

ELEMENT WASHINGTON DC LLC

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MEASUREMENT REPORT FCC PART 15.247 WLAN OFDMA

Applicant Name:

Samsung Electronics Co., Ltd. 129, Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, 16677, Korea Date of Testing: 9/08/2022 - 1/27/2023 Test Report Issue Date: 02/24/2023 Test Site/Location: Element lab., Columbia, MD, USA Test Report Serial No.: 1M2212080137-10-R1.A3L

FCC ID:

A3LSMS918JPN

APPLICANT:

Samsung Electronics Co., Ltd.

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

Certification SC-52D, SCG20 Portable Handset 2412 – 2472MHz CCK/DSSS/OFDMA Digital Transmission System (DTS) Part 15 Subpart C (15.247) ANSI C63.10-2013, KDB 558074 D01 v05r02, KDB 662911 D01 v02r01, KDB 648474 D03 v01r04

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013 and KDB 558074 D01 v05r02. Test results reported herein relate only to the item(s) tested.

Note: This revised Test Report (S/N: 1M2212080137-10-R1.A3L) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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

RJ Ortanez Executive Vice President



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			ANT2			MIMO				
		T. 5	Avg Co	nducted	Peak Co	onducted	Avg Co	nducted	Peak Co	onducted
Mode	Tones	Tx Frequency [MHz]	Max. Power (mW)	Max. Power (dBm)						
802.11ax OFDMA	26T	2412 - 2472	24.889	13.96	169.434	22.29	47.354	16.75	332.408	25.22
802.11ax OFDMA	52T	2412 - 2472	31.550	14.99	196.336	22.93	62.883	17.99	405.362	26.08
802.11ax OFDMA	106T	2412 - 2472	50.003	16.99	330.370	25.19	93.362	19.70	605.614	27.82
802.11ax OFDMA	242T	2412 - 2472	47.643	16.78	345.939	25.39	99.663	19.99	724.978	28.60

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 **Samsung Portable Handset FCC ID: A3LSMS918JPN**. The test data contained in this report pertains only to the emissions due to the EUT's WLAN (DTS) transmitter.

Test Device Serial No.: 0137M, 0128M, 1553M, 1521M

2.2 Device Capabilities

This device contains the following capabilities:

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

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

Note: 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:

Mode	Antenna	Bandwidth [MHz]	Channel	Tone	Duty Cycle
				26T	99.6
802.11ax	2	20	1	52T	99.6
DTS RU	2	20	1	106T	99.3
				242T	99.2
				26T	98.4
802.11ax	802.11ax DTS RU MIMO CDD	20	1	52T	98.9
DTS RU		20	1	106T	98.3
				242T	98.1

 Table 2-2. Measured Duty Cycles

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

WiFi Con	figurations	SISO		SDM		CDD	
WIFI COI	ilgurations	ANT1	ANT2	ANT1	ANT2	ANT1	ANT2
2.4GHz	11ax	×	✓	\checkmark	✓	\checkmark	✓

Table 2-3. Frequency / Channel Operations

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

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

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

Description	2.4 GHz Emission	5 GHz Emission
Antenna	1,2	1,2
Channel	11	120
Operating Frequency (MHz)	2462	5600
Data Rate (Mbps)	1Mbps	6Mbps
Mode	b	а

Table 2-4. Config-1 (ANT1 2.4GHz & ANT2 5GHz)

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

Description	5 GHz Emission	2.4 GHz Emission
Antenna	1,2	1,2
Channel	100	6
Operating Frequency (MHz)	5500	2437
Data Rate (Mbps)	6Mbps	1Mbps
Mode	а	b

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

Configuration 3: ANT1 and ANT2 both transmitting in 2.4GHz and 6GHz modes simultaneously

Description	2.4 GHz Emission	6 GHz Emission
Antenna	1, 2	1, 2
Channel	6	25
Operating Frequency (MHz)	2437	6075
Data Rate (Mbps)	1Mbps	6Mbps
Mode	b	а

Table 2-6. Config-3 (ANT1 MIMO & ANT2 MIMO)

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2.3 Test Configuration

The EUT was tested per the guidance of KDB 558074 D01 v05r02. 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.

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

2.4 Antenna Description

Following antenna was used for the testing.

Frequency [GHz]	Antenna 1 Gain [dBi]	Antenna 2 Gain [dBi]
2.4	-1.11	-5.47

Table 2-7. Antenna Peak Gain

2.5 Software and Firmware

The test was conducted with software/firmware version S918USQU0AVJH installed on the EUT.

2.6 EMI Suppression Device(s)/Modifications

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

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3.0 **DESCRIPTION OF TESTS**

3.1 Evaluation Procedure

The measurement procedures described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) and the guidance provided in KDB 558074 D01 v05r02 were used in the measurement of the EUT.

Deviation from measurement procedure.....None

3.2 Radiated Emissions

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

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

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

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 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
-	WL25-1	Conducted Cable Set (25GHz)	7/29/2022	Annual	7/29/2023	WL25-1
-	WL25-2	Conducted Cable Set (25GHz)	7/29/2022	Annual	7/29/2023	WL25-2
-	WL25-3	Conducted Cable Set (25GHz)	7/29/2022	Annual	7/29/2023	WL25-3
Agilent	N9038A	MXE EMI Receiver	1/21/2022	Annual	1/21/2023	MY51210133
Agilent	N9020A	MXA Signal Analyzer	3/15/2022	Annual	3/15/2023	US46470561
Agilent	N9030A	PXA Signal Analyzer (44GHz)	8/18/2022	Annual	8/18/2023	MY49430494
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	1/19/2022	Biennial	1/19/2024	121034
Emco	3115	Horn Antenna (1-18GHz)	8/8/2022	Biennial	8/8/2024	9704-5182
Emco	3116	Horn Antenna (18 - 40GHz)	7/20/2021	Biennial	7/202023	9203-2178
ETS-Lindgren	3816/2NM	Line Impedance Stabilization Network	8/11/2022	Biennial	8/11/2024	114451
Pasternack	NMLC-2	Line Conducted Emissions Cable (NM)	12/19/2021	Annual	12/19/2022	NMLC-2
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	8/29/2022	Annual	8/29/2023	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	8/25/2022	Annual	8/25/2023	100348
Solar Electronics	8012-50-R-24-BNC	Line Impedance Stabilization Network	9/21/2021	Biennial	9/21/2023	310233
Sunol	DRH-118	Horn Antenna (1-18GHz)	1/14/2022	Biennial	1/14/2024	A050307

Table 6-1. Annual Test Equipment Calibration Schedule

Note:

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

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7.0 **TEST RESULTS**

7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.		
FCC ID:	A3LSMS918JPN		
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]	6dB Bandwidth	> 500kHz		PASS	Section 7.2
15.247(b)(3)	RSS-247 [5.4]	Transmitter Output Power	< 1 Watt		PASS	Sections 7.3
15.247(e)	RSS-247 [5.2]	Transmitter Power Spectral Density < 8dBm / 3kHz Band CONDUCTED		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	Sections 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 "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 "Chamber Automation," Version 1.3.1.
- 802.11ax OFDMA testing was performed for all signal tone configurations as specified by the 802.11ax standard. Worst case results are determined and reported per the guidance provided at the October 2018 TCB Workshop.

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7.2 6dB Bandwidth Measurement

<u>§15.247(a.2); RSS-247 [5.2]</u>

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 permissible 6dB bandwidth is 500 kHz.

Test Procedure Used

ANSI C63.10-2013 – Section 11.8.2 Option 2 KDB 558074 D01 v05r02 – Section 8.2

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.

C. see some Rear State	
Van set toty not set	
	EUT

Figure 7-1. Test Instrument & Measurement Setup

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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.

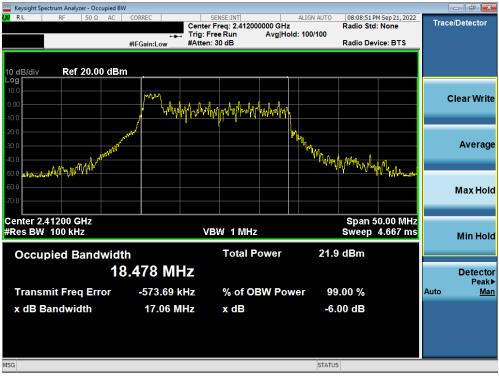
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SISO Antenna-2 6 dB Bandwidth Measurements

Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
2412	1	ax	26T	MCS0	17.06	0.500
2437	6	ax	26T	MCS0	15.84	0.500
2462	11	ax	26T	MCS0	2.662	0.500
2412	1	ax	242T	MCS0	19.06	0.500
2437	6	ax	242T	MCS0	19.09	0.500
2462	11	ax	242T	MCS0	19.05	0.500

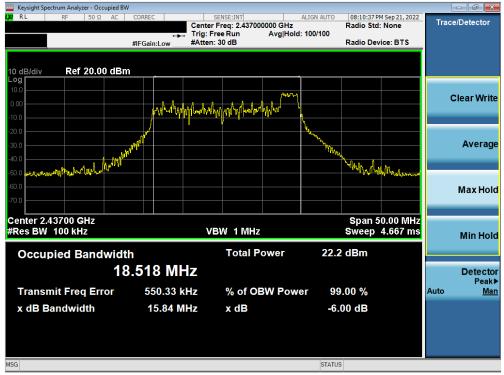
Table 7-2. Conducted Bandwidth Measurements SISO ANT2



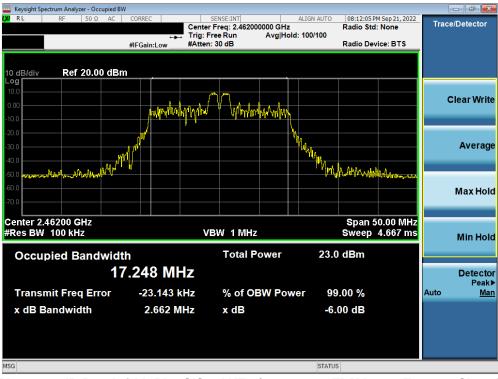
Plot 7-1. 6dB Bandwidth Plot SISO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 1)

FCC ID: A3LSMS918JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-2. 6dB Bandwidth Plot SISO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 6)



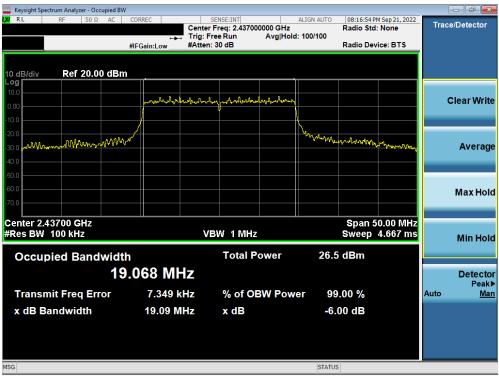
Plot 7-3. 6dB Bandwidth Plot SISO ANT2 (802.11ax OFDMA – 26 Tones – Ch. 11)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	Test Dates: EUT Type:		
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www.www.com analyzer - Occupied BW					
(X) RL RF 50Ω AC	++++ Trig: F		Radi d:>100/100	14:39 PM Sep 21, 2022 o Std: None	Trace/Detector
	#IFGain:Low #Atter	n: 30 dB	Radi	io Device: BTS	
10 dB/div Ref 20.00 dBm			_		
0.00	J. J	any motor of the second contractions of the second se	• •		Clear Write
-10.0 -20.0 -30.0 -40.0			milerenser	when or worked	Average
-50.0					Max Hold
Center 2.41200 GHz #Res BW 100 kHz	v	BW 1 MHz		oan 50.00 MHz eep 4.667 ms	Min Hold
Occupied Bandwidt	า	Total Power	26.6 dB	m	
19	.030 MHz				Detector Peak▶
Transmit Freq Error	7.241 kHz	% of OBW Pov	wer 99.00	%	Auto <u>Man</u>
x dB Bandwidth	19.06 MHz	x dB	-6.00 d	В	
MSG			STATUS		

Plot 7-4. 6dB Bandwidth Plot SISO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 1)



Plot 7-5. 6dB Bandwidth Plot SISO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 6)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)		
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www. Keysight Spectrum Analyzer - Occupied B	W				
LXI RL RF 50Ω AC		SENSE:INT Freg: 2.462000000 GHz	ALIGN AUTO 08:19:20 Radio St	PM Sep 21, 2022	Trace/Detector
	🛶 Trig: F		d: 100/100	evice: BTS	
	#IFGain:Low #Atten	: 30 dB	Radio Di	evice: BTS	
10 dB/div Ref 20.00 dBi	n				
10.0	- mhalashar	Le - Arabealander de alar			
0.00		man mar al hard land and a series	h		Clear Write
-10.0			<u></u>		
-20.0	h A A		handren and the start		
-30.0 Manutaling mark Marked Mark			1 444 19 (14410)	when all and	Average
-40.0					
-50.0					
-60.0					Max Hold
-70.0					
Center 2.46200 GHz			Snan	50.00 MHz	
#Res BW 100 kHz	v	BW 1 MHz		4.667 ms	Min Hold
			00 7 IB		WIIITIOIG
Occupied Bandwid		Total Power	26.7 dBm		
1	9.051 MHz				Detector
Transmit Freq Error	-12.400 kHz	% of OBW Pov	ver 99.00 %		Peak► Auto Man
					nuto <u>mun</u>
x dB Bandwidth	19.05 MHz	x dB	-6.00 dB		
MSG			STATUS		

Plot 7-6. 6dB Bandwidth Plot SISO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 11)

