



ELEMENT WASHINGTON DC LLC

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PART 24 MEASUREMENT REPORT

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

Date of Testing:
11/7/2023 - 12/29/2023
Test Report Issue Date:
12/29/2023
Test Site/Location:
Element lab., Columbia, MD, USA
Test Report Serial No.:
1M2311010111-03.A3L

FCC ID:	A3LSMA356U
Applicant Name:	Samsung Electronics Co., Ltd.

Application Type:	Certification
Model:	SM-A356U
Additional Model(s):	SM-A356U1, SM-S356V
EUT Type:	Portable Handset
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part:	24
Test Procedure(s):	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.

RJ Ortanez
Executive Vice President



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Antenna-1						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
GSM/GPRS	N/A	GMSK	1850.2 - 1909.8	1.136	30.56	244KGXW
EDGE	N/A	8-PSK	1850.2 - 1909.8	0.403	26.06	245KG7W
MA	N/A	Spread Spectrum	1852.4 - 1907.6	0.282	24.50	4M19F9W
LTE Band 25/2	20 MHz	QPSK	1860 - 1905	0.264	24.22	18M0G7D
		16QAM	1860 - 1905	0.216	23.35	18M0W7D
	15 MHz	QPSK	1857.5 - 1907.5	0.262	24.18	13M5G7D
		16QAM	1857.5 - 1907.5	0.207	23.15	13M5W7D
	10 MHz	QPSK	1855 - 1910	0.261	24.17	9M05G7D
		16QAM	1855 - 1910	0.217	23.36	9M04W7D
	5 MHz	QPSK	1852.5 - 1912.5	0.274	24.37	4M56G7D
		16QAM	1852.5 - 1912.5	0.210	23.22	4M54W7D
	3 MHz	QPSK	1851.5 - 1913.5	0.264	24.21	2M73G7D
		16QAM	1851.5 - 1913.5	0.222	23.46	2M73W7D
	1.4 MHz	QPSK	1850.7 - 1914.3	0.260	24.15	1M10G7D
		16QAM	1850.7 - 1914.3	0.209	23.21	1M10W7D
NR Band n25/2	40 MHz	$\pi/2$ BPSK	1870 - 1895	0.227	23.56	39M0G7D
		QPSK	1870 - 1895	0.224	23.50	38M8G7D
		16QAM	1870 - 1895	0.177	22.49	38M8W7D
	30 MHz	$\pi/2$ BPSK	1865 - 1900	0.237	23.75	28M8G7D
		QPSK	1865 - 1900	0.228	23.58	28M9G7D
		16QAM	1865 - 1900	0.191	22.82	28M8W7D
	25 MHz	$\pi/2$ BPSK	1862.5 - 1902.5	0.235	23.71	23M1G7D
		QPSK	1862.5 - 1902.5	0.227	23.57	23M9G7D
		16QAM	1862.5 - 1902.5	0.182	22.61	24M0W7D
	20 MHz	$\pi/2$ BPSK	1860 - 1905	0.236	23.74	18M0G7D
		QPSK	1860 - 1905	0.220	23.42	19M1G7D
		16QAM	1860 - 1905	0.177	22.47	19M0W7D
	15 MHz	$\pi/2$ BPSK	1857.5 - 1907.5	0.233	23.67	13M5G7D
		QPSK	1857.5 - 1907.5	0.222	23.46	14M2G7D
		16QAM	1857.5 - 1907.5	0.180	22.54	14M2W7D
	10 MHz	$\pi/2$ BPSK	1855 - 1910	0.235	23.71	9M02G7D
		QPSK	1855 - 1910	0.232	23.65	9M36G7D
		16QAM	1855 - 1910	0.184	22.65	9M39W7D
5 MHz	$\pi/2$ BPSK	1852.5 - 1912.5	0.231	23.64	4M55G7D	
	QPSK	1852.5 - 1912.5	0.219	23.41	4M54G7D	
	16QAM	1852.5 - 1912.5	0.170	22.30	4M54W7D	

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Antenna-2						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
LTE Band 25/2	20 MHz	QPSK	1860 - 1905	0.111	20.46	18M0G7D
		16QAM	1860 - 1905	0.093	19.66	18M1W7D
	15 MHz	QPSK	1857.5 - 1907.5	0.114	20.56	13M5G7D
		16QAM	1857.5 - 1907.5	0.092	19.65	13M5W7D
	10 MHz	QPSK	1855 - 1910	0.114	20.57	9M10G7D
		16QAM	1855 - 1910	0.094	19.71	9M09W7D
	5 MHz	QPSK	1852.5 - 1912.5	0.114	20.56	4M57G7D
		16QAM	1852.5 - 1912.5	0.090	19.56	4M57W7D
	3 MHz	QPSK	1851.5 - 1913.5	0.112	20.47	2M73G7D
		16QAM	1851.5 - 1913.5	0.091	19.59	2M74W7D
	1.4 MHz	QPSK	1850.7 - 1914.3	0.108	20.35	1M10G7D
		16QAM	1850.7 - 1914.3	0.093	19.68	1M11W7D
NR Band n25/2	40 MHz	$\pi/2$ BPSK	1870 - 1895	0.123	20.89	38M8G7D
		QPSK	1870 - 1895	0.124	20.92	39M7G7D
		16QAM	1870 - 1895	0.097	19.87	38M7W7D
	30 MHz	$\pi/2$ BPSK	1865 - 1900	0.127	21.02	28M8G7D
		QPSK	1865 - 1900	0.124	20.93	28M9G7D
		16QAM	1865 - 1900	0.096	19.83	28M7W7D
	25 MHz	$\pi/2$ BPSK	1862.5 - 1902.5	0.126	20.99	23M0G7D
		QPSK	1862.5 - 1902.5	0.124	20.93	23M9G7D
		16QAM	1862.5 - 1902.5	0.100	19.99	23M9W7D
	20 MHz	$\pi/2$ BPSK	1860 - 1905	0.126	21.02	18M0G7D
		QPSK	1860 - 1905	0.124	20.95	19M0G7D
		16QAM	1860 - 1905	0.094	19.72	19M1W7D
	15 MHz	$\pi/2$ BPSK	1857.5 - 1907.5	0.125	20.97	13M5G7D
		QPSK	1857.5 - 1907.5	0.118	20.70	14M2G7D
		16QAM	1857.5 - 1907.5	0.099	19.96	14M2W7D
	10 MHz	$\pi/2$ BPSK	1855 - 1910	0.126	21.01	9M04G7D
		QPSK	1855 - 1910	0.123	20.90	9M40G7D
		16QAM	1855 - 1910	0.102	20.10	9M43W7D
	5 MHz	$\pi/2$ BPSK	1852.5 - 1912.5	0.123	20.92	4M54G7D
		QPSK	1852.5 - 1912.5	0.126	21.00	4M57G7D
		16QAM	1852.5 - 1912.5	0.102	20.07	4M57W7D

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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.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMA356U**. 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 24 and RSS-133.

Test Device Serial No.: 3393M, 3597M, 3698M, 3699M

2.2 Device Capabilities

This device contains the following capabilities:

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

Band	Ant1	Ant2
GSM/GPRS	Ant B	N/A
WCDMA	Ant B	N/A
B25/2	Ant B	Ant F
n25/2	Ant B	Ant F

Table 2-1. Antenna Naming Convention

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.

2.4 Software and Firmware

Testing was performed on device(s) using software/firmware version A356USQU0AWJ2 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.

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3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

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

Deviation from Measurement Procedure.....None

3.2 Radiated Power and Radiated Spurious Emissions

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

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

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

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

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

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

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

And

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

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

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

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4.0 MEASUREMENT UNCERTAINTY

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

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

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5.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	AP2-001	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	AP2-001
-	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
-	MD 1M 18-40	EMC Cable and Switch System	1/11/2023	Annual	1/11/2024	MD 1M 18-40
-	WL40-1	Conducted Cable Set (40GHz)	1/12/2023	Annual	1/12/2024	WL40-1
-	WL25-1	Conducted Cable Set (25GHz)	1/12/2023	Annual	1/12/2024	WL25-1
Anritsu	MA24406A	Microwave Peak Power Sensor	9/7/2023	Annual	9/7/2024	11240
Emco	3115	Horn Antenna (1-18GHz)	8/8/2022	Biennial	8/8/2024	9704-5182
Emco	3116	Horn Antenna (18 - 40GHz)	7/5/2022	Biennial	7/5/2024	9203-2178
Pastermack	MNLC-2	Line Conducted Emission Cable (NM)	1/11/2023	Annual	1/11/2024	MNLC-2
ETS-Lindgren	3816/2NM	Line Impedance Stabilization Network	8/11/2022	Biennial	8/11/2024	114451
ETS Lindgren	3116C	1-18 GHz DRG Horn Antenna	2/27/2023	Biennial	2/27/2024	00218893
ETS Lindgren	3115	Double Ridged Guide Horn	4/12/2022	Biennial	4/12/2024	82333
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	4/13/2022	Biennial	4/13/2025	121034
Keysight Technologies	N9020A	MXA Signal Analyzer	3/15/2023	Annual	3/15/2024	MY54500644
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	3/15/2023	Annual	3/15/2024	MY52350166
Keysight Technologies	N9030A	PXA Signal Analyzer	1/31/2023	Annual	1/31/2024	MY55410501
Keysight Technologies	N9030B	PXA Signal Analyzer, Multi-touch	9/7/2023	Annual	9/7/2024	MY57141001
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	9/25/2023	Annual	9/25/2024	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/11/2023	Annual	9/11/2024	100348
Rohde & Schwarz	ESW44	EMI Test Receiver 2Hz to 44 GHz	3/1/2023	Annual	3/1/2024	101716
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	1/13/2023	Annual	1/13/2024	103200
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	2/21/2023	Biennial	2/21/2025	A051107
Sunol	JB6	LB6 Antenna	3/2/2023	Biennial	3/2/2025	A082816

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.

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6.0 SAMPLE CALCULATIONS

GSM Emission Designator

Emission Designator = 250KGXW

GSM BW = 250 kHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 250KG7W

EDGE BW = 250 kHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M16F9W

WCDMA BW = 4.16 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

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

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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.

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7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LSMA356U
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 Mode(s): GSM/GPRS/EDGE/WCDMA/LTE/NR

Test Condition	Test Description	FCC Part Section(s)	RSS Section(s)	Test Limit	Test Result	Reference
CONDUCTED	Transmitter Conducted Output Power*	2.1046(a), 2.1046(c)	RSS-Gen(6.12)	N/A	PASS	See RF Exposure Report
	Occupied Bandwidth	2.1049(h)	RSS-Gen(6.7)	N/A	PASS	Section 7.2
	Conducted Band Edge / Spurious Emissions	2.1051, 24.238(a)	RSS-Gen(6.13), RSS-133(6.5)	> 43 + 10log ₁₀ (P[Watts]) at Band Edge and for all out-of-band emissions	PASS	Sections 7.3, 7.4
	Peak-to-Average Ratio	24.232(d)	RSS-133(6.4)	≤ 13 dB	PASS	Section 7.5
	Frequency Stability	2.1055, 24.235	RSS-Gen(6.11), RSS-133(6.3)	Fundamental emissions stay within authorized frequency block **Carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm	PASS	Section 7.8
RADIATED	Equivalent Isotropic Radiated Power	24.232(c)	RSS-Gen(6.12), RSS-133(6.4)	< 2 Watts max. EIRP	PASS	Section 7.6
	Radiated Spurious Emissions	2.1053, 24.238(a)	RSS-Gen(6.13), RSS-133(6.5)	≥ 43 + 10 log (P[Watts]) dB of attenuation below transmitter power **Spurious emissions from receivers shall not exceed the limits detailed in RSS-Gen(7.3)	PASS	Section 7.7

Table 7-1. Summary of Test Results

Notes:

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

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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.

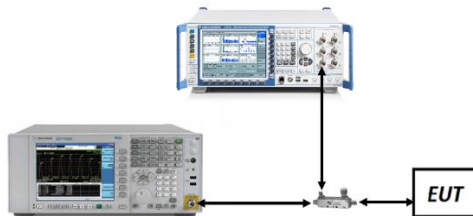


Figure 7-1. Test Instrument & Measurement Setup

Test Notes

1. Conducted power measurements were evaluated using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device.
2. All other conducted power measurements are contained in the RF exposure report for this filing.
3. Conducted power was found to reduce for the higher order QAM modulations when compared to 16QAM. Due to this trend, only the worst-case QAM (16QAM) powers are included in this section.

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
20 MHz	QPSK	26140	1860.0	1 / 0	22.88
		26365	1882.5	1 / 0	23.09
		26590	1905.0	1 / 99	23.02
	16-QAM	26140	1860.0	1 / 99	22.19
15 MHz	QPSK	26115	1857.5	1 / 74	22.97
		26365	1882.5	1 / 0	23.07
		26615	1907.5	1 / 74	23.00
	16-QAM	26115	1857.5	1 / 0	22.17
10 MHz	QPSK	26090	1855.0	1 / 0	22.99
		26365	1882.5	1 / 49	23.01
		26640	1910.0	1 / 0	22.96
	16-QAM	26090	1855.0	1 / 0	22.24
5 MHz	QPSK	26065	1852.5	1 / 0	22.98
		26365	1882.5	1 / 12	23.16
		26665	1912.5	1 / 12	23.02
	16-QAM	26365	1882.5	1 / 24	22.49
3 MHz	QPSK	26055	1851.5	1 / 0	22.89
		26365	1882.5	1 / 0	23.24
		26675	1913.5	1 / 0	23.08
	16-QAM	26055	1851.5	1 / 14	22.12
1.4 MHz	QPSK	26047	1850.7	1 / 5	22.77
		26365	1882.5	1 / 3	22.98
		26683	1914.3	1 / 0	22.87
	16-QAM	26047	1850.7	1 / 0	22.20

Table 7-2. Conducted Powers – LTE – Band 25/2

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
40 MHz	π/2 BPSK	374000	1870.0	1 / 214	23.12
		376500	1882.5	1 / 108	23.15
		379000	1895.0	1 / 108	23.32
	QPSK	374000	1870.0	1 / 214	23.12
		376500	1882.5	1 / 108	23.29
		379000	1895.0	1 / 108	23.25
16-QAM	376500	1882.5	1 / 108	22.13	
30 MHz	π/2 BPSK	372000	1865.0	1 / 158	23.20
		376500	1882.5	1 / 158	23.29
		381000	1900.0	1 / 80	23.19
	QPSK	372000	1865.0	1 / 158	23.14
		376500	1882.5	1 / 158	23.30
		381000	1900.0	1 / 80	23.22
16-QAM	376500	1882.5	1 / 158	22.10	
25 MHz	π/2 BPSK	372000	1862.5	1 / 131	23.14
		376500	1882.5	1 / 131	23.26
		381000	1902.5	1 / 66	23.11
	QPSK	372000	1862.5	1 / 131	23.15
		376500	1882.5	1 / 131	23.30
		381000	1902.5	1 / 66	23.49
16-QAM	376500	1882.5	1 / 131	22.26	
20 MHz	π/2 BPSK	372000	1860.0	1 / 53	23.24
		376500	1882.5	1 / 53	23.29
		381000	1905.0	1 / 1	23.14
	QPSK	372000	1860.0	1 / 53	23.06
		376500	1882.5	1 / 53	23.32
		381000	1905.0	1 / 1	23.25
16-QAM	376500	1882.5	1 / 53	21.98	
15 MHz	π/2 BPSK	371500	1857.5	1 / 39	23.02
		376500	1882.5	1 / 39	23.24
		381500	1907.5	1 / 39	23.32
	QPSK	371500	1857.5	1 / 39	23.19
		376500	1882.5	1 / 39	23.08
		381500	1907.5	1 / 39	23.15
16-QAM	376500	1882.5	1 / 39	22.22	
10 MHz	π/2 BPSK	371000	1855.0	1 / 26	23.09
		376500	1882.5	1 / 26	23.27
		382000	1910.0	1 / 26	23.30
	QPSK	371000	1855.0	1 / 26	22.90
		376500	1882.5	1 / 26	23.27
		382000	1910.0	1 / 26	23.39
16-QAM	376500	1882.5	1 / 26	22.36	
5 MHz	π/2 BPSK	370500	1852.5	1 / 23	23.01
		376500	1882.5	1 / 1	23.18
		382500	1912.5	1 / 1	23.12
	QPSK	370500	1852.5	1 / 23	23.10
		376500	1882.5	1 / 1	23.37
		382500	1912.5	1 / 1	23.29
16-QAM	376500	1882.5	1 / 1	22.33	

Table 7-3. Conducted Powers – NR – Band n25/2

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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7.3 Occupied Bandwidth

Test Overview

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

Test Procedure Used

ANSI C63.26-2015 – Section 5.4.4

Test Settings

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

Test Setup

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

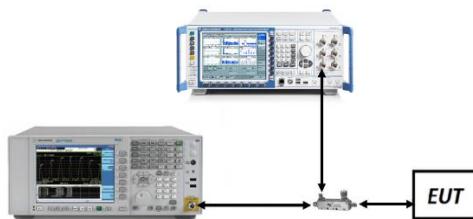


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

None.

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Mode	Bandwidth	Modulation	OBW [MHz]
GSM-PCS	N/A	GMSK	0.244
GSM-PCS EDGE		8-PSK	0.245
WCDMA-PCS		Spread Spectrum	4.186
LTE-B25-2	20MHz	QPSK	18.05
		16QAM	18.02
	15MHz	QPSK	13.55
		16QAM	13.53
	10MHz	QPSK	9.05
		16QAM	9.04
	5MHz	QPSK	4.56
		16QAM	4.54
	3MHz	QPSK	2.73
		16QAM	2.73
	1.4MHz	QPSK	1.10
		16QAM	1.10

Table 7-4. Occupied Bandwidth Summary – Antenna 1

Mode	Bandwidth	Modulation	OBW [MHz]
LTE-B25-2	20MHz	QPSK	17.96
		16QAM	18.09
	15MHz	QPSK	13.51
		16QAM	13.54
	10MHz	QPSK	9.10
		16QAM	9.09
	5MHz	QPSK	4.57
		16QAM	4.57
	3MHz	QPSK	2.73
		16QAM	2.74
	1.4MHz	QPSK	1.10
		16QAM	1.11

Table 7-5. Occupied Bandwidth Summary – Antenna 2

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Mode	Bandwidth	Modulation	OBW [MHz]
NR-n25-2	40MHz	BPSK	39.00
		QPSK	38.82
		16QAM	38.78
	30MHz	BPSK	28.83
		QPSK	28.87
		16QAM	28.78
	25MHz	BPSK	23.08
		QPSK	23.93
		16QAM	23.97
	20MHz	BPSK	18.01
		QPSK	19.07
		16QAM	19.05
	15MHz	BPSK	13.51
		QPSK	14.19
		16QAM	14.23
	10MHz	BPSK	9.02
		QPSK	9.36
		16QAM	9.39
	5MHz	BPSK	4.55
		QPSK	4.54
		16QAM	4.54

Table 7-6. Occupied Bandwidth Summary – Antenna 1

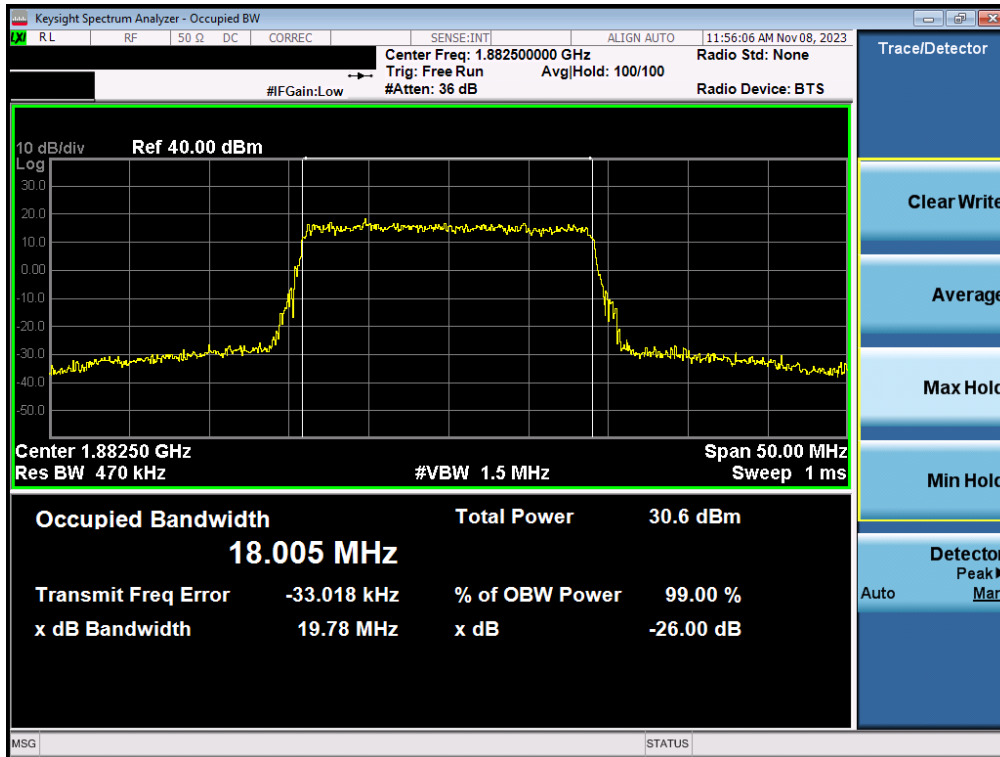
FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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Mode	Bandwidth	Modulation	OBW [MHz]
NR-n25-2	40MHz	BPSK	38.82
		QPSK	39.72
		16QAM	38.67
	30MHz	BPSK	28.77
		QPSK	28.88
		16QAM	28.75
	25MHz	BPSK	23.02
		QPSK	23.90
		16QAM	23.95
	20MHz	BPSK	18.03
		QPSK	19.04
		16QAM	19.08
	15MHz	BPSK	13.50
		QPSK	14.21
		16QAM	14.22
	10MHz	BPSK	9.04
		QPSK	9.40
		16QAM	9.43
	5MHz	BPSK	4.54
		QPSK	4.57
		16QAM	4.57

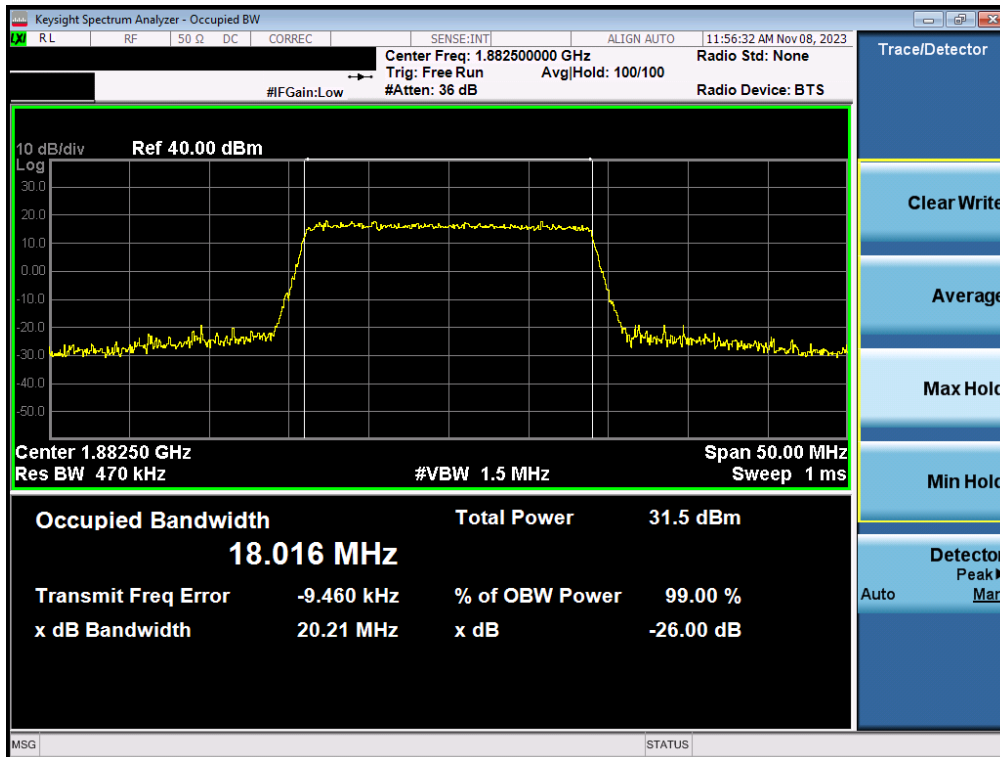
Table 7-7. Occupied Bandwidth Summary – Antenna 2

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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LTE Band 25/2 – Ant1



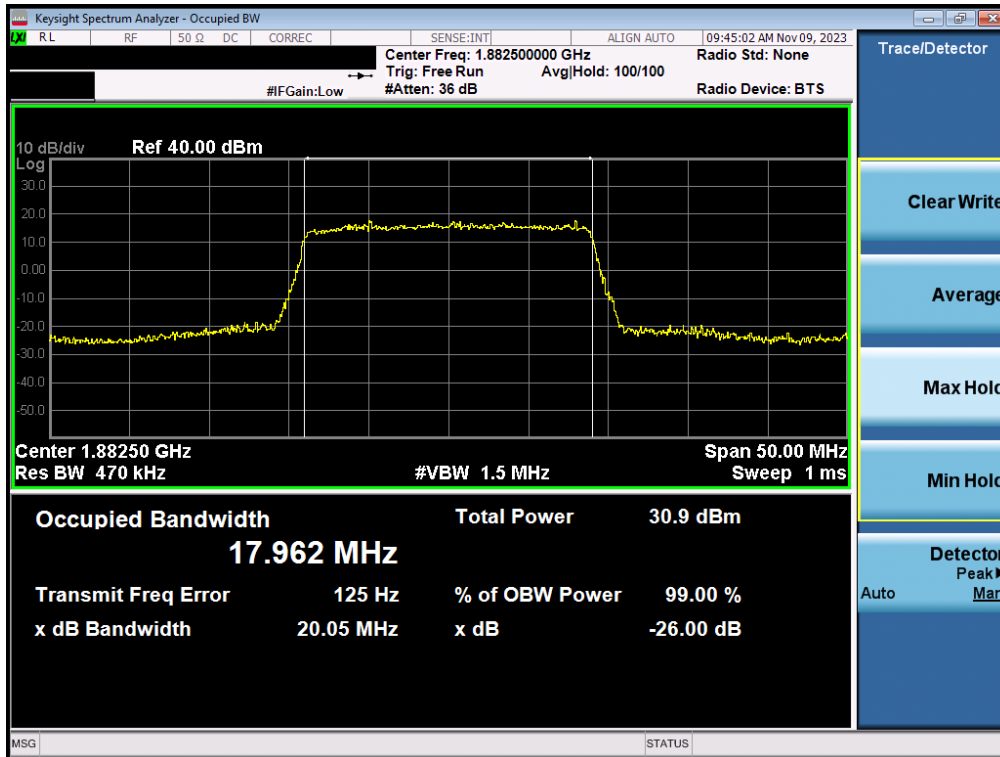
Plot 7-1. Occupied Bandwidth Plot (LTE Band 25/2 - 20MHz QPSK - Full RB - Ant1)



