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MEASUREMENT REPORT FCC PART 15.407 / ISED RSS-247 UNII OFDMA

Applicant Name:

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

Date of Testing:

4/17 - 6/22/2020 **Test Site/Location:** PCTEST Lab. Columbia, MD, USA **Test Report Serial No.:** 1M2004170065-10-R1.A3L

FCC ID:

A3LSMN986U

Certification

APPLICANT:

Samsung Electronics Co., Ltd.

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

SM-N986U SM-N986U1 Portable Handset 5180 – 5825MHz OFDMA Unlicensed National Information Infrastructure (UNII) Part 15 Subpart E (15.407) RSS-247 Issue 2 ANSI C63.10-2013, KDB 789033 D02 v02r01, KDB 648474 D03 v01r04, KDB 662911 D01 v02r01

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

This revised Test Report (S/N: 1M2004170065-10-R1.FCC Report SNs) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 1 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 1 01 292
© 2020 PCTEST				V 9.0 02/01/2019

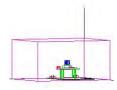


TABLE OF CONTENTS

1.0	INTRO	DUCTIC	۶N	4
	1.1	Scope		4
	1.2	PCTE	ST Test Location	4
	1.3	Test F	acility / Accreditations	4
2.0	PROD	UCT INF	ORMATION	5
	2.1	Equip	ment Description	5
	2.2	Device	e Capabilities	5
	2.3	Test C	Configuration	8
	2.4	EMI S	uppression Device(s)/Modifications	8
3.0	DESC	RIPTION	OF TESTS	9
	3.1	Evalua	ation Procedure	9
	3.2	Radiat	ed Emissions	9
	3.3	Enviro	nmental Conditions	9
4.0	ANTEN	NA REG	QUIREMENTS	10
5.0	MEAS	UREMEI	NT UNCE RTAINTY	11
6.0	TEST	EQUIPM	ENT CALIBRATION DATA	12
7.0	TESTI	RESULT	S	13
	7.1	Summ	ary	13
	7.2	26dB	Bandwidth Measurement – 802.11ax OFDMA	14
	7.3	6dB B	andwidth Measurement – 802.11ax OFDMA	63
	7.4	UNIIC	Dutput Power Measurement – 802.11ax OFDMA	80
	7.5	Maxim	um Power Spectral Density – 802.11ax OFDMA	.100
	7.6	Radiat	ed Spurious Emission Measurements – Above 1GHz	.222
		7.6.1	SISO Antenna-1 Radiated Spurious Emission Measurements	.225
		7.6.2	SISO Antenna-2 Radiated Spurious Emission Measurements	.243
		7.6.3	MIMO Radiated Spurious Emission Measurements	.261
		7.6.4	SISO Antenna-1 Radiated Band Edge Measurements (20MHz BW)	.270
		7.6.5	SISO Antenna-1 Radiated Band Edge Measurements (40MHz BW)	.272
		7.6.6	SISO Antenna-1 Radiated Band Edge Measurements (80MHz BW)	.274
		7.6.7	SISO Antenna-2 Radiated Band Edge Measurements (20MHz BW)	.276
		7.6.8	SISO Antenna-2 Radiated Band Edge Measurements (40MHz BW)	.278
		7.6.9	SISO Antenna-2 Radiated Band Edge Measurements (80MHz BW)	.280
		7.6.10	MIMO Radiated Band Edge Measurements (20MHz BW)	.282
		7.6.11	MIMO Radiated Band Edge Measurements (40MHz BW)	.284
		7.6.12	MIMO Radiated Band Edge Measurements (80MHz BW)	.286
	7.7	Radiat	ed Spurious Emissions Measurements – Below 1GHz	.288
8.0	CONC	LUSION		.292

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 2 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 2 01 2 9 2
© 2020 PCTEST				V 9.0 02/01/2019





MEASUREMENT REPORT



Channel			AN	JTT1	AN	JT2	MIMO		
UNII Band	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	56.364	17.51	59.704	17.76	56.184	17.50	
2A	20	5260 - 5320	54.954	17.40	58.479	17.67	58.731	17.69	
2C	20	5500 - 5720	62.087	17.93	59.566	17.75	54.773	17.39	
3		5745 - 5825	58.345	17.66	57.412	17.59	51.479	17.12	
1		5190 - 5230	47.098	16.73	49.888	16.98	46.638	16.69	
2A	40	5270 - 5310	45.920	16.62	47.424	16.76	49.744	16.97	
2C	40	5510 - 5710	45.499	16.58	49.091	16.91	49.840	16.98	
3		5755 - 5795	46.238	16.65	47.643	16.78	47.094	16.73	
1		5210	38.815	15.89	38.637	15.87	38.691	15.88	
2A	80	5290	36.559	15.63	39.264	15.94	39.589	15.98	
2C	00	5530 - 5690	39.355	15.95	39.719	15.99	36.194	15.59	
3		5775	39.355	15.95	39.355	15.95	39.642	15.98	

EUT Overview

FCC ID: A3LSMN986U	hout to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	st Dates: EUT Type:		Page 3 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 5 01 292
© 2020 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 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

FCC ID: A3LSMN986U	PCTEST Houst forbe part of B	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 4 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset	Fage 4 01 292
© 2020 PCTEST			V 9.0 02/01/2019



2.0 **PRODUCT INFORMATION**

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMN986U**. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter.

Test Device Serial No.: 1326M, 1325M, 1109M, 1107M, 1148M, 1175M, 0697M, 0704M

2.2 Device Capabilities

This device contains the following capabilities:

800/850/1900 CDMA/EvDO Rev0/A, 1x Advanced (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900, WCDMA/HSPA, Multi-band LTE, 5G NR (n5, n12, n71, n41, n66, n2/n25, n260, n261), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer, UWB

	Band 1		Band 2A		Band 2C		Band 3
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
36	5180	52	5260	100	5500	149	5745
:	:	:	:	:	:	:	:
42	5210	56	5280	120	5600	157	5785
:	:	:	:	:	:	:	:
48	5240	64	5320	144	5720	165	5825
		040	00 44 ave (00 MUL-) E	 		 _	

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

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

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

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

	Band 3
Ch.	Frequency (MHz)
151	5755
:	

5795

159

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

Band 1 Ba		Band 2A		Band 2C			Band 3	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	С	h.	Frequency (MHz)
42	5210	58	5290	106	5530	1:	55	5775
				:	:			
				138	5690			

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

FCC ID: A3LSMN986U	Hourd Gribe part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 5 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 5 01 292
© 2020 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:

Mode	Antenna	Bandwidth [MHz]	Channel	Tone	Duty Cycle	
				26T	99.4	
802.11ax	1		36	52T	99.7	
NII RU			30	106T	99.3	
		20		242T	98.1	
		20		26T	99.4	
802.11ax	2		36	52T	99.7	
NII RU	2		50	106T	99.3	
				242T	98.6	
				26T	99.7	
802.11ax	MIMO CDD	20	36	52T	99.3	
NII RU		20	50	106T	98.8	
				242T	97.1	
				26T	98.7	
802 1100				52T	99.0	
802.11ax	1		38	106T	99.3	
NII RU				242T	98.4	
		40		484T	93.2	
		40		26T	98.8	
000.44				52T	99.0	
802.11ax	2	2	38	106T	98.1	
NII RU				242T	98.4	
				484T	95.7	
				26T	99.1	
002.11.				52T	98.1	
802.11ax	MIMO CDD 40	38	106T	96.3		
NII RU					242T	97.1
				484T	88.8	
				26T	99.4	
				52T	99.2	
802.11ax	1		42	106T	99.4	
NII RU	1		42	242T	98.6	
				484T	96.1	
		00		996T	94.7	
		80		26T	99.5	
				52T	99.7	
802.11ax	2		42	106T	99.4	
NII RU	RU 2		42	242T	98.6	
				484T	97.4	
				996T	95.9	
				26T	99.2	
				52T	98.1	
802.11ax	MIMO CDD	CDD 80	42	106T	96.2	
NII RU		00	42	242T	92.7	
				484T	95.5	
				996T	91.2	

Table 2-4. Measured Duty Cycles

FCC ID: A3LSMN986U	Hourd to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 6 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 0 01 292
© 2020 PCTEST				V 9.0 02/01/2019



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

WiFi Configurations		SISO		SDM		MIMO	
VVIFI CO	ringulations	ANT1	ANT2	ANT1	ANT2	ANT1	ANT2
	11ax (20MHz)	✓	\checkmark	\checkmark	✓	✓	✓
5GHz	11ax (40MHz)	✓	\checkmark	\checkmark	✓	✓	✓
	11ax (80MHz)	\checkmark	\checkmark	✓	✓	✓	\checkmark

Table 2-5. Frequency / Channel Operations

 \checkmark = Support ; * = NOT Support SISO = Single Input Single Output SDM = Spatial Diversity Multiplexing – MIMO function

3. This device supports simultaneous transmission operation, which allows for two SISO channels to operate independent of one another in the 2.4GHz (WLAN & BT) and 5GHz bands simultaneously on each antenna. The following tables show the worst case configurations determined during testing. The data for these configurations is contained in this test report. The BT + 5GHz case is not considered as worst case since the BT power is lower than the 2.4GHz WLAN power.

