

## PCTEST

7185 Oakland Mills Road, Columbia, MD 21046 USA Tel. 410.290.6652 / Fax 410.290.6654 http://www.pctest.com

## PART 24 MEASUREMENT REPORT

#### **Applicant Name:**

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

#### Date of Testing:

9/14/2021 - 11/16/2021 Test Report Issue Date: 12/02/2021 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M2109090102-03.A3L

## FCC ID:

#### A3LSMS908U

Applicant Name:

#### Samsung Electronics Co., Ltd.

Application Type: Model: Additional Model(s): EUT Type: FCC Classification: FCC Rule Part: Test Procedure(s): Certification SM-S908U SM-S908U1 Portable Handset PCS Licensed Transmitter Held to Ear (PCE) 24 ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01, 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.

Note: This revised Test Report (S/N: 1M2109090102-03-R1.A3L) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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

Randy Ortanez

Randy Ortane President



FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 1 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 1 of 146
© 2021 PCTEST	·	•		V2.0 3/15/2021



## TABLE OF CONTENTS

1.0	INTR	ODUCTION	5
	1.1	Scope	5
	1.2	PCTEST Test Location	5
	1.3	Test Facility / Accreditations	5
2.0	PRO	DUCT INFORMATION	6
	2.1	Equipment Description	6
	2.2	Device Capabilities	6
	2.3	Test Configuration	6
	2.4	EMI Suppression Device(s)/Modifications	6
	2.5	Software and Firmware	6
3.0	DES	CRIPTION OF TESTS	7
	3.1	Evaluation Procedure	7
	3.2	Radiated Power and Radiated Spurious Emissions	7
4.0	MEA	SUREMENT UNCERTAINTY	8
5.0	TES	T EQUIPMENT CALIBRATION DATA	9
6.0	SAM	PLE CALCULATIONS	10
7.0	TES	T RESULTS	12
	7.1	Summary	12
	7.2	Conducted Power Output Data	
	7.3	Occupied Bandwidth	17
	7.4	Spurious and Harmonic Emissions at Antenna Terminal	37
	7.5	Band Edge Emissions at Antenna Terminal	58
	7.6	Peak-Average Ratio	98
	7.7	Radiated Power (ERP/EIRP)	118
	7.8	Radiated Spurious Emissions Measurements	123
	7.9	Frequency Stability / Temperature Variation	141
8.0	CON	CLUSION	146

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 2 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 2 01 140
© 2021 PCTEST	·	·		V2.0 3/15/2021





# **PART 24 MEASUREMENT REPORT**



				EI	RP	
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	Max. Power [W]	Max. Power [dBm]	Emission Designator
	20 MHz	QPSK	1860 - 1905	0.238	23.76	18M0G7D
	20 10112	16QAM	1860 - 1905	0.199	22.98	18M1W7D
	15 MHz	QPSK	1857.5 - 1907.5	0.234	23.69	13M6G7D
LTE Band 25/2	10 10112	16QAM	1857.5 - 1907.5	0.197	22.96	13M6W7D
	10 MHz	QPSK	1855 - 1910	0.259	24.13	9M05G7D
		16QAM	1855 - 1910	0.213	23.29	9M07W7D
	5 MHz	QPSK	1852.5 - 1912.5	0.266	24.24	4M55G7D
		16QAM	1852.5 - 1912.5	0.213	23.28	4M54W7D
	3 MHz	QPSK	1851.5 - 1913.5	0.254	24.05	2M72G7D
		16QAM	1851.5 - 1913.5	0.203	23.08	2M72W7D
	1.4 MHz	QPSK	1850.7 - 1914.3	0.245	23.89	1M11G7D
		16QAM	1850.7 - 1914.3	0.212	23.27	1M11W7D
		π/2 BPSK	1870 - 1895	0.172	22.34	38M8G7D
	40 MHz	QPSK	1870 - 1895	0.160	22.03	38M9G7D
		16QAM	1870 - 1895	0.132	21.20	38M7W7D
NR Band n25		π/2 BPSK	1865 - 1900	0.172	22.37	28M9G7D
ANT A	30 MHz	QPSK	1865 - 1900	0.169	22.29	28M7G7D
		16QAM	1865 - 1900	0.132	21.21	28M7W7D
	25 MHz	π/2 BPSK	1862.5 - 1902.5	0.188	22.74	23M1G7D
		QPSK	1862.5 - 1902.5	0.177	22.48	23M9G7D
		16QAM	1862.5 - 1902.5	0.137	21.37	23M9W7D
	20 MHz	π/2 BPSK	1860 - 1905	0.167	22.23	18M0G7D
		QPSK	1860 - 1905	0.165	22.18	19M0G7D
		16QAM	1860 - 1905	0.133	21.22	19M0W7D
		π/2 BPSK	1857.5 - 1907.5	0.174	22.41 22.20	13M5G7D
NR Band n25/2	15 MHz	QPSK 1604M	1857.5 - 1907.5	0.166	22.20	14M1G7D 14M0W7D
	10 MHz	16QAM π/2 BPSK	1857.5 - 1907.5 1855 - 1910	0.134	22.33	9M04G7D
ANT A		QPSK	1855 - 1910	0.166	22.20	9M38G7D
		16QAM	1855 - 1910	0.100	21.35	9M33W7D
	5 MHz	π/2 BPSK	1852.5 - 1912.5	0.173	22.38	4M50G7D
		QPSK	1852.5 - 1912.5	0.166	22.19	4M51G7D
		16QAM	1852.5 - 1912.5	0.130	21.13	4M51W7D
		π/2 BPSK	1870 - 1895	0.310	24.91	38M8G7D
	40 MHz	QPSK	1870 - 1895	0.310	25.06	38M9G7D
		16QAM	1870 - 1895	0.242	23.83	38M7W7D
		π/2 BPSK	1865 - 1900	0.297	24.73	28M9G7D
NR Band n25	30 MHz	QPSK	1865 - 1900	0.316	24.99	28M7G7D
ANT J		16QAM	1865 - 1900	0.253	24.03	28M7W7D
		π/2 BPSK	1862.5 - 1902.5	0.276	24.41	23M1G7D
	25 MHz	QPSK	1862.5 - 1902.5	0.280	24.48	23M9G7D
		16QAM	1862.5 - 1902.5	0.220	23.42	23M9W7D
		π/2 BPSK	1860 - 1905	0.266	24.25	18M0G7D
	20 MHz	QPSK	1860 - 1905	0.265	24.23	19M0G7D
		16QAM	1860 - 1905	0.201	23.04	19M0W7D
		π/2 BPSK	1857.5 - 1907.5	0.269	24.29	13M5G7D
	15 MHz	QPSK	1857.5 - 1907.5	0.293	24.67	14M1G7D
NR Band n25/2		16QAM	1857.5 - 1907.5	0.216	23.34	14M0W7D
ANT J		π/2 BPSK	1855 - 1910	0.268	24.28	9M04G7D
	10 MHz	QPSK	1855 - 1910	0.272	24.34	9M38G7D
		16QAM	1855 - 1910	0.213	23.28	9M33W7D
		π/2 BPSK	1852.5 - 1912.5	0.251	23.99	4M50G7D
	5 MHz	QPSK	1852.5 - 1912.5	0.262	24.18	4M51G7D
		16QAM	1852.5 - 1912.5	0.193	22.86	4M51W7D

#### **EUT Overview**

FCC ID: A3LSMS908U	PCTEST Proud to be per of () element	PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 3 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 5 01 140
© 2021 PCTEST		·		V/2 0 3/15/2021



		EIRP			
Mode	Modulation	Tx Frequency Range [MHz]	Max. Power [W]	Max. Power [dBm]	Emission Designator
GSM/GPRS	GMSK	1850.2 - 1909.8	0.765	28.83	243KGXW
EDGE	8-PSK	1850.2 - 1909.8	0.245	23.88	241KG7W
WCDMA	Spread Spectrum	1852.4 - 1907.6	0.277	24.42	4M16F9W

**EUT Overview** 

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 4 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 4 01 140
© 2021 PCTEST				V2.0 3/15/2021



## **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 PCTEST Test Location

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

#### 1.3 Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

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

FCC ID: A3LSMS908U	Poud to be part of (® element	PART 24 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 5 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Fage 5 01 140
© 2021 PCTEST			1/2 0 2/15/2021



## 2.0 PRODUCT INFORMATION

#### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID:A3LSMS908U**. 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.

Test Device Serial No.: 1261M, 1167M, 0323M, 0341M, 1125M, 1158M, 1128M, 0283M, 0584M,

#### 2.2 Device Capabilities

This device contains the following capabilities:

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

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

LTE Band 25 (1850 - 1915 MHz) overlaps the entire frequency range of LTE Band 2 (1850 - 1910 MHz). Therefore, test data provided in this report covers Band 2 as well as Band 25.

NR Band n25 (1850 - 1915 MHz) overlaps the entire frequency range of NR Band n2 (1850 - 1910 MHz). Therefore, test data provided in this report covers n2 as well as n25 for the operating BWs that overlap between the 2 bands.

This EUT supports 2 antennas (Antenna A and Antenna J) for n2/n25 operations. This report includes conducted and radiated data from both antennas to ensure compliance.

### 2.3 Test Configuration

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

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

#### 2.4 EMI Suppression Device(s)/Modifications

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

#### 2.5 Software and Firmware

The test was conducted with software/firmware version S908USQU0AUJK installed on the EUT.

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 6 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 0 01 140
© 2021 PCTEST				\/2 0 3/15/2021



## 3.0 DESCRIPTION OF TESTS

#### 3.1 Evaluation Procedure

The measurement procedures described in the "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-E-2016) and "Measurement Guidance for Certification of Licensed Digital Transmitters" (KDB 971168 D01 v03r01) 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/TIA-603-E-2016. A halfwave dipole is substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

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

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

For radiated spurious emissions measurements and calculations, conversion method is used per the formulas in KDB 971168 Section 5.8.4. Field Strength (EIRP) is calculated using the following formulas:

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

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

Radiated power and radiated spurious emission levels are investigated with the receive antenna horizontally and vertically polarized per ANSI/TIA-603-E-2016.

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 7 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 7 of 146
© 2021 PCTEST				V2 0 3/15/2021

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.



## 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: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 8 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 8 01 146
© 2021 PCTEST		•		V2.0 3/15/2021



## 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	EMC Cable and Switch System	ble and Switch System 3/4/2021 Annual 3/4/2022		AP2	
-	AP1	EMC Cable and Switch System	3/9/2021	Annual	3/9/2022	AP1
-	ETS	EMC Cable and Switch System	3/4/2021	Annual	3/4/2022	ETS
-	LTx2	Licensed Transmitter Cable Set	3/12/2021	Annual	3/12/2022	LTx2
-	LTx5	LIcensed Transmitter Cable Set	3/3/2021	Annual	3/3/2022	LTx5
Agilent	E5515C	Wireless Communications Test Set		N/A		GB45360985
Agilent	N9030A	50GHz PXA Signal Analyzer	1/20/2021	Annual	1/20/2022	US51350301
Anritsu	MT8820C	Radio Communication Analyzer		N/A		6201300731
Anritsu	MT8821C	Radio Communication Analyzer		N/A		6201381794
Com-Power	AL-130R	Active Loop Antenna	10/29/2020	Biennial	10/29/2022	10160045
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Emco	3116	Horn Antenna (18 - 40GHz)	7/20/2021	Biennial	7/20/2023	9203-2178
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/12/2020	Biennial	3/12/2022	128337
ETS Lindgren	3816/2NM	LISN	7/9/2020	Biennial	7/9/2022	00114451
Keysight Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	7/21/2021	Annual	7/21/2022	MY49430494
Agilent	N9030A	50GHz PXA Signal Analyzer	1/20/2021	Annual	1/20/2022	US51350301
Keysight Technologies	N9038A	MXE EMI Receiver	8/11/2020	Annual	12/11/2021	MY51210133
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11208010032
Rohde & Schwarz	CMW500	Radio Communication Tester		N/A		100976
Rohde & Schwarz	CMW500	Radio Communication Tester		N/A		112347
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	8/3/2021 Annual 8/3/2022		100342	
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	5/25/2021	Annual	5/25/2022	100348
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	8/25/2021	Annual	8/25/2022	103200
Sunol	JB6	LB6 Antenna	11/13/2020	Biennial	11/13/2022	A082816

Table 5-1. Test Equipment

#### Notes:

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

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:		Page 9 of 146		
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	9/14/2021 - 11/16/2021 Portable Handset				
© 2021 PCTEST	-	•		V2.0 3/15/2021		



## 6.0 SAMPLE CALCULATIONS

#### **GSM Emission Designator**

### Emission Designator = 250KGXW

GSM BW = 250 kHzG = 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

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 10 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 10 01 146
© 2021 PCTEST				V2 0 3/15/2021



#### **Spurious Radiated Emission**

#### Example: Spurious emission at 3700.40 MHz

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

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 11 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 11 of 146
© 2021 PCTEST		·		V2.0 3/15/2021



#### TEST RESULTS 7.0

#### 7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.
FCC ID:	A3LSMS908U
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)	Test Limit	Test Result	Reference
0	Occupied Bandwidth	2.1049	N/A	PASS	Section 7.2
CONDUCTED	Conducted Band Edge / Spurious Emissions	2.1051, 24.238(b)	> 43 + 10log10(P[Watts]) at Band Edge and for all out-of- band emissions	PASS	Sections 7.3, 7.4
IDNO	Transmitter Conducted Output Power	2.1046	N/A	PASS	See RF Exposure Report
0	Frequency Stability	2.1055, 24.235	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8
RADIATED	Equivalent Isotropic Radiated Power	24.232(c)	< 2 Watts max. EIRP	PASS	Section 7.6
RADI	Radiated Spurious Emissions	2.1053, 24.238(b)	> 43 + 10 log10 (P[Watts]) for all out-of-band emissions	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 PCTEST EMC Software Tool v1.0.

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:		Page 12 of 146		
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Portable Handset			
© 2021 PCTEST				V2 0 3/15/2021		

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.



# 7.2 Conducted Power Output Data §2.1046

#### Test Overview

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

A-MPR is implemented in this device per the A-MPR specification in 3GPP TS 36.101. The conducted powers are shown herein to cover the different A-MPR levels specified in the standard. Measurement equipment was set up with triggering/gating on the spectrum analyzer such that powers were measured only during the on-time of the signal.

#### Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

#### **Test Settings**

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

#### Test Setup

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



Figure 7-1. Test Instrument & Measurement Setup

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 13 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 13 01 140
© 2021 PCTEST				V2.0 3/15/2021



#### Test Notes:

- Conducted power measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device.
- Conducted power measurements are also evaluated for simultaneous transmission of two NR FR1 carriers operating in different bands (interband NR FR1 ULCA). The powers were investigated while both bands are operating at their widest supported channel bandwidth.
- 3. All other conducted power measurements are contained in the RF exposure report for this filing.

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:		Page 14 of 146		
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	9/14/2021 - 11/16/2021 Portable Handset				
© 2021 PCTEST				V2 0 3/15/2021		



Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
		374000	1870.0	1 / 54	24.49
	π/2 BPSK	376500	1882.5	1 / 161	24.47
40 MHz		379000	1895.0	1 / 54	23.88
		374000	1870.0	1 / 54	24.32
	QPSK	376500	1882.5	1 / 161	24.13
		379000	1895.0	1 / 54	23.84
	16-QAM	374000	1870.0	1 / 54	23.35
		372000	1865.0	1 / 40	24.30
	π/2 BPSK	376500	1882.5	1 / 80	24.21
		381000	1900.0	1 / 80	24.44
30 MHz		372000	1865.0	1 / 40	24.24
	QPSK	376500	1882.5	1 / 80	24.18
		381000	1900.0	1 / 80	24.30
	16-QAM	372000	1865.0	1 / 40	23.55
		372000	1862.5	1 / 33	23.98
	π/2 BPSK	376500	1882.5	1 / 99	23.81
		381000	1902.5	1 / 99	24.10
25 MHz		372000	1862.5	1 / 33	23.73
	QPSK	376500	1882.5	1 / 99	23.13
		381000	1902.5	1 / 99	23.45
	16-QAM	372000	1862.5	1 / 33	22.93
		372000	1860.0	1 / 79	23.82
	π/2 BPSK	376500	1882.5	1 / 79	23.67
		381000	1905.0	1 / 79	23.81
20 MHz		372000	1860.0	1 / 79	23.48
	QPSK	376500	1882.5	1 / 79	23.39
		381000	1905.0	1 / 79	23.75
	16-QAM	372000	1860.0	1 / 79	22.55
		371500	1857.5	1 / 58	23.86
	π/2 BPSK	376500	1882.5	1 / 20	23.61
15 MHz		381500	1907.5	1 / 39	23.96
	QPSK	371500	1857.5	1 / 58	23.93
	16-QAM	371500	1857.5	1 / 58	22.86
		371000	1855.0	1 / 38	23.85
	π/2 BPSK	376500	1882.5	1 / 38	23.58
		382000	1910.0	1 / 26	23.93
10 MHz		371000	1855.0	1 / 38	23.59
	QPSK	376500	1882.5	1 / 38	23.38
		382000	1910.0	1 / 26	23.77
	16-QAM	371000	1855.0	1 / 38	22.80
		370500	1852.5	1/6	23.56
	π/2 BPSK	376500	1882.5	1 / 18	23.60
		382500	1912.5	1 / 6	23.76
5 MHz		370500	1852.5	1 / 6	23.43
	QPSK	376500	1882.5	1 / 18	23.42
		382500	1912.5	1 / 6	23.49
	16-QAM	370500	1852.5	1 / 6	22.38

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 15 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Fage 15 01 140
© 2021 PCTEST			V2.0 3/15/2021



PCC					SCC											
PCC Band	PCC Bandwidth [MHz]	PCC Channel	PCC Frequency (MHz)	PCC (UL) channel	Mod.	PCC UL RB#/Offset	SCC Band	SCC Channel	SCC Frequency (MHz)	SCC Bandwidth [MHz]	SCC (UL) channel	Mod.	SCC UL RB#/Offset	PCC Conducted Power [dBm]	SCC Conducted Power [dBm]	Inter-Band ULCA Total Tx. Power (dBm)
					π/2 BPSK	1/162						π/2 BPSK	1/205	19.75	20.55	23.18
					QPSK	216/0			2546.0		Low	QPSK	270/0	19.61	20.35	23.01
		374000	1870.0	Low	QPSK	1/54		509202				QPSK	1/68	19.58	20.44	23.04
		574000	10/0.0	2011	QPSK	1/108		509202				QPSK	1/137	19.61	20.60	23.14
					QPSK	1/162						QPSK	1/205	19.72	20.64	23.21
					16Q	1/162						16Q	1/205	19.92	20.82	23.40
					π/2 BPSK	1/54						π/2 BPSK	1/68	19.64	20.99	23.38
					QPSK	216/0		518598	2593.0	100	Mid	QPSK	270/0	19.65	20.51	23.11
n25	40	376500	1882.5	Mid	QPSK	1/54	n41					QPSK	1/68	19.60	21.02	23.38
1125	40	570500	1002.5	IVIIG	QPSK	1/108	1141					QPSK	1/137	19.62	20.52	23.10
					QPSK	1/162						QPSK	1/205	19.71	20.33	23.04
					16Q	1/54						16Q	1/68	19.89	21.26	23.64
					π/2 BPSK	1/162						π/2 BPSK	1/205	20.04	20.56	23.32
					QPSK	216/0						QPSK	270/0	20.06	20.30	23.19
	37	379000	1895.0	High	QPSK	1/54		528000	2640.0		High	QPSK	1/68	20.06	20.55	23.32
		5.5000	10000.0	rigi	QPSK	1/108		525000	2010.0			QPSK	1/137	20.08	20.41	23.26
					QPSK	1 / 162						QPSK	1/205	20.17	20.38	23.29
					16Q	1/162						16Q	1/205	20.18	20.72	23.47

Table 7-2. Max Conducted Output Power (NR Bands n25 - n41)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 16 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 16 of 146
© 2021 PCTEST	·	•		V2.0 3/15/2021



## 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

KDB 971168 D01 v03r01 - Section 4.2

#### **Test Settings**

- 1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 1 5% of the expected OBW
- 3. VBW  $\geq$  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.

