



BUREAU Test Report No.: W7L-P22110036RF02
VERITAS

3.4.7 TEST RESULTS

3.4.7.1 MAXIMUM PEAK OUTPUT POWER

Please Refer to Appendix1/2 Of this test report.



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3.4.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)

The average power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

Please Refer to Appendix1/2 Of this test report.

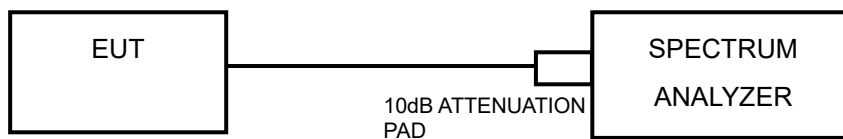


3.5 POWER SPECTRAL DENSITY MEASUREMENT

3.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm/3KHz.

3.5.2 TEST SETUP



3.5.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.5.4 TEST PROCEDURE

1. Set the span to 1.5 times the DTS bandwidth
2. Set the RBW = 3 kHz, VBW $\geq 3 \times$ RBW, Detector = peak.
3. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

3.5.5 DEVIATION FROM TEST STANDARD

No deviation.

3.5.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



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3.5.7 TEST RESULTS

Please Refer to Appendix1/2 Of this test report.

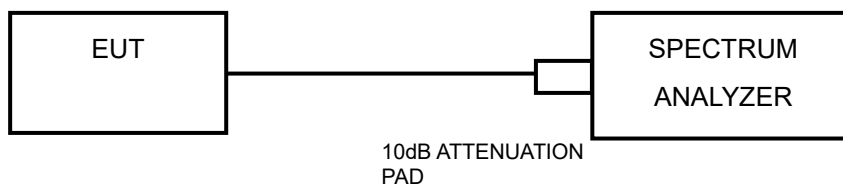


3.6 OUT OF BAND EMISSION MEASUREMENT

3.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

3.6.2 TEST SETUP



3.6.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW \geq 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.



MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW \geq 300 kHz.
3. Set span to encompass the spectrum to be examined
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

3.6.5 DEVIATION FROM TEST STANDARD

No deviation.

3.6.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.6.7 TEST RESULTS

The spectrum plots are attached on the following images. D1 line indicates the highest level. D2 line indicates the 20dB offset below D1. It shows compliance to the requirement.

Please Refer to Appendix1/2 Of this test report.



3.7 ANTENNA REQUIREMENTS

3.7.1 STANDARD APPLICABLE

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.7.2 ANTENNA CONNECTED CONSTRUCTION

An embedded-in antenna design is used.

3.7.3 ANTENNA GAIN

According to FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = GANT + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = $10 \log(NANT / Nss)$ dB;

For power measurements on IEEE 802.11 devices, Array Gain = 0 dB for $NANT \leq 4$;

The EUT supports Cyclic Delay Diversity (CDD) mode,

For power measurements, the directional GANT is set equal to the antenna having the highest gain as following formulas.

$$\text{Directional Gain} = \text{Max.Gain} + \text{Array Gain.}$$

For PSD measurements, the directional GANT calculation is following F)2)f)ii of KDB 662911 D01 v02r01.

The directional gain is calculated as following table.

2.4GHz	Ant 1 (dBi)	Ant 2 (dBi)	DG For Power (dBi)	DG For PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
	0.10	-3.70	0.10	1.42	0.00	0.00

NOTE :DG= directional gain, Power Limit Reduction = DG For Power Gain -6dBi<0

PSD Limit Reduction = DG For PSD - 6dBi<0. Therefore, it is not necessary to reduce maximum peak output power and PSD limit.



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4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



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5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.



6 Appendix 1

WLAN 2.4G DTS BANDWIDTH

TEST RESULT

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B-CDD	Ant1	2412	7.560	2408.000	2415.560	0.5	PASS
	Ant2	2412	7.600	2408.440	2416.040	0.5	PASS
	Ant1	2437	7.800	2432.960	2440.760	0.5	PASS
	Ant2	2437	8.120	2432.520	2440.640	0.5	PASS
	Ant1	2462	8.080	2457.960	2466.040	0.5	PASS
	Ant2	2462	8.040	2457.960	2466.000	0.5	PASS
11G-CDD	Ant1	2412	16.280	2403.880	2420.160	0.5	PASS
	Ant2	2412	16.320	2403.880	2420.200	0.5	PASS
	Ant1	2437	16.080	2428.840	2444.920	0.5	PASS
	Ant2	2437	16.360	2428.800	2445.160	0.5	PASS
	Ant1	2462	16.320	2453.840	2470.160	0.5	PASS
	Ant2	2462	16.320	2453.840	2470.160	0.5	PASS
11N20MIMO	Ant1	2412	15.600	2404.800	2420.400	0.5	PASS
	Ant2	2412	16.320	2404.480	2420.800	0.5	PASS
	Ant1	2437	17.560	2428.200	2445.760	0.5	PASS
	Ant2	2437	17.640	2428.160	2445.800	0.5	PASS
	Ant1	2462	17.560	2453.200	2470.760	0.5	PASS
	Ant2	2462	15.680	2453.200	2468.880	0.5	PASS
11N40MIMO	Ant1	2422	32.720	2404.240	2436.960	0.5	PASS
	Ant2	2422	32.560	2406.960	2439.520	0.5	PASS
	Ant1	2437	36.080	2418.840	2454.920	0.5	PASS
	Ant2	2437	36.320	2418.840	2455.160	0.5	PASS
	Ant1	2452	35.680	2433.840	2469.520	0.5	PASS
	Ant2	2452	35.680	2433.840	2469.520	0.5	PASS
11AX20MIMO	Ant1	2412	18.640	2402.720	2421.360	0.5	PASS
	Ant2	2412	16.920	2404.440	2421.360	0.5	PASS
	Ant1	2437	18.920	2427.520	2446.440	0.5	PASS



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	Ant2	2437	18.720	2427.520	2446.240	0.5	PASS
	Ant1	2462	18.880	2452.480	2471.360	0.5	PASS
	Ant2	2462	17.680	2452.560	2470.240	0.5	PASS
11AX40MIMO	Ant1	2422	34.000	2403.680	2437.680	0.5	PASS
	Ant2	2422	34.880	2405.680	2440.560	0.5	PASS
	Ant1	2437	38.000	2417.880	2455.880	0.5	PASS
	Ant2	2437	37.040	2418.040	2455.080	0.5	PASS
	Ant1	2452	37.840	2433.120	2470.960	0.5	PASS
	Ant2	2452	36.480	2433.120	2469.600	0.5	PASS



