Test data, Bandwidth, continued

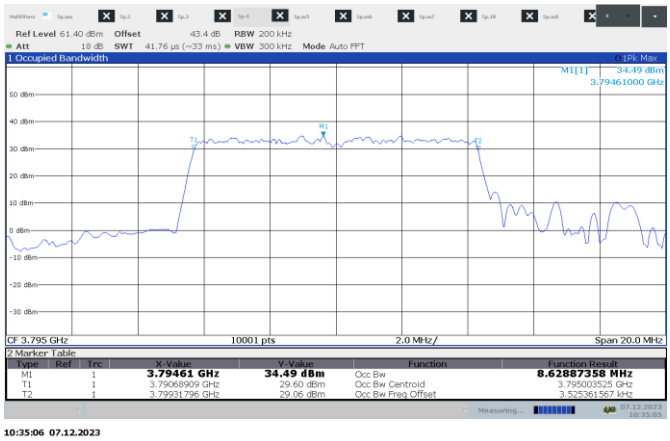

Figure 7.1-120: *OBW, n78, ch 653000*

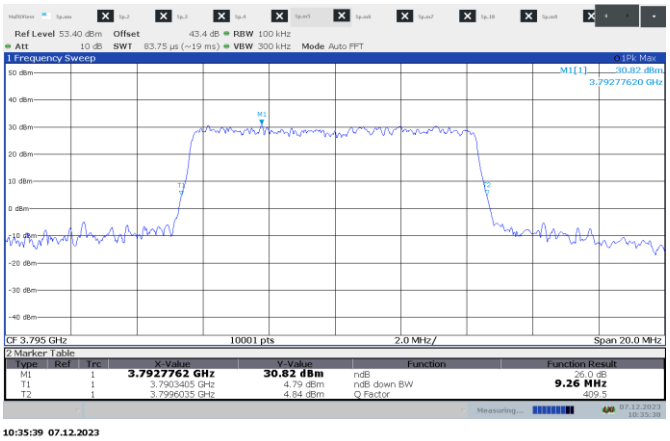

Figure 7.1-121 : *EBW, n78, ch 653000*

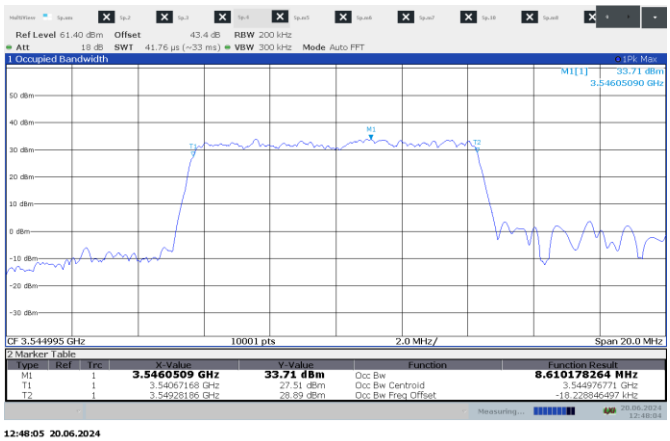

Figure 7.1-122: *OBW, n77, ch 636333 (FCC)*

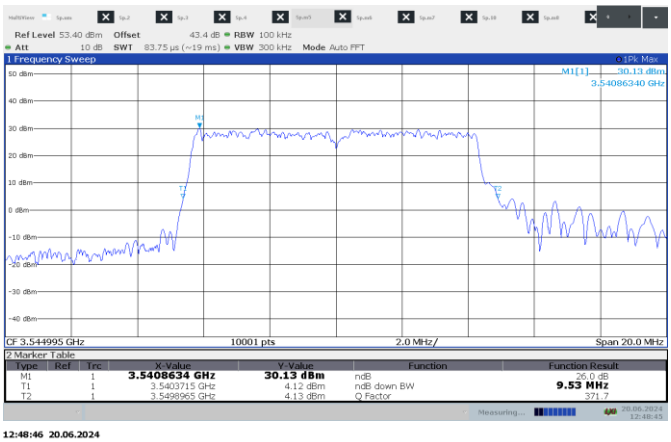

Figure 7.1-123 : *EBW, n77, ch 636333 (FCC)*

7.2 Band edges and Spurious emissions

References, definitions and limits

FCC §22.917:

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

FCC §24.238:

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

FCC §27.53:

(h) AWS emission limits

(1) General protection levels. Except as otherwise specified below, for operations in the 1695–1710 MHz, 1710–1755 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2110–2155 MHz, 2155–2180 MHz, and 2180–2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\log_{10}$ (P) dB.

