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MEASUREMENT REPORT FCC PART 15.407 UNII OFDMA

Applicant Name:

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

Date of Testing: 9/14/2021 - 11/12/2021 Test Report Issue Date: 11/19/2021 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M2112100159-08.A3L

FCC ID:

A3LSMS908JPN

APPLICANT:

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

Certification

Samsung Electronics Co., Ltd.

SC-52C SCG14 Portable Handset 5180 – 5885MHz OFDMA Unlicensed National Information Infrastructure TX (NII) Part 15 Subpart E (15.407) ANSI C63.10-2013, KDB 789033 D02 v02r01, KDB 648474 D03 v01r04, KDB 662911 D01 v02r01 KDB 291074 DR01 v01

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 789033 D02 v02r01. 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



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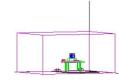


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	Channel		MIMO			
UNII Band	Channel Bandwidth (MHz)	Tx Frequency (MHz)	Max. Power (mW)	Max. Power (dBm)		
1		5180 - 5240	62.661	17.97		
2A		5260 - 5320	62.806	17.98		
2C	20	5500 - 5720	67.453	18.29		
3		5745 - 5825	70.632	18.49		
4		5845 - 5885	29.580	14.71		
1		5190 - 5230	66.681	18.24		
2A		5270 - 5310	70.632	18.49		
2C	40	5510 - 5710	70.632	18.49		
3		5755 - 5795	70.632	18.49		
4		5835 - 5875	31.477	14.98		
1		5210	68.865	18.38		
2A		5290	68.549	18.36		
2C	80	5530 - 5690	70.469	18.48		
3		5775	69.183	18.40		
4		5855	32.810	15.16		
1/2A		5250	70.632	18.49		
2C	160	5570	70.632	18.49		
3/4		5815	33.266	15.22		
EUT Overview						

Note: UNII Band 4 powers shown in the table above are EIRP values.

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1.0 INTRODUCTION

1.1 Scope

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

1.2 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.

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PRODUCT INFORMATION 2.0

2.1 **Equipment Description**

The Equipment Under Test (EUT) is the Samsung Portable Handset FCC ID: A3LSMS908JPN. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter.

Test Device Serial No.: 0501M, 0579M, 3922M, 0299M, 0545M

2.2 **Device Capabilities**

This device contains the following capabilities:

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

	Band 1		Band 2A		Band 2C		Band 3			Band 4
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)		Ch.	Frequency (MHz)
36	5180	52	5260	100	5500	149	5745		169	5845
:	:	:	-	:	:	:	:		•••	:
40	5200	56	5280	120	5600	157	5785		173	5865
:	:	:	:	:	:	:	:		:	:
48	5240	64	5320	144	5720	165	5825] [177	5885

Table 2-1. 802.11a / 802.11n / 802.11ac / 802.11ax (20MHz) Frequency / Channel Operations

	Band 1
Ch.	Frequency (MHz)
38	5190
	:
46	5230

	Band 2A
Ch.	Frequency (MHz)
54	5270
	:
62	5310

Ch.

58

	Band 2C
Ch.	Frequency (MHz)
102	5510
118	5590
•••	••
142	5710

	Band 3
Ch.	Frequency (MHz)
151	5755
•••	:
159	5795

Band	4

Ch.	Frequency (MHz)
167	5835
:	:
175	5875

Table 2-2. 802.11n / 802.11ac / 802.11ax (40MHz BW) Frequency / Channel Operations

Band 2C

Frequency

Band 1	
Frequency	

Ch.	(MHz)	
42	5210	

Band 2A				
Frequency (MHz)	Ch.			
5290	106			
	:			
	138			

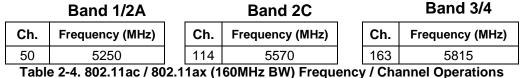
	(MHz)	
06	5530	
:	• •	
38	5690	

	Band 3
Ch.	Frequency (MHz)
155	5775

Band 4

Ch.	Frequency (MHz)
171	5855

Table 2-3. 802.11ax (80MHz BW) Frequency / Channel Operation



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Notes:

5GHz NII operation is possible in 20MHz, and 40MHz, and 80MHz channel bandwidths. 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 B)2)b) of ANSI C63.10-2013 and KDB 789033 D02 v02r01. 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	Bandwidth [MHz]	Tone	Duty Cycle	
			26T	99.0	
802.11ax	MIMO CDD	20	52T	97.7	
NII RU		20	106T	95.8	
			242T	93.4	
			26T	98.9	
802.11ax			52T	98.0	
NII RU	MIMO CDD	40	106T	96.1	
			242T	92.8	
			484T	90.9	
	MIMO CDD		26T	98.9	
			52T	98.3	
802.11ax		80	106T	96.5	
NII RU			242T	93.9	
			484T	90.0	
			996T	90.3	
		160 L	26T	99.0	
	MIMO CDD		52T	97.9	
802.11ax			106T	96.0	
NII RU			242T	95.6	
			484T	92.0	
			996T	91.5	
			26T	99.0	
			52T	97.9	
802.11ax	MIMO CDD	160	106T	96.0	
NII RU		U	242T	91.9	
			484T	91.3	
			996T	90.7	

Table 2-5. Measured Duty Cycles

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

WiFi Configurations		SDM		CDD	
		ANT1	ANT2	ANT1	ANT2
	11ax (20MHz)	✓	✓	✓	✓
5GHz	11ax (40MHz)	✓	✓	✓	✓
	11ax (80MHz)	✓	✓	✓	✓
	11ax (160MHz)	✓	✓	✓	✓

Table 2-6. Frequency / Channel Operations

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

3. This device supports simultaneous transmission operation, which allows for two SISO channels to operate independent of one another in the 2.4GHz (WLAN & BT) and 5GHz bands simultaneously on each antenna. The following tables show the worst case configurations determined during testing. The data for these configurations is contained in this test report. The BT + 5GHz case is not considered as worst case since the BT power is lower than the 2.4GHz WLAN power.

Configuration 1: ANT1 transmitting in 2.4GHz mode and ANT2 in 5GHz mode

Description	2.4 GHz Emission	5 GHz Emission
Antenna	1,2	1,2
Channel	6	100
Operating Frequency (MHz)	2437	5500
Data Rate (Mbps)	1	6
Mode	802.11b	802.11a

Table 2-7. Config-1 (ANT1 2.4GHz & ANT2 5GHz)

Configuration 2: ANT1 and ANT2 transmitting in 2.4GHz and 6GHz mode

Description	2.4 GHz Emission	6 GHz Emission
Antenna	1,2	1,2
Channel	6	25
Operating Frequency (MHz)	2437	6075
Data Rate (Mbps)	1	6
Mode	802.11b	802.11a

Table 2-8. Config-1 (ANT1 2.4GHz & ANT2 6GHz)

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Configuration 3: ANT1 and ANT2 both transmitting in Bluetooth and 5GHz modes simultaneously

Description	Bluetooth Emission	5 GHz Emission
Antenna	1,2	1,2
Channel	39	120
Operating Frequency (MHz)	2441	5600
Data Rate (Mbps)	1Mbps	6
Mode	ePA	802.11a

Table 2-9. Config-1 (ANT1 2.4GHz & ANT2 5GHz)

Configuration 4: ANT1 and ANT2 both transmitting in Bluetooth and 6GHz modes simultaneously

Description	Bluetooth Emission	6 GHz Emission
Antenna	1,2	1,2
Channel	39	117
Operating Frequency (MHz)	2441	6535
Data Rate (Mbps)	1Mbps	6Mbps
Mode	ePA	а

Table 2-10. Config-1 (ANT1 2.4GHz & ANT2 6GHz)

2.3 Antenna Description

Following antenna was used for the testing.

Frequency [GHz]	Antenna 1 Gain (dBi)	Antenna 2 Gain (dBi)	Directional Gain (dBi)
5.25	-6.12	-8.14	-4.06
5.35	-6.88	-7.57	-4.21
5.50	-5.68	-7.39	-3.48
5.80	-6.53	-6.04	-3.27
5.895	-6.32	-6.33	-3.31

Table 2-11. Antenna Peak Gain

2.4 Test Configuration

The EUT was tested per the guidance of KDB 789033 D02 v02r01. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing.

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

2.5 Software and Firmware

The test was conducted with firmware version S908WVLU0AUI8 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.

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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 789033 D02 v02r01 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 414788 D01 v01r01.

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).

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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 connection to an external antenna.

Conclusion:

The EUT complies with the requirement of §15.203.

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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

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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)	9/7/2021	Annual	9/7/2022	WL25-1
-	WL25-2	Conducted Cable Set (25GHz)	9/7/2021	Annual	9/7/2022	WL25-2
-	WL25-3	Conducted Cable Set (25GHz)	9/7/2021	Annual	9/7/2022	WL25-3
-	WL40-1	Conducted Cable Set (40GHz)	9/10/2021	Annual	9/10/2022	WL40-1
Agilent	N9038A	MXE EMI Receiver	8/11/2020	Annual	12/1/2021	MY51210133
Agilent	N9030A	PXA Signal Analyzer (44GHz)	7/21/2021	Annual	7/21/2022	MY49430494
Anritsu	ML2495A	Power Meter	1/18/2021	Annual	1/18/2022	941001
Anritsu	MA2411B	Pulse Power Sensor	3/8/2021	Annual	3/8/2022	1339007
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Emco	3116C	Horn Antenna (18 - 40GHz)	5/11/2021	Biennial	5/11/2023	218893
ETS-Lindgren	3816/2NM	Line Impedance Stabilization Network	7/9/2020	Biennial	7/9/2022	114451
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	8/17/2020	Annual	12/17/2021	MY52350166
Pasternack	NMLC-2	Line Conducted Emissions Cable (NM)	9/10/2021	Annual	9/10/2022	NMLC-2
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	7/21/2021	Annual	7/12/2022	MY49430494
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	8/3/2021	Annual	8/3/2022	100342
Rohde & Schwarz	ESW44	EMI Test Receiver 2Hz to 44GHz	1/21/2021	Annual	1/21/2022	101716
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	9/3/2021	Annual	9/3/2022	102138

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.

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7.0 TEST RESULTS

7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.
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FCC Classification:	Unlicensed National Information Infrastructure (UNII)

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
N/A	26dB Bandwidth	N/A		PASS	Section 7.2
15.407(e)	6dB Bandwidth	>500kHz(5725-5850MHz)		PASS	Section 7.3
15.407 (a.1.iv), (a.2), (a.3)	Maximum Conducted Output Power	Maximum conducted powers must meet the limits detailed in 15.407 (a) (RSS- 247 [6.2])		PASS	Section 7.4
15.407(a)(3)(iii)	e.i.r.p.(UNII-4)	30dBm	CONDUCTED	PASS	Section 7.4
15.407 (a.1.iv), (a.2), (a.3)	Maximum Power Spectral Density	Maximum power spectral density must meet the limits detailed in 15.407 (a) (RSS-247 [6.2])	CONDUCTED	PASS	Section 7.5
15.407(a)(3)(iii)	Maximum e.i.r.p. Density (UNII-4)	14dBm/MHz		PASS	Section 7.5
15.407(h)	Dynamic Frequency Selection	See DFS Test Report		PASS	See DFS Test Report
15.407(b.1), (2), (3), (4)	Undesirable Emissions	Undesirable emissions must meet the limits detailed in 15.407(b) (RSS-247 [6.2])	RADIATED	PASS	Section 7.6
15.205, 15.407(b.1), (4), (5), (6)	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])		PASS	Section 7.6, 7.7

Table 7-1. Summary of Test Results

Notes:

- 1) All channels, modes, and modulations/data rates were investigated among all UNII bands. 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 "UNII Automation," Version 4.7.
- 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.
- 6) Per RSS-247 Section 6.2.3, transmission on channels which overlap the 5600-5650 MHz is prohibited. This device operates under these frequencies only under the control of a certified master device and does not support active scanning on these channels. This device does not transmit any beacons or initiate any transmissions in UNII Bands 2A or 2C.
- 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.
- 8) Only one RU index could be selected at a time so no contiguous or non-contiguous RU's were considered for testing.

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7.2 26dB Bandwidth Measurement – 802.11ax OFDMA RSS-Gen [6.2]

Test Overview and Limit

The bandwidth at 26dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2013 and KDB 789033 D02 v02r01, and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26dB bandwidth.

The 26dB bandwidth is used to determine the conducted power limits.

Test Procedure Used

ANSI C63.10-2013 – Section 12.4 KDB 789033 D02 v02r01 – Section C

Test Settings

- The signal analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 26. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = approximately 1% of the emission bandwidth
- 3. VBW <u>></u> 3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold

Test Setup

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



Figure 7-1. Test Instrument & Measurement Setup

Test Notes

The 26dB Bandwidth measurement for each channel was measured with the RU index showing the highest conducted power.

