FCC CERTIFICATION TEST REPORT

Applicant:	iFIT Health and Fitness, Inc.
Address:	1500 S 1000 W, Logan, Utah 84321, United States
Manufacturer:	Guangzhou Yuandong Smart Sports Technology Co., Ltd.
Address:	Room 518, No. 198, Kezhu Road, Huangpu District, Guangzhou
Product Description:	Tablet
Brand Name:	iFIT
Tested Model:	MP24-Xenon-V; MP16-Xenon-V; MP10-Xenon-V
FCC ID:	OMC453584V
Report No.:	JCF240131021-003
Received Date:	Jan. 31, 2024
Tested Date:	Jan. 31, 2024 ~ Mar. 07, 2024
Issued Date:	Mar. 07, 2024
Test Standards:	FCC Rules and Regulations Part 15 Subpart C
Test Procedure:	ANSI C63.10:2013
Test Result:	Pass

Prepared By:

Roger Li

Roger Li/Engineer **Date:** Mar. 07, 2024

Reviewed By:

Kennys Zhang

Kennys Zhang/Engineer **Date:** Mar. 07, 2024

Approved By:

Talent Zhang

Talent Zhang/Engineer **Date:** Mar. 07, 2024

Note: The test results in this report apply exclusively to the tested model / sample. Without written approval of Guangzhou Jingce Testing Technology Co., Ltd. the test report shall not be reproduced except in full.

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Mar. 07, 2024	Original Report	/

Table of Contents

1. Test Report Declare **5**
2. Summary of Test Results **6**
3. Test Laboratory **6**
4. Equipment Under Test **7**
4.1. Description of EUT 7
4.2. Channel List 7
4.3. Test Channel Configuration 8
4.4. Test environment conditions 8
4.5. Description of Available Antennas 8
4.6. Description of Available Antennas 9
5. Description of Test Setup **9**
5.1. Accessory 9
5.2. Support Equipment 9
5.3. Test Setup 9
5.4. Setup Diagram for Tests 9
6. Measurement Uncertainty **10**
7. Measuring Instrument and Software Used **10**
8. On Time and Duty Cycle **12**
8.1. Block diagram of test setup 12
8.2. Limits 12
8.3. Procedure 12
8.4. Results 12
8.5. Original test data 13
9. 6 dB DTS Bandwidth **22**
9.1. Block diagram of test setup 22
9.2. Limits 22
9.3. Test Procedure 22
9.4. Results 22
9.5. Original test data 23
10. Conducted Output Power **40**
10.1. Block diagram of test setup 40
10.2. Limits 40
10.3. Test Procedure 40
10.4. Results 40
11. Power Spectral Density **42**
11.1. Block diagram of test setup 42
11.2. Limits 42
11.3. Test Procedure 42
11.4. Results 42
11.5. Original test data 43
12. Conducted Band edge and Spurious Emissions **52**
12.1. Block diagram of test setup 52
12.2. Limits 52
12.3. Test Procedure 52
12.4. Test result 52
12.5. Original test data 54
13. Radiated Emission **83**
13.1. Block diagram of test setup 83
13.2. Limit 84
13.3. Test Procedure 85
13.4. Results 87
13.5. Original test data 87

14. AC Power Line Conducted Emissions 88
14.1. Block diagram of test setup 88
14.2. Limits 88
14.3. Test procedure 88
14.4. Test result 89
14.5. Original test data 89
15. Antenna Requirements 90
15.1. Applicable Requirements 90
15.2. Result 90
APPENDIX A – Radiated Emission Below 1GHz Test Data 91
APPENDIX B – Radiated Emission Above 1GHz Test Data 97
APPENDIX C – AC Power Line Conducted Emission Test Data 163

1. Test Report Declare

Applicant:	iFIT Health and Fitness, Inc.
Address:	1500 S 1000 W, Logan, Utah 84321, United States
Manufacturer:	Guangzhou Yuandong Smart Sports Technology Co., Ltd.
Address:	Room 518, No. 198, Kezhu Road, Huangpu District, Guangzhou
Product Name:	Tablet
Brand Name:	iFIT
Model Name:	MP24-Xenon-V; MP16-Xenon-V; MP10-Xenon-V
Difference Description:	The three size variants of the product only differ in appearance, dimensions, and display circuitry, while everything else remains the same. All models share the same main chip and RF hardware, including modules, crystal oscillators, antennas, etc., and have identical functionality.

We Declare:

The equipment described above is tested by Guangzhou Jingce Testing Technology Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Guangzhou Jingce Testing Technology Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests except as provided information by clients.

2. Summary of Test Results

Summary of Test Results			
Clause	**Test Items**	**FCC Rules**	**Test Results**
1	6dB Bandwidth	FCC Part 15.247 (a) (2)	Pass
2	Peak Conducted Output Power	FCC Part 15.247 (b) (3)	Pass
3	Power Spectral Density	FCC Part 15.247 (e)	Pass
4	Conducted Bandedge and Spurious Emission	FCC Part 15.247 (d)	Pass
5	Radiated Bandedge and Spurious Emission	FCC Part 15.247 (d) FCC Part 15.209 FCC Part 15.205	Pass
6	Conducted Emission Test For AC Power Port	FCC Part 15.207	Pass
7	Antenna Requirement	FCC Part 15.203	Pass

Note: The model: MP24-Xenon-V; MP16-Xenon-V; MP10-Xenon-V share the same main chip and RF hardware, including modules, crystal oscillators, antennas, etc., and have identical functionality. So except for item 5&6 above, which requires all models to be tested, the remaining items only test model MP24-Xenon-V.

3. Test Laboratory

Guangzhou Jingce Testing Technology Co., Ltd.

Add.: No.10, Hefeng No.1 street, Huangpu District, Guangzhou, Guangdong, People's Republic of China

Association for Laboratory Accreditation(A2LA). Certificate Number: 6594.03

FCC Designation Number: CN1381. Test Firm Registration Number: 486550

IC Test Firm Registration Number: 31808

Conformity Assessment Body identifier: CN0173

4. Equipment Under Test

4.1. Description of EUT

EUT Name:	Tablet
Model Number:	MP24-Xenon-V; MP16-Xenon-V; MP10-Xenon-V
EUT Function Description:	Refer to user manual
Power Supply:	DC 12V 3A
Hardware Version:	N/A
Software Version:	N/A
Radio Specification:	IEEE802.11b/g/n
Operation Frequency:	IEEE 802.11b: 2412MHz—2462MHz IEEE 802.11g: 2412MHz—2462MHz IEEE 802.11n HT20: 2412MHz—2462MHz IEEE 802.11n HT40: 2422MHz—2452MHz
Modulation:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n (HT20/40): OFDM (64QAM, 16QAM, QPSK, BPSK)
Data Rate:	IEEE 802.11b: 1, 2, 5.5, 11 Mbps IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps IEEE 802.11n HT20: 14.4, 28.9, 43.3, 57.8, 86.7, 115.6, 130.0, 144.4Mbps IEEE 802.11n HT40: 30.0, 60.0, 90.0, 120.0, 180.0, 240.0, 270.0, 300.0 Mbps
Antenna Type:	FPC Antenna, MAX. Gain: 4.81 dBi

Antenna Gain:		
MP10-Xenon-V	BT ANT	2.4G: 3.14dBi
	WIFI ANT1	2.4G: 2.67dBi; 5G: 2.89dBi
	WIFI ANT 2	2.4G: 1.96dBi; 5G: 1.37dBi
MP16-Xenon-V	BT ANT	2.4G: 4.90dBi
	WIFI ANT1	2.4G: 3.90dBi; 5G: 3.81dBi
	WIFI ANT 2	2.4G: 4.55dBi; 5G: 3.27dBi
MP24-Xenon-V	BT ANT	2.4G: 5.16dBi
	WIFI ANT1	2.4G: 4.81dBi; 5G: 4.37dBi
	WIFI ANT 2	2.4G: 4.39dBi; 5G: 5.83dBi

Note 1: EUT is the ab. of equipment under test.

Note 2: The antenna gain is declared by the customer and the laboratory is not responsible for the accuracy of the antenna gain.

4.2. Channel List

Channel List for 802.11b/g/n (20 MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	4	2427	7	2442	10	2457
2	2417	5	2432	8	2447	11	2462
3	2422	6	2437	9	2452	/	/

Channel List for 802.11n (40 MHz)					
Channel	Frequency (MHz)	Channel	Frequency(MHz)	Channel	Frequency (MHz)
3	2422	6	2437	9	2452
4	2427	7	2442	/	/
5	2432	8	2447	/	/

4.3. Test Channel Configuration

Tested mode, channel and rand data rate information			
Mode	Data rate (Mbps) (see Note)	Channel	Frequency (MHz)
802.11b	1	Low: CH1	2412
	1	Middle: CH6	2437
	1	High: CH11	2462
802.11g	6	Low: CH1	2412
	6	Middle: CH6	2437
	6	High: CH11	2462
802.11n HT20	MCS 8	Low: CH1	2412
	MCS 8	Middle: CH6	2437
	MCS 8	High: CH11	2462
802.11n HT40	MCS 8	Low: CH3	2422
	MCS 8	Middle: CH6	2437
	MCS 8	High: CH9	2452
Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.			

4.4. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-25 ℃
Humidity range:	40-75%
Pressure range:	86-106 kPa

4.5. Description of Available Antennas

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band				
Test Software		Adb instruction		
Modulation Mode	Transmit Antenna Number	Test Software Setting Value		
		Channel	ANT1	ANT2
802.11b	2	CH1	Default	12
		CH6	Default	12
		CH11	Default	12
802.11g	2	CH1	12	12
		CH6	12	12
		CH11	11	11
802.11HT20	2	CH1	6	6

		CH6	6	6
		CH11	6	6
802.11n HT40	2	CH3	6	6
		CH6	6	6
		CH9	7	7

4.6. Description of Available Antennas

Test Mode	Transmit and Receive Mode	Description
802.11b	☒ 2TX, 2RX	ANT 1 and ANT2 can be used as transmitting/receiving antenna.
802.11g	☒ 2TX, 2RX	ANT 1 and ANT2 can be used as transmitting/receiving antenna.
802.11n HT20	☒ 2TX, 2RX	ANT 1 and ANT2 can be used as transmitting/receiving antenna.
802.11n HT40	☒ 2TX, 2RX	ANT 1 and ANT2 can be used as transmitting/receiving antenna.
802.11ax HE20	☒ 2TX, 2RX	ANT 1 and ANT2 can be used as transmitting/receiving antenna.
802.11ax HE40	☒ 2TX, 2RX	ANT 1 and ANT2 can be used as transmitting/receiving antenna.
Note: 1. Only 802.11n HT20/HT40 support MIMO mode 2. WLAN 2.4 GHz & WLAN 5G can’t transmit simultaneously. (declared by client)		

5. Description of Test Setup

5.1. Accessory

Description of Accessories	Manufacturer	Model Number	Description	Remark
/	/	/	/	/

5.2. Support Equipment

Equipment	Brand Name	Model Name	P/N
PC	Lenovo	T480	/
Adapter	SOY	SOY-1200300	/

5.3. Test Setup

The EUT can work in Fixed Frequency mode.

5.4. Setup Diagram for Tests

6. Measurement Uncertainty

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

Test Item	Uncertainty
AC Power Conduction emission	1.37 dB
All Radiated emissions	5.4dB
Conducted emissions	3.09 dB
Occupied Channel Bandwidth	1.1%
Conducted Output power	0.82dB
Power Spectral Density	0.82dB
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k = 2.	

