

**ELEMENT WASHINGTON DC LLC** 

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# MEASUREMENT REPORT FCC PART 15.247/ ISED RSS-247 802.11ax/be (OFDMA)

#### **Applicant Name:**

Microsoft Corporation One Microsoft Way Redmond, WA 98052 United States

### Date of Testing: 12/14/2023 - 03/05/2024 Test Report Issue Date: 03/20/2024 Test Site/Location: Element lab., Columbia, MD, USA Test Report Serial No.: 1M2312040120-18.C3K

# FCC ID:

IC:

C3K2077

APPLICANT:

### 00112011

3048A-2077

**Microsoft Corporation** 

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

Certification 2077 Portable Computing Device 2412 – 2472MHz OFDMA Digital Transmission System (DTS) Part 15 Subpart C (15.247) RSS-247 Issue 3 ANSI C63.10-2013

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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# **MEASUREMENT REPORT**

Channel			Тх	МІМО			
Bandwidth [MHz]	IEEE Mode	Tones	Frequency	Avg. Conducted		Peak Conducted	
				Max. Power [mW]	Max. Power [dBm]	Max. Power [mW]	Max. Power [dBm]
	802.11ax/be OFDMA	26T	2412 - 2462	192.67	22.85	987.49	29.95
	802.11ax/be OFDMA	52T	2412 - 2462	191.13	22.81	977.51	29.90
20	802.11be OFDMA	52+26T	2412 - 2462	192.03	22.83	963.90	29.84
20	802.11ax/be OFDMA	106T	2412 - 2462	192.45	22.84	969.49	29.87
	802.11be OFDMA	106+26T	2412 - 2462	191.81	22.83	984.08	29.93
	802.11ax/be OFDMA	242T	2412 - 2462	168.25	22.26	954.95	29.80
40	802.11ax/be OFDMA	484T	2412 - 2462	67.45	18.29	400.30	26.02

**EUT Overview** 

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# 1.0 INTRODUCTION

### 1.1 Scope

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

### **1.2 Element Test Location**

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

### 1.3 Test Facility / Accreditations

Measurements were performed at 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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# 2.0 **PRODUCT INFORMATION**

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Microsoft Corporation Portable Computing Device FCC ID: C3K2077**. The test data contained in this report pertains only to the emissions due to the EUT's WLAN (DTS) transmitter.

Test Device Serial No.: 7CCX2, 7CDJ2, B44G2, B44D2, B44T2

### 2.2 Device Capabilities

This device contains the following capabilities:

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

Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432	12	2467
6	2437	13	2472
7	2442		

#### Table 2-1. Frequency/ Channel Operations

#### Notes:

 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 6.0 b) of ANSI C63.10-2013 and KDB 558074 D01 v05r02. 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:

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	Bandwidth	-		MIMO (1+2)
Band		Tone Type	Tone Size	Duty Cycle [%]
			26T	99.28
	20MHz	RU	52T	99.28
		MRU	106T	99.23
			242T	98.68
			52+26T	99.28
2.4GHz			106+26T	98.62
			26T	99.28
			52T	99.28
	40MHz	RU	106T	99.23
			242T	98.68
			484T	97.59

Table 2-2. M	easured Dut	y Cycles
--------------	-------------	----------

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

WiFi Configurations		SE	M	C	DD
		ANT1	ANT2	ANT1	ANT2
2.4GHz 11ax/be		✓	✓	$\checkmark$	✓

Table 2-3. Antenna Configuration

 $\checkmark$  = Support ; **\*** = NOT Support **MIMO** = Single Input Single Output **SDM** = Spatial Diversity Multiplexing – MIMO function **CDD** = Cyclic Delay Diversity - 2Tx Function

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

MCS	Index	Spatial	OFDMA (802.11ax/be)											
		Stream		26T			52T			106T			242T	
HE	EHT		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	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
1	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
2	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
3	3	1	3.5	3.3	3	7.1	6.7	6	15	14.2	12.8	34.4	32.5	29.3
4	4	1	5.3	5	4.5	10.6	10	9	22.5	21.3	19.1	51.6	48.8	43.9
5	5	1	7.1	6.7	6	14.1	13.3	12	30	28.3	25.5	68.8	65	58.5
6	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
7	7	1	8.8	8.3	7.5	17.6	16.7	15	37.5	35.4	31.9	86	81.3	73.1
8	8	1	10.6	10	9	21.2	20	18	45	42.5	38.3	103.2	97.5	87.8
9	9	1	11.8	11.1	10	23.5	22.2	20	50	47.2	42.5	114.7	108.3	97.5
10	10	1	13.2	12.5	11.3	26.5	25	22.5	56.3	53.1	47.8	129	121.9	109.7
11	11	1	14.7	13.9	12.5	29.4	27.8	25	62.5	59	53.1	143.4	135.4	121.9
	12	1	15.9	15	13.5	31.8	30	27	67.5	63.8	57.4	154.9	146.3	131.6
	13	1	17.6	16.7	15	35.3	33.3	30	75	70.8	63.8	172.1	162.5	146.3
0	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
1	1	2	3.5	3.3	3	7.1	6.7	6	15	14.2	12.8	34.4	32.5	29.3
2	2	2	5.3	5	4.5	10.6	10	9	22.5	21.3	19.1	51.6	48.8	43.9
3	3	2	7.1	6.7	6	14.1	13.3	12	30	28.3	25.5	68.8	65	58.5
4	4	2	10.6	10	9	21.2	20	18	45	42.5	38.3	103.2	97.5	87.8
5	5	2	14.1	13.3	12	28.2	26.7	24	60	56.7	51	137.6	130	117
6	6	2	15.9	15	13.5	31.8	30	27	67.5	63.8	57.4	154.9	146.3	131.6
7	7	2	17.6	16.7	15	35.3	33.3	30	75	70.8	63.8	172.1	162.5	146.3
8	8	2	21.2	20	18	42.4	40	36	90	85	76.5	206.5	195	175.5
9	9	2	23.5	22.2	20	47.1	44.4	40	100	94.4	85	229.4	216.7	195
10	10	2	26.5	25	22.5	52.9	50	45	112.5	106.3	95.6	258.1	243.8	219.4
11	11	2	29.4	27.8	25	58.8	55.6	50	125	118.1	106.3	286.8	270.8	243.8
	12	2	31.8	30	27	63.5	60	54	135	127.5	114.8	309.7	292.5	263.3
	13	2	35.3	33.3	30	70.6	66.7	60	150	141.7	127.5	344.1	325	292.5

 Table 2-4. Supported Data Rates

# 2.3 Test Configuration

ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions 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.

### 2.4 Antenna Description

The following antenna gains were used for the testing.

Frequency [GHz]	Antenna-1 Gain [dBi]	Antenna-2 Gain [dBi]	Directional Gain [dBi]			
2.4	0.55	0.14	3.36			

 Table 2-5. Antenna Peak Gain

#### 2.5 Software and Firmware

The test was conducted with software/firmware version 2024.111.46 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) was used in the measurement of the EUT.

Deviation from measurement procedure.....None

# 3.2 Radiated Emissions

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

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

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

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

#### **Conclusion:**

The EUT unit complies with the requirement of §15.203.

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# 5.0 MEASUREMENT UNCERTAINTY

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

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

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# 6.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
N/A	WL25-1	Conducted Cable Set (25GHz)	11/15/2023	Annual	11/15/2024	WL25-1
N/A	WL25-2	WLAN Cable Set (25GHz)	11/15/2023	Annual	11/15/2024	WL25-2
N/A	WL40-1	WLAN Cable Set (40GHz)	11/15/2023	Annual	11/15/2024	WL40-1
N/A	ETS-001	EMC Cable and Switch System	11/15/2023	Annual	11/15/2024	ETS-001
N/A	ETS-002	EMC Cable and Switch System	11/15/2023	Annual	11/15/2024	ETS-002
N/A	AP1-002	EMC Cable and Switch System	11/15/2023	Annual	11/15/2024	AP1-002
N/A	AP2-001	EMC Cable and Switch System	11/15/2023	Annual	11/15/2024	AP2-001
N/A	AP2-002	EMC Cable and Switch System	11/15/2023	Annual	11/15/2024	AP2-002
Anritsu	MA2411B	Pulse Power Sensor	11/8/2023	Annual	11/8/2024	1027293
Anritsu	MA2411B	Pulse Power Sensor	6/14/2023	Annual	6/14/2024	1911105
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	4/13/2022	Biennial	4/13/2024	121034
Keysight Technologies	N9038A	MXE EMI Receiver	8/30/2023	Annual	8/30/2024	MY51210133
Keysight Technologies	N9030A	PXA Signal Analyzer	2/29/2024	Annual	3/1/2025	MY55410501
Keysight Technologies	N9020A	MXA Signal Analyzer	3/15/2023	Annual	3/15/2024	MY54500644
Pasternack	NMLC-2	Line Conducted Emissions Cable (NM)	11/15/2023	Annual	11/15/2024	NMLC-2
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	9/25/2023	Annual	9/25/2024	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/11/2023	Annual	9/11/2024	100348
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	2/15/2024	Annual	2/15/2025	103200
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	3/15/2023	Biennial	3/15/2025	102136
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	3/15/2023	Biennial	3/15/2025	102132
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	1/11/2024	Annual	1/11/2025	102151
Sunol Sciences	DRH-118	Horn (Small)	2/21/2024	Biennial	2/21/2026	A050307
Sunol Sciences	JB5	Bi-Log Antenna (30M-5GHz)	8/30/2022	Biennial	8/30/2024	A051107

Table 6-1. Annual Test Equipment Calibration Schedule

#### Note:

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

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# 7.0 TEST RESULTS

### 7.1 Summary

Company Name:	Microsoft Corporation
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FCC Classification:	Digital Transmission System (DTS)

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(2)	RSS-247 [5.2(a)]	6dB Bandwidth	The minimum 6 dB bandwidth shall be at least 500 kHz.		PASS	Section 7.2
15.247(b)(3)	RSS-247 [5.4(b)]	Transmitter Output Power	shall not exceed 1 W		PASS	Section 7.3
N/A	RSS-247 [5.4(b)]	e.i.r.p	Shall not exceed 4 W	CONDUCTED	PASS	Section 7.3
15.247(e)	RSS-247 [5.2(b)]	Transmitter Power Spectral Density	shall not be greater than 8 dBm in any 3 kHz band		PASS	Section 7.4
15.247(d)	RSS-247 [5.5]	Band Edge / Out-of-Band Emissions	≥ 20dBc		PASS	Sections 7.5, 7.6
15.205 15.209	RSS-Gen [8.9]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209 (RSS-Gen [8.9])	RADIATED	PASS	Section 7.7

Table 7-1. Summary of Test Results

#### Notes:

- 1) All modes of operation and data rates were investigated. 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 "WLAN Automation," Version 3.5.
- 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.
- 802.11be OFDMA testing was performed for all signal tone configurations as specified by the 802.11be standard. Worst case results are determined and reported per the guidance provided at the October 2018 TCB Workshop.

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## 7.2 6dB Bandwidth Measurement

#### Test Overview and Limit

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the transmitter antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated and the worst-case configuration results are reported in this section.

#### The minimum 6 dB bandwidth shall be at least 500 kHz.

#### Test Procedure Used

ANSI C63.10-2013 - Section 11.8.2 Option 2

#### **Test Settings**

- The signal analyzer's automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 100kHz
- 3. VBW  $\geq$  3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize

#### 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. Based on preliminary measurements, it was determined that, of all the tone configurations, the 26T configuration produced the worst case 6dB Bandwidth measurement. Only the worst-case data is included in this section.
- 2. The 6dB bandwidth for each channel was measured with the RU index showing the highest conducted power.

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# 6dB Bandwidth Measurements

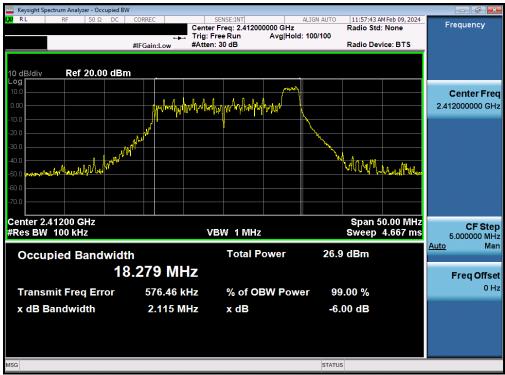
Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Antenna-1 6dB Bandwidth [MHz]	Antenna-2 6dB Bandwidth [MHz]	Minimum Bandwidth [MHz]
2412	1	be	26T	MCS0	2.12	2.11	0.500
2437	6	be	26T	MCS0	2.12	2.15	0.500
2462	11	be	26T	MCS0	2.10	2.06	0.500
2412	1	be	242T	MCS0	19.05	19.14	0.500
2437	6	be	242T	MCS0	19.10	19.06	0.500
2462	11	be	242T	MCS0	19.10	19.10	0.500
2422	3	be	484T	MCS0	38.13	38.08	0.500
2437	6	be	484T	MCS0	38.21	37.95	0.500
2462	11	be	484T	MCS0	38.13	38.18	0.500

Table 7-2. Conducted 6dB Bandwidth Measurements MIMO

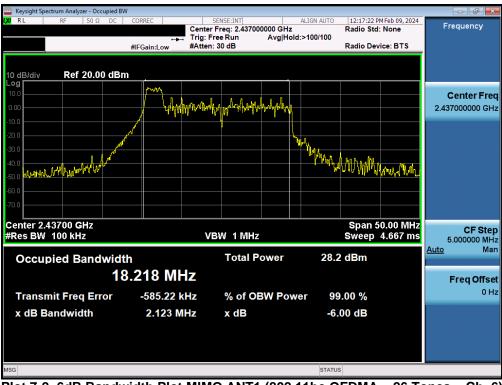
FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT		
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# 7.2.1 MIMO Antenna-1 6dB Bandwidth Measurements



Plot 7-1. 6dB Bandwidth Plot MIMO ANT1 (802.11be OFDMA – 26 Tones – Ch. 1)



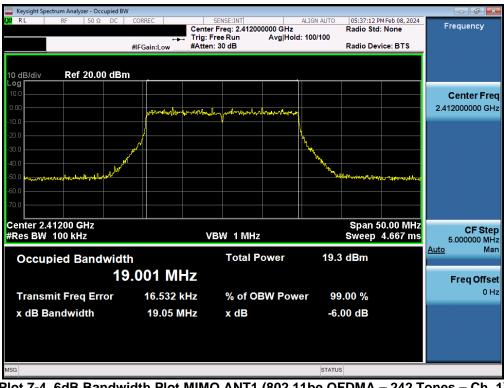
Plot 7-2. 6dB Bandwidth Plot MIMO ANT1 (802.11be OFDMA – 26 Tones – Ch. 6)

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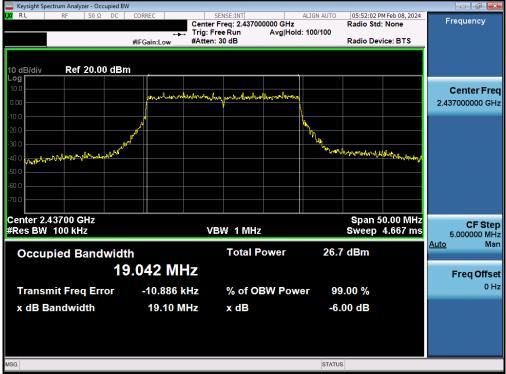
Plot 7-3. 6dB Bandwidth Plot MIMO ANT1 (802.11be OFDMA – 26 Tones – Ch. 11)



