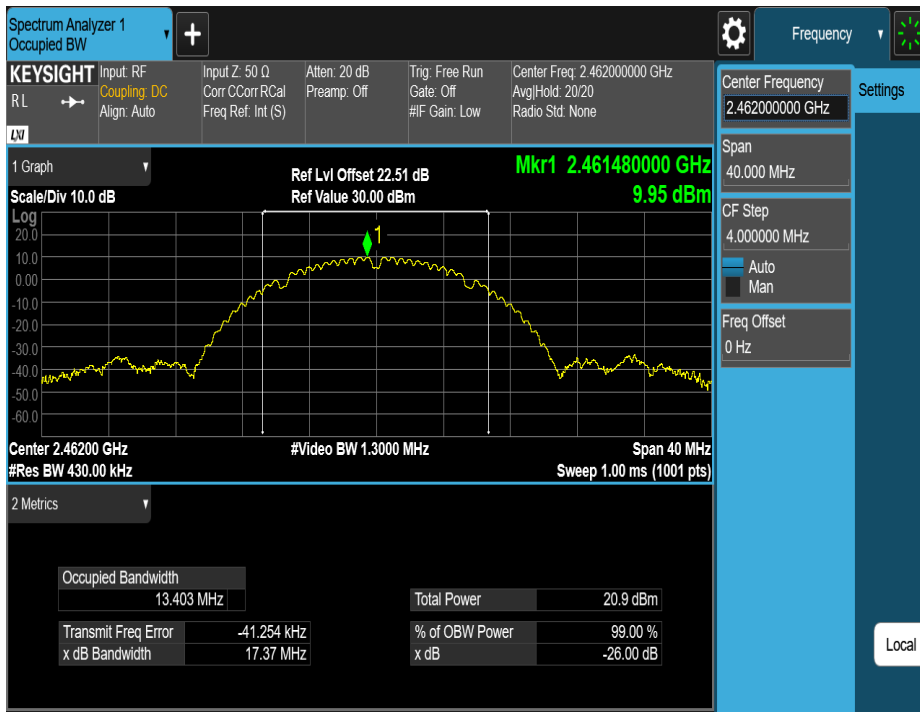


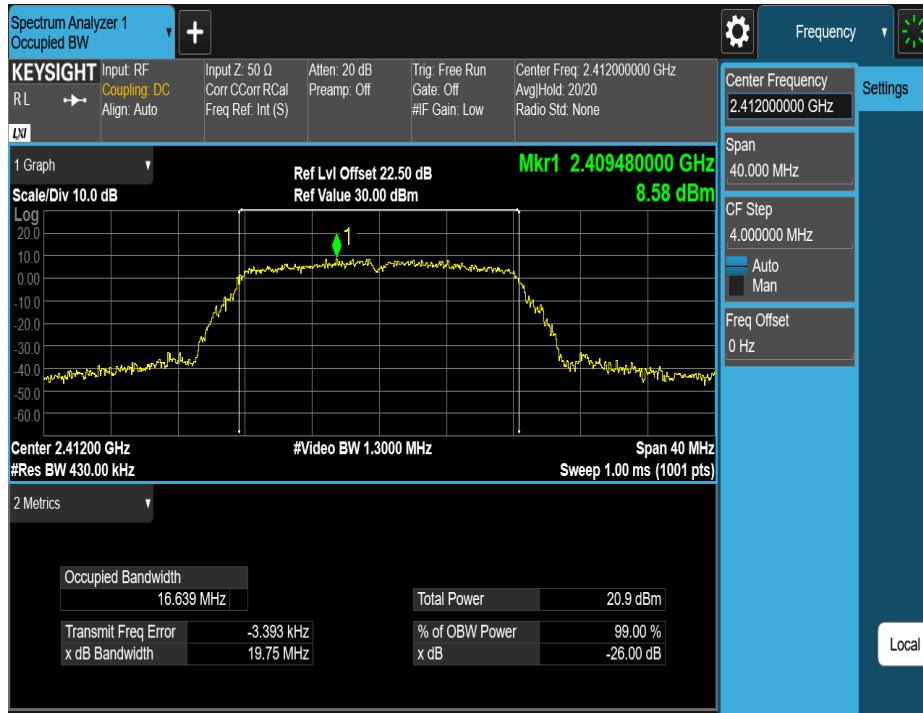
11B-CDD_Ant1_2462



11B-CDD_Ant2_2462



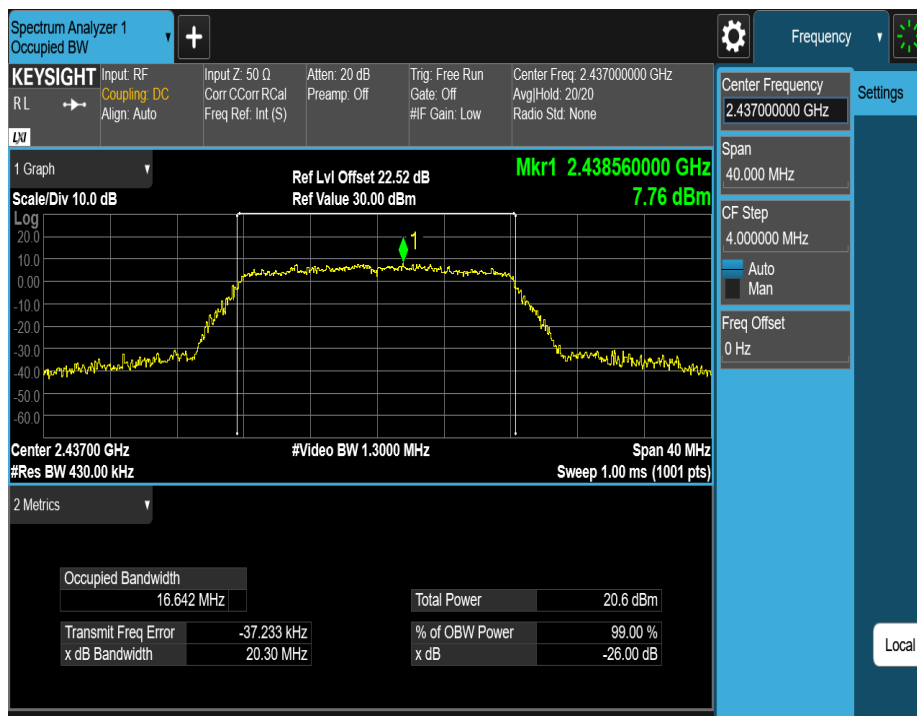
11G-CDD_Ant1_2412



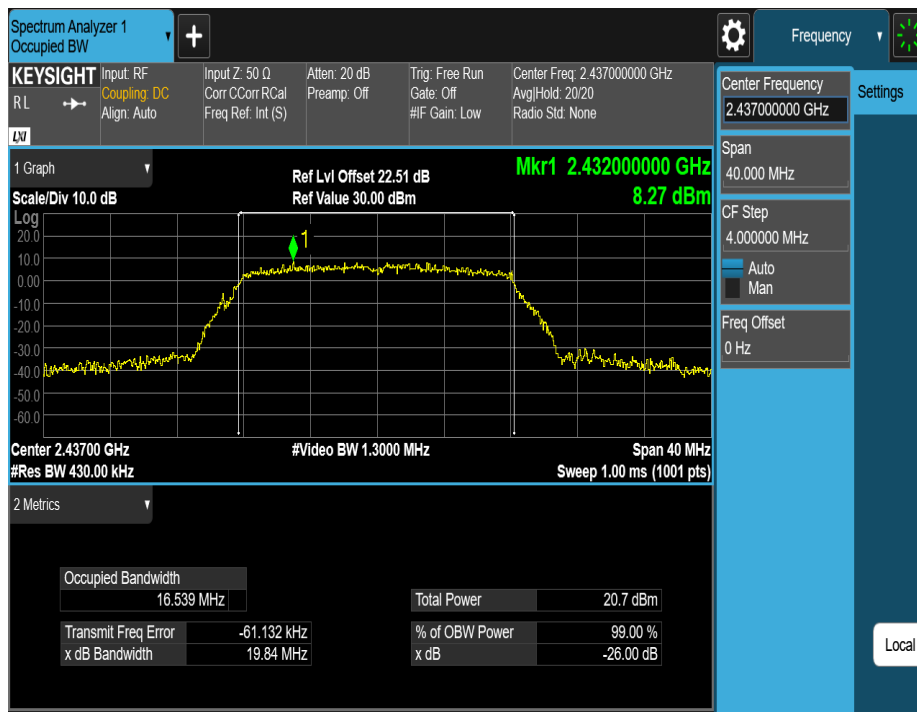
11G-CDD_Ant2_2412



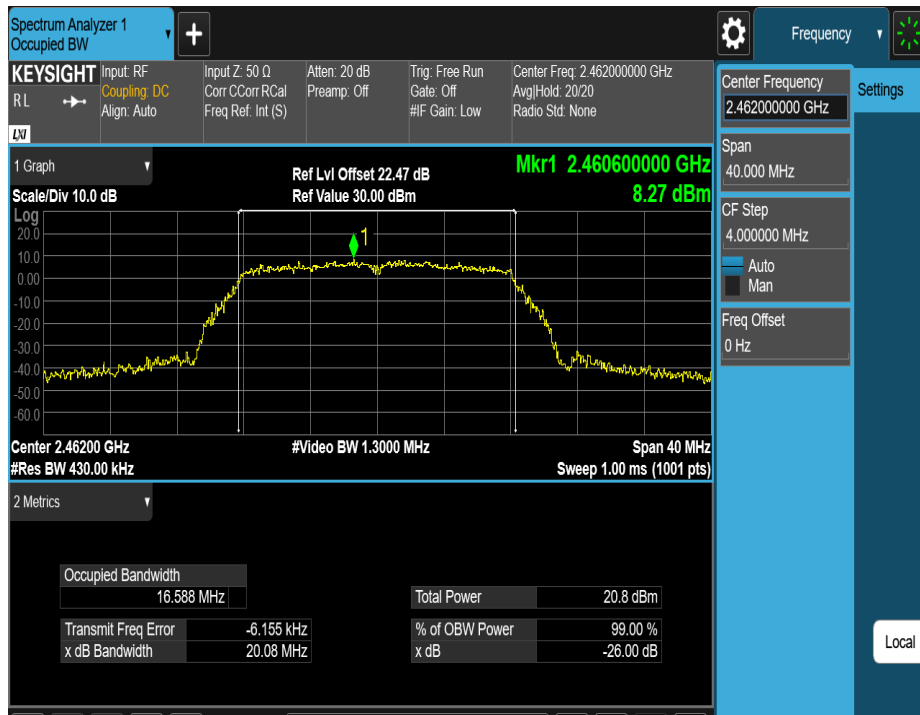
11G-CDD_Ant1_2437



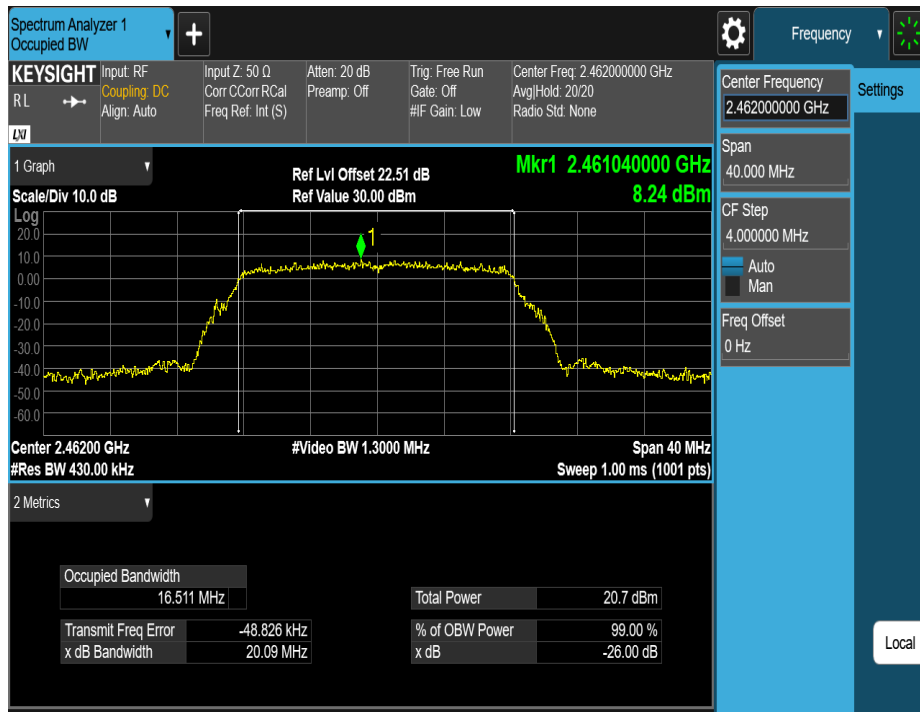
11G-CDD_Ant2_2437



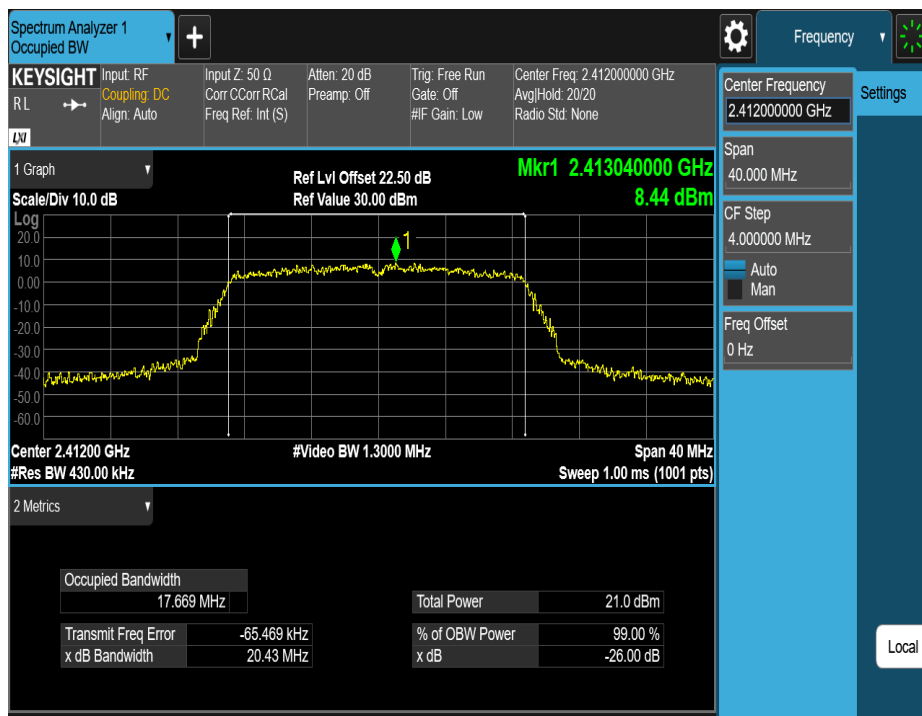
11G-CDD_Ant1_2462



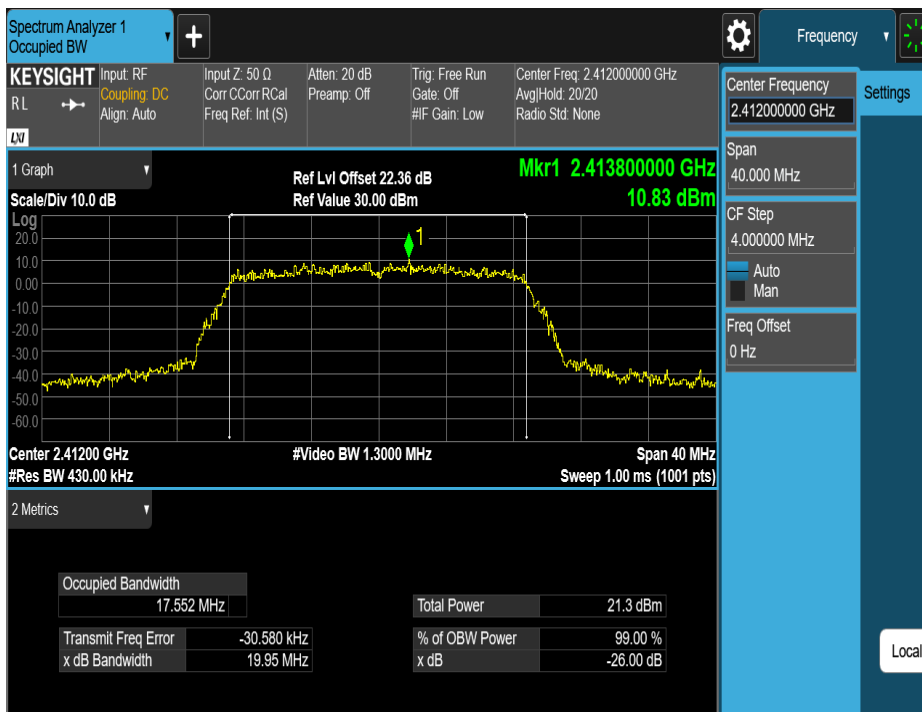
11G-CDD_Ant2_2462



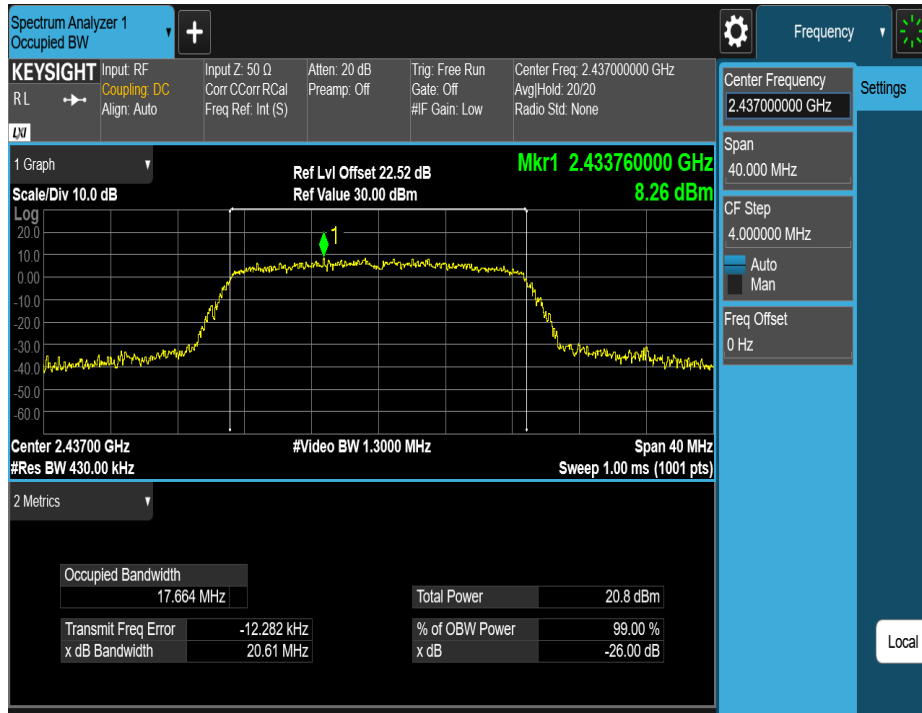
11N20MIMO_Ant1_2412



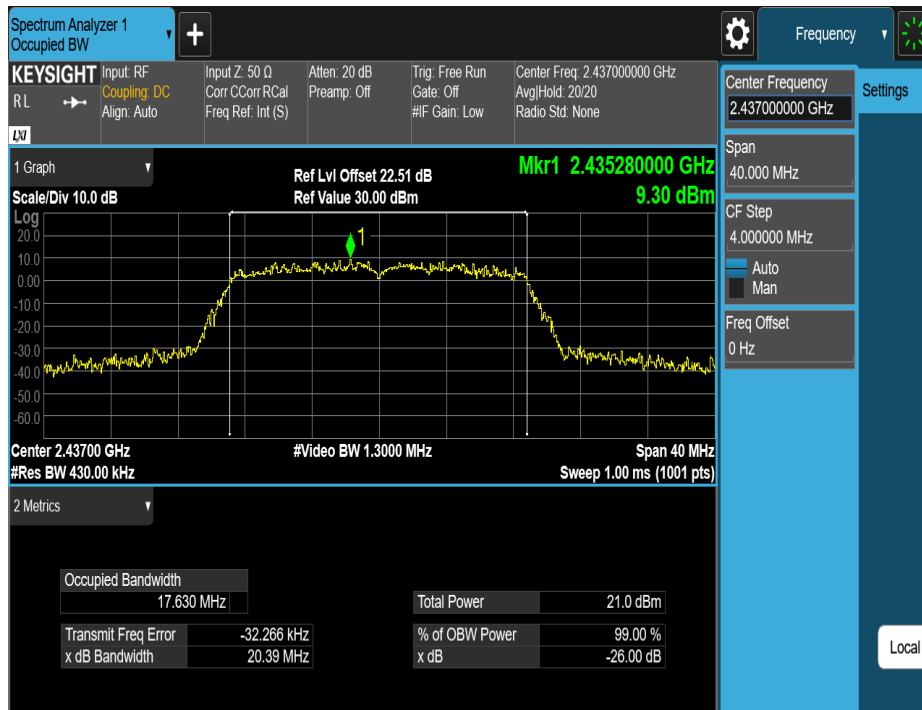
11N20MIMO_Ant2_2412



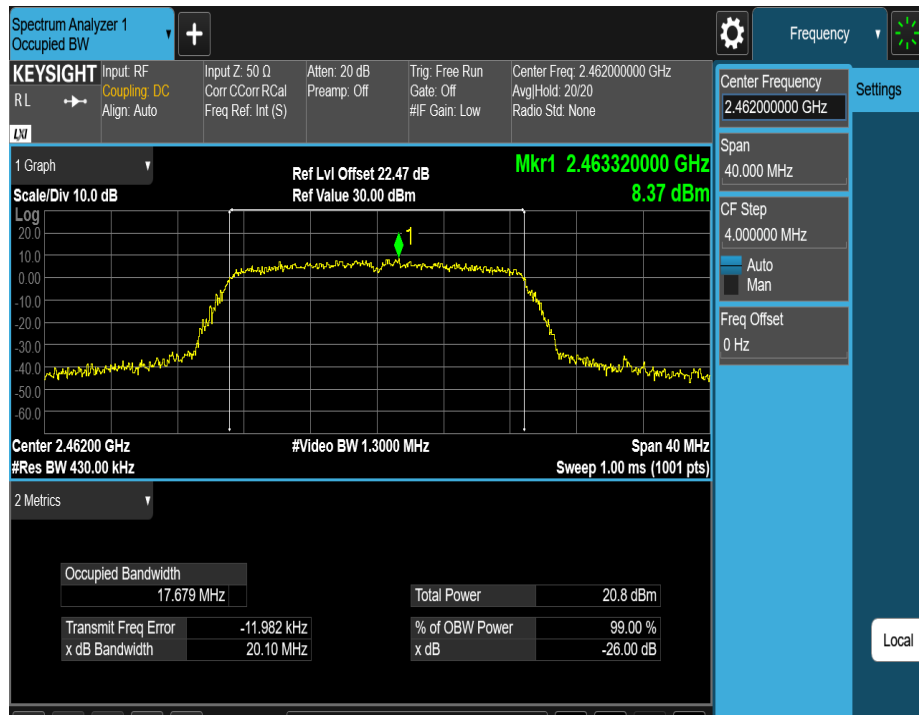
11N20MIMO_Ant1_2437



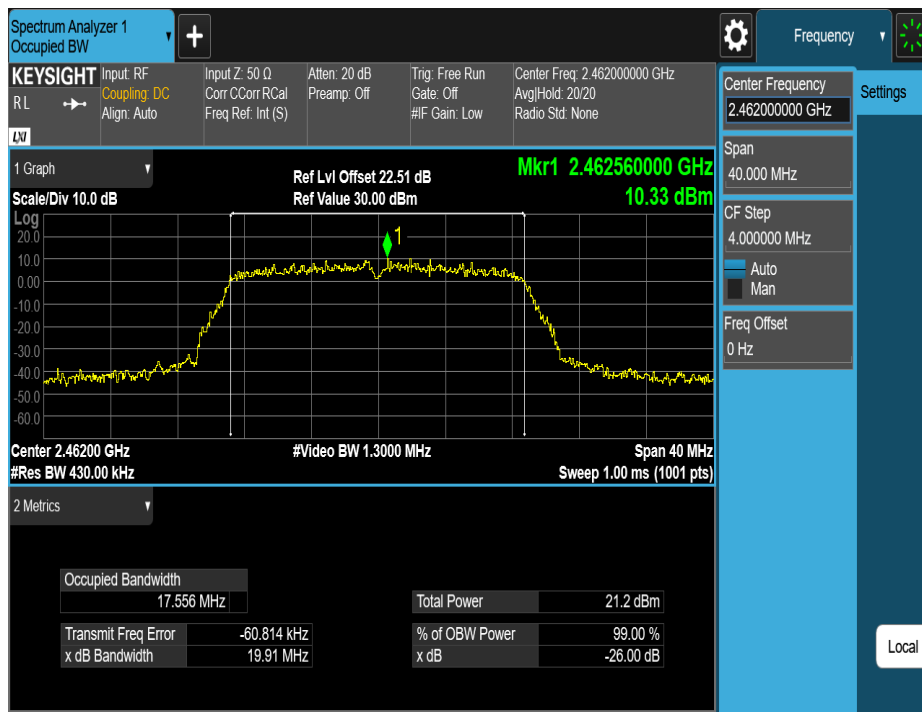
11N20MIMO_Ant2_2437



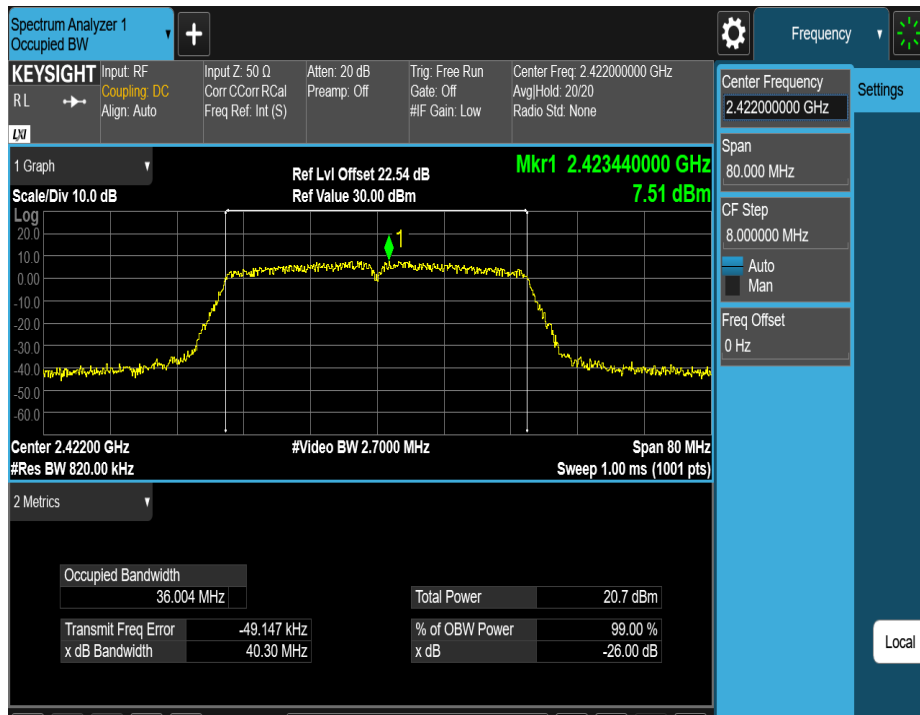
11N20MIMO_Ant1_2462



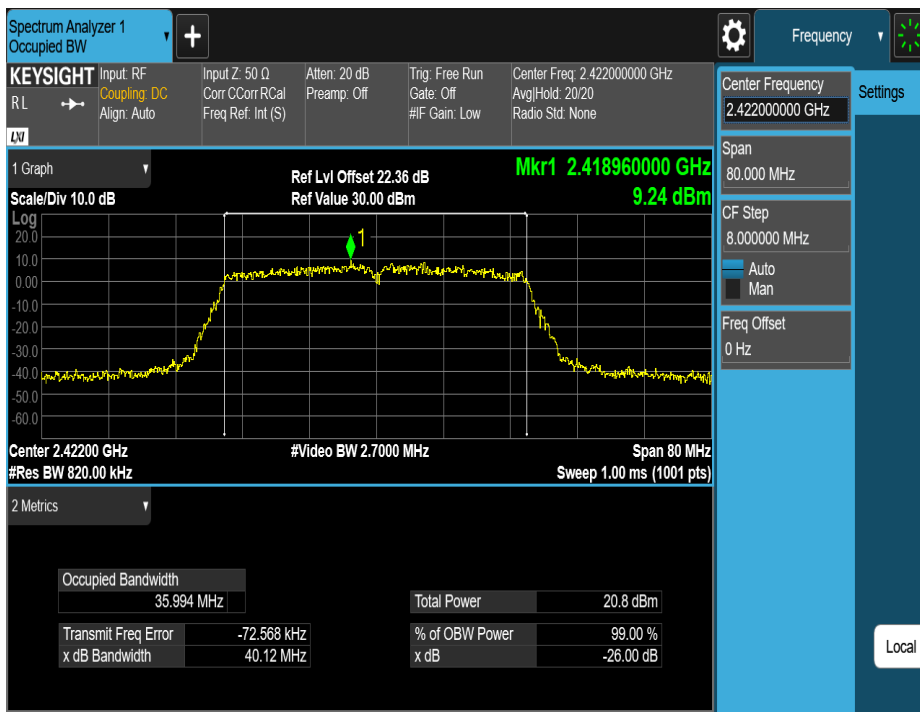
11N20MIMO_Ant2_2462



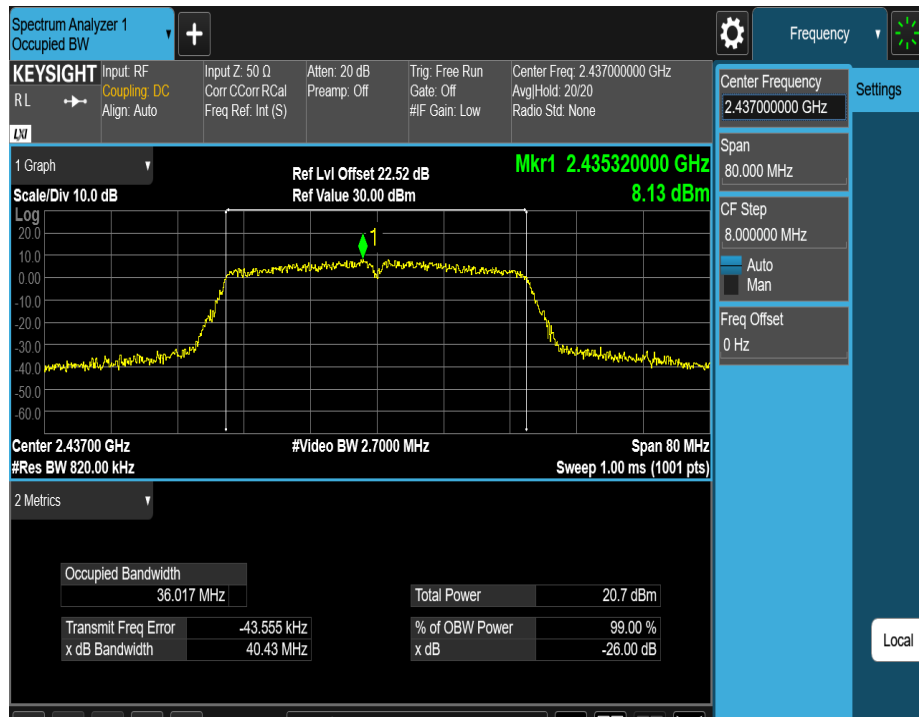
11N40MIMO_Ant1_2422



