

PCTEST ENGINEERING LABORATORY, INC.

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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: 10/31/2018-1/9/2019 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M1811120202-06.A3L

# FCC ID:

## A3LSMG9750

Certification

APPLICANT:

# Samsung Electronics Co., Ltd.

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

SM-G9750 SM-G9758 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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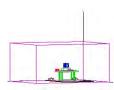


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# **MEASUREMENT REPORT**



			AN	NT1	AN	IT2	MIMC	/CDD
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	61.802	17.91	59.704	17.76	120.686	20.82
2A	20	5260 - 5320	62.661	17.97	61.802	17.91	124.321	20.95
2C	20	5500 - 5720	62.806	17.98	61.376	17.88	124.182	20.94
3		5745 - 5825	62.661	17.97	61.518	17.89	123.475	20.92
1		5190 - 5230	48.641	16.87	49.888	16.98	95.738	19.81
2A	40	5270 - 5310	46.881	16.71	49.317	16.93	93.763	19.72
2C	40	5510 - 5710	49.774	16.97	49.091	16.91	98.414	19.93
3		5755 - 5795	49.888	16.98	49.888	16.98	97.641	19.90
1		5210	19.454	12.89	19.634	12.93	17.261	12.37
2A	80	5290	18.880	12.76	18.030	12.56	17.581	12.45
2C	00	5530 - 5690	37.239	15.71	37.670	15.76	74.910	18.75
3		5775	35.645	15.52	38.905	15.90	74.550	18.72

**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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#### **PRODUCT INFORMATION** 2.0

#### 2.1 **Equipment Description**

The Equipment Under Test (EUT) is the Samsung Portable Handset FCC ID: A3LSMG9750. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter.

Test Device Serial No.: 0505M, 0218M, 0193M, 0181M, 0573M

#### 2.2 **Device Capabilities**

This device contains the following capabilities:

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

	Band 1		Band 2A		Band 2C		Band 3
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	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 2.4.00	2 44 - 10	02 110 / 202 1100 /		no muon ou / Chonn		4:ana

el Operations Table 2-1. 802.11a / 802.11n / 802.11ac (20M

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

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

1Hz) Frequency / Chann				
	Band 2C			
Ch.	Frequency (MHz)			
102	5510			
:	:			
118	5590			
:	:			
142	5710			

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

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

Band 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		

Table 2-3. 802.11ac (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					
902 11 M	ode/Band		Duty Cycle [%]		
802.11 1	oue/ Banu	ANT1 ANT2 M		ΜΙΜΟ	
	а	98.8	98.9	98.7	
	n (HT20)	98.7	98.7	98.7	
	ac (HT20)	98.8	98.7	97.5	
5GHz	n (HT40)	97.4	97.3	98.1	
	ac (HT40)	97.1	97.3	98.1	
	ac (HT80)	94.4	94.5	98.0	
	ax (HE80)	99.2	99.9	99.5	

Table 2-4. Measured Duty Cycles

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

WiFi Configurations		S	SISO	SDM		CDD	
	oningurations	ANT1	ANT2	ANT1	ANT2	ANT1	ANT2
	11a	✓	✓	×	×	✓	✓
	11n (20/40MHz)	✓	✓	✓	✓	✓	✓
5GHz	11ac (20/40/80MHz)	✓	✓	✓	✓	✓	✓
	11ax (20/40/80MHz)	✓	√	✓	√	✓	✓

Table 2-5. Frequency / Channel Operations

 $\checkmark$  = 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	165
Operating Frequency (MHz)	2437	5825
Data Rate (Mbps)	1Mbps	MCS0
Mode	802.11b	802.11ac

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	144
Operating Frequency (MHz)	2437	5720
Data Rate (Mbps)	1Mbps	MCS0
Mode	802.11b	802.11ac

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	1	144
Operating Frequency (MHz)	2412	5720
Data Rate (Mbps)	MCS0	MCS8
Mode	802.11n	802.11ac

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

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#### 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 7.8 for AC line conducted emissions test setups, Section 7.6 and 7.7 for radiated emissions test setups, and Section 7.2, 7.3, 7.4, and 7.5 for 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 on an authorized wireless charging pad (WCP) FCC ID: 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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#### ANTENNA REQUIREMENTS 4.0

### 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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#### **MEASUREMENT UNCERTAINTY** 5.0

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 UCISPR 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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#### TEST EQUIPMENT CALIBRATION DATA 6.0

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)	1/23/2018	Annual	1/23/2019	WL25-1
Agilent	N9020A	MXA Signal Analyzer	1/24/2018	Annual	1/24/2019	US46470561
Agilent	N9030A	PXA Signal Analyzer (44GHz)	5/25/2018	Annual	5/25/2019	MY52350166
Anritsu	MA2411B	Pulse Power Sensor	10/30/2018	Annual	10/30/2019	846215
Anritsu	ML2495A	Power Meter	10/21/2018	Annual	10/21/2019	941001
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2017	Biennial	10/10/2019	121034
COM-Power	PAM-103	Pre-Amplifier (1-1000MHz)	9/17/2018	Annual	9/17/2019	441119
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
ETS-Lindgren	3816/2NM	Line Impedance Stabilization Network	12/27/2016	Biennial	12/27/2018	114451
Huber + Suhner	Sucoflex 102A	40GHz Radiated Cable Set	1/23/2018	Annual	1/23/2019	251425001
Pasternack	NMLC-2	Line Conducted Emissions Cable (NM)	1/23/2018	Annual	1/23/2019	NMLC-2
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	5/21/2018	Annual	5/21/2019	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	8/9/2018	Annual	8/9/2019	100348
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	6/18/2018	Annual	6/18/2019	102134
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	6/25/2018	Annual	6/25/2019	102133
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	1/24/2018	Annual	1/24/2019	100040
Rohde & Schwarz	TS-PR40	26.5-40 GHz Pre-Amplifier	1/24/2018	Annual	1/24/2019	100037
Seekonk	NC-100	Torque Wrench	12/28/2017	Annual	12/28/2018	N/A
Sunol	DRH-118	Horn Antenna (1-18GHz)	8/11/2017	Biennial	8/11/2019	A050307
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:	A3LSMG9750
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)	General Field Strength Limits (Restricted Bands and Radiated Emission 15 209 (RSS-Gen [8 9])		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

### Notes:

Table 7-1. Summary of Test Results

- 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 4.6.
- 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 0.2.16.

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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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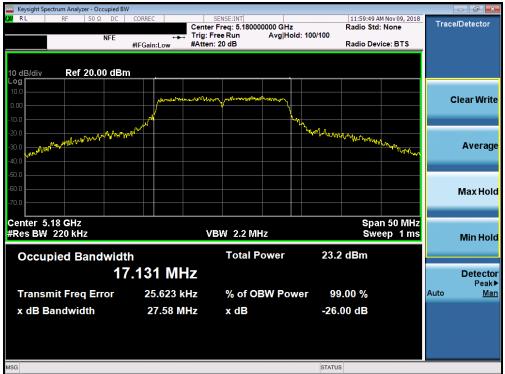
# SISO Antenna-1 26 dB Bandwidth Measurements

	Frequency	Channel	902 11 Modo	Data Pata [Mhna]	Measured 26dB
	[MHz]	No.	802.11 Mode	Data Rate [Mbps]	Bandwidth
	5180	36	а	6	[MHz] 27.58
	5200	40	a	6	30.35
	5240	48	a	6	29.03
	5180	36	a n (20MHz)	6.5/7.2 (MCS0)	35.71
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	29.16
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	34.97
_	5180	36	ax (20MHz)	6.5/7.2 (MCS0)	33.97
Band 1	5200	40	ax (20MHz)	6.5/7.2 (MCS0)	27.79
Bar	5240	40	ax (20MHz)	6.5/7.2 (MCS0)	28.53
	5190	38	n (40MHz)	13.5/15 (MCS0)	75.08
	5230	46	n (40MHz)	13.5/15 (MCS0)	74.79
	5190	38	ax (40MHz)	13.5/15 (MCS0)	39.73
	5230	46	ax (40MHz)	13.5/15 (MCS0)	40.15
	5230	40	ac (80MHz)	29.3/32.5 (MCS0)	89.56
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	80.81
	5260	52	ax (0011112) a	29.3/32.3 (NC30) 6	28.54
	5280	56		6	28.15
	5320	64	a a	6	25.95
	5260	52		6.5/7.2 (MCS0)	30.85
	5280	56	n (20MHz)	, ,	26.98
	5320	64	n (20MHz) n (20MHz)	6.5/7.2 (MCS0)	30.81
∢		52	ax (20MHz)	6.5/7.2 (MCS0)	28.22
d 2	5260 5280	56	, ,	6.5/7.2 (MCS0)	
Band 2A		64	ax (20MHz)	6.5/7.2 (MCS0) 6.5/7.2 (MCS0)	31.43 23.17
ш	5320	-	ax (20MHz)	, ,	
	5270	54 62	n (40MHz)	13.5/15 (MCS0)	69.05
	5310 5270	62 54	n (40MHz) ax (40MHz)	13.5/15 (MCS0) 13.5/15 (MCS0)	73.55 39.83
	5310	62	ax (40MHz)	13.5/15 (MCS0)	40.32
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	82.59
		58		29.3/32.5 (MCS0)	
	5290 5500	100	ax (80MHz)	29.3/32.3 (INC30) 6	80.99 21.36
	5600	120	a a	6	23.18
	5720	120	a	6	23.61
	5500	144	a n (20MHz)	6.5/7.2 (MCS0)	27.74
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	23.94
	5720	120	n (20MHz)	6.5/7.2 (MCS0)	24.90
	5500	144	ax (20MHz)	6.5/7.2 (MCS0)	24.90
	5600	120	ax (20MHz)	6.5/7.2 (MCS0)	29.59
	5720	120	ax (20MHz)	6.5/7.2 (MCS0)	29.09
с					
Band 2C	5510 5590	102 118	n (40MHz)	13.5/15 (MCS0)	57.67 65.22
Ban	5590 5710	142	n (40MHz)	13.5/15 (MCS0)	65.22 66.84
ш	5710 5590		n (40MHz)	13.5/15 (MCS0)	
	5590 5710	118 142	ax (40MHz) ax (40MHz)	13.5/15 (MCS0) 13.5/15 (MCS0)	39.78 40.12
	5530	142	ac (80MHz)	29.3/32.5 (MCS0)	40.12
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	80.80
		106	ac (80MHz)		
	5610 5690			29.3/32.5 (MCS0) 29.3/32.5 (MCS0)	86.93 85.74
	5530	138 106	ac (80MHz) ax (80MHz)	29.3/32.5 (MCS0) 29.3/32.5 (MCS0)	85.74 81.35
	5550				81.35
	5610	100			
	5610 5690	122 138	ax (80MHz) ax (80MHz)	29.3/32.5 (MCS0) 29.3/32.5 (MCS0)	81.83 81.45