FCC ID: A3LSMS918JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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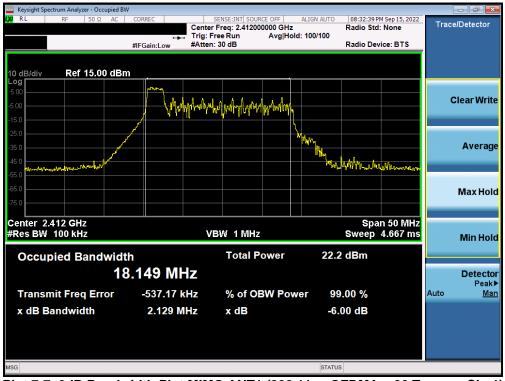
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MIMO Antenna-1 6 dB Bandwidth Measurements

Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
2412	1	ax	26T	MCS0	2.129	0.500
2437	6	ax	26T	MCS0	2.104	0.500
2462	11	ax	26T	MCS0	2.686	0.500
2412	1	ax	242T	MCS0	19.13	0.500
2437	6	ax	242T	MCS0	19.12	0.500
2462	11	ax	242T	MCS0	19.15	0.500

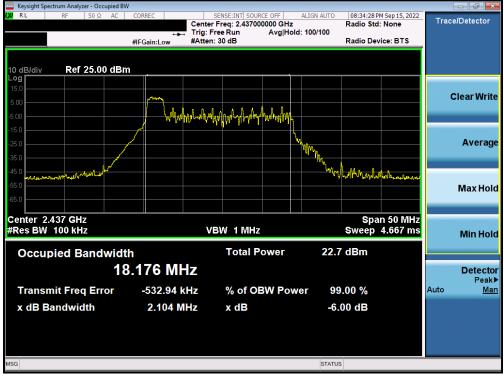
Table 7-3. Conducted Bandwidth Measurements MIMO ANT1



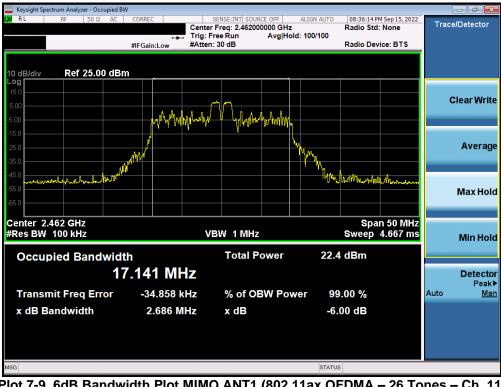
Plot 7-7. 6dB Bandwidth Plot MIMO ANT1 (802.11ax OFDMA - 26 Tones - Ch. 1)

FCC ID: A3LSMS918JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-8. 6dB Bandwidth Plot MIMO ANT1 (802.11ax OFDMA – 26 Tones – Ch. 6)



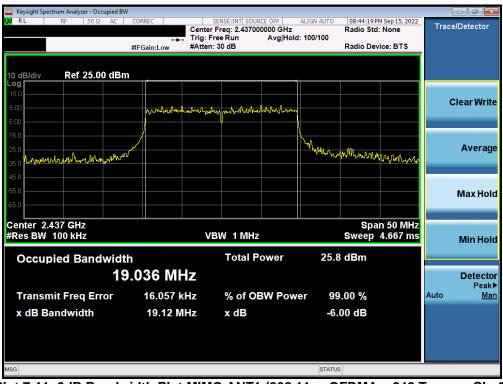
Plot 7-9. 6dB Bandwidth Plot MIMO ANT1 (802.11ax OFDMA – 26 Tones – Ch. 11)

FCC ID: A3LSMS918JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 20 of 102
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Keysight Spectrum Analyzer - Occupied BW						- 6 - X -
KX RL RF 50Ω AC		SENSE:INT SOURCE OFF	ALIGN AUTO 08:42:45 Radio St	PM Sep 15, 2022	Trace	Detector
	Trig: F	ree Run Avg Hol	d: 100/100	u. None		
	#IFGain:Low #Atten	: 30 dB	Radio De	evice: BTS		
10 dB/div Ref 25.00 dBm						
Log 15.0						
					С	lear Write
5.00	montantantanta	by mound when have been a server a se				
-5.00						
-15.0	1		λ			_
-25.0 -35.0 Way to hall with Myderlan for more marked by	N ²		White here with the second start	معام الم		Average
-35.0 พระนิสินใหญ่ในในขณะการจากการ				M.M.M.M.M.M		
-45.0						
-55.0						Max Hold
-65.0						
Center 2.412 GHz #Res BW 100 kHz	M	BW 1 MHz		an 50 MHz 4.667 ms		
#Res BW TOO KH2	v		Sweep	4.007 1115		Min Hold
Occupied Bandwidth	n	Total Power	25.3 dBm			
	030 MHz					Detector
19						Detector Peak▶
Transmit Freq Error	5.518 kHz	% of OBW Pow	ver 99.00 %		Auto	Man
x dB Bandwidth	19.13 MHz	x dB	-6.00 dB			
	19.13 WITZ	X UB	-0.00 uB			
MSG			STATUS			

Plot 7-10. 6dB Bandwidth Plot MIMO ANT1 (802.11ax OFDMA – 242 Tones – Ch. 1)



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

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)		
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Keysight Spectrum Analyzer - Occupied B	w				
LXX RL RF 50Ω AC		SENSE:INT SOURCE OFF	ALIGN AUTO 08:45:44 Radio St	PM Sep 15, 2022	Trace/Detector
	Trig: F	ree Run Avg Hold	d: 100/100		
	#IFGain:Low #Atten	: 30 dB	Radio De	evice: BTS	
10 dB/div Ref 25.00 dB	m				
Log 15.0					
					Clear Write
5.00	www.www.www.	wy more all all all and a los			
-5.00					
-15.0			<u>,</u>		_
-25.0 Martin Mar	hirza		Mananananan	MI	Average
-35.0				. A MIMIN WAY	
-45.0					
-55.0					Max Hold
-65.0					Muxitoru
Center 2.462 GHz				an 50 MHz	
#Res BW 100 kHz	V	BW 1 MHz	Sweep	4.667 ms	Min Hold
Occupied Bandwid	th	Total Power	26.0 dBm		
			20.0 0.8		
1	9.048 MHz				Detector Peak►
Transmit Freq Error	1.451 kHz	% of OBW Pow	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	19.15 MHz	x dB	-6.00 dB		
MSG			STATUS		

Plot 7-12. 6dB Bandwidth Plot MIMO ANT1 (802.11ax OFDMA – 242 Tones – Ch. 11)

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MIMO Antenna-2 6 dB Bandwidth Measurements

Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
2412	1	ax	26T	MCS0	2.139	0.500
2437	6	ax	26T	MCS0	2.132	0.500
2462	11	ax	26T	MCS0	2.781	0.500
2412	1	ax	242T	MCS0	19.00	0.500
2437	6	ax	242T	MCS0	19.06	0.500
2462	11	ax	242T	MCS0	19.04	0.500

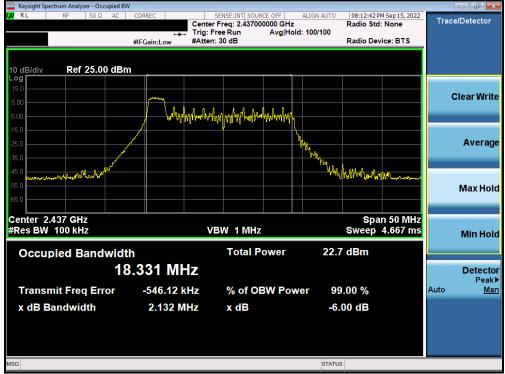
Table 7-4. Conducted Bandwidth Measurements MIMO ANT2



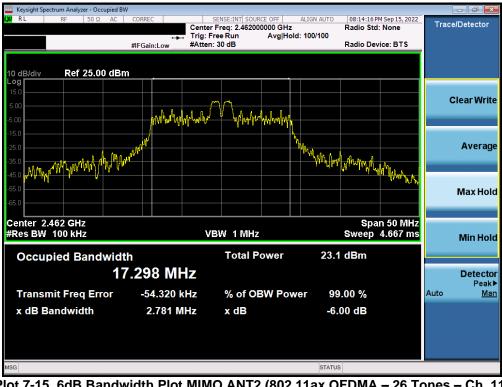
Plot 7-13. 6dB Bandwidth Plot MIMO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 1)

FCC ID: A3LSMS918JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-14. 6dB Bandwidth Plot MIMO ANT2 (802.11ax OFDMA – 26 Tones – Ch. 6)



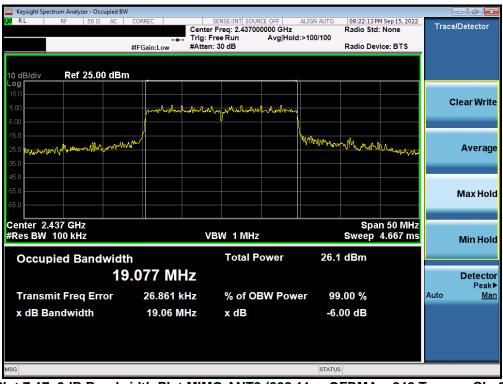
Plot 7-15. 6dB Bandwidth Plot MIMO ANT2 (802.11ax OFDMA – 26 Tones – Ch. 11)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)	
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Keysight Spectrum Analyzer - Occupied BW						r X
i xu RL RF 50 Ω AC	Center	SENSE:INT SOURCE OFF Freq: 2.412000000 GHz Free Run Avg Hol	Radio St d:>100/100	PM Sep 15, 2022 d: None	Trace/Det	tector
10 dB/div Ref 25.00 dBm						
Log 15.0 5.00	parent a land and and and	my gother hand a lower			Clea	r Write
-15.0 -25.0 -35.0	m, 1 ⁴		hanne with wat	Mrshallhalully	A	verage
-45.0 -55.0 -65.0					Ma	ix Hold
Center 2.412 GHz #Res BW 100 kHz Occupied BandwidtI		BW 1 MHz Total Power		an 50 MHz 4.667 ms	Mi	in Hold
	19.040 MHz					etector Peak▶
Transmit Freq Error x dB Bandwidth	17.943 kHz 19.00 MHz	% of OBW Pow x dB	ver 99.00 % -6.00 dB		Auto	Man
MSG			STATUS			

Plot 7-16. 6dB Bandwidth Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 1)



Plot 7-17. 6dB Bandwidth Plot MIMO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 6)

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Keysight Spectrum Analyzer - Occupied BW					
(X) RL RF 50 Ω AC (SENSE:INT SOURCE OFF er Freq: 2.462000000 GHz Free Run Avg Hol	ALIGN AUTO 08:24:04 Radio St d:>100/100	PM Sep 15, 2022 d: None	Trace/Detector
#		en: 30 dB		evice: BTS	
10 dB/div Ref 25.00 dBm					
Log 15.0					
5.00	parter polyander the	alm which alma	4		Clear Write
-5.00	<mark> </mark>				
-25.0 -25.0 -25.0	~		Mumer marker of		A
			and the party of the Araby	Wmp to man hay	Average
-35.0					
-55.0					Max Hold
-65.0					Μάχ Ποία
Center 2,462 GHz			<u> </u>	an 50 MHz	
#Res BW 100 kHz		VBW 1 MHz		4.667 ms	Min Hold
Occupied Bandwidth		Total Power	26.4 dBm		
	067 MHz				Detector
		0/ - f ODW/ D			Peak▶ Auto Man
Transmit Freq Error	-3.727 kHz	% of OBW Pov			Auto <u>Man</u>
x dB Bandwidth	19.04 MHz	x dB	-6.00 dB		
MSG			STATUS		

Plot 7-18. 6dB Bandwidth Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 11)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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7.3 Output Power Measurement §15.247(b.3); RSS-247 [5.4]

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.

