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

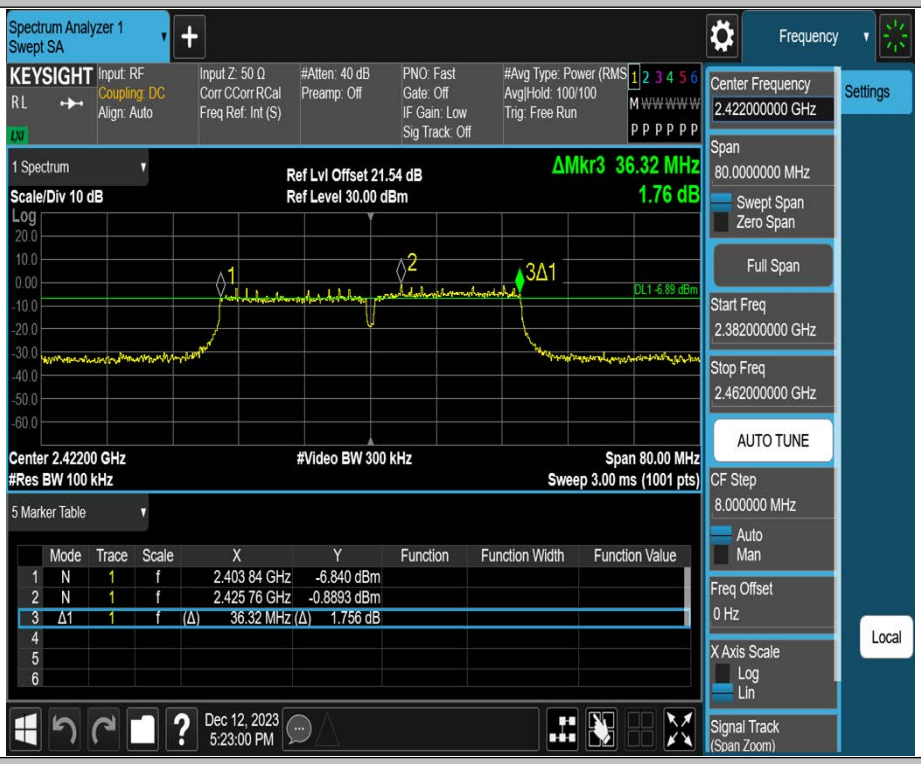

11N20MIMO_Ant1_2437

11N20MIMO_Ant2_2437


11N20MIMO_Ant1_2462

11N20MIMO_Ant2_2462


11N40MIMO_Ant1_2422



11N40MIMO_Ant2_2422

