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MEASUREMENT REPORT FCC Part 15.407 802.11be WiFi 6GHz (OFDM)

Applicant Name:

Samsung Electronics Co., Ltd.

129, Samsung-ro,

Yeongtong-gu, Suwon-si Gyeonggi-do, 16677, Korea Date of Testing:

12/15/2023 - 1/11/2024

Test Report Issue Date:

1/18/2024

Test Site/Location:

Element lab., Gyeonggi-do, South Korea

Test Report Serial No.: 1M2312180128-06.A3L

FCC ID: A3LSMX910

IC: 649E-SMX910

APPLICANT: Samsung Electronics Co., Ltd.

Application Type: Class II Permissive Change

Model/HVIN: SM-X910

EUT Type: Portable Tablet **Frequency Range:** 5935 – 7115MHz

Modulation Type: OFDM

FCC Classification: 15E 6GHz Low Power Dual Client (6CD)

FCC Rule Part(s): Part 15 Subpart E (15.407)

ISED Specification: RSS-248 Issue 2

Test Procedure(s): ANSI C63.10-2013, KDB 987594 D02 v02r01
Class II Permissive Change: Enabling WiFi 7 functionality via software

Original Grant Date: 06/08/2023

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. 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.

/h

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Prepared by Reviewed by

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Channel				MII	мо
Bandwidth [MHz]	IEEE Mode	UNII Band	Tx Frequency [MHz]	Max. Power [mW]	Max. Power [dBm]
	802.11be	5	5935 - 6415	37.24	15.71
20	802.11be	6	6435 - 6515	36.48	15.62
20	802.11be	7	6535 - 6875	33.73	15.28
	802.11be	8	6895 - 7115	29.99	14.77
	802.11be	5	5965 - 6405	55.98	17.48
40	802.11be	6	6445 - 6525	53.83	17.31
40	802.11be	7	6565 - 6845	54.95	17.40
	802.11be	8	6885 - 7085	49.20	16.92
	802.11be	5	5985 - 6385	54.83	17.39
80	802.11be	6	6465	56.89	17.55
00	802.11be	7	6545 - 6865	52.60	17.21
	802.11be	8	6945 - 7025	54.20	17.34
	802.11be	5	6025 - 6345	47.21	16.74
160	802.11be	6	6505	43.15	16.35
100	802.11be	7	6665 - 6825	43.75	16.41
	802.11be	8	6985	44.16	16.45
	802.11be	5	6105 - 6265	46.24	16.65
320	802.11be	6	6425	45.08	16.54
320	802.11be	7	6585 - 6745	46.77	16.70
	802.11be	8	6905	49.43	16.94

EUT Overview – Low Power Indoor Client – Conducted Power

Note:

The powers in the table above are maximum conducted powers. The maximum EIRP's are determined from the relevant tables in Section 7.3 of this report.

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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 Element Test Location

These measurement tests were conducted at the Element Suwon Laboratory located at 13, Heungdeok 1-ro, Giheung-gu, Yongin-si, Gyeonggi-do, 16954, South Korea. 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 Element Materials Technology Suwon, Ltd. located in Yongin-si, Gyeonggi-do, 16954, South Korea.

- Element Materials Technology Suwon, Ltd. is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation(A2LA) with Certificate number 2041.04 for Specific Absorption Rate (SAR), and Electromagnetic Compatibility (EMC) & Telecommunications testing for FCC and Innovation, Science, and Economic Development Canada rules.
- Element Materials Technology Suwon, Ltd. facility is accredited, designated, and recognized in accordance with the provision of Radio Wave Act and International Standard ISO/IEC 17025:2017 under the National Radio Research Agency.
 - Designation Number / CABID: KR0169
 - Test Firm Registration Number of FCC: 417945
 - Test Firm Registration Number of ISED: 26168

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2.0 PRODUCT INFORMATION

Equipment Description 2.1

The Equipment Under Test (EUT) is the Portable Tablet FCC: A3LSMX910, IC: 649E-SMX910. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter while operating in the 6GHz band.

Test Device Serial No.: 0150M, 4628G, 3657M

2.2 Device Capabilities

This device contains the following capabilities:

802.11b/g/n/ax/be WLAN, 802.11a/n/ac/ax/be UNII (5 and 6 GHz), Bluetooth (1x, EDR, LE), Wireless Power Transfer.

