TEST REPORT

Report Number: 15126863-E7V1

Applicant	:	Sonos Inc. 301 Coromar Dr. Goleta, CA 93117 USA
Model	:	S55
Brand	:	Sonos
FCC ID	:	SBVRM055
IC	:	5373A-RM055
EUT Description	:	Wireless Smart Speaker
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART E ISED RSS-248 ISSUE 2 ISED RSS-GEN ISSUE 5 + A1 +A2

Date Of Issue:
2024-05-30

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538 U.S.A.
TEL: (510) 319-4000
FAX: (510) 661-0888

ACCREDITED
CERT #0751.05

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2024-05-30	Initial Issue	---

UL VERIFICATION SERVICES
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

TABLE OF CONTENTS

UL VERIFICATION SERVICES
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Sonos Inc.
301 Coromar Dr
Goleta, CA, 93117, U.S.A.

EUT DESCRIPTION: Wireless Smart Speaker

MODEL: S55

BRAND: Sonos

SERIAL NUMBER: Radiated Sample: 000E58BF9FD11 and 000E585B5F1DE
Conducted Sample: 000E538EEB9D05

SAMPLE RECEIPT DATE: 2024-04-01

DATE TESTED: 2024-04-15 to 2024-05-15

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Complies
ISED RSS-248 Issue 2	Complies
ISED RSS-GEN Issue 5 + A1 + A2	Complies

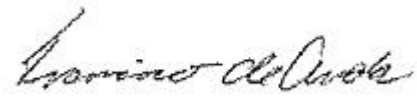
UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document.

UL VERIFICATION SERVICES
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

Approved & Released For
UL Verification Services Inc. By:



Francisco de Anda
Staff Engineer
Consumer Technology Division
UL Verification Services Inc.

Prepared By:

Glenn Escano
Senior Test Engineer
Consumer Technology Division
UL Verification Services Inc.

2. TEST RESULT SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for correctly integrating customer-provided data with measurements performed by UL Verification Services Inc.

FCC Clause	ISED Clause	Requirement	Result	Comment
See Comment		Duty Cycle	Reporting purposes only	ANSI C63.10 Section 12.2 ...
See Comment	RSS-GEN 6.7	99% BW	Reporting purposes only	ANSI C63.10 Section 6.9.3
See Comment	---	26dB BW	Compliant	None.
§15.407 (a) (8)	RSS-248 4.5.3	Output Power e.i.r.p.	Compliant	Indoor Client.
§15.407 (a) (8)	RSS-248 4.5.3	PSD e.i.r.p	Compliant	Indoor Client.
§15.407 (b) (6)	RSS-248 4.6.2(a)	Emissions outside 5.925-7.125 GHz band	Compliant	None
§15.407 (b) (7)	RSS-248 4.6.2(b)	Emissions within 5.925-7.125 GHz Band(Emissions Mask)	Compliant	None
§15.205	RSS-GEN 8.10	Unwanted emissions in restricted bands	Compliant	None
§15.209	RSS-GEN 8.9	Radiated Spurious Emissions	Compliant	None
§15.207	RSS-GEN 8.8	AC Mains Conducted Emissions	Compliant	None

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with.

- FCC CFR 47 Part 2
- FCC CFR 47 Part 15
- FCC KDB 662911 Measurement of Transmitters with Multiple Output, MIMO
- FCC KDB 789033 D02 UNII Test Procedures New Rules
- FCC KDB 987594 D01 U-NII 6GHz General Requirements
- FCC KDB 987594 D02 U-NII 6 GHz EMC Measurement
- KDB 414788 D01 Radiated Test Site
- ANSI C63.10-2013
- RSS-GEN Issue 5 + A1 + A2
- RSS-248 Issue 2

4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, Certificate Number 0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☒	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
☐	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
☐	Building 3: 843 Auburn Court, Fremont, CA 94538, USA			
☒	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA			
☐	Building 5: 47670 Kato Rd, Fremont, CA 94538, USA			

UL VERIFICATION SERVICES
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U_{Lab}
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22%
RF Power Measurement Direct Method Using Power Meter	1.3 dB (PK) / 0.45 dB (AV)
RF Power Measurement Using Spectrum Analyzer	0.33dB
Unwanted Emissions, Conducted	1.94 dB
Power Spectral Density	2.466 dB
Worst Case Conducted Disturbance, 9kHz to 0.15 MHz	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9kHz to 30 MHz	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 dB
Time Domain Measurements	3.39%
Temperature	0.57˚C
Relative Humidity	3.39%
DC Supply Voltages	0.57%

Uncertainty figures are valid to a confidence level of 95%.

UL VERIFICATION SERVICES
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

UL VERIFICATION SERVICES
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT is a Wireless Smart Speaker.

This report covers non-ax 6E Wifi radio.

6.2. EUT DEVICE CLASS

Low Power Client	U-NII Bands of Operation			
	5	6	7	8
Indoor Client (6XD) / Category 1	☒	☒	☒	☒

6.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum e.i.r.p. output power as follows:

Frequency Range (MHz)	Mode	Output Power EIRP	Output Power EIRP (mW)
UNII-5 band, 2TX			
5955-6415	802.11a	7.24	5.30
UNII-6 band, 2TX			
6435-6515	802.11a	6.61	4.58
UNII-7 band, 2TX			
6535-6875	802.11a	6.39	4.36
UNII-8 band, 2TX			
6895-7115	802.11a	6.01	3.99

6.4. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna(s) gain and type, as provided by the manufacturer' are as follows:

The radio utilizes PCB type antenna, with max gains of:

Frequency Range (GHz)	Type	Declared Uncorrelated Gain (dBi)	Declared correlated Gain (dBi)
5.925-6.425	PCB	5.8	8.0
6.425-6.525		2.9	5.8
6.525-6.875		2.8	5.4
6.875-7.125		2.8	5.6

6.5. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was 78.1-48130-diag-jaws-dev-woosung-202312211600

6.6. WORST-CASE CONFIGURATION AND MODE FOR FINAL TEST

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle, and high channels.

The EUT can only be setup in desktop orientation; therefore, all radiated testing was performed with the EUT in desktop orientation.

The fundamental of the EUT was investigated in the antenna combinations, it was determined that:
ANT2 and ANT4 was the worst case in the UNII 5.
ANT1 and ANT3 was the worst case in the UNII 6,7,8.
Therefore, all final testing was performed with ANT2 and ANT4 and ANT1 and ANT3 as stated above.
Worst-case data rates as provided by the client were:

802.11a mode: 6 Mbps

6.7. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID/ DoC**
Laptop	Lenovo	X1 Carbon	R90HKAXZ	Doc
Laptop AC/DC AC/DC Adapter	Lenovo	ADLX90NLC2A	11S45N0247Z1ZS9B54B8EJ	Doc
USB-A to Ethernet Adapter	Plugable	USB2-E100	8CAE4CEBE0D9	Doc

I/O CABLES (CONDUCTED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	3	AC	Un-shielded	1.25	AC Mains to Spectrum Analyzer/AC/DC Adapter
2	DC	1	DC	Un-shielded	1	AC/DC Adapter to Laptop
3	USB-A to Ethernet Adapter	1	USB-A	Shielded	0.5	Laptop to EUT
4	Ethernet	1	RJ45	Un-shielded	1	Laptop to USB Ethernet Adapter
5	SMA Cable	1	SMA	Un-Shielded	1.0	EUT to Spectrum Analyzer

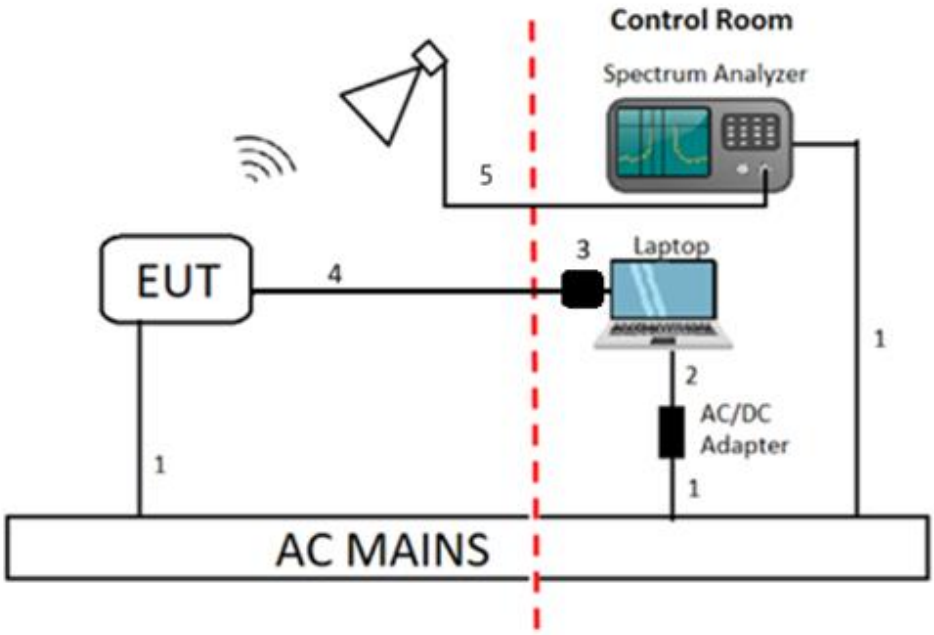
I/O CABLES (RADIATED TEST)						
Cable No.	**Port**	**# Of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	3	AC	Un-shielded	1.25	AC Mains to Spectrum Analyzer/AC/DC Adapter
2	DC	1	DC	Un-shielded	1	AC/DC Adapter to Laptop
3	USB-A to Ethernet Adapter	1	USB-A	Shielded	0.5	Laptop to EUT
4	Ethernet	1	RJ45	Un-shielded	1	Laptop to USB Ethernet Adapter
5	SMA Cable	1	SMA	Un-Shielded	10	EUT to Horn Antenna

TEST SETUP

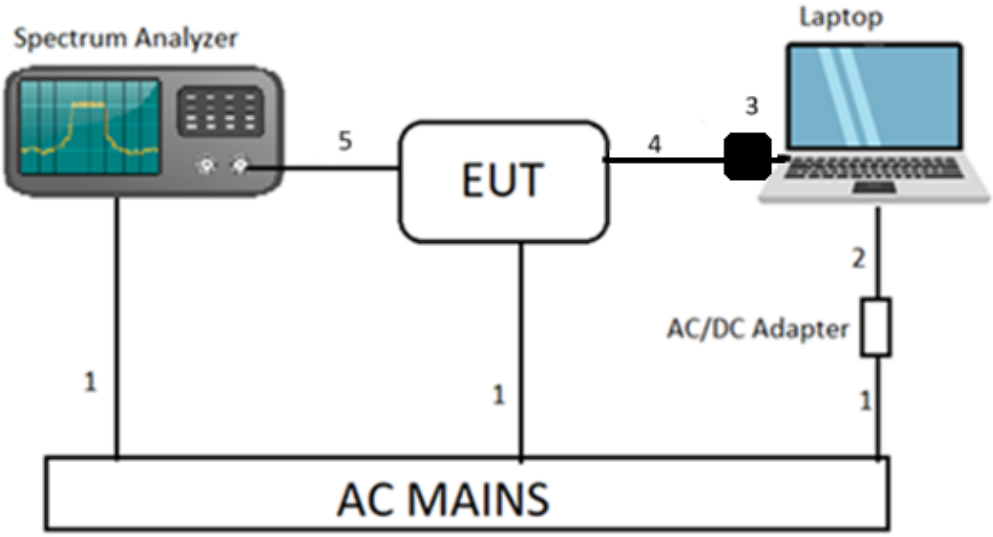
The EUT is a stand-alone unit and the radio is exercised by Sonos Compliance GUI test utility software via ethernet.

SETUP DIAGRAM

Radiated Configuration



Conducted Configuration/AC Line Configuration



7. MEASUREMENT METHOD

On Time and Duty Cycle: KDB 789033 D02 v02r01, Section II B.