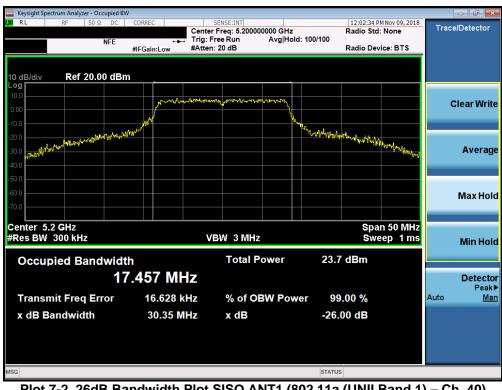
#### Table 7-2. Conducted Bandwidth Measurements SISO ANT1

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

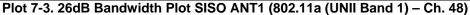


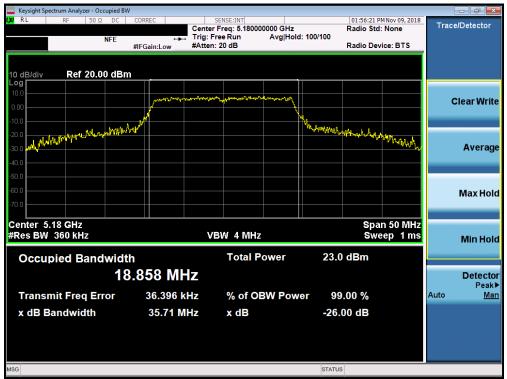
Plot 7-2. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 1) - Ch. 40)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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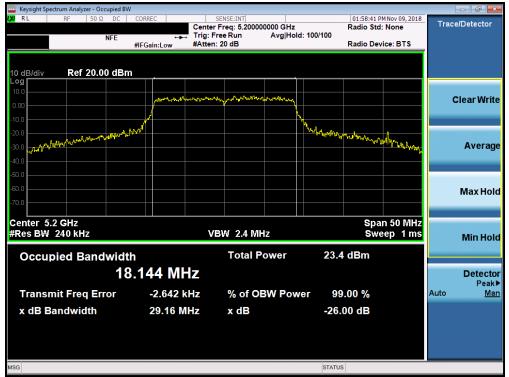




Plot 7-4. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 1) - Ch. 36)

FCC ID: A3LSMG9750		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)

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www.com analyzer - Oc	cupied BW				- • •
LXI L RF 50 S	DC CORREC	Center Freq: 5.18000	0000 GHz Avg Hold: 100/100	03:53:17 PM Nov 28, 2018 Radio Std: None	Trace/Detector
	#IFGain:Low	#Atten: 20 dB		Radio Device: BTS	
10 dB/div Ref 30.0	00 dBm				
20.0	مراسيم الأجر	And the second	h-furthantal		Clear Write
0.00	NN G T				
-10.0 -20.0 -30.0 ห <i>าก</i> างให้คะกับไปเรากำรูดใปหาการใหม่	n bry han about		hundred and a second	hallow have a factor of the second of the se	Average
-40.0					
-50.0					
-60.0					Max Hold
Center 5.18 GHz #Res BW 270 kHz		VBW 2.7 MH	lz	Span 50 MHz Sweep 1 ms	
Occupied Band	dwidth	Total P	ower 25.3	dBm	Min Hold
	19.186 N	<b>/</b> Hz			Detector
Transmit Freq Er	ror 4.00	3 kHz % of OE	BW Power 99.	00 %	Peak▶ Auto <u>Man</u>
x dB Bandwidth	33.97	MHz x dB	-26.0	0 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)

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www.com analyzer - Occ	upied BW									- • •
<b>LXI</b> L   RF   50 Ω	NFE	in:Low	Center Fr		0000 GHz Avg Hold	i: 100/100	04:04:13 P Radio Std Radio Dev		Trac	e/Detector
10 dB/div Ref 30.0	0 dBm				,					
20.0 10.0		᠕ᢧᡁᡁᡗᢧ᠇ᢩᢪ᠆ᠮᡁᢞ᠋	Mary Mary Internet	h join an	WWWWW					Clear Write
-10.0 -20.0 -30.0	ng ngapan Cyranafar					) Manufannah	alyhdfpringlyw	whith make and		Average
-40.0										Max Hold
Center 5.24 GHz #Res BW 240 kHz			VBV	V 2.4 MH	z			n 50 MHz ep 1 ms		Min Hold
Occupied Band	lwidth 19.15	8 MH	7	Total Po	ower	25.6	dBm			
Transmit Freq Er	ror -5	1.114 k	Hz	% of OE	SW Powe		.00 %		Auto	Detector Peak▶ <u>Man</u>
x dB Bandwidth		28.53 M	Hź	x dB			00 dB			
MSG						STATUS				

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



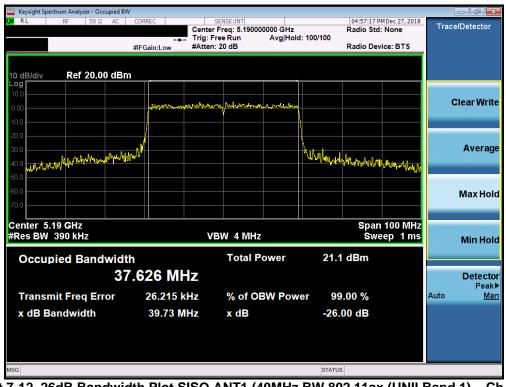
Plot 7-10. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 1) - Ch. 38)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occupied B\	N						- • ×
LXXIRL RF 50Ω AC		SENSE:INT enter Freq: 5.23000		Radio Std	M Nov 28, 2018 None	Trace	/Detector
		rig: Free Run Atten: 20 dB	Avg Hold: 100/100	, Radio Dev	rice: BTS		
10 dB/div Ref 25.00 dBr	n						
Log 15.0 5.00		wang taun taun taun taun taun	Nampurent na			с	lear Write
-5.00 -15.0 -25.0 -35.0	mut		and the second s	endelmand	Manuto Mar		Average
-45.0 -55.0 -65.0							Max Hold
Center 5.23 GHz #Res BW 750 kHz		VBW 8 MHz			100 MHz ep 1 ms		Min Hold
Occupied Bandwidt	th	Total P	ower 2	4.4 dBm			
30	6.703 MHz						Detector Peak▶
Transmit Freq Error	55.814 kHz	% of O	<b>BW Power</b>	99.00 %		Auto	Man
x dB Bandwidth	74.79 MHz	x dB		26.00 dB			
MSG			ST	ATUS			

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



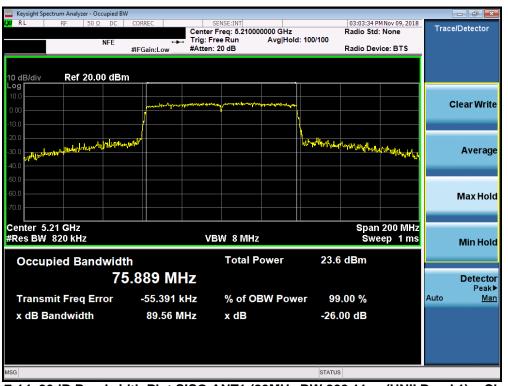
Plot 7-12. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax (UNII Band 1) - Ch. 38)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Occu	pied BW					_	
<b>LX/</b> RL RF 50 Ω	AC CORREC	SENSE:INT Center Freg: 5.23000	0000 GHz	04:58:05 PM		Trace/	Detector
		Trig: Free Run	Avg Hold: 100/100				
	#IFGain:Low	#Atten: 20 dB		Radio Devic	e: BTS		
10 dB/div Ref 20.00	dBm						
Log							
0.00	shah should and	بلى مەرىيە مەرىيەن رالىكى كەركى مەر	anderhanding			CI	ear Write
-10.0			l N				
-20.0							_
-30.0	Mr. Jacob W		Work La	Whitehalling			Average
-40.0					(Holinki Witune		
-50.0							
-60.0							Max Hold
-70.0							
Center 5.23 GHz #Res BW 390 kHz		VBW 4 MHz			100 MHz ep 1 ms		
#Res DW J90 KHZ				Swee	sp i llis		Min Hold
Occupied Bandy	vidth	Total P	ower 21	.2 dBm			
	37.521 MH						Detector
	37.321 WIR	Z					Detector Peak▶
Transmit Freq Erro	or 50.686 kl	Hz % of Ol	3W Power 9	9.00 %		Auto	Man
x dB Bandwidth	40.15 MI		- 20	6.00 dB			
	40.15 Wi		-20	5.00 UB			
MSG			STAT	US			

