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PART 22 & 90 MEASUREMENT REPORT

Applicant Name:

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

Date of Testing:

9/8/2022 – 11/6/2022 **Test Report Issue Date:** 11/16/2022 **Test Site/Location:** Element Lab. Yongin-Si, Gyeonggi-do, South Korea **Test Report Serial No.:** 1M2209010098-11.A3L

FCC ID: APPLICANT:

A3LSMS918U

Samsung Electronics Co., Ltd.

Application Type: Model: Additional Model(s): EUT Type: FCC Classification: FCC Rule Part: Test Procedure(s): Certification SM-S918U SM-S918U1 Portable Handset PCS Licensed Transmitter Held to Ear (PCE) §22(H), §90(S), §90(R) ANSI C63.26-2015, KDB 648474 D03 v01r04

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

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Prepared by

N

Reviewed by

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	Test Dates: EUT Type:	
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 1 of 64
© 2022 ELEMENT		·	V3.0 1/6/2022



TABLE OF CONTENTS

1.0	INTR	ODUCTION	4
	1.1	Scope	4
	1.2	Element Test Location	4
	1.3	Test Facility / Accreditations	4
2.0	PRO	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
3.0	DESC	RIPTION OF TESTS	6
	3.1	Evaluation Procedure	6
	3.2	Radiated Power and Radiated Spurious Emissions	6
4.0	MEAS	SUREMENT UNCERTAINTY	7
5.0	TEST	EQUIPMENT CALIBRATION DATA	8
6.0	SAM	PLE CALCULATIONS	9
7.0	TEST	RESULTS	10
	7.1	Summary	10
	7.2	Conducted Output Power Data	12
	7.3	Occupied Bandwidth	14
	7.4	Spurious and Harmonic Emissions at Antenna Terminal	28
	7.5	Band Edge Emissions at Antenna Terminal	35
	7.6	Radiated Power (ERP)	48
	7.7	Radiated Spurious Emissions Measurements	51
	7.8	Frequency Stability / Temperature Variation	60
8.0	CON	CLUSION	64

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Page 2 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Fage 2 01 04
© 2022 ELEMENT			V3.0 1/6/2022



MEASUREMENT REPORT FCC Part 22 & 90

Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	Measurement	Max. Power [W]	Max. Power [dBm]	Emission Designator
	10 MHz	QPSK	793.0	ERP	0.103	20.15	9M02G7D
LTE Bond 14		16QAM	793.0	ERP	0.087	19.42	Designator 9M02G7D 9M02G7D 9M05W7D 4M55G7D 13M5G7D 13M5G7D 13M5G7D 13M5G7D 13M5G7D 13M5G7D 9M02G7D 9M03W7D 9M03W7D 2M73G7D 1M11G7D 1M1407D 1M45G7D 19M0G7D 19M0G7D 19M0G7D 13M5G7D 14M1G7D 13M5G7D 14M1G7D 13M5G7D 9M03G7D 9M03G7D 9M03G7D 9M03G7D 9M03G7D 9M03G7D 9M03G7D 9M33G7D 9M33G7D 9M35W7D 9M35W7D
LTE Band 14	5 MHz	QPSK	790.5 - 795.5	ERP	0.105	20.21	4M55G7D
	5 10112	16QAM	790.5 - 795.5	ERP	0.092	19.64	4M54W7D
	15 MHz	QPSK	821.5	ERP	0.141	21.49	13M5G7D
	10 10112	16QAM	821.5	ERP	0.118	20.73	13M5W7D
	15 MHz	QPSK	821.5	Conducted	0.287	24.57	13M5G7D
	10 10112	16QAM	821.5	Conducted	0.226	23.55	Designator 9M02G7D 9M05W7D 4M55G7D 4M55G7D 4M55G7D 13M5G7D 13M5G7D 13M5G7D 13M5G7D 13M5G7D 13M5G7D 13M5G7D 9M02G7D 9M03W7D 4M57G7D 2M73G7D 2M73W7D 1M11G7D 1M11G7D 19M0G7D 9M33G7D 9M33G7D 9M33G7D 9M35W7D
	10 MHz	QPSK	819.0	Conducted	0.301	24.78	9M02G7D
LTE Band 26	10 10112	16QAM	819.0	Conducted	0.246	23.91	9M03W7D
ETE Build 20	5 MHz	QPSK	816.5 - 821.5	Conducted	0.316	25.00	4M57G7D
	0 10112	16QAM	816.5 - 821.5	Conducted	0.252	24.02	4M54W7D
	3 MHz	QPSK	815.5 - 822.5	Conducted	0.303	24.81	2M73G7D
	0 10112	16QAM	815.5 - 822.5	Conducted	0.248	23.94	Designator 9M02G7D 9M05W7D 4M55G7D 4M55G7D 4M55G7D 13M5G7D 13M5G7D 13M5G7D 13M5G7D 13M5G7D 13M5G7D 13M5G7D 13M5G7D 9M02G7D 9M02G7D 9M03W7D 4M54W7D 2M73G7D 2M73W7D 1M11G7D 1M12W7D 19M0G7D 14M1G7D 14M1G7D 14M1G7D 9M01G7D 9M33G7D 9M33G7D 9M35W7D 4M52G7D 4M50G7D
	1.4 MHz	QPSK	814.7 - 823.3	Conducted	0.294	24.69	
	1.4 10112	16QAM	814.7 - 823.3	Conducted	0.247	23.92	Designator 9M02G7D 9M05W7D 4M55G7D 4M55G7D 13M5G7D 13M5G7D 13M5G7D 13M5G7D 13M5G7D 13M5G7D 9M02G7D 9M02G7D 9M03W7D 4M54W7D 2M73G7D 2M73W7D 1M1G7D 1M1G7D 19M0G7D 19M0G7D 19M0G7D 19M0G7D 19M0G7D 13M5G7D 14M1G7D 14M2W7D 19M0G7D 19M0G7D 19M0G7D 9M33507D 9M33G7D 9M33G7D 9M35W7D 4M50G7D
		π/2 BPSK	824	ERP	0.103	20.12	17M9G7D
	20 MHz	QPSK	824	ERP	0.099	19.97	19M0G7D
		16QAM	824	ERP	0.081	19.07	19M0W7D
		π/2 BPSK	821.5	ERP	0.105	20.20	13M5G7D
	15 MHz	QPSK	821.5	ERP	0.102	20.07	14M1G7D
		16QAM	821.5	ERP	0.074	18.71	14M2W7D
		π/2 BPSK	824	Conducted	0.254	24.05	17M9G7D
	20 MHz	QPSK	824	Conducted	0.249	23.96	19M0G7D
		16QAM	824	Conducted	0.218	23.39	Designator 9M02G7D 9M05W7D 4M55G7D 4M55G7D 4M55G7D 4M55G7D 13M5G7D 13M5G7D 13M5G7D 13M5W7D 13M5G7D 9M02G7D 9M02G7D 9M03W7D 4M54W7D 2M73G7D 4M54W7D 2M73G7D 1M11G7D 1M12W7D 17M9G7D 19M0G7D 9M35G7D 9M33G7D 9M33G7D 9M35W7D 4M52G7D 4M50G7D
NR Band n26		π/2 BPSK	821.5	Conducted	0.259	24.13	13M5G7D
	15 MHz	QPSK	821.5	Conducted	0.255	24.06	14M1G7D
E		16QAM	821.5	Conducted	0.201	23.03	14M2W7D
		π/2 BPSK	819	Conducted	0.251	24.00	9M01G7D
	10 MHz	QPSK	819	Conducted	0.257	24.10	9M33G7D
		16QAM	819	Conducted	0.204	23.10	19.42 9M05W7D 20.21 4M55G7D 19.64 4M54W7D 21.49 13M5G7D 20.73 13M5W7D 24.57 13M5G7D 23.55 13M5W7D 24.57 13M5G7D 23.55 13M5W7D 24.78 9M02G7D 23.91 9M03W7D 25.00 4M57G7D 24.02 4M54W7D 24.81 2M73G7D 23.94 2M73W7D 24.69 1M11G7D 23.92 1M12W7D 20.12 17M9G7D 19.97 19M0W7D 20.00 13M5G7D 20.07 14M1G7D 18.71 14M2W7D 24.05 17M9G7D 23.96 19M0W7D 23.39 19M0W7D 24.06 14M1G7D 23.39 19M0W7D 24.06 14M1G7D 23.30 14M2W7D 24.06 14M1G7D 23.10
		π/2 BPSK	816.5 - 821.5	Conducted	0.255	24.06	4M52G7D
	5 MHz	QPSK	816.5 - 821.5	Conducted	0.249	23.97	4M50G7D
		16QAM	816.5 - 821.5	Conducted	0.222	23.46	4M52W7D

