)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Dama 04 at 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 24 of 94	
© 2023 ELEMENT		·	V11.0 9/14/2022	





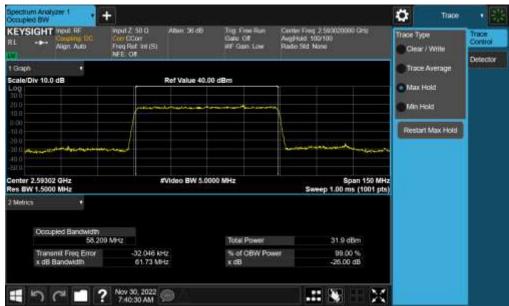
Plot 7-19. Occupied Bandwidth Plot (NR Band n41(PC3) - 70MHz QPSK - Full RB)



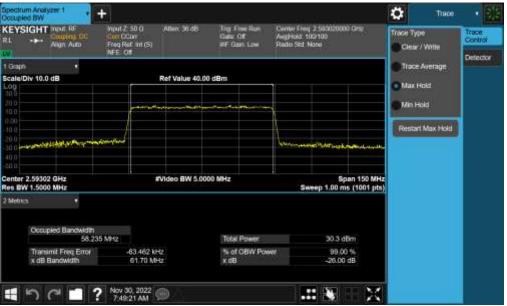
Plot 7-20. Occupied Bandwidth Plot (NR Band n41(PC3) - 70MHz 16-QAM - Full RB)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dage 25 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 25 of 94	
© 2023 ELEMENT	•		V11.0 9/14/2022	





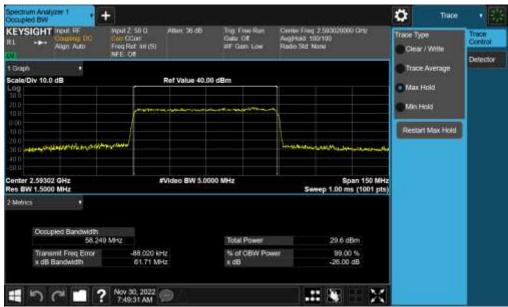
Plot 7-21. Occupied Bandwidth Plot (NR Band n41(PC3) - 60MHz π/2 BPSK - Full RB)



Plot 7-22. Occupied Bandwidth Plot (NR Band n41(PC3) - 60MHz QPSK - Full RB)

FCC ID: A3LSMS911JPN	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 26 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 26 of 94	
© 2023 ELEMENT	•		V11.0 9/14/2022	





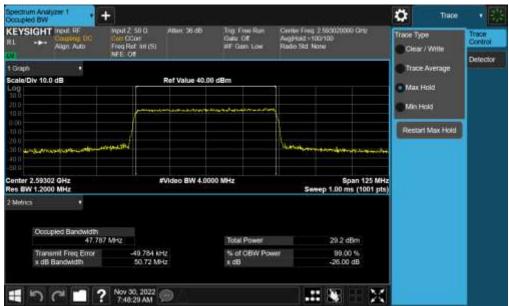
Plot 7-23. Occupied Bandwidth Plot (NR Band n41(PC3) - 60MHz 16-QAM - Full RB)

	and the second se	Mput Z. 50 0 Com OCorr Freq Ref. int (S)	Allen 36.dB	Tig FreeRun Gate Of #F-Gain Low	Center Freg. 2.593020000 (Avg0+told: 100r100 Radio Std. None	DH2	Trace Type Clear / 1		Trace Control
M I Graph		NFE Of					Trace A		Detector
cale/Div 10.1	0 dB		Ref Value 40.00) dBm				actage.	
00							O Max He	ka:	
10.0				monter			Min Hol	đ	
10.0							Restart 1	dax Hold	
	-				Lum		-		
10.0						and the second			
enter 2.5930 les IIW 1.200			Video BW 4.000	00 MHz	Sweep 1.00 ms	125 MHz (1001 pts)			
Metrics									
Occu	pled Bandwidth 45.9	77 MHz		Total Power	31.8 dBr	n i			
Tran	smit Freq Error	-931.31 ki	Hz	% of OBW Pov	wir 99.00 %	6			
x dB	Bandwidth	49.11 M	Hz	жdВ	-26.00 di	8			
	201 (200) (2	Ale: 10 1012	~						
1	C	? Nov 30, 2022 7:41:01 AM	@			\sim			

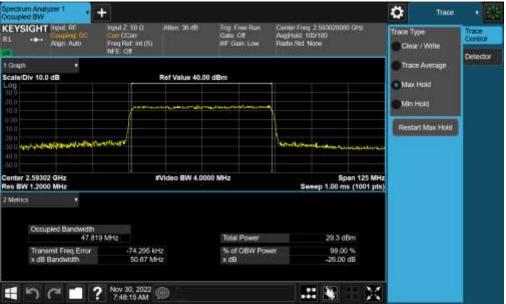
Plot 7-24. Occupied Bandwidth Plot (NR Band n41(PC3) - 50MHz π/2 BPSK - Full RB)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dage 07 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 27 of 94	
© 2023 ELEMENT	•		V11.0 9/14/2022	





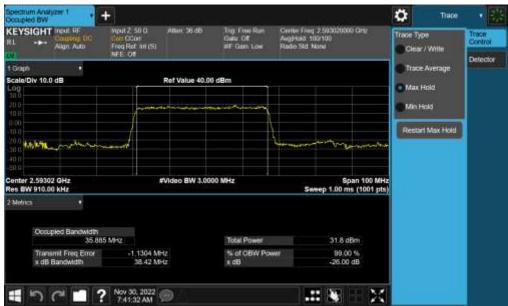
Plot 7-25. Occupied Bandwidth Plot (NR Band n41(PC3) - 50MHz QPSK - Full RB)



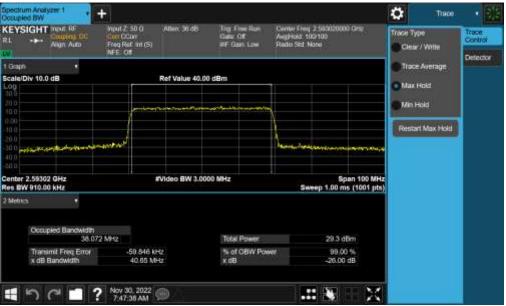
Plot 7-26. Occupied Bandwidth Plot (NR Band n41(PC3) - 50MHz 16-QAM - Full RB)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Page 28 of 94	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset		
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Plot 7-27. Occupied Bandwidth Plot (NR Band n41(PC3) - 40MHz π/2 BPSK - Full RB)



Plot 7-28. Occupied Bandwidth Plot (NR Band n41(PC3) - 40MHz QPSK - Full RB)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 29 of 94	
© 2023 ELEMENT	•	·	V11.0 9/14/2022	





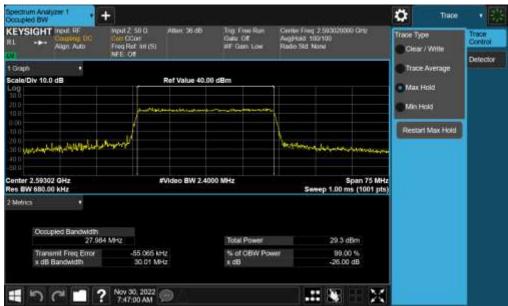
Plot 7-29. Occupied Bandwidth Plot (NR Band n41(PC3) - 40MHz 16-QAM - Full RB)



Plot 7-30. Occupied Bandwidth Plot (NR Band n41(PC3) - 30MHz π/2 BPSK - Full RB)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 30 of 94	
© 2023 ELEMENT	•	·	V11.0 9/14/2022	





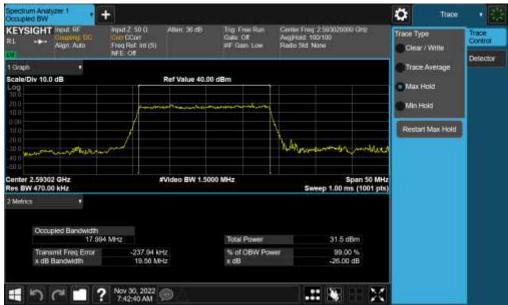
Plot 7-31. Occupied Bandwidth Plot (NR Band n41(PC3) - 30MHz QPSK - Full RB)



Plot 7-32. Occupied Bandwidth Plot (NR Band n41(PC3) - 30MHz 16-QAM - Full RB)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dage 21 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 31 of 94	
© 2023 ELEMENT	•		V11.0 9/14/2022	





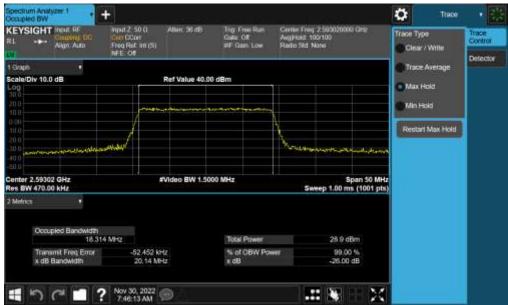
Plot 7-33. Occupied Bandwidth Plot (NR Band n41(PC3) - 20MHz π/2 BPSK - Full RB)



Plot 7-34. Occupied Bandwidth Plot (NR Band n41(PC3) - 20MHz QPSK - Full RB)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dage 22 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 32 of 94	
© 2023 ELEMENT		·	V11.0 9/14/2022	





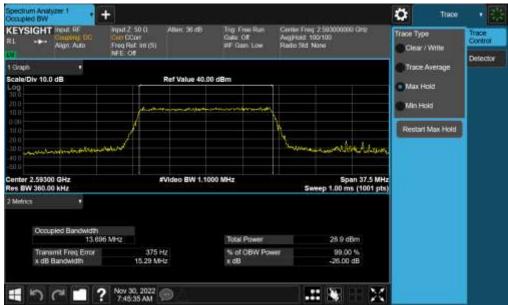
Plot 7-35. Occupied Bandwidth Plot (NR Band n41(PC3) - 20MHz 16-QAM - Full RB)



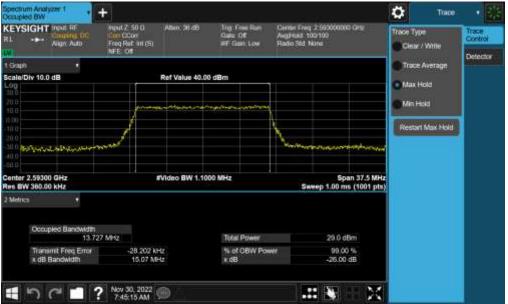
Plot 7-36. Occupied Bandwidth Plot (NR Band n41(PC3) - 15MHz π/2 BPSK - Full RB)

FCC ID: A3LSMS911JPN	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Daga 22 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 33 of 94	
© 2023 ELEMENT	•		V11.0 9/14/2022	





Plot 7-37. Occupied Bandwidth Plot (NR Band n41(PC3) - 15MHz QPSK - Full RB)



Plot 7-38. Occupied Bandwidth Plot (NR Band n41(PC3) - 15MHz 16-QAM - Full RB)

FCC ID: A3LSMS911JPN	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 24 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 34 of 94	
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Plot 7-39. Occupied Bandwidth Plot (NR Band n41(PC3) - 10MHz π/2 BPSK - Full RB)



Plot 7-40. Occupied Bandwidth Plot (NR Band n41(PC3) - 10MHz QPSK - Full RB)

FCC ID: A3LSMS911JPN	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 35 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	
© 2023 ELEMENT	•		V11.0 9/14/2022





Plot 7-41. Occupied Bandwidth Plot (NR Band n41(PC3) - 10MHz 16-QAM - Full RB)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 26 of 04
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 36 of 94
© 2023 ELEMENT	·		V11.0 9/14/2022



7.4 Spurious and Harmonic Emissions at Antenna Terminal

Test Overview

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

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

For LTE/NR 41, the minimum permissible attenuation level of any spurious emission is 55 + 10log₁₀(*P*[*w*atts]).