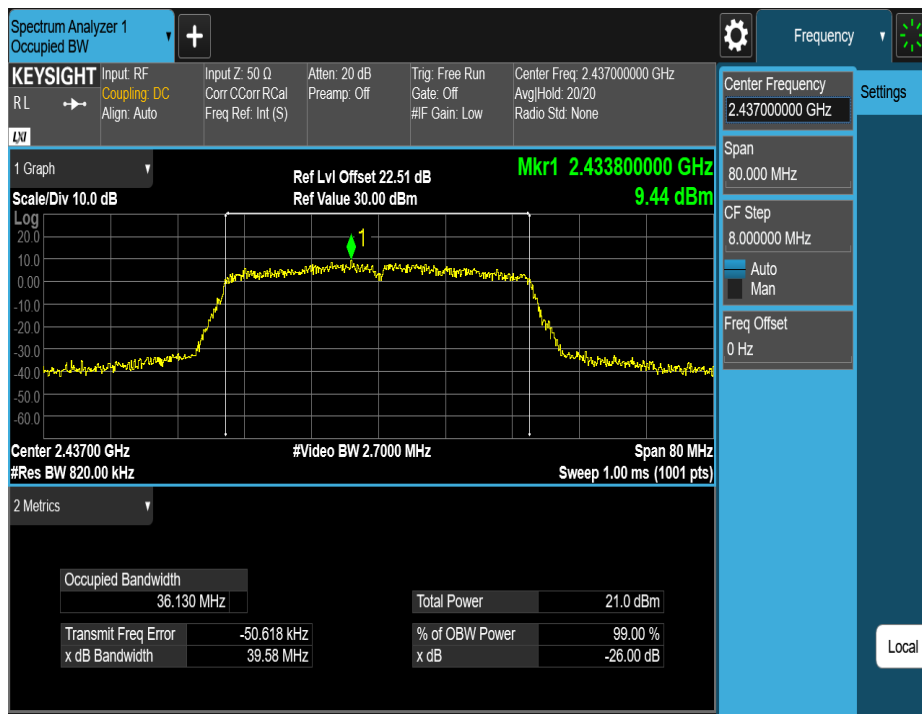
11N40MIMO_Ant2_2422



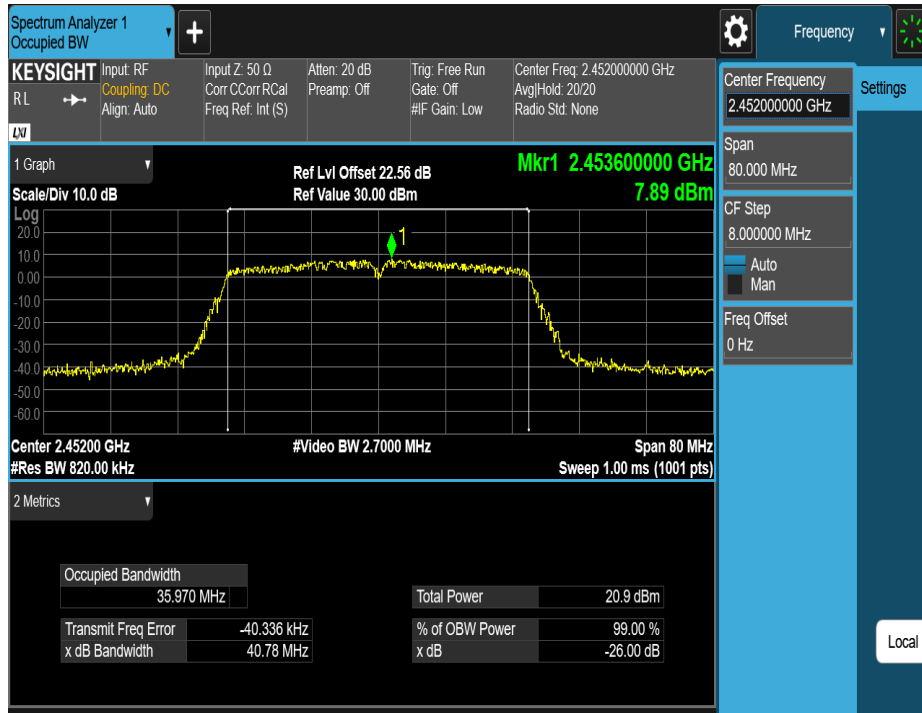
11N40MIMO_Ant1_2437



11N40MIMO_Ant2_2437



11N40MIMO_Ant1_2452



11N40MIMO_Ant2_2452



3.5 Maximum conducted output power

3.5.1 Limit

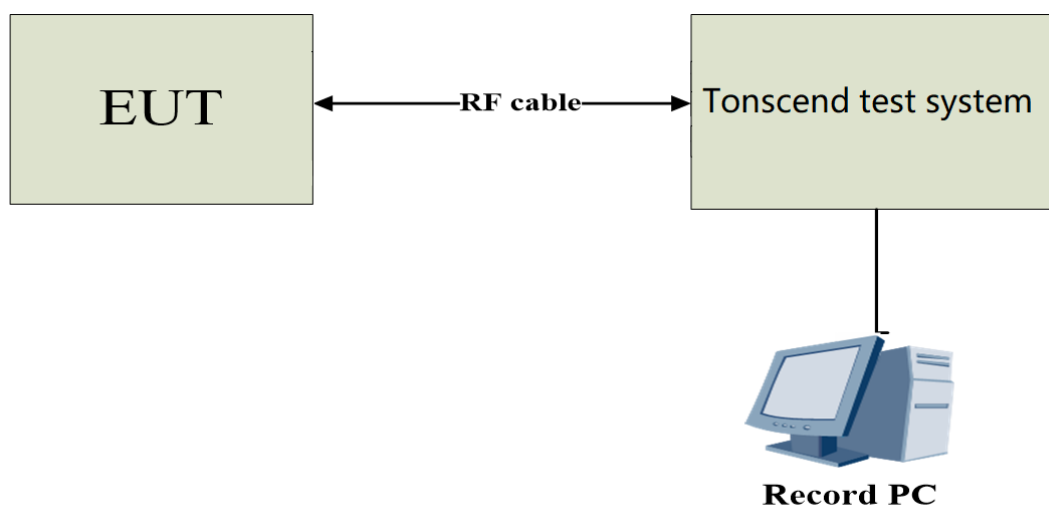
For systems using digital modulation in the 2400~2483.5MHz, The Maximum output Power shall not exceed 1W(30dBm)

3.5.2 Test Procedure

Test Method	
☒ Conducted Measurement	☐ Radiated Measurement
Test Channels	
☒ Lowest, Middle and Highest Channel	☐ Lowest and Highest Channel
Environmental conditions	
☒ Normal	☐ Normal and Extreme
Note: ☒ : Test ☐ : No Test	

- The EUT was directly connected to the tonscend test system and antenna output port as show in the block diagram below.
- The maximum conducted output power was performed in accordance with method 11.9.2.3 (for average power) of ANSI C63.10-2013 and FCC KDB 662911 D01 v02r01 Multiple Transmitter Output.

3.5.3 Test Setup