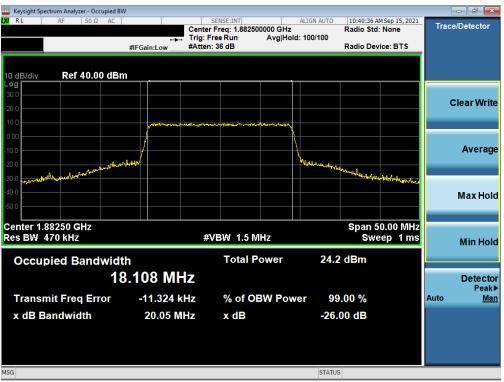
FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 17 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 17 01 140
© 2021 PCTEST	·	·		V2.0 3/15/2021



## LTE Band 25/2

www.www.www.www.www.www.www.www.www.ww	ed BW				
🗶 RL RF 50Ω /	AC	SENSE:INT	ALIGN AUTO	10:40:08 AM Sep 15, 2021	Trace/Detector
		Center Freq: 1.88250 Trig: Free Run	Avg Hold: 100/100	Radio Std: None	ind cold of co
	#IFGain:Low	#Atten: 36 dB	Avginola. Tool too	Radio Device: BTS	
	in dameon				
10 dB/div Ref 40.00 c	iBm				
Log 30.0					
					Clear Write
20.0					
10.0	مىلىرالىغانىيىسىلى <sub>تى</sub>				
0.00					
	/		1 h		Average
-10.0					Average
-20.0	Ward March March 100		Law Martin and		
-30.0 million with and					
-40.0					
					Max Hold
-50.0					
Center 1.88250 GHz				Span 50.00 MHz	
Res BW 470 kHz		#VBW 1.5 M	H7	Sweep 1 ms	
Res DW 470 KIIZ		#8098 1.3 W	112	aweep 1 ma	Min Hold
Occupied Bandw	idth	Total P	ower 25.3	3 dBm	
			20.0		
	18.041 MH	Z			Detector
					Peak►
Transmit Freq Error	-174 I	z % of OE	BW Power 99	0.00 %	Auto <u>Man</u>
x dB Bandwidth	19.99 MI	lz xdB	-26	00 dB	
	13.33 MI		-20.		
MSG			STATUS	6	

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



Plot 7-3. Occupied Bandwidth Plot (LTE Band 25/2 - 20MHz 16-QAM - Full RB)

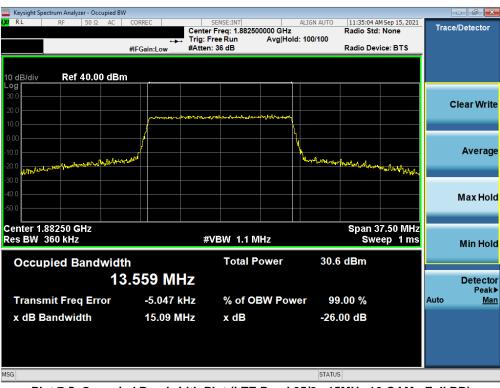
FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 19 of 146	
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 18 of 146	
© 2021 PCTEST	•	·		V2.0 3/15/2021	

© 2021 PCTEST



Keysight Spectrum Analyzer - Occupie					
RL RF 50 Ω A		SENSE:INT	ALIGN AUTO	11:34:47 AM Sep 15, 2021	Trace/Detector
	Trig	nter Freq: 1.88250 g: Free Run ten: 36 dB	Avg Hold: 100/100	Radio Std: None Radio Device: BTS	
) dB/div Ref 40.00 d	IBm				
0.0	- Brithman Man	man Amaran Marine	shhurman a		Clear Writ
00					
1.0 1.0 1.0 1.0 1.0	ng hen Nillan W			un marty part to any	Avera
0					Max Ho
enter 1.88250 GHz es BW 360 kHz		#VBW 1.1 M	IHz	Span 37.50 MHz Sweep 1 ms	Min Ho
Occupied Bandw		Total P	ower 31.4	dBm	
	13.597 MHz				Detect Pea
Transmit Freq Error	-12.205 kHz	% of O	BW Power 99	.00 %	Auto <u>M</u>
x dB Bandwidth	14.91 MHz	x dB	-26.	00 dB	
à			STATU	6	

Plot 7-4. Occupied Bandwidth Plot (LTE Band 25/2 - 15MHz QPSK - Full RB)



Plot 7-5. Occupied Bandwidth Plot (LTE Band 25/2 - 15MHz 16-QAM - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 19 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 19 01 146
© 2021 PCTEST		•		V2.0 3/15/2021



Keysight Spectrum Analyzer - Occupied BW					
RL RF 50 Ω AC	CORREC	SENSE:INT	ALIGN AUTO	01:56:05 PM Sep 15, 2021	Trace/Detector
	Trig:	er Freq: 1.8825000 Free Run en: 36 dB	000 GHz Avg Hold: 100/100	Radio Std: None Radio Device: BTS	nuccibetector
dB/div Ref 40.00 dBm					
<b>99</b> 0.0 0.0		humpher attinguesticity and			Clear Wri
0	w		Mar Mar and		Avera
0				maline mathe and will a provided	
0					Max Ho
enter 1.88250 GHz es BW 240 kHz	į	≇VBW 750 kH	lz	Span 25.00 MHz Sweep 1 ms	Min Ho
Occupied Bandwidtl		Total Po	wer 31.	ō dBm	
9.0	0494 MHz				Detect Pea
Transmit Freq Error	3.434 kHz	% of OB	W Power 99	.00 %	Auto <u>M</u>
x dB Bandwidth	10.09 MHz	x dB	-26.	00 dB	
			STATU	5	

Plot 7-6. Occupied Bandwidth Plot (LTE Band 25/2 - 10MHz QPSK - Full RB)



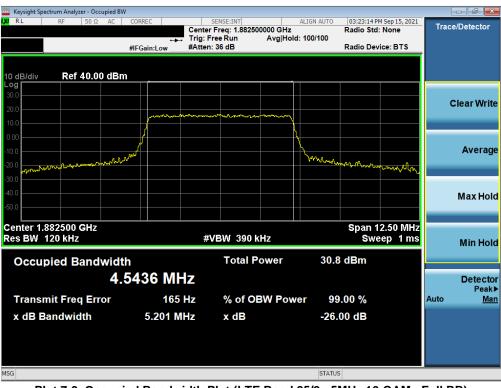
Plot 7-7. Occupied Bandwidth Plot (LTE Band 25/2 - 10MHz 16-QAM - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 20 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 20 01 146
© 2021 PCTEST	<u>.</u>	·		V2.0 3/15/2021



Keysight Spectrum Analyzer -	Occupied BV	v						-	-   #
RL RF 50	Ω AC	CORREC	SENSE:INT		ALIGN AUTO		4 Sep 15, 2021	Tracel	Detector
		↔ #IFGain:Low	Center Freq: 1. Trig: Free Run #Atten: 36 dB	882500000 GHz Avg Hol	d: 100/100	Radio Std: Radio Dev		Tace	Delector
dB/div Ref 40	.00 dBn	n							
).0 		مىمىمىس	erthumsen and the dates	-~~~ h~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				С	lear Writ
.0								-	
.0 .0 <mark>////////////////////////////////////</mark>	and a constant	~			- Low Margaret and	mar have for	Mummer		Avera
o o									Max Ho
enter 1.882500 GH es BW 120 kHz	z		#VBW 3	90 kHz			2.50 MHz ep 1 ms		Min Ho
Occupied Ban				al Power	32.2	2 dBm		_	
		5460 M							Detect Pea
Transmit Freq E	rror	-231	Hz %o	of OBW Pow	ver 99	.00 %		Auto	M
x dB Bandwidth		5.284 M	/IHz xd	B	-26.	00 dB			
					STATUS	5		_	_

Plot 7-8. Occupied Bandwidth Plot (LTE Band 25/2 - 5MHz QPSK - Full RB)



Plot 7-9. Occupied Bandwidth Plot (LTE Band 25/2 - 5MHz 16-QAM - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 21 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 21 of 146
© 2021 PCTEST	·			V2.0 3/15/2021





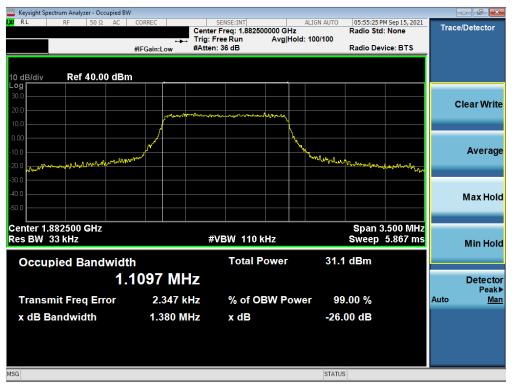
Plot 7-10. Occupied Bandwidth Plot (LTE Band 25/2 - 3MHz QPSK - Full RB)



Plot 7-11. Occupied Bandwidth Plot (LTE Band 25/2 - 3MHz 16-QAM - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 22 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 22 01 140
© 2021 PCTEST	·	•		V2.0 3/15/2021





Plot 7-12. Occupied Bandwidth Plot (LTE Band 25/2 - 1.4MHz QPSK - Full RB)

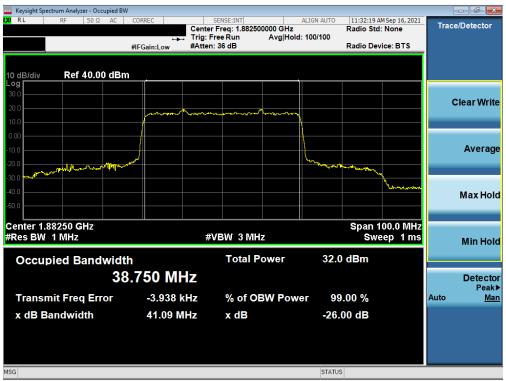


Plot 7-13. Occupied Bandwidth Plot (LTE Band 25/2 - 1.4MHz 16-QAM - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 22 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 23 of 146
© 2021 PCTEST	·	•		V2.0 3/15/2021



## NR Band n25/2



Plot 7-14. Occupied Bandwidth Plot (NR Band n25/2 - 40.0MHz DFT-s-OFDM BPSK - Full RB)



Plot 7-15. Occupied Bandwidth Plot (NR Band n25/2 - 40.0MHz CP-OFDM QPSK - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 24 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Fage 24 01 140
© 2021 PCTEST	•	·	V2.0 3/15/2021

© 2021 PCTEST



Keysight Spectrum Analyzer - Occupied	BW						
X/RL RF 50Ω AC	CORREC	SENSE:INT ter Freg: 1.882500000 0	ALIGN AUTO	11:32:44 AM	4 Sep 16, 2021	Trace/	Detector
	🛶 Trig		Hold: 100/100	Radio Std.			
10 dB/div Ref 40.00 dB	m						
30.0						С	lear Writ
0.00						_	_
20.0				un Mully			Averag
40.0					han mar		Max Ho
enter 1.88250 GHz Res BW 1 MHz		#VBW 3 MHz			00.0 MHz ep 1 ms		Min Hol
Occupied Bandwid		Total Powe	r 30.1	dBm			_
3	8.669 MHz						Detecto
Transmit Freq Error	-39.303 kHz	% of OBW F	ower 99	.00 %		Auto	Ma
x dB Bandwidth	41.11 MHz	x dB	-26.	00 dB			
G			STATUS	6			

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



Plot 7-17. Occupied Bandwidth Plot (NR Band n25/2 - 30.0MHz DFT-s-OFDM BPSK - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 25 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 25 01 140
© 2021 PCTEST				V2.0 3/15/2021



Keysight Spectrum Analyzer - (								ð   <b>-</b>
RL RF 50	Ω AC	CORREC	SENSE:INT Center Freq: 1.882		N AUTO 12:43:39 Radio Sto	M Sep 16, 2021	Trace/Det	ector
		₩IFGain:Low		Avg Hold: 100				
dB/div Ref 40.	.00 dBn	<u>ا</u>						
0.0							Clear	r Wri
).0		moriany	with the second of the second	14 more many				
.0							Av	era
	-	hand			markel hand the second			
approximation of the second se					Sand March Street	monthetran		
.0								
							Ма	x Ho
							_	
enter 1.88250 GHz					Span	75.00 MHz		
Res BW 750 kHz			#VBW 2.4	MHz	Sw	eep 1 ms	Mi	n Ho
Occupied Ban	dwidt	h	Total	Power	30.5 dBm			
occupied Bail			<b>I</b> -				_	
	20	.709 MI					De	tect Pea
Transmit Freq E	rror	-13.979 I	kHz % of (	DBW Power	99.00 %		Auto	M
x dB Bandwidth		30.55 N	IHz x dB		-26.00 dB			
		00.00			20100 00			
i					STATUS			

Plot 7-18. Occupied Bandwidth Plot (NR Band n25/2 - 30.0MHz CP-OFDM QPSK - Full RB)



Plot 7-19. Occupied Bandwidth Plot (NR Band n25/2 - 30.0MHz CP-OFDM 16QAM - Full RB)

FCC ID: A3LSMS908U	POUL to be part of @ element	PART 24 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 26 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Fage 20 01 140
© 2021 PCTEST			V2.0 3/15/2021



Keysight Spectrum Analy:		· · · · · · · · · · · · · · · · · · ·									- 0 ×
X RL RF	50 Ω	AC	CORREC	Conto	SENSE:INT	00000 GH-	ALIGN AUTO	12:56:54 P Radio Std	M Sep 16, 2021	Trace	e/Detector
				🔺 Trig: I	Free Run		ld: 100/100	Raulo Stu	. None		
			#IFGain:Low	#Atter	n: 36 dB			Radio Dev	ice: BTS		
10 dB/div Ref	40.00	dBm									
Log											
30.0										c	lear Write
20.0			m	~~~~	mannaghar	mon					
10.0											
0.00											
-10.0							- <u>{</u>				Average
-20.0	melle 1	1	ليهى				have	math			
-30.0							- Marthan		mar m		
-40.0											Max Hold
-50.0											
											_
Center 1.88250 G									2.50 MHz		
Res BW 620 kHz				#	VBW 2 M	IZ		Swe	ep 1 ms		Min Hold
			_		Total	Power	22.4	dBm			
Occupied B	angy				Total	OWEI	52.	ubiii			
		23	.053 N	IHz							Detector
Transmit Free			-472.80	: 647	% of C	BW Pov		.00 %		Auto	Peak⊅ Mar
		51				BWFOV				Auto	Ivial
x dB Bandwid	dth		24.74	MHz	x dB		-26.	00 dB			
ISG							STATU	5			
	_										

Plot 7-20. Occupied Bandwidth Plot (NR Band n25/2 - 25.0MHz DFT-s-OFDM BPSK - Full RB)



Plot 7-21. Occupied Bandwidth Plot (NR Band n25/2 - 25.0MHz CP-OFDM QPSK - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 27 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 27 01 146
© 2021 PCTEST	·	·		V2.0 3/15/2021