TEST GRAPHS

11B-CDD_Ant1_2412



11B-CDD_Ant2_2412



11B-CDD_Ant1_2437



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11B-CDD_Ant2_2437

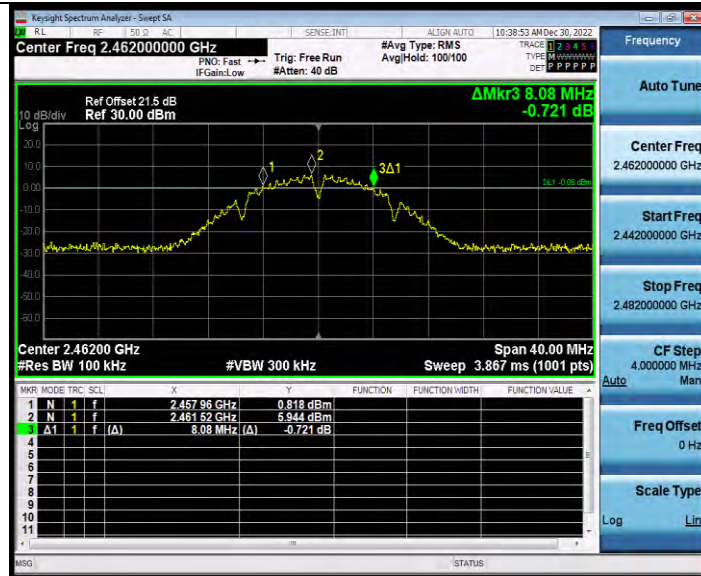


11B-CDD_Ant1_2462



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11B-CDD_Ant2_2462

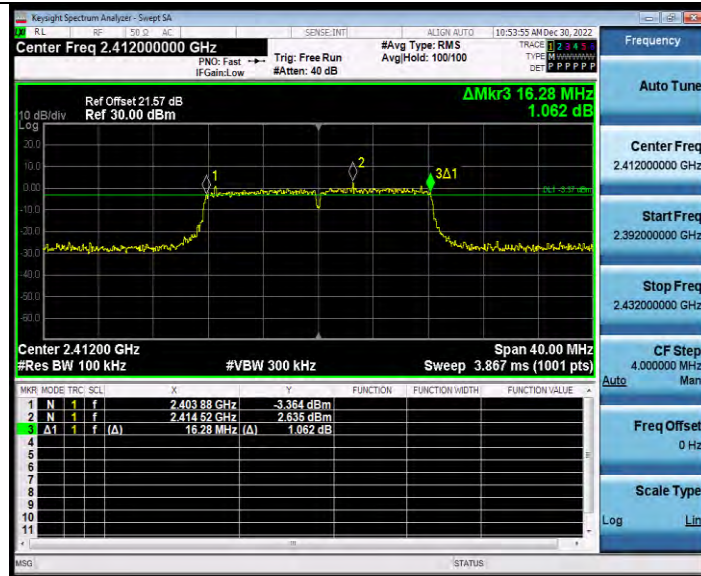


11G-CDD_Ant1_2412

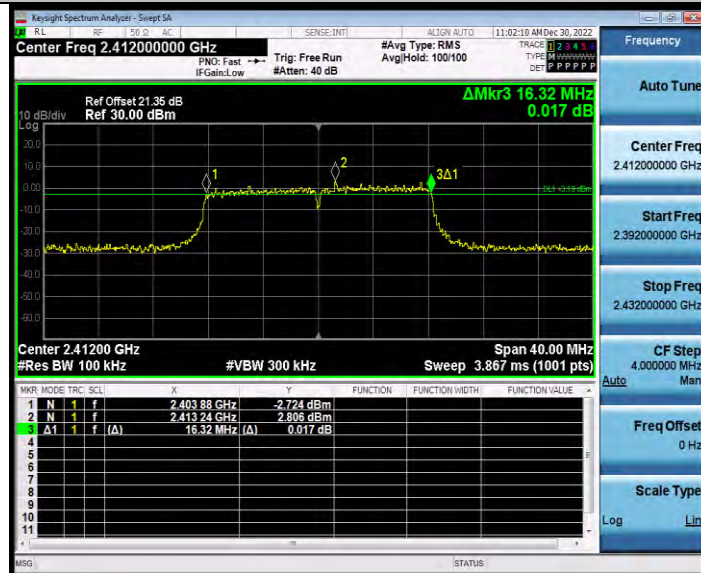


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11G-CDD_Ant2_2412



11G-CDD_Ant1_2437



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11G-CDD_Ant2_2437

