

# PCTEST

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# MEASUREMENT REPORT FCC PART 15.407 UNII OFDMA

#### **Applicant Name:**

Samsung Electronics Co., Ltd. 129, Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, 16677, Korea Date of Testing: 04/12/2021 – 07/16/2021 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M2106100066-12.A3L

# FCC ID:

# A3LSMF711JPN

# **APPLICANT:**

# Samsung Electronics Co., Ltd.

Application Type: Model: Additional Model(s): EUT Type: Frequency Range: Modulation Type: FCC Classification: FCC Rule Part(s): Test Procedure(s): Certification SC-54B SCG12 Portable Handset 5180 – 5825MHz OFDMA Unlicensed National Information Infrastructure (UNII) Part 15 Subpart E (15.407) ANSI C63.10-2013, KDB 789033 D02 v02r01, KDB 648474 D03 v01r04, KDB 662911 D01 v02r01

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

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

**Randy Ortanez** President



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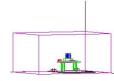


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# **MEASUREMENT REPORT**



	Channel		AN	JT1	MI	MO
UNII Band Bandwidth (MHz)		Tx Frequency (MHz)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)
1		5180 - 5240	29.717	14.73	60.407	17.81
2A	20	5260 - 5320	29.512	14.70	59.271	17.73
2C		5500 - 5720	30.479	14.84	60.399	17.81
3		5745 - 5825	30.832	14.89	59.130	17.72
1		5190 - 5230	30.903	14.90	61.473	17.89
2A	40	5270 - 5310	31.405	14.97	61.952	17.92
2C		5510 - 5710	29.107	14.64	61.243	17.87
3		5755 - 5795	28.973	14.62	59.040	17.71
1		5210	27.669	14.42	54.576	17.37
2A	80	5290	27.102	14.33	53.703	17.30
2C		5530 - 5690	31.550	14.99	62.165	17.94
3		5775	31.550	14.99	61.889	17.92

**EUT Overview** 

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# 1.0 INTRODUCTION

#### 1.1 Scope

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

#### 1.2 PCTEST Test Location

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

#### **1.3 Test Facility / Accreditations**

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

- PCTEST is an ISO 17025-2017 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.

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#### **PRODUCT INFORMATION** 2.0

#### 2.1 **Equipment Description**

The Equipment Under Test (EUT) is the Samsung Portable Handset FCC ID: A3LSMF711JPN. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter.

Test Device Serial No.: 0189M, 0837M, 0843M, 0174M, 0863M, 0677M, 0209M, 0059S, 0585S, 1600S

#### 2.2 **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

.

Ch.	Frequency (MHz)
36	5180
•••	•••
42	5210
:	
48	5240

	Band 2A
Ch.	Frequency (MHz)
52	5260
:	• •
56	5280
:	:
64	5320

	Band 2C
Ch.	Frequency (MHz)
100	5500
•	:
120	5600
•••	:
144	5720

	Band 3
Ch.	Frequency (MHz)
149	5745
:	:
157	5785
:	• •
165	5825

. .

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)		С				
102	5510		1				
:	:						
118	5590		1				
:	:						
142	5710						

100

Band 3	5
--------	---

Ch.	Frequency (MHz)
151	5755
:	
159	5795

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

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

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

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#### Notes:

5GHz NII operation is possible in 20MHz, and 40MHz, and 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = peak per the guidance of Section B)2)b) of ANSI C63.10-2013 and KDB 789033 D02 v02r01. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

Mode	Antenna	Channel	Tone	Duty Cycle
			26T	99.7
802.11ax	1	36	52T	2T 99.7
NII RU	Ŧ	50	106T	99.7
			242T	99.7
			26T	99.7
802.11ax	MIMO CDD	36	52T	99.7
NII RU		50	106T	99.7
			242T	99.7
			26T	99.7
802.11ax			52T	99.7
NII RU	1	38	106T	99.7
			242T	99.7
			484T	99.7
			26T	99.7
802.11ax			52T 99.7	99.7
NII RU	MIMO CDD	38	106T	99.7
			242T	99.7
			484T	99.7
			26T	99.7
			52T	99.7
802.11ax	1	42	106T	99.6
NII RU	Ŧ	42	242T	99.7
			484T	99.7
			996T	99.7
			26T	99.6
			52T	99.7
802.11ax	MIMO CDD	42	106T	99.5
NII RU		42	242T	99.7
			484T	99.7
			996T	99.6

#### Table 2-4. Measured Duty Cycles

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

WiFi Configurations		SISO		SDM		MIMO	
		ANT1	ANT2	ANT1	ANT2	ANT1	ANT2
11ax (20MHz)		✓	×	√	✓	✓	✓
5GHz	11ax (40MHz)	✓	×	√	✓	✓	✓
	11ax (80MHz)	$\checkmark$	×	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$

✓ = Support ; × = NOT Support

**SDM** = Spatial Diversity Multiplexing – MIMO function

### 2.3 Antenna Description

Following antenna was used for the testing.

Frequency [GHz]	Antenna 1 Gain (dBi)	Antenna 2 Gain (dBi)
5.20	-6.6	-6.1
5.30	-8.1	-6.3
5.50	-9.8	-7.3
5.80	-7.7	-8.0

Table 2-6. Antenna Peak Gain

## 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.

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.

This device supports two configurations: one is with screen open, and one is with screen closed. Both configurations for each chipset are tested, and the worst case radiated emissions data is shown in this report.

### 2.5 Software and Firmware

The test was conducted with firmware version 711USQU0AUEF installed on the EUT.

### 2.6 EMI Suppression Device(s)/Modifications

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

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# 3.0 DESCRIPTION OF TESTS

#### 3.1 Evaluation Procedure

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

Deviation from measurement procedure.....None

# 3.2 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).

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# 4.0 ANTENNA REQUIREMENTS

#### Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

- The antennas of the EUT are permanently attached.
- There are no provisions for connection to an external antenna.

#### **Conclusion:**

The EUT complies with the requirement of §15.203.

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# 5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the  $U_{CISPR}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty (±dB)
Conducted Bench Top Measurements	1.13
Line Conducted Disturbance	3.09
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

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# 6.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	WL25-1	Conducted Cable Set (25GHz)	2/23/2021	Annual	2/23/2022	WL25-1
-	WL40-1	WLAN Cable Set (40GHz)	2/23/2021	Annual	2/23/2022	WL40-1
-	WL25-2	WLAN Cable Set (25GHz)	2/23/2021	Annual	2/23/2022	WL25-2
-	WL25-3	Conducted Cable Set (25GHz)	3/12/2021	Annual	3/12/2022	WL25-3
-	WL40-2	WLAN Cable Set (40GHz)	3/12/2021	Annual	3/12/2022	WL40-2
Anritsu	ML2495A	Power Meter	3/4/2021	Annual	3/4/2022	1328004
Anritsu	MA2411B	Pulse Power Sensor	10/19/2020	Annual	10/19/2021	1339026
Anritsu	M\$46322A	Vector Network Analyzer	11/6/2020	Annual	11/6/2021	1521001
Anritsu	36585K-2F	Precision Autocal 2-Port	10/24/2020	Annual	10/24/2021	1628014
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2019	Biennial	10/10/2021	121034
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Emco	3116	Horn Antenna (18 - 40GHz)	8/7/2018	Triennial	8/7/2021	9203-2178
Espec	ESX-2CA	Environmental Chamber	8/27/2020	Biennial	8/27/2022	17620
ETS-Lindgren	3816/2NM	LISN	7/9/2020	Biennial	7/9/2022	114451
ETS-Lindgren	3115	Double Ridged Guide Horn 750MHz - 18GHz	3/12/2020	Biennial	3/12/2022	150693
Keysight Technologies	N9020A	MXA Signal Analyzer	8/14/2020	Annual	8/14/2021	U\$46470561
Keysight Technologies	N9038A	MXE EMI Receiver	8/11/2020	Annual	8/11/2021	MY51210133
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	8/17/2020	Annual	8/17/2021	MY52350166
Keysight Technologies	N9020A	MXA Signal Analyzer	9/22/2020	Annual	9/22/2021	MY54500644
Pasternack	NMLC-2	Line Conducted Emissions Cable (NM)	2/25/2021	Annual	2/25/2022	NMLC-2
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	7/15/2020	Annual	7/15/2021	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	5/25/2021	Annual	5/25/2022	100348
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	8/10/2020	Annual	8/10/2021	103200
Solar Electronics	8012-50-R-24-BNC	Line Impedance Stabilization Network	10/1/2019	Biennial	10/1/2021	310233
Sunol	DRH-118	Horn Antenna (1-18 GHz)	8/27/2019	Biennial	8/27/2021	A042511
Sunol Science	JB5	Bi-Log Antenna (30M - 5GHz)	7/27/2020	Biennial	7/27/2022	A051107

Table 6-1. Annual Test Equipment Calibration Schedule

#### Note:

For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

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# 7.0 TEST RESULTS

#### 7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.
FCC ID:	A3LSMF711JPN
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.
- 7) Only one RU index could be selected at a time so no contiguous or non-contiguous RU's were considered for testing.

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### 7.2 26dB Bandwidth Measurement – 802.11ax OFDMA

#### **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 ≥ 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: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
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# 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	18.50
_	5200	40	ax (20MHz)	26T	MCS0	18.65
p L	5240	48	ax (20MHz)	26T	MCS0	18.22
Band 1	5190	38	ax (40MHz)	26T	MCS0	37.94
	5230	46	ax (40MHz)	26T	MCS0	39.86
	5210	42	ax (80MHz)	26T	MCS0	78.10
	5260	52	ax (20MHz)	26T	MCS0	19.92
∢	5280	56	ax (20MHz)	26T	MCS0	19.78
d 2A	5320	64	ax (20MHz)	26T	MCS0	19.90
Band	5270	54	ax (40MHz)	26T	MCS0	37.94
ш	5310	62	ax (40MHz)	26T	MCS0	37.87
	5290	58	ax (80MHz)	26T	MCS0	78.04
	5500	100	ax (20MHz)	26T	MCS0	18.06
	5600	120	ax (20MHz)	26T	MCS0	18.20
	5720	144	ax (20MHz)	26T	MCS0	19.45
5C	5510	102	ax (40MHz)	26T	MCS0	39.46
Band	5590	118	ax (40MHz)	26T	MCS0	39.70
Ba	5710	142	ax (40MHz)	26T	MCS0	38.06
	5530	106	ax (80MHz)	26T	MCS0	81.47
	5610	122	ax (80MHz)	26T	MCS0	80.67
	5690	138	ax (80MHz)	26T	MCS0	77.25

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

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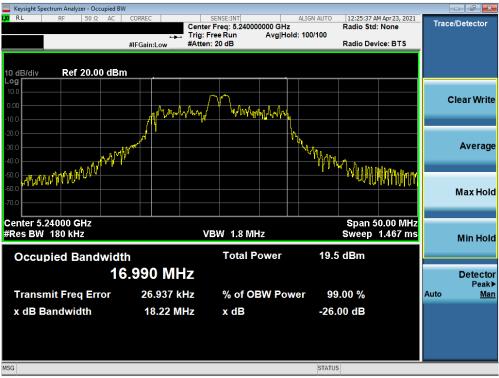
Plot 7-1. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 36)



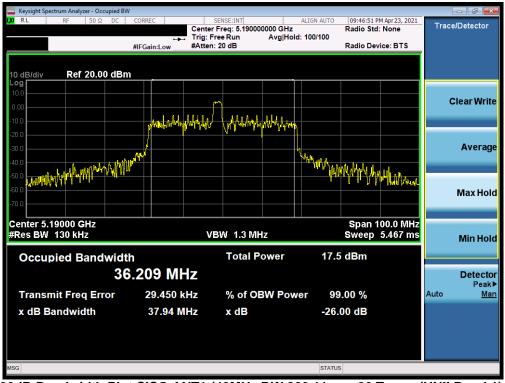
Plot 7-2. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 40)

FCC ID: A3LSMF711JPN	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 210	
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Plot 7-3. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 48)



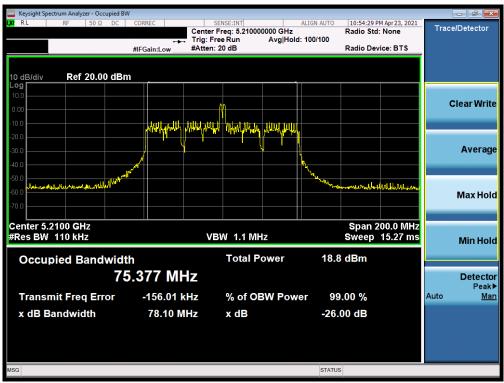
Plot 7-4. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 38)

FCC ID: A3LSMF711JPN	PCTEST* Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 16 of 216	
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Plot 7-5. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 46)



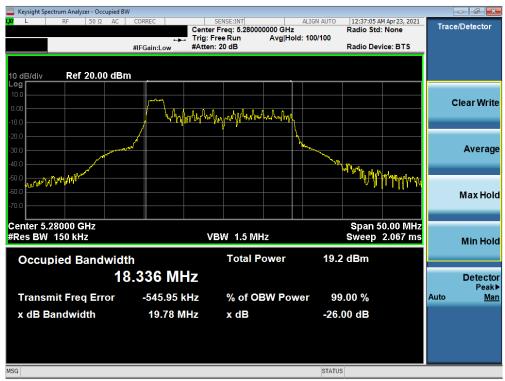
Plot 7-6. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 42)

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dama 47 at 040	
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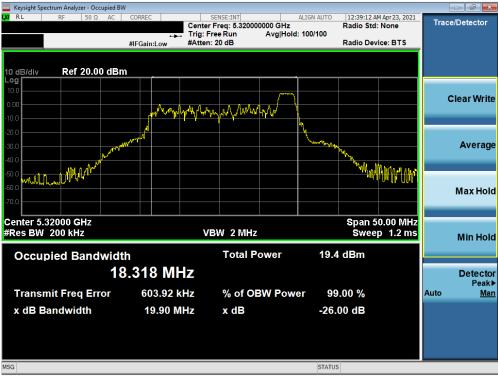
Plot 7-7. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 52)



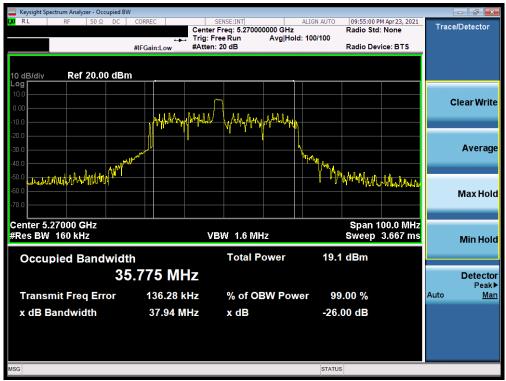
Plot 7-8. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMF711JPN	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 19 of 216	
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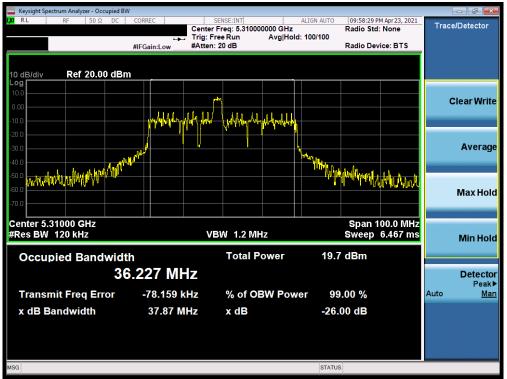
Plot 7-9. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 64)



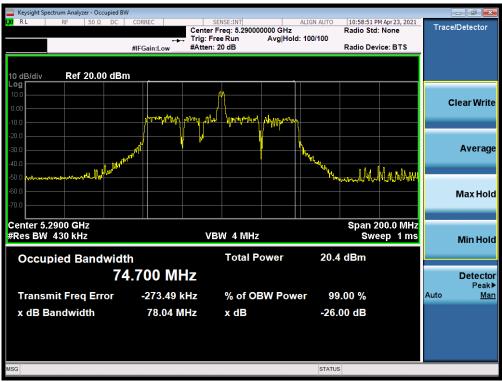
Plot 7-10. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 54)

FCC ID: A3LSMF711JPN	Proved to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dama 40 - 6 04 0	
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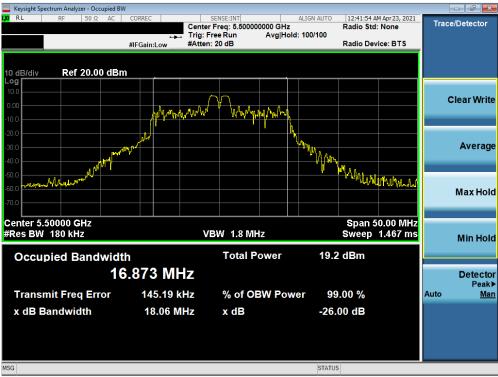
Plot 7-11. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax – 26 Tones (UNII Band 2A) – Ch. 62)



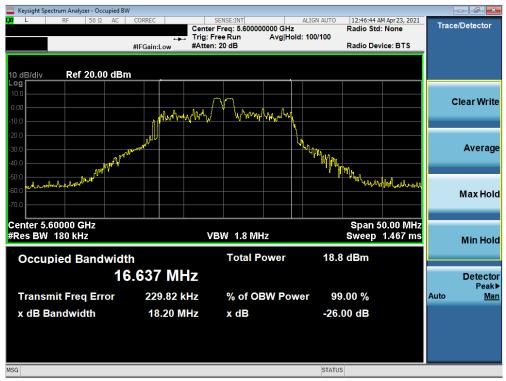
Plot 7-12. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
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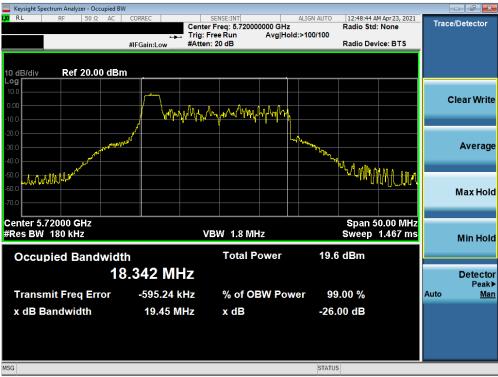
Plot 7-13. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 100)



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

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dama 04 at 040	
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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: A3LSMF711JPN	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 22 of 246	
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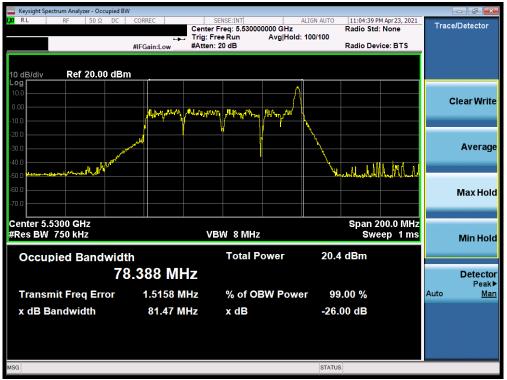
Plot 7-17. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax – 26 Tones (UNII Band 2C) – Ch. 118)



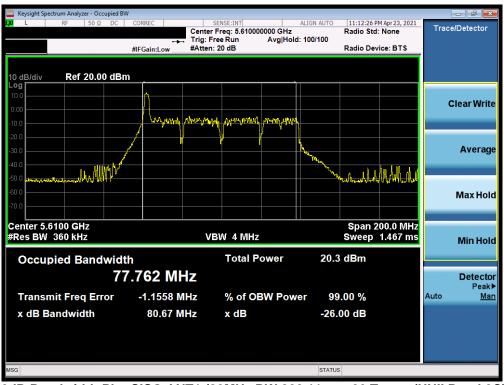
Plot 7-18. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMF711JPN	PCTEST <sup>®</sup> Proud to be part of <sup>®</sup> element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates: EUT Type:		Dogo 22 of 216	
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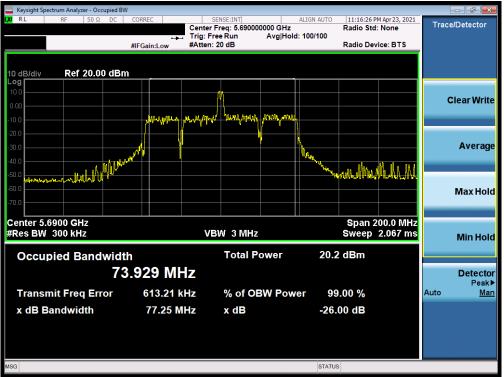
Plot 7-19. 26dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax – 26 Tones (UNII Band 2C) – Ch. 106)



