

PCTEST

7185 Oakland Mills Road, Columbia, MD 21046 USA Tel. 410.290.6652 / Fax 410.290.6654 http://www.pctest.com



MEASUREMENT REPORT FCC PART 15.407 UNII

Applicant Name:

Samsung Electronics Co., Ltd. 129, Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, 16677, Korea Date of Testing: 09/22 – 12/22/2021 Test Report Issue Date: 01/07/2022 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M2112090153-11.A3L

FCC ID:

A3LSMS901JPN

Samsung Electronics Co., Ltd.

APPLICANT:

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

Certification SC-51C SCG13 Portable Handset 5180 – 5885MHz OFDM Unlicensed National Information Infrastructure TX (NII) 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, KDB 291074 DR01 v01

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013 and KDB 789033 D02 v02r01. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Randy Ortanez President



FCC ID: A3LSMS901JPN	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 1 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 1 of 295
© 2022 PCTEST			V 9.0 02/01/2019

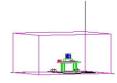


TABLE OF CONTENTS

1.0	INTRO	DUCTION	۱	4
	1.1	Scope		4
	1.2	PCTES	ST Test Location	4
	1.3	Test F	acility / Accreditations	4
2.0	PROD	UCT INFC	DRMATION	5
	2.1	Equipr	nent Description	5
	2.2	Device	Capabilities	5
	2.3	Antenr	na Description	7
	2.4	Test C	onfiguration	
	2.5	Softwa	are and Firmware	
	2.6	EMI St	uppression Device(s)/Modifications	
3.0	DESC	RIPTION (OF TESTS	9
	3.1	Evalua	ation Procedure	9
	3.2	AC Lin	e Conducted Emissions	9
	3.3	Radiat	ed Emissions	
	3.4	Enviro	nmental Conditions	
4.0	ANTE	NNA REQ	UIREMENTS	11
5.0	MEAS	UREMEN	T UNCERTAINTY	12
6.0	TEST	EQUIPME	NT CALIBRATION DATA	13
7.0	TEST	RESULTS)	14
	7.1	Summ	ary	
	7.2	26dB E	Sandwidth Measurement – 802.11a/n/ac/ax	15
	7.3	6dB Ba	andwidth Measurement – 802.11a/n/ac/ax	
	7.4	UNII O	Output Power Measurement – 802.11a/n/ac/ax	103
	7.5	Maxim	um Power Spectral Density – 802.11a/n/ac/ax	
	7.6	Radiat	ed Spurious Emission Measurements – Above 1GHz	
		7.6.1	SISO Antenna-1 Radiated Spurious Emission Measurements	
		7.6.2	SISO Antenna-2 Radiated Spurious Emission Measurements	219
		7.6.3	CDD Radiated Spurious Emission Measurements	230
		7.6.4	Simultaneous Tx Radiated Spurious Emissions Measurements	241
		SISO A	Intenna-1 Radiated Band Edge Measurements (20MHz BW)	247
		7.6.5	SISO Antenna-1 Radiated Band Edge Measurements (40MHz BW)	
		7.6.6	SISO Antenna-1 Radiated Band Edge Measurements (80MHz BW)	
		7.6.7	SISO Antenna-2 Radiated Band Edge Measurements (20MHz BW)	
		7.6.8	SISO Antenna-2 Radiated Band Edge Measurements (40MHz BW)	259
		7.6.9	SISO Antenna-2 Radiated Band Edge Measurements (80MHz BW)	
		7.6.10	MIMO Radiated Band Edge Measurements (20MHz BW)	
		7.6.11	MIMO Radiated Band Edge Measurements (40MHz BW)	
		7.6.12	MIMO Radiated Band Edge Measurements (80MHz BW)	273
	7.7	Radiat	ed Spurious Emissions Measurements – Below 1GHz	
	7.8	Line-C	onducted Test Data	
8.0	CONC	LUSION		

FCC ID: A3LSMS901JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 2 of 295
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 2 01 295
© 2022 PCTEST			V 9.0 02/01/2019





MEASUREMENT REPORT



			AN	NT1	AN	IT2	MIN	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	62.806	17.98	61.660	17.90	123.595	20.92
2A		5260 - 5320	62.951	17.99	62.373	17.95	125.314	20.98
2C	20	5500 - 5720	62.661	17.97	62.230	17.94	124.738	20.96
3		5745 - 5825	62.806	17.98	62.517	17.96	123.027	20.90
4		5845 - 5885	14.962	11.75	10.351	10.15	49.545	16.95
1		5190 - 5230	59.841	17.77	62.373	17.95	121.899	20.86
2A		5270 - 5310	62.517	17.96	62.517	17.96	122.462	20.88
2C	40	5510 - 5710	62.806	17.98	62.951	17.99	124.738	20.96
3		5755 - 5795	61.518	17.89	60.814	17.84	122.180	20.87
4		5835 - 5875	14.256	11.54	10.423	10.18	49.204	16.92
1		5210	49.317	16.93	49.091	16.91	98.401	19.93
2A	Ī	5290	58.345	17.66	61.802	17.91	118.304	20.73
2C	80	5530 - 5690	62.087	17.93	62.517	17.96	124.451	20.95
3	Ī	5775	59.566	17.75	58.345	17.66	118.032	20.72
4		5855	14.158	11.51	10.116	10.05	48.306	16.84
	EUT Overview							

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

FCC ID: A3LSMS901JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 2 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 3 of 295
© 2022 PCTEST			V 9.0 02/01/2019



1.0 INTRODUCTION

1.1 Scope

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

1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

1.3 Test Facility / Accreditations

Measurements were performed at PCTEST located in Columbia, MD 21046, U.S.A.

- PCTEST is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

FCC ID: A3LSMS901JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 4 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 4 of 295
© 2022 PCTEST			V 9.0 02/01/2019



PRODUCT INFORMATION 2.0

Equipment Description

The Equipment Under Test (EUT) is the Samsung Portable Handset FCC ID: A3LSMS901JPN. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter.

Test Device Serial No.: 1045M, 1013M, 1350M, 1342M, 1133M

Device Capabilities

This device contains the following capabilities:

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

Band 1		Band 2A		Band 2C		Band 3		Band 4
Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
5180	52	5260	100	5500	149	5745	169	5845
:	:	:	:	:	:	:	:	:
5200	56	5280	120	5600	157	5785	173	5865
:	:	:	:	:	:	:	:	:
5240	64	5320	144	5720	165	5825	177	5885
	Frequency (MHz) 5180 : 5200 :	Frequency (MHz) Ch. 5180 52 : : 5200 56 : :	Frequency (MHz) Ch. Frequency (MHz) 5180 52 5260 : : : : 5200 56 5280 : : : :	Frequency (MHz) Ch. Frequency (MHz) Ch. 5180 52 5260 100 : : : : 120 5200 : : : : : : : : :	Frequency (MHz) Ch. Frequency (MHz) Ch. Frequency (MHz) 5180 52 5260 100 5500 : : : : 100 5500 : : : : : : 5200 56 5280 120 5600 : : : : : :	Frequency (MHz) Ch. Image: Chi Image: Chi <th< td=""><td>Frequency (MHz) Ch. Frequency (MHz) Ch. Frequency (MHz) Ch. Frequency (MHz) 5180 52 5260 100 5500 149 5745 : : : : : : : : : 5200 56 5280 120 5600 157 5785 : : : : : : : :</td><td>Frequency (MHz) Ch. Frequency (MHz) Info Info</td></th<>	Frequency (MHz) Ch. Frequency (MHz) Ch. Frequency (MHz) Ch. Frequency (MHz) 5180 52 5260 100 5500 149 5745 : : : : : : : : : 5200 56 5280 120 5600 157 5785 : : : : : : : :	Frequency (MHz) Ch. Frequency (MHz) Info Info

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

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

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

Ch.

58

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

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

Band 4

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

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

	Band 1
Ch.	Frequency (MHz)
42	5210

Band 2A
Frequency
(MHz)

5290

Frequency (MHz)				
5530				
:				
5690				

	Band 3
Ch.	Frequency (MHz)
155	5775

	Danu 4
Ch.	Frequency (MHz)

171

Dand 1

5855

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

FCC ID: A3LSMS901JPN	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga E of 20E
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 5 of 295
© 2022 PCTEST			V 9.0 02/01/2019



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					
002 11 Made /David		Duty Cycle [%]			
802.11 W	802.11 Mode/Band		ANT2	ΜΙΜΟ	
	а	93.8	93.8	93.3	
	n (HT20)	92.8	92.8	93.5	
	ac (HT20)	92.8	92.8	92.0	
	ax (HT20)	99.7	99.7	99.8	
5GHz	n (HT40)	92.7	92.8	93.3	
	ac (HT40)	92.8	92.7	91.8	
	ax (HT40)	99.7	99.7	99.8	
	ac (HT80)	92.4	92.3	91.7	
	ax (HT80)	99.6	99.7	99.8	

Table 2-4. Measured Duty Cycles

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

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

FCC ID: A3LSMS901JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dege C of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 6 of 295
© 2022 PCTEST			V 9.0 02/01/2019



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.

2.4 GHz Emission	5 GHz Emission
1	2
6	100
2437	5500
1	6
802.11b	802.11a
	1 6 2437 1

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

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	120
Operating Frequency (MHz)	2437	5600
Data Rate (Mbps)	1Mbps	6Mbps
Mode	802.11b	802.11a

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

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

Description	2.4 GHz Emission	5 GHz Emission
Antenna	1, 2	1, 2
Channel	6	120
Operating Frequency (MHz)	2437	5600
Data Rate (Mbps)	1Mbps	6Mbps
Mode	802.11b	802.11a

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

2.3 Antenna Description

Following antenna was used for the testing.

Frequency [GHz]	Antenna 1 Gain (dBi)	Antenna 2 Gain (dBi)	Directional Gain (dBi)
5.15	-5.7	-7.9	-3.72
5.30	-5.4	-6.4	-2.88
5.50	-5.3	-5.0	-2.14
5.725	-5.6	-6.4	-2.98
5.96	-6.2	-7.8	-3.95

Table 2-9. Antenna Peak Gain

FCC ID: A3LSMS901JPN	PCTEST [®] Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 7 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 7 of 295
© 2022 PCTEST	•	·	V 9.0 02/01/2019



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

2.5 Software and Firmware

The test was conducted with firmware version S901USQU0AUJ5 installed on the EUT.

EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

FCC ID: A3LSMS901JPN	PCTEST* Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: Test Dates:		EUT Type:	Dage 9 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 8 of 295
© 2022 PCTEST		•	V 9.0 02/01/2019



3.0 DESCRIPTION OF TESTS

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

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.

FCC ID: A3LSMS901JPN	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 0 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset		Page 9 of 295
© 2022 PCTEST	•			V 9.0 02/01/2019



Radiated Emissions

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

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

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

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 414788 D01 v01r01.

