

MEASUREMENT REPORT

FCC Part 15.407 802.11ax WiFi 6GHz VLP (OFDMA)

Applicant Name:

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

Date of Testing:

1/6/2025 – 2/28/2025

Test Report Issue Date:

3/1/2025

Test Site/Location:

Element lab., Columbia, MD, USA

Test Report Serial No.:

1M2501020001-27.A3L

FCC ID:

A3LSMG766U

APPLICANT:

Samsung Electronics Co., Ltd.

Application Type:

Certification

Model:

SM-G766U

Additional Model:

SM-G766U1

EUT Type:

Portable Handset

Frequency Range:

5925 - 6425MHz and 6525 - 6875MHz

Modulation Type:

OFDMA

FCC Classification:

15E 6GHz Very Low Power Device (6VL)

FCC Rule Part(s):

Part 15 Subpart E (15.407)

Test Procedure(s):

ANSI C63.10-2013, KDB 987594 D02 v03,
KDB 648474 D03 v01r04

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.



RJ Ortanez
Executive Vice President



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Channel Bandwidth [MHz]	UNII Band	Tx Frequency [MHz]	MIMO	
			Max. Power [mW]	Max. Power [dBm]
20	5	5935 - 6415	2.84	4.53
	7	6535 - 6875	2.67	4.26
40	5	5965 - 6405	4.34	6.37
	7	6565 - 6845	4.06	6.08
80	5	5985 - 6385	8.13	9.10
	7	6545 - 6865	8.63	9.36
160	5	6025 - 6345	8.28	9.18
	7	6665 - 6825	8.77	9.43

EUT Overview - EIRP

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1 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 laboratory 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 Element lab located in Columbia, MD 21046, U.S.A.

- Element Washington DC LLC 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.
- Element Washington DC LLC 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).
- Element Washington DC LLC facility is a registered (2451B) test laboratory with the site description on file with ISED.
- Element Washington DC LLC is a Recognized U.S. Certification Assessment Body (CAB # US0110) for ISED Canada as designated by NIST under the U.S. and Canada Mutual Recognition Agreements (MRAs).

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2 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Electronics Co., Ltd. Portable Handset FCC ID: A3LSMG766U**. 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 in very low power (VLP) mode.

Test Device Serial No.: 2120M, 2115M, 2110M, 2575M, 2605M, 2528M

2.2 Device Capabilities

This device contains the following capabilities:

850/1700/1900 WCDMA/HSPA, 850/1900 GSM/GPRS/EDGE, Multi-Band LTE, MultiBand 5G NR (FR1), 802.11b/g/n/ac/ax WLAN, 802.11a/n/ac/ax UNII (5GHz and 6GHz), Bluetooth (1x, EDR, LE), NFC

Band 5		Band 7	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
2	5935	117	6535
:	:	:	:
45	6175	149	6695
:	:	:	:
93	6415	185	6875

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

Band 5		Band 7	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
3	5965	123	6565
:	:	:	:
43	6165	155	6725
:	:	:	:
91	6405	179	6845

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

Band 5		Band 7	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
7	5985	119	6545
:	:	:	:
39	6145	151	6705
:	:	:	:
87	6385	183	6865

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

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Band 5

Ch.	Frequency (MHz)
15	6025
:	:
47	6185
:	:
79	6345

Band 7

Ch.	Frequency (MHz)
143	6665
:	:
175	6825

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

Notes:

- 6GHz NII operation is possible in 20MHz, 40MHz, 80MHz, and 160MHz 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:

Band	Bandwidth	Tone Type	Tone Size	MIMO (1+2)	
				Duty Cycle [%]	Radiated DCCF [dB]
6GHz	20MHz	RU	26T	98.45	N/A
			52T	96.74	0.14
			106T	97.17	0.12
			242T	95.95	0.18
	40MHz	RU	26T	98.92	N/A
			52T	99.19	N/A
			106T	98.55	N/A
			242T	99.24	N/A
			484T	98.47	N/A
	80MHz	RU	26T	98.85	N/A
			52T	98.16	N/A
			106T	96.87	0.14
			242T	99.03	N/A
			484T	98.15	N/A
			996T	97.52	0.11
	160MHz	RU	26T	99.45	N/A
			52T	99.42	N/A
			106T	99.56	N/A
			242T	99.56	N/A
			484T	99.6	N/A
			996T	99.52	N/A
			2x996T	99.56	N/A

Table 2-5. Measured Duty Cycles

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

WiFi Configurations		CDD		SDM	
		ANT1	ANT2	ANT1	ANT2
6 GHz	11ax	✓	✓	✓	✓
	11be	✓	✓	✓	✓

Table 2-6. Frequency / Channel Operations

✓ = Support; ✗ = 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):

MCS Index	Spatial Stream	OFDMA (802.11ax)																	
		26T			52T			106T			242T			484T			996T		
		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 GI	0.8μs GI	1.6μs GI	3.2μs GI	0.8μs GI	1.6μs GI	3.2μs GI
0	1	0.9	0.8	0.8	1.8	1.7	1.5	3.8	3.5	3.2	8.6	8.1	7.3	17.2	16.3	14.6	36	34	30.6
1	1	1.8	1.7	1.5	3.5	3.3	3	7.5	7.1	6.4	17.2	16.3	14.6	34.4	32.5	29.3	72.1	68.1	61.3
2	1	2.6	2.5	2.3	5.3	5	4.5	11.3	10.6	9.6	25.8	24.4	21.9	51.6	48.8	43.9	108.1	102.1	91.9
3	1	3.5	3.3	3	7.1	6.7	6	15	14.2	12.8	34.4	32.5	29.3	68.8	65	58.5	144.1	136.1	122.5
4	1	5.3	5	4.5	10.6	10	9	22.5	21.3	19.1	51.6	48.8	43.9	103.2	97.5	87.8	216.2	204.2	183.8
5	1	7.1	6.7	6	14.1	13.3	12	30	28.3	25.5	68.8	65	58.5	137.6	130	117	288.2	272.2	245
6	1	7.9	7.5	6.8	15.9	15	13.5	33.8	31.9	28.7	77.4	73.1	65.8	154.9	146.3	131.6	324.3	306.3	275.6
7	1	8.8	8.3	7.5	17.6	16.7	15	37.5	35.4	31.9	86	81.3	73.1	172.1	162.5	146.3	360.3	340.3	306.3
8	1	10.6	10	9	21.2	20	18	45	42.5	38.3	103.2	97.5	87.8	206.5	195	175.5	432.4	408.3	367.5
9	1	11.8	11.1	10	23.5	22.2	20	50	47.2	42.5	114.7	108.3	97.5	229.4	216.7	195	480.4	453.7	408.3
10	1	13.2	12.5	11.3	26.5	25	22.5	56.3	53.1	47.8	129	121.9	109.7	258.1	243.8	219.4	540.4	510.4	459.4
11	1	14.7	13.9	12.5	29.4	27.8	25	62.5	59	53.1	143.4	135.4	121.9	286.8	270.8	243.8	600.5	567.1	510.4
0	2	1.8	1.7	1.5	3.5	3.3	3	7.5	7.1	6.4	17.2	16.3	14.6	34.4	32.5	29.3	72.1	68.1	61.3
1	2	3.5	3.3	3	7.1	6.7	6	15	14.2	12.8	34.4	32.5	29.3	68.8	65	58.5	144.1	136.1	122.5
2	2	5.3	5	4.5	10.6	10	9	22.5	21.3	19.1	51.6	48.8	43.9	103.2	97.5	87.8	216.2	204.2	183.8
3	2	7.1	6.7	6	14.1	13.3	12	30	28.3	25.5	68.8	65	58.5	137.6	130	117	288.2	272.2	245
4	2	10.6	10	9	21.2	20	18	45	42.5	38.3	103.2	97.5	87.8	206.5	195	175.5	432.4	408.3	367.5
5	2	14.1	13.3	12	28.2	26.7	24	60	56.7	51	137.6	130	117	275.3	260	234	576.5	544.4	490
6	2	15.9	15	13.5	31.8	30	27	67.5	63.8	57.4	154.9	146.3	131.6	309.7	292.5	263.3	648.5	612.5	551.3
7	2	17.6	16.7	15	35.3	33.3	30	75	70.8	63.8	172.1	162.5	146.3	344.1	325	292.5	720.6	680.6	612.5
8	2	21.2	20	18	42.4	40	36	90	85	76.5	206.5	195	175.5	412.9	390	351	864.7	816.7	735
9	2	23.5	22.2	20	47.1	44.4	40	100	94.4	85	229.4	216.7	195	458.8	433.3	390	960.8	907.4	816.7
10	2	26.5	25	22.5	52.9	50	45	112.5	106.3	95.6	258.1	243.8	219.4	516.2	487.5	438.8	1080.9	1020.8	918.8
11	2	29.4	27.8	25	58.8	55.6	50	125	118.1	106.3	286.8	270.8	243.8	573.5	541.7	487.5	1201	1134.3	1020.8

Table 2-7. Supported Data Rates

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4. The device supports either Standard Power (SP) or Low Power Indoor (LPI) or Very Low Power (VLP) operation in the following UNII bands:

UNII Band	Standard Power (SP)	Low Power Indoor (LPI)	Very Low Power (VLP)
UNII 5	✓	✓	✓
UNII 6	✗	✓	✗
UNII 7	✓	✓	✓
UNII 8	✗	✓	✗

Table 2-8. Power Operation

✓ = Support; ✗ = NOT Support

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2.3 Antenna Description

The following antenna gains were used for the testing.

	Ant1 Peak Gain [dBi]	Ant2 Peak Gain [dBi]	Directional Gain [dBi]
5925 – 6425 MHz	-8.40	-8.40	-5.39
6425 – 6525 MHz	-8.60	-8.70	-5.64
6525 – 6875 MHz	-8.50	-8.50	-5.49
6875 – 7125 MHz	-8.30	-8.60	-5.44

Table 2-9. Antenna Peak Gain

2.4 Test Configuration

ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing. See Sections 3.2 for AC line conducted emissions test setups, 3.3 for radiated emissions test setups, and 7.2, 7.3, 7.4, 7.5 and 7.6 for antenna port conducted emissions test setups.

This device supports operation in very low power mode limited to the 5925 - 6425MHz and 6525 - 6875MHz bands.

2.5 Software and Firmware

The test was conducted with firmware version C766USQ0AXL3 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 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 to v03 were used in the measurement of the EUT.

Deviation from measurement procedure.....None

3.2 AC Line Conducted Emissions

The line-conducted facility is located inside a 10'x16'x9' shielded enclosure. The shielded enclosure is manufactured by ETS Lindgren RF Enclosures. The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-5. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. The external power line filter is an ETS Lindgren Model LPRX-4X30 (100dB Attenuation, 14kHz-18GHz) and the two EMI/RFI filters are ETS Lindgren Model LRW-2030-S1 (100dB Minimum Insertion Loss, 14kHz – 10GHz). These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the second LISN. All interconnecting cables more than 1 meter were shortened to a 1-meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference groundplane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Once the worst-case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions is used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

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3.3 Radiated Emissions

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

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

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

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

3.4 Environmental Conditions

The temperature is controlled within range of 15°C to 35°C. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).

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4 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 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 ($\pm$ dB)
Contention Based Protocol Conducted Measurements	0.86
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

Table 5-1. Measurement Uncertainty Budget

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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6 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)	4/2/2024	Annual	4/2/2025	WL25-1
-	WL25-2	Conducted Cable Set (25GHz)	4/2/2024	Annual	4/2/2025	WL25-2
-	WL40-1	Conducted Cable Set (40GHz)	4/2/2024	Annual	4/2/2025	WL40-1
-	MD 1M 18-40	EMC Cable and Switch System	4/2/2024	Annual	4/2/2025	MD 1M 18-40
-	AP1-002	EMC Cable and Switch System	4/2/2024	Annual	4/2/2025	AP1-002
-	ETS-001	EMC Cable and Switch System	4/2/2024	Annual	4/2/2025	ETS-001
-	ETS-002	EMC Cable and Switch System	4/2/2024	Annual	4/2/2025	ETS-002
ETS-Lindgren	3116C	Horn Antenna (18-40GHz)	2/27/2023	Biennial	2/27/2025	218893
Rohde & Schwarz	TC-TA18	Vivaldi Antenna	2/23/2023	Biennial	2/23/2025	26040036
Rohde & Schwarz	FSW26	Spectrum Analyzer (26.5GHz)	3/8/2024	Annual	3/8/2025	103187
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	10/16/2024	Annual	10/16/2025	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	11/25/2024	Annual	11/25/2025	100348
Pasternack	NMLC-2	Line Conducted Emissions Cable	4/2/2024	Annual	4/2/2025	NMLC-2
Rohde & Schwarz	ENV216	Two-Line V-Network	1/31/2023	Biennial	1/31/2025	101379
Sunol	JB6	Bi-Log Antenna (20M-6GHz)	3/2/2023	Biennial	3/2/2025	A082816
Sunol	JB5	Bi-Log Antenna (20M-5GHz)	9/11/2024	Biennial	9/11/2026	A051107
Anritsu	MA24408A	Microwave Peak Power Sensor	5/21/2024	Annual	5/21/2025	11675
Anritsu	MA24408A	Microwave Peak Power Sensor	4/10/2024	Annual	4/10/2025	12798
Rohde & Schwarz	ESW44	EMI Test Receiver (44GHz)	4/5/2024	Annual	4/5/2025	101716
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	4/9/2024	Annual	4/9/2025	MY52350166
Keysight Technologies	N9020A	MXA Signal Analyzer	4/11/2024	Annual	4/11/2025	MY54500644
Keysight Technologies	N9030A	PXA Signal Analyzer	2/29/2024	Annual	3/1/2025	MY55410501
Keysight Technologies	N9030B	PXA Signal Analyzer	9/19/2024	Annual	9/19/2025	MY57141001
Rohde & Schwarz	SMW200A	Vector Signal Generator	4/4/2024	Annual	4/4/2025	109456

Table 6-1. Annual Test Equipment Calibration Schedule – MD

Note:

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

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 15 of 70

7 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LSMG766U
 FCC Classification: 15E 6GHz Very Low Power Device (6VL)

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1046, 15.407(a)(12)	Maximum Conducted Output Power	N/A	CONDUCTED	PASS	Section 7.3
15.407(a)(9)	Maximum Radiated Output Power	< 14dBm e.i.r.p.		PASS	Section 7.3
2.1049, 15.407(a)(11)	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.		PASS	Section 7.2
15.407(a)(9)	Maximum Power Spectral Density	< -5dBm/MHz e.i.r.p.		PASS	Section 7.4
15.407(b)(7)	In-Band Emissions	EUT must meet the limits detailed in 15.407(b)(7)		PASS	Section 7.5
15.407(d)(6)	Contention Based Protocol	EUT must detect AWGN signal with 90% (or better) certainty	RADIATED	PASS	Please see WiFi 6GHz (6VL) OFDM report
15.407(d)(10)	Transmit Power Control	Must operate at least 6 dB below the maximum EIRP power spectral density (PSD) value of -5 dBm/MHz		PASS	Please see WiFi 6GHz (6VL) OFDM report
15.407(b)(6)	Undesirable Emissions	< -27dBm/MHz e.i.r.p. outside of the 5.925 – 7.125GHz band		PASS	Sections 7.6, 7.7
15.205, 15.209	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS	Sections 7.6, 7.7
15.407(b)(9)	AC Conducted Emissions (150kHz – 30MHz)	< FCC 15.207 limits	LINE CONDUCTED	PASS	Please see WiFi 6GHz (6VL) OFDM report

Table 7-1. Summary of Test Results

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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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) 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 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 Element "Chamber Automation," Version 1.3.1.
- 6) 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 RUs were considered for testing.

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 17 of 70

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. $VBW \geq 3 \times RBW$
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

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

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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	Frequency [MHz]	Channel	802.11 MODE	Antenna-1 26dB Bandwidth [MHz]	Antenna-2 26dB Bandwidth [MHz]
Band 5	5935	2	ax (20MHz)	19.02	18.54
	6175	45	ax (20MHz)	18.99	17.16
	6415	93	ax (20MHz)	17.70	18.61
	5965	3	ax (40MHz)	39.06	37.04
	6165	43	ax (40MHz)	38.26	38.47
	6405	91	ax (40MHz)	36.69	36.09
	5985	7	ax (80MHz)	79.68	77.79
	6145	39	ax (80MHz)	79.73	78.21
	6385	87	ax (80MHz)	79.21	78.77
	6025	15	ax (160MHz)	159.15	160.49
	6185	47	ax (160MHz)	160.29	159.00
	6345	79	ax (160MHz)	159.37	159.58
Band 7	6535	117	ax (20MHz)	19.18	17.85
	6695	149	ax (20MHz)	19.62	18.38
	6695	181	ax (20MHz)	19.37	18.53
	6565	123	ax (40MHz)	37.42	38.33
	6685	155	ax (40MHz)	38.56	38.35
	6845	179	ax (40MHz)	38.11	38.60
	6545	135	ax (80MHz)	79.55	78.71
	6705	151	ax (80MHz)	78.84	78.20
	6865	167	ax (80MHz)	79.91	78.69
	6665	143	ax (160MHz)	160.06	158.53
	6825	175	ax (160MHz)	160.27	158.29

Table 7-2. 26dB Bandwidth Results – 26 Tones – VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 19 of 70

	Frequency [MHz]	Channel	802.11 MODE	Antenna-1 26dB Bandwidth [MHz]	Antenna-2 26dB Bandwidth [MHz]
Band 5	5935	2	ax (20MHz)	22.51	22.49
	6175	45	ax (20MHz)	23.01	22.62
	6415	93	ax (20MHz)	23.08	22.64
	5965	3	ax (40MHz)	44.32	40.77
	6165	43	ax (40MHz)	43.74	44.19
	6405	91	ax (40MHz)	43.73	44.21
	5985	7	ax (80MHz)	92.34	90.87
	6145	39	ax (80MHz)	92.34	92.29
	6385	87	ax (80MHz)	92.90	91.29
	6025	15	ax (160MHz)	164.41	165.73
	6185	47	ax (160MHz)	166.28	165.05
	6345	79	ax (160MHz)	164.11	164.85
Band 7	6535	117	ax (20MHz)	22.68	22.64
	6695	149	ax (20MHz)	22.50	22.20
	6695	181	ax (20MHz)	22.75	22.99
	6565	123	ax (40MHz)	43.85	44.25
	6685	155	ax (40MHz)	43.75	44.17
	6845	179	ax (40MHz)	44.11	43.54
	6545	135	ax (80MHz)	89.58	91.66
	6705	151	ax (80MHz)	90.39	89.31
	6865	167	ax (80MHz)	91.15	91.75
	6665	143	ax (160MHz)	164.75	165.83
	6825	175	ax (160MHz)	165.25	164.81

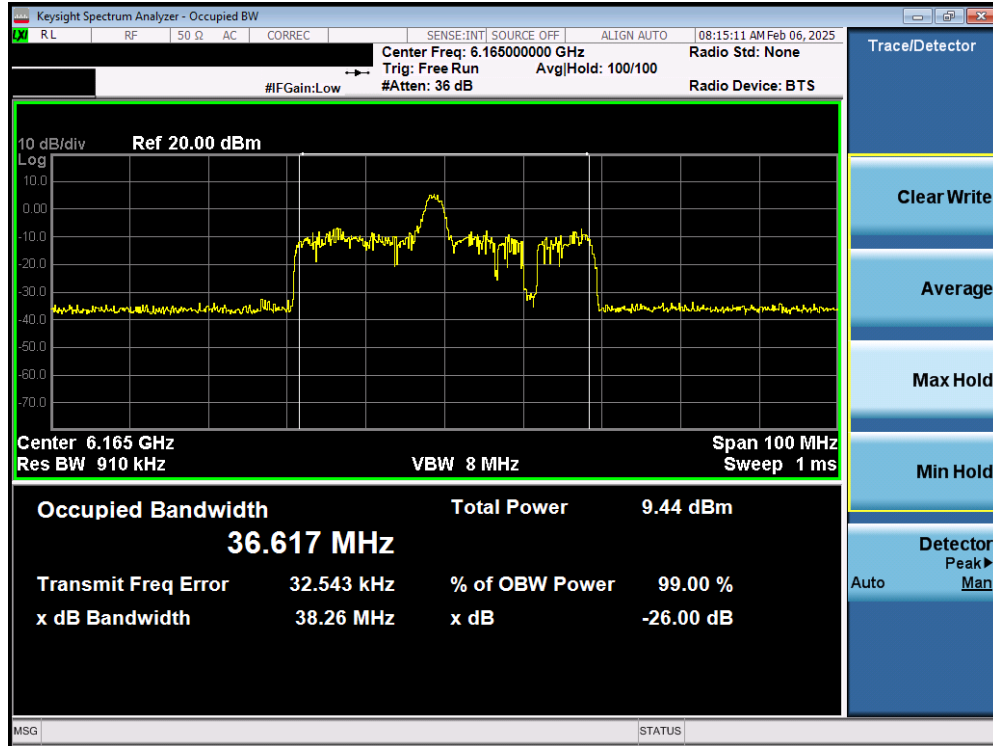
Table 7-3. 26dB Bandwidth Results – Full Tones – VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 20 of 70

7.2.1 MIMO Antenna-1 Bandwidth Measurements - (Partial Tones)



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

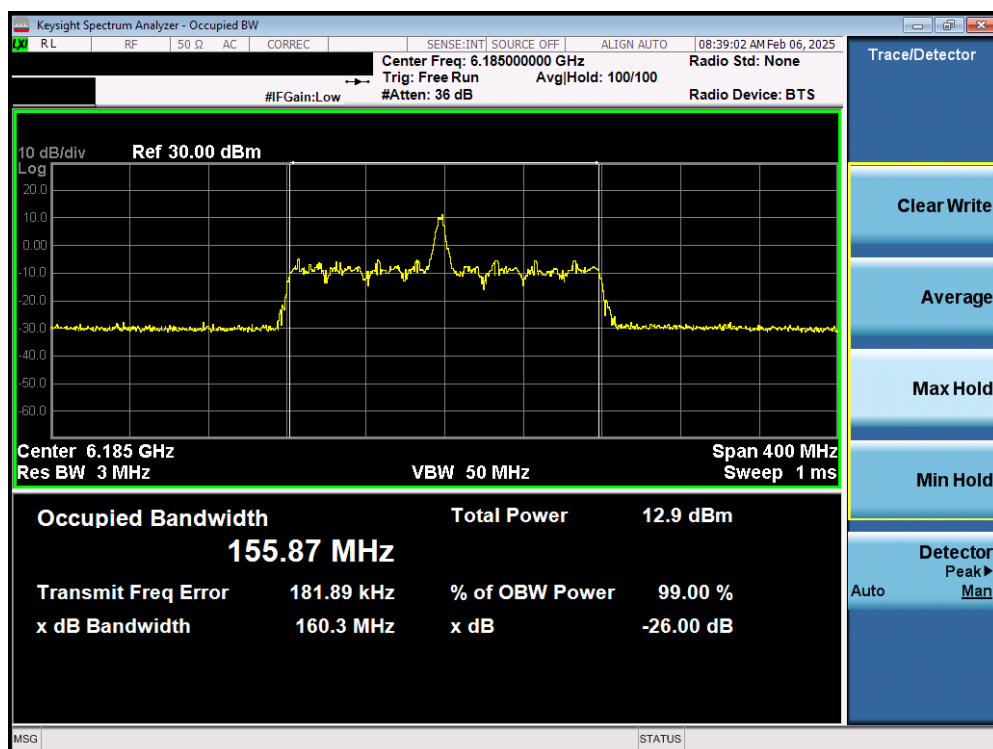


Plot 7-2. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 43) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 21 of 70



