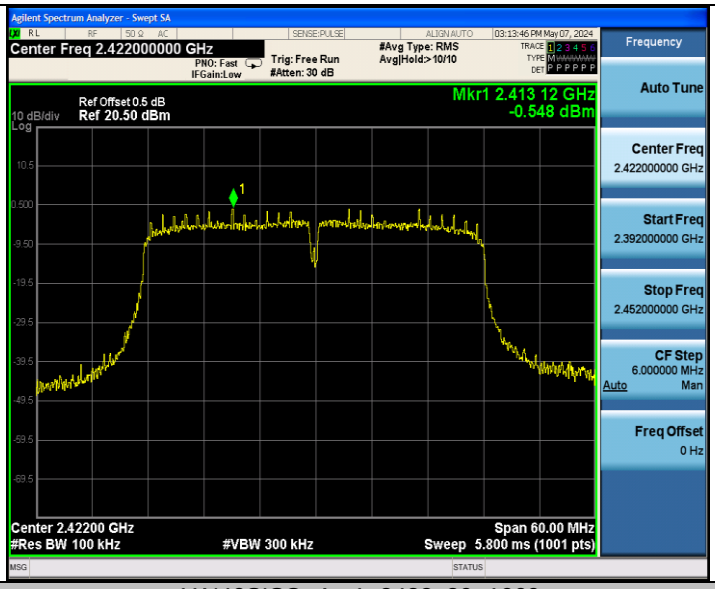
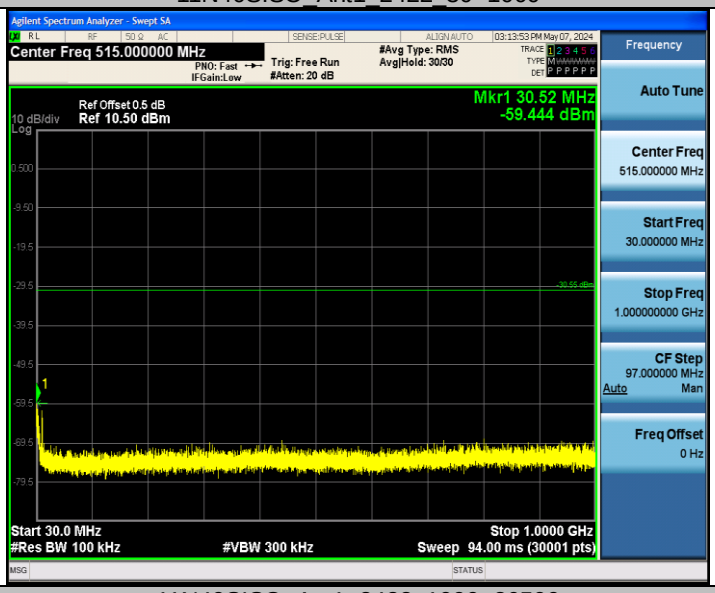
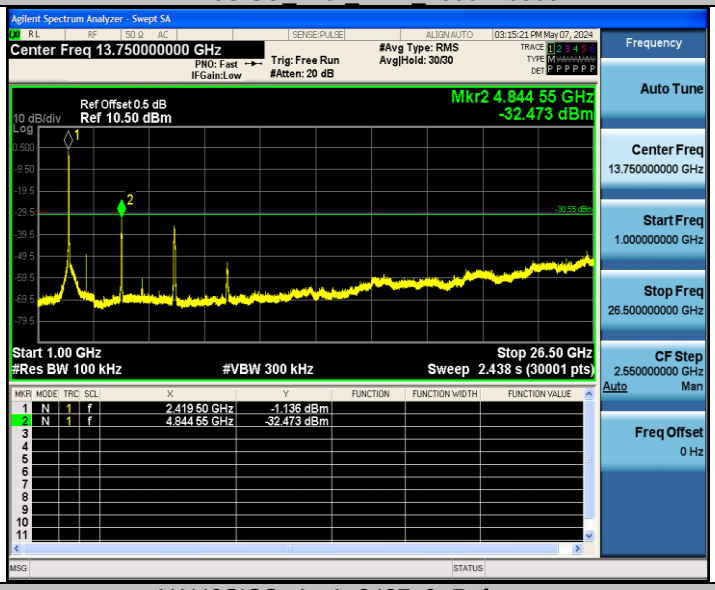