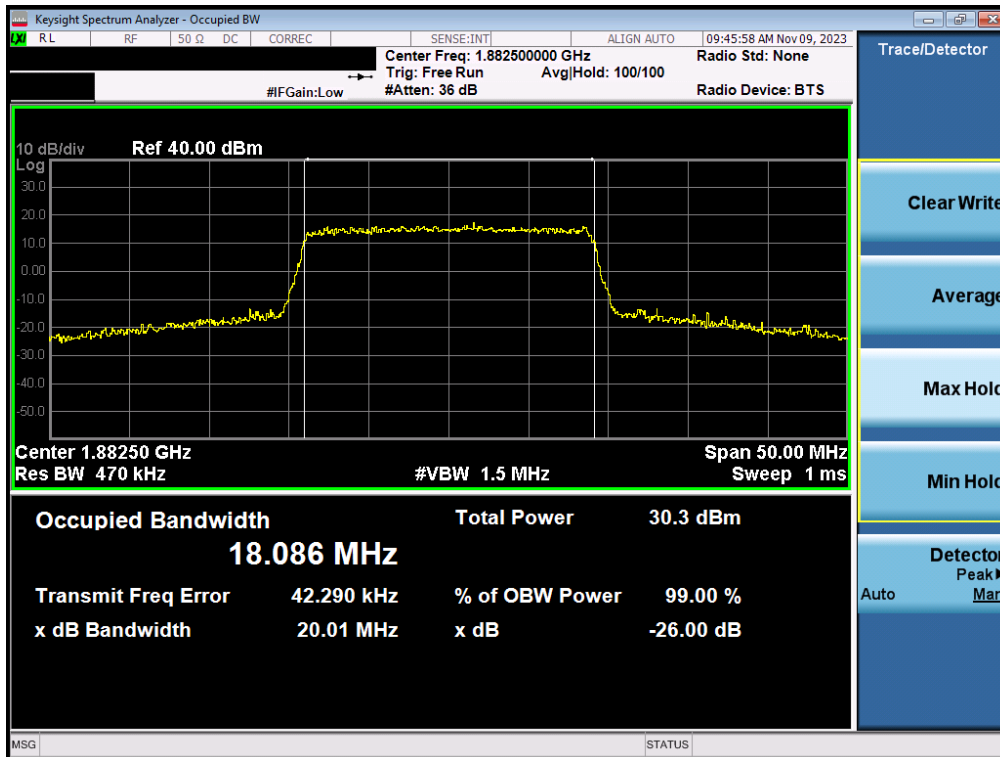
Plot 7-2. Occupied Bandwidth Plot (LTE Band 25/2 - 20MHz 16-QAM - Full RB - Ant1)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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LTE Band 25/2 – Ant2



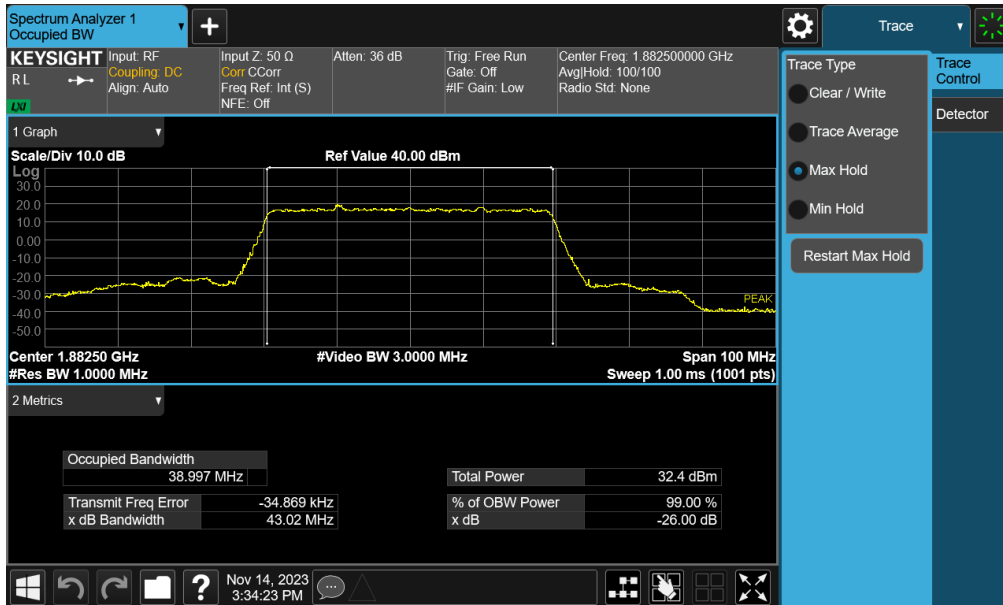
Plot 7-3. Occupied Bandwidth Plot (LTE Band 25/2 - 20MHz QPSK - Full RB - Ant2)



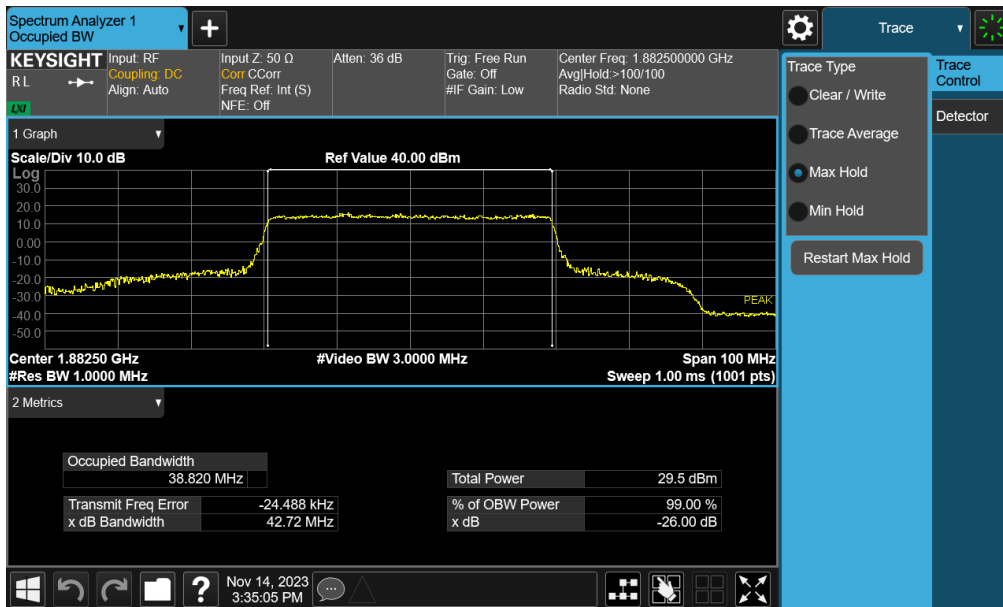
Plot 7-4. Occupied Bandwidth Plot (LTE Band 25/2 - 20MHz 16-QAM - Full RB - Ant2)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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NR Band n25/2 – Ant1

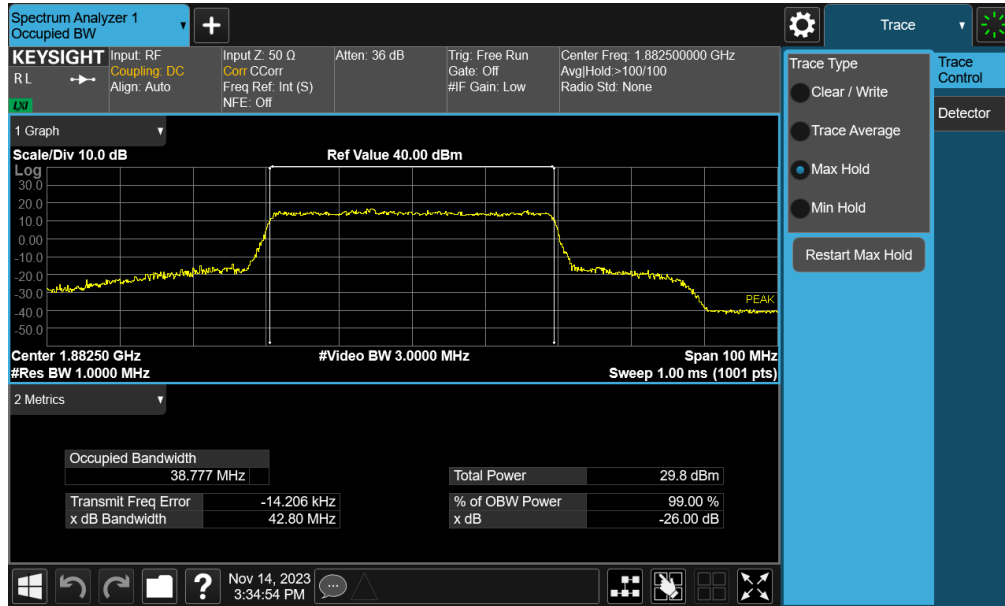


Plot 7-5. Occupied Bandwidth Plot (NR Band n25/2 - 40.0MHz DFT-s-OFDM BPSK - Full RB - ANT1)



Plot 7-6. Occupied Bandwidth Plot (NR Band n25/2 - 40.0MHz CP-OFDM QPSK - Full RB - ANT1)

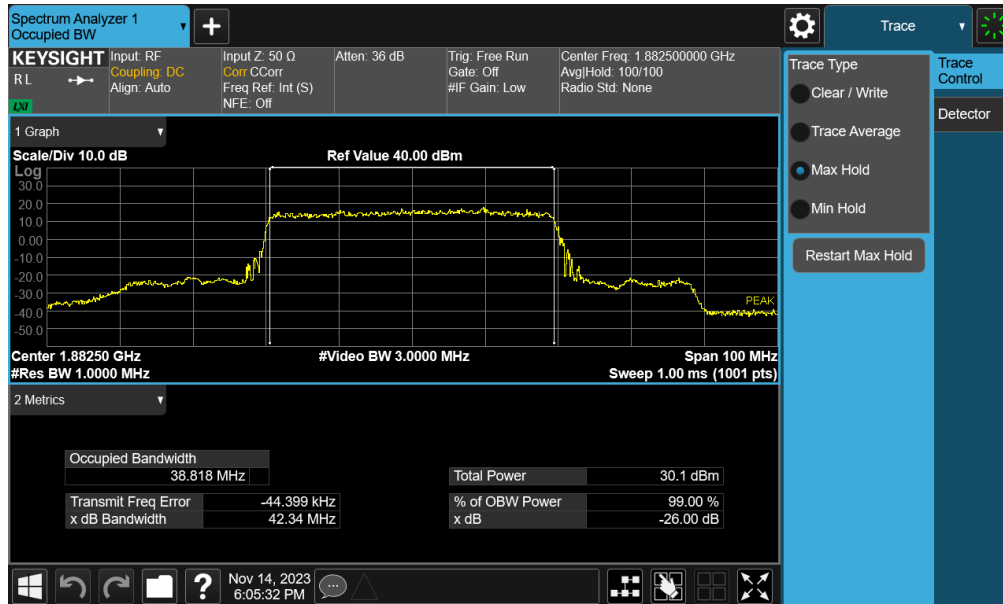
FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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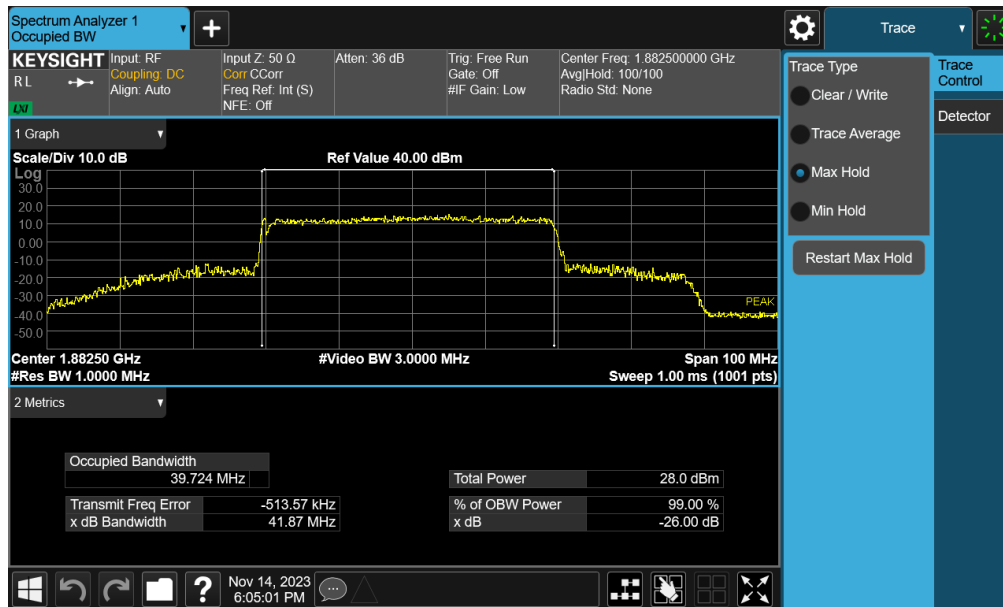
Plot 7-7. Occupied Bandwidth Plot (NR Band n25/2 - 40.0MHz CP-OFDM 16QAM - Full RB - ANT1)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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NR Band n25/2 – Ant2

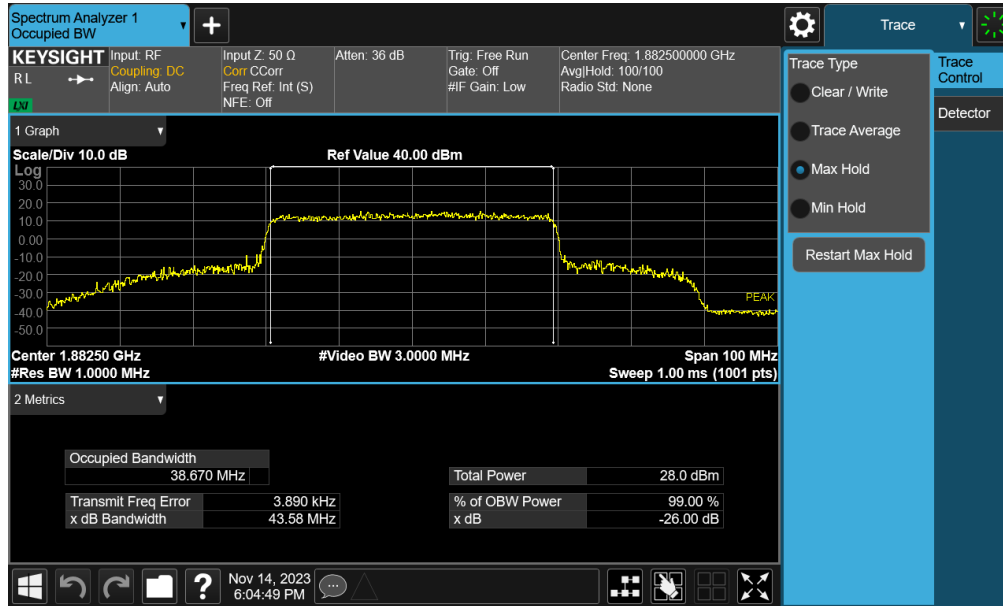


Plot 7-8. Occupied Bandwidth Plot (NR Band n25/2 - 40.0MHz DFT-s-OFDM BPSK - Full RB - ANT2)



Plot 7-9. Occupied Bandwidth Plot (NR Band n25/2 - 40.0MHz CP-OFDM QPSK - Full RB - ANT2)

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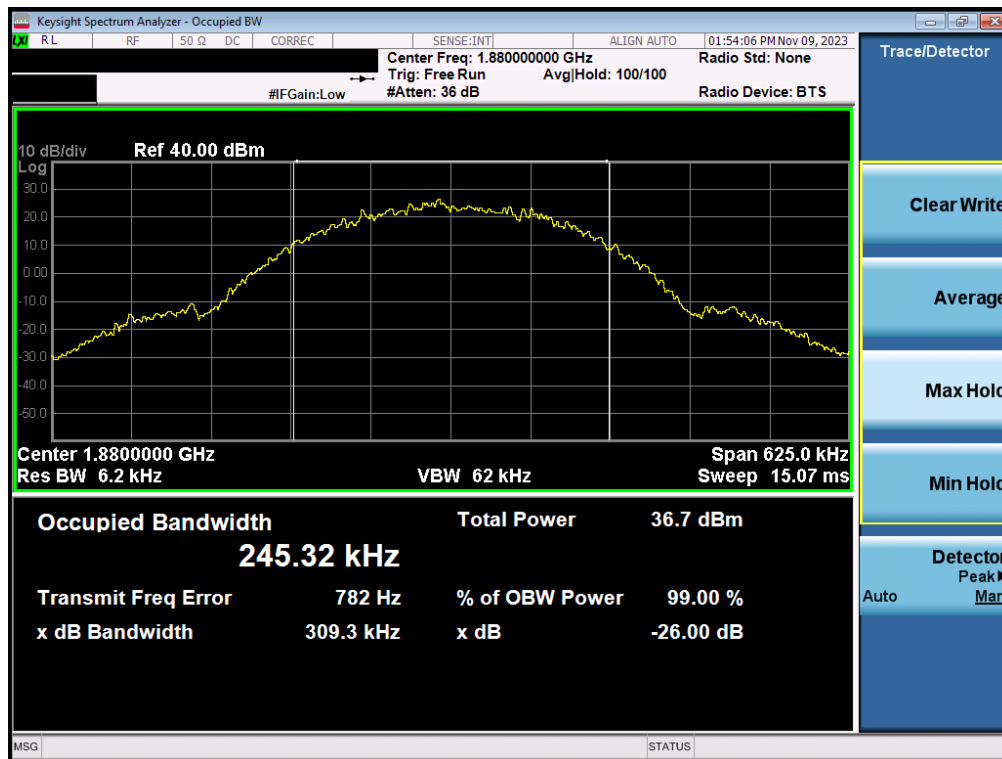
Plot 7-10. Occupied Bandwidth Plot (NR Band n25/2 - 40.0MHz CP-OFDM 16QAM - Full RB - ANT2)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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GSM/GPRS PCS – Ant1



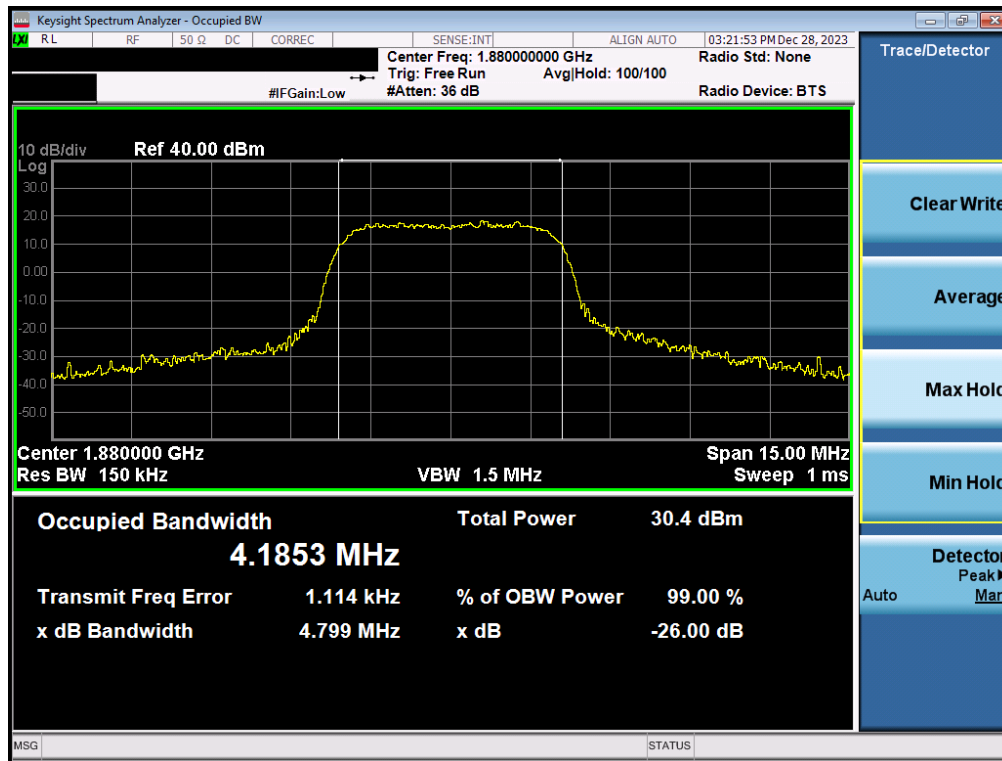
Plot 7-11. Occupied Bandwidth Plot (GPRS, Ch. 661 - Ant1)



Plot 7-12. Occupied Bandwidth Plot (EDGE, Ch. 661 - Ant1)

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WCDMA PCS – Ant1



Plot 7-13. Occupied Bandwidth Plot (WCDMA, Ch. 9400 - Ant1)

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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 $43 + 10 \log_{10}(P_{\text{Watts}})$, 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 20GHz (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.

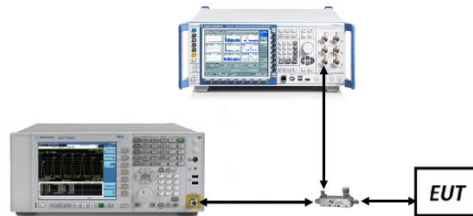


Figure 7-3. Test Instrument & Measurement Setup

Test Notes

1. Per Part 24 and RSS-133, 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.

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Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
GSM-PCS	250kHz	Low	30.0 - 1845.0	-38.46	-13	-25.46
		Low	1910.0 - 10000.0	-38.26	-13	-25.26
		Low	10000.0 - 20000.0	-54.35	-13	-41.35
		Mid	30.0 - 1850.0	-42.74	-13	-29.74
		Mid	1910.0 - 10000.0	-38.74	-13	-25.74
		Mid	10000.0 - 20000.0	-54.01	-13	-41.01
		High	30.0 - 1850.0	-43.04	-13	-30.04
		High	1915.0 - 10000.0	-38.58	-13	-25.57
WCDMA-PCS	5MHz	Low	30.0 - 1845.0	-53.43	-13	-40.43
		Low	1910.0 - 10000.0	-47.14	-13	-34.14
		Low	10000.0 - 20000.0	-62.60	-13	-49.60
		Mid	30.0 - 1850.0	-53.70	-13	-40.70
		Mid	1910.0 - 10000.0	-47.07	-13	-34.07
		Mid	10000.0 - 20000.0	-62.65	-13	-49.65
		High	30.0 - 1850.0	-53.65	-13	-40.65
		High	1915.0 - 10000.0	-47.20	-13	-34.20
LTE-B25-2	20MHz	Low	30.0 - 1849.0	-39.14	-13	-26.14
		Low	1915.0 - 10000.0	-46.47	-13	-33.47
		Low	10000.0 - 20000.0	-63.11	-13	-50.11
		Mid	30.0 - 1850.0	-50.92	-13	-37.92
		Mid	1915.0 - 10000.0	-46.93	-13	-33.93
		Mid	10000.0 - 20000.0	-62.41	-13	-49.41
		High	30.0 - 1850.0	-53.89	-13	-40.89
		High	1916.0 - 10000.0	-47.13	-13	-34.13
		High	10000.0 - 20000.0	-62.99	-13	-49.99

Table 7-8. Spurious Emissions Test Summary – Antenna 1

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
LTE-B25-2	20MHz	Low	30.0 - 1849.0	-39.01	-13	-26.01
		Low	1915.0 - 10000.0	-46.76	-13	-33.76
		Low	10000.0 - 20000.0	-62.43	-13	-49.43
		Mid	30.0 - 1850.0	-52.19	-13	-39.19
		Mid	1915.0 - 10000.0	-46.84	-13	-33.84
		Mid	10000.0 - 20000.0	-62.67	-13	-49.67
		High	30.0 - 1850.0	-53.85	-13	-40.85
		High	1916.0 - 10000.0	-47.30	-13	-34.30
		High	10000.0 - 20000.0	-62.89	-13	-49.89

Table 7-9. Spurious Emissions Test Summary – Antenna 2

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n25-2	40MHz	Low	30.0 - 1849.0	-40.34	-13	-27.34
		Low	1915.0 - 10000.0	-46.13	-13	-33.13
		Low	10000.0 - 20000.0	-63.70	-13	-50.70
		Mid	30.0 - 1850.0	-40.88	-13	-27.88
		Mid	1915.0 - 10000.0	-44.44	-13	-31.43
		Mid	10000.0 - 20000.0	-63.69	-13	-50.69
		High	30.0 - 1850.0	-44.87	-13	-31.87
		High	1916.0 - 10000.0	-42.17	-13	-29.17
		High	10000.0 - 20000.0	-63.43	-13	-50.43