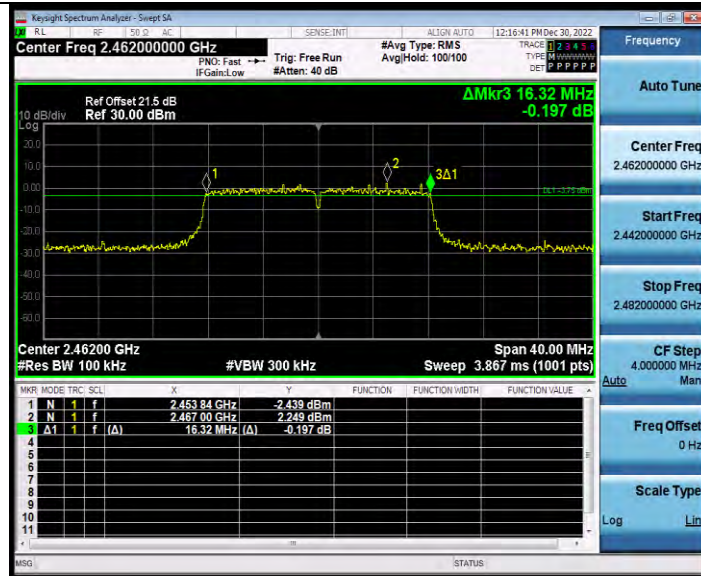


11G-CDD_Ant1_2462

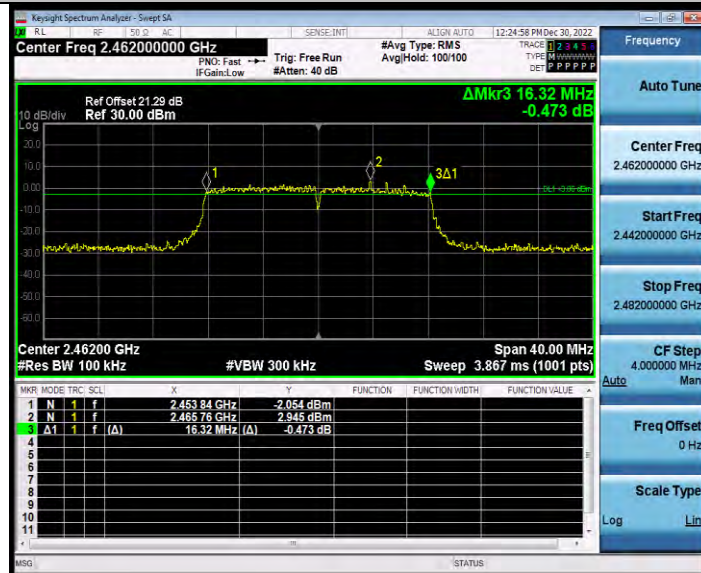


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11G-CDD_Ant2_2462

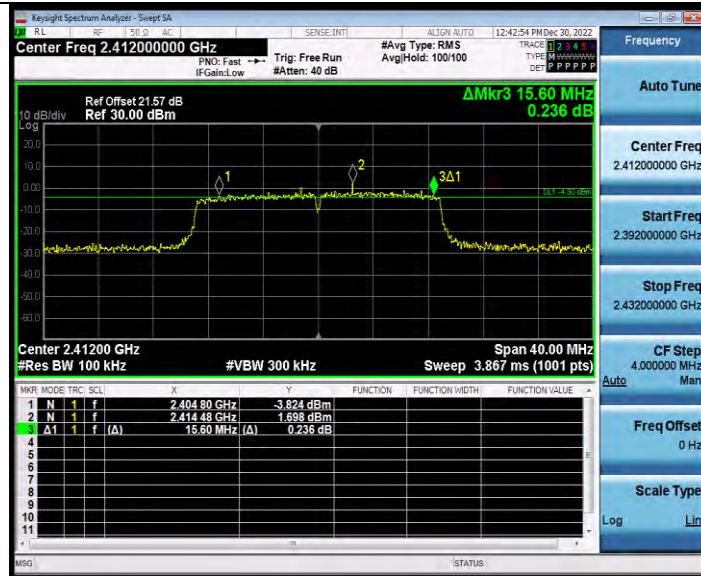


11N20MIMO_Ant1_2412



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11N20MIMO_Ant2_2412

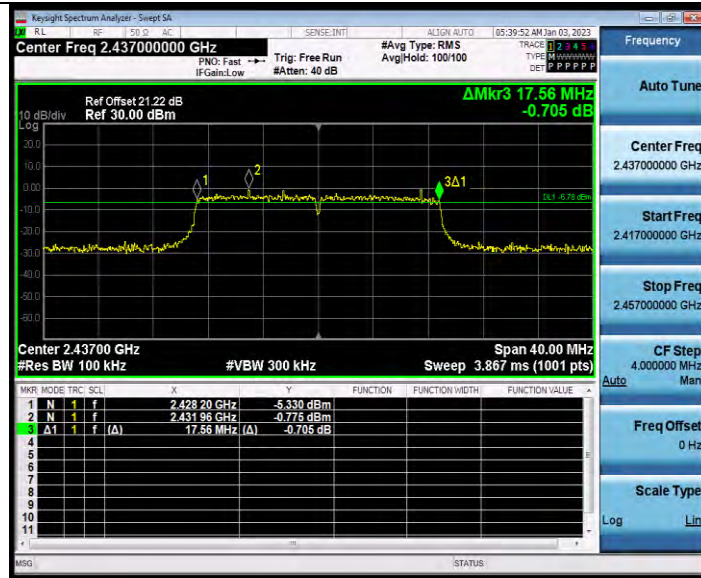


11N20MIMO_Ant1_2437



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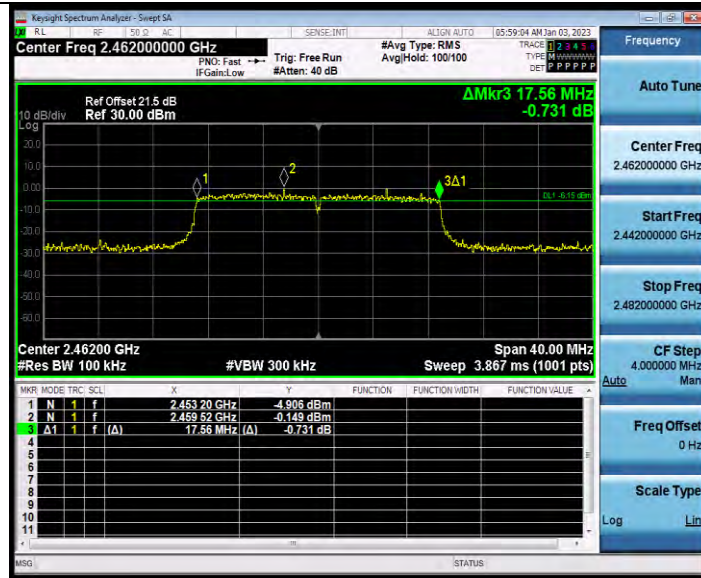


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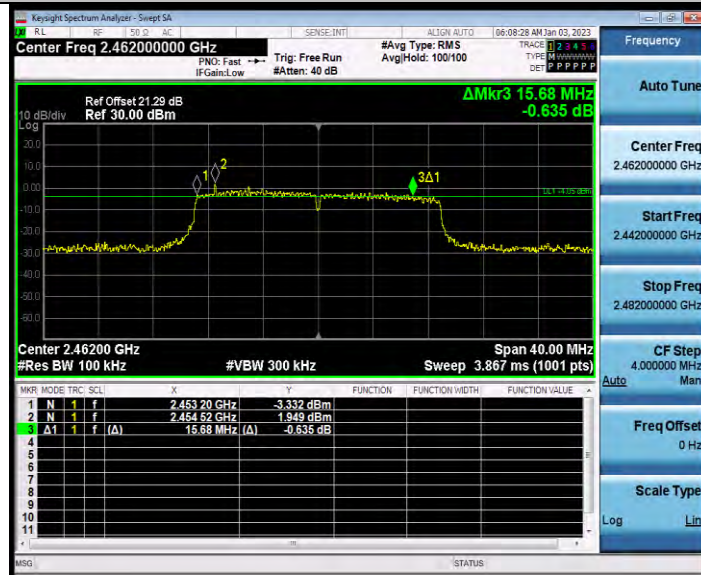