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

Description	2.4 GHz Emission	5 GHz Emission
Antenna	1	2
Channel	11	157
Operating Frequency (MHz)	2462	5785
Data Rate (Mbps)	1	MCS0
Mode	802.11b	802.11n

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

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

Description	2.4 GHz Emission	5 GHz Emission
Antenna	2	1
Channel	1	100
Operating Frequency (MHz)	2412	5500
Data Rate (Mbps)	1	MCS0
Mode	802.11b	802.11n

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

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

Description	2.4 GHz Emission	5 GHz Emission
Antenna	1, 2	1, 2
Channel	1	100
Operating Frequency (MHz)	2412	5500
Data Rate (Mbps)	1	MCS0
Mode	802.11b	802.11n

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

FCC ID: A3LSMN986U	Hourd to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 7 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage / 01 232
© 2020 PCTEST				V 9.0 02/01/2019



2.3 Test Configuration

The EUT was tested per the guidance of KDB 789033 D02 v02r01. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing.

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with the EUT lying flat on an authorized wireless charging pad (WCP) Model: EP-N5100 while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

2.4 EMI Suppression Device(s)/Modifications

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

FCC ID: A3LSMN986U	PCTEST Houst forbe part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 8 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 0 01 292
© 2020 PCTEST				V 9.0 02/01/2019



3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) and the guidance provided in KDB 789033 D02 v02r01 were used in the measurement of the EUT.

Deviation from measurement procedure.....None

3.2 Radiated Emissions

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

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

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

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

3.3 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: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 9 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Page 9 01 292
© 2020 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: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 10 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 1001292
© 2020 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: A3LSMN986U	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 11 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 1101292
© 2020 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)	10/30/2019	Annual	10/30/2020	WL25-1
-	WL40-1	Conducted Cable Set (40GHz)	3/13/2020	Annual	3/13/2021	WL40-1
-	WL25-4	Conducted Cable Set (25GHz)	1/22/2020	Annual	1/22/2021	WL25-4
Agilent	N9038A	MXE EMI Receiver	7/17/2019	Annual	7/17/2020	MY51210133
Anritsu	ML2495A	Power Meter	12/17/2019	Annual	12/17/2020	941001
Anritsu	MA2411B	Pulse Power Sensor	12/4/2019	Annual	12/4/2020	846215
Anritsu	MA2411B	Pulse Power Sensor	8/14/2019	Annual	8/14/2020	1315051
Anritsu	ML2495A	Power Meter	1/15/2020	Annual	1/15/2021	1328004
Anritsu	ML2496A	Power Meter	11/6/2019	Annual	11/6/2020	1405003
Anritsu	MA2411B	Pulse Power Sensor	8/27/2019	Annual	8/27/2020	1339027
Anritsu	MA2411B	Pulse Power Sensor	10/15/2019	Annual	10/15/2020	1339026
Anritsu	MS46322A	Vector Network Analyzer	8/19/2019	Annual	8/19/2020	1521001
Anritsu	36585K-2F	Precision Autocal 2-Port	7/16/2019	Annual	7/16/2020	1628014
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2019	Biennial	10/10/2021	121034
EMCO	3160-09	Small Horn (18 - 26.5GHz)	8/9/2018	Biennial	8/9/2020	135427
EMCO	3160-10	Small Horn (26.5 - 40GHz)	8/9/2018	Biennial	8/9/2020	130993
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	2/14/2019	Biennial	2/14/2021	125518
ETS-Lindgren	3115	Double Ridged Guide Horn 750MHz - 18GHz	3/12/2020	Biennial	3/12/2022	150693
Pasternack	NMLC-2	Line Conducted Emissions Cable (NM)	1/9/2020	Annual	1/9/2021	NMLC-2
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	11/1/2019	Annual	11/1/2020	100040
Rohde & Schwarz	TS-PR40	26.5-40 GHz Pre-Amplifier	11/1/2019	Annual	11/1/2020	100037
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/23/2019	Annual	9/23/2020	100348
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/11/2019	Annual	7/11/2020	102134
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/8/2019	Annual	7/8/2020	102133
Sunol	DRH-118	Horn Antenna (1-18 GHz)	8/27/2019	Biennial	8/27/2021	A042511

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: A3LSMN986U		MEASUREMENTREPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 12 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 12 01 292
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7.0 TEST RESULTS

7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.
FCC ID:	A3LSMN986U
FCC Classification:	Unlicensed National Information Infrastructure (UNII)

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
N/A	RSS-Gen [6.7]	26dB Bandwidth	N/A		PASS	Section 7.2
15.407(e)	RSS-Gen [6.7]	6dB Bandwidth	>500kHz(5725-5850MHz)		PASS	Section 7.3
15.407 (a.1.iv), (a.2), (a.3)	RSS-247 [6.2]	Maximum Conducted Output Power	Maximum conducted powers must meet the limits detailed in 15.407 (a) (RSS-247 [6.2])	CONDUCTED	PASS	Section 7.4
15.407 (a.1.iv), (a.2), (a.3)	RSS-247 [6.2]	Maximum Power Spectral Density	Maximum power spectral density must meet the limits detailed in 15.407 (a) (RSS-247 [6.2])		PASS	Section 7.5
15.407(h)	RSS-247 [6.3]	Dynamic Frequency Selection	See DFS Test Report		PASS	See DFS Test Report
15.407(b.1), (2), (3), (4)	RSS-247 [6.2]	Undesirable Emissions	Undesirable emissions must meet the limits detailed in 15.407(b) (RSS-247 [6.2])		PASS	Section 7.6
15.205, 15.407(b.1), (4), (5), (6)	RSS-Gen [8.9]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209 (RSS-Gen [8.9])	RADIATED	PASS	Section 7.6, 7.7

Table 7-1. Summary of Test Results

Notes:

- 1) All channels, modes, and modulations/data rates were investigated among all UNII bands. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "UNII Automation," Version 4.7.
- 5) For radiated band edge, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "Chamber Automation," Version 1.3.1.
- 802.11ax OFDMA testing was performed for all signal tone configurations as specified by the 802.11ax standard. Worst case results are determined and reported per the guidance provided at the October 2018 TCB Workshop.
- Only one RU index could be selected at a time so no contiguous or non-contiguous RU's were considered for testing.

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 13 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 1301292
© 2020 PCTEST				V 9.0 02/01/2019



7.2 26dB Bandwidth Measurement – 802.11ax OFDMA 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

The 26dB Bandwidth measurement for each channel was measured with the RU index showing the highest conducted power.

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Page 14 of 292		
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 14 01 292		
2020 PCTEST V 9.0.02/01/2019						



SISO Antenna-1 26 dB Bandwidth Measurements (26 Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
	5180	36	ax (20MHz)	26T	MCS0	17.15
_	5200	40	ax (20MHz)	26T	MCS0	25.64
Band 1	5240	48	ax (20MHz)	26T	MCS0	20.14
Bar	5190	38	ax (40MHz)	26T	MCS0	19.95
	5230	46	ax (40MHz)	26T	MCS0	17.37
	5210	42	ax (80MHz)	26T	MCS0	34.74
	5260	52	ax (20MHz)	26T	MCS0	18.15
∢	5280	56	ax (20MHz)	26T	MCS0	15.00
d 2	5320	64	ax (20MHz)	26T	MCS0	17.03
Band 2A	5270	54	ax (40MHz)	26T	MCS0	18.98
ш	5310	62	ax (40MHz)	26T	MCS0	18.90
	5290	58	ax (80MHz)	26T	MCS0	18.57
	5500	100	ax (20MHz)	26T	MCS0	18.30
	5600	120	ax (20MHz)	26T	MCS0	17.54
	5720	144	ax (20MHz)	26T	MCS0	17.48
2C	5510	102	ax (40MHz)	26T	MCS0	18.52
Band 2C	5590	118	ax (40MHz)	26T	MCS0	19.75
Ba	5710	142	ax (40MHz)	26T	MCS0	17.99
	5530	106	ax (80MHz)	26T	MCS0	19.67
	5610	122	ax (80MHz)	26T	MCS0	18.37
	5690	138	ax (80MHz)	26T	MCS0	34.84

Table 7-2. Conducted Bandwidth Measurements SISO ANT1 (26 Tones)

FCC ID: A3LSMN986U	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 15 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 1501292
© 2020 PCTEST				V 9.0 02/01/2019





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



Plot 7-2. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 40)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 16 of 202
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Page 16 of 292
© 2020 PCTEST				V 9.0 02/01/2019





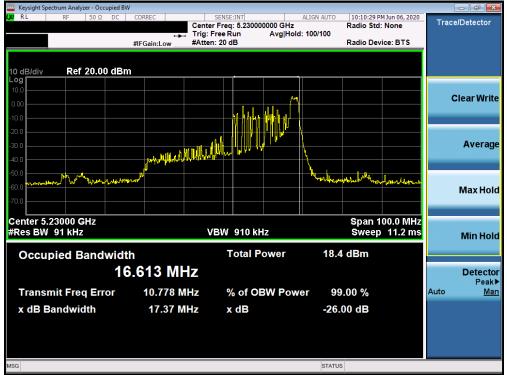
Plot 7-3. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 48)



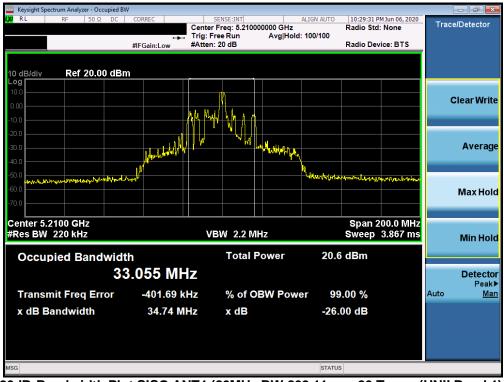
Plot 7-4. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 38)

