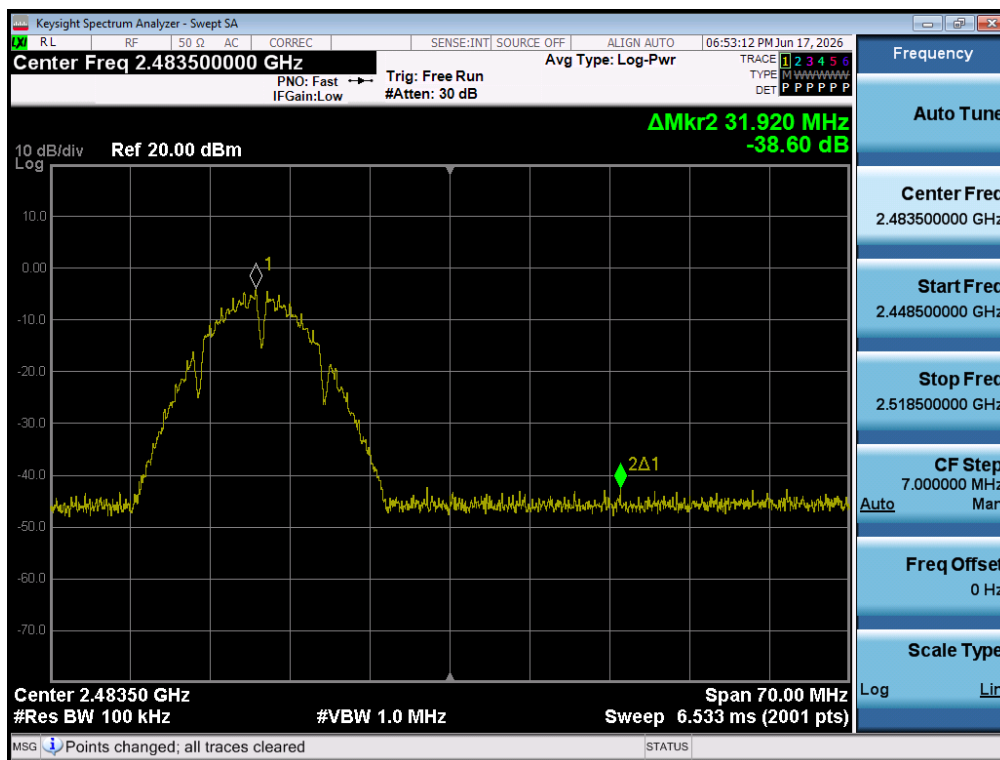
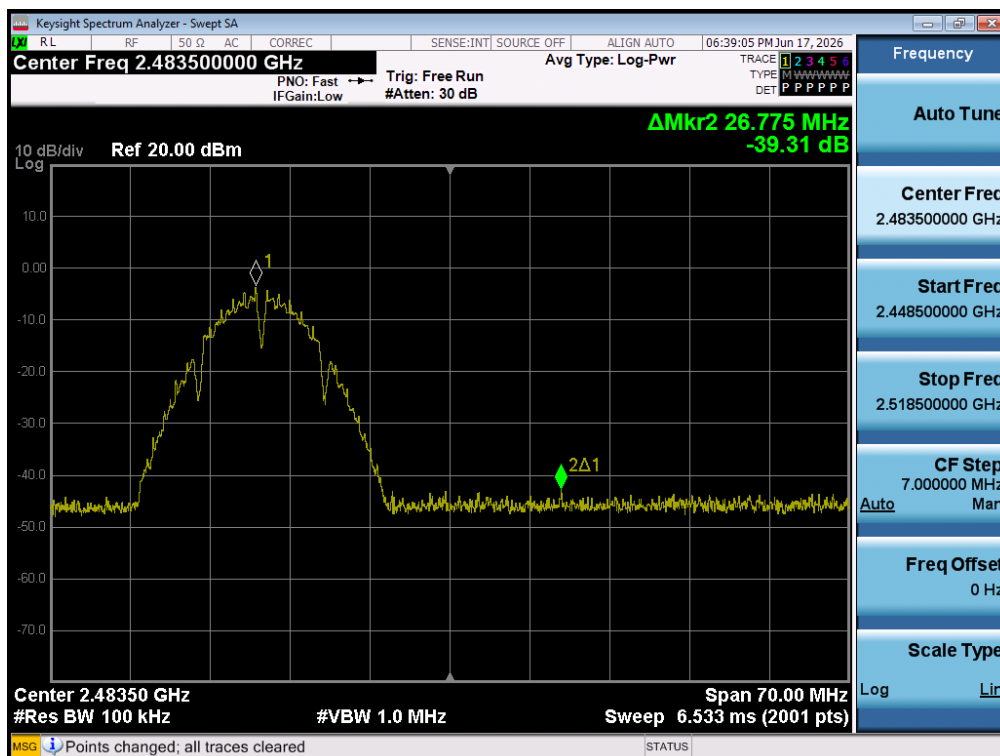


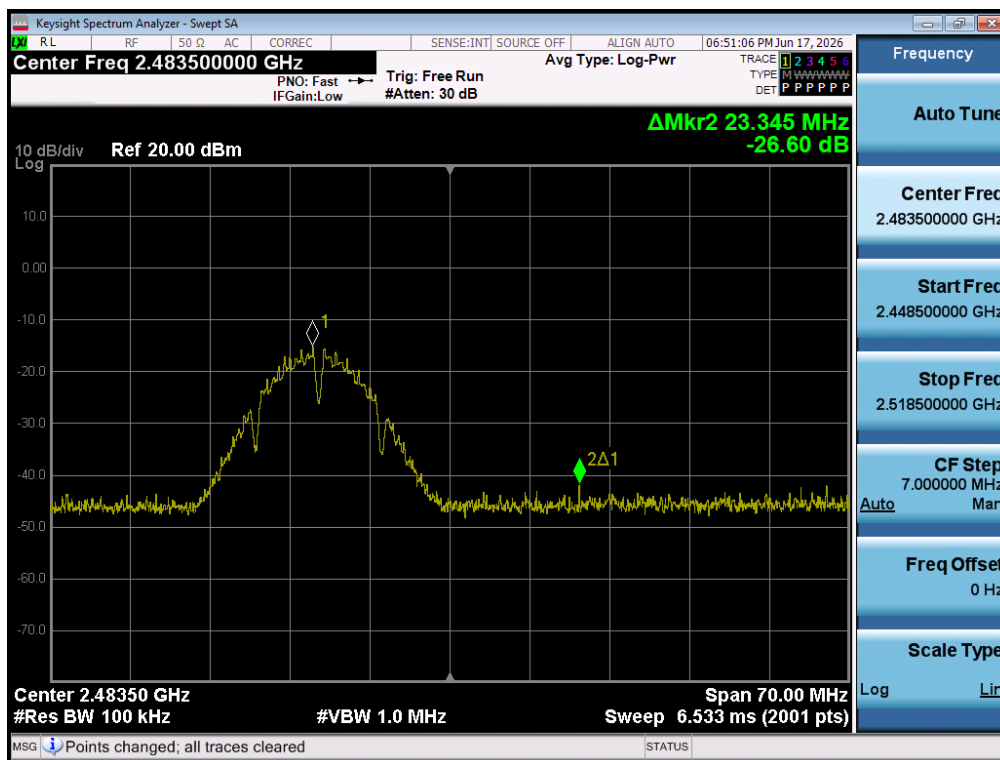
Plot 5-61 802.11b CH12. Conducted Upper Band edge - (Ant 1)



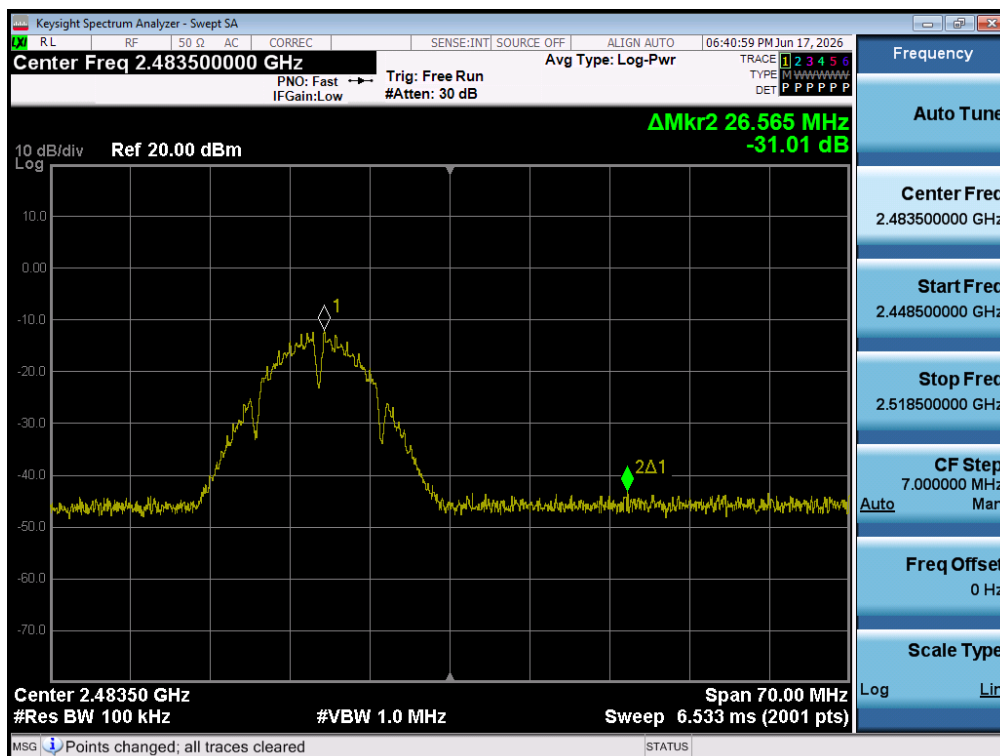
Plot 5-62 802.11b CH12. Conducted Upper Band edge - (Ant 2)



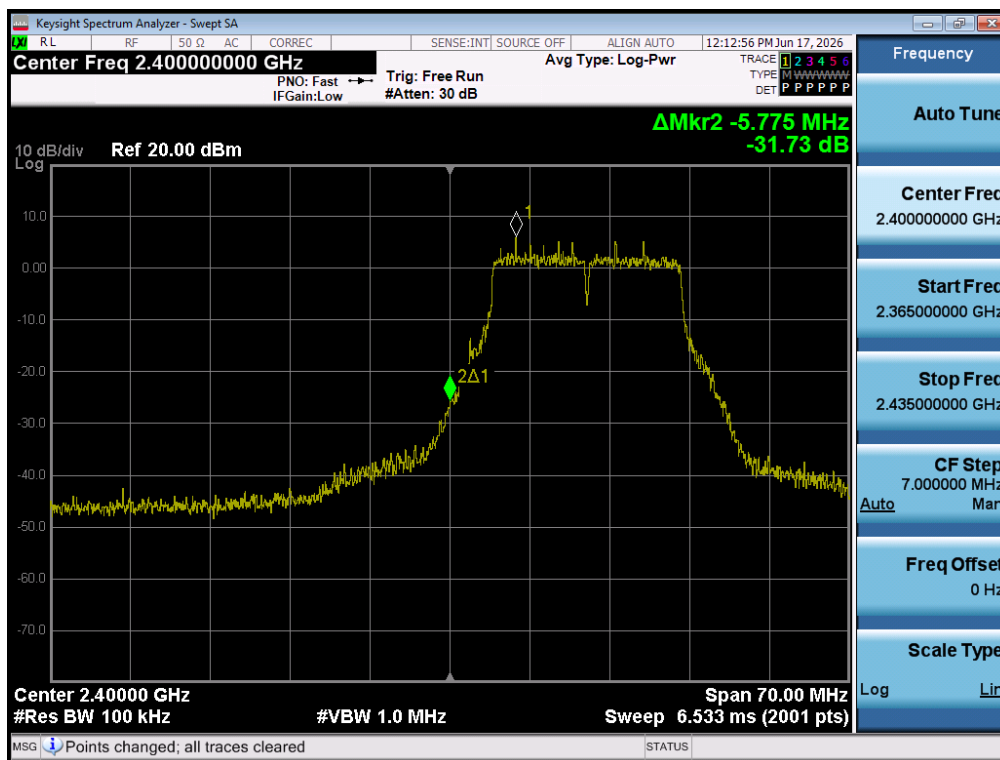
Plot 5-63 802.11b CH13. Conducted Upper Band edge - (Ant 1)



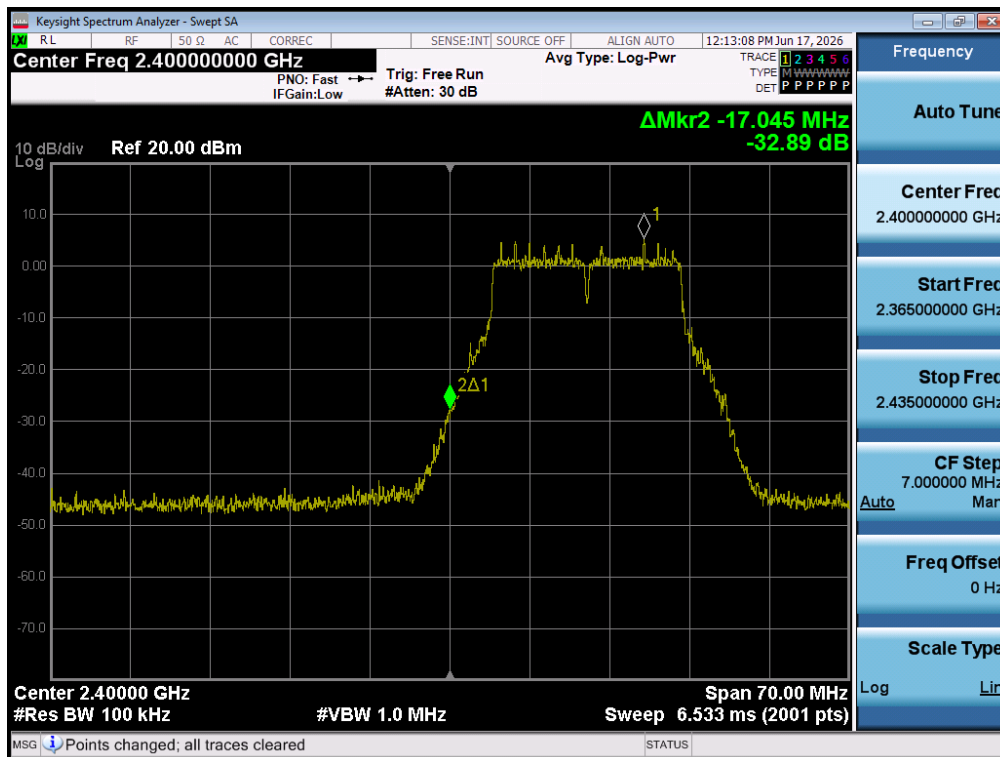
Plot 5-64 802.11b CH13. Conducted Upper Band edge - (Ant 2)



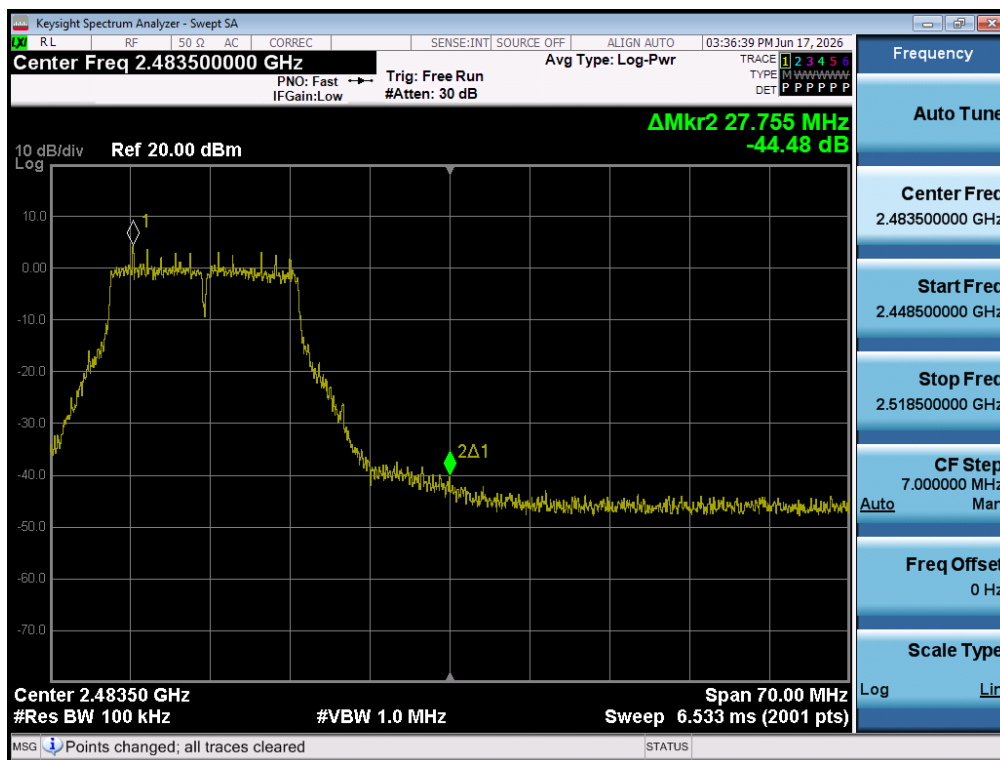
Plot 5-65 802.11g CH1. Conducted Lower Band edge - (Ant 1)



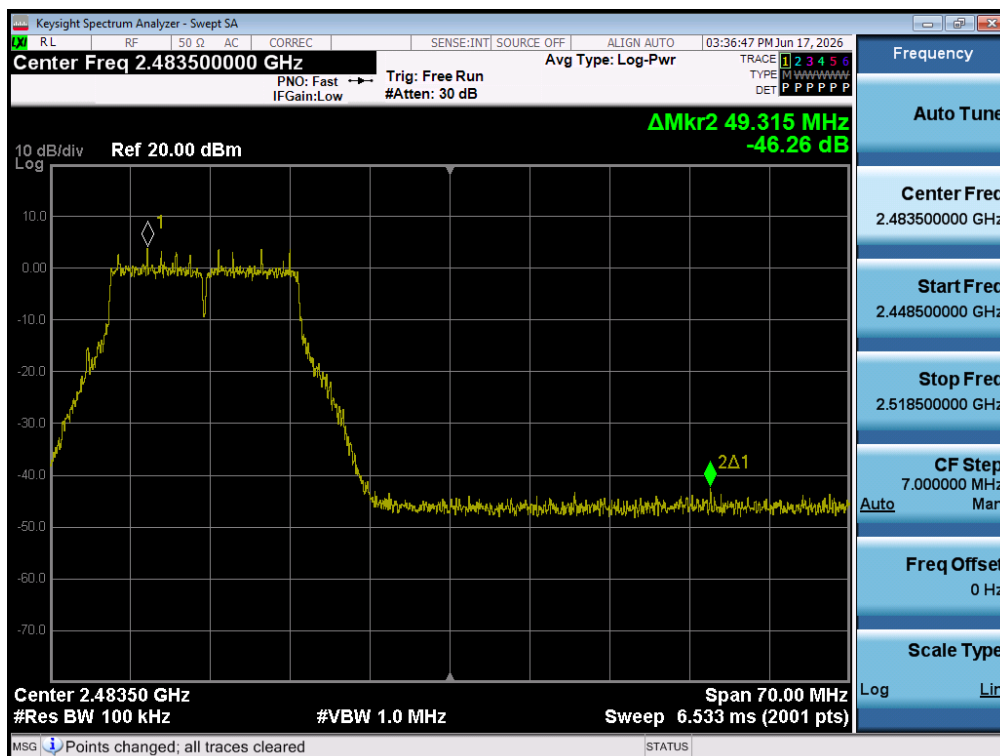
Plot 5-66 802.11g CH1. Conducted Lower Band edge - (Ant 2)



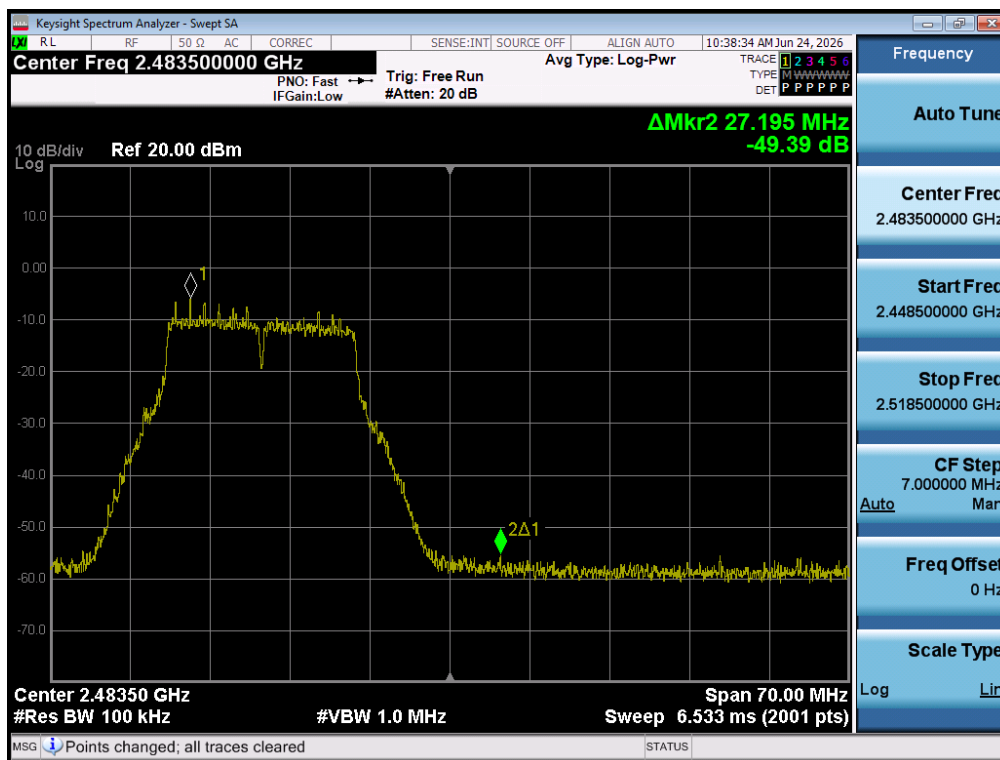
Plot 5-67 802.11g CH11. Conducted Upper Band edge - (Ant 1)



