

PCTEST

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



MEASUREMENT REPORT FCC PART 15.247 WLAN OFDMA

Applicant Name:

Samsung Electronics Co., Ltd. 129, Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, 16677, Korea Date of Testing: 03/26 – 05/28/2021 Test Site/Location: PCTEST Lab. Columbia, MD USA Test Report Serial No.: 1M2104190044-12.A3L

FCC ID:

A3LSMF926B

APPLICANT:

Samsung Electronics Co., Ltd.

Application Type: Model: Additional Model(s): EUT Type: Frequency Range: Modulation Type: FCC Classification: FCC Rule Part(s): Test Procedure(s):

Certification SM-F926B SM-F926B/DS Portable Handset 2412 – 2472MHz CCK/DSSS/OFDMA Digital Transmission System (DTS) Part 15 Subpart C (15.247) ANSI C63.10-2013, KDB 558074 D01 v05r02, KDB 662911 D01 v02r01, 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 ANSI C63.10-2013 and KDB 558074 D01 v05r02. Test results reported herein relate only to the item(s) tested.

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

Randy Ortanez President



FCC ID: A3LSMF926B	PCTEST Next bite part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 1 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 1 of 75
© 2021 PCTEST	•			V 9.0 02/01/2019

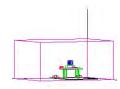


TABLE OF CONTENTS

1.0	INTR	ODUCTION	4
	1.1	Scope	4
	1.2	PCTEST Test Location	4
	1.3	Test Facility / Accreditations	4
2.0	PRO	DUCT INFORMATION	5
	2.1	Equipment Description	5
	2.2	Device Capabilities	5
	2.3	Test Configuration	6
	2.4	Antenna Description	6
	2.5	Software and Firmware	6
	2.6	EMI Suppression Device(s)/Modifications	6
3.0	DES	CRIPTION OF TESTS	7
	3.1	Evaluation Procedure	7
	3.2	Radiated Emissions	7
	3.3	Environmental Conditions	7
4.0	ANTE	ENNA REQUIREMENTS	8
5.0	MEA	SUREMENT UNCERTAINTY	9
6.0	TEST	EQUIPMENT CALIBRATION DATA	10
7.0	TEST	RESULTS	11
	7.1	Summary	11
	7.2	6dB Bandwidth Measurement	12
	7.3	Output Power Measurement	21
	7.4	Power Spectral Density	25
	7.5	Conducted Emissions at the Band Edge	34
	7.6	Conducted Spurious Emissions	43
	7.7	Radiated Spurious Emission Measurements – Above 1 GHz	57
		7.7.1 MIMO Radiated Spurious Emission Measurements	60
		MIMO Radiated Restricted Band Edge Measurements	70
8.0	CON	CLUSION	75

FCC ID: A3LSMF926B	PCTEST Proced to be part of G	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 2 of 75	
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 2 of 75	
© 2021 PCTEST	•			V 9.0 02/01/2019	





MEASUREMENT REPORT



		MIMO				
			Avg Co	nducted	Peak Co	onducted
Mode	Tones	Tx Frequency [MHz]	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)
802.11ax OFDMA	26T	2412 - 2472	49.317	16.93	682.339	28.34
802.11ax OFDMA	52T	2412 - 2472	79.068	18.98	931.108	29.69
802.11ax OFDMA	106T	2412 - 2472	85.704	19.33	837.529	29.23
802.11ax OFDMA	242T	2412 - 2472	119.950	20.79	706.318	28.49

EUT Overview

FCC ID: A3LSMF926B	PCTEST Rout bie part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 2 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 3 of 75
© 2021 PCTEST				V 9.0 02/01/2019



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 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: A3LSMF926B	PCTEST Proud to be part of &	MEASUREMENT REPORT (CERTIFICATION)	<u>(</u>	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 4 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 4 of 75
© 2021 PCTEST	•			V 9.0 02/01/2019



2.0 **PRODUCT INFORMATION**

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMF926B**. The test data contained in this report pertains only to the emissions due to the EUT's WLAN (DTS) transmitter.

Test Device Serial No.: 1578M, 1580M, 2007M, 2038M, 1571M, 2004M, 2024M, 2044M

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, Multi-band 5G NR (n5, n66), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII (5GHz and 6GHz), Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer, UWB

Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432	12	2467
6	2437	13	2472
7	2442		

Table 2-1. Frequency/ Channel Operations

Note: The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = peak per the guidance of Section 6.0 b) of ANSI C63.10-2013 and KDB 558074 D01 v05r02. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

Mode	Antenna	Tone	Duty Cycle
802.11ax DTS RU	МІМО	26T	99.2
		52T	99.2
		106T	99.2
		242T	99.2

Table 2-2. Measured Duty Cycles

FCC ID: A3LSMF926B	Rout ble part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 5 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 5 of 75
© 2021 PCTEST	•	·		V 9.0 02/01/2019



The device employs MIMO technology. Below are the possible configurations.

WiFi Configurations		SISO SDM		M CDD		D	
WIFI COIII	igurations	ANT1	ANT2	ANT1	ANT2	ANT1	ANT2
2.4GHz	11ax	×	×	✓	\checkmark	\checkmark	\checkmark

Table 2-3. Frequency / Channel Operations

 \checkmark = Support ; ***** = NOT Support SISO = Single Input Single Output SDM = Spatial Diversity Multiplexing – MIMO function CDD = Cyclic Delay Diversity - 2Tx Function

2.3 Test Configuration

The EUT was tested per the guidance of KDB 558074 D01 v05r02. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing. See Sections 3.2 for radiated emissions test setups, and 7.2, 7.3, 7.4, 7.5, and 7.6 for antenna port conducted emissions test setups.

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-NG930 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 Antenna Description

Following antenna was used for the testing.

Frequency [GHz]	Antenna 1 Gain [dBi]	Antenna 2 Gain [dBi]			
2.4	-1.54	-5.43			
Table 0.4. Antenna Deals Opin					

Table 2-4. Antenna Peak Gain

2.5 Software and Firmware

The test was conducted with firmware version F926USQU0AUCE installed on the EUT.

2.6 EMI Suppression Device(s)/Modifications

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

FCC ID: A3LSMF926B	PCTEST Proud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dama () af 75	
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 6 of 75	
© 2021 PCTEST				V 9.0 02/01/2019	



3.0 **DESCRIPTION OF TESTS**

3.1 Evaluation Procedure

The measurement procedures described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) and the guidance provided in KDB 558074 D01 v05r02 were used in the measurement of the EUT.

Deviation from measurement procedure.....None

3.2 Radiated 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. An 80cm tall test table made of Styrodur is placed on top of the turn table. For measurements above 1GHz, an additional Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33 depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions.

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 474788 D01.

3.3 Environmental Conditions

The temperature is controlled within range of 15°C to 35°C. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).

FCC ID: A3LSMF926B	Rout to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 7 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 7 of 75
© 2021 PCTEST				V 9.0 02/01/2019



4.0 ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

- The antennas of the EUT are permanently attached.
- There are no provisions for connections to an external antenna.

Conclusion:

The EUT unit complies with the requirement of §15.203.

FCC ID: A3LSMF926B	PCTEST Pout bie part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 9 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 8 of 75
© 2021 PCTEST	•			V 9.0 02/01/2019



5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013. 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
Line Conducted Disturbance	3.09
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)	6	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 9 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 9 01 75
© 2021 PCTEST				V 9.0 02/01/2019



6.0 **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
-	WL25-1	Conducted Cable Set (25GHz)	2/23/2021	Annual	2/23/2022	WL25-1
-	WL40-1	WLAN Cable Set (40GHz)	2/23/2021	Annual	2/23/2022	WL40-1
Agilent	N5183A	MXG Analog Signal Generator	1/21/2021	Annual	1/21/2022	MY50141900
Anritsu	ML2495A	Power Meter	1/18/2021	Annual	1/18/2022	941001
Anritsu	MA2411B	Pulse Power Sensor	2/5/2021	Annual	2/5/2022	846215
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2019	Biennial	10/10/2021	121034
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Emco	3116	Horn Antenna (18 - 40GHz)	8/7/2018	Triennial	8/7/2021	9203-2178
ETS-Lindgren	3816/2NM	LISN	7/9/2020	Biennial	7/9/2022	114451
Keysight Technologies	N9020A	MXA Signal Analyzer	8/14/2020	Annual	8/14/2021	US46470561
Keysight Technologies	N9038A	MXE EMI Receiver	8/11/2020	Annual	8/11/2021	MY51210133
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	8/17/2020	Annual	8/17/2021	MY52350166
Keysight Technologies	N9020A	MXA Signal Analyzer	9/22/2020	Annual	9/22/2021	MY54500644
Pasternack	NMLC-2	Line Conducted Emissions Cable (NM)	2/25/2021	Annual	2/25/2022	NMLC-2
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	7/15/2020	Annual	7/15/2021	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/9/2020	Annual	9/9/2021	100348
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	8/10/2020	Annual	8/10/2021	103200
Solar Electronics	8012-50-R-24-BNC	Line Impedance Stabilization Network	10/1/2019	Biennial	10/1/2021	310233
Sunol	DRH-118	Horn Antenna (1-18 GHz)	8/27/2019	Biennial	8/27/2021	A042511
Sunol Science	JB5	Bi-Log Antenna (30M - 5GHz)	7/27/2020	Biennial	7/27/2022	A051107

Table 6-1. Annual Test Equipment Calibration Schedule

Note:

For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

FCC ID: A3LSMF926B	PCTEST Preud to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 10 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 10 of 75
© 2021 PCTEST		•		V 9.0 02/01/2019



7.0 **TEST RESULTS**

7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.		
FCC ID:	A3LSMF926B		
FCC Classification:	Digital Transmission System (DTS)		

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(2)	RSS-247 [5.2]	6dB Bandwidth	> 500kHz		PASS	Section 7.2
15.247(b)(3)	RSS-247 [5.4]	Transmitter Output Power	< 1 Watt		PASS	Sections 7.3
15.247(e)	RSS-247 [5.2]	Transmitter Power Spectral Density	< 8dBm / 3kHz Band	CONDUCTED	PASS	Section 7.4
15.247(d)	RSS-247 [5.5]	Band Edge / Out-of-Band Emissions			PASS	Sections 7.5, 7.6
15.205 15.209	RSS-Gen [8.9]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209 (RSS-Gen [8.9])	RADIATED	PASS	Sections 7.7, 7.8

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 shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer 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 and attenuators.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "WLAN Automation," Version 3.5.
- 5) For radiated band edge, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "Chamber Automation," Version 1.3.1.
- 802.11ax OFDMA testing was performed for all signal tone configurations as specified by the 802.11ax standard. Worst case results are determined and reported per the guidance provided at the October 2018 TCB Workshop.

FCC ID: A3LSMF926B	Rout ble part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 11 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 11 of 75
© 2021 PCTEST		•		V 9.0 02/01/2019



7.2 6dB Bandwidth Measurement §15.247(a.2); RSS-247 [5.2]

Test Overview and Limit

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the transmitter 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 and the worst case configuration results are reported in this section.

The minimum permissible 6dB bandwidth is 500 kHz.

Test Procedure Used

ANSI C63.10-2013 – Section 11.8.2 Option 2 KDB 558074 D01 v05r02 – Section 8.2

Test Settings

- The signal analyzer's automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 100kHz
- 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

Test Setup

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

Energy of the local division of the local di	
TIM	
	EUT

Figure 7-1. Test Instrument & Measurement Setup

FCC ID: A3LSMF926B	Rout ble part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 10 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 12 of 75
© 2021 PCTEST	-			V 9.0 02/01/2019



Test Notes

- 1. Based on preliminary measurements, it was determined that, of all the tone configurations, the 26T configuration produced the worst case 6dB Bandwidth measurement. Only the worst case data is included in this section.
- 2. The 6dB bandwidth for each channel was measured with the RU index showing the highest conducted power.

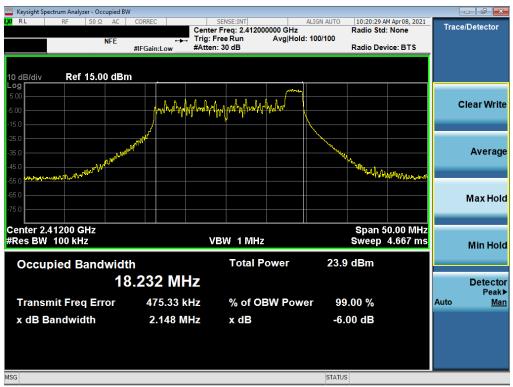
FCC ID: A3LSMF926B	Rout to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 13 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 13 01 75
© 2021 PCTEST				V 9.0 02/01/2019



MIMO 6 dB Bandwidth Measurements

Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Antenna 1 Measured Bandwidth [MHz]	Antenna 2 Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
2412	1	ax	26T	MCS0	2.148	2.131	0.500
2437	6	ax	26T	MCS0	2.152	2.106	0.500
2462	11	ax	26T	MCS0	7.641	2.707	0.500
2412	1	ax	242T	MCS0	18.91	18.85	0.500
2437	6	ax	242T	MCS0	19.00	18.95	0.500
2462	11	ax	242T	MCS0	18.93	18.96	0.500

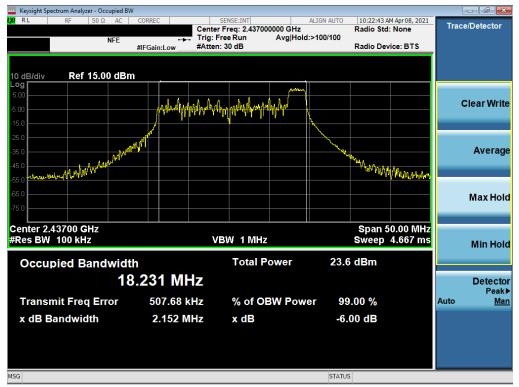
Table 7-2. Conducted Bandwidth Measurements MIMO



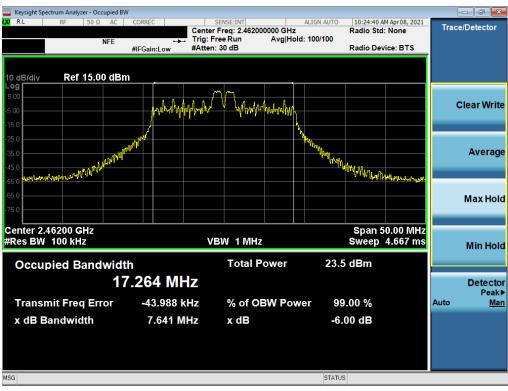
Plot 7-1. 6dB Bandwidth Plot MIMO ANT1 (802.11ax OFDMA - 26 Tones - Ch. 1)

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)	SUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 14 of 75	
1M2104190044-12.A3L 03/26 - 05/28/2021		Portable Handset		Page 14 of 75	
© 2021 PCTEST				V 9.0 02/01/2019	