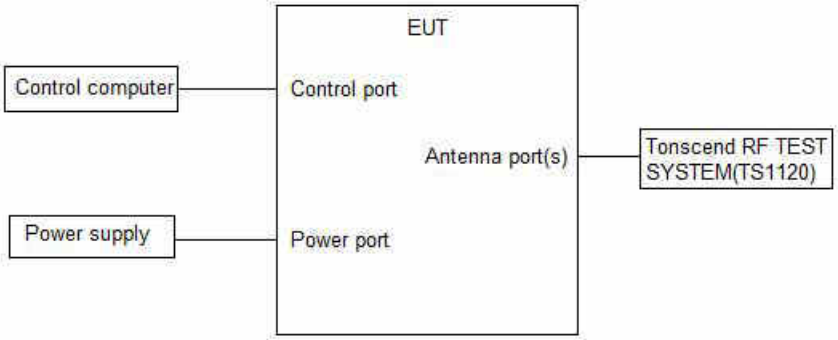
7. Measuring Instrument and Software Used

TS Test System						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
☑	Spectrum Analyzer	Keysight	N9030B	MY56320512	Sep. 12, 2023	Sep. 11, 2024
☑	Vector Signal Generator	Keysight	N5182B	MY57300334	Sep. 12, 2023	Sep. 11, 2024
☑	Signal Generator	Keysight	N5171B	MY57280639	Sep. 12, 2023	Sep. 11, 2024
☑	DC POWER	Keysight	E342A	MY59020356	Jul. 14, 2023	Jul. 13, 2024
☑	Incubator thermometer	GWS	EL-02JA	21107288	Sep. 12, 2023	Sep. 11, 2024
☑	Control unit(Power sensor)	Tonscend	JS0806-2	/	Sep. 12, 2023	Sep. 11, 2024
☑	Wideband radio communication tester	R&S	CMW500	163478	Jul. 11, 2023	Jul. 10, 2024
☑	Spectrum Analyzer	Keysight	N9020B	MY60112206	Sep. 12, 2023	Sep. 12, 2024
☑	Control unit(Power sensor)	Tonscend	JS0806-2	21H8060465	Sep. 12, 2023	Sep. 12, 2024
Software						
Used	Description	Manufacturer	Name		Version	
☑	Test software	Tonscend	JS1120-3		V3.3.10	
RSE Test System						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
☑	EMI Receiver	R&S	ESW	101685	Jul. 12, 2023	Jul. 11, 2024
☑	Bilog Antenna	Schwarzbeck	VULB 9163	01416	Mar. 21, 2023	Mar. 20, 2024
☑	Horn Antenna 1	Schwarzbeck	BBHA 9120 D	02411	May. 25, 2023	May. 24, 2024
☑	Horn Antenna 2	ETS	BBHA 9170	1090	Sep. 04, 2023	Sep. 03, 2024
☑	loop-antenna	Schwarzbeck	FMZB 1513-60	00030	Jan.14,2024	Jan. 13, 2025
☑	Signal Pre-Amplifier	Tonscend	TAP01018050	AP21C806122	Jul. 10, 2023	Jul. 09, 2024

☑	Signal Pre-Amplifier	Tonscend	TAP9K3G32	AP20K806104	Jul. 10, 2023	Jul. 09, 2024
☑	Signal Pre-Amplifier	ETS	3116C-PA	00217677	Aug. 24, 2023	Aug. 23, 2024
☑	3m Fully-anechoic Chamber	ETS	RFD-100	/	Apr. 24, 2021	Apr. 23, 2024
Software						
Used	Description	Manufacturer	Name		Version	
☑	Test software	Tonscend	TS+		V3.0.0.4	
Conducted Emission Test For AC Power Port						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
☑	LISN	R&S	ENV216	102154	Jul. 10, 2023	Jul. 09, 2024
☑	EMI Receiver	R&S	ESR3	102509	Jul. 12, 2023	Jul. 11, 2024
Software						
Used	Description	Manufacturer	Name		Version	
☑	Test software	EZ	EZ-EMC		EMEC-3A1	
Other Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
☑	Temperature & Humidity	Temperature	HTC-1	/	Nov. 02, 2023	Nov. 01, 2024

8. On Time and Duty Cycle

8.1. Block diagram of test setup



8.2. Limits

None; for reporting purposes only

8.3. Procedure

KDB 558074 Zero-Span Spectrum Analyzer Method

8.4. Results

Test Mode	Ant.	Freq. (MHz)	Transmission Duration (ms)	Transmission Period (ms)	Duty Cycle (%)
11B	Ant1	2412	8.38	8.41	99.64
	Ant2	2412	8.39	8.43	99.53
	Ant1	2437	8.38	8.42	99.52
	Ant2	2437	8.38	8.42	99.52
	Ant1	2462	8.38	8.43	99.41
	Ant2	2462	8.39	8.43	99.53
11G	Ant1	2412	1.39	1.45	95.86
	Ant2	2412	1.39	1.44	96.53
	Ant1	2437	1.40	1.45	96.55
	Ant2	2437	1.39	1.44	96.53
	Ant1	2462	1.39	1.45	95.86
	Ant2	2462	1.39	1.44	96.53
11N20MIMO	Ant1	2412	1.30	1.35	96.30
	Ant2	2412	1.30	1.36	95.59
	Ant1	2437	1.30	1.35	96.30
	Ant2	2437	1.30	1.35	96.30
	Ant1	2462	1.30	1.36	95.59
	Ant2	2462	1.30	1.36	95.59
11N40MIMO	Ant1	2422	0.65	0.70	92.86
	Ant2	2422	0.64	0.70	91.43
	Ant1	2437	0.65	0.70	92.86
	Ant2	2437	0.65	0.70	92.86
	Ant1	2452	0.65	0.70	92.86
	Ant2	2452	0.64	0.70	91.43

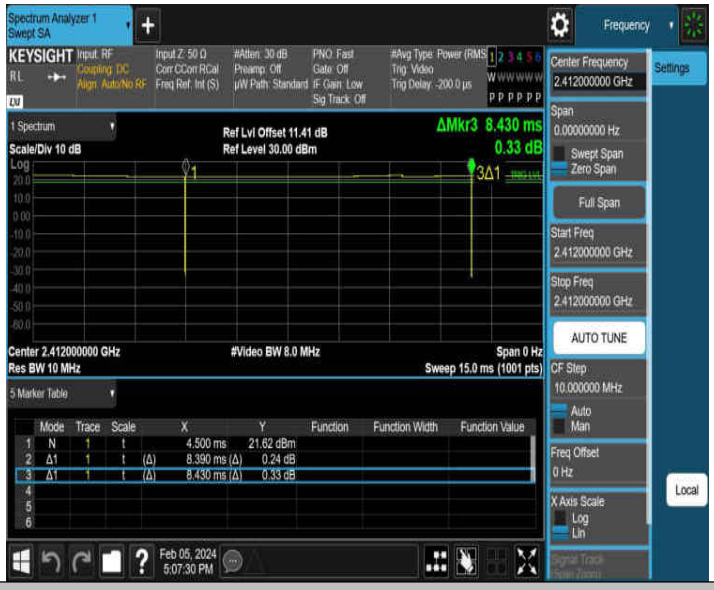
Note: Duty Cycle Correction Factor = 10log (1/x).
Where: x is Duty Cycle (Linear)
Where: T is On Time
If that calculated VBW is not available on the analyzer, then the next higher value should be used.

For mode 11b, the duty cycle is greater than 98 %, so it can set VBW to 10 Hz.