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11N20MIMO_Ant2_2462

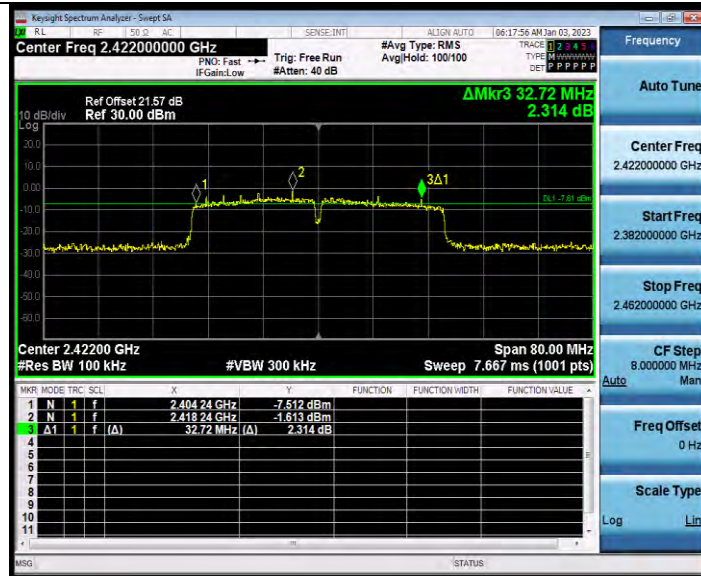


11N40MIMO_Ant1_2422



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11N40MIMO_Ant2_2422

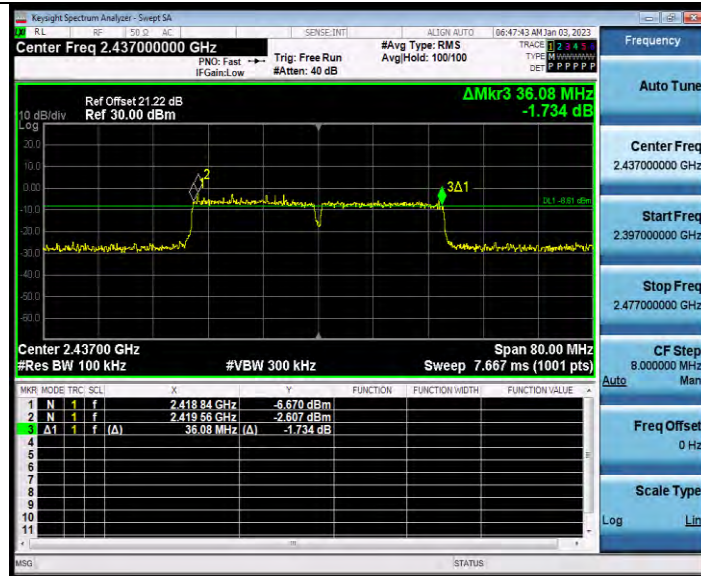


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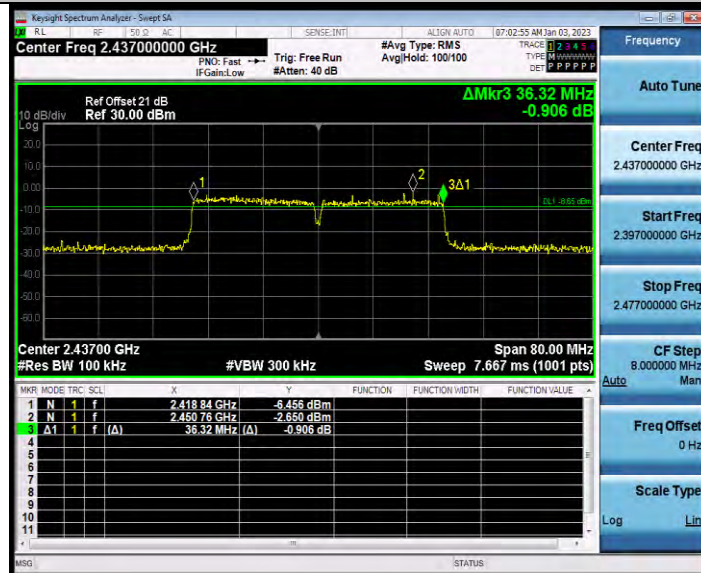