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



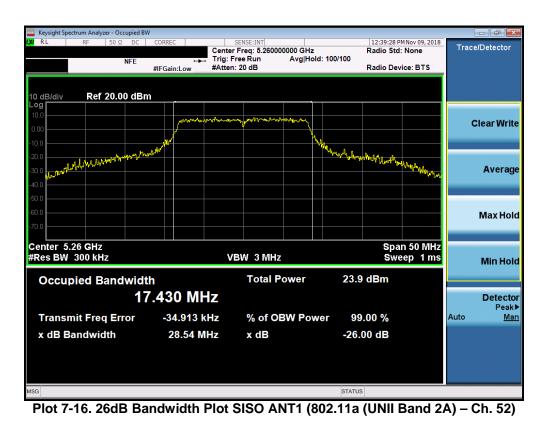
Plot 7-14. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ac (UNII Band 1) - Ch. 42)

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🤤 Keysight Spectrum Analyzer - Occupier	d BW						
<mark>(X)</mark> RL RF 50 Ω AC	C CORREC	SENSE:INT Center Freg: 5.21000	0000 GHz	05:09:45 PI Radio Std:	MDec 27, 2018	Trace	Detector
	·+·	Trig: Free Run	Avg Hold: 100/100				
	#IFGain:Low	#Atten: 20 dB		Radio Dev	ice: BTS		
10 dB/div Ref 20.00 d	Bm						
10.0							
0.00	manystalwarship	hone work may	ebuildurg			С	lear Write
-10.0							
-20.0							
20.0							Average
-40.0 Month to the strange the start with	the state of the s		wowledge	Million rode	als an ellerer		
-50.0					and helion the		
-60.0							
							Max Hold
-70.0							_
Center 5.21 GHz				Span	200 MHz		
#Res BW 820 kHz		VBW 8 MHz			ep 1ms		Min Hold
	-141-	Total P	ower 24	1 dBm			
Occupied Bandwi			ower Z1.	тавт			
	77.027 MH	Ζ					Detector
Transmit Freq Error	96.442 k	Hz % of OF	3W Power 9	9.00 %		Auto	Peak▶ Man
-							
x dB Bandwidth	80.81 M	Hz xdB	-26	.00 dB			
MSG			STATU	JS			

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



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



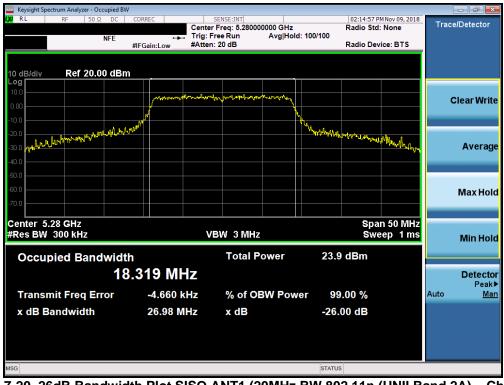
Plot 7-18. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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🔤 Keysight Spectrum Analyzer - Occupied	d BW					x
LXIRL RF 50Ω DC		SENSE:INT er Freg: 5.260000000 GHz	02:11:53 P Radio Std	MNov 09, 2018	Trace/Detector	r
NFE	Trig:	Free Run Avg Hold:	100/100			
	#IFGain:Low #Atte	en: 20 dB	Radio Dev	/ice: BTS		
10 dB/div Ref 20.00 dl	Bm					
Log 10.0						
0.00	ganaganaganakaka	and along and a second and			Clear Wr	ite
-10.0	1	. I V.				
	ANN MAT		Langer Marthanther Mithan Sofon			
-20.0 -30.0 mar My Mr. And martin marter			and an all of the state	WWWWWWWWW	Avera	
				for M	Avera	iye
-40.0						
-50.0						
-60.0					Max Ho	old
-70.0						_
Center 5.26 GHz			Cna	n 50 MHz		
#Res BW 300 kHz		VBW 3 MHz		eep 1 ms		
					Min Ho	סומ
Occupied Bandwi	dth	Total Power	23.8 dBm			
	18.379 MHz				Detect	tor
					Pea	
Transmit Freq Error	-3.828 kHz	% of OBW Powe	r 99.00 %		Auto <u>M</u>	lan
x dB Bandwidth	30.85 MHz	x dB	-26.00 dB			
MSG			STATUS			

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



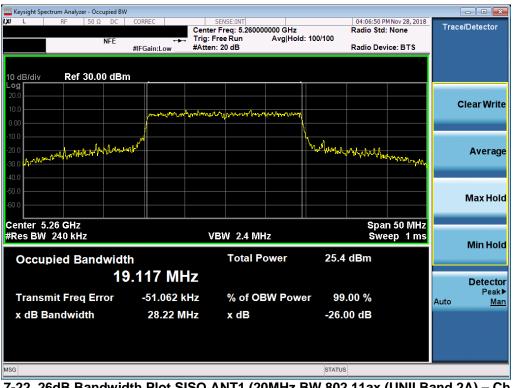
Plot 7-20. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMG9750		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)



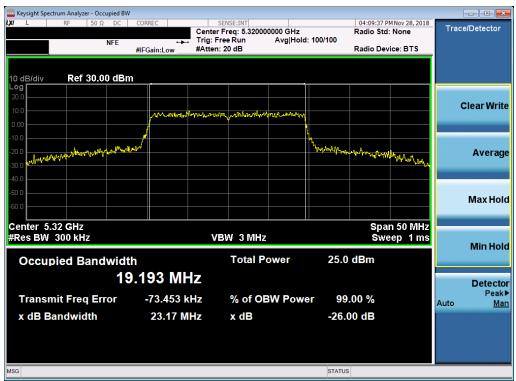
Plot 7-22. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 07 of 040
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Even Strate Stra					- • •
LX/L RF 50Ω DC	CORREC	SENSE:INT er Freq: 5.280000000 GHz	04:08:38 P Radio Std	MNov 28, 2018	Trace/Detector
NFE	Trig:	Free Run Avg Hold	1: 100/100		
	#IFGain:Low #Atte	en: 20 dB	Radio Dev	/ice: BTS	
10 dB/div Ref 30.00 dB	m				
20.0					
10.0	14/4/10/10/10/14/14/14/14/14	where the the second test of the second			Clear Write
0.00					
-10.0	f				
-20.0	//\^ <sup>#</sup>		Marker hard and hard and hard and hard and hard hard hard hard hard hard hard har	In the second	Average
-30.0 WYNYY .				- When	
-40.0					
-50.0					Max Hold
-60.0					Maxiloid
Center 5.28 GHz			Sna	n 50 MHz	
#Res BW 300 kHz		VBW 3 MHz		eep 1 ms	
					Min Hold
Occupied Bandwid	th	Total Power	25.2 dBm		
1	9.187 MHz				Detector
			00.00 %		Detector Peak►
Transmit Freq Error	-24.927 kHz	% of OBW Pow	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	31.43 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)



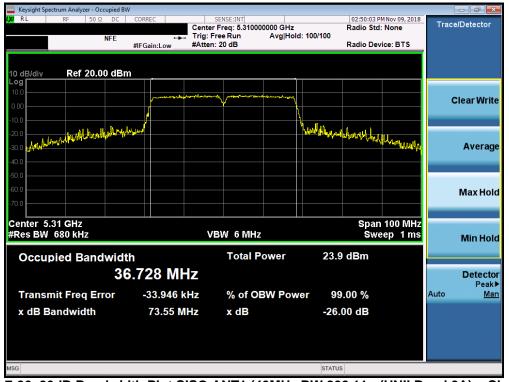
Plot 7-24. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMG9750		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: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 20 of 242
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Keysight Spectrum Analyzer - Occupied BW							
LX/RL RF 50Ω AC	CORREC	SENSE:INT Center Freq: 5.27000	0000 GHz	05:01:09 PM D		Trace/E	Detector
		Trig: Free Run	Avg Hold: 100/100				
	#IFGain:Low	#Atten: 20 dB		Radio Device	E BTS		
10 dB/div Ref 20.00 dBm							
10.0							
0.00	manan	multingeneration	wythenhydrogen			Cle	ear Write
-10.0							
-20.0							
-30.0	nfl .						Average
-40.0 a not the the April of the Market	RAA		Վել/դեպել	MALLY THE MUNITY	(mhts. a)		_
-50.0				1.1.1.14	e e l'a defetta		
-60.0							/lax Hold
-70.0							παχ ποιά
Center 5.27 GHz				Span 1			
#Res BW 390 kHz		VBW 4 MHz		Swee	p 1 ms		Min Hold
Occupied Bandwidt	า	Total P	ower 21.	3 dBm			
	.580 MH						Detector
37	.500 1010	Z					Peak▶
Transmit Freq Error	17.976 ki	Hz % of OE	BW Power 99	9.00 %		Auto	Man
x dB Bandwidth	39.83 MI	Hz xdB	-26	.00 dB			
	00100 111						
MSG			STATU	ic.			
MOG			STATU				

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



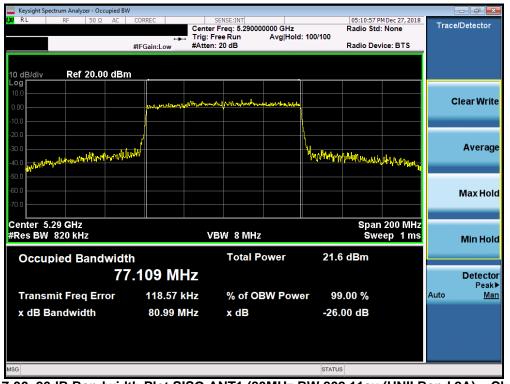
Plot 7-28. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 2A) - Ch. 62)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 242
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Plot 7-29. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ac (UNII Band 2A) - Ch. 58)