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

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dama 04 at 040	
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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: A3LSMF711JPN	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 216
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	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
	5180	36	ax (20MHz)	242T	MCS0	33.08
	5200	40	ax (20MHz)	242T	MCS0	29.47
p 1	5240	48	ax (20MHz)	242T	MCS0	28.56
Band 1	5190	38	ax (40MHz)	484T	MCS0	41.35
	5230	46	ax (40MHz)	484T	MCS0	44.53
	5210	42	ax (80MHz)	996T	MCS0	86.07
	5260	52	ax (20MHz)	242T	MCS0	24.44
∢	5280	56	ax (20MHz)	242T	MCS0	25.63
d 2	5320	64	ax (20MHz)	242T	MCS0	22.77
Band 2A	5270	54	ax (40MHz)	484T	MCS0	48.37
ш	5310	62	ax (40MHz)	484T	MCS0	48.17
	5290	58	ax (80MHz)	996T	MCS0	89.46
	5500	100	ax (20MHz)	242T	MCS0	24.28
	5600	120	ax (20MHz)	242T	MCS0	21.66
	5720	144	ax (20MHz)	242T	MCS0	25.46
5C	5510	102	ax (40MHz)	484T	MCS0	42.36
Band 2C	5590	118	ax (40MHz)	484T	MCS0	43.89
Ba	5710	142	ax (40MHz)	484T	MCS0	43.94
	5530	106	ax (80MHz)	996T	MCS0	84.41
	5610	122	ax (80MHz)	996T	MCS0	89.33
	5690	138	ax (80MHz)	996T	MCS0	98.75

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

FCC ID: A3LSMF711JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysight Spectrum Analyzer - Occupied BW									- 6 ×
X/RL RF 50Ω AC	CORREC		ISE:INT		ALIGN AUTO		M Apr 23, 2021	Trac	e/Detector
			eq: 5.18000		d: 100/100	Radio Std	: None	mac	
	#IFGain:Low	#Atten: 20		Avginoid	. 100/100	Radio Dev	rice: BTS		
10 dB/div Ref 20.00 dBm									
10.0									
	month	whith a production	<sup>p</sup> ananalonanalon	www.wh					Clear Write
0.00					1				
-10.0					\				
-20.0 -30.0 m/m/ml/whin m/mm/h	~~~				White the second	han yunya			
-30.0 mlph he win which a second					1. 4. 44	ዀ፝፞፞ኯኯኯኯኯ	Will Wink tomore		Average
-40.0									Ŭ
-50.0									
-60.0									Max Hold
-70.0									
Center 5.18000 GHz							0.00 MHz		
#Res BW 300 kHz		VBV	V 3 MHz			Swe	eep 1 ms		Min Hold
									minitiona
Occupied Bandwidth	ו		Total P	ower	21.7	dBm			
19	.114 MH	7							Detector
19		12							Delector Peak▶
Transmit Freq Error	-37.233 k	Hz	% of OE	SW Pow	er <u>99</u>	.00 %		Auto	Man
-									
x dB Bandwidth	33.08 M	HZ	x dB		-26.	00 dB			
MSG					STATUS				

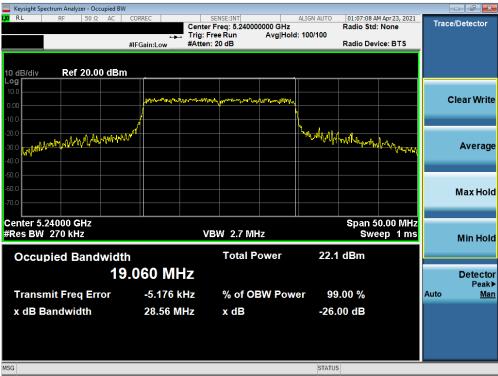
Plot 7-22. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 1) - Ch. 36)



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

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager					
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Plot 7-24. 26dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 1) - Ch. 48)



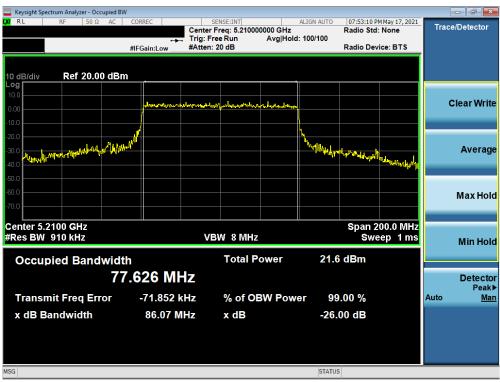
Plot 7-25. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 1) - Ch. 38)

FCC ID: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager					
Test Report S/N:	Test Dates:	EUT Type:	Dage 29 of 216					
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Keysight Spectrum Analyzer - Occupied BW							
🗶 RL RF 50Ω AC	CORREC	SENSE:INT	ALIGN AUTO		M May 17, 2021	Trac	e/Detector
		Center Freq: 5.23000 Trig: Free Run	Avg Hold: 100/100	Radio Std	: None		0.20100101
		#Atten: 20 dB	Aughtera. Teerree	Radio Dev	rice: BTS		
10 dB/div Ref 20.00 dBm							
10.0							
0.00	entromenter	untermeter personality	homethere				Clear Write
		ľ	l N				
-10.0							
-20.0	N			1			
-20.0 -30.0 -40.0 makes the house the with the fight of the state				~4\M <sub>ber</sub> lown			Average
-40.0 Mala Mar 10 - 40.0					When the little		
-50.0							
-60.0							Max Hold
-70.0							
Center 5.23000 GHz				Enon 1	00.0 MHz		
#Res BW 430 kHz		VBW 4 MHz			ep 1 ms		
TRes Buy 430 RHZ				OWG	sep rins		Min Hold
Occupied Bandwidth		Total P	ower 22	0 dBm			
37.	.976 MH	Ζ					Detector
Transmit Frag Free	67 474 kl	- % <u></u>		0 00 %		Auto	Peak▶ Man
Transmit Freq Error	-67.471 kH	12 % of Of	BW Power 9	9.00 %		Auto	iwan
x dB Bandwidth	44.53 MH	z xdB	-26	.00 dB			
MSG			STATU	JS			

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: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager				
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Keysight Spectrum Analyzer - Occup					- đ <mark>×</mark>
<b>LXI</b> RL RF 50 Ω	DC CORREC	SENSE:INT	ALIGN AUTO	09:03:34 PM Apr 23, 2021 Radio Std: None	Trace/Detector
	÷	Trig: Free Run	Avg Hold: 100/100		
	#IFGain:Low	#Atten: 20 dB		Radio Device: BTS	
10 dB/div Ref 20.00	dBm				
Log 10.0					
	and a second	water the water	din fil han bua		Clear Write
0.00		P			
-10.0	1				
-20.0	Jun Mar				
-20.0 -30.0	AN ONADI		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	ᠬ᠉ᡝᠹᡏᠯᡘᡃᡂᡁᢔᡟ᠋ᢧᠬᢦᡃᡅᡏᡨᡨᡔᠬᠬᠧᡁ	Average
-40.0				ա հուսին	
-50.0					
-60.0					Max Hold
-70.0					Max Hold
10.0					
Center 5.26000 GHz				Span 50.00 MHz	
#Res BW 220 kHz		VBW 2.2 M	Ηz	Sweep 1 ms	Min Hold
		T-4-1 B		) -ID	
Occupied Bandw		Total P	ower 21.2	2 dBm	
	19.019 M	-IZ			Detector
					Peak►
Transmit Freq Erro	r -34.310 l	(Hz % of O	BW Power 99	0.00 %	Auto <u>Man</u>
x dB Bandwidth	24.44 N	lHz xdB	-26.	00 dB	
MSG			0717		
MSG			STATUS		

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: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysight Spectrum											- đ <b>×</b>
L <mark>XI</mark> RL F	RF 50 Ω	DC COR	REC		NSE:INT reg: 5.32000	0000 GHz	ALIGN AUTO	09:01:44 P Radio Std	M Apr 23, 2021	Trac	e/Detector
			·→	Trig: Free	e Run		d: 100/100				
		#IFG	Bain:Low	#Atten: 2	0 dB			Radio Dev	rice: BTS		
10 dB/div	Ref 20.0	0 dBm									
Log 10.0											
0.00			Mary Presenter	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	www.hwh						Clear Write
-10.0			1	<b>'</b>	1		l				
		01					5				
-20.0 -30.0 -40.0		Internation in the					White the	qalwqaqqy	٥.		Average
-30.0 a how might	W	- p. p.						Y U WAY YA	White March		Average
-50.0											
-60.0											Max Hold
-70.0											
Center 5.320								Snan 5	0.00 MHz		
#Res BW 22				VB/	N 2.2 MH	Iz			ep 1 ms		Min Hold
Occupie	d Band	width			Total P	ower	21.0	dBm			
		19.0	46 MI	17							Detector
		10.0									Peak▶
Transmit	Freq Err	ror -	36.276	(Hz	% of O	3W Pow	/er 99	.00 %		Auto	<u>Man</u>
x dB Band	dwidth		22.77 N	IHz	x dB		-26.	00 dB			
MSG							STATUS				
MSG							STATUS				

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



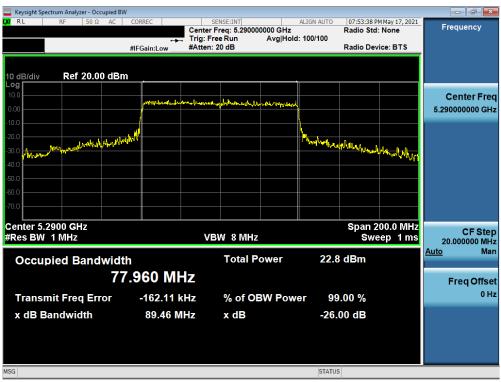
Plot 7-31. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 2A) - Ch. 54)

FCC ID: A3LSMF711JPN	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	G	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:	EUT Type:				
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset		Page 31 of 216			
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www.commercenter.com Keysight Spectrum Analyzer - Occupied BW							- 6 ×
LXX RL RF 50Ω AC	CORREC	SENSE:INT	ALIGN AUTO	07:32:43 P Radio Std	M May 17, 2021	Trac	e/Detector
		Frig: Free Run	Avg Hold: 100/100	Radio Sta	None		
		Atten: 20 dB	<b>.</b> .	Radio Dev	ice: BTS		
10 dB/div Ref 20.00 dBm							
Log							
10.0	the way when	munder munderal					Clear Write
0.00	the land and the second s	and second and second second	"hereforentilligent			, c	slear write
-10.0			N				
-20.0			W				
-20.0	é.,		A THAT A	h follow why any	Sec. 4 . 11		Average
-SU. UNIN MARINE					W WWW WWW		Average
-40.0							
-50.0							
-60.0							Max Hold
-70.0							
Center 5.31000 GHz					00.0 MHz		
#Res BW 470 kHz		VBW 5 MHz		Swe	ep 1 ms		Min Hold
Occurried Developidat		Total Po	owor 22	2 dBm			
Occupied Bandwidth			JWEI 23.	z udili			
38	.004 MHz						Detector
							Peak▶
Transmit Freq Error	-93.092 kH	z % of OE	3W Power 9	9.00 %		Auto	<u>Man</u>
x dB Bandwidth	48.17 MH	z xdB	-26	.00 dB			
			1				
MSG			STATU	JS			

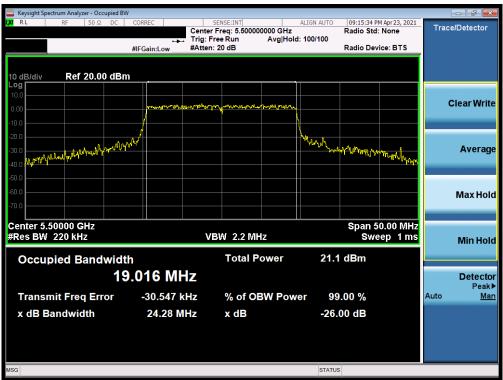
Plot 7-32. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 2A) - Ch. 62)



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

FCC ID: A3LSMF711JPN	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 216				
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	Page 32 of 216				
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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: A3LSMF711JPN	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dama 22 of 246		
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	Page 33 of 216		
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Keysight Spectrum Analyzer - Occupied BW							
LX/ RL RF 50Ω DC CC		Freq: 5.72000000 GH	ALIGN AUTO	09:19:06 PI Radio Std:	M Apr 23, 2021	Trac	e/Detector
	🛶 Trig: Fi	ree Run Avg H	old: 100/100				
	FGain:Low #Atten:	20 dB		Radio Dev	ice: BTS		
10 dB/div Ref 20.00 dBm							
Log 10.0							
	And Malowender Brancold	up mandamly in	m				Clear Write
0.00	1		4				
-10.0			<b>N</b> . <b>I</b>				
-20.0				ht-llrwhytrug	Mathan		
-30.0 When Will a control					ւ, ու և ավարու է ենդե		Average
-40.0							
-50.0							
-60.0							Manulated
-70.0							Max Hold
-70.0							_
Center 5.72000 GHz				Span 5	0.00 MHz		
#Res BW 510 kHz	V	3W 5 MHz			ep 1 ms		Min Hold
Occupied Bandwidth		Total Power	22.1	dBm			
19.3	303 MHz						Detector
							Peak▶
Transmit Freq Error	14.689 kHz	% of OBW Po	wer 99	.00 %		Auto	Man
x dB Bandwidth	25.46 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)



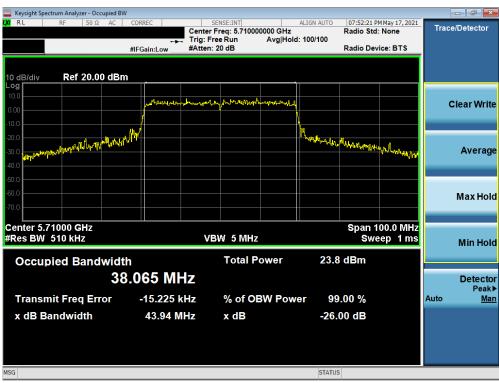
Plot 7-37. 26dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dega 24 of 246		
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	Page 34 of 216		
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Keysight Spectrum Analyzer - Occupied BW								
ίχα L RF 50Ω AC	i i i i i i i i i i i i i i i i i i i	SENSE:INT enter Freq: 5.59000 rig: Free Run Atten: 20 dB			Radio Std:		Trac	e/Detector
	#IFGain:Low ##	Atten: 20 dB			Radio Dev	ICE: BIS		
10 dB/div Ref 20.00 dBm								
Log								
0.00	dunanarahaham	wordson promotions	numalipling				(	Clear Write
-10.0								
-20.0				hungan				
	hu l			Mundallar	molenter			Average
-30.0					107	a. Aut. Ar Alby Pr		
-50.0								
-60.0								
								Max Hold
-70.0							_	
Center 5.59000 GHz					Span 1	00.0 MHz		
#Res BW 620 kHz		VBW 6 MHz			Swe	ep 1 ms		Min Hold
Occupied Bandwidth	1	Total P	ower	20.9	dBm			
	990 MHz							Detector
								Detector Peak▶
Transmit Freq Error	18.191 kHz	% of O	<b>BW Powe</b>	er 99.	00 %		Auto	<u>Man</u>
x dB Bandwidth	43.89 MHz	x dB		-26.0	0 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: A3LSMF711JPN	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 246	
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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: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dama 00 af 040		
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	Page 36 of 216		
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Keysight Spectrum Analyzer - Occ	upied BW				- đ 🔀
<mark>(X/RL</mark> RF 50Ω	DC CORREC	SENSE:INT Center Freq: 5.69000	ALIGN AUTO	11:42:15 PM Apr 23, 2021 Radio Std: None	Trace/Detector
	↔		Avg Hold: 100/100	Radio Std. None	
	#IFGain:Low	#Atten: 20 dB		Radio Device: BTS	_
10 dB/div Ref 20.00	) dBm				
Log					
10.0	MATHINA	when more and the	mpertmenter		Clear Write
0.00					erea mice
-10.0	<u>/</u>		<u>├</u>		
-20.0			Norm With w	ally and block of the second	
-20.0 -30.0	Mar and a				Average
-40.0					
-50.0					
-60.0					
-70.0					Max Hold
-70.0					
Center 5.6900 GHz				Span 200.0 MHz	
#Res BW 1.1 MHz		VBW 8 MHz		Sweep 1 ms	Min Hold
Occupied Band	width	Total P	ower 23.3	3 dBm	
	77.767 MI	z			Detector
					Peak►
Transmit Freq Err	or 52.556	KHZ % of OE	3W Power 99	9.00 %	Auto <u>Man</u>
x dB Bandwidth	98.75 N	IHz x dB	-26.	00 dB	
MSG			STATUS	S	

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

FCC ID: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 27 of 216
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset		Page 37 of 216
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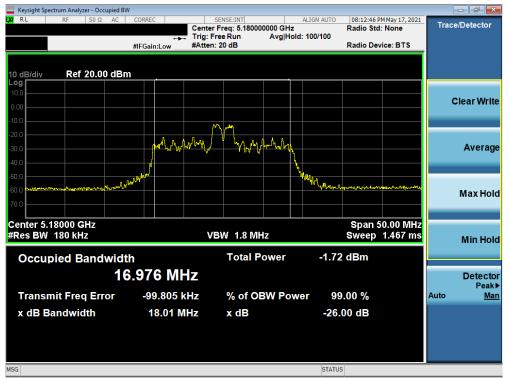
# MIMO 26dB Bandwidth Measurements (26 Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
	5180	36	ax (20MHz)	26T	MCS0	18.01
	5200	40	ax (20MHz)	26T	MCS0	18.06
Band 1	5240	48	ax (20MHz)	26T	MCS0	18.38
Bar	5190	38	ax (40MHz)	26T	MCS0	38.13
	5230	46	ax (40MHz)	26T	MCS0	37.89
	5210	42	ax (80MHz)	26T	MCS0	78.59
	5260	52	ax (20MHz)	26T	MCS0	18.31
∢	5280	56	ax (20MHz)	26T	MCS0	18.29
d 2A	5320	64	ax (20MHz)	26T	MCS0	19.43
Band	5270	54	ax (40MHz)	26T	MCS0	38.04
ш	5310	62	ax (40MHz)	26T	MCS0	38.10
	5290	58	ax (80MHz)	26T	MCS0	78.41
	5500	100	ax (20MHz)	26T	MCS0	18.16
	5600	120	ax (20MHz)	26T	MCS0	18.41
	5720	144	ax (20MHz)	26T	MCS0	19.72
5C	5510	102	ax (40MHz)	26T	MCS0	39.65
Band	5590	118	ax (40MHz)	26T	MCS0	38.21
Ba	5710	142	ax (40MHz)	26T	MCS0	39.90
	5530	106	ax (80MHz)	26T	MCS0	81.99
	5610	122	ax (80MHz)	26T	MCS0	81.80
	5690	138	ax (80MHz)	26T	MCS0	78.50

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

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 20 of 216
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Plot 7-43. 26dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 36)



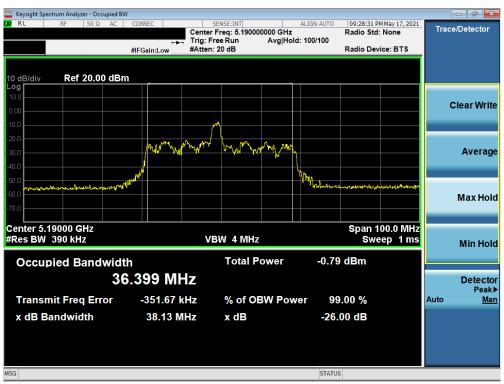
Plot 7-44. 26dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 40)

FCC ID: A3LSMF711JPN	PCTEST <sup>®</sup> Proud to be part of <sup>®</sup> element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dama 20 at 040	
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	Page 39 of 216	
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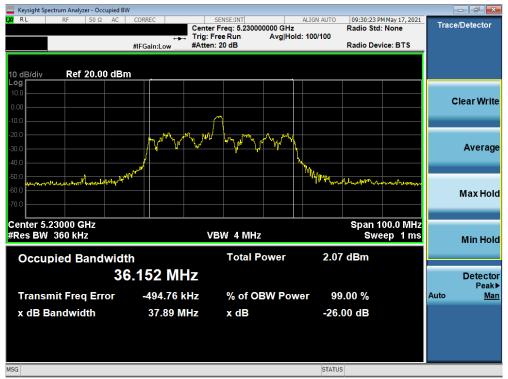
Plot 7-45. 26dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 48)



