

ELEMENT WASHINGTON DC LLC

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MEASUREMENT REPORT FCC Part 15.407 802.11a/ax WIFI 6E

Applicant Name:

Samsung Electronic Co., Ltd. 129, Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, 16677, Korea Date of Testing: 4/1/2022 – 6/17/2022 Test Report Issue Date: 7/8/2022 Test Site/Location: Element Washington DC LLC. Columbia, MD, USA Test Report Serial No.: 1M2204110052-13.A3L

FCC ID:

A3LSMF936B

APPLICANT:

Samsung Electronics Co., Ltd.

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

Certification SM-F936B/DS SM-F936B Portable Handset 5935 – 7115MHz OFDM 15E 6GHz Low Power Indoor Client (6XD) ANSI C63.10-2013, KDB 648474 D03 v01r04, KDB 987594 D02 v01r01, KDB 987594 D04 v01

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

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

RJ Ortanez Executive Vice President



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			Conducted Power			
UNII Band	Channel Bandwidth (MHz)	Tx Frequency (MHz)	Max. Power (mW)	Max. Power (dBm)		
5		5935 - 6415	24.044	13.81		
6	20	6435 - 6515	24.831	13.95		
7	20	6535 - 6875	25.003	13.98		
8		6895 - 7115	24.099	13.82		
5	40	5965 - 6405	23.988	13.80		
6		6445 -6525	24.266	13.85		
7		6565 - 6845	24.044	13.81		
8		6885 - 7085	23.714	13.75		
5		5985 - 6385	23.714	13.75		
6	80	6465	24.099	13.82		
7	00	6545 - 6865	23.823	13.77		
8		6945 - 7025	24.946	13.97		
5		6025 - 6345	23.335	13.68		
6	160	6505	22.131	13.45		
7	160	6665 -6825	23.714	13.75		
8		6985	24.099	13.82		

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 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 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 Agreement.

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2.0 **PRODUCT INFORMATION**

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMF936B**. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter while operating in the 6GHz band.

Test Device Serial No.: 0109M, 0303M, 0374M, 3059R

2.2 Device Capabilities

This device contains the following capabilities:

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

	Band 5		Band 6			Band 7		Band 8
Ch.	Frequency (MHz)	Ch	Frequency (MHz)	С	ch.	Frequency (MHz)	Ch.	Frequency (MHz)
2	5935	97	6435	1	17	6535	189	6895
:	:	:	:		:	:	:	:
45	6175	105	6475	1	49	6695	209	6995
:	:	:	:		:	:	:	:
93	6415	113	6515	1	85	6875	233	7115
	Tabla	1 000	110 / 902 110x /20ML			anav / Channal On		

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

	Band 5		Band 6		Band 7		Band 8
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
3	5965	99	6445	123	6565	187	6885
:	:	:	:	:	:	:	:
43	6165	107	6485	155	6725	211	7005
:	:	:	:	:	:	:	:
91	6405	115	6525	179	6845	227	7085

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

	Band 5		Band 6		Band 7		Band 8	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	
7	5985	103	6465	119	6545	199	6945	
:	:		·	:	:	:	:	
39	6145			151	6705	215	7025	
:	:			:	:			
87	6385			183	6865			
L	Table 2-3. 802.11ax (80MHz BW) Frequency / Channel Operations							

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_	Band 5	Band 6				Band 7			Band 8		
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)		Ch.	Frequency (MHz)		Ch.	Frequency (MHz)		
15	6025	111	6505		143	6665		207	6985		
47	6185				175	6825					
79	6345										

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

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Notes:

6GHz NII operation is possible in 20MHz, and 40MHz, and 80MHz and 160MHz channel bandwidths. The
maximum achievable duty cycles for all modes were determined based on measurements performed on a
spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = peak per the guidance
of Section B)2)b) of ANSI C63.10-2013 and KDB 789033 D02 v02r01. The RBW and VBW were both greater
than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater
than 100. The duty cycles are as follows:

		мімо	
802.11 Mode/Band		Duty	
		Cycle [%]	
	а	96.65	
	ax (HE20)	99.67	
6GHz	ax (HE40)	99.71	
	ax (HE80)	99.71	
	ax (HE160)	99.71	
Table 2-5. Measured Duty Cycles			

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

WiFi Configurations		SISO		CDD		SDM	
	Jonngurations	ANT1	ANT2	ANT1	ANT2	ANT1	ANT2
	11a	×	×	✓	✓	×	×
	11ax (20MHz)	×	×	✓	✓	✓	✓
6GHz	11ax (40MHz)	×	×	✓	✓	✓	✓
	11ax (80MHz)	×	×	✓	✓	✓	✓
	11ax (160MHz)	×	×	✓	✓	✓	✓

Table 2-6. Frequency / Channel Operations

✓ = Support ; ×= NOT Support

SDM = Spatial Diversity Multiplexing – MIMO function

CDD = Cyclic Delay Diversity – 2Tx Function

2.3 Antenna Description

Following antenna was used for the testing.

	Ant1 Peak Gain [dBi]	Ant2 Peak Gain [dBi]	Directional Gain [dBi]
5925 – 6425 MHz	-3.83	-3.42	-0.61
6425 – 6525 MHz	-3.83	-10.50	-3.53
6525 – 6875 MHz	-7.21	-8.64	-4.89
6875 – 7125 MHz	-8.90	-11.46	-7.08

Table 2-7. Antenna Peak Gain

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2.4 Test Configuration

The EUT was tested per the guidance of KDB 987594 D02 v01r01 and KDB 789033 D02 v02r01. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing. See Sections 3.2 for AC line conducted emissions test setups, 3.3 for radiated emissions test setups, and 7.2, 7.3, 7.4, 7.5 and 7.6 for antenna port conducted emissions test setups.

This device supports two configurations: one is with screen open and one is with screen closed. Open, half opened and closed configurations are tested, and the worst case radiated emissions data is shown in this report.

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.

2.5 Software and Firmware

The test was conducted with firmware version F936BXXU0AVD9 installed on the EUT.

2.6 EMI Suppression Device(s)/Modifications

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

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3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

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

Deviation from measurement procedure.....None

3.2 AC Line Conducted Emissions

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

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

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

Line conducted emissions test results are shown in Section 7.9. The EMI Receiver mode of the Agilent MXE was used to perform AC line conducted emissions testing.

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3.3 Radiated Emissions

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

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

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

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

3.4 Environmental Conditions

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

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4.0 ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

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

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

Conclusion:

The EUT complies with the requirement of §15.203.

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5.0 MEASUREMENT UNCERTAINTY

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

Contribution	Expanded Uncertainty (±dB)
Contention Based Protocol Conducted Measurements	0.86
Conducted Bench Top Measurements	1.13
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)	12/19/2021	Annual	12/19/2022	WL25-1
-	WL25-2	Conducted Cable Set (25GHz)	12/19/2021	Annual	12/19/2022	WL25-2
-	WL40-1	Conducted Cable Set (40GHz)	12/19/2021	Annual	12/19/2022	WL40-1
-	ETS-001	EMC Cable and Switch System	12/9/2021	Annual	12/9/2022	ETS-001
-	ETS-002	EMC Cable and Switch System	3/10/2022	Annual	3/10/2023	ETS-002
-	AP1-002	EMC Cable and Switch System	3/9/2022	Annual	3/9/2023	AP1-002
-	AP2-001	EMC Cable and Switch System	1/4/2022	Annual	1/4/2023	AP2-001
-	AP2-002	EMC Cable and Switch System	3/11/2022	Annual	3/11/2023	AP2-002
Agilent	N9038A	MXE EMI Receiver	1/21/2022	Annual	1/21/2023	MY51210133
Agilent	N9020A	MXA Signal Analyzer	3/4/2022	Annual	3/4/2023	US46470561
Agilent	N9030A	PXA Signal Analyzer (44GHz)	7/21/2021	Annual	7/21/2022	MY49430494
Anritsu	ML2495A	Power Meter	3/17/2022	Annual	3/17/2023	1328004
Anritsu	ML2495A	Power Meter	3/17/2022	Annual	3/17/2023	941001
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	4/13/2022	Biennial	4/13/2024	121034
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Emco	3116	Horn Antenna (18 - 40GHz)	7/20/2021	Biennial	7/20/2023	9203-2178
ETS-Lindgren	3816/2NM	Line Impedance Stabilization Network	7/9/2020	Biennial	7/9/2022	114451
Pasternack	NMLC-2	Line Conducted Emissions Cable (NM)	12/19/2021	Annual	12/19/2022	NMLC-2
Rohde & Schwarz	FSV40-N	Spectrum Analyzer	1/14/2021	Annual	8/3/2022	83244
Rohde & Schwarz	SMW200A	Vector Signal Generator	N/A		83365	
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	8/3/2021	Annual	8/3/2022	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	5/25/2021	Annual	5/25/2022	100348
Sunol	DRH-118	Horn Antenna (1-18GHz)	2/14/2022	Biennial	2/14/2024	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	7/27/2020	Biennial	7/27/2022	A051107

Table 6-1. Annual Test Equipment Calibration Schedule

Note:

- 1. For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.
- 2. Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

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7.0 TEST RESULTS

7.1 Summary

Company Name:Samsung Electronics Co., Ltd.FCC ID:A3LSMF936BFCC Classification:15E 6GHz Low Power Indoor Client (6XD)

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1046, 15.407(a)(11)	Maximum Conducted Output Power	N/A		PASS	Section 7.3
2.1049, 15.407(a)(10)	Occupied Bandwidth/ 26dB Bandwidth	99% of the occupied bandwidth of any channel must be contained within each of its respective U-NII sub bands The maximum transmitter channel bandwidth for U-NII devices in the 5.925-7.125 GHz band is 320 megahertz.	CONDUCTED	PASS	Section 7.2
15.407(a)(8)	Maximum Power Spectral Density	< -1dBm/MHz e.i.r.p.		PASS	Section 7.4
15.407(a)(8)	Maximum Radiated Output Power	< 24dBm over the frequency band of operation		PASS	Section 7.3
15.407(b)(7)	In-Band Emissions	EUT must meet the limits detailed in 15.407(b)(7)		PASS	Section 7.5
15.407(b)(6)	Undesirable Emissions	< -27dBm/MHz e.i.r.p. outside of the 5.925 – 7.125GHz band		PASS	Section 7.7
15.407(d)(6)	Contention Based Protocol	EUT must detect AWGN signal with 90% (or better) certainty	RADIATED	PASS	Section 7.6
15.205, 15.209	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	KADIATED	PASS	Section 7.7, 7.8
15.407(b)(9)	AC Conducted Emissions (150kHz – 30MHz)	< FCC 15.207 limits	LINE CONDUCTED	PASS	Section 7.9

Table 7-1. Summary of Test Results

Notes:

- 1) All channels, modes, and modulations/data rates were investigated among all UNII bands. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "UNII Automation," Version 4.7.
- 5) For radiated band edge, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "Chamber Automation," Version 1.3.1.

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7.2 26dB Bandwidth Measurement – 802.11a/ax

2.1049, 15.407(a)(10)

Test Overview and Limit

The bandwidth at 26dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2013 and KDB 789033 D02 v02r01, and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26dB bandwidth.

The 26dB bandwidth is used to determine the conducted power limits.