Test Procedure Used

ANSI C63.10-2013 – Section 11.9.1.3 PKPM1 Peak Power Method KDB 558074 D01 v05r02 – Section 8.3.1.3 PKPM1 Peak-reading Power Meter Method ANSI C63.10-2013 – Section 11.9.2.3.2 Method AVGPM-G KDB 558074 D01 v05r02 – Section 8.3.2.3 Measurement using a Power Meter (PM) ANSI C63.10-2013 – Section 14.2 Measure-and-Sum Technique KDB 662911 D01 v02r01 – Section E)1) 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	Detector	Conducted Powers (dBm)	Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
				0	AVG	13.76	30.00	-16.24	-8.54	5.22	36.02	-30.80
					PEAK	21.52	30.00	-8.48	-8.54	12.98	36.02	-23.04
	2412	1	26T	4	AVG	13.68	30.00	-16.32	-8.54	5.14	36.02	-30.88
			-		PEAK	21.65	30.00	-8.35	-8.54	13.11	36.02	-22.91
				8	AVG	13.87	30.00	-16.13	-8.54	5.33	36.02	-30.69
					PEAK	21.57	30.00	-8.43	-8.54	13.03	36.02	-22.99
				0	AVG	13.89	30.00	-16.11	-7.61	6.28	36.02	-29.74
					PEAK	21.77	30.00	-8.23	-7.61	14.16	36.02	-21.86
	2437	6 26T		4	AVG	13.66	30.00	-16.34	-7.61	6.05	36.02	-29.97
			PEAK	21.83	30.00	-8.17	-7.61	14.22	36.02	-21.80		
N				8	AVG	13.90	30.00	-16.10	-7.61	6.29	36.02	-29.73
Î					PEAK	21.34	30.00	-8.66	-7.61	13.73	36.02	-22.29
2.4GHz	2462			0	AVG	13.62	30.00	-16.38	-7.04	6.58	36.02	-29.44
4					PEAK	21.32	30.00	-8.68	-7.04	14.28	36.02	-21.74
N		11	26T	4	AVG	13.96	30.00	-16.04	-7.04	6.92	36.02	-29.10
	2102			4	PEAK	22.29	30.00	-7.71	-7.04	15.25	36.02	-20.77
				8	AVG	13.89	30.00	-16.11	-7.04	6.85	36.02	-29.17
				U	PEAK	22.19	30.00	-7.81	-7.04	15.15	36.02	-20.87
				0	AVG	5.60	30.00	-24.40	-7.04	-1.44	36.02	-37.46
				0	PEAK	12.92	30.00	-17.08	-7.04	5.88	36.02	-30.14
	2467	12	26T	4	AVG	5.46	30.00	-24.54	-7.04	-1.58	36.02	-37.60
	2407	12	201	Ŧ	PEAK	13.57	30.00	-16.43	-7.04	6.53	36.02	-29.49
				8	AVG	5.58	30.00	-24.42	-7.04	-1.46	36.02	-37.48
				0	PEAK	14.40	30.00	-15.60	-7.04	7.36	36.02	-28.66
				0	AVG	-3.11	30.00	-33.11	-7.46	-10.57	36.02	-46.59
				0	PEAK	4.12	30.00	-25.88	-7.46	-3.34	36.02	-39.36
	2472	12	26T	4	AVG	-3.40	30.00	-33.40	-7.46	-10.86	36.02	-46.88
	2472	13	201	4	PEAK	4.97	30.00	-25.03	-7.46	-2.49	36.02	-38.51
				8	AVG	-3.26	30.00	-33.26	-7.46	-10.72	36.02	-46.74
				0	PEAK	4.79	30.00	-25.21	-7.46	-2.67	36.02	-38.69

Table 7-5. Conducted Output Power Measurements SISO ANT2 (26 Tones)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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	Freq [MHz]	Channel	Tones	RU Index	Detector	Conducted Powers (dBm)	Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
				37	AVG	14.70	30.00	-15.30	-8.54	6.16	36.02	-29.86
				37	PEAK	22.93	30.00	-7.07	-8.54	14.39	36.02	-21.63
	2412	1	52T	38	AVG	14.99	30.00	-15.01	-8.54	6.45	36.02	-29.57
	2412	1	521	30	PEAK	22.40	30.00	-7.60	-8.54	13.86	36.02	-22.16
				40	AVG	14.65	30.00	-15.35	-8.54	6.11	36.02	-29.91
				40	PEAK	22.42	30.00	-7.58	-8.54	13.88	36.02	-22.14
				37	AVG	14.64	30.00	-15.36	-7.61	7.03	36.02	-28.99
				57	PEAK	22.56	30.00	-7.44	-7.61	14.95	36.02	-21.07
	2437	6	52T	38	AVG	14.51	30.00	-15.49	-7.61	6.90	36.02	-29.12
	2437	0	J2 I	30	PEAK	22.55	30.00	-7.45	-7.61	14.94	36.02	-21.08
				40	AVG	14.99	30.00	-15.01	-7.61	7.38	36.02	-28.64
F				40	PEAK	22.58	30.00	-7.42	-7.61	14.97	36.02	-21.05
I	2462			37	AVG	14.86	30.00	-15.14	-7.04	7.82	36.02	-28.20
2.4G					PEAK	22.70	30.00	-7.30	-7.04	15.66	36.02	-20.36
<u>v</u> .		11	52T	38 40	AVG	14.63	30.00	-15.37	-7.04	7.59	36.02	-28.43
2					PEAK	22.30	30.00	-7.70	-7.04	15.26	36.02	-20.76
					AVG	14.68	30.00	-15.32	-7.04	7.64	36.02	-28.38
				-10	PEAK	22.80	30.00	-7.20	-7.04	15.76	36.02	-20.26
				37	AVG	5.81	30.00	-24.19	-7.04	-1.23	36.02	-37.25
				57	PEAK	13.32	30.00	-16.68	-7.04	6.28	36.02	-29.74
	2467	12	52T	38	AVG	5.89	30.00	-24.11	-7.04	-1.15	36.02	-37.17
	2407	12	521	50	PEAK	13.39	30.00	-16.61	-7.04	6.35	36.02	-29.67
				40	AVG	5.49	30.00	-24.51	-7.04	-1.55	36.02	-37.57
				-10	PEAK	14.25	30.00	-15.75	-7.04	7.21	36.02	-28.81
				37	AVG	-0.73	30.00	-30.73	-7.46	-8.19	36.02	-44.21
					PEAK	6.76	30.00	-23.24	-7.46	-0.70	36.02	-36.72
	2472	13	52T	38	AVG	-0.82	30.00	-30.82	-7.46	-8.28	36.02	-44.30
	2712	10	021		PEAK	7.07	30.00	-22.93	-7.46	-0.39	36.02	-36.41
				40	AVG	-0.56	30.00	-30.56	-7.46	-8.02	36.02	-44.04
				-10	PEAK	7.69	30.00	-22.31	-7.46	0.23	36.02	-35.79

Table 7-6. Conducted Output Power Measurements SISO ANT2 (52 Tones)

	Freq [MHz]	Channel	Tones	RU Index	Detector	Conducted Powers (dBm)	Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
				53	AVG	16.63	30.00	-13.37	-8.54	8.09	36.02	-27.93
	2412	1	106T	- 55	PEAK	24.73	30.00	-5.27	-8.54	16.19	36.02	-19.83
	2412	1	1001	54	AVG	16.70	30.00	-13.30	-8.54	8.16	36.02	-27.86
				54	PEAK	25.19	30.00	-4.81	-8.54	16.65	36.02	-19.37
				53	AVG	16.97	30.00	-13.03	-7.61	9.36	36.02	-26.66
	2437	6	106T		PEAK	24.94	30.00	-5.06	-7.61	17.33	36.02	-18.69
N	2407	Ū	1001	54	AVG	16.70	30.00	-13.30	-7.61	9.09	36.02	-26.93
I				04	PEAK	25.06	30.00	-4.94	-7.61	17.45	36.02	-18.57
2.4G	2462	11	106T	53 54	AVG	16.99	30.00	-13.01	-7.04	9.95	36.02	-26.07
7					PEAK	25.03	30.00	-4.97	-7.04	17.99	36.02	-18.03
2	2.02				AVG	16.56	30.00	-13.44	-7.04	9.52	36.02	-26.50
				01	PEAK	24.88	30.00	-5.12	-7.04	17.84	36.02	-18.18
				53	AVG	5.21	30.00	-24.79	-7.04	-1.83	36.02	-37.85
	2467	12	106T		PEAK	13.31	30.00	-16.69	-7.04	6.27	36.02	-29.75
	2107	.2	1001	54	AVG	5.01	30.00	-24.99	-7.04	-2.03	36.02	-38.05
				<u> </u>	PEAK	12.98	30.00	-17.02	-7.04	5.94	36.02	-30.08
				53	AVG	-0.73	30.00	-30.73	-7.46	-8.19	36.02	-44.21
	2472 13	13	106T -	53	PEAK	7.11	30.00	-22.89	-7.46	-0.35	36.02	-36.37
		1061	54	AVG	-0.88	30.00	-30.88	-7.46	-8.34	36.02	-44.36	
				51	PEAK	7.23	30.00	-22.77	-7.46	-0.23	36.02	-36.25

Table 7-7. Conducted Output Power Measurements SISO ANT2 (106 Tones)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 20 of 102
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	Freq [MHz]	Channel	Tones	RU Index	Detector	Conducted Powers (dBm)	Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
	2412	1	242T	61	AVG	16.78	30.00	-13.22	-8.54	8.24	36.02	-27.78
N	2412		2421	01	PEAK	25.39	30.00	-4.61	-8.54	16.85	36.02	-19.17
I	2437	6	242T	61	AVG	16.64	30.00	-13.36	-7.61	9.03	36.02	-26.99
Ģ	2407	0	2421	01	PEAK	25.29	30.00	-4.71	-7.61	17.68	36.02	-18.34
4	2462	11	242T	61	AVG	16.56	30.00	-13.44	-7.04	9.52	36.02	-26.50
2	2402		2421	01	PEAK	25.08	30.00	-4.92	-7.04	18.04	36.02	-17.98
	2467	12	242T	61	AVG	5.21	30.00	-24.79	-7.04	-1.83	36.02	-37.85
	2407	12	2421	01	PEAK	13.21	30.00	-16.79	-7.04	6.17	36.02	-29.85
	2472	13	242T	61	AVG	-0.87	30.00	-30.87	-7.46	-8.33	36.02	-44.35
	2472	15	2421	01	PEAK	7.88	30.00	-22.12	-7.46	0.42	36.02	-35.60

Table 7-8. Conducted Output Power Measurements SISO ANT2 (242 Tones)

	Freq [MHz]	Channel	Tones	RU Index	Detector	Conc	lucted Power [dBm]	Conducted Power Limit	Conducted Power	Directional Ant. Gain	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
						ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	[]		
				0	AVG	14.07	13.39	16.75	30.00	-13.25	-3.12	13.64	36.02	-22.38
				0	PEAK	22.32	21.50	24.94	30.00	-5.06	-3.12	21.82	36.02	-14.20
	2412	1	26T	4	AVG	13.81	13.14	16.50	30.00	-13.50	-3.12	13.38	36.02	-22.64
	2412	'	201	4	PEAK	22.31	21.48	24.93	30.00	-5.07	-3.12	21.81	36.02	-14.21
				8	AVG	14.10	12.77	16.50	30.00	-13.50	-3.12	13.38	36.02	-22.64
				0	PEAK	21.96	20.88	24.46	30.00	-5.54	-3.12	21.35	36.02	-14.67
				0	AVG	13.79	13.41	16.61	30.00	-13.39	-2.81	13.81	36.02	-22.21
				0	PEAK	22.03	21.56	24.81	30.00	-5.19	-2.81	22.01	36.02	-14.01
	2437	6	26T	4	AVG	13.58	13.17	16.39	30.00	-13.61	-2.81	13.58	36.02	-22.44
	2457		201	-	PEAK	22.01	21.63	24.83	30.00	-5.17	-2.81	22.03	36.02	-13.99
N				8	AVG	13.29	13.41	16.36	30.00	-13.64	-2.81	13.55	36.02	-22.47
보				0	PEAK	21.41	21.03	24.23	30.00	-5.77	-2.81	21.43	36.02	-14.59
				0	AVG	13.67	13.04	16.38	30.00	-13.62	-1.35	15.03	36.02	-20.99
4 0			26T		PEAK	21.41	20.71	24.08	30.00	-5.92	-1.35	22.74	36.02	-13.28
N.	2462	11		4	AVG	13.64	13.49	16.58	30.00	-13.42	-1.35	15.23	36.02	-20.79
	2.02				PEAK	22.51	21.88	25.22	30.00	-4.78	-1.35	23.87	36.02	-12.15
				8	AVG	13.64	12.87	16.28	30.00	-13.72	-1.35	14.94	36.02	-21.08
					PEAK	21.89	21.28	24.61	30.00	-5.39	-1.35	23.26	36.02	-12.76
				0	AVG	6.23	5.69	8.98	30.00	-21.02	-1.35	7.63	36.02	-28.39
					PEAK	13.86	12.88	16.41	30.00	-13.59	-1.35	15.06	36.02	-20.96
	2467	12	26T	4	AVG	6.31	5.49	8.93	30.00	-21.07	-1.35	7.58	36.02	-28.44
	2101		201	· ·	PEAK	14.78	13.63	17.25	30.00	-12.75	-1.35	15.91	36.02	-20.11
				8	AVG	6.58	4.18	8.55	30.00	-21.45	-1.35	7.21	36.02	-28.81
					PEAK	14.31	13.15	16.78	30.00	-13.22	-1.35	15.43	36.02	-20.59
				0	AVG	-3.56	-3.47	-0.50	30.00	-30.50	-0.71	-1.21	36.02	-37.23
					PEAK	4.42	3.94	7.20	30.00	-22.80	-0.71	6.49	36.02	-29.53
	2472	13	26T	26T 4	AVG	-2.27	-3.99	-0.04	30.00	-30.04	-0.71	-0.74	36.02	-36.76
	2.02		201	-	PEAK	5.93	4.65	8.35	30.00	-21.65	-0.71	7.64	36.02	-28.38
			-	8	AVG	-2.54	-4.06	-0.22	30.00	-30.22	-0.71	-0.93	36.02	-36.95
				Ŭ	PEAK	5.34	4.22	7.83	30.00	-22.17	-0.71	7.12	36.02	-28.90