26 dB Emission BW: ANSI C63.10-2013 Section 12.4.1

99% Occupied Bandwidth: KDB 789033 D02 v02r01, Section II-D

Conducted Output Power: KDB 789033 D02 v02r01, Section II E.2.d (Method SA-2).
Output Power (e.i.r.p), Conducted Power + Ant Gain= EIRP:

Power Spectral Density (PSD): KDB 789033 D02 v02r01, Section F.3.a (Method SA-2).

Spurious emissions within 5.925-7.125 GHz Band (Emissions Mask): KDB 987594 D02 EMC Measurement Section II-J

Unwanted emissions in restricted bands: KDB 789033 D02 v02r01, Sections G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v02r01, Sections G.3, G.4, and G.5.

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

Radiated Spurious Emissions Below 30MHz: ANSI C63.10-2013 Section 6.4

UL VERIFICATION SERVICES
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

8. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
Antenna, Broadband Hybrid, 30MHz to 2GHz	Sunol Sciences Corp.	JB1	80293	2025-04-30	2023-04-11
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	213877	2025-03-31	2024-03-25
Antenna, Horn 1-18GHz	ETS-Lindgren (Cedar Park, Texas)	3117	206805	2024-07-31	2023-07-11
RF Filter Box, 1-18GHz	FREMONT	6 Port Silver box	171013	2025-12-02	2024-02-02
RF Filter Box, 1-18GHz	FREMONT	n/a	171875	2025-03-31	2024-03-23
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	191429	2025-02-28	2024-02-11
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	230547	2025-02-28	2024-02-11
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	225688	2025-02-11	2024-02-11
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826/B	199659	2024-12-31	2022-12-06
Amplifier 18-26.5GHz, +5Vdc, 60dB min	AMPLICAL	AMP18G26.5-60	234683	2025-05-31	2024-05-13
Antenna, Passive Loop 30Hz - 1MHz	ELECTRO METRICS	EM-6871	219908	2024-09-30	2023-09-13
Antenna, Passive Loop 100KHz - 30MHz	ELECTRO METRICS	EM-6872	219910	2024-05-31	2023-05-31
Spectrum Analyzer, PXA, 2Hz to 26.5GHz	Keysight Technologies Inc	N9030B	245121	2025-02-07	2024-02-07
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90718	2025-01-31	2024-01-25
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	90388	2024-06-30	2023-06-23
AC Line Conducted					
LISN	Fischer Custom Communications, Inc`	FCC-LISN-50/250-25-2-01-480V	175765	2025-01-31	2024-01-26
EMI TEST RECEIVER	Rohde & Schwarz	ESR	171646	2025-02-28	2024-02-27
Transient Limiter	TE	TBFL1	127455	2025-02-28	2024-02-27
UL TEST SOFTWARE LIST					
Radiated Software	UL	UL EMC	Ver 2023-01-18, , 2023-05-01		
Antenna Port Software	UL	UL RF	Ver 2022-08-16		
AC Line Conducted Software	UL	UL EMC	Rev 9.5, 2023-03-03		

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

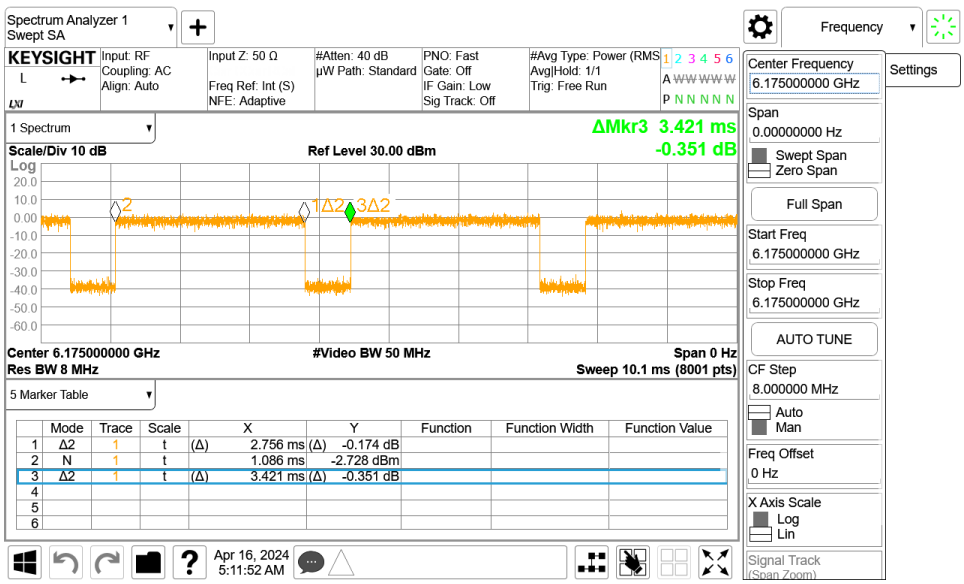
KDB 789033 Zero-Span Spectrum Analyzer Method.

Test Engineer:	CW
Test Date:	2024-04-16

RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
802.11a	2.756	3.421	0.806	80.56%	0.94	0.363

DUTY CYCLE PLOTS



802.11a MODE

9.2. 26 dB BANDWIDTH

LIMITS

§15.407 (a) (10)

The maximum transmitter channel bandwidth for U-NII devices in the 5.925-7.125 GHz band is 320 megahertz.

RESULTS

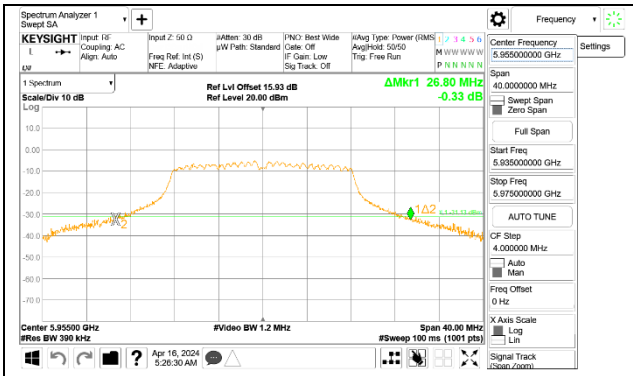
Test Engineer:	ZS 16080 and JB 45256
Test Date:	2024-04-15 to 2024-05-15

9.2.1. 802.11a MODE 2TX IN THE UNII-5 BAND

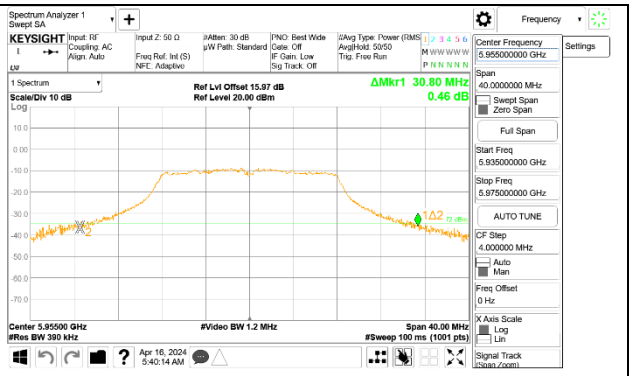
2TX Antenna 2 + Antenna 4 CDD MODE:

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 2 (MHz)	26 dB Bandwidth Antenna 4 (MHz)
Low	5955	26.80	30.80
Mid	6175	29.08	28.36
High	6415	27.32	28.16

LOW CHANNEL

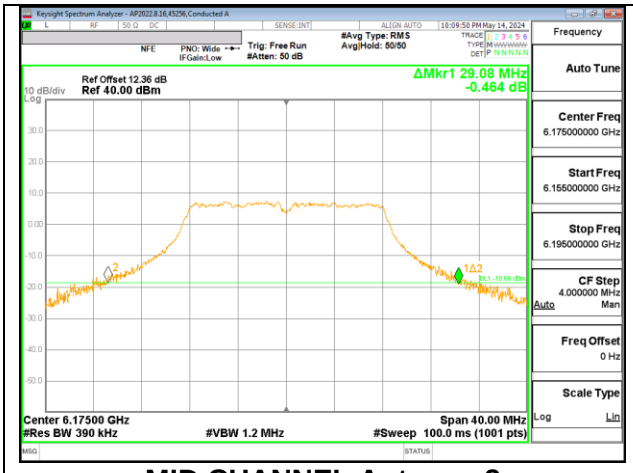


LOW CHANNEL Antenna 2

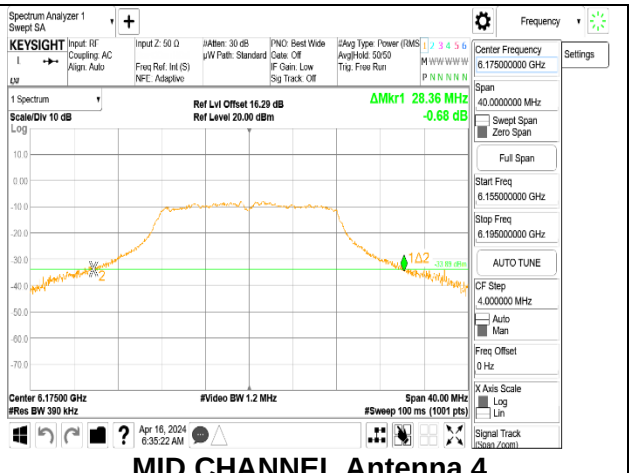


LOW CHANNEL Antenna 4

MID CHANNEL

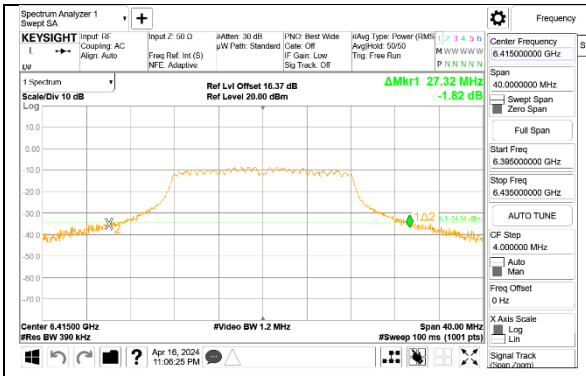


MID CHANNEL Antenna 2

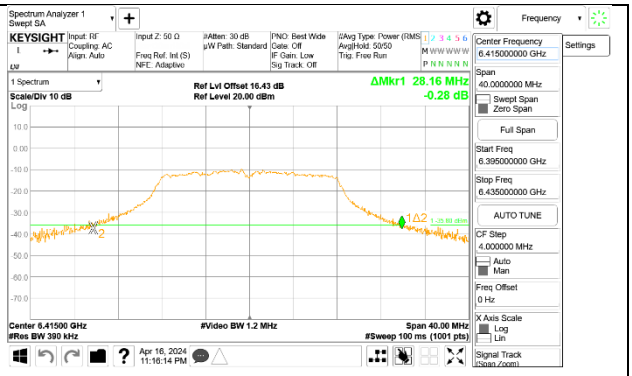


MID CHANNEL Antenna 4

HIGH CHANNEL



HIGH CHANNEL Antenna 2



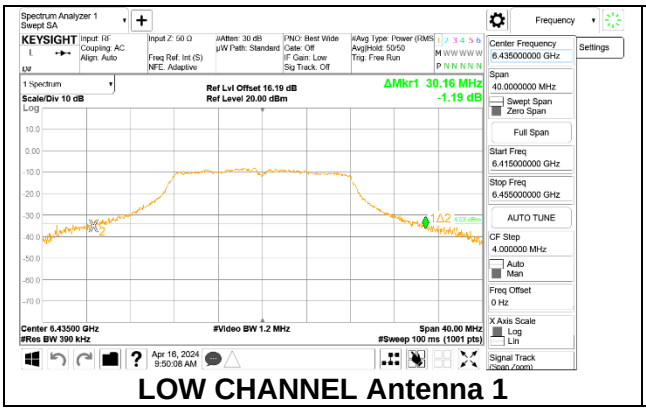
HIGH CHANNEL Antenna 4

9.2.2. 802.11a MODE 2TX IN THE UNII-6 BAND

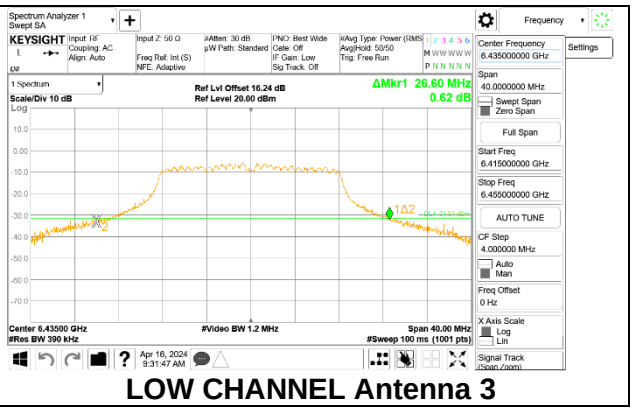
2TX Antenna 1 + Antenna 3 CDD MODE:

