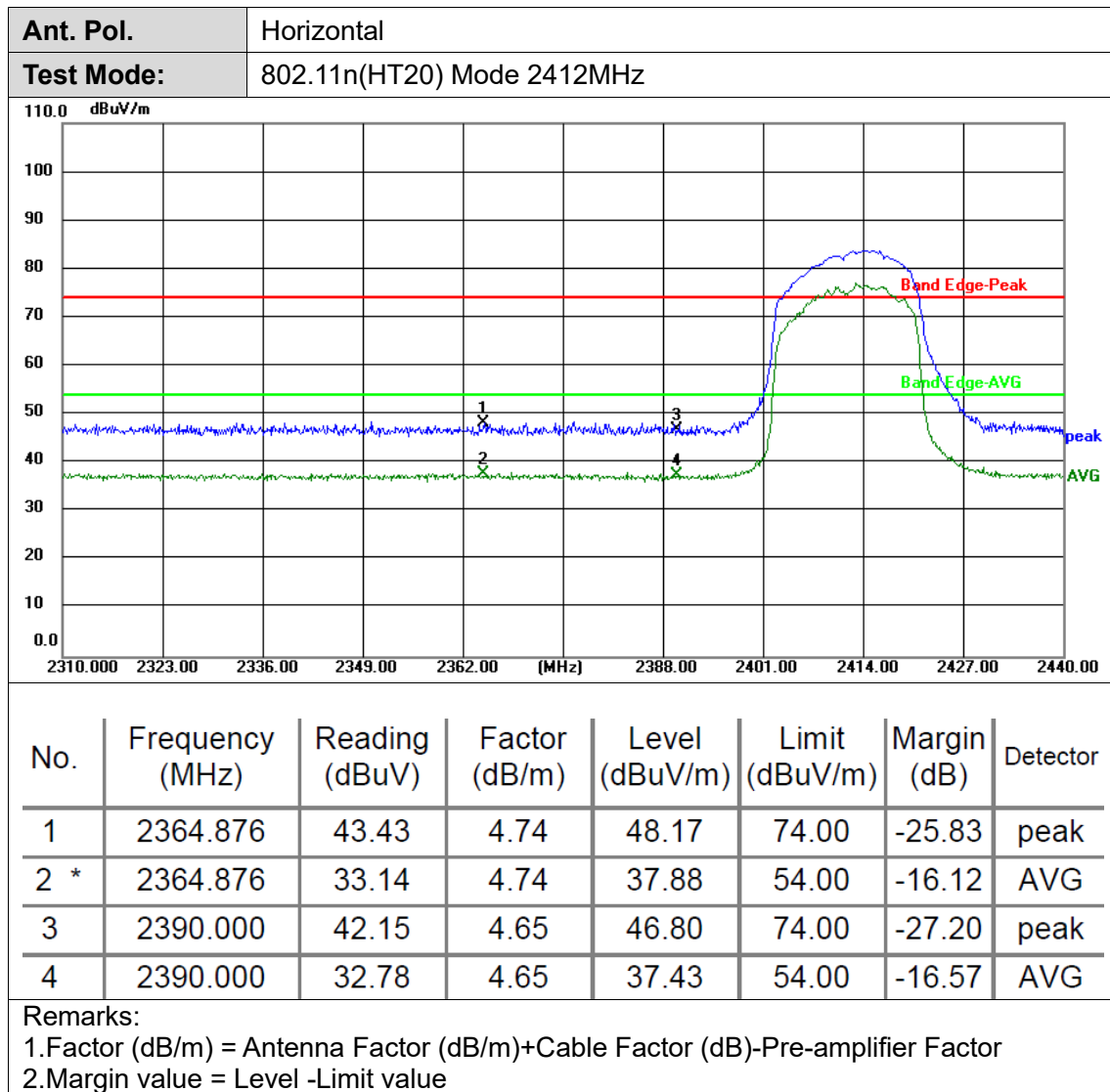
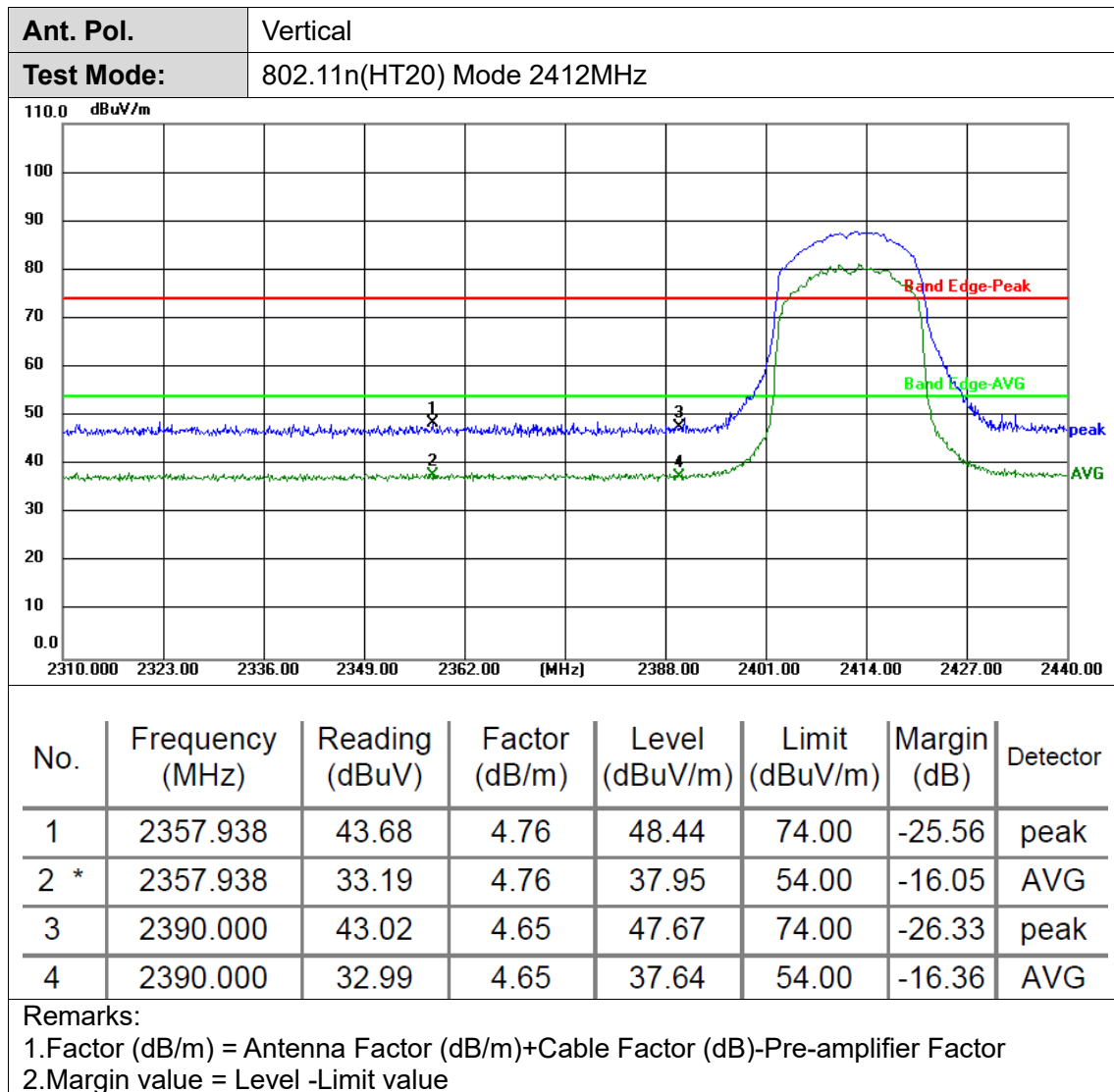
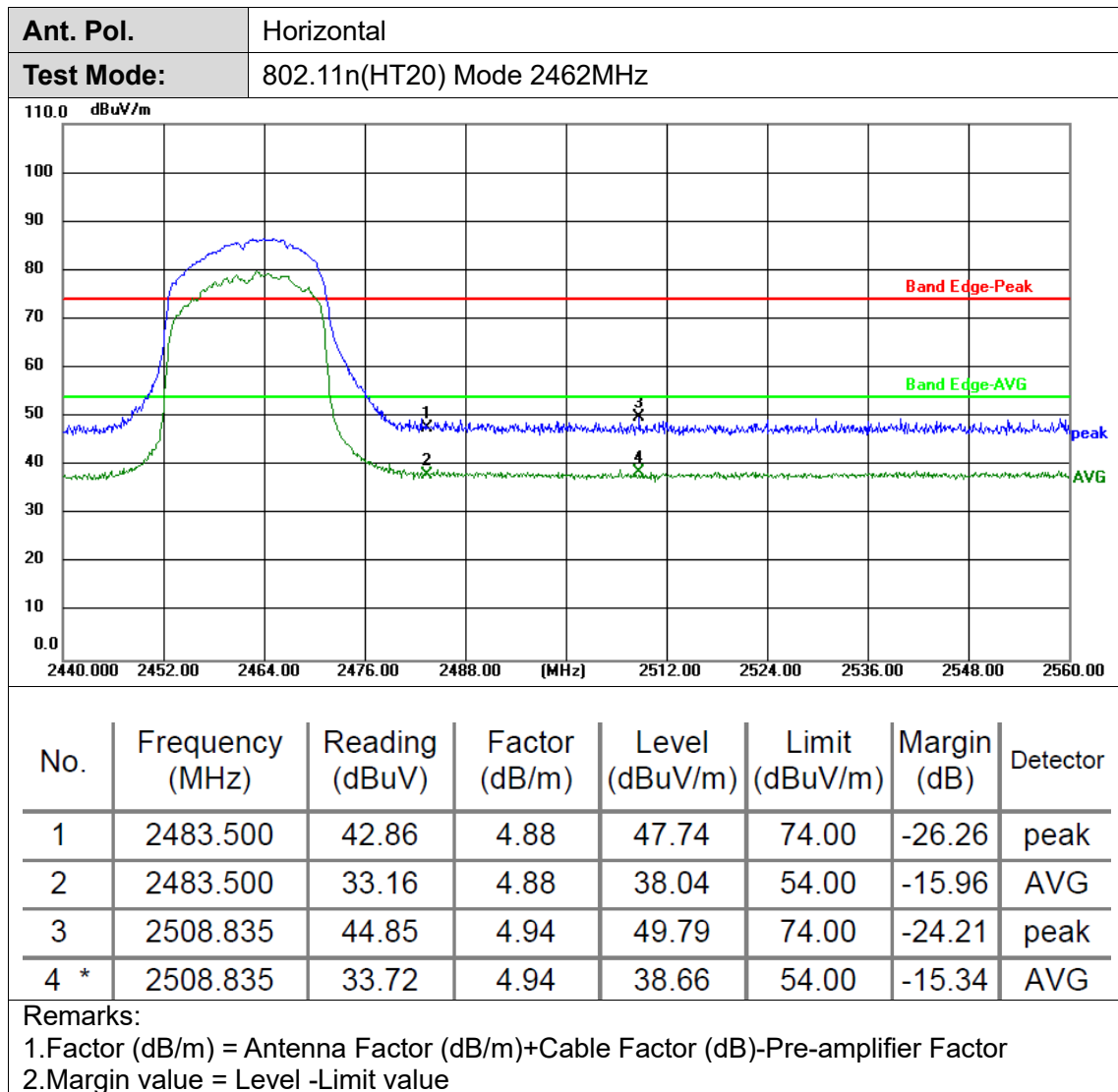
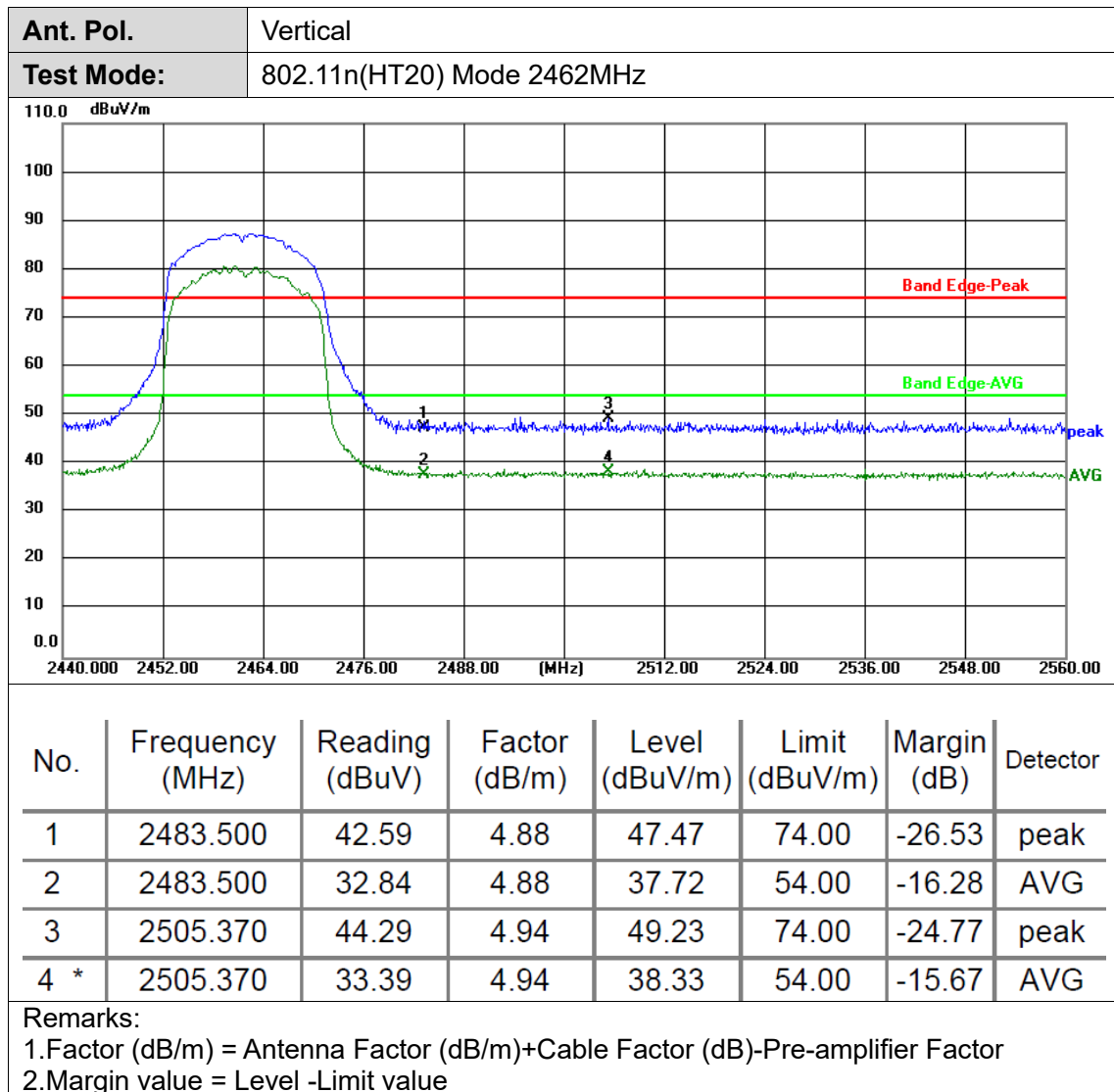
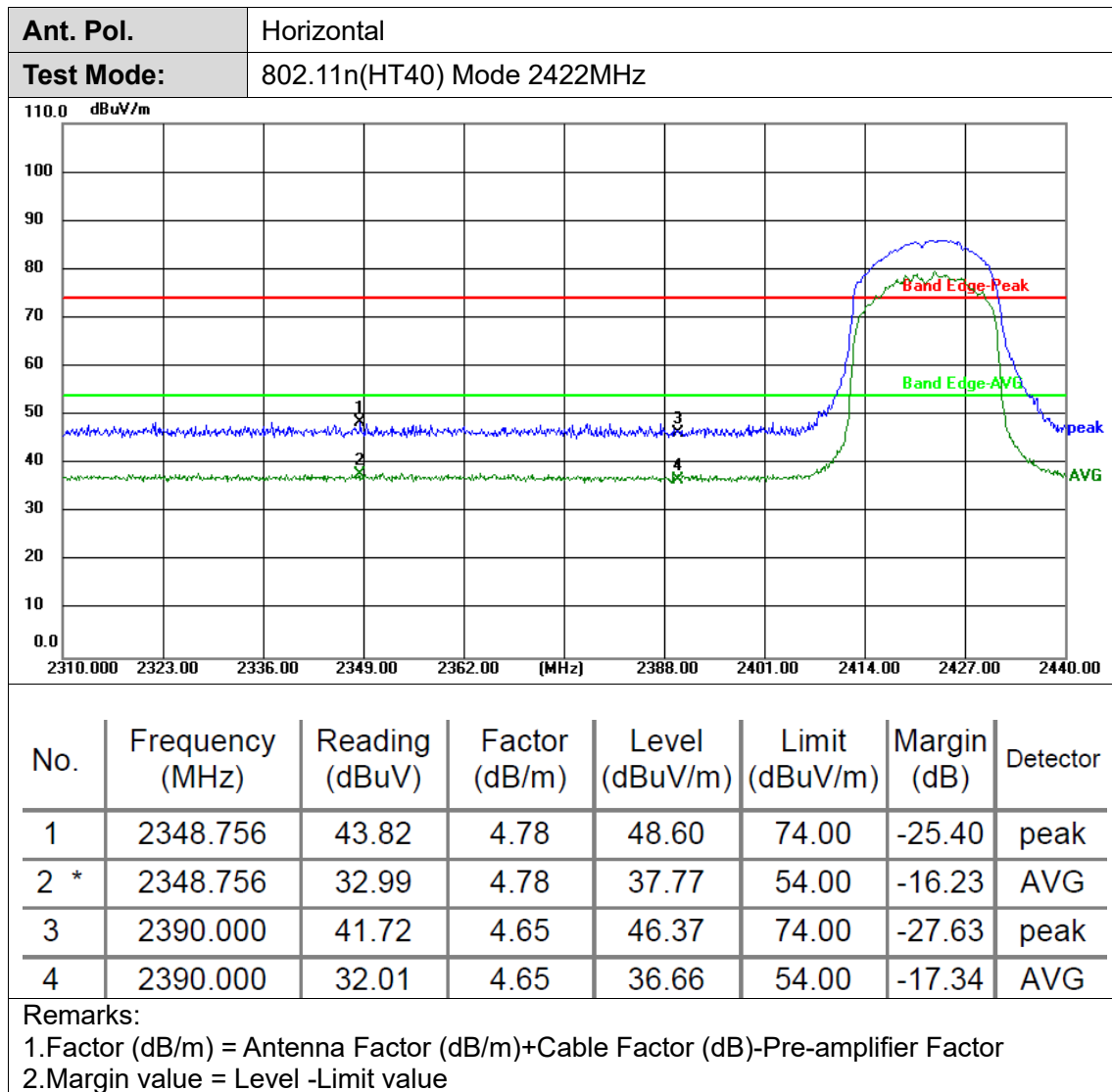