Test Procedure Used

ANSI C63.10-2013 – Section 12.4 KDB 789033 D02 v02r01 – Section C KDB 987594 D02 v01r01

Test Settings

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

Test Setup

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



Figure 7-1. Test Instrument & Measurement Setup

Test Notes

None.

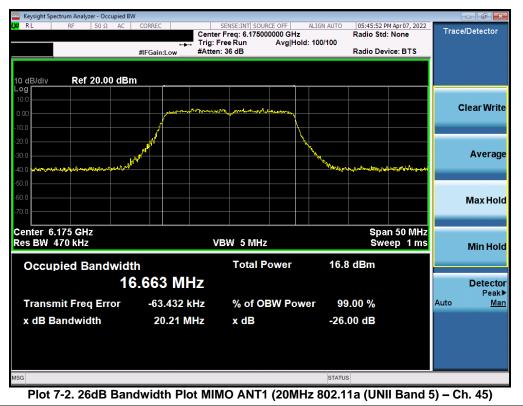
FCC ID: A3LSMF936B		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dana 45 at 007
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MIMO Antenna-1 26 dB Bandwidth Measurements - (UNII Band 5)



Plot 7-1. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11a (UNII Band 5) - Ch. 2)



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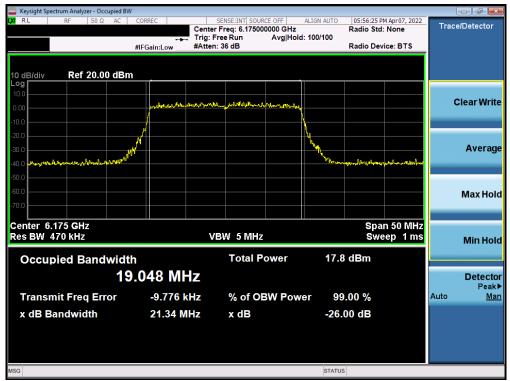
Plot 7-3. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11a (UNII Band 5) - Ch. 93)



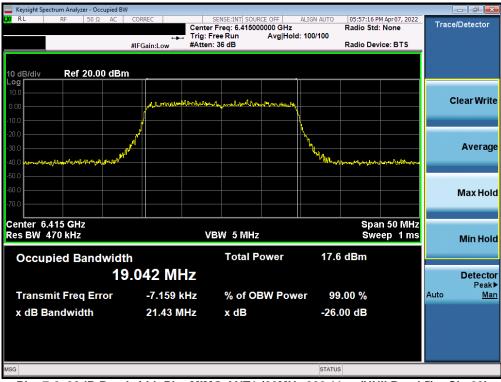
Plot 7-4. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11ax (UNII Band 5) - Ch. 2)

FCC ID: A3LSMF936B		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 17 of 227
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Plot 7-5. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11ax (UNII Band 5) – Ch. 45)



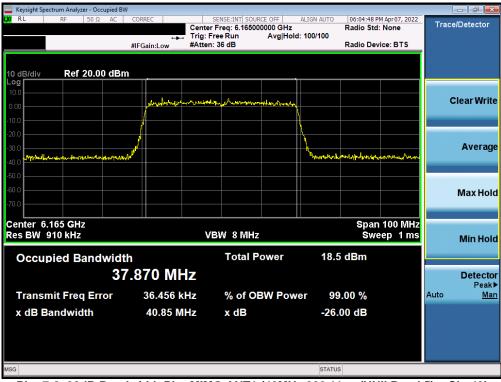
Plot 7-6. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11ax (UNII Band 5) – Ch. 93)

FCC ID: A3LSMF936B		Approved by: Technical Manager	
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🔤 Keysight Spectrum Analyzer - Occupie						
LX/ RL RF 50Ω A	C CORREC	SENSE:INT SOUR		06:04:07 PM Ap Radio Std: No		Trace/Detector
		Trig: Free Run	Avg Hold: 100/100			
	#IFGain:Low	#Atten: 36 dB		Radio Device	BTS	
10 dB/div Ref 20.00 d	IBm					
Log 10.0						
0.00	ى. مەلەلىمەممەنى	han white the son of the	net relation			Clear Write
-10.0			N			
-20.0	J.					
	,		N.			Average
-30.0	hung		hopping	and man particular	montheren	Average
-40.0						
-50.0						
-60.0						Max Hold
-70.0						
Center 5.965 GHz				Span 10	10 MHz	
Res BW 910 kHz		VBW 8 MHz			5 1 ms	Min Hole
						WIIITHOR
Occupied Bandwi	idth	Total P	ower 18.	3 dBm		
	37.907 MF	7				Detecto
						Peak
Transmit Freq Error	21.452 k	Hz % of O	3W Power 99	9.00 %		Auto <u>Mar</u>
x dB Bandwidth	41.28 M	Hz x dB	-26	.00 dB		
MSG			STATU	IS		

Plot 7-7. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11ax (UNII Band 5) - Ch. 3)



Plot 7-8. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11ax (UNII Band 5) - Ch. 43)

FCC ID: A3LSMF936B		Approved by: Technical Manager	
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🔤 Keysight Spectrum Analyzer - Occuj	pied BW					- 6
LXI RL RF 50 Ω	AC CORREC	SENSE:INT SOU Center Freg: 6.4050		TO 06:05:28 PM Radio Std:		Trace/Detector
	·→-	Trig: Free Run	Avg Hold: 100/100)		
	#IFGain:Low	#Atten: 36 dB		Radio Devid	ce: BTS	
10 dB/div Ref 20.00	dBm					
Log 10.0						
0.00	برابيا. 100 ميليوريايو	margenthing officience	whenny			Clear Write
-10.0	/		N			
-20.0	1		1 A			
-30.0	1		ų.			Average
-40.0 monand market	huguna		Mary Jours	manne	murphine	Avenuge
-50.0						
-60.0						Max Hold
-70.0						
Center 6.405 GHz				Span '	100 MHz	
Res BW 910 kHz		VBW 8 MH	z		ep 1 ms	Min Hold
		T - 4 - 1 1		8.3 dBm		
Occupied Bandy		Total I	ower 1	8.3 aBM		
	37.816 MI	z				Detector
Transmit Freq Erro	or 68.279 k		BW Power	99.00 %		Peak▶ Auto Man
x dB Bandwidth	41.19 M	Hz x dB	-2	26.00 dB		
MSG			ST	ATUS		

Plot 7-9. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11ax (UNII Band 5) - Ch. 91)



Plot 7-10. 26dB Bandwidth Plot MIMO ANT1 (80MHz 802.11ax (UNII Band 5) – Ch. 7)

FCC ID: A3LSMF936B		Approved by: Technical Manager	
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Keysight Spectrum Analyzer - Occupied BW							
IXI RE S0Ω AC CO	ORREC	SENSE:INT SOURCE		06:13:20 PM Radio Std:		Trace	/Detector
	😛 Trig:	Free Run /	Avg Hold: 100/100				
#IF	Gain:Low #Atte	n: 36 dB		Radio Devid	ce: BTS		
10 dB/div Ref 20.00 dBm							
Log 10.0							
0.00	montaine many and	mont on the second has	and the state of the second			C	lear Write
-10.0							
-20.0							
			1				Average
-30.0 morrowington with the program with a start			murutun	mondant	he maket we		Average
-40.0							
-50.0							
-60.0							Max Hold
-70.0							
Center 6.145 GHz				Snan '	200 MHz		
Res BW 1.8 MHz	١	/BW 8 MHz			ep 1 ms		Min Hold
					<u> </u>		
Occupied Bandwidth		Total Pov	wer 19.3	2 dBm			
77.3	322 MHz						Detector
							Peak►
Transmit Freq Error	115.41 kHz	% of OBV	V Power 99	9.00 %		Auto	<u>Man</u>
x dB Bandwidth	83.78 MHz	x dB	-26	.00 dB			
MSG			STATU	s			

Plot 7-11. 26dB Bandwidth Plot MIMO ANT1 (80MHz 802.11ax (UNII Band 5) - Ch. 39)



Plot 7-12. 26dB Bandwidth Plot MIMO ANT1 (80MHz 802.11ax (UNII Band 5) - Ch. 87)

FCC ID: A3LSMF936B		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 01 of 007
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Keysight Spectrum Analyzer - Occ	upied BW								
LXI RL RF 50 Ω	AC CORREC		NSE:INT SOURC		ALIGN AUTO	06:19:45 P	M Apr 07, 2022	Trac	e/Detector
		Trig: Free	e Run	Avg Hold:	: 100/100				
	#IFGain:Lo	.ow #Atten: 36	3 dB			Radio Devi	ice: BTS		
10 dB/div Ref 20.00	0 dBm								
Log 10.0									
0.00	المريساني	en martines	multent	a hand way have				(Clear Write
-10.0									
-20.0									
-20.0	and the second								Average
					Provide Street Street	and the second	Children and the second spectrum of the second s		Average
-40.0									
-50.0									
-60.0									Max Hold
-70.0									
Center 6.025 GHz						Span	400 MHz		
Res BW 3 MHz		VBV	N 50 MHz	z			ep 1 ms		Min Hold
					10.0				
Occupied Band			Total Po	ower	19.3	dBm			
	156.39	MHz							Detector
Tronomit Frog Err	504	.04 kHz	% of OF	3W Powe	or 00	.00 %		Auto	Peak▶ Man
Transmit Freq Err				SW POWE				Auto	IVIAII
x dB Bandwidth	167	7.2 MHz	x dB		-26.0	00 dB			
MSG					STATUS	3			

Plot 7-13. 26dB Bandwidth Plot MIMO ANT1 (160MHz 802.11ax (UNII Band 5) - Ch. 15)



Plot 7-14. 26dB Bandwidth Plot MIMO ANT1 (160MHz 802.11ax (UNII Band 5) - Ch. 47)

FCC ID: A3LSMF936B		MEASUREMENT REPORT (CERTIFICATION)		
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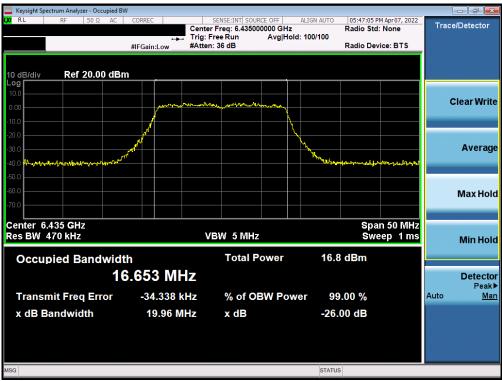
🔤 Keysight Spectrum Analyzer - Occupier	d BW						[- 🗗 🗙
L <mark>X/</mark> RL RF 50Ω A0	C CORREC	SENSE:INT	SOURCE OFF	ALIGN AUTO	06:21:24 P	M Apr 07, 2022	Trace	e/Detector
		Trig: Free Run		d: 100/100				
	#IFGain:Low	#Atten: 36 dB			Radio Dev	ice: BTS		
10 dB/div Ref 20.00 d	Bm			•				
Log								
0.00	Junear Internet	allow and the second second	and a stand and				C	Clear Write
-10.0								
-20.0								
-30.0				N	L and the last	the second second		Average
-30.0				All survey and the	NUMBER OF STREET	traffic and the base		Arciugo
-50.0								
-60.0								Max Hold
-70.0								
Center 6.345 GHz	I				Span	400 MHz		
Res BW 3 MHz		VBW 50	MHz			ep 1 ms		Min Hold
		_ /		10.4				
Occupied Bandwi			l Power	19.1	dBm			
	156.53 M⊦	z						Detector
Tronomit From Freeze	207.26	0/ - 6			00.0/		Auto	Peak►
Transmit Freq Error			OBW Pow	er 99	.00 %		Auto	Man
x dB Bandwidth	166.2 M	Hz x dB		-26.	00 dB			
MSG				STATUS	6			

