Annex A

Measurement plots

part of / in addition to

Test report no.: 24040015-40555-1

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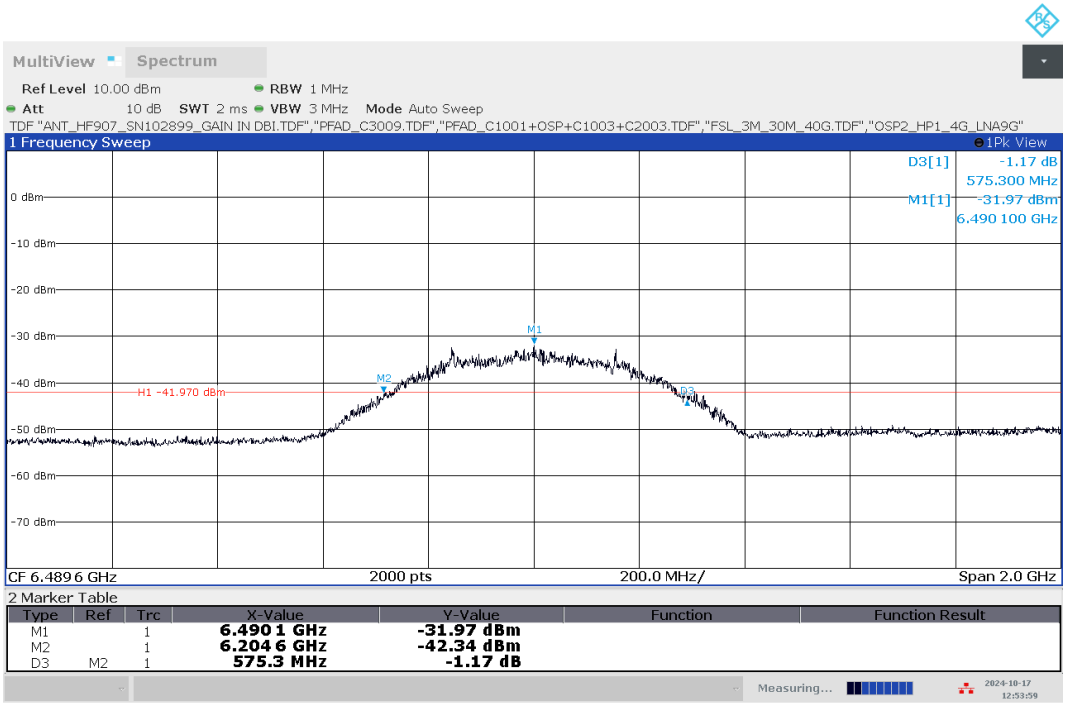
1 OCCUPIED BANDWIDTH

1.1 10 dB bandwidth, set-up 1, op. 1



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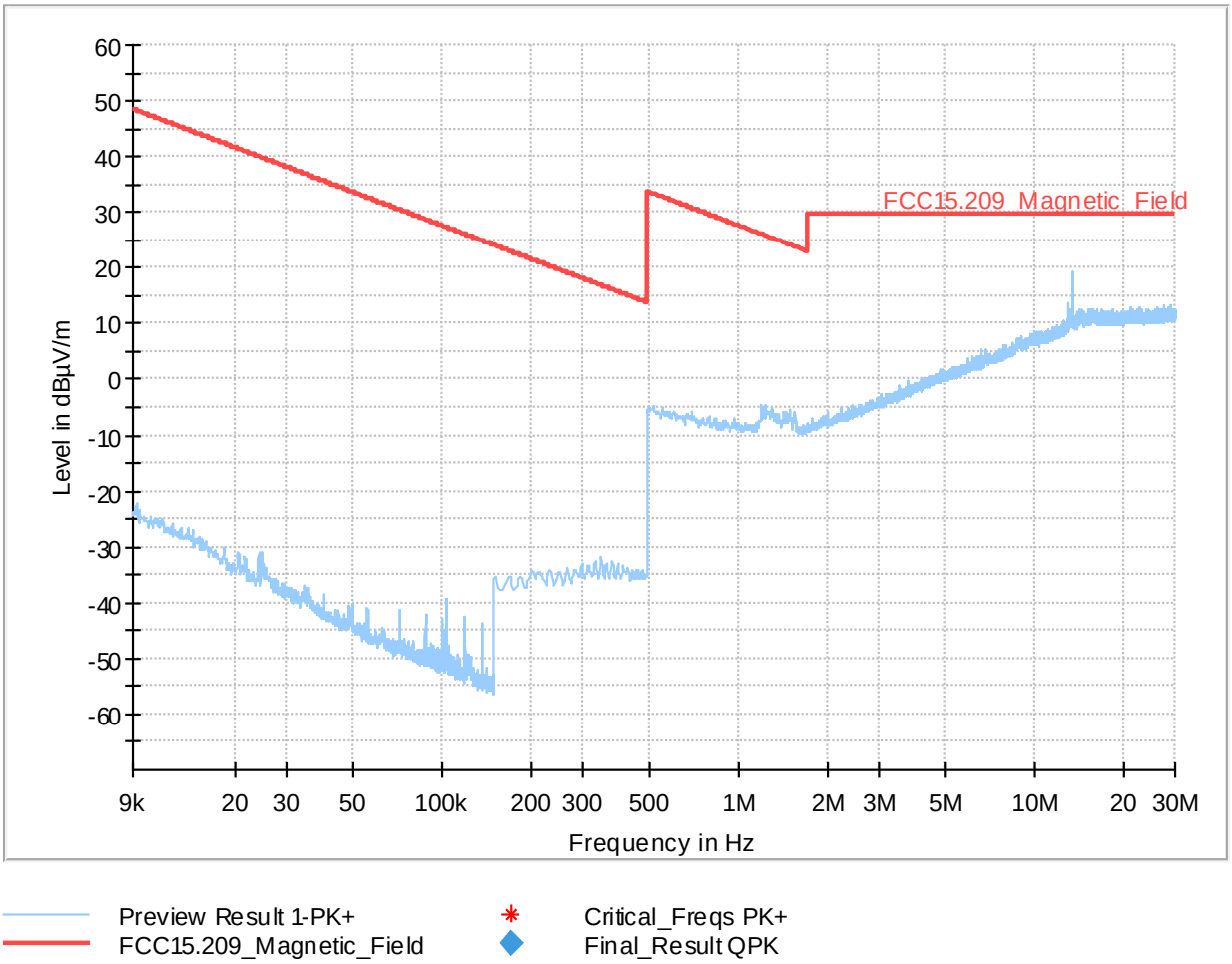
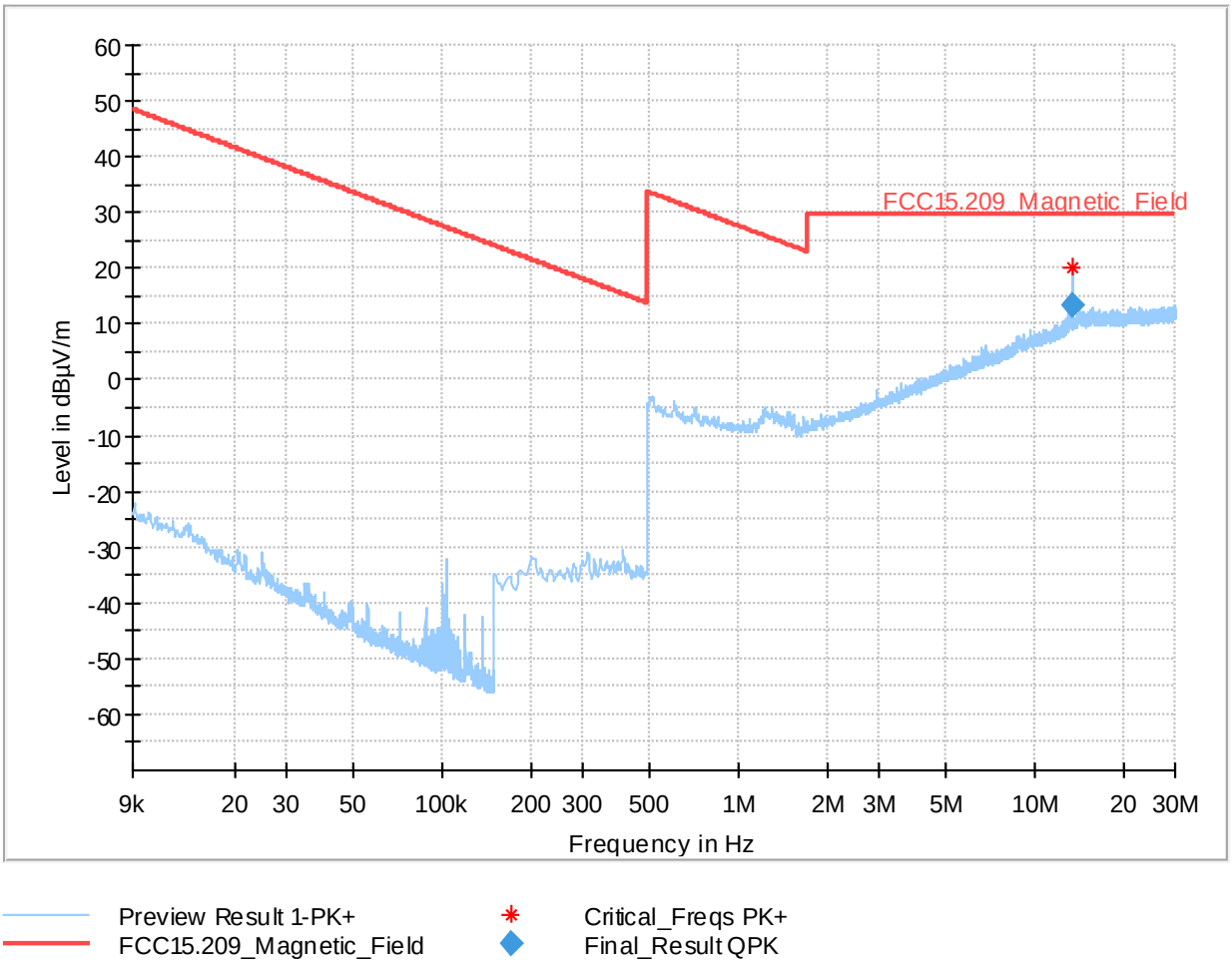
2 GENERAL LIMIT - RADIATED FIELD STRENGTH EMISSIONS, 9 kHz – 5 GHz