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11N40MIMO_Ant2_2437

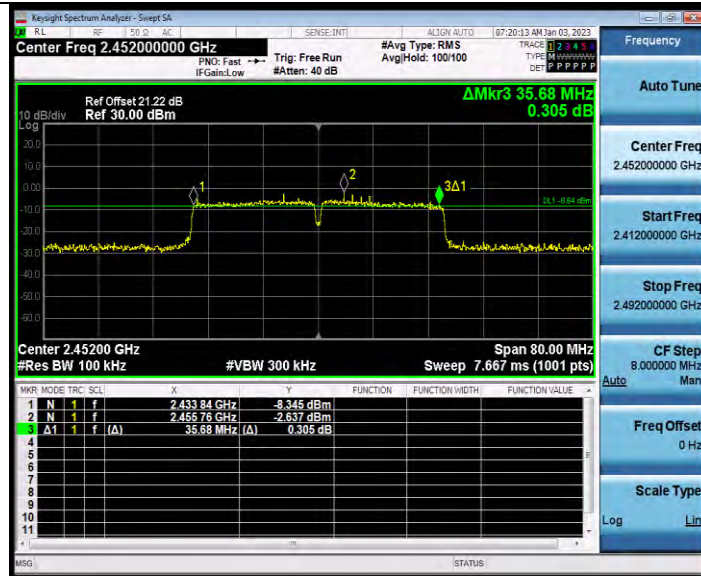


11N40MIMO_Ant1_2452



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11N40MIMO_Ant2_2452

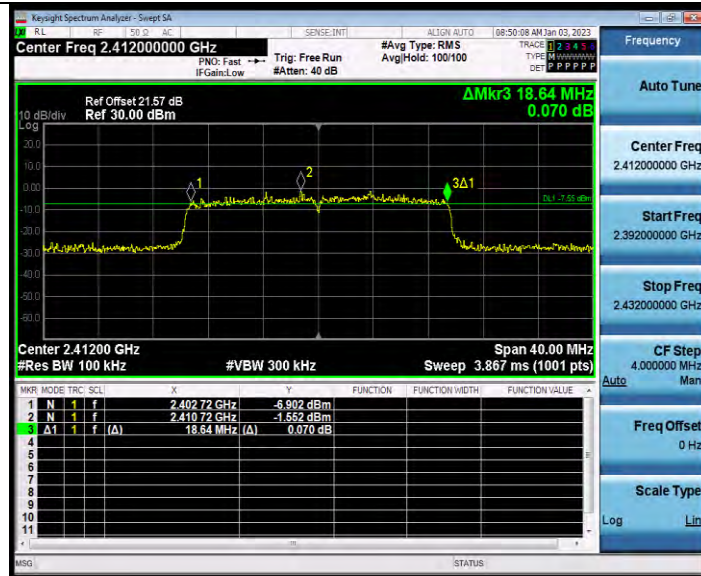


11AX20MIMO_Ant1_2412



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11AX20MIMO_Ant2_2412

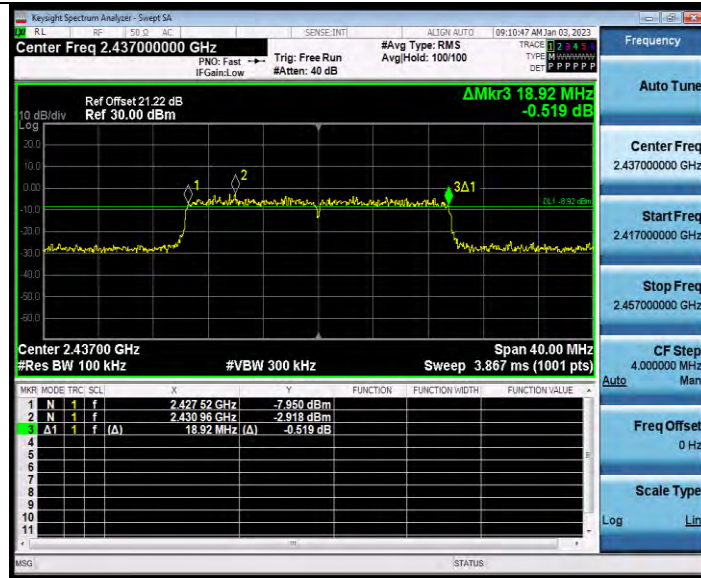


11AX20MIMO_Ant1_2437

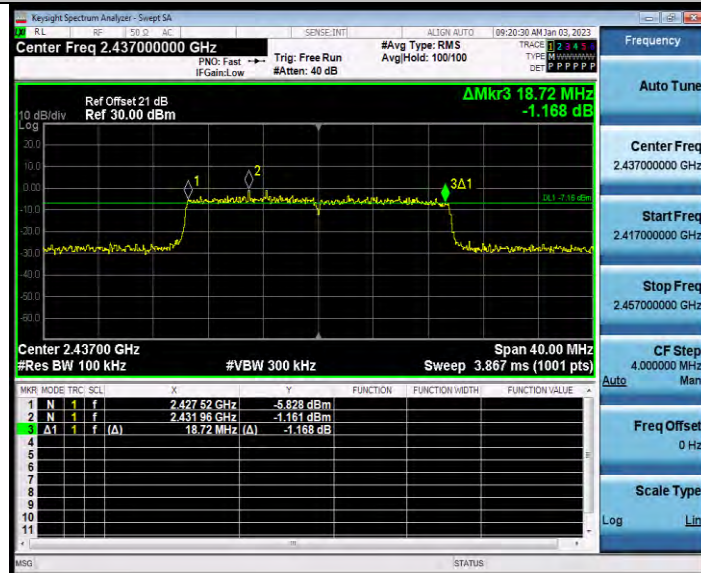


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11AX20MIMO_Ant2_2437

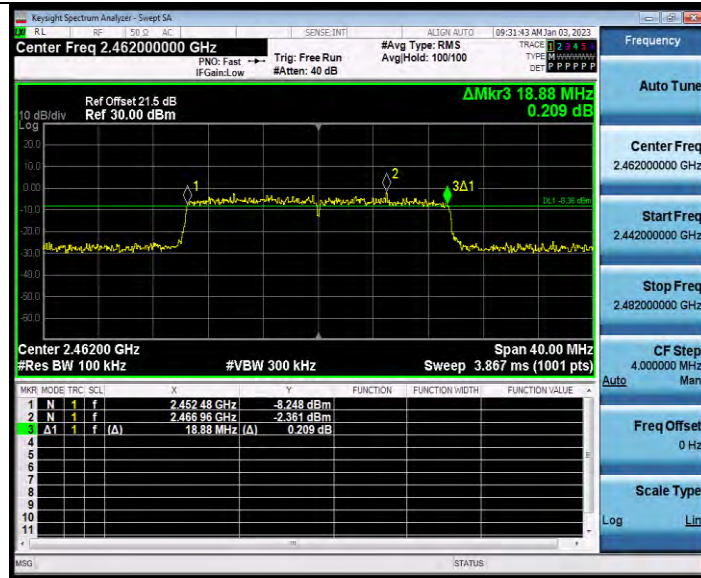


11AX20MIMO_Ant1_2462

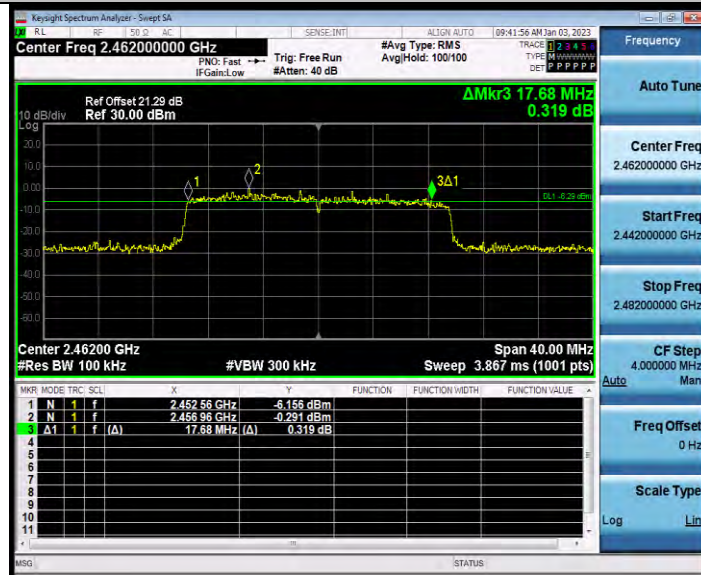


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11AX20MIMO_Ant2_2462

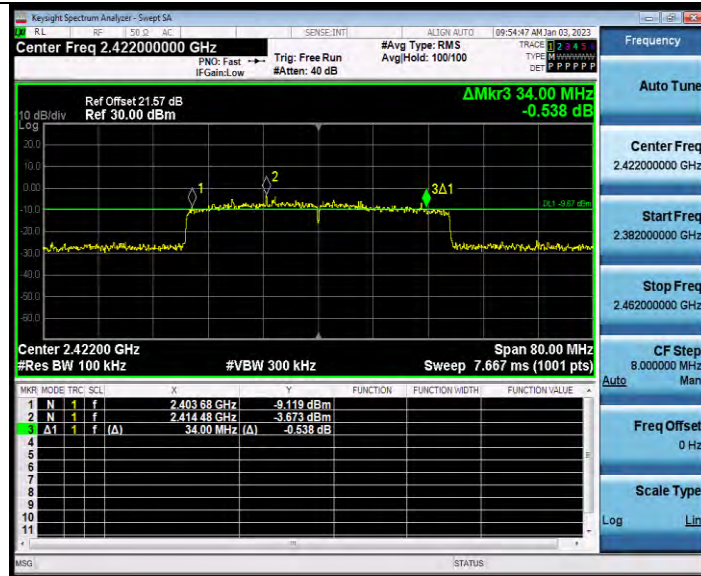


11AX40MIMO_Ant1_2422



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11AX40MIMO_Ant2_2422

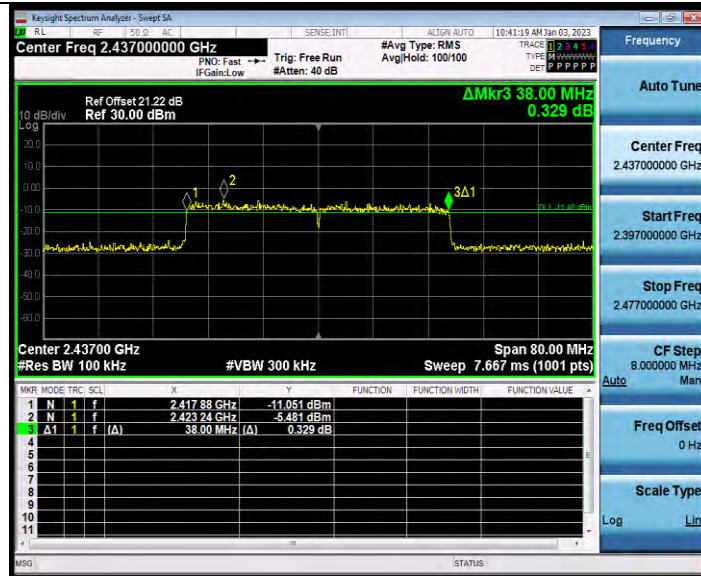


11AX40MIMO_Ant1_2437

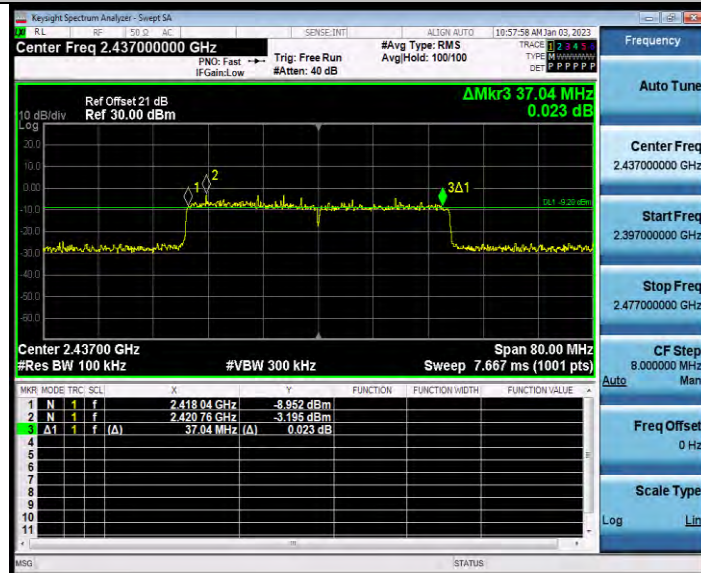


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11AX40MIMO_Ant2_2437

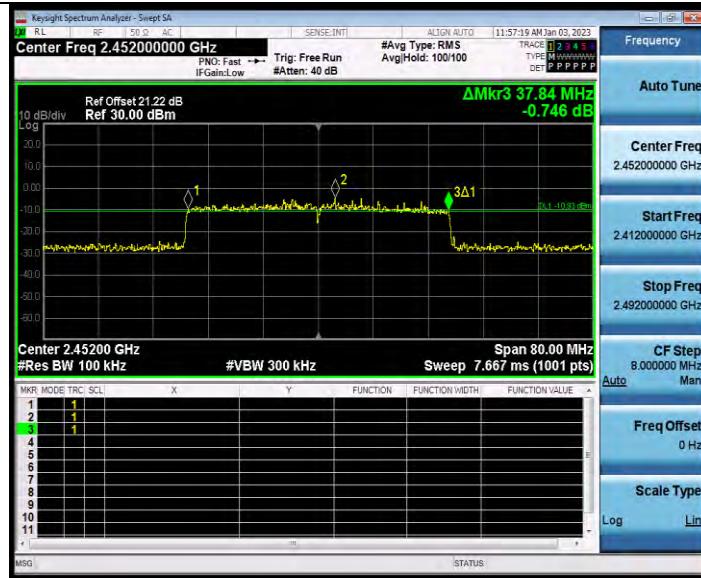


11AX40MIMO_Ant1_2452



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11AX40MIMO_Ant2_2452





OCCUPIED CHANNEL BANDWIDTH

TEST RESULT

TestMode	Antenna	Channel Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B-CDD	Ant1	2412	14.552	2404.8815	2419.4335	---	---
	Ant2	2412	14.463	2404.9795	2419.4425	---	---
	Ant1	2437	14.957	2429.3897	2444.3467	---	---
	Ant2	2437	14.701	2429.4585	2444.1595	---	---
	Ant1	2462	14.704	2454.5867	2469.2907	---	---