3.5.4 Table of Parameters of Text Software Setting

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

For Power Setting value

Test Software Version	Command		
Frequency (MHz)	2412	2437	2462
IEEE 802.11b	default	default	default
IEEE 802.11g	default	default	default
IEEE 802.11n(20)	default	default	default
Frequency (MHz)	2422	2437	2452
IEEE 802.11n(40)	default	default	default

3.5.5 The Result

Test Mode	Antenna	Frequency [MHz]	Maximum Conducted Output Power [dBm] ^{Note1}	Limit [dBm]	Verdict
11B-CDD	Ant1	2412	9.35	≤28.73	PASS
	Ant2	2412	9.23	≤28.73	PASS
	total	2412	12.30	≤28.73	PASS
	Ant1	2437	9.45	≤28.73	PASS
	Ant2	2437	9.41	≤28.73	PASS
	total	2437	12.44	≤28.73	PASS
	Ant1	2462	9.22	≤28.73	PASS
	Ant2	2462	9.18	≤28.73	PASS
	total	2462	12.21	≤28.73	PASS
11G-CDD	Ant1	2412	10.98	≤28.73	PASS
	Ant2	2412	11.16	≤28.73	PASS
	total	2412	14.08	≤28.73	PASS
	Ant1	2437	10.89	≤28.73	PASS
	Ant2	2437	11.14	≤28.73	PASS
	total	2437	14.03	≤28.73	PASS
	Ant1	2462	10.74	≤28.73	PASS
