

# PCTEST

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# MEASUREMENT REPORT FCC PART 15.407 / ISED RSS-247 UNII 802.11a/n/ac/ax

#### **Applicant Name:**

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

# Date of Testing:

1/16 – 1/22/2021 **Test Site/Location:** PCTEST Lab. Columbia, MD, USA **Test Report Serial No.:** 1M2101110003-08.A3L

# FCC ID:

# A3LSMG998JPN

# APPLICANT:

# Samsung Electronics Co., Ltd.

Application Type: Model: EUT Type: Frequency Range: Modulation Type: FCC Classification: FCC Rule Part(s): Test Procedure(s): Certification SC-52B Portable Handset 5180 – 5825MHz OFDM Unlicensed National Information Infrastructure (UNII) Part 15 Subpart E (15.407) ANSI C63.10-2013, KDB 789033 D02 v02r01, KDB 648474 D03 v01r04, KDB 662911 D01 v02r01

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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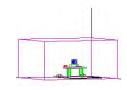


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# **MEASUREMENT REPORT**



			MI	MO
UNII Band	Channel Bandwidth (MHz)	Tx Frequency (MHz)	Max. Power (mW)	Max. Power (dBm)
1		5180 - 5240	100.693	20.03
2A	20	5260 - 5320	110.662	20.44
2C	20	5500 - 5720	110.408	20.43
3		5745 - 5825	111.686	20.48
1		5190 - 5230	90.365	19.56
2A	40	5270 - 5310	86.099	19.35
2C	40	5510 - 5710	92.683	19.67
3		5755 - 5795	87.700	19.43
1		5210	55.590	17.45
2A	80	5290	61.094	17.86
2C	00	5530 - 5690	84.528	19.27
3		5775	78.343	18.94
1	160	5250	39.628	15.98
2C	100	5570	50.003	16.99

**EUT Overview** 

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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

#### 2.1 Equipment Description

The Equipment Under Test (EUT) is the Samsung Portable Handset FCC ID A3LSMG998JPN. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter.

Test Device Serial No.: 0280M, 0301M, 0703M, 0289M

Ch.

52

56

1

64

#### 2.2 **Device Capabilities**

This device contains the following capabilities:

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

Band 1 Frequency (MHz)

5180

2

5210

:

5240

Ch.

36

42

2

48

Band 2A

5260

5280

÷

5320

Frequency (MHz) Ch.

Band 2C Frequency (MHz) 100 5500 120 5600 ÷ 144 5720

	Band 3
Ch.	Frequency (MHz)
149	5745
:	:
157	5785
:	:
165	5825

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

2

Band 1

nd 24

Ch.	Frequency (MHz)
38	5190
	:
46	5230

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

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

Band 3

	Bulla 0
Ch.	Frequency (MHz)
151	5755
:	
159	5795

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

|--|

Band	2A
------	----

Ch.

58

Dana				
Ch.	Frequency (MHz)			
42	5210			

Bana ZA
Frequency (MHz)
5290

Band 2C		
Ch.	Frequency (MHz)	
106	5530	
:	:	
138	5690	

	Band 3
h.	Frequency (MHz)

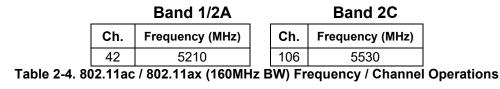
CI 155 5775

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

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#### Notes:

5GHz NII operation is possible in 20MHz, and 40MHz, 80MHz and 160MHz 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:

802.11 Mode/Band		
		а
n (HT20)	98.9	
ac (HT20)	97.9	
ax (HT20)	97.0	
n (HT40)	97.4	
ac (HT40)	95.3	
ax (HT40)	94.9	
ac (HT80)	91.3	
ax (HT80)	91.0	
ac (HT160)	87.1	
ax (HT160)	87.5	
	a n (HT20) ac (HT20) ax (HT20) n (HT40) ac (HT40) ac (HT40) ac (HT80) ac (HT80) ac (HT160)	

Table 2-5. Measured Duty Cycles

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

WiFi Configurations		SDM		CDD	
		ANT1	ANT2	ANT1	ANT2
	11a	×	×	$\checkmark$	✓
5GHz	11n/ac/ax (20 MHz)	√	✓	$\checkmark$	✓
	11n/ac/ax (40 MHz)	√	✓	$\checkmark$	✓
	11ac/ax (80 MHz)	√	✓	$\checkmark$	✓
	11ac/ax (160 MHz)	✓	✓	$\checkmark$	$\checkmark$

Table 2-6. Frequency / Channel Operations

✓ = Support ; × = NOT Support

**SISO** = Single Input Single Output

**SDM** = Spatial Diversity Multiplexing – MIMO function

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## 2.3 Antenna Description

Following antenna was used for the testing.

Frequency [GHz]	Antenna 1 Gain (dBi)	Antenna 2 Gain (dBi)
5.20	-6.5	-6.0
5.30	-6.3	-5.9
5.50	-6.4	-6.2
5.80	-6.2	-5.8

Table 2-7. 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 and AC line conducted testing. See Sections 3.2 for AC line conducted emissions test setups, 3.3 for radiated emissions test setups, and 7.2, 7.3, 7.4, and 7.5 for antenna port conducted emissions test setups.

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with the EUT lying flat on an authorized wireless charging pad (WCP) 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 G998USQU0ATJ7 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 AC Line Conducted Emissions

The line-conducted facility is located inside a 10'x16'x9' shielded enclosure. The shielded enclosure is manufactured by ETS Lindgren RF Enclosures. The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-5. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz,  $50\Omega/50\mu$ H Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. The external power line filter is an ETS Lindgren Model LPRX-4X30 (100dB Attenuation, 14kHz-18GHz) and the two EMI/RFI filters are ETS Lindgren Model LRW-2030-S1 (100dB Minimum Insertion Loss, 14kHz – 10GHz). These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference groundplane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

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 RF output of the LISN was connected to the spectrum analyzer and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions is used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

Line conducted emissions test results are shown in Section 7.8. The EMI Receiver mode of the Agilent MXE was used to perform AC line conducted emissions testing.

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# 3.3 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. An 80cm tall test table made of Styrodur is placed on top of the turn table. For measurements above 1GHz, an additional Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

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

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

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 474788 D01.

#### 3.4 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  $U_{\text{CISPR}}$  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)	9/16/2020	Annual	9/16/2021	WL25-1
-	WL40-1	WLAN Cable Set (40GHz)	9/16/2020	Annual	9/16/2021	WL40-1
Anritsu	ML2495A	Power Meter	12/17/2019	Annual	12/17/2020	941001
Anritsu	MA2411B	Pulse Power Sensor	12/4/2019	Annual	12/4/2020	846215
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2019	Biennial	10/10/2021	121034
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Emco	3116	Horn Antenna (18 - 40GHz)	8/7/2018	Triennial	8/7/2021	9203-2178
Espec	ESX-2CA	Environmental Chamber	8/27/2020	Biennial	8/27/2022	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	2/14/2019	Biennial	2/14/2021	125518
ETS-Lindgren	3816/2NM	LISN	7/9/2020	Biennial	7/9/2022	114451
ETS-Lindgren	3115	Double Ridged Guide Horn 750MHz - 18GHz	3/12/2020	Biennial	3/12/2022	150693
Keysight Technologies	N9020A	MXA Signal Analyzer	8/14/2020	Annual	8/14/2021	US46470561
Keysight Technologies	N9038A	MXE EMI Receiver	8/11/2020	Annual	8/11/2021	MY51210133
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	8/17/2020	Annual	8/17/2021	MY52350166
Keysight Technologies	N9020A	MXA Signal Analyzer	9/22/2020	Annual	9/22/2021	MY54500644
Pasternack	NMLC-2	Line Conducted Emissions Cable (NM)	1/9/2020	Annual	1/9/2021	NMLC-2
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/9/2020	Annual	9/9/2021	100348
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	8/10/2020	Annual	8/10/2021	103200
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	2/10/2020	Annual	2/10/2021	102134
Solar Electronics	8012-50-R-24-BNC	Line Impedance Stabilization Network	10/1/2019	Biennial	10/1/2021	310233
Sunol	DRH-118	Horn Antenna (1-18GHz)	10/3/2019	Biennial	10/3/2021	A050307
Sunol Science	JB5	Bi-Log Antenna (30M - 5GHz)	7/27/2020	Biennial	7/27/2022	A051107

Table 6-1. Annual Test Equipment Calibration Schedule

#### Note:

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

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### 7.0 TEST RESULTS

#### 7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.
FCC ID:	A3LSMG998JPN
FCC Classification:	Unlicensed National Information Infrastructure (UNII)

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	RSS-Gen [6.6]	26dB Bandwidth	N/A		PASS	Section 7.2
15.407(e)	RSS-Gen [6.6]	6dB Bandwidth	>500kHz(5725-5850MHz)		PASS	Section 7.3
15.407 (a.1.iv), (a.2), (a.3)	RSS-247 [6.2]	Maximum Conducted Output Power	Maximum conducted powers must meet the limits detailed in 15.407 (a) (RSS-247 [6.2])	CONDUCTED	PASS	Section 7.4
15.407 (a.1.iv), (a.2), (a.3)	RSS-247 [6.2]	Maximum Power Spectral Density	Maximum power spectral density must meet the limits detailed in 15.407 (a) (RSS-247 [6.2])		PASS	Section 7.5
15.407(h)	RSS-247 [6.3]	Dynamic Frequency Selection	See DFS Test Report		PASS	See DFS Test Report
15.407(b.1), (2), (3), (4)	RSS-247 [6.2]	Undesirable Emissions	Undesirable emissions must meet the limits detailed in 15.407(b) (RSS-247 [6.2])		PASS	Section 7.6
15.205, 15.407(b.1), (4), (5), (6)	RSS-Gen [8.9]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209 (RSS-Gen [8.9])			Section 7.6, 7.7
15.407	RSS-Gen [8.8]	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 (RSS-Gen [8.8]) limits	LINE CONDUCTED	PASS	Section 7.8

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 4.8.
- 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.

