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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: 10/11/19 – 01/15/20 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M1911010179-06.A3L

FCC ID: IC:

A3LSMG986W

649E-SMG986W

APPLICANT:

Samsung Electronics Co., Ltd.

Application Type: Model/HVIN: EUT Type: Frequency Range: FCC Classification: FCC Rule Part(s): ISED Specification: Test Procedure(s): Certification SM-G986W Portable Handset 5180 – 5825MHz Unlicensed National Information Infrastructure (UNII) Part 15 Subpart E (15.407) RSS-247 Issue 2 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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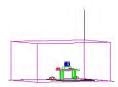


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			AN	JT1	AN	IT2	MIM	ЛО
UNII Band	Channel Bandwidth (MHz)	Tx Frequency (MHz)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)
1		5180 - 5240	59.704	17.76	54.828	17.39	112.460	20.51
2A	20	5260 - 5320	62.517	17.96	57.280	17.58	117.220	20.69
2C	20	5500 - 5720	59.841	17.77	61.802	17.91	121.339	20.84
3		5745 - 5825	62.806	17.98	62.517	17.96	123.310	20.91
1		5190 - 5230	44.668	16.50	44.668	16.50	89.331	19.51
2A	40	5270 - 5310	50.003	16.99	45.082	16.54	94.842	19.77
2C	40	5510 - 5710	48.195	16.83	49.888	16.98	98.175	19.92
3		5755 - 5795	46.238	16.65	49.888	16.98	96.161	19.83
1		5210	20.045	13.02	22.131	13.45	42.170	16.25
2A	80	5290	16.672	12.22	19.409	12.88	28.907	14.61
2C	00	5530 - 5690	34.356	15.36	36.728	15.65	70.632	18.49
3		5775	34.514	15.38	34.198	15.34	68.707	18.37

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 Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

1.3 Test Facility / Accreditations Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST is an ISO 17025-2005 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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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMG986W**. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter.

Test Device Serial No.: 0306M, 0071M, 0388M, 0337M, 0930H, 0764H

2.2 Device Capabilities

This device contains the following capabilities:

850 CDMA/EvDO Rev0/A, 1x Advanced (BC0), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 5G NR (n71, n66, n41), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE), NFC, ANT+, Wireless Power Transfer

	Band 1		Band 2A		Band 2C		Band 3
Ch.	Frequency (MHz)						
36	5180	52	5260	100	5500	149	5745
:	:	:	:	:	:	:	:
42	5210	56	5280	120	5600	157	5785
:	:	:	:	:	:	:	:
48	5240	64	5320	144	5720	165	5825

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
•	Frequency (MHz)
	5270
	:
	5310

Ch 54 : 62 . . .

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

Band	3
------	---

	Bana o
Ch.	Frequency (MHz)
151	5755
:	:
159	5795

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

	Band 1		Band 2A		Band 2C		Band 3
Ch.	Frequency (MHz)						
42	5210	58	5290	106	5530	155	5775
				:	:		
				138	5690		

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, 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:

Maximum Achievable Duty Cycles					
			ANT2	MIMO / CDD	
802.11 Mode/Band		Duty Cycle [%]	Duty Cycle [%]	Duty Cycle [%]	
	а	98.8	98.9	98.8	
	n (HT20)	98.7	98.8	98.7	
	ac (HT20)	98.8	98.8	97.5	
	ax (HT20)	98.5	98.5	97.0	
5GHz	n (HT40)	97.3	97.4	97.4	
	ac (HT40)	97.3	97.5	95.0	
	ax (HT40)	97.0	96.9	94.7	
	ac (HT80)	94.7	94.7	91.2	
	ax (HT80)	94.3	94.2	91.4	

Table 2-4. Measured Duty Cycles

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

WiFi Configurations		SISO		SDM		CDD	
		ANT1	ANT2	ANT1	ANT2	ANT1	ANT2
	11a	\checkmark	✓	×	×	~	✓
ECH-	11n/ac/ax (20MHz)	\checkmark	✓	✓	✓	~	✓
5GHz	11n/ac/ax (40MHz)	\checkmark	✓	✓	✓	~	✓
	11ac/ax (80MHz)	✓	✓	✓	\checkmark	✓	✓

 Table 2-5. Frequency / Channel Operations

✓ = Support ; × = 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.

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

Description	2.4 GHz Emission	5 GHz Emission
Antenna	1	2
Channel	6	157
Operating Frequency (MHz)	2437	5785
Data Rate (Mbps)	1	MCS0
Mode	802.11b	802.11n

Table 2-6. Config-1 (ANT1 2.4GHz & ANT2 5GHz)

Configuration 2: ANT1 transmitting in 5GHz mode and ANT2 in 2.4GHz mode

Description	2.4 GHz Emission	5 GHz Emission
Antenna	2	1
Channel	6	149
Operating Frequency (MHz)	2437	5745
Data Rate (Mbps)	1	6
Mode	802.11b	802.11a

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

Configuration 3: ANT1 and ANT2 both transmitting in 2.4GHz and 5GHz modes simultaneously

Description	2.4 GHz Emission	5 GHz Emission
Antenna	1, 2	1, 2
Channel	6	165
Operating Frequency (MHz)	2437	5825
Data Rate (Mbps)	6	MCS8
Mode	802.11g	802.11n

Table 2-8. Config-3 (ANT1 MIMO & ANT2 MIMO)

2.3 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) Model: EP-N5100 while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/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_{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
-	WL25-2	Conducted Cable Set (25GHz)	6/3/2019	Annual	6/3/2020	WL25-2
-	WL25-1	Conducted Cable Set (25GHz)	6/5/2019	Annual	6/5/2020	WL25-1
-	WL25-4	Conducted Cable Set (25GHz)	6/4/2019	Annual	6/4/2020	WL25-4
Agilent	N9030A	PXA Signal Analyzer (44GHz)	6/12/2019	Annual	6/12/2020	MY52350166
Agilent	N9020A	MXA Signal Analyzer	4/20/2019	Annual	4/20/2020	US46470561
Emco	3115	Horn Antenna (1-18GHz)	3/28/2018	Biennial	3/28/2020	9704-5182
Emco	3116	Horn Antenna (18 - 40GHz)	6/7/2018	Triennial	6/7/2021	9203-2178
Emco	3160-09	Small Horn (18 - 26.5GHz)	8/9/2018	Biennial	8/9/2020	00135427
Emco	3160-10	Small Horn (26.5 - 40GHz)	8/9/2018	Biennial	8/9/2020	00130993
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	2/14/2019	Biennial	2/14/2021	125518
ETS-Lindgren	3816/2NM	Line Impedance Stabilization Network	6/18/2018	Biennial	6/18/2020	114451
Pasternack	NMLC-2	Line Conducted Emissions Cable (NM)	6/3/2019	Annual	6/3/2020	NMLC-2
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	6/5/2019	Annual	6/5/2020	100342
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	5/6/2019	Annual	5/6/2020	103200
Seekonk	NC-100	Torque Wrench 8in-lb	5/9/2018	Biennial	5/9/2020	N/A
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	4/19/2018	Biennial	4/19/2020	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:	A3LSMG986W
FCC Classification:	Unlicensed National Information Infrastructure (UNII)

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
N/A	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])	RADIATED	PASS	Section 7.6, 7.9
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 4.7.
- 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.

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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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SISO Antenna-1 26 dB Bandwidth Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]	
	5180	36	а	6	21.37	
	5200	40	а	6	24.49	
	5240	48	а	6	30.21	
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	24.30	
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	31.88	
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	30.25	
.	5180	36	ax (20MHz)	6.5/7.2 (MCS0)	21.41	
Band 1	5200	40	ax (20MHz)	6.5/7.2 (MCS0)	21.21	
ä	5240	48	ax (20MHz)	6.5/7.2 (MCS0)	21.55	
	5190	38	n (40MHz)	13.5/15 (MCS0)	66.22	
	5230	46	n (40MHz)	13.5/15 (MCS0)	73.70	
	5190	38	ax (40MHz)	13.5/15 (MCS0)	40.14	
	5230	46	ax (40MHz)	13.5/15 (MCS0)	39.87	
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	81.22	
	5210	42	ax (80MHz)	29.3/32.5 (MCS0)	81.40	
	5260	52	а	6	29.58	
	5280	56	а	6	35.67	
	5320	64	а	6	30.14	
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	30.58	
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	41.47	
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	34.85	
ZA	5260	52	ax (20MHz)	6.5/7.2 (MCS0)	21.44	
Band 2A	5280	56	ax (20MHz)	6.5/7.2 (MCS0)	21.73	
Ba	5320	64	ax (20MHz)	6.5/7.2 (MCS0)	30.83	
	5270	54	n (40MHz)	13.5/15 (MCS0)	77.18	
	5310	62	n (40MHz)	13.5/15 (MCS0)	73.29	
	5270	54	ax (40MHz)	13.5/15 (MCS0)	39.94	
	5310	62	ax (40MHz)	13.5/15 (MCS0)	40.08	
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	103.50	
	5290	58	ax (80MHz)	29.3/32.5 (MCS0)	81.09	
	5500	100	а	6	31.33	
	5600	120	а	6	34.39	
	5720	144	а	6	37.52	
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	30.90	
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	40.52	
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	38.98	
	5500	100	ax (20MHz)	6.5/7.2 (MCS0)	26.17	
	5600	120	ax (20MHz)	6.5/7.2 (MCS0)	25.34	
	5720	144	ax (20MHz)	6.5/7.2 (MCS0)	23.20	
SC	5510	102	n (40MHz)	13.5/15 (MCS0)	77.23	
Band 2C	5590	118	n (40MHz)	13.5/15 (MCS0)	74.69	
Bai	5710	142	n (40MHz)	13.5/15 (MCS0)	74.55	
	5510	102	ax (40MHz)	13.5/15 (MCS0)	39.55	
	5590	118	ax (40MHz)	13.5/15 (MCS0)	39.73	
	5710	142	ax (40MHz)	13.5/15 (MCS0)	40.06	
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	105.90	
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	109.30	
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	111.20	
	5530	106	ax (80MHz)	29.3/32.5 (MCS0)	81.92	
	5610	122	ax (80MHz)	29.3/32.5 (MCS0)	81.34	
	5690	138	ax (80MHz)	29.3/32.5 (MCS0)	80.94	
Table				Measuremer		Г1
	EST		EASUREMENT (CERTIFICAT	REPORT	SAMSUNG	Approved b
st Dates:		EUT Type:		•		
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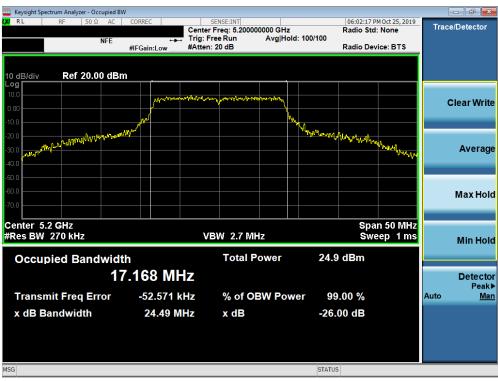
1M1911010179-06.A3L

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



Plot 7-2. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 1) – Ch. 40)