EUT Overview

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 3 of 64
© 2022 ELEMENT		•	V3.0.1/6/2022



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 Suwon Laboratory located at 13, Heungdeok 1-ro, Giheung-gu, Yongin-si, Gyeonggi-do, 16954, South Korea. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

1.3 Test Facility / Accreditations

Measurements were performed at Element Materials Technology Suwon, Ltd. located in Yongin-si, Gyeonggi-do, 16954, South Korea.

- Element Materials Technology Suwon, Ltd. is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation(A2LA) with Certificate number 2041.04 for Specific Absorption Rate (SAR), and Electromagnetic Compatibility (EMC) & Telecommunications testing for FCC and Innovation, Science, and Economic Development Canada rules.
- Element Materials Technology Suwon, Ltd. facility is accredited, designated, and recognized in accordance with the provision of Radio Wave Act and International Standard ISO/IEC 17025:2017 under the National Radio Research Agency.
 - Designation Number / CABID: KR0169
 - Test Firm Registration Number of FCC: 417945
 - Test Firm Registration Number of ISED: 26168

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Dage 4 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 4 of 64
© 2022 ELEMENT	·	•	V3.0 1/6/2022

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMS918U**. 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 90 and 22H.

Test Device Serial No.: 0130M, 0187M, 0131M , 0167M, 1616M, 0430M

2.2 Device Capabilities

This device contains the following capabilities:

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

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 S918USQU0AVJH 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: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Dage 5 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 5 of 64
© 2022 ELEMENT			V3.0 1/6/2022



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:

Pd [dBm] = Pg [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 $P_{g \, [dBm]}$ – 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:

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

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

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

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 6 of 64
© 2022 ELEMENT			V3.0 1/6/2022



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: A3LSMS918U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 7 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 7 of 64
© 2022 ELEMENT	<u>.</u>		V3.0 1/6/2022



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
AAMCS	UDC	Directional Coupler	2022-07-05	Annual	2023-07-04	N/A
Agilent	N9030A	PXA Signal Analyzer	2022-07-04	Annual	2023-07-03	MY49432391
Anritsu	\$820E	Cable and Antenna Analyzer	2022-07-06	Annual	2023-07-05	1839097
Anritsu	MA24106A	USB Power Sensor	2022-07-06	Annual	2023-07-05	1244512
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	2022-10-21	Biennial	2024-10-20	10160045
Com-Power	PAM-118A	Preamplifier	2022-07-06	Annual	2023-07-05	551042
Espec	SH-242	Environmental Chamber	2022-08-26	Annual	2023-08-25	93011064
Fairview Microwave	FM2CP1122-10	Coupler	2022-07-06	Annual	2023-07-05	1946
Keysight Technologies	N9030B	MXA Signal Analyzer	2022-05-10	Annual	2023-05-19	MY57142018
AAMCS	UDC	Directional Coupler	2022-07-05	Annual	2022-07-04	N/A
Mini-Circuits	BW-N10W5+	Attenuator	2022-05-09	Annual	2023-05-08	1607
Mini-Circuits	BW-N10W5+	Attenuator	2022-05-09	Annual	2023-05-08	1607
Rohde & Schwarz	TS-PR18	Preamplifier	2022-07-06	Annual	2023-07-05	102141
Rohde & Schwarz	SMB100A03	Signal Generator	2022-01-18	Annual	2023-01-17	182487
Rohde & Schwarz	CMW500	Wideband Radio Communication Tester	2022-02-18	Annual	2023-02-17	131453
Rohde & Schwarz	ESW	EMI Test Receiver	2022-07-04	Annual	2023-07-03	101761
Rohde & Schwarz	FSW43	Signal & Spectrum Analyzer	2022-01-18	Annual	2023-01-17	101250
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	2022-02-18	Annual	2023-02-17	102131
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	2022-03-28	Annual	2023-03-27	102151
Schwarzbeck	VULB9162	Broadband TRILOG Antenna	2021-07-13	Biennial	2023-07-12	9162-217
Schwarzbeck	UHA9105	Dipole Antenna	2022-07-19	Biennial	2024-07-18	91052522
Sunol	DRH-118	Horn Antenna	2021-07-14	Biennial	2023-07-13	A102416-1
Sunol	DRH-118	Horn Antenna	2021-01-12	Biennial	2023-01-11	A060215

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: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 8 of 64
© 2022 ELEMENT	·	-	V3.0 1/6/2022



6.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 8M62G7D

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

QAM Modulation

Emission Designator = 8M45W7D

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

Spurious Radiated Emission – LTE Band

Example: Middle Channel LTE Mode 2nd Harmonic (1564 MHz)

The average spectrum analyzer reading at 3 meters with the EUT on the turntable was -81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of -81.0 dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 1564 MHz. So 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm - (-24.80) = 50.3 dBc.

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Dago 0 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 9 of 64
© 2022 ELEMENT	·	•	V3.0 1/6/2022



7.0 TEST RESULTS

7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.
FCC ID:	A3LSMS918U
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	LTE/NR

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
	Transmitter Conducted Output Power*	2.1046(a), 90.635(b)	< 100 Watts	PASS	Section 7.2
	Occupied Bandwidth	2.1049(h)	N/A	PASS	Section 7.3
CONDUCTED	Conducted Band Edge / Spurious Emissions (LTE Band 14)	2.1051, 90.543(c)(e)	On all frequencies between 769-775 MHz and 799- 805 MHz, attenuation by a factor not less than 65 + 10 log(P) dB in a 6.25 kHz band segment, for mobile and pottable stations. On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, attenuation by at least 43 + 10 log(P) dB > 43 + 10log10(P[Watts]) for all out-of-band emissions outside of those specified in 90.543(e)	PASS	Sections 7.4, 7.5
	Conducted Band Edge / Spurious Emissions (LTE Band 26; NR Band n26)	2.1051, 90.691(a)	> 43 + 10 log10(P[Watts]) for all out-of-band emissions except emissions beyond 37.5kHz from the block edge > 50 + 10 log10(P[Watts]) at Band Edge and for all out-of-band emissions within 37.5kHz of Block Edge	PASS	Sections 7.4, 7.5
	Frequency Stability	2.1055, 90.213	< 2.5 ppm **Fundamental emissions stay within authorized frequency block	PASS	Section 7.8
	Effective Radiated Power (LTE Band 14)	90.542(a)(7)	< 3 Watts max. ERP	PASS	Section 7.6
ATED	Effective Radiated Power (LTE Band 26; NR Band n26)	22.913(a)(2)	< 7 Watts max. ERP	PASS	Section 7.6
RADIATED	Radiated Spurious Emissions (LTE Band 14)	2.1053, 90.543(e)(f)	> 43 + 10 log10 (P[Watts]) for all out-of-band emissions except emissions in the 1559 - 1610MHz band are subject to a limit of - 40dBm/MHz for wideband signals	PASS	Section 7.7
	Radiated Spurious Emissions (LTE Band 26; NR Band n26)	2.1053, 90.691(a)	> 43 + 10 log10(P[Watts]) for all out-of-band emissions except emissions beyond 37.5kHz from the block edge > 50 + 10 log10(P[Watts]) at Band Edge and for all out-of-band emissions within 37.5kHz of Block Edge	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

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Dage 10 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 10 of 64
© 2022 ELEMENT	<u>.</u>		V3.0 1/6/2022



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 shown in Section 7.0 were 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.
- For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is EMC Software Tool V1.0.