Test Procedure Used

ANSI C63.26-2015 – Section 5.7.4

Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to 10GHz (separated into at least two plots per channel)
- 2. Detector = RMS
- 3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 4. Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings

Test Setup

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



Figure 7-3. Test Instrument & Measurement Setup

Test Notes

- 1. Per Part 27, RSS-195 and RSS-199, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz.
- 2. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Page 37 of 94	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 37 01 94	
© 2023 ELEMENT	· · · ·	·	V11.0 9/14/2022	

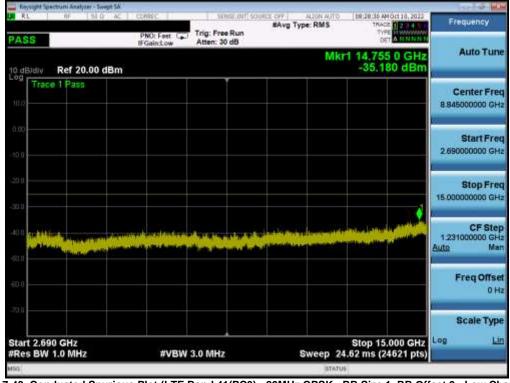
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LTE Band 41(PC3)

Rt RF 500		SENSE INT SOU	ALION AUTO	56:28:19 AM Oct 18, 2022	Contrast of
	PNO: Fast	Trig: Free Run	#Avg Type: RMS	TRACE 1 2 3 4 5 TYPE Providentian	Frequency
ASS	IFGain:Low	Atten: 30 dB	M	r1 2.424 5 GHz -38.408 dBm	Auto Tune
Trace 1 Pass					Center Fred 1.252500000 GH:
00					Start Free 30.000000 MH
ан 					Stop Free 2.475000000 GH
au	and all all and the second states of	مەت ەتەيدە، بىلغىدان مەزۇر دە	anialisedation and the	ana	CF Ster 244.600000 MH Auta Ma
0.0					Freq Offse 0 H
tart 0.030 GHz		3.0 MHz		Stop 2.475 GHz	Scale Type

Plot 7-42. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-43. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Page 38 of 94	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 30 01 94	
© 2023 ELEMENT			V11.0 9/14/2022	



PASS	F 50.0 AC	PNO: Fast ()	Trig: Free Run Atten: 10 dB	#Avg Type: RMS	TO 08:28:41 AMO(118, 202 TRACE 1 2:04 TYPE M DET 4 MSING	Frequency
	ef 0.00 dBm	II GROAD W		Ň	lkr1 26.206 5 GH -41.137 dBn	
Trace 1	Pass					Center Fre 21.000000000 GH
30.0 20.0						Start Fre 15.00000000 GH
401						Stop Fre 27.00000000 GH
						CF Ste 1.200000000 Gi Auto Mi
60.0						Freq Offs 0 f
Start 15.000			3.0 MHz		Stop 27.000 GH 30.40 ms (24001 pts	Scale Typ

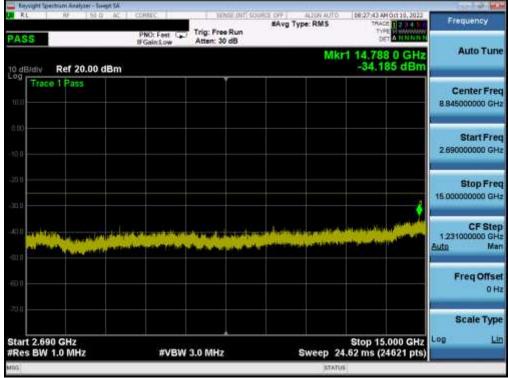
Plot 7-44. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

Frequency	18:27:34 AM Oct 16, 2022 TRACE	ALION AUTO	in INT SOURCE O	SER	HREC	ο Ω 4C	RF 5		Ri
	DET A IN N.N.N.N.		Run	Trig: Free Atten: 30	PNO: Fast 😱	1		S	PAS
Auto Tun	r1 2.367 5 GHz -38.736 dBm	M				0 dBm	Ref 20.00	sidiv R	0 dB
Center Fre 1.263000000 GH							Pass	Trace 1	100 g
Start Fre 30.000000 MH									0.00 10.0
Stop Fre 2.496000000 GH									2018 3018
CF Ster 246.600000 MH wto Ma	۲۰۰۵ میلید میرود ماندند به ا	isengelisisiona	irs.yourusauth	مخمطيفه	م ا ردین وارد اور ا	والإوروبالياني	interinter	ئىلىچىچەرتىد	4111
Freq Offse 0 H									80.0
Scale Typ	Stop 2,496 GHz .288 ms (4933 pts)	Sween 3		3.0 MHz	#VBW 3			t 0.030 C s BW 1.0	

Plot 7-45. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 04
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 39 of 94
© 2023 ELEMENT	•		V11.0 9/14/2022





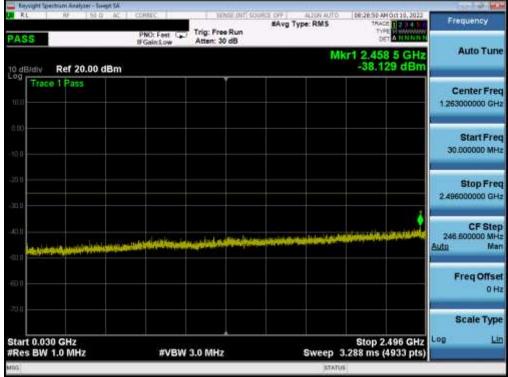
Plot 7-46. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



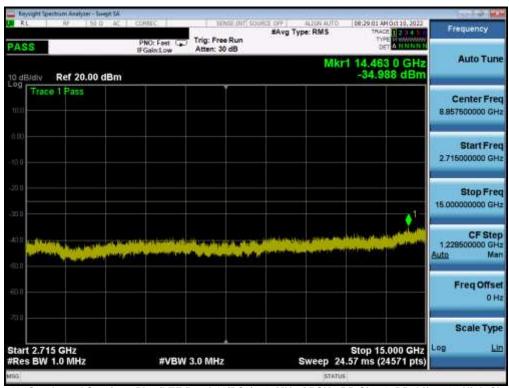
Plot 7-47. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Page 40 of 04
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 40 of 94
© 2023 ELEMENT			V11.0 9/14/2022





Plot 7-48. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-49. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Dage 41 of 04
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 41 of 94
© 2023 ELEMENT	·		V11.0 9/14/2022





Plot 7-50. Conducted Spurious Plot (LTE Band 41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Dage 42 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 42 of 94	
© 2023 ELEMENT			V11.0 9/14/2022	



NR Band n41(PC3)

EYSIGHT neut RF Comping CC Augn Auto	Nput 2, 50 0 Che CCor Freq Ref. Int (S) NFE: Of	Allen 10 dB	PNO Feat Gate Off IF Gain Low Sig Track Off	MAvg Type, Power (Ting: Free Run	ANNNN N	Center Frequency 1.25000000 GHz Span	Settinge
Spectrum • ale/Div 10 dB		Ref Level 20.00	dBm	Mkr1	2.425 1 GHz -43.72 dBm	2 44000000 GHz Swept Span Zero Span	
Trace 1 Pass					_	Full Span	1
						Start Freq 30.000000 MHz	1
						Stop Freq 2.47000000 GHz	1
						AUTO TUNE	
10 10 10 yuluuduuuduutuduutuduutuduutuduutuduutud		and the second second	n lan mini kana inte	tailatinaistaiteiteiteiteiteiteiteiteiteiteiteiteitei	مېرىيى ئېرىنى ئەرىپىد	CF Slep 244 000000 MHz Auto Man	
						Freq Offset 0 Hz	1
rt 0.030 GHz es BW 1.0 MHz		#Video BW 3.0	MHz	Sweep 3.	Stop 2.470 GHz 26 ms (4891 pts)	X Axis Scale	
501	Nov 30, 2022 8:56:31 AM	P				Employ	

Plot 7-51. Conducted Spurious Plot (NR Band n41(PC3) - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



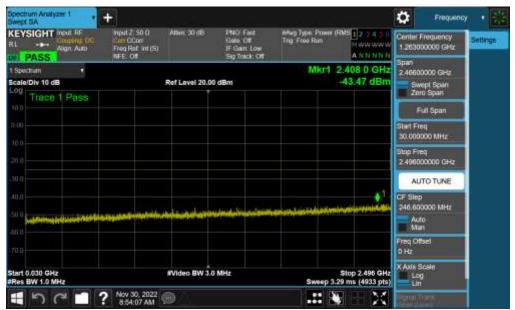
Plot 7-52. Conducted Spurious Plot (NR Band n41(PC3) - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Dage 42 of 04
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 43 of 94
© 2023 ELEMENT			V11.0 9/14/2022





Plot 7-53. Conducted Spurious Plot (NR Band n41(PC3) - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-54. Conducted Spurious Plot (NR Band n41(PC3) - 100MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMS911JPN	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 44 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 44 of 94	
© 2023 ELEMENT	•		V11.0 9/14/2022	





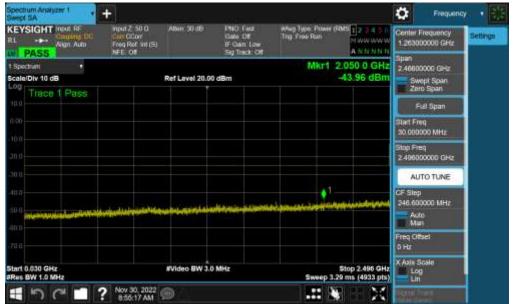
Plot 7-55. Conducted Spurious Plot (NR Band n41(PC3) - 100MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



Plot 7-56. Conducted Spurious Plot (NR Band n41(PC3) - 100MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 45 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 45 01 94
© 2023 ELEMENT	•		V11.0 9/14/2022





Plot 7-57. Conducted Spurious Plot (NR Band n41(PC3) - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-58. Conducted Spurious Plot (NR Band n41(PC3) - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Dage 46 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 46 of 94	
© 2023 ELEMENT	·	· · ·	V11.0 9/14/2022	





Plot 7-59. Conducted Spurious Plot (NR Band n41(PC3) - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

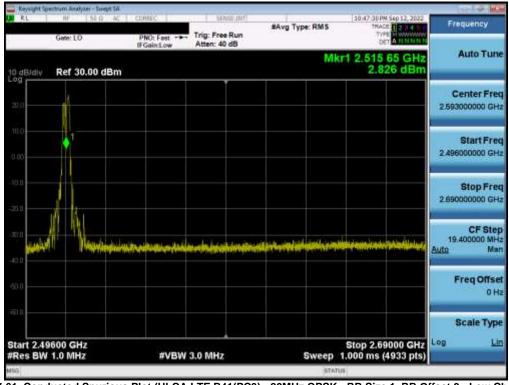
FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Page 47 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 47 of 94	
© 2023 ELEMENT	·	·	V11.0 9/14/2022	



ULCA - LTE B41(PC3)

Rsysoph Topectrum Analyzer - Swept SA RL RF SA 0 4C	COHREC	SENGE:UNI	#Avg Type: RMS	10:19:27 PM Sep 12, 2022	Frequency
Gate: LO	PNO: Fast +++	Trig: Free Run Atten: 30 dB	#Avg Type: Hill'S	TYPE IS WARKING	
dBidiv Ref 20.00 dBm			М	kr1 2.444 6 GHz -45.821 dBm	Auto Tuni
Trace 1 Pass					Center Free 1.252500000 GH
00 0					Start Fre 30.000000 MH
ou					Stop Fre 2.476000000 GH
00 00				a di kata sa kata kata kata kata kata kata k	CF Ste 244.500000 MH Auta Ma
	111 Contraction of the local data				Freq Offse 0 H
ăŭ					Scale Typ
tart 0.030 GHz Res BW 1.0 MHz	#VBW :	3.0 MHz	Sweep	Stop 2.475 GHz 1.000 ms (4913 pts)	Log <u>Li</u>

Plot 7-60. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-61. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 48 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 40 01 94
© 2023 ELEMENT			V11.0 9/14/2022