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



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

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



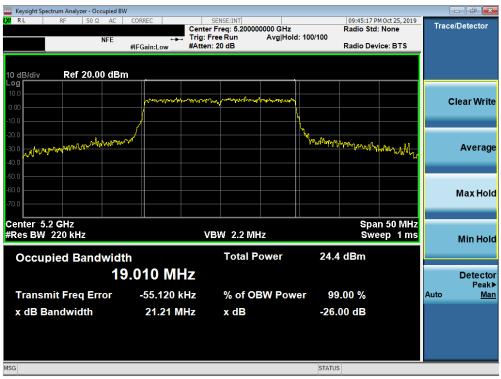
Plot 7-6. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 1) - Ch. 48)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNE	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied B	W					
LXI RL RF 50Ω AC	CORREC	SENSE:INT	09:44:41 Radio Sto	M Oct 25, 2019	Trace/D	etector
NFE		r Freq: 5.180000000 GHz Free Run Avg Hol	d: 100/100	: None		
NFE		n: 20 dB	Radio De	vice: BTS		
10 dB/div Ref 20.00 dB	m					
Log						
10.0	anymen	try mark when a				
0.00	APPART APPARt APPARt	. and a substantial providence of the			Cle	ar Write
-10.0						
-20.0	N					
B A MIN M	104 ¹¹		Marger H. M. What have below	Al		Average
-30.0 Arghyman and a start and a start				WIND-WUND	4	Average
-40.0						
-50.0						
-60.0					N	ax Hold
-70.0						
Center 5.18 GHz				in 50 MHz		
#Res BW 220 kHz	V	BW 2.2 MHz	Sw	eep 1 ms	Ν	lin Hold
	41	Total Power	24.5 dBm			
Occupied Bandwid		rotal Power	24.5 GBM			
1	9.064 MHz				I	Detector
						Peak►
Transmit Freq Error	-60.535 kHz	% of OBW Pow	ver 99.00 %		Auto	<u>Man</u>
x dB Bandwidth	21.41 MHz	x dB	-26.00 dB			
MSG			STATUS			

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



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

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occu	ipied BW								
💢 RL RF 50 Ω	AC CORREC		ISE:INT				M Oct 25, 2019	Trac	e/Detector
			eq: 5.240000	000 GHz Avg Hold	. 100/100	Radio Std	: None	ITac	e/Detector
N	IFE #IFGain:L			Avginoid	1. 100/100	Radio Dev	ice: BTS		
	## Outil.2								
10 dB/div Ref 20.00	dBm								
Log									
	مەم <u>ا</u>	whypermethlypety	MAN MAR	maintrat				0	Clear Write
0.00									
-10.0	/				ι 1_				
-20.0	n de M				No. of the second secon				
-20.0	Www.				"""Tyleny	Multing	nature		Average
-40.0							- Minder My		·····g-
-50.0									
-60.0									Max Hold
-70.0									muxitolu
Center 5.24 GHz						Spa	n 50 MHz		
#Res BW 220 kHz		VBV	V 2.2 MHz	Z		Swe	eep 1 ms		Min Hold
									linitioid
Occupied Bandy	width		Total Po	wer	24.7	dBm			
	19.034	MHZ							Detector
	13.034								Peak
Transmit Freq Erro	or -48.	929 kHz	% of OB	W Pow	er 99	.00 %		Auto	Man
x dB Bandwidth	21	.55 MHz	x dB		-26.0	00 dB			
					EUN				
MSG					STATUS				

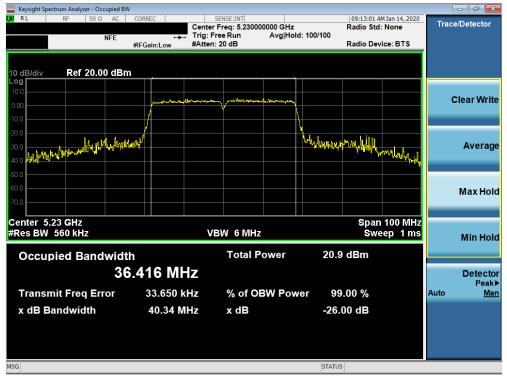
Plot 7-9. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax (UNII Band 1) - Ch. 48)



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

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



Plot 7-12. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax (UNII Band 1) - Ch. 38)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied	IBW				
LXI RL RF 50 Ω AC		SENSE:INT er Freg: 5.230000000 GHz	09:52:22 P Radio Std	M Oct 25, 2019	Trace/Detector
NFE	Trig:	Free Run Avg Hol	ld: 100/100		
	#IFGain:Low #Atte	en: 20 dB	Radio Dev	vice: BTS	
10 dB/div Ref 20.00 df	3m		·		
10.0					
0.00	pour man proposition	when the state of			Clear Write
-10.0	1				
-20.0	/				
					Average
-30.0 -40.0 mgzarananaly//#//////////////////////////////////	alitetin augusta and a second a		hat water weiler (La Walanta)	weekil .	· · · · · · · · · · · · · · · · · · ·
-50.0					
-60.0					
					Max Hold
-70.0					
Center 5.23 GHz			Spar	100 MHz	
#Res BW 390 kHz		VBW 4 MHz	Swe	eep 1 ms	Min Hold
Occurried Denduci		Total Power	22.4 dBm		
Occupied Bandwi		Total Fower	ZZ.4 UBIII		
3	37.562 MHz				Detector
Transmit Freg Error	-63.900 kHz	% of OBW Pov	ver 99.00 %		Peak▶ Auto Man
x dB Bandwidth	39.87 MHz	x dB	-26.00 dB		
MSG			STATUS		

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



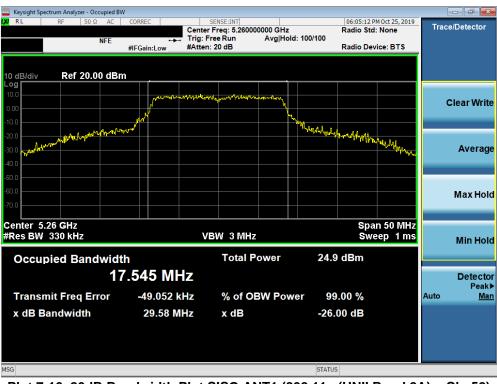
Plot 7-14. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ac (UNII Band 1) - Ch. 42)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied	BW				
LX/ RL RF 50Ω AC		SENSE:INT Freq: 5.210000000 GHz	09:56:00 P Radio Std	M Oct 25, 2019 : None	Trace/Detector
NFE	Trig:		d: 100/100 Radio Dev	de la DTC	
	#IFGain:Low #Atte	n: 20 dB	Radio Dev	/ice: BTS	
10 dB/div Ref 20.00 dE	3m				
10.0					
0.00	monthly warden	all wy real marker preserves and			Clear Write
-10.0					
-20.0	 				
-30.0			<u>\</u>		Average
-40.0 mhately man war and and	htwise,		Mr. Mr. Margaret margaret	When when	
-50.0				I	
-60.0					Max Hold
-70.0					Muxiloid
Center 5.21 GHz #Res BW 820 kHz		/BW 8 MHz		200 MHz eep 1 ms	
WIGS DW 020 KHZ				sep mis	Min Hold
Occupied Bandwid	dth	Total Power	21.6 dBm		
	6.874 MHz				Detector
					Peak►
Transmit Freq Error	-43.239 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	81.40 MHz	x dB	-26.00 dB		
MSG			STATUS		

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



Plot 7-16. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2A) – Ch. 52)

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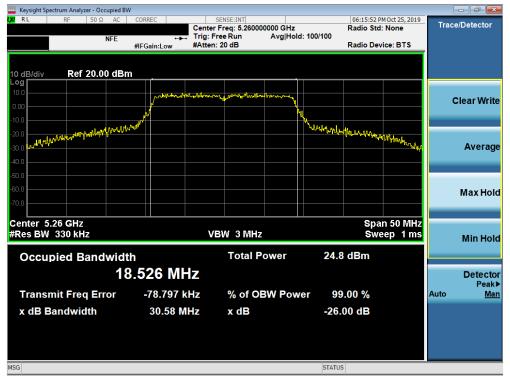
Plot 7-17. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2A) - Ch. 56)



Plot 7-18. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2A) - Ch. 64)

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Plot 7-19. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 2A) - Ch. 52)



Plot 7-20. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied BW					
IXI RL RF 50Ω AC	Trig: I	SENSE:INT Freq: 5.320000000 GHz Free Run Avg Holo n: 20 dB	Radio St d: 100/100	PM Oct 25, 2019 d: None	Trace/Detector
	#IFGain:Low #Atter	n. 20 ab	Raulo De	FVICE. BTS	
10 dB/div Ref 20.00 dBm Log					
10.0	and the second s	and a second and the			Clear Write
-10.0	Margar Margar	·	the manufacture of the base of the	1.1.	
-30.0 -30.0				- Aldi for the plan	Average
-40.0					
-60.0					Max Hold
Center 5.32 GHz				an 50 MHz	
#Res BW 390 kHz	V	/BW 4 MHz	Sw	reep 1 ms	Min Hold
Occupied Bandwidt		Total Power	25.3 dBm		
19	.556 MHz				Detector Peak▶
Transmit Freq Error	-58.584 kHz	% of OBW Pow			Auto <u>Man</u>
x dB Bandwidth	34.85 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-21. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 2A) - Ch. 64)



Plot 7-22. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied B	W				
X RL RF 50Ω AC	CORREC	SENSE:INT	09:47:57 F Radio Std	M Oct 25, 2019	Trace/Detector
NFE	trig:	er Freq: 5.280000000 GHz Free Run AvalHol	d: 100/100	: None	
NFE		en: 20 dB	Radio Dev	vice: BTS	
10 dB/div Ref 20.00 dB	m				
10.0	When the way of the street	where where an all all all and a low of the set			
0.00	PO PARA PICE 1 144	and a second sec			Clear Write
-10.0	N				
-20.0	MIN				
-20.0 -30.0 monthemation of the particular			world Was prograde the full from the	Mr. M. M.	Average
-40.0				er nywelder	,
-50.0					
-60.0					Max Hold
-70.0					
				- 50 Mill-	
Center 5.28 GHz #Res BW 270 kHz	,	VBW 2.7 MHz		n 50 MHz eep 1 ms	
WILCS DW ZI O RIIZ			010	cep mis	Min Hold
Occupied Bandwid	th	Total Power	24.0 dBm		
	9.099 MHz				Detector Peak▶
Transmit Freq Error	-62.799 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	21.73 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-23. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 56)



Plot 7-24. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dara 07 at 044
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Keysight Spectrum Analyzer - Occupied B\	N				
DO RL RF 50 Ω AC	Center	SENSE:INT Freq: 5.270000000 GHz Free Run Avg Hold: I: 20 dB	Radio Std:		Trace/Detector
10 dB/div Ref 25.00 dBr Log 15.0 5.00 .5.00					Clear Write
-150 -250 -350 -450	angeter 		sentrano dynardiny	hanner at the state	Average
-45.0 -55.0 -65.0					Max Hold
Center 5.27 GHz #Res BW 750 kHz Occupied Bandwidt		BW 8 MHz Total Power		100 MHz ep 1 ms	Min Hold
	6.996 MHz				Detector Peak▶
Transmit Freq Error x dB Bandwidth	-51.123 kHz 77.18 MHz	% of OBW Powe x dB	er 99.00 % -26.00 dB	A	uto <u>Man</u>
MSG			STATUS		

Plot 7-25. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 2A) - Ch. 54)