*(2) Additional protection levels. Notwithstanding the foregoing paragraph (h)(1) of this section:

(i) Operations in the 2180–2200 MHz band are subject to the out-of-band emission requirements set forth in §27.1134 for the protection of federal government operations operating in the 2200–2290 MHz band.

RSS-130, Clause 4.7.1:

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 $\log_{10}$ p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

RSS-132, Clause 5.5:

Equipment shall meet the unwanted emission limits specified below:

i. In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated below the transmitter output power P (dBW) by at least 43 + 10 log(p) dB.

ii. After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated below the transmitter output power P (dBW) by at least 43 + 10 log(p) dB. If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

RSS-133, Clause 6.5.1:

Equipment shall comply with the limits in (i) and (ii) below.

i. In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 $\log_{10}$p(watts).

ii. After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 $\log_{10}$p(watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

References, definitions and limits, continued

RSS-139, Clause 5.6:

Unwanted emissions shall be measured in terms of average values.

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors) of the unwanted emissions outside the frequency block or frequency block group shall not exceed the below limits.

Offset from the edge of the frequency block or frequency block group	Unwanted emission limits
1 MHz	-13 dBm/ (1% of OBW)
>1 MHz	-13 dBm/MHz

RSS-192, Clause 5.6:

The unwanted emissions of base station, P-P and P-MP equipment shall comply with the following:

- the limits in table 2 for all frequencies between 3450-3900 MHz.
- a limit of -13 dBm TRP /MHz or conducted power (sum of conducted power across all antenna connectors), where applicable, for all frequencies below 3400 MHz.
- the limits in table 4 for all frequencies above 3900 MHz.
- a limit of -30 dBm TRP /MHz or conducted power (sum of conducted power across all antenna connectors), where applicable, for all frequencies between 4200-4400 MHz.

Table 2: Unwanted emission limits for outdoor base station, P-P, and P-MP equipment in the band 3450-3900 MHz	
Offset frequency from the edge of the frequency block group (MHz)	**Non-AAS e.i.r.p. (dBm/5 MHz) per antenna**
0-5	Min {($e.i.r.p_{max}$ - 40), 21}
5-10	Min {($e.i.r.p_{max}$ - 43), 15}
>10	Min {($e.i.r.p_{max}$ - 43), 13}

Table 4: Unwanted emission limits for outdoor base station, P-P and P-MP equipment above 3900 MHz	
Offset from 3900 MHz band edge	**TRP or conducted power (sum of conducted power across all antenna connectors), where applicable**
1 MHz	-13 dBm/(1% of OBW)
>1 MHz	-13 dBm/MHz

RSS-198, Clause 5.6:

The unwanted emission outside the frequency block group shall not exceed the TRP or total conducted power (sum of conducted power across all antenna connectors) limits as specified in table 2.

Table 2: Unwanted emission limits for all equipment	
Offset from the edge of the frequency block or frequency block group	**Unwanted emission limits**
1 MHz	-13 dBm/ (1% of OBW)
>1 MHz	-13 dBm/MHz

For frequencies between 4200 MHz and 4400 MHz, the unwanted emission of outdoor base station, indoor base station and fixed service equipment shall not exceed a TRP or total conducted power (sum of conducted power across all antenna connectors) limit of -30 dBm/MHz.

RSS-199, Clause 5.6:

Unwanted emissions shall be measured in terms of average values when the transmitter is operating at the manufacturer's rated power and modulated as specified in RSS-Gen.

Equipment shall meet the unwanted emission limits, specified below, outside each frequency block group. For each channel bandwidth supported by the equipment under test, the unwanted emissions shall be measured and reported for two channel frequencies: one located as close as possible to the low end and one located as close as possible to the high end of the equipment's operating frequency range.