8.5. Original test data

11B_Ant1_2412

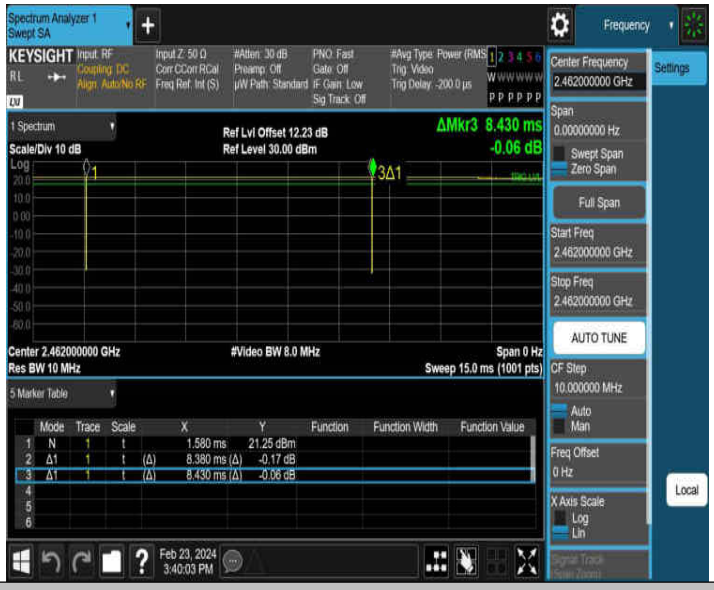
11B_Ant2_2412



11B_Ant1_2437

11B_Ant2_2437

11B_Ant1_2462



11B_Ant2_2462

11G_Ant1_2412

11G_Ant2_2412

11G_Ant1_2437

11G_Ant2_2437

11G_Ant1_2462

11G_Ant2_2462

11N20MIMO_Ant1_2412

11N20MIMO_Ant2_2412

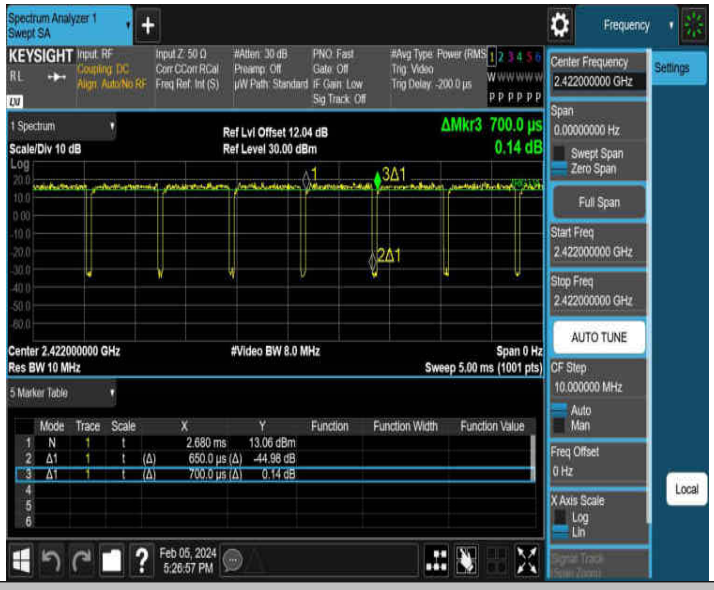
11N20MIMO_Ant1_2437

11N20MIMO_Ant2_2437

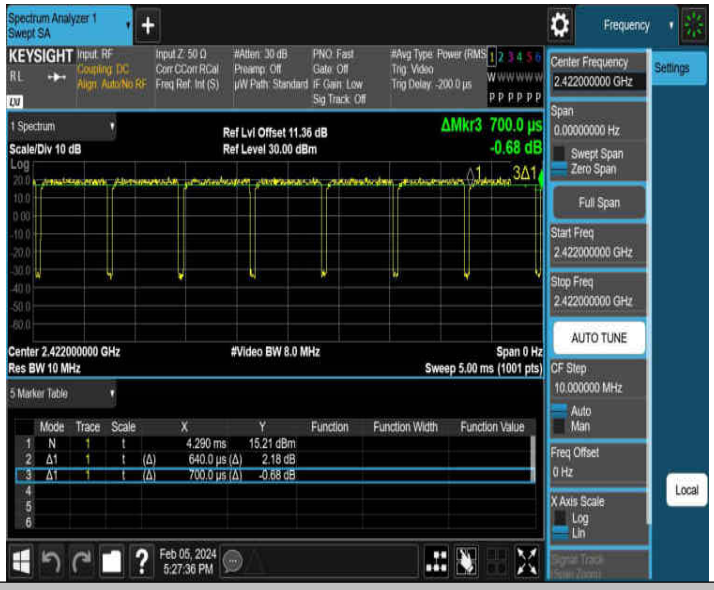
11N20MIMO_Ant1_2462

11N20MIMO_Ant2_2462

11N40MIMO_Ant1_2422

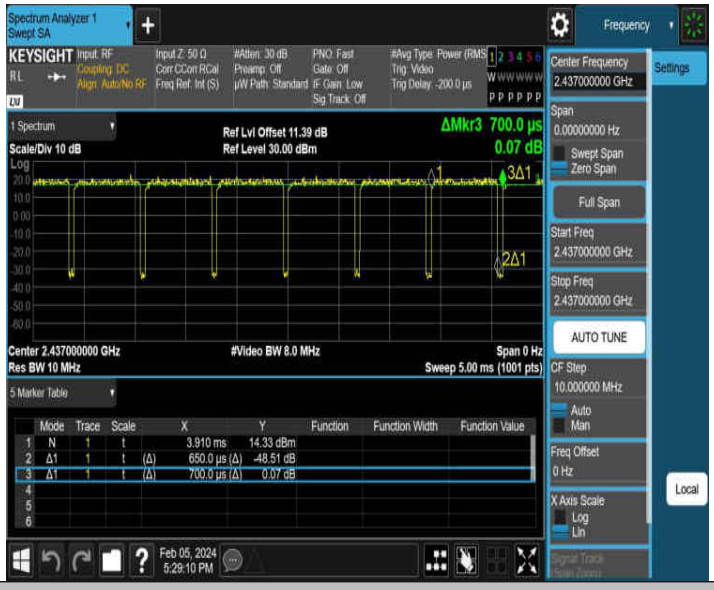


11N40MIMO_Ant2_2422

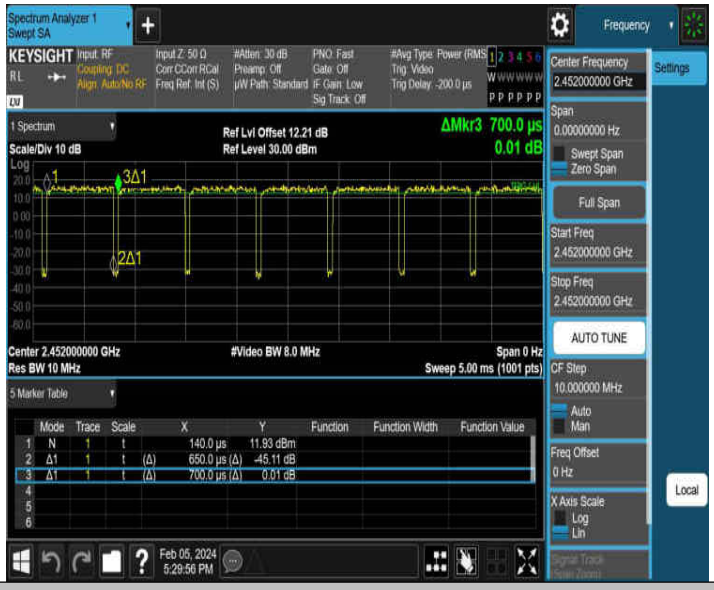


11N40MIMO_Ant1_2437

11N40MIMO_Ant2_2437



11N40MIMO_Ant1_2452



11N40MIMO_Ant2_2452

Spectrum Analyzer 1
Swept SA
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto/No RF
Input Z: 50 Ω
Corr CCorr RCal
Freq Ref: Int (S)
#Atten: 30 dB
Preamp: Off
µW Path: Standard
PNO: Fast
Gate: Off
IF Gain: Low
Sig Track: Off
#Avg Type: Power (RMS)
Trig: Video
Trig Delay: -200.0 µs
1 Spectrum
Scale/Div 10 dB
Log
Ref Lvl Offset 11.57 dB
Ref Level 30.00 dBm
ΔMkr3 700.0 µs
0.01 dB
Center 2.452000000 GHz
Res BW 10 MHz
#Video BW 8.0 MHz
Span 0 Hz
Sweep 5.00 ms (1001 pts)
5 Marker Table
Mode Trace Scale X Y Function Function Width Function Value
1 N 1 t 2.860 ms 15.71 dBm
2 Δ1 1 t (Δ) 640.0 µs (Δ) 3.93 dB
3 Δ1 1 t (Δ) 700.0 µs (Δ) 0.01 dB
Feb 05, 2024
5:30:36 PM
Frequency
Center Frequency
2.452000000 GHz
Settings
Span
0.00000000 Hz
Swept Span
Zero Span
Full Span
Start Freq
2.452000000 GHz
Stop Freq
2.452000000 GHz
AUTO TUNE
CF Step
10.000000 MHz
Auto
Man
Freq Offset
0 Hz
X Axis Scale
Log
Lin
Local

9. 6 dB DTS Bandwidth

9.1. Block diagram of test setup

Same as section 8.1

9.2. Limits

CFR 47 FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(a)(2)	6 dB Bandwidth	≥ 500 kHz	2400-2483.5

9.3. Test Procedure

Connect the UUT to the spectrum analyzer and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	For 6 dB Bandwidth :100 kHz For 99 % Occupied Bandwidth :1 % to 5 % of the occupied bandwidth
VBW	For 6 dB Bandwidth: ≥ 3 × RBW For 99 % Occupied Bandwidth : ≥ 3×RBW
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB and 99 % relative to the maximum level measured in the fundamental emission.

9.4. Results

6dB bandwidth:

Test Mode	Ant.	Freq. (MHz)	DTS BW (MHz)	FL (MHz)	FH (MHz)	Limit (MHz)	Verdict
11B	Ant1	2412	8.600	2407.960	2416.560	0.5	PASS
	Ant2	2412	7.880	2408.120	2416.000	0.5	PASS
	Ant1	2437	7.880	2432.960	2440.840	0.5	PASS
	Ant2	2437	6.720	2433.800	2440.520	0.5	PASS
	Ant1	2462	7.120	2458.000	2465.120	0.5	PASS
	Ant2	2462	8.480	2458.080	2466.560	0.5	PASS
11G	Ant1	2412	14.840	2404.680	2419.520	0.5	PASS
	Ant2	2412	16.040	2403.840	2419.880	0.5	PASS
	Ant1	2437	16.080	2428.840	2444.920	0.5	PASS
	Ant2	2437	15.840	2429.080	2444.920	0.5	PASS
	Ant1	2462	16.280	2453.880	2470.160	0.5	PASS
	Ant2	2462	16.280	2453.880	2470.160	0.5	PASS
11N20MIMO	Ant1	2412	17.560	2403.200	2420.760	0.5	PASS
	Ant2	2412	15.720	2403.200	2418.920	0.5	PASS
	Ant1	2437	16.040	2429.720	2445.760	0.5	PASS
	Ant2	2437	17.520	2428.240	2445.760	0.5	PASS
	Ant1	2462	16.000	2453.880	2469.880	0.5	PASS
	Ant2	2462	17.240	2453.520	2470.760	0.5	PASS
11N40MIMO	Ant1	2422	34.000	2404.880	2438.880	0.5	PASS
	Ant2	2422	28.400	2404.240	2432.640	0.5	PASS
	Ant1	2437	27.600	2426.920	2454.520	0.5	PASS
	Ant2	2437	35.440	2419.720	2455.160	0.5	PASS
	Ant1	2452	34.480	2435.680	2470.160	0.5	PASS

	Ant2	2452	28.800	2441.360	2470.160	0.5	PASS

99 % bandwidth：

Test Mode	Ant.	Channel Freq. (MHz)	OCB (MHz)	FL (MHz)	FH (MHz)	Limit (MHz)	Verdict
11B	Ant1	2412	13.410	2405.3609	2418.7709	---	---
	Ant2	2412	13.419	2405.3046	2418.7236	---	---
	Ant1	2437	13.443	2430.2453	2443.6883	---	---
	Ant2	2437	13.441	2430.2643	2443.7053	---	---
	Ant1	2462	13.563	2455.1481	2468.7111	---	---
	Ant2	2462	13.459	2455.2291	2468.6881	---	---
11G	Ant1	2412	16.620	2403.6290	2420.2490	---	---
	Ant2	2412	16.499	2403.7084	2420.2074	---	---
	Ant1	2437	16.389	2428.8078	2445.1968	---	---
	Ant2	2437	16.499	2428.7278	2445.2268	---	---
	Ant1	2462	16.514	2453.7279	2470.2419	---	---
	Ant2	2462	16.417	2453.7419	2470.1589	---	---
11N20MIMO	Ant1	2412	17.632	2403.1504	2420.7824	---	---
	Ant2	2412	17.537	2403.1568	2420.6938	---	---
	Ant1	2437	17.642	2428.1541	2445.7961	---	---
	Ant2	2437	17.686	2428.1400	2445.8260	---	---
	Ant1	2462	17.581	2453.1405	2470.7215	---	---
	Ant2	2462	17.532	2453.2401	2470.7721	---	---
11N40MIMO	Ant1	2422	35.806	2404.0909	2439.8969	---	---
	Ant2	2422	36.047	2403.8015	2439.8485	---	---
	Ant1	2437	36.004	2419.1735	2455.1775	---	---
	Ant2	2437	36.237	2418.9215	2455.1585	---	---
	Ant1	2452	35.741	2434.3113	2470.0523	---	---
	Ant2	2452	36.144	2434.1013	2470.2453	---	---

9.5. Original test data

6dB bandwidth:

11B_Ant1_2412

11B_Ant2_2412

11B_Ant1_2437

11B_Ant2_2437

11B_Ant1_2462

11B_Ant2_2462

11G_Ant1_2412

11G_Ant2_2412

11G_Ant1_2437

11G_Ant2_2437

11G_Ant1_2462

11G_Ant2_2462

11N20MIMO_Ant1_2412

11N20MIMO_Ant2_2412

11N20MIMO_Ant1_2437

11N20MIMO_Ant2_2437

11N20MIMO_Ant1_2462

11N20MIMO_Ant2_2462

11N40MIMO_Ant1_2422

11N40MIMO_Ant2_2422

11N40MIMO_Ant1_2437

11N40MIMO_Ant2_2437

11N40MIMO_Ant1_2452

11N40MIMO_Ant2_2452

99 % bandwidth：

11B_Ant1_2412

11B_Ant2_2412

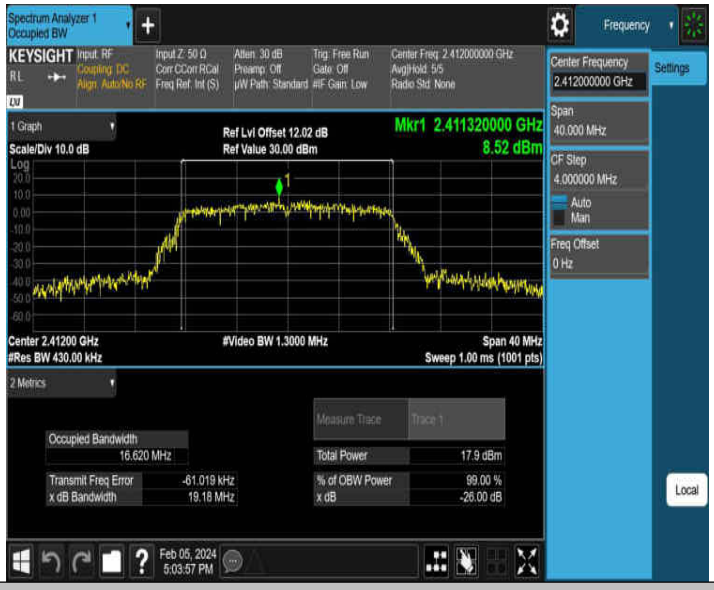
11B_Ant1_2437

11B_Ant2_2437

11B_Ant1_2462

11B_Ant2_2462

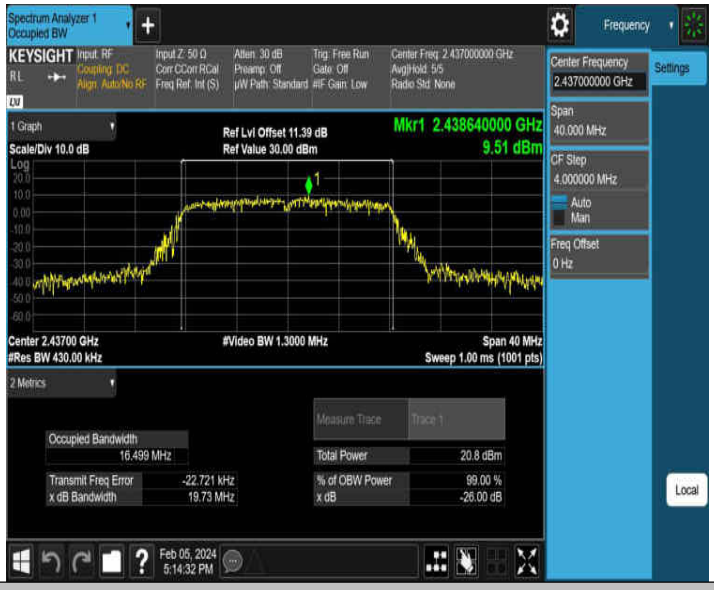
11G_Ant1_2412



11G_Ant2_2412

11G_Ant1_2437

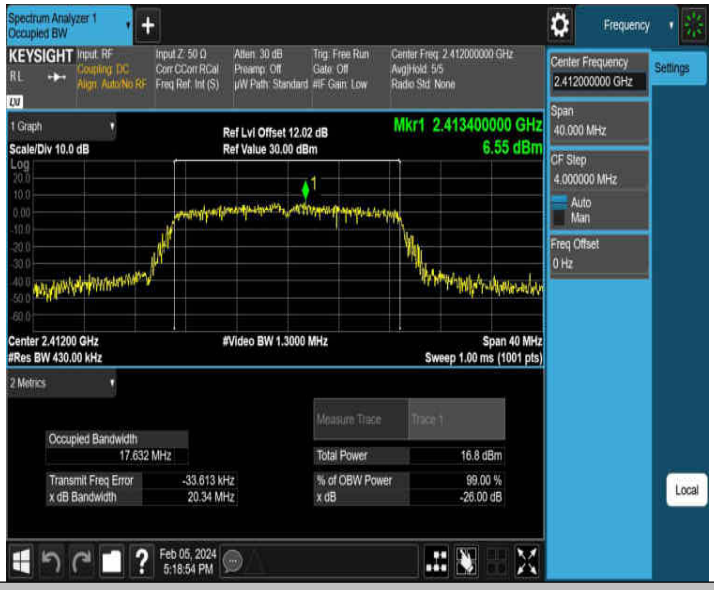
11G_Ant2_2437



11G_Ant1_2462

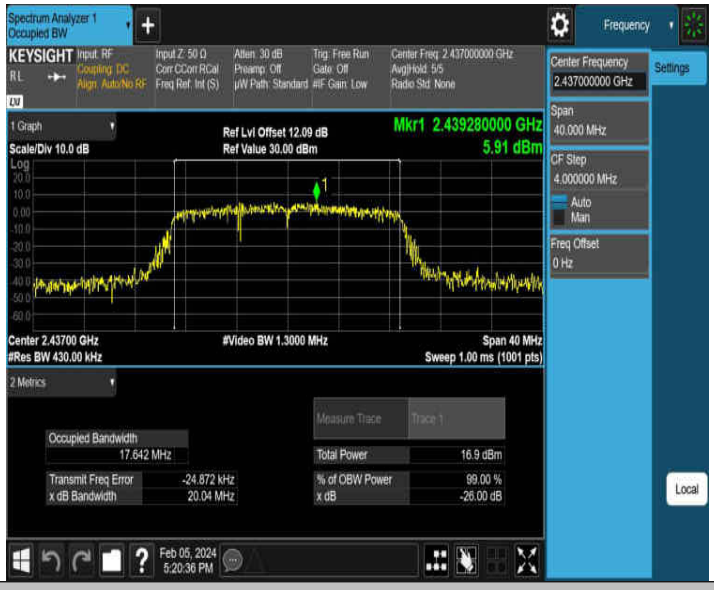
11G_Ant2_2462

11N20MIMO_Ant1_2412

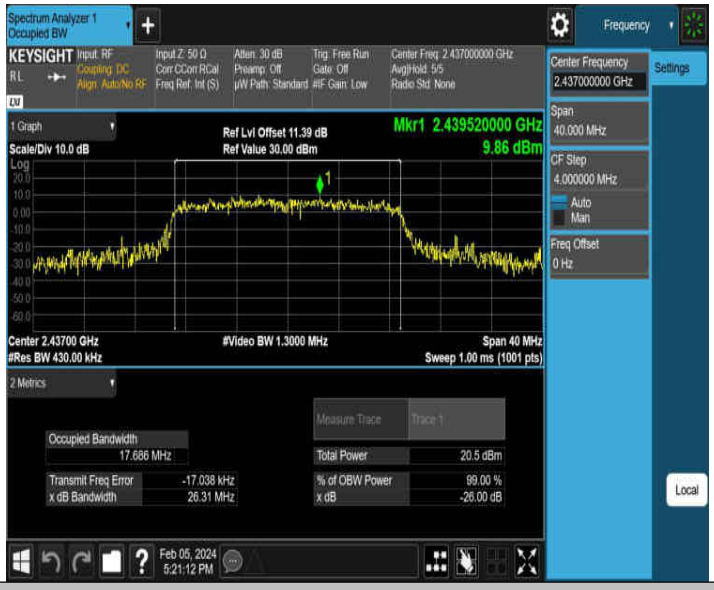


11N20MIMO_Ant2_2412

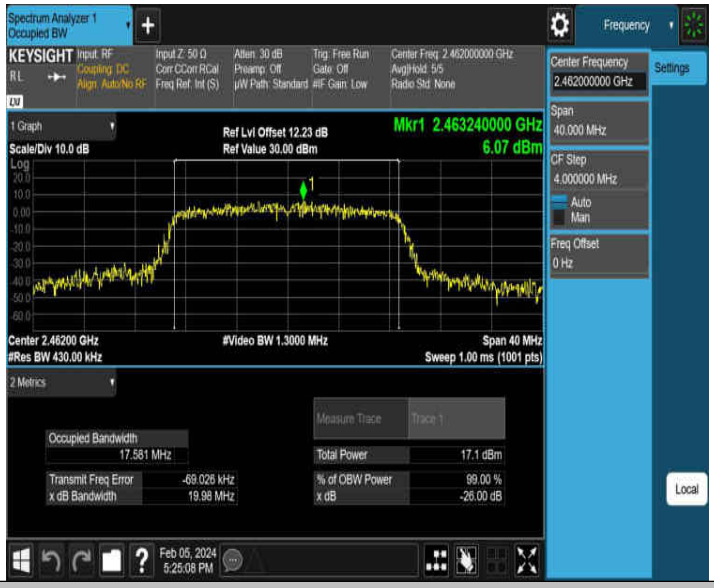
11N20MIMO_Ant1_2437



11N20MIMO_Ant2_2437

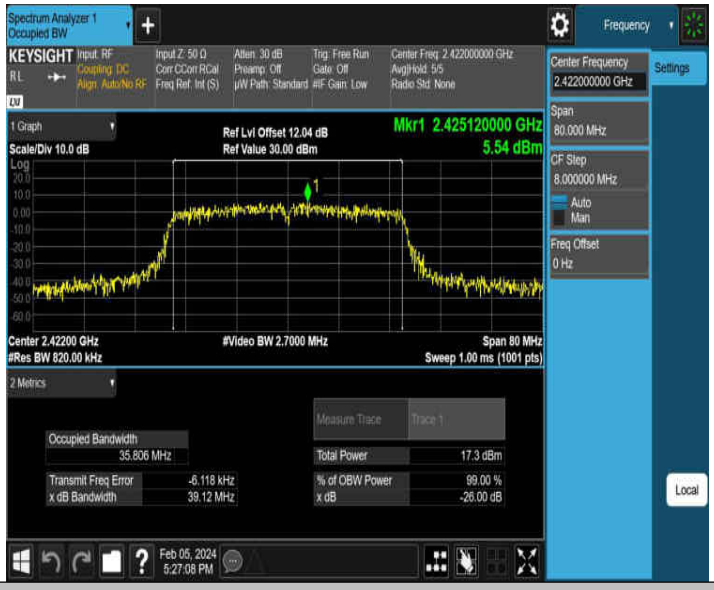


11N20MIMO_Ant1_2462

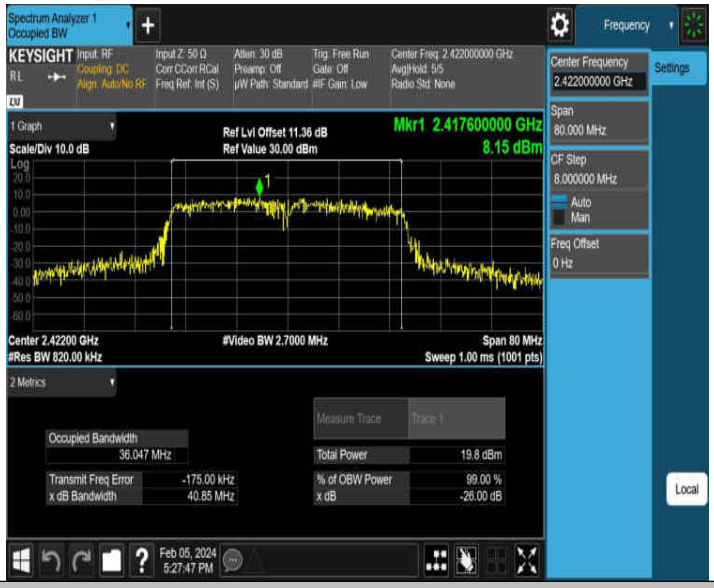


11N20MIMO_Ant2_2462

11N40MIMO_Ant1_2422

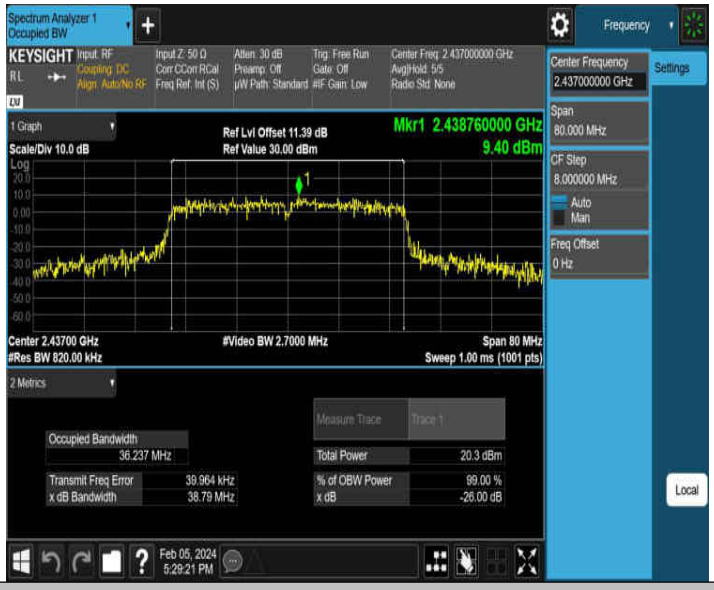


11N40MIMO_Ant2_2422

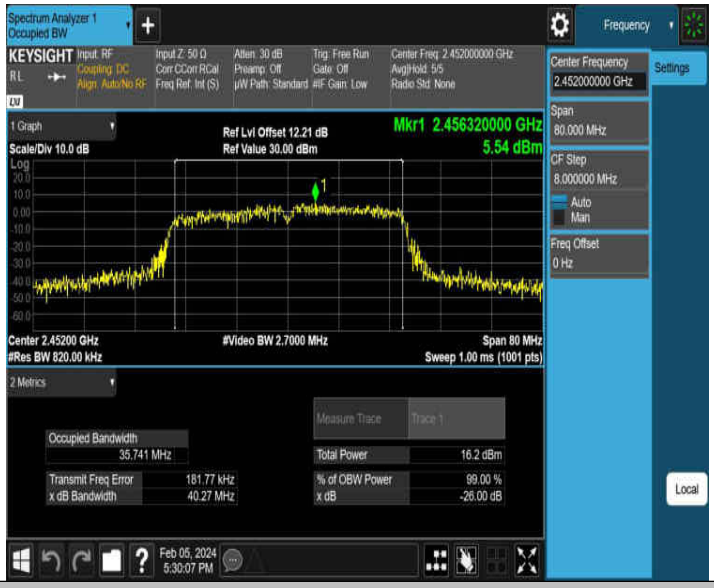


11N40MIMO_Ant1_2437

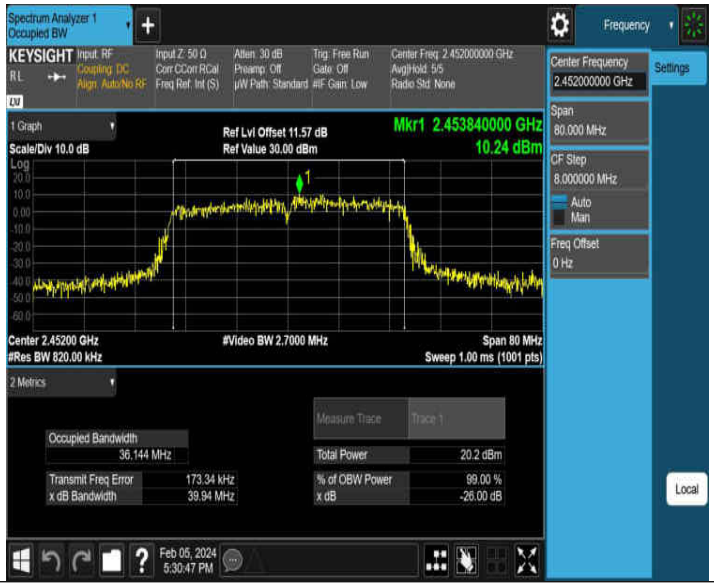
11N40MIMO_Ant2_2437



11N40MIMO_Ant1_2452



11N40MIMO_Ant2_2452



10. Conducted Output Power

10.1. Block diagram of test setup

Same as section 8.1

10.2. Limits

CFR 47 FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(b)(3)	Peak Output Power	1 watt or 30 dBm	2400-2483.5

10.3. Test Procedure

Place the EUT on the table and set it in the transmitting mode.

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power sensor.

Measure peak power each channel.

Peak Detector use for Peak result.

AVG Detector use for AVG result.

10.4. Results

Test Mode	Ant.	Freq. (MHz)	Peak Power (dBm)	Conducted Limit (dBm)	Verdict
11B	Ant1	2412	20.04	≤30.00	PASS
	Ant2	2412	16.37	≤30.00	PASS
	Ant1	2437	20.21	≤30.00	PASS
	Ant2	2437	16.29	≤30.00	PASS
	Ant1	2462	18.07	≤30.00	PASS
	Ant2	2462	16.96	≤30.00	PASS