3.4 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).

FCC ID: A3LSMS901JPN	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 10 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 10 of 295
© 2022 PCTEST		·	V 9.0 02/01/2019



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.

FCC ID: A3LSMS901JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 11 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset		Page 11 of 295
© 2022 PCTEST				V 9.0 02/01/2019



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

FCC ID: A3LSMS901JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: Test Dates:		EUT Type:	Daga 12 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 12 of 295
© 2022 PCTEST	•	·	V 9.0 02/01/2019



6.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	WL25-1	Conducted Cable Set (25GHz)	9/7/2021	Annual	9/7/2022	WL25-1
-	WL25-2	Conducted Cable Set (25GHz)	9/7/2021	Annual	9/7/2022	WL25-2
-	WL25-3	Conducted Cable Set (25GHz)	9/7/2021	Annual	9/7/2022	WL25-3
-	WL40-1	Conducted Cable Set (40GHz)	9/10/2021	Annual	9/10/2022	WL40-1
Agilent	N9038A	MXE EMI Receiver	8/11/2020	Annual	12/1/2021	MY51210133
Agilent	N9030A	PXA Signal Analyzer (44GHz)	7/21/2021	Annual	7/21/2022	MY49430494
Anritsu	ML2495A	Power Meter	1/18/2021	Annual	1/18/2022	941001
Anritsu	MA2411B	Pulse Power Sensor	3/8/2021	Annual	3/8/2022	1339007
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Emco	3116C	Horn Antenna (18 - 40GHz)	5/112021	Biennial	5/11/2023	218893
ETS-Lindgren	3816/2NM	Line Impedance Stabilization Network	7/9/2020	Biennial	7/9/2022	114451
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	8/17/2020	Annual	12/17/2021	MY52350166
Pasternack	NMLC-2	Line Conducted Emissions Cable (NM)	9/10/2021	Annual	9/10/2022	NMLC-2
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	7/21/2021	Annual	7/12/2022	MY49430494
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	8/3/2021	Annual	8/3/2022	100342
Rohde & Schwarz	ESW44	EMI Test Receiver 2Hz to 44GHz	1/21/2021	Annual	1/21/2022	101716
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	8/25/2021	Annual	8/25/2022	103200
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	9/3/2021	Annual	9/3/2022	102138
Solar Electronics	8012-50-R-24-BNC	Line Impedance Stabilization Network	9/21/2021	Biennial	9/21/2023	310233
Schwarzbeck	VULB9162	Bilog Antenna	4/17/2020	Biennial	4/17/2022	00301

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.

FCC ID: A3LSMS901JPN	PCTEST* Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 12 of 205	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 13 of 295	
© 2022 PCTEST V 9.0 02/01/2019				



7.0 TEST RESULTS

Summary

Company Name:	Samsung Electronics Co., Ltd.
FCC ID:	A3LSMS901JPN
FCC Classification:	Unlicensed National Information Infrastructure (UNII)

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
N/A	26dB Bandwidth	N/A		PASS	Section 7.2
15.407(e)	6dB Bandwidth	>500kHz(5725-5850MHz)		PASS	Section 7.3
15.407 (a)(1)(iv), (a)(2), (a)(3)(i)	Maximum Conducted Output Power	Maximum conducted powers must meet the limits detailed in 15.407 (a)		PASS	Section 7.4
15.407(a)(3)(iii)	e.i.r.p.(UNII-4)	30dBm	CONDUCTED	PASS	Section 7.4
15.407 (a)(1)(iv), (a)(2), (a)(3)(i)	Maximum Power Spectral Density	Maximum power spectral density must meet the limits detailed in 15.407 (a)		PASS	Section 7.5
15.407(a)(3)(iii)	Maximum e.i.r.p. Density (UNII-4)	14dBm/MHz		PASS	Section 7.5
15.407(h)	Dynamic Frequency Selection	See DFS Test Report		PASS	See DFS Test Report
15.407(b)(1), (b)(2), (b)(3), (b)(4)(i), (b)(5)(ii), (b)(5)(iii)	Undesirable Emissions	Undesirable emissions must meet the limits detailed in 15.407(b)	RADIATED	PASS	Section 7.6, 7.7
15.205, 15.209	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS	Section 7.6, 7.7
15.407(b)(9), 15.207	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 limits	LINE CONDUCTED	PASS	Section 7.8
	Table	e 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.

FCC ID: A3LSMS901JPN	PCTEST [®] Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	AMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	ЈТ Туре:		Dage 14 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset		Page 14 of 295
© 2022 PCTEST				V 9.0 02/01/2019



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 \geq 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.

FCC ID: A3LSMS901JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dage 15 of 205		
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 15 of 295		
© 2022 PCTEST V 9.0 02/01/2019					



SISO Antenna-1 26 dB Bandwidth Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
	5180	36	а	6	22.07
	5200	40	а	6	20.40
	5240	48	а	6	19.71
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	20.34
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	19.84
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	19.87
	5180	36	ax (20MHz)	6.5/7.2 (MCS0)	26.91
Band 1	5200	40	ax (20MHz)	6.5/7.2 (MCS0)	22.94
Ba	5240	48	ax (20MHz)	6.5/7.2 (MCS0)	22.43
	5190	38	n (40MHz)	13.5/15 (MCS0)	38.74
	5230	46	n (40MHz)	13.5/15 (MCS0)	38.83
	5190	38	ax (40MHz)	13.5/15 (MCS0)	39.80
	5230	46	ax (40MHz)	13.5/15 (MCS0)	40.02
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	79.86
	5210	42	ax (80MHz)	29.3/32.5 (MCS0)	80.95
	5260	52	a	6	20.86
	5280	56	а	6	20.33
	5320	64	а	6	19.36
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	21.00
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	20.75
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	20.99
ZA	5260	52	ax (20MHz)	6.5/7.2 (MCS0)	23.69
Band 2A	5280	56	ax (20MHz)	6.5/7.2 (MCS0)	20.13
Bal	5320	64	ax (20MHz)	6.5/7.2 (MCS0)	20.68
	5270	54	n (40MHz)	13.5/15 (MCS0)	38.87
	5310	62	n (40MHz)	13.5/15 (MCS0)	38.92
	5270	54	ax (40MHz)	13.5/15 (MCS0)	39.61
	5310	62	ax (40MHz)	13.5/15 (MCS0)	39.85
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	81.29
	5290	58	ax (80MHz)	29.3/32.5 (MCS0)	80.98
	5500	100	а	6	19.58
	5600	120	а	6	21.16
	5720	144	а	6	21.10
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	20.06
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	20.29
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	19.84
	5500	100	ax (20MHz)	6.5/7.2 (MCS0)	20.52
	5600	120	ax (20MHz)	6.5/7.2 (MCS0)	21.12
	5720	144	ax (20MHz)	6.5/7.2 (MCS0)	20.52
SC	5510	102	n (40MHz)	13.5/15 (MCS0)	38.94
Band 2C	5590	118	n (40MHz)	13.5/15 (MCS0)	39.07
ä	5710	142	n (40MHz)	13.5/15 (MCS0)	38.70
	5510	102	ax (40MHz)	13.5/15 (MCS0)	39.46
	5590	118	ax (40MHz)	13.5/15 (MCS0)	39.45
	5710	142	ax (40MHz)	13.5/15 (MCS0)	39.89
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	81.32
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	79.92
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	80.37
	5530	106	ax (80MHz)	29.3/32.5 (MCS0)	80.82
	5610	122	ax (80MHz)	29.3/32.5 (MCS0)	80.75
	5690	138	ax (80MHz)	29.3/32.5 (MCS0)	80.16
Tab	10 7-2 Ca	nductod	Bandwidt	n Measuremen	te SISO ANT

Approved by: FCC ID: A3LSMS901JPN *((c* SAMSUNG (CERTIFICATION) Proud to be part of 😑 element **Technical Manager** Test Dates: EUT Type: Test Report S/N: Page 16 of 295 1M2112090153-11.A3L 09/22 - 12/22/2021 Portable Handset

V 9.0 02/01/2019





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: A3LSMS901JPN	PCTEST [®] Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 17 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 17 of 295
© 2022 PCTEST			V 9.0 02/01/2019





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



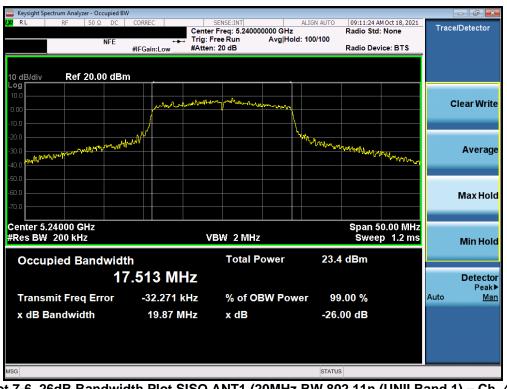
Plot 7-4. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 1) - Ch. 36)

FCC ID: A3LSMS901JPN	PCTEST* Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 18 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 18 of 295
© 2022 PCTEST			V 9.0 02/01/2019





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: A3LSMS901JPN	PCTEST [®] Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: Test Dates:		EUT Type:	Dage 10 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 19 of 295
© 2022 PCTEST			V 9.0 02/01/2019



🔤 Keysight Spectrum Analyzer - Occi	upied BW			
(X) RL RF 50 Ω	DC CORREC NFE ↔→→	SENSE:INT Center Freq: 5.180000000 GHz Trig: Free Run Avg Hol #Atten: 20 dB	ALIGN AUTO 08:53:40 AM Oct 19, 20 Radio Std: None d: 100/100 Radio Device: BTS	Trace/Detector
10 dB/div Ref 20.00	0 dBm			
10.0 0.00	have have have here a	alongram peralangen and the same	· · · · · · · · · · · · · · · · · · ·	Clear Write
-10.0 -20.0 -30.0 hen/hester/hystol.appr/hester -40.0	And the stand of t		han han german welling he	🚾 Average
-50.0 -60.0 -70.0				Max Hold
Center 5.18000 GHz #Res BW 200 kHz		VBW 2 MHz	Span 50.00 M Sweep 1.2 r	
Occupied Band	width 18.938 MH	Total Power	24.7 dBm	Detector Peak▶
Transmit Freq Erro x dB Bandwidth	or -12.751 kl 26.91 Mł		ver 99.00 % -26.00 dB	Auto <u>Man</u>
MSG			STATUS	

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



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

FCC ID: A3LSMS901JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset		Page 20 of 295
© 2022 PCTEST	•	•		V 9.0 02/01/2019