Table 7-9. Conducted Output Power Measurements MIMO (26 Tones)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 20 of 102
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	Freq [MHz]	Channel	Tones	RU Index	Detector	Conducted Power [dBm]		Conducted Conducted Power Limit Power		Directional Ant. Gain	Max e.i.r.p.	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]					
						ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	[dBm]	τιμιτ (αρμί	wargin [db]				
				37	AVG	14.69	14.55	17.63	30.00	-12.37	-3.12	14.51	36.02	-21.51				
				37	PEAK	22.76	22.40	25.59	30.00	-4.41	-3.12	22.48	36.02	-13.54				
	2412	1	52T	38	AVG	14.96	14.99	17.99	30.00	-12.01	-3.12	14.87	36.02	-21.15				
	2412		521	30	PEAK	23.23	22.90	26.08	30.00	-3.92	-3.12	22.96	36.02	-13.06				
				40	AVG	14.85	14.56	17.72	30.00	-12.28	-3.12	14.60	36.02	-21.42				
				40	PEAK	22.80	22.33	25.58	30.00	-4.42	-3.12	22.47	36.02	-13.56				
				37	AVG	14.68	14.99	17.85	30.00	-12.15	-2.81	15.04	36.02	-20.98				
				57	PEAK	22.58	23.04	25.83	30.00	-4.17	-2.81	23.02	36.02	-13.00				
	2437 6	52T	38	AVG	14.75	14.99	17.88	30.00	-12.12	-2.81	15.08	36.02	-20.94					
	2437	2437 6 52T	521	30	PEAK	22.64	23.04	25.85	30.00	-4.15	-2.81	23.05	36.02	-12.97				
				40	AVG	14.32	14.98	17.67	30.00	-12.33	-2.81	14.87	36.02	-21.15				
N				40	PEAK	22.17	22.45	25.32	30.00	-4.68	-2.81	22.52	36.02	-13.50				
2.4GHz	2462			37	AVG	14.78	14.86	17.83	30.00	-12.17	-1.35	16.48	36.02	-19.54				
Ģ				- 57	PEAK	22.39	22.37	25.39	30.00	-4.61	-1.35	24.04	36.02	-11.98				
<u>v</u> .		11	52T	38	AVG	14.79	14.99	17.90	30.00	-12.10	-1.35	16.55	36.02	-19.47				
2	2402				PEAK	22.66	22.79	25.74	30.00	-4.26	-1.35	24.39	36.02	-11.63				
				40	AVG	14.61	14.63	17.63	30.00	-12.37	-1.35	16.28	36.02	-19.74				
				-10	PEAK	22.63	22.85	25.75	30.00	-4.25	-1.35	24.41	36.02	-11.62				
				37	AVG	6.00	5.60	8.81	30.00	-21.19	-1.35	7.47	36.02	-28.55				
									PEAK	13.77	12.93	16.38	30.00	-13.62	-1.35	15.03	36.02	-20.99
	2467	12	52T	52T	52T	52T	52T	38	AVG	5.99	5.78	8.90	30.00	-21.10	-1.35	7.55	36.02	-28.47
	2407	12	021		PEAK	13.98	13.26	16.65	30.00	-13.35	-1.35	15.30	36.02	-20.72				
				40	AVG	6.98	4.66	8.98	30.00	-21.02	-1.35	7.64	36.02	-28.38				
				-10	PEAK	14.84	13.38	17.18	30.00	-12.82	-1.35	15.83	36.02	-20.19				
				37	AVG	-0.63	-0.77	2.31	30.00	-27.69	-0.71	1.60	36.02	-34.42				
				- 57	PEAK	7.48	7.02	10.27	30.00	-19.73	-0.71	9.56	36.02	-26.46				
	2472	13	52T	38	AVG	-0.31	-1.36	2.21	30.00	-27.79	-0.71	1.50	36.02	-34.52				
		10	021		PEAK	7.99	6.56	10.34	30.00	-19.66	-0.71	9.64	36.02	-26.38				
				-		40	AVG	-0.01	-1.74	2.22	30.00	-27.78	-0.71	1.51	36.02	-34.51		
				-70	PEAK	7.94	6.26	10.19	30.00	-19.81	-0.71	9.48	36.02	-26.54				

Table 7-10. Conducted Output Power Measurements MIMO (52 Tones)

	Freq [MHz]	Channel	Tones	RU Index	Detector	Cond	lucted Power [dBm]	Conducted Power Limit	Conducted Power	Directional Ant. Gain	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]	
						ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	[abiii]	Ennie [GDing	Margin [ab]	
				53	AVG	16.35	16.59	19.48	30.00	-10.52	-3.12	16.37	36.02	-19.65	
	2412	1	106T	- 55	PEAK	24.81	24.56	27.70	30.00	-2.30	-3.12	24.58	36.02	-11.44	
	2412	'	1001	54	AVG	16.80	16.58	19.70	30.00	-10.30	-3.12	16.59	36.02	-19.44	
				34	PEAK	24.93	24.69	27.82	30.00	-2.18	-3.12	24.71	36.02	-11.31	
				53	AVG	16.39	16.64	19.53	30.00	-10.47	-2.81	16.72	36.02	-19.30	
	2437	6	106T		PEAK	24.55	24.83	27.70	30.00	-2.30	-2.81	24.90	36.02	-11.12	
N	2451		1001	54	AVG	16.28	16.87	19.60	30.00	-10.40	-2.81	16.79	36.02	-19.23	
I				04	PEAK	24.38	24.92	27.67	30.00	-2.33	-2.81	24.86	36.02	-11.16	
4 0	2462		1 106T	53	53	AVG	16.14	16.85	19.52	30.00	-10.48	-1.35	18.17	36.02	-17.85
		11			PEAK	24.09	24.65	27.39	30.00	-2.61	-1.35	26.04	36.02	-9.98	
2	2402			54	AVG	16.13	16.95	19.57	30.00	-10.43	-1.35	18.22	36.02	-17.80	
				54	PEAK	24.43	25.04	27.76	30.00	-2.24	-1.35	26.41	36.02	-9.61	
				53	AVG	5.86	5.11	8.51	30.00	-21.49	-1.35	7.16	36.02	-28.86	
	2467	12	106T		PEAK	13.76	13.27	16.53	30.00	-13.47	-1.35	15.19	36.02	-20.84	
	2401	12	1001	54	AVG	5.84	4.58	8.27	30.00	-21.73	-1.35	6.92	36.02	-29.10	
				54	PEAK	13.95	12.78	16.41	30.00	-13.59	-1.35	15.07	36.02	-20.95	
				53	AVG	-0.01	-0.71	2.66	30.00	-27.34	-0.71	1.96	36.02	-34.06	
	2472	13	106T		PEAK	8.23	7.23	10.77	30.00	-19.23	-0.71	10.06	36.02	-25.96	
	2-472		1501	54	AVG	0.37	-0.81	2.83	30.00	-27.17	-0.71	2.12	36.02	-33.90	
					PEAK	8.21	7.34	10.81	30.00	-19.19	-0.71	10.10	36.02	-25.92	

 Table 7-11. Conducted Output Power Measurements MIMO (106 Tones)

	Freq [MHz] Channel	Tones	RU Index	Detector Conducted Power [dBm]			Conducted Conducted Power Limit Power	Directional Ant. Gain	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]								
						ANT1	ANT2	MIMO	[dBm]	Margin [dB]	[dBi]	Lapud	Cinic [abili]	Margin [GD]					
	2412	1	242T	61	AVG	16.99	16.96	19.99	30.00	-10.01	-3.12	16.87	36.02	-19.15					
N	2412	1	2421	01	PEAK	25.43	25.75	28.60	30.00	-1.40	-3.12	25.49	36.02	-10.53					
Ξ	2437	6	242T	61	AVG	16.60	16.99	19.81	30.00	-10.19	-2.81	17.00	36.02	-19.02					
4 0	2437	2457 0	2421	01	PEAK	25.17	25.75	28.48	30.00	-1.52	-2.81	25.67	36.02	-10.35					
	2462	11	242T	61	AVG	16.41	16.52	19.48	30.00	-10.52	-1.35	18.13	36.02	-17.89					
2	2402			01	PEAK	25.31	25.39	28.36	30.00	-1.64	-1.35	27.01	36.02	-9.01					
	2467 12	12 242T	12	242T	040T	242T	242T	242T	61	AVG	5.66	4.78	8.25	30.00	-21.75	-1.35	6.91	36.02	-29.11
		12	2421	01	PEAK	14.52	13.41	17.01	30.00	-12.99	-1.35	15.66	36.02	-20.36					
	2472	13	242T	61	AVG	0.07	-0.87	2.64	30.00	-27.36	-0.71	1.93	36.02	-34.09					
	2472	13	13	2421	2421	01	PEAK	9.19	7.76	11.54	30.00	-18.46	-0.71	10.84	36.02	-25.18			

Table 7-12. Conducted Output Power Measurements MIMO (242 Tones)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)		
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Note:

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

Sample MIMO Calculation:

At 2412MHz the average conducted output power was measured to be 17.51 dBm for Antenna 1 and 17.57 dBm for Antenna 2.

Antenna 1 + Antenna 2 = MIMO

(17.51 dBm + 17.57 dBm) = (56.31 mW + 57.19 mW) = 113.50 mW = 20.55 dBm

Sample e.i.r.p Calculation:

At 2412MHz in 802.11ax (20MHz BW) mode, the average MIMO conducted power was calculated to be 16.75 dBm with directional gain of -3.12 dBi.

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

16.75 dBm + -3.12 dBi = 13.63 dBm

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7.4 Power Spectral Density

§15.247(e); RSS-247 [5.2]

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 is 8 dBm in any 3 kHz band.

Test Procedure Used

ANSI C63.10-2013 – Section 11.10.2 Method PKPSD KDB 558074 D01 v05r02 – Section 8.4 DTS Maximum Power Spectral Density level in the fundamental emission ANSI C63.10-2013 – Section 14.3.2.2 Measure-and-Sum Technique KDB 662911 D01 v02r01 – Section E)2) 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.

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Figure 7-3. Test Instrument & Measurement Setup

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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.

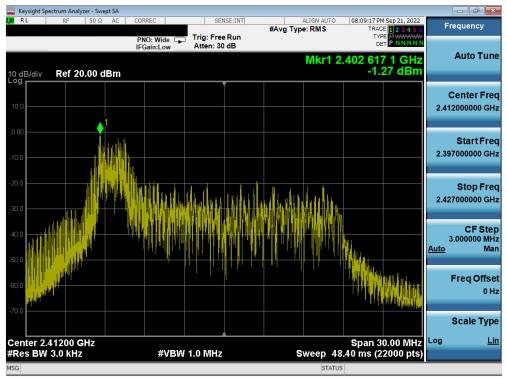
FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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SISO Antenna-2 Power Spectral Density Measurements

Frequency [MHz]	Channel No.	802.11 Mode	Tones	Data Rate [Mbps]	Measured Power Spectral Density [dBm]	Maximum Permissible Power Density [dBm / 3kHz]	Margin [dB]	Pass / Fail
2412	1	ax	26T	MCS0	-1.27	8.00	-9.27	Pass
2437	6	ax	26T	MCS0	-0.87	8.00	-8.87	Pass
2462	11	ax	26T	MCS0	-3.36	8.00	-11.36	Pass
2412	1	ax	242T	MCS0	-6.13	8.00	-14.13	Pass
2437	6	ax	242T	MCS0	-6.35	8.00	-14.35	Pass
2462	11	ax	242T	MCS0	-6.10	8.00	-14.10	Pass

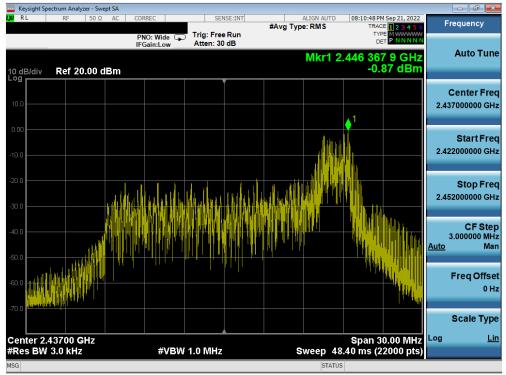
Table 7-13. Conducted Bandwidth Measurements SISO ANT2



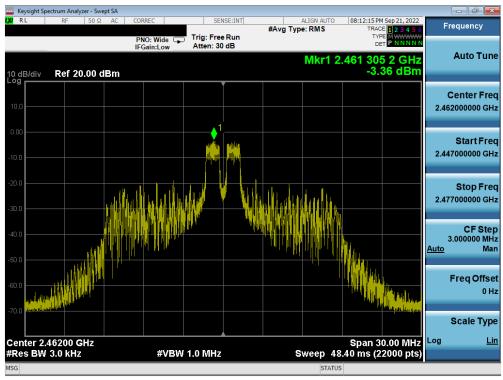
Plot 7-19. Power Spectral Density Plot SISO ANT2 (802.11ax OFDMA – 26 Tones – Ch. 1)

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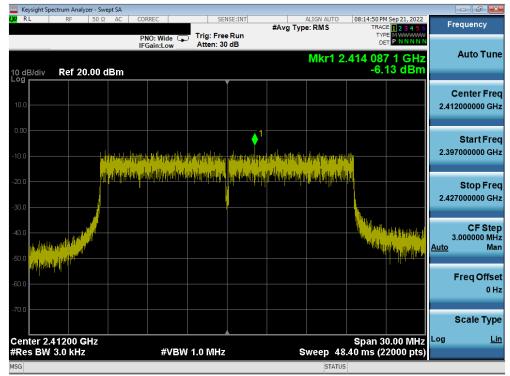
Plot 7-20. Power Spectral Density Plot SISO ANT2 (802.11ax OFDMA – 26 Tones – Ch. 6)



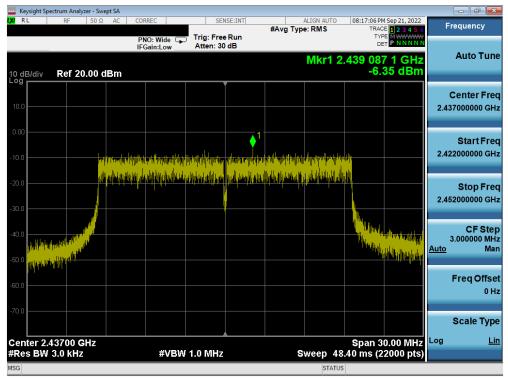
Plot 7-21. Power Spectral Density Plot SISO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 11)