2.1 Radiated field strength measurements (f < 30 MHz)

2.1.1 Set-up 1, 9 kHz – 30 MHz, Op. 1, EUTs lying



2.1.2 Set-up 1, 9 kHz – 30 MHz, Op. 1, EUTs standing

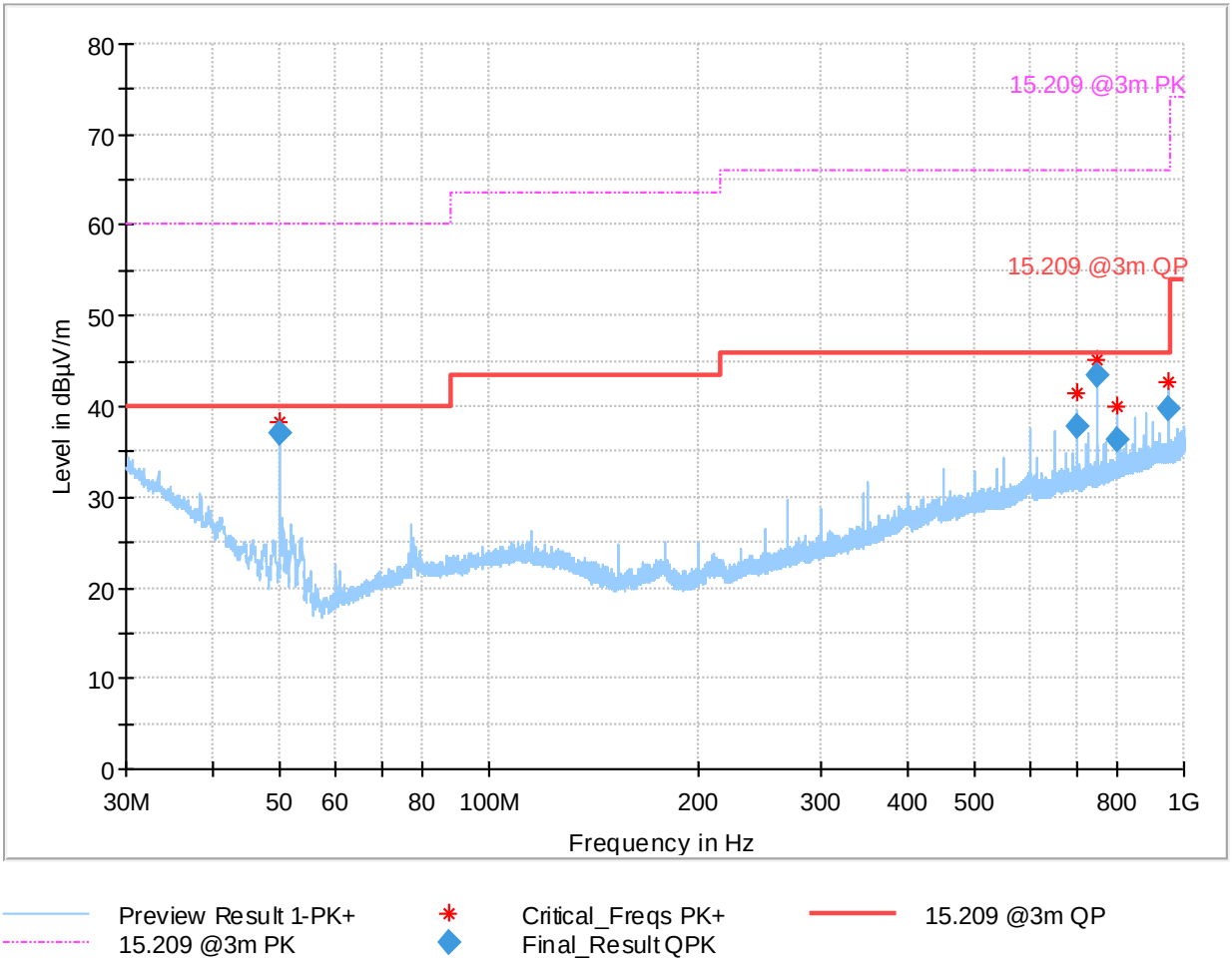


Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
13.560000	13.50	29.54	16.04	100.0	9.000	V	286.0	-0.9