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#### 7.2 26dB Bandwidth Measurement – 802.11a/n/ac/ax 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

None.

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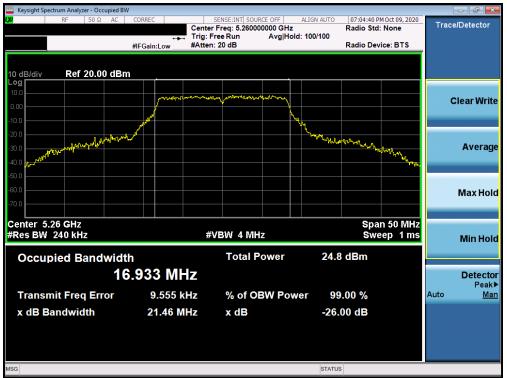
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Antenna-1 26dB Bandwidth [MHz]	Antenna-2 26dB Bandwidth [MHz]
	5180	36	а	6	21.46	30.74
	5200	40	а	6	21.38	27.75
	5240	48	а	6	21.38	25.81
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	32.08	34.85
Band 1	5200	40	n (20MHz)	6.5/7.2 (MCS0)	31.57	37.66
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	30.85	32.78
Ξ	5180	36	ax (20MHz)	6.5/7.2 (MCS0)	34.37	36.74
anc	5200	40	ax (20MHz)	6.5/7.2 (MCS0)	34.06	34.03
8	5240	48	ax (20MHz)	6.5/7.2 (MCS0)	34.56	35.80
	5190	38	n (40MHz)	13.5/15 (MCS0)	39.66	39.33
	5230	46	n (40MHz)	13.5/15 (MCS0)	41.51	39.40
	5190	38	ax (40MHz)	13.5/15 (MCS0)	40.15	56.88
	5230	46	ax (40MHz)	13.5/15 (MCS0)	40.22	56.52
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	81.39	81.23
	5210	42	ax (80MHz)	29.3/32.5 (MCS0)	80.88	80.89
Band 1/2A	5250	50	ac (160MHz)	58.5/65 (MCS0)	164.70	167.80
₿ 7	5250	50	ax (160MHz)	72.1/61.3 (MCS0)	165.90	163.30
	5260	52	а	6	27.37	23.71
	5280	56	а	6	27.93	22.41
	5320	64	а	6	21.06	24.86
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	29.69	33.51
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	28.88	30.04
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	28.89	28.41
Band 2A	5260	52	ax (20MHz)	6.5/7.2 (MCS0)	31.64	34.77
	5280	56	ax (20MHz)	6.5/7.2 (MCS0)	33.46	33.34
	5320	64	ax (20MHz)	6.5/7.2 (MCS0)	22.00	21.60
	5270	54	n (40MHz)	13.5/15 (MCS0)	39.57	39.29
	5310	62	n (40MHz)	13.5/15 (MCS0)	39.84	39.96
	5270	54	ax (40MHz)	13.5/15 (MCS0)	40.07	40.94
	5310	62	ax (40MHz)	13.5/15 (MCS0)	40.17	39.93
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	81.77	81.22
	5290	58	ax (80MHz)	29.3/32.5 (MCS0)	81.43	80.96
	5500	100	а	6	21.03	22.05
	5600	120	а	6	21.05	24.24
	5720	144	а	6	21.94	22.03
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	21.34	25.92
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	21.57	25.03
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	21.67	24.69
	5500	100	ax (20MHz)	6.5/7.2 (MCS0)	21.71	24.32
	5600	120	ax (20MHz)	6.5/7.2 (MCS0)	25.20	26.47
	5720	144	ax (20MHz)	6.5/7.2 (MCS0)	29.29	26.58
	5510	102	n (40MHz)	13.5/15 (MCS0)	39.80	39.57
Band 2C	5590	118	n (40MHz)	13.5/15 (MCS0)	44.73	39.65
and	5710	142	n (40MHz)	13.5/15 (MCS0)	40.06	43.18
ä	5510	102	ax (40MHz)	13.5/15 (MCS0)	40.33	40.03
	5590	118	ax (40MHz)	13.5/15 (MCS0)	40.35	40.58
	5710	142	ax (40MHz)	13.5/15 (MCS0)	45.33	40.22
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	81.65	80.88
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	81.07	81.44
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	81.49	80.91
	5530	106	ax (80MHz)	29.3/32.5 (MCS0)	81.11	80.84
	5610	122	ax (80MHz)	29.3/32.5 (MCS0)	80.74	80.77
	5690	138	ax (80MHz)	29.3/32.5 (MCS0)	80.93	81.04
	5570	114	ac (160MHz)	58.5/65 (MCS0)	164.80	169.30
	5570 <b>Tabla</b>	114 7 2 Co	ax (160MHz)	72.1/61.3 (MCS0)	165.70	164.30

 Table 7-2. Conducted Bandwidth Measurements MIMO

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### MIMO Antenna-1 26 dB Bandwidth Measurements



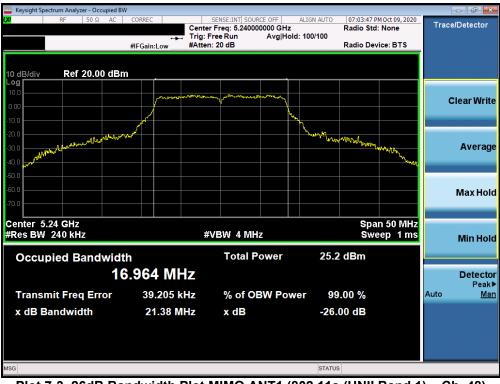
Plot 7-1. 26dB Bandwidth Plot MIMO ANT1 (802.11a (UNII Band 1) - Ch. 36)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
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Plot 7-2. 26dB Bandwidth Plot MIMO ANT1 (802.11a (UNII Band 1) - Ch. 40)



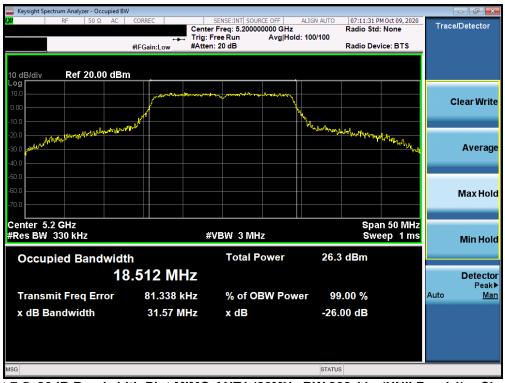
Plot 7-3. 26dB Bandwidth Plot MIMO ANT1 (802.11a (UNII Band 1) - Ch. 48)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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🔤 Keysight Spectrum Analyzer - Occupied BV	V				
<b>μ</b> RF 50 Ω AC	Trig: I	r Freq: 5.180000000 GHz Free Run Avg Hold	Radio Std : 100/100		Trace/Detector
	#IFGain:Low #Atter	n: 20 dB	Radio Dev	vice: BTS	
10 dB/div <b>Ref 20.00 dBn</b> Log	n				
0.00		way manager and the			Clear Write
-10.0	AND		and		
-20.0 -30.0 all Marine and a second and a se			······································	when when the	Average
-50.0					
-60.0					Max Hold
-70.0					
Center 5.18 GHz #Res BW 330 kHz	#	VBW 3 MHz		n 50 MHz eep 1 ms	Min Hold
Occupied Bandwidt	h	Total Power	26.6 dBm		
-	8.598 MHz				Detector Peak▶
Transmit Freq Error	72.576 kHz	% of OBW Powe	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	32.08 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-4. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 1) - Ch. 36)



Plot 7-5. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 1) - Ch. 40)

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Plot 7-6. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 1) – Ch. 48)