11G	Ant1	2412	18.48	≤30.00	PASS
	Ant2	2412	18.44	≤30.00	PASS
	Ant1	2437	19.08	≤30.00	PASS
	Ant2	2437	17.23	≤30.00	PASS
	Ant1	2462	14.48	≤30.00	PASS
	Ant2	2462	17.51	≤30.00	PASS
11N20MIMO	Ant1	2412	11.86	≤30.00	PASS
	Ant2	2412	10.91	≤30.00	PASS
	total	2412	14.42	≤30.00	PASS
	Ant1	2437	11.89	≤30.00	PASS
	Ant2	2437	12.28	≤30.00	PASS
	total	2437	15.10	≤30.00	PASS
	Ant1	2462	8.17	≤30.00	PASS
	Ant2	2462	11.75	≤30.00	PASS
	total	2462	13.33	≤30.00	PASS
11N40MIMO	Ant1	2422	9.06	≤30.00	PASS
	Ant2	2422	11.04	≤30.00	PASS
	total	2422	13.17	≤30.00	PASS
	Ant1	2437	9.86	≤30.00	PASS
	Ant2	2437	11.67	≤30.00	PASS
	total	2437	13.87	≤30.00	PASS
	Ant1	2452	13.23	≤30.00	PASS
	Ant2	2452	12.44	≤30.00	PASS

	total	2452	15.86	≤30.00	PASS

11. Power Spectral Density

11.1. Block diagram of test setup

Same as section 8.1

11.2. Limits

CFR 47 FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC §15.247 (e)	Power Spectral Density	8 dBm/3 kHz	2400-2483.5

11.3. Test Procedure

Connect the UUT to the spectrum analyzer and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	3 kHz ≤ RBW ≤100 kHz
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

11.4. Results

Test Mode	Ant.	Freq. (MHz)	Result (dBm/3-100kHz)	Limit (dBm/3kHz)	Verdict
11B	Ant1	2412	1.27	≤8.00	PASS
	Ant2	2412	-7.32	≤8.00	PASS
	Ant1	2437	5.34	≤8.00	PASS
	Ant2	2437	4.48	≤8.00	PASS
	Ant1	2462	-9.59	≤8.00	PASS
	Ant2	2462	7.03	≤8.00	PASS
11G	Ant1	2412	-12.42	≤8.00	PASS
	Ant2	2412	-9.04	≤8.00	PASS
	Ant1	2437	-12.48	≤8.00	PASS
	Ant2	2437	-9.29	≤8.00	PASS
	Ant1	2462	-18.31	≤8.00	PASS
	Ant2	2462	-9.00	≤8.00	PASS
11N20MIMO	Ant1	2412	-11.05	≤8.00	PASS
	Ant2	2412	-10.09	≤8.00	PASS
	total	2412	-7.53	≤8.00	PASS
	Ant1	2437	-11.49	≤8.00	PASS
	Ant2	2437	-8.26	≤8.00	PASS
	total	2437	-6.57	≤8.00	PASS
	Ant1	2462	-12.82	≤8.00	PASS
	Ant2	2462	-8.75	≤8.00	PASS
	total	2462	-7.31	≤8.00	PASS
11N40MIMO	Ant1	2422	-15.81	≤8.00	PASS
	Ant2	2422	-12.53	≤8.00	PASS
	total	2422	-10.86	≤8.00	PASS

	Ant1	2437	-18.23	≤8.00	PASS
	Ant2	2437	-12.30	≤8.00	PASS
	total	2437	-11.31	≤8.00	PASS
	Ant1	2452	-15.36	≤8.00	PASS
	Ant2	2452	-12.16	≤8.00	PASS
	total	2452	-10.46	≤8.00	PASS

