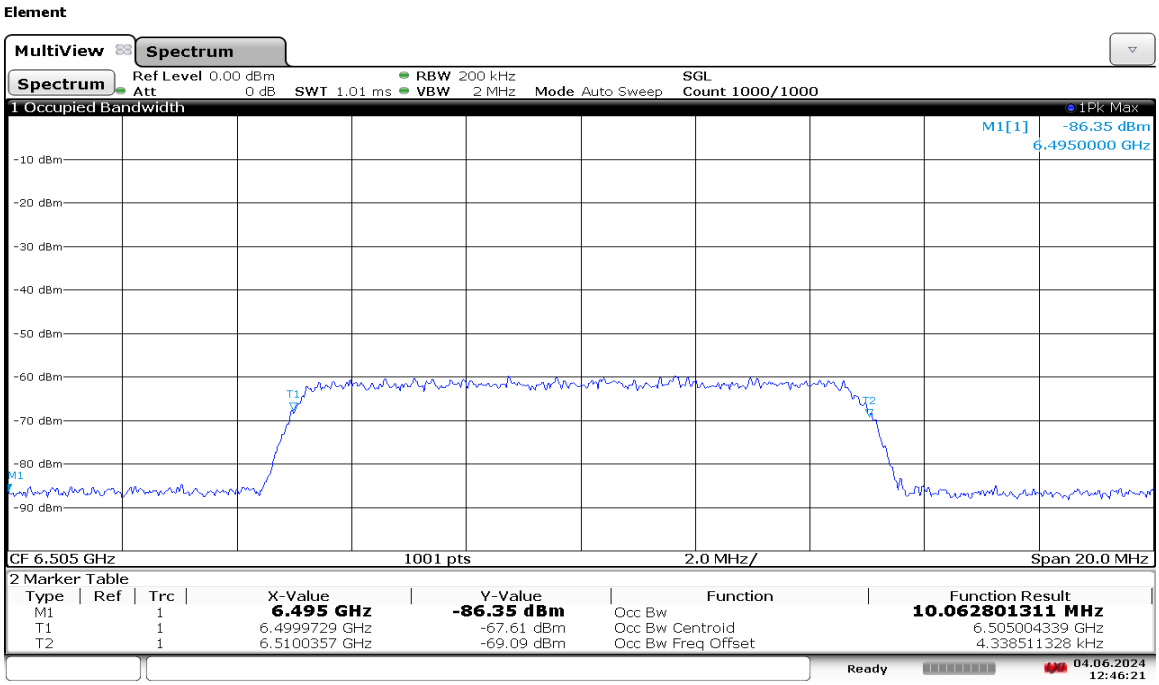
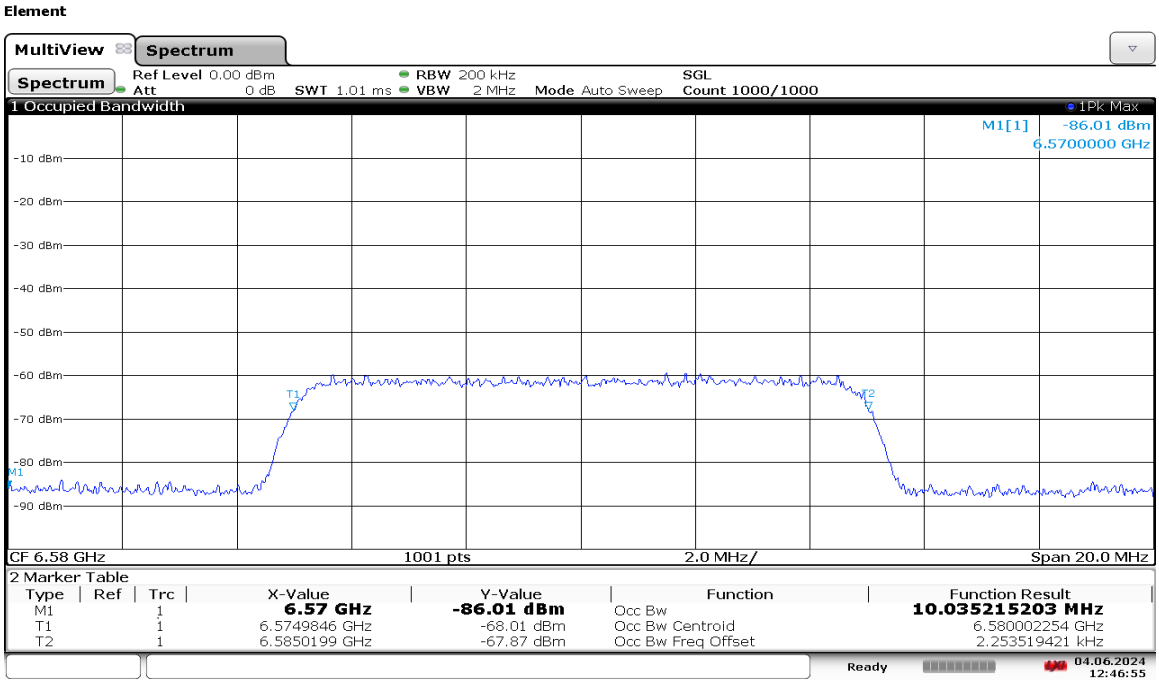


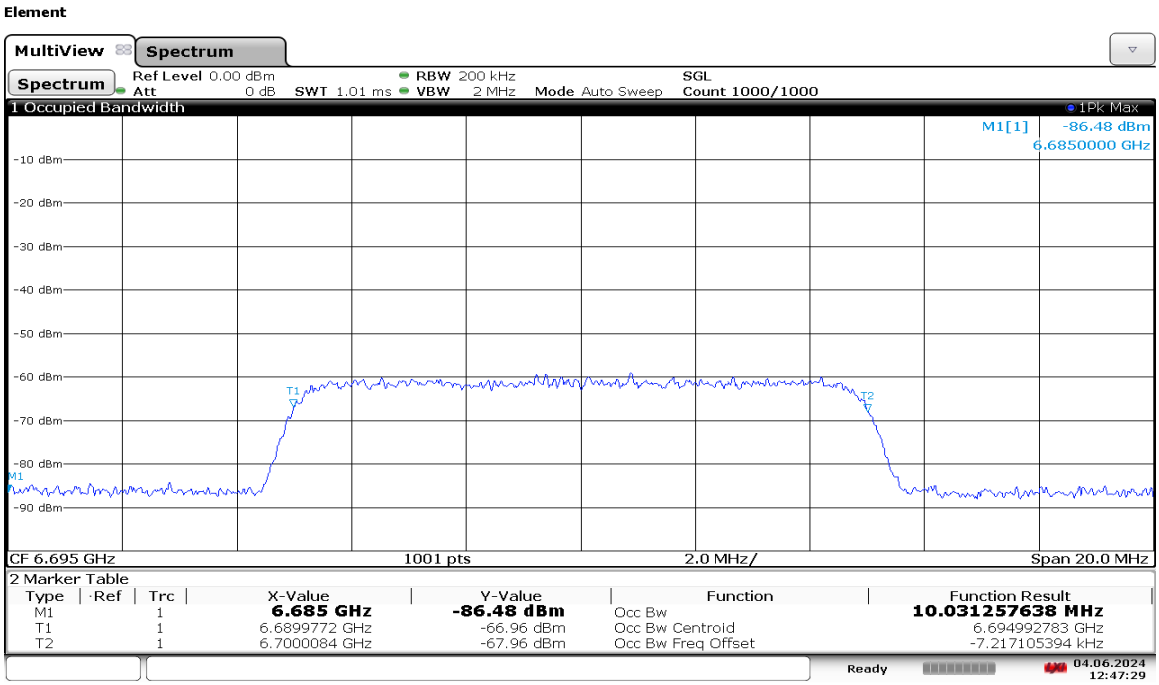
12:46:21 04.06.2024

Plot 7-375. AWGN Signal – UNII 6 – 160MHz – Mid

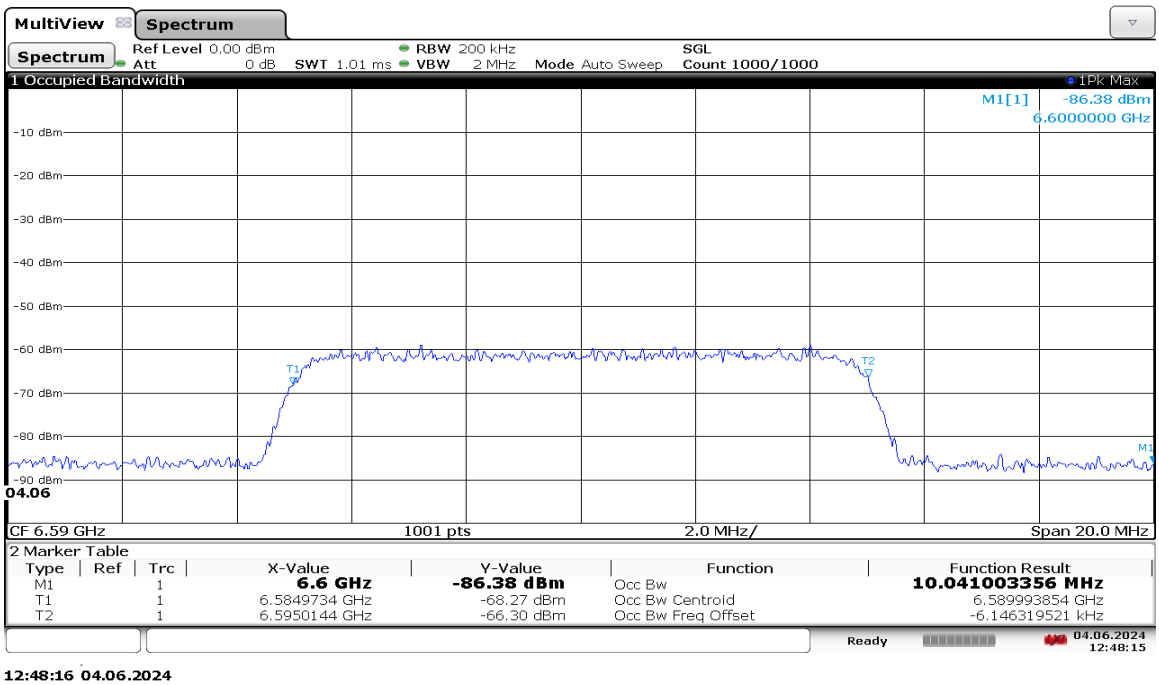


12:46:56 04.06.2024

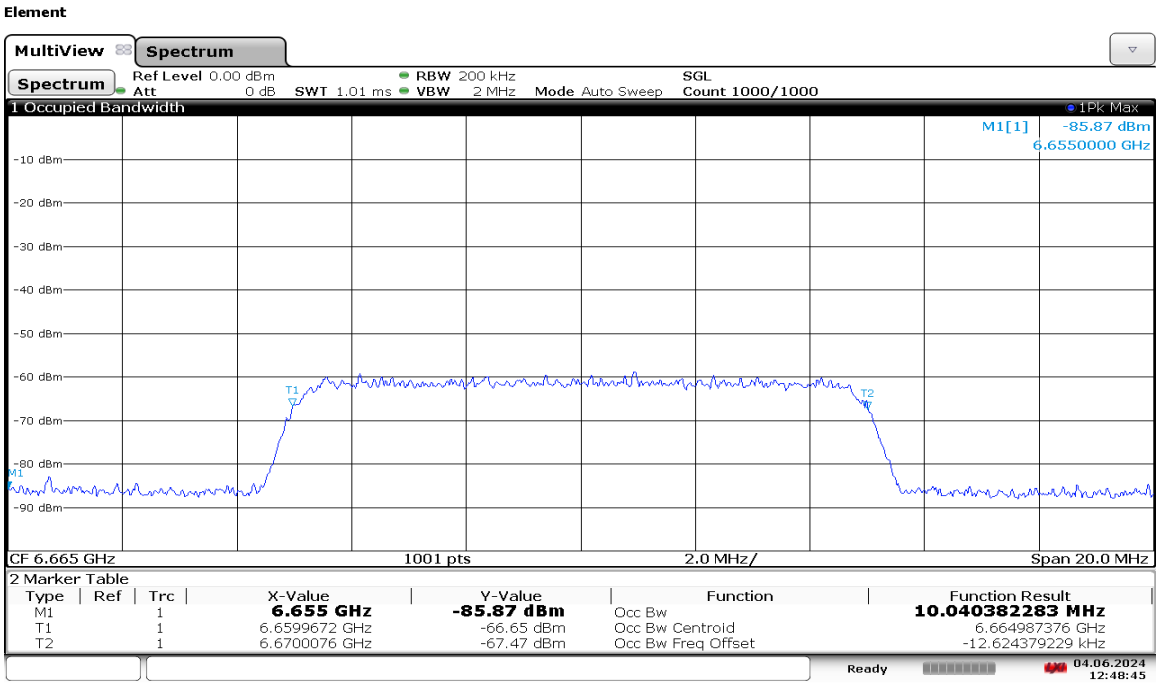
Plot 7-376. AWGN Signal – UNII 6 – 160MHz - High



Plot 7-377. AWGN Signal – UNII 7 – 20MHz

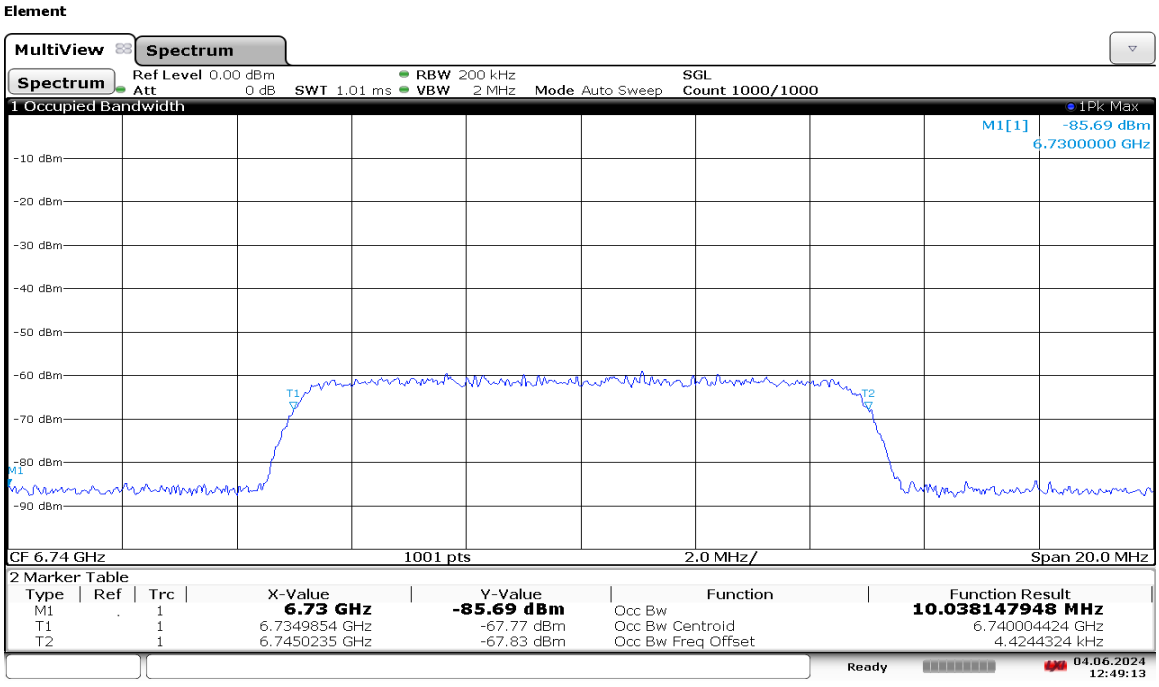


Plot 7-378. AWGN Signal – UNII 7 – 160MHz - Low



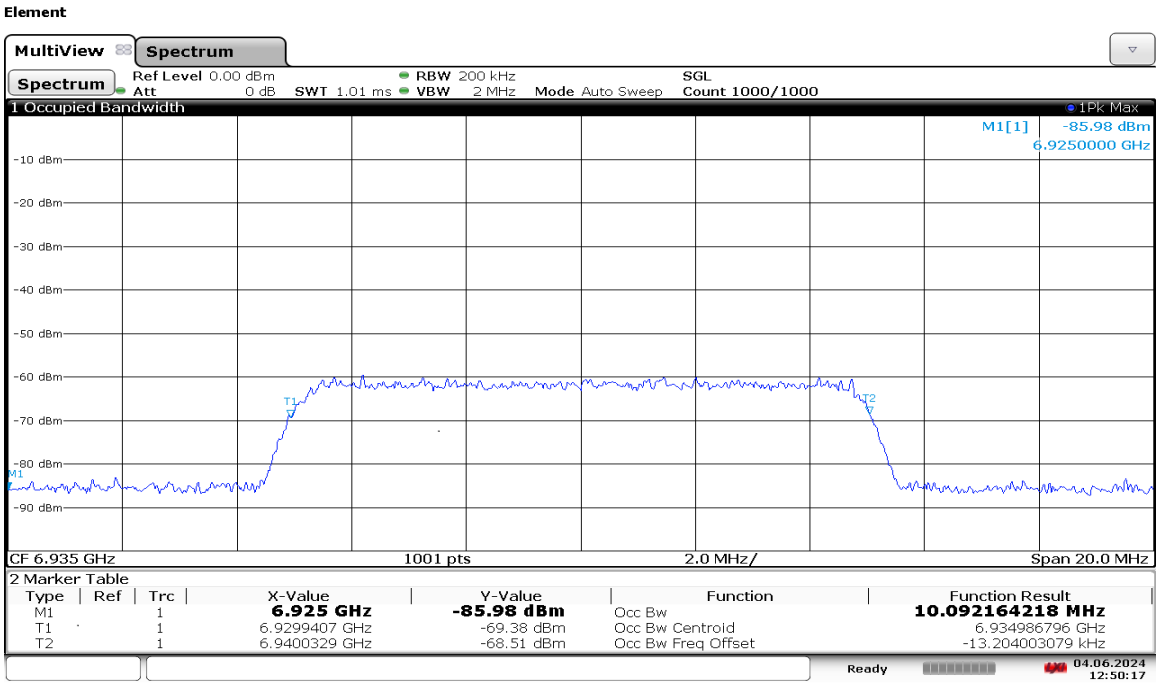
12:48:45 04.06.2024

Plot 7-379. AWGN Signal – UNII 7 – 160MHz – Mid



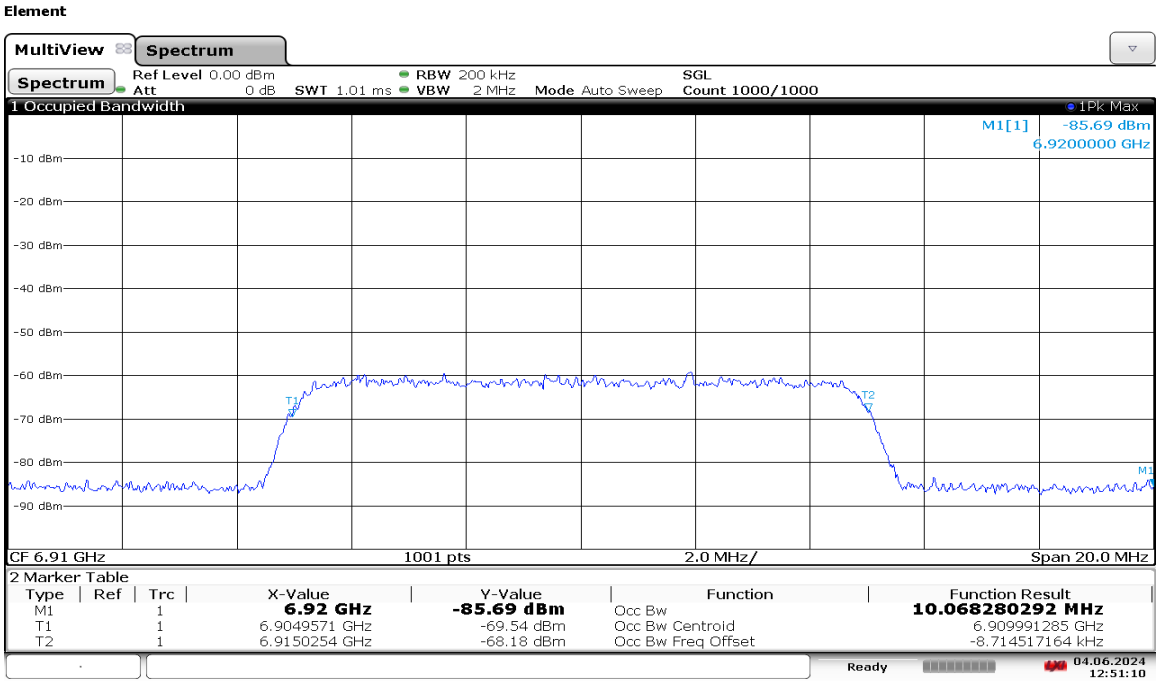
12:49:14 04.06.2024

Plot 7-380. AWGN Signal – UNII 7 – 160MHz - High



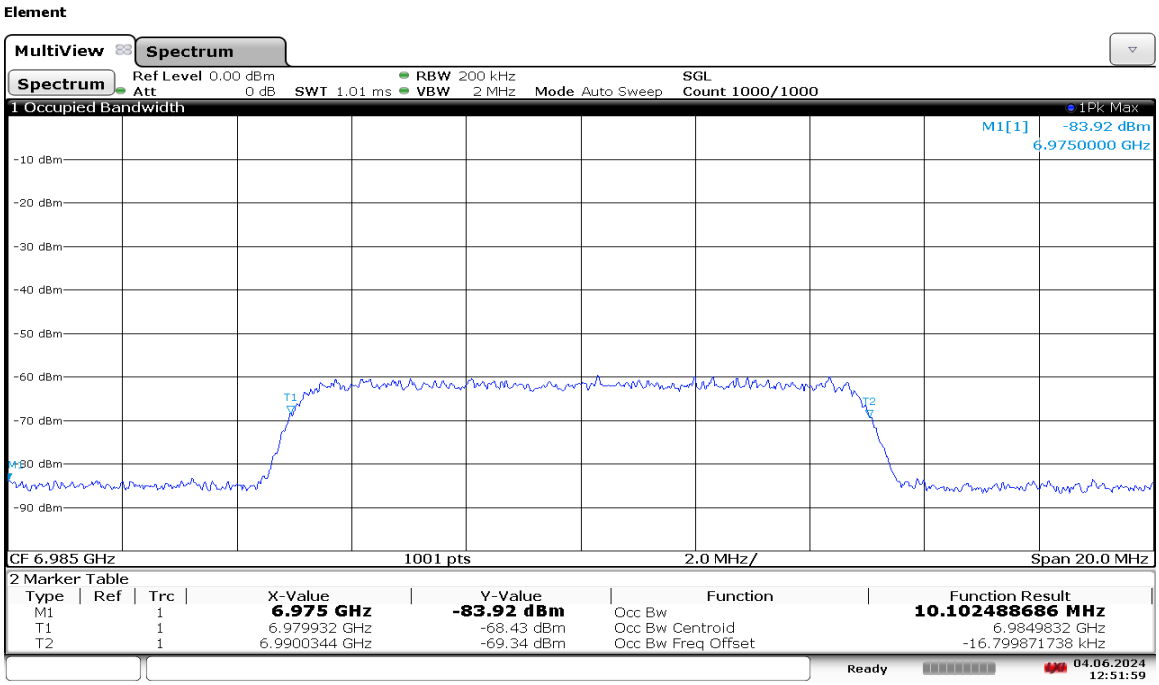
12:50:18 04.06.2024

Plot 7-381. AWGN Signal – UNII 8 – 20MHz



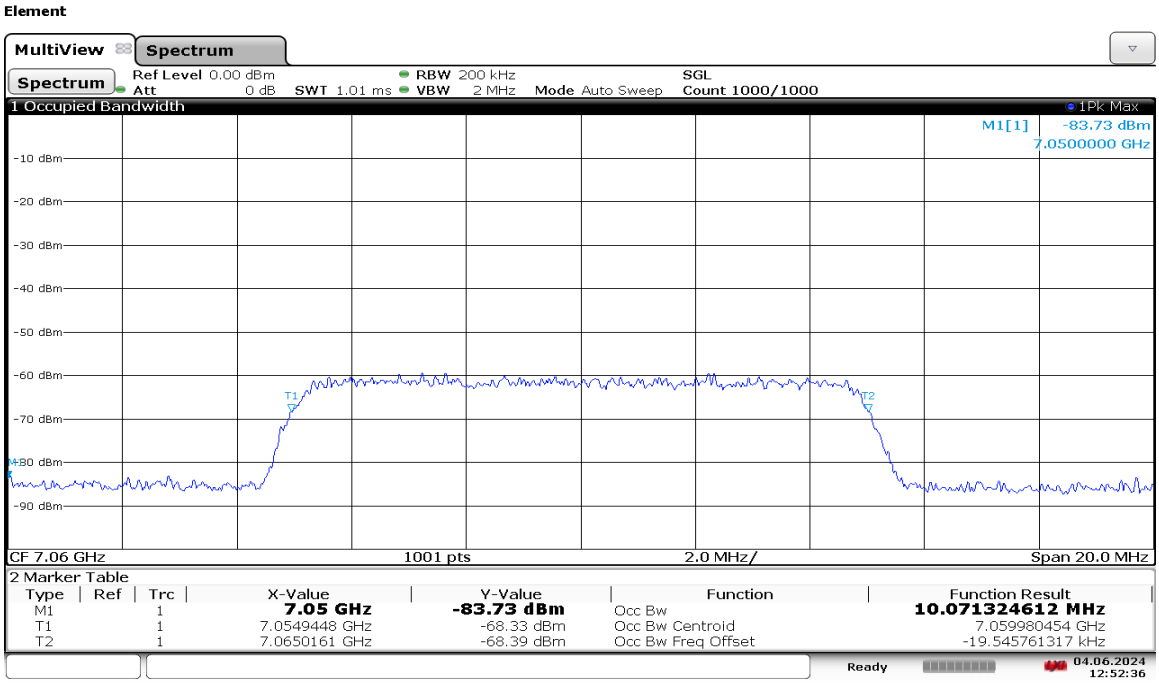
12:51:11 04.06.2024

Plot 7-382. AWGN Signal – UNII 8 – 160MHz - Low



12:52:00 04.06.2024

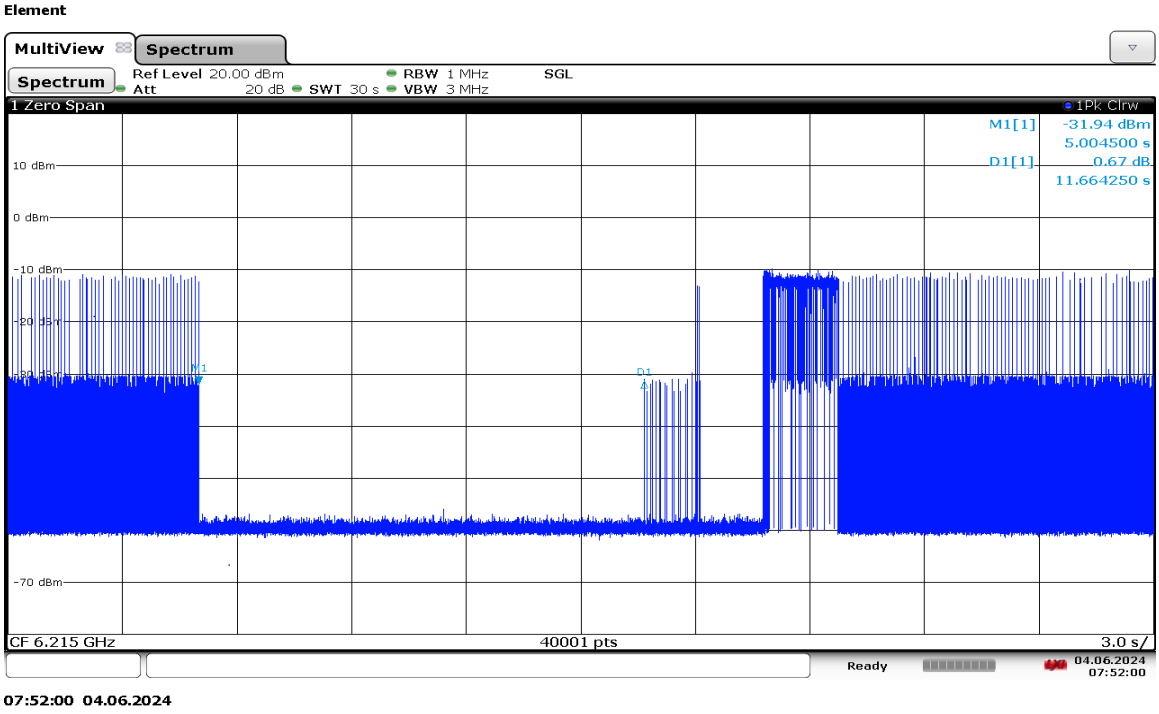
Plot 7-383. AWGN Signal – UNII 8 – 160MHz – Mid