Plot 7-2. 6dB Bandwidth Plot MIMO ANT1 (802.11ax OFDMA - 26 Tones - Ch. 6)



Plot 7-3. 6dB Bandwidth Plot MIMO ANT1 (802.11ax OFDMA - 26 Tones - Ch. 11)

FCC ID: A3LSMF926B	Rout to be part of Brown	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 15 of 75	
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 15 of 75	
© 2021 PCTEST				V 9.0 02/01/2019	





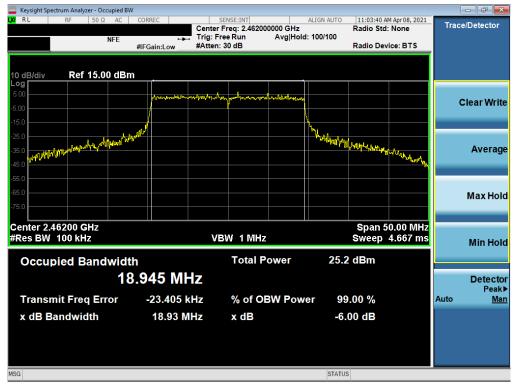
Plot 7-4. 6dB Bandwidth Plot MIMO ANT1 (802.11ax OFDMA - 242 Tones - Ch. 1)



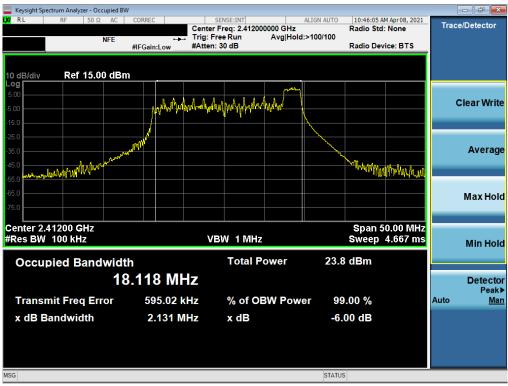
Plot 7-5. 6dB Bandwidth Plot MIMO ANT1 (802.11ax OFDMA - 242 Tones - Ch. 6)

FCC ID: A3LSMF926B	PCTEST Preud to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 40 at 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 16 of 75
© 2021 PCTEST				V 9.0 02/01/2019





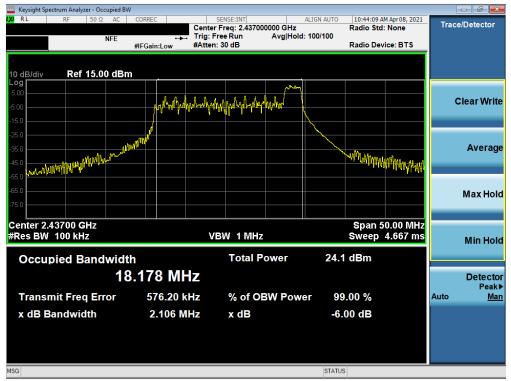
Plot 7-6. 6dB Bandwidth Plot MIMO ANT1 (802.11ax OFDMA - 242 Tones - Ch. 11)



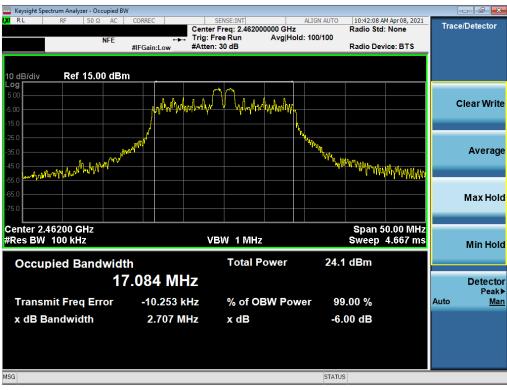
Plot 7-7. 6dB Bandwidth Plot MIMO ANT2 (802.11ax OFDMA – 26 Tones – Ch. 1)

FCC ID: A3LSMF926B	Read to be part of &	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 17 of 75	
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 17 of 75	
© 2021 PCTEST	•			V 9.0 02/01/2019	





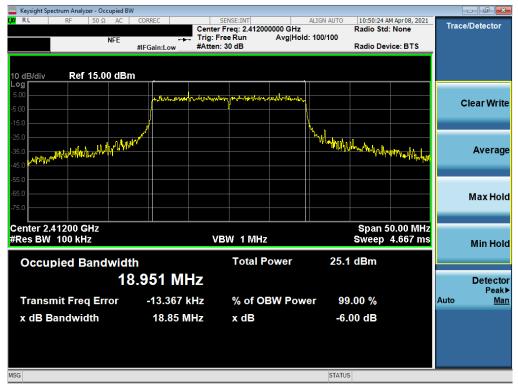
Plot 7-8. 6dB Bandwidth Plot MIMO ANT2 (802.11ax OFDMA – 26 Tones – Ch. 6)



Plot 7-9. 6dB Bandwidth Plot MIMO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 11)

FCC ID: A3LSMF926B	Rout to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 19 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset	Page 18 of 75	
© 2021 PCTEST		•		V 9.0 02/01/2019





Plot 7-10. 6dB Bandwidth Plot MIMO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 1)



Plot 7-11. 6dB Bandwidth Plot MIMO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 6)

FCC ID: A3LSMF926B	Read to be part of &	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Bago 10 of 75	
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 19 of 75	
© 2021 PCTEST	·	•		V 9.0 02/01/2019	



Keysight Spectrum Analyzer - Occupied BW							
KL RF 50Ω AC		SENSE:INT Freq: 2.462000000 GHz	Radio S	0 AM Apr 08, 2021 td: None	Trace/Detector		
NFE		FreeRun Avg Ho I: 30 dB	ld: 100/100 Radio D	evice: BTS			
10 dB/div Ref 15.00 dBm							
5.00	and subscription for the surface of the	wa water brown also also allos					
-5.00			* <u> </u>		Clear Write		
-15.0							
-25.0			With the Mirallie Martin	1			
				WWW WWW	Average		
-45.0				,			
-65.0							
-75.0					Max Hold		
Center 2.46200 GHz #Res BW 100 kHz	v	BW 1 MHz		Span 50.00 MHz Sweep 4.667 ms			
			00.4 18	n			
Occupied Bandwidt		Total Power	26.1 dBm				
18	.963 MHz				Detector Peak		
Transmit Freq Error	-2.190 kHz	% of OBW Pov	wer 99.00 %		Auto <u>Mar</u>		
x dB Bandwidth	18.96 MHz	x dB	-6.00 dB	ľ			
ISG			STATUS				

Plot 7-12. 6dB Bandwidth Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 11)

FCC ID: A3LSMF926B	PCTEST Proced to be part of G	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 75	
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 20 of 75	
© 2021 PCTEST				V 9.0 02/01/2019	



7.3 Output Power Measurement §15.247(b.3); RSS-247 [5.4]

Test Overview and Limits

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter capable of making peak and average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

The maximum permissible conducted output power is 1 Watt.

Test Procedure Used

ANSI C63.10-2013 – Section 11.9.1.3 PKPM1 Peak Power Method KDB 558074 D01 v05r02 – Section 8.3.1.3 PKPM1 Peak-reading Power Meter Method ANSI C63.10-2013 – Section 11.9.2.3.2 Method AVGPM-G KDB 558074 D01 v05r02 – Section 8.3.2.3 Measurement using a Power Meter (PM) ANSI C63.10-2013 – Section 14.2 Measure-and-Sum Technique KDB 662911 D01 v02r01 – Section E)1) Measure-and-Sum Technique

Test Settings

Method PKPM1 (Peak Power Measurement)

Peak power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The pulse sensor employs a VBW = 50MHz so this method was only used for signals whose DTS bandwidth was less than or equal to 50MHz.

Method AVGPM-G (Average Power Measurement)

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

Test Setup

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



Figure 7-2. Test Instrument & Measurement Setup for Power Meter Measurements

Test Notes

None

FCC ID: A3LSMF926B	PCTEST Now to be part of Second	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 24 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 21 of 75
© 2021 PCTEST				V 9.0 02/01/2019



	Freq [MHz] Channe		nnel Tones	RU Index	Detector	Cond	lucted Power [dBm]	Conducted Power Limit	Power	Directional Ant. Gain	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]		
						ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	[]				
				0	AVG	13.87	13.91	16.90	30.00	-13.10	-0.26	16.64	36.02	-19.38		
				0	PEAK	25.36	25.29	28.34	30.00	-1.66	-0.26	28.08	36.02	-7.94		
	2412	1	26T	4	AVG	13.44	13.51	16.49	30.00	-13.51	-0.26	16.23	36.02	-19.79		
	2412	'	201	4	PEAK	24.34	24.38	27.37	30.00	-2.63	-0.26	27.11	36.02	-8.91		
				8	AVG	14.01	13.59	16.82	30.00	-13.18	-0.26	16.56	36.02	-19.46		
				0	PEAK	24.90	24.67	27.80	30.00	-2.20	-0.26	27.54	36.02	-8.48		
					0	AVG	13.98	13.86	16.93	30.00	-13.07	-0.26	16.67	36.02	-19.35	
				0	PEAK	24.63	24.75	27.70	30.00	-2.30	-0.26	27.44	36.02	-8.58		
	2437	6	6	6	26T	4	AVG	13.63	13.53	16.59	30.00	-13.41	-0.26	16.33	36.02	-19.69
	2437		201	4	PEAK	24.36	24.46	27.42	30.00	-2.58	-0.26	27.16	36.02	-8.86		
N							8	AVG	13.69	13.89	16.80	30.00	-13.20	-0.26	16.54	36.02
Ξ				0	PEAK	24.34	24.38	27.37	30.00	-2.63	-0.26	27.11	36.02	-8.91		
.4GHz				0	AVG	13.76	13.86	16.82	30.00	-13.18	-0.26	16.56	36.02	-19.46		
4					PEAK	24.49	24.29	27.40	30.00	-2.60	-0.26	27.14	36.02	-8.88		
N.	2462	11	26T	4	AVG	13.77	13.67	16.73	30.00	-13.27	-0.26	16.47	36.02	-19.55		
	2402			-	PEAK	24.42	24.26	27.35	30.00	-2.65	-0.26	27.09	36.02	-8.93		
				8	AVG	13.74	13.41	16.59	30.00	-13.41	-0.26	16.33	36.02	-19.69		
				0	PEAK	24.81	24.69	27.76	30.00	-2.24	-0.26	27.50	36.02	-8.52		
				0	AVG	5.72	6.18	8.97	30.00	-21.03	-0.26	8.71	36.02	-27.31		
					PEAK	15.94	13.88	18.04	30.00	-11.96	-0.26	17.78	36.02	-18.24		
	2467	12	26T	4	AVG	5.80	5.96	8.89	30.00	-21.11	-0.26	8.63	36.02	-27.39		
	2407	12	201	-	PEAK	16.64	13.95	18.51	30.00	-11.49	-0.26	18.25	36.02	-17.77		
				8	AVG	5.61	5.62	8.63	30.00	-21.37	-0.26	8.37	36.02	-27.65		
				Ŭ	PEAK	16.40	13.87	18.33	30.00	-11.67	-0.26	18.07	36.02	-17.95		
				0	AVG	-0.53	-0.45	2.52	30.00	-27.48	-0.26	2.26	36.02	-33.76		
				Ľ	PEAK	9.81	7.27	11.73	30.00	-18.27	-0.26	11.47	36.02	-24.55		
	2472	13	26T	4	AVG	-0.16	-0.32	2.77	30.00	-27.23	-0.26	2.51	36.02	-33.51		
	2712	10	201	4	PEAK	10.37	8.25	12.45	30.00	-17.55	-0.26	12.19	36.02	-23.83		
				8	AVG	-0.64	-0.45	2.47	30.00	-27.53	-0.26	2.21	36.02	-33.81		
				Ŭ	PEAK	10.40	7.29	12.13	30.00	-17.87	-0.26	11.87	36.02	-24.15		

Table 7-3. Conducted Output Power Measurements MIMO (26 Tones)

	Freq [MHz]	Channel	Tones	RU Index	Detector	Conc	lucted Power [dBm]	Conducted Power Limit	Conducted Power	Directional Ant. Gain	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]	
						ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	Lapuid	Cinic [GBin]	Margin [ub]	
	2412			37	AVG	15.97	15.96	18.98	30.00	-11.02	-0.26	18.72	36.02	-17.30	
				51	PEAK	26.23	27.09	29.69	30.00	-0.31	-0.26	29.43	36.02	-6.59	
		1	52T	38	AVG	15.77	15.83	18.81	30.00	-11.19	-0.26	18.55	36.02	-17.47	
	2412	'	521	30	PEAK	26.07	25.82	28.96	30.00	-1.04	-0.26	28.70	36.02	-7.32	
				40	AVG	15.86	15.45	18.67	30.00	-11.33	-0.26	18.41	36.02	-17.61	
				40	PEAK	25.92	24.73	28.38	30.00	-1.62	-0.26	28.12	36.02	-7.90	
		6		37	AVG	15.91	15.69	18.81	30.00	-11.19	-0.26	18.55	36.02	-17.47	
			52T	57	PEAK	25.66	25.51	28.60	30.00	-1.40	-0.26	28.34	36.02	-7.68	
	2437			38	AVG	15.98	15.80	18.90	30.00	-11.10	-0.26	18.64	36.02	-17.38	
	2437			- 30	PEAK	25.67	25.50	28.60	30.00	-1.40	-0.26	28.34	36.02	-7.68	
				40	AVG	15.42	15.64	18.54	30.00	-11.46	-0.26	18.28	36.02	-17.74	
Ł					40	PEAK	25.39	25.34	28.38	30.00	-1.62	-0.26	28.12	36.02	-7.90
				37	AVG	15.55	15.67	18.62	30.00	-11.38	-0.26	18.36	36.02	-17.66	
4 0				57	PEAK	25.75	25.55	28.66	30.00	-1.34	-0.26	28.40	36.02	-7.62	
	2462	11	52T	38	AVG	15.62	15.61	18.63	30.00	-11.37	-0.26	18.37	36.02	-17.65	
N	2402		521	30	PEAK	25.72	25.44	28.59	30.00	-1.41	-0.26	28.33	36.02	-7.69	
				40	AVG	15.64	15.14	18.41	30.00	-11.59	-0.26	18.15	36.02	-17.87	
				40	PEAK	25.98	25.62	28.81	30.00	-1.19	-0.26	28.56	36.02	-7.47	
				37	AVG	5.64	6.15	8.91	30.00	-21.09	-0.26	8.65	36.02	-27.37	
				5/	PEAK	15.88	14.32	18.18	30.00	-11.82	-0.26	17.92	36.02	-18.10	
	2467	12	52T	38	AVG	5.49	5.88	8.70	30.00	-21.30	-0.26	8.44	36.02	-27.58	
	2407	12	521	30	PEAK	15.87	14.04	18.06	30.00	-11.94	-0.26	17.80	36.02	-18.22	
				40	AVG	5.56	5.49	8.54	30.00	-21.46	-0.26	8.28	36.02	-27.74	
				40	PEAK	16.37	14.10	18.39	30.00	-11.61	-0.26	18.13	36.02	-17.89	
				37	AVG	-0.02	-0.22	2.89	30.00	-27.11	-0.26	2.63	36.02	-33.39	
				31	PEAK	10.40	8.19	12.44	30.00	-17.56	-0.26	12.19	36.02	-23.83	
	2472	13	3 52T	38	AVG	-0.10	-0.29	2.82	30.00	-27.18	-0.26	2.56	36.02	-33.46	
	2412	15		30	PEAK	10.42	8.13	12.43	30.00	-17.57	-0.26	12.18	36.02	-23.84	
				40	AVG	-0.53	-0.50	2.50	30.00	-27.50	-0.26	2.24	36.02	-33.78	
				40	PEAK	10.33	8.12	12.37	30.00	-17.63	-0.26	12.12	36.02	-23.90	