For the unwanted emission limits, in the 1 MHz band immediately outside and adjacent to the frequency block group, the power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth for fixed stations, base stations, and fixed subscriber equipment, and 2% for subscriber equipment other than fixed subscriber equipment. Beyond this 1 MHz band, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz, or 1% or 2% of the occupied bandwidth, as applicable.

References, definitions and limits, continued

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors), where applicable, of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in the tables below.

Table 4: Unwanted emission limits for fixed station, base station, and fixed subscriber equipment	
Offset from the edge of the frequency block or frequency block group (MHz)	**Unwanted emission limits**
≤ 1	-13 dBm/ (1% of OBW)
> 1	-13 dBm/MHz

Test summary

Verdict	Pass		
Test date	December 6, 2023	Temperature	21 °C
Tested by	Tarek Elkholy	Air pressure	974 mbar
Test location	Cambridge	Relative humidity	33 %

Observations, settings and special notes

- The spectrum was searched from 30 MHz to the 10th harmonic.
- All measurements were performed using an average (RMS) detector per ANSI C63.26 Paragraph 5.7.3 method.
- Spurious emissions tests and band edges were performed at RF antenna connector and a radiated cabinet spurious emission was performed with the antenna ports terminated with 50Ω termination.

Spectrum analyser settings for out of band emissions:

Resolution bandwidth:	1 MHz (Signals greater than 1 GHz) 100 kHz (Signals below 1 GHz)
Video bandwidth:	> RBW
Detector mode:	RMS
Trace mode:	Averaging

Spectrum analyser settings for spurious emissions in the 1 MHz bands immediately outside and adjacent to the licensee's frequency block:

Resolution bandwidth:	At least 1% of EBW
Video bandwidth:	> RBW
Detector mode:	RMS
Trace mode:	Averaging