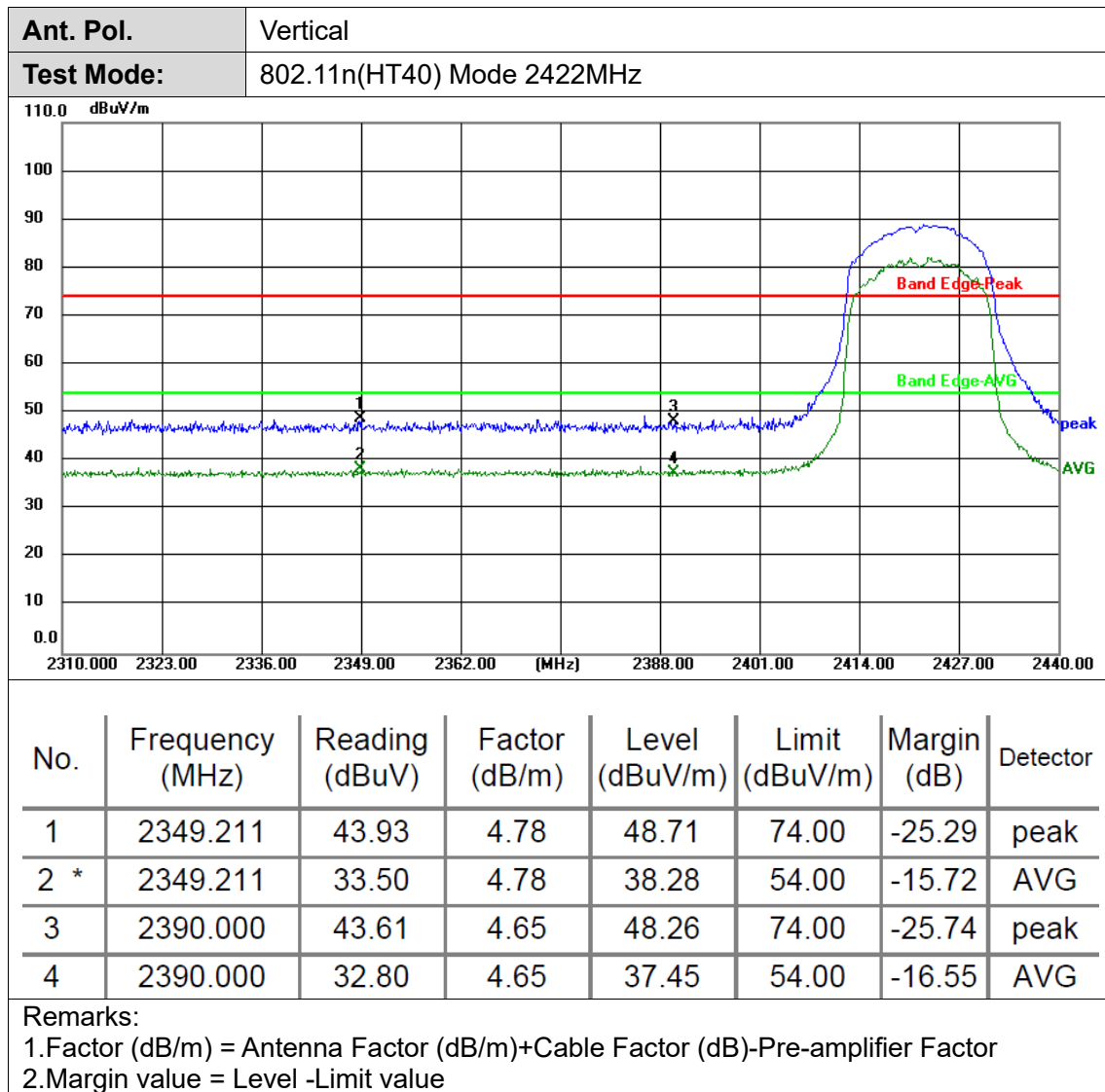


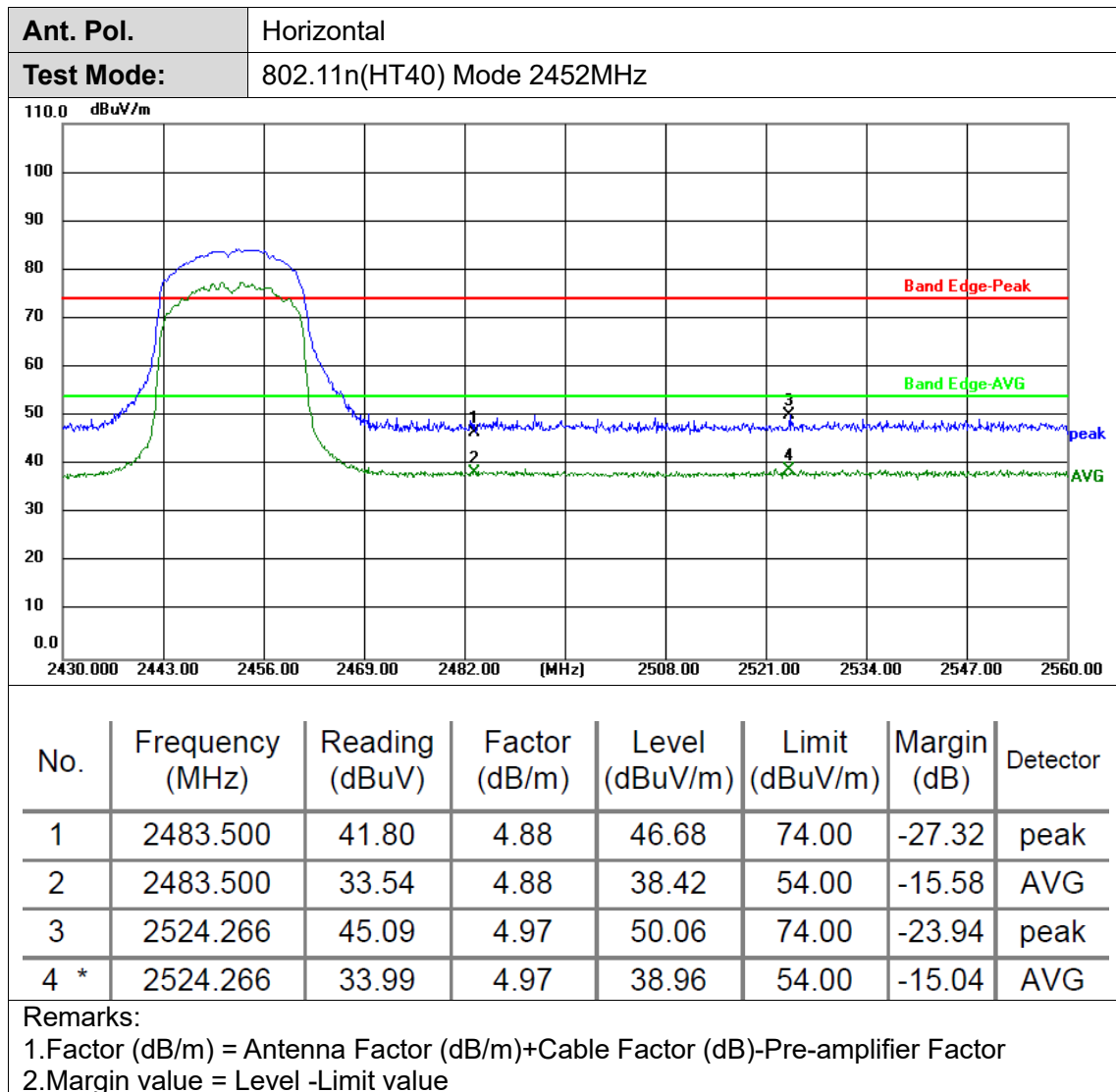


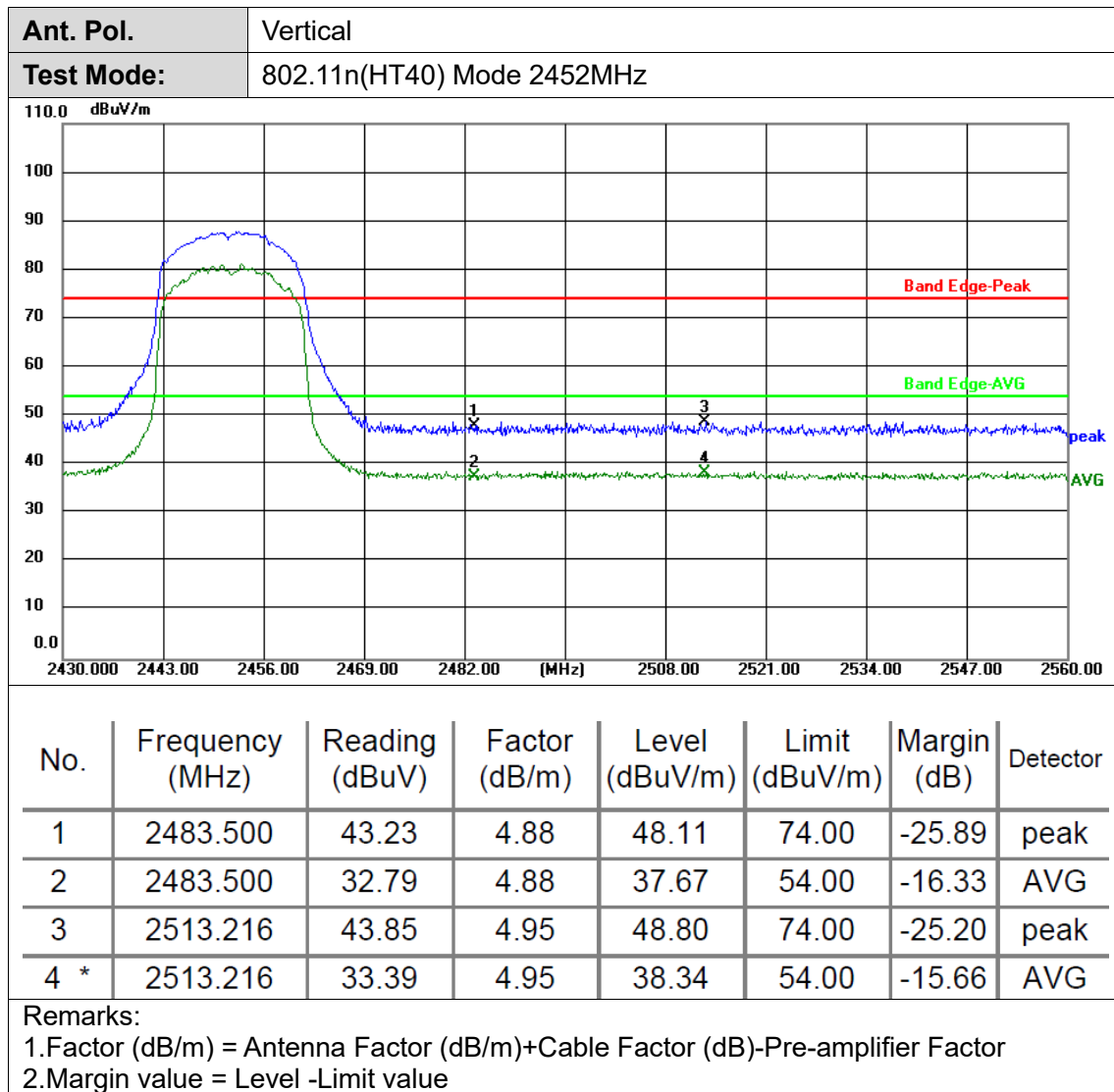












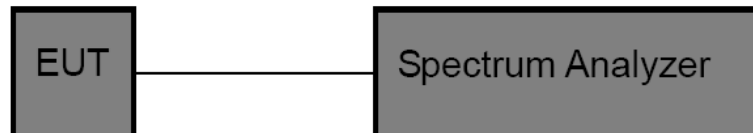


3.4. Band edge and Spurious Emissions (Conducted)

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d)/ RSS-247 6.6: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

Test Configuration



Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:
RBW = 100 kHz, VBW $\geq$ RBW, scan up through 10th harmonic.
Sweep = auto, Detector function = peak, Trace = max hold
4. Measure and record the results in the test report.

Test Mode

Please refer to the clause 2.4.

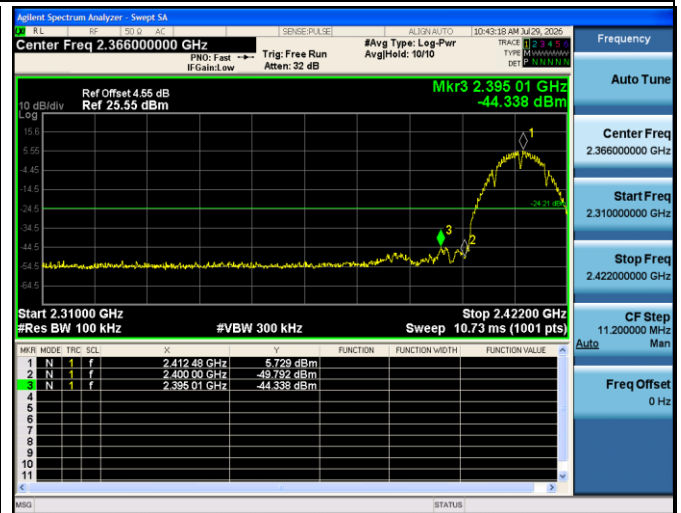
Test Results

**(1) Band edge Conducted Test**

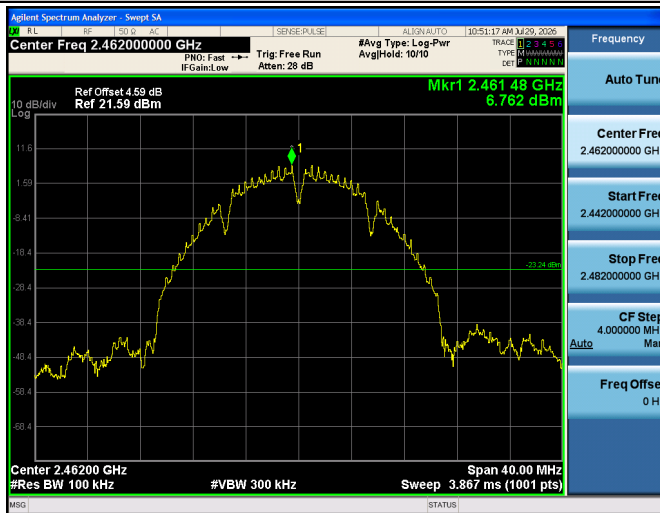
Test Mode	Test Frequency	Ref Level[dBm]	Result[dBm]	Limit[dBm]	Verdict
802.11b	2412	5.791	-44.338	-24.209	PASS
	2462	6.762	-46.619	-23.238	PASS
802.11g	2412	3.277	-30.431	-26.723	PASS
	2462	3.548	-40.482	-26.452	PASS
802.11n(HT20)	2412	3.431	-32.246	-26.569	PASS
	2462	3.708	-43.407	-26.292	PASS
802.11n(HT40)	2422	0.389	-37.365	-29.611	PASS
	2452	0.657	-38.503	-29.343	PASS



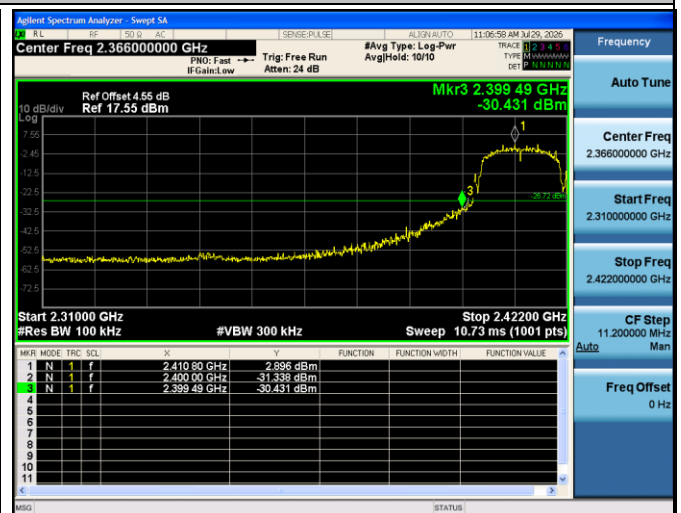
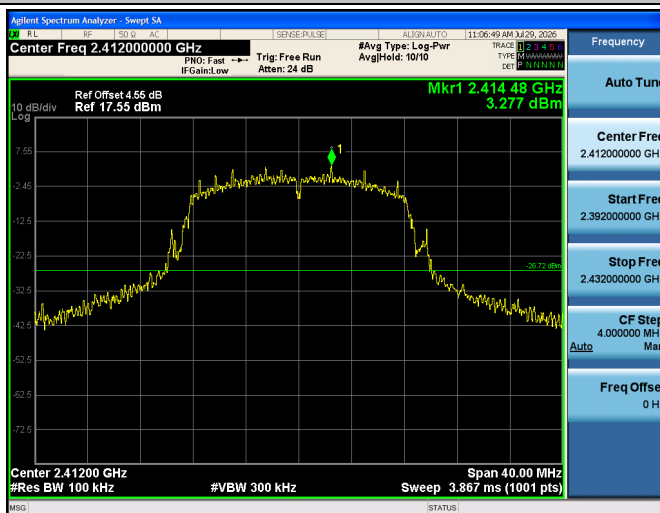
802.11b_2412



