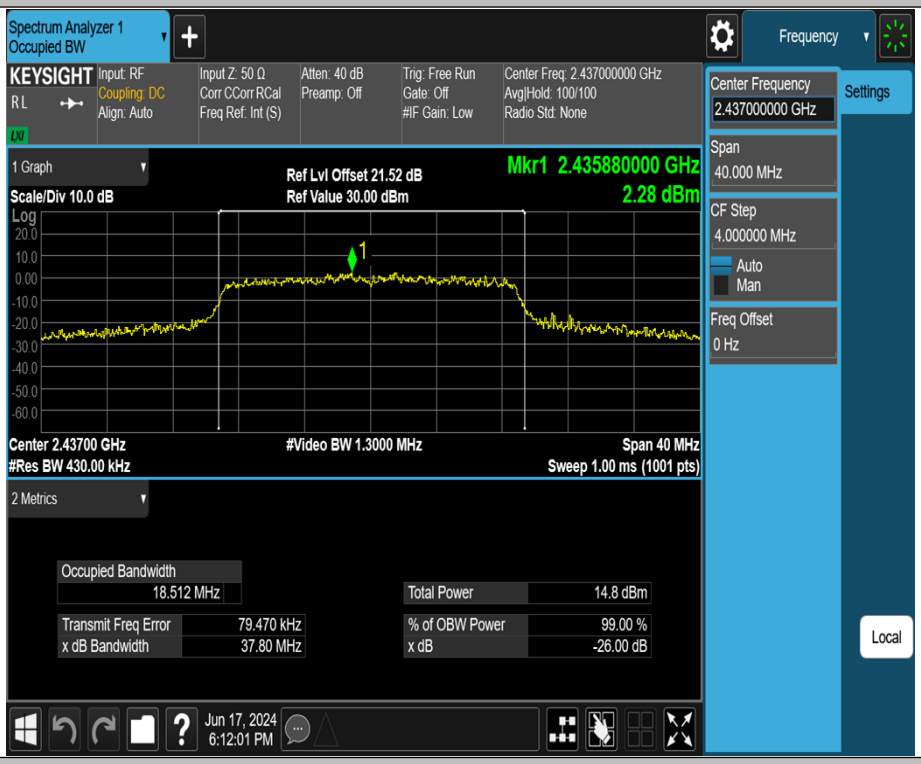
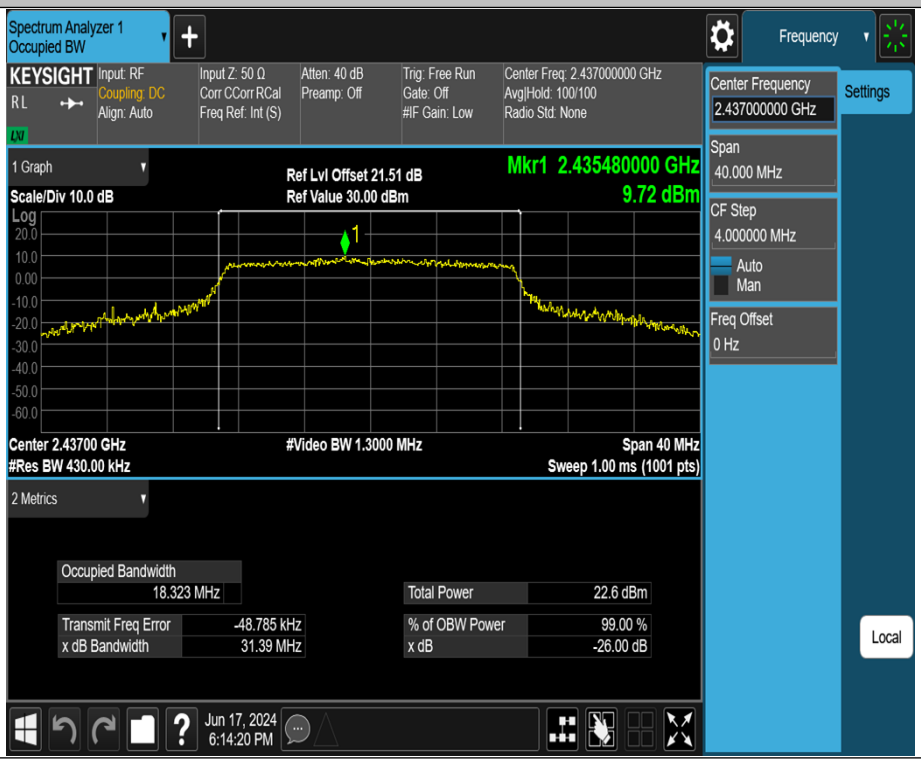
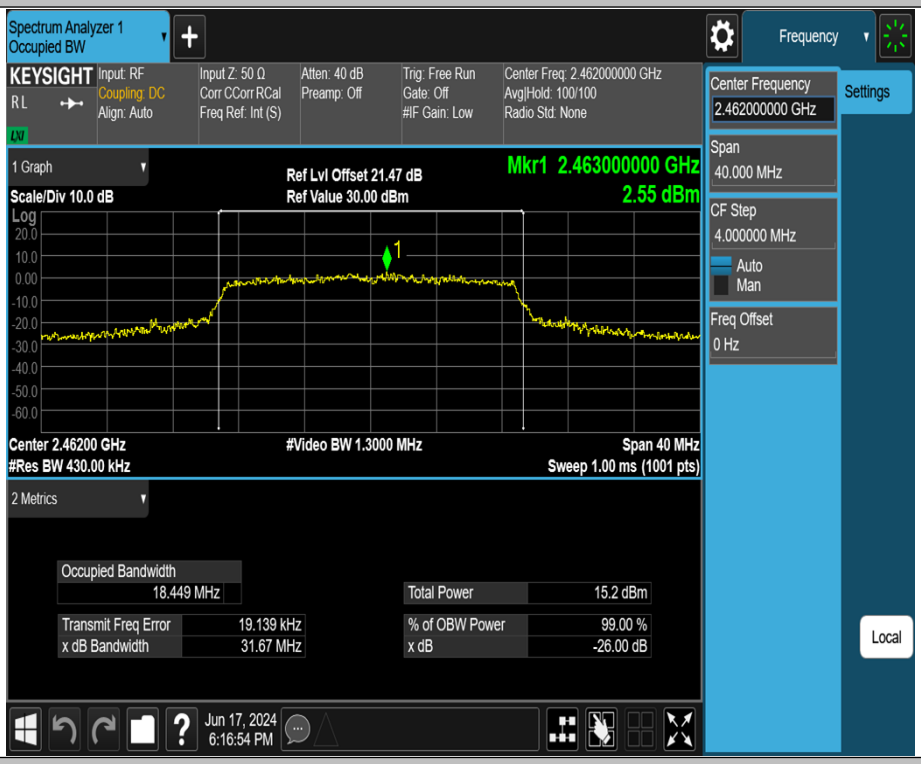
11AC20MIMO_Ant1_2437