Test data

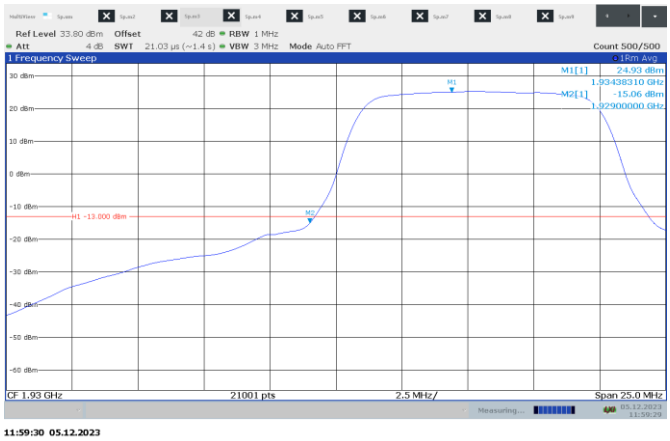

Figure 7.2-1: *Conducted band edge, n2, ch 387100*

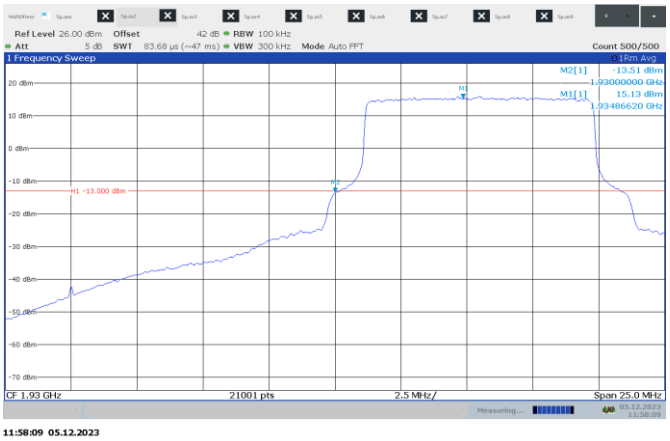

Figure 7.2-2: *Conducted band edge (RBW 1% of EBW), n2, ch 387100*

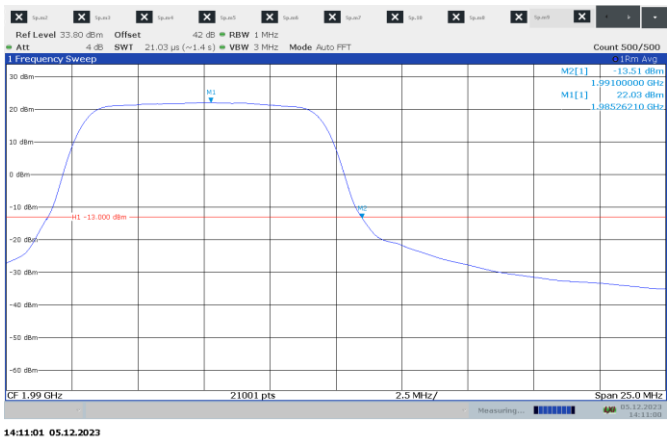

Figure 7.2-3: *Conducted band edge, n2, ch 397000*

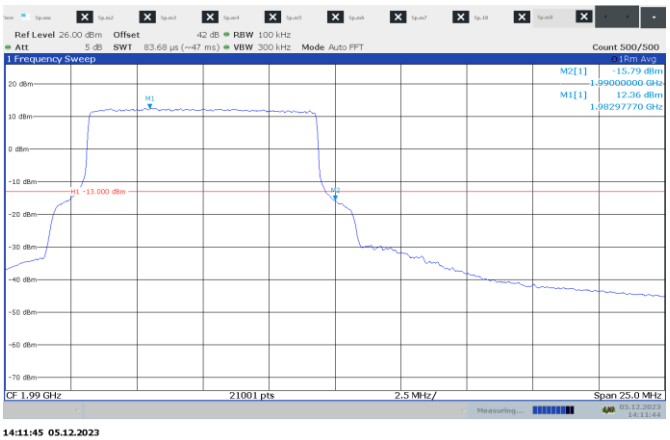

Figure 7.2-4: *Conducted band edge (RBW 1% of EBW), n2, ch 397000*

Test data, Band edges, continued

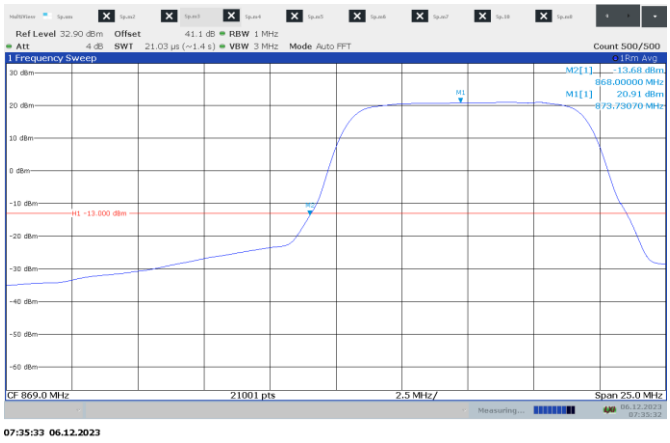

Figure 7.2-5: *Conducted band edge, n5, ch 174800*