FCC ID: A3LSMN986U	Houst for be part of B	MEASUREMENT REPORT (CERTIFICATION)	SUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 17 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 17 01 292
© 2020 PCTEST	•			V 9.0 02/01/2019





Plot 7-5. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 46)



Plot 7-6. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 42)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 18 of 202
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Page 18 of 292
© 2020 PCTEST				V 9.0 02/01/2019





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



Plot 7-8. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMN986U		MEASUREMENTREPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 19 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 1901292
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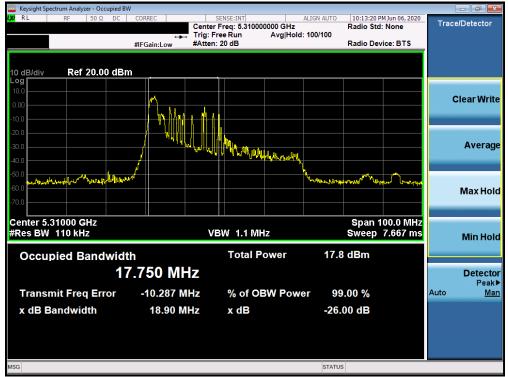
Plot 7-9. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 64)



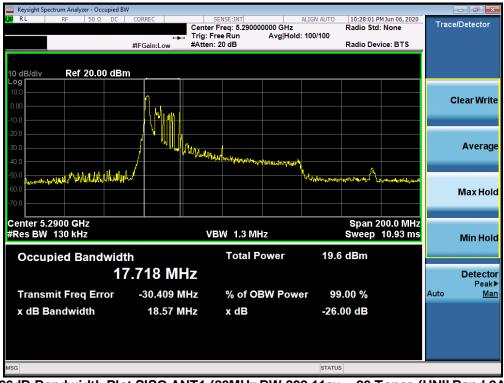
Plot 7-10. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 54)

FCC ID: A3LSMN986U		MEASUREMENTREPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 20 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 20 01 292
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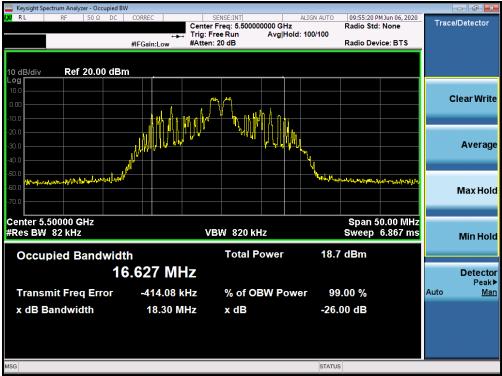
Plot 7-11. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 62)



Plot 7-12. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMN986U		MEASUREMENTREPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 21 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		
© 2020 PCTEST		·		V 9.0 02/01/2019





Plot 7-13. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 100)



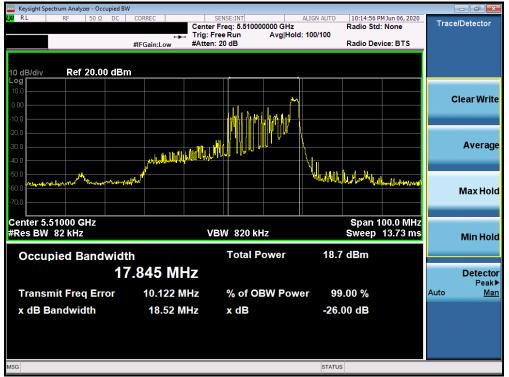
Plot 7-14. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 22 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 22 01 292
© 2020 PCTEST				V 9.0 02/01/2019





Plot 7-15. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 144)



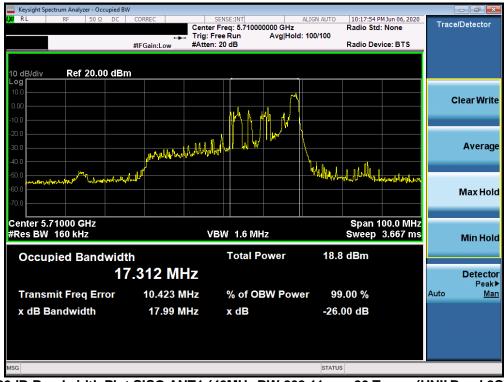
Plot 7-16. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	AMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 23 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 23 01 292
© 2020 PCTEST				V 9.0 02/01/2019





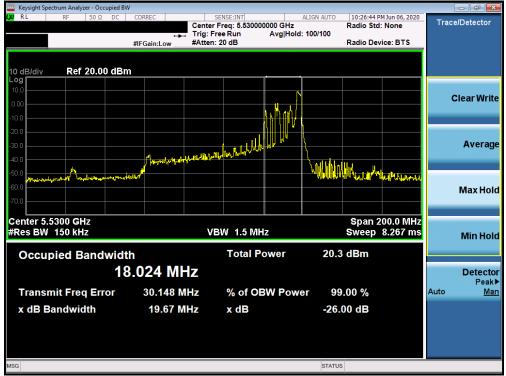
Plot 7-17. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 118)



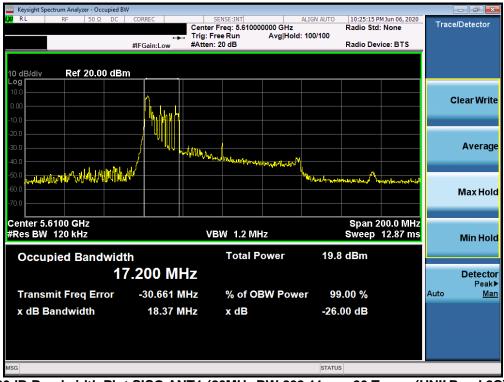
Plot 7-18. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Page 24 of 202		
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	0 Portable Handset Page 24 of 292				
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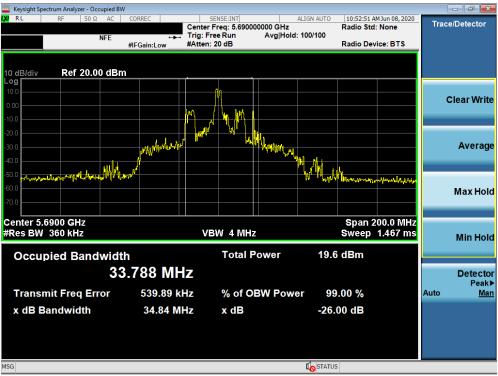
Plot 7-19. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 106)



Plot 7-20. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 122)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Page 25 of 292		
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset				
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Plot 7-21. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax – 26 Tones (UNII Band 2C) – Ch. 138)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 26 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 20 01 292
© 2020 PCTEST				V 9.0 02/01/2019



SISO Antenna-1 26 dB Bandwidth Measurements (Full Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
	5180	36	ax (20MHz)	242T	MCS0	23.36
	5200	40	ax (20MHz)	242T	MCS0	22.65
Band 1	5240	48	ax (20MHz)	242T	MCS0	31.74
Bar	5190	38	ax (40MHz)	484T	MCS0	48.82
	5230	46	ax (40MHz)	484T	MCS0	40.50
	5210	42	ax (80MHz)	996T	MCS0	81.24
	5260	52	ax (20MHz)	242T	MCS0	35.14
	5280	56	ax (20MHz)	242T	MCS0	38.71
Band 2A	5320	64	ax (20MHz)	242T	MCS0	36.77
Ban	5270	54	ax (40MHz)	484T	MCS0	52.19
	5310	62	ax (40MHz)	484T	MCS0	67.25
	5290	58	ax (80MHz)	996T	MCS0	102.20
	5500	100	ax (20MHz)	242T	MCS0	33.37
	5580	116	ax (20MHz)	242T	MCS0	35.95
	5700	140	ax (20MHz)	242T	MCS0	36.42
ပ္ရ	5510	102	ax (40MHz)	484T	MCS0	65.33
Band 2C	5590	118	ax (40MHz)	484T	MCS0	71.44
B	5710	142	ax (40MHz)	484T	MCS0	52.80
	5530	106	ax (80MHz)	996T	MCS0	103.50
	5610	122	ax (80MHz)	996T	MCS0	97.51
	5690	138	ax (80MHz)	996T	MCS0	96.79

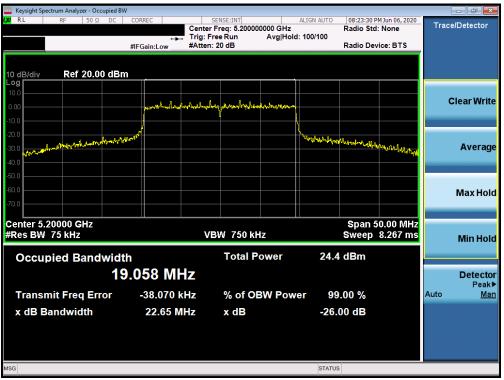
Table 7-3. Conducted Bandwidth Measurements SISO ANT1 (Full Tones)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 27 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 27 01 292
© 2020 PCTEST				V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied B\	V				- ē x
μX RL RF 50 Ω DC	Center		Radio Ste d: 100/100	PM Jun 06, 2020 d: None vice: BTS	Trace/Detector
10 dB/div Ref 20.00 dBr	n				
0.00	and the second s	ซา _ป ใกละเวงาะระการใจราชตะกระชาญา			Clear Write
-10.0 -20.0 -30.0	MAN		h Mulun langer holy of the	n.e	•
-30.0				^{cyr r} Wbdytydylfy	Average
-60.0					Max Hold
Center 5.18000 GHz #Res BW 220 kHz	VI	BW 2.2 MHz		50.00 MHz eep 1 ms	Min Hold
Occupied Bandwidt		Total Power	22.6 dBm		Detector
Transmit Freq Error	39.361 kHz	% of OBW Pow	ver 99.00 %		Detector Peak► Auto <u>Man</u>
x dB Bandwidth	23.36 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-22. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 1) - Ch. 36)



