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MEASUREMENT REPORT FCC PART 15.407 UNII / ISED RSS-247

Applicant Name:

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

Date of Testing:

05/04 - 07/06/2020 **Test Site/Location:** PCTEST Lab. Columbia, MD, USA **Test Report Serial No.:** 1M2005040080-08.A3L

FCC ID: IC:

A3LSMF707U

649E-SMF707U

Certification

APPLICANT:

Samsung Electronics Co., Ltd.

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

SM-F707U SM-F707W SM-F707U1, SM-F707W 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 662911 D01 v02r01, KDB 648474 D03 v01r04

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013 and KDB 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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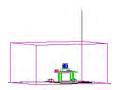


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			AN	JT1	AN	IT2	MIM	ON
UNII Band	Channel Bandwidth (MHz)	Tx Frequency (MHz)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)
1		5180 - 5240	49.888	16.98	49.659	16.96	99.083	19.96
2A	20	5260 - 5320	49.888	16.98	49.545	16.95	99.083	19.96
2C	20	5500 - 5720	49.888	16.98	48.865	16.89	96.383	19.84
3		5745 - 5825	49.545	16.95	49.888	16.98	99.083	19.96
1		5190 - 5230	39.628	15.98	39.628	15.98	79.250	18.99
2A	40	5270 - 5310	39.264	15.94	38.459	15.85	77.446	18.89
2C	40	5510 - 5710	39.537	15.97	39.537	15.97	79.068	18.98
3		5755 - 5795	37.757	15.77	39.264	15.94	75.162	18.76
1		5210	30.832	14.89	31.550	14.99	61.660	17.90
2A	90	5290	24.210	13.84	24.660	13.92	48.865	16.89
2C	80	5530 - 5690	30.620	14.86	31.405	14.97	61.944	17.92
3		5775	30.974	14.91	30.479	14.84	60.814	17.84

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 17025-2005 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: A3LSMF707U**. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter.

This device can operate in one of two physical configurations – "open" and "closed". All emissions are investigated in both modes for compliance.

Test Device Serial No.: 0025H, 0023H, 0009H, 0036H, 0038H, 1064M, 1049M

2.2 Device Capabilities

This device contains the following capabilities:

800/850/1900 CDMA/EvDO Rev0/A, 1x Advanced (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 5G NR (n71, n5, n66, n25, n2, n41), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer

Band 1 Band 2A			Band 2C	_		Band 3			
Ch.	Frequency (MHz)	C	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)		Ch.	Frequency (MHz)
36	5180	5	52	5260	100	5500		149	5745
:	:		:	:	:	:	Ē	••	:
42	5210	5	56	5280	120	5600		157	5785
:	:		:	:	:	:		•	:
48	5240	6	64	5320	144	5720		165	5825

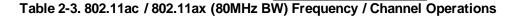
Table 2-1. 802.11a / 802.11n / 802.11ac / 802.11ax (20MHz) Frequency / Channel Operations

	Band 1		Band 2A		Band 2C		Band 3
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
38	5190	54	5270	102	5510	151	5755
:	:	:	:	:	:	:	:
46	5230	62	5310	118	5590	159	5795
					:		

142 5710

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

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



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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:

		ANT1	ANT2	ΜΙΜΟ
802.11 N	802.11 Mode/Band		Duty	Duty
		Cycle [%]	Cycle [%]	Cycle [%]
	а	98.9	98.9	98.9
	n (HT20)	98.6	98.8	99.7
	ac (HT20)	98.8	98.9	99.7
	ax (HT20)	98.6	98.6	99.7
5GHz	n (HT40)	97.7	97.7	99.8
	ac (HT40)	97.7	97.7	99.8
	ax (HT40)	97.4	97.4	99.7
	ac (HT80)	95.4	95.5	99.7
	ax (HT80)	95.2	95.1	99.7

Table 2-4. Measured Duty Cycles

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

WiFi Configurations		SI	SO	SE	DM	CDD	
		ANT1	ANT2	ANT1	ANT2	ANT1	ANT2
	11a	✓	✓	×	×	✓	✓
5GHz	11n/ac/ax (20MHz)	✓	✓	✓	✓	×	×
SGHZ	11n/ac/ax (40MHz)	✓	✓	✓	✓	×	×
	11ac/ax (80MHz)	✓	✓	✓	✓	×	×

Table 2-5. Frequency / Channel Operations

 \checkmark = Support ; \star = 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	1	153
Operating Frequency (MHz)	2412	5765
Data Rate (Mbps)	1M	6M
Mode	802.11b	802.11a

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	1	124
Operating Frequency (MHz)	2412	5620
Data Rate (Mbps)	1M	6M
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	2	64
Operating Frequency (MHz)	2417	5320
Data Rate (Mbps)	MCS0	MCS0
Mode	802.11n	802.11n

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

2.3 Antenna Description

Following antenna was used for the testing.

Frequency [GHz]	Antenna Gain (dBi)
5.20	-6.5
5.30	-6.2
5.50	-6.1
5.80	-5.9

Table 2-9. Antenna Peak Gain

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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 software version F707USQE0ATEJ 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_{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)	10/30/2019	Annual	10/30/2020	WL25-1
-	WL40-1	Conducted Cable Set (40GHz)	3/13/2020	Annual	3/13/2021	WL40-1
-	WL25-4	Conducted Cable Set (25GHz)	1/22/2020	Annual	1/22/2021	WL25-4
Agilent	N9038A	MXE EMI Receiver	7/17/2019	Annual	7/17/2020	MY51210133
Anritsu	ML2495A	Power Meter	12/17/2019	Annual	12/17/2020	941001
Anritsu	MA2411B	Pulse Power Sensor	8/27/2019	Annual	8/27/2020	1339027
Anritsu	MA2411B	Pulse Power Sensor	10/15/2019	Annual	10/15/2020	1339026
Anritsu	MS46322A	Vector Network Analyzer	8/19/2019	Annual	8/19/2020	1521001
Anritsu	36585K-2F	Precision Autocal 2-Port	7/16/2019	Annual	7/16/2020	1628014
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2019	Biennial	10/10/2021	121034
EMCO	3160-09	Small Horn (18 - 26.5GHz)	8/9/2018	Biennial	8/9/2020	135427
EMCO	3160-10	Small Horn (26.5 - 40GHz)	8/9/2018	Biennial	8/9/2020	130993
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	2/14/2019	Biennial	2/14/2021	125518
ETS-Lindgren	3115	Double Ridged Guide Horn 750MHz - 18GHz	3/12/2020	Biennial	3/12/2022	150693
Pasternack	NMLC-2	Line Conducted Emissions Cable (NM)	1/9/2020	Annual	1/9/2021	NMLC-2
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	11/1/2019	Annual	11/1/2020	100040
Rohde & Schwarz	TS-PR40	26.5-40 GHz Pre-Amplifier	11/1/2019	Annual	11/1/2020	100037
Rohde & Schwarz	ESU 40	EMI Test Receiver (40GHz)	9/23/2019	Annual	9/23/2020	100348
Rohde & Schwarz	SFU NIT-Rx	Shielded Filter Unit	7/11/2019	Annual	7/11/2020	102134
Rohde & Schwarz	SFU NIT-Rx	Shielded Filter Unit	7/8/2019	Annual	7/8/2020	102133
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

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:	<u>A3LSMF707U</u>
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	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)	tricted Bands Emissions in restricted bands must		PASS	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 4.7.
- 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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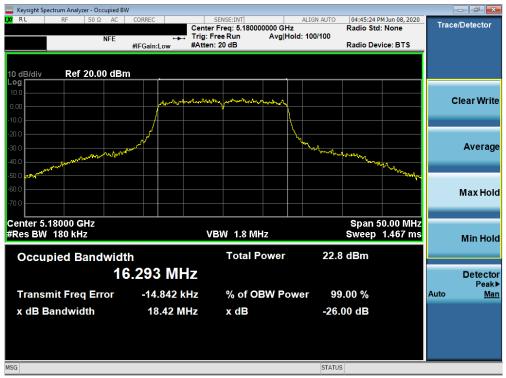
SISO Antenna-1 26 dB Bandwidth Measurements

	Frequency	Channel			Measured 26dB
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Bandwidth
	[101112]				[MHz]
	5180	36	а	6	18.42
	5200	40	а	6	18.51
	5240	48	а	6	18.46
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	20.52
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	19.87
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	19.79
-	5180	36	ax (20MHz)	6.5/7.2 (MCS0)	22.14
Band 1	5200	40	ax (20MHz)	6.5/7.2 (MCS0)	23.98
B	5240	48	ax (20MHz)	6.5/7.2 (MCS0)	21.83
	5190	38	n (40MHz)	13.5/15 (MCS0)	39.33
	5230	46	n (40MHz)	13.5/15 (MCS0)	39.20
	5190	38	ax (40MHz)	13.5/15 (MCS0)	40.25
	5230	46	ax (40MHz)	13.5/15 (MCS0)	40.13
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	81.82
	5210	42	ax (80MHz)	29.3/32.5 (MCS0)	81.53
	5260	52	а	6	18.50
	5280	56	а	6	18.36
	5320	64	а	6	18.49
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	20.02
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	19.74
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	19.67
2A	5260	52	ax (20MHz)	6.5/7.2 (MCS0)	22.91
Band 2A	5280	56	ax (20MHz)	6.5/7.2 (MCS0)	22.19
Ba	5320	64	ax (20MHz)	6.5/7.2 (MCS0)	21.51
	5270	54	n (40MHz)	13.5/15 (MCS0)	39.24
	5310	62	n (40MHz)	13.5/15 (MCS0)	39.31
	5270	54	ax (40MHz)	13.5/15 (MCS0)	40.22
	5310	62	ax (40MHz)	13.5/15 (MCS0)	40.31
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	82.03
	5290	58	ax (80MHz)	29.3/32.5 (MCS0)	81.88
	5500	100	а	6	18.48
	5600	120	а	6	18.55
	5720	144	а	6	18.56
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	19.76
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	19.87
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	19.69
	5500	100	ax (20MHz)	6.5/7.2 (MCS0)	20.62
	5600	120	ax (20MHz)	6.5/7.2 (MCS0)	20.69
	5720	144	ax (20MHz)	6.5/7.2 (MCS0)	20.63
SC	5510	102	n (40MHz)	13.5/15 (MCS0)	39.55
Band 2C	5590	118	n (40MHz)	13.5/15 (MCS0)	39.46
Bai	5710	142	n (40MHz)	13.5/15 (MCS0)	39.23
	5510	102	ax (40MHz)	13.5/15 (MCS0)	40.30
	5590	118	ax (40MHz)	13.5/15 (MCS0)	40.44
	5710	142	ax (40MHz)	13.5/15 (MCS0)	40.26
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	82.14
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	81.35
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	81.34
	5530	106	ax (80MHz)	29.3/32.5 (MCS0)	81.52
	5610	122	ax (80MHz)	29.3/32.5 (MCS0)	81.92
	5690	138	ax (80MHz)	29.3/32.5 (MCS0)	82.19
able				Measuremer	