	Band 5
Ch.	Frequency (MHz)
2	5935
•••	•
45	6175
:	•
93	6415

	Band 6
Ch.	Frequency (MHz)
97	6435
:	•
105	6475
:	:
113	6515

Band 6

		Band 7	
Cł	٦.	Frequency (MHz)	
11	7	6535	
:		:	
14	9	6695	
:		:	
18	5	6875	
	requency / Channel Oner		

Band 7

	Baria 0
Ch.	Frequency (MHz)
189	6895
:	:
209	6995
	:
233	7115

Rand 8

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

Band 5)
--------	---

Ch.	Frequency (MHz)
3	5965
:	:
43	6165
:	:
91	6405
	Toble

	Bana o
Ch.	Frequency (MHz)
99	6445
:	:
107	6485
:	:
115	6525

	Ch.	Frequency (MHz)
	123	6565
	:	:
	155	6725
	:	:
	179	6845
w	\ Fraguer	cv / Channel One

Ch. Frequency (MHz)	
187	6885
	:
211	7005
	:
227	7085

Band 8

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

Band 5

Ch.	Frequency (MHz)
7	5985
• •	
39	6145
:	:
87	6385

	Band 6
Ch.	Frequency (MHz)
103	6465

Ch.	Frequency (MHz)
119	6545
:	:
454	6705

Band 7

119	6545
• •	•
151	6705
:	:
183	6865

Ch. Frequency (MHz)	
199	6945
:	:
215	7025

Band 8

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

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Band 5

Ch. Frequency (MHz	
15	6025
47	6185
79	6345

Band 6

Ch.	Frequency (MHz)
111	6505

Band 7

Ch.	Frequency (MHz)
143	6665
175	6825

Band 8

Ch.	Frequency (MHz)
207	6985

Table 2-4. 802.11ax/be (160MHz BW) Frequency / Channel Operations

Band	5
-------------	---

Ch.	Frequency (MHz)
31	6105
63	6265

Band 6

	24114 0
Ch.	Frequency (MHz)
95	6425

Band 7

Ch.	Frequency (MHz)
127	6585
159	6745

Band 8

Ch.	Frequency (MHz)
191	6905

Table 2-5. 802.11be (320MHz BW) Frequency / Channel Operations

Notes:

1. 6GHz NII operation is possible in 20MHz, 40MHz, 80MHz, 160MHz and 320MHz 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. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

		ANT1	ANT2	MIMO (1+2)			
802.11 Mode/Band		Duty Cycle [%]					
	а	96.62	96.62	96.62			
	ax (HE20)	99.63	99.65	99.63			
	be (EHT20)	99.63	99.63	99.63			
	ax (HE40)	99.65	99.67	99.65			
6GHz	be (EHT40)	99.67	99.67	99.65			
OGHZ	ax (HE80)	99.65	99.67	99.65			
	be (EHT80)	99.67	99.67	99.63			
	ax (HE160)	99.65	99.65	99.63			
	be (EHT160)	99.65	99.65	99.65			
	be (EHT320)	99.65	99.65	99.67			

Table 2-6. Measured Duty Cycles

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

WiFi Configurations		SISO		CI)D	SDM	
		ANT1	ANT2	ANT1	ANT2	ANT1	ANT2
	11a	✓	✓	✓	✓	×	*
6GHz	11ax	✓	✓	✓	✓	✓	✓
	11be	✓	✓	✓	✓	✓	✓