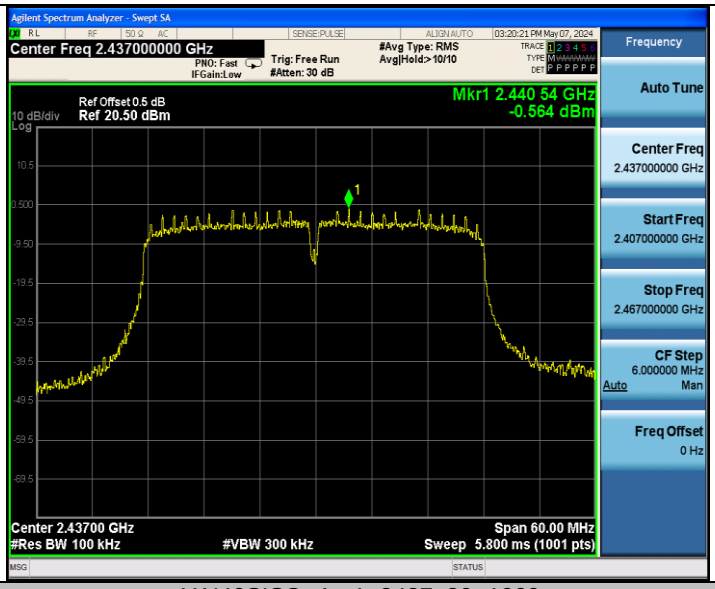
11N40SISO_Ant1_2422_30~1000



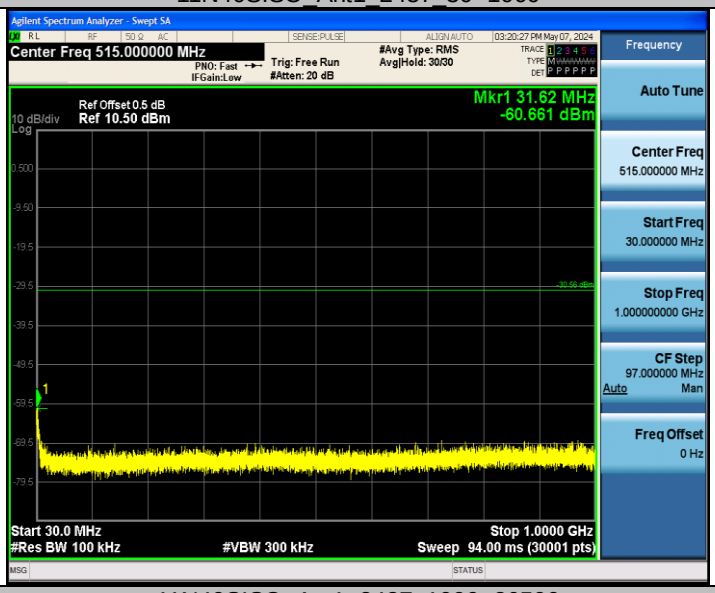
11N40SISO_Ant1_2422_1000~26500



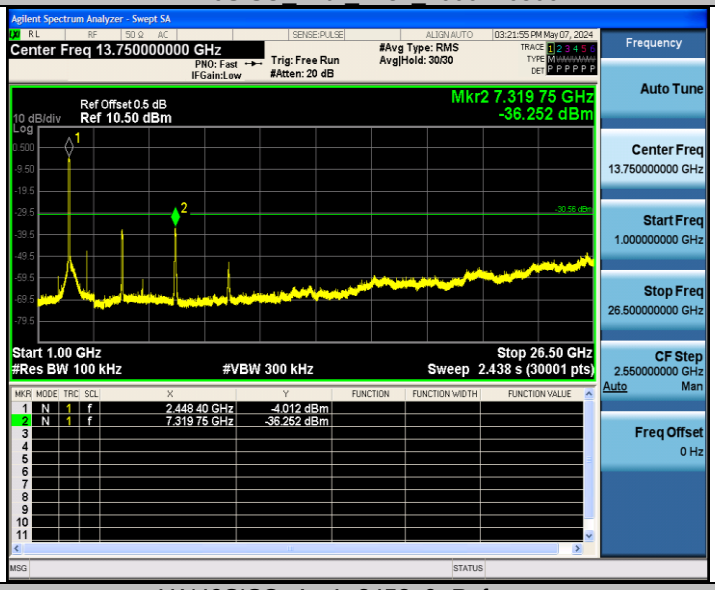
11N40SISO_Ant1_2437_0~Reference



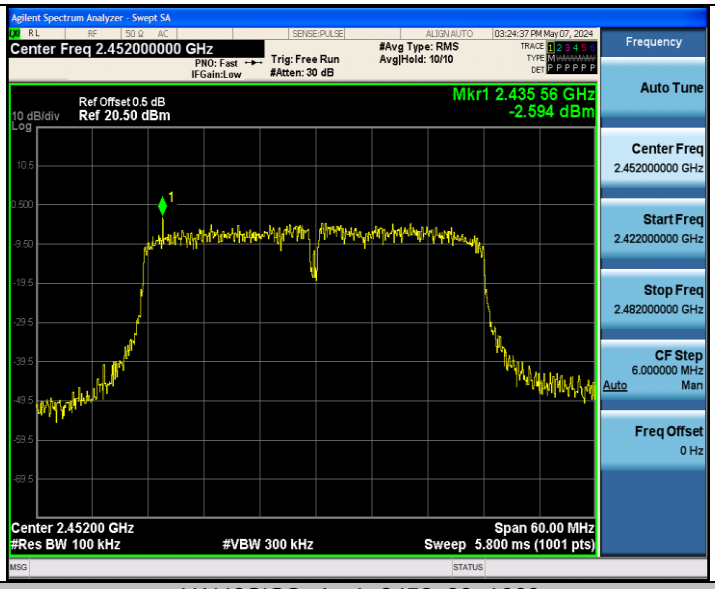
11N40SISO_Ant1_2437_30~1000



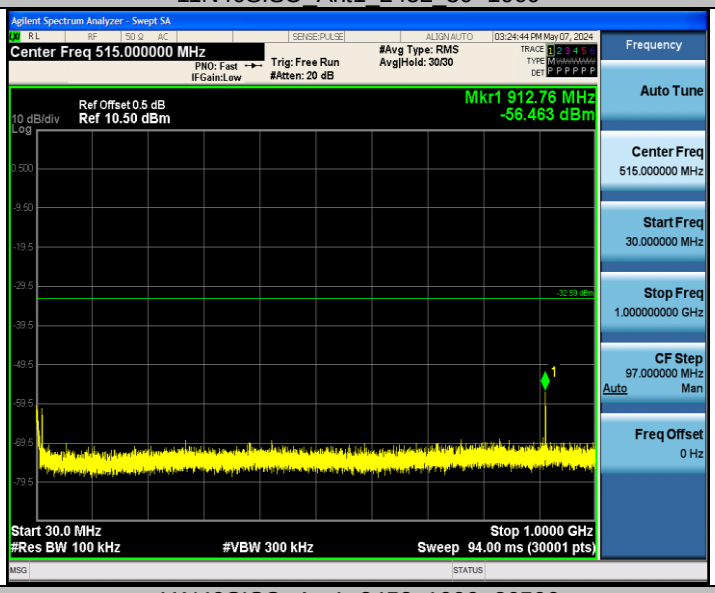
11N40SISO_Ant1_2437_1000~26500



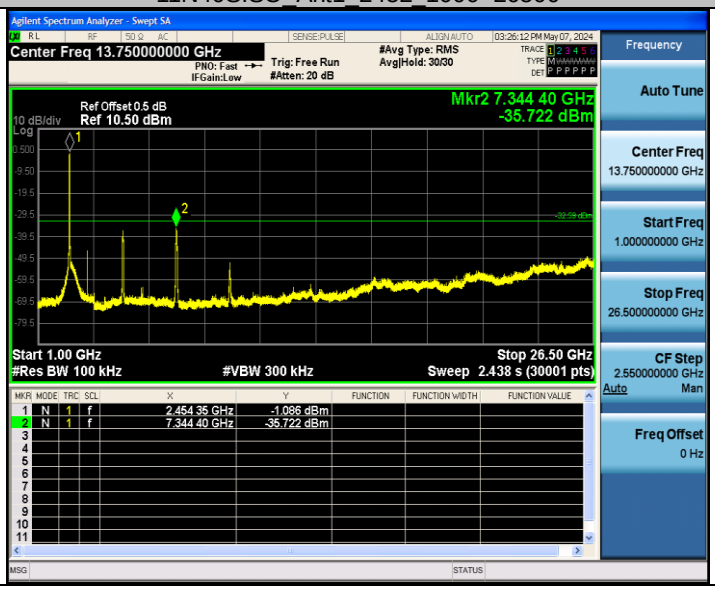
11N40SISO_Ant1_2452_0~Reference



11N40SISO_Ant1_2452_30~1000



11N40SISO_Ant1_2452_1000~26500



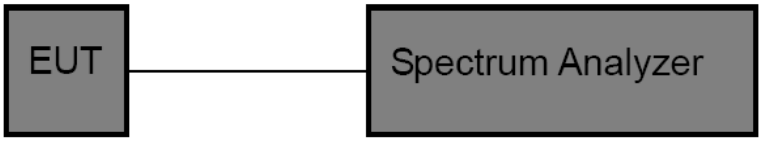
3.5. Bandwidth

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2)

Test Item	Limit	Frequency Range(MHz)
Bandwidth	>=500 KHz (6dB bandwidth)	2400~2483.5

Test Configuration



Test Procedure

5. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
6. DTS Spectrum Setting:
   (1) Set RBW = 100 kHz.
   (2) Set the video bandwidth (VBW) ≥ 3 RBW.
   (3) Detector = Peak.
   (4) Trace mode = Max hold.
   (5) Sweep = Auto couple.
   OCB Spectrum Setting:
   (1) Set RBW = 1% ~ 5% occupied bandwidth.
   (2) Set the video bandwidth (VBW) ≥ 3 RBW.
   (3) Detector = Peak.
   (4) Trace mode = Max hold.
   (5) Sweep = Auto couple.

NOTE: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

Test Mode

Please refer to the clause 2.3.

Test Results

DTS Bandwidth Test Result

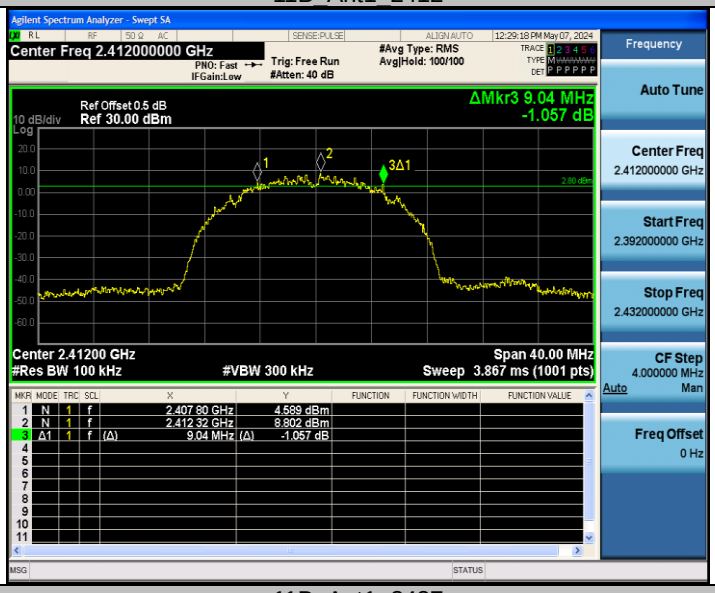
TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.040	2407.800	2416.840	0.5	PASS
		2437	7.560	2432.800	2440.360	0.5	PASS
		2462	9.840	2456.960	2466.800	0.5	PASS
11G	Ant1	2412	16.400	2403.600	2420.000	0.5	PASS
		2437	16.560	2428.520	2445.080	0.5	PASS
		2462	16.360	2453.640	2470.000	0.5	PASS
11N20SISO	Ant1	2412	17.600	2403.000	2420.600	0.5	PASS
		2437	17.080	2428.280	2445.360	0.5	PASS
		2462	17.440	2453.160	2470.600	0.5	PASS
11N40SISO	Ant1	2422	35.120	2404.240	2439.360	0.5	PASS
		2437	32.320	2421.160	2453.480	0.5	PASS
		2452	34.960	2434.320	2469.280	0.5	PASS

Occupied Channel Bandwidth Test Result

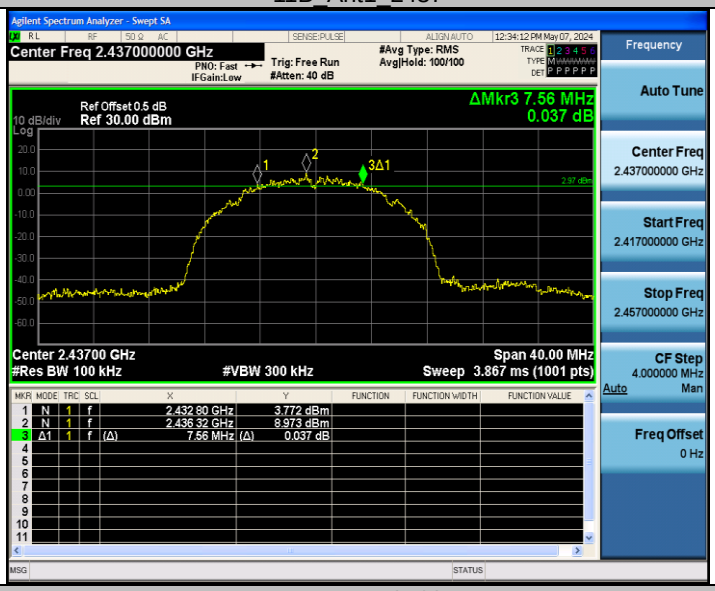
TestMode	Antenna	Channel Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	13.044	2405.2855	2418.3295	---	---
		2437	12.980	2430.3046	2443.2846	---	---
		2462	12.987	2455.2981	2468.2851	---	---
11G	Ant1	2412	16.805	2403.4435	2420.2485	---	---
		2437	16.776	2428.4379	2445.2139	---	---
		2462	16.796	2453.4450	2470.2410	---	---
11N20SISO	Ant1	2412	17.533	2403.0479	2420.5809	---	---
		2437	17.533	2428.0630	2445.5960	---	---
		2462	17.514	2453.0672	2470.5812	---	---
11N40SISO	Ant1	2422	35.800	2403.9338	2439.7338	---	---
		2437	35.762	2418.9421	2454.7041	---	---
		2452	35.826	2433.9657	2469.7917	---	---