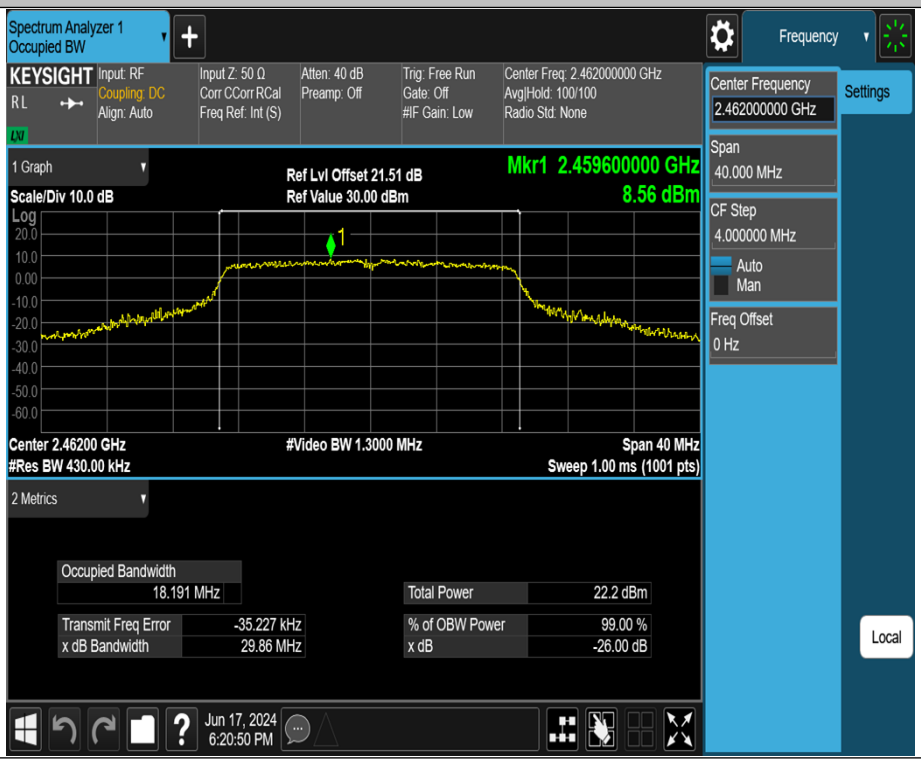
11AC20MIMO_Ant2_2437



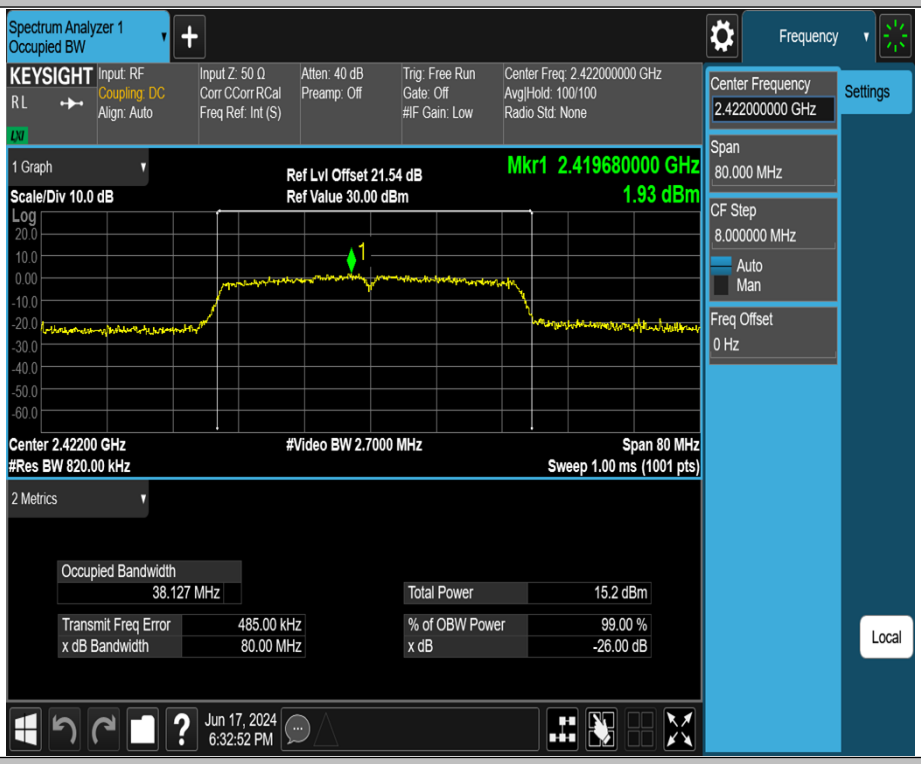
11AC20MIMO_Ant1_2462



11AC20MIMO_Ant2_2462

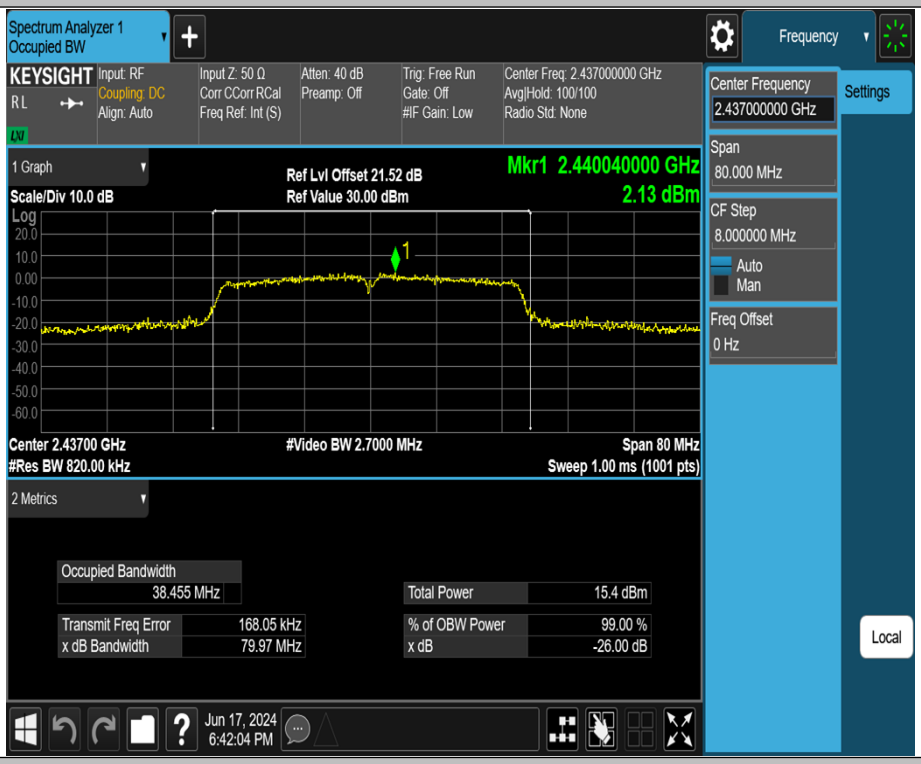


11AC40MIMO_Ant1_2422



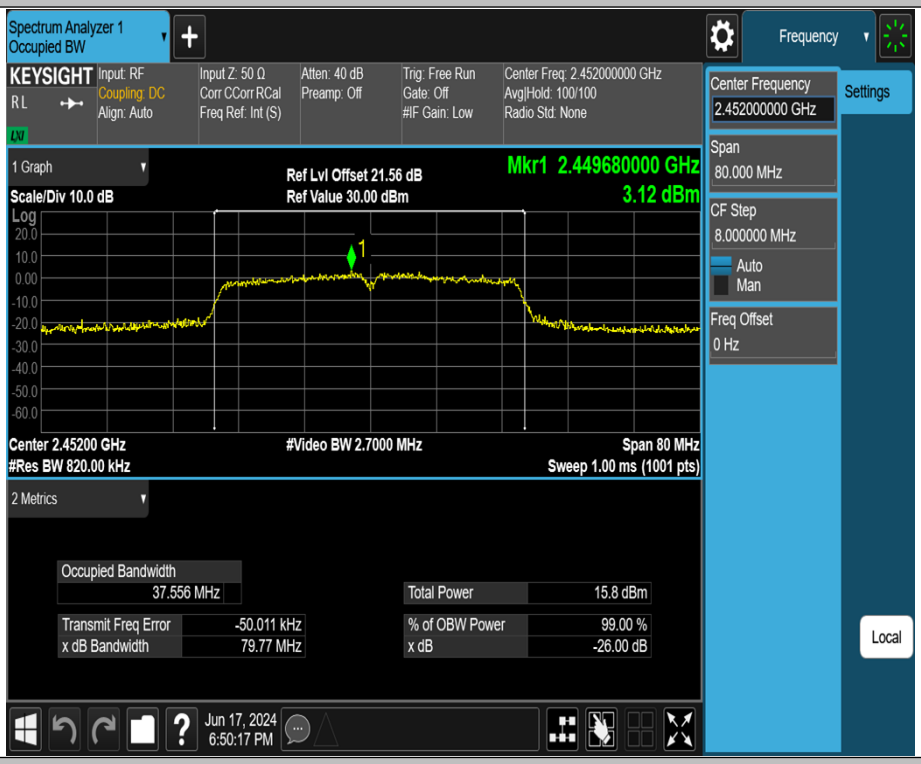
11AC40MIMO_Ant2_2422

11AC40MIMO_Ant1_2437



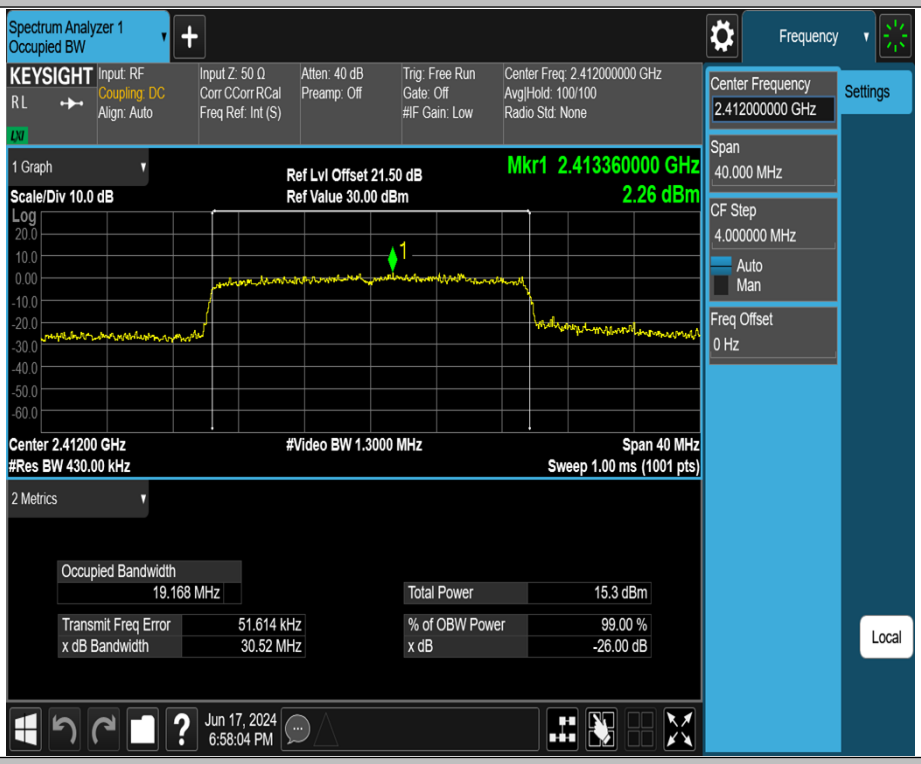
11AC40MIMO_Ant2_2437

11AC40MIMO_Ant1_2452

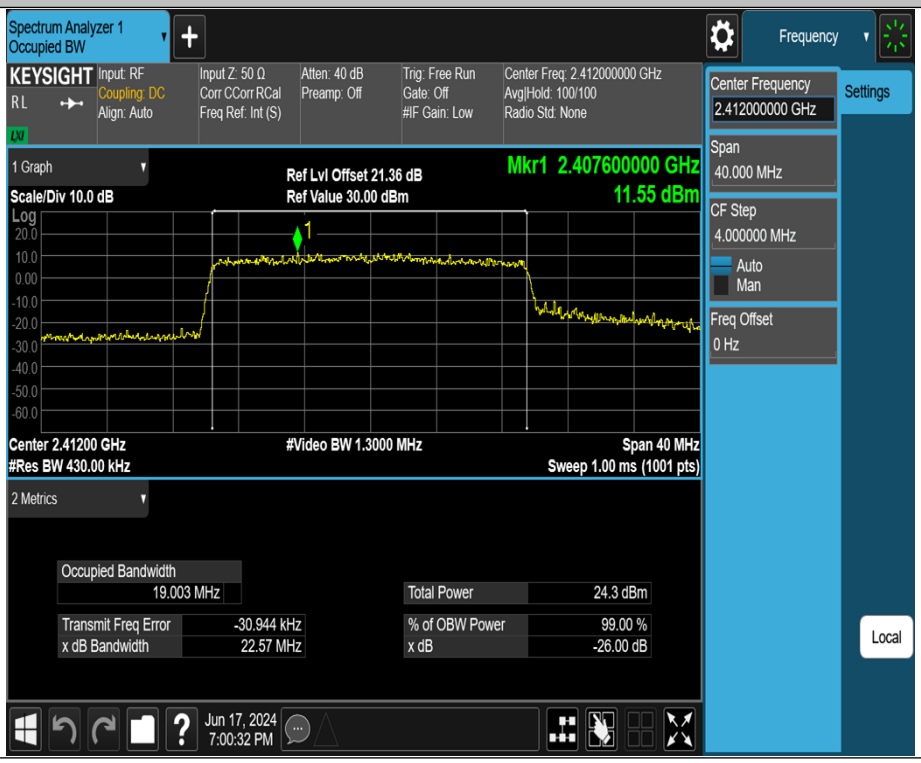


11AC40MIMO_Ant2_2452

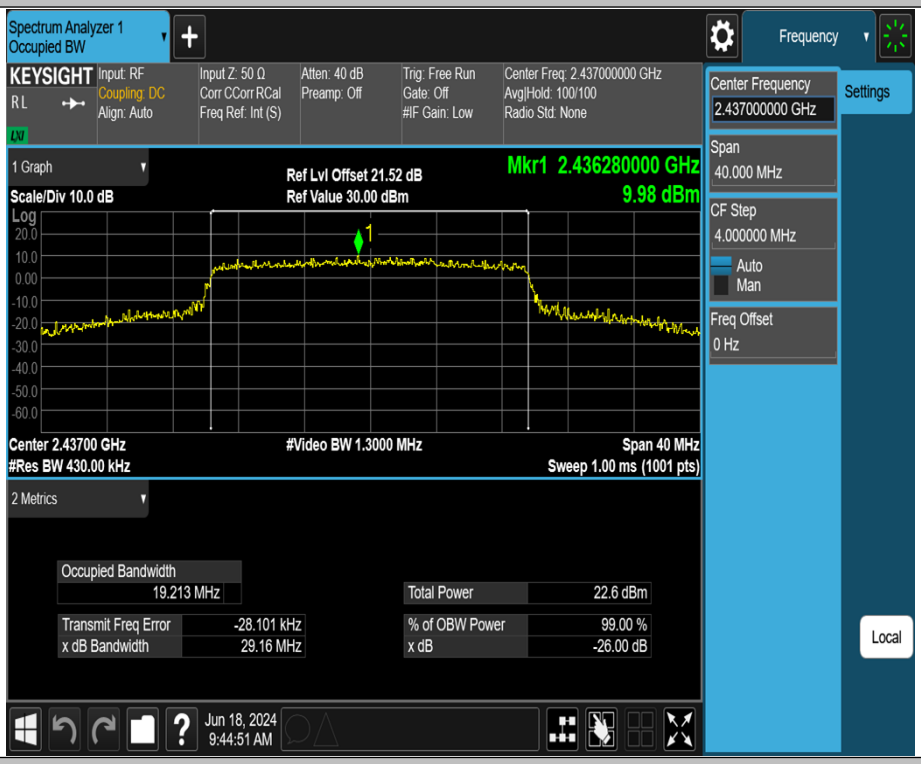
11AX20MIMO_Ant1_2412



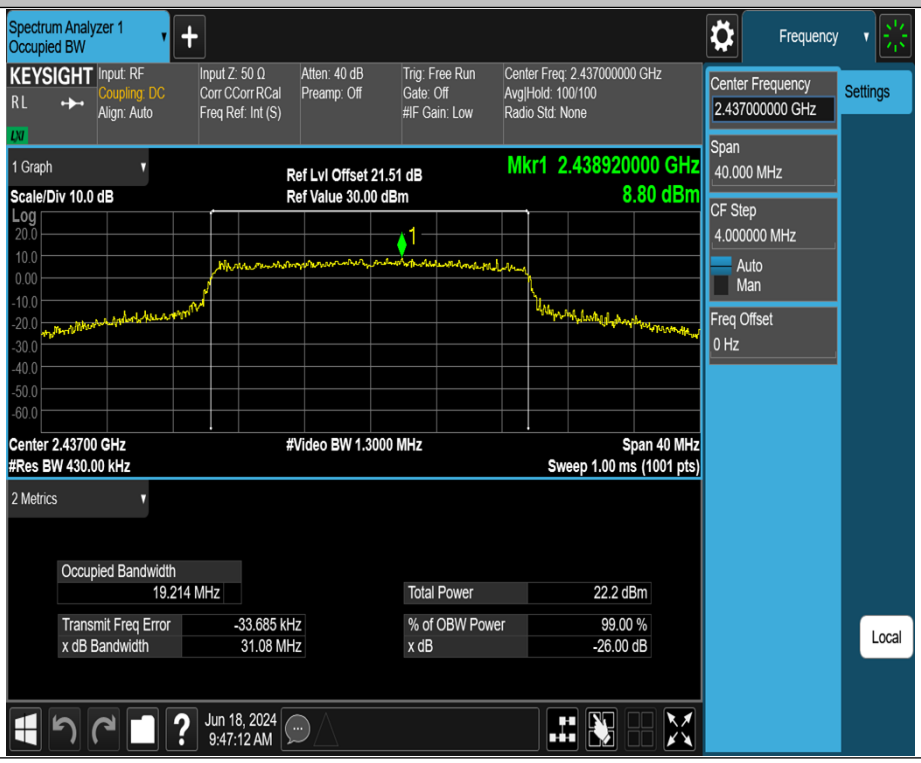
11AX20MIMO_Ant2_2412



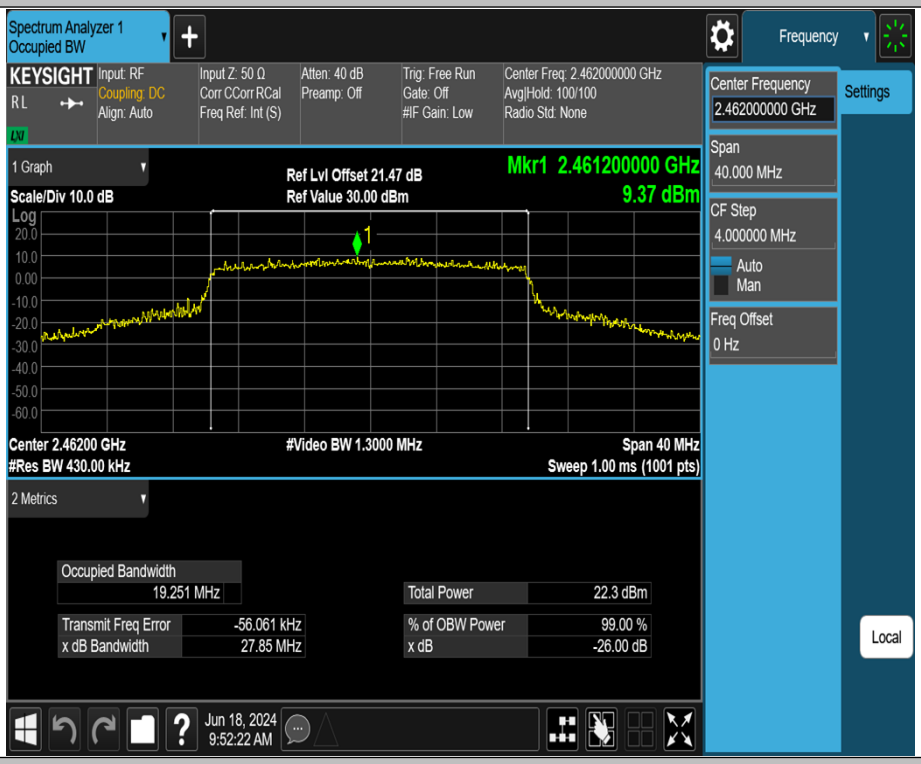
11AX20MIMO_Ant1_2437



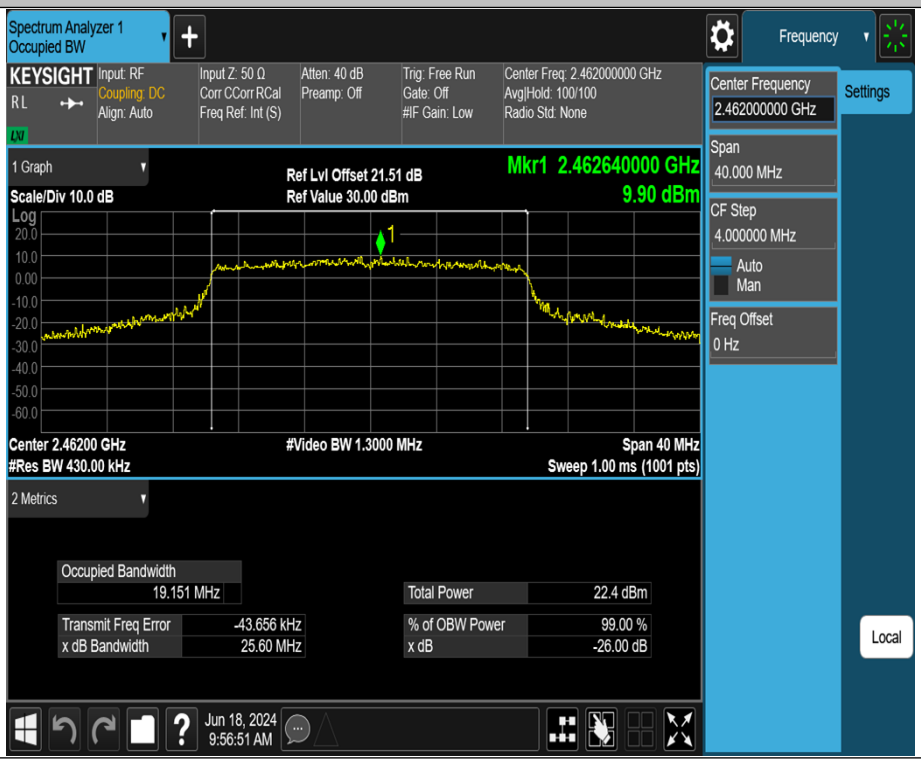