Plot 7-26. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 2A) - Ch. 62)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied E	BW						
XX RL RF 50Ω AC	CORREC	SENSE:INT r Freg: 5.270000000 GHz	09:52:45 P Radio Std	M Oct 25, 2019	Trace/Detector		
NFE	: None						
	NFE Trig: Free Run Avg Hold: 100/100 #IFGain:Low #Atten: 20 dB Radio Device: BTS						
10 dB/div Ref 20.00 dB	m						
Log							
10.0					Clear Write		
0.00	Non and Marian	My Inall when you have			Clear write		
-10.0	I						
-20.0							
	. /				Average		
ha Manage	**\v		normality and the south of the		Averuge		
				Marrie Married			
-50.0							
-60.0					Max Hold		
-70.0							
Center 5.27 GHz	N N			100 MHz			
#Res BW 390 kHz	V	BW 4 MHz	SW	eep 1 ms	Min Hold		
Occupied Bandwid	th	Total Power	22.2 dBm				
3	7.672 MHz				Detector		
Transmit Freq Error	-67.487 kHz	% of OBW Pow	ver 99.00 %		Peak▶ Auto Man		
· · · ·							
x dB Bandwidth	39.94 MHz	x dB	-26.00 dB				
MSG			STATUS				
DCM			STATUS				

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



Plot 7-28. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax (UNII Band 2A) - Ch. 62)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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🔤 Keysight Spectrum Analyzer - Occupie	ed BW						×
LX/RL RF 50Ω A		SENSE:INT Center Freg: 5.29000	00000 GHz	06:33:35 P Radio Std	M Oct 25, 2019	Trace/Detector	
NFE	-+-	Trig: Free Run	Avg Hold: 1	00/100			
	#IFGain:Low	#Atten: 20 dB		Radio Dev	/ice: BTS		
10 dB/div Ref 25.00 d	IBm						
15.0							
5.00		I when the storage				Clear Writ	te
			and the state of t				
-5.00	/						
-15.0	white			hun .		_	
-25.0 -35.0 4104/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1	All has to a			And Anthroper Construction	ant marit	Averag	ge
-35.0 MM					T MARKING		
-45.0							
-55.0						Max Ho	Id
-65.0							
Center 5.29 GHz #Res BW 820 kHz		VBW 8 MHz			200 MHz		
#RES DW 820 KHZ				SWG	eep 1 ms	Min Ho	ld
Occupied Bandwi	idth	Total F	ower	23.9 dBm			
		_					
	75.746 MH	Ζ				Detecto Peak	
Transmit Freq Error	-119.82 kH	z % of O	BW Power	99.00 %		Auto <u>Ma</u>	
x dB Bandwidth	103.5 MF	z x dB		-26.00 dB			
MSG				STATUS			
MBG				STATUS			

Plot 7-29. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ac (UNII Band 2A) - Ch. 58)



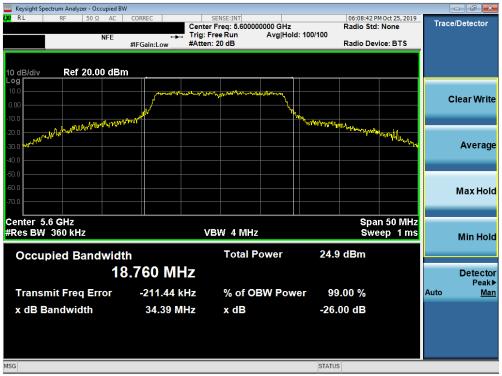
Plot 7-30. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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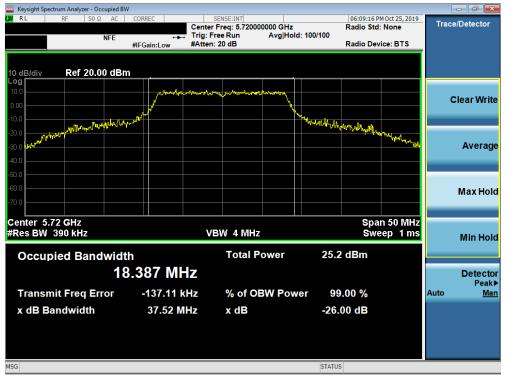
Plot 7-31. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2C) - Ch. 100)



Plot 7-32. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Plot 7-33. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2C) - Ch. 144)



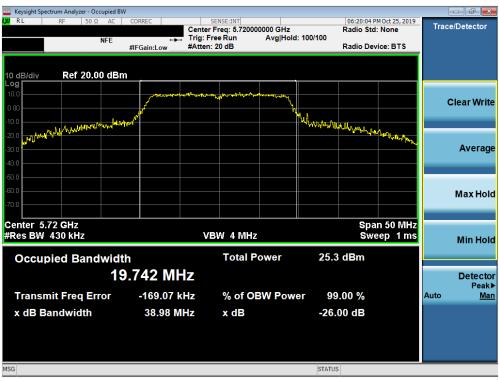
Plot 7-34. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 2C) - Ch. 100)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occ	cupied BW								
X RL RF 50 Ω	AC CORREC	Center Fr)00 GHz Avg Hold:	100/100	Radio Std		Trace	e/Detector
	#IFGain:Lo	w #Atten: 2	0 dB			Radio Dev	ice: BTS		
10 dB/div Ref 20.0	0 dBm								
10.0		to the second second second	เมาะสำนักสาวการการการการการการการการการการการการการก	The second second					
0.00				\ \				C	Clear Write
-10.0	M			<u> </u>	MAL NO.				
and all all all all all all all all all al	a Row way to				" WY WALL	ht mut way ly	Myrula 10		
-30.0							· · · · · · / · · · ·		Average
-40.0									Average
-50.0									
-60.0									Max Hold
-70.0									
Center 5.6 GHz						Spa	n 50 MHz		
#Res BW 430 kHz		VBI	N/4 MHz				ep 1ms		Min Hold
Occupied Band	width		Total Po	wer	24.9	dBm			
	19.665	MHZ							Detector
									Peak▶
Transmit Freq Err	or -155.	32 kHz	% of OB	N Powe	er 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth	40.5	52 MHz	x dB		-26.0)0 dB			
MSG					STATUS				

Plot 7-35. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 2C) - Ch. 120)



Plot 7-36. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 2C) - Ch. 144)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied BW	1				
IXI RL RF 50Ω AC		SENSE:INT	09:49:04 F Radio Std	PM Oct 25, 2019	Trace/Detector
NFE	Trig: F		d: 100/100	. None	
AFL		: 20 dB	Radio Dev	vice: BTS	
10 dB/div Ref 20.00 dBn	า				
Log					
10.0	مى ^{يەرىم} ىيارلىكى ئەركىلى ئايا دە ر يەرىمەرمە ^ر مەركى	wel province through the second			Clear Write
0.00			N		Cicul Willic
-10.0			N		
-20.0	₩		hallon with the second states		
-30.0 matrin Mirmi Vielan and the of the			ու օրջինեն	Wert Marty and	Average
-40.0					
-50.0					
-60.0					
					Max Hold
-70.0					
Center 5.5 GHz			Spa	n 50 MHz	
#Res BW 270 kHz	v	BW 2.7 MHz		eep 1 ms	Min Hold
,				<u> </u>	
Occupied Bandwidt	h	Total Power	24.1 dBm		
19).174 MHz				Detector
					Peak►
Transmit Freq Error	-84.740 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	26.17 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-37. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 100)



Plot 7-38. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied E	W				
LXIRL RF 50Ω AC	Trig: I	SENSE:INT r Freq: 5.720000000 GHz Free Run Avg Hole	09:49:53 P Radio Std d: 100/100 Radio Dev		Trace/Detector
	#IFGalli.Low #/ tee	. 20 00	rtudio Bet		
10 dB/div Ref 20.00 dB	m		1		
10.0	w14 mars - Malla Marin	the watchest and the source of			
0.00					Clear Write
-10.0	/		N.,		
-20.0 -30.0 Man Mar Mar Mar Mark Mark			M Marchastralitana		
-30.0 What Yang Trans				* Lawi Ying May	Average
-40.0					
-50.0					
-60.0					Max Hold
-70.0					
Center 5.72 GHz			Sna	n 50 MHz	
#Res BW 330 kHz	V	/BW 3 MHz		eep 1 ms	Min Hold
		- /			WIIITTIOIG
Occupied Bandwid		Total Power	24.6 dBm		
1	9.156 MHz				Detector
Transmit Freq Error	-58.420 kHz	% of OBW Pow	ver 99.00 %		Peak▶ Auto <u>Man</u>
x dB Bandwidth	23.20 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-39. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 144)



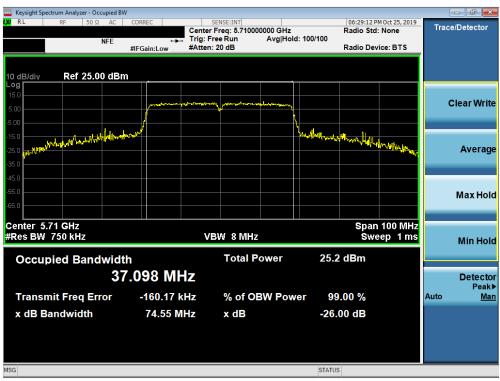
Plot 7-40. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	sight Spectrum	Analyzer - Oc	cupied BW									
L <mark>XI</mark> RI	_ RF	- 50 Ω	AC COR	REC	Center F		00000 GHz		06:28:23 P Radio Std	M Oct 25, 2019 : None	Trac	e/Detector
			NFE #IFC	⊶ Gain:Low	 Trig: Fre #Atten: 2 		Avg Hol	d: 100/100	Radio Dev	/ice: BTS		
										le la		
10 dE	3/div	Ref 25.0	0 dBm				,					
Log 15.0												
5.00				-	mont	and the second second						Clear Write
-5.00				i				L				
-15.0			have a subscription of the second	, 				- www.	un un and the state			
-25.0	waterburn								deally	Area March March		Average
-35.0												
-45.0												
-55.0												Max Hold
-65.0												
Cen	ter 5.59 (GHz				1			Span	100 MHz		
#Re	s BW 750) kHz			VB	W 8 MH:	z		Swe	eep 1 ms		Min Hold
0	ccupied	d Band	width			Total F	Power	24.	4 dBm			
			37.1	23 MI	-IZ							Detector
						o/ _ c _						Peak▶
	ransmit l		ror -	119.28			BW Pow		9.00 %		Auto	Man
X	dB Band	width		74.69 N	IHz	x dB		-26	.00 dB			
100								07.17				
MSG								STATU	15			

Plot 7-41. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 2C) - Ch. 118)



Plot 7-42. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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Keysight Spectrum Analyzer - Occupied BV	v				
IXI RL RF 50Ω AC	CORREC	SENSE:INT Freg: 5.510000000 GHz	09:53:35 F Radio Std	M Oct 25, 2019	Trace/Detector
NFE			d: 100/100	. None	
	#IFGain:Low #Atter	n: 20 dB	Radio Dev	vice: BTS	
10 dB/div Ref 20.00 dBn	n j				
Log					
	. Astiles state suchile	m. Lon reline marcher			Clear Write
0.00					
-10.0					
-20.0					
-30.0	l/m ^{rel}		Mulal Area to a Maria		Average
-30.0 -40.0 pm Alimment him have have been			mulationalipper	malingentilist	
-50.0					
-60.0					Max Hold
-70.0					
Center 5.51 GHz				n 100 MHz	
#Res BW 390 kHz	V V	/BW 4 MHz	Sw	eep 1 ms	Min Hold
Occupied Bandwidt	h	Total Power	21.2 dBm		
		i otari otioi			
37	7.559 MHz				Detector Peak▶
Transmit Freq Error	-115.66 kHz	% of OBW Pow	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	39.55 MHz	x dB	-26.00 dB		
MSG			STATUS		
			SIAIOS		