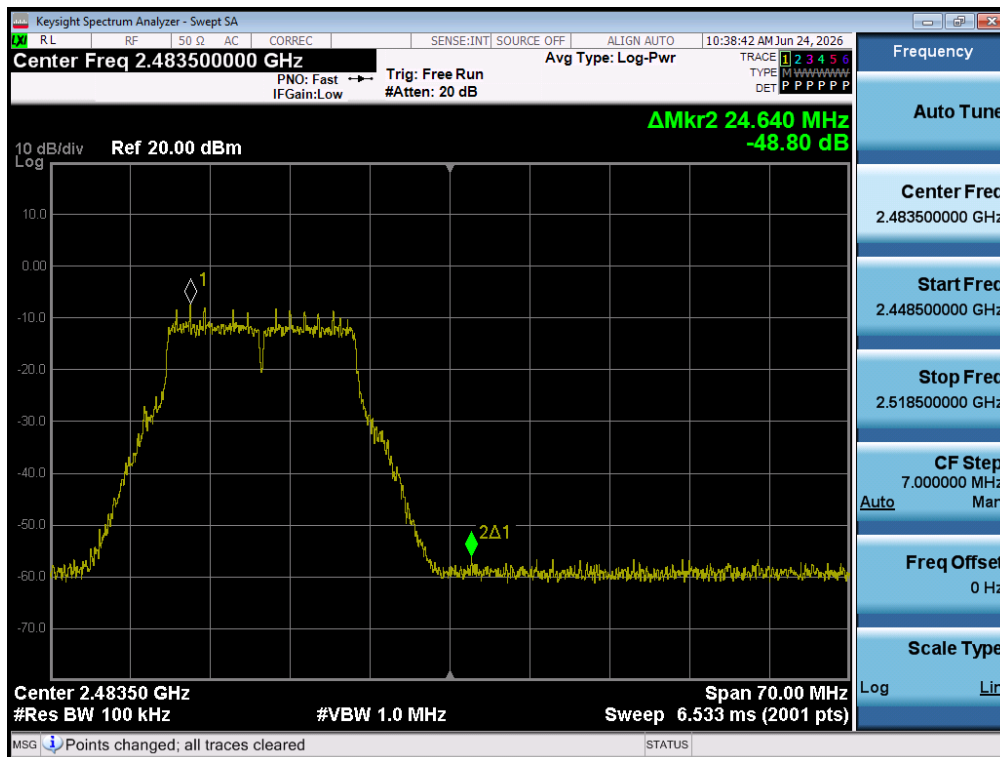
Plot 5-68 802.11g CH11. Conducted Upper Band edge - (Ant 2)



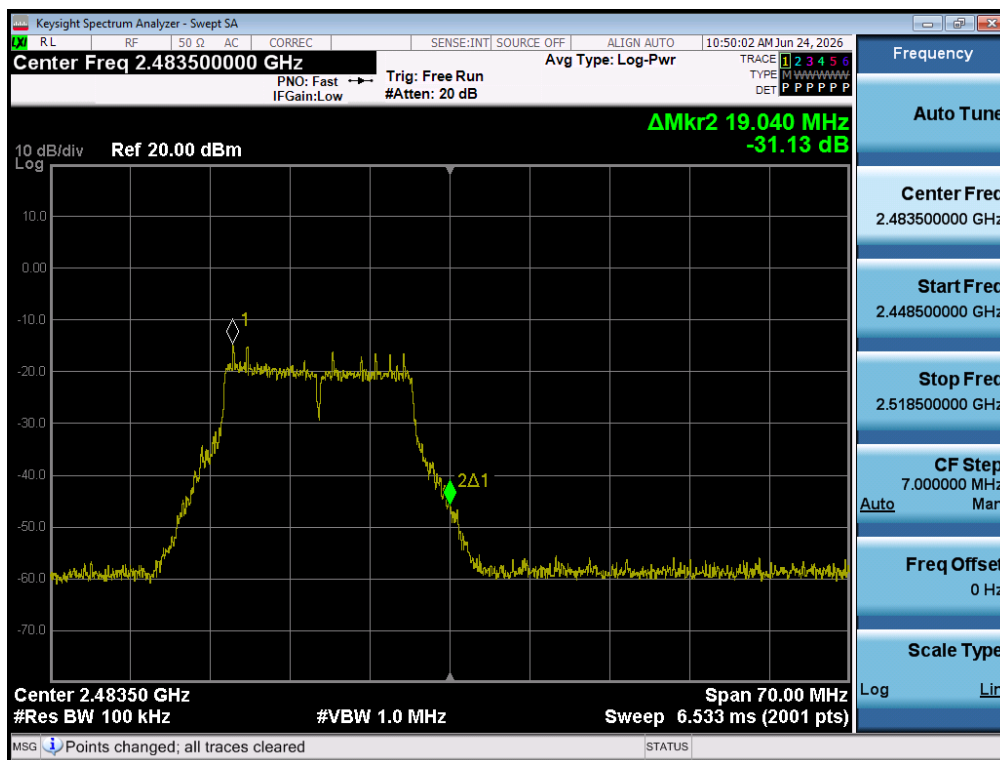
Plot 5-69 802.11g CH12. Conducted Upper Band edge - (Ant 1)



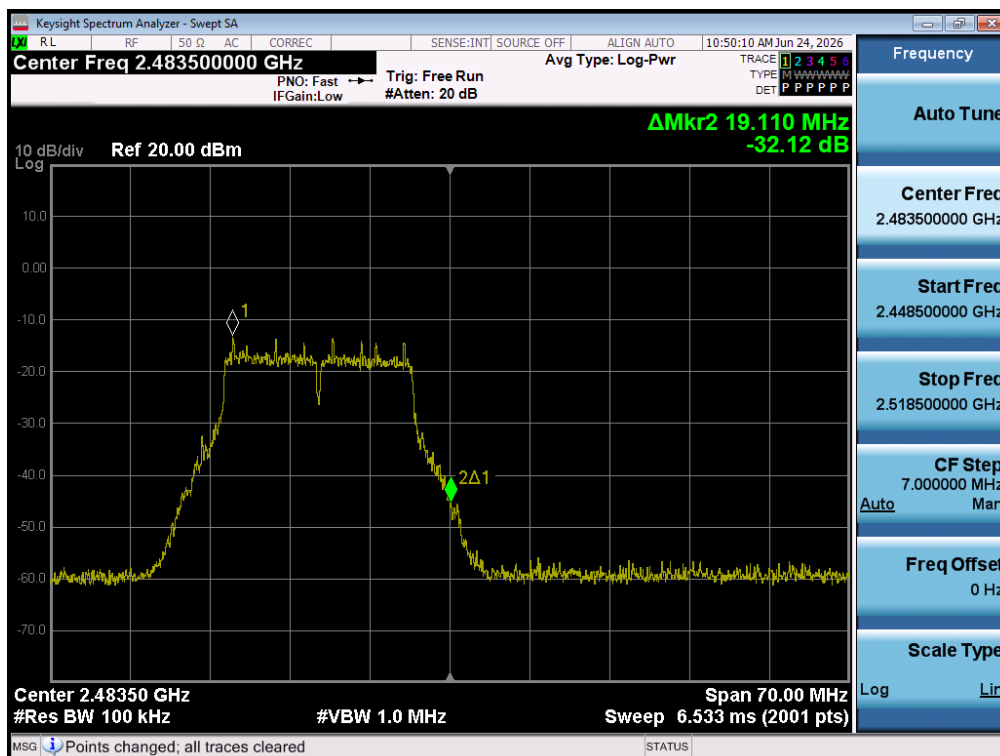
Plot 5-70 802.11g CH12. Conducted Upper Band edge - (Ant 2)



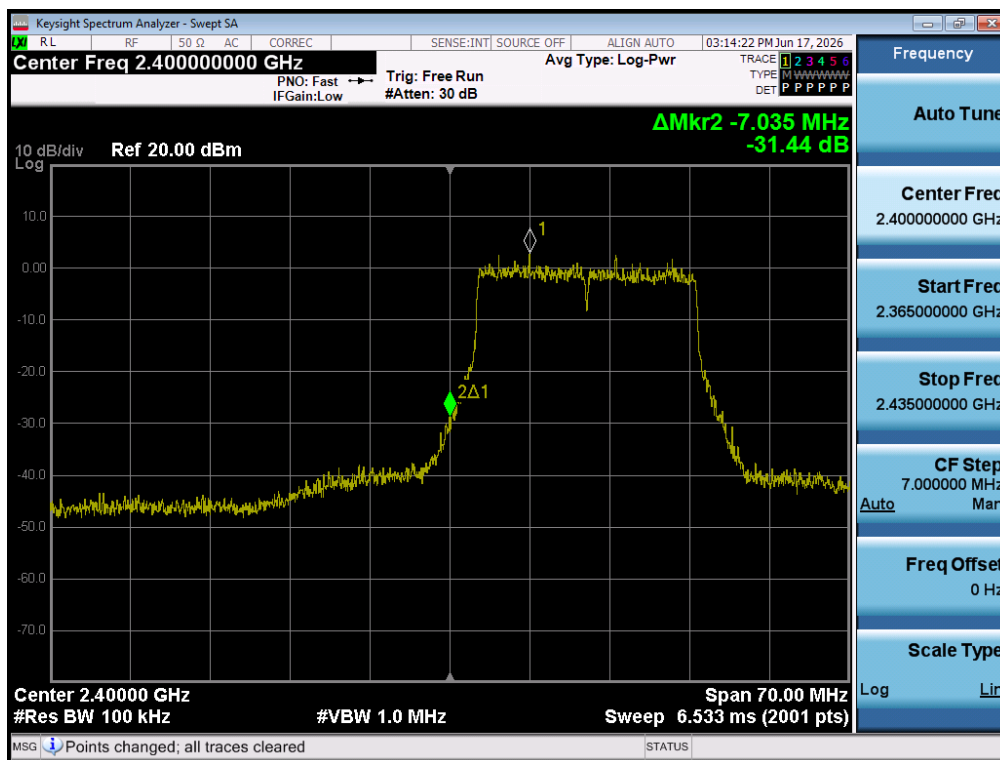
Plot 5-71 802.11g CH13. Conducted Upper Band edge - (Ant 1)



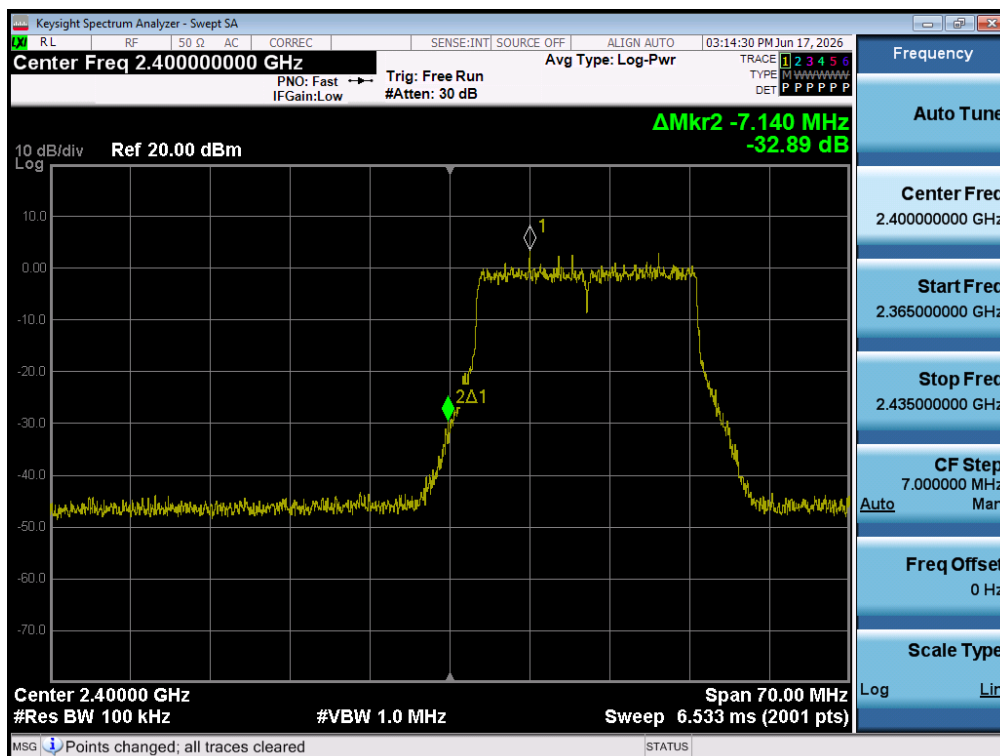
Plot 5-72 802.11g CH13. Conducted Upper Band edge - (Ant 2)



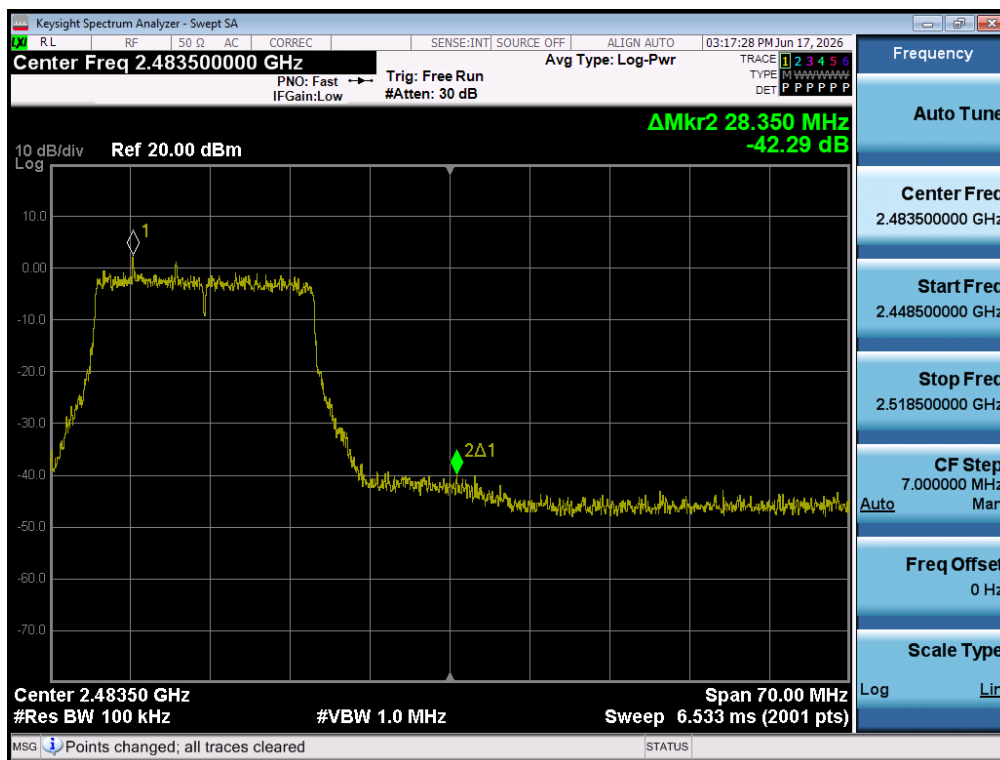
Plot 5-73 802.11ax20 CH1. Conducted Lower Band edge - (Ant 1)



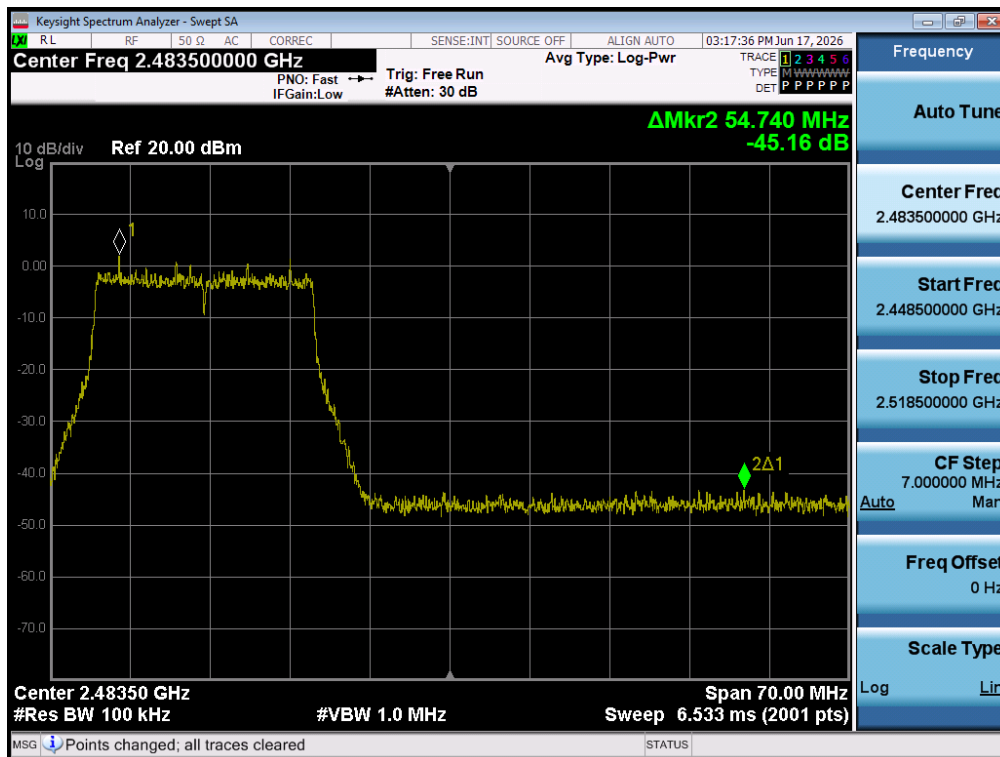
Plot 5-74 802.11ax20 CH1. Conducted Lower Band edge - (Ant 2)



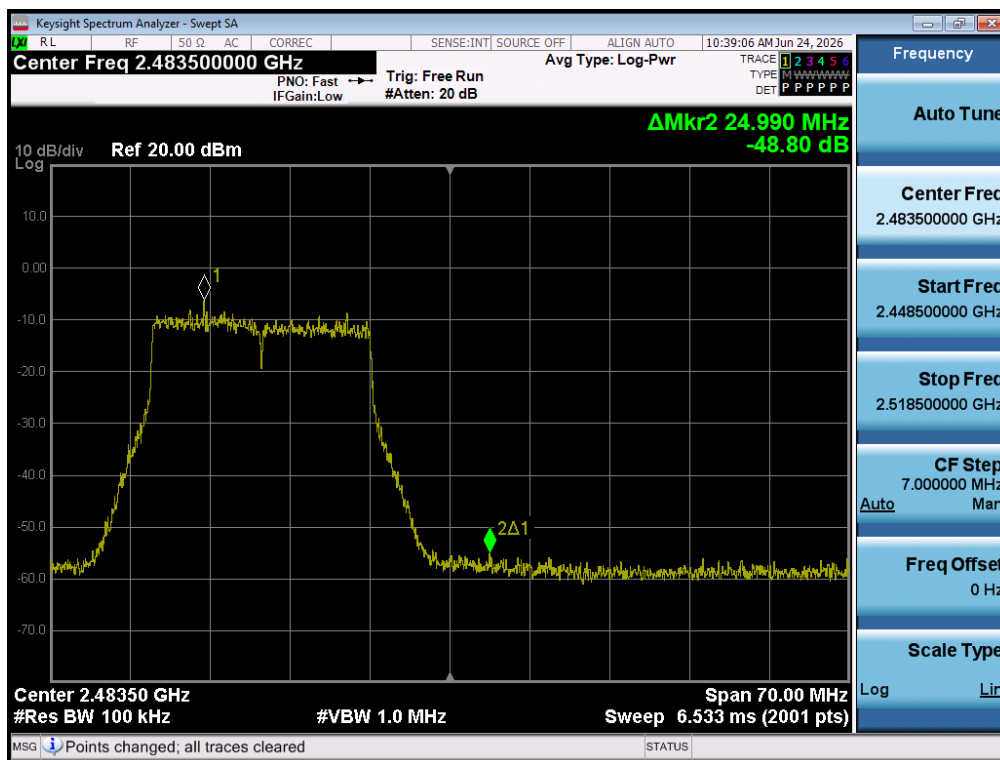
Plot 5-75 802.11ax20 CH11. Conducted Upper Band edge - (Ant 1)