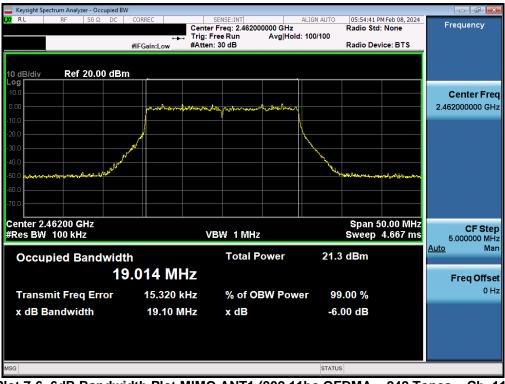
Plot 7-4. 6dB Bandwidth Plot MIMO ANT1 (802.11be OFDMA – 242 Tones – Ch. 1)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
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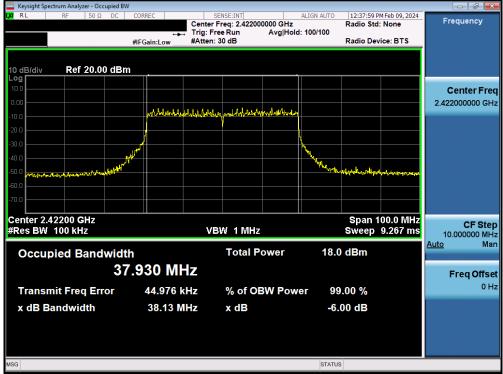
Plot 7-5. 6dB Bandwidth Plot MIMO ANT1 (802.11be OFDMA - 242 Tones - Ch. 6)



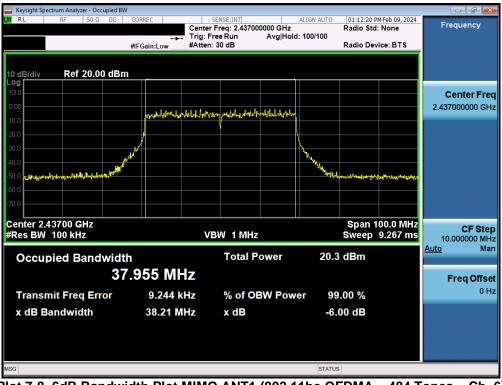
Plot 7-6. 6dB Bandwidth Plot MIMO ANT1 (802.11be OFDMA – 242 Tones – Ch. 11)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
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Plot 7-7. 6dB Bandwidth Plot MIMO ANT1 (802.11be OFDMA - 484 Tones - Ch. 3)



Plot 7-8. 6dB Bandwidth Plot MIMO ANT1 (802.11be OFDMA - 484 Tones - Ch. 6)

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Keysight Spectrum Analyzer - Occupied B						
<mark>ιχ)</mark> RL RF 50Ω DC	CORREC	SENSE:INT r Freg: 2.462000000 GHz	ALIGN AUTO	01:25:39 F Radio Std	M Feb 09, 2024	Frequency
		Free Run Avg Hol n: 30 dB	d: 100/100	Radio Dev	vice: BTS	
	#IFGain:Low #Atter	1. 30 0.5		Radio De	VICE. DTS	
10 dB/div Ref 20.00 dBr	~					
Log	<u>"</u>					
10.0						Center Freq
0.00						2.462000000 GHz
-10.0						
-20.0	mbelahuhuhuhuhu	hoy and all marked described				
-30.0						
-40.0	. v					
-50.0 manustration to be a series of the ser	the second se		Walter Marry	in white a state of the second	adal and a stranged	
-60.0						
-70.0						
Center 2.46200 GHz				Span 1	00.0 MHz	CF Step
#Res BW 100 kHz	V	BW 1 MHz			9.267 ms	10.000000 MHz
Occupied Bandwidt	the second second	Total Power	2.82	dBm		<u>Auto</u> Man
		Total Tower	2.02			
38	3.017 MHz					Freq Offset
Transmit Freq Error	-10.198 kHz	% of OBW Pow	ver 99	.00 %		0 Hz
x dB Bandwidth	38.13 MHz	x dB	-6-	00 dB		
			0.			
MSG			STATUS	3		

Plot 7-9. 6dB Bandwidth Plot MIMO ANT1 (802.11be OFDMA – 484 Tones – Ch. 11)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
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# 7.2.2 MIMO Antenna-2 6 dB Bandwidth Measurements

Keysight Spectrum Analyzer - Occupied BW RL SENSE:IN ALIGN AUTO 12:01:59 PM Feb 09, 2024 Frequency Center Freq: 2.412000000 GHz Trig: Free Run Avg|Hol Radio Std: None Avg|Hold: 100/100 #IFGain:Low #Atten: 30 dB Radio Device: BTS 10 dB/div Ref 20.00 dBm \_00 **Center Freq** ๛ๅ๛ฦ๚๛๚๛๚๛๛๚ 2.412000000 GHz MMMuranahar w/m/ Met. I Center 2.41200 GHz #Res BW 100 kHz Span 50.00 MHz **CF** Step VBW 1 MHz Sweep 4.667 ms 5.000000 MHz Man Auto Total Power 26.8 dBm Occupied Bandwidth 18.189 MHz **Freq Offset** 0 Hz Transmit Freq Error 540.67 kHz % of OBW Power 99.00 % 2.106 MHz x dB Bandwidth x dB -6.00 dB MSG STATUS

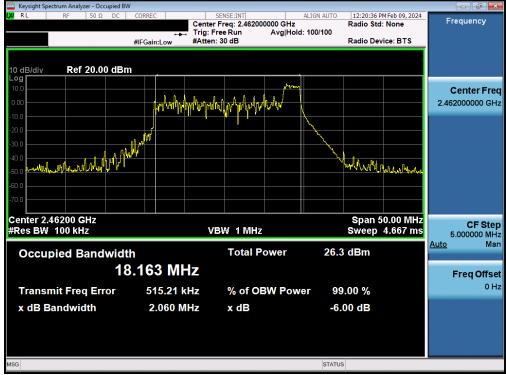
Plot 7-10. 6dB Bandwidth Plot MIMO ANT2 (802.11be OFDMA – 26 Tones – Ch. 1)



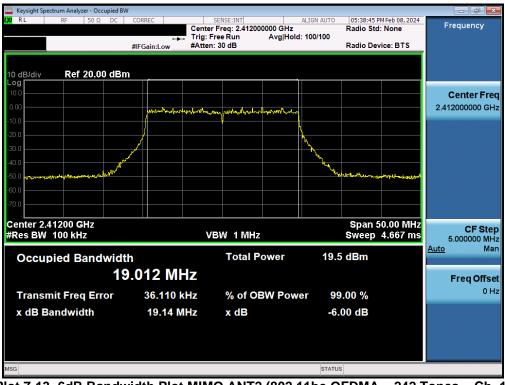
Plot 7-11. 6dB Bandwidth Plot MIMO ANT2 (802.11be OFDMA – 26 Tones – Ch. 6)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT		Approved by: Technical Manager
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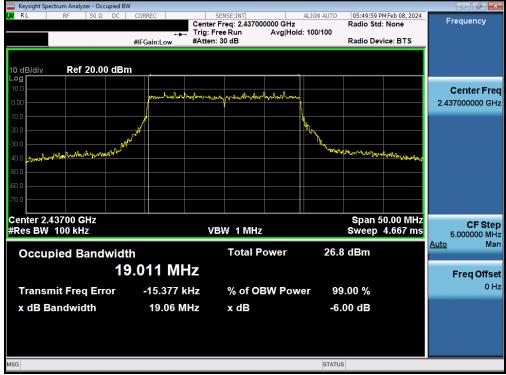
Plot 7-12. 6dB Bandwidth Plot MIMO ANT2 (802.11be OFDMA - 26 Tones - Ch. 11)



Plot 7-13. 6dB Bandwidth Plot MIMO ANT2 (802.11be OFDMA – 242 Tones – Ch. 1)

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Plot 7-14. 6dB Bandwidth Plot MIMO ANT2 (802.11be OFDMA - 242 Tones - Ch. 6)



Plot 7-15. 6dB Bandwidth Plot MIMO ANT2 (802.11be OFDMA – 242 Tones – Ch. 11)

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Keysight Spectrum Analyzer - Occupied BW						
LXI RL RF 50Ω DC	CORREC	SENSE:INT	ALIGN AUTO		M Feb 09, 2024	Frequency
		r Freq: 2.422000000 GH Free Run Avg H	z old: 100/100	Radio Std	: None	Frequency
		reekun Avg∣⊓ h:30 dB	ola: 100/100	Radio Dev	vice: BTS	
	#IFGdill.LOW #/tech	1. 00 UD		Itaalo Bel		
10 dB/div Ref 20.00 dBm						
Log						
10.0						Center Freq
0.00						2.422000000 GHz
-10.0	march and a state of the states	he mark hours	ho			
			a l			
-20.0						
-30.0	- M		- <u>h</u>			
-40.0	<u>/'</u>		19 <sub>10</sub>			
-50.0			Muran .	A	A	
and the state of t				and to be the state of the stat	arter a la l	
-60.0						
-70.0						
Center 2.42200 GHz				Span 1	00.0 MHz	CF Step
#Res BW 100 kHz	۷	'BW 1 MHz		Sweep	9.267 ms	10.000000 MHz
				-		Auto Man
Occupied Bandwidth	า	Total Power	17.7	7 dBm		
31	.909 MHz					Freq Offset
Tronomit Erog Error	35.023 kHz	% of OBW Po		9.00 %		0 Hz
Transmit Freq Error	55.025 KHZ	% OF OBW PO	wei 95	0.00 %		
x dB Bandwidth	38.08 MHz	x dB	-6.	00 dB		
MSG			STATU	s		
			01410			

Plot 7-16. 6dB Bandwidth Plot MIMO ANT2 (802.11be OFDMA - 484 Tones - Ch. 3)



Plot 7-17. 6dB Bandwidth Plot MIMO ANT2 (802.11be OFDMA – 484 Tones – Ch. 6)

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Keysight Spectrum Analyzer - Occupied BW	000050					
XV RL RF 50Ω DC	CORREC	SENSE:INT Center Freq: 2.46200		Radio Sto	PM Feb 09, 2024 I: None	Frequency
	++→ #IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Hold: 100/100	Radio De	vice: BTS	
	#I Gam.Low					
10 dB/div Ref 20.00 dBm						
Log						
10.0						Center Fre
0.00						2.462000000 GH
10.0						
20.0	shamperla	whether was have	مهلها والعالمة			
30.0						
-40.0			<u> </u>			
50.0 www.www.www.shawty.a.	He Mar		- Annew	*****	ի՝ուսաներիլորես	
60.0						
-70.0						
Center 2.46200 GHz #Res BW 100 kHz		VBW 1 MHz			100.0 MHz 9.267 ms	CF Ste
				encop		10.000000 MH Auto Ma
Occupied Bandwidth	1	Total P	ower 2.	.72 dBm		
37	.965 M⊦	7				Freq Offse
Transmit Freq Error	8.867 k	Hz % of O	BW Power	99.00 %		01
x dB Bandwidth	38.18 M	Hz xdB		-6.00 dB		
SG			ST/	ATUS		

Plot 7-18. 6dB Bandwidth Plot MIMO ANT2 (802.11be OFDMA – 484 Tones – Ch. 11)

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### 7.3 Output Power Measurement

#### Test Overview and Limits

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter capable of making peak and average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

# The maximum permissible conducted output power is 1 Watt per 15.247 and RSS-247. The e.i.r.p. shall not exceed 4 W per RSS-247.

#### **Test Procedure Used**

ANSI C63.10-2013 – Section 11.9.1.3 PKPM1 Peak Power Method ANSI C63.10-2013 – Section 11.9.2.3.2 Method AVGPM-G ANSI C63.10-2013 – Section 14.2 Measure-and-Sum Technique

#### Test Settings

#### Method PKPM1 (Peak Power Measurement)

Peak 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 pulse sensor employs a VBW = 50MHz so this method was only used for signals whose DTS bandwidth was less than or equal to 50MHz.

#### Method AVGPM-G (Average Power Measurement)

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 diagrams below.



#### Figure 7-2. Test Instrument & Measurement Setup for Power Meter Measurements

#### Test Notes

None.

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Freq [MHz]	Channel	Tones	RU Index			Conducted I	Power [dBm]			Conducted Power	Avg Conducted	Peak Conducted	Ant. Gain	Max e.i.r.p	e.i.r.p Limit	e.i.r.p Margin
Fied [win2]	Channel	Tones	RO IIIdex	Anter	nna-1	Ante	nna-2	MI	MO		Power Margin [dB]	Power Margin [dB]	[dBi]	[dBm]	[dBm]	[dB]
				AVG	PEAK	AVG	PEAK	AVG	PEAK	[dBm]						
			0	17.84	25.04	17.38	24.67	20.63	27.87	30.00	-9.37	-2.13	3.36	23.98	36.02	-12.04
2412	1	26T	4	17.49	25.01	16.93	24.68	20.23	27.86	30.00	-9.77	-2.14	3.36	23.59	36.02	-12.43
			8	17.86	24.95	17.55	24.84	20.72	27.91	30.00	-9.28	-2.09	3.36	24.08	36.02	-11.94
			0	19.43	26.75	19.35	26.65	22.40	29.71	30.00	-7.60	-0.29	3.36	25.76	36.02	-10.26
2417	2	26T	4	19.65	26.81	19.51	26.73	22.59	29.78	30.00	-7.41	-0.22	3.36	25.95	36.02	-10.07
			8	19.74	26.95	19.70	26.92	22.73	29.95	30.00	-7.27	-0.05	3.36	26.09	36.02	-9.93
			0	19.64	26.43	19.96	26.79	22.81	29.62	30.00	-7.19	-0.38	3.36	26.17	36.02	-9.85
2437	6	26T	4	19.43	26.46	19.77	26.91	22.61	29.70	30.00	-7.39	-0.30	3.36	25.97	36.02	-10.05
			8	19.45	25.66	19.85	25.99	22.66	28.84	30.00	-7.34	-1.16	3.36	26.02	36.02	-10.00
			0	19.68	26.28	19.99	26.65	22.85	29.48	30.00	-7.15	-0.52	3.36	26.21	36.02	-9.81
2457	10	26T	4	19.25	26.33	19.63	26.81	22.45	29.59	30.00	-7.55	-0.41	3.36	25.81	36.02	-10.21
			8	19.65	26.44	19.81	26.87	22.74	29.67	30.00	-7.26	-0.33	3.36	26.10	36.02	-9.92
			0	17.15	24.98	17.73	25.11	20.46	28.06	30.00	-9.54	-1.94	3.36	23.82	36.02	-12.20
2462	11	26T	4	17.25	25.37	17.53	25.97	20.40	28.69	30.00	-9.60	-1.31	3.36	23.76	36.02	-12.26
			8	17.54	25.28	17.78	25.72	20.67	28.52	30.00	-9.33	-1.48	3.36	24.03	36.02	-11.99
			0	-5.10	2.86	-4.82	2.55	-1.95	5.72	30.00	-31.95	-24.28	3.36	1.41	36.02	-34.61
2467	12	26T	4	-4.92	3.29	-4.94	3.21	-1.92	6.26	30.00	-31.92	-23.74	3.36	1.44	36.02	-34.58
l			8	-5.24	2.54	-4.83	2.99	-2.02	5.78	30.00	-32.02	-24.22	3.36	1.34	36.02	-34.68
1			0	-6.59	1.04	-6.55	0.99	-3.56	4.02	30.00	-33.56	-25.98	3.36	-0.20	36.02	-36.22
2472	13	26T	4	-6.48	1.57	-6.54	1.48	-3.50	4.53	30.00	-33.50	-25.47	3.36	-0.14	36.02	-36.16
1			8	-6.58	1.53	-6.56	1.44	-3.56	4.49	30.00	-33.56	-25.51	3.36	-0.21	36.02	-36.23

Table 7-3. Conducted Output Power Measurements MIMO (26 Tones)