802.11b_2462

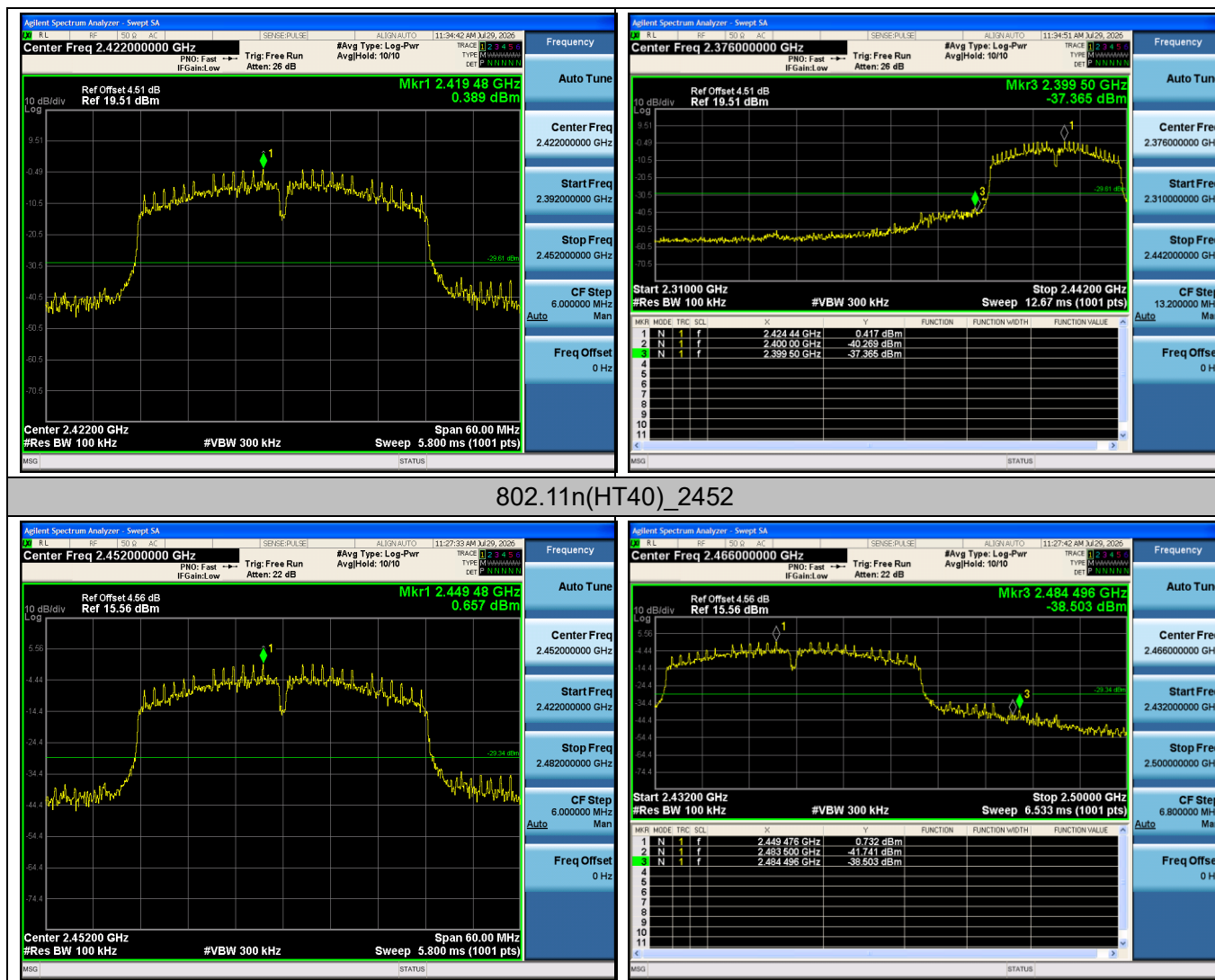


802.11g_2412



802.11g_2462





**(2) Conducted Spurious Emissions Test**

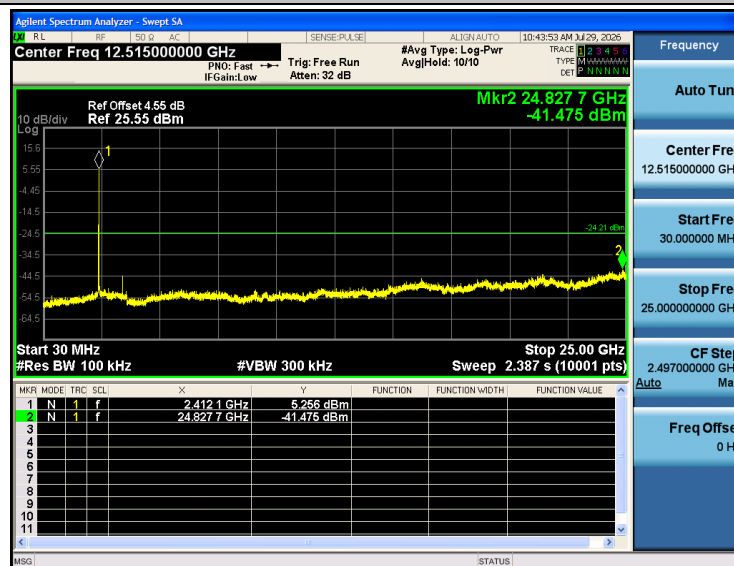
Test Mode	Frequency [MHz]	Ref Level [dBm]	Spurious level[dBm]	Limit[dBm]	Verdict
802.11b	2412	5.791	-41.475	-24.209	PASS
	2437	6.012	-44.895	-23.988	PASS
	2462	6.762	-44.578	-23.238	PASS
802.11g	2412	3.277	-49.021	-26.723	PASS
	2437	2.174	-43.804	-27.826	PASS
	2462	3.548	-43.551	-26.452	PASS
802.11n(HT20)	2412	3.431	-44.225	-26.569	PASS
	2437	3.484	-42.748	-26.516	PASS
	2462	3.708	-43.890	-26.292	PASS
802.11n(HT40)	2422	0.389	-46.899	-29.611	PASS
	2437	0.416	-46.734	-29.584	PASS
	2452	0.657	-48.920	-29.343	PASS