Table 7-10. Spurious Emissions Test Summary – Antenna 1

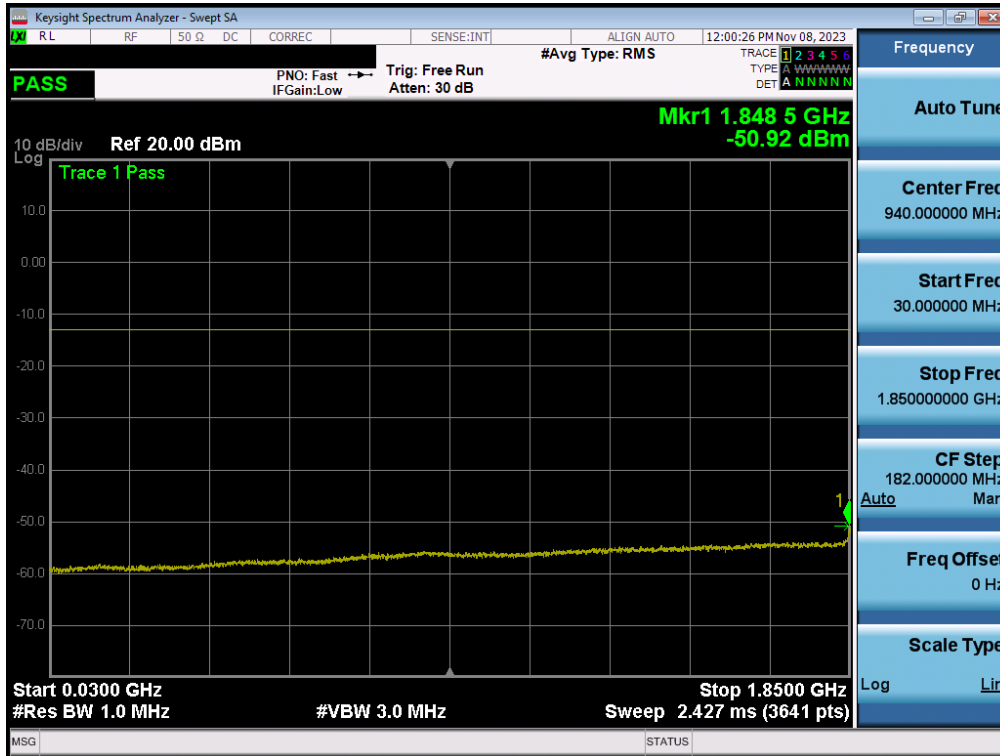
FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 29 of 97

Mode	Bandwidth	Channel	Range [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n25-2	40MHz	Low	30.0 - 1849.0	-41.35	-13	-28.35
		Low	1915.0 - 10000.0	-47.34	-13	-34.34
		Low	10000.0 - 20000.0	-63.26	-13	-50.25
		Mid	30.0 - 1850.0	-44.35	-13	-31.35
		Mid	1915.0 - 10000.0	-45.71	-13	-32.71
		Mid	10000.0 - 20000.0	-63.18	-13	-50.18
		High	30.0 - 1850.0	-47.08	-13	-34.08
		High	1916.0 - 10000.0	-42.06	-13	-29.06
		High	10000.0 - 20000.0	-63.30	-13	-50.30

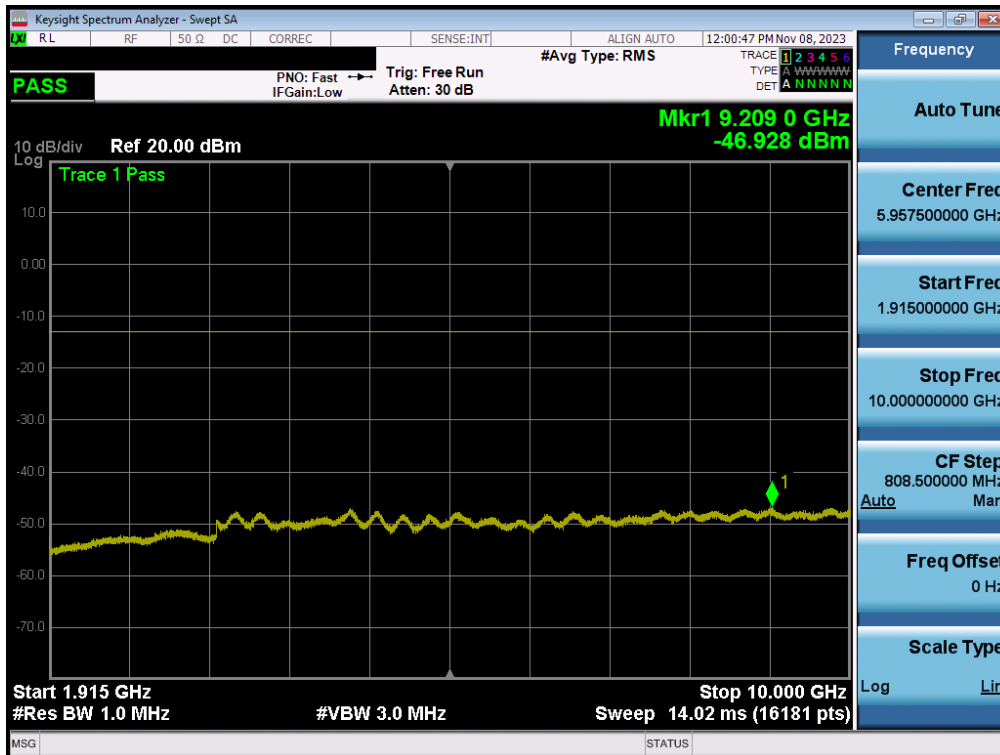
Table 7-11. Spurious Emissions Test Summary – Antenna 2

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 30 of 97

LTE Band 25/2 – Ant1

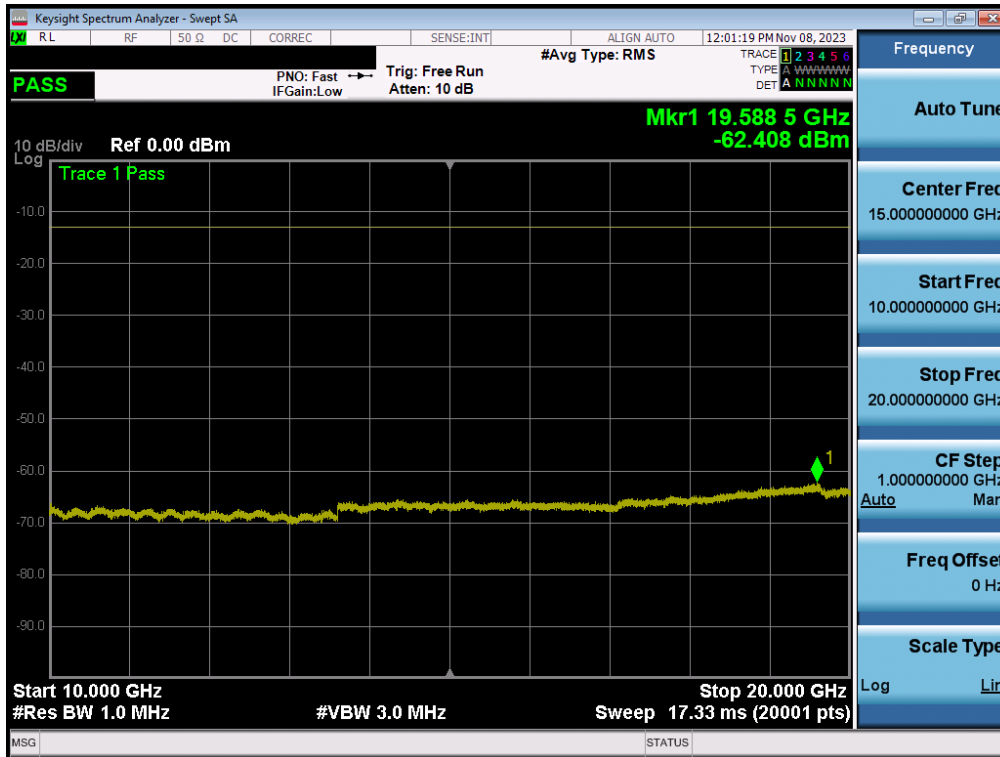


Plot 7-14. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Mid Channel - Ant1)



Plot 7-15. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Mid Channel - Ant1)

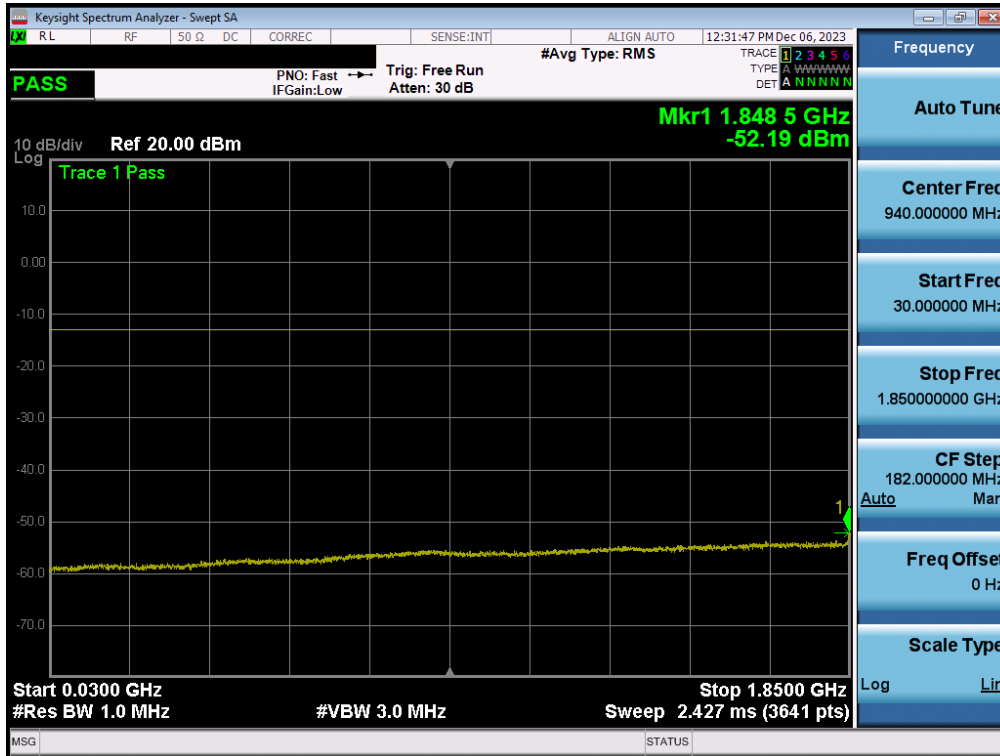
FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 31 of 97



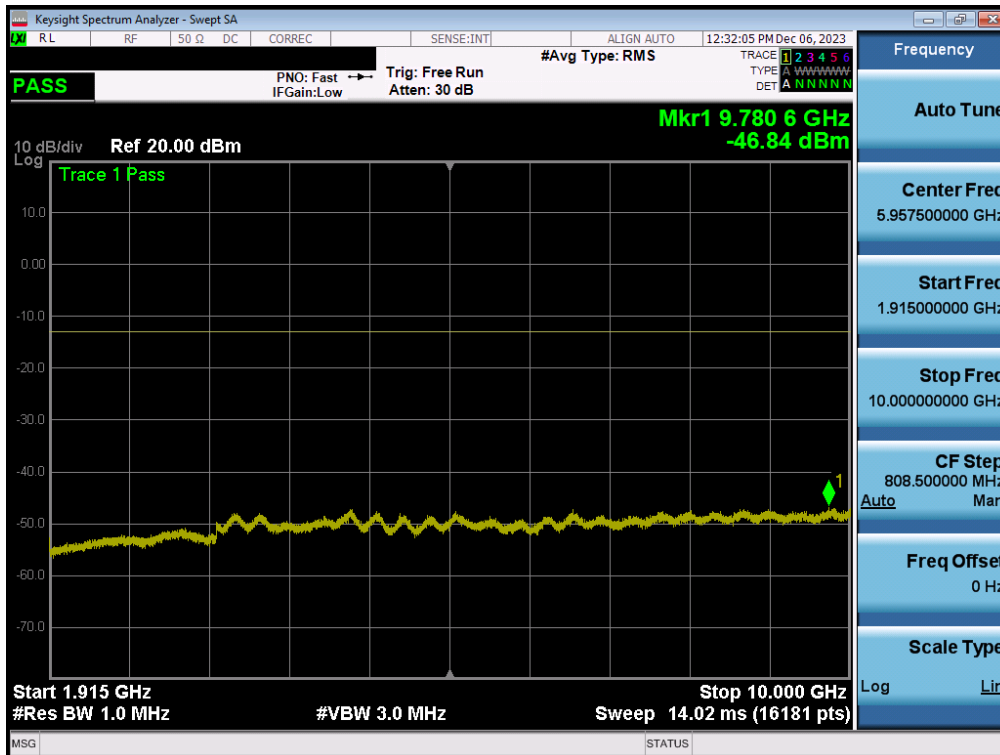
Plot 7-16. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Mid Channel - Ant1)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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LTE Band 25/2 – Ant2

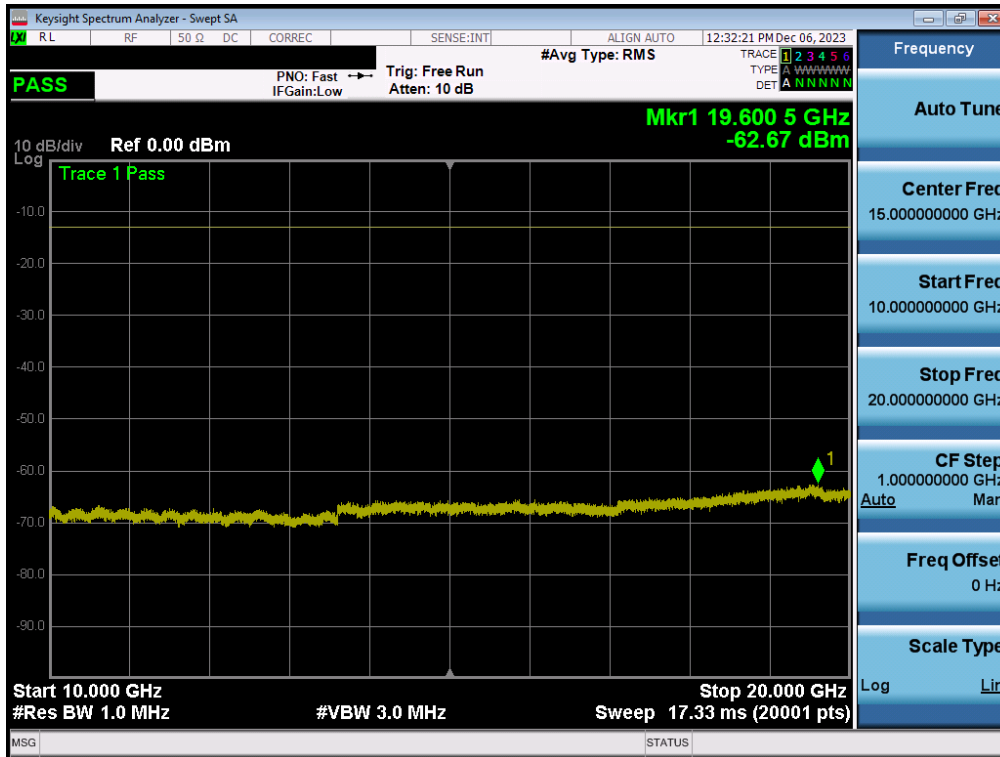


Plot 7-17. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Mid Channel - Ant2)



Plot 7-18. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Mid Channel - Ant2)

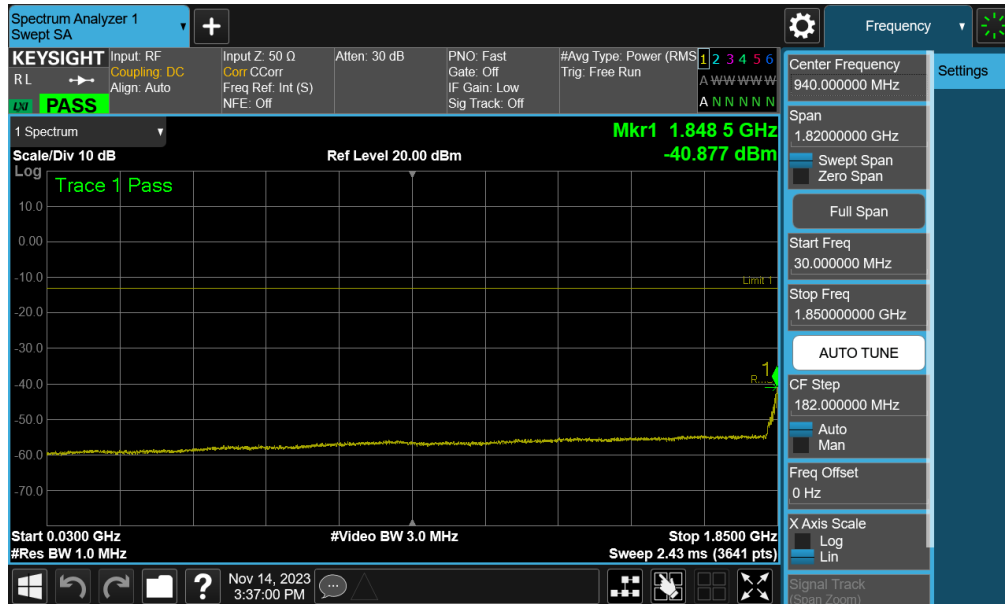
FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 33 of 97



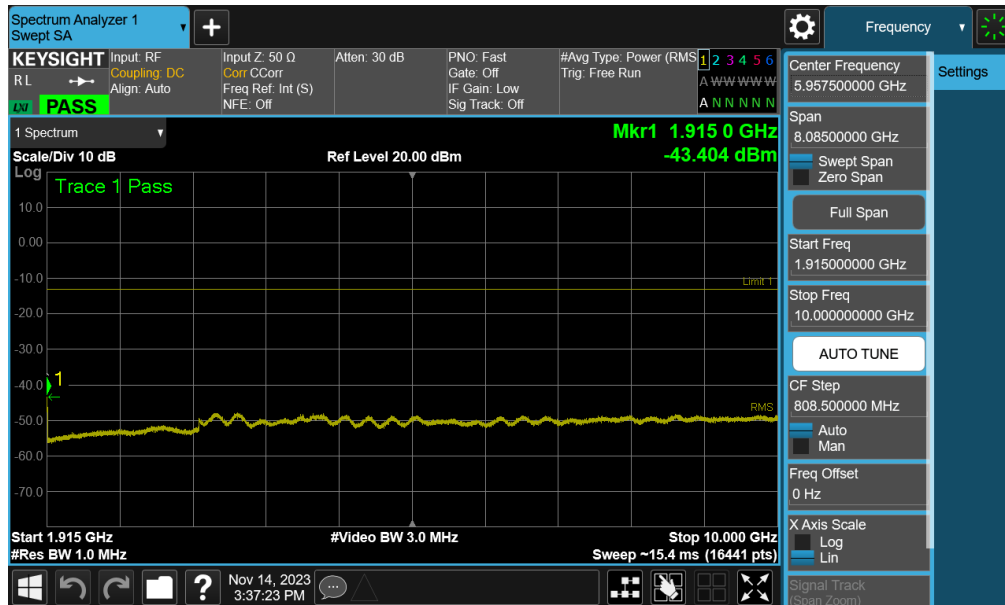
Plot 7-19. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Mid Channel - Ant2)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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NR Band n25/2 – Ant1

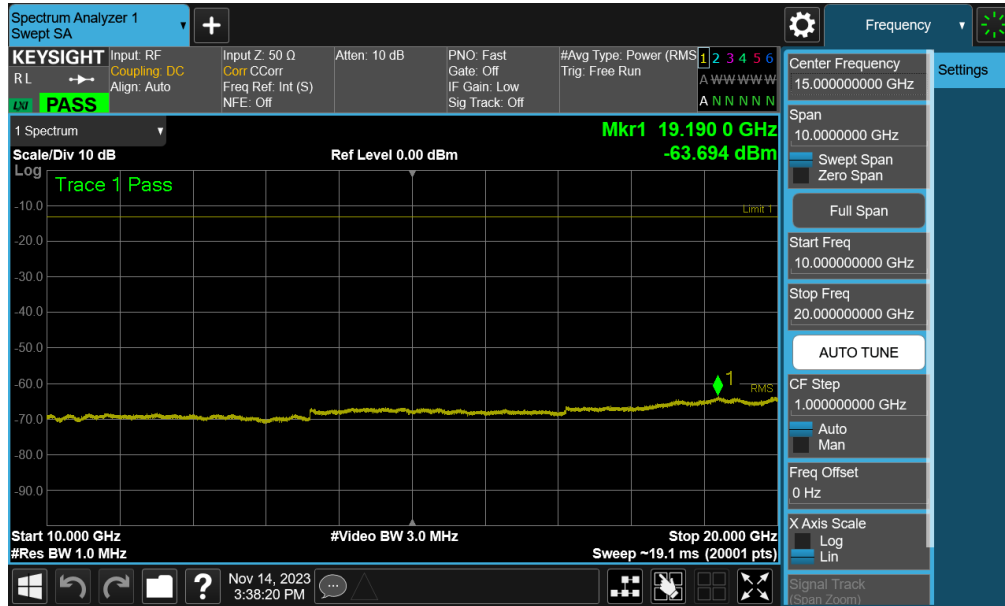


Plot 7-20. Conducted Spurious Plot (NR Band n25/2 - 40.0MHz - 1RB - Mid Channel - Ant1)



Plot 7-21. Conducted Spurious Plot (NR Band n25/2 - 40.0MHz - 1RB - Mid Channel - Ant1)

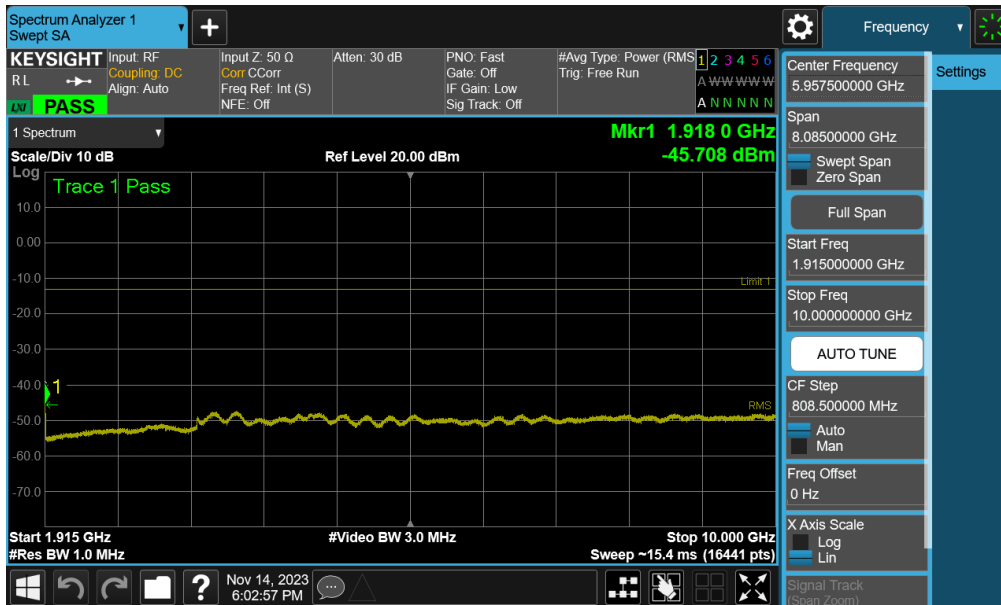
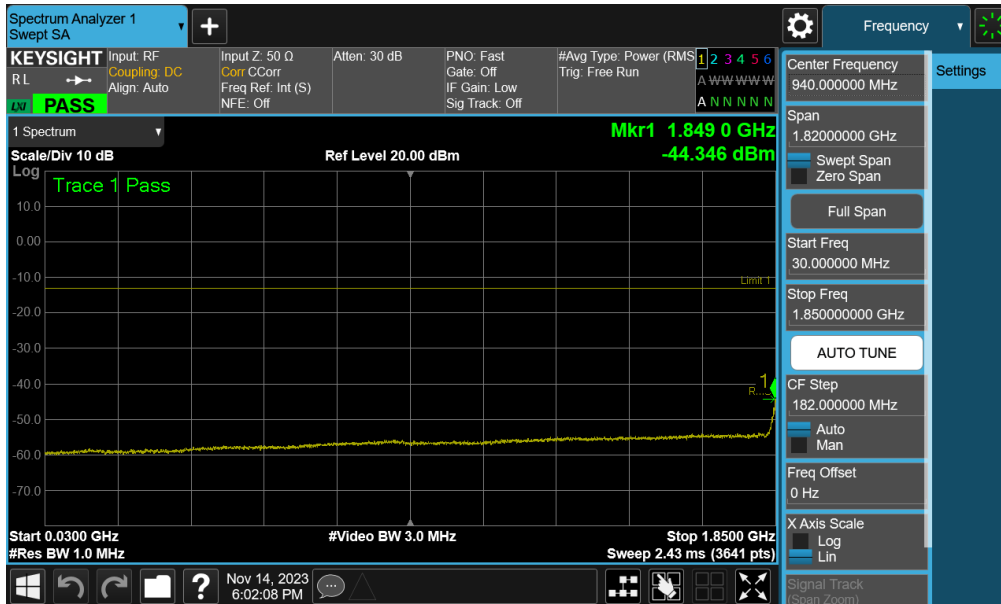
FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 35 of 97