Correction and	Channel	Tones	Dittaday			Conducted F	Power [dBm]			Conducted Power	Avg Conducted	Peak Conducted	Ant. Gain	Max e.i.r.p	e.i.r.p Limit	e.i.r.p Margin
Freq [MHz]	Channel	Tones	RU Index	Anter	nna-1	Ante	nna-2	MI	MO		Power Margin [dB]	Power Margin [dB]	[dBi]	[dBm]	[dBm]	[dB]
				AVG	PEAK	AVG	PEAK	AVG	PEAK	[dBm]						
			37	18.32	25.36	18.16	25.28	21.25	28.33	30.00	-8.75	-1.67	3.36	24.61	36.02	-11.41
2412	1	52T	38	18.11	25.35	17.98	25.28	21.06	28.33	30.00	-8.94	-1.67	3.36	24.41	36.02	-11.61
			40	18.27	25.36	18.31	25.27	21.30	28.33	30.00	-8.70	-1.67	3.36	24.66	36.02	-11.36
			37	19.39	26.71	19.31	26.76	22.36	29.75	30.00	-7.64	-0.25	3.36	25.72	36.02	-10.30
2417	2	52T	38	19.32	26.81	19.26	26.73	22.30	29.78	30.00	-7.70	-0.22	3.36	25.66	36.02	-10.36
			40	19.62	26.98	19.62	26.80	22.63	29.90	30.00	-7.37	-0.10	3.36	25.99	36.02	-10.03
			37	19.64	26.34	19.96	26.84	22.81	29.61	30.00	-7.19	-0.39	3.36	26.17	36.02	-9.85
2437	6	52T	38	19.56	26.49	19.96	26.96	22.77	29.74	30.00	-7.23	-0.26	3.36	26.13	36.02	-9.89
			40	19.28	26.05	19.67	26.49	22.49	29.29	30.00	-7.51	-0.71	3.36	25.85	36.02	-10.17
			37	19.15	26.02	19.60	26.33	22.39	29.19	30.00	-7.61	-0.81	3.36	25.75	36.02	-10.27
2457	10	52T	38	19.46	26.39	19.71	26.99	22.60	29.71	30.00	-7.40	-0.29	3.36	25.95	36.02	-10.07
			40	19.27	26.08	19.68	26.49	22.49	29.30	30.00	-7.51	-0.70	3.36	25.85	36.02	-10.17
			37	17.34	25.51	17.56	25.91	20.46	28.72	30.00	-9.54	-1.28	3.36	23.82	36.02	-12.20
2462	11	52T	38	17.35	25.61	17.54	25.97	20.46	28.80	30.00	-9.54	-1.20	3.36	23.81	36.02	-12.21
			40	17.51	25.56	17.74	25.93	20.64	28.76	30.00	-9.36	-1.24	3.36	23.99	36.02	-12.03
			37	-1.07	6.81	-0.91	6.82	2.02	9.83	30.00	-27.98	-20.17	3.36	5.38	36.02	-30.64
2467	12	52T	38	-0.71	7.47	-0.78	7.35	2.27	10.42	30.00	-27.73	-19.58	3.36	5.62	36.02	-30.40
			40	-0.79	7.28	-0.54	7.33	2.35	10.32	30.00	-27.65	-19.68	3.36	5.70	36.02	-30.32
			37	-4.71	3.12	-4.67	3.06	-1.68	6.10	30.00	-31.68	-23.90	3.36	1.68	36.02	-34.34
2472	13	52T	38	-4.88	3.09	-4.96	3.01	-1.91	6.06	30.00	-31.91	-23.94	3.36	1.45	36.02	-34.57
			40	-4.98	3.16	-5.00	3.01	-1.98	6.10	30.00	-31.98	-23.90	3.36	1.38	36.02	-34.64

Table 7-4. Conducted Output Power Measurements MIMO (52 Tones)

		_				Conducted I	Power [dBm]			Conducted Power	Avg Conducted	Peak Conducted	Ant. Gain	Max e.i.r.p	e.i.r.p Limit	e.i.r.p Margin
Freq [MHz]	Channel	Tones	MRU Index	Ante	nna-1	Ante	nna-2	M	MO	Limit	Power Margin [dB]	Power Margin [dB]	[dBi]	[dBm]	[dBm]	[dB]
				AVG	PEAK	AVG	PEAK	AVG	PEAK	[dBm]						
			70	18.05	24.93	18.29	25.46	21.18	28.21	30.00	-8.82	-1.79	3.36	24.54	36.02	-11.48
2412	1	52+26T	71	17.91	24.78	18.22	25.27	21.08	28.04	30.00	-8.92	-1.96	3.36	24.44	36.02	-11.58
			72	18.06	24.92	17.23	25.26	20.68	28.10	30.00	-9.32	-1.90	3.36	24.03	36.02	-11.99
			70	19.44	26.80	19.33	26.58	22.40	29.70	30.00	-7.60	-0.30	3.36	25.76	36.02	-10.26
2417	2	52+26T	71	19.18	26.82	19.10	26.84	22.15	29.84	30.00	-7.85	-0.16	3.36	25.51	36.02	-10.51
			72	19.36	26.73	19.35	26.74	22.37	29.75	30.00	-7.63	-0.25	3.36	25.72	36.02	-10.30
			70	19.64	26.32	19.86	26.83	22.76	29.59	30.00	-7.24	-0.41	3.36	26.12	36.02	-9.90
2437	6	52+26T	71	19.58	26.41	19.81	26.82	22.71	29.63	30.00	-7.29	-0.37	3.36	26.06	36.02	-9.96
			72	19.65	26.42	19.99	26.82	22.83	29.63	30.00	-7.17	-0.37	3.36	26.19	36.02	-9.83
			70	19.52	26.12	19.99	26.81	22.77	29.49	30.00	-7.23	-0.51	3.36	26.13	36.02	-9.89
2457	10	52+26T	71	19.43	26.33	19.89	26.85	22.68	29.61	30.00	-7.32	-0.39	3.36	26.03	36.02	-9.99
			72	19.49	26.15	19.78	26.83	22.65	29.51	30.00	-7.35	-0.49	3.36	26.01	36.02	-10.01
			70	17.44	25.32	17.93	25.67	20.70	28.51	30.00	-9.30	-1.49	3.36	24.06	36.02	-11.96
2462	11	52+26T	71	17.33	25.41	17.71	25.76	20.53	28.60	30.00	-9.47	-1.40	3.36	23.89	36.02	-12.13
			72	17.41	25.34	17.67	25.69	20.55	28.53	30.00	-9.45	-1.47	3.36	23.91	36.02	-12.11
			70	-0.65	7.08	-0.65	7.15	2.36	10.13	30.00	-27.64	-19.87	3.36	5.72	36.02	-30.30
2467	12	52+26T	71	-0.74	7.03	-0.81	7.15	2.24	10.10	30.00	-27.76	-19.90	3.36	5.59	36.02	-30.43
			72	-0.69	7.07	-0.61	7.18	2.36	10.14	30.00	-27.64	-19.86	3.36	5.72	36.02	-30.30
	_		70	-4.85	2.75	-4.93	2.82	-1.88	5.80	30.00	-31.88	-24.20	3.36	1.48	36.02	-34.54
2472	13	52+26T	71	-4.98	2.17	-5.00	2.98	-1.98	5.60	30.00	-31.98	-24.40	3.36	1.38	36.02	-34.64
			72	-5.26	1.58	-4.89	2.74	-2.06	5.21	30.00	-32.06	-24.79	3.36	1.30	36.02	-34.72

Table 7-5. Conducted Output Power Measurements MIMO (52 + 26 Tones)

En a la dela	req [MHz] Channel Tones	Tones	Tones	RU Index			Conducted I	Power [dBm]			Conducted Power	Avg Conducted	Peak Conducted	Ant. Gain	Max e.i.r.p	e.i.r.p Limit	e.i.r.p Margin
Freq [MHZ]	Channel	Tones	RU Index	Anter	nna-1	Ante	nna-2	MI	мо		Power Margin [dB]	Power Margin [dB]	[dBi]	[dBm]	[dBm]	[dB]	
				AVG	PEAK	AVG	PEAK	AVG	PEAK	[dBm]							
2412	1	106T	53	17.24	25.03	16.63	24.69	19.96	27.87	30.00	-10.04	-2.13	3.36	23.31	36.02	-12.71	
2412		1001	54	17.16	24.95	16.73	24.84	19.96	27.91	30.00	-10.04	-2.09	3.36	23.32	36.02	-12.70	
2417	2	106T	53	19.28	26.80	19.19	26.61	22.24	29.72	30.00	-7.76	-0.28	3.36	25.60	36.02	-10.42	
2417	2	1001	54	19.42	26.89	19.38	26.82	22.41	29.87	30.00	-7.59	-0.13	3.36	25.77	36.02	-10.25	
2437	4	106T	53	19.62	26.51	19.86	26.71	22.75	29.62	30.00	-7.25	-0.38	3.36	26.11	36.02	-9.91	
2437	0	1001	54	19.67	26.46	19.99	26.79	22.84	29.64	30.00	-7.16	-0.36	3.36	26.20	36.02	-9.82	
2457	10	106T	53	19.56	26.31	19.99	26.82	22.79	29.58	30.00	-7.21	-0.42	3.36	26.15	36.02	-9.87	
2437	10	1001	54	19.54	26.38	19.76	26.88	22.66	29.65	30.00	-7.34	-0.35	3.36	26.02	36.02	-10.00	
2462	11	106T	53	17.42	25.57	17.61	25.79	20.53	28.69	30.00	-9.47	-1.31	3.36	23.88	36.02	-12.14	
2402		1001	54	17.44	25.58	17.64	25.78	20.55	28.69	30.00	-9.45	-1.31	3.36	23.91	36.02	-12.11	
2467	12	106T	53	-0.20	7.98	-0.08	7.92	2.87	10.96	30.00	-27.13	-19.04	3.36	6.23	36.02	-29.79	
2407	12	1001	54	-0.18	7.94	-0.08	7.88	2.88	10.92	30.00	-27.12	-19.08	3.36	6.24	36.02	-29.78	
2472	13	106T	53	-2.32	5.71	-2.27	5.64	0.71	8.69	30.00	-29.29	-21.31	3.36	4.07	36.02	-31.95	
24/2	13	1061	54	-2.42	5.82	-2.50	5.67	0.55	8.75	30.00	-29.45	-21.25	3.36	3.91	36.02	-32.11	

Table 7-6. Conducted Output Power Measurements MIMO (106 Tones)

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Eron [Mila]	Freq [MHz] Channel	Tones	MRU Index			Conducted I	Power [dBm]			Conducted Power	Avg Conducted	Peak Conducted	Ant. Gain	Max e.i.r.p	e.i.r.p Limit	e.i.r.p Margin
Freq (Winz)	Channel	Tones	WRO IIIdex	Anter	nna-1	Ante	nna-2	MI	MO	[dBm]	Power Margin (dB)	Power Margin [dB]	(dBi)	[dBm]	(dBm)	[dB]
				AVG	PEAK	AVG	PEAK	AVG	PEAK							
2412	1	106+26T	82	16.96	23.99	17.22	24.41	20.10	27.22	30.00	-9.90	-2.78	3.36	23.46	36.02	-12.56
2412		100+201	83	17.01	23.81	17.28	24.55	20.16	27.21	30.00	-9.84	-2.79	3.36	23.52	36.02	-12.50
2417	2	106+26T	82	19.38	26.66	19.34	26.67	22.37	29.68	30.00	-7.63	-0.32	3.36	25.73	36.02	-10.29
2417	-	100+201	83	19.35	26.91	19.32	26.93	22.35	29.93	30.00	-7.65	-0.07	3.36	25.71	36.02	-10.31
2437	4	106+26T	82	19.64	26.58	19.99	26.99	22.83	29.80	30.00	-7.17	-0.20	3.36	26.19	36.02	-9.83
2437	0	100+201	83	19.64	26.53	19.99	26.91	22.83	29.73	30.00	-7.17	-0.27	3.36	26.19	36.02	-9.83
2457	10	106+26T	82	19.45	26.61	19.98	27.00	22.73	29.82	30.00	-7.27	-0.18	3.36	26.09	36.02	-9.93
2437	10	1001201	83	19.46	26.46	19.74	26.82	22.61	29.65	30.00	-7.39	-0.35	3.36	25.97	36.02	-10.05
2462	11	106+26T	82	17.38	25.71	17.81	25.76	20.61	28.75	30.00	-9.39	-1.25	3.36	23.97	36.02	-12.05
2402		100+201	83	17.40	25.66	17.59	25.99	20.51	28.84	30.00	-9.49	-1.16	3.36	23.86	36.02	-12.16
2467	12	106+26T	82	-0.33	7.88	-0.26	7.84	2.72	10.87	30.00	-27.28	-19.13	3.36	6.07	36.02	-29.95
2407	12	1001201	83	-0.27	7.99	-0.19	7.98	2.78	11.00	30.00	-27.22	-19.00	3.36	6.14	36.02	-29.88
2472	13	106+26T	82	-2.51	5.54	-2.56	5.49	0.48	8.53	30.00	-29.52	-21.47	3.36	3.83	36.02	-32.19
24/2	13	100+201	83	-2.78	5.68	-2.44	5.79	0.40	8.75	30.00	-29.60	-21.25	3.36	3.76	36.02	-32.26

Table 7-7. Conducted Output Power Measurements MIMO (106 + 26 Tones)

Freq [MHz]	Channel	<b>.</b>	RU Index		Conducted Power [dBm]					Conducted Power	Avg Conducted	Peak Conducted	Ant. Gain	Max e.i.r.p	e.i.r.p Limit	e.i.r.p Margin
Freq [MHZ]	Channel	Tones	RU Index	Ante	nna-1	Ante	nna-2	MI	MO	[dBm]	Power Margin [dB]	Power Margin [dB]	[dBi]	[dBm]	(dBm)	[dB]
				AVG	PEAK	AVG	PEAK	AVG	PEAK	(asm)						
2412	1	242T	61	11.53	20.43	11.10	20.33	14.33	23.39	30.00	-15.67	-6.61	3.36	17.69	36.02	-18.33
2417	2	242T	61	15.32	23.53	15.11	23.49	18.23	26.52	30.00	-11.77	-3.48	3.36	21.58	36.02	-14.44
2422	3	242T	61	19.07	26.35	18.88	26.55	21.99	29.46	30.00	-8.01	-0.54	3.36	25.34	36.02	-10.68
2437	6	242T	61	19.00	26.29	19.31	26.61	22.17	29.46	30.00	-7.83	-0.54	3.36	25.53	36.02	-10.49
2447	8	242T	61	19.05	26.42	19.44	27.13	22.26	29.80	30.00	-7.74	-0.20	3.36	25.62	36.02	-10.40
2452	9	242T	61	17.34	25.75	17.66	25.43	20.51	28.60	30.00	-9.49	-1.40	3.36	23.87	36.02	-12.15
2457	10	242T	61	17.28	25.89	17.55	26.09	20.43	29.00	30.00	-9.57	-1.00	3.36	23.79	36.02	-12.23
2462	11	242T	61	13.80	22.42	13.99	22.70	16.91	25.57	30.00	-13.09	-4.43	3.36	20.26	36.02	-15.76
2467	12	242T	61	10.33	19.15	10.44	19.21	13.40	22.19	30.00	-16.60	-7.81	3.36	16.75	36.02	-19.27
2472	13	242T	61	-2.52	6.21	-2.52	6.08	0.49	9.15	30.00	-29.51	-20.85	3.36	3.85	36.02	-32.17

Table 7-8. Conducted Output Power Measurements MIMO (242 Tones)

Free Data	reg [MHz] Channel		Fones RU Index							Peak Conducted	Ant. Gain	Max e.i.r.p	e.i.r.p Limit	e.i.r.p Margin		
Freq [MHZ]	Channel	Tones	RUINdex	Ante	nna-1	Ante	nna-2	MI	мо	[dBm]	Power Margin [dB]	Power Margin [dB]	[dBi]	[dBm]	[dBm]	[dB]
				AVG	PEAK	AVG	PEAK	AVG	PEAK							
2422	3	484T	65	12.12	19.19	12.05	19.18	15.10	22.20	30.00	-14.90	-7.80	3.36	18.46	36.02	-17.56
2427	4	484T	65	13.35	20.73	13.51	20.54	16.44	23.65	30.00	-13.56	-6.35	3.36	19.80	36.02	-16.22
2432	5	484T	65	13.65	20.71	13.45	20.55	16.56	23.64	30.00	-13.44	-6.36	3.36	19.92	36.02	-16.10
2437	6	484T	65	15.26	22.26	15.10	22.12	18.19	25.20	30.00	-11.81	-4.80	3.36	21.55	36.02	-14.47
2447	8	484T	65	15.37	23.04	15.18	22.98	18.29	26.02	30.00	-11.71	-3.98	3.36	21.65	36.02	-14.37
2452	9	484T	65	13.86	21.13	13.87	21.15	16.88	24.15	30.00	-13.12	-5.85	3.36	20.23	36.02	-15.79
2457	10	484T	65	13.07	23.31	13.13	20.44	16.11	25.12	30.00	-13.89	-4.88	3.36	19.47	36.02	-16.55
2462	11	484T	65	-0.91	6.44	-0.85	6.34	2.13	9.40	30.00	-27.87	-20.60	3.36	5.49	36.02	-30.53

Table 7-9. Conducted Output Power Measurements MIMO (484 Tones)

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Note:

Per ANSI C63.10-2013 Section 14.2, the conducted powers at Antenna 1 and Antenna 2 were first measured separately during MIMO transmission as shown in the section above. The measured values were then summed in linear power units then converted back to dBm.