Table 7-2. Conducted Bandwidth Measurements SISO ANT1

FCC ID: A3LSMF707U	PCTEST Praud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-1. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 1) - Ch. 36)



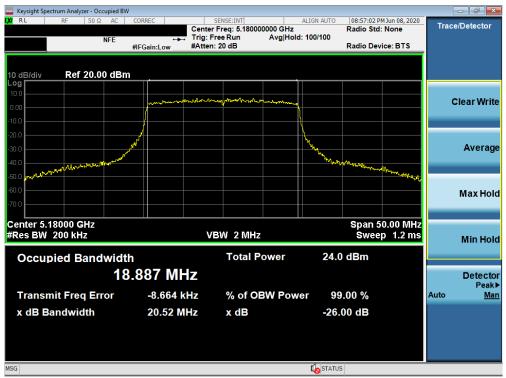
Plot 7-2. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 1) - Ch. 40)

FCC ID: A3LSMF707U	PCTEST Proud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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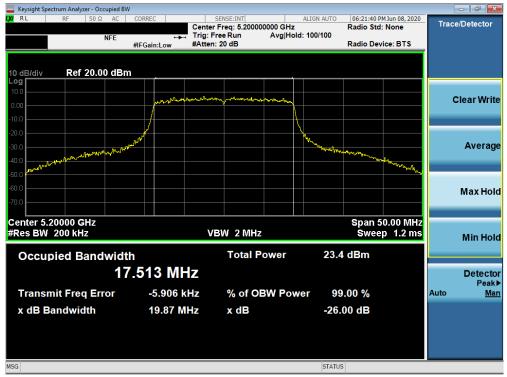




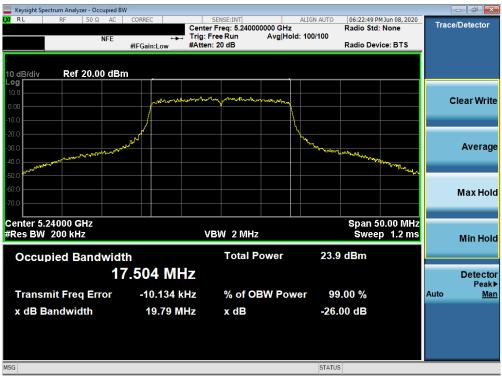
Plot 7-4. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 1) - Ch. 36)

FCC ID: A3LSMF707U	PCTEST Freud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-5. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 1) - Ch. 40)



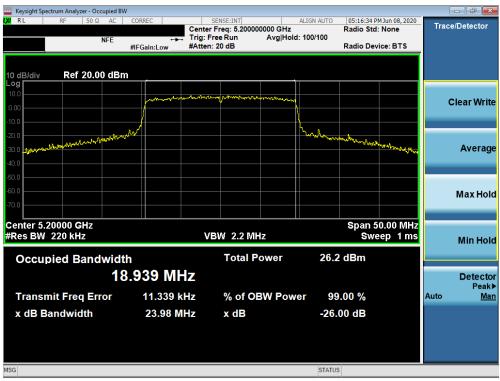
Plot 7-6. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 1) - Ch. 48)

FCC ID: A3LSMF707U	PCTEST Proud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied E						
XIRL RF 50Ω AC	CORREC	SENSE:INT Freg: 5.180000000 GHz	ALIGN AUTO	05:14:38 PM Ju Radio Std: N		race/Detector
NFE	Trig: I	Free Run Avg Ho	old: 100/100			
	#IFGain:Low #Atter	n: 20 dB		Radio Device	: BTS	
10 dB/div Ref 20.00 dB	m					
Log						
0.00	the all and a second	and the second of the second second	7			Clear Write
10.0	/					
20.0	www		Manner			
20.0				water what we	Marriel Jak	Average
						Average
40.0						
-50.0						
-60.0						Max Hold
-70.0						
Center 5.18000 GHz				Span 50.	00 MHz	
#Res BW 220 kHz	V	/BW 2.2 MHz			o 1 ms	Min Hold
	41-	Total Power	26.2	dBm		
Occupied Bandwid		Total Power	20.5	авт		
1	8.965 MHz					Detector
Transmit Freq Error	-7.896 kHz	% of OBW Pov	Mor 00	.00 %	Au	Peak∎ to Mar
x dB Bandwidth	22.14 MHz	x dB	-26.	00 dB		
ISG			STATUS			

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



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

FCC ID: A3LSMF707U	PCTEST Proved to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied E	W				
KL RF 50 Ω AC	CORREC	SENSE:INT ter Freg: 5.240000000 GHz	ALIGN AUTO 05:17:47 I Radio Sto	PM Jun 08, 2020	Trace/Detector
NEE		: Free Run Avg Hold		1: None	
	#IFGain:Low #Att	en: 20 dB	Radio De	vice: BTS	
10 dB/div Ref 20.00 dB	m				
Log					
10.0	mannan	most providence market			Clear Write
0.00	<mark>/</mark>				
-10.0	<u>/</u>		· · · · · · · · · · · · · · · · · · ·		
-20.0	what		hymnether		
-20.0			hypower the way way have	nemound .	Average
-40.0					·····j·
-50.0					
-60.0					Max Hold
-70.0					
Center 5.24000 GHz				50.00 MHz	
#Res BW 220 kHz		VBW 2.2 MHz		eep 1 ms	
		V D V Z.Z IVII 12		cep mis	Min Hold
Occupied Bandwid	th	Total Power	26.4 dBm		
	8.952 MHz				Detector Peak▶
Transmit Freq Error	-11.416 kHz	% of OBW Pow	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	21.83 MHz	x dB	-26.00 dB		
	21100 11112				
MSG			STATUS		

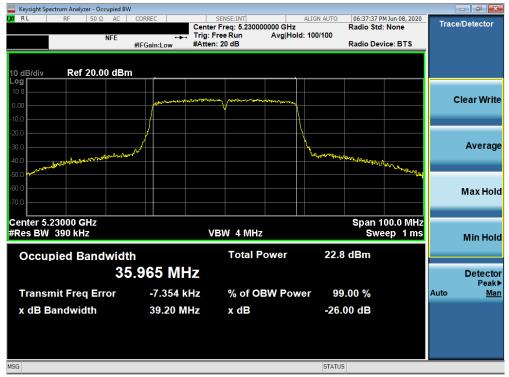
Plot 7-9. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax SU (UNII Band 1) - Ch. 48)



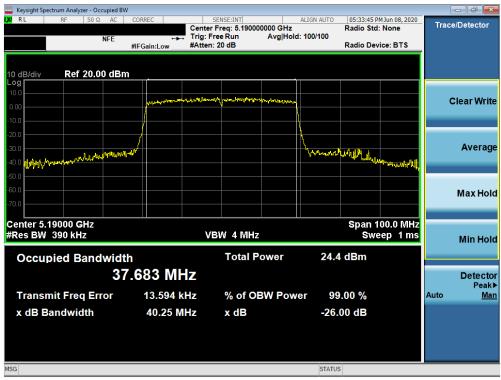
Plot 7-10. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 1) - Ch. 38)

FCC ID: A3LSMF707U	Read to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
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Plot 7-11. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 1) - Ch. 46)



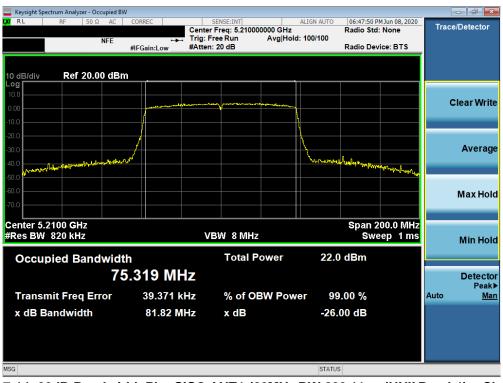
Plot 7-12. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax SU (UNII Band 1) - Ch. 38)

FCC ID: A3LSMF707U	PCTEST Fred to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Oc	cupied BW									- •
L <mark>X/</mark> RL RF 50 Ω	AC CORI	REC		ISE:INT eq: 5.23000		ALIGN AUTO	05:34:48 P Radio Std	M Jun 08, 2020	Trac	e/Detector
	NFE	÷				d: 100/100	Raulo Stu	. None		
		ain:Low	#Atten: 2	0 dB			Radio Dev	rice: BTS		
10 dB/div Ref 20.0	0 dBm									
Log										
0.00		monour	alonderse for the second	ponteresting	monor					Clear Write
-10.0										
						t,				
-20.0	کر					<u> </u>				•
-30.0 -40.0 <mark>]]1[]]1[]]1]1]1[]]</mark>	NIN YA ALVY					"how frog	an hallow			Average
								- Martandar		
-50.0										
-60.0										Max Hold
-70.0										
Center 5.23000 GHz							Snan 1	00.0 MHz		
#Res BW 390 kHz			VBV	V 4 MHz				ep 1 ms		Min Hold
								<u> </u>		
Occupied Band	width			Total P	ower	25.0	dBm			
	37.6	36 MI	7							Detector
										Peak▶
Transmit Freq Er	ror	-2.914 k	Hz	% of O	BW Pow	er 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth		40.13 M	IHz	x dB		-26.	00 dB			
MSG						STATUS				

Plot 7-13. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax SU (UNII Band 1) - Ch. 38)



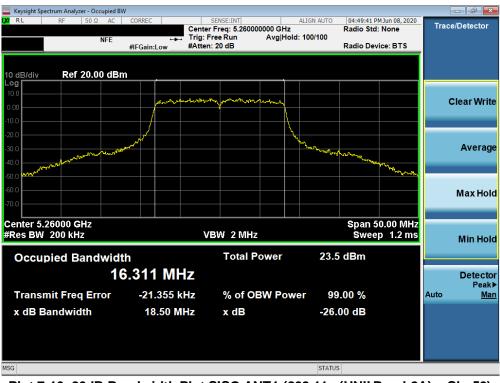
Plot 7-14. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ac (UNII Band 1) - Ch. 42)

FCC ID: A3LSMF707U	PCTEST Provid to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied BW					
LX/ RL RF 50 Ω AC	CORREC	SENSE:INT er Freg: 5.210000000 GHz	ALIGN AUTO 05:46:55 F Radio Sto	M Jun 08, 2020	Trace/Detector
NEE	Trig:	Free Run Avg Hold	d: 100/100	. None	
	#IFGain:Low #Atte	en: 20 dB	Radio De	vice: BTS	
10 dB/div Ref 20.00 dBm					
Log 10.0					
0.00	Martin and and a fill of and the	Heyeven to man and the second second			Clear Write
-10.0					
-20.0			l L		•
-30.0	N I		Marchanderweinight		Average
HOLD HANNING THE REAL				WHIN WYLN PILLA	
-50.0					
-60.0					Max Hold
-70.0					
Center 5.2100 GHz			Span '	200.0 MHz	
#Res BW 820 kHz	,	VBW 8 MHz		eep 1 ms	Min Hold
					Min Hold
Occupied Bandwidt	h	Total Power	23.9 dBm		
76	.981 MHz				Detector
					Peak▶
Transmit Freq Error	-4.195 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	81.53 MHz	x dB	-26.00 dB		
MSG			STATUS		