Keysight Spectrum Analyzer - Occupied BW							
XIRL RF 50Ω AC	CORREC	SENSE:INT	ALIGN A	AUTO 12:57:19 P Radio Std	M Sep 16, 2021	Trace/E	Detector
		Frig: Free Run Atten: 36 dB	Avg Hold: 100/1				
10 dB/div Ref 40.00 dBm							
- <b>0g</b> 30.0 20.0		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				Cle	ear Writ
10.0							Averaq
10.0 20.0 				and the second	Yerthan the second		Averay
40.0						r	/lax Hol
Center 1.88250 GHz Res BW 620 kHz		#VBW 2 MH	Z		2.50 MHz ep 1 ms		Min Hol
Occupied Bandwidt	h	Total P	ower	30.2 dBm			
	.865 MHz	2					Detecto Peak
Transmit Freq Error	-7.126 kH	z % of Of	3W Power	99.00 %		Auto	Ma
x dB Bandwidth	25.55 MH:	z xdB		-26.00 dB			
SG				STATUS			_

Plot 7-22. Occupied Bandwidth Plot (NR Band n25/2 - 25.0MHz CP-OFDM 16QAM - Full RB)



Plot 7-23. Occupied Bandwidth Plot (NR Band n25/2 - 20.0MHz DFT-s-OFDM BPSK - Full RB)

FCC ID: A3LSMS908U	PCTEST Proud to be part of @ element	PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 28 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 28 01 146
© 2021 PCTEST		·		V2.0 3/15/2021



Keysight Spectrum Analyzer - Occupied E					
CIRL RF 50Ω AC	CORREC	SENSE:INT enter Freg: 1.882500	ALIGN AUTO	02:18:57 PM Sep 16, 2021 Radio Std: None	Trace/Detector
	т т	rig: Free Run Atten: 36 dB	Avg Hold: 100/100	Radio Device: BTS	
10 dB/div Ref 40.00 dB	m				
- <b>og</b> 30.0 20.0	h MC The work				Clear Writ
10.0 0.00 10.0					Averag
20.0 				haran haran Marine	Max Hol
Senter 1.88250 GHz Res BW 470 kHz		#VBW 1.6 MI	Hz	Span 50.00 MHz Sweep 1 ms	Min Hol
Occupied Bandwid	th	Total Po	ower 29.7	dBm	
1	9.020 MHz				Detecto Peak
Transmit Freq Error	-29.733 kHz	% of OB	W Power 99	.00 %	Auto <u>Ma</u>
x dB Bandwidth	20.38 MHz	x dB	-26.	00 dB	
G			STATU	5	

Plot 7-24. Occupied Bandwidth Plot (NR Band n25/2 - 20.0MHz CP-OFDM QPSK - Full RB)



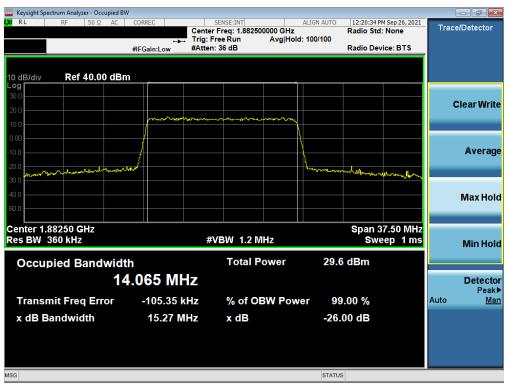
Plot 7-25. Occupied Bandwidth Plot (NR Band n25/2 - 20.0MHz CP-OFDM 16QAM - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 29 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 29 01 140
© 2021 PCTEST	·			V2.0 3/15/2021



🚾 Keysight Spectrum Analyzer - Occupied B	W				
<b>LXI</b> RL RF 50Ω AC	CORREC	SENSE:INT nter Freg: 1.882500000	ALIGN AUTO	12:20:12 PM Sep 26, 2021 Radio Std: None	Trace/Detector
	🛶 Tri	g: Free Run Av	g Hold: 100/100		
	#IFGain:Low #A	tten: 36 dB		Radio Device: BTS	-
10 dB/div Ref 40.00 dB	m				
Log 30.0					
20.0					Clear Write
10.0	h	······································	$\sim$		
0.00					
-10.0					Average
-20.0					///orugo
-20.0 marting from a	All and a second s		~~~~	~~~~~	
-30.0					
-40.0					Max Hold
-50.0					
Center 1.88250 GHz				Span 37.50 MHz	
Res BW 360 kHz		#VBW 1.2 MHz		Sweep 1 ms	
	41	Total Powe		9 dBm	
Occupied Bandwid		Total Powe	ST.	a a Bini	
1	3.502 MHz				Detector
Transmit Freq Error	-404.47 kHz	% of OBW	Power 00	9.00 %	Peak▶ Auto Man
-					nuto <u>muri</u>
x dB Bandwidth	14.59 MHz	x dB	-26.	.00 dB	
MSG			STATU	S	

Plot 7-26. Occupied Bandwidth Plot (NR Band n25/2 - 15.0MHz DFT-s-OFDM BPSK - Full RB)



Plot 7-27. Occupied Bandwidth Plot (NR Band n25/2 - 15.0MHz CP-OFDM QPSK - Full RB)

FCC ID: A3LSMS908U	POINTEST Proud to be part of @ element	PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 20 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Page 30 of 146	
© 2021 PCTEST	·			V2.0 3/15/2021



Keysight Spectrum Analyzer - Oc										
<mark>X/</mark> RL RF 50Ω	AC O	ORREC		ISE:INT eq: 1.88250	0000 GHz	ALIGN AUTO	12:20:50 P Radio Std	M Sep 26, 2021	Trac	e/Detector
			Trig: Free	Run		d:>100/100				
	#I	FGain:Low	#Atten: 36	6 dB			Radio Dev	ice: BTS		
10 dB/div Ref 40.0	0 dBm									
Log										
30.0										Clear Write
20.0		An	-10 1.0-0							
10.0		a al Alta de alta anti	ontonne for the	★↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓	- All a second					
0.00						\				
-10.0		4				Į				Average
-20.0	. detablication	<u> </u>				10 1 1				
-20.0	State of the second					w. and Lotter	Min younghory	Taland Mary my		
-40.0										
-50.0										Max Hold
-50.0										_
Center 1.88250 GHz							Span 3	7.50 MHz		
Res BW 360 kHz			#VB	W 1.2 M	IHz			ep 1ms		Min Hold
				_						
Occupied Banc	lwidth			Total P	ower	28.9	dBm			
	14.0	007 MI	Ηz							Detector
										Peak▶
Transmit Freq Er	ror	-77.583	kHz	% of O	BW Pow	er 99	0.00 %		Auto	Mar
x dB Bandwidth		15.13 N	IHz	x dB		-26.	00 dB			
ISG						STATU				
34						STATUS	2			

Plot 7-28. Occupied Bandwidth Plot (NR Band n25/2 - 15.0MHz CP-OFDM 16QAM - Full RB)



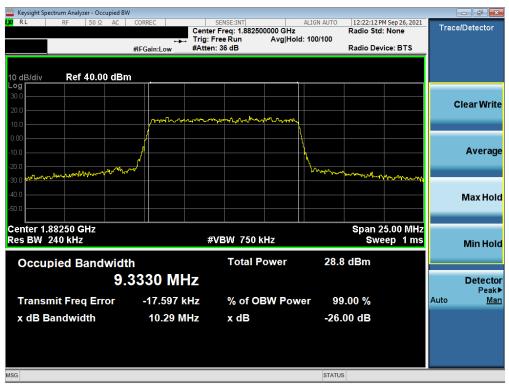
Plot 7-29. Occupied Bandwidth Plot (NR Band n25/2 - 10.0MHz DFT-s-OFDM BPSK - Full RB)

FCC ID: A3LSMS908U	PCTEST Proud to be part of the element	PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 31 of 146	
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 31 01 146	
© 2021 PCTEST				V2.0 3/15/2021	



Keysight Spectrum Analyzer - Occ										
XIRL RF 50Ω	AC COR	REC		NSE:INT rea: 1.88250	0000 GHz	ALIGN AUTO	12:21:59 P	M Sep 26, 2021	Trace	/Detector
				e Run		d: 100/100	Radio Dev	iaa: BTC		
	#IFG	ain:Low	#Attent 5	0 UD			Radio Dev	ICE. BTS		
10 dB/div Ref 40.00	) dBm									
10 dB/div Ref 40.00	авт									
30.0										lear Write
20.0									```	
10.0		1								
0.00		( 								
-10.0	/					1				Average
-20.0	Wenner					Junant	markan	1		
-30.0								www.wl.		
-40.0										Max Hold
-50.0										
Center 1.88250 GHz							Span 2	5.00 MHz		
Res BW 240 kHz			#VE	3W 750 k	Hz			ep 1 ms		Min Hold
Occupied Band	width			Total P	ower	20.8	dBm			
Occupied Band				Total I	ower	20.0				
	9.38	02 M⊦	1Z							Detector Peak
Transmit Freq Err	or	-4.320 k	Hz	% of O	<b>BW Pow</b>	ver 99	.00 %		Auto	Mar
x dB Bandwidth		10.38 M	Hz	x dB		-26	00 dB			
		10100 111		X GE		201	00 a 2			
ISG						STATUS				

Plot 7-30. Occupied Bandwidth Plot (NR Band n25/2 - 10.0MHz CP-OFDM QPSK - Full RB)



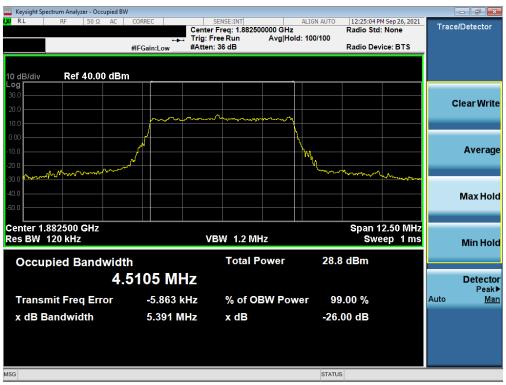
Plot 7-31. Occupied Bandwidth Plot (NR Band n25/2 - 10.0MHz CP-OFDM 16QAM - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 32 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Fage 32 01 140
© 2021 PCTEST		·	V2.0 3/15/2021



Keysight Spectrum Analyzer - Occupied BW					
CIRL RF 50Ω AC	CORREC	SENSE:INT nter Freg: 1.882500000 GI	ALIGN AUTO	12:23:29 PM Sep 26, 202: Radio Std: None	Trace/Detector
	🛶 Tri	g: Free Run Avg l	Hold: 100/100		
	#IFGain:Low #At	tten: 36 dB		Radio Device: BTS	-
I0 dB/div Ref 40.00 dBn	<u> </u>		_		
.og 30.0					
20.0					Clear Writ
10.0	how	· ····································			
0.00			1		
			Å		Averag
10.0			$\sim$		Averag
20.0 30.0 MM			- marine	mm. n	
				mphin	v
40.0					Max Hol
50.0					
Center 1.882500 GHz				Span 12.50 MH	7
Res BW 120 kHz		VBW 1.2 MHz		Sweep 1 ms	
Occupied Bandwidt	h	Total Power	31.3	3 dBm	
4.	5016 MHz				Detecto
					Peak Auto Ma
Transmit Freq Error	2.578 kHz	% of OBW P	ower 99	0.00 %	Auto <u>Ma</u>
x dB Bandwidth	5.022 MHz	x dB	-26.	00 dB	
36			STATU	5	

Plot 7-32. Occupied Bandwidth Plot (NR Band n25/2 - 5.0MHz DFT-s-OFDM BPSK - Full RB)



Plot 7-33. Occupied Bandwidth Plot (NR Band n25/2 - 5.0MHz CP-OFDM QPSK - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 22 of 146	
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 33 of 146	
© 2021 PCTEST	·	·		V2.0 3/15/2021	



Keysight Spectrum Analyzer - Oc									[	
RL RF 50 Ω	AC (	CORREC		SE:INT		ALIGN AUTO	12:24:26 P Radio Std	M Sep 26, 2021	Trace	e/Detector
	#	↔ IFGain:Low	Talas David			d: 100/100	Radio Std			
) dB/div Ref 40.0	0 dBm									
									c	Clear Writ
J.0 00			ᡗᠬᡊ᠆ᡎᡊᢧ᠕	-Manna	~~~~~					
.0						h ho				Avera
.0	www.www.					hom	www.	ᢁᡔᡊᡢ᠆ᡁᡭᡂᡣᠽ		
I.O										Max Ho
enter 1.882500 GHz es BW 120 kHz			VBW	1.2 MHz	2			2.50 MHz ep 1 ms		Min Ho
Occupied Band				Total Po	wer	28.3	dBm			_
	4.5	104 M								Detect Peal
Transmit Freq Er	ror	-7.763	kHz ʻ	% of OB	W Pow	ver 99	.00 %		Auto	<u>M</u>
x dB Bandwidth		5.180 N	/iHz >	x dB		-26.	00 dB			
						STATUS	6			

Plot 7-34. Occupied Bandwidth Plot (NR Band n25/2 - 5.0MHz CP-OFDM 16QAM - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 34 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 34 01 140
© 2021 PCTEST				V2 0 3/15/2021



## **GSM/GPRS PCS**



Plot 7-35. Occupied Bandwidth Plot (GPRS, Ch. 661)



Plot 7-36. Occupied Bandwidth Plot (EDGE, Ch. 661)

FCC ID: A3LSMS908U	PCTEST Proud to be part of @ element	PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 25 of 146	
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 35 of 146	
© 2021 PCTEST				V2.0 3/15/2021	

© 2021 PCTEST



## WCDMA PCS

www. Keysight Spectrum Analyzer - Occupied B	3W					
L <mark>XI</mark> RL RF 50Ω AC	CORREC	SENSE:INT enter Freq: 1.880000000 GHz		4 PM Sep 14, 2021	Trace/Dete	ctor
	inger Ti	rig: Free Run Avg Hold	: 100/100			
	#IFGain:Low #/	Atten: 36 dB	Radio E	evice: BTS		
10 dB/div Ref 40.00 dB	m					
30.0						
20.0					Clear	Write
10.0						
0.00						
-10.0					Δνε	erage
-20.0		۲. ۲. ۲. ۲. ۲. ۲. ۲. ۲. ۲. ۲. ۲. ۲. ۲. ۲				nuge
CO. C.	alment		mar and a second			
-40.0				ale a la se a la s		
					Max	Hold
-50.0						_
Center 1.880000 GHz			Spar	15.00 MHz		
Res BW 150 kHz		VBW 1.5 MHz	S	weep 1ms	Min	Hold
Occurried Developid	41-	Total Power	32.8 dBm			
Occupied Bandwid			52.0 ubm			
4	.1641 MHz					ector <sup>P</sup> eak▶
Transmit Freq Error	-555 Hz	% of OBW Powe	er 99.00 %		Auto	Peak.∎ Man
	4.783 MHz					-
x dB Bandwidth	4.763 MHZ	X dB	-26.00 dB			
MSG			STATUS			

Plot 7-37. Occupied Bandwidth Plot (WCDMA, Ch. 9400)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 36 of 146	
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 30 01 140	
© 2021 PCTEST				V2 0 3/15/2021	



## 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 10<sup>th</sup> 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

KDB 971168 D01 v03r01 - Section 6.0

## 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

- Per Part 24 and RSS-133, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth 100 kHz or greater for measurements below 1GHz. However, 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. 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.
- 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: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 37 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 37 01 140
© 2021 PCTEST				V2.0 3/15/2021



## LTE Band 25/2

	ectrum Analyz	er - Swep	ot SA										
L <mark>XI</mark> RL	RF	<u>50 Ω</u>	AC	CORREC		SEI	NSE:INT		ALIGN AUTO		M Sep 15, 2021	Fi	requency
PASS				PNO: F IFGain:l	ast ↔ Low	Trig: Free Atten: 30		#Avg Ty	pe: RIVIS	TY	CE 1 2 3 4 5 6 PE A WWWWW A NNNNN		
10 dB/div	Ref 20	.00 di	Bm						Mł	(r1 1.84 -50.2	7 5 GHz 74 dBm		Auto Tune
Log Trac	e 1 Pass												Center Freq 9.500000 MHz
-10.0												30	Start Freq 0.000000 MHz
-20.0												1.84	Stop Freq 9000000 GHz
-40.0											1	181 <u>Auto</u>	CF Step I.900000 MHz Man
		an the second	las reiden	unation of the state of the	<del>م</del> وارد مهرسترین	weed and a state of the state of	-daridiktifari-yyyiy	**************************************	hally in players of the providence of	an a	an diamagan dan gabakan di di		Freq Offset 0 Hz
-70.0													Scale Type
Start 0.03 #Res BW					#VBW	3.0 MHz			Sweep 2	Stop 1.3 425 ms	3490 GHz (3639 pts)	Log	<u>Lin</u>
MSG									STATUS	5			



Plot 7-38. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Low Channel)

Plot 7-39. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Low Channel)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 38 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 30 01 140
© 2021 PCTEST		·		V2 0 3/15/2021



🔤 Keysight Spe			ot SA											
XU RL	RF	50 Ω	AC	CORREC		SEN	ISE:INT	#Ava Tv	ALIGN AU pe: RMS	то		M Sep 15, 2021 CE 1 2 3 4 5 6	Fn	equency
PASS				PNO: Fa IFGain:Lo		Trig: Free Atten: 10					TY			
10 dB/div	Ref 0.0	)0 dB	m						N	lkr	1 18.30 -62.	2 5 GHz 30 dBm		Auto Tune
-og Trace	e 1 Pass					, 								enter Frec 0000000 GHz
30.0													10.000	Start Frec
40.0 50.0													20.000	Stop Fred
70.0						and the second se	~~~~		,	~~~	1		1.000 <u>Auto</u>	CF Step 0000000 GHz Mar
80.0													I	Freq Offse 0 Hz
-90.0														Scale Type
Start 10.00 #Res BW				#	VBW	3.0 MHz			Sweep	25.	Stop 20 .33 ms (2	).000 GHz 20001 pts)	Log	<u>Lin</u>
ISG										ATUS				