DTS Bandwidth Test Graphs

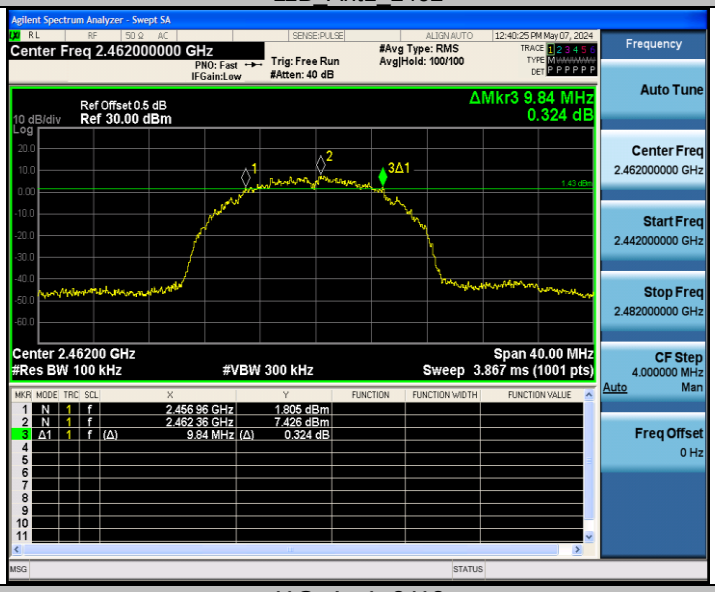
11B_Ant1_2412



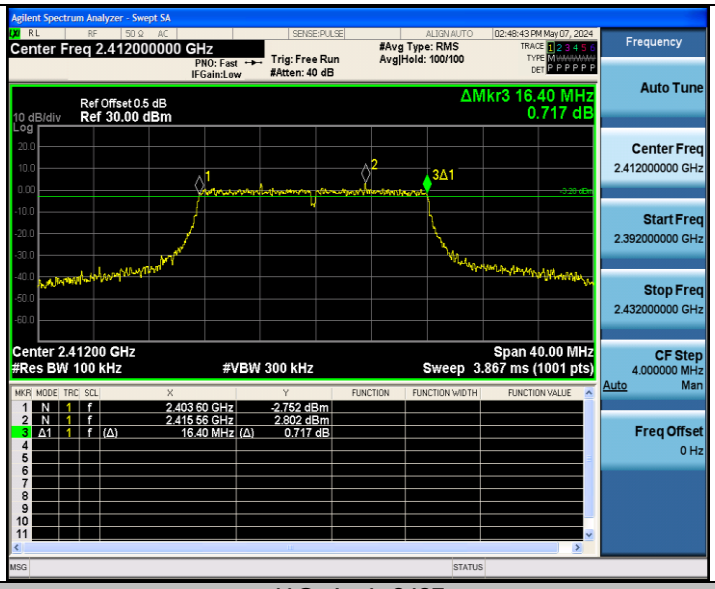
11B_Ant1_2437



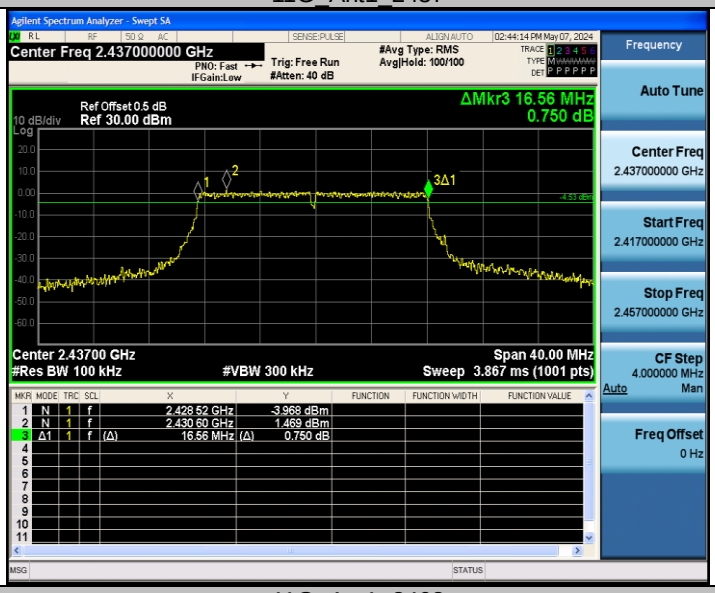
11B_Ant1_2462



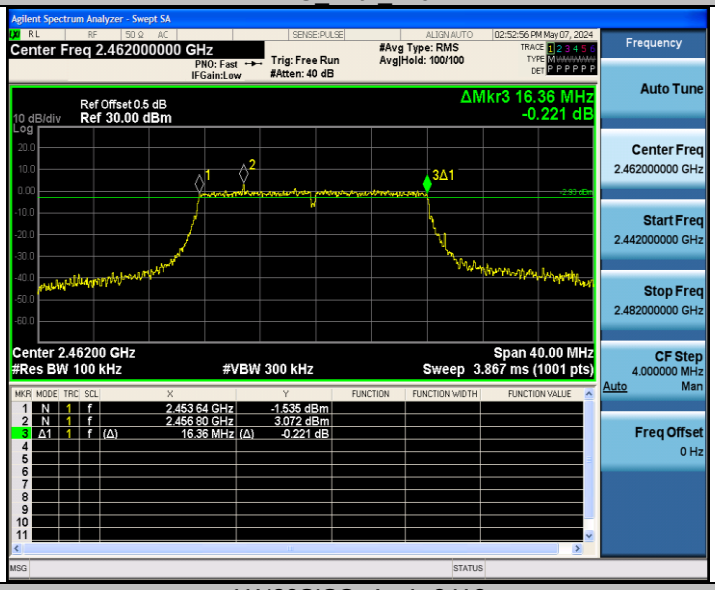
11G_Ant1_2412



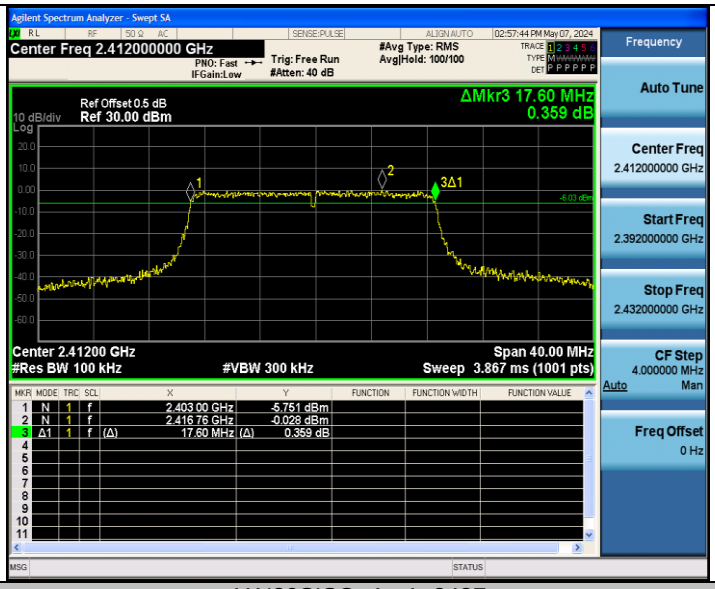
11G_Ant1_2437



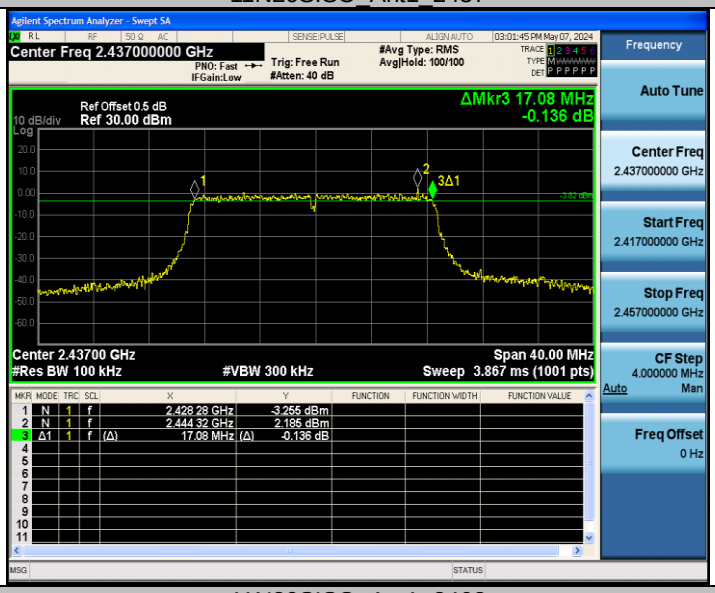
11G_Ant1_2462



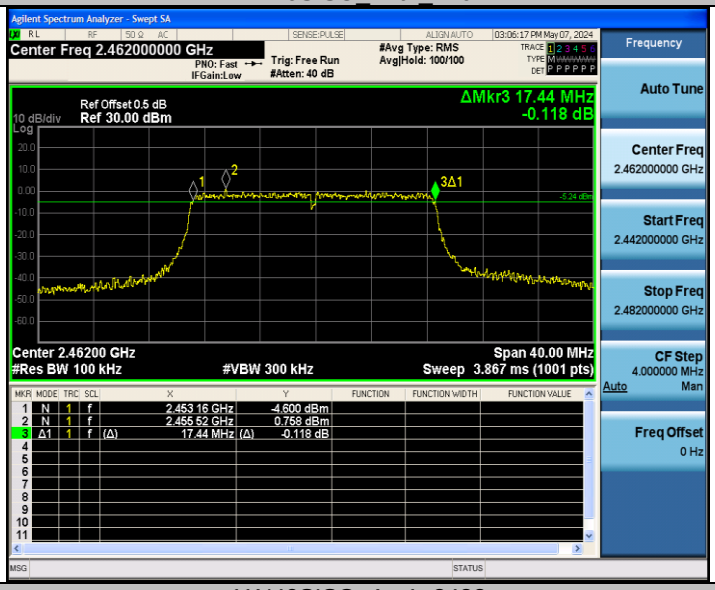
11N20SISO_Ant1_2412



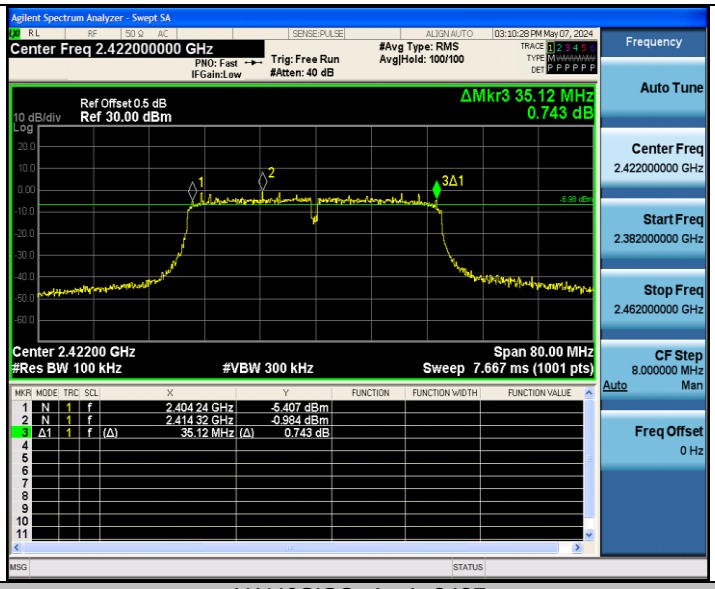
11N20SISO_Ant1_2437



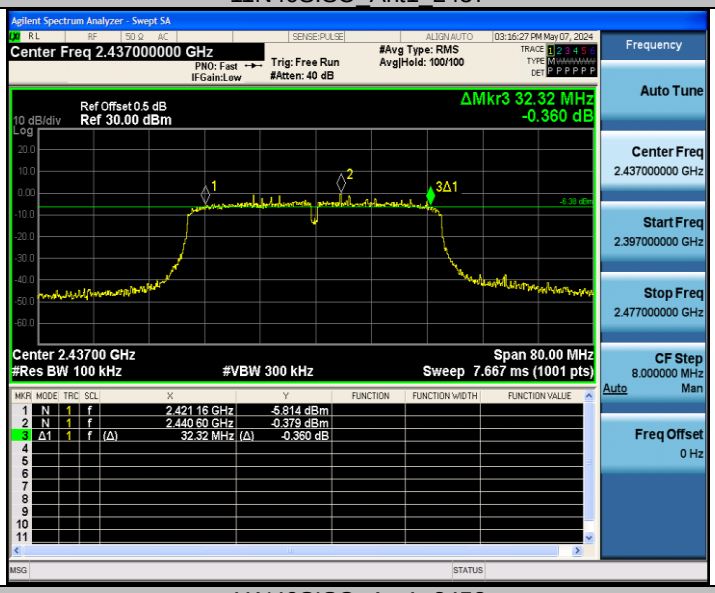
11N20SISO_Ant1_2462



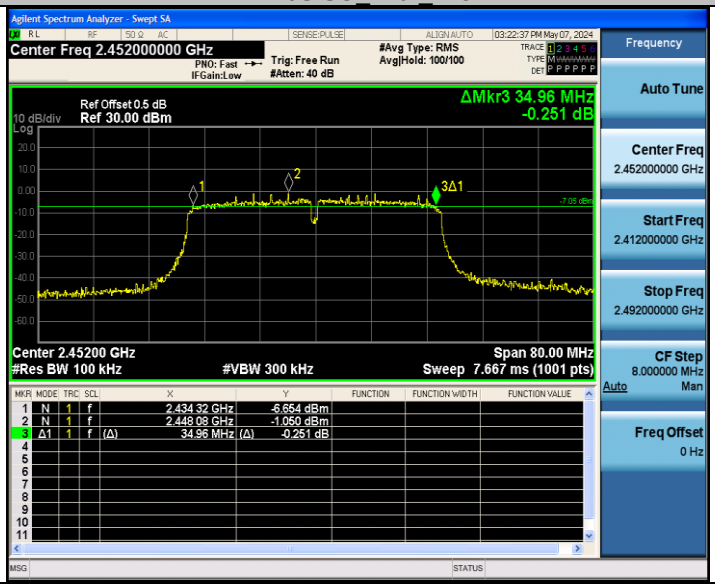
11N40SISO_Ant1_2422



11N40SISO_Ant1_2437

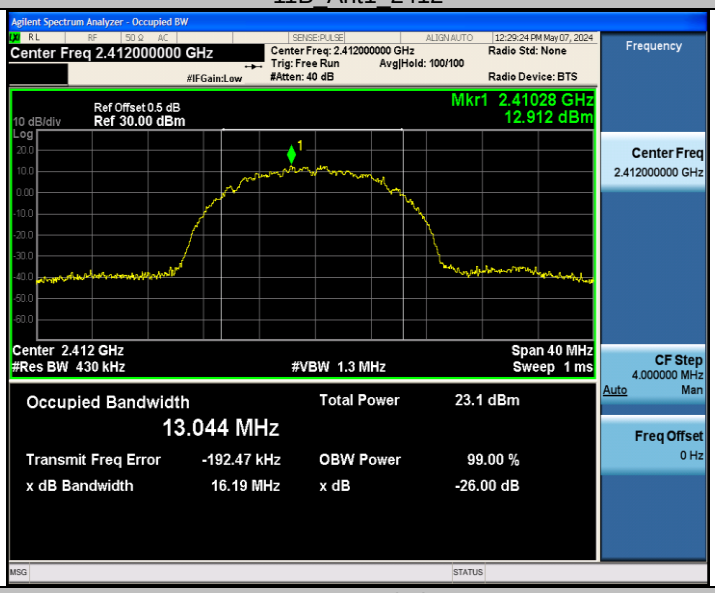


11N40SISO_Ant1_2452

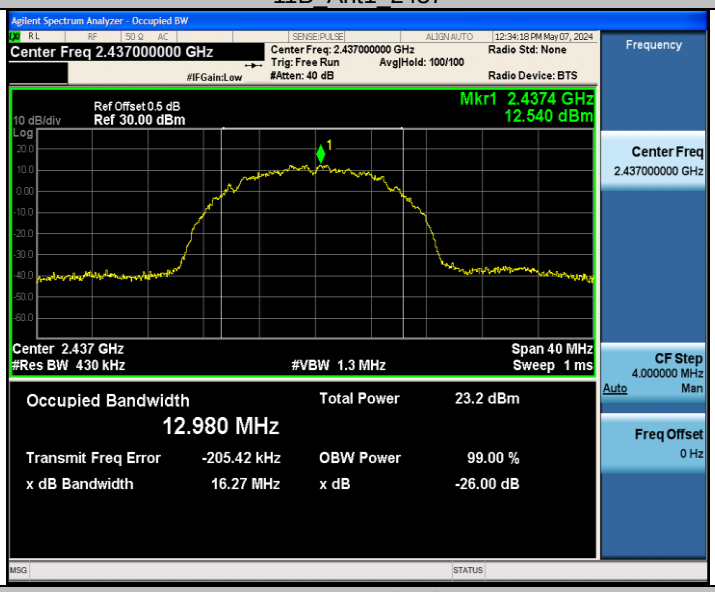


Occupied Channel Bandwidth Test Result

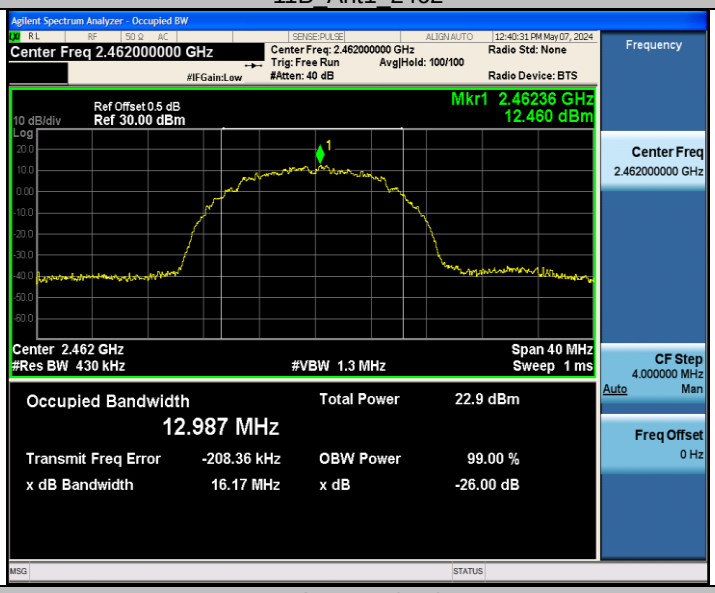
11B_Ant1_2412



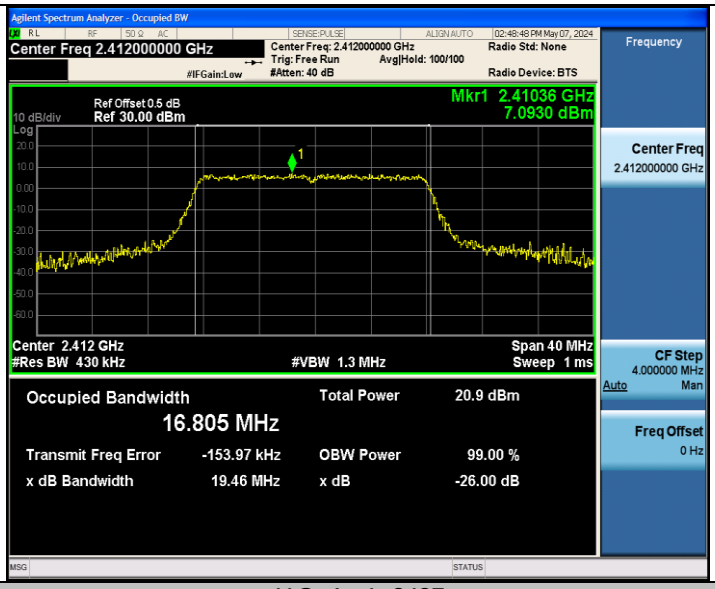
11B_Ant1_2437



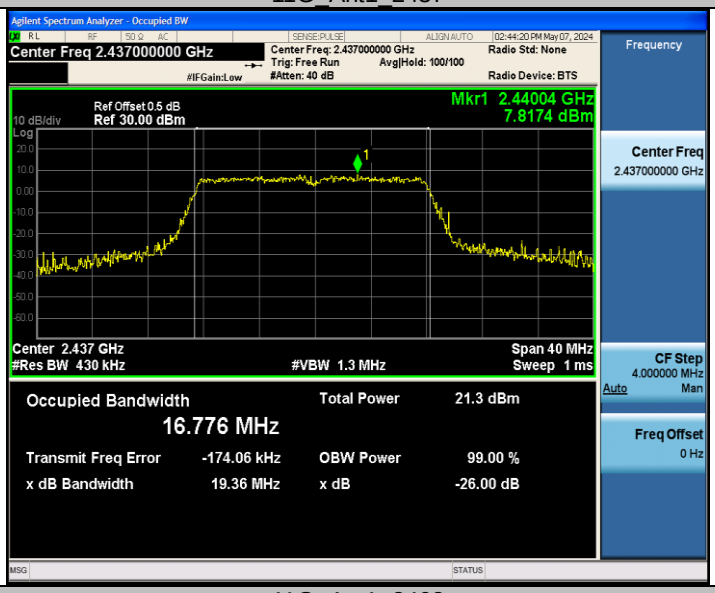
11B_Ant1_2462



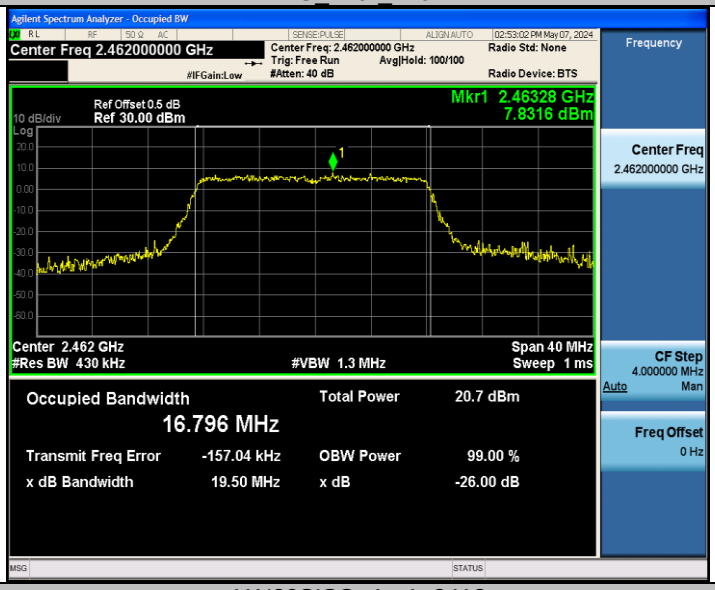
11G_Ant1_2412



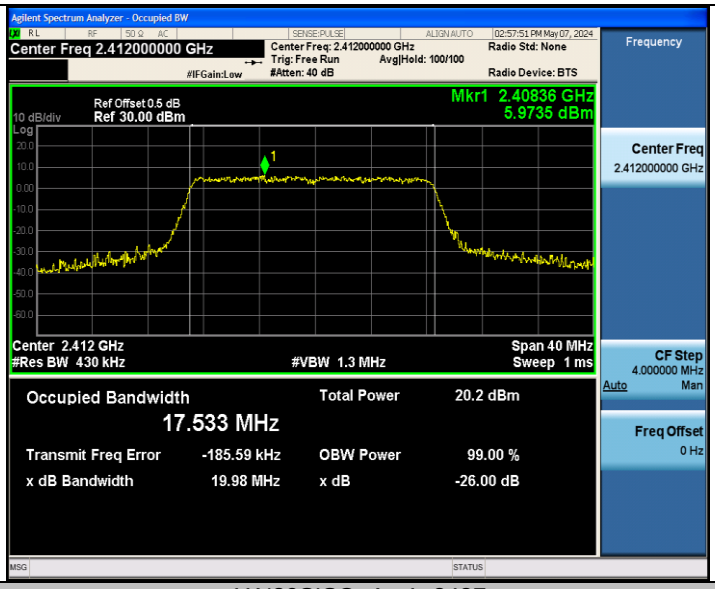
11G_Ant1_2437



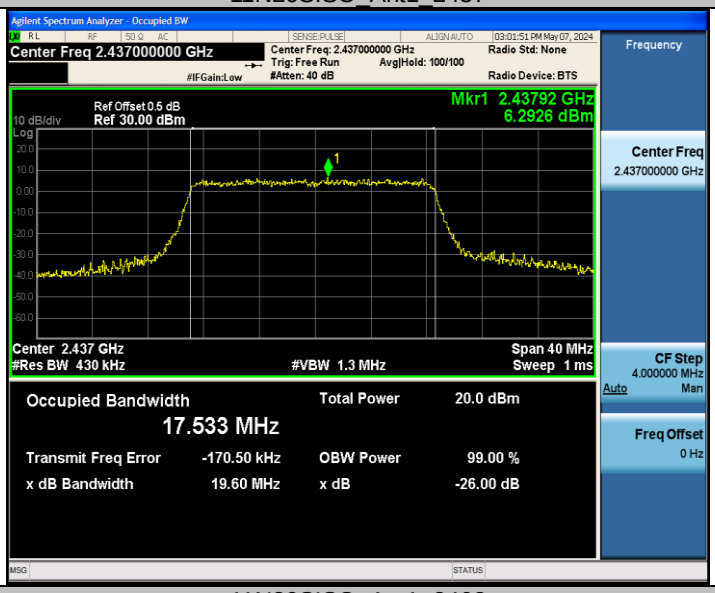
11G_Ant1_2462



11N20SISO_Ant1_2412

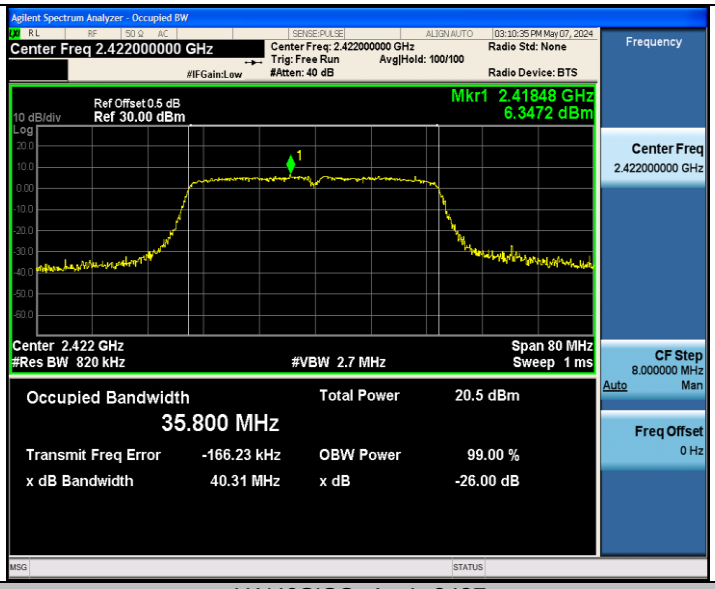


11N20SISO_Ant1_2437



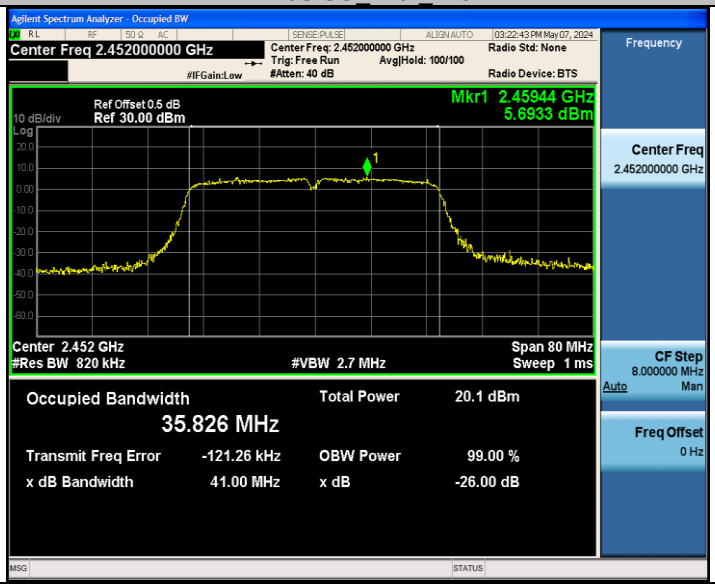
11N20SISO_Ant1_2462

11N40SISO_Ant1_2422



11N40SISO_Ant1_2437

11N40SISO_Ant1_2452



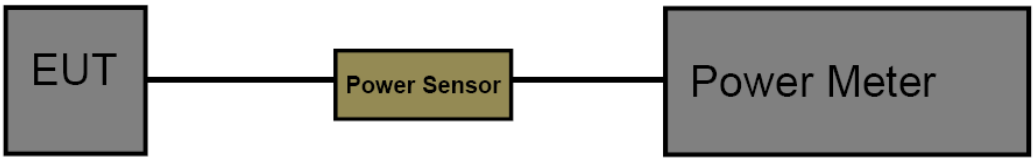