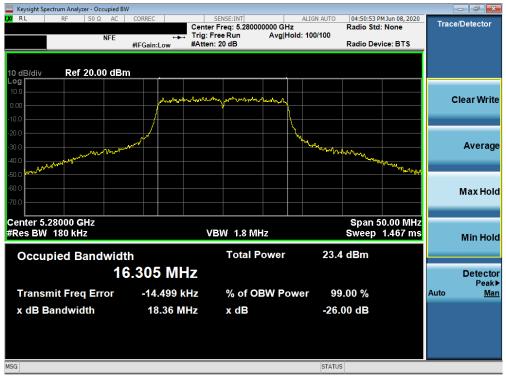
Plot 7-15. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax SU (UNII Band 1) - Ch. 42)



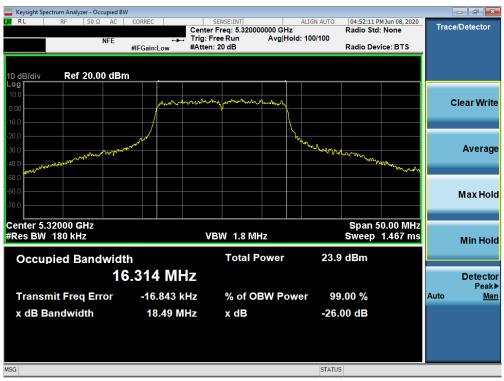
Plot 7-16. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMF707U	PCTEST Freud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
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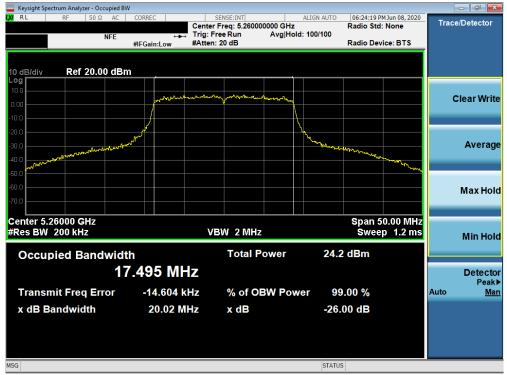
Plot 7-17. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2A) - Ch. 56)



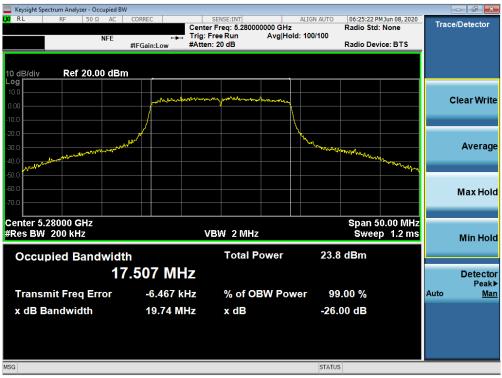
Plot 7-18. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMF707U	PCTEST Provid to be part of (2) - man	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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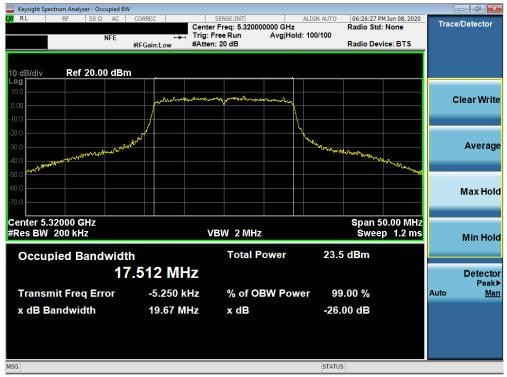
Plot 7-19. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 2A) - Ch. 52)



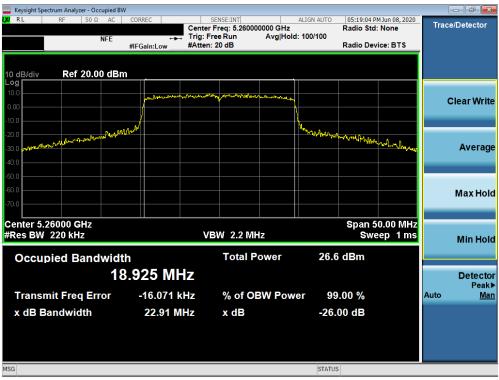
Plot 7-20. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMF707U	PCTEST Proved to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-21. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 2A) - Ch. 64)



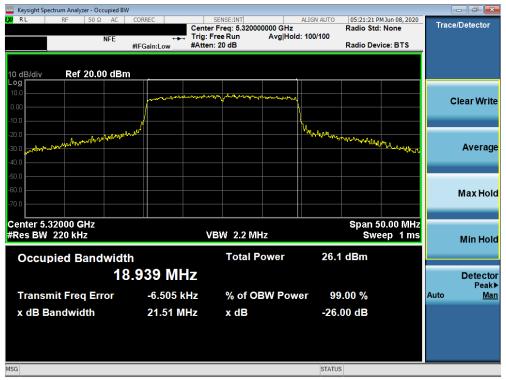
Plot 7-22. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax SU (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMF707U	PCTEST Fred to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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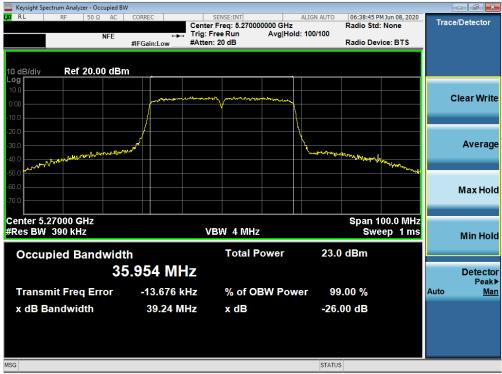
Plot 7-23. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax SU (UNII Band 2A) - Ch. 56)



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

FCC ID: A3LSMF707U	Roud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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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: A3LSMF707U	PCTEST Fred to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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Image: NFE Serve:	etector
NFE Trig: Free Run Avg Hold: 100/100	
#FGain:Low #Atten: 20 dB Radio Device: BTS	
10 dB/div Ref 20.00 dBm	
0.00 Cle	ar Write
-10.0	
-20.0	
	verage
and the second	Worugo
-500	
	ax Hold
Center 5.27000 GHz Span 100.0 MHz	
#Res BW 390 kHz VBW 4 MHz Sweep 1 ms N	lin Hold
Occupied Bandwidth Total Power 25.1 dBm	
37.639 MHz	Detector
Transmit Freq Error -27.188 kHz % of OBW Power 99.00 % Auto	Peak▶ <u>Man</u>
x dB Bandwidth 40.22 MHz x dB -26.00 dB	
MSG STATUS	

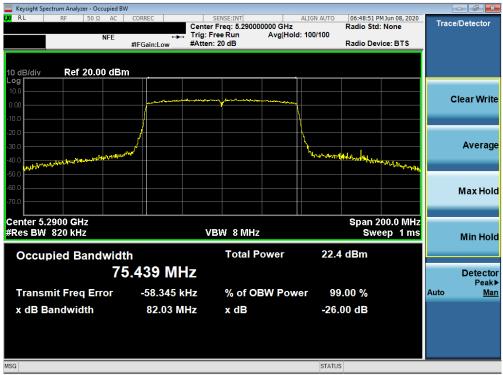
Plot 7-27. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax SU (UNII Band 2A) - Ch. 54)



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

FCC ID: A3LSMF707U	PCTEST Preved to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 20 of 240	
1M2005040080-08.A3L	05/04 - 07/06/2020	Portable Handset		Page 30 of 240	
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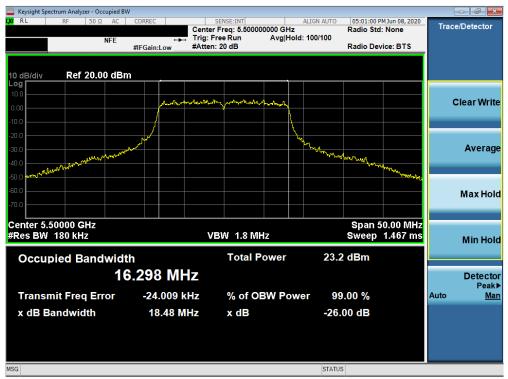
Plot 7-29. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ac (UNII Band 2A) - Ch. 58)



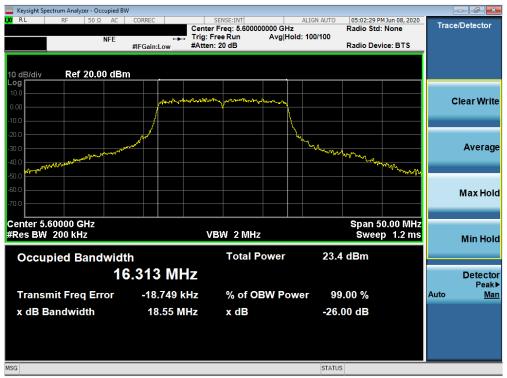
Plot 7-30. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax SU (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMF707U	PCTEST Fred to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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Plot 7-32. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMF707U	PCTEST Frad to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 32 of 240
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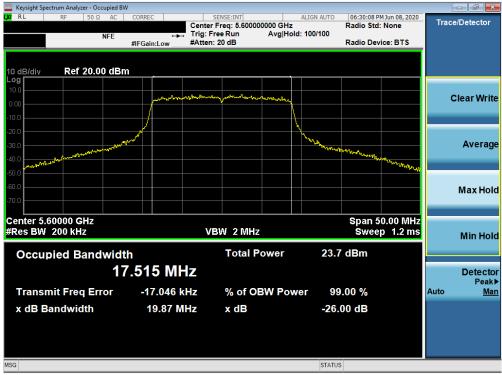
Plot 7-33. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2C) - Ch. 144)



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

FCC ID: A3LSMF707U	PCTEST Freud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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Plot 7-35. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 2C) - Ch. 120)



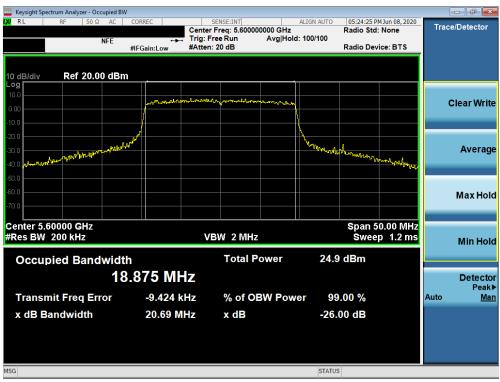
Plot 7-36. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 2C) - Ch. 144)