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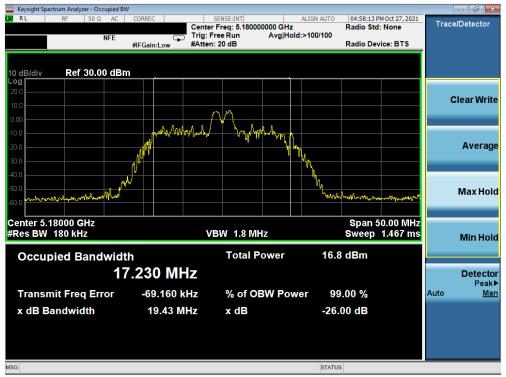
MIMO Antenna-1 26 dB Bandwidth Measurements (26 Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
	5180	36	ax (20MHz)	26T	MCS0	19.43
_	5200	40	ax (20MHz)	26T	MCS0	19.36
Band 1	5240	48	ax (20MHz)	26T	MCS0	18.88
Bar	5190	38	ax (40MHz)	26T	MCS0	22.50
	5230	46	ax (40MHz)	26T	MCS0	22.03
	5210	42	ax (80MHz)	26T	MCS0	41.70
Band 1/2A	5250	50	ax (160MHz L)	26T	MCS0	46.19
Ba 1//	5250	50	ax (160MHz U)	26T	MCS0	24.42
	5260	52	ax (20MHz)	26T	MCS0	19.00
∢	5280	56	ax (20MHz)	26T	MCS0	18.87
Band 2A	5320	64	ax (20MHz)	26T	MCS0	18.66
3an	5270	54	ax (40MHz)	26T	MCS0	21.57
	5310	62	ax (40MHz)	26T	MCS0	21.71
	5290	58	ax (80MHz)	26T	MCS0	38.57
	5500	100	ax (20MHz)	26T	MCS0	18.82
	5600	120	ax (20MHz)	26T	MCS0	18.35
	5720	144	ax (20MHz)	26T	MCS0	18.60
	5510	102	ax (40MHz)	26T	MCS0	22.25
2C	5590	118	ax (40MHz)	26T	MCS0	22.01
Band 2C	5710	142	ax (40MHz)	26T	MCS0	19.01
Ba	5530	106	ax (80MHz)	26T	MCS0	37.50
	5610	122	ax (80MHz)	26T	MCS0	20.95
	5690	138	ax (80MHz)	26T	MCS0	38.66
	5570	114	ax (160MHz L)	26T	MCS0	38.91
	5570	114	ax (160MHz U)	26T	MCS0	22.03

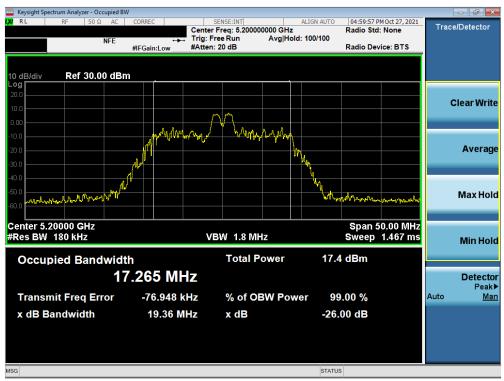
Table 7-2. Conducted Bandwidth Measurements MIMO ANT1 (26 Tones)

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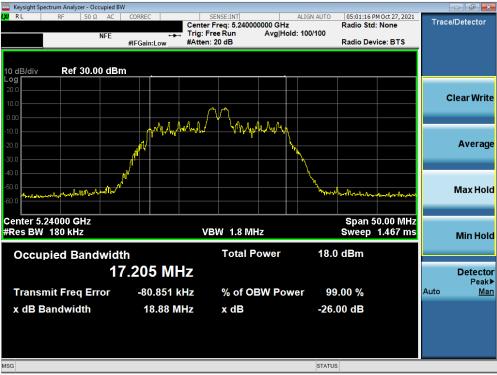
Plot 7-1. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 36)



Plot 7-2. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 40)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
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Plot 7-3. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 48)



Plot 7-4. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 38)

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Plot 7-5. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 46)



Plot 7-6. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 42)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
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Plot 7-7. 26dB Bandwidth Plot MIMO ANT1 (160MHz BW L 802.11ax - 26 Tones (UNII Band 1/2A) - Ch. 50)



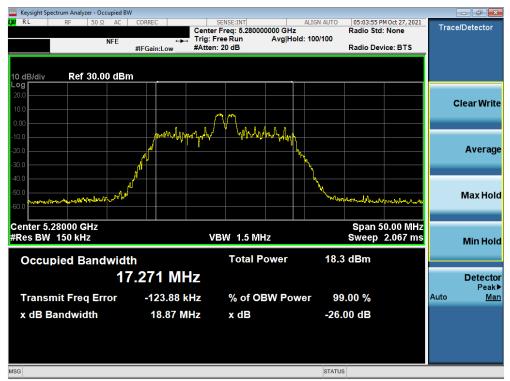
Plot 7-8. 26dB Bandwidth Plot MIMO ANT1 (160MHz BW U 802.11ax - 26 Tones (UNII Band 1/2A) - Ch. 50)

FCC ID: A3LSMS908JPN	PCTEST [®] Proud to be part of ® element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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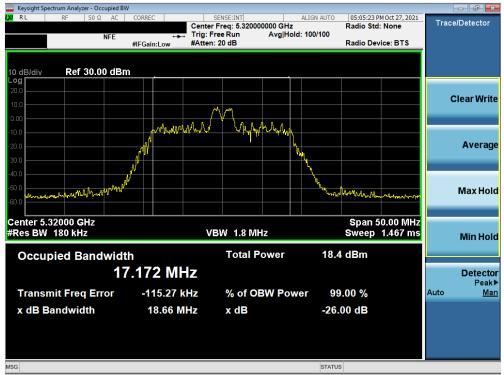
Plot 7-9. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 52)



Plot 7-10. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-11. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 64)



Plot 7-12. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 54)

FCC ID: A3LSMS908JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
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Keysight Spectrum Analyzer - Occupied BW		- I			-		(
LXXIRL RF 50Ω AC CO		SENSE:INT enter Freq: 5.31000	0000 GHz	LIGN AUTO	05:26:29 P Radio Std:	M Oct 27, 2021 None	Trace	e/Detector
NFE #IF		rig: Free Run Atten: 20 dB	Avg Hold:	100/100	Radio Dev	ice: BTS		
	Gameen							
10 dB/div Ref 30.00 dBm								
Log 20.0								
10.0							c	Clear Write
0.00		<u> </u>						
-10.0	MAMM	r/₩/ \						
-20.0		1. A.						Average
-30.0	<u>/</u>	مېلىرسى	M. W. West					
-40.0			<u> </u>					
-50.0				What land				Max Hold
-60.0				· Long of particular	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	han manager and the states of		
Center 5.31000 GHz					Snan 1	00.0 MHz		
#Res BW 220 kHz		VBW 2.2 M	lz			1.933 ms		Min Hold
		Total P		40.7	dBm			Millinoid
Occupied Bandwidth			ower	18.7	aBm			
19.8	36 MHz							Detector Peak►
Transmit Freq Error	8.2151 MHz	% of Ol	BW Powe	r 99	.00 %		Auto	Man
x dB Bandwidth	21.71 MHz	x dB		-26.0	00 dB			
MSG				STATUS				

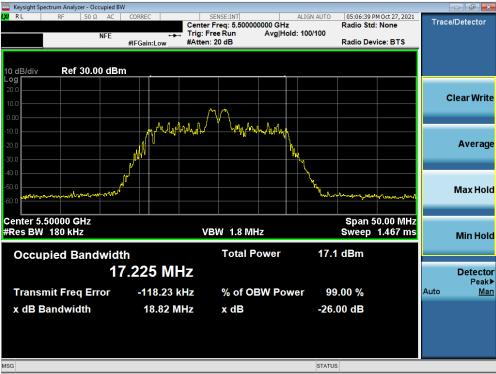
Plot 7-13. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 62)



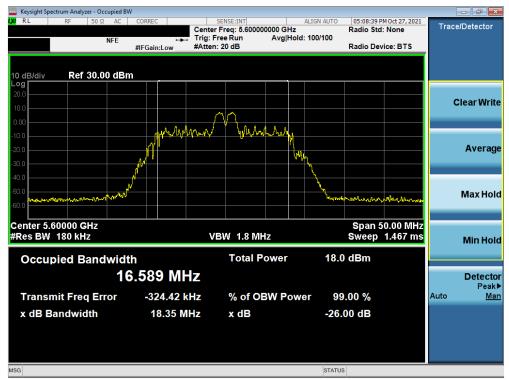
Plot 7-14. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager				
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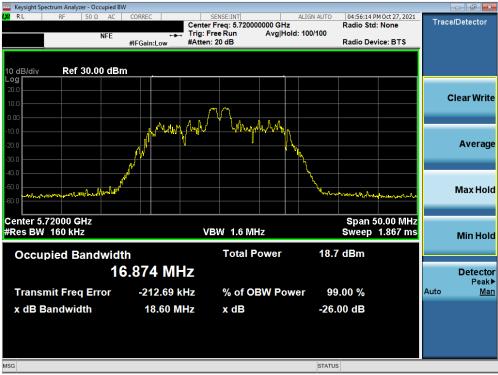
Plot 7-15. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 100)



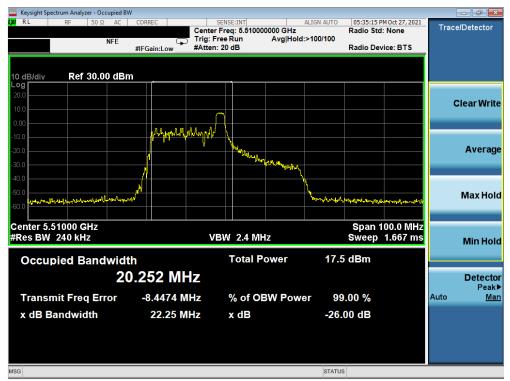
Plot 7-16. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMS908JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
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Plot 7-17. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 144)



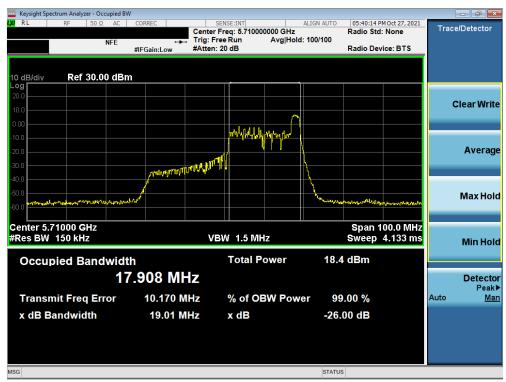
Plot 7-18. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
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Plot 7-19. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 118)



Plot 7-20. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMS908JPN	PCTEST ° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🚾 Keysight Spectrum Analyzer - Occupied BW							
LX RL RF 50Ω AC		sense:INT enter Freq: 5.530000			9 PM Oct 27, 2021 Std: None	Trace	Detector
NFE		ig: Free Run tten: 20 dB	Avg Hold: 10		evice: BTS		
	#IFGall.Low #/	aten. 20 ab		Tradio 1	Jethice: Bird		
10 dB/div Ref 30.00 dBm							
Log 20.0							
10.0						с	lear Write
0.00		<u>M</u>					
-10.0		warry men pour					
-20.0	, 1	· · ·					Average
-30.0	- ALLahalahar W		WWW. HUN				
-40.0							
-50.0	<u>/</u>		<u>`</u>	margen Marman Marken	Magunan		Max Hold
-60.0							
Center 5.5300 GHz				Spar	200.0 MHz		
#Res BW 430 kHz		VBW 4 MHz			weep 1 ms		Min Hold
Occupied Bandwidt	b	Total Po	ower	17.7 dBm			
	.632 MHz	roturi e					Detector
30							Detector Peak▶
Transmit Freq Error	242.96 kHz	% of OB	W Power	99.00 %		Auto	<u>Man</u>
x dB Bandwidth	37.50 MHz	x dB		-26.00 dB			
MSG				STATUS			

Plot 7-21. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 106)



Plot 7-22. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 122)

FCC ID: A3LSMS908JPN	PCTEST ° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:		Dama 00 at 040			
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Keysight Spectrum Ana	alyzer - Occup	oied BW									
LX/RL RF	50 Ω	AC COF	RREC		NSE:INT		ALIGN AUTO		M Oct 27, 2021	Trac	e/Detector
			_	Center Fr Trig: Free	req: 5.69000	00000 GHz Avg Hold:	>100/100	Radio Std	None	mac	cibereetoi
	NF		Gain:Low	#Atten: 2		Avginoid.	- 100/100	Radio Dev	ice: BTS		
	ef 30.00 (dBm									
20.0											
											Clear Write
10.0				f f	η						
0.00											
-10.0				and graph	L-Wigner's	l					
-20.0											Average
			MMM			MM					/ troi ugo
-30.0			N			Willing .					
-40.0		(l				
-50.0		J.					have some to	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			Max Hold
-60.0	tadas Assesses a						- A Martin Martin	0.010	ար փորուրի ստվել		maxinoid
Center 5.6900 G	SHz							Span 2	00.0 MHz		
#Res BW 430 k	Hz			VBV	N 4 MHz				ep 1 ms		Min Hold
											Minitiona
Occupied	Bandw	/idth			Total F	ower	19.8	dBm			
			91 MF								Detector
		30.1		12							Detector Peak▶
Transmit Fre	eq Erro	r ·	-368.22 k	Hz	% of O	BW Powe	er 99	.00 %		Auto	Man
x dB Bandw	idth		38.66 M	H7	x dB		-26	00 dB			
	iuui		30.00 M	112	A UD		-20.				
										_	
MSG							STATUS				