Plot 7-15. 26dB Bandwidth Plot MIMO ANT1 (160MHz 802.11ax (UNII Band 5) – Ch. 79)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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MIMO Antenna-1 26 dB Bandwidth Measurements - (UNII Band 6)



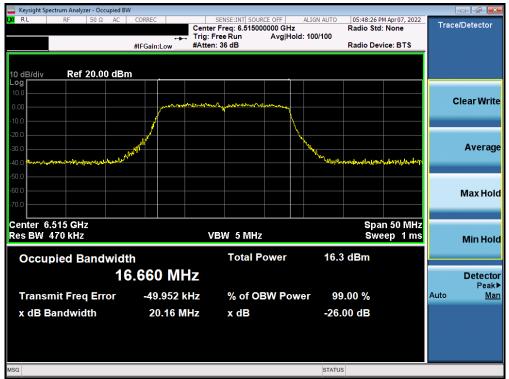
Plot 7-16. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11a (UNII Band 6) - Ch. 97)



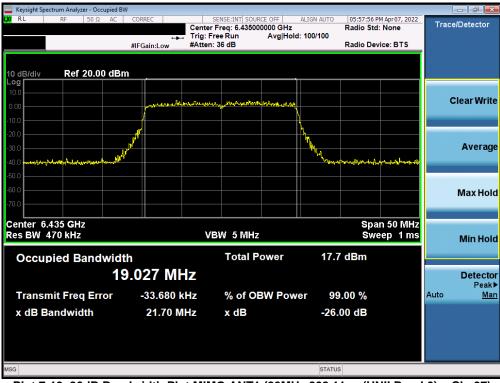
Plot 7-17. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11a (UNII Band 6) - Ch. 105)

FCC ID: A3LSMF936B		MEASUREMENT REPORT (CERTIFICATION)	
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Plot 7-18. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11a (UNII Band 6) - Ch. 113)



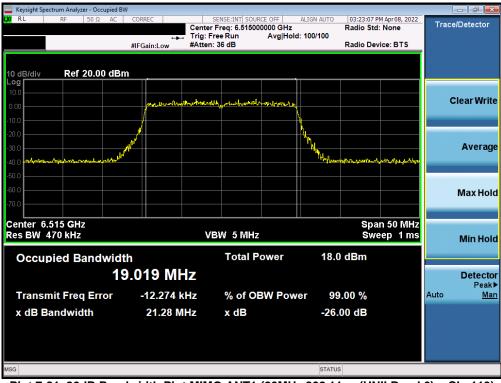
Plot 7-19. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11ax (UNII Band 6) - Ch. 97)

FCC ID: A3LSMF936B		Approved by: Technical Manager	
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Plot 7-20. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11ax (UNII Band 6) - Ch. 105)



Plot 7-21. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11ax (UNII Band 6) - Ch. 113)

FCC ID: A3LSMF936B		MEASUREMENT REPORT (CERTIFICATION)		
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Keysight Spectrum Analyzer - Occupied	IBW					
LX/ RL RF 50 Ω AC	CORREC	SENSE:INT SOUR Center Freq: 6.44500		06:06:06 PM Apr 0 Radio Std: None		Trace/Detector
	·•••	Trig: Free Run	Avg Hold: 100/100			
	#IFGain:Low	#Atten: 36 dB		Radio Device: B	TS	
10 dB/div Ref 20.00 dE	3m					
10.0						
0.00	millionation	wardhild and manager both	white			Clear Write
-10.0						
-20.0			h			
-30.0	J.		h h			Average
-30.0 with margin in feel the Marshine and the marshine of the	June		holesterne	where a ling to make the former to	NARAN	Attenuge
-50.0						
-60.0						Max Hold
-70.0						
Center 6.445 GHz				Span 100	MHz	
Res BW 910 kHz		VBW 8 MHz		Sweep		Min Hold
		T-4-1 D				
Occupied Bandwid		Total P	ower 18.1	dBm		
3	37.879 MH	Z				Detector
Transmit From Frees	20 540 14	0/ af OF	3W Power 99	.00 %		Peak▶ Auto Man
Transmit Freq Error	39.518 kl				í l	
x dB Bandwidth	41.16 MI	Hz xdB	-26.	00 dB		
MSG			STATUS	5		

Plot 7-22. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11ax (UNII Band 6) - Ch. 99)



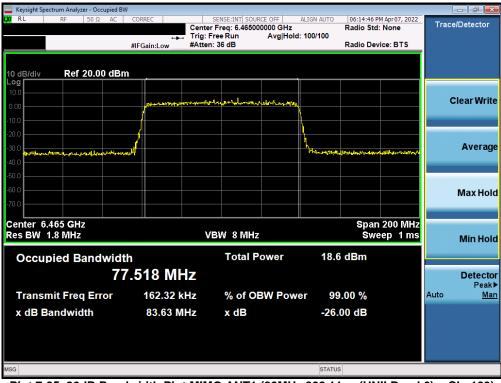
Plot 7-23. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11ax (UNII Band 6) - Ch. 107)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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μ RF 50 Ω AC CORREC SENSE:INT SOURCE OFF ALIGN AUTO 06:07:34 PM Apr07, 2022 Center Freq: 6.525000000 GHz Radio Std: None Tra	ce/Detector
Trig: Free Run Avg Hold: 100/100	
#IFGain:Low #Atten: 36 dB Radio Device: BTS	
10 dB/div Ref 20.00 dBm	
0.00 June production of the second of the se	Clear Write
10.0	
	Avorago
-30.0	Average
50.0	
60.0	Max Hold
-70.0	
Center 6.525 GHz Span 100 MHz	
Res BW 910 kHz VBW 8 MHz Sweep 1 ms	Min Hold
	Min Hold
Occupied Bandwidth Total Power 18.2 dBm	
37.873 MHz	Detector
	Peak▶
Transmit Freq Error 41.758 kHz % of OBW Power 99.00 %	Man
x dB Bandwidth 41.27 MHz x dB -26.00 dB	
MSG STATUS	

Plot 7-24. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11ax (UNII Band 6) - Ch. 115)



Plot 7-25. 26dB Bandwidth Plot MIMO ANT1 (80MHz 802.11ax (UNII Band 6) - Ch. 103)

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Keysight Spectrum Analyzer - Occupied BW							
🗶 RL RF 50Ω AC CO		INSE:INT SOURCE OFF	ALIGN AUTO	06:22:06 P Radio Std	M Apr 07, 2022	Trace	/Detector
	Trig: Fre	eRun Avg∣Ho	ld: 100/100	Radio Stu	None		
#IF	Gain:Low #Atten: 3	36 dB		Radio Dev	ice: BTS		
10 dB/div Ref 20.00 dBm							
Log							
10.0	. madel more marked	. Matel Material Science Lands				c	lear Write
0.00	Policipulation and and		*				
-10.0							
-20.0							
-30.0 and and a state of the second state of t			h	and the state of the	and the state of the		Average
-40.0							
-50.0							
-60.0							Max Hold
-70.0							Max Holu
Center 6.505 GHz					400 MHz		
Res BW 3 MHz	VB	W 50 MHz		Swe	ep 1 ms		Min Hold
Occurried Dandwidth		Total Power	10 () dBm			
Occupied Bandwidth		TOtal FOwer	13.0	, abili			
156.	.47 MHz						Detector
Transmit Freq Error	277.45 kHz	% of OBW Pov		.00 %		Auto	Peak▶ Man
-						Auto	IVIAII
x dB Bandwidth	167.4 MHz	x dB	-26.	00 dB			
MSG			STATU	5			

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

FCC ID: A3LSMF936B		Approved by: Technical Manager	
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MIMO Antenna-1 26 dB Bandwidth Measurements - (UNII Band 7)



Plot 7-27. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11a (UNII Band 7) - Ch. 117)



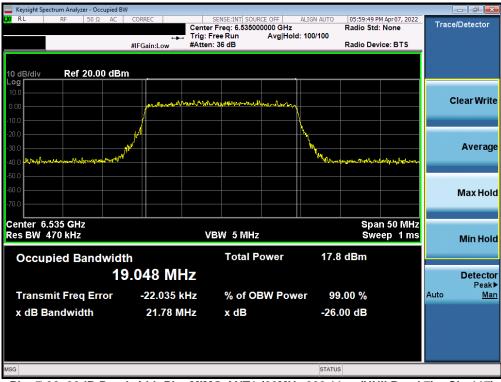
Plot 7-28. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11a (UNII Band 7) - Ch. 149)

FCC ID: A3LSMF936B		MEASUREMENT REPORT (CERTIFICATION)			
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Plot 7-29. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11a (UNII Band 7) - Ch. 185)



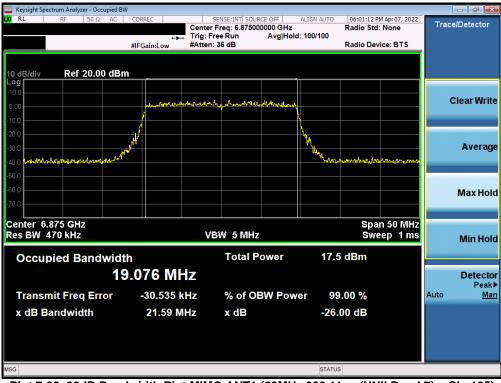
Plot 7-30. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11ax (UNII Band 7) - Ch. 117)

FCC ID: A3LSMF936B		MEASUREMENT REPORT (CERTIFICATION)			
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Plot 7-31. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11ax (UNII Band 7) - Ch. 149)



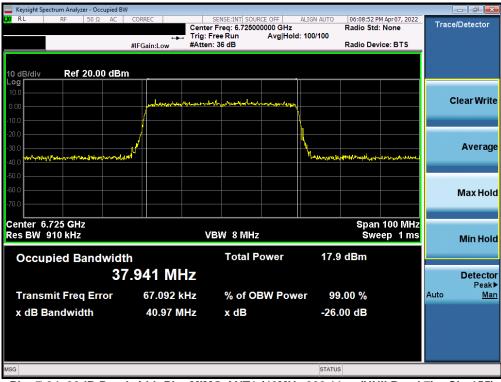
Plot 7-32. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11ax (UNII Band 7) – Ch. 185)