FCC ID: A3LSMF707U	PCTEST Provid to be part of (2) - man	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 34 of 240	
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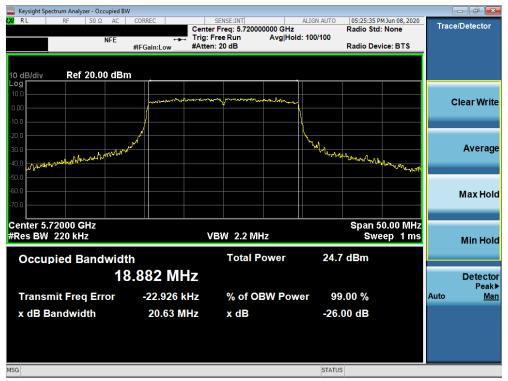
Plot 7-37. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax SU (UNII Band 2C) - Ch. 100)



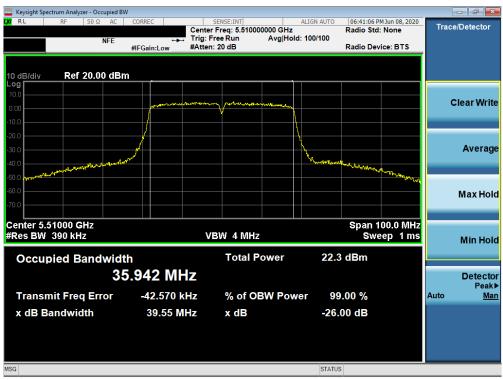
Plot 7-38. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax SU (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMF707U	PCTEST Proved to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dogo 25 of 240		
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Plot 7-39. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax SU (UNII Band 2C) - Ch. 144)



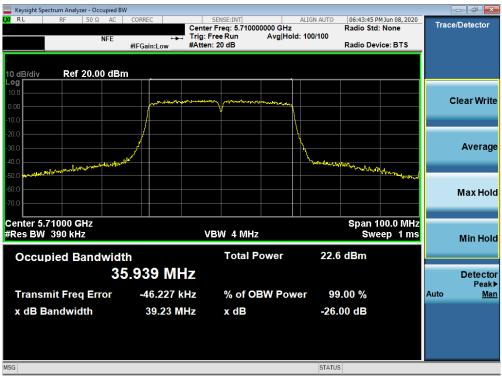
Plot 7-40. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMF707U	Read to be part of @ 1 = man	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dogo 26 of 240		
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Plot 7-41. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 2C) - Ch. 118)



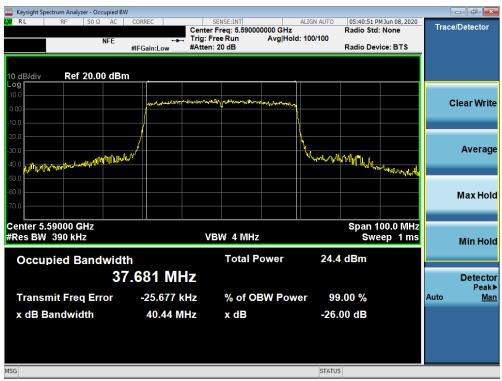
Plot 7-42. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMF707U	PCTEST Proved to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied BV	/				
LXX RL RF 50Ω AC	CORREC	SENSE:INT Freq: 5.510000000 GHz	ALIGN AUTO 05:39:33 Radio Sto	PM Jun 08, 2020	Trace/Detector
NEE	Trig:	Free Run Avg Hold	d: 100/100		
	#IFGain:Low #Atte	n: 20 dB	Radio De	vice: BTS	
10 dB/div Ref 20.00 dBn	า				
Log					
10.0	nor up of the thirty and	my show and the montering			Clear Write
0.00					
-10.0					
-20.0			1		
-30.0			Munderwic Anthol Martin		Average
-40.0 mmmulatorer	¥*		~ means rapping the	Andreal and a state	
-50.0				and the second s	
-60.0					Max Hold
-70.0					
Center 5.51000 GHz				100.0 MHz	
#Res BW 390 kHz	<u> </u>	/BW 4 MHz	Sw	eep 1 ms	Min Hold
Occurried Dandwidt	L	Total Power	24.2 dBm		
Occupied Bandwidt		Total Fower	24.2 UBIII		
37	7.600 MHz				Detector
Transmit Freq Error	-66.384 kHz	% of OBW Pow	ver 99.00 %		Peak▶ Auto Man
-					
x dB Bandwidth	40.30 MHz	x dB	-26.00 dB		
MSG			STATUS		

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



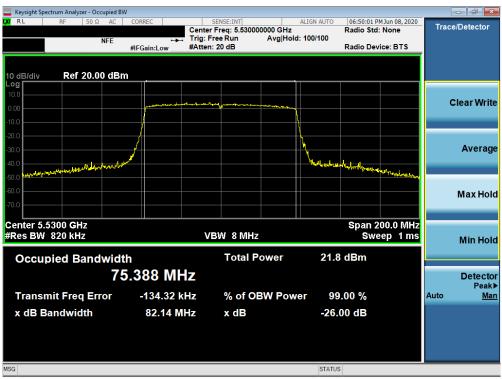
Plot 7-44. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax SU (UNII Band 2C) - Ch. 118)

FCC ID: A3LSMF707U	PCTEST Proved to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager			
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Keysight Spectrum Analyzer - Occupied B\	V				
10 RL RF 50Ω AC NFE	🛻 Trig: F	SENSE:INT r Freq: 5.710000000 GHz Free Run Avg Holo n: 20 dB	Radio Sto 1: 100/100	PM Jun 08, 2020 d: None vice: BTS	Trace/Detector
10 dB/div Ref 20.00 dBr	n				
10.0 -10.0	and the second s	and Assession and a second property and			Clear Write
-20.0 -30.0 -40.0	Jr		L Warmon Mar Julin M.	have been the	Average
-50.0 -60.0 -70.0					Max Hold
Center 5.71000 GHz #Res BW 390 kHz	v	/BW 4 MHz		100.0 MHz eep 1 ms	Min Hold
Occupied Bandwidt		Total Power	24.5 dBm		
	7.683 MHz				Detector Peak▶
Transmit Freq Error	-35.265 kHz	% of OBW Pow	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	40.26 MHz	x dB	-26.00 dB		
MSG			STATUS		

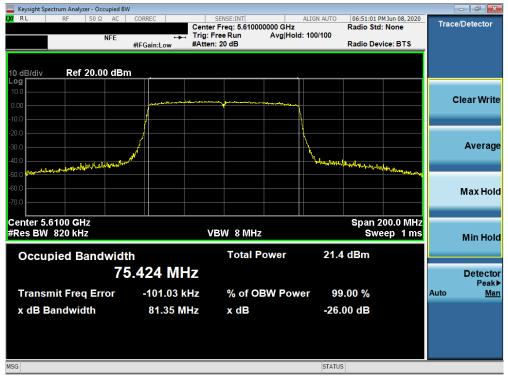
Plot 7-45. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax SU (UNII Band 2C) - Ch. 142)



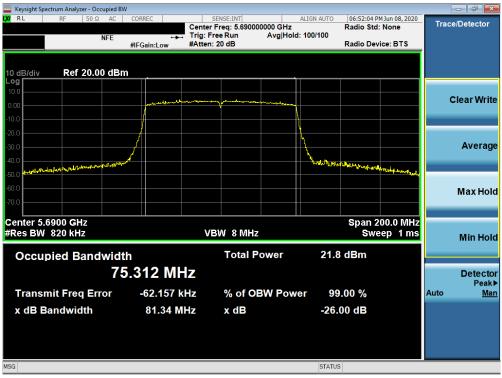
Plot 7-46. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 106)

FCC ID: A3LSMF707U	PCTEST Proved to be part of (2) - mmmer	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-47. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 122)



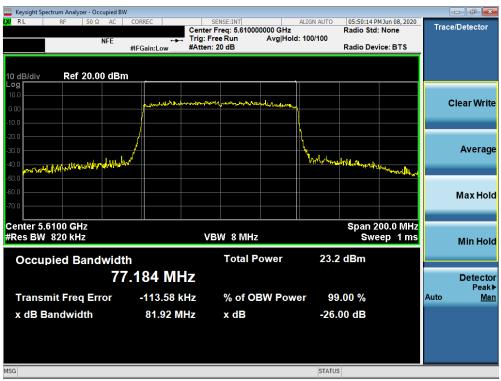
Plot 7-48. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 138)

FCC ID: A3LSMF707U	PCTEST Proud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied	BW				
00 RL RF 50Ω AC NFE 10 dB/div Ref 20.00 dB	Cente Trig: #IFGain:Low #Atte	SENSE:INT er Freq: 5.53000000 GHz Free Run Avg Hold n: 20 dB	ALIGN AUTO 05:49:07 F Radio Sto d: 100/100 Radio De		Trace/Detector
Log 10.0 0.00 -10.0	and a state of the	wang paga waka babapati na asa wang			Clear Write
-20.0 -30.0 -40.0 -50.0			Marcan allowed and the same	Anton will be a	Average
-60.0					Max Hold
Center 5.5300 GHz #Res BW 820 kHz Occupied Bandwid		/BW 8 MHz Total Power		200.0 MHz eep 1 ms	Min Hold
7	6.929 MHz				Detector Peak▶
Transmit Freq Error	-180.85 kHz	% of OBW Pow	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	81.52 MHz	x dB	-26.00 dB		
MSG			STATUS		

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



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

FCC ID: A3LSMF707U	PCTEST Provid to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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🔤 Keysight Spectrum Ana	alyzer - Occ	upied BW									
LXIRL RF	50 Ω	AC	CORREC	Con	SENSE:INT ter Freg: 5.6900	00000 GHz	ALIGN AUTO	05:51:33 P	M Jun 08, 2020	Trace	e/Detector
		NFE		++ Trig	: Free Run	Avg Hold	: 100/100	Raulo Stu	None		
			FGain:Low	#Att	en: 20 dB			Radio Dev	ice: BTS		
10 dB/div Re	ef 20.00) dBm									
Log											
10.0			n month	Maring and	when when the	al mouth and a second				c	Clear Write
0.00											
-10.0											
-20.0			┦				- <u>-</u>				
-30.0			/				<u>\</u>				Average
-40.0	. telunet	and shade					manutar		1		
-50.0	4-04 March	apalana.							Mary-Marthallynam		
-60.0											
-70.0											Max Hold
-70.0											
Center 5.6900 G	SHz							Span 2	00.0 MHz		
#Res BW 820 k	Hz				VBW 8 MH	z			ep 1ms		Min Hold
											Millinoid
Occupied I	Band	width			Total	Power	23.9	dBm			
		76.	987 I	ИНz							Detector
											Peak▶
Transmit Fre	eq Err	or	-28.14	1 kHz	% of C	BW Pow	er 99	.00 %		Auto	<u>Man</u>
x dB Bandw	idth		82.1) MHz	x dB		-26.	00 dB			
MSG							STATUS				