	Ant2	2462	14.312	2454.7324	2469.0444	---	---
11G-CDD	Ant1	2412	16.766	2403.6575	2420.4235	---	---
	Ant2	2412	16.699	2403.7382	2420.4372	---	---
	Ant1	2437	16.863	2428.4972	2445.3602	---	---
	Ant2	2437	16.755	2428.5800	2445.3350	---	---
	Ant1	2462	16.793	2453.5651	2470.3581	---	---
	Ant2	2462	16.644	2453.6547	2470.2987	---	---
11N20MIMO	Ant1	2412	17.948	2403.1105	2421.0585	---	---
	Ant2	2412	17.963	2403.1407	2421.1037	---	---
	Ant1	2437	18.217	2427.8798	2446.0968	---	---
	Ant2	2437	18.104	2427.9401	2446.0441	---	---
	Ant1	2462	18.153	2452.8901	2471.0431	---	---
	Ant2	2462	17.981	2452.9347	2470.9157	---	---
11N40MIMO	Ant1	2422	37.197	2403.4365	2440.6335	---	---
	Ant2	2422	36.759	2403.7001	2440.4591	---	---
	Ant1	2437	37.553	2418.1261	2455.6791	---	---
	Ant2	2437	37.099	2418.4184	2455.5174	---	---
	Ant1	2452	37.519	2433.2925	2470.8115	---	---
	Ant2	2452	37.151	2433.3511	2470.5021	---	---
11AX20MIMO	Ant1	2412	19.239	2402.4305	2421.6695	---	---
	Ant2	2412	19.206	2402.4803	2421.6863	---	---
	Ant1	2437	19.343	2427.2983	2446.6413	---	---
	Ant2	2437	19.293	2427.3260	2446.6190	---	---
	Ant1	2462	19.347	2452.2928	2471.6398	---	---



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	Ant2	2462	19.222	2452.3273	2471.5493	---	---
11AX40MIMO	Ant1	2422	39.743	2402.3195	2442.0625	---	---
	Ant2	2422	38.735	2402.7290	2441.4640	---	---
	Ant1	2437	42.035	2416.0149	2458.0499	---	---
	Ant2	2437	39.122	2417.4006	2456.5226	---	---
	Ant1	2452	42.408	2430.6269	2473.0349	---	---
	Ant2	2452	39.778	2432.0384	2471.8164	---	---