11AX20MIMO_Ant2_2437



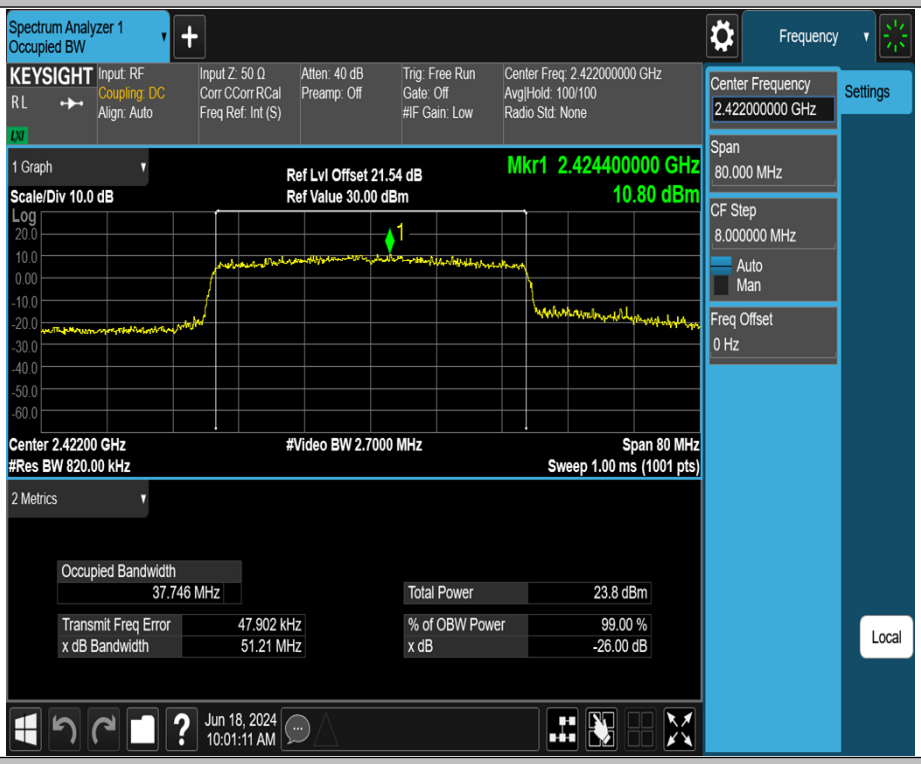
11AX20MIMO_Ant1_2462



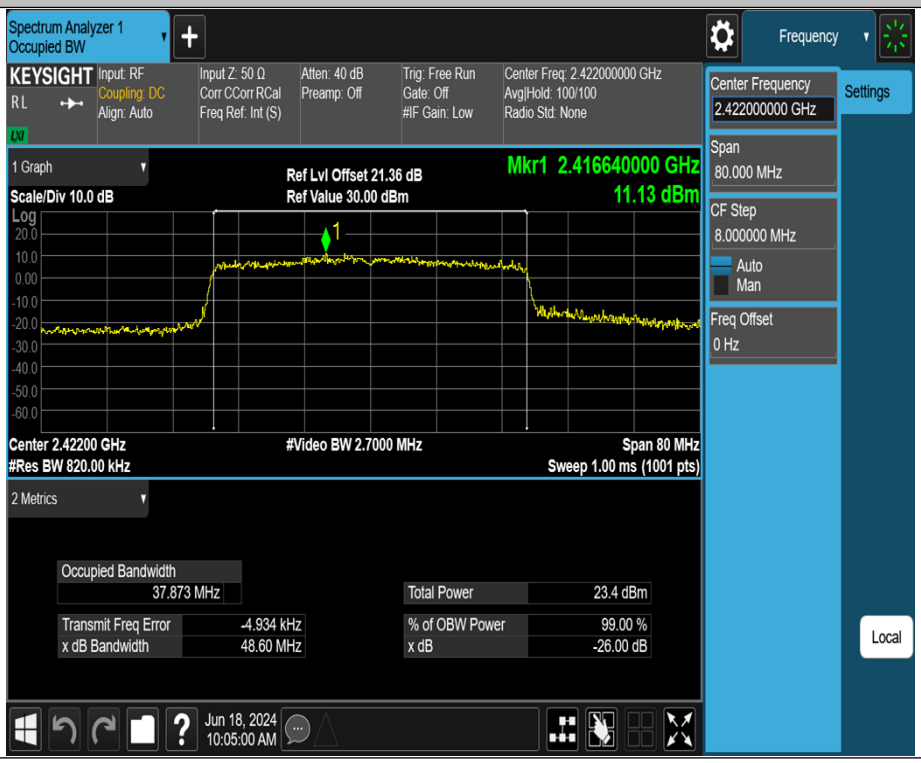
11AX20MIMO_Ant2_2462



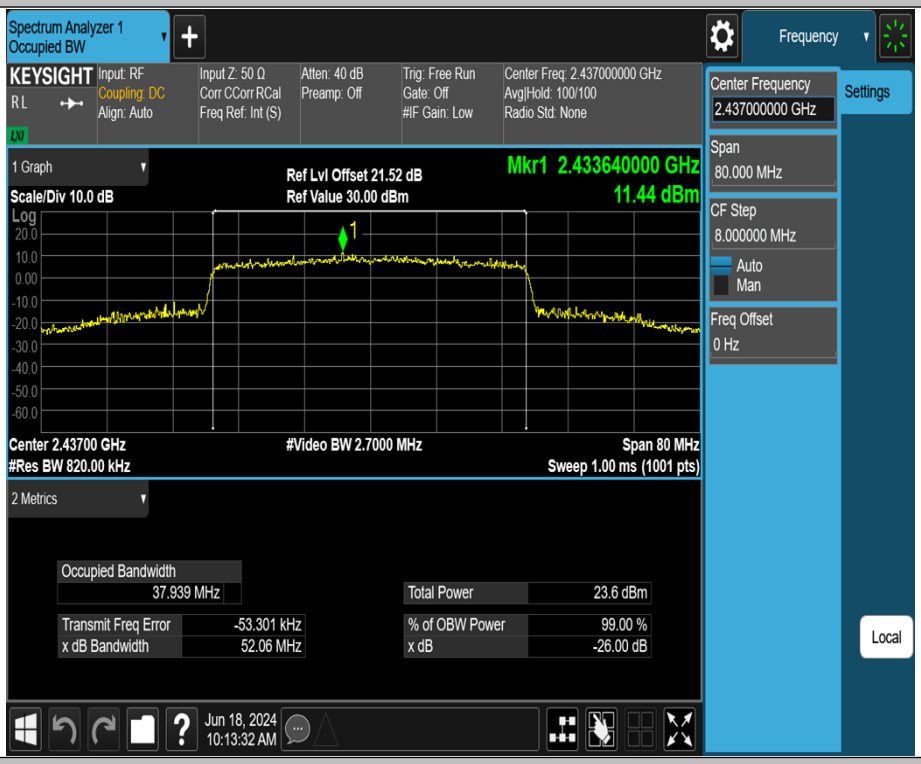
11AX40MIMO_Ant1_2422



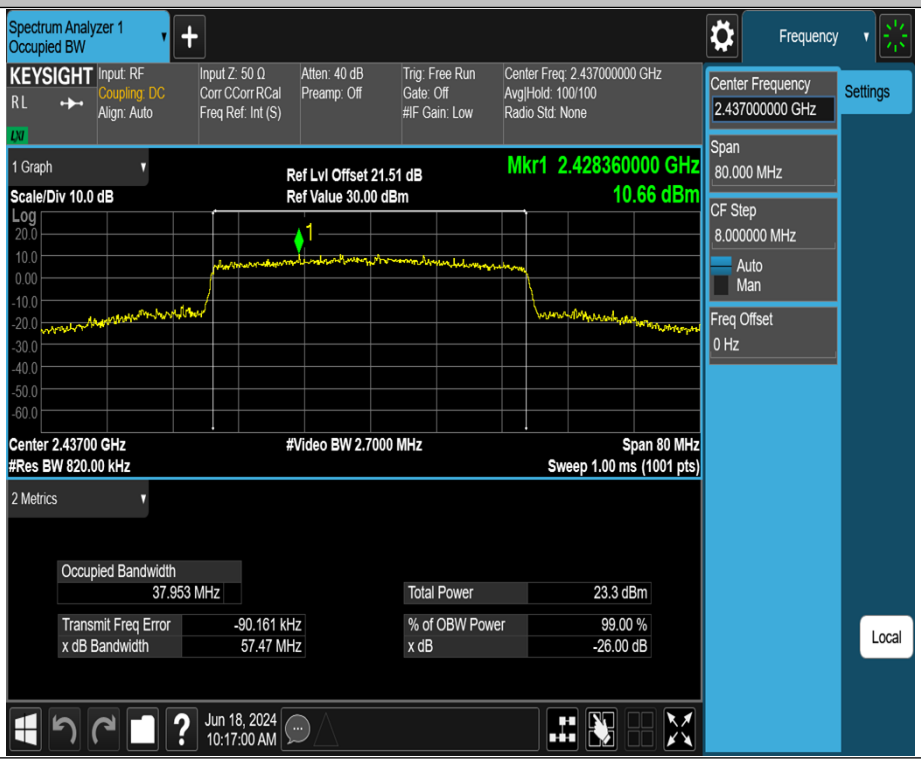
11AX40MIMO_Ant2_2422



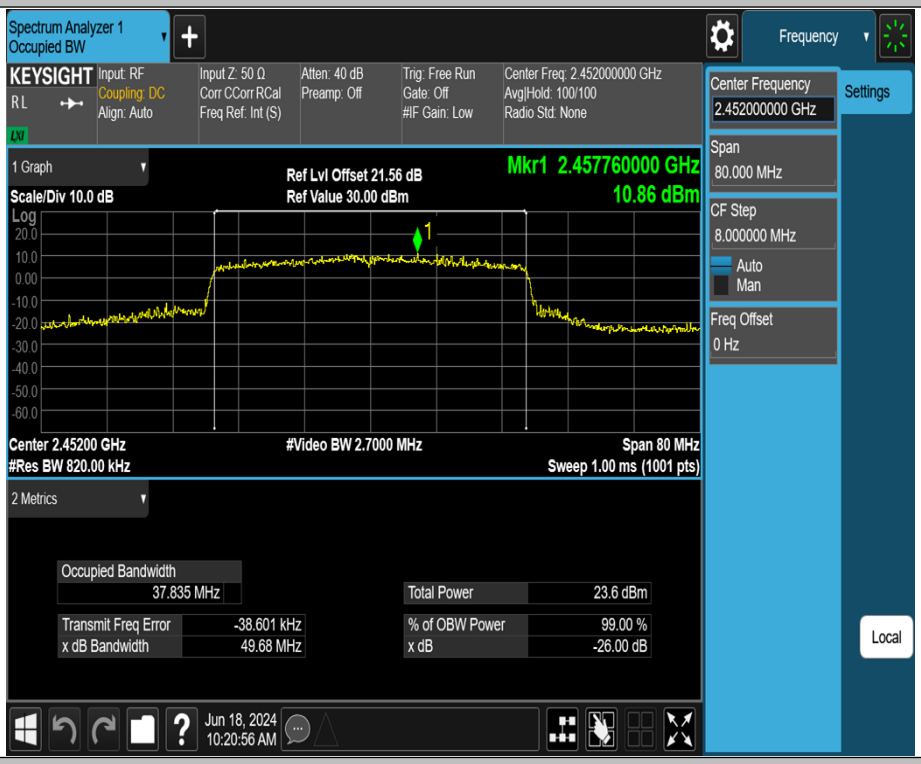
11AX40MIMO_Ant1_2437



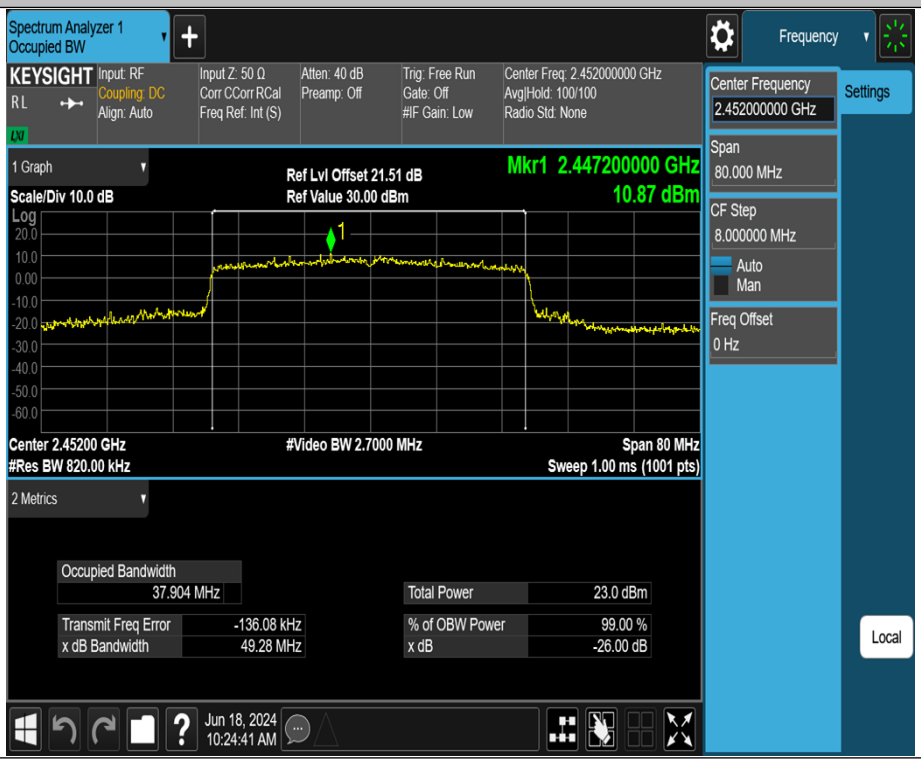
11AX40MIMO_Ant2_2437



11AX40MIMO_Ant1_2452



11AX40MIMO_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)

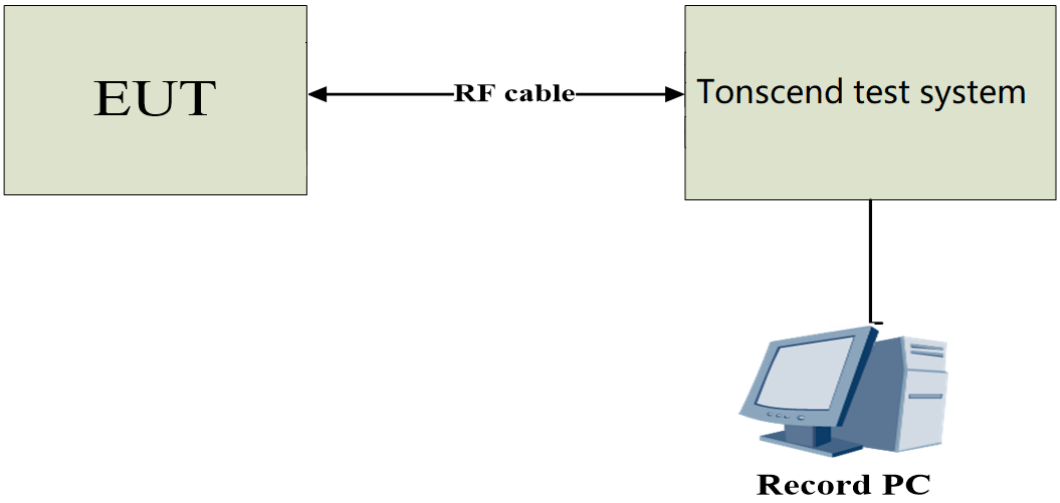
3.5.2 Test Procedure

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	

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