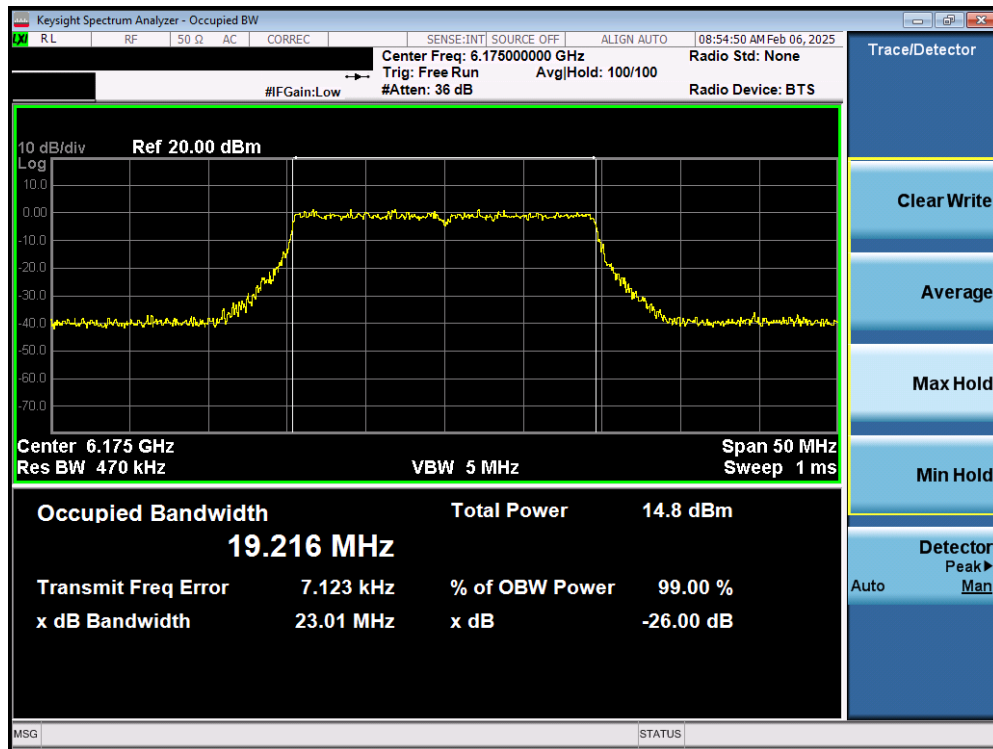
Plot 7-3. 26dB Bandwidth Plot MIMO ANT1 (80MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 39) - VLP



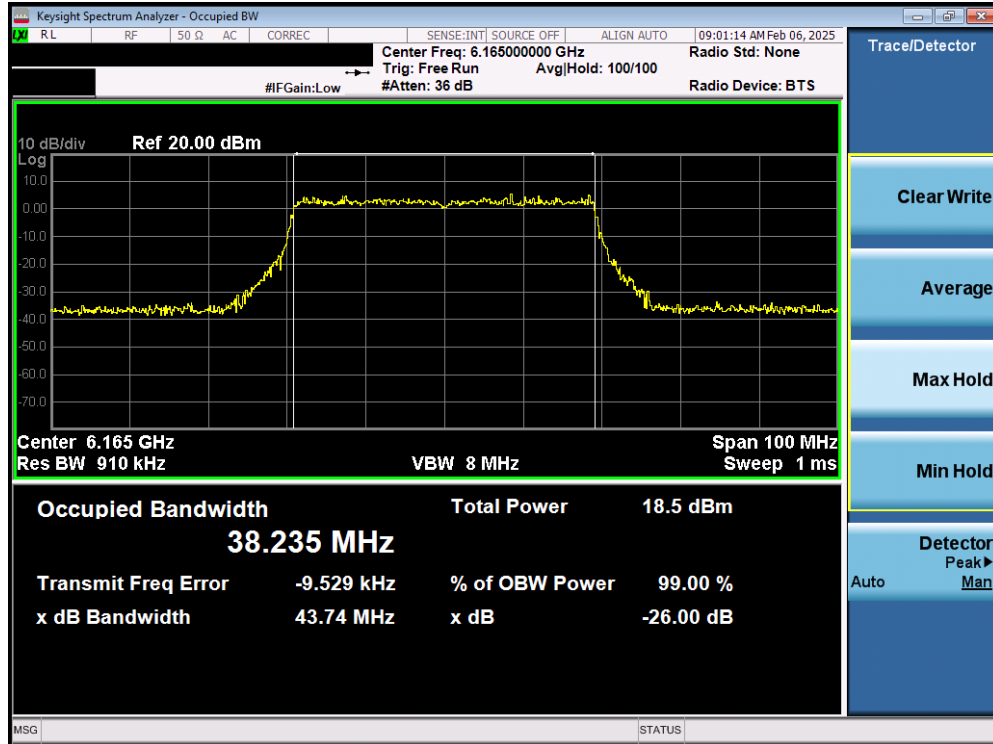
Plot 7-4. 26dB Bandwidth Plot MIMO ANT1 (160MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 47) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 22 of 70

7.2.2 MIMO Antenna-1 Bandwidth Measurements - (Full Tones)

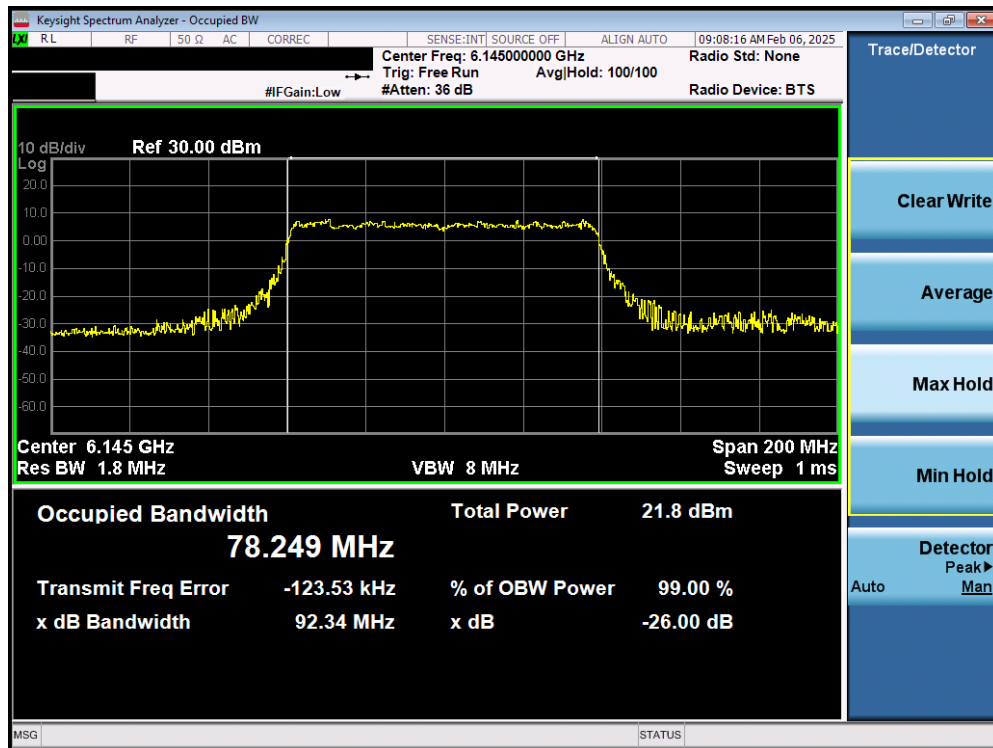


Plot 7-5. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 45) - VLP

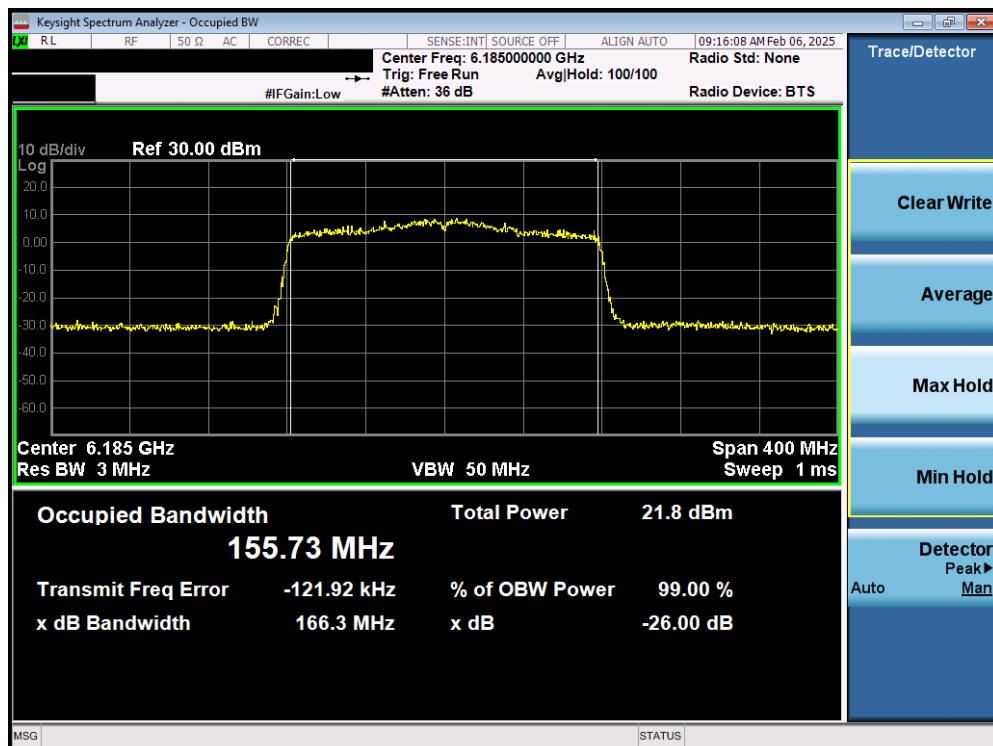


Plot 7-6. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 43) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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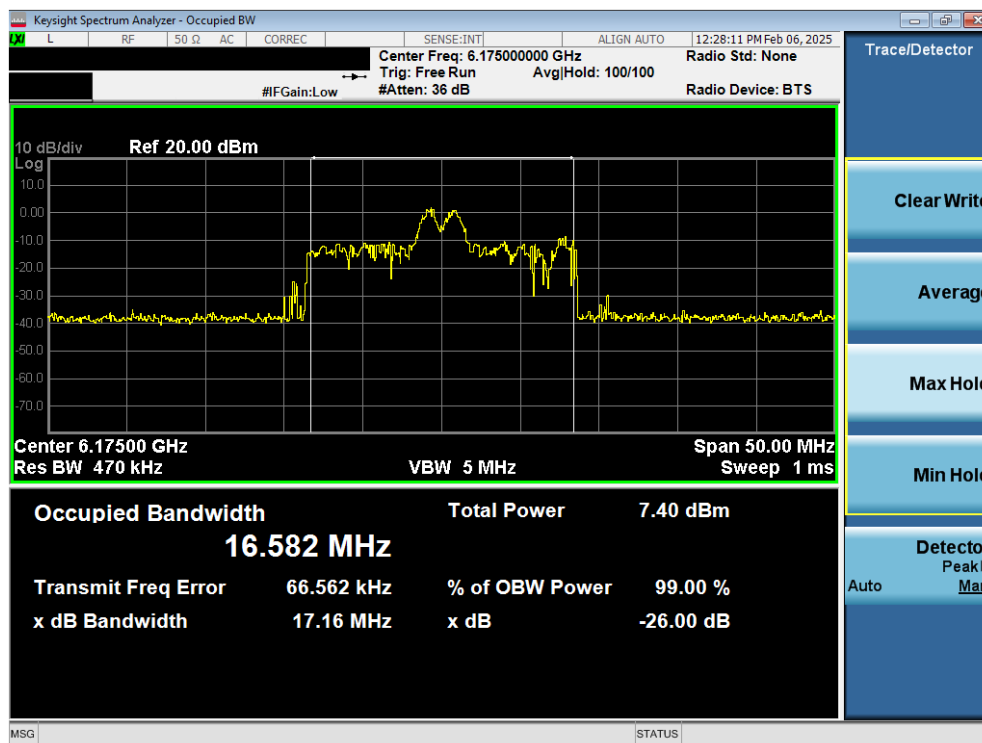
Plot 7-7. 26dB Bandwidth Plot MIMO ANT1 (80MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 39) - VLP



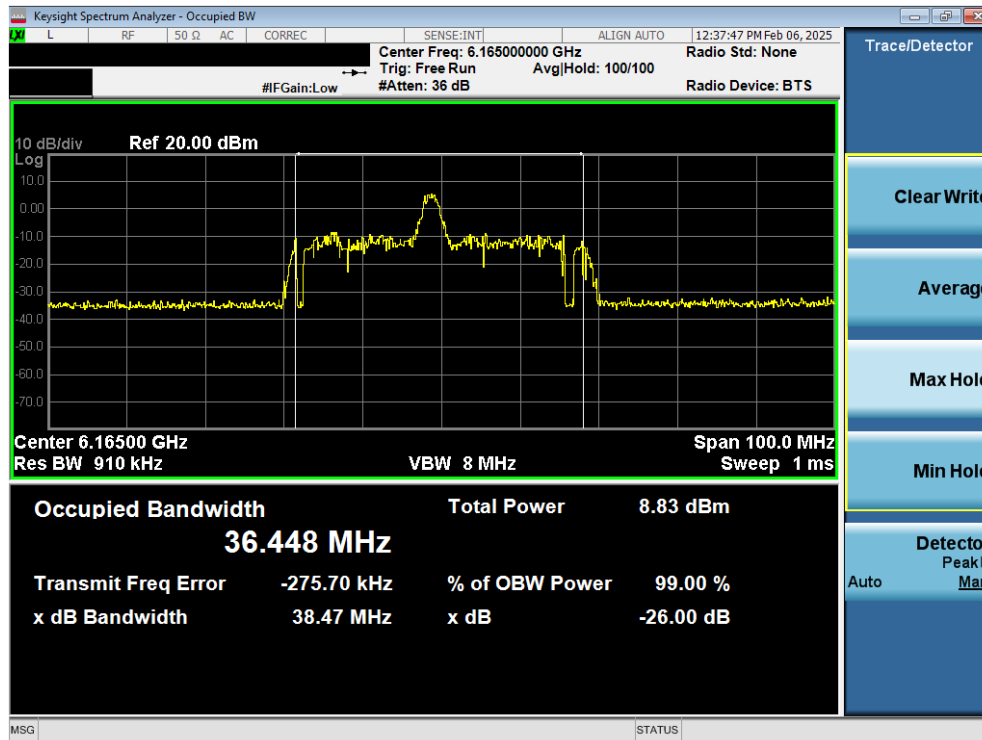
Plot 7-8. 26dB Bandwidth Plot MIMO ANT1 (160MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 47) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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7.2.3 MIMO Antenna-2 Bandwidth Measurements – (Partial Tones)

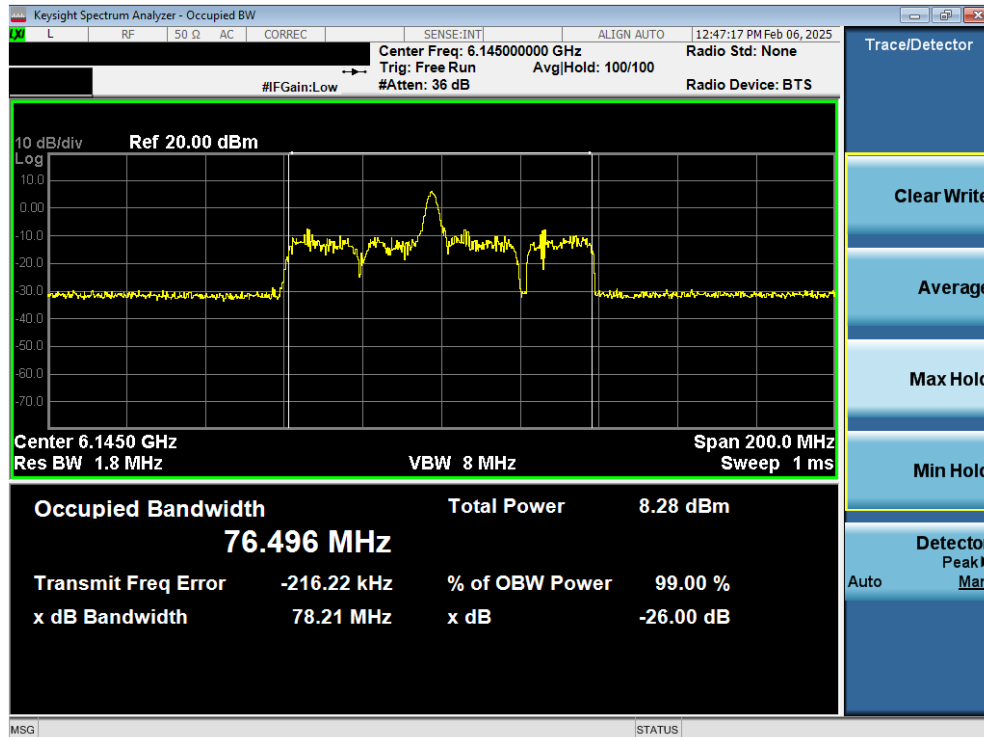


Plot 7-9. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 45) - VLP

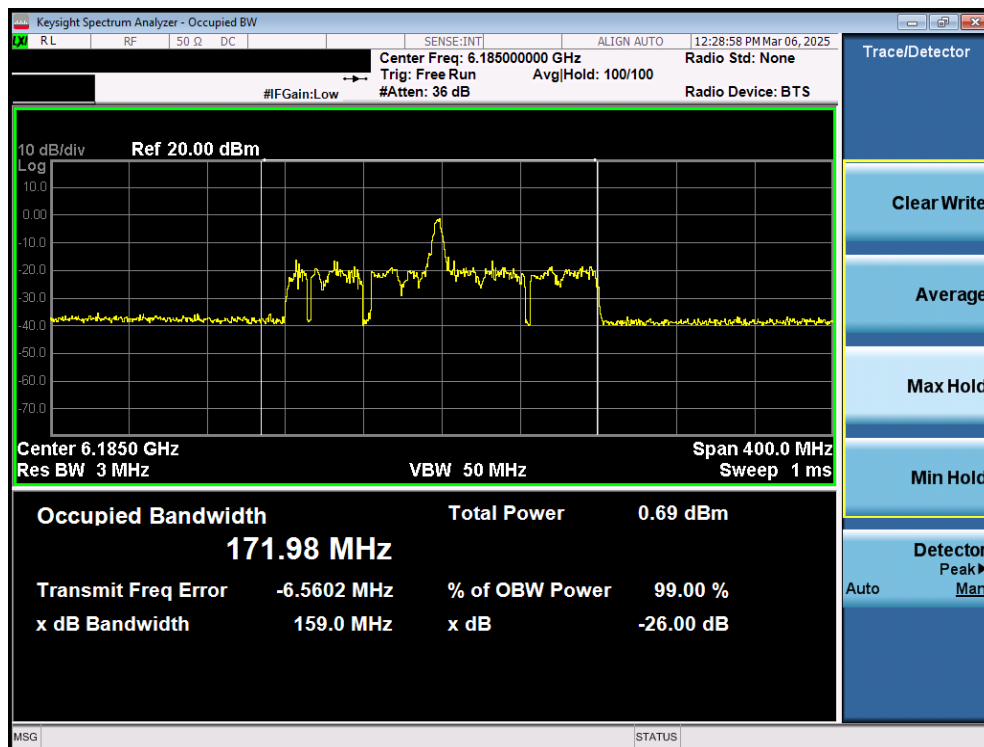


Plot 7-10. 26dB Bandwidth Plot MIMO ANT2 (40MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 43) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 25 of 70



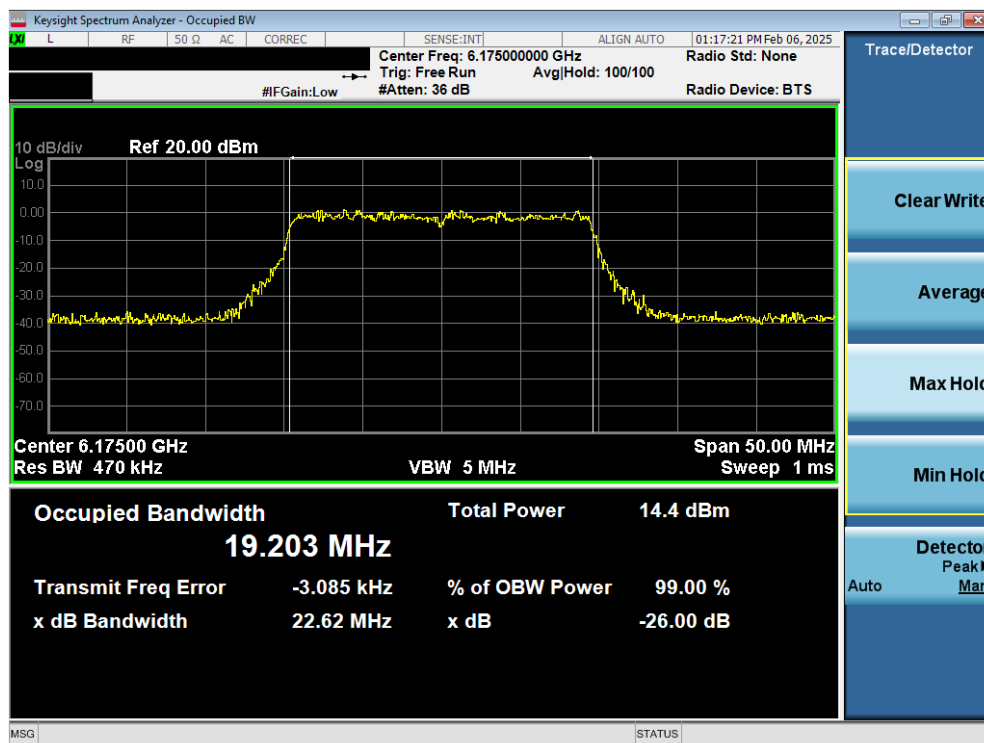
Plot 7-11. 26dB Bandwidth Plot MIMO ANT2 (80MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 39) - VLP



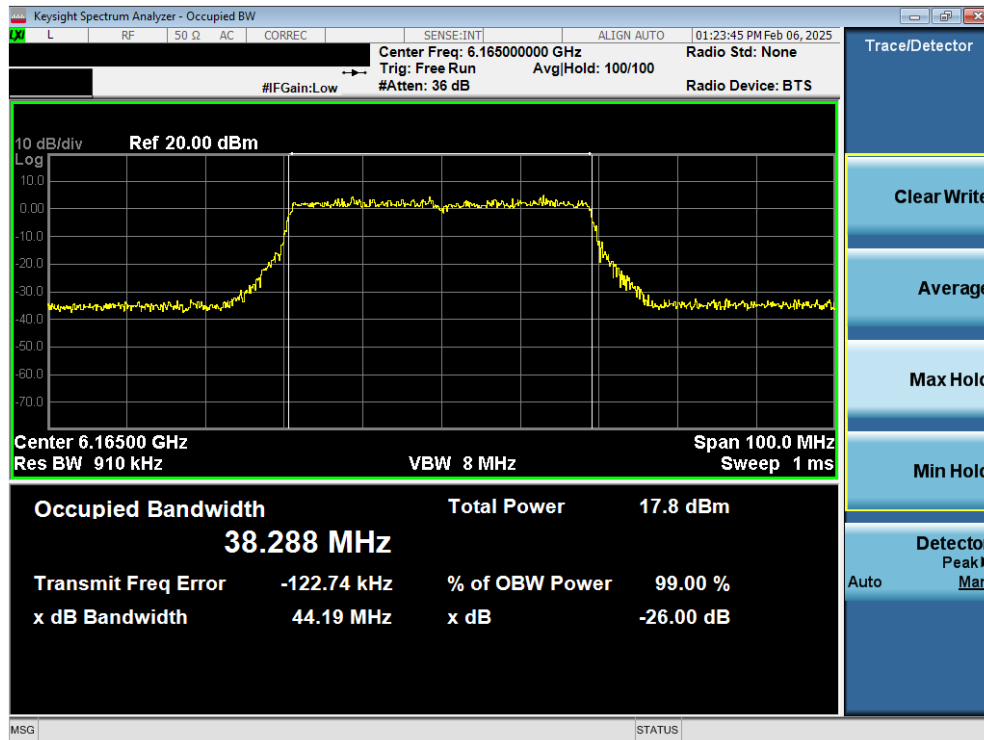
Plot 7-12. 26dB Bandwidth Plot MIMO ANT2 (160MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 47) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 26 of 70