FCC ID: A3LSMS918U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 11 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Fage 11 01 04
© 2022 ELEMENT	-	•	V3.0 1/6/2022



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

Test Setup

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



Figure 7-1. Test Instrument & Measurement Setup

Test Notes

- 1. For LTE mode, the device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with 1 RB.
- 2. This unit was tested with its standard battery.
- 3. 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.
- 4. All other conducted power measurements are contained in the RF exposure report for this filing.

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Dage 12 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 12 of 64
© 2022 ELEMENT	·	•	V3.0 1/6/2022



Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]	Conducted Power [Watts]	Conducted Power Limit [dBm]	Margin [dB]
15 MHz	QPSK	26765	821.5	1 / 37	24.57	0.287	50.00	-25.43
	16-QAM	26765	821.5	1 / 37	23.55	0.226	50.00	-26.45
10 MHz	QPSK	26740	819.0	1 / 25	24.78	0.301	50.00	-25.22
	16-QAM	26740	819.0	1 / 25	23.91	0.246	50.00	-26.09
	QPSK	26715	816.5	1 / 12	24.69	0.294	50.00	-25.31
5 MHz	QFOR	26765	821.5	1 / 12	25.00	0.316	50.00	-25.00
	16-QAM	26715	816.5	1 / 12	23.91	0.246	50.00	-26.09
		26765	821.5	1 / 12	24.02	0.252	50.00	-25.98
	QPSK	26705	815.5	1 / 0	24.81	0.303	50.00	-25.19
3 MHz	QFOR	26775	822.5	1 / 7	24.70	0.295	50.00	-25.30
	16-QAM	26705	815.5	1 / 0	23.88	0.245	50.00	-26.12
	10-QAIVI	26775	822.5	1 / 7	23.94	0.248	50.00	-26.06
1.4 MHz	26697	814.7	1/3	24.69	0.294	50.00	-25.31	
	26783	823.3	1/3	24.57	0.287	50.00	-25.43	
	16-QAM	26697	814.7	1/3	23.92	0.247	50.00	-26.08
		26783	823.3	1/3	23.83	0.242	50.00	-26.17

Table 7-2. Conducted Power Output Data (LTE Band 26)

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]	Conducted Power [Watts]	Conducted Power Limit [dBm]	Margin [dB]
	π/2 BPSK	167300	836.5	1 / 53	24.05	0.254	50.00	-25.95
20 MHz	QPSK	167300	836.5	1 / 26	23.96	0.249	50.00	-26.04
	16-QAM	167300	836.5	1 / 53	23.39	0.218	50.00	-26.61
	π/2 BPSK	167300	836.5	1 / 20	24.13	0.259	50.00	-25.87
15 MHz	QPSK	167300	836.5	1 / 20	24.06	0.255	50.00	-25.94
	16-QAM	167300	836.5	1 / 20	23.03	0.201	50.00	-26.97
	π/2 BPSK	167300	836.5	1 / 26	24.00	0.251	50.00	-26.00
10 MHz	QPSK	167300	836.5	1 / 38	24.10	0.257	50.00	-25.90
	16-QAM	167300	836.5	1 / 13	23.10	0.204	50.00	-26.90
	π/2 BPSK	165300	826.5	1 / 6	24.04	0.254	50.00	-25.96
	II/2 DF3K	169300	846.5	1 / 18	24.06	0.255	50.00	-25.94
5 MHz QPS	ODSK	165300	826.5	1 / 12	23.92	0.247	50.00	-26.08
	QF'SK	169300	846.5	1 / 18	23.97	0.249	50.00	-26.03
	16-QAM	165300	826.5	1 / 18	23.46	0.222	50.00	-26.54
		169300	846.5	1 / 6	22.95	0.197	50.00	-27.05

Table 7-3. Conducted Power Output Data (NR Band n26)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Dama 12 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 13 of 64
© 2022 ELEMENT	-	•	V3.0 1/6/2022



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: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Dage 14 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 14 of 64
© 2022 ELEMENT	•		V3.0 1/6/2022



LTE Band 14



Plot 7-1. Occupied Bandwidth Plot (LTE Band 14 - 10MHz QPSK - Full RB)



Plot 7-2. Occupied Bandwidth Plot (LTE Band 14 - 10MHz 16-QAM - Full RB)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 15 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 15 of 64
© 2022 ELEMENT	-	-	V3.0 1/6/2022





Plot 7-3. Occupied Bandwidth Plot (LTE Band 14 - 5MHz QPSK - Full RB)



Plot 7-4. Occupied Bandwidth Plot (LTE Band 14 - 5MHz 16-QAM - Full RB)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Dage 16 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 16 of 64
© 2022 ELEMENT	· · · ·		V3.0 1/6/2022



LTE Band 26



Plot 7-5. Occupied Bandwidth Plot (LTE Band 26 - 15MHz QPSK - Full RB)



Plot 7-6. Occupied Bandwidth Plot (LTE Band 26 - 15MHz 16-QAM - Full RB)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 17 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 17 of 64		
© 2022 ELEMENT		•	V3.0 1/6/2022		





Plot 7-7. Occupied Bandwidth Plot (LTE Band 26 - 10MHz QPSK - Full RB)



Plot 7-8. Occupied Bandwidth Plot (LTE Band 26 - 10MHz 16-QAM - Full RB)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dage 19 of 64	
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 18 of 64	
© 2022 ELEMENT		·	V3.0 1/6/2022	



Keysight Spectrum Analyzer - Occup	oied BW				
ί χα R L RF 50 Ω	TI	SENSE:INT Senter Freq: 816.500000 MHz rig: Free Run Avg H Atten: 36 dB			Trace/Detector
10 dB/div Ref 40.00	dBm				
20.0	, and the second s	and a second			Clear Write
10.0 10.0 -10.0 -20.0	mm		how was a start of the	and the second state	Average
-30.0 -40.0 -50.0					Max Hold
Center 816.500 MHz Res BW 120 kHz		#VBW 390 kHz	Sw	12.50 MHz eep 1 ms	Min Hold
Occupied Bandw	vidth 4.5663 MHz	Total Power	32.8 dBm		Detector Peak▶
Transmit Freq Erro x dB Bandwidth	r -1.222 kHz 5.250 MHz		wer 99.00 % -26.00 dB		Auto <u>Man</u>
MSG			STATUS		

Plot 7-9. Occupied Bandwidth Plot (LTE Band 26 - 5MHz QPSK - Full RB)



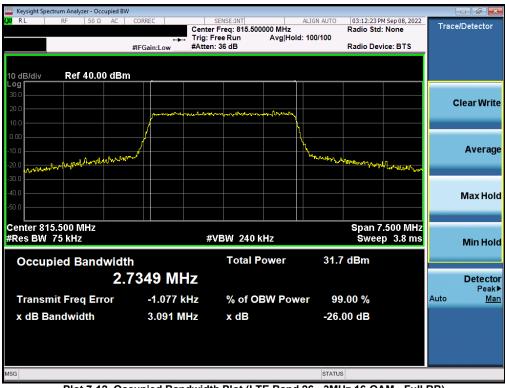
Plot 7-10. Occupied Bandwidth Plot (LTE Band 26 - 5MHz 16-QAM - Full RB)

FCC ID: A3LSMS918U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 19 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Fage 19 01 04
© 2022 ELEMENT	•		V3.0 1/6/2022





Plot 7-11. Occupied Bandwidth Plot (LTE Band 26 - 3MHz QPSK - Full RB)