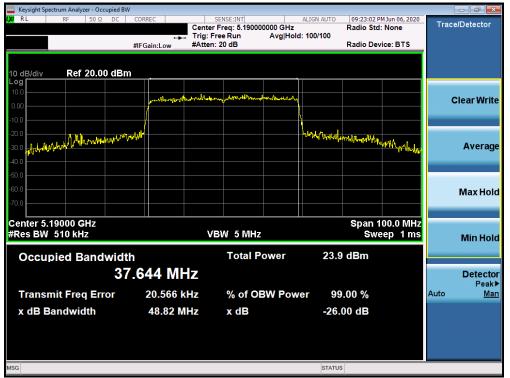
Plot 7-23. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 1) - Ch. 40)

FCC ID: A3LSMN986U		MEASUREMENTREPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 28 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 20 01 292
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Keysight Spectrum Analyzer - Occupied	BW						
LXI RL RF 50Ω DC	CORREC	SENSE:INT Center Freg: 5.24000	ALIGN AUTO	08:27:29 PN Radio Std:	1 Jun 06, 2020	Trace	/Detector
		Trig: Free Run	Avg Hold:>100/100				
	#IFGain:Low	#Atten: 20 dB		Radio Devi	ce: BTS		
10 dB/div Ref 20.00 dl	Bm						
10.0							
	Barrowski	withered and mainthe	& Mohrowing			c	lear Write
0.00	4		\ <u>.</u>				
-10.0	Lohan		Myrolway	يدر بالد			
-20.0				when white	when the well		
-30.0							Average
-40.0							
-50.0							
-60.0							Max Hold
-70.0							Μάλ Πυίμ
Center 5.24000 GHz					0.00 MHz		
#Res BW 330 kHz		VBW 3 MHz		Swe	ep 1 ms		Min Hold
Occurried Denduci		Total P	ower 24	7 dBm			
Occupied Bandwi			ower 24.	ubili			
	19.344 MH	Z					Detector
Transmit From Freeze	0 260 ki	l= % of O		00.0/		Auto	Peak▶ Man
Transmit Freq Error	8.260 ki	12 % 01 OE		9.00 %		Auto	IVIAII
x dB Bandwidth	31.74 MI	Hz xdB	-26.	00 dB			
MSG			STATU	s			

Plot 7-24. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 1) - Ch. 48)



Plot 7-25. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 1) - Ch. 38)

FCC ID: A3LSMN986U	Houst for be part of B	MEASUREMENTREPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 29 of 292
1M2004170065-10-R1.A3L 4/17 - 6/22/2020		Portable Handset		Page 29 01 292
© 2020 PCTEST	•	·		V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied BW	/				- 6 - ×
UM RL RF 50 Ω DC	+++ Trig: I	SENSE:INT Freq: 5.230000000 GHz Free Run Avg Hol n: 20 dB	ALIGN AUTO 09:24:15 F Radio Sto d: 100/100 Radio De		Trace/Detector
10 dB/div Ref 20.00 dBn	n				
Log 10.0 0.00	or and a second and a second and	oute pormula or function of the second			Clear Write
-10.0 -20.0 -30.0	nparth		homelle layped provident	WAG	
-40.0				" " "White will fight	Average
-50.0					Max Hold
Center 5.23000 GHz #Res BW 510 kHz		/BW 5 MHz		I00.0 MHz eep 1 ms	Min Hold
Occupied Bandwidt		Total Power	24.2 dBm		
37 Transmit Freq Error	7.772 MHz 17.062 kHz	% of OBW Pow	ver 99.00 %		Detector Peak▶ Auto Man
x dB Bandwidth	40.50 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-26. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 1) - Ch. 46)



Plot 7-27. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax - 996 Tones (UNII Band 1) - Ch. 42)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Т Туре:	
1M2004170065-10-R1.A3L	065-10-R1.A3L 4/17 - 6/22/2020 Portable Handset			Page 30 of 292
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🔤 Keysight Spectrum Analyzer - Occu	ipied BW							
LX RL RF 50 Ω	DC CORREC		E:INT q: 5.260000000 GH	ALIGN AUTO	08:28:40 P Radio Std	M Jun 06, 2020	Trac	e/Detector
		🛶 Trig: Free F	Run Avg∣H	lold: 100/100				
	#IFGain:Low	#Atten: 20	dB		Radio Dev	ice: BTS		
10 dB/div Ref 20.00	dBm							
Log 10.0								
0.00	the states	wenter the loss of the	wall and a state of the second s	ron			(Clear Write
49.0								
	كملجهما فيقلوها			TV WARDON WY	well well and			
-20.0						through the		Average
-30.0								Average
-40.0								
-50.0								
-60.0								Max Hold
-70.0								
Center 5.26000 GHz					Snan 5	0.00 MHz		
#Res BW 330 kHz		VBW	3 MHz			ep 1 ms		Min Hold
								Min Hold
Occupied Bandy	width		Total Power	24.6	i dBm			
	19.290 N	ЛНт						Detector
								Peak▶
Transmit Freq Erro	or -17.03	8 kHz	% of OBW Po	ower 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth	35.14	MHz >	k dB	-26.	00 dB			
MSG				STATUS				
mod				314103				

Plot 7-28. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 2A) - Ch. 52)



Plot 7-29. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMN986U	Houst for be part of B	MEASUREMENT REPORT (CERTIFICATION)	G	pproved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 21 of 202	
1M2004170065-10-R1.A3L 4/17 - 6/22/2020		Portable Handset	F	Page 31 of 292	
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🔤 Keysight Spectrum Analyzer - Occ										
LXI RL RF 50 Ω	DC CORR	EC		ISE:INT eq: 5.32000	0000 GHz	ALIGN AUTO	08:32:15 P Radio Std	M Jun 06, 2020	Trac	e/Detector
			Trig: Free	Run	Avg Hold	I: 100/100				
	#IFG	ain:Low	#Atten: 20	0 dB			Radio Dev	ice: BTS		
10 dB/div Ref 20.00) dBm									
10.0		11 400 11	March Ollo Seller at	<u>โนะเวราให้ไ</u> ประหุณภั	D. Do anti-constitution					
0.00	/	processing of	The day is a marked	Julian Charles I Charles	Olements, M.P.				(Clear Write
-10.0						4				
-20.0	and we have a for the second					warware gange	hlundarung	almon as		
-30.0								and the second second		Average
-40.0										
-50.0										
-60.0										
										Max Hold
-70.0										
Center 5.32000 GHz							Span 5	0.00 MHz		
#Res BW 360 kHz			VBV	V 4 MHz			Swe	ep 1 ms		Min Hold
				Total P	owor	24.0	dBm			
Occupied Band			_	TOLAT	ower	24.0	UDIII			
	19.52	23 M⊦	Z							Detector
Transmit Freq Err	or -1	18.354 k	Hz	% of OE	W Pow	er 99	.00 %		Auto	Peak▶ <u>Man</u>
x dB Bandwidth		36.77 M	U 7	x dB		-26	00 dB			
		50.77 W	HZ	X UD		-20.	00 UB			
MSG						STATUS				

Plot 7-30. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 2A) - Ch. 64)



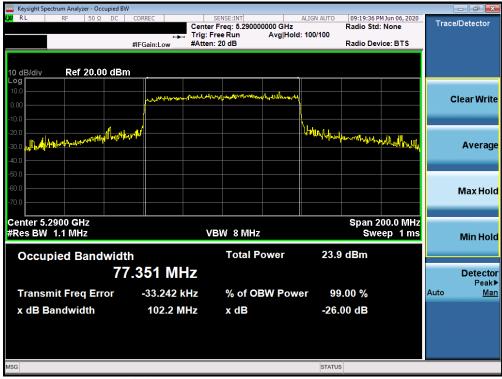
Plot 7-31. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 2A) - Ch. 54)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	EUT Type:	
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Page 32 of 292
© 2020 PCTEST				V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupie	ed BW									
<mark>(X)</mark> RL RF 50Ω D	CORREC		Center Fr	ISE:INT eq: 5.31000		ALIGN AUTO	09:27:01 P Radio Std	MJun 06, 2020 : None	Trac	e/Detector
	#IFGain		Trig: Free #Atten: 20		Avg Hold	d: 100/100	Radio Dev	ice: BTS		
10 dB/div Ref 20.00 c	lBm									
Log 10.0										
0.00	m	North and and and	and a contraction of the second	Madmilla	+What will n					Clear Write
-10.0]			_	
-20.0	manam					MP440	Mwilden Autom			
-30.0 Mar 1/10 mm							the state of the s	, while a light of the		Average
-40.0										
-50.0										
-60.0										Max Hold
-70.0										
Center 5.31000 GHz							Span 1	00.0 MHz		
#Res BW 620 kHz			VBV	V 6 MHz				ep 1 ms		Min Hold
	: -141-			Total P	owor	24.2	dBm			
Occupied Bandw				TOLATE	ower	24.5	UBIII			
	37.734	4 MH	Z							Detector Peak▶
Transmit Freq Error	-12	.673 kH	z	% of O	BW Pow	ver 99	.00 %		Auto	Man
x dB Bandwidth	6	7.25 MF	z	x dB		-26.	00 dB			
MSG						STATUS				