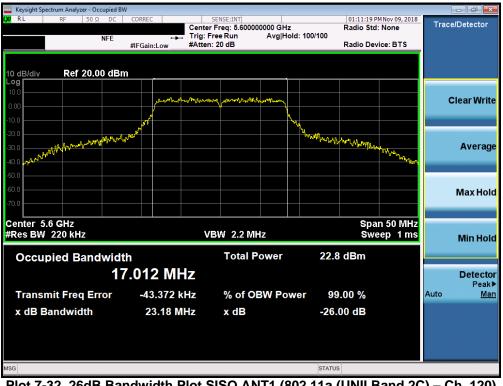
Plot 7-30. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 21 of 242
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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: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 22 of 242
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Plot 7-33. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2C) - Ch. 144)



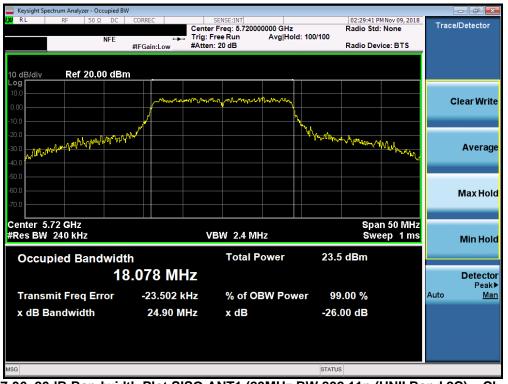
Plot 7-34. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 2C) - Ch. 100)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 242
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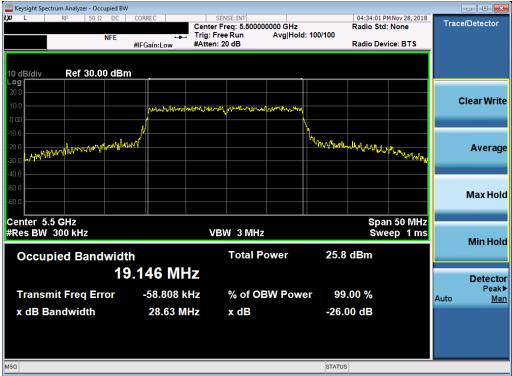
Plot 7-35. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 2C) - Ch. 120)



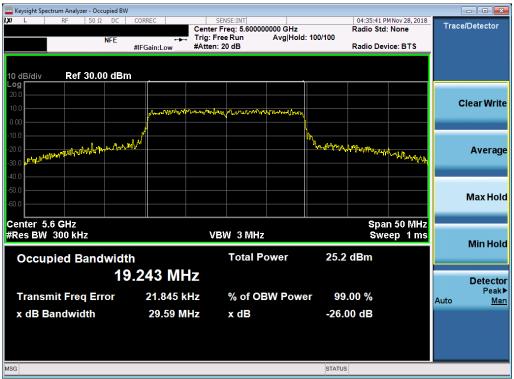
Plot 7-36. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 2C) - Ch. 144)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 24 of 242
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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: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 25 of 242
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🔤 Keysight Spectrum Analyzer - Occupied BW							
<b>LXI L</b> RF 50 Ω	DC CORREC	Center Freq: 5.7200		04:37:11 PM Nov Radio Std: Nor		Trace/Detector	
	NFE #IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Hold: 100/100	Radio Device:	втя		
10 dB/div Ref 30.0	0 dBm						
20.0							
10.0	-Almhr	w Marcallorday barandlach	wherefulling			Clear Write	
0.00	/						
-10.0	n harrest My All		Monortha	al		_	
-20.0 -30.0	Alved of a			white the second for the second	Nr. Mal	Average	
-40.0							
-50.0							
-60.0						Max Hold	
Center 5.72 GHz				Span 5			
#Res BW 300 kHz		VBW 3 MH:	z	Sweep			
		- / 1	05	- 10		Min Hold	
Occupied Band	19.155 N	Total F	ower 25.	5 dBm			
		Detector					
Transmit Freq Err	ror -26.56	0 kHz % of O	BW Power 9	9.00 %		Peak► Auto Man	
x dB Bandwidth	24.05	MHz x dB	-26	.00 dB	Í		
MSG			STATU	JS			

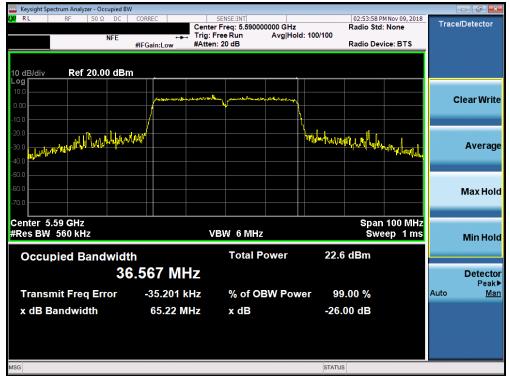
Plot 7-39. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 144)



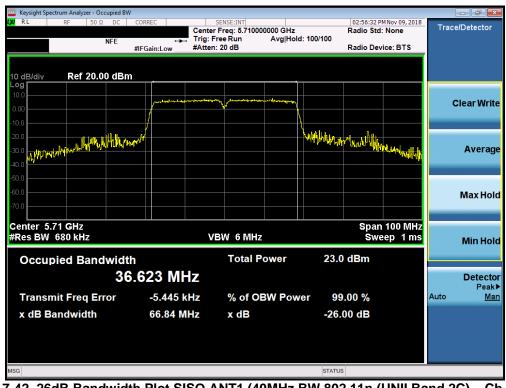
Plot 7-40. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 36 of 243	
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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: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Page 37 of 243		
1M1811120202-06.A3L	10/31/2018-1/9/2019	Portable Handset				
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Keysight Spectrum Analyzer - Occupied BV	V					
LXI RL RF 50Ω AC	CORREC	SENSE:INT enter Freg: 5.510000000 GHz	05:04:28 Radio St	PMDec 27, 2018	Trace/Det	ector
	tana Tr	ig: Free Run Avg Ho	ld: 100/100			
	#IFGain:Low #A	Atten: 20 dB	Radio De	vice: BTS		
10 dB/div Ref 20.00 dBn	n		·			
10.0						
0.00	L.M. Martin	hall when mark and a strength			Clea	r Write
-10.0	/					
-20.0	<mark>/</mark>					
-30.0	- M				A	/erage
. it with met the south of the	MY'		my man man			5
-40.0				ANNA PARA		
-60.0						
-70.0					Ma	x Hold
-70.0						
Center 5.51 GHz			Spa	n 100 MHz		
#Res BW 390 kHz		VBW 4 MHz	Sw	eep 1ms	Mi	n Hold
		Total Power	21.7 dBm			
Occupied Bandwidt			21.7 UBIII			
37	7.603 MHz				De	tector
Transmit Freq Error	-20.158 kHz	% of OBW Pov	ver 99.00 %		Auto	Peak▶ Man
						man
x dB Bandwidth	39.78 MHz	x dB	-26.00 dB			
MSG			STATUS			

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



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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 38 of 243	
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Keysight Spectrum Analyzer - Occupied BW							
			R: Id: 100/100	05:05:41 PME adio Std: N adio Devic	lone	Trace	/Detector
#1	Gain:Low #Atten:	20 00	K	adio Devic	e. DT3		
10 dB/div Ref 20.00 dBm							
Log 10.0 0.00	J. J. March Marcheller	yulkhorskirmuskimu	4			c	lear Write
-10.0 -20.0 -30.0 -40.0			hand how have a how	wrtheralyman	h		Average
-50.0 -60.0 -70.0					······································		Max Hold
Center 5.67 GHz #Res BW 390 kHz	VE	SW 4 MHz			00 MHz p 1 ms		Min Hold
Occupied Bandwidth		Total Power	22.0 d	Bm			
	24 MHz						Detector Peak▶
Transmit Freq Error	4.650 kHz	% of OBW Pov	ver 99.00	0 %		Auto	<u>Man</u>
x dB Bandwidth	40.02 MHz	x dB	-26.00	dB			
MSG			STATUS				

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



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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
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🔤 Keysight Spectrum Analyzer - Occupied BW	1					
KX RL RF 50Ω DC	++- Trig:	SENSE:INT er Freq: 5.610000000 GHz Free Run Avg Hol en: 20 dB	Radio Sto d: 100/100	PM Nov 09, 2018 I: None vice: BTS	Trace/D	etector
10 dB/div Ref 20.00 dBm	n j					
Log 10.0						
0.00	and the second s	and all all and all all all all all all all all all al			Cle	ar Write
-10.0						
-20.0						
-30.0	ألبانيا		Wharm he mall work	Alexan		Average
-30.0 -40.0 -40.0				a an		
-50.0						
-60.0					N	lax Hold
-70.0						
Center 5.61 GHz			Spar	1 200 MHz		
#Res BW 820 kHz	۲ ۱	VBW 8 MHz		eep 1 ms		Ain Hold
		Total Power	22.7 dBm			
Occupied Bandwidt		Total Fower	22.7 UBIII			
15	5.788 MHz					Detector Peak▶
Transmit Freq Error	-21.219 kHz	% of OBW Pow	ver 99.00 %		Auto	Man
x dB Bandwidth	86.93 MHz	x dB	-26.00 dB			
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: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 40 of 242	
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Keysight Spectrum Analyzer - Occupied B	W						-
LX/RL RF 50Ω AC	CORREC	SENSE:INT enter Freg: 5.53000	0000 GHz	05:13:12 Pf Radio Std:	Dec 27, 2018	Trace	/Detector
	T	rig: Free Run	Avg Hold: 100/100				
	#IFGain:Low #	Atten: 20 dB		Radio Dev	ice: BTS		
10 dB/div Ref 20.00 dBi	m		· · · · · · · · · · · · · · · · · · ·				
10.0							
0.00	annon	and an a property services	a Norman and the			C	lear Write
-10.0	<mark>,</mark>						
-20.0							
-30.0	, <b>, , , ,</b> , , , , , , , , , , , , , ,		L				Average
-40.0 - water from der Malthan bort	www.		"hullend	- Mary Marya	Multin		-
-50.0							
-60.0							Max Hold
-70.0							Max Hold
Center 5.53 GHz					200 MHz		
#Res BW 820 kHz		VBW 8 MHz		Swe	ep 1 ms		Min Hold
Occupied Bandwid	th	Total P	ower 21.	1 dBm			
							Detector
	7.107 MHz						Detector Peak►
Transmit Freq Error	-7.984 kHz	% of OE	BW Power 99	9.00 %		Auto	Man
x dB Bandwidth	81.35 MHz	x dB	-26	.00 dB			
	0 1100 11112		20				
MSG			STATU				
mod			STATO				