🔤 Keysight Spectrum Analyzer - Oco	cupied BW						
	DC CORREC		ALIGN AUTO 00 GHz Avg Hold: 100/100	08:57:32 AM (Radio Std: N	lone	Trace/D	etector
	#IFGain:Low	#Atten: 20 dB		Radio Devic	e: BTS		
10 dB/div Ref 20.0	0 dBm						
Log 10.0 0.00	การางปังวัตถุกมีกา เกิด	Wirth Marin and Maring Mary	v-sl/shime			Cle	ar Write
-10.0							
-20.0 -30.0			<u><u></u> </u>	ᢉᡃᠰᢪᢦ᠋ᢩᢊᡎᡘᡰᢌᠿ _{ᡫᡫᡀ}	Wallhang & Uny	Ļ	verage
-40.0							
-60.0							
-70.0						M	ax Hold
Center 5.24000 GHz #Res BW 220 kHz		VBW 2.2 MHz		Span 50 Swee	.00 MHz p 1 ms	N	lin Hold
Occupied Band	width	Total Pov	ver 24.6	dBm			
	18.915 M	lz				0	etector Peak▶
Transmit Freq Err	ror -41.325 k	Hz % of OBV	V Power 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth	22.43 N	lHz x dB	-26.	00 dB			
MSG			STATUS	6			

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: A3LSMS901JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 21 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 21 of 295
© 2022 PCTEST	•	•	V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied BV	N				
LXI RL RF 50Ω DC	CORREC Cente	SENSE:INT A	LIGN AUTO 09:59:28 AM Radio Std:	Oct 18, 2021 None	Trace/Detector
NFE		Free Run Avg Hold: n: 20 dB	100/100 Radio Devi	ce: BTS	
	#ir Gam.cow #ir tate				
10 dB/div Ref 20.00 dBr	n				
Log 10.0					
0.00	White Work and a start of the	may more thank the been			Clear Write
-10.0					
-20.0	/	<u> </u>			
-30.0	and a start and a start		Way Many Contractions		Average
-30.0				Mary Marsh V	
-50.0					
-60.0					Max Hold
-70.0					
Center 5.23000 GHz			Span 10	0.0 MHz	
#Res BW 390 kHz	V	/BW 4 MHz		ep 1 ms	Min Hold
Occupied Bandwidt	h	Total Power	23.5 dBm		
	5.801 MHz				Detector
					Detector Peak▶
Transmit Freq Error	-21.803 kHz	% of OBW Powe	r 99.00 %		Auto <u>Man</u>
x dB Bandwidth	38.83 MHz	x dB	-26.00 dB		
MSG			STATUS		

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: A3LSMS901JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dama 00 at 005	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 22 of 295	
© 2022 PCTEST V 9.0 02/01/2019				



🔤 Keysight Spectrum Analyzer - Oce	cupied BW					7 ×
(X) RL RF 50 Ω	DC CORREC	SENSE:INT Center Freq: 5.230000 Trig: Free Run #Atten: 20 dB	ALIGN AUTO 0000 GHz Avg Hold: 100/100	09:21:38 AM Oct 19, 202 Radio Std: None Radio Device: BTS	Trace/Dete	ctor
10 dB/div Ref 20.0	0 dBm					
10.0 0.00	mann	n	hankara		Clear	Write
-10.0 -20.0 -30.0 -40.0	gshlynn) Maring Maring	mal Marty war had	A.	erage
-50.0 -60.0 -70.0					Max	Hold
Center 5.23000 GHz #Res BW 390 kHz		VBW 4 MHz		Span 100.0 MH Sweep 1 m		Hold
Occupied Band	width 37.606 MH	Total Po 1 Z	ower 24.9) dBm		tector
Transmit Freq Err	ror -67.306 k	Hz % of OB	W Power 99	.00 %	Auto	Peak▶ <u>Man</u>
x dB Bandwidth	40.02 M	IHz x dB	-26.	00 dB		
MSG			STATUS	3		

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



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

FCC ID: A3LSMS901JPN	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 22 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 23 of 295
© 2022 PCTEST			V 9.0 02/01/2019



🔤 Keysight Spectrum Analyzer - Occupi	ied BW						
IXI RL RF 50 Ω [SENSE:INT Center Freq: 5.21 Trig: Free Run #Atten: 20 dB		Rac 100/100	3:39:58 AM Oct 19, 2021 dio Std: None dio Device: BTS	Trace	Detector
10 dB/div Ref 20.00 d	dBm						
	Margan Margha	washing	hand from the server			c	lear Write
-10.0 -20.0	hulphray-day			heperateryl-qulidardyteret	hh.d.		
-30.0 John John Market Market Aller					and and the states of the states and		Average
-50.0							Max Hold
Center 5.2100 GHz					pan 200.0 MHz		_
#Res BW 820 kHz		VBW 8 M	Hz		Sweep 1 ms		Min Hold
Occupied Bandw			Power	25.4 dE	Bm		
Transmit Freq Erro	76.757 M		OBW Powe	er 99.00	%	Auto	Detector Peak▶ Man
x dB Bandwidth	80.95 N			-26.00			
MSG				STATUS			

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



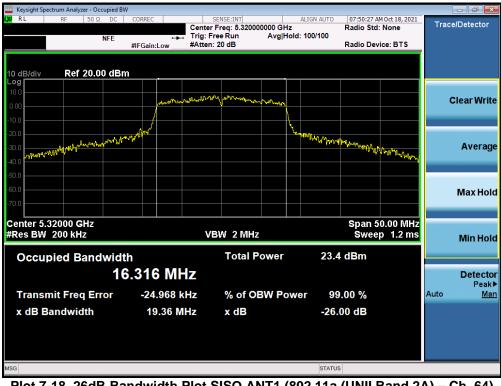
Plot 7-16. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMS901JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dama 04 af 005
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 24 of 295
© 2022 PCTEST	•	·	V 9.0 02/01/2019





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



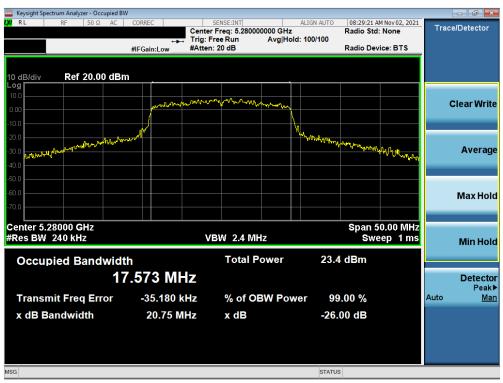
Plot 7-18. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMS901JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N: Test Dates:		EUT Type:	Dage 25 of 205	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 25 of 295	
© 2022 PCTEST V 9.0 02/01/2019				





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: A3LSMS901JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N: Test Dates:		EUT Type:	Dage 26 of 205	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 26 of 295	
© 2022 PCTEST V 9.0 02/01/2019				



🔤 Keysight Spectrum Analyzer - O					
LXI RL RF 50 9	Ω DC CORREC	SENSE:INT Center Freg: 5.32000	ALIGN AUTO	09:29:06 AM Oct 18, 20 Radio Std: None	Trace/Detector
	NFE ++	Trig: Free Run	Avg Hold: 100/100		
	#IFGain:Low	#Atten: 20 dB		Radio Device: BTS	_
	00 dBm				
Log 10.0					
		and marker and	Mur waln -		Clear Write
0.00					
-10.0	/				
-20.0	and the part of the second sec		My March Vore and	white when the work	
-20.0 -30.0 -40.0	MUNN			White the state	Average
-40.0				- vi VM	lun,
-50.0					
-60.0					Max Hold
-70.0					Max Hold
10.0					
Center 5.32000 GHz				Span 50.00 MI	
#Res BW 200 kHz		VBW 2 MHz		Sweep 1.2 n	ns Min Hold
		Total P	22	3 dBm	
Occupied Ban			ower 23.	3 abm	
	17.507 M	Hz			Detector
Trono and it Farmer				0.00 %	Peak► Auto Mon
Transmit Freq E			BW Power 9	9.00 %	Auto <u>Man</u>
x dB Bandwidth	20.99	MHz xdB	-26	.00 dB	
MSG			STAT	IS	
WOG			STAT		

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



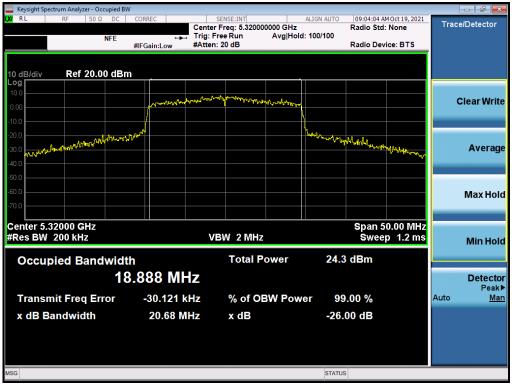
Plot 7-22. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMS901JPN	PCTEST [®] Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 07 of 205	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 27 of 295	
© 2022 PCTEST V 9.0 02/01/2019				



Keysight Spectrum Analyzer - Occupied B ¹	N				- 6 -
μα RL RF 50Ω DC	Trig: I	SENSE:INT r Freq: 5.280000000 GH Free Run Avg H n: 20 dB	z Radio St old: 100/100	AM Oct 18, 2021 d: None evice: BTS	Trace/Detector
10 dB/div Ref 20.00 dBr	n				
10.0 0.00		M Mary Marillow Marillow			Clear Write
-10.0	and the second s		hyperse and a		
-20.0 -30.0 -40.0			Whether the physical and the physical an	all	Average
-50.0					Max Hold
-70.0					Max Hold
Center 5.28000 GHz #Res BW 200 kHz	v	/BW 2 MHz		50.00 MHz ep 1.2 ms	Min Hold
Occupied Bandwid		Total Power	23.7 dBm		
	7.518 MHz				Detector Peak▶
Transmit Freq Error	-33.482 kHz	% of OBW Po			Auto <u>Man</u>
x dB Bandwidth	20.13 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: A3LSMS901JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N: Test Dates:		EUT Type:	Dama 00 of 005	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 28 of 295	
© 2022 PCTEST V 9.0 02/01/2019				



🔤 Keysight Spectrum Analyzer - Occup	pied BW				
LX/ RL RF 50 Ω		SENSE:INT Center Freg: 5.270000000 G		0:01:46 AM Oct 18, 2021	Trace/Detector
N	FE ++-	Trig: Free Run Avg	Hold: 100/100		
	#IFGain:Low	#Atten: 20 dB	Ra	adio Device: BTS	
10 dB/div Ref 20.00	dBm				
10.0					
0.00	moundant	man hand benerge and hand	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Clear Write
-10.0			N. I. I. I.		
-20.0	/				
	Lander Martin		Martin Makes all	tool we want way got	Average
a hashed between rain				tooly work may and	Average
-40.0					
-50.0					
-60.0					Max Hold
-70.0					
Center 5.27000 GHz				Span 100.0 MHz	
#Res BW 390 kHz		VBW 4 MHz	````	Sweep 1 ms	Min Hold
					WIN HOID
Occupied Bandw	vidth	Total Power	r 23.5 d	Bm	
	35.791 MH	7			Detector
					Peak►
Transmit Freq Erro	or -45.541 kH	z % of OBW F	ower 99.00	0 %	Auto <u>Man</u>
x dB Bandwidth	38.87 MH	z x dB	-26.00	dB	
			OT AT		
MSG			STATUS		