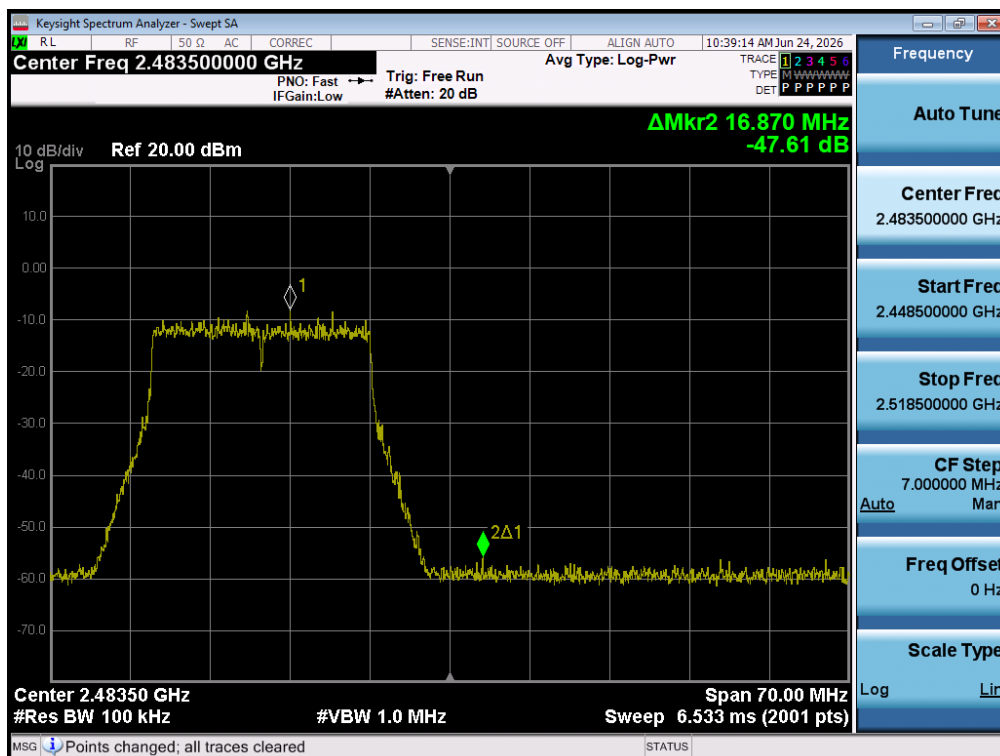
Plot 5-76 802.11ax20 CH11. Conducted Upper Band edge - (Ant 2)



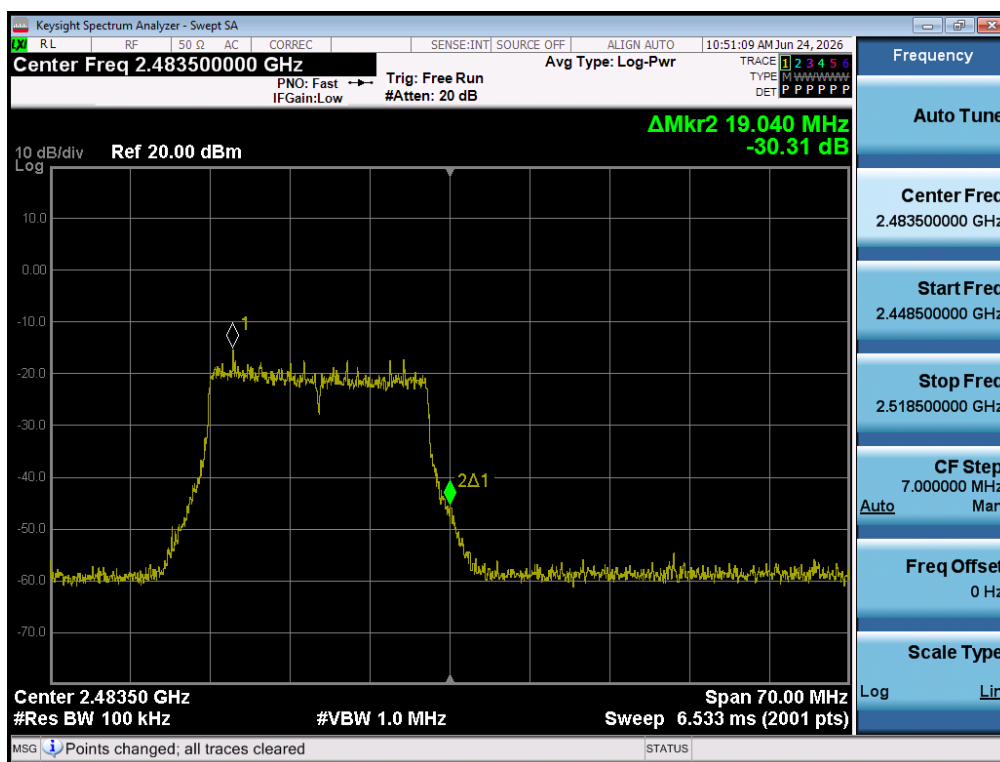
Plot 5-77 802.11ax20 CH12. Conducted Upper Band edge - (Ant 1)



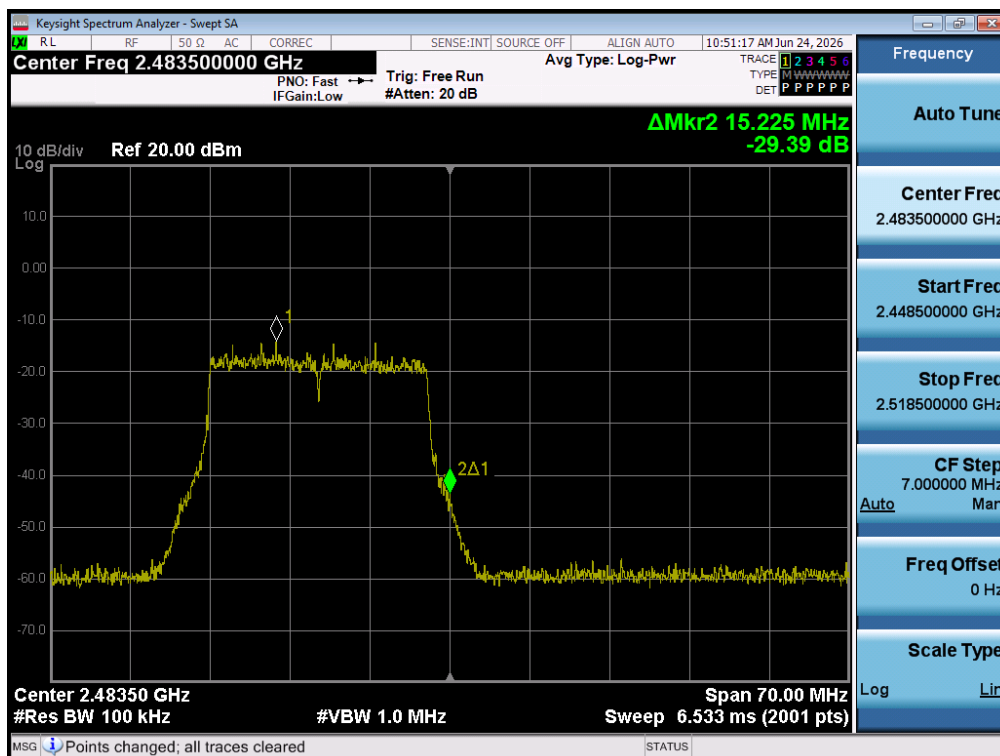
Plot 5-78 802.11ax20 CH12. Conducted Upper Band edge - (Ant 2)



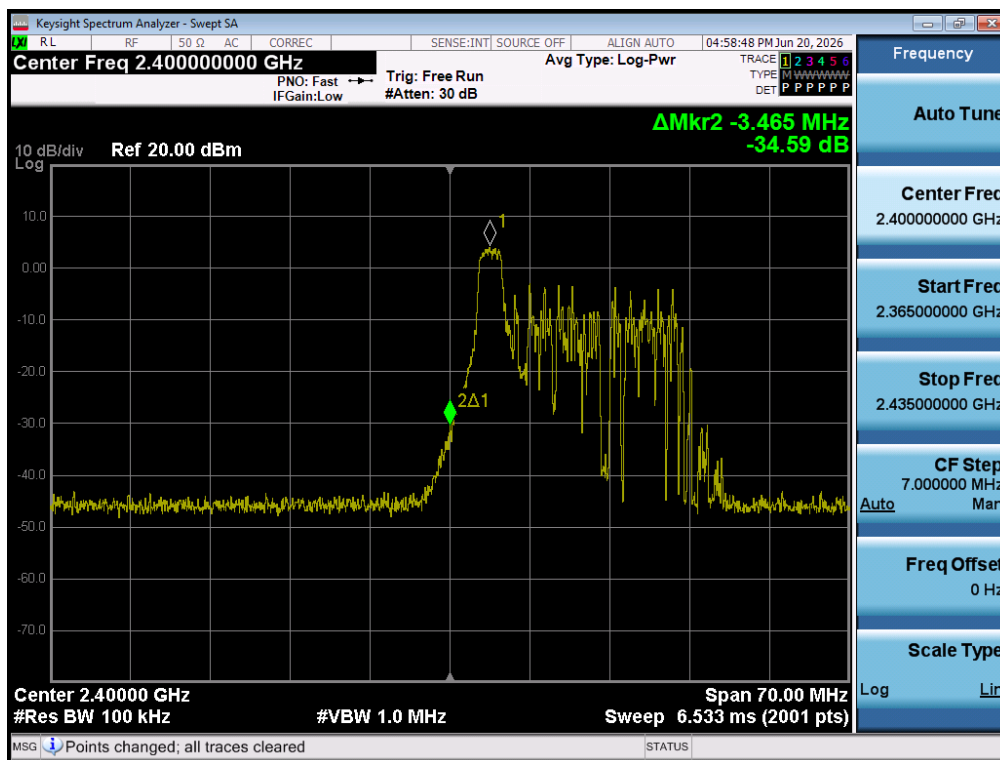
Plot 5-79 802.11ax20 CH13. Conducted Upper Band edge - (Ant 1)



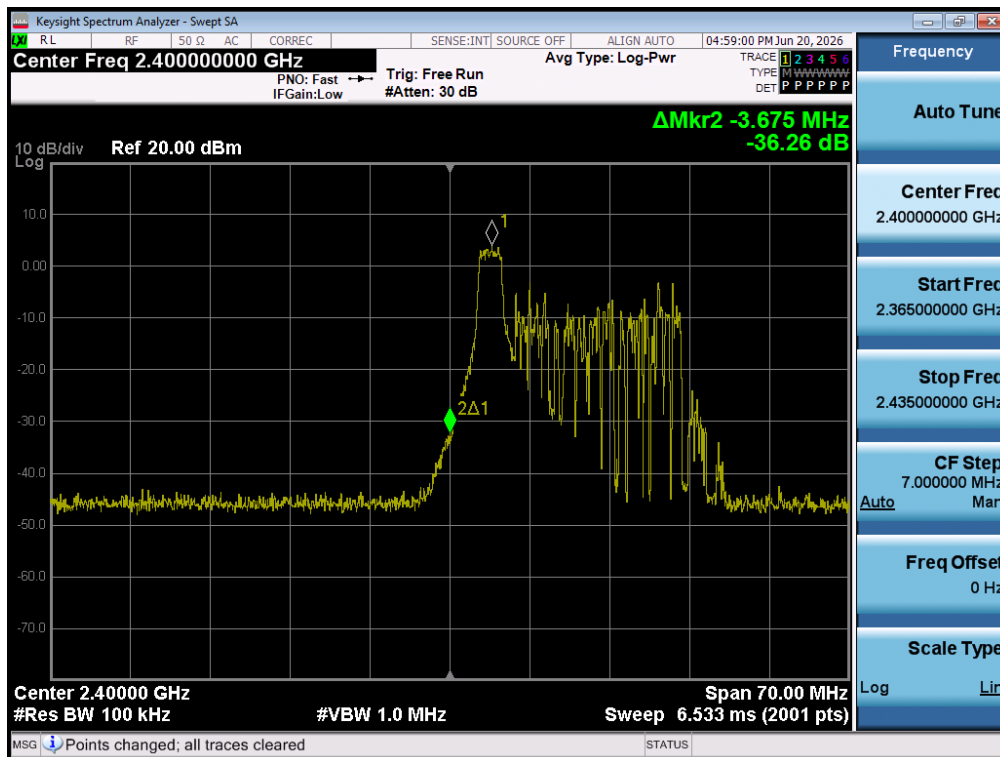
Plot 5-80 802.11ax20 CH13. Conducted Upper Band edge - (Ant 2)



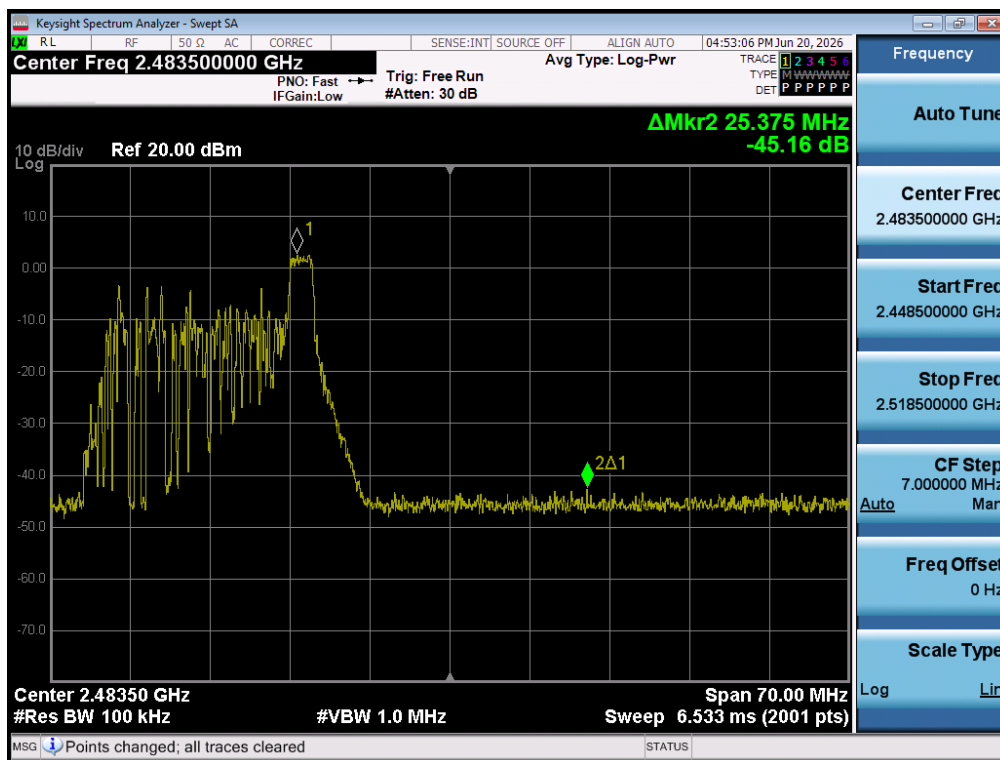
Plot 5-81 802.11ax20 CH1. 26 Tone Conducted Lower Band edge - (Ant 1)



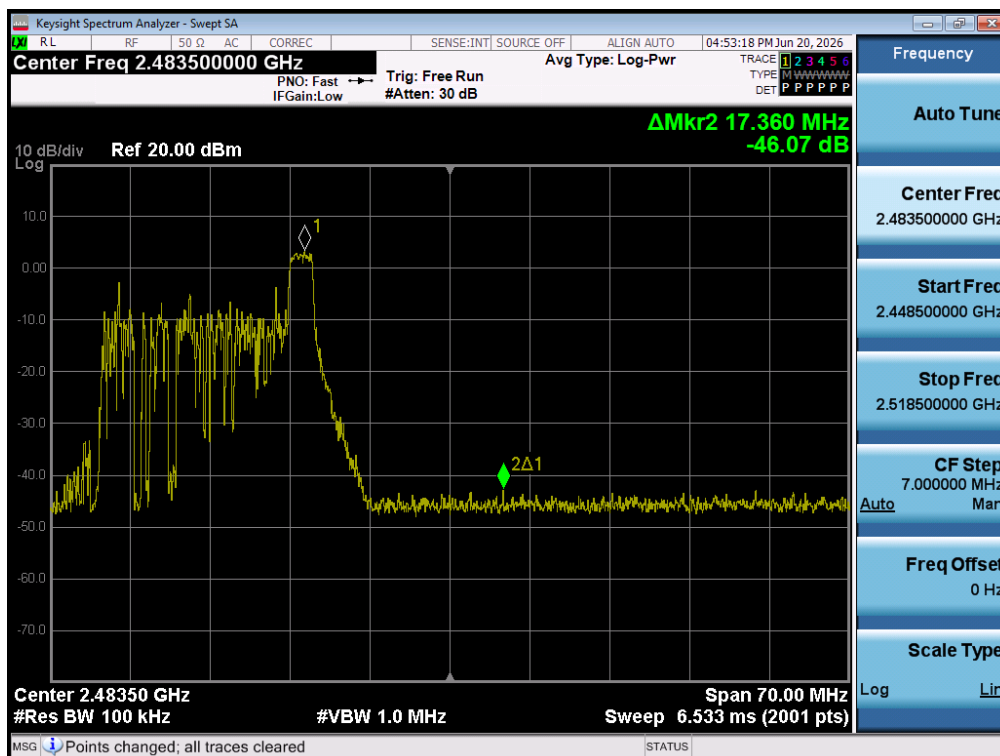
Plot 5-82 802.11 ax20 CH1. 26 Tone Conducted Lower Band edge - (Ant 2)



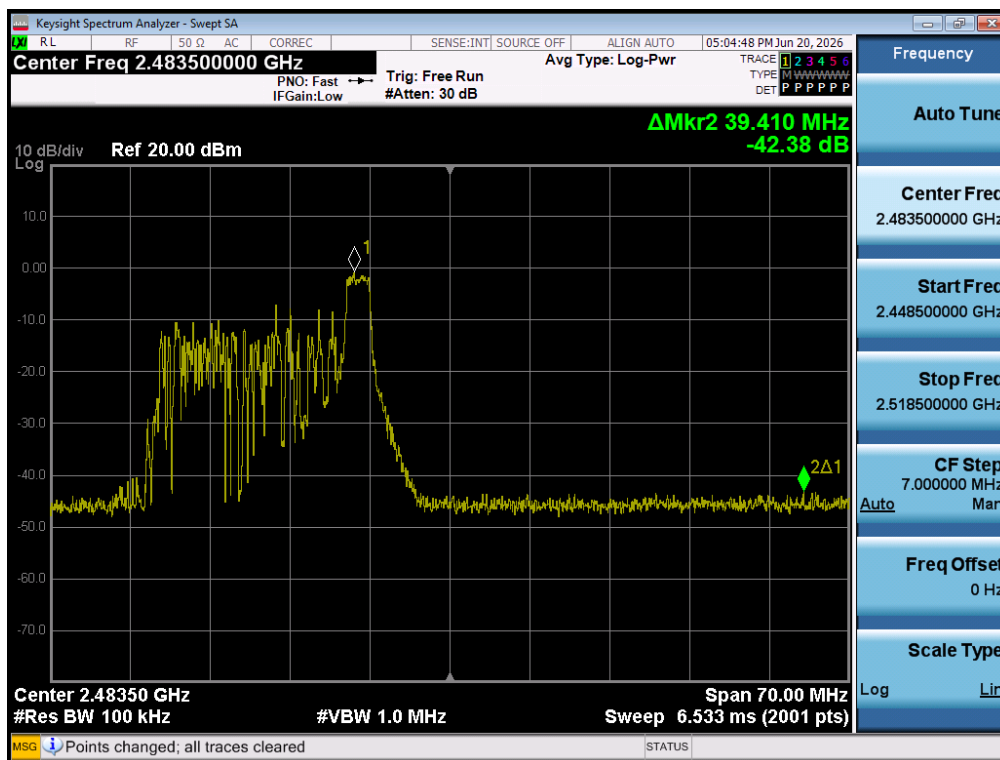
Plot 5-83 802.11 ax20 CH11. 26 Tone Conducted Upper Band edge - (Ant 1)