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

FCC ID: A3LSMF711JPN	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 40 of 240
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Plot 7-47. 26dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 46)



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

FCC ID: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dama 44 at 040	
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	Page 41 of 216	
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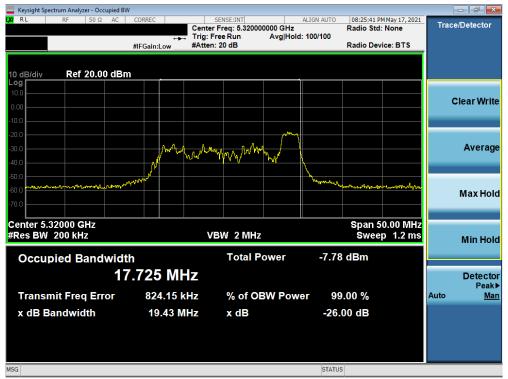
Plot 7-49. 26dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 52)



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

FCC ID: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dama 40 at 040	
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Plot 7-51. 26dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 64)



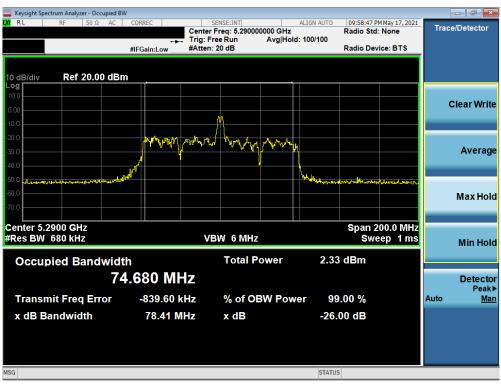
Plot 7-52. 26dB Bandwidth Plot MIMO (40MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 54)

FCC ID: A3LSMF711JPN	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dama 40 at 040	
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Plot 7-53. 26dB Bandwidth Plot MIMO (40MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 62)



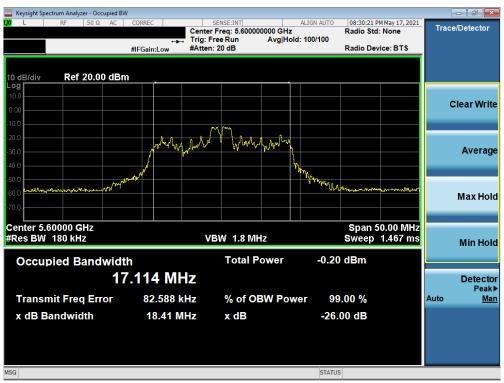
Plot 7-54. 26dB Bandwidth Plot MIMO (80MHz BW 802.11ax - 26 Tones (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMF711JPN	PCTEST <sup>®</sup> Proud to be part of <sup>®</sup> element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dama 44 af 040	
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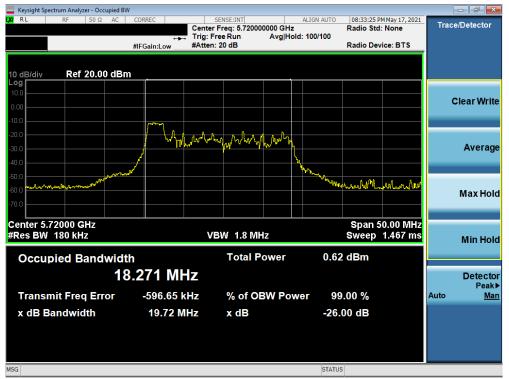
Plot 7-55. 26dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 100)



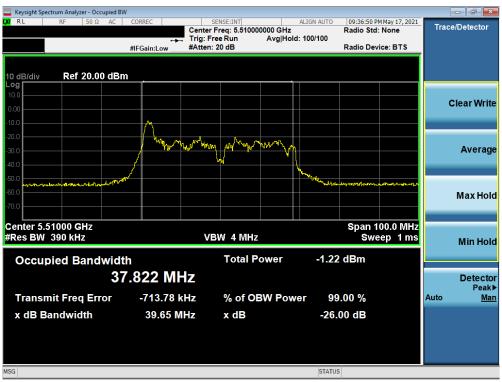
Plot 7-56. 26dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dama 45 -4 04 0
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Plot 7-57. 26dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 144)



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

FCC ID: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dama 40 at 040	
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Keysight Spectrum Analyzer - Occu					
LXI L RF 50 Ω		SENSE:INT A	LIGN AUTO 09:38:55 P Radio Std	M May 17, 2021	Trace/Detector
		Free Run Avg Hold:		: None	
	#IFGain:Low #Atte	en: 20 dB	Radio Dev	/ice: BTS	
10 dB/div Ref 20.00	dBm				
Log 10.0					
0.00					Clear Write
-10.0		<u></u>			
-20.0	and and a stranger with the	1 Warman ward			
-30.0	he and a shirt and	A Martin Handan Hardin . Marin			Average
-40.0	<u>/</u>				
-50.0	the second se		MM Mithow and more	h al es de las de	
-60.0	4		· · · · · · · · · · · · · · · · · · ·		Max Hold
-70.0					Muxilolu
Center 5.59000 GHz				00.0 MHz	
#Res BW 360 kHz		VBW 4 MHz	SW	eep 1 ms	Min Hold
Occupied Bandy	width	Total Power	-1.82 dBm		
	36.201 MHz				Detector
					Detector Peak►
Transmit Freq Erro	or 196.65 kHz	% of OBW Powe	r 99.00 %		Auto <u>Man</u>
x dB Bandwidth	38.21 MHz	x dB	-26.00 dB		
MSG			STATUS		
					Auto <u>Man</u>

Plot 7-59. 26dB Bandwidth Plot MIMO (40MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 118)



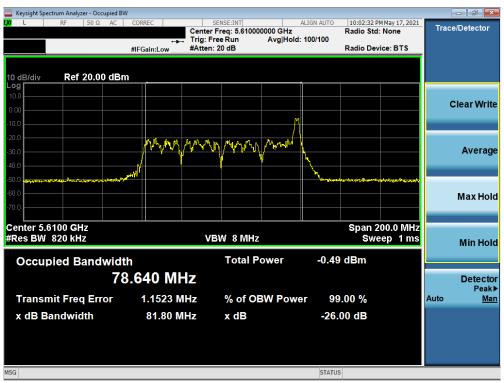
Plot 7-60. 26dB Bandwidth Plot MIMO (40MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMF711JPN	Proved to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dama 47 at 040		
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Plot 7-61. 26dB Bandwidth Plot MIMO (80MHz BW 802.11ax - 26 Tones (UNII Band 2C) - Ch. 106)



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

FCC ID: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dama 40 at 040		
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	Page 48 of 216		
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Keysight Spectrum Analyzer - Occup	oied BW				
<mark>X/</mark> RL RF 50 Ω	AC CORREC	SENSE:INT Iter Freg: 5.690000000 GH:	ALIGN AUTO	10:04:51 PM May 17, 2021 Radio Std: None	Trace/Detector
	Trig	j:Free Run Avg H	old: 100/100		
	#IFGain:Low #At	ten: 20 dB		Radio Device: BTS	_
10 dB/div Ref 20.00	dBm				
Log					
10.0					Clear Write
0.00					
-10.0					
-20.0			0		
-30.0	- Man Mar	how bryowner without			Average
-40.0			-11		
-50.0 Jarrow way war and the work			manue	Had Man mar mar mar	
-60.0					Max Hold
-70.0					
Center 5.6900 GHz				Span 200.0 MHz	
#Res BW 750 kHz		VBW 8 MHz		Sweep 1 ms	Min Hold
Occupied Dandu	ri al fila	Total Power	-2 10	dBm	
Occupied Bandw		I Otal FOWEI	-2.13	dBill	
	75.589 MHz				Detector
Transmit Freq Erro	r 180.82 kHz	% of OBW Po		.00 %	Peak▶ Auto Man
					Auto
x dB Bandwidth	78.50 MHz	x dB	-26.	00 dB	
ISG			STATUS		

Plot 7-63. 26dB Bandwidth Plot MIMO (80MHz BW 802.11ax – 26 Tones (UNII Band 2C) – Ch. 138)

FCC ID: A3LSMF711JPN	PCTEST* Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 40 ef 216
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# MIMO 26dB Bandwidth Measurements (Full Tones)

Fpeg     5180     36     ax (20MHz)     242T     MCS0     24.58       5200     40     ax (20MHz)     242T     MCS0     26.47       5240     48     ax (20MHz)     242T     MCS0     30.31       5190     38     ax (40MHz)     484T     MCS0     66.72       5230     46     ax (40MHz)     484T     MCS0     68.13       5210     42     ax (80MHz)     996T     MCS0     115.90       5260     52     ax (20MHz)     242T     MCS0     26.25       5280     56     ax (20MHz)     242T     MCS0     23.01       5320     64     ax (20MHz)     242T     MCS0     23.01       5320     64     ax (20MHz)     242T     MCS0     23.01       5320     64     ax (20MHz)     242T     MCS0     63.24       5310     62     ax (40MHz)     484T     MCS0     24.61       5290     58     ax (80MHz)     996T     MCS0     22.58		Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 26dB Bandwidth [MHz]
FUND     5240     48     ax (20MHz)     242T     MCS0     30.31       5190     38     ax (40MHz)     484T     MCS0     66.72       5230     46     ax (40MHz)     484T     MCS0     68.13       5210     42     ax (80MHz)     996T     MCS0     115.90       5260     52     ax (20MHz)     242T     MCS0     26.25       5280     56     ax (20MHz)     242T     MCS0     23.01       5320     64     ax (20MHz)     242T     MCS0     21.42       5270     54     ax (40MHz)     484T     MCS0     63.24       5310     62     ax (40MHz)     484T     MCS0     54.61       5290     58     ax (80MHz)     996T     MCS0     104.10       5500     100     ax (20MHz)     242T     MCS0     22.58       5600     120     ax (20MHz)     242T     MCS0     22.58       5600     120     ax (20MHz)     242T     MCS0     21.72		5180	36	ax (20MHz)	242T	MCS0	24.58
5230     46     ax (40MHz)     484T     MCS0     68.13       5210     42     ax (80MHz)     996T     MCS0     115.90       5260     52     ax (20MHz)     242T     MCS0     26.25       5280     56     ax (20MHz)     242T     MCS0     23.01       5320     64     ax (20MHz)     242T     MCS0     21.42       5270     54     ax (40MHz)     484T     MCS0     63.24       5310     62     ax (40MHz)     484T     MCS0     54.61       5290     58     ax (80MHz)     996T     MCS0     104.10       5500     100     ax (20MHz)     242T     MCS0     22.58       5600     120     ax (20MHz)     242T     MCS0     22.74       5720     144     ax (20MHz)     242T     MCS0     21.72       5510     102     ax (40MHz)     242T     MCS0     21.72       5510     102     ax (40MHz)     484T     MCS0     69.51		5200	40	ax (20MHz)	242T	MCS0	26.47
5230     46     ax (40MHz)     484T     MCS0     68.13       5210     42     ax (80MHz)     996T     MCS0     115.90       5260     52     ax (20MHz)     242T     MCS0     26.25       5280     56     ax (20MHz)     242T     MCS0     23.01       5320     64     ax (20MHz)     242T     MCS0     21.42       5270     54     ax (40MHz)     484T     MCS0     63.24       5310     62     ax (40MHz)     484T     MCS0     54.61       5290     58     ax (80MHz)     996T     MCS0     104.10       5500     100     ax (20MHz)     242T     MCS0     22.58       5600     120     ax (20MHz)     242T     MCS0     22.74       5720     144     ax (20MHz)     242T     MCS0     21.72       5510     102     ax (40MHz)     242T     MCS0     21.72       5510     102     ax (40MHz)     484T     MCS0     69.51	p 1	5240	48	ax (20MHz)	242T	MCS0	30.31
S210     42     ax (80MHz)     996T     MCS0     115.90       5260     52     ax (20MHz)     242T     MCS0     26.25       5280     56     ax (20MHz)     242T     MCS0     23.01       5320     64     ax (20MHz)     242T     MCS0     21.42       5270     54     ax (40MHz)     484T     MCS0     63.24       5310     62     ax (40MHz)     484T     MCS0     54.61       5290     58     ax (80MHz)     996T     MCS0     104.10       5500     100     ax (20MHz)     242T     MCS0     22.58       5600     120     ax (20MHz)     242T     MCS0     22.74       5720     144     ax (20MHz)     242T     MCS0     22.74       5720     144     ax (20MHz)     242T     MCS0     21.72       5510     102     ax (40MHz)     484T     MCS0     21.72       5590     118     ax (40MHz)     484T     MCS0     69.51	Bar	5190	38	ax (40MHz)	484T	MCS0	66.72
STORE     5260     52     ax (20MHz)     242T     MCS0     26.25       5280     56     ax (20MHz)     242T     MCS0     23.01       5320     64     ax (20MHz)     242T     MCS0     21.42       5270     54     ax (40MHz)     484T     MCS0     63.24       5210     62     ax (40MHz)     484T     MCS0     54.61       5290     58     ax (80MHz)     996T     MCS0     22.58       5600     100     ax (20MHz)     242T     MCS0     22.58       5600     120     ax (20MHz)     242T     MCS0     22.74       5720     144     ax (20MHz)     242T     MCS0     21.72       5510     102     ax (40MHz)     242T     MCS0     21.72       5510     102     ax (40MHz)     484T     MCS0     69.51       5710     142     ax (40MHz)     484T     MCS0     69.51       5710     142     ax (40MHz)     484T     MCS0     62.26 </td <th></th> <td>5230</td> <td>46</td> <td>ax (40MHz)</td> <td>484T</td> <td>MCS0</td> <td>68.13</td>		5230	46	ax (40MHz)	484T	MCS0	68.13
Solution     Solution		5210	42	ax (80MHz)	996T	MCS0	115.90
Solution     5320     64     ax (20MHz)     242T     MCS0     21.42       5270     54     ax (40MHz)     484T     MCS0     63.24       5310     62     ax (40MHz)     484T     MCS0     54.61       5290     58     ax (80MHz)     996T     MCS0     104.10       5500     100     ax (20MHz)     242T     MCS0     22.58       5600     120     ax (20MHz)     242T     MCS0     22.74       5720     144     ax (20MHz)     242T     MCS0     21.72       5510     102     ax (40MHz)     242T     MCS0     21.72       5510     102     ax (40MHz)     242T     MCS0     21.72       5510     102     ax (40MHz)     484T     MCS0     69.51       5710     142     ax (40MHz)     484T     MCS0     69.51       5710     142     ax (40MHz)     484T     MCS0     62.26       5530     106     ax (80MHz)     996T     MCS0     9		5260	52	ax (20MHz)	242T	MCS0	26.25
Deg     3320     0.4     ax (20MHz)     2.421     MCS0     2.1.42       5270     54     ax (40MHz)     484T     MCS0     63.24       5310     62     ax (40MHz)     484T     MCS0     54.61       5290     58     ax (80MHz)     996T     MCS0     104.10       5500     100     ax (20MHz)     242T     MCS0     22.58       5600     120     ax (20MHz)     242T     MCS0     22.74       5720     144     ax (20MHz)     242T     MCS0     21.72       5510     102     ax (40MHz)     484T     MCS0     46.30       5590     118     ax (40MHz)     484T     MCS0     69.51       5710     142     ax (40MHz)     484T     MCS0     62.26       5530     106     ax (80MHz)     996T     MCS0     91.83	⊲	5280	56	ax (20MHz)	242T	MCS0	23.01
5310     62     ax (40MHz)     484T     MCS0     54.61       5290     58     ax (80MHz)     996T     MCS0     104.10       5500     100     ax (20MHz)     242T     MCS0     22.58       5600     120     ax (20MHz)     242T     MCS0     22.74       5720     144     ax (20MHz)     242T     MCS0     21.72       5510     102     ax (40MHz)     484T     MCS0     69.51       5590     118     ax (40MHz)     484T     MCS0     69.51       5710     142     ax (40MHz)     484T     MCS0     62.26       5530     106     ax (80MHz)     996T     MCS0     91.83	d 2	5320	64	ax (20MHz)	242T	MCS0	21.42
5310     62     ax (40MHz)     484T     MCS0     54.61       5290     58     ax (80MHz)     996T     MCS0     104.10       5500     100     ax (20MHz)     242T     MCS0     22.58       5600     120     ax (20MHz)     242T     MCS0     22.74       5720     144     ax (20MHz)     242T     MCS0     21.72       5510     102     ax (40MHz)     484T     MCS0     69.51       5590     118     ax (40MHz)     484T     MCS0     69.51       5710     142     ax (40MHz)     484T     MCS0     62.26       5530     106     ax (80MHz)     996T     MCS0     91.83	gan	5270	54	ax (40MHz)	484T	MCS0	63.24
S500     100     ax (20MHz)     242T     MCS0     22.58       5600     120     ax (20MHz)     242T     MCS0     22.74       5720     144     ax (20MHz)     242T     MCS0     21.72       5510     102     ax (40MHz)     484T     MCS0     46.30       5590     118     ax (40MHz)     484T     MCS0     69.51       5710     142     ax (40MHz)     484T     MCS0     69.51       5730     106     ax (80MHz)     996T     MCS0     91.83	ш	5310	62	ax (40MHz)	484T	MCS0	54.61
Second     Second<		5290	58	ax (80MHz)	996T	MCS0	104.10
S720     144     ax (20MHz)     242T     MCS0     21.72       5510     102     ax (40MHz)     484T     MCS0     46.30       5590     118     ax (40MHz)     484T     MCS0     69.51       5710     142     ax (40MHz)     484T     MCS0     69.51       5710     142     ax (40MHz)     996T     MCS0     91.83		5500	100	ax (20MHz)	242T	MCS0	22.58
Specific     5510     102     ax (40MHz)     484T     MCS0     46.30       5590     118     ax (40MHz)     484T     MCS0     69.51       5710     142     ax (40MHz)     484T     MCS0     69.51       5710     142     ax (40MHz)     484T     MCS0     62.26       5530     106     ax (80MHz)     996T     MCS0     91.83		5600	120	ax (20MHz)	242T	MCS0	22.74
5590     118     ax (40MHz)     484T     MCS0     69.51       5710     142     ax (40MHz)     484T     MCS0     62.26       5530     106     ax (80MHz)     996T     MCS0     91.83		5720	144	ax (20MHz)	242T	MCS0	21.72
5590     118     ax (40MHz)     484T     MCS0     69.51       5710     142     ax (40MHz)     484T     MCS0     62.26       5530     106     ax (80MHz)     996T     MCS0     91.83	5C	5510	102	ax (40MHz)	484T	MCS0	46.30
5530 106 ax (80MHz) 996T MCS0 91.83	pu	5590	118	ax (40MHz)	484T	MCS0	69.51
	Ba	5710	142	ax (40MHz)	484T	MCS0	62.26
5610 122 ax (80MHz) 996T MCS0 101.30		5530	106	ax (80MHz)	996T	MCS0	91.83
		5610	122	ax (80MHz)	996T	MCS0	101.30
5690 138 ax (80MHz) 996T MCS0 100.90		5690	138	ax (80MHz)	996T	MCS0	100.90

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

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage E0 of 216
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	Page 50 of 216
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🔤 Keysight Spectrum Analyzer - Occupied BW						
LX/ RL RF 50Ω AC	CORREC	SENSE:INT r Freg: 5.180000000 GHz	ALIGN AUTO 09:14:04 Radio Sto	PM May 17, 2021	Trace/Detector	
			d: 100/100	a. None		
	#IFGain:Low #Atter	n: 20 dB	Radio De	vice: BTS		
10 dB/div Ref 20.00 dB	m					
Log 10.0						
					Clear Write	
0.00						
-10.0	Jon Mar Swall and March and Same	m. moled Brown when him				
-20.0	A AND AN AND AND AND AND					
-30.0			1		Average	
-40.0	1. J. J. M.					
-50.0 Harrow Prostation - 1000	·			When May Charles		
-60.0					Max Hold	
-70.0					Maxilola	
Center 5.18000 GHz				50.00 MHz		
#Res BW 270 kHz	v	/BW 2.7 MHz	Sw	eep 1 ms	Min Hold	
Occupied Bandwid	lth	Total Power	1.99 dBm			
1	9.089 MHz				Detector Peak▶	
Transmit Freq Error	-44.900 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>	
x dB Bandwidth	24.58 MHz	x dB	-26.00 dB			
MSG			STATUS			