FCC ID: A3LSMS918JPN		Approved by: Technical Manager	
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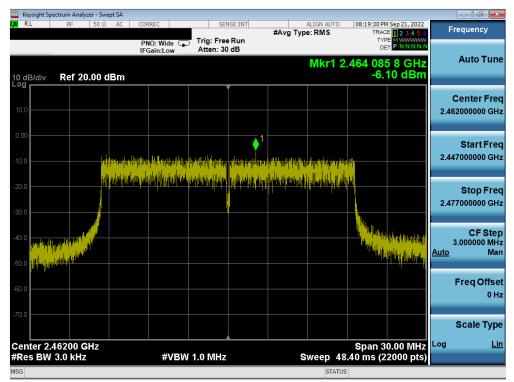
Plot 7-22. Power Spectral Density Plot SISO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 1)



Plot 7-23. Power Spectral Density Plot SISO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 6)

FCC ID: A3LSMS918JPN		Approved by: Technical Manager	
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Plot 7-24. Power Spectral Density Plot SISO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 11)

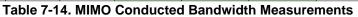
FCC ID: A3LSMS918JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 20 of 102
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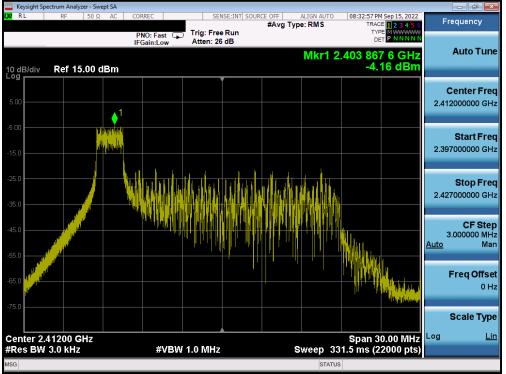
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MIMO Power Spectral Density Measurements

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	ax	26T	MCS0	-4.16	-3.41	-0.76	8.00	-8.76	Pass
2437	6	ax	26T	MCS0	-4.42	-3.52	-0.94	8.00	-8.94	Pass
2462	11	ax	26T	MCS0	-4.03	-3.82	-0.91	8.00	-8.91	Pass
2412	1	ax	242T	MCS0	-8.40	-8.46	-5.42	8.00	-13.42	Pass
2437	6	ax	242T	MCS0	-7.83	-8.06	-4.93	8.00	-12.93	Pass
2462	11	ax	242T	MCS0	-7.51	-7.80	-4.64	8.00	-12.64	Pass

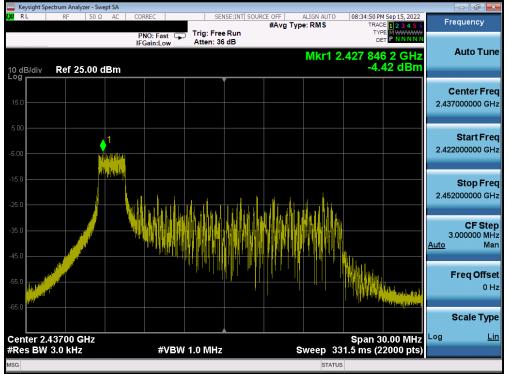




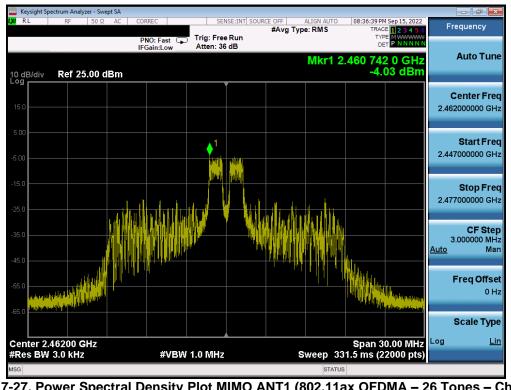
Plot 7-25. Power Spectral Density Plot MIMO ANT1 (802.11ax OFDMA – 26 Tones – Ch. 1)

FCC ID: A3LSMS918JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dega 20 of 102
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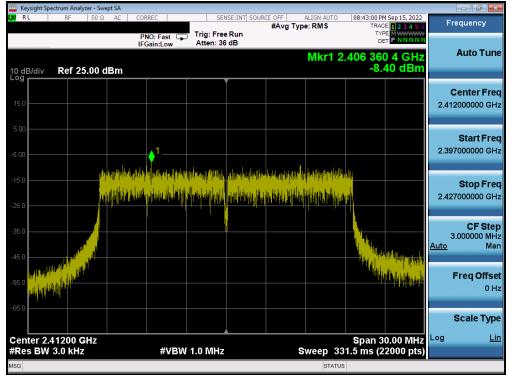
Plot 7-26. Power Spectral Density Plot MIMO ANT1 (802.11ax OFDMA – 26 Tones – Ch. 6)



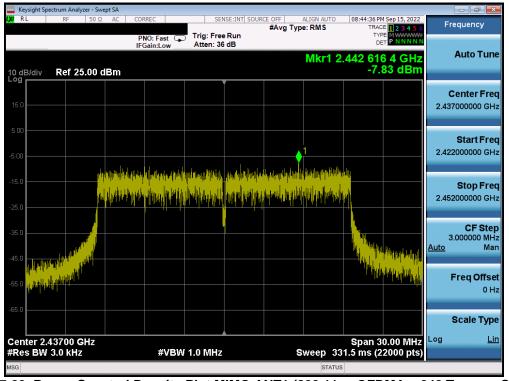
Plot 7-27. Power Spectral Density Plot MIMO ANT1 (802.11ax OFDMA – 26 Tones – Ch. 11)

FCC ID: A3LSMS918JPN		Approved by: Technical Manager	
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Plot 7-28. Power Spectral Density Plot MIMO ANT1 (802.11ax OFDMA - 242 Tones - Ch. 1)



Plot 7-29. Power Spectral Density Plot MIMO ANT1 (802.11ax OFDMA - 242 Tones - Ch. 6)

FCC ID: A3LSMS918JPN		Approved by: Technical Manager	
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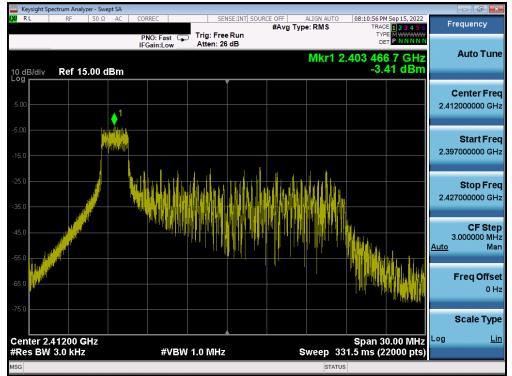
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SG							STATU	s			

Plot 7-30. Power Spectral Density Plot MIMO ANT1 (802.11ax OFDMA – 242 Tones – Ch. 11)

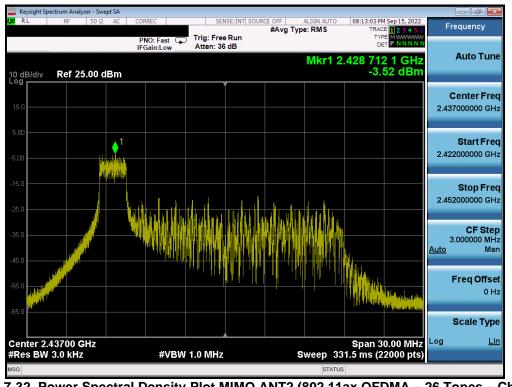
FCC ID: A3LSMS918JPN		Approved by: Technical Manager	
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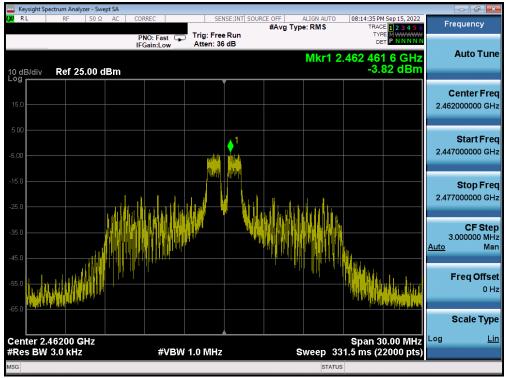
Plot 7-31. Power Spectral Density Plot MIMO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 1)



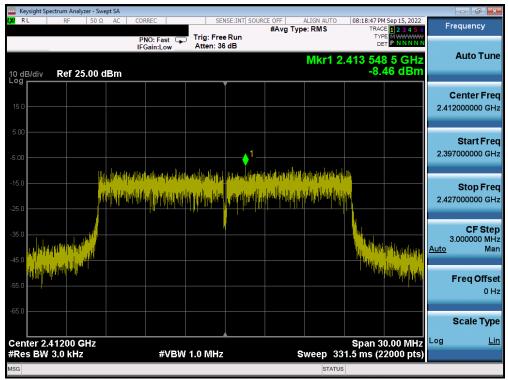
Plot 7-32. Power Spectral Density Plot MIMO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 6)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)			
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Plot 7-33. Power Spectral Density Plot MIMO ANT2 (802.11ax OFDMA – 26 Tones – Ch. 11)



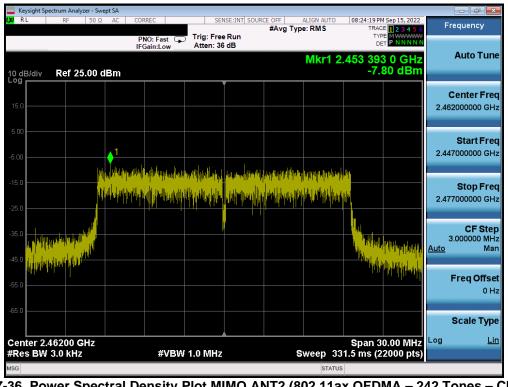
Plot 7-34. Power Spectral Density Plot MIMO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 1)

FCC ID: A3LSMS918JPN		Approved by: Technical Manager	
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Keysight Spectrum Analyzer - Swept SA					
XIRL RF 50Ω AC		#Avg Type	e: RMS TRAC	M Sep 15, 2022 E 1 2 3 4 5 6	Frequency
10 dB/div Ref 25.00 dBm	PNO: Fast 🖵 Trig: Free IFGain:Low Atten: 36		Mkr1 2.435 89	8 8 GHz 06 dBm	Auto Tune
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-35.0					CF Step 3.000000 MHz <u>o</u> Man
-55.0			1 (*1		Freq Offset 0 Hz
-65.0 Center 2.43700 GHz			Snap 3	0.00 MHz	Scale Type
#Res BW 3.0 kHz	#VBW 1.0 MHz	s	weep 331.5 ms (2	0.00 191112	
MSG			STATUS		

Plot 7-35. Power Spectral Density Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 6)



Plot 7-36. Power Spectral Density Plot MIMO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 11)

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Note:

Per ANSI C63.10-2013 Section 14.3.2.2 and KDB 662911 D01 v02r01 Section E)2), the power spectral density at Antenna 1 and Antenna 2 were first measured separately as shown in the section above. The measured values were then summed in linear power units then converted back to dBm.

Sample MIMO Calculation:

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

Antenna 1 + Antenna 2 = MIMO

(N/A dBm + N/A dBm) = (N/A mW + N/A mW) = N/A mW = -0.76dBm

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7.5 Conducted Emissions at the Band Edge §15.247(d); RSS-247 [5.5]

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 802.11ax 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 PSD procedure (Section 7.4).

Test Procedure Used

ANSI C63.10-2013 – Section 11.11.3 KDB 558074 D01 v05r02 – Section 8.7.2

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

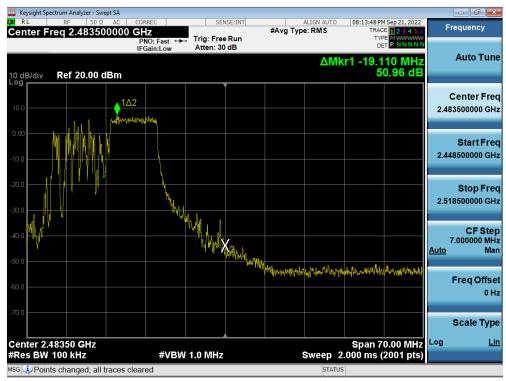
FCC ID: A3LSMS918JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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SISO Antenna-2 Conducted Emissions at the Band Edge



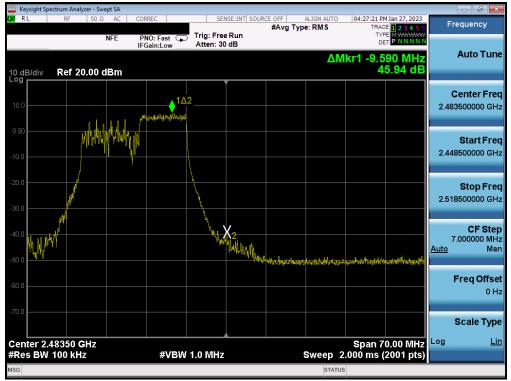
Plot 7-37. Band Edge Plot SISO ANT2 (802.11ax OFDMA - 106 Tones - Ch. 1)



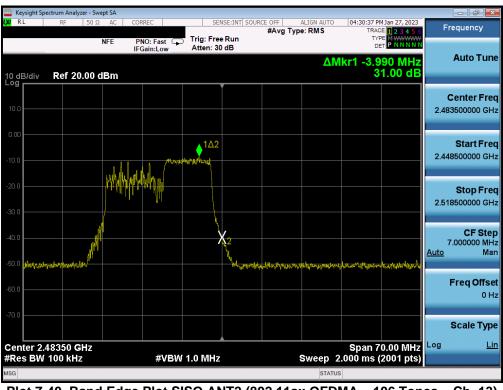
Plot 7-38. Band Edge Plot SISO ANT2 (802.11ax OFDMA – 106 Tones – Ch. 11)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)		
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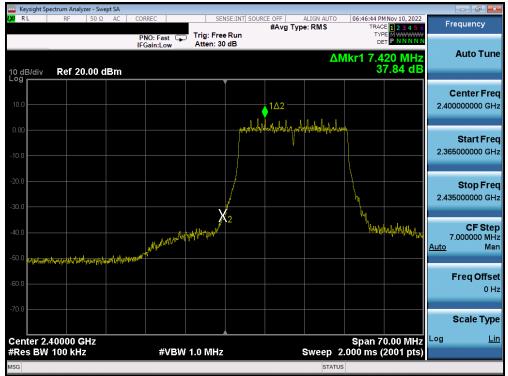
Plot 7-39. Band Edge Plot SISO ANT2 (802.11ax OFDMA – 106 Tones – Ch. 12)