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



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

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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🔤 Keysight Spectrum Analyzer - Occupied BW						
💢 RL RF 50Ω AC	CORREC	SENSE:INT	09:54:32 Radio Sto	PM Oct 25, 2019	Trace/Detector	
NFE		r Freq: 5.710000000 GHz Free Run Avg Hold	Radio Sto d: 100/100	d: None		
NFE		n: 20 dB		vice: BTS		
10 dB/div Ref 20.00 dBn						
10 dB/div Ref 20.00 dBn						
10.0						
0.00	mobilementer	the moth man up up month and			Clear Write	
-10.0						
-20.0					_	
-30.0 -40.0 TA LARSA MALANA MARAMAN	Int IV		Mr. M. M. Somman Market	4	Average	
-40.0 Dupon of the And				Wing Window Harporto		
-50.0						
-60.0						
					Max Hold	
-70.0						
Center 5.71 GHz			Spa	n 100 MHz		
#Res BW 390 kHz	V	/BW 4 MHz		eep 1 ms	Min Hold	
					Min Hold	
Occupied Bandwidt	h	Total Power	21.9 dBm			
	7.578 MHz				Detector	
31					Detector Peak▶	
Transmit Freq Error	-77.530 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>	
x dB Bandwidth	40.06 MHz	x dB	-26.00 dB			
			20.00 48			
MSG			STATUS			

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



Plot 7-46. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 106)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager		
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🔤 Keysight Spectrum Analyzer - Occupied BW						
MARL RF 50Ω AC	Cente →→ Trig: I	SENSE:INT r Freq: 5.610000000 GHz Free Run Avg Holo n: 20 dB	Radio Std		Trace/Detector	
10 dB/div Ref 25.00 dE	3m					
15.0 5.00 -5.00		way past and the providence			Clear Write	
-15.0 -25.0 -35.0			Well by the sty be showed and	**P*runnmin	Average	
-45.0 -65.0 -65.0					Max Hold	
Center 5.61 GHz #Res BW 1.1 MHz		/BW 8 MHz	Śwo	200 MHz eep 1 ms	Min Hold	
Occupied Bandwid	dth 76.060 MHz	Total Power	23.7 dBm		Detector Peak▶	
Transmit Freq Error x dB Bandwidth	-78.203 kHz 109.3 MHz	% of OBW Pow x dB	er 99.00 % -26.00 dB		Auto <u>Man</u>	
MSG			STATUS			

Plot 7-47. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 122)



Plot 7-48. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 138)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager		
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🔤 Keysight Spectrum Analyzer - Occupied BW						
LXI RE 50 Ω AC	CORREC	SENSE:INT r Freg: 5.530000000 GHz	09:57:08 F Radio Std	M Oct 25, 2019	Trace/Detector	
NFE			d: 100/100	. None		
	#IFGain:Low #Atter	n: 20 dB	Radio Dev	vice: BTS		
10 dB/div Ref 20.00 dBn	n -					
Log						
10.0					Clear Write	
0.00	and the second state of the second states	I wan das Constant and a star setter and a star setter.			eloui mino	
-10.0			-			
-20.0			h			
-30.0	whe		Well's for a different of		Average	
-30.0 -40.0 June June June June June June June June			mariant	mound		
-50.0				·		
-60.0						
-70.0					Max Hold	
-70.0						
Center 5.53 GHz			Spar	200 MHz		
#Res BW 820 kHz	v	/BW 8 MHz	Sw	eep 1 ms	Min Hold	
		T- (-) D	04.4.48			
Occupied Bandwidt		Total Power	21.1 dBm			
76	5.916 MHz				Detector	
			00.00		Peak►	
Transmit Freq Error	-83.869 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>	
x dB Bandwidth	81.92 MHz	x dB	-26.00 dB			
MSG			STATUS			
			010100			

Plot 7-49. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax (UNII Band 2C) - Ch. 106)



Plot 7-50. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax (UNII Band 2C) - Ch. 122)

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Keysight Spectrum Analyzer - Occupied BW	1				
LX RL RF 50Ω AC	CORREC	SENSE:INT er Freg: 5.690000000 GHz		PM Oct 25, 2019 d: None	Trace/Detector
NFE		Free Run Avg Ho en: 20 dB	ld: 100/100	vice: BTS	
	#IFGain:Low #Atte	en. 20 dB	Radio De	evice. BTS	
10 dB/div Ref 20.00 dBn					
10.0		Mahan monther shall mar and			Clear Write
0.00	Augusta Materia Magazia	man particular and providence	~		Clear Write
-10.0					
-20.0					
-30.0	hu f		howholeson and hours	uthaman do	Average
				Ho talk	
-50.0					
-60.0					Max Hold
-70.0					
Center 5.69 GHz				n 200 MHz	
#Res BW 820 kHz		VBW 8 MHz	Sw	reep 1 ms	Min Hold
Occupied Bandwidt	h	Total Power	21.7 dBm		
	 .082 MHz				Detector
					Detector Peak▶
Transmit Freq Error	-151.49 kHz	% of OBW Pov	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	80.94 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-51. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax (UNII Band 2C) - Ch. 138)

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SISO Antenna-2 26dB Bandwidth Measurements

	_	<u>.</u>			Measured 26dB
	Frequency	Channel No.	802.11 Mode	Data Rate [Mbps]	Bandwidth
	[MHz]	NO.			[MHz]
	5180	36	а	6	21.07
	5200	40	а	6	22.08
	5240	48	а	6	21.91
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	23.16
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	29.73
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	25.95
÷	5180	36	ax (20MHz)	6.5/7.2 (MCS0)	21.48
Band 1	5200	40	ax (20MHz)	6.5/7.2 (MCS0)	21.68
Ω.	5240	48	ax (20MHz)	6.5/7.2 (MCS0)	21.19
	5190	38	n (40MHz)	13.5/15 (MCS0)	43.23
	5230	46	n (40MHz)	13.5/15 (MCS0)	72.24
	5190	38	ax (40MHz)	13.5/15 (MCS0)	39.81
	5230	46	ax (40MHz)	13.5/15 (MCS0)	39.58
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	87.07
	5210	42	ax (80MHz)	29.3/32.5 (MCS0)	80.73
	5260	52	а	6	23.57
	5280	56	а	6	24.15
	5320	64	а	6	21.61
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	24.92
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	24.13
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	24.86
ZA	5260	52	ax (20MHz)	6.5/7.2 (MCS0)	21.40
Band 2A	5280	56	ax (20MHz)	6.5/7.2 (MCS0)	21.63
Ba	5320	64	ax (20MHz)	6.5/7.2 (MCS0)	21.40
	5270	54	n (40MHz)	13.5/15 (MCS0)	71.75
	5310	62	n (40MHz)	13.5/15 (MCS0)	39.74
	5270	54	ax (40MHz)	13.5/15 (MCS0)	39.58
	5310	62	ax (40MHz)	13.5/15 (MCS0)	39.57
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	81.19
	5290	58	ax (80MHz)	29.3/32.5 (MCS0)	80.63
	5500	100	а	6	22.04
	5600	120	а	6	21.84
	5720	144	а	6	25.31
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	24.80
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	23.99
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	33.47
	5500	100	ax (20MHz)	6.5/7.2 (MCS0)	21.61
	5600	120	ax (20MHz)	6.5/7.2 (MCS0)	21.13
	5720	144	ax (20MHz)	6.5/7.2 (MCS0)	21.41
S	5510	102	n (40MHz)	13.5/15 (MCS0)	39.65
Band 2C	5590	118	n (40MHz)	13.5/15 (MCS0)	71.95
Bai	5710	142	n (40MHz)	13.5/15 (MCS0)	67.44
	5510	102	ax (40MHz)	13.5/15 (MCS0)	39.77
	5590	118	ax (40MHz)	13.5/15 (MCS0)	39.59
	5710	142	ax (40MHz)	13.5/15 (MCS0)	39.74
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	80.91
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	81.37
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	81.42
	5530	106	ax (80MHz)	29.3/32.5 (MCS0)	81.36
	5610	122	ax (80MHz)	29.3/32.5 (MCS0)	81.20
	5690	138	ax (80MHz)	29.3/32.5 (MCS0)	81.01
Tablo				Measuremer	

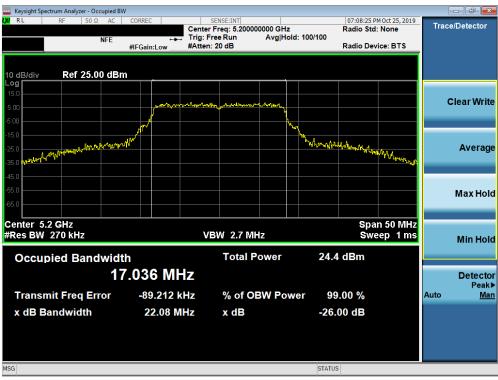
Table 7-3. Conducted Bandwidth Measurements SISO ANT2

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 40 at 044
1M1911010179-06.A3L	10/11/19 - 01/15/20	Portable Handset		Page 42 of 241
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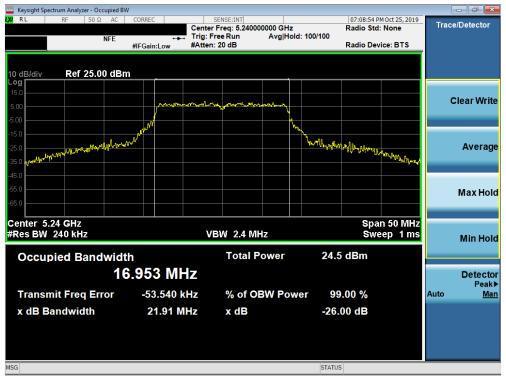
Plot 7-52. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 1) - Ch. 36)



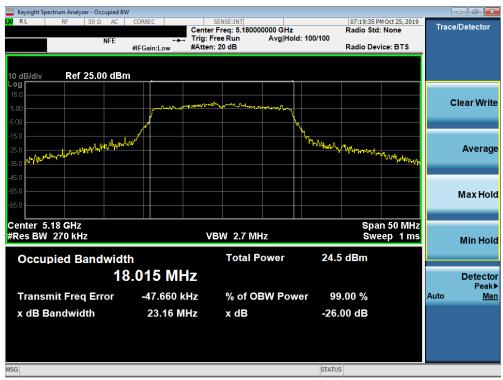
Plot 7-53. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 1) - Ch. 40)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dama 40 at 044
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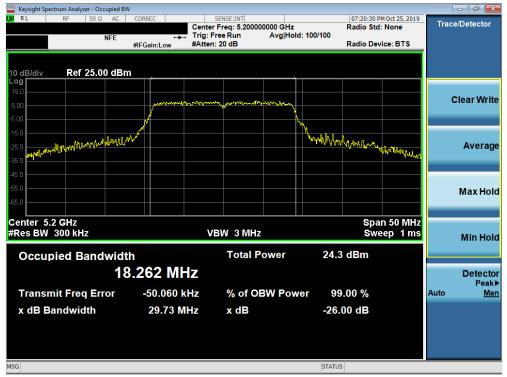
Plot 7-54. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 1) - Ch. 48)



Plot 7-55. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 36)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dama 44 at 044
1M1911010179-06.A3L	10/11/19 - 01/15/20	Portable Handset	Page 44 of 241
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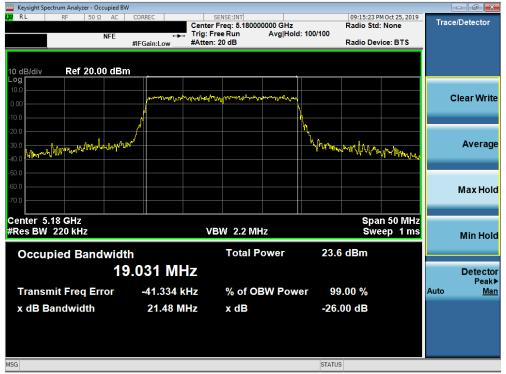
Plot 7-56. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 40)