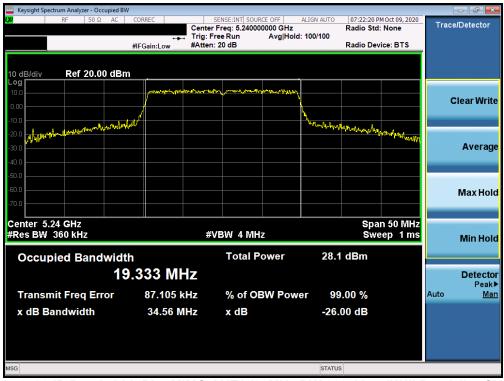
Plot 7-7. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 1) - Ch. 36)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied BV	V					×
<b>LXI</b> RF 50 Ω AC		SENSE:INT SOURCE OFF	ALIGN AUTO 07:21:18 Radio Sto	PM Oct 09, 2020	Trace/Detect	or
	→ Trig: F		d: 100/100	a. None		
	#IFGain:Low #Atten	: 20 dB	Radio De	vice: BTS		
10 dB/div Ref 20.00 dBn	n					
Log						
10.0	and the second second	~my profiles and a second s			Clear W	Irito
0.00			<b>\</b>		Clear W	me
-10.0	All		walling the			
-10.0 -20.0			Uniperine Internet and	nulphan		
-30.0				" ነየቆጥ	Aver	age
-40.0						
-50.0						
-60.0					Max H	lold
-70.0						_
Center 5.2 GHz			En:	an 50 MHz		
#Res BW 360 kHz	#	VBW 4 MHz		eep 1 ms	Min I	
					Min H	1010
Occupied Bandwidt	h	Total Power	28.3 dBm			_
	9.262 MHz				Dete	otor
						ctor ak▶
Transmit Freq Error	38.737 kHz	% of OBW Pow	ver 99.00 %			Man
x dB Bandwidth	34.06 MHz	x dB	-26.00 dB			
	0-1.00 MITIZ		-20.00 ub			
MSG			STATUS			

Plot 7-8. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 1) – Ch. 40)



Plot 7-9. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 1) - Ch. 48)

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🔤 Keysight Spectrum Analyzer - Occup	bied BW				
<mark>(X/</mark> RL RF 50 Ω	AC CORREC	SENSE:INT Center Freg: 5.19000000		07:09:43 PM Dec 10, 2020	Trace/Detector
		Trig: Free Run A	vg Hold: 100/100		
	#IFGain:Low	#Atten: 20 dB	R	adio Device: BTS	
10 dB/div Ref 20.00	dBm				
Log					
					Clear Write
0.00	and a second of the	and a start and a start of the	interference in the second sec		
-10.0					
-20.0	/				
-30.0	Warks .		Taskin I	r.La Mayaya Jawa Ma	Average
-40.0 1 Hat A 100 m00 1	(TYN)109W		. A Charlen and A Charlen a	MAN THUMAN IN	
-30.0 -40.0 -50.0				I P P P Gold	
-60.0					Max Hold
-70.0					Maxilola
Center 5.19000 GHz				Span 100.0 MHz	
#Res BW 390 kHz		VBW 4 MHz		Sweep 1ms	Min Hold
Occupied Bandw	ridth	Total Pow	ver 19.6 d	IBm	
			10.00		
	36.332 MH	Z			Detector
Transmit Freq Erro	r -23.103 k	Hz % of OBW	Power 99.0	0 %	Peak▶ Auto Man
x dB Bandwidth	39.66 M	Hz xdB	-26.00	dB	
MSG			STATUS		

Plot 7-10. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 1) - Ch. 38)



Plot 7-11. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 1) - Ch. 46)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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Plot 7-12. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 1) – Ch. 38)



Plot 7-13. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 1) - Ch. 46)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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www.www.com analyzer - Occupied BW						
<b>ΙΧΙ</b> RF 50 Ω AC	CORREC	SENSE:INT SOURCE OFF		PM Oct 09, 2020	Trace	Detector
			d: 100/100	ta: None		
	#IFGain:Low #	#Atten: 24 dB	Radio D	evice: BTS		
10 dB/div Ref 20.00 dBm						
Log 10.0						
0.00	and the second days and have	and an and superstanding to an and the	-		С	lear Write
	1					
-10.0						
-20.0	level.		he all all the party model have			
- o alfall alfantan			The second second	malinations		Average
-40.0						
-50.0						
-60.0				_		Max Hold
-70.0						
Center 5.21 GHz			<u> </u>	n 200 MHz		
#Res BW 820 kHz		#VBW 8 MHz		veep 1 ms		
						Min Hold
Occupied Bandwidth	า	Total Power	24.9 dBm			
75	.842 MHz	7				Detector
	.042 Mill	2				Peak►
Transmit Freq Error	241.25 kH	z % of OBW Pow	ver 99.00 %		Auto	<u>Man</u>
x dB Bandwidth	81.39 MH	z xdB	-26.00 dB			
MSG			STATUS			

Plot 7-14. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)



Plot 7-15. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax (UNII Band 1) - Ch. 42)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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🔤 Keysight Spectrum Analyzer - Occup	pied BW									
💢 RL RF 50 Ω	AC COR	REC		ISE:INT	0000 011-	ALIGN AUTO	07:52:36 P	M Dec 10, 2020	Trac	e/Detector
				eq: 5.25000 Run	Avg Hold	I: 100/100	Radio Std	None		
	#IFG	ain:Low	#Atten: 2				Radio Dev	ice: BTS		
, ,										
10 dB/div Ref 20.00	dBm									
10 dB/div Ref 20.00	иыш									
10.0										
0.00			all work with the	MUMARA	And deline				(	Clear Write
						1				
-10.0	(									
-20.0										
-30.0 -40.0	WWW PAR					1. A. B. M. M.	MAN NA.			Average
-40.0 whine 100 miles 100 miles 100 miles						man	MAN NAY	Contraction and		
-50.0										
-60.0										
										Max Hold
-70.0										
Center 5.2500 GHz							Enon /	00.0 MHz		
#Res BW 1.5 MHz			VB	V 8 MHz				ep 1 ms		
			VDV	V O IVII IZ			3000	ep mis		Min Hold
Occupied Bandw	vidth			Total P	ower	20.7	dBm			
Occupied Ballow						2011				
	154.	92 MI	ΤZ							Detector
Transmit Francis	-	27 420-1		0/ -1 0			00.0/		Auto	Peak▶ Man
Transmit Freq Erro	- T	27.420	(HZ	% of OI	3W Pow	er 99	.00 %		Auto	<u>Ivian</u>
x dB Bandwidth		164.7 M	IHz	x dB		-26.	00 dB			
MSG						STATUS				

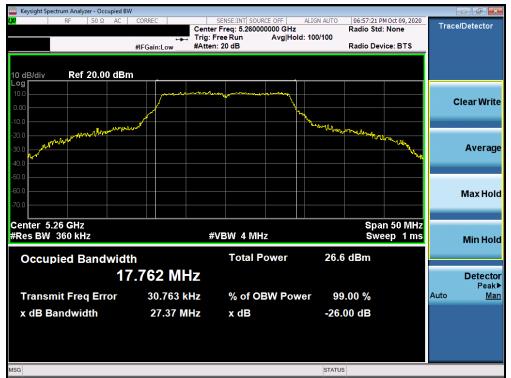
Plot 7-16. 26dB Bandwidth Plot MIMO ANT1 (160MHz BW 802.11ac (UNII Band 1) - Ch. 50)



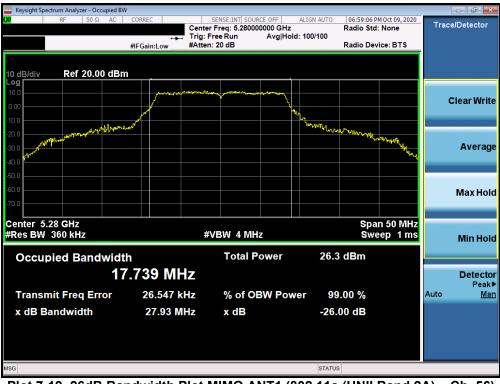
Plot 7-17. 26dB Bandwidth Plot MIMO ANT1 (160MHz BW 802.11ax (UNII Band 1) - Ch. 50)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager	
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Plot 7-18. 26dB Bandwidth Plot MIMO ANT1 (802.11a (UNII Band 2A) – Ch. 52)



Plot 7-19. 26dB Bandwidth Plot MIMO ANT1 (802.11a (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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Plot 7-20. 26dB Bandwidth Plot MIMO ANT1 (802.11a (UNII Band 2A) - Ch. 64)



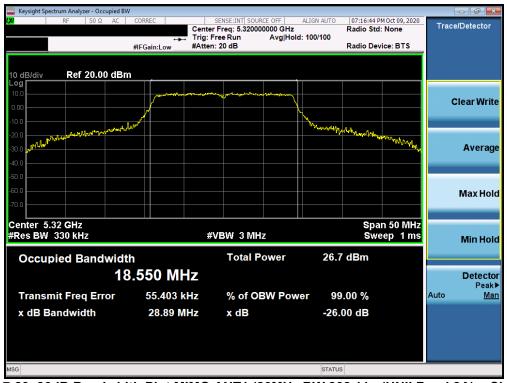
Plot 7-21. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMG998JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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Plot 7-22. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 2A) - Ch. 56)



Plot 7-23. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 2A) - Ch. 64)