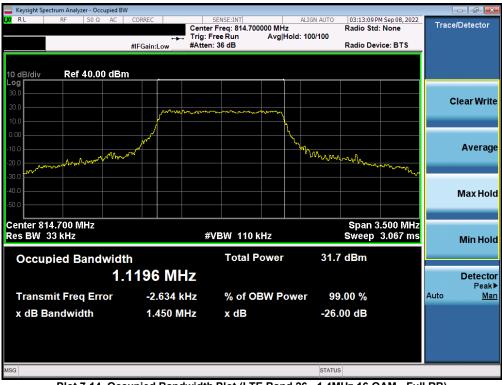
Plot 7-12. Occupied Bandwidth Plot (LTE Band 26 - 3MHz 16-QAM - Full RB)

FCC ID: A3LSMS918U		Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 20 of 64		
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Plot 7-13. Occupied Bandwidth Plot (LTE Band 26 - 1.4MHz QPSK - Full RB)



Plot 7-14. Occupied Bandwidth Plot (LTE Band 26 - 1.4MHz 16-QAM - Full RB)

FCC ID: A3LSMS918U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 21 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 21 of 64
© 2022 ELEMENT		•	V3.0 1/6/2022



NR Band n26

Occupied		+								₽	Trace	▼
L	GHT Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corr CCorr RCal Freq Ref: Int (S) NFE: Off	Atten: 36 dB µW Path: Standa	rd Gate:	ree Run Off ain: Low		Center Freq Avg Hold: 1 Radio Std: 1		MHz	Trace Type Clear /		Trace Control
1 Graph		NFL. UI								Trace	Average	Detector
Log 🖂	v 10.0 dB	F	Ref Value 40.00	dBm						Max H	old	
30.0 20.0 10.0		prove the wo	er for an all and a second	- man an a	-	\				Min Ho	bld	
0.00 -10.0 -20.0						ľ				Restart	Max Hold	
-30.0	Ayon of the state					-	Marine from	- Marthallon	Andrew and a failed			
Center 8	24.00 MHz 470.00 kHz	#\	/ideo BW 1.200	0 MHz			Sw	Si Si Si	pan 50 MHz s (1001 pts)			
2 Metrics	•											
	Occupied Bandwidth 17.9	40 MHz		Total	Power			30.6 dE	3m			
	Transmit Freq Error x dB Bandwidth	-544.61 kH: 19.12 MH:			OBW Pc	owe	۲.	99.00 -26.00	%			
EĽ	ってし	Sep 15, 2022 12:27:01 PM										

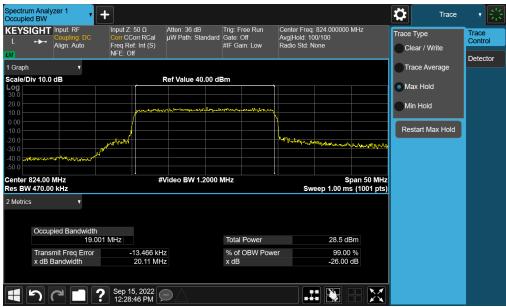
Plot 7-15. Occupied Bandwidth Plot (NR Band n26- 20MHz π/2 BPSK - Full RB)

Spectrum Analy Occupied BW	yzer 1 🔻	+								₽	Trace	- * 张
	Input: RF Coupling: DC Align: Auto	Input Z: 5 Corr CCor Freq Ref: NFE: Off	rr RCal	Atten: 36 dB JW Path: Standa	rd Gate:	ree Run Off ain: Low	Center Freq Avg Hold: 10 Radio Std: N		MHz	Trace Type Clear / W	/rite	Trace Control
1 Graph	•									Trace Av	erage	
Scale/Div 10.0	dB		R	ef Value 40.00	dBm	,,				Max Hold	4	
Log 30.0												
20.0			And the former of the second second	n marganest at all on	manyal	manning				Min Hold		
0.00		/					}			Restart M	av Hold	
-10.0		walne					holin the second			Restart M		
-30.0		Part of the second s					1 1.1.1.1.1.1	hand have	ann-consolytily			
-40.0 -50.0	and a second											
Center 824.00			#Vi	deo BW 1.200	0 MHz				pan 50 MHz			
Res BW 470.00	0 kHz						Sw	eep 1.00 m	s (1001 pts)			
2 Metrics	•											
Occup	pied Bandwidth				T -4-1	Power		00.5 -1	D			
Trene	mit Freq Error	977 MHz	5.580 kHz			OBW Powe		28.5 dl 99.00				
	Bandwidth		0.16 MHz		x dB	OBW POW		-26.00				
	C	? Sep 15, 12:28:1	2022 5 PM									

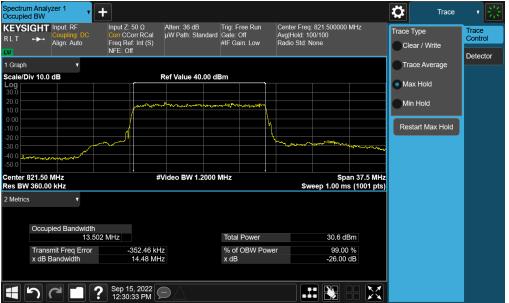
Plot 7-16. Occupied Bandwidth Plot (NR Band n26- 20MHz QPSK - Full RB)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dega 22 of 64	
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 22 of 64	
© 2022 ELEMENT	·		V3.0 1/6/2022	





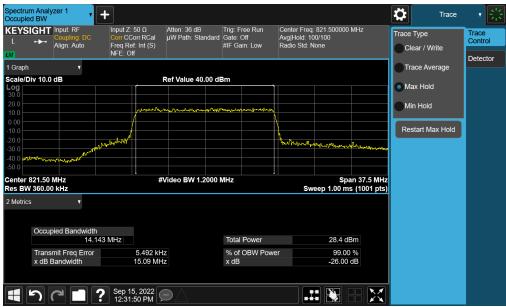
Plot 7-17. Occupied Bandwidth Plot (NR Band n26- 20MHz 16-QAM - Full RB)



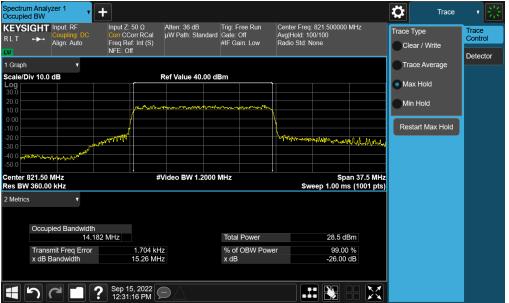
Plot 7-18. Occupied Bandwidth Plot (NR Band n26- 15MHz π/2 BPSK - Full RB)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 22 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 23 of 64		
© 2022 ELEMENT			V3.0 1/6/2022		





Plot 7-19. Occupied Bandwidth Plot (NR Band n26- 15MHz QPSK - Full RB)



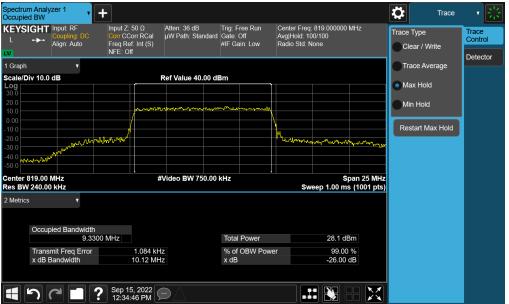
Plot 7-20. Occupied Bandwidth Plot (NR Band n26- 15MHz 16-QAM - Full RB)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 24 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 24 of 64		
© 2022 ELEMENT		•	V3.0 1/6/2022		





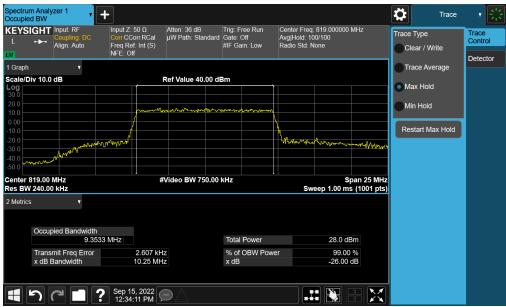
Plot 7-21. Occupied Bandwidth Plot (NR Band n26- 10MHz π/2 BPSK - Full RB)