b) The maximum conducted output power was performed in accordance with method 11.9.1.3 (for peak 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 Mode	Power Level Setting defined by Manufacturer		
Test Software Version	QATool_Dbg		
Frequency (MHz)	2412	2437	2462
IEEE 802.11b	22	22	22
IEEE 802.11g	22	22	22
IEEE 802.11n (20MHz)	18	18	18
IEEE 802.11ax (20MHz)	18	18	18

Test Mode	Power Level Setting defined by Manufacturer		
Test Software Version	cmd.exe		
Frequency (MHz)	2422	2437	2452
IEEE 802.11n (40MHz)	18	18	18
IEEE 802.11ax (40MHz)	18	18	18

3.5.5 The Result

Test Mode	Antenna	Frequency[MHz]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	24.94	≤30.00	PASS
	Ant2	2412	25.43	≤30.00	PASS
	Ant1	2437	25.32	≤30.00	PASS
	Ant2	2437	25.16	≤30.00	PASS
	Ant1	2462	25.21	≤30.00	PASS
	Ant2	2462	24.78	≤30.00	PASS
11G	Ant1	2412	25.23	≤30.00	PASS
	Ant2	2412	24.72	≤30.00	PASS
	Ant1	2437	24.95	≤30.00	PASS
	Ant2	2437	24.19	≤30.00	PASS
	Ant1	2462	24.98	≤30.00	PASS
	Ant2	2462	23.62	≤30.00	PASS
11N20MIMO	Ant1	2412	20.75	≤28.69	PASS
	Ant2	2412	23.09	≤28.69	PASS
	total	2412	25.09	≤28.69	PASS
	Ant1	2437	23.63	≤28.69	PASS
	Ant2	2437	21.55	≤28.69	PASS
	total	2437	25.72	≤28.69	PASS
	Ant1	2462	20.63	≤28.69	PASS
	Ant2	2462	23.23	≤28.69	PASS
	total	2462	25.13	≤28.69	PASS
11N40MIMO	Ant1	2422	23.60	≤28.69	PASS
	Ant2	2422	21.74	≤28.69	PASS
	total	2422	25.78	≤28.69	PASS
	Ant1	2437	20.69	≤28.69	PASS