Table 7-4. Conducted Output Power Measurements MIMO (52 Tones)

FCC ID: A3LSMF926B	PCTEST Next to be part of Second	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 22 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 22 of 75
© 2021 PCTEST	-	·		V 9.0 02/01/2019



	Freq [MHz]	Channel	Tones	RU Index	Detector	Conc	lucted Power [dBm]	Conducted Power Limit		Directional Ant. Gain	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
						ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	Lapuil		wargin [ub]
				53	AVG	16.25	16.19	19.23	30.00	-10.77	-0.26	18.97	36.02	-17.05
	2412	1	106T	- 55	PEAK	26.31	26.12	29.23	30.00	-0.77	-0.26	28.97	36.02	-7.05
	2412	'	1001	54	AVG	16.49	16.15	19.33	30.00	-10.67	-0.26	19.07	36.02	-16.95
				54	PEAK	26.29	26.01	29.16	30.00	-0.84	-0.26	28.90	36.02	-7.12
				53	AVG	16.09	15.87	18.99	30.00	-11.01	-0.26	18.73	36.02	-17.29
	2437	6	106T		PEAK	25.80	25.61	28.72	30.00	-1.28	-0.26	28.46	36.02	-7.56
N	2407	0	1001	54	AVG	16.09	16.19	19.15	30.00	-10.85	-0.26	18.89	36.02	-17.13
Ξ					PEAK	25.72	25.57	28.66	30.00	-1.34	-0.26	28.40	36.02	-7.62
40				53	AVG	16.23	16.18	19.22	30.00	-10.78	-0.26	18.96	36.02	-17.06
	2462	11	106T		PEAK	26.01	25.93	28.98	30.00	-1.02	-0.26	28.72	36.02	-7.30
2	2402		1001	54	AVG	16.34	15.92	19.15	30.00	-10.85	-0.26	18.89	36.02	-17.13
					PEAK	26.18	25.76	28.99	30.00	-1.01	-0.26	28.73	36.02	-7.29
				53	AVG	5.62	5.61	8.63	30.00	-21.37	-0.26	8.37	36.02	-27.65
	2467	12	106T		PEAK	16.10	14.05	18.21	30.00	-11.79	-0.26	17.95	36.02	-18.07
	2101			54	AVG	5.69	5.71	8.71	30.00	-21.29	-0.26	8.45	36.02	-27.57
					PEAK	16.40	13.89	18.33	30.00	-11.67	-0.26	18.08	36.02	-17.95
				53	AVG	-0.10	0.03	2.98	30.00	-27.02	-0.26	2.72	36.02	-33.30
	2472	13	106T		PEAK	10.20	8.79	12.56	30.00	-17.44	-0.26	12.30	36.02	-23.72
	2.02	.0		54	AVG	-0.38	-0.25	2.70	30.00	-27.30	-0.26	2.44	36.02	-33.58
					PEAK	10.29	8.24	12.40	30.00	-17.60	-0.26	12.14	36.02	-23.88

Table 7-5. Conducted Output Power Measurements MIMO (106 Tones)

	Freq [MHz] Chann	Channel	Tones	RU Index	Detector	Cond	lucted Power [dBm]	Conducted Power Limit		Directional Ant. Gain	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
						ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	[ubiii]	Cinic [OBin]	Margin [ub]
	2412	1	242T	61	AVG	17.21	17.78	20.51	30.00	-9.49	-0.26	20.26	36.02	-15.76
N	2412		2421	01	PEAK	25.02	25.57	28.31	30.00	-1.69	-0.26	28.06	36.02	-7.97
I	2437	6	242T	61	AVG	17.57	17.98	20.79	30.00	-9.21	-0.26	20.53	36.02	-15.49
Ģ	2437	0	2421	01	PEAK	25.25	25.70	28.49	30.00	-1.51	-0.26	28.23	36.02	-7.79
4	2462	11	242T	61	AVG	17.07	17.11	20.10	30.00	-9.90	-0.26	19.84	36.02	-16.18
N	2402	11	2421	01	PEAK	24.64	24.96	27.81	30.00	-2.19	-0.26	27.55	36.02	-8.47
	2467	12	242T	61	AVG	5.44	5.69	8.58	30.00	-21.42	-0.26	8.32	36.02	-27.70
	2407	12	2421 01	PEAK	15.93	14.33	18.21	30.00	-11.79	-0.26	17.95	36.02	-18.07	
	2472	13	242T	61	AVG	-0.23	-0.08	2.86	30.00	-27.14	-0.26	2.60	36.02	-33.42
	2472	15	2421	01	PEAK	10.27	8.47	12.47	30.00	-17.53	-0.26	12.21	36.02	-23.81

Table 7-6. Conducted Output Power Measurements MIMO (242 Tones)

FCC ID: A3LSMF926B	PCTEST Proud to be part of B	MEASUREMENT REPORT (CERTIFICATION)	AMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 23 of 75
© 2021 PCTEST				V 9.0 02/01/2019



Note:

Per ANSI C63.10-2013 and KDB 662911 D01 v02r01 Section E)1), the conducted powers at Antenna 1 and Antenna 2 were first measured separately during MIMO transmission as shown in the section above. The measured values were then summed in linear power units then converted back to dBm.

Sample MIMO Calculation:

At 2412MHz the average conducted output power was measured to be 17.21 dBm for Antenna-1 and 17.78 dBm for Antenna-2.

Antenna 1 + Antenna 2 = MIMO

(17.21 dBm + 17.78 dBm) = (52.60 mW + 59.98 mW) = 112.58 mW = 20.51 dBm

FCC ID: A3LSMF926B	PCTEST Prout to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 04 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 24 of 75
© 2021 PCTEST	-			V 9.0 02/01/2019



7.4 Power Spectral Density

§15.247(e); RSS-247 [5.2]

Test Overview and Limit

The peak power density is 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, tones configurations, and RU indices were investigated and the worst case configuration results are reported in this section.

The maximum permissible power spectral density is 8 dBm in any 3 kHz band.

Test Procedure Used

ANSI C63.10-2013 – Section 11.10.2 Method PKPSD KDB 558074 D01 v05r02 – Section 8.4 DTS Maximum Power Spectral Density level in the fundamental emission ANSI C63.10-2013 – Section 14.3.2.2 Measure-and-Sum Technique KDB 662911 D01 v02r01 – Section E)2) Measure-and-Sum Technique

Test Settings

- 1. Analyzer was set to the center frequency of the DTS channel under investigation
- 2. Span = 1.5 times the DTS channel bandwidth
- 3. RBW = 3kHz
- 4. VBW = 1MHz
- 5. Detector = peak
- 6. Sweep time = auto couple
- 7. Trace mode = max hold
- 8. Trace was allowed to stabilize

Test Setup

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

Canada Standard	P2.8 (004-	NACE OF	1	
FAAAS.				
LARY PAR LINE FOR MAN SOLA				
The second second second				$\rightarrow EUT$
IC TTTPPA		EGOE CO		



FCC ID: A3LSMF926B	Road to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 25 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 25 of 75
© 2021 PCTEST				V 9.0 02/01/2019



Test Notes

- 1. Based on preliminary measurements, it was determined that, of all of the tone configurations, the 26T configuration produced the worst case power spectral density measurement for partial loaded case. Therefore, only the 26 Tone configuration and 242 Tone data is included in this section.
- 2. The power spectral density for each channel was measured with the RU index showing the highest conducted power.

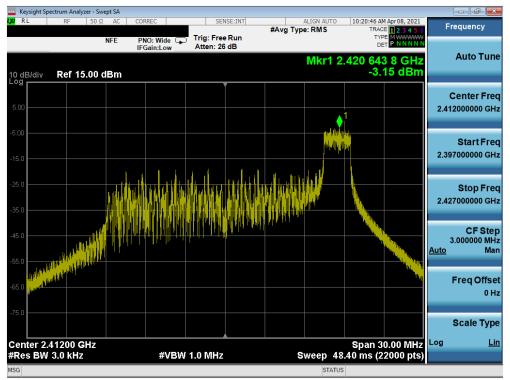
FCC ID: A3LSMF926B	Rout take part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 26 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 26 01 75
© 2021 PCTEST				V 9.0 02/01/2019



MIMO Power Spectral Density Measurements

Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	ANT 1 Power Spectral Density [dBm]	ANT 2 Power Spectral Density [dBm]	Summed MIMO Power Spectral Density [dBm]	Maximum Permissible Power Density [dBm / 3kHz]	Margin [dB]	Pass / Fail
2412	1	ax	26T	MCS0	-3.15	-2.13	0.40	8.00	-7.60	Pass
2437	6	ax	26T	MCS0	-3.00	-2.34	0.35	8.00	-7.65	Pass
2462	11	ax	26T	MCS0	-3.04	-2.52	0.24	8.00	-7.76	Pass
2412	1	ax	242T	MCS0	-6.60	-6.70	-3.64	8.00	-11.64	Pass
2437	6	ax	242T	MCS0	-6.48	-6.28	-3.37	8.00	-11.37	Pass
2462	11	ax	242T	MCS0	-7.41	-7.48	-4.43	8.00	-12.43	Pass

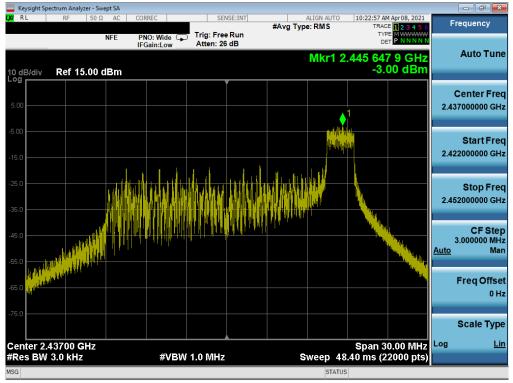
Table 7-7. Conducted Power Density Measurements MIMO



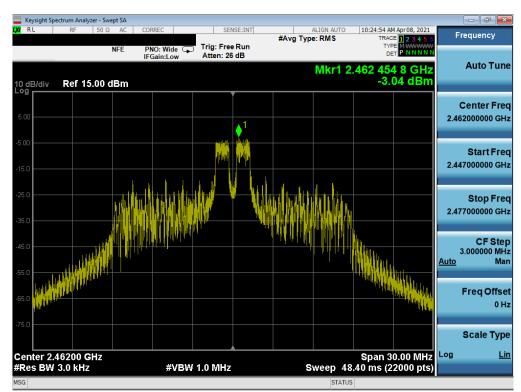
Plot 7-13. Power Spectral Density Plot MIMO ANT1 (802.11ax OFDMA – 26 Tones – Ch. 1)

FCC ID: A3LSMF926B	PCTEST Nout table part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 07 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 27 of 75
© 2021 PCTEST				V 9.0 02/01/2019





Plot 7-14. Power Spectral Density Plot MIMO ANT1 (802.11ax OFDMA - 26 Tones - Ch. 6)



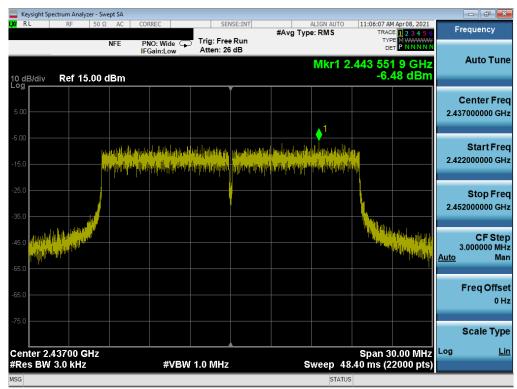
Plot 7-15. Power Spectral Density Plot MIMO ANT1 (802.11ax OFDMA - 26 Tones - Ch. 11)

FCC ID: A3LSMF926B	Rout to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 28 of 75
© 2021 PCTEST				V 9.0 02/01/2019



	ght Spectrum Analyze											
L <mark>XI</mark> RL	RF	50 Ω AC	C COR	REC	SEN	ISE:INT	#Avg Type	ALIGN AUTO e: RMS	TRACI	Apr 08, 2021	Fre	equency
10 dB/	div Ref 15.	NFE 00 dBn	IFG	O: Wide ⊊ ain:Low	Trig: Free Atten: 26	Run dB		Mkr1 2.	₀ 418 554	6 GHz 6 dBm		Auto Tune
5.00 —								1				enter Freq 2000000 GHz
-5.00 -		no, en pri plus su plu	lar Angenta Aliya kani kuta	la felelegenet Alafielegenet	eelekatoo ku tu Kapaan Alepaka	un de la company Company de la company de	landered pool de Gellectrene (gel	alaa kala Aala kala			2.397	Start Freq 2000000 GHz
-25.0 -											2.427	Stop Freq 2000000 GHz
-45.0	land poly and a long of the second									n La di Sarahan (M) Natata kan Lukuma	3. <u>Auto</u>	CF Step 000000 MHz Man
-65.0 —											F	Freq Offset 0 Hz
-75.0	er 2.41200 GF								Snan 3	0.00 MHz		Scale Type Lin
	BW 3.0 kHz	12		#VBW	1.0 MHz		S	weep 48.	40 ms (2	2000 pts)		
MSG								STATUS				

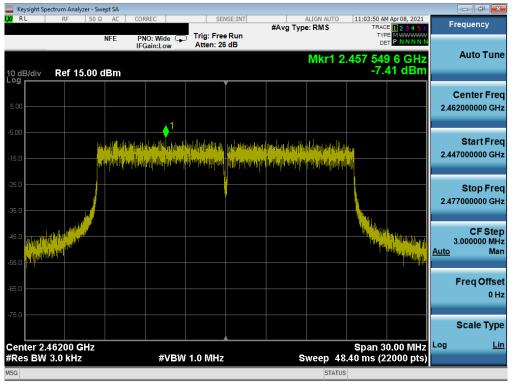
Plot 7-16. Power Spectral Density Plot MIMO ANT1 (802.11ax OFDMA - 242 Tones - Ch. 1)