Plot 7-32. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 2A) - Ch. 62)



Plot 7-33. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax - 996 Tones (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:	Туре:		
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Page 33 of 292	
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www.www.com analyzer - Occupied BW							- • •
KL RF 50Ω DC C		SENSE:INT	ALIGN AUTO	08:33:36 P	M Jun 06, 2020	Trac	e/Detector
	Trig: F	ree Run Avg H	z old: 100/100	Radio Stu	None		
#	IFGain:Low #Atten	: 20 dB		Radio Dev	ice: BTS		
10 dB/div Ref 20.00 dBm							
Log 10.0							
0.00	Julia Land and a later and a start and	in white we wanted and the started	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				Clear Write
			l.				
-10.0	r l		Www. Www.	why have			
a children f.					" stud men and		
-30.0							Average
-40.0							
-50.0							
-60.0							Max Hold
-70.0							
Center 5.50000 GHz #Res BW 390 kHz	v	BW 4 MHz			0.00 MHz ep 1 ms		
#Res BW J90 KHZ	V			300	ep mis		Min Hold
Occupied Bandwidth		Total Power	24.7	dBm		_	
	475 MHz						Detector
19.4							Peak
Transmit Freq Error	-1.239 kHz	% of OBW Po	wer 99	.00 %		Auto	Man
x dB Bandwidth	33.37 MHz	x dB	-26.	00 dB			
			201				
NSO			CTATIC				
MSG			STATUS	·			

Plot 7-34. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax – 242 Tones (UNII Band 2C) – Ch. 100)



Plot 7-35. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 34 of 292	
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 34 01 292	
© 2020 PCTEST				V 9.0 02/01/2019	



🔤 Keysight Spectrum Analyzer - Occupied BW 💿 🔂 💌							
LXX RL RF 50Ω DC COR		NSE:INT reg: 5.720000000 GHz	ALIGN AUTO	08:36:22 P	M Jun 06, 2020	Trac	e/Detector
	Trig: Free	e Run Avg Hold	d: 100/100	Raulo Stu	None		
#IFG	Gain:Low #Atten: 2	0 dB		Radio Dev	ice: BTS		
10 dB/div Ref 20.00 dBm							
Log 10.0							
	mound through the and my the	Marin Marin Mary					Clear Write
0.00							
-10.0			handerstan	Marin Lord			
-20.0 untrativition and an and the				an aleta da Mal	How was a stranger to		
-30.0							Average
-40.0							
-50.0							
-60.0							Max Hold
-70.0							ινίαχ ποιά
Center 5.72000 GHz					0.00 MHz		
#Res BW 360 kHz	VBI	N/4 MHz		Swe	ep 1 ms		Min Hold
		Total Power	24.6	dBm			
Occupied Bandwidth		Total Power	24.0	авт			
19.4	60 MHz						Detector
Tana a sait Fas a Fassa	24 244 1.11-			00.0/		Auto	Peak►
Transmit Freq Error -	24.211 kHz	% of OBW Pow	er 99	.00 %		Auto	Man
x dB Bandwidth	36.42 MHz	x dB	-26.0	00 dB			
MSG			STATUS				

Plot 7-36. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax – 242 Tones (UNII Band 2C) – Ch. 144)



Plot 7-37. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 35 of 292	
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset			
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Keysight Spectrum Analyzer - Occupied BW					- ē 💌
			Radio S d: 100/100	5 PM Jun 06, 2020 td: None evice: BTS	Trace/Detector
10 dB/div Ref 20.00 dBm					
Log 10.0 0.00	jonglangeligden der sollik kunne	an manakalistan tan tan ta			Clear Write
-10.0 -20.0 -30.0 Www.html/h.t.f.mlh/m.met/m -40.0	ullu li		Wally and a start of the start	^{ֈֈֈ} ՠ _{֎՟ՠՠ֎} ֈ֍ _{ՠՠ} ֈֈՠ	Average
-50.0					
-60.0					Max Hold
Center 5.59000 GHz #Res BW 750 kHz	VE	BW 8 MHz		100.0 MHz veep 1 ms	Min Hold
Occupied Bandwidth	า	Total Power	24.3 dBm		
37.899 MHz					Detector Peak▶
Transmit Freq Error	-24.388 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	71.44 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-38. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax – 484 Tones (UNII Band 2C) – Ch. 118)



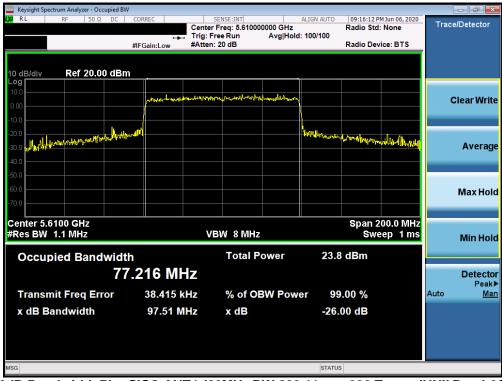
Plot 7-39. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 36 of 292	
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset			
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Keysight Spectrum Analyzer - Occupied	IBW				- ē 🔀
L X RL RF 50 Ω DC	Cer Tri	SENSE:INT hter Freq: 5.530000000 GH; g: Free Run Avg H tten: 20 dB	z Radio Sto old: 100/100	PMJun 06, 2020 d: None evice: BTS	Trace/Detector
10 dB/div Ref 20.00 df	3m				
Log 10.0 0.00	Horan Maria Jorgia	winston, populitor Weathorners	n		Clear Write
-10.0 -20.0 -30.0 How Define And the American American American American Americ	Ally-Ally		for Marchelyn Hraufmanny	walling_Junita	Average
-50.0 -60.0 -70.0					Max Hold
Center 5.5300 GHz #Res BW 1 MHz		VBW 8 MHz		200.0 MHz eep 1 ms	Min Hold
Occupied Bandwig	dth	Total Power	23.9 dBm		
	7.186 MHz				Detector Peak▶
Transmit Freq Error	28.880 kHz	% of OBW Po	wer 99.00 %		Auto <u>Man</u>
x dB Bandwidth	103.5 MHz	x dB	-26.00 dB		
MSG			STATUS		

Plot 7-40. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax - 996 Tones (UNII Band 2C) - Ch. 106)



Plot 7-41. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax - 996 Tones (UNII Band 2C) - Ch. 122)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 37 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 37 01 292
V 9.0 02/01/2019				



#Atten: 20 dB	ALIGN AUTO 09:14:45 PM Radio Std: 1: 100/100 Radio Devi		Trace/Detector
annainna an taol an tao			Clear Write
	her the week of the stand	Munhuhay	Average
			Max Hold
VBW 8 MHz Total Power			Min Hold
Hz % of OBW Pow	-26.00 dB	,	Detector Peak≯ Auto <u>Man</u>
	Total Power IZ Hz % of OBW Pow	Span 2 VBW 8 MHz Total Power 23.8 dBm Iz Hz % of OBW Power 99.00 %	VBW 8 MHz Span 200.0 MHz VBW 8 MHz Sweep 1 ms Total Power 23.8 dBm IZ Hz % of OBW Power 99.00 % Hz x dB -26.00 dB

Plot 7-42. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax – 996 Tones (UNII Band 2C) – Ch. 138)

FCC ID: A3LSMN986U	PCTEST Pout forby part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 38 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 30 01 292
© 2020 PCTEST				V 9.0 02/01/2019



SISO Antenna-2 26dB Bandwidth Measurements (26 Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
	5180	36	ax (20MHz)	26T	MCS0	20.02
	5200	40	ax (20MHz)	26T	MCS0	18.53
pt pt	5240	48	ax (20MHz)	26T	MCS0	6.25
Band 1	5190	38	ax (40MHz)	26T	MCS0	21.04
	5230	46	ax (40MHz)	26T	MCS0	19.45
	5210	42	ax (80MHz)	26T	MCS0	32.88
	5260	52	ax (20MHz)	26T	MCS0	18.90
∢	5280	56	ax (20MHz)	26T	MCS0	17.59
d 2	5320	64	ax (20MHz)	26T	MCS0	17.29
Band 2A	5270	54	ax (40MHz)	26T	MCS0	20.92
	5310	62	ax (40MHz)	26T	MCS0	20.05
	5290	58	ax (80MHz)	26T	MCS0	38.23
	5500	100	ax (20MHz)	26T	MCS0	13.30
	5600	120	ax (20MHz)	26T	MCS0	15.06
	5720	144	ax (20MHz)	26T	MCS0	19.70
2C	5510	102	ax (40MHz)	26T	MCS0	16.75
Band	5590	118	ax (40MHz)	26T	MCS0	18.81
Ba	5710	142	ax (40MHz)	26T	MCS0	17.99
	5530	106	ax (80MHz)	26T	MCS0	36.56
	5610	122	ax (80MHz)	26T	MCS0	37.16
	5690	138	ax (80MHz)	26T	MCS0	34.84