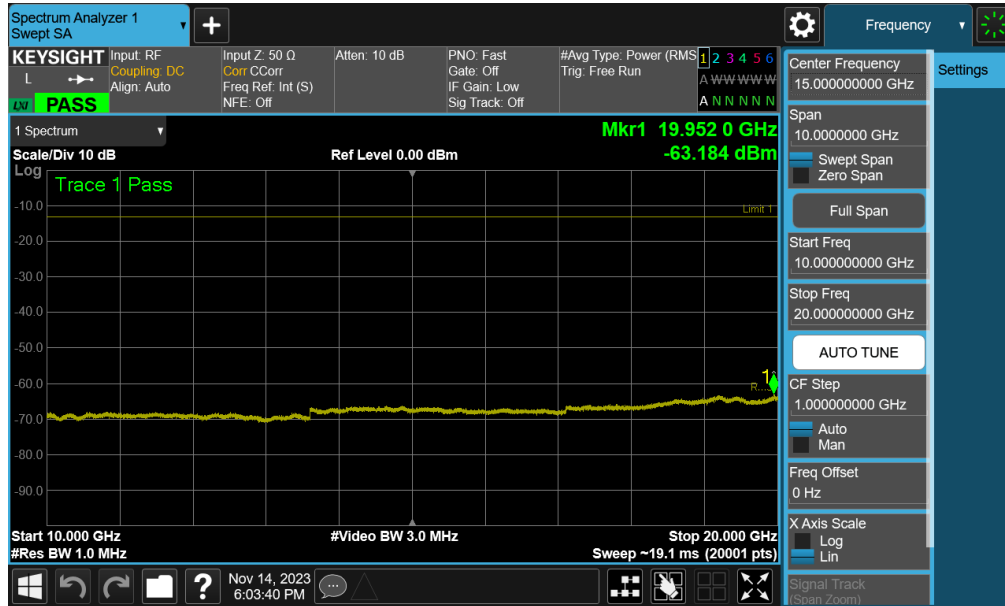
Plot 7-22. Conducted Spurious Plot (NR Band n25/2 - 40.0MHz - 1RB - Mid Channel - Ant1)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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NR Band n25/2 – Ant2



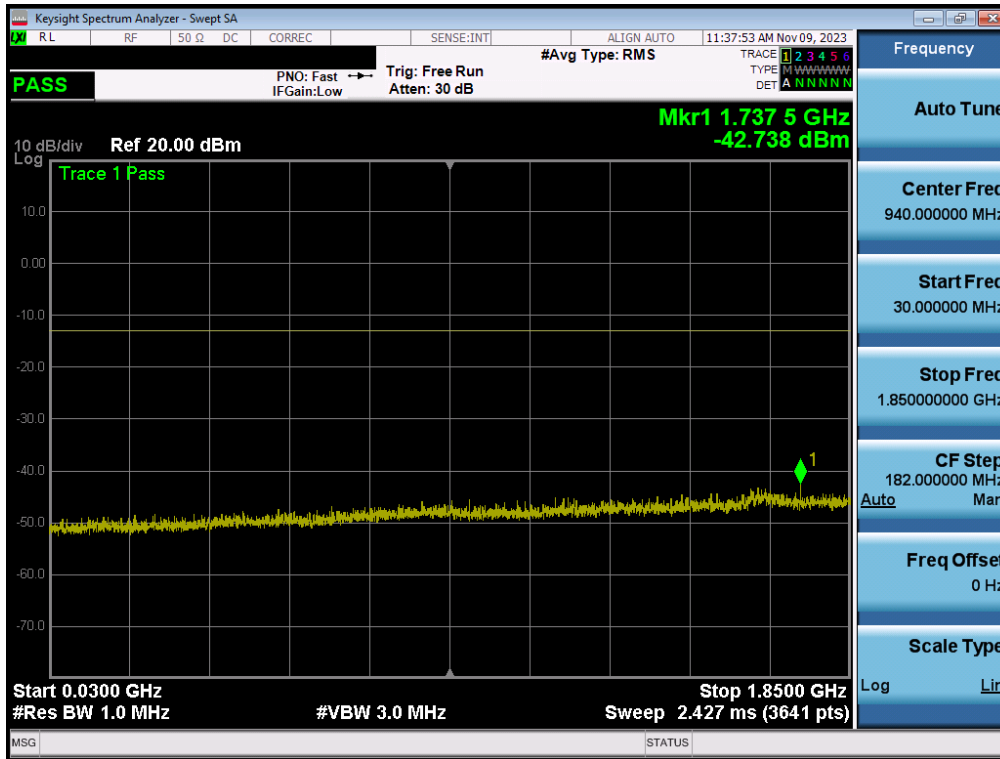
FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 37 of 97



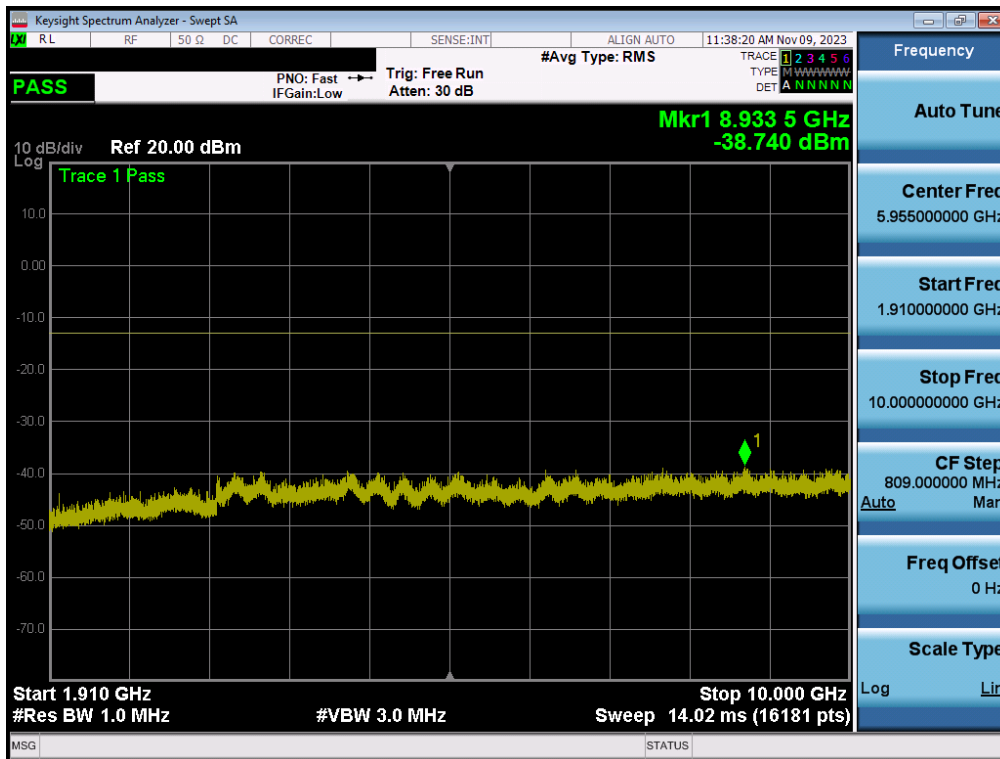
Plot 7-25. Conducted Spurious Plot (NR Band n25/2 - 40.0MHz - 1RB - Mid Channel - Ant2)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 38 of 97

GSM/GPRS PCS – Ant1

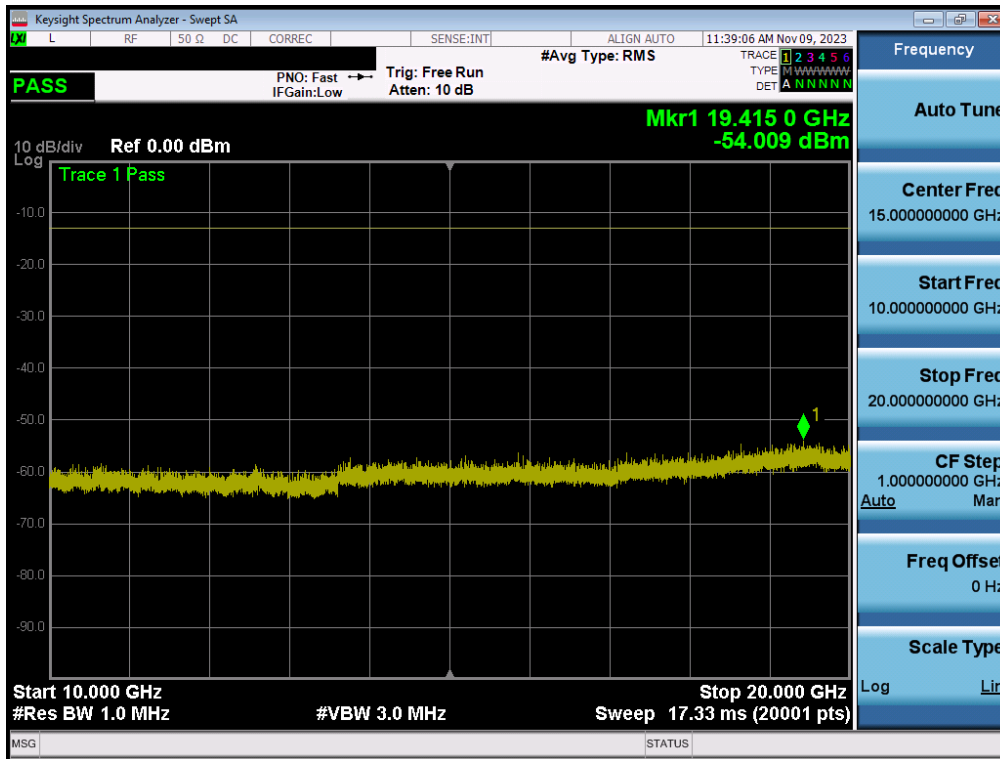


Plot 7-26. Conducted Spurious Plot (GPRS Ch. 661 - Ant1)



Plot 7-27. Conducted Spurious Plot (GPRS Ch. 661 - Ant1)

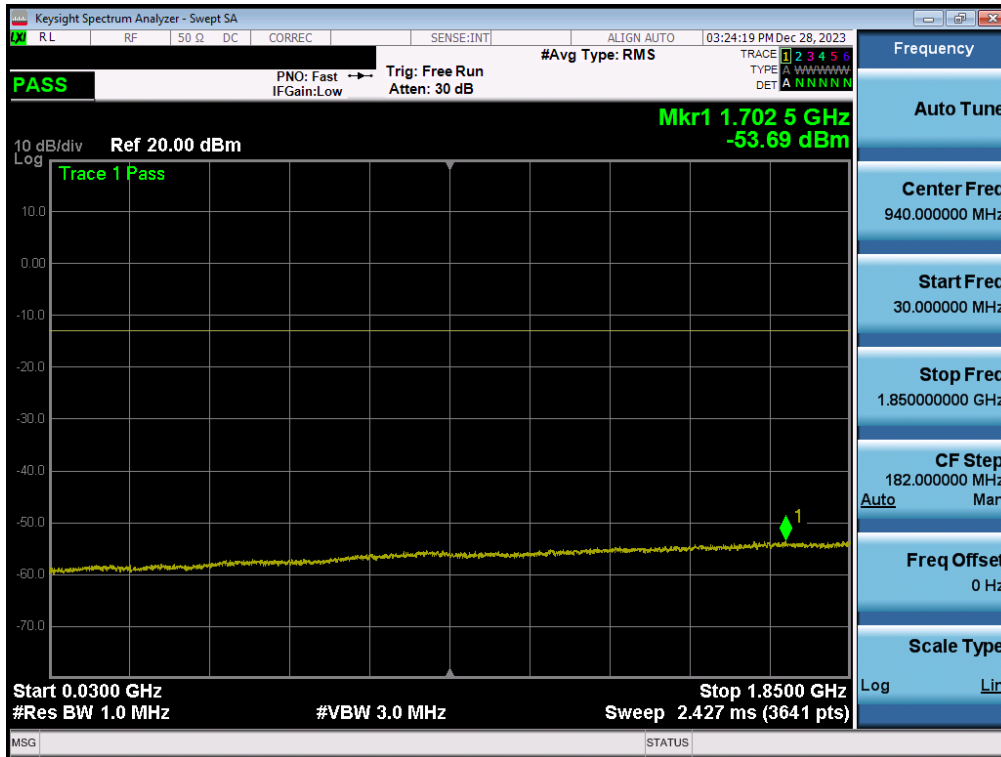
FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 39 of 97



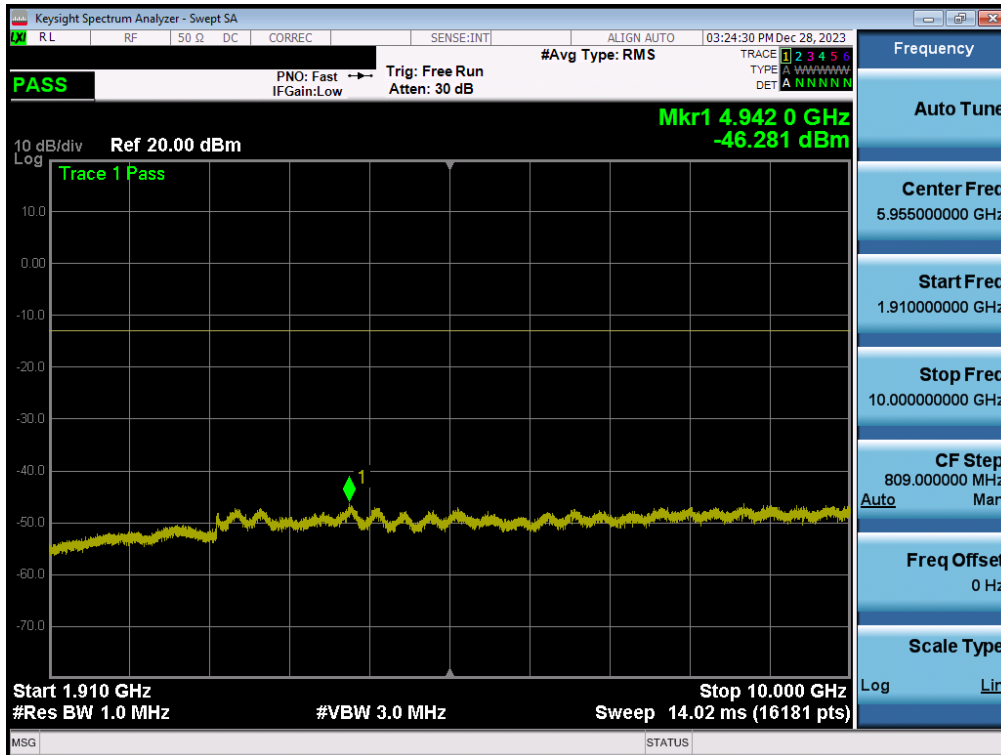
Plot 7-28. Conducted Spurious Plot (GPRS Ch. 661 - Ant1)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 40 of 97

WCDMA PCS – Ant1

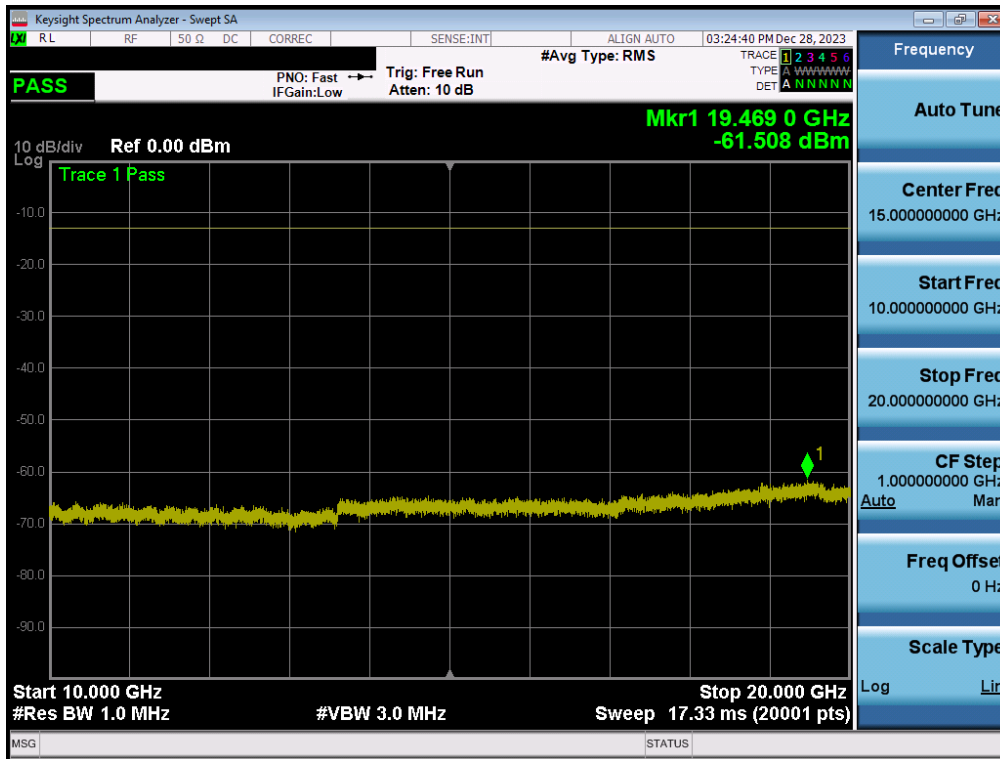


Plot 7-29. Conducted Spurious Plot (WCDMA Ch. 9400 - Ant1)



Plot 7-30. Conducted Spurious Plot (WCDMA Ch. 9400 - Ant1)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 41 of 97



Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 9400 - Ant1)

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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 of any spurious emission is $43 + 10 \log_{10}(P_{\text{Watts}})$, where P is the transmitter power in Watts.

Test Procedure Used

ANSI C63.26-2015 – Section 5.7.3

Test Settings

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

Test Setup

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

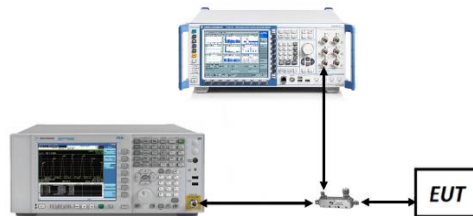


Figure 7-4. Test Instrument & Measurement Setup

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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Test Notes

- Per 24.238(b) and RSS-133(6.5), 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.
- 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.

Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
GSM-PCS	250kHz	Low	Band Edge	-44.59	-13	-31.59
		High	Band Edge	-44.60	-13	-31.60
WCDMA-PCS	5MHz	Low	Band Edge	-24.33	-13	-11.33
		Low	Extended	-17.38	-13	-4.38
		High	Band Edge	-23.53	-13	-10.53
		High	Extended	-18.63	-13	-5.63
		Low	Band Edge	-31.51	-13	-18.51
LTE-B25-2	20MHz	Low	Extended	-29.09	-13	-16.09
		High [B2]	Band Edge	-33.25	-13	-20.25
		High [B25]	Band Edge	-34.12	-13	-21.12
		High [B2]	Extended	-31.90	-13	-18.90
		High [B25]	Extended	-31.56	-13	-18.56
		Low	Band Edge	-30.91	-13	-17.91
	15MHz	Low	Extended	-27.04	-13	-14.04
		High [B2]	Band Edge	-32.69	-13	-19.69
		High [B25]	Band Edge	-32.13	-13	-19.13
		High [B2]	Extended	-29.66	-13	-16.66
		High [B25]	Extended	-28.66	-13	-15.66
		Low	Band Edge	-29.25	-13	-16.25
	10MHz	Low	Extended	-23.54	-13	-10.54
		High [B2]	Band Edge	-31.45	-13	-18.45
		High [B25]	Band Edge	-30.11	-13	-17.11
		High [B2]	Extended	-25.10	-13	-12.10
		High [B25]	Extended	-24.60	-13	-11.60
		Low	Band Edge	-24.01	-13	-11.00
	5MHz	Low	Extended	-29.47	-13	-16.47
		High [B2]	Band Edge	-24.02	-13	-11.02
		High [B25]	Band Edge	-22.82	-13	-9.82
		High [B2]	Extended	-13.77	-13	-0.77
		High [B25]	Extended	-13.30	-13	-0.30
		Low	Band Edge	-23.65	-13	-10.64
	3MHz	Low	Extended	-28.76	-13	-15.76
		High [B2]	Band Edge	-23.33	-13	-10.33
		High [B25]	Band Edge	-24.14	-13	-11.14
		High [B2]	Extended	-29.31	-13	-16.31
		High [B25]	Extended	-30.02	-13	-17.02
		Low	Band Edge	-27.61	-13	-14.61
	1.4MHz	Low	Extended	-32.91	-13	-19.91
		High [B2]	Band Edge	-26.87	-13	-13.87
High [B25]		Band Edge	-27.76	-13	-14.76	
High [B2]		Extended	-32.59	-13	-19.59	
High [B25]		Extended	-31.72	-13	-18.72	

Table 7-12. Band Edge Summary – Antenna 1

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 44 of 97

Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
LTE-B25-2	20MHz	Low	Band Edge	-29.16	-13	-16.16
		Low	Extended	-26.17	-13	-13.17
		High [B2]	Band Edge	-31.50	-13	-18.50
		High [B25]	Band Edge	-31.02	-13	-18.02
		High [B2]	Extended	-26.60	-13	-13.60
		High [B25]	Extended	-28.37	-13	-15.37
	15MHz	Low	Band Edge	-29.62	-13	-16.62
		Low	Extended	-25.09	-13	-12.09
		High [B2]	Band Edge	-28.85	-13	-15.85
		High [B25]	Band Edge	-32.13	-13	-19.13
		High [B2]	Extended	-24.23	-13	-11.23
		High [B25]	Extended	-26.36	-13	-13.36
	10MHz	Low	Band Edge	-28.21	-13	-15.21
		Low	Extended	-22.66	-13	-9.66
		High [B2]	Band Edge	-27.06	-13	-14.06
		High [B25]	Band Edge	-28.61	-13	-15.61
		High [B2]	Extended	-22.89	-13	-9.89
		High [B25]	Extended	-24.13	-13	-11.13
	5MHz	Low	Band Edge	-27.07	-13	-14.07
		Low	Extended	-13.45	-13	-0.45
		High [B2]	Band Edge	-25.38	-13	-12.38
		High [B25]	Band Edge	-24.05	-13	-11.05
		High [B2]	Extended	-13.79	-13	-0.79
		High [B25]	Extended	-14.65	-13	-1.65
	3MHz	Low	Band Edge	-24.25	-13	-11.25
		Low	Extended	-22.78	-13	-9.78
		High [B2]	Band Edge	-22.94	-13	-9.94
		High [B25]	Band Edge	-24.49	-13	-11.49
		High [B2]	Extended	-17.39	-13	-4.39
		High [B25]	Extended	-23.75	-13	-10.75
1.4MHz	Low	Band Edge	-27.35	-13	-14.35	
	Low	Extended	-27.38	-13	-14.38	
	High [B2]	Band Edge	-27.28	-13	-14.28	
	High [B25]	Band Edge	-27.95	-13	-14.95	
	High [B2]	Extended	-28.17	-13	-15.17	
	High [B25]	Extended	-29.31	-13	-16.31	

Table 7-13. Band Edge Summary – Antenna 2

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 45 of 97

Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n25-2	40MHz	Low	Band Edge	-24.01	-13	-11.01
		Low	Extended	-26.99	-13	-13.99
		High [n25]	Band Edge	-25.27	-13	-12.27
		High [n25]	Extended	-26.49	-13	-13.49
	30MHz	Low	Band Edge	-24.08	-13	-11.08
		Low	Extended	-25.63	-13	-12.63
		High [n25]	Band Edge	-26.72	-13	-13.72
		High [n25]	Extended	-26.78	-13	-13.78
	25MHz	Low	Band Edge	-27.63	-13	-14.63
		Low	Extended	-26.06	-13	-13.06
		High [n25]	Band Edge	-26.48	-13	-13.48
		High [n25]	Extended	-28.37	-13	-15.37
	20MHz	Low	Band Edge	-29.71	-13	-16.71
		Low	Extended	-25.51	-13	-12.51
		High [n2]	Band Edge	-28.56	-13	-15.56
		High [n25]	Band Edge	-30.34	-13	-17.34
		High [n2]	Extended	-26.11	-13	-13.11
	15MHz	High [n25]	Extended	-26.76	-13	-13.76
		Low	Band Edge	-27.28	-13	-14.28
		Low	Extended	-22.52	-13	-9.52
		High [n2]	Band Edge	-27.87	-13	-14.87
		High [n25]	Band Edge	-28.02	-13	-15.02
	10MHz	High [n2]	Extended	-23.82	-13	-10.82
		High [n25]	Extended	-23.60	-13	-10.60
		Low	Band Edge	-26.33	-13	-13.33
		Low	Extended	-18.13	-13	-5.13
		High [n2]	Band Edge	-28.68	-13	-15.68
	5MHz	High [n25]	Band Edge	-25.82	-13	-12.82
		High [n2]	Extended	-19.68	-13	-6.68
		High [n25]	Extended	-19.69	-13	-6.69
		Low	Band Edge	-25.12	-13	-12.12
		Low	Extended	-29.40	-13	-16.40
		High [n2]	Band Edge	-22.06	-13	-9.06
		High [n25]	Band Edge	-23.11	-13	-10.11
		High [n2]	Extended	-31.53	-13	-18.53
		High [n25]	Extended	-30.15	-13	-17.15

Table 7-14. Band Edge Summary – Antenna 1

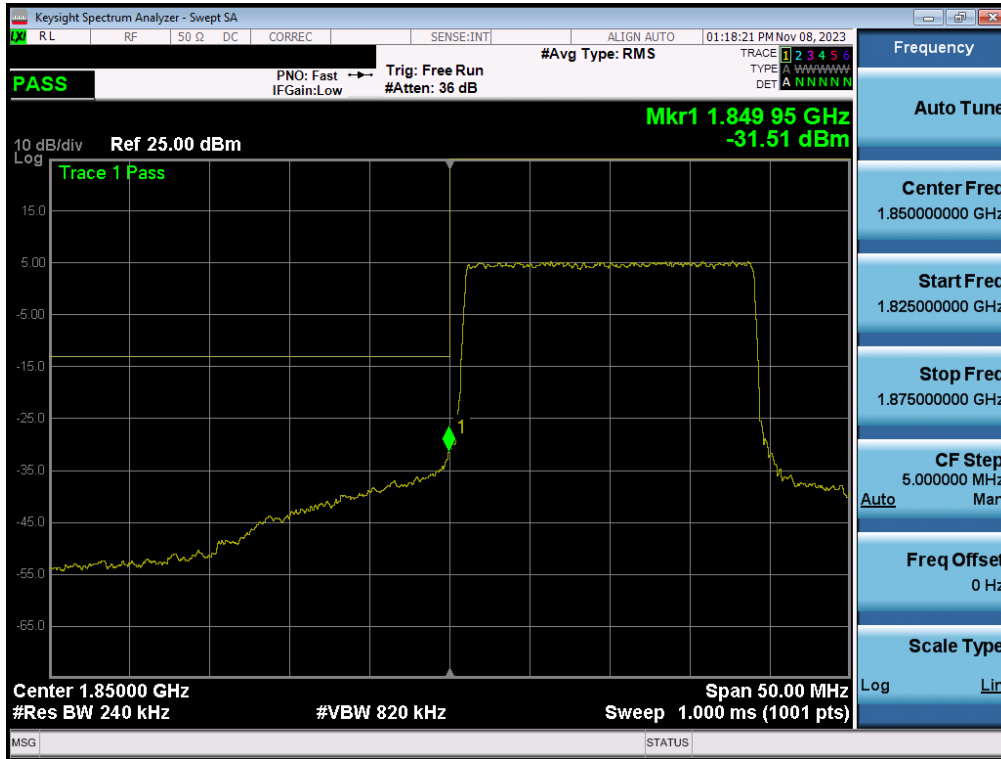
FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 46 of 97