3.6. Output Power

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3)

Section	Test Item	Limit	Frequency Range(MHz)
CFR 47 FCC 15.247(b)(3)	Maximum conducted output power	1 Watt or 30dBm	2400~2483.5

Test Configuration



Test Procedure

1. The maximum conducted output power may be measured using a broadband RF power meter.
2. Power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor.
3. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.
4. Record the measurement data.

Test Mode

Please refer to the clause 2.3

Test Result

Test Mode	Antenna	Frequency [MHz]	AV Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	16.45	≤30.00	PASS
		2437	16.41	≤30.00	PASS
		2462	16.15	≤30.00	PASS
11G	Ant1	2412	14.86	≤30.00	PASS
		2437	15.05	≤30.00	PASS
		2462	14.66	≤30.00	PASS
11N20SISO	Ant1	2412	14.06	≤30.00	PASS
		2437	13.80	≤30.00	PASS
		2462	13.81	≤30.00	PASS
11N40SISO	Ant1	2422	13.51	≤30.00	PASS
		2437	13.20	≤30.00	PASS
		2452	13.12	≤30.00	PASS

Note:
1. Test results increased RF cable loss by 0.5dB.

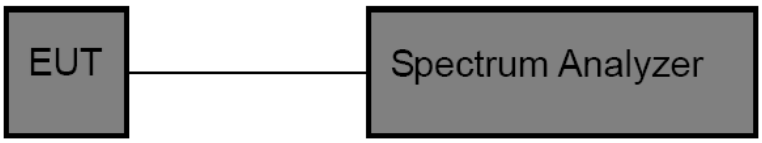
3.7. Power Spectral Density

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e)

Test Item	Limit	Frequency Range(MHz)
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
3. Spectrum Setting:
3. Spectrum Setting:

Measure the duty cycle (D) of the transmitter output signal as described in 11.6.