	Ant2	2462	11.22	≤28.73	PASS
	total	2462	14.00	≤28.73	PASS
11N20MIMO	Ant1	2412	10.68	≤28.73	PASS
	Ant2	2412	10.40	≤28.73	PASS
	total	2412	13.55	≤28.73	PASS
	Ant1	2437	10.66	≤28.73	PASS
	Ant2	2437	10.73	≤28.73	PASS
	total	2437	13.71	≤28.73	PASS
	Ant1	2462	10.50	≤28.73	PASS
	Ant2	2462	10.74	≤28.73	PASS
	total	2462	13.63	≤28.73	PASS
11N40MIMO	Ant1	2422	9.80	≤28.73	PASS
	Ant2	2422	10.14	≤28.73	PASS
	total	2422	12.98	≤28.73	PASS
	Ant1	2437	10.11	≤28.73	PASS
	Ant2	2437	10.28	≤28.73	PASS
	total	2437	13.21	≤28.73	PASS
	Ant1	2452	10.05	≤28.73	PASS
	Ant2	2452	10.30	≤28.73	PASS
	total	2452	13.19	≤28.73	PASS

Note1: The measured value already includes the cable loss and DT factor.

For MIMO mode

Frequency[MHz]	ANT 1 Antenna Gain (dBi)	ANT 2 Antenna Gain (dBi)	Correlated chains directional gain (dBi)	Conducted Power Limit (dBm)
2412-2462	4.41	4.10	7.27	28.73