#### Sample MIMO Calculation:

At 2412MHz the average conducted output power was measured to be 17.84 dBm for Antenna 1 and 17.38 dBm for Antenna 2.

Antenna 1 + Antenna 2 = MIMO

(17.84 dBm + 17.38 dBm) = (60.81 mW + 54.70 mW) = 115.52 mW = 20.63 dBm

#### Sample e.i.r.p. Calculation:

At 2412MHz the average MIMO conducted output power was calculated to be 20.63 dBm with directional gain of 3.36 dBi.

e.i.r.p. (dBm) = Conducted Power (dBm) + Ant gain (dBi)

20.63 dBm + 3.36 dBi = 23.99

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# 7.4 Power Spectral Density

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

The peak power density is measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates, tones configurations, and RU indices were investigated and the worst-case configuration results are reported in this section.

#### The maximum permissible power spectral density shall not be greater than 8 dBm in any 3 kHz band.

#### **Test Procedure Used**

ANSI C63.10-2013 – Section 11.10.2 Method PKPSD ANSI C63.10-2013 – Section 14.3.1 Measure-and-Sum Technique

#### **Test Settings**

- 1. Analyzer was set to the center frequency of the DTS channel under investigation
- 2. Span = 1.5 times the DTS channel bandwidth
- 3. RBW = 3kHz
- 4. VBW = 1MHz
- 5. Detector = peak
- 6. Sweep time = auto couple
- 7. Trace mode = max hold
- 8. Trace was allowed to stabilize

#### 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

- 1. Based on preliminary measurements, it was determined that, of all of the tone configurations, the 26T configuration produced the worst case power spectral density measurement for partial loaded case. Therefore, only the 26 Tone configuration and 242 Tone data is included in this section.
- 2. The power spectral density for each channel was measured with the RU index showing the highest conducted power.

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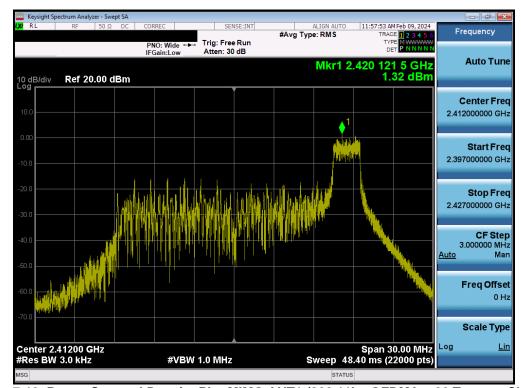
# **Power Spectral Density Measurements**

Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	ANT 1 Power Spectral Density [dBm]	ANT 2 Power Spectral Density [dBm]	Summed MIMO Power Spectral Density [dBm]	Maximum Permissible Power Density [dBm / 3kHz]	Margin [dB]	Pass / Fail
2412	1	be	26T	MCS0	1.32	0.44	3.91	8.00	-4.09	Pass
2437	6	be	26T	MCS0	3.09	2.11	5.64	8.00	-2.36	Pass
2462	11	be	26T	MCS0	0.08	-0.17	2.97	8.00	-5.03	Pass
2412	1	be	242T	MCS0	-13.45	-13.50	-10.46	8.00	-18.46	Pass
2437	6	be	242T	MCS0	-5.95	-6.12	-3.02	8.00	-11.02	Pass
2462	11	be	242T	MCS0	-12.48	-12.48	-9.47	8.00	-17.47	Pass
2422	3	be	484T	MCS0	-18.68	-24.11	-17.59	8.00	-25.59	Pass
2437	6	be	484T	MCS0	-16.45	-15.35	-12.85	8.00	-20.85	Pass
2462	11	be	484T	MCS0	-32.86	-31.97	-29.38	8.00	-37.38	Pass

Table 7-10. Conducted Power Spectral Density Measurements MIMO

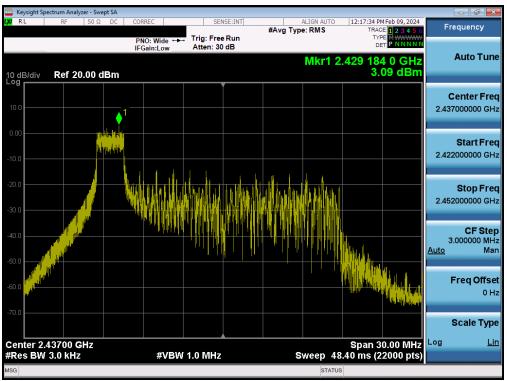
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# 7.4.1 MIMO Antenna-1 Power Spectral Density Measurements

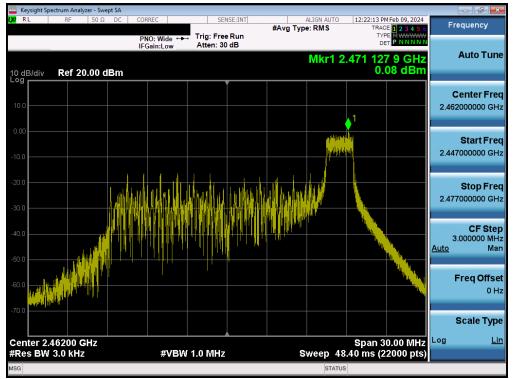




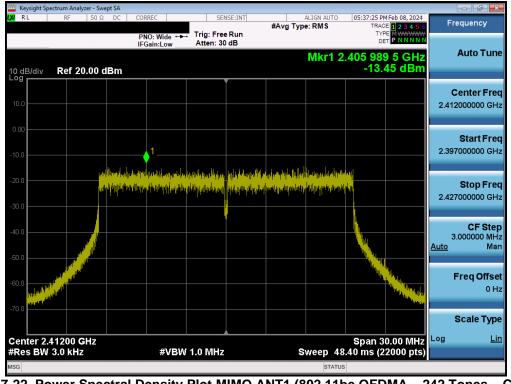
Plot 7-20. Power Spectral Density Plot MIMO ANT1 (802.11be OFDMA – 26 Tones – Ch. 6)

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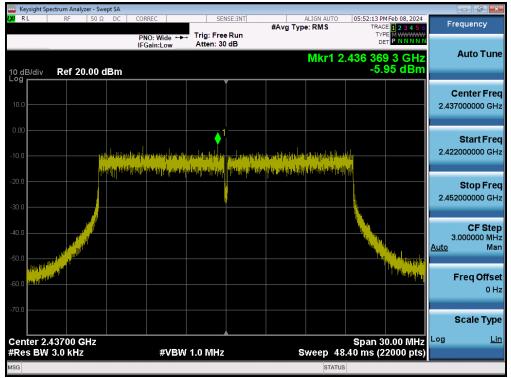
Plot 7-21. Power Spectral Density Plot MIMO ANT1 (802.11be OFDMA - 26 Tones - Ch. 11)



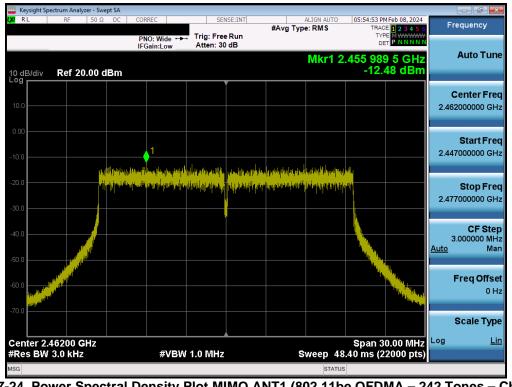
Plot 7-22. Power Spectral Density Plot MIMO ANT1 (802.11be OFDMA - 242 Tones - Ch. 1)

FCC ID: C3K2077 IC: 3048A-2077		Approved by: Technical Manager	
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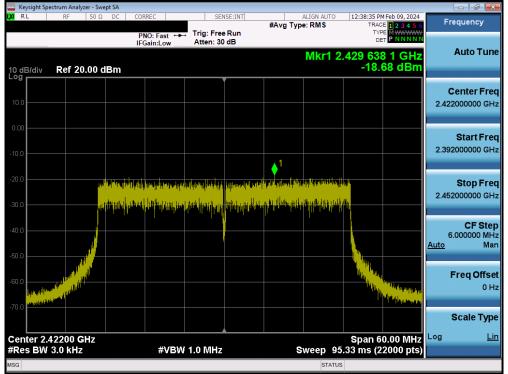
Plot 7-23. Power Spectral Density Plot MIMO ANT1 (802.11be OFDMA - 242 Tones - Ch. 6)



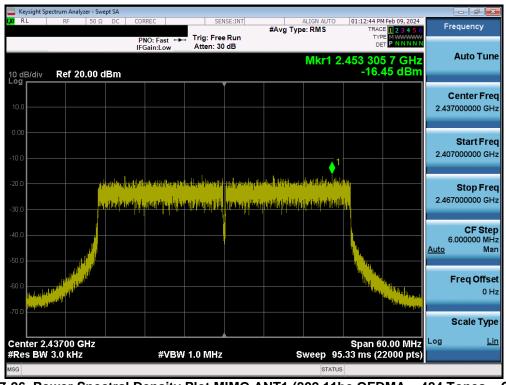
Plot 7-24. Power Spectral Density Plot MIMO ANT1 (802.11be OFDMA - 242 Tones - Ch. 11)

FCC ID: C3K2077 IC: 3048A-2077		Approved by: Technical Manager	
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Plot 7-25. Power Spectral Density Plot MIMO ANT1 (802.11be OFDMA - 484 Tones - Ch. 3)



Plot 7-26. Power Spectral Density Plot MIMO ANT1 (802.11be OFDMA - 484 Tones - Ch. 6)

FCC ID: C3K2077 IC: 3048A-2077	MEASUREMENT REPORT		Approved by: Technical Manager
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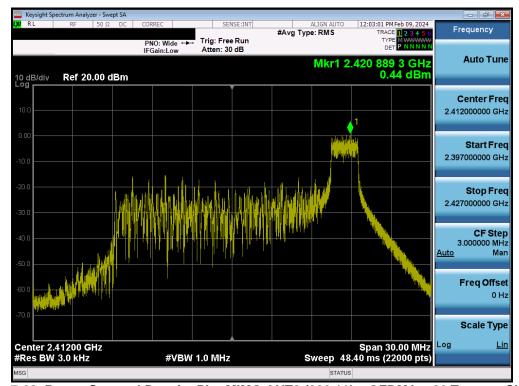


	ht Spectrum Analyzer - Sw									[	
IXI RL	RF 50 Ω	DC CO	RREC	SEN	NSE:INT	#Avg T	ALIGN AUTO		M Feb 09, 2024	Fre	quency
		P IF	NO: Fast ↔ Gain:Low	Trig: Free Atten: 30		movg I		ייז ס 2.475 12			Auto Tune
10 dB/di Log	iv Ref 20.00	dBm						-32.	86 dBm		
10.0											<b>enter Freq</b> 000000 GHz
-10.0										2.432	<b>Start Freq</b> 000000 GHz
-20.0							<b>1</b>			2.492	<b>Stop Freq</b> 000000 GHz
-40.0		Hereiten Hereite Mathematik	karanny pany day A Dipala ( 1976) ki p	an madan meny An deringen der	entysteinentin Joartii jobioj	oner) (Hernau) In Detroited	traduc <mark>iona</mark> na (dise Interpleto disente (dise			6. <u>Auto</u>	<b>CF Step</b> 000000 MHz Man
-60.0									lality range front from	F	r <b>eq Offset</b> 0 Hz
	2.46200 GHz								illingdowdial.co.am		Scale Type Lin
	3W 3.0 kHz		#VBW	1.0 MHz			Sweep 9	5.33 ms (2	2000 pts)		
MSG							STAT	JS			

Plot 7-27. Power Spectral Density Plot MIMO ANT1 (802.11be OFDMA - 484 Tones - Ch. 11)

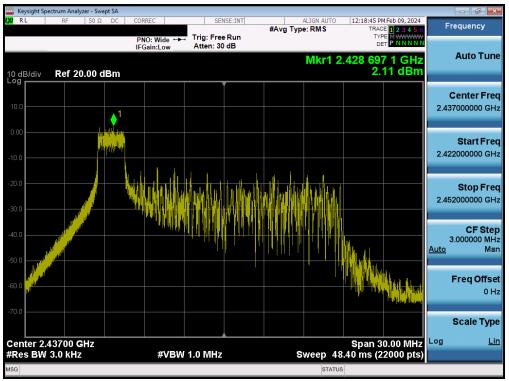
FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
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# 7.4.2 MIMO Antenna-2 Power Spectral Density Measurements

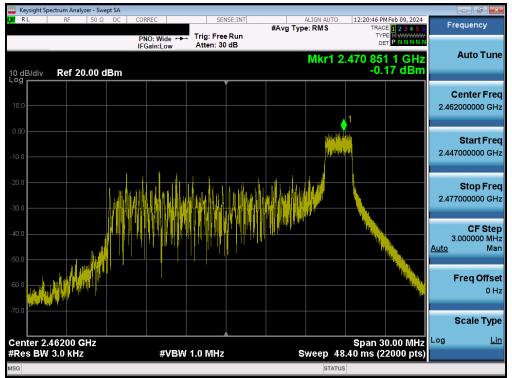




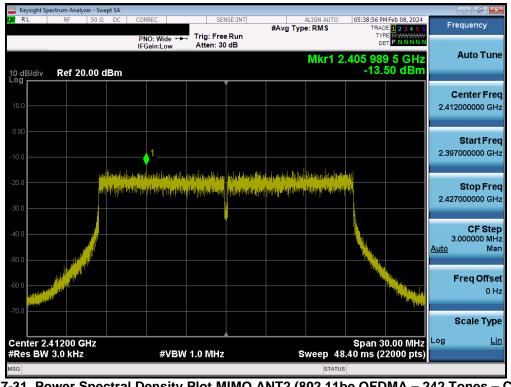
Plot 7-29. Power Spectral Density Plot MIMO ANT2 (802.11be OFDMA – 26 Tones – Ch. 6)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
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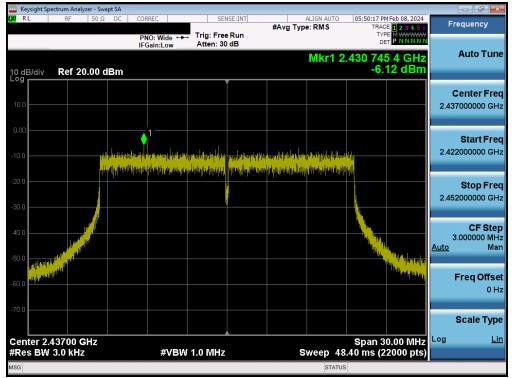
Plot 7-30. Power Spectral Density Plot MIMO ANT2 (802.11be OFDMA - 26 Tones - Ch. 11)