11N40MIMO_Ant1_2437

11N40MIMO_Ant2_2437

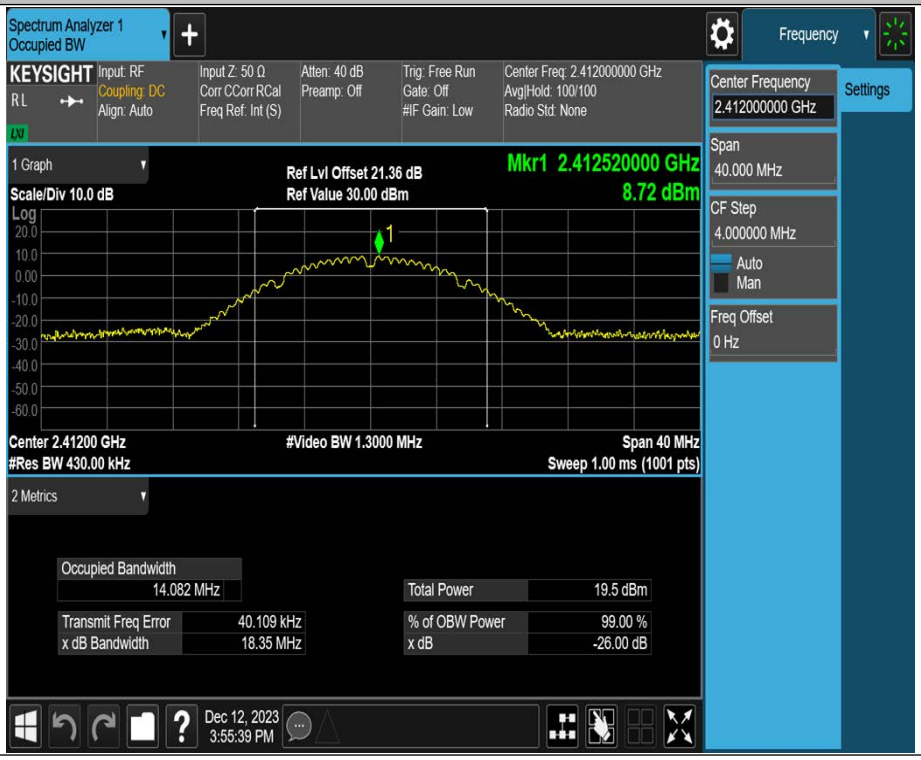
11N40MIMO_Ant1_2452

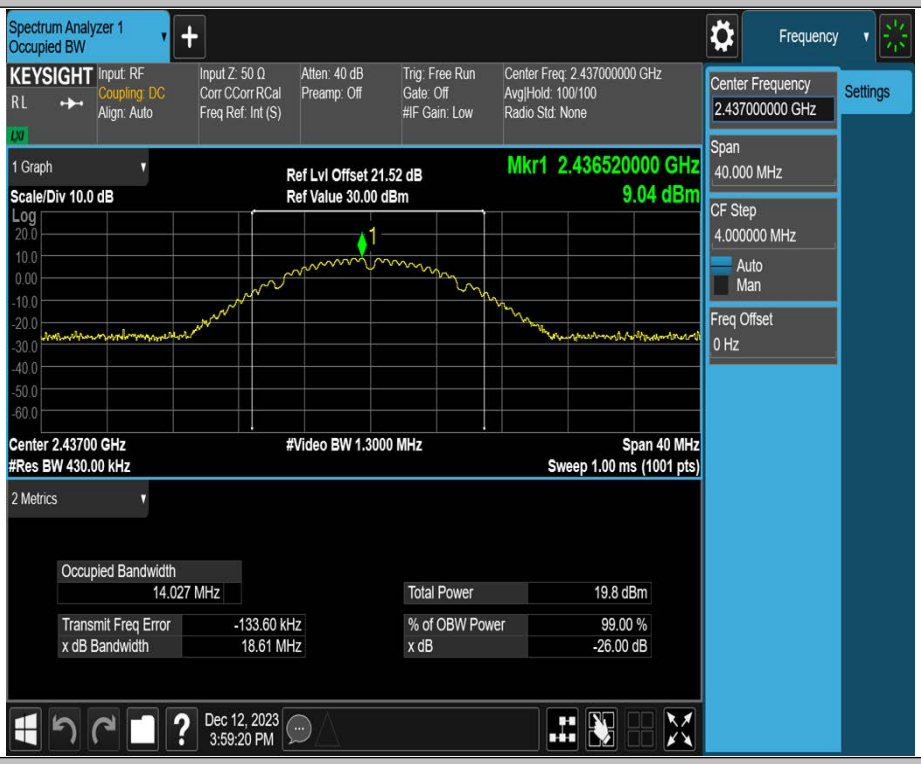
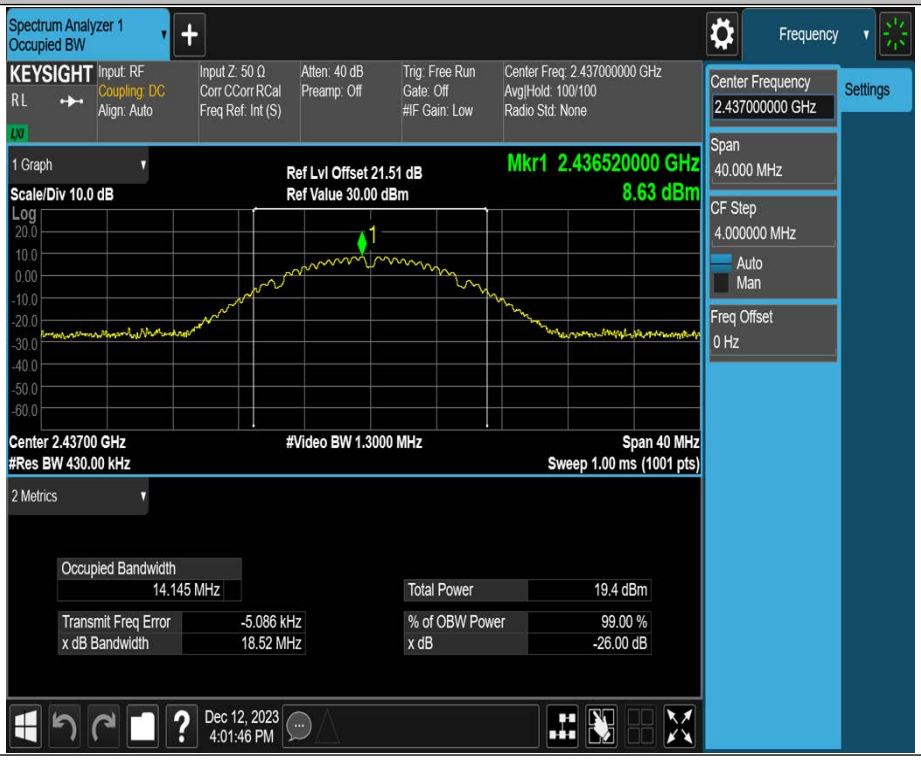
11N40MIMO_Ant2_2452