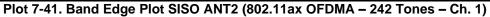


Plot 7-40. Band Edge Plot SISO ANT2 (802.11ax OFDMA – 106 Tones – Ch. 13)

FCC ID: A3LSMS918JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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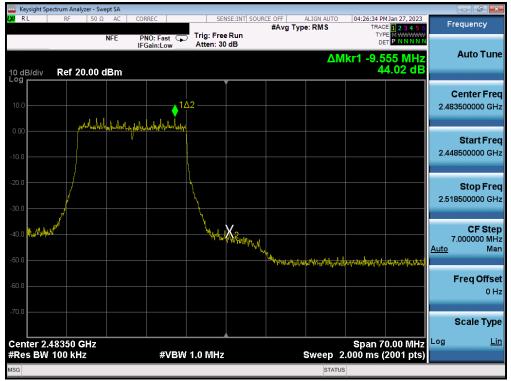




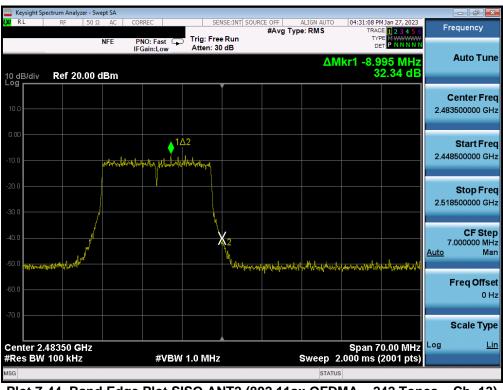
Plot 7-42. Band Edge Plot SISO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 11)

FCC ID: A3LSMS918JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-43. Band Edge Plot SISO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 12)



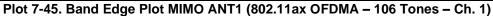
Plot 7-44. Band Edge Plot SISO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 13)

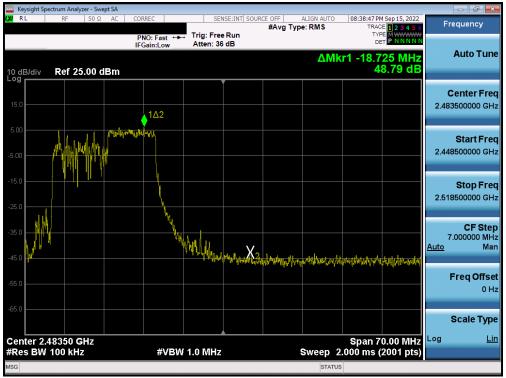
FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)	
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Keysight Spectrum Analyzer - Swept SA RI 08:38:28 PM Sep 15, 2022 TRACE 1 2 3 4 5 6 SENSE:INT SOURC ΔΙΤ Frequency #Avg Type: RMS 2345 Trig: Free Run PNO: Fast IFGain:Low DE Atten: 36 dB Auto Tune ΔMkr1 8.015 MHz 37.21 dB Ref 25.00 dBm 10 dB/div **Center Freq** 2.40000000 GHz 1Δ2 Start Freq 2.365000000 GHz Stop Freq 2.435000000 GHz 6 CF Step 7.000000 MHz h aba Auto Man des bla Without **Freq Offset** 0 Hz Scale Type Center 2.40000 GHz #Res BW 100 kHz Span 70.00 MHz Sweep 2.000 ms (2001 pts) Log Lin #VBW 1.0 MHz ASG STATUS

MIMO Antenna-1 Conducted Emissions at the Band Edge





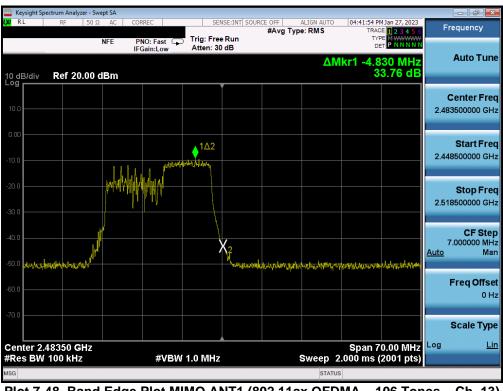
Plot 7-46. Band Edge Plot MIMO ANT1 (802.11ax OFDMA – 106 Tones – Ch. 11)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dama 50 of 400	
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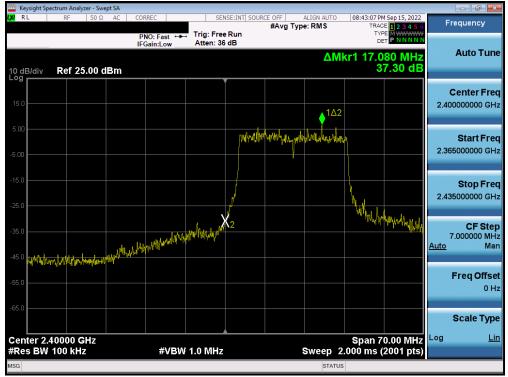
Plot 7-47. Band Edge Plot MIMO ANT1 (802.11ax OFDMA – 106 Tones – Ch. 12)

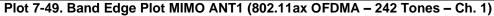


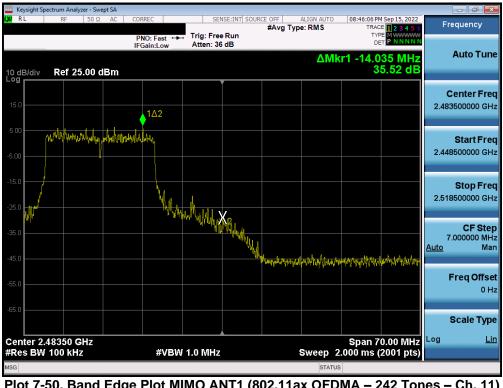
Plot 7-48. Band Edge Plot MIMO ANT1 (802.11ax OFDMA – 106 Tones – Ch. 13)

FCC ID: A3LSMS918JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 52 of 102
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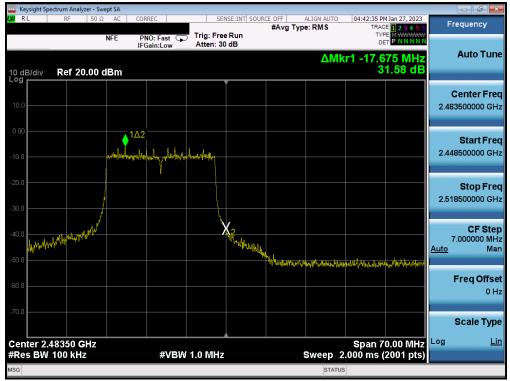




Plot 7-50. Band Edge Plot MIMO ANT1 (802.11ax OFDMA - 242 Tones - Ch. 11)

FCC ID: A3LSMS918JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo E4 of 102
1M2212080137-10-R1.A3L	9/08/2022 - 1/27/2023	Portable Handset	Page 54 of 103
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Plot 7-51. Band Edge Plot MIMO ANT1 (802.11ax OFDMA – 242 Tones – Ch. 12)



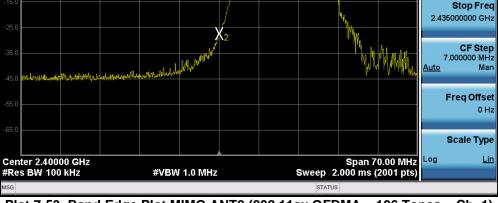
Plot 7-52. Band Edge Plot MIMO ANT1 (802.11ax OFDMA – 242 Tones – Ch. 13)

FCC ID: A3LSMS918JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo EE of 102
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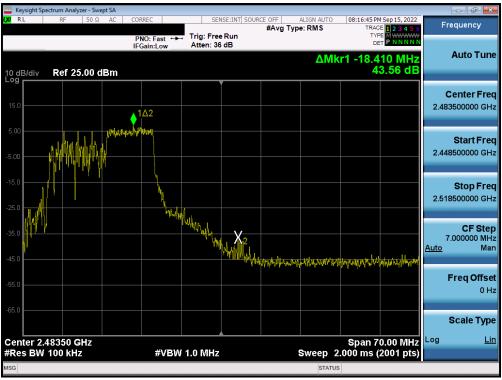


Keysight Spectrum Analyzer - Swept SA RI 06:43:37 PM Nov 10, 2022 TRACE 1 2 3 4 5 6 SENSE:INT SOURC ΔΙΤ GN AUTO Frequency #Avg Type: RMS Trig: Free Run PNO: Fast 😱 IFGain:Low DE Atten: 36 dB Auto Tune ΔMkr1 8.645 MHz 34.37 dB Ref 25.00 dBm 10 dB/div **Center Freq** 2.40000000 GHz 142 Start Freq 2.365000000 GHz <u>Х</u>2 Murshalada belly the Auto

MIMO Antenna-2 Conducted Emissions at the Band Edge



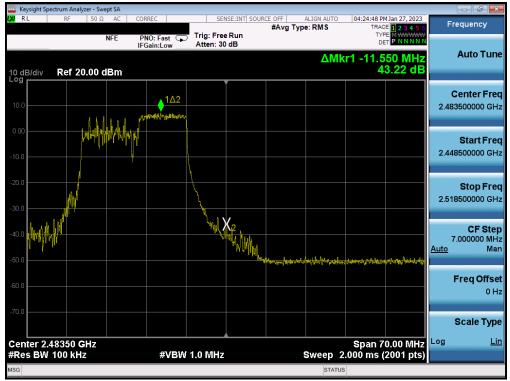
Plot 7-53. Band Edge Plot MIMO ANT2 (802.11ax OFDMA - 106 Tones - Ch. 1)



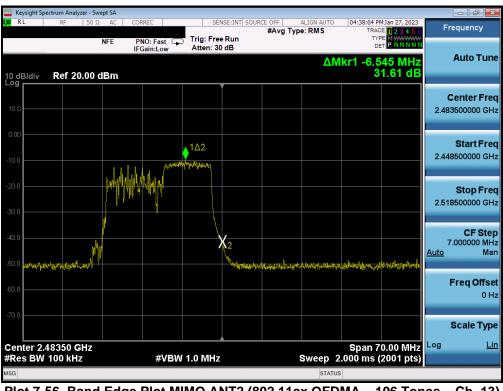
Plot 7-54. Band Edge Plot MIMO ANT2 (802.11ax OFDMA – 106 Tones – Ch. 11)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dama 50 at 400	
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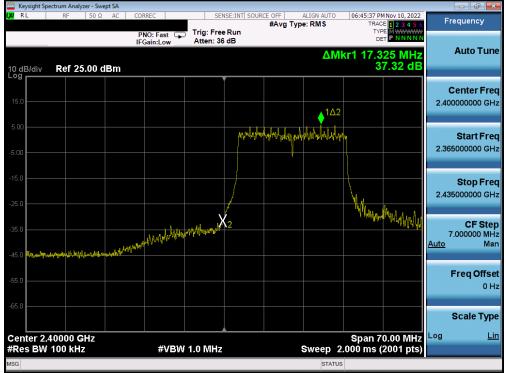
Plot 7-55. Band Edge Plot MIMO ANT2 (802.11ax OFDMA – 106 Tones – Ch. 12)

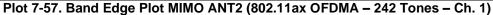


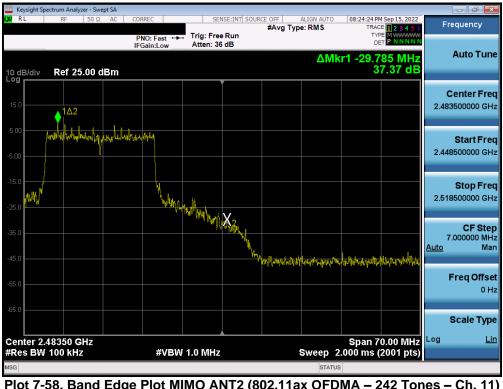
Plot 7-56. Band Edge Plot MIMO ANT2 (802.11ax OFDMA – 106 Tones – Ch. 13)

FCC ID: A3LSMS918JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo EZ of 102
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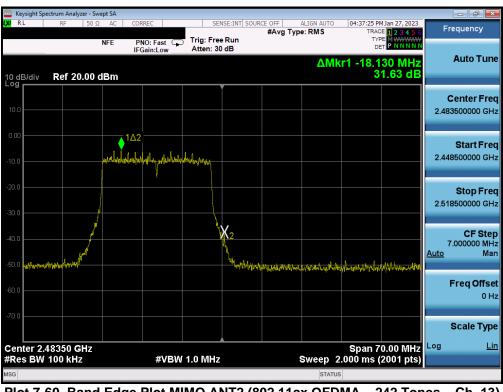
Plot 7-58. Band Edge Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 11)

FCC ID: A3LSMS918JPN		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dogo EQ of 102
1M2212080137-10-R1.A3L	9/08/2022 - 1/27/2023	Portable Handset	Page 58 of 103
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Plot 7-59. Band Edge Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 12)



Plot 7-60. Band Edge Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 13)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dogo 50 of 102		
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7.6 Conducted Spurious Emissions §15.247(d); RSS-247 [5.5]

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 802.11ax 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 11.1 of ANSI C63.10-2013 and KDB 558074 D01 v05r02.