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Keysight Spectrum Analyzer - Occupied BW					
KM RF 50 Ω AC	Center	SENSE:INT SOURCE OFF Freq: 5.260000000 GHz ree Run Avg Hol : 20 dB	ALIGN AUTO 07:24:30 F Radio Sto d: 100/100 Radio De		Trace/Detector
10 dB/div Ref 20.00 dBm					
0.00	AANAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	<u>Any</u> anitahorana <mark>kanana</mark>			Clear Write
-10.0 -20.0 -30.0	udi <sup>d</sup>		Martin and a hip may and	marthamatry	Average
-40.0					
-60.0					Max Hold
Center 5.26 GHz #Res BW 360 kHz		VBW 4 MHz	Sw	n 50 MHz eep 1 ms	Min Hold
	Occupied Bandwidth Total Power 28.1 dBm 19.236 MHz				
Transmit Freq Error	58.153 kHz	% of OBW Pow	/er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	31.64 MHz	x dB	-26.00 d <b>B</b>		
MSG			STATUS		

Plot 7-24. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 2A) – Ch. 52)



Plot 7-25. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 29 of 207
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Keysight Spectrum Analyzer - Occupied I	BW				
<b>LX/</b> RF 50 Ω AC		SENSE:INT SOURCE OFF r Freq: 5.320000000 GHz Free Run Avg Hold		54 PM Oct 09, 2020 Std: None	Trace/Detector
		n: 20 dB		Device: BTS	
10 dB/div Ref 20.00 dB	im				
Log 10.0					
0.00	and a second building and				Clear Write
-10.0	/		<b>\</b>		
	a allow		MANIAL A		
-20.0			mander approved	pathen engline and	Average
-40.0					Average
-50.0					
-60.0					Max Hold
-70.0					
Center 5.32 GHz				Span 50 MHz	
#Res BW 240 kHz	#	VBW 2 MHz		Sweep 1ms	Min Hold
Occupied Bandwid	lth	Total Power	26.7 dBm	ı	
1	9.140 MHz				Detector
					Peak▶
Transmit Freq Error	31.135 kHz	% of OBW Pow	er 99.00 %	0	Auto <u>Man</u>
x dB Bandwidth	22.00 MHz	x dB	-26.00 dE	3	
MSG			STATUS		

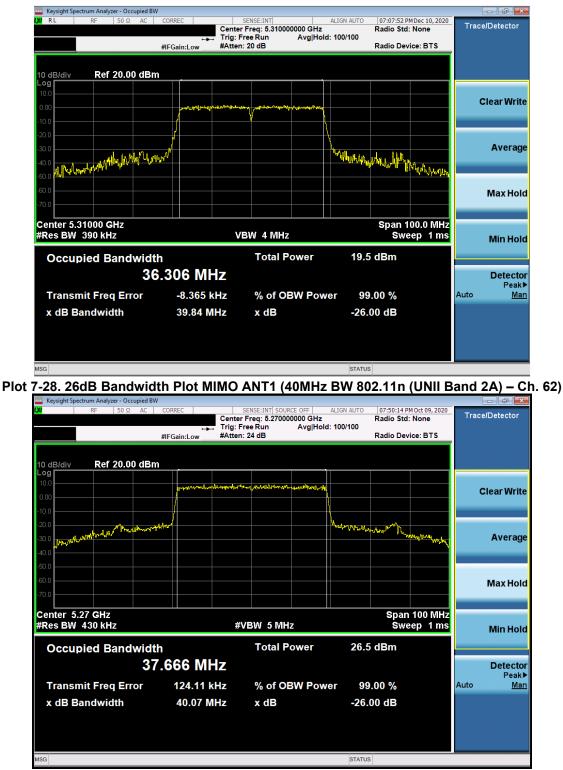
Plot 7-26. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 64)



Plot 7-27. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 2A) - Ch. 54)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dama 00 af 007	
1M2101110003-08.A3L	1/16 - 1/22/2021	rtable Handset		Page 29 of 207	
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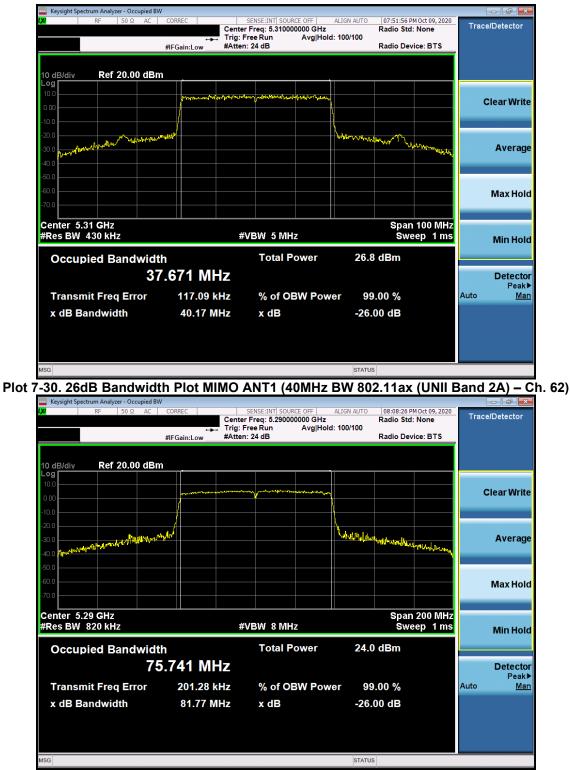




Plot 7-29. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 2A) - Ch. 54)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 20 of 207
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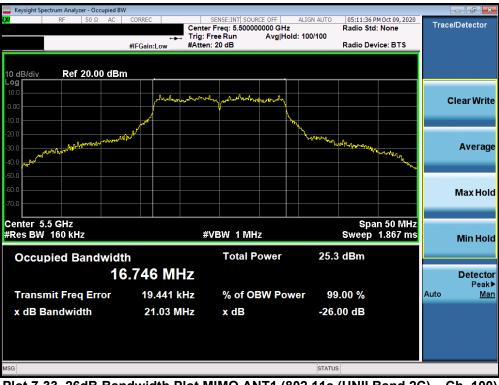
Plot 7-31. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ac (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 21 of 207	
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Keysight Spectrum Analyzer - Occupied BW					
IXI RF 50 Ω AC	Trig: F	SENSE:INT SOURCE OFF r Freq: 5.290000000 GHz Free Run Avg Holo n: 24 dB	ALIGN AUTO 08:07:13 F Radio Std d: 100/100 Radio Dev		Trace/Detector
10 dB/div Ref 20.00 dBm			1		
0.00	palestrumbulation	ally diamany many marked of the			Clear Write
-10.0					
-20.0 -30.0 -40.0	•/¥		mulalmymallularmiter	(any) the many of	Average
-50.0					Max Hold
-70.0					
Center 5.29 GHz #Res BW 820 kHz	#	VBW 8 MHz		eep 1 ms	Min Hold
Occupied Bandwidth	ո .935 MHz	Total Power	25.3 dBm		Detector
Transmit Freq Error	127.64 kHz	% of OBW Pow	er 99.00 %		Peak► Auto <u>Man</u>
x dB Bandwidth	81.43 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-32. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax (UNII Band 2A) – Ch. 58)



Plot 7-33. 26dB Bandwidth Plot MIMO ANT1 (802.11a (UNII Band 2C) – Ch. 100)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	<b>c</b>	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 22 of 207
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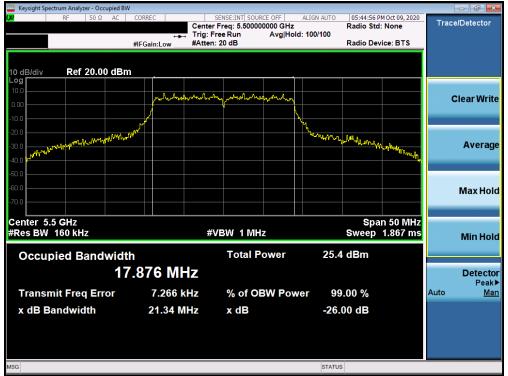
Plot 7-34. 26dB Bandwidth Plot MIMO ANT1 (802.11a (UNII Band 2C) - Ch. 120)



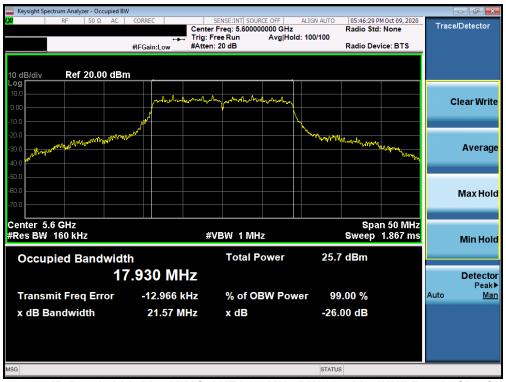
Plot 7-35. 26dB Bandwidth Plot MIMO ANT1 (802.11a (UNII Band 2C) - Ch. 144)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 22 of 207
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Plot 7-36. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 2C) - Ch. 100)



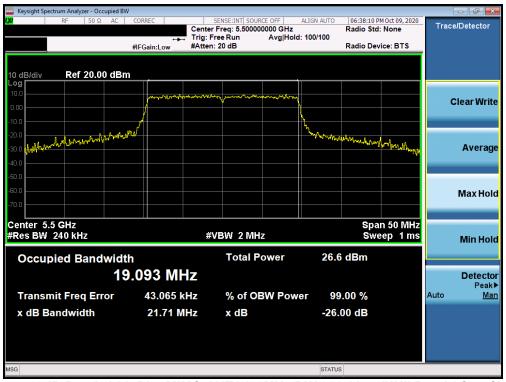
Plot 7-37. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 24 of 207
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Plot 7-38. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 2C) - Ch. 144)