2.2 Radiated field strength measurements (30 MHz < f < 1000 MHz)

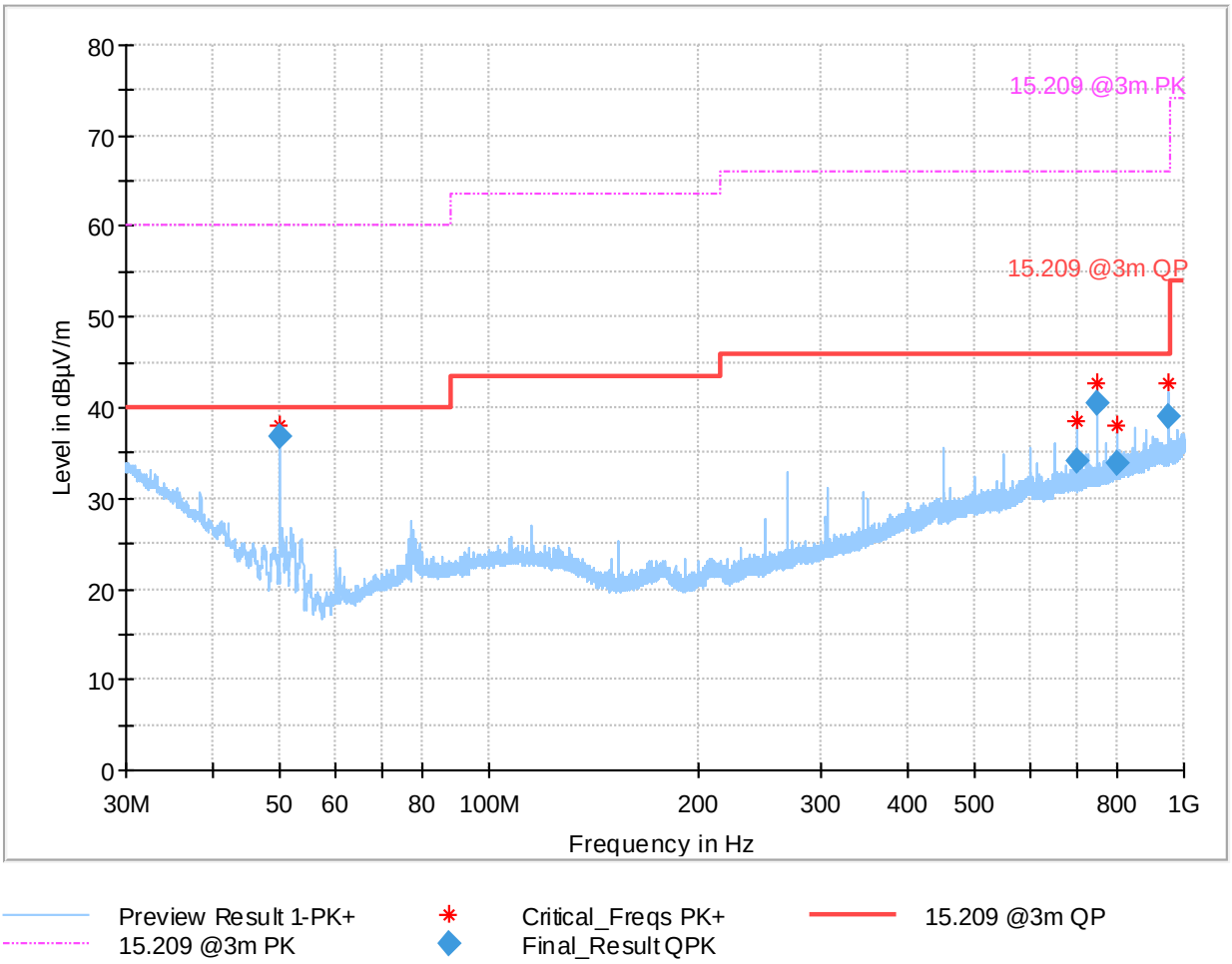
2.2.1 Lying, Set-up 1, Op. 1



Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
50.000000	36.96	40.00	3.04	100.0	120.000	103.0	V	261.0
700.050000	37.78	46.00	8.22	100.0	120.000	118.0	H	113.0
750.050000	43.40	46.00	2.60	100.0	120.000	103.0	H	131.0
800.050000	36.37	46.00	9.63	100.0	120.000	103.0	H	225.0
950.075000	39.76	46.00	6.24	100.0	120.000	100.0	H	328.0

2.2.2 Standing, Set-up 1, Op. 1

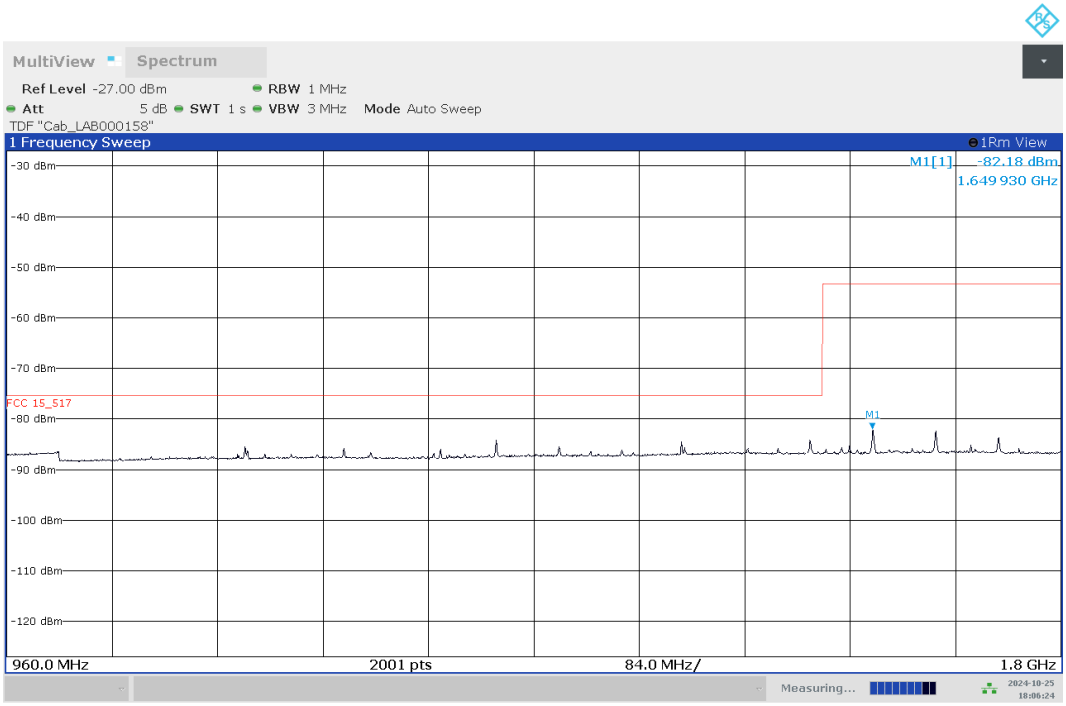


Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
50.000000	36.74	40.00	3.26	100.0	120.000	100.0	V	28.0
700.050000	33.99	46.00	12.01	100.0	120.000	115.0	H	181.0
750.050000	40.41	46.00	5.59	100.0	120.000	100.0	H	186.0
800.050000	33.96	46.00	12.04	100.0	120.000	103.0	H	311.0
950.075000	38.90	46.00	7.10	100.0	120.000	106.0	V	79.0

2.3 Radiated field strength measurements (1 GHz < f < 40 GHz)

2.3.1 960 MHz – 1800 MHz, Set-up 1, Op. 1, conducted measurement, cable connected to UWB port



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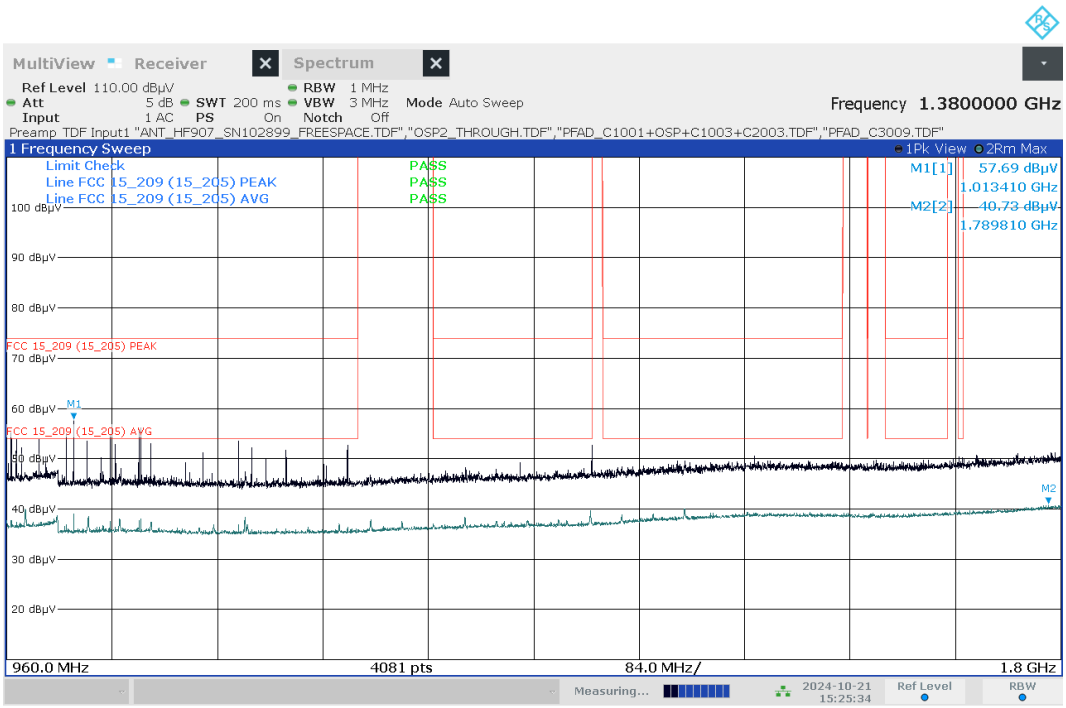
2.3.2 960 MHz – 1800 MHz, Set-up 1, Op. 1, radiated measurement, § 15.209 limits.