Test Procedure Used

ANSI C63.10-2013 – Section 11.11.3 KDB 558074 D01 v05r02 – Section 8.5 ANSI C63.10-2013 – Section 14.3.3 KDB 662911 D01 v02r01 – Section E)3)b)

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

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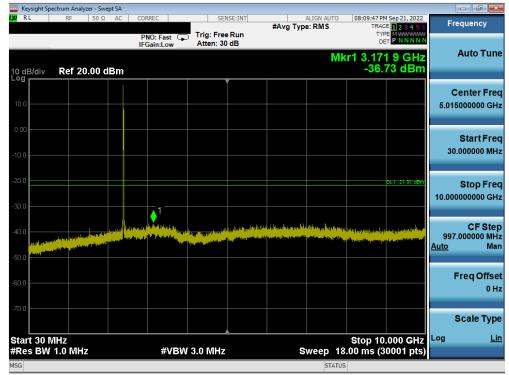
Test Notes

- 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.
- 4. The conducted spurious emissions were measured to relative limits. Therefore, in accordance with ANSI C63.10-2013 and KDB 662911 D01 v02r01 Section E)3)b), it was unnecessary to show compliance through the summation of test results of the individual outputs.

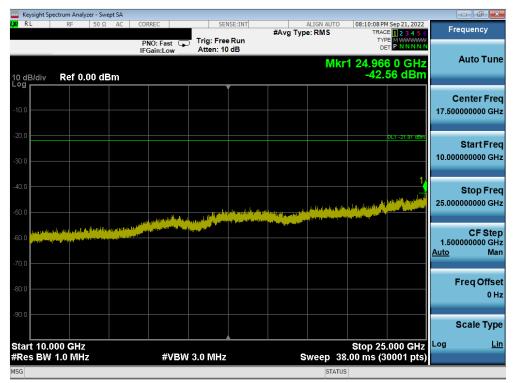
FCC ID: A3LSMS918JPN		Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dogo 61 of 102	
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SISO Antenna-2 Conducted Spurious Emissions



Plot 7-61. Conducted Spurious Plot SISO ANT2 (802.11ax OFDMA – 26 Tones – Ch. 1)



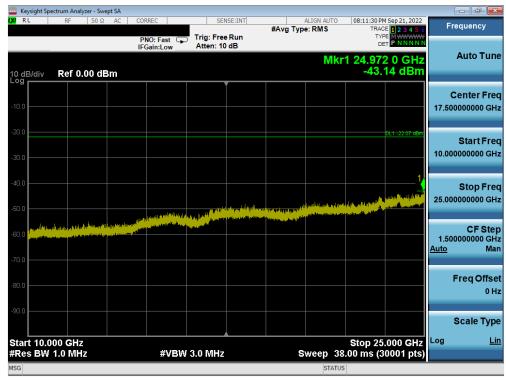
Plot 7-62. Conducted Spurious Plot SISO ANT2 (802.11ax OFDMA – 26 Tones – Ch. 1)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 62 of 102		
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Keysight Spectrum Analyzer - Swept SA				
LX RL RF 50Ω AC	CORREC SEN	ISE:INT #Avg Type		Sep 21, 2022 1 2 3 4 5 6 Frequency
10 dB/div Ref 20.00 dBm	PNO: Fast Trig: Free IFGain:Low Atten: 30	Run	TYPE DE Mkr1 3.034	
10.0				Center Freq 5.015000000 GHz
-10.0				Start Freq 30.000000 MHz
-20.0				Ct -2207/dbm Stop Freq 10.000000000 GHz
-40.0		tung ta Anga di stata ya ka ta paka tekengaka serata. Mga kata ya paka sa patri ka sa pana ka sa pana sa paka s	(here det by more det social and the spectrum of the det being of the spectrum of the spectru	CF Step 997.000000 MHz <u>Auto</u> Man
-60.0				Freq Offset 0 Hz
-70.0 Start 30 MHz			Stop 40	000 GHz Log Lin
#Res BW 1.0 MHz	#VBW 3.0 MHz	S	weep 18.00 ms (30	000 0112
мsg 🔱 Points changed; all traces c	leared		STATUS	

Plot 7-63. Conducted Spurious Plot SISO ANT2 (802.11ax OFDMA – 26 Tones – Ch. 6)



Plot 7-64. Conducted Spurious Plot SISO ANT2 (802.11ax OFDMA – 26 Tones – Ch. 6)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Daga 62 of 102		
1M2212080137-10-R1.A3L	9/08/2022 - 1/27/2023	Portable Handset	Page 63 of 103		
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🔤 Keysight Spectrum Analyze							
LXXI RL RF	50 Ω AC C	ORREC	SENSE:INT	ALIGN ALIGN		Sep 21, 2022	Frequency
			rig: Free Run tten: 30 dB		DE Mkr1 3.596	6 GHz	Auto Tune
10 dB/div Ref 20.	00 dBm				-30.0	6 dBm	
10.0							Center Freq 5.015000000 GHz
-10.0							Start Freq 30.000000 MHz
-20.0						01 <u>1 - 20.76 dBm</u>	Stop Freq 10.00000000 GHz
-40.0	Pignor Bitting a spiller			an a	ana fallas de la face da la segura. Generativa	en general konstantina International konstantina	CF Step 997.000000 MHz
-50.0							<u>Auto</u> Man
-60.0							Freq Offset 0 Hz
-70.0							Scale Type
Start 30 MHz #Res BW 1.0 MHz		#VBW 3.0) MHz	Swee	Stop 10. p 18.00 ms (30		Log <u>Lin</u>
MSG Doints changed	: all traces clea				STATUS		

Plot 7-65. Conducted Spurious Plot SISO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 11)



Plot 7-66. Conducted Spurious Plot SISO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 11)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dogo 64 of 102		
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	ectrum Analyzer -									
LXI RL	RF 50	Ω AC	CORREC		NSE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	Sep 21, 2022 E 1 2 3 4 5 6	Frequency
			PNO: Fast IFGain:Lov					DE		Auto Tune
10 dB/div Log	Ref 20.00) dBm					N	lkr1 3.598 -35.0	3 6 GHz 62 dBm	Auto Func
					Ĭ					Center Freq
10.0										5.015000000 GHz
0.00										Start Freq
-10.0										30.000000 MHz
-20.0									DL1 -22.45 dBm	Stop Freq
-30.0										10.000000000 GHz
			المعرفية والمعالم			Constanting the	and a start of the			CF Step
and delivery of										997.000000 MHz Auto Man
-50.0										FreqOffset
-60.0										0 Hz
-70.0										Scale Type
Start 30 N	1H7							Stop 10	.000 GHz	Log Lin
#Res BW			#V	BW 3.0 MHz	2	s	weep	18.00 ms (3	0001 pts)	
MSG							STAT	US		

Plot 7-67. Conducted Spurious Plot SISO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 1)



Plot 7-68. Conducted Spurious Plot SISO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 1)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage CE of 102		
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Keysight Spectrum Analyzer			1		1				
RL RF 5 arker 1 3.15027	7666667 G			SE:INT	#Avg Typ	ALIGN AUTO e: RMS	TRAC	Sep 21, 2022 1 2 3 4 5 6 E MWWWWW	Marker
	F IF	PNO: Fast 😱 Gain:Low	Trig: Free Atten: 30						Select Marker
0 dB/div Ref 20.0	0 dBm					Μ	kr1 3.150 -38.2) 3 GHz 23 dBm	1
	1								Norma
10.0									NOTING
).00									
0.0									Delt
20.0								DL1 -22.37 dBm	Fixed
80.0		<u></u> 1							
10.0	a mark in the		Alt of the state o		gan tang an Uta	alblerey kirstende	a barren and	ang southeast the state	
			المدينة أأنه والأعدر	المعددانا المترجعا بالأراسي	and the second secon	فاعتمر وملتوغ بخلافتهم	iko dhika paka kata basa	ere y stadilland Marin	0
50.0									
60.0									Properties
70.0									
									Mor
tart 30 MHz		41 (D) M	2.0.8411-				Stop 10.	000 GHz	1 of
Res BW 1.0 MHz		#VBW	3.0 MHz		S	stati	8.00 ms (3	oour prs)	

Plot 7-69. Conducted Spurious Plot SISO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 6)



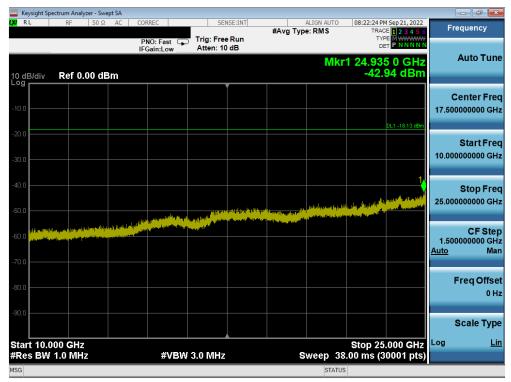
Plot 7-70. Conducted Spurious Plot SISO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 6)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dage CC of 102	
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Keysight Spectrum Analyzer - Swept					- ē 🔀
LX/ RL RF 50Ω	AC CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	08:22:03 PM Sep 21, 2022 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 25.00 dB	PNO: Fast 😱 FGain:Low	Trig: Free Run Atten: 36 dB	N	Ikr1 3.253 3 GHz -30.85 dBm	Auto Tune
10 dB/div Ref 25.00 dB					Center Freq 5.015000000 GHz
-5.00					Start Freq 30.000000 MHz
-15.0	1			DL1 -18,13 dBm	Stop Freq 10.000000000 GHz
-35.0 the fill of the trail of the second s		ternet sign of the second sign o	al yy Mahanan y congo y Addi yadagi a kata y katao ny kany katao ya kata di kana katao ny k	tern y af frysyn fel halos (physicsyn y proces) by tern) ¹³ er offen og af brysont ovy erys homenske hel folde	CF Step 997.000000 MHz <u>Auto</u> Man
-55.0					Freq Offset 0 Hz
-65.0 Start 30 MHz				Stop 10.000 GHz	Scale Type
#Res BW 1.0 MHz	#VBW	3.0 MHz	Sweep 1	18.00 ms (30001 pts)	
мsg 🔱 Points changed; all tra	ces cleared		STAT	US	

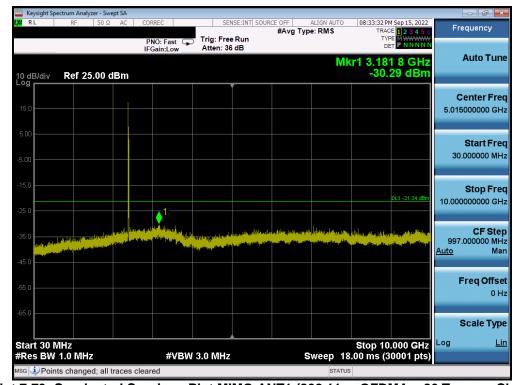
Plot 7-71. Conducted Spurious Plot SISO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 11)



Plot 7-72. Conducted Spurious Plot SISO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 11)

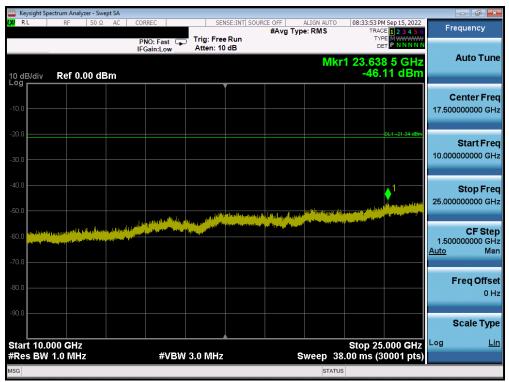
FCC ID: A3LSMS918JPN		Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dama 07 at 400	
1M2212080137-10-R1.A3L	9/08/2022 - 1/27/2023	Portable Handset	Page 67 of 103	
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MIMO Antenna-1 Conducted Spurious Emissions

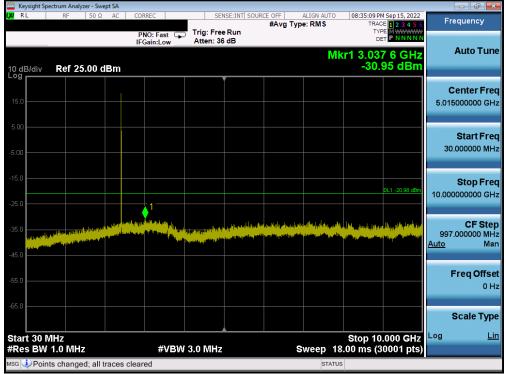




Plot 7-74. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA – 26 Tones – Ch. 1)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dama 00 of 400	
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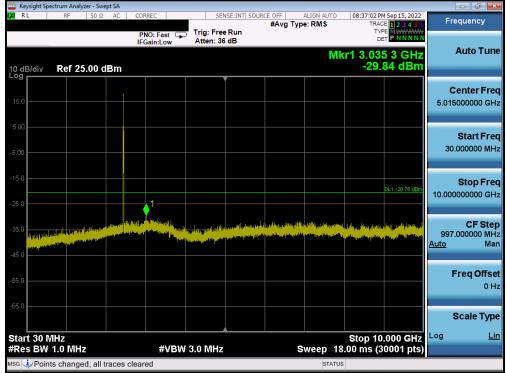
Plot 7-75. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA - 26 Tones - Ch. 6)



Plot 7-76. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA – 26 Tones – Ch. 6)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dage 60 of 102	
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Plot 7-77. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA - 26 Tones - Ch. 11)