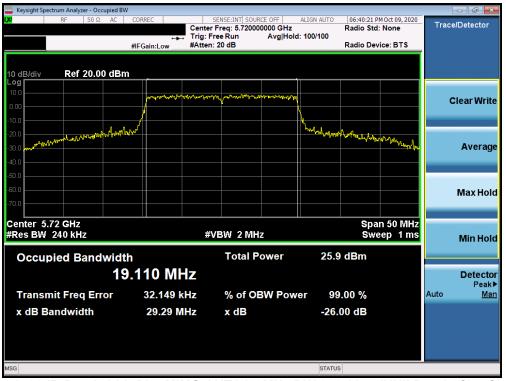
Plot 7-39. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 100)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 25 of 207
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Plot 7-40. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 120)



Plot 7-41. 26dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 144)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 26 of 207
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Keysight Spectrum Analyzer - Occupied I	BW				
X RL RF 50Ω AC	CORREC	SENSE:INT		2 PM Dec 10, 2020	Trace/Detector
		r Freq: 5.510000000 GHz Free Run Avg Ho	Id: 100/100	Std: None	ind on D of oto it.
		: 20 dB		Device: BTS	
10 dB/div Ref 20.00 dB	m				
10.0					
					Clear Write
0.00	and and be all the second second	and here and the second s			
-10.0					
-20.0	/		<u>\</u>		
-30.0			hulla.		Average
	4 Wr		With Mart and West for the	Mars. A	
-30.0				WWILL	
-50.0					
-60.0					Max Hold
-70.0					maxitora
Center 5.51000 GHz			Spar	100.0 MHz	
#Res BW 390 kHz	V	BW 4 MHz		weep 1ms	Min Hold
					Minitiona
Occupied Bandwid	lth	Total Power	20.1 dBm		
3	6.232 MHz				Detector Peak►
Transmit Freq Error	-70.316 kHz	% of OBW Pov	wer 99.00 %		Auto <u>Man</u>
x dB Bandwidth	39.80 MHz	x dB	-26.00 dB		
X dB Bandwidth	39.00 MIHZ	хав	-20.00 dB		
MSG			STATUS		
mod			STATUS		

Plot 7-42. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 2C) - Ch. 102)



Plot 7-43. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 2C) - Ch. 118)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dega 27 of 207
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Keysight Spectrum Analyzer - Occupied BW	I						
KL RF 50Ω AC	CORREC	SENSE:INT	ALIGN AUTO		MDec 10, 2020	Trac	e/Detector
		er Freq: 5.710000000 G Free Run Avg	Hz  Hold: 100/100	Radio Std:	None		
		en: 20 dB		Radio Dev	ice: BTS		
10 dB/div Ref 20.00 dBm	)						
Log 10.0							
						0	Clear Write
0.00	All a strange all and a strange		****				
-10.0							
-20.0	<mark>/</mark>		<u> </u>				
-30.0	. /						Average
-40.0 to to the hard of the hard of the hard	₩~		"M"Hwayn	1.4.00	an an a faith		Ŭ
ULAN MARK				1.6. AL 1. Al	HIM MANN		
-50.0							
-60.0							Max Hold
-70.0							
Center 5.71000 GHz					00.0 MHz		
#Res BW 390 kHz		VBW 4 MHz		Swe	ep 1 ms		Min Hold
Occupied Bandwidt	h	Total Powe	r 19.9	dBm			
36	.282 MHz						Detector
							Peak
Transmit Freq Error	-120.45 kHz	% of OBW F	ower 99	.00 %		Auto	Man
x dB Bandwidth	40.06 MHz	x dB	-26	00 dB		_	
	40.00 10112	A UD	-20.				
MSG			STATUS	5			

Plot 7-44. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 2C) - Ch. 142)



Plot 7-45. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 29 of 207	
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Keysight Spectrum Analyzer - Occupied BW	/				- ē <del>x</del>
<b>CM</b> RF 50 Ω AC	Center Trig: F		ALIGN AUTO 07:55:24 F Radio Sto d: 100/100 Radio De		Trace/Detector
	#IFGain:Low #Atten	. 24 00	Radio De	vice. D13	
10 dB/div Ref 20.00 dBn	1				
Log 10.0	Jung R Jack Junitry of Malury My	and			Clear Write
0.00					Clear Write
-10.0					
-20.0	ph. 2157		He Manur Marker The	margh makes	Average
U <sup>2 - 14 - 1</sup>				and the state of t	Average
-40.0					
-60.0					
-70.0					Max Hold
Center 5.59 GHz #Res BW 430 kHz	#\	VBW 5 MHz		n 100 MHz eep 1 ms	Min Hold
	P	Total Power	26.7 dBm		MITTOIL
Occupied Bandwidt		Total Power	20.7 0611		
37	.654 MHz				Detector Peak▶
Transmit Freq Error	91.263 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	40.35 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-46. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 2C) - Ch. 118)



Plot 7-47. 26dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 20 of 207
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Keysight Spectrum Analyzer - Occupied BV	V				
KM RF 50 Ω AC	Trig: F		Radio Sto 1: 100/100		Trace/Detector
,	#IFGain:Low #Atten	:: 24 dB	Radio De	vice: BTS	
10 dB/div Ref 20.00 dBn	n				
10.0					
0.00		and have a second a second a second			Clear Write
-10.0	/				
-20.0					
-20.0 -30.0	1404 ·		wind hours production of the		Average
-40.0 How all and a state				Whentrach	
-50.0					
-60.0					Max Hold
-70.0					Maxilola
Center 5.53 GHz #Res BW 820 kHz	#	VBW 8 MHz		n 200 MHz eep 1 ms	
					Min Hold
Occupied Bandwidt	h	Total Power	24.7 dBm		
7!	5.637 MHz				Detector
			00.00		Peak►
Transmit Freq Error	196.58 kHz	% of OBW Pow	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	81.65 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-48. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 106)



Plot 7-49. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 122)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 40 of 207
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Keysight Spectrum Analyzer - Occupied BW					- ē 🔀
<b>ΙΧΙ</b> RF 50 Ω AC	Trig: I	SENSE:INT SOURCE OFF r Freq: 5.690000000 GHz Free Run Avg Hold n: 24 dB	Radio Std		Trace/Detector
10 dB/div Ref 20.00 dBm					
0.00					Clear Write
-10.0 -20.0 -30.0 -40.0	Per		American and a second s	Vall Mar Mar Mar	Average
-50.0 -60.0 -70.0					Max Hold
Center 5.69 GHz #Res BW 820 kHz	#	VBW 8 MHz		200 MHz ep 1 ms	Min Hold
Occupied Bandwidth 75	.805 MHz	Total Power	24.3 dBm		Detector Peak▶
Transmit Freq Error x dB Bandwidth	141.95 kHz 81.49 MHz	% of OBW Powe x dB	er 99.00 % -26.00 dB		Peak▼ Auto <u>Man</u>
MSG			STATUS		

Plot 7-50. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 138)



Plot 7-51. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax (UNII Band 2C) - Ch. 106)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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www.com analyzer - Occupied BW					
<b>LX1</b> RF 50 Ω AC	Center		ALIGN AUTO 08:14:15 F Radio Std d: 100/100 Radio Dev		Trace/Detector
10 dB/div Ref 20.00 dBm					
0.00	hand hall and a state of the	mproverseling			Clear Write
-10.0 -20.0 -30.0 -40.0			hard and the state of the second states of the seco	h halphary	Average
-50.0					Max Hold
Center 5.61 GHz #Res BW 820 kHz		/BW 8 MHz	Sw	1200 MHz eep 1ms	Min Hold
Occupied Bandwidth 76	.967 MHz	Total Power	26.0 dBm		Detector Peak▶
Transmit Freq Error x dB Bandwidth	141.44 kHz 80.74 MHz	% of OBW Pow x dB	er 99.00 % -26.00 dB		Peak► Auto <u>Man</u>
MSG			STATUS		

Plot 7-52. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax (UNII Band 2C) - Ch. 122)



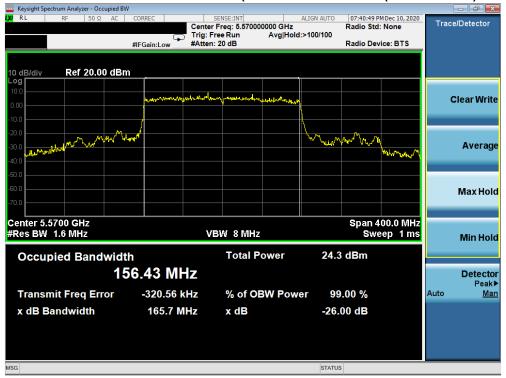
Plot 7-53. 26dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax (UNII Band 2C) - Ch. 138)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 42 of 207
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Plot 7-54. 26dB Bandwidth Plot MIMO ANT1 (160MHz BW 802.11ac (UNII Band 2C) - Ch. 114)