11.5. Original test data

11B_Ant1_2412

11B_Ant2_2412

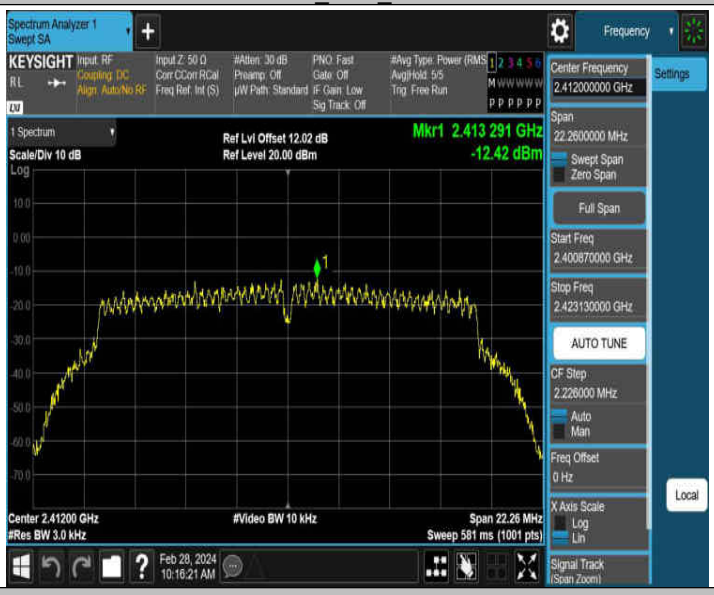
11B_Ant1_2437

11B_Ant2_2437

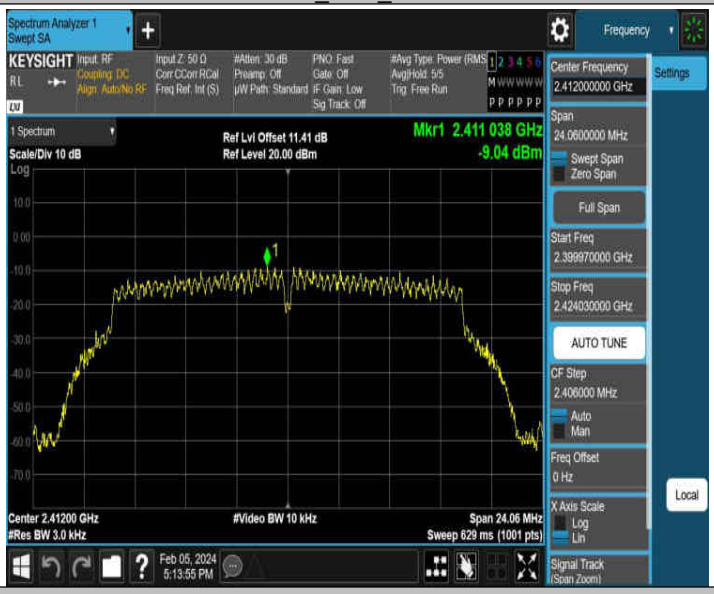
11B_Ant1_2462

11B_Ant2_2462

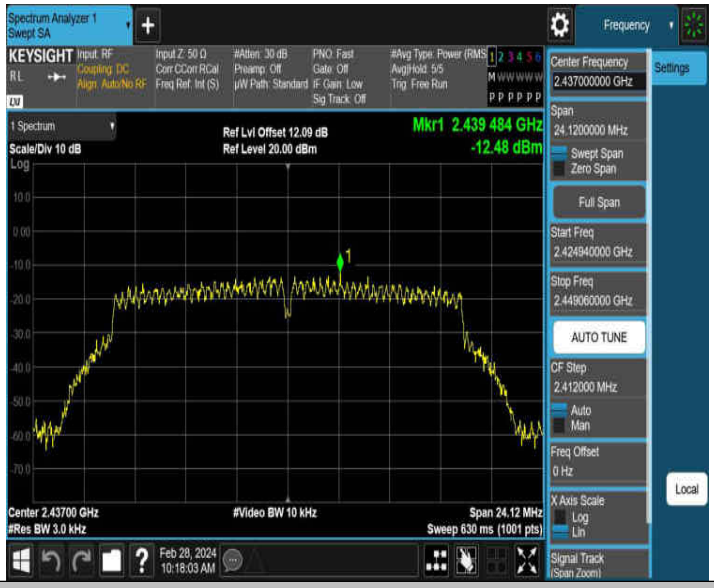
11G_Ant1_2412



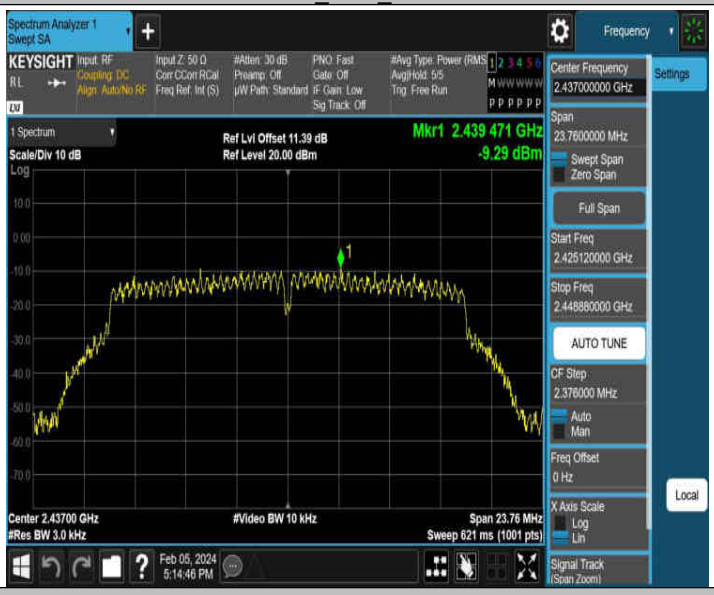
11G_Ant2_2412



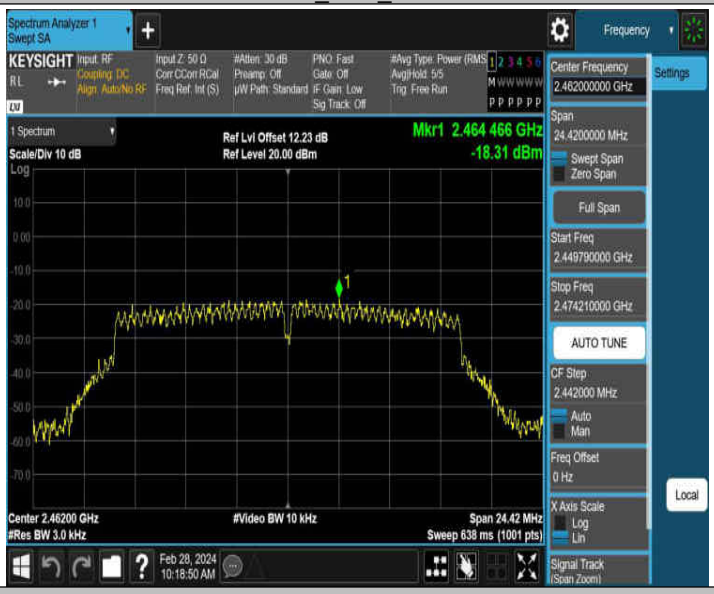
11G_Ant1_2437



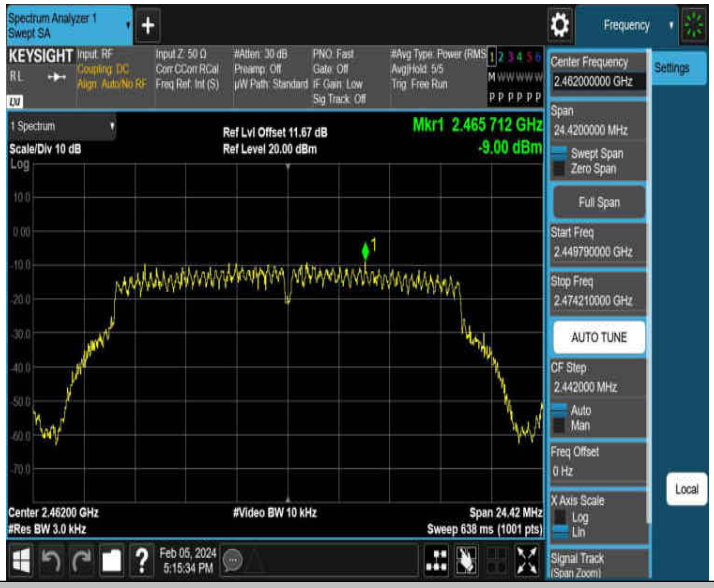
11G_Ant2_2437



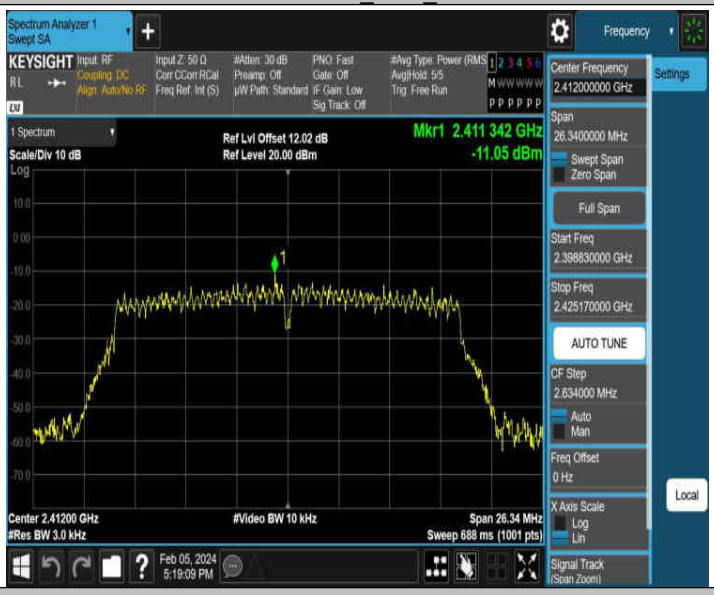
11G_Ant1_2462



11G_Ant2_2462

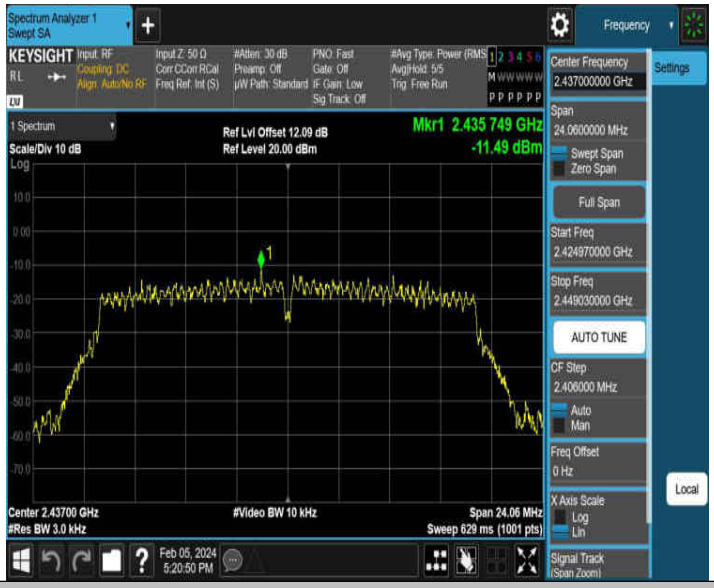


11N20MIMO_Ant1_2412

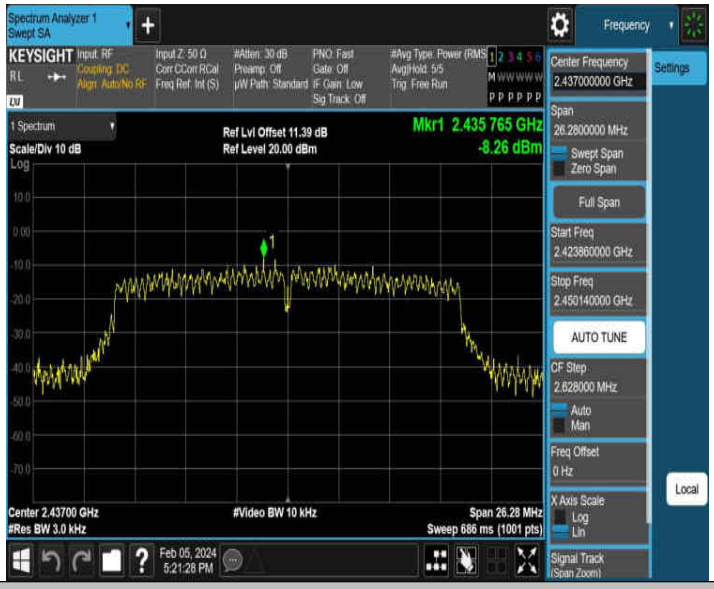


11N20MIMO_Ant2_2412

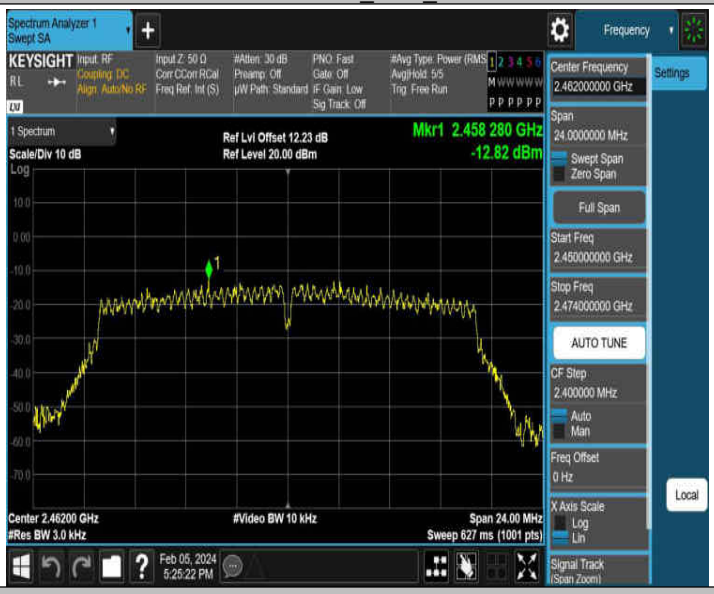
11N20MIMO_Ant1_2437



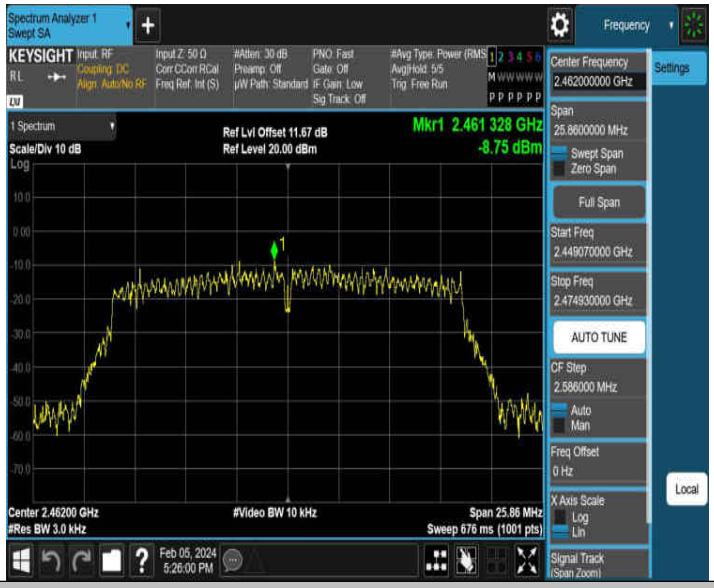
11N20MIMO_Ant2_2437



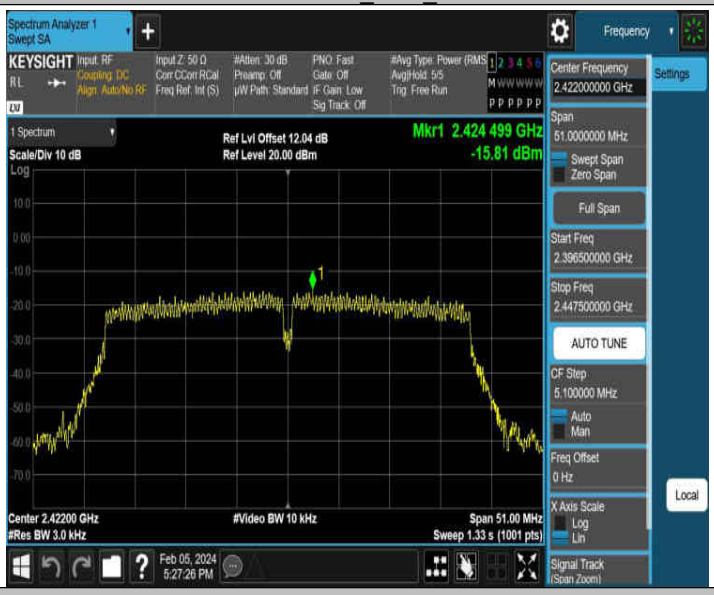
11N20MIMO_Ant1_2462



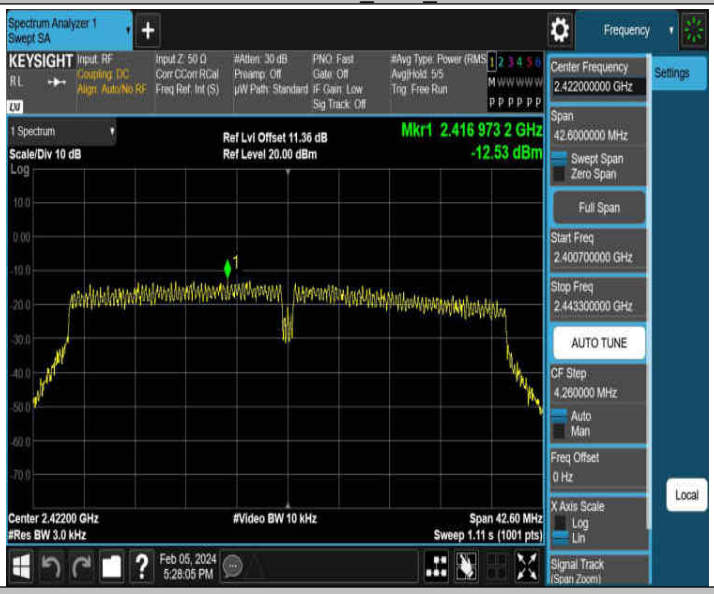
11N20MIMO_Ant2_2462



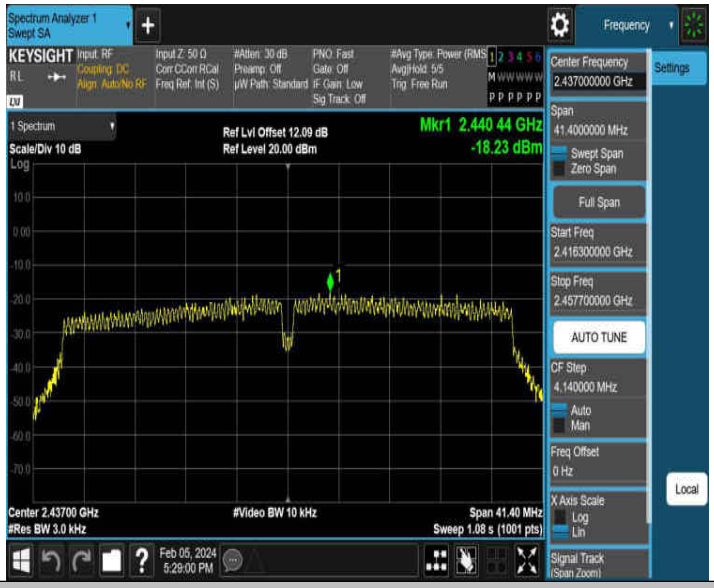
11N40MIMO_Ant1_2422



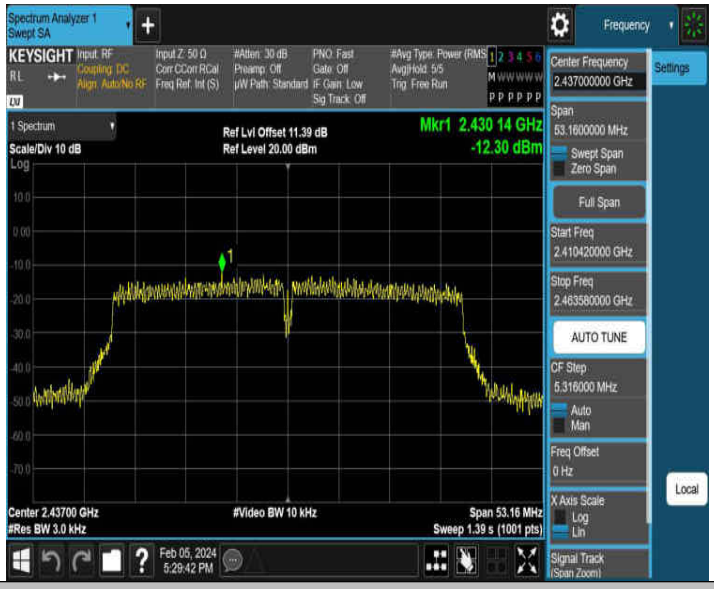
11N40MIMO_Ant2_2422



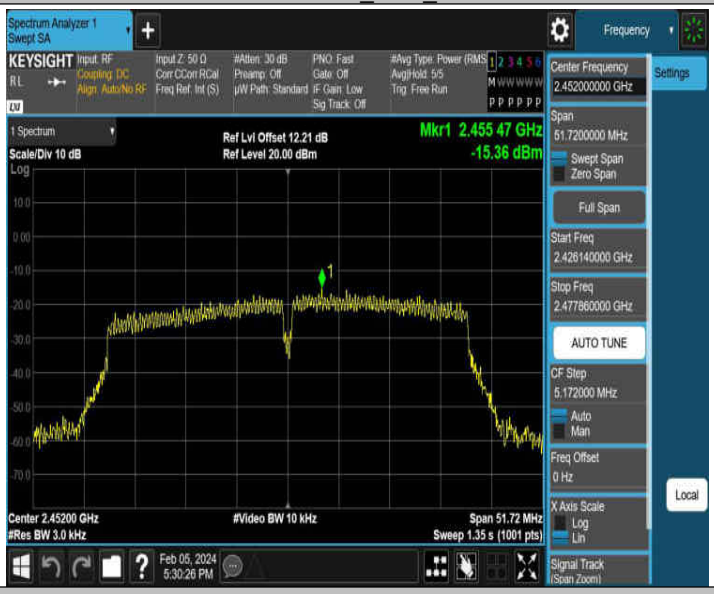
11N40MIMO_Ant1_2437



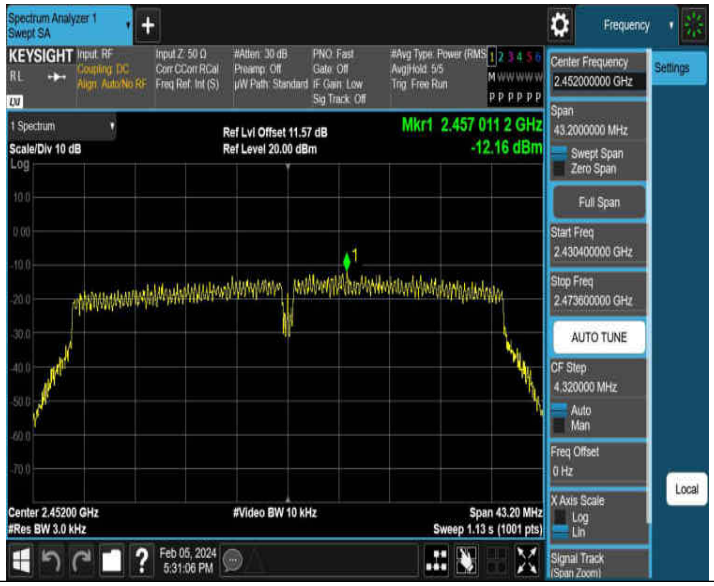
11N40MIMO_Ant2_2437



11N40MIMO_Ant1_2452



11N40MIMO_Ant2_2452


Spectrum Analyzer 1
Swept SA
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto/No RF
Input Z: 50 Ω
Corr CCorr RCal
Freq Ref: Int (S)
#Atten: 30 dB
Preamp: Off
µW Path: Standard
PNO: Fast
Gate: Off
IF Gain: Low
Sig Track: Off
#Avg Type: Power (RMS)
Avg|Hold: 5/5
Trig: Free Run
1 Spectrum
Scale/Div 10 dB
Log
Ref Lvl Offset 11.57 dB
Ref Level 20.00 dBm
Mkr1 2.457 011 2 GHz
-12.16 dBm
Center 2.45200 GHz
#Res BW 3.0 kHz
#Video BW 10 kHz
Span 43.20 MHz
Sweep 1.13 s (1001 pts)
Feb 05, 2024
5:31:06 PM
Frequency
Settings
Center Frequency
2.452000000 GHz