FCC ID: A3LSMF936B		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 22 of 227		
1M2204110052-13.A3L	4/1/2022 - 6/17/2022	Portable Handset	Page 32 of 237		
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Keysight Spectrum Analyzer - Occupied I								
L <mark>X/</mark> RL RF 50Ω AC	CORREC	SENSE:INT S		ALIGN AUTO	06:08:12 PM Radio Std:	1 Apr 07, 2022	Trac	e/Detector
		Trig: Free Run		d: 100/100				
	#IFGain:Low	#Atten: 36 dB			Radio Devi	ce: BTS		
10 dB/div Ref 20.00 dB	m							
Log 10.0								
0.00	manoperal	women porter porter agen	and the second					Clear Write
-10.0	1							
-20.0								
	d l							Avorago
-30.0	- All All All All All All All All All Al			Manne		rleasterners		Average
-40.0								
-50.0								
-60.0								Max Hold
-70.0								
Center 6.565 GHz					Snan	100 MHz		
Res BW 910 kHz		VBW 8 MI	z			ep 1 ms		Min Hold
								WIIITHOID
Occupied Bandwid	lth	Total	Power	17.9	dBm			
3	7.865 MH	7						Detector
								Peak►
Transmit Freq Error	15.267 k	Hz % of	OBW Pow	er 99.	00 %		Auto	<u>Man</u>
x dB Bandwidth	40.96 M	Hz x dB		-26.0	0 dB			
MSG				STATUS				

Plot 7-33. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11ax (UNII Band 7) - Ch. 123)



Plot 7-34. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11ax (UNII Band 7) - Ch. 155)

FCC ID: A3LSMF936B		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 22 of 227		
1M2204110052-13.A3L	4/1/2022 - 6/17/2022	Portable Handset	Page 33 of 237		
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🔤 Keysight Spectrum Analyzer - Occupie						
LX/ RL RF 50Ω A	C CORREC	SENSE:INT SOUR		06:09:27 PM Ap		Trace/Detector
	• • -	Trig: Free Run	Avg Hold: 100/100			
	#IFGain:Low	#Atten: 36 dB		Radio Device	BTS	
10 dB/div Ref 20.00 d	IBm					
10.0						
0.00	magan	Somball same read light out	Revensed from			Clear Write
-10.0						
-20.0	/					
-30.0	r 1		L.			Average
-40.0 Harman Hard -40.0	willian 1			widdyna lith ynawlana	whether	Arciugo
-50.0						
-60.0						Max Hold
-70.0						
Center 6.845 GHz				Span 10	00 MHz	
Res BW 910 kHz		VBW 8 MHz			o 1 ms	Min Hold
		T -4-1 D	40	4		
Occupied Bandwi		Total P	ower 18.	1 dBm		
	37.930 MH	z				Detector
Transmit Frag Error	52.706 k		BW Power 99	9.00 %		Peak▶ Auto Man
Transmit Freq Error						
x dB Bandwidth	41.05 M	lHz x dB	-26	.00 dB		
MSG			STATU	IS		

Plot 7-35. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11ax (UNII Band 7) - Ch. 179)



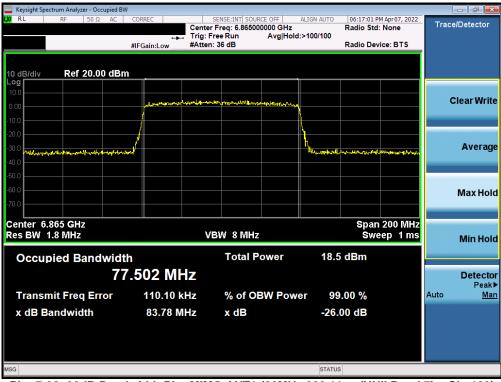
Plot 7-36. 26dB Bandwidth Plot MIMO ANT1 (80MHz 802.11ax (UNII Band 7) - Ch. 119)

FCC ID: A3LSMF936B MEASUREMENT REPORT (CERTIFICATION)					
Test Report S/N:	Test Dates:	EUT Type:	Dage 24 of 227		
1M2204110052-13.A3L	4/1/2022 - 6/17/2022	Portable Handset	Page 34 of 237		
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Keysight Spectrum Analyzer - Occupied BW								
LX/ RL RF 50Ω AC	CORREC		T SOURCE OFF	ALIGN AUTO	06:16:14 P	M Apr 07, 2022	Trac	e/Detector
	•	Trig: Free Run		d: 100/100				
	#IFGain:Low	#Atten: 36 dB			Radio Dev	ice: BTS		
10 dB/div Ref 20.00 dBn	n			•				
10.0								
0.00	Marin Marine	Lange last of the marged and	Marghadresonton Stratego					Clear Write
-10.0	1							
-20.0	1							
20.0	1			Y.				Average
-30.0 emillionerfilinger un rightingstelling mestions	le ⁿ			n _{bryan} eroana	iden an all with	nanipusting*~art.		Average
-50.0								
-60.0								Max Hold
-70.0								
Center 6.705 GHz					Span	200 MHz		
Res BW 1.8 MHz		VBW 8	MHz			ep 1ms		Min Hold
				40.4	dDee			
Occupied Bandwidt			tal Power	18.4	dBm			
77	7.436 MI	z						Detector
Transmit Freq Error	184.03 k	(Hz %)	of OBW Pow	ver 99	.00 %		Auto	Peak▶ Man
x dB Bandwidth	82.82 M	lHz x d	в	-20.0	00 dB			
MSG				STATUS				

Plot 7-37. 26dB Bandwidth Plot MIMO ANT1 (80MHz 802.11ax (UNII Band 7) - Ch. 151)



Plot 7-38. 26dB Bandwidth Plot MIMO ANT1 (80MHz 802.11ax (UNII Band 7) - Ch. 183)

FCC ID: A3LSMF936B		MEASUREMENT REPORT (CERTIFICATION)			
Test Report S/N:	Test Dates:	EUT Type:	Dage 25 of 227		
1M2204110052-13.A3L	4/1/2022 - 6/17/2022	Portable Handset	Page 35 of 237		
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Keysight Spectrum Analyzer - Occupied BW									- 6 ×
L <mark>X/</mark> RL RF 50Ω AC	CORREC		NSE:INT SOUR		ALIGN AUTO	06:22:54 P	M Apr 07, 2022	Trac	e/Detector
			e Run		d: 100/100				
	#IFGain:Low	#Atten: 30	6 dB			Radio Dev	ICE: BIS		
10 dB/div Ref 30.00 dBm									
20.0	يعصياكم								
10.0	بصطالة	صع							Clear Write
0.00	and the second s	when my	and a start and	ale and a strategy and a strategy and	ļ				
-10.0	رمصارك	صع							
-20.0									Average
-30.0 Marganetering of the statement of the second statement of the					-	Access of the location	ant gray sho anta		
-40.0	يعطيا								
-50.0	رصدالا								Maxilald
-60.0	رصدي								Max Hold
	الككالة								
Center 6.665 GHz							400 MHz		
Res BW 3 MHz		VBV	N 50 MH	Z		Swe	eep 1 ms		Min Hold
Occupied Bandwidth			Total P	ower	18.8	dBm			
15	6.16 MH	Z							Detector Peak▶
Transmit Freq Error	396.40 kl	Hz	% of OE	SW Pow	er 99	.00 %		Auto	Man
x dB Bandwidth	166.4 MI	Hz	x dB		-26	00 dB			
		12	A GB						
MSG					STATUS				

Plot 7-39. 26dB Bandwidth Plot MIMO ANT1 (160MHz 802.11ax (UNII Band 7) - Ch. 143)



Plot 7-40. 26dB Bandwidth Plot MIMO ANT1 (160MHz 802.11ax (UNII Band 7) - Ch. 175)

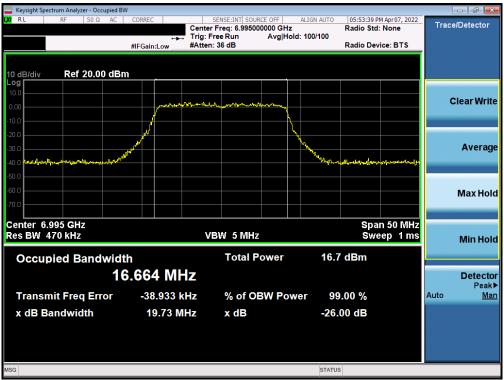
FCC ID: A3LSMF936B		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Daga 26 at 227
1M2204110052-13.A3L	4/1/2022 - 6/17/2022	Portable Handset	Page 36 of 237
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MIMO Antenna-1 26 dB Bandwidth Measurements - (UNII Band 8)

 Keysight Spectrum Analyzer - Occupied BW
 KL _ RF 50 Ω AC - 0 SENSE:INT| SOURCE OFF | ALIGN AUTO Center Freq: 6.895000000 GHz Trig: Free Run AvgiHold: 100/400 06:01:51 PM Apr 07, 2022 Radio Std: None Trace/Detector #IFGain:Low #Atten: 36 dB Radio Device: BTS Ref 20.00 dBm 0 dB/div .og **Clear Write** Average A. Artal Max Hold Center 6.895 GHz Res BW 470 kHz Span 50 MHz VBW 5 MHz Sweep 1 ms **Min Hold Total Power** 17.7 dBm **Occupied Bandwidth** 19.019 MHz Detector Peak Transmit Freq Error -16.899 kHz % of OBW Power 99.00 % Auto Man x dB Bandwidth 21.45 MHz x dB -26.00 dB STATUS

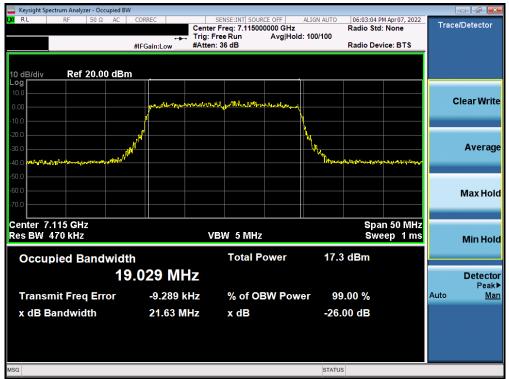
Plot 7-41. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11a (UNII Band 8) - Ch. 189)



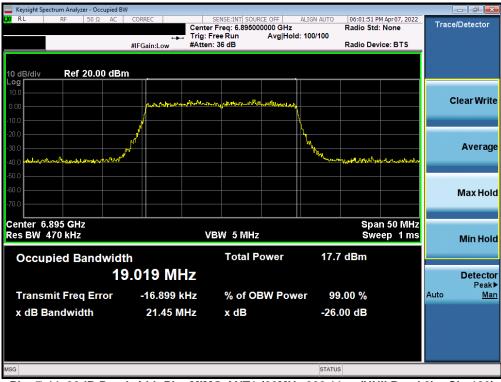
Plot 7-42. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11a (UNII Band 8) - Ch. 209)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dama 07 of 007
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Plot 7-43. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11a (UNII Band 8) - Ch. 233)



Plot 7-44. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11ax (UNII Band 8) - Ch. 189)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 227
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Plot 7-45. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11ax (UNII Band 8) - Ch. 209)



Plot 7-46. 26dB Bandwidth Plot MIMO ANT1 (20MHz 802.11ax (UNII Band 8) - Ch. 233)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 227
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Plot 7-47. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11ax (UNII Band 8) – Ch. 187)



Plot 7-48. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11ax (UNII Band 8) - Ch. 211)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 40 of 227
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Plot 7-49. 26dB Bandwidth Plot MIMO ANT1 (40MHz 802.11ax (UNII Band 8) - Ch. 227)



Plot 7-50. 26dB Bandwidth Plot MIMO ANT1 (80MHz 802.11ax (UNII Band 8) - Ch. 199)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 41 of 227
1M2204110052-13.A3L	4/1/2022 - 6/17/2022	Portable Handset	Page 41 of 237
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Plot 7-51. 26dB Bandwidth Plot MIMO ANT1 (80MHz 802.11ax (UNII Band 8) – Ch. 215)