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



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

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dara 54 at 040		
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	Page 51 of 216		
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www.www.com analyzer - Occupied BW	1				
KAL RF 50Ω AC	CORREC	SENSE:INT		L6:05 PM May 17, 2021	Trace/Detector
		er Freq: 5.240000000 GHz Free Run Avg Ho	Radi Id: 100/100	o Sta: None	
		n: 20 dB		o Device: BTS	
10 dB/div Ref 20.00 dBm	1				
Log 10.0					
					Clear Write
0.00					
-10.0	Janesa Warding alaparticus	may and many and			
			N .		Average
-30.0			Mar .		Average
-40.0				way and the second second	
-50.0				and the fact of the	
-60.0					Max Hold
-70.0					
Center 5.24000 GHz #Res BW 270 kHz	1	/BW 2.7 MHz	sp	an 50.00 MHz Sweep 1 ms	
#Res BW ZIO RHZ				Sweep This	Min Hold
Occupied Bandwidt	h	Total Power	3.79 dB	m	
19	.054 MHz				Detector
					Peak►
Transmit Freq Error	-42.330 kHz	% of OBW Pov	ver 99.00	%	Auto <u>Man</u>
x dB Bandwidth	30.31 MHz	x dB	-26.00 d	В	
MSG			STATUS		

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



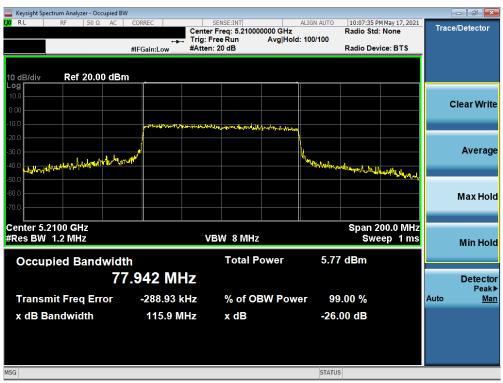
Plot 7-67. 26dB Bandwidth Plot MIMO (40MHz BW 802.11ax - 484 Tones (UNII Band 1) - Ch. 38)

FCC ID: A3LSMF711JPN	PCTEST <sup>®</sup> Proud to be part of <sup>®</sup> element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dama 50 at 040		
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	Page 52 of 216		
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Keysight Spectrum Analyzer - Occupied E	3W				
LX/ RL RF 50Ω AC	CORREC	SENSE:INT r Freg: 5.230000000 GHz	ALIGN AUTO 09:47:20 P Radio Std	M May 17, 2021	Trace/Detector
		Free Run Avg Hold		. None	
	#IFGain:Low #Atter	n: 20 dB	Radio Dev	vice: BTS	
10 dB/div Ref 20.00 dB	m				
Log 10.0					
					Clear Write
-10.0					
-20.0	porter the second and the prover hard the	and hallow on the property alor			
-30.0					Average
-40.0			M his h		
-50.0 mapping the market water	Nymbe <sup>r ne</sup>		Weekland and the shape of the stranger	and the second	
-60.0					Max Hold
-70.0					maxitora
Center 5.23000 GHz				00.0 MHz	
#Res BW 620 kHz	V	BW 6 MHz	SWO	eep 1 ms	Min Hold
Occupied Bandwid	th	Total Power	-3.81 dBm		
	8.165 MHz				Detector
					Detector Peak►
Transmit Freq Error	-28.568 kHz	% of OBW Powe	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	68.13 MHz	x dB	-26.00 dB		
MSG			STATUS		
Mod			314103		

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



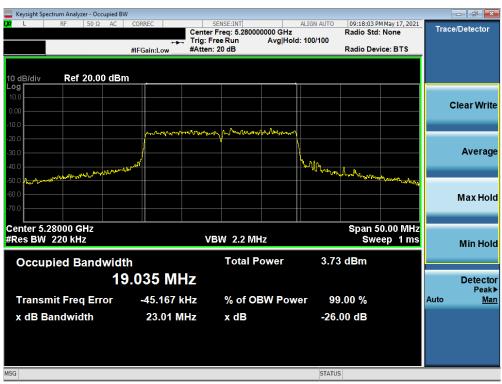
Plot 7-69. 26dB Bandwidth Plot MIMO (80MHz BW 802.11ax - 996 Tones (UNII Band 1) - Ch. 42)

FCC ID: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Daga 52 of 216	
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset		Page 53 of 216	
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Keysight Spectrum Analyzer - Occupied BW								
LXI RL RF 50Ω AC	CORREC	SENSE:INT		ALIGN AUTO	09:17:09 PM Radio Std:	May 17, 2021	Trac	e/Detector
		Center Freq: 5.2600 Trig: Free Run	Avg Hold		Radio Std:	None		
	#IFGain:Low	#Atten: 20 dB	<b>.</b>		Radio Devi	ice: BTS		
10 dB/div Ref 20.00 dBm								
Log								
10.0								Clear Write
0.00								
-10.0	, and the second s	the marine marine	mohern					
-20.0								
-30.0								Average
-40.0	J <sup>w<sup>4</sup></sup>			WUMMANN	www.lugu			
-40.0 -50.0 March					And a start of a solid of	when when any		
-60.0								Max Hold
-70.0								
Center 5.26000 GHz						0.00 MHz		
#Res BW 300 kHz		VBW 3 MHz	2		Swe	ep 1 ms		Min Hold
		Total F	lower	3.53	dDm			
Occupied Bandwidth			ower	3,33	иыш			
19.	121 MH	Z						Detector
Tronowit From From	27 022 -	N= 0/ -50		00	00.0/		Auto	Peak►
Transmit Freq Error	-37.822 kl		BW Pow	er 99.	00 %		Auto	<u>Man</u>
x dB Bandwidth	26.25 M	Hz xdB		-26.0	0 dB			
MSG				STATUS				

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



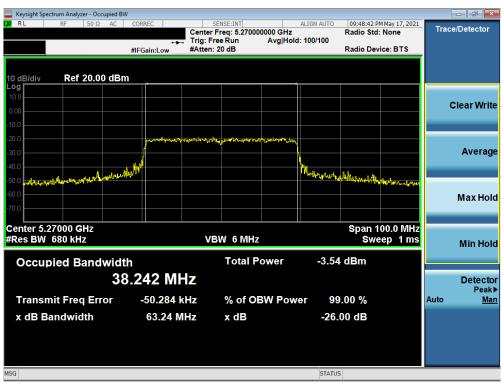
Plot 7-71. 26dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 242 Tones (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMF711JPN	PCTEST <sup>®</sup> Proud to be part of <sup>®</sup> element	MEASUREMENT REPORT (CERTIFICATION)	SUNG	pproved by: echnical Manager
Test Report S/N:	Test Dates:	EUT Type:	n	
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	P	Page 54 of 216
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🔤 Keysight Spectrum Analyzer - Occupied	H BW				
🗶 RL RF 50Ω AC		SENSE:INT		PM May 17, 2021	Trace/Detector
		enter Freq: 5.320000000 GHz rig: Free Run Avg Ho	id: 100/100	a: None	
		Atten: 20 dB		vice: BTS	
10 dB/div Ref 20.00 dl	Bm				
Log					
					Clear Write
0.00					
-10.0	manun	-auguna marian - white the started			
-20.0		and the second	×		
-30.0			1.		Average
-40.0	4 -1 10-17		Manua I.		
-40.0	MUD		mormorrylabourg	and the grand with the way	
-60.0					Max Hold
-70.0					
Center 5.32000 GHz				50.00 MHz	
#Res BW 240 kHz		VBW 2.4 MHz	Sw	reep 1ms	Min Hold
Occurried Dendui	-141-	Total Power	2.39 dBm		
Occupied Bandwi			2.59 ubiii		
	19.023 MHz				Detector
Transmit Freg Error	-42.648 kHz	% of OBW Pov	wer 99.00 %		Peak▶ Auto Man
					Mato <u>iman</u>
x dB Bandwidth	21.42 MHz	x dB	-26.00 dB		
MSG			STATUS		

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



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

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	Page 55 of 216
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🔤 Keysight Spectrum Analyzer - Occupied B	3W					- ē 💌
LXI RE 50Ω AC	CORREC	SENSE:INT	ALIGN AUTO	09:49:40 PM M		Trace/Detector
		Center Freq: 5.3100000 Trig: Free Run A	Avg Hold: 100/100	Radio Std: N	one	
		¢Atten: 20 dB		Radio Device	BTS	
10 dB/div Ref 20.00 dB	m					
Log						
10.0						Clear Write
0.00						
-10.0						
-20.0	monthown	Muphanya horanga ang	Real Advert			
-30.0	<b>(</b>					Average
-40.0						
-50.0	app <sup>age</sup>		Winner	Mander Marian	Truck change	
-60.0					and a second	
-70.0						Max Hold
-70.0						
Center 5.31000 GHz				Span 100	.0 MHz	
#Res BW 620 kHz		VBW 6 MHz			o 1 ms	Min Hold
						minifierd
Occupied Bandwid	th	Total Pov	ver -3.30	dBm		
3	8.148 MHz	2				Detector
						Peak▶
Transmit Freq Error	-31.392 kH	z % of OBW	Power 99	.00 %		Auto <u>Man</u>
x dB Bandwidth	54.61 MH	z xdB	-26.0	00 dB		
MSG			STATUS			

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



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

FCC ID: A3LSMF711JPN	PCTEST <sup>®</sup> Proud to be part of <sup>®</sup> element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	De 22 50 26 040
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	Page 56 of 216
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Keysight Spectrum Analyzer - Occupied BW						_	- 🗗 💌
LXX RL RF 50Ω AC	CORREC	SENSE:INT	ALIGN AUTO	09:20:47 PM Mar Radio Std: No		Trace	Detector
			Avg Hold: 100/100	Radio Sta: No	ne		
	#IFGain:Low#	Atten: 20 dB	•.	Radio Device:	BTS		
10 dB/div Ref 20.00 dBm							
Log							
10.0						c	ear Write
0.00							
-10.0							
-20.0	and the second	mmmmmh	~~~~~				
-30.0			N				Average
-40.0							
-40.0 -50.0 -60.0			- Uhhadan	unghan hant hall and			
-60.0				and the proof profilement	ray low		
-70.0							Max Hold
-70.0						_	_
Center 5.50000 GHz				Span 50.0	0 MHz		
#Res BW 220 kHz		VBW 2.2 MHz		Sweep			Min Hold
		T-4-1 D-					
Occupied Bandwidth		Total Pov	wer 1.03	5 dBm			
19.	014 MHz						Detector
						• •	Peak▶
Transmit Freq Error	-30.522 kHz	z % of OBV	V Power 99	0.00 %		Auto	<u>Man</u>
x dB Bandwidth	22.58 MHz	z xdB	-26.	00 dB			
MSG			STATUS				

Plot 7-76. 26dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 242 Tones (UNII Band 2C) - Ch. 100)



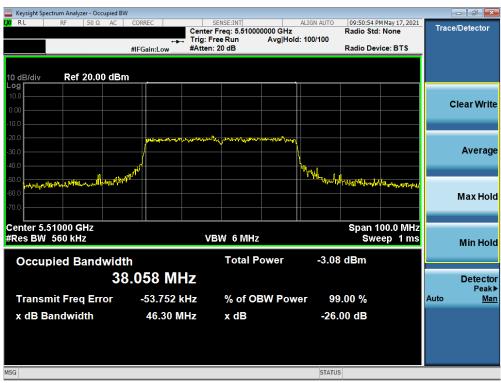
Plot 7-77. 26dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 242 Tones (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMF711JPN	PCTEST <sup>®</sup> Proud to be part of <sup>®</sup> element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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🔤 Keysight Spectrum Analyzer - Occu	upied BW						- 6 ×
LXI RL RF 50Ω	AC CORREC	SENSE:INT Center Freq: 5.72000	ALIGN AUTO	09:23:17 PM Ma		Trace	/Detector
			Avg Hold: 100/100	Radio Std: No	one		
	#IFGain:Low	#Atten: 20 dB		Radio Device	BTS		
10 dB/div Ref 20.00	dBm						
Log							
10.0						<u>م</u>	lear Write
0.00						Č	
-10.0							
-20.0	Approximente	han ward and the second	h h h h e h a h a h a h a h a h a h a h				
-30.0							Average
-40.0	, <u> </u>		l l				
	man will a man		Muhulta.	All March March			
-50.0				apple of the second	when		
-60.0							Max Hold
-70.0							
Center 5.72000 GHz				On on 50 /			
#Res BW 240 kHz		VBW 2.4 MH	17	Span 50.0	00 10112 0 1 ms		
WINCS DW 240 KHZ			12	owee	5 1 1115		Min Hold
Occupied Bandy	width	Total P	ower -0.79	dBm			
		1-					
	19.048 MI	Z					Detector Peak▶
Transmit Freq Erro	or -47.529	kHz % of OE	3W Power 99	.00 %		Auto	Peak≱ <u>Man</u>
x dB Bandwidth	21.72 N	lHz x dB	26	00 dB			
	21.72 W		-20.0	00 UB			
MSG			STATUS				

Plot 7-78. 26dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 242 Tones (UNII Band 2C) - Ch. 144)



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

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager				
Test Report S/N:	Test Dates:	EUT Type:	Daga 59 of 246				
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www.www.com analyzer - Occupied BW							- 6 <b>-</b>
	🛻 Tri	SENSE:INT nter Freq: 5.590000000 G g: Free Run Avg tten: 20 dB	ALIGN AUTO Hz Hold: 100/100	Radio Std		Trac	e/Detector
	#IFGain:Low #A1	tten: 20 dB		Radio Dev	ICE: BIS		
10 dB/div Ref 20.00 dBm			_				
							Clear Write
-10.0	<u> </u>	مراكلهم مساله المسيسي					
-20.0		and Change and Milling and and a second s					Average
-40.0			May May North	hullentyh	Mart Marta		
-60.0							Max Hold
Center 5.59000 GHz				Span 1	00.0 MHz		
#Res BW 620 kHz		VBW 6 MHz			ep 1 ms		Min Hold
Occupied Bandwidth		Total Power	-0.96	dBm			
	215 MHz						Detector Peak▶
Transmit Freq Error	-21.087 kHz	% of OBW P	ower 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth	69.51 MHz	x dB	-26.0	00 dB			
MSG			STATUS				

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



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

FCC ID: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:	Page 59 of 216			
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset				
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🔤 Keysight Spectrum Analyzer - Occupied BW							- 6 ×
XIRL RF 50Ω AC	CORREC	SENSE:INT	ALIGN AUT	2 10:09:13 P Radio Std	M May 17, 2021	Trac	e/Detector
		Frig: Free Run	Avg Hold: 100/100	Radio Stu	None		
	#IFGain:Low #	#Atten: 20 dB		Radio Dev	ice: BTS		
10 dB/div Ref 20.00 dBm							
Log							
10.0							Clear Write
0.00							
-10.0							
-20.0	at the set of the set	h-wheneyeddineyddineyddineg	-ser-des-des-des-labor				
-30.0							Average
-40.0	//		k <sub>a</sub>				
-40.0	eee		Withulante	www.	American		
-60.0							
-70.0							Max Hold
-70.0						_	
Center 5.5300 GHz				Span 2	00.0 MHz		
#Res BW 1 MHz		VBW 8 MHz			eep 1 ms		Min Hold
							minnora
Occupied Bandwidt	า	Total P	ower 1.	50 dBm			
77	.735 MHz	2					Detector
							Peak▶
Transmit Freq Error	-182.14 kH	z % of O	3W Power	99.00 %		Auto	<u>Man</u>
x dB Bandwidth	91.83 MH	z xdB	-2	6.00 dB			
MSG			STA	rus			

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



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

FCC ID: A3LSMF711JPN	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 010		
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	Page 60 of 216		
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🚾 Keysight Spec			upied BV										- 0 ×
XVIRL	RF	50 Ω	AC	CORREC			NSE:INT	000000 GHz	ALIGN AUTO	10:10:56 Pf Radio Std:	May 17, 2021	Trac	e/Detector
					- <b>-</b>	Trig: Fre	e Run		l: 100/100				
				#IFGain	:Low	#Atten: 2	20 dB			Radio Dev	ice: BTS		
10 dB/div	Ref	20.00	) dBn	n									
Log 10.0													
0.00												0	Clear Write
-10.0													
-20.0					w. w	unter hase	hunder	the marker and					
-30.0				į.									Average
-40.0									1.				Average
-40.0		والهراي	Another	îw <sup>pr</sup>					Willy washingth	Marthanapoly			
	and the second										and an an a start of the start of the		
-60.0													Max Hold
-70.0													
Center 5.6	900 GH	z								Span 2	00.0 MHz		
#Res BW	910 kH;	z				VB	W 8 MH	z			ep 1 ms		Min Hold
							Tetel	D	0.74	dBm			
Occup	led Ba	and					lotal	Power	0.71	aBm			
			77	7.575	5 MH	Z							Detector
Transm	it Eroa	Err		45	.071 k	LI	9/ of (	DBW Pow	or 00	.00 %		Auto	Peak▶ Man
			0I									Auto	<u>Ivian</u>
x dB Ba	andwid	th		10	00.9 M	Hz	x dB		-26.	00 dB			
MSG									STATUS	5			

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

FCC ID: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	Dates: EUT Type:		Page 61 of 216	
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	set		
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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: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:	Dama 00 at 010			
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	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
	5745	149	ax (20MHz)	26T	MCS0	2.69
	5785	157	ax (20MHz)	26T	MCS0	2.14
d 3	5825	165	ax (20MHz)	26T	MCS0	2.67
Band	5755	151	ax (40MHz)	26T	MCS0	2.20
_	5795	159	ax (40MHz)	26T	MCS0	2.15
	5775	155	ax (80MHz)	26T	MCS0	2.86

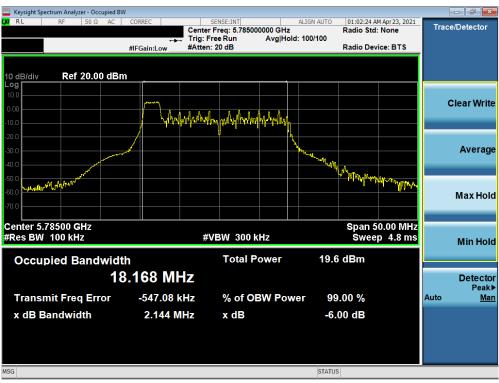
Table 7-6. Conducted Bandwidth Measurements SISO ANT1 (26 Tones)

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-85. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 149)



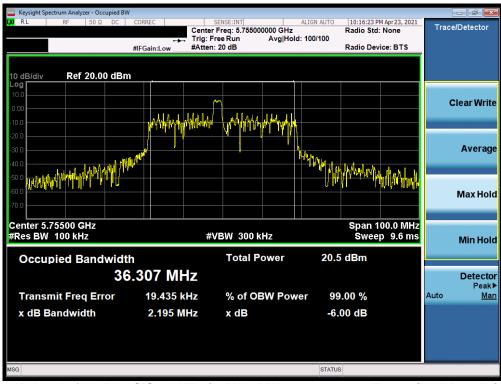
Plot 7-86. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 157)

FCC ID: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager			
Test Report S/N:	Test Dates:	EUT Type:	D 04 (040			
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Plot 7-87. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 165)



Plot 7-88. 6dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 151)

FCC ID: A3LSMF711JPN	Proved to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Page 65 of 216		
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Keysight Spectrum Analyzer - Occupied BV	N					a x
LX/ RL RF 50Ω DC	CORREC	SENSE:INT er Freg: 5.795000000 GHz	ALIGN AUTO	10:25:59 PM Apr 23, 2021 Radio Std: None	Trace/D	etector
	Trig:	Free Run Avg Ho	ld: 100/100			
	#IFGain:Low #Atte	n: 20 dB		Radio Device: BTS	-	
10 dB/div Ref 20.00 dBn	n					
Log 10.0						
		m	-		Cle	ar Write
0.00	1 1 1 11 1	1 1. 1.1.1.1.1				
-10.0		alat har war har a har har har har har har har har				
-20.0			$\mathbb{N}$			
-30.0	1.		+		4	Average
-40.0	₿~ <sup>/™</sup>		- Multin	and H. L. N		
-50.0 - 1 - dilamonte della 10/10/10/10/10/10/10/10/10/10/10/10/10/1			107	MARY MALINHALLANT		
-50.0				<u> </u>	м	ax Hold
-70.0					141	
Center 5.79500 GHz				Span 100.0 MHz		
#Res BW 100 kHz	#	#VBW 300 kHz		Sweep 9.6 ms	N	lin Hold
Occurried Denduridt		Total Power	10.9	dBm		
Occupied Bandwidt		Total Fower	19.0	UBIII		
37	7.399 MHz				C	Detector
Transmit From Freez	522 44 kH=	% of OBW Pov		00.9/	Auto	Peak▶ Man
Transmit Freq Error	533.44 kHz		ver 99	.00 %	Auto	IVIAII
x dB Bandwidth	2.152 MHz	x dB	-6.	00 dB		
MSG			STATUS			
			UNATOC			