Plot 7-40. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Low Channel)

	SA			
	AC CORREC SEN	#Avg Type:	TYPE A WWWW	6 Frequency
PASS	IFGain:Low Atten: 30		Mkr1 1.848 5 GH	z Auto Tune
10 dB/div Ref 20.00 dB	m		-49.26 dBn	1
10.0				Center Freq 940.000000 MHz
0.00				
-10.0				Start Freq 30.000000 MHz
-20.0				Stop Freq
-30.0				1.850000000 GHz
-40.0				CF Step 182.000000 MHz <u>Auto</u> Man
-50.0	an a far far anna an a	n, and affirm any frances of the start of th	<mark>₽₽₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩</mark>	Freq Offset
-60.0				0 Hz
-70.0				Scale Type
Start 0.0300 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz		Stop 1.8500 GH weep 2.427 ms (3641 pts	z Log <u>Lin</u>
MSG			STATUS	

Plot 7-41. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Mid Channel)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 39 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 39 01 140
© 2021 PCTEST	·	·		V2.0 3/15/2021



	ectrum Analyzer - Sw										
LXI RL	RF 50 Ω	AC (	CORREC	SEI	NSE:INT	#Avg Typ	ALIGN AUTO		M Sep 16, 2021	Fre	equency
PASS			PNO: Fast ↔ IFGain:Low	Trig: Free Atten: 30		#/ (g / )		TYI Di			
10 dB/div Log	Ref 20.00 (	dBm					M	(r1 5.99 -44.8	4 5 GHz 71 dBm		Auto Tune
10.0	e 1 Pass										<b>enter Freq</b> 500000 GHz
-10.0										1.915	Start Freq 0000000 GHz
-20.0										10.000	Stop Freq 000000 GHz
-40.0		$\sim$			1					808. <u>Auto</u>	<b>CF Step</b> 500000 MHz Man
-60.0										F	F <b>req Offset</b> 0 Hz
-70.0								04.5 - 40		tog	Scale Type Lin
Start 1.91 #Res BW			#VBW	/ 3.0 MHz			Sweep 14	Stop 10 .02 ms <u>(1</u>	.000 GHz 6181 pts)		
MSG							STATUS				

Plot 7-42. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Mid Channel)



Plot 7-43. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - Mid Channel)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 40 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 40 01 146
© 2021 PCTEST	-	·		V2.0 3/15/2021



Keysight Spe	ctrum Analyz		t SA										
KU RL	RF	50 Ω	AC	CORREC		SEN	ISE:INT	#Avg	ALIGN AUTO Type: RMS	TF	AM Sep 15, 2021	Fr	equency
PASS				PNO: Fa IFGain:Lo		Trig: Free Atten: 30							
0 dB/div	Ref 20.	.00 dE	3m						Μ	kr1 1.8 -54	05 0 GHz 4.04 dBm		Auto Tune
.og	e 1 Pass					,						c	enter Fred
10.0												940	.000000 MH;
0.00													Start Free
10.0												30	.000000 MH:
20.0													Stop Fre
80.0												1.85	0000000 GH
10.0												182	CF Stej .000000 MH
50.0											1	<u>Auto</u>	Ma
i0.0 <b></b>	1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-		والمجمعيهم	******	1749.000.000		Autor of Controls	an a	an a				Freq Offse
70.0													0 H
												:	Scale Type
tart 0.03 Res BW				#	VBW	3.0 MHz			Sweep	Stop <sup>2</sup> 2.427 ms	1.8500 GHz s (3641 pts)	Log	<u>Lir</u>
SG									STAT				

Plot 7-44. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - High Channel)



Plot 7-45. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - High Channel)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 41 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 41 01 140
© 2021 PCTEST	·	•		V2.0 3/15/2021



PNO: Fast →→ Trig: Free Run IFGain:Low Trig: Free Run Atten: 10 dB Mkr1 17.498 0 GHz 10 dB/div Ref 0.00 dBm -58.047 dBm		ectrum Analyzer - Swe									
PASS     If Gain:Low     Atten: 10 dB     Det ANNANK       Mkr1 17.498 0 GHz     Mkr1 17.498 0 GHz     Auto Tune       10 dB/div     Ref 0.00 dBm     -58.047 dBm     Gener Freq       100 dB/div     Ref 0.00 dBm     -58.047 dBm     Gener Freq       200     Image: Construction of the second of the seco	L <mark>XI</mark> RL	RF 50 Ω				 #Avg Typ		TRAC	E 1 2 3 4 5 6	Frequ	iency
Log     Trace 1 Pass     Center Freq       100     Center Freq       200     Start Freq       200     Start Freq       400     Start Freq       5	PASS	Dof 0.00 dB	IF				Mkr	DE	ANNNN	Au	ito Tune
300     Image: Start Freq       400     Image: Start Freq       400     Image: Start Freq       500     Image: Start Freq       500     Image: Start Freq       500     Image: Start Freq       600     Image: S	Log Trac										
500 500 500 500 500 500 500 500											
600     CF Step       700     CF Step       800     CF Step       900     CF Step       900     CF Step       Start 10.000 GHz     WBW 3.0 MHz       #VBW 3.0 MHz     Sweep 25.33 ms (20001 pts)											
.800	and the second				-					1.00000	0000 GHz
Start 10.000 GHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 25.33 ms (20001 pts)										Fre	
#Res BW 1.0 MHz #VBW 3.0 MHz Sweep 25.33 ms (20001 pts)		000 GHz						Stop <u>20</u>	.000 GH <u>z</u>		
	#Res BW			#VB	W 3.0 MHz	S		5.33 ms (2	0001 pts)		

Plot 7-46. Conducted Spurious Plot (LTE Band 25/2 - 20MHz QPSK - 1RB - High Channel)

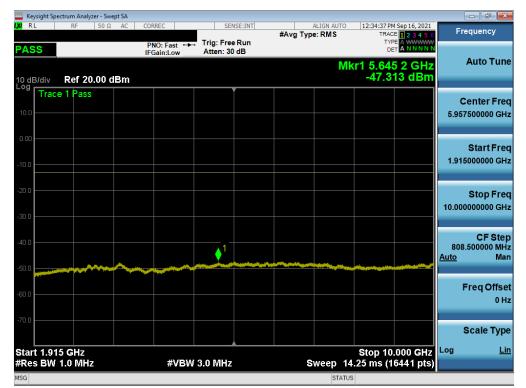
FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 42 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 42 of 146
© 2021 PCTEST	•	·		V2.0 3/15/2021



## NR Band n25/2

	ectrum Analy											_	
RL	RF	50 Ω	AC	CORREC		SEI	ISE:INT	#A T.	ALIGN AUTO		PM Sep 16, 2021	E	requency
ASS				PNO: F IFGain:	ast ⊶► Low	Trig: Free Atten: 30		#Avg I	ype: RWS		RACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNN		
) dB/div	Ref 20	).00 dE	3m						N	lkr1 1.8 -49	46 5 GHz 9.66 dBm		Auto Tui
<sup>og</sup> Trac	e 1 Pass	;											Center Fre
0.0													0.000000 MI
.00													Start Fre
0.0												3	0.000000 M
0.0													
0.0													Stop Fr
												1.85	0000000 G
0.0													
0.0													CF St
5.0											1	18: <u>Auto</u>	2.000000 M M
0.0										na na sin panalaji Pernetak	11401000000000000000000000000		
			<b>95,0</b> 00000140		مريني المرينيي المرينيي المرينية المرينية الم	anderford and group and and and and		**************************************					Freq Offs
0.0													0
0.0													
													Scale Ty
tart 0.03	300 GHz									Stop /	.8500 GHz	Log	1
	1.0 MH				#VBW	3.0 MHz			Sweep	2.427 m	(3641 pts)		
G									STAT				

Plot 7-47. Conducted Spurious Plot (NR Band n25/2 -40.0MHz - 1RB - Low Channel)



Plot 7-48. Conducted Spurious Plot (NR Band n25/2 - 40.0MHz - 1RB - Low Channel)

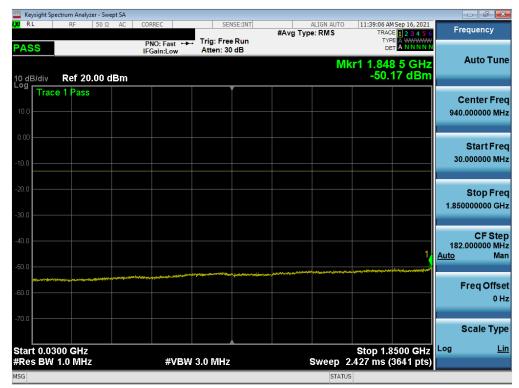
FCC ID: A3LSMS908U	PCTEST Proud to be part of @ element	PART 24 MEASUREMENT REPORT	SUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 43 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 43 01 140
© 2021 PCTEST	•	·		V2.0 3/15/2021

© 2021 PCTEST



	ectrum Analy:		pt SA										- 🗗 💌
RL	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Ty	ALIGN AUTO		M Sep 16, 2021	Fre	quency
ASS				PNO: F IFGain:I	ast ↔ Low	Trig: Fre Atten: 1		• ,		TY			
0 dB/div	Ref 0.0	00 dB	m						Mk	r1 18.28 -59.0	8 5 GHz 31 dBm		uto Tun
00	e 1 Pass						Ť					Ce	enter Fre
0.0													00000 GH
0.0													Start Fre
0.0													00000 GI
0.0													Stop Fre
0.0													00000 GI
3.0										<b>♦</b> <sup>1</sup>			CF Ste
		-	and a star			and the second	and the second second					1.0000 <u>Auto</u>	00000 GI M
												E	req Offs
3.0													01
D.0												S	cale Typ
	000 GHz									Stop 20	0.000 GHz	Log	L
Res BW	1.0 MHz	2			₽VBW	3.0 MHz			sweep 2	5.33 ms (2	20001 pts)		

Plot 7-49. Conducted Spurious Plot (NR Band n25/2 - 40.0MHz - 1RB - Low Channel)

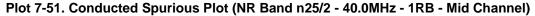


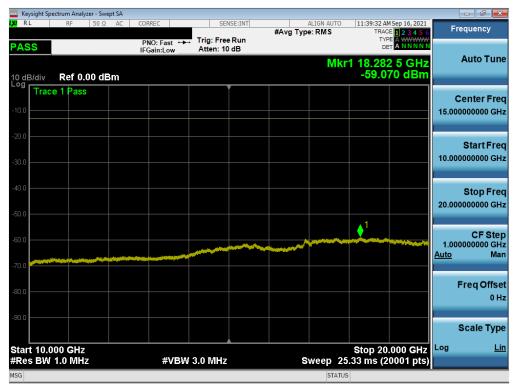
Plot 7-50. Conducted Spurious Plot (NR Band n25/2 - 40.0MHz - 1RB - Mid Channel)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 44 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 44 01 140
© 2021 PCTEST	·	·		V2.0 3/15/2021



	ctrum Analyze												
LXU RL	RF	50 Ω	AC	CORREC		SEI	SE:INT	#Avg Ty	ALIGN AUTO		M Sep 16, 2021	Frequ	ency
PASS				PNO: F	ast ⊶⊶ .ow	Trig: Free Atten: 30		"		TY			
10 dB/div	Ref 20.	00 di	Bm						M	(r1 6.90 -47.3	3 2 GHz 67 dBm	Au	to Tune
Log Trac	e 1 Pass											Cen	ter Freq
10.0													0000 GHz
0.00													
0.00												St	art Freq
-10.0												1.915000	0000 GHz
-20.0												St	op Freq
-30.0												10.00000	0000 GHz
-30.0													
-40.0													CF Step
								<b>∮</b> <sup>1</sup>				Auto	Man
-50.0		****			-								
-60.0												Fre	q Offset
-00.0													0 Hz
-70.0													
												Sca	ale Type
Start 1.91	5 GHz									Stop 10	.000 0112	Log	<u>Lin</u>
#Res BW	1.0 MHz			-	#VBW	3.0 MHz					6441 pts)		
MSG									STATUS	6			





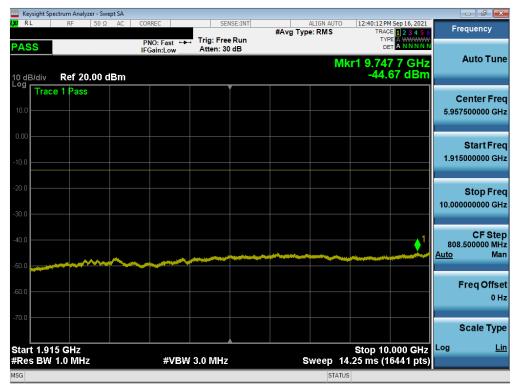
Plot 7-52. Conducted Spurious Plot (NR Band n25/2 - 40.0MHz - 1RB - Mid Channel)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 45 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 43 01 140
© 2021 PCTEST	·	•		V2.0 3/15/2021



	ectrum Analy:		t SA										
(RL	RF	50 Ω	AC	CORREC			NSE:INT	#Av	ALIGN AUTO g Type: RMS	TF	PM Sep 16, 2021	Fn	equency
ASS				PNO: Fa IFGain:L	ist ↔→ ow	Trig: Free Atten: 30							
0 dB/div	Ref 20	.00 dE	Зm						N	lkr1 1.8 -49	46 0 GHz 9.54 dBm		Auto Tun
<sup>og</sup> Trac	e 1 Pass						Ĭ						Center Fre
10.0													.000000 MH
).00													
0.0												30	Start Fre
20.0												4.05	Stop Fre
80.0												1.850	000000 GP
io.o												102	CF Ste
50.0											1	Auto	Ma
iu.u	<b>4</b>		ly' <del>t filet (<sup>the</sup> to</del>	hen egen benedistri		*****		10000000000000000000000000000000000000					Freq Offs
i0.0													0 F
′0.0 <b></b>													
													Scale Typ
tart 0.03 Res BW		,		#	VBW	3.0 MHz			Sweep		1.8500 GHz (3641 pts)		L
SG									STAT				

Plot 7-53. Conducted Spurious Plot (NR Band n25/2 - 40.0MHz - 1RB - High Channel)



Plot 7-54. Conducted Spurious Plot (NR Band n25/2 - 40.0MHz - 1RB - High Channel)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 46 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 40 01 140
© 2021 PCTEST		·		V2.0 3/15/2021



	nt Spectrum Ana												
RL	RF	50 Ω	AC	CORREC		SEN	ISE:INT	#Avg Ty	ALIGN AUTO		M Sep 16, 2021 CE 1 2 3 4 5 6	Fr	equency
PASS				PNO: Fa	ast ↔ ow	Trig: Free Atten: 10		#Avg iy	pe. King	TY D			
0 dB/di	iv Ref0	.00 dE	3m						M	(r1 17.68 -55	5 5 GHz 89 dBm		Auto Tun
og Tr 10.0	race 1 Pas	S				,							Center Free
20.0												10.00	Start Fre
10.0												20.00	Stop Fre
i0.0										1 		1.000 Auto	CF Ste 0000000 GH Ma
0.0													
0.0													Freq Offs 0 H
0.0													Scale Typ
	0.000 GH: SW 1.0 MH					3.0 MHz			Sween (	Stop 20 25.33 ms (2		Log	L
17.1		115							STAT		Looo I proj		

Plot 7-55. Conducted Spurious Plot (NR Band n25/2 - 40.0MHz - 1RB - High Channel)

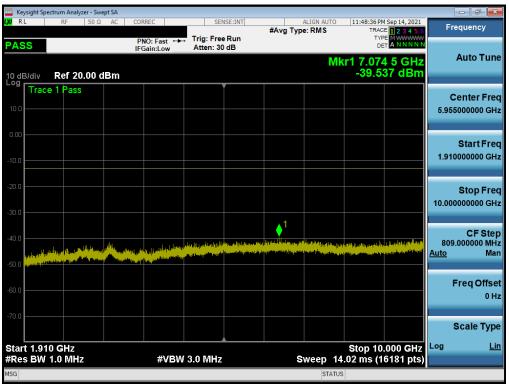
FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 47 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 47 01 140
© 2021 PCTEST				V2.0 3/15/2021