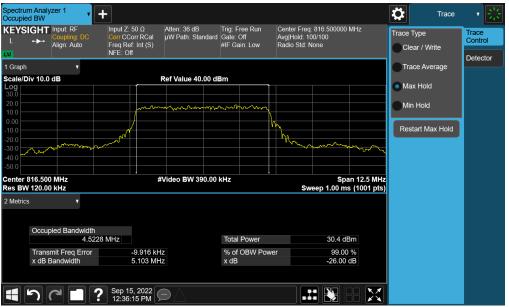
Plot 7-22. Occupied Bandwidth Plot (NR Band n26- 10MHz QPSK - Full RB)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dama 25 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 25 of 64		
© 2022 ELEMENT	·	•	V3.0 1/6/2022		





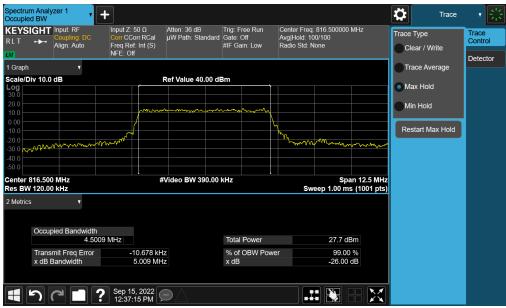
Plot 7-23. Occupied Bandwidth Plot (NR Band n26- 10MHz 16-QAM - Full RB)



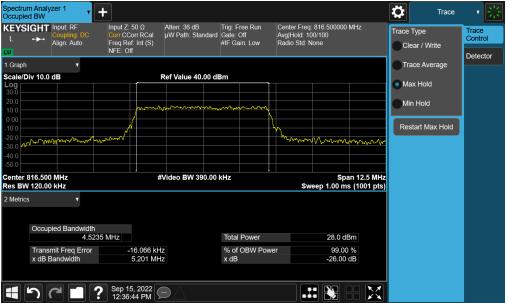
Plot 7-24. Occupied Bandwidth Plot (NR Band n26- 5MHz π/2 BPSK - Full RB)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 26 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 26 of 64		
© 2022 ELEMENT	·		V3.0 1/6/2022		





Plot 7-25. Occupied Bandwidth Plot (NR Band n26- 5MHz QPSK - Full RB)



Plot 7-26. Occupied Bandwidth Plot (NR Band n26- 5MHz 16-QAM - Full RB)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Page 27 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 27 01 64		
© 2022 ELEMENT			V3.0 1/6/2022		



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.

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. RBW ≥ 100kHz
- 3. VBW \geq 3 x RBW
- 4. Detector = RMS
- 5. Trace mode = max hold
- 6. Sweep time = auto couple
- 7. The trace was allowed to stabilize

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 22H and 90, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.
- 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.

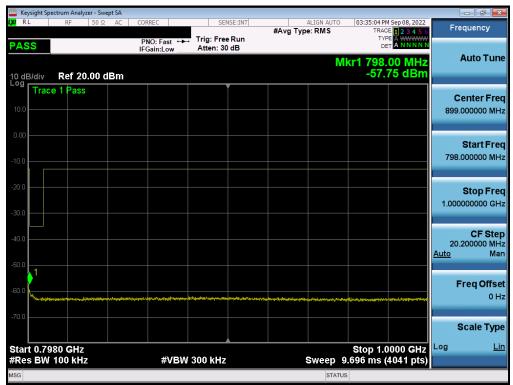
FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dega 29 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 28 of 64		
© 2022 ELEMENT	•		V3.0 1/6/2022		



LTE Band 14

	ectrum Analy:		ot SA										
LXI RL	RF	50 Ω	AC	CORREC		SEI	NSE:INT	#Avg Typ	ALIGN AUTO		M Sep 08, 2022 E 1 2 3 4 5 6	F	requency
PASS				PNO: I IFGain	ast ↔ Low	Trig: Free Atten: 30		#/(18/)P		TY D			
10 dB/div Log	Ref 20	.00 di	Bm						M	kr1 787 -57.	.95 MHz 07 dBm		Auto Tune
10.0 Trac	e 1 Pass												Center Freq 9.000000 MHz
-10.0												3	Start Freq 0.000000 MHz
-20.0												78	Stop Freq B.000000 MHz
-40.0												7! <u>Auto</u>	CF Step 5.800000 MHz Man
-60.0		the spand			, e a deservation				in the second				Freq Offset 0 Hz
-70.0													Scale Type
Start 30.0										Stop 7	88.0 MHz	Log	Lin
#Res BW	100 KHz	-			#VBW	300 kHz		s			5161 pts)		
MSG									STATUS				

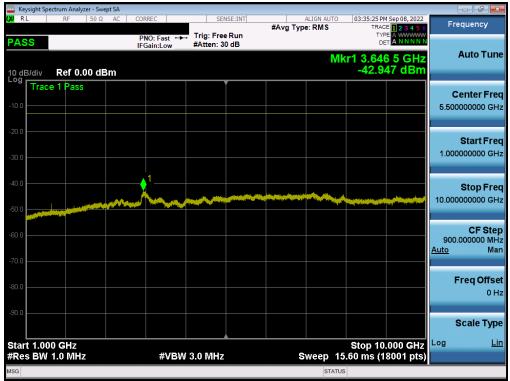
Plot 7-27. Conducted Spurious Plot (LTE Band 14 - 10MHz QPSK - RB Size 1, RB Offset 0)



Plot 7-28. Conducted Spurious Plot (LTE Band 14 - 10MHz QPSK - RB Size 1, RB Offset 0)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 64	
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 29 of 64	
© 2022 ELEMENT			V3.0 1/6/2022	





Plot 7-29. Conducted Spurious Plot (LTE Band 14 - 10MHz QPSK - RB Size 1, RB Offset 0)

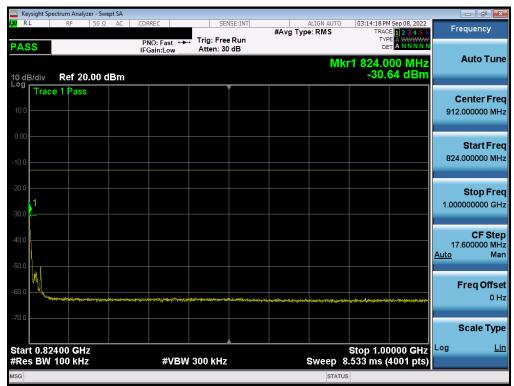
FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 30 of 64		
© 2022 ELEMENT	·	·	V3.0 1/6/2022		



LTE Band 26

	ectrum Analyzer -						
X/RL	RF 5	ΩΩ AC	CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	03:14:09 PM Sep 08, 2022 TRACE 1 2 3 4 5 6	Frequency
PASS			PNO: Fast ↔→ IFGain:Low	Trig: Free Run Atten: 30 dB		TYPE A WWWWW DET A NNNNN	
10 dB/div	Ref 20.0	0 dBm			Mkr	1 813.960 8 MHz -49.40 dBm	Auto Tune
Log Trac	e 1 Pass						Center Freq
10.0							422.000000 MHz
0.00							
							Start Freq
-10.0							30.000000 MHz
-20.0							Stop Freq
							814.000000 MHz
-30.0							
-40.0							CF Step 78.400000 MHz
59.9						1	<u>Auto</u> Man
-50.0							
-60.0							Freq Offset 0 Hz
-70.0				ter all a second and a second as a			
							Scale Type
Start 30.0						Stop 8 14.0 Miliz	Log <u>Lin</u>
#Res BW			#VBW	300 kHz	Sweep 3	7.33 ms (20001 pts)	
MSG					STATU	JS	

Plot 7-30. Conducted Spurious Plot (LTE Band 26 - 15MHz QPSK - RB Size 1, RB Offset 0)