Table 2-7. Antenna / Technology Configurations

✓ = Support; **x**= NOT Support **SISO** = Single Input Single Output

SDM = Spatial Diversity Multiplexing – MIMO function

CDD = Cyclic Delay Diversity – 2Tx Function

3. The device supports the following data rates (shown in Mbps):

802.11a	Spatial							OFD	M (802.11a	x/be)						
201411-	Stream		20MHz	Hz 40MHz				80MHz			160MHz		320MHz			
20MHz		0.8μs GI	1.6μs GI	3.2μs Gl	0.8μs GI	1.6μs GI	3.2μs GI	0.8μs GI	1.6μs GI	3.2μs GI	0.8μs GI	1.6μs GI	3.2μs GI	0.8μs GI	1.6μs GI	3.2μs G
6	1	8.6	8.1	7.3	17.2	16.3	14.6	36	34	30.6	72.1	68.1	61.3	144.1	136.1	122.5
9	1	17.2	16.3	14.6	34.4	32.5	29.3	72.1	68.1	61.3	144.1	136.1	122.5	288.2	272.2	245
12	1	25.8	24.4	21.9	51.6	48.8	43.9	108.1	102.1	91.9	216.2	204.2	183.8	432.4	408.3	367.5
18	1	34.4	32.5	29.3	68.8	65	58.5	144.1	136.1	122.5	288.2	272.2	245	576.5	544.4	490
24	1	51.6	48.8	43.9	103.2	97.5	87.8	216.2	204.2	183.8	432.4	408.3	367.5	864.7	816.7	735
36	1	68.8	65	58.5	137.6	130	117	288.2	272.2	245	576.5	544.4	490	1152.9	1088.9	980
48	1	77.4	73.1	65.8	154.9	146.3	131.6	324.3	306.3	275.6	648.5	612.5	551.3	1297.1	1225	1102.5
54	1	86	81.3	73.1	172.1	162.5	146.3	360.3	340.3	306.3	720.6	680.6	612.5	1441.2	1361.1	1225
	1	103.2	97.5	87.8	206.5	195	175.5	432.4	408.3	367.5	864.7	816.7	735	1729.4	1633.3	1470
	1	114.7	108.3	97.5	229.4	216.7	195	480.4	453.7	408.3	960.8	907.4	816.7	1921.6	1814.8	1633.3
	1	129	121.9	109.7	258.1	243.8	219.4	540.4	510.4	459.4	1080.9	1020.8	918.8	2161.8	2041.7	1837.5
	1	143.4	135.4	121.9	286.8	270.8	243.8	600.5	567.1	510.4	1201	1134.3	1020.8	2402	2268.5	2041.7
	1	154.9	146.3	131.6	309.7	292.5	263.3	648.5	612.5	551.3	1297.1	1225	1102.5	2594.1	2450	2205
	1	172.1	162.5	146.3	344.1	325	292.5	720.6	680.6	612.5	1441.2	1361.1	1225	2882.4	2722.2	2450
6	2	17.2	16.3	14.6	34.4	32.5	29.3	72.1	68.1	61.3	144.1	136.1	122.5	288.2	272.2	245
9	2	34.4	32.5	29.3	68.8	65	58.5	144.1	136.1	122.5	288.2	272.2	245	576.5	544.4	490
12	2	51.6	48.8	43.9	103.2	97.5	87.8	216.2	204.2	183.8	432.4	408.3	367.5	864.7	816.7	735
18	2	68.8	65	58.5	137.6	130	117	288.2	272.2	245	576.5	544.4	490	1152.9	1088.9	980
24	2	103.2	97.5	87.8	206.5	195	175.5	432.4	408.3	367.5	864.7	816.7	735	1729.4	1633.3	1470
36	2	137.6	130	117	275.3	260	234	576.5	544.4	490	1152.9	1088.9	980	2305.9	2177.8	1960
48	2	154.9	146.3	131.6	309.7	292.5	263.3	648.5	612.5	551.3	1297.1	1225	1102.5	2594.1	2450	2205
54	2	172.1	162.5	146.3	344.1	325	292.5	720.6	680.6	612.5	1441.2	1361.1	1225	2882.4	2722.2	2450
	2	206.5	195	175.5	412.9	390	351	864.7	816.7	735	1729.4	1633.3	1470	3458.8	3266.7	2940
	2	229.4	216.7	195	458.8	433.3	390	960.8	907.4	816.7	1921.6	1814.8	1633.3	3843.1	3629.6	3266.7
	2	258.1	243.8	219.4	516.2	487.5	438.8	1080.9	1020.8	918.8	2161.8	2041.7	1837.5	4323.5	4083.3	3675
	2	286.8	270.8	243.8	573.5	541.7	487.5	1201	1134.3	1020.8	2402	2268.5	2041.7	4803.9	4537	4083.3
	2	309.7	292.5	263.3	619.4	585	526.5	1297.1	1225	1102.5	2594.1	2450	2205	5188.2	4900	4410
	2	344.1	325	292.5	688.2	650	585	1441.2	1361.1	1225	2882.4	2722.2	2450	5764.7	5444.4	4900

Table 2-8. Supported Data Rates

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2.3 Antenna Description

The following antenna gains are used in this device per the "Unlicensed Band Antenna Gain" document provided by the client. This document is also included in the filing as a public exhibit.