## **GSM/GPRS PCS**

ASS PNO: Fast Trig: Free Run Atten: 30 dB Mikr1 1.845 0 GHz -31.761 dBm Center Freq 937.500000 MHz Start Freq 30.000000 MHz Start Freq 30.000000 MHz Start Freq 30.000000 MHz Center Step 181.500000 GHz Trace 1 Pass Center Freq 937.500000 MHz Start Freq 30.000000 MHz Start Freq 30.000000 MHz Start Freq 181.500000 GHz Trace 1 Pass Center Step 181.500000 GHz CF Step 181.500000 MHz CF Step 181.500000 MHz CF Step 181.500000 MHz CF Step 181.50000 MHz CF Step 181.500000 MHz CF Step 181.500000 MHz CF Step 181.500000 MHz CF Step 181.50000 MHz CF Step 181.50000 MHz CF Step		ight Spect	rum Analyzer -	Swept SA										
ASS PRO: Fast Trig: Free Run IFGain:Low Atten: 30 dB Mkr1 1.845 0 GHz -31.761 dBm Center Freq 937.500000 MHz Start Freq 30.00000 MHz Start Freq 30.00000 MHz Start Freq 1.84500000 GHz 1.84500000 GHz 1.8450000 GHz 1.8450000 GHz 1.8450000 GHz 1.8450000 GHz 1.8450000 GHz 1.8450000 GHz 1.8450000 GHz 1.8450000 GHz 1.8450000 GHz 1.845000 GHZ 1.8450000 GHZ 1.845000 GHZ 1.845000 GHZ 1.845000 GHZ 1.845000 GHZ 1.845000 GHZ 1.84500 GHZ 1.84	IXI RL		RF 5	0Ω AC	CORRE	C	SEI	ISE:INT	#Ava Tva				Frequ	iency
Bildiv     Ref 20.00 dBm     Center Freq       9     Trace 1 Pass     Center Freq       00     Start Freq       00     Start Freq       00     Start Freq       00     Start Freq       01     Start Freq       02     Start Freq       03     Start Freq       04     Start Freq       05     Start Freq       06     Start Freq       07     Start Freq       08     Start Freq       09     Start Freq       1.845000000 GHz     Start Freq       1.84500000 GHz     St	PASS	S									TYF DE			
Image: Structure of Pass     Center Freq       937.500000 MHz     937.500000 MHz       937.50000 MHz     937.500000	10 404	diu	Pef 20.0	0 dBm						Mł	r1 1.84 -31.7	50 GHz 61 dBm	Au	ito Tune
Center Freq 937.500000 MHz 30.00000 MHz 30.00000 MHz 30.00000 MHz 30.00000 MHz 30.00000 MHz 145500000 GHz 181.50000 GHz 181.50000 GHz 181.50000 GHz 181.50000 MHz 181.50000 MHz	Log -						,							
00     1		nuce	1 455											•
000   Start Freq 30.00000 MHz     000   Start Freq 30.000000 MHz     000   Start Freq 30.00000 MHz     000   Start Freq 1.84500000 GHz     000   Start Freq 1.84500000 GHz <td>10.0</td> <td></td> <td>937.50</td> <td>0000 MHz</td>	10.0												937.50	0000 MHz
000   Start Freq 30.00000 MHz     000   Start Freq 30.000000 MHz     000   Start Freq 30.00000 MHz     000   Start Freq 1.84500000 GHz     000   Start Freq 1.84500000 GHz <td>0.00</td> <td></td>	0.00													
Image: Stop Freq       1														
000   1     000   1	-10.0												30.00	0000 MHz
000   1     000   1														
0.0     Image: state of the	-20.0 —												S	top Freq
D0   CF Step     D0   Image: set of the set of	20.0											1	1.84500	0000 GHz
000	-30.0													
0.0   Auto     0.0   Auto     0.0   Auto	-40.0													
D0 Freq Offset   00 0						يعدار		and station before to come	الما المراسلين	internation the	a in the strength of the	المنط المعادية والمناط		
	-50.0 🖌		telester and the				and a state of the second	stor Bala sus de						
													Fre	q Offset
	-60.0 —													0 Hz
	-70.0													
													Sc	ale Type
tart 0.0300 GHz Stop 1.8450 GHz Log Lin	Start	0 0 20									Stop 4-9		Log	Lin
tart 0.0300 GHz Stop 1.8450 GHz Log Lin Res BW 1.0 MHz #VBW 3.0 MHz Sweep 2.427 ms (3641 pts)						#VBW	3.0 MHz			Sweep 2	.427 ms (	3641 pts)	-	<u></u>
	MSG													

Plot 7-56. Conducted Spurious Plot (GPRS Ch. 512)



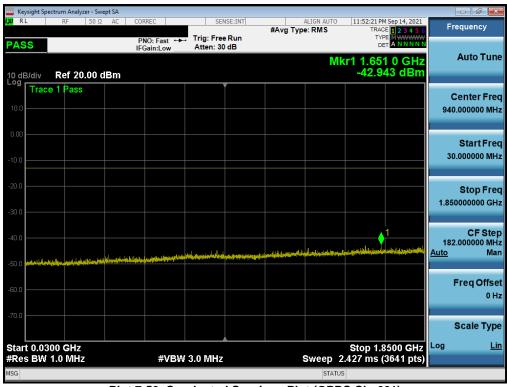
Plot 7-57. Conducted Spurious Plot (GPRS Ch. 512)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 48 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 48 of 146
© 2021 PCTEST	•	·		V2.0 3/15/2021



	ectrum Analyzer ·	- Swept SA									
L <mark>XI</mark> RL	RF 5	0Ω AC	CORREC	SE	NSE:INT	#Avg Typ	ALIGN AUTO	11:49:14 PM	Sep 14, 2021	Frequ	ency
PASS			PNO: Fast IFGain:Low	Trig: Fre		#Avg Typ	e. RIVIS	TYPE	1 2 3 4 5 6 MWWWWW A N N N N N		
10 dB/div	Ref 0.00	dBm					Mkr	1 17.725 -51.38	0 GHz 3 dBm	Au	to Tune
Log Trac	e 1 Pass				Ĭ					Con	ter Fred
-10.0										15.00000	
										10.000000	
20.0											
											artFre
-30.0										10.00000	0000 GH
-40.0											op Fre
-50.0							1			20.00000	0000 GH
					. Indonalisatika .	htadað	pastantapelland	and a state of the second s	dest play to the		
60.0 <b></b>		have a shared	legteren fijnen regenske fiktion Generaties (May en lefter (1945)	ally descent the second	a sugar the second second	and the part of the second second			and in all the state of the Real	1.00000	CF Ste
and the second second	State of States	فالتعالج بالرواف	Antonia in a little salitation ( an an							Auto	Ma
70.0											
										Fre	qOffse
-80.0											0 н
-90.0											
-90:0										Sca	ale Typ
Start 10.0	00 GH7							Stop 20.	000 GHz	Log	Li
#Res BW			#VB	W 3.0 MHz		s	weep 25	.33 ms (20	0001 pts)		
ISG							STATUS				

Plot 7-58. Conducted Spurious Plot (GPRS Ch. 512)



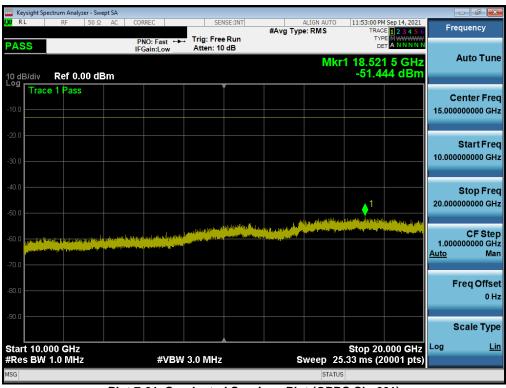
Plot 7-59. Conducted Spurious Plot (GPRS Ch. 661)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 49 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 49 01 140
© 2021 PCTEST				V2.0 3/15/2021



🔤 Keysight Spectrum Analyzer - Swept SA 🛛					
L <mark>XU</mark> RL RF 50Ω AC	CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	11:52:42 PM Sep 14, 2021 TRACE 1 2 3 4 5 6	Frequency
PASS	PNO: Fast ↔ IFGain:Low	Trig: Free Run Atten: 30 dB	• //		• · · · • <b>-</b> · · · ·
10 dB/div Ref 20.00 dBm			Mł	r1 9.976 5 GHz -38.933 dBm	Auto Tune
10.0					Center Freq 5.955000000 GHz
-10.0					Start Freq 1.910000000 GHz
-20.0					Stop Freq 10.000000000 GHz
-40.0		e la generación de la seguina de la sector de Conserva de la sector	a de la companya de La companya de la comp		CF Step 809.000000 MHz <u>Auto</u> Man
-60.0					Freq Offset 0 Hz
-70.0					Scale Type
Start 1.910 GHz #Res BW 1.0 MHz	#VBW	3.0 MHz	Sweep 14	Stop 10.000 GHz .02 ms (16181 pts)	Log <u>Lin</u>
MSG			STATUS	5	

Plot 7-60. Conducted Spurious Plot (GPRS Ch. 661)



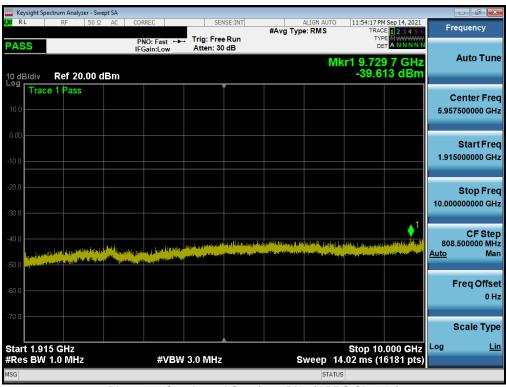
Plot 7-61. Conducted Spurious Plot (GPRS Ch. 661)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 50 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 50 of 146
© 2021 PCTEST	•	·		V2.0 3/15/2021



	ctrum Analyzer - Sv	wept SA								- 5
LXI RL	RF 50 S	2 AC C	ORREC	SEN	ISE:INT	#Avg Typ	ALIGN AUTO	11:53:53 PM TRACE	Sep 14, 2021	Frequency
PASS			PNO: Fast 🔸 FGain:Low	Trig: Free Atten: 30				TYPE DET	M WWWWW A N N N N N	Auto Tur
10 dB/div	Ref 20.00	dBm					Mk	r1 1.662 -44.05	0 GHz 0 dBm	Auto Tun
10.0	e 1 Pass									Center Fre 940.000000 MH
-10.0										Start Fre 30.000000 M⊦
-20.0										Stop Fre 1.850000000 G⊦
-40.0	collect of a state black date			, alpha a the first of the second	and a state of the second s		a iji kan di ali ku da	etai kantijisi di a ku	1	CF Ste 182.000000 MH <u>Auto</u> Ma
-60.0	(sec.ex), been it is only the first									Freq Offse 0 H
-70.0										Scale Typ
Start 0.03 #Res BW			#VBW	3.0 MHz			Sweep 2	Stop 1.8: 427 ms (3		Log <u>L</u> i
MSG							STATUS	5		

Plot 7-62. Conducted Spurious Plot (GPRS Ch. 810)



Plot 7-63. Conducted Spurious Plot (GPRS Ch. 810)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 51 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 51 01 140
© 2021 PCTEST	·	•		V2.0 3/15/2021



	ectrum Analyzer -										
XU RL	RF 5	0Ω AC	CORREC	SEI	ISE:INT	#Avg Typ	ALIGN AUTO		M Sep 14, 2021	Frequ	iency
PASS			PNO: Fast ++ IFGain:Low	Trig: Free Atten: 10				TYF DE			
I0 dB/div	Ref 0.00	dBm					Mkr	1 19.06 -50.6	5 0 GHz 78 dBm	Au	ito Tun
-og Trace	e 1 Pass			)						Cer	nter Fre
10.0										15.00000	
20.0										S	tart Fre
30.0										10.00000	0000 GH
40.0											top Fre
50.0									<b>♦</b> <sup>1</sup>	20.00000	0000 GH
					Lector (Payloller)	All to search of the second	an philips areas	اللي في المحمد الأسباع . المحمد الأحمد الأمريكي الم	and Hanning and		
60.0 <mark>quantersite</mark>	a series of the surface of		n de la companya de Norma de la companya d	ويتعالم المراجع	u	No. of Concession, Name					CF Ste 0000 GH
70.0	i inner fra de plinad d		- Arabita barata an an							<u>Auto</u>	Ма
/0.0										_	
80.0										Fre	eq Offse 0 H
90.0										Sc	ale Typ
	00 OU-							<b>0</b> 1 00		Log	<u>Li</u>
itart 10.0 Res BW			#VBW	/ 3.0 MHz		s	weep 25	stop 20 5.33 ms <u>(2</u>	.000 GHz 0001 pts)	L-99	<u> </u>
SG							STATUS				

Plot 7-64. Conducted Spurious Plot (GPRS Ch. 810)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 52 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 52 01 140
© 2021 PCTEST				V2 0 3/15/2021



## WCDMA PCS

	ectrum Analyzer						
LXU RL	RF 5	iOΩ AC	CORREC	Trig: Free Run	#Avg Type: RMS	11:00:36 PM Sep 14, 2021 TRACE 1 2 3 4 5 6 TYPE A WWWW	Frequency
PASS			IFGain:Low	Atten: 30 dB		cr1 1.845 0 GHz	Auto Tune
10 dB/div Log	Ref 20.0	0 dBm			IVII	-34.34 dBm	
Trac	e 1 Pass						Center Freq
10.0							937.500000 MHz
0.00							
-10.0							Start Freq 30.000000 MHz
-10.0							
-20.0							Stop Freq
-30.0						1	1.845000000 GHz
-40.0							CF Step
40.0							181.500000 MHz <u>Auto</u> Man
-50.0							
-60.0	ientintation		interferences and the second standard and the second standard standard standard standard standard standard stan	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			Freq Offset 0 Hz
-70.0							
.0.0							Scale Type
Start 0.03				<b>▲</b>			Log <u>Lin</u>
#Res BW	1.0 MHz		#VBN	/ 3.0 MHz		2.427 ms (3641 pts)	
MSG			7.05.0		STATU		

Plot 7-65. Conducted Spurious Plot (WCDMA Ch. 9262)



Plot 7-66. Conducted Spurious Plot (WCDMA Ch. 9262)

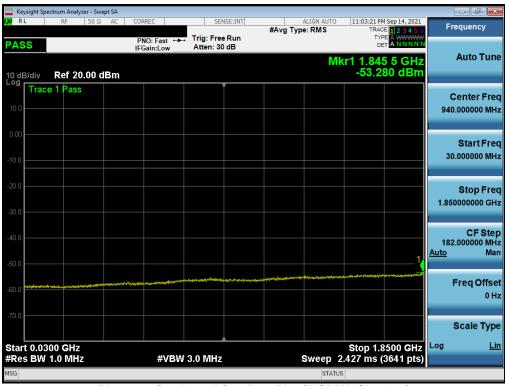
FCC ID: A3LSMS908U	PCTEST Proud to be part of @ element	PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 52 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 53 of 146
© 2021 PCTEST	•			V2.0 3/15/2021

© 2021 PCTEST



RF   50 Ω   AC   CORREC   SENSE:INT   ALIGN AUTO   11:01:38 PM Sep 14, 2021     S   PNO: Fast   Trig: Free Run   DET & NNNNN     Mkr1 18.304 5 GHz   Mkr1 18.304 5 GHz   Center Fr     Trace 1 Pass   Center Fr   15.00000000 0     Start Fr   Start Fr     10.00000000 0
S PNO: Fast Trig: Free Run Atten: 10 dB Per ANNANN DET ANNANN DET ANNANN DET ANNANN DET ANNANN DET ANNANN Atten: 10 dB Control of the second details and the sec
Wiki Tio.304 3 GH2         Wiki Tio.304 3 GH2         Center F         Trace 1 Pass         Center F         Start F         10.00000000 0
Center F 15.00000000 0 Start F 10.00000000 0
Stop F
20.00000000 0
L CFSI 1.000000000 C Auto
Freq Off 0
Scale Ty
t 10.000 GHz Stop 20.000 GHz Log S BW 1.0 MHz #VBW 3.0 MHz Sweep 25.33 ms (20001 pts)
STATUS

Plot 7-67. Conducted Spurious Plot (WCDMA Ch. 9262)



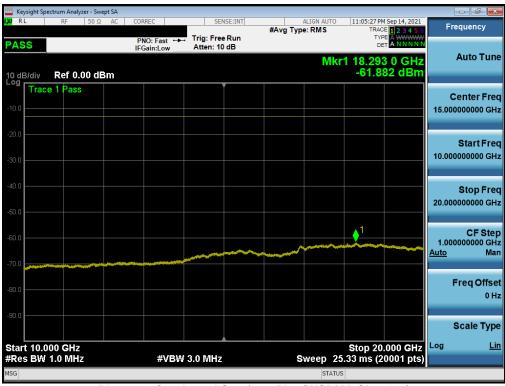
Plot 7-68. Conducted Spurious Plot (WCDMA Ch. 9400)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 54 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 34 01 140
© 2021 PCTEST	·	•		V2.0 3/15/2021



Keysight Spectrum Analyzer - Swept S					
<b>X<sup>1</sup> RL</b> RF 50Ω A		SENSE:INT	#Avg Type: RMS	11:04:31 PM Sep 14, 2021 TRACE 1 2 3 4 5 6 TYPE A WWWWW	Frequency
PASS	PNO: Fast +++ IFGain:Low	Atten: 30 dB		DET A NNNN	
			M	(r1 6.935 5 GHz -50.091 dBm	Auto Tune
10 dB/div Ref 20.00 dBr	m	•		-30.091 0.811	
					Center Freq
10.0					5.955000000 GHz
0.00					
					Start Freq 1.91000000 GHz
-10.0					
-20.0					Stop Freq
					10.000000000 GHz
-30.0					
-40.0					CF Step 809.00000 MHz
-50.0			<b>♦</b> <sup>1</sup>		<u>Auto</u> Man
	$\sim$				
-60.0					Freq Offset 0 Hz
-70.0					
-70.0					Scale Type
Start 1.910 GHz				Stop 10.000 GHz	Log <u>Lin</u>
#Res BW 1.0 MHz	#VBW	3.0 MHz	Sweep 14	.02 ms (16181 pts)	
MSG			STATUS	5	

Plot 7-69. Conducted Spurious Plot (WCDMA Ch. 9400)



Plot 7-70. Conducted Spurious Plot (WCDMA Ch. 9400)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo EE of 146	
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 55 of 146	
© 2021 PCTEST	·	•		V2.0 3/15/2021	



🚾 Keysight Spectrum Analyzer - Swept SA	4				
LXU RE 50Ω A0	C CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	11:06:25 PM Sep 14, 2021 TRACE 1 2 3 4 5 6	Frequency
PASS	PNO: Fast +++ IFGain:Low	Trig: Free Run Atten: 30 dB			• · · · •
10 dB/div Ref 20.00 dBn	n		Mł	r1 1.819 5 GHz -53.67 dBm	Auto Tune
Trace 1 Pass		Ĭ			Center Freq
10.0					940.000000 MHz
0.00					Start Freq
-10.0					30.000000 MHz
-20.0					Stop Freq
-30.0					1.850000000 GHz
-40.0					CF Step
				t.	182.000000 MHz <u>Auto</u> Man
-50.0			المربع المحمد المحمد والمحمد و		
-60.0 <b></b>	and and the state of the state				Freq Offset 0 Hz
-70.0					Scale Type
Start 0.0300 GHz #Res BW 1.0 MHz	#VBW 3	B.0 MHz	Sweep 2	Stop 1.8500 GHz .427 ms (3641 pts)	Log <u>Lin</u>
MSG			STATUS		

Plot 7-71. Conducted Spurious Plot (WCDMA Ch. 9538)



Plot 7-72. Conducted Spurious Plot (WCDMA Ch. 9538)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 56 of 146	
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 56 of 146	
© 2021 PCTEST	•	·		V2.0 3/15/2021	



	ctrum Analyz												a X
XI RL	RF	50 Ω	AC	CORREC			NSE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRA	PM Sep 14, 2021	Frequ	ency
PASS				PNO: Fa	nst ↔ ow	Trig: Free Atten: 10						•	
10 dB/div	Ref 0.0	00 dB	m						Mkr	1 18.31 61-	0 0 GHz .62 dBm	Au	to Tune
Log Trace	e 1 Pass											Cent	ter Freq
-10.0												15.000000	000 GHz
-20.0													
~												Sta 10.000000	art Freq
-30.0													
-40.0												St	op Freq
-50.0												20.00000	000 GHz
										<b>1</b>			CF Step
-60.0									and the second second			1.000000 Auto	
-70.0					-							Auto	Ivian
-80.0												Free	qOffset
00.0													0 Hz
-90.0												Sca	le Type
						,				<b>8</b> 1 01		Log	Lin
Start 10.0 #Res BW	00 GHZ 1.0 MHZ			#	VBW	3.0 MHz		s	weep 25	stop 2 5.33 ms (	0.000 GHz 20001 pts)	LUg	
MSG									STATUS	5			

Plot 7-73. Conducted Spurious Plot (WCDMA Ch. 9538)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 57 of 146	
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 57 01 140	
© 2021 PCTEST				V2 0 3/15/2021	



## 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 $43 + 10 \log_{10}(P_{[Watts]})$ , where P is the transmitter power in Watts.