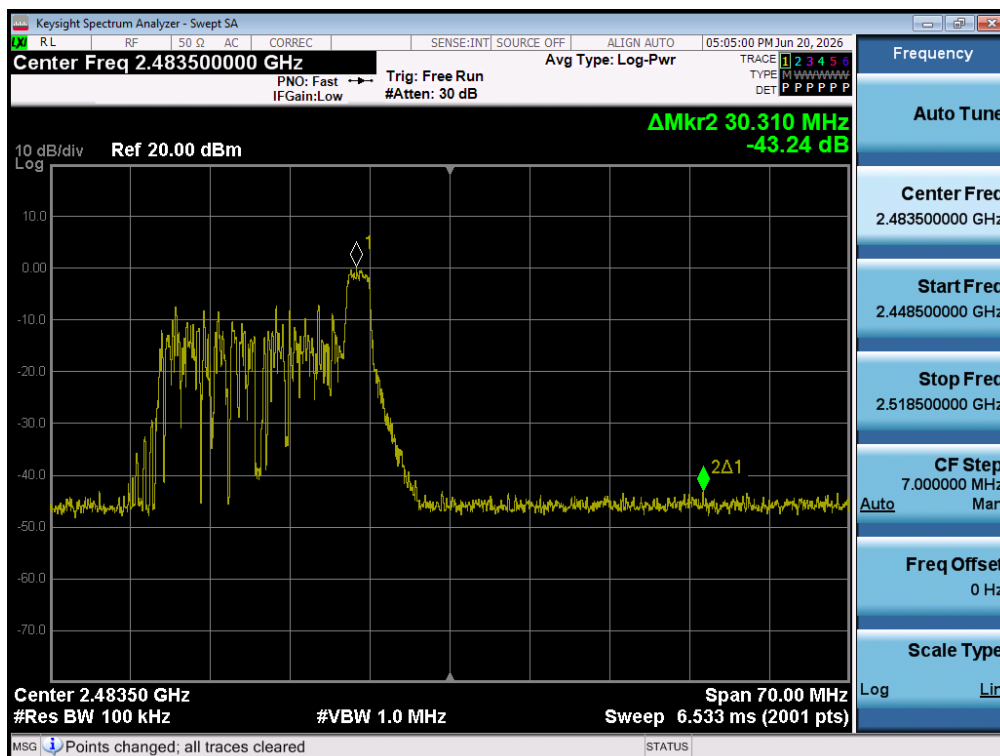
Plot 5-84 802.11 ax20 CH11. 26 Tone Conducted Upper Band edge - (Ant 2)



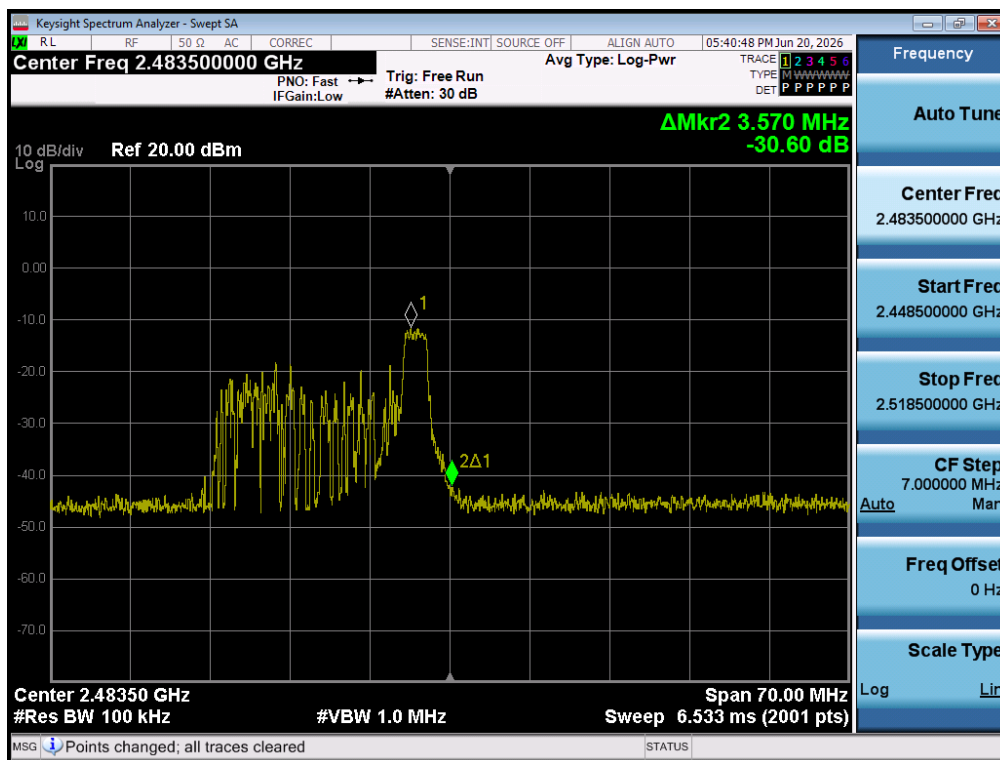
Plot 5-85 802.11 ax20 CH12. 26 Tone Conducted Upper Band edge - (Ant 1)



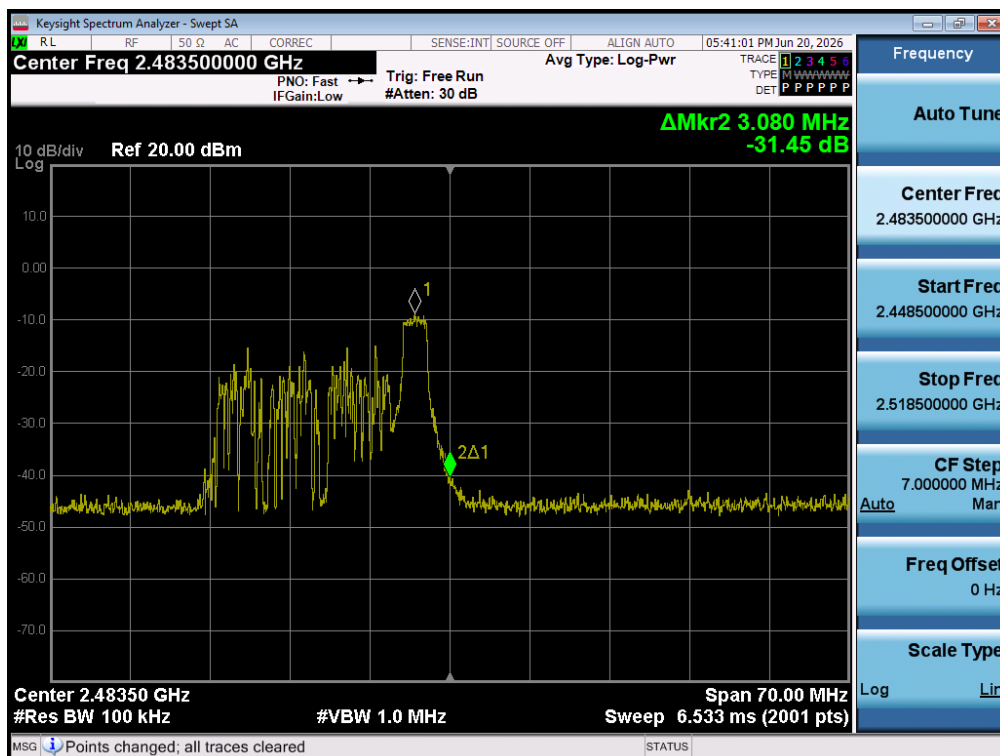
Plot 5-86 802.11 ax20 CH12. 26 Tone Conducted Upper Band edge - (Ant 2)



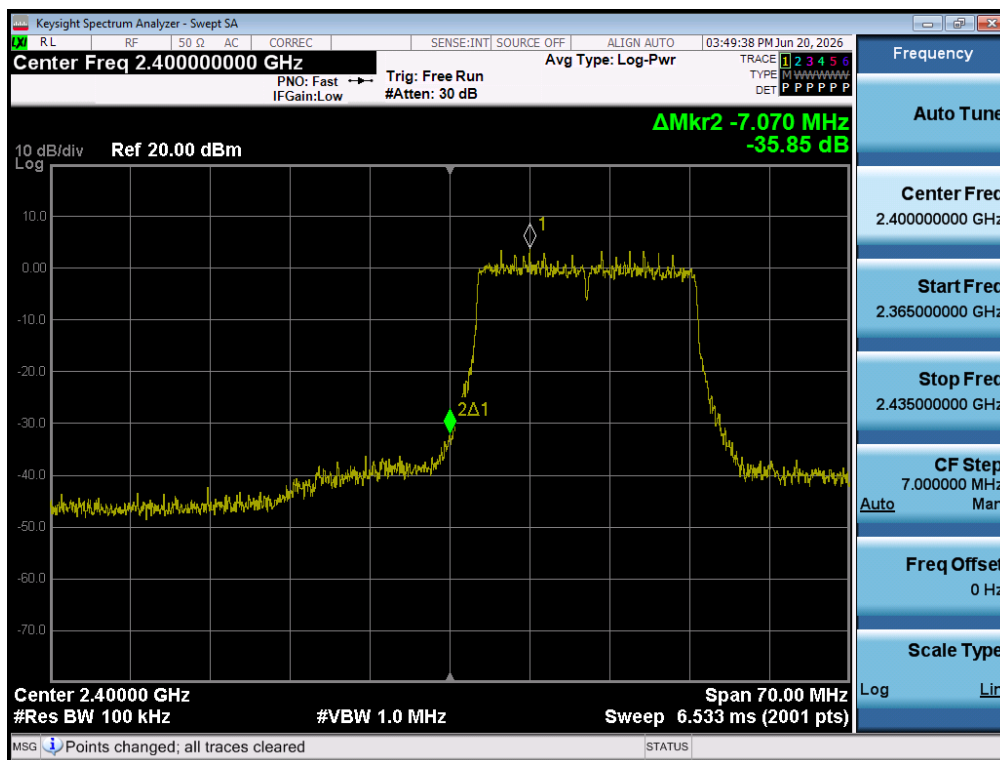
Plot 5-87 802.11 ax20 CH13. 26 Tone Conducted Upper Band edge - (Ant 1)



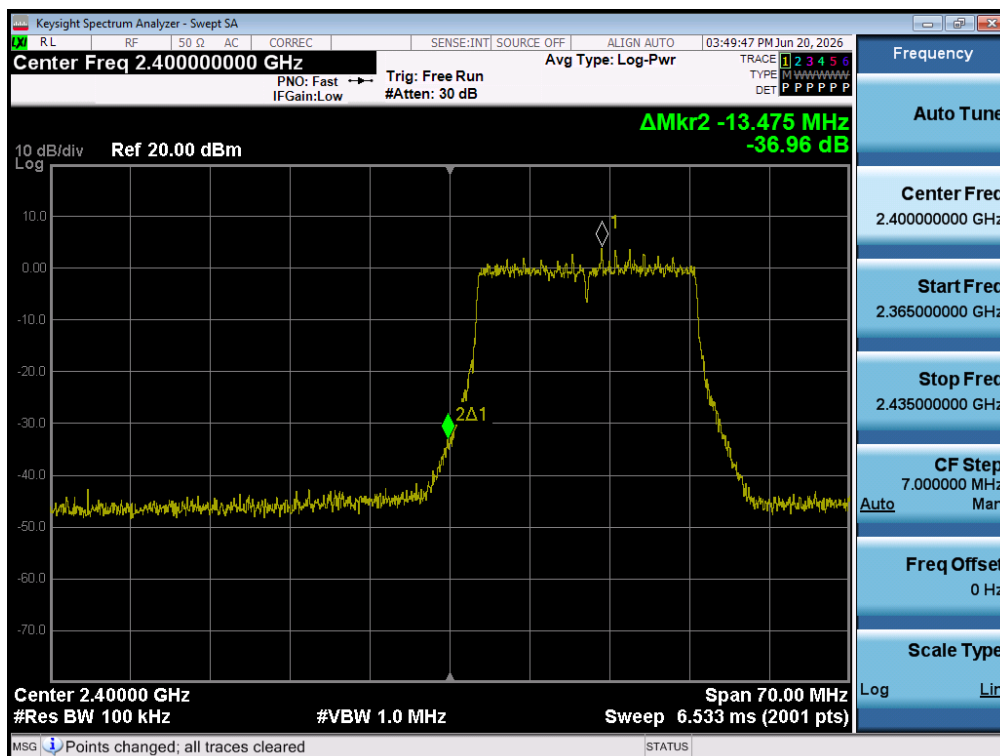
Plot 5-88 802.11 ax20 CH13. 26 Tone Conducted Upper Band edge - (Ant 2)



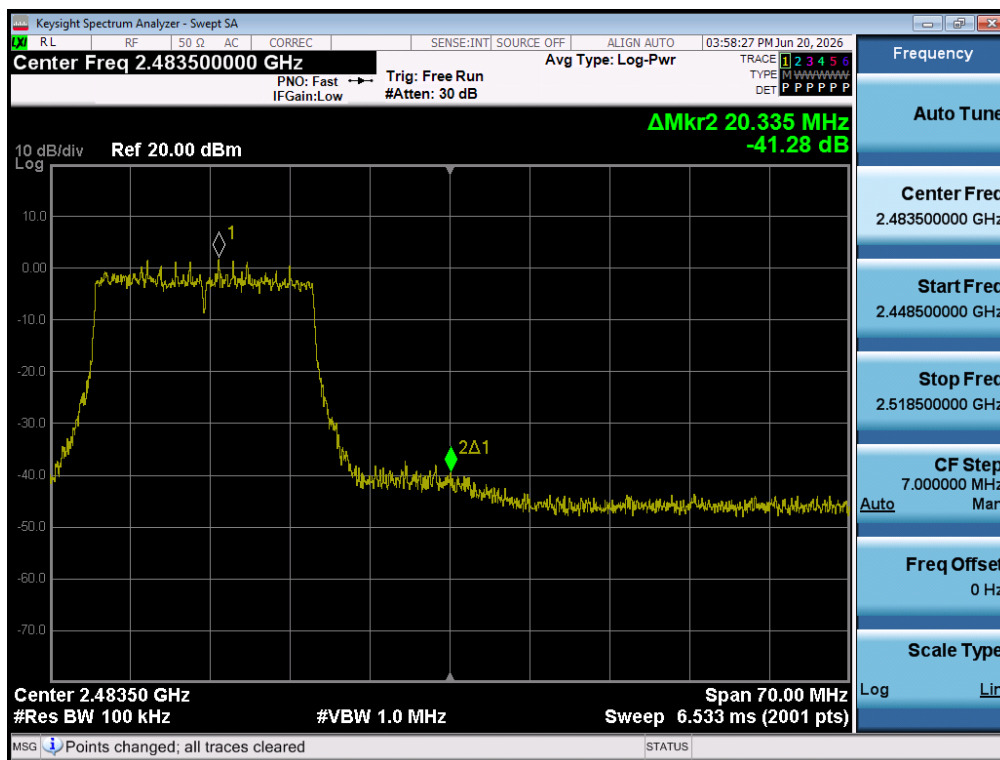
Plot 5-89 802.11 ax20 CH1. 242 Tone Conducted Lower Band edge - (Ant 1)



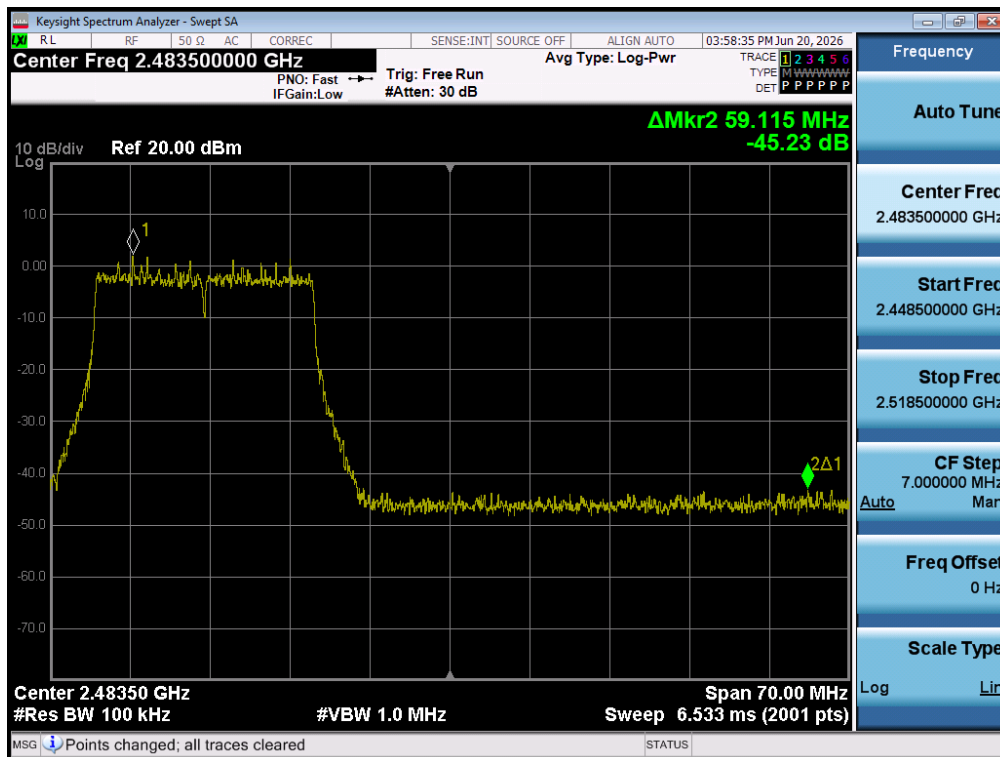
Plot 5-90 802.11 ax20 CH1. 242 Tone Conducted Lower Band edge - (Ant 2)



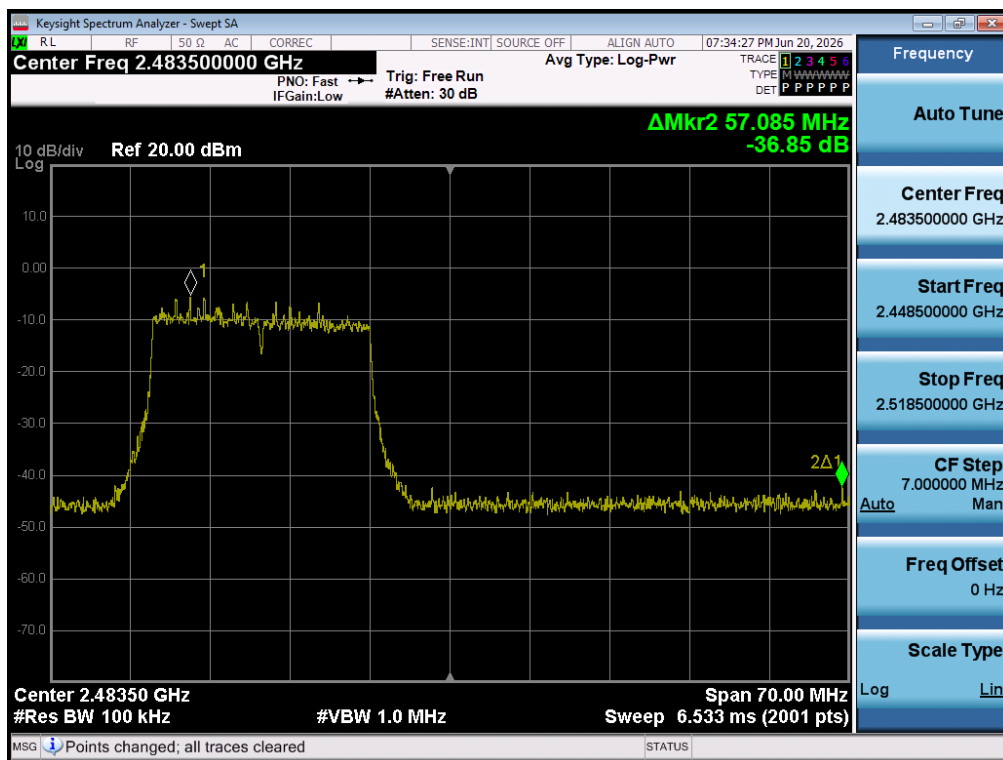
Plot 5-91 802.11 ax20 CH11. 242 Tone Conducted Upper Band edge - (Ant 1)



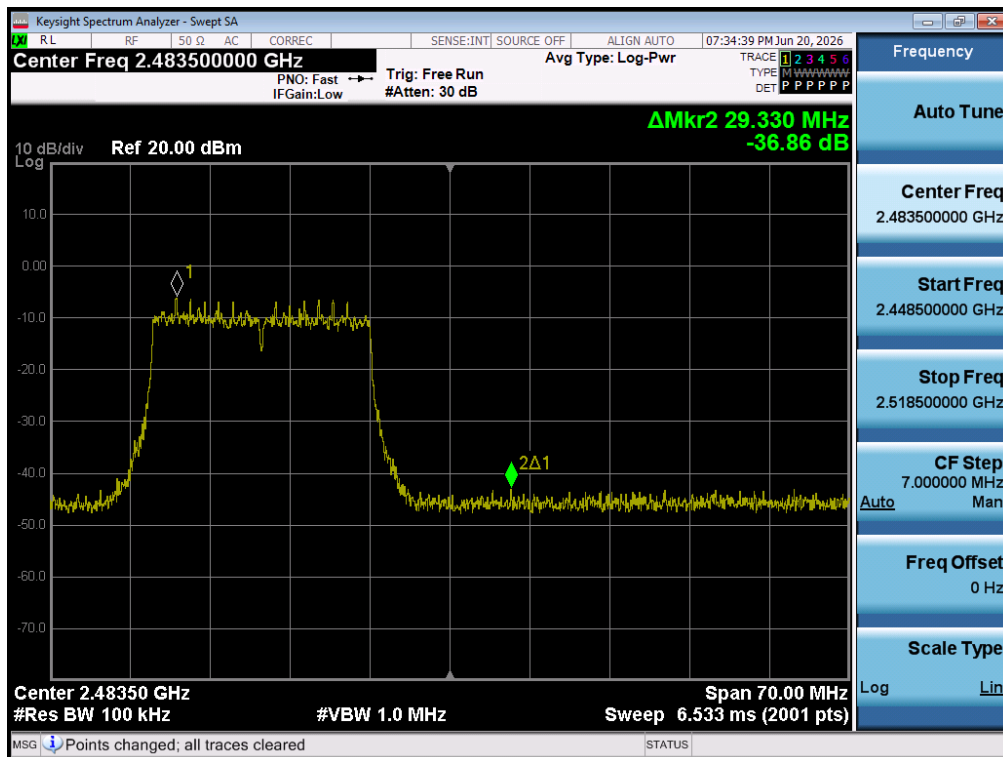
Plot 5-92 802.11 ax20 CH11. 242 Tone Conducted Upper Band edge - (Ant 2)