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



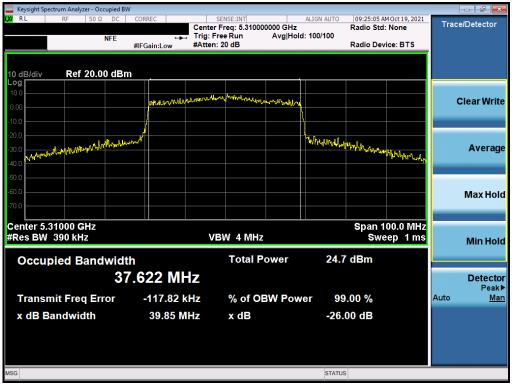
Plot 7-26. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 2A) - Ch. 62)

FCC ID: A3LSMS901JPN	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 29 of 295
© 2022 PCTEST			V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied	I BW				- d <u>×</u>
IXI RL RF 50Ω DC	Center →→ Trig: F	SENSE:INT r Freq: 5.270000000 GHz Free Run Avg Hol n: 20 dB			Trace/Detector
10 dB/div Ref 20.00 dB	3m				
0.00	malin Aller Marchenter	when any when	<u>a</u>		Clear Write
-10.0	- to be a set		Multiple of the		
-20.0 -30.0 -40.0			What was and low is	www.	Average
-50.0					Max Hold
Center 5.27000 GHz			Snan 1	100.0 MHz	
#Res BW 390 kHz		'BW 4 MHz	Swe	eep 1 ms	Min Hold
Occupied Bandwi	^{dth} 37.486 MHz	Total Power	24.8 dBm		Detector
Transmit Freq Error	-67.377 kHz	% of OBW Pov	ver 99.00 %		Peak► Auto <u>Man</u>
x dB Bandwidth	39.61 MHz	x dB	-26.00 dB		
MSG			STATUS		

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



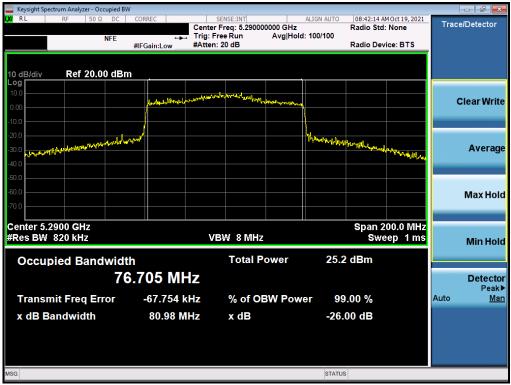
Plot 7-28. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax (UNII Band 2A) - Ch. 62)

FCC ID: A3LSMS901JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N: Test Dates:		EUT Type:	Dage 20 of 205		
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 30 of 295		
© 2022 PCTEST V 9.0 02/01/2019					



🔤 Keysight Spectrum Analyzer - Occupied B	W				
KX RL RF 50Ω DC	🛶 Trig: I	SENSE:INT r Freq: 5.290000000 GHz Free Run Avg Hold: n: 20 dB	Radio Sto : 100/100	AM Oct 18, 2021 d: None vice: BTS	Trace/Detector
10 dB/div Ref 20.00 dB	in ounces				
Log 10.0 0.00		man and an and an and an and and and and			Clear Write
-10.0 -20.0 -30.0 -40.0	MW ^{AULA}		artoger work of the hill define out	1) marine marke	Average
-50.0 -60.0 -70.0					Max Hold
Center 5.2900 GHz #Res BW 820 kHz	V	/BW 8 MHz		200.0 MHz eep 1 ms	Min Hold
Occupied Bandwid	th 5.093 MHz	Total Power	24.5 dBm		Detector
Transmit Freq Error x dB Bandwidth	-92.662 kHz 81.29 MHz	% of OBW Powe x dB	er 99.00 % -26.00 dB		Peak≯ Auto <u>Man</u>
MSG			STATUS		

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



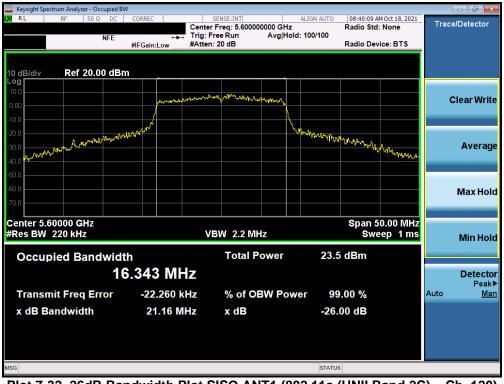
Plot 7-30. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMS901JPN	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 21 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 31 of 295
© 2022 PCTEST		·	V 9.0 02/01/2019





Plot 7-31. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2C) - Ch. 100)



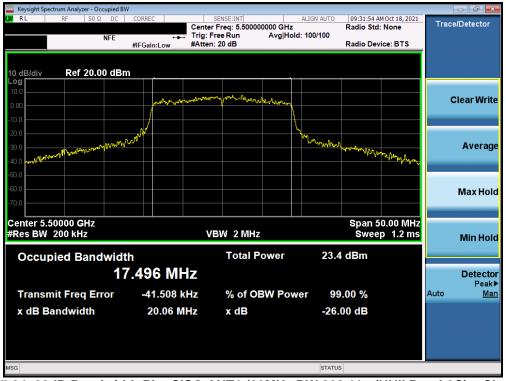
Plot 7-32. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMS901JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 22 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 32 of 295
© 2022 PCTEST			V 9.0 02/01/2019





Plot 7-33. 26dB Bandwidth Plot SISO ANT1 (802.11a (UNII Band 2C) - Ch. 144)



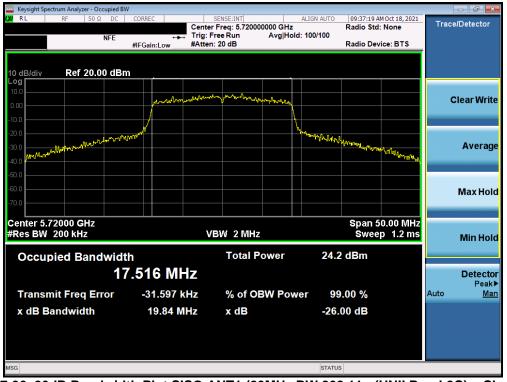
Plot 7-34. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11n (UNII Band 2C) - Ch. 100)

FCC ID: A3LSMS901JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: Test Dates:		EUT Type:	Dogo 22 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 33 of 295
© 2022 PCTEST			V 9.0 02/01/2019





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: A3LSMS901JPN	PCTEST [®] Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N: Test Dates:		EUT Type:	Dage 24 of 205		
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 34 of 295		
© 2022 PCTEST V 9.0 02/01/2019					



Keysight Spectrum Analyzer - Occupied B ¹	N				
UN RL RF 50Ω DC	Trig:	SENSE:INT Pr Freq: 5.500000000 GHz Free Run Avg Hold n: 20 dB	ALIGN AUTO 09:05:05 / Radio Sto d: 100/100 Radio De		Trace/Detector
10 dB/div Ref 20.00 dBr	n				
Log 10.0 0.00	www.warnaharanahar	Mr. Marthank Marthan			Clear Write
-20.0 -30.0 -40.0			Whatewark and have and	ant man	Average
-50.0 -60.0 -70.0					Max Hold
Center 5.50000 GHz #Res BW 200 kHz	II I	/BW 2 MHz		50.00 MHz ep 1.2 ms	Min Hold
Occupied Bandwid	th	Total Power	24.5 dBm		
	8.844 MHz				Detector Peak▶
Transmit Freq Error	-47.280 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	20.52 MHz	x dB	-26.00 dB		
MSG			STATUS		

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



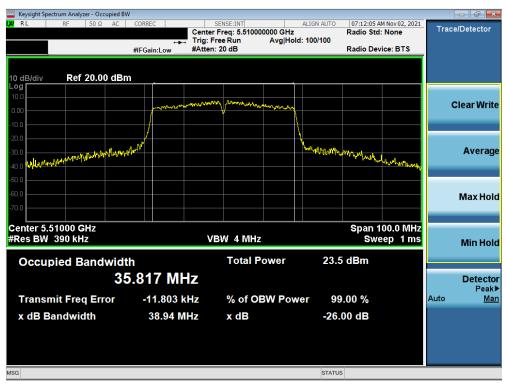
Plot 7-38. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802. 11ax (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMS901JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N: Test Dates:		EUT Type:	Dage 25 of 205		
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 35 of 295		
© 2022 PCTEST V 9.0 02/01/2019					



🥮 Keysight Spectrum Analyzer - Occupie	ed BW				
UX RL RF 50Ω D NFE	Co ⊷⊷ Tr	SENSE:INT enter Freq: 5.720000000 GH; ig: Free Run Avg H tten: 20 dB	z Radio Ste old: 100/100	AM Oct 19, 2021 d: None evice: BTS	Trace/Detector
10 dB/div Ref 20.00 d	Bm				
Log 10.0 0.00 -10.0	p. Aloch alpondormal	wanner Jarlon Mandager Mathematica	ин.		Clear Write
-10.0 -20.0 -30.0	mansal		harden huller wellinger	www.all-storman	Average
-60.0 -60.0 -70.0					Max Hold
Center 5.72000 GHz #Res BW 200 kHz		VBW 2 MHz		50.00 MHz ep 1.2 ms	Min Hold
Occupied Bandwi	idth	Total Power	24.9 dBm		
	18. <mark>904 MH</mark> z				Detector Peak▶
Transmit Freq Error	-37.942 kHz	% of OBW Po	wer 99.00 %		Auto <u>Man</u>
x dB Bandwidth	20.52 MHz	x dB	-26.00 dB		
MSG			STATUS		

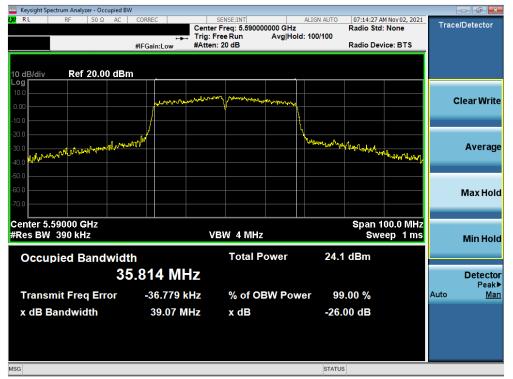
Plot 7-39. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802. 11ax (UNII Band 2C) - Ch. 144)