Unequal antenna gains, with equal transmit powers. For antenna gains given by $G_1, G_2, \dots, G_N$ dBi If transmit signals are correlated, then Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}]$ dBi [Note the "20"s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.] Directional gain = $10 \log[(10^{4.41/20} + 10^{4.10/20})^2 / N_{ANT}]$ dBi=7.27				

3.6 Power Spectral Density

3.6.1 Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmitting.

3.6.2 Test Procedure

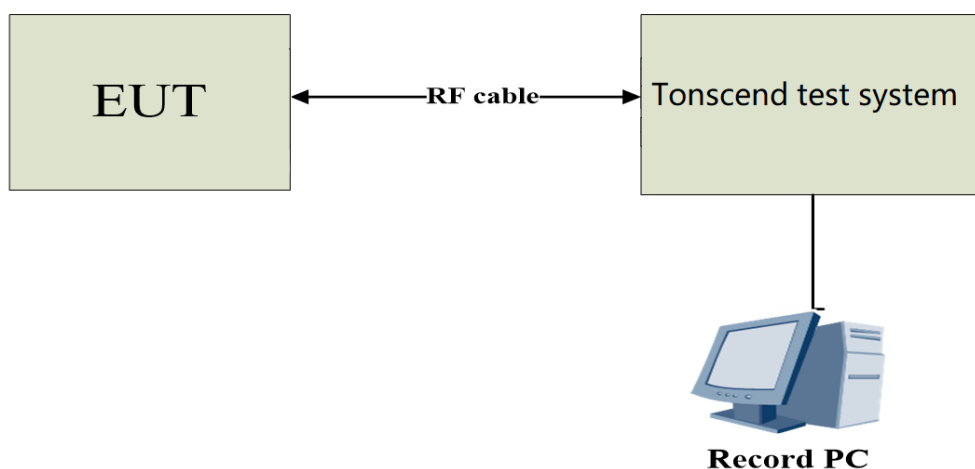
Test Method	
☒ Conducted Measurement	☐ Radiated Measurement
Test Channels	
☒ Lowest, Middle and Highest Channel	☐ Lowest and Highest Channel
Environmental conditions	
☒ Normal	☐ Normal and Extreme
Note: ☒ : Test ☐ : No Test	

a) The EUT was directly connected to the tonscend test system and antenna output port as show in the block diagram below.

b) Spectrum analyser settings as following:

Spectrum Parameters	Setting
Span Frequency	1.5 times the OBW bandwidth
RBW	3 kHz
VBW	10 kHz
Detector	RMS
Trace	Max Hold
Sweep Time	Auto