Mode	Bandwidth	Channel	Test Case	Level [dBm]	Limit [dBm]	Margin [dB]
NR-n25-2	40MHz	Low	Band Edge	-24.92	-13	-11.92
		Low	Extended	-25.89	-13	-12.89
		High [n25]	Band Edge	-21.45	-13	-8.45
		High [n25]	Extended	-24.94	-13	-11.94
	30MHz	Low	Band Edge	-24.37	-13	-11.37
		Low	Extended	-23.50	-13	-10.50
		High [n25]	Band Edge	-26.59	-13	-13.59
		High [n25]	Extended	-25.08	-13	-12.08
	25MHz	Low	Band Edge	-27.26	-13	-14.26
		Low	Extended	-23.59	-13	-10.59
		High [n25]	Band Edge	-26.55	-13	-13.55
		High [n25]	Extended	-24.06	-13	-11.06
	20MHz	Low	Band Edge	-25.70	-13	-12.70
		Low	Extended	-22.38	-13	-9.38
		High [n2]	Band Edge	-25.53	-13	-12.53
		High [n25]	Band Edge	-27.64	-13	-14.64
		High [n2]	Extended	-21.95	-13	-8.95
		High [n25]	Extended	-23.30	-13	-10.30
	15MHz	Low	Band Edge	-26.10	-13	-13.10
		Low	Extended	-20.72	-13	-7.72
		High [n2]	Band Edge	-26.08	-13	-13.08
		High [n25]	Band Edge	-27.37	-13	-14.37
		High [n2]	Extended	-21.70	-13	-8.70
		High [n25]	Extended	-20.86	-13	-7.86
	10MHz	Low	Band Edge	-26.53	-13	-13.53
		Low	Extended	-17.61	-13	-4.61
		High [n2]	Band Edge	-26.15	-13	-13.15
		High [n25]	Band Edge	-26.48	-13	-13.48
		High [n2]	Extended	-18.11	-13	-5.11
		High [n25]	Extended	-18.58	-13	-5.58
5MHz	Low	Band Edge	-24.09	-13	-11.09	
	Low	Extended	-19.25	-13	-6.25	
	High [n2]	Band Edge	-22.95	-13	-9.95	
	High [n25]	Band Edge	-23.89	-13	-10.89	
	High [n2]	Extended	-18.60	-13	-5.60	
	High [n25]	Extended	-25.49	-13	-12.49	

Table 7-15. Band Edge Summary – Antenna 2

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 47 of 97

LTE Band 25/2 – Ant1



Plot 7-32. Lower Band Edge Plot (LTE Band 25/2 - 20MHz QPSK – Full RB - Ant1)



Plot 7-33. Extended Lower Band Edge Plot (LTE Band 25/2 - 20MHz QPSK – Full RB - Ant1)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 48 of 97

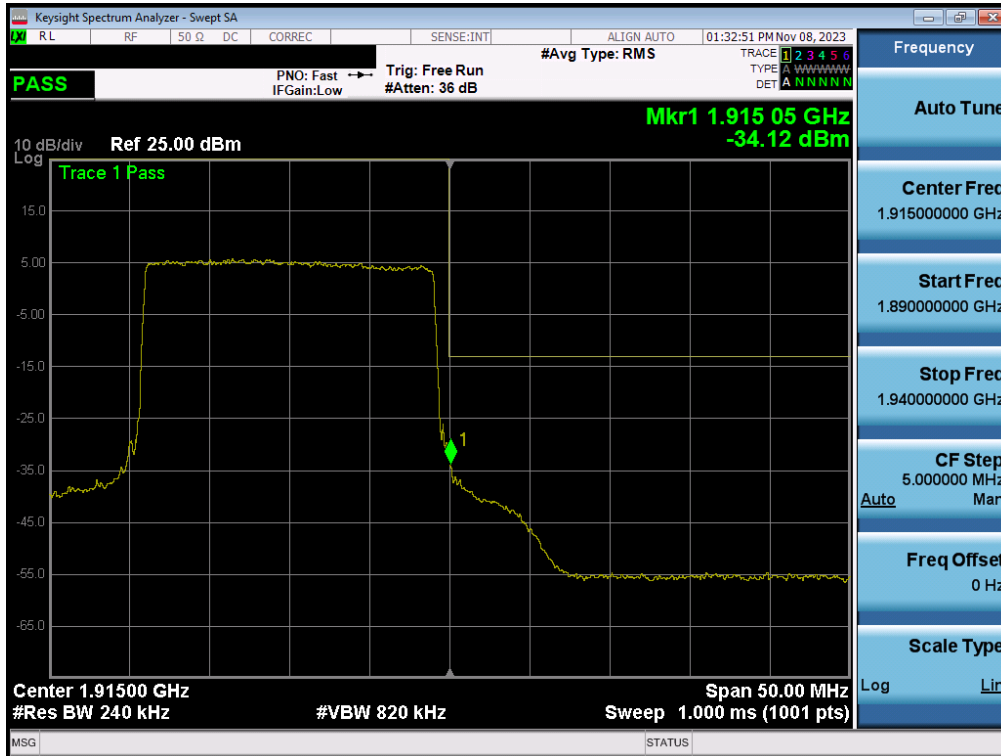


Plot 7-34. Upper Band Edge Plot (LTE Band 2 - 20MHz QPSK – Full RB - Ant1)

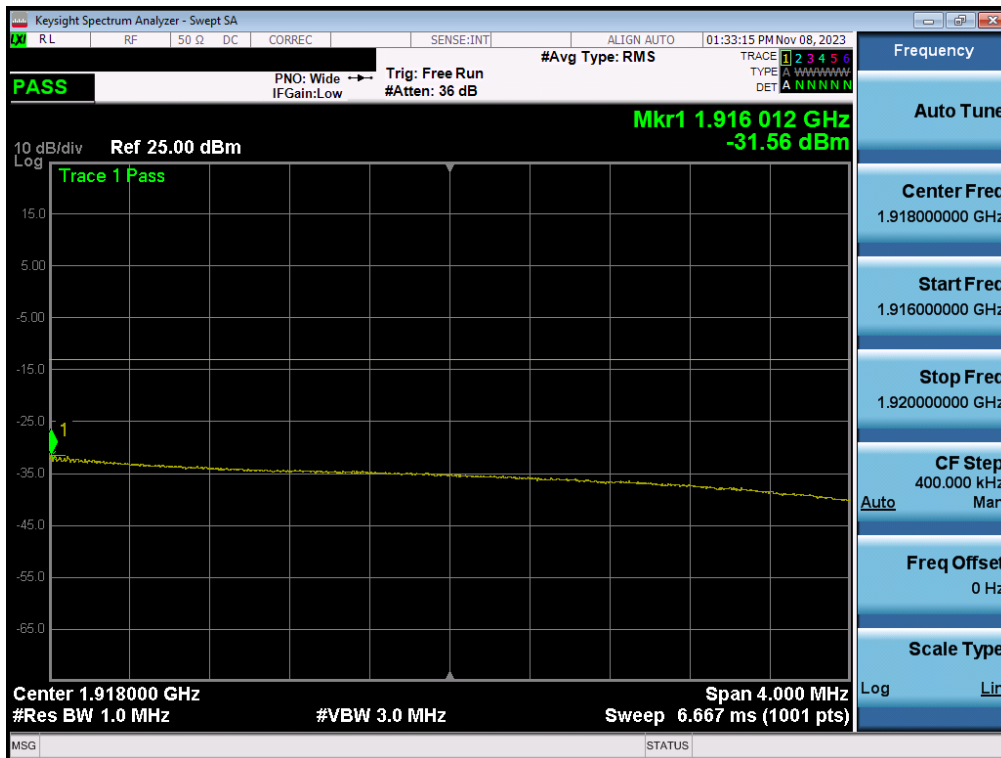


Plot 7-35. Extended Upper Band Edge Plot (LTE Band 2 - 20MHz QPSK – Full RB - Ant1)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 49 of 97



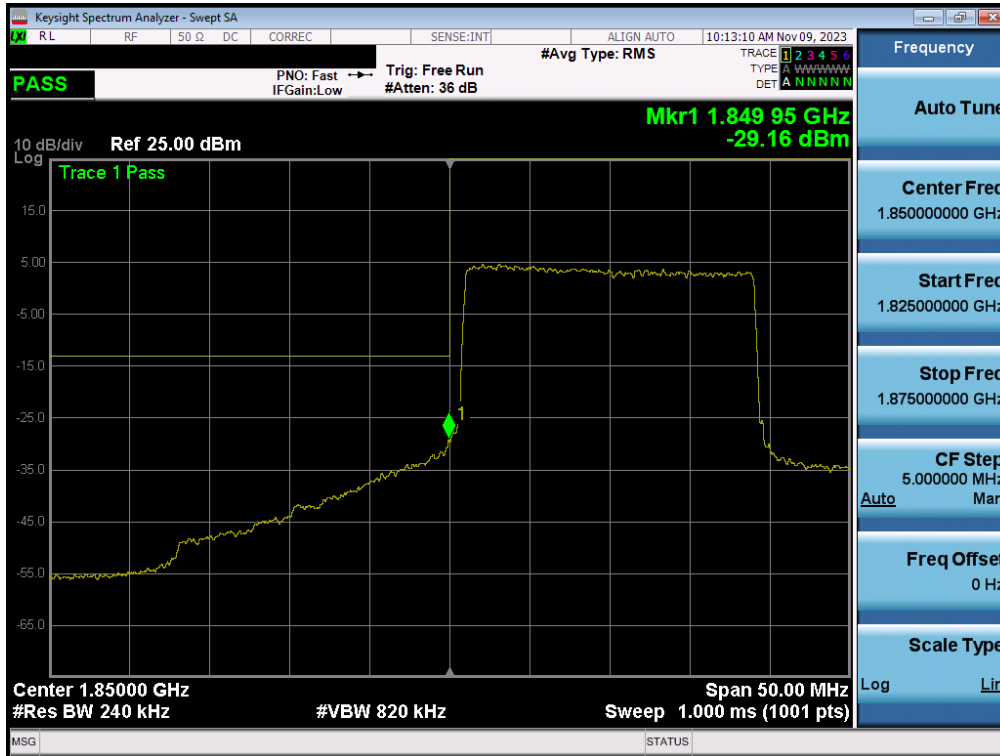
Plot 7-36. Upper Band Edge Plot (LTE Band 25 - 20MHz QPSK – Full RB - Ant1)



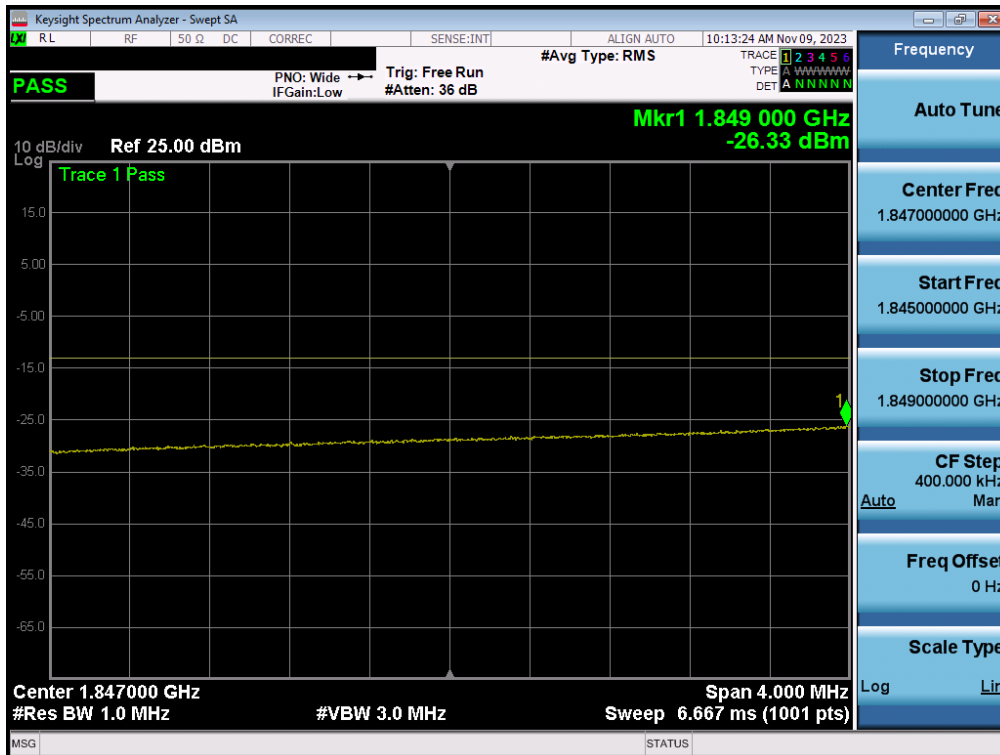
Plot 7-37. Extended Upper Band Edge Plot (LTE Band 25 - 20MHz QPSK – Full RB - Ant1)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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LTE Band 25/2 – Ant2

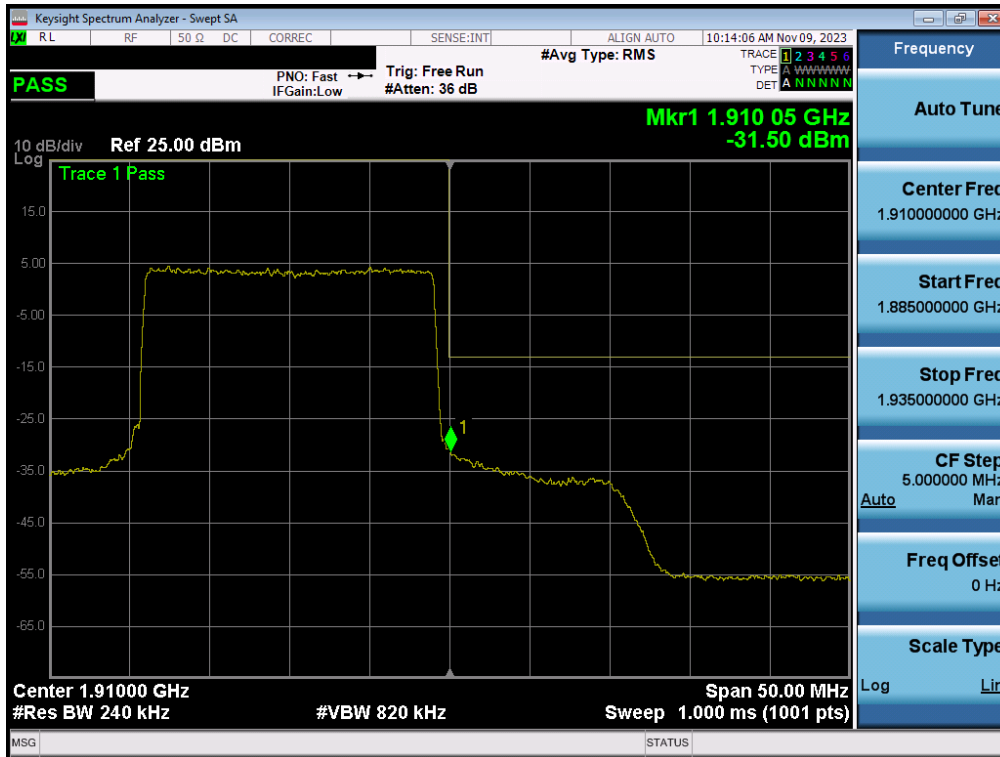


Plot 7-38. Lower Band Edge Plot (LTE Band 25/2 - 20MHz QPSK – Full RB - Ant2)

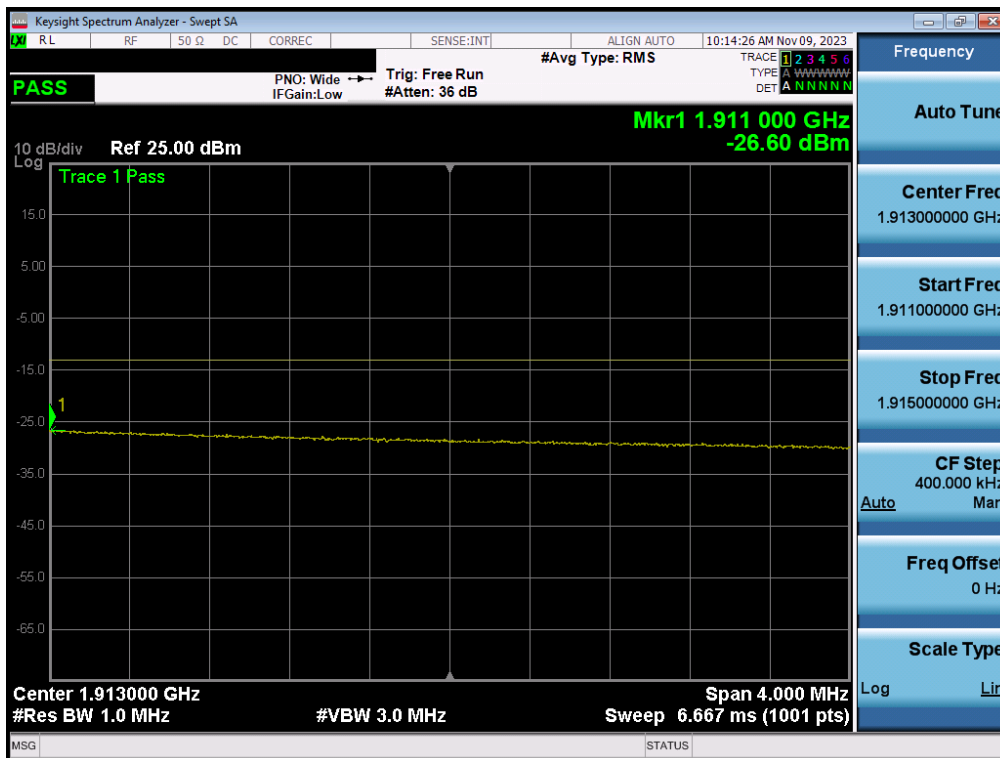


Plot 7-39. Extended Lower Band Edge Plot (LTE Band 25/2 - 20MHz QPSK – Full RB - Ant2)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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Plot 7-40. Upper Band Edge Plot (LTE Band 2 - 20MHz QPSK – Full RB - Ant2)

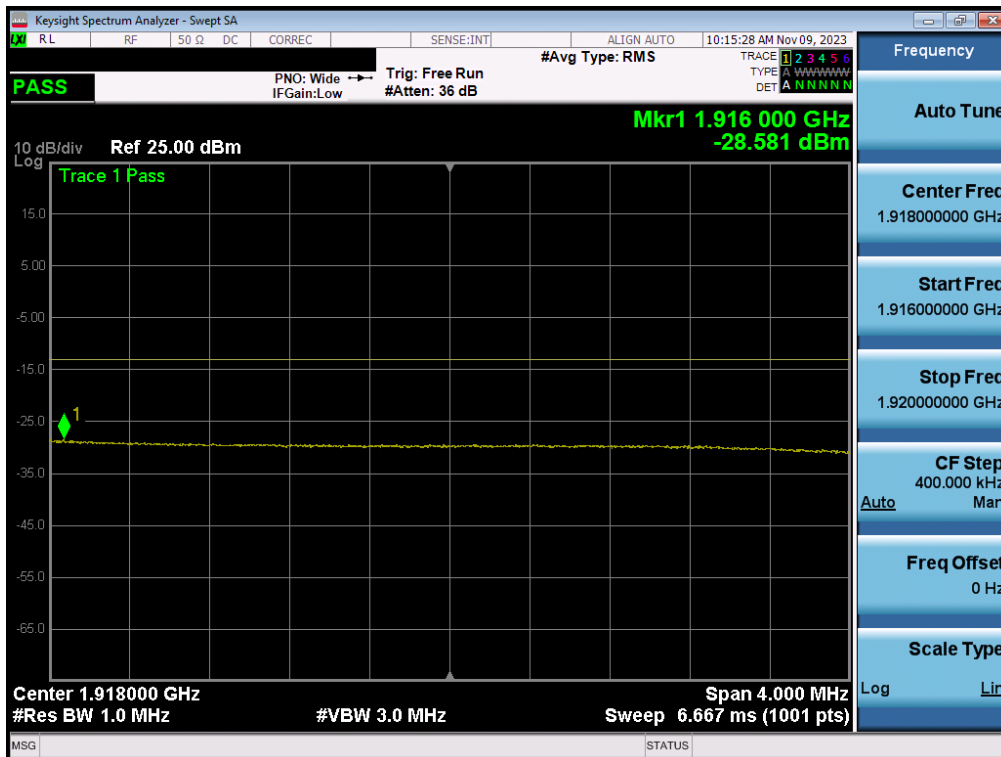


Plot 7-41. Extended Upper Band Edge Plot (LTE Band 2 - 20MHz QPSK – Full RB - Ant2)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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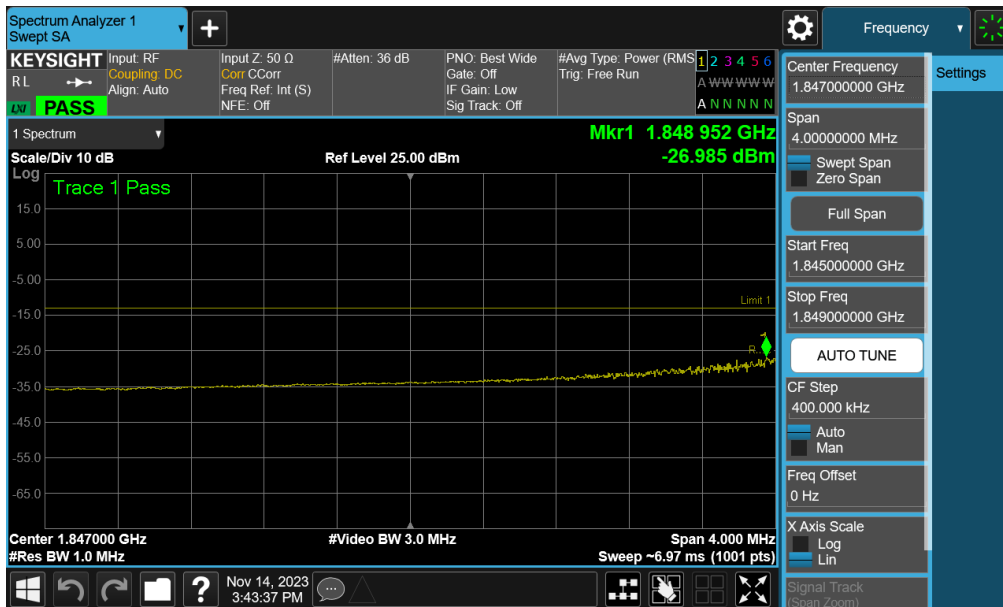
Plot 7-42. Upper Band Edge Plot (LTE Band 25 - 20MHz QPSK – Full RB - Ant2)



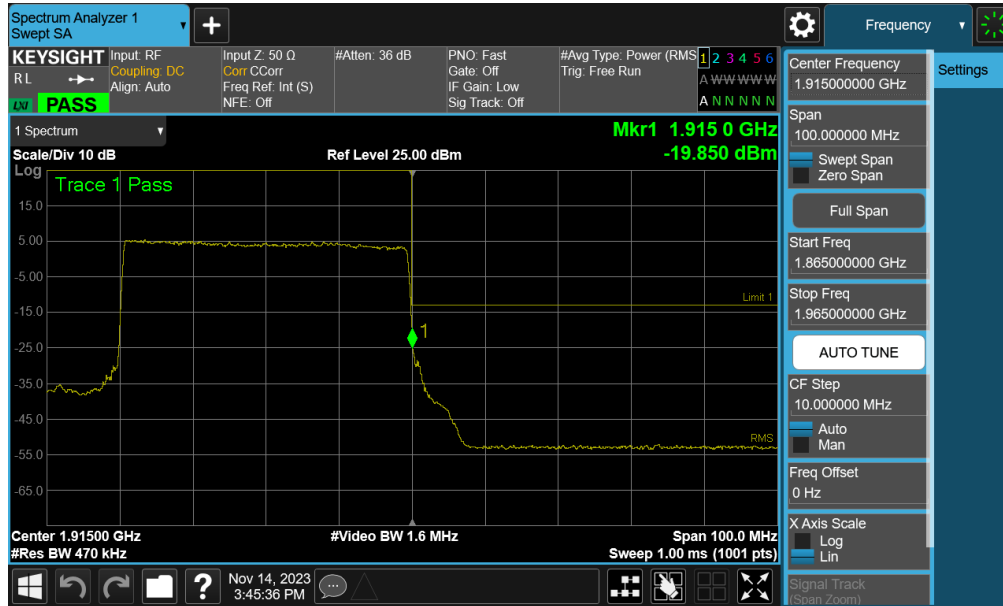
Plot 7-43. Extended Upper Band Edge Plot (LTE Band 25 - 20MHz QPSK – Full RB - Ant2)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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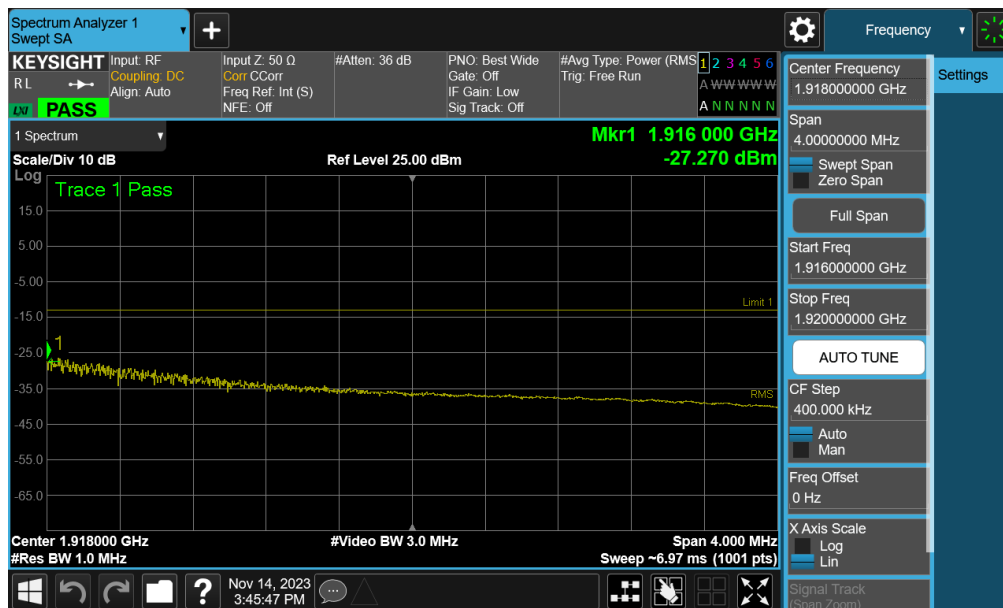
NR Band n25/2 – Ant1



FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 54 of 97



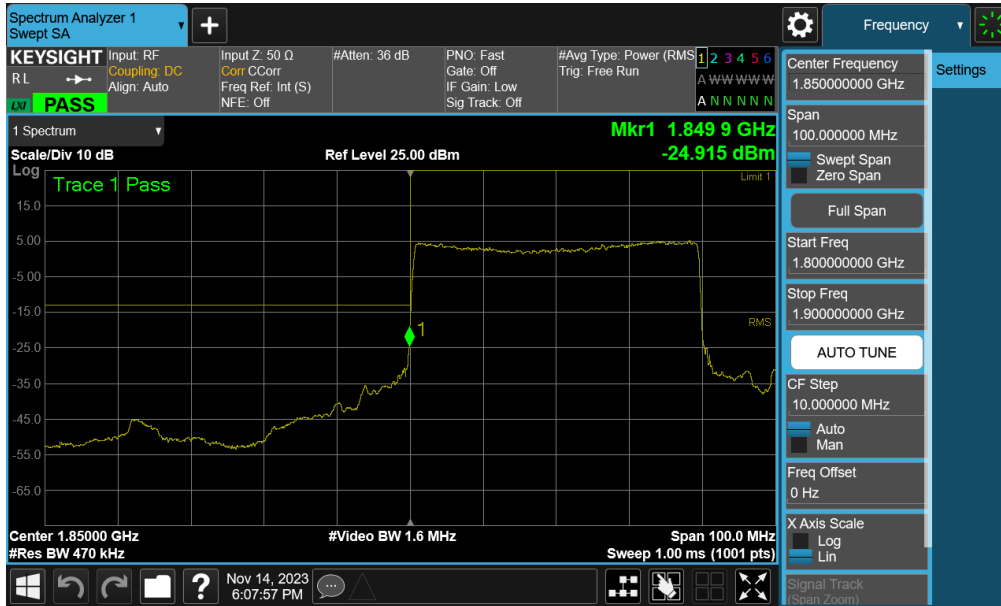
Plot 7-46. Upper Band Edge Plot (NR Band n25 - 40MHz QPSK – Full RB - Ant1)



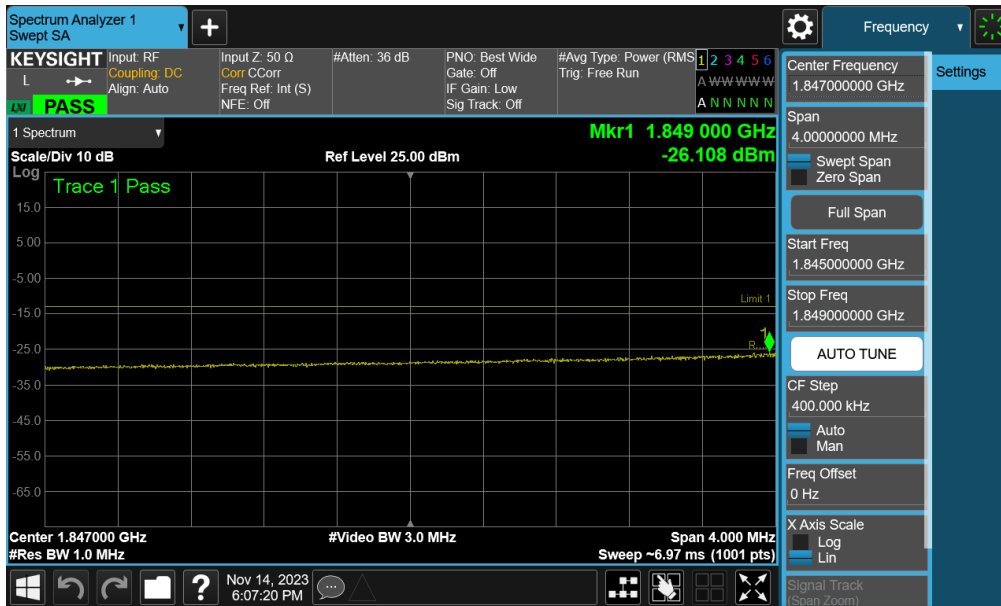
Plot 7-47. Extended Upper Band Edge Plot (NR Band n25 - 40MHz QPSK – Full RB - Ant1)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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NR Band n25/2 – Ant2

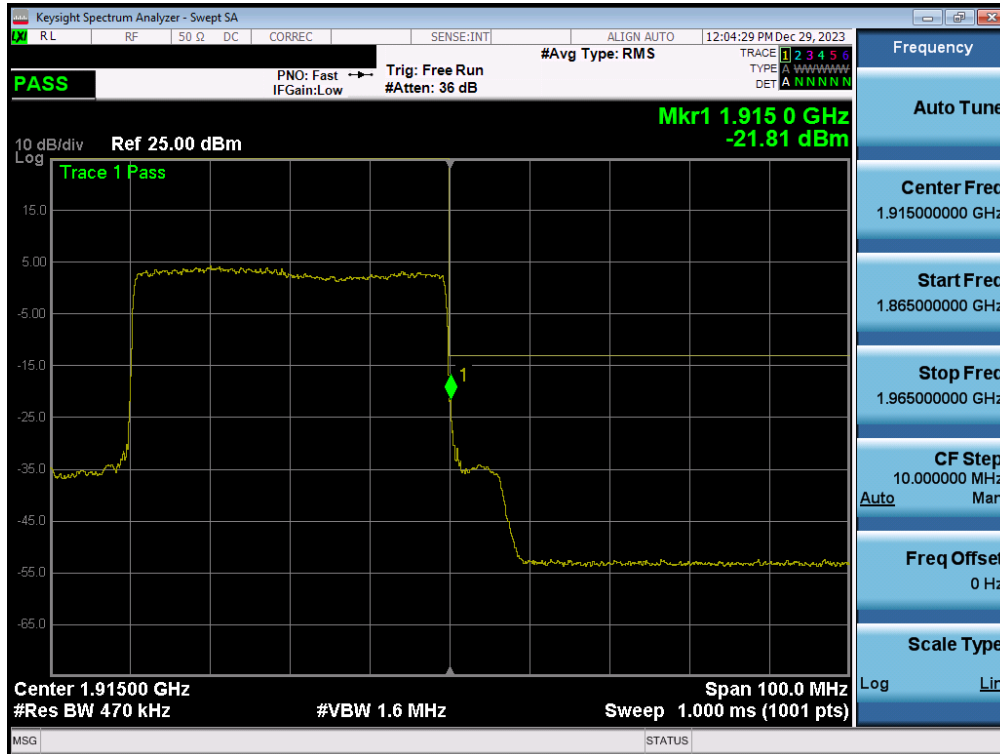


Plot 7-48. Lower Band Edge Plot (NR Band n25 - 40MHz QPSK – Full RB - Ant2)

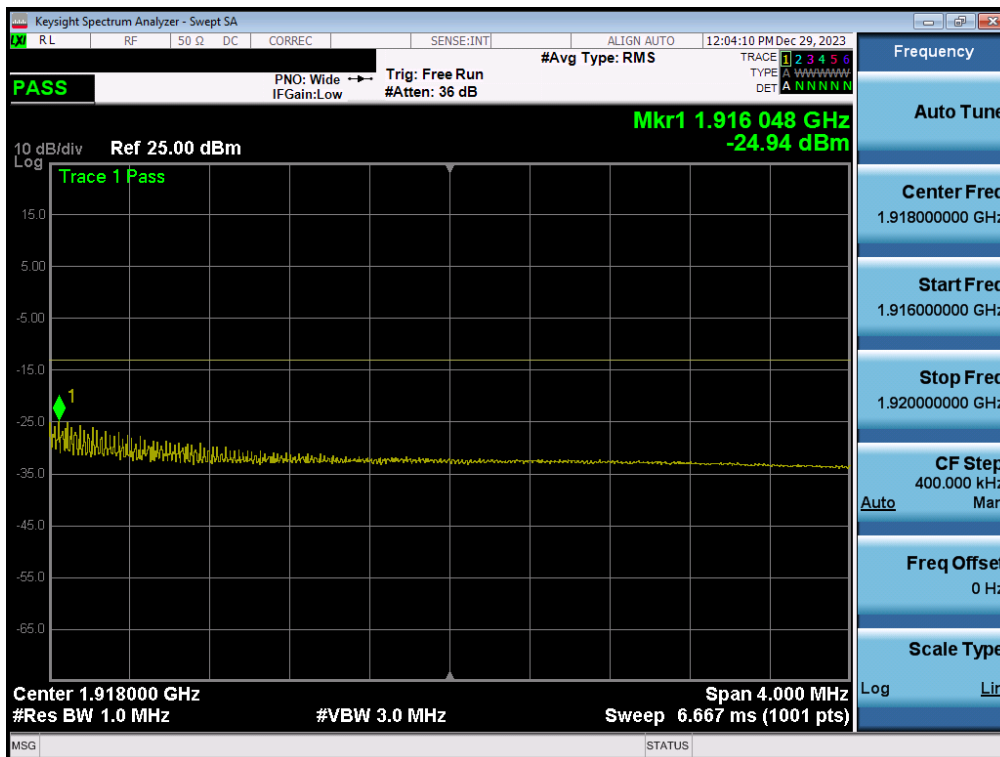


Plot 7-49. Extended Lower Band Edge Plot (NR Band n25 - 40MHz QPSK – Full RB - Ant2)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2311010111-03.A3L	Test Dates: 11/7/2023 - 12/29/2023	EUT Type: Portable Handset	Page 56 of 97



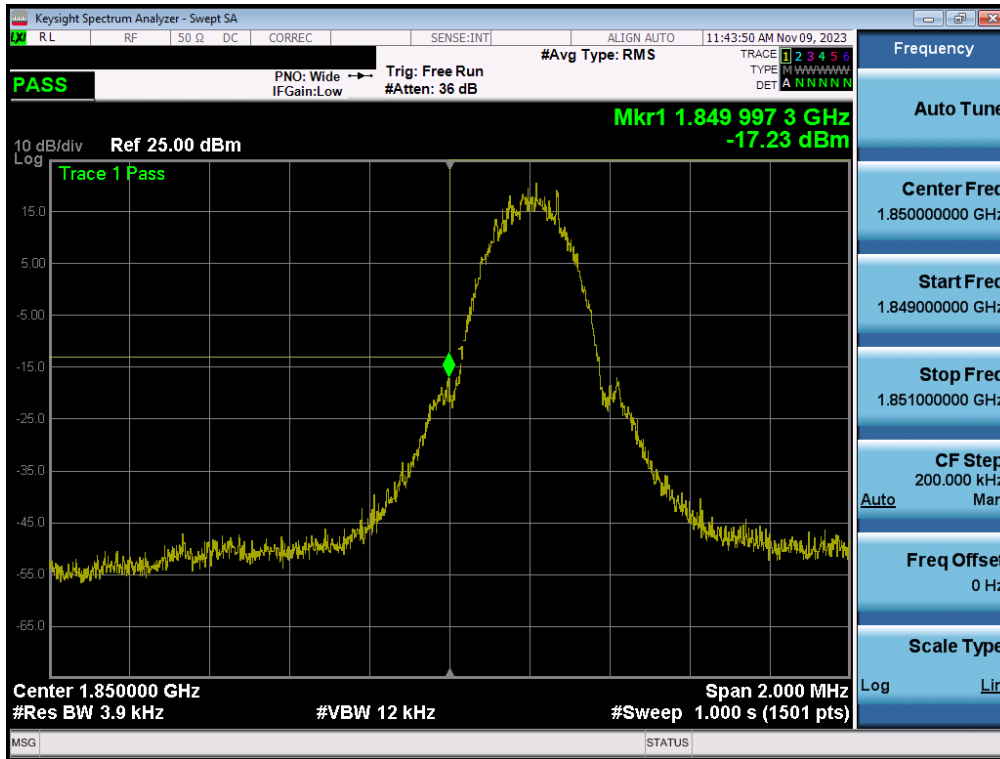
Plot 7-50. Upper Band Edge Plot (NR Band n25 - 40MHz QPSK – Full RB - Ant2)



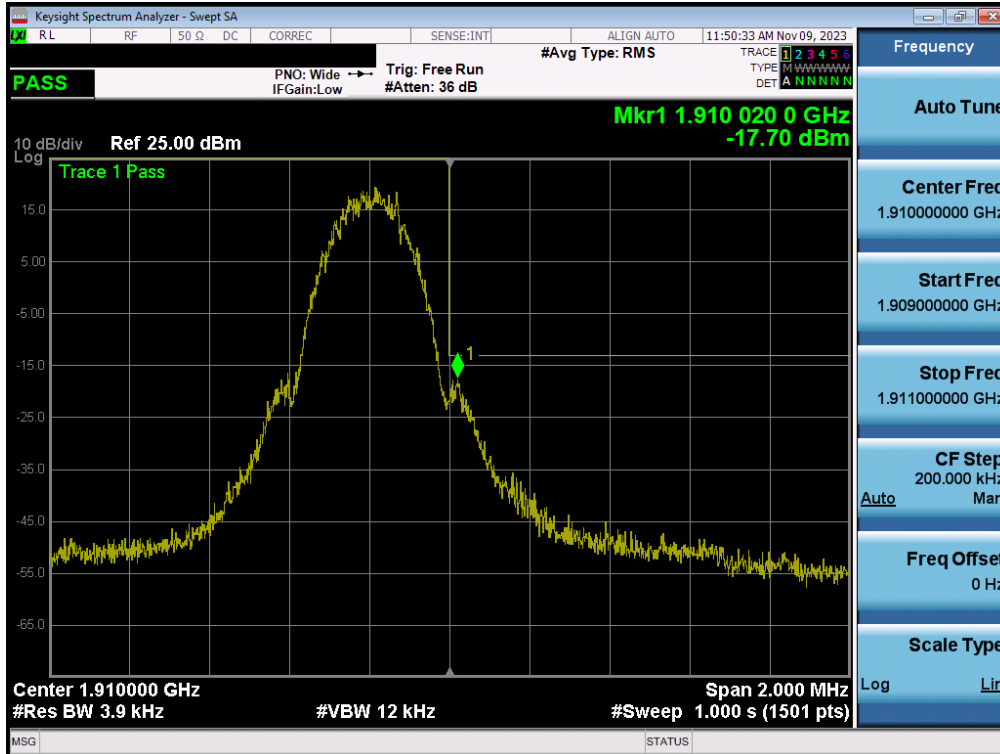
Plot 7-51. Extended Upper Band Edge Plot (NR Band n25 - 40MHz QPSK – Full RB - Ant2)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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GSM/GPRS PCS – Ant1



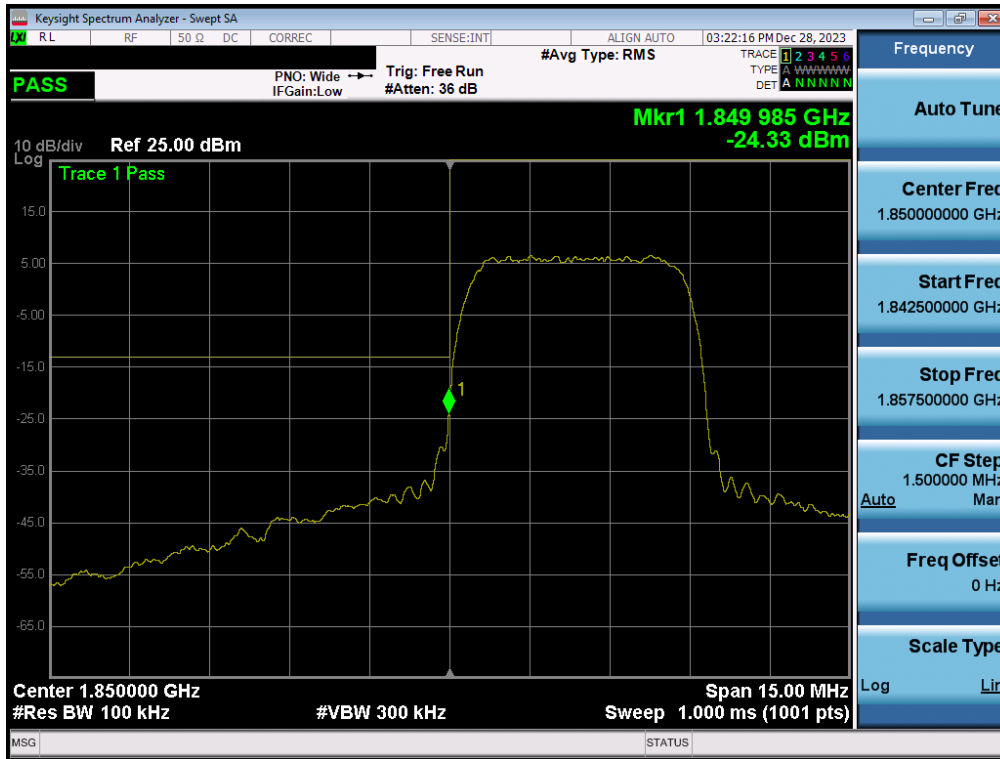
Plot 7-52. Lower Band Edge Plot (GPRS PCS – Ch. 512 - Ant1)



Plot 7-53. Upper Band Edge Plot (GPRS PCS – Ch. 810 - Ant1)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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WCDMA PCS – Ant1



Plot 7-54. Lower Band Edge Plot (WCDMA PCS – Ch. 9262 - Ant1)



Plot 7-55. Upper Band Edge Plot (WCDMA PCS – Ch. 9538 - Ant1)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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7.6 Peak-Average Ratio

Test Overview

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.

Test Procedure Used

ANSI C63.26-2015 – Section 5.2.3.4

Test Settings

1. The signal analyzer’s CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW \geq OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal “RF Burst” trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the “on time” of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Setup

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

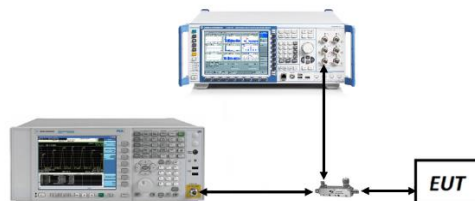


Figure 7-5. Test Instrument & Measurement Setup

Test Notes

For the QAM modulations, 256QAM was found to have the worst-case peak-to-average ratio so it is the only QAM measurement included in this section.

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Mode	Bandwidth	Modulation	Average Power [dBm]	PAR at 0.1% [dB]	PAR Limit [dB]	Margin [dB]
GSM-PCS	N/A	GMSK	27.33	2.86	13	-10.14
GSM-PCS EDGE		8-PSK	27.02	2.85	13	-10.15
WCDMA-PCS		Spread Spectrum	2.66	3.02	13	-9.98
LTE-B25-2	20MHz	QPSK	22.98	5.76	13	-7.24
		256QAM	18.98	6.35	13	-6.65
	15MHz	QPSK	23.17	5.98	13	-7.02
		256QAM	19.10	6.26	13	-6.74
	10MHz	QPSK	23.17	5.70	13	-7.30
		256QAM	19.04	6.29	13	-6.71
	5MHz	QPSK	23.10	5.70	13	-7.30
		256QAM	19.00	6.18	13	-6.82
	3MHz	QPSK	22.75	5.76	13	-7.24
		256QAM	18.61	6.30	13	-6.70
1.4MHz	QPSK	22.72	5.74	13	-7.26	
	256QAM	18.62	6.22	13	-6.78	

Table 7-16. Peak-Average Ratio Summary – Antenna 1

Mode	Bandwidth	Modulation	Average Power [dBm]	PAR at 0.1% [dB]	PAR Limit [dB]	Margin [dB]
LTE-B25-2	20MHz	QPSK	21.82	5.26	13	-7.74
		256QAM	16.79	5.70	13	-7.30
	15MHz	QPSK	22.02	5.28	13	-7.72
		256QAM	16.87	5.58	13	-7.42
	10MHz	QPSK	21.97	5.15	13	-7.85
		256QAM	16.86	5.60	13	-7.40
	5MHz	QPSK	22.02	5.10	13	-7.90
		256QAM	16.90	5.48	13	-7.52
	3MHz	QPSK	22.02	5.09	13	-7.91
		256QAM	16.86	5.54	13	-7.46
1.4MHz	QPSK	22.04	4.94	13	-8.06	
	256QAM	16.92	5.24	13	-7.76	

Table 7-17. Peak-Average Ratio Summary – Antenna 2

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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Mode	Bandwidth	Modulation	Average Power [dBm]	PAR at 0.1% [dB]	PAR Limit [dB]	Margin [dB]
NR-n25-2	40MHz	BPSK	23.01	5.21	13	-7.79
		QPSK	20.46	7.93	13	-5.07
		256QAM	16.91	8.68	13	-4.32
	30MHz	BPSK	23.09	4.57	13	-8.43
		QPSK	20.53	7.77	13	-5.23
		256QAM	16.99	8.52	13	-4.48
	25MHz	BPSK	23.01	4.78	13	-8.22
		QPSK	20.50	7.74	13	-5.26
		256QAM	16.97	8.63	13	-4.37
	20MHz	BPSK	22.99	4.46	13	-8.54
		QPSK	20.49	7.61	13	-5.39
		256QAM	16.94	7.79	13	-5.21
	15MHz	BPSK	23.04	4.39	13	-8.61
		QPSK	20.50	7.49	13	-5.51
		256QAM	16.96	8.51	13	-4.49
	10MHz	BPSK	23.00	4.50	13	-8.50
		QPSK	20.46	7.56	13	-5.44
		256QAM	16.95	8.50	13	-4.50
	5MHz	BPSK	23.00	4.41	13	-8.59
		QPSK	20.46	7.39	13	-5.61
		256QAM	16.90	8.44	13	-4.56

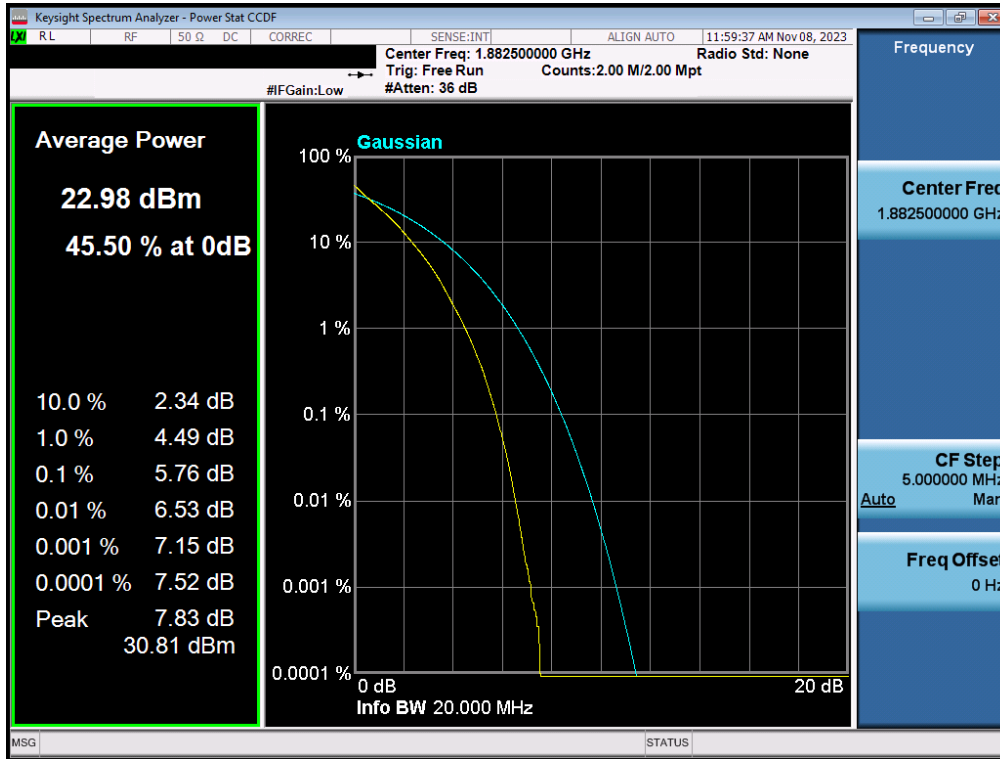
Table 7-18. Peak-Average Ratio Summary – Antenna 1