R1 IF 5	A G AC COHREC	sense; inf	#Avg Type: RMS	10:20:01 PM Sep 12, 2022	Frequency
PASS Getter LO	PNO: Fast +++	Trig: Free Run Atten: 30 dB	any type. hairs	DET A IN NIN IN	
IQ dEldiv Ref 20.0	0 dBm		Mki	1 14.909 3 GHz -40.375 dBm	Auto Tun
Trace 1 Pass					Center Fre 8.845000000 GH
0.00					Start Fre 2.69000000 GH
20 11					Stop Fre 15.00000000 GH
	المتابك أنفية المحينة المسالية	and a state of the			CF Ste 1.231000000 GH Auto Ma
60.0					Freq Offs 0 f
Start 2.690 GHz				atop 13.000 anz	Scale Typ
Res BW 1.0 MHz	#VBW	3.0 MHz	Sweep 1.	000 ms (24841 pts)	

Plot 7-62. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



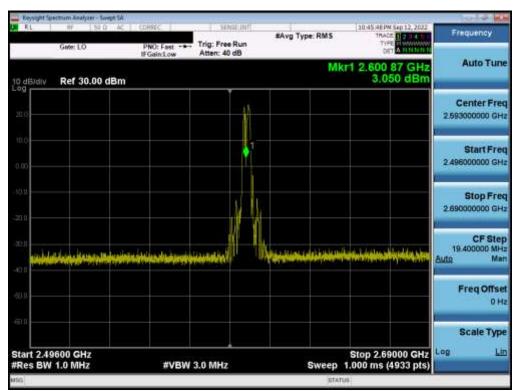
Plot 7-63. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Dage 40 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 49 of 94	
© 2023 ELEMENT	•	•	V11.0 9/14/2022	



Keysight Spectrum Analyzer - Swept Sa				1000010-0000000-00000	001-2
PASS Geter LO	PNO: Fast +++	Stream and	#Avg Type: RMS	10:21 S7 PM Sep 12, 2022 19402 1 2 3 4 8 4 TyPE IS WARDED	Frequency
10 dBJdlv Ref 20.00 dBr	IFGaintLow	Atten: 30 dB	М	kr1 2.489 2 GHz -45.110 dBm	Auto Tun
Trace 1 Pass					Center Fre 1 263000000 GH
0.00					Start Fre 30.000000 MH
20 11					Stop Fre 2.496000000 GH
			والمراجع والمراجع والمراجع والمراجع	1.	CF Ste 246.600000 MH Auta Ma
0.0					Freq Offs 0 F
Start 0.030 GHz Res BW 1.0 MHz	#VBW :	3.0 MHz	Sweep	Stop 2.495 GHz 1.000 ms (5087 pts)	Scale Typ
ng			STAT		~

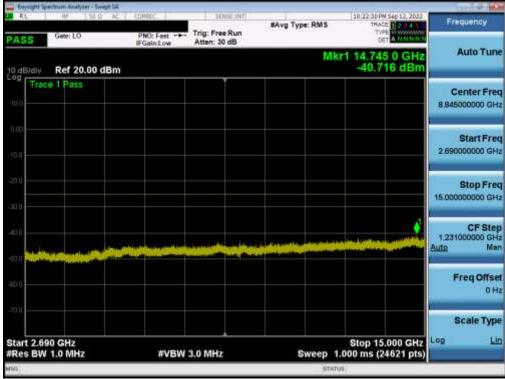
Plot 7-64. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



Plot 7-65. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Daga 50 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 50 of 94	
© 2023 ELEMENT	<u>.</u>		V11.0 9/14/2022	





Plot 7-66. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel - Ant B)



Plot 7-67. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

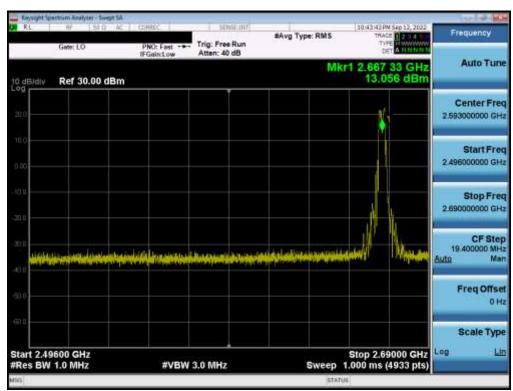
FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Dage 51 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 51 of 94	
© 2023 ELEMENT	•		V11.0 9/14/2022	

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Envight Spectrum Analyzer - Swept SA				1000-000-000-000-000-000-000-000-000-00	100 LS -
RL #F ISLD AC	PNO: Fast +++	Trig: Free Run Atten: 30 dB	#Avg Type: RMS	10:25:02 PM Sep 12, 2022 TMACE 1 2 0 4 5 TYPE DEMONSTRATE DET 4 N S1 10 1	Frequency
10 dBJdly Ref 20.00 dBm		Hubit w up	М	kr1 2.348 8 GHz -45.560 dBm	Auto Tune
Trace 1 Pass					Center Free 1 263000000 GH
10.0					Start Fre 30.000000 MH
2011					Stop Fre 2.496000000 GH
40 11			المحاد المحاوية والمحاد المحاد المحاد	analananih daramangan daraman	CF Ste 246.600000 MH Auta Ma
0.0					Freq Offse 0 H
Start 0.030 GHz Res BW 1.0 MHz	#VBW	3.0 MHz	Sweep	Stop 2.495 GHz 1.000 ms (5161 pts)	Scale Typ
66			STAT		

Plot 7-68. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-69. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Dage 52 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 52 of 94	
© 2023 ELEMENT		·	V11.0 9/14/2022	

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Plot 7-70. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-71. Conducted Spurious Plot (ULCA LTE B41(PC3) - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 53 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 55 01 94
© 2023 ELEMENT			V11.0 9/14/2022



7.5 Band Edge Emissions at Antenna Terminal

Test Overview

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

The minimum permissible attenuation level for LTE/NR and 41 is as noted in the Test Notes on the following page.

Test Procedure Used

ANSI C63.26-2015 - Section 5.7.3

Test Settings

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

Test Setup

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



Figure 7-4. Test Instrument & Measurement Setup

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dama 54 of 04
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 54 of 94
© 2023 ELEMENT		•	V11.0 9/14/2022



Test Notes

- Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.
- 2. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

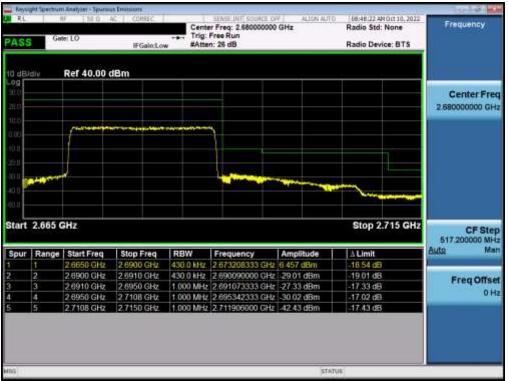
FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 55 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 55 01 94
© 2023 ELEMENT			V11.0 9/14/2022



LTE Band 41(PC3)

R		Matalyaer - Sparse IF 58 0 W: LO		Trig:	stret INT Source r Freq: 2.5060000 Free Run n: 25 dB		(88:40:25 AHO Radio Std: N Radio Device	one	Frequency
				w #71118			Habio Device	. Bra	
lū di	Bidly	Ref 40.00	dBm					_	
no mo									Center Freq 2.50600000 GHz
10.0					junear		والموذودة حدسيوسي		
10.0								-Y-	
anti-									
1010					100 A			here	
40.0		1 - leans and						_	
61.0	and the second s								
Star	t 2.475 (GHz					Stop 2.5	17 GHz	CF Ste 517.200000 MH
Spu	r Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude.	A Limit		Auto Ma
1	1	2.4750 GHz	2.4905 GHz	the state of the second se	2.490241667 G	Cardinal State State of State	-3.969 dB		A
2	2	2 4905 GHz	2.4950 GHz		2.494602500 G		-12.68 dB		Freq Offse
3 4	3	2 4950 GHz 2 4960 GHz	2.4960 GHz 2.5170 GHz		2.495958333 G 2.511225000 G		-14.09 dB		0 H
-1	- A.		1.0110.014	Here a rate					

Plot 7-72. Lower ACP Plot (LTE Band 41(PC3) - 20MHz QPSK - Full RB - Ant B)



Plot 7-73. Upper ACP Plot (LTE Band 41(PC3) - 20MHz QPSK - Full RB - Ant B)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 56 of 04
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 56 of 94
© 2023 ELEMENT			V/11 0 9/14/2022



d: None	Radio Std		stream (MT) source er Freq: 2.5035000 Free Run n: 26 dB	Trig:	FGain1.ov	⊮ 58Ω w:10		RI
					18m	Ref 40.00 c	lidiy	0 dB
								0g 110 200
								0.003-
			-					10.0
	war.			and the second				30-11 30-11
					And the second s	- Andrewson		40.0 61.0
2.517 GHz	Stop 2					GHZ	2.475 0	Start
2.517 GHz	Stop 2	Amplitude	Frequency	RBW	Stop Freq			Start
		Exception of the second s	Frequency 2.490448333 GI		Stop Freq 2.4905 GHz			
8	∆ Limit	-27.25 dBm		1.000 MHz		Start Freq	Range	
8	∆ Limit -2.250 dB	-27 25 dBm -22 76 dBm	2.490448333 GI	1.000 MHz	2.4905 GHz	Start Freq 2 4750 GHz	Range	Spur 1
							Ref 40.00 dBm	div Ref 40.00 dBm

Plot 7-74. Lower ACP Plot (LTE Band 41(PC3) - 15MHz QPSK - Full RB - Ant B)



Plot 7-75. Upper ACP Plot (LTE Band 41(PC3) - 15MHz QPSK - Full RB - Ant B)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 57 of 04
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 57 of 94
© 2023 ELEMENT	•		V11.0 9/14/2022





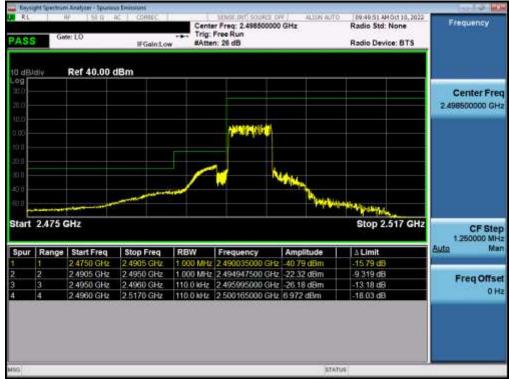
Plot 7-76. Lower ACP Plot (LTE Band 41(PC3) - 10MHz QPSK - Full RB - Ant B)



Plot 7-77. Upper ACP Plot (LTE Band 41(PC3) - 10MHz QPSK – Full RB - Ant B)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 58 of 04
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 58 of 94
© 2023 ELEMENT			V11.0 9/14/2022





Plot 7-78. Lower ACP Plot (LTE Band 41(PC3) - 5MHz QPSK - Full RB - Ant B)



Plot 7-79. Upper ACP Plot (LTE Band 41(PC3) - 5MHz QPSK – Full RB - Ant B)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 50 of 04
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 59 of 94
© 2023 ELEMENT	•	•	V11.0 9/14/2022



NR Band n41(PC3)