Plot 7-89. 6dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax – 26 Tones (UNII Band 3) – Ch. 159)



Plot 7-90. 6dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 155)

FCC ID: A3LSMF711JPN	PCTEST <sup>®</sup> Proud to be part of <sup>®</sup> element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		
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	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
	5745	149	ax (20MHz)	242T	MCS0	18.96
~	5785	157	ax (20MHz)	242T	MCS0	19.12
1d 3	5825	165	ax (20MHz)	242T	MCS0	19.06
Band	5755	151	ax (40MHz)	484T	MCS0	38.17
	5795	159	ax (40MHz)	484T	MCS0	38.19
	5775	155	ax (80MHz)	996T	MCS0	78.13

## SISO Antenna-1 6 dB Bandwidth Measurements (Full Tones)

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

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 67 of 216
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Keysight Spectrum Analyzer - Occupied BW							
LX RL RF 50Ω DC CC	RREC	SENSE:INT		IN AUTO 09:32:02 PI Radio Std:	4 Apr 23, 2021	Trace	Detector
	- <b>-</b>	Trig: Free Run	Avg Hold: 100	0/100			
#IF	Gain:Low	#Atten: 20 dB		Radio Dev	ice: BTS		
10 dB/div Ref 20.00 dBm							
10.0							
0.00	and	nature adortan	Profit and an Inc			С	lear Write
-10.0							
			\.				
h alar NEAR AND T			•البل	Wight Mary W Winner	Al atom		Average
-30.0 -40.0					and the stand of t		Average
-50.0							
-60.0							Max Hold
-70.0						_	
Center 5.74500 GHz		I		Span 5	0.00 MHz		
#Res BW 100 kHz		#VBW 300 H	Hz	Swee	p 4.8 ms		Min Hold
							minina
Occupied Bandwidth		Total P	ower	22.2 dBm			
19.0	)60 MH	Z					Detector
	00 400 11			00.00.0/		0	Peak►
	-29.190 kH		BW Power	99.00 %		Auto	Man
x dB Bandwidth	18.96 MH	z x dB		-6.00 dB			
MSG				STATUS			

Plot 7-91. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 3) - Ch. 149)



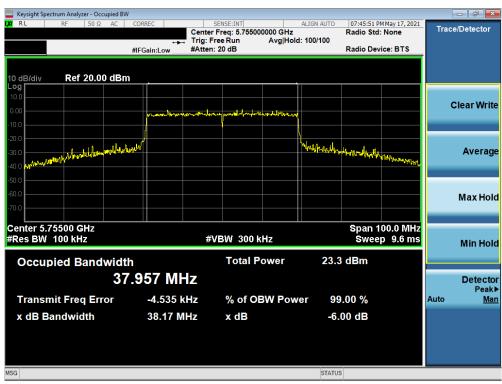
Plot 7-92. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 3) - Ch. 157)

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dama 60 at 010		
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Keysight Spectrum Analyzer - Occupied BW				
X/ RL RF 50 Ω DC CORREC	SENSE:INT Center Freg: 5.825	ALIGN AUTO	09:36:29 PM Apr 23, 2021 Radio Std: None	Trace/Detector
	Trig: Free Run	Avg Hold: 100/100	Radio Stu. None	
#IFGain	:Low #Atten: 20 dB		Radio Device: BTS	
10 dB/div Ref 20.00 dBm				
10.0				
				Clear Write
0.00	ann-on-angeler of the original	Martin and and		
-10.0				
-20.0		Wm houghle	allow water water	
-30.0		·	a contraction of the state	Average
-40.0				
-50.0				
-60.0				Max Hold
-70.0				Maxiloid
Center 5.82500 GHz			Span 50.00 MHz	
#Res BW 100 kHz	#VBW 300	kHz	Sweep 4.8 ms	Min Hold
Occupied Bandwidth	Total	Power 21.8	3 dBm	
		21.0		
19.15	1 MHz			Detector
Transmit Freq Error -27	7.818 kHz % of 0	BW Power 99	9.00 %	Peak▶ Auto Man
				india
x dB Bandwidth 19	9.06 MHz x dB	-6.	00 dB	
MSG		STATUS	5	

Plot 7-93. 6dB Bandwidth Plot SISO ANT1 (20MHz BW 802.11ax - 242 Tones (UNII Band 3) - Ch. 165)



Plot 7-94. 6dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 3) - Ch. 151)

FCC ID: A3LSMF711JPN	Proved to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dara (0. st 040		
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www.www.com.com/www.cow/www.co					- ē 💌
LXX RL RF 50Ω AC C	ORREC	SENSE:INT		:46:36 PM May 17, 2021	Trace/Detector
	Trig: F	Free Run Avg Hold	d: 100/100	alo sta. None	
#I	FGain:Low #Atter	n: 20 dB	Rad	dio Device: BTS	
10 dB/div Ref 20.00 dBm					
Log 10.0					
					Clear Write
0.00	melener	mon monder to an a stand and a stand a			
-10.0					
-20.0	J		hold on a mail of the story	fu h	
-20.0				WWWW.	Average
-40.0					
-50.0					
-60.0					Max Hold
-70.0					maxiloid
Center 5.79500 GHz				pan 100.0 MHz	
#Res BW 100 kHz	#	VBW 300 kHz		Sweep 9.6 ms	Min Hold
Occupied Bandwidth		Total Power	23.3 dE	3m	
38.	106 MHz				Detector Peak▶
Transmit Freq Error	-7.283 kHz	% of OBW Pow	er 99.00	%	Auto <u>Man</u>
x dB Bandwidth	38.19 MHz	x dB	-6.00 (	B	
	00.10 11112		0.00 (		
MSG			STATUS		

Plot 7-95. 6dB Bandwidth Plot SISO ANT1 (40MHz BW 802.11ax - 484 Tones (UNII Band 3) - Ch. 159)



Plot 7-96. 6dB Bandwidth Plot SISO ANT1 (80MHz BW 802.11ax - 996 Tones (UNII Band 3) - Ch. 155)

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dama 70 of 010		
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© 2021 PCTEST V 9.0 02/01/2019					



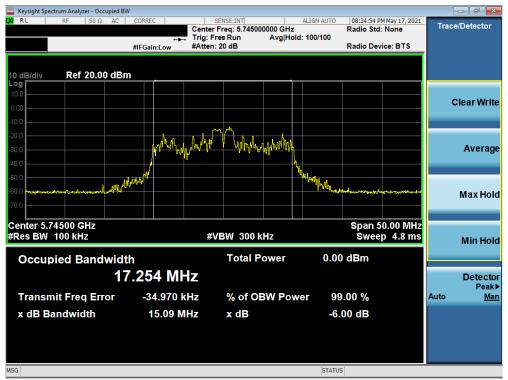
# MIMO 6dB Bandwidth Measurements (26 Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
	5745	149	ax (20MHz)	26T	MCS0	15.09
~	5785	157	ax (20MHz)	26T	MCS0	8.34
1d 3	5825	165	ax (20MHz)	26T	MCS0	2.06
Band	5755	151	ax (40MHz)	26T	MCS0	2.12
	5795	159	ax (40MHz)	26T	MCS0	2.13
	5775	155	ax (80MHz)	26T	MCS0	2.83

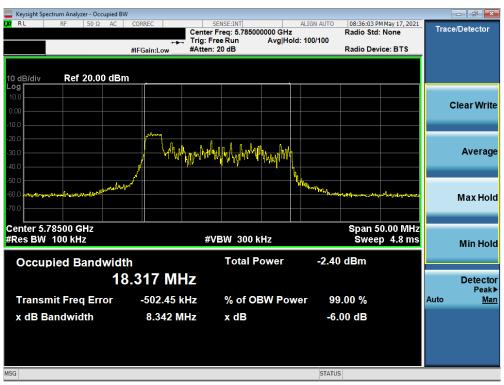
Table 7-8. Conducted Bandwidth Measurements MIMO (26 Tones)

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 71 of 016
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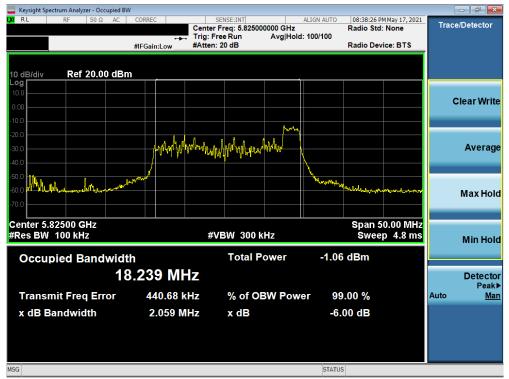
Plot 7-97. 6dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 149)



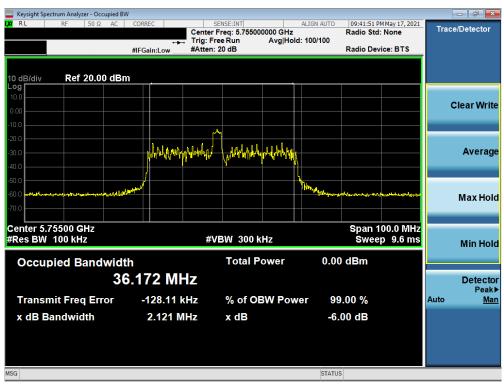
Plot 7-98. 6dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 157)

FCC ID: A3LSMF711JPN	Proved to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dama 70 at 040		
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	Page 72 of 216		
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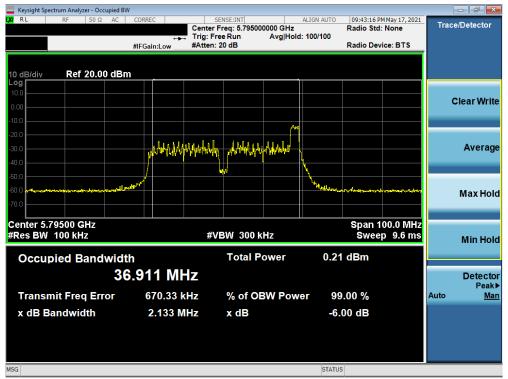
Plot 7-99. 6dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 165)



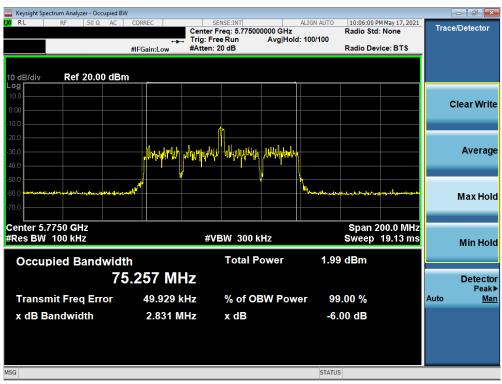
Plot 7-100. 6dB Bandwidth Plot MIMO (40MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 151)

FCC ID: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dana 70 af 040	
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Plot 7-101. 6dB Bandwidth Plot MIMO (40MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 159)



Plot 7-102. 6dB Bandwidth Plot MIMO (80MHz BW 802.11ax - 26 Tones (UNII Band 3) - Ch. 155)

FCC ID: A3LSMF711JPN	PCTEST <sup>®</sup> Proud to be part of <sup>®</sup> element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dama 74 af 040	
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## MIMO 6dB Bandwidth Measurements (Full Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured 6dB Bandwidth [MHz]
	5745	149	ax (20MHz)	242T	MCS0	18.73
~	5785	157	ax (20MHz)	242T	MCS0	18.88
d 3	5825	165	ax (20MHz)	242T	MCS0	18.80
Band	5755	151	ax (40MHz)	484T	MCS0	37.90
	5795	159	ax (40MHz)	484T	MCS0	37.94
	5775	155	ax (80MHz)	996T	MCS0	74.71

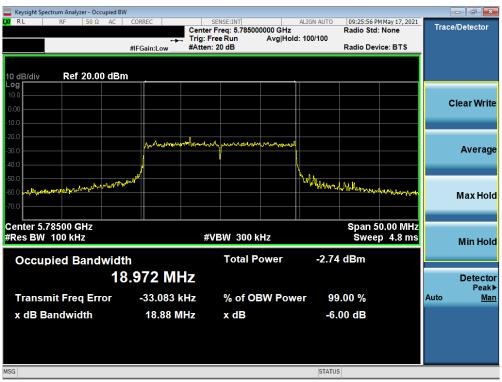
Table 7-9. Conducted Bandwidth Measurements MIMO (Full Tones)

FCC ID: A3LSMF711JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 75 of 216
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🤤 Keysight Spectrum Analyzer - Occupie	ed BW				- • <b>•</b>
L <mark>X/</mark> RL RF 50Ω A		SENSE:INT	ALIGN AUTO 09:24:25 PN Radio Std:	May 17, 2021	Trace/Detector
		Frig: Free Run Avg Hold		None	
	#IFGain:Low	#Atten: 20 dB	Radio Devi	ce: BTS	
10 dB/div Ref 20.00 d	IBm				
Log 10.0					
					Clear Write
0.00					
-10.0					
-20.0	مهالماليدين ريرياوي	the war war when the man of			
-30.0					Average
-40.0	/				
-50.0	. หมางให <sup>้เสร</sup>		1 Marin Milliman		
-50.0	· · · · ·		· And March Children	Induran	Max Hold
-70.0					Max Holu
Center 5.74500 GHz				0.00 MHz	
#Res BW 100 kHz		#VBW 300 kHz	Sweep	o 4.8 ms	Min Hold
Occupied Bandwi	idth	Total Power	-1.63 dBm		
	18.978 MHz				Data t
					Detector Peak▶
Transmit Freq Error	-34.511 kH	z % of OBW Pow	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	18.73 MH	z xdB	-6.00 dB		
MSG			STATUS		

Plot 7-103. 6dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 242 Tones (UNII Band 3) - Ch. 149)



Plot 7-104. 6dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 242 Tones (UNII Band 3) - Ch. 157)

FCC ID: A3LSMF711JPN	PCTEST <sup>®</sup> Proud to be part of <sup>®</sup> element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 76 of 216	
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset		
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Keysight Spectrum Analyzer - Occupied E					
LX/ RL RF 50Ω AC		SENSE:INT Freg: 5.825000000 GHz	ALIGN AUTO 09:26:35 PM Radio Std:	May 17, 2021	Trace/Detector
		ree Run Avg Hold:		None	
	#IFGain:Low #Atten	: 20 dB	Radio Devi	ice: BTS	
10 dB/div Ref 20.00 dB	m				
Log					
					Clear Write
0.00					
-10.0					
-20.0	Morhogolherdoningernor	phy real and real and and and the second			
-30.0	Ver a free from the second	and Marian Million and Maria			Average
-40.0					
-50.0			Notes and the second se		
-50.0	WOL.		Wallhamen Mahane	manden	Max Hold
-70.0					Max Holu
Center 5.82500 GHz				0.00 MHz	
#Res BW 100 kHz	#\	VBW 300 kHz	Swee	p 4.8 ms	Min Hold
Occupied Bandwid	th	Total Power	-2.94 dBm		
			-2.54 (10)		
1	8.984 MHz				Detector Peak▶
Transmit Freq Error	-39.962 kHz	% of OBW Powe	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	18.80 MHz	x dB	-6.00 dB		
	10:00 10112		-0.00-010		
MSG			STATUS		

Plot 7-105. 6dB Bandwidth Plot MIMO (20MHz BW 802.11ax - 242 Tones (UNII Band 3) - Ch. 165)



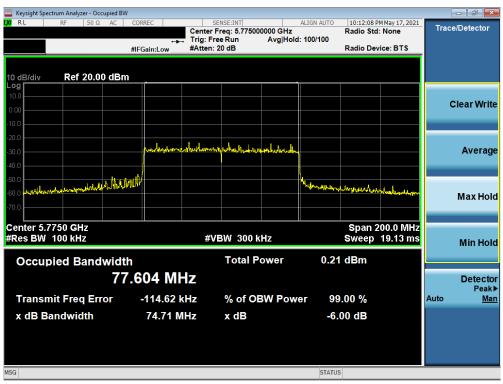
Plot 7-106. 6dB Bandwidth Plot MIMO (40MHz BW 802.11ax - 484 Tones (UNII Band 3) - Ch. 151)

FCC ID: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 77 of 216	
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset		
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Keysight Spectrum Analyzer - Occupied E	3W				
LXI RL RF 50Ω AC	CORREC	SENSE:INT er Freg: 5.795000000 GHz	ALIGN AUTO 09:53:53 P Radio Std	M May 17, 2021	Trace/Detector
			d: 100/100	None	
	#IFGain:Low #Atte	n: 20 dB	Radio Dev	ice: BTS	
10 dB/div Ref 20.00 dB	m				
Log					
0.00					Clear Write
-10.0					
-20.0	mulubulanterate	any out alman the areas			
-30.0					Average
-40.0					
-50.0			Manufacture and a		
-60.0 - Alfred and Martin Value and Control and the second			Marthard Millinghald hand	brownham	Max Hold
-70.0					maxmona
Center 5.79500 GHz				00.0 MHz	
#Res BW 100 kHz		#VBW 300 kHz	Swee	p 9.6 ms	Min Hold
Occupied Bandwid	th	Total Power	-0.13 dBm		
2	7.932 MHz				Detector
J					Detector Peak►
Transmit Freq Error	-32.563 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	37.94 MHz	x dB	-6.00 dB		
MSG			STATUS		
MOG			STATUS		

Plot 7-107. 6dB Bandwidth Plot MIMO (40MHz BW 802.11ax - 484 Tones (UNII Band 3) - Ch. 159)



Plot 7-108. 6dB Bandwidth Plot MIMO (80MHz BW 802.11ax - 996 Tones (UNII Band 3) - Ch. 155)

FCC ID: A3LSMF711JPN	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 70 of 010
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset	Page 78 of 216	
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# 7.4 UNII Output Power Measurement – 802.11ax OFDMA §15.407(a.1.iv) §15.407(a.2) §15.407(a.3); RSS-247 [6.2]

#### **Test Overview and Limits**

A transmitter antenna terminal of the EUT is connected to the input of an RF pulse power sensor. Measurement is made using a broadband average power meter 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.

In the 5.15 – 5.25GHz band, the maximum permissible conducted output power is 250mW (23.98dBm). The maximum e.i.r.p. shall not exceed the lesser of 200 mW or 10 + 10 log10B, dBm.

In the 5.25 – 5.35GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) or 11 dBm +  $10\log_{10}(26dB BW) = 11 dBm + 10\log_{10}(17.93) = 23.54dBm$ . The maximum e.i.r.p. shall not exceed the lesser of 1.0 W or 17 + 10 log10B, dBm.

In the 5.47 – 5.725GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) or 11 dBm +  $10\log_{10}(26dB BW) = 11 dBm + 10\log_{10}(17.98) = 23.55 dBm$ . The maximum e.i.r.p. shall not exceed the lesser of 1.0 W or 17 + 10 log10B, dBm.

In the 5.725 – 5.850GHz band, the maximum permissible conducted output power is 1W (30dBm). The maximum e.i.r.p. is 36 dBm.