Mode	Bandwidth	Modulation	Average Power [dBm]	PAR at 0.1% [dB]	PAR Limit [dB]	Margin [dB]
NR-n25-2	40MHz	BPSK	22.26	5.33	13	-7.67
		QPSK	19.79	7.61	13	-5.39
		256QAM	16.56	8.63	13	-4.37
	30MHz	BPSK	22.58	3.99	13	-9.01
		QPSK	20.09	7.14	13	-5.86
		256QAM	16.56	8.51	13	-4.49
	25MHz	BPSK	22.57	4.11	13	-8.89
		QPSK	20.09	7.13	13	-5.87
		256QAM	16.57	8.57	13	-4.43
	20MHz	BPSK	22.58	4.35	13	-8.65
		QPSK	20.08	6.99	13	-6.01
		256QAM	16.52	6.75	13	-6.25
	15MHz	BPSK	22.62	4.30	13	-8.70
		QPSK	20.10	6.85	13	-6.15
		256QAM	16.57	8.44	13	-4.56
	10MHz	BPSK	22.59	4.30	13	-8.70
		QPSK	20.06	6.89	13	-6.11
		256QAM	16.56	8.43	13	-4.57
	5MHz	BPSK	22.59	4.26	13	-8.74
		QPSK	20.07	6.76	13	-6.24
		256QAM	16.52	8.45	13	-4.55

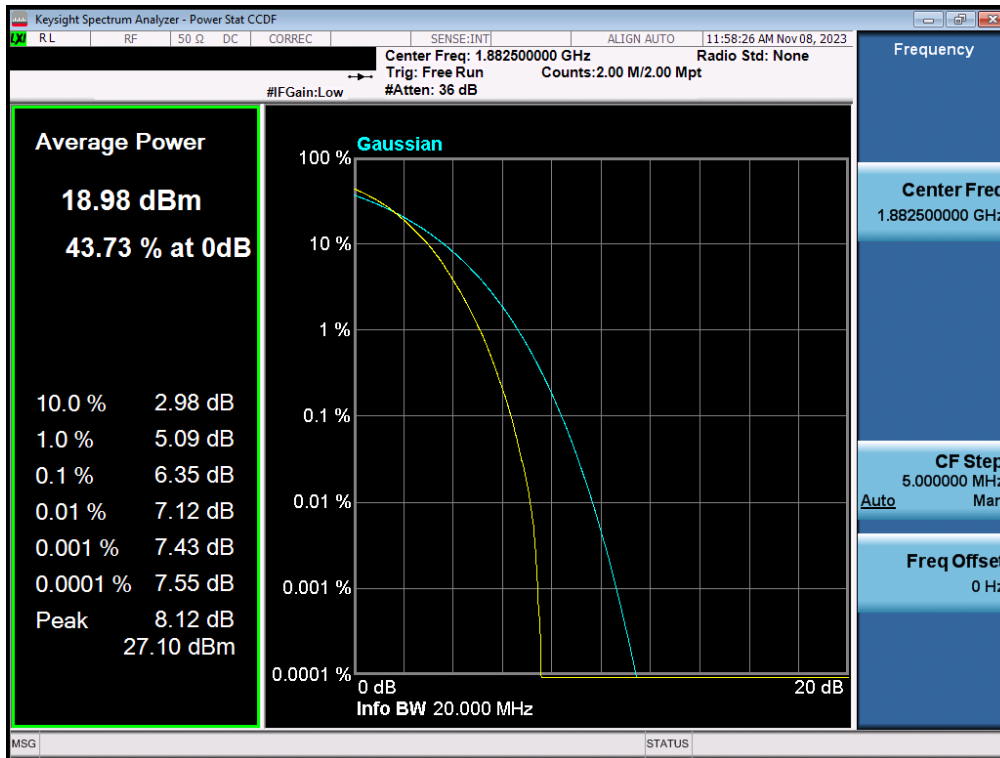
Table 7-19. Peak-Average Ratio Summary – Antenna 2

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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LTE Band 25/2 – Ant1



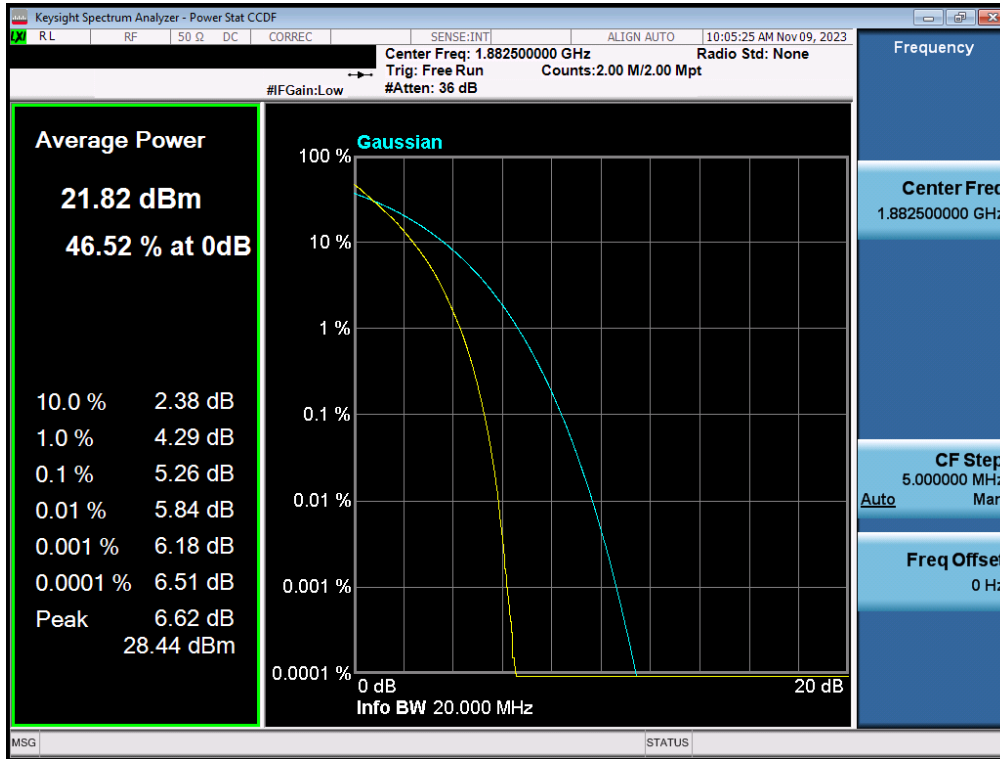
Plot 7-56. PAR Plot (LTE Band 25/2 - 20MHz QPSK - Full RB - Ant1)



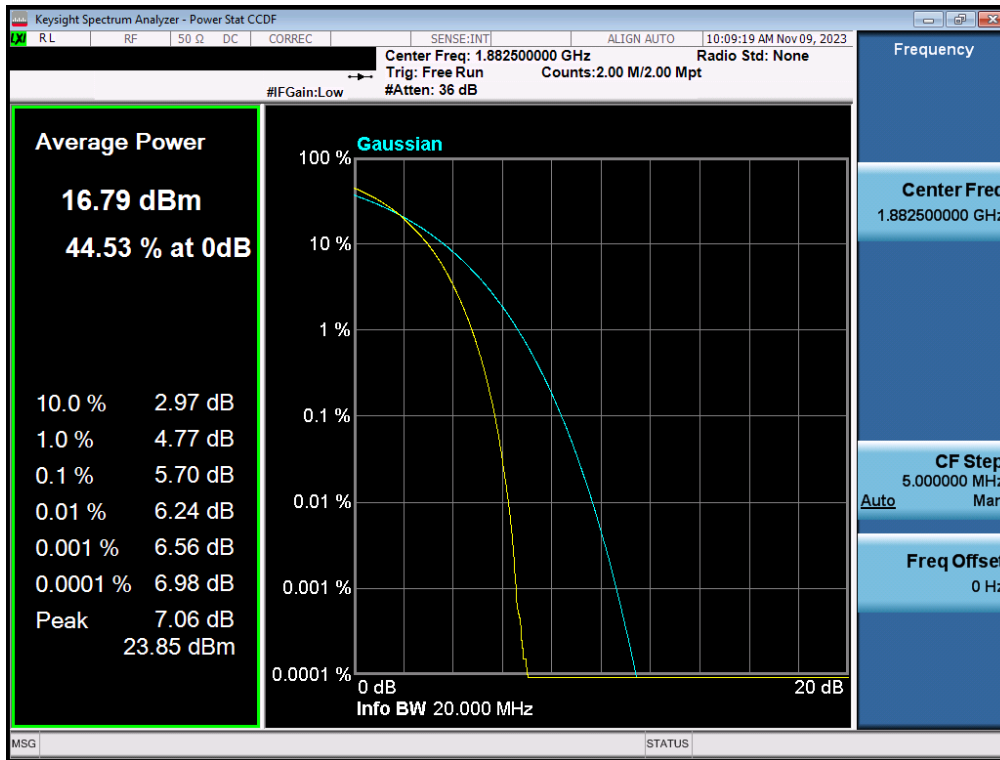
Plot 7-57. PAR Plot (LTE Band 25/2 - 20MHz 256-QAM - Full RB - Ant1)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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LTE Band 25/2 – Ant2



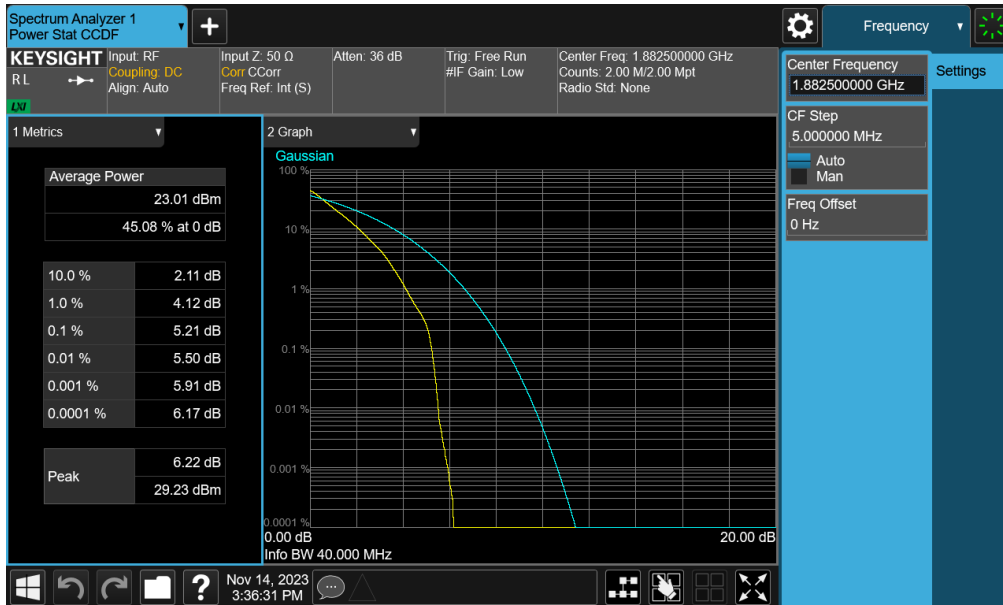
Plot 7-58. PAR Plot (LTE Band 25/2 - 20MHz QPSK - Full RB - Ant2)



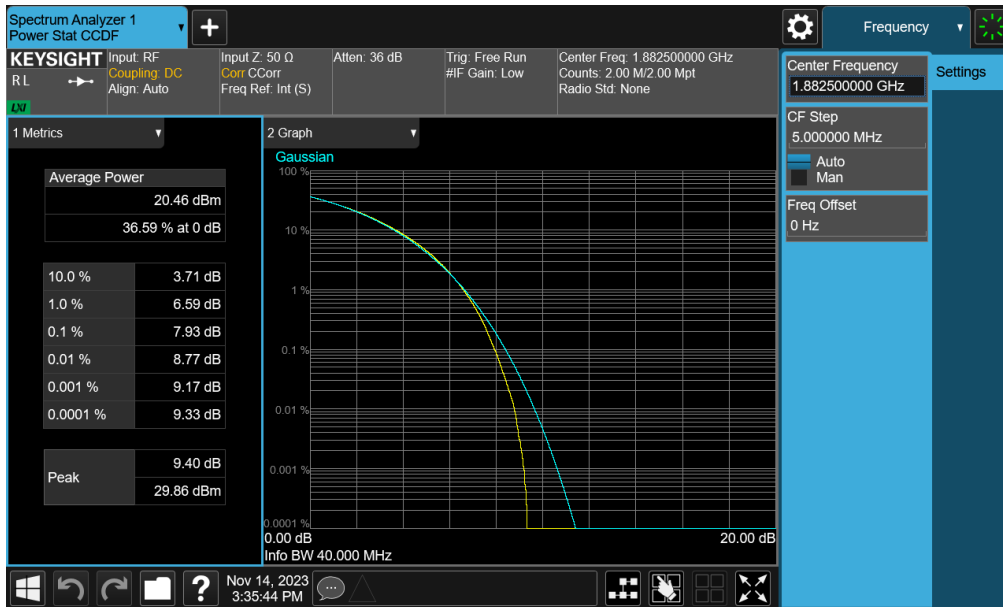
Plot 7-59. PAR Plot (LTE Band 25/2 - 20MHz 256-QAM - Full RB - Ant2)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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NR Band n25/2 – Ant1



Plot 7-60. PAR Plot (NR Band n25/2 - 40.0MHz DFT-s-OFDM BPSK - Full RB - ANT1)



Plot 7-61. PAR Plot (NR Band n25/2 - 40.0MHz CP-OFDM QPSK - Full RB - ANT1)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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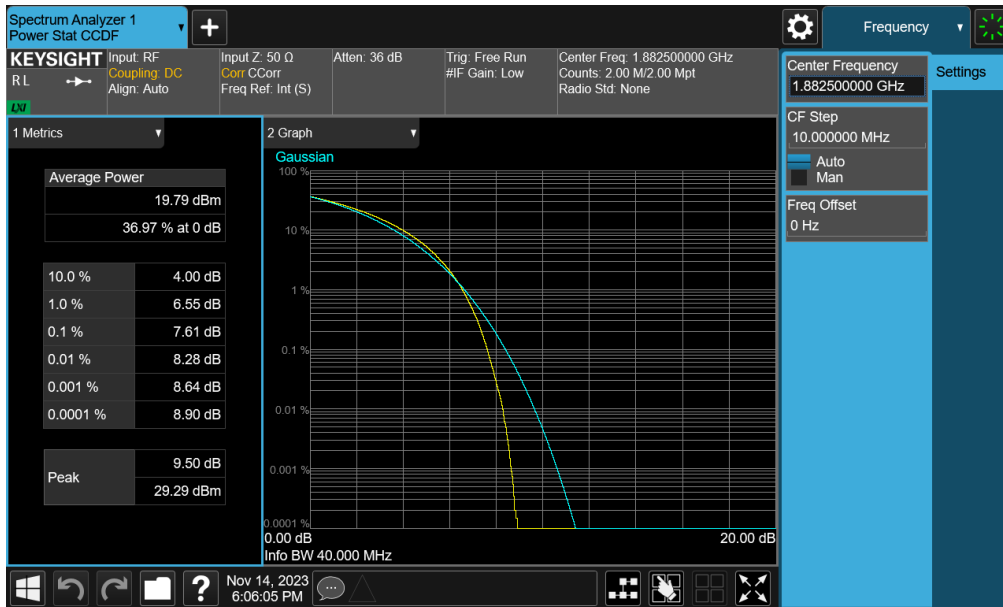
Plot 7-62. PAR Plot (NR Band n25/2 - 40.0MHz CP-OFDM 256-QAM - Full RB - ANT1)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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NR Band n25/2 – Ant2

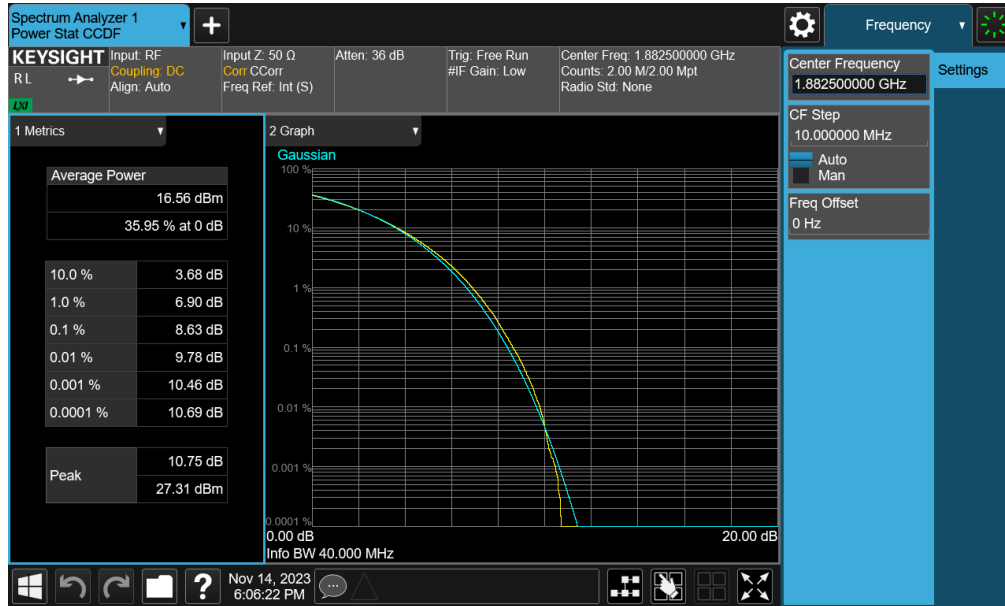


Plot 7-63. PAR Plot (NR Band n25/2 - 40.0MHz DFT-s-OFDM BPSK - Full RB - ANT2)



Plot 7-64. PAR Plot (NR Band n25/2 - 40.0MHz CP-OFDM QPSK - Full RB - ANT2)

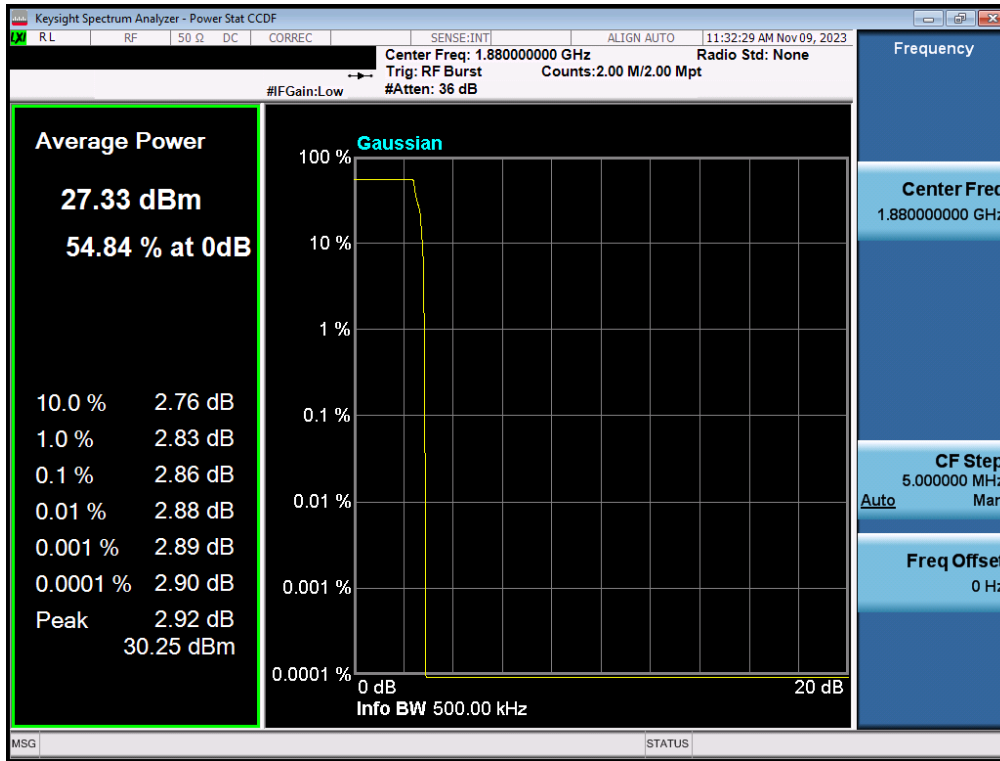
FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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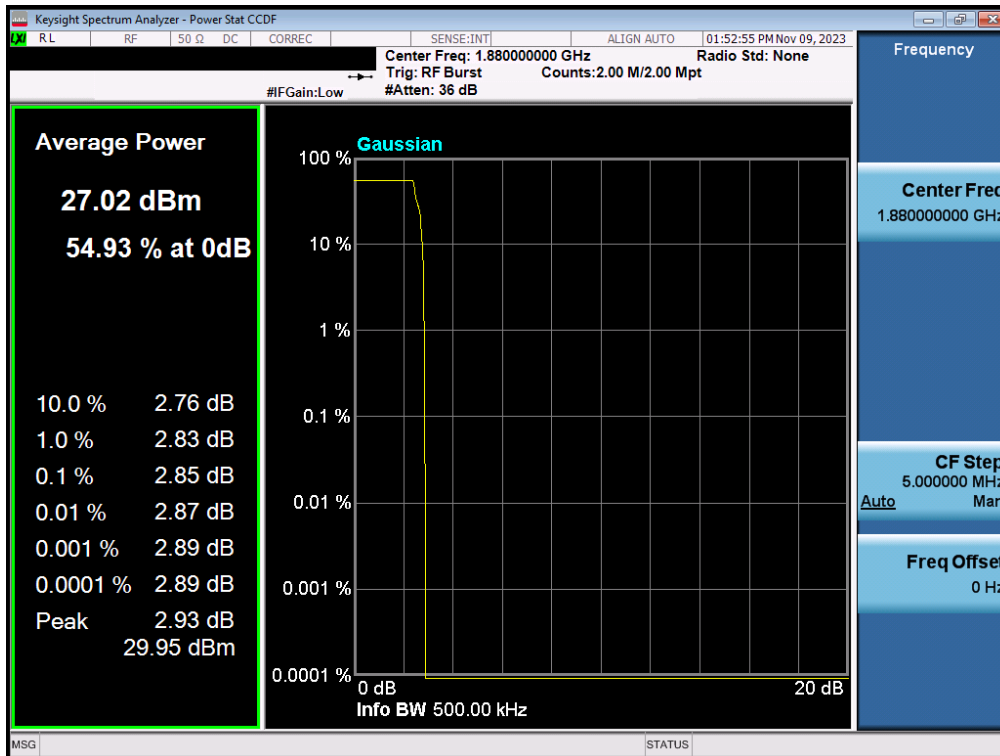
Plot 7-65. PAR Plot (NR Band n25/2 - 40.0MHz CP-OFDM 256-QAM - Full RB - ANT2)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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GSM/GPRS PCS – Ant1



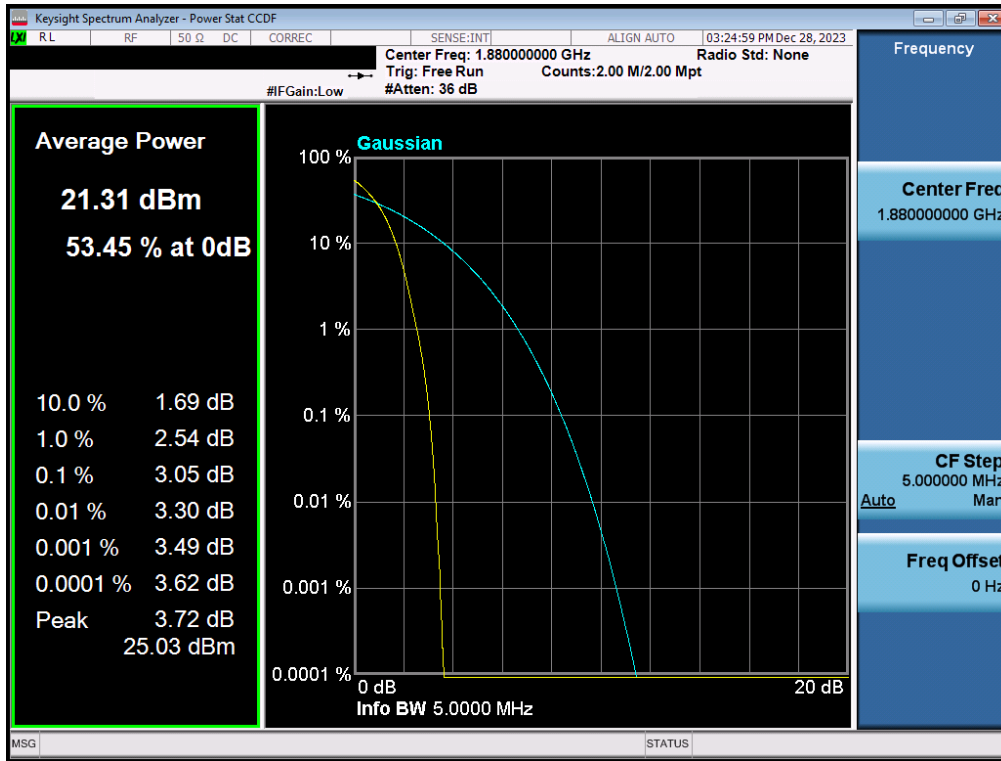
Plot 7-66. PAR Plot (GPRS, Ch. 661 - Ant1)



Plot 7-67. PAR Plot (EDGE, Ch. 661 - Ant1)

FCC ID: A3LSMA356U	PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
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WCDMA PCS – Ant1



Plot 7-68. PAR Plot (WCDMA, Ch. 9400 - Ant1)

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7.7 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

1. 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 \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”. 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.