	Ant2	2437	23.27	≤28.69	PASS
	total	2437	25.18	≤28.69	PASS
	Ant1	2452	23.56	≤28.69	PASS
	Ant2	2452	21.65	≤28.69	PASS
	total	2452	25.72	≤28.69	PASS
11AX20MIMO	Ant1	2412	21.46	≤28.69	PASS
	Ant2	2412	23.81	≤28.69	PASS
	total	2412	25.80	≤28.69	PASS
	Ant1	2437	21.07	≤28.69	PASS
	Ant2	2437	23.71	≤28.69	PASS
	total	2437	25.60	≤28.69	PASS
	Ant1	2462	21.32	≤28.69	PASS
	Ant2	2462	23.73	≤28.69	PASS

	total	2462	25.70	≤28.69	PASS
11AX40MIMO	Ant1	2422	23.85	≤28.69	PASS
	Ant2	2422	23.17	≤28.69	PASS
	total	2422	**26.53**	≤28.69	PASS
	Ant1	2437	23.57	≤28.69	PASS
	Ant2	2437	23.22	≤28.69	PASS
	total	2437	26.41	≤28.69	PASS
	Ant1	2452	23.51	≤28.69	PASS
	Ant2	2452	22.96	≤28.69	PASS
	total	2452	26.25	≤28.69	PASS