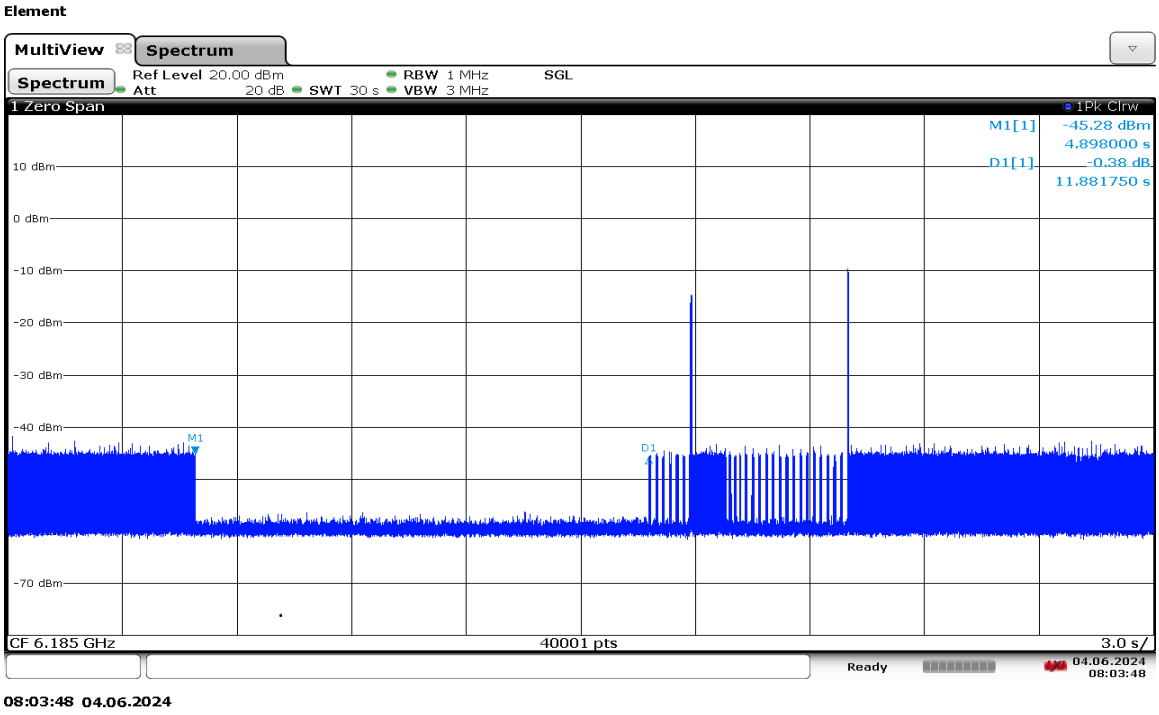
12:52:36 04.06.2024

Plot 7-384. AWGN Signal – UNII 8 – 160MHz – High

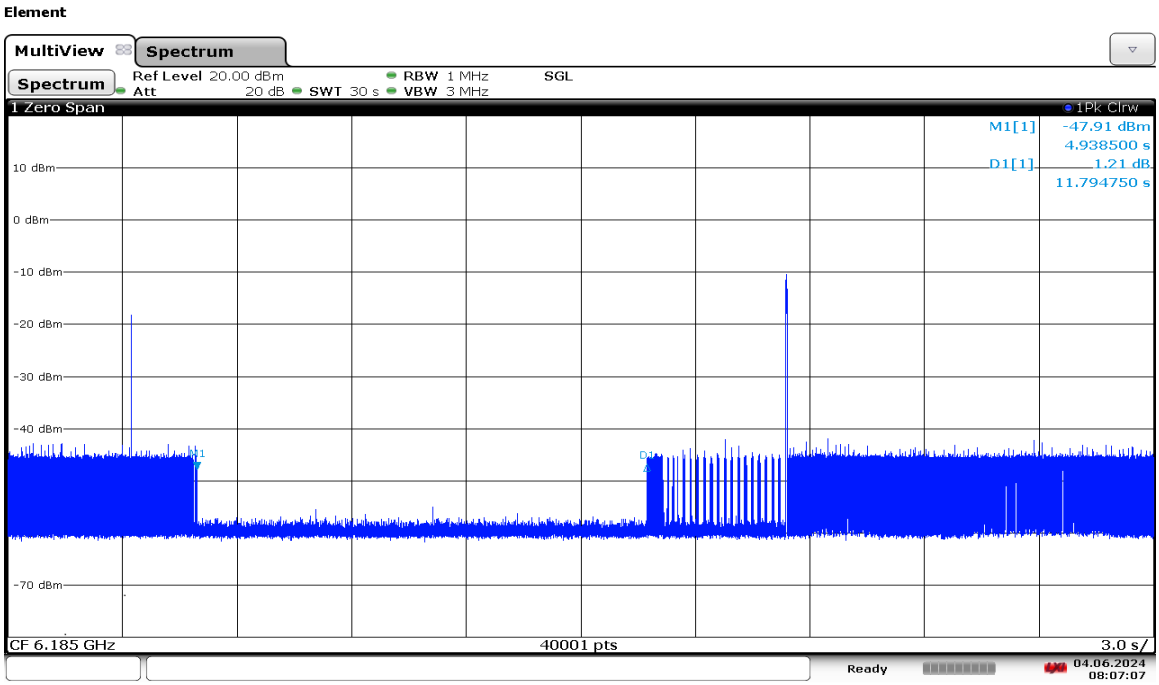
Contention-Based Protocol Timing Plots



Plot 7-385. LPI, Contention Based Protocol Timing Plot – UNII 5 – 20MHz Channel 53

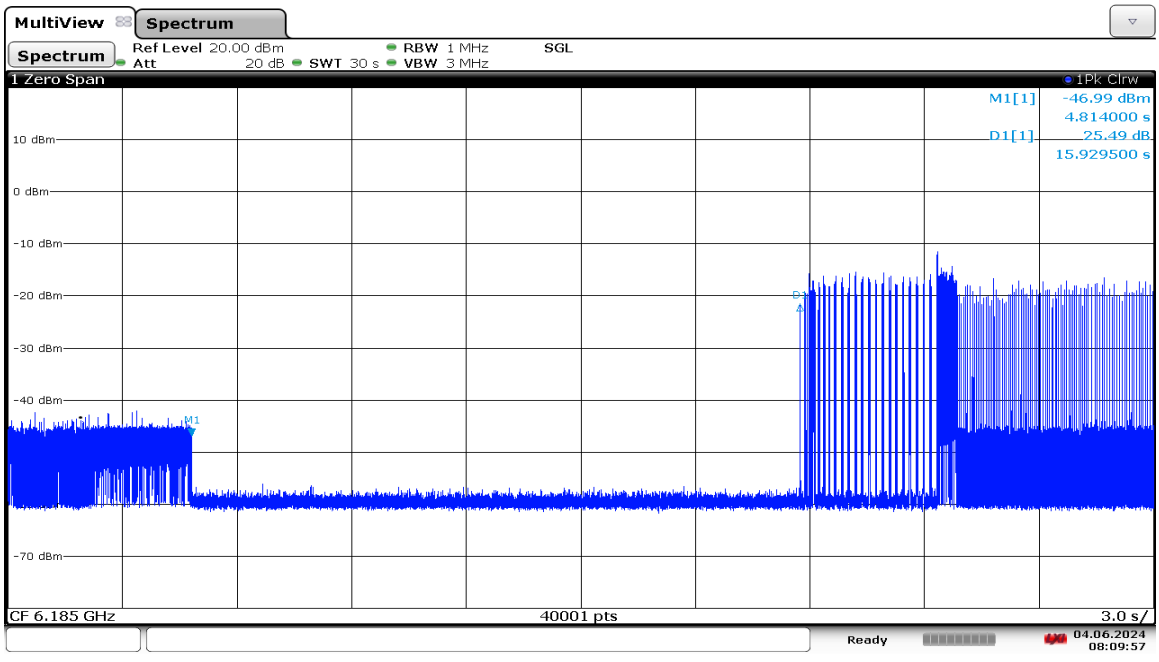


Plot 7-386. LPI, Contention Based Protocol Timing Plot – UNII 5 – 160MHz Channel 47 – Low



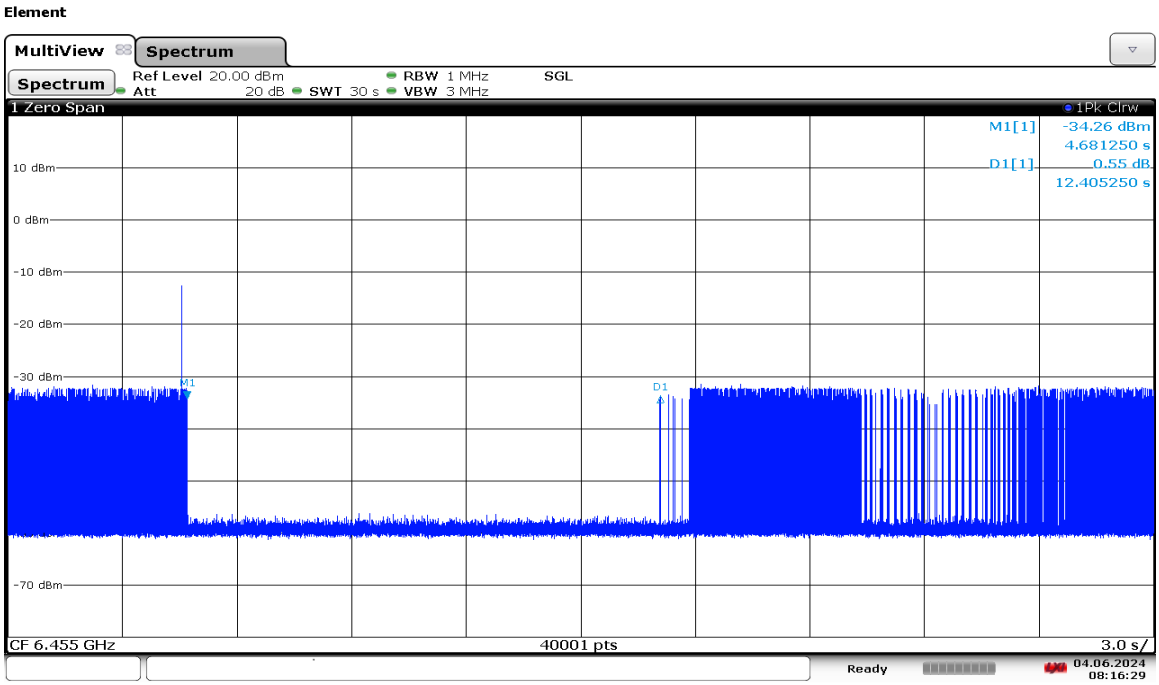
08:07:08 04.06.2024

Plot 7-387. LPI, Contention Based Protocol Timing Plot – UNII 5 – 160MHz Channel 47 – Mid

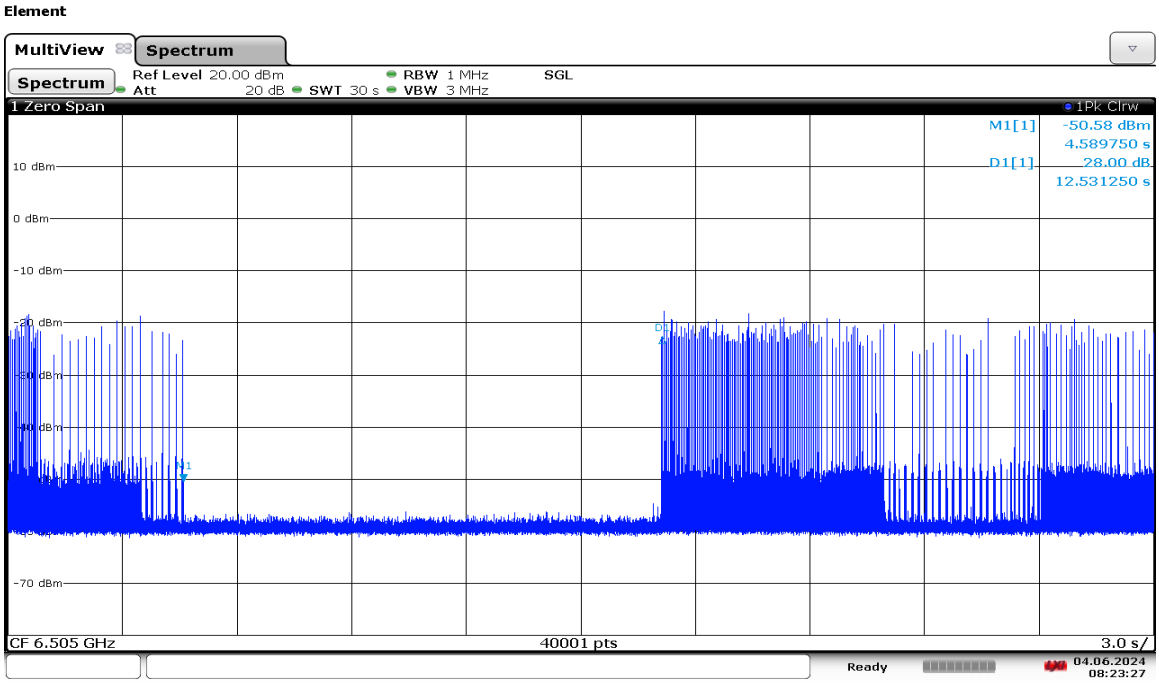


08:09:57 04.06.2024

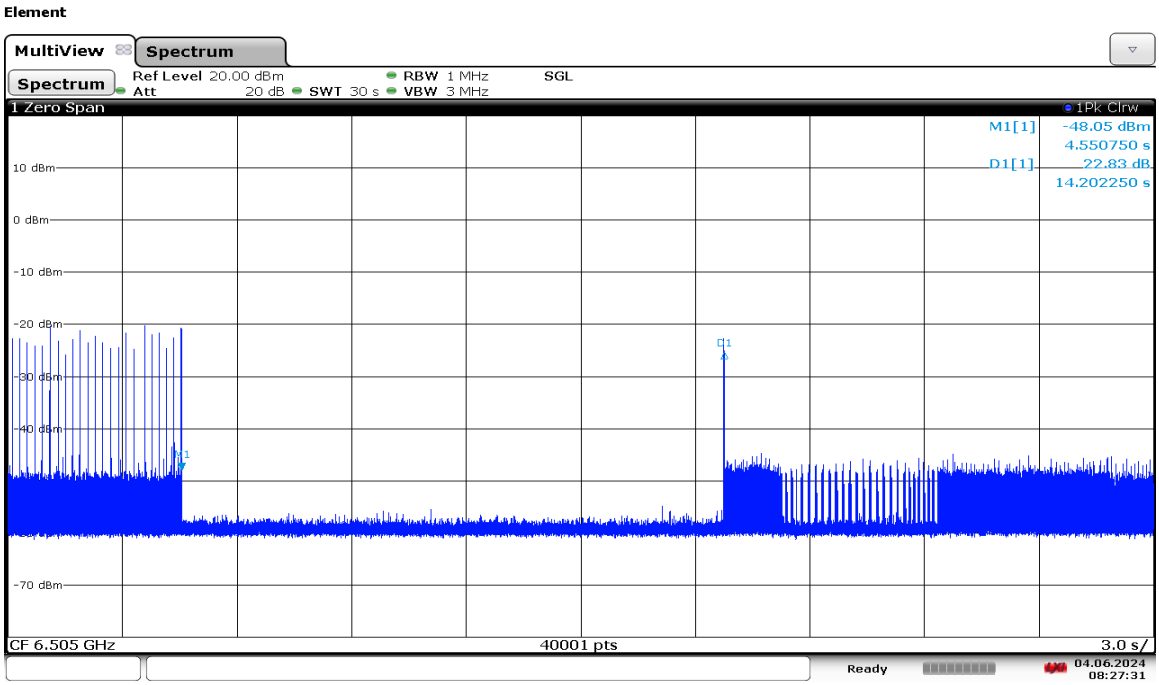
Plot 7-388. LPI, Contention Based Protocol Timing Plot – UNII 5 – 160MHz Channel 47 – High



Plot 7-389. LPI, Contention Based Protocol Timing Plot – UNII 6 – 20MHz Channel 101

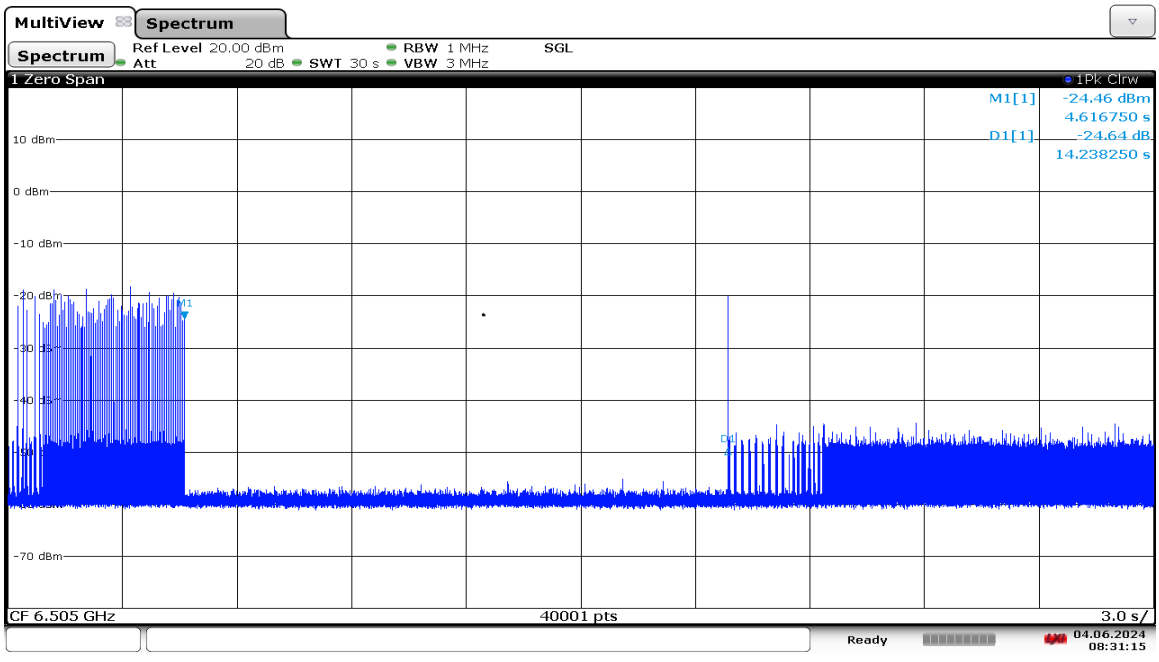


Plot 7-390. LPI, Contention Based Protocol Timing Plot – UNII 6 – 160MHz Channel 111 – Low



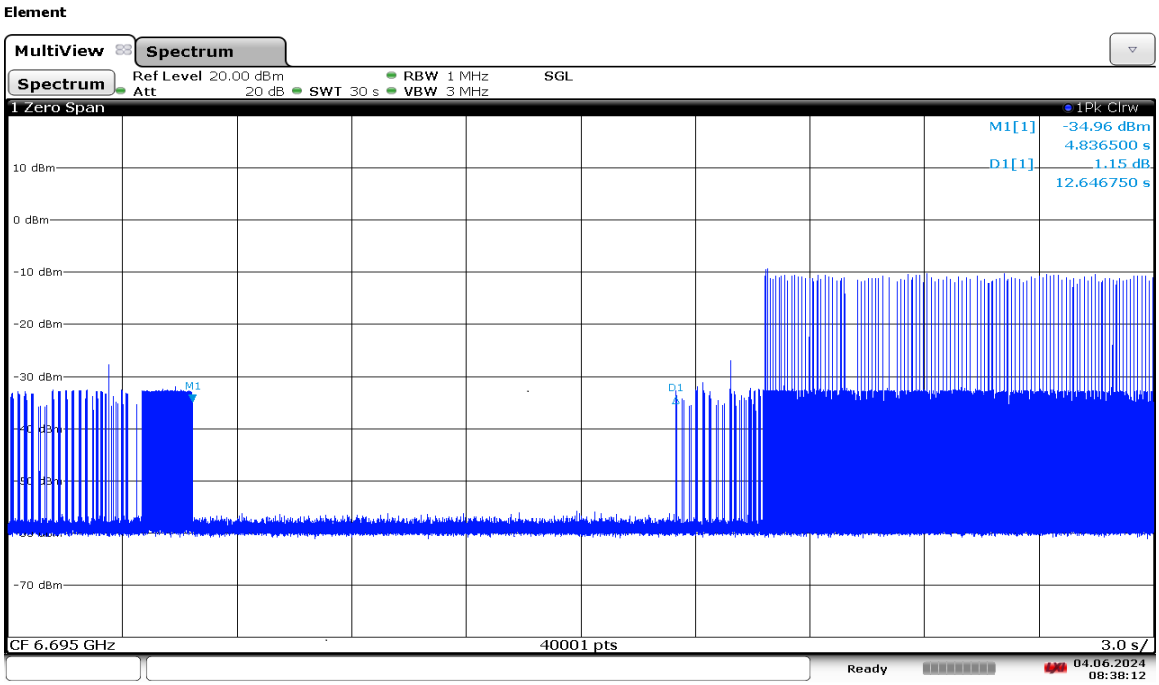
08:27:32 04.06.2024

Plot 7-391. LPI, Contention Based Protocol Timing Plot – UNII 6 – 160MHz Channel 111 – Mid