Table 7-4. Conducted Bandwidth Measurements SISO ANT2 (26 Tones)

FCC ID: A3LSMN986U	PCTEST	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 39 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 39 01 292
© 2020 PCTEST				V 9.0 02/01/2019





Plot 7-43. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 36)



Plot 7-44. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 40)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 40 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 40 01 292
© 2020 PCTEST				V 9.0 02/01/2019





Plot 7-45. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 48)



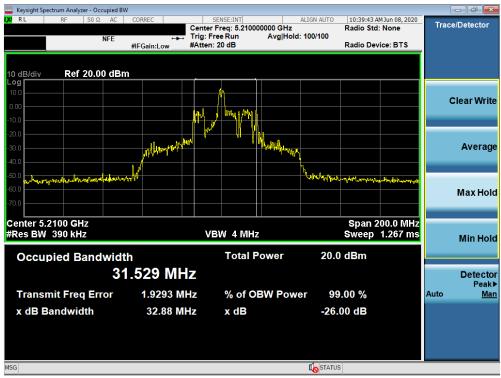
Plot 7-46. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 38)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 41 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset	Fage 41 01 292
© 2020 PCTEST			V 9.0 02/01/2019





Plot 7-47. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 46)



Plot 7-48. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax – 26 Tones (UNII Band 1) – Ch. 42)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 42 of 202	
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Page 42 of 292	
© 2020 PCTEST				V 9.0 02/01/2019	





Plot 7-49. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 52)



Plot 7-50. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 43 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Page 43 01 292
© 2020 PCTEST				V 9.0 02/01/2019





Plot 7-51. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 64)



Plot 7-52. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 54)

FCC ID: A3LSMN986U	Hourd to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 11 of 202	
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Page 44 of 292	
0 2020 PCTEST V 9.0 02/01/2019					





Plot 7-53. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 62)



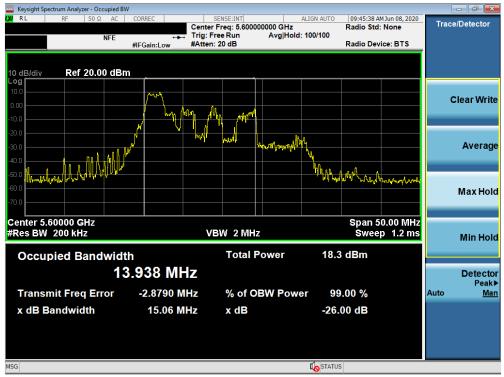
Plot 7-54. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Page 45 of 202		
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Page 45 of 292		
V 9.0 02/01/2019						





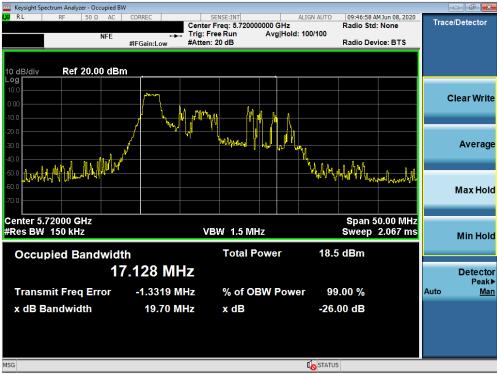
Plot 7-55. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 100)



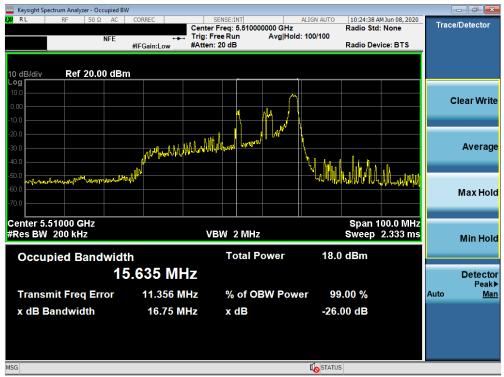
Plot 7-56. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMN986U	Houst for be part of B	MEASUREMENT REPORT (CERTIFICATION)	ING	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 46 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	4/17 - 6/22/2020 Portable Handset		Fage 40 01 292
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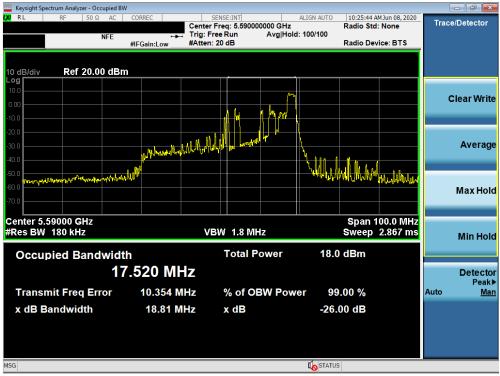
Plot 7-57. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 144)



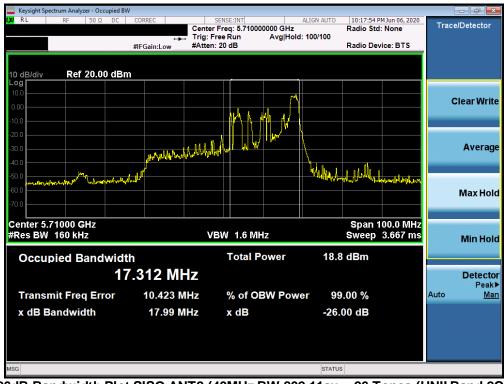
Plot 7-58. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMN986U	Houst for be part of B	MEASUREMENT REPORT (CERTIFICATION)	UNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 47 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	I/17 - 6/22/2020 Portable Handset		Fage 47 01 292
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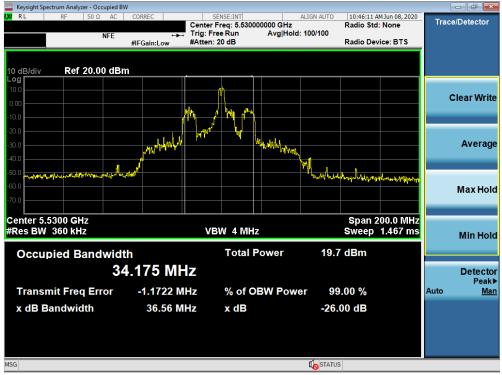
Plot 7-59. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 118)



Plot 7-60. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Page 48 of 292			
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 40 01 292			
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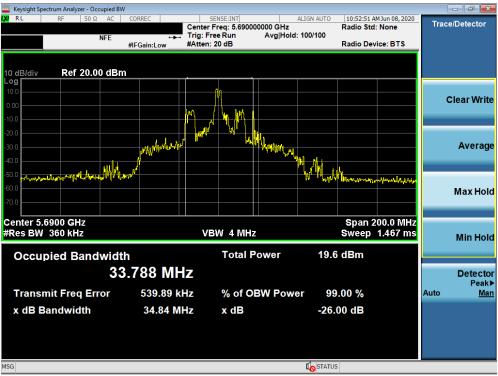
Plot 7-61. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 106)



Plot 7-62. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 122)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Page 49 of 292			
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	0 Portable Handset		Fage 49 01 292			
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Plot 7-63. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax – 26 Tones (UNII Band 2C) – Ch. 138)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 50 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020 Portable Handset			Fage 50 01 292
© 2020 PCTEST				V 9.0 02/01/2019



SISO Antenna-2 26dB Bandwidth Measurements (Full Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
	5180	36	ax (20MHz)	242T	MCS0	27.08
	5200	40	ax (20MHz)	242T	MCS0	29.63
Band 1	5240	48	ax (20MHz)	242T	MCS0	31.59
Bar	5190	38	ax (40MHz)	484T	MCS0	41.78
	5230	46	ax (40MHz)	484T	MCS0	49.12
	5210	42	ax (80MHz)	996T	MCS0	80.76
	5260	52	ax (20MHz)	242T	MCS0	33.68
	5280	56	ax (20MHz)	242T	MCS0	34.53
Band 2A	5320	64	ax (20MHz)	242T	MCS0	33.73
Ban	5270	54	ax (40MHz)	484T	MCS0	49.26
	5310	62	ax (40MHz)	484T	MCS0	67.43
	5290	58	ax (80MHz)	996T	MCS0	81.45
	5500	100	ax (20MHz)	242T	MCS0	42.35
	5580	116	ax (20MHz)	242T	MCS0	47.62
	5700	140	ax (20MHz)	242T	MCS0	48.16
ပ္ရ	5510	102	ax (40MHz)	484T	MCS0	79.43
Band 2C	5590	118	ax (40MHz)	484T	MCS0	83.33
B	5710	142	ax (40MHz)	484T	MCS0	78.40
	5530	106	ax (80MHz)	996T	MCS0	161.20
	5610	122	ax (80MHz)	996T	MCS0	158.10
	5690	138	ax (80MHz)	996T	MCS0	137.00