ASS		w:10	4C COAREC	-a- Trig:	r Freq: 2.546000 Free Run	ALTON AUTO	Radio Std:		Frequency	
Aaa			IFGains.or	w #Atte	n: 32 dB		Radio Devi	ce: BTS		
10 dB	ldiv	Ref 30.00 (dBm							
10 gg									Center F	rec
111,15									2.546000000 GHz	
0.00										
100							1			
20.0										
10.0							_			
41.0										
60.0			and a second	-						
(EEE)										
	2.371 0	GHz					Stop 2.	621 GHz	CF S	
		3Hz Start Freq	Stop Freq	RBW	Frequency	Amplitude	Stop 2.	621 GHz	525 200000 1	MH:
Start	Range	Start Freq 2 3710 GHz	2.4905 GHz	1.000 MHz	2.490500000	Hz -37.59 dBm	∆ Limit -12.59 dB	621 GHz	525.200000	
Start	Range 1 2	Start Freq 2.3710 GHz 2.4905 GHz	2.4905 GHz 2.4950 GHz	1.000 MHz 1.000 MHz	2.490500000 2.494325000 0	Hz -37.59 dBm Hz -37.31 dBm	∆ Limit -12.59 dB -24.31 dB	621 GHz	525.200000	MH: Mar
Start	Range 1 2 3	Start Freq 2 3710 GHz 2 4905 GHz 2 4950 GHz	2.4905 GHz 2.4950 GHz 2.4960 GHz	1.000 MHz 1.000 MHz 1.000 MHz	2 490500000 C 2 494325000 C 2 496000000 C	Hz -37.59 dBm Hz -37.31 dBm Hz -30.82 dBm	Δ Limit -12.59 dB -24.31 dB -17.82 dB	621 GHz	525.200000 (Auto Freq Off	MH: Mar
Start	Range	Start Freq 2 3710 GHz	2.4905 GHz	1.000 MHz	2.490500000	Hz -37.59 dBm	∆ Limit -12.59 dB	621 GHz	525.200000 <u>Auto</u>	
tart	Range 1 2	Start Freq 2.3710 GHz 2.4905 GHz	2.4905 GHz 2.4950 GHz	1.000 MHz 1.000 MHz 1.000 MHz	2.490500000 2.494325000 0	Hz -37.59 dBm Hz -37.31 dBm Hz -30.82 dBm	∆ Limit -12.59 dB -24.31 dB	621 GHz	525.200000 (Auto Freq Off	MH
Start	Range 1 2 3	Start Freq 2 3710 GHz 2 4905 GHz 2 4950 GHz	2.4905 GHz 2.4950 GHz 2.4960 GHz	1.000 MHz 1.000 MHz 1.000 MHz	2 490500000 C 2 494325000 C 2 496000000 C	Hz -37.59 dBm Hz -37.31 dBm Hz -30.82 dBm	Δ Limit -12.59 dB -24.31 dB -17.82 dB	621 GHz	525.200000 (Auto Freq Off	MH

Plot 7-80. Lower ACP Plot (NR Band n41(PC3) - 100MHz CP-OFDM-QPSK - Full RB)



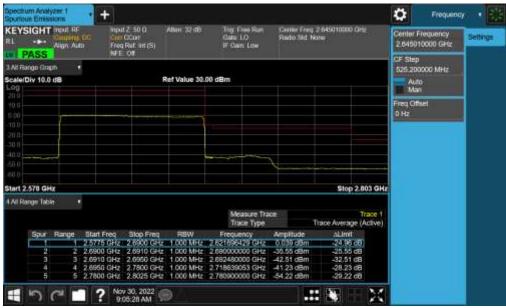
Plot 7-81. Upper ACP Plot (NR Band n41(PC3) - 100MHz CP-OFDM-QPSK – Full RB)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 60 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 60 01 94
© 2023 ELEMENT	•		V11.0 9/14/2022



nomenen erenn e.		GHz	e Run	Trig: F					ASS
						dBm	Ref 30.00 c	div	0 dB
									111.00 111.15
									0.00
									20.0
have									0.5
				- Andrew					41.0
									60 0
Stop 2.596 GHz							Hz	2.396 G	Start
A Limit		Amplitude.	requency .	w	q R	Stop Freq	Start Freq	Range	Spur
11.41 dB		-36,41 dBm	190500000 GHz	0 MHz	Hz 1.	2,4905 GHz	2.3960 GHz	1	1
22.33 dB		-35.33 dBm	194595000 GHz	0 MHz	Hz 1.0	2.4950 GHz	2.4905 GHz	2	2
17.31 dB		-30.31 dBm	496000000 GHz	0 kHz	Hz 91	2.4960 GHz	2 4950 GHz	3	3
21.97 dB			583437186 GHz			2.5960 GHz			
	Radio Std: None Radio Device: BTS Stop 2.596 GHz	Radio Device: BTS Radio Device: BTS Stop 2.596 GHz	GHz Radio Std: None Radio Device: BTS	Freq: 2.541000000 GHz Radio Std: None Freq: 2.64100000 GHz Radio Device: BTS 2.32 dB Radio Device: BTS Stop 2.596 GHz Stop 2.596 GHz Frequency Amplitude Δ Limit 2.490500000 GHz -36.41 dBm -11.41 dB	Center Freq. 2.54100000 GHz Trig: Free Run #Atten: 32 dB Radio Device: BTS Radio Device: BTS Stop 2.596 GHz BW Frequency Amplitude <u>A Limit</u> 00 MHz 2.49050000 GHz -36.41 dBm -11.41 dB	Center Freq: 2.541000000 GHz Trig: Free Run WAtten: 32 dB Radio Device: BTS Radio Device: BTS Stop 2.596 GHz 1.000 MHz 2.490500000 GHz -36.41 dBm -11.41 dB	Center Freq: 2.54100000 GHz Trig: Free Run MAtten: 32 dB IBm IBm Stop Freq RBW 2.4905 GHz 1.000 MHz 2.490500000 GHz 36.11 dBm -11.41 dB	Center Freq: 2.541000000 GHz Radio Std: None Trig: Free Run MAtten: 32 dB Radio Device: BTS Ref 30.00 dBm Stati Freq Stap Freq Stop 2.596 GHz Start Freq Stop Freq RBW Frequency Amplitude ALimit 2.3900 GHz 2.3900 GHz 2.4905 GHz Matten: 2.4905 GHz Stop 1.000 MHz 2.490500000 GHz -36.41 dBm -11.41 dB	Gate: LO Gat

Plot 7-82. Lower ACP Plot (NR Band n41(PC3) - 90MHz CP-OFDM-QPSK - Full RB)



Plot 7-83. Upper ACP Plot (NR Band n41(PC3) - 90MHz CP-OFDM-QPSK - Full RB)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 61 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 01 01 94
© 2023 ELEMENT	•		V11.0 9/14/2022



125653 PMDer 12, 2022 Radio Std: None Radio Device: BTS	ALION AUTO BHZ	Center Freq: 2.535990000 GHz Trig: Free Run			F 38,0, 4 e: 10		ASS
				1Bm	Ref 30.00 c	div	O dB
							111.6 111.6
							5011
							20.0 20.5
			/				4110
							(E) (I) -
Stop 2.596 GHz					SHZ	2.396 G	Start
A Limit	Amplitude.	Frequency	RBW	Stop Freq	Start Freq	Range	Spur
-11.01 dB	36.01.dBm	2.490500000 GHz	1.000 MHz	2.4905 GHz	2.3960 GHz	1	1
-22.27 dB	35 27 dBm	2.492750000 GHz	1.000 MHz	2.4950 GHz	2.4905 GHz	2	2
-22.27 00					and the second se		à
-23.39 dB		2.495990000 GHz	820.0 kHz	2.4960 GHz	2.4950 GHz	3	3
	Stop 2.596 GH2	Stop 2.596 GHz	r: 32 dB Radio Device: BTS	Radio Device: BTS Radio Device: BTS Stop 2.596 GH2 RBW Frequency Amplitude △Limit	IFGainLow #Atten: 32 dB Radio Device: BTS	Ref 30.00 dBm	Clinit to If Gain:Low #Atten: 32 dB Radio Device: BTS div Ref 30.00 dBm If Gain:Low If Gain:Low div If Gain:Low If Gain:Low If Gain:Low div Ref 30.00 dBm If Gain:Low If Gain:Low div If Gain:Low If Gain:Low If Gain:

Plot 7-84. Lower ACP Plot (NR Band n41(PC3) - 80MHz CP-OFDM-QPSK - Full RB)



Plot 7-85. Upper ACP Plot (NR Band n41(PC3) - 80MHz CP-OFDM-QPSK - Full RB)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Technical Manager Page 62 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 02 01 94
© 2023 ELEMENT	•		V11.0 9/14/2022



Radio Std: None Radio Device: BTS	Radio	se mm Allow auto reg: 2,530980000 GHz Run dB					# [31.0 4 w:10		ASS
				_		dBm	Ref 30.00 c	ldiv	0 dB
									og 110 -
		dependente to							100 - 1011 -
									20.0
parameter the				por					41.0
					and all	Anninan A			50.0
Stop 2.584 GHz	Ste						SHZ	2.409 0	Start
				BW	Econ I	Chain	Start Freq	Range	Spur
∆ Limit	ude. A Li	Amplit	requency .		r req.	Stop			
Δ Limit -9.999 dB			requency 189406667 GHz			2.490	2.4085 GHz	1	
	dBm -9.99	-35.00		00 MHz	5 GHz 1		2 4085 GHz 2 4905 GHz	1	2
-9.999 dB	dBm -9.99 dBm -20.5	-35.00	189406667 GHz	00 MHz 00 MHz	5 GHz 1 0 GHz 1	2,490		1	2
		Radio Device: BTS		n: 32 dB Radio Device: BTS	#Atten: 32 dB Radio Device: BTS	Gaint.ow #Atten: 32 dB Radio Device: BTS	IFGaintLow #Atten: 32 dB Radio Device: BTS	Ref 30.00 dBm	And the second s

Plot 7-86. Lower ACP Plot (NR Band n41(PC3) - 70MHz CP-OFDM-QPSK - Full RB)



Plot 7-87. Upper ACP Plot (NR Band n41(PC3) - 70MHz CP-OFDM-QPSK - Full RB)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Technical Manager Page 63 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 03 01 94
© 2023 ELEMENT	•		V11.0 9/14/2022



Frequency	ot-93:33 PMDec 12, 2022 adio Std: None adio Device: BTS	Radio S	GHz	Freq: 2.526000000 ree Run : 32 dB	Trig:	IF CORREC	fe: LO		ASS
						1Bm	Ref 30.00 c	ldiv	i dBi
Center Fre 2.52600000 GH									111.05 111.15
									1011 2011 -
	and the second second								40.0 40.0
									60 0 - 60 11 -
CF Ste 525.200000 MH	Stop 2.571 GHz	Stop					SHz	2.421 0	Start
Auto Ma	Limit	A Limi	Amplitude.	Frequency	RBW	Stop Freg	Start Freq	Range	Spur
and the second s	415 4 4 100	-10.14	-35,14 dBm	2.489920833 GHz	1.000 MHz	2,4905 GHz	2.4210 GHz	1	
	10.14 db			and the designed advectory makes in the second second of	A month min	2.4950 GHz	2 4905 GHz	2	2
	20.21 dB	-20.21	-33.21 dBm	2.494715000 GHz	1.000 MHZ	12.4900 OFIZ	2.1000000000		
Freq Offse				2.494715000 GHz 2.495981667 GHz		2.4960 GHz	2 4950 GHz	3	3

Plot 7-88. Lower ACP Plot (NR Band n41(PC3) - 60MHz CP-OFDM-QPSK - Full RB)



Plot 7-89. Upper ACP Plot (NR Band n41(PC3) - 60MHz CP-OFDM-QPSK - Full RB)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Technical Manager Page 64 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 04 01 94
© 2023 ELEMENT	•		V11.0 9/14/2022



Frequency	9 PMDer 12, 2022 itd: None levice: BTS	Radio Std				Cente Trig: #Atter			F 310 4		ASS
ă.							-	dBm	Ref 30.00 c	div	0 dB
Center Free 2.621020000 GH											og 200
		asering		Courses of	pro-						- 00.0
											20.0
	Lanna and	L			u l	-					10.0
							1				50.0
											001 II -
CF Step 525.200000 MH	2.559 GHz	Stop 2							SHz	2.434 0	Start
<u>Auto</u> Ma	t.	A Limit	itude.	Ampl	requency	RBW	Freq	Stop	Start Freq	Range	Spur
	dB	-8,230 dB	dBm	Hz -33.23	490500000 G	000 MHz	15 GHz	2,490	2.4335 GHz	1	1
Eren Offen	dB	-19.67 dB	dBm	Hz -32.67	493695000 G	000 MHz	i0 GHz	2.49	2.4905 GHz	2	2
Freq Offset	dB	-23.12 dB	dBm	Hz -36.12	495980000 G	60.0 kHz	i0 GHz	2.498	2 4950 GHz	3	}
0 H		-23.99 dB		Hz 1.005		60.0 kHz	IS GHz		2.4960 GHz	4	

Plot 7-90. Lower ACP Plot (NR Band n41(PC3) - 50MHz CP-OFDM-QPSK - Full RB)