7.2.4 MIMO Antenna-2 Bandwidth Measurements – (Full Tones)

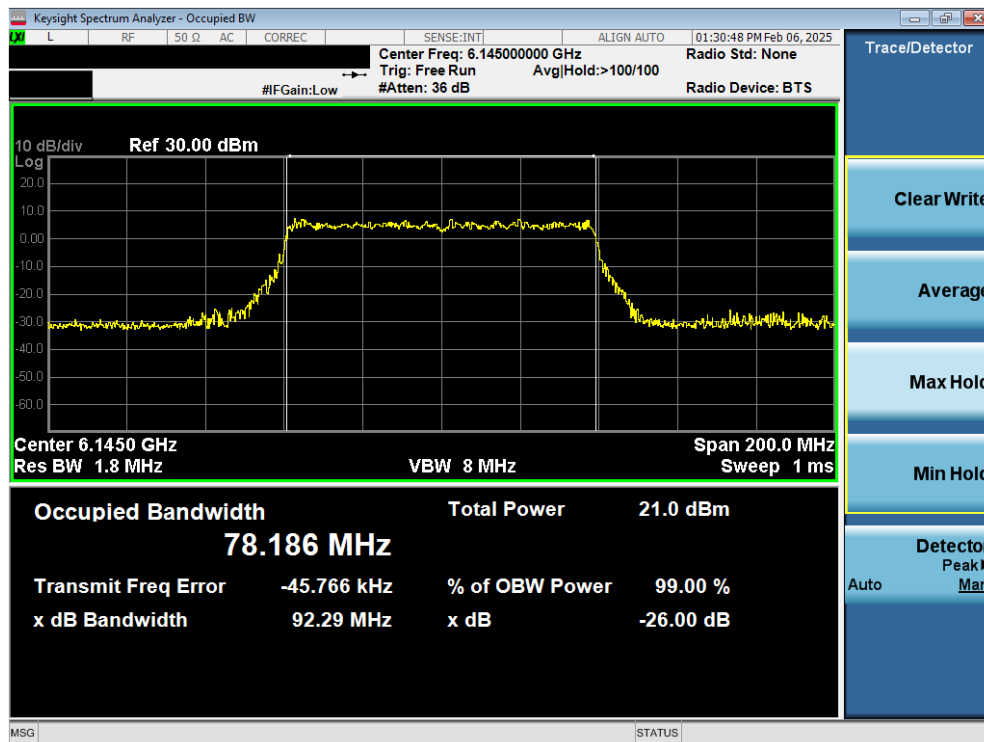


Plot 7-13. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 45) - VLP

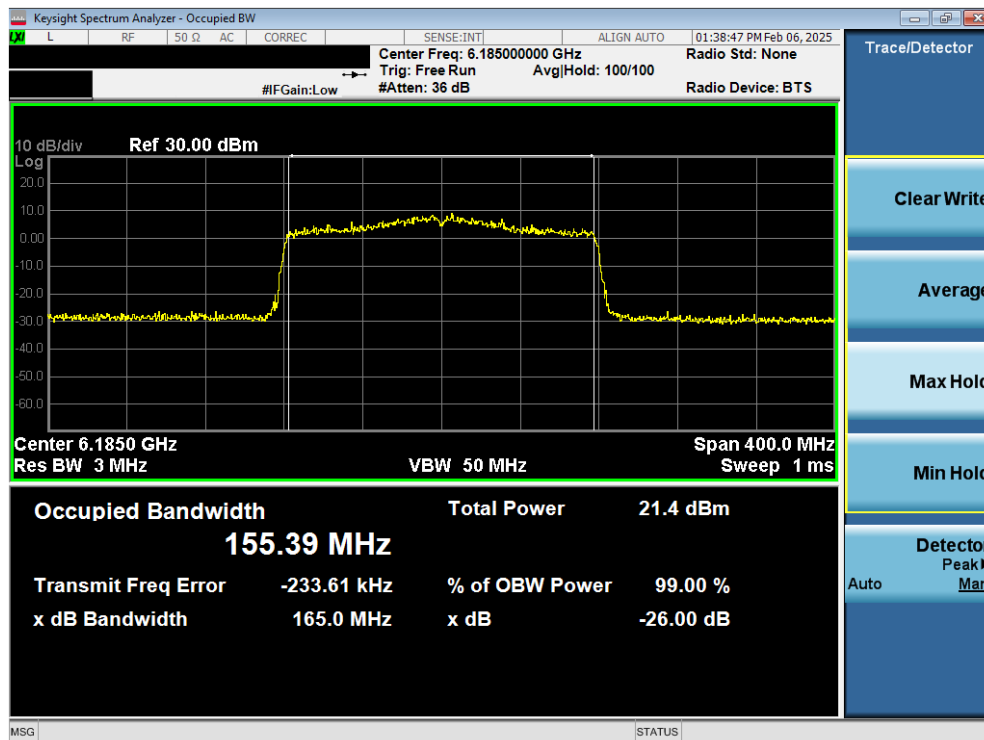


Plot 7-14. 26dB Bandwidth Plot MIMO ANT2 (40MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 43) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 27 of 70



Plot 7-15. 26dB Bandwidth Plot MIMO ANT2 (80MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 39) - VLP



Plot 7-16. 26dB Bandwidth Plot MIMO ANT2 (160MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 47) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 28 of 70

7.3 UNII Output Power Measurement

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 at the appropriate frequencies.

For very low power devices operating in the 5.925-6.425 GHz and 6.525-6.875 GHz bands, the maximum power spectral density must not exceed -5 dBm e.i.r.p in any 1-megahertz band and the maximum e.i.r.p must not exceed 14 dBm.

Test Procedure Used

ANSI C63.10-2013 – Section 12.3.3.2 Method PM-G

ANSI C63.10-2013 – Section 14.2 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 7-2. Test Instrument & Measurement Setup

Test Notes

None.

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 29 of 70

MIMO Maximum Conducted Output Power Measurements (26 Tones)

20MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)									Dir. Ant. Gain [dBi]	Max e.i.r.p [dBm]	e.i.r.p Limit [dBm]	e.i.r.p Margin [dB]
					RU Index												
					0			4			8						
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO				
5	5935	2	26T	1.82	1.57	4.71	1.37	1.03	4.21	1.69	1.60	4.66	-5.39	-0.68	24.0	-24.68	
	6175	45	26T	1.29	1.27	4.29	1.78	1.72	4.76	1.04	1.32	4.19	-5.39	-0.63	24.0	-24.63	
	6415	93	26T	1.07	1.29	4.19	1.44	1.90	4.69	1.69	1.57	4.64	-5.39	-0.70	24.0	-24.70	
7	6535	117	26T	1.65	1.65	4.66	1.75	1.55	4.66	1.54	1.55	4.56	-5.49	-0.83	24.0	-24.83	
	6695	149	26T	1.94	1.44	4.71	1.49	1.64	4.58	1.44	1.49	4.48	-5.49	-0.78	24.0	-24.78	

Table 7-4. MIMO 20MHz BW 802.11ax (UNII) Maximum Conducted Output Power – VLP

MIMO Maximum Conducted Output Power Measurements (52 Tones)

20MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)										Dir. Ant. Gain [dBi]	Max e.i.r.p [dBm]	e.i.r.p Limit [dBm]	e.i.r.p Margin [dB]
					RU Index													
					37			38			40							
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO					
5	5935	2	52T	3.65	3.49	6.58	3.56	3.48	6.53	3.16	3.79	6.50	-5.39	1.19	24.0	-22.81		
	6175	45	52T	3.46	3.58	6.53	3.46	3.58	6.53	3.91	3.67	6.80	-5.39	1.41	24.0	-22.59		
	6415	93	52T	3.88	3.49	6.70	3.18	3.22	6.21	3.48	3.49	6.50	-5.39	1.31	24.0	-22.69		
7	6535	117	52T	3.49	3.99	6.76	3.88	3.61	6.76	3.58	3.58	6.59	-5.49	1.27	24.0	-22.73		
	6695	149	52T	3.20	3.87	6.56	3.94	3.18	6.59	3.74	3.49	6.63	-5.49	1.14	24.0	-22.86		

Table 7-5. MIMO 20MHz BW 802.11ax (UNII) Maximum Conducted Output Power – VLP

MIMO Maximum Conducted Output Power Measurements (106 Tones)

RB 24MHz	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)						Dir. Ant. Gain [dBi]	Max e.i.r.p [dBm]	e.i.r.p Limit [dBm]	e.i.r.p Margin [dB]
					RU Index									
					53			54						
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO				
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO				
5	5935	2	106T	3.56	3.74	6.66	3.48	3.89	6.70	-5.39	1.31	24.0	-22.69	
	6175	45	106T	3.49	3.84	6.68	3.57	3.48	6.54	-5.39	1.29	24.0	-22.71	
	6415	93	106T	3.58	3.59	6.60	3.19	3.58	6.40	-5.39	1.21	24.0	-22.79	
7	6535	117	106T	3.21	3.97	6.61	3.62	3.61	6.63	-5.49	1.14	24.0	-22.86	
	6695	149	106T	3.19	3.64	6.43	3.29	3.84	6.58	-5.49	1.09	24.0	-22.91	

Table 7-6. MIMO 20MHz BW 802.11ax (UNII) Maximum Conducted Output Power – VLP

MIMO Maximum Conducted Output Power Measurements (242 Tones)

20MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)			Dir. Ant. Gain [dBi]	Max e.i.r.p [dBm]	e.i.r.p Limit [dBm]	e.i.r.p Margin [dB]
					RU Index						
					61						
					ANT1	ANT2	MIMO				
5		5935	2	242T	6.51	6.91	9.72	-5.39	4.34	24.0	-19.66
		6175	45	242T	6.84	6.28	9.58	-5.39	4.19	24.0	-19.81
		6415	93	242T	6.98	6.84	9.92	-5.39	4.53	24.0	-19.47
7		6535	117	242T	6.91	6.28	9.62	-5.49	4.13	24.0	-19.87
		6695	149	242T	6.48	6.99	9.75	-5.49	4.26	24.0	-19.74

Table 7-7. MIMO 20MHz BW 802.11ax (UNII) Maximum Conducted Output Power – VLP

MIMO Maximum Conducted Output Power Measurements (484 Tones)

40MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)			Dir. Ant. Gain [dBi]	Max e.i.r.p [dBm]	e.i.r.p Limit [dBm]	e.i.r.p Margin [dB]
					RU Index						
					65						
					ANT1	ANT2	MIMO				
5		5965	3	484T	8.49	8.18	11.35	-5.39	5.96	24.0	-18.04
		6165	43	484T	8.55	8.94	11.76	-5.39	6.37	24.0	-17.63
		6405	91	484T	8.49	8.48	11.50	-5.39	6.11	24.0	-17.89
7		6565	123	484T	8.58	8.33	11.47	-5.49	5.98	24.0	-18.02
		6725	155	484T	8.67	8.44	11.57	-5.49	6.08	24.0	-17.92
		6845	179	484T	8.79	8.17	11.50	-5.49	6.01	24.0	-17.99

Table 7-8. MIMO 40MHz BW 802.11ax (UNII) Maximum Conducted Output Power – VLP

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MIMO Maximum Conducted Output Power Measurements (996 Tones)

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)			Dir. Ant. Gain [dBi]	Max e.i.r.p [dBm]	e.i.r.p Limit [dBm]	e.i.r.p Margin [dB]
					RU Index						
					67						
					ANT1	ANT2	MIMO				
	5	5985	7	996T	11.08	11.78	14.45	-5.39	9.06	24.0	-14.94
6145		39	996T	11.53	11.26	14.41	-5.39	9.02	24.0	-14.98	
6385		87	996T	11.87	11.05	14.49	-5.39	9.10	24.0	-14.90	
7	6705	151	996T	11.77	11.91	14.85	-5.49	9.36	24.0	-14.64	

Table 7-9. MIMO 80MHz BW 802.11ax (UNII) Maximum Conducted Output Power – VLP

MIMO Maximum Conducted Output Power Measurements (2x996 Tones)

160MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)			Dir. Ant. Gain [dBi]	Max e.i.r.p [dBm]	e.i.r.p Limit [dBm]	e.i.r.p Margin [dB]
					RU Index						
					68						
	ANT1	ANT2	MIMO								
	5	6025	15	2x996T	11.08	11.71	14.42	-5.39	9.03	24.0	-14.97
6185		47	2x996T	11.49	11.62	14.57	-5.39	9.18	24.0	-14.82	
6345		79	2x996T	11.24	11.22	14.24	-5.39	8.85	24.0	-15.15	
7	6665	143	2x996T	11.85	11.97	14.92	-5.49	9.43	24.0	-14.57	

Table 7-10. MIMO 160MHz BW 802.11ax (UNII) Maximum Conducted Output Power – VLP

Sample MIMO Calculation:

At 5935MHz in 802.11ax (20MHz BW – 26 Tones) mode, the average conducted output power was measured to be 1.82 dBm for Antenna-1 and 1.57 dBm for Antenna-2.

$$\text{Antenna 1} + \text{Antenna 2} = \text{MIMO}$$

$$(1.82 \text{ dBm} + 1.57 \text{ dBm}) = (1.521 \text{ mW} + 1.435 \text{ mW}) = 2.956 \text{ mW} = 4.71 \text{ dBm}$$

Sample Directional Gain Calculation:

Per ANSI C63.10-2013 Section 14.4.3, the directional gain is calculated using the following formula, where GN is the gain of the nth antenna and NANT, the total number of antennas used.

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

Sample e.i.r.p. Calculation:

At 5935MHz in 802.11ax (20MHz BW – 26 Tones) mode, the average MIMO conducted power was calculated to be 4.71 dBm with directional gain of -5.39 dBi.

$$\text{e.i.r.p. (dBm)} = \text{Conducted Power (dBm)} + \text{Ant gain (dBi)}$$

$$4.71 \text{ dBm} + -5.39 \text{ dBi} = -0.68 \text{ dBm}$$

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7.4 Maximum Power Spectral Density

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 at the appropriate frequencies. Method SA-1, as defined in ANSI C63.10-2013, was used to measure the power spectral density.

For very low power devices operating in the 5.925-6.425 GHz and 6.525-6.875 GHz bands, the maximum power spectral density must not exceed -5 dBm e.i.r.p in any 1-megahertz band and the maximum e.i.r.p must not exceed 14 dBm.

Test Procedure Used

ANSI C63.10-2013 – Section 12.3.2.2

ANSI C63.10-2013 – Section 14.3.2.2 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 $\geq 2 \times (\text{span}/\text{RBW})$
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 7-3. Test Instrument & Measurement Setup

Test Notes

None.

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MIMO Power Spectral Density Measurements

	Frequency [MHz]	Channel	802.11 MODE	Antenna-1 Power Density [dBm/MHz]	Antenna-2 Power Density [dBm/MHz]	Antenna-1 Gain [dBi]	Antenna-2 Gain [dBi]	Summed MIMO Power Density [dBm/MHz]	Directional Gain [dBi]	EIRP Density [dBm/MHz]	EIRP Density Limit [dBm/MHz]	Margin [dB]
Band 5	5935	2	ax (20MHz)	-3.53	-5.59	-8.40	-8.40	-1.43	-5.39	-6.82	-5	-1.82
	6175	45	ax (20MHz)	-1.77	-5.19	-8.40	-8.40	-0.14	-5.39	-5.53	-5	-0.53
	6415	93	ax (20MHz)	-3.51	-6.98	-8.40	-8.40	-1.90	-5.39	-7.29	-5	-2.29
	5965	3	ax (40MHz)	-1.98	-4.21	-8.40	-8.40	0.06	-5.39	-5.33	-5	-0.33
	6165	43	ax (40MHz)	-2.59	-3.92	-8.40	-8.40	-0.19	-5.39	-5.58	-5	-0.58
	6405	91	ax (40MHz)	-2.68	-5.82	-8.40	-8.40	-0.96	-5.39	-6.35	-5	-1.35
	5985	7	ax (80MHz)	-2.48	-4.40	-8.40	-8.40	-0.33	-5.39	-5.72	-5	-0.72
	6145	39	ax (80MHz)	-3.86	-4.70	-8.40	-8.40	-1.25	-5.39	-6.64	-5	-1.64
	6385	87	ax (80MHz)	-2.96	-6.15	-8.40	-8.40	-1.26	-5.39	-6.65	-5	-1.65
	6025	15	ax (160MHz)	-2.16	-4.07	-8.40	-8.40	0.00	-5.39	-5.39	-5	-0.39
Band 7	6185	47	ax (160MHz)	-1.57	-5.06	-8.40	-8.40	0.04	-5.39	-5.35	-5	-0.35
	6345	79	ax (160MHz)	-2.51	-5.79	-8.40	-8.40	-0.84	-5.39	-6.23	-5	-1.23
	6535	117	ax (20MHz)	-2.29	-5.63	-8.50	-8.50	-0.64	-5.49	-6.13	-5	-1.13
	6695	149	ax (20MHz)	-2.80	-5.08	-8.50	-8.50	-0.78	-5.49	-6.27	-5	-1.27
	6695	181	ax (20MHz)	-2.27	-3.59	-8.50	-8.50	0.13	-5.49	-5.36	-5	-0.36
	6565	123	ax (40MHz)	-1.44	-4.56	-8.50	-8.50	0.29	-5.49	-5.20	-5	-0.20
	6685	155	ax (40MHz)	-1.86	-4.13	-8.50	-8.50	0.16	-5.49	-5.33	-5	-0.33
	6845	179	ax (40MHz)	-2.07	-3.69	-8.50	-8.50	0.21	-5.49	-5.28	-5	-0.28
	6545	135	ax (80MHz)	-2.01	-4.83	-8.50	-8.50	-0.18	-5.49	-5.67	-5	-0.67
	6705	151	ax (80MHz)	-2.51	-4.36	-8.50	-8.50	-0.33	-5.49	-5.82	-5	-0.82
Band 7	6865	167	ax (80MHz)	-2.84	-4.08	-8.50	-8.50	-0.40	-5.49	-5.89	-5	-0.89
	6665	143	ax (160MHz)	-2.63	-5.28	-8.50	-8.50	-0.75	-5.49	-6.23	-5	-1.23
	6825	175	ax (160MHz)	-2.14	-2.98	-8.50	-8.50	0.47	-5.49	-5.02	-5	-0.02

Table 7-11. MIMO e.i.r.p. Conducted Power Spectral Density Measurements (26 Tones) – VLP

	Frequency [MHz]	Channel	802.11 MODE	Antenna-1 Power Density [dBm/MHz]	Antenna-2 Power Density [dBm/MHz]	Antenna-1 Gain [dBi]	Antenna-2 Gain [dBi]	Summed MIMO Power Density [dBm/MHz]	Directional Gain [dBi]	DCCF	EIRP Density [dBm/MHz]	EIRP Density Limit [dBm/MHz]	Margin [dB]
Band 5	5935	2	ax (20MHz)	-4.71	-4.62	-8.40	-8.40	-1.65	-5.39	0.18	-7.04	-5	-2.04
	6175	45	ax (20MHz)	-4.25	-4.73	-8.40	-8.40	-1.47	-5.39	0.18	-6.86	-5	-1.86
	6415	93	ax (20MHz)	-4.11	-6.08	-8.40	-8.40	-1.98	-5.39	0.18	-7.37	-5	-2.37
	5965	3	ax (40MHz)	-4.03	-3.62	-8.40	-8.40	-0.81	-5.39	0.00	-6.20	-5	-1.20
	6165	43	ax (40MHz)	-4.15	-4.84	-8.40	-8.40	-1.47	-5.39	0.00	-6.86	-5	-1.86
	6405	91	ax (40MHz)	-3.42	-5.94	-8.40	-8.40	-1.49	-5.39	0.00	-6.88	-5	-1.88
	5985	7	ax (80MHz)	-4.57	-4.65	-8.40	-8.40	-1.60	-5.39	0.11	-6.88	-5	-1.88
	6145	39	ax (80MHz)	-4.30	-5.20	-8.40	-8.40	-1.72	-5.39	0.11	-7.00	-5	-2.00
	6385	87	ax (80MHz)	-3.79	-6.19	-8.40	-8.40	-1.82	-5.39	0.11	-7.10	-5	-2.10
	6025	15	ax (160MHz)	-5.24	-5.96	-8.40	-8.40	-2.57	-5.39	0.00	-7.96	-5	-2.96
Band 7	6185	47	ax (160MHz)	-5.17	-5.74	-8.40	-8.40	-2.44	-5.39	0.00	-7.83	-5	-2.83
	6345	79	ax (160MHz)	-5.08	-6.62	-8.40	-8.40	-2.77	-5.39	0.00	-8.16	-5	-3.16
	6535	117	ax (20MHz)	-4.26	-6.31	-8.50	-8.50	-2.15	-5.49	0.18	-7.46	-5	-2.46
	6695	149	ax (20MHz)	-4.47	-5.67	-8.50	-8.50	-2.02	-5.49	0.18	-7.33	-5	-2.33
	6695	181	ax (20MHz)	-3.68	-5.52	-8.50	-8.50	-1.49	-5.49	0.18	-6.80	-5	-1.80
	6565	123	ax (40MHz)	-4.08	-6.30	-8.50	-8.50	-2.04	-5.49	0.00	-7.53	-5	-2.53
	6685	155	ax (40MHz)	-3.86	-5.57	-8.50	-8.50	-1.62	-5.49	0.00	-7.11	-5	-2.11
	6845	179	ax (40MHz)	-3.04	-5.21	-8.50	-8.50	-0.98	-5.49	0.00	-6.47	-5	-1.47
	6545	135	ax (80MHz)	-3.22	-6.05	-8.50	-8.50	-1.39	-5.49	0.11	-6.77	-5	-1.77
	6705	151	ax (80MHz)	-3.91	-5.81	-8.50	-8.50	-1.74	-5.49	0.11	-7.12	-5	-2.12
Band 7	6865	167	ax (80MHz)	-3.46	-5.54	-8.50	-8.50	-1.37	-5.49	0.11	-6.75	-5	-1.75
	6665	143	ax (160MHz)	-5.50	-6.77	-8.50	-8.50	-3.08	-5.49	0.00	-8.57	-5	-3.57
	6825	175	ax (160MHz)	-4.70	-6.41	-8.50	-8.50	-2.46	-5.49	0.00	-7.95	-5	-2.95

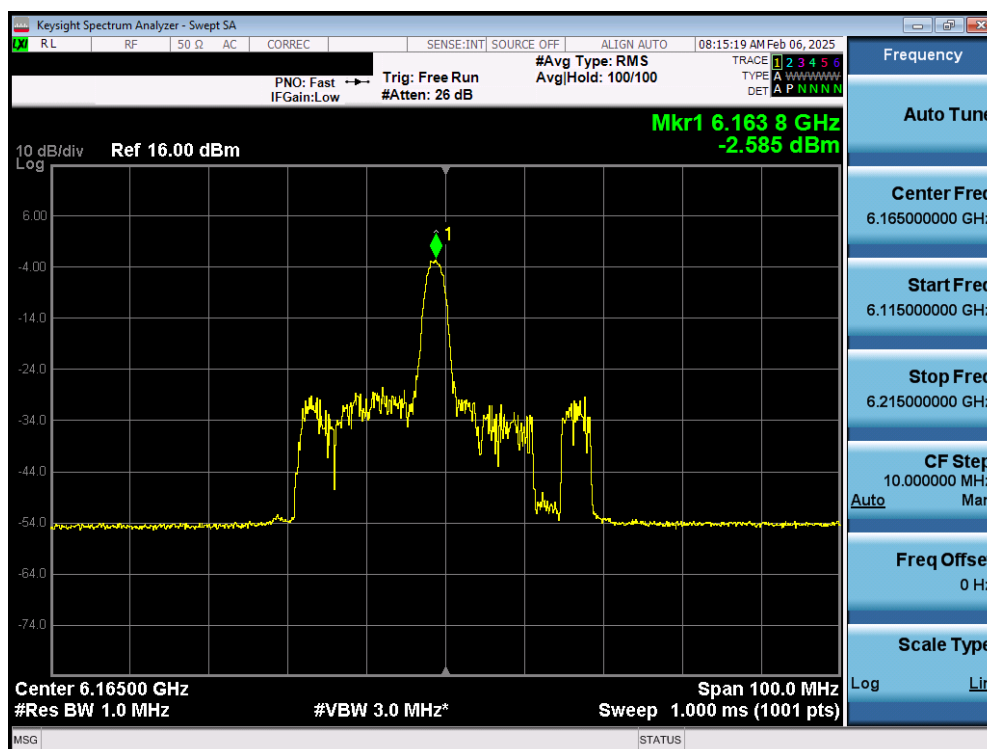
Table 7-12. MIMO e.i.r.p. Conducted Power Spectral Density Measurements (Full Tones) – VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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7.4.1 MIMO Antenna-1 Power Spectral Density Measurements