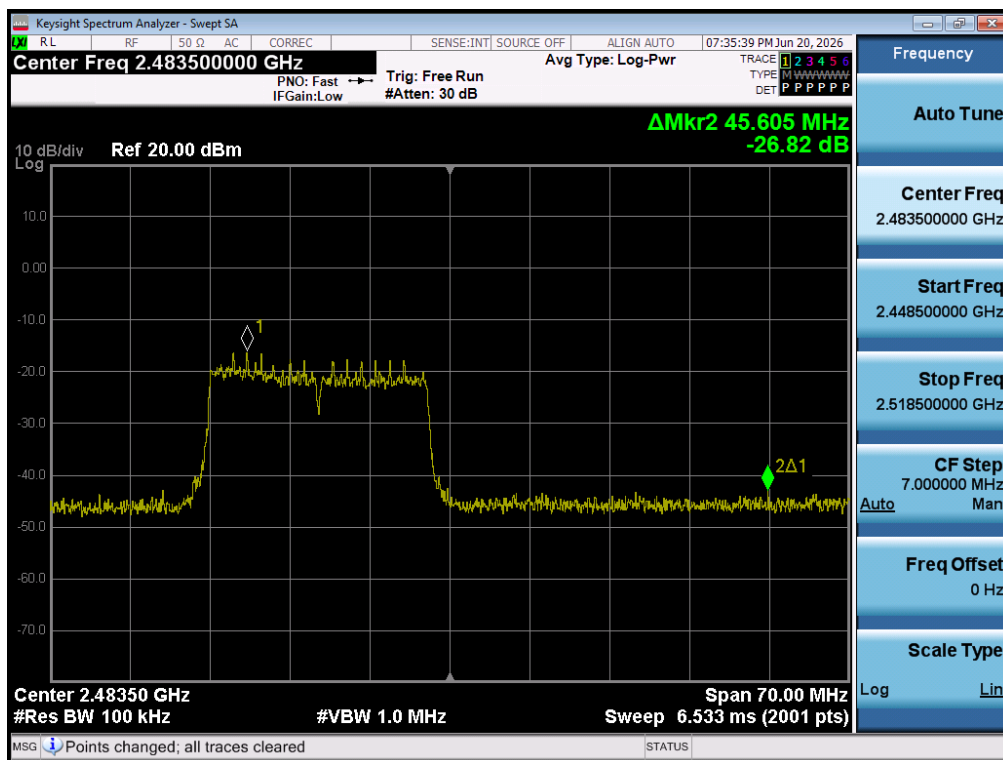
Plot 5-93 802.11 ax20 CH12. 242 Tone Conducted Upper Band edge - (Ant 1)



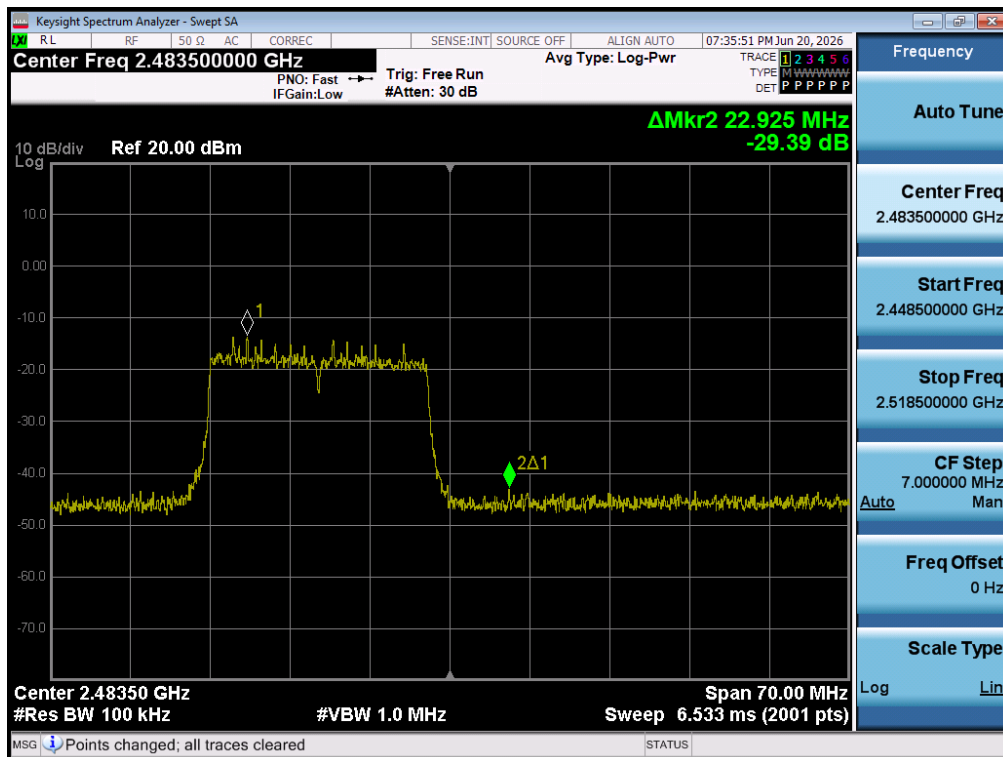
Plot 5-94 802.11 ax20 CH12. 242 Tone Conducted Upper Band edge - (Ant 2)



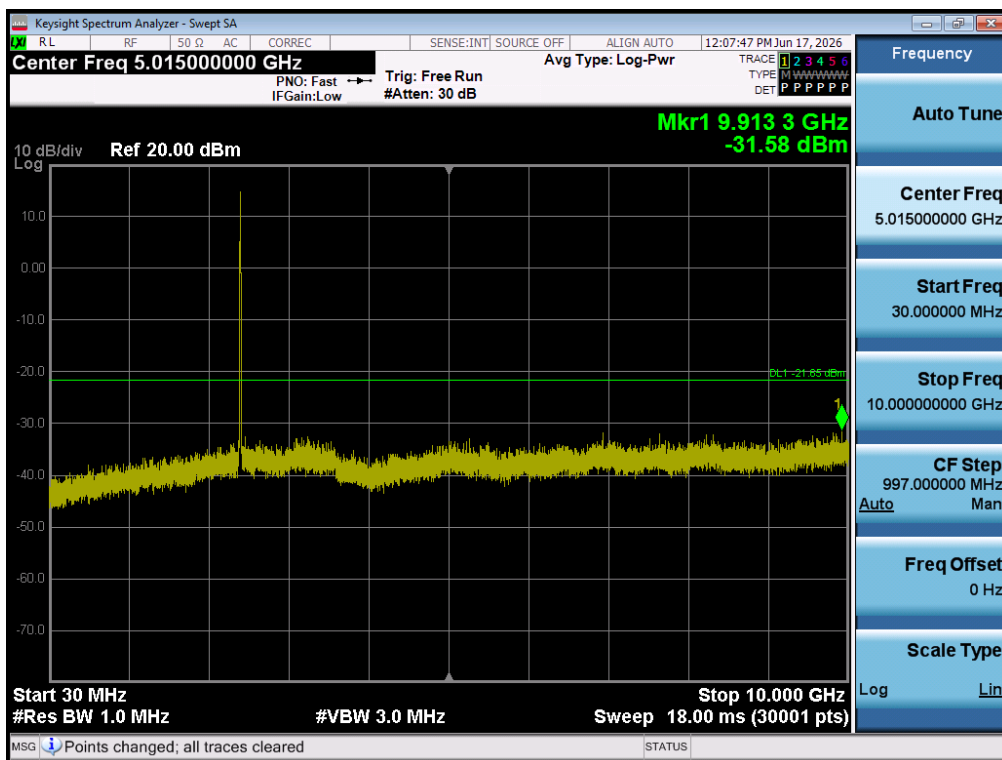
Plot 5-95 802.11 ax20 CH13. 242 Tone Conducted Upper Band edge - (Ant 1)



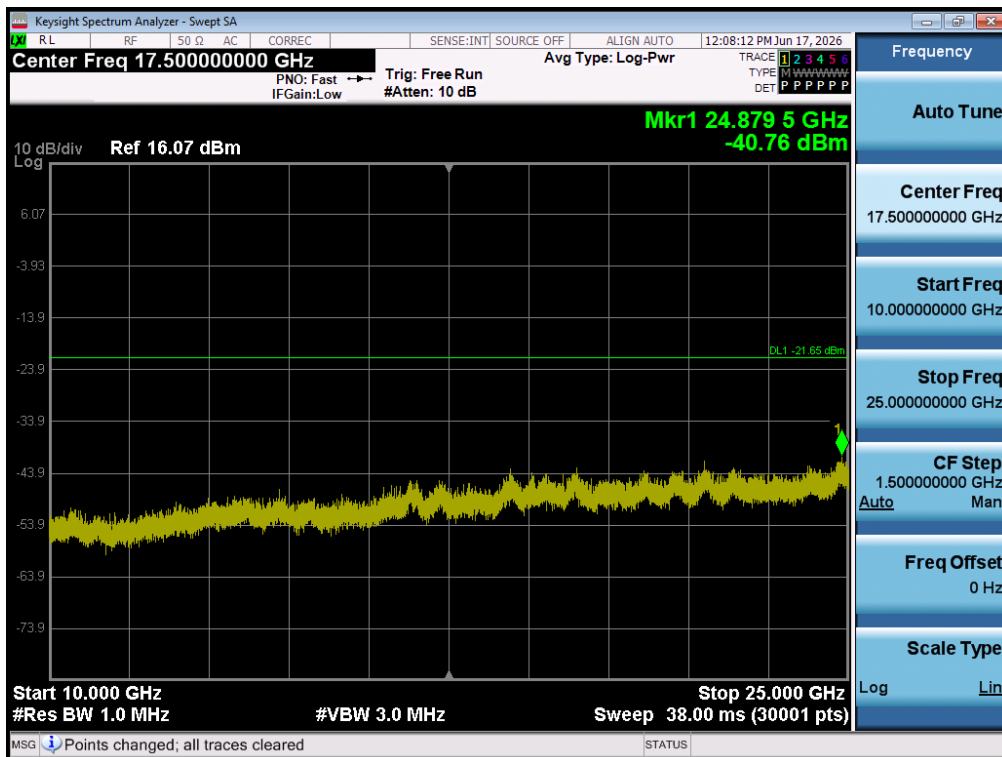
Plot 5-96 802.11 ax20 CH13. 242 Tone Conducted Upper Band edge - (Ant 2)



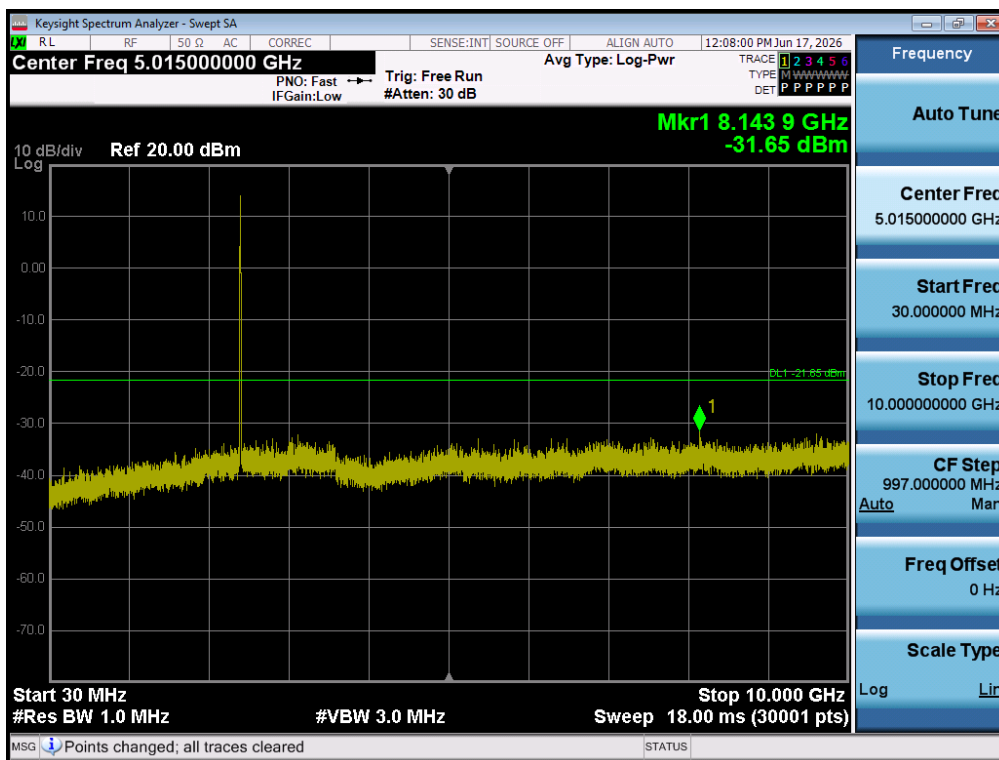
Plot 5-97 802.11b CH1. Conducted Spurious Emission 0.03 to 10 GHz - (Ant 1)



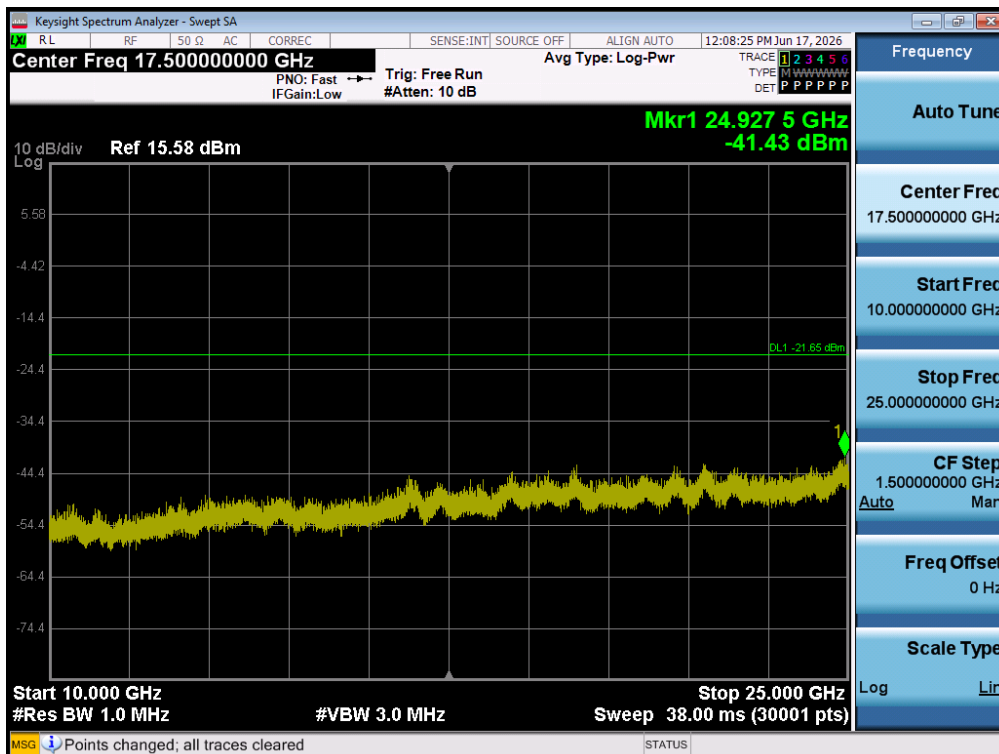
Plot 5-98 802.11b CH1. Conducted Spurious Emission 10 to 25 GHz - (Ant 1)



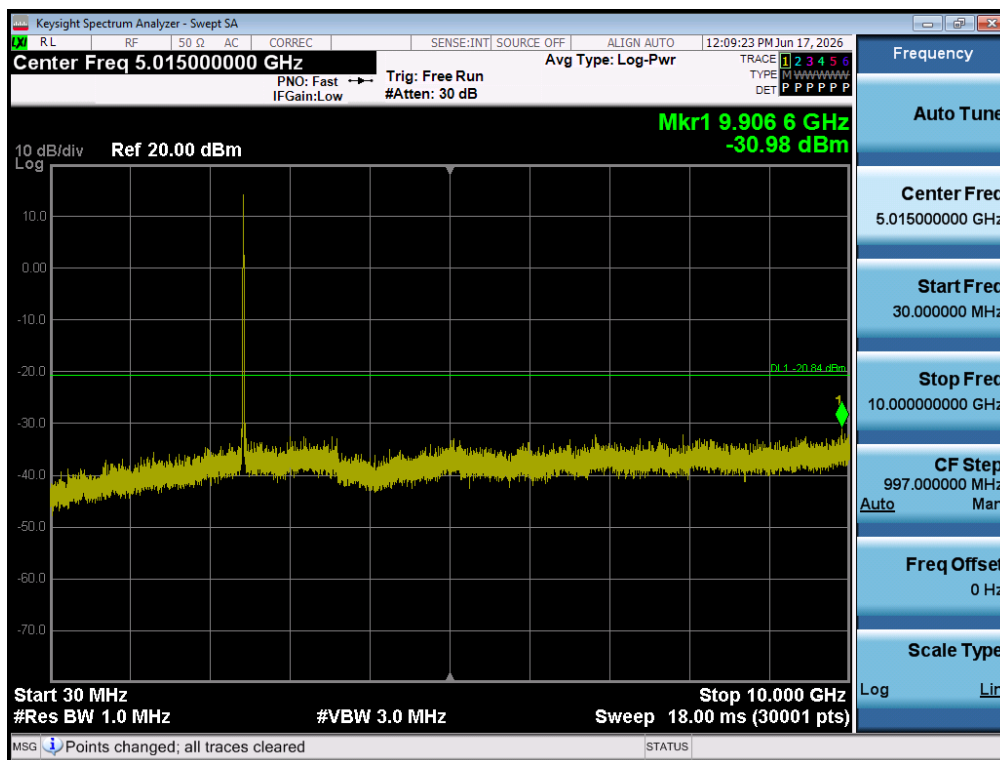
Plot 5-99 802.11b CH1. Conducted Spurious Emission 0.03 to 10 GHz - (Ant 2)



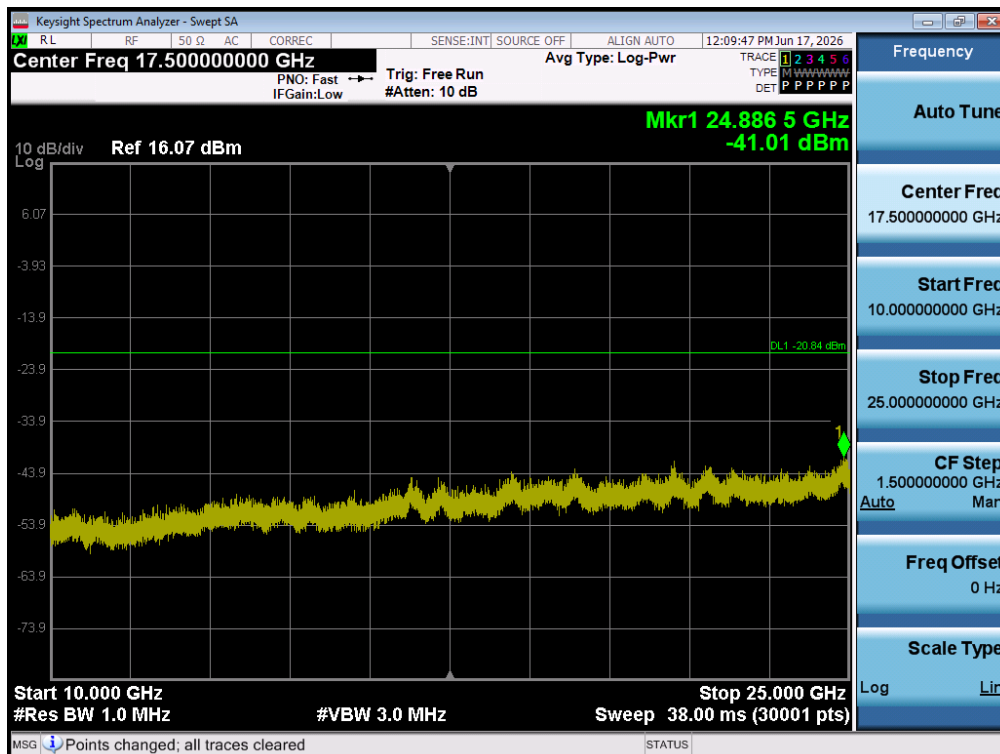
Plot 5-100 802.11b CH1. Conducted Spurious Emission 10 to 25 GHz - (Ant 2)