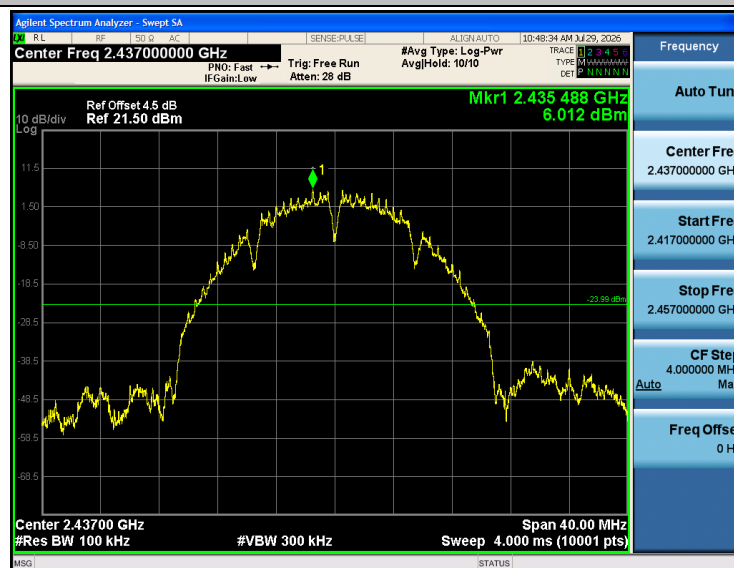
802.11b_2412_0~Reference



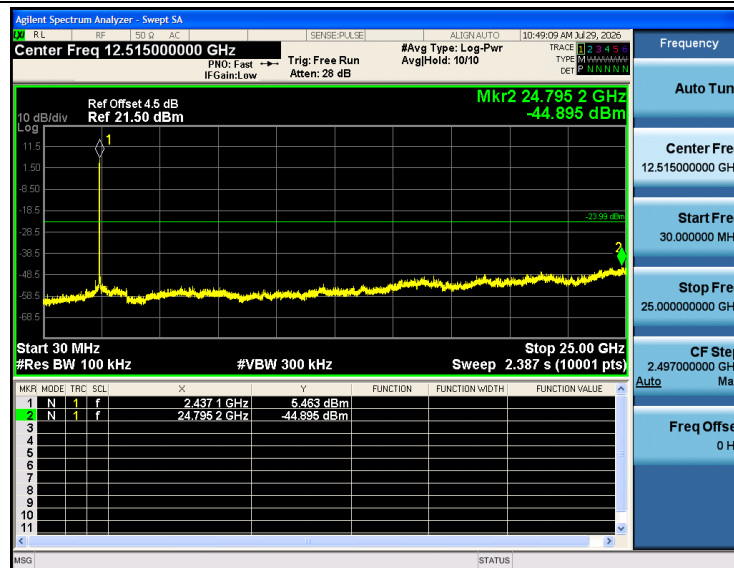
802.11b_2412_30~25000



802.11b_2437_0~Reference



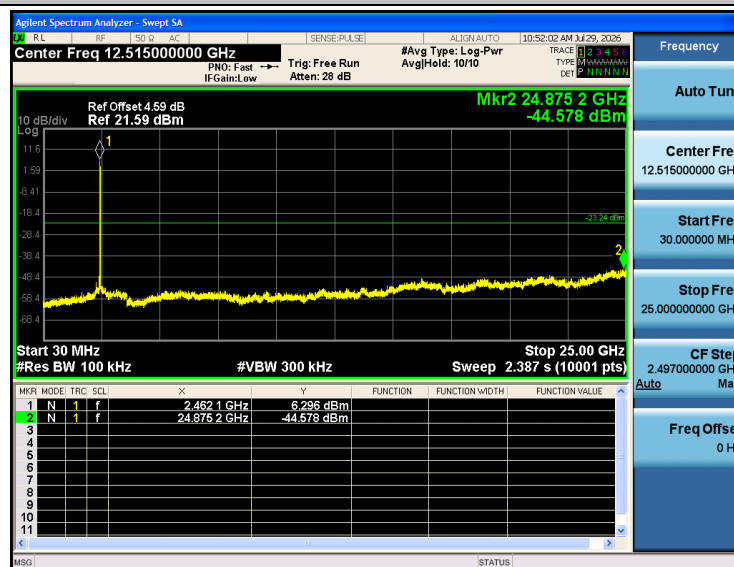
802.11b_2437_30~25000



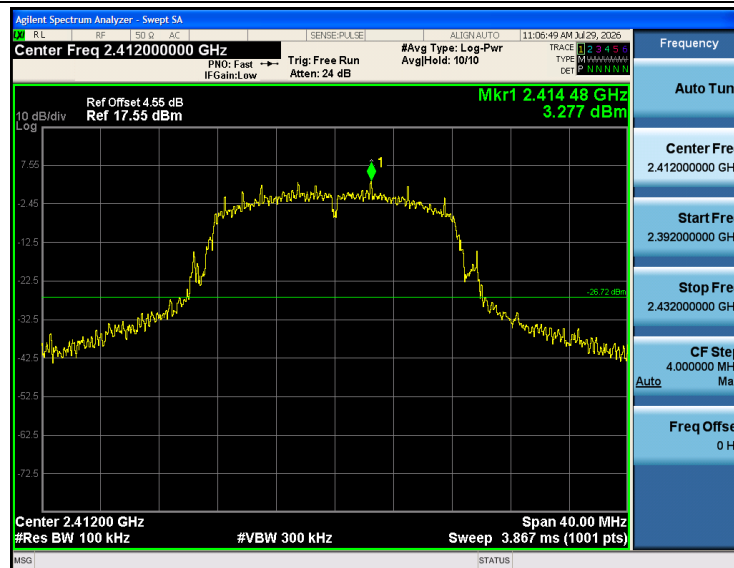
802.11b_2462_0~Reference



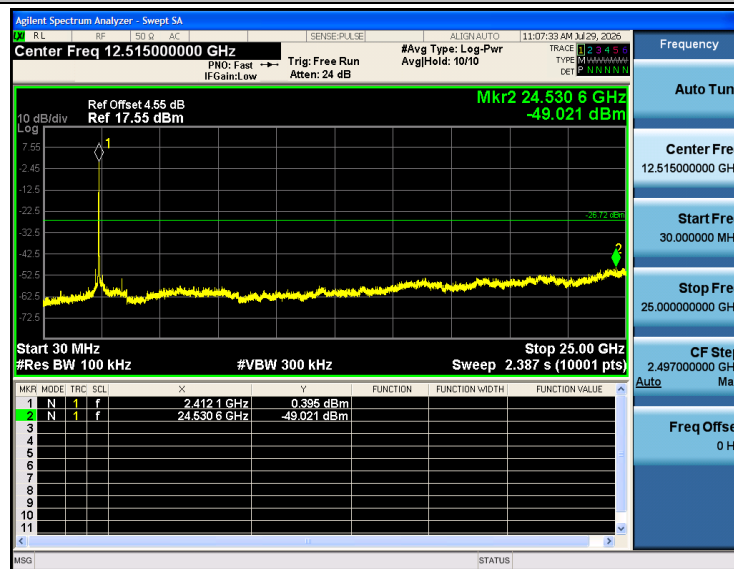
802.11b_2462_30~25000



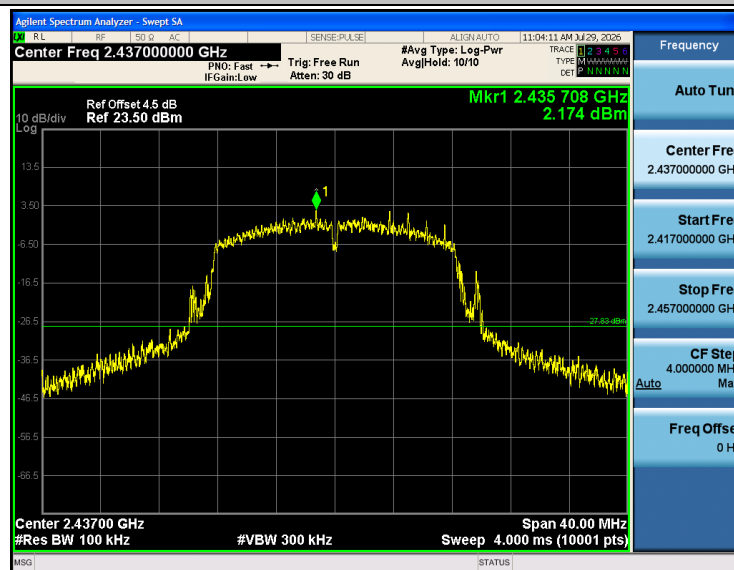
802.11g_2412_0~Reference



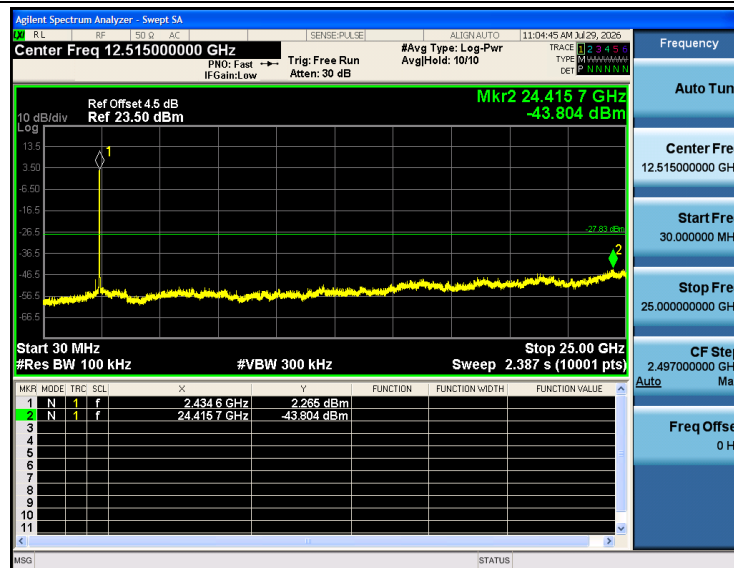
802.11g_2412_30~25000



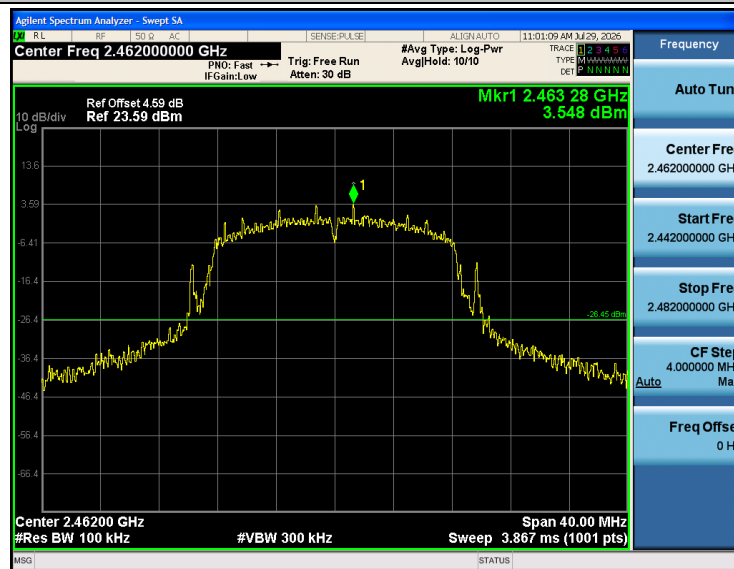
802.11g_2437_0~Reference



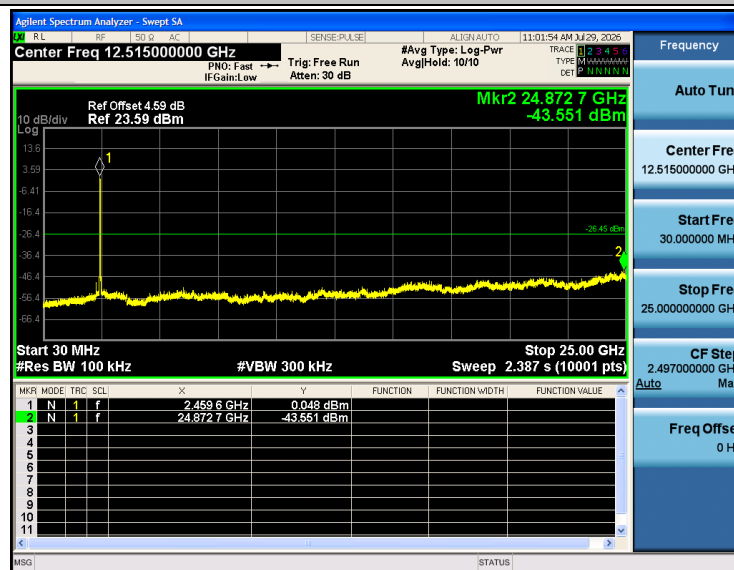
802.11g_2437_30~25000



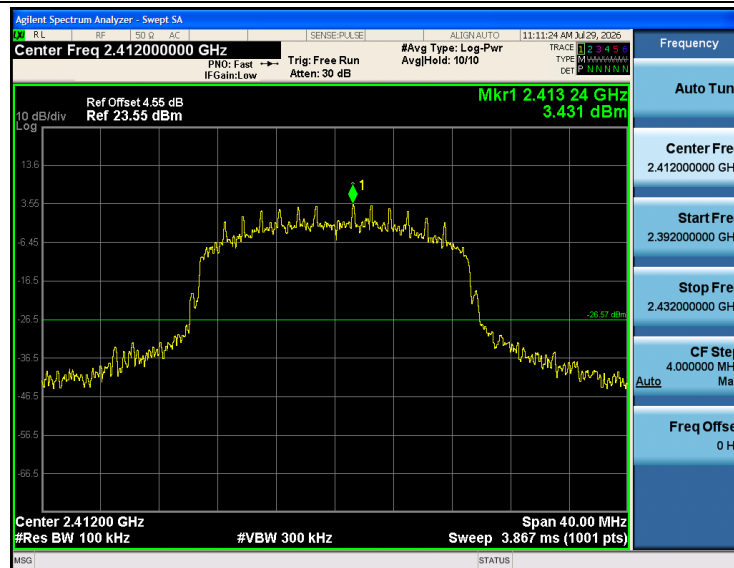
802.11g_2462_0~Reference



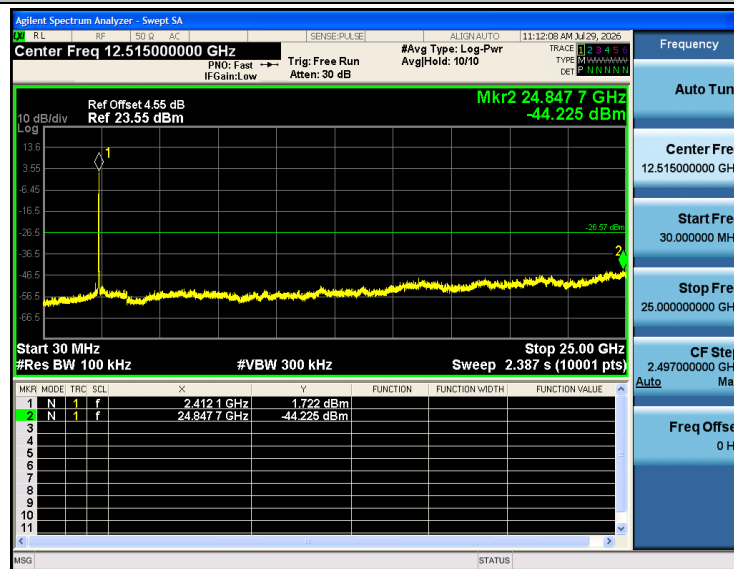
802.11g_2462_30~25000



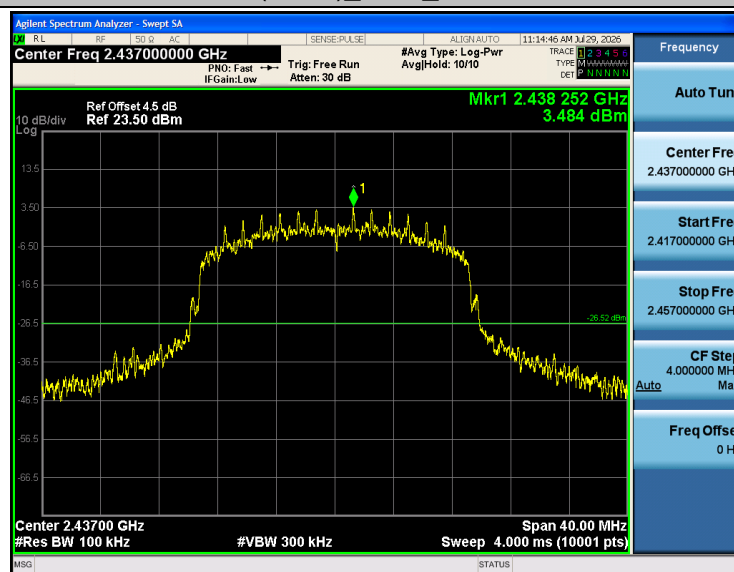
802.11n(HT20)_2412_0~Reference



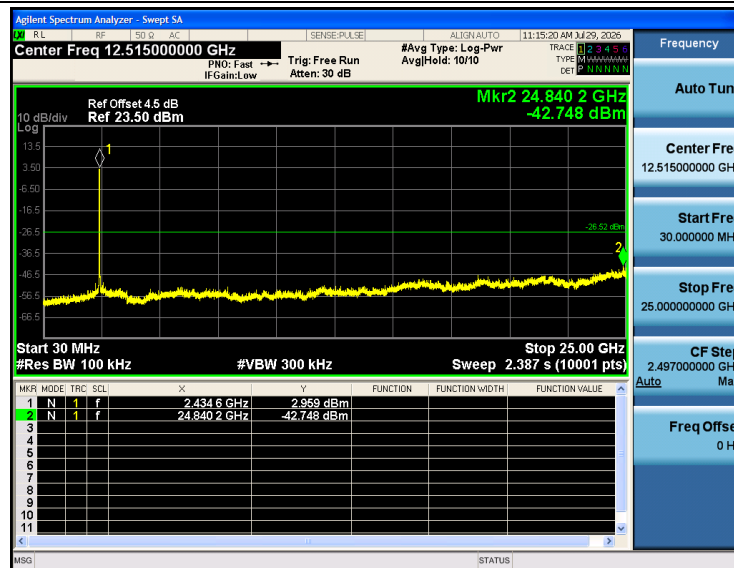
802.11n(HT20)_2412_30~25000



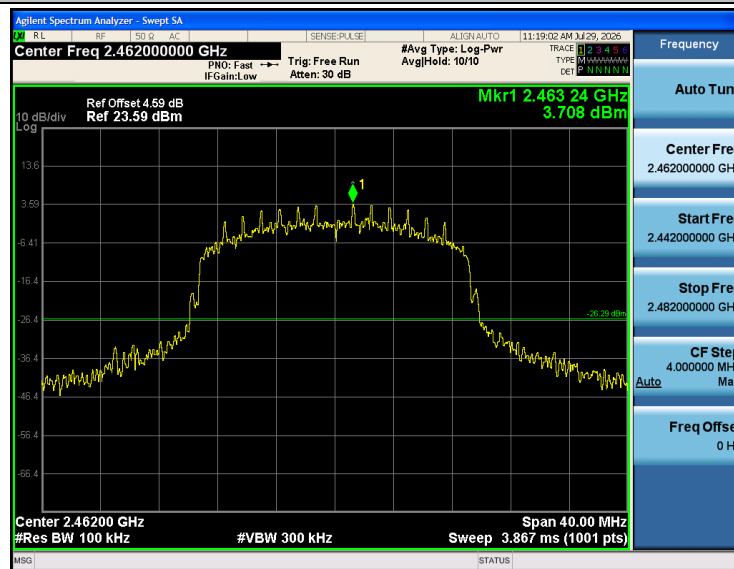
802.11n(HT20)_2437_0~Reference



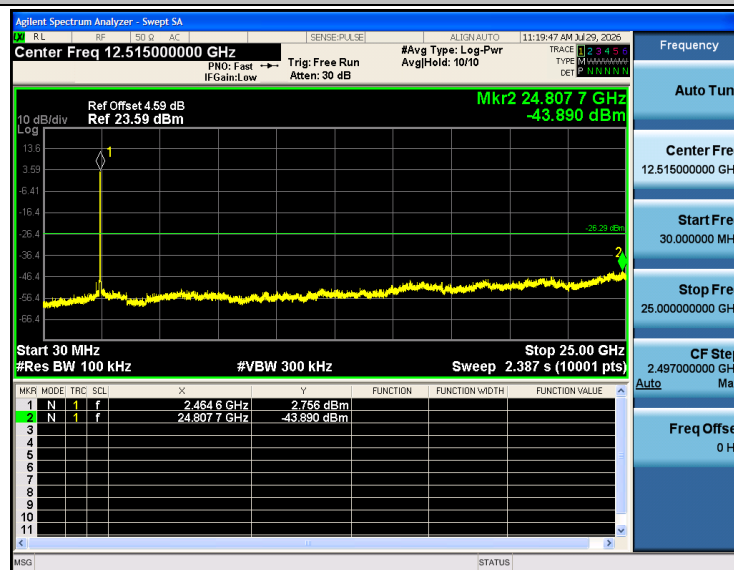
802.11n(HT20)_2437_30~25000



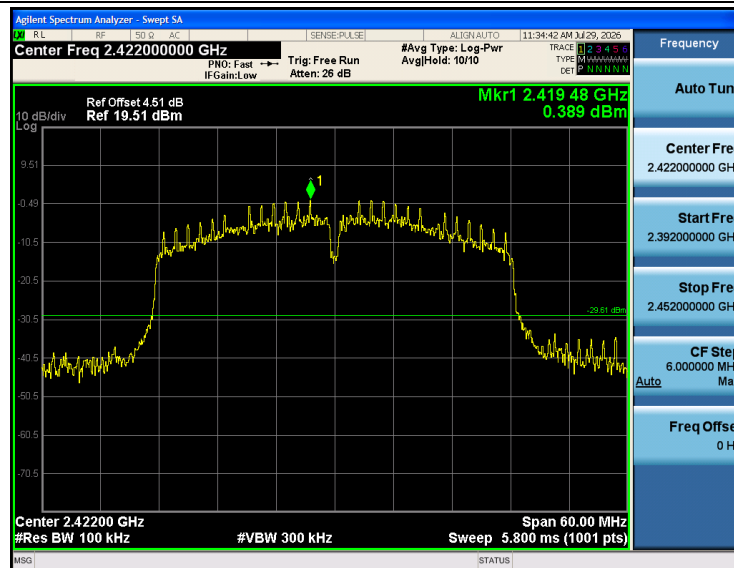
802.11n(HT20)_2462_0~Reference



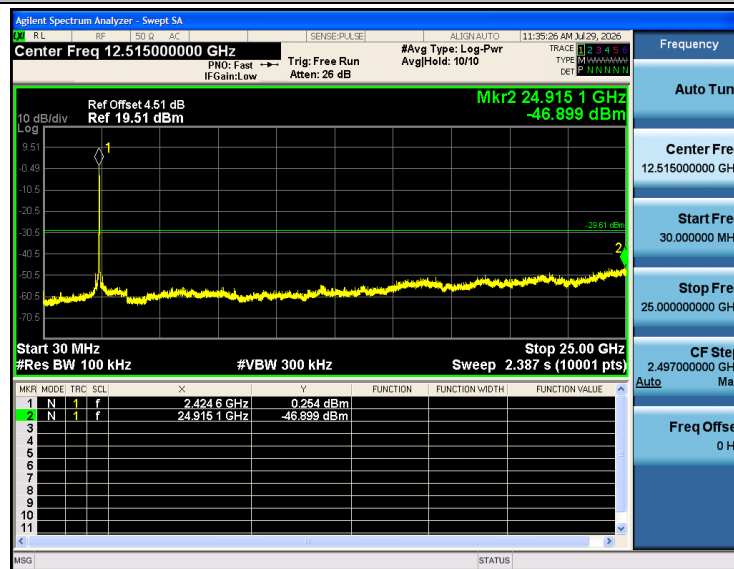
802.11n(HT20)_2462_30~25000



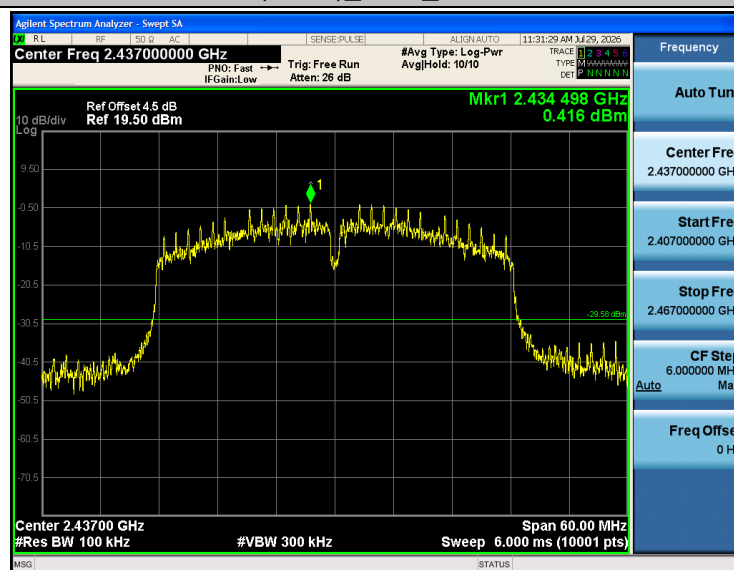
802.11n(HT40)_2422_0~Reference



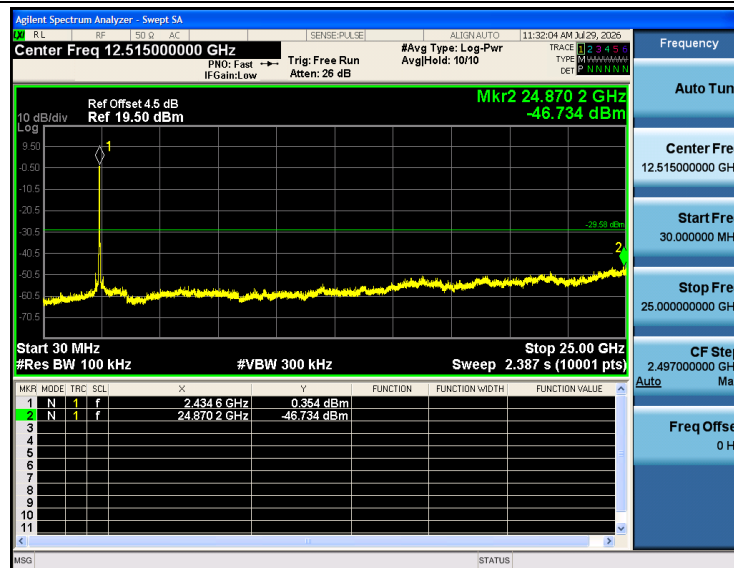
802.11n(HT40)_2422_30~25000



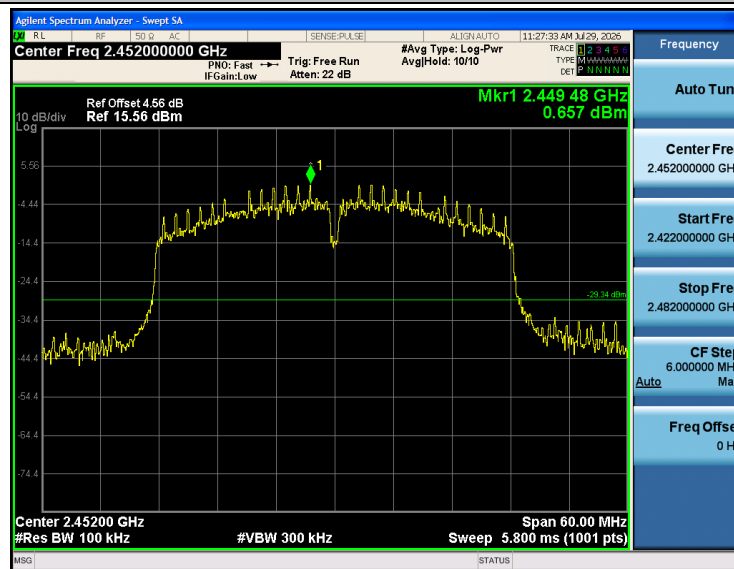
802.11n(HT40)_2437_0~Reference



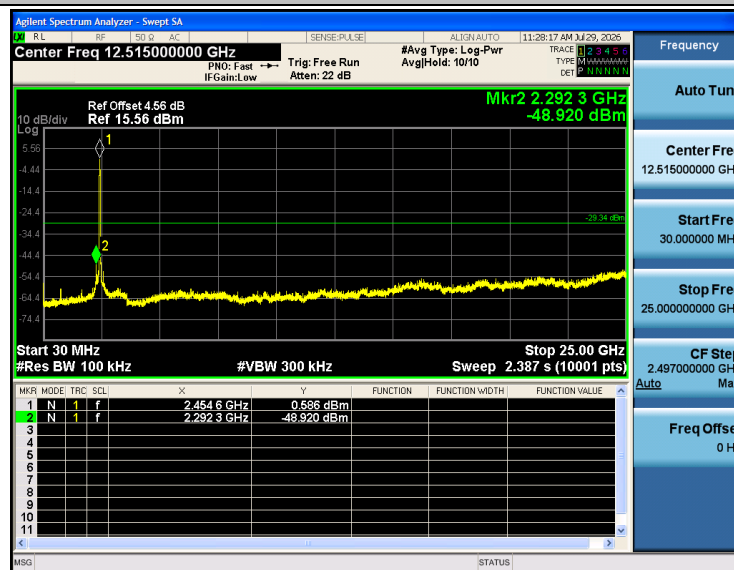
802.11n(HT40)_2437_30~25000



802.11n(HT40)_2452_0~Reference



802.11n(HT40)_2452_30~25000





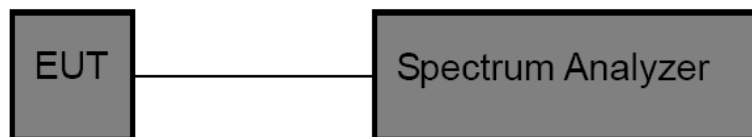
3.5. DTS Bandwidth

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2)/ RSS-247 6.3.1 (a):

Test Item	Limit	Frequency Range(MHz)
DTS Bandwidth	≥ 500 KHz (6dB bandwidth)	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. DTS Spectrum Setting:
 - (1) Set RBW = Shall be in the range of 1%to 5% of the OBW but not less than 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

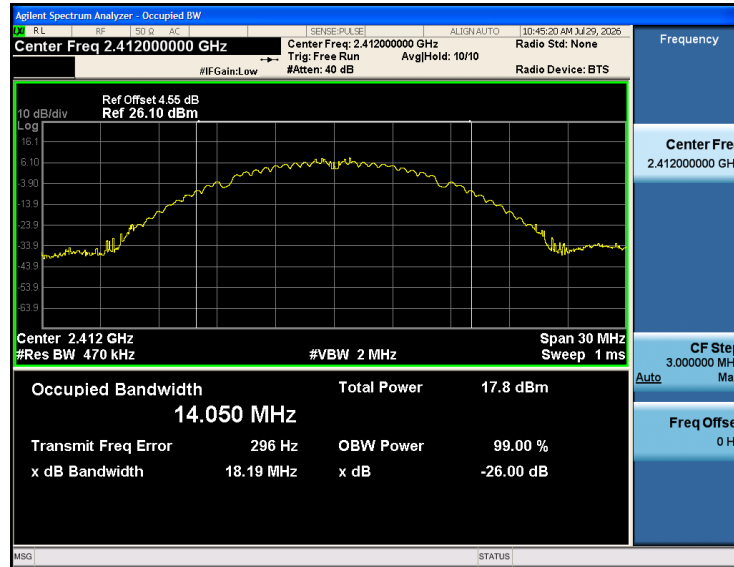
Please refer to the clause 2.4.