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

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SISO Antenna-2 26dB Bandwidth Measurements

	Bandwidth Measurements							
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Bandwidth [MHz]			
	5180	36	а	6	18.54			
	5200	40	a	6	18.72			
	5240	48	a	6	18.41			
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	19.99			
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	19.95			
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	19.77			
-	5180	36	ax (20MHz)	6.5/7.2 (MCS0)	20.43			
Band 1	5200	40	ax (20MHz)	6.5/7.2 (MCS0)	20.77			
Bai	5240	48	ax (20MHz)	6.5/7.2 (MCS0)	20.60			
	5190	38	n (40MHz)	13.5/15 (MCS0)	38.95			
	5230	46	n (40MHz)	13.5/15 (MCS0)	38.73			
	5190	38	ax (40MHz)	13.5/15 (MCS0)	40.38			
	5230	46	ax (40MHz)	13.5/15 (MCS0)	40.37			
	5230	42	ac (80MHz)	29.3/32.5 (MCS0)	80.11			
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	81.30			
	5260	42 52	ax (ouiviriz) a	29.3/32.5 (IVIC30) 6	20.20			
	5280	56	a	6	19.23			
	5320	64	a	6	18.46			
	5260	52	a n (20MHz)	6.5/7.2 (MCS0)	20.25			
	5280	56	, ,	6.5/7.2 (MCS0)	19.87			
		64	n (20MHz)	6.5/7.2 (MCS0)				
∢	5320		n (20MHz)	6.5/7.2 (MCS0)	19.45			
d 2	5260	52	ax (20MHz)	,	20.59			
Band 2A	5280	56	ax (20MHz)	6.5/7.2 (MCS0)	20.65			
-	5320	64	ax (20MHz)	6.5/7.2 (MCS0)	20.67			
	5270	54	n (40MHz)	13.5/15 (MCS0)	39.06			
	5310	62	n (40MHz)	13.5/15 (MCS0)	38.97			
	5270	54	ax (40MHz)	13.5/15 (MCS0)	40.22			
	5310	62	ax (40MHz)	13.5/15 (MCS0)	40.34			
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	81.04			
	5290	58	ax (80MHz)	29.3/32.5 (MCS0)	81.91			
	5500	100	а	6	18.69			
	5600	120	а	6	18.53			
	5720	144	a	6	18.58			
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	20.18			
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	19.78			
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	19.79			
	5500	100	ax (20MHz)	6.5/7.2 (MCS0)	20.32			
	5600	120	ax (20MHz)	6.5/7.2 (MCS0)	20.50			
	5720	144	ax (20MHz)	6.5/7.2 (MCS0)	20.48			
Band 2C	5510	102	n (40MHz)	13.5/15 (MCS0)	38.69			
and	5590	118	n (40MHz)	13.5/15 (MCS0)	39.05			
Ő	5710	142	n (40MHz)	13.5/15 (MCS0)	39.03			
	5510	102	ax (40MHz)	13.5/15 (MCS0)	40.02			
	5590	118	ax (40MHz)	13.5/15 (MCS0)	40.23			
	5710	142	ax (40MHz)	13.5/15 (MCS0)	40.27			
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	79.24			
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	81.05			
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	80.64			
	5530	106	ax (80MHz)	29.3/32.5 (MCS0)	82.16			
	5610	122	ax (80MHz)	29.3/32.5 (MCS0)	81.60			
	5690	138	ax (80MHz)	29.3/32.5 (MCS0)	81.62			

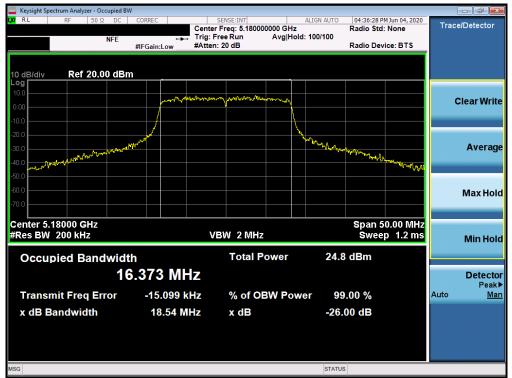
FCC ID: A3LSMF707U	Roud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 43 of 240
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Table 7-3. Conducted Bandwidth Measurements SISO ANT2

	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by:	
	HOLE DISPIECE	(•=)		Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 44 of 240
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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: A3LSMF707U	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-55. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 36)

FCC ID: A3LSMF707U	Read to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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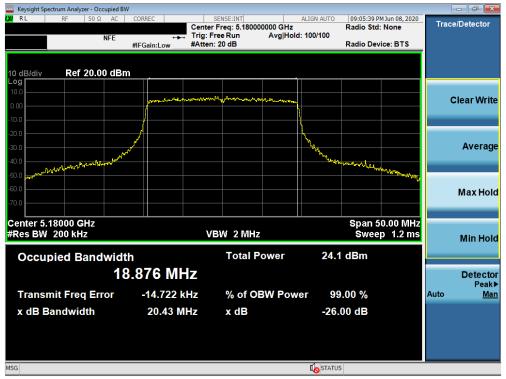
Plot 7-56. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 40)



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

FCC ID: A3LSMF707U	PCTEST Proud to be part of @ 1 = market	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-58. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax SU (UNII Band 1) - Ch. 36)



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

FCC ID: A3LSMF707U	PCTEST Proved to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-60. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax SU (UNII Band 1) - Ch. 48)



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

FCC ID: A3LSMF707U	Road to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-62. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 1) - Ch. 46)



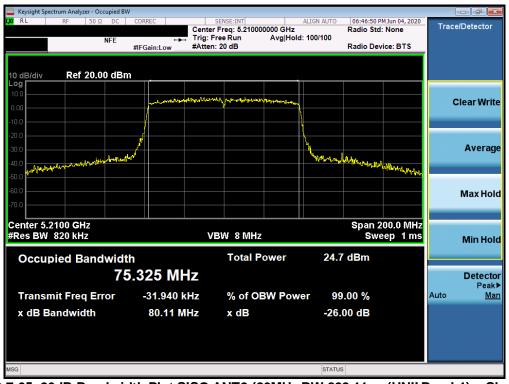
Plot 7-63. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 1) - Ch. 38)

FCC ID: A3LSMF707U	PCTEST Proud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 50 of 240
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🔤 Keysight Spectrum Analyzer - Occ	cupied BW					x
LXI RL RF 50 Ω		SENSE:INT ter Freq: 5.230000000 GHz	ALIGN AUTO 09:23:55 Radio Sto	PM Jun 08, 2020	Trace/Detecto	r
	NEE +++ Trig	g: Free Run Avg Hold	: 100/100			
	#IFGain:Low #At	ten: 20 dB	Radio De	vice: BTS		
10 dB/div Ref 20.00	0 dBm					
Log 10.0						
	environ limite	and and a second and a second and a second			Clear Wr	ite
0.00						
-10.0						
-20.0	,					
-30.0	<u>}</u>		<u>}</u>		Avera	ige
-40.0	a bokerer		www.unm			
-40.0 -50.0 margalument of the second			how we have a full and the start	March a topoly and		
-60.0					MaxHo	hla
-70.0						Jiu
Center 5.23000 GHz				100.0 MHz		
#Res BW 390 kHz		VBW 4 MHz	Sw	eep 1 ms	Min Ho	old
		Total Power	24.1 dBm			
Occupied Band		Total Fower	24.1 UBIII			
	37.657 MHz				Detec	
Transmit Freq Err	ror -13.094 kHz	% of OBW Powe	er 99.00 %		Pea Auto N	ak▶ ⁄lan
· · · ·		% OF OBW POWE				an
x dB Bandwidth	40.37 MHz	x dB	-26.00 dB			
MSG			STATUS			

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



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

FCC ID: A3LSMF707U	PCTEST Proud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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🔤 Keysight Spectrum Analyzer - Occup	ied BW						×
LX/ RL RF 50 Ω	AC CORREC	SENSE:INT Center Freg: 5.21000	ALIGN AUT	0 09:33:40 P Radio Std	M Jun 08, 2020	Trace/Detec	tor
NF		Trig: Free Run #Atten: 20 dB	Avg Hold: 100/100	Radio Dev			
	#IFGain:Low	#Atten: 20 dB		Radio Dev	ICE: BIS		
10 dB/div Ref 20.00	dBm						
10.0							
0.00	padentromolecolit	watesplassisty and the same	allandor			Clear V	Vrite
-10.0							_
-20.0							
-30.0			\			Ave	rage
-40.0	<u> </u>		L \				Ŭ
-50.0 up month in motion	Maganat		matric	montheriterry	Malphane Male		
-60.0							
-70.0						Max	Hold
-70.0							_
Center 5.2100 GHz					00.0 MHz		
#Res BW 820 kHz		VBW 8 MHz		Swe	ep 1 ms	Min	Hold
Occupied Bandw	vidth	Total P	ower 23	3.1 dBm			
			20				
	77.057 MH	Z					ector eak▶
Transmit Freq Erro	r 16.513 kH	z % of O	BW Power	99.00 %		Auto	Man
x dB Bandwidth	81.30 MI	z xdB	-2	6.00 dB			
MSG			I STA	TUS			
			-00				

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



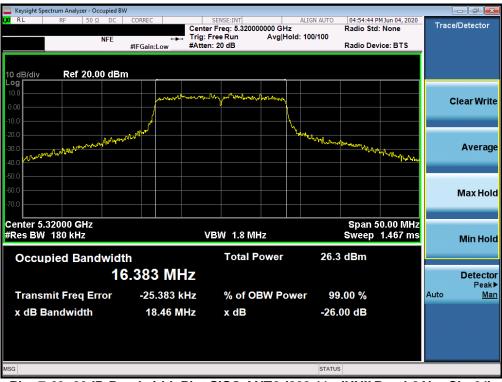
Plot 7-67. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2A) – Ch. 52)

FCC ID: A3LSMF707U	Roud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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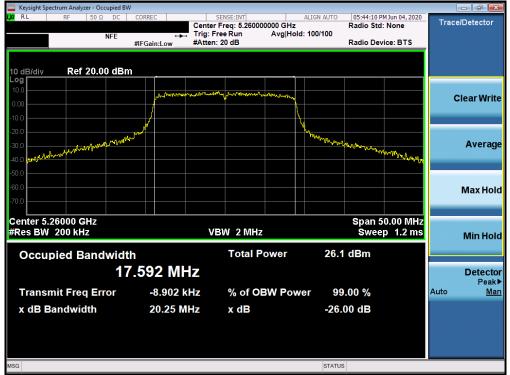
Plot 7-68. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2A) - Ch. 56)