Span
43.2000000 MHz
Swept Span
Zero Span
Full Span
Start Freq
2.430400000 GHz
Stop Freq
2.473600000 GHz
AUTO TUNE
CF Step
4.320000 MHz
Auto
Man
Freq Offset
0 Hz
X Axis Scale
Log
Lin
Signal Track
(Span Zoom)
Local

12. Conducted Band edge and Spurious Emissions

12.1. Block diagram of test setup

Same as section 8.1

12.2. Limits

CFR 47 FCC Part15 (15.247) Subpart C		
Section	Test Item	Limit
CFR 47 FCC §15.247 (d)	Conducted Bandedge and Spurious Emissions	at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

12.3. Test Procedure

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	100 kHz
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Connect the UUT to the spectrum analyzer and use the following settings:
Use the peak marker function to determine the maximum PSD level.

Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100 kHz
VBW	≥ 3 × RBW
measurement points	≥ span/RBW
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum amplitude level.

12.4. Test result

Test Mode	Ant.	Ch Name	Freq. (MHz)	Ref Level (dBm)	Result (dBm)	Limit (dBm)	Verdict
11B	Ant1	Low	2412	8.02	-38.11	≤-11.98	PASS
	Ant2	Low	2412	8.96	-37.29	≤-11.04	PASS
	Ant1	High	2462	8.01	-47.05	≤-11.99	PASS
	Ant2	High	2462	9.64	-47.28	≤-10.36	PASS
11G	Ant1	Low	2412	6.26	-34.48	≤-13.74	PASS
	Ant2	Low	2412	4.80	-37.24	≤-15.2	PASS
	Ant1	High	2462	6.34	-45.54	≤-13.66	PASS
	Ant2	High	2462	7.16	-45.16	≤-12.84	PASS
11N20MIMO	Ant1	Low	2412	4.45	-34.47	≤-15.55	PASS
	Ant2	Low	2412	5.95	-36.42	≤-14.05	PASS
	Ant1	High	2462	6.02	-46.97	≤-13.98	PASS
	Ant2	High	2462	6.74	-45.84	≤-13.26	PASS

11N40MIMO	Ant1	Low	2422	4.69	-32.17	≤-15.31	PASS
	Ant2	Low	2422	4.15	-30.42	≤-15.85	PASS
	Ant1	High	2452	2.56	-36.85	≤-17.44	PASS
	Ant2	High	2452	4.61	-37.65	≤-15.39	PASS