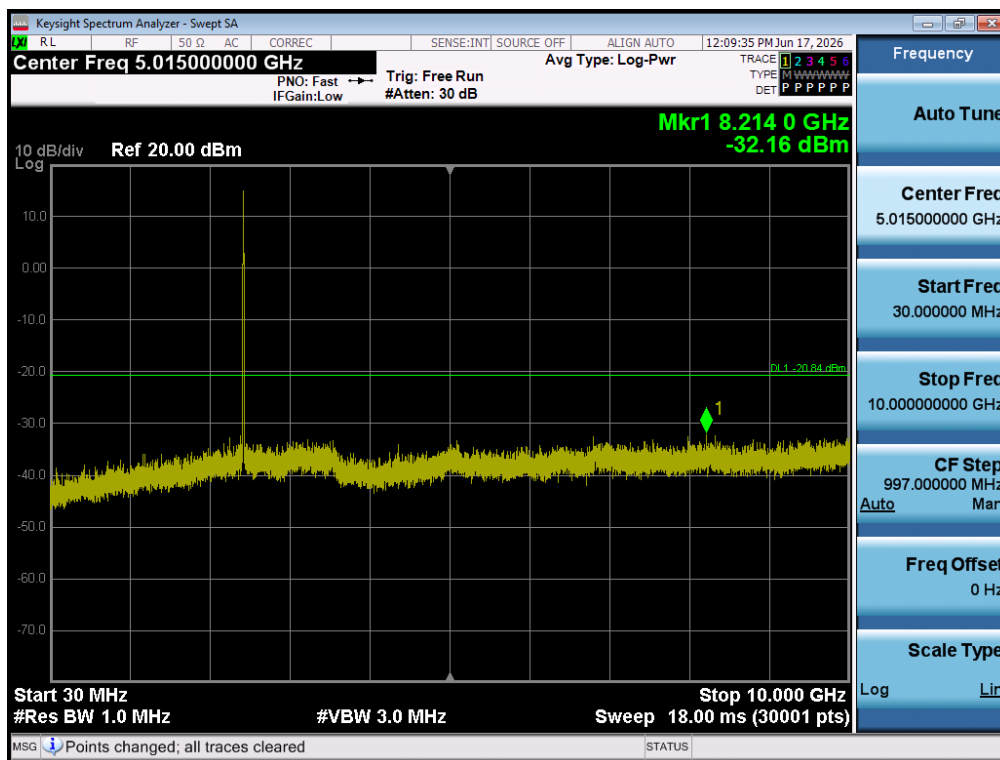
Plot 5-101 802.11b CH6. Conducted Spurious Emission 0.03 to 10 GHz - (Ant 1)



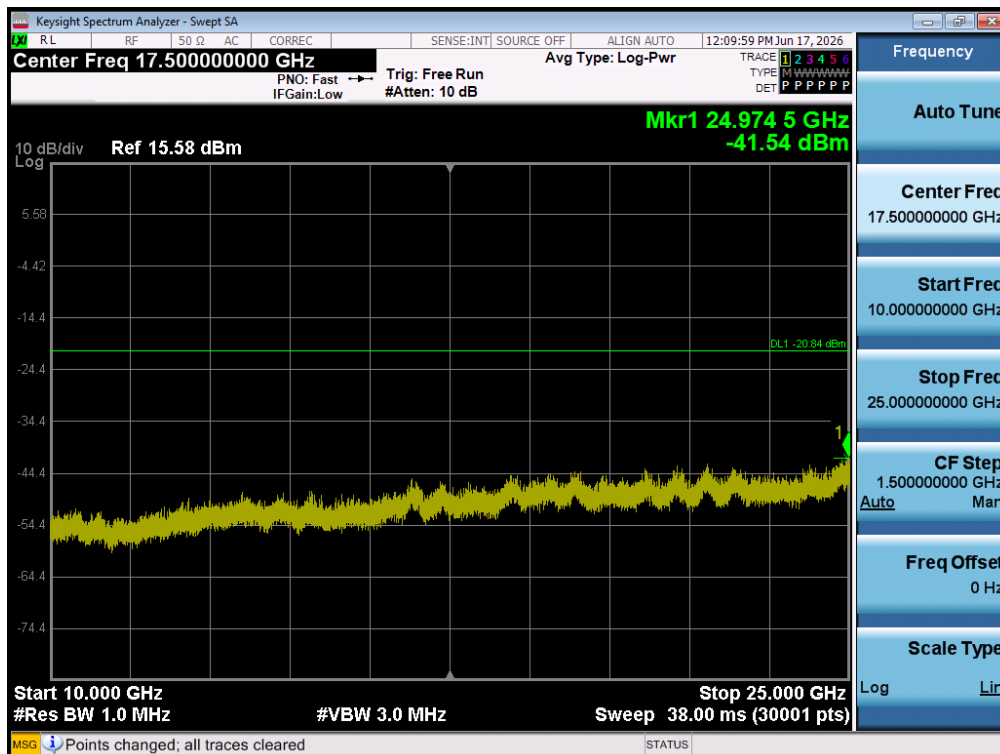
Plot 5-102 802.11b CH6. Conducted Spurious Emission 10 to 25 GHz - (Ant 1)



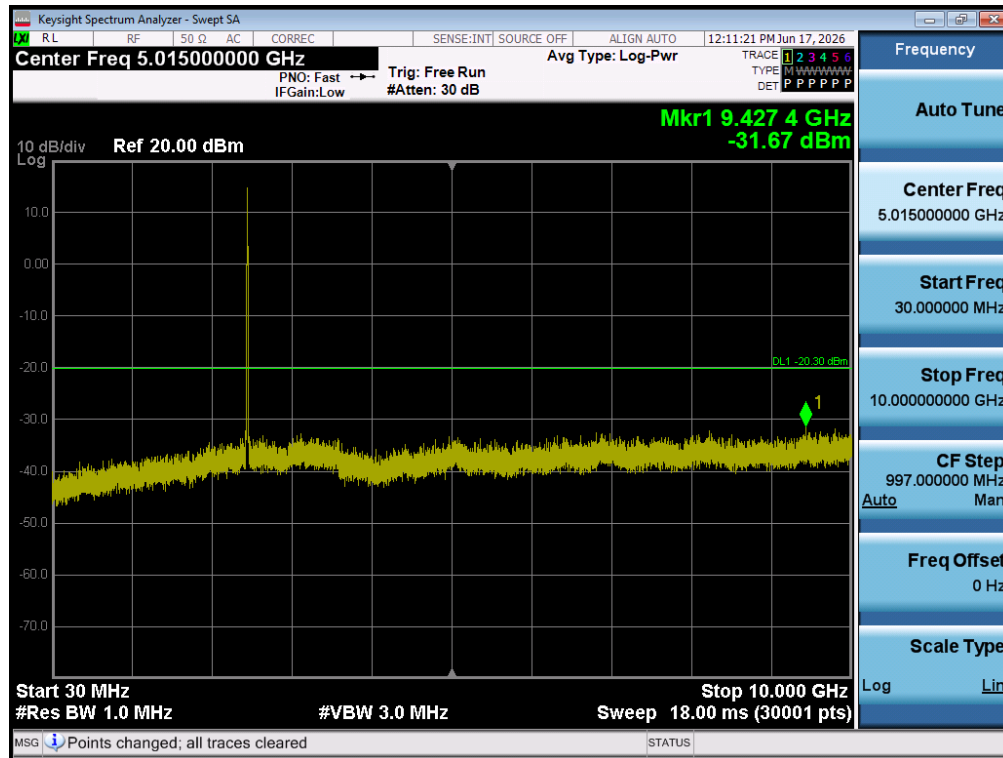
Plot 5-103 802.11b CH6. Conducted Spurious Emission 0.03 to 10 GHz - (Ant 2)



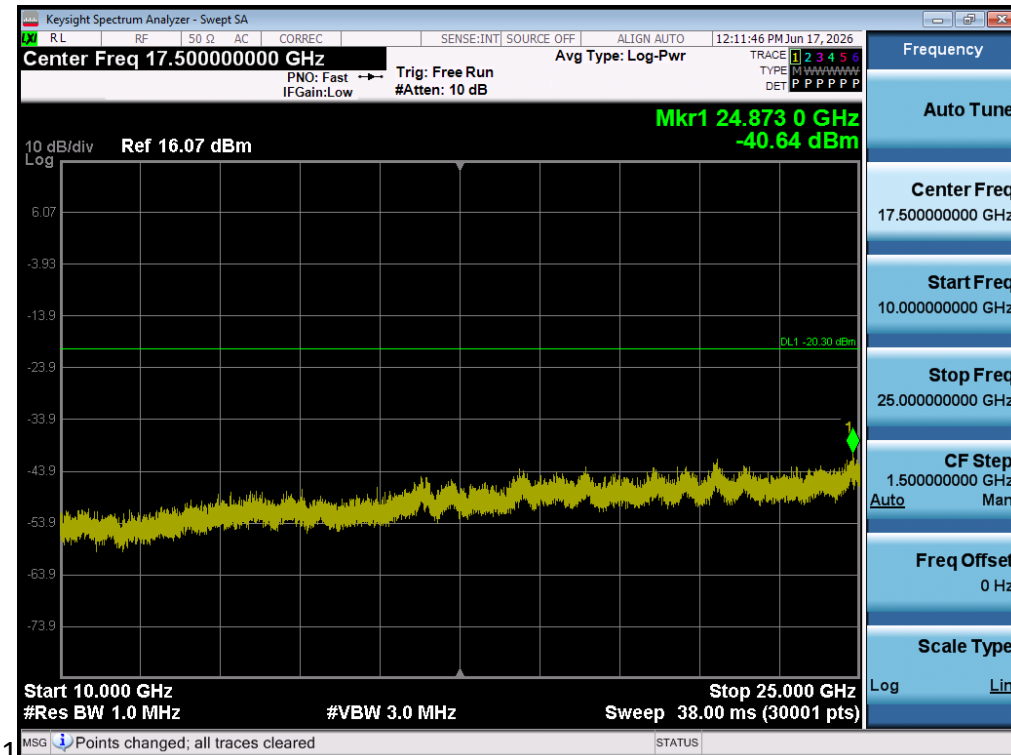
Plot 5-104 802.11b CH6. Conducted Spurious Emission 10 to 25 GHz - (Ant 2)



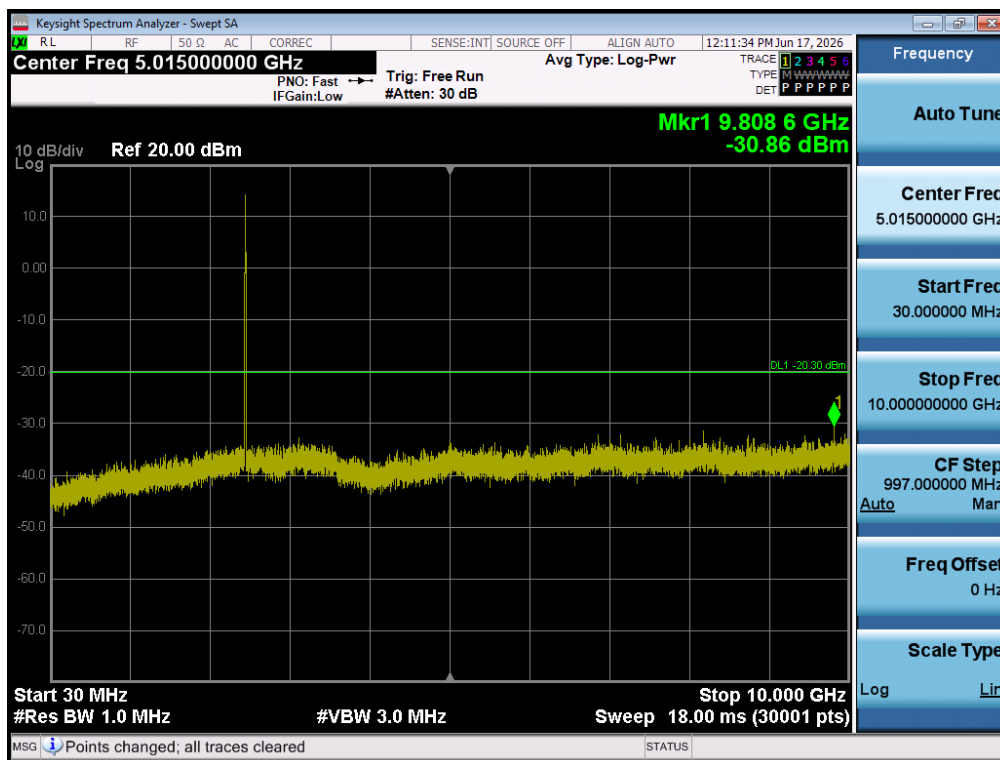
Plot 5-105 802.11b CH11. Conducted Spurious Emission 0.03 to 10 GHz - (Ant 1)



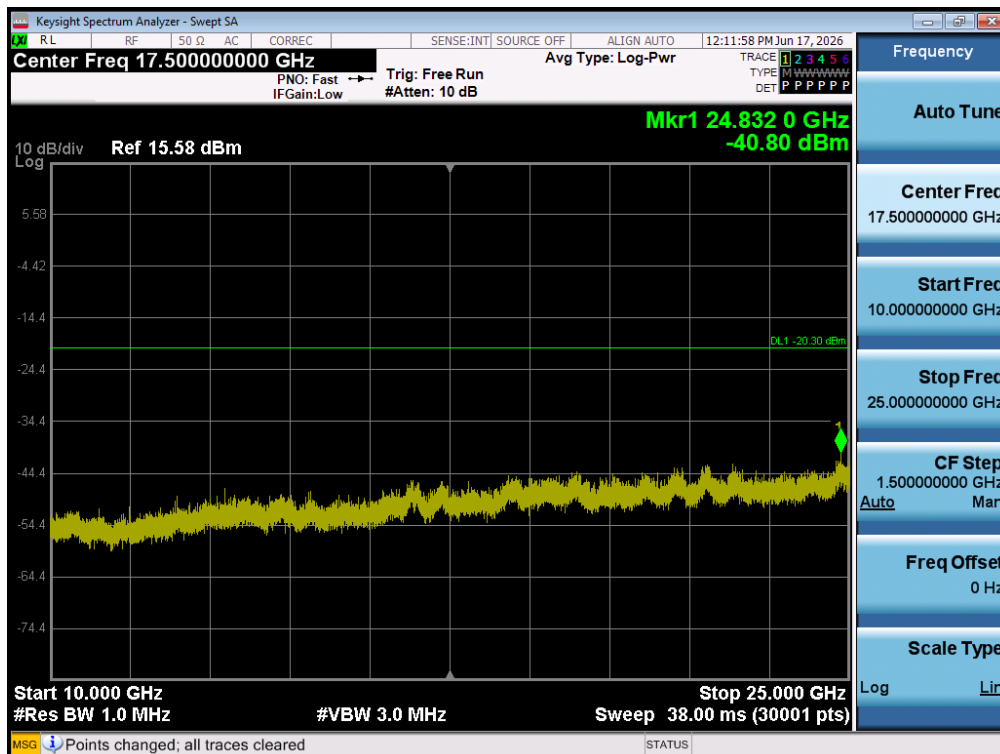
Plot 5-106 802.11b CH11. Conducted Spurious Emission 10 to 25 GHz - (Ant 1)



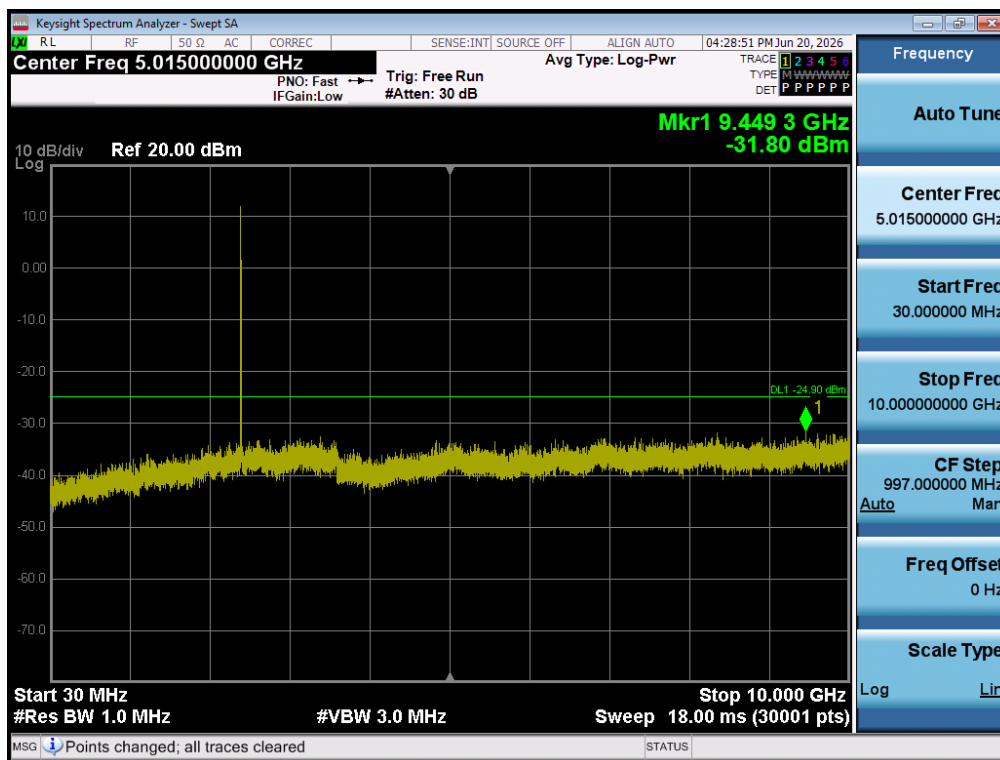
Plot 5-107 802.11b CH11. Conducted Spurious Emission 0.03 to 10 GHz - (Ant 2)



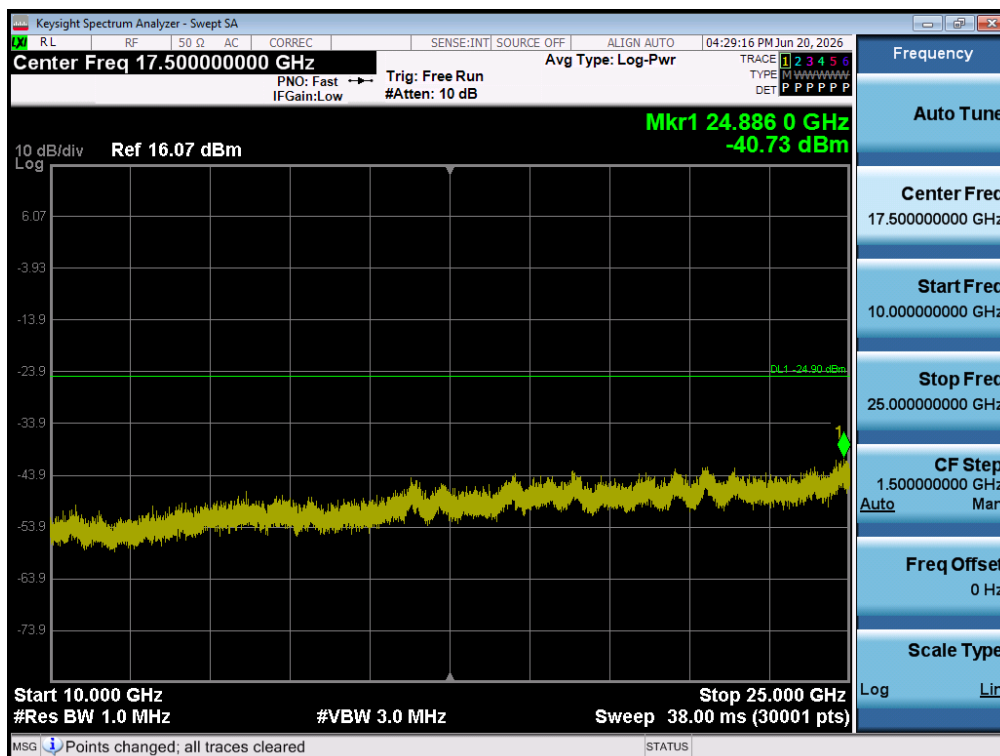
Plot 5-108 802.11b CH11. Conducted Spurious Emission 10 to 25 GHz - (Ant 2)



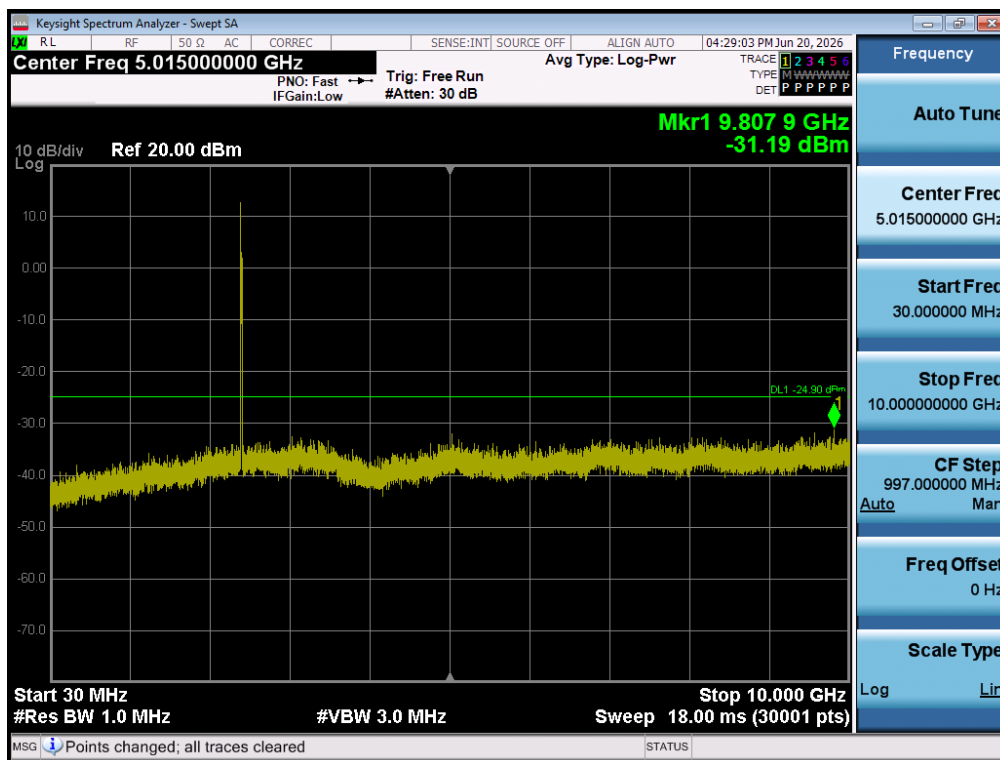
Plot 5-109 802.11ax20 CH1. 26 Tone Conducted Spurious Emission 0.03 to 10 GHz - (Ant 1)