**Test Results**

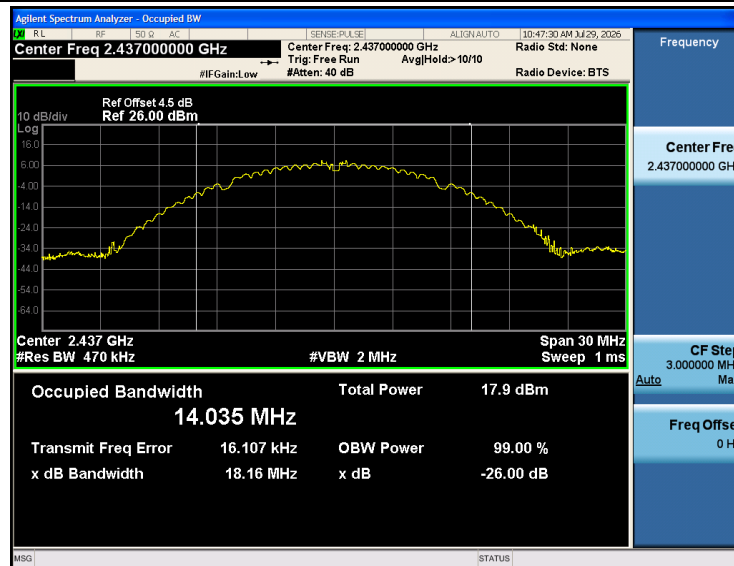
Test Mode	Frequency [MHz]	OBW [MHz]	DTS BW [MHz]	Limit [MHz]	Verdict
802.11b	2412	14.050	9.15	≥ 0.5	PASS
	2437	14.035	9.18	≥ 0.5	PASS
	2462	14.048	9.20	≥ 0.5	PASS
802.11g	2412	17.409	15.16	≥ 0.5	PASS
	2437	17.350	15.05	≥ 0.5	PASS
	2462	17.435	15.10	≥ 0.5	PASS
802.11n(HT20)	2412	18.150	15.73	≥ 0.5	PASS
	2437	18.143	15.71	≥ 0.5	PASS
	2462	18.144	15.71	≥ 0.5	PASS
802.11n(HT40)	2422	34.830	27.05	≥ 0.5	PASS
	2437	34.821	28.76	≥ 0.5	PASS
	2452	34.814	26.96	≥ 0.5	PASS