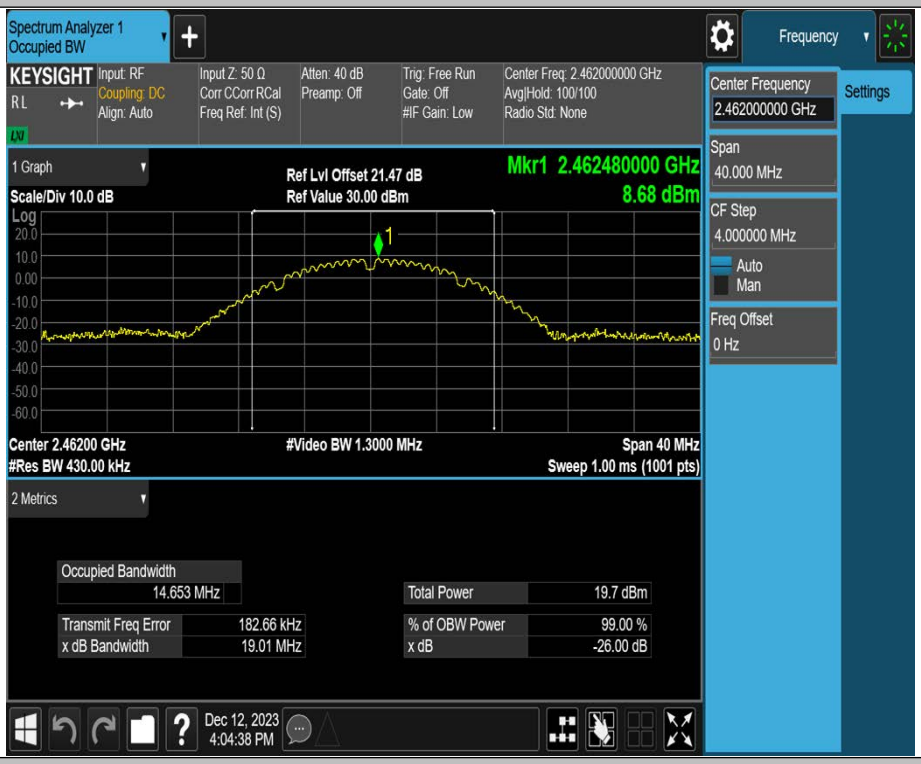

Occupied Channel Bandwidth

Test Mode	Antenna	Channel Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B-CDD	Ant1	2412	14.500	2404.7953	2419.2953	---	---
	Ant2	2412	14.082	2404.9991	2419.0811	---	---
	Ant1	2437	14.027	2429.8529	2443.8799	---	---
	Ant2	2437	14.145	2429.9224	2444.0674	---	---
	Ant1	2462	14.653	2454.8562	2469.5092	---	---
	Ant2	2462	14.122	2454.9635	2469.0855	---	---
11G-CDD	Ant1	2412	17.402	2403.2272	2420.6292	---	---
	Ant2	2412	16.989	2403.4638	2420.4528	---	---
	Ant1	2437	17.035	2428.3281	2445.3631	---	---
	Ant2	2437	16.894	2428.5408	2445.4348	---	---
	Ant1	2462	17.376	2453.2996	2470.6756	---	---
	Ant2	2462	17.133	2453.3621	2470.4951	---	---
11N20MIMO	Ant1	2412	17.343	2403.2478	2420.5908	---	---
	Ant2	2412	17.015	2403.4772	2420.4922	---	---
	Ant1	2437	18.081	2427.8829	2445.9639	---	---
	Ant2	2437	18.164	2427.8843	2446.0483	---	---
	Ant1	2462	18.497	2452.7504	2471.2474	---	---
	Ant2	2462	18.397	2452.7413	2471.1383	---	---
11N40MIMO	Ant1	2422	37.062	2403.5317	2440.5937	---	---
	Ant2	2422	37.070	2403.4464	2440.5164	---	---
	Ant1	2437	36.576	2418.5989	2455.1749	---	---
	Ant2	2437	36.689	2418.5442	2455.2332	---	---
	Ant1	2452	37.478	2433.0828	2470.5608	---	---
	Ant2	2452	37.165	2433.2720	2470.4370	---	---