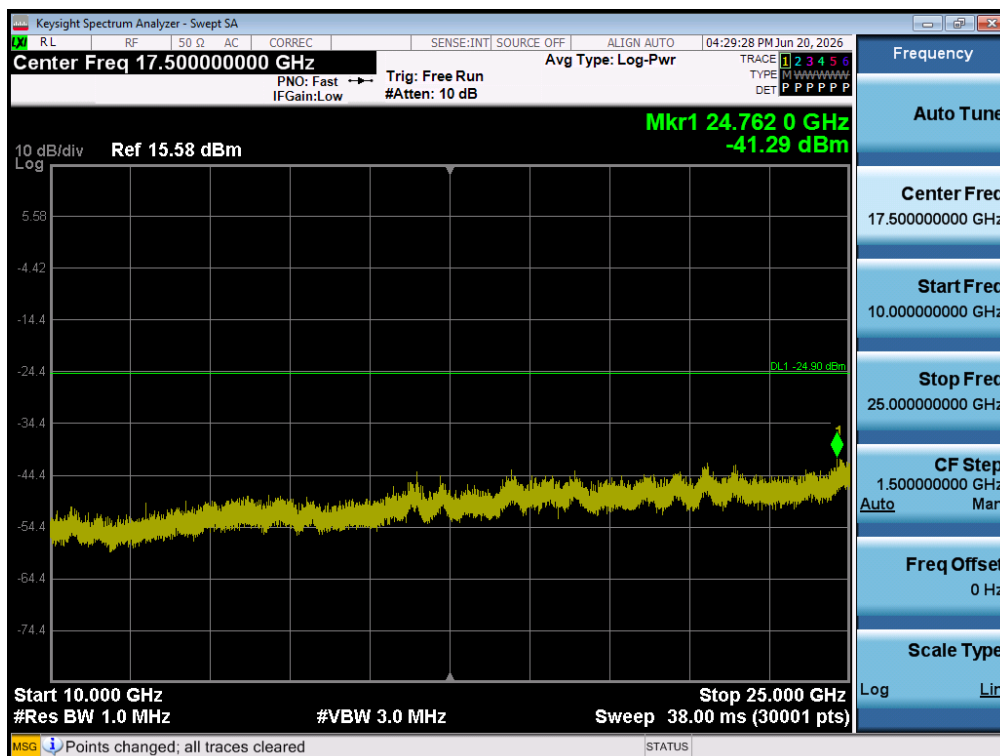
Plot 5-110 802.11ax20 CH1. 26 Tone Conducted Spurious Emission 10 to 25 GHz - (Ant 1)



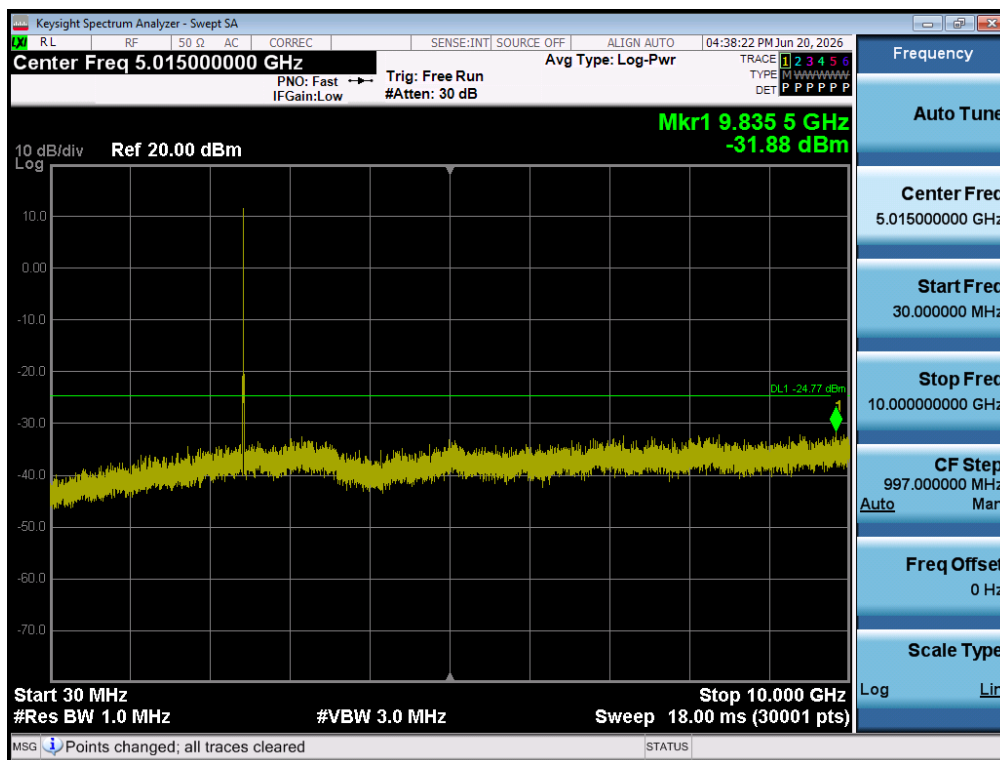
Plot 5-111 802.11ax20 CH1. 26 Tone Conducted Spurious Emission 0.03 to 10 GHz - (Ant 2)



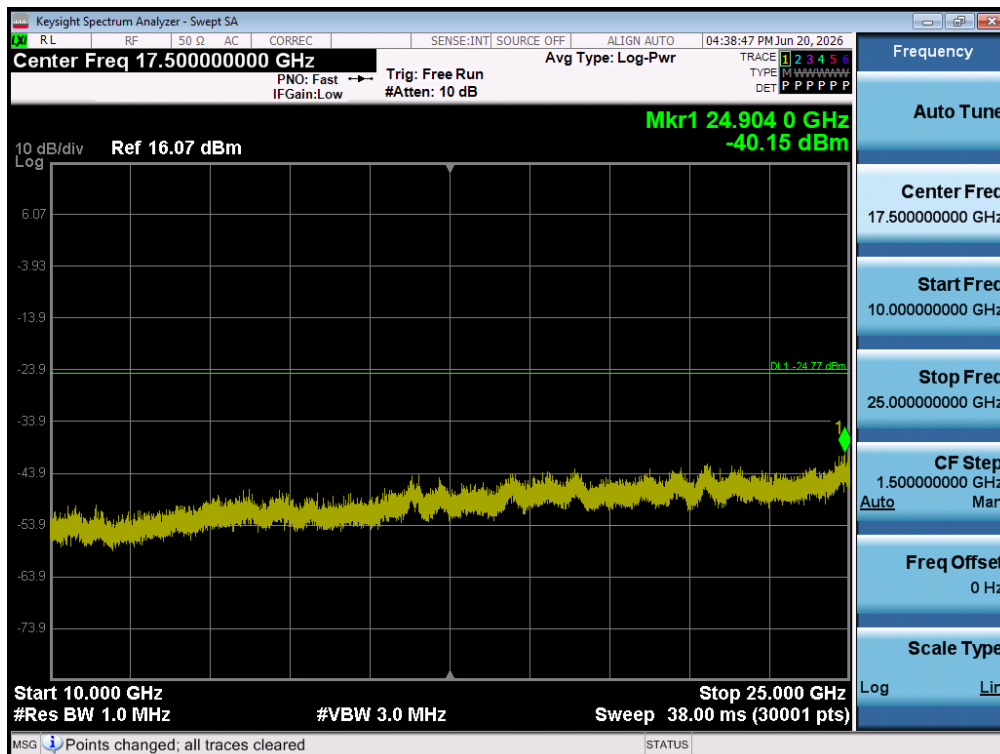
Plot 5-112 802.11 ax20 CH1. 26 Tone Conducted Spurious Emission 10 to 25 GHz - (Ant 2)



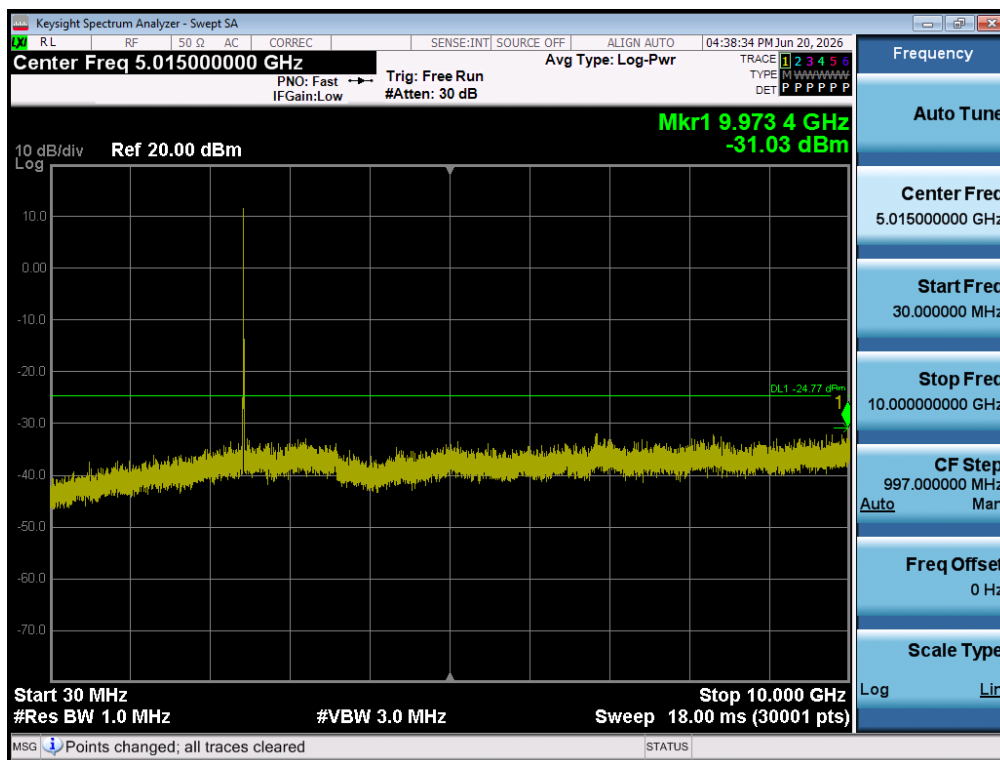
Plot 5-113 802.11 ax20 CH6. 26 Tone Conducted Spurious Emission 0.03 to 10 GHz - (Ant 1)



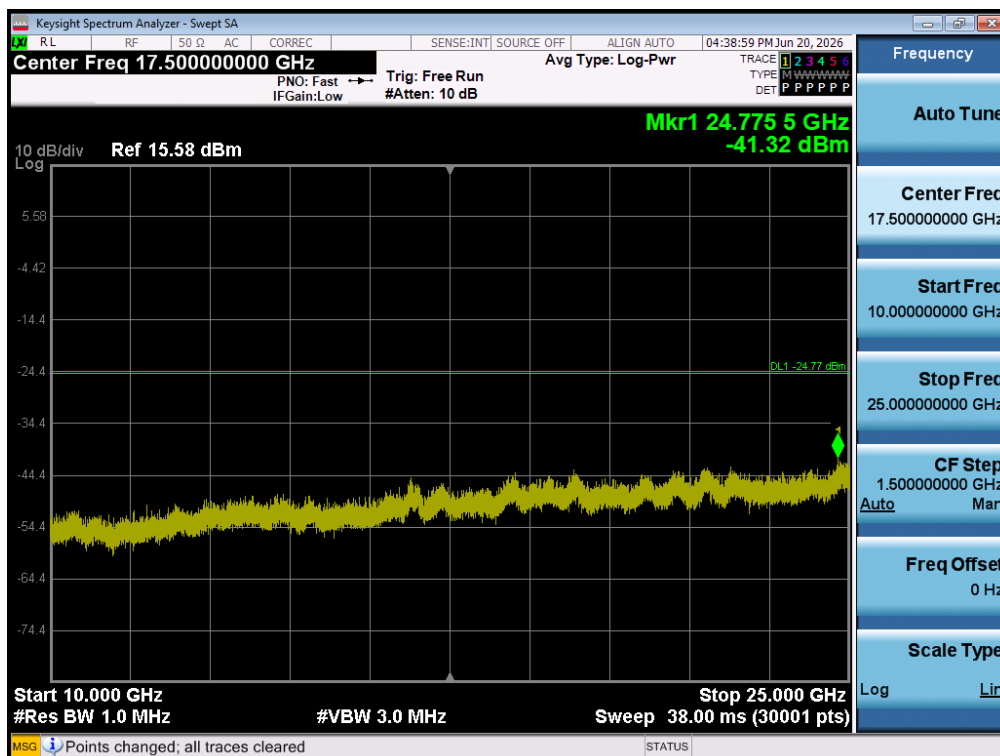
Plot 5-114 802.11 ax20 CH6. 26 Tone Conducted Spurious Emission 10 to 25 GHz - (Ant 1)



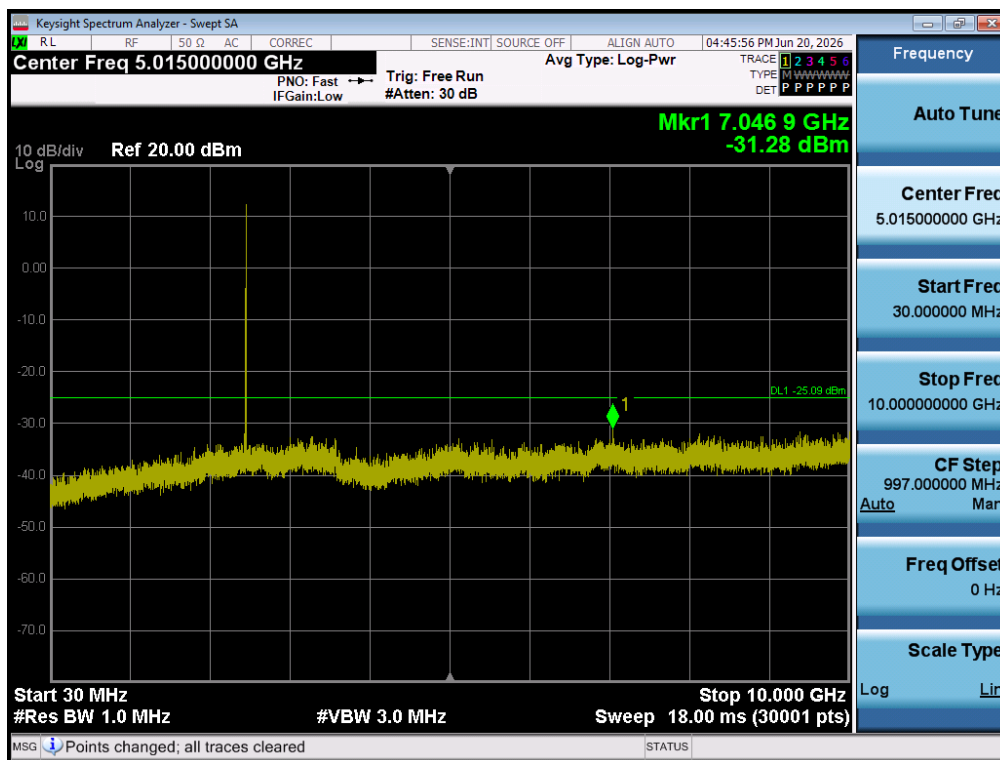
Plot 5-115 802.11 ax20 CH6. 26 Tone Conducted Spurious Emission 0.03 to 10 GHz - (Ant 2)



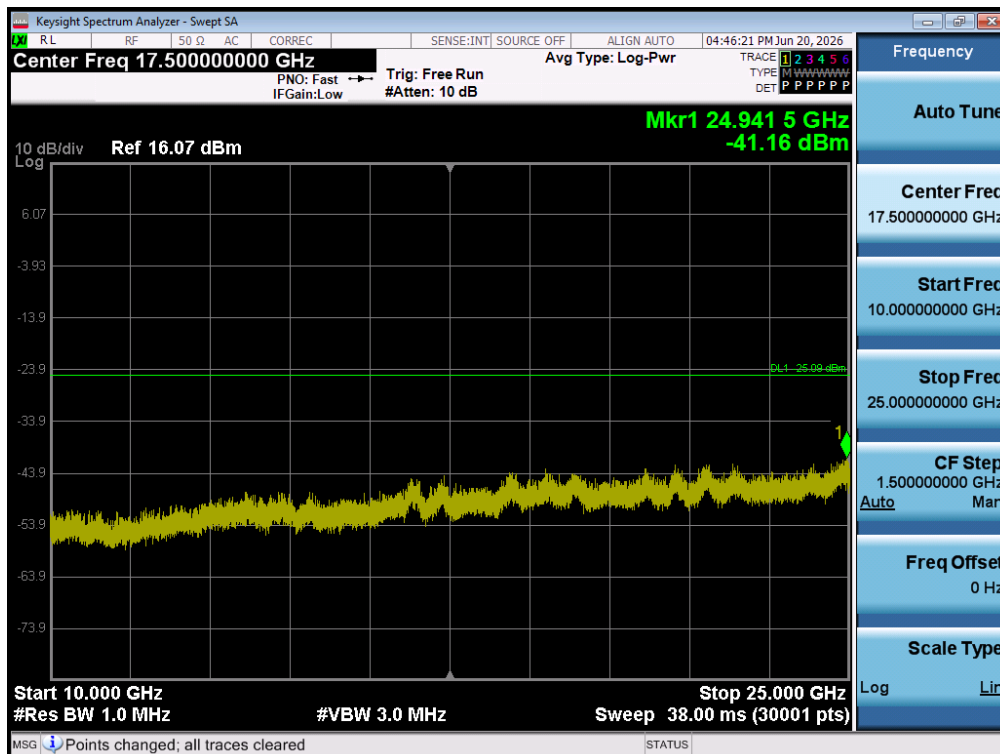
Plot 5-116 802.11 ax20 CH6. 26 Tone Conducted Spurious Emission 10 to 25 GHz - (Ant 2)



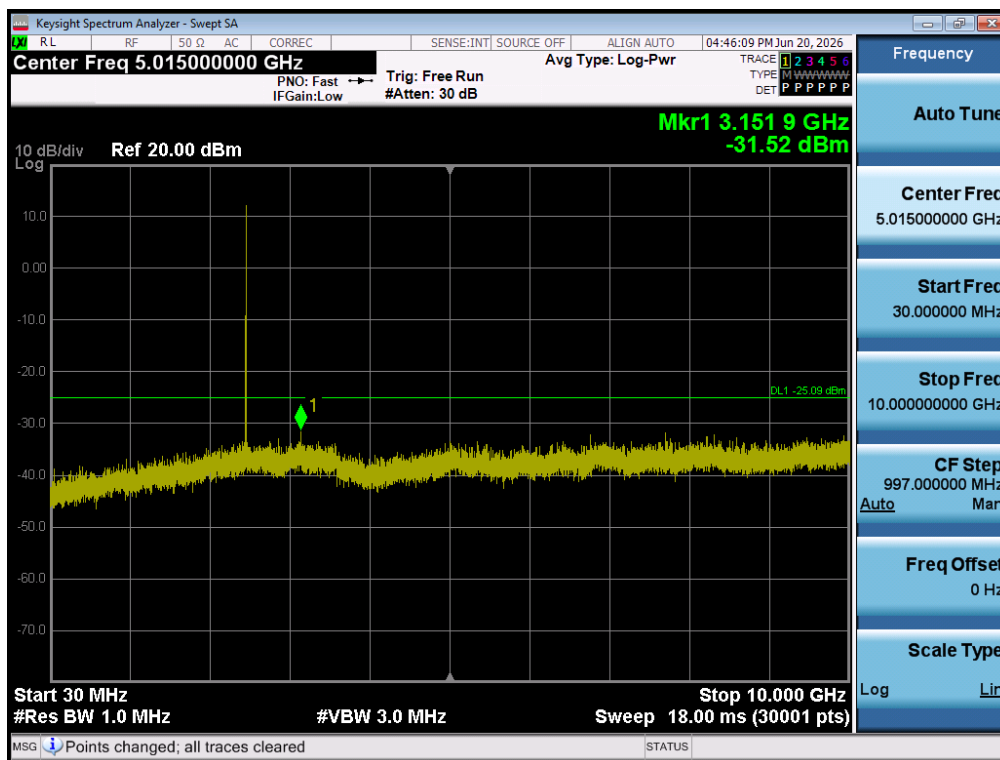
Plot 5-117 802.11 ax20 CH11. 26 Tone Conducted Spurious Emission 0.03 to 10 GHz - (Ant 1)