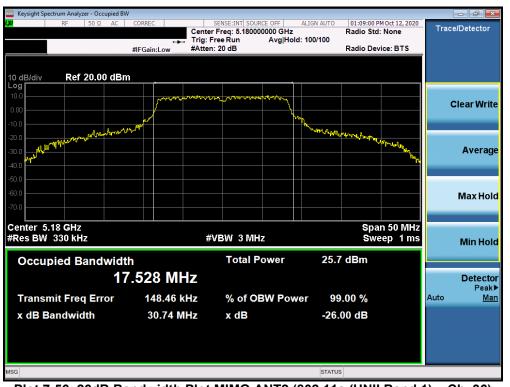


Plot 7-55. 26dB Bandwidth Plot MIMO ANT1 (160MHz BW 802.11ax (UNII Band 2C) - Ch. 114)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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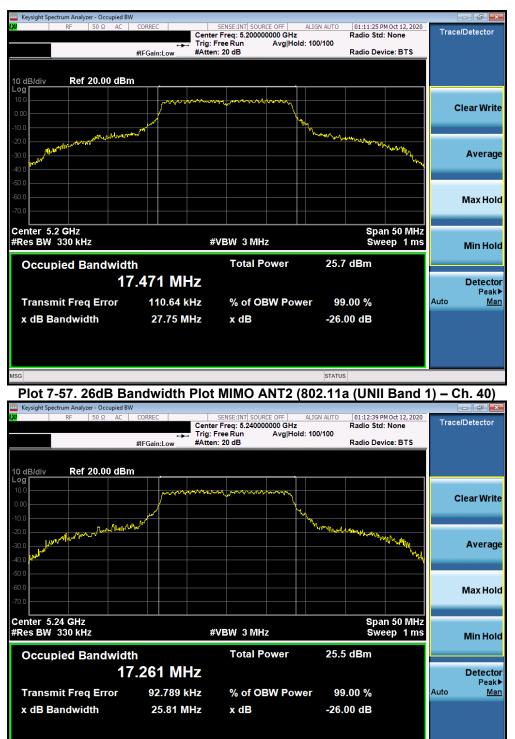
## MIMO Antenna-2 26dB Bandwidth Measurements



Plot 7-56. 26dB Bandwidth Plot MIMO ANT2 (802.11a (UNII Band 1) - Ch. 36)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dama 11 of 207	
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Plot 7-58. 26dB Bandwidth Plot MIMO ANT2 (802.11a (UNII Band 1) – Ch. 48)

STATUS

FCC ID: A3LSMG998JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied BW							
KM RF 50 Ω AC CORR		ENSE:INT SOURCE OFF	ALIGN AUTO	01:23:13 P	4 Oct 12, 2020	Trace	e/Detector
	Trig: Fre	e Run Avg Holo	d: 100/100				
#IFG	ain:Low #Atten: :	20 dB		Radio Dev	ice: BTS		
10 dB/div Ref 20.00 dBm							
Log							
10.0	Numeround	www.www.and.					Clear Write
0.00	<i>f</i>		X,				
-10.0 -20.0			May Mary Land	Malandonianan			
-20.0				and the floor of	Maryle Here		
-30.0					·~~		Average
-40.0							
-50.0							
-60.0							Maxilald
-70.0							Max Hold
Center 5.18 GHz				Spa	n 50 MHz		
#Res BW 360 kHz	#V	BW 4 MHz		Swe	ep 1 ms		Min Hold
		Total Power	26.7	d Dara			
Occupied Bandwidth		Total Power	20.7	автт			
19.06	62 MHz						Detector
		% -f ODM D		00.0/		Auto	Peak▶ Man
Transmit Freq Error 6	67.614 kHz	% of OBW Pow	er 99.	00 %		Auto	<u>ivian</u>
x dB Bandwidth	34.85 MHz	x dB	-26.0	0 dB			
MSG			STATUS				

Plot 7-59. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 36)



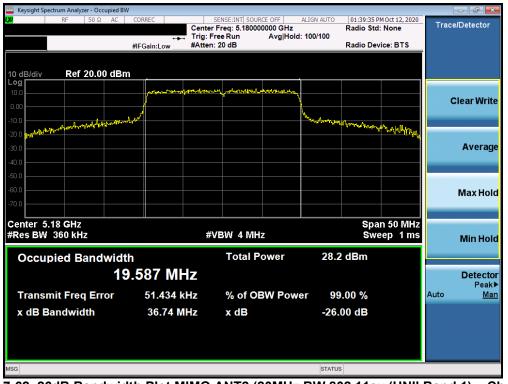
Plot 7-60. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 40)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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Plot 7-61. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 48)



Plot 7-62. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 1) - Ch. 36)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied BW					x
IXI RF 50 Ω AC CORREC	SENSE:INT SOURCE OFF Center Freq: 5.200000000 Trig: Free Run Avg		M Oct 12, 2020 I: None	Trace/Detector	-
#IFGain:Low	#Atten: 20 dB	Radio De	vice: BTS		
10 dB/div Ref 20.00 dBm					
10.0	warman made marked the free	ANLA			
0.00				Clear Wri	ite
-10.0 -20.0 arrillow and the and the arrited and the arrited and the arrited and the arrited area and the arrited area area area area area area area ar		and and a second a	Weet and a		
			A MARKED	Avera	an
-30.0				Avera	ye
-40.0					
-50.0					
-60.0				Max Ho	old
-70.0					
Center 5.2 GHz		Sna	n 50 MHz		
#Res BW 360 kHz	#VBW 4 MHz		eep 1 ms	Min Ho	Jd
			<u> </u>	MITTHO	nu
Occupied Bandwidth	Total Powe	r 27.3 dBm			
19.447 M	H7			Detect	or
				Pea	
Transmit Freq Error 46.614	kHz % of OBW I	ower 99.00 %		Auto <u>M</u>	an
x dB Bandwidth 34.03	MHz xdB	-26.00 dB			
MSG		STATUS			

Plot 7-63. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 1) – Ch. 40)



Plot 7-64. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 1) - Ch. 48)

FCC ID: A3LSMG998JPN	Proud to be part of element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occupied BW							🗗 💌
LX RL RF 50Ω AC	CORREC	SENSE:INT	ALIGN AUTO		MDec 10, 2020	Trace	e/Detector
		enter Freq: 5.19000 rig: Free Run	0000 GHz Avg Hold: 100/100	Radio Std	None	ITAC	Belector
		Atten: 20 dB	Avginoid. 100/100	Radio Dev	ice: BTS		
	#IFGaIII.LOW #			Tradio Der			
10 dB/div Ref 20.00 dBm							
Log						_	
10.0							
0.00	Mentralizante	which must have	willyharthy			C	Clear Write
		W					
-10.0			h				
-20.0							
-30.0	had a second sec		Marth Lalar	ar march has			Average
-30.0 -30.0 -40.0 -40.0 -40.0				W WWWWWWW	moles and		-
					and the second		
-50.0							
-60.0							Max Hold
-70.0							Max Holu
-70.0						_	
Center 5.19000 GHz				Snan 1	00.0 MHz		
#Res BW 390 kHz		VBW 4 MHz			ep 1 ms		
WILCO DW 350 KIIZ				040	ep i ma		Min Hold
Occurried Developidate		Total P	ower 21	3 dBm			
Occupied Bandwidth			21.	5 ubili			
36	.301 MHz	/					Detector
							Peak▶
Transmit Freq Error	-4.569 kHz	z % of OE	3W Power 9	9.00 %		Auto	Man
x dB Bandwidth	39.33 MHz	z x dB	26	.00 dB		_	
	39.33 WI⊓2		-20	.00 UB			
MSG			STATU	IS			

Plot 7-65. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 1) - Ch. 38)



Plot 7-66. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 1) - Ch. 46)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager	
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Keysight Spectrum Analyzer - Occupied BW					_	
<b>ΙΧΙ</b> RF 50 Ω AC		sense:INT SOURCE OFF enter Freq: 5.190000000 GHz ig: Free Run Avg Ho		M Oct 12, 2020	Trace/	Detector
		tten: 20 dB	Radio Dev	vice: BTS		
10 dB/div Ref 20.00 dBm						
Log						
0.00	V. Landaran Maria	and the second			CI	ear Write
-10.0	[]					
Company and the second se	mar		have have the			
-20.0 -30.0 Holy Month And Market				W-Melly Mythingh		Average
						Average
-40.0						
-50.0						
-60.0					1	Max Hold
-70.0						
Center 5.19 GHz			Spar	100 MHz		
#Res BW 680 kHz		#VBW 6 MHz	Sw	eep 1 ms		Min Hold
Occupied Dendwidth		Total Power	26.3 dBm			
Occupied Bandwidth		Total Fower	20.5 000			
37	.865 MHz					Detector Peak►
Transmit Freq Error	124.08 kHz	% of OBW Pov	ver 99.00 %		Auto	Peak► <u>Man</u>
x dB Bandwidth	56.88 MHz	x dB	-26.00 dB			
MSG			STATUS			