		1	,
Frequency (MHz)	Ant1 Peak Gain [dBi]	Ant2 Peak Gain [dBi]	Directional Gain [dBi]
5915	-6.89	-7.84	-4.34
6015	-6.14	-8.42	-4.20
6115	-6.17	-7.98	-4.02
6215	-5.99	-8.27	-4.05
6315	-7.21	-9.47	-5.26
6350	-7.45	-9.9	-5.58
6415	-8.71	-11.1	-6.81
6515	-9.73	-11.8	-7.69
6615	-10.6	-12.5	-8.49
6700	-9.74	-12.75	-8.10
6715	-9.9	-12.5	-8.09
6815	-9.96	-12.5	-8.13
6915	-9.92	-11.7	-7.75
7015	-9.82	-11.8	-7.74
7100	-10.26	-12.29	-8.21
7125	-10.1	-13.2	-8.50

Table 2-9 Antenna Peak Gain per Frequency

2.4 Test Configuration

The EUT was tested per the guidance of ANSI C63.10-2013 and KDB 987594 D02 v02r01. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing. See Sections 7.7 for radiated emissions test setups, and 7.2, 7.3, 7.4, 7.5 and 7.6 for antenna port conducted emissions test setups.

This device operates in the 5.925-7.125 GHz band when under control of a low power indoor access point. Additionally, the device may operate in the 5.925-6.425 GHz and 6.525-6.875 GHz bands when under control of a standard power access point.

2.5 Software and Firmware

The test was conducted with firmware version X910XXU1BWL3 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 987594 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 for them to warm up to their normal operating condition. The test setup 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 precautions were 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 were noted for each frequency found.

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

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

3.3 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)
Contention Based Protocol Conducted Measurements	0.86
Conducted Bench Top Measurements	1.95
Line Conducted Disturbance	3.09
Radiated Disturbance (<1GHz)	4.10
Radiated Disturbance (>1GHz)	4.82
Radiated Disturbance (>18GHz)	4.96

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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
Agilent	N9030A	PXA Signal Analyzer	7/6/2023	Annual	7/3/2024	MY49432391
Antritsu	S820E	Cable and Antenna Analyzer	7/4/2023	Annual	7/3/2024	1839097
Antritsu	TOSLKF50A-40	Calibration Kit	N/A	-	N/A	1825024
Com-Power	AL-130R	Active Loop Antenna	10/21/2022	Biennial	10/20/2024	10160045
Fairview Microwave	FM2CP1122-10	Coupler	7/4/2023	Annual	7/3/2024	1946
Keysight Technologies	N9030B	PXA Signal Analyzer	4/6/2023	Annual	4/5/2024	MY57142018
Mini-Circuits	BW-N10W5+	Attenuator	4/6/2023	Annual	4/5/2024	TEMPNO.01-151
Rohde & Schwarz	TS-PR1840	Preamplifier	7/6/2023	Annual	7/5/2024	100049
Rohde & Schwarz	ESW	EMI TEST Receiver	7/5/2023	Annual	7/4/2024	101761
Rohde & Schwarz	FSW43	Signal & Spectrum Analyzer	4/6/2023	Annual	4/5/2024	101250
Rohde & Schwarz	TS-SFUNIT-Rx	Shielded Filter Unit	1/13/2023	Annual	1/12/2024	102151
Schwarzbeck	VULB9162	Broadband TRILOG Antenna	6/1/2023	Biennial	5/31/2025	9162-217
Sunol Sciences	DRH-118	Horn Antenna	1/26/2023	Biennial	1/25/2025	A102416-1
Anritsu	MA24106A	Power Sensor	7/4/2023	Annual	7/3/2024	1244512

Table 6-1. Annual Test Equipment Calibration Schedule

Note:

- 1. 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.
- 2. Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

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7.0 TEST RESULTS

7.1 Summary

Company Name: <u>Samsung Electronics CO., Ltd.</u>

FCC ID: <u>A3LSMX910</u> IC: <u>649E-SMX910</u>

FCC Classification: <u>15E 6GHz Low Power Dual Client (6CD)</u>

FCC Part Section(s)	RSS Section(s)	Test Description Test Limit		Test Condition	Test Result	Reference
2.1046, 15.407(a)(11)	RSS-Gen [6.12]	Maximum Conducted Output Power	N/A		PASS	Section 7.3
15.407(a)(8)	RSS-248 [4.5.3]	Maximum Radiated Output Power	< 24dBm over the frequency band of operation		PASS	Section 7.3
2.1049, 15.407(a)(10)	RSS-Gen [6.7], RSS-248 [4.4]	Occupied Bandwidth/ 26dB Bandwidth	99% of the occupied bandwidth of any channel must be contained within each of its respective U-NII sub bands. The maximum transmitter channel bandwidth for U-NII devices in the 5.925-7.125 GHz band is 320 megahertz.	CONDUCTED	PASS	Section 7.2
15.407(a)(8)	RSS-248 [4.5.3]	Maximum Power Spectral Density	< -1dBm/MHz e.i.r.p.		PASS	Section 7.4
15.407(b)(7)	RSS-248 [4.6.2]	In-Band Emissions	EUT must meet the limits detailed in 15.407(b)(7)		PASS	Section 7.5
15.407(d)(6)	RSS-248 [4.7]	Contention Based Protocol	Based EUT must detect AWGN signal with 90% (or better) certainty		PASS	Section 7.6
15.407(b)(6)	RSS-248 [4.6.2]	Undesirable Emissions	< -27dBm/MHz e.i.r.p. outside of the 5.925 – 7.125GHz band	le of the		Section 7.7
15.205, 15.209	205, 15.209 RSS-Gen [8.9] Gene Limits Band Emiss		Emissions in restricted bands must meet the radiated limits detailed in 15.209	RADIATED	PASS	Section 7.7

Table 7-1. Summary of Test Results

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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) Per 15.407(a)(7), a device operating under the control of a standard power access point in 5.925-6.425 GHz and 6.525-6.875 GHz bands must not have the maximum power spectral density exceed 17 dBm/MHz e.i.r.p., must limit the maximum e.i.r.p. over the frequency band of operation does not exceed 30 dBm, and must limit its power to no more than 6 dB below its associated standard power access point's authorized transmit power. Compliance to this clause is addressed via submission of an attestation following Appendix B of KDB 987594 D01 v02r02.
- 5) 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 Element "UNII Automation," Version .
- 6) 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 Element "Chamber Automation," Version 1.6.4.

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7.2 26dB Bandwidth Measurement

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 at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26dB bandwidth.

Test Procedure Used

ANSI C63.10-2013 - Section 12.4

Test Settings

- 1. The signal analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 26. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = approximately 1% of the emission bandwidth
- 3. VBW \geq 3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold

Test Setup

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



Figure 7-1. Test Instrument & Measurement Setup

Test Notes

All cases were investigated; a subset of the taken plots were included to represent relevant settings and measurements.