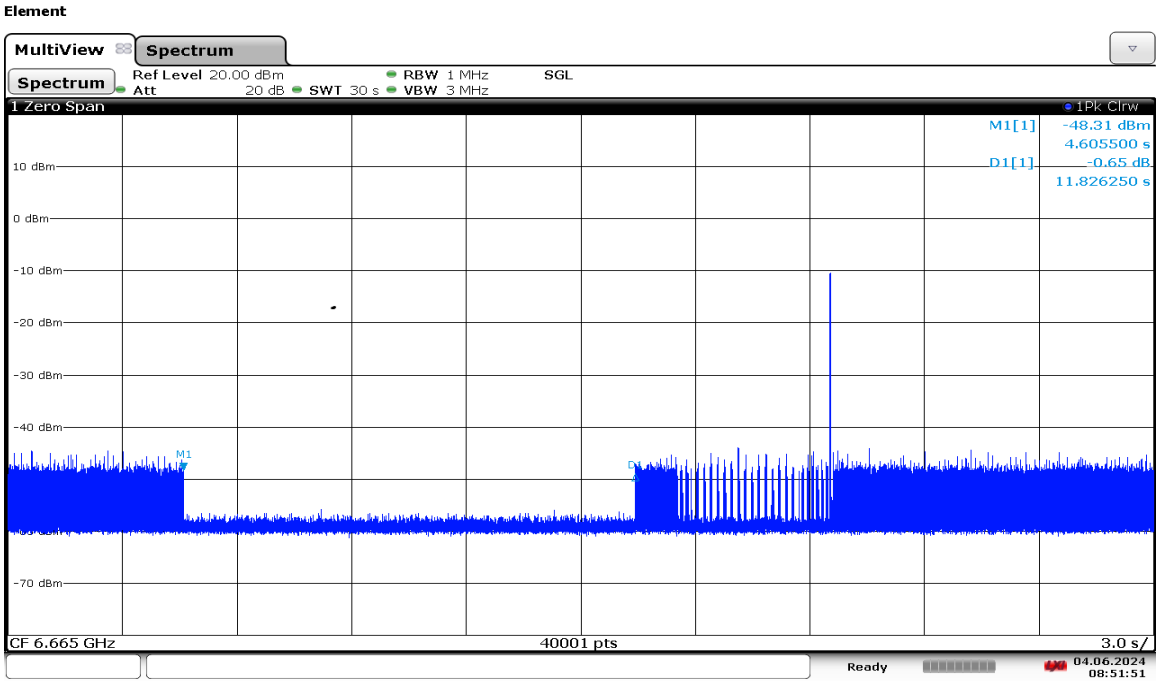


08:31:16 04.06.2024

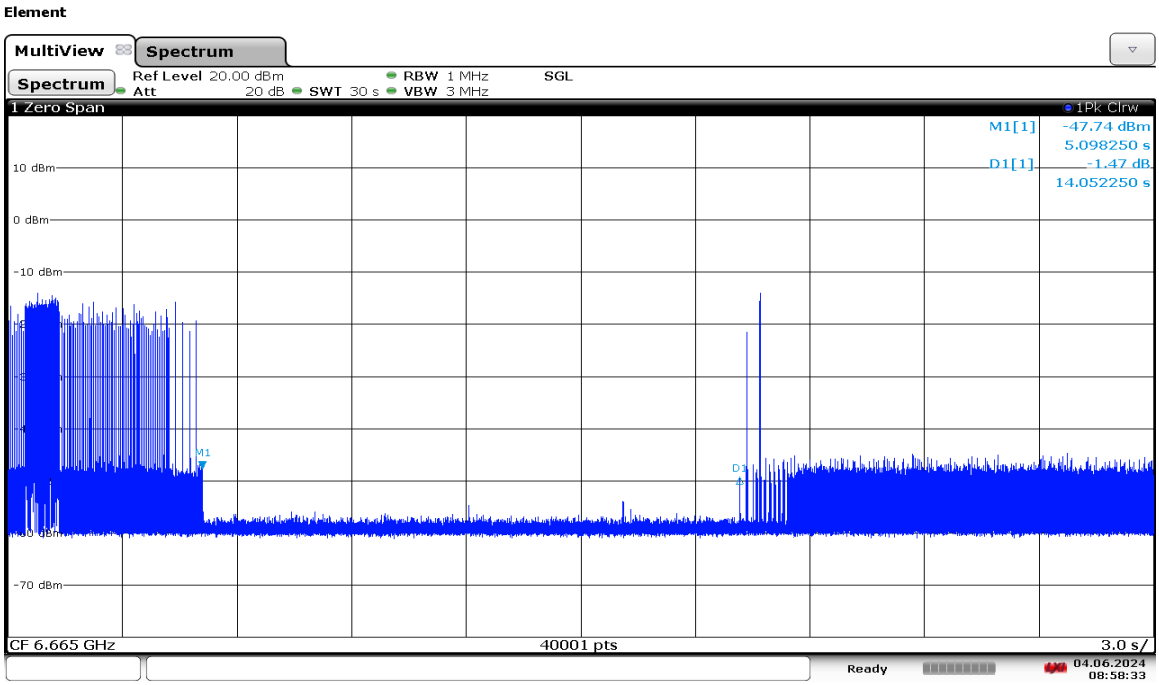
Plot 7-392. LPI, Contention Based Protocol Timing Plot – UNII 6 – 160MHz Channel 111 – High



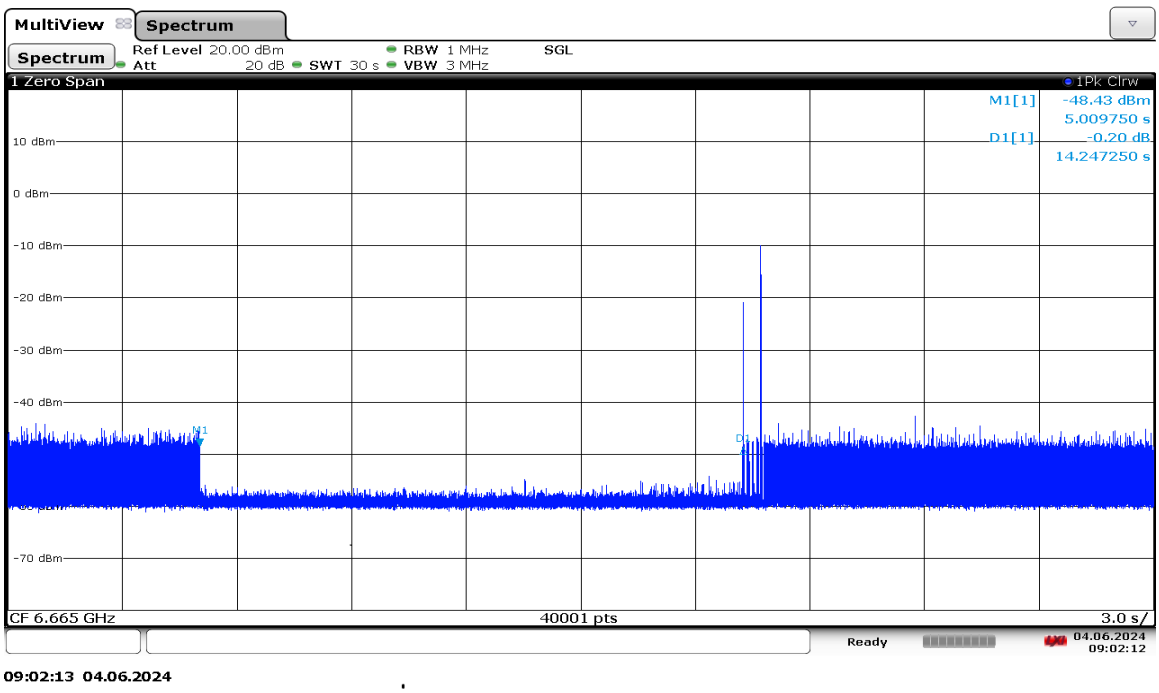
Plot 7-393. LPI, Contention Based Protocol Timing Plot – UNII 7 – 20MHz Channel 149



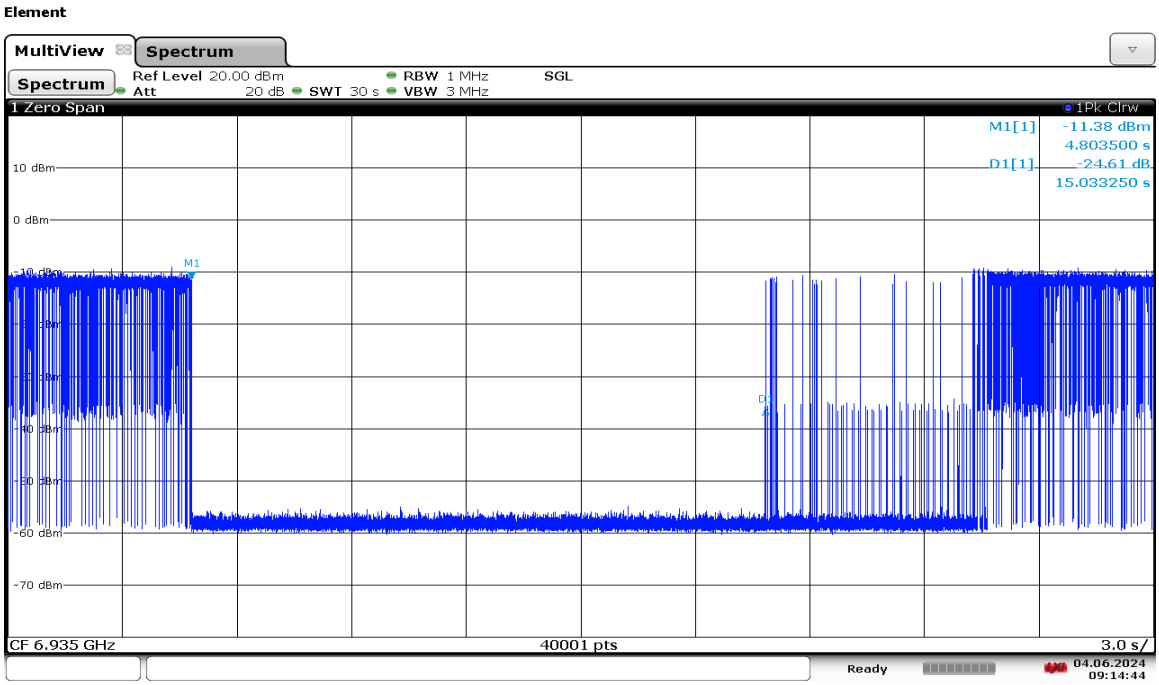
Plot 7-394. LPI, Contention Based Protocol Timing Plot – UNII 7 – 160MHz Channel 143 – Low



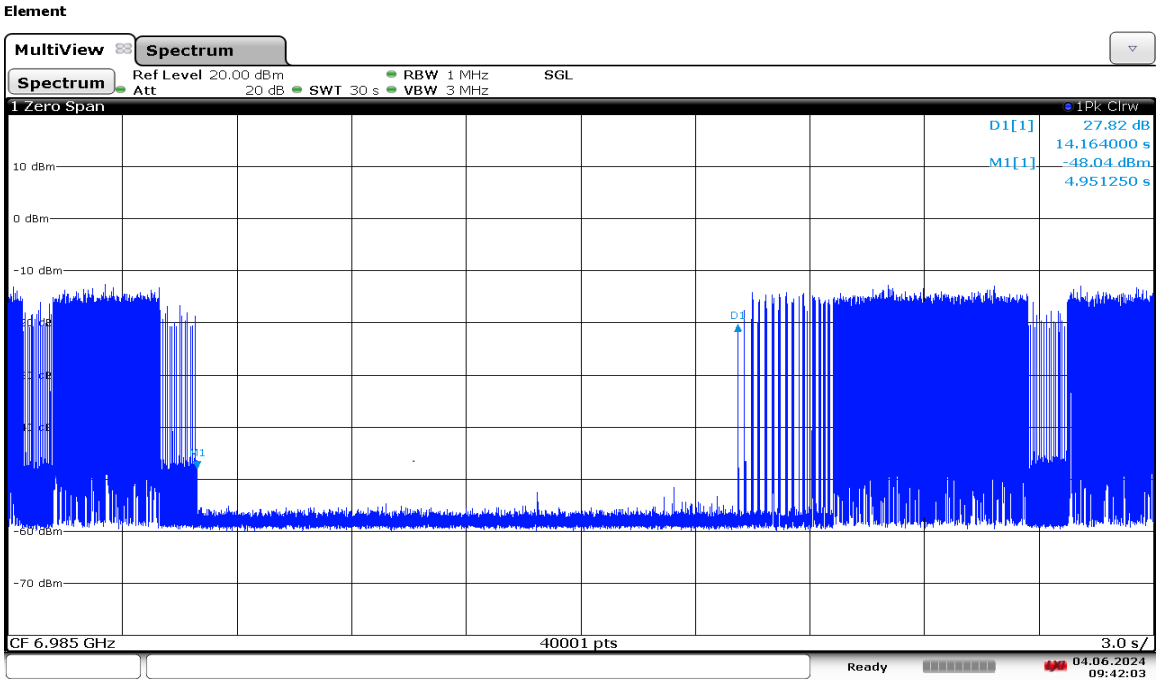
Plot 7-395. LPI, Contention Based Protocol Timing Plot – UNII 7 – 160MHz Channel 143 – Mid



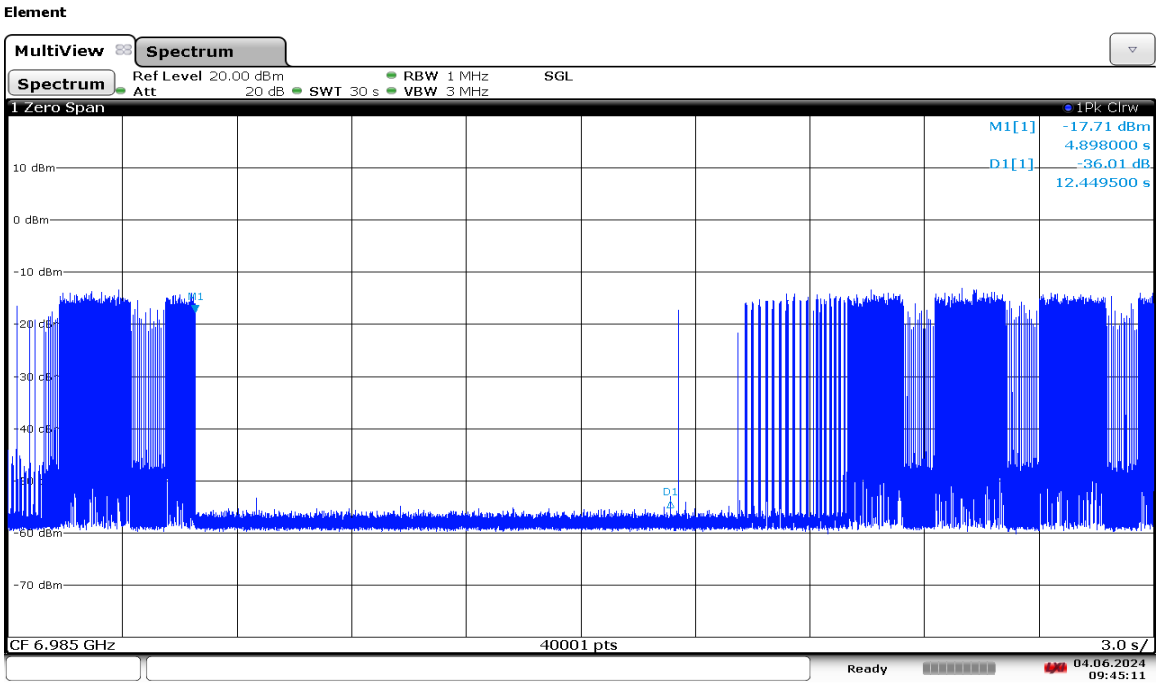
Plot 7-396. LPI, Contention Based Protocol Timing Plot – UNII 7 – 160MHz Channel 143 – High



Plot 7-397. LPI, Contention Based Protocol Timing Plot – UNII 8 – 20MHz Channel 197

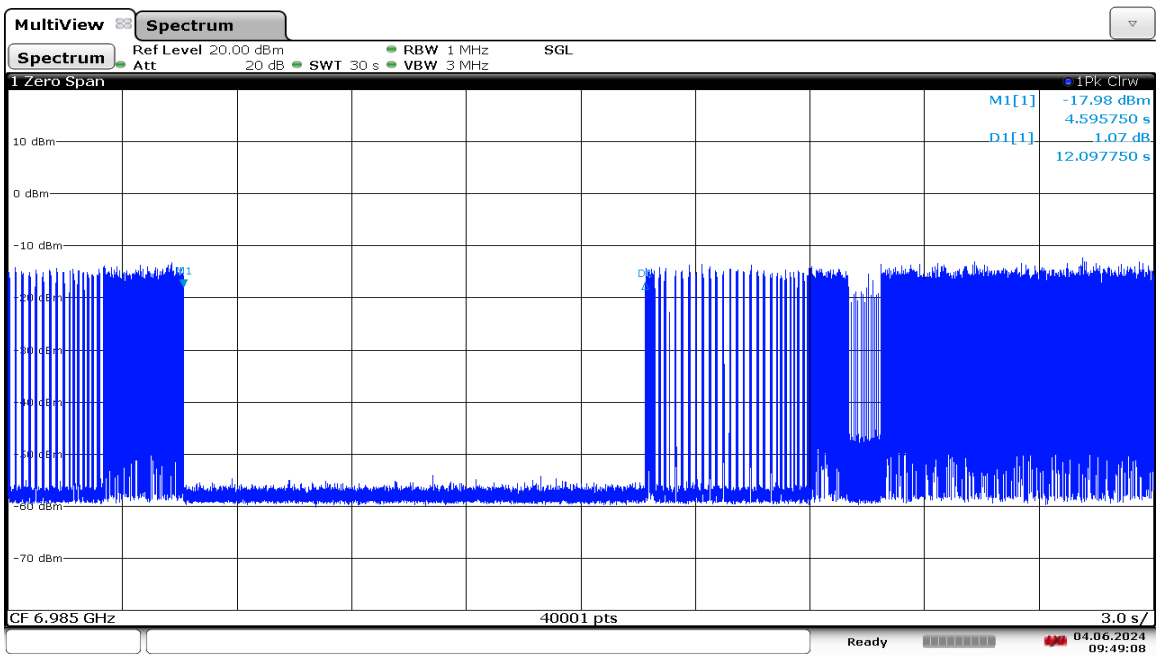


Plot 7-398. LPI, Contention Based Protocol Timing Plot – UNII 8 – 160MHz Channel 207 – Low



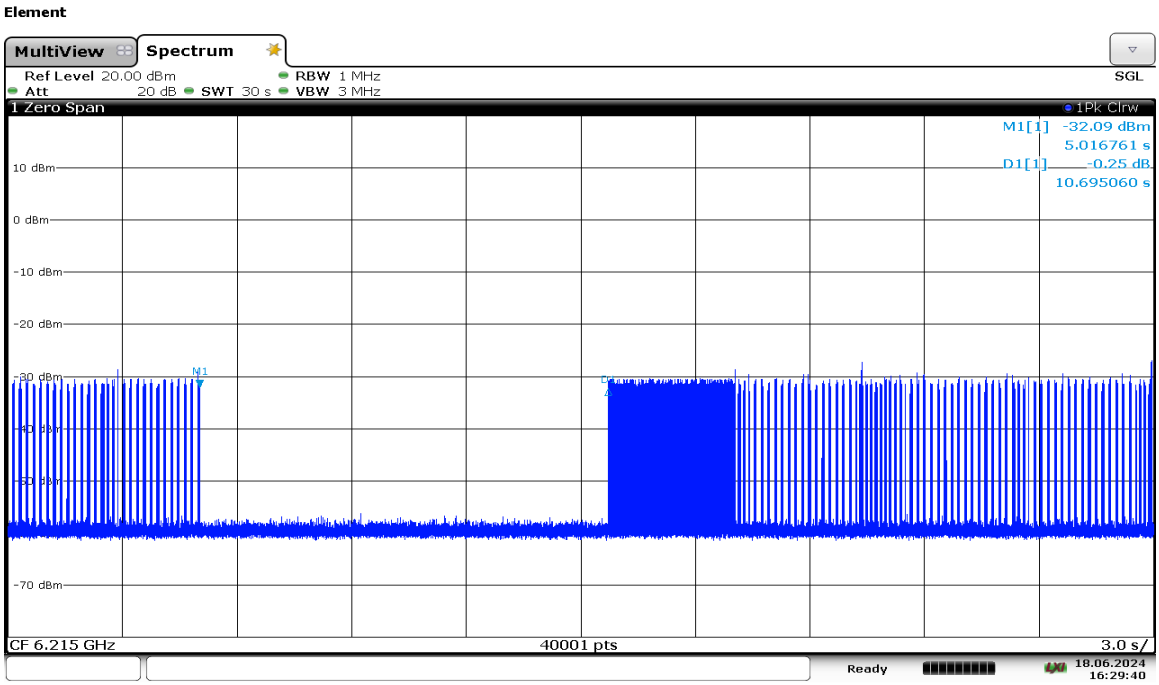
09:45:11 04.06.2024

Plot 7-399. LPI, Contention Based Protocol Timing Plot – UNII 8 – 160MHz Channel 207 – Mid



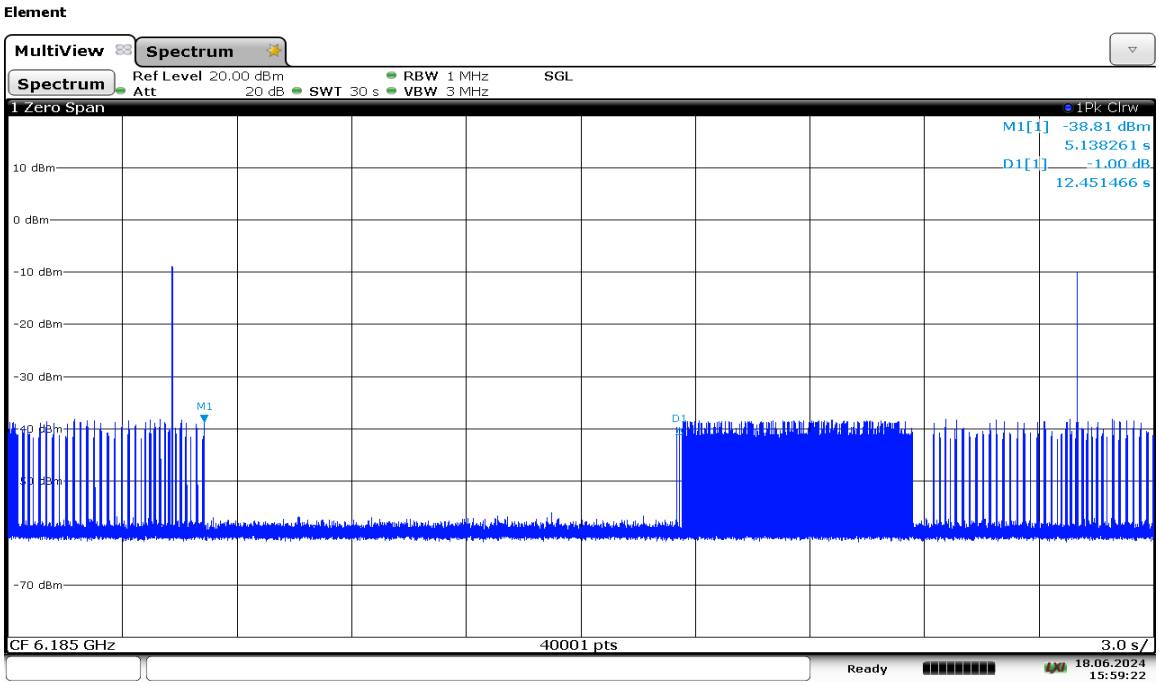
09:49:09 04.06.2024

Plot 7-400. LPI, Contention Based Protocol Timing Plot – UNII 8 – 160MHz Channel 207 – High



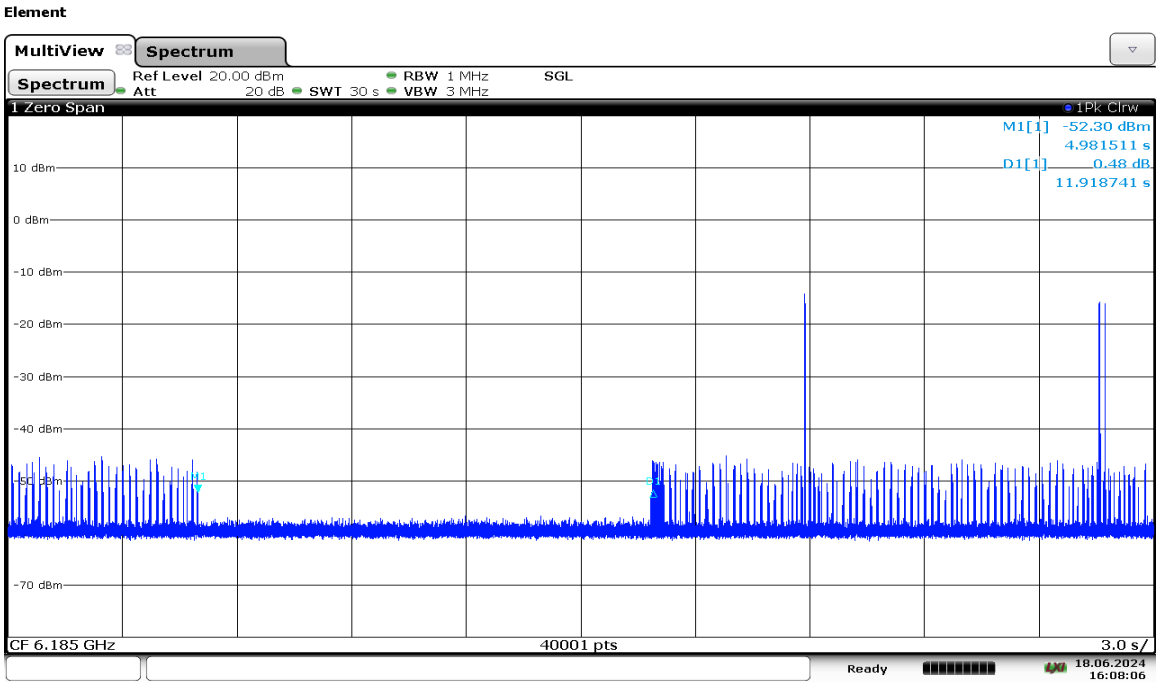
16:29:41 18.06.2024

Plot 7-401. VLP, Contention Based Protocol Timing Plot – UNII 5 – 20MHz Channel 53