3.6.3 Test Setup



3.6.4 The Result

Test Mode	Antenna	Frequency[MHz]	Result[dBm/3kHz] ^{NOTE1}	Limit[dBm/3kHz]	Verdict
11B-CDD	Ant1	2412	-5.09	≤6.73	PASS
	Ant2	2412	-7.03	≤6.73	PASS
	total	2412	-2.94	≤6.73	PASS
	Ant1	2437	-2.98	≤6.73	PASS
	Ant2	2437	-8.35	≤6.73	PASS
	total	2437	-1.87	≤6.73	PASS
	Ant1	2462	-2.10	≤6.73	PASS
	Ant2	2462	-7.83	≤6.73	PASS
	total	2462	-1.07	≤6.73	PASS
11G-CDD	Ant1	2412	-14.92	≤6.73	PASS
	Ant2	2412	-14.30	≤6.73	PASS
	total	2412	-11.59	≤6.73	PASS
	Ant1	2437	-15.09	≤6.73	PASS
	Ant2	2437	-15.50	≤6.73	PASS
	total	2437	-12.28	≤6.73	PASS
	Ant1	2462	-15.73	≤6.73	PASS
	Ant2	2462	-15.48	≤6.73	PASS
	total	2462	-12.59	≤6.73	PASS
11N20MIMO	Ant1	2412	-15.58	≤6.73	PASS
	Ant2	2412	-15.41	≤6.73	PASS
	total	2412	-12.48	≤6.73	PASS
	Ant1	2437	-15.18	≤6.73	PASS
	Ant2	2437	-15.45	≤6.73	PASS
	total	2437	-12.30	≤6.73	PASS
	Ant1	2462	-16.21	≤6.73	PASS
	Ant2	2462	-15.74	≤6.73	PASS
	total	2462	-12.96	≤6.73	PASS
11N40MIMO	Ant1	2422	-19.11	≤6.73	PASS
	Ant2	2422	-19.49	≤6.73	PASS
	total	2422	-16.29	≤6.73	PASS
	Ant1	2437	-19.06	≤6.73	PASS
	Ant2	2437	-19.49	≤6.73	PASS
	total	2437	-16.26	≤6.73	PASS
	Ant1	2452	-18.73	≤6.73	PASS
	Ant2	2452	-19.39	≤6.73	PASS
	total	2452	-16.04	≤6.73	PASS

Note1: The measured value already includes the cable loss and DT factor.

For MIMO mode

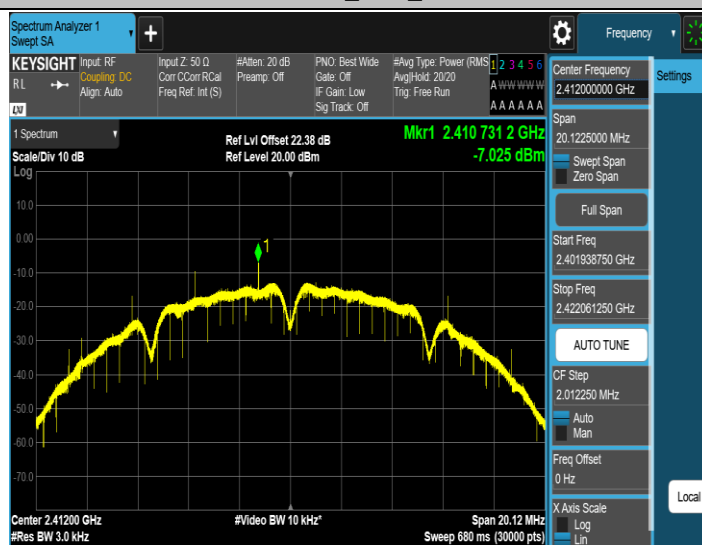
Frequency[MHz]	ANT 1 Antenna Gain (dBi)	ANT 2 Antenna Gain (dBi)	Correlated chains directional gain (dBi)	Max. PSD Limit (dBm)
2412-2462	4.41	4.10	7.27	6.73
Unequal antenna gains, with equal transmit powers. For antenna gains given by $G_1, G_2, \dots, G_N$ dBi If transmit signals are correlated, then Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}]$ dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]				
Directional gain = $10 \log[(10^{4.41/20} + 10^{4.10/20})^2 / N_{ANT}]$ dBi=7.27				