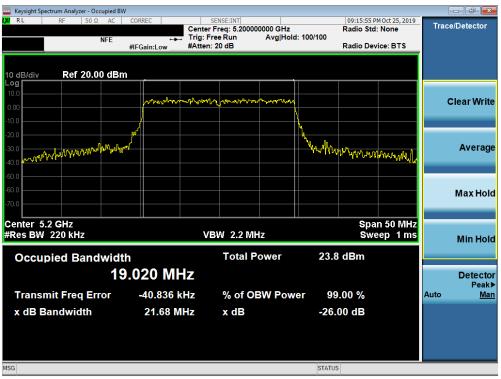
Plot 7-57. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 48)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dama 45 - 6 044	
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Plot 7-58. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 1) - Ch. 36)



Plot 7-59. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 1) - Ch. 40)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 40 at 044
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Keysight Spectrum Analyzer - Occupied B	W				
IXI RL RF 50Ω AC	🛶 Trig: I	SENSE:INT r Freq: 5.240000000 GHz Free Run Avg Hol n: 20 dB	09:19:10 PM Radio Std: N d: 100/100 Radio Devic	lone Tra	ice/Detector
10 dB/div Ref 20.00 dB					
0.00		and wellen the strangeton and	N		Clear Write
-10.0	IN MA		Marthampport margaret		Average
-30.0 -40.0 Might way of the mark that the mark the mark that the mark the ma			And Armen a	Mr/Waway	
-70.0					Max Hold
Center 5.24 GHz #Res BW 220 kHz	V	/BW 2.2 MHz	Swee	50 MHz p 1 ms	Min Hold
Occupied Bandwid	th	Total Power	24.1 dBm		
	9.137 MHz				Detector Peak▶
Transmit Freq Error	-97.459 kHz	% of OBW Pow	ver 99.00 %	Auto	<u>Man</u>
x dB Bandwidth	21.19 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-60. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 1) - Ch. 48)



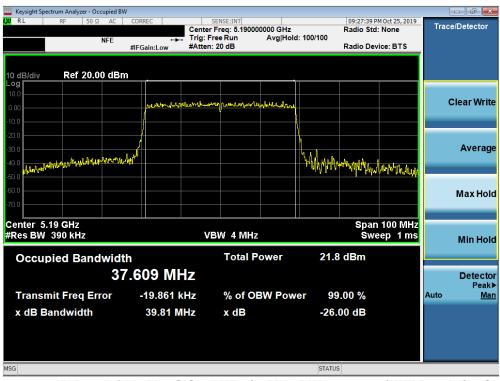
Plot 7-61. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 1) - Ch. 38)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dana 47 at 044
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Plot 7-62. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 1) - Ch. 46)



Plot 7-63. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax (UNII Band 1) - Ch. 38)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 40 at 044
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Keysight Spectrum Analyzer - Occupied E	3W				
LX RL RF 50 Ω AC	CORREC	SENSE:INT r Freg: 5.230000000 GHz	09:28:13 P Radio Std	M Oct 25, 2019	Trace/Detector
NEE		Free Run Avg Hold		. None	
	#IFGain:Low #Atter	n: 20 dB	Radio Dev	vice: BTS	
10 dB/div Ref 20.00 dB	m				
Log					
10.0	and the second	when any when any when the			Clear Write
0.00	programmed and and and and and and and and and an				Cicul Willic
-10.0					
-20.0			l		
-30.0			<u>\</u>		Average
-40.0	n 14 m		Maldon line my		Ŭ
No Vortegia and			Why was by the	White Male And	
-50.0					
-60.0					Max Hold
-70.0					
Center 5.23 GHz				100 MHz	
#Res BW 390 kHz	v	/BW 4 MHz		eep 1 ms	
WRES DVV JSO RHZ	v		300	eep mis	Min Hold
Occupied Bandwid	th	Total Power	22.1 dBm		
3	7.571 MHz				Detector Peak▶
Transmit Freq Error	-29.478 kHz	% of OBW Pow	er 99.00 %	/	Auto <u>Man</u>
x dB Bandwidth	39.58 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-64. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax (UNII Band 1) - Ch. 46)



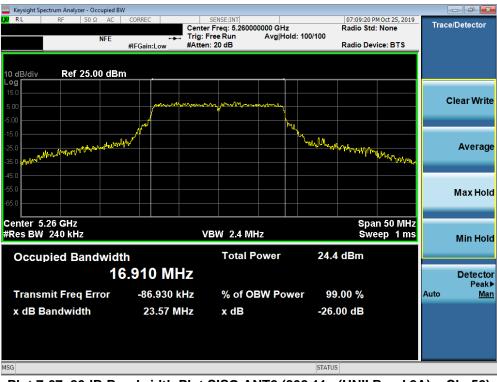
Plot 7-65. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ac (UNII Band 1) - Ch. 42)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Do no. 40 of 044
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Keysight Spectrum Analyzer - Occupied BW					E	
<mark>()//</mark> RL RF 50Ω AC C		SENSE:INT Freq: 5.210000000 GHz	09:32:16 F Radio Std	M Oct 25, 2019	Trace	/Detector
NFE	🛶 Trig: F	ree Run Avg Hold	d: 100/100			
#	FGain:Low #Atten	: 20 dB	Radio Dev	vice: BTS		
10 dB/div Ref 20.00 dBm						
Log 10.0						
0.00	al merene front with	en marcheling the march			С	lear Write
-10.0						
-20.0						
-30.0			N. I			Average
-40.0			Salta -			Average
-50.0			Welman will wanter the	when the way of all		
-60.0						Max Hold
-70.0						
Center 5.21 GHz			Spar	1 200 MHz		
#Res BW 820 kHz	V	BW 8 MHz	Sw	eep 1 ms		Min Hold
		Total Power	20.7 dBm			
Occupied Bandwidth		Total Power	20.7 dBm			
76.	907 MHz					Detector
Transmit Freq Error	6.648 kHz	% of OBW Pow	ver 99.00 %		Auto	Peak▶ Man
						man
x dB Bandwidth	80.73 MHz	x dB	-26.00 dB			
MSG			STATUS			

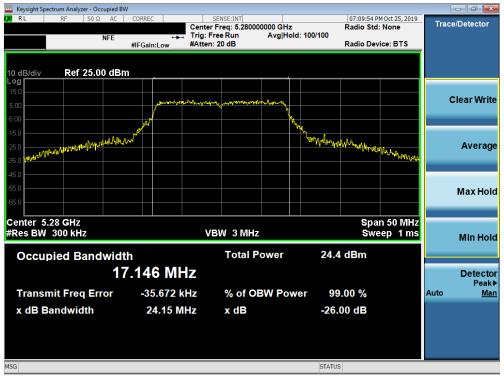
Plot 7-66. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax (UNII Band 1) - Ch. 42)



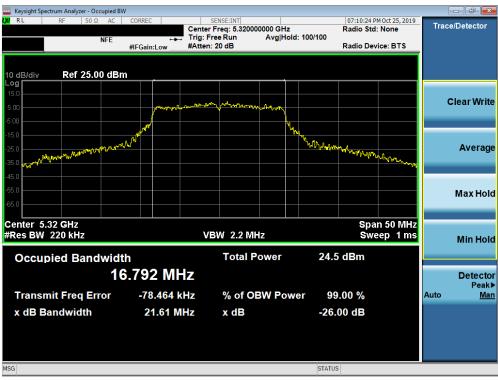
Plot 7-67. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2A) – Ch. 52)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 50 of 244
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Plot 7-68. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2A) - Ch. 56)



Plot 7-69. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2A) – Ch. 64)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dama 54 at 044
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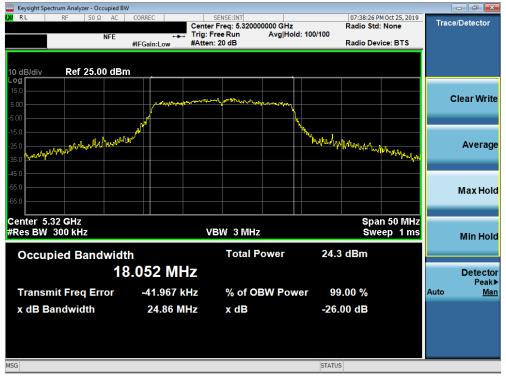
Plot 7-70. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 52)



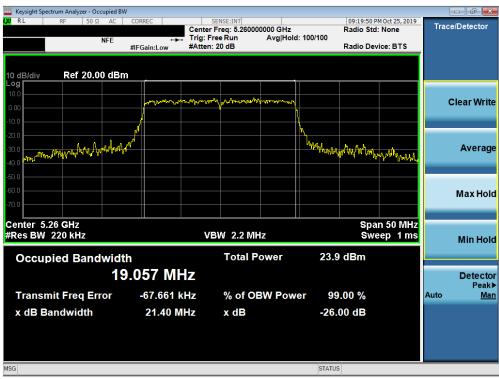
Plot 7-71. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Da
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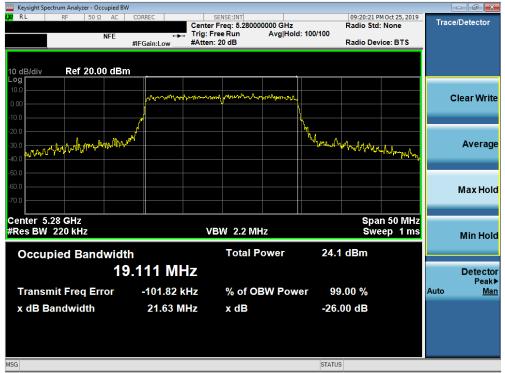
Plot 7-72. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 64)



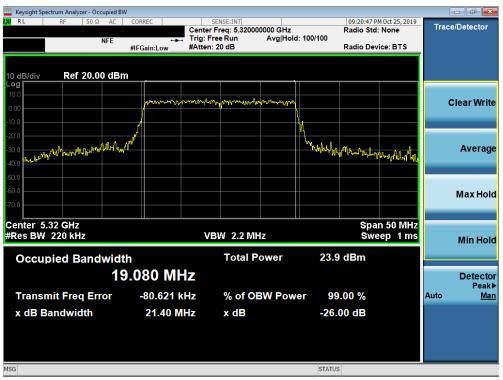
Plot 7-73. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dara 50 at 044
1M1911010179-06.A3L	10/11/19 - 01/15/20	Portable Handset		Page 53 of 241
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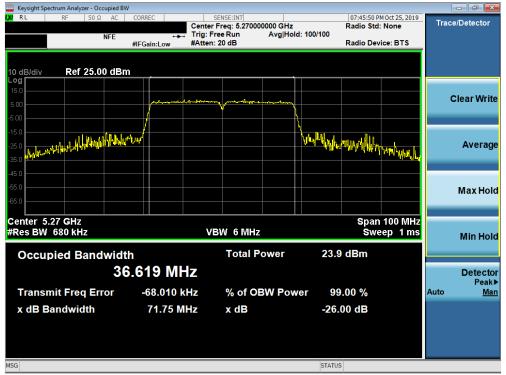
Plot 7-74. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 56)



Plot 7-75. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		D
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Plot 7-76. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 2A) - Ch. 54)