Plot 7-52. 26dB Bandwidth Plot MIMO ANT1 (160MHz 802.11ax (UNII Band 8) - Ch. 207)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 42 of 227
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MIMO Antenna-2 26 dB Bandwidth Measurements - (UNII Band 5)



Plot 7-53. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11a (UNII Band 5) - Ch. 1)



Plot 7-54. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11a (UNII Band 5) – Ch. 45)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dama 40 - 4 007
1M2204110052-13.A3L	4/1/2022 - 6/17/2022	Portable Handset	Page 43 of 237
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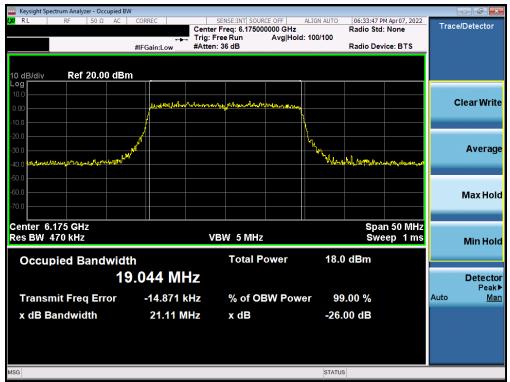
Plot 7-55. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11a (UNII Band 5) - Ch. 93)



Plot 7-56. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11ax (UNII Band 5) - Ch. 1)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dava 44 at 007
1M2204110052-13.A3L	4/1/2022 - 6/17/2022	Portable Handset	Page 44 of 237
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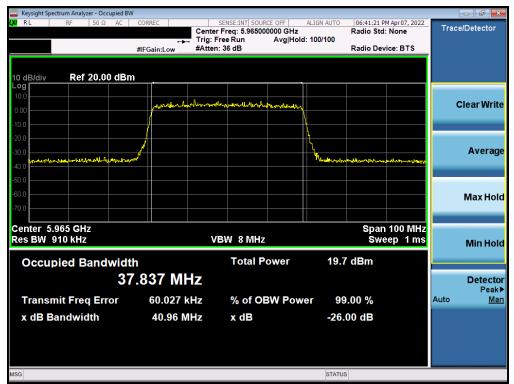
Plot 7-57. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11ax (UNII Band 5) – Ch. 45)



Plot 7-58. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11ax (UNII Band 5) - Ch. 93)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 45 of 227
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Plot 7-59. 26dB Bandwidth Plot MIMO ANT2 (40MHz 802.11ax (UNII Band 5) – Ch. 3)



Plot 7-60. 26dB Bandwidth Plot MIMO ANT2 (40MHz 802.11ax (UNII Band 5) - Ch. 43)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 46 of 227
1M2204110052-13.A3L	4/1/2022 - 6/17/2022	Portable Handset	Page 46 of 237
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Plot 7-61. 26dB Bandwidth Plot MIMO ANT2 (40MHz 802.11ax (UNII Band 5) – Ch. 91)



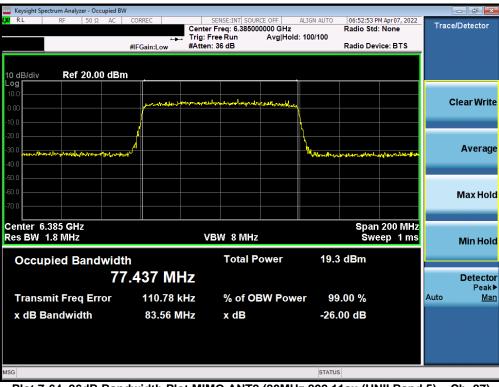
Plot 7-62. 26dB Bandwidth Plot MIMO ANT2 (80MHz 802.11ax (UNII Band 5) - Ch. 7)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 47 of 227
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Plot 7-63. 26dB Bandwidth Plot MIMO ANT2 (80MHz 802.11ax (UNII Band 5) – Ch. 39)



Plot 7-64. 26dB Bandwidth Plot MIMO ANT2 (80MHz 802.11ax (UNII Band 5) - Ch. 87)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 49 of 227
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Keysight Spectrum Analyzer - Occupied BW								
LX/ RL RF 50Ω AC CO	RREC	SENSE:INT SOUR		ALIGN AUTO	06:59:05 P	M Apr 07, 2022	Trac	e/Detector
	Trig	g: Free Run	Avg Hold:	: 100/100				
#IF	Gain:Low #Att	tten: 36 dB			Radio Dev	ice: BTS		
10 dB/div Ref 20.00 dBm								
Log 10.0								
0.00	approved on the second	manymunant	mound					Clear Write
-10.0)				
-20.0								Average
Balance and the state of the st				horal balland of the	et et all and a state of the st	and a second second		Average
-40.0								
-50.0								
-60.0								Max Hold
-70.0							_	
Center 6.025 GHz					Snan	400 MHz		
Res BW 3 MHz		VBW 50 MH;	z			ep 1 ms		Min Hold
								Min Hold
Occupied Bandwidth		Total Po	ower	20.1	dBm			
156	.62 MHz							Detector
								Peak▶
Transmit Freq Error	137.82 kHz	% of OE	SW Powe	er 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth	166.8 MHz	x dB		-26.0	00 dB			
MSG				STATUS				

Plot 7-65. 26dB Bandwidth Plot MIMO ANT2 (160MHz 802.11ax (UNII Band 5) – Ch. 15)



Plot 7-66. 26dB Bandwidth Plot MIMO ANT2 (160MHz 802.11ax (UNII Band 5) - Ch. 47)

FCC ID: A3LSMF936B		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dama 40 at 007
1M2204110052-13.A3L	4/1/2022 - 6/17/2022	Portable Handset	Page 49 of 237
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🔤 Keysig	ght Spectrum Analyz	er - Occu	upied BW									- # X
L <mark>XI</mark> RL	RF	50 Ω	AC	CORREC		ENSE:INT SOUF		ALIGN AUTO	07:00:32 P	M Apr 07, 2022	Trac	e/Detector
					+++ Trig: Fr	ee Run		d: 100/100	Raulo Stu	. None		
				#IFGain:Lo	w #Atten:	36 dB			Radio Dev	/ice: BTS		
10 dB/	div Ref	20.00	dBm									
Log 10.0												
0.00				و مراجع و م	monopermanil	n parassan	hormanna					Clear Write
				1								
-10.0				1				Î.				
-20.0				1				h.				
-30.0 🙀	and a second	anter alle	ad a stand of the second	-				West Standing	and the state of the second	And the second second		Average
-40.0												
-50.0												
-60.0												Max Hold
-70.0 —												
Cente	er 6.345 GHz	 7							Cnar	1400 MHz		
	W 3 MHz	4			VE	W 50 MH	z		Swi	eep 1 ms		Min Hold
												Min Hold
Oc	cupied Ba	andv	width			Total P	ower	20.2	2 dBm			
			15	6.45	MHz							Detector
												Peak▶
Tra	insmit Freq	Erro	or	423.	00 kHz	% of O	BW Pow	er 99	.00 %		Auto	<u>Man</u>
x d	B Bandwid	lth		166.	2 MHz	x dB		-26.	00 dB			
MSG								STATUS	3			
		_						UNATOR				

Plot 7-67. 26dB Bandwidth Plot MIMO ANT2 (160MHz 802.11ax (UNII Band 5) – Ch. 79)

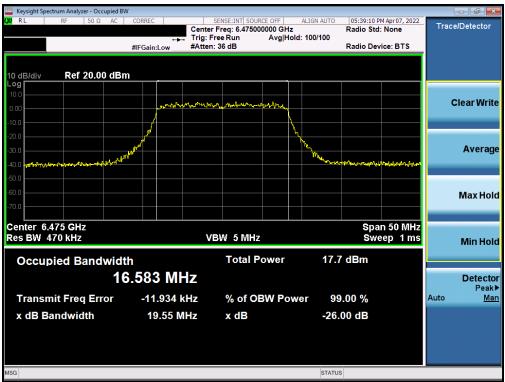
FCC ID: A3LSMF936B		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage E0 of 227
1M2204110052-13.A3L	4/1/2022 - 6/17/2022	Portable Handset	Page 50 of 237
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MIMO Antenna-2 26 dB Bandwidth Measurements - (UNII Band 6)



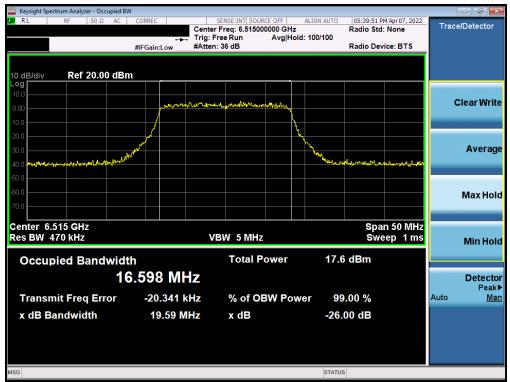
Plot 7-68. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11a (UNII Band 6) - Ch. 97)



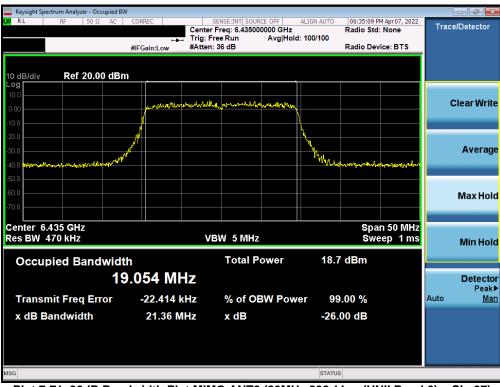
Plot 7-69. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11a (UNII Band 6) - Ch. 105)

FCC ID: A3LSMF936B		MEASUREMENT REPORT (CERTIFICATION)		
Test Report S/N:	Test Dates:	EUT Type:	Dawa 54 at 007	
1M2204110052-13.A3L	4/1/2022 - 6/17/2022	Portable Handset	Page 51 of 237	
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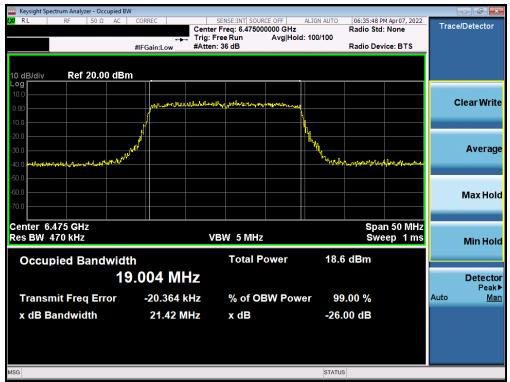
Plot 7-70. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11a (UNII Band 6) - Ch. 113)



Plot 7-71. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11ax (UNII Band 6) - Ch. 97)

FCC ID: A3LSMF936B		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Daga 50 of 227
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Plot 7-72. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11ax (UNII Band 6) - Ch. 105)



Plot 7-73. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11ax (UNII Band 6) - Ch. 113)

FCC ID: A3LSMF936B		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Daga 52 of 227
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Plot 7-74. 26dB Bandwidth Plot MIMO ANT2 (40MHz 802.11ax (UNII Band 6) – Ch. 99)