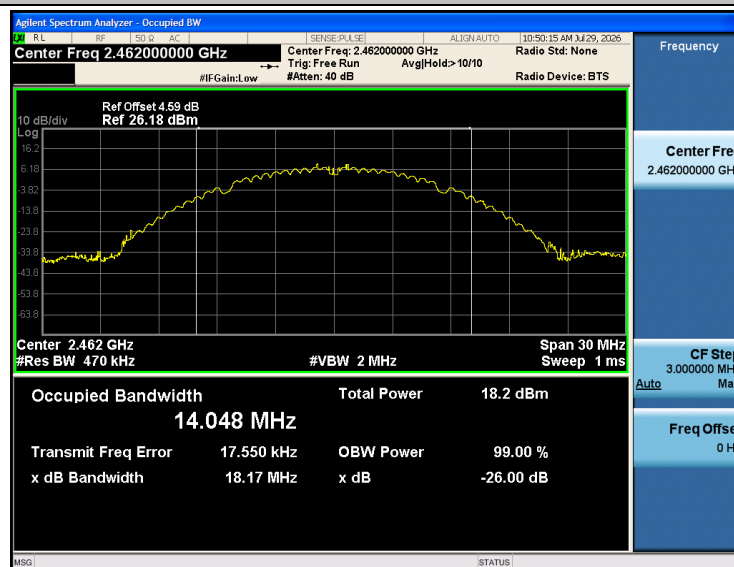
802.11b_OBW_2412



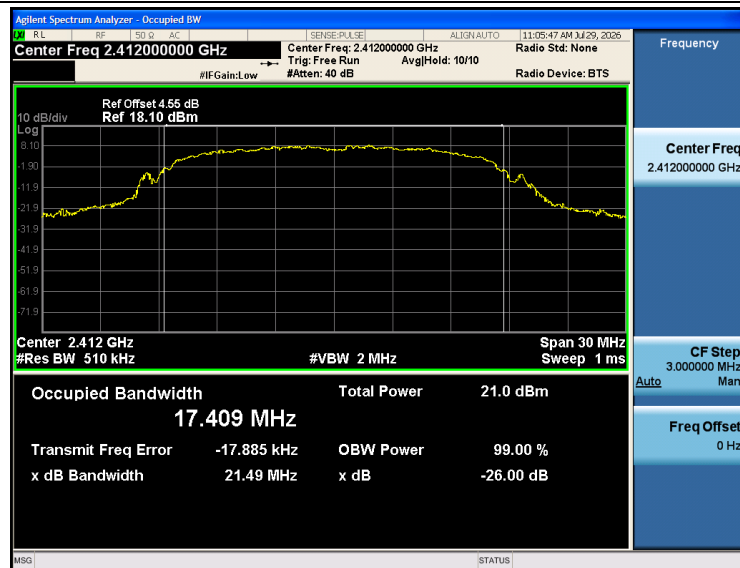
802.11b_OBW_2437



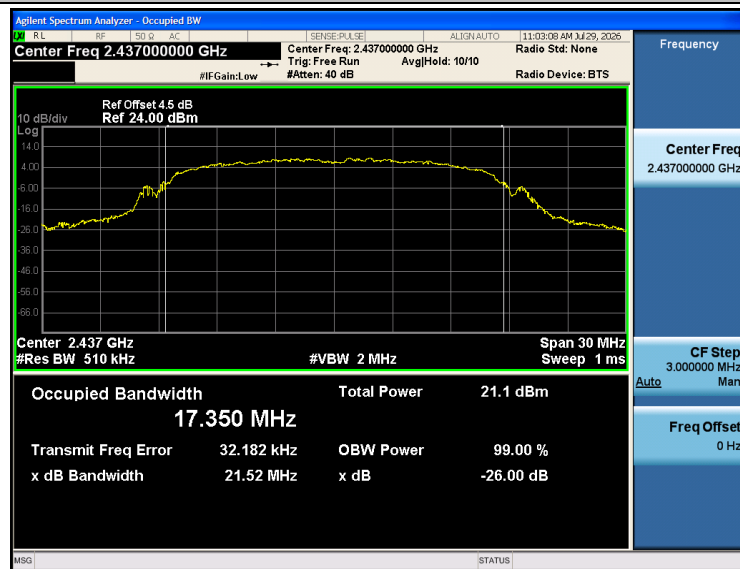
802.11b_OBW_2462



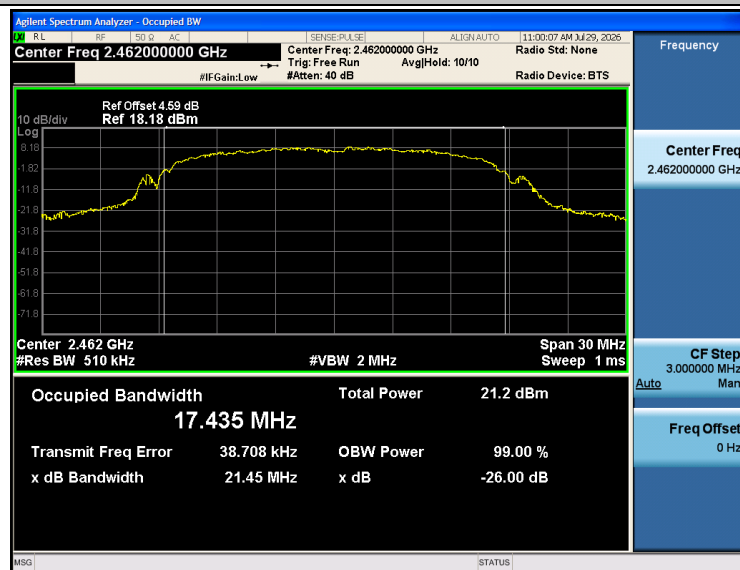
802.11g_OBW_2412



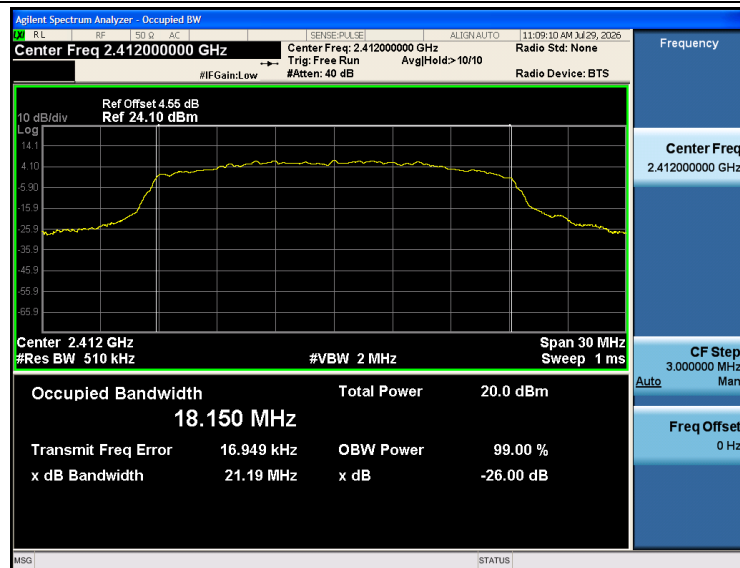
802.11g_OBW_2437



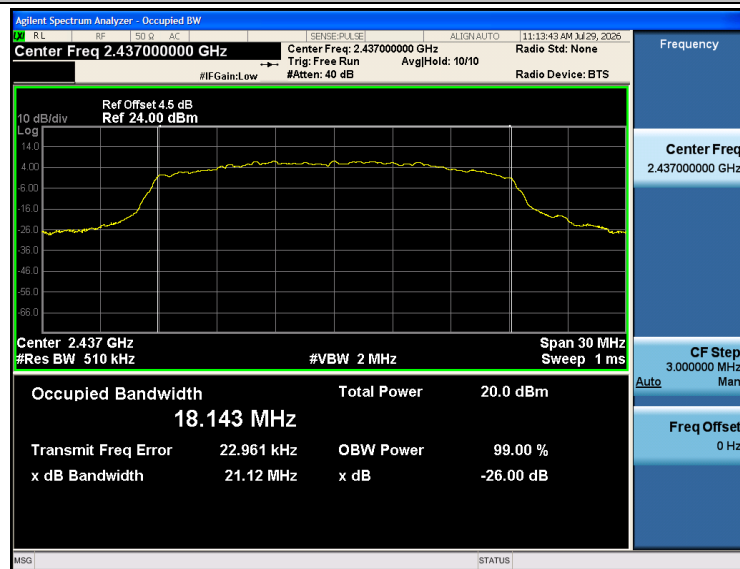
802.11g_OBW_2462



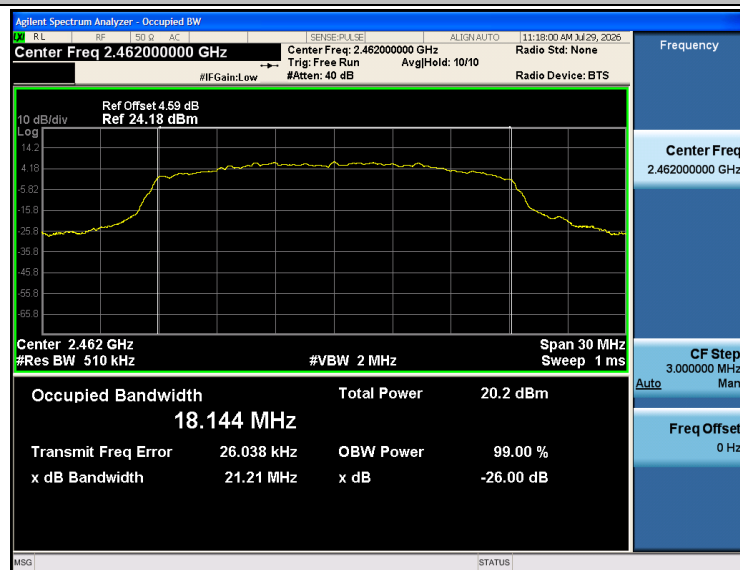
802.11n(HT20)_OBW_2412



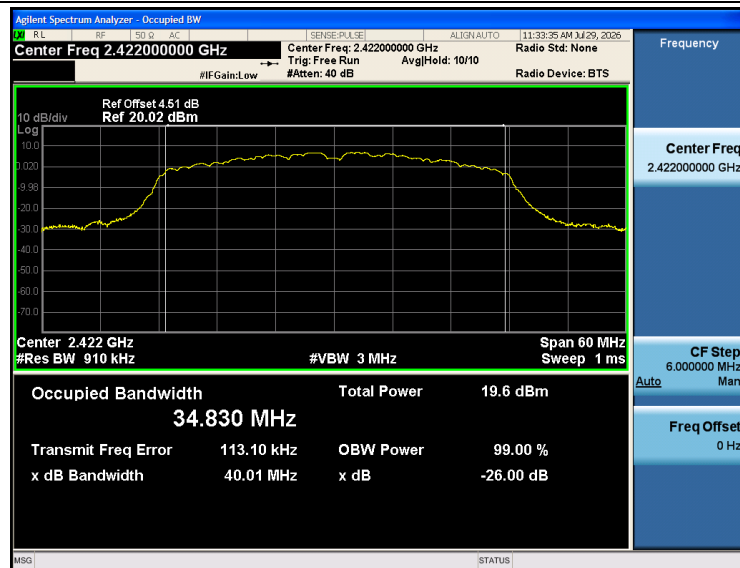
802.11n(HT20)_OBW_2437



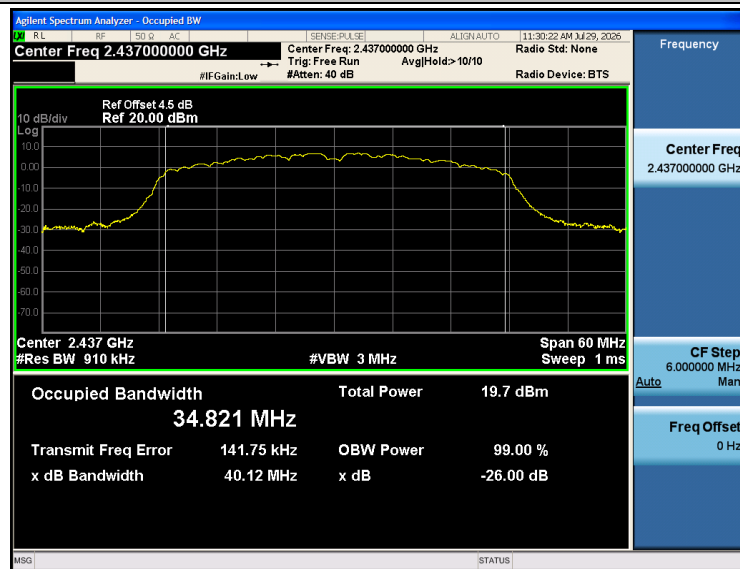
802.11n(HT20)_OBW_2462



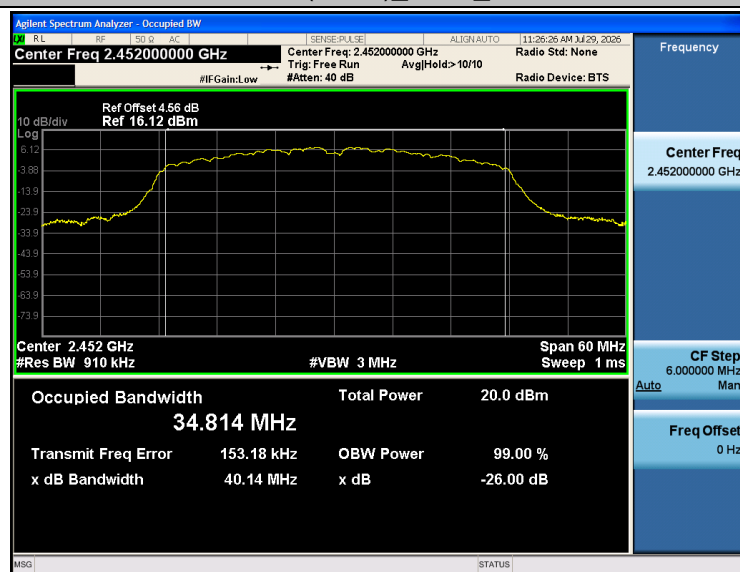
802.11n(HT40)_OBW_2422



802.11n(HT40)_OBW_2437

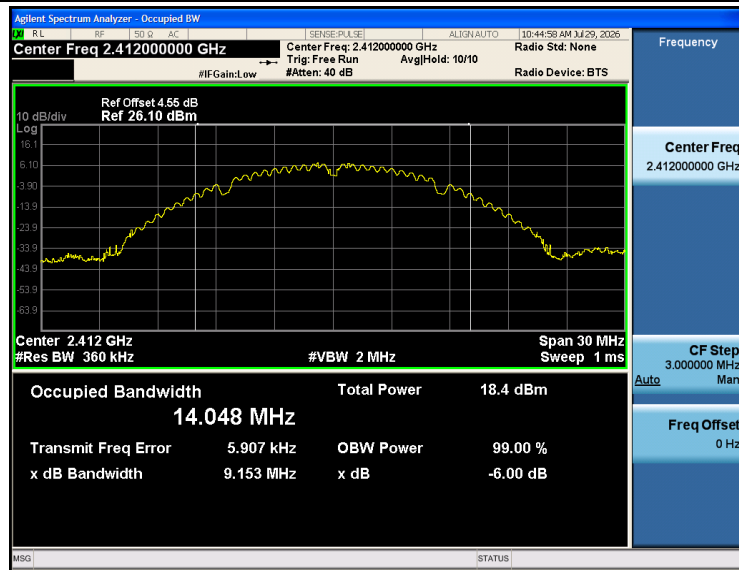


802.11n(HT40)_OBW_2452

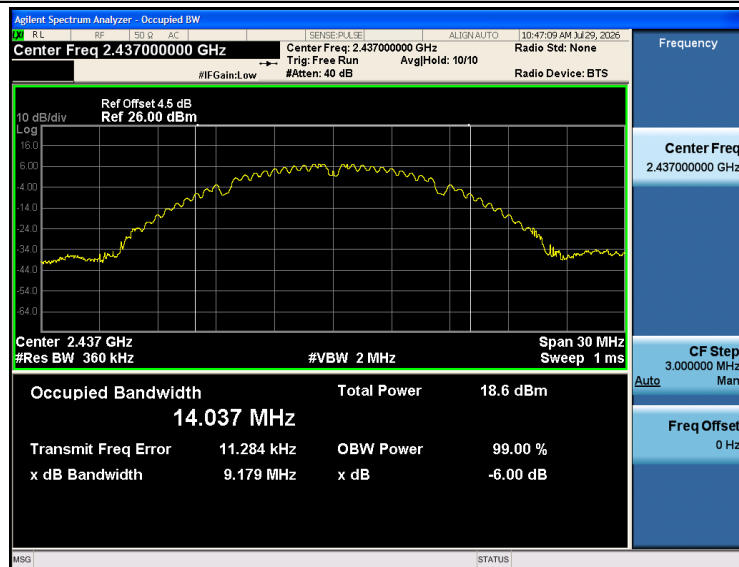




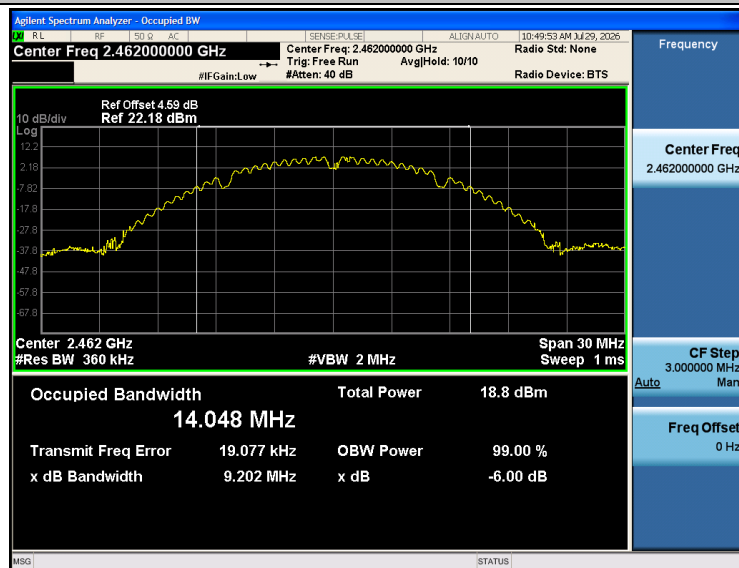
802.11b_DTS_2412



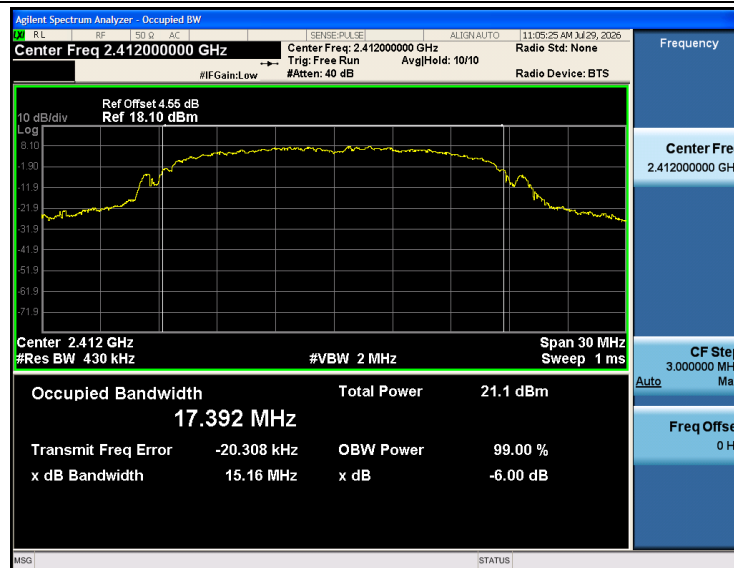
802.11b_DTS_2437



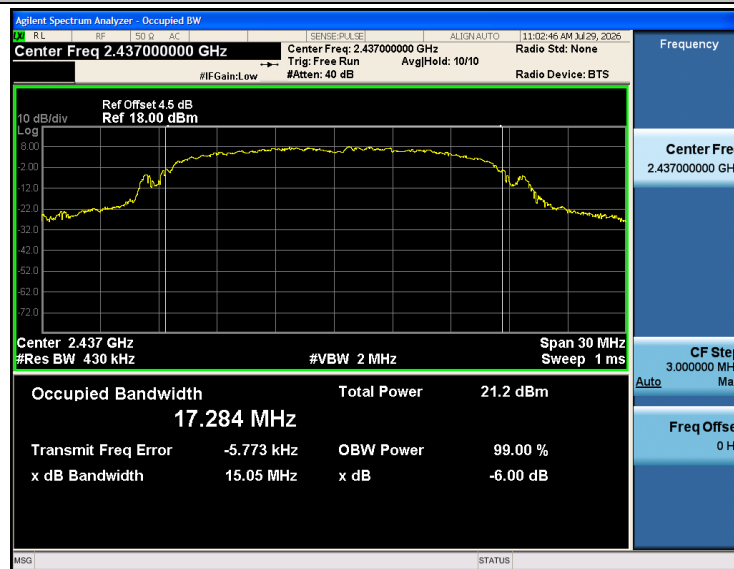
802.11b_DTS_2462



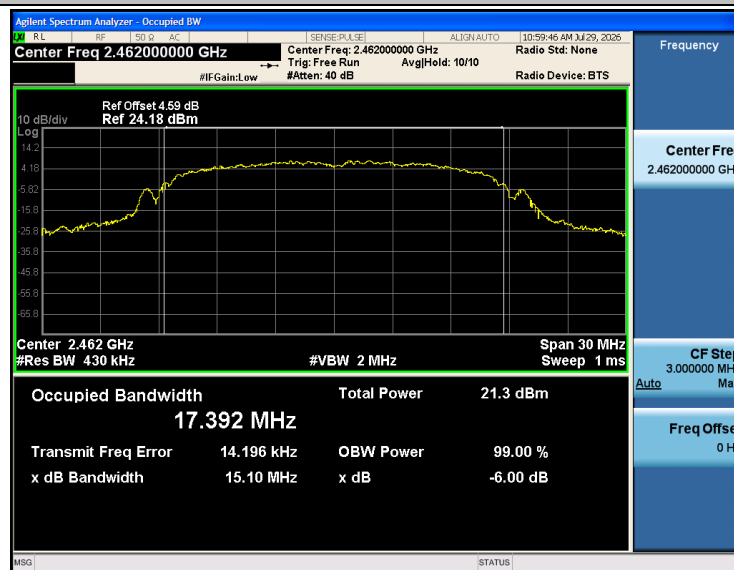
802.11g_DTS_2412



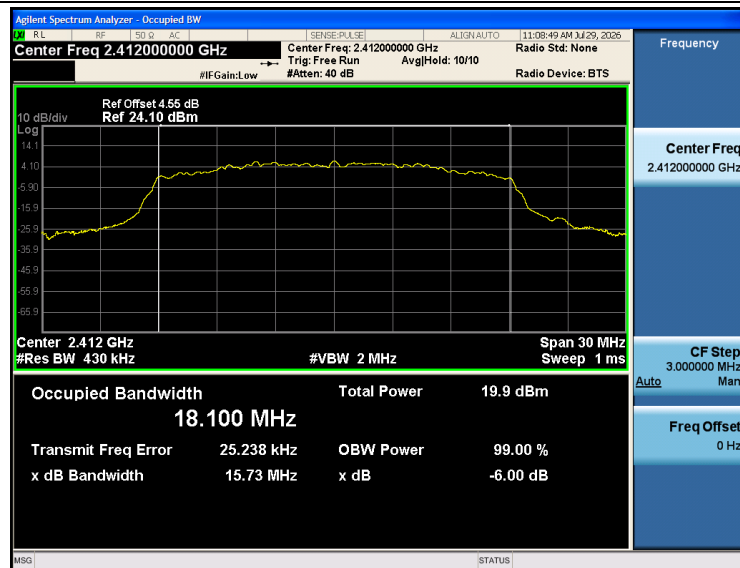
802.11g_DTS_2437



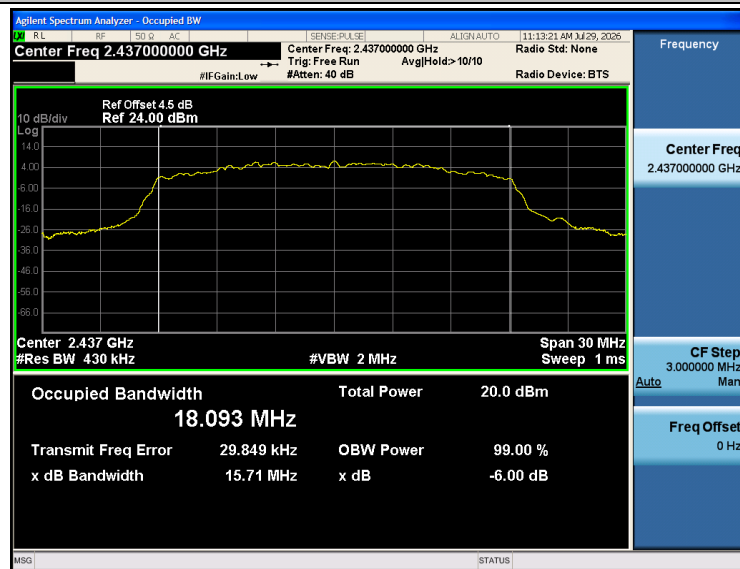
802.11g_DTS_2462



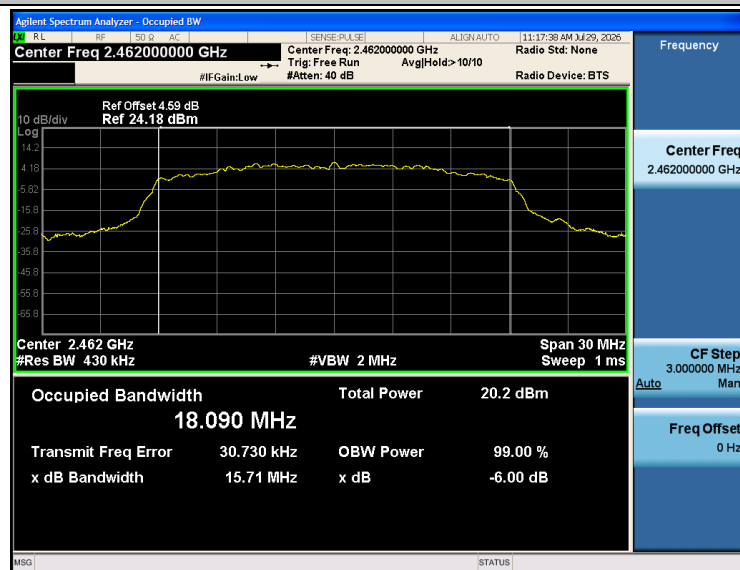
802.11n(HT20)_DTS_2412



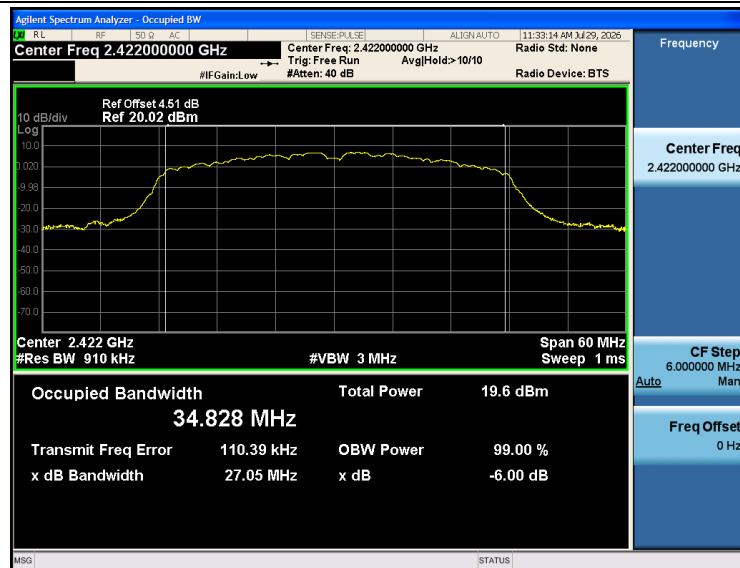
802.11n(HT20)_DTS_2437



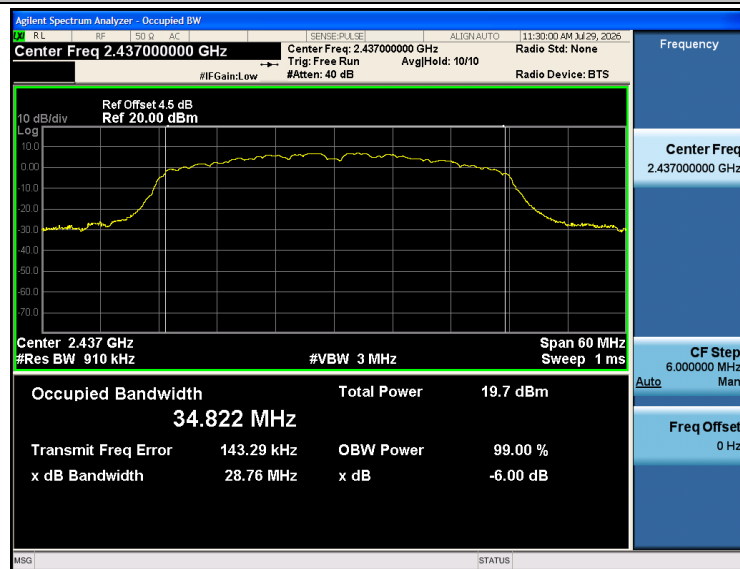
802.11n(HT20)_DTS_2462



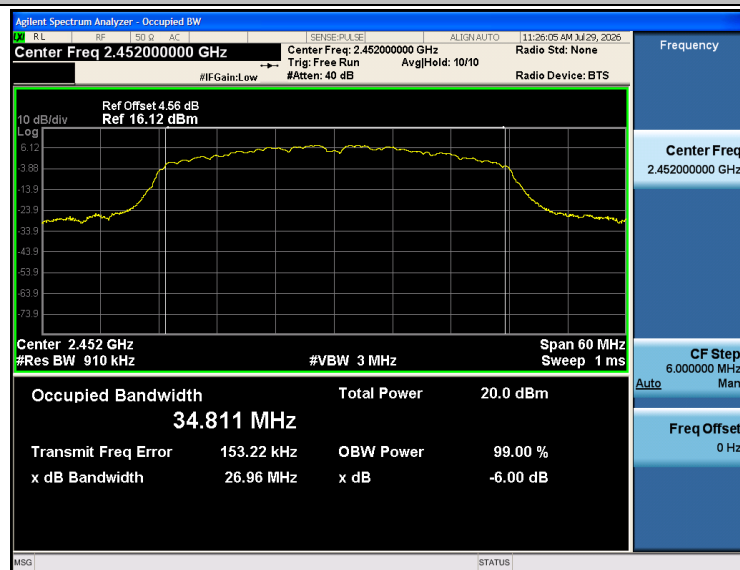
802.11n(HT40)_DTS_2422



802.11n(HT40)_DTS_2437



802.11n(HT40)_DTS_2452





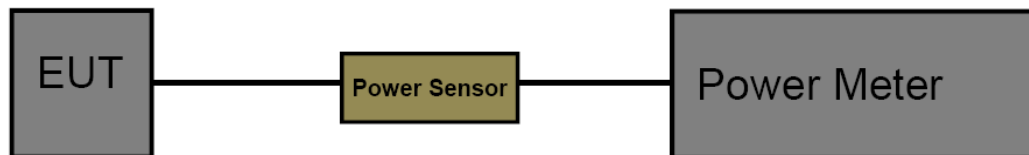
3.6. Maximum Conducted Output Power

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3)/ RSS-247 6.3.2:

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
ISED RSS-247 6.3.2	Maximum conducted output power	1 Watt or 30dBm	2400~2483.5
ISED RSS-247 6.3.2	EIRP	4 Watt or 36dBm	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 AVG 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 2.4.

Test Result



Test Mode	Frequency [MHz]	Result AVG [dBm]	E.I.R.P Result[dBm]	E.I.R.P Limit[dBm]	Verdict
802.11b	2412	14.49	16.8	<=36	PASS
	2437	14.55	16.86	<=36	PASS
	2462	14.81	17.12	<=36	PASS
802.11g	2412	13.33	15.64	<=36	PASS
	2437	13.43	15.74	<=36	PASS
	2462	13.65	15.96	<=36	PASS
802.11n(HT20)	2412	13.11	15.42	<=36	PASS
	2437	13.16	15.47	<=36	PASS
	2462	13.42	15.73	<=36	PASS
802.11n(HT40)	2422	11.86	14.17	<=36	PASS
	2437	11.95	14.26	<=36	PASS
	2452	12.22	14.53	<=36	PASS

Note: Test results increased RF cable loss by 0.7dB and Duty Cycle Factor.