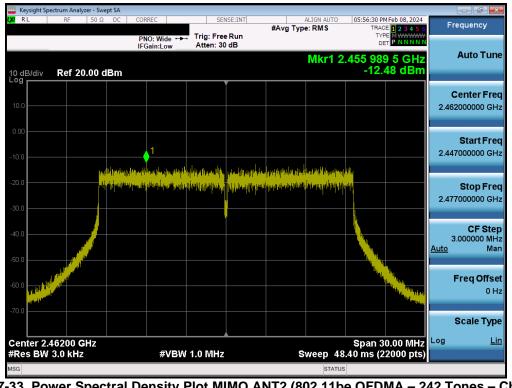
Plot 7-31. Power Spectral Density Plot MIMO ANT2 (802.11be OFDMA - 242 Tones - Ch. 1)

FCC ID: C3K2077 IC: 3048A-2077		Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dogo 27 of 112	
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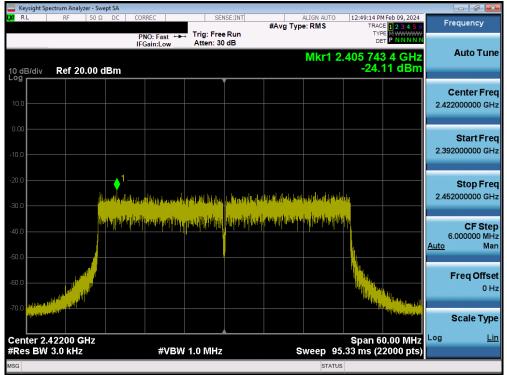
Plot 7-32. Power Spectral Density Plot MIMO ANT2 (802.11be OFDMA - 242 Tones - Ch. 6)



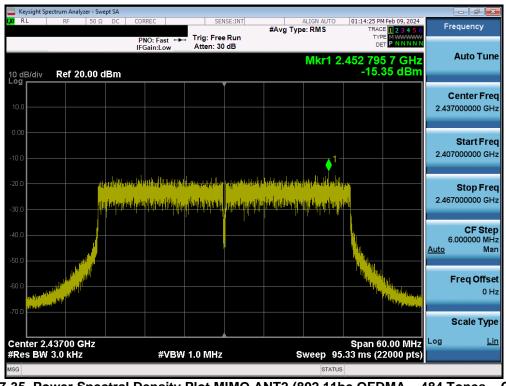
Plot 7-33. Power Spectral Density Plot MIMO ANT2 (802.11be OFDMA - 242 Tones - Ch. 11)

FCC ID: C3K2077 IC: 3048A-2077		Approved by: Technical Manager		
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Plot 7-34. Power Spectral Density Plot MIMO ANT2 (802.11be OFDMA - 484 Tones - Ch. 3)



Plot 7-35. Power Spectral Density Plot MIMO ANT2 (802.11be OFDMA - 484 Tones - Ch. 6)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
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RL     RF     50 Ω     DC     CORREC     SENSE:INT     ALION AUTO     [01:21:32 PMFeb 09, 2024]       #Avg Type: RMS     TRACE     [2:3:45:6]     Span       PNO: Fast +       IFGain:Low       Mkr1 2.445 124 2 GHz       OdB/div       Ref 20.00 dBm
Atten: 30 dB         Det PINNNN         Spa           Mkr1 2.445 124 2 GHz         60.0000000 MH           0 dB/div         Ref 20.00 dBm         -31.97 dBm           0 0         0         0         0
0 dB/div Ref 20.00 dBm -31.97 dBm
Zero Spa
o o o o o o o o o o o o o o o o o o o
Signal Trac (Span Zoor
enter 2.46200 GHz Span 60.00 MHz Span 60.00 MHz Res BW 3.0 kHz #VBW 1.0 MHz Sweep 95.33 ms (22000 pts)

Plot 7-36. Power Spectral Density Plot MIMO ANT2 (802.11be OFDMA – 484 Tones – Ch. 11)

# Note:

Per ANSI C63.10-2013 Section 14.3.1, 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.

## Sample MIMO Calculation:

At 2412MHz the average conducted power spectral density was measured to be 1.32 dBm for Antenna 1 and 0.44 dBm for Antenna 2.

Antenna 1 + Antenna 2 = MIMO

(1.32 dBm + 0.44 dBm) = (1.36 mW + 1.11 mW) = 2.46 mW = 3.91 dBm

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# 7.5 Conducted Band Edge Emissions

# **Test Overview and Limit**

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates, tone configurations, and RU indices were investigated to determine the worst-case configuration. For the following out of band conducted emissions plots at the band edge, the EUT was set to a data rate of MCS0 in 802.11be mode as this setting produced the worst-case emissions.

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100kHz bandwidth per the PSD procedure (Section 7.4).

## Test Procedure Used

ANSI C63.10-2013 - Section 11.11.3

## **Test Settings**

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW = 100kHz
- 4. VBW = 1MHz
- 5. Detector = Peak
- 6. Number of sweep points  $\geq 2 \times \text{Span/RBW}$
- 7. Trace mode = max hold
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize

## 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

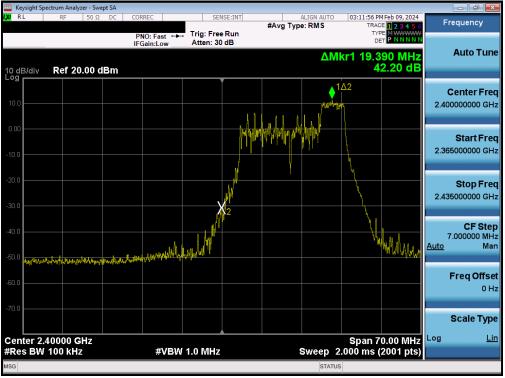
None.

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
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# 7.5.1 MIMO Antenna-1 Conducted Band Edge Emissions

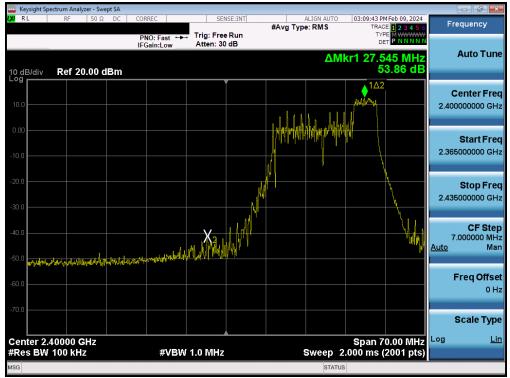
# 106T

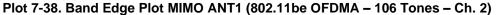


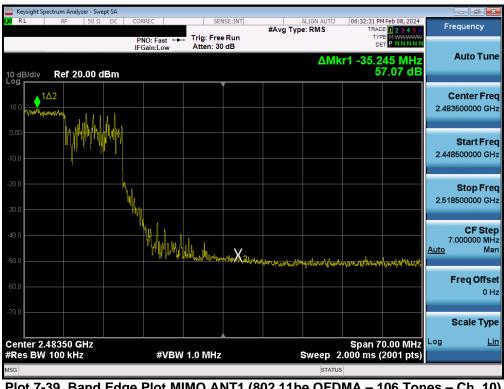
Plot 7-37. Band Edge Plot MIMO ANT1 (802.11be OFDMA - 106 Tones - Ch. 1)

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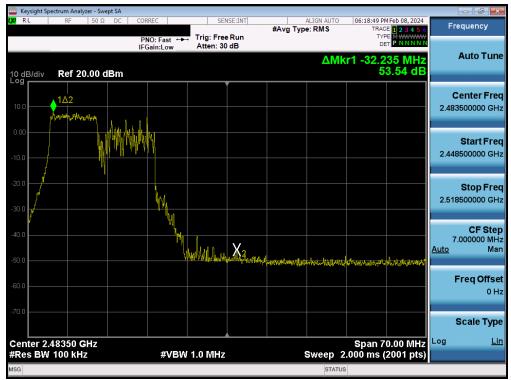


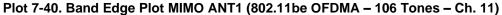


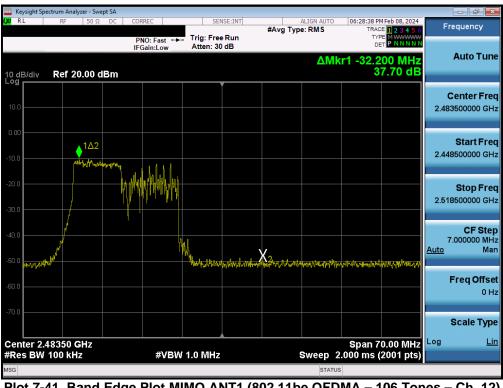
Plot 7-39. Band Edge Plot MIMO ANT1 (802.11be OFDMA - 106 Tones - Ch. 10)

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Plot 7-41. Band Edge Plot MIMO ANT1 (802.11be OFDMA - 106 Tones - Ch. 12)

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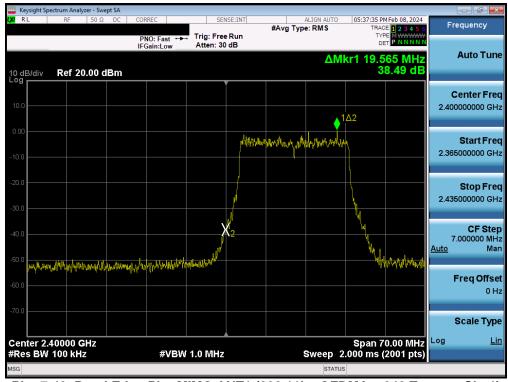


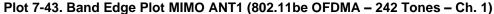
	pectrum Analyzer - Swe									_	- d ×
(XIRL	RF 50 Ω	DC CO	RREC	SEI	ISE:INT	#Avg Typ	ALIGN AUTO		M Feb 08, 2024	Fr	requency
	_		PNO: Fast ↔ Gain:Low	. Trig: Free Atten: 30				TYF DE kr1 -51.3			Auto Tune
10 dB/div Log	Ref 20.00 c	lBm						3	1.03 dB		
10.0											<b>Center Freq</b> 3500000 GHz
-10.0		1∆2								2.44	Start Freq 8500000 GHz
-20.0		WARTING WAR								2.51	<b>Stop Freq</b> 8500000 GHz
-40.0				- 11 L			the state of		X2	7 <u>Auto</u>	<b>CF Step</b> 7.000000 MHz Man
-60.0	an the fille of the second			- 1 Jun	ikon nya nya nya nya nya nya nya nya nya ny	in flinder og ander	ANA CANAGE	graf genel ging tit for som	er Heistyn ffin Hogewyr		Freq Offset 0 Hz
-70.0											Scale Type
	.48350 GHz 100 kHz		#VBW	( 1.0 MHz			Sweep	5 Span 2.000 ms (	0.00 MHz 2001 pts)	Log	Lin
MSG							STATL	-			

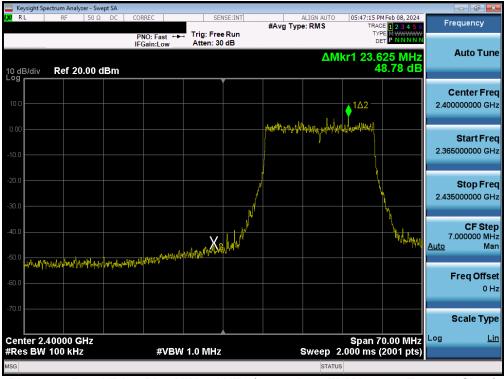
Plot 7-42. Band Edge Plot MIMO ANT1 (802.11be OFDMA – 106 Tones – Ch. 13)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
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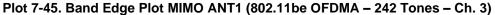


Plot 7-44. Band Edge Plot MIMO ANT1 (802.11be OFDMA - 242 Tones - Ch. 2)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT			
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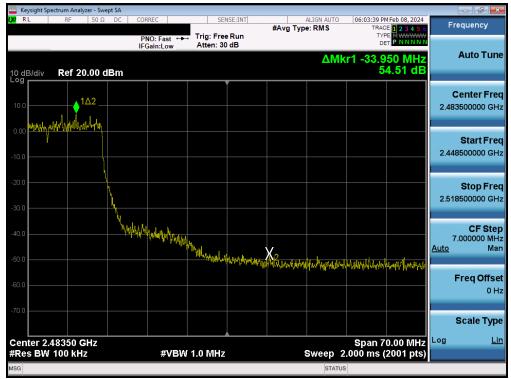


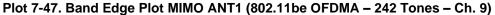


Plot 7-46. Band Edge Plot MIMO ANT1 (802.11be OFDMA - 242 Tones - Ch. 8)

FCC ID: C3K2077 IC: 3048A-2077		Approved by: Technical Manager	
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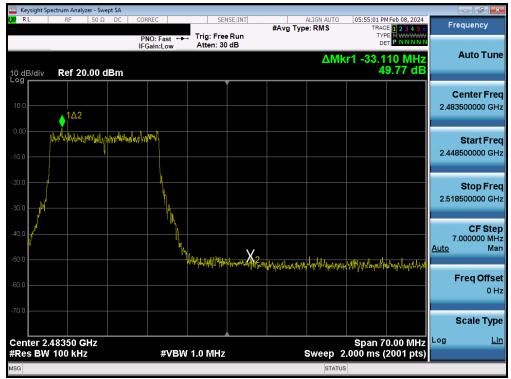


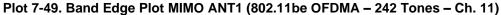


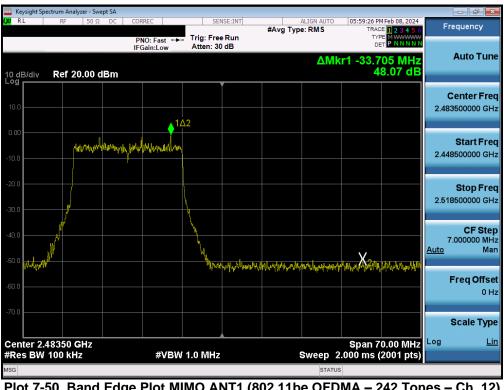
Plot 7-48. Band Edge Plot MIMO ANT1 (802.11be OFDMA - 242 Tones - Ch. 10)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT			
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Plot 7-50. Band Edge Plot MIMO ANT1 (802.11be OFDMA - 242 Tones - Ch. 12)

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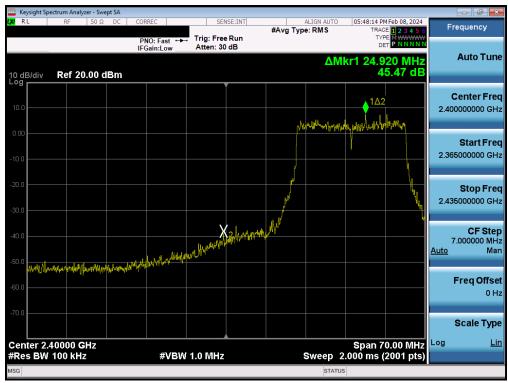