11B-CDD_Ant1_2412

11B-CDD_Ant2_2412


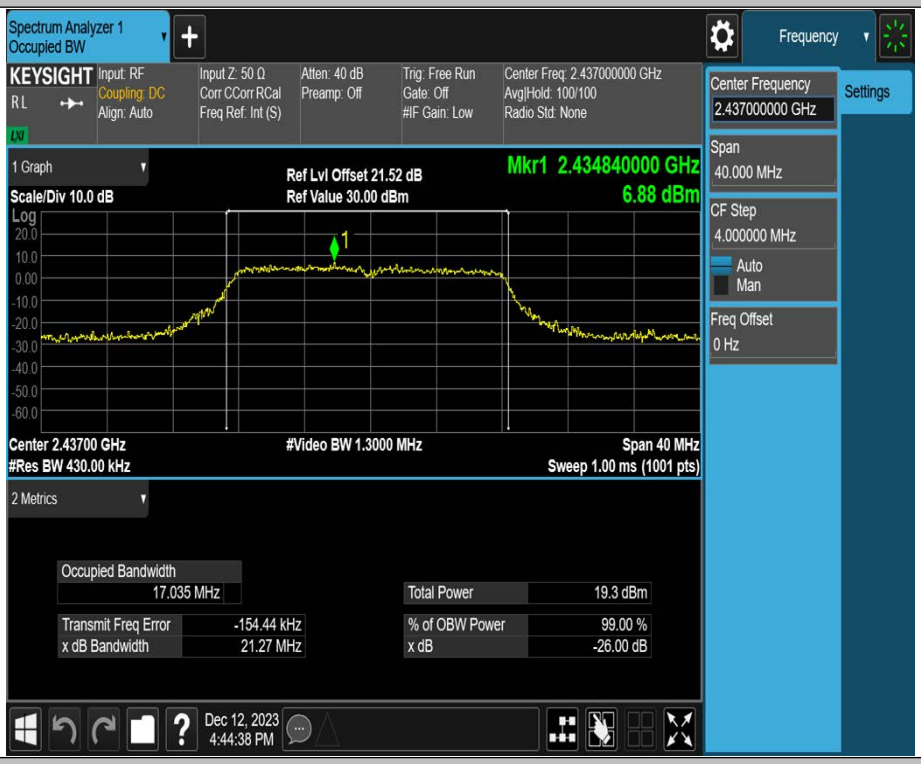
11B-CDD_Ant1_2437

11B-CDD_Ant2_2437


11B-CDD_Ant1_2462

11B-CDD_Ant2_2462


11G-CDD_Ant1_2412

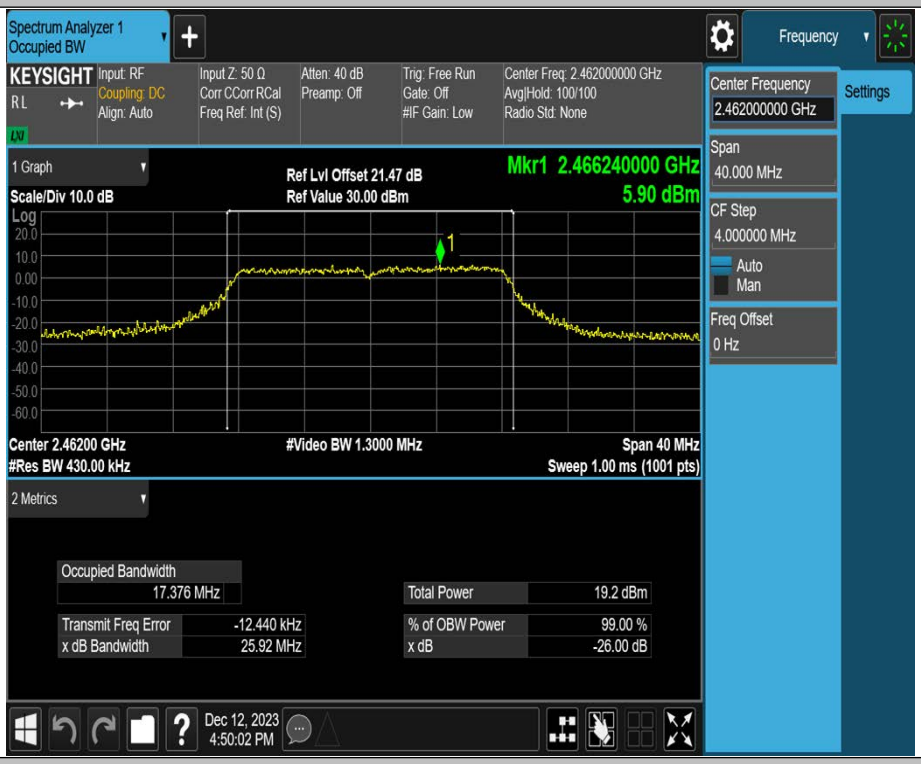
11G-CDD_Ant2_2412

11G-CDD_Ant1_2437

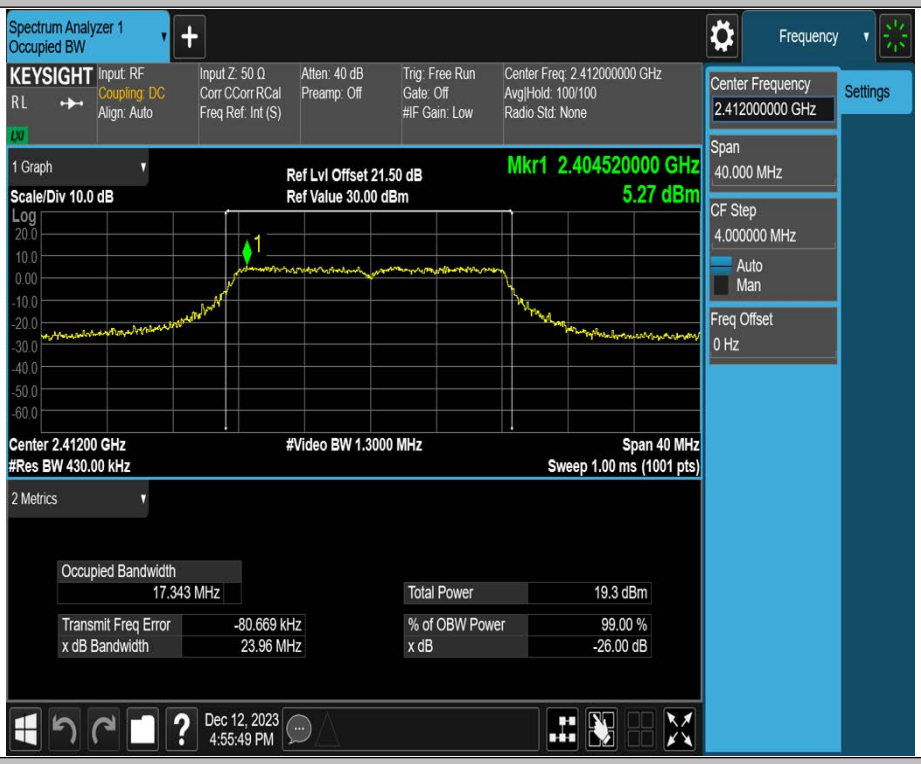


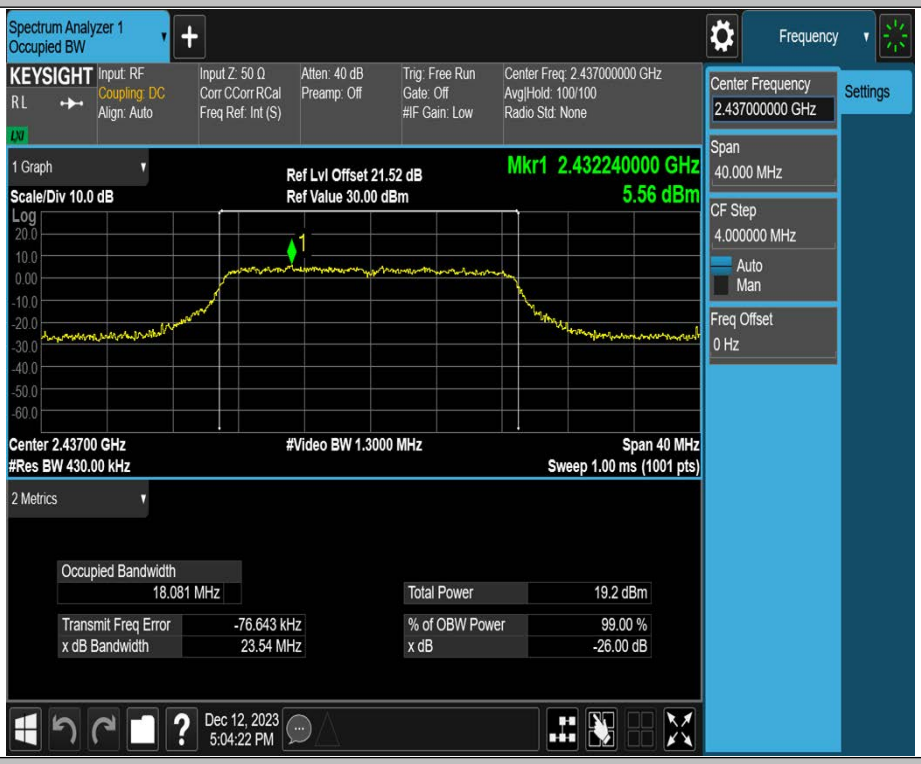
11G-CDD_Ant2_2437

11G-CDD_Ant1_2462

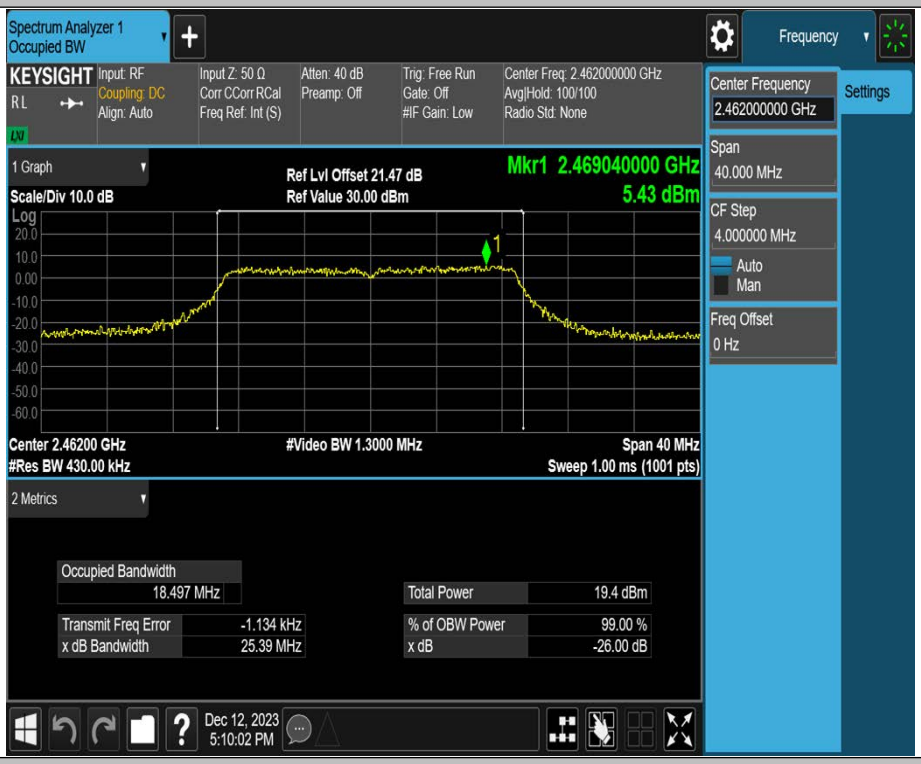


11G-CDD_Ant2_2462

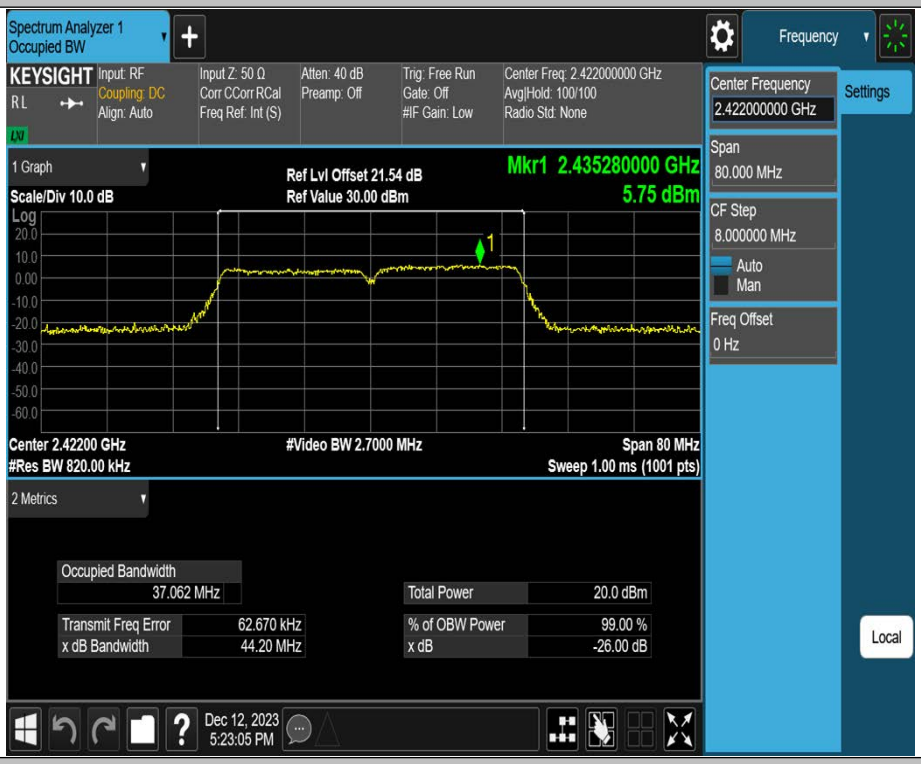
11N20MIMO_Ant1_2412

11N20MIMO_Ant2_2412


11N20MIMO_Ant1_2437

11N20MIMO_Ant2_2437


11N20MIMO_Ant1_2462

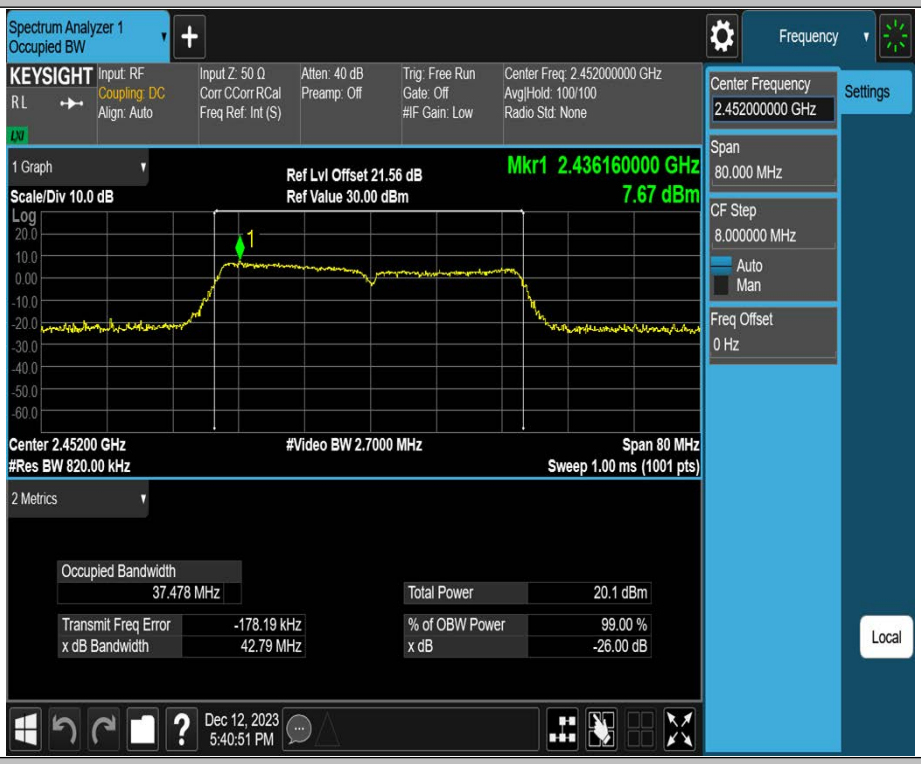