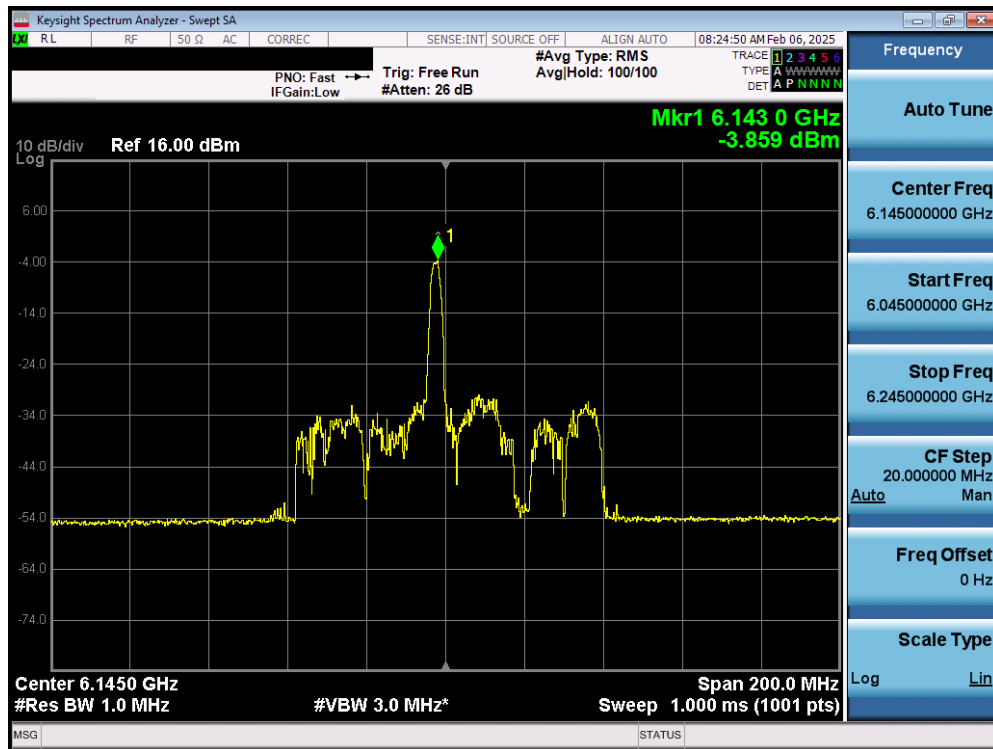


Plot 7-17. Power Spectral Density Plot MIMO ANT1 (20MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 45) - VLP

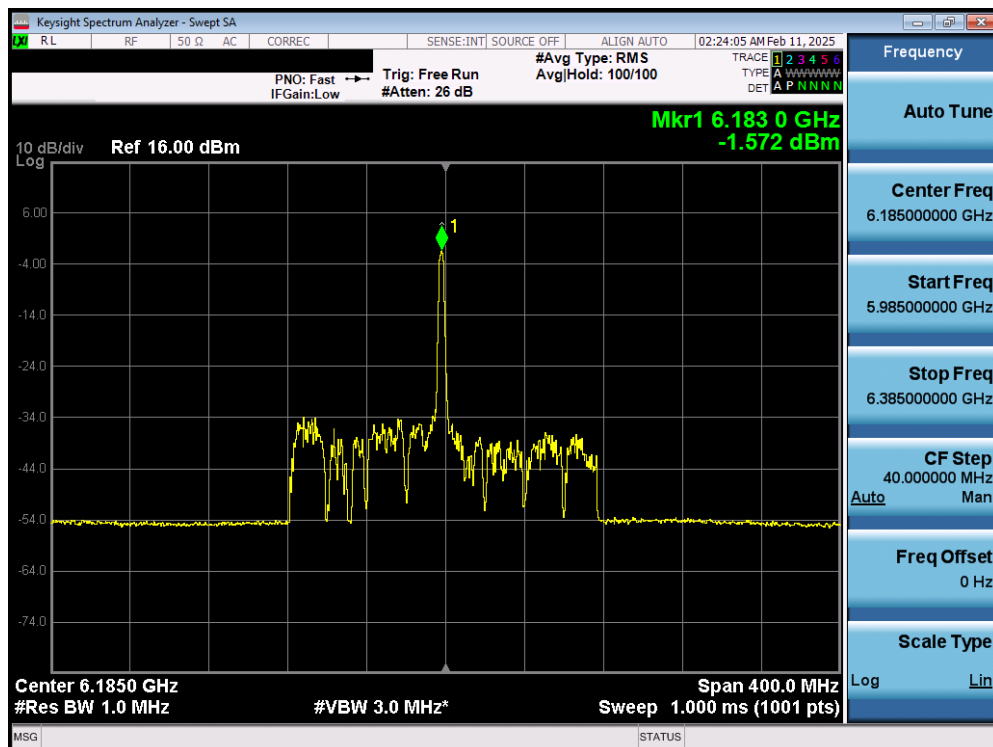


Plot 7-18. Power Spectral Density Plot MIMO ANT1 (40MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 43) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 34 of 70

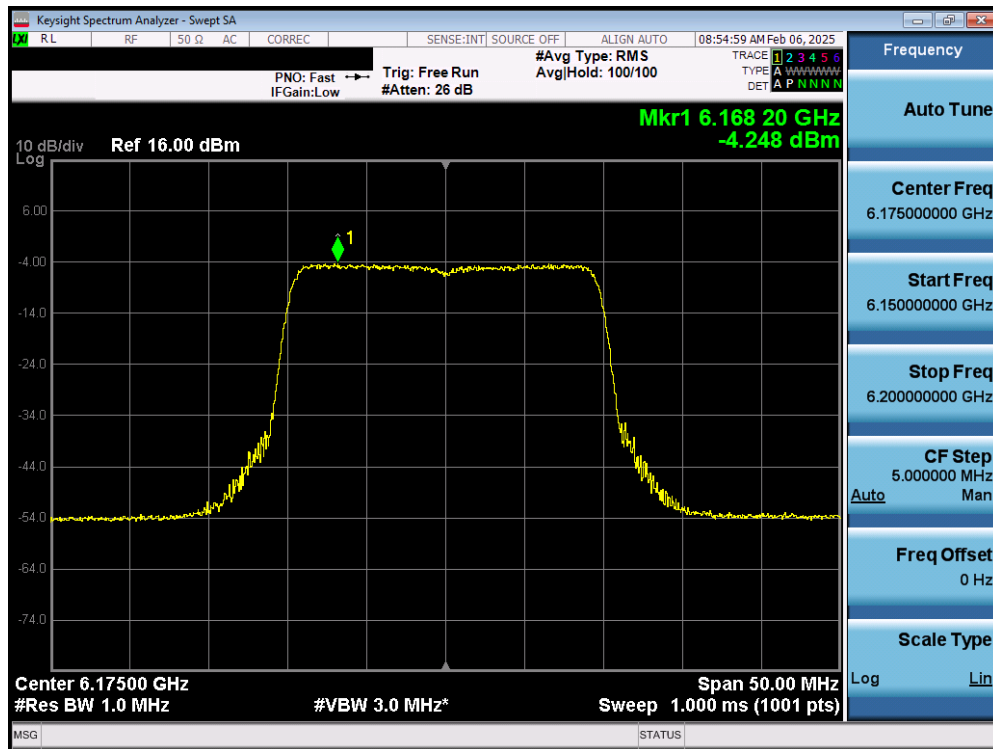


Plot 7-19. Power Spectral Density Plot MIMO ANT1 (80MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 39) - VLP

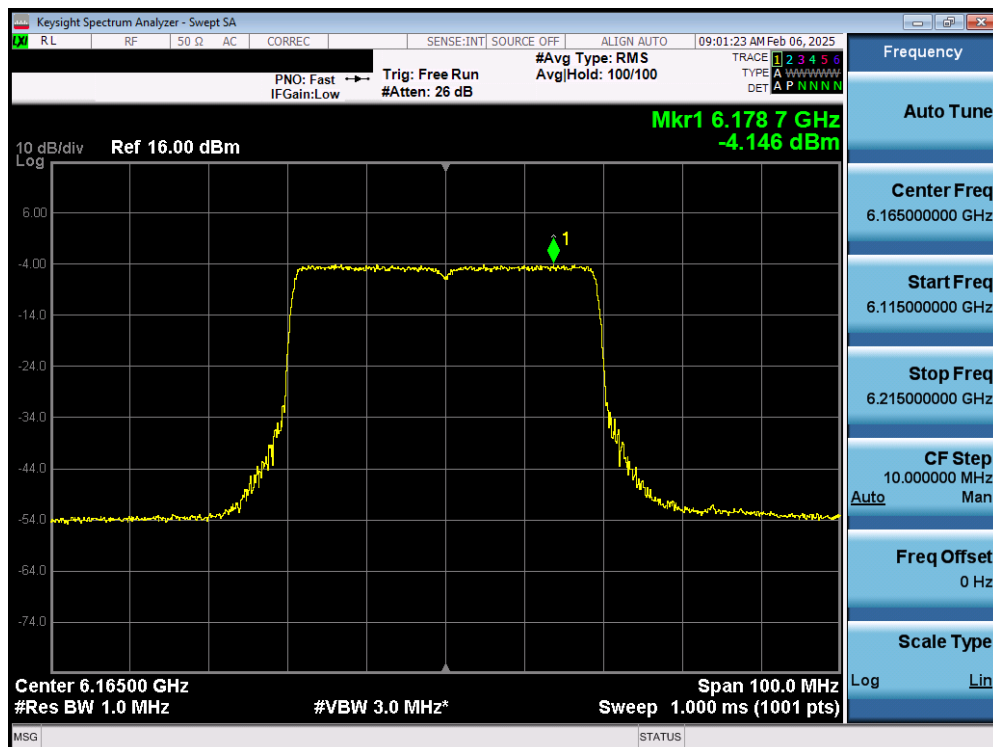


Plot 7-20. Power Spectral Density Plot MIMO ANT1 (160MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 47) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 35 of 70

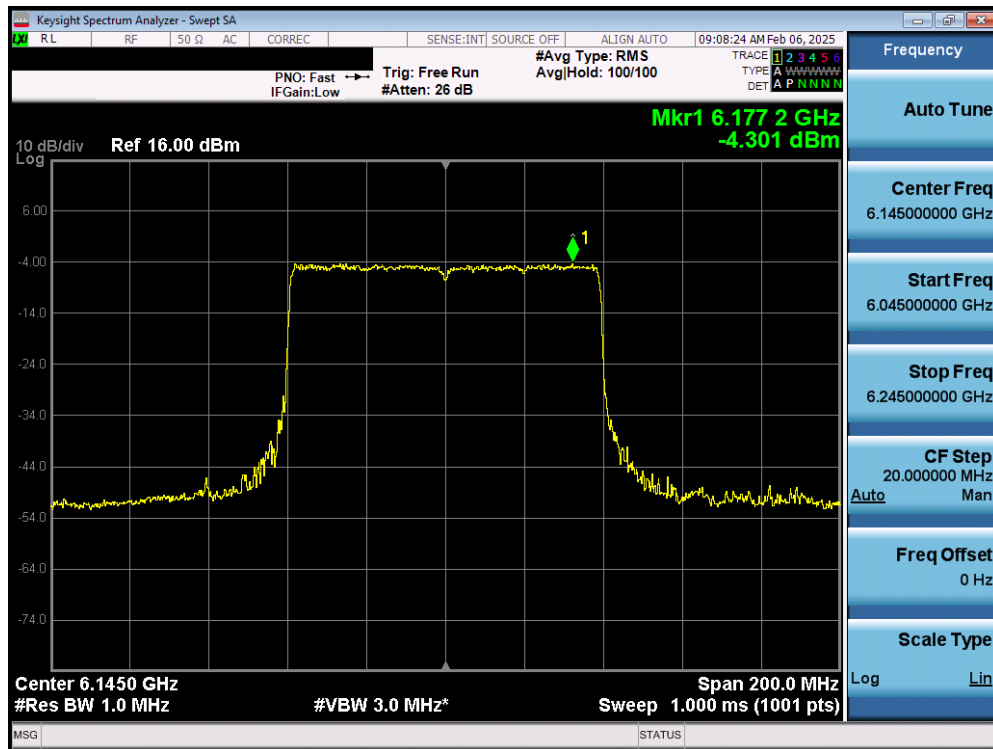


Plot 7-21. Power Spectral Density Plot MIMO ANT1 (20MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 45) - VLP

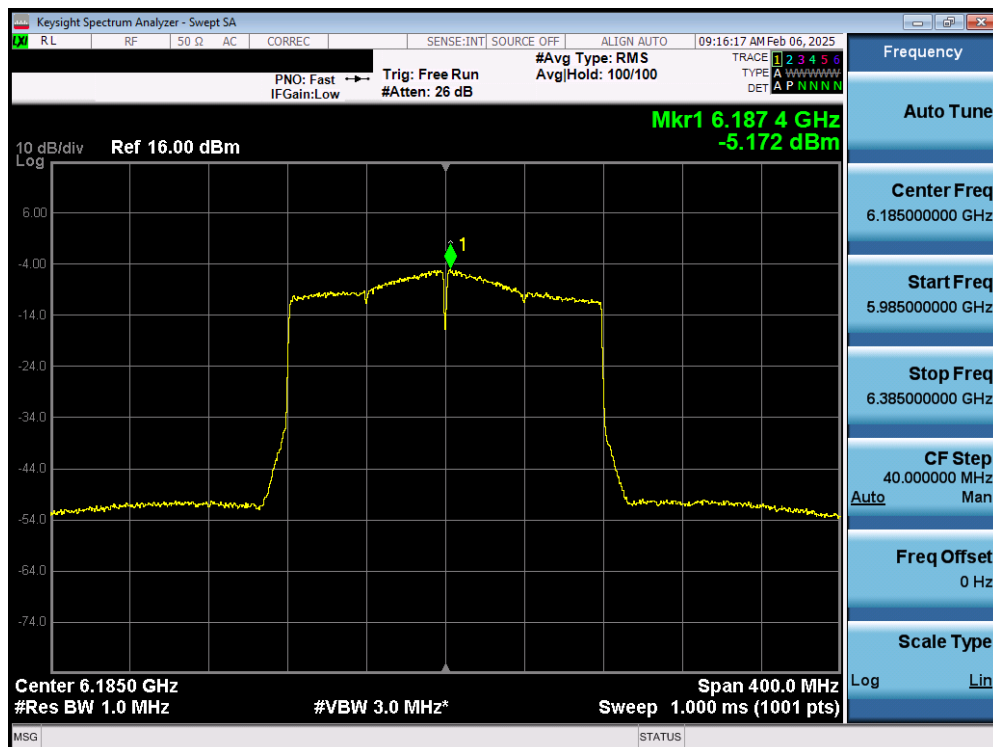


Plot 7-22. Power Spectral Density Plot MIMO ANT1 (40MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 43) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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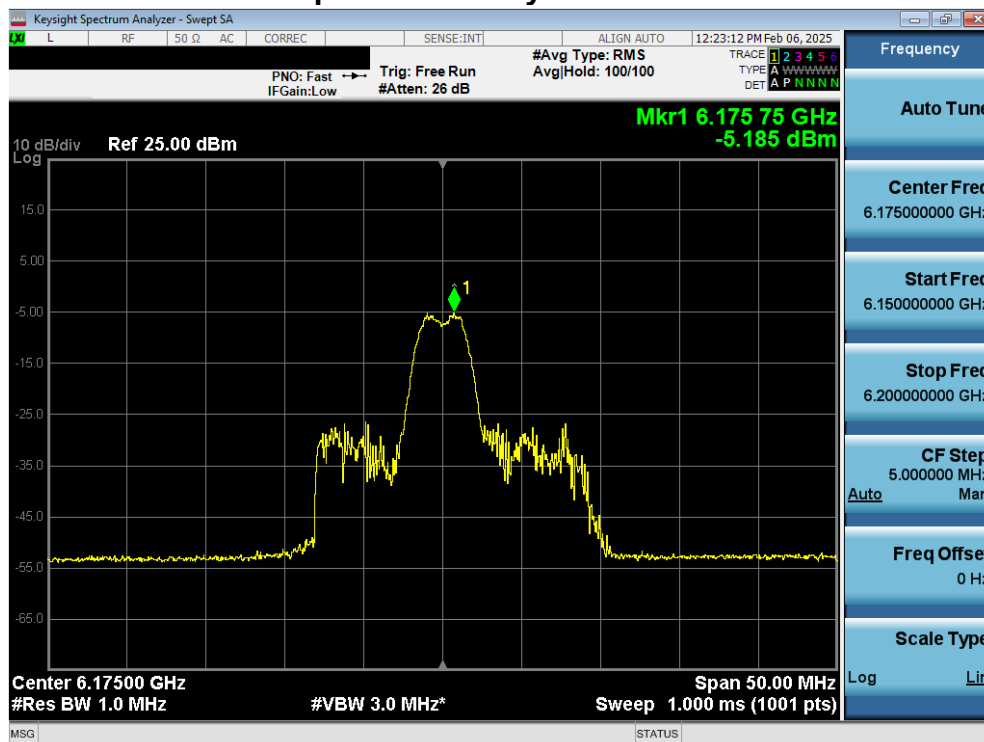
Plot 7-23. Power Spectral Density Plot MIMO ANT1 (80MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 39) - VLP



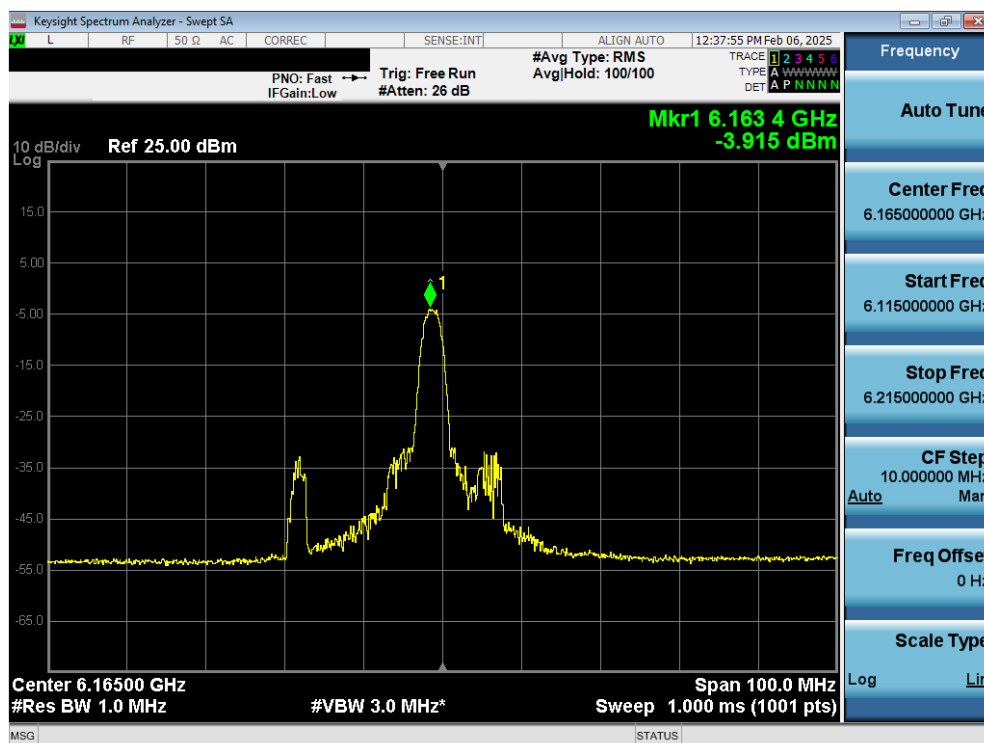
Plot 7-24. Power Spectral Density Plot MIMO ANT1 (160MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 47) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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7.4.2 MIMO Antenna-2 Power Spectral Density Measurements

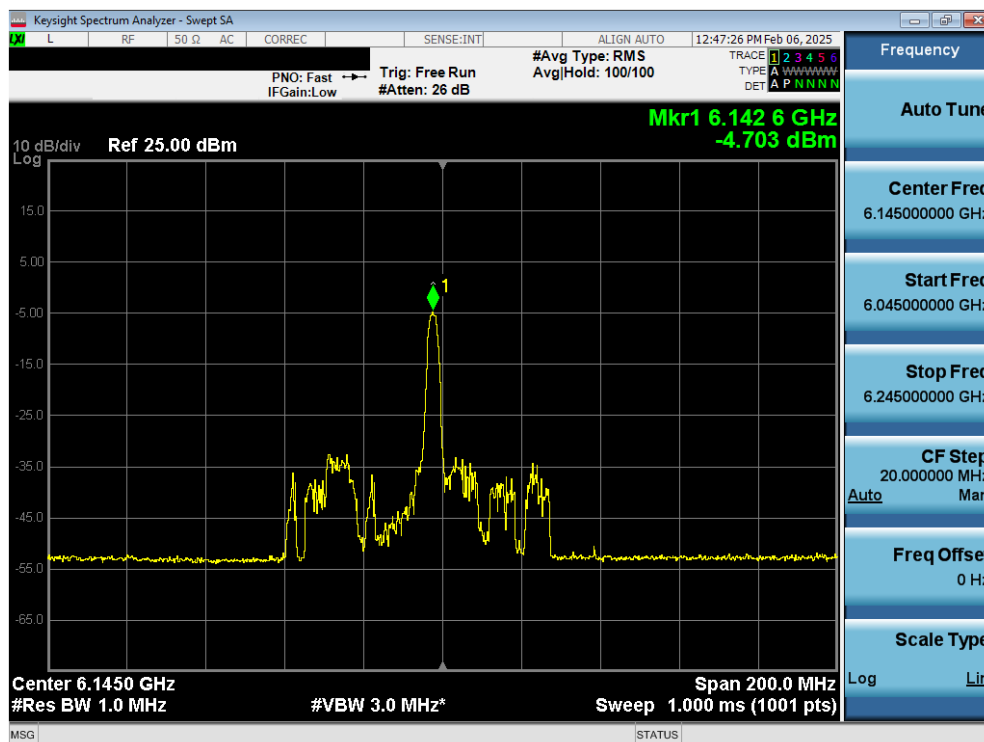


Plot 7-25. Power Spectral Density Plot MIMO ANT2 (20MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 45) - VLP

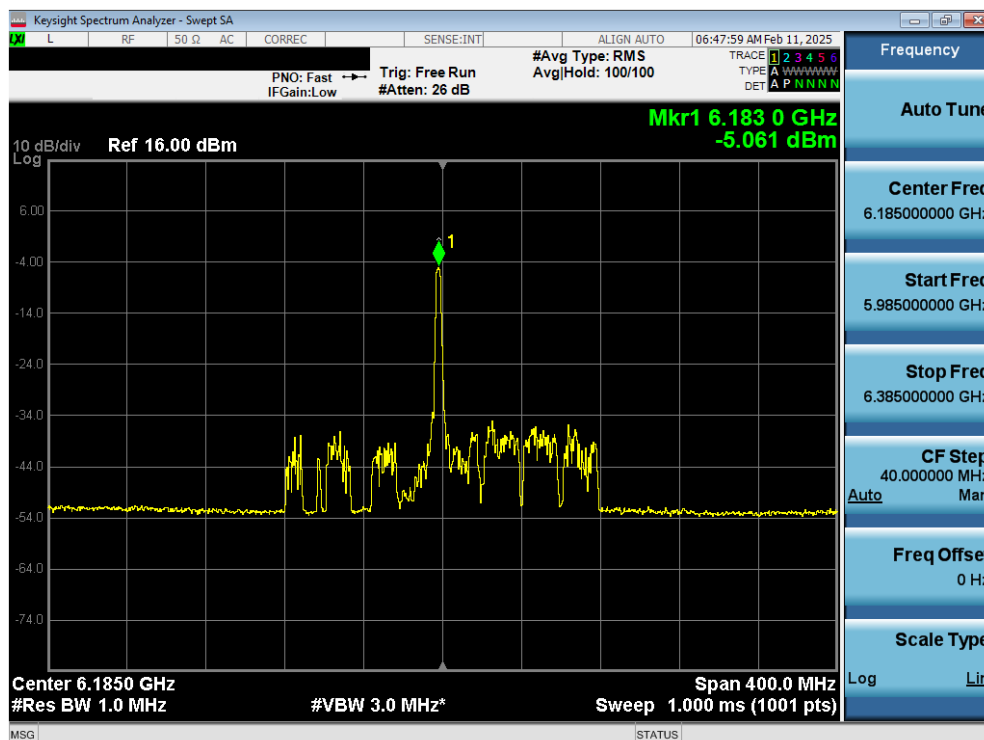


Plot 7-26. Power Spectral Density Plot MIMO ANT2 (40MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 43) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 38 of 70