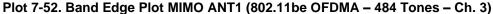
	oectrum Analyzer - Sw									_	
LXU RL	RF 50 Ω	DC CC	ORREC	SEI	NSE:INT	#Avg Typ	ALIGN AUTO		1 Feb 08, 2024	Fr	equency
			PNO: Fast ↔ Gain:Low	Atten: 30				TYP			Auto Tune
10 dB/div Log	Ref 20.00 (	dBm						3	2.60 dB		
10.0											enter Freq 8500000 GHz
0.00											
-10.0		4	△2							2.448	Start Freq 8500000 GHz
		munderlin	un un avialitat	thematha							
-20.0		l I IN IN IN INT	and the state	*** #117 VrY * *1						2.518	Stop Freq 500000 GHz
-40.0											CF Step
-50.0					<b>X</b> 2					7 <u>Auto</u>	.000000 MHz Man
Մերեզիցեր	walkingshill Aller				WMm-traff	halishylmathymappellyr	ann ngallan	, yill-alishykilyi yill	, tela Mikaki kutaki	F	req Offset
-60.0											0 Hz
-70.0											Scale Type
Center 2. #Res BW	48350 GHz 100 kHz		#VBW	/ 1.0 MHz			Sweep <u>2</u>	Span 7 .000 ms (:	0.00 MHz 2001 pts)	Log	<u>Lin</u>
MSG							STATUS				

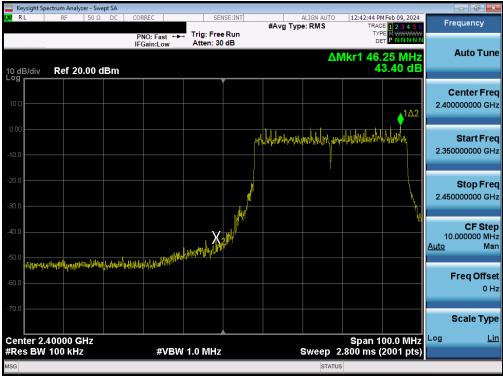
Plot 7-51. Band Edge Plot MIMO ANT1 (802.11be OFDMA – 242 Tones – Ch. 13)

FCC ID: C3K2077 IC: 3048A-2077		Approved by: Technical Manager	
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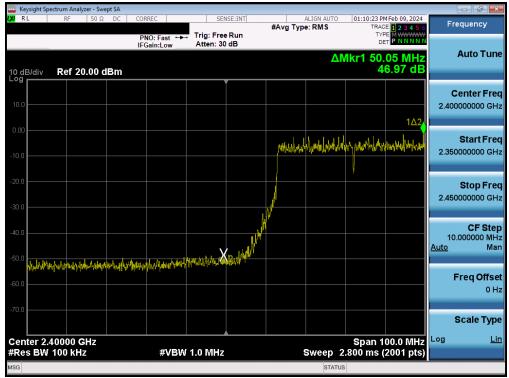


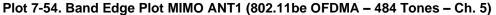


Plot 7-53. Band Edge Plot MIMO ANT1 (802.11be OFDMA - 484 Tones - Ch. 4)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT			
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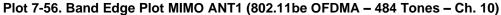


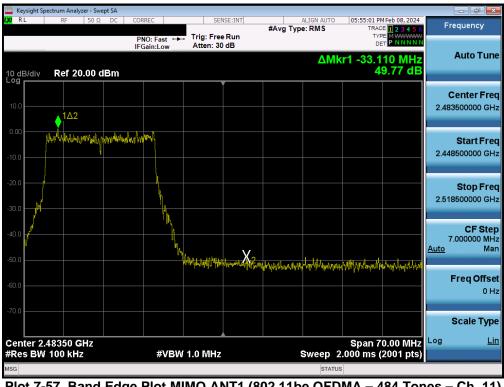
Plot 7-55. Band Edge Plot MIMO ANT1 (802.11be OFDMA - 484 Tones - Ch. 9)

FCC ID: C3K2077 IC: 3048A-2077		Approved by: Technical Manager	
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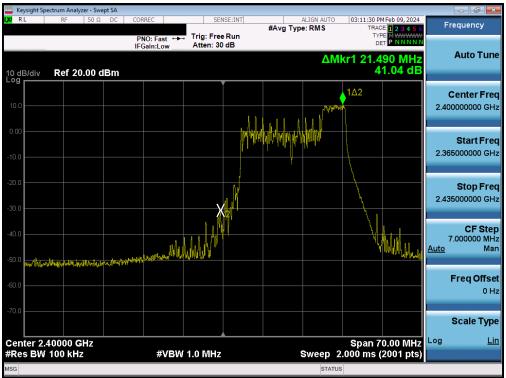
Plot 7-57. Band Edge Plot MIMO ANT1 (802.11be OFDMA - 484 Tones - Ch. 11)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT			
Test Report S/N:	Test Dates:	EUT Type:	Dogo E2 of 112		
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# 7.5.2 MIMO Antenna-2 Conducted Band Edge Emissions

106T

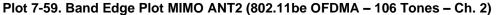


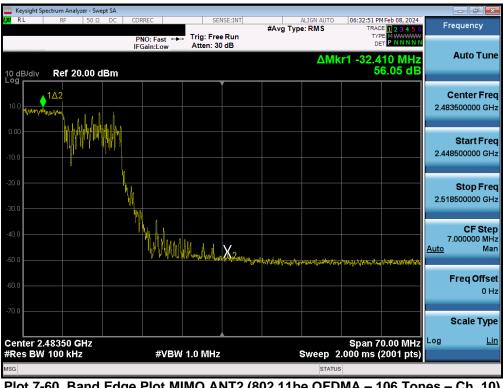
Plot 7-58. Band Edge Plot MIMO ANT2 (802.11be OFDMA - 106 Tones - Ch. 1)

FCC ID: C3K2077 IC: 3048A-2077		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dogo E4 of 112
1M2312040120-18.C3K	12/14/2023 - 03/05/2024	Portable Computing Device	Page 54 of 113
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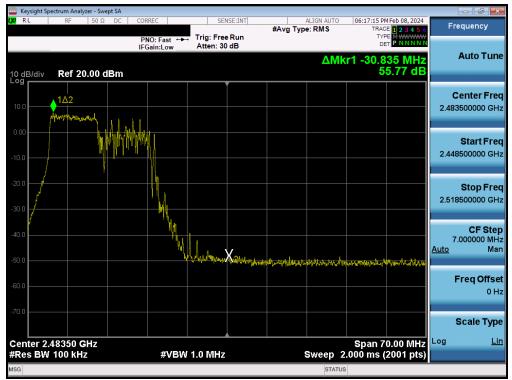


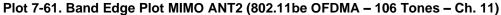


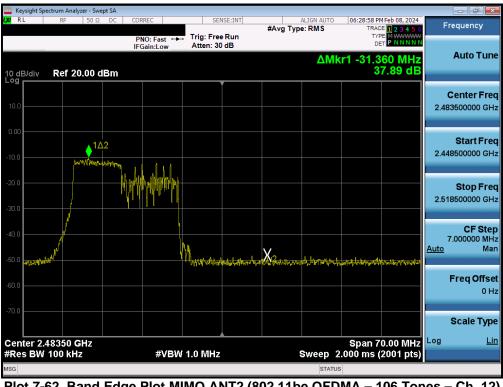
Plot 7-60. Band Edge Plot MIMO ANT2 (802.11be OFDMA - 106 Tones - Ch. 10)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT			
Test Report S/N:	Test Dates:	EUT Type:	Page 55 of 113		
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Plot 7-62. Band Edge Plot MIMO ANT2 (802.11be OFDMA - 106 Tones - Ch. 12)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT			
Test Report S/N:	Test Dates:	EUT Type:	Dogo EC of 112		
1M2312040120-18.C3K	12/14/2023 - 03/05/2024	Portable Computing Device	Page 56 of 113		
© 2024 ELEMENT		·	V11.1 08/28/2023		

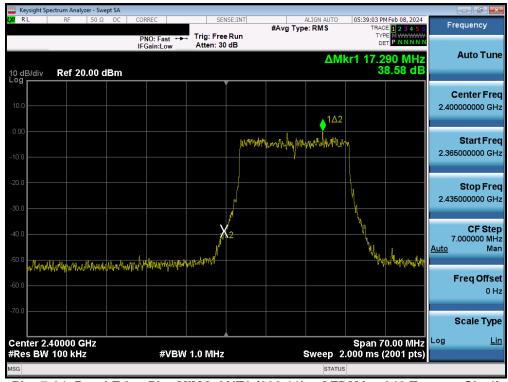


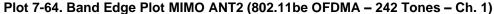
	pectrum Analyzer - Swe										
LXI RL	RF 50 Ω	DC CC	ORREC	SEI	NSE:INT	#Avg Typ	ALIGN AUTO		Feb 08, 2024	Fr	equency
	_	l	PNO: Fast 🔸 Gain:Low	Trig: Free Atten: 30		0 ,1		TYF DE <b>kr1 -18.1</b>			Auto Tune
10 dB/div Log	Ref 20.00 c	lBm						3	1.41 dB		
10.0											<b>Center Freq</b> 3500000 GHz
-10.0		1Δ:	2							2.44	<b>Start Freq</b> 3500000 GHz
-20.0		who have								2.51	<b>Stop Freq</b> 3500000 GHz
-40.0	- Hurson		, Muri		Xent	<u></u>				7 <u>Auto</u>	<b>CF Step</b> .000000 MHz Man
-60.0	And Harris				₽~?** <b> </b> ***₩.4000000		AD ALAY AN AN	hild Head and Annal Andrews	, , , , , , , , , , , , , , , , , , ,		Freq Offset 0 Hz
-70.0											Scale Type
	.48350 GHz 100 kHz		#VBV	V 1.0 MHz			Sweep 3	5 Span 2.000 ms (	0.00 MHz 2001 pts)	Log	<u>Lin</u>
MSG							STATU				

Plot 7-63. Band Edge Plot MIMO ANT2 (802.11be OFDMA – 106 Tones – Ch. 13)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Daga 57 of 112
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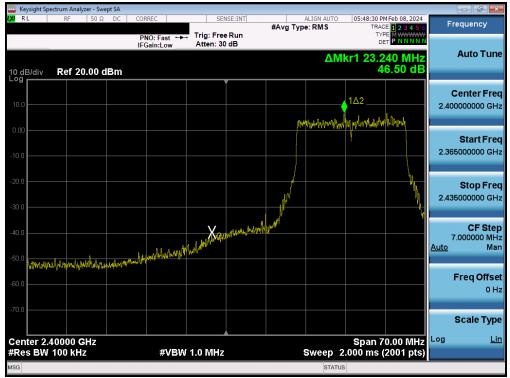


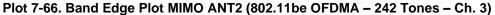


Plot 7-65. Band Edge Plot MIMO ANT2 (802.11be OFDMA - 242 Tones - Ch. 2)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Dama 50 at 440
1M2312040120-18.C3K	12/14/2023 - 03/05/2024	Portable Computing Device	Page 58 of 113
© 2024 ELEMENT	•		V11.1 08/28/2023







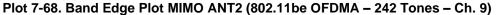


Plot 7-67. Band Edge Plot MIMO ANT2 (802.11be OFDMA - 242 Tones - Ch. 8)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 50 of 112
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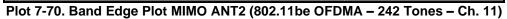


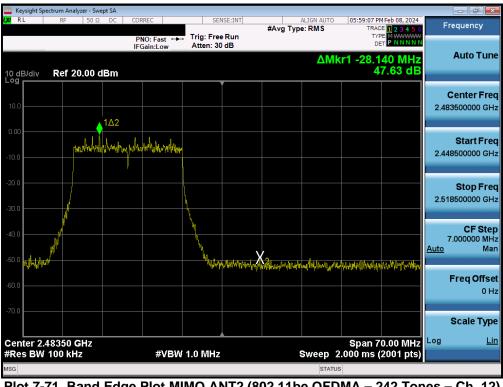
Plot 7-69. Band Edge Plot MIMO ANT2 (802.11be OFDMA - 242 Tones - Ch. 10)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Daga 60 of 112
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	pectrum Analyzer - Sw	/ept SA									
(XI) RL	RF 50 Ω	DC	CORREC	SEI	NSE:INT	#Avg Typ	ALIGN AUTO e: RMS		M Feb 08, 2024	Fi	requency
			PNO: Fast ++ IFGain:Low	Trig: Free Atten: 30				TYF			
			IFGalli.LOW	Atten: 00	ub.			(r1 -26.4	95 MHz		Auto Tune
10 dB/div	Ref 20.00	dBm						5	0.81 dB		
Log					Ĭ						Center Freq
10.0											3500000 GHz
	♦ <sup>1∆2</sup>										
0.00	with a white with	antolomical	Kathilikunt								Start Freq
-10.0										2.44	8500000 GHz
-10.0											
-20.0									——————————————————————————————————————		Stop Freq
										2.51	8500000 GHz
-30.0			<sup>1</sup> 1								
-40.0			<u> </u>								CF Step
10.0			۳. Vi							Auto	7.000000 MHz Man
-50.0				Mannink	Red Aller	nlawldlyn, ywrtadd	MALLIN	dan bil Holt Maar	AL MAL MURAN		
					a o d Webler	an an Alfar Black and an Alfar	փելել, ապետելու էջնե	a, ales té a sétara a	גנאיד אישי א <b>ר</b> וית אינ		Freq Offset
-60.0											0 Hz
-70.0											
											Scale Type
Center 2	.48350 GHz							Snan 7	0.00 MHz	Log	Lin
	/ 100 kHz		#VBV	/ 1.0 MHz			Sweep 2	2.000 ms (	2001 pts)		
MSG							STATU	5			





Plot 7-71. Band Edge Plot MIMO ANT2 (802.11be OFDMA – 242 Tones – Ch. 12)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 61 of 112
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© 2024 ELEMENT			V11.1 08/28/2023

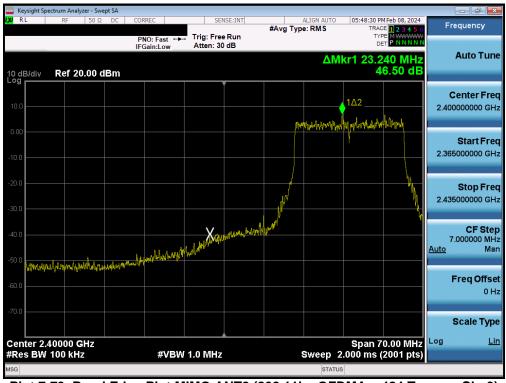


	pectrum Analyzer - Sw									-	
LXI RL	RF 50 Ω	DC CC	RREC	SEI	NSE:INT	#Avg Typ	ALIGN AUTO		1 Feb 08, 2024	Freq	uency
	-		PNO: Fast ↔ Gain:Low	Trig: Free Atten: 30				TYP		A	uto Tune
10 dB/div Log	Ref 20.00 d	dBm						3	3.05 dB		
10.0											nter Freq
0.00										2.48350	00000 GHz
0.00											tart Freq
-10.0		∮1∆2 -								2.44850	00000 GHz
-20.0		where the second	www.padalicel.fu	phydradyging							top Freq
-30.0		1								2.51850	00000 GHz
-40.0	į									7.00	CF Step
50.0	. W <sup>A</sup>			۱ ۱	X.					Auto 7.00	00000 MHz Man
-50.0	which the stand which the				N Rady Mylend W	helphillerinspecto	MMANAMANIA	AN WARDAN WAR	Wind the former	Er	og Offaat
-60.0										- FI	e <b>q Offset</b> 0 Hz
-70.0											
											ale Type
	.48350 GHz / 100 kHz		#VBW	1.0 MHz			Sweep 2	Span 7 .000 ms (	0.00 MHz 2001 pts)	Log	Lin
MSG							STATUS	-			