Plot 7-31. Conducted Spurious Plot (LTE Band 26 - 15MHz QPSK - RB Size 1, RB Offset 0)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 21 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 31 of 64		
© 2022 ELEMENT		•	V3.0 1/6/2022		



	rum Analyzer - Sw										X
LXI RL	RF 50 Ω	AC O	ORREC	SEN	NSE:INT	#Avg Typ	ALIGN AUTO e: RMS		M Sep 08, 2022	Frequency	
PASS			PNO: Fast ↔ FGain:Low	Trig: Free #Atten: 3		• ,,		TY			
10 dB/div Log	Ref 0.00 di	Bm					MI	(r1 3.65 -43.0	6 5 GHz 57 dBm	Auto Tu	une
-10.0	1 Pass									Center F 5.500000000	
-20.0										Start F 1.000000000 (
-40.0							^	Announce the second sec		Stop F 10.0000000000	
-60.0										CF S 900.000000 M <u>Auto</u>	
-80.0										Freq Off ر	fset 0 Hz
-90.0										Scale Ty	ype Lin
Start 1.000 #Res BW 1			#VBW	3.0 MHz		s	weep 1	Stop 10 5.60 ms (1	.000 GHz 8001 pts)		<u>LII</u>
MSG							STATU	5			

Plot 7-32. Conducted Spurious Plot (LTE Band 26 - 15MHz QPSK - RB Size 1, RB Offset 0)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dere 22 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 32 of 64		
© 2022 ELEMENT	·		V3.0 1/6/2022		



NR Band n26



Plot 7-33. Conducted Spurious Plot (NR Band n26 - 20MHz QPSK - RB Size 1, RB Offset 0)

KEYSIGHT Input RF RL T Input Z 50 Ω Align: Auto Input Z 50 Ω Freq Ref. Int (S) NFE: Off Atten: 30 dB µW Path. Standard Gate. Off IS gate. Off PNO. Fast. Tig. Free Run #Avg Type. Power (RMS] 2 3 4 5 6 Tig. Free Run Center Frequency 913.000000 MHz 1 Spectrum NFE: Off Isge Level 20.00 dBm Mkr1 826.00 MHz Swept Span	Settings
1 Spectrum Mkr1 826.00 MHz 174.000000 MHz	
10.0 Full Span	
0.00 Start Freq 826.00000 MHz Stop Freq	
-20.0 1.00000000 GHz	
-40.0 CF Step 17.40000 MHz	
-70.0	
Start 0.82600 GHz #Video BW 300 kHz Stop 1.00000 GHz Log #Res BW 100 kHz Sweep 8.27 ms (4001 pts) Log Lin Image: Sep 15, 2022 Imag	

Plot 7-34. Conducted Spurious Plot (NR Band n26 - 20MHz QPSK - RB Size 1, RB Offset 0)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dama 22 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 33 of 64		
© 2022 ELEMENT	•		V3.0 1/6/2022		





Plot 7-35. Conducted Spurious Plot (NR Band n26 - 20MHz QPSK - RB Size 1, RB Offset 0)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Dega 24 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 34 of 64
© 2022 ELEMENT			V3.0 1/6/2022



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.

For LTE B26 operation under Part 90.691, the minimum permissible attenuation level of any spurious emission removed from the EA licensee's frequency block by greater than 37.5 kHz is $43 + 10\log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts. The minimum permissible attenuation level of any spurious emission removed from the EA licensee's frequency block by up to and including 37.5 kHz is $50 + 10\log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

For LTE Band 14 operation under Part 90.543, the power of any emission must be reduced below the mean output power (P) by at least 43 + 10log (P) dB measured in a 100 kHz bandwidth for frequencies less than 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.

Additionally, for LTE Band 14 operation, on all frequencies between 769-775 MHz and 799-805 MHz, the power of any emission shall be attenuated by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

Test Procedure Used

ANSI C63.26-2015 – Section 5.7.3

Test Settings

- 1. Span was set large enough so as to capture all out of band emissions near the band edge
- 2. RBW = 100 kHz
- 3. VBW = 300 kHz
- 4. Detector = RMS
- 5. Trace mode = trace average
- 6. Sweep time = auto couple
- 7. 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: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N:	Test Dates:	EUT Type:	Dere 25 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 35 of 64
© 2022 ELEMENT	•		V3.0 1/6/2022



Test Notes

- 1. For channel edge emission, the signal analyzer's "ACP" measurement capability is used.
- 2. Per 22.917(b) in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.
- 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: A3LSMS918U	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 26 of 64
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 36 of 64
© 2022 ELEMENT		•	V3.0 1/6/2022



LTE Band 14



Plot 7-36. Lower Band Edge Plot (LTE Band 14, 10MHz QPSK - RB Size 50)



Plot 7-37. Lower Emission Mask Plot (LTE Band 14, 10MHz QPSK - RB Size 50)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 27 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 37 of 64		
© 2022 ELEMENT		•	V3.0 1/6/2022		



Keysight Spectro											
X/RL	RF 50	Ω AC	CORREC	SE	NSE:INT	#Avg Typ	ALIGN AUTO		E 1 2 3 4 5 6	F	requency
PASS			PNO: Wide ↔ IFGain:Low	Atten: 3				TYP DE			
10 dB/div	Ref 25.00	dBm					Mk	r1 798.0 -28.	26 MHz 50 dBm		Auto Tune
Trace ⁻	Pass				Í						Center Freq
15.0										79	3.000000 MHz
5.00		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~									Start Freq
-5.00			\mathbf{h}							79	7.000000 MHz
-15.0			<u></u>								Stop Freq
-25.0			Mr. A	۸	1					79	9.000000 MHz
			W	Am	~~~~						CF Step
-35.0										<u>Auto</u>	200.000 kH: Mar
-45.0											
-55.0											Freq Offse 0 Hz
-65.0											
											Scale Type
Center 798. #Res BW 10			#VBV	V 300 kHz			Sween	Span 2. 1.000 ms (.000 MHz 1001 pts)	Log	Lir
ISG							STATU		reo i pioj		

Plot 7-38. Upper Band Edge Plot (LTE Band 14, 10MHz QPSK - RB Size 50)



Plot 7-39. Upper Emission Mask Plot (LTE Band 14, 10MHz QPSK - RB Size 50)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Page 38 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 36 01 64		
© 2022 ELEMENT			V3.0 1/6/2022		



Keysight Spec													
LXI RL	RF	50 Ω	AC	CORREC		SEI	ISE:INT	#Avg Typ	ALIGN AUTO		1 Sep 08, 2022 E 1 2 3 4 5 6	F	requency
PASS				PNO: W IFGain:	lide ↔ Low	Trig: Free #Atten: 3				TYP			
10 dB/div Log	Ref 25	.00 dl	Bm						Mk	r1 787.9 -22.	96 MHz 09 dBm		Auto Tune
15.0	1 Pass												Center Freq 8.000000 MHz
-5.00												78	Start Freq 6.000000 MHz
-15.0						~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1					79	Stop Freq 0.000000 MHz
-35.0	mmnm		yw~~~y	when	www							<u>Auto</u>	CF Step 400.000 kHz Man
-55.0													Freq Offset 0 Hz
-65.0													Scale Type
Center 788 #Res BW 1					#VBW	300 kHz			Sweep 2	Span 4	.000 MHz 1001 pts)	Log	Lin
MSG									STATUS		ine proj		

Plot 7-40. Lower Band Edge Plot (LTE Band 14, 5MHz QPSK - RB Size 25)



Plot 7-41. Lower Emission Mask Plot (LTE Band 14, 5MHz QPSK - RB Size 25)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 39 of 64		
© 2022 ELEMENT	•	•	V3.0 1/6/2022		





Plot 7-42. Upper Band Edge Plot (LTE Band 14, 5MHz QPSK - RB Size 25)



Plot 7-43. Upper Emission Mask Plot (LTE Band 14, 5MHz QPSK - RB Size 25)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Page 40 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 40 01 64		
© 2022 ELEMENT	•	•	V3.0 1/6/2022		