Plot 7-23. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 138)



Plot 7-24. 26dB Bandwidth Plot MIMO ANT1 (160MHz BW L 802.11ax - 26 Tones (UNII Band 2C) - Ch. 114)

FCC ID: A3LSMS908JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager				
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	ectrum Analyz													
L <mark>XI</mark> RL	RF	50 Ω	AC	CORREC	2		ENSE:INT		0000 GHz	ALIGN AUTO	07:01:06 F	M Oct 27, 2021	Trac	e/Detector
			NFE			, Trig: Fr	ee Run		Avg Hold	I: 100/100				
				#IFGair	n:Low	#Atten:	20 dB				Radio De	vice: BTS		
10 dB/div Log	Ref	30.00) dBm				_							
20.0														
10.0														Clear Write
0.00													_	
-10.0							WILMA							
-20.0							/	<u>ا</u>						Average
-30.0						and and the		<u>Ц</u> ц.						J
-40.0					MARKAN MAR	HIN ST		- Mil	halled and					
-50.0				e contraction of the second					- VII.	APPin L				
	horwalloppen	mon	- ANDER							mareles		-		Max Hold
-60.0														
Center 5												350.0 MHz		
#Res BW	270 kH	Z				VE	3W 2.	7 MI	z		Sweep	4.467 ms		Min Hold
000	pied B	and	widt	h			Tot	al P	ower	19 () dBm			
Occu	pieu D	anu					100	un		10.0				
			20	.18	6 MI	ΗZ								Detector Peak▶
Trans	mit Fred	q Err	or	8.6	6040 N	IHz	% o	f OE	BW Pow	er 99	9.00 %		Auto	<u>Man</u>
x dB E	Bandwic	lth		2	2.03 N	IHz	x d	В		-26	00 dB			
MSG										STATU	s			
										OTATO				

Plot 7-25. 26dB Bandwidth Plot MIMO ANT1 (160MHz BW U 802.11ax – 26 Tones (UNII Band 2C) – Ch. 114)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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MIMO Antenna-1 26 dB Bandwidth Measurements (Full Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
	5180	36	ax (20MHz)	242T	MCS0	22.08
	5200	40	ax (20MHz)	242T	MCS0	21.58
Band 1	5240	48	ax (20MHz)	242T	MCS0	21.68
Bar	5190	38	ax (40MHz)	484T	MCS0	42.03
	5230	46	ax (40MHz)	484T	MCS0	40.25
	5210	42	ax (80MHz)	996T	MCS0	91.17
Band 1/2A	5250	50	ax (160MHz L)	996T	MCS0	187.20
Ba 1//	5250	50	ax (160MHz U)	996T	MCS0	114.80
	5260	52	ax (20MHz)	242T	MCS0	21.60
	5280	56	ax (20MHz)	242T	MCS0	21.83
Band 2A	5320	64	ax (20MHz)	242T	MCS0	21.58
Bane	5270	54	ax (40MHz)	484T	MCS0	40.00
	5310	62	ax (40MHz)	484T	MCS0	40.20
	5290	58	ax (80MHz)	996T	MCS0	81.43
	5500	100	ax (20MHz)	242T	MCS0	21.49
	5600	120	ax (20MHz)	242T	MCS0	21.45
	5720	144	ax (20MHz)	242T	MCS0	21.50
	5510	102	ax (40MHz)	484T	MCS0	40.22
S	5590	118	ax (40MHz)	484T	MCS0	40.32
Band 2C	5710	142	ax (40MHz)	484T	MCS0	40.26
B	5530	106	ax (80MHz)	996T	MCS0	81.25
	5610	122	ax (80MHz)	996T	MCS0	81.70
	5690	138	ax (80MHz)	996T	MCS0	81.41
	5570	114	ax (160MHz L)	996T	MCS0	117.40
	5570	114	ax (160MHz U)	996T	MCS0	104.80

Table 7-3. Conducted Bandwidth Measurements MIMO ANT1 (Full Tones)

FCC ID: A3LSMS908JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N: Test Dates:		EUT Type:		Dage 20 of 242	
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🔤 Keysight Spectrum Analyzer - Oc	cupied BW								
LX/ RL RF 50Ω	AC CORRE		ENSE:INT		ALIGN AUTO	04:58:47 PI Radio Std:	4 Oct 27, 2021	Trac	e/Detector
	NFE	Trig: Fr	Freq: 5.18000 ee Run	Avg Hold	1: 100/100	Radio Std:	None		
		in:Low #Atten:				Radio Dev	ice: BTS		
	A								
10 dB/div Ref 30.0	U aBm								
20.0									
10.0								0	Clear Write
			a manufactorer						
0.00	l l		Y						
-10.0	/				<u> </u>				
-20.0					N				Average
30.0	manyan				hotros				-
-30.0 -40.0 +++++++++++++++++++++++++++++++++++					ղ իստ	mom			
							Whenty		
-50.0									Max Hold
-60.0									
Center 5.18000 GHz							0.00 MHz		
#Res BW 220 kHz		VE	SW 2.2 MH	Z		Swe	ep 1 ms		Min Hold
			_						
Occupied Band	width		Total P	ower	22.5	dBm			
	19 14	6 MHz							Detector
									Peak▶
Transmit Freq Er	ror -2	2.911 kHz	% of O	3W Pow	er 99	.00 %		Auto	Man
x dB Bandwidth	2	22.08 MHz	x dB		-26.0	00 dB			
x ab Ballamaal	-		AUB		20.0				
MSG					STATUS				

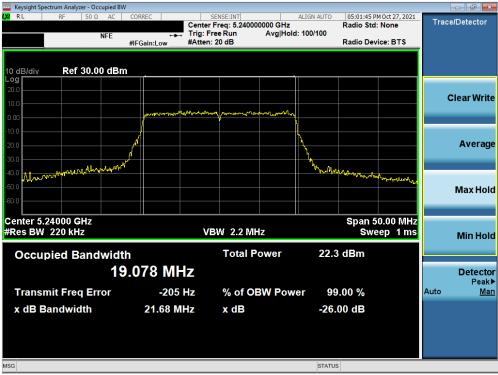
Plot 7-26. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 1) - Ch. 36)



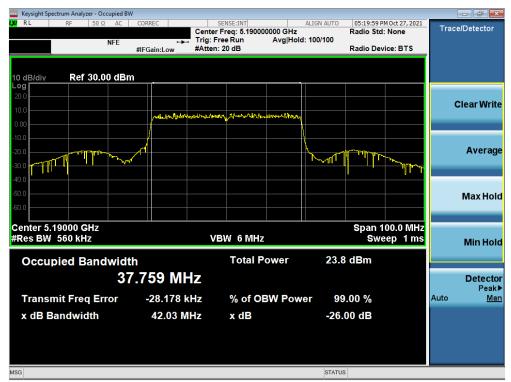
Plot 7-27. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 1) - Ch. 40)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager				
Test Report S/N:			Page 30 of 242				
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Plot 7-28. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 1) - Ch. 48)



Plot 7-29. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 1) - Ch. 38)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager			
Test Report S/N: Test Dates:		EUT Type:	Dage 21 of 242			
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Keysight Spectrum Analyzer - Occ	cupied BW						
LXI RL RF 50 Ω	AC CORREC	SENSE:INT	ALIGN AUTO		MOct 27, 2021	Trac	e/Detector
	1.00.00	Center Freq: 5.23000 Trig: Free Run	0000 GHz Avg Hold: 100/100	Radio Std:	None	1140	
	NFE +++ #IFGain:Low	#Atten: 20 dB	Avginola. 100/100	Radio Dev	ice: BTS		
	MI Guill.20W						
10 dB/div Ref 30.0	0 dBm						
Log							
20.0							Clear Write
10.0							
0.00	and marked and the second s	mannennennente	and a rate and				
-10.0							
	<u> </u>						Average
-20.0							Average
-30.0			h				
-40.0 - white man and	And Wall Unit		MMMMM	Murphonen.	Mymily		
-50.0					and a characteristic second		
							Max Hold
-60.0							
Center 5.23000 GHz				Span 1	00.0 MHz		
#Res BW 390 kHz		VBW 4 MHz			ep 1 ms		
THES DW JOOKIIZ				300	ep mis		Min Hold
Occupied Band	width	Total P	ower 23	3 dBm			
Occupied Ballu			20.				
	37.557 M⊦	Z					Detector
							Peak►
Transmit Freq Err	ror 11.044 k	Hz % of O	3W Power 9	9.00 %		Auto	<u>Man</u>
x dB Bandwidth	40.25 M	Hz xdB	-26	.00 dB			
x ab Banamaan	40.20 11		20				
MSG			STAT	JS			

Plot 7-30. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 1) - Ch. 46)



Plot 7-31. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax - 996 Tones (UNII Band 1) - Ch. 42)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager				
Test Report S/N: Test Dates:		EUT Type:	Dama 00 of 040				
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset	Page 32 of 242				
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🔤 Keysight Spectrum Analyzer - Oc	cupied BW								
L <mark>XI</mark> RL RF 50Ω	AC CORREC		ISE:INT		ALIGN AUTO		M Oct 27, 2021	Trac	e/Detector
		Center Fr	eq: 5.25000	Avg Hold:	100/100	Radio Std:	None		0.000000
	NFE #IFGain:l			Avginoid.	. 100/100	Radio Dev	ice: BTS		
,									
10 dB/div Ref 30.0	0 dBm								
20.0									
									Clear Write
10.0	Mar Martin	we my you and							
0.00									
-10.0			man .						
-20.0	- and a second s		Mark	Hulkerson	m.				Average
					A. A.A.A.	Melluminum	usla s		711 of ugo
-30.0					- Ar March	and the second states of	angeling Hiselanse in a		
-40.0									
-50.0									Max Hold
-60.0									ινίαλ ποια
-00.0									
Center 5.2500 GHz						Span 3	50.0 MHz		
#Res BW 1.6 MHz		VBV	V 8 MHz				ep 1 ms		Min Hold
							<u> </u>		WITI HOID
Occupied Band	width		Total P	ower	24.5	dBm			
	93.907	MHZ							Detector
Troponit From Fro		126 MHz	0/ -5 05	SW Powe		.00 %		Auto	Peak▶ Man
Transmit Freq Err	-55.		% OI UE		er 99	.00 %		Auto	IVIAII
x dB Bandwidth	18	7.2 MHz	x dB		-26.	00 dB			
MSG					STATUS	3			

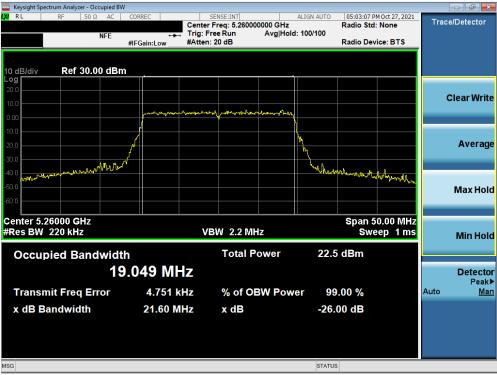
Plot 7-32. 26dB Bandwidth Plot MIMO ANT1 (160MHz BW L 802.11ax - 996 Tones (UNII Band 1/2A) - Ch. 50)



Plot 7-33. 26dB Bandwidth Plot MIMO ANT1 (160MHz BW U 802.11ax - 996 Tones (UNII Band 1/2A) - Ch. 50)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager				
Test Report S/N: Test Dates:		EUT Type:	Dama 00 af 040				
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset	Page 33 of 242				
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Plot 7-34. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 2A) - Ch. 52)



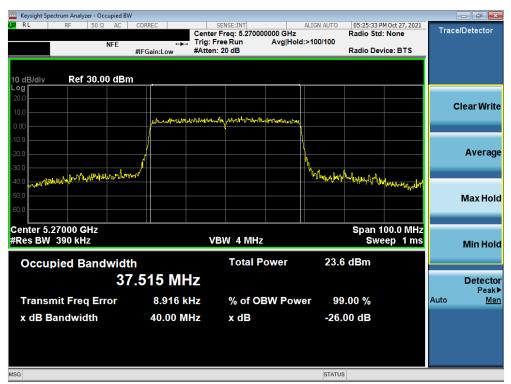
Plot 7-35. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: Test Dates: E		EUT Type:		Dara 04 af 040
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	upied BW					
L <mark>X/</mark> RL RF 50 Ω	AC CORREC	SENSE:INT Center Freq: 5.32000	ALIGN AUTO	05:05:51 PM 0 Radio Std: N		Trace/Detector
	NFE 🔸	The second second second	Avg Hold: 100/100	Radio Std: N	ione	
	#IFGain:Low	#Atten: 20 dB	-	Radio Devic	e: BTS	
10 dB/div Ref 30.00	0 dBm					
Log						
20.0						Clear Write
10.0						Clear write
0.00	mannyan	har wall with the second of	twow			
-10.0	/		<u> </u>			
-20.0	كمر		N			Average
						Arenuge
-30.0	helport		<u>ل</u> ر بر ا	A		
-40.0 allower have a stranger				m My Muller	Munch Buch	
-50.0					ar and pr	Max Hold
-60.0						
Center 5.32000 GHz			-	Span 50.		
#Res BW 220 kHz		VBW 2.2 M	IZ	Swee	p 1 ms	Min Hold
Occupied Band	width	Total P	ower 22 P	5 dBm		
	19.003 M	HZ				Detector
Transmit Freq Err	or -15.002	kHz % of Ol	3W Power 99	0.00 %		Peak▶ Auto <u>Man</u>
x dB Bandwidth	21.58	/Hz xdB	-26	00 dB		
	21.301		-20.	00 00		
MSG			STATUS	5		