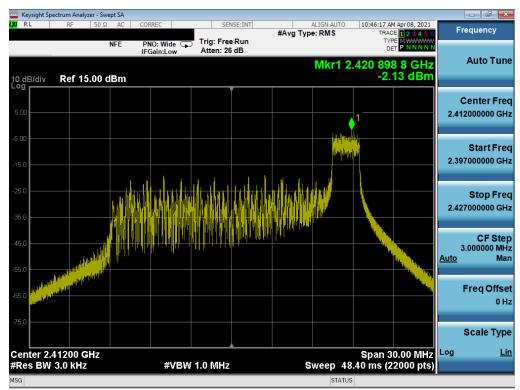
Plot 7-17. Power Spectral Density Plot MIMO ANT1 (802.11ax OFDMA - 242 Tones - Ch. 6)

FCC ID: A3LSMF926B	PCTEST Next bite part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 29 of 75
© 2021 PCTEST				V 9.0 02/01/2019





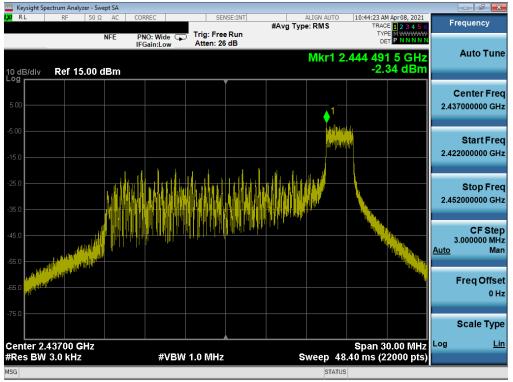
Plot 7-18. Power Spectral Density Plot MIMO ANT1 (802.11ax OFDMA - 242 Tones - Ch. 11)



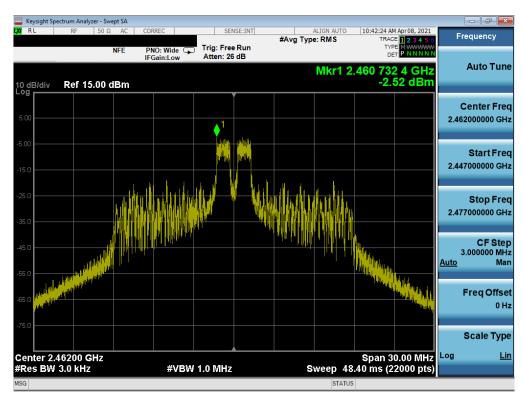
Plot 7-19. Power Spectral Density Plot MIMO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 1)

FCC ID: A3LSMF926B	PCTEST Next to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 30 of 75
© 2021 PCTEST	<u>.</u>	·		V 9.0 02/01/2019





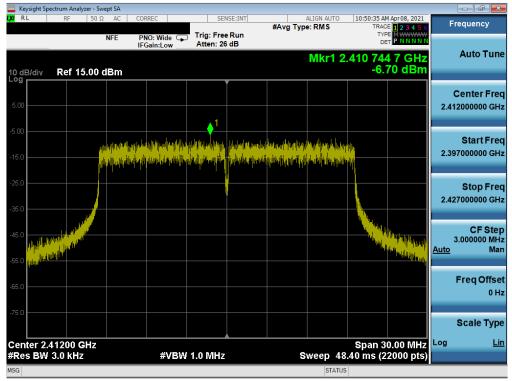
Plot 7-20. Power Spectral Density Plot MIMO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 6)



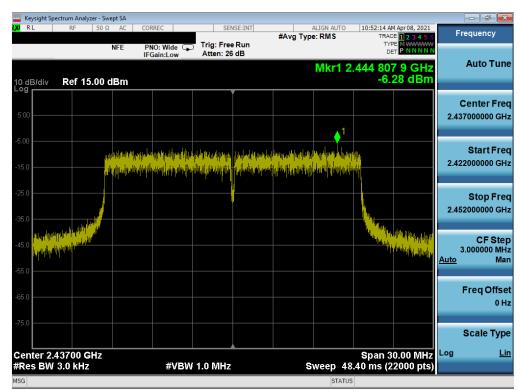
Plot 7-21. Power Spectral Density Plot MIMO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 11)

FCC ID: A3LSMF926B	Rout to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 21 of 75	
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 31 of 75	
© 2021 PCTEST		•		V 9.0 02/01/2019	





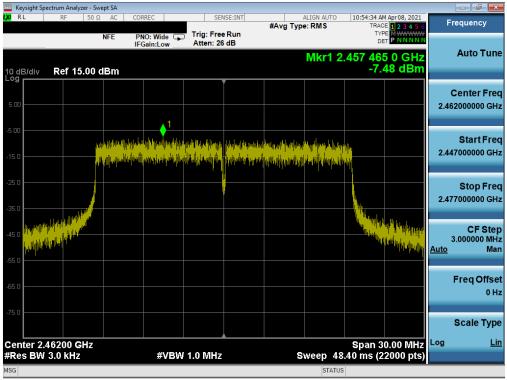
Plot 7-22. Power Spectral Density Plot MIMO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 1)



Plot 7-23. Power Spectral Density Plot MIMO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 6)

FCC ID: A3LSMF926B	Read to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 75	
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 32 of 75	
© 2021 PCTEST				V 9.0 02/01/2019	





Plot 7-24. Power Spectral Density Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 11)

Note:

Per ANSI C63.10-2013 Section 14.3.2.2 and KDB 662911 D01 v02r01 Section E)2), the power spectral density at Antenna 1 and Antenna 2 were first measured separately as shown in the section above. The measured values were then summed in linear power units then converted back to dBm.

Sample MIMO Calculation:

At 2412MHz the average conducted power spectral density was measured to be -3.15 dBm for Antenna-1 and -2.13 dBm for Antenna-2.

Antenna 1 + Antenna 2 = MIMO

(N/A dBm + -2.13 dBm) = (0.484 mW + 0.612 mW) = 1.097 mW = 0.40 dBm

FCC ID: A3LSMF926B	PCTEST Proced to be part of G	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 75	
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 33 of 75	
© 2021 PCTEST				V 9.0 02/01/2019	



7.5 Conducted Emissions at the Band Edge §15.247(d); RSS-247 [5.5]

Test Overview and Limit

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates, tone configurations, and RU indices were investigated to determine the worst case configuration. For the following out of band conducted emissions plots at the band edge, the EUT was set to a data rate of MCS0 in 802.11ax mode as this setting produced the worst-case emissions.

The limit for out-of-band spurious emissions at the band edge is 30dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100kHz bandwidth per the PSD procedure (Section 7.4).

Test Procedure Used

ANSI C63.10-2013 – Section 11.11.3 KDB 558074 D01 v05r02 – Section 8.7.2

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 = 100kHz
- 4. VBW = 1MHz
- 5. Detector = Peak
- 6. Number of sweep points $\geq 2 \times \text{Span/RBW}$
- 7. Trace mode = max hold
- 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

Test Notes

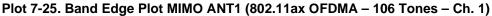
None

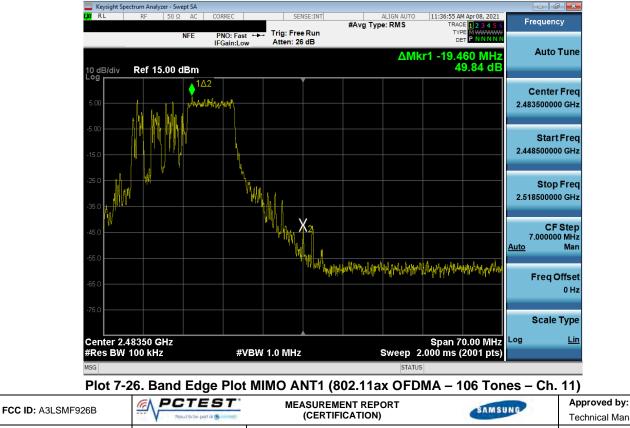
FCC ID: A3LSMF926B	PCTEST Preud to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 24 of 75	
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 34 of 75	
© 2021 PCTEST	•	•		V 9.0 02/01/2019	



MIMO Conducted Emissions at the Band Edge





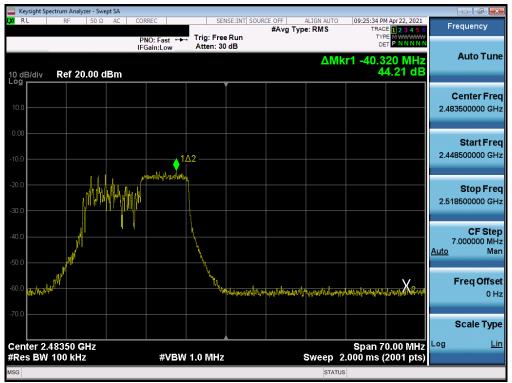


 Test Report S/N:
 Test Dates:
 EUT Type:
 Page 35 of 75

 1M2104190044-12.A3L
 03/26 - 05/28/2021
 Portable Handset
 Page 35 of 75

 © 2021 PCTEST
 V 9.0 02/01/2019
 V 9.0 02/01/2019





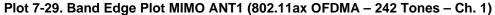
Plot 7-27. Band Edge Plot MIMO ANT1 (802.11ax OFDMA - 106 Tones - Ch. 12)

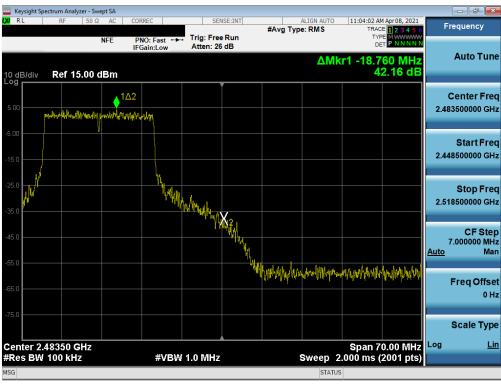


FCC ID: A3LSMF926B	PCTEST Proud to be part of &	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 26 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 36 of 75
© 2021 PCTEST	•			V 9.0 02/01/2019





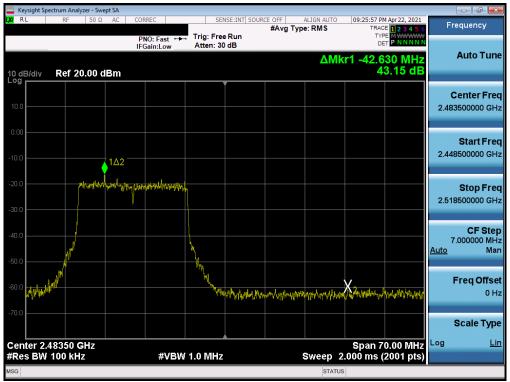




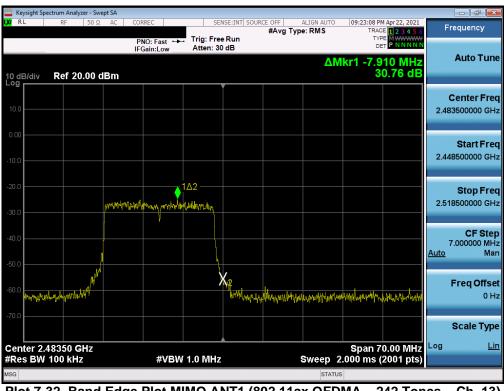
Plot 7-30. Band Edge Plot MIMO ANT1 (802.11ax OFDMA – 242 Tones – Ch. 11)

FCC ID: A3LSMF926B	Rout ble part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 27 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 37 of 75
© 2021 PCTEST				V 9.0 02/01/2019





Plot 7-31. Band Edge Plot MIMO ANT1 (802.11ax OFDMA – 242 Tones – Ch. 12)



Plot 7-32. Band Edge Plot MIMO ANT1 (802.11ax OFDMA – 242 Tones – Ch. 13)

FCC ID: A3LSMF926B	PCTEST Rout ble perid &	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 20 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 38 of 75
© 2021 PCTEST	•	·		V 9.0 02/01/2019





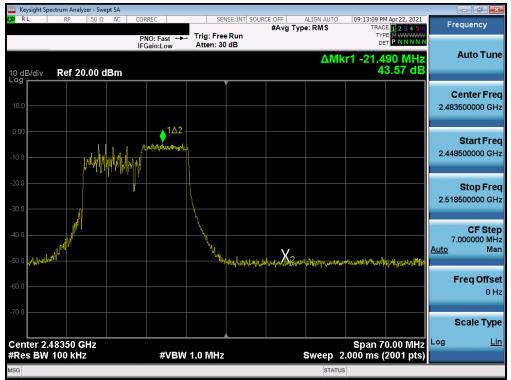


Plot 7-33. Band Edge Plot MIMO ANT2 (802.11ax OFDMA – 106 Tones – Ch. 1)

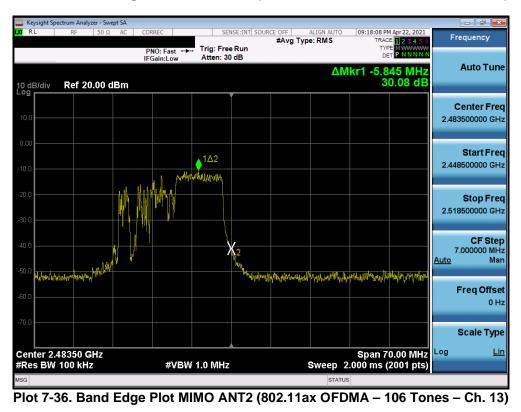
Plot 7-34. Band Edge Plot MIMO ANT2 (802.11ax OFDMA – 106 Tones – Ch. 11)

FCC ID: A3LSMF926B	Rout ble part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 39 of 75
© 2021 PCTEST				V 9.0 02/01/2019





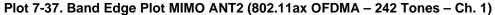
Plot 7-35. Band Edge Plot MIMO ANT2 (802.11ax OFDMA - 106 Tones - Ch. 12)

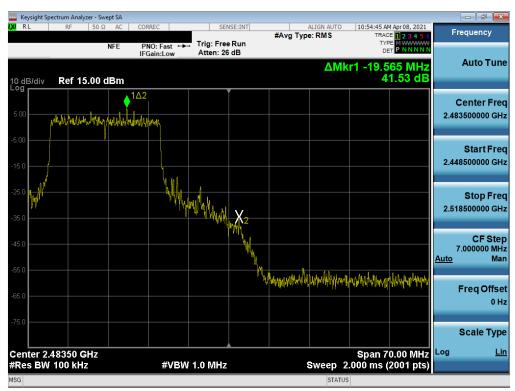


FCC ID: A3LSMF926B	PCTEST Proud to be part of & remove	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 40 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 40 of 75
© 2021 PCTEST				V 9.0 02/01/2019