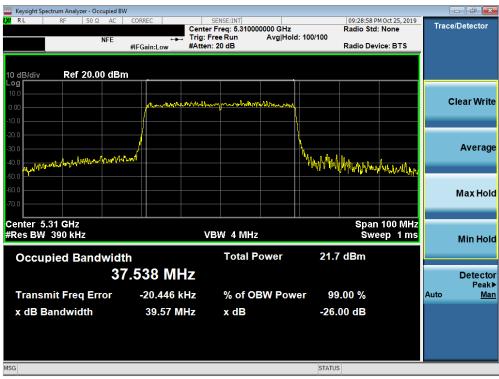
Plot 7-77. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 2A) - Ch. 62)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dogo EE of 244	
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Keysight Spectrum Analyzer - Occupied B\	V				
LX/ RL RF 50 Ω AC	Correc	SENSE:INT r Freg: 5.270000000 GHz	09:28:36 P Radio Std	M Oct 25, 2019	Trace/Detector
NEE	🛶 Trig: I	Free Run Avg Hold	d: 100/100		
	#IFGain:Low #Atter	:: 20 dB	Radio Dev	rice: BTS	
10 dB/div Ref 20.00 dBr	n				
Log 10.0					
	March March March March March	met philipping (hypling and beau			Clear Write
0.00					
-10.0					
-20.0					
-30.0	l.al				Average
-30.0 -40.0 hpt-mmallitypaineductore			Walker Marine	Mathle III.	
-50.0			of a state of the	ի ուոշիկնեսն	
-60.0					Max Hold
-70.0					
Center 5.27 GHz #Res BW 390 kHz		BW 4 MHz		100 MHz ep 1 ms	
#Res BW 390 KHZ	V		Swe	ep mis	Min Hold
Occupied Bandwidt	h	Total Power	22.0 dBm		
					Data d
	7.608 MHz				Detector Peak▶
Transmit Freq Error	-95.656 kHz	% of OBW Pow	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	39.58 MHz	x dB	-26.00 dB		
MSG			STATUS		
mod			016100		

Plot 7-78. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax (UNII Band 2A) - Ch. 54)



Plot 7-79. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax (UNII Band 2A) - Ch. 62)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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🔤 Keysight Spectrum Analyzer - Occi	upied BW						
(X) RL RF 50 Ω	NFE ++-		00000 GHz Avg Hold: 100/10	Radio Std: 0		Trace/	Detector
	#IFGain:Low	#Atten: 20 dB		Radio Dev	ice: BTS		
10 dB/div Ref 25.00) dBm						
15.0							
5.00	- to day locked					CI	ear Write
-5.00							
-15.0	/						
-25.0							Average
-25.0	Under the second se		- Miller	Marakan talkan tang talan tang talan tang tang tang tang tang tang tang ta	Where whe de		Ŭ
-35.0 Month 199					and the property of the		
-55.0							
-65.0							Max Hold
-03.0							
Center 5.29 GHz					200 MHz		
#Res BW 820 kHz		VBW 8 MHz		Swe	ep 1 ms		Min Hold
Occupied Band		Total P	ower 2	23.3 dBm			
	75.498 M⊦	IZ					Detector
Transmit Freq Erro	or -112.48 k	Hz % of O	BW Power	99.00 %		Auto	Peak▶ <u>Man</u>
x dB Bandwidth	81.19 M	Hz xdB		26.00 dB			
	01.19 M		-	20.00 08			
MSG			ST	TATUS			

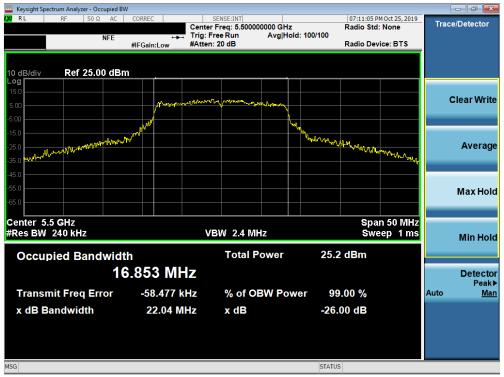
Plot 7-80. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ac (UNII Band 2A) - Ch. 58)



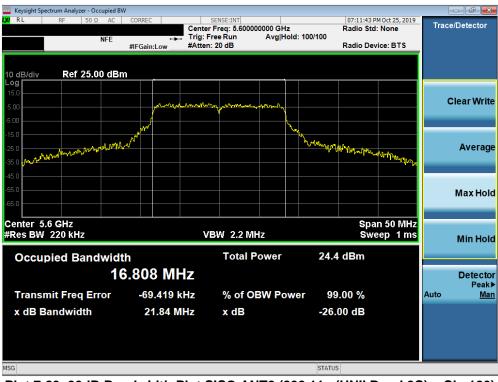
Plot 7-81. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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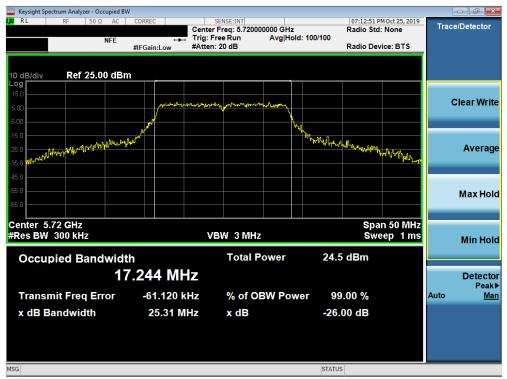
Plot 7-82. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2C) - Ch. 100)



Plot 7-83. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:	De 22 50 at 044	
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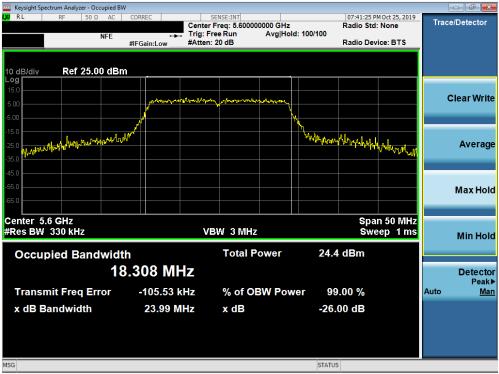
Plot 7-84. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2C) - Ch. 144)



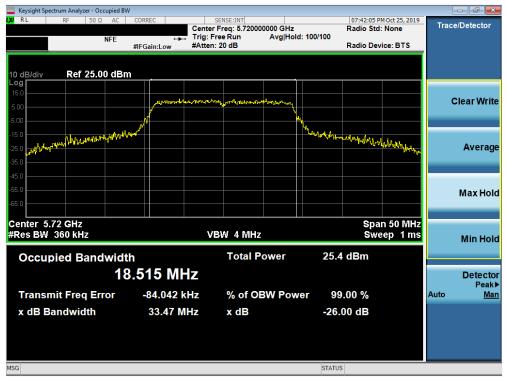
Plot 7-85. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2C) - Ch. 100)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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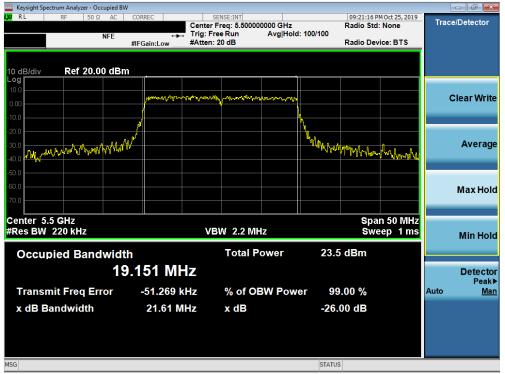
Plot 7-86. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2C) - Ch. 120)



Plot 7-87. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2C) - Ch. 144)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-88. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 100)



Plot 7-89. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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Keysight Spectrum Analyzer - Occupied BW						x
μα RL RF 50Ω AC	🛶 Trig: F	SENSE:INT r Freq: 5.720000000 GHz Free Run Avg Ho n: 20 dB	Radio Sto Id: 100/100	PM Oct 25, 2019 d: None vice: BTS	Trace/Detector	1
	#IPGalli.Low #/ tech		Tudio Be	HOC. BTO		
10 dB/div Ref 20.00 dBm						
10.0						
0.00	MANAN MENT	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			Clear Wr	ite
-10.0						
-20.0						
-30.0 Mlynllfall - 10.0			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	malerm	Avera	ge
-50.0						
-60.0					Max Ho	ha
-70.0					Waxnu	Ju
Center 5.72 GHz #Res BW 220 kHz	v	/BW 2.2 MHz		an 50 MHz eep 1 ms		
The sources of the second seco	•	DW 2.2 WI12	54	eep mis	Min Ho	bld
Occupied Bandwidt	า	Total Power	23.9 dBm			
19	.085 MHz				Detec	
Transmit Freq Error	-57.467 kHz	% of OBW Pov	ver 99.00 %			lan
x dB Bandwidth	21.41 MHz	x dB	-26.00 dB			
MSG			STATUS			

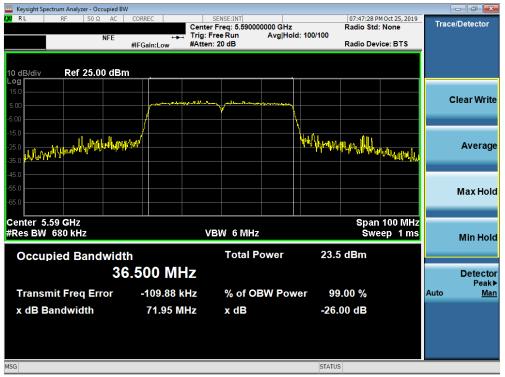
Plot 7-90. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 144)



Plot 7-91. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Plot 7-92. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 2C) - Ch. 118)



Plot 7-93. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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www.www.com analyzer - Occupied BW						
KAL RF 50Ω AC	CORREC	SENSE:INT	09:29:19 Radio Sto	PM Oct 25, 2019	Trace/	Detector
NFE		r Freq: 5.510000000 GHz Free Run Avg Hold		a: None		
		n: 20 dB		vice: BTS		
10 dB/div Ref 20.00 dBm						
Log						
10.0					-	
0.00	muniter	mapmatrianonmaked			CI	ear Write
-10.0						
-20.0			1			
						Average
السئير برما ا	۱. <i>۲</i>		h a also and a			Average
-40.0 mil market the transfer that the second state of the second	×		mannant	Mal America 11		
-50.0				a ha di nadi (il fol) di	_	
-60.0						Max Hold
-70.0						
Center 5.51 GHz				n 100 MHz		
#Res BW 390 kHz	V	'BW 4 MHz	Sw	eep 1 ms		Min Hold
		Total Power	21.6 dBm			
Occupied Bandwidth		Total Power	21.0 aBm			
37	.516 MHz					Detector
						Peak▶
Transmit Freq Error	-66.052 kHz	% of OBW Pow	er 99.00 %		Auto	<u>Man</u>
x dB Bandwidth	39.77 MHz	x dB	-26.00 dB			
MSG			STATUS			

Plot 7-94. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax (UNII Band 2C) - Ch. 102)



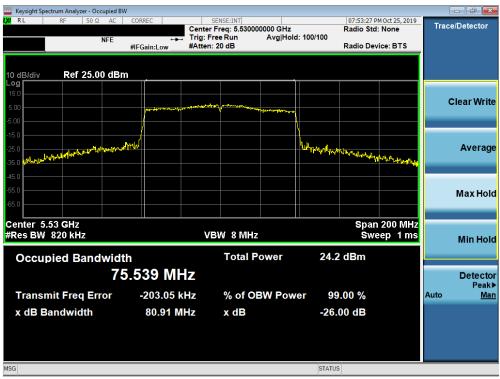
Plot 7-95. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax (UNII Band 2C) - Ch. 118)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied BW						x
NFE	Center		09:30:18 Radio Sto d: 100/100 Radio De		Trace/Detector	
10 dB/div Ref 20.00 dBm						
10.0	and manufacture and a second	un promer protogramme and			Clear Writ	te
-10.0 -20.0 -30.0 -40.0 -40.0			l Waterplated all and and all and a	With Marsoly.	Averag	je
-50.0 -60.0 -70.0					Max Hol	Id
Center 5.71 GHz #Res BW 390 kHz	VE	BW 4 MHz		n 100 MHz eep 1 ms	Min Hol	ld
Occupied Bandwidth	529 MHz	Total Power	21.8 dBm		Detecto	or
	-41.699 kHz 39.74 MHz	% of OBW Pow x dB	ver 99.00 % -26.00 dB		Peak Auto <u>Ma</u>	ᢙ
MSG			STATUS			