Plot 7-91. Upper ACP Plot (NR Band n41(PC3) - 50MHz CP-OFDM-QPSK – Full RB)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Technical Manager Page 65 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 05 01 94
© 2023 ELEMENT	•		V11.0 9/14/2022



ne Frequency	18:25 PMDer 12, 2022 lio Std: None lio Device: BTS	Radio St				Cente Trig: #Atter	IFGain\$.ow	F 38.0 4		ASS
				_			3m	Ref 30.00 c	div	0 dB
Center Free 2.516010000 GHz										og 20.0
		managerra	- and - good - dama		pussionidan					0.00
		l l								20.0
										10.5
Manager .	- marginery	Ň			H					41.0
							1			60.0
										00.N
6 GHz CF Step	top 2.546 GHz	Stop						SHz	2.446 0	Start
Auto Mar	.imit	A Limit	litude.	An	Frequency	RBW	Stop Freq	Start Freq	Range	Spur
	907 dB	-8.907 d	1 dBm	GHz -33	2.490500000	1.000 MHz	2.4905 GHz	2.4460 GHz	1	1
Freq Offse		-18.70 d			2 494820000		2.4950 GHz	2 4905 GHz	2	2
0 Hz		-22.10 d			2.495990000		2.4960 GHz	2.4950 GHz	3	3
0 H2	04 (15)	-24.04 d	d rifferi	GH2 0.95	2.529116883	430.0 kHz	2.5460 GHz	2.4960 GHz	4	4

Plot 7-92. Lower ACP Plot (NR Band n41(PC3) - 40MHz CP-OFDM-QPSK - Full RB)



Plot 7-93. Upper ACP Plot (NR Band n41(PC3) - 40MHz CP-OFDM-QPSK – Full RB)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 66 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 00 01 94
© 2023 ELEMENT	•		V11.0 9/14/2022



Frequency		Radio Std: Radio Dev	er Freq: 2.511000000 GHz Freq: 2.511000000 GHz Free Run en: 32 dB			aintow	IC CORI	F 38.0 4		ASS
							tBm	Ref 30.00 c	div	0 dB
Center Fre 2.511000000 GH										og 200
		ļ								0.00) 1011
										2010
	were and	1								41.0
										60 0 60 11 -
CF Ste 525.200000 MH	.534 GHz	Stop 2						SHz	2.459 0	Start
<u>Auto</u> Ma		A Limit	mplitude.	quency.	N	req. Ri	Stop Fi	Start Freq	Range	Spur
1)	-8.597 dB	3.60 dBm	0180000 GHz	0 MHz	GHz 1.0	2,4905	2.4585 GHz	1	1
Freq Offse		-18.44 dB	1.44 dBm	4910000 GHz	0 MHz	GHz 1.0	2.4950	2.4905 GHz	2	2
Frequest	1	-21.94 dB	4.94 dBm	5930000 GHz	0 kHz	GHz 334	2.4960	2.4950 GHz	3	3
0 H		-24.38 dB		3544248 GHz		GHz 330	2.5335	2.4960 GHz	4	

Plot 7-94. Lower ACP Plot (NR Band n41(PC3) - 30MHz CP-OFDM-QPSK - Full RB)



Plot 7-95. Upper ACP Plot (NR Band n41(PC3) - 30MHz CP-OFDM-QPSK - Full RB)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dage 67 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 67 of 94	
© 2023 ELEMENT			V11.0 9/14/2022	



	: None	Radio Std: Radio Dev	ALTON AUTO	0000 G	SENSE (MT) r Freq: 2.505990 Free Run 1: 32 dB	-a- Trig:	IFGain\$.ov	F 58.0 A		ASS
							m	Ref 30.00 d	div	0 dB
Center Fre 2.505990000 GH										111.00
										100
										20.0
	Ling				\mathcal{V}	~				41.0
										50 G
										HIII -
CF Ste 525.20000 MH	2.521 GHz	Stop 2						Hz	2.471 0	Start
Auto Ma		A Limit	plitude.		Frequency.	RBW	Stop Freq	Start Freq	Range	Spur
	3.	-6.553 (6)	55 dBm	GHz .	2.488355000	1.000 MHz	2.4905 GHz	2.4710 GHz	1	
		-17.33 dB	33 dBm		2.495000000		2 4950 GHz	2.4905 GHz	2	2
Ereo Offsi	3						10000			
Freq Offse	3	-20.85 dB			2.495980000 (2.514357488 (2.4960 GHz 2.5210 GHz	2.4950 GHz 2.4960 GHz	3	<u>ا</u>

Plot 7-96. Lower ACP Plot (NR Band n41(PC3) - 20MHz CP-OFDM-QPSK - Full RB)



Plot 7-97. Upper ACP Plot (NR Band n41(PC3) - 20MHz CP-OFDM-QPSK – Full RB)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dogo 68 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 68 of 94	
© 2023 ELEMENT	•		V11.0 9/14/2022	





Plot 7-98. Lower ACP Plot (NR Band n41(PC3) - 15MHz DFTs-OFDM-QPSK – Full RB)



Plot 7-99. Upper ACP Plot (NR Band n41(PC3) - 15MHz CP-OFDM-QPSK – Full RB)

FCC ID: A3LSMS911JPN	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 60 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 69 of 94	
© 2023 ELEMENT	•	·	V11.0 9/14/2022	





Plot 7-100. Lower ACP Plot (NR Band n41(PC3) - 10MHz CP-OFDM-QPSK - Full RB)



Plot 7-101. Upper ACP Plot (NR Band n41(PC3) - 10MHz CP-OFDM-QPSK - Full RB)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 70 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 70 01 94
© 2023 ELEMENT			V11.0 9/14/2022



ULCA - LTE Band 41(PC3)



Plot 7-102. Lower ACP Plot (ULCA LTE B41(PC3) - 20MHz QPSK - Full RB)



Plot 7-103. Upper ACP Plot (ULCA LTE B41(PC3) - 20MHz QPSK - Full RB)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Daga 71 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 71 of 94	
© 2023 ELEMENT	•		V11.0 9/14/2022	



7.6 Radiated Power (EIRP)

Test Overview

Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI C63.26-2015 with the EUT transmitting into an integral antenna. Measurements are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

ANSI C63.26-2015 - Section 5.2.4.4

Test Settings

- Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
- 2. RBW = 1 5% of the expected OBW, not to exceed 1MHz
- 3. VBW \ge 3 x RBW
- 4. Span = 1.5 times the OBW
- 5. No. of sweep points $\geq 2 \times \text{span} / \text{RBW}$
- 6. Detector = RMS
- 7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration.
- 8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power.
- 9. Trace mode = trace averaging (RMS) over 100 sweeps
- 10. The trace was allowed to stabilize.

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Dage 70 of 04
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 72 of 94
© 2023 ELEMENT	•		V11.0 9/14/2022



Test Setup

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

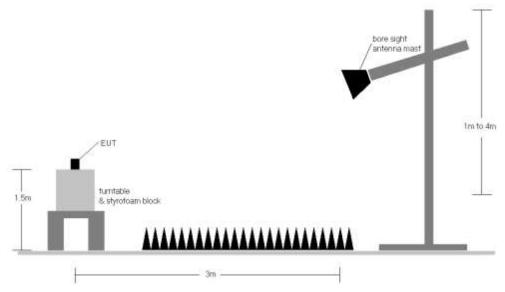


Figure 7-5. Radiated Test Setup >1GHz

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) This unit was tested with its standard battery.
- 3) For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Page 73 of 94	
1M2212080136-04-R1.A3L	0136-04-R1.A3L 9/9/2022 - 2/6/2023 Portable Handset			
© 2023 ELEMENT			V11.0 9/14/2022	



Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. (H/V)	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level (dBm)	EIRP (dBm)	EIRP [Watts]	EIRP Limit (dBm)	Margin (dB)
N	QPSK	2506.0	н	165	29	9.50	1/50	14.68	24.18	0.262	33.01	-8.83
- E	QPSK	2593.0	H	112	225	9.49	1/99	15.08	24.57	0.286	33.01	-8.44
20 MHz	QPSK	2680.0	H	125	106	9.87	1/99	14.90	24.77	0.300	33.01	-8.24
N	16-QAM	2680.0	н	125	106	9.87	1/99	14.06	23.93	0.247	33.01	-9.08
N	QPSK	2503.5	н	165	29	9.50	1/0	14.75	24.25	0.266	33.01	-8.76
ZHM	QP5K	2593.0	H	112	225	9.49	1/37	15.25	24.74	0.298	33.01	-8.27
15 N	QPSK	2682.5	н	125	106	9.87	1/37	14.83	24.69	0.295	33,01	-8.32
	16-QAM	2682.5	H	125	106	9.87	1/37	14.08	23.95	0.248	33.01	-9.06
N	QPSK	2501.0	H	165	29	9.49	1/49	15.31	24.80	0.302	33.01	-8.21
MHz	QPSK	2593.0	H	112	225	9.49	1/49	15.80	25.29	0.338	33.01	-7.72
101	QPSK.	2685.0	н	125	106	9.86	1/49	15.25	25.11	0.324	33.01	-7.90
	16-QAM	2593.0	H	112	225	9.49	1/49	15.13	24.62	0.290	33.01	-8.39
22	QPSK	2498.5	н	165	29	9.49	1/12	15.07	24.56	0.286	33.01	-8.45
5 MHz	QP5K	2593.0	н	112	225	9.49	1/0	15.31	24.81	0.302	33.01	-8.20
2	QPSK	2687.5	н	125	106	9.86	1/12	15.22	25.08	0.322	33.01	-7.93
N 12	16-QAM	2498.5	н	165	29	9,49	1/12	14.68	24.17	0.261	33.01	-8.84
20 1414-	Opposite Pol.	2680.0	V	115	90	9.51	1/0	15.25	24.76	0.299	33.01	-8.25
20 MHz	WCP	2680.0	н	133	214	9.87	1/12	13.46	23.33	0.215	33.01	-9.68

Table 7-7. EIRP Data (LTE Band 41(PC3))