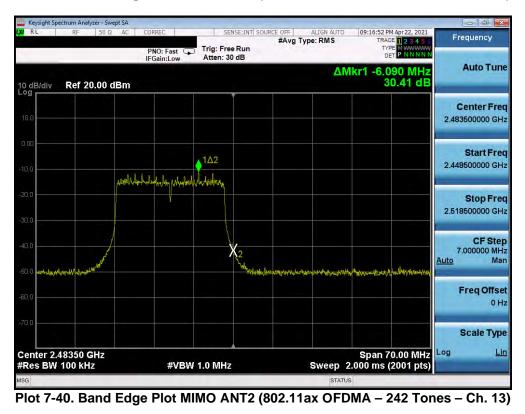
Plot 7-38. Band Edge Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 11)

FCC ID: A3LSMF926B	PCTEST Proud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 41 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 41 of 75
© 2021 PCTEST				V 9.0 02/01/2019



Atten: 30 dB	ΔMk	r1 -38.325 MHz 44.20 dB	Auto Tune Center Free 2.483500000 GH: Start Free 2.448500000 GH: Stop Free 2.518500000 GH:
			2.483500000 GH: Start Free 2.448500000 GH: Stop Free
			2.448500000 GH Stop Free
			2.518500000 61
Net William	Xarat		CF Ste 7.000000 MH <u>Auto</u> Ma
	allelation and a second se	alayaniyan silan tirtana	Freq Offso 0 H
		Span 70.00 MHz	Scale Typ Log <u>Li</u>
	VBW 1.0 MHz		VBW 1.0 MHz

Plot 7-39. Band Edge Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 12)



Approved by: PCTEST (m MEASUREMENT REPORT SAMSUNG FCC ID: A3LSMF926B (CERTIFICATION) Technical Manager Test Report S/N: EUT Type: Test Dates: Page 42 of 75 1M2104190044-12.A3L 03/26 - 05/28/2021 Portable Handset © 2021 PCTEST V 9.0 02/01/2019



7.6 Conducted Spurious Emissions §15.247(d); RSS-247 [5.5]

Test Overview and Limit

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates, tone configurations, and RU indices were investigated to determine the worst case configuration. For the following out of band conducted emissions plots, the EUT was set to a data rate of MCS0 in 802.11ax mode as this setting produced the worst-case emissions.

The limit for out-of-band spurious emissions at the band edge is 30dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100kHz bandwidth per the procedure in Section 11.1 of ANSI C63.10-2013 and KDB 558074 D01 v05r02.

Test Procedure Used

ANSI C63.10-2013 – Section 11.11.3 KDB 558074 D01 v05r02 – Section 8.5 ANSI C63.10-2013 – Section 14.3.3 KDB 662911 D01 v02r01 – Section E)3)b)

Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to 25GHz (separated into two plots per channel)
- 2. RBW = 1MHz
- 3. VBW = 3MHz
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep time = auto couple
- 7. The trace was allowed to stabilize

Test Setup

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



Figure 7-5. Test Instrument & Measurement Setup

FCC ID: A3LSMF926B	PCTEST Prout to be part of &	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 42 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 43 of 75
© 2021 PCTEST				V 9.0 02/01/2019



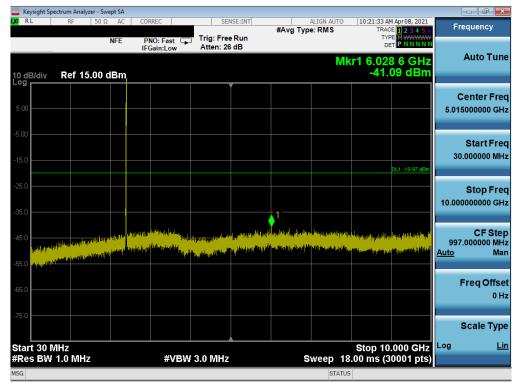
Test Notes

- 1. RBW was set to 1MHz rather than 100kHz in order to increase the measurement speed.
- 2. The display line shown in the following plots denotes the limit at 30dB below the fundamental emission level measured in a 100kHz bandwidth. However, since the traces in the following plots are measured with a 1MHz RBW, the display line may not necessarily appear to be 30dB below the level of the fundamental in a 1MHz bandwidth.
- 3. For plots showing conducted spurious emissions near the limit, the frequencies were investigated with a reduced RBW to ensure that no emissions were present.
- 4. The conducted spurious emissions were measured to relative limits. Therefore, in accordance with ANSI C63.10-2013 and KDB 662911 D01 v02r01 Section E)3)b), it was unnecessary to show compliance through the summation of test results of the individual outputs.

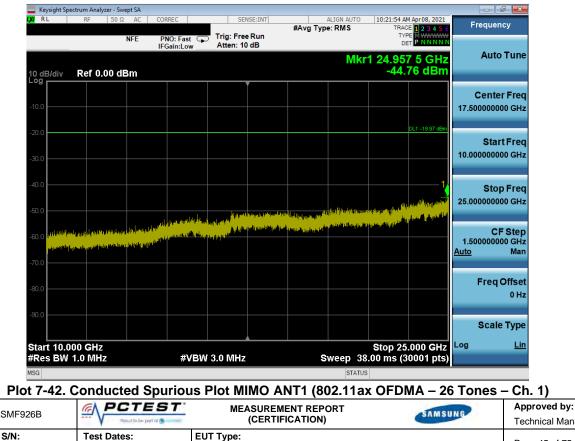
FCC ID: A3LSMF926B	PCTEST Proud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 44 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 44 of 75
© 2021 PCTEST	•			V 9.0 02/01/2019



MIMO Conducted Spurious Emissions



Plot 7-41. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA - 26 Tones - Ch. 1)

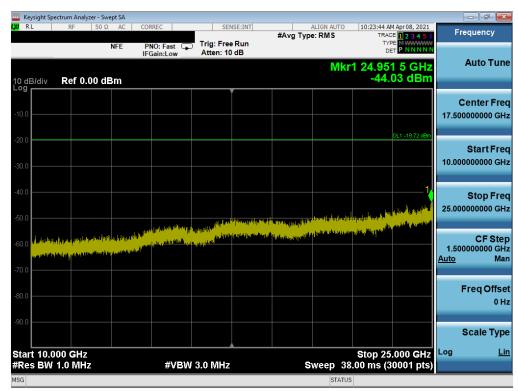


FCC ID: A3LSMF926B	Phouse to be part of	(CERTIFICATION)	Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 45 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset	Fage 45 01 75
© 2021 PCTEST			V 9.0 02/01/2019



	ectrum Analyzer - Swe									- P	×
LXU RL	RF 50 Ω		ORREC		ISE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	M Apr 08, 2021	Frequency	v
10 dB/div Log	Ref 15.00 c		PNO: Fast 😱 FGain:Low	Atten: 26			MI	DE kr1 7.064		Auto T	une
5.00										Center I 5.015000000	
-5.00									DL1 -19.72 dBm	Start F 30.000000	
-25.0							1			Stop F 10.000000000	
-45.0	g fullen gegelden bei som s		, ^{ala} duka ma _{la}	n an	n _{ya} pen bilan sekara Napen bilan kabu	ingenagi bitekenipi Matakepi antangan	ling, Filende Brander (Melekan)	ilden synddygelle Ironnegeniae yn de g	lan geochiek and	CF 5 997.000000 <u>Auto</u>	
-65.0										Freq O	ffset 0 Hz
-75.0 Start 30 P								Stop 10	.000 GHz	Scale 1 Log	Гуре <u>Lin</u>
#Res BW				3.0 MHz		s			0001 pts)		
POIN	nts changed; all t	uaces clea	neu				STATU	3			

Plot 7-43. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA - 26 Tones - Ch. 6)



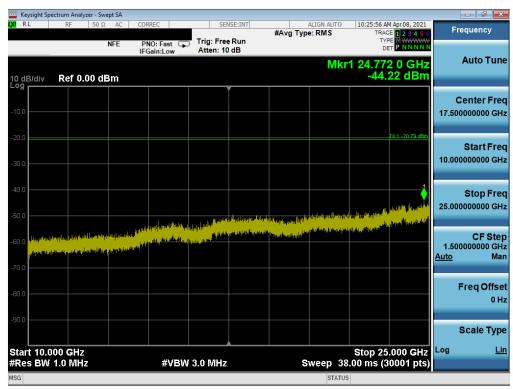
Plot 7-44. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA - 26 Tones - Ch. 6)

FCC ID: A3LSMF926B	Read to be part of &	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 46 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 46 of 75
© 2021 PCTEST				V 9.0 02/01/2019



	n Analyzer - Swept									(
<mark>XI</mark> RL	RF 50 Ω NF	E PI	RREC	Trig: Free		#Avg Typ	ALIGN AUTO e: RMS	TRAC	M Apr 08, 2021 DE 1 2 3 4 5 6 PE M WWWWW T P N N N N N	Fre	equency
10 dB/div R	ef 15.00 dB		Gain:Low	Atten: 26	dB		M	kr1 3.14			Auto Tune
5.00										-	enter Fred 000000 GH
.15.0									DL1 -20.79 dBm	30.	Start Free 000000 MH
35.0			1							10.000	Stop Free
-45.0 nkodonovila	¹⁰ 11 ¹ 1 ¹⁰ 0011 ¹⁰ 1011 ¹⁰ 1011	and and an an	andan na sa kata na sa	∙e¦(neestateest) hydetteetthete	n yn ffil yn yn yn fran yn	intelajun kiliptypin Istelajun senatur	ar (ti qaraki ayan) Mangariya (ta aya)	stel for paper supplies ¹⁸ 1 Mary all non-mark	aliyayyyyndi Daliyy ar a pri Y blaa tarafa y sifaata	997. <u>Auto</u>	CF Step 000000 MH Mai
										F	Freq Offse 0 Hi
Start 30 MHz								Stop 10	.000 GHz	tog	Scale Type <u>Lir</u>
#Res BW 1.0			#VBW	3.0 MHz		s	weep 1	8.00 ms (3	0001 pts)		
ISG							STAT	US			

Plot 7-45. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA – 26 Tones – Ch. 11)



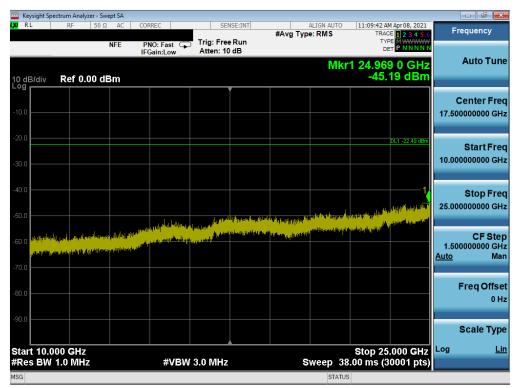
Plot 7-46. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA – 26 Tones – Ch. 11)

FCC ID: A3LSMF926B	PCTEST Prout to be part of &	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 47 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 47 of 75
© 2021 PCTEST		•		V 9.0 02/01/2019



		trum Analyzer - Sv											
L <mark>XI</mark> RL		RF 50 Ω		COR				#Avg Typ	ALIGN AUTO e: RMS	TRAC	Apr 08, 2021 E 1 2 3 4 5 6 E M WWWW	Fre	quency
10 dB Log r	l/div	Ref 15.00	NFE dBm		O: Fast 🕞	Atten: 26			М				Auto Tune
5.00 -													enter Freq 000000 GHz
-5.00 -											DL1 -22.49 dBm		Start Freq 000000 MHz
-25.0					.1								Stop Freq 000000 GHz
-45.0 - 1 -55.0 -	r _{tel} ti dan televitet National dan televitet	an sa glant i prepare	a vitalist	litters at the second s	alia kata da kata nagan ^{Inden} tener den k _{ata a} n	eng sing sing sing some All sing sing some	10 C C			^{the} nature and set of the	(Alexandria) (Alexandria) (Alexandria) (Alexandria)	997. <u>Auto</u>	CF Step 000000 MHz Man
-65.0 -												F	req Offset 0 Hz
-75.0	: 30 M	Hz								Stop 10	.000 GHz		cale Type <u>Lin</u>
		.0 MHz			#VBW	3.0 MHz		S	weep 1	8.00 ms (3	0001 pts)		
MSG									STATI	US			

Plot 7-47. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA - 242 Tones - Ch. 1)



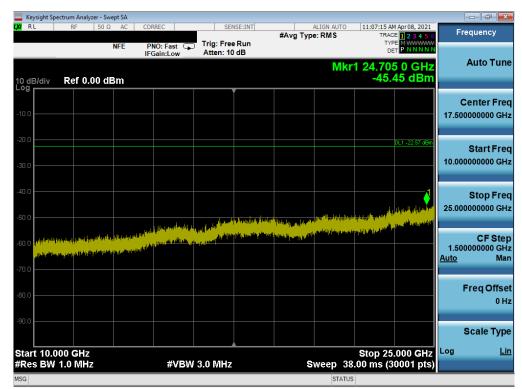
Plot 7-48. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA - 242 Tones - Ch. 1)

FCC ID: A3LSMF926B	Road to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 49 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 48 of 75
© 2021 PCTEST				V 9.0 02/01/2019



Keysight Spectrum Analyzer - Swept						
X/RL RF 50Ω	AC CORREC	SEN	ISE:INT #Avg Typ		4 AM Apr 08, 2021 RACE 1 2 3 4 5 6	Frequency
NF 10 dB/div Ref 15.00 dB	IFGain:l	ast Trig: Free Low Atten: 26		Mkr1 2.8	21 9 GHz 0.74 dBm	Auto Tune
5.00						Center Freq 5.015000000 GHz
-5.00					DL1 -22.57 dBm	Start Freq 30.000000 MHz
-25.0						Stop Freq 10.000000000 GHz
-45.0 hydrochala (Alasta (Manalasta (Manala	ngte Taland tee velen. Ngte onengeneg ^{kal} ank	listen der berechtigt an der sollten die werden eine der songenet die geschieften die werden eine begenet der sollte die sollte die sollte die sollte die	an sa	a filit til promotion til far betyden læder på Det had som flevet inden som en som ekser at		CF Step 997.000000 MHz <u>Auto</u> Man
-65.0						Freq Offset 0 Hz
-75.0 Start 30 MHz				Stop	10.000 GHz	Scale Type
#Res BW 1.0 MHz	ł	#VBW 3.0 MHz	S	weep 18.00 ms	10.000 0112	
мsg 🧼Points changed; all tra	ces cleared			STATUS		

Plot 7-49. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA - 242 Tones - Ch. 6)