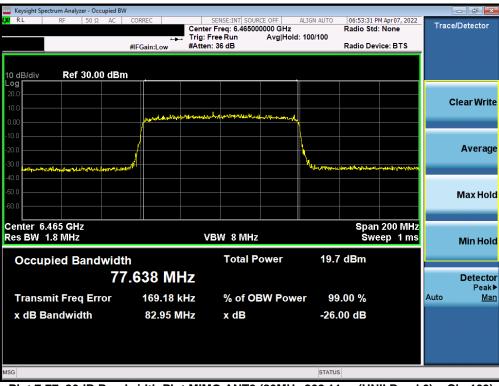
Plot 7-75. 26dB Bandwidth Plot MIMO ANT2 (40MHz 802.11ax (UNII Band 6) - Ch. 107)

FCC ID: A3LSMF936B		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dava 54 at 007
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Keysight Spectrum Analyzer - Occupied E	3W				
LXIRL RF 50Ω AC	CORREC	SENSE:INT SOURCE OFF		4:56 PM Apr 07, 2022 Std: None	Trace/Detector
	Tri	ig: Free Run Avg	Hold: 100/100		
	#IFGain:Low #At	tten: 36 dB	Radio	Device: BTS	
10 dB/div Ref 20.00 dB	m				
Log 10.0	<u>و مد از م</u>				
0.00	mound	mayon productor aller and any			Clear Write
-10.0					
-20.0					
					Average
-30.0 -40.0	awred		haleballer was	monorman	Average
	ه صر ا				
-50.0					
-60.0	ه کا ک				Max Hold
-70.0	ه کا ک				
Center 6.525 GHz			S	pan 100 MHz	
Res BW 910 kHz		VBW 8 MHz		Sweep 1 ms	Min Hold
					WIIITTOIG
Occupied Bandwid	th	Total Power	18.8 dBn	n	
3	7.868 MHz				Detector
					Peak►
Transmit Freq Error	6.431 kHz	% of OBW P	ower 99.00 %	6	Auto <u>Man</u>
x dB Bandwidth	40.83 MHz	x dB	-26.00 di	3	
MSG			STATUS		

Plot 7-76. 26dB Bandwidth Plot MIMO ANT2 (40MHz 802.11ax (UNII Band 6) – Ch. 115)



Plot 7-77. 26dB Bandwidth Plot MIMO ANT2 (80MHz 802.11ax (UNII Band 6) - Ch. 103)

FCC ID: A3LSMF936B		Approved by: Technical Manager	
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🧱 Keysight Spectrum Analyzer - Occupied BW							
LXI RL RF 50Ω AC		req: 6.505000000 GHz	ALIGN AUTO	07:02:22 PM Radio Std:	Apr 07, 2022	Trac	e/Detector
	🛶 Trig: Fre	e Run Avg Hold	1: 100/100				
	#FGain:Low #Atten:	36 dB		Radio Devi	ce: BTS		
10 dB/div Ref 20.00 dBm Log							
10.0							
0.00	and a stand of the second second	ware and the shall and the second	-			(Clear Write
-10.0	_		<u>l</u>				
-20.0							
-30.0 - Andrew antiger and an and a state of the state of	4		humber	mahanana	draweddrawyga		Average
-40.0							
-50.0							
-60.0							Max Hold
-70.0							
Center 6.505 GHz				- Cnon	400 844-		
Res BW 3 MHz	VB	W 50 MHz			400 MHz ep 1 ms		Min Hold
							Min Hold
Occupied Bandwidth	า	Total Power	19.8	dBm			
15	6.10 MHz						Detector
				00.0/		A	Peak▶
Transmit Freq Error	407.15 kHz	% of OBW Pow		00 %		Auto	Man
x dB Bandwidth	167.1 MHz	x dB	-26.0	0 dB			
MSG			STATUS				

Plot 7-78. 26dB Bandwidth Plot MIMO ANT2 (160MHz 802.11ax (UNII Band 6) - Ch. 111)

FCC ID: A3LSMF936B		Approved by: Technical Manager	
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MIMO Antenna-2 26 dB Bandwidth Measurements - (UNII Band 7)



Plot 7-79. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11a (UNII Band 7) - Ch. 117)



Plot 7-80. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11a (UNII Band 7) - Ch. 149)

FCC ID: A3LSMF936B		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
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Plot 7-81. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11a (UNII Band 7) – Ch. 185)



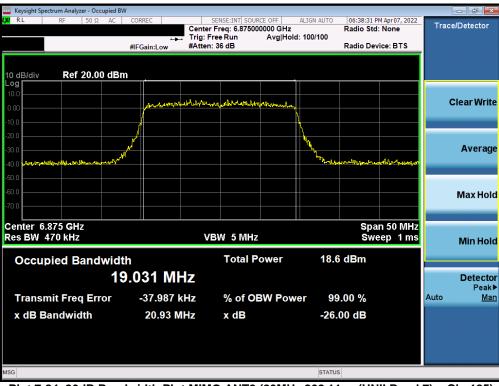
Plot 7-82. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11ax (UNII Band 7) - Ch. 117)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-83. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11ax (UNII Band 7) - Ch. 149)



Plot 7-84. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11ax (UNII Band 7) - Ch. 185)

FCC ID: A3LSMF936B		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Daga 50 of 227
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Plot 7-85. 26dB Bandwidth Plot MIMO ANT2 (40MHz 802.11ax (UNII Band 7) – Ch. 123)



Plot 7-86. 26dB Bandwidth Plot MIMO ANT2 (40MHz 802.11ax (UNII Band 7) - Ch. 155)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager	
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Plot 7-87. 26dB Bandwidth Plot MIMO ANT2 (40MHz 802.11ax (UNII Band 7) - Ch. 179)



Plot 7-88. 26dB Bandwidth Plot MIMO ANT2 (80MHz 802.11ax (UNII Band 7) - Ch. 119)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-89. 26dB Bandwidth Plot MIMO ANT2 (80MHz 802.11ax (UNII Band 7) - Ch. 151)



Plot 7-90. 26dB Bandwidth Plot MIMO ANT2 (80MHz 802.11ax (UNII Band 7) - Ch. 183)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga (2) of 227
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www.www.www.com.com.com.com.com.com.com.com.com.com										
LXI RL RF 50Ω	AC COR	RREC		NSE:INT SOUR		ALIGN AUTO	07:03:19 Pr Radio Std:	M Apr 07, 2022	Trac	e/Detector
		· · ·	🔒 Trig: Free	e Run	Avg Hold	l: 100/100				
	#IF0	Gain:Low	#Atten: 3	6 dB			Radio Dev	lice: B15		
B-6.00.00										
10 dB/div Ref 20.00	dBm									
10.0					هها					
0.00		and the second	a Brahadinkaragenty	a and a second	6 des tomar anguno					Clear Write
-10.0					هد					
-20.0	l i i i i i i i i i i i i i i i i i i i									
-30.0 water water and a second state of the se	mander				<u>کک</u>	mound	any approximation	a payer the separate		Average
-40.0					<u>کک</u>					
-50.0					وي ا					
-60.0										Max Hold
-70.0						و ال				Muxinera
Center 6.665 GHz Res BW 3 MHz			VB	W 50 MH	-			400 MHz eep 1 ms		
Res BW J MITZ				A SO WIT	2		0.00	seb Luis		Min Hold
Occupied Bandy	width			Total P	ower	19.7	dBm			
		72 MI	17							Detector
										Peak►
Transmit Freq Erro	or	238.13	kHz	% of O	BW Powe	er 99	.00 %		Auto	<u>Man</u>
x dB Bandwidth		167.1 N	ИHz	x dB		-26.	00 dB			
MSG						STATUS	3			

Plot 7-91. 26dB Bandwidth Plot MIMO ANT2 (160MHz 802.11ax (UNII Band 7) - Ch. 143)



Plot 7-92. 26dB Bandwidth Plot MIMO ANT2 (160MHz 802.11ax (UNII Band 7) - Ch. 175)

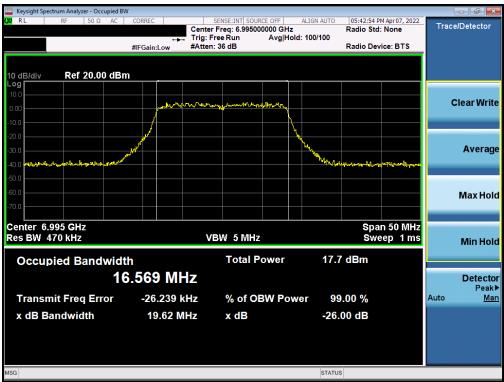
FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Daga 62 at 227	
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MIMO Antenna-2 26 dB Bandwidth Measurements - (UNII Band 8)



Plot 7-93. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11a (UNII Band 8) - Ch. 189)



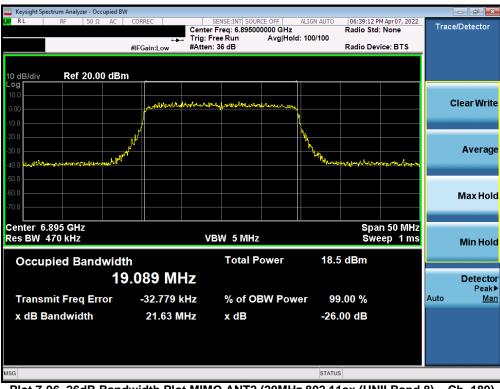
Plot 7-94. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11a (UNII Band 8) - Ch. 209)

FCC ID: A3LSMF936B		MEASUREMENT REPORT (CERTIFICATION)	
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Plot 7-95. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11a (UNII Band 8) - Ch. 233)



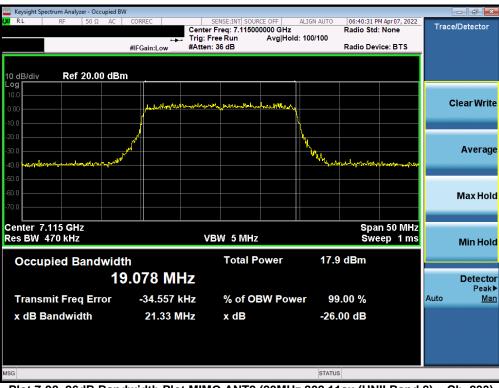
Plot 7-96. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11ax (UNII Band 8) - Ch. 189)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-97. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11ax (UNII Band 8) - Ch. 209)



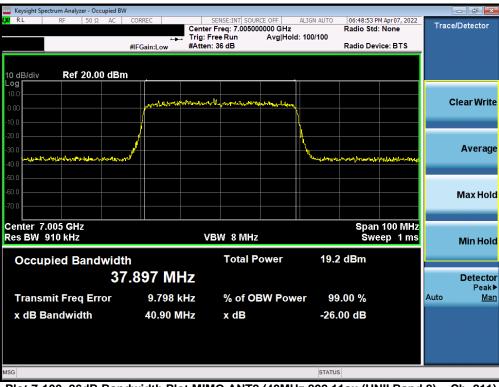
Plot 7-98. 26dB Bandwidth Plot MIMO ANT2 (20MHz 802.11ax (UNII Band 8) - Ch. 233)