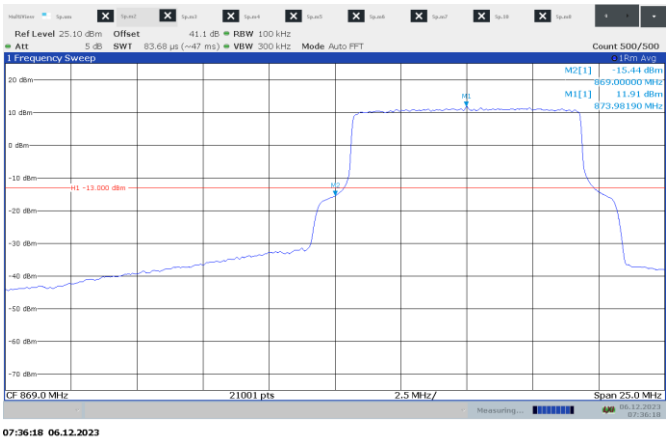

Figure 7.2-6: *Conducted band edge (RBW 1% of EBW), n5, ch 174800*

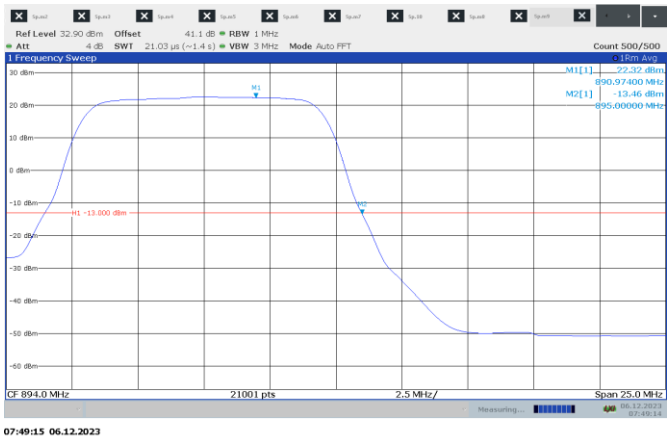

Figure 7.2-7: *Conducted band edge, n5, ch 177800*

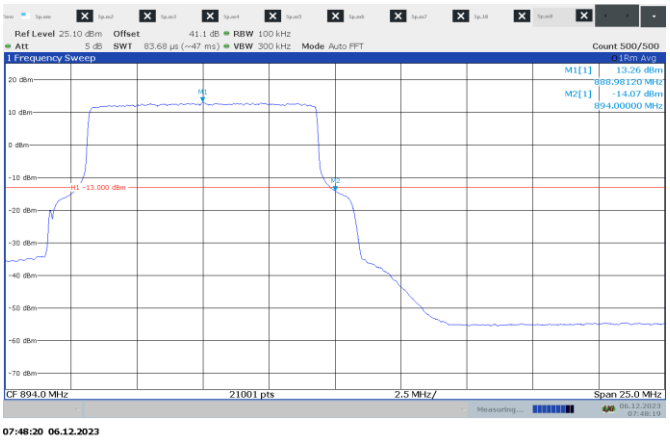

Figure 7.2-8: *Conducted band edge (RBW 1% of EBW), n5, ch 177800*

Test data, Band edges, continued

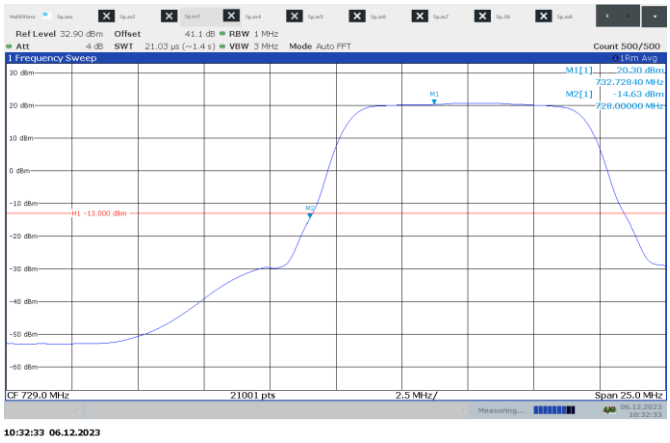

Figure 7.2-9: *Conducted band edge, n12, ch 146800*

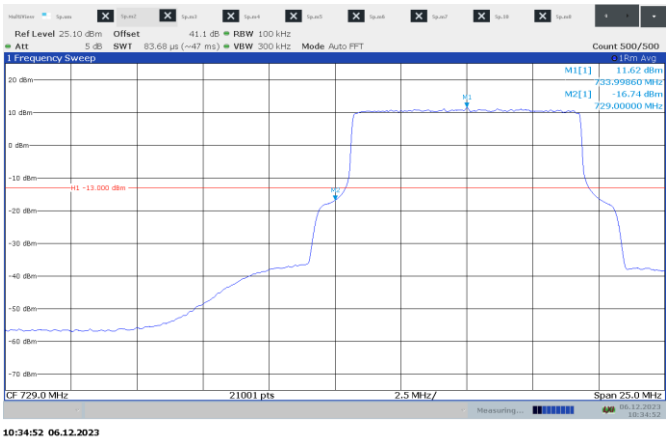