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Test Setup

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

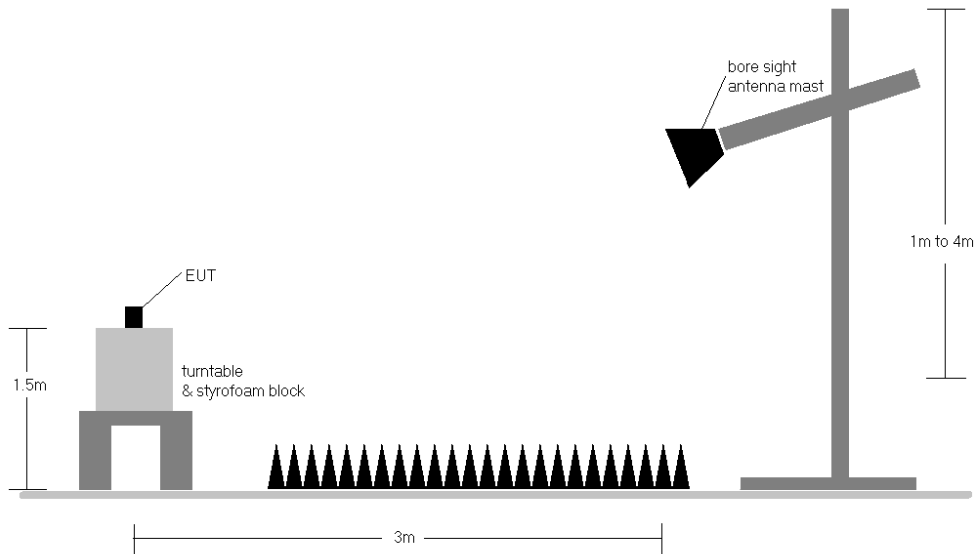


Figure 7-6. Radiated Test Setup >1GHz

Test Notes

- 1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest powers are reported in GPRS mode while transmitting with one slot active.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest powers are reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1".
- 3) 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.
- 4) This unit was tested with its standard battery.
- 5) 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.

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Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	EUT Pol.	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
20 MHz	QPSK	1860.00	H	X	116	238	2.79	1 / 0	21.43	24.22	0.264	33.01	-8.79
	QPSK	1882.50	H	X	109	237	2.65	1 / 0	21.31	23.96	0.249	33.01	-9.05
	QPSK	1905.00	H	X	102	246	2.54	1 / 0	20.55	23.09	0.204	33.01	-9.92
	16-QAM	1860.00	H	X	116	238	2.79	1 / 0	20.56	23.35	0.216	33.01	-9.66
15 MHz	QPSK	1857.50	H	X	116	238	2.81	1 / 0	21.26	24.07	0.255	33.01	-8.94
	QPSK	1882.50	H	X	109	237	2.65	1 / 74	21.53	24.18	0.262	33.01	-8.83
	QPSK	1907.50	H	X	102	246	2.54	1 / 37	20.85	23.39	0.218	33.01	-9.62
	16-QAM	1857.50	H	X	116	238	2.81	1 / 74	20.34	23.15	0.207	33.01	-9.86
10 MHz	QPSK	1855.00	H	X	116	238	2.82	1 / 0	21.34	24.17	0.261	33.01	-8.84
	QPSK	1882.50	H	X	109	237	2.65	1 / 0	21.48	24.13	0.259	33.01	-8.88
	QPSK	1910.00	H	X	102	246	2.55	1 / 49	20.77	23.32	0.215	33.01	-9.69
	16-QAM	1882.50	H	X	109	237	2.65	1 / 0	20.71	23.36	0.217	33.01	-9.65
5 MHz	QPSK	1852.50	H	X	116	238	2.84	1 / 12	21.38	24.22	0.264	33.01	-8.79
	QPSK	1882.50	H	X	109	237	2.65	1 / 24	21.72	24.37	0.273	33.01	-8.64
	QPSK	1912.50	H	X	102	246	2.55	1 / 24	20.88	23.42	0.220	33.01	-9.59
	16-QAM	1852.50	H	X	116	238	2.84	1 / 0	20.38	23.22	0.210	33.01	-9.79
3 MHz	QPSK	1851.50	H	X	116	238	2.85	1 / 7	21.36	24.21	0.264	33.01	-8.80
	QPSK	1882.50	H	X	109	237	2.65	1 / 14	21.48	24.13	0.259	33.01	-8.88
	QPSK	1913.50	H	X	102	246	2.55	1 / 7	20.98	23.52	0.225	33.01	-9.49
	16-QAM	1851.50	H	X	116	238	2.85	1 / 14	20.61	23.46	0.222	33.01	-9.55
1.4 MHz	QPSK	1850.70	H	X	116	238	2.85	1 / 5	21.17	24.02	0.252	33.01	-8.99
	QPSK	1882.50	H	X	109	237	2.65	1 / 0	21.50	24.15	0.260	33.01	-8.86
	QPSK	1914.30	H	X	102	246	2.55	1 / 0	20.82	23.37	0.217	33.01	-9.64
	16-QAM	1850.70	H	X	116	238	2.85	1 / 0	20.36	23.21	0.209	33.01	-9.80

Table 7-20. EIRP Data (LTE Band 25/2 – Ant1)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	EUT Pol.	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
20 MHz	QPSK	1860.00	H	Z	178	354	2.79	1 / 50	17.67	20.46	0.111	33.01	-12.55
	QPSK	1882.50	H	Z	162	4	2.65	1 / 50	17.50	20.15	0.104	33.01	-12.86
	QPSK	1905.00	H	Z	203	2	2.54	1 / 50	17.34	19.88	0.097	33.01	-13.13
	16-QAM	1860.00	H	Z	178	354	2.79	1 / 50	16.87	19.66	0.093	33.01	-13.35
15 MHz	QPSK	1857.50	H	Z	178	354	2.81	1 / 74	17.75	20.56	0.114	33.01	-12.45
	QPSK	1882.50	H	Z	162	4	2.65	1 / 0	17.49	20.14	0.103	33.01	-12.87
	QPSK	1907.50	H	Z	203	2	2.54	1 / 74	17.32	19.86	0.097	33.01	-13.15
	16-QAM	1857.50	H	Z	178	354	2.81	1 / 0	16.84	19.65	0.092	33.01	-13.36
10 MHz	QPSK	1855.00	H	Z	178	354	2.82	1 / 0	17.75	20.57	0.114	33.01	-12.44
	QPSK	1882.50	H	Z	162	4	2.65	1 / 49	17.43	20.08	0.102	33.01	-12.93
	QPSK	1910.00	H	Z	203	2	2.55	1 / 0	17.28	19.82	0.096	33.01	-13.19
	16-QAM	1855.00	H	Z	178	354	2.82	1 / 0	16.89	19.71	0.094	33.01	-13.30
5 MHz	QPSK	1852.50	H	Z	178	354	2.84	1 / 0	17.72	20.56	0.114	33.01	-12.45
	QPSK	1882.50	H	Z	162	4	2.65	1 / 12	17.58	20.23	0.105	33.01	-12.78
	QPSK	1912.50	H	Z	203	2	2.55	1 / 12	17.34	19.88	0.097	33.01	-13.13
	16-QAM	1882.50	H	Z	162	4	2.65	1 / 24	16.91	19.56	0.090	33.01	-13.45
3 MHz	QPSK	1851.50	H	Z	178	354	2.85	1 / 0	17.63	20.47	0.112	33.01	-12.54
	QPSK	1882.50	H	Z	162	4	2.65	1 / 0	17.65	20.30	0.107	33.01	-12.71
	QPSK	1913.50	H	Z	203	2	2.55	1 / 0	17.39	19.94	0.099	33.01	-13.07
	16-QAM	1851.50	H	Z	178	354	2.85	1 / 14	16.74	19.59	0.091	33.01	-13.42
1.4 MHz	QPSK	1850.70	H	Z	178	354	2.85	1 / 5	17.50	20.35	0.108	33.01	-12.66
	QPSK	1882.50	H	Z	162	4	2.65	1 / 3	17.39	20.04	0.101	33.01	-12.97
	QPSK	1914.30	H	Z	203	2	2.55	1 / 0	17.19	19.74	0.094	33.01	-13.27
	16-QAM	1850.70	H	Z	178	354	2.85	1 / 0	16.83	19.68	0.093	33.01	-13.33

Table 7-21. EIRP Data (LTE Band 25/2 – Ant2)

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Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	EUT Pol.	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
40 MHz	π/2 BPSK	1870.00	H	X	169	359	2.73	1 / 108	20.65	23.38	0.218	33.01	-9.63
	π/2 BPSK	1882.50	H	X	159	3	2.65	1 / 108	20.91	23.56	0.227	33.01	-9.45
	π/2 BPSK	1895.00	H	X	157	353	2.57	1 / 108	20.42	22.99	0.199	33.01	-10.02
	QPSK	1870.00	H	X	169	359	2.73	1 / 108	20.61	23.34	0.216	33.01	-9.67
	QPSK	1882.50	H	X	159	3	2.65	1 / 108	20.85	23.50	0.224	33.01	-9.51
	QPSK	1895.00	H	X	157	353	2.57	1 / 108	20.43	23.00	0.200	33.01	-10.01
30 MHz	16-QAM	1882.50	H	X	159	3	2.65	1 / 108	19.84	22.49	0.177	33.01	-10.52
	π/2 BPSK	1865.00	H	X	169	359	2.76	1 / 158	20.57	23.33	0.215	33.01	-9.68
	π/2 BPSK	1882.50	H	X	159	3	2.65	1 / 158	21.10	23.75	0.237	33.01	-9.26
	π/2 BPSK	1900.00	H	X	157	353	2.54	1 / 80	20.54	23.08	0.203	33.01	-9.93
	QPSK	1865.00	H	X	169	359	2.76	1 / 158	20.69	23.45	0.221	33.01	-9.56
	QPSK	1882.50	H	X	159	3	2.65	1 / 158	20.93	23.58	0.228	33.01	-9.43
25 MHz	QPSK	1900.00	H	X	157	353	2.54	1 / 80	20.68	23.22	0.210	33.01	-9.79
	16-QAM	1882.50	H	X	159	3	2.65	1 / 158	20.17	22.82	0.191	33.01	-10.19
	π/2 BPSK	1862.50	H	X	169	359	2.78	1 / 131	20.60	23.38	0.218	33.01	-9.63
	π/2 BPSK	1882.50	H	X	159	3	2.65	1 / 66	21.06	23.71	0.235	33.01	-9.30
	π/2 BPSK	1902.50	H	X	157	353	2.54	1 / 66	20.46	23.01	0.200	33.01	-10.00
	QPSK	1862.50	H	X	169	359	2.78	1 / 131	20.59	23.37	0.217	33.01	-9.64
20 MHz	QPSK	1882.50	H	X	159	3	2.65	1 / 66	20.92	23.57	0.227	33.01	-9.44
	QPSK	1902.50	H	X	157	353	2.54	1 / 66	20.47	23.01	0.200	33.01	-10.00
	16-QAM	1882.50	H	X	159	3	2.65	1 / 66	19.96	22.61	0.182	33.01	-10.40
	π/2 BPSK	1860.00	H	X	169	359	2.79	1 / 104	20.50	23.29	0.213	33.01	-9.72
	π/2 BPSK	1882.50	H	X	159	3	2.65	1 / 53	21.09	23.74	0.236	33.01	-9.27
	π/2 BPSK	1905.00	H	X	157	353	2.54	1 / 1	20.46	23.00	0.200	33.01	-10.01
15 MHz	QPSK	1860.00	H	X	169	359	2.79	1 / 104	20.56	23.35	0.216	33.01	-9.66
	QPSK	1882.50	H	X	159	3	2.65	1 / 53	20.77	23.42	0.220	33.01	-9.59
	QPSK	1905.00	H	X	157	353	2.54	1 / 1	20.50	23.05	0.202	33.01	-9.96
	16-QAM	1882.50	H	X	159	3	2.65	1 / 53	19.82	22.47	0.177	33.01	-10.54
	π/2 BPSK	1857.50	H	X	169	359	2.81	1 / 77	20.62	23.43	0.220	33.01	-9.59
	π/2 BPSK	1882.50	H	X	159	3	2.65	1 / 39	21.02	23.67	0.233	33.01	-9.34
10 MHz	π/2 BPSK	1907.50	H	X	157	353	2.54	1 / 77	20.45	23.00	0.199	33.01	-10.01
	QPSK	1857.50	H	X	169	359	2.81	1 / 77	20.55	23.36	0.217	33.01	-9.65
	QPSK	1882.50	H	X	159	3	2.65	1 / 39	20.81	23.46	0.222	33.01	-9.55
	QPSK	1907.50	H	X	157	353	2.54	1 / 77	20.48	23.03	0.201	33.01	-9.98
	16-QAM	1882.50	H	X	159	3	2.65	1 / 39	19.90	22.54	0.180	33.01	-10.47
	π/2 BPSK	1855.00	H	X	169	359	2.82	1 / 1	20.43	23.26	0.212	33.01	-9.76
5 MHz	π/2 BPSK	1882.50	H	X	159	3	2.65	1 / 50	21.07	23.71	0.235	33.01	-9.30
	π/2 BPSK	1910.00	H	X	157	353	2.55	1 / 26	20.39	22.94	0.197	33.01	-10.07
	QPSK	1855.00	H	X	169	359	2.82	1 / 50	20.42	23.25	0.211	33.01	-9.76
	QPSK	1882.50	H	X	159	3	2.65	1 / 50	21.01	23.65	0.232	33.01	-9.36
	QPSK	1910.00	H	X	157	353	2.55	1 / 26	20.38	22.93	0.196	33.01	-10.08
	16-QAM	1882.50	H	X	159	3	2.65	1 / 50	20.00	22.65	0.184	33.01	-10.36
40 MHz	π/2 BPSK	1852.50	H	X	169	359	2.84	1 / 1	20.39	23.23	0.210	33.01	-9.78
	π/2 BPSK	1882.50	H	X	159	3	2.65	1 / 1	20.99	23.64	0.231	33.01	-9.37
	π/2 BPSK	1912.50	H	X	157	353	2.55	1 / 12	20.69	23.24	0.211	33.01	-9.77
	QPSK	1852.50	H	X	169	359	2.84	1 / 1	20.49	23.33	0.215	33.01	-9.68
	QPSK	1882.50	H	X	159	3	2.65	1 / 1	20.76	23.41	0.219	33.01	-9.60
	QPSK	1912.50	H	X	157	353	2.55	1 / 12	20.62	23.17	0.207	33.01	-9.84
40 MHz	16-QAM	1882.50	H	X	159	3	2.65	1 / 1	19.65	22.30	0.170	33.01	-10.71
40 MHz	QPSK (CP-OFDM)	1882.50	H	X	159	3	2.65	1 / 108	19.31	21.96	0.157	33.01	-11.05

Table 7-22. EIRP Data (NR Band n25/2 – Ant1)

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Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	EUT Pol.	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
40 MHz	π/2 BPSK	1870.00	H	Z	163	356	2.73	1 / 108	17.63	20.36	0.109	33.01	-12.65
	π/2 BPSK	1882.50	H	Z	167	353	2.65	1 / 108	18.24	20.89	0.123	33.01	-12.12
	π/2 BPSK	1895.00	H	Z	160	357	2.57	1 / 108	17.71	20.28	0.107	33.01	-12.73
	QPSK	1870.00	H	Z	163	356	2.73	1 / 108	17.61	20.34	0.108	33.01	-12.67
	QPSK	1882.50	H	Z	167	353	2.65	1 / 108	18.27	20.92	0.124	33.01	-12.09
	QPSK	1895.00	H	Z	160	357	2.57	1 / 108	17.71	20.28	0.107	33.01	-12.73
30 MHz	16-QAM	1882.50	H	Z	167	353	2.65	1 / 108	17.22	19.87	0.097	33.01	-13.14
	π/2 BPSK	1865.00	H	Z	163	356	2.76	1 / 158	17.68	20.44	0.111	33.01	-12.57
	π/2 BPSK	1882.50	H	Z	167	353	2.65	1 / 158	18.37	21.02	0.127	33.01	-11.99
	π/2 BPSK	1900.00	H	Z	160	357	2.54	1 / 80	17.61	20.15	0.103	33.01	-12.87
	QPSK	1865.00	H	Z	163	356	2.76	1 / 158	17.60	20.36	0.109	33.01	-12.65
	QPSK	1882.50	H	Z	167	353	2.65	1 / 158	18.28	20.93	0.124	33.01	-12.08
25 MHz	QPSK	1900.00	H	Z	160	357	2.54	1 / 80	17.71	20.25	0.106	33.01	-12.76
	16-QAM	1882.50	H	Z	167	353	2.65	1 / 158	17.18	19.83	0.096	33.01	-13.18
	π/2 BPSK	1862.50	H	Z	163	356	2.78	1 / 131	17.60	20.38	0.109	33.01	-12.63
	π/2 BPSK	1882.50	H	Z	167	353	2.65	1 / 131	18.35	20.99	0.126	33.01	-12.02
	π/2 BPSK	1902.50	H	Z	160	357	2.54	1 / 66	17.53	20.07	0.102	33.01	-12.94
	QPSK	1862.50	H	Z	163	356	2.78	1 / 131	17.60	20.37	0.109	33.01	-12.64
20 MHz	QPSK	1882.50	H	Z	167	353	2.65	1 / 131	18.28	20.93	0.124	33.01	-12.08
	QPSK	1902.50	H	Z	160	357	2.54	1 / 66	17.97	20.51	0.113	33.01	-12.50
	16-QAM	1882.50	H	Z	167	353	2.65	1 / 131	17.34	19.99	0.100	33.01	-13.02
	π/2 BPSK	1860.00	H	Z	163	356	2.79	1 / 53	17.68	20.47	0.112	33.01	-12.54
	π/2 BPSK	1882.50	H	Z	167	353	2.65	1 / 53	18.37	21.02	0.126	33.01	-11.99
	π/2 BPSK	1905.00	H	Z	160	357	2.54	1 / 1	17.55	20.09	0.102	33.01	-12.92
15 MHz	QPSK	1860.00	H	Z	163	356	2.79	1 / 53	17.49	20.28	0.107	33.01	-12.73
	QPSK	1882.50	H	Z	167	353	2.65	1 / 53	18.30	20.95	0.124	33.01	-12.06
	QPSK	1905.00	H	Z	160	357	2.54	1 / 1	17.74	20.28	0.107	33.01	-12.73
	16-QAM	1882.50	H	Z	167	353	2.65	1 / 53	17.07	19.72	0.094	33.01	-13.29
	π/2 BPSK	1857.50	H	Z	163	356	2.81	1 / 39	17.45	20.26	0.106	33.01	-12.75
	π/2 BPSK	1882.50	H	Z	167	353	2.65	1 / 39	18.32	20.97	0.125	33.01	-12.04
10 MHz	π/2 BPSK	1907.50	H	Z	160	357	2.54	1 / 39	17.73	20.28	0.107	33.01	-12.73
	QPSK	1857.50	H	Z	163	356	2.81	1 / 39	17.60	20.41	0.110	33.01	-12.60
	QPSK	1882.50	H	Z	167	353	2.65	1 / 39	18.05	20.70	0.118	33.01	-12.31
	QPSK	1907.50	H	Z	160	357	2.54	1 / 39	17.63	20.18	0.104	33.01	-12.83
	16-QAM	1882.50	H	Z	167	353	2.65	1 / 39	17.31	19.96	0.099	33.01	-13.05
	π/2 BPSK	1855.00	H	Z	163	356	2.82	1 / 26	17.50	20.32	0.108	33.01	-12.69
5 MHz	π/2 BPSK	1882.50	H	Z	167	353	2.65	1 / 26	18.36	21.01	0.126	33.01	-12.00
	π/2 BPSK	1910.00	H	Z	160	357	2.55	1 / 26	17.71	20.26	0.106	33.01	-12.75
	QPSK	1855.00	H	Z	163	356	2.82	1 / 26	17.30	20.12	0.103	33.01	-12.89
	QPSK	1882.50	H	Z	167	353	2.65	1 / 26	18.25	20.90	0.123	33.01	-12.11
	QPSK	1910.00	H	Z	160	357	2.55	1 / 26	17.87	20.41	0.110	33.01	-12.60
	16-QAM	1882.50	H	Z	167	353	2.65	1 / 26	17.45	20.10	0.102	33.01	-12.91
40 MHz	π/2 BPSK	1852.50	H	Z	163	356	2.84	1 / 23	17.40	20.24	0.106	33.01	-12.77
	π/2 BPSK	1882.50	H	Z	167	353	2.65	1 / 1	18.27	20.92	0.123	33.01	-12.09
	π/2 BPSK	1912.50	H	Z	160	357	2.55	1 / 1	17.53	20.08	0.102	33.01	-12.93
	QPSK	1852.50	H	Z	163	356	2.84	1 / 23	17.48	20.32	0.108	33.01	-12.69
	QPSK	1882.50	H	Z	167	353	2.65	1 / 1	18.35	21.00	0.126	33.01	-12.01
	QPSK	1912.50	H	Z	160	357	2.55	1 / 1	17.77	20.32	0.108	33.01	-12.69
40 MHz	16-QAM	1882.50	H	Z	167	353	2.65	1 / 1	17.42	20.07	0.102	33.01	-12.94
40 MHz	QPSK (CP-OFDM)	1882.50	H	Z	167	3	2.65	1 / 108	16.32	18.97	0.079	33.01	-14.04

Table 7-23. EIRP Data (NR Band n25/2 – Ant2)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.20	GSM1900	H	146	166	25.08	2.86	27.94	0.622	33.01	-5.07
1880.00	GSM1900	H	178	2	27.89	2.67	30.56	1.136	33.01	-2.46
1909.80	GSM1900	H	123	9	25.72	2.55	28.27	0.671	33.01	-4.74
1880.00	EDGE1900	H	178	2	23.39	2.67	26.06	0.403	33.01	-6.96

Table 7-24. EIRP Data (GPRS PCS – Ant1)

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Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1852.40	WCDMA1900	H	257	9	21.66	2.84	24.50	0.282	33.01	-8.51
1880.00	WCDMA1900	H	162	5	21.75	2.67	24.42	0.276	33.01	-8.60
1907.60	WCDMA1900	H	195	7	21.24	2.54	23.78	0.239	33.01	-9.23

Table 7-25. EIRP Data (WCDMA PCS – Ant1)

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7.8 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 $\geq 3 \times$ RBW
3. Span = 1.5 times the OBW
4. No. of sweep points $\geq 2 \times$ span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

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Test Setup

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

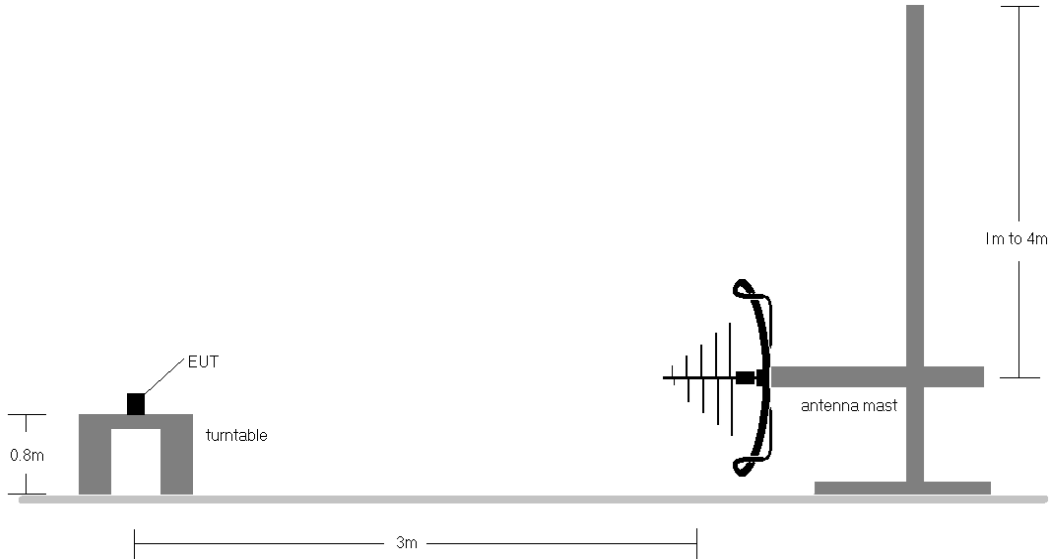


Figure 7-7. Test Instrument & Measurement Setup < 1GHz

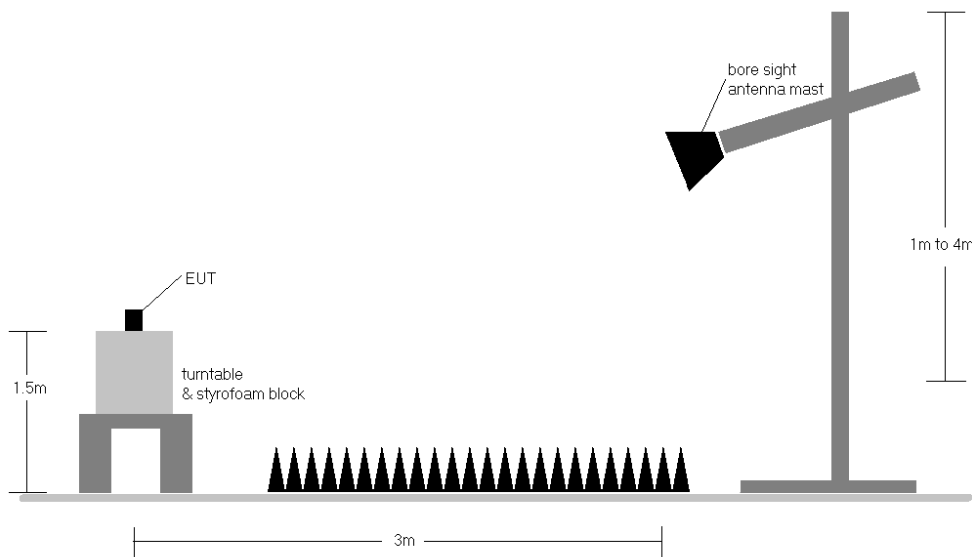


Figure 7-8. Test Instrument & Measurement Setup >1 GHz

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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) $E(\text{dB}\mu\text{V}/\text{m}) = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$
 - b) $\text{EIRP (dBm)} = E(\text{dB}\mu\text{V}/\text{m}) + 20\log D - 104.8$; where D is the measurement distance in meters.
- 2) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest powers are reported in GPRS mode while transmitting with one slot active.
- 3) This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest powers are reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1".
- 4) 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.
- 5) This unit was tested with its standard battery.
- 6) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 7) 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.
- 8) The "-" shown in the following RSE tables are used to denote a noise floor measurement.
- 9) 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.
- 10) 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 are 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.

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