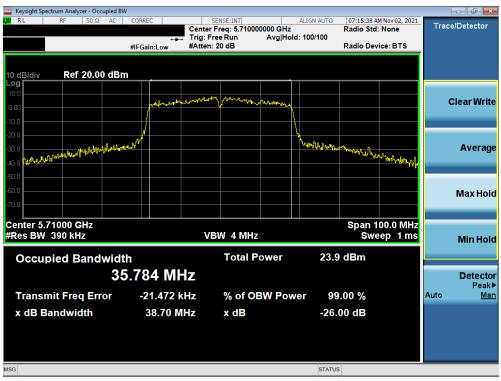
Plot 7-40. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11n (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMS901JPN	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 26 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 36 of 295
© 2022 PCTEST			V 9.0 02/01/2019





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: A3LSMS901JPN	PCTEST [®] Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N: Test Dates:		EUT Type:	Dage 27 of 205	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 37 of 295	
© 2022 PCTEST		· · · · · · · · · · · · · · · · · · ·	V 9.0 02/01/2019	



🔤 Keysight Spectrum Analyzer - O							
LXX RL RF 50 S	Ω DC CORREC NFE #IFGain:L	🛶 Trig: Free Ru	5.510000000 GHz n Avg Hol	Ra d: 100/100	adio Std: None adio Device: BTS	21 Trac	e/Detector
10 dB/div Ref 20.0	00 dBm						
0.00		Allynyn llyn hynn	the here have				Clear Write
-10.0 -20.0 -30.0 -40.0	way way have been and the second			haraman al-alama	Nulleeleeleert	M	Average
-50.0 -60.0 -70.0							Max Hold
Center 5.51000 GHz #Res BW 390 kHz		VBW 4	MHz	ŝ	Span 100.0 MH Sweep 1 m		Min Hold
Occupied Band	dwidth 37.479		otal Power	25.3 d	Bm		Detector
Transmit Freq Er x dB Bandwidth	rror -60.8	371 kHz %	of OBW Pow dB	ver 99.00 -26.00		Auto	Peak► <u>Man</u>
MSG				STATUS			

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



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

FCC ID: A3LSMS901JPN	PCTEST [®] Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 20 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 38 of 295
© 2022 PCTEST			V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupie	ed BW				
ບຜູ້RL RF 50 Ω C		SENSE:INT Center Freq: 5.710000000 GHz Trig: Free Run Avg Hol #Atten: 20 dB	ALIGN AUTO 09:29:55 / Radio Sto Id: 100/100 Radio De		Trace/Detector
10 dB/div Ref 20.00 c	IBm				
Log 10.0 0.00	man and the second	getterflower and more reliable mit the			Clear Write
-10.0 -20.0 -30.0	all hours high		and and the second proton	Nrd martin	Average
-50.0 -60.0 -70.0					Max Hold
Center 5.71000 GHz #Res BW 470 kHz		VBW 5 MHz		100.0 MHz eep 1 ms	Min Hold
Occupied Bandw	idth 37.600 MHz	Total Power	25.8 dBm		Detector
Transmit Freq Error x dB Bandwidth		z % of OBW Pov	ver 99.00 % -26.00 dB		Peak▶ Auto <u>Man</u>
MSG			STATUS		

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



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

FCC ID: A3LSMS901JPN	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 39 of 295
© 2022 PCTEST		·	V 9.0 02/01/2019



🔤 Keysight Spectrum Analyzer - C					
10 dB/div Ref 20.	Ω DC CORREC NFE #FGain:Low ↔	SENSE:INT Center Freq: 5.61000 Trig: Free Run #Atten: 20 dB	ALIGN AUTO 0000 GHz Avg Hold: 100/100	I0:36:16 AM Oct 18, Radio Std: None Radio Device: BT	Trace/Detector
10.00 -10.0		har man and a state and			Clear Write
-20.0 -30.0 -40.0	welver with the		have the former of the former	Rowan M. Proglad date	Average
-50.0					Max Hold
Center 5.6100 GHz #Res BW 820 kHz Occupied Ban	dwidth	VBW 8 MHz Total P		Span 200.0 M Sweep 1 .9 dBm	
	75.026 MI	lz			Detector Peak▶
Transmit Freq E x dB Bandwidth				99.00 % 6.00 dB	Auto <u>Man</u>
MSG			STA	TUS	

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: A3LSMS901JPN	PCTEST [®] Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 40 of 205	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 40 of 295	
© 2022 PCTEST			V 9.0 02/01/2019	



🔤 Keysight Spectrum Analyzer - O								
IX RL RF 50 S	DC CORREC	Center Fr →→ Trig: Free		d: 100/100	08:44:11 AM Radio Std: Radio Devi		Trace	e/Detector
10 dB/div Ref 20.0	00 dBm							
0.00	,,	nontralisinguration of the second of the sec	Munum Miller Montheasterney	k,			c	lear Write
-10.0 -20.0 -30.0	MAN AND A			h harselikeran	Hunghand Jam	Nalman selled		Average
-40.0 -50.0 -60.0 -70.0								Max Hold
Center 5.5300 GHz #Res BW 820 kHz		VBV	N 8 MHz			00.0 MHz ep 1 ms		Min Hold
Occupied Band	dwidth 76.599) MHz	Total Power	25.5	dBm			Detector
Transmit Freq Er x dB Bandwidth	тог -13	0.57 kHz).82 MHz	% of OBW Pow x dB	ver 99. -26.0	00 % 0 dB		Auto	Peak▶ <u>Man</u>
				2010				
MSG				STATUS				

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



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

FCC ID: A3LSMS901JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dama 44 at 005	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset		Page 41 of 295	
© 2022 PCTEST	•	-		V 9.0 02/01/2019	



Keysight Spectrum Analyzer - O										
LX/ RL RF 50 9	Ω DC CO	RREC		NSE:INT reg: 5.69000	00000 GHz	ALIGN AUTO	08:46:44 A Radio Std	M Oct 19, 2021 : None	Trac	e/Detector
	NFE	⊶ Gain:Low	. Trig: Free #Atten: 2		Avg Hold	i: 100/100	Radio Dev	vice: BTS		
	#IF	Gain:Low	#Atten. 2	0 ub			Radio Dev	ACE. DT3		
10 dB/div Ref 20.0	00 dBm									
Log										
10.0		Jughunger	mounda	work and working the	David					Clear Write
0.00		1 Capitolia a ca			and the second start of the	1				
-10.0						{				
-20.0	ANT AL AND					Monther				
-30.0	A THE ARM						ally hours and an only a	wheneysel		Average
-40.0										
-50.0										
-60.0										Max Hold
-70.0										
Center 5.6900 GHz							Span 2	200.0 MHz		
#Res BW 820 kHz			VB	N 8 MHz				eep 1 ms		Min Hold
				-		05.4				Millinoid
Occupied Ban				Total F	ower	25.4	dBm			
	76.6	33 MI	-IZ							Detector
Transmit Freq E	rror	-111.95	Hz	% of O	BW Pow	er 99	.00 %		Auto	Peak▶ Man
x dB Bandwidth		80.16 M	IHZ	x dB		-20.0	00 dB			
MSG						STATUS				

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

FCC ID: A3LSMS901JPN	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 42 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 42 of 295
© 2022 PCTEST	•	•	V 9.0 02/01/2019



SISO Antenna-2 26dB Bandwidth Measurements

	_				Measured 26dB
	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Bandwidth
	[141112]	NO.			[MHz]
	5180	36	а	6	18.24
	5200	40	а	6	18.05
	5240	48	а	6	18.07
	5180	36	n (20MHz)	6.5/7.2 (MCS0)	19.57
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	19.47
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	19.89
Ξ	5180	36	ax (20MHz)	6.5/7.2 (MCS0)	20.36
Band	5200	40	ax (20MHz)	6.5/7.2 (MCS0)	20.53
ä	5240	48	ax (20MHz)	6.5/7.2 (MCS0)	20.56
	5190	38	n (40MHz)	13.5/15 (MCS0)	38.81
	5230	46	n (40MHz)	13.5/15 (MCS0)	38.70
	5190	38	ax (40MHz)	13.5/15 (MCS0)	39.66
	5230	46	ax (40MHz)	13.5/15 (MCS0)	39.42
	5210	42	ac (80MHz)	29.3/32.5 (MCS0)	80.42
	5210	42	ax (80MHz)	29.3/32.5 (MCS0)	80.23
	5260	52	а	6	18.52
	5280	56	а	6	18.51
	5320	64	а	6	18.01
	5260	52	n (20MHz)	6.5/7.2 (MCS0)	20.39
	5280	56	n (20MHz)	6.5/7.2 (MCS0)	20.68
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	20.05
₹	5260	52	ax (20MHz)	6.5/7.2 (MCS0)	22.05
Band 2A	5280	56	ax (20MHz)	6.5/7.2 (MCS0)	21.47
Bar	5320	64	ax (20MHz)	6.5/7.2 (MCS0)	20.34
	5270	54	n (40MHz)	13.5/15 (MCS0)	38.75
	5310	62	n (40MHz)	13.5/15 (MCS0)	38.74
	5270	54	ax (40MHz)	13.5/15 (MCS0)	39.57
	5310	62	ax (40MHz)	13.5/15 (MCS0)	39.65
	5290	58	ac (80MHz)	29.3/32.5 (MCS0)	79.68
	5290	58	ax (80MHz)	29.3/32.5 (MCS0)	80.23
	5500	100	a	6	18.22
	5600	120	a	6	18.22
	5720	144	a	6	18.07
	5500	100	n (20MHz)	6.5/7.2 (MCS0)	19.82
	5600	120	n (20MHz)	6.5/7.2 (MCS0)	19.53
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	19.88
	5500	100	ax (20MHz)	6.5/7.2 (MCS0)	21.14
	5600	120	ax (20MHz)	6.5/7.2 (MCS0)	20.41
	5720	144	ax (20MHz)	6.5/7.2 (MCS0)	20.28
υ	5510	102	n (40MHz)	13.5/15 (MCS0)	38.37
9	5590	118	n (40MHz)	13.5/15 (MCS0)	38.80
Band 2C	5710	142	n (40MHz)	13.5/15 (MCS0)	38.58
	5510	102	ax (40MHz)	13.5/15 (MCS0)	39.15
	5590	118	ax (40MHz)	13.5/15 (MCS0)	39.79
	5710	142	ax (40MHz)	13.5/15 (MCS0)	39.49
	5530	106	ac (80MHz)	29.3/32.5 (MCS0)	80.03
	5610	122	ac (80MHz)	29.3/32.5 (MCS0)	79.54
	5690	138	ac (80MHz)	29.3/32.5 (MCS0)	79.69
	5530		ac (80MHz)	29.3/32.5 (MCS0)	80.65
		106		29.3/32.5 (MCS0) 29.3/32.5 (MCS0)	
	5610	122	ax (80MHz)	, ,	80.12
	5690	138	ax (80MHz)	29.3/32.5 (MCS0)	80.68