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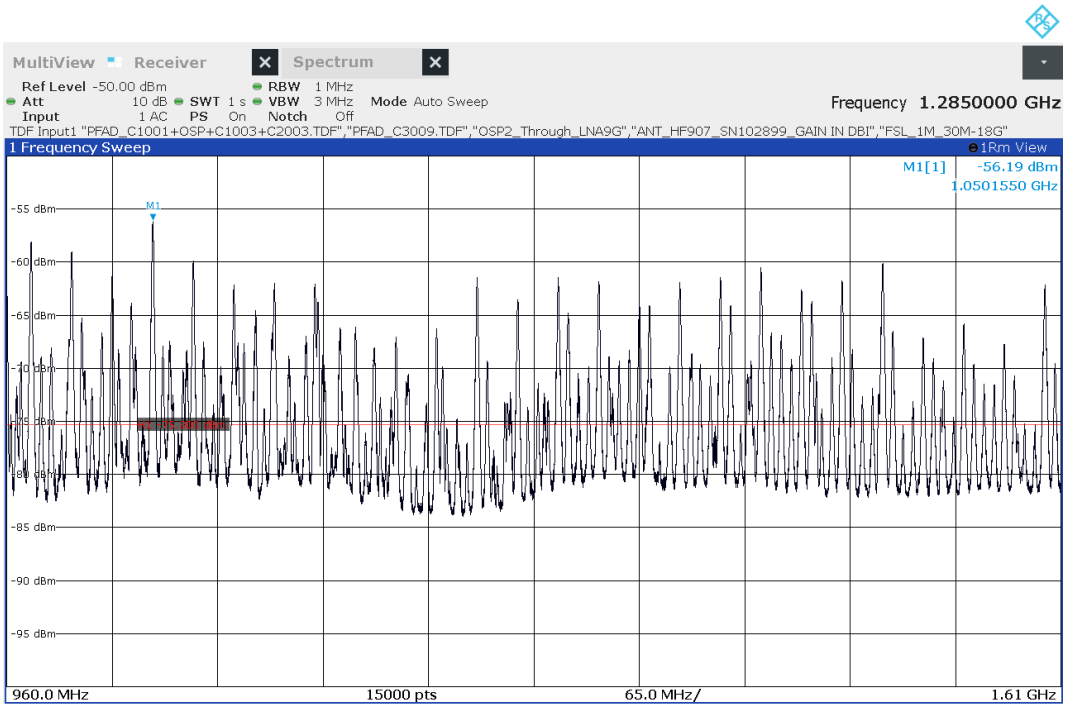
2.3.3 960 MHz – 1610 MHz, Set-up 1, Op. 1, radiated measurement*



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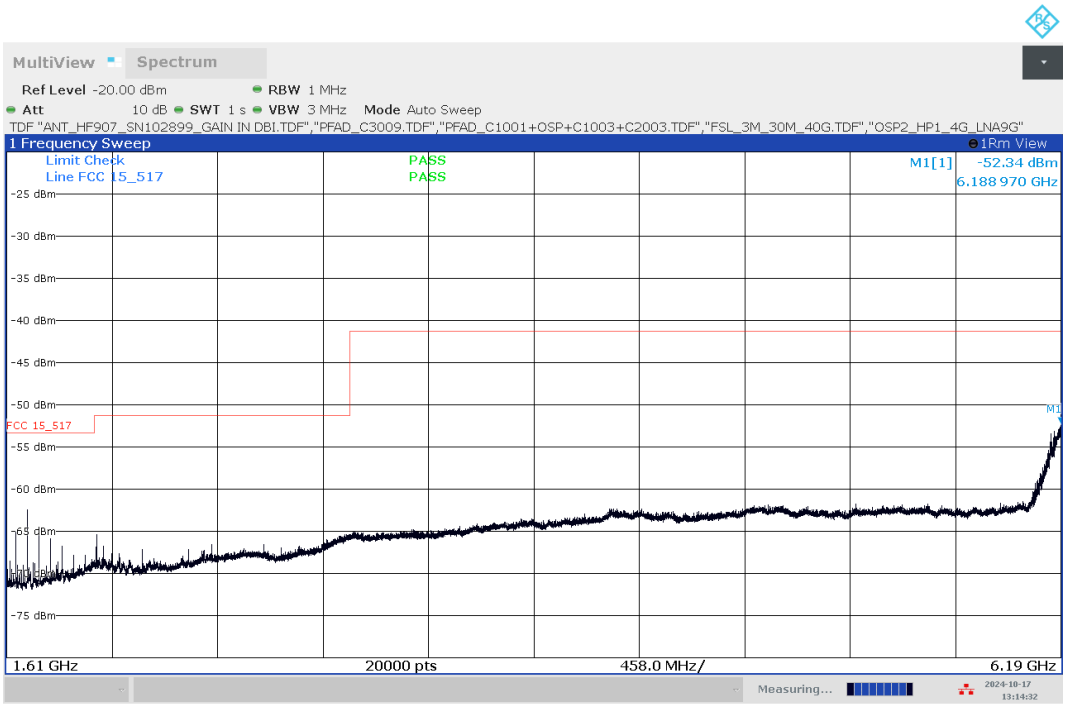
* According to FCC 15.521 (c): *Emissions from digital circuitry used to enable the operation of the UWB transmitter shall comply with the limits in § 15.209, rather than the limits specified in this subpart, provided it can be clearly demonstrated that those emissions from the UWB device are due solely to emissions from digital circuitry contained within the transmitter and that the emissions are not intended to be radiated from the transmitter's antenna.*

Plot 2.3.1 shows clearly, that there are no significant emissions coming from UWB module, correspondently from the UWB antenna. Thus, the emissions in the plot 2.3.3 are the emissions from digital circuitry. Thus, § 15.209 limits can be used here. Please see plot 2.3.2 for the measurement with § 15.209 limits.

2.3.4 1610 MHz – 6190 MHz, Set-up 1, Op. 1, radiated measurement



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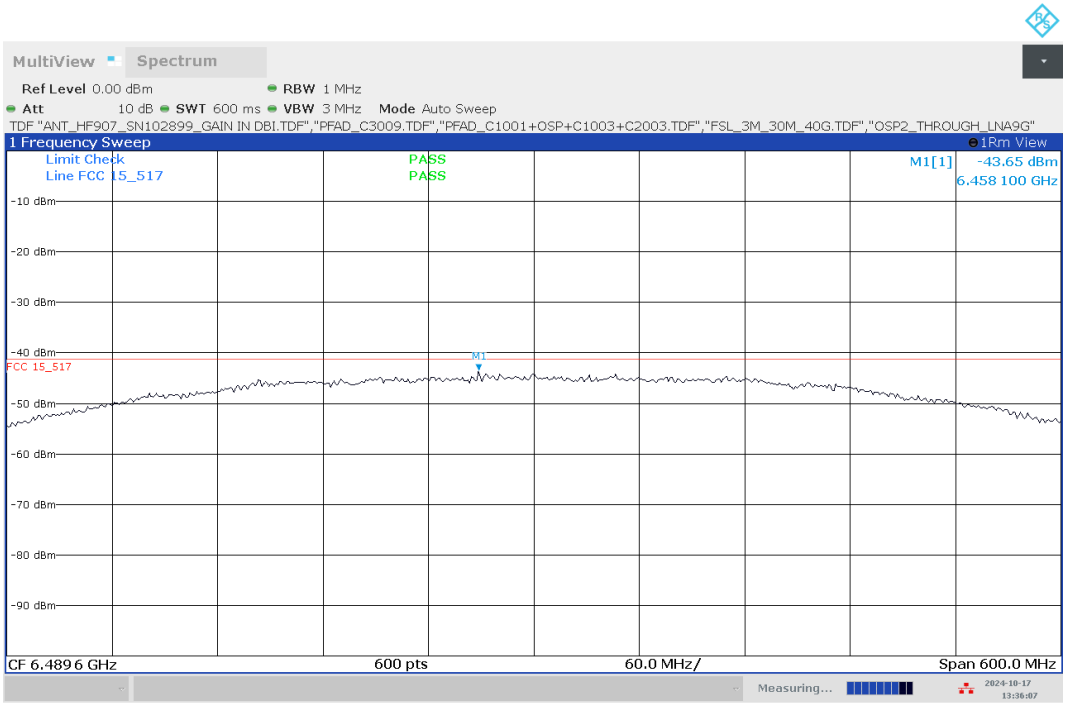
2.3.5 fc=6489.6, span = 600 MHz, pts = 600, swt = 600 ms, Set-up 1, Op. 1, radiated measurement