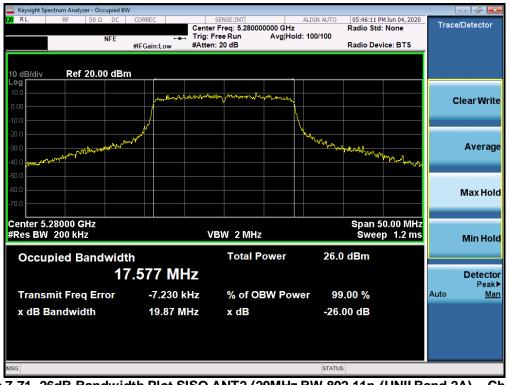
Plot 7-69. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMF707U	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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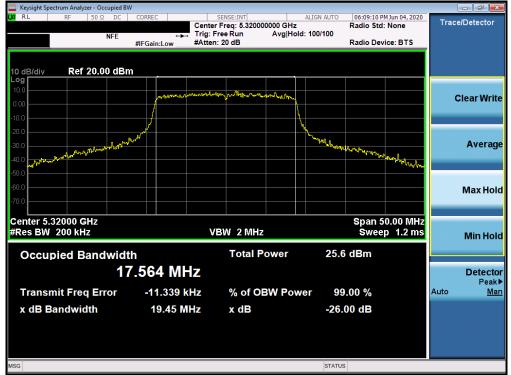
Plot 7-70. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 52)



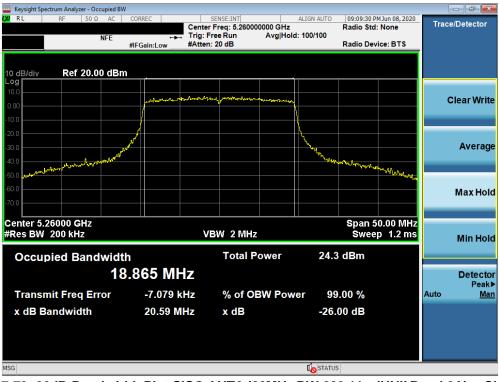
Plot 7-71. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMF707U	PCTEST Fred to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 54 of 240	
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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 802.11n (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMF707U	PCTEST Proved to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 55 of 240	
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Plot 7-74. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 56)



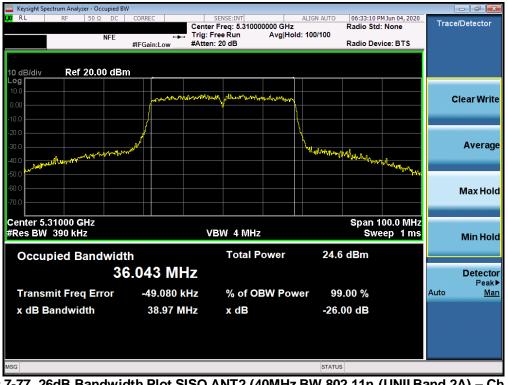
Plot 7-75. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMF707U	Read to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 56 of 240
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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: A3LSMF707U	PCTEST Preved to be part of @,	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 57 of 240	
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🔤 Keysight Spectrum Analyzer - Occu					
LXI RL RF 50 Ω		SENSE:INT enter Freg: 5.270000000	ALIGN AUTO	09:25:04 PM Jun 08, 2020 Radio Std: None	Trace/Detector
N	FE +++ T	rig: Free Run Av	g Hold: 100/100		
	#IFGain:Low#	Atten: 20 dB		Radio Device: BTS	
10 dB/div Ref 20.00	dBm				
10.0					
0.00	Humen borne	waynanier frither waarde	muluty		Clear Write
-10.0			N		
-20.0			N		
-30.0					Average
-40.0			he he he	um huffer in	-
-40.0 -50.0 partor a Alward Market			1000 million 10000 million 1000 million 10000 million 1000000000000000000000000000000000000	angle fly and and appress	
-60.0					Max Hold
-70.0					Max Hold
Center 5.27000 GHz				Span 100.0 MHz	
#Res BW 390 kHz		VBW 4 MHz		Sweep 1 ms	Min Hold
Occupied Bandy	vidth	Total Powe	er 23.9	dBm	
occupied Ballar	37.683 MHz	,			Detector
	37.003 IVITZ				Detector Peak▶
Transmit Freq Erro	or -22.505 kHz	% of OBW	Power 99	0.00 %	Auto <u>Man</u>
x dB Bandwidth	40.22 MHz	x dB	-26.	00 dB	
MSG			I STATU:	S	

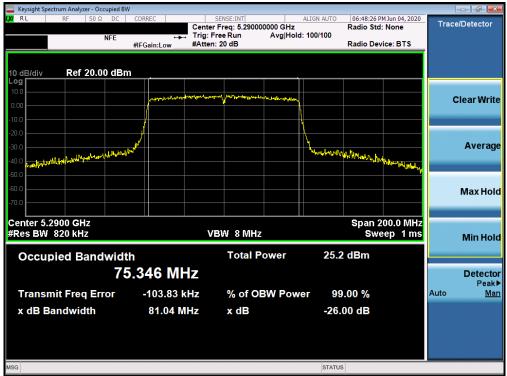
Plot 7-78. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax SU (UNII Band 2A) - Ch. 54)



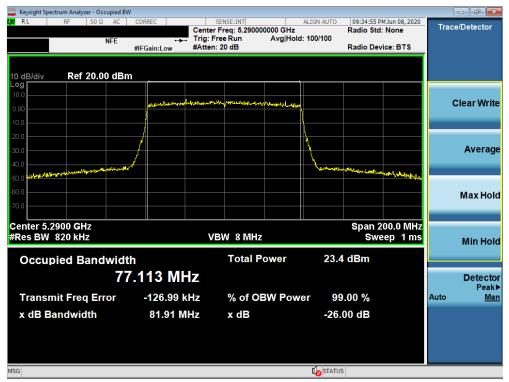
Plot 7-79. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax SU (UNII Band 2A) - Ch. 62)

FCC ID: A3LSMF707U	PCTEST Proud to be part of @,	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dogo 58 of 240		
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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 SU (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMF707U	Read to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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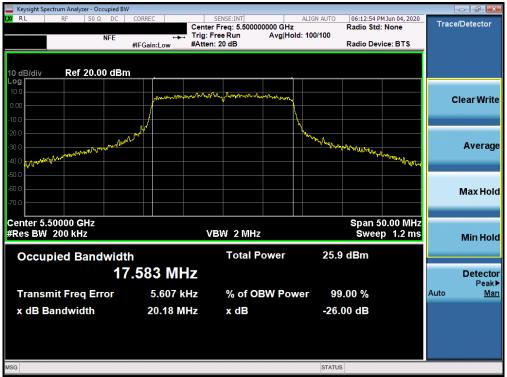
Plot 7-83. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMF707U	Roud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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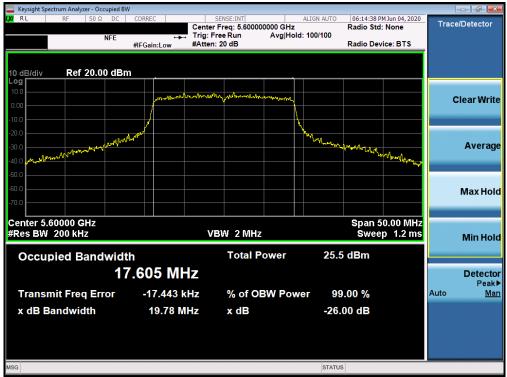
Plot 7-84. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2C) - Ch. 144)



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

FCC ID: A3LSMF707U	PCTEST Fred to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	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)



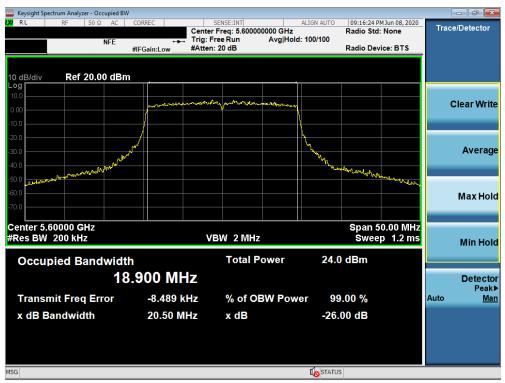
Plot 7-87. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2C) - Ch. 144)

FCC ID: A3LSMF707U	PCTEST Fred to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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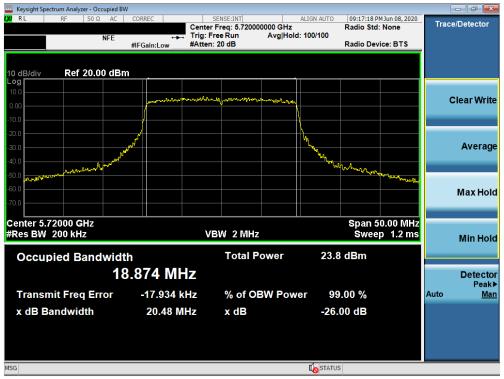
Plot 7-88. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax SU (UNII Band 2C) - Ch. 100)



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

FCC ID: A3LSMF707U	PCTEST Freud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dama (2) of 0.40	
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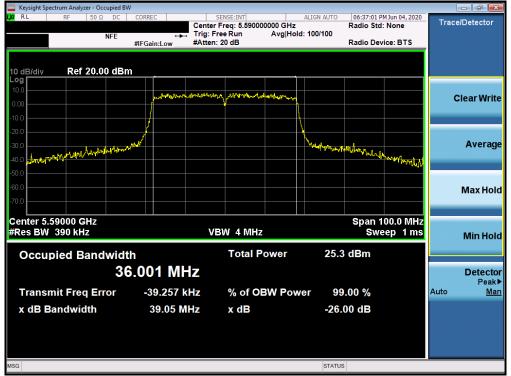
Plot 7-90. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax SU (UNII Band 2C) - Ch. 144)



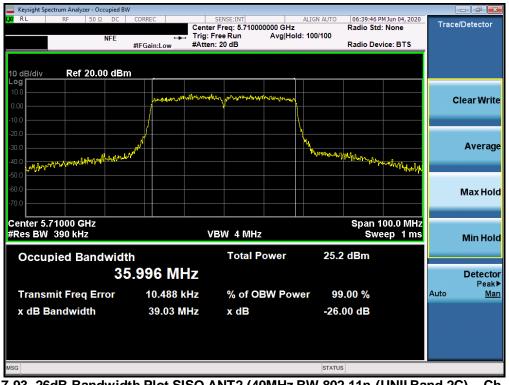
Plot 7-91. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMF707U	PCTEST Proved to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dogo 64 of 240		
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Plot 7-92. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 2C) - Ch. 118)