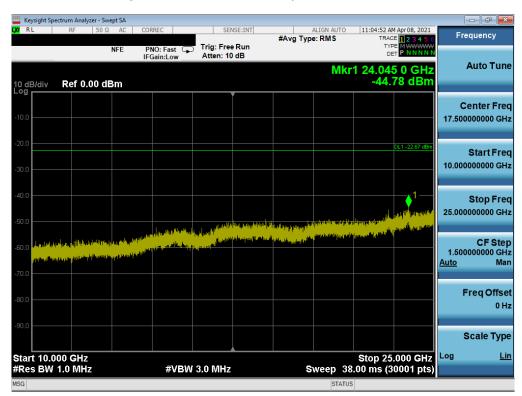
Plot 7-50. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA - 242 Tones - Ch. 6)

FCC ID: A3LSMF926B	Rout to be part of Brown	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 40 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 49 of 75
© 2021 PCTEST				V 9.0 02/01/2019



	m Analyzer - Swept S									- đ ×
L <mark>XI</mark> RL	RF 50 Ω A	AC COR	REC	SEN	ISE:INT	#Avg Typ	ALIGN AUTO e: RMS		M Apr 08, 2021	Frequency
	NFE	e pi IFC	IO: Fast 🖵 ain:Low	Trig: Free Atten: 26			N	DI 1kr1 6.26		Auto Tune
10 dB/div R	lef 15.00 dBr	m						-41.	32 dBm	
5.00										Center Freq 5.015000000 GHz
-5.00										Start Freq 30.000000 MHz
-25.0									DL1 -22:67 dBm	Stop Freq 10.000000000 GHz
	n a stand a sta	alle dadhaadh aide ann aide	andarasarita _{Mara} V ^{ana} n ata	Managing Salaya Managing Salaya	h _{aran} a da katen Ma ^{lan} a arendari	eksedelinger han tille Ten frigtelaur das tid fe		na presenta a la deserva de la deserva d	Digitar Designed	CFStep 997.000000 MHz <u>Auto</u> Man
-65.0										Freq Offset 0 Hz
-75.0										Scale Type
Start 30 MHz #Res BW 1.0			#VBW	3.0 MHz		S	weep	Stop 10 18.00 ms (3	.000 GHz 0001 pts)	Log <u>Lin</u>
MSG							STAT	_		

Plot 7-51. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA - 242 Tones - Ch. 11)



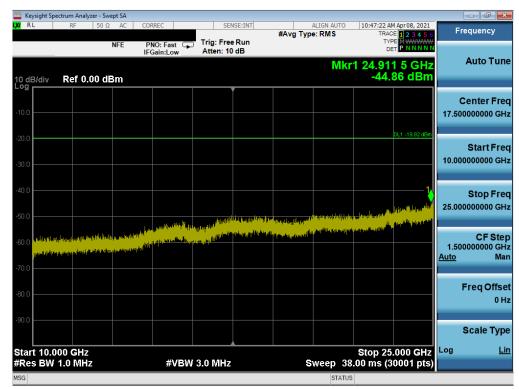
Plot 7-52. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA – 242 Tones – Ch. 11)

FCC ID: A3LSMF926B	Rout to be part of Brown	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 50 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 50 of 75
© 2021 PCTEST				V 9.0 02/01/2019



Keysight Spectrum Analyzer - Swe										×
<mark>X</mark> RL RF 50 Ω	AC CO	ORREC		ISE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRA	M Apr 08, 2021 CE 1 2 3 4 5 6	Frequency	У
10 dB/div Ref 15.00 d	I	PNO: Fast 🕞 Gain:Low	Atten: 26			N	□ lkr1 3.02	8 3 GHz 01 dBm	Auto T	une
5.00									Center 5.015000000	
-15.0								DL1 -19.82 dBm	Start I 30.000000	
-25.0		1							Stop I 10.00000000	
-45.0	e (e yali ya Atimu ya		la popular and a second a se	AND CONTROL COMP.	Wellywaging som pro , and star provide starte		eria di Propi di pulo turo ^{An} te ^{dist} eria da publica	n an fille an an an fille an f	CF \$ 997.000000 <u>Auto</u>	Step MHz Man
-65.0									Freq O	ffset 0 Hz
-75.0 Start 30 MHz							Stop 10	.000 GHz	Scale 1 Log	Type <u>Lin</u>
#Res BW 1.0 MHz		#VBW	3.0 MHz		S		8.00 ms (3	30001 pts)		
MSG						STAT	US			

Plot 7-53. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 1)



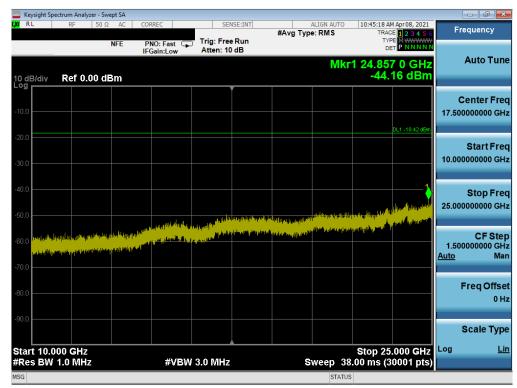
Plot 7-54. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 1)

FCC ID: A3LSMF926B	Rout ble part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 51 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 51 of 75
© 2021 PCTEST		·		V 9.0 02/01/2019



Keysight Spectrum Analyzer - Swept SA						- 7
X RL RF 50 Ω AC	CORREC	SENSE	#Avg Typ	e: RMS TR.	AM Apr 08, 2021 ACE 1 2 3 4 5 6 YPE M WWWWW	Frequency
10 dB/div Ref 15.00 dBm	PNO: Fast 🖵 IFGain:Low	Atten: 26 dl		Mkr1 7.10	DET P NNNNN	Auto Tune
5.00						Center Freq 5.015000000 GHz
-5.00					DL1 -18.42 dBm	Start Freq 30.000000 MHz
-25.0				1		Stop Freq 10.000000000 GHz
	enternet ^{den} service de la composita Republica de la composita de la Referencia de la composita de la	HALF FRAME PROPERTY.	<mark>ha kangan laka hapita inte bang pula an kana kana kana kana kana kana kana</mark>	B. Juli achieve	an tana ang pana ang pana an	CF Step 997.000000 MHz <u>Auto</u> Man
-65.0						Freq Offset 0 Hz
Start 30 MHz #Res BW 1.0 MHz	#\(B)A(3.0 MHz		Stop 1 weep 18.00 ms (0.000 0112	Scale Type Log <u>Lin</u>
ARGS DW TO WITZ	#4044	5.0 19112	3	STATUS	Sooon pisj	

Plot 7-55. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA – 26 Tones – Ch. 6)



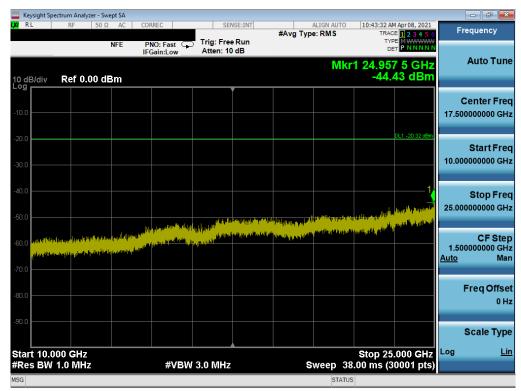
Plot 7-56. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 6)

FCC ID: A3LSMF926B	Road to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 52 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 52 of 75
© 2021 PCTEST	·	•		V 9.0 02/01/2019



Keysight Spectrum Analyzer										
🗶 RL RF !	50 Ω AC	CORREC		ISE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	M Apr 08, 2021	Free	quency
	NFE	PNO: Fast IFGain:Low	Trig: Free Atten: 26				TYI Di			
10 dB/div Ref 15.0	00 dBm					M	kr1 6.25 -40.	0 6 GHz 14 dBm	4	Auto Tune
5.00										enter Freq 100000 GHz
-15.0								DL1 -20.32 dBm		Start Freq 00000 MHz
-25.0					1					Stop Freq 100000 GHz
-45.0	a i sulla si sulla i la la Sulla si sulla sulla i sulla	n de la colonia de la colon Colonia de la colonia de la Colonia de la colonia de la	ing a sign to post	D _{han} g bilang pilankan (18 ⁷ M _{an} alah siya m ^{akan} (1899)	n Dan dy dariel en politi na provinci en activitation	allan og eller og en for Selere selere selere se	Pearl Inspiring	u vyska strati v stalovani Angeles stranog sedani	997.0 <u>Auto</u>	CF Step 000000 MHz Man
-65.0									FI	req Offset 0 Hz
-75.0										cale Type
Start 30 MHz #Res BW 1.0 MHz		#VBM	3.0 MHz		2	ween 1	Stop 10 8.00 ms (3	.000 GHz	Log	Lin
MSG		<i></i>	540 WH12			STAT		ooor pisj		

Plot 7-57. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 11)



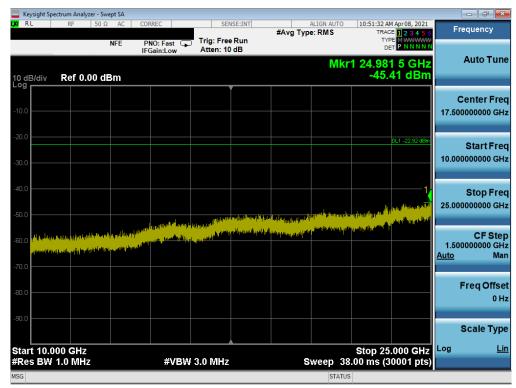
Plot 7-58. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA – 26 Tones – Ch. 11)

FCC ID: A3LSMF926B	Road to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 52 of 75	
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 53 of 75	
© 2021 PCTEST				V 9.0 02/01/2019	



	ectrum Ana	·										
RL	RF	50 Ω		COR		Taiau	SENSE:INT	#Avg Typ	ALIGN AU	TRA	AM Apr 08, 2021	Frequency
0 dB/div	Ref 1	5.00 d	NFE Bm	IFO	IO: Fast (Sain:Low		: 26 dB			Mkr1 6.83	34 2 GHz 71 dBm	Auto Tu
og												Center Fi 5.015000000 G
5.0												Start Fi 30.000000 N
5.0											DL1 -22.92 dBm	Stop Fr 10.000000000
5.0 	العال ويورو _{لير} العال ويورو _{لير}	Magazina di Para da Managana da Managa Managana da Managana da Mana	ال بر الأرب	lin berlittern Hapenkinstern	ta Verpersettud (chesece)stetera		ugun karan di sa kirina mani mani karatikan			Norman Holey Johnson Ar		CF St 997.000000 M <u>Auto</u> M
5.0												Freq Off 0
5.0 tart 30 I	ИН7									Stop 1	0.000 GHz	Scale Ty
	1.0 MI					W 3.0 M				18.00 ms (erede eriz	-

Plot 7-59. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 1)



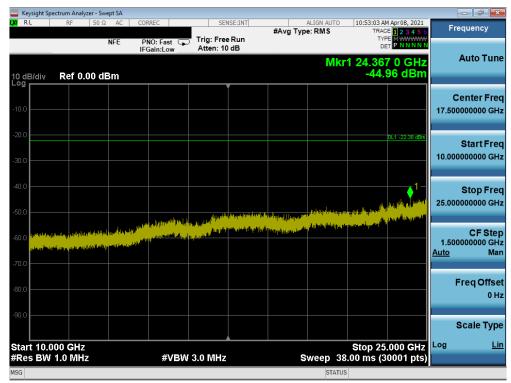
Plot 7-60. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 1)

FCC ID: A3LSMF926B	PCTEST Next to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 54 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 54 of 75
© 2021 PCTEST	<u>.</u>	·		V 9.0 02/01/2019



	ctrum Analyzer - Sw									
LXI RL	RF 50 Ω	AC	CORREC		ISE:INT	#Avg Typ	ALIGN AUTO E: RMS	TRAC	M Apr 08, 2021	Frequency
		NFE	PNO: Fast IFGain:Low	Trig: Free Atten: 26				TYF DE		
10 dB/div Log	Ref 15.00 o	lBm					Μ	kr1 3.03 -40.	9 9 GHz 74 dBm	Auto Tune
3										Center Freq
5.00										5.015000000 GHz
-5.00										Start Freq
-15.0										30.000000 MHz
25.0									DL1 -22.38 dBm	
-25.0										Stop Freq 10.00000000 GHz
-35.0	, Marifolistani delina sa sa sa sa	, the Part	1 Justic Chalses R _{burg}	alation of a particular state	alexander (1) (1) (1)	An an An an Anna An		la telengi geter si teleg	(_{maya} tika tarata (141))	CF Step 997.000000 MH2
יין איז איקעאיז משרינה איז 1.55.0	And point of the second se	a seguine the first	and Milderstein av	in the state of th	Welling and south	n de sal de salection direction Alle de la constantion direction de la constantion de la constantion de la constantion de la constantion de la c	n dinter at priperte	وبوالمراجع والمراجع	as provident and a state of the state	<u>Auto</u> Man
										Freq Offset
-65.0										0 Hz
-75.0										Scale Type
Start 30 M #Res BW			#VBW	3.0 MHz		S	weep 1	Stop 10 8.00 ms (3	.000 GHz 0001 pts)	
ISG							STATU	IS		

Plot 7-61. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 6)



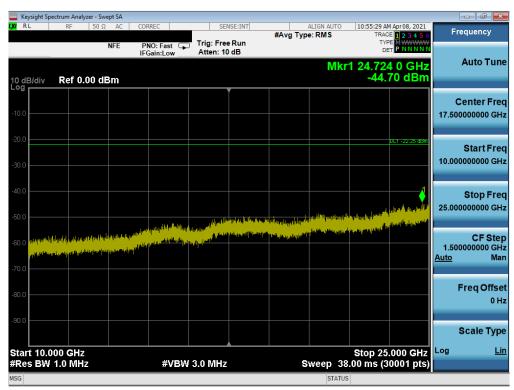
Plot 7-62. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 6)

FCC ID: A3LSMF926B	PCTEST Froud to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage FE of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 55 of 75
© 2021 PCTEST				V 9.0 02/01/2019



Keysight Spectrum Analyzer - Swept SA					- J V
XIRL RF 50 Ω AC		SENSE:INT	#Avg Type: RMS	10:55:08 AM Apr 08, 2021 TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P N N N N N	Frequency
10 dB/div Ref 15.00 dBm	IFGain:Low	Atten: 26 dB	M	lkr1 3.055 2 GHz -40.95 dBm	Auto Tune
5.00					Center Fred 5.015000000 GH;
15.0				DL1 -22.25 dBm	Start Free 30.000000 MH
-25.0	1				Stop Free 10.000000000 GH
-45.0 Magalian and an addition of the second state	t to so the second s	ligger by general of the sector sector de-	kayan ay kana ay katan ta'na ta' kana ay katan Kana ana ang sa katan sa ta'na ta ta ta ta ta	ten litelasseetta senten ette sasta hat partici Menti ese ja etta space, e participate este tente	CF Step 997.000000 MH <u>Auto</u> Ma
65.0					Freq Offse 0 H
-75.0 Start 30 MHz				0100 10.000 0112	Scale Type Log <u>Li</u> i
#Res BW 1.0 MHz	#VBW	3.0 MHz	Sweep 1	8.00 ms (30001 pts)	