Test Graphs

11B-CDD_Ant1_2412



11B-CDD_Ant2_2412



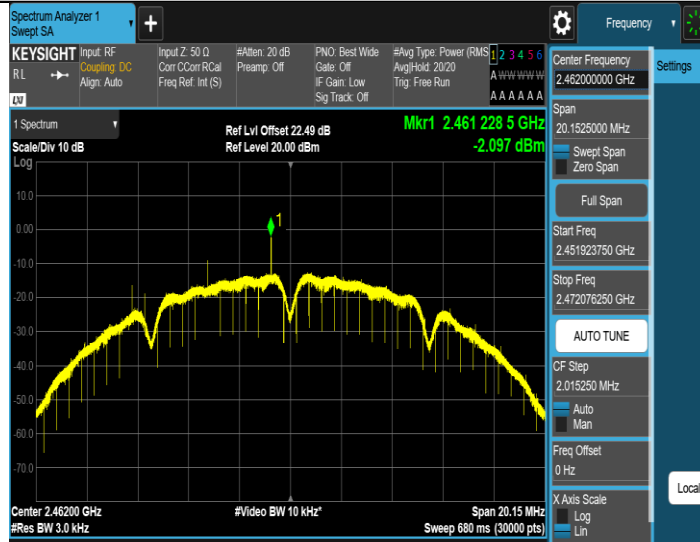
11B-CDD_Ant1_2437



11B-CDD_Ant2_2437



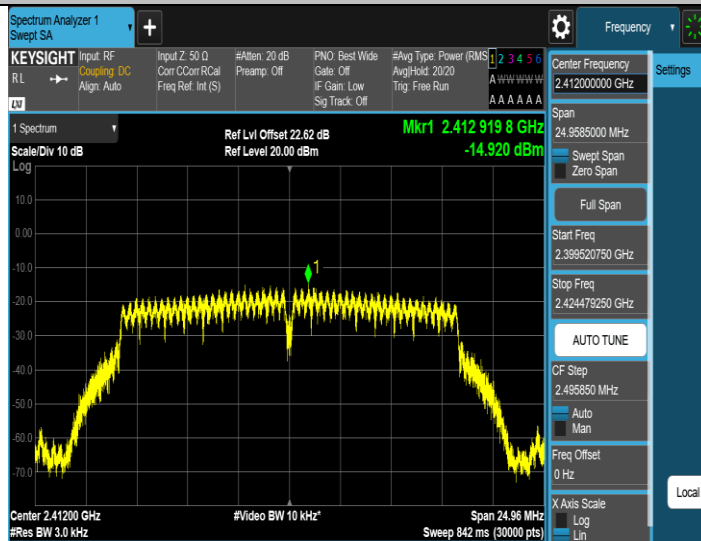
11B-CDD_Ant1_2462



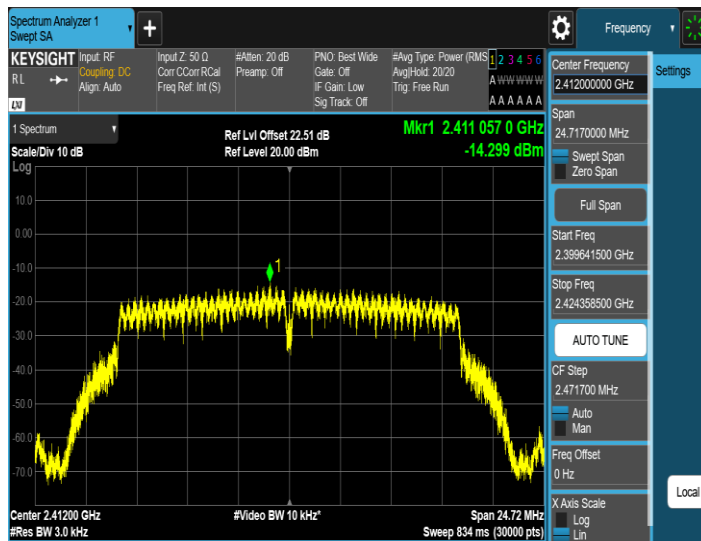
11B-CDD_Ant2_2462



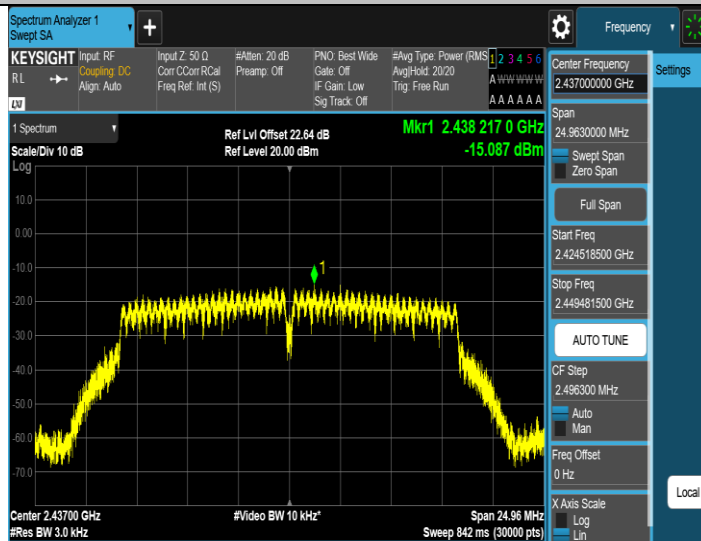
11G-CDD_Ant1_2412



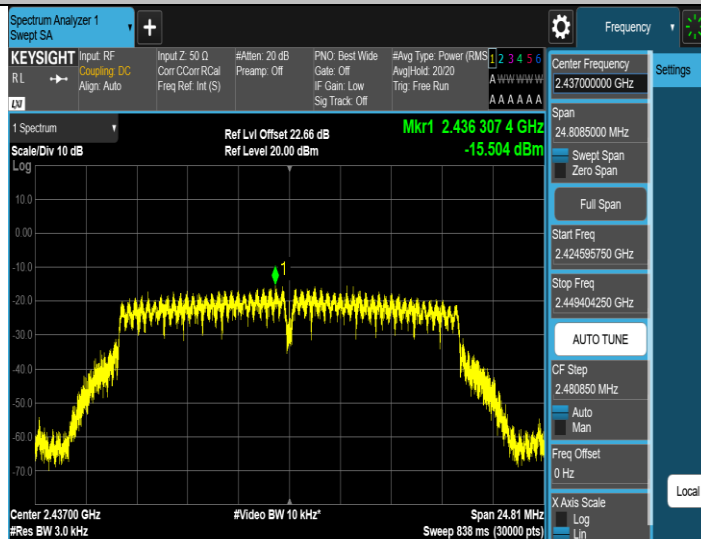
11G-CDD_Ant2_2412



11G-CDD_Ant1_2437



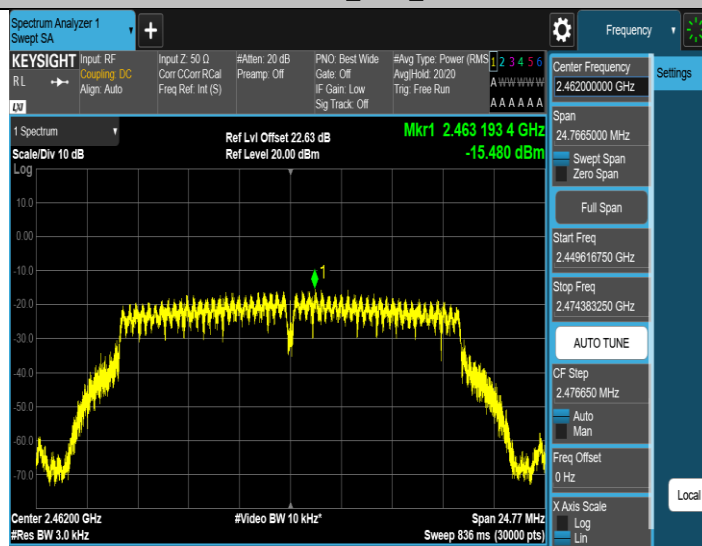
11G-CDD_Ant2_2437



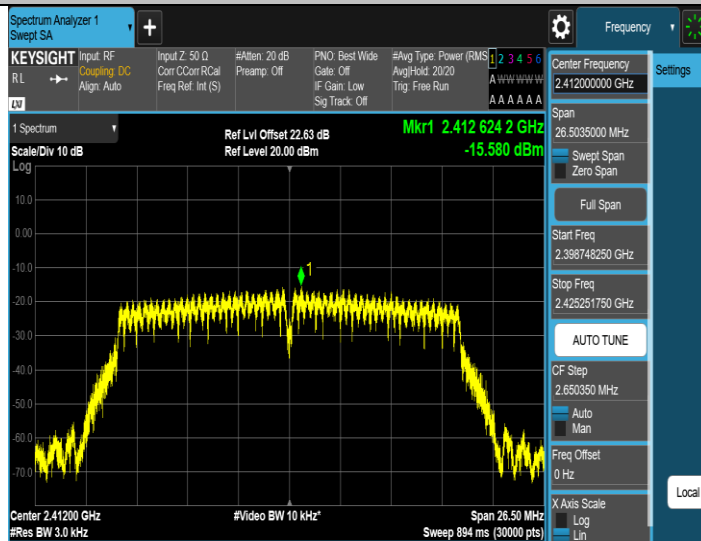
11G-CDD_Ant1_2462



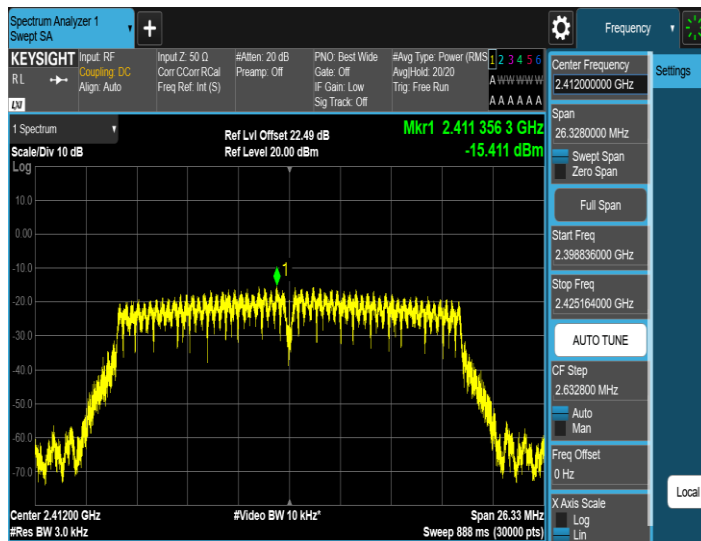
11G-CDD_Ant2_2462



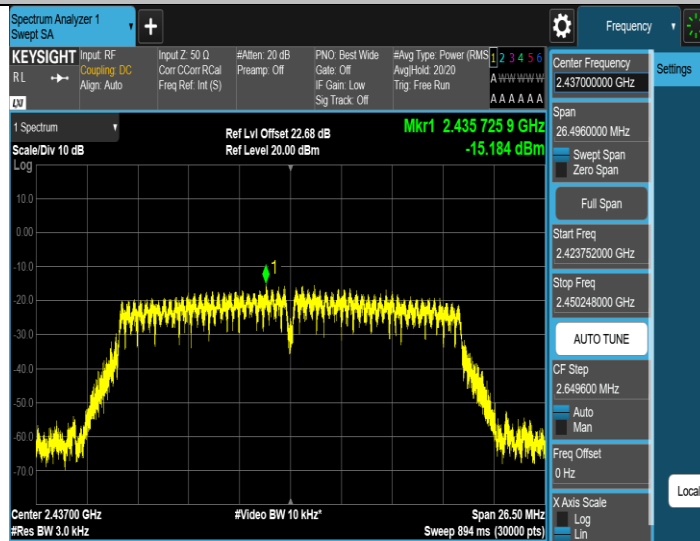
11N20MIMO_Ant1_2412



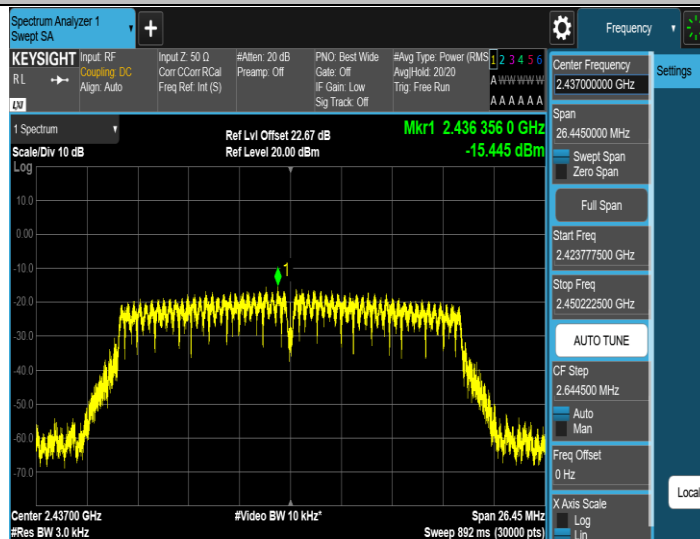