Test Mode	Ant.	Freq. (MHz)	Freq Range (Mhz)	Ref Level (dBm)	Result (dBm)	Limit (dBm)	Verdict
11B	Ant1	2412	30~1000	8.02	-60.58	≤-11.98	PASS
			1000~26500	8.02	-48.84	≤-11.98	PASS
	Ant2	2412	30~1000	8.96	-62.56	≤-11.04	PASS
			1000~26500	8.96	-50.73	≤-11.04	PASS
	Ant1	2437	30~1000	8.44	-61.53	≤-11.56	PASS
			1000~26500	8.44	-47.26	≤-11.56	PASS
	Ant2	2437	30~1000	9.53	-61.55	≤-10.47	PASS
			1000~26500	9.53	-51	≤-10.47	PASS
	Ant1	2462	30~1000	8.01	-60.52	≤-11.99	PASS
			1000~26500	8.01	-48.03	≤-11.99	PASS
	Ant2	2462	30~1000	9.64	-60.61	≤-10.36	PASS
			1000~26500	9.64	-49.99	≤-10.36	PASS
11G	Ant1	2412	30~1000	6.26	-61.39	≤-13.74	PASS
			1000~26500	6.26	-49.69	≤-13.74	PASS
	Ant2	2412	30~1000	4.80	-62.16	≤-15.2	PASS
			1000~26500	4.80	-50.28	≤-15.2	PASS
	Ant1	2437	30~1000	6.84	-61.47	≤-13.16	PASS
			1000~26500	6.84	-49.49	≤-13.16	PASS
	Ant2	2437	30~1000	7.39	-61.29	≤-12.61	PASS
			1000~26500	7.39	-50.44	≤-12.61	PASS
	Ant1	2462	30~1000	6.34	-61.52	≤-13.66	PASS
			1000~26500	6.34	-50.48	≤-13.66	PASS
	Ant2	2462	30~1000	7.16	-61.4	≤-12.84	PASS
			1000~26500	7.16	-50.39	≤-12.84	PASS
11N20MIMO	Ant1	2412	30~1000	4.45	-61.21	≤-15.55	PASS
			1000~26500	4.45	-50.35	≤-15.55	PASS
		2437	30~1000	4.32	-61.11	≤-15.68	PASS
			1000~26500	4.32	-47.27	≤-15.68	PASS
	Ant2	2437	30~1000	6.05	-61.95	≤-13.95	PASS
			1000~26500	6.05	-47.52	≤-13.95	PASS
	Ant1	2462	30~1000	6.02	-60.58	≤-13.98	PASS
			1000~26500	6.02	-49.25	≤-13.98	PASS
	Ant2	2462	30~1000	6.74	-61.64	≤-13.26	PASS
			1000~26500	6.74	-49.38	≤-13.26	PASS
11N40MIMO	Ant1	2422	30~1000	4.69	-61.12	≤-15.31	PASS
			1000~26500	4.69	-50.03	≤-15.31	PASS
	Ant2	2422	30~1000	4.15	-61.12	≤-15.85	PASS
			1000~26500	4.15	-50.36	≤-15.85	PASS
	Ant1	2437	30~1000	4.44	-60.94	≤-15.56	PASS
			1000~26500	4.44	-48.65	≤-15.56	PASS
	Ant2	2437	30~1000	3.63	-61.8	≤-16.37	PASS
			1000~26500	3.63	-48.08	≤-16.37	PASS
	Ant1	2452	30~1000	2.56	-61.66	≤-17.44	PASS
			1000~26500	2.56	-49.94	≤-17.44	PASS

	Ant2	2452	30~1000	4.61	-60.83	≤-15.39	PASS
			1000~26500	4.61	-48.79	≤-15.39	PASS

12.5. Original test data

Reference level

11B_Ant1_2412

11B_Ant2_2412

11B_Ant1_2437

11B_Ant2_2437

11B_Ant1_2462

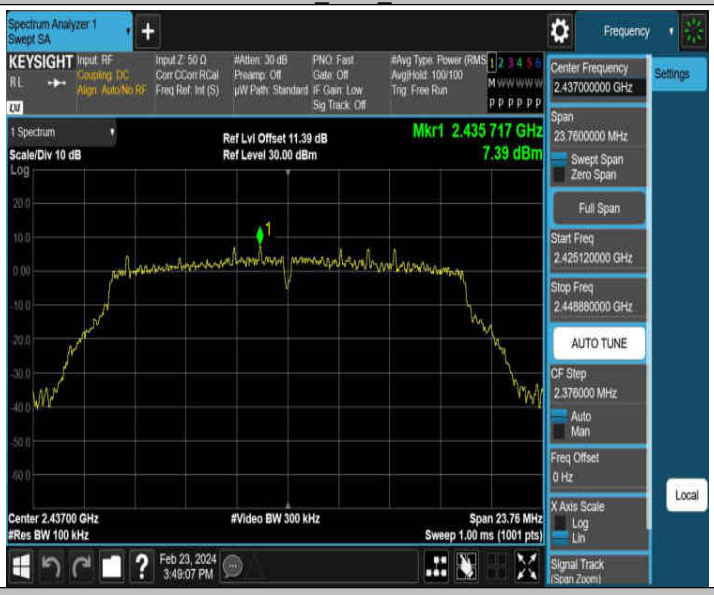
11B_Ant2_2462

11G_Ant1_2412

11G_Ant2_2412

11G_Ant1_2437

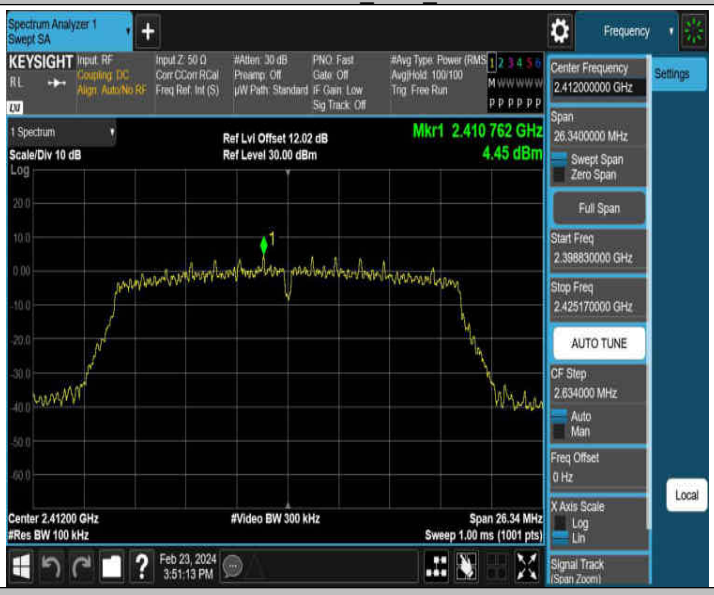
11G_Ant2_2437



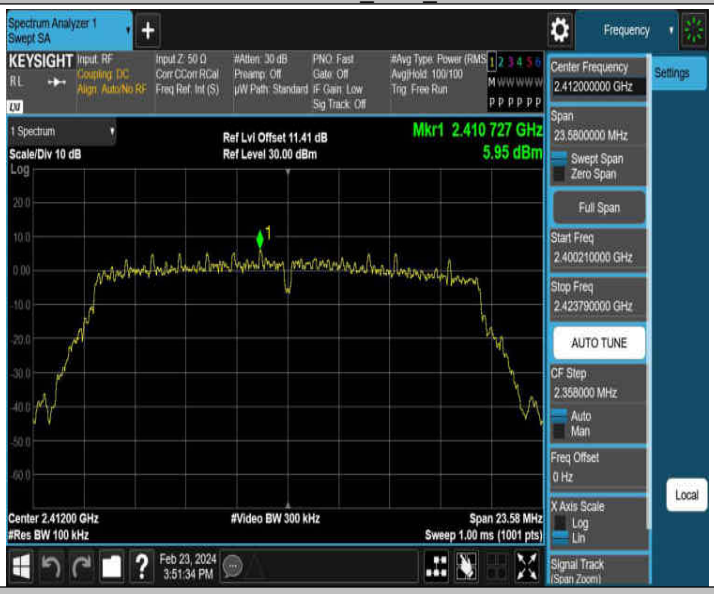
11G_Ant1_2462

11G_Ant2_2462

11N20MIMO_Ant1_2412



11N20MIMO_Ant2_2412

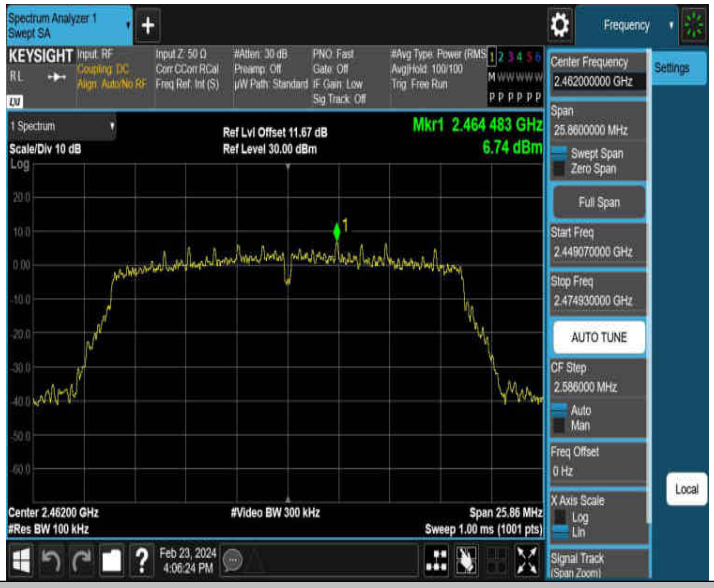


11N20MIMO_Ant1_2437

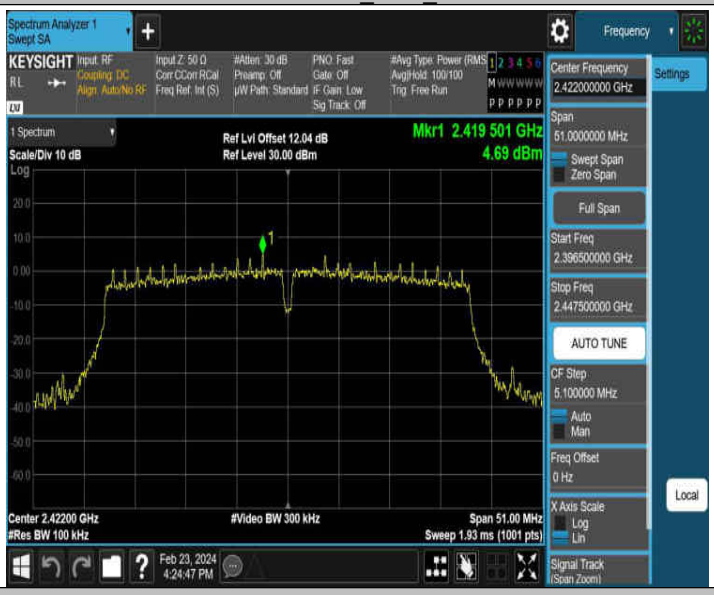
11N20MIMO_Ant2_2437

11N20MIMO_Ant1_2462

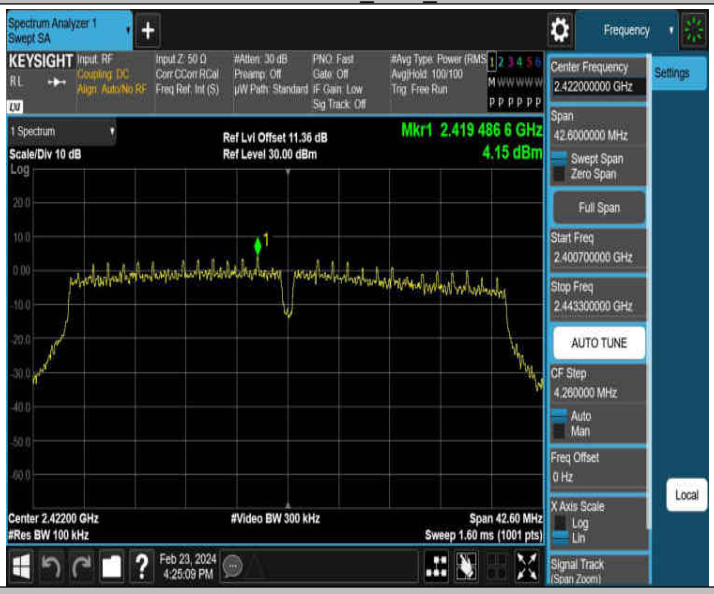
11N20MIMO_Ant2_2462



11N40MIMO_Ant1_2422



11N40MIMO_Ant2_2422



11N40MIMO_Ant1_2437