#### **Test Procedure Used**

KDB 971168 D01 v03r01 - Section 6.0

### 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  $\geq 2 \times \text{Span/RBW}$
- 7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize

#### Test Setup

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



Figure 7-4. Test Instrument & Measurement Setup

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 59 of 146	
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 58 of 146	
© 2021 PCTEST	·			V2.0 3/15/2021	



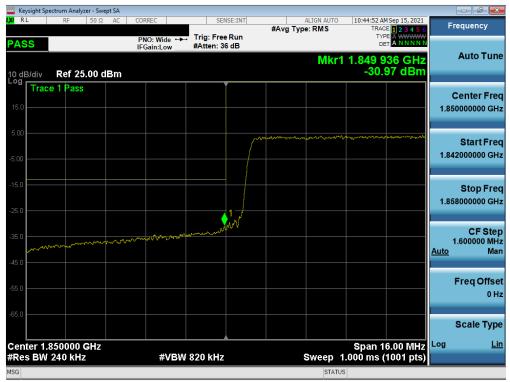
## Test Notes

- 1. 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.
- 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: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage E0 of 146	
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 59 of 146	
© 2021 PCTEST				V2.0 3/15/2021	



## LTE Band 25/2



Plot 7-74. Lower Band Edge Plot (LTE Band 25/2 - 20MHz QPSK - Full RB)



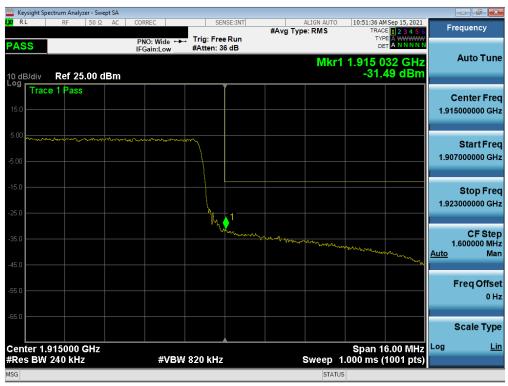
Plot 7-75. Extended Lower Band Edge Plot (LTE Band 25/2 - 20MHz QPSK - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 60 of 146	
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Fage 00 01 146	
© 2021 PCTEST			V2.0 3/15/2021	



	pectrum Analy:												- Ø X
X/RL	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Ava T	ALIGN AUTO		M Sep 15, 2021 CE <b>1 2 3 4 5 6</b>	Fr	equency
PASS				PNO: Wi IFGain:L		Trig: Fre #Atten: 3			,	TY D			
10 dB/div Log	Ref 25	.00 dE	3m						Mkr	1.910 3 -31.	320 GHz 19 dBm		Auto Tune
15.0 Trac	e 1 Pass												enter Freq 0000000 GHz
-5.00		and the second	ww.chr.wh	~~~~	~~~~~~							1.902	Start Frec
-15.0												1.918	Stop Frec
35.0						W.,	, I	Monto	<u>~~^</u> 01ptmline%conver	man	when the market	1 <u>Auto</u>	CF Step 600000 MHz Mar
45.0 <u></u> 55.0 <u></u>												F	Freq Offse 0 Ha
-65.0													Scale Type
	.910000 240 kHz			#	VBW	820 kHz			Sweep	Span 1 1.000 ms	6.00 MHz (1001 pts)	Log	Lin
4SG									STATU				

Plot 7-76. Upper Band Edge Plot (LTE Band 2 - 20MHz QPSK - Full RB)



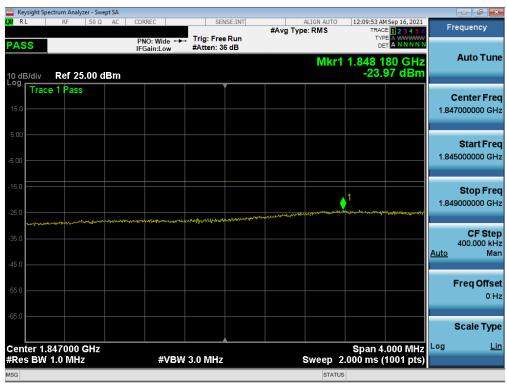
Plot 7-77. Upper Band Edge Plot (LTE Band 25 - 20MHz QPSK – Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 61 of 146	
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 61 of 146	
© 2021 PCTEST		·		V2.0 3/15/2021	



	pectrum Analyz		: SA										
KU RL	RF	50 Ω	AC	CORREC		SEI	NSE:INT	# <b>A</b> ver Ty	ALIGN AUTO		M Sep 16, 2021	F	requency
PASS				PNO: W IFGain:L	ide ↔ .ow	Trig: Free #Atten: 3		#Avg 1)	pe. Rino	TYF			
I0 dB/div	Ref 25	.00 dE	3m						Mkr1	1.848 0 -30.	80 GHz 05 dBm		Auto Tune
15.0	e 1 Pass												Center Free 0000000 GH
5.00								Am	yner Maryng		nn	1.84	<b>Start Free</b> 4000000 GH
-15.0					1							1.85	<b>Stop Free</b> 6000000 GH
35.0	Mar and a start		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	, and for the second		www.ww	2 <sup>42</sup>					<u>Auto</u>	CF Ste 1.200000 MH Ma
55.0													Freq Offse 0 H
-65.0													Scale Type
	.850000 ( 180 kHz			;	¢VBW	620 kHz			Sweep 1	Span 1 .000 m <u>s (</u>	2.00 MHz 1001 pts)	Log	<u>Lir</u>
ISG									STATU				

Plot 7-78. Lower Band Edge Plot (LTE Band 25/2 - 15MHz QPSK - Full RB)



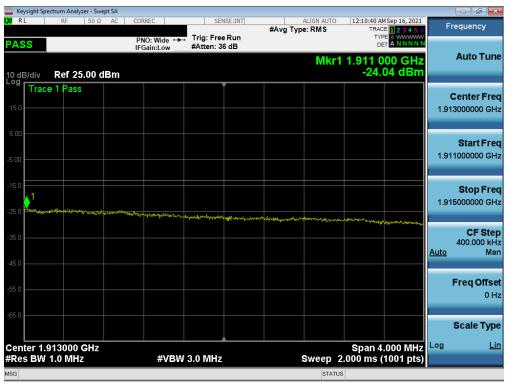
Plot 7-79. Extended Lower Band Edge Plot (LTE Band 25/2 - 15MHz QPSK - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 62 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 02 01 140
© 2021 PCTEST				V2.0 3/15/2021



	pectrum Analy:											
XU RL	RF	50 Ω AC	CORRE	C		NSE:INT	#Avg Ty	ALIGN AUTO pe: RMS	TRAC	MSep 15, 2021	Fr	equency
PASS				Wide +++ n:Low	Trig: Free #Atten: 3			Mkr1				Auto Tune
10 dB/div Log	Ref 25	.00 dBn	ı						-29.	52 dBm		
15.0 Trac	ce 1 Pass											Center Freq 0000000 GHz
5.00	u	~~~~			~~~						1.90	Start Fred 4000000 GH2
25.0						L					1.91	Stop Free 6000000 GH:
35.0					will h	- Ann		and the second second	hours	·····	1 <u>Auto</u>	CF Step .200000 MH: Mar
45.0 <u> </u>												Freq Offse 0 H
65.0												Scale Type
	.910000 180 kHz			#VBW	620 kHz			Sweep 1	Span 1 .000 m <u>s (</u>	2.00 MHz 1001 pts)	Log	Lin
1SG								STATU				

Plot 7-80. Upper Band Edge Plot (LTE Band 2 - 15MHz QPSK - Full RB)



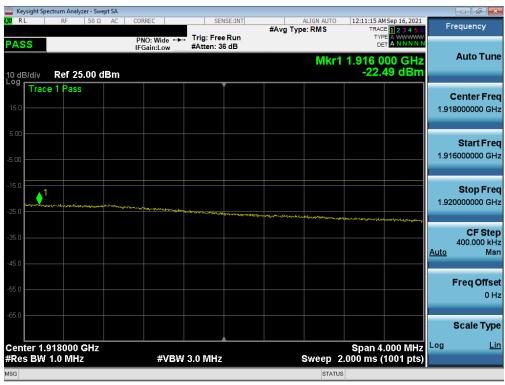
Plot 7-81. Extended Upper Band Edge Plot (LTE Band 2 - 15MHz QPSK – Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 63 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 03 01 140
© 2021 PCTEST	·	·		V2.0 3/15/2021



	pectrum Analy	zer - Swept	SA									[	- 0 ×
X/RL	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Ty	ALIGN AUTO		M Sep 15, 2021 CE 1 2 3 4 5 6	Fr	equency
PASS				PNO: W IFGain:L		Trig: Fre #Atten: 3				TY C			
10 dB/div	Ref 25	.00 dB	3m						Mkr1	1.915 -29.	108 GHz .09 dBm		Auto Tune
Log Tra	ce 1 Pass												enter Freq 5000000 GHz
-5.00	v			V	~~~~~							1.909	Start Freq
-15.0							 1					1.921	Stop Freq
35.0									Mary war	Jon w	www.www.	1 <u>Auto</u>	CF Step 200000 MHz Man
45.0 55.0												F	Freq Offset 0 Hz
-65.0													Scale Type
	.915000 / 180 kH				VBW	620 kHz			Sween_1	Span '	12.00 MHz (1001 pts)	Log	<u>Lin</u>
ASG					4 10 9 4	020 NH2			STATU		(Tool pls)		

Plot 7-82. Upper Band Edge Plot (LTE Band 25 - 15MHz QPSK - Full RB)



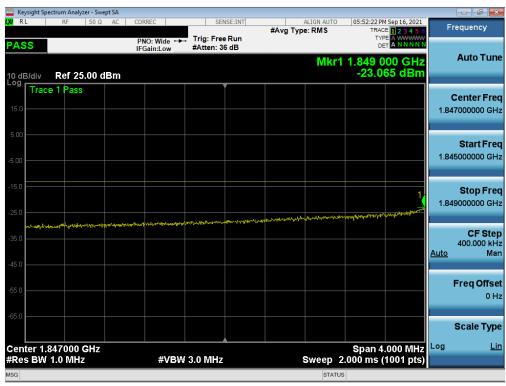
Plot 7-83. Extended Upper Band Edge Plot (LTE Band 25 - 15MHz QPSK - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 64 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 64 01 146
© 2021 PCTEST		·		V2.0 3/15/2021



	pectrum Analy:	er - Swept	SA										
X/RL	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Ty	ALIGN AUTO	02:07:55 PM S TRACE	1 2 3 4 5 6	Fr	equency
PASS				PNO: Wi IFGain:L		Trig: Fre #Atten: 3				TYPE DET	Ă WWWWW A N N N N N		
10 dB/div Log	Ref 25	.00 dB	m						Mkr1	1.849 99 -29.8	2 GHz 4 dBm		Auto Tune
15.0 Tra	ce 1 Pass												Center Freq 0000000 GHz
5.00							$\int$		~^~	an a	ngthengterne	1.84	Start Fred 6000000 GH2
25.0							1.1					1.85	Stop Free 4000000 GH2
35.0 45.0	where and a frances	leyeddiwyad ALA	₩ ₽ ₽ ₽ ₽ ₽ ₽ ₽ ₽ ₽ ₽ ₽ ₽ ₽ ₽ ₽ ₽ ₽ ₽ ₽	vdorg for normality	معفري مريي	and a second						<u>Auto</u>	CF Step 800.000 kHz Mar
55.0													Freq Offse 0 H
-65.0													Scale Type
	.850000 ( 120 kHz			#	VBW	430 kHz			Sween_1	Span 8.0 3.33 ms (10	00 1911 12	Log	Lin
ISG						100-11112			STATUS		non proj		

Plot 7-84. Lower Band Edge Plot (LTE Band 25/2 - 10MHz QPSK - Full RB)



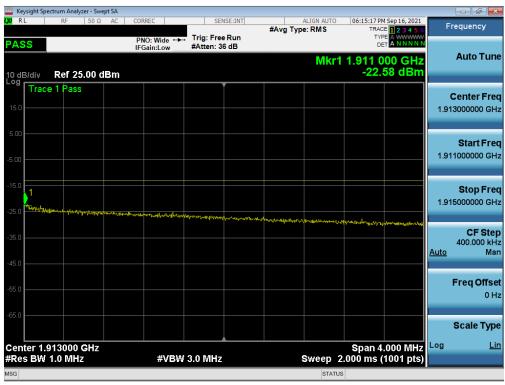
Plot 7-85. Extended Lower Band Edge Plot (LTE Band 25/2 - 10MHz QPSK - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 65 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 65 01 146
© 2021 PCTEST		·		V2.0 3/15/2021



	pectrum Analy												
X/RL	RF	50 Ω	AC	CORREC		SEI	ISE:INT	#Avg Ty	ALIGN AUTO		M Sep 15, 2021	F	requency
PASS				PNO: Wi IFGain:L		Trig: Free #Atten: 3		The second secon	pe. Kino	TYI			
10 dB/div Log	Ref 25	.00 di	Bm						Mkr1	1.910 0 -30.	)32 GHz 04 dBm		Auto Tune
15.0	ce 1 Pass												Center Freq 0000000 GHz
-5.00	han an a	4numpelingeren	*(%*g-3-*++)	Algerrageling (fruiterunte)	•••••••							1.90	Start Freq 6000000 GHz
-15.0							×1					1.91	Stop Fred 4000000 GHz
35.0						Norv	Concert Strandy	and good of the stand of the st	an generation and a second		Ward and the second second	<u>Auto</u>	CF Step 800.000 kHz Mar
45.0 <u></u> 55.0 <u></u>													Freq Offse 0 H;
-65.0													Scale Type
	.910000 / 120 kH			#	VBW	430 kHz			Sweep	Span 8 13.33 ms (	.000 MHz (1001 pts)	Log	Lin
ISG									STATU				

Plot 7-86. Upper Band Edge Plot (LTE Band 2 - 10MHz QPSK – Full RB)



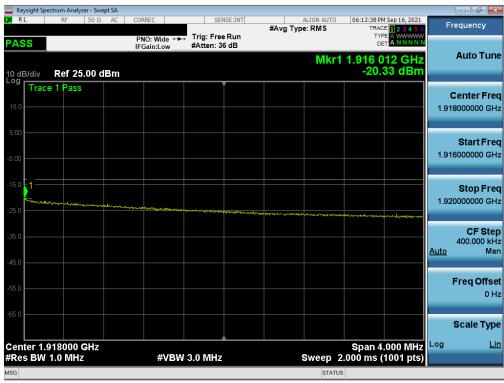
Plot 7-87. Extended Upper Band Edge Plot (LTE Band 2 - 10MHz QPSK – Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 66 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 66 01 146
© 2021 PCTEST	·	·		V2.0 3/15/2021



	ectrum Analy:	er - Swept	t SA										
XU RL	RF	50 Ω	AC	CORREC		SEI	ISE:INT	#Avg Typ	ALIGN AUTO		M Sep 15, 2021	F	requency
PASS				PNO: W IFGain:L	ide ↔ .ow	Trig: Free #Atten: 3		#/18/JP		TY			
10 dB/div	Ref 25	.00 dE	3m						Mkr	1.915 0 -27.	16 GHz 35 dBm		Auto Tune
Log Trac	e 1 Pass												Center Freq 5000000 GHz
5.00	4.97.47907496.479264cf	140-33-974-344 140-33-974-34	<i>৻</i>	~~{}~~~{}~~~{}~~~~~~~~~~~~~~~~~~~~~~~~	en Mandra	~						1.91	Start Freq 1000000 GHz
-15.0							1					1.91	Stop Freq 9000000 GHz
-25.0						and a	in margine and	And Alfred Lamon And Jone	anin day agent	har and the state of the state	the state of the s	<u>Auto</u>	CF Step 800.000 kHz Man
-45.0													Freq Offset 0 Hz
-65.0													Scale Type
Center 1. #Res BW				;	¢VB₩	430 kHz			Sweep	Span 8 13.33 m <u>s (</u>	.000 MHz 1001 pts)	Log	<u>Lin</u>
MSG									STATU				