#### Test Procedure Used

ANSI C63.10-2013 – Section 12.3.3.2 Method PM-G KDB 789033 D02 v02r01 – Section E)3)b) Method PM-G ANSI C63.10-2013 – Section 14.2 Measure-and-Sum Technique KDB 662911 v02r01 – Section E)1) Measure-and-Sum Technique

#### **Test Settings**

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

#### Test Setup

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



Figure 7-3. Test Instrument & Measurement Setup

FCC ID: A3LSMF711JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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	Freq [MHz] Channel Detector Tones		Tones		RU Index		Conducted Power Limit	Conducted Power	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]	
					0	4	8	[dBm]	Margin [dB]	[ubij	Lapuil	сили (авил)	Margin [ub]
N	5180	36	AVG	26T	10.43	10.48	10.41	23.98	-13.50	-6.60	3.88	22.39	-18.51
E C	5200	40	AVG	26T	10.21	10.26	10.09	23.98	-13.72	-6.60	3.66	22.39	-18.73
돌诺	5240	48	AVG	26T	10.37	10.39	10.23	23.98	-13.59	-6.60	3.79	22.39	-18.60
S: ≦	5260	52	AVG	26T	10.35	10.34	10.15	23.47	-13.12	-8.10	2.25	29.47	-27.22
<u>S</u> <u>S</u>	5280	56	AVG	26T	10.42	10.45	10.27	23.47	-13.02	-8.10	2.35	29.47	-27.12
N	5320	64	AVG	26T	10.23	10.24	10.49	23.47	-12.98	-8.10	2.39	29.47	-27.08
ч	5500	100	AVG	26T	10.26	10.38	10.34	22.80	-12.42	-9.80	0.58	28.80	-28.22
C m	5600	120	AVG	26T	10.07	10.12	10.08	22.80	-12.68	-9.80	0.32	28.80	-28.48
<u>ں</u>	5720	144	AVG	26T	10.48	10.11	10.08	22.80	-12.32	-9.80	0.68	28.80	-28.12
	5745	149	AVG	26T	10.41	10.48	10.47	30.00	-19.52	-7.70	2.78	-	-
	5785	157	AVG	26T	10.48	10.13	10.09	30.00	-19.52	-7.70	2.78	-	-
	5825	165	AVG	26T	10.32	10.44	10.35	30.00	-19.56	-7.70	2.74	-	-

## SISO ANT 1 Maximum Conducted Output Power Measurements (26 Tones)

Table 7-10. 20MHz BW (UNII) Maximum Conducted Output Power (26 Tones)

		Freq [MHz]	Channel	Detector	Tones		RU Index		Conducted Power Limit	Conducted Power	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
Ϋ́						0	8	17	[dBm]	Margin [dB]	[abi]	[ubiii]	Cinic [abin]	Maigin [ub]
5	÷	5190	38	AVG	26T	10.11	10.16	10.02	23.98	-13.82	-6.60	3.56	22.39	-18.83
5	σ	5230	46	AVG	26T	10.42	10.25	10.07	23.98	-13.56	-6.60	3.82	22.39	-18.57
4	≥	5270	54	AVG	26T	10.13	10.49	10.42	23.47	-12.98	-8.10	2.39	29.47	-27.08
$\sim$	σ	5310	62	AVG	26T	10.13	10.48	10.46	23.47	-12.99	-8.10	2.38	29.47	-27.09
우		5510	102	AVG	26T	10.10	9.89	10.01	22.80	-12.70	-9.80	0.30	28.80	-28.50
六	Sa	5590	118	AVG	26T	10.24	10.06	10.17	22.80	-12.56	-9.80	0.44	28.80	-28.36
20	ш	5710	142	AVG	26T	10.02	10.28	10.02	22.80	-12.52	-9.80	0.48	28.80	-28.32
		5755	151	AVG	26T	10.41	10.46	10.07	30.00	-19.54	-7.70	2.76	-	-
		5795	159	AVG	26T	10.13	10.23	10.44	30.00	-19.56	-7.70	2.74	-	-

Table 7-11. MIMO 40MHz BW (UNII) Maximum Conducted Output Power (26 Tones)

N	Freq [MHz]	Channel	Detector	Tones		RU Index		Conducted Power Limit	Conducted Power	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin (dB)
E €					0	18	36	[dBm]	Margin [dB]	[ubij	lapui	Linit [abiii]	Margin [ub]
<u> </u>	5210	42	AVG	26T	10.26	10.39	10.27	23.98	-13.59	-6.60	3.79	22.39	-18.60
<u>8</u> <u>8</u>	5290	58	AVG	26T	10.35	10.47	10.23	23.47	-13.00	-8.10	2.37	29.47	-27.10
P o	5530	106	AVG	26T	10.27	10.14	10.46	22.80	-12.34	-9.80	0.66	28.80	-28.14
Ba G	5610	122	AVG	26T	10.42	10.36	10.25	22.80	-12.38	-9.80	0.62	28.80	-28.18
5	5690	138	AVG	26T	9.91	10.44	10.43	22.80	-12.36	-9.80	0.64	28.80	-28.16
	5775	155	AVG	26T	9.97	10.23	10.02	30.00	-19.77	-7.70	2.53	-	-

Table 7-12. MIMO 80MHz BW (UNII) Maximum Conducted Output Power (26 Tones)

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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## SISO ANT 1 Conducted Output Power Measurements (52 Tones)

	Freq [MHz]	Channel	Detector	Tones		RU Index	-	Conducted Power Limit	Conducted Power	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
					37	39	40	[dBm]	Margin [dB]	[abi]	[GDill]	Emit [abiii]	Margin [ab]
N	5180	36	AVG	52T	10.93	10.97	10.91	23.98	-13.01	-6.60	4.37	22.39	-18.02
ΞΞ	5200	40	AVG	52T	10.92	10.86	10.79	23.98	-13.06	-6.60	4.32	22.39	-18.07
₹ ¥	5240	48	AVG	52T	10.86	10.91	10.76	23.98	-13.07	-6.60	4.31	22.39	-18.08
<b>O</b> .=	5260	52	AVG	52T	10.88	10.89	10.77	23.47	-12.58	-8.10	2.79	29.47	-26.68
<u> </u>	5280	56	AVG	52T	10.92	10.91	10.78	23.47	-12.55	-8.10	2.82	29.47	-26.65
N 2	5320	64	AVG	52T	10.67	10.66	10.98	23.47	-12.49	-8.10	2.88	29.47	-26.59
E I	5500	100	AVG	52T	10.41	10.48	10.39	22.80	-12.32	-9.80	0.68	28.80	-28.12
C m	5600	120	AVG	52T	10.72	10.79	10.65	22.80	-12.01	-9.80	0.99	28.80	-27.81
5	5720	144	AVG	52T	10.62	10.81	10.79	22.80	-11.99	-9.80	1.01	28.80	-27.79
	5745	149	AVG	52T	10.91	10.63	10.58	30.00	-19.09	-7.70	3.21	-	-
	5785	157	AVG	52T	10.97	10.76	10.71	30.00	-19.03	-7.70	3.27	-	-
	5825	165	AVG	52T	10.94	10.98	10.96	30.00	-19.02	-7.70	3.28	-	-

Table 7-13. 20MHz BW (UNII) Maximum Conducted Output Power (52 Tones)

N	Freq [MHz]	Channel	Detector	Tones		RU Index		Conducted Power Limit	Conducted Power	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
17 📿	•				37	40	44	[dBm]	Margin [dB]	[abi]	[ubiii]		Mai gin [db]
l≧ ÷	5190	38	AVG	52T	10.73	10.54	10.55	23.98	-13.25	-6.60	4.13	22.39	-18.26
5.2	5230	46	AVG	52T	10.47	10.76	10.68	23.98	-13.22	-6.60	4.16	22.39	-18.23
4 3	5270	54	AVG	52T	10.67	10.99	10.50	23.47	-12.48	-8.10	2.89	29.47	-26.58
<del>.</del> 5	5310	62	AVG	52T	10.72	10.48	10.57	23.47	-12.75	-8.10	2.62	29.47	-26.85
₽⊆	5510	102	AVG	52T	10.25	10.67	10.23	22.80	-12.13	-9.80	0.87	28.80	-27.93
ta as	5590	118	AVG	52T	10.34	10.81	10.48	22.80	-11.99	-9.80	1.01	28.80	-27.79
Юш	5710	142	AVG	52T	10.75	10.79	10.52	22.80	-12.01	-9.80	0.99	28.80	-27.81
~	5755	151	AVG	52T	10.59	10.76	10.41	30.00	-19.24	-7.70	3.06	-	-
	5795	159	AVG	52T	10.72	10.80	10.53	30.00	-19.20	-7.70	3.10	-	-

Table 7-14. 40MHz BW (UNII) Maximum Conducted Output Power (52 Tones)

Hz (I	Freq [MHz]	Channel	Detector	Tones		RU Index		Conducted Power Limit	Conducted Power	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
E €					37	44	52	[dBm]	Margin [dB]	[GDI]	Lapud	Ennie [GBnij	Margin [ab]
<u> </u>	5210	42	AVG	52T	10.75	10.89	10.81	23.98	-13.09	-6.60	4.29	22.39	-18.10
<u>8</u> 8	5290	58	AVG	52T	10.87	10.81	10.74	23.47	-12.60	-8.10	2.77	29.47	-26.70
P u	5530	106	AVG	52T	10.57	10.88	10.73	22.80	-11.92	-9.80	1.08	28.80	-27.72
Ba G	5610	122	AVG	52T	10.93	10.88	10.76	22.80	-11.87	-9.80	1.13	28.80	-27.67
5	5690	138	AVG	52T	10.64	10.62	10.69	22.80	-12.11	-9.80	0.89	28.80	-27.91
	5775	155	AVG	52T	10.36	10.97	10.77	30.00	-19.03	-7.70	3.27	-	-

Table 7-15. 80MHz BW (UNII) Maximum Conducted Output Power (52 Tones)

FCC ID: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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## SISO ANT 1 Conducted Output Power Measurements (106 Tones)

	Freq [MHz]	Channel	Detector	Tones	RUI	ndex	Conducted Power Limit	Conducted Power	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
					53	54	[dBm]	Margin [dB]	[001]	Lapud	Ennie [GBin]	margin [ab]
N	5180	36	AVG	106T	14.32	14.27	23.98	-9.66	-6.60	7.72	22.39	-14.67
ΞΞ	5200	40	AVG	106T	14.15	14.05	23.98	-9.83	-6.60	7.55	22.39	-14.84
₹ ¥	5240	48	AVG	106T	14.11	14.03	23.98	-9.87	-6.60	7.51	22.39	-14.88
	5260	52	AVG	106T	14.15	14.04	23.47	-9.32	-8.10	6.05	29.47	-23.42
<u>&lt;</u> 3	5280	56	AVG	106T	14.15	14.08	23.47	-9.32	-8.10	6.05	29.47	-23.42
N	5320	64	AVG	106T	14.05	14.02	23.47	-9.42	-8.10	5.95	29.47	-23.52
a T	5500	100	AVG	106T	14.27	14.27	22.80	-8.53	-9.80	4.47	28.80	-24.33
С Ш	5600	120	AVG	106T	14.19	14.10	22.80	-8.61	-9.80	4.39	28.80	-24.41
S _	5720	144	AVG	106T	14.01	14.06	22.80	-8.74	-9.80	4.26	28.80	-24.54
	5745	149	AVG	106T	14.25	14.29	30.00	-15.71	-7.70	6.59	-	-
	5785	157	AVG	106T	14.22	14.27	30.00	-15.73	-7.70	6.57	-	-
	5825	165	AVG	106T	14.43	14.45	30.00	-15.55	-7.70	6.75	-	-

Table 7-16. 20MHz BW (UNII) Maximum Conducted Output Power (106 Tones)

N	Freq [MHz]	Channel	Detector	Tones		RU Index		Conducted Power Limit	Conducted Power	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
Π C					53	54	56	[dBm]	Margin [dB]	[abi]	[ubiii]		
t Z	5190	38	AVG	106T	14.18	14.47	14.07	23.98	-9.51	-6.60	7.87	22.39	-14.52
ig o	5230	46	AVG	106T	14.17	14.25	13.96	23.98	-9.73	-6.60	7.65	22.39	-14.74
4 3	5270	54	AVG	106T	14.19	14.28	13.94	23.47	-9.19	-8.10	6.18	29.47	-23.29
φ	5310	62	AVG	106T	14.44	14.10	14.29	23.47	-9.03	-8.10	6.34	29.47	-23.13
P 4	5510	102	AVG	106T	14.43	14.04	14.33	22.80	-8.37	-9.80	4.63	28.80	-24.17
Ba Ba	5590	118	AVG	106T	14.12	14.42	14.16	22.80	-8.38	-9.80	4.62	28.80	-24.18
D D D D	5710	142	AVG	106T	14.09	14.46	14.20	22.80	-8.34	-9.80	4.66	28.80	-24.14
~	5755	151	AVG	106T	14.04	14.32	14.11	30.00	-15.68	-7.70	6.62	-	-
	5795	159	AVG	106T	14.08	14.34	14.06	30.00	-15.66	-7.70	6.64	-	-

Table 7-17. 40MHz BW (UNII) Maximum Conducted Output Power (106 Tones)

N	Freq [MHz]	Channel	Detector	Tones		RU Index		Conducted Power Limit	Conducted Power	Ant. Gain	Max e.i.r.p.	Max e.i.r.p.	e.i.r.p.
ΞĈ					53	56	60	[dBm]	Margin [dB]	[dBi]	[dBm]	Limit [dBm]	Margin [dB]
80M	5210	42	AVG	106T	14.37	14.42	14.26	23.98	-9.56	-6.60	7.82	22.39	-14.57
l (8	5290	58	AVG	106T	14.28	14.33	14.23	23.47	-9.14	-8.10	6.23	29.47	-23.24
E H	5530	106	AVG	106T	14.20	14.45	14.32	22.80	-8.35	-9.80	4.65	28.80	-24.15
<b>GH</b> Bar	5610	122	AVG	106T	14.22	14.49	14.48	22.80	-8.31	-9.80	4.69	28.80	-24.11
_ ۍ	5690	138	AVG	106T	13.89	14.37	14.38	22.80	-8.42	-9.80	4.58	28.80	-24.22
	5775	155	AVG	106T	13.86	14.32	14.17	30.00	-15.68	-7.70	6.62	-	-

Table 7-18. 80MHz BW (UNII) Maximum Conducted Output Power (106 Tones)

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	
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## SISO ANT 1 Conducted Output Power Measurements (242 Tones)

	Freq [MHz]	Channel	Detector	Tones	RU Index	Conducted Power Limit	Conducted Power	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin (dB)
					61	[dBm]	Margin [dB]	[ubi]	Lapud	Emit [GBiii]	ina gii [ab]
N	5180	36	AVG	242T	14.73	23.98	-9.25	-6.60	8.13	22.39	-14.26
ΞĒ	5200	40	AVG	242T	14.62	23.98	-9.36	-6.60	8.02	22.39	-14.37
dt S	5240	48	AVG	242T	14.64	23.98	-9.34	-6.60	8.04	22.39	-14.35
$\bigcirc$ .=	5260	52	AVG	242T	14.55	23.47	-8.92	-8.10	6.45	29.47	-23.02
<ul><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li><li></li></ul>	5280	56	AVG	242T	14.70	23.47	-8.77	-8.10	6.60	29.47	-22.87
	5320	64	AVG	242T	14.65	23.47	-8.82	-8.10	6.55	29.47	-22.92
a T	5500	100	AVG	242T	14.57	22.80	-8.23	-9.80	4.77	28.80	-24.03
C m	5600	120	AVG	242T	14.84	22.80	-7.96	-9.80	5.04	28.80	-23.76
5	5720	144	AVG	242T	14.81	22.80	-7.99	-9.80	5.01	28.80	-23.79
	5745	149	AVG	242T	14.44	30.00	-15.56	-7.70	6.74	-	-
	5785	157	AVG	242T	14.89	30.00	-15.11	-7.70	7.19	-	-
	5825	165	AVG	242T	14.69	30.00	-15.31	-7.70	6.99	-	-

Table 7-19. 20MHz BW (UNII) Maximum Conducted Output Power (242 Tones)

N _	Freq [MHz]	Channel	Detector	Tones	RU li	ndex	Conducted Power Limit	Conducted Power	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
Τ̈́					61	62	[dBm]	Margin [dB]	[abi]	[abiii]	Cinic [GDinj	
÷ ÷	5190	38	AVG	242T	13.25	13.07	23.98	-10.73	-6.60	6.65	22.39	-15.74
S P	5230	46	AVG	242T	14.90	14.76	23.98	-9.08	-6.60	8.30	22.39	-14.09
<u>4</u>	5270	54	AVG	242T	14.97	14.80	23.47	-8.50	-8.10	6.87	29.47	-22.60
	5310	62	AVG	242T	12.63	12.97	23.47	-10.50	-8.10	4.87	29.47	-24.60
μĞ	5510	102	AVG	242T	12.94	12.85	22.80	-9.86	-9.80	3.14	28.80	-25.66
3a	5590	118	AVG	242T	14.50	14.59	22.80	-8.21	-9.80	4.79	28.80	-24.01
B G	5710	142	AVG	242T	14.58	14.81	22.80	-7.99	-9.80	5.01	28.80	-23.79
~	5755	151	AVG	242T	14.46	14.62	30.00	-15.38	-7.70	6.92	-	-
	5795	159	AVG	242T	14.60	14.56	30.00	-15.40	-7.70	6.90	-	-

Table 7-20. 40MHz BW (UNII) Maximum Conducted Output Power (242 Tones)

N	Freq [MHz]	Channel	Detector	Tones		RU Index		Conducted Power Limit	Conducted Power	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
E E					61	62	64	[dBm]	Margin [dB]	[GDI]	[GDili]	Emit [GDin]	margin [ab]
oM	5210	42	AVG	242T	12.81	12.82	12.42	23.98	-11.16	-6.60	6.22	22.39	-16.17
<u>®</u> <u>&gt;</u>	5290	58	AVG	242T	11.16	11.04	10.93	23.47	-12.31	-8.10	3.06	29.47	-26.41
P u	5530	106	AVG	242T	11.06	11.23	11.20	22.80	-11.57	-9.80	1.43	28.80	-27.37
Ba G	5610	122	AVG	242T	14.80	14.96	14.99	22.80	-7.81	-9.80	5.19	28.80	-23.61
2	5690	138	AVG	242T	14.96	14.32	14.48	22.80	-7.84	-9.80	5.16	28.80	-23.64
	5775	155	AVG	242T	14.82	14.95	14.99	30.00	-15.01	-7.70	7.29	-	-

Table 7-21. 80MHz BW (UNII) Maximum Conducted Output Power (242 Tones)

FCC ID: A3LSMF711JPN	PCTEST* Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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## SISO ANT 1 Conducted Output Power Measurements (484 Tones)

N	Freq [MHz]	Channel	Detector	Tones	RU Index	Conducted Power Limit	Conducted Power	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin (dB)
lΫ ?					65	[dBm]	Margin [dB]	[*=.]	[]		
	5190	38	AVG	484T	13.47	23.98	-10.51	-6.60	6.87	22.39	-15.52
E O	5230	46	AVG	484T	14.85	23.98	-9.13	-6.60	8.25	22.39	-14.14
4 2	5270	54	AVG	484T	14.86	23.47	-8.61	-8.10	6.76	29.47	-22.71
$\overline{\mathbf{D}}$	5310	62	AVG	484T	12.77	23.47	-10.70	-8.10	4.67	29.47	-24.80
Υč	5510	102	AVG	484T	12.98	22.80	-9.82	-9.80	3.18	28.80	-25.62
t e	5590	118	AVG	484T	14.49	22.80	-8.31	-9.80	4.69	28.80	-24.11
D C	5710	142	AVG	484T	14.64	22.80	-8.16	-9.80	4.84	28.80	-23.96
	5755	151	AVG	484T	14.53	30.00	-15.47	-7.70	6.83	-	-
	5795	159	AVG	484T	14.54	30.00	-15.46	-7.70	6.84	-	-

Table 7-22. 40MHz BW (UNII) Maximum Conducted Output Power (484 Tones)

N	Freq [MHz]	Channel	Detector	Tones	RU li	ndex	Conducted Power Limit	Conducted Power	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]	
E					65	66	[dBm]	Margin [dB]	[abi]	Lapud	Ennie [GBnij	ina giri [ab]	
id O	5210	42	AVG	484T	12.79	12.55	23.98	-11.19	-6.60	6.19	22.39	-16.20	
<u>⊗</u> <u>≥</u>	5290	58	AVG	484T	11.16	11.07	23.47	-12.31	-8.10	3.06	29.47	-26.41	
рс Ч	5530	106	AVG	484T	11.32	11.49	22.80	-11.31	-9.80	1.69	28.80	-27.11	
Ba	5610	122	AVG	484T	14.89	14.98	22.80	-7.82	-9.80	5.18	28.80	-23.62	
- 5	5690	138	AVG	484T	14.28	14.49	22.80	-8.31	-9.80	4.69	28.80	-24.11	
	5775	155	AVG	484T	14.82	14.99	30.00	-15.01	-7.70	7.29	-	-	