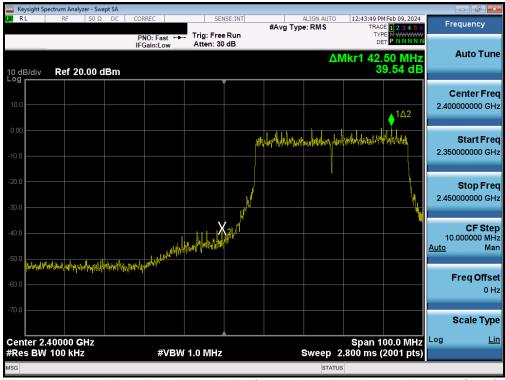
Plot 7-72. Band Edge Plot MIMO ANT2 (802.11be OFDMA – 242 Tones – Ch. 13)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Daga 62 of 112
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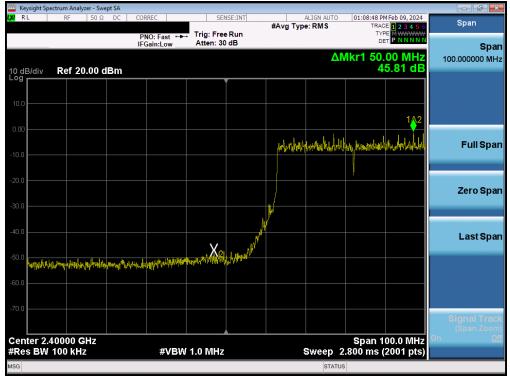
Plot 7-73. Band Edge Plot MIMO ANT2 (802.11be OFDMA - 484 Tones - Ch. 3)

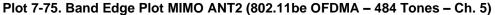


Plot 7-74. Band Edge Plot MIMO ANT2 (802.11be OFDMA - 484 Tones - Ch. 4)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Dava 00 st 440
1M2312040120-18.C3K	12/14/2023 - 03/05/2024	Portable Computing Device	Page 63 of 113
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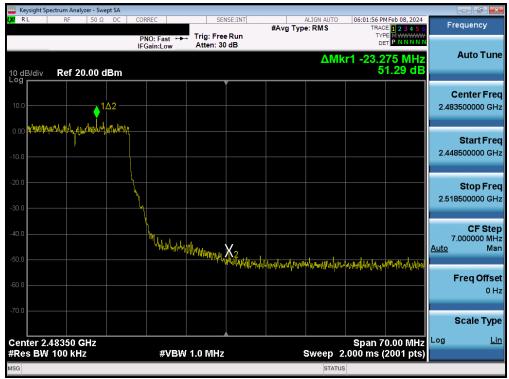


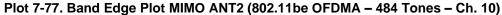


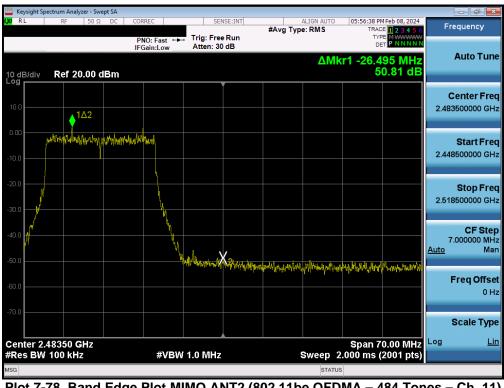
Plot 7-76. Band Edge Plot MIMO ANT2 (802.11be OFDMA - 484 Tones - Ch. 9)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Dage 64 of 112
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Plot 7-78. Band Edge Plot MIMO ANT2 (802.11be OFDMA - 484 Tones - Ch. 11)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Dogo CE of 112
1M2312040120-18.C3K	12/14/2023 - 03/05/2024	Portable Computing Device	Page 65 of 113
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# 7.6 Conducted Spurious Emissions

# **Test Overview and Limit**

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates, tone configurations, and RU indices were investigated to determine the worst-case configuration. For the following out of band conducted emissions plots, the EUT was set to a data rate of MCS0 in 802.11be mode as this setting produced the worst-case emissions.

The limit for out-of-band spurious emissions at the band edge is 30dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100kHz bandwidth per the procedure in Section 11.11.3 of ANSI C63.10-2013.

## Test Procedure Used

ANSI C63.10-2013 – Section 11.11.3 ANSI C63.10-2013 – Section 14.3.3

## **Test Settings**

- 1. Start frequency was set to 30MHz and stop frequency was set to 25GHz (separated into two plots per channel)
- 2. RBW = 1MHz
- 3. VBW = 3MHz
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep time = auto couple
- 7. The trace was allowed to stabilize

#### Test Setup

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



Figure 7-5. Test Instrument & Measurement Setup

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	
Test Report S/N:	Test Dates:	EUT Type:	Dama 00 at 440
1M2312040120-18.C3K	12/14/2023 - 03/05/2024	Portable Computing Device	Page 66 of 113
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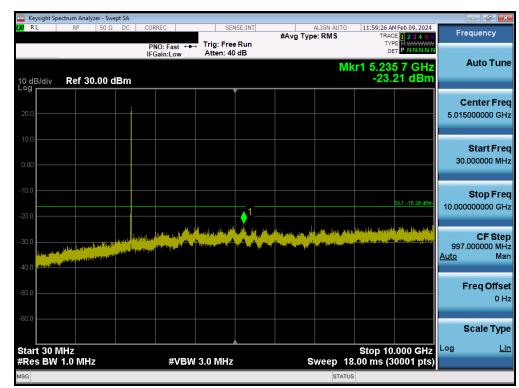


# Test Notes

- 1. RBW was set to 1MHz rather than 100kHz in order to increase the measurement speed.
- 2. The display line shown in the following plots denotes the limit at 30dB below the fundamental emission level measured in a 100kHz bandwidth. However, since the traces in the following plots are measured with a 1MHz RBW, the display line may not necessarily appear to be 30dB below the level of the fundamental in a 1MHz bandwidth.
- 3. For plots showing conducted spurious emissions near the limit, the frequencies were investigated with a reduced RBW to ensure that no emissions were present.
- The conducted spurious emissions were measured to relative limits. Therefore, in accordance with ANSI C63.10-2013 Section 14.3.3, it was unnecessary to show compliance through the summation of test results of the individual outputs.

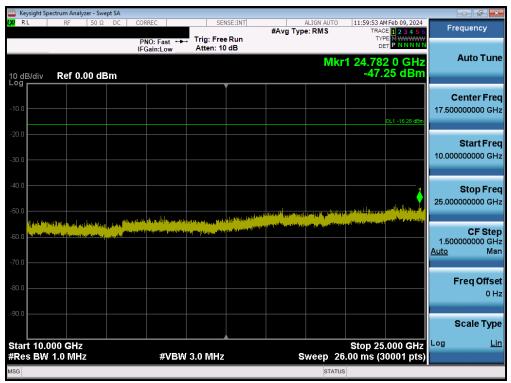
FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT					
Test Report S/N:	Test Dates:	s: EUT Type:					
1M2312040120-18.C3K	12/14/2023 - 03/05/2024	12/14/2023 - 03/05/2024 Portable Computing Device					
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# 7.6.1 MIMO Antenna-1 Conducted Spurious Emission





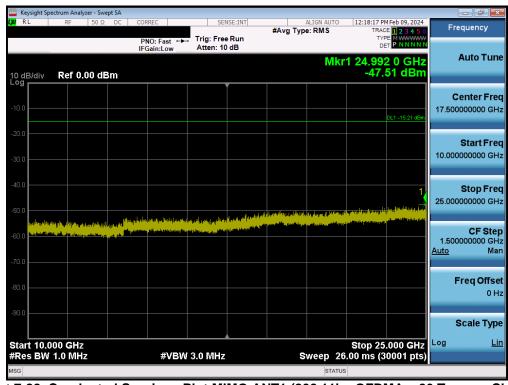
Plot 7-80. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA - 26 Tones - Ch. 1)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	Approved by: Technical Manager				
Test Report S/N:	Test Dates:	Test Dates: EUT Type:					
1M2312040120-18.C3K	12/14/2023 - 03/05/2024	2/14/2023 - 03/05/2024 Portable Computing Device					
© 2024 ELEMENT			V11 1 08/28/2023				



	ght Spectru											
LXI RL		RF !	50ΩD	C COI	RREC	SEI	NSE:INT	#Avg Typ	ALIGN AUT e: RMS	TRA	M Feb 09, 2024	Frequency
10 dB/c	div R	ef 30.0	0 dBr	IF	NO: Fast ↔ Gain:Low	Atten: 40			N	₀ //kr1 6.11	1 4 GHz 43 dBm	Auto Tune
20.0												Center Freq 5.015000000 GHz
10.0												Start Freq 30.000000 MHz
-10.0								1			DL1 -15.21 dBm	Stop Fred 10.000000000 GHz
-30.0 —	en anderste der State		na spina se a la sa	er ordiniger				An Anna San Anna An		almutelite Missisters <sup>II</sup> I 2019 - Dispite State (1999) 2019 - Dispite State (1999)	typelogoveten Kor namisyansyasian	CF Step 997.000000 MHz <u>Auto</u> Mar
-40.0												Freq Offse 0 H:
-60.0												Scale Type
	30 MHz BW 1.0				#VBV	V 3.0 MHz		s	weep	Stop 10 18.00 ms (3	.000 GHz 30001 pts)	Log <u>Lin</u>
MSG									STA	TUS		

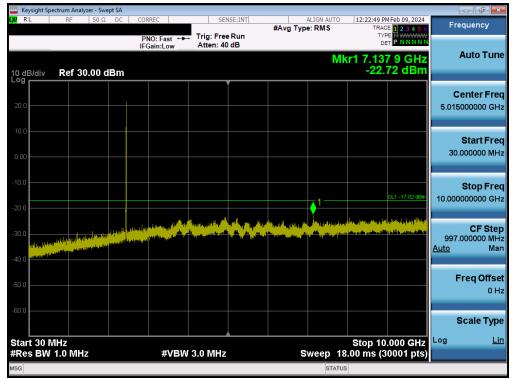
Plot 7-81. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA – 26 Tones – Ch. 6)



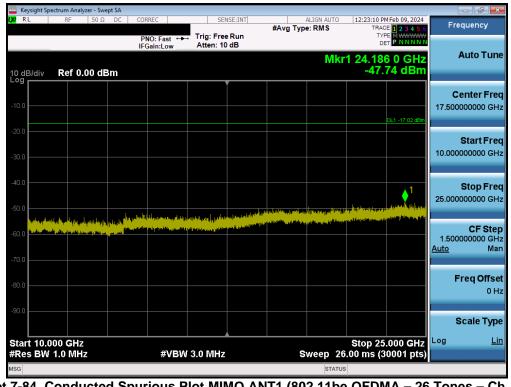
Plot 7-82. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA – 26 Tones – Ch. 6)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT				
Test Report S/N:	Test Dates:	Fest Dates: EUT Type:				
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Plot 7-83. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA - 26 Tones - Ch. 11)



Plot 7-84. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA - 26 Tones - Ch. 11)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT				
Test Report S/N:	Test Dates:	est Dates: EUT Type:				
1M2312040120-18.C3K	12/14/2023 - 03/05/2024	2/14/2023 - 03/05/2024 Portable Computing Device				
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🧫 Keysight Spectrum Analyzer - Swept SA 👘				
LX RL RF 50Ω DC	CORREC SEM	A A A A A A A A A A A A A A A A A A A	LIGN AUTO 05:38:04 PM : RMS TRACE	Feb 08, 2024 <b>1 2 3 4 5 6</b> Frequency
	PNO: Fast +++ Trig: Free IFGain:Low Atten: 30		TYPE DET	M WWWW P N N N N N
10 dB/div Ref 20.00 dBm			Mkr1 8.898 -32.9	4 dBm
				Center Freq
10.0				5.015000000 GHz
0.00				Start Freq
-10.0				30.000000 MHz
-20.0				Stop Freq
-30.0			1	10.00000000 GHz
-40.0	trans the state of the state of the state of the state of the	allaha darih disaka di	ally designed and all the designed of the	CF Step
				997.000000 MHz <u>Auto</u> Man
				Freq Offset
-60.0				0 Hz
-70.0				Scale Type
Start 30 MHz #Res BW 1.0 MHz	#VBW 3.0 MHz	S	Stop 10.0 veep 18.00 ms (30	000 GHz Log Lin
MSG	# 15 W 3.0 Will2		STATUS	

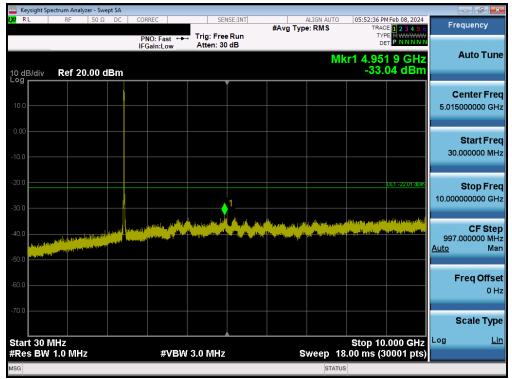
Plot 7-85. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA – 242 Tones – Ch. 1)



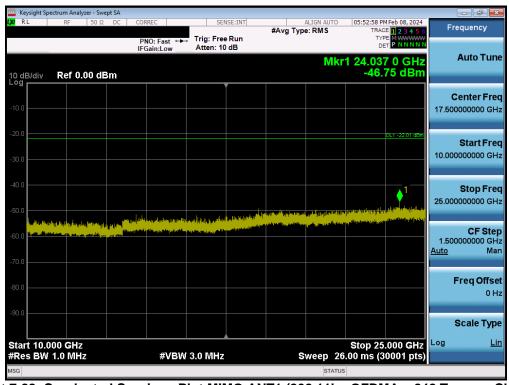
Plot 7-86. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA – 242 Tones – Ch. 1)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT					
Test Report S/N:	Test Dates:	EUT Type:	Page 71 of 113				
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Plot 7-87. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA – 242 Tones – Ch. 6)



Plot 7-88. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA – 242 Tones – Ch. 6)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT					
Test Report S/N:	Test Dates:	st Dates: EUT Type:					
1M2312040120-18.C3K	12/14/2023 - 03/05/2024	12/14/2023 - 03/05/2024 Portable Computing Device					
© 2024 ELEMENT							



	pectrum Ana											- Ø	×
LXI RL	RF	50 Ω	DC	CORREC			NSE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	M Feb 08, 2024	Frequency	/
10 dB/div	Ref 2	20.00 d	Bm	PNO: IFGain	Fast ↔ :Low	. Trig: Free Atten: 30			М	bi kr1 9.45	0 3 GHz 24 dBm	Auto T	une
10.0												Center F 5.015000000	
-10.0												Start F 30.000000	
-20.0											DL1 -27.00 ±Bm	Stop F 10.000000000	
-40.0		n Alfred Market and a		Ang Salan (1996) University of the						a and an and a second secon	lef filligen fan gebene útfikke	CF S 997.000000 <u>Auto</u>	
-60.0												Freq Of	ffse 0 Hi
-70.0 Start 30										Stop 10	.000 GHz	Scale T	Гуре <u>Lir</u>
#Res BW	1.0 M	z			#VBW	3.0 MHz		s			0001 pts)		
MSG									STATU	IS			

Plot 7-89. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA - 242 Tones - Ch. 11)