Plot 7-36. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 2A) - Ch. 64)



Plot 7-37. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 2A) - Ch. 54)

FCC ID: A3LSMS908JPN	PCTEST [°] Proud to be part of ® element	MEASUREMENT REPORT (CERTIFICATION)	MSUNG	Approved by: Technical Manager		
Test Report S/N:	Test Dates: EUT Type:		Dara 05 at 040			
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	ortable Handset		Page 35 of 242		
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- Keysight Spectrum Analyzer - Occ	cupied BW			
	NFE +++ T #IFGain:Low #	SENSE:INT Center Freq: 5.310000000 GHz Irig: Free Run Avg Hold Atten: 20 dB	ALIGN AUTO 08:19:54 PM Oct Radio Std: No I: 100/100 Radio Device:	ne Trace/Detector
10 dB/div Ref 30.00 Log 20.0 10.0 0.00		which and a particular a particular and a p		Clear Write
-10.0				Average
-40.0 -50.0 -60.0			Martin the second the second the second the second	Max Hold
Center 5.31000 GHz #Res BW 390 kHz Occupied Band	width	VBW 4 MHz Total Power	Span 100. Sweep 23.1 dBm	
37.565 MHz				Detector Peak▶
Transmit Freq Err x dB Bandwidth	or 29.756 kH 40.20 MH		er 99.00 % -26.00 dB	Auto <u>Man</u>
MSG			STATUS	

Plot 7-38. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 2A) - Ch. 62)



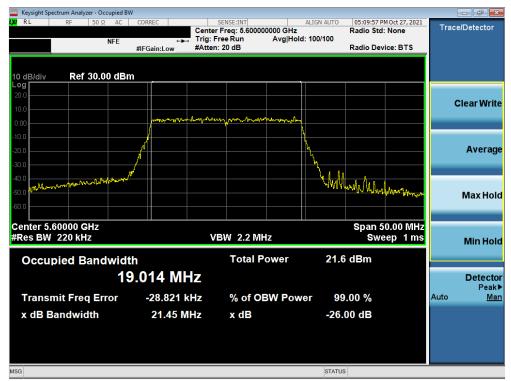
Plot 7-39. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax - 996 Tones (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 36 of 242	
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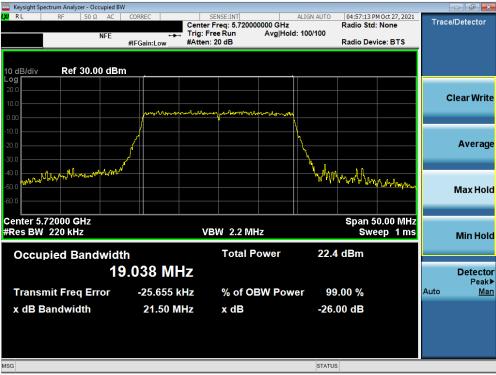
Plot 7-40. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 2C) - Ch. 100)



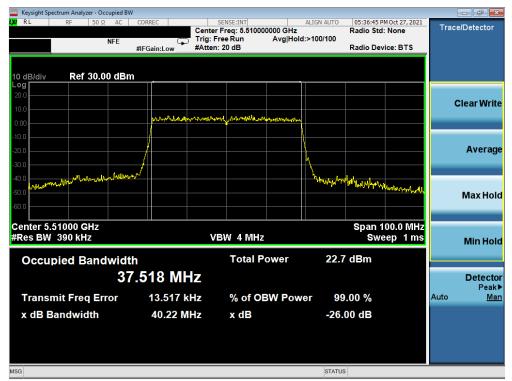
Plot 7-41. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		D 07 (040	
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset		Page 37 of 242	
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Plot 7-42. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 2C) - Ch. 144)



Plot 7-43. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		D 00 (010	
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www.www.www.www.www.www.www.www.www.ww	cupied BW								
<mark>LXI</mark> RL RF 50Ω	AC CORRE		SENSE:INT Center Freq: 5.5	00000000 CH-	ALIGN AUTO	05:39:01 P	MOct 27, 2021	Trac	e/Detector
	NFE		Trig: Free Run		d:>100/100	Radio Stu:	None		
			#Atten: 20 dB	.		Radio Dev	ice: BTS		
10 dB/div Ref 30.0	0 dBm								
Log									
20.0									
10.0									Clear Write
0.00		reprised and	Largered hand promised	hand and a start and a start a					
-10.0	1							_	
	/								A
-20.0	/								Average
-30.0					<u>\</u>				
-40.0	angles Male				Mulur	W. Warden Martin Mar			
-50.0						- astration and b	John Myron willy		Max Hold
-60.0									Max Holu
00.0									
Center 5.59000 GHz						Span 1	00.0 MHz		
#Res BW 390 kHz			VBW 4 N	1Hz		Swe	ep 1 ms		Min Hold
									IIIIIII
Occupied Band	width		Tota	I Power	22.8	dBm			
	37 55	55 MHz	7						Detector
	07.00		4						Peak▶
Transmit Freq Er	ror -4	0.239 kH	z % of	OBW Pow	ver 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth		40.32 MH	z x dE	1	-26 (00 dB			
				·	2010				
MSG					STATUS				

Plot 7-44. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 2C) - Ch. 118)



Plot 7-45. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMS908JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager				
Test Report S/N:	Test Dates:	EUT Type:	Dama 00 of 040				
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Plot 7-46. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax - 996 Tones (UNII Band 2C) - Ch. 106)



Plot 7-47. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax - 996 Tones (UNII Band 2C) - Ch. 122)

FCC ID: A3LSMS908JPN	PCTEST [°] Proud to be part of ® element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager				
Test Report S/N:	Test Dates:	EUT Type:	Dama 40 of 040				
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset	Page 40 of 242				
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Keysight Spectrum Analyzer - Occ	upied BW									
<mark>(X)</mark> RL RF 50 Ω	AC CORRE	EC		ISE:INT		ALIGN AUTO		M Oct 27, 2021	Trac	e/Detector
			Center Fr Trig: Free	eq: 5.69000		i: 100/100	Radio Std	None	mac	CID CLOCUOI
	NFE #IFGa	in:Low	#Atten: 20		Avginoid	. 100/100	Radio Dev	ice: BTS		
10 dB/div Ref 30.00	0 dBm									
Log										
20.0										Clear Write
10.0			ا م استحاد م	www.						
0.00	ſ	Japa Jawa Allanda	Contract of the second s	harden ander ander ander	Meridian Meridian	\				
-10.0	/									
										A
-20.0						1				Average
-30.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					Murry Marter	1 ⁰⁰⁰ 1111	~	_	
-30.0 -40.0 10000000000000000000000000000000000							1 I I''''''	1 Yong		
-50.0								v v∧aM		
										Max Hold
-60.0										
Center 5.6900 GHz							Enon 2			
#Res BW 820 kHz			VDV	V 8 MHz				00.0 MHz ep 1 ms		
#Res BW 820 KHZ			VDV				SWG	ep mis		Min Hold
Occurried Dand				Total P	ower	24.3	dBm			
Occupied Band				Γυτάι Γ	OWEI	24.5	ubm			
	77.04	1 MH	Z							Detector
										Peak▶
Transmit Freq Err	or -2	21.433 kl	Hz	% of O	3W Pow	er 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth	1	81.41 MI	H7	x dB		-26 (00 dB			
		01.41 101	12	A GD		-20.0				
									_	
MSG						STATUS				

Plot 7-48. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax - 996 Tones (UNII Band 2C) - Ch. 138)



Plot 7-49. 26dB Bandwidth Plot MIMO ANT1 (160MHz BW L 802.11ax - 996 Tones (UNII Band 2C) - Ch. 114)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager				
Test Report S/N:	Test Dates:	EUT Type:	Dama 44 at 040				
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🔤 Keysight Spectrum Analyzer - Occ											
<mark>LX/</mark> RL RF 50Ω	AC	CORREC	Cer	SENSE:INT	70000000 G		GN AUTO	07:03:10 P Radio Std	M Oct 27, 2021	Trac	e/Detector
	NFE		+++ Trig	g: Free Run ten: 20 dB		Hold: 10	0/100	Radio Dev			
,	i	#IFGain:Low	#At	ten: 20 dB				Radio Dev	ICE: BIS		
10 dB/div Ref 30.0	0 dBm							1			
20.0											
10.0										0	Clear Write
0.00				manah	methowww	hadrong				_	
-10.0							1				
-20.0			1. 14	AN AN			\backslash				Average
-30.0	1	᠇᠇᠆ᠬᡃᠮᡢ	Alter alter a				land				
-40.0	1.11						1 V V	$\mathcal{M}_{\mathcal{M}}$	la la		
-50.0 How man and really of the	of the second second								WWww		
											Max Hold
-60.0										_	_
Center 5.5700 GHz								Span 3	50.0 MHz		
#Res BW 1.1 MHz				VBW 8N	1Hz			Swe	ep 1 ms		Min Hold
				Tota	l Power		22.6	i dBm			
Occupied Band				1018	Fower		25.0	u billi			
	78.	557 I	ИНz								Detector
Transmit Freq Err	or	39.35		%	OBW P	ower	00	.00 %		Auto	Peak▶ Man
· · · ·	01										
x dB Bandwidth		104.8	8 MHz	x dE			-26.	00 dB			
MSG							STATUS	5			

Plot 7-50. 26dB Bandwidth Plot MIMO ANT1 (160MHz BW U 802.11ax – 996 Tones (UNII Band 2C) – Ch. 114)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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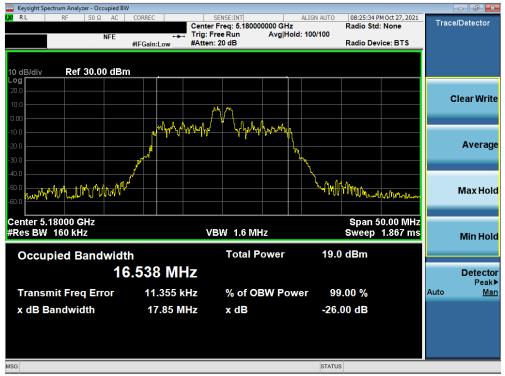
MIMO Antenna-2 26dB Bandwidth Measurements (26 Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
	5180	36	ax (20MHz)	26T	MCS0	17.85
_	5200	40	ax (20MHz)	26T	MCS0	17.87
Band 1	5240	48	ax (20MHz)	26T	MCS0	17.99
Bar	5190	38	ax (40MHz)	26T	MCS0	22.05
	5230	46	ax (40MHz)	26T	MCS0	21.65
	5210	42	ax (80MHz)	26T	MCS0	38.32
Band 1/2A	5250	50	ax (160MHz L)	26T	MCS0	38.54
Ba 1//	5250	50	ax (160MHz U)	26T	MCS0	21.02
	5260	52	ax (20MHz)	26T	MCS0	17.91
∢	5280	56	ax (20MHz)	26T	MCS0	18.12
Band 2A	5320	64	ax (20MHz)	26T	MCS0	18.06
3an	5270	54	ax (40MHz)	26T	MCS0	20.92
	5310	62	ax (40MHz)	26T	MCS0	21.96
	5290	58	ax (80MHz)	26T	MCS0	37.85
	5500	100	ax (20MHz)	26T	MCS0	18.11
	5600	120	ax (20MHz)	26T	MCS0	18.01
	5720	144	ax (20MHz)	26T	MCS0	18.02
	5510	102	ax (40MHz)	26T	MCS0	21.48
2C	5590	118	ax (40MHz)	26T	MCS0	21.84
Band 2C	5710	142	ax (40MHz)	26T	MCS0	18.73
Ba	5530	106	ax (80MHz)	26T	MCS0	38.08
	5610	122	ax (80MHz)	26T	MCS0	19.27
	5690	138	ax (80MHz)	26T	MCS0	38.17
	5570	114	ax (160MHz L)	26T	MCS0	38.60
	5570	114	ax (160MHz U)	26T	MCS0	21.50

Table 7-4. Conducted Bandwidth Measurements MIMO ANT2 (26 Tones)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 42 of 242
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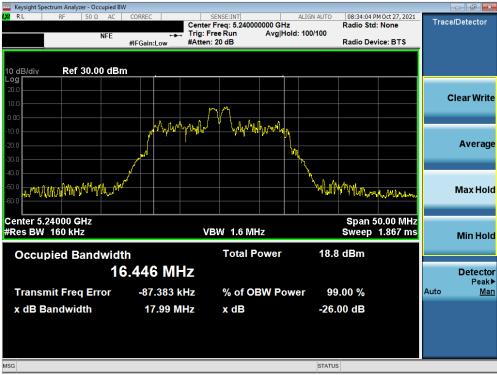
Plot 7-51. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 36)