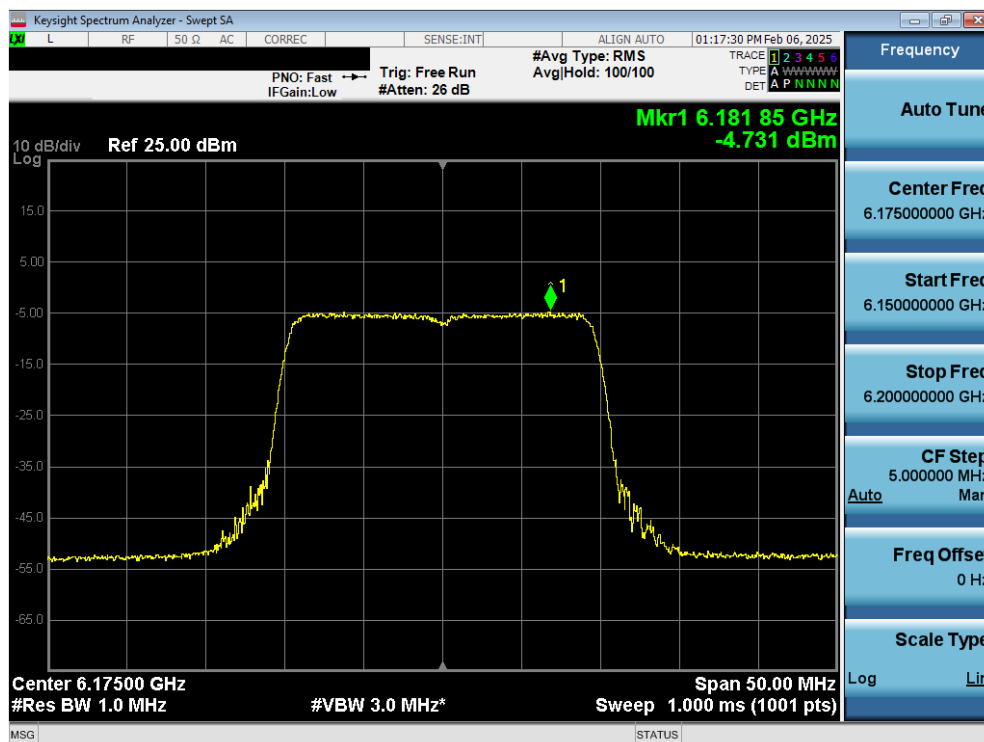


Plot 7-27. Power Spectral Density Plot MIMO ANT2 (80MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 39) - VLP

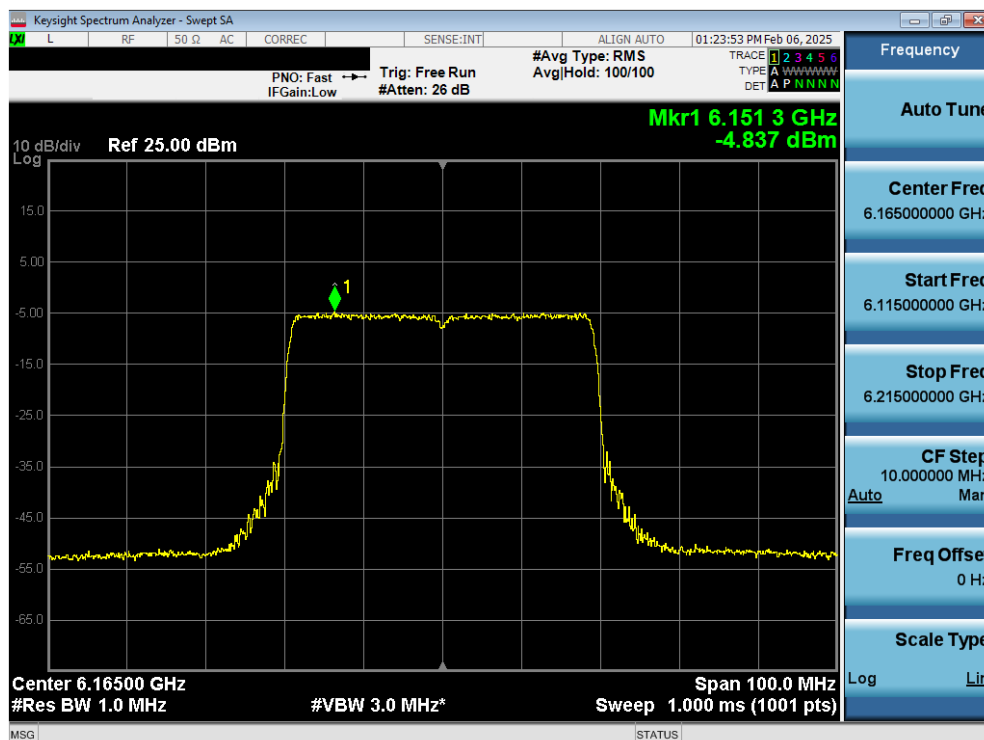


Plot 7-28. Power Spectral Density Plot MIMO ANT2 (160MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 47) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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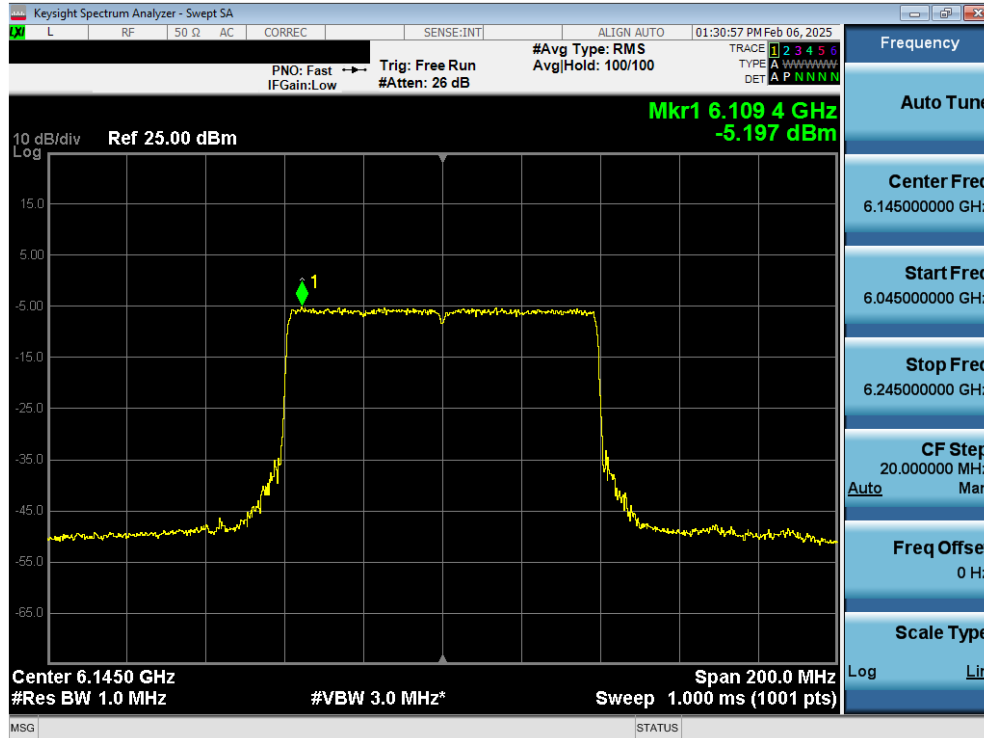


Plot 7-29. Power Spectral Density Plot MIMO ANT2 (20MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 45) - VLP

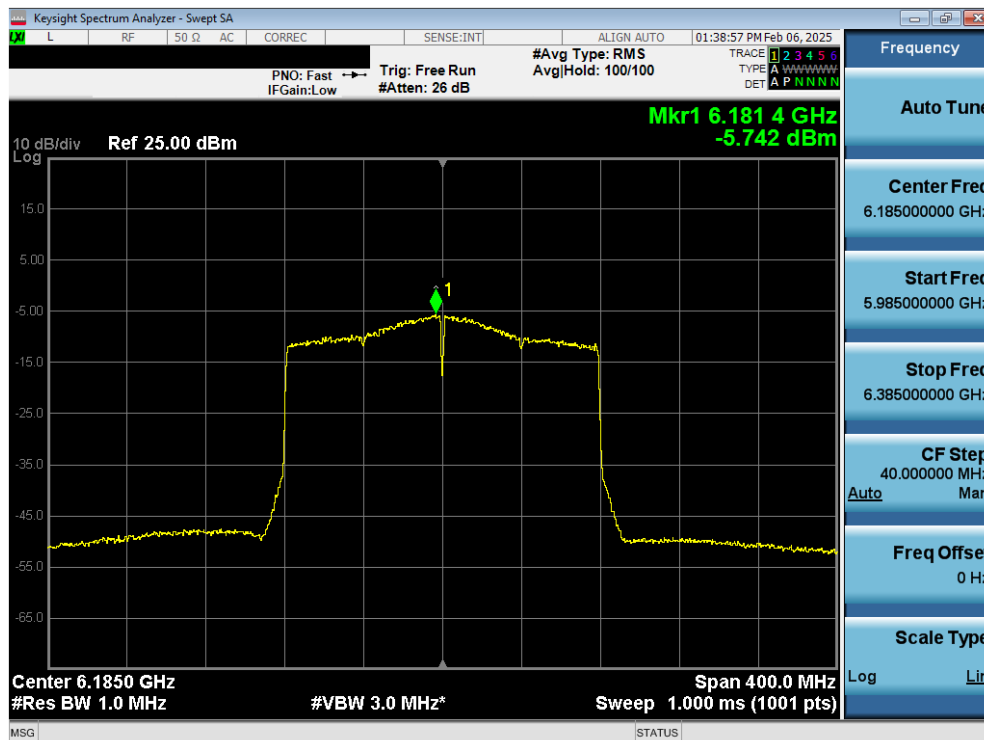


Plot 7-30. Power Spectral Density Plot MIMO ANT2 (40MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 43) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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Plot 7-31. Power Spectral Density Plot MIMO ANT2 (80MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 39) - VLP



Plot 7-32. Power Spectral Density Plot MIMO ANT2 (160MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 47) - VLP

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Note:

Per ANSI C63.10-2013 Section 14.3.2.2 and KDB 662911 v02r01 Section E)2), the power spectral density at Antenna 1 and Antenna 2 were first measured separately 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 GN is the gain of the nth antenna and NANT, the total number of antennas used.

$$\text{Directional gain} = 10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{\text{ANT}}] \text{ dBi}$$

Sample MIMO Calculation:

At 5935MHz in 802.11ax (20MHz BW) mode, the average conducted power spectral density was measured to be -6.98 dBm for Antenna-1 and -6.49 dBm for Antenna-2.

$$\text{Antenna 1} + \text{Antenna 2} = \text{MIMO}$$

$$(-6.98 \text{ dBm} + -6.49 \text{ dBm}) = (0.200 \text{ mW} + 0.224 \text{ mW}) = 0.424 \text{ mW} = -3.73 \text{ dBm}$$

Sample e.i.r.p Power Spectral Density Calculation:

At 5935 MHz in 802.11ax (20MHz BW) mode, the average MIMO power density was calculated to be -3.73 dBm with directional gain of -2.63 dBi.

$$\text{e.i.r.p. Power Spectral Density(dBm)} = \text{Power Spectral Density (dBm)} + \text{Ant gain (dBi)}$$

$$-3.73 \text{ dBm} + -2.63 \text{ dBi} = -6.36 \text{ dBm}$$

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7.5 In-Band Emissions

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 at the appropriate frequencies.

For transmitters operating within the 5.925-7.125 GHz bands: Power spectral density must be suppressed by 20 dB at 1 MHz outside of channel edge, by 28 dB at one channel bandwidth from the channel center, and by 40 dB at one- and one-half times the channel bandwidth away from channel center. At frequencies between one megahertz outside an unlicensed device's channel edge and one channel bandwidth from the center of the channel, the limits must be linearly interpolated between 20 dB and 28 dB suppression, and at frequencies between one and one- and one-half times an unlicensed device's channel bandwidth, the limits must be linearly interpolated between 28 dB and 40 dB suppression. Emissions removed from the channel center by more than one- and one-half times the channel bandwidth must be suppressed by at least 40 dB.

Test Procedure Used

KDB 987594 D02 v03

Test Settings

1. Connect output of the antenna port to a spectrum analyzer or EMI receiver, with appropriate attenuation, as to not damage the instrumentation.
2. Set the reference level of the measuring equipment in accordance with procedure 4.1.5.2 of ANSI C63.10-2013.
3. Measure the 26 dB EBW using the test procedure 12.4.1 of ANSI C63.10-2013. (This will be used to determine the channel edge.)
4. Measure the power spectral density (which will be used for emissions mask reference) using the following procedure:
 - a) Set the span to encompass the entire 26 dB EBW of the signal.
 - b) Set RBW = same RBW used for 26 dB EBW measurement.
 - c) Set VBW $\geq 3 \times$ RBW
 - d) Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$.
 - e) Sweep time = auto.
 - f) Detector = RMS (i.e., power averaging)
 - g) Trace average at least 100 traces in power averaging (rms) mode.
 - h) Use the peak search function on the instrument to find the peak of the spectrum.
5. For the purposes of developing the emission mask, the channel bandwidth is defined as the 26 dB EBW.
6. Using the measuring equipment limit line function, develop the emissions mask based on the following requirements. The emissions power spectral density must be reduced below the peak power spectral density (in dB) as follows:
 - a) Suppressed by 20 dB at 1 MHz outside of the channel edge. (The channel edge is defined as the 26-dB point on either side of the carrier center frequency.)
 - b) Suppressed by 28 dB at one channel bandwidth from the channel center.
 - c) Suppressed by 40 dB at one- and one-half times the channel bandwidth from the channel center.
7. Adjust the span to encompass the entire mask as necessary.
8. Clear trace.
9. Trace average at least 100 traces in power averaging (rms) mode.
10. Adjust the reference level as necessary so that the crest of the channel touches the top of the emission mask.

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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

None.

	Frequency [MHz]	Channel	802.11 MODE	Antenna-1 In-Band Emission	Antenna-2 In-Band Emission
Band 5	5935	2	ax (20MHz)	PASS	PASS
	6175	45	ax (20MHz)	PASS	PASS
	6415	93	ax (20MHz)	PASS	PASS
	5965	3	ax (40MHz)	PASS	PASS
	6165	43	ax (40MHz)	PASS	PASS
	6405	91	ax (40MHz)	PASS	PASS
	5985	7	ax (80MHz)	PASS	PASS
	6145	39	ax (80MHz)	PASS	PASS
	6385	87	ax (80MHz)	PASS	PASS
	6025	15	ax (160MHz)	PASS	PASS
	6185	47	ax (160MHz)	PASS	PASS
	6345	79	ax (160MHz)	PASS	PASS
Band 7	6535	117	ax (20MHz)	PASS	PASS
	6695	149	ax (20MHz)	PASS	PASS
	6875	185	ax (20MHz)	PASS	PASS
	6565	123	ax (40MHz)	PASS	PASS
	6725	155	ax (40MHz)	PASS	PASS
	6885	179	ax (40MHz)	PASS	PASS
	6545	119	ax (80MHz)	PASS	PASS
	6705	151	ax (80MHz)	PASS	PASS
	6865	183	ax (80MHz)	PASS	PASS
	6665	143	ax (160MHz)	PASS	PASS
	6825	175	ax (160MHz)	PASS	PASS

Table 7-13. In Band Emission Results (26 Tones)

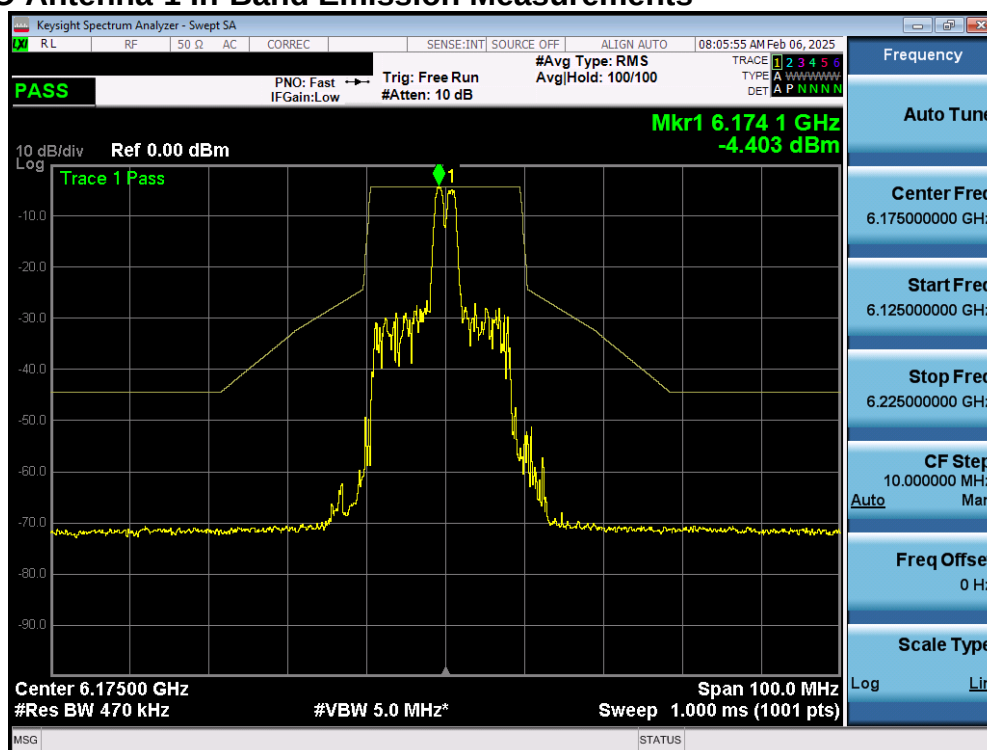
FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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	Frequency [MHz]	Channel	802.11 MODE	Antenna-1 In-Band Emission	Antenna-2 In-Band Emission
Band 5	5935	2	ax (20MHz)	PASS	PASS
	6175	45	ax (20MHz)	PASS	PASS
	6415	93	ax (20MHz)	PASS	PASS
	5965	3	ax (40MHz)	PASS	PASS
	6165	43	ax (40MHz)	PASS	PASS
	6405	91	ax (40MHz)	PASS	PASS
	5985	7	ax (80MHz)	PASS	PASS
	6145	39	ax (80MHz)	PASS	PASS
	6385	87	ax (80MHz)	PASS	PASS
	6025	15	ax (160MHz)	PASS	PASS
	6185	47	ax (160MHz)	PASS	PASS
	6345	79	ax (160MHz)	PASS	PASS
Band 7	6535	117	ax (20MHz)	PASS	PASS
	6695	149	ax (20MHz)	PASS	PASS
	6875	185	ax (20MHz)	PASS	PASS
	6565	123	ax (40MHz)	PASS	PASS
	6725	155	ax (40MHz)	PASS	PASS
	6885	179	ax (40MHz)	PASS	PASS
	6545	119	ax (80MHz)	PASS	PASS
	6705	151	ax (80MHz)	PASS	PASS
	6865	183	ax (80MHz)	PASS	PASS
	6665	143	ax (160MHz)	PASS	PASS
	6825	175	ax (160MHz)	PASS	PASS

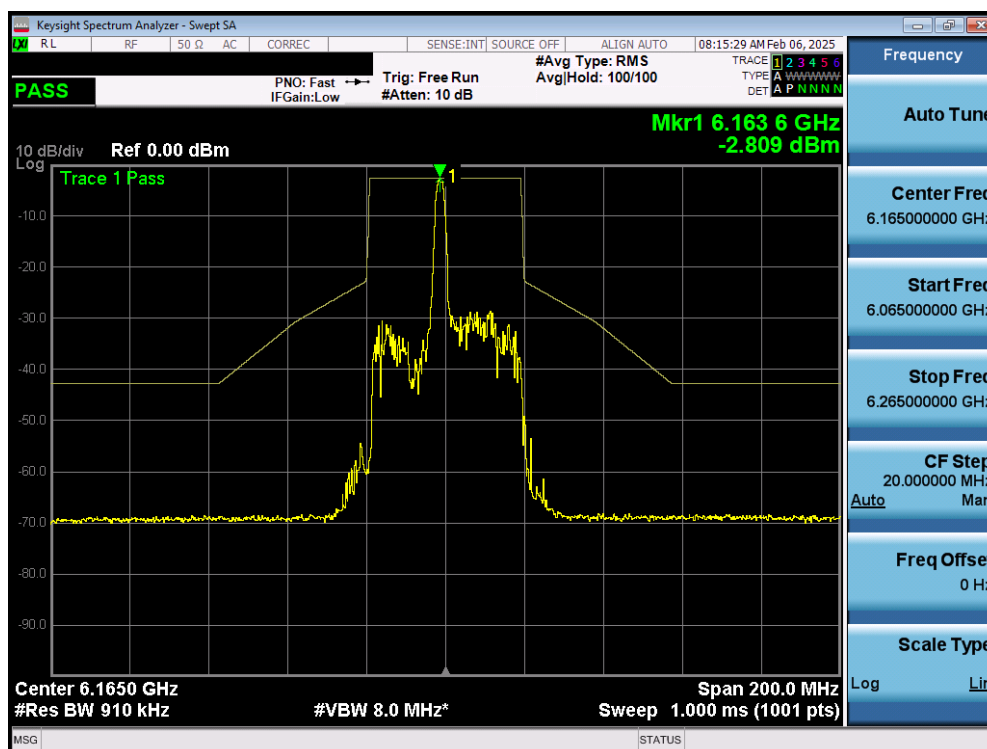
Table 7-14. In Band Emission Results (Full Tones)

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7.5.1 MIMO Antenna-1 In-Band Emission Measurements



Plot 7-33. In Band Emissions Plot MIMO ANT1 (20MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 45) - VLP