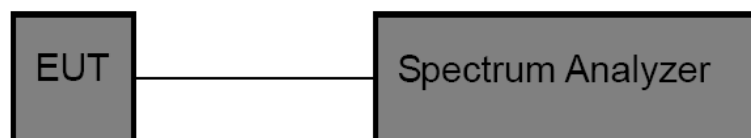
3.7. Power Spectral Density

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e)/ RSS-247 6.3.1 (b):

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:
Set analyzer center frequency to DTS channel center frequency.
Set the span to 1.5 times the DTS bandwidth.
Set the RBW to: 30 kHz
Set the VBW to: 100 kHz
Detector: PK
Sweep time: Auto
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

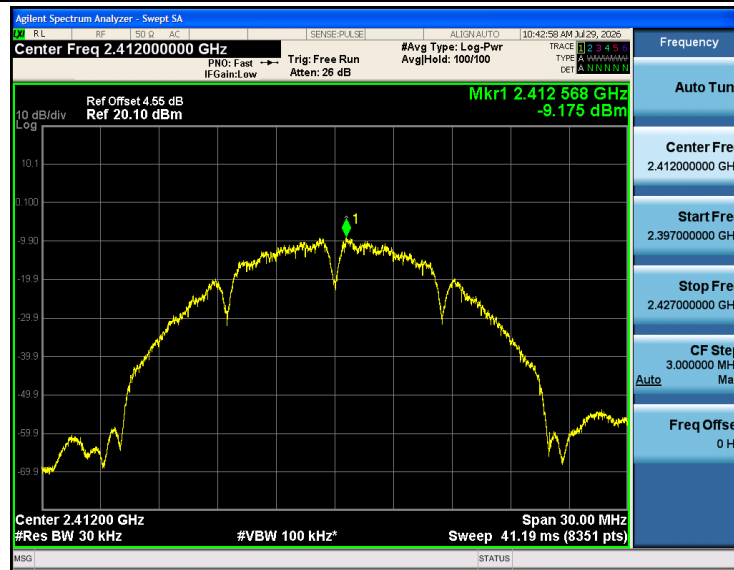
Please refer to the clause 2.4.

Test Result

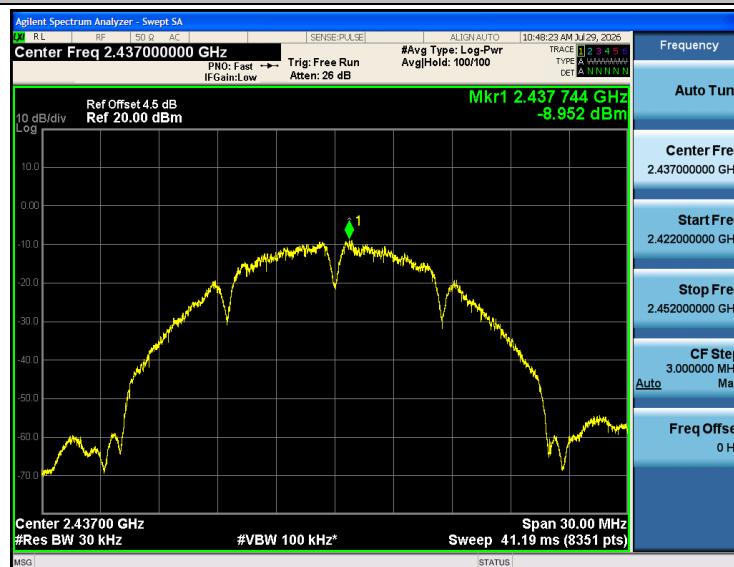
Test Mode	Frequency [MHz]	Result [dBm/30kHz]	Limit [dBm/3kHz]	Verdict
802.11b	2412	-9.18	<=8	PASS
	2437	-8.95	<=8	PASS
	2462	-8.44	<=8	PASS
802.11g	2412	-11.30	<=8	PASS
	2437	-11.11	<=8	PASS
	2462	-11.13	<=8	PASS
802.11n(HT20)	2412	-10.08	<=8	PASS
	2437	-9.74	<=8	PASS
	2462	-9.80	<=8	PASS
802.11n(HT40)	2422	-11.11	<=8	PASS
	2437	-10.81	<=8	PASS
	2452	-10.63	<=8	PASS



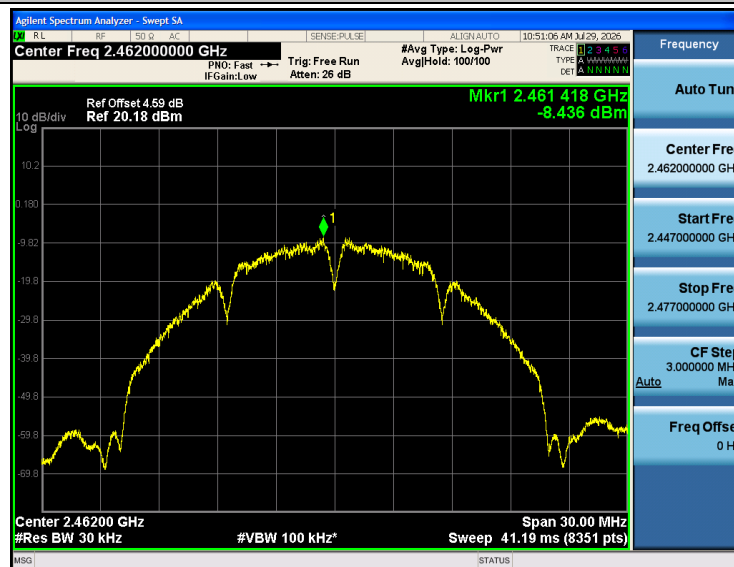
802.11b_2412



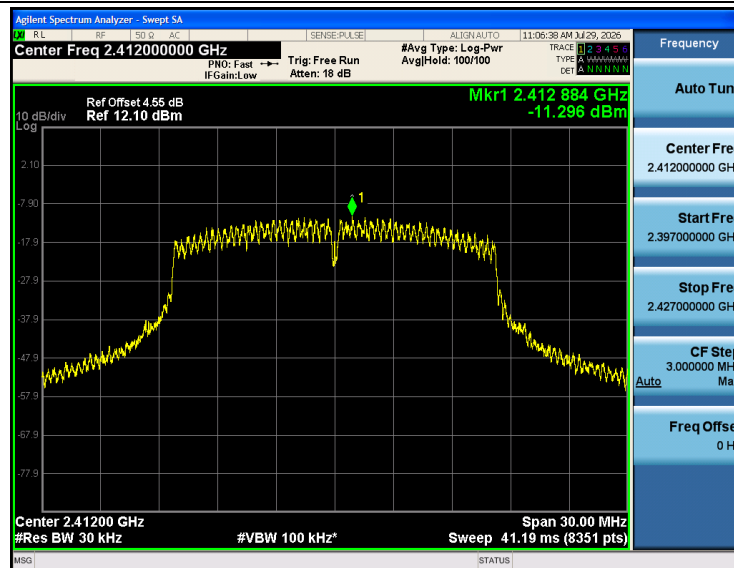
802.11b_2437



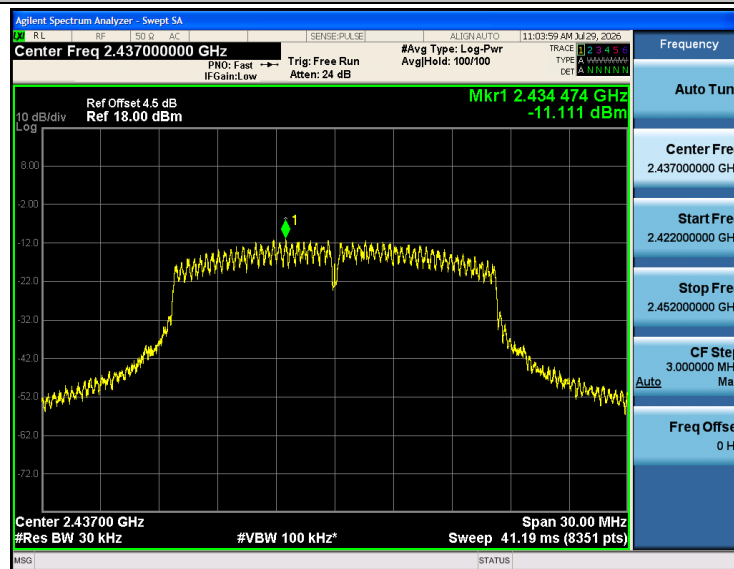
802.11b_2462



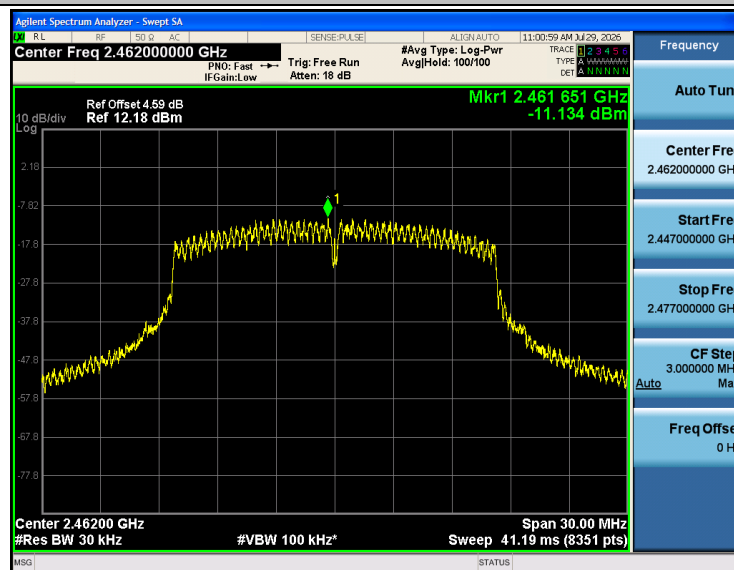
802.11g_2412



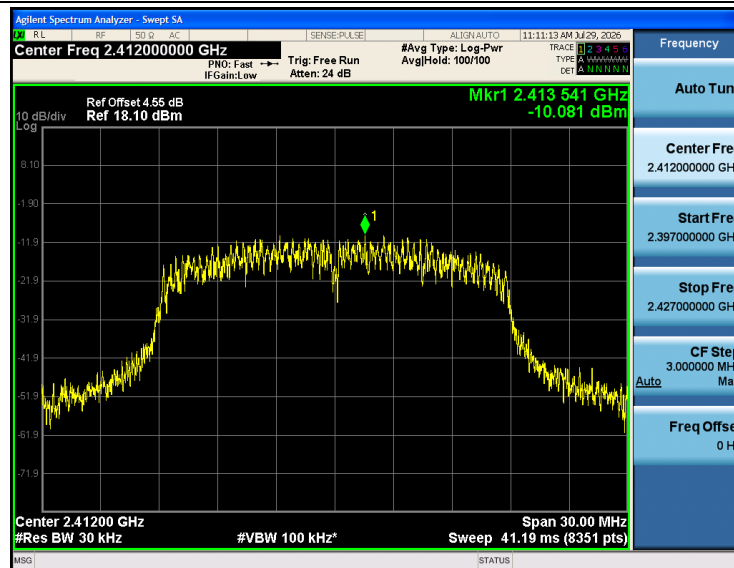
802.11g_2437



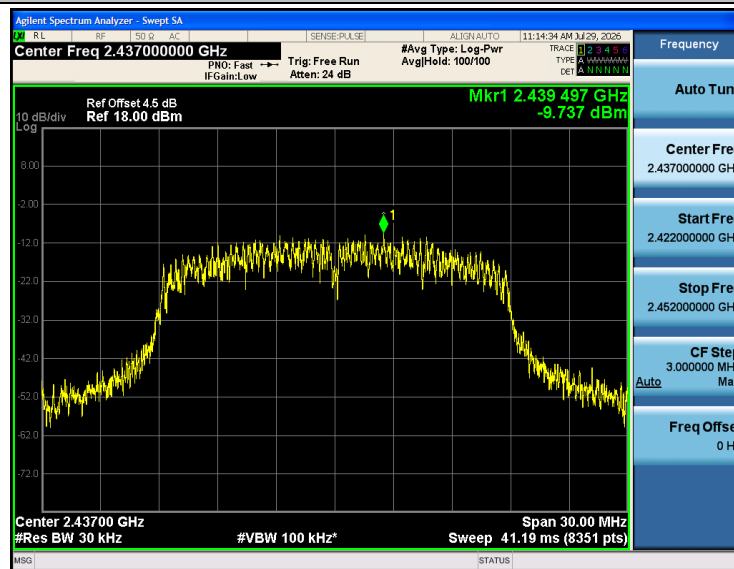
802.11g_2462



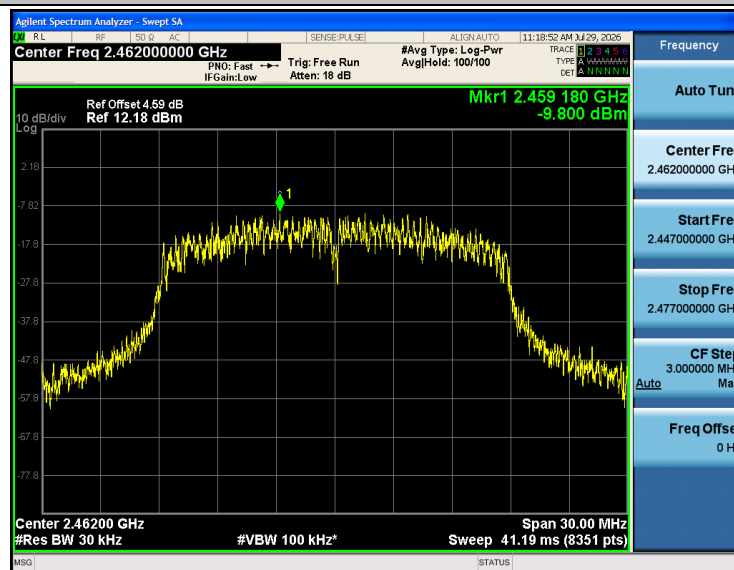
802.11n(HT20)_2412



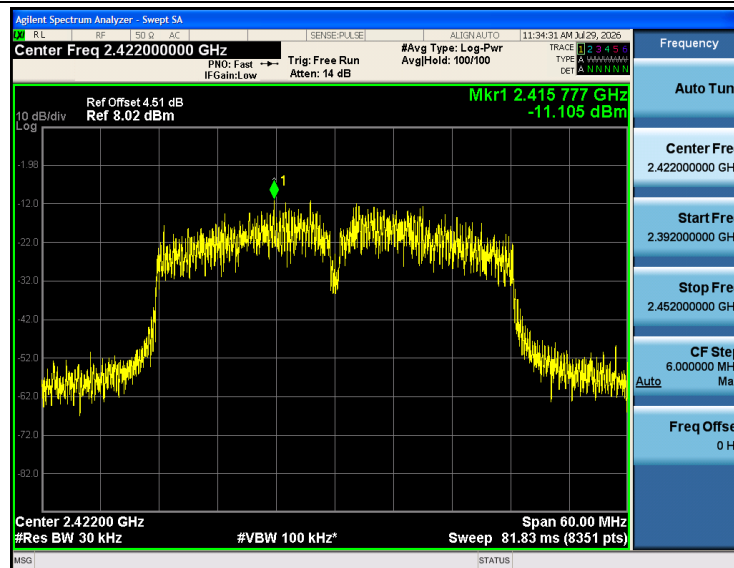
802.11n(HT20)_2437



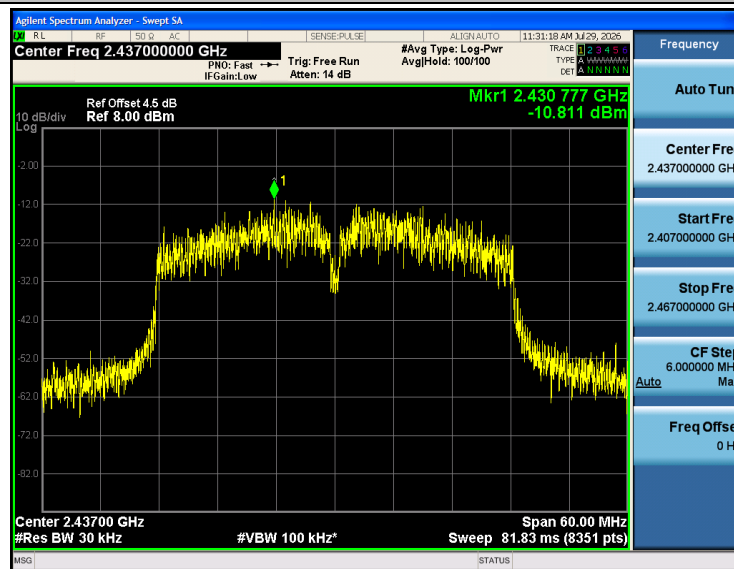
802.11n(HT20)_2462



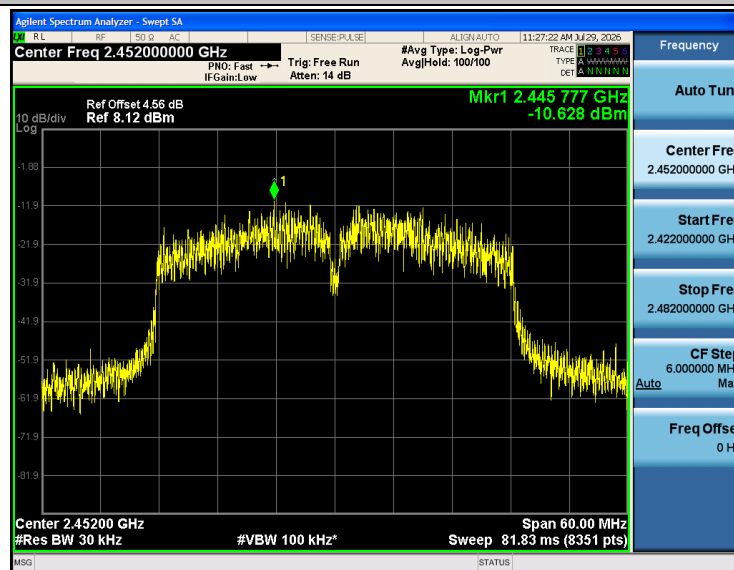
802.11n(HT40)_2422



802.11n(HT40)_2437



802.11n(HT40)_2452





3.8. Duty Cycle

Limit

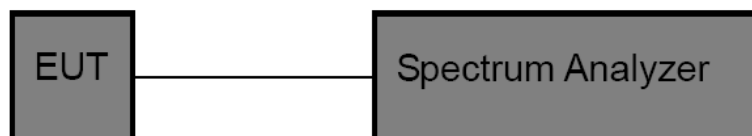
None, for report purposes only.