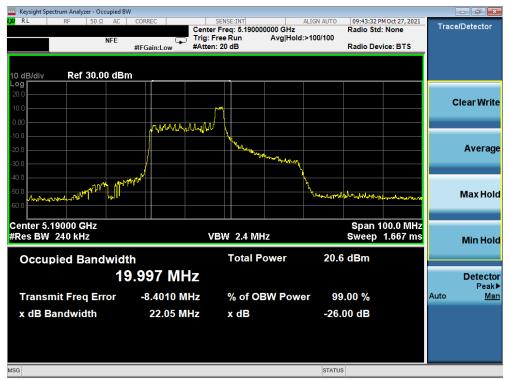
Plot 7-52. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 40)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager				
Test Report S/N:	Test Dates:	EUT Type:	Dama 11 - f 010				
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset	Page 44 of 242				
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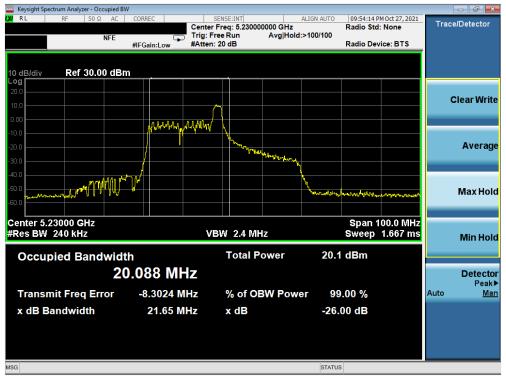
Plot 7-53. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 48)



Plot 7-54. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 38)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dana 45 at 040	
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset		Page 45 of 242	
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Plot 7-55. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 46)



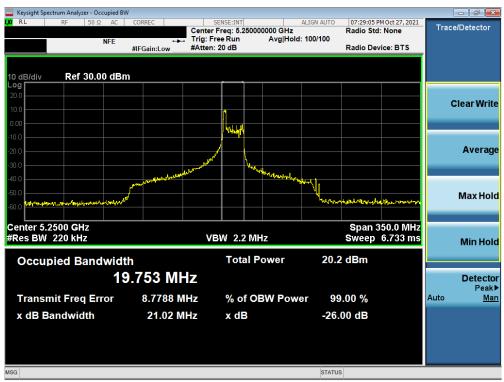
Plot 7-56. 26dB Bandwidth Plot MIMO ANT2 (80MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 42)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:	Dama 40 - 4 0 40			
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset	Page 46 of 242			
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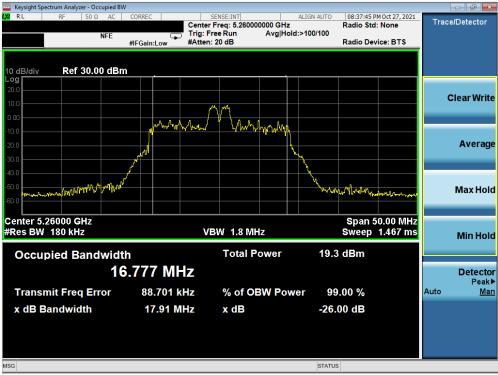
Plot 7-57. 26dB Bandwidth Plot MIMO ANT2 (160MHz BW L 802.11ax - 26 Tones (UNII Band 1/2A) - Ch. 50)



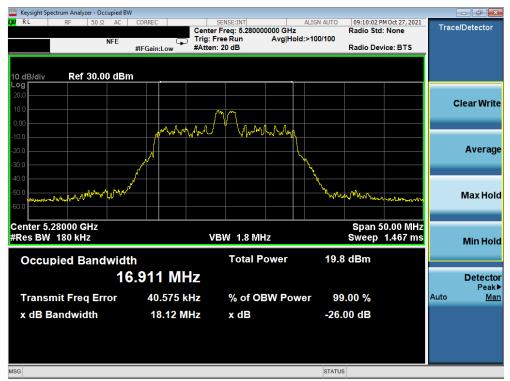
Plot 7-58. 26dB Bandwidth Plot MIMO ANT2 (160MHz BW U 802.11ax - 26 Tones (UNII Band 1/2A) - Ch. 50)

FCC ID: A3LSMS908JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dage 47 of 242		
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset		Page 47 of 242		
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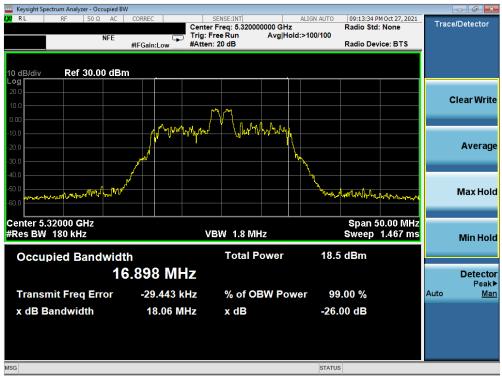
Plot 7-59. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 52)



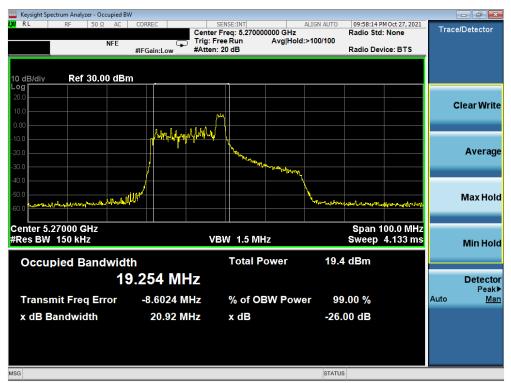
Plot 7-60. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dama 40 at 040	
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Plot 7-61. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 64)



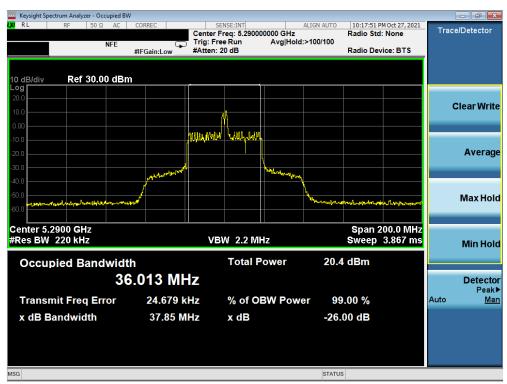
Plot 7-62. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 54)

FCC ID: A3LSMS908JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dama 40 at 040	
1M2112100159-08.A3L 9/14/2021 - 11/12/2021		Portable Handset		Page 49 of 242	
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Keysight Spectrum Analyzer - Occupied					
LXU RL RF 50 Ω AC	CORREC	SENSE:INT r Freq: 5.310000000 GHz	Radio	:14 PM Oct 27, 2021 Std: None	Trace/Detector
NFE		Free Run Avg Hol n: 20 dB	d:>100/100 Radio	Device: BTS	
	#IFGail.Low #/ tech		Ruaro	Dettoe: DTO	
10 dB/div Ref 30.00 dE	Im				
Log					
20.0					Clear Write
10.0		\wedge			
-10.0	MANAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA				
-20.0		Two Island			Average
-30.0		and the second descended and a second of the			, it of ago
-40.0			<u>\</u>		
-50.0			<u></u>		Max Hold
-50.0			"Man Markey and the source	motionalisement	
Center 5.31000 GHz #Res BW 240 kHz	v	'BW 2.4 MHz		an 100.0 MHz ep 1.667 ms	
				<u> </u>	Min Hold
Occupied Bandwic	ith	Total Power	20.2 dBm	ı	
1	9.754 MHz				Detector
Transmit Freq Error	-8.3452 MHz	% of OBW Pow	ver 99.00 %	,	Peak► Auto Man
x dB Bandwidth	21.96 MHz	x dB	-26.00 dE	3	
MSG			STATUS		
MSG			STATUS		

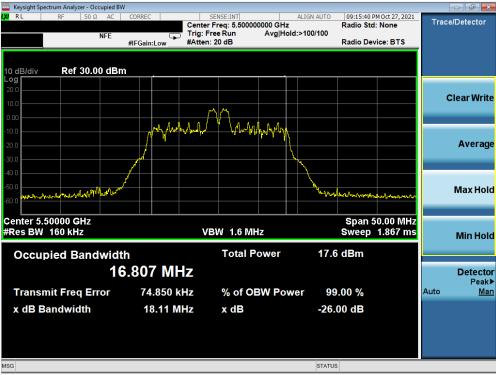
Plot 7-63. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 62)



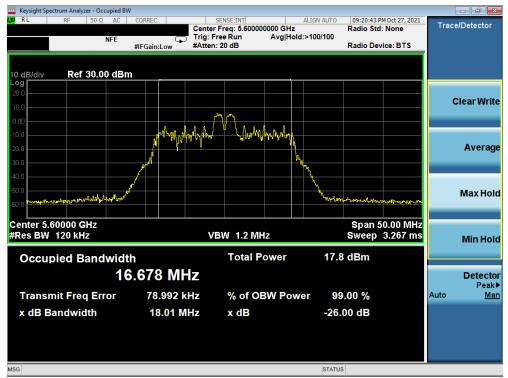
Plot 7-64. 26dB Bandwidth Plot MIMO ANT2 (80MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:	Page 50 of 242			
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	1 - 11/12/2021 Portable Handset				
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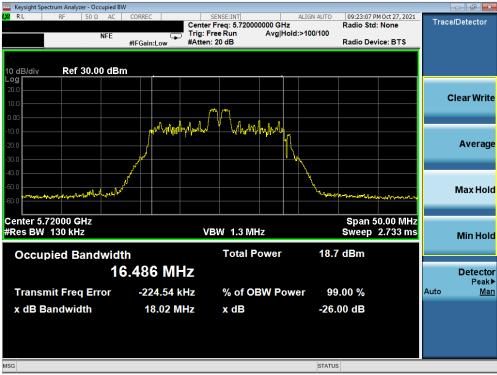
Plot 7-65. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 100)



Plot 7-66. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMS908JPN	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dama 54 at 040	
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset		Page 51 of 242	
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Plot 7-67. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 144)



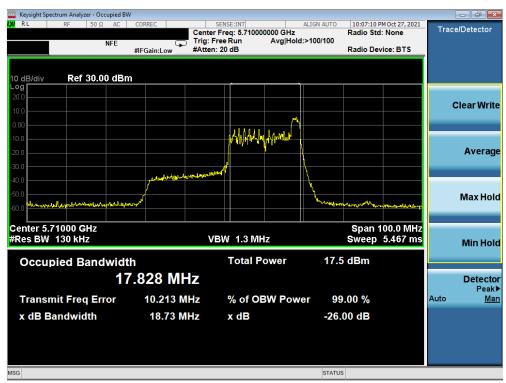
Plot 7-68. 26dB Bandwidth Plot S MIMO ANT2 (40MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dava 50 at 040	
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset		Page 52 of 242	
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Keysight Spectrum Analyzer - Occupied B					- 6 -
LX RL RF 50Ω AC	CORREC	SENSE:INT Freq: 5.59000000 GHz		24 PM Oct 27, 2021 Std: None	Trace/Detector
NFE		Free Run Avg Holo n: 20 dB	d:>100/100	Device: BTS	
	#IFGain:Low #Atter	n. 20 dB	Radio	Device. B13	
40 JDAN Dof 20.00 dB					
10 dB/div Ref 30.00 dBr Log					
20.0					Clear Write
10.0		m			Clear write
0.00	0.08 b 0.180 c				
-10.0	ֈՐՆՔՆԼԱդեգոնիաներ				
-20.0		T Margaret and the second seco			Average
-30.0		- wilderlandersterretar	<u> </u>		
-40.0			1		
-50.0	ym ^{et}		The second states and		Max Hold
-60.0					
Center 5.59000 GHz			Spa	n 100.0 MHz	
#Res BW 240 kHz	V	/BW 2.4 MHz		ep 1.667 ms	Min Hold
		Total Power	18.1 dBm		
Occupied Bandwid		Total Power	18.1 dBm		
1	9.943 MHz				Detector
Transmit Freq Error	-8.4749 MHz	% of OBW Pow	ver 99.00 %		Peak▶ Auto Man
x dB Bandwidth	21.84 MHz	x dB	-26.00 dE		
MSG			STATUS		

Plot 7-69. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 118)