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



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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
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Keysight Spectrum Analyzer - Occupied BW					
LX/RL RF 50Ω AC	CORREC	SENSE:INT er Freg: 5.690000000 GHz	05:14:31 Radio Sto	M Dec 27, 2018	Trace/Detector
	++- Trig:	Free Run Avg Hol	d: 100/100		
	#IFGain:Low #Atte	en: 20 dB	Radio De	vice: BTS	
10 dB/div Ref 20.00 dBm					
Log					
0.00	Martin Martin Martin	amperation by her and the	-		Clear Write
-10.0					
-20.0					
20.0			<b>1</b> .		Average
-30.0 +++++++++++++++++++++++++++++++++++	4		Muralmannanhalmaraha	Heredoh man	Average
-50.0				A Shirts in	
-60.0					Max Hold
-70.0					
Center 5.69 GHz			Spar	1 200 MHz	
#Res BW 820 kHz		VBW 8 MHz		eep 1 ms	Min Hold
		Total Damas	21.7 dBm		
Occupied Bandwidth		Total Power	21.7 dBm		
77.	.009 MHz				Detector
Transmit Freq Error	32.364 kHz	% of OBW Pow	ver 99.00 %		Peak▶ Auto Man
-					
x dB Bandwidth	81.45 MHz	x dB	-26.00 dB		
MSG			STATUS		

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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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## SISO Antenna-2 26dB Bandwidth Measurements

	Frequency	Channel			Measured 26dB
	[MHz]	No.	802.11 Mode	Data Rate [Mbps]	Bandwidth
		NO.			[MHz]
	5180	36	а	6	21.32
	5200	40	а	6	21.37
	5240	48	а	6	21.36
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	27.38
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	23.48
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	21.96
÷	5180	36	ax (20MHz)	6.5/7.2 (MCS0)	21.70
Band 1	5200	40	ax (20MHz)	6.5/7.2 (MCS0)	24.05
8	5240	48	ax (20MHz)	6.5/7.2 (MCS0)	24.37
	5190	38	n (40MHz)	13.5/15 (MCS0)	40.04
	5230	46	n (40MHz)	13.5/15 (MCS0)	39.93
	5190	38	ax (40MHz)	13.5/15 (MCS0)	39.94
	5230	46	ax (40MHz)	13.5/15 (MCS0)	39.67
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	89.08
	5210	42	ax (80MHz)	29.3/32.5 (MCS0)	81.47
	5260	52	а	6	21.25
	5280	56	а	6	21.44
	5320	64	а	6	24.28
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	21.91
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	22.29
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	23.88
2A	5260	52	ax (20MHz)	6.5/7.2 (MCS0)	21.80
Band 2A	5280	56	ax (20MHz)	6.5/7.2 (MCS0)	25.23
ä	5320	64	ax (20MHz)	6.5/7.2 (MCS0)	27.46
	5270	54	n (40MHz)	13.5/15 (MCS0)	57.21
	5310	62	n (40MHz)	13.5/15 (MCS0)	64.92
	5270	54	ax (40MHz)	13.5/15 (MCS0)	39.81
	5310	62	ax (40MHz)	13.5/15 (MCS0)	40.15
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	83.88
	5290	58	ax (80MHz)	29.3/32.5 (MCS0)	81.33
	5500	100	а	6	21.72
	5600	120	а	6	23.12
	5720	144	а	6	25.39
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	25.66
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	32.62
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	27.03
	5500	100	ax (20MHz)	6.5/7.2 (MCS0)	22.39
	5600	120	ax (20MHz)	6.5/7.2 (MCS0)	26.36
	5720	144	ax (20MHz)	6.5/7.2 (MCS0)	35.07
Band 2C	5510	102	n (40MHz)	13.5/15 (MCS0)	70.90
and	5590	118	n (40MHz)	13.5/15 (MCS0)	71.04
ä	5710	142	n (40MHz)	13.5/15 (MCS0)	73.15
	5590	118	ax (40MHz)	13.5/15 (MCS0)	40.12
	5710	142	ax (40MHz)	13.5/15 (MCS0)	39.69
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	40.11
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	106.60
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	118.20
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	97.21
	5530	106	ax (80MHz)	29.3/32.5 (MCS0)	80.96
	5610	122	ax (80MHz)	29.3/32.5 (MCS0)	81.24
	5690	138	ax (80MHz)	29.3/32.5 (MCS0)	81.11
	7 2 0	ام م 4 م ر رام	Downstructure	Magguramar	AL CICO ANT

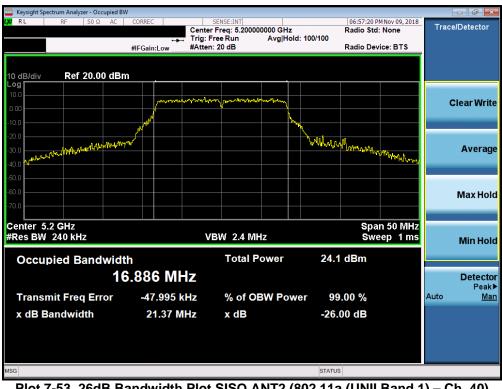
Table 7-3. Conducted Bandwidth Measurements SISO ANT2

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 42 of 242	
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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: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 14 of 242	
1M1811120202-06.A3L	10/31/2018-1/9/2019	Portable Handset		Page 44 of 243	
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018				





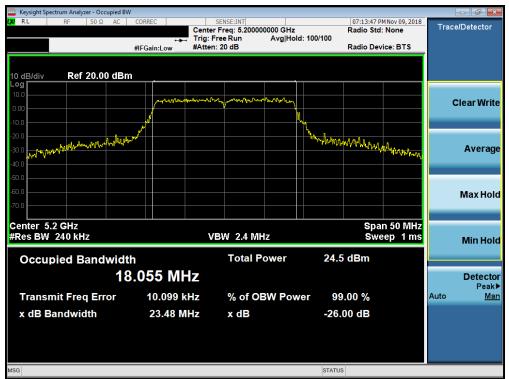
Plot 7-54. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 1) - Ch. 48)



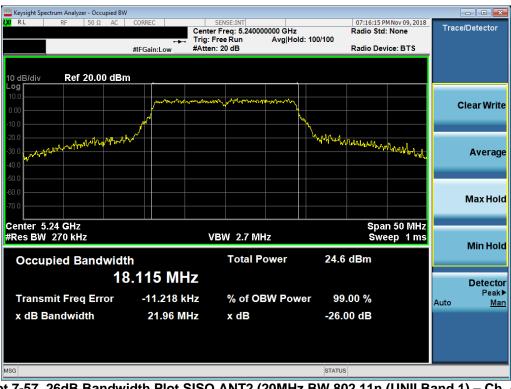
Plot 7-55. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 36)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 45 of 242	
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Plot 7-56. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 40)



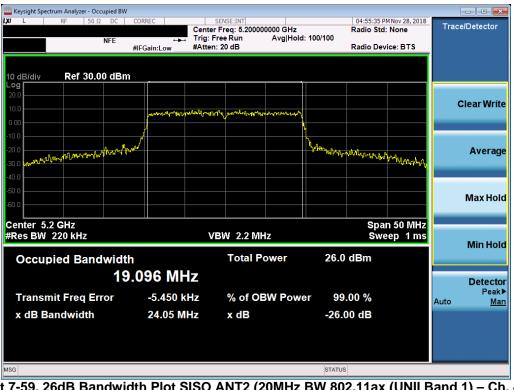
Plot 7-57. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 48)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 46 of 242	
1M1811120202-06.A3L	10/31/2018-1/9/2019	Portable Handset		Page 46 of 243	
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www.com analyzer - Occ	upied BW			- • •
	NFE #IFGain:Low	SENSE:INT Center Freq: 6.18000000 GHz Trig: Free Run Avg Hc #Atten: 20 dB	04:54:02 PM Nov 28, 201 Radio Std: None Jd: 100/100 Radio Device: BTS	Trace/Detector
10 dB/div Ref 30.0		workericherschaperson		Clear Write
-10.0 -20.0 -30.0 -40.0	all and a second s		Mayunarran Makandan	Average
-50.0			Span 50 MHz	Max Hold
#Res BW 220 kHz	width	VBW 2.2 MHz Total Power	Sweep 1 ms	
	19.073 MI	lz		Detector Peak►
Transmit Freq Err x dB Bandwidth	ror -28.121 k 21.70 M		ver 99.00 % -26.00 dB	Auto <u>Man</u>
MSG			STATUS	

Plot 7-58. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 1) - Ch. 36)