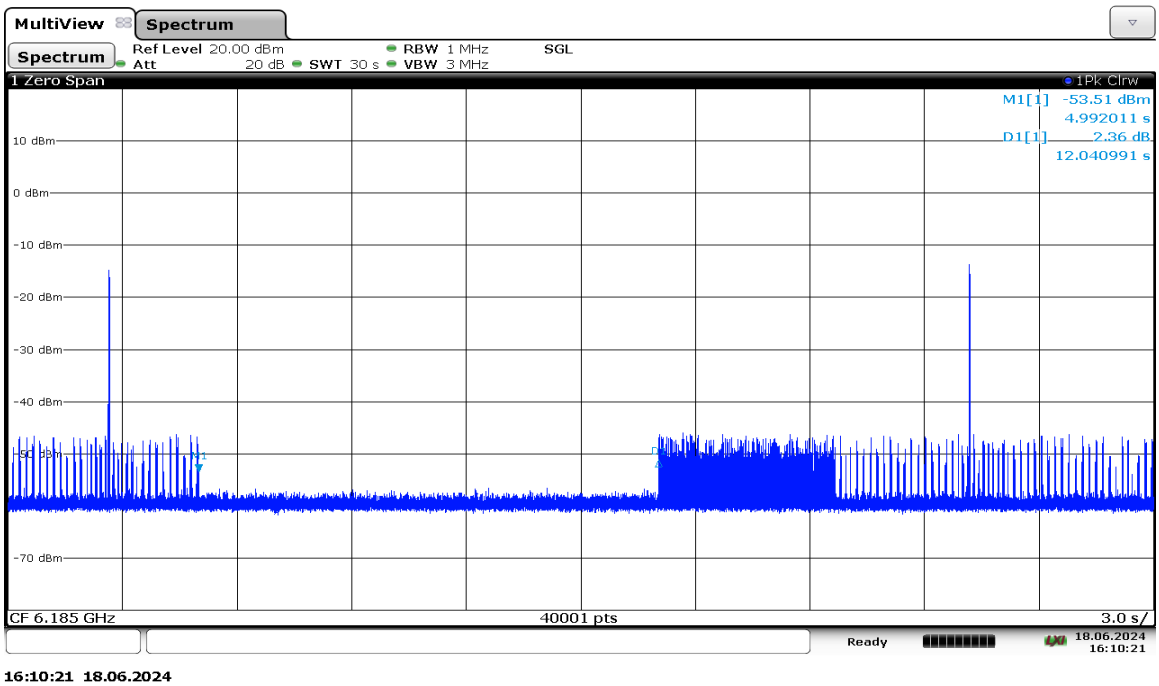


15:59:22 18.06.2024

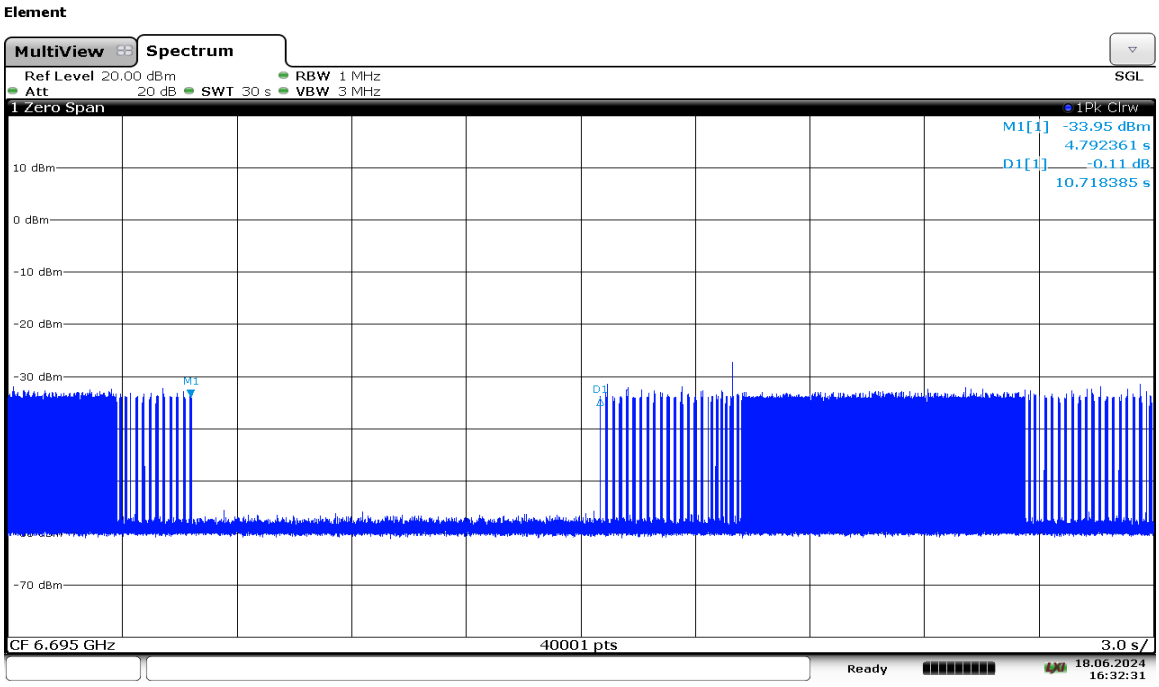
Plot 7-402. VLP, Contention Based Protocol Timing Plot – UNII 5 – 160MHz Channel 47 – Low



Plot 7-403. VLP, Contention Based Protocol Timing Plot – UNII 5 – 160MHz Channel 47 – Mid

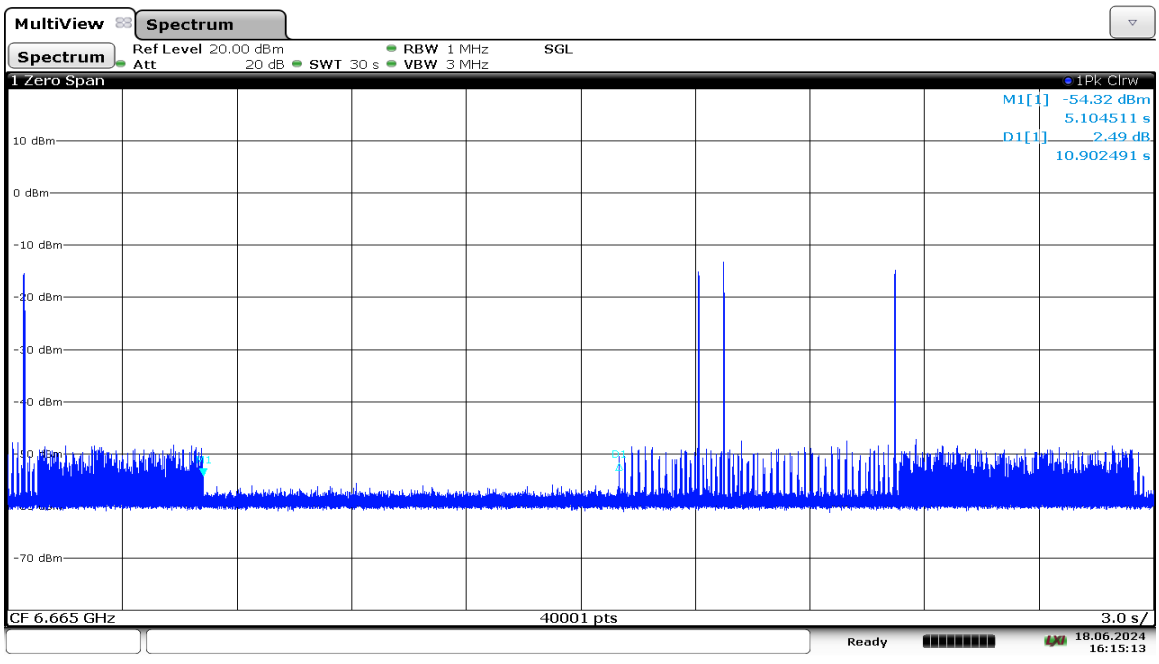


Plot 7-404. VLP, Contention Based Protocol Timing Plot – UNII 5 – 160MHz Channel 47 – High



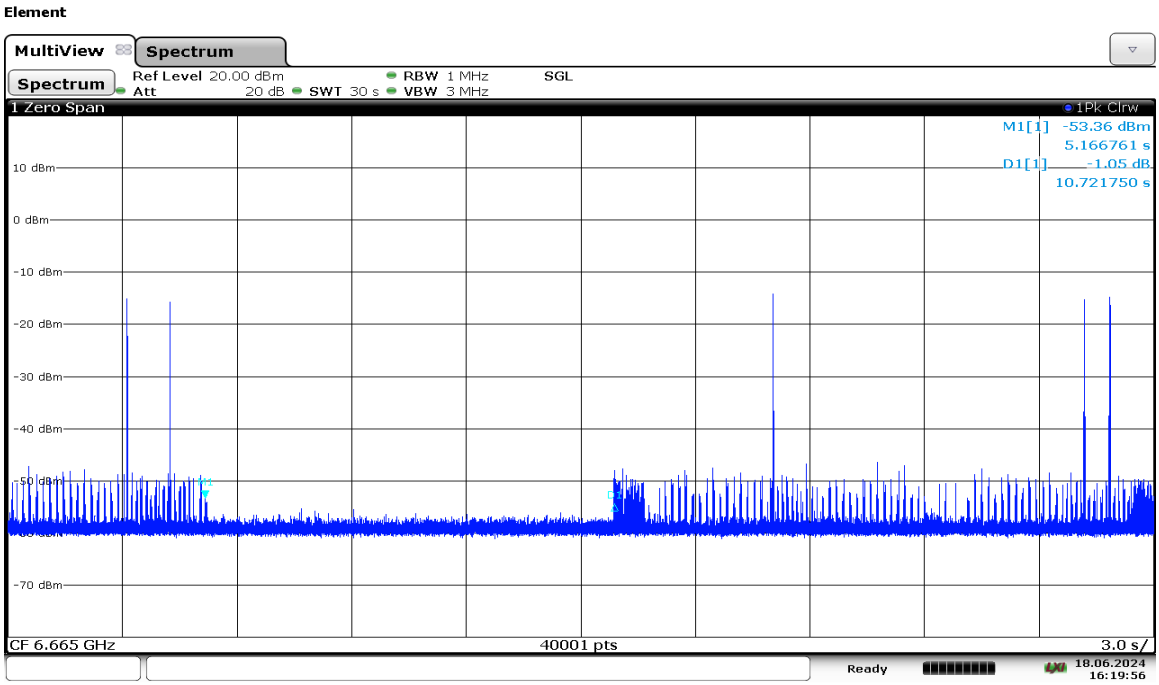
16:32:32 18.06.2024

Plot 7-405. VLP, Contention Based Protocol Timing Plot – UNII 7 – 20MHz Channel 149



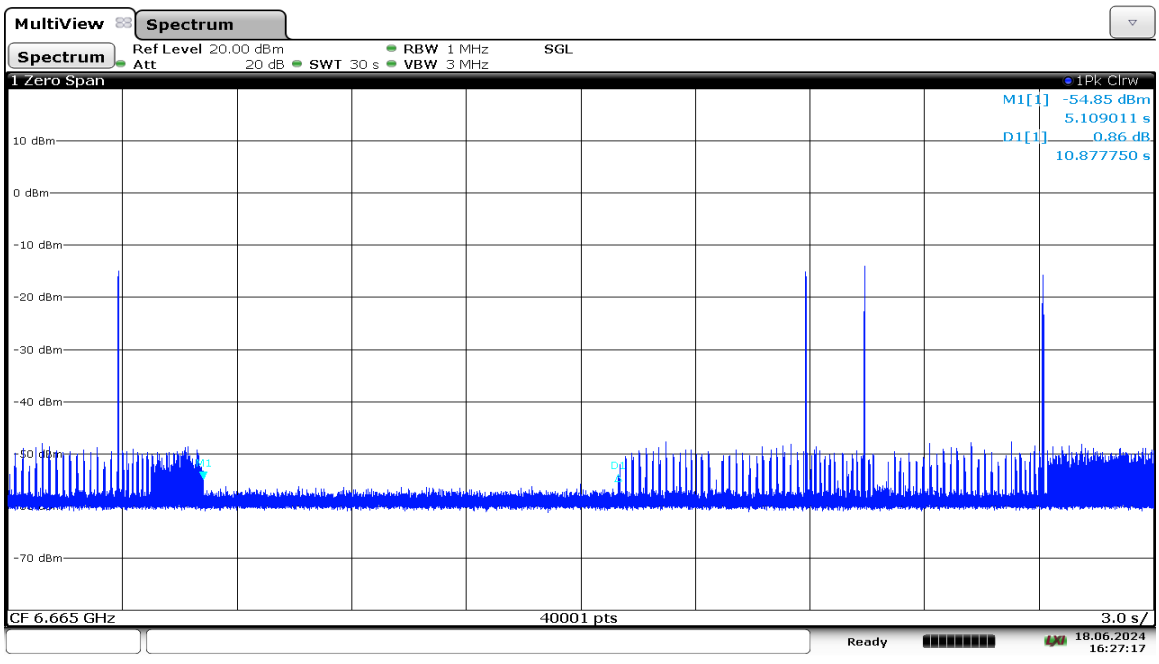
16:15:14 18.06.2024

Plot 7-406. VLP, Contention Based Protocol Timing Plot – UNII 7 – 160MHz Channel 143 – Low



16:19:57 18.06.2024

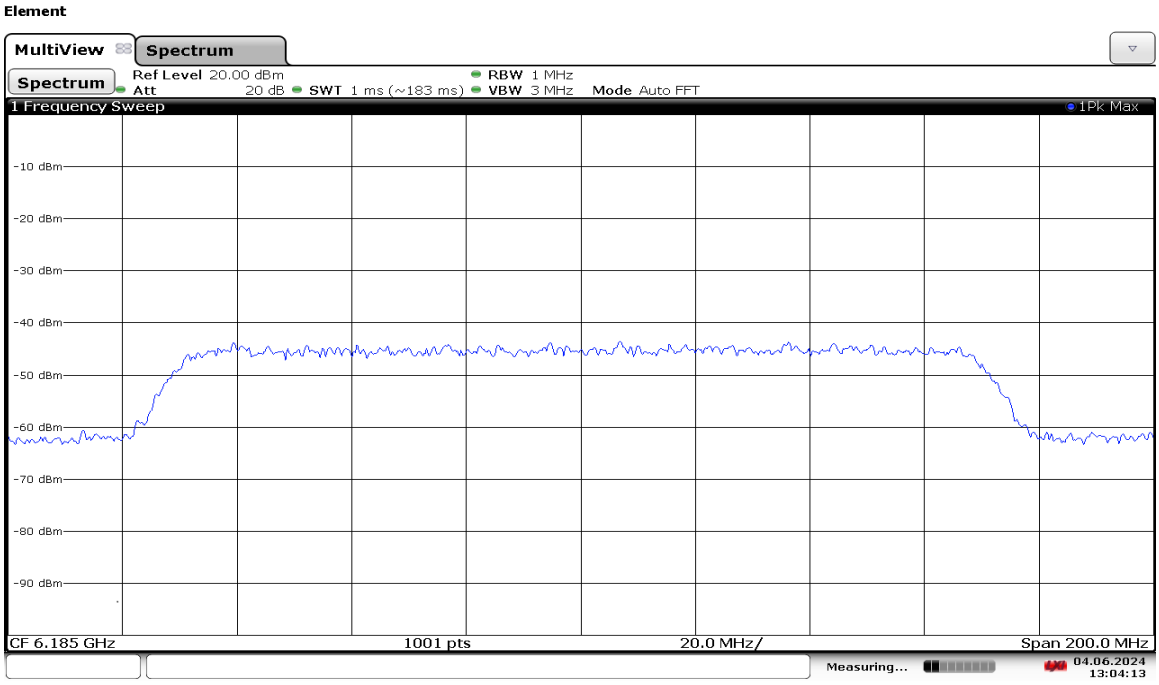
Plot 7-407. VLP, Contention Based Protocol Timing Plot – UNII 7 – 160MHz Channel 143 – Mid



16:27:18 18.06.2024

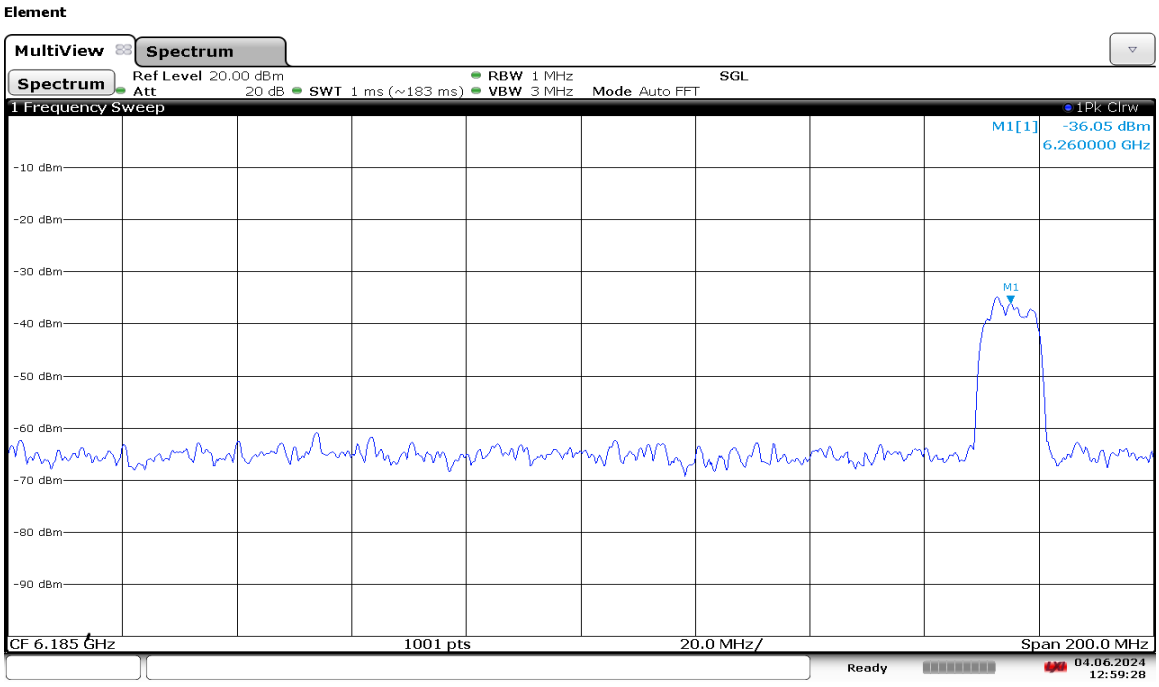
Plot 7-408. VLP, Contention Based Protocol Timing Plot – UNII 7 – 160MHz Channel 143 – High

CBP Bandwidth Reduction Plots



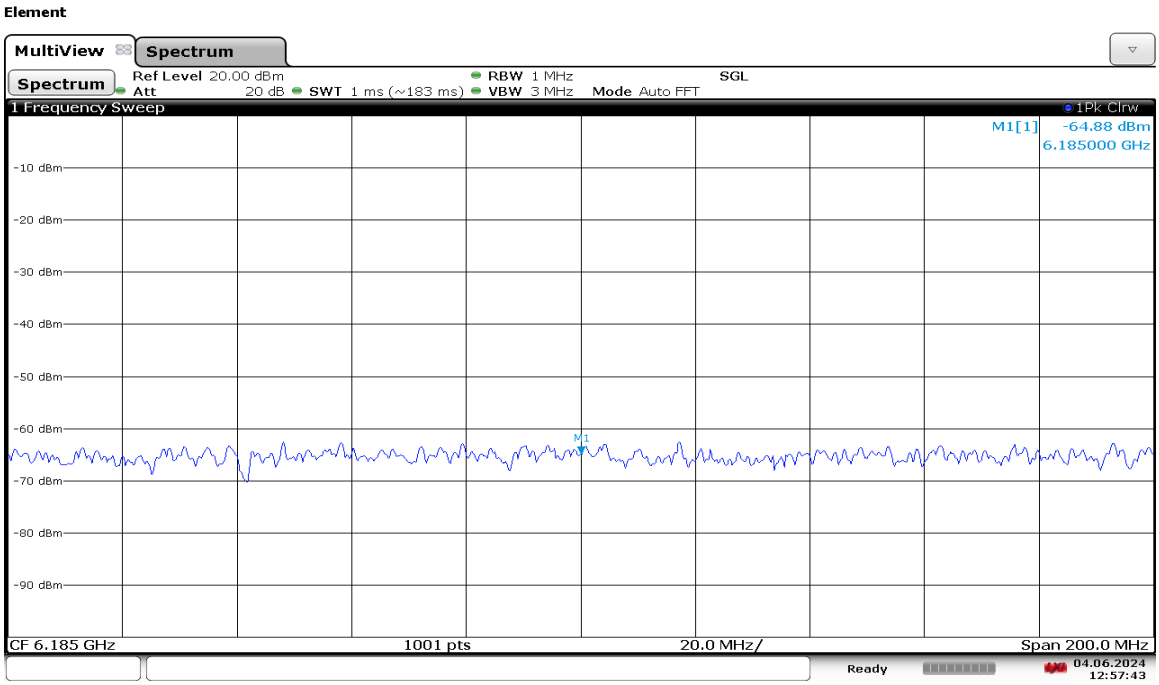
13:04:14 04.06.2024

Plot 7-409. 160MHz Bandwidth, Before AWGN Signal Injected – Channel 47

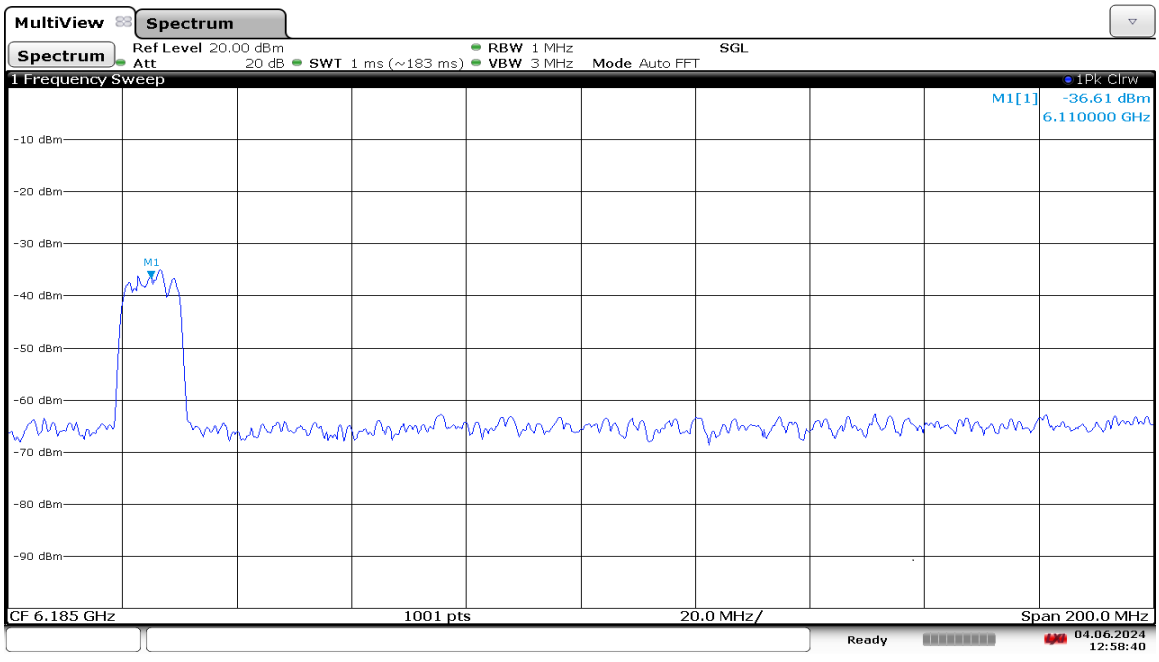


12:59:29 04.06.2024

Plot 7-410. 160MHz Bandwidth, AWGN Signal Injected at Low End – Channel 47



Plot 7-411. 160MHz Bandwidth, AWGN Signal Injected at Center – Channel 47



Plot 7-412. 160MHz Bandwidth, AWGN Signal Injected at High End – Channel 47

7.7 Transmit Power Control (TPC)

§15.407(d.10)

Test Overview and Limit

Very low power devices operating in the 5.925-6.425 and 6.525-6.875 GHz bands shall employ a transmit power control (TPC) mechanism. A very low power device is required to have the capability to operate at least 6 dB below the maximum EIRP power spectral density (PSD) value of −5 dBm/MHz.

Test Procedure Used

ANSI C63.10-2020 – Section 12.4.2.6
KDB 789033 D02 v02r01 – Section F

Test Settings

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Set span to encompass the entire 99% OBW of the signal..
3. Set sweep trigger to “free run.”
4. Set RBW = 1 MHz.
5. Set VBW ≥ 3 MHz
6. Number of points in sweep ≥ 2 × span / RBW.
7. Sweep time ≤ (number of points in sweep) × T, where T is defined
8. Detector = power averaging (rms).
9. Trace mode = max hold.
10. Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

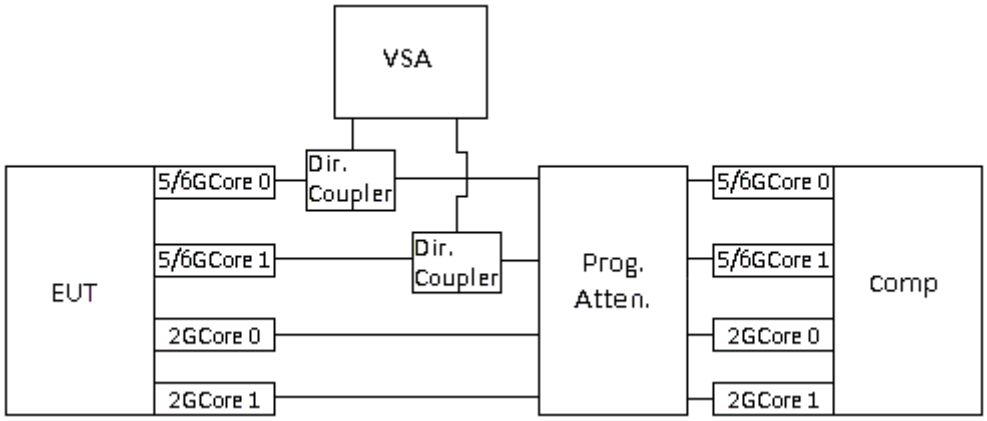


Figure 7-6. Test Instrument & Measurement Setup

This test demonstrates the ability of the device to increase and decrease power by the required 6dB as the RSSI is decreased and increased.

1. Configure EUT and companion device for peer-to-peer communication as shown in Figure 7-6.
2. Set variable attenuator to 0dB (noise free spectral environment, high RSSI simulation)
3. Establish a link and start communication between EUT and companion device
4. Capture PSD on spectrum analyzer
5. Set attenuator to 20dB (noisy spectral environment, low RSSI simulation)
6. Capture PSD on spectrum analyzer
7. Compare the highest PSD captured in step 4 to the highest PSD on step 6 and determine the delta.

Implementation Expectation: Tx power Backoff enabled at -20dBm or stronger RSSI, backoff disabled at -40dBm or weaker RSSI (RSSI updated every second)

Test Notes

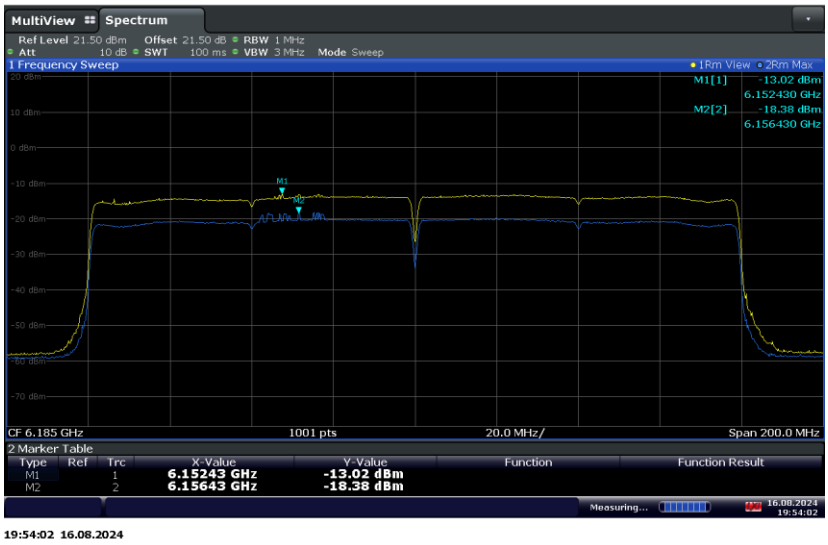
1. Companion device used was model: A2995 (refer to Table 2-10)
2. Per manufacturer's declaration, after establishing communication between the EUT and the companion device, 6GHz UNII signal was used to maintain communication and traffic.
3. TPC is triggered when a high RSSI is detected. As RSSI detected signal decreases, the transmitters output power will increase back to maximum allowed power.