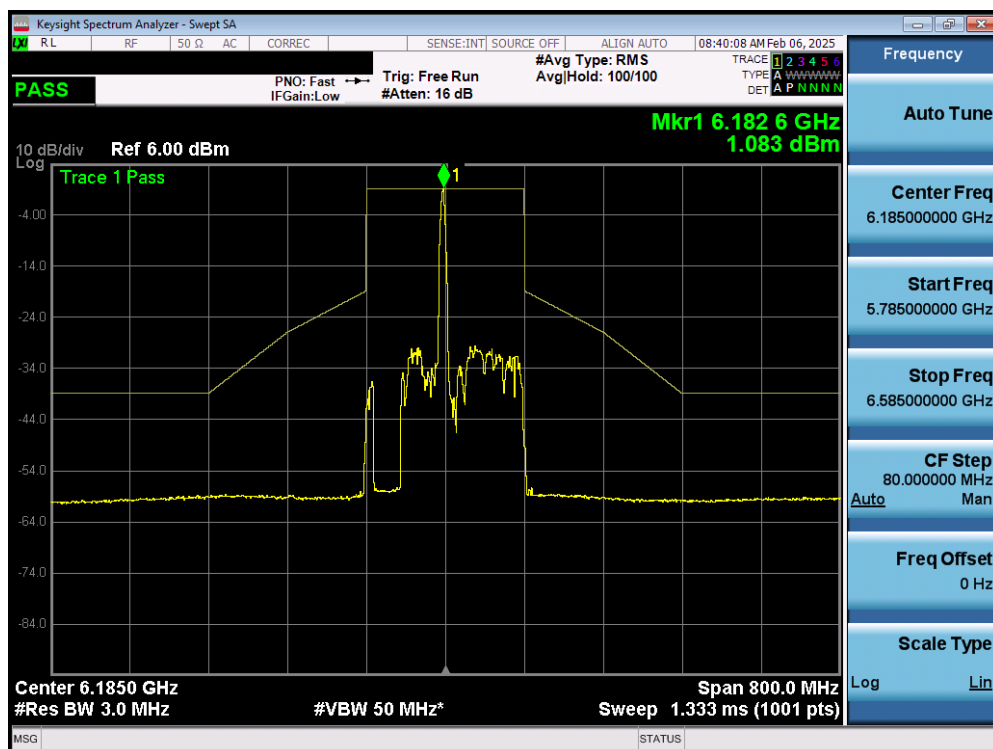


Plot 7-34. In Band Emissions Plot MIMO ANT1 (40MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 43) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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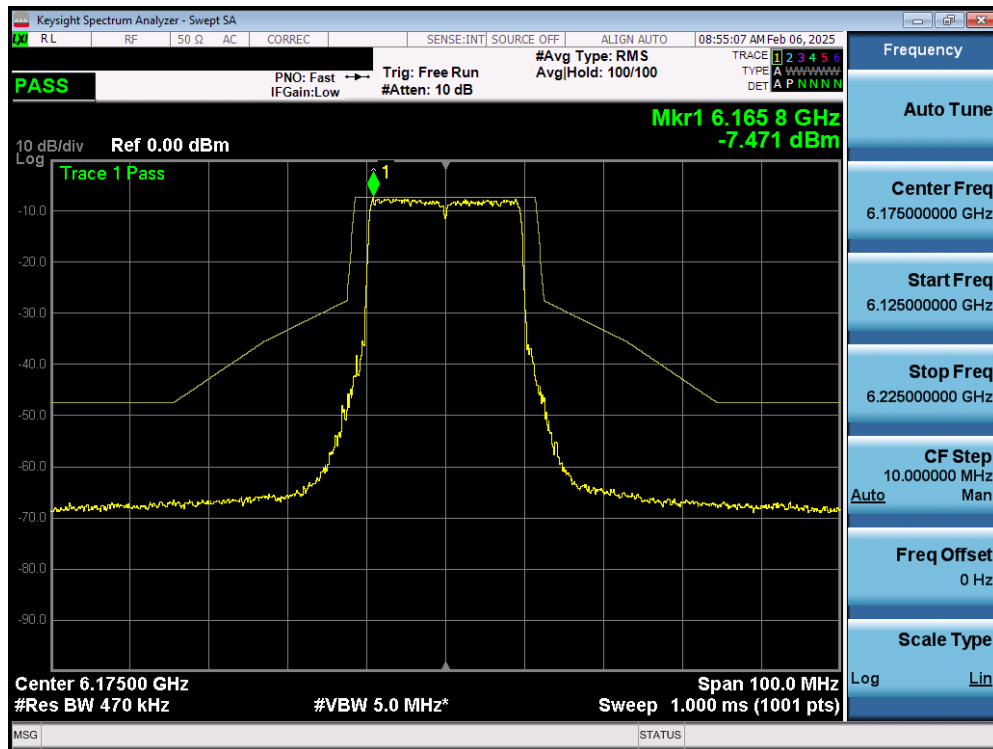


Plot 7-35. In Band Emissions Plot MIMO ANT1 (80MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 39) - VLP

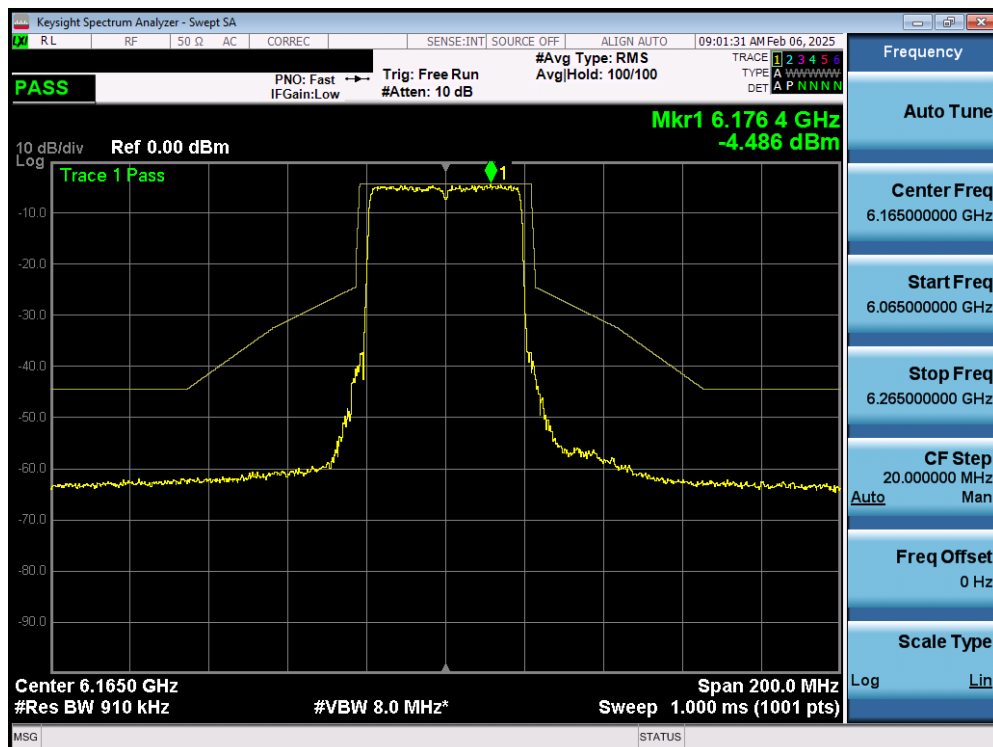


Plot 7-36. In Band Emissions Plot MIMO ANT1 (160MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 47) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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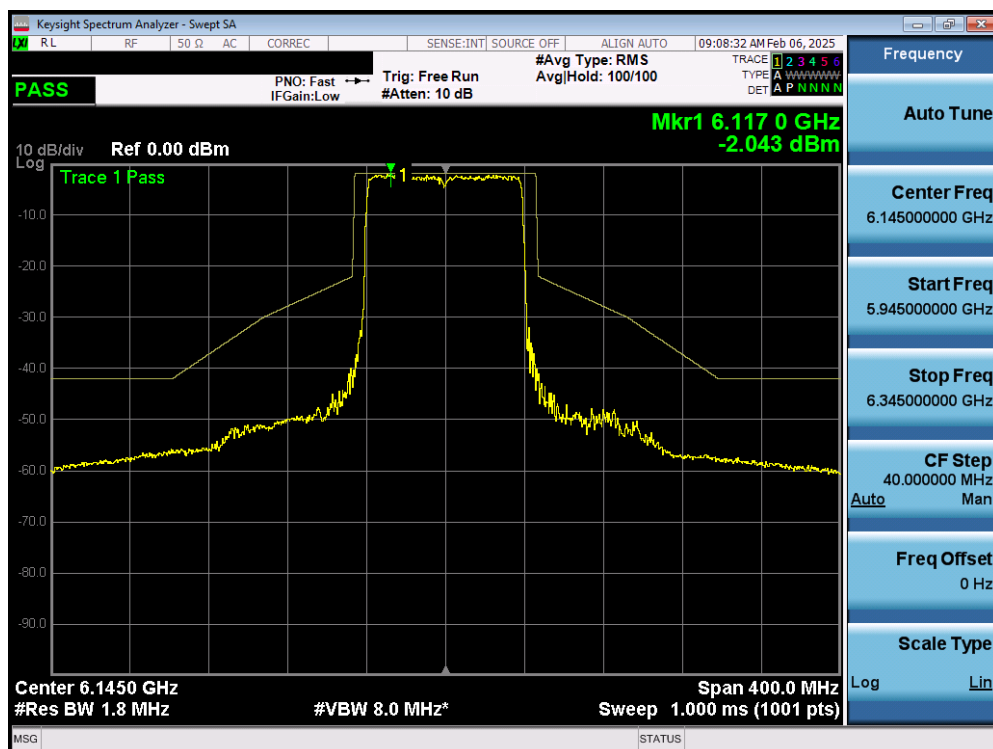


Plot 7-37. In Band Emissions Plot MIMO ANT1 (20MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 45) - VLP

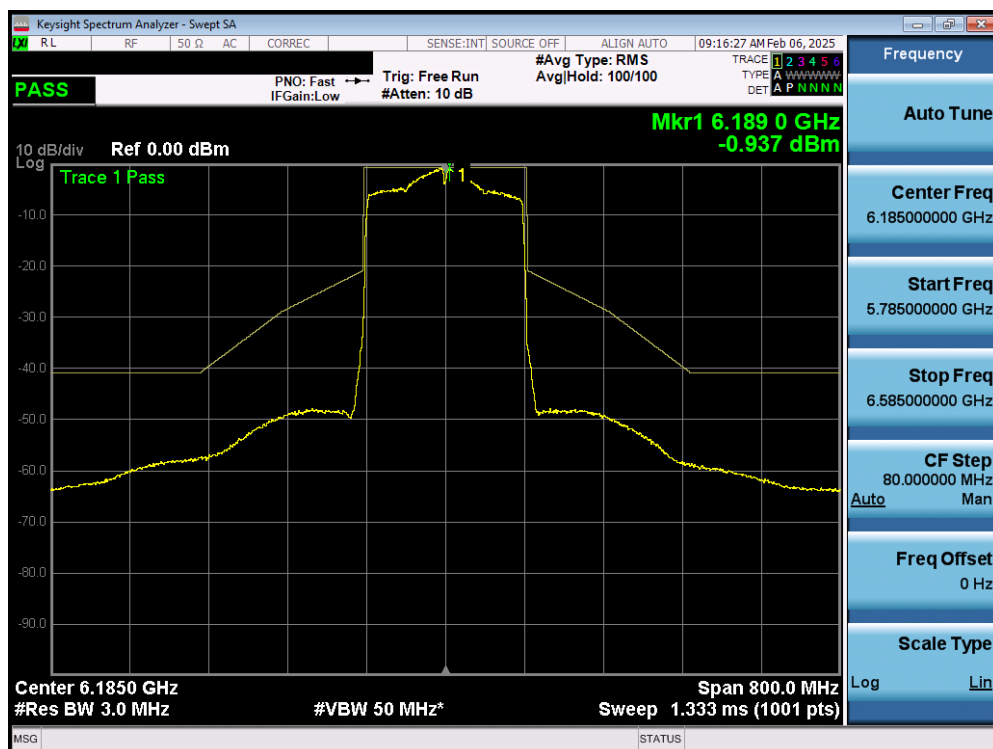


Plot 7-38. In Band Emissions Plot MIMO ANT1 (40MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 43) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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Plot 7-39. In Band Emissions Plot MIMO ANT1 (80MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 39) - VLP



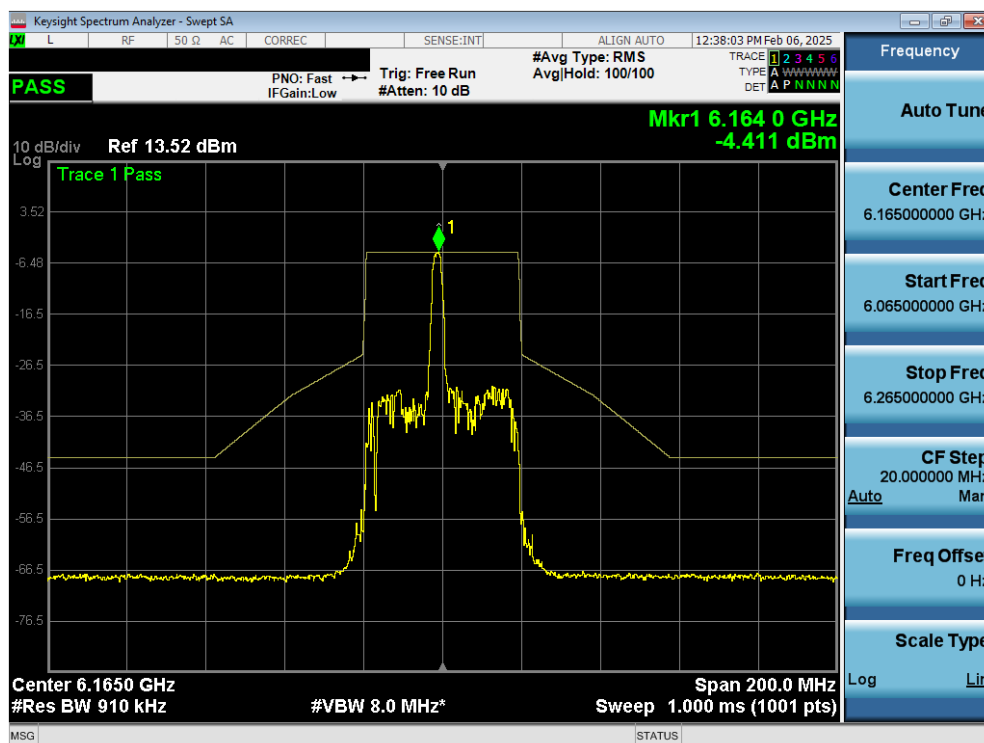
Plot 7-40. In Band Emissions Plot MIMO ANT1 (160MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 47) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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7.5.2 MIMO Antenna-2 In-Band Emission Measurements

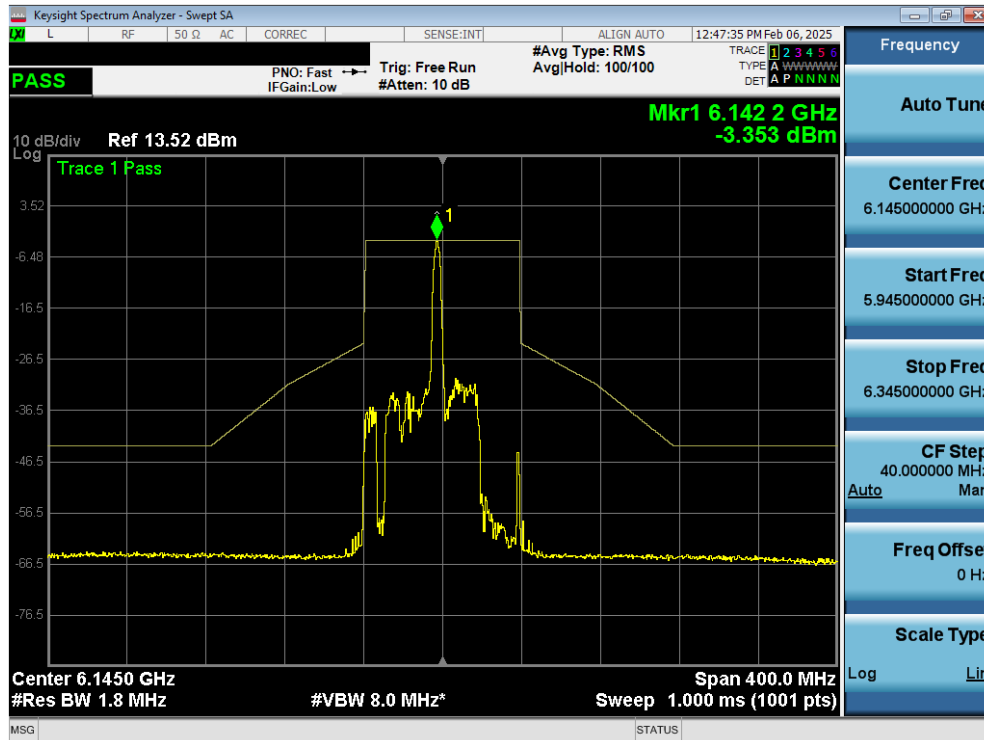


Plot 7-41. In Band Emissions Plot MIMO ANT2 (20MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 45) - VLP

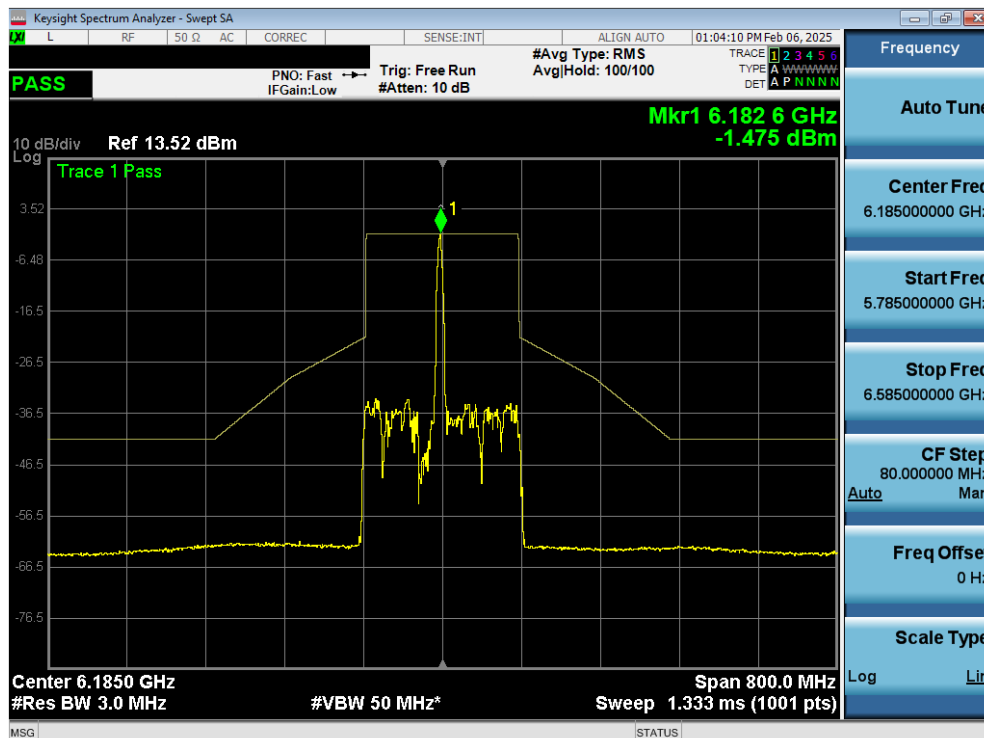


Plot 7-42. In Band Emissions Plot MIMO ANT2 (40MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 43) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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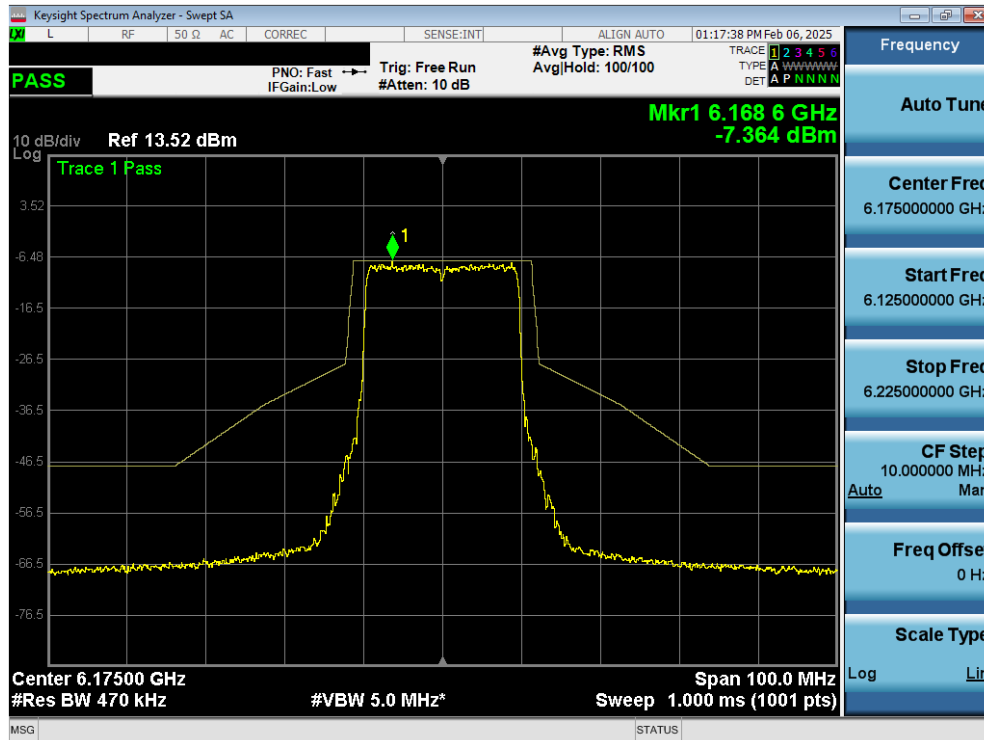


Plot 7-43. In Band Emissions Plot MIMO ANT2 (80MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 39) - VLP

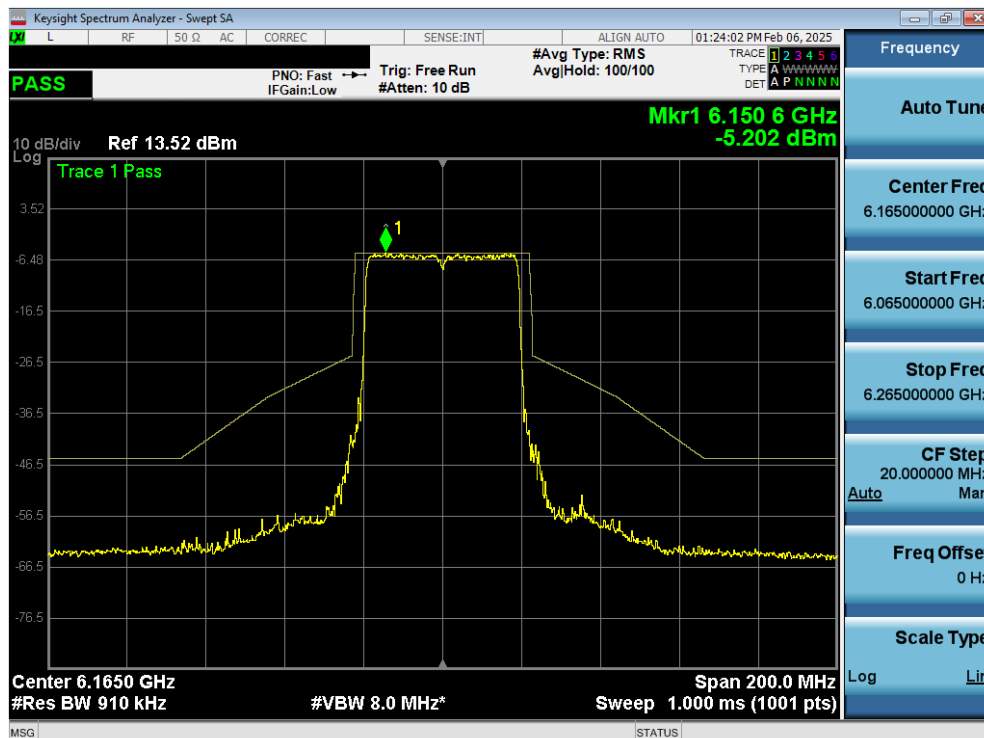


Plot 7-44. In Band Emissions Plot MIMO ANT2 (160MHz 802.11ax (26 Tones) (UNII Band 5) – Ch. 47) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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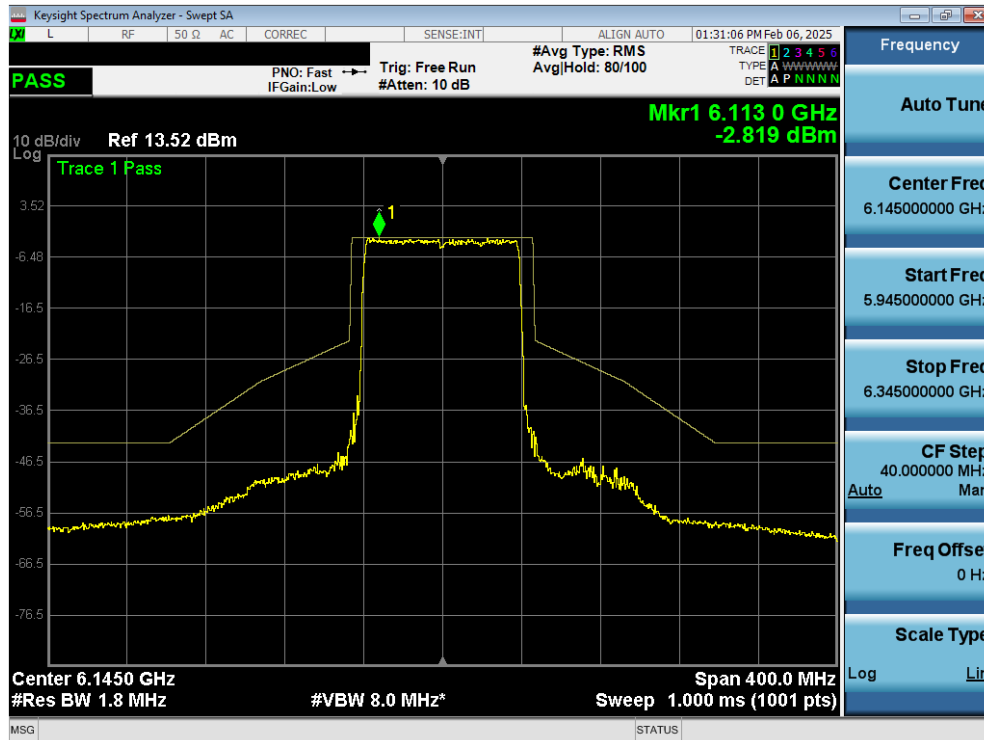