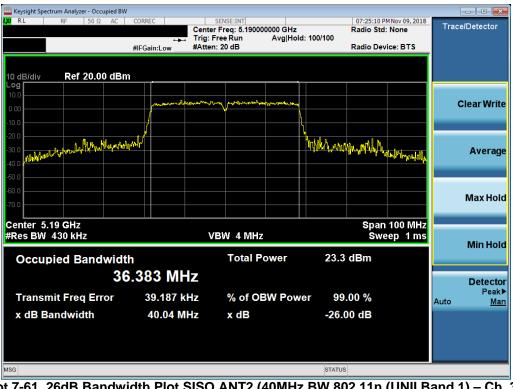
Plot 7-59. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 1) - Ch. 40)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 47 of 242
1M1811120202-06.A3L	10/31/2018-1/9/2019	Portable Handset		Page 47 of 243
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www.www.com.com.com.com.com.com.com.com.com.com	cupied BW							-	- • •
<b>LXI L</b> RF 50 Ω	DC CORREC	Cent	SENSE:INT er Freq: 5.24000			04:58:53 P Radio Std	MNov 28, 2018 None	Trace	/Detector
	NFE #IFGai	-	: Free Run en: 20 dB	Avg Hold	l: 100/100	Radio Dev	ice: BTS		
10 dB/div Ref 30.0	IO dBm								
20.0									
10.0		ᢞ᠇᠋ᡨᠬᢇᠵᡊᢞᡊᢧᡡᡊᡀᠽᢪ	Mr. www.	white white				С	lear Write
0.00									
-10.0	المسلموه ورو				Medual at				•
-20.0	Įurijų į Ynym <sup>an</sup> Vi				************	ᡩᡃᠬᢪᡟ᠈ᡪ᠕᠕	hand with the off		Average
-40.0							ا <del>رد ا</del>		
-50.0									
-60.0									Max Hold
Center 5.24 GHz						<u>Cno</u>	n 50 MHz		
#Res BW 220 kHz			VBW 2.2 MH	Iz			ep 1 ms		
							_		Min Hold
Occupied Band			Total P	ower	26.0	dBm			
	19.16	7 MHz							Detector
Transmit Freq Er	ror <u>-5</u> (	0.952 kHz	% of O	3W Powe	er 99.	00 %		Auto	Peak►
x dB Bandwidth		4.37 MHz	x dB			0 dB		Auto	Man
	2	4.57 10112	A UD		-20.0	U UB			
MSG					STATUS				

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



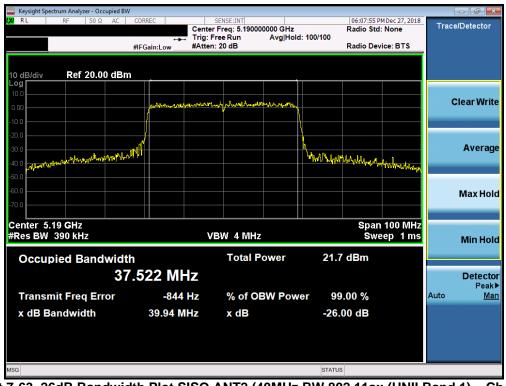
Plot 7-61. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 1) - Ch. 38)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 49 of 242	
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wy Keysight Spectrum Analyzer - Occupied B	W				
<b>LX RL</b> RF 50 Ω AC	CORREC	SENSE:INT		07:25:35 PM Nov 09, 2018 Radio Std: None	Trace/Detector
		Center Freq: 5.230000000 Trig: Free Run Av	g Hold: 100/100	Radio Std: None	
	#IFGain:Low	#Atten: 20 dB	 F	Radio Device: BTS	
10 dB/div Ref 20.00 dB	im				
Log					
0.00	warman	when many man	mound		Clear Write
	1	Y			
-10.0	/		N I		
-20.0	Manufu		MM the work of	ha at Îla	
-30.0	hter de		Part Part of the P	Mart Call Diana	Average
-40.0				the second se	
-50.0					
-60.0					Max Hold
-70.0					Muxitoru
Center 5.23 GHz				Span 100 MHz	
#Res BW 330 kHz		VBW 3 MHz		Sweep 1 ms	
				enrop into	Min Hold
Occupied Bandwid	lth	Total Powe	er 23.6 d	Bm	
	6.266 MHz				
<b>)</b>	0.200 10112				Detector
Transmit Freq Error	5.862 kH	z % of OBW	Power 99.0	0 %	Peak▶ Auto Man
x dB Bandwidth	39.93 MH;	z xdB	-26.00		
	39.93 MIL	2 2 4 4 5	-20.00	uв	
			1		
MSG			STATUS		

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: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 40 of 242
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🔤 Keysight Spectrum Analyzer - Occupied BV	V				
LXI RL RF 50 Ω AC	CORREC	SENSE:INT er Freg: 5.230000000 GHz	06:08:53 P Radio Std	MDec 27, 2018	Trace/Detector
	Trig:	Free Run Avg Hole	d: 100/100		
	#IFGain:Low #Atte	en: 20 dB	Radio Dev	vice: BTS	
10 dB/div Ref 20.00 dBn	n				
Log 10.0					
0.00	and a story of the best of the section	Need - Marchard march on			Clear Write
-10.0					
-20.0					
-30.0	Jul W		Hundradalan.		Average
-40.0 Alvert Average and a second and a second and a second and a second a			TY WWWWWWWWWWW	AND US AND A	
-50.0					
-60.0					Max Hold
-70.0					
Center 5.23 GHz #Res BW 300 kHz		VBW 3 MHz		100 MHz 1.067 ms	
THES DIV JOO KITZ			oweep	1.007 1115	Min Hold
Occupied Bandwidt	h	Total Power	22.0 dBm		
					Detector
3/	7.505 MHz				Detector Peak►
Transmit Freq Error	-20.779 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	39.67 MHz	x dB	-26.00 dB		
	39.07 WIFIZ	хub	-20.00 uB		
MSG			STATUS		

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



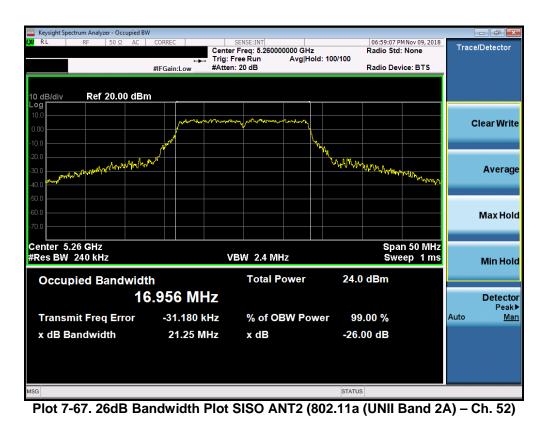
Plot 7-65. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ac (UNII Band 1) - Ch. 42)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 50 of 242
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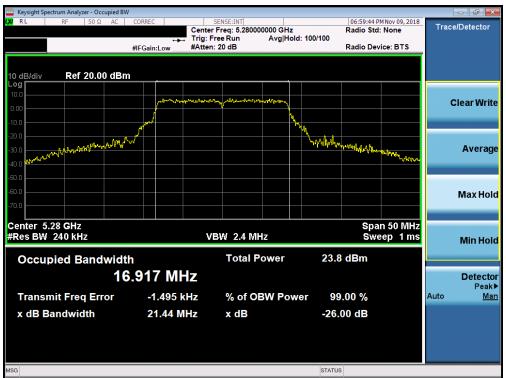
Keysight Spectrum Analyzer - Occupied BW					
XX RL RF 50Ω AC	CORREC Cente	SENSE:INT r Freq: 5.210000000 GHz	06:16:25 F Radio Std	MDec 27, 2018	Trace/Detector
	Trig: I	Free Run Avg Hol	d: 100/100		
	#IFGain:Low #Atter	n: 20 dB	Radio Dev	vice: BTS	
10 dB/div Ref 20.00 dBm					
Log 10.0					
	and a started by	an maring the method and an			Clear Write
0.00	with a second second second				
-10.0					
-20.0					
-30.0	. #		<u>\</u>		Average
-40.0 Marry up the preserve about - 40.0	<u>, , , , , , , , , , , , , , , , , , , </u>		Marching rock - polyetter	- Mattheway	
-50.0					
-60.0					Max Hold
-70.0					IVIAX HOIU
10.0					
Center 5.21 GHz				1 200 MHz	
#Res BW 820 kHz	v	BW 8 MHz	Sw	eep 1 ms	Min Hold
		Total Power	20.7 dBm		
Occupied Bandwidth		rotal Fower	20.7 dBm		
77	.065 MHz				Detector
	74 667 64		00.00		Peak▶ Auto Man
Transmit Freq Error	74.667 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Ivian</u>
x dB Bandwidth	81.47 MHz	x dB	-26.00 dB		
MSG			STATUS		
			014100		

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

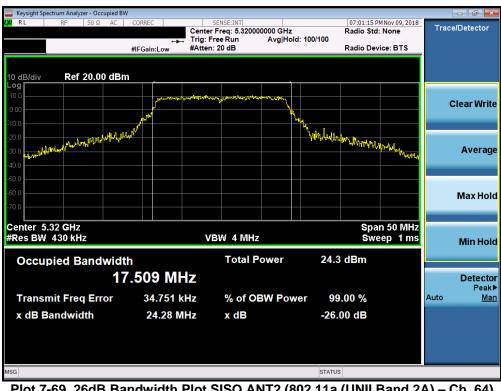


FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 51 of 242
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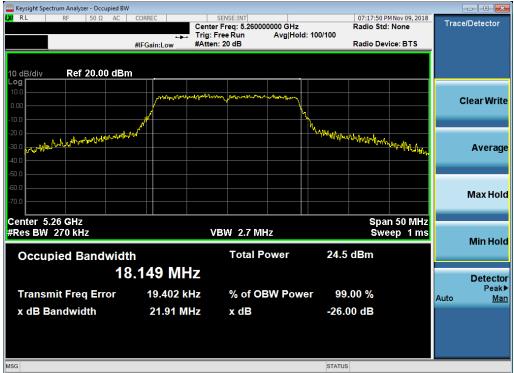
Plot 7-68. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2A) - Ch. 56)