Plot 7-96. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax (UNII Band 2C) - Ch. 142)



Plot 7-97. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 106)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage CE of 244
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www.www.com.com.com.com.com.com.com.com.com.com	BW						
LX/RL RF 50Ω AC	CORREC	SENSE:INT ter Freq: 5.610000000 G	u.,	07:54:05 P Radio Std	M Oct 25, 2019	Trace	e/Detector
NFE	trig		Hold: 100/100	Raulo Stu	. None		
	#IFGain:Low #At	ten: 20 dB		Radio Dev	vice: BTS		
10 dB/div Ref 25.00 dE	3m						
Log							
15.0							lear Write
5.00	press and	and American should be a special to	Yinstein				
-5.00							
-15.0	/						
-25.0	nathalit		- Williams	~~~~	latin d		Average
-35.0 Lawy M rate Law Martin					Contraction () In		
-45.0							
-55.0							
-65.0							Max Hold
Center 5.61 GHz				Span	200 MHz		
#Res BW 820 kHz		VBW 8 MHz		Swe	eep 1 ms		Min Hold
		T-4-1 D					
Occupied Bandwic		Total Power	23.8	dBm			
7	5.842 MHz						Detector
							Peak▶
Transmit Freq Error	-160.40 kHz	% of OBW P	ower 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth	81.37 MHz	x dB	-26.	00 dB			
MSG			STATUS				
			STATUS				

Plot 7-98. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 122)



Plot 7-99. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 138)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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www.commonstatewistics.commonstatewistics.commonstatewistics.commonstatewistics.commonstatewistics.com/commonstatewistics.com/commonstatewistics.com/commonstatewistics.com/commonstatewistics.com/commonstatewistics.com/commonstatewistics.com/commonstatewistics.com/commonstatewistics.com/commonstatewistics.com/com/com/com/com/com/com/com/com/com/							
IXI RL RF 50Ω AC	Trig	SENSE:INT nter Freq: 5.530000000 g: Free Run A ten: 20 dB) GHz vg Hold: 100/100	09:33:27 Pl Radio Std: Radio Dev		Trace	e/Detector
10 dB/div Ref 20.00 dBm							
0.00	younger and the second	Mr. Le parmenter meter	eleter			c	lear Write
-10.0						_	
-30.0 -40.0 monthal (144 146 partils and 1			house	hed reliminan	abda		Average
-50.0					v • Nederse (Uddioor)		Max Hold
-70.0							Muxinolu
Center 5.53 GHz #Res BW 820 kHz		VBW 8 MHz			200 MHz ep 1 ms		Min Hold
Occupied Bandwidth	՝ .951 MHz	Total Pow	er 21.2	2 dBm			Detector
۲ o Transmit Freq Error	-193.87 kHz	% of OBW	Power 99	9.00 %		Auto	Detector Peak▶ <u>Man</u>
x dB Bandwidth	81.36 MHz	x dB	-26.	00 dB			
MSG			STATU	S			

Plot 7-100. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax (UNII Band 2C) - Ch. 106)



Plot 7-101. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax (UNII Band 2C) - Ch. 122)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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🔤 Keysight Spect			upied BW									[- 6 ×
LXI RL	RF	50 Ω	AC	CORREC			NSE:INT	0000000 GHz		09:34:09 PI Radio Std:	None	Trace	e/Detector
			NFE		-+-	Trig: Fre	e Run	Avg Hold	i: 100/100				
				#IFGain:	Low	#Atten: 2	0 dB			Radio Dev	ICE: BTS		
10 dB/div Log	Ref	20.00	0 dBm				1						
10.0													
0.00				~~	An application	nenertineterty/	Martham	montonion				Ċ	Clear Write
-10.0													
-20.0													
-30.0				_/									Average
-40.0	- Martin	. Mark	abalanda	<i>.</i> /					multilla	all the work which the	-		
-50.0											Ward and a start of the		
-60.0													Max Hold
-70.0													
Center 5.6 #Res BW		_				VB	N 8 MI	u.,			200 MHz		
#Res DW	820 KH.	2				VDI	/V 8 IVI	ΠZ		SWE	ep 1ms		Min Hold
Occup	ied Ba	and	widt	า			Total	Power	21.2	dBm			
				.964	ML	7							Detector
			10	.304		12							Peak ►
Transm	it Freq	Err	or	-189	9.23 k	Hz	% of	OBW Pow	er 99	.00 %		Auto	<u>Man</u>
x dB Ba	ndwid	th		81	.01 M	Hz	x dB		-26.	00 dB			
MSG									STATUS				
									JIATOS				

Plot 7-102. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax (UNII Band 2C) - Ch. 138)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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7.3 6dB Bandwidth Measurement – 802.11a/n/ac/ax §15.407 (e); RSS-Gen [6.2]

Test Overview and Limit

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the 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 band, 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

None.

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
	5745	149	а	6	16.41
	5785	157	а	6	16.41
	5825	165	а	6	16.41
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	17.62
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	17.58
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	17.60
e	5745	149	ax (20MHz)	6.5/7.2 (MCS0)	19.02
Band	5785	157	ax (20MHz)	6.5/7.2 (MCS0)	19.01
ä	5825	165	ax (20MHz)	6.5/7.2 (MCS0)	18.97
	5755	151	n (40MHz)	13.5/15 (MCS0)	36.35
	5795	159	n (40MHz)	13.5/15 (MCS0)	35.80
	5755	151	ax (40MHz)	13.5/15 (MCS0)	37.71
	5795	159	ax (40MHz)	13.5/15 (MCS0)	37.37
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	75.37
	5775	155	ax (80MHz)	29.3/32.5 (MCS0)	77.48

SISO Antenna-1 6 dB Bandwidth Measurements

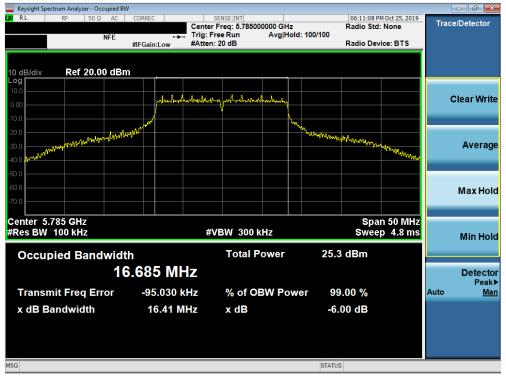
Table 7-4. Conducted Bandwidth Measurements SISO ANT1



Plot 7-103. 6dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 3) - Ch. 149)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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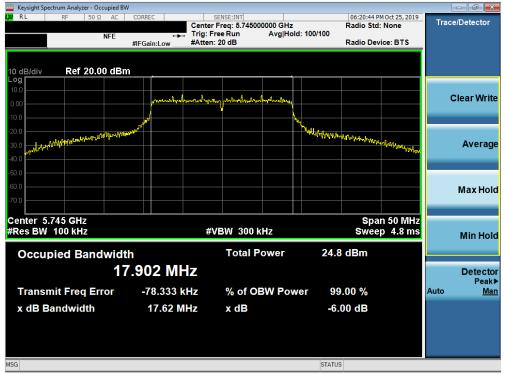
Plot 7-104. 6dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 3) - Ch. 157)



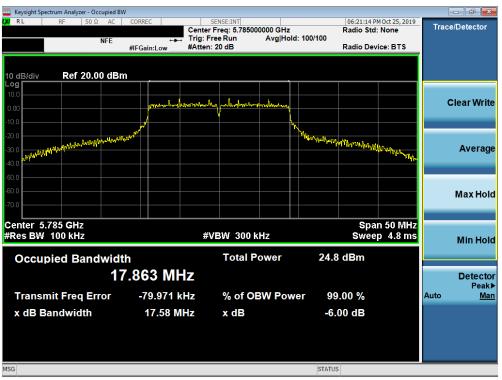
Plot 7-105. 6dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 3) – Ch. 165)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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Plot 7-106. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 3) - Ch. 149)



Plot 7-107. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 3) - Ch. 157)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNE	Approved by: Quality Manager	
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Plot 7-108. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 3) - Ch. 165)



Plot 7-109. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax (UNII Band 3) – Ch. 149)

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Keysight Spectrum Analyzer - Occupied BW					
X/RL RF 50Ω AC	CORREC	SENSE:INT r Freg: 5.785000000 GHz	09:50:27 F Radio Sto	M Oct 25, 2019	Trace/Detector
NFE	🛶 Trig: F	Free Run Avg Hol	d: 100/100		
	#IFGain:Low #Atten	n: 20 dB	Radio De	vice: BTS	
10 dB/div Ref 20.00 dBm					
10.0					
0.00	- was boroli way a brent and	m mapping the on the			Clear Write
-10.0					
-20.0					
-30.0			Munand Manually	Mithew Martine	Average
-40.0 h.d.d.				· · · · · · · · · · · · · · · · · · ·	
-50.0					
-60.0					Max Hold
-70.0					
			0	- 50 Mills	
Center 5.785 GHz #Res BW 100 kHz	#	VBW 300 kHz		n 50 MHz p 4.8 ms	
TOO KIIZ	u.	VEW JOO KIIZ	GWCC	-p -+.0 III5	Min Hold
Occupied Bandwidt	h	Total Power	23.7 dBm		
	.013 MHz				Detector
18					Detector Peak►
Transmit Freq Error	-82.095 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	19.01 MHz	x dB	-6.00 dB		
MSG			STATUS		

Plot 7-110. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax (UNII Band 3) - Ch. 157)



Plot 7-111. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax (UNII Band 3) – Ch. 165)

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Keysight Spectrum Analyzer - Occupied BV	V				
XX RL RF 50Ω AC	CORREC	SENSE:INT		PM Oct 25, 2019	Trace/Detector
NFE		er Freq: 5.755000000 GHz Free Run Avg Ho	di: 100/100	a: None	
NFL		n: 20 dB	Radio De	evice: BTS	
10 dB/div Ref 25.00 dBn	n				
Log					
15.0					Clear Write
5.00	المراجلية والمراج	elen prosekal Instation leby With			Clear write
-5.00	ala lada a far	etery prospectionshare bely when			
-15.0		Y			
-25.0					Average
-25.0	'vha'		And the Anton of t	hand as	, it of ago
35.0 Withinkington to				San Strategister	
-45.0					
-55.0					Max Hold
-65.0					
Center 5.755 GHz #Res BW 100 kHz		VBW 300 kHz		n 100 MHz ep 9.6 ms	
#Res BW Too KHZ	#		Swe	ep 9.0 ms	Min Hold
Occupied Bandwidt	h	Total Power	24.5 dBm		
36	5.272 MHz				Detector Peak▶
Transmit Freq Error	-68.317 kHz	% of OBW Po	wer 99.00 %		Auto <u>Man</u>
x dB Bandwidth	36.35 MHz	x dB	-6.00 dB		
MSG			STATUS		

Plot 7-112. 6dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 3) - Ch. 151)



Plot 7-113. 6dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 3) - Ch. 159)