Plot 7-45. In Band Emissions Plot MIMO ANT2 (20MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 45) - VLP

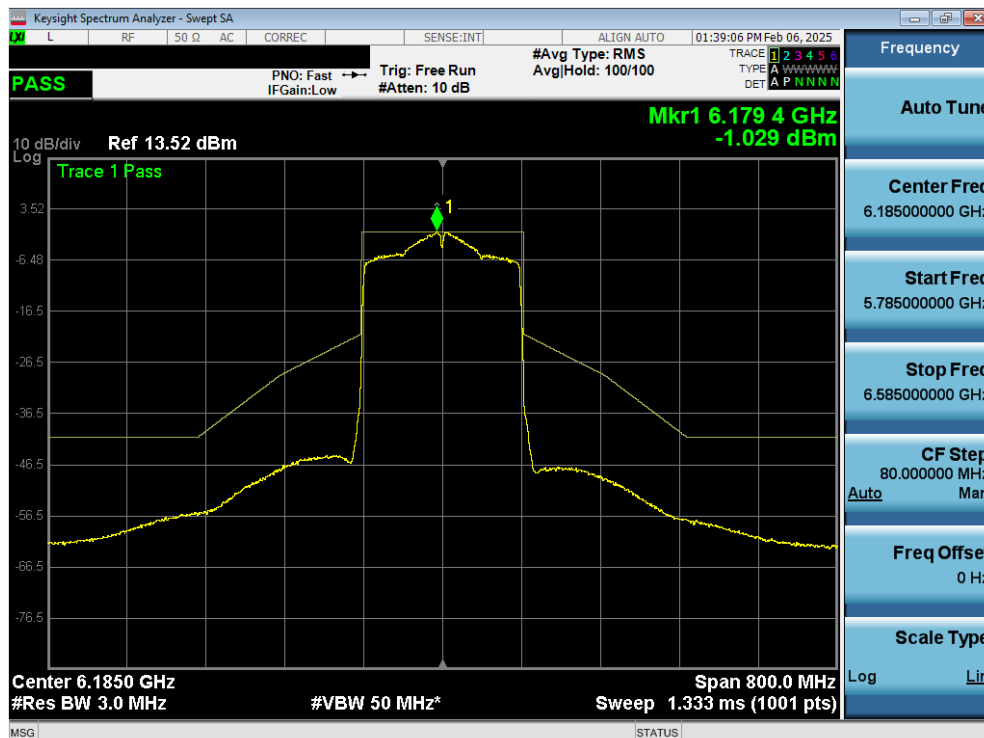


Plot 7-46. In Band Emissions Plot MIMO ANT2 (40MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 43) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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Plot 7-47. In Band Emissions Plot MIMO ANT2 (80MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 39) - VLP



Plot 7-48. In Band Emissions Plot MIMO ANT2 (160MHz 802.11ax (Full Tones) (UNII Band 5) – Ch. 47) - VLP

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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7.6 Radiated Emission Measurements

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna 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. All channels, modes (e.g. 802.11ax (20/40/80/160MHz)), and modulations/data rates were investigated among all UNII bands. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

For transmitters operating within the 5.925-7.125 GHz band: Any emissions outside of the 5.925-7.125 GHz band must not exceed an e.i.r.p. of -27 dBm/MHz

Emissions found in a restricted band are subject to the limits of 15.209 as shown in the table below.

Frequency	Field Strength [μ V/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 7-15. Radiated Limits

Test Procedures Used

ANSI C63.10-2013 – Sections 12.7.7.2, 12.7.6, 12.7.5

Test Settings – Above 1GHz

Average Field Strength Measurements (Method AD – Average Detection)

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest.
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be $\geq 2 \times \text{span} \backslash \text{RBW}$)
6. Sweep time = auto
7. Trace (RMS) averaging was performed over at least 100 traces.

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Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest.
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize.

Test Settings – Below 1GHz

Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest.
2. RBW = 120kHz (for emissions from 30MHz – 1GHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize.

Test Setup

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

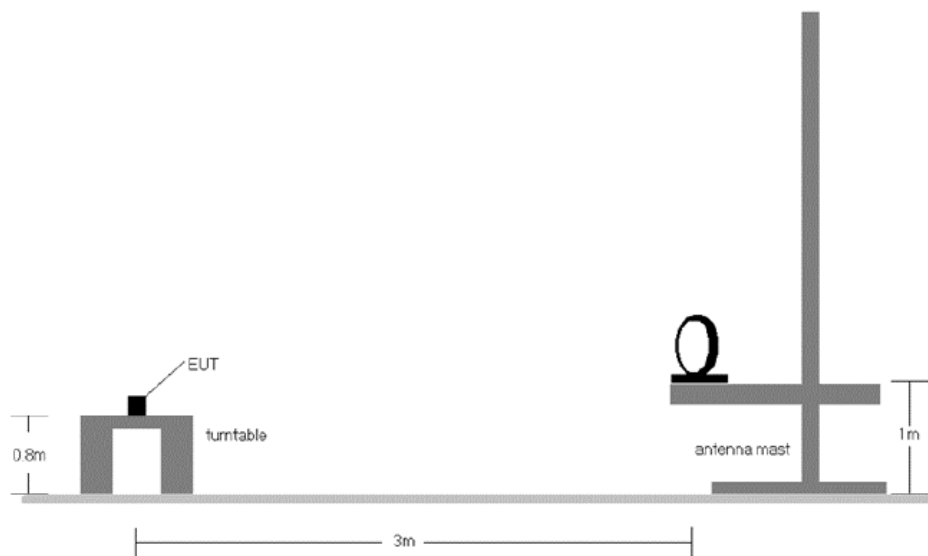


Figure 7-5. Radiated Test Setup < 30MHz

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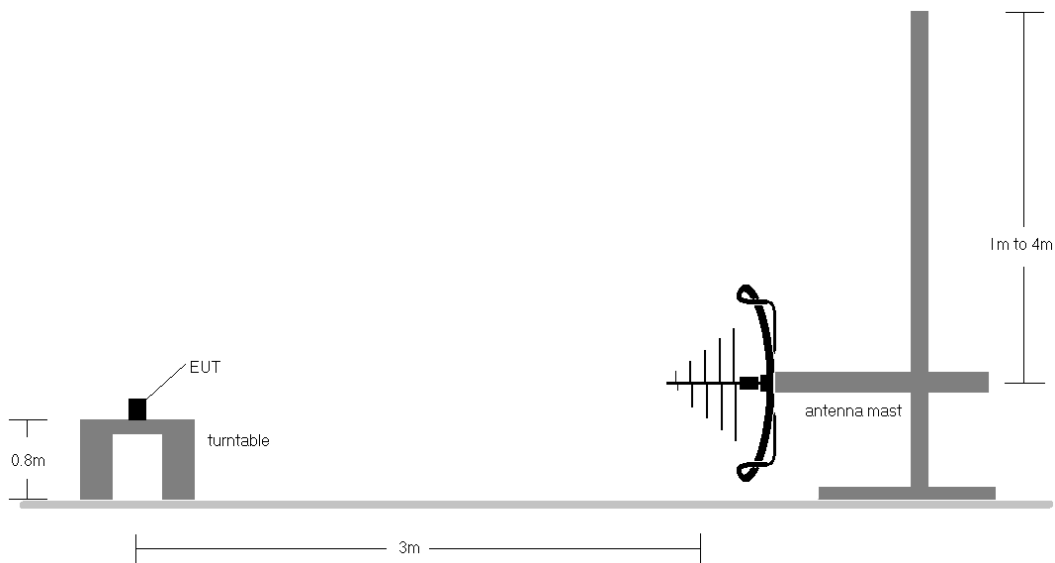


Figure 7-6. Radiated Test Setup < 1GHz

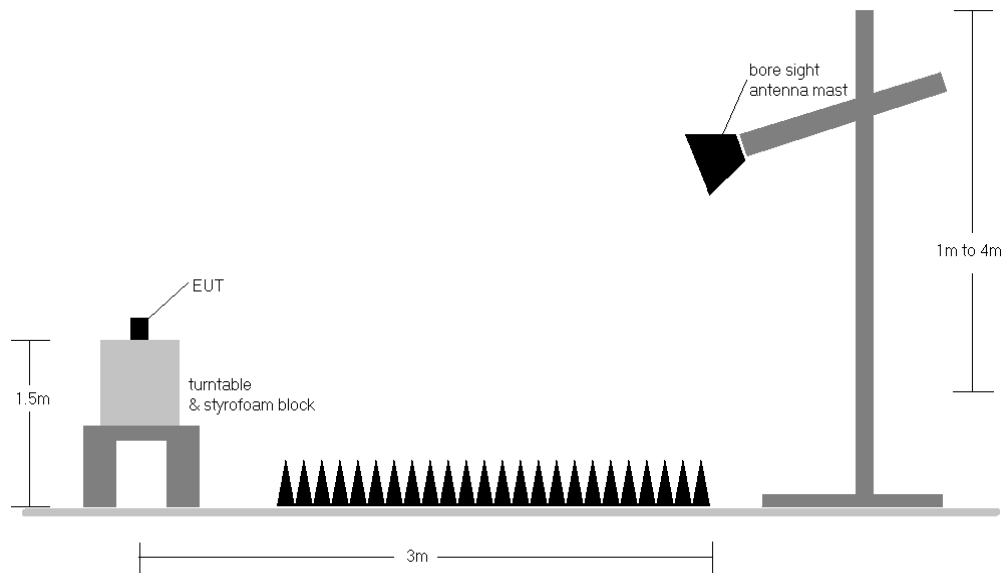


Figure 7-7. Radiated Test Setup > 1GHz

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Test Notes

1. All spurious emissions lying in restricted bands specified in §15.205 are below the limit shown in §15.209. All spurious emissions that do not lie in a restricted band are subject to an average limit of -27dBm/MHz. At 3 meters, the field strength limit in dB μ V/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dB μ V/m.
2. All spurious emissions that do not lie in a restricted band are subject to a peak limit not to exceed 20dB of the average limit [68.2dB μ V/m]. If a peak measurement passes the average limit, it was determined no further investigation is necessary.
3. The antenna is manipulated through typical positions, polarity, and length during the tests. The EUT is manipulated through three orthogonal planes.
4. This unit was tested with its standard battery.
5. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported, however emissions whose levels were not within 20dB of the respective limits were not reported.
6. Emissions below 18GHz were measured at a 3-meter test distance while emissions above 18GHz were measured at a 1-meter test distance with the application of a distance correction factor.
7. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section.
8. The “-” shown in the following RSE tables are used to denote a noise floor measurement.
9. For radiated measurements, emissions were investigated for the fully-loaded RU configuration and for all of the partially-loaded RU configurations. Among all of the available partially-loaded RU configurations, only the configuration with the worst case emissions is reported.

Sample Calculations

Determining Spurious Emissions Levels

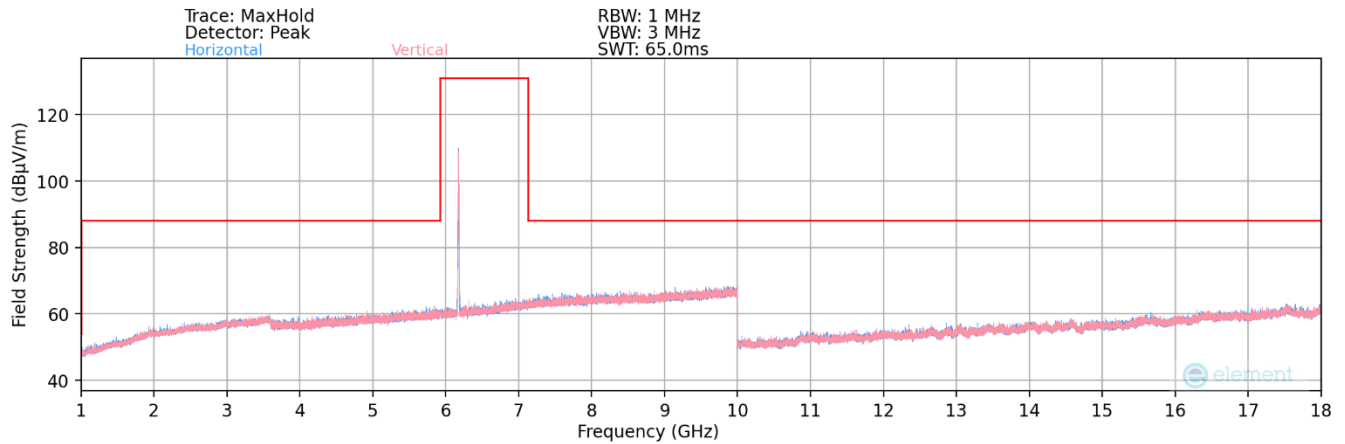
- Field Strength Level [dB μ V/m] = Analyzer Level [dBm] + 107 + AFCL [dB/m]
- AFCL [dB/m] = Antenna Factor [dB/m] + Cable Loss [dB]
- Margin [dB] = Field Strength Level [dB μ V/m] – Limit [dB μ V/m]

Radiated Band Edge Measurement Offset

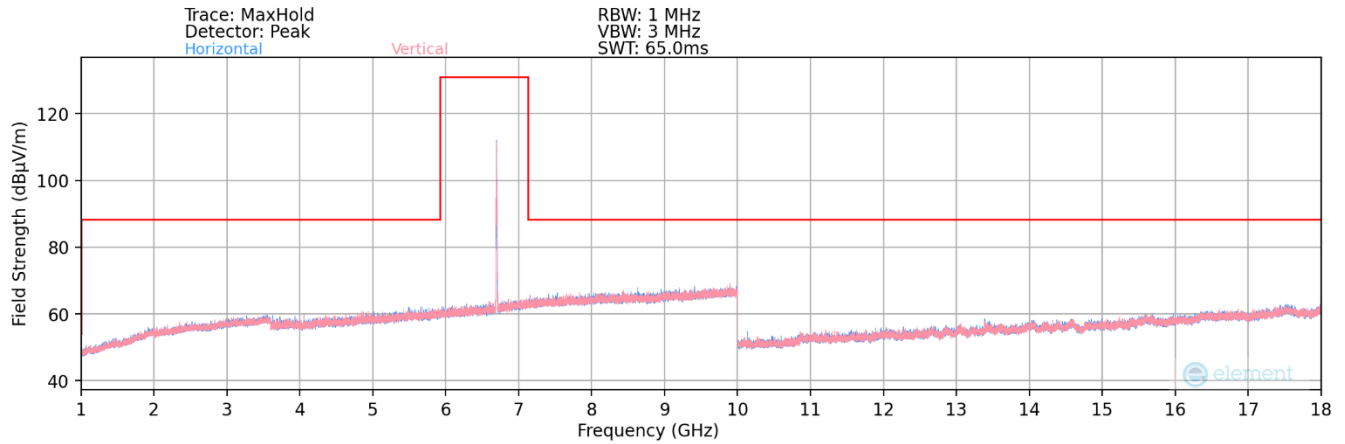
- The amplitude offset shown in the radiated restricted band edge plots was calculated using the formula:
Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

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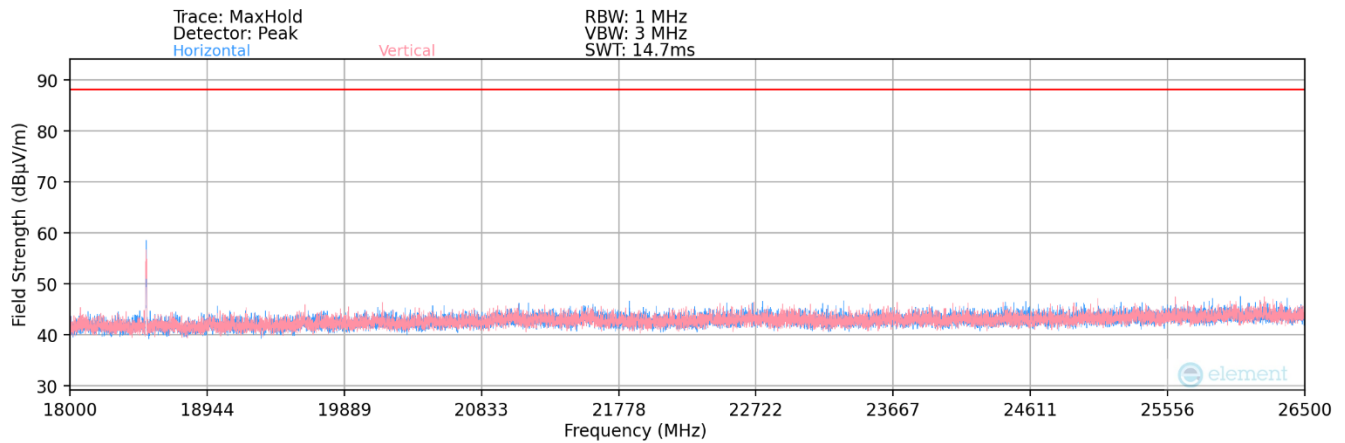
7.6.1 MIMO Radiated Spurious Emission Measurements (26 Tones)



Plot 7-49. Radiated Spurious Plot 1GHz – 18GHz MIMO (802.11ax – UNII Band 5 Ch. 45)

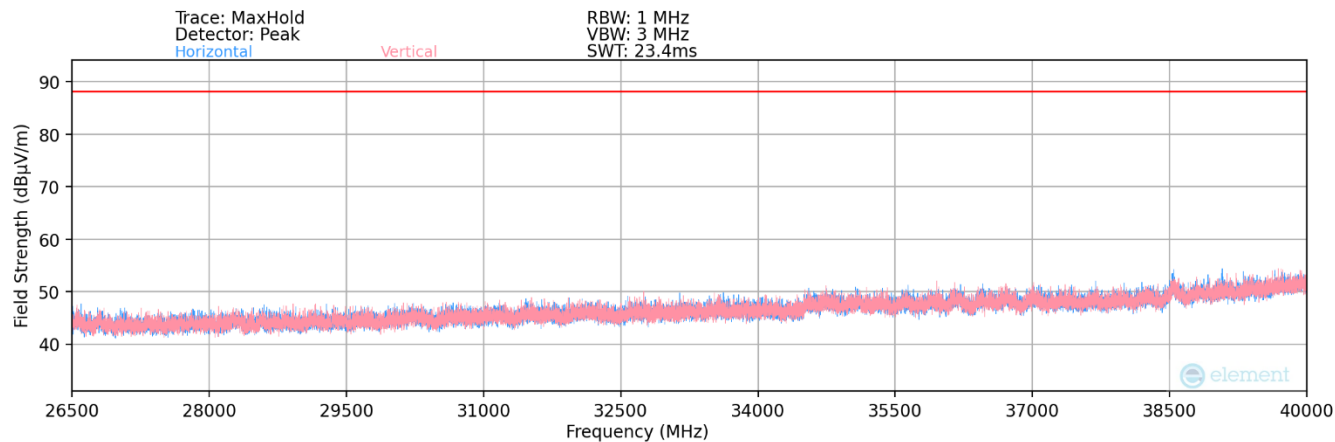


Plot 7-50. Radiated Spurious Plot 1GHz – 18GHz MIMO (802.11ax – UNII Band 7 Ch. 149)



Plot 7-51. Radiated Spurious Plot 18GHz - 26.5GHz (802.11ax)

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Plot 7-52. Radiated Spurious Plot 26.5GHz - 40GHz (802.11ax)

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 59 of 70

7.6.2 MIMO Radiated Spurious Emission Measurements (26 Tones) – UNII Band 5

Mode	Antenna	UNII Band	Channel	Test Channel Freq.	RU Index	Restricted	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degrees]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBuV/m]	Limit [dBuV/m]	Margin [dB]
802.11ax RU 26T	MIMO	5	2	5935	4	*	11870.00	Average	H	209	333	-78.96	18.16	0.00	46.20	53.98	-7.78
						*	11870.00	Peak	H	209	333	-67.17	18.16	0.00	57.99	73.98	-15.99
						*	17805.00	Average	H	136	46	-80.59	24.47	0.00	50.88	53.98	-3.10
						*	17805.00	Peak	H	136	46	-68.27	24.47	0.00	63.20	73.98	-10.78
						*	23740.00	Average	H	-	-	-66.92	3.58	-9.54	34.12	53.98	-19.86
						*	23740.00	Peak	H	-	-	-56.55	3.58	-9.54	44.49	73.98	-29.49
			45	6175	4		29675.00	Peak	H	-	-	-57.44	5.33	-9.54	45.35	68.20	-22.85
						*	12350.00	Average	H	168	43	-75.20	18.37	0.00	50.17	53.98	-3.81
						*	12350.00	Peak	H	168	43	-62.58	18.37	0.00	62.79	73.98	-11.19
						*	18525.00	Average	H	150	77	-50.81	1.16	-9.54	47.81	53.98	-6.17
						*	18525.00	Peak	H	150	77	-37.56	1.16	-9.54	61.07	73.98	-12.91
							24700.00	Peak	H	-	-	-55.67	3.72	-9.54	45.51	68.20	-22.69
			93	6415	4		30875.00	Peak	H	-	-	-56.83	6.32	-9.54	46.95	68.20	-21.25
							12830.00	Peak	H	150	41	-61.46	19.33	0.00	64.87	68.20	-3.33
						*	19245.00	Average	H	150	68	-60.58	1.84	-9.54	38.72	53.98	-15.26
						*	19245.00	Peak	H	150	68	-48.78	1.84	-9.54	50.52	73.98	-23.46
							25660.00	Peak	H	-	-	-55.86	3.90	-9.54	45.50	68.20	-22.70
							32075.00	Peak	H	-	-	-57.22	6.64	-9.54	46.88	68.20	-21.32

Table 7-16. Radiated Measurements MIMO (26 Tones)

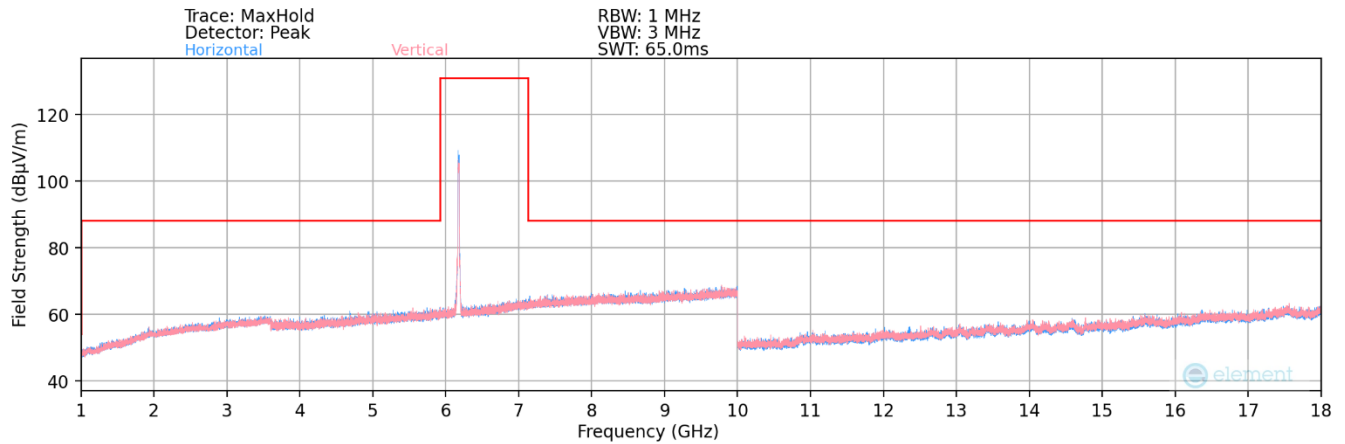
7.6.3 MIMO Radiated Spurious Emission Measurements (26 Tones) – UNII Band 7