Plot 7-90. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA - 242 Tones - Ch. 11)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT			
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		nalyzer - Swe											
LXI RL	RF	50 Ω	DC	CORR	EC	SEI	ISE:INT	#Avg Typ	ALIGN AUTO e: RMS		M Feb 09, 2024 CE 1 2 3 4 5 6	Freq	uency
10 dB/div	v Ref	10.00 d	Bm	PNC IFGa	): Fast ↔ in:Low	<ul> <li>Trig: Free Atten: 20</li> </ul>			М	۳۲ ۱۵ kr1 9.16	6 2 GHz 17 dBm	A	uto Tune
0.00													n <b>ter Freq</b> 10000 GHz
-10.0													<b>tart Freq</b> 0000 MHz
-30.0											DL1 -33.98 dBm		<b>top Freq</b> 00000 GHz
-50.0	مرد من المرد من المادي. المرد ما المنتخب المرد الم	and fitter in the second s		- Cooper I.				in and a second seco Second second		ing a financial with the fighter and a set of the set of the set			CF Step 0000 MHz Man
-70.0												Fre	e <b>q Offset</b> 0 Hz
-80.0	0 MHz									Stop 10	0.000 GHz	Log	ale Type <u>Lin</u>
	W 1.0 N	lHz			#VBW	3.0 MHz		S	weep 1	8.00 ms (:	30001 pts)		
MSG									STAT	JS			

Plot 7-91. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA – 484 Tones – Ch. 3)



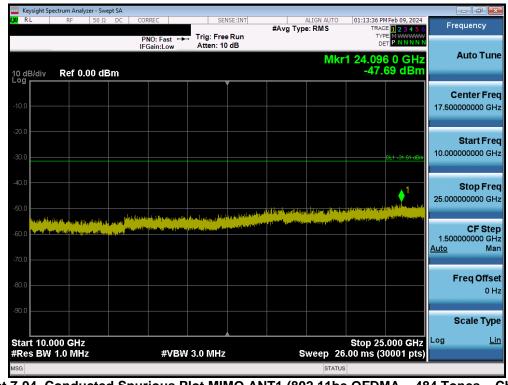
Plot 7-92. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA – 484 Tones – Ch. 3)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT					
Test Report S/N:	Test Dates:	est Dates: EUT Type:					
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Keysight Spectrum Analyzer - Swept SA				
XIRL RF 50Ω DC	CORREC SEN	AVG Type		Feb 09, 2024 Frequency
10 dB/div <b>Ref 10.00 dBm</b>	PNO: Fast + Trig: Free IFGain:Low Atten: 20		DE Mkr1 9.238	3 0 GHz Auto Tuno 3 dBm
0.00				Center Free 5.015000000 GH
-10.0				Start Free 30.000000 MH
-40.0				et
-50.0			n fille an eigener an eine film an eine seiter. Seiter eine seiter eine seite	CF Ster 997.000000 MH <u>Auto</u> Mar
-70.0				Freq Offse 0 H
-80.0 Start 30 MHz			Stop 10.	.000 GHz
#Res BW 1.0 MHz	#VBW 3.0 MHz	S	weep 18.00 ms (3	0001 pts)
MSG			STATUS	

Plot 7-93. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA – 484 Tones – Ch. 6)



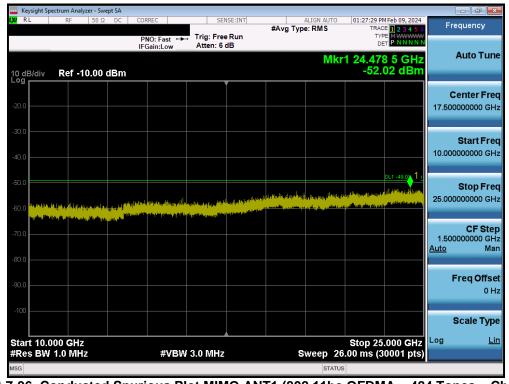
Plot 7-94. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA - 484 Tones - Ch. 6)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	Approved by: Technical Manager
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200 200 200 200 200 200 200 200		ysight Spec													X
IFGain:Low       Atten: 10 dB       Mkr1 4.957 2 GHz       Auto Tu         10 dB/div       Ref 0.00 dBm       -53.81 dBm       -53.81 dBm       Center F         10 dB/div       Ref 0.00 dBm       -50.81 dBm       -50.81 dBm       -50.9500000 dBm         200       -	<mark>,X/</mark> R	L	RF	50 Ω	DC							TRAC	E 1 2 3 4 5 6	Frequenc	У
Center F 5.015000000 f 300 400 400 400 400 400 400 400		B/div	Ref 0.	.00 dB	sm	IFG	Sain:Low	Atten: 10	) dB		N	lkr1 4.95	7 2 GHz	Auto 1	Гun
Start F S000 400 400 400 400 400 400 40															
500       Pt1 +49 02 dBm       10000000000 C         600       Pt1 +49 02 dBm       Pt1 +49 02 dBm         600       Pt1 +49 02 dBm       Pt1 +49 02 dBm         600       Pt1 +49 02 dBm       Pt1 +49 02 dBm         600       Pt1 +49 02 dBm       Pt1 +49 02 dBm         600       Pt1 +49 02 dBm       Pt1 +49 02 dBm         600       Pt1 +49 02 dBm       Pt1 +49 02 dBm         600       Pt1 +49 02 dBm       Pt1 +49 02 dBm         600       Pt1 +49 02 dBm       Pt1 +49 02 dBm         600       Pt1 +49 02 dBm       Pt1 +49 02 dBm         600       Pt1 +49 02 dBm       Pt1 +49 02 dBm         600       Pt1 +49 02 dBm       Pt1 +49 02 dBm         600       Pt1 +49 02 dBm       Pt1 +49 02 dBm         600       Pt1 +49 02 dBm       Pt1 +49 02 dBm         600       Pt1 +49 02 dBm       Pt1 +49 02 dBm         600       Pt1 +49 02 dBm       Pt1 +49 02 dBm         600       Pt1 +49 02 dBm       Pt1 +49 02															
997.000000 M Auto 900 900 Start 30 MHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 18.00 ms (30001 pts)									1				DL1 -49.02 dBm		
Start 30 MHz     #VBW 3.0 MHz     Stop 10.000 GHz     Log		all any firmula	adita aariib Adire walista	alperi (di terri alperi (di terri		(d) a Second	nteriti begen fan <sup>900</sup> fan Jerstelen <sub>en g</sub> lent <sup>ikk</sup> fan						n an	997.000000	
Start 30 MHz Res BW 1.0 MHz #VBW 3.0 MHz Sweep 18.00 ms (30001 pts)														Freq O	offs 0 H
	Star											Stop 10	.000 GHz	Log	тур Ц
	#Re	s BW 1	1.0 MH	z			#VBN	3.0 MHz		s	weep		0001 pts)		

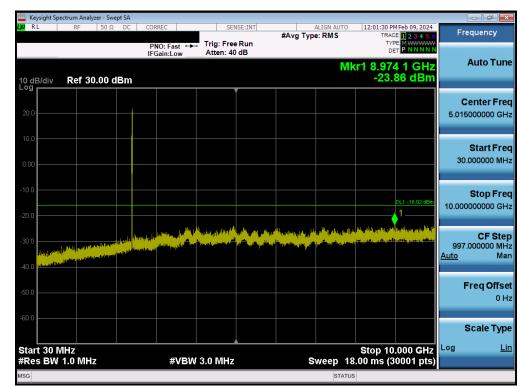
Plot 7-95. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA - 484 Tones - Ch. 11)



Plot 7-96. Conducted Spurious Plot MIMO ANT1 (802.11be OFDMA - 484 Tones - Ch. 11)

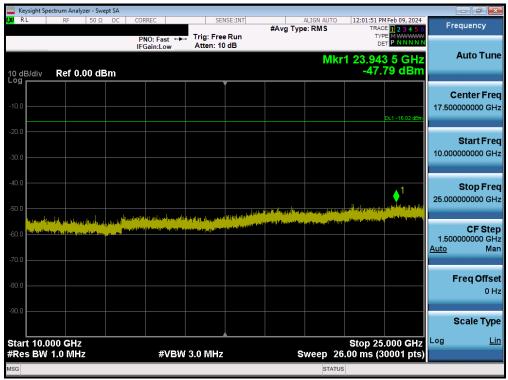
FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	Approved by: Technical Manager
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# 7.6.2 MIMO Antenna-2 Conducted Spurious Emissions





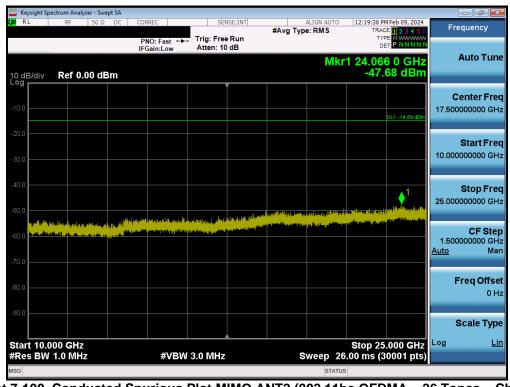
Plot 7-98. Conducted Spurious Plot MIMO ANT2 (802.11be OFDMA – 26 Tones – Ch. 1)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	Approved by: Technical Manager
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		Analyzer - Sw										
l <mark>XI</mark> RL	R	F 50 Ω	DC	COR	REC		NSE:INT	#Avg Typ	ALIGN AUT	TRA	CE 1 2 3 4 5 6	Frequency
10 dB/d	liv Re	ef 30.00 c	dBm	PN IFC	NO:Fast ⊶ Gain:Low	Atten: 40			I	۔ 12.21 Mkr1	87 GHz 29 dBm	Auto Tune
20.0												Center Freq 5.015000000 GHz
10.0 0.00												Start Freq 30.000000 MHz
-10.0							1				DL1 -14.89 dBm	Stop Freq 10.000000000 GHz
-30.0	gegegeligtegtingt pageogeligtegtingt	a ga da ga kana sa		a an tha an	andra, a a <mark>ha</mark>							CF Step 997.000000 MHz <u>Auto</u> Mar
-50.0												Freq Offset 0 Hz
-60.0	0 MHz									Stop 10	).000 GHz	Scale Type
	3W 1.0	MHz			#VB\	V 3.0 MHz		s	weep	18.00 ms (3	30001 pts)	
MSG									ST/	ATUS		

Plot 7-99. Conducted Spurious Plot MIMO ANT2 (802.11be OFDMA – 26 Tones – Ch. 6)



Plot 7-100. Conducted Spurious Plot MIMO ANT2 (802.11be OFDMA – 26 Tones – Ch. 6)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	Approved by: Technical Manager
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Keysight !														
LX/ RL	R	F   !	50 Ω	DC	CORREC			NSE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	M Feb 09, 2024 DE 1 2 3 4 5 6	Frequen	су
10 dB/div	Re	ef 30.0	00 dE	3m	PNO: IFGain	Fast ↔ :Low	<ul> <li>Trig: Free Atten: 40</li> </ul>			M	⊳ kr1 9.85	3 1 GHz 21 dBm	Auto	Tune
20.0													Center 5.01500000	
0.00													Star 30.00000	t Frec 00 MHz
-10.0												DL1 -16.44 d <sup>p</sup>	Stop 10.00000000	D Free D0 GH2
-30.0	eppener Northead	Historic II.	and a state of the s				in the second free second free second free second sec		d <sup>hal</sup> ngbalkijk konsepti <del>Internetise polise o</del> nter	a di basi di b Basi di basi di Basi di basi di	in telling of the plate of the		CF 997.00000 <u>Auto</u>	F Step 00 MH: Mar
-50.0													Freq	Offse 0 Hi
-60.0 Start 30											Stop 10	.000 GHz	Scale	e Type <u>Lir</u>
#Res BV	V 1.0	MHz				#VBW	3.0 MHz		s	weep 1		0001 pts)		
150										STATU	5			

Plot 7-101. Conducted Spurious Plot MIMO ANT2 (802.11be OFDMA - 26 Tones - Ch. 11)



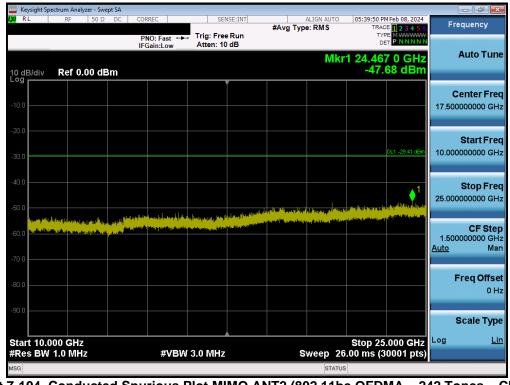
Plot 7-102. Conducted Spurious Plot MIMO ANT2 (802.11be OFDMA - 26 Tones - Ch. 11)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	Approved by: Technical Manager
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		Analyzer - Sw										- <b>6</b>
L <mark>XI</mark> RL	RI	= <u>50</u> Ω	2 DC	COF	REC		NSE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	M Feb 08, 2024 DE 1 2 3 4 5 6	Frequency
		6 00 00		IFO	NO: Fast ← Gain:Low	Trig: Free Atten: 30			M	⊳ (r1 4.95	2 2 GHz 78 dBm	Auto Tur
10 dB/div Log 10.0	Re	f 20.00	dBm									Center Fre 5.015000000 GH
-10.00												Start Fre 30.000000 M⊦
-20.0						<u> </u>	1				DL1 -29.41 dBm	Stop Fre 10.000000000 G⊦
-40.0										, an gharpy and a so	ing til og belanden for og Turskinger for det som forsettere	<b>CF Ste</b> 997.000000 M⊦ <u>Auto</u> Ma
-60.0												Freq Offse 0 ⊦
-70.0 Start 30											.000 GHz	Scale Typ
#Res BV	V 1.0	MHz			#VB۱	N 3.0 MHz		s		-	10001 pts)	
ISG									STATUS	6		

Plot 7-103. Conducted Spurious Plot MIMO ANT2 (802.11be OFDMA – 242 Tones – Ch. 1)



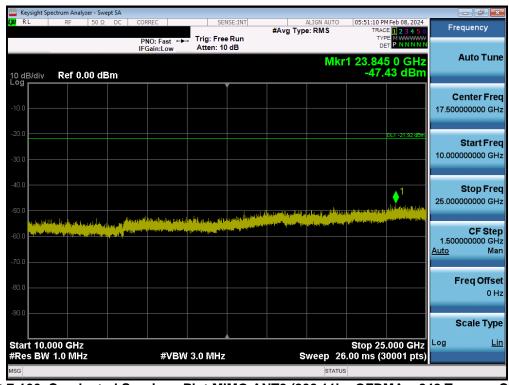
Plot 7-104. Conducted Spurious Plot MIMO ANT2 (802.11be OFDMA - 242 Tones - Ch. 1)

FCC ID: C3K2077 IC: 3048A-2077		MEASUREMENT REPORT	Approved by: Technical Manager
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	nt Spectrum			SA												
L <mark>XI</mark> RL	F	KF S	50 Ω	DC	CORR	EC		SEI	NSE:INT	#Avg Typ	ALIGN AUT	0 05:	TRAC	Feb 08, 2024	F	requency
						): Fast in:Low		Trig: Free Atten: 30				Mkr1 S	DE			Auto Tune
10 dB/di Log	iv Re	ef 20.0	)0 dB	m									-31.9	96 dBm		
10.0																<b>Center Freq</b> 5000000 GHz
-10.0															3(	Start Freq 0.000000 MHz
-20.0														DU1-21.92 dBm	10.00	<b>Stop Freq</b> 0000000 GHz
-40.0	و الله زير <sub>و</sub> يد. د الله رير وي	terative (Sara	inega (géne) a fill a shara cili		le gygel of a							and a first sector		and and a second se	99 <sup>.</sup> <u>Auto</u>	<b>CF Step</b> 7.000000 MHz Man
-60.0																Freq Offset 0 Hz
-70.0																Scale Type
Start 30 #Res B						#VE	SW 3	.0 MHz		s	weep	Sto 18.00 r	p 10. ns (3	.000 GHz 0001 pts)	Log	Lin
MSG											STA	ATUS				

Plot 7-105. Conducted Spurious Plot MIMO ANT2 (802.11be OFDMA – 242 Tones – Ch. 6)



Plot 7-106. Conducted Spurious Plot MIMO ANT2 (802.11be OFDMA – 242 Tones – Ch. 6)

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