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 1 (MHz)	26 dB Bandwidth Antenna 3 (MHz)
Low	6435	30.16	26.60
Mid	6475	29.72	26.20
High	6515	30.28	26.40

LOW CHANNEL

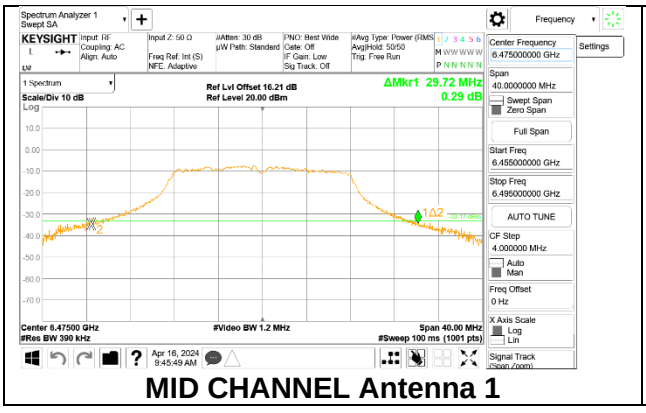


LOW CHANNEL Antenna 1

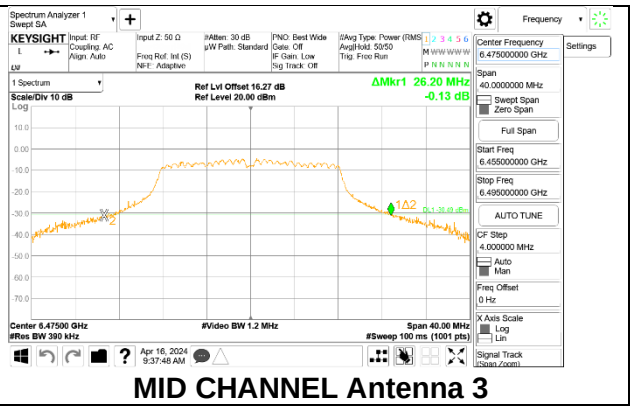


LOW CHANNEL Antenna 3

MID CHANNEL

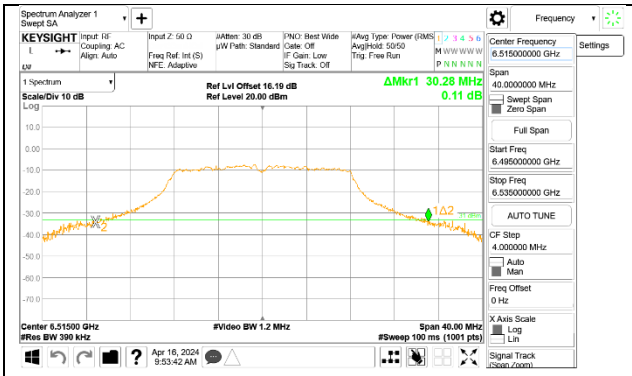


MID CHANNEL Antenna 1

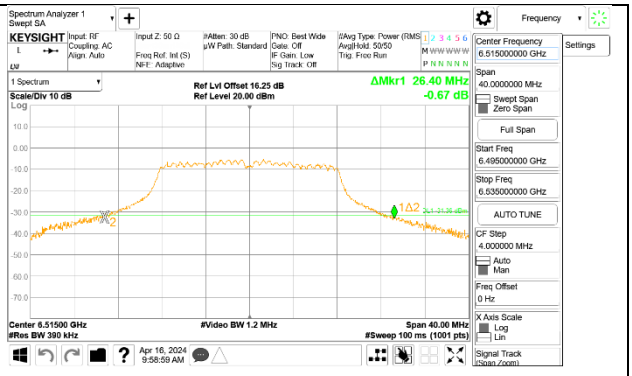


MID CHANNEL Antenna 3

HIGH CHANNEL



HIGH CHANNEL Antenna 1



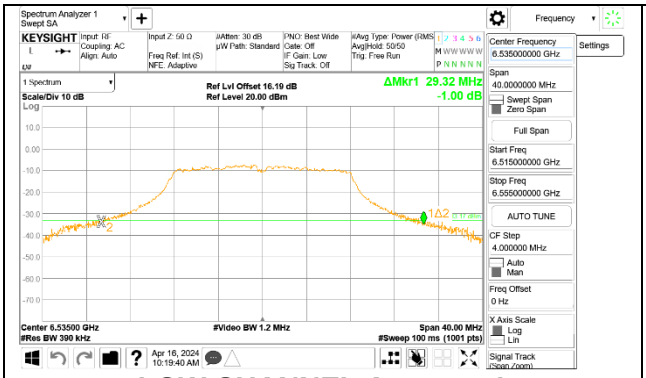
HIGH CHANNEL Antenna 3

9.2.3. 802.11a MODE 2TX IN THE UNII-7 BAND

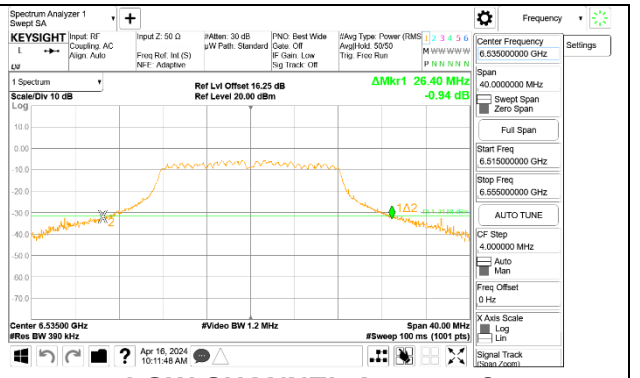
2TX Antenna 1 + Antenna 3 CDD MODE:

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 1 (MHz)	26 dB Bandwidth Antenna 3 (MHz)
Low	6535	29.32	26.40
Mid	6715	29.88	26.96
High	6855	29.80	26.52
Straddle	6875	26.72	25.48

LOW CHANNEL



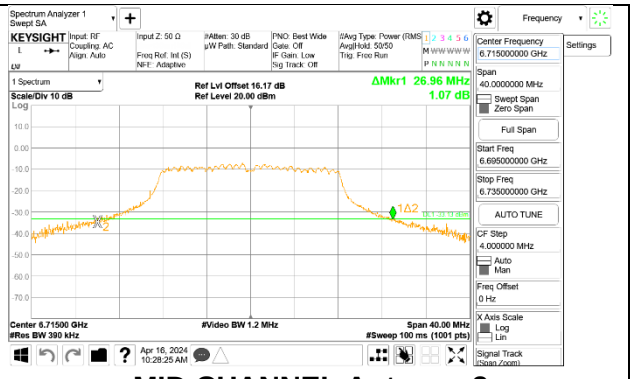
LOW CHANNEL Antenna 1



LOW CHANNEL Antenna 3

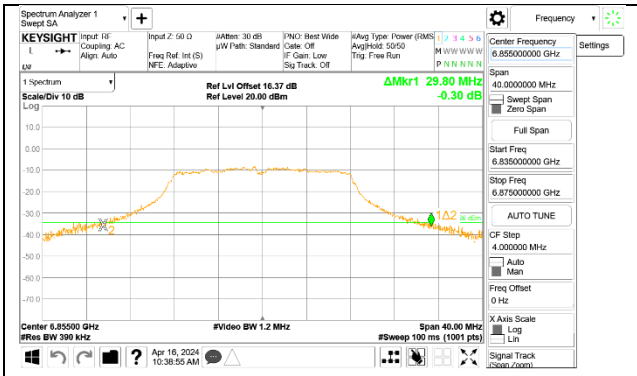
MID CHANNEL

MID CHANNEL Antenna 1

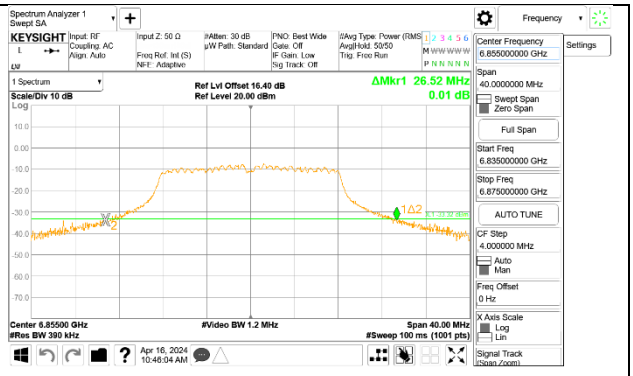


MID CHANNEL Antenna 3

HIGH CHANNEL



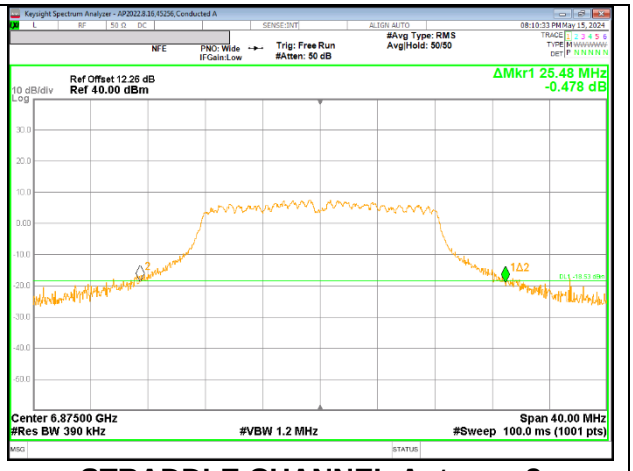
HIGH CHANNEL Antenna 1



HIGH CHANNEL Antenna 3

STRADDLE CHANNEL

STRADDLE CHANNEL Antenna 1



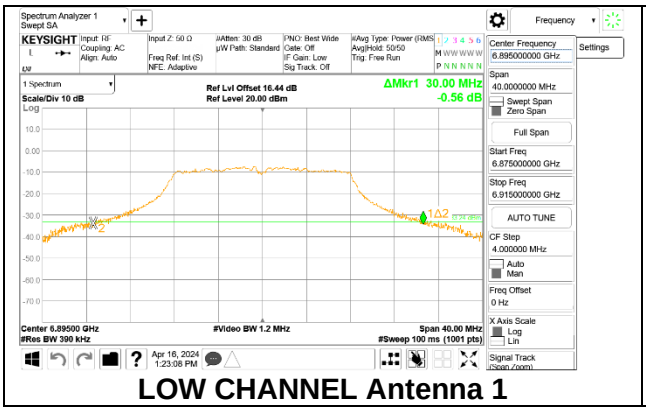
STRADDLE CHANNEL Antenna 3

9.2.4. 802.11a MODE 2TX IN THE UNII-8 BAND

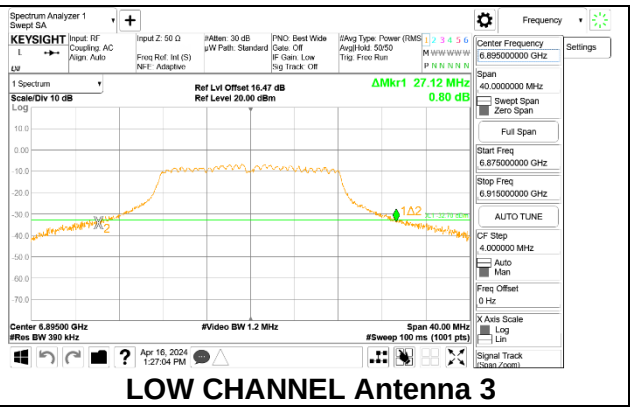
2TX Antenna 1 + Antenna 3 CDD MODE:

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 1 (MHz)	26 dB Bandwidth Antenna 3 (MHz)
Low	6895	30.00	27.12
Mid	6995	29.96	26.88
High	7115	30.00	26.76

LOW CHANNEL

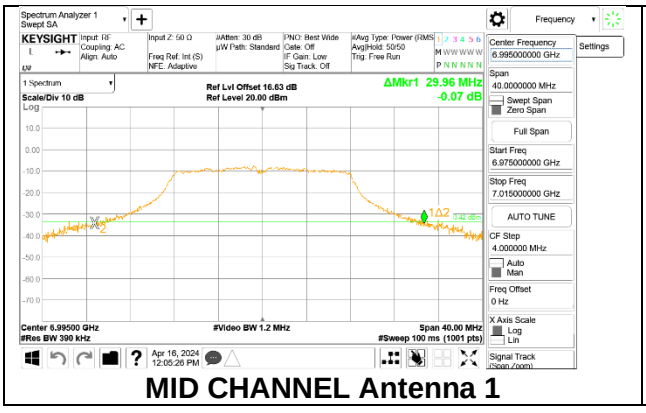


LOW CHANNEL Antenna 1

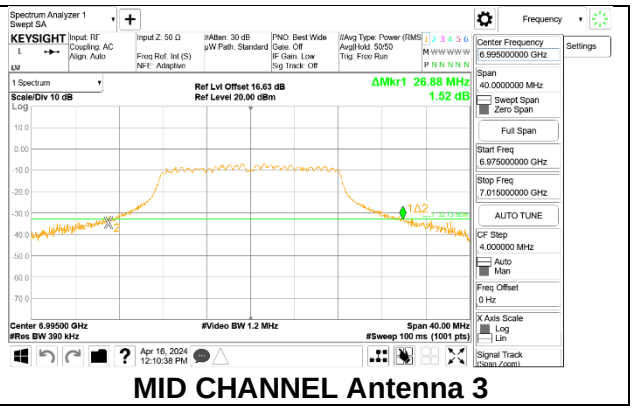


LOW CHANNEL Antenna 3

MID CHANNEL

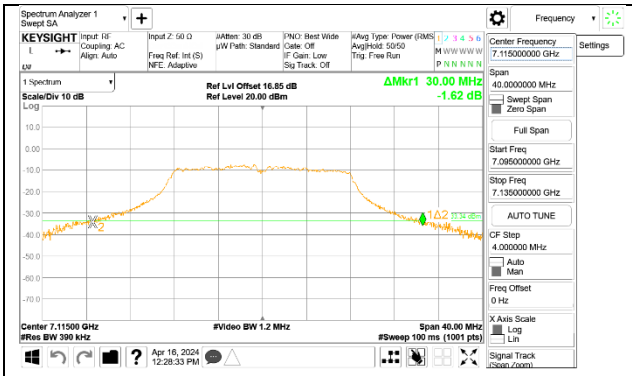


MID CHANNEL Antenna 1

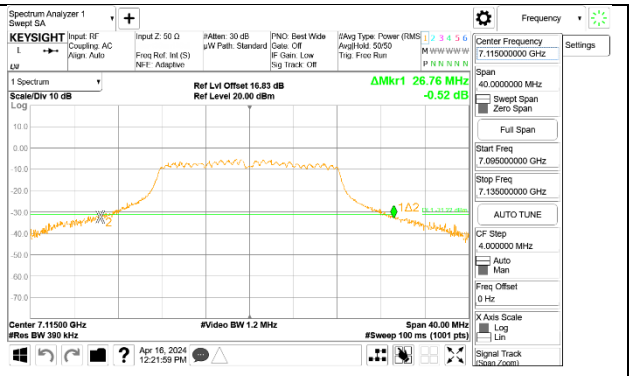


MID CHANNEL Antenna 3

HIGH CHANNEL



HIGH CHANNEL Antenna 1



HIGH CHANNEL Antenna 3

9.3. 99% BANDWIDTH

LIMITS

FCC -None; for reporting purposes only.

RSS-248 4.4

The occupied bandwidth shall not exceed 320 MHz.

RESULTS

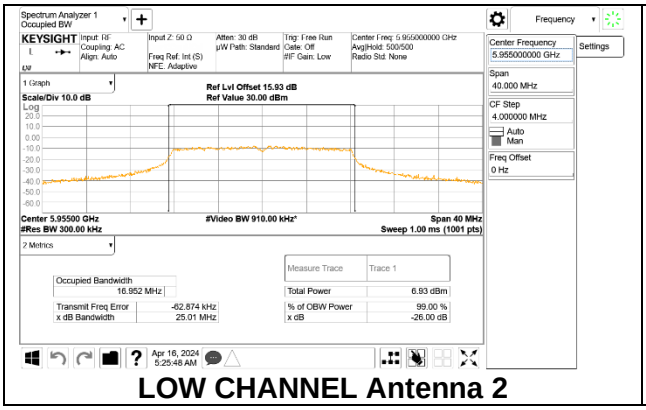
Test Engineer:	ZS 16080 and JB 45256
Test Date:	2024-04-15 to 2024-05-15

9.3.1. 802.11a MODE 2TX IN THE UNII-5 BAND

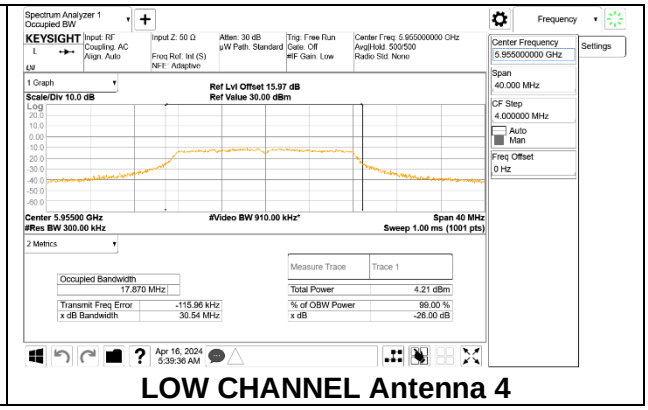
2TX Antenna 2 + Antenna 4 CDD MODE:

Channel	Frequency (MHz)	99% Bandwidth Antenna 2 (MHz)	99% Bandwidth Antenna 4 (MHz)
Low	5955	16.952	17.870
Mid	6175	17.218	17.690
High	6415	17.050	17.878

LOW CHANNEL

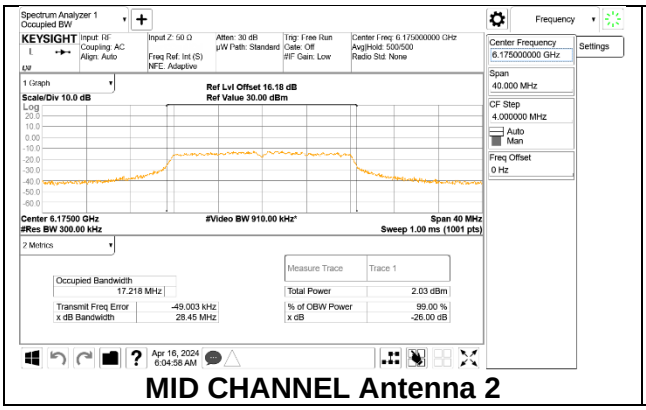


LOW CHANNEL Antenna 2

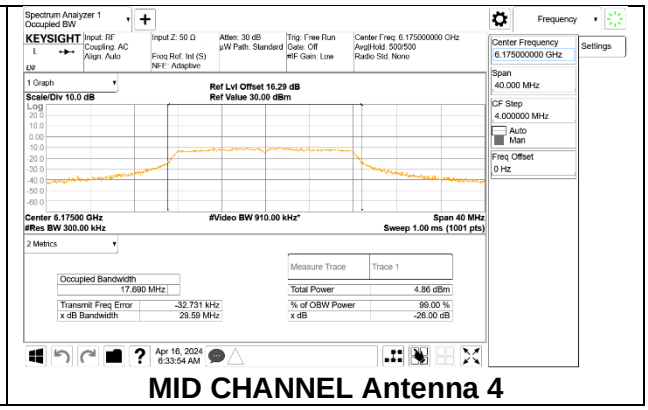


LOW CHANNEL Antenna 4

MID CHANNEL

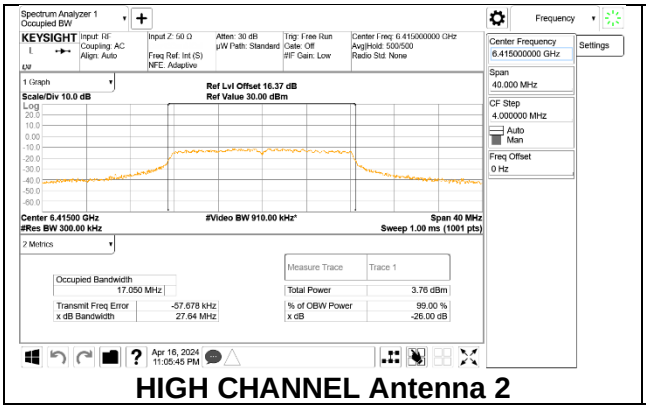


MID CHANNEL Antenna 2

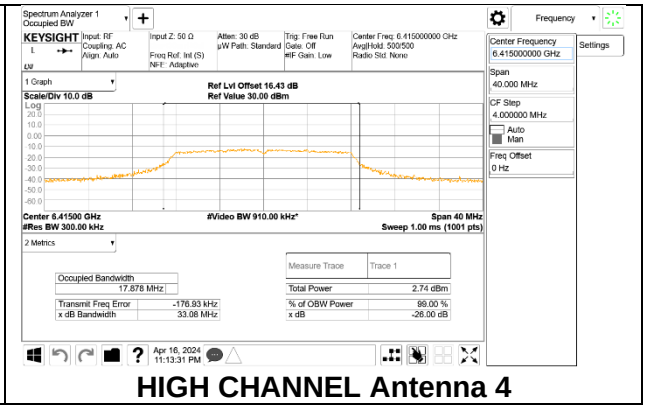


MID CHANNEL Antenna 4

HIGH CHANNEL



HIGH CHANNEL Antenna 2



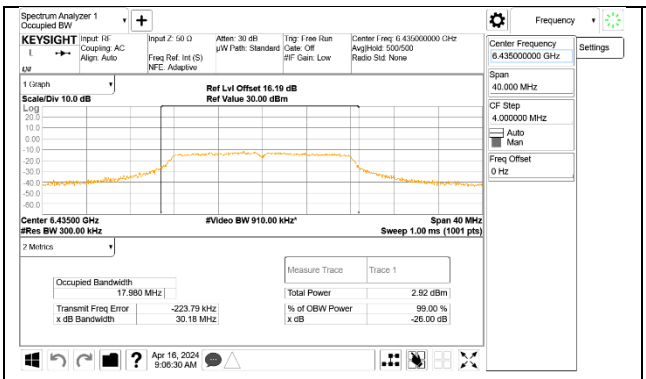
HIGH CHANNEL Antenna 4

9.3.2. 802.11a MODE 2TX IN THE UNII-6 BAND

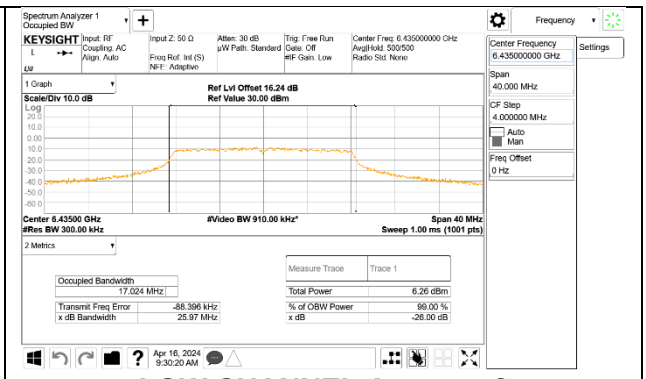
2TX Antenna 1 + Antenna 3 CDD MODE:

Channel	Frequency (MHz)	99% Bandwidth Antenna 1 (MHz)	99% Bandwidth Antenna 3 (MHz)
Low	6435	17.980	17.024
Mid	6475	17.626	16.919
High	6515	17.725	16.960

LOW CHANNEL

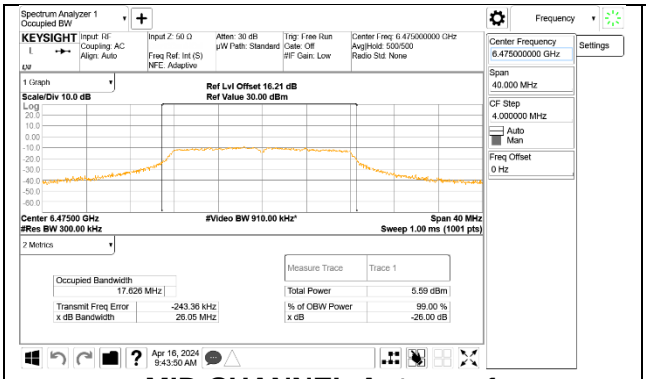


LOW CHANNEL Antenna 1

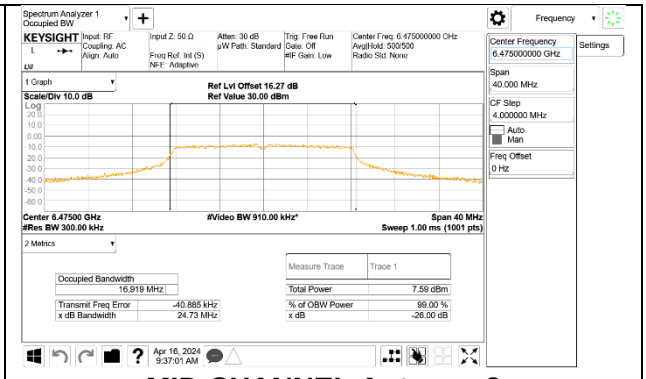


LOW CHANNEL Antenna 3

MID CHANNEL

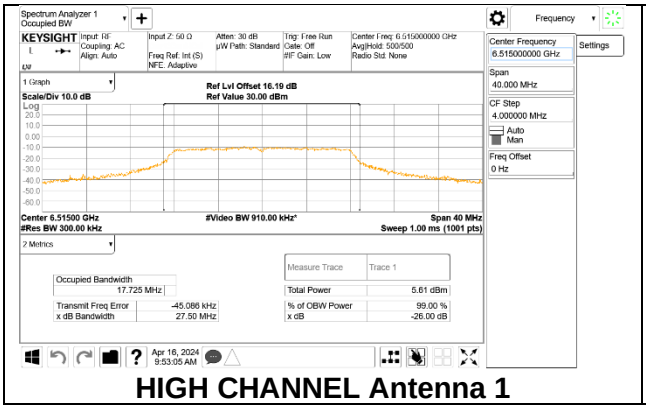


MID CHANNEL Antenna 1

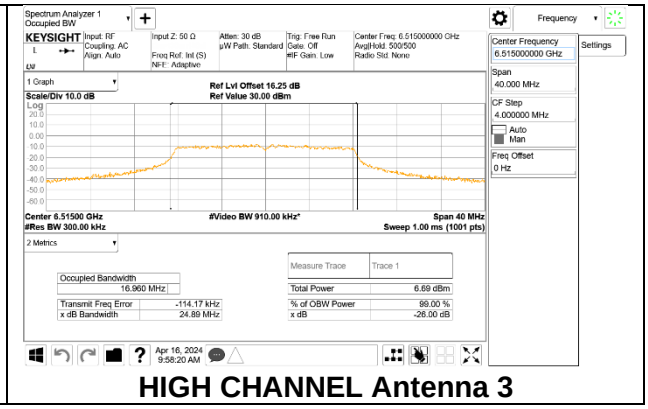


MID CHANNEL Antenna 3

HIGH CHANNEL



HIGH CHANNEL Antenna 1



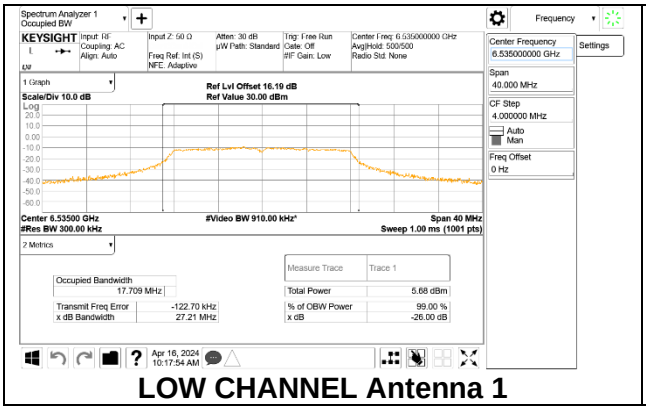
HIGH CHANNEL Antenna 3

9.3.3. 802.11a MODE 2TX IN THE UNII-7 BAND

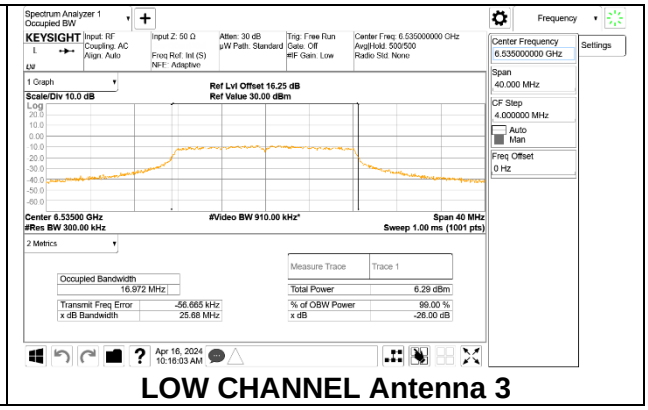
2TX Antenna 1 + Antenna 3 CDD MODE:

Channel	Frequency (MHz)	99% Bandwidth Antenna 1 (MHz)	99% Bandwidth Antenna 3 (MHz)
Low	6535	17.709	16.972
Mid	6715	17.810	17.056
High	6855	17.672	17.010
Straddle	6875	16.808	16.766

LOW CHANNEL

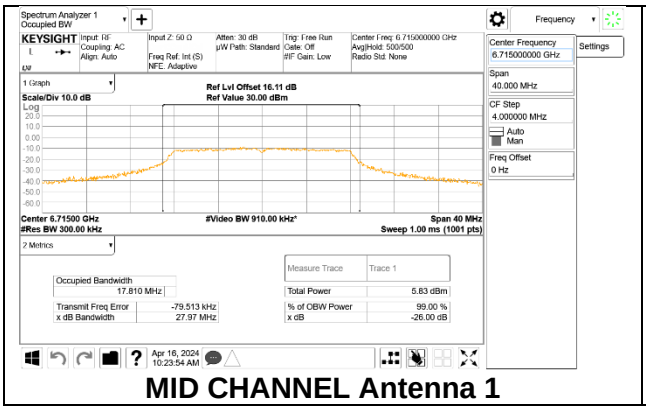


LOW CHANNEL Antenna 1

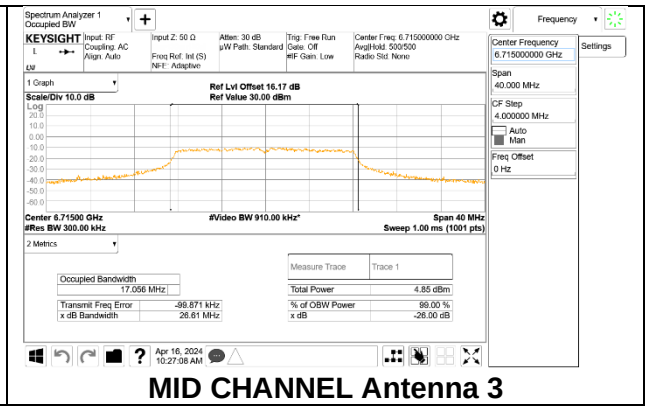


LOW CHANNEL Antenna 3

MID CHANNEL

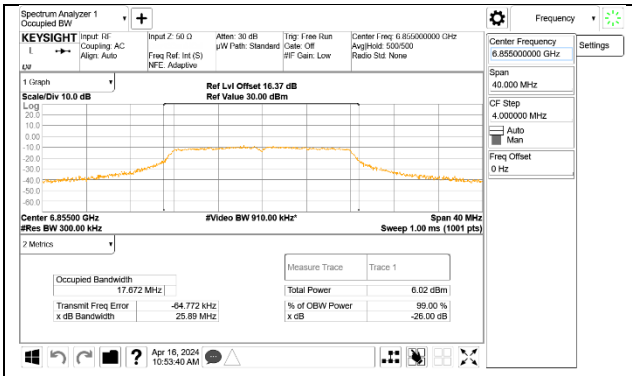


MID CHANNEL Antenna 1

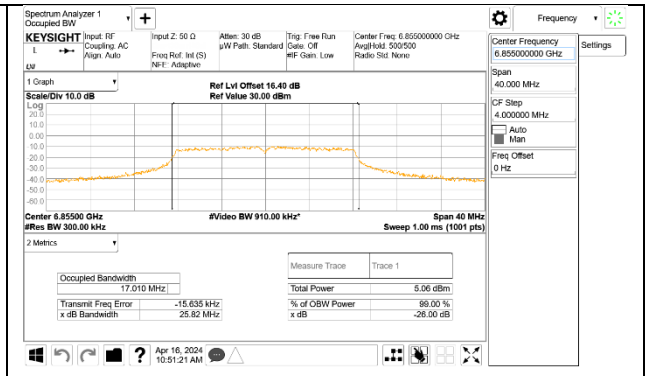


MID CHANNEL Antenna 3

HIGH CHANNEL

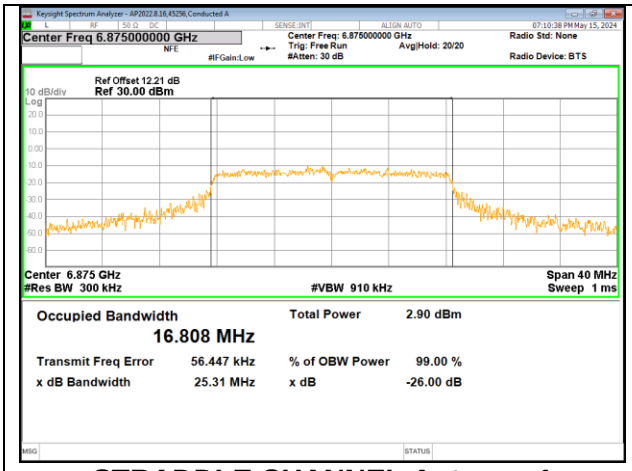


HIGH CHANNEL Antenna 1

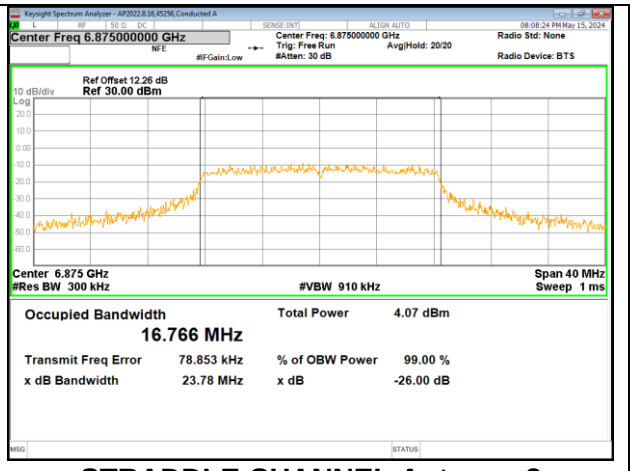


HIGH CHANNEL Antenna 3

STRADDLE CHANNEL



STRADDLE CHANNEL Antenna 1



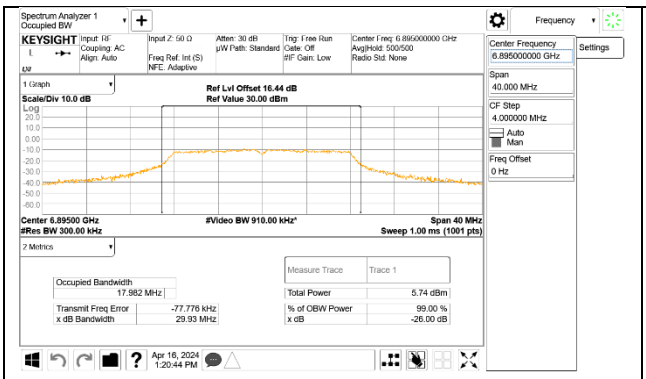
STRADDLE CHANNEL Antenna 3

9.3.4. 802.11a MODE 2TX IN THE UNII-8 BAND

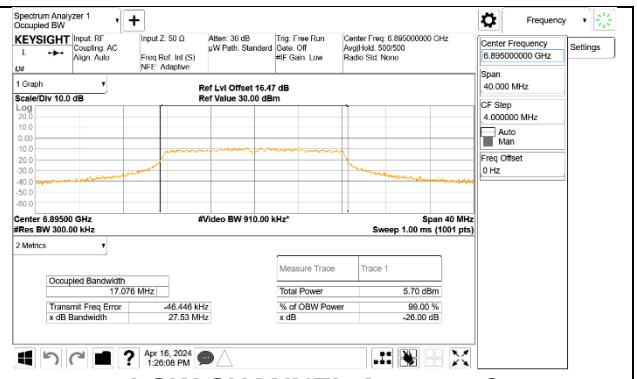
2TX Antenna 1 + Antenna 3 CDD MODE:

Channel	Frequency (MHz)	99% Bandwidth Antenna 1 (MHz)	99% Bandwidth Antenna 3 (MHz)
Low	6895	17.982	17.076
Mid	6995	17.855	17.076
High	7115	17.948	17.012

LOW CHANNEL

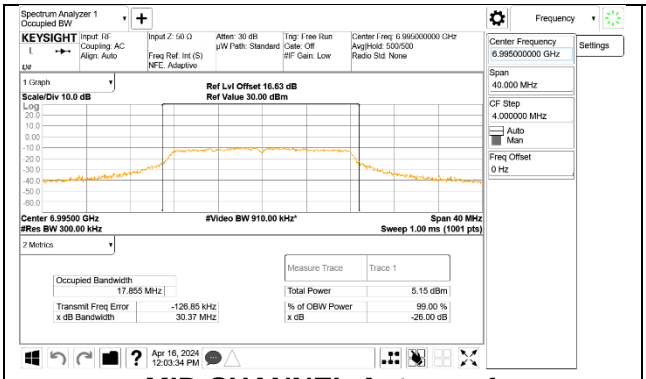


LOW CHANNEL Antenna 1

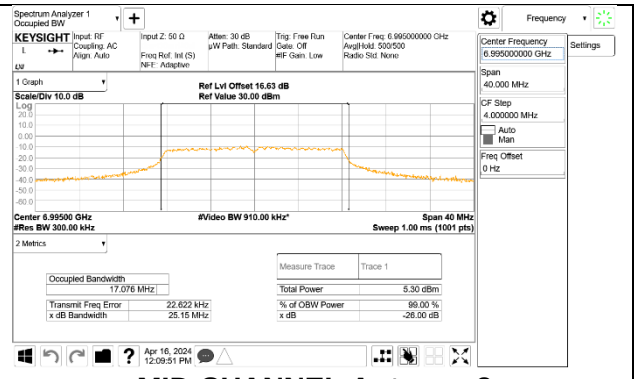


LOW CHANNEL Antenna 3

MID CHANNEL

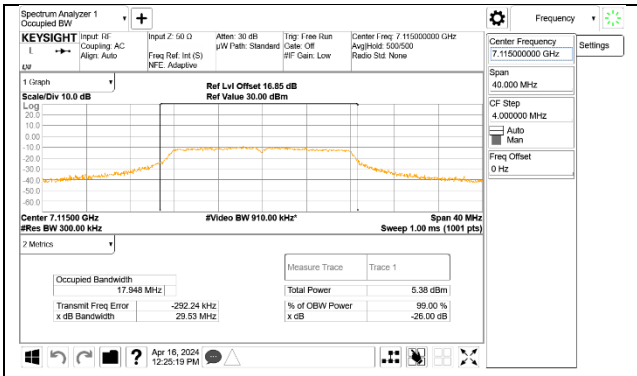


MID CHANNEL Antenna 1

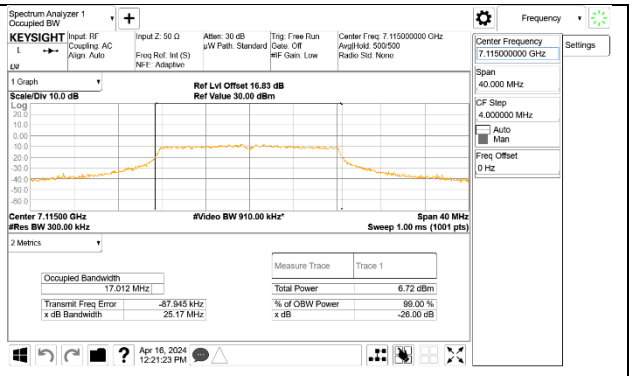


MID CHANNEL Antenna 3

HIGH CHANNEL



HIGH CHANNEL Antenna 1



HIGH CHANNEL Antenna 3

9.4. OUTPUT POWER AND PSD

LIMITS

FCC §15.407(a)

Band 5.925-7.125 GHz

(8) For client devices operating under the control of an indoor access point 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, and the maximum e.i.r.p. over the frequency band of operation must not exceed 24 dBm.

RSS 248

4.5.3. Power limits for client devices
The following limits shall apply to client devices:
a. the maximum e.i.r.p. spectral density shall not exceed –1 dBm/MHz; and
b. the maximum e.i.r.p. shall not exceed 24 dBm/occupied bandwidth.

TEST PROCEDURE

The measurement method used for output power is KDB 789033 D02 v02r01, Section E.2.d (Method SA-2) was used.

The measurement method used for power spectral density is KDB 789033 D02 v02r01, Section F.

UL VERIFICATION SERVICES
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

RESULTS

9.4.1. 802.11a MODE 2TX IN THE UNII-5 BAND

2TX Antenna 2 + Antenna 4 CDD MODE:

Test Engineer:	ZS16080 and JB45256
Test Date:	2024-04-15 to 2024-04-16

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low	5955	5.80	8.00	24.00	-1.00
Mid	6175	5.80	8.00	24.00	-1.00
High	6415	5.80	8.00	24.00	-1.00

Duty Cycle CF (dB)	0.94	**Included in Calculations of Corr'd PSD**

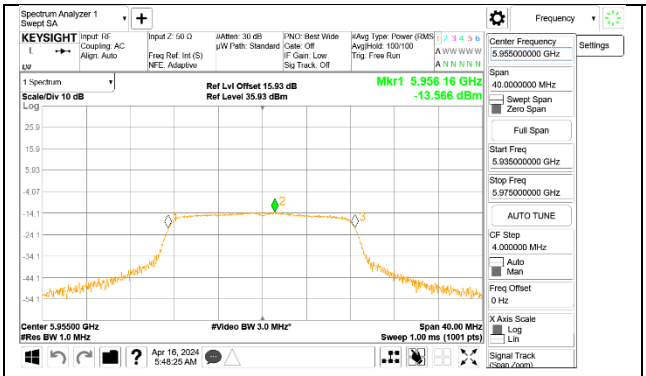
Output Power Results

Channel	Frequency (MHz)	Antenna 2 Meas Power (dBm)	Antenna 4 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low	5955	-2.06	-1.47	7.06	24.00	-16.94
Mid	6175	-1.96	-1.21	7.24	24.00	-16.76
High	6415	-1.76	-2.20	6.84	24.00	-17.16

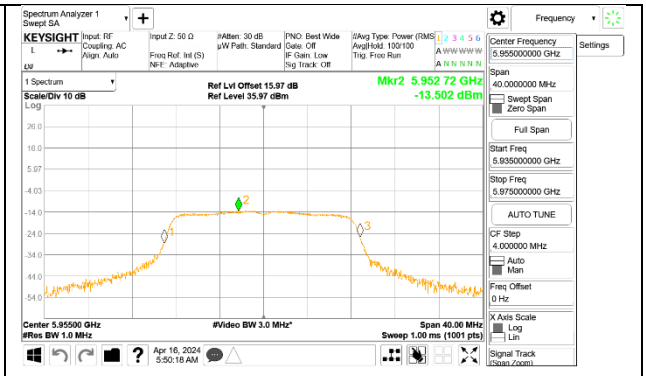
PSD Results

Channel	Frequency (MHz)	Antenna 2 Meas PSD (dBm)	Antenna 4 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5955	-13.566	-13.502	-1.58	-1.00	-0.58
Mid	6175	-14.506	-13.183	-1.84	-1.00	-0.84
High	6415	-13.410	-14.451	-1.95	-1.00	-0.95

LOW CHANNEL

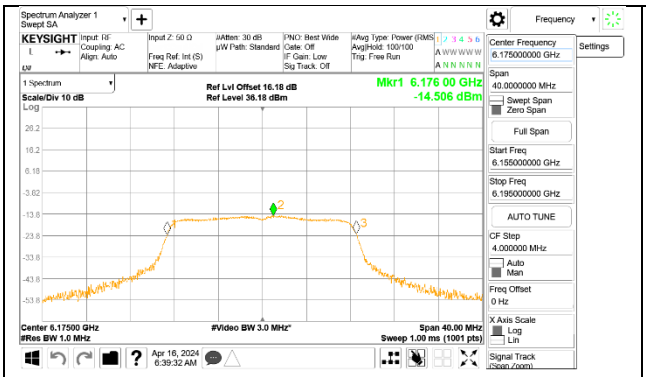


LOW CHANNEL Antenna 2

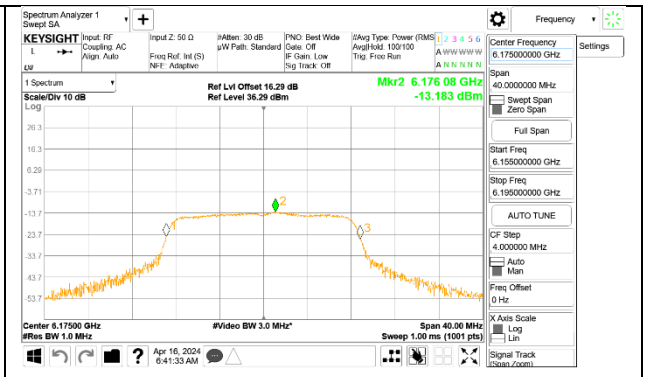


LOW CHANNEL Antenna 4

MID CHANNEL

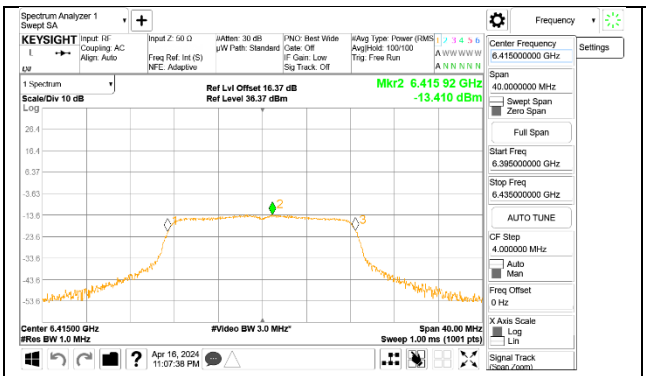


MID CHANNEL Antenna 2

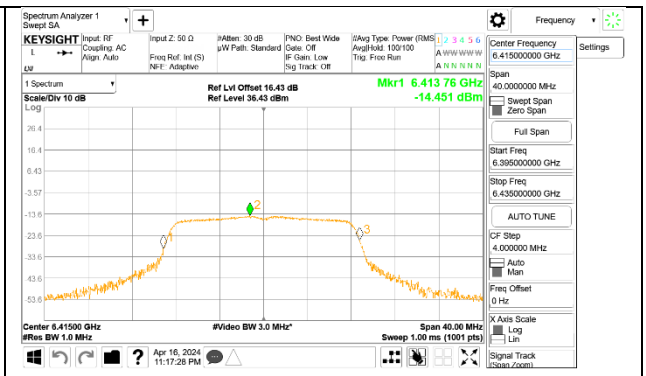


MID CHANNEL Antenna 4

HIGH CHANNEL



HIGH CHANNEL Antenna 2



HIGH CHANNEL Antenna 4

9.4.2. 802.11a MODE 2TX IN THE UNII-6 BAND

2TX Antenna 1 + Antenna 3 CDD MODE:

Test Engineer:	ZS16080 and JB45256
Test Date:	2024-04-15 to 2024-04-16

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low	6435	2.90	5.80	24.00	-1.00
Mid	6475	2.90	5.80	24.00	-1.00
High	6515	2.90	5.80	24.00	-1.00

Duty Cycle CF (dB)	0.94	**Included in Calculations of Corr'd PSD**

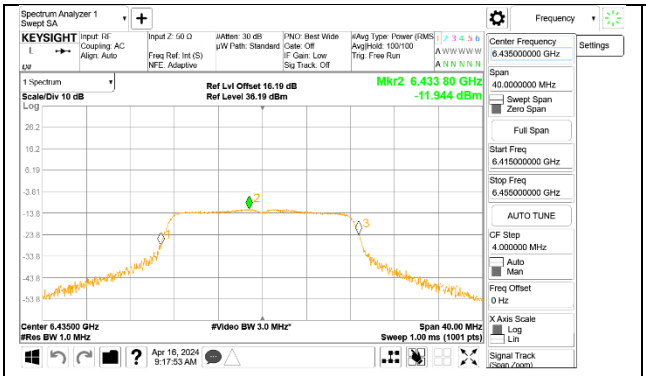
Output Power Results

Channel	Frequency (MHz)	Antenna 1 Meas Power (dBm)	Antenna 3 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low	6435	0.26	0.27	6.18	24.00	-17.82
Mid	6475	0.23	0.15	6.10	24.00	-17.90
High	6515	0.20	1.15	6.61	24.00	-17.39

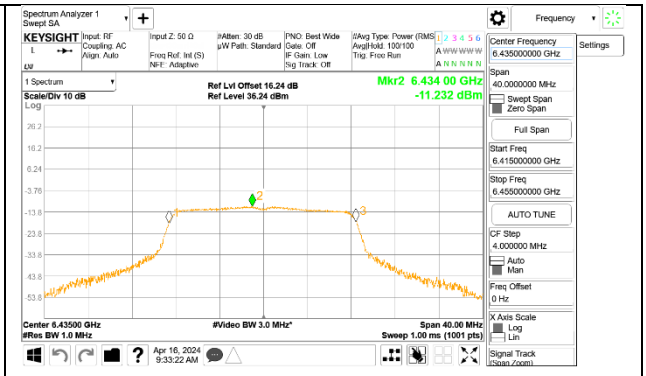
PSD Results

Channel	Frequency (MHz)	Antenna 1 Meas PSD (dBm)	Antenna 3 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	6435	-11.944	-11.232	-1.82	-1.00	-0.82
Mid	6475	-11.523	-11.117	-1.56	-1.00	-0.56
High	6515	-11.902	-10.788	-1.56	-1.00	-0.56

LOW CHANNEL

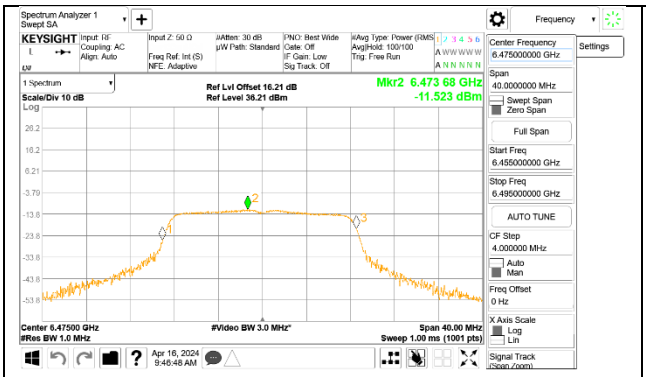


LOW CHANNEL Antenna 1

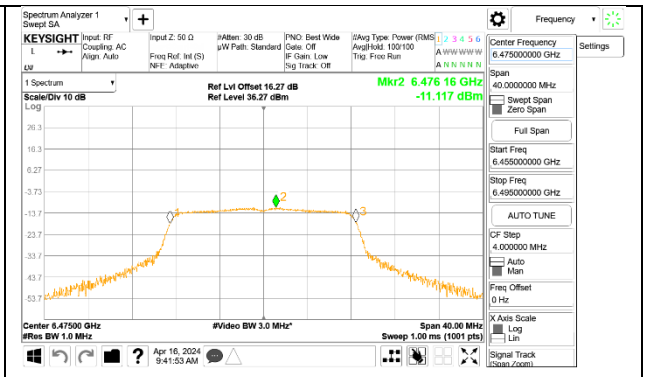


LOW CHANNEL Antenna 3

MID CHANNEL

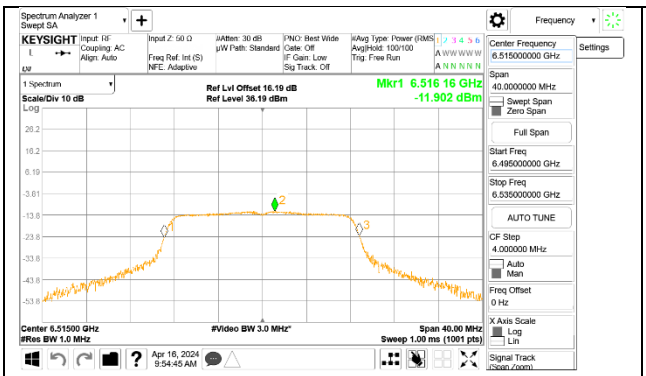


MID CHANNEL Antenna 1

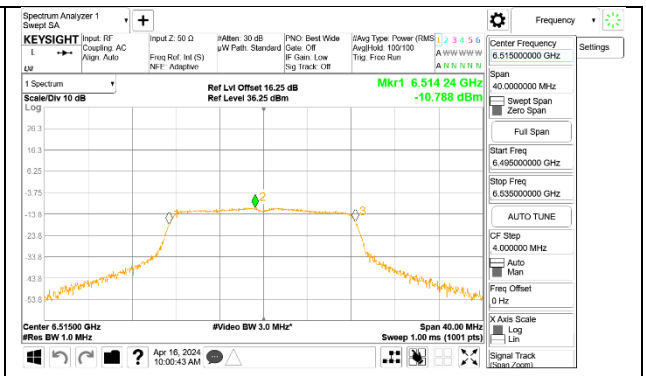


MID CHANNEL Antenna 3

HIGH CHANNEL



HIGH CHANNEL Antenna 1



HIGH CHANNEL Antenna 3

9.4.3. 802.11a MODE 2TX IN THE UNII-7 BAND

2TX Antenna 1 + Antenna 3 CDD MODE:

Test Engineer:	ZS16080 and JB45256
Test Date:	2024-04-15 to 2024-05-15

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low	6535	2.80	5.40	24.00	-1.00
Mid	6715	2.80	5.40	24.00	-1.00
High	6855	2.80	5.40	24.00	-1.00
Straddle	6875	2.80	5.40	24.00	-1.00

Duty Cycle CF (dB)	0.94	**Included in Calculations of Corr'd PSD**

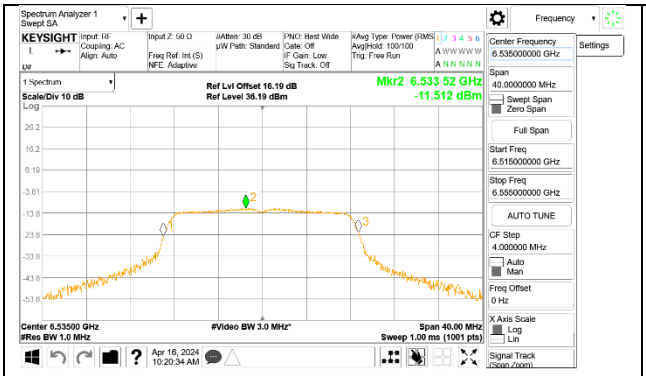
Output Power Results

Channel	Frequency (MHz)	Antenna 1 Meas Power (dBm)	Antenna 3 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low	6535	0.32	0.50	6.22	24.00	-17.78
Mid	6715	1.19	-0.36	6.29	24.00	-17.71
High	6855	0.35	-0.40	5.80	24.00	-18.20
Straddle	6875	0.40	-0.12	5.96	24.00	-18.04

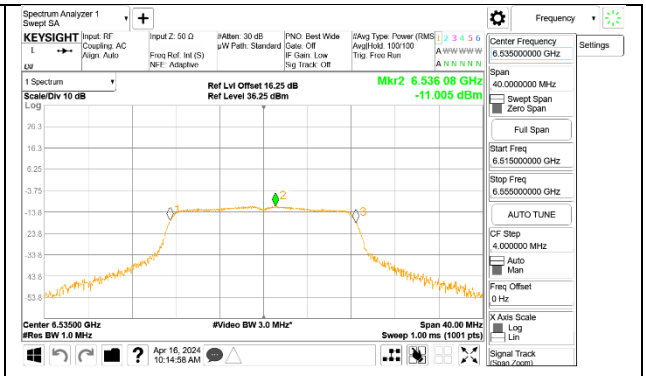
PSD Results

Channel	Frequency (MHz)	Antenna 1 Meas PSD (dBm)	Antenna 3 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	6535	-11.512	-11.005	-1.90	-1.00	-0.90
Mid	6715	-10.631	-11.463	-1.68	-1.00	-0.68
High	6855	-10.706	-11.873	-1.90	-1.00	-0.90
Straddle	6875	-11.284	-11.074	-1.83	-1.00	-0.83