Table 7-3. Conducted Bandwidth Measurements SISO ANT2

FCC ID: A3LSMS901JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 42 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset		Page 43 of 295
© 2022 PCTEST	•			V 9 0 02/01/2019





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: A3LSMS901JPN	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 44 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 44 of 295
© 2022 PCTEST	•	•	V 9.0 02/01/2019





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



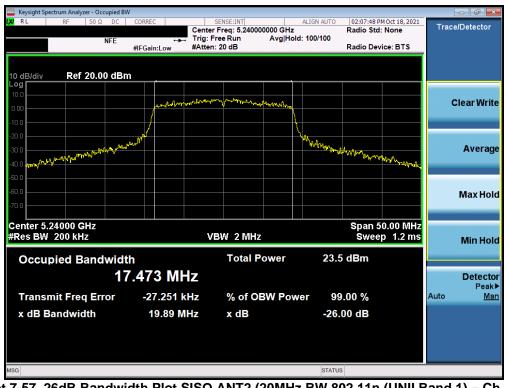
Plot 7-55. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 36)

FCC ID: A3LSMS901JPN	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 45 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 45 of 295
© 2022 PCTEST			V 9.0 02/01/2019





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: A3LSMS901JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: Test Dates:		EUT Type:	Dage 46 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 46 of 295
© 2022 PCTEST			V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied E	3W				
IXI RL RF 50Ω DC	CORREC	SENSE:INT er Freq: 5.180000000 GHz	Radio Std	M Oct 18, 2021 : None	Trace/Detector
NFE		FreeRun Avg Holo en:20 dB	d: 100/100 Radio Dev	rice: BTS	
	an sumer				
10 dB/div Ref 20.00 dB	m				
Log 10.0					
0.00	Nowlanghowthern	mon with fun and which allow			Clear Write
-10.0					
-20.0	non la				
-20.0 -30.0	(Me Care		VL-Congrege Ward	And the second second	Average
-40.0					
-50.0					
-60.0					Max Hold
-70.0					
Center 5.18000 GHz			Span 5	0.00 MHz	
#Res BW 200 kHz		VBW 2 MHz		p 1.2 ms	Min Hold
Occupied Bandwid	th	Total Power	24.7 dBm		
	8.854 MHz				Detector
	0.004 IVITIZ				Detector Peak▶
Transmit Freq Error	-20.552 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	20.36 MHz	x dB	-26.00 dB		
MSG			STATUS		

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



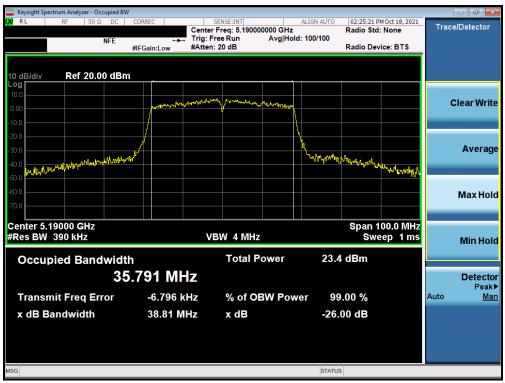
Plot 7-59. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 1) - Ch. 40)

FCC ID: A3LSMS901JPN	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 47 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 47 of 295
© 2022 PCTEST			V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied	BW				
IX RL RF 50Ω DC	Center ⊷⊷ Trig:	SENSE:INT er Freq: 5.240000000 GHz Free Run Avg Hol m: 20 dB	ALIGN AUTO 12:38:45 I Radio Sto d: 100/100 Radio De		Trace/Detector
10 dB/div Ref 20.00 dB	3m				
	man Man	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	h		Clear Write
-10.0	- 10				
-20.0 -30.0 -40.0			Mundul Mundul Mundul	Munky Multy	Average
-50.0					
-70.0					Max Hold
Center 5.24000 GHz #Res BW 200 kHz		VBW 2 MHz		50.00 MHz ep 1.2 ms	Min Hold
Occupied Bandwid		Total Power	24.4 dBm		
	8.868 MHz				Detector Peak▶
Transmit Freq Error	-20.453 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	20.56 MHz	x dB	-26.00 dB		
MSG			STATUS		

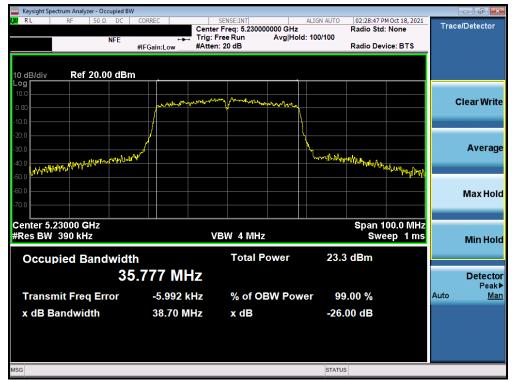
Plot 7-60. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 1) - Ch. 48)



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

FCC ID: A3LSMS901JPN	PCTEST* Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: Test Dates:		EUT Type:	Bage 48 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 48 of 295
© 2022 PCTEST			V 9.0 02/01/2019





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: A3LSMS901JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 40 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 49 of 295
© 2022 PCTEST	•		V 9.0 02/01/2019



🔤 Keysight Spectrum Analyzer - Oo					
LXI RL RF 50 Ω	2 DC CORREC	SENSE:INT Center Freg: 5.2300	ALIGN AUTO	01:18:56 PM Oct 18, 2021 Radio Std: None	Trace/Detector
	NFE	Trig: Free Run	Avg Hold: 100/100		
,	#IFGain:Low	#Atten: 20 dB		Radio Device: BTS	
10 dB/div Ref 20.0	00 dBm				
Log 10.0					
0.00	Mr. Andrew	white the photometry	hornowally		Clear Write
-10.0					
-10.0					
					Average
-30.0	and the state of the		MANNAU MANNAU	Un handly wardt all have	Average
-50.0					
-60.0					Max Hold
-70.0					
Center 5.23000 GHz				Span 100.0 MHz	
#Res BW 390 kHz		VBW 4 MHz	,	Span 100.0 MHz Sweep 1 ms	
					Min Hold
Occupied Band	dwidth	Total F	ower 24.5	dBm	
	37.451 M				Detector
					Peak▶
Transmit Freq Er	ror 3.287	kHz % of O	BW Power 99	.00 %	Auto <u>Man</u>
x dB Bandwidth	39.42	MHz x dB	-26.	00 dB	
MSG			STATUS		
MSG			STATUS	•	

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



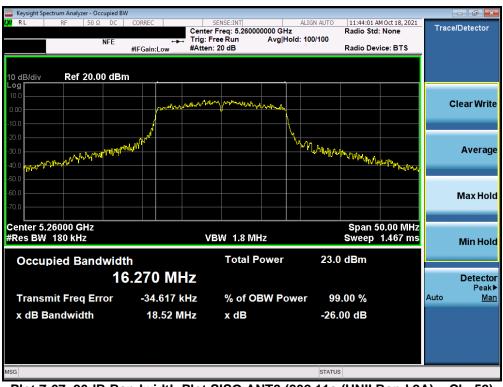
Plot 7-65. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ac (UNII Band 1) - Ch. 42)

FCC ID: A3LSMS901JPN	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 50 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 50 of 295
© 2022 PCTEST			V 9.0 02/01/2019





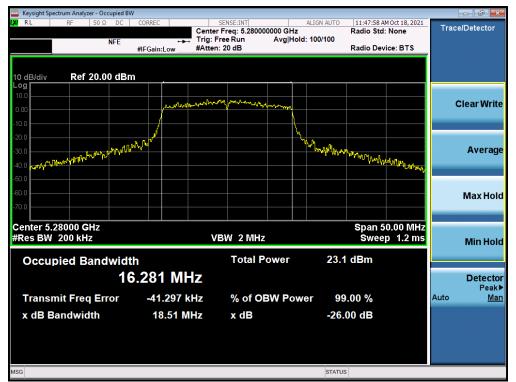
Plot 7-66. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax (UNII Band 1) - Ch. 42)



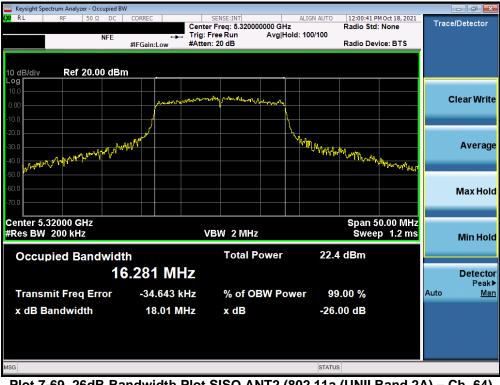
Plot 7-67. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMS901JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: Test Dates:		EUT Type:	Dage 51 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 51 of 295
© 2022 PCTEST		·	V 9.0 02/01/2019





Plot 7-68. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2A) - Ch. 56)



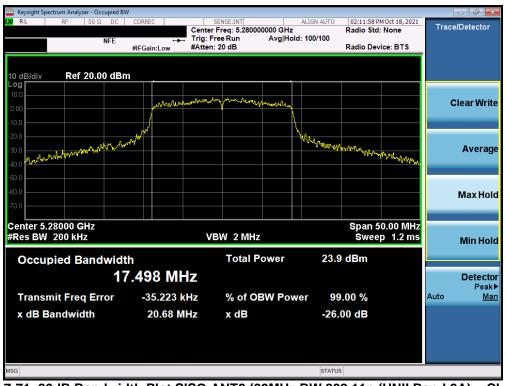
Plot 7-69. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMS901JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N: Test Dates:		EUT Type:	Daga 52 of 205	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 52 of 295	
© 2022 PCTEST V 9.0 02/01/2019				





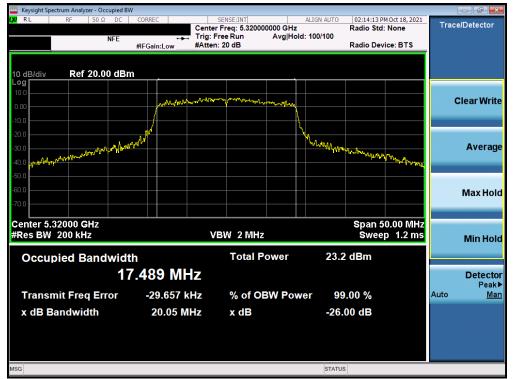
Plot 7-70. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 52)