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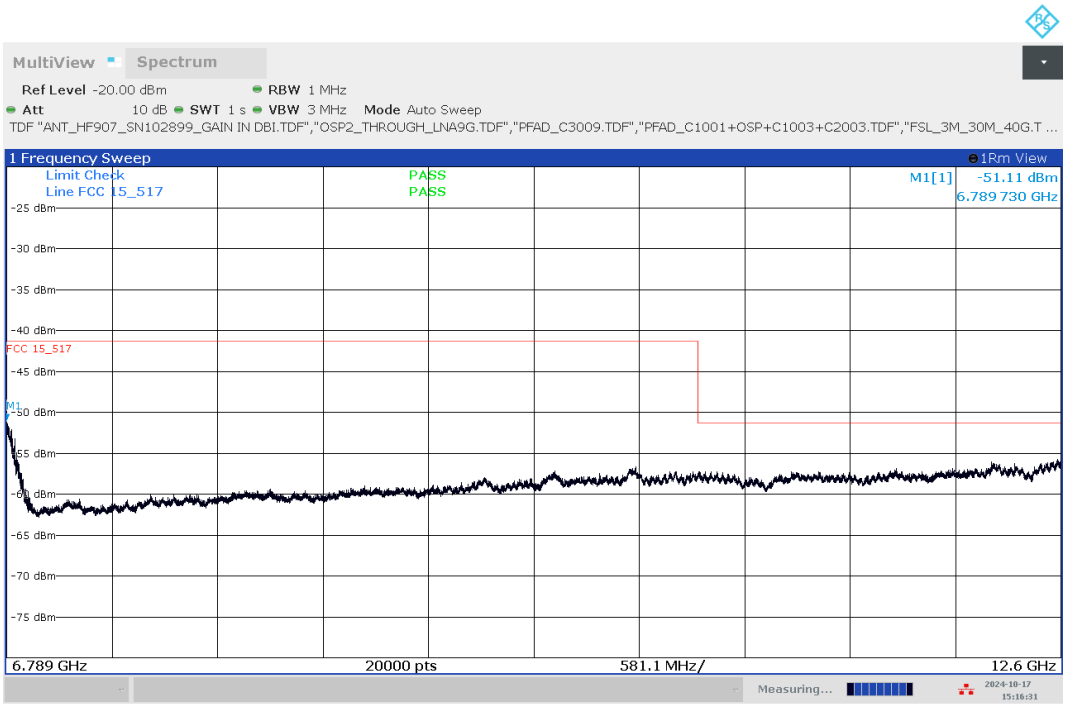
2.3.6 6789 MHz – 12600 MHz, Set-up 1, Op. 1, radiated measurement



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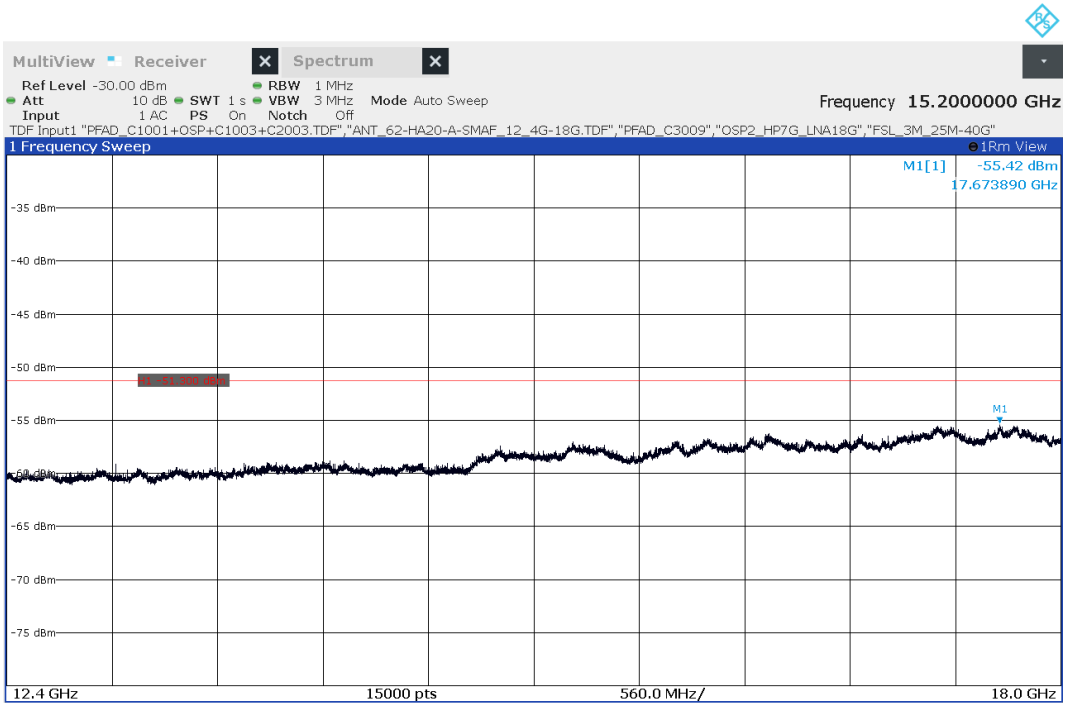
2.3.7 12400 MHz – 18000 MHz, Set-up 1, Op. 1, ANT HOR, radiated measurement



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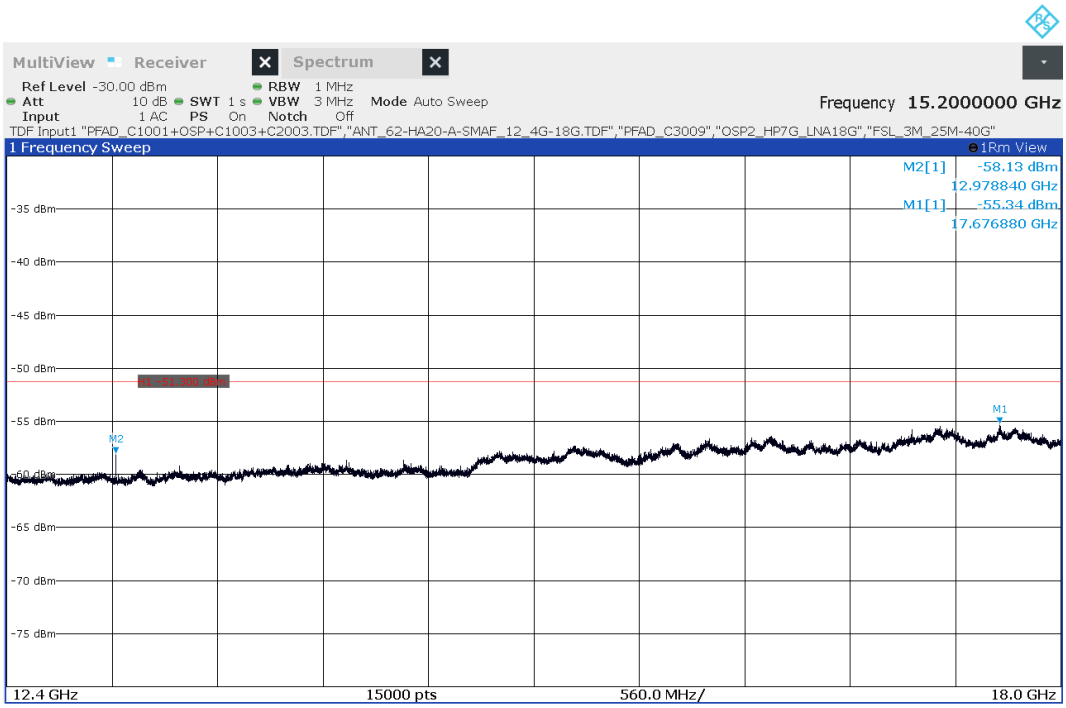
2.3.8 12400 MHz – 18000 MHz, Set-up 1, Op. 1, ANT VER, radiated measurement



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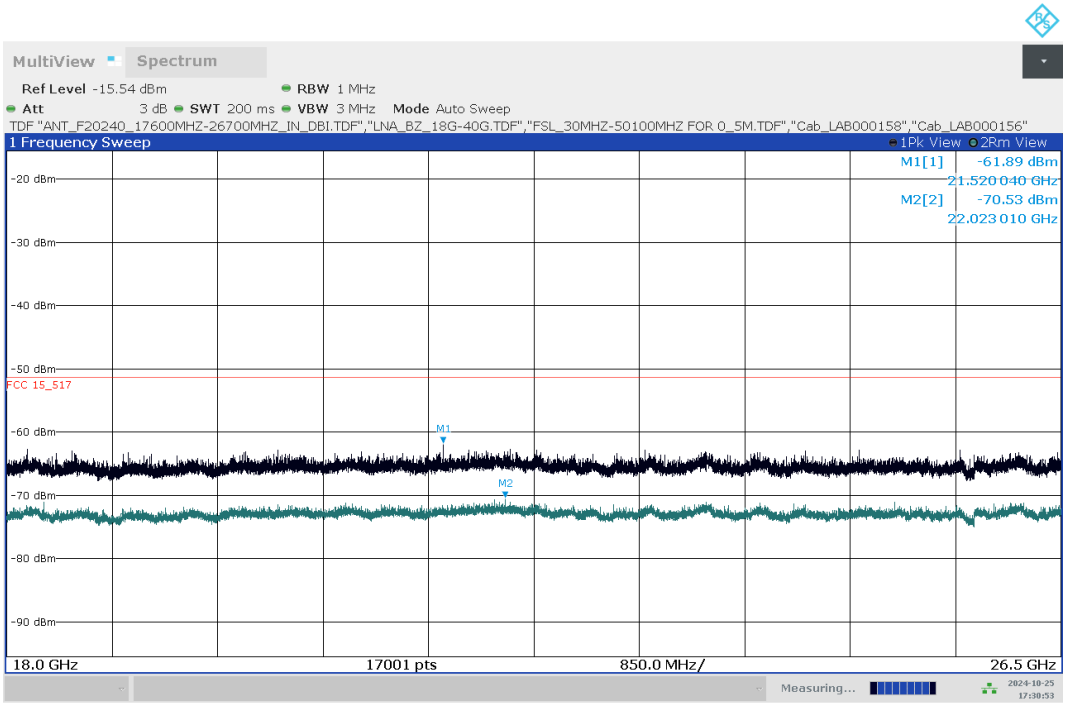
2.3.9 18000 MHz – 26500 MHz, Set-up 1, Op. 1, ANT HOR, radiated measurement