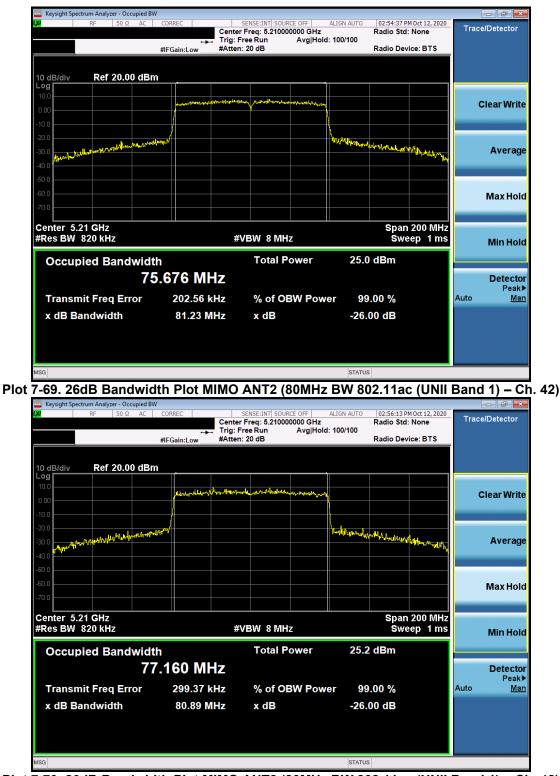
Plot 7-67. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 1) - Ch. 38)



Plot 7-68. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 1) - Ch. 46)

FCC ID: A3LSMG998JPN	Poud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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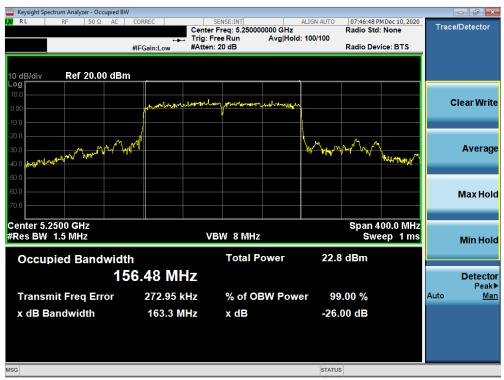
Plot 7-70. 26dB Bandwidth Plot MIMO ANT2 (80MHz BW 802.11ax (UNII Band 1) - Ch. 42)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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Keysight Spectrum Analyzer - Occu	upied BW						
LX/ RL RF 50 Ω	AC COR		SENSE:INT	ALIGN AUTO		Dec 10, 2020	Frequency
			enter Freq: 5.250000		Radio Std:	None	Frequency
	#15.0		rig: Free Run Atten: 20 dB	Avg Hold: 100/100	Radio Devi	CO' BTS	
	#IFG	ain:Low #/	Riten. 20 ab		Radio Devi	ce. DT3	
10 dB/div Ref 20.00	dBm						
Log							
10.0							Center Freq
0.00		L Mrthur Mar	and the particular the second	and a second			5.250000000 GHz
			V Ť				0.200000000000
-10.0							
-20.0							
-30.0	A				MA WWW		
-30.0 -40.0	. valk it.			Y MUN WALK	Part and they	kata in a la l	
-40.0 manifed that						A B WAND	
-50.0							
-60.0							
-70.0							
-70.0							
Center 5.2500 GHz					Snan 4(	00.0 MHz	
#Res BW 1.5 MHz			VBW 8 MHz			ep 1 ms	CF Step
					OWC	ep ma	40.000000 MHz
Occurried Band	مرا فالغالم		Total Po	wor 20/	dBm		<u>Auto</u> Man
Occupied Bandy				20.4	i ubili		
	154	97 MHz					Freq Offset
							•
Transmit Freq Erro	or	-481 Hz	% of OB	W Power 99	.00 %		0 Hz
x dB Bandwidth		167.8 MHz	x dB	26	00 dB		
			хив	-20.	00 aB		
MSG				STATUS	5		

Plot 7-71. 26dB Bandwidth Plot MIMO ANT2 (1600MHz BW 802.11ac (UNII Band 1) - Ch. 50)



Plot 7-72. 26dB Bandwidth Plot MIMO ANT2 (160MHz BW 802.11ax (UNII Band 1) - Ch. 50)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	AMSUNG	Approved by: Technical Manager
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Plot 7-73. 26dB Bandwidth Plot MIMO ANT2 (802.11a (UNII Band 2A) – Ch. 52)



Plot 7-74. 26dB Bandwidth Plot MIMO ANT2 (802.11a (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 52 of 207
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Plot 7-75. 26dB Bandwidth Plot MIMO ANT2 (802.11a (UNII Band 2A) - Ch. 64)



Plot 7-76. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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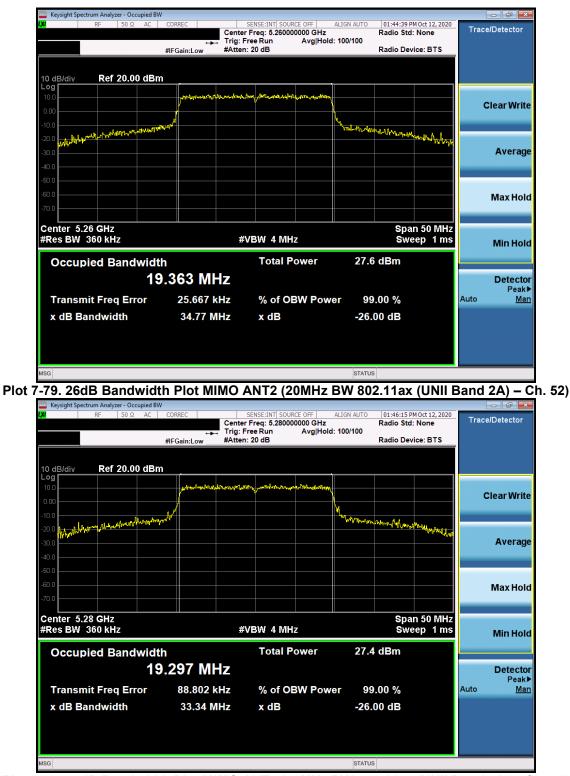
Plot 7-77. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 56)



Plot 7-78. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama EE of 207
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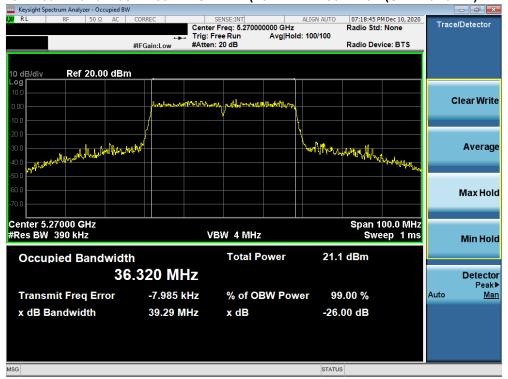
Plot 7-80. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage FC of 207
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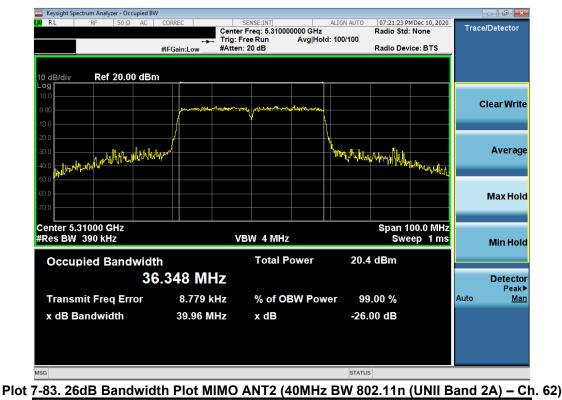
Plot 7-81. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 64)



Plot 7-82. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 2A) - Ch. 54)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Demo EZ of 207
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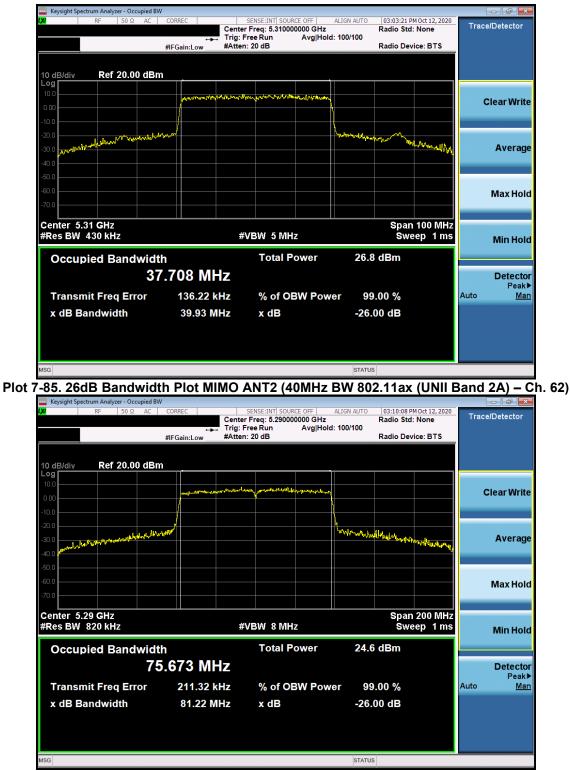