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 74 of 94	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 74 01 94	
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Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
	π/2 BPSK	2546.01	V	130	56	9.40	1 / 136	13.84	23.24	0.211	33.01	-9.77
М	π/2 BPSK	2592.99	V	144	43	9.46	1 / 204	14.54	24.00	0.251	33.01	-9.01
IHz	π/2 BPSK	2640.00	V	125	42	9.50	1 / 204	15.83	25.33	0.341	33.01	-7.68
100 MHz	QPSK	2546.01	V	130	56	9.40	1 / 136	13.80	23.20	0.209	33.01	-9.81
10	QPSK	2592.99	V	144	43	9.46	1 / 204	14.53	23.99	0.251	33.01	-9.02
	QPSK	2640.00	V	125	42	9.50	1 / 204	15.73	25.23	0.334	33.01	-7.78
	16-QAM	2640.00	V	125	42	9.50	1 / 204	14.66	24.16	0.261	33.01	-8.85
	π/2 BPSK	2541.00	V	130	56	9.46	1 / 183	13.96	23.42	0.220	33.01	-9.59
N	π/2 BPSK	2592.99	V	144	43	9.46	1 / 61	14.57	24.03	0.253	33.01	-8.98
90 MHz	π/2 BPSK	2644.98	V	125	42	9.51	1 / 183	15.89	25.40	0.347	33.01	-7.61
20	QPSK	2541.00	V	130	56	9.46	1 / 183	13.91	23.37	0.217	33.01	-9.64
ดิ	QPSK	2592.99	V	144	43	9.46	1 / 61	14.51	23.97	0.250	33.01	-9.04
	QPSK	2644.98	V	125	42	9.51	1 / 183	15.76	25.27	0.337	33.01	-7.74
	16-QAM	2644.98	V	125	42	9.51	1 / 183	14.75	24.26	0.267	33.01	-8.75
	π/2 BPSK π/2 BPSK	2536.02	V	130 144	56 43	9.49 9.46	1 / 162 1 / 54	13.84 14.61	23.33 24.07	0.215	33.01 33.01	-9.68 -8.94
N	π/2 BPSK	2592.99 2649.99	V	144	43	9.46	1 / 54	14.61	24.07 25.39	0.255	33.01	-8.94
80 MHz	QPSK	2536.02	V	125	56	9.49	1 / 162	13.86	23.35	0.340	33.01	-7.62
0	QPSK	2592.99	V	130	43	9.46	1 / 54	14.52	23.98	0.250	33.01	-9.03
æ	QPSK	2649.99	V	125	43	9.52	1 / 162	14.32	25.26	0.230	33.01	-3.03
•	16-QAM	2649.99	V	125	42	9.52	1 / 162	14.73	24.24	0.266	33.01	-8.77
	π/2 BPSK	2531.01	V	130	56	9.51	1 / 141	13.88	23.40	0.219	33.01	-9.61
	π/2 BPSK	2592.99	V	144	43	9.46	1/47	14.55	24.01	0.252	33.01	-9.00
보	π/2 BPSK	2655.00	V	125	42	9.51	1 / 47	15.82	25.33	0.341	33.01	-7.68
70 MHz	QPSK	2531.01	V	130	56	9.51	1 / 141	13.77	23.29	0.213	33.01	-9.72
20	QPSK	2592.99	V	144	43	9.46	1 / 47	14.54	24.00	0.251	33.01	-9.01
	QPSK	2655.00	V	125	42	9.51	1 / 47	15.70	25.21	0.332	33.01	-7.80
	16-QAM	2655.00	V	125	42	9.51	1 / 47	14.57	24.08	0.256	33.01	-8.93
	π/2 BPSK	2526.00	V	130	56	9.52	1 / 121	13.89	23.41	0.219	33.01	-9.60
	π/2 BPSK	2592.99	V	144	43	9.46	1 / 40	14.67	24.13	0.259	33.01	-8.88
	π/2 BPSK	2659.98	V	125	42	9.50	1 / 121	15.98	25.48	0.353	33.01	-7.53
60 MHz	QPSK	2526.00	V	130	56	9.52	1 / 121	13.80	23.32	0.215	33.01	-9.69
Σ	QPSK	2592.99	V	144	43	9.46	1 / 40	14.64	24.10	0.257	33.01	-8.91
60	QPSK	2659.98	V	125	42	9.50	1 / 121	15.82	25.32	0.341	33.01	-7.69
	16-QAM	2526.00	V	130	56	9.52	1 / 121	12.92	22.44	0.175	33.01	-10.57
	16-QAM	2592.99	V	144	43	9.46	1 / 40	13.91	23.37	0.217	33.01	-9.64
	16-QAM	2659.98	V	125	42	9.50	1 / 121	14.80	24.30	0.269	33.01	-8.71
	π/2 BPSK	2521.02	V	130	56	9.51	1 / 99	13.89	23.40	0.219	33.01	-9.61
	π/2 BPSK	2592.99	V	144	43	9.46	1 / 33	14.69	24.15	0.260	33.01	-8.86
50 MHz	π/2 BPSK	2664.99	V	125	42	9.51	1 / 99	15.94	25.45	0.351	33.01	-7.56
2	QPSK	2521.02	V	130	56	9.51	1 / 99	13.82	23.33	0.215	33.01	-9.68
2(QPSK	2592.99	V	144	43	9.46	1/33	14.66	24.12	0.258	33.01	-8.89
	QPSK	2664.99	V	125	42	9.51	1 / 99	15.88	25.39	0.346	33.01	-7.62
	16-QAM	2664.99	V	125	42	9.51	1 / 99	14.81	24.32	0.270	33.01	-8.69

Table 7-8. EIRP Data (NR Band n41(PC3))

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 75 of 94	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 75 01 94	
© 2023 ELEMENT V11.0 9/14/2022				



Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
	π/2 BPSK	2516.01	V	130	56	9.52	1 / 79	13.88	23.41	0.219	33.01	-9.60
	π/2 BPSK	2592.99	V	144	43	9.46	1 / 79	14.68	24.14	0.260	33.01	-8.87
£	π/2 BPSK	2670.00	V	125	42	9.52	1 / 79	16.03	25.55	0.359	33.01	-7.46
40 MHz	QPSK	2516.01	V	130	56	9.52	1 / 79	13.87	23.40	0.219	33.01	-9.61
40	QPSK	2592.99	V	144	43	9.46	1 / 79	14.70	24.16	0.261	33.01	-8.85
	QPSK	2670.00	V	125	42	9.52	1 / 79	15.87	25.39	0.346	33.01	-7.62
	16-QAM	2670.00	V	125	42	9.52	1 / 79	14.87	24.39	0.275	33.01	-8.62
	π/2 BPSK	2511.00	V	130	56	9.54	1 / 58	13.75	23.29	0.213	33.01	-9.72
	π/2 BPSK	2592.99	V	144	43	9.46	1 / 58	14.62	24.08	0.256	33.01	-8.93
¥	π/2 BPSK	2674.98	V	125	42	9.52	1 / 58	15.98	25.49	0.354	33.01	-7.52
30 MHz	QPSK	2511.00	V	130	56	9.54	1 / 58	13.69	23.23	0.210	33.01	-9.78
30	QPSK	2592.99	V	144	43	9.46	1 / 58	14.65	24.11	0.258	33.01	-8.90
	QPSK	2674.98	V	125	42	9.52	1 / 58	15.84	25.35	0.343	33.01	-7.66
	16-QAM	2674.98	V	125	42	9.52	1 / 58	14.79	24.30	0.269	33.01	-8.71
	π/2 BPSK	2506.02	V	130	56	9.54	1 / 37	13.58	23.13	0.205	33.01	-9.88
	π/2 BPSK	2592.99	V	144	43	9.46	1 / 13	14.60	24.06	0.255	33.01	-8.95
¥	π/2 BPSK	2679.99	V	125	42	9.51	1 / 37	15.94	25.45	0.351	33.01	-7.56
20 MHz	QPSK	2506.02	V	130	56	9.54	1 / 37	13.51	23.06	0.202	33.01	-9.95
20	QPSK	2592.99	V	144	43	9.46	1 / 13	14.56	24.02	0.252	33.01	-8.99
	QPSK	2679.99	V	125	42	9.51	1 / 37	15.78	25.29	0.338	33.01	-7.72
	16-QAM	2679.99	V	125	42	9.51	1 / 37	14.88	24.39	0.275	33.01	-8.62
	π/2 BPSK	2503.50	V	130	56	9.54	1 / 28	13.50	23.04	0.201	33.01	-9.97
	π/2 BPSK	2592.99	V	144	43	9.46	1 / 28	14.65	24.11	0.258	33.01	-8.90
보	π/2 BPSK	2682.48	V	125	42	9.52	1/9	16.04	25.55	0.359	33.01	-7.46
15 MHz	QPSK	2503.50	V	130	56	9.54	1 / 28	13.41	22.95	0.197	33.01	-10.06
15	QPSK	2592.99	V	144	43	9.46	1 / 28	14.57	24.03	0.253	33.01	-8.98
	QPSK	2682.48	V	125	42	9.52	1/9	15.90	25.41	0.348	33.01	-7.60
	16-QAM	2682.48	V	125	42	9.52	1/9	14.89	24.40	0.276	33.01	-8.61
	π/2 BPSK	2501.00	V	130	56	9.54	1 / 17	13.59	23.14	0.206	33.01	-9.87
	π/2 BPSK	2592.99	V	144	43	9.46	1 / 17	14.52	23.98	0.250	33.01	-9.03
보	π/2 BPSK	2685.00	V	125	42	9.51	1 / 17	15.75	25.26	0.336	33.01	-7.75
10 MHz	QPSK	2501.00	V	130	56	9.54	1 / 17	13.55	23.10	0.204	33.01	-9.91
10	QPSK	2592.99	V	144	43	9.46	1 / 17	14.51	23.97	0.250	33.01	-9.04
	QPSK	2685.00	V	125	42	9.51	1 / 17	15.68	25.19	0.330	33.01	-7.82
	16-QAM	2685.00	V	125	42	9.51	1 / 17	14.58	24.09	0.257	33.01	-8.92
	QPSK (CP-OFDM)	2640.00	V	125	41	9.50	1 / 204	14.01	23.51	0.224	33.01	-9.50
100 MHz	QPSK (Opposite Pol.)	2640.00	Н	101	322	9.50	1 / 136	14.42	23.92	0.247	33.01	-9.09
	QPSK (WCP)	2640.00	V	144	22	9.50	1 / 136	13.39	22.89	0.195	33.01	-10.12

Table 7-9. EIRP Data (NR Band n41(PC3))

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 76 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 70 01 94
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7.7 Radiated Spurious Emissions Measurements

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.

Test Procedures Used

ANSI C63.26-2015 - Section 5.5.4

Test Settings

- 1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
- 2. VBW \geq 3 x RBW
- 3. Span = 1.5 times the OBW
- 4. No. of sweep points > 2 x span / RBW
- 5. Detector = RMS
- 6. Trace mode = Average (Max Hold for pulsed emissions)
- 7. The trace was allowed to stabilize

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:	Page 77 of 94			
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	0/9/2022 - 2/6/2023 Portable Handset				
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The EUT and measurement equipment were set up as shown in the diagram below.

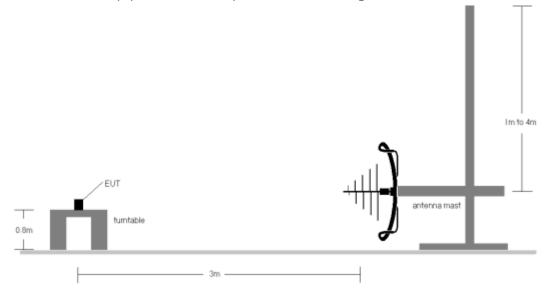


Figure 7-6. Test Instrument & Measurement Setup < 1GHz

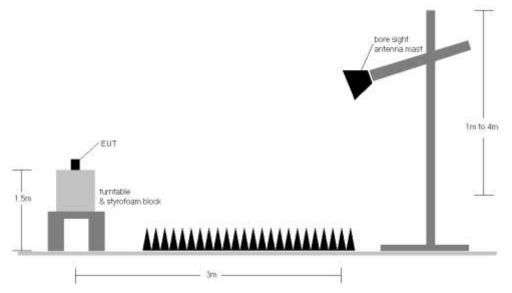


Figure 7-7. Test Instrument & Measurement Setup >1 GHz

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT				
Test Report S/N:	Test Dates:	EUT Type:	Page 78 of 94			
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	/9/2022 - 2/6/2023 Portable Handset				
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Test Notes

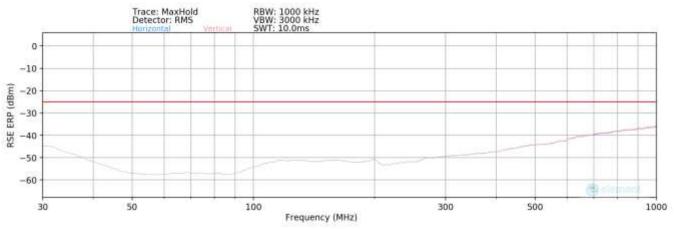
- 1) Field strengths are calculated using the Measurement quantity conversions in ANSI C63.26-2015 Section 5.2.7:
 - a) $E(dB\mu V/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m) b) EIRP (dBm) = E(dB\mu V/m) + 20logD 104.8; where D is the measurement distance in meters.$
- 2) 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.
- 3) This unit was tested with its standard battery.
- 4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 5) Emissions below 18GHz were measured at a 3-meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 6) The "-" shown in the following RSE tables are used to denote a noise floor measurement.
- 7) ULCA spurious emissions 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.
- 8) For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.
- 9) Spurious emissions shown in this section are measured while operating in EN-DC mode with Sub 6GHz NR carrier as well as an LTE carrier (anchor). Spurious emissions from the NR carrier device, is subject to the rules under which the NR carrier operates. Spurious emissions caused by the LTE carrier must meet the requirements of the rules under which the LTE carrier operates.