11N20MIMO_Ant2_2412



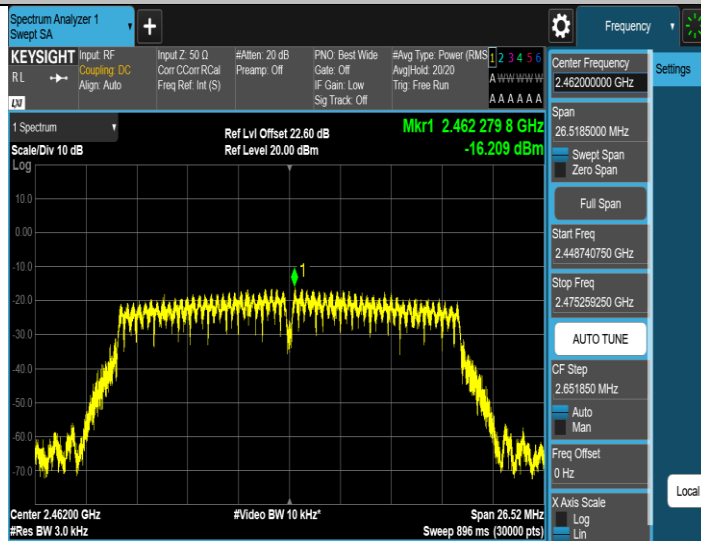
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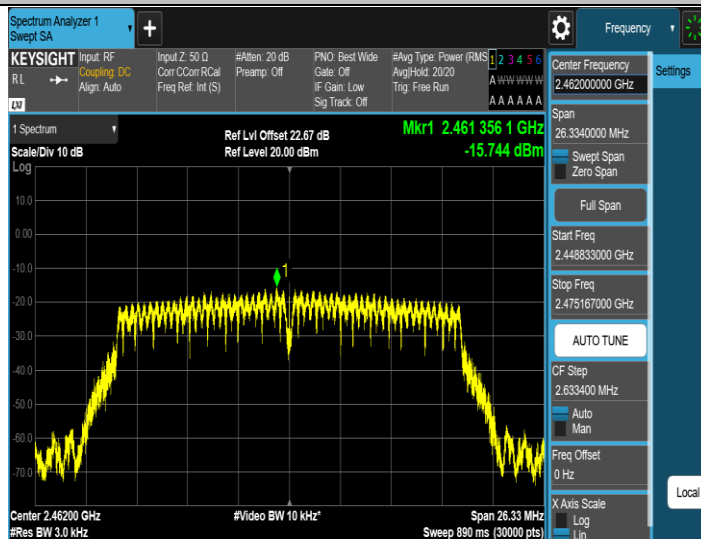
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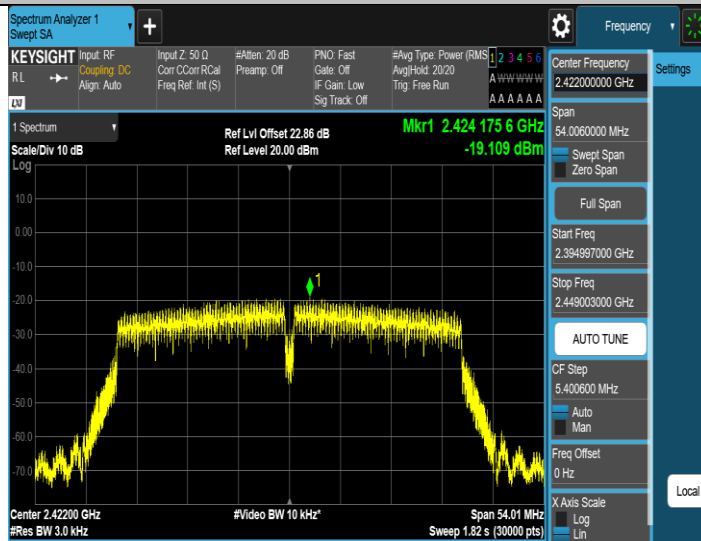
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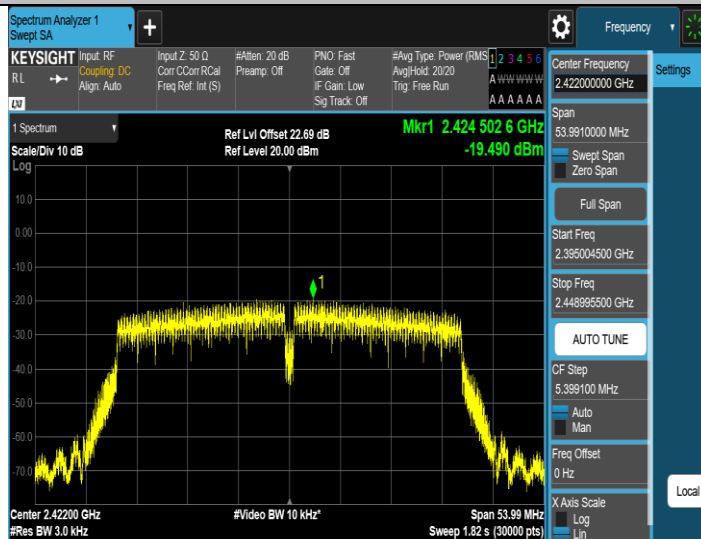
11N20MIMO_Ant2_2462



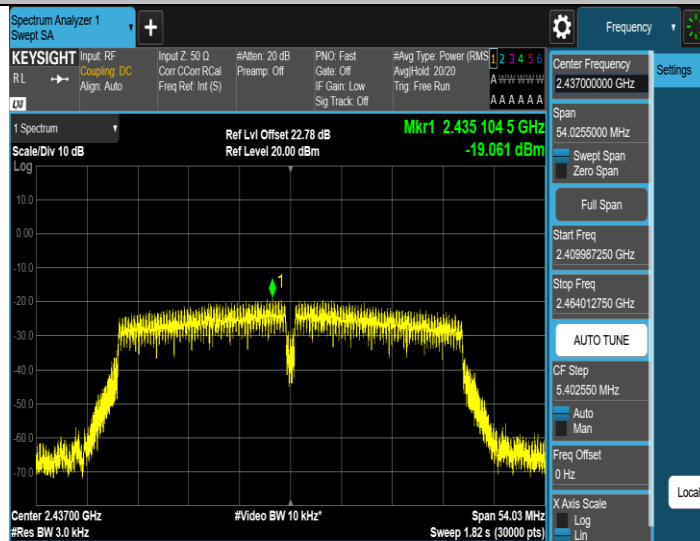
11N40MIMO_Ant1_2422



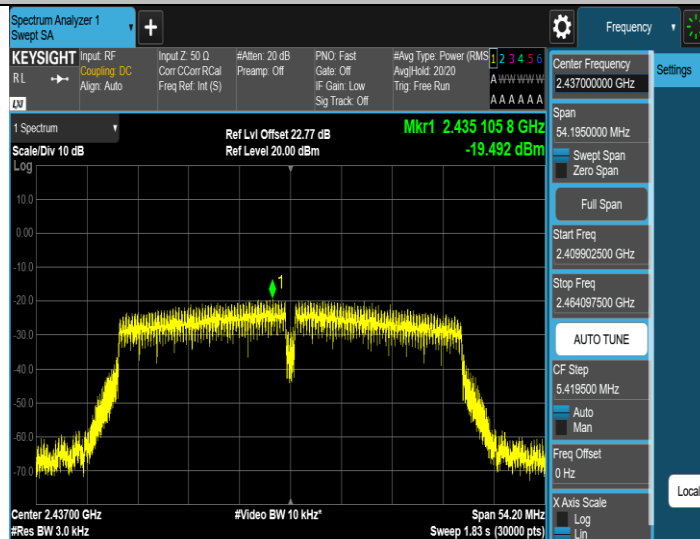
11N40MIMO_Ant2_2422



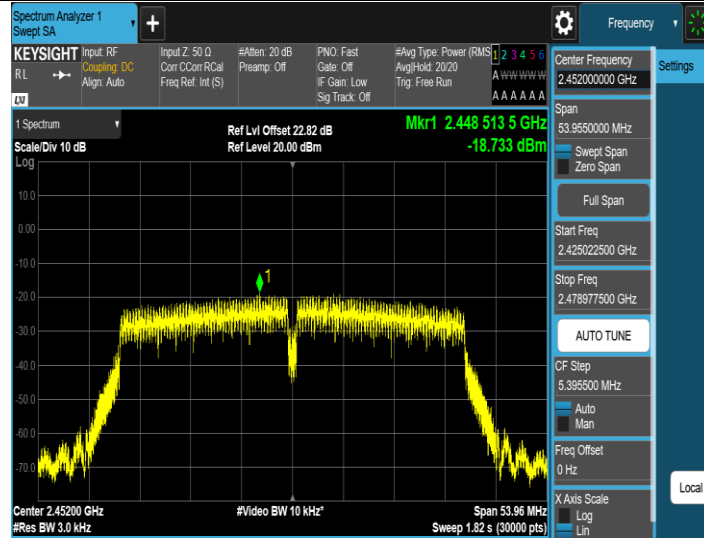
11N40MIMO_Ant1_2437



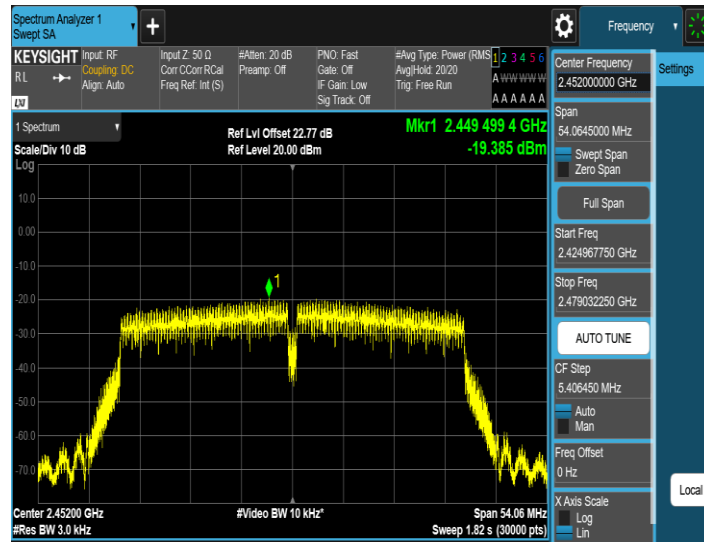
11N40MIMO_Ant2_2437



11N40MIMO_Ant1_2452



11N40MIMO_Ant2_2452



End of Test Report