BW [MHz]	Frequency [MHz]	MIMO Measured Power Density [dBm/MHz]		Summed Power Density [dBm/Mhz]	Antenna Gain [dBi]	e.i.r.p. Power Density [dBm/Mhz]	e.i.r.p. Power Density Limit [dBm/Mhz]	Pass/Fail
		Antenna WF5T	Antenna WF2					
160	6185MHz	-13.02	-13.41	-10.20	2.76	-7.44	-5	PASS

Table 7-59. PSD Measurements (No TPC)

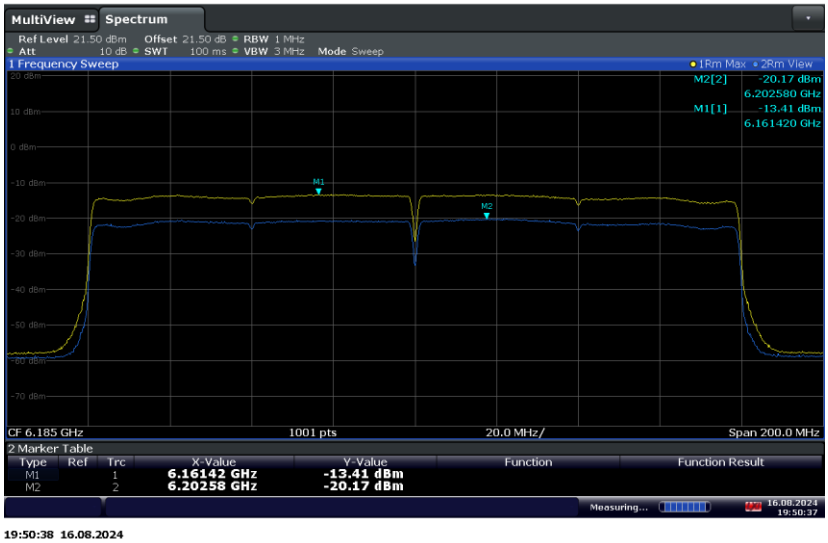
BW [MHz]	Frequency [MHz]	MIMO Measured Power Density [dBm/MHz]		Summed Power Density [dBm/Mhz]	Antenna Gain [dBi]	e.i.r.p. Power Density [dBm/Mhz]	TPC e.i.r.p. Power Density Limit [dBm/Mhz]	Pass/Fail
		Antenna WF5T	Antenna WF2					
160	6185MHz	-18.38	-20.17	-16.17	2.76	-13.42	-11	PASS

Table 7-60. PSD Measurements (with TPC)



19:54:02 16.08.2024

Plot 7-413. 160MHz Bandwidth – 6185MHz Antenna WF5T



Plot 7-414. 160MHz Bandwidth – 6185MHz Antenna WF2

7.8 Radiated Spurious Emissions – Above 1GHz

§15.407(b) §15.205 §15.209

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2020 and KDB 789033 D02 v02r01, and at the appropriate frequencies. All channels, modes (e.g. 802.11a, 802.11ax(SU) (20MHz BW), 802.11ax(SU) (40MHz BW), 802.11ax(SU) (80MHz), 802.11ax(SU) (160MHz) and modulations/data rates were investigated among all UNII bands. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

For transmitters operating in the 5.925-7.125 GHz band: All emissions outside of the 5.925-7.125 GHz band shall not exceed an EIRP of −27 dBm/MHz. Emissions found in a restricted band are subject to the limits of 15.209 as shown in the table below.

Frequency	Field Strength [µV/m]	Measured Distance [Meters]
Above 960.0 MHz	500	3

Table 7-61. Radiated Limits

Test Procedures Used

ANSI C63.10-2020 – Sections 12.7.7.2, 12.7.6.
KDB 789033 D02 v02r01 – Section G

Test Settings

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be ≥ 2 x span/RBW)
6. Averaging type = power (RMS)
7. Sweep time = auto couple
8. Trace was averaged over 100 sweeps

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

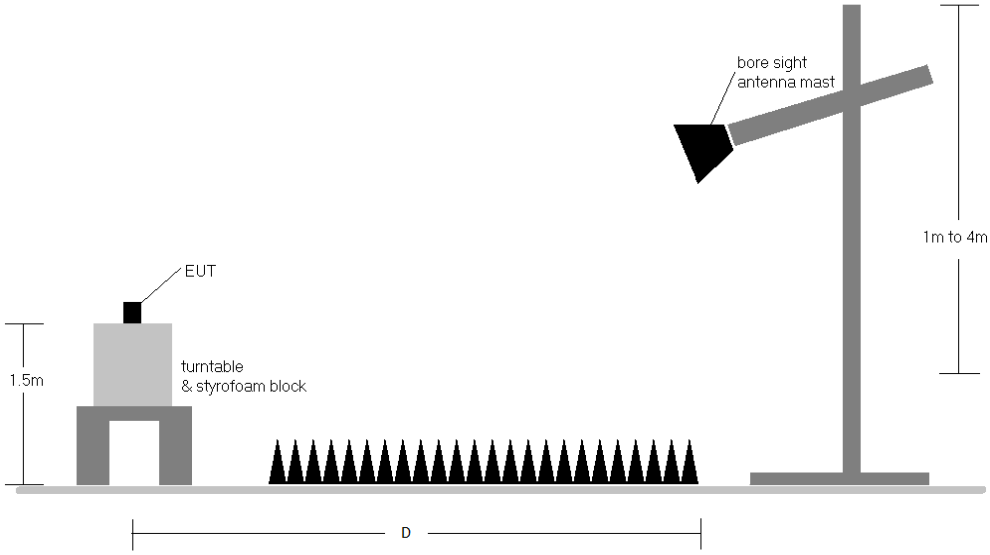


Figure 7-7. Test Instrument & Measurement Setup

Test Notes

1. All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 7-61.
2. All spurious emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 7-61. All spurious emissions that do not lie in a restricted band are subject to a limit of -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. This unit was tested with its standard battery.
5. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas.
6. D is the measurement test distance and emissions 1-18GHz were measured at a 3 meters test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
7. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section.
8. All data rates were investigated and only the worse case is reported
9. The unit was tested with all possible modes and only the highest emission is reported.
10. The "-" shown in the following RSE tables are used to denote a noise floor measurement.
11. All radiated measurements were tested at the highest supported power setting per band.

Sample Calculations

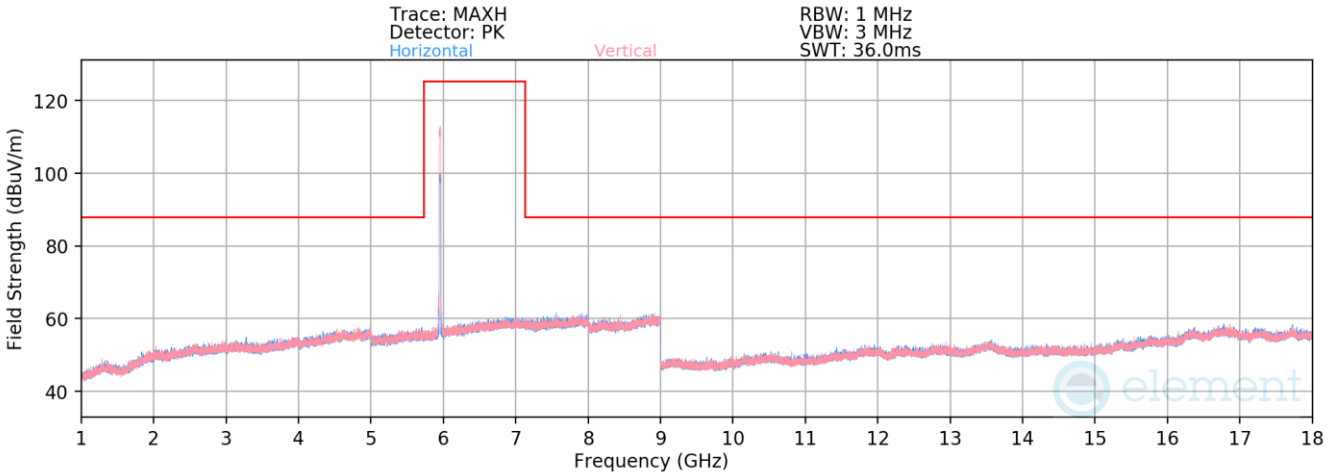
Determining Spurious Emissions Levels

- Field Strength Level [dBμV/m] = Analyzer Level [dBm] + 107 + AFCL [dB/m]
- AFCL [dB/m] = Antenna Factor [dB/m] + Cable Loss [dB] – Preamplifier Gain [dB]
- Margin [dB] = Field Strength Level [dBμV/m] – Limit [dBμV/m]

Radiated Band Edge Measurement Offset

- The amplitude offset shown in the radiated restricted band edge plots in Section 7.7.6 to 7.7.25 was calculated using the formula:
  Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

7.8.1 Antenna WF5T Radiated Spurious Emission

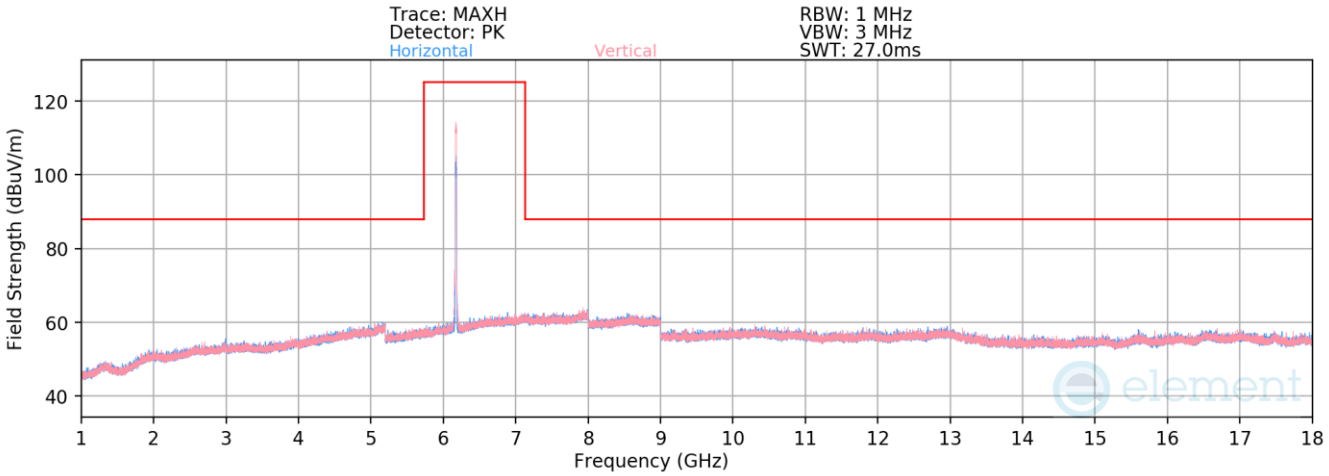


Plot 7-415. Radiated Spurious Emissions above 1GHz Antenna WF5T (802.11ax – Ch. 1)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5955MHz
Channel:	1

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11910.00	Average	V	-	-	-82.48	16.30	40.82	53.98	-13.16
*	11910.00	Peak	V	-	-	-73.71	16.30	49.59	73.98	-24.39
*	17865.00	Average	V	-	-	-84.55	23.81	46.26	53.98	-7.72
*	17865.00	Peak	V	-	-	-74.22	23.81	56.59	73.98	-17.39

Table 7-62. Radiated Spurious Emission Measurements Antenna WF5T

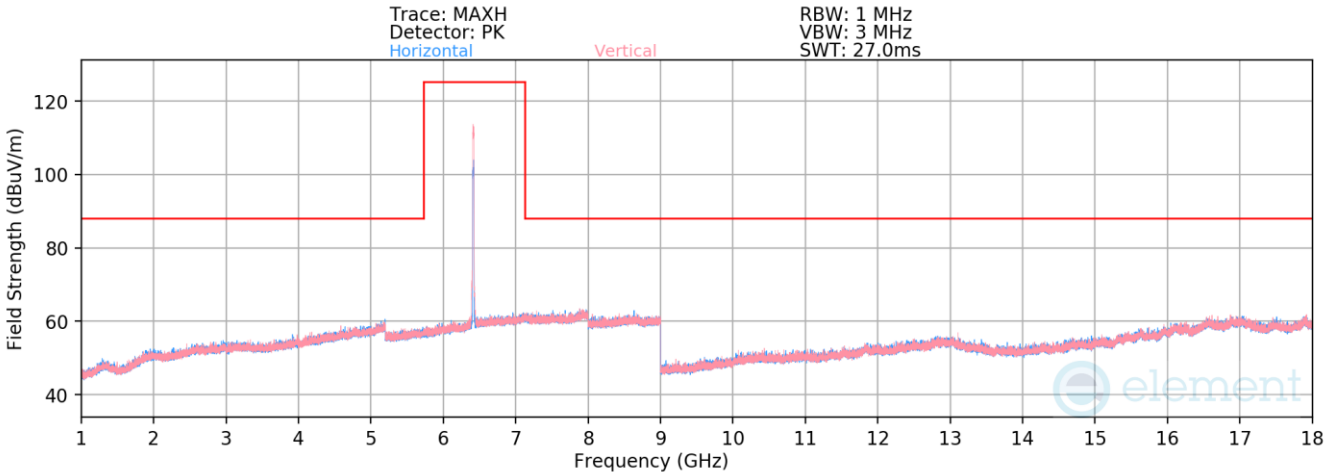


Plot 7-416. Radiated Spurious Emissions above 1GHz Antenna WF5T (802.11ax – Ch. 45)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6175MHz
Channel:	45

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	12350.00	Average	V	-	-	-85.71	21.24	42.53	53.98	-11.45
*	12350.00	Peak	V	-	-	-74.37	21.24	53.87	73.98	-20.11

Table 7-63. Radiated Spurious Emission Measurements Antenna WF5T

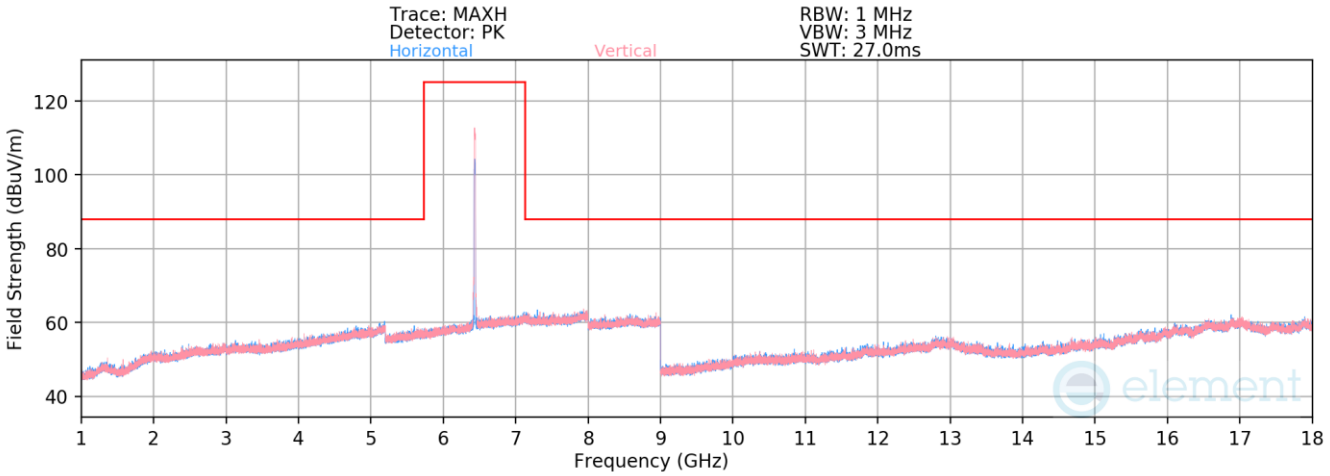


Plot 7-417. Radiated Spurious Emissions above 1GHz Antenna WF5T (802.11ax – Ch. 93)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6415MHz
Channel:	93

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
12830.00	Average	V	-	-	-85.66	22.29	43.63	68.20	-24.57
12830.00	Peak	V	-	-	-74.21	22.29	55.08	88.23	-33.15

Table 7-64. Radiated Spurious Emission Measurements Antenna WF5T

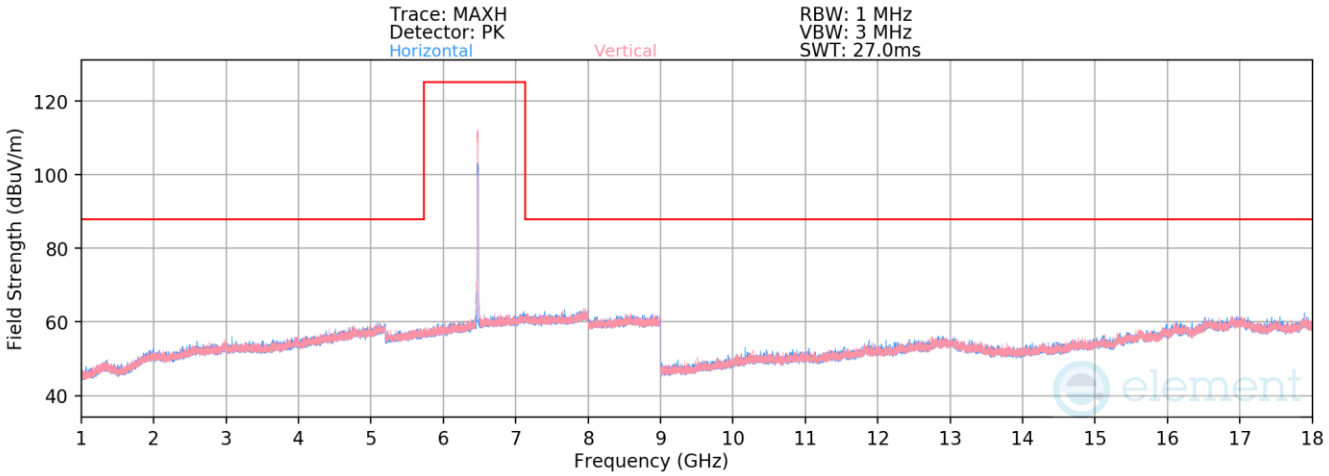


Plot 7-418. Radiated Spurious Emissions above 1GHz Antenna WF5T (802.11ax – Ch. 97)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6435MHz
Channel:	97

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
12870.00	Average	V	-	-	-85.61	22.00	43.39	68.20	-24.81
12870.00	Peak	V	-	-	-74.28	22.00	54.72	88.23	-33.51

Table 7-65. Radiated Spurious Emission Measurements Antenna WF5T

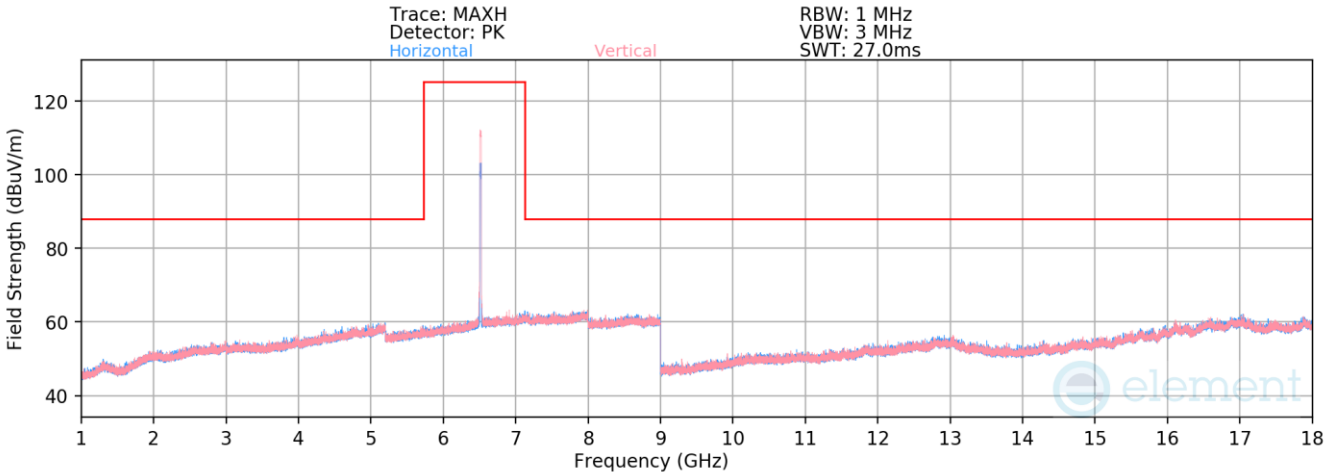


Plot 7-419. Radiated Spurious Emissions above 1GHz Antenna WF5T (802.11ax – Ch. 105)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6475MHz
Channel:	105

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
12950.00	Average	V	-	-	-85.75	22.25	43.50	68.20	-24.70
12950.00	Peak	V	-	-	-74.05	22.25	55.20	88.23	-33.03

Table 7-66. Radiated Spurious Emission Measurements Antenna WF5T

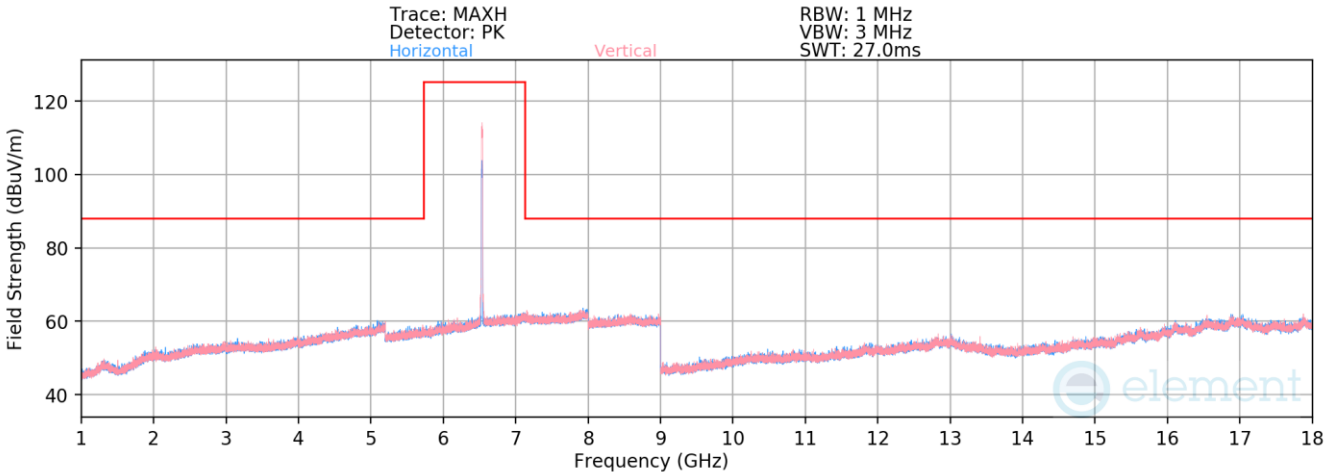


Plot 7-420. Radiated Spurious Emissions above 1GHz Antenna WF5T (802.11ax – Ch. 113)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6515MHz
Channel:	113

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13030.00	Average	V	-	-	-85.38	22.37	43.99	68.20	-24.21
13030.00	Peak	V	-	-	-74.06	22.37	55.31	88.23	-32.92

Table 7-67. Radiated Spurious Emission Measurements Antenna WF5T

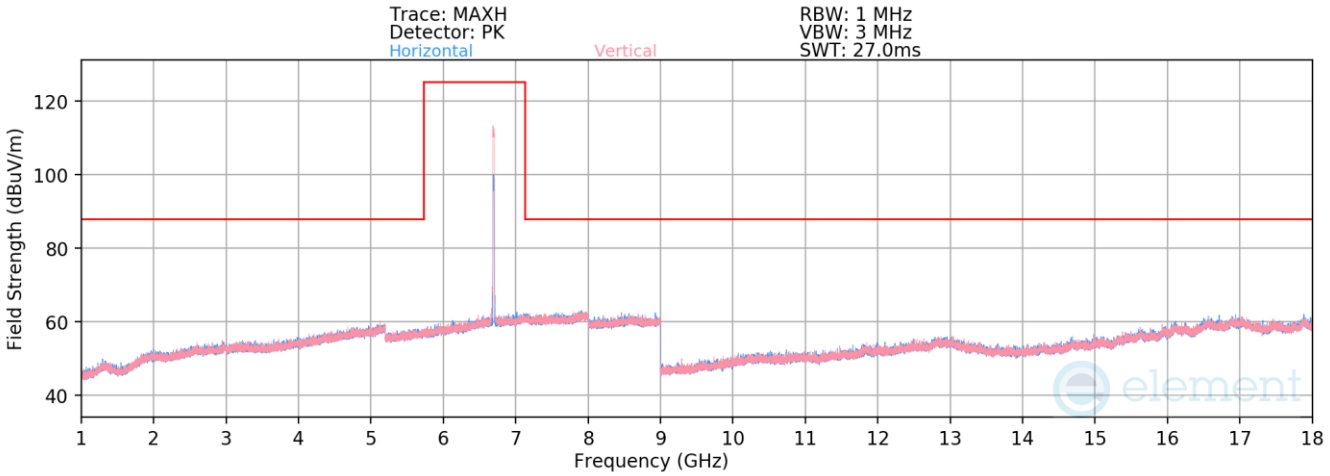


Plot 7-421. Radiated Spurious Emissions above 1GHz Antenna WF5T (802.11ax – Ch. 117)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6535MHz
Channel:	117

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13070.00	Average	V	-	-	-85.32	22.37	44.05	68.20	-24.15
13070.00	Peak	V	-	-	-74.48	22.37	54.89	88.23	-33.34