Mode	Antenna	UNII Band	Channel	Test Channel Freq.	RU Index	Restricted	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degrees]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBuV/m]	Limit [dBuV/m]	Margin [dB]
802.11ax RU 26T	MIMO	7	117	6535	4		13070.00	Peak	H	169	42	-61.72	19.50	0.00	64.78	68.20	-3.42
						*	19605.00	Average	H	150	359	-62.39	2.38	-9.54	37.45	53.98	-16.53
						*	19605.00	Peak	H	150	359	-47.71	2.38	-9.54	52.13	73.98	-21.85
							26140.00	Peak	H	150	341	-52.96	4.03	-9.54	48.53	68.20	-19.67
							32675.00	Peak	H	-	-	-56.78	6.46	-9.54	47.14	68.20	-21.06
			149	6695	4	*	13390.00	Average	H	189	346	-76.98	19.86	0.00	49.88	53.98	-4.10
						*	13390.00	Peak	H	189	346	-64.47	19.86	0.00	62.39	73.98	-11.59
						*	20085.00	Average	H	150	11	-56.04	2.58	-9.54	44.00	53.98	-9.98
						*	20085.00	Peak	H	150	11	-40.54	2.58	-9.54	59.50	73.98	-14.48
							26780.00	Peak	H	150	324	-56.55	4.33	-9.54	45.24	68.20	-22.96
							33475.00	Peak	H	-	-	-56.80	6.96	-9.54	47.62	68.20	-20.58
			185	6875	4		13750.00	Peak	H	181	345	-63.47	20.38	0.00	63.91	68.20	-4.29
						*	20625.00	Average	H	150	359	-54.83	3.01	-9.54	45.64	53.98	-8.34
						*	20625.00	Peak	H	150	359	-39.97	3.01	-9.54	60.49	73.98	-13.49
							27500.00	Peak	H	-	-	-56.45	3.97	-9.54	44.99	68.20	-23.21
							34375.00	Peak	H	-	-	-57.06	7.33	-9.54	47.73	68.20	-20.47

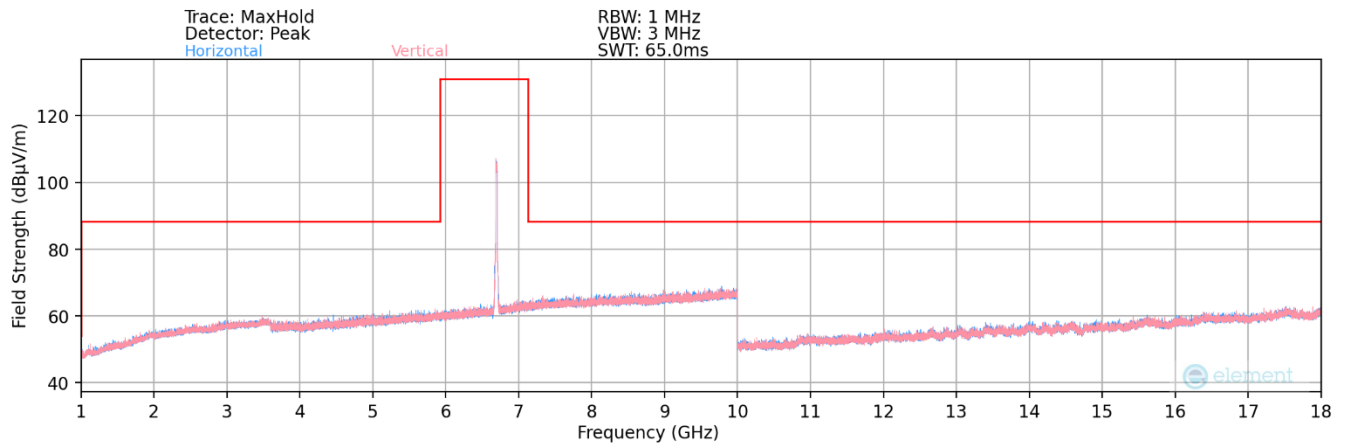
Table 7-17. Radiated Measurements MIMO (26 Tones)

FCC ID: A3LSMG766U	MEASUREMENT REPORT			Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset		Page 60 of 70

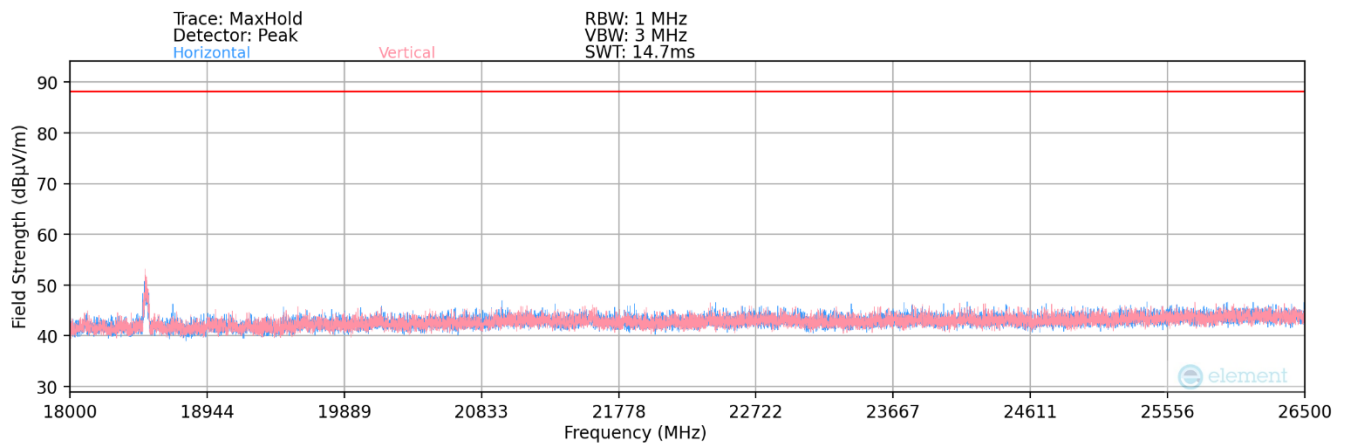
7.6.4 MIMO Radiated Spurious Emission Measurements (242 Tones)



Plot 7-53. Radiated Spurious Plot 1GHz – 18GHz MIMO (802.11ax – UNII Band 5 Ch. 45)

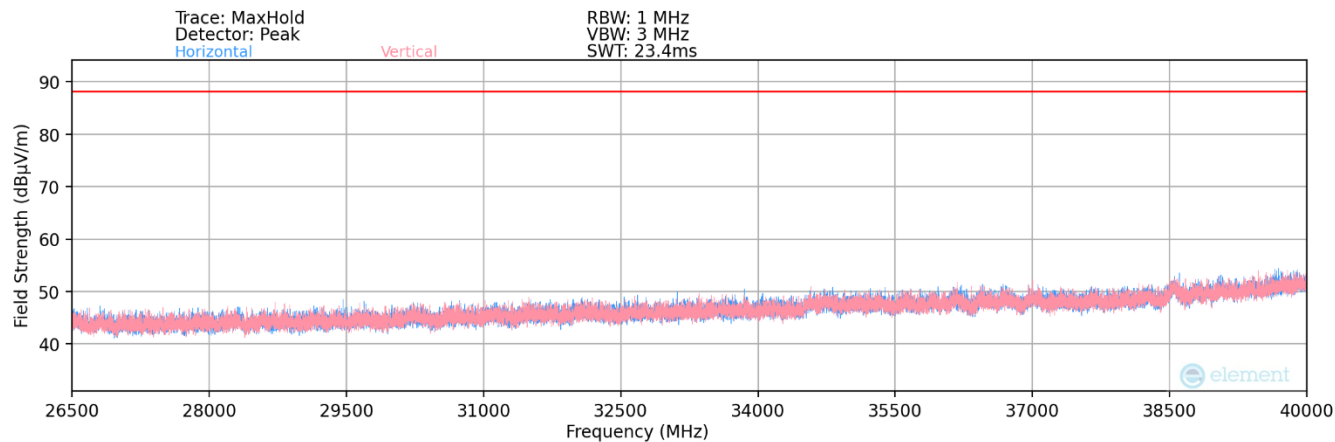


Plot 7-54. Radiated Spurious Plot 1GHz – 18GHz MIMO (802.11ax – UNII Band 7 Ch. 149)



Plot 7-55. Radiated Spurious Plot 18GHz - 26.5GHz (802.11ax)

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 61 of 70



Plot 7-56. Radiated Spurious Plot 26.5GHz - 40GHz (802.11ax)

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 62 of 70

7.6.4.1 MIMO Radiated Spurious Emission Measurements (242 Tones) – UNII Band 5

Mode	Antenna	UNII Band	Channel	Test Channel Freq. [MHz]	RU Index	Restricted	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBuV/m]	Limit [dBuV/m]	Margin [dB]
802.11ax RU 242T	MIMO	5	2	5935	61	*	11870.00	Average	H	209	333	-79.75	18.16	0.00	45.41	53.98	-8.57
						*	11870.00	Peak	H	209	333	-68.29	18.16	0.00	56.87	73.98	-17.11
						*	17805.00	Average	H	136	46	-80.55	24.47	0.00	50.92	53.98	-3.06
						*	17805.00	Peak	H	136	46	-68.67	24.47	0.00	62.80	73.98	-11.18
						*	23740.00	Average	H	-	-	-67.31	3.58	-9.54	33.73	53.98	-20.25
						*	23740.00	Peak	H	-	-	-55.81	3.58	-9.54	45.23	73.98	-28.75
			45	6175	61		29675.00	Peak	H	-	-	-57.76	5.33	-9.54	45.02	68.20	-23.18
						*	12350.00	Average	H	168	43	-77.15	18.37	0.00	48.22	53.98	-5.76
						*	12350.00	Peak	H	168	43	-65.12	18.37	0.00	60.25	73.98	-13.73
						*	18525.00	Average	H	150	76	-56.38	1.16	-9.54	42.25	53.98	-11.73
						*	18525.00	Peak	H	150	76	-45.47	1.16	-9.54	53.15	73.98	-20.83
							24700.00	Peak	H	-	-	-56.89	3.72	-9.54	44.29	68.20	-23.91
			93	6415	61		30875.00	Peak	H	-	-	-57.29	6.32	-9.54	46.49	68.20	-21.71
							12830.00	Peak	H	150	41	-61.50	19.33	0.00	64.83	68.20	-3.37
						*	19245.00	Average	H	150	68	-63.57	1.84	-9.54	35.73	53.98	-18.25
						*	19245.00	Peak	H	150	68	-51.96	1.84	-9.54	47.34	73.98	-26.64
							25660.00	Peak	H	-	-	-56.60	3.90	-9.54	44.76	68.20	-23.44
							32075.00	Peak	H	-	-	-56.97	6.64	-9.54	47.13	68.20	-21.07

Table 7-18. Radiated Measurements MIMO (242 Tones)

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 63 of 70

7.6.4.2 MIMO Radiated Spurious Emission Measurements (242 Tones) – UNII Band 7

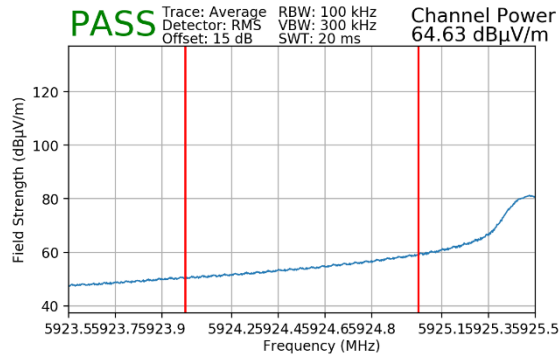
Mode	Antenna	UNII Band	Channel	Test Channel Freq. [MHz]	RU Index	Restricted	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Distance Correction Factor [dB]	Field Strength [dBuV/m]	Limit [dBuV/m]	Margin [dB]
802.11ax RU 242T	MIMO	7	117	6535	61		13070.00	Peak	H	169	42	-65.38	19.50	0.00	61.12	68.20	-7.08
						*	19605.00	Average	H	150	0	-60.53	2.38	-9.54	39.31	53.98	-14.67
						*	19605.00	Peak	H	150	0	-47.42	2.38	-9.54	52.42	73.98	-21.56
							26140.00	Peak	H	-	-	-55.59	4.03	-9.54	45.89	68.20	-22.31
							32675.00	Peak	H	-	-	-56.69	6.46	-9.54	47.23	68.20	-20.97
			149	6695	61	*	13390.00	Average	H	189	346	-78.92	19.86	0.00	47.94	53.98	-6.04
						*	13390.00	Peak	H	189	346	-68.05	19.86	0.00	58.81	73.98	-15.17
						*	20085.00	Average	H	150	0	-58.03	2.58	-9.54	42.01	53.98	-11.97
						*	20085.00	Peak	H	150	0	-45.28	2.58	-9.54	54.76	73.98	-19.22
							26780.00	Peak	H	-	-	-46.27	4.33	-9.54	55.51	68.20	-12.69
							33475.00	Peak	H	-	-	-57.28	6.96	-9.54	47.14	68.20	-21.06
			185	6875	61		13750.00	Peak	H	181	345	-67.13	20.38	0.00	60.25	68.20	-7.95
						*	20625.00	Average	H	150	9	-63.94	3.01	-9.54	36.53	53.98	-17.45
						*	20625.00	Peak	H	150	9	-51.80	3.01	-9.54	48.66	73.98	-25.32
							27500.00	Peak	H	-	-	-56.01	3.97	-9.54	45.43	68.20	-22.77
							34375.00	Peak	H	-	-	-55.80	7.33	-9.54	48.99	68.20	-19.21

Table 7-19. Radiated Measurements MIMO (242 Tones)

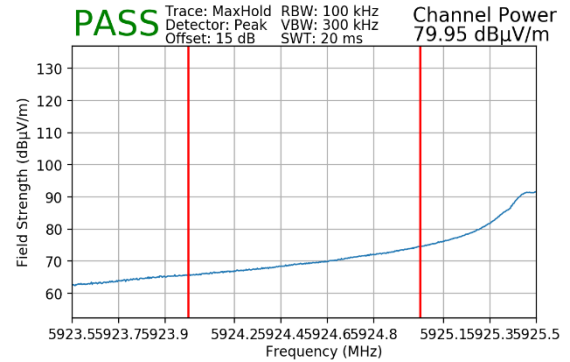
FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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7.6.5 MIMO Radiated Band Edge Measurements (20MHz BW – Partial Tone – 106T)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
RU Index	53
Distance of Measurements:	3 Meters
Operating Frequency:	5935MHz
Channel:	2



Plot 7-57. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 5 – 106T)

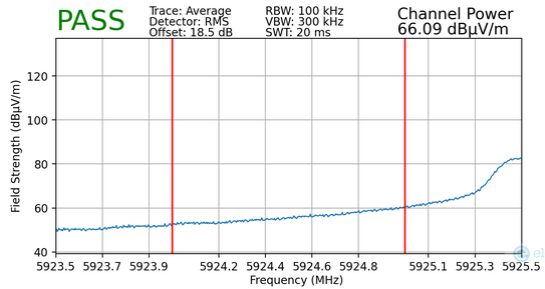


Plot 7-58. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 5 – 106T)

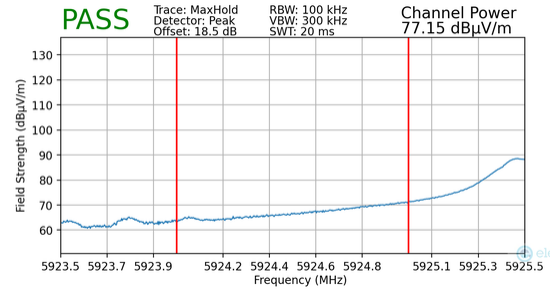
FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
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7.6.6 MIMO Radiated Band Edge Measurements (20MHz BW – Full Tone – 242T)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
RU Index	61
Distance of Measurements:	3 Meters
Operating Frequency:	5935MHz
Channel:	2

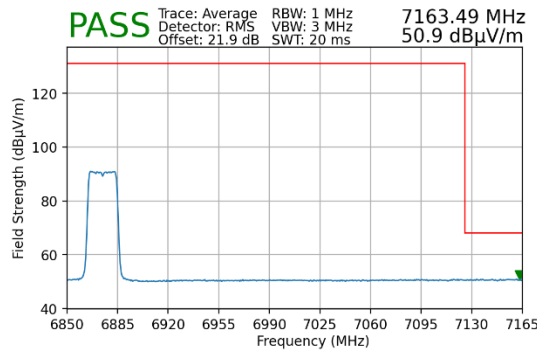


Plot 7-59. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 5 – 242T)

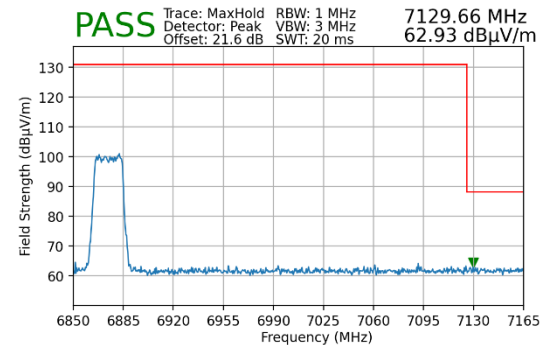


Plot 7-60. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 5 – 242T)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
RU Index	61
Distance of Measurements:	3 Meters
Operating Frequency:	6875MHz
Channel:	185



Plot 7-61. Radiated Upper Band Edge Plot MIMO (Average – UNII Band 7 – 242T)

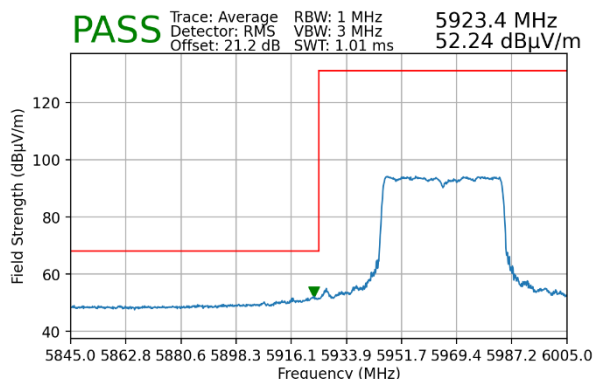


Plot 7-62. Radiated Upper Band Edge Plot MIMO (Peak – UNII Band 7 – 242T)

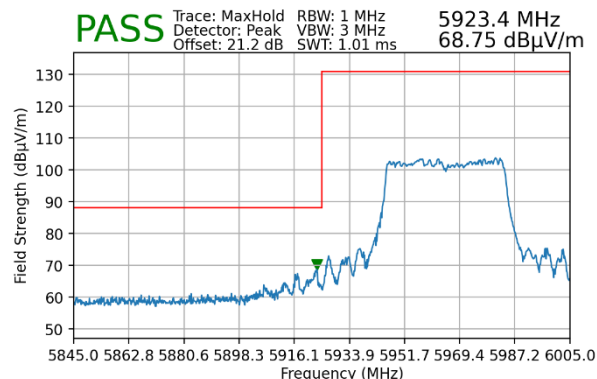
FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 66 of 70

7.6.7 MIMO Radiated Band Edge Measurements (40MHz BW – Full Tone – 484T)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
RU Index	65
Distance of Measurements:	3 Meters
Operating Frequency:	5965MHz
Channel:	3



**Plot 7-63. Radiated Lower Band Edge Plot MIMO
(Average – UNII Band 5 – 484T)**

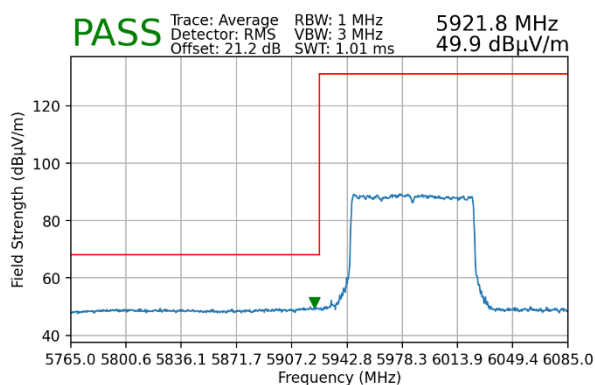


**Plot 7-64. Radiated Lower Band Edge Plot MIMO
(Peak – UNII Band 5 – 484T)**

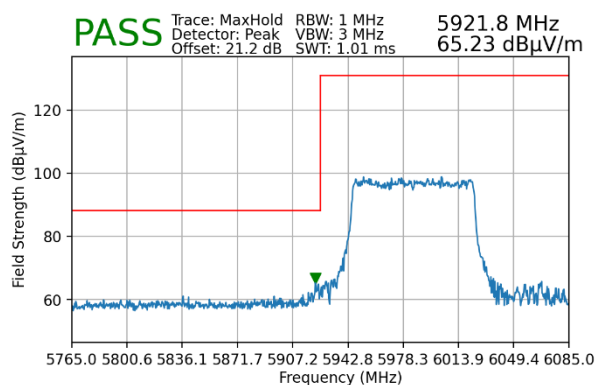
FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 67 of 70

7.6.8 MIMO Radiated Band Edge Measurements (80MHz BW – Full Tone – 996T)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
RU Index	67
Distance of Measurements:	3 Meters
Operating Frequency:	5985MHz
Channel:	7



Plot 7-65. Radiated Lower Band Edge Plot MIMO (Average – UNII Band 5 – 996T)

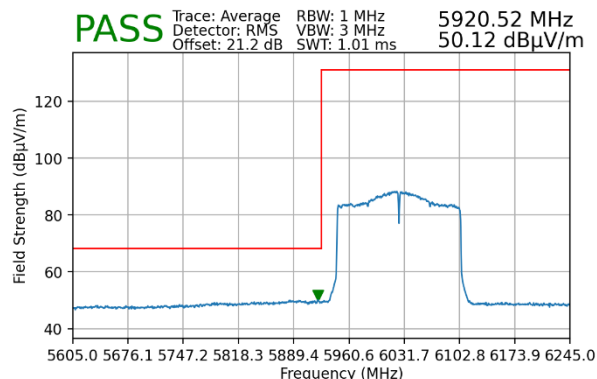


Plot 7-66. Radiated Lower Band Edge Plot MIMO (Peak – UNII Band 5 – 996T)

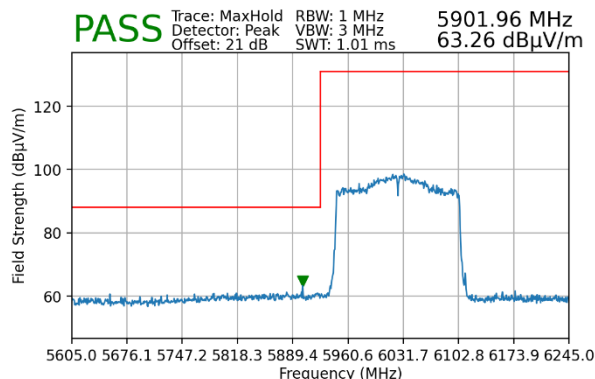
FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 68 of 70

7.7 MIMO Radiated Band Edge Measurements (160MHz BW – Full Tone – 2x996T)

Worst Case Mode:	802.11ax
Worst Case Transfer Rate:	MCS0
RU Index	68
Distance of Measurements:	3 Meters
Operating Frequency:	6025MHz
Channel:	15



**Plot 7-67. Radiated Lower Band Edge Plot MIMO
(Average – UNII Band 5 – 2x996T)**



**Plot 7-68. Radiated Lower Band Edge Plot MIMO
(Peak – UNII Band 5 – 2x996T)**

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 69 of 70

8 CONCLUSION

The data collected relate only the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMG766U** is in compliance with FCC Part Subpart E (15.407) of the FCC rules for operation as a client device.

FCC ID: A3LSMG766U	MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2501020001-27.A3L	Test Dates: 1/6/2025 – 2/28/2025	EUT Type: Portable Handset	Page 70 of 70