Note: The Duty Cycle Factor is compensated in the test system

for mimo mode: Directional gain = G_{ANT} + 10 log(N_{ANT}) dBi=4.3+3.01=7.31dBi

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

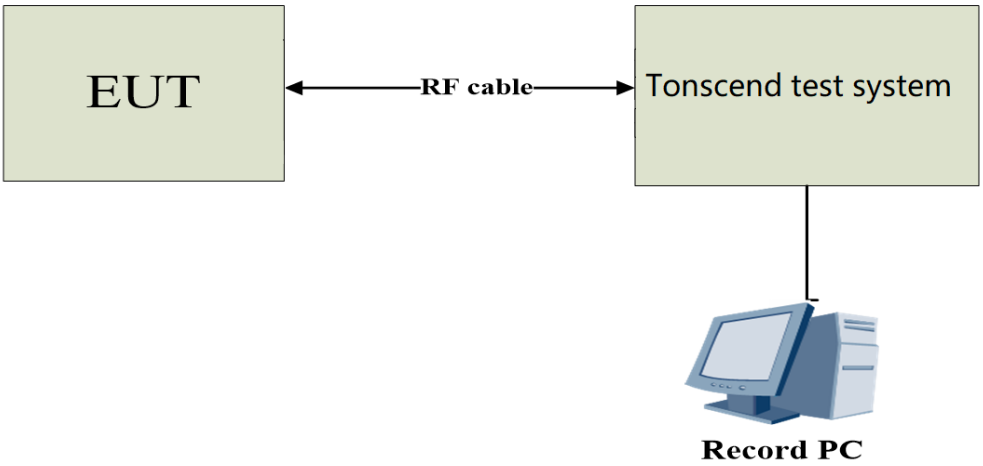
Test Method	
●Conducted Measurement	○Radiated Measurement
Test Channels	
●Lowest, Middle and Highest Channel	○ Lowest and Highest Channel
Environmental conditions	
●Normal	○Normal and Extreme
Note:●:Test ○:No Test	

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 DTS bandwidth
RBW	3 kHz
VBW	10 kHz
Detector	peak
Trace	Max Hold
Sweep Time	Auto

3.6.3 Test Setup



3.6.4 The Result

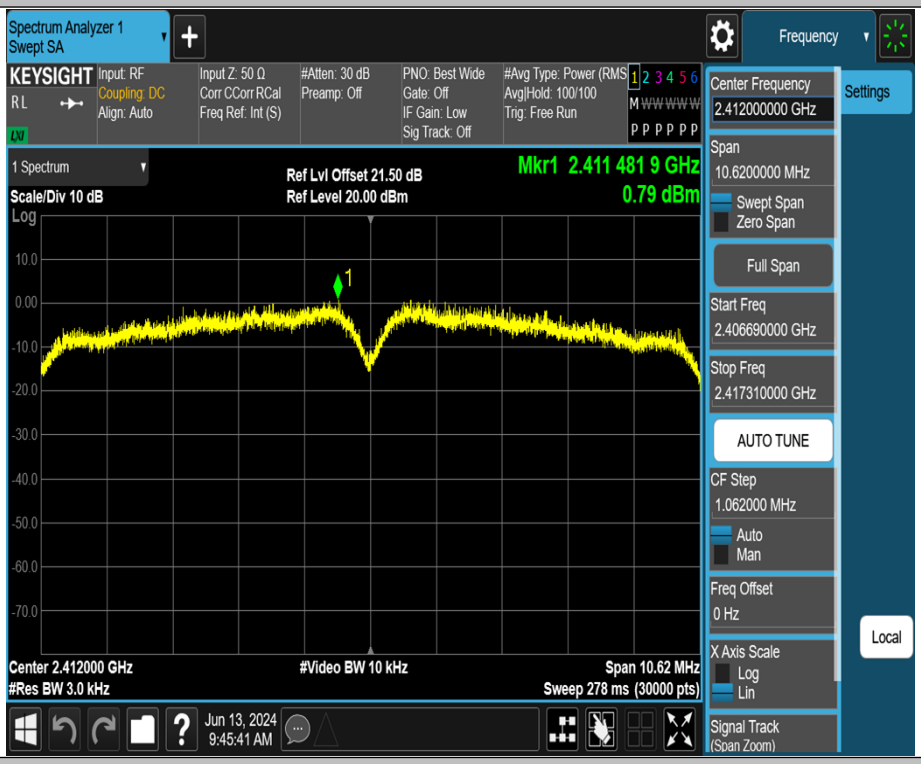
TestMode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	0.79	≤8.00	PASS
	Ant2	2412	1.25	≤8.00	PASS
	Ant1	2437	2.08	≤8.00	PASS
	Ant2	2437	1.08	≤8.00	PASS
	Ant1	2462	0.96	≤8.00	PASS
	Ant2	2462	0.77	≤8.00	PASS
11G	Ant1	2412	-1.74	≤8.00	PASS
	Ant2	2412	-6.68	≤8.00	PASS
	Ant1	2437	-5.37	≤8.00	PASS
	Ant2	2437	-7.44	≤8.00	PASS
	Ant1	2462	-5.81	≤8.00	PASS
	Ant2	2462	-7.28	≤8.00	PASS
11N20MIMO	Ant1	2412	-13.23	≤6.69	PASS
	Ant2	2412	-7.40	≤6.69	PASS
	total	2412	-6.39	≤6.69	PASS
	Ant1	2437	-15.70	≤6.69	PASS
	Ant2	2437	-7.40	≤6.69	PASS
	total	2437	-6.80	≤6.69	PASS
	Ant1	2462	-15.40	≤6.69	PASS
	Ant2	2462	-7.79	≤6.69	PASS
	total	2462	-7.10	≤6.69	PASS
11N40MIMO	Ant1	2422	-18.35	≤6.69	PASS
	Ant2	2422	-10.65	≤6.69	PASS
	total	2422	-9.97	≤6.69	PASS
	Ant1	2437	-18.62	≤6.69	PASS
	Ant2	2437	-8.71	≤6.69	PASS
	total	2437	-8.29	≤6.69	PASS
	Ant1	2452	-17.38	≤6.69	PASS
	Ant2	2452	-10.21	≤6.69	PASS
	total	2452	-9.45	≤6.69	PASS
11AX20MIMO	Ant1	2412	-17.37	≤6.69	PASS
	Ant2	2412	-7.59	≤6.69	PASS
	total	2412	-7.16	≤6.69	PASS
	Ant1	2437	-9.12	≤6.69	PASS
	Ant2	2437	-9.22	≤6.69	PASS
	total	2437	-6.16	≤6.69	PASS
	Ant1	2462	-9.70	≤6.69	PASS
	Ant2	2462	-10.34	≤6.69	PASS
	total	2462	-7.00	≤6.69	PASS

11AX40MIMO	Ant1	2422	-11.44	≤6.69	PASS
	Ant2	2422	-12.57	≤6.69	PASS
	total	2422	-8.96	≤6.69	PASS
	Ant1	2437	-11.80	≤6.69	PASS
	Ant2	2437	-12.07	≤6.69	PASS
	total	2437	-8.92	≤6.69	PASS
	Ant1	2452	-11.26	≤6.69	PASS
	Ant2	2452	-11.71	≤6.69	PASS
	total	2452	-8.47	≤6.69	PASS