LTE Band 26

Keysight Spectrum		P.											
LXI RL	RF 50 Ω	AC	CORREC			NSE:INT		ALIGN AUT		:17:20 PM	Sep 08, 2022	F	requency
					Talas Das	req: 821.5000 e Run		I· 100/100		alo Sta: I	None		
PASS			IFGain:		#Atten: 3		, angli tere			dio Devid	e: BTS		
10 dB/div	Ref 25.0	0 dBm	1										
Log 15.0													
			ļ		23.5	dBm		ļ.					Center Freq
5.00												821	1.500000 MHz
-5.00													
-15.0													
-25.0			. /				1	Anna -			RMS AVG		
-35.0		and and a second	~~					mm	manna	the second second	and have not the		
-45.0	<i>س</i> ر کر												
-55.0	Store State												
Server Server	m												
-65.0													
Center 821.5								#		non 97	50 MILL-		
#Res BW 10					44\/E	3W 300 k	u.,		0		7.50 MHz p 20 ms		CF Step
#Res DW TU					#VE	SAA DOOK	ΠZ			Sweet	J 201115		3.750000 MHz
Total Carrier	Power	23.502	2 dBm/ 1	5.00 MH	Z	ACP-I	BW					<u>Auto</u>	Man
							١٥	wer	U	pper			
Carrier Powe	er		Filter	Offse	et Freg	Integ BW	dBc	dBm	dBc	dBm	Filter		Freq Offset
1 23 502	dBm / 15.0	0 MHz	-3 dB		0.0 Hz	37.50 kHz	-59.30	-35.80		-35.75			0 Hz
20.002		-0-101112	o ab		0 kHz	100.0 kHz		-32.17		-31.83			0112
				07.5		100.0 KHZ	00.01	02.11	00.00	51.00	-0 00		
MSG	G												
								517					

Plot 7-44. Channel Edge Plot (LTE Band 26 - 15MHz QPSK - Mid Channel)



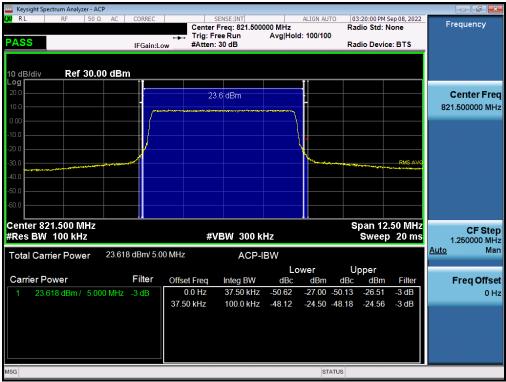
Plot 7-45. Channel Edge Plot (LTE Band 26 - 10MHz QPSK - Mid Channel)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dame 41 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 41 of 64		
© 2022 ELEMENT	·	•	V3.0 1/6/2022		



🧱 Keysight Spectrum Analyzer - ACP									×
XX RL RF 50Ω AC	CORREC		NSE:INT reg: 816.5000	00 MHz	ALIGN AUTO	03:19:17 PM Radio Std:	Sep 08, 2022	Frequency	
B 4 6 6	↔	Trig: Free	e Run	Avg Hold	I: 100/100				
PASS	IFGain:Low	#Atten: 3	0 dB			Radio Devi	ce: BTS		
10 dB/div Ref 30.00 dBn	n								
20.0								Center Fre	
10.0		23.0	dBm		1			816.500000 M	
0.00				munny				810.500000 Mil	
-10.0									
-20.0	1						RMS AVG		
-30.0							RMS AVG		
-40.0									
-50.0									
-60.0									
Center 816.500 MHz						Span 11	2.50 MHz		
#Res BW 100 kHz		#VE	300 ki	Hz			p 20 ms	CF Ste 1.250000 MI	
Total Carrier Power 23.626	6 dBm/ 5.00 MH:	Z	ACP-II	BW					lan
				Lo	wer	Upper			
Carrier Power	Filter Offs	set Freq	Integ BW	dBc	dBm d	lBc dBm	Filter	Freq Offs	set
1 23.626 dBm / 5.000 MHz	o ab	0.0 Hz	37.50 kHz	-51.04	-27.42 -51			01	Hz
	37.	50 kHz	100.0 kHz	-48.18	-24.56 -47	.70 -24.07	-3 dB		
MSG					STATUS				

Plot 7-46. Channel Edge Plot (LTE Band 26 - 5MHz QPSK - Low Channel)



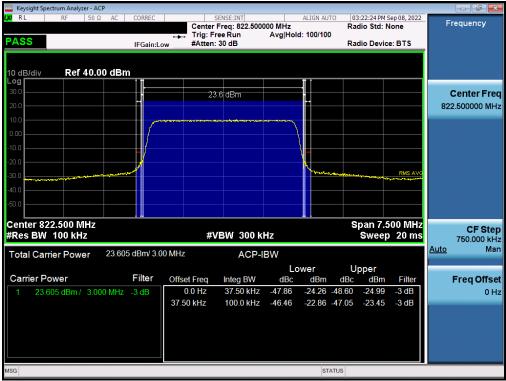
Plot 7-47. Channel Edge Plot (LTE Band 26 - 5MHz QPSK - High Channel)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Page 42 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 42 01 64		
© 2022 ELEMENT			V3.0 1/6/2022		



🔤 Keysight Spectrum Analyzer - ACP				
XX RL RF 50Ω AC CORREC	Center Freq: 815.5000	ALIGN AUTO 000 MHz Avg Hold: 100/100	03:21:08 PM Sep 08, 2022 Radio Std: None	Frequency
IFGain:Lo	w #Atten: 30 dB		Radio Device: BTS	
10 dB/div Ref 40.00 dBm				
Log 30.0	23.6 dBm			Center Free
20.0 *	23.0 dbm			815.500000 MH;
10.0				
0.00				
-10.0				
-20.0		¥		
-30.0		and the form	RMS AVG	
-40.0				
-50.0				
Center 815.500 MHz			Span 7.500 MHz	
#Res BW 100 kHz	#VBW_300 ki	Hz	Sweep 20 ms	CF Stej 750.000 kH
Total Carrier Power 23.603 dBm/ 3.0	0 MHz ACP-II	BW		<u>Auto</u> Ma
- "		Lower	Upper	
Carrier Power Filter	Offset Freq Integ BW 0.0 Hz 37.50 kHz	dBc dBm d	Bc dBm Filter 22 -24.61 -3 dB	FreqOffse
1 23.603 dBm / 3.000 MHz -3 dB	37.50 kHz 100.0 kHz			0 H
ISG		STATUS		

Plot 7-48. Channel Edge Plot (LTE Band 26 - 3MHz QPSK - Low Channel)



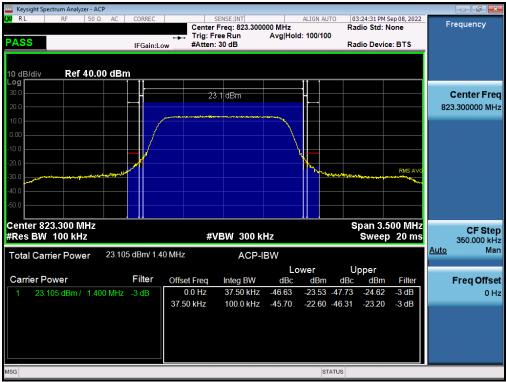
Plot 7-49. Channel Edge Plot (LTE Band 26 - 3MHz QPSK - High Channel)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Page 43 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 43 01 64		
© 2022 ELEMENT	-		V3.0 1/6/2022		