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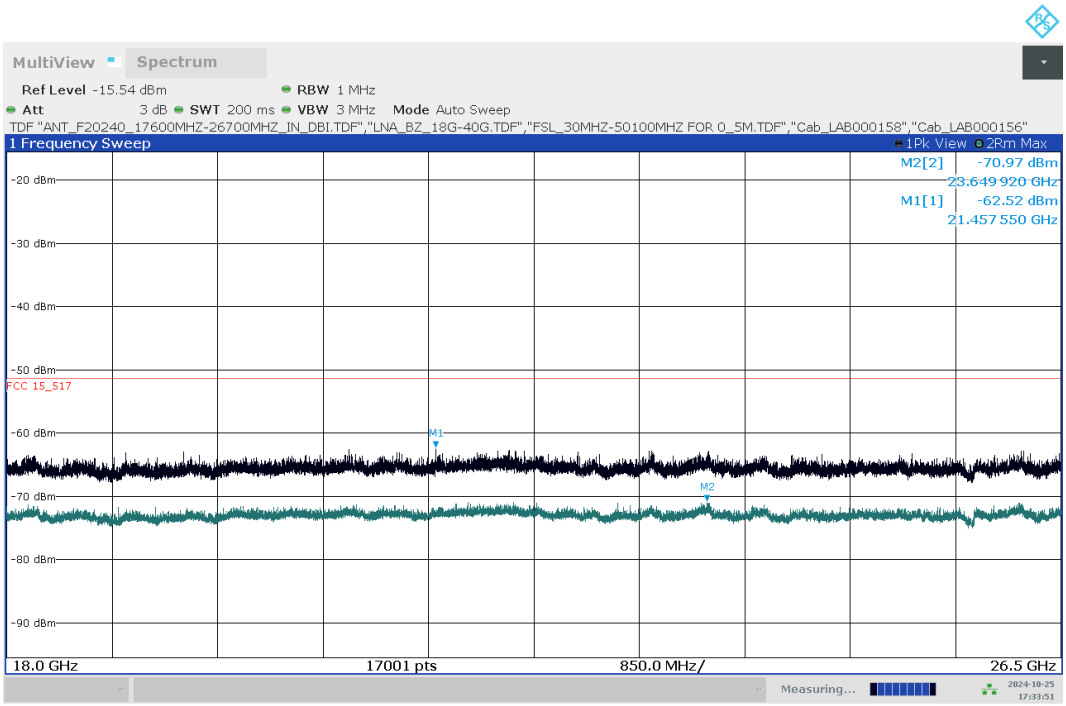
2.3.10 18000 MHz – 26500 MHz, Set-up 1, Op. 1, ANT VER, radiated measurement



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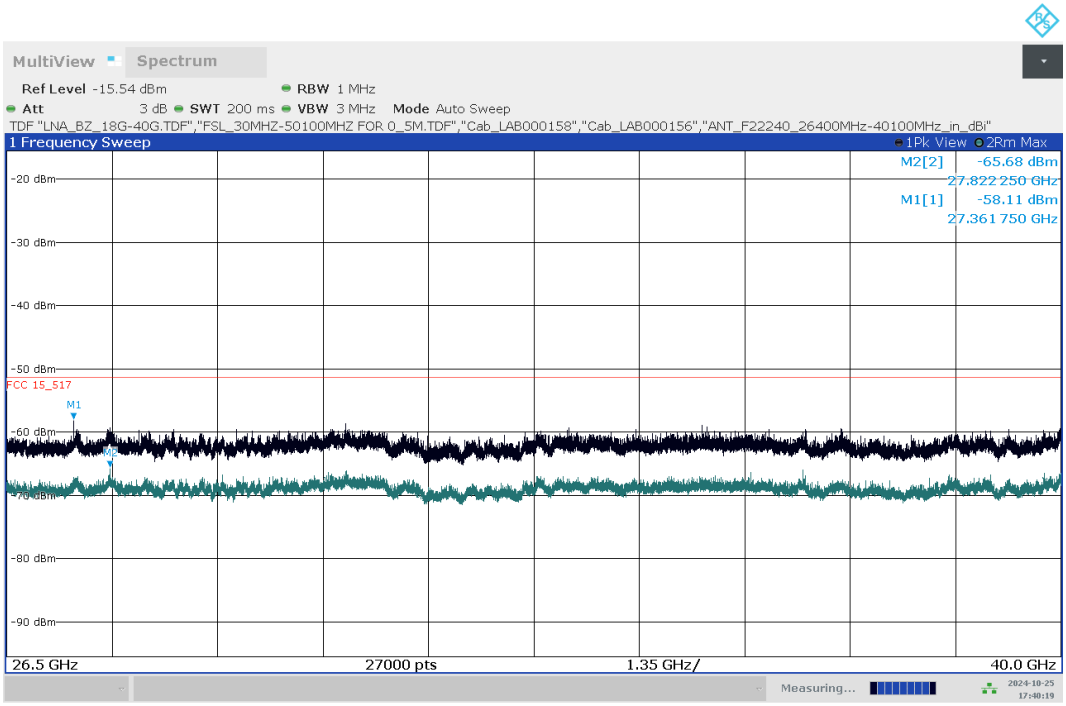
2.3.11 26500 MHz – 40000 MHz, Set-up 1, Op. 1, ANT HOR, radiated measurement



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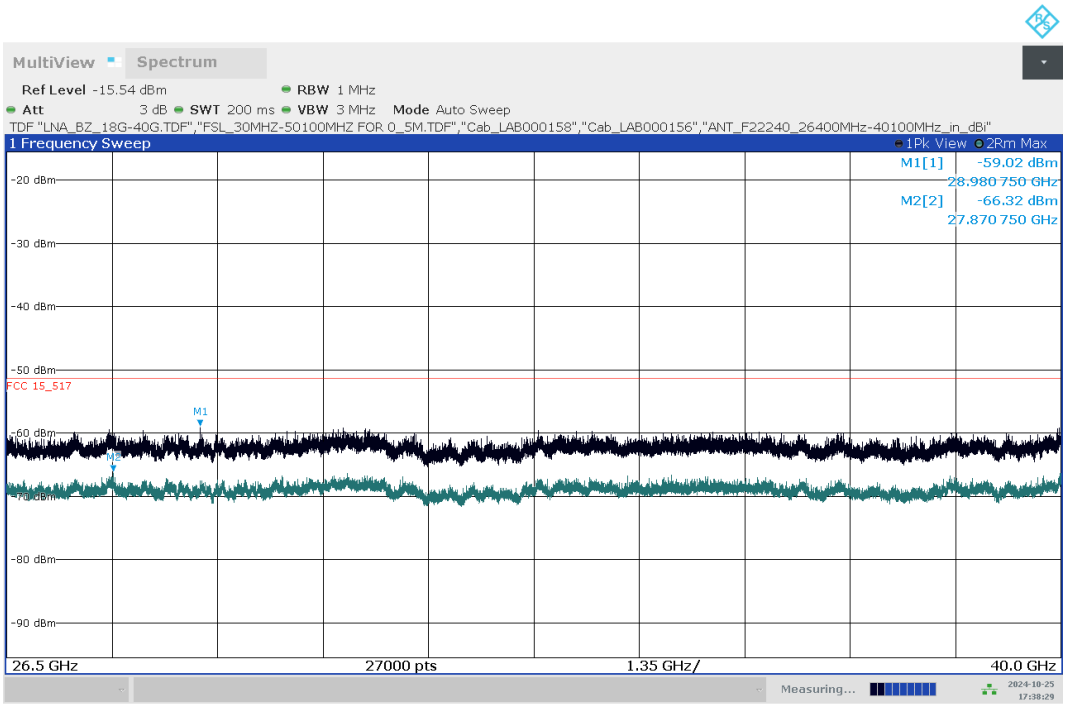
2.3.12 26500 MHz – 40000 MHz, Set-up 1, Op. 1, ANT VER, radiated measurement