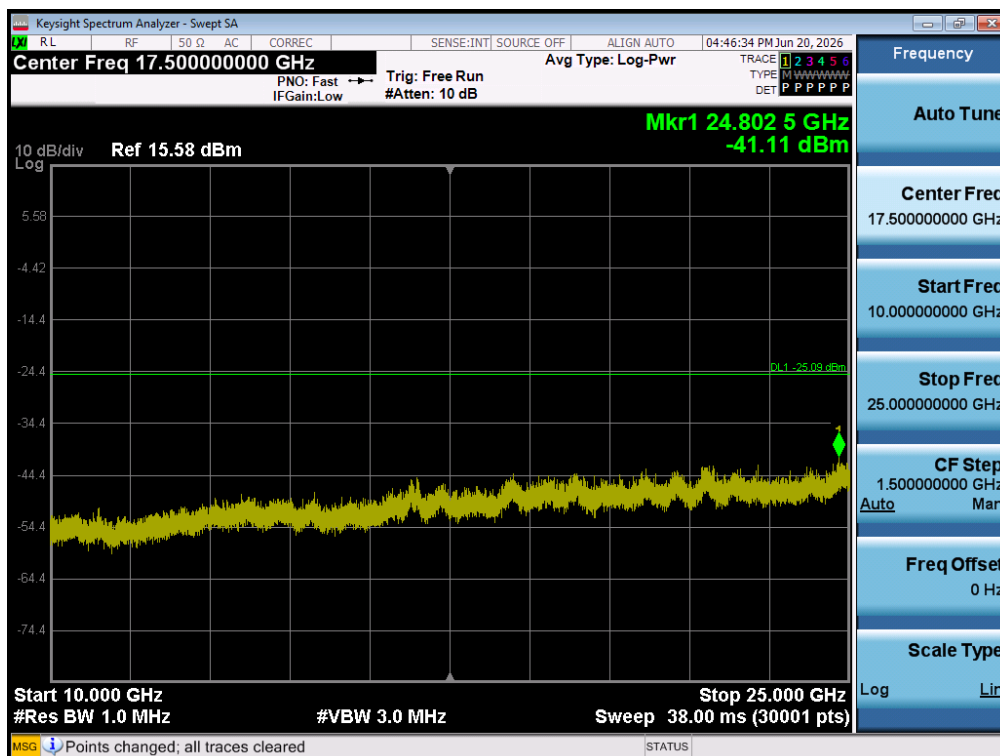
Plot 5-118 802.11 ax20 CH11. 26 Tone Conducted Spurious Emission 10 to 25 GHz - (Ant 1)



Plot 5-119 802.11 ax20 CH11. 26 Tone Conducted Spurious Emission 0.03 to 10 GHz - (Ant 2)



Plot 5-120 802.11 ax20 CH11. 26 Tone Conducted Spurious Emission 10 to 25 GHz - (Ant 2)



6. Radiated Test Results

6.1. Test Configuration

Radiated Test Facilities & Setup

Radiated emissions testing was conducted in an indoor 3-meter semi-anechoic chamber (SAC). For all frequency ranges, the turntable was rotated 360° and the receive antenna height was varied from 1 m to 4 m to maximize emissions. The specific test setups and calibrated, linearly polarized antennas utilized are as follows:

- 9 kHz to 30 MHz : DUT height at 0.8 m / Active Loop Antenna
- 30 MHz to 1 GHz : DUT height at 0.8 m / No floor absorbers / Broadband Bi-log Antenna
- 1 GHz to 18 GHz : DUT height at 1.5 m / Floor absorbers deployed / Broadband Double-Ridge Horn Antenna
- Above 18 GHz : DUT height at 1.5 m / Floor absorbers deployed / Standard Gain Horn Antenna

Test Orientations

The DUT was investigated in three orthogonal orientations (X, Y, and Z) for each band. Since the equipment transmits below 10 GHz, Radiated Spurious Emissions testing was performed from 9 kHz up to the lower of the tenth harmonic of the highest fundamental frequency or 40 GHz. Testing from 1 GHz to 18 GHz was performed on the low, mid, and high channels. Testing below 1 GHz and above 18 GHz was conducted only under the worst-case configuration. In accordance with ANSI C63.10, measurement results for frequencies below 1 GHz and above 18 GHz are included in the report only when emissions are detected within 20 dB of the applicable limit.

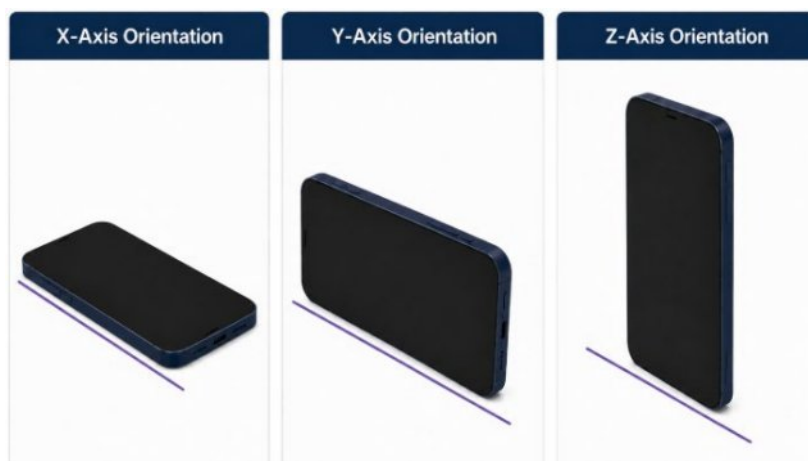


Figure 6-1 Three orthogonal orientations.

Radiated emissions were captured using automated test software 'NGTL ATE' Ver. 0.00.

6.2. Radiated Measurement Setup

Figure 6-2 Radiated Measurement Setup Below 30 MHz

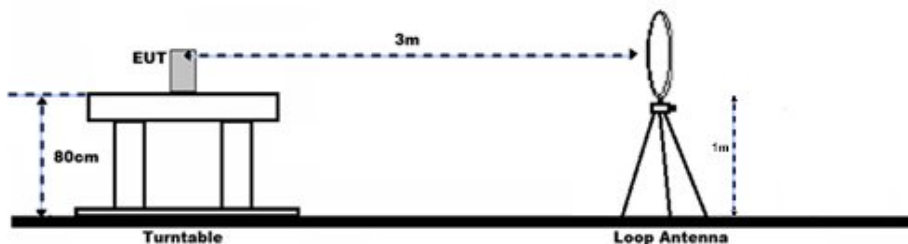


Figure 6-3 Radiated Measurement Setup Below 1 GHz

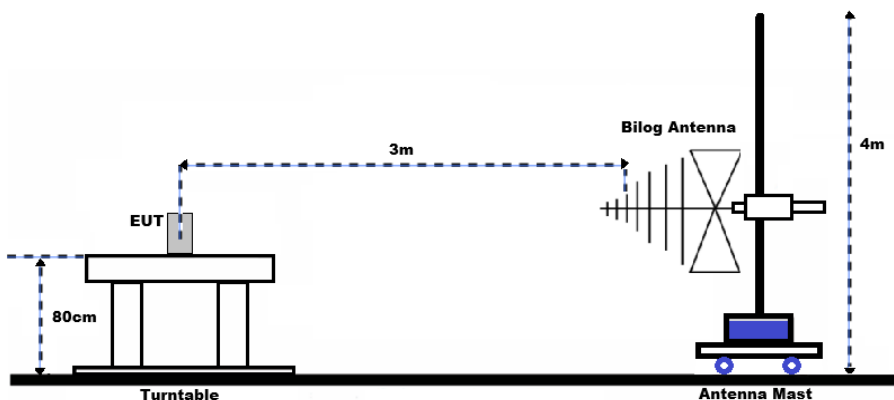
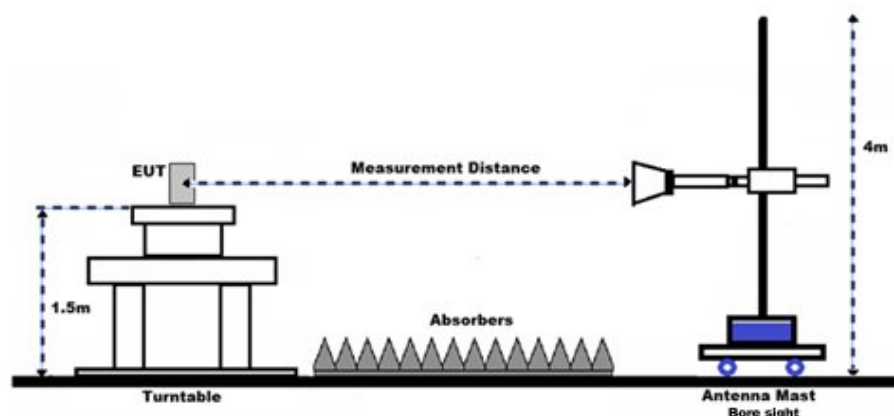


Figure 6-4 Radiated Measurement Setup Above 1 GHz



6.3. Radiated Measurement Sample

Serial Number(s) :

ZDH0461M, ZDH0460M

6.4. Radiated Spurious Emissions

6.4.1. Regulatory Limit

§ Part 15.205 Restriction band of operation

Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(Above 38.6)
13.36-13.41			

§ Part 15.209 Radiated emission limit; general requirements

Except as shown in paragraph (b)(6) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 – 0.490	2400 / F(kHz)	300
0.490 – 1.705	24000 / F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100**	3
88 – 216	150**	3
216 – 960	200**	3
Above 960	500	3

****Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.**

Part 15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

RSS-GEN - Section 8.9

Except where otherwise indicated in the applicable RSS, radiated emissions shall comply with the field strength limits shown in table 5 and table 6. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission.

Frequency (MHz)	Magnetic field strength (H-Field) (μA/m)	Measurement Distance (m)
0.009 – 0.490 ^{Note}	6.37/F (F in kHz)	300
0.490 – 1.705	63.7/F (F in kHz)	30
1.705 – 30.0	0.08	30

Note

The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

RSS-GEN - Section 8.10

Restricted frequency bands

Restricted frequency bands, identified in table 7, are designated primarily for safety-of-life services (distress calling and certain aeronautical activities), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following conditions related to the restricted frequency bands apply:

- a. The transmit frequency, including fundamental components of modulation, of license-exempt radio apparatus shall not fall within the restricted frequency bands listed in table 7 except for apparatus compliant with RSS-287, Emergency Position Indicating Radio Beacons (EPIRB), Emergency Locator Transmitters (ELT), Personal Locator Beacons (PLB), and Maritime Survivor Locator Devices (MSLD).
- b. Unwanted emissions that fall into restricted frequency bands listed in table 7 shall comply with the limits specified in table 5 and table 6.
- c. Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6.

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	13.36 - 13.41	960 - 1427	9.0 - 9.2
0.495 - 0.505	16.42 - 16.423	1435 - 1626.5	9.3 - 9.5
2.1735 - 2.1905	16.69475 - 16.69525	1645.5 - 1646.5	10.6 - 12.7
3.020 - 3.026	16.80425 - 16.80475	1660 - 1710	13.25 - 13.4
4.125 - 4.128	25.5 - 25.67	1718.8 - 1722.2	14.47 - 14.5
4.17725 - 4.17775	37.5 - 38.25	2200 - 2300	15.35 - 16.2
4.20725 - 4.20775	73 - 74.6	2310 - 2390	17.7 - 21.4
5.677 - 5.683	74.8 - 75.2	2483.5 - 2500	22.01 - 23.12
6.215 - 6.218	108 - 138	2655 - 2900	23.6 - 24.0
6.26775 - 6.26825	149.9 - 150.05	3260 - 3267	31.2 - 31.8
6.31175 - 6.31225	156.52475 - 156.52525	3332 - 3339	36.43 - 36.5
8.291 - 8.294	156.7 - 156.9	3345.8 - 3358	Above 38.6
8.362 - 8.366	162.0125 - 167.17	3500 - 4400	
8.37625 - 8.38675	167.72 - 173.2	4500 - 5150	
8.41425 - 8.41475	240 - 285	5350 - 5460	
12.29 - 12.293	322 - 335.4	5350 - 5460	
12.51975 - 12.52025	399.9 - 410	7250 - 7750	
12.57675 - 12.57725	608 - 614	8025 - 8500	

RSS-247 - Section 6.6

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum device, digitally modulated device, or hybrid system is operating, the RF power that is produced shall be at least 20 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 – provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 6.3.2, the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

6.4.2. Test Method

ANSI C63.10 – 2020, clause 11.11

ANSI C63.10 – 2020, clause 11.12

6.4.3. Test Procedure

Quasi-Peak - Below 1 GHz

- a) RBW = 120 kHz
- b) Detector = Quasi-Peak
- c) Sweep time = Auto (Coupled) or sufficient to investigate
- d) Trace mode = Max-Hold

Peak measurement - above 1 GHz

- a) RBW = 1 MHz
- b) VBW $\geq [3 \times \text{RBW}]$
- c) Detector = Peak
- d) Sweep time = Auto (Coupled) or sufficient to investigate
- e) Trace mode = Max-Hold

Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, then the time required for the trace to stabilize will increase by a factor of approximately $1 / D$, where D is the duty cycle. For example, at 50% duty cycle, the measurement time will increase by a factor of two, relative to measurement time for continuous transmission.

Average measurement - above 1 GHz [Method AD]

- a) RBW = 1 MHz
- b) VBW $\geq [3 \times \text{RBW}]$
- c) Detector = RMS
- d) Sweep time = Auto (Coupled) or sufficient to investigate
- e) Trace mode = Max-Hold
- f) Sweep count = Same or greater than 100
- g) If tests are performed with the EUT transmitting at a duty cycle less than 98%, then a correction factor shall be added to the measurement results prior to comparing with the emission limit, to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:

1) If power averaging (rms) mode was used in the preceding step e), then the correction factor is $[10 \log (1 / D)]$, where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB shall be added to the measured emission levels.

6.4.4. Sample Calculation

Where relevant, the following sample calculation is provided:

$E(\text{dB}\mu\text{V}/\text{m}) = \text{Measured Voltage (dB}\mu\text{V)} + \text{DCCF (dB)} + \text{Antenna Factor (dB/m)} + \text{Total Loss [Cable Loss (dB) – Preamplifier Gain (dB)]}$

$E(\text{dB}\mu\text{V}/\text{m}) = 47.64 \text{ dB}\mu\text{V} + (-6.80) \text{ dB/m} = 40.84 \text{ dB}\mu\text{V}/\text{m}$

6.4.5. Radiated Spurious Test Results

Plot 6-1 30 MHz to 1 000 MHz Worst case 802.11b 2437 MHz

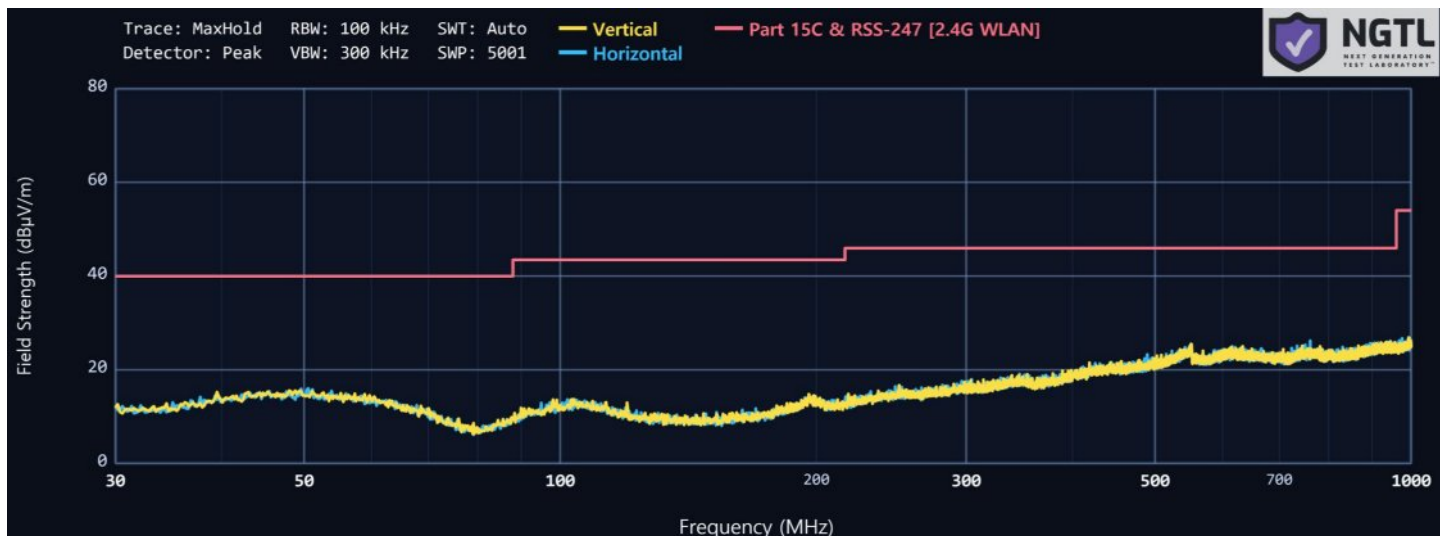


Table 6-1 Radiated Spurious Emissions 30 MHz to 1000 MHz

Test mode	Tested Frequency [MHz]	Frequency [MHz]	Reading Value [dBμV]	Pol [H/V]	Detector Mode	DCCF [dB]	AFCL [dB/m]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]
b	2437	39.51	48.04	V	PK	0.00	- 32.79	15.25	40.00	-24.75
		119.82	48.65	V	PK	0.00	- 30.66	17.99	43.50	-25.51
		550.70	51.72	H	PK	0.00	- 26.17	25.55	46.00	-20.45

Plot 6-2 Above 18 GHz Worst case 802.11b 2462 MHz

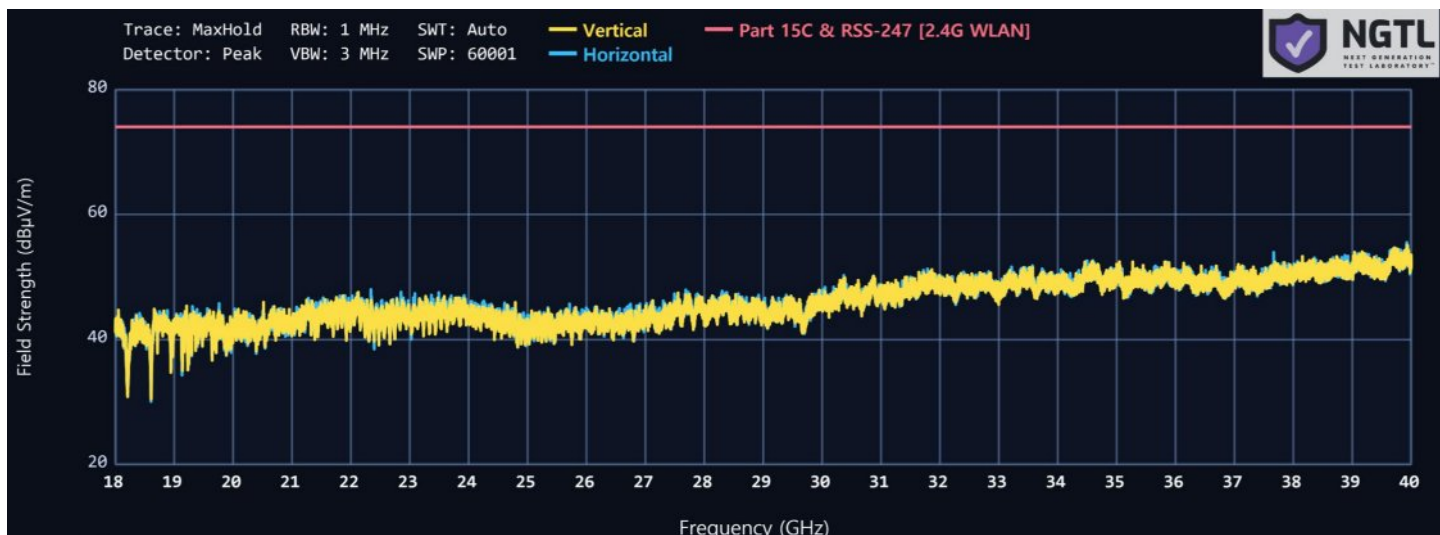


Table 6-2 Radiated Spurious Emissions Above 18 GHz

Test mode	Tested Frequency [MHz]	Frequency [MHz]	Reading Value [dBμV]	Pol [H/V]	Detector Mode	DCCF [dB]	AFCL [dB/m]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]
b	2462	19 494.79	38.99	H	PK	0.00	5.60	44.59	74.00	-29.41
		19 495.66	28.28	H	AV	0.00	5.60	33.88	54.00	-20.12
	2467	21 932.27	35.09	H	PK	0.00	7.60	42.69	74.00	-31.31
		21 934.75	24.88	H	AV	0.00	7.60	32.48	54.00	-21.52
	2472	24 371.35	37.23	H	PK	0.00	6.10	43.33	74.00	-30.67
		24 371.67	25.13	H	AV	0.00	6.10	31.23	54.00	-22.77