Figure 7.2-10: *Conducted band edge (RBW 1% of EBW), n12, ch 146800*

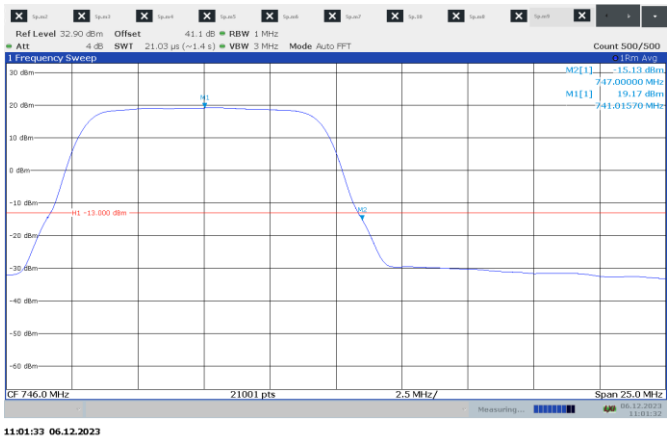

Figure 7.2-11: *Conducted band edge, n12, ch 148200*

Figure 7.2-12: *Conducted band edge (RBW 1% of EBW), n12, ch 148200*

Test data, Band edges, continued

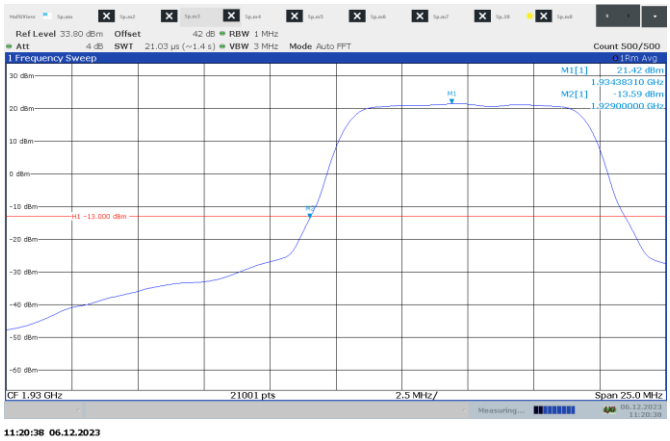

Figure 7.2-13: *Conducted band edge, n25, ch 387000*

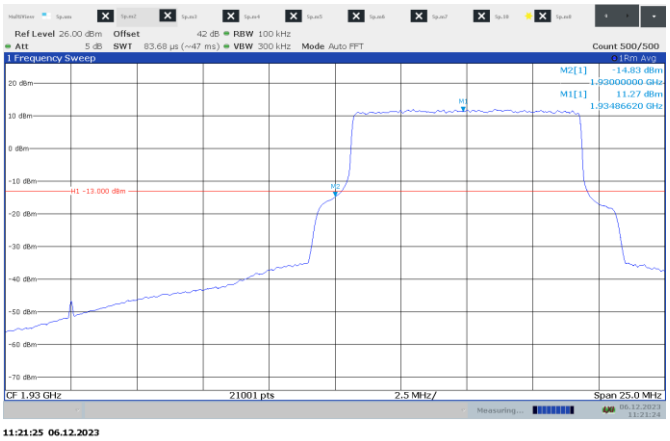

Figure 7.2-14: *Conducted band edge (RBW 1% of EBW), n25, ch 387000*

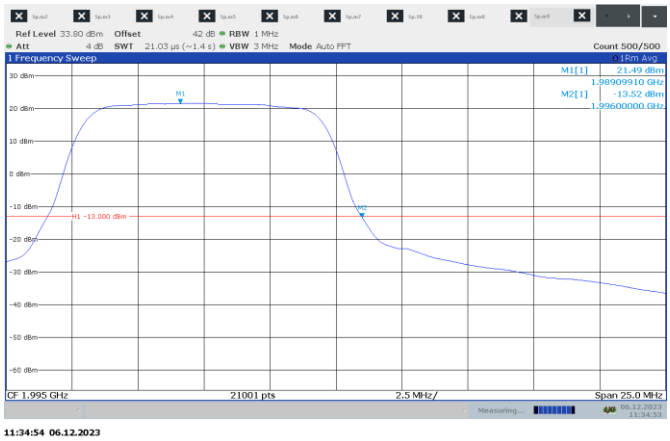

Figure 7.2-15: *Conducted band edge, n25, ch 398000*