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TEST GRAPHS



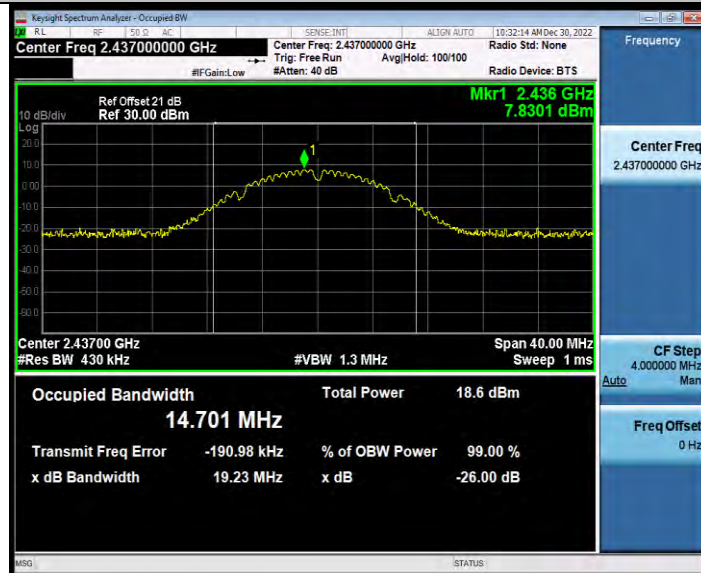


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11B-CDD_Ant2_2437

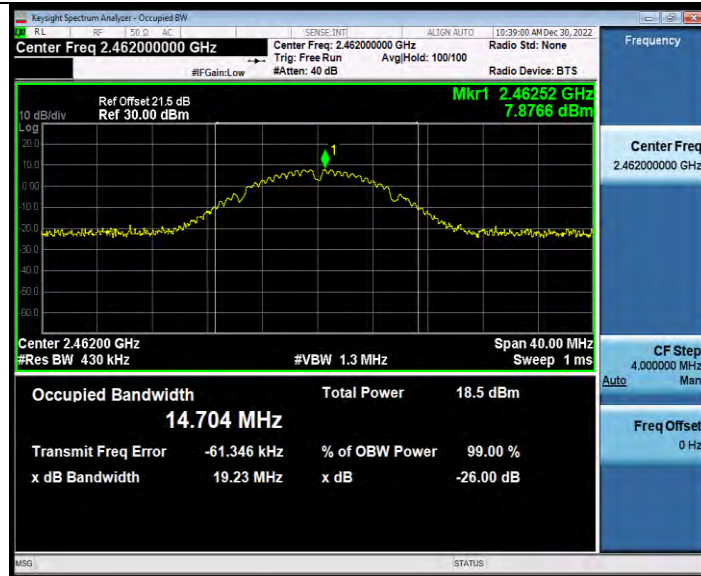


11B-CDD_Ant1_2462

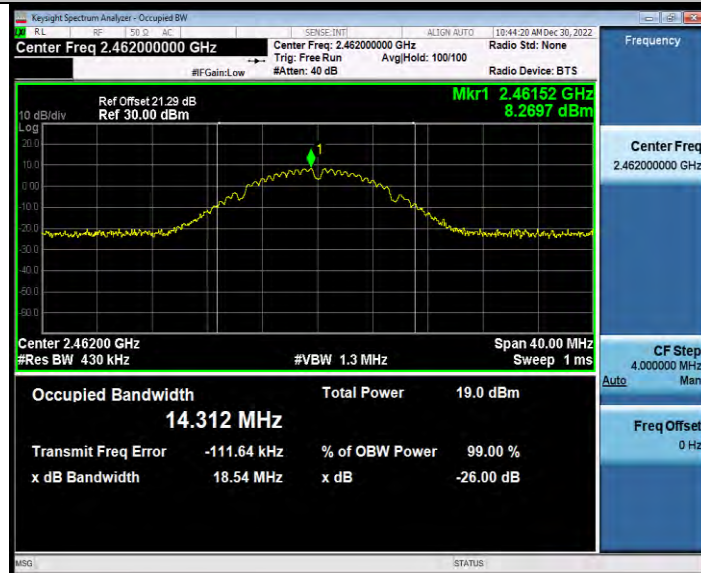


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11B-CDD_Ant2_2462

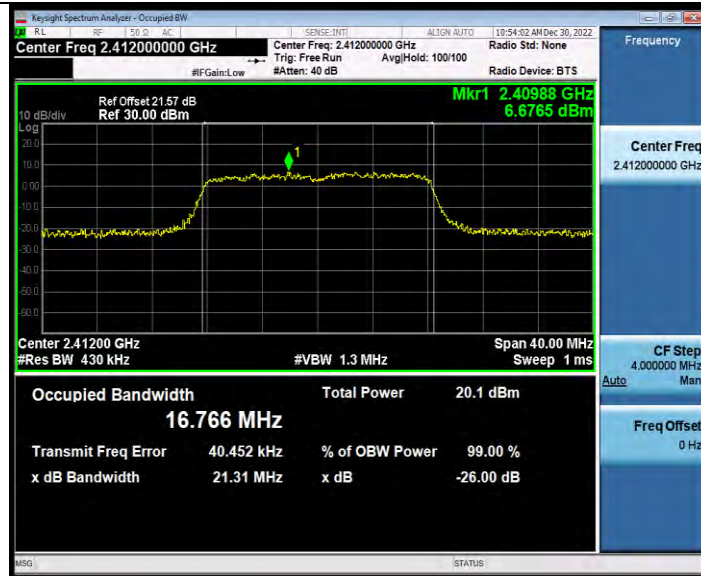


11G-CDD_Ant1_2412

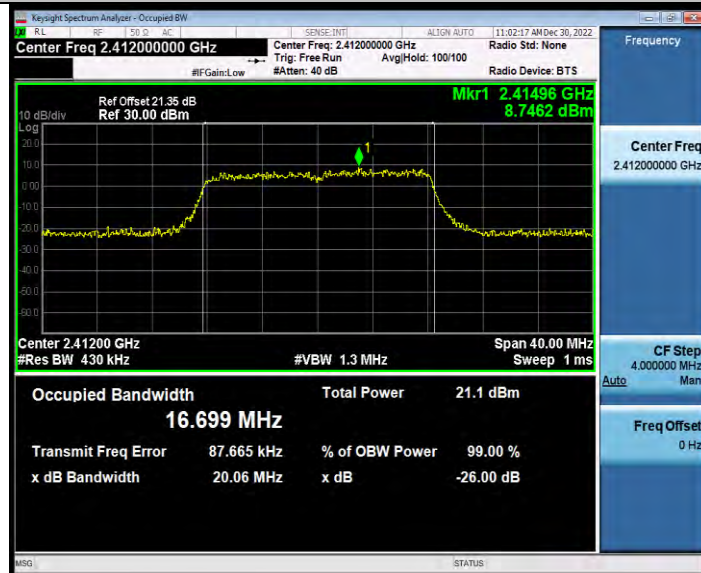


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11G-CDD_Ant2_2412