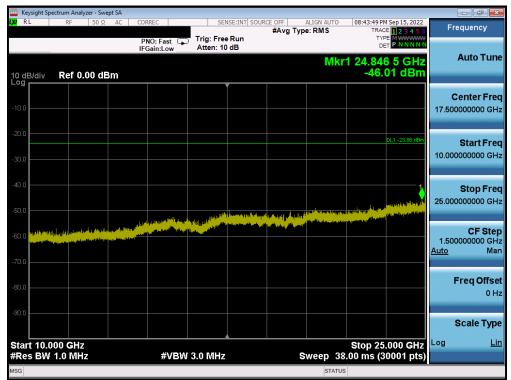
Plot 7-78. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA - 26 Tones - Ch. 11)

FCC ID: A3LSMS918JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 70 of 102
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	um Analyzer - Swe	ept SA									
XI RL	RF 50 Ω		ORREC		NSE:INT SOUR	#Avg Typ	ALIGN AUTO e: RMS	TRAC	M Sep 15, 2022 CE 1 2 3 4 5 6 DE M WWWW	Frequ	iency
10 dB/div	Ref 25.00 d	I	FGain:Low	Atten: 36	dB		Mk	r1 3.27	9 2 GHz 35 dBm	Au	ito Tuni
15.0										Cen 5.01500	iter Fre 0000 GH
-5.00											art Fre
-15.0			1						DL1 -23.86 dBm	St 10.00000	t op Fre 0000 GH
35.0	and the first state in the first state	and data and data		treggend gegytter bestellt. Namen an gegytter bestellter skille	a man di san na ji pasi Na san na si tang sa ta	ang bengang tenggang bengang sebelah s Sebelah sebelah s		al Constitutions) and Al Constitution and a second	dan jumi da fuqa misuumi antista		CF Ste 0000 MH Ma
55.0										Fre	qOffs o 0⊦
-65.0	7							Stop 10	.000 GHz	Sca	ale Typ Li
≇Res BW 1.	0 MHz			/ 3.0 MHz		s	weep 18	.00 ms (3	.000 GH2 0001 pts)		
isg 🗼 Points (changed; all t	races clea	ared				STATUS				

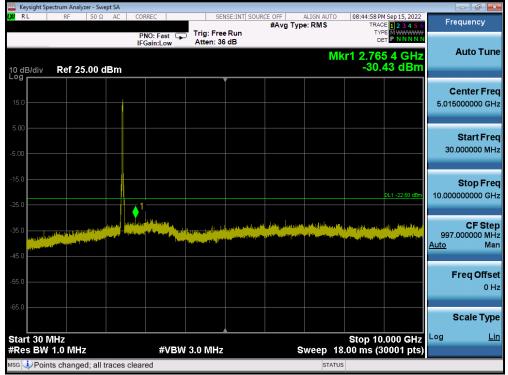
Plot 7-79. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA - 242 Tones - Ch. 1)



Plot 7-80. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA - 242 Tones - Ch. 1)

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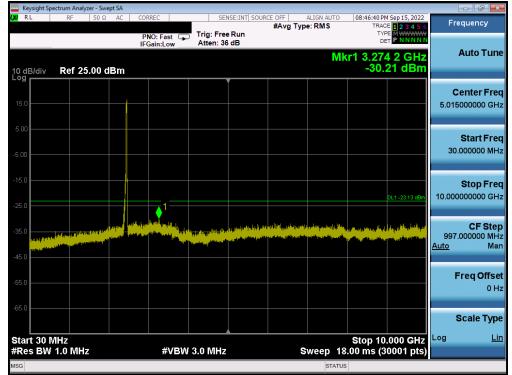
Plot 7-81. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA – 242 Tones – Ch. 6)



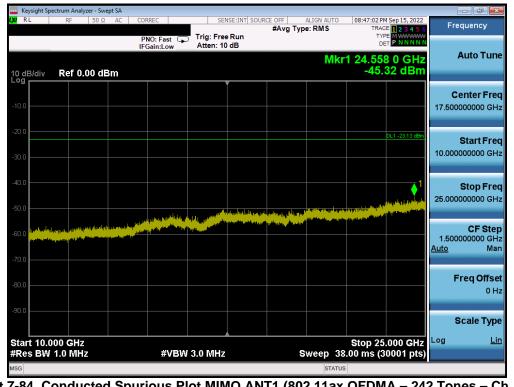
Plot 7-82. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA – 242 Tones – Ch. 6)

FCC ID: A3LSMS918JPN	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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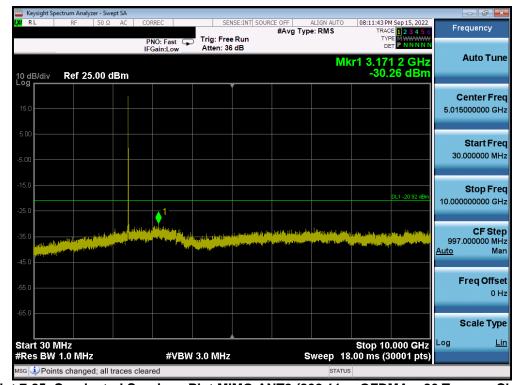
Plot 7-83. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA – 242 Tones – Ch. 11)



Plot 7-84. Conducted Spurious Plot MIMO ANT1 (802.11ax OFDMA – 242 Tones – Ch. 11)

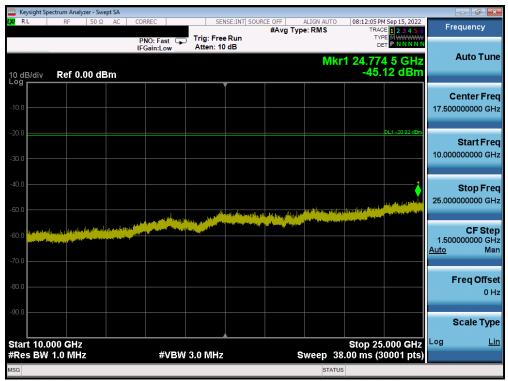
FCC ID: A3LSMS918JPN		Approved by: Technical Manager	
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MIMO Antenna-2 Conducted Spurious Emissions

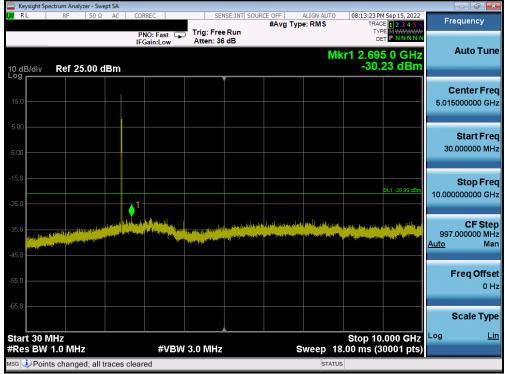




Plot 7-86. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA – 26 Tones – Ch. 1)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)		
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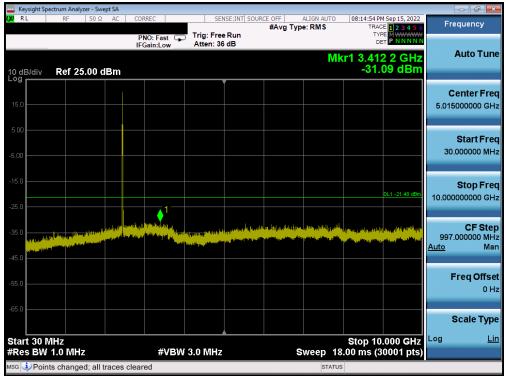
Plot 7-87. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 6)



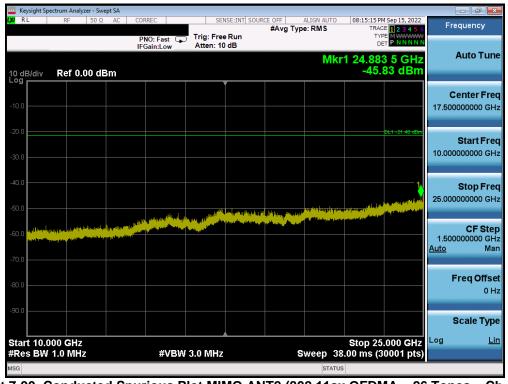
Plot 7-88. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA – 26 Tones – Ch. 6)

FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)		
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Plot 7-89. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 11)



Plot 7-90. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA - 26 Tones - Ch. 11)

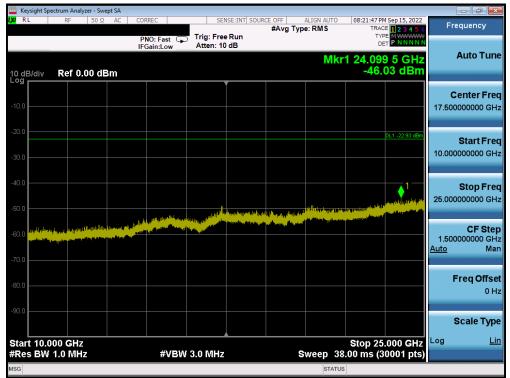
FCC ID: A3LSMS918JPN		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Daga 76 of 102		
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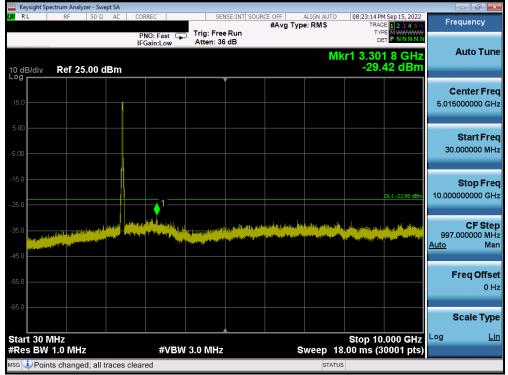
Plot 7-91. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 1)



Plot 7-92. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 1)

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Plot 7-93. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 6)



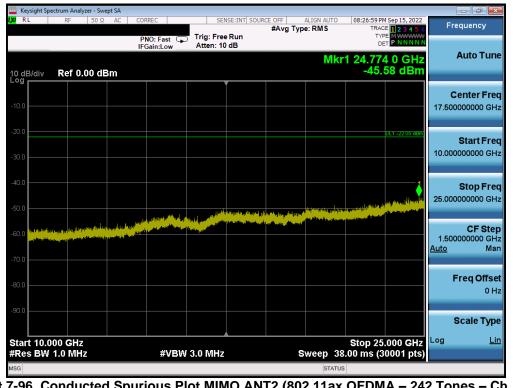
Plot 7-94. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA – 242 Tones – Ch. 6)

FCC ID: A3LSMS918JPN		Approved by: Technical Manager	
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Plot 7-95. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 11)



Plot 7-96. Conducted Spurious Plot MIMO ANT2 (802.11ax OFDMA - 242 Tones - Ch. 11)

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7.7 Radiated Spurious Emission Measurements – Above 1 GHz §15.247(d) §15.205 & §15.209; RSS-Gen [8.9]

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-15 per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [μV/m]	Measured Distance [Meters]
Above 960.0 MHz	500	3

Table 7-15. Radiated Limits

Test Procedures Used

ANSI C63.10-2013 – Section 6.6.4.3 KDB 558074 D01 v05r02 – Sections 8.6, 8.7

Test Settings

Average Field Strength Measurements

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

Peak Field Strength Measurements

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

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

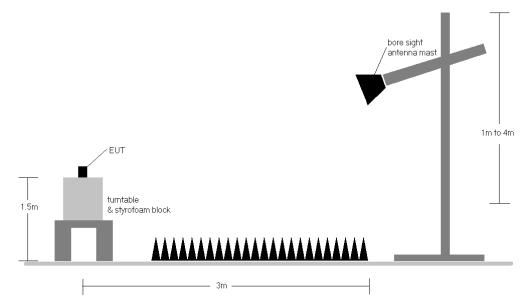


Figure 7-6. Test Instrument & Measurement Setup

Test Notes

- The optional test procedures for antenna port conducted measurements of unwanted emissions per the guidance of KDB 558074 D01 v05r02 were not used to evaluate this device for compliance to radiated limits. All radiated spurious emissions levels were measured in a radiated test setup.
- 2. All emissions lying in restricted bands specified in Section 15.205 and Section 8.10 of RSS-Gen are below the limit shown in Table 7-15.
- 3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- 4. This unit was tested with its standard battery.
- 5. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
- 6. Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 7. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section.
- 8. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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- 9. Some band edge measurements were performed using a channel integration method to determine compliance with the out of band average radiated spurious emissions limit in the 2483.5 2500MHz band. Per KDB 558074 D01 v05r02 Section 13.3, a measurement was performed using a RBW of 100kHz at the frequency with highest emission outside of band edge. For integration that does not start at 2483.5MHz, consideration was taken to ensure the worst case emission is in the 1MHz spectrum. The results were integrated up to the 1MHz reference bandwidth to show compliance with the 15.209 radiated limit for emissions greater than 1GHz.
- 10. For radiated measurements, emissions were investigated for the fully-loaded RU configuration and for all the partially-loaded RU configurations. Among all of the available partially-loaded RU configurations, only the configuration with the worst case emissions is reported.

Sample Calculations

Determining Spurious Emissions Levels

- Field Strength Level [dBµV/m] = Analyzer Level [dBm] + 107 + AFCL [dB/m]
- AFCL [dB/m] = Antenna Factor [dB/m] + Cable Loss [dB]
- Margin [dB] = Field Strength Level $[dB\mu V/m]$ Limit $[dB\mu V/m]$

Radiated Band Edge Measurement Offset

• The amplitude offset shown in the radiated restricted band edge plots in Section 7.7 was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

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