Table 7-68. Radiated Spurious Emission Measurements Antenna WF5T

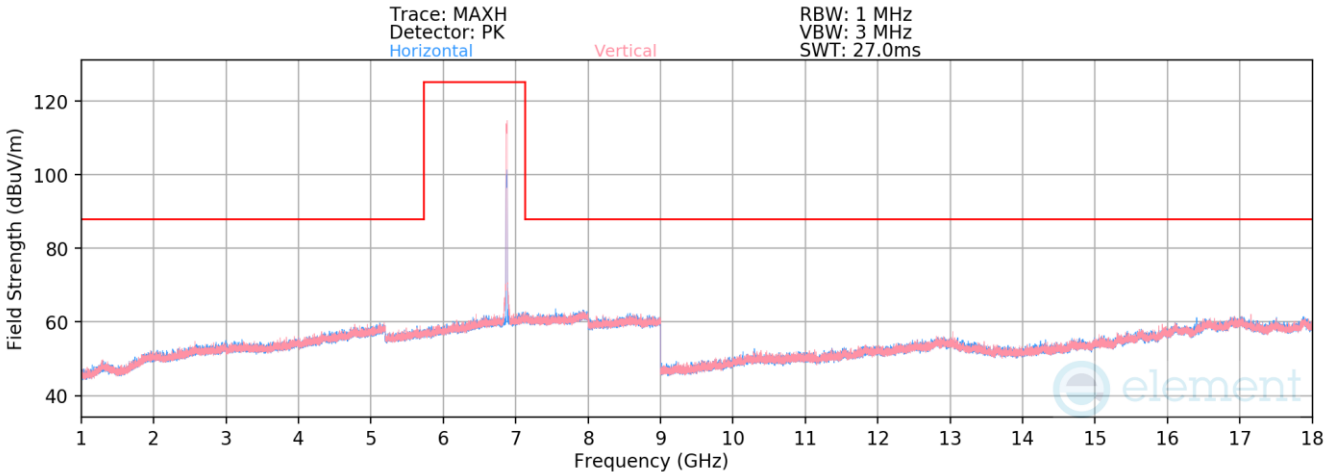


Plot 7-422. Radiated Spurious Emissions above 1GHz Antenna WF5T (802.11ax – Ch. 149)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6695MHz
Channel:	149

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	13390.00	Average	V	-	-	-85.91	22.03	43.12	53.98	-10.86
*	13390.00	Peak	V	-	-	-74.11	22.03	54.92	73.98	-19.06

Table 7-69. Radiated Spurious Emission Measurements Antenna WF5T

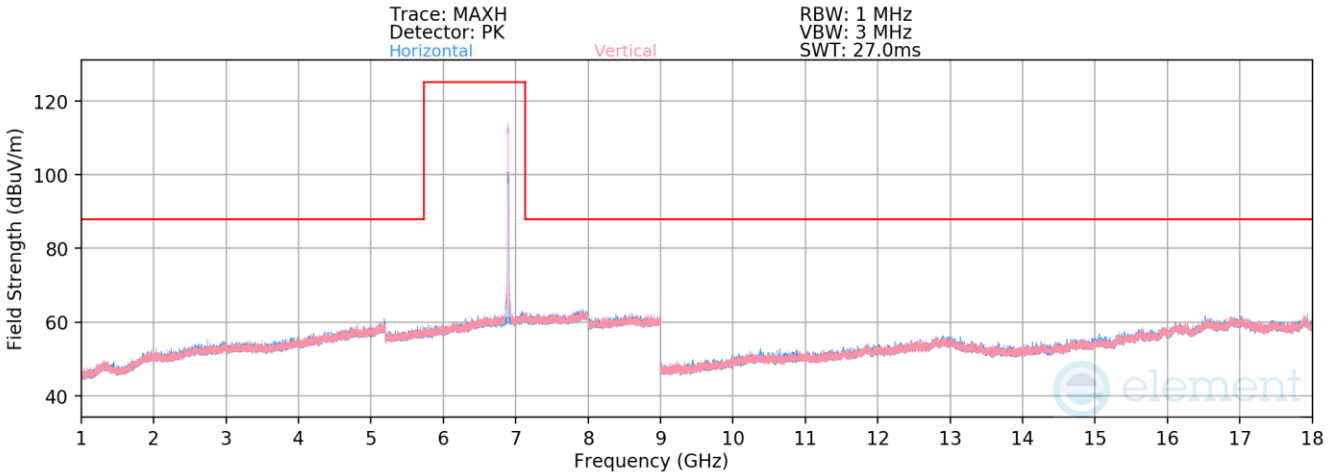


Plot 7-423. Radiated Spurious Emissions above 1GHz Antenna WF5T (802.11ax – Ch. 185)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6875MHz
Channel:	185

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13750.00	Average	V	-	-	-86.06	21.86	42.80	68.20	-25.40
13750.00	Peak	V	-	-	-74.97	21.86	53.89	88.23	-34.34

Table 7-70. Radiated Spurious Emission Measurements Antenna WF5T

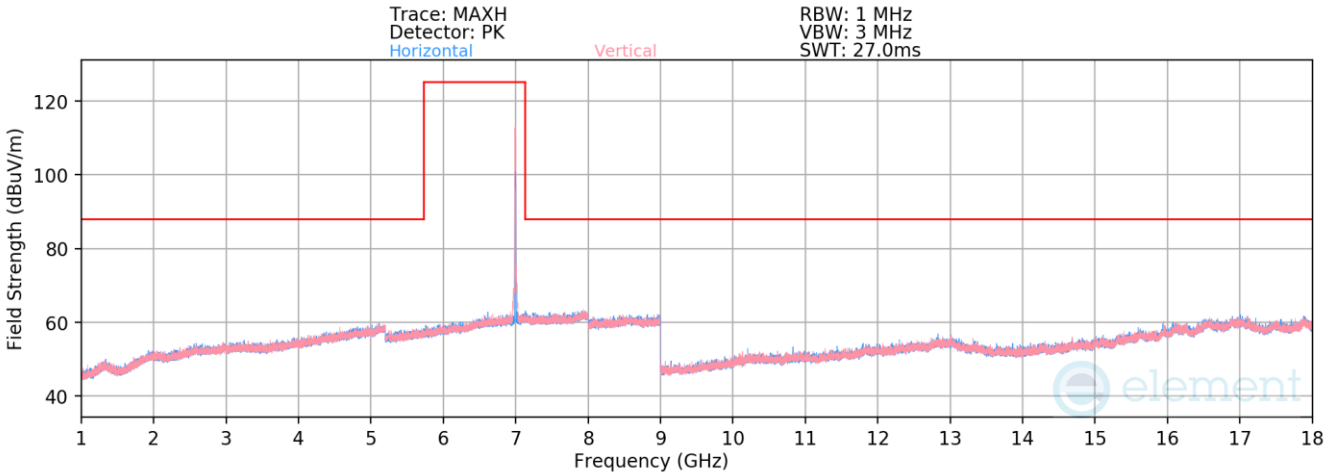


Plot 7-424. Radiated Spurious Emissions above 1GHz Antenna WF5T (802.11ax – Ch. 189)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6895MHz
Channel:	189

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13790.00	Average	V	-	-	-86.48	22.38	42.90	68.20	-25.30
13790.00	Peak	V	-	-	-75.27	22.38	54.11	88.23	-34.12

Table 7-71. Radiated Spurious Emission Measurements Antenna WF5T

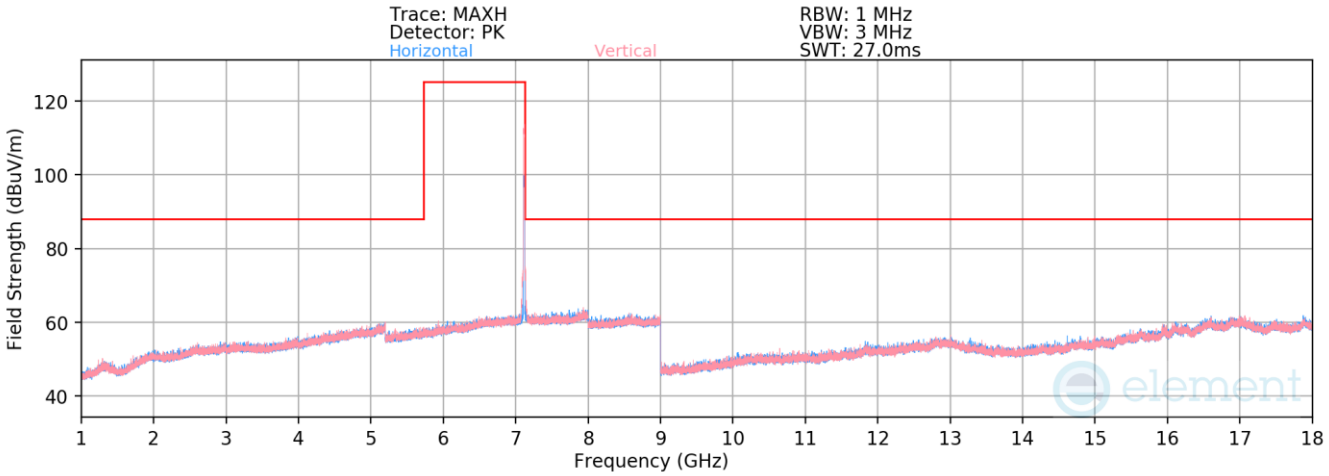


Plot 7-425. Radiated Spurious Emissions above 1GHz Antenna WF5T (802.11ax – Ch. 209)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6995MHz
Channel:	209

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13990.00	Average	H	-	-	-86.54	22.31	42.77	68.20	-25.43
13990.00	Peak	H	-	-	-75.33	22.31	53.98	88.23	-34.25

Table 7-72. Radiated Spurious Emission Measurements Antenna WF5T



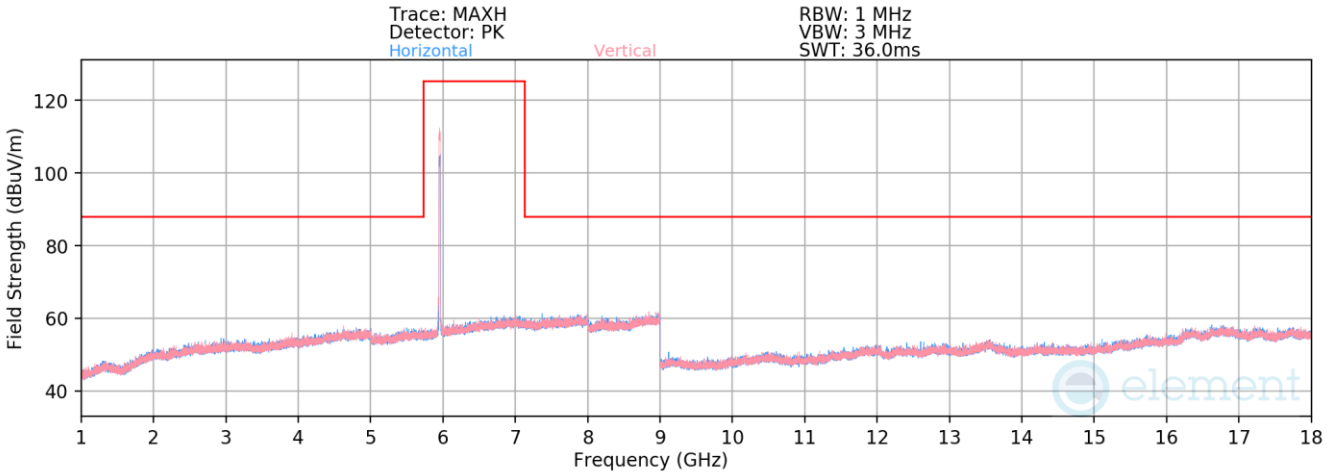
Plot 7-426. Radiated Spurious Emissions above 1GHz Antenna WF5T (802.11ax – Ch. 233)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	7115MHz
Channel:	233

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
14230.00	Average	H	-	-	-85.88	22.37	43.49	68.20	-24.71
14230.00	Peak	H	-	-	-75.08	22.37	54.29	88.23	-33.94

Table 7-73. Radiated Spurious Emission Measurements Antenna WF5T

7.8.2 Antenna WF2 Radiated Spurious Emission

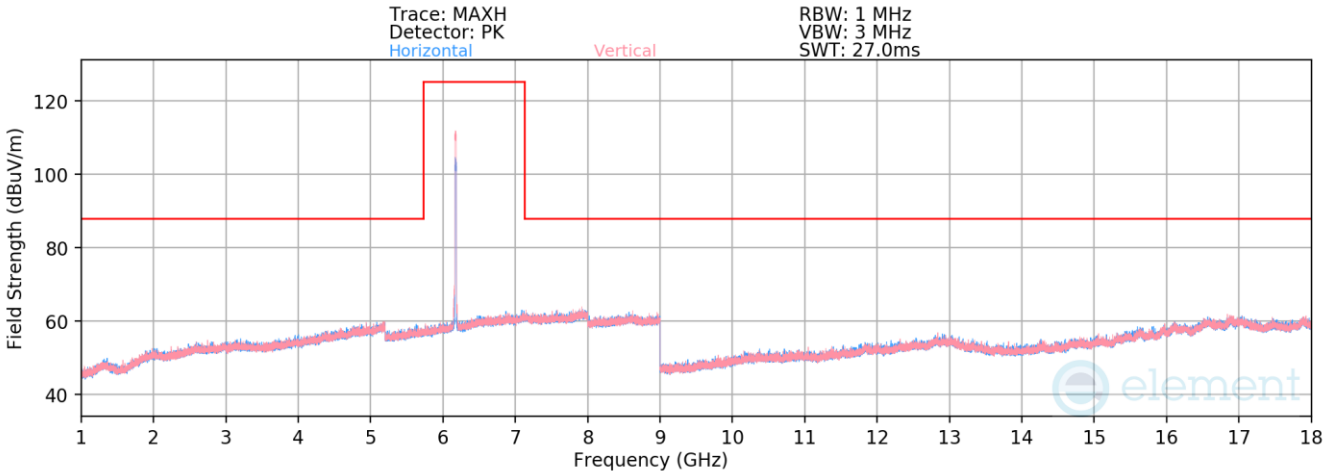


Plot 7-427. Radiated Spurious Emissions above 1GHz Antenna WF2 (802.11ax – Ch. 1)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5955MHz
Channel:	1

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11910.00	Average	H	-	-	-82.79	16.30	40.51	53.98	-13.47
*	11910.00	Peak	H	-	-	-74.17	16.30	49.13	73.98	-24.85
*	17865.00	Average	H	-	-	-84.73	23.81	46.08	53.98	-7.90
*	17865.00	Peak	H	-	-	-74.25	23.81	56.56	73.98	-17.42

Table 7-74. Radiated Spurious Emission Measurements Antenna WF2

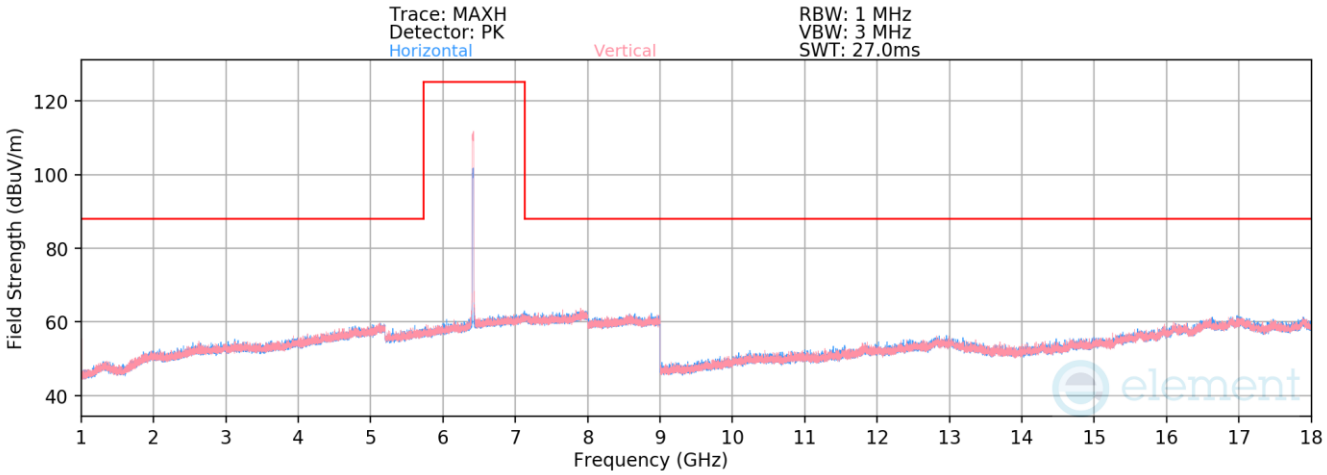


Plot 7-428. Radiated Spurious Emissions above 1GHz Antenna WF2 (802.11ax – Ch. 45)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6175MHz
Channel:	45

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	12350.00	Average	H	-	-	-85.63	21.24	42.61	53.98	-11.37
*	12350.00	Peak	H	-	-	-74.66	21.24	53.58	73.98	-20.40

Table 7-75. Radiated Spurious Emission Measurements Antenna WF2

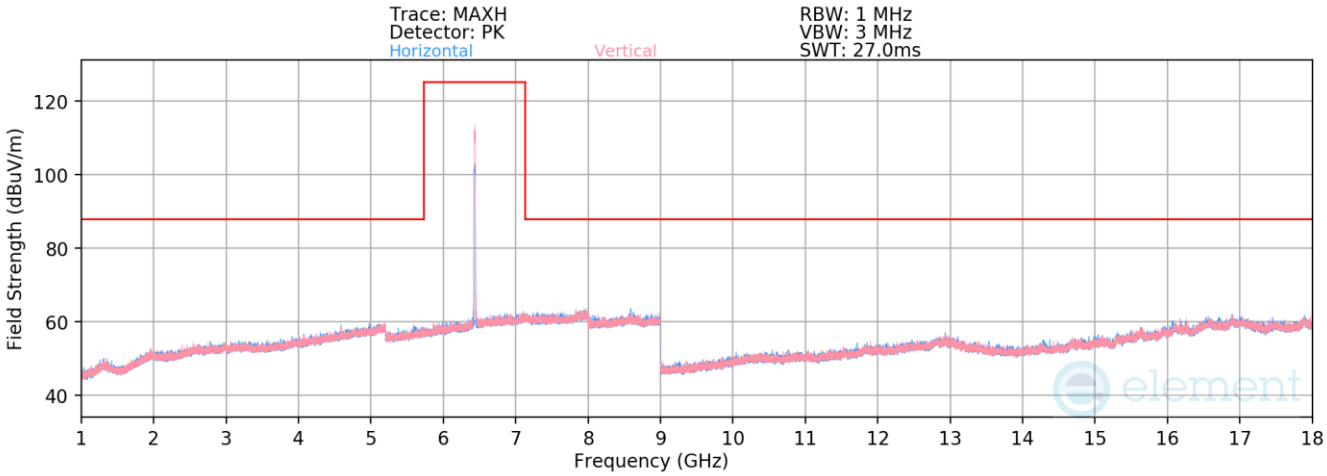


Plot 7-429. Radiated Spurious Emissions above 1GHz Antenna WF2 (802.11ax – Ch. 93)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6415MHz
Channel:	93

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
12830.00	Average	H	-	-	-85.55	22.29	43.74	68.20	-24.46
12830.00	Peak	H	-	-	-73.94	22.29	55.35	88.23	-32.88

Table 7-76. Radiated Spurious Emission Measurements Antenna WF2

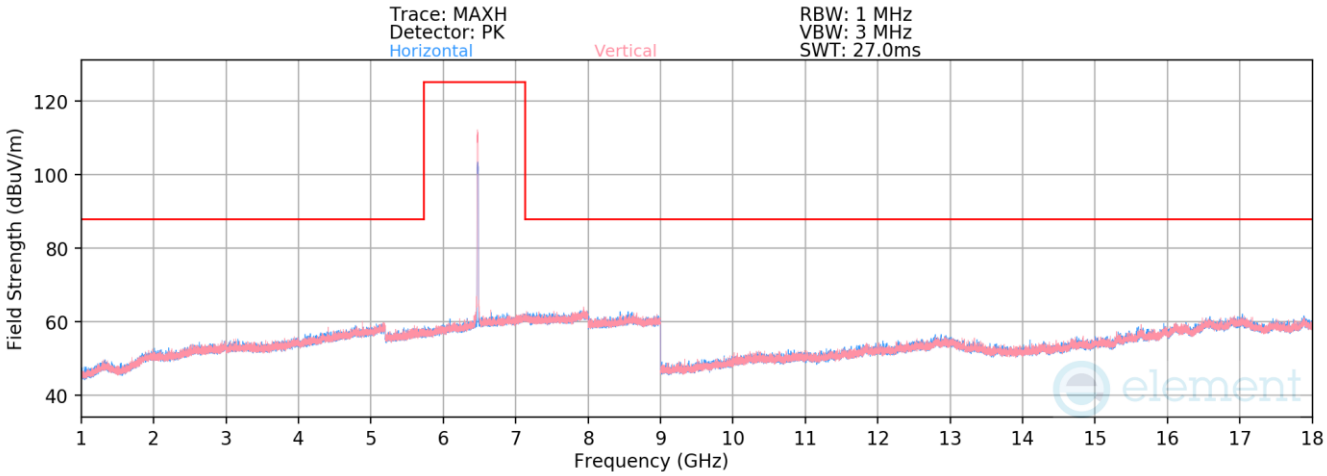


Plot 7-430. Radiated Spurious Emissions above 1GHz Antenna WF2 (802.11ax – Ch. 97)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6435MHz
Channel:	97

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
12870.00	Average	H	-	-	-85.53	22.00	43.47	68.20	-24.73
12870.00	Peak	H	-	-	-74.30	22.00	54.70	88.23	-33.53

Table 7-77. Radiated Spurious Emission Measurements Antenna WF2

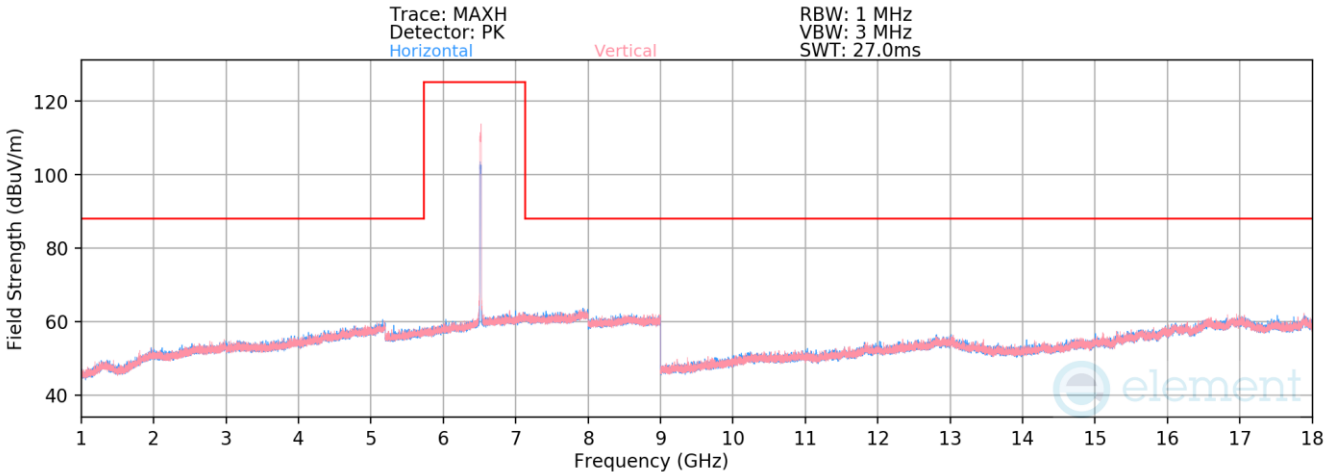


Plot 7-431. Radiated Spurious Emissions above 1GHz Antenna WF2 (802.11ax – Ch. 105)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6475MHz
Channel:	105

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
12950.00	Average	H	-	-	-85.75	22.25	43.50	68.20	-24.70
12950.00	Peak	H	-	-	-73.98	22.25	55.27	88.23	-32.96

Table 7-78. Radiated Spurious Emission Measurements Antenna WF2

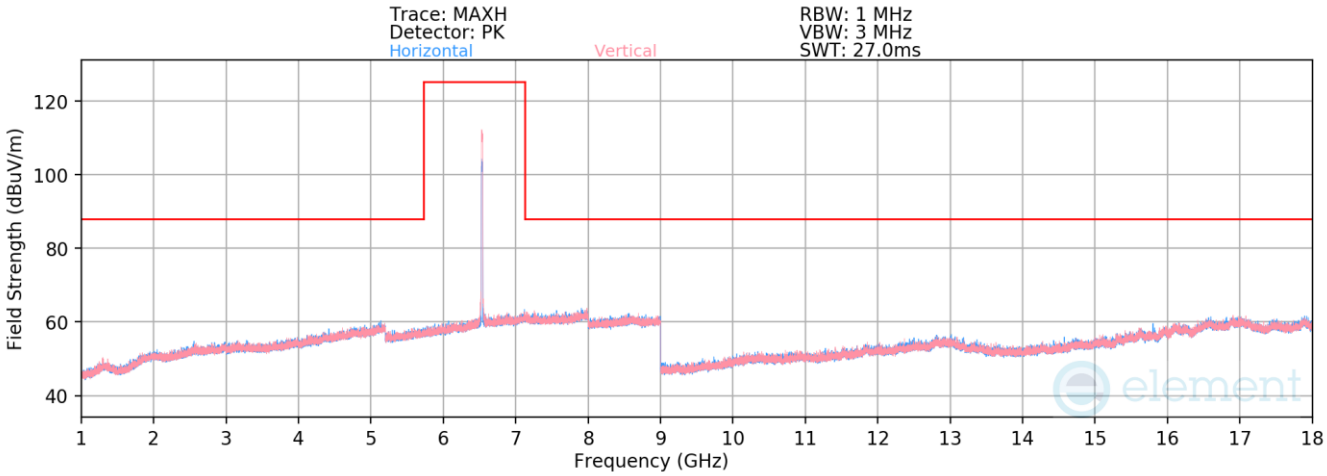


Plot 7-432. Radiated Spurious Emissions above 1GHz Antenna WF2 (802.11ax – Ch. 113)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6515MHz
Channel:	113

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13030.00	Average	H	-	-	-85.35	22.37	44.02	68.20	-24.18
13030.00	Peak	H	-	-	-74.05	22.37	55.32	88.23	-32.91