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	Frequency [MHz]	Channel	802.11 MODE	Antenna-1 26dB Bandwidth [MHz]	Antenna-2 26dB Bandwidth [MHz]	Antenna-1 Occupied Bandwidth [MHz]	Antenna-2 Occupied Bandwidth [MHz]
	6175	45	be (20MHz)	21.94	21.44	19.17	19.15
	6165	43	be (40MHz)	42.96	43.02	38.18	38.17
Band 5	6145	39	be (80MHz)	90.05	91.06	78.29	77.96
Ban	6185	47	be (160MHz)	177.00	173.10	157.46	157.57
	6105	31	be (320MHz)*	333.60	333.30	314.55	315.35
	6265	63	be (320MHz)*	331.20	332.30	314.36	315.80
	6475	105	be (20MHz)	21.80	21.61	19.17	19.13
Band 6	6485	107	be (40MHz)	42.89	42.29	38.28	38.32
Bar	6465	103	be (80MHz)	87.71	88.75	78.06	78.08
	6505	111	be (160MHz)	174.00	172.70	157.79	157.71
Band 5/6/7	6425	95	be (320MHz)*	329.30	333.08	313.89	315.09
	6695	149	be (20MHz)	21.75	21.66	19.10	19.14
7 Pi	6725	155	be (40MHz)	43.15	42.40	38.02	38.18
Band 7	6705	151	be (80MHz)	89.69	89.14	78.30	78.00
	6665	143	be (160MHz)	171.80	173.90	157.27	157.26
Band 6/7	6585	127	be (320MHz)*	332.50	331.40	315.98	314.41
Band 7/8	6745	159	be (320MHz)*	337.00	332.60	315.07	314.04
	6995	209	be (20MHz)	22.10	21.62	19.14	19.13
Band 8	7005	211	be (40MHz)	43.18	42.21	38.15	38.25
Bar	7025	215	be (80MHz)	88.69	90.95	78.02	78.06
	6985	207	be (160MHz)	175.70	172.10	157.42	157.58
Band 7/8	6905	191	be (320MHz)*	331.60	332.00	314.76	314.51

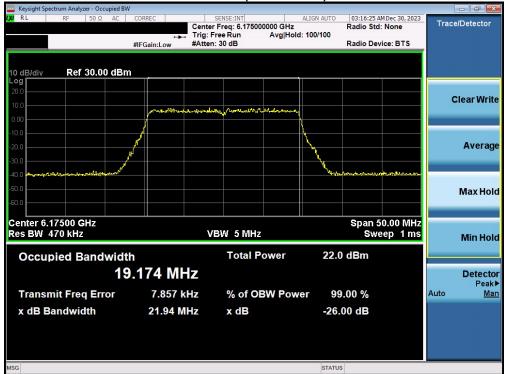
Table 7-2. Bandwidth Test Results

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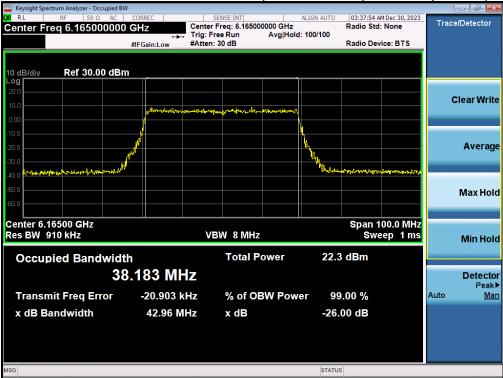
^{*}Occupied Bandwidth Measurement was used to demonstrate compliance.



MIMO Antenna-1 26 dB Bandwidth Measurements - (UNII Band 5)



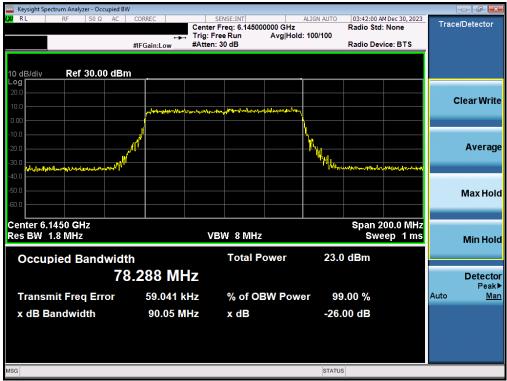
Plot 7-1. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11be (UNII Band 5) - Ch. 45)



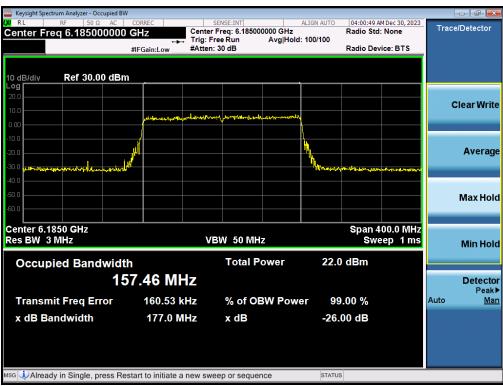
Plot 7-2. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11be (UNII Band 5) - Ch. 43)