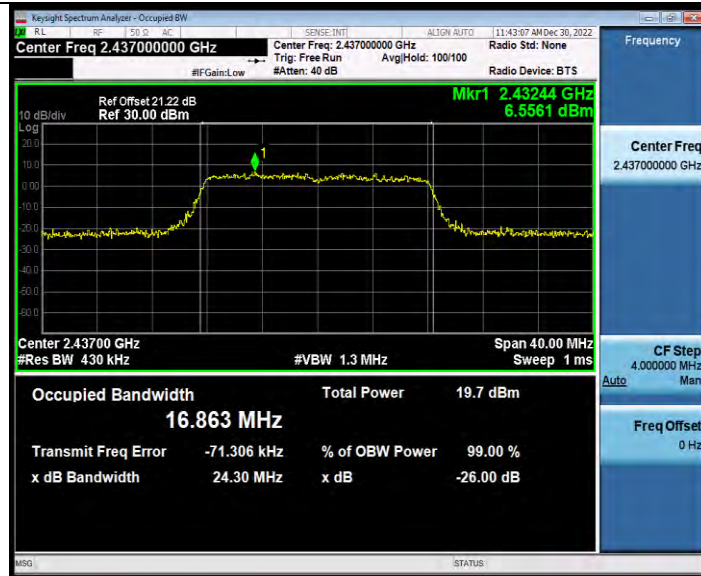


11G-CDD_Ant1_2437

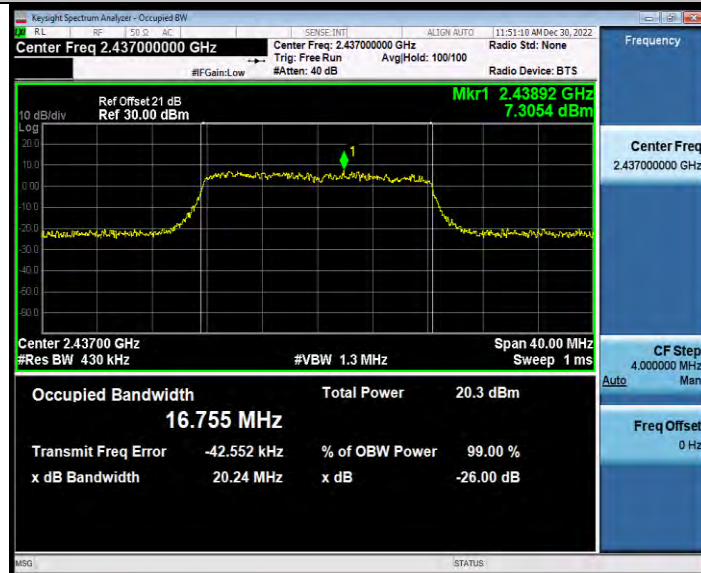


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11G-CDD_Ant2_2437

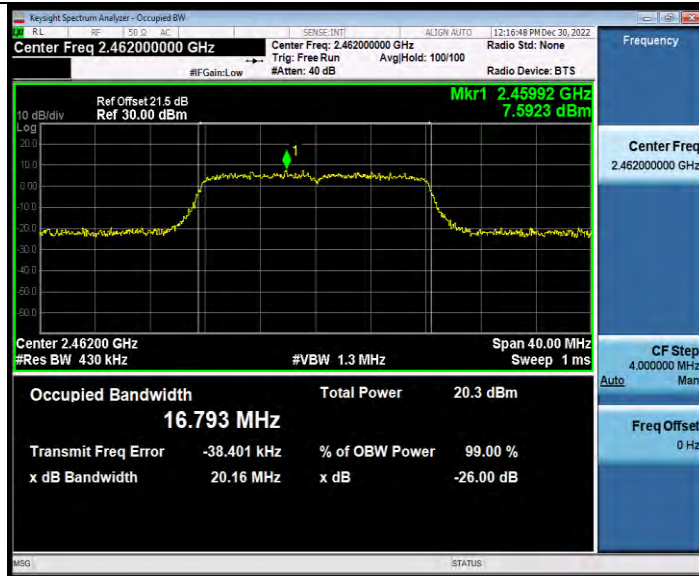


11G-CDD_Ant1_2462

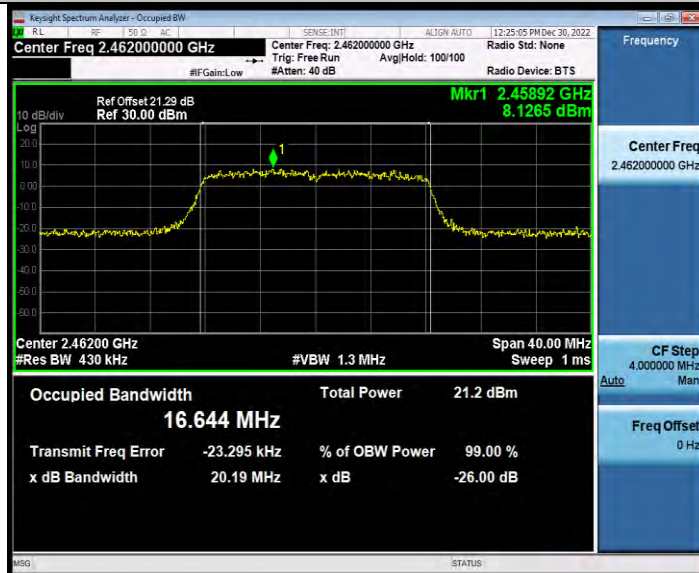


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11G-CDD_Ant2_2462

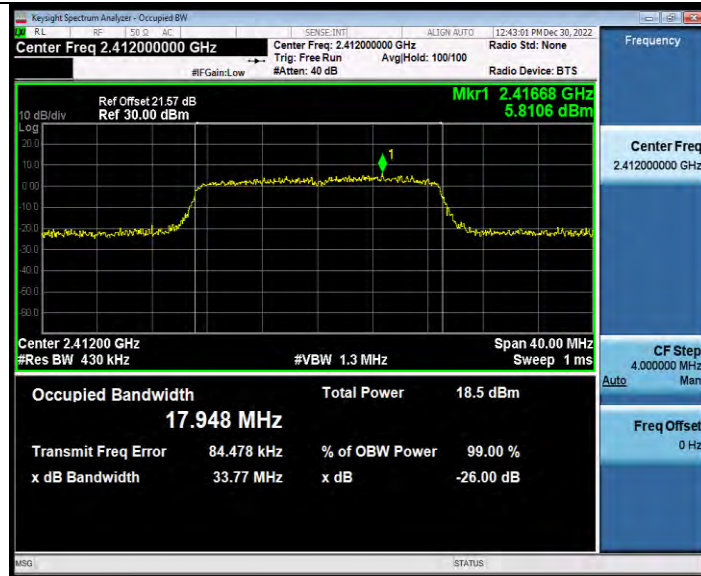


11N20MIMO_Ant1_2412

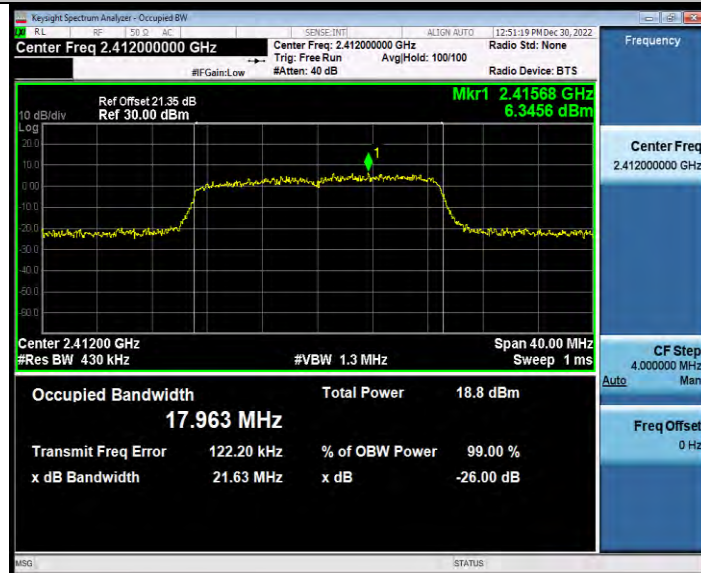


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11N20MIMO_Ant2_2412



11N20MIMO_Ant1_2437