b) Set instrument center frequency to DTS channel center frequency.

c) Set span to at least 1.5 times the OBW.

d) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz.

e) Set VBW ≥ [3 × RBW].

f) Detector = power averaging (rms) or sample detector (when rms not available).

g) Ensure that the number of measurement points in the sweep □ [2 × span / RBW].

h) Sweep time = auto couple.

i) Do not use sweep triggering; allow sweep to “free run.”

j) Employ trace averaging (rms) mode over a minimum of 100 traces.

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

l) Add [10 log (1 / D)], where D is the duty cycle measured in step a), to the measured PSD to compute the average PSD during the actual transmission time.

m) If measured value exceeds requirement specified by regulatory agency, then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced).

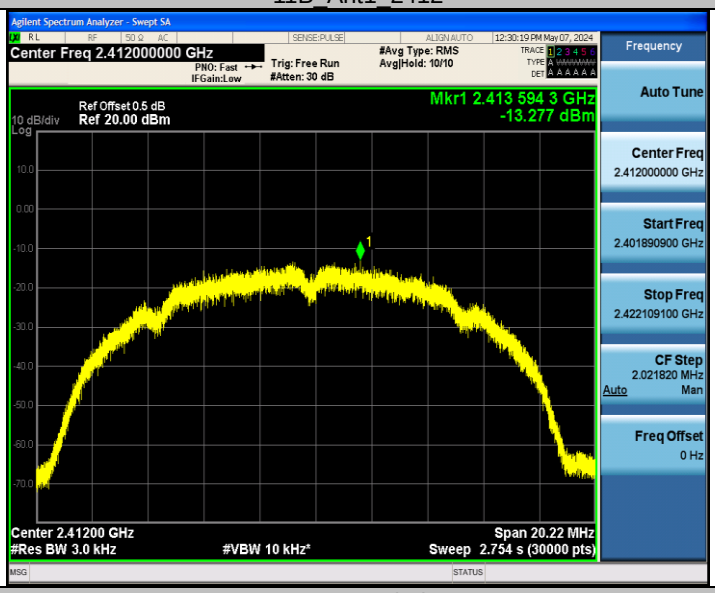
Test Mode

Please refer to the clause 2.3

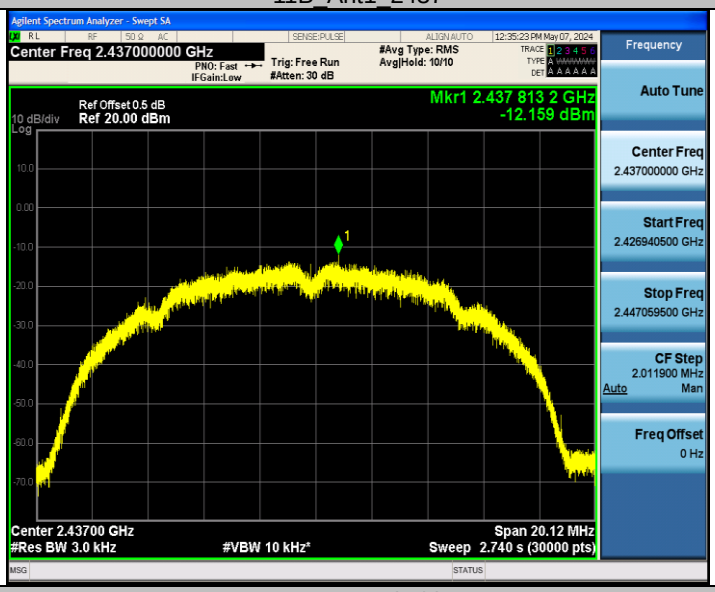
Test Result

TestMode	Antenna	Frequency[MHz]	AV Result [dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-13.28	≤8.00	PASS
		2437	-12.16	≤8.00	PASS
		2462	-13.46	≤8.00	PASS
11G	Ant1	2412	-15.53	≤8.00	PASS
		2437	-16.40	≤8.00	PASS
		2462	-15.65	≤8.00	PASS
11N20SISO	Ant1	2412	-17.59	≤8.00	PASS
		2437	-17.33	≤8.00	PASS
		2462	-17.17	≤8.00	PASS
11N40SISO	Ant1	2422	-19.12	≤8.00	PASS
		2437	-19.55	≤8.00	PASS
		2452	-20.16	≤8.00	PASS