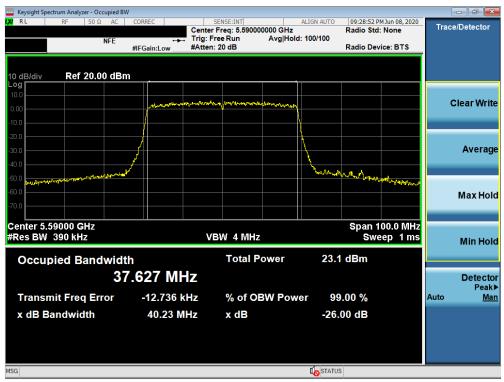
Plot 7-93. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMF707U	PCTEST Proud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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- Contemporary Con					
LXI RL RF 50 Ω	AC CORREC	SENSE:INT Center Freq: 5.51000	ALIGN AUTO	09:27:30 PM Jun 08 Radio Std: None	,2020 Trace/Detector
	NFE +++	Trig: Free Run	Avg Hold: 100/100	Radio Sta. None	
	#IFGain:Low	#Atten: 20 dB		Radio Device: B1	S
10 dB/div Ref 20.0	0 dBm				
Log					
10.0	L'umment	where we want	holyph ways		Clear Write
0.00	1				
-10.0					
-20.0					
-30.0	<u> </u>		<u> </u>		Average
-40.0	- ¹				
-50.0	Martin Control		unand.	willinghall was a	
-60.0					
-70.0					Max Hold
Center 5.51000 GHz				Span 100.0	MHz
#Res BW 390 kHz		VBW 4 MHz		Sweep 1	ms Min Hold
		Total P		4 dBm	
Occupied Band			ower 23.4	ғ авт	
	37.690 M⊦	Z			Detector
Terrer it Ferrer Fer		U- 0/ -f OF	NA/ D	00.0/	Peak►
Transmit Freq Er	ror -28.323 k	HZ % OF OE	3W Power 99	0.00 %	Auto <u>Man</u>
x dB Bandwidth	40.02 M	Hz xdB	-26.	00 dB	
MSG			I STATU	S	

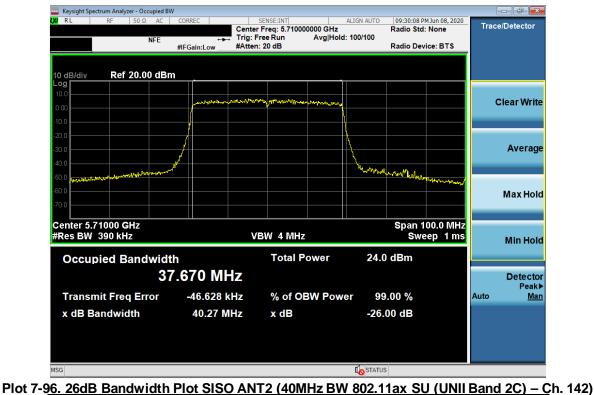
Plot 7-94. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax SU (UNII Band 2C) – Ch. 102)



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

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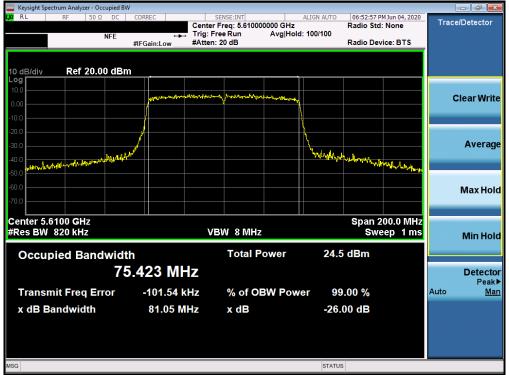




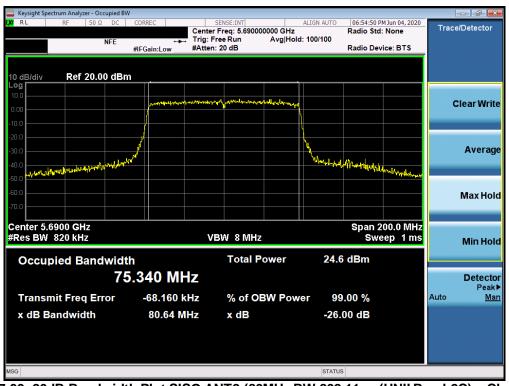
Plot 7-97. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 106)

FCC ID: A3LSMF707U	Roud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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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)

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- Keysight Spectrum Analyzer - Oce					
LXI RL RF 50 Ω		SENSE:INT enter Freq: 5.530000000 GHz	ALIGN AUTO 09:36:04 Radio Sto	PM Jun 08, 2020	Trace/Detector
			d: 100/100	a. None	
	#IFGain:Low #	Atten: 20 dB	Radio De	vice: BTS	
10 dB/div Ref 20.0	0 dBm				
Log					
10.0	, destudibly detailed	inversion of the structure of the			Clear Write
0.00			*		
-10.0					
-20.0	<u> </u>		- <u>\</u>		
-30.0	<u> </u>				Average
-40.0					
-50.0 Aprestant March Press Providen	watthe wat		"We man algorithment	many	
-60.0					May Hald
-70.0					Max Hold
40.0					
Center 5.5300 GHz			Span :	200.0 MHz	
#Res BW 820 kHz		VBW 8 MHz	Sw	eep 1 ms	Min Hold
		Total Power	22.6 dBm		
Occupied Band			22.0 UBIII		
	77.228 MHz				Detector
Tronomit Frog Fr	ror -91.977 kHz	% of OBW Pow	ver 99.00 %		Peak▶ Auto Man
Transmit Freq Err					Man Man
x dB Bandwidth	82.16 MHz	x dB	-26.00 dB		
MSG			STATUS		
			<u> </u>		

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



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

FCC ID: A3LSMF707U	PCTEST Preved to be part of @,	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Page 69 of 240		
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🔤 Keysight Spectrum Analyze											
LXIRL RF	50 Ω AC	CORRE	EC		NSE:INT reg: 5.69000	0000 GHz	ALIGN AUTO	09:39:12 P	MJun 08, 2020	Trac	e/Detector
	NFE		↔	Trig: Fre	e Run		d: 100/100				
		#IFGa	in:Low	#Atten: 2	0 dB			Radio Dev	ice: BTS		
10 dB/div Ref 2	20.00 dE	3m									
10.0											
0.00			and the second	www.	potene (nordisme	hard langer	N			(Clear Write
-10.0		/									_
-20.0											
-30.0		/					<u>1</u>				Average
-40.0		1					l l				-
-50.0 whopper the ment	and the second	-พ์					however	white marked	and opticities street		
-60.0											Max Hold
-70.0											Max Holu
Center 5.6900 GHz) (5)				Span 2	00.0 MHz		
#Res BW 820 kHz				VB	N 8 MHz			Swe	ep 1 ms		Min Hold
Occupied Ba	ndwid	dth			Total P	ower	22.5	i dBm			
			4 MI	J -7							Detector
	4	/	4 1011	12							Peak
Transmit Freq	Error	2	0.497	κHz	% of O	BW Pow	er 99	.00 %		Auto	<u>Man</u>
x dB Bandwidt	th	8	81.62 N	IHz	x dB		-26.	00 dB			
MSG							I STATUS	5			

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

FCC ID: A3LSMF707U	Read to be part of @	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.

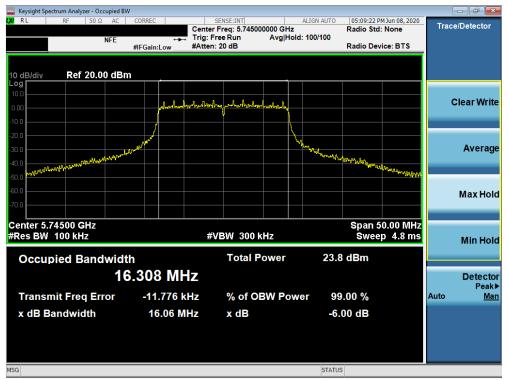
FCC ID: A3LSMF707U	Roud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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SISO Antenna-1 6 dB Bandwidth Measuremen	ts
--	----

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
	5745	149	а	6	16.06
	5785	157	а	6	16.26
	5825	165	а	6	16.32
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	16.85
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	17.19
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	16.90
e	5745	149	ax (20MHz)	6.5/7.2 (MCS0)	18.85
Band	5785	157	ax (20MHz)	6.5/7.2 (MCS0)	18.85
ä	5825	165	ax (20MHz)	6.5/7.2 (MCS0)	18.83
	5755	151	n (40MHz)	13.5/15 (MCS0)	35.59
	5795	159	n (40MHz)	13.5/15 (MCS0)	35.50
	5755	151	ax (40MHz)	13.5/15 (MCS0)	37.92
	5795	159	ax (40MHz)	13.5/15 (MCS0)	37.74
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	75.05
	5775	155	ax (80MHz)	29.3/32.5 (MCS0)	77.53

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: A3LSMF707U	PCTEST Freud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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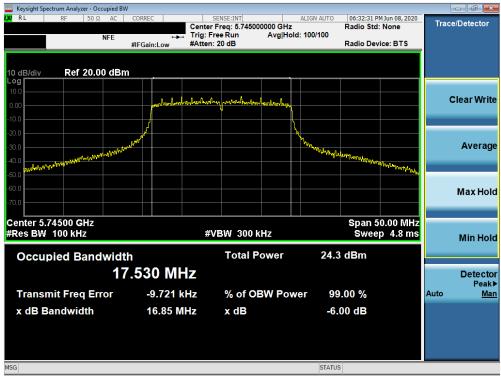




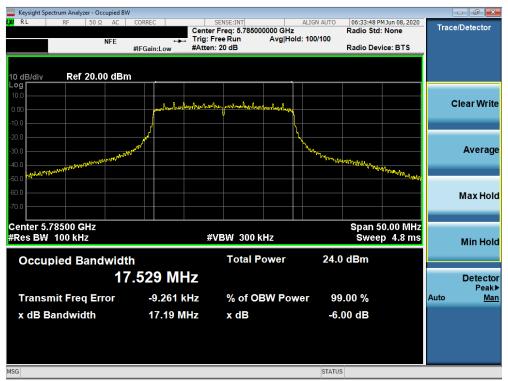
Plot 7-105. 6dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 3) - Ch. 165)

FCC ID: A3LSMF707U	Roud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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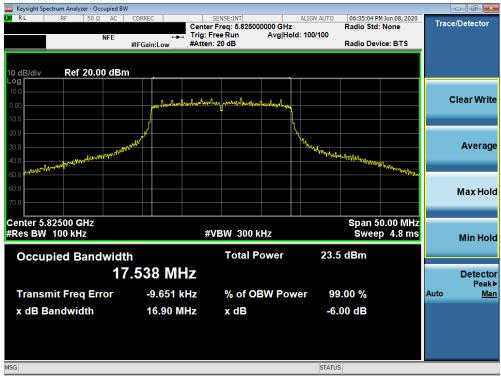
Plot 7-106. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 3) - Ch. 149)



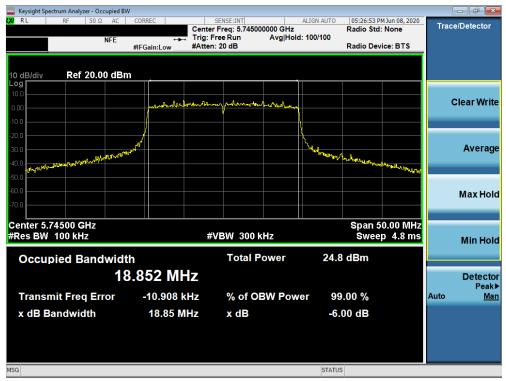
Plot 7-107. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 3) - Ch. 157)