11N20MIMO_Ant2_2462

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)

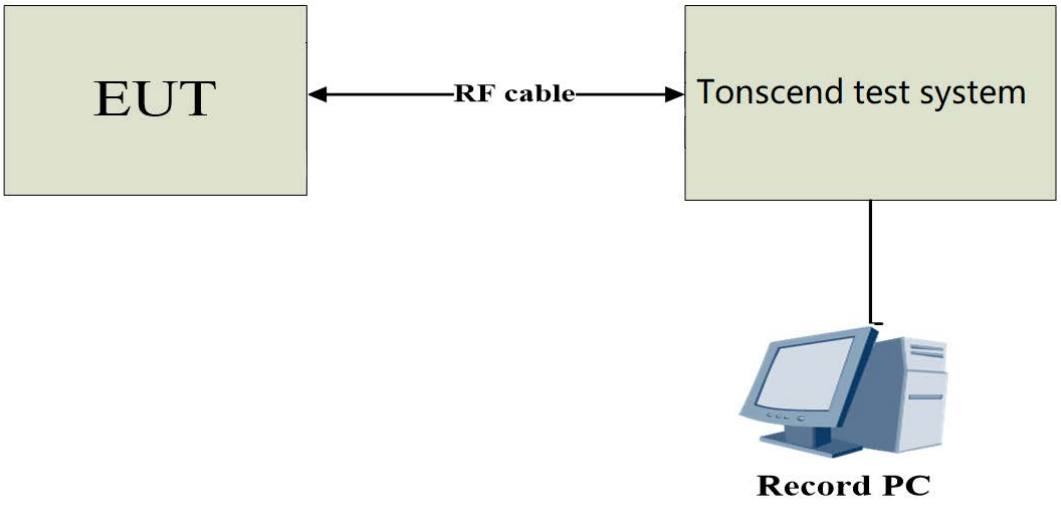
3.5.2 Test Procedure

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	

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 11.9.2.3 (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 Mode	Power Level Setting defined by Manufacturer		
Test Software Version	QRCT4		
Frequency (MHz)	2412	2437	2462
IEEE 802.11b	12	12	12
IEEE 802.11g	11	11	11
IEEE 802.11n(20)	11	11	11
Frequency (MHz)	2422	2437	2452
IEEE 802.11n(40)	11	11	11

3.5.5 The Result