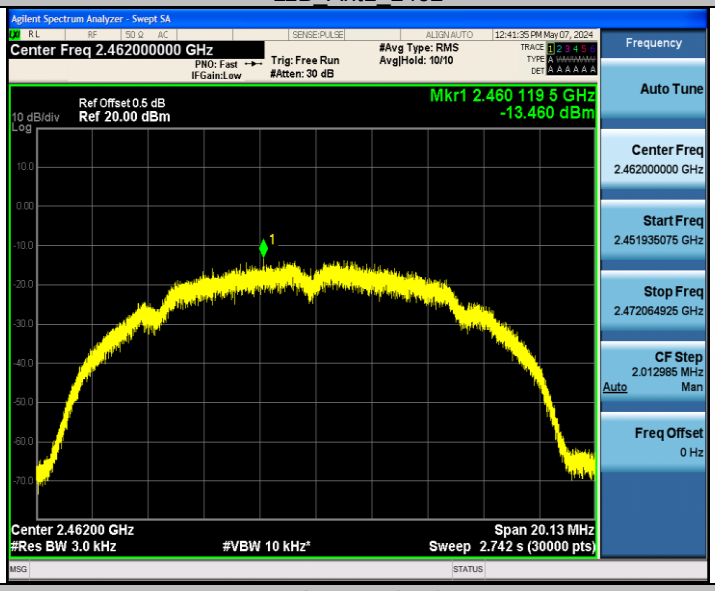
11B_Ant1_2412



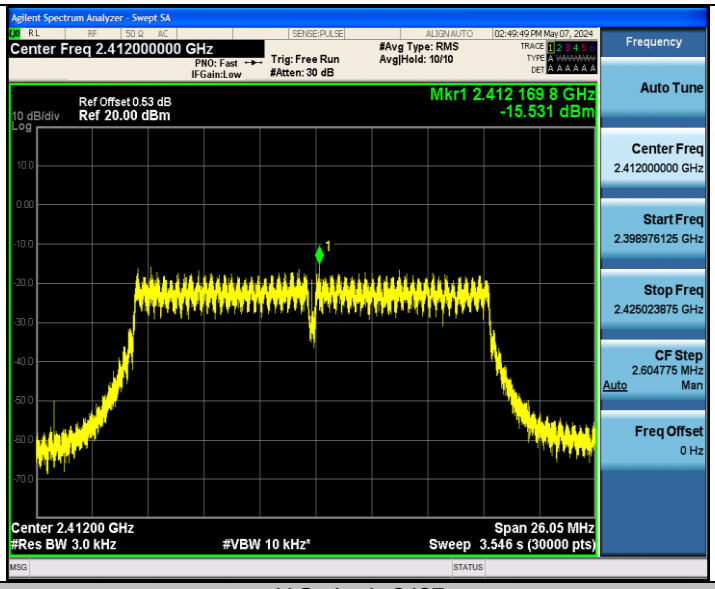
11B_Ant1_2437



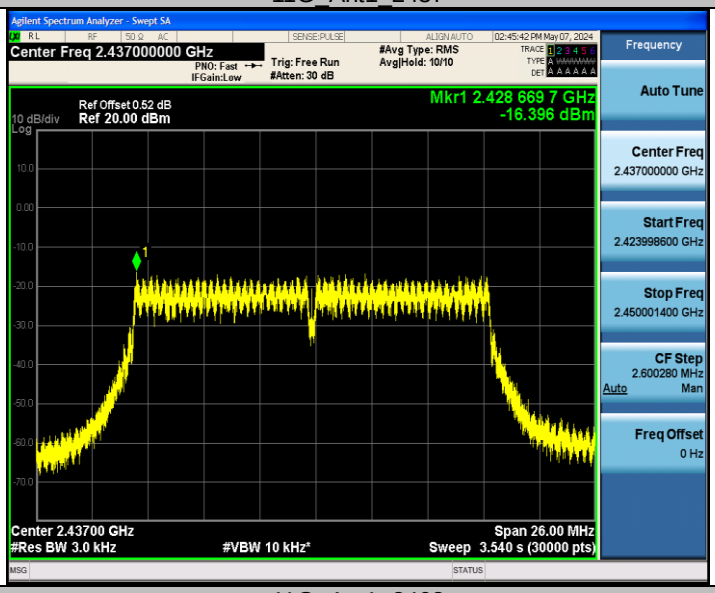
11B_Ant1_2462



11G_Ant1_2412



11G_Ant1_2437



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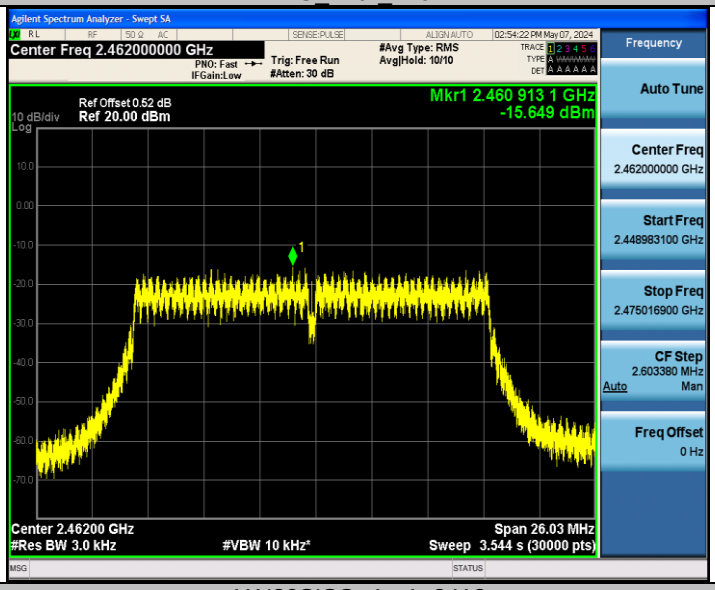
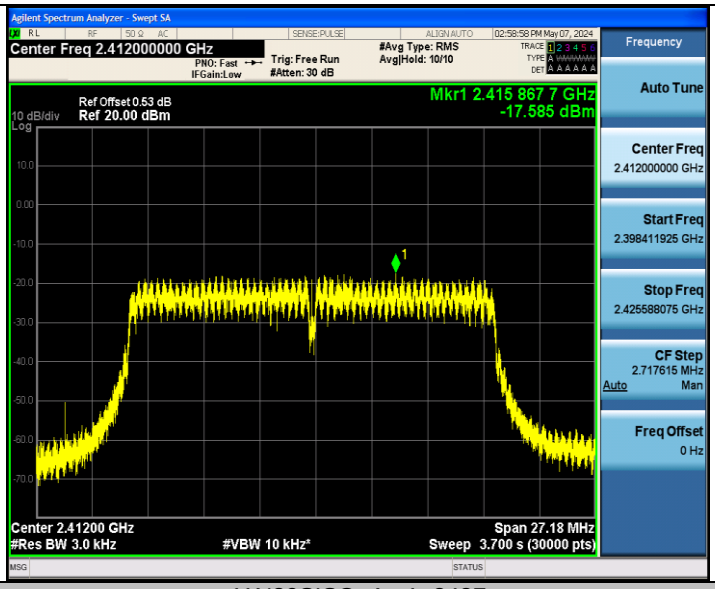


11N20SISO_Ant1_2412



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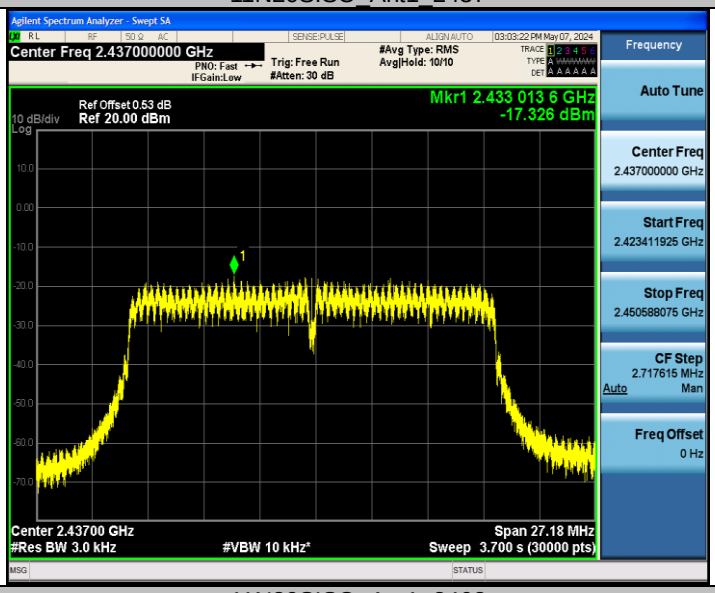

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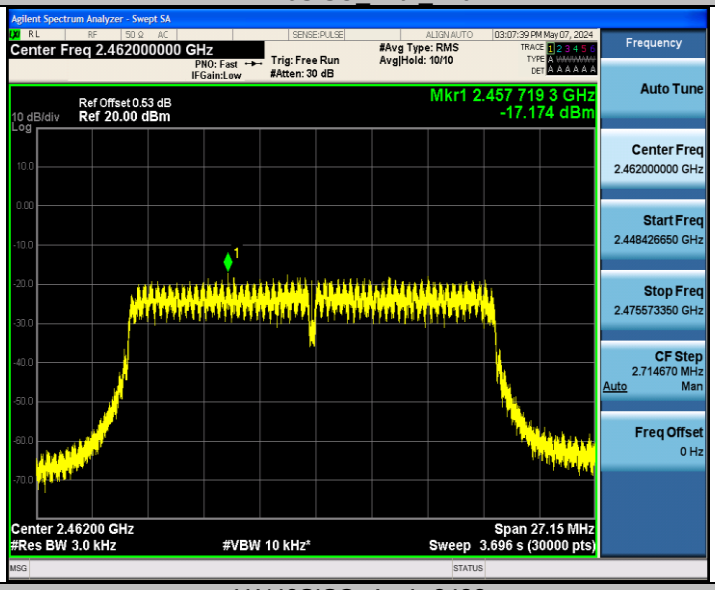
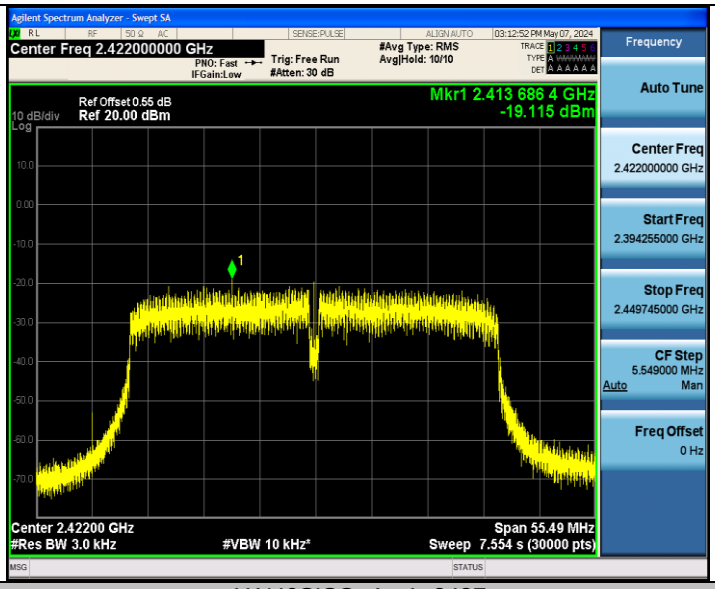