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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 52 of 242
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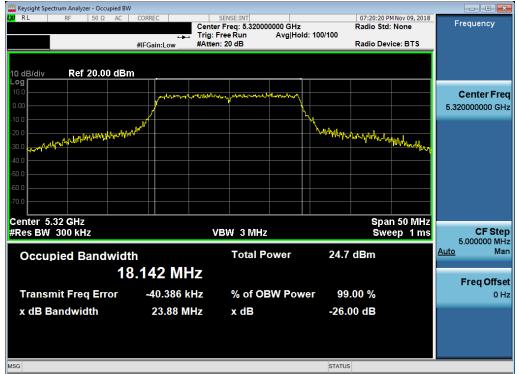
Plot 7-70. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 52)



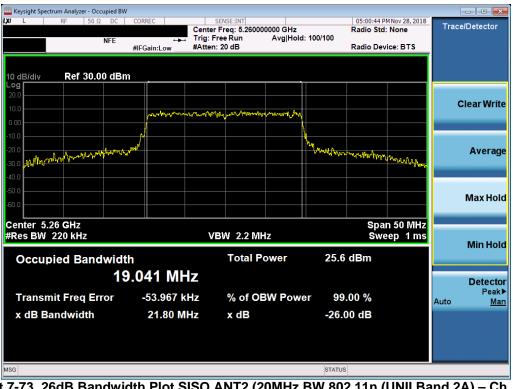
Plot 7-71. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 52 of 242
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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: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 54 of 242
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L RF 50 Ω DC CORREC SENSEINT 05:02:25 PM Mov 28, 2018   Center Freq: 5.280000000 GHz   NFE   #IFGain:Low   WHE   Trace/Detector   Trace/Detector   Center Freq: 5.280000000 GHz   Radio Std: None   #IFGain:Low   #IFGain:Low   #Atten: 20 dB   Clear Wr   Clear Wr   Clear Wr	
Image: Window	ite
10 dB/div Ref 30.00 dBm	ite
Log 200 10.0 10.0 10.0 10.0	ite
200 Clear Wr 10.0 Motor/http://www.wij.motor/htmp//	ite
	ite
200 Magner Manufacture And	ige
-50.0	
-60.0 Max Ho	old
Center 5.28 GHz Span 50 MHz Span 50 MHz Span 50 MHz Sweep 1 ms	
#Res BW 220 KH2 VBW 2.2 WH2 Sweep This Min Ho	old
Occupied Bandwidth Total Power 25.3 dBm	
19.151 MHz	tor
	<u>lan</u>
x dB Bandwidth 25.23 MHz x dB -26.00 dB	
MSG STATUS	

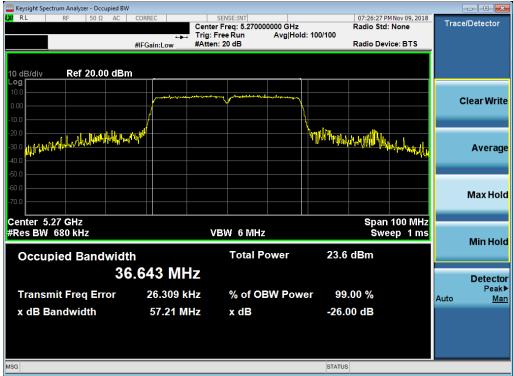
Plot 7-74. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 56)



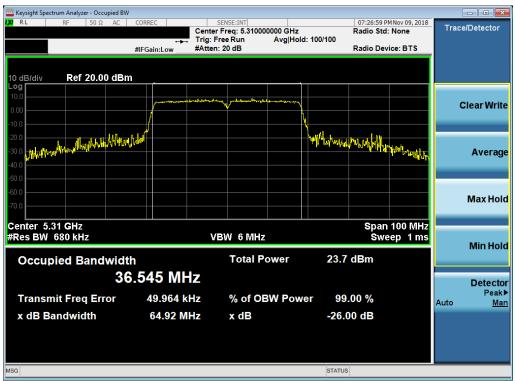
Plot 7-75. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 55 of 242
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Plot 7-76. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 2A) - Ch. 54)



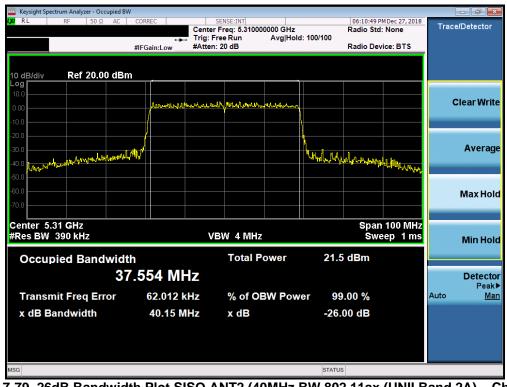
Plot 7-77. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 2A) - Ch. 62)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage EC of 242
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Keysight Spectrum Analyzer - Occupied	BW					×
LX/RL RF 50Ω AC	CORREC	SENSE:INT er Freg: 5.270000000 GHz	06:10:08 P Radio Std	MDec 27, 2018	Trace/Detect	tor
	+++ Trig:	Free Run Avg Hold	: 100/100			
	#IFGain:Low #Atte	n: 20 dB	Radio Dev	vice: BTS		
10 dB/div Ref 20.00 dB	m					
Log 10.0						
0.00	and hall here and have a state of the second s	my marker with the second second			Clear W	Vrite
-10.0	,					
-20.0	M				•	
-30.0 -40.0	with the second		Win Manner Marine		Aver	rage
-40.0 her Marthand Some Contract			· · · · · · · · · · · · · · · · · · ·	Williamy		
-50.0						
-60.0					MaxH	Hold
-70.0						
Center 5.27 GHz #Res BW 390 kHz	1	VBW 4 MHz		ep 1 ms		
#Res BW J90 KH2			Swe	ep mis	Min H	Hold
Occupied Bandwid	lth	Total Power	21.4 dBm			
	7.584 MHz				Dete	
ు					Dete	eak ►
Transmit Freq Error	-41.291 kHz	% of OBW Pow	er 99.00 %			Man
x dB Bandwidth	39.81 MHz	x dB	-26.00 dB			
MSG			STATUS			
Woo			514105			

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: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 57 of 242
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Plot 7-80. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ac (UNII Band 2A) - Ch. 58)



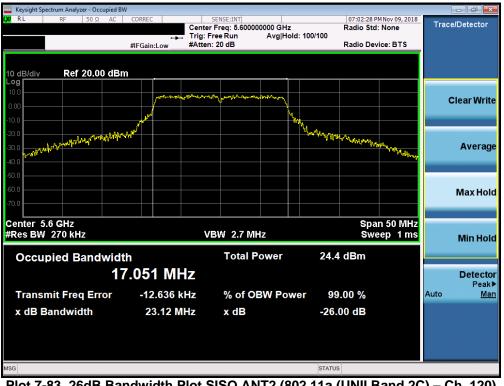
Plot 7-81. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-82. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2C) - Ch. 100)



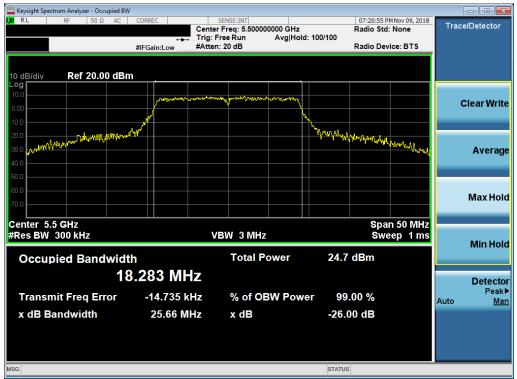
Plot 7-83. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-85. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2C) - Ch. 100)

FCC ID: A3LSMG9750		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)



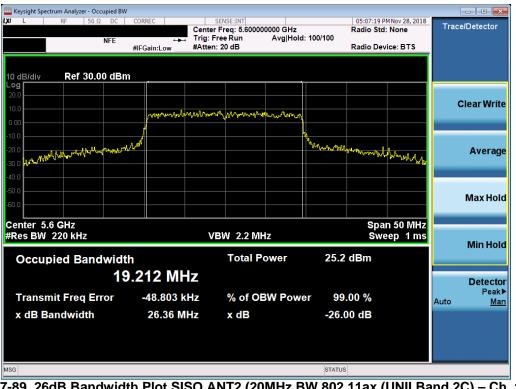
Plot 7-87. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2C) - Ch. 144)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 61 of 242
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🪾 Keysight Spectrum Analyzer - Occu	upied BW									
<b>LXI L RF 50 Ω</b>	DC COR	REC	Center Fr	ISE:INT eq: 5.50000 Run	0000 GHz Avg Hold	I: 100/100	05:06:26 P Radio Std	M Nov 28, 2018 : None	Trac	e/Detector
		ain:Low	#Atten: 2				Radio Dev	rice: BTS		
10 dB/div Ref 30.00	0 dBm									
20.0		MMAN	myrat all and	well-month	h) hanna (ha)					Clear Write
-10.0						hurren				
-20.0 -30.0 Vywydrownywlwn	<sub>A</sub> agalarala <sup>(11</sup> 7)"					<sup>w</sup> Կեպո <sub>տ</sub> ոլել	LV Water your	mmyn		Average
-40.0										Max Hold
Center 5.5 GHz							Spa	n 50 MHz		
#Res BW 220 kHz			VBV	V 2.2 MH	IZ		Swe	ep 1 ms		Min Hold
Occupied Band				Total P	ower	25.8	dBm			WIITTIOID
	19.14	49 M⊦	1Z							Detector
Transmit Freq Err	or -	36.962 k	Hz	% of OE	SW Pow	er 99	.00 %		Auto	Peak▶ <u>Man</u>
x dB Bandwidth		22.39 M	Hz	x dB		-26.0	00 dB			
MSG						STATUS				