Plot 7-88. Upper Band Edge Plot (LTE Band 25 - 10MHz QPSK - Full RB)



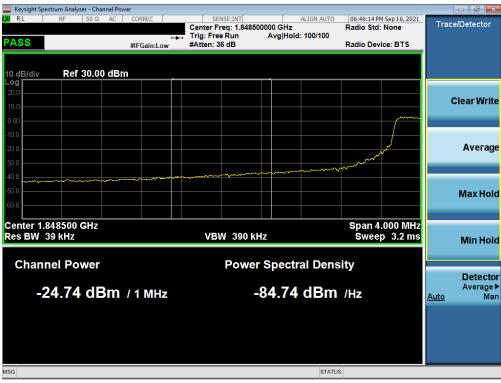
Plot 7-89. Extended Upper Band Edge Plot (LTE Band 25 - 10MHz QPSK – Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 67 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 07 01 140
© 2021 PCTEST	•			V2.0 3/15/2021



	ectrum Analyze	er - Swept SA								
L <mark>XI</mark> RL	RF	50 Ω AC	CORREC	SEN	ISE:INT		ALIGN AUTO	03:28:53 PM Sep 15, 2021	Er	equency
PASS			PNO: Wide ↔ IFGain:Low	. Trig: Free #Atten: 36		#Avg Ty	be:RMS	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN		
10 dB/div	Ref 25.	00 dBm					Mkr1	1.849 992 GHz -25.17 dBm		Auto Tune
Log Trac	e 1 Pass									Center Freq 0000000 GHz
-5.00							botherson who they are shown	derlenderlene often ernen son ander	1.84	Start Freq 8000000 GHz
-15.0					1,000				1.85	Stop Freq 2000000 GHz
-35.0	ware for the second	wy <del>wy y taol</del> ife twaad	man and a start of the second start of the sec	and an and the second					<u>Auto</u>	CF Step 400.000 kHz Man
-45.0										Freq Offset 0 Hz
-65.0										Scale Type
Center 1. #Res BW		Hz	#VBW	220 kHz			Sweep 6	Span 4.000 MHz 6.667 ms (1001 pts)	Log	<u>Lin</u>
MSG							STATU	5		

Plot 7-90. Lower Band Edge Plot (LTE Band 25/2 - 5MHz QPSK - Full RB)



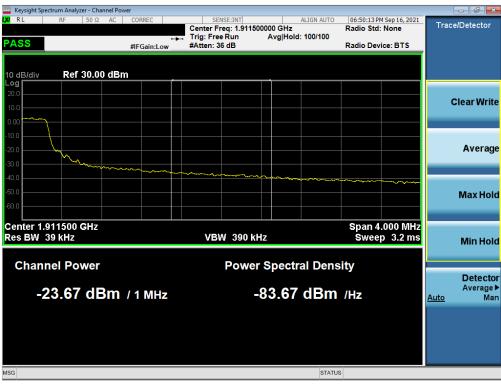
Plot 7-91. Extended Lower Band Edge Plot (LTE Band 25/2 - 5MHz QPSK – Full RB)

FCC ID: A3LSMS908U	POINTEST Proud to be part of @ element	PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 68 of 146	
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 68 of 146	
© 2021 PCTEST	·			V2.0 3/15/2021	



	ectrum Analy:	zer - Swep	ot SA										
X/RL	RF	<u>50 Ω</u>	AC	CORREC			ISE:INT	#Avg Ty	ALIGN AUTO pe: RMS	TRA	M Sep 15, 2021 CE <b>1 2 3 4 5</b> 6	F	requency
PASS				PNO: W IFGain:L	ide ↔ ow	Trig: Free #Atten: 30				TY D			
10 dB/div	Ref 25	.00 di	Bm						Mkr	1 1.910 ( -25.	004 GHz 58 dBm		Auto Tune
Log Trac	e 1 Pass												Center Freq 0000000 GHz
-5.00	mann			u	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~						1.90	Start Fred 8000000 GHz
-15.0						- L	1					1.91	Stop Fred 2000000 GHz
-35.0							L for the second second	han an a	North Markenson	n and the second	hor when the	<u>Auto</u>	CF Step 400.000 kHz Mar
45.0 55.0													Freq Offse 0 Ha
-65.0													Scale Type
Center 1.9 #Res BW		GHz		;	VBW	220 kHz			Sweep	Span 4 6.667 ms	.000 MHz (1001 pts)	Log	<u>Lin</u>
MSG									STAT				

Plot 7-92. Upper Band Edge Plot (LTE Band 2 - 5MHz QPSK - Full RB)



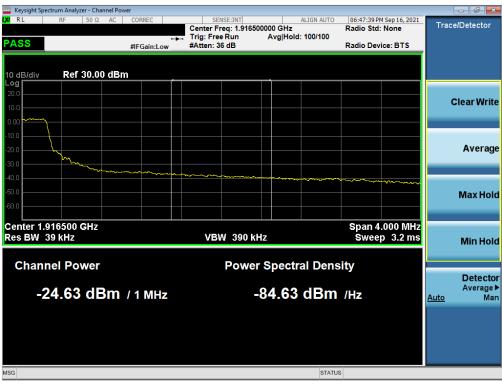
Plot 7-93. Extended Upper Band Edge Plot (LTE Band 2 - 5MHz QPSK – Full RB)

FCC ID: A3LSMS908U	PCTEST Poud to be part of @element	PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 60 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Page 69 of 146	
© 2021 PCTEST	-			V2.0 3/15/2021



	ectrum Analy:	zer - Swej	pt SA										
XI RL	RF	50 Ω	AC	CORREC			NSE:INT	#Avg Ty	ALIGN AUTO	TRA	OM Sep 15, 2021	F	requency
PASS				PNO: W IFGain:	/ide ↔ Low	Trig: Fre #Atten: 3				T) [			
10 dB/div	Ref 25	.00 d	Bm						Mkr	1 1.915 -26	008 GHz .13 dBm		Auto Tune
-og Trac	e 1 Pass												Center Freq
5.00												1.9	13000000 GH2
5.00	adatal frank and	kust-ta	\n#^*****/^~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m						1.91	Start Freq
15.0						h.	1					1.91	Stop Fred 7000000 GHz
25.0						ų	Mark Marken	We work and					CF Ster
35.0									9 (AN X- 44	and a start of the	Marine Contraction Contraction	<u>Auto</u>	400.000 kHz Mar
45.0													Freq Offse
55.0													0 Hz
65.0													Scale Type
Center 1.9		GHz			(D) (D) (d)	220 611					4.000 MHz	Log	Lin
#Res BW	OZ KHZ				₩VBW	220 kHz			Sweep		(1001 pts)		

Plot 7-94. Upper Band Edge Plot (LTE Band 25 - 5MHz QPSK - Full RB)



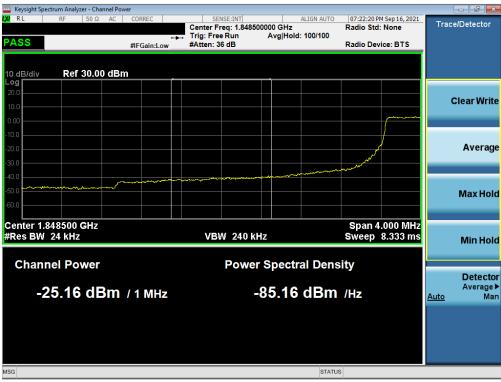
Plot 7-95. Extended Upper Band Edge Plot (LTE Band 25 - 5MHz QPSK – Full RB)

FCC ID: A3LSMS908U	PCTEST Proud to be per of @ element	PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 70 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Page 70 of 146	
© 2021 PCTEST	•			V2.0 3/15/2021



	ectrum Analyz		SA											
XI RL	RF	50 Ω	AC C	ORREC		SE	NSE:INT	# <b>A</b> .v/	ALIGN A			M Sep 16, 2021	F	requency
PASS				PNO: Wi FGain:L	de ↔ ow	Trig: Fre #Atten: 3		#AV	g Type. King	,	TY			
I0 dB/div	Ref 25	.00 dB	m						М	<b>kr1</b> 1	1.849 9 -24.	96 GHz 21 dBm		Auto Tune
15.0	e 1 Pass													Center Free 50000000 GH:
5.00								~~~~		~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		1.84	<b>Start Fre</b> 18000000 GH
25.0						(	1						1.8	<b>Stop Fre</b> 52000000 GH
45.0	~~~~			~~~~	~~~								<u>Auto</u>	CF Ste 400.000 kH Ma
55.0														FreqOffse 0 ⊦
65.0														Scale Typ
Center 1.3 #Res BW		GHz		#	VBW	120 kHz			Swee	p 2.0	Span 4 100 ms (	.000 MHz (1001 pts)	Log	<u>Lir</u>
ISG										TATUS				

Plot 7-96. Lower Band Edge Plot (LTE Band 25/2 - 3MHz QPSK - Full RB)



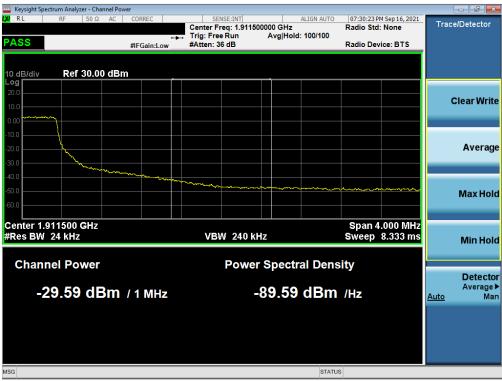
Plot 7-97. Extended Lower Band Edge Plot (LTE Band 25/2 - 3MHz QPSK – Full RB)

FCC ID: A3LSMS908U	PCTEST Poud to be part of @element	PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 71 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Page 71 of 146	
© 2021 PCTEST	-	•		V2.0 3/15/2021



	ectrum Analy	er - Swept S	A										
X/RL	RF	50Ω A	IC CO	RREC		SE	NSE:INT	#Avg Ty	ALIGN AUTO		M Sep 15, 2021	F	requency
PASS				NO: Wi Gain:L	de ⊶⊶ ow_	Trig: Fre #Atten: 3		• •		TY D			
10 dB/div	Ref 25	.00 dBr	n						Mkr1	1.910 ( -24.	016 GHz 45 dBm		Auto Tune
Log Trac	e 1 Pass												Center Freq 0000000 GHz
-5.00	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	w	an a	~~~~~	MU	~~~~~						1.90	Start Freq 8000000 GHz
-15.0						4	1					1.91	Stop Freq 2000000 GHz
35.0							Mr. Car	www.www.	Myher and a failed	n		<u>Auto</u>	CF Step 400.000 kHz Mar
45.0 <u></u> 55.0 <u></u>													Freq Offse 0 Hi
65.0													Scale Type
Center 1. #Res BW		GHz		<u>±</u>	VRW	120 kHz			Sween_f	Span 4	.000 MHz (1001 pts)	Log	Lin
ISG	00 MH2			"	4 E) ¥ 4	129 MH2	<u> </u>		STATU		(roor pla)		

Plot 7-98. Upper Band Edge Plot (LTE Band 2 - 3MHz QPSK - Full RB)



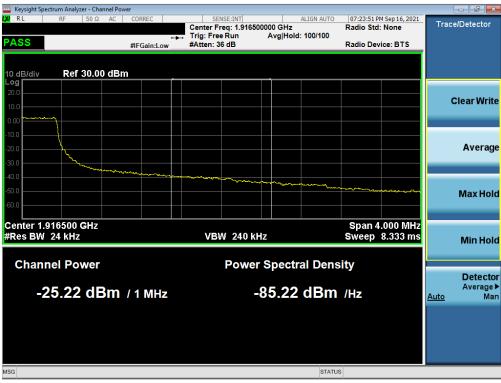
Plot 7-99. Extended Upper Band Edge Plot (LTE Band 2 - 3MHz QPSK – Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 72 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Page 72 of 146	
© 2021 PCTEST	·			V2.0 3/15/2021



	ectrum Analy	zer - Swept	SA										
X/RL	RF	50 Ω	AC	CORREC		SEI	ISE:INT	#Avg Ty	ALIGN AUTO pe: RMS	TRAC	M Sep 15, 2021 CE 1 2 3 4 5 6 DE A WWWWW	F	requency
PASS				PNO: W IFGain:L	ide ↔ ow	#Atten: 3			Mkr1	1.915 C	04 GHz		Auto Tune
10 dB/div Log		.00 dB	m							-24.	52 dBm		
15.0	e 1 Pass												Center Frec 5000000 GHz
5.00	Level and the second	~~~~		<u>~~~</u> ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	yr en							1.91	Start Fred 3000000 GH2
25.0							1					1.91	Stop Free 7000000 GH2
35.0							and the second	when when	March at home for the	a martine martine martine	aland, have good and	<u>Auto</u>	CF Step 400.000 kH Mar
45.0 55.0													Freq Offse 0 H
65.0													Scale Type
Center 1.9 #Res BW		GHz			VBW	120 kHz			Sweep 6	Span 4 6.667 ms.	.000 MHz 1001 pts)	Log	Lin
ISG									STATU				_

Plot 7-100. Upper Band Edge Plot (LTE Band 25 - 3MHz QPSK - Full RB)



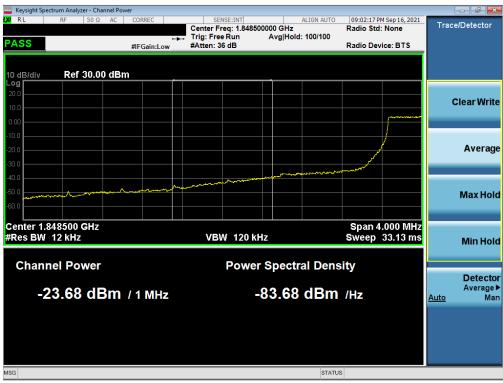
Plot 7-101. Extended Upper Band Edge Plot (LTE Band 25 - 3MHz QPSK – Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 73 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 73 01 140
© 2021 PCTEST	· · ·			V2.0 3/15/2021



	ectrum Analyz	er - Swept S	5A										- 0 ×
XU RL	RF	50 Ω A		DRREC			ISE:INT	#Avg Ty	ALIGN AUTO	TRAC	A Sep 15, 2021	Fi	requency
PASS				PNO: Wi Gain:L	de ↔ ow	Trig: Free #Atten: 3			Miland				Auto Tune
10 dB/div Log	Ref 25	.00 dBi	m						MKL	1.849 9 -25.	96 GHz 60 dBm		
Trac	e 1 Pass					, ,						(	Center Freq
15.0												1.85	0000000 GHz
5.00								<del>~~~~~~</del>	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	}			Start Free
-5.00												1.84	8000000 GHz
-15.0													Stop Free
-25.0							1					1.85	2000000 GH2
					- ^	mark				L.M.	m		CF Step
35.0	~~~~	, men	Martin	<u>-</u> -~~~~	ware i						· · · · · · · · · · · · · · · · · · ·	<u>Auto</u>	400.000 kH Mar
45.0													
-55.0													Freq Offse 0 Ha
65.0													
													Scale Type
Center 1.8 #Res BW		GHz		#	VBW	56 kHz			Sweep 6	Span 4 .667 ms (	.000 MHz 1001 pts)	Log	Lir
MSG									STATUS				

Plot 7-102. Lower Band Edge Plot (LTE Band 25/2 – 1.4MHz QPSK – Full RB)



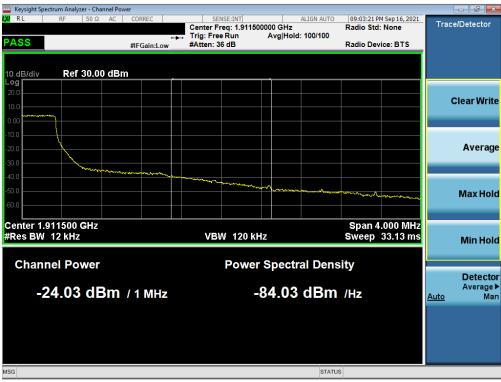
Plot 7-103. Extended Lower Band Edge Plot (LTE Band 25/2 – 1.4MHz QPSK – Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 74 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 74 of 146
© 2021 PCTEST	·	·		V2.0 3/15/2021



	ectrum Analyz	er - Swept	SA										
XIRL	RF	50 Ω	AC (	CORREC		SE	NSE:INT	#Avg Ty	ALIGN AUTO		M Sep 15, 2021	Fi	equency
PASS				PNO: Wi IFGain:Le		Trig: Fre #Atten: 3		#Avg iy	pe: RIVIS	TY	CE 1 2 3 4 5 6 PE A WWWWW ET A N N N N N		
10 dB/div	Ref 25	.00 dB	m						Mkr1	1.910 ( -26.	04 GHz 28 dBm		Auto Tune
Log Trac	e 1 Pass												Center Freq 0000000 GHz
-5.00			Janga_A-		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~							1.90	Start Fred 8000000 GH2
-15.0							1					1.91	Stop Free 2000000 GH2
-35.0	man						Mar Market	hon an	Aur	Maria		<u>Auto</u>	CF Step 400.000 kHz Mar
55.0													Freq Offse 0 H
-65.0													Scale Type
Center 1.9 #Res BW		GHz		#	VBW	56 kHz			Sweep (	Span 4 6.667 ms (	.000 MHz (1001 pts)	Log	Lin
MSG									STATU	S			