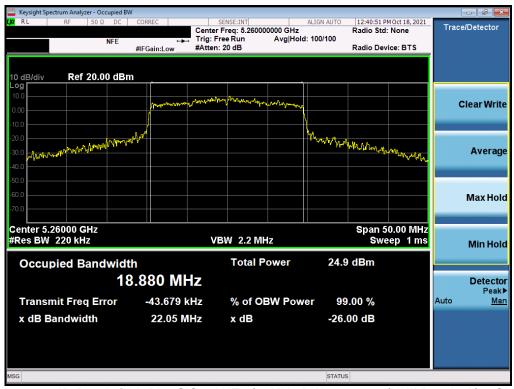
Plot 7-71. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMS901JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Daga 52 of 205	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 53 of 295	
© 2022 PCTEST V 9.0 02/01/2019				





Plot 7-72. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 64)



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

FCC ID: A3LSMS901JPN	PCTEST [®] Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N: Test Dates:		EUT Type:	Daga 54 of 205	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 54 of 295	
© 2022 PCTEST V 9.0 02/01/2019				



Keysight Spectrum Analyzer - Occup	ied BW				
ΙΧΙ RF 50 Ω Ι		SENSE:INT ter Freq: 5.280000000 GHz I: Free Run Avg Hol	ALIGN AUTO 12:44:18 P Radio Std d: 100/100	M Oct 18, 2021 : None	Trace/Detector
	#IFGain:Low #Att	ten: 20 dB	Radio Dev	rice: BTS	
10 dB/div Ref 20.00	dBm				
10.0 0.00	Margar Margar and Margar	ranger frittin alexanderitation			Clear Write
-20.0	. allowed and		Month Martin and Martin		
-20.0 -30.0 -40.0			and the second of the second o	Mound Werk	Average
-50.0					
-60.0					Max Hold
Center 5.28000 GHz			Span 5	0.00 MHz	
#Res BW 200 kHz		VBW 2 MHz		p 1.2 ms	Min Hold
Occupied Bandw	vidth	Total Power	24.6 dBm		
	18.898 MHz				Detector Peak▶
Transmit Freq Erro	r -23.123 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	21.47 MHz	x dB	-26.00 dB		
MSG			STATUS		

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



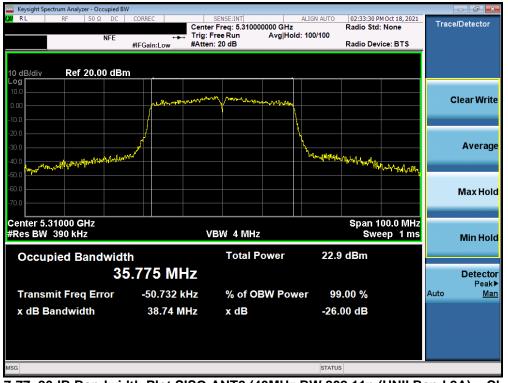
Plot 7-75. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMS901JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dawa 55 at 005
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset		Page 55 of 295
© 2022 PCTEST		•		V 9.0 02/01/2019





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: A3LSMS901JPN	PCTEST* Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage EC of 20E
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 56 of 295
© 2022 PCTEST			V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied	BW					×
<mark>()20</mark> RL RF 50Ω DC	CORREC	SENSE:INT nter Freq: 5.270000000 GHz g: Free Run Avg Ho		PM Oct 18, 2021 d: None	Trace/Detec	tor
NFE		ten: 20 dB		evice: BTS		
10 dB/div Ref 20.00 dE	im					
Log 10.0						
0.00	mannahihundarw	worker all Al more wall be look	4		ClearV	Vrite
-10.0						_
-20.0						
-30.0 -40.0 tourstanting Maring Ma	ն, թ ե րի ^ք		hanner Inditioner		Ave	rage
-40.0 town when the week of the second	**•		a state a main which	white where the stand		Ŭ
-50.0						
-60.0					Мах	
-70.0					IVIAX	noiu
Center 5.27000 GHz #Res BW 390 kHz		VBW 4 MHz		100.0 MHz		
#Res DW J90 KHZ			5₩	/eep 1 ms	Min	Hold
Occupied Bandwic	lth	Total Power	24.6 dBm			
	7.479 MHz				Dete	ector
						eak▶
Transmit Freq Error	-37.415 kHz	% of OBW Pov	wer 99.00 %		Auto	<u>Man</u>
x dB Bandwidth	39.57 MHz	x dB	-26.00 dB			
MSG			STATUS			

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



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

FCC ID: A3LSMS901JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 57 at 005
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset		Page 57 of 295
© 2022 PCTEST		•		V 9.0 02/01/2019



🧫 Keysight Spectrum Analyzer - Occupied BW 🚽					_	- • • ×
LXX RL RF 50Ω DC C	ORREC Cente	SENSE:INT Freq: 5.290000000 GHz		MOct 18, 2021	Tracel	Detector
NFE	+++ Trig:	Free Run Avg Ho	ld: 100/100			
#1	FGain:Low #Atte	n: 20 dB	Radio De	/ice: BTS		
10 dB/div Ref 20.00 dBm						
10.0		and altread				
0.00	and the second s	and the second s	vi.		CI	ear Write
-10.0			<u> </u>			
-20.0	4					
-30.0	/		What I am			Average
-40.0 worked how allow was a share when the second states of the second			himber and winned which	Minds the co		
-50.0				. Mulass		
-60.0						Max Hold
-70.0						
Center 5.2900 GHz #Res BW 820 kHz	,	/BW 8 MHz		200.0 MHz		
#Res BW 820 KH2			500	eep 1 ms		Min Hold
Occupied Bandwidth		Total Power	24.0 dBm			
	900 MHz					Detector
/4.3						Peak►
Transmit Freq Error	-105.04 kHz	% of OBW Pov	wer 99.00 %		Auto	<u>Man</u>
x dB Bandwidth	79.68 MHz	x dB	-26.00 dB			
MSG			STATUS			

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



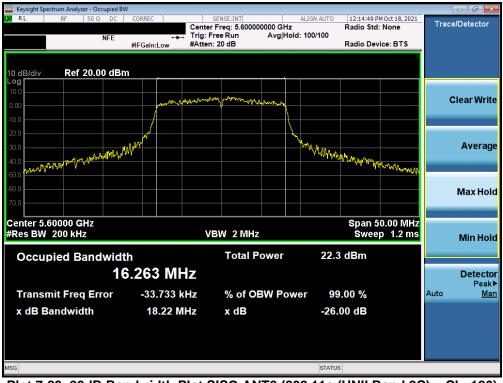
Plot 7-81. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMS901JPN	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 59 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 58 of 295
© 2022 PCTEST			V 9.0 02/01/2019





Plot 7-82. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2C) - Ch. 100)



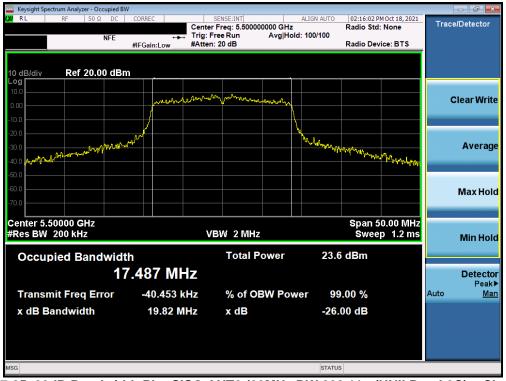
Plot 7-83. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMS901JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 50 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 59 of 295
© 2022 PCTEST			V 9.0 02/01/2019





Plot 7-84. 26dB Bandwidth Plot SISO ANT2 (802.11a (UNII Band 2C) - Ch. 144)



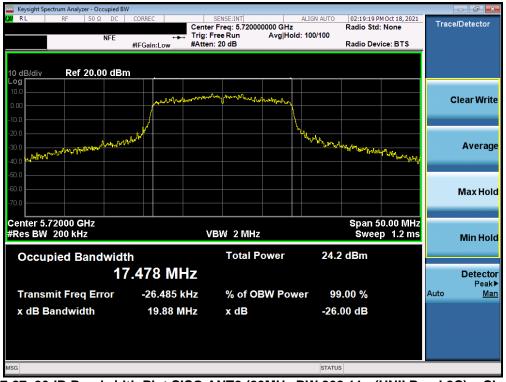
Plot 7-85. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2C) - Ch. 100)

FCC ID: A3LSMS901JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N: Test Dates:		EUT Type:	Dogo 60 of 205	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 60 of 295	
© 2022 PCTEST V 9.0 02/01/2019				





Plot 7-86. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2C) - Ch. 120)



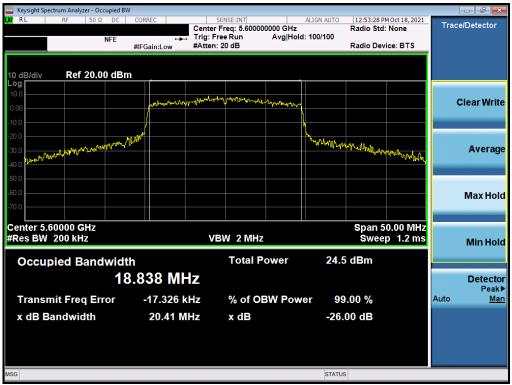
Plot 7-87. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11n (UNII Band 2C) - Ch. 144)

FCC ID: A3LSMS901JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dage 61 of 205		
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 61 of 295		
© 2022 PCTEST V 9.0 02/01/2019					



Keysight Spectrum Analyzer - Occupie	ed BW				
μα RL RF 50 Ω D		SENSE:INT Center Freq: 5.500000 Trig: Free Run #Atten: 20 dB	ALIGN AUTO 0000 GHz Avg Hold: 100/100	12:50:02 PM Oct 18, 20 Radio Std: None Radio Device: BTS	21 Trace/Detector
10 dB/div Ref 20.00 d	Bm			1	
0.00	A short and a short and a short a shor	Juliu with a same with a street with	y-uhandhur		Clear Write
-10.0 -20.0 -30.0 10000000000000000000000000000000000	YW4xerv		Ma particulary	With Marit Mallon Marit	w Average
-50.0 -60.0 -70.0					Max Hold
Center 5.50000 GHz #Res BW 510 kHz		VBW 5 MHz		Span 50.00 M Sweep 1 n	
Occupied Bandwi	_{idth} 18.876 MH	Total Po Z	ower 24.	5 dBm	Detector
Transmit Freq Error			W Power 9	9.00 %	Peak▶ Auto <u>Man</u>
x dB Bandwidth	21.14 MH	lz x dB	-26	.00 dB	
MSG			STATU	JS	

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



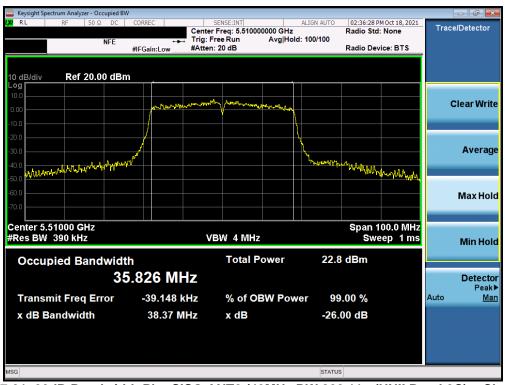
Plot 7-89. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMS901JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dama 00 at 005
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 62 of 295
© 2022 PCTEST			V 9.0 02/01/2019