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT		
Test Report S/N:	Test Dates:	EUT Type:	Page 79 of 94	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 79 01 94	
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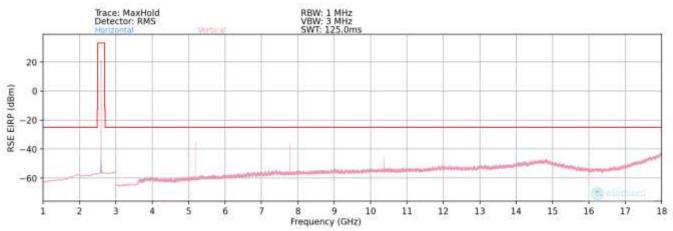
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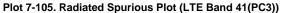


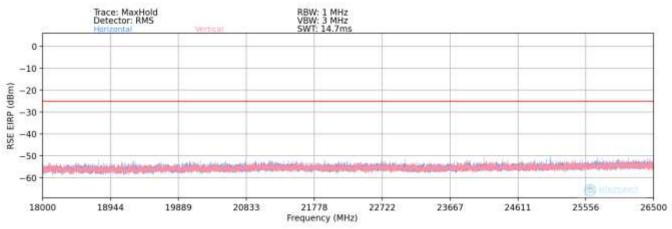
LTE Band 41(PC3)

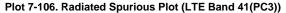












FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:	Page 80 of 94			
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023 Portable Handset Page 8					
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Bandwidth (MHz):	20
Frequency (MHz):	2593.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
61.33	V	-	-	-84.24	14.37	37.13	-60.27	-25.00	-35.27
100.68	V	-	-	-84.16	17.68	40.52	-56.89	-25.00	-31.89
297.31	V	-	-	-84.07	21.28	44.21	-53.19	-25.00	-28.19

Table 7-10. Radiated Spurious Data Below 1GHz (LTE Band 41(PC3) - Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	2506.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5012.00	V	121	28	-48.45	-0.47	58.08	-37.17	-25.00	-12.17
7518.00	V	111	296	-50.91	4.19	60.28	-34.98	-25.00	-9.98
10024.00	V	123	91	-72.49	8.01	42.52	-52.74	-25.00	-27.74
12530.00	V	186	244	-76.91	9.81	39.90	-55.35	-25.00	-30.35
15036.00	V	-	-	-78.06	12.60	41.54	-53.72	-25.00	-28.72
17542.00	V	-	-	-78.53	14.18	42.65	-52.61	-25.00	-27.61
20048.00	V	-	-	-65.24	2.99	44.75	-60.05	-25.00	-35.05

Table 7-11. Radiated Spurious Data (LTE Band 41(PC3) – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	2593.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5186.00	V	129	21	-47.10	-0.18	59.72	-35.54	-25.00	-10.54
7779.00	V	115	300	-47.34	4.76	64.42	-30.84	-25.00	-5.84
10372.00	V	135	80	-73.95	8.25	41.30	-53.96	-25.00	-28.96
12965.00	V	-	-	-78.22	10.41	39.19	-56.07	-25.00	-31.07
15558.00	V	-	-	-78.60	10.44	38.84	-56.42	-25.00	-31.42
18151.00	V	- 12 Dadiatas	-	-65.34	1.37	43.03	-61.77	-25.00	-36.77

Table 7-12. Radiated Spurious Data (LTE Band 41(PC3) – Mid Channel)

Bandwidth (MHz): Frequency (MHz): RB / Offset:		2680.0					
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]		
5360.00	V	137	19	-56.06	0.31		
8040.00	V	129	303	-70.94	5.57		

8040.00	V	129	303	-70.94	5.57	41.63	-53.63	-25.00	-28.63
10720.00	V	129	297	-78.02	8.53	37.51	-57.75	-25.00	-32.75
13400.00	V	-	-	-78.41	10.78	39.37	-55.89	-25.00	-30.89
16080.00	V	-	-	-77.50	8.02	37.52	-57.74	-25.00	-32.74
18760.00	V	-	-	-65.00	1.80	43.81	-60.99	-25.00	-35.99
Table 7-13. Radiated Spurious Data (LTE Band 41(PC3) – High Channel)									

Field

Strength

[dBµV/m]

51.25

EIRP Spurious

Emission Level

[dBm]

-44.01

Limit

[dBm]

-25.00

Margin

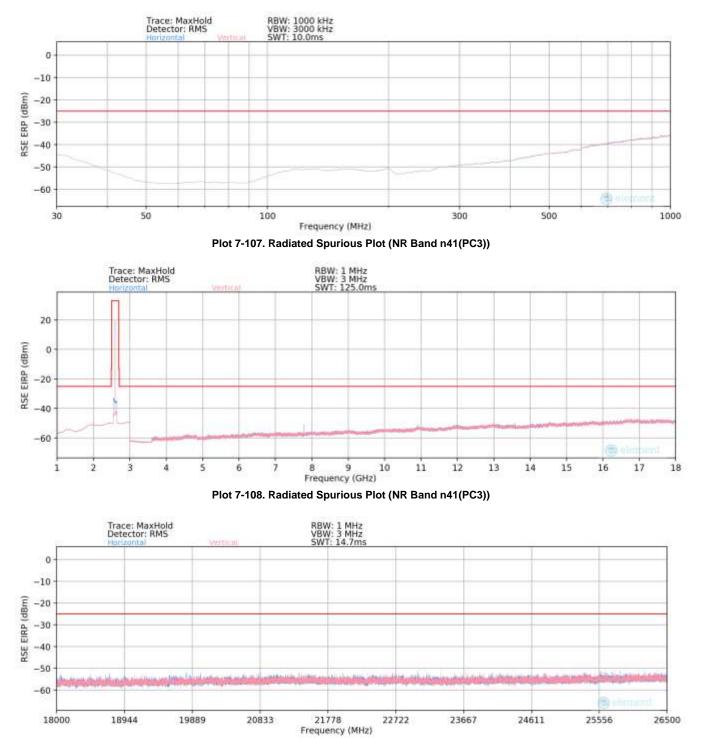
[dB]

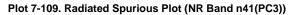
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FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT			
Test Report S/N:	Test Dates:	Test Dates: EUT Type:			
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 81 of 94		
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NR Band n41(PC3)





FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT			
Test Report S/N:	Test Dates:	Test Dates: EUT Type:			
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	0/2022 - 2/6/2023 Portable Handset			
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Bandwidth (MHz):	100
Frequency (MHz):	2592.99
RB / Offset:	1 / 136

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
124.43	Н	-	-	-80.87	20.55	46.68	-50.72	-25.00	-25.72
281.89	Н	-	-	-80.79	20.81	47.02	-50.39	-25.00	-25.39
420.75	Н	-	-	-80.68	24.12	50.44	-46.96	-25.00	-21.96

Table 7-14. Radiated Spurious Data (NR Band n41(PC3) – Mid Channel)

Bandwidth (MHz):	100
Frequency (MHz):	2550.00
RB / Offset:	1 / 136

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5100.00	Н	158	322	-75.23	4.75	36.52	-58.73	-25.00	-33.73
7650.00	Н	149	11	-68.93	7.70	45.77	-49.49	-25.00	-24.49
10200.00	Н	-	-	-78.17	11.01	39.84	-55.42	-25.00	-30.42
12750.00	Н	-	-	-78.47	13.94	42.47	-52.79	-25.00	-27.79
15300.00	Н	-	-	-79.14	15.84	43.70	-51.55	-25.00	-26.55

Table 7-15. Radiated Spurious Data (NR Band n41(PC3) - Low Channel)

Bandwidth (MHz):	100
Frequency (MHz):	2592.99
RB / Offset:	1 / 136

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5185.98	Н	167	328	-74.80	5.06	37.26	-57.99	-25.00	-32.99
7778.97	Н	143	24	-65.97	7.29	48.32	-46.93	-25.00	-21.93
10371.96	Н	-	-	-77.84	11.01	40.17	-55.09	-25.00	-30.09
12964.95	Н	-	-	-78.10	14.59	43.49	-51.77	-25.00	-26.77
15557.94	Н	-	-	-78.27	15.64	44.37	-50.89	-25.00	-25.89

Table 7-16. Radiated Spurious Data (NR Band n41(PC3) – Mid Channel)

Bandwidth (MHz):		100							
Frequency (MHz):		2640.00							
RB / Offset:		1 / 136							
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5280.00	Н	164	173	-75.70	4.75	36.05	-59.21	-25.00	-34.21
7920.00	Н	161	328	-70.55	8.35	44.80	-50.46	-25.00	-25.46
10560.00	Н	-	-	-78.75	11.58	39.83	-55.43	-25.00	-30.43
13200.00	Н	-	-	-78.46	13.82	42.36	-52.89	-25.00	-27.89
15840.00	Н	-	-	-78.78	16.90	45.12	-50.14	-25.00	-25.14
	Table 7	17. Radiated	Sourious Da	ta (NR Ban	d n41(PC3) - High Ch	annel)		•

Table 7-17. Radiated Spurious Data (NR Band n41(PC3) – High Channel)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT			
Test Report S/N:	Test Dates:	EUT Type:	Page 83 of 94		
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 03 01 94		
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Case:	w/ Wireless Charging Pad
Bandwidth (MHz):	100
Frequency (MHz):	2593.0
RB / Offset:	1 / 136

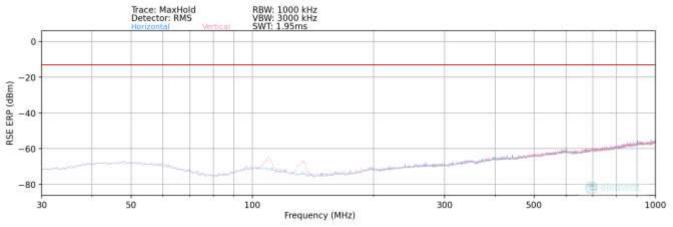
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5185.98	Н	334	207	-72.86	5.06	39.20	-56.05	-25.00	-31.05
7778.97	Н	122	196	-70.33	7.29	43.96	-51.29	-25.00	-26.29
10371.96	Н	-	-	-78.12	11.01	39.89	-55.37	-25.00	-30.37
12964.95	Н	-	-	-78.62	14.59	42.97	-52.29	-25.00	-27.29
15557.94	Н	-	-	-78.49	15.64	44.15	-51.11	-25.00	-26.11

Table 7-18. Radiated Spurious Data with WCP (NR Band n41(PC3))

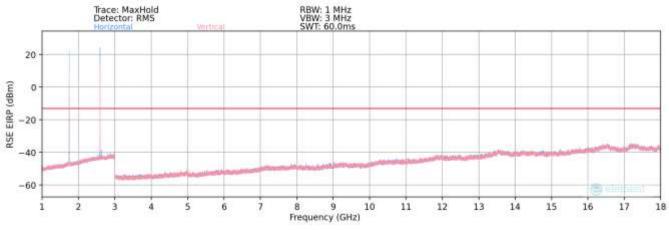
FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT			
Test Report S/N:	Test Dates:	EUT Type:	Daga 84 of 04		
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 84 of 94		
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EN-DC n41(PC3) - Band 66







Plot 7-111. Radiated Spurious Plot (NR 41(PC3) - Band 66)

Bandwidth (MHz):	100 & 20
Frequency (MHz):	2593 & 1745
RB / Offset:	1/136 & 1/50
Mode:	EN-DC
Anchor Band:	B66