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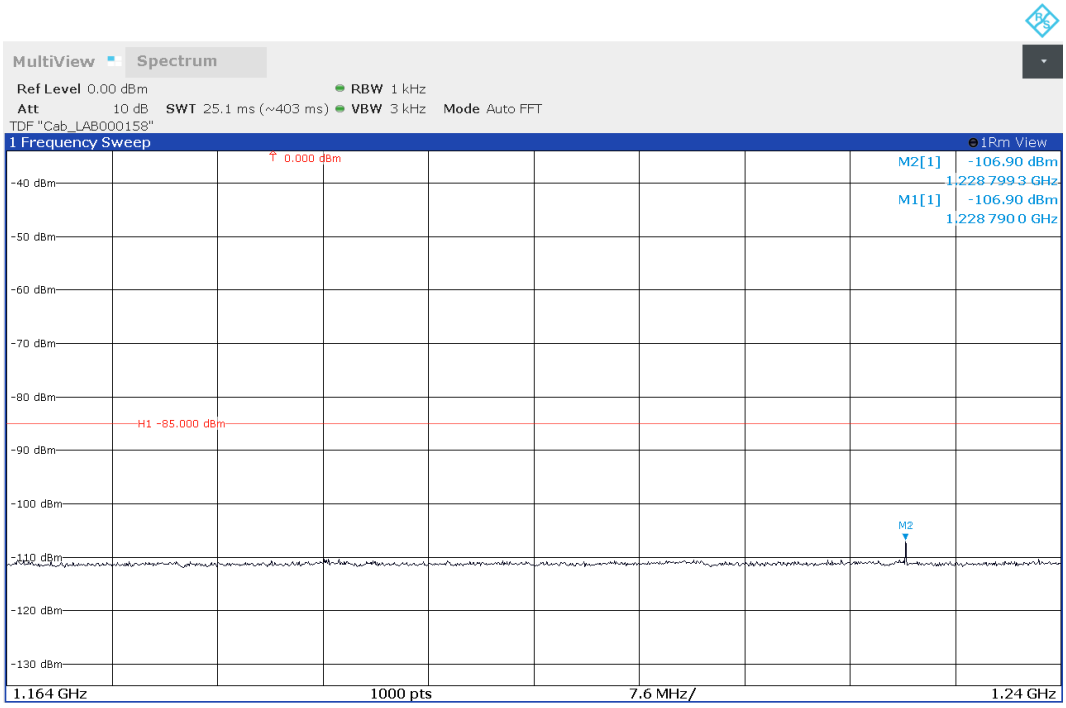
3 FUNDAMENTAL EMISSIONS IN THE GPS BAND

3.1 Frequency range 1164 MHz – 1240 MHz, Set-up 1, Op. 1, conducted measurement, cable connected to UWB port



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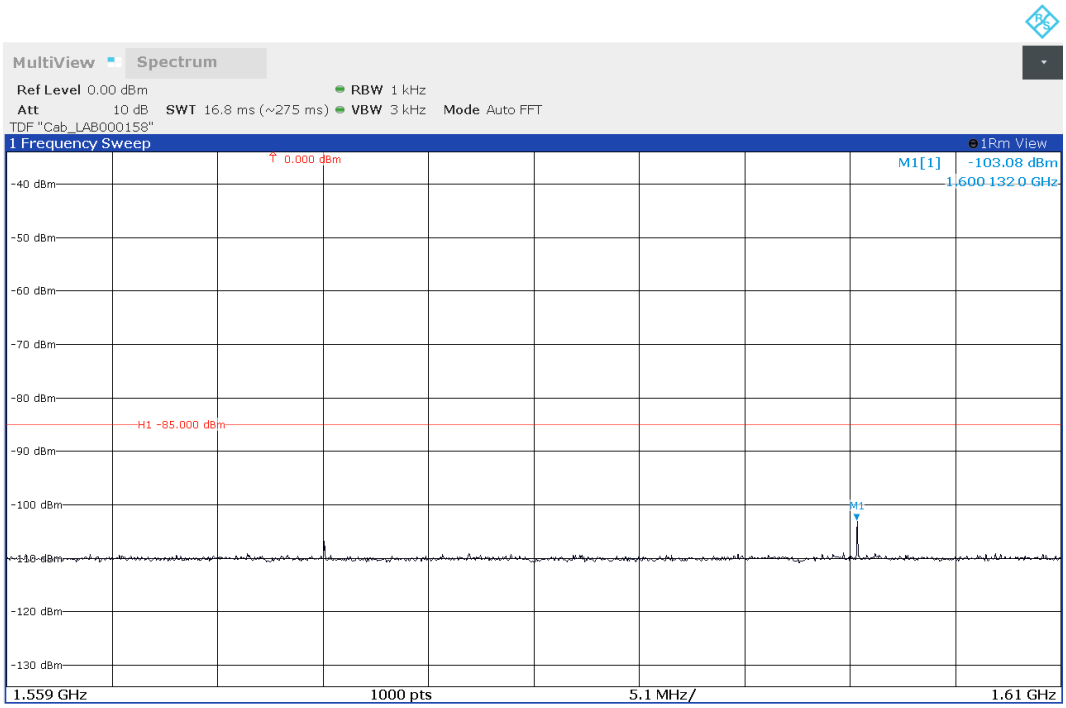
3.2 Frequency range 1559 MHz – 1610 MHz, Set-up 1, Op. 1, conducted measurement, cable connected to UWB port



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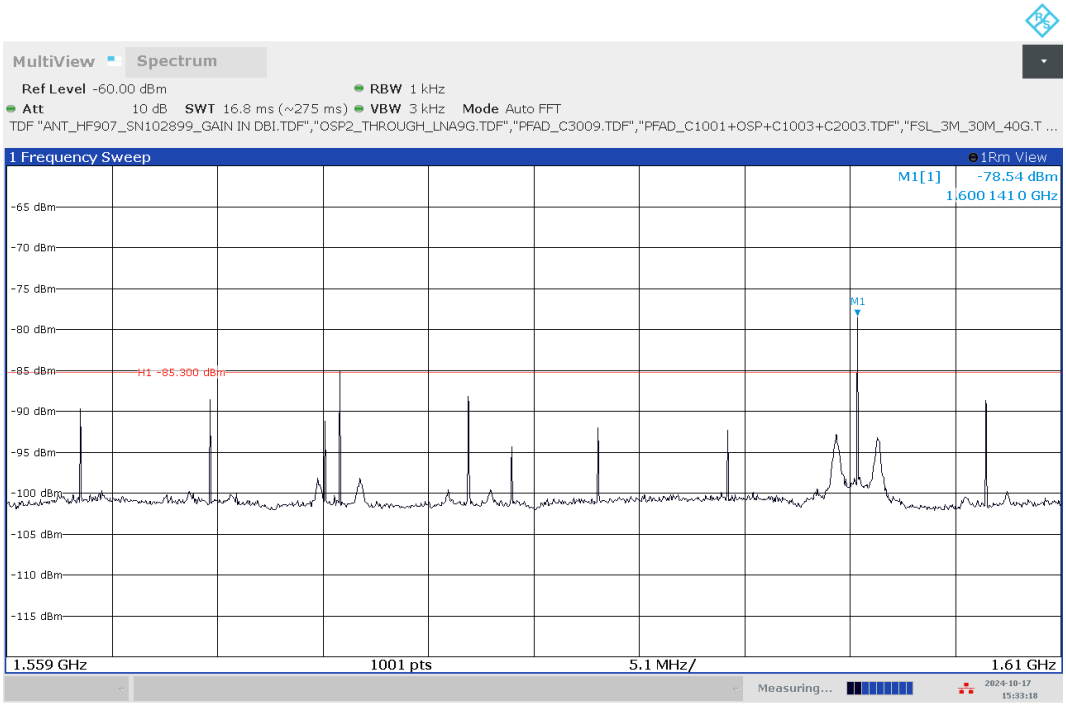
3.3 Frequency range 1164 MHz – 1240 MHz, Set-up 1, Op. 1, radiated measurement**

** According to FCC 15.521 (c): *Emissions from digital circuitry used to enable the operation of the UWB transmitter shall comply with the limits in § 15.209, rather than the limits specified in this subpart, provided it can be clearly demonstrated that those emissions from the UWB device are due solely to emissions from digital circuitry contained within the transmitter and that the emissions are not intended to be radiated from the transmitter's antenna.*

Plot 3.1 shows clearly, that there are no significant emissions coming from UWB module, correspondently from the UWB antenna. Thus, the emissions in the plot 3.3 are the emissions from digital circuitry. Thus, § 15.209 limits can be used here. Please see plot 2.3.2 for the measurement with § 15.209 limits.