Note:

for mimo mode: Directional gain = G_{ANT} + 10 log(N_{ANT}) dBi=4.3+3.01=7.31dBi

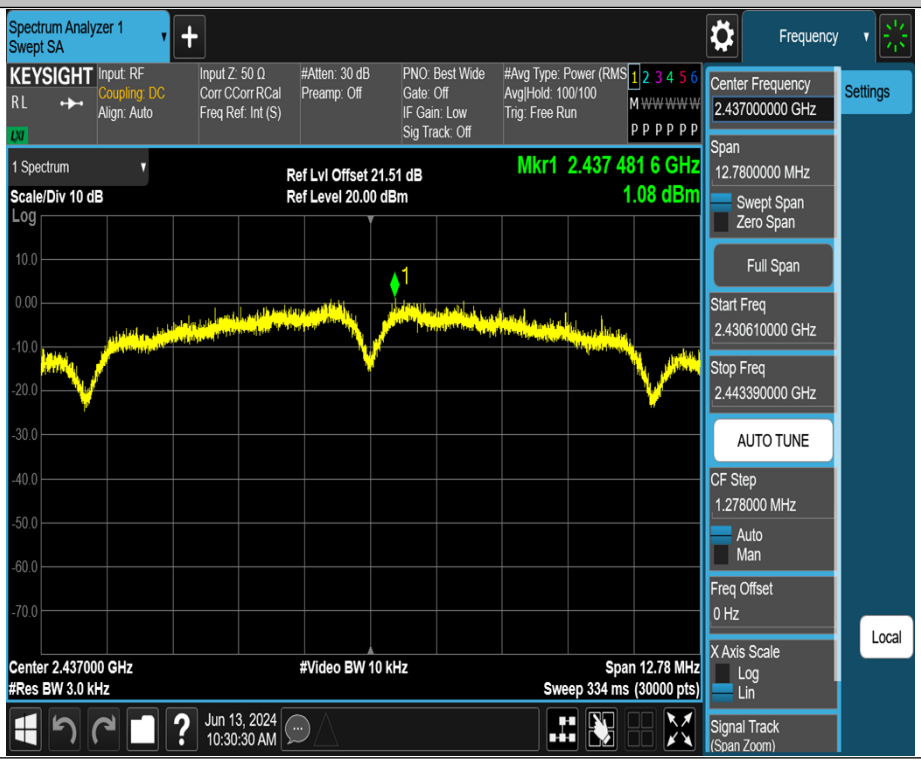
11B_Ant1_2412



11B_Ant2_2412

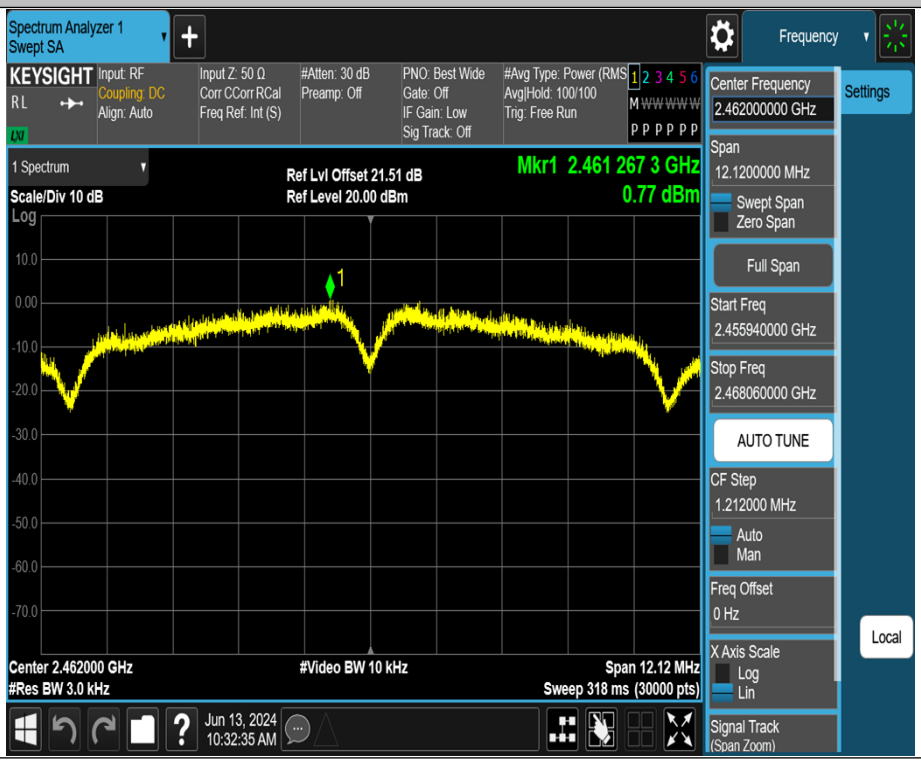
11B_Ant1_2437

11B_Ant2_2437

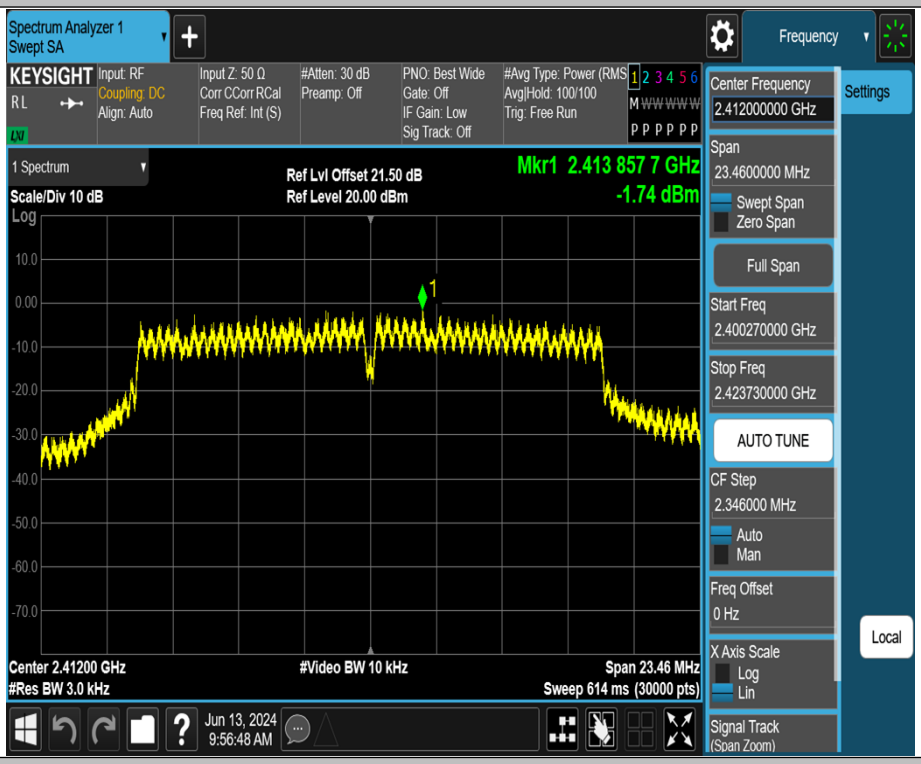
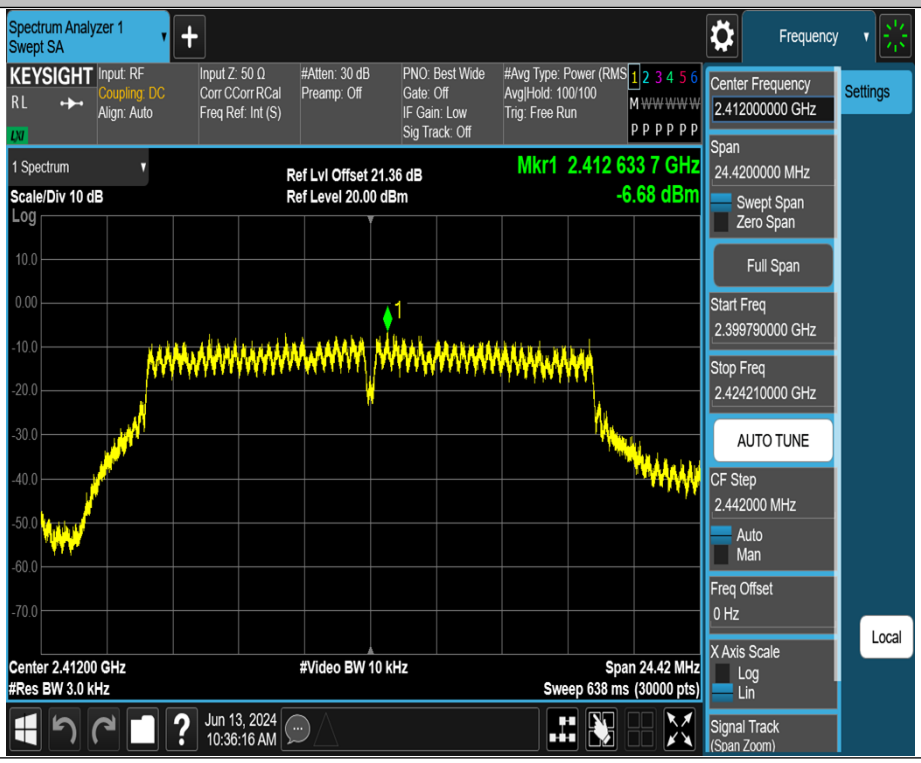


11B_Ant1_2462

11B_Ant2_2462



11G_Ant1_2412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