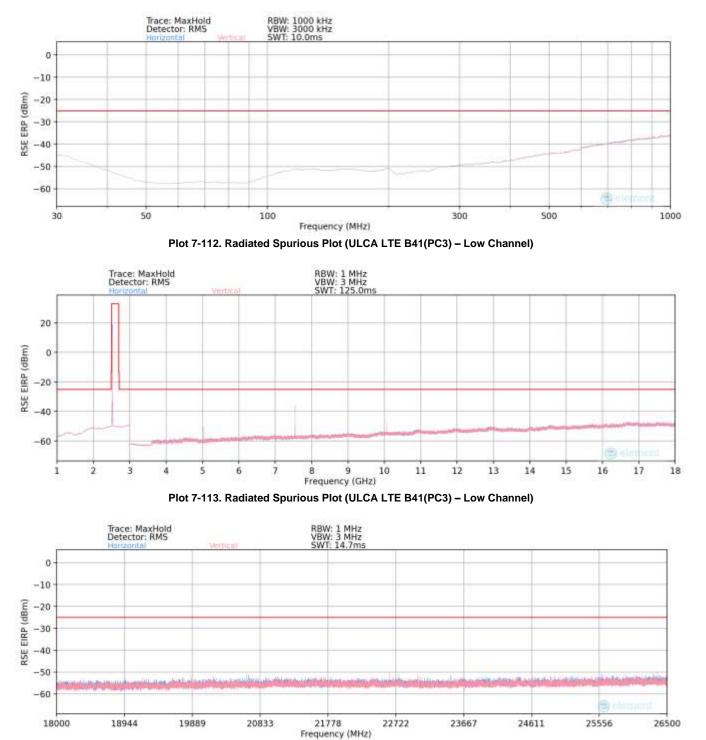
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
109.00	V	322	78	-63.36	-16.53	27.11	-68.15	-13.00	-55.15
134.00	V	120	287	-60.41	-19.60	26.99	-68.27	-13.00	-55.27
799.00	V	-	-	-71.80	-4.64	30.56	-64.70	-13.00	-51.70
5137.00	V	-	-	-73.57	11.12	44.55	-50.71	-13.00	-37.71
8774.00	V	-	-	-75.02	16.80	48.78	-46.48	-13.00	-33.48
13063.00	V	-	-	-75.98	24.01	55.03	-40.23	-13.00	-27.23

Table 7-19 . Radiated Spurious Data (NR 41(PC3) – Band 66)

FCC ID: A3LSMS911JPN		PART 27 MEASUREMENT REPORT			
Test Report S/N:	Test Dates:	EUT Type:	Daga 95 of 04		
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 85 of 94		
© 2023 ELEMENT	•		V11.0 9/14/2022		



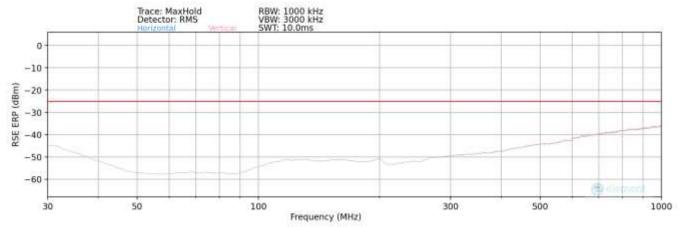
ULCA - LTE B41(PC3)

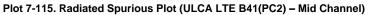


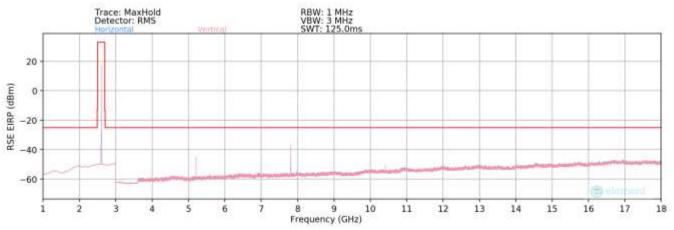
Plot 7-114. Radiated Spurious Plot (ULCA LTE B41(PC3) - Low Channel)

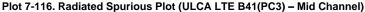
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Test Report S/N:	Test Dates:	EUT Type:	Page 86 of 94			
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	/2023 Portable Handset				
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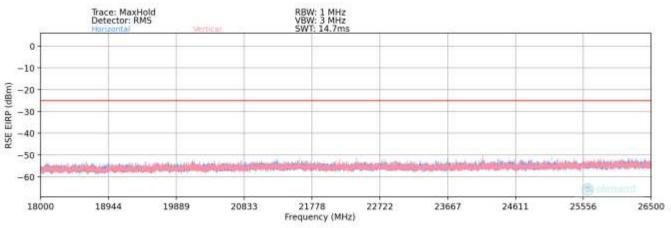


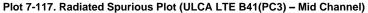






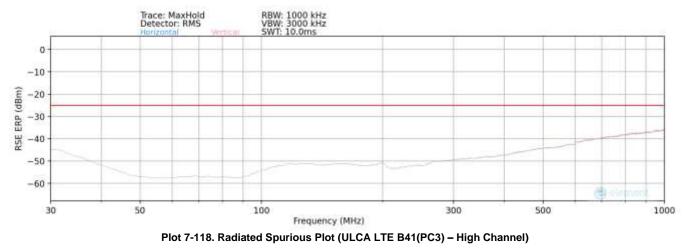


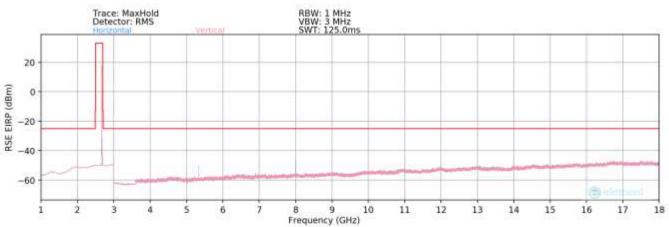




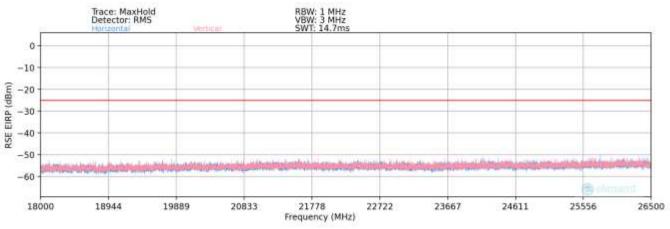
FCC ID: A3LSMS911JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 87 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 07 01 94
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FCC ID: A3LSMS911JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 88 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Faye 00 01 94
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PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	2593.0
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	2612.8
SCC RB / Offset:	1/0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
95.27	Н	-	-	-81.04	15.99	41.95	-55.46	-25.00	-30.46
305.76	Н	-	-	-80.70	21.28	47.58	-49.83	-25.00	-24.83
485.65	Н	-	-	-81.05	25.96	51.91	-45.50	-25.00	-20.50

Table 7-20. Radiated Spurious Data Below 1GHz (ULCA LTE B41(PC3) - Mid Channel)

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	2506.0
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	2525.8
SCC RB / Offset:	1/0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5012.00	Н	120	25	-58.70	4.36	52.66	-42.60	-25.00	-17.60
7518.00	Н	139	332	-57.06	7.50	57.44	-37.82	-25.00	-12.82
10024.00	Н	197	47	-65.85	10.28	51.43	-43.83	-25.00	-18.83
12530.00	Н	-	-	-69.74	13.59	50.85	-44.41	-25.00	-19.41
15036.00	Н	-	-	-69.77	15.29	52.52	-42.73	-25.00	-17.73
17542.00	Н	-	-	-69.60	17.15	54.55	-40.71	-25.00	-15.71

Table 7-21. Radiated Spurious Data (ULCA LTE B41(PC3) – Low Channel)

PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	2593.0
PCC RB / Offset:	1 / 99
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	2612.8
SCC RB / Offset:	1/0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5186.00	Н	120	135	-48.25	5.06	63.81	-31.44	-25.00	-6.44
7779.00	Н	120	328	-53.68	7.29	60.61	-34.64	-25.00	-9.64
10372.00	Н	119	351	-68.98	11.01	49.03	-46.23	-25.00	-21.23
12965.00	Н	-	-	-69.50	14.59	52.09	-43.17	-25.00	-18.17
15558.00	Н	-	-	-69.10	15.64	53.54	-41.72	-25.00	-16.72
18151.00	Н	-	-	-59.12	1.37	49.25	-55.55	-25.00	-30.55

Table 7-22. Radiated Spurious Data (ULCA LTE B41(PC3) - Mid Channel)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 89 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	2 - 2/6/2023 Portable Handset	
© 2023 ELEMENT	*	•	V11.0 9/14/2022



PCC Bandwidth (MHz):	20
PCC Frequency (MHz):	2680.0
PCC RB / Offset:	1/0
SCC Bandwidth (MHz):	20
SCC Frequency (MHz):	2660.2
SCC RB / Offset:	1 / 99

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5360.00	н	120	312	-55.92	4.86	55.94	-39.32	-25.00	-14.32
8040.00	Н	120	275	-56.75	8.14	58.39	-36.87	-25.00	-11.87
10720.00	Н	119	52	-67.47	11.70	51.23	-44.03	-25.00	-19.03
13400.00	Н	-	-	-69.50	13.81	51.31	-43.94	-25.00	-18.94
16080.00	Н	-	-	-69.94	16.85	53.91	-41.34	-25.00	-16.34
18760.00	Н	-	-	-59.02	1.80	49.78	-55.02	-25.00	-30.02

Table 7-23. Radiated Spurious Data (ULCA LTE B41(PC3) – High Channel)

FCC ID: A3LSMS911JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 90 of 94
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 90 01 94
© 2023 ELEMENT	•	·	V11.0 9/14/2022



7.8 Frequency Stability / Temperature Variation

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI C63.26-2015 – Section 5.6

Test Settings

- 1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- 2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

Test Notes

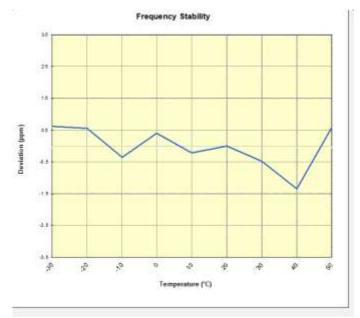
None

FCC ID: A3LSMS911JPN	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 01 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 91 of 94	
© 2023 ELEMENT	•		V11.0 9/14/2022	



LTE Band 41/38						
	Operating F	requency (Hz):	2,593,000,000			
	Ref. Voltage (VDC):		4.3	4.34		
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)	
		- 30	2,593,090,866	1,614	0.0000622	
		- 20	2,593,090,684	1,432	(%)	
		- 10	2,593,088,314	-938		
		0	2,593,090,315	1,062	0.0000410	
100 %	4.34	+ 10	2,593,088,695	-558	-0.0000215	
		+ 20 (Ref)	2,593,089,252	0	0.0000000	
		+ 30	2,593,087,988	-1,264	-0.0000487	
		+ 40	2,593,085,752	-3,501	-0.0001350	
		+ 50	2,593,090,781	1,529	0.0000590	
Battery Endpoint	3.71	+ 20	2,593,088,825	-427	-0.0000165	

Table 7-24. LTE Band 41(PC3) Frequency Stability Data



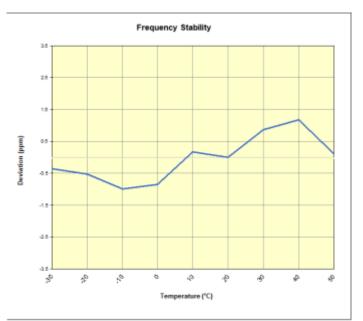
Plot 7-121. LTE Band 41(PC3) Frequency Stability Chart

FCC ID: A3LSMS911JPN	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 02 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 92 of 94	
© 2023 ELEMENT			V11.0 9/14/2022	



NR Band n41						
	Operating F	requency (Hz):	2,593,000,000			
	Ref. Voltage (VDC):		4.34			
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)	
		- 30	2,592,975,115	-930	-0.0000359	
		- 20	2,592,974,669	-1,377	-0.0000531	
		- 10	2,592,973,479	-2,566	-0.0000990	
		0	2,592,973,850	-2,196	-0.0000847	
100 %	4.34	+ 10	2,592,976,479	434	0.0000167	
		+ 20 (Ref)	2,592,976,046	0	0.0000000	
		+ 30	2,592,978,277	2,231	0.0000860	
		+ 40	2,592,979,079	3,034	0.0001170	
		+ 50	2,592,976,322	277	0.0000107	
Battery Endpoint	3.71	+ 20	2,592,974,564	-1,481	-0.0000571	

Table 7-25. NR Band n41(PC3) Frequency Stability Data



Plot 7-122. NR Band n41(PC3) Frequency Stability Chart

FCC ID: A3LSMS911JPN	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 02 of 04	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Page 93 of 94	
© 2023 ELEMENT	•		V11.0 9/14/2022	



8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMS911JPN** complies with all the requirements of Part 27 of the FCC rules.

FCC ID: A3LSMS911JPN	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 94 of 94	
1M2212080136-04-R1.A3L	9/9/2022 - 2/6/2023	Portable Handset	Fage 94 01 94	
© 2023 ELEMENT			V11.0 9/14/2022	