Plot 7-63. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 11)



Plot 7-64. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 11)

FCC ID: A3LSMF926B	PCTEST Nout to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 50 of 75	
1M2104190044-12.A3L	03/26 - 05/28/2021	ortable Handset		Page 56 of 75	
© 2021 PCTEST				V 9.0 02/01/2019	



7.7 Radiated Spurious Emission Measurements – Above 1 GHz §15.247(d) §15.205 & §15.209; RSS-Gen [8.9]

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-8 per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [μV/m]	Measured Distance [Meters]
Above 960.0 MHz	500	3

Table 7-8. Radiated Limits

Test Procedures Used

ANSI C63.10-2013 – Section 6.6.4.3 KDB 558074 D01 v05r02 – Sections 8.6, 8.7

Test Settings

Average Field Strength Measurements

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz
- 3. VBW = 3MHz
- 4. Detector = power average (RMS)
- 5. Number of measurement points = 1001 (Number of points must be $\geq 2 \times \text{span/RBW}$)
- 6. Sweep time = auto
- 7. Trace (RMS) averaging was performed over at least 100 traces

Peak Field Strength Measurements

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz
- 3. VBW = 3MHz
- 4. Detector = peak
- 5. Sweep time = auto couple
- 6. Trace mode = max hold
- 7. Trace was allowed to stabilize

FCC ID: A3LSMF926B	PCTEST Nout bite part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 57 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	ortable Handset		Page 57 of 75
© 2021 PCTEST				V 9 0 02/01/2019



Test Setup

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

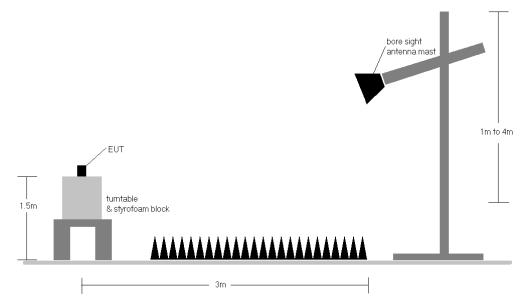


Figure 7-6. Test Instrument & Measurement Setup

Test Notes

- The optional test procedures for antenna port conducted measurements of unwanted emissions per the guidance of KDB 558074 D01 v05r02 were not used to evaluate this device for compliance to radiated limits. All radiated spurious emissions levels were measured in a radiated test setup.
- 2. All emissions lying in restricted bands specified in Section 15.205 and Section 8.10 of RSS-Gen are below the limit shown in Table 7-8.
- 3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- 4. This unit was tested with its standard battery.
- 5. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
- 6. Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 7. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section.
- 8. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

FCC ID: A3LSMF926B	PCTEST Next bite part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 50 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 58 of 75
© 2021 PCTEST	•			V 9.0 02/01/2019



- 9. Some band edge measurements were performed using a channel integration method to determine compliance with the out of band average radiated spurious emissions limit in the 2483.5 2500MHz band. Per KDB 558074 D01 v05r02 Section 13.3, a measurement was performed using a RBW of 100kHz at the frequency with highest emission outside of band edge. For integration that does not start at 2483.5MHz, consideration was taken to ensure the worst case emission is in the 1MHz spectrum. The results were integrated up to the 1MHz reference bandwidth to show compliance with the 15.209 radiated limit for emissions greater than 1GHz.
- 10. For radiated measurements, emissions were investigated for the fully-loaded RU configuration and for all the partially-loaded RU configurations. Among all of the available partially-loaded RU configurations, only the configuration with the worst case emissions is reported.

Sample Calculations

Determining Spurious Emissions Levels

- Field Strength Level [dBµV/m] = Analyzer Level [dBm] + 107 + AFCL [dB/m]
- AFCL [dB/m] = Antenna Factor [dB/m] + Cable Loss [dB]
- Margin [dB] = Field Strength Level [dBμV/m] Limit [dBμV/m]

Radiated Band Edge Measurement Offset

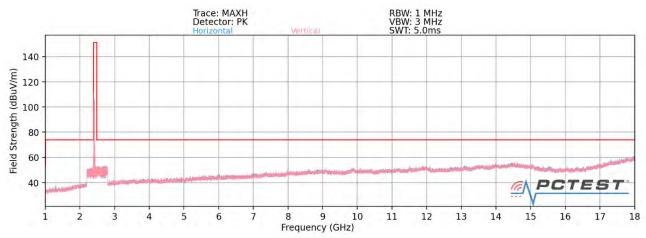
• The amplitude offset shown in the radiated restricted band edge plots in Section 7.7 was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

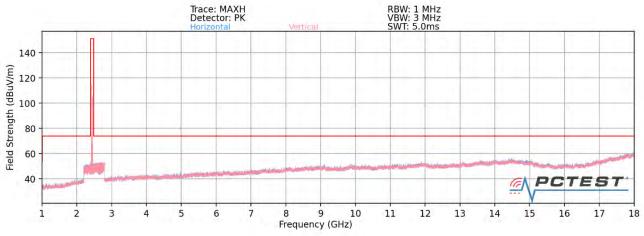
FCC ID: A3LSMF926B	PCTEST Pour lo le part al Brenne	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 50 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 59 of 75
© 2021 PCTEST				V 9.0 02/01/2019



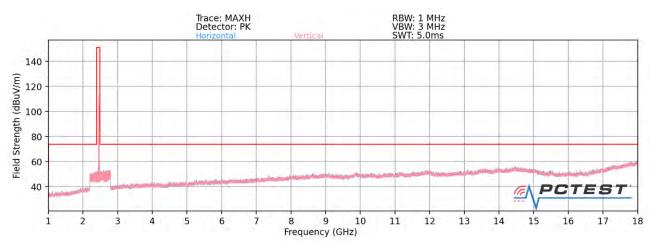
7.7.1 MIMO Radiated Spurious Emission Measurements §15.247(d) §15.205 & §15.209; RSS-Gen [8.9]



Plot 7-65. Radiated Spurious Plot above 1GHz MIMO (802.11ax OFDMA – 26 Tones – Ch. 1) Open



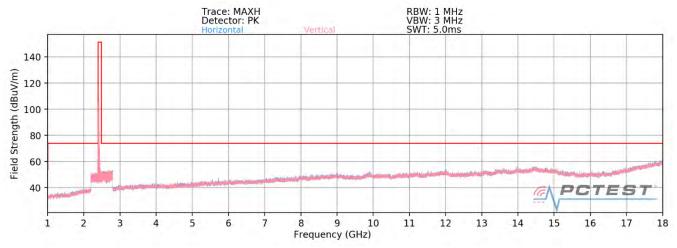
Plot 7-66. Radiated Spurious Plot above 1GHz MIMO (802.11ax OFDMA – 26 Tones – Ch. 6) Open



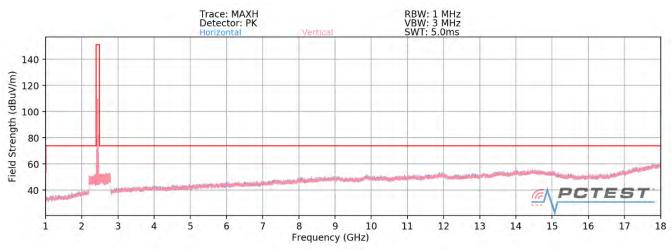
Plot 7-67. Radiated Spurious Plot above 1GHz MIMO (802.11ax OFDMA – 26 Tones – Ch. 11) Open

FCC ID: A3LSMF926B	PCTEST Proud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 60 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 60 of 75
© 2021 PCTEST	· ·			V 9.0 02/01/2019

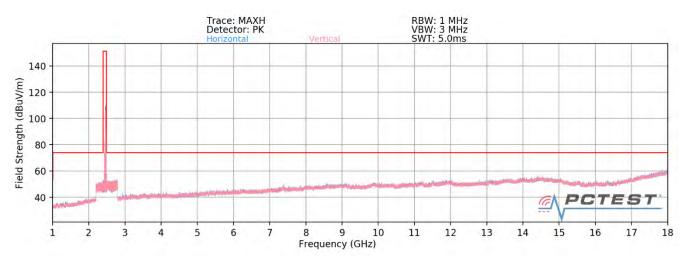








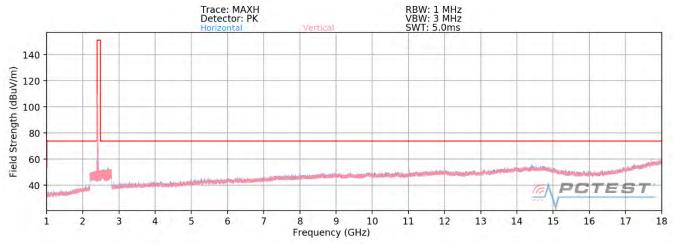




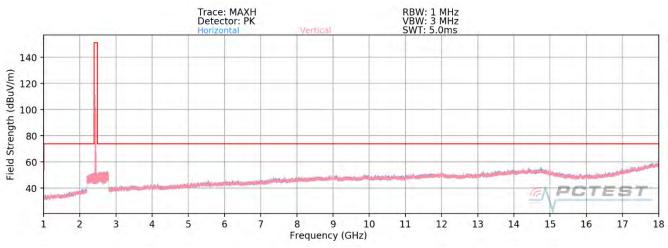
Plot 7-70. Radiated Spurious Plot above 1GHz MIMO (802.11ax OFDMA – 242 Tones – Ch. 11) Open

FCC ID: A3LSMF926B	PCTEST Proud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 61 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 61 of 75
© 2021 PCTEST				V 9.0 02/01/2019

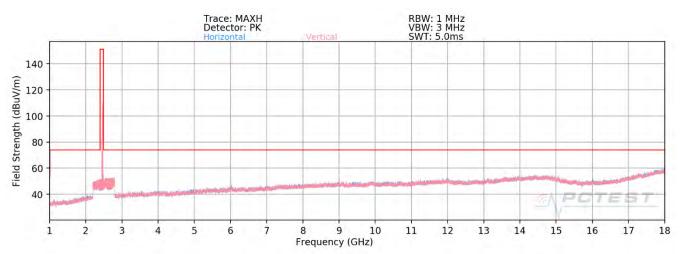








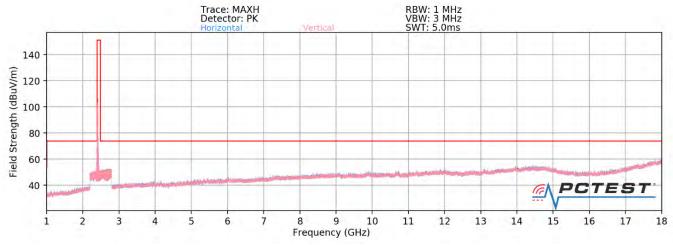




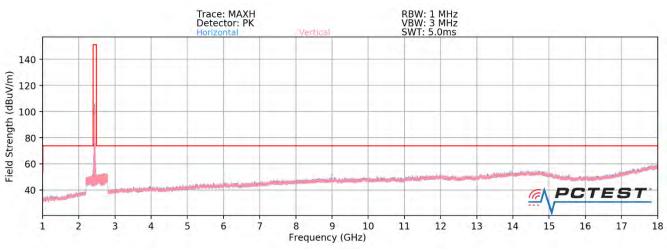
Plot 7-73. Radiated Spurious Plot above 1GHz MIMO (802.11ax OFDMA – 26 Tones – Ch. 11) Closed

FCC ID: A3LSMF926B	PCTEST Proud to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 62 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 62 of 75
© 2021 PCTEST				V 9.0 02/01/2019

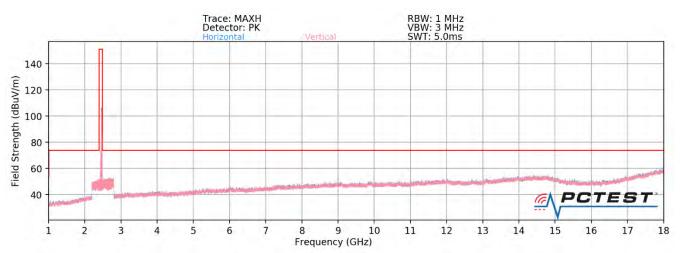










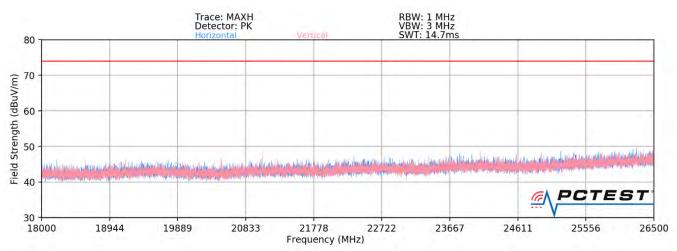


Plot 7-76. Radiated Spurious Plot above 1GHz MIMO (802.11ax OFDMA – 242 Tones – Ch. 11) Closed

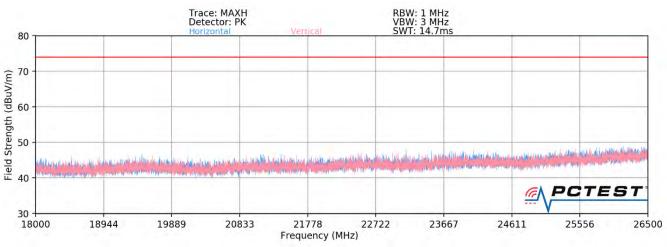
FCC ID: A3LSMF926B	PCTEST Proud to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 00 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 63 of 75
© 2021 PCTEST				V 9.0 02/01/2019



MIMO Radiated Spurious Emissions Measurements (Above 18GHz) §15.209; RSS-Gen [8.9]



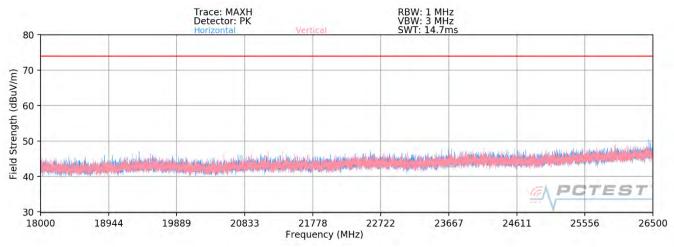
Plot 7-77. Radiated Spurious Plot above 18GHz MIMO (802.11ax OFDMA - 26 Tones) Open