Plot 7-88. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 100)



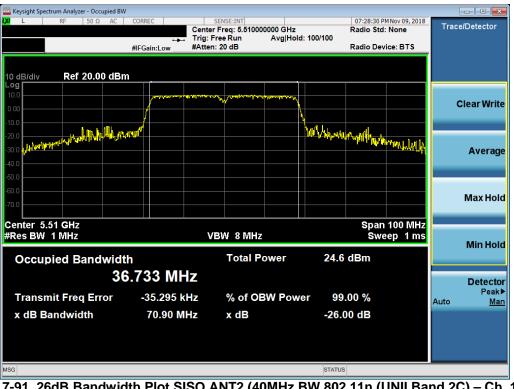
Plot 7-89. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dage 62 of 242		
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www.com analyzer - Occ	upied BW								- • •
LXI L RF 50 Ω			ENSE:INT Freq: 5.72000	0000 GHz Avg Hold	I- 100/100	05:10:10 P Radio Std	M Nov 28, 2018 : None	Trac	e/Detector
	NFE #IFGain:	-		Avginoid	. 100/100	Radio Dev	ice: BTS		
10 dB/div Ref 30.0	0 dBm								
20.0									
10.0		the work all and the and	M <sup>N</sup> NNNNNNNNNN	Jura-halimuhy				(	Clear Write
0.00					<b>h</b>				
-10.0	www.				WWWWWWW				
-20.0 -30.0							www.lolling		Average
-40.0									
-50.0									
-60.0									Max Hold
-00.0									
Center 5.72 GHz							n 50 MHz		
#Res BW 300 kHz		VE	SW 3 MHz			SWe	ep 1 ms		Min Hold
Occupied Band	width		Total P	ower	25.3	dBm			
	19.287	MHZ							
									Detector Peak▶
Transmit Freq Err	or -55.	.274 kHz	% of OE	BW Powe	er 99.	.00 %		Auto	Man
x dB Bandwidth	35	.07 MHz	x dB		-26.0	)0 dB			
MSG					STATUS				

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



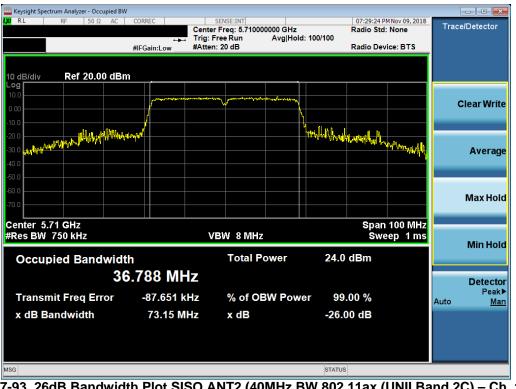
Plot 7-91. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dama (0) of 040	
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www.com analyzer - Occupied Keysight Spectrum Analyzer - Occupied	d BW					
<b>LX RL</b> RF 50 Ω A	C CORREC	SENSE:INT Center Freg: 5.59000	0000 CH-	07:28:58 P Radio Std	MNov 09, 2018	Trace/Detector
		Trig: Free Run	Avg Hold: 100/100	Radio Stu	None	
	#IFGain:Low	#Atten: 20 dB		Radio Dev	ice: BTS	
10 dB/div Ref 20.00 d	IBm					
Log 10.0						
0.00		- and a second of the second sec				Clear Write
-10.0	/		h			
	Ray mush		Sand the			
The second se			have the start	Mar What whe	Kaabula ta Ar	
V COLUMN						Average
-40.0						
-50.0						
-60.0						Max Hold
-70.0						IVIAX HUIU
				0		
Center 5.59 GHz #Res BW 750 kHz		VBW 8 MHz			100 MHz ep 1 ms	
#Res BW 7 JU RH2				SWG	ep mis	Min Hold
Occupied Bandwi	idth	Total P	ower 24.2	dBm		
		_				
	36.753 MH	Ζ				Detector
Transmit Freq Error	-6.855 kl	Hz % of OE	3W Power 99	.00 %		Peak▶ Auto Man
x dB Bandwidth	71.04 MH	lz xdB	-26	00 dB		Auto <u>man</u>
	7 1.04 WI		-20.	00 UB		
MSG			STATU	S		

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 802.11ax (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 64 of 242
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Keysight Spectrum Analyzer - Occupied BW						[	
X/RL RF 50Ω AC CC		ENSE:INT Freq: 5.510000000 GHz		06:11:54 P Radio Std	M Dec 27, 2018	Trace	e/Detector
	Trig: Fre	ee Run Avg Hold	d: 100/100				
#1	FGain:Low #Atten:	20 dB		Radio Dev	ice: BTS		
10 dB/div Ref 20.00 dBm							
Log							
	use A . B. Andinat-Lash O date	Lugallar manual				c	lear Write
0.00							
-10.0							
-20.0	/						
-30.0	<b> </b>		And the same				Average
-40.0			WIMUMM	where where here	WWWWWWW		
-50.0					- qui tha		
-60.0							Max Hold
-70.0							Max Holu
Center 5.51 GHz					100 MHz		
#Res BW 390 kHz	VB	W 4 MHz		Swe	ep 1 ms		Min Hold
Occurried Department		Total Power	24.3	dBm			
Occupied Bandwidth		Total Fower	21.3	ubiii			
37.5	593 MHz						Detector
Transmit Frog Error	-2.766 kHz	% of OBW Pow	or 00	.00 %		Auto	Peak▶ Man
Transmit Freq Error						Auto	man
x dB Bandwidth	40.12 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)



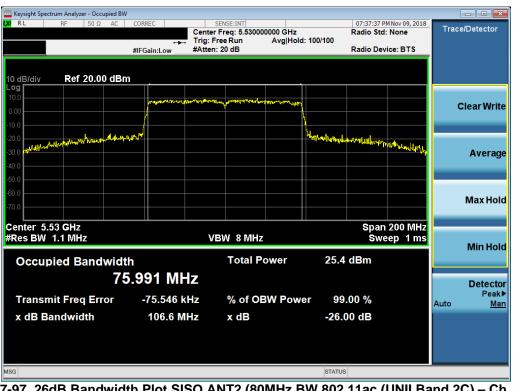
Plot 7-95. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax (UNII Band 2C) - Ch. 118)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dage (E of 242		
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Keysight Spectrum Analyzer - Occupied B\	N				
LXI RL RF 50Ω AC	CORREC	SENSE:INT ter Freg: 5.710000000 GHz	06:13:06 P Radio Std	MDec 27, 2018	Trace/Detector
			d: 100/100	None	
	#IFGain:Low #Att	en: 20 dB	Radio Dev	ice: BTS	
10 dB/div Ref 20.00 dBr	n				
Log					
10.0	un shareh tean.	Mar Warman and and a			Clear Write
0.00					
-10.0					
-20.0					
-30.0			With Minds and a distance of		Average
-40.0 atom and the ly My warmen war	MRI -		Word have been and have been a	al more and	
-50.0					
-60.0					Maxilald
-70.0					Max Hold
-70.0					
Center 5.71 GHz				100 MHz	
#Res BW 390 kHz		VBW 4 MHz	Swe	ep 1 ms	Min Hold
		Total Power	21.5 dBm		
Occupied Bandwidt		lotal Power	21.5 dBm		
37	7.619 MHz				Detector
	50 474 141		00.00.00		Peak►
Transmit Freq Error	-53.171 kHz	% of OBW Pow	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	40.11 MHz	x dB	-26.00 dB		
MSG			STATUS		
mod			514105		

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



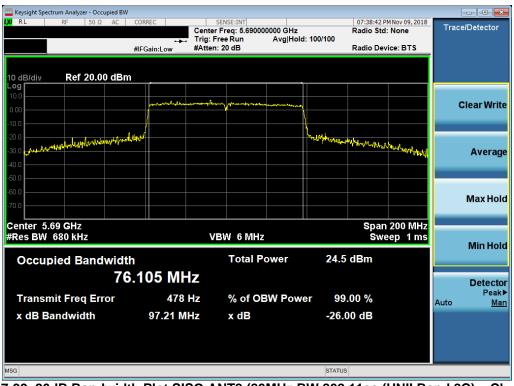
Plot 7-97. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 106)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:				
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🔤 Keysight Spectrum Analyzer - Occupied BW 💦 🕞 💷 💌										
LX/ RL RF 50 Ω AC	CORREC		SE:INT 9 <b>q: 5.61000</b>	0000 GHz		07:38:11 P Radio Std	MNov 09, 2018	Trac	e/Detector	
	↔ #IFGain:Low	Trig: Free #Atten: 20		Avg Hold	d: 100/100	Radio Dev	ion BTS			
	#IFGaIn:Low	#Atten: 20	ub			Radio Dev	ice. DT3			
10 dB/div Ref 20.00 dBm										
Log										
10.0	man	manan	hand a second	warness and a start					Clear Write	
0.00										
-10.0					\. <b>1</b> .					
-20.0	ul mi				Muthenter	withinsouthing	W handle			
30.0									Average	
-40.0										
-50.0										
-60.0									Max Hold	
-70.0										
Center 5.61 GHz							200 MHz			
#Res BW 1 MHz		VBW	/ 8 MHz			Swe	eep 1 ms		Min Hold	
Occupied Bandwidth	•		Total Po	ower	25.0	dBm			MITHOL	
Occupied Bandwidth					20.0	abiii				
/6	.060 MI	IZ							Detector	
Transmit Freq Error	38.010 k	Hz	% of OE	W Pow	er 99	.00 %		Auto	Peak▶ Man	
x dB Bandwidth	118.2 M		x dB			00 dB		Auto	ivian	
	110.2 1	пг	хuв		-20.0					
MSG					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: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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