LOW CHANNEL

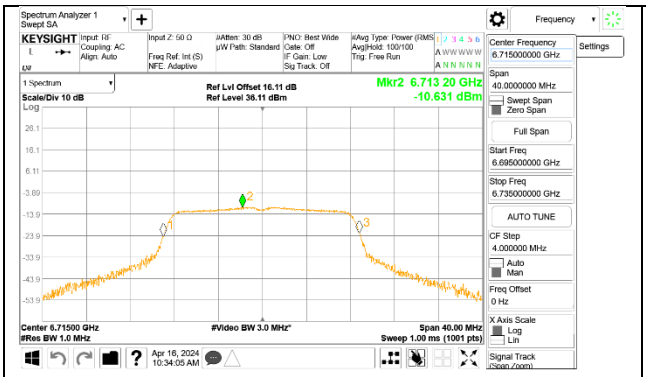


LOW CHANNEL Antenna 1

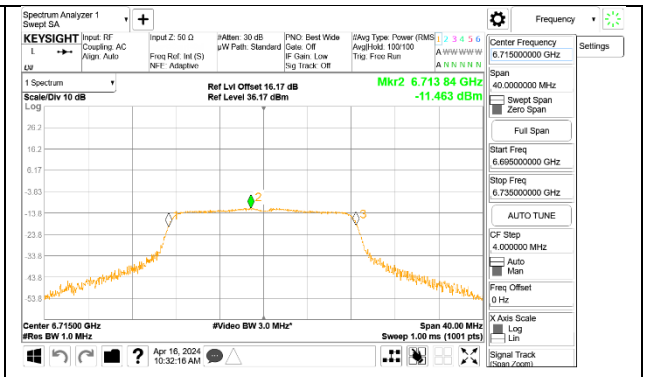


LOW CHANNEL Antenna 3

MID CHANNEL

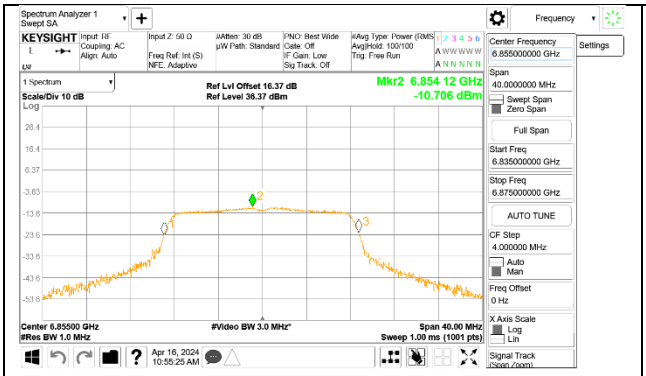


MID CHANNEL Antenna 1

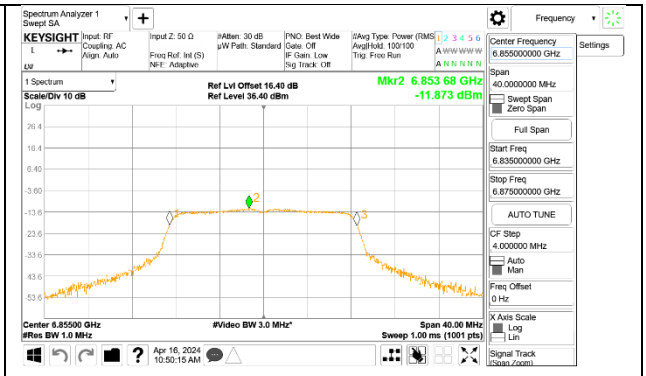


MID CHANNEL Antenna 3

HIGH CHANNEL

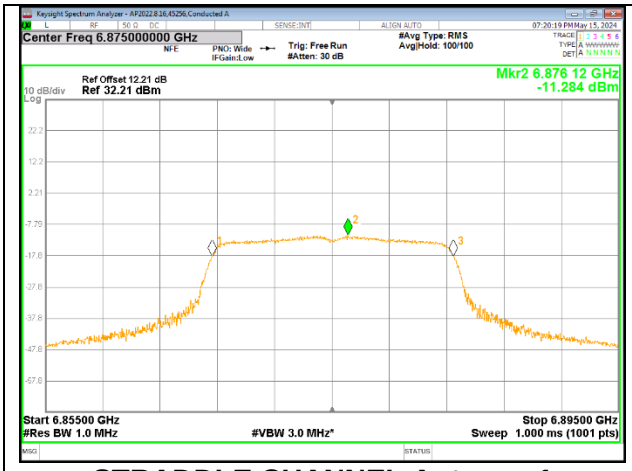


HIGH CHANNEL Antenna 1

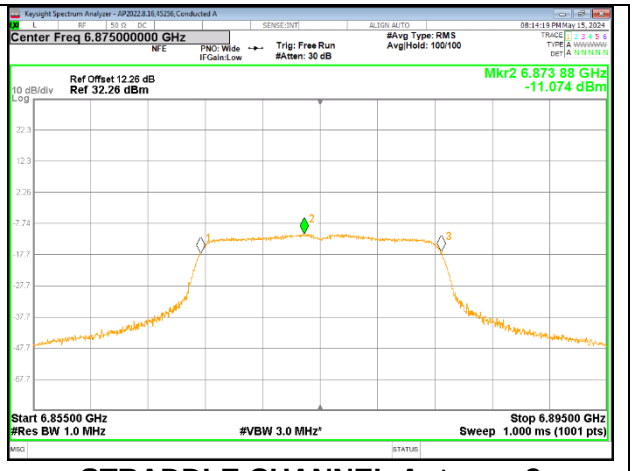


HIGH CHANNEL Antenna 3

STRADDLE CHANNEL



STRADDLE CHANNEL Antenna 1



STRADDLE CHANNEL Antenna 3

9.4.4. 802.11a MODE 2TX IN THE UNII-8 BAND

2TX Antenna 1 + Antenna 3 CDD MODE:

Test Engineer:	ZS16080 and JB45256
Test Date:	2024-04-15 to 2024-04-16

Bandwidth, Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	e.i.r.p. Power Limit (dBm)	PSD Limit (dBm)
Low	6895	2.80	5.60	24.00	-1.00
Mid	6995	2.80	5.60	24.00	-1.00
High	7115	2.80	5.60	24.00	-1.00

Duty Cycle CF (dB)	0.94	**Included in Calculations of Corr'd PSD**

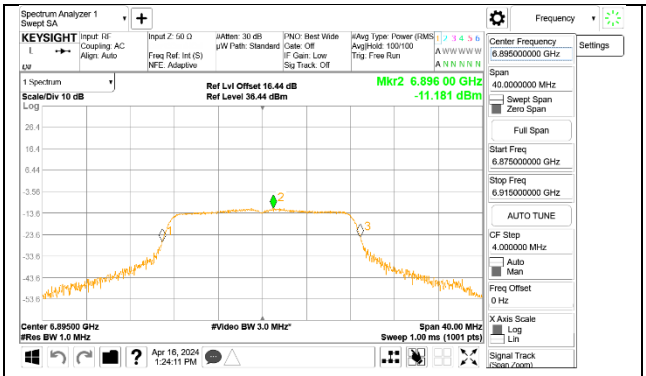
Output Power Results

Channel	Frequency (MHz)	Antenna 1 Meas Power (dBm)	Antenna 3 Meas Power (dBm)	Total Corr'd EIRP (dBm)	Power Limit EIRP (dBm)	Power Margin (dB)
Low	6895	-0.04	-0.12	5.73	24.00	-18.27
Mid	6995	0.26	-0.23	5.83	24.00	-18.17
High	7115	-0.12	0.50	6.01	24.00	-17.99

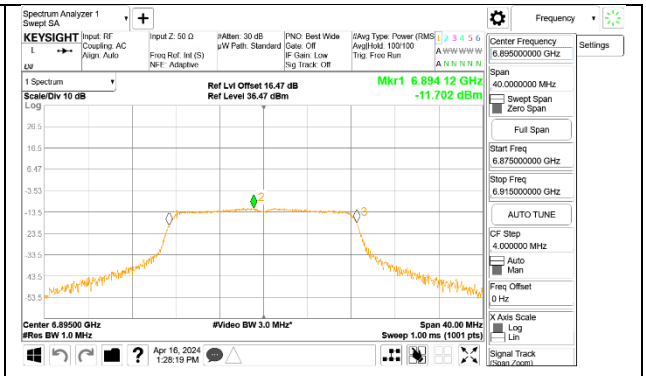
PSD Results

Channel	Frequency (MHz)	Antenna 1 Meas PSD (dBm)	Antenna 3 Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	6895	-11.181	-11.702	-1.88	-1.00	-0.88
Mid	6995	-11.534	-11.408	-1.92	-1.00	-0.92
High	7115	-11.357	-10.945	-1.60	-1.00	-0.60

LOW CHANNEL

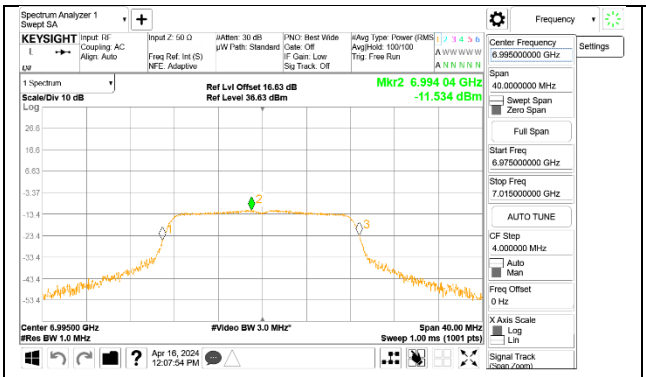


LOW CHANNEL Antenna 1

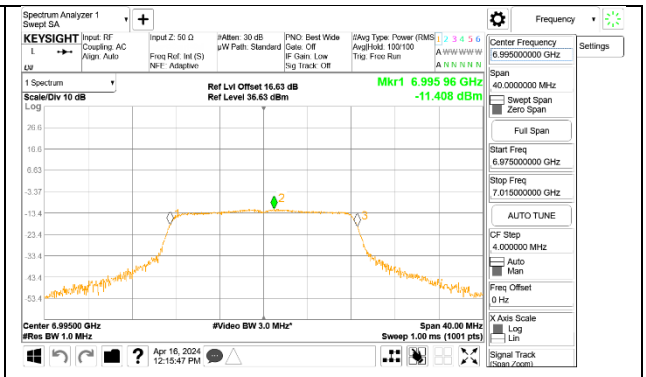


LOW CHANNEL Antenna 3

MID CHANNEL

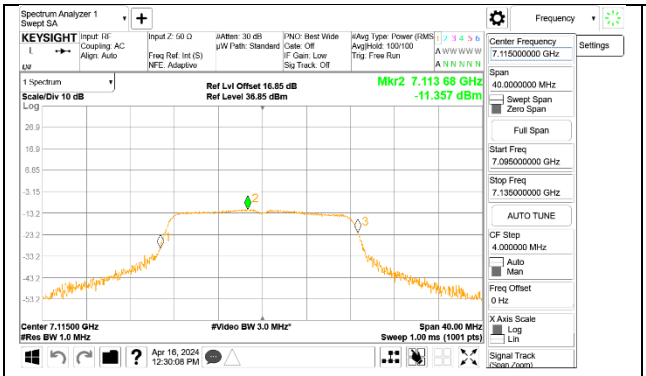


MID CHANNEL Antenna 1

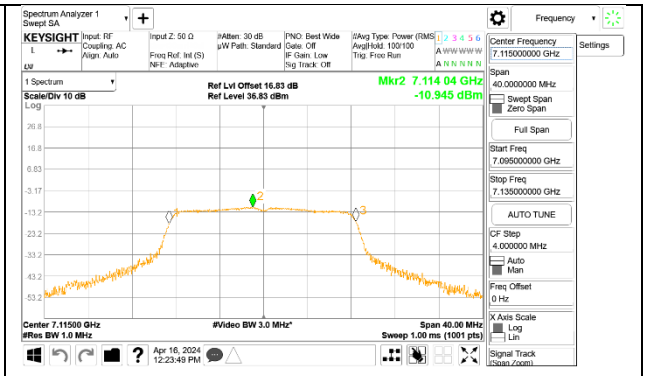


MID CHANNEL Antenna 3

HIGH CHANNEL



HIGH CHANNEL Antenna 1



HIGH CHANNEL Antenna 3

9.5. SPURIOUS EMMISSIONS IN-BAND – EMISSION MASK

LIMITS

FCC §15.407

(b)(7) For transmitters operating within the 5.925-7.125 GHz bands: power spectral density must be suppressed by 20 dB at 1 MHz outside of channel edge, by 28 dB at one channel bandwidth from the channel center, and by 40 dB at one- and one-half times the channel bandwidth away from channel center. At frequencies between one megahertz outside an unlicensed device's channel edge and one channel bandwidth from the center of the channel, the limits must be linearly interpolated between 20 dB and 28 dB suppression, and at frequencies between one and one- and one-half times an unlicensed device's channel bandwidth, the limits must be linearly interpolated between 28 dB and 40 dB suppression. Emissions removed from the channel center by more than one- and one-half times the channel bandwidth must be suppressed by at least 40 dB.

RSS-248

4.6.2 b. e.i.r.p. spectral density of unwanted emissions falling into the 5925-7125 MHz band shall be attenuated (in dB) below the reference power spectral density by:
i. 20 dB at 1 MHz away from the channel edge; and
ii. a linearly interpolated value between 20 dB and 28 dB at frequencies between 1 MHz outside of channel edge and one (1) channel bandwidth from the operating channel centre, respectively; and
iii. 28 dB at one (1) channel bandwidth away from the operating channel centre; and
iv. a linearly interpolated value between 28 dB and 40 dB at frequencies between one (1) channel bandwidth from the channel centre and one- and one-half (1.5) times the channel bandwidth away from the operating channel centre, respectively; and
v. 40 dB at one- and one-half (1.5) times the channel bandwidth away from the channel centre; and
vi. a minimum of 40 dB at frequencies that are further away than one and one-half (1.5) times the channel bandwidth from the channel centre.

TEST PROCEDURE

Per KDB 987594 D02 v01r01, Section II-J

RESULTS

Test Engineer:	ZS16080 and JB45256
Test Date:	2024-04-17 to 2024-05-15