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Plot 7-3. 26dB Bandwidth Plot MIMO ANT1 (80MHz 802.11be (UNII Band 5) - Ch. 39)



Plot 7-4. 26dB Bandwidth Plot MIMO ANT1 (160MHz 802.11be (UNII Band 5) - Ch. 47)

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Plot 7-5. 26dB Bandwidth Plot MIMO ANT1 (320MHz 802.11be (UNII Band 5) - Ch. 31)



Plot 7-6. 26dB Bandwidth Plot MIMO ANT1 (320MHz 802.11be (UNII Band 5) - Ch. 63)

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MIMO Antenna-1 26 dB Bandwidth Measurements - (UNII Band 6)



Plot 7-7. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11be (UNII Band 6) - Ch. 105)



Plot 7-8. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11be (UNII Band 6) - Ch. 107)

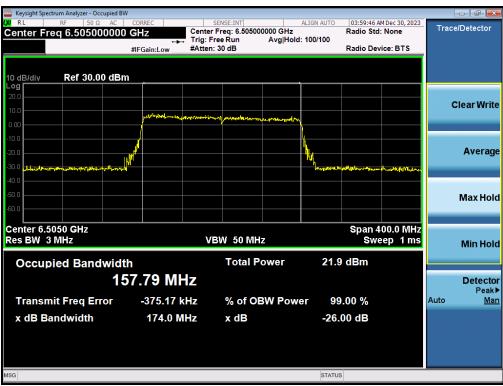
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Plot 7-9. 26dB Bandwidth Plot MIMO ANT1 (80MHz 802.11be (UNII Band 6) - Ch. 103)



Plot 7-10. 26dB Bandwidth Plot MIMO ANT1 (160MHz 802.11be (UNII Band 6) - Ch. 111)

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Plot 7-11. 26dB Bandwidth Plot MIMO ANT1 (320MHz 802.11be (UNII Band 5/6/7) - Ch. 95)

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MIMO Antenna-1 26 dB Bandwidth Measurements - (UNII Band 7)



Plot 7-12. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11be (UNII Band 7) - Ch. 149)



Plot 7-13. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11be (UNII Band 7) - Ch. 155)

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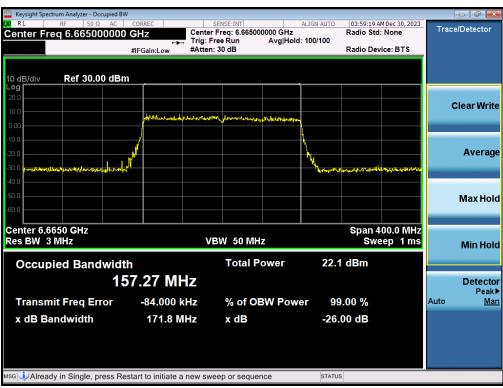
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Plot 7-14. 26dB Bandwidth Plot MIMO ANT1 (80MHz 802.11be (UNII Band 7) - Ch. 151)



Plot 7-15. 26dB Bandwidth Plot MIMO ANT1 (160MHz 802.11be (UNII Band 7) - Ch. 143)

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Plot 7-16. 26dB Bandwidth Plot MIMO ANT1 (320MHz 802.11be (UNII Band 6/7) - Ch. 127)



Plot 7-17. 26dB Bandwidth Plot MIMO ANT1 (320MHz 802.11be (UNII Band 7/8) - Ch. 159)

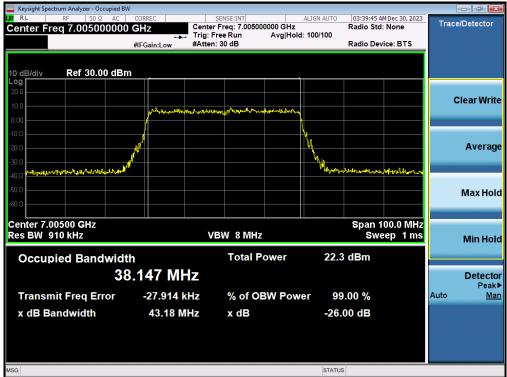
FCC ID: A3LSMX910 IC: 649E-SMX910	MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Technical Manager
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MIMO Antenna-1 26 dB Bandwidth Measurements - (UNII Band 8)