3.4 Frequency range 1559 MHz – 1610 MHz, Set-up 1, Op. 1, radiated measurement***



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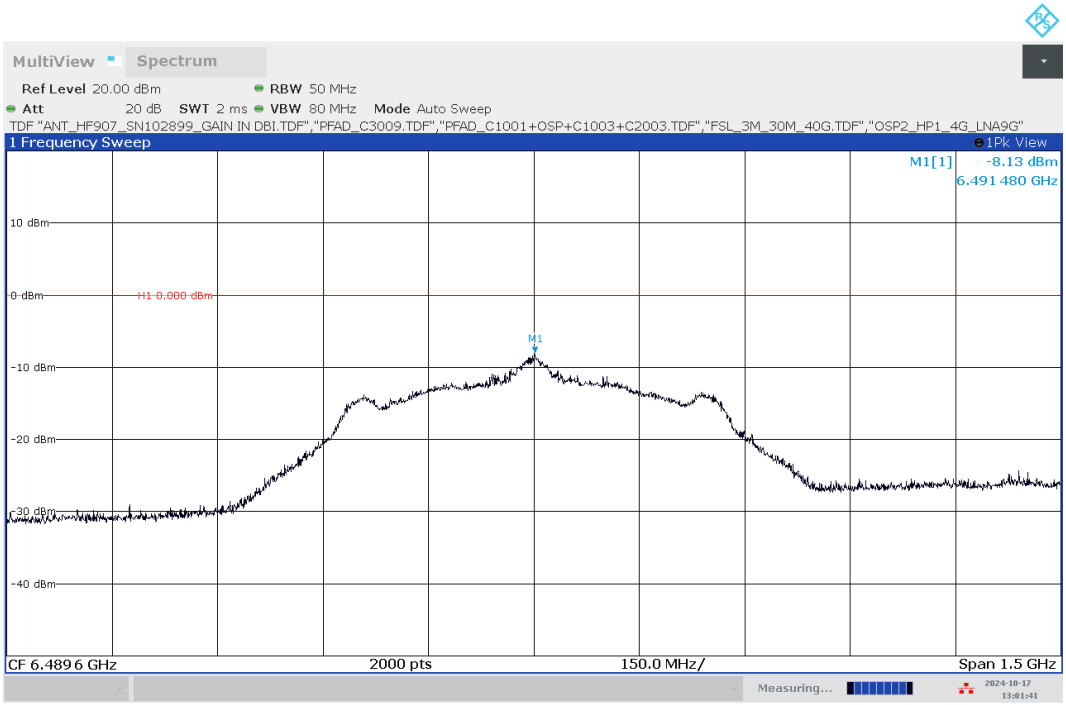
*** According to FCC 15.521 (c): *Emissions from digital circuitry used to enable the operation of the UWB transmitter shall comply with the limits in § 15.209, rather than the limits specified in this subpart, provided it can be clearly demonstrated that those emissions from the UWB device are due solely to emissions from digital circuitry contained within the transmitter and that the emissions are not intended to be radiated from the transmitter's antenna.*

Plot 3.2 shows clearly, that there are no significant emissions coming from UWB module, correspondently from the UWB antenna. Thus, the emissions in the plot 3.4 are the emissions from digital circuitry. Thus, § 15.209 limits can be used here. Please see plot 2.3.2 for the measurement with § 15.209 limits.

4 FUNDAMENTAL EMISSION PEAK POWER

4.1 Set-up 1, Op. 1



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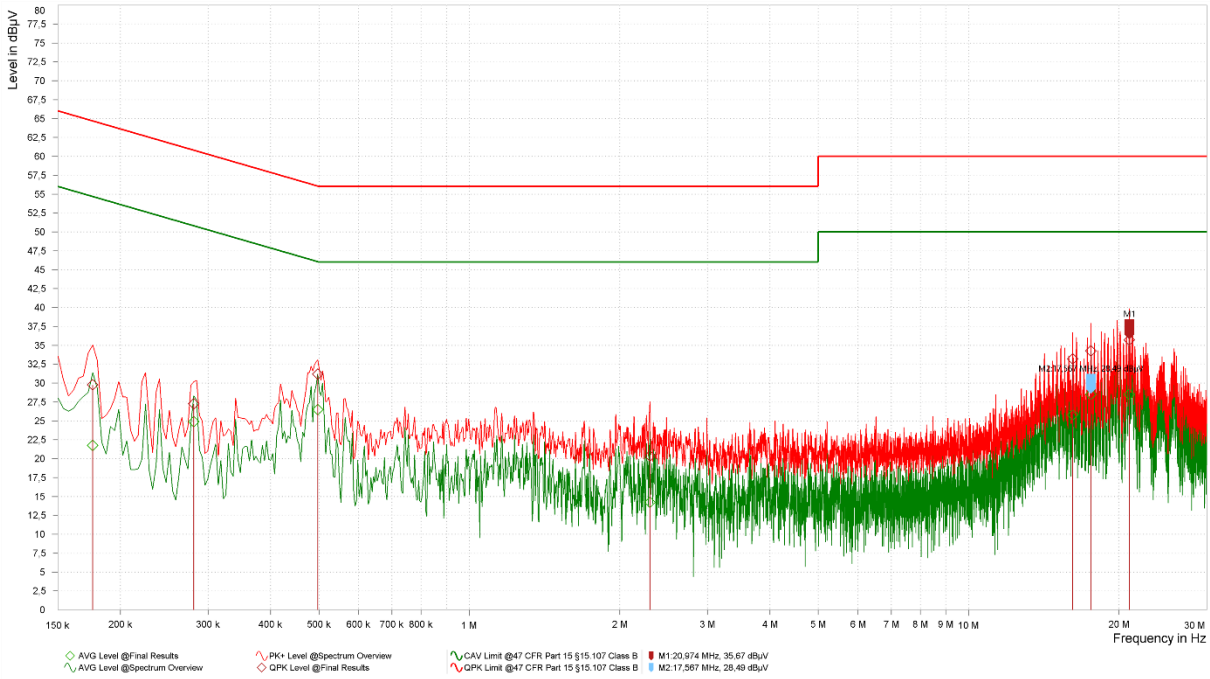
5 Conducted emissions

5.1 Set-up 1, Op. 1, L1

EMI Final Results

Rg	Frequency [MHz]	QPK Level [dBµV]	QPK Limit [dBµV]	QPK Margin [dB]	AVG Level [dBµV]	AVG: CAV Limit [dBµV]	AVG Margin [dB]	Correction [dB]	Line	Meas. BW [kHz]	Meas. Time [s]
1	0,161	31,36	65,40	34,04	23,77	55,40	31,63	10,02	L1	9,000	15,000
1	0,284	29,31	60,69	31,38	27,65	50,69	23,03	9,85	L1	9,000	15,000
1	0,493	30,61	56,11	25,50	25,98	46,11	20,14	10,18	L1	9,000	15,000
1	0,915	20,41	56,00	35,59	14,66	46,00	31,34	10,01	L1	9,000	15,000
1	3,889	19,60	56,00	36,40	13,30	46,00	32,70	9,98	L1	9,000	15,000
1	17,862	33,61	60,00	26,39	25,69	50,00	24,31	10,40	L1	9,000	15,000
1	20,411	33,71	60,00	26,29	26,66	50,00	23,34	10,44	L1	9,000	15,000
1	22,694	29,93	60,00	30,07	23,75	50,00	26,25	10,48	L1	9,000	15,000

5.2 Set-up 1, Op. 1, N



EMI Final Results

Rg	Frequency [MHz]	QPK Level [dBµV]	QPK Limit [dBµV]	QPK Margin [dB]	AVG Level [dBµV]	AVG: CAV Limit [dBµV]	AVG Margin [dB]	Correction [dB]	Line	Meas. BW [kHz]	Meas. Time [s]
1	0,176	29,74	64,67	34,93	21,72	54,67	32,95	10,13	N	9,000	15,000
1	0,281	27,24	60,80	33,55	24,88	50,80	25,92	9,84	N	9,000	15,000
1	0,497	31,16	56,05	24,89	26,47	46,05	19,58	10,18	N	9,000	15,000
1	2,299	20,36	56,00	35,64	14,20	46,00	31,80	9,92	N	9,000	15,000
1	16,157	33,17	60,00	26,83	25,77	50,00	24,23	10,45	N	9,000	15,000
1	17,567	34,24	60,00	25,76	28,49	50,00	21,51	10,49	N	9,000	15,000
1	20,974	35,67	60,00	24,33	28,47	50,00	21,53	10,58	N	9,000	15,000