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Keysight Spectrum Analyzer - Occupies	d BW					
LXI RL RF 50Ω AC	α RL RF 50 Ω AC CORREC SENSE:INT 09:55:00 PM Oct 25, 2019 Center Freq: 5.755000000 GHz Radio Std: None					
NFE	ti Tr	ig: Free Run Avg I	Hold: 100/100			
	#IFGain:Low #A	tten: 20 dB	Radio De	evice: BTS		
10 dB/div Ref 20.00 d	Bm					
10.0						
					Clear Write	
0.00	post-human	alter and	h _{the}			
-10.0						
-20.0					_	
-30.0	1		history and a		Average	
-40.0	Harphilager		an raise and a shirt and a	Michigher a		
-50.0 Huntrathatin						
-60.0					Max Hold	
-70.0						
Center 5.755 GHz #Res BW 100 kHz		#VBW 300 kHz		n 100 MHz ep 9.6 ms		
WRCS DW TOO KHZ		#VEVV JOOKHZ	GWC	ep 9.0 ms	Min Hold	
Occupied Bandwi	dth	Total Power	22.0 dBm			
	37.537 MHz				Detector	
	57.557 WINZ				Detector Peak►	
Transmit Freq Error	-68.964 kHz	% of OBW P	ower 99.00 %		Auto <u>Man</u>	
x dB Bandwidth	37.71 MHz	x dB	-6.00 dB			
			074710			
MSG			STATUS			

Plot 7-114. 6dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax (UNII Band 3) - Ch. 151)



Plot 7-115. 6dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax (UNII Band 3) – Ch. 159)

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	ght Spectrum Analyzer - Oce	cupied BW									- • •
L <mark>XI</mark> RL	RF 50 Ω	AC COR	REC		NSE:INT				M Oct 25, 2019	Trac	e/Detector
		NFE			eq: 5.77500 Run		d: 100/100	Radio Std	: None		
	#IFGain:Low #Atten: 20 dB Radio Device: BTS										
10 dB/	div Ref 25.0	0 dBm									
	alv Rel 25.0	U UBIII									
15.0											
5.00											Clear Write
-5.00			աս Աա	JARAA JAAA JA	and a data.	IIIIIII IIIII					
-15.0											
-25.0							ι.				Average
-35.0	Anonal Margaret	and the state of the					"All Waterpart ope	unlighting dudy	Muranul		
-45.0 🚙	Anon the full at the second										
-55.0											Mayllald
-65.0											Max Hold
-85.0										_	
Cente	er 5.775 GHz							Spar	200 MHz		
	BW 100 kHz			#VE	SW 300 k	Hz			19.13 ms		Min Hold
											Millinoid
Oc	cupied Band	width			Total P	ower	24.0	dBm			
		75 5	03 MI	7							Detector
		15.5									Detector Peak▶
Tra	insmit Freq Err	ror -	61.393 I	κHz	% of O	BW Pow	er 99	.00 %		Auto	Man
x d	B Bandwidth		75.37 M	IHz	x dB		-6.	00 dB			
MSG							STATUS	6			

Plot 7-116. 6dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ac (UNII Band 3) - Ch. 155)



Plot 7-117. 6dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax (UNII Band 3) – Ch. 155)

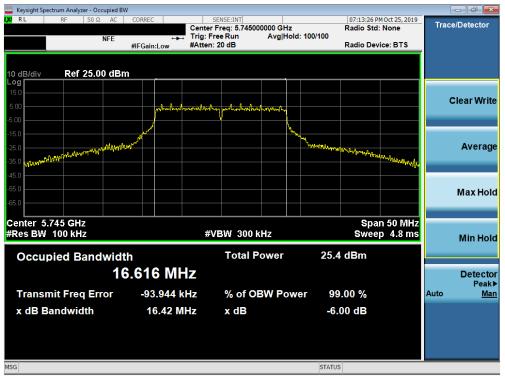
FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 77 of 244
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SISO Antenna-2 6dB Bandwidth Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
	5745	149	а	6	16.42
	5785	157	а	6	16.39
	5825	165	а	6	16.41
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	17.64
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	17.64
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	17.58
ო	5745	149	ax (20MHz)	6.5/7.2 (MCS0)	19.10
Band	5785	157	ax (20MHz)	6.5/7.2 (MCS0)	19.05
ä	5825	165	ax (20MHz)	6.5/7.2 (MCS0)	19.03
	5755	151	n (40MHz)	13.5/15 (MCS0)	36.26
	5795	159	n (40MHz)	13.5/15 (MCS0)	35.94
	5755	151	ax (40MHz)	13.5/15 (MCS0)	37.73
	5795	159	ax (40MHz)	13.5/15 (MCS0)	37.38
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	75.72
	5775	155	ax (80MHz)	29.3/32.5 (MCS0)	77.21

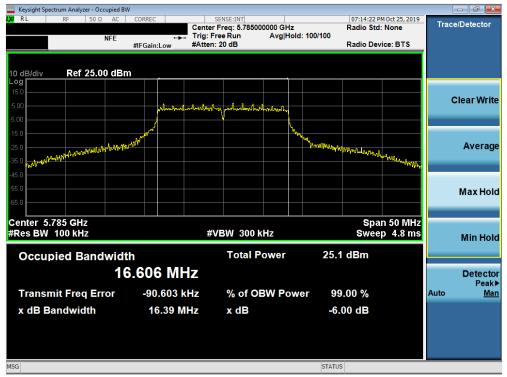
Table 7-5. Conducted Bandwidth Measurements SISO ANT2



Plot 7-118. 6dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 3) - Ch. 149)

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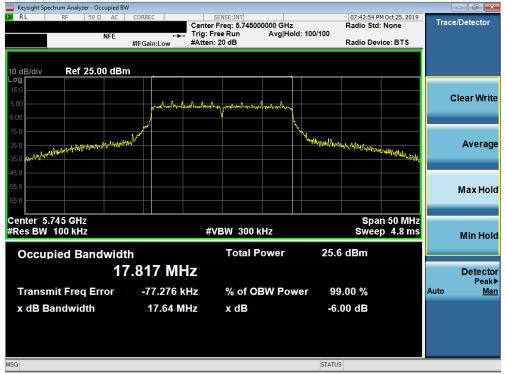
Plot 7-119. 6dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 3) - Ch. 157)



Plot 7-120. 6dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 3) - Ch. 165)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager		
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Plot 7-121. 6dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 3) - Ch. 149)



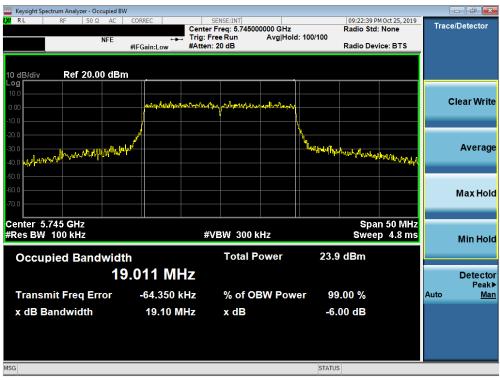
Plot 7-122. 6dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 3) - Ch. 157)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	D 00
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Keysight Spectrum Analyzer - Occupied B\	N				-	- 0 -
KL RF 50Ω AC	CORREC	SENSE:INT		4:09 PM Oct 25, 2019	Trace/	Detector
		er Freq: 5.825000000 GH Free Run Avg H	IZ Radio lold: 100/100	Std: None	macor	Detector
NFE		n: 20 dB		Device: BTS		
10 dB/div Ref 25.00 dBr	<u>n</u>					
15.0						
5.00		ny what shall be and			CI	ear Write
	and post of the second	a far have a series and a series of the seri	Y			
-5.00			h.			
-15.0 -25.0 -35.0	م م		Mildala Int			
-25.0			margamargan	Maring hypology		Average
-35.0 W/War 19 19 1				Mar Carrier		
-45.0						
-55.0						
						Max Hold
-65.0						
Center 5.825 GHz				Span 50 MHz		
#Res BW 100 kHz	#	VBW 300 kHz		weep 4.8 ms		
						Min Hold
Occupied Bandwidt	h	Total Power	25.4 dBn	n		
	7.937 MHz					Detector Peak▶
Transmit Freq Error	-44.594 kHz	% of OBW Po	ower 99.00 %	6	Auto	Peak≱ <u>Man</u>
x dB Bandwidth	17.58 MHz	x dB	-6.00 dl	3		
	11.00 11112		0.00 u			
					_	
MSG			STATUS			

Plot 7-123. 6dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 3) - Ch. 165)



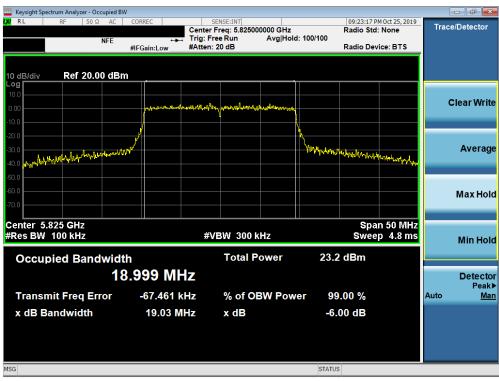
Plot 7-124. 6dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 3) – Ch. 149)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occu	pied BW				
(X) RL RF 50 Ω	EF →→ Trig:	SENSE:INT er Freq: 5.785000000 GHz Free Run Avg Hold: en: 20 dB	09:22:58 PM Radio Std: 1 : 100/100 Radio Devic	None	Trace/Detector
10 dB/div Ref 20.00	dBm				
10.0 0.00	nt work and the Mathin	May all mar and and part of the			Clear Write
-10.0 -20.0 -30.0 -40.0 ayhin ayna (hertlehill) th r 11 ¹⁰	red happing the		Water Management and and the	Month Work	Average
-50.0					Max Hold
Center 5.785 GHz #Res BW 100 kHz	3	#VBW 300 kHz		50 MHz 4.8 ms	Min Hold
Occupied Bandy	vidth 18.979 MHz	Total Power	23.8 dBm		Detector
Transmit Freq Erro		% of OBW Powe	er 99.00 %	P	Peak► Auto <u>Man</u>
x dB Bandwidth	19.05 MHz	x dB	-6.00 dB		
MSG			STATUS		

Plot 7-125. 6dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 3) - Ch. 157)



Plot 7-126. 6dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 3) – Ch. 165)

FCC ID: A3LSMG986W	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occu	upied BW				
(X) RL RF 50 Ω	IFE +++ T	SENSE:INT enter Freq: 5.755000000 GHz rig: Free Run Avg Hc Atten: 20 dB	Radio Ste Radio Ste	PM Oct 25, 2019 d: None vice: BTS	Trace/Detector
	#IFGain:Low #/	Atten: 20 dB	Radio De	VICE: BTS	
10 dB/div Ref 25.00	dBm				
15.0					
5.00	1.0 LA.0.L. J.0	1			Clear Write
-5.00	بالباليورا بعاية؟ ا ^ر انوالي ال	halinderland anondralenterlanderstations and a second second second second second second second second second s			
-15.0					
-25.0	helphant and a		had the production of the		Average
hand half a faith				What and the state of the state	
-45.0					
-55.0					Max Hold
-65.0					
Center 5.755 GHz				n 100 MHz	
#Res BW 100 kHz		#VBW 300 kHz	Swe	ep 9.6 ms	Min Hold
Occupied Bandy	width	Total Power	25.0 dBm		
	36.217 MHz				Detector
			00 00 of		Peak▶
Transmit Freq Erro					Auto <u>Man</u>
x dB Bandwidth	36.26 MHz	x dB	-6.00 dB		
100			CTATUC		
MSG			STATUS		

Plot 7-127. 6dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 3) - Ch. 151)



Plot 7-128. 6dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 3) - Ch. 159)

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