11N40SISO_Ant1_2422



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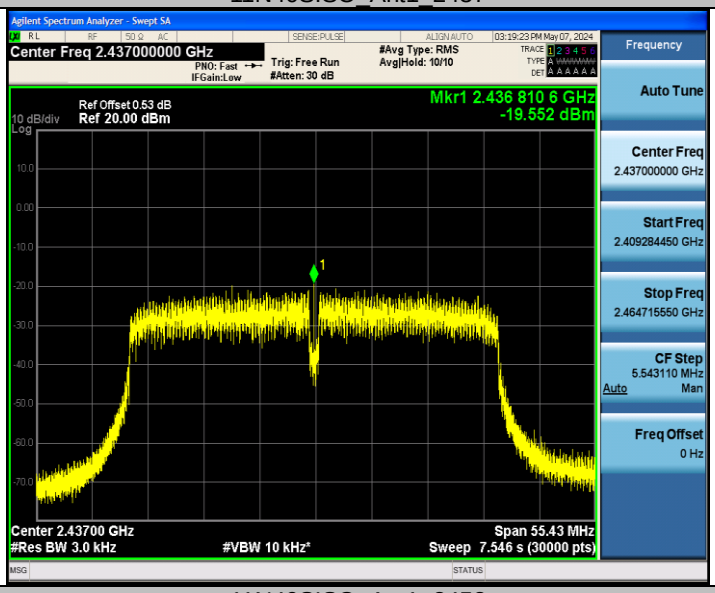
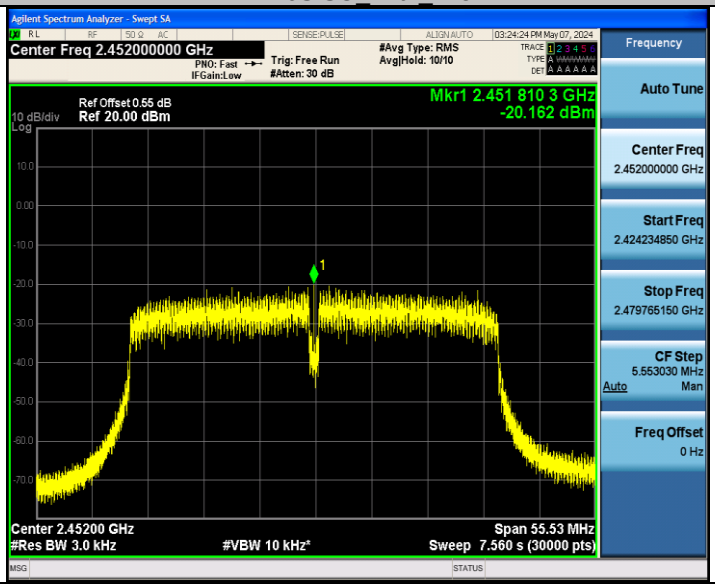


11N40SISO_Ant1_2452

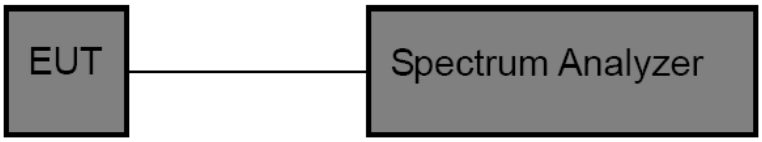


3.8. Duty Cycle

Limit

None, for report purposes only.

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
3. Spectrum Setting:

Set analyzer center frequency to test channel center frequency.
Set the span to 0Hz.
Set the RBW to 10MHz.
Set the VBW to 10MHz.
Detector: Peak.
Sweep time: Auto.
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

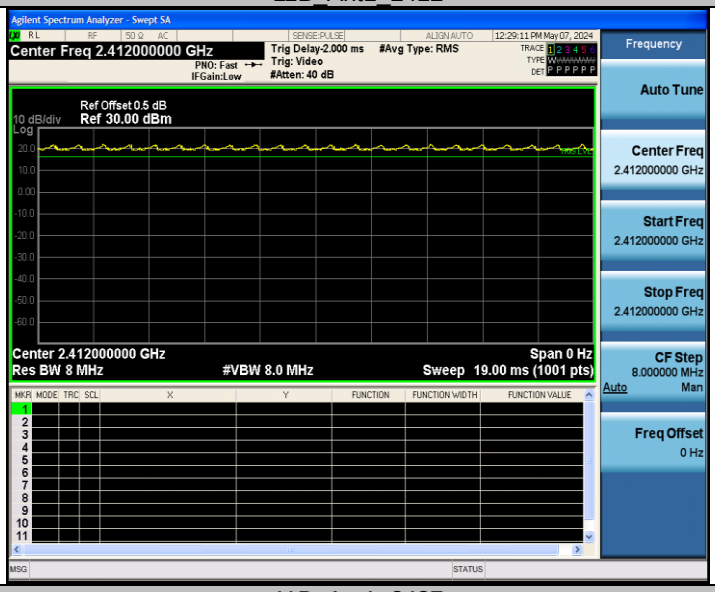
Please refer to the clause 2.4.

Test Result

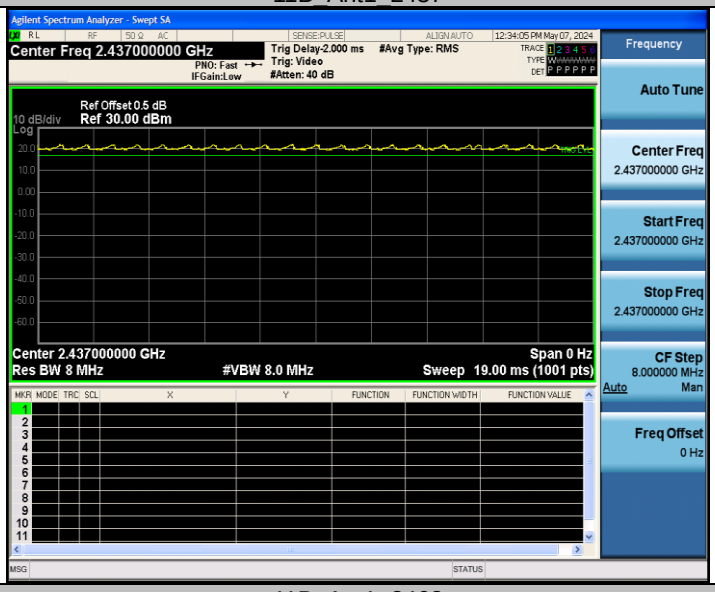
TestMode	Antenna	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T Minimum VBW (kHz)	Final Setting for VBW (kHz)
11B	Ant1	2412	19.00	19.00	100.00	0.05	1
		2437	19.00	19.00	100.00	0.05	1
		2462	19.00	19.00	100.00	0.05	1
11G	Ant1	2412	5.47	5.51	99.27	0.18	1
		2437	5.48	5.51	99.46	0.18	1
		2462	5.49	5.51	99.64	0.18	1
11N20SISO	Ant1	2412	5.07	5.10	99.41	0.20	1
		2437	5.08	5.11	99.41	0.20	1
		2462	5.08	5.11	99.41	0.20	1
11N40SISO	Ant1	2422	2.46	2.49	98.80	0.41	1
		2437	2.47	2.49	99.20	0.40	1
		2452	2.47	2.50	98.80	0.40	1

Test plot as follows:

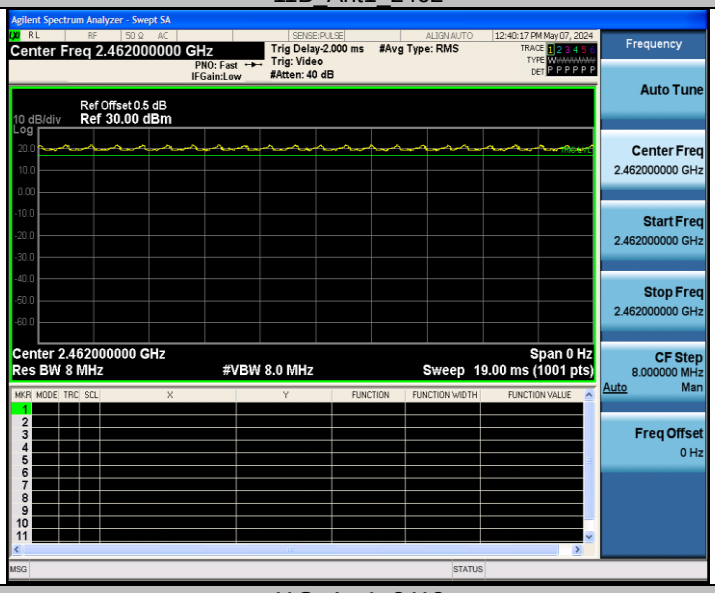
11B_Ant1_2412



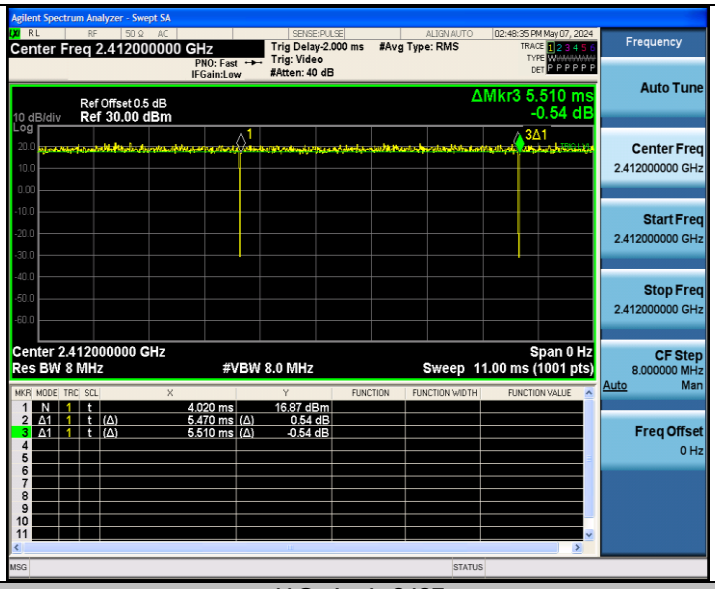
11B_Ant1_2437



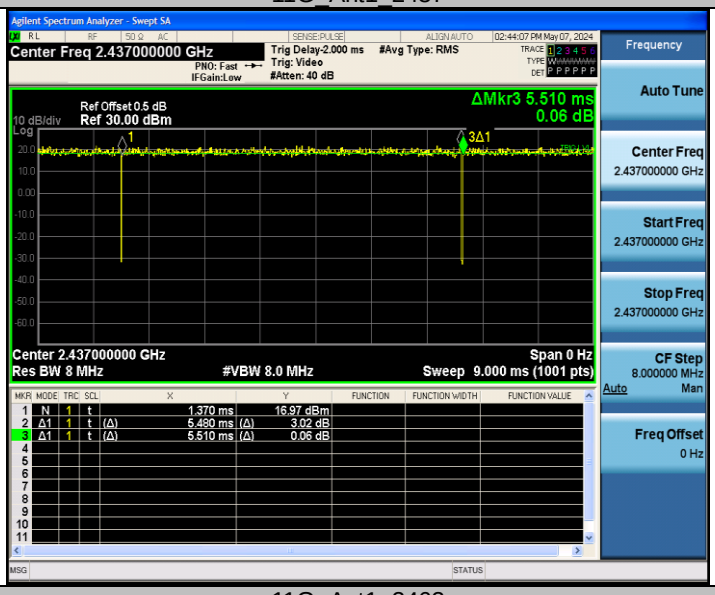
11B_Ant1_2462



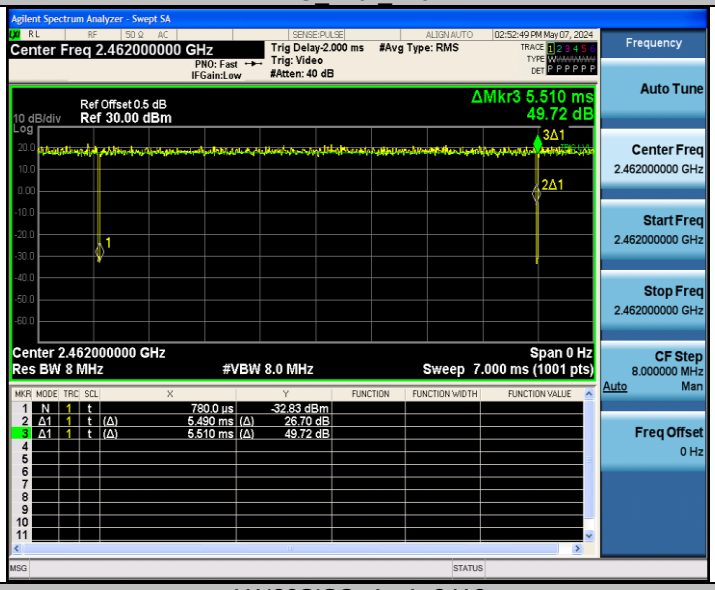
11G_Ant1_2412



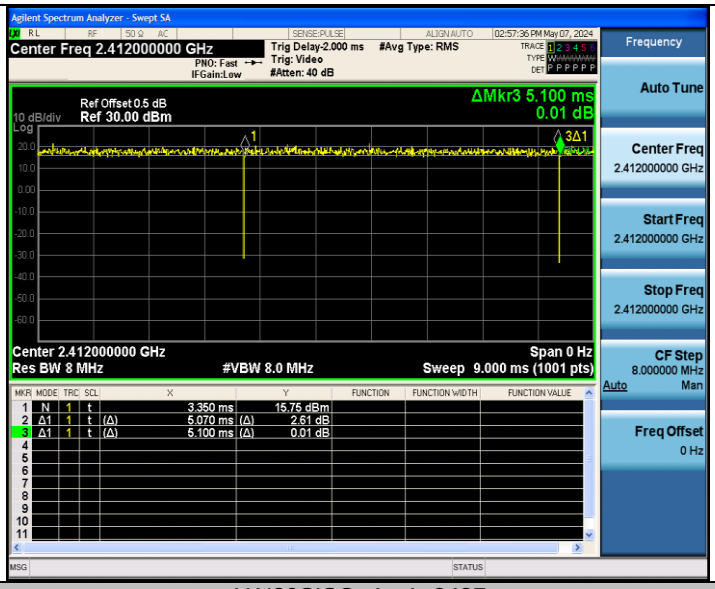
11G_Ant1_2437



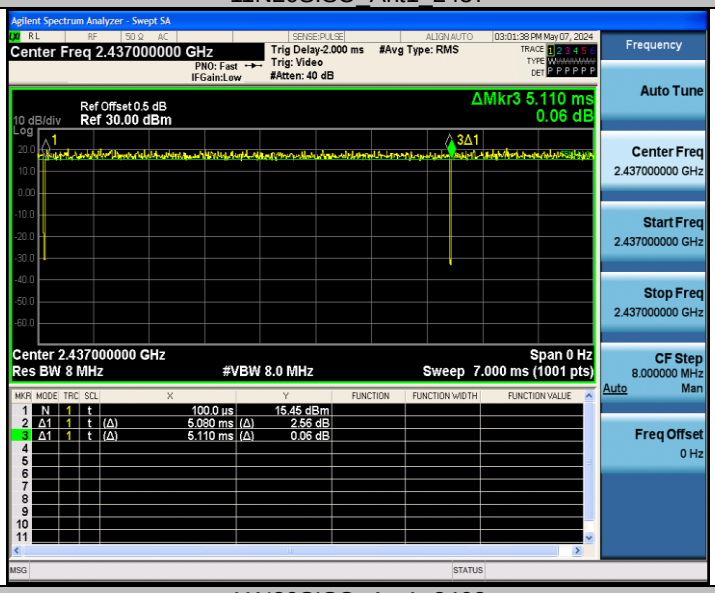
11G_Ant1_2462



11N20SISO_Ant1_2412



11N20SISO_Ant1_2437



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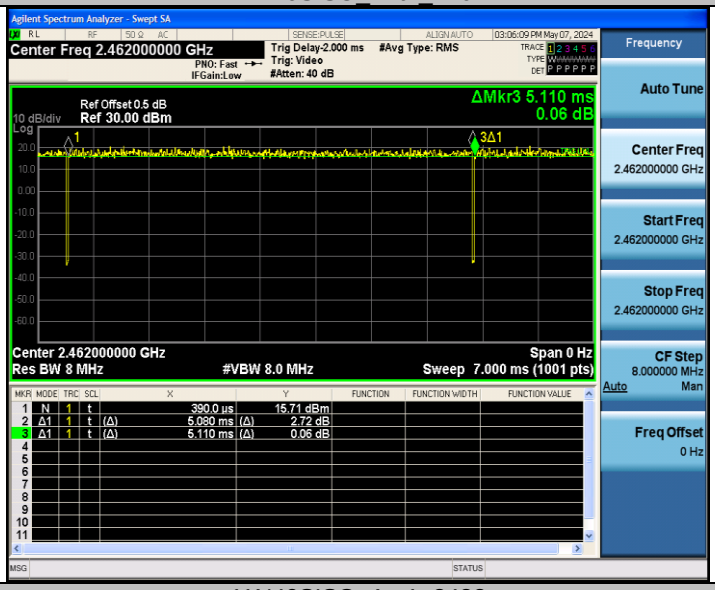
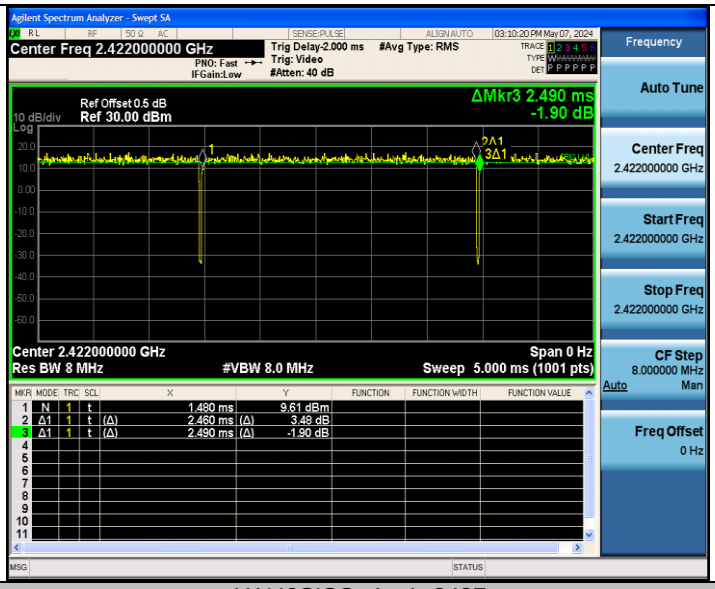


11N40SISO_Ant1_2422



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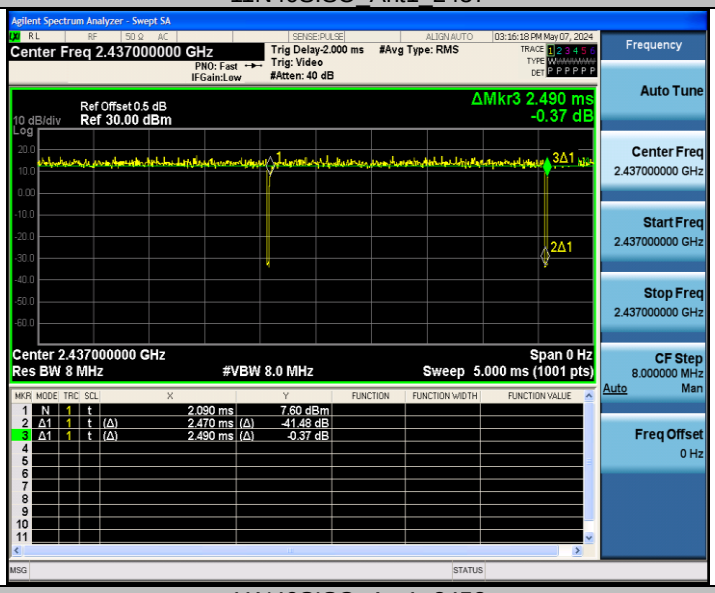
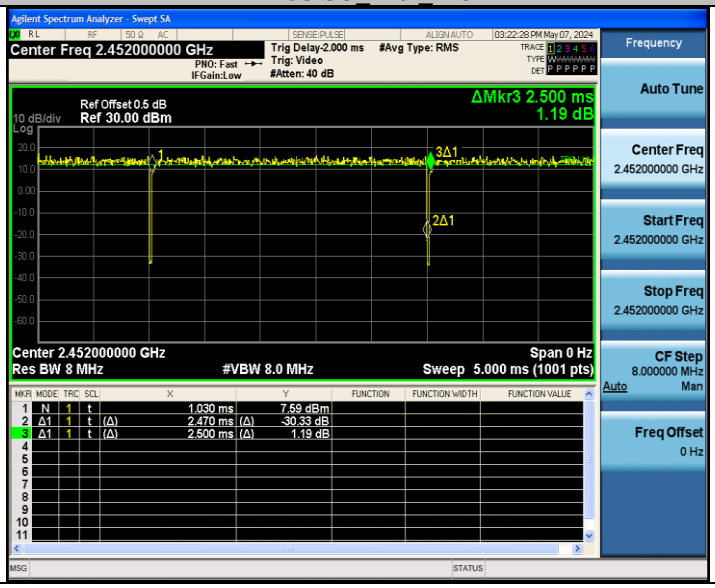


11N40SISO_Ant1_2452



3.9. Antenna requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 15.203:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):
(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result
The directional gain of the antenna is less than 6dBi, please refer to the EUT internal photographs antenna photo.