Plot 7-70. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMS908JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dama 50 at 040		
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🔤 Keysight Spectrum Analyzer - Occupied BW							
LX RL RF 50Ω AC	CORREC	SENSE:INT Center Freq: 5.53000	0000 GHz	UTO 10:19:48 P Radio Std	M Oct 27, 2021 : None	Trace/D	etector
NFE		Trig: Free Run #Atten: 20 dB	Avg Hold:>100/1	100 Radio Dev	rice: BTS		
	#IPGalli.Low +	staten. 20 ab		rtualo Ber			
10 dB/div Ref 30.00 dBm							
Log							
20.0						Cle	ar Write
10.0		AN .					
-10.0	W	warden fertrenten					
-20.0	1						Average
-30.0						-	Torugo
-40.0	r lage low All and		What a well a county				
-50.0			<u>\</u>			M	ax Hold
-60.0 เกาะเลลาไม่หน้าไหน และการเปลาไปการการไปการการไป	~~**			-loringer Ministerionstation	mphathathanen	IV	
Center 5.5300 GHz #Res BW 300 kHz		VBW 3 MHz			00.0 MHz 2.067 ms	_	
						N	lin Hold
Occupied Bandwidt	ו	Total P	ower	18.8 dBm			
35	.840 MHz	Z				[Detector
Transmit Freq Error	223.47 kH	7 % of O	3W Power	99.00 %		Auto	Peak▶ Man
						/ luto	man
x dB Bandwidth	38.08 MH	z xdB		-26.00 dB			
MSG				STATUS			
inou				11100			

Plot 7-71. 26dB Bandwidth Plot MIMO ANT2 (80MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 106)



Plot 7-72. 26dB Bandwidth Plot MIMO ANT2 (80MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 122)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:	Dawa 54 at 040			
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset	Page 54 of 242			
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Keysight Spectrum Analyzer - Occupier				1	- đ <mark>-x</mark>
<mark>Ι X1</mark> RL RF 50 Ω AC	Ce	SENSE:INT enter Freq: 5.690000000 GH		10:27:18 PM Oct 27, 2021 Radio Std: None	Trace/Detector
NFE		ig: Free Run Avg H Atten: 20 dB	old:>100/100	Radio Device: BTS	
10 dB/div Ref 30.00 d	Bm				
Log					
20.0					Clear Write
0.00		M I			
-10.0	Juli-	when professor			
-20.0					Average
-30.0	and a				, tronugo
-40.0	(North and a star	AN ANNO	k**		
-50.0	1		<u> </u>		Max Hold
-60.0	ete frankend		"milig mal bur	mlan Mighanda Angelen an antion in the	Max Hold
Center 5.6900 GHz #Res BW 330 kHz		VBW 3 MHz		Span 200.0 MHz Sweep 1.733 ms	
WILL BAA 330 KIIZ				3weep 1.735 ms	Min Hold
Occupied Bandwi	dth	Total Power	19.7 (dBm	
	35.848 MHz				Detector
					Peak►
Transmit Freq Error	79.848 kHz			00 %	Auto <u>Man</u>
x dB Bandwidth	38.17 MHz	x dB	-26.0) dB	
MSG			STATUS		

Plot 7-73. 26dB Bandwidth Plot MIMO ANT2 (80MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 138)



Plot 7-74. 26dB Bandwidth Plot MIMO ANT2 (160MHz BW L 802.11ax - 26 Tones (UNII Band 2C) - Ch. 114)

FCC ID: A3LSMS908JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dara 55 at 040		
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	ectrum Analyzer - Occi											
L <mark>XI</mark> RL	RF 50 Ω	AC CC	ORREC	Cente	SENSE:INT r Freq: 5.5	70000	000 GHz	ALIGN AUTO	07:47:39 F Radio Std	M Oct 27, 2021	Trac	e/Detector
	1	NFE	(Trig: I	Free Run			l:>100/100				
		#1	Gain:Low	#Atter	n: 20 dB				Radio De	vice: BTS		
10 dB/div Log	Ref 30.00) dBm	_									
20.0												
10.0												Clear Write
0.00											_	
-10.0					14.14							
-20.0												Average
-30.0					<i>A</i>	<u>\</u>						Ŭ
-40.0			lowlard	All Markey and		AN ALLEN	Mr. Markowskiller	1.1-				
-50.0			AND A					ANN'T				
-60.0	al a state of the second s	and the second						⁷ Wyrwlyd	ر ۱۹۹۰ میلومی ا م	mound		Max Hold
-00.0												
	5700 GHz									350.0 MHz		
#Res BW	270 kHz			V	/BW 2.7	' MHz	Z		Sweep	4.467 ms		Min Hold
Occu	pied Band	width			Tota	al Po	wer	19.3	3 dBm			
Occu								101				
		19.8	911 N	IHZ								Detector Peak▶
Transr	mit Freq Erre	or	8.6225	MHz	% o	f OB	W Pow	er 99	9.00 %		Auto	Man
	Bandwidth		21.50	M니~	x dE	•		26	00 dB			
			21.50	WIT 12	A UL			-20.				
									-			
MSG								STATU	S			

Plot 7-75. 26dB Bandwidth Plot MIMO ANT2 (160MHz BW U 802.11ax – 26 Tones (UNII Band 2C) – Ch. 114)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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MIMO Antenna-2 26dB Bandwidth Measurements (Full Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
	5180	36	ax (20MHz)	242T	MCS0	21.37
	5200	40	ax (20MHz)	242T	MCS0	21.28
Band 1	5240	48	ax (20MHz)	242T	MCS0	21.46
Bar	5190	38	ax (40MHz)	484T	MCS0	42.20
	5230	46	ax (40MHz)	484T	MCS0	42.31
	5210	42	ax (80MHz)	996T	MCS0	90.14
Band 1/2A	5250	50	ax (160MHz L)	996T	MCS0	119.10
Ba 1//	5250	50	ax (160MHz U)	996T	MCS0	170.30
	5260	52	ax (20MHz)	242T	MCS0	21.43
	5280	56	ax (20MHz)	242T	MCS0	21.34
Band 2A	5320	64	ax (20MHz)	242T	MCS0	21.46
Ban	5270	54	ax (40MHz)	484T	MCS0	39.92
	5310	62	ax (40MHz)	484T	MCS0	39.83
	5290	58	ax (80MHz)	996T	MCS0	81.23
	5500	100	ax (20MHz)	242T	MCS0	21.22
	5600	120	ax (20MHz)	242T	MCS0	21.23
	5720	144	ax (20MHz)	242T	MCS0	21.13
	5510	102	ax (40MHz)	484T	MCS0	39.85
2C	5590	118	ax (40MHz)	484T	MCS0	39.96
p	5710	142	ax (40MHz)	484T	MCS0	39.82
Ba	5530	106	ax (80MHz)	996T	MCS0	80.79
	5610	122	ax (80MHz)	996T	MCS0	81.20
	5690	138	ax (80MHz)	996T	MCS0	81.10
	5570	114	ax (160MHz L)	996T	MCS0	96.81
	5570	114	ax (160MHz U)	996T	MCS0	97.79

Table 7-5. Conducted Bandwidth Measurements MIMO ANT2 (Full Tones)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	MSUNG	Approved by: Technical Manager
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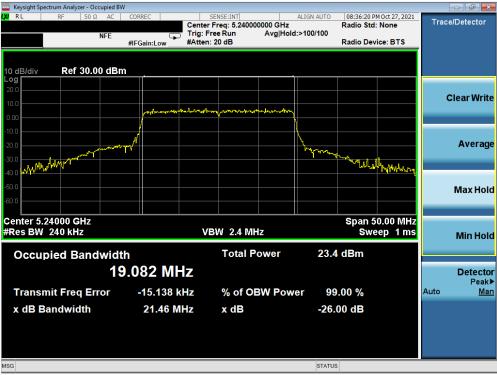
Plot 7-76. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 1) - Ch. 36)



Plot 7-77. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 1) - Ch. 40)

FCC ID: A3LSMS908JPN	PCTEST [®] Proud to be part of ® element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dana 50 at 040		
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset	Page 58 of 242		
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Plot 7-78. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 1) - Ch. 48)



Plot 7-79. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax - 484 Tones (UNII Band 1) - Ch. 38)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dogo 50 of 242		
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Plot 7-80. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax - 484 Tones (UNII Band 1) - Ch. 46)



Plot 7-81. 26dB Bandwidth Plot MIMO ANT2 (80MHz BW 802.11ax - 996 Tones (UNII Band 1) - Ch. 42)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dama 60 at 040		
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset	Page 60 of 242		
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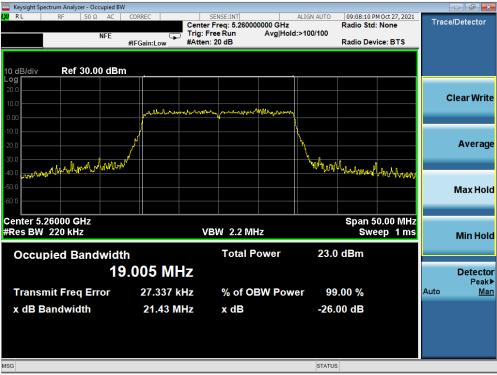
Plot 7-82. 26dB Bandwidth Plot MIMO ANT2 (160MHz BW L 802.11ax - 996 Tones (UNII Band 1/2A) - Ch. 50)



Plot 7-83. 26dB Bandwidth Plot MIMO ANT2 (160MHz BW U 802.11ax - 996 Tones (UNII Band 1/2A) - Ch. 50)

FCC ID: A3LSMS908JPN	PCTEST ° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:	Dama 04 at 040			
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Plot 7-84. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 2A) - Ch. 52)



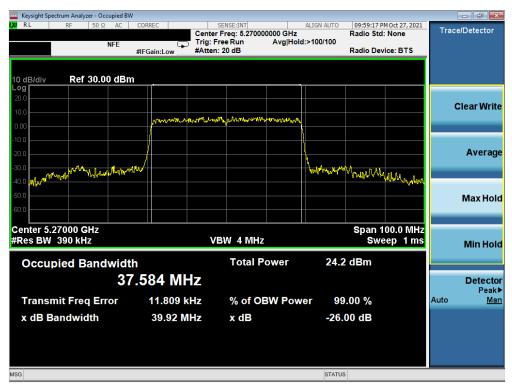
Plot 7-85. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Daga 62 of 242		
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🔤 Keysight Spectrum /	Analyzer - Oco	upied BW									
LXI RL RF	50 Ω	AC COR	REC		NSE:INT	0000 011-	ALIGN AUTO		M Oct 27, 2021	Trac	e/Detector
		NFE	_	Trig: Fre	req: 5.32000 e Run		d:>100/100	Radio Std	: None		
			Gain:Low	#Atten: 2				Radio Dev	ice: BTS		
10 dB/div	Ref 30.00	0 dBm	· · · · · ·						1		
20.0											
10.0											Clear Write
			and an about the	-	1 John march and	Anto more the					
0.00											
-10.0							'n				
-20.0		<u>/</u>					<u>\</u>				Average
-30.0		~ ~									
	Mur	m hymror .					Mary IN	WIRLAN-GAMIN	.h.,		
fidle e av us								W W W	www.www.		
-50.0											Max Hold
-60.0											
Center 5.3200									0.00 MHz		
#Res BW 220	KHZ			VBI	N 2.2 MH	IZ		SWG	ep 1 ms		Min Hold
0					Total P	ower	22.0	dBm			
Occupied	i Band				TULATE	Ower	22.3	ubill			
		19.0	87 MH	z							Detector
											Peak►
Transmit F	req Err	or	7.347 k	Hz	% of O	3W Pow	ver 99	.00 %		Auto	<u>Man</u>
x dB Band	width		21.46 M	Hz	x dB		-26	00 dB			
	Witatan		21.40 10	112	Adb		-20.	00 00			
MSG							STATUS	5			

Plot 7-86. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 2A) - Ch. 64)



Plot 7-87. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax - 484 Tones (UNII Band 2A) - Ch. 54)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N: Test Dates:		EUT Type:		Dama 00 at 040	
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🔤 Keysight Spectrum Analyzer - Occu	upied BW								
LXI RL RF 50 Ω	AC CORREC		ISE:INT		ALIGN AUTO		M Oct 27, 2021	Trac	e/Detector
		Tains France	eq: 5.31000		d:>100/100	Radio Std	: None		
N	#IFGain:Low	#Atten: 2		, trainer		Radio Dev	rice: BTS		
10 dB/div Ref 30.00	dBm								
20.0									
									Clear Write
10.0	at Anthor	how have the second	manun	MUNTYLIN					
0.00									
-10.0					1				
-20.0									Average
-30.0	1 Mills of				A LA INC				J
	Challes and that				Norman North	$\mathcal{M}_{\mathcal{W}}$	Mulle 1		
-40.0 pyper							1 Mary Way		
-50.0									Max Hold
-60.0									
Center 5.31000 GHz							00.0 MHz		
#Res BW/390 kHz		VBV	V 4 MHz			Swe	ep 1 ms		Min Hold
Occupied Bandy	width		Total P	ower	24.2	dBm			
	37.453 N	Hz							Detector
									Peak▶
Transmit Freq Erro	or -12.412	2 kHz	% of O	3W Pow	er 99	.00 %		Auto	Man
x dB Bandwidth	39.83	MHZ	x dB		-26	00 dB			
	39.03	WIF12	X UD		-20.	00 UB			
MSG					STATUS	5			

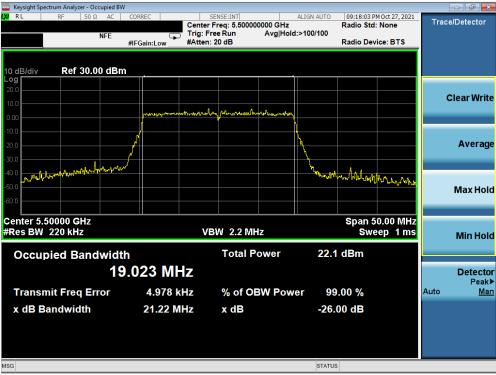
Plot 7-88. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax - 484 Tones (UNII Band 2A) - Ch. 62)