Table 7-23. 80MHz BW (UNII) Maximum Conducted Output Power (484 Tones)

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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## SISO ANT 1 Conducted Output Power Measurements (996 Tones)

₹ (	Freq [MHz]	Channel	Detector	Tones	RU Index	Conducted Power Limit	Conducted Power	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
					67	[dBm]	Margin [dB]	[GDI]	Lapud	Enne [GBnij	margin [ab]
o M	5210	42	AVG	996T	12.84	23.98	-11.14	-6.60	6.24	22.39	-16.15
<u>8</u> (8	5290	58	AVG	996T	11.30	23.47	-12.17	-8.10	3.20	29.47	-26.27
р С	5530	106	AVG	996T	11.47	22.80	-11.33	-9.80	1.67	28.80	-27.13
5Gł Ba	5610	122	AVG	996T	14.72	22.80	-8.08	-9.80	4.92	28.80	-23.88
2	5690	138	AVG	996T	14.96	22.80	-7.84	-9.80	5.16	28.80	-23.64
	5775	155	AVG	996T	14.74	30.00	-15.26	-7.70	7.04	-	-

Table 7-24. 80MHz BW (UNII) Maximum Conducted Output Power (996 Tones)

FCC ID: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 05 of 016
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## MIMO Maximum Conducted Output Power Measurements (26 Tones)

									RU Index					Conducted	Conducted	Directional	Manadana	Max e.i.r.p.	e.i.r.p.
	Freq [MHz]	Channel	Detector	Tones		0			4			8		Power Limit	Power	Ant. Gain	Max e.i.r.p. [dBm]	Limit [dBm]	
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	Lapuil	Linii (ubiii)	margin [ub]
	5180	36	AVG	26T	10.43	10.17	13.31	10.48	10.29	13.40	10.41	10.13	13.28	23.98	-10.58	-3.34	10.06	22.39	-12.33
	5200	40	AVG	26T	10.21	10.33	13.28	10.26	10.46	13.37	10.09	10.33	13.22	23.98	-10.61	-3.34	10.03	22.39	-12.36
E H	5240	48	AVG	26T	10.37	10.29	13.34	10.39	10.43	13.42	10.23	10.33	13.29	23.98	-10.56	-3.34	10.08	22.39	-12.31
₹. Ş	5260	52	AVG	26T	10.35	10.39	13.38	10.34	10.48	13.42	10.15	10.37	13.27	23.47	-10.05	-4.14	9.28	29.47	-20.19
<u> </u>	5280	56	AVG	26T	10.42	9.79	13.13	10.45	10.20	13.34	10.27	10.01	13.15	23.47	-10.13	-4.14	9.20	29.47	-20.27
1 2	5320	64	AVG	26T	10.23	9.96	13.11	10.24	10.14	13.20	10.49	10.45	13.48	23.47	-9.99	-4.14	9.34	29.47	-20.13
5	5500	100	AVG	26T	10.26	10.25	13.27	10.38	10.38	13.39	10.34	10.25	13.31	22.80	-9.41	-5.45	7.94	28.80	-20.86
) m	5600	120	AVG	26T	10.07	10.01	13.05	10.12	10.18	13.16	10.08	9.91	13.01	22.80	-9.64	-5.45	7.71	28.80	-21.09
	5720	144	AVG	26T	10.48	10.36	13.43	10.11	10.44	13.29	10.08	10.27	13.19	22.80	-9.37	-5.45	7.98	28.80	-20.82
	5745	149	AVG	26T	10.41	10.27	13.35	10.48	10.30	13.40	10.47	10.18	13.34	30.00	-16.60	-4.84	8.56		-
	5785	157	AVG	26T	10.48	10.38	13.44	10.13	10.46	13.31	10.09	10.30	13.21	30.00	-16.56	-4.84	8.60	-	-
	5825	165	AVG	26T	10.32	10.10	13.22	10.44	10.07	13.27	10.35	10.37	13.37	30.00	-16.63	-4.84	8.53	1.1	1.0

Table 7-25. MIMO 20MHz BW (UNII) Maximum Conducted Output Power (26 Tones)

									RU Index					Conducted	Conducted	Directional		Manualian	
	Freq [MHz]	Channel	Detector	Tones		0			8			17		Power Limit	Power	Ant. Gain		Max e.i.r.p. Limit [dBm]	e.i.r.p.
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	Lapuil	Linii (ubiii)	margin [ub]
= +	5190	38	AVG	26T	10.11	10.13	13.13	10.16	10.30	13.24	10.02	10.11	13.08	23.98	-10.74	-3.34	9.90	22.39	-12.49
	5230	46	AVG	26T	10.42	9.95	13.20	10.25	10.34	13.31	10.07	9.69	12.89	23.98	-10.67	-3.34	9.97	22.39	-12.42
4 S	5270	54	AVG	26T	10.13	10.28	13.22	10.49	10.25	13.38	10.42	10.25	13.35	23.47	-10.09	-4.14	9.24	29.47	-20.23
<u> </u>	5310	62	AVG	26T	10.13	10.29	13.22	10.48	10.25	13.38	10.46	10.13	13.31	23.47	-10.09	-4.14	9.24	29.47	-20.23
ΡČ	5510	102	AVG	26T	10.10	10.19	13.16	9.89	10.18	13.05	10.01	10.13	13.08	22.80	-9.64	-5.45	7.71	28.80	-21.09
a	5590	118	AVG	26T	10.24	9.88	13.07	10.06	10.32	13.20	10.17	9.81	13.00	22.80	-9.60	-5.45	7.75	28.80	-21.05
ы С	5710	142	AVG	26T	10.02	10.17	13.11	10.28	10.48	13.39	10.02	9.85	12.95	22.80	-9.41	-5.45	7.94	28.80	-20.86
.,	5755	151	AVG	26T	10.41	10.17	13.30	10.46	10.47	13.48	10.07	9.94	13.02	30.00	-16.52	-4.84	8.64	-	-
	5795	159	AVG	26T	10.13	10.42	13.29	10.23	10.35	13.30	10.44	10.19	13.33	30.00	-16.67	-4.84	8.49		-

Table 7-26. MIMO 40MHz BW (UNII) Maximum Conducted Output Power (26 Tones)

									RU Index						Conducted	Directional	Max e.i.r.p.	Manualian	e.i.r.p.
N	Freq [MHz]	Channel	Detector	Tones		0			18			36		Power Limit	Power	Ant. Gain		Limit [dBm]	
ਹ ਦੇ ਦ					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	Lapuid	Linii (ubiiij	margin [ub]
동분	5210	42	AVG	26T	10.26	10.27	13.28	10.39	10.49	13.45	10.27	9.98	13.14	23.98	-10.53	-3.34	10.11	22.39	-12.28
≥≥	5290	58	AVG	26T	10.35	10.16	13.27	10.47	10.30	13.40	10.23	10.29	13.27	23.47	-10.07	-4.14	9.26	29.47	-20.21
1 2	5530	106	AVG	26T	10.27	10.40	13.35	10.14	10.10	13.13	10.46	10.11	13.30	22.80	-9.45	-5.45	7.90	28.80	-20.90
a c	5610	122	AVG	26T	10.42	10.10	13.27	10.36	10.31	13.35	10.25	10.43	13.35	22.80	-9.45	-5.45	7.90	28.80	-20.90
- 2	5690	138	AVG	26T	9.91	10.44	13.19	10.44	10.48	13.47	10.43	10.31	13.38	22.80	-9.33	-5.45	8.02	28.80	-20.78
	5775	155	AVG	26T	9.97	10.44	13.22	10.23	10.43	13.34	10.02	10.14	13.09	30.00	-16.66	-4.84	8.50	-	

Table 7-27. MIMO 80MHz BW (UNII) Maximum Conducted Output Power (26 Tones)

FCC ID: A3LSMF711JPN	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 96 of 916
1M2106100066-12.A3L	04/12/2021 - 07/16/2021	Portable Handset		Page 86 of 216
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### MIMO Conducted Output Power Measurements (52 Tones)

									RU Index					Conducted	Conducted	Directional	Max e.i.r.p.	Max e.i.r.p.	e.i.r.p.
	Freq [MHz]	Channel	Detector	Tones		37			39			40		Power Limit	Power	Ant. Gain		Limit [dBm]	
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	Lapui	сппк (автіј	margin [ub]
N	5180	36	AVG	52T	10.93	10.77	13.86	10.97	10.80	13.90	10.91	10.60	13.77	23.98	-10.08	-3.34	10.56	22.39	-11.83
2	5200	40	AVG	52T	10.92	10.96	13.95	10.86	10.87	13.88	10.79	10.85	13.83	23.98	-10.03	-3.34	10.61	22.39	-11.78
- <b>H</b>	5240	48	AVG	52T	10.86	10.83	13.86	10.91	10.96	13.95	10.76	10.80	13.79	23.98	-10.03	-3.34	10.61	22.39	-11.78
Ϊž	5260	52	AVG	52T	10.88	10.92	13.91	10.89	10.90	13.91	10.77	10.84	13.82	23.47	-9.56	-4.14	9.77	29.47	-19.70
<u>ح</u> ،	5280	56	AVG	52T	10.92	10.60	13.77	10.91	10.57	13.75	10.78	10.50	13.65	23.47	-9.70	-4.14	9.63	29.47	-19.84
2	5320	64	AVG	52T	10.67	10.51	13.60	10.66	10.49	13.59	10.98	10.46	13.74	23.47	-9.73	-4.14	9.60	29.47	-19.87
a	5500	100	AVG	52T	10.41	10.86	13.65	10.48	10.82	13.66	10.39	10.75	13.58	22.80	-9.14	-5.45	8.21	28.80	-20.59
m	5600	120	AVG	52T	10.72	10.97	13.86	10.79	10.99	13.90	10.65	10.88	13.78	22.80	-8.90	-5.45	8.45	28.80	-20.35
	5720	144	AVG	52T	10.62	10.49	13.57	10.81	10.43	13.63	10.79	10.27	13.55	22.80	-9.17	-5.45	8.18	28.80	-20.62
	5745	149	AVG	52T	10.91	10.89	13.91	10.63	10.84	13.75	10.58	10.77	13.69	30.00	-16.09	-4.84	9.07		-
	5785	157	AVG	52T	10.97	10.47	13.74	10.76	10.38	13.58	10.71	10.24	13.49	30.00	-16.26	-4.84	8.90	-	
	5825	165	AVG	52T	10.94	10.48	13.73	10.98	10.43	13.72	10.96	10.31	13.66	30.00	-16.27	-4.84	8.89		

Table 7-28. MIMO 20MHz BW (UNII) Maximum Conducted Output Power (52 Tones)

									RU Index					Conducted	Conducted	Directional	Max e.i.r.p.	Max e.i.r.p.	
	Freq [MHz]	Channel	Detector	Tones		37			40			44		Power Limit	Power	Ant. Gain		Limit [dBm]	e.i.r.p. Margin [dB]
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	[ubiii]	Ennik (GDing	margin [ub]
- <b>+</b>	5190	38	AVG	52T	10.73	10.79	13.77	10.54	10.70	13.63	10.55	10.69	13.63	23.98	-10.21	-3.34	10.43	22.39	-11.96
p p	5230	46	AVG	52T	10.47	10.72	13.61	10.76	10.98	13.88	10.68	10.53	13.62	23.98	-10.10	-3.34	10.54	22.39	-11.85
ΓĒ	5270	54	AVG	52T	10.67	10.95	13.82	10.99	10.67	13.84	10.50	10.71	13.62	23.47	-9.63	-4.14	9.70	29.47	-19.77
- 6	5310	62	AVG	52T	10.72	10.87	13.81	10.48	10.67	13.59	10.57	10.74	13.67	23.47	-9.66	-4.14	9.67	29.47	-19.80
1 Č	5510	102	AVG	52T	10.25	10.68	13.48	10.67	10.96	13.83	10.23	10.61	13.43	22.80	-8.97	-5.45	8.38	28.80	-20.42
a	5590	118	AVG	52T	10.34	10.68	13.52	10.81	10.90	13.87	10.48	10.55	13.53	22.80	-8.93	-5.45	8.42	28.80	-20.38
מ ש	5710	142	AVG	52T	10.75	10.27	13.53	10.79	10.46	13.64	10.52	10.01	13.28	22.80	-9.16	-5.45	8.19	28.80	-20.61
	5755	151	AVG	52T	10.59	10.89	13.75	10.76	10.54	13.66	10.41	10.58	13.51	30.00	-16.25	-4.84	8.91	-	-
	5795	159	AVG	52T	10.72	10.60	13.67	10.80	10.79	13.81	10.53	10.89	13.72	30.00	-16.19	-4.84	8.97	-	

Table 7-29. MIMO 40MHz BW (UNII) Maximum Conducted Output Power (52 Tones)

									RU Index					Conducted	Conducted	Directional	Max e.i.r.p.	Manualian	e.i.r.p.
N	Freq [MHz]	Channel	Detector	Tones		37			44			52		Power Limit	Power	Ant. Gain		Limit [dBm]	
ਹ ਦੇ ਦ					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	Lapud	Linii [ubiii]	margin [ub]
동분	5210	42	AVG	52T	10.75	10.84	13.81	10.89	10.97	13.94	10.81	10.83	13.83	23.98	-10.04	-3.34	10.60	22.39	-11.79
≥≥	5290	58	AVG	52T	10.87	10.68	13.79	10.81	10.80	13.82	10.74	10.74	13.75	23.47	-9.65	-4.14	9.68	29.47	-19.79
2 2	5530	106	AVG	52T	10.57	10.72	13.66	10.88	10.90	13.90	10.73	10.51	13.63	22.80	-8.90	-5.45	8.45	28.80	-20.35
ה <u>ה</u>	5610	122	AVG	52T	10.93	10.94	13.95	10.88	10.74	13.82	10.76	10.55	13.67	22.80	-8.85	-5.45	8.50	28.80	-20.30
- 2	5690	138	AVG	52T	10.64	10.92	13.79	10.62	10.97	13.81	10.69	10.67	13.69	22.80	-8.99	-5.45	8.36	28.80	-20.44
	5775	155	AVG	52T	10.36	10.92	13.66	10.97	10.82	13.91	10.77	10.53	13.66	30.00	-16.09	-4.84	9.07	-	

Table 7-30. MIMO 80MHz BW (UNII) Maximum Conducted Output Power (52 Tones)

FCC ID: A3LSMF711JPN	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 87 of 216
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### MIMO Conducted Output Power Measurements (106 Tones)

							RU I	ndex			Conducted	Conducted	Directional	Marrialian	Max e.i.r.p.	e.i.r.p.
	Freq [MHz]	Channel	Detector	Tones		53			54		Power Limit	Power	Ant. Gain	Max e.i.r.p. [dBm]	Limit [dBm]	
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	[ubiii]	Linit [ubiii]	Margin [ub]
N	5180	36	AVG	106T	14.32	14.13	17.24	14.27	14.10	17.20	23.98	-6.74	-3.34	13.90	22.39	-8.49
ΞΞ	5200	40	AVG	106T	14.15	14.22	17.20	14.05	14.16	17.12	23.98	-6.78	-3.34	13.86	22.39	-8.53
E E	5240	48	AVG	106T	14.11	14.16	17.15	14.03	14.08	17.07	23.98	-6.83	-3.34	13.81	22.39	-8.58
S .≦	5260	52	AVG	106T	14.15	14.16	17.17	14.04	14.19	17.13	23.47	-6.30	-4.14	13.03	29.47	-16.44
<u>S</u> S	5280	56	AVG	106T	14.15	13.94	17.06	14.08	13.85	16.98	23.47	-6.41	-4.14	12.92	29.47	-16.55
N C	5320	64	AVG	106T	14.05	13.93	17.00	14.02	13.81	16.93	23.47	-6.47	-4.14	12.86	29.47	-16.61
J T	5500	100	AVG	106T	14.27	13.97	17.13	14.27	13.89	17.09	22.80	-5.67	-5.45	11.68	28.80	-17.12
C m	5600	120	AVG	106T	14.19	14.38	17.30	14.10	14.31	17.22	22.80	-5.50	-5.45	11.85	28.80	-16.95
<u>ں</u>	5720	144	AVG	106T	14.14	14.23	17.20	14.06	14.11	17.10	22.80	-5.60	-5.45	11.75	28.80	-17.05
	5745	149	AVG	106T	14.14	14.05	17.11	14.29	13.94	17.13	30.00	-12.87	-4.84	12.29	-	-
	5785	157	AVG	106T	14.22	14.45	17.35	14.27	14.28	17.29	30.00	-12.65	-4.84	12.51	-	-
	5825	165	AVG	106T	14.43	14.33	17.39	14.45	14.26	17.37	30.00	-12.61	-4.84	12.55	-	-

Table 7-31. MIMO 20MHz BW (UNII) Maximum Conducted Output Power (106 Tones)

									RU Index					Conducted	Conducted	Directional	Max e.i.r.p.	Maxoirp	e.i.r.p.
Freq	[MHz]	Channel	Detector	Tones		53			54			56		Power Limit	Power	Ant. Gain	[dBm]	Limit [dBm]	
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	Lapuil	Linii [ubiii]	margin [ub
51	190	38	AVG	106T	14.18	14.00	17.10	14.47	14.26	17.38	14.07	13.94	17.02	23.98	-6.60	-3.34	14.04	22.39	-8.35
52	230	46	AVG	106T	14.17	13.93	17.06	14.25	14.15	17.21	13.96	14.19	17.09	23.98	-6.77	-3.34	13.87	22.39	-8.52
2 52	270	54	AVG	106T	14.19	14.35	17.28	14.28	13.98	17.14	13.94	14.22	17.09	23.47	-6.19	-4.14	13.14	29.47	-16.33
5 53	310	62	AVG	106T	14.44	13.98	17.23	14.10	14.14	17.13	14.29	14.29	17.30	23.47	-6.17	-4.14	13.16	29.47	-16.31
<b>C</b> 55	510	102	AVG	106T	14.43	14.13	17.29	14.04	14.34	17.20	14.33	14.39	17.37	22.80	-5.43	-5.45	11.92	28.80	-16.88
55	590	118	AVG	106T	14.12	14.21	17.18	14.42	14.49	17.47	14.16	14.11	17.15	22.80	-5.33	-5.45	12.02	28.80	-16.78
57	710	142	AVG	106T	14.09	13.73	16.92	14.46	13.94	17.22	14.20	14.25	17.24	22.80	-5.56	-5.45	11.79	28.80	-17.01
57	755	151	AVG	106T	14.04	14.29	17.18	14.32	14.47	17.41	14.11	13.97	17.05	30.00	-12.59	-4.84	12.57	-	-
57	795	159	AVG	106T	14.08	14.15	17.13	14.34	14.23	17.30	14.06	14.39	17.24	30.00	-12.70	-4.84	12.46	-	-

Table 7-32. MIMO 40MHz BW (UNII) Maximum Conducted Output Power (106 Tones)

								RU Index					Conducted	Conducted	Directional			
Freq [MHz]	Channel	Detector	Tones		53			56			60		Power Limit	Power	Ant. Gain	Max e.i.r.p.	Max e.i.r.p.	
				ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	[dBm]	Limit [dBm]	Margin [dB]
5210	42	AVG	106T	14.37	14.19	17.29	14.42	14.30	17.37	14.26	14.35	17.32	23.98	-6.61	-3.34	14.03	22.39	-8.36
5290	58	AVG	106T	14.28	14.13	17.22	14.33	14.25	17.30	14.23	14.25	17.25	23.47	-6.17	-4.14	13.16	29.47	-16.31
5530	106	AVG	106T	14.20	14.19	17.21	14.45	14.24	17.36	14.32	14.28	17.31	22.80	-5.44	-5.45	11.91	28.80	-16.89
5610	122	AVG	106T	14.22	14.02	17.13	14.49	14.12	17.32	14.48	14.02	17.27	22.80	-5.48	-5.45	11.87	28.80	-16.93
5690	138	AVG	106T	13.89	14.17	17.04	14.37	14.15	17.27	14.38	13.93	17.17	22.80	-5.53	-5.45	11.82	28.80	-16.98
6776	166	AVC	106T	12.96	14.44	47.47	14.22	14.25	47.25	14.17	14.20	47.04	20.00	10.65	4.94	10.51		

Table 7-33. MIMO 80MHz BW (UNII) Maximum Conducted Output Power (106 Tones)