Table 7-5. Conducted Bandwidth Measurements SISO ANT2 (Full Tones)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 51 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	22/2020 Portable Handset		Fage 51 01 292
© 2020 PCTEST				V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied	d BW				
LX RL RF 50Ω DC		SENSE:INT		M Jun 06, 2020	Trace/Detector
	Cent	er Freq: 5.180000000 GHz Free Run AvalHol	Radio Std d: 100/100	: None	
		en: 20 dB	Radio Dev	vice: BTS	
10 dB/div Ref 20.00 dl	Bm				
Log					
10.0					
0.00	and a second sec	May a warman and a shall as			Clear Write
-10.0	/				
	- And		Malon A. I		
and a phone library and a second second	~~~~		Margan Much por provide Margar	trong by 1.	A
				- Why	Average
-40.0					
-50.0					
-60.0					Max Hold
-70.0					Maxiloid
Center 5.18000 GHz			Span (50.00 MHz	
#Res BW 240 kHz		VBW 2.4 MHz	Sw	eep 1 ms	Min Hold
Occupied Bandwi	dth	Total Power	24.0 dBm		
	19.172 MHz				Detector
					Peak▶
Transmit Freq Error	-20.533 kHz	% of OBW Pov	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	27.08 MHz	x dB	-26.00 dB		
	21.00 11112	A dB	-20.00 dB		
MSG			STATUS		

Plot 7-64. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 1) - Ch. 36)



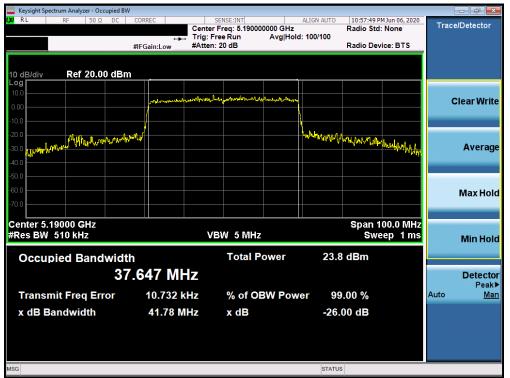
Plot 7-65. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 1) - Ch. 40)

FCC ID: A3LSMN986U		MEASUREMENTREPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 52 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 52 01 292
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Keysight Spectrum Analyzer - Occupied B	W							
KL RF 50Ω DC	CORREC	SENSE:INT Center Freg: 5.24000		IGN AUTO	11:14:56 Pf Radio Std:	4 Jun 06, 2020	Trac	e/Detector
		Trig: Free Run	Avg Hold: 1	100/100	Raulo Stu.	None		
	#IFGain:Low	#Atten: 20 dB			Radio Dev	ice: BTS		
10 dB/div Ref 20.00 dB	m							
10.0								
	Mar Roaman	and the second of the second o	www.un				(Clear Write
0.00			l l					
-10.0			l l	Murhalm.	0.			
-20.0				PH VPUMp	Withwhite	My Warned to		_
-30.0						in the second		Average
-40.0								
-50.0								
-60.0								Max Hold
-70.0								maxinoia
Center 5.24000 GHz						0.00 MHz		
#Res BW 300 kHz		VBW 3 MHz			Swe	ep 1 ms		Min Hold
Occupied Bandwid	th	Total P	ower	24.5	dBm			
				2110				
	9.225 MH	Z						Detector Peak▶
Transmit Freq Error	-11.974 ki	z % of O	3W Power	99	.00 %		Auto	Peak► <u>Man</u>
x dB Bandwidth	31.59 MH	z x dB		-26.0)0 dB			
	0 1100 mil			2011				
MSG				STATUS				

Plot 7-66. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 1) - Ch. 48)



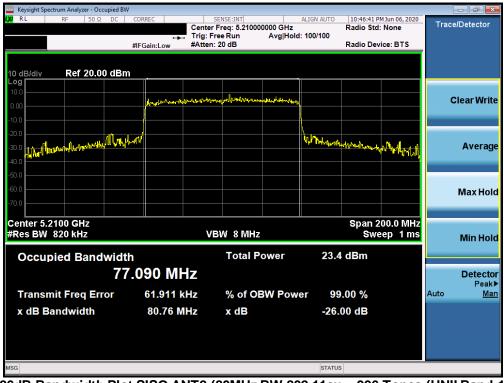
Plot 7-67. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax - 484 Tones (UNII Band 1) - Ch. 38)

FCC ID: A3LSMN986U	Houst for be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 53 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 55 01 292
© 2020 PCTEST	•			V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied BW							- 6 ×
			ALIGN AUTO	10:59:19 P Radio Std: Radio Dev		Trace	e/Detector
10 dB/div Ref 20.00 dBm Log							
0.00	hand the south months and	from total and the sources,				c	Clear Write
-10.0 -20.0 -30.0	р Д		Lartharmant,	/thhiselawaline	Iden Hummerk _ 1		
-40.0							Average
-50.0							Max Hold
Center 5.23000 GHz #Res BW 680 kHz	VB	W 6 MHz			00.0 MHz ep 1 ms		Min Hold
Occupied Bandwidth		Total Power	24.6	dBm			
	594 MHz 15.173 kHz	% of OBW Pow		.00 %		Auto	Detector Peak▶ Man
Transmit Freq Error x dB Bandwidth	49.12 MHz	x dB		00 % 00 dB		Auto	Man
MSG			STATUS				

Plot 7-68. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax - 484 Tones (UNII Band 1) - Ch. 46)



Plot 7-69. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax - 996 Tones (UNII Band 1) - Ch. 42)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 54 of 202
1M2004170065-10-R1.A3L 4/17 - 6/22/2020		Portable Handset	Page 54 of 292	
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Keysight Spectrum Analyzer - Occupied	d BW						
LXI RL RF 50Ω DC	CORREC	SENSE:INT Center Freg: 5.26000	ALIGN AUTO	11:16:06 PM Radio Std:	Jun 06, 2020	Trace/De	tector
		Total France Brown	Avg Hold: 100/100	Raulo Stu.	None		
	#IFGain:Low	#Atten: 20 dB		Radio Devi	ce: BTS		
10 dB/div Ref 20.00 dl	Bm						
10.0							
	maliner	www.www.mww.	monor			Clea	ar Write
0.00			l N				
-10.0	a new P		Muller 1				
-20.0 An which we will and the second	124/10		ווייער איזיאאן	www.chwwhw	Mandella .		
-30.0					-10 BA	4	verage
-40.0							
-50.0							
-60.0						м	ax Hold
-70.0						141	αλ Πυία
Center 5.26000 GHz).00 MHz		
#Res BW/270 kHz		VBW 2.7 MI	lz	Swee	ep 1 ms	M	lin Hold
Occurried Developing		Total P	ower 247	/ dBm			
Occupied Bandwi			Ower 24.1	ubili			
1	19.249 M⊦	Z				D	etector
Transmit Freq Error	-24.463 k	Hz % of Ol	BW Power 99	0.00 %		Auto	Peak▶ <u>Man</u>
x dB Bandwidth	33.68 M	Hz xdB	26	00 dB			
	55.00 W		-20.	00 UB			
MSG			STATUS	S			

Plot 7-70. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 2A) - Ch. 52)



Plot 7-71. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMN986U	hout to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 55 of 292
1M2004170065-10-R1.A3L 4/17 - 6/22/2020 Portab		Portable Handset	Fage 55 01 292	
© 2020 PCTEST				V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied BW					_	
🗱 RL RF 50Ω DC COF		ENSE:INT Freg: 5.320000000 GHz		:43 PM Jun 06, 2020 Std: None	Trac	e/Detector
	Trig: Fr	ee Run Avg Hol	d: 100/100	Device: BTS		
#IF(Gain:Low #Atten:	20 dB	Radio	Device: D I S		
10 dB/div Ref 20.00 dBm						
10.0	man hand man hand	K. Marko and Markov and a file				
0.00						Clear Write
-10.0						
-20.0 Ander trade of the market and			Unphalippelinent	with the st		
-30.0				. And		Average
-40.0						
-50.0						
-60.0						Max Hold
-70.0						muarrora
Center 5.32000 GHz #Res BW 360 kHz	VB	W 4 MHz		in 50.00 MHz Sweep 1 ms		
						Min Hold
Occupied Bandwidth		Total Power	24.3 dBm		_	
19.4	76 MHz					Detector
						Peak▶
Transmit Freq Error	-1.911 kHz	% of OBW Pov	ver 99.00 %		Auto	<u>Man</u>
x dB Bandwidth	33.73 MHz	x dB	-26.00 dE	3		
MSG			STATUS			

Plot 7-72. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 2A) - Ch. 64)



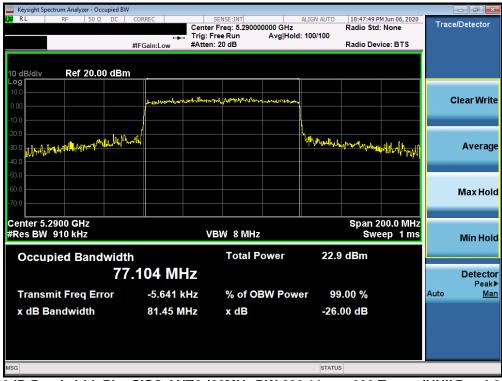
Plot 7-73. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax - 484 Tones (UNII Band 2A) - Ch. 54)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 56 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 50 01 292
© 2020 PCTEST				V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied BW						[- 6
#IF(d: 100/100	11:01:54 PM Radio Std: Radio Devi		Trace	e/Detector
10 dB/div Ref 20.00 dBm Log 10.0 -10.0	- - mallomenter almander allowed	Jan Man Mit Martin Man game and	k			c	Clear Write
-20.0 -30.0 0000000000000000000000000000000000			Www.situathy	hutrely (), the	^{II} &~?* <mark>\</mark>] _{784#47678}		Average
-50.0							Max Hold
Center 5.31000 GHz #Res BW 510 kHz Occupied Bandwidth	VBV	₩ 5 MHz Total Power	23.7	Swe	00.0 MHz ep 1 ms		Min Hold
	03 MHz						Detector Peak▶
Transmit Freq Error	-30.368 kHz 67.43 MHz	% of OBW Pow x dB	ver 99. -26.0	00 % 0 dB		Auto	<u>Man</u>
MSG			STATUS				