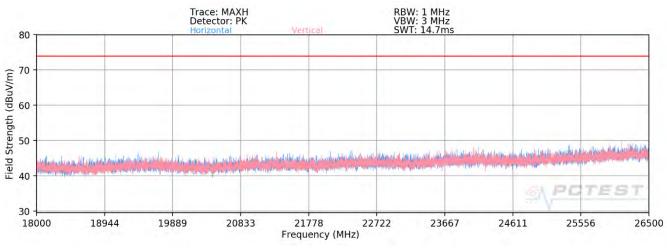
Plot 7-78. Radiated Spurious Plot above 18GHz MIMO (802.11ax OFDMA – 242 Tones) Open

FCC ID: A3LSMF926B	PCTEST Preud to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 64 of 75
1M2104190044-12.A3L 03/26 – 05/28/2021		Portable Handset		Page 64 of 75
© 2021 PCTEST		·		V 9.0 02/01/2019









Plot 7-80. Radiated Spurious Plot above 18GHz MIMO (802.11ax OFDMA – 242 Tones) Closed

FCC ID: A3LSMF926B	PCTEST Preud to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage (E of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 65 of 75
© 2021 PCTEST				V 9.0 02/01/2019



MIMO Radiated Spurious Emission Measurements §15.247(d) §15.205 & §15.209; RSS-Gen [8.9]

Worst Case Mode:	802.11ax OFDMA
Worst Case Transfer Rate:	MCS0
RU Index:	0
Distance of Measurements:	3 Meters
Operating Frequency:	2412MHz
Channel:	01

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4824.00	Avg	V	-	-	-78.56	4.67	33.11	53.98	-20.87
4824.00	Peak	V	-	-	-65.33	4.67	46.34	73.98	-27.64
12060.00	Avg	V	-	-	-81.00	14.67	40.67	53.98	-13.31
12060.00	Peak	V	-	-	-68.75	14.67	52.92	73.98	-21.06

Table 7-9. Radiated Measurements MIMO (26 Tones)

Worst Case Mode: Worst Case Transfer Rate: RU Index: Distance of Measurements: Operating Frequency: Channel: 802.11ax OFDMA MCS0 0 3 Meters 2437MHz 06

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4874.00	Avg	V	-	-	-78.41	5.32	33.91	53.98	-20.07
4874.00	Peak	V	-	-	-65.96	5.32	46.36	73.98	-27.62
7311.00	Avg	V	-	-	-80.04	10.07	37.03	53.98	-16.95
7311.00	Peak	V	-	-	-68.20	10.07	48.87	73.98	-25.11
12185.00	Avg	V	-	-	-81.21	14.54	40.33	53.98	-13.65
12185.00	Peak	V	-	-	-69.04	14.54	52.50	73.98	-21.48

Table 7-10. Radiated Measurements MIMO (26 Tones)

FCC ID: A3LSMF926B	PCTEST Next to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 66 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 66 of 75
© 2021 PCTEST	<u>.</u>	·		V 9.0 02/01/2019



Worst Case Mode:	802.11ax OFDMA
Worst Case Transfer Rate:	MCS0
RU Index:	0
Distance of Measurements:	3 Meters
Operating Frequency:	2462MHz
Channel:	11

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4924.00	Avg	V	-	-	-78.81	5.47	33.66	53.98	-20.32
4924.00	Peak	V	-	-	-66.29	5.47	46.18	73.98	-27.80
7386.00	Avg	V	-	-	-79.67	10.03	37.36	53.98	-16.62
7386.00	Peak	V	-	-	-67.48	10.03	49.55	73.98	-24.43
12310.00	Avg	V	-	-	-81.46	14.63	40.17	53.98	-13.81
12310.00	Peak	V	-	-	-69.62	14.63	52.01	73.98	-21.97

Table 7-11. Radiated Measurements MIMO (26 Tones)

Worst Case Mode: Worst Case Transfer Rate: RU Index: Distance of Measurements: Operating Frequency: Channel:

802.11ax OFDMA MCS0 61 3 Meters 2412MHz 01

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4824.00	Avg	V	-	-	-78.36	4.67	33.31	53.98	-20.67
4824.00	Peak	V	-	-	-66.32	4.67	45.35	73.98	-28.63
12060.00	Avg	V	-	-	-80.89	14.67	40.78	53.98	-13.20
12060.00	Peak	V	-	-	-69.09	14.67	52.58	73.98	-21.40

Table 7-12. Radiated Measurements MIMO (242 Tones)

FCC ID: A3LSMF926B	PCTEST Next to be part of Second	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 67 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 67 of 75
© 2021 PCTEST	-			V 9.0 02/01/2019



Worst Case Mode:	802.11ax OFDMA
Worst Case Transfer Rate:	MCS0
RU Index:	61
Distance of Measurements:	3 Meters
Operating Frequency:	2437MHz
Channel:	06

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4874.00	Avg	V	-	-	-78.81	5.32	33.51	53.98	-20.47
4874.00	Peak	V	-	-	-66.65	5.32	45.67	73.98	-28.31
7311.00	Avg	V	-	-	-80.05	10.07	37.02	53.98	-16.96
7311.00	Peak	V	-	-	-67.68	10.07	49.39	73.98	-24.59
12185.00	Avg	V	-	-	-81.35	14.54	40.19	53.98	-13.79
12185.00	Peak	V	-	-	-69.69	14.54	51.85	73.98	-22.13

Table 7-13. Radiated Measurements MIMO (242 Tones)

802.11ax OFDMA
MCS0
61
3 Meters
2462MHz
11

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4924.00	Avg	V	-	-	-78.75	5.47	33.72	53.98	-20.26
4924.00	Peak	V	-	-	-66.90	5.47	45.57	73.98	-28.41
7386.00	Avg	V	-	-	-79.74	10.03	37.29	53.98	-16.69
7386.00	Peak	V	-	-	-67.85	10.03	49.18	73.98	-24.80
12310.00	Avg	V	-	-	-81.76	14.63	39.87	53.98	-14.11
12310.00	Peak	V	-	-	-69.36	14.63	52.27	73.98	-21.71

Table 7-14. Radiated Measurements MIMO (242 Tones)

FCC ID: A3LSMF926B	PCTEST Next to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 69 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 68 of 75
© 2021 PCTEST	<u>.</u>	·		V 9.0 02/01/2019



Worst Case Mode:	802.11ax OFDMA
Worst Case Transfer Rate:	MCS0
RU Index:	61
Distance of Measurements:	3 Meters
Operating Frequency:	2462MHz
Channel:	11

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4924.00	Avg	V	-	-	-78.52	5.47	33.95	53.98	-20.03
4924.00	Peak	V	-	-	-67.22	5.47	45.25	73.98	-28.73
7386.00	Avg	V	-	-	-79.30	10.03	37.73	53.98	-16.25
7386.00	Peak	V	-	-	-67.96	10.03	49.07	73.98	-24.91
12310.00	Avg	V	-	-	-80.34	14.63	41.29	53.98	-12.69
12310.00	Peak	V	-	-	-68.58	14.63	53.05	73.98	-20.93

Table 7-15. Radiated Measurements MIMO with WCP

FCC ID: A3LSMF926B	PCTEST Prout to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 60 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 69 of 75
© 2021 PCTEST				V 9.0 02/01/2019



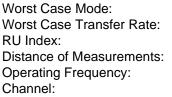
MIMO Radiated Restricted Band Edge Measurements §15.205 §15.209; RSS-Gen [8.9]

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting.

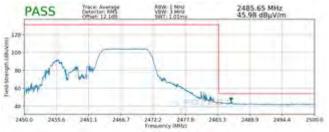
802.11ax OFDMA
MCS0
53
3 Meters
2412MHz
1



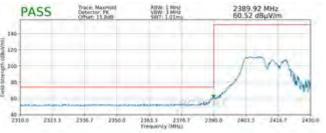
Plot 7-81. Radiated Restricted Lower Band Edge Measurement MIMO (Average – 106 Tones)



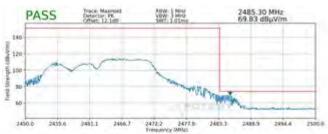
	802.11ax OFDMA
te:	MCS0
	54
nts:	3 Meters
	2462MHz
	11



Plot 7-83. Radiated Restricted Upper Band Edge Measurement MIMO (Average – 106 Tones)



Plot 7-82. Radiated Restricted Lower Band Edge Measurement MIMO (Peak – 106 Tones)

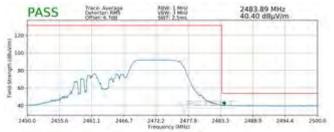


Plot 7-84. Radiated Restricted Upper Band Edge Measurement MIMO (Peak – 106 Tones)

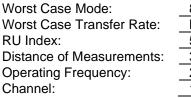
FCC ID: A3LSMF926B	PCTEST Next bite part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 70 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 70 of 75
© 2021 PCTEST	-			V 9.0 02/01/2019



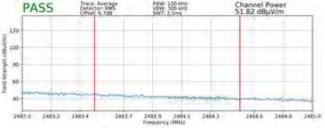
Worst Case Mode:	802.11ax OFDMA
Worst Case Transfer Rate:	MCS0
RU Index:	54
Distance of Measurements:	3 Meters
Operating Frequency:	2467MHz
Channel:	12

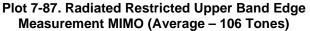


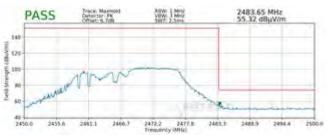
Plot 7-85. Radiated Restricted Lower Band Edge Measurement MIMO (Average – 106 Tones)



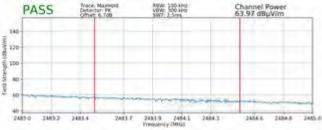
	802.11ax OFDMA
te:	MCS0
	54
nts:	3 Meters
	2472MHz
	13







Plot 7-86. Radiated Restricted Lower Band Edge Measurement MIMO (Peak – 106 Tones)

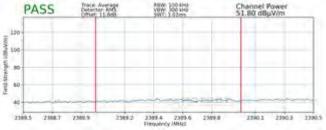


Plot 7-88. Radiated Restricted Upper Band Edge Measurement MIMO (Peak – 106 Tones)

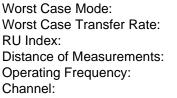
FCC ID: A3LSMF926B	Read to be part of &	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 71 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 71 of 75
© 2021 PCTEST		·		V 9.0 02/01/2019



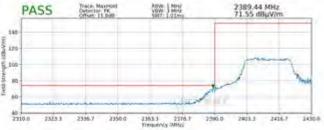
Worst Case Mode:	802.11ax OFDMA
Worst Case Transfer Rate:	MCS0
RU Index:	61
Distance of Measurements:	3 Meters
Operating Frequency:	2412MHz
Channel:	1



Plot 7-89. Radiated Restricted Lower Band Edge Measurement MIMO (Average – 242 Tones)



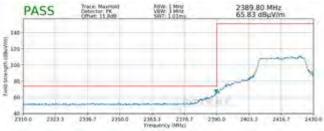
	802.11ax OFDMA	
e:	MCS0	
	61	
s:	3 Meters	
	2417MHz	
	2	



Plot 7-90. Radiated Restricted Lower Band Edge Measurement MIMO (Peak – 242 Tones)



Plot 7-91. Radiated Restricted Lower Band Edge Measurement MIMO (Average – 242 Tones)

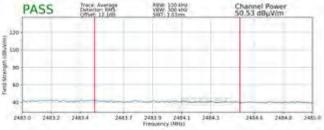


Plot 7-92. Radiated Restricted Lower Band Edge Measurement MIMO (Peak – 242 Tones)

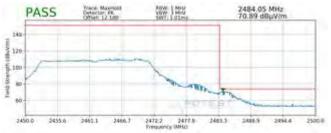
FCC ID: A3LSMF926B	Rout ble part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 70 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 72 of 75
© 2021 PCTEST				V 9.0 02/01/2019



Worst Case Mode:	802.11ax OFDMA
Worst Case Transfer Rate:	MCS0
RU Index:	61
Distance of Measurements:	3 Meters
Operating Frequency:	2462MHz
Channel:	11

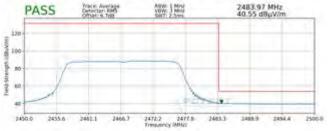






Plot 7-94. Radiated Restricted Upper Band Edge Measurement MIMO (Peak – 242 Tones)

Worst Case Mode:	802.11ax OFDMA
Worst Case Transfer Rate:	MCS0
RU Index:	61
Distance of Measurements:	3 Meters
Operating Frequency:	2467MHz
Channel:	12





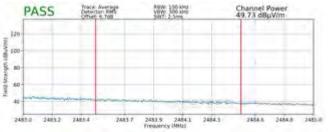


Plot 7-96. Radiated Restricted Lower Band Edge Measurement MIMO (Peak – 242 Tones)

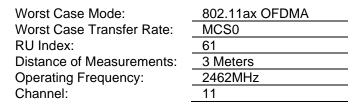
FCC ID: A3LSMF926B	Road to be part of &	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 72 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 73 of 75
© 2021 PCTEST	·			V 9.0 02/01/2019

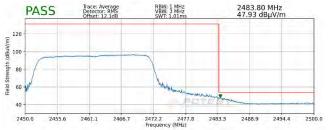


Worst Case Mode:	802.11ax OFDMA
Worst Case Transfer Rate:	MCS0
RU Index:	61
Distance of Measurements:	3 Meters
Operating Frequency:	2472MHz
Channel:	13

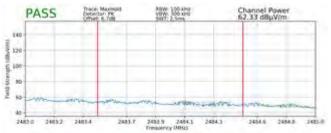


Plot 7-97. Radiated Restricted Upper Band Edge Measurement MIMO (Average – 242 Tones)

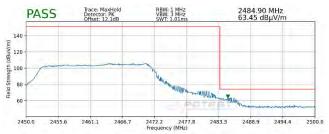




Plot 7-99. Radiated Restricted Band Edge Measurement MIMO with WCP (Average)



Plot 7-98. Radiated Restricted Upper Band Edge Measurement MIMO (Peak – 242 Tones)



Plot 7-100. Radiated Restricted Band Edge Measurement MIMO with WCP (Peak)

FCC ID: A3LSMF926B	PCTEST Rout bite part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 74 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 74 of 75
© 2021 PCTEST	•	·		V 9.0 02/01/2019



8.0 **CONCLUSION**

The data collected relate only the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMF926B** is in compliance with Part 15 Subpart C (15.247) of the FCC Rules.

FCC ID: A3LSMF926B	PCTEST Prout to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 75 of 75
1M2104190044-12.A3L	03/26 - 05/28/2021	Portable Handset		Page 75 of 75
© 2021 PCTEST				V 9.0 02/01/2019