Plot 7-104. Upper Band Edge Plot (LTE Band 2 – 1.4MHz QPSK – Full RB)



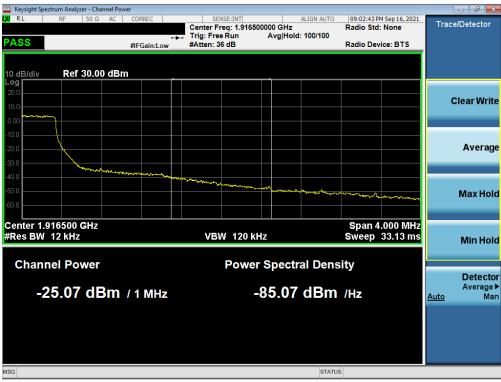
Plot 7-105. Extended Upper Band Edge Plot (LTE Band 2 – 1.4MHz QPSK – Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 75 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 75 01 140
© 2021 PCTEST	· · ·			V2.0 3/15/2021



	ctrum Analyz	er - Swep	ot SA										
X/RL	RF	50 Ω	AC	CORREC		SEI	ISE:INT	#Avg Typ	ALIGN AUTO		M Sep 15, 2021	Fi	requency
PASS				PNO: W IFGain:L	ide ↔ .ow	Trig: Free #Atten: 3		#Avg / yi		TYF DE			
10 dB/div Log	Ref 25	.00 dl	Bm						Mkr1	1.915 0 -25.	04 GHz 74 dBm		Auto Tune
15.0 Trace	e 1 Pass												Center Freq 5000000 GHz
-5.00			~	<u>~_~~~~</u>	~~~~							1.91	Start Freq 3000000 GHz
-15.0							1					1.91	Stop Freq 7000000 GHz
-35.0	www						how	v	my my	m		<u>Auto</u>	CF Step 400.000 kHz Man
-45.0													Freq Offset 0 Hz
-65.0													Scale Type
Center 1.9 #Res BW		GHz		;	¢VBW	56 kHz			Sweep (	Span 4 5.667 ms (	.000 MHz 1001 pts)	Log	Lin
ISG									STATU	S			

Plot 7-106. Upper Band Edge Plot (LTE Band 25 – 1.4MHz QPSK – Full RB)



Plot 7-107. Extended Upper Band Edge Plot (LTE Band 25 – 1.4MHz QPSK – Full RB)

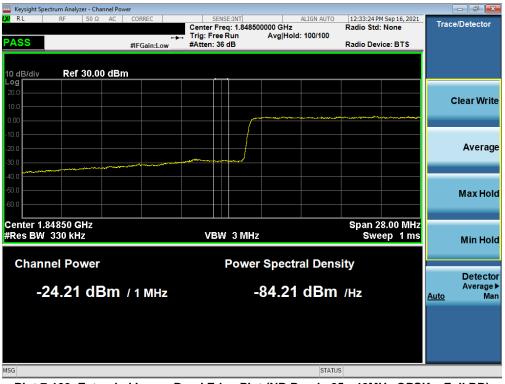
FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 76 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage / 0 01 140
© 2021 PCTEST	·	•		V2.0 3/15/2021



## NR Band n25/2



Plot 7-108. Lower Band Edge Plot (NR Band n25 - 40MHz QPSK - Full RB)



Plot 7-109. Extended Lower Band Edge Plot (NR Band n25 - 40MHz QPSK – Full RB)

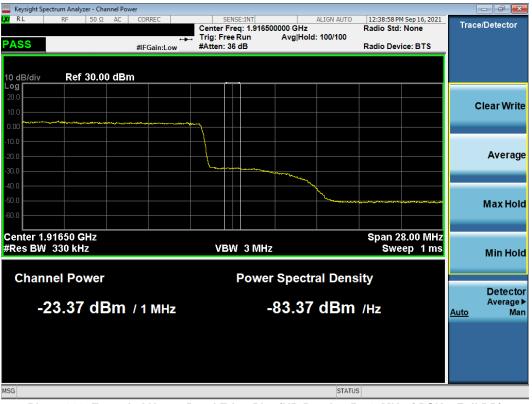
FCC ID: A3LSMS908U	Poul to be part of @ element	PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 77 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage // 01 140
© 2021 PCTEST	•	•		V2.0 3/15/2021

© 2021 PCTEST





Plot 7-110. Upper Band Edge Plot (NR Band n25 - 40MHz QPSK - Full RB)



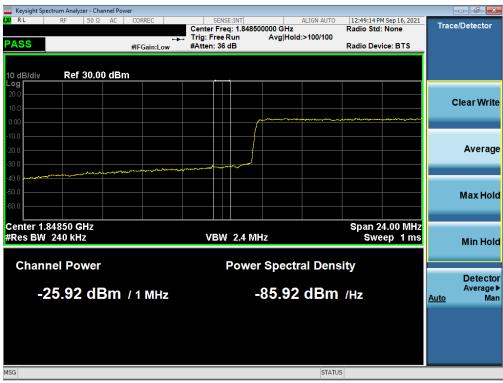
## Plot 7-111. Extended Upper Band Edge Plot (NR Band n25 - 40MHz QPSK - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 79 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Page 78 of 146
© 2021 PCTEST	•			V2.0 3/15/2021



	ectrum Analyze	r - Swept SA									
XI RL	RF	50 Ω AC	CORREC	SEN	NSE:INT	#Avg Type	LIGN AUTO	12:48:51 PM TRACE	Sep 16, 2021	Fre	equency
PASS			PNO: Wide ↔ IFGain:Low	Trig: Free #Atten: 3				TYP! DE			
10 dB/div	Ref 25.	00 dBm					Mkr1	1.849 9 -26.8	28 GHz 88 dBm		Auto Tune
Log Trac	e 1 Pass										enter Frec 0000000 GHz
5.00						~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	and and an	₽₩	مىلىكى مەرىكىكى مەرىكىكى مەرىكىكى مەرىكىكى مەرىكىكى مەرىكىكى مەرىكىكى مەرىكىكى مەرىكىكىكى مەرىكىكىكى مەرىكىكىكى مەرىكىكى مەرىكىكىكىكىكىكىكىكىكىكىكىكىكىكىكىكىكىكىك	1.838	Start Fred
-15.0					1					1.862	Stop Fred
35.0 	honor	man and a second	when an and the for	and the second second						2. <u>Auto</u>	CF Stej 400000 MH Mai
55.0										F	Freq Offse 0 H
65.0											Scale Type
Center 1.3 #Res BW		Z	#VBW	1.2 MHz		5	Sweep_1	24 Span 24 Span. 24 Span.		Log	Lin
ISG							STATUS				

Plot 7-112. Lower Band Edge Plot (NR Band n25 - 30MHz QPSK - Full RB)



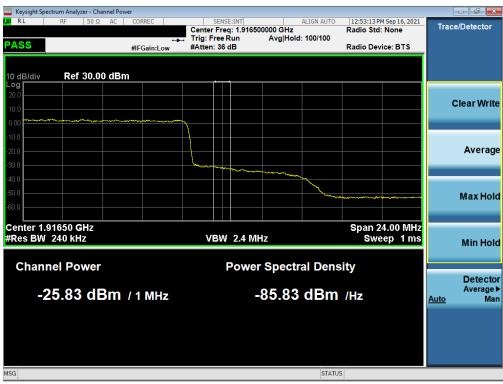
Plot 7-113. Extended Lower Band Edge Plot (NR Band n25 - 30MHz QPSK - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 79 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset		Fage 79 01 140
© 2021 PCTEST	•	·		V2.0 3/15/2021



	ectrum Analyz	er - Swept SA							
L <mark>XI</mark> RL	RF	50 Ω AC	CORREC	SEN	ISE:INT		ALIGN AUTO	12:52:41 PM Sep 16, 2021	Frequency
PASS			PNO: Wide ↔ IFGain:Low	Trig: Free #Atten: 3		#Avg Typ	e:RMS	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNN	
10 dB/div	Ref 25	.00 dBm					Mkr1	1.915 120 GHz -27.35 dBm	Auto Tune
Log Trac	e 1 Pass								Center Freq 1.915000000 GHz
-5.00	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	an a	<u> </u>						Start Freq 1.903000000 GHz
-15.0					1				Stop Freq 1.927000000 GHz
-35.0					and and a second	Josha Markan	A Server States Orker		CFStep 2.400000 MHz <u>Auto</u> Man
-45.0									Freq Offset 0 Hz
-65.0									Scale Type
Center 1. #Res BW			#VBV	V 1.2 MHz			Sweep 1	Span 24.00 MHz I.000 ms (1001 pts)	Log <u>Lin</u>
MSG							STATU	S	

Plot 7-114. Upper Band Edge Plot (NR Band n25 - 30MHz QPSK - Full RB)



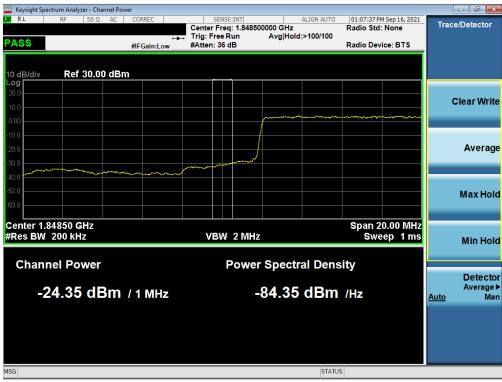
Plot 7-115. Extended Upper Band Edge Plot (NR Band n25 - 30MHz QPSK – Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 90 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Page 80 of 146	
© 2021 PCTEST	· · · · ·			V2.0 3/15/2021



Keysight Spectrum Analyzer - Swept SA					
XIRL RF 50Ω AC		SENSE:INT	ALIGN AUTO #Avg Type: RMS	01:07:29 PM Sep 16, 2021 TRACE 1 2 3 4 5 6 TYPE A WWWWW	Frequency
PASS 10 dB/div Ref 25.00 dBm	IFGain:Low #	#Atten: 36 dB	Mkr	1 1.849 98 GHz -25.83 dBm	Auto Tune
15.0 Trace 1 Pass					Center Freq 1.850000000 GHz
5.00					Start Fred 1.840000000 GH2
25.0		1			Stop Fred 1.860000000 GH
35.0	and the second s				CF Stej 2.000000 MH <u>Auto</u> Ma
55.0					Freq Offse 0 H
65.0 Center 1.85000 GHz				00uii 20.00 mii 12	Scale Type Log <u>Lir</u>
#Res BW 300 kHz	#VBW 1.	.0 MHz	Sweep 1	.000 ms (1001 pts)	

Plot 7-116. Lower Band Edge Plot (NR Band n25 - 25MHz QPSK - Full RB)



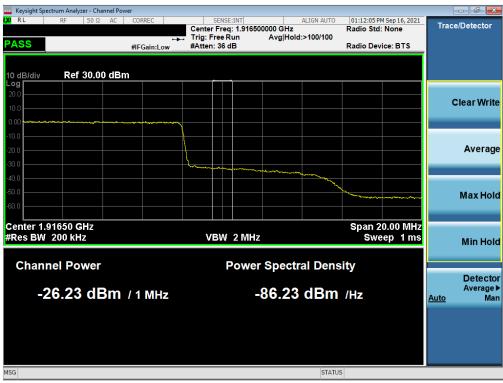
Plot 7-117. Extended Lower Band Edge Plot (NR Band n25 - 25MHz QPSK – Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 81 of 146	
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	l/2021 - 11/16/2021 Portable Handset			
© 2021 PCTEST	· · ·			V2.0 3/15/2021	





Plot 7-118. Upper Band Edge Plot (NR Band n25 - 25MHz QPSK - Full RB)



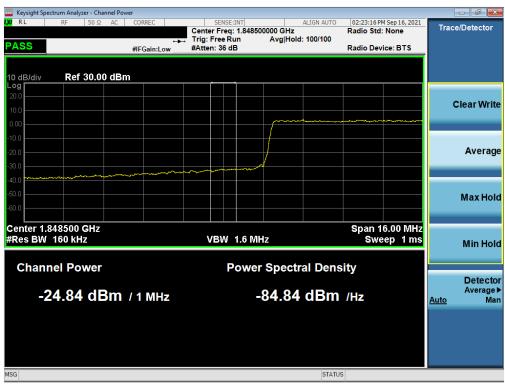
Plot 7-119. Extended Upper Band Edge Plot (NR Band n25 - 25MHz QPSK – Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 92 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Page 82 of 146	
© 2021 PCTEST	·			V2.0 3/15/2021



	ectrum Analyze	r - Swept SA									
LXI RL	RF	50 Ω AC	CORREC	SE	NSE:INT	#Avg Typ	ALIGN AUTO	02:23:11 PM	Sep 16, 2021	Fre	equency
PASS			PNO: Wide IFGain:Low	HAtten: 3		#Avg iyp	e. KWS	TYPE DET	A WWWWW A NNNNN		
10 dB/div	Ref 25.0	00 dBm					Mkr1	1.849 9 -27.9	68 GHz 94 dBm		Auto Tune
Log Trac	e 1 Pass										enter Freq 000000 GHz
-5.00						~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	an a	hard and a stand and a stand	an a	1.842	Start Freq 000000 GHz
-15.0					1					1.858	Stop Freq 000000 GHz
-35.0	and and and a second	m	~~~~~~	- Anno and a second						1. <u>Auto</u>	CF Step 600000 MHz Man
-45.0										F	req Offset 0 Hz
-65.0										ę	Scale Type
Center 1.3 #Res BW		Hz	#VI	3W 820 kHz			Sweep 1	Span 16 .000 ms (1	.00 MHz 001 pts)	Log	<u>Lin</u>
MSG							STATUS	;			

Plot 7-120. Lower Band Edge Plot (NR Band n25/2 - 20MHz QPSK - Full RB)



Plot 7-121. Extended Lower Band Edge Plot (NR Band n25/2 - 20MHz QPSK - Full RB)

FCC ID: A3LSMS908U	PCTEST' Froud to be part of @ element	PART 24 MEASUREMENT REPORT	AMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 92 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Page 83 of 146	
© 2021 PCTEST	•			V2.0 3/15/2021



	ectrum Analy		: SA										
RL	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Ty	ALIGN AUTO		M Sep 26, 2021	Frequency	<b>,</b>
ASS				PNO: W IFGain:L	ide ↔ .ow	Trig: Fre #Atten: 3		• • •		T			
) dB/div	Ref 25	.00 dE	3m						Mkr1	1.910 -27.3	000 GHz 311 dBm	Auto T	un
<sup>rg</sup> Trac	e 1 Pass											Center F	Fre
5.0												1.910000000	
.00	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	wyw lyww	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	مسمحم		www.						Start F	Era
.00												1.902000000	
5.0													
5.0							<b>1</b>					<b>Stop F</b> 1.918000000	
3.U						```	Mun .					CFS	2t
5.0								and a subscription of the	war work for	hann	And Topped Contraction	1.600000	
5.0													
5.0												Freq Of	ffs 0
5.0													
												Scale T	
	910000 240 kHz			#	VBW	820 kHz			Sweep 1	Span .000 ms	16.00 MHz (1001 pts)	Log	Ī
3									STATUS				-

Plot 7-122. Upper Band Edge Plot (NR Band n2 - 20MHz QPSK - Full RB)



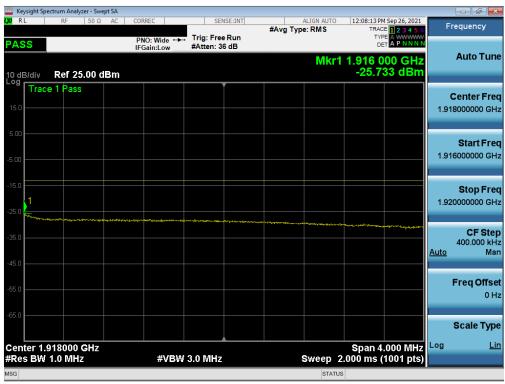
Plot 7-123. Extended Upper Band Edge Plot (NR Band n2 - 20MHz QPSK - Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 94 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Page 84 of 146	
© 2021 PCTEST				V2.0 3/15/2021



	pectrum Analyze	er - Swept SA								
RL	RF	50 Ω AC	CORREC		SENSE:INT	#Avg Typ	ALIGN AUTO	12:07:34 PM S	ep 26, 2021	Frequency
PASS			PNO: Wide IFGain:Lov		Free Run n: 36 dB	#///8/JP		TYPE	A WWWWW A P N N N N	
0 dB/div	Ref 25.	00 dBm					Mkr1	1.915 06	4 GHz 4 dBm	Auto Tune
.og Tra	ce 1 Pass				Ĭ					Center Free
15.0										1.915000000 GH
5.00 <del>""""^</del>	᠁ᠰ᠕ᠰᠺ᠕ᠰ	www.ww	to the the two and the	mann						Start Fre
5.00										1.907000000 GH
15.0										Stop Fre
25.0					1					1.923000000 GH
35.0					Whenter	Marria				CF Step
45.0							- Marine Carl	and when the second	my	1.600000 MH <u>Auto</u> Ma
45.0									مىر <sub>ال</sub> ىر	Freq Offse
55.0										он
65.0										Scale Type
	.915000 0	Hz						Span 16.	00 MHz	
Res BV	240 kHz		#V	BW 820 k	Hz		Sweep 1	.000 ms (10	001 pts)	
SG							STATUS			

Plot 7-124. Upper Band Edge Plot (NR Band n25 - 20MHz QPSK - Full RB)



Plot 7-125. Extended Upper Band Edge Plot (NR Band n25 - 20MHz QPSK – Full RB)

FCC ID: A3LSMS908U		PART 24 MEASUREMENT REPORT	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 95 of 146
1M2109090102-03-R1.A3L	9/14/2021 - 11/16/2021	Portable Handset	Page 85 of 146	
© 2021 PCTEST	•			V2.0 3/15/2021