FCC ID: A3LSMF711JPN	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 89 of 210
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## MIMO Conducted Output Power Measurements (242 Tones)

						RU Index		Conducted	Conducted	Directional	Max e.i.r.p.	Max e.i.r.p.	e.i.r.p.
	Freq [MHz]	Channel	Detector	Tones		61		Power Limit	Power	Ant. Gain	[dBm]	Limit [dBm]	
					ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	Lapud	Ennie [GBinj	margin [ab]
N	5180	36	AVG	242T	14.73	14.87	17.81	23.98	-6.17	-3.34	14.47	22.39	-7.92
ΞĒ	5200	40	AVG	242T	14.62	14.80	17.72	23.98	-6.26	-3.34	14.38	22.39	-8.01
₹ ₹	5240	48	AVG	242T	14.64	14.88	17.77	23.98	-6.21	-3.34	14.43	22.39	-7.96
0	5260	52	AVG	242T	14.55	14.88	17.73	23.47	-5.74	-4.14	13.59	29.47	-15.88
<u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	5280	56	AVG	242T	14.70	14.62	17.67	23.47	-5.80	-4.14	13.53	29.47	-15.94
N 2	5320	64	AVG	242T	14.65	14.44	17.56	23.47	-5.91	-4.14	13.42	29.47	-16.05
<b>T</b>	5500	100	AVG	242T	14.57	14.51	17.55	22.80	-5.25	-5.45	12.10	28.80	-16.70
U m	5600	120	AVG	242T	14.84	14.73	17.80	22.80	-5.00	-5.45	12.35	28.80	-16.45
5	5720	144	AVG	242T	14.81	14.79	17.81	22.80	-4.99	-5.45	12.36	28.80	-16.44
	5745	149	AVG	242T	14.44	14.96	17.72	30.00	-12.28	-4.84	12.88	-	-
	5785	157	AVG	242T	14.46	14.64	17.56	30.00	-12.44	-4.84	12.72	-	-
	5825	165	AVG	242T	14.69	14.51	17.61	30.00	-12.39	-4.84	12.77	-	-

Table 7-34. MIMO 20MHz BW (UNII) Maximum Conducted Output Power (242 Tones)

							RUI	ndex			Conducted	Conducted	Directional			
N	Freq [MHz]	Channel	Detector	Tones		61			62		Power Limit	Power	Ant. Gain	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
τ̈́					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	[ubiii]	Cinic [GDinj	Margin [ub]
t i	5190	38	AVG	242T	13.25	13.04	16.16	13.07	13.33	16.21	23.98	-7.77	-3.34	12.87	22.39	-9.52
o pi	5230	46	AVG	242T	14.90	14.44	17.69	14.76	14.99	17.89	23.98	-6.09	-3.34	14.55	22.39	-7.84
<u>4</u> ×	5270	54	AVG	242T	14.97	14.46	17.73	14.80	14.88	17.85	23.47	-5.62	-4.14	13.71	29.47	-15.76
) p	5310	62	AVG	242T	12.63	12.72	15.69	12.97	12.63	15.81	23.47	-7.66	-4.14	11.67	29.47	-17.80
ΡĒ	5510	102	AVG	242T	12.94	12.95	15.96	12.85	12.82	15.85	22.80	-6.84	-5.45	10.51	28.80	-18.29
Ва Ва	5590	118	AVG	242T	14.50	14.67	17.60	14.59	14.59	17.60	22.80	-5.20	-5.45	12.15	28.80	-16.65
ю В	5710	142	AVG	242T	14.58	14.63	17.62	14.81	14.91	17.87	22.80	-4.93	-5.45	12.42	28.80	-16.38
~,	5755	151	AVG	242T	14.46	14.72	17.60	14.62	14.44	17.54	30.00	-12.40	-4.84	12.76	-	-
	5795	159	AVG	242T	14.60	14.80	17.71	14.56	14.51	17.55	30.00	-12.29	-4.84	12.87	-	-

Table 7-35. MIMO 40MHz BW (UNII) Maximum Conducted Output Power (242 Tones)

									RU Index					Conducted	Conducted	Directional	Max e.i.r.p.	Maxoirp	e.i.r.p.
	Freq [MHz]	Channel	Detector	Tones		61			62			64		Power Limit	Power	Ant. Gain		Max e.i.r.p. Limit [dBm]	
E					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	Lapud	chine (doing	margin [ab]
5 5 1	5210	42	AVG	242T	12.81	12.41	15.62	12.82	12.83	15.84	12.42	12.79	15.62	23.98	-8.14	-3.34	12.50	22.39	-9.89
2_≧ [	5290	58	AVG	242T	11.16	11.41	14.30	11.04	11.44	14.25	10.93	11.32	14.14	23.47	-9.17	-4.14	10.16	29.47	-19.31
2 2	5530	106	AVG	242T	11.06	10.85	13.97	11.23	11.05	14.15	11.20	10.96	14.09	22.80	-8.65	-5.45	8.70	28.80	-20.10
5 8 (	5610	122	AVG	242T	14.80	14.53	17.68	14.96	14.60	17.79	14.99	14.72	17.87	22.80	-4.93	-5.45	12.42	28.80	-16.38
_ n	5690	138	AVG	242T	14.96	14.73	17.86	14.32	14.66	17.50	14.48	14.69	17.60	22.80	-4.94	-5.45	12.41	28.80	-16.39
	5775	155	AVG	242T	14.82	14.52	17.68	14.95	14.40	17.69	14.99	14.51	17.77	30.00	-12.23	-4.84	12.93	-	-

Table 7-36. MIMO 80MHz BW (UNII) Maximum Conducted Output Power (242 Tones)

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## MIMO Conducted Output Power Measurements (484 Tones)

						RU Index		Conducted	Conducted	Directional	Maxainn	Maxainn	
N	Freq [MHz]	Channel	Detector	Tones		65 Po		Power Limit	Power	Ant. Gain	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
÷ 1					ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	[ubiii]	Linic [ubiii]	Margin [ub]
5	5190	38	AVG	484T	13.47	13.47	16.48	23.98	-7.50	-3.34	13.14	22.39	-9.25
5	5230	46	AVG	484T	14.85	14.65	17.76	23.98	-6.22	-3.34	14.42	22.39	-7.97
4	5270	54	AVG	484T	14.86	14.96	17.92	23.47	-5.55	-4.14	13.78	29.47	-15.69
$\sim$ -	5310	62	AVG	484T	12.77	12.73	15.76	23.47	-7.71	-4.14	11.62	29.47	-17.85
우	<b>5</b> 510	102	AVG	484T	12.98	12.97	15.99	22.80	-6.81	-5.45	10.54	28.80	-18.26
古	5590	118	AVG	484T	14.49	14.47	17.49	22.80	-5.31	-5.45	12.04	28.80	-16.76
5	5710	142	AVG	484T	14.64	14.72	17.69	22.80	-5.11	-5.45	12.24	28.80	-16.56
	5755	151	AVG	484T	14.53	14.64	17.60	30.00	-12.40	-4.84	12.76	-	-
	5795	159	AVG	484T	14.54	14.69	17.63	30.00	-12.37	-4.84	12.79	-	-

Table 7-37. MIMO 40MHz BW (UNII) Maximum Conducted Output Power (484 Tones)

							RU I	ndex			Conducted	Conducted	Directional	Max e.i.r.p.		e.i.r.p.
N	Freq [MHz]	Channel	Detector	Tones		65			66		Power Limit	Power	Ant. Gain		Max e.i.r.p. Limit [dBm]	
E					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	[ubiii]		Margin [db]
S Đ	5210	42	AVG	484T	12.79	12.61	15.71	12.55	12.79	15.68	23.98	-8.27	-3.34	12.37	22.39	-10.02
∞≥	5290	58	AVG	484T	11.16	11.38	14.28	11.07	11.41	14.25	23.47	-9.19	-4.14	10.14	29.47	-19.33
P P	5530	106	AVG	484T	11.32	11.46	14.40	11.49	11.49	14.50	22.80	-8.30	-5.45	9.05	28.80	-19.75
ы В С	5610	122	AVG	484T	14.89	14.57	17.74	14.98	14.85	17.93	22.80	-4.87	-5.45	12.48	28.80	-16.32
5	5690	138	AVG	484T	14.28	14.67	17.49	14.49	14.85	17.68	22.80	-5.12	-5.45	12.23	28.80	-16.57
	5775	155	AVG	484T	14.82	14.99	17.92	14.99	14.55	17.79	30.00	-12.08	-4.84	13.08	-	-

Table 7-38. MIMO 80MHz BW (UNII) Maximum Conducted Output Power (484 Tones)

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#### MIMO Conducted Output Power Measurements (996 Tones)

						RU Index		Conducted	Conducted	Directional	Maxainn	Maxainn	
N	Freq [MHz]	Channel	Detector	Tones		67		Power Limit	Power	Ant. Gain	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
l ₹ £					ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	Lapini	спла (авта)	Margin [ub]
S E	5210	42	AVG	996T	12.84	12.62	15.74	23.98	-8.24	-3.34	12.40	22.39	-9.99
<u>®</u> <u>&gt;</u>	5290	58	AVG	996T	11.30	11.48	14.40	23.47	-9.07	-4.14	10.26	29.47	-19.21
P S	5530	106	AVG	996T	11.47	11.11	14.30	22.80	-8.50	-5.45	8.85	28.80	-19.95
5Gł Ba	5610	122	AVG	996T	14.72	14.73	17.74	22.80	-5.06	-5.45	12.29	28.80	-16.51
5	5690	138	AVG	996T	14.96	14.89	17.94	22.80	-4.86	-5.45	12.49	28.80	-16.31
	5775	155	AVG	996T	14.74	14.63	17.70	30.00	-12.30	-4.84	12.86	-	-

Table 7-39. MIMO 80MHz BW (UNII) Maximum Conducted Output Power (996 Tones)

#### Note:

Per ANSI C63.10-2013 and KDB 662911 D01 v02r01 Section E)1), the conducted powers at Antenna 1 and Antenna 2 were first measured separately during MIMO transmission as shown in the section above. The measured values were then summed in linear power units then converted back to dBm.

Per ANSI C63.10-2013 Section 14.4.3, the directional gain is calculated using the following formula, where G<sub>N</sub> is the gain of the nth antenna and N<sub>ANT</sub>, the total number of antennas used.

Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2 / N_{ANT}] dBi$ 

#### Sample MIMO Calculation:

At 5180MHz in 802.11n (20MHz BW) mode, the average conducted output power was measured to be 17.97 dBm for Antenna-1 and 17.15 dBm for Antenna-2.

Antenna 1 + Antenna 2 = MIMO

(17.97 dBm + 17.15 dBm) = (62.66 mW + 51.88 mW) = 114.54 mW = 20.59 dBm

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# 7.5 Maximum Power Spectral Density – 802.11ax OFDMA §15.407(a.1.iv) §15.407(a.2) §15.407(a.3); RSS-247 [6.2]

#### **Test Overview and Limit**

The spectrum analyzer was connected to the antenna terminal while the EUT was 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. Method SA-1, as defined in ANSI C63.10-2013 and KDB 789033 D02 v02r01, was used to measure the power spectral density.

## In the 5.15 – 5.25GHz, 5.25 – 5.35GHz, 5.47 – 5.725GHz bands, the maximum permissible power spectral density is 11dBm/MHz.

In the 5.725 – 5.850GHz band, the maximum permissible power spectral density is 30dBm/500kHz.

#### Test Procedure Used

ANSI C63.10-2013 – Section 12.3.2.2 KDB 789033 D02 v02r01 – Section F ANSI C63.10-2013 – Section 14.3.2.2 Measure-and-Sum Technique KDB 662911 v02r01 – Section E)2) Measure-and-Sum Technique

#### Test Settings

- 1. Analyzer was set to the center frequency of the UNII channel under investigation
- 2. Span was set to encompass the entire emission bandwidth of the signal
- 3. RBW = 1MHz
- 4. VBW = 3MHz
- 5. Number of sweep points  $\geq 2 \times (\text{span/RBW})$
- 6. Sweep time = auto
- 7. Detector = power averaging (RMS)
- 8. Trigger was set to free run for all modes
- 9. Trace was averaged over 100 sweeps
- 10. The peak search function of the spectrum analyzer was used to find the peak of the spectrum.

#### Test Setup

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



Figure 7-4. Test Instrument & Measurement Setup

#### Test Notes

The power spectral density for each channel was measured with the RU index showing the highest conducted power.

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## SISO ANT 1 Power Spectral Density Measurements (26 Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured Power Density [dBm]	Max Power Density [dBm/MHz]	Margin [dB]
	5180	36	ax (20MHz)	26T	MCS0	6.79	11.0	-4.21
_	5200	40	ax (20MHz)	26T	MCS0	6.75	11.0	-4.25
Band 1	5240	48	ax (20MHz)	26T	MCS0	7.04	11.0	-3.96
Bar	5190	38	ax (40MHz)	26T	MCS0	6.90	11.0	-4.10
	5230	46	ax (40MHz)	26T	MCS0	7.84	11.0	-3.16
	5210	42	ax (80MHz)	26T	MCS0	5.02	11.0	-5.98
	5260	52	ax (20MHz)	26T	MCS0	7.89	11.0	-3.11
⊲	5280	56	ax (20MHz)	26T	MCS0	7.84	11.0	-3.16
Band 2A	5320	64	ax (20MHz)	26T	MCS0	7.87	11.0	-3.13
an	5270	54	ax (40MHz)	26T	MCS0	7.65	11.0	-3.35
ш	5310	62	ax (40MHz)	26T	MCS0	7.33	11.0	-3.67
	5290	58	ax (80MHz)	26T	MCS0	6.28	11.0	-4.72
	5500	100	ax (20MHz)	26T	MCS0	6.89	11.0	-4.11
	5600	120	ax (20MHz)	26T	MCS0	6.45	11.0	-4.55
	5720	144	ax (20MHz)	26T	MCS0	8.37	11.0	-2.63
SC	5510	102	ax (40MHz)	26T	MCS0	7.34	11.0	-3.66
Band 2C	5590	118	ax (40MHz)	26T	MCS0	7.65	11.0	-3.35
Ba	5710	142	ax (40MHz)	26T	MCS0	8.06	11.0	-2.94
	5530	106	ax (80MHz)	26T	MCS0	7.21	11.0	-3.79
	5610	122	ax (80MHz)	26T	MCS0	7.47	11.0	-3.53
	5690	138	ax (80MHz)	26T	MCS0	6.97	11.0	-4.03

Table 7-40. Bands 1, 2A, 2C Conducted Power Spectral Density Measurements (26 Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density	Margin [dB]
	5745	149	ax (20MHz)	26T	MCS0	5.12	30.00	-24.88
e	5785	157	ax (20MHz)	26T	MCS0	5.11	30.00	-24.89
	5825	165	ax (20MHz)	26T	MCS0	4.78	30.00	-25.22
Band	5755	151	ax (40MHz)	26T	MCS0	5.94	30.00	-24.06
	5795	159	ax (40MHz)	26T	MCS0	5.65	30.00	-24.35
	5775	155	ax (80MHz)	26T	MCS0	5.45	30.00	-24.55

Table 7-41. Band 3 Conducted Power Spectral Density Measurements (26 Tones)

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## SISO ANT 1 Power Spectral Density Measurements (Full Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured Power Density [dBm]	Max Power Density [dBm/MHz]	Margin [dB]
	5180	36	ax (20MHz)	242T	MCS0	2.91	11.0	-8.09
_	5200	40	ax (20MHz)	242T	MCS0	2.96	11.0	-8.04
Band 1	5240	48	ax (20MHz)	242T	MCS0	3.30	11.0	-7.70
Bar	5190	38	ax (40MHz)	484T	MCS0	0.04	11.0	-10.96
	5230	46	ax (40MHz)	484T	MCS0	-0.15	11.0	-11.15
	5210	42	ax (80MHz)	996T	MCS0	-3.36	11.0	-14.36
	5260	52	ax (20MHz)	242T	MCS0	2.81	11.0	-8.19
⊲	5280	56	ax (20MHz)	242T	MCS0	2.88	11.0	-8.12
d 2A	5320	64	ax (20MHz)	242T	MCS0	2.66	11.0	-8.34
Band	5270	54	ax (40MHz)	484T	MCS0	1.16	11.0	-9.84
ш	5310	62	ax (40MHz)	484T	MCS0	1.13	11.0	-9.87
	5290	58	ax (80MHz)	996T	MCS0	-2.31	11.0	-13.31
	5500	100	ax (20MHz)	242T	MCS0	2.80	11.0	-8.20
	5600	120	ax (20MHz)	242T	MCS0	2.00	11.0	-9.00
	5720	144	ax (20MHz)	242T	MCS0	2.99	11.0	-8.01
SC	5510	102	ax (40MHz)	484T	MCS0	0.34	11.0	-10.66
Band 2C	5590	118	ax (40MHz)	484T	MCS0	0.98	11.0	-10.02
Ba	5710	142	ax (40MHz)	484T	MCS0	1.40	11.0	-9.60
	5530	106	ax (80MHz)	996T	MCS0	-3.58	11.0	-14.58
	5610	122	ax (80MHz)	996T	MCS0	-3.51	11.0	-14.51
	5690	138	ax (80MHz)	996T	MCS0	-2.42	11.0	-13.42

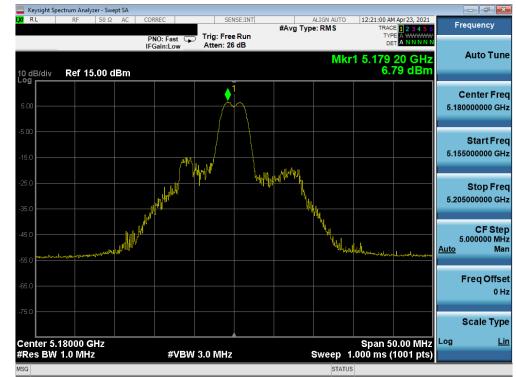
Table 7-42. Bands 1, 2A, 2C Conducted Power Spectral Density Measurements (Full Tones)

	Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured Power Density [dBm]	Max Permissible Power Density	Margin [dB]
	5745	149	ax (20MHz)	242T	MCS0	0.35	30.00	-29.65
	5785	157	ax (20MHz)	242T	MCS0	1.00	30.00	-29.00
	5825	165	ax (20MHz)	242T	MCS0	0.49	30.00	-29.51
Band	5755	151	ax (40MHz)	484T	MCS0	-1.03	30.00	-31.03
	5795	159	ax (40MHz)	484T	MCS0	-0.80	30.00	-30.80
	5775	155	ax (80MHz)	996T	MCS0	-4.13	30.00	-34.13

Table 7-43. Band 3 Conducted Power Spectral Density Measurements (Full Tones)

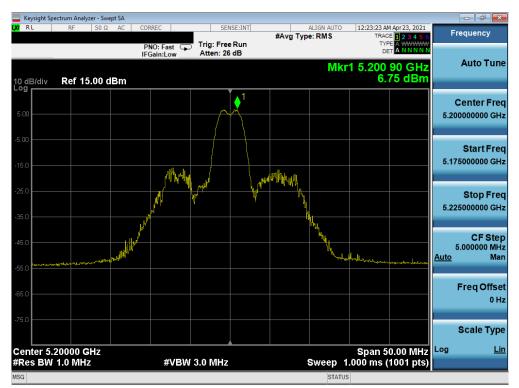
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#### SISO ANT 1 Power Spectral Density Measurements (26 Tones)

Plot 7-109. Power Spectral Density Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 36)



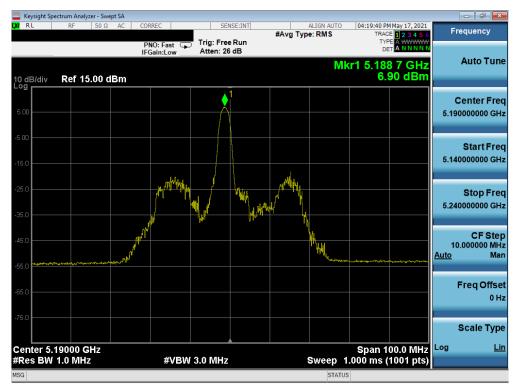
Plot 7-110. Power Spectral Density Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 40)

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Plot 7-111. Power Spectral Density Plot SISO ANT1 (20MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 48)



Plot 7-112. Power Spectral Density Plot SISO ANT1 (40MHz BW 802.11ax - 26 Tones (UNII Band 1) - Ch. 38)

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