FCC ID: A3LSMF936B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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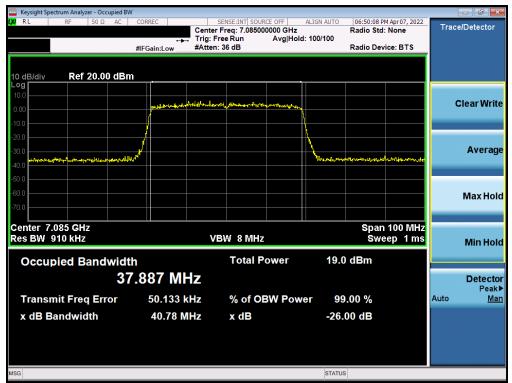
Plot 7-99. 26dB Bandwidth Plot MIMO ANT2 (40MHz 802.11ax (UNII Band 8) – Ch. 187)



Plot 7-100. 26dB Bandwidth Plot MIMO ANT2 (40MHz 802.11ax (UNII Band 8) - Ch. 211)

FCC ID: A3LSMF936B		Approved by: Technical Manager	
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Plot 7-101. 26dB Bandwidth Plot MIMO ANT2 (40MHz 802.11ax (UNII Band 8) - Ch. 227)



Plot 7-102. 26dB Bandwidth Plot MIMO ANT2 (80MHz 802.11ax (UNII Band 8) - Ch. 199)

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Plot 7-103. 26dB Bandwidth Plot MIMO ANT2 (80MHz 802.11ax (UNII Band 8) - Ch. 215)



Plot 7-104. 26dB Bandwidth Plot MIMO ANT2 (160MHz 802.11ax (UNII Band 8) - Ch. 207)

FCC ID: A3LSMF936B		MEASUREMENT REPORT (CERTIFICATION)			
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7.3 UNII Output Power Measurement – 802.11a/ax § 2.1046, §15.407(a)(11), §15.407(a)(8)

Test Overview and Limits

A transmitter antenna terminal of the EUT is connected to the input of an RF pulse power sensor. Measurement is made using a broadband average power meter while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2013 and KDB 789033 D02 v02r01, and at the appropriate frequencies.

Test Procedure Used

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

Test Settings

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

Test Setup

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



Figure 7-2. Test Instrument & Measurement Setup

Test Notes

None.

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MIMO Maximum Conducted Output Power Measurements

	6GHz (20MHz) 802.11a Conducted Power [dBm]								
width)	Freq [MHz]	Channel	ANT1 [dBm]	ANT2 [dBm]	MIMO [dBm]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
Ξ	5935	2	10.55	10.48	13.53	-0.61	12.92	24.00	-11.08
ð	6075	25	10.66	10.66	13.67	-0.61	13.06	24.00	-10.94
	6175	45	10.4	10.83	13.63	-0.61	13.02	24.00	-10.98
a	6275	65	10.59	10.91	13.76	-0.61	13.15	24.00	-10.85
Ш	6415	93	10.49	10.89	13.70	-0.61	13.09	24.00	-10.91
N	6435	97	10.81	10.86	13.85	-3.53	10.32	24.00	-13.68
	6475	105	10.76	10.78	13.78	-3.53	10.25	24.00	-13.75
Σ	6515	113	10.71	10.44	13.59	-3.53	10.06	24.00	-13.94
0	6535	117	10.67	10.39	13.54	-4.89	8.65	24.00	-15.35
5	6675	145	10.89	10.87	13.89	-4.89	9.00	24.00	-15.00
N	6695	149	10.78	10.73	13.77	-4.89	8.88	24.00	-15.12
	6875	185	10.62	10.59	13.62	-4.89	8.73	24.00	-15.27
U	6895	189	10.59	10.57	13.59	-7.08	6.51	24.00	-17.49
Ŭ	6995	209	10.47	10.95	13.73	-7.08	6.65	24.00	-17.35
	7115	233	10.68	10.94	13.82	-7.08	6.74	24.00	-17.26
	Table 7			000 44 - /11	NIII) NA			D	

Table 7-2. MIMO 20MHz BW 802.11a (UNII) Maximum Conducted Output Power

	6GHz (20MHz) 802.11ax Conducted Power [dBm]								
idth)	Freq [MHz]	Channel	ANT1 [dBm]	ANT2 [dBm]	MIMO [dBm]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
Ň	5935	2	10.64	10.61	13.64	-0.61	13.03	24.00	-10.97
d	6075	25	10.74	10.85	13.81	-0.61	13.20	24.00	-10.80
_	6175	45	10.48	10.94	13.73	-0.61	13.12	24.00	-10.88
a	6275	65	10.31	10.51	13.42	-0.61	12.81	24.00	-11.19
Δ	6415	93	10.59	10.59	13.60	-0.61	12.99	24.00	-11.01
N	6435	97	10.89	10.98	13.95	-3.53	10.42	24.00	-13.58
I	6475	105	10.69	10.9	13.81	-3.53	10.28	24.00	-13.72
Σ	6515	113	10.79	10.54	13.68	-3.53	10.15	24.00	-13.85
0	6535	117	10.76	10.49	13.64	-4.89	8.75	24.00	-15.25
(5	6675	145	10.98	10.96	13.98	-4.89	9.09	24.00	-14.91
N	6695	149	10.85	10.84	13.86	-4.89	8.97	24.00	-15.03
T	6875	185	10.71	10.61	13.67	-4.89	8.78	24.00	-15.22
Ċ	6895	189	10.67	10.67	13.68	-7.08	6.60	24.00	-17.40
Ō	6995	209	10.55	10.51	13.54	-7.08	6.46	24.00	-17.54
	7115	233	10.67	10.58	13.64	-7.08	6.56	24.00	-17.44

Table 7-3. MIMO 20MHz BW 802.11ax (UNII) Maximum Conducted Output Power

FCC ID: A3LSMF936B		MEASUREMENT REPORT (CERTIFICATION)		
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		6GHz (40MHz) 802.11ax Conducted Power [dBm]							
idth)	Freq [MHz]	Channel	ANT1 [dBm]	ANT2 [dBm]	MIMO [dBm]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
Š	5965	3	10.76	10.82	13.80	-0.61	13.19	24.00	-10.81
ð	6085	27	10.64	10.7	13.67	-0.61	13.06	24.00	-10.94
	6165	43	10.45	10.89	13.69	-0.61	13.08	24.00	-10.92
a	6285	67	10.59	11.0	13.79	-0.61	13.18	24.00	-10.82
Ш	6405	91	10.52	10.99	13.77	-0.61	13.16	24.00	-10.84
<u>N</u>	6445	99	10.79	10.89	13.85	-3.53	10.32	24.00	-13.68
	6485	107	10.77	10.56	13.68	-3.53	10.15	24.00	-13.85
Σ	6525	115	10.67	10.47	13.58	-3.53	10.05	24.00	-13.95
(40	6565	123	10.69	10.55	13.63	-4.89	8.74	24.00	-15.26
T	6685	147	10.79	10.8	13.81	-4.89	8.92	24.00	-15.08
N	6725	155	10.38	10.62	13.51	-4.89	8.62	24.00	-15.38
I	6845	179	10.74	10.58	13.67	-4.89	8.78	24.00	-15.22
Ū	6885	187	10.73	10.63	13.69	-7.08	6.61	24.00	-17.39
Ö	7005	211	10.49	10.98	13.75	-7.08	6.67	24.00	-17.33
	7085	227	10.69	10.47	13.59	-7.08	6.51	24.00	-17.49

Table 7-4. MIMO 40MHz BW 802.11ax (UNII) Maximum Conducted Output Power

	6GHz (80MHz) 802.11ax Conducted Power [dBm]								
N	Freq [MHz]	Channel	ANT1 [dBm]	ANT2 [dBm]	MIMO [dBm]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
P C	5985	7	10.66	10.76	13.72	-0.61	13.11	24.00	-10.89
t d	6065	23	10.71	10.8	13.75	-0.61	13.14	24.00	-10.86
0M idt	6145	39	10.49	10.94	13.73	-0.61	13.12	24.00	-10.88
× 80	6305	71	10.29	10.9	13.59	-0.61	12.98	24.00	-11.02
	6385	87	10.56	10.56	13.57	-0.61	12.96	24.00	-11.04
P C	6465	103	10.77	10.84	13.82	-3.53	10.29	24.00	-13.71
a T	6545	119	10.7	10.59	13.66	-4.89	8.77	24.00	-15.23
Ū Ö	6705	151	10.76	10.75	13.77	-4.89	8.88	24.00	-15.12
9	6785	167	10.38	10.65	13.53	-4.89	8.64	24.00	-15.36
	6865	183	10.68	10.57	13.64	-4.89	8.75	24.00	-15.25
	6945	199	10.98	10.93	13.97	-7.08	6.89	24.00	-17.11
	7025	215	10.66	10.59	13.64	-7.08	6.56	24.00	-17.44

Table 7-5. MIMO 80MHz BW 802.11ax (UNII) Maximum Conducted Output Power

			6GH	z (160MHz) 80	2.11ax Condu	ucted Power [c	lBm]		
<mark>0MHz</mark> dth)	Freq [MHz]	Channel	ANT1 [dBm]	ANT2 [dBm]	MIMO [dBm]	Directional Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
60 vid	6025	15	10.57	10.76	13.68	-0.61	13.07	24.00	-10.93
(16 dwi	6185	47	10.61	10.58	13.61	-0.61	13.00	24.00	-11.00
nd (6345	79	10.39	10.59	13.50	-0.61	12.89	24.00	-11.11
ад	6505	111	10.53	10.35	13.45	-3.53	9.92	24.00	-14.08
<u>ы</u> п	6665	143	10.69	10.79	13.75	-4.89	8.86	24.00	-15.14
9	6825	175	10.55	10.59	13.58	-4.89	8.69	24.00	-15.31
	6985	207	10.88	10.73	13.82	-7.08	6.74	24.00	-17.26
	Toble 7			002 1 1 av /I	INIII) Movin	num Condu		+ Dawar	

Table 7-6. MIMO 160MHz BW 802.11ax (UNII) Maximum Conducted Output Power

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Sample MIMO Calculation:

At 5955MHz in 802.11ax (20MHz BW) mode, the average conducted output power was measured to be 10.64 dBm for Antenna-1 and 10.61 dBm for Antenna-2.

Antenna 1 + Antenna 2 = MIMO

(10.64 dBm + 10.61 dBm) = (11.59 mW + 11.50 mW) = 23.09 mW = 13.64 dBm

Sample Directional Gain Calculation:

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

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

Sample e.i.r.p. Calculation:

At 5955MHz in 802.11ax (20MHz BW) mode, the average MIMO conducted power was calculated to be 13.64 dBm with directional gain of -0.61 dBi.

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

13.64 dBm + -0.61 dBi = 13.03 dBm

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7.4 Maximum Power Spectral Density – 802.11a/ax §15.407(a)(8)

Test Overview and Limit

The spectrum analyzer was connected to the antenna terminal while the EUT was operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2013 and KDB 789033 D02 v02r01, and at the appropriate frequencies. Method SA-1, as defined in ANSI C63.10-2013 and KDB 789033 D02 v02r01, was used to measure the power spectral density for 802.11a/ax.

In the 5.925-7.125 GHz bands, the maximum power spectral density must not exceed −1 dBm e.i.r.p. in any 1-megahertz band

Test Procedure Used

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

Test Settings

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

Test Setup

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



Figure 7-3. Test Instrument & Measurement Setup

Test Notes

None.