🔤 Keysight Spectrum Analyzer - Oo	cupied BW					
ίχα RL RF 50 Ω	P. DC CORREC NFE	SENSE:INT Center Freq: 5.72000 Trig: Free Run #Atten: 20 dB	ALIGN AUT 00000 GHz Avg Hold: 100/100	Radio Std: No	one	Trace/Detector
10 dB/div Ref 20.0	00 dBm	m.Jonahorn farmatillasia	Marmine May May			Clear Write
-20.0 -30.0 -40.0 0	handharara		- North Marken	22-24 Langer	warra	Average
-60.0						Max Hold
Center 5.72000 GHz #Res BW 200 kHz Occupied Banc	lwidth	VBW 2 MHz Total P		Span 50.0 Sweep 4.6 dBm		Min Hold
	18.842 M	Ηz				Detector Peak▶
Transmit Freq Er x dB Bandwidth	ror -17.075 20.28 M		-2	99.00 % 26.00 dB	A	uto <u>Man</u>
MSG			ST	ATUS		

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: A3LSMS901JPN	PCTEST* Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 62 of 205	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 63 of 295	
© 2022 PCTEST			V 9.0 02/01/2019	





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: A3LSMS901JPN	PCTEST [®] Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 64 of 205	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 64 of 295	
© 2022 PCTEST			V 9.0 02/01/2019	



Keysight Spectrum Analyzer - Occupied B	W				
0/2 RL RF 50Ω DC	Trig:	SENSE:INT Pr Freq: 5.510000000 GHz Free Run Avg Holo n: 20 dB	Radio St d: 100/100	PM Oct 18, 2021 d: None evice: BTS	Trace/Detector
10 dB/div Ref 20.00 dB	m				
Log 10.0 0.00	nonnonatale namende	prologing and and and and and			Clear Write
-10.0 -20.0 -30.0 -40.0 Malana minarika	Hydred		Mupple mary and a	My Backles	Average
-400 50 .0					Max Hold
Center 5.51000 GHz #Res BW 390 kHz	 \	/BW 4 MHz		100.0 MHz reep 1 ms	Min Hold
Occupied Bandwid	th	Total Power	24.6 dBm		
	7.527 MHz				Detector Peak▶
Transmit Freq Error	-61.863 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	39.15 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: A3LSMS901JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 65 of 205	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 65 of 295	
© 2022 PCTEST			V 9.0 02/01/2019	



CORREC	SENS	TATAT						
#IFGain:Low	Center Fre Trig: Free	q: 5.71000 Run		ALIGN AUTO	Radio Std		Trac	e/Detector
	MUUMAN	kalimphan wija	which march th					Clear Write
Angura A				Lunnung A	hankelykeftulky	r		Average
								Max Hold
lth			ower	25.1	Swe			Min Hold
7.484 MH	Z							Detector Peak▶
			W Pow	-26.	00 dB		Auto	Man
	#FGain:Low	Trig: Free #Atten: 20	Trig: Free Run #Atten: 20 dB	Trig: Free Run #Atten: 20 dB Avg Hold Sm	Image: Sime state Trig: Free Run #Atten: 20 dB Avg Hold: 100/100 Sime state Image: Sime state Image: Sime state Image: Sime state Image: Sime state Image: Sime state Image: Sime state Image: Sime state Image: Sime state Image: Sime state Image: Sime state Image: Sime state Image: Sime state Image: Sime state<	Trig: Free Run Avg Hold: 100/100 Radio Dev Sm Image: Small of the second s	Image: Trig: Free Run #Avg Hold: 100/100 Radio Device: BTS Radio Device: BTS Sm Image: Comparison of the second	Trig: Free Run Avg Hold: 100/100 Radio Device: BTS Sm Radio Device: BTS Sm Sm Marketter: 20 dB Avg Hold: 100/100 Radio Device: BTS Sm Sm Marketter: 20 dB Avg Hold: 100/100 Radio Device: BTS Sm Sm Marketter: 20 dB Avg Hold: 100/100 Marketter: 20 dB Marketter: 20 dB Sm Sm Marketter: 20 dB Marketter: 20 dB Marketter: 20 dB Sm Marketter: 20 dB Marketter: 20 dB Marketter: 20 dB Marketter: 20 dB Marketter: 20 dB Marketter: 20 dB

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



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

FCC ID: A3LSMS901JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 66 of 205	
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset		Page 66 of 295	
© 2022 PCTEST	•	•		V 9.0 02/01/2019	



Keysight Spectrum Analyzer - Occupied	BW				
IXIRL RF 50Ω DC	Cent	SENSE:INT er Freq: 5.610000000 GHz	Rad	52:18 PM Oct 18, 2021 io Std: None	Trace/Detector
NFE		Free Run Avg Ho en: 20 dB	ld: 100/100 Rad	io Device: BTS	
10 dB/div Ref 20.00 dB	3m				
10.0		and the line of th			Clear Write
0.00		and a second and a second s			Clear write
-10.0	<u>/</u>				
-20.0			h.,		Average
-40.0 manufalar and hereward working	ANN C		John Marine Contract	Univerly harristy and	Average
-50.0				and the second	
-60.0					Max Hold
-70.0					
Center 5.6100 GHz			Sp	an 200.0 MHz	
#Res BW 820 kHz		VBW 8 MHz		Sweep 1 ms	Min Hold
Occupied Bandwig	dth	Total Power	24.2 dB	m	
	4.926 MHz				Detector
Transmit Freq Error	-12.417 kHz	% of OBW Pov	ver 99.00	0/	Peak▶ Auto Man
	79.54 MHz	x dB	-26.00 d		
x dB Bandwidth	79.54 WHZ	хав	-20.00 a	в	
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: A3LSMS901JPN	PCTEST [®] Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 67 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 67 of 295
© 2022 PCTEST			V 9.0 02/01/2019



🔤 Keysight Spectrum Analyzer - O										
LXIRL RF 50 S	Ω DC CORF	(EC	SENS Center Fre	SE:INT	0000 GHz	ALIGN AUTO	01:47:14 P	MOct 18, 2021	Trac	e/Detector
	NFE	- -	Trig: Free	Run		d: 100/100				
	#IFG	ain:Low	#Atten: 20	dB			Radio Dev	ice: BTS		
10 dB/div Ref 20.0	00 dBm									
Log 10.0										
0.00		Alpely Trace	and and a start of the	-TVALL'S - VALUE - AND	mem-based					Clear Write
-10.0										
-10.0										
	1 mladtick					Mandress				Avorago
-30.0	We hap to a					and should be a second s	MANIA MARINA	Midney 1		Average
-40.0 Howennet all a start of the second								PUNUMAN		
-50.0	الكركات									
-60.0										Max Hold
-70.0										
Center 5.5300 GHz							Enan 2	00.0 MHz		
#Res BW 820 kHz			VBW	/ 8 MHz				ep 1 ms		Min Hold
										Min Hold
Occupied Band	dwidth			Total P	ower	24.8	dBm			
		86 MH	7							Detector
										Peak►
Transmit Freq Er	rror -	153.98 k	Hz	% of O	3W Pow	er 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth		80.65 M	Hz	x dB		-26.	00 dB			
MSG						STATUS				
MSG						STATUS				

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



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

FCC ID: A3LSMS901JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: Test Dates: 1M2112090153-11.A3L 09/22 - 12/22/2021		EUT Type:	Dama 68 of 205
		Portable Handset	Page 68 of 295
© 2022 PCTEST	•		V 9.0 02/01/2019



🔤 Keysight Spectrum Analyzer - Occup	pied BW								
LXI R L RF 50 Ω		Center Fre Trig: Free	Run	0000 GHz Avg Hold	ALIGN AUTO	Radio Std:		Trac	e/Detector
	#IFGain:Low	#Atten: 20	dB			Radio Dev	ice: BTS		
10 dB/div Ref 20.00	dBm								
Log 10.0	manutation	Matultania	and the form	grand water to be a fill	\			(Clear Write
-10.0									
-30.0	WANNAN AN				Jundymung	Lange Mary Mary	and hours		Average
-50.0									
-70.0									Max Hold
Center 5.6900 GHz #Res BW 820 kHz		VBW	8 MHz				00.0 MHz ep 1 ms		Min Hold
Occupied Bandw			Total P	ower	25.5	dBm			
	76.586 M								Detector Peak▶
Transmit Freq Erro	r 28.048	kHz ^o	% of OE	3W Pow	er 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth	80.68	MHz	k dB		-26.0	00 dB			
MSG					STATUS				

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

FCC ID: A3LSMS901JPN	PCTEST* Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: Test Dates:		EUT Type:	Dogo 60 of 205
1M2112090153-11.A3L 09/22 - 12/22/2021		Portable Handset	Page 69 of 295
© 2022 PCTEST		·	V 9.0 02/01/2019

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.



7.3 6dB Bandwidth Measurement – 802.11a/n/ac/ax

<u>§15.407 (e); RSS-Gen [6.2]</u>

Test Overview and Limit

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

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

Test Procedure Used

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

Test Settings

- The signal analyzers' automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 100 kHz
- 3. VBW <u>></u> 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: A3LSMS901JPN	PCTEST [®] Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N: Test Dates: 1M2112090153-11.A3L 09/22 - 12/22/2021		EUT Type:	Daga 70 of 205		
		Portable Handset	Page 70 of 295		
© 2022 PCTEST V 9.0 02/01/2019					



SISO Antenna-1 6 dB Bandwidth Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
	5745	149	а	6	14.24
	5785	157	а	6	15.10
	5825	165	а	6	16.04
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	13.94
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	15.16
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	15.93
ო	5745	149	ax (20MHz)	6.5/7.2 (MCS0)	13.77
Band	5785	157	ax (20MHz)	6.5/7.2 (MCS0)	15.49
ä	5825	165	ax (20MHz)	6.5/7.2 (MCS0)	14.64
	5755	151	n (40MHz)	13.5/15 (MCS0)	33.93
	5795	159	n (40MHz)	13.5/15 (MCS0)	35.06
	5755	151	ax (40MHz)	13.5/15 (MCS0)	23.10
	5795	159	ax (40MHz)	13.5/15 (MCS0)	30.34
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	71.32
	5775	155	ax (80MHz)	29.3/32.5 (MCS0)	70.07

Table 7-4. Conducted Bandwidth Measurements UNII 3 SISO ANT1



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

FCC ID: A3LSMS901JPN	PCTEST*	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N: Test Dates:		EUT Type:	Dage 71 of 205
1M2112090153-11.A3L	09/22 - 12/22/2021	Portable Handset	Page 71 of 295
© 2022 PCTEST			V 9.0 02/01/2019