Table 7-79. Radiated Spurious Emission Measurements Antenna WF2

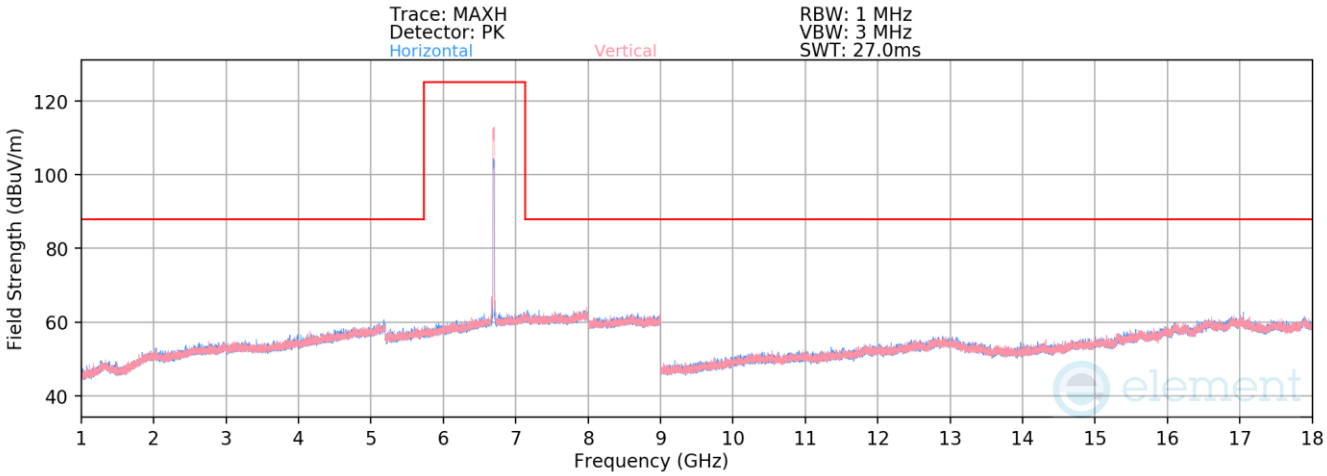


Plot 7-433. Radiated Spurious Emissions above 1GHz Antenna WF2 (802.11ax – Ch. 117)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6535MHz
Channel:	117

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13070.00	Average	V	-	-	-85.86	22.37	43.51	68.20	-24.69
13070.00	Peak	V	-	-	-73.98	22.37	55.39	88.23	-32.84

Table 7-80. Radiated Spurious Emission Measurements Antenna WF2

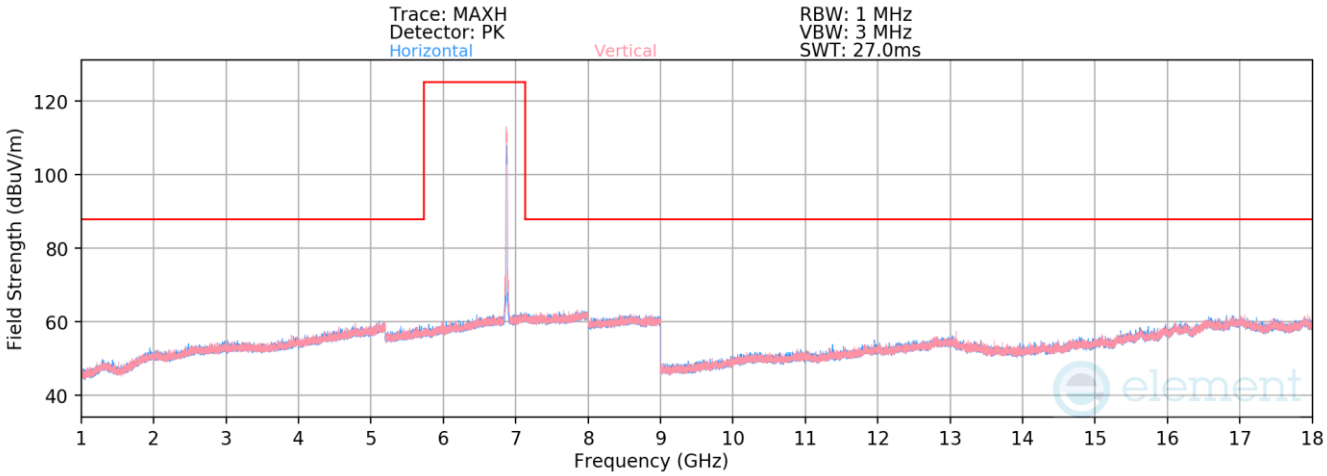


Plot 7-434. Radiated Spurious Emissions above 1GHz Antenna WF2 (802.11ax – Ch. 149)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6695MHz
Channel:	149

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	13390.00	Average	V	-	-	-85.87	22.03	43.16	53.98	-10.82
*	13390.00	Peak	V	-	-	-74.05	22.03	54.98	73.98	-19.00

Table 7-81. Radiated Spurious Emission Measurements Antenna WF2

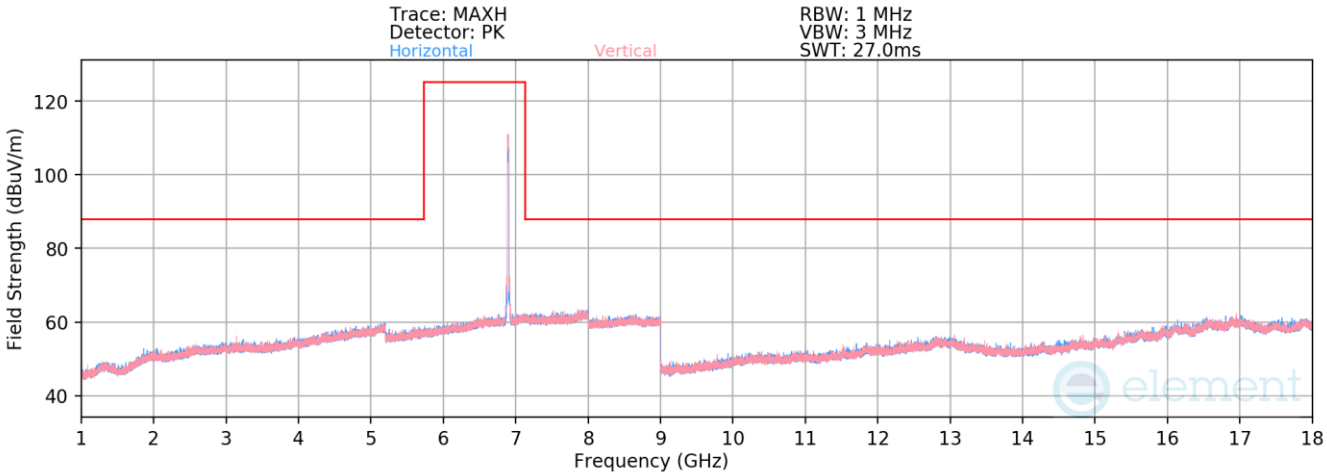


Plot 7-435. Radiated Spurious Emissions above 1GHz Antenna WF2 (802.11ax – Ch. 185)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6875MHz
Channel:	185

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13750.00	Average	V	-	-	-86.11	21.86	42.75	68.20	-25.45
13750.00	Peak	V	-	-	-74.46	21.86	54.40	88.23	-33.83

Table 7-82. Radiated Spurious Emission Measurements Antenna WF2

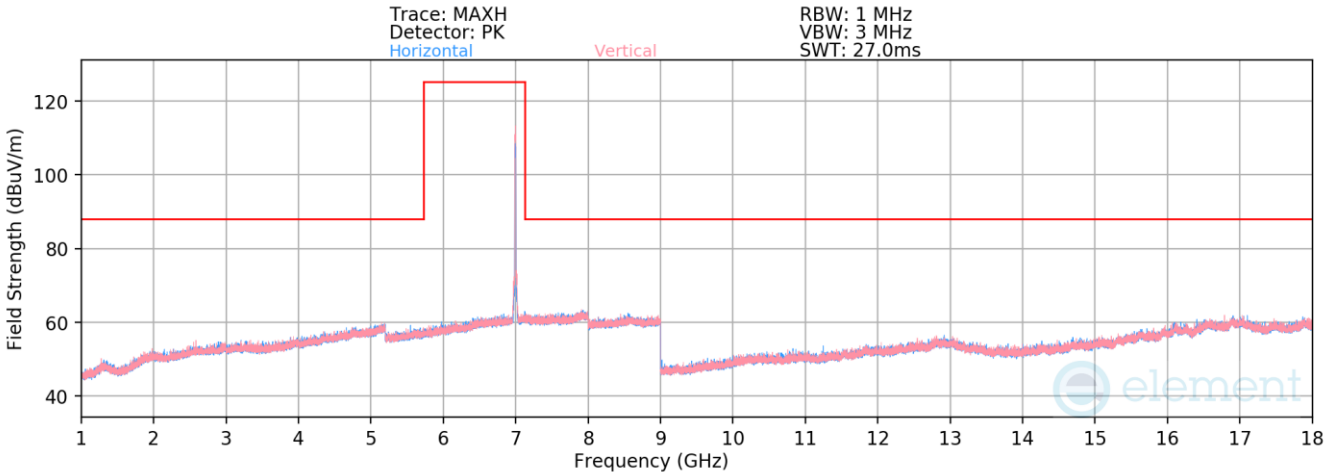


Plot 7-436. Radiated Spurious Emissions above 1GHz Antenna WF2 (802.11ax – Ch. 189)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6895MHz
Channel:	189

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13790.00	Average	V	-	-	-86.53	22.38	42.85	68.20	-25.35
13790.00	Peak	V	-	-	-74.88	22.38	54.50	88.23	-33.73

Table 7-83. Radiated Spurious Emission Measurements Antenna WF2

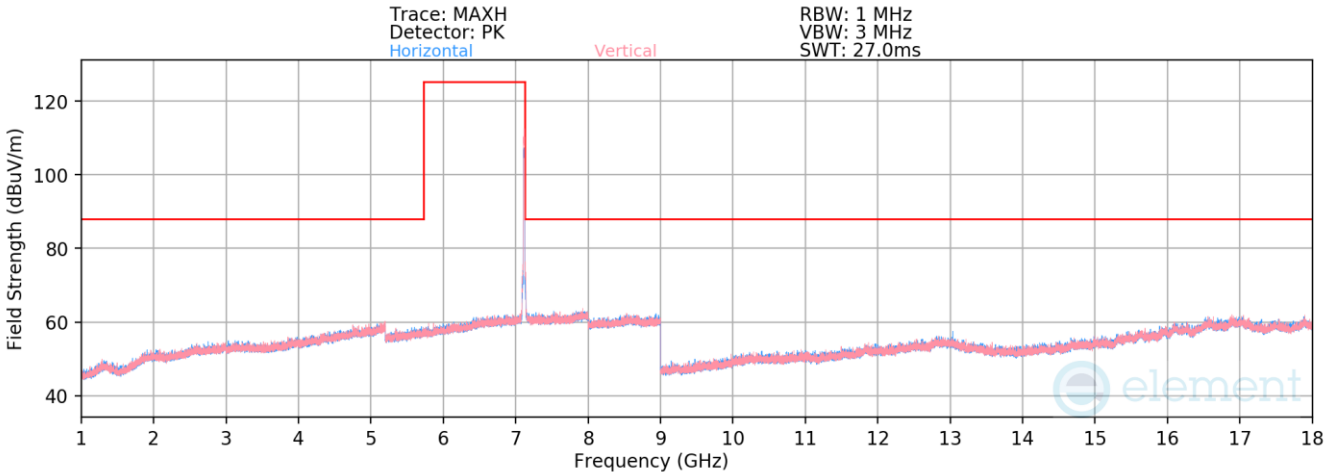


Plot 7-437. Radiated Spurious Emissions above 1GHz Antenna WF2 (802.11ax – Ch. 209)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6995MHz
Channel:	209

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13990.00	Average	V	-	-	-86.39	22.31	42.92	68.20	-25.28
13990.00	Peak	V	-	-	-75.03	22.31	54.28	88.23	-33.95

Table 7-84. Radiated Spurious Emission Measurements Antenna WF2



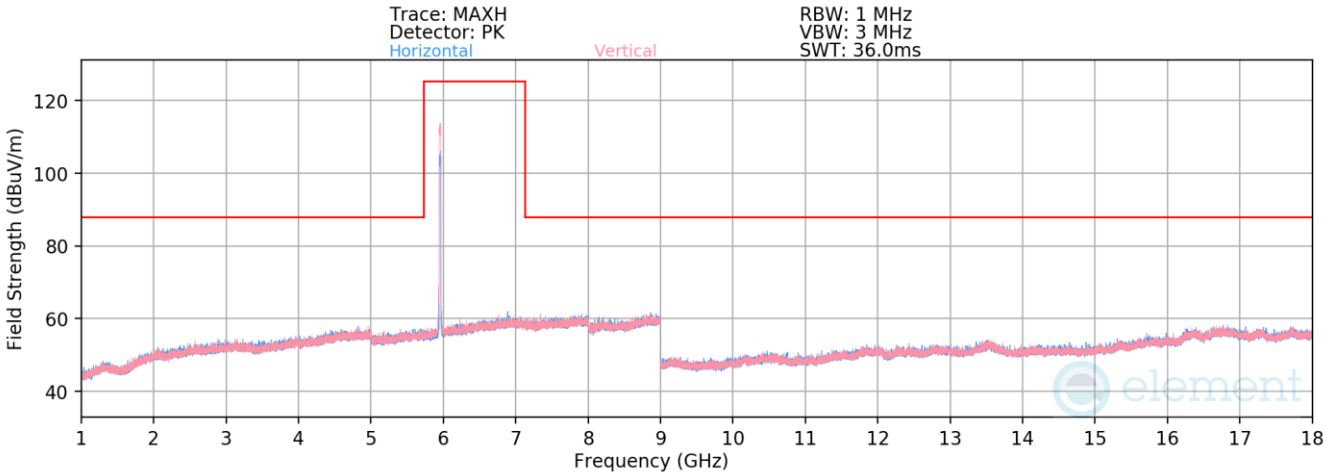
Plot 7-438. Radiated Spurious Emissions above 1GHz Antenna WF2 (802.11ax – Ch. 233)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	7115MHz
Channel:	233

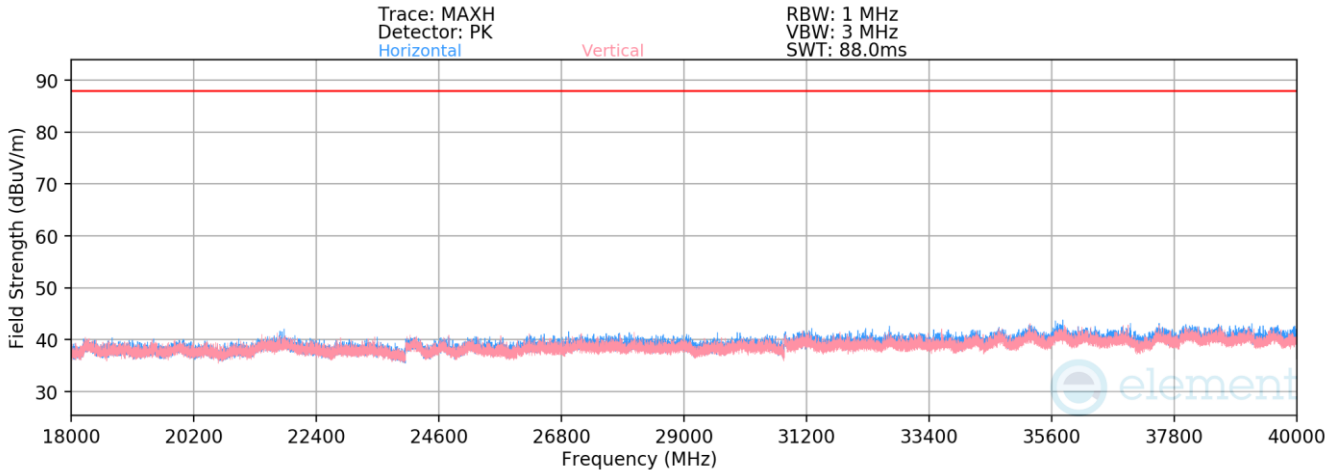
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
14230.00	Average	V	-	-	-85.92	22.37	43.45	68.20	-24.75
14230.00	Peak	V	-	-	-74.34	22.37	55.03	88.23	-33.20

Table 7-85. Radiated Spurious Emission Measurements Antenna WF2

7.8.3 SDM Radiated Spurious Emission



Plot 7-439. Radiated Spurious Emissions above 1GHz SDM (802.11ax – Ch. 1)

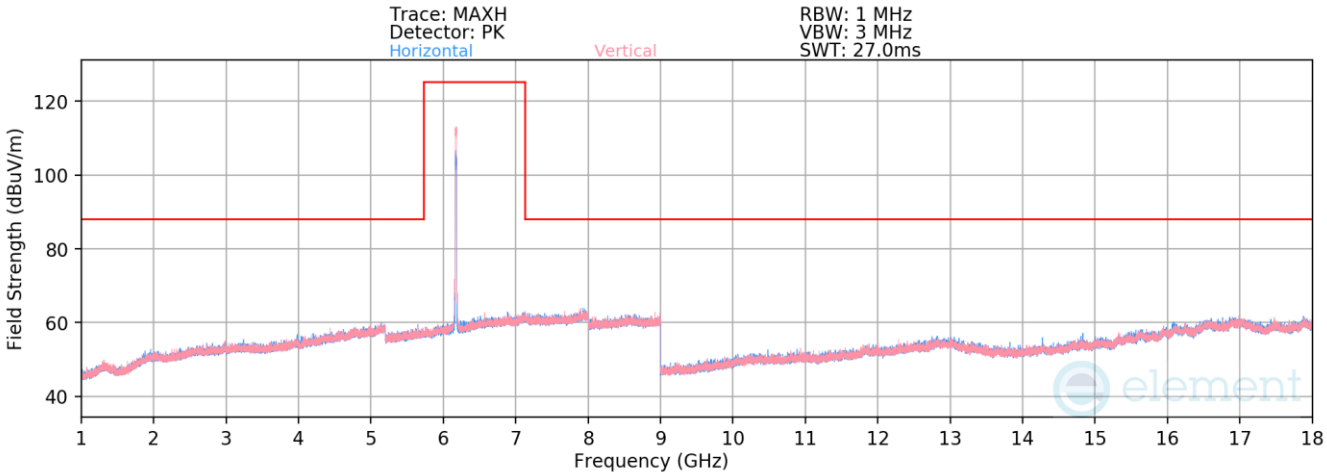


Plot 7-440. Radiated Spurious Emissions 18-40GHz SDM (802.11ax – Ch. 1)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5955MHz
Channel:	1

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11910.00	Average	H	-	-	-82.43	16.30	40.87	53.98	-13.11
*	11910.00	Peak	H	-	-	-74.24	16.30	49.06	73.98	-24.92
*	17865.00	Average	H	-	-	-84.54	23.81	46.27	53.98	-7.71
*	17865.00	Peak	H	-	-	-74.12	23.81	56.69	73.98	-17.29

Table 7-86. Radiated Spurious Emission Measurements SDM

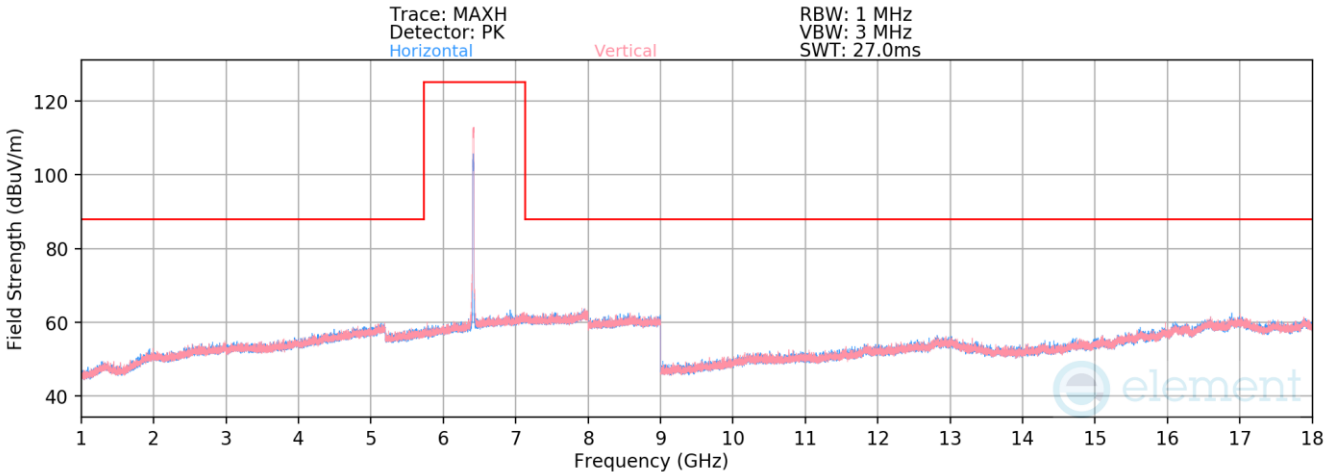


Plot 7-441. Radiated Spurious Emissions above 1GHz SDM (802.11ax – Ch. 45)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6175MHz
Channel:	45

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	12350.00	Average	H	-	-	-85.74	21.24	42.50	53.98	-11.48
*	12350.00	Peak	H	-	-	-74.15	21.24	54.09	73.98	-19.89

Table 7-87. Radiated Spurious Emission Measurements SDM

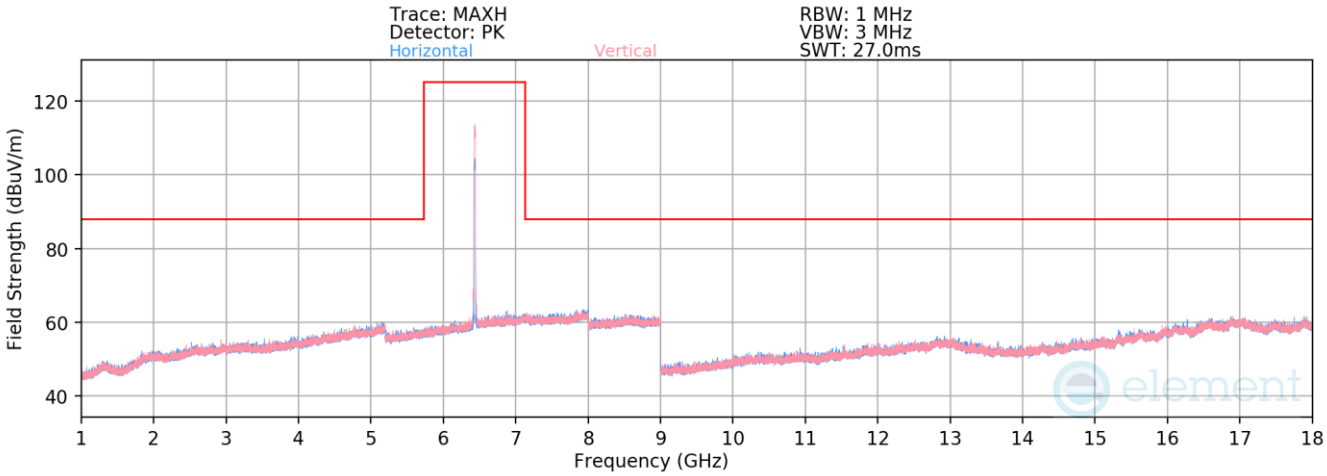


Plot 7-442. Radiated Spurious Emissions above 1GHz SDM (802.11ax – Ch. 93)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6415MHz
Channel:	93

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
12830.00	Average	H	-	-	-85.72	22.29	43.57	68.20	-24.63
12830.00	Peak	H	-	-	-73.87	22.29	55.42	88.23	-32.81

Table 7-88. Radiated Spurious Emission Measurements SDM

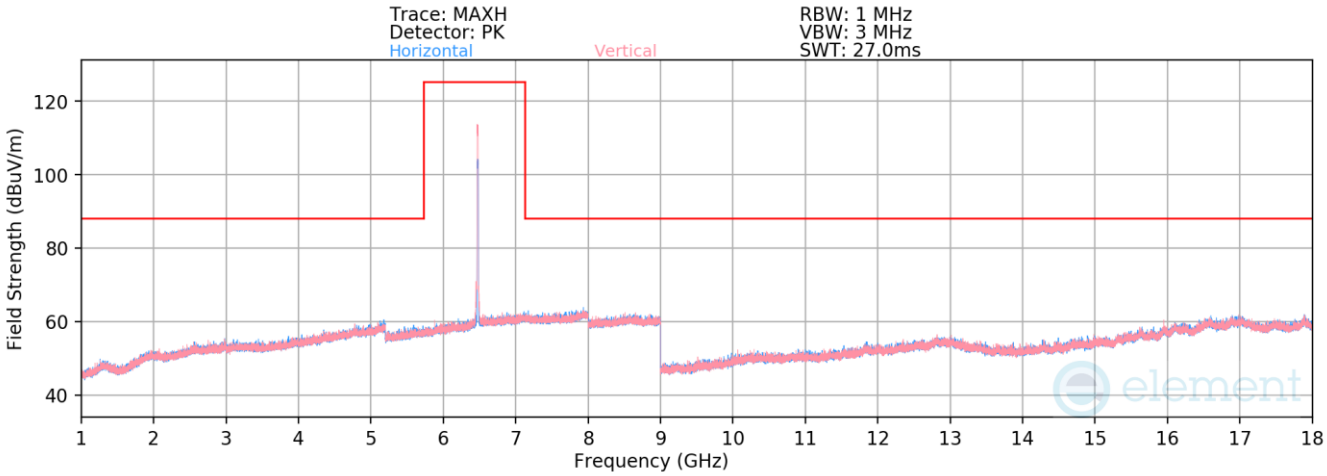


Plot 7-443. Radiated Spurious Emissions above 1GHz SDM (802.11ax – Ch. 97)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6435MHz
Channel:	97

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
12870.00	Average	H	-	-	-85.22	22.00	43.78	68.20	-24.42
12870.00	Peak	H	-	-	-74.11	22.00	54.89	88.23	-33.34