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MIMO Power Spectral Density Measurements

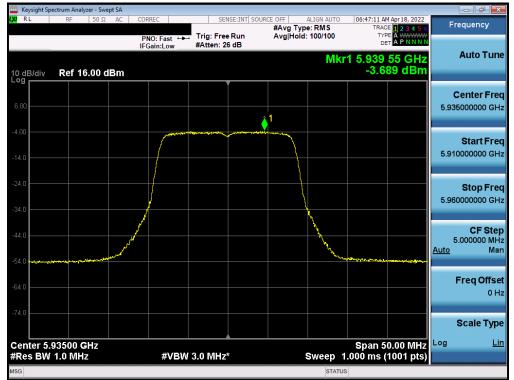
				Antenna-1	Antenna-2			Summed MIMO			Max EIRP	
	Frequency	Channel	802.11	Power Density	Power Density		Antenna-2 Gain	Power Density	Directional Gain	e.i.r.p Density	Density	Margin
	[MHz]	channel	MODE	[dBm]	[dBm]	[dBi]	[dBi]	[dBm/MHz]	[dBi]	[dBm/MHz]	[dBm/MHz]	[dB]
	5935	2	а	-3.69	-3.43	-3.83	-3.42	-0.55	-0.61	-1.16	-1	-0.16
	6175	45	a	-3.54	-3.41	-3.83	-3.42	-0.47	-0.61	-1.08	-1	-0.08
	6415	93	a	-0.98	-0.98	-3.83	-10.50	2.03	-3.53	-1.50	-1	-0.50
	5935	2	ax (20MHz)	-4.15	-3.50	-3.83	-3.42	-0.80	-0.61	-1.41	-1	-0.41
	6175	45	ax (20MHz)	-3.70	-3.28	-3.83	-3.42	-0.47	-0.61	-1.08	-1	-0.08
	6415	93	ax (20MHz)	-1.53	-1.07	-3.83	-10.50	1.72	-3.53	-1.81	-1	-0.81
5	5965	3	ax (40MHz)	-4.18	-3.45	-3.83	-3.42	-0.79	-0.61	-1.40	-1	-0.40
p	6165	43	ax (40MHz)	-4.04	-4.06	-3.83	-3.42	-1.04	-0.61	-1.65	-1	-0.40
Band	6405	43 91	ax (40MHz)	-4.04	-4.00	-3.83	-10.50	-1.15	-3.53	-4.68	-1	-3.68
	5985	7	ax (40MHz)	-7.26	-6.70	-3.83	-3.42	-3.96	-0.61	-4.08	-1	-3.57
	6145	39	. ,	-6.98	-6.83	-3.83	-3.42	-3.89	-0.61	-4.57	-1	-3.57
	-		ax (80MHz)	-6.98				-3.89		-4.51 -7.51	-1 -1	
	6385	87	ax (80MHz)	-	-6.61	-3.83	-10.50		-3.53			-6.51
	6025	15	ax (160MHz)	-9.82	-9.27	-3.83	-3.42	-6.52	-0.61	-7.14	-1	-6.14
	6185	47	ax (160MHz)	-10.18	-9.52	-3.83	-3.42	-6.83	-0.61	-7.44	-1	-6.44
	6345	79	ax (160MHz)	-10.12	-9.07	-3.83	-10.50	-6.55	-3.53	-10.08	-1	-9.08
	6435	97	а	-0.74	-0.49	-3.83	-10.50	2.40	-3.53	-1.13	-1	-0.13
	6475	105	а	-0.89	-0.16	-3.83	-10.50	2.50	-3.53	-1.03	-1	-0.03
	6515	113	а	-1.12	-0.32	-3.83	-10.50	2.31	-3.53	-1.22	-1	-0.22
	6435	97	ax (20MHz)	-1.42	-0.68	-3.83	-10.50	1.97	-3.53	-1.55	-1	-0.55
Band 6	6475	105	ax (20MHz)	-1.72	-0.50	-3.83	-10.50	1.94	-3.53	-1.59	-1	-0.59
and	6515	113	ax (20MHz)	-1.21	-0.45	-3.83	-10.50	2.20	-3.53	-1.33	-1	-0.33
-	6445	99	ax (40MHz)	-4.43	-3.58	-3.83	-10.50	-0.97	-3.53	-4.50	-1	-3.50
	6485	107	ax (40MHz)	-4.28	-3.78	-3.83	-10.50	-1.01	-3.53	-4.54	-1	-3.54
	6525	115	ax (40MHz)	-4.28	-3.86	-3.83	-10.50	-1.05	-3.53	-4.58	-1	-3.58
	6465	103	ax (80MHz)	-7.35	-6.31	-3.83	-10.50	-3.79	-3.53	-7.32	-1	-6.32
	6505	111	ax (160MHz)	-10.22	-9.15	-3.83	-10.50	-6.64	-3.53	-10.17	-1	-9.17
	6535	117	а	-1.44	-0.75	-7.21	-8.64	1.93	-4.89	-2.95	-1	-1.95
	6695	149	а	-1.10	-0.44	-7.21	-8.64	2.26	-4.89	-2.63	-1	-1.63
	6875	185	а	-0.59	-0.27	-7.21	-8.64	2.58	-4.89	-2.30	-1	-1.30
	6535	117	ax (20MHz)	-1.36	-0.85	-7.21	-8.64	1.91	-4.89	-2.98	-1	-1.98
	6695	149	ax (20MHz)	-1.82	-0.46	-7.21	-8.64	1.92	-4.89	-2.96	-1	-1.96
	6875	185	ax (20MHz)	-1.57	-0.80	-7.21	-8.64	1.84	-4.89	-3.05	-1	-2.05
4 <u>7</u>	6565	123	ax (40MHz)	-4.75	-4.25	-7.21	-8.64	-1.48	-4.89	-6.37	-1	-5.37
Band 7	6725	155	ax (40MHz)	-4.60	-3.83	-7.21	-8.64	-1.19	-4.89	-6.07	-1	-5.07
	6885	179	ax (40MHz)	-4.32	-3.98	-7.21	-8.64	-1.13	-4.89	-6.02	-1	-5.02
	6545	119	ax (80MHz)	-7.54	-6.99	-7.21	-8.64	-4.24	-4.89	-9.13	-1	-8.13
	6705	151	ax (80MHz)	-7.64	-6.32	-7.21	-8.64	-3.92	-4.89	-8.80	-1	-7.80
	6865	183	ax (80MHz)	-7.31	-6.92	-7.21	-8.64	-4.10	-4.89	-8.98	-1	-7.98
	6665	143	ax (160MHz)	-10.33	-9.38	-7.21	-8.64	-6.82	-4.89	-11.70	-1	-10.70
	6825	175	ax (160MHz)	-10.58	-9.84	-7.21	-8.64	-7.18	-4.89	-12.07	-1	-11.07
	6895	189	a	-0.59	-0.50	-8.90	-11.46	2.47	-7.08	-4.61	-1	-3.61
	6995	209	а	-0.75	-0.16	-8.90	-11.46	2.57	-7.08	-4.51	-1	-3.51
	7115	233	a	-0.59	-0.32	-8.90	-11.46	2.56	-7.08	-4.52	-1	-3.52
	6895	189	ax (20MHz)	-1.51	-0.78	-8.90	-11.46	1.88	-7.08	-5.19	-1	-4.19
	6995	209	ax (20MHz)	-2.16	-0.70	-8.90	-11.46	1.64	-7.08	-5.44	-1	-4.44
8	7115	233	ax (20MHz)	-1.96	-1.16	-8.90	-11.46	1.47	-7.08	-5.61	-1	-4.61
Band 8	6885	187	ax (20MHz)	-4.32	-3.76	-8.90	-11.46	-1.02	-7.08	-8.09	-1	-7.09
6	7005	211	ax (40MHz)	-4.58	-3.47	-8.90	-11.46	-0.98	-7.08	-8.09	-1	-7.09
	7085	211 227	ax (40MHz)	-4.38	-3.74	-8.90	-11.40	-1.21	-7.08	-8.29	-1	-7.29
	6945	199		-4.76	-3.74	-8.90	-11.46	-1.21 -4.14	-7.08	-8.29	-1 -1	-10.22
			ax (80MHz)					-4.14 -4.24				1
	7025	215	ax (80MHz)	-7.75	-6.80	-8.90	-11.46		-7.08	-11.31	-1	-10.31
	6985	207	ax (160MHz)	-10.63	-9.38	-8.90	-11.46	-6.95 ctral Dens	-7.08 ity Measu	-14.03	-1	-13.03

Table 7-7. MIMO e.i.r.p. Conducted Power Spectral Density Measurements

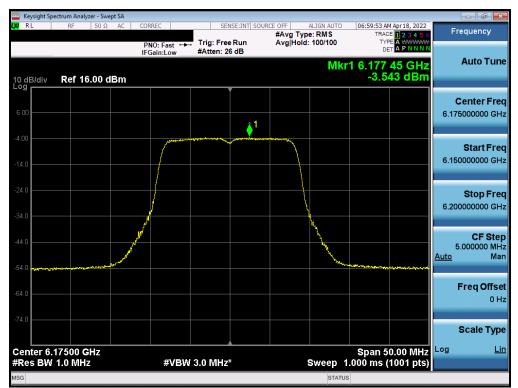
FCC ID: A3LSMF936B		Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dega 75 of 007	
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MIMO Antenna-1 Power Spectral Density Measurement - (UNII Band 5)



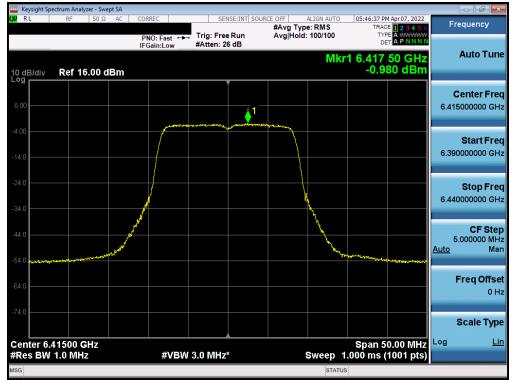
Plot 7-105. Power Spectral Density Measurement MIMO ANT1 (20MHz 802.11a (UNII Band 5) - Ch. 1)



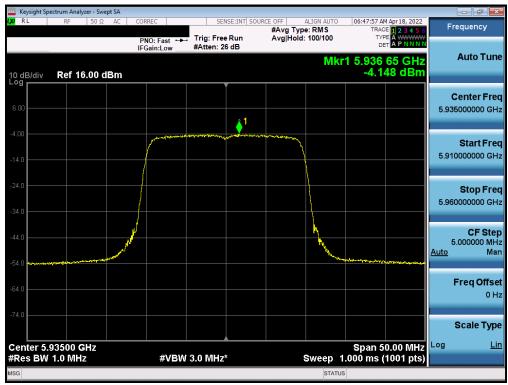
Plot 7-106. Power Spectral Density Measurement MIMO ANT1 (20MHz 802.11a (UNII Band 5) - Ch. 45)

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Plot 7-107. Power Spectral Density Measurement MIMO ANT1 (20MHz 802.11a (UNII Band 5) - Ch. 93)



Plot 7-108. Power Spectral Density Measurement MIMO ANT1 (20MHz 802.11ax (UNII Band 5) - Ch. 1)

FCC ID: A3LSMF936B		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	
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