FCC ID: A3LSMF707U	Roud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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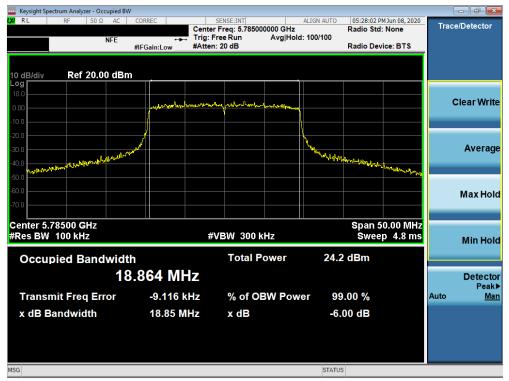
Plot 7-108. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 3) - Ch. 165)



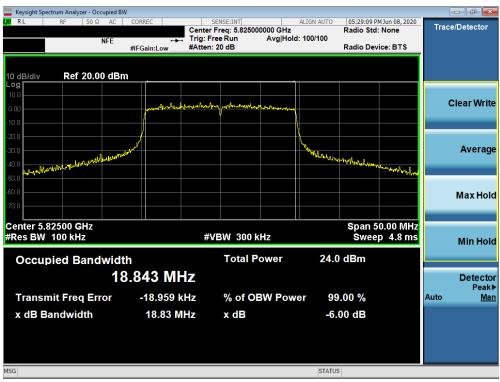
Plot 7-109. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax SU (UNII Band 3) - Ch. 149)

FCC ID: A3LSMF707U	Roud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-110. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax SU (UNII Band 3) - Ch. 157)



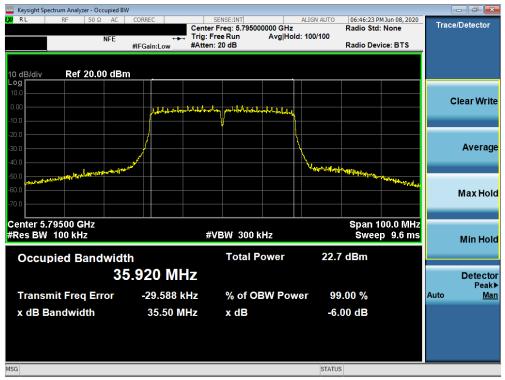
Plot 7-111. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax SU (UNII Band 3) - Ch. 165)

FCC ID: A3LSMF707U	PCTEST Proud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-112. 6dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 3) - Ch. 151)



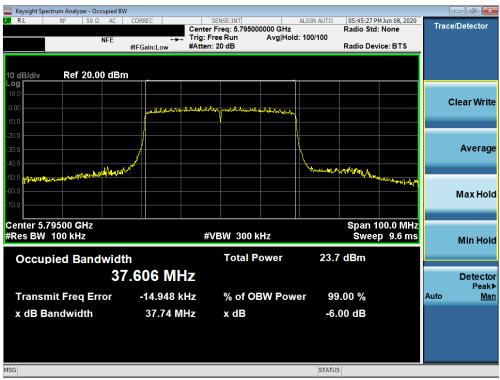
Plot 7-113. 6dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 3) - Ch. 159)

FCC ID: A3LSMF707U	Road to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied	BW				
LX/RL RF 50Ω AC		SENSE:INT enter Freq: 5.755000000 GHz		3:39 PM Jun 08, 2020 5 Std: None	Trace/Detector
NFE	i i i i i i i i i i i i i i i i i i i	rig: Free Run Avg Ho	old: 100/100		
	#IFGain:Low ##	Atten: 20 dB	Radi	Device: BTS	
10 dB/div Ref 20.00 dl	3m		_		
Log					
0.00		with marting and infertance by the second stars of a			Clear Write
-10.0	mulation	with the second states and the second s			
-20.0					
-30.0			N I		Average
-40.0			l l		Averuge
	- David A		Multimen Rullingell	h all	
-50.0				wall war water up by	
					Max Hold
-70.0					
Center 5.75500 GHz			Sp	an 100.0 MHz	
#Res BW 100 kHz		#VBW 300 kHz	S	weep 9.6 ms	Min Hold
Occupied Denduci		Total Power	23.2 dBr	n	
Occupied Bandwig			23.2 UBI	•	
3	37.646 MHz				Detector
Transmit Freq Error	-19.813 kHz	% of OBW Po	wer 99.00 9	6	Peak▶ Auto <u>Man</u>
x dB Bandwidth	37.92 MHz	x dB	-6.00 d	в	
MSG			STATUS		

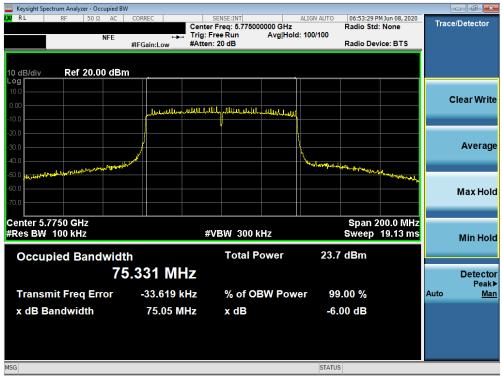
Plot 7-114. 6dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax SU (UNII Band 3) - Ch. 151)



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

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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 SU (UNII Band 3) - Ch. 155)

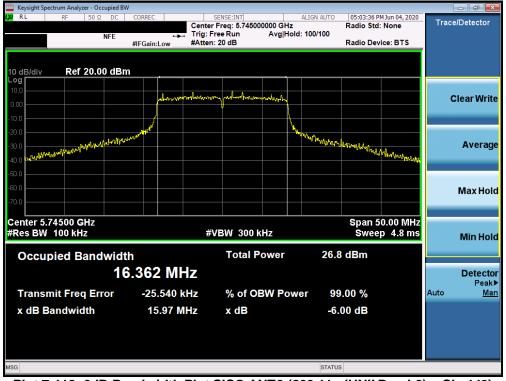
FCC ID: A3LSMF707U	Roud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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SISO Antenna-2 6dB Bandwidth Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
	5745	149	а	6	15.97
	5785	157	а	6	16.13
	5825	165	а	6	15.77
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	17.31
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	17.24
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	17.60
e	5745	149	ax (20MHz)	6.5/7.2 (MCS0)	18.82
Band	5785	157	ax (20MHz)	6.5/7.2 (MCS0)	18.96
ä	5825	165	ax (20MHz)	6.5/7.2 (MCS0)	18.88
	5755	151	n (40MHz)	13.5/15 (MCS0)	36.05
	5795	159	n (40MHz)	13.5/15 (MCS0)	35.82
	5755	151	ax (40MHz)	13.5/15 (MCS0)	37.78
	5795	159	ax (40MHz)	13.5/15 (MCS0)	37.88
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	75.56
	5775	155	ax (80MHz)	29.3/32.5 (MCS0)	77.80

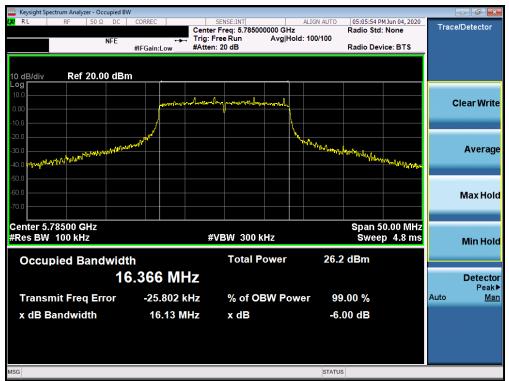
Table 7-5. Conducted Bandwidth Measurements SISO ANT2



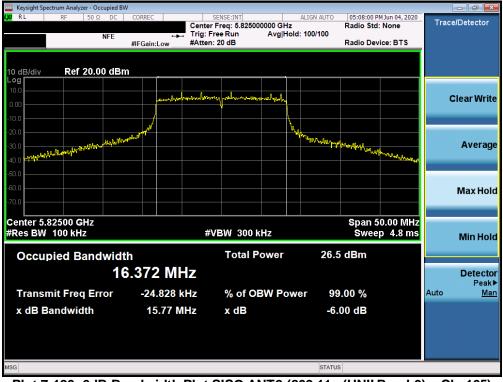
Plot 7-118. 6dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 3) - Ch. 149)

FCC ID: A3LSMF707U	Read to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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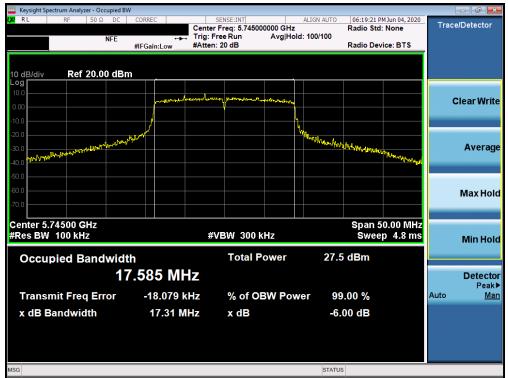




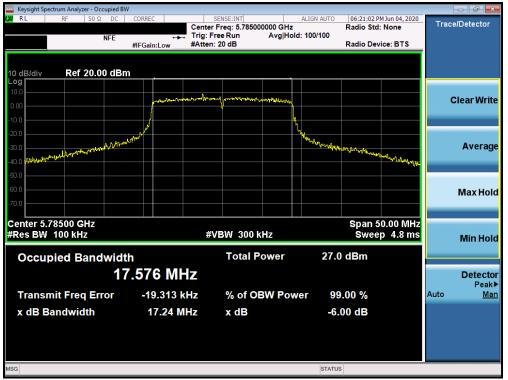
Plot 7-120. 6dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 3) - Ch. 165)

FCC ID: A3LSMF707U	Road to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	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)



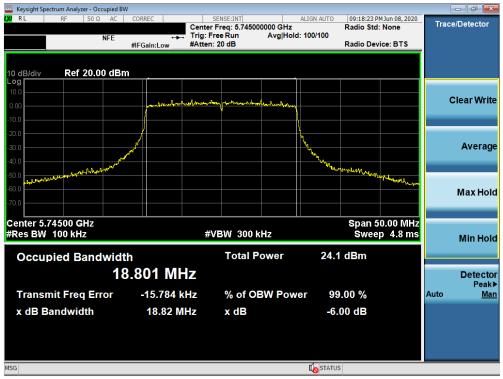
Plot 7-122. 6dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 3) - Ch. 157)

FCC ID: A3LSMF707U	PCTEST Fred to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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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 SU (UNII Band 3) - Ch. 149)

FCC ID: A3LSMF707U	Roud to be part of @	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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