Table 7-89. Radiated Spurious Emission Measurements SDM

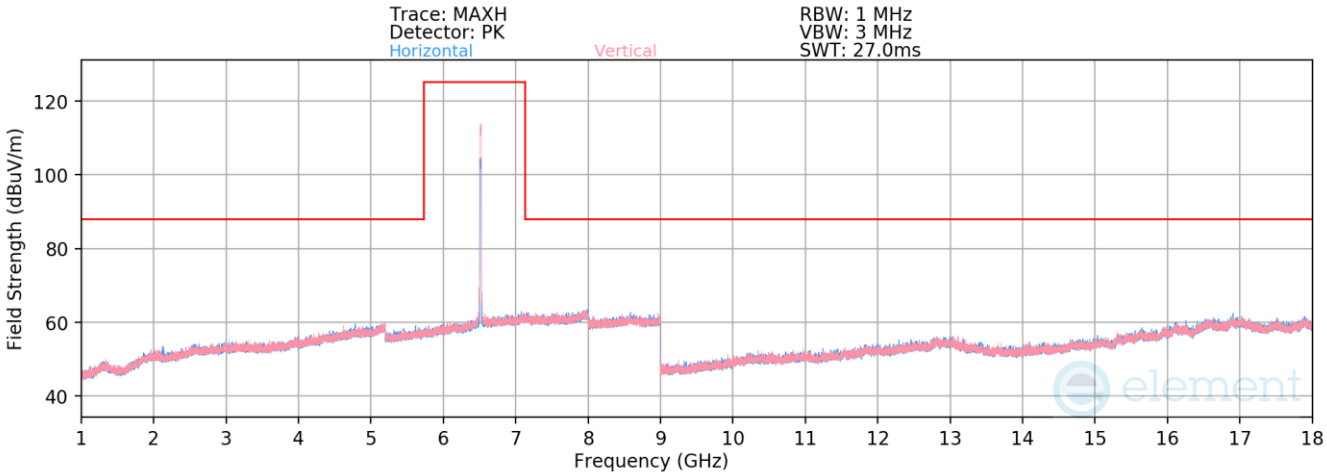


Plot 7-444. Radiated Spurious Emissions above 1GHz SDM (802.11ax – Ch. 105)

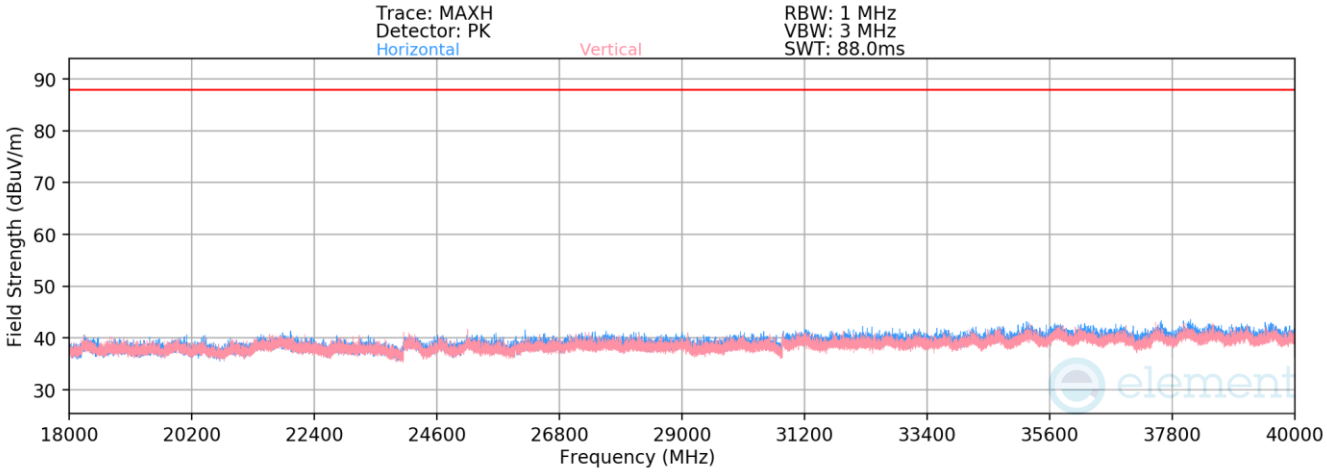
Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6475MHz
Channel:	105

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
12950.00	Average	H	-	-	-85.81	22.25	43.44	68.20	-24.76
12950.00	Peak	H	-	-	-75.44	22.25	53.81	88.23	-34.42

Table 7-90. Radiated Spurious Emission Measurements SDM



Plot 7-445. Radiated Spurious Emissions above 1GHz SDM (802.11ax – Ch. 113)

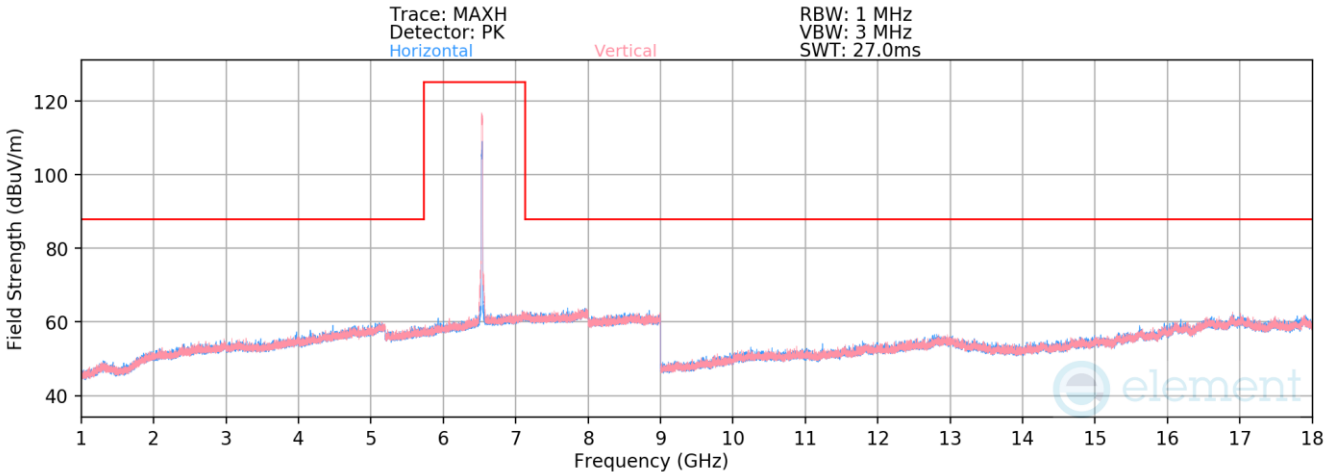


Plot 7-446. Radiated Spurious Emissions 18-40GHz SDM (802.11ax – Ch. 113)

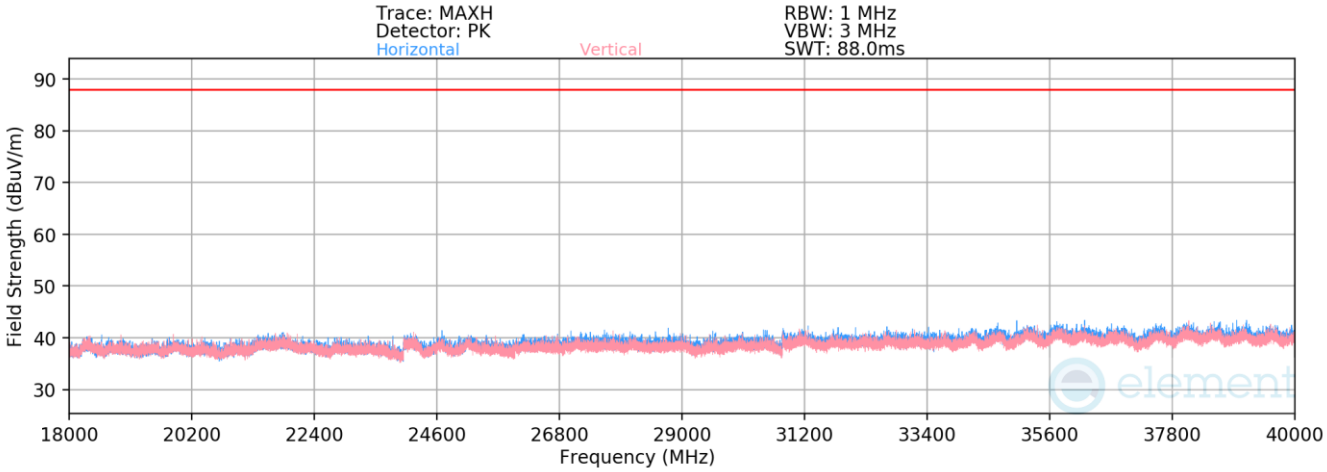
Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6515MHz
Channel:	113

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13030.00	Average	H	-	-	-85.36	22.37	44.01	68.20	-24.19
13030.00	Peak	H	-	-	-74.57	22.37	54.80	88.23	-33.43

Table 7-91. Radiated Spurious Emission Measurements SDM



Plot 7-447. Radiated Spurious Emissions above 1GHz SDM (802.11ax – Ch. 117)

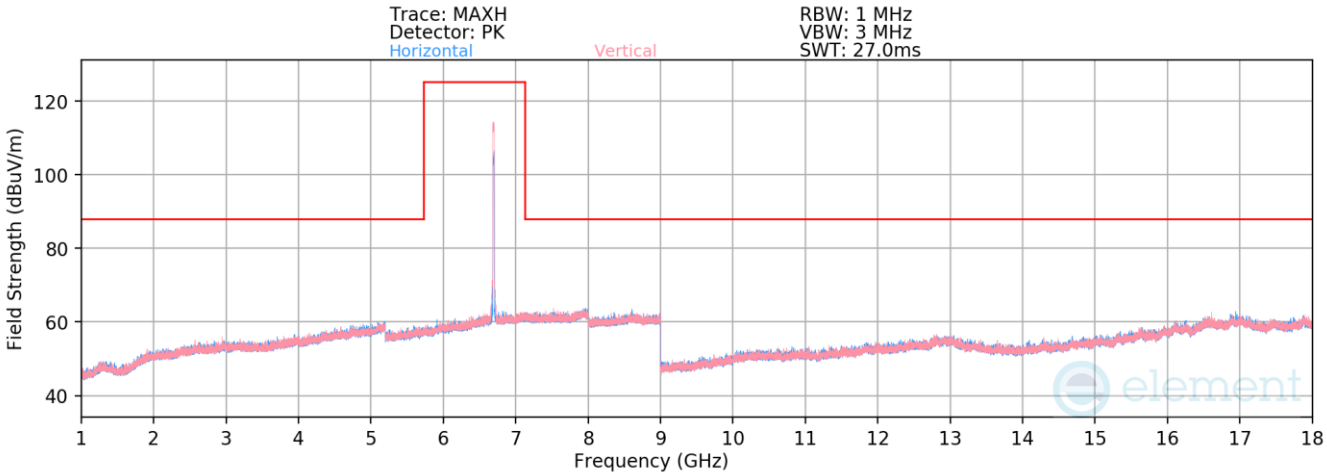


Plot 7-448. Radiated Spurious Emissions 18-40GHz SDM (802.11ax – Ch. 117)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6535MHz
Channel:	117

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13070.00	Average	H	-	-	-85.64	22.59	43.95	68.20	-24.25
13070.00	Peak	H	-	-	-74.11	22.59	55.48	88.23	-32.75

Table 7-92. Radiated Spurious Emission Measurements SDM

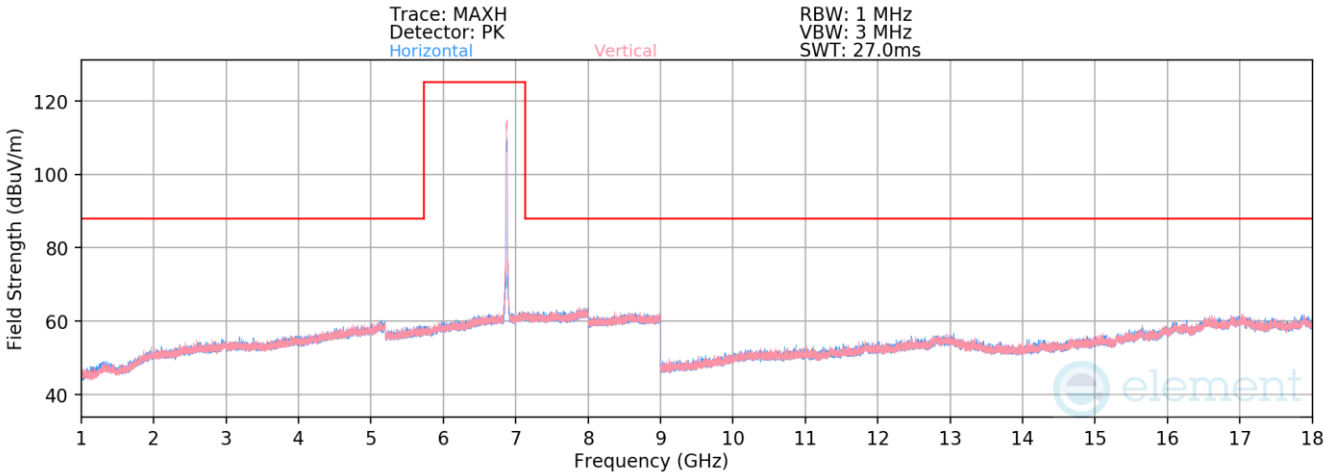


Plot 7-449. Radiated Spurious Emissions above 1GHz SDM (802.11ax – Ch. 149)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6695MHz
Channel:	149

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	13390.00	Average	H	-	-	-85.70	22.36	43.66	53.98	-10.32
*	13390.00	Peak	H	-	-	-74.61	22.36	54.75	73.98	-19.23

Table 7-93. Radiated Spurious Emission Measurements SDM

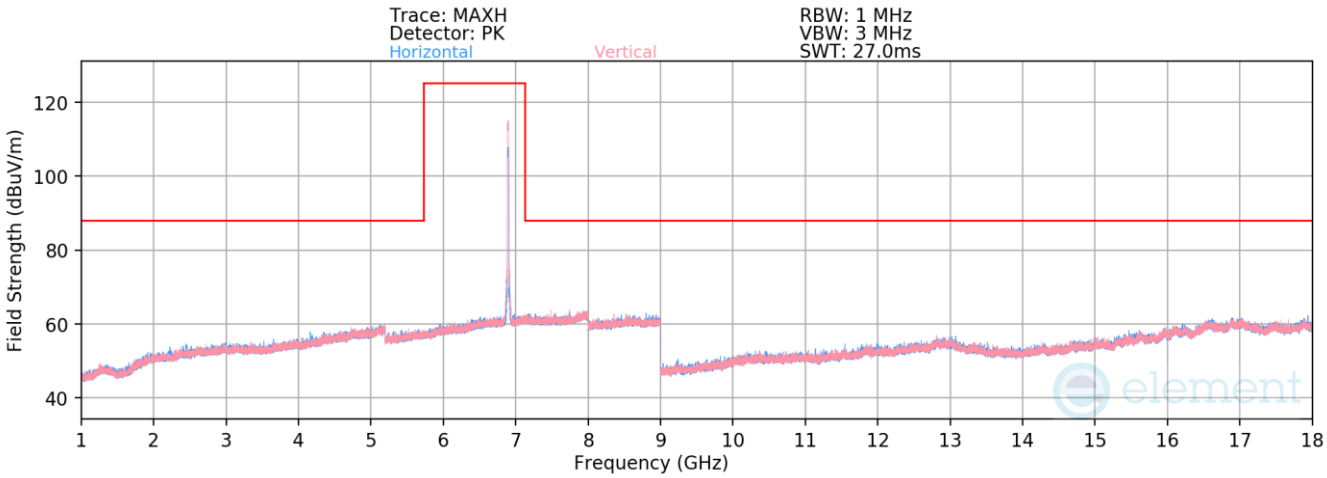


Plot 7-450. Radiated Spurious Emissions above 1GHz SDM (802.11ax – Ch. 185)

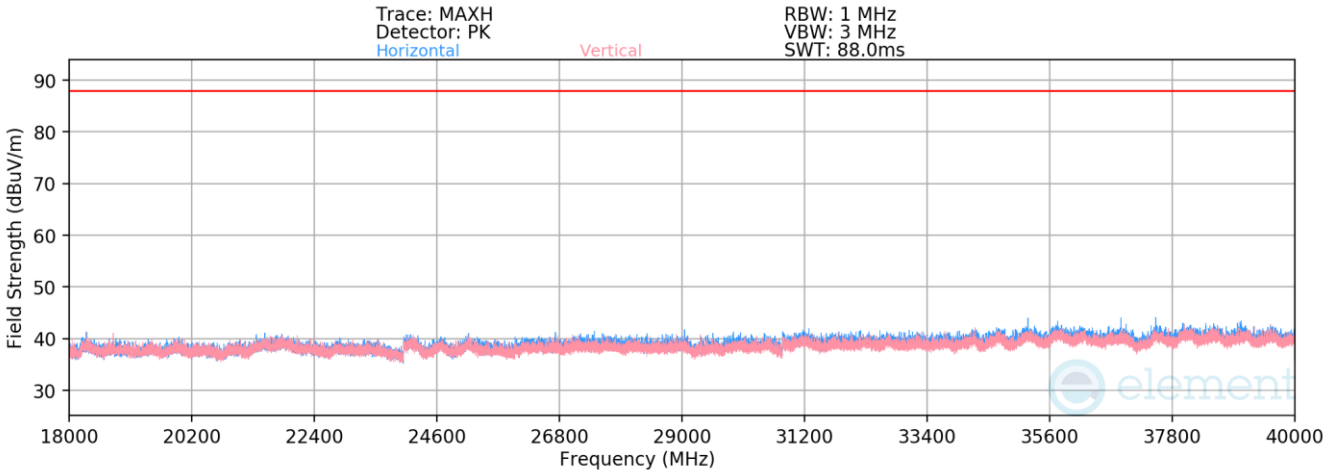
Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6875MHz
Channel:	185

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13750.00	Average	H	-	-	-85.96	22.10	43.14	68.20	-25.06
13750.00	Peak	H	-	-	-74.24	22.10	54.86	88.23	-33.37

Table 7-94. Radiated Spurious Emission Measurements SDM



Plot 7-451. Radiated Spurious Emissions above 1GHz SDM (802.11ax – Ch. 189)

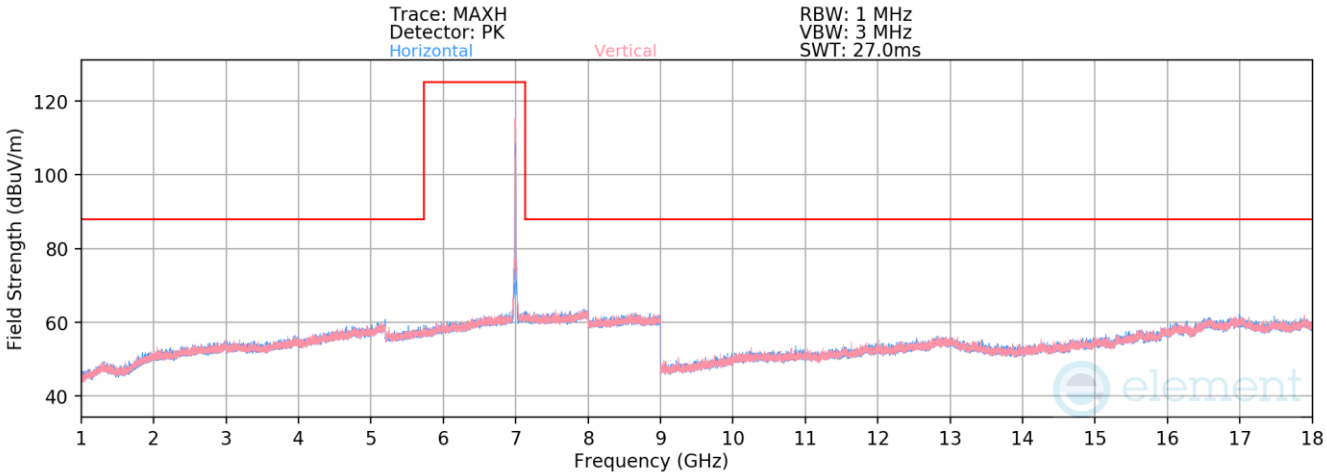


Plot 7-452. Radiated Spurious Emissions 18-40GHz SDM (802.11ax – Ch. 189)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6895MHz
Channel:	189

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13790.00	Average	H	-	-	-86.16	22.38	43.22	68.20	-24.98
13790.00	Peak	H	-	-	-74.97	22.38	54.41	88.23	-33.82

Table 7-95. Radiated Spurious Emission Measurements SDM

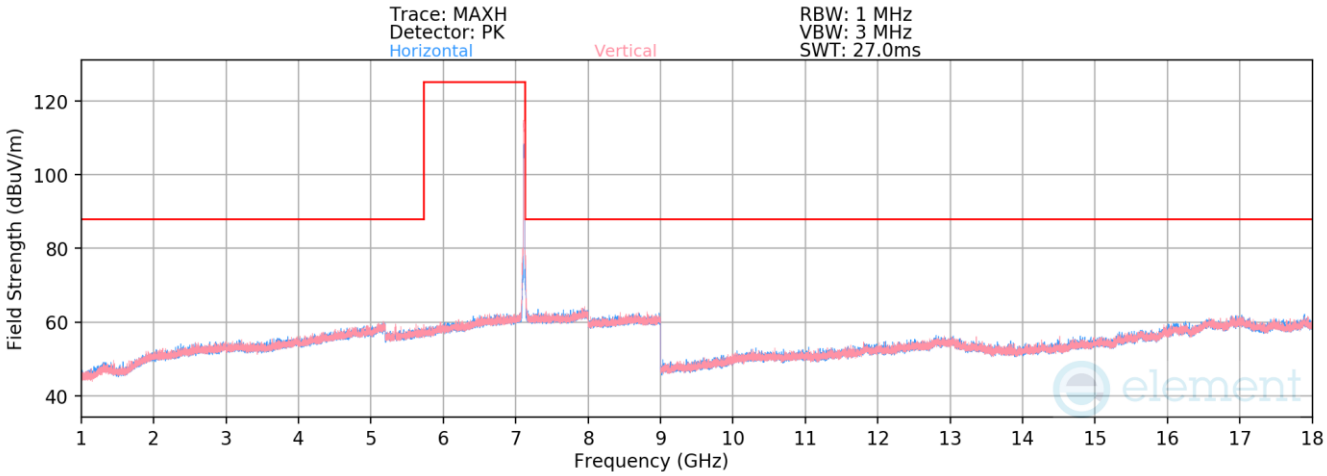


Plot 7-453. Radiated Spurious Emissions above 1GHz SDM (802.11ax – Ch. 209)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	6995MHz
Channel:	209

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13990.00	Average	H	-	-	-86.40	22.31	42.91	68.20	-25.29
13990.00	Peak	H	-	-	-75.03	22.31	54.28	88.23	-33.95

Table 7-96. Radiated Spurious Emission Measurements SDM



Plot 7-454. Radiated Spurious Emissions above 1GHz SDM (802.11ax – Ch. 233)

Mode:	802.11ax
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	7115MHz
Channel:	233

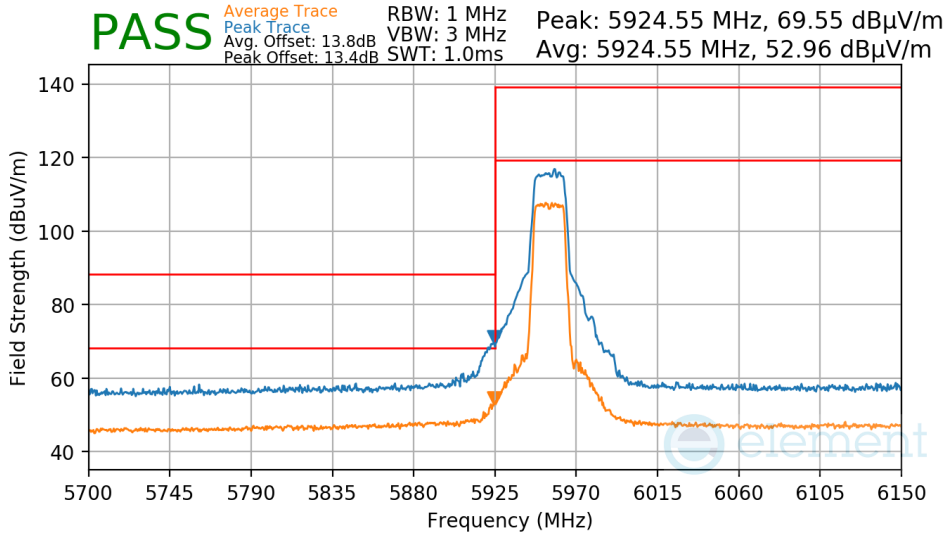
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
14230.00	Average	H	-	-	-85.86	22.37	43.51	68.20	-24.69
14230.00	Peak	H	-	-	-74.71	22.37	54.66	88.23	-33.57

Table 7-97. Radiated Spurious Emission Measurements SDM

7.8.4 Antenna WF5T Radiated Band Edge Measurements (20MHz BW)

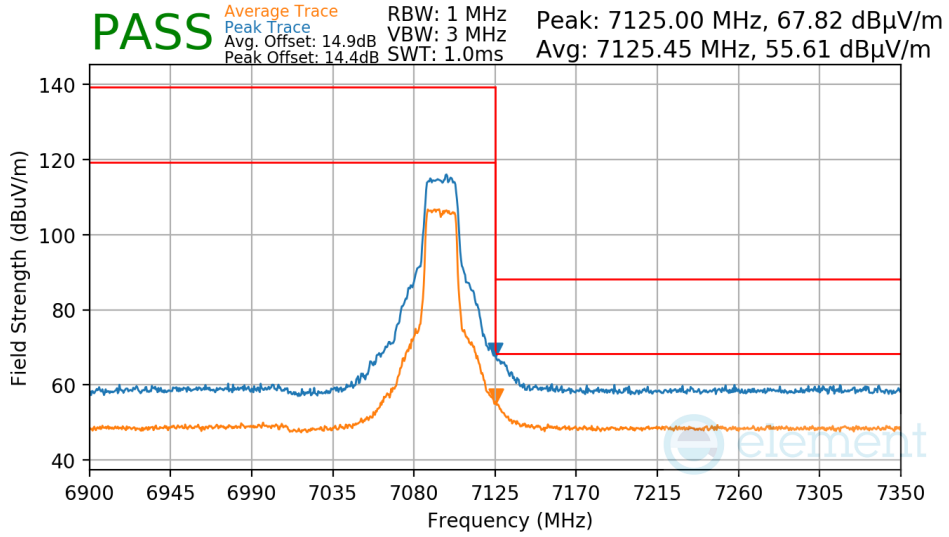
§15.407(b.1)(b.2) §15.205 §15.209

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	54Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	5955MHz
Channel:	1



Plot 7-455. Antenna WF5T Radiated Lower Band Edge (Peak/Average – UNII Band 5)

Worst Case Mode:	802.11a
Worst Case Transfer Rate:	54Mbps
Distance of Measurements:	3 Meters
Operating Frequency:	7095MHz
Channel:	229



Plot 7-456. Antenna WF5T Radiated Upper Band Edge (Peak/Average – UNII Band 8)