Plot 7-18. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11be (UNII Band 8) - Ch. 209)



Plot 7-19. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11be (UNII Band 8) - Ch. 211)

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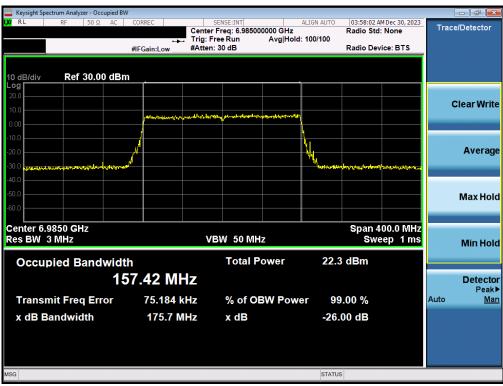
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Plot 7-20. 26dB Bandwidth Plot MIMO ANT1 (80MHz 802.11be (UNII Band 8) - Ch. 215)



Plot 7-21. 26dB Bandwidth Plot MIMO ANT1 (160MHz 802.11be (UNII Band 8) - Ch. 207)

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Plot 7-22. 26dB Bandwidth Plot MIMO ANT1 (320MHz 802.11be (UNII Band 7/8) - Ch. 191)

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MIMO Antenna-2 26 dB Bandwidth Measurements - (UNII Band 5)



Plot 7-23. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11be (UNII Band 5) - Ch. 45)



Plot 7-24. 26dB Bandwidth Plot MIMO ANT2 (40MHz 802.11be (UNII Band 5) - Ch. 43)

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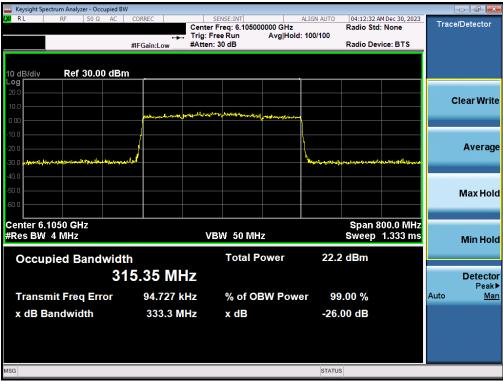
Plot 7-25. 26dB Bandwidth Plot MIMO ANT2 (80MHz 802.11be (UNII Band 5) - Ch. 39)



Plot 7-26. 26dB Bandwidth Plot MIMO ANT2 (160MHz 802.11be (UNII Band 5) - Ch. 47)

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Plot 7-27. 26dB Bandwidth Plot MIMO ANT2 (320MHz 802.11be (UNII Band 5) - Ch. 31)



Plot 7-28. 26dB Bandwidth Plot MIMO ANT2 (320MHz 802.11be (UNII Band 5) - Ch. 63)

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MIMO Antenna-2 26 dB Bandwidth Measurements - (UNII Band 6)



Plot 7-29. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11be (UNII Band 6) - Ch. 105)

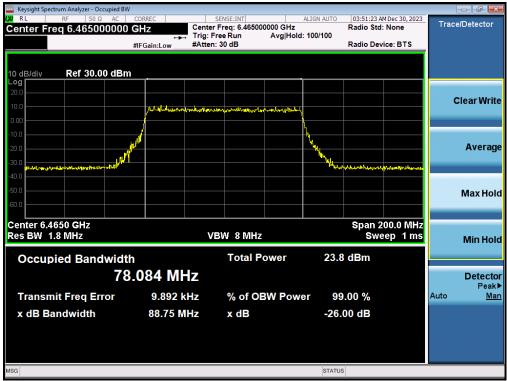


Plot 7-30. 26dB Bandwidth Plot MIMO ANT2 (40MHz 802.11be (UNII Band 6) - Ch. 107)

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Plot 7-31. 26dB Bandwidth Plot MIMO ANT2 (80MHz 802.11be (UNII Band 6) - Ch. 103)



Plot 7-32. 26dB Bandwidth Plot MIMO ANT2 (160MHz 802.11be (UNII Band 6) - Ch. 111)

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Plot 7-33. 26dB Bandwidth Plot MIMO ANT2 (320MHz 802.11be (UNII Band 5/6/7) - Ch. 95)

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