Plot 7-74. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax - 484 Tones (UNII Band 2A) - Ch. 62)



Plot 7-75. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax - 996 Tones (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager				
Test Report S/N:	Test Dates:	EUT Type:		Page 57 of 202				
1M2004170065-10-R1.A3L 4/17 - 6/22/2020		Portable Handset	Page 57 of 292					
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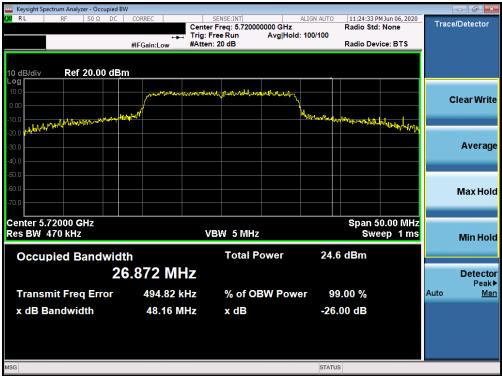
Plot 7-76. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 2C) - Ch. 100)



Plot 7-77. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 58 of 202
1M2004170065-10-R1.A3L		Portable Handset	Page 58 of 292	
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Plot 7-78. 26dB Bandwidth Plot SISO ANT2 (20MHz BW 802.11ax - 242 Tones (UNII Band 2C) - Ch. 144)



Plot 7-79. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax - 484 Tones (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 59 of 292
1M2004170065-10-R1.A3L 4/17 - 6/22/2020 Portab		Portable Handset	Fage 59 01 292	
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M RL RF 50 Ω DC CORREC SENSEINT ALION AUTO 11:04:43 PP. Center Freq: 5.590000000 GHz Radio Std: Radio Std: Radio Devi #FGain:Low #FFreq Run Avg Hold: 100/100 Radio Devi 10 dB/div Ref 20.00 dBm Image: Sense Freq: Se	vice: BTS	/Detector
Log 100 000 -100 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -20		lear Write
10.0 0.00 -10.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.0 -20.		lear Write
-40.0	y John John John John John John John John	Average
-50.0 -60.0 -70.0		Max Hold
	l00.0 MHz eep 1 ms	Min Hold
Occupied Bandwidth Total Power 23.8 dBm 38.521 MHz		Detector Peak▶
Transmit Freq Error -43.850 kHz % of OBW Power 99.00 % x dB Bandwidth 83.33 MHz x dB -26.00 dB	Auto	Peak► <u>Man</u>

Plot 7-80. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax - 484 Tones (UNII Band 2C) - Ch. 118)



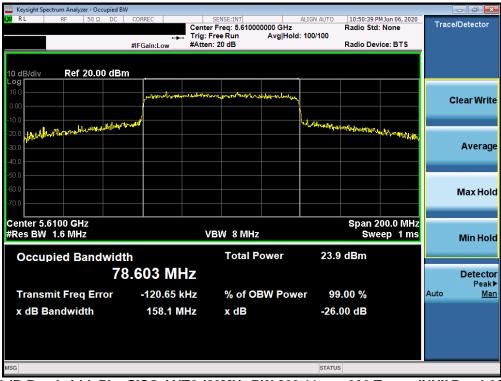
Plot 7-81. 26dB Bandwidth Plot SISO ANT2 (40MHz BW 802.11ax - 484 Tones (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager					
Test Report S/N:	Test Dates:	EUT Type:	Page 60 of 292					
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset	Fage 60 01 292					
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Keysight Spectrum Analyzer - Occup	pied BW								
LXX RL RF 50Ω				0000 GHz Avg Hold	ALIGN AUTO : 100/100	10:49:21 P Radio Std: Radio Dev		Trac	e/Detector
10 dB/div Ref 20.00	dBm).				
10.0 0.00	juandyan	n Myurun Million Angen	an tean an a	hilina harridan				(Clear Write
-10.0 -20.0 -30.0 -40.0	Highmund				huppy	<mark>ԴԱստեղիստերև</mark>	^{ni A} wirelityyp ^a ly		Average
-40.0									Max Hold
Center 5.5300 GHz #Res BW 1.6 MHz		VBI	W 8 MHz				:00.0 MHz ep 1 ms		Min Hold
Occupied Bandw	Occupied Bandwidth Total Power 24.2 dBm 78.309 MHz							Detector Peak▶	
Transmit Freq Erro x dB Bandwidth	or -47.844 161.2		% of OE x dB	3W Powe		.00 % 00 dB		Auto	Peak► <u>Man</u>
MSG					STATUS	5			

Plot 7-82. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax – 996 Tones (UNII Band 2C) – Ch. 106)



Plot 7-83. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax - 996 Tones (UNII Band 2C) - Ch. 122)

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Page 61 of 292			
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 01 01 292			
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	pectrum Analyz											_	
LXI RL	RF	50 Ω	DC C	ORREC			NSE:INT	000000 GHz	ALIGN AUTO	10:51:51 P Radio Std	M Jun 06, 2020	Trac	e/Detector
						Trig: Fre	e Run		l: 100/100				
			#	FGain:L	.ow	#Atten: 2	0 dB			Radio Dev	ice: BTS		
10 dB/div	Ref	20.00	dBm										
Log 10.0													
				مەللەتلە ر	Versen altreat	Aler Milling of solution	and an alternation of the second s	noter warden	1				Clear Write
0.00													
-10.0		Institut	all and the second	Ń					the show the start	Mapping			
-20.0	a hare when when the	Water 1								- I I I I I I I I I I I I I I I I I I I	W-liter with diving		
-30.0													Average
-40.0													
-50.0													
-60.0													Max Hold
-70.0													Maxilolu
	.6900 GH										00.0 MHz		
#Res BW	V 1.6 MH	Z				VBI	N 8 MH	Z		Swe	ep 1 ms		Min Hold
000	unied P	ondu	width				Total	Power	24.2	2 dBm			
Occu	ipied B	anu					Total	I OWCI	24.2	ubm			
			78.	380	MH	Z							Detector
Tranc	mit Fred		or	_22	402 kH	-	% of C	DBW Pow	or 00	.00 %		Auto	Peak▶ Man
												/ lato	Intern
x dB l	Bandwic	lth		13	7.0 MH	z	x dB		-26.	00 dB			
MSG									STATUS	5			

Plot 7-84. 26dB Bandwidth Plot SISO ANT2 (80MHz BW 802.11ax – 996 Tones (UNII Band 2C) – Ch. 138)

FCC ID: A3LSMN986U	PCTEST Mout forby part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 62 of 292	
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 02 01 292	
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7.3 6dB Bandwidth Measurement – 802.11ax OFDMA

§15.407 (e); RSS-Gen [6.7]

Test Overview and Limit

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

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

Test Procedure Used

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

Test Settings

- The signal analyzers' automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 100 kHz
- 3. VBW \geq 3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Figure 7-2. Test Instrument & Measurement Setup

Test Notes

The 6dB Bandwidth measurement for each channel was measured with the RU index showing the highest conducted power.

FCC ID: A3LSMN986U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Page 63 of 292			
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Page 63 01 292			
© 2020 PCTEST V 9.0 02/01/2019							



-		Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
		5745	149	ax (20MHz)	26T	MCS0	2.09
		5785	157	ax (20MHz)	26T	MCS0	2.07
	d 3	5825	165	ax (20MHz)	26T	MCS0	2.64
	Band	5755	151	ax (40MHz)	26T	MCS0	2.15
		5795	159	ax (40MHz)	26T	MCS0	2.11
		5775	155	ax (80MHz)	26T	MCS0	2.88

SISO Antenna-1 6 dB Bandwidth Measurements (26 Tones)

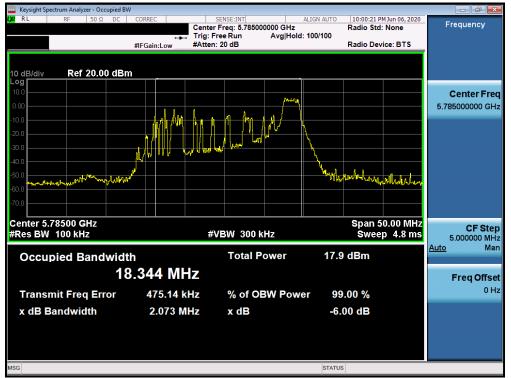
Table 7-6. Conducted Bandwidth Measurements SISO ANT1 (26 Tones)

FCC ID: A3LSMN986U	PCTEST Houst forbe part of B	MEASUREMENTREPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Page 64 of 292	
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset			
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Plot 7-85. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 149)



Plot 7-86. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 157)

FCC ID: A3LSMN986U	hout to be part of B	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 65 of 292
1M2004170065-10-R1.A3L	4/17 - 6/22/2020	Portable Handset		Fage 05 01 292
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