🤤 Keysight Spectrum Analyzer - ACP									
LXI RL RF 50 Ω AC	CORREC		ENSE:INT Freg: 814.7000		ALIGN AUTO	03:23:27 P Radio Std	M Sep 08, 2022	Fr	equency
PASS		+++ Trig: Fre	ee Run		d: 100/100				
FASS	IFGain:Low	#Atten:	30 dB			Radio Dev	ice: BTS		
10 dB/div Ref 40.00 dBr	n 				•• •				
30.0	L j		0 dBm						Center Freq
20.0		23.	o ubin		Ĩ⊸				.700000 MHz
10.0			~~~~					01-	
0.00									
-10.0									
					\				
-20.0	4 M P				Marrie Warren	m	RMS AVG		
-30.0							and the second s		
-40.0									
-50.0									
Center 814.700 MHz	i ii				11 1	Snan 3	.500 MHz		
#Res BW 100 kHz		#V	BW 300 kl	Hz			ep 20 ms		CF Step 350.000 kHz
Total Carrier Power 23.04	1 dBm/ 1.40 l	MHz	ACP-II	BW				<u>Auto</u>	Man
				Lo	wer	Upper			
Carrier Power	Filter	Offset Freq	Integ BW	dBc	dBm	dBc dBr			Freq Offset
1 23.041 dBm / 1.400 MHz		0.0 Hz	37.50 kHz	-46.06	-23.02 -4				0 Hz
		37.50 kHz	100.0 kHz	-44.81	-21.77 -4	5.02 -21.9	8 -3 dB		
MSG					STAT	US			

Plot 7-50. Channel Edge Plot (LTE Band 26 - 1.4MHz QPSK - Low Channel)

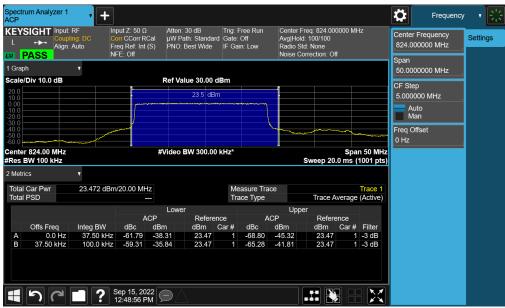


Plot 7-51. Channel Edge Plot (LTE Band 26 - 1.4MHz QPSK - High Channel)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 44 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 44 of 64		
© 2022 ELEMENT	·		V3.0 1/6/2022		



NR Band n26



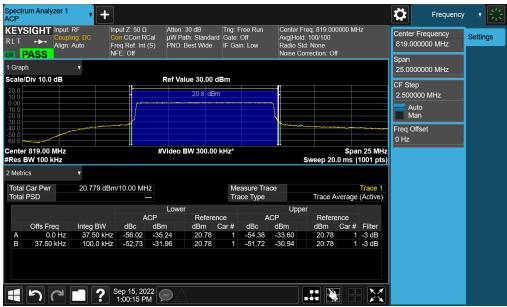
Plot 7-52. Channel Edge Plot (NR Band n26 - 20MHz DFT-s $\pi/2$ BPSK - Mid Channel)

Spect ACP	rum Analyzer	1 • +											Frequenc	y , 崇
RLT	Aliq	ut: RF upling: DC jn: Auto	Input Z: 50 Ω Corr CCorr RC Freq Ref: Int (NFE: Off	al µW Pa	30 dB ath: Standard Best Wide	Trig: Fro I Gate: C IF Gain	lff	Avg Hol Radio S	Freq: 821.50 d: 100/100 td: None orrection: Of		z		Frequency 00000 MHz	Settings
1 Gra		•	NFE. UI					NOISE C	orrection. Or			Span 37.500	00000 MHz	J
20.0 10.0	e/Div 10.0 dB			Ref Va	23.4 dBn							CF Ste 3.7500	р)00 MHz	
0.00 -10.0 -20.0 -30.0												AL Ma	ito an	
-40.0 -50.0 -60.0									~~~~		~~~~~	Freq O 0 Hz	ffset	
#Res	er 821.50 MH BW 100 kHz			#Video	BW 300.00	kHz*			Sweep 20		37.5 MHz 001 pts)			
2 Met	il Car Pwr	23.433 dE	sm/15.00 MH	z		Mea	sure Trac	e			Trace 1			
Tota	I PSD		-	-		Trac	е Туре			verage	(Active)			
			Δ	Lowe CP	r Referen	ice.	A	Upp P	er Refere	ence				
	Offs Freq	Integ BW	dBc	dBm	dBm	Car#	dBc	dBm	dBm	Car #				
AB	0.0 H 37.50 kH			-36.35 -32.03	23.43 23.43		-64.78 -61.47	-41.35 -38.03	23.43 23.43		-3 dB -3 dB			
			Sep 15, 202	22 /										

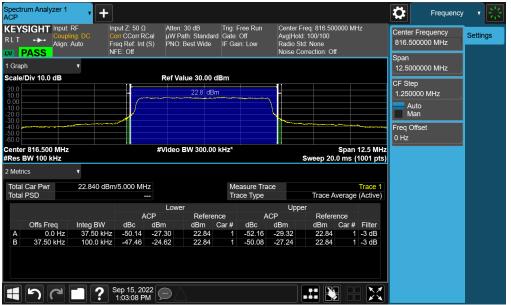
Plot 7-53. Channel Edge Plot (NR Band n26 - 15MHz DFT-s π/2 BPSK - Mid Channel)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dage 45 of 64	
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 45 of 64	
© 2022 ELEMENT			V3.0 1/6/2022	





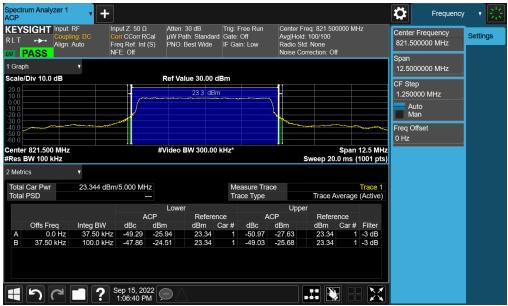
Plot 7-54. Channel Edge Plot (NR Band n26 - 10MHz CP QPSK - Mid Channel)



Plot 7-55. Channel Edge Plot (NR Band n26 - 5MHz DFT-s QPSK - Low Channel)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 46 of 64		
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 46 of 64		
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Plot 7-56. Channel Edge Plot (NR Band n26 - 5MHz DFT-s π/2 BPSK - High Channel)

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Page 47 of 64	
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset		
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7.6 Radiated Power (ERP)

Test Overview

Effective Radiated Power (ERP) 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

- 1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
- 2. RBW = 1 5% of the expected OBW
- 3. VBW \geq 3 x RBW
- 4. Span = 1.5 times the OBW
- 5. No. of sweep points \geq 2 x span / RBW
- 6. Detector = RMS
- 7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
- 8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
- 9. Trace mode = trace averaging (RMS) over 100 sweeps
- 10. The trace was allowed to stabilize.

FCC ID: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dage 49 of 64	
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 48 of 64	
© 2022 ELEMENT	·	•	V3.0 1/6/2022	

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

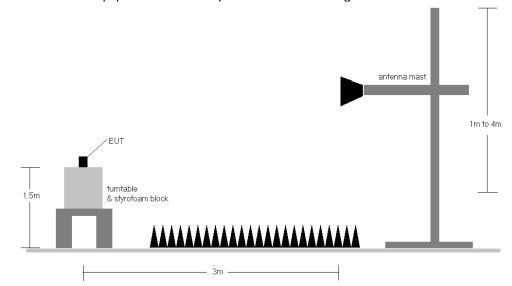


Figure 7-5. Radiated Test Setup <1GHz

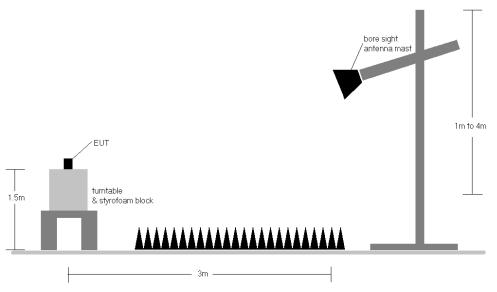


Figure 7-6. Radiated Test Setup > 1GHz

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: A3LSMS918U		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dogo 40 of 64	
1M2209010098-11.A3L	9/8/2022 - 11/6/2022	Portable Handset	Page 49 of 64	
© 2022 ELEMENT	·		V3.0 1/6/2022	