Plot 7-89. 26dB Bandwidth Plot MIMO ANT2 (80MHz BW 802.11ax - 996 Tones (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dama 04 at 040
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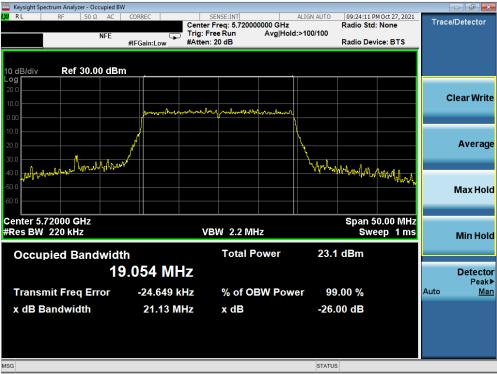
Plot 7-90. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 2C) - Ch. 100)



Plot 7-91. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N: Test Dates:		EUT Type:	Dama 65 of 242	
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Plot 7-92. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 2C) - Ch. 144)



Plot 7-93. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax - 484 Tones (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMS908JPN	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: Test Dates:		EUT Type:		Dama 00 at 040
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🔤 Keysight Spectrum Analyzer - Oce	cupied BW						- # X
<mark>LX/</mark> RL RF 50Ω	AC CORREC	SENSE:INT Center Freg: 5.59000	ALIGN AUTO	10:05:23 PM Radio Std:	Oct 27, 2021	Trace	/Detector
	NFE	Tains France Disa	Avg Hold:>100/100	Radio Stu:	None		
	#IFGain:Low	#Atten: 20 dB		Radio Devi	ce: BTS		
10 dB/div Ref 30.0	0 dBm						
Log							_
20.0							le en Muite
10.0						ں د	lear Write
0.00	- Partinena	with the with the part was not	hourse				
-10.0							
-20.0							Average
							Average
-30.0	mont		YWY WC	hamanal			
-40.0 10 -40.0					Ry the weller also		
-50.0					and the state		Max Hold
-60.0							
Center 5.59000 GHz					00.0 MHz		
#Res BW 390 kHz		VBW 4 MHz		Swe	ep 1 ms		Min Hold
Occupied Band	huidth	Total P	ower 23.6	i dBm			
Occupied Ballu			20.0				
	37.537 M	HZ					Detector
Transmit Freq Err	ror -32.680	kHz % of Ol	BW Power 99	.00 %		Auto	Peak▶ Man
x dB Bandwidth	39.96	MHz xdB	-26.	00 dB			
MSG			STATUS	3			

Plot 7-94. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax - 484 Tones (UNII Band 2C) - Ch. 118)



Plot 7-95. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax - 484 Tones (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMS908JPN	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager				
Test Report S/N:	Test Dates:	EUT Type:	Dage 67 of 242				
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www.www.com.com.com.com.com.com.com.com.com.com	upied BW									
LX RL RF 50 Ω	AC COR	REC	Center Fr	NSE:INT req: 5.53000 e Run		ALIGN AUTO	10:23:30 P Radio Std	M Oct 27, 2021 None	Trac	e/Detector
		Gain:Low 📩	#Atten: 2				Radio Dev	ice: BTS		
10 dB/div Ref 30.00	0 dBm									
20.0										
10.0										Clear Write
0.00		monum	noham	montheman	manhum					
-10.0										
-20.0										Average
	an al					1				Average
-30.0						and a second	man	\sim		
								WWW.		
-50.0										Max Hold
-60.0										
Center 5.5300 GHz							Span 2	00.0 MHz		
#Res BW 820 kHz			VB	N 8 MHz				ep 1ms		Min Hold
Occurried Dend				Total P	owor	24.0	dBm			
Occupied Band				TOLATE	ower	24.0	ubili			
	77.1	57 MH	Z							Detector Peak▶
Transmit Freq Err	or	65.560 k	Hz	% of O	BW Pow	er 99	.00 %		Auto	Man
x dB Bandwidth		80.79 M	Hz	x dB		-26	00 dB			
x ab Banamaan		00.10 11		AGE		20.				
MSG						STATUS				
Mod						STATUS	,			

Plot 7-96. 26dB Bandwidth Plot MIMO ANT2 (80MHz BW 802.11ax - 996 Tones (UNII Band 2C) - Ch. 106)



Plot 7-97. 26dB Bandwidth Plot MIMO ANT2 (80MHz BW 802.11ax - 996 Tones (UNII Band 2C) - Ch. 122)

FCC ID: A3LSMS908JPN	PCTEST [°] Proud to be part of ® element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dama 69 of 242
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Plot 7-98. 26dB Bandwidth Plot MIMO ANT2 (80MHz BW 802.11ax - 996 Tones (UNII Band 2C) - Ch. 138)



Plot 7-99. 26dB Bandwidth Plot MIMO ANT2 (160MHz BW L 802.11ax - 996 Tones (UNII Band 2C) - Ch. 114)

FCC ID: A3LSMS908JPN	PCTEST [®] Proud to be part of ® element	MEASUREMENT REPORT (CERTIFICATION)	ISUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 00 at 040
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🔤 Keysight Spectrum Analyzer - Occupie						
LX/ RL RF 50Ω A0		SENSE:INT	ALIGN AU	JTO 07:51:12 PM Radio Std:		Trace/Detector
NFE	Trig	g: Free Run ten: 20 dB	Avg Hold:>100/10			
10 dB/div Ref 30.00 d	Bm					
20.0						Clear Write
0.00		man the solution and	Martin Manager			
-10.0	البلهمة المنابعة المعاديم المعالم	ugudd ar		MAAAA.		Average
-30.0 -40.0	M.			 	n . Lahahahad	
-50.0						Max Hold
Center 5.5700 GHz #Res BW 1.1 MHz		VBW 8 MHz			i0.0 MHz ep 1 ms	Min Hold
Occupied Bandwi		Total Po	ower 2	24.7 dBm		
	78.007 MHz					Detector Peak▶
Transmit Freq Error	39.586 MHz	% of OB	W Power	99.00 %	/	Auto <u>Man</u>
x dB Bandwidth	97.79 MHz	x dB	-	26.00 dB		
MSG			ST	TATUS		

Plot 7-100. 26dB Bandwidth Plot MIMO ANT2 (160MHz BW U 802.11ax – 996 Tones (UNII Band 2C) – Ch. 114)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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7.3 6dB Bandwidth Measurement – 802.11ax OFDMA

§15.407 (e); RSS-Gen [6.7]

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 antenna terminal while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2013 and KDB 789033 D02 v02r01, and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 6dB bandwidth.

In the 5.725 – 5.850GHz and 5.850 – 5.895 GHz bands, the 6dB bandwidth must be \geq 500 kHz.

Test Procedure Used

ANSI C63.10-2013 – Section 6.9.2 KDB 789033 D02 v02r01 – Section C

Test Settings

- The signal analyzers' automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 100 kHz
- 3. VBW \geq 3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple

Test Setup

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



Figure 7-2. Test Instrument & Measurement Setup

Test Notes

The 6dB Bandwidth measurement for each channel was measured with the RU index showing the highest conducted power.

FCC ID: A3LSMS908JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	MSUNG	Approved by: Technical Manager
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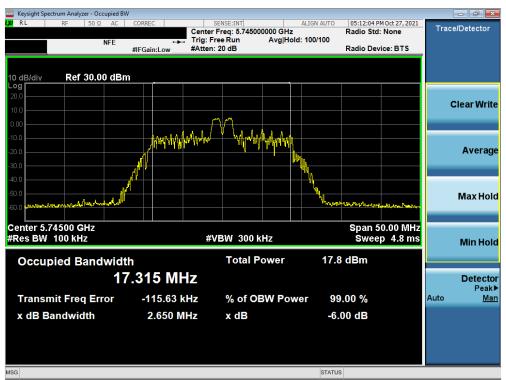
MIMO Antenna-1 6 dB Bandwidth Measurements (26 Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
	5745	149	ax (20MHz)	26T	MCS0	2.65
e	5785	157	ax (20MHz)	26T	MCS0	2.65
	5825	165	ax (20MHz)	26T	MCS0	2.66
Band	5755	151	ax (40MHz)	26T	MCS0	2.17
	5795	159	ax (40MHz)	26T	MCS0	2.14
	5775	155	ax (80MHz)	26T	MCS0	2.77

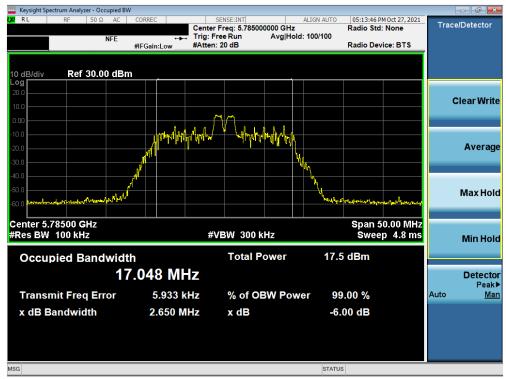
Table 7-6. Conducted Bandwidth Measurements MIMO ANT1 (26 Tones)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 70 of 040
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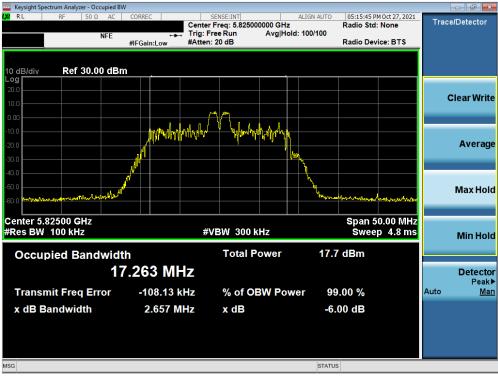
Plot 7-101. 6dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 149)



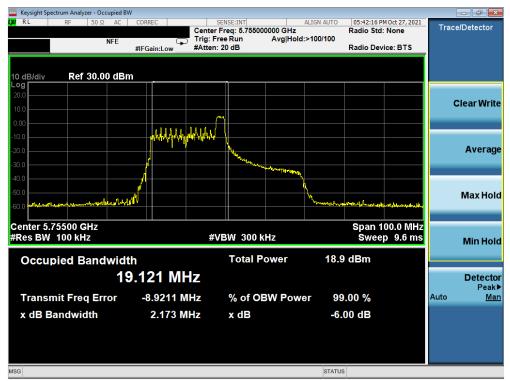
Plot 7-102. 6dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax – 26 Tones (UNII Band 3) – Ch. 157)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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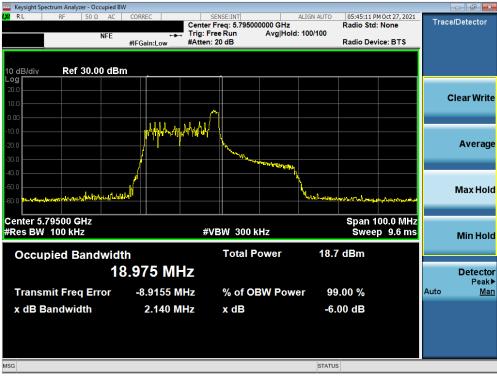
Plot 7-103. 6dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 165)



Plot 7-104. 6dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 151)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager			
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Plot 7-105. 6dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 159)



Plot 7-106. 6dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 155)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:	Dama 75 at 040			
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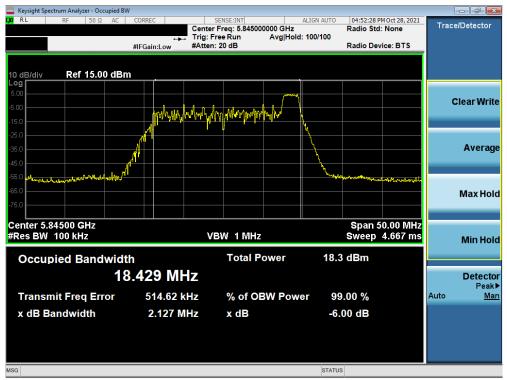


	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
Band 3/4	5845	169	ax (20MHz)	26T	MCS0	2.13
Band 4	5865	173	ax (20MHz)	26T	MCS0	2.13
Danu 4	5885	177	ax (20MHz)	26T	MCS0	2.10
Band 3/4	5835	167	ax (40MHz)	26T	MCS0	2.05
Band 4	5875	175	ax (40MHz)	26T	MCS0	2.12
	5855	171	ax (80MHz)	26T	MCS0	2.75
Band 3/4	5815	163	ax (160MHz L)	26T	MCS0	3.04
	5815	163	ax (160MHz U)	26T	MCS0	3.02