Keysight Spectrum Analyzer - Occupied BW Center Freq: 5.270000000 GHz 03:01:41 PM Oct 12, 2020 Radio Std: None Trace/Detector Avg|Hold: 100/100 Tria: Free Run #IFGain:Low #Atten: 20 dB Radio Device: BTS Ref 20.00 dBm 0 dB/c og - 1 a **Clear Write** Weller Margan And Apl 1m Average Max Hold Center 5.27 GHz #Res BW 430 kHz Span 100 MHz Sweep 1 ms #VBW 4 MHz **Min Hold Total Power** 25.9 dBm **Occupied Bandwidth** 37.671 MHz Detector Peak▶ **Transmit Freq Error** 108.55 kHz % of OBW Power 99.00 % Auto Man x dB Bandwidth 40.94 MHz x dB -26.00 dB

Plot 7-84. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 2A) - Ch. 54)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 50 af 007
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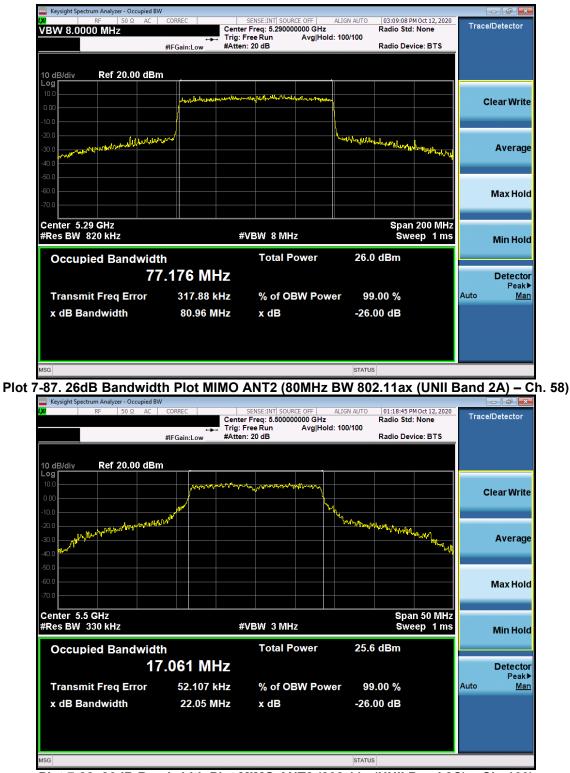




Plot 7-86. 26dB Bandwidth Plot MIMO ANT2 (80MHz BW 802.11ac (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMG998JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga E0 of 207
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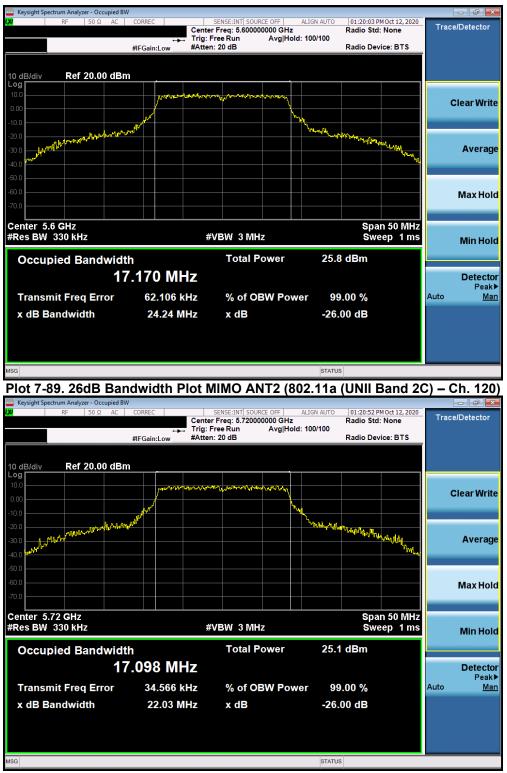




Plot 7-88. 26dB Bandwidth Plot MIMO ANT2 (802.11a (UNII Band 2C) - Ch. 100)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 60 of 207
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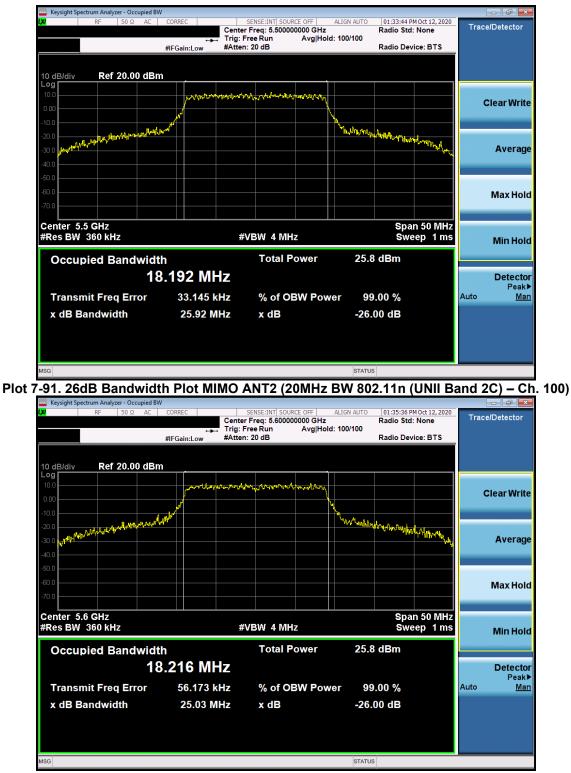




Plot 7-90. 26dB Bandwidth Plot MIMO ANT2 (802.11a (UNII Band 2C) - Ch. 144)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 01 - 6 007
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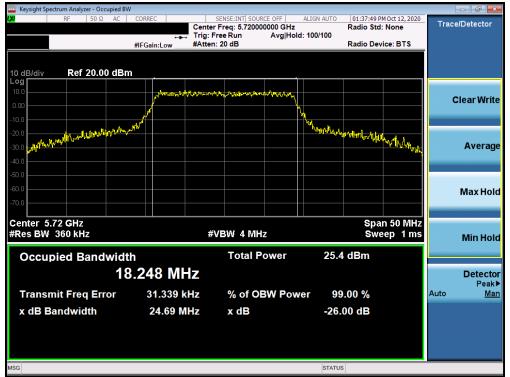




Plot 7-92. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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Plot 7-93. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 2C) - Ch. 144)



Plot 7-94. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 100)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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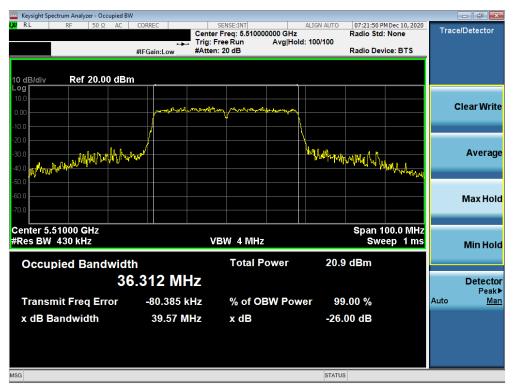
Plot 7-95. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 120)



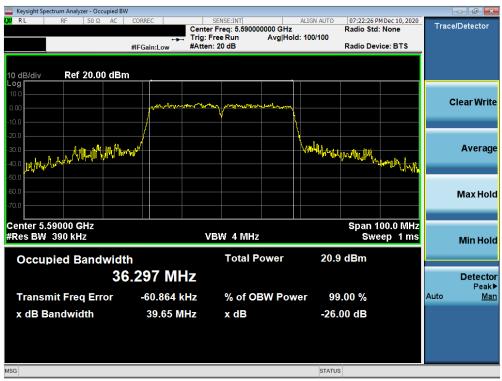
Plot 7-96. 26dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 144)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
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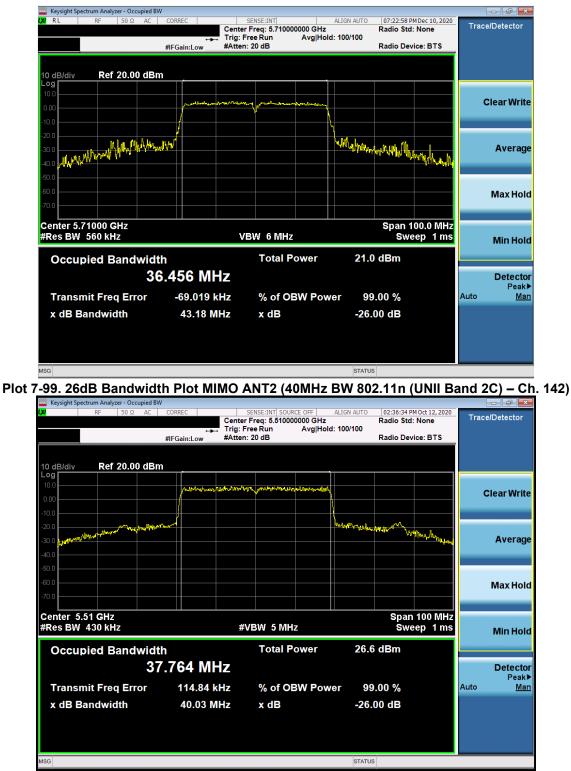
Plot 7-97. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)



Plot 7-98. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 2C) - Ch. 118)

FCC ID: A3LSMG998JPN	Proud to be part of @ element	MEASUREMENT REPORT (Certification)	Approved by: Technical Manager
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Plot 7-100. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMG998JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (Certification)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 66 of 207
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