Test Mode	Antenna	Frequency[MHz]	Maximum conducted output Power [dBm]	Limit [dBm]	Verdict
11B-CDD	Ant1	2412	12.87	≤30.00	PASS
	Ant2	2412	12.33	≤30.00	PASS
	total	2412	15.62	≤30.00	PASS
	Ant1	2437	12.69	≤30.00	PASS
	Ant2	2437	12.12	≤30.00	PASS
	total	2437	15.42	≤30.00	PASS
	Ant1	2462	12.41	≤30.00	PASS
	Ant2	2462	12.54	≤30.00	PASS
	total	2462	15.49	≤30.00	PASS
11G-CDD	Ant1	2412	12.26	≤30.00	PASS
	Ant2	2412	12.09	≤30.00	PASS
	total	2412	15.19	≤30.00	PASS
	Ant1	2437	12.12	≤30.00	PASS
	Ant2	2437	12.14	≤30.00	PASS
	total	2437	15.14	≤30.00	PASS
	Ant1	2462	12.01	≤30.00	PASS
	Ant2	2462	12.33	≤30.00	PASS
	total	2462	15.18	≤30.00	PASS
11N20MIMO	Ant1	2412	12.17	≤30.00	PASS
	Ant2	2412	11.81	≤30.00	PASS
	total	2412	15.00	≤30.00	PASS
	Ant1	2437	11.80	≤30.00	PASS
	Ant2	2437	12.20	≤30.00	PASS
	total	2437	15.01	≤30.00	PASS
	Ant1	2462	12.21	≤30.00	PASS
	Ant2	2462	12.01	≤30.00	PASS
	total	2462	15.12	≤30.00	PASS
11N40MIMO	Ant1	2422	11.89	≤30.00	PASS
	Ant2	2422	11.61	≤30.00	PASS
	total	2422	14.76	≤30.00	PASS
	Ant1	2437	12.34	≤30.00	PASS
	Ant2	2437	12.02	≤30.00	PASS
	total	2437	15.19	≤30.00	PASS
	Ant1	2452	11.99	≤30.00	PASS
	Ant2	2452	12.19	≤30.00	PASS
	total	2452	15.10	≤30.00	PASS

Note: The Duty Cycle Factor is compensated in the result.

Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dBi
If transmit signals are correlated, then Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2 / N_{ANT}$] 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 = 10log[$(10^{1.93/20} + 10^{2.07/20})^2/N_{ANT}$] dBi=5.01

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

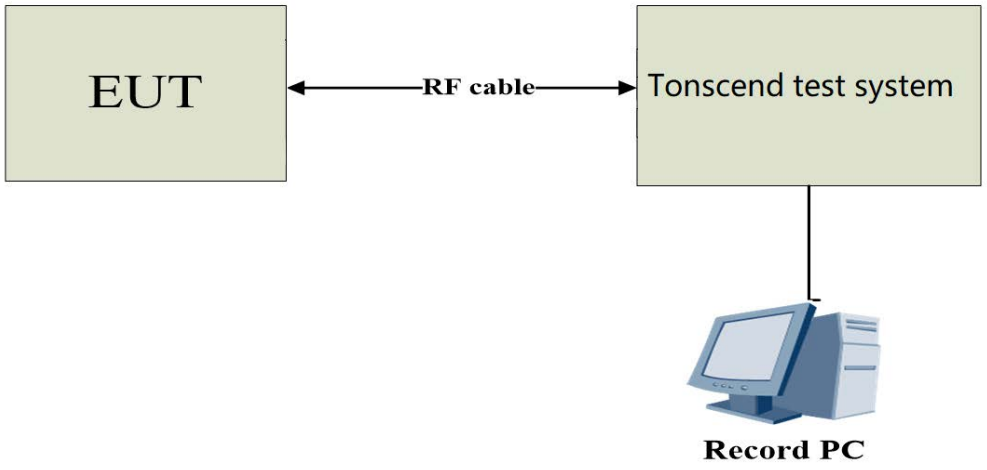
Test Method	
●Conducted Measurement	○Radiated Measurement
Test Channels	
●Lowest, Middle and Highest Channel	○ Lowest and Highest Channel
Environmental conditions	
●Normal	○Normal and Extreme
Note:●:Test ○:No Test	

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	AV
Trace	Max Hold
Sweep Time	Auto

3.6.3 Test Setup



3.6.4 The Result

Test Mode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B-CDD	Ant1	2412	-14.65	≤8.00	PASS
	Ant2	2412	-14.97	≤8.00	PASS
	total	2412	-11.80	≤8.00	PASS
	Ant1	2437	-14.39	≤8.00	PASS
	Ant2	2437	-14.70	≤8.00	PASS
	total	2437	-11.53	≤8.00	PASS
	Ant1	2462	-14.50	≤8.00	PASS
	Ant2	2462	-14.44	≤8.00	PASS
	total	2462	-11.46	≤8.00	PASS
11G-CDD	Ant1	2412	-19.83	≤8.00	PASS
	Ant2	2412	-20.01	≤8.00	PASS
	total	2412	-16.91	≤8.00	PASS
	Ant1	2437	-19.83	≤8.00	PASS
	Ant2	2437	-19.83	≤8.00	PASS
	total	2437	-16.82	≤8.00	PASS
	Ant1	2462	-19.68	≤8.00	PASS
	Ant2	2462	-19.42	≤8.00	PASS
	total	2462	-16.54	≤8.00	PASS
11N20MIMO	Ant1	2412	-19.80	≤8.00	PASS
	Ant2	2412	-20.00	≤8.00	PASS
	total	2412	-16.89	≤8.00	PASS
	Ant1	2437	-20.52	≤8.00	PASS
	Ant2	2437	-17.52	≤8.00	PASS
	total	2437	-15.76	≤8.00	PASS
	Ant1	2462	-20.01	≤8.00	PASS
	Ant2	2462	-20.32	≤8.00	PASS
	total	2462	-17.15	≤8.00	PASS
11N40MIMO	Ant1	2422	-21.83	≤8.00	PASS
	Ant2	2422	-22.55	≤8.00	PASS
	total	2422	-19.16	≤8.00	PASS
	Ant1	2437	-20.89	≤8.00	PASS
	Ant2	2437	-20.34	≤8.00	PASS
	total	2437	-17.60	≤8.00	PASS
	Ant1	2452	-20.96	≤8.00	PASS
	Ant2	2452	-21.66	≤8.00	PASS
	total	2452	-18.29	≤8.00	PASS

Note: The Duty Cycle Factor is compensated in the graph.

Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dBi
If transmit signals are correlated, then Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2 / N_{ANT}$] 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 = 10log[$(10^{1.93/20} + 10^{2.07/20})^2 / N_{ANT}$] dBi=5.01

11B-CDD_Ant1_2412

11B-CDD_Ant2_2412


11B-CDD_Ant1_2437

11B-CDD_Ant2_2437


11B-CDD_Ant1_2462

11B-CDD_Ant2_2462