Table 7-7. Conducted Bandwidth Measurements MIMO ANT1 (26 Tones)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 76 of 040
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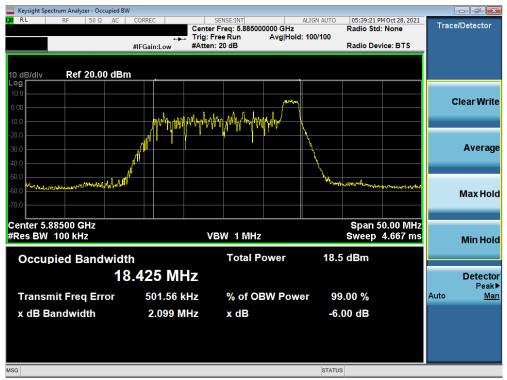
Plot 7-107. 6dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax – 26 Tones (UNII Band 3/4) – Ch. 169)



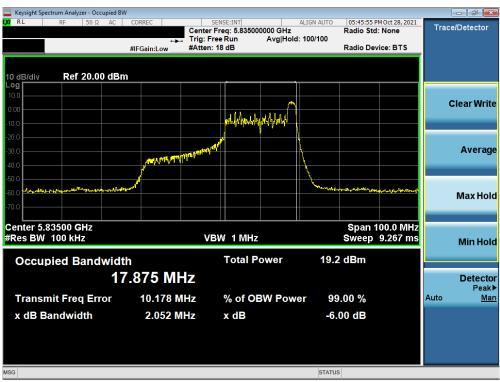
Plot 7-108. 6dB Bandwidth Plot S MIMO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 4) - Ch. 173)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:		Dega 77 of 040			
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Plot 7-109. 6dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 4) - Ch. 177)



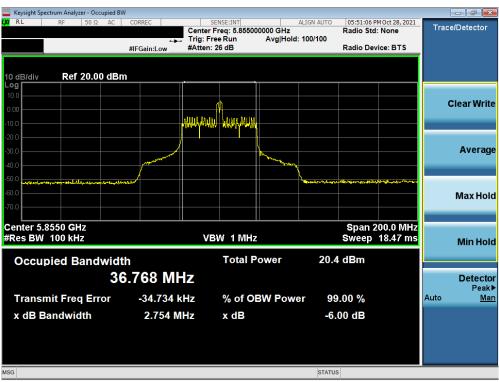
Plot 7-110. 6dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 3/4) - Ch. 167)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager				
Test Report S/N:	Test Dates:	EUT Type:	Dama 70 at 040				
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Keysight Spectrum Analy												- 0 ×
LXIRL RF	50 Ω	AC C	ORREC			NSE:INT	00000 GHz	ALIGN AUTO	05:46:51 Radio St	PM Oct 28, 2021	Trace	e/Detector
				- + -	Trig: Fre	e Run		d: 100/100				
		#	IFGain:L	.ow	#Atten: 1	8 dB			Radio De	vice: BTS		
10 dB/div Ref	20.00	dBm						1				
10.0												
0.00							<u> </u>				C	Clear Write
-10.0						La Minh	he contract					
-20.0						1 41.	aller die	<u>\</u>				
-30.0					- ALLAN			<u> \</u>				Average
-40.0			<i>p</i> tri	WANT !!								J
-50.0			٢									
-60 0 upper and man	when got and	manhamer	٦					"Interestic	mandrena	and Manager and Manager		
-70.0												Max Hold
-70,0												
Center 5.87500 G										100.0 MHz		
#Res BW 100 kH	Z				VBI	N 1 MH	Z		Sweep	9.267 ms		Min Hold
Occupied B	and	width				Total	Power	18	8 dBm			
Occupied B	anuv		~~~			lotui		10.	o abiii			
		1/.	887	MH	Z							Detector Peak►
Transmit Fre	a Erra	or	10.1	86 M	Hz	% of C	BW Pow	ver 9	9.00 %		Auto	<u>Man</u>
x dB Bandwid	-			18 M		x dB		6	.00 dB			
	uun		2.1		72	X UD		-0	.00 UB			
									_			
MSG								STATU	JS			

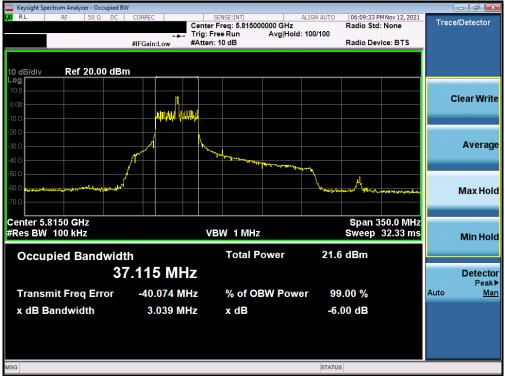
Plot 7-111. 6dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 4) - Ch. 175)



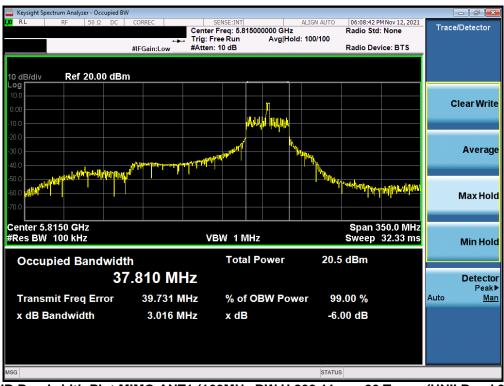
Plot 7-112. 6dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax - 26 Tones (UNII Band 3/4) - Ch. 171)

FCC ID: A3LSMS908JPN	PCTEST* Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager				
Test Report S/N:	Test Dates:	EUT Type:	Baga 70 of 242				
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Plot 7-113. 6dB Bandwidth Plot MIMO ANT1 (160MHz BW L 802.11ax - 26 Tones (UNII Band 3/4) - Ch. 163)



Plot 7-114. 6dB Bandwidth Plot MIMO ANT1 (160MHz BW U 802.11ax – 26 Tones (UNII Band 3/4) – Ch. 163)

FCC ID: A3LSMS908JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager			
Test Report S/N:	Test Dates: EUT Type:		Dage 00 ef 242			
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset	Page 80 of 242			
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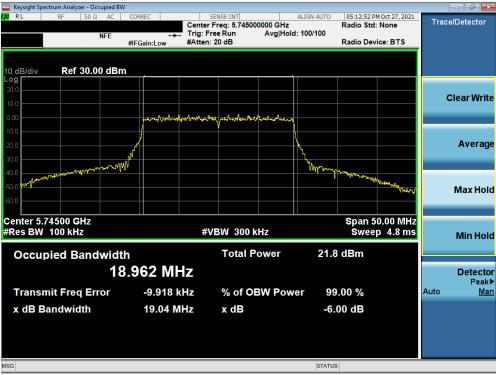
	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
	5745	149	ax (20MHz)	242T	MCS0	19.04
	5785	157	ax (20MHz)	242T	MCS0	19.10
ld 3	5825	165	ax (20MHz)	242T	MCS0	19.08
Band	5755	151	ax (40MHz)	484T	MCS0	37.78
	5795	159	ax (40MHz)	484T	MCS0	37.74
	5775	155	ax (80MHz)	996T	MCS0	77.30

SISO Antenna-1 6 dB Bandwidth Measurements (Full Tones)

Table 7-8. Conducted Bandwidth Measurements MIMO ANT1 (Full Tones)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:			
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Plot 7-115. 6dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 3) - Ch. 149)



Plot 7-116. 6dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 3) - Ch. 157)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dara 00 at 040	
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset		Page 82 of 242	
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Keysight Spectrum Analyzer - Oc	cupied BW						- 6 ×
[XI RL RF 50 Ω	AC CORREC NFE #IFGain:Low	SENSE:INT Center Freq: 5.8250 Trig: Free Run #Atten: 20 dB	ALIGN AUTO 00000 GHz Avg Hold:>100/100	08:21:42 P Radio Std Radio Dev		Trace	Detector
10 dB/div Ref 30.0	0 dBm						
20.0 10.0						c	lear Write
-10.0		an transford produced and and and and and and and and and an					Average
-30.0 -40.0 -50.0	and the second sec			hall host mall	M. M. Jan Marine		Max Hold
-60.0 Center 5.82500 GHz #Res BW 100 kHz		#VBW 300	kHz		0.00 MHz p 4.8 ms		Min Hold
Occupied Band	lwidth 18.962 M	Total F H 7	Power 23.	1 dBm			Detector
Transmit Freq Er x dB Bandwidth		kHz % of O		9.00 % .00 dB		Auto	Peak▶ <u>Man</u>
MSG			STATU	9			

Plot 7-117. 6dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 3) - Ch. 165)



Plot 7-118. 6dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 3) - Ch. 151)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:	Dogo 82 of 242			
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Plot 7-119. 6dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 3) - Ch. 159)



Plot 7-120. 6dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax - 996 Tones (UNII Band 3) - Ch. 155)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dama 04 at 040	
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset		Page 84 of 242	
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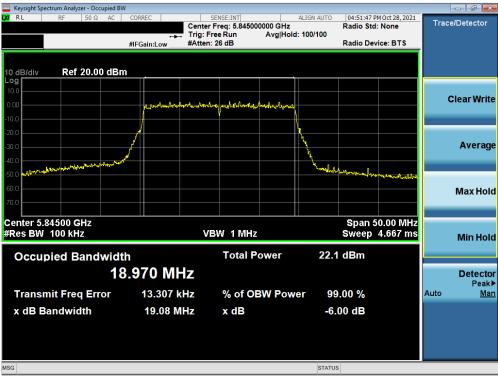


	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
Band 3/4	5845	169	ax (20MHz)	242T	MCS0	19.08
Band 4	5865	173	ax (20MHz)	242T	MCS0	19.08
Dallu 4	5885	177	ax (20MHz)	242T	MCS0	19.13
Band 3/4	5835	167	ax (40MHz)	484T	MCS0	37.70
Band 4	5875	175	ax (40MHz)	484T	MCS0	37.77
	5855	171	ax (80MHz)	996T	MCS0	77.49
Band 3/4	5815	163	ax (160MHz L)	996T	MCS0	78.35
	5815	163	ax (160MHz U)	996T	MCS0	78.02

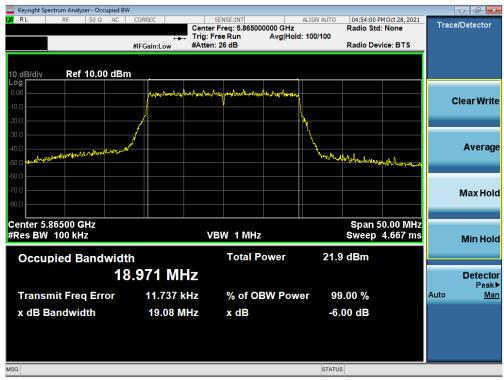
Table 7-9. Conducted Bandwidth Measurements MIMO ANT1 (Full Tones)

FCC ID: A3LSMS908JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 05 of 040	
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset		Page 85 of 242	
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Plot 7-121. 6dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax – 242 Tones (UNII Band 3/4) – Ch. 169)



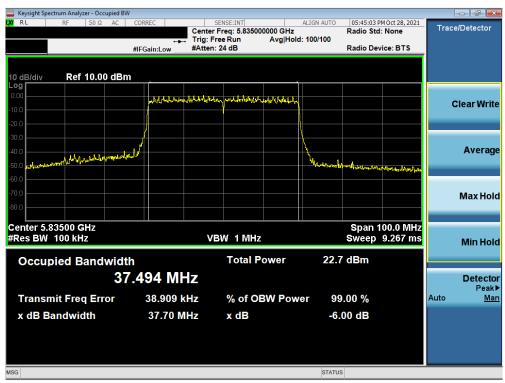
Plot 7-122. 6dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 4) - Ch. 173)

FCC ID: A3LSMS908JPN	PCTEST [®] Proud to be part of ® element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:	Dama 86 of 242			
1M2112100159-08.A3L	9/14/2021 - 11/12/2021	Portable Handset	Page 86 of 242			
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www.www.www.www.www.www.www.www.www.ww	BW				
L <mark>X/</mark> RL RF 50Ω AC		SENSE:INT	ALIGN AUTO	05:38:47 PM Oct 28, 202 Radio Std: None	Trace/Detector
	Trig:	: Free Run	Avg Hold:>100/100		
	#IFGain:Low #Atte	en: 28 dB		Radio Device: BTS	_
10 dB/div Ref 20.00 dE	3m				
Log 10.0					
0.00	an mail and and maker of	man an Amman	all		Clear Write
-10.0		<u> </u>			
-20.0	4		N.		
-30.0	f II - II		× .		Average
					A to tugo
-40.0			where of the	Amm. Markenner	
-60.0					Max Hold
-70.0					
Center 5.88500 GHz				Span 50.00 MH	z
#Res BW 100 kHz		VBW 1MHz		Sweep 4.667 m	s Min Hold
		Total Po) dBm	
Occupied Bandwic		Total PC	ower 22.9	авт	
1	8.972 MHz				Detector
Transmit Freq Error	22.165 kHz	% of OB	W Power 99	.00 %	Peak▶ Auto Man
					Mari
x dB Bandwidth	19.13 MHz	x dB	-6.	00 dB	
MSG			STATUS	5	

Plot 7-123. 6dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 4) - Ch. 177)



Plot 7-124. 6dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 3/4) - Ch. 167)

FCC ID: A3LSMS908JPN		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
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