If duty cycle is $\geq 98\%$, duty factor is not required.

If duty cycle is $< 98\%$, duty factor shall be considered.

The output power = measured power + duty factor.

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 DTS channel center frequency.
Set the span to 0Hz
Set the RBW to 8MHz
Set the VBW to 8MHz
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.

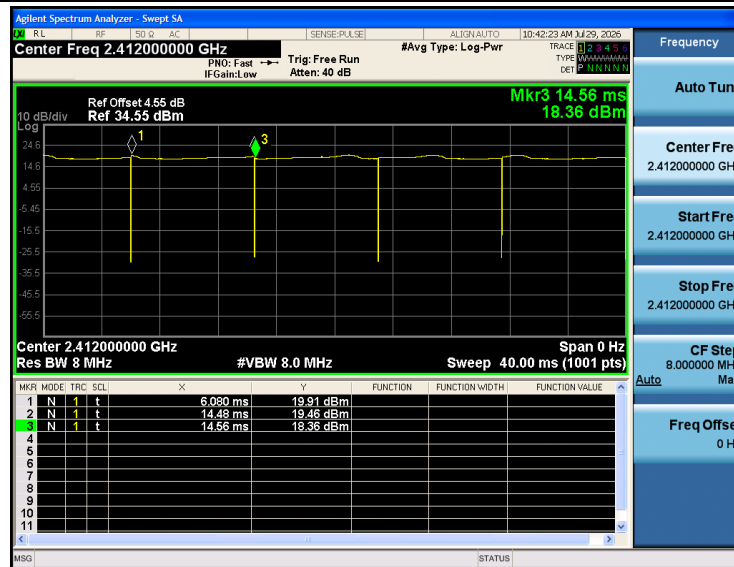
**Test Result**

Test Mode	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Duty Cycle Factor	1/T Minimum VBW (kHz)	Final setting For VBW (Hz)
802.11b	2412	8.40	8.48	99.06	0	/	10
	2437	8.40	8.48	99.06	0	/	10
	2462	8.36	8.48	98.58	0	/	10
802.11g	2412	100	100	100	0	/	10
	2437	100	100	100	0	/	10
	2462	100	100	100	0	/	10
802.11n(HT20)	2412	100	100	100	0	/	10
	2437	100	100	100	0	/	10
	2462	100	100	100	0	/	10
802.11n(HT40)	2422	100	100	100	0	/	10
	2437	100	100	100	0	/	10
	2452	100	100	100	0	/	10

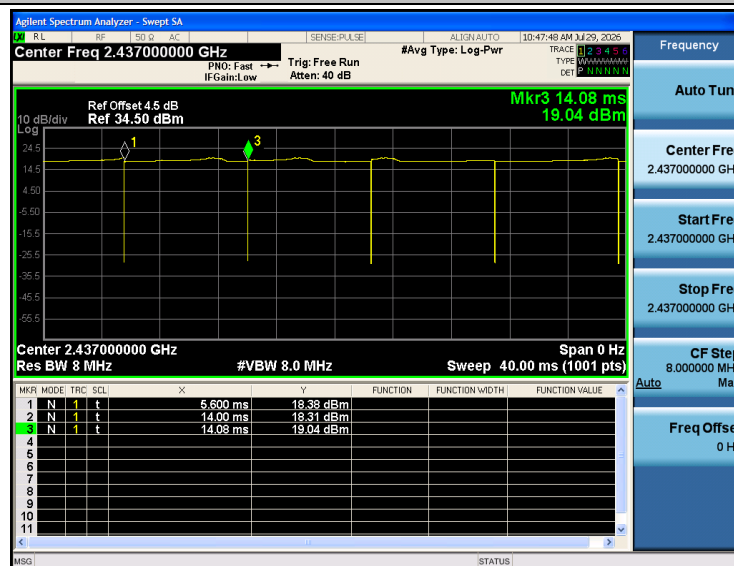
Note: Duty Cycle Factor = $10 \cdot \log_{10}(1/\text{Duty Cycle})$



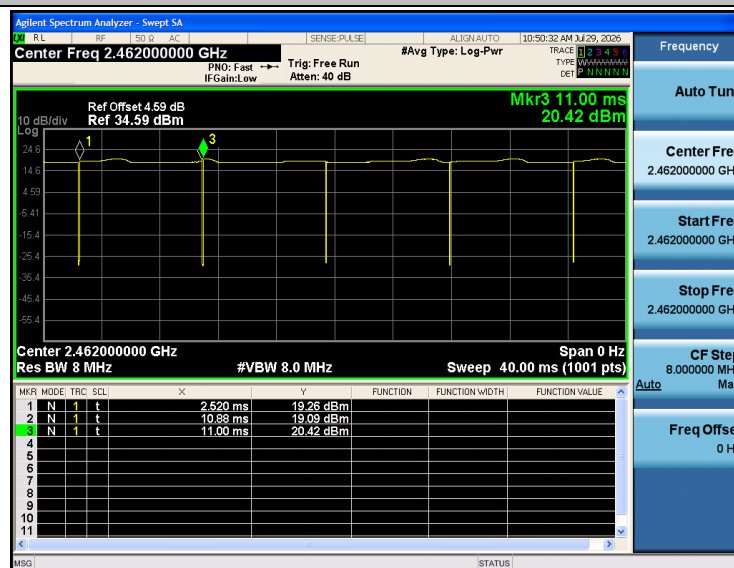
802.11b_2412



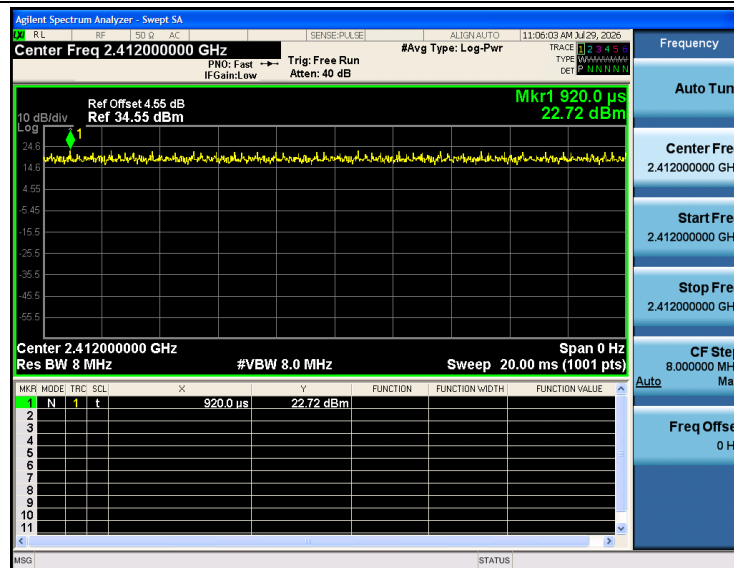
802.11b_2437



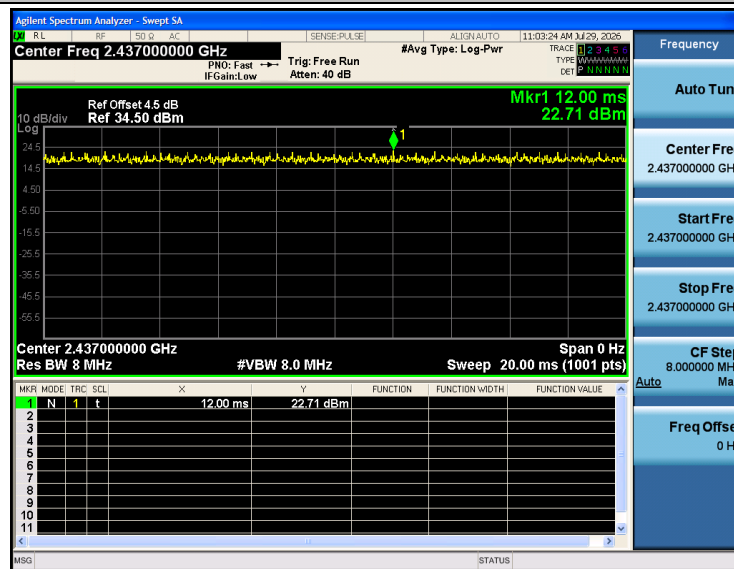
802.11b_2462



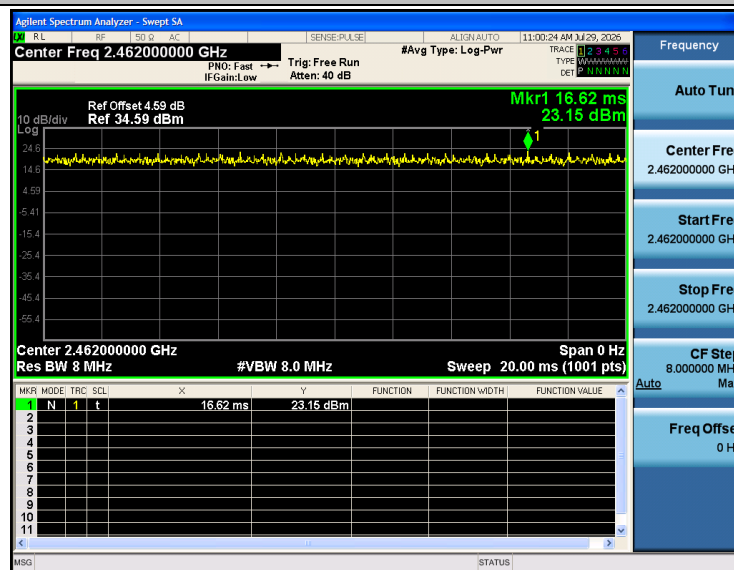
802.11g_2412



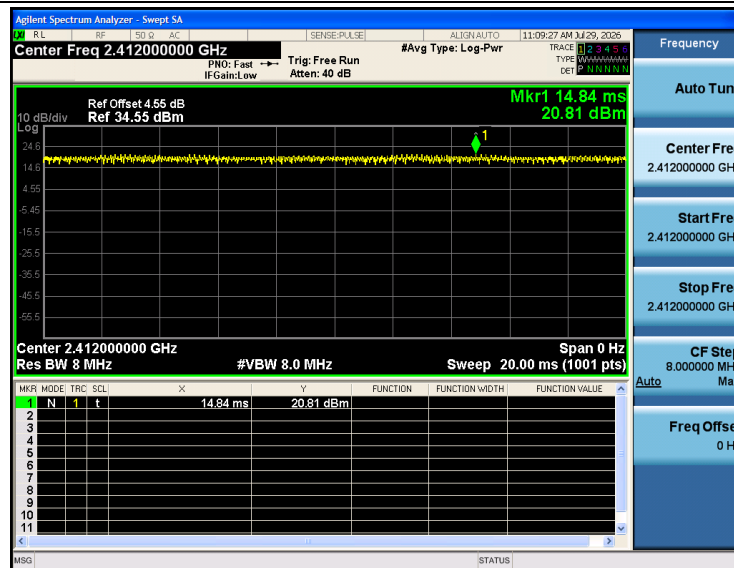
802.11g_2437



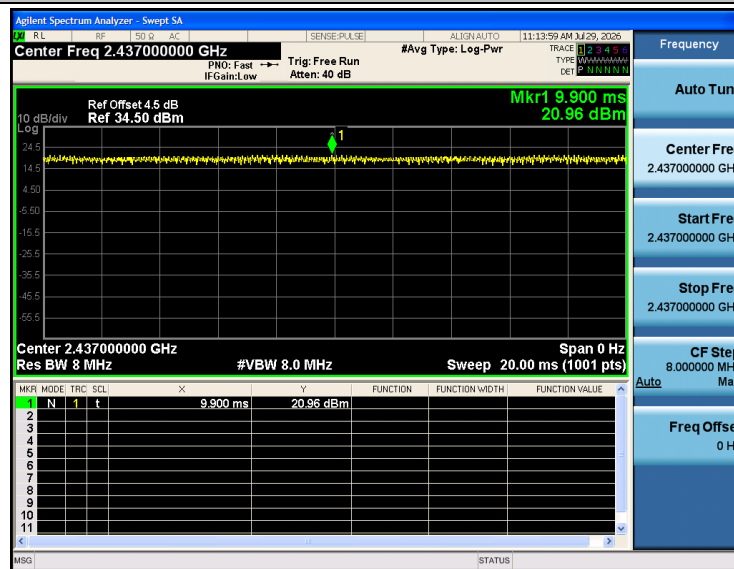
802.11g_2462



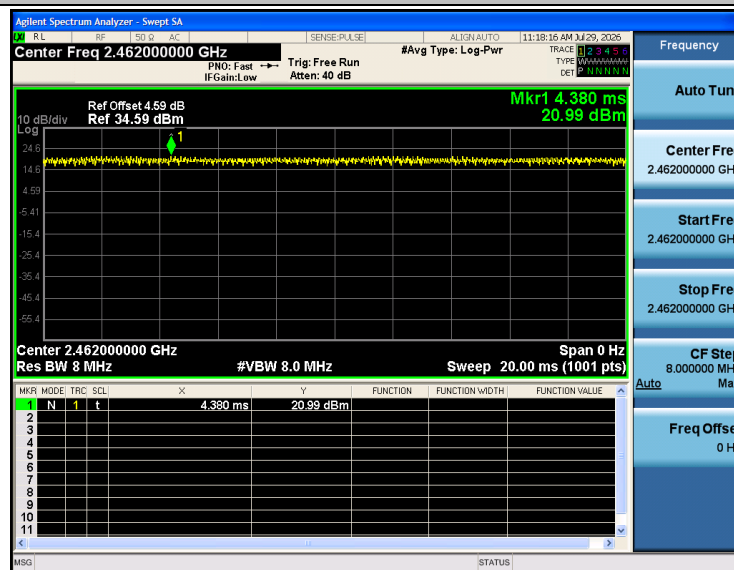
802.11n(HT20)_2412



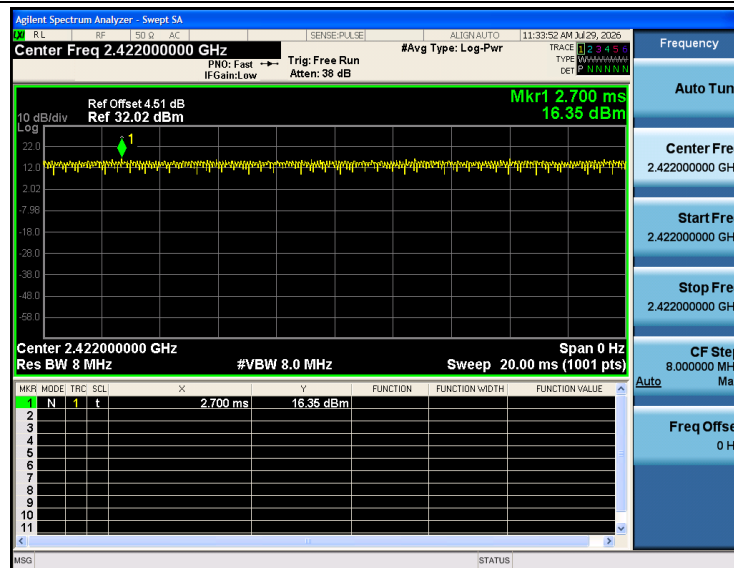
802.11n(HT20)_2437



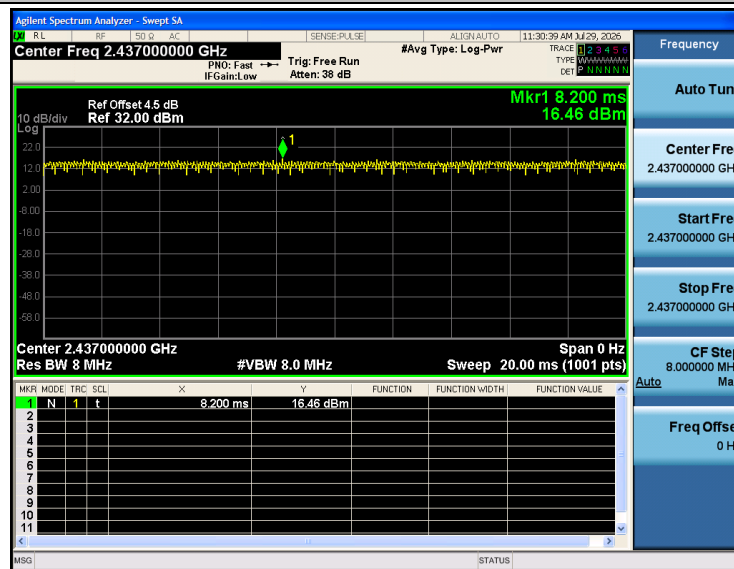
802.11n(HT20)_2462



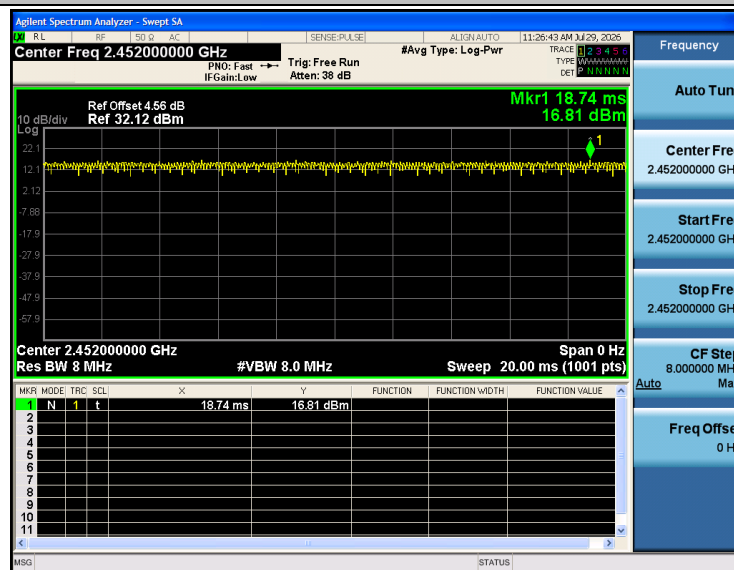
802.11n(HT40)_2422



802.11n(HT40)_2437



802.11n(HT40)_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.

According to RSS-GEN Issue 5, section 6.8, The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer. The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

Test Result

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

*****THE END*****