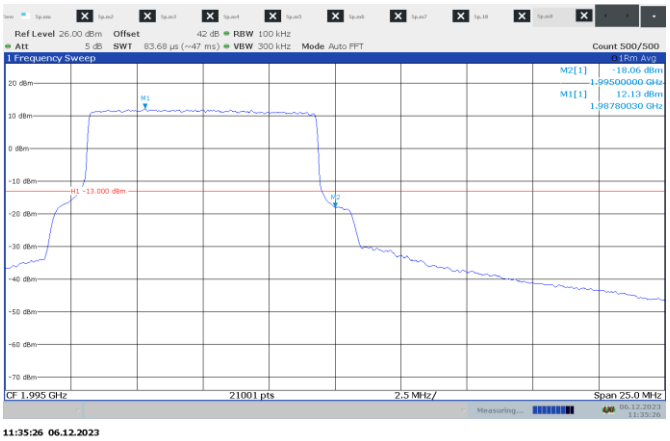

Figure 7.2-16: *Conducted band edge (RBW 1% of EBW), n25, ch 398000*

Test data, Band edges, continued

Figure 7.2-17: *Conducted band edge, n41, ch 510000*

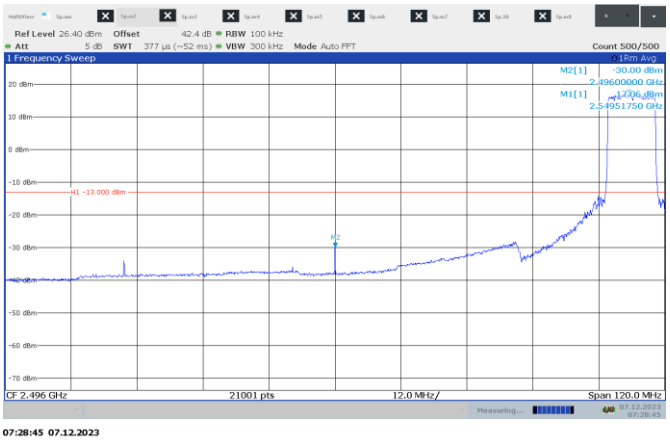

Figure 7.2-18: *Conducted band edge (RBW 1% of EBW), n41, ch 510000*

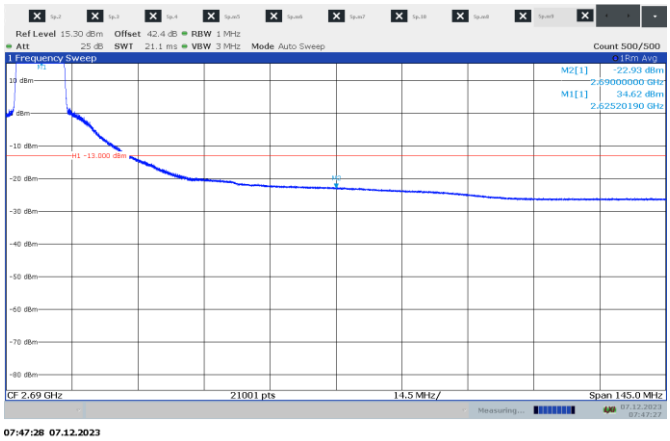

Figure 7.2-19: *Conducted band edge, n41, ch 525000*

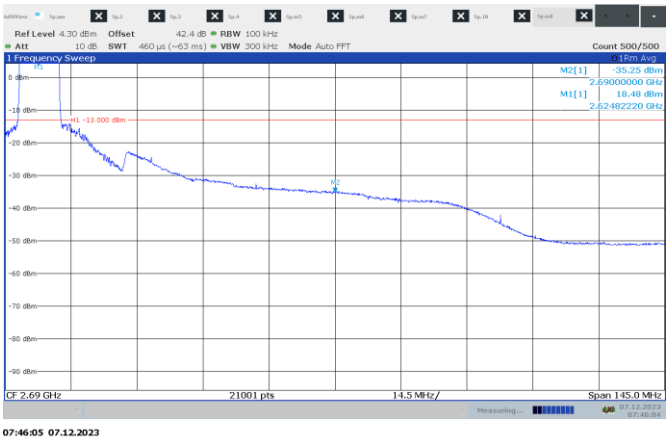

Figure 7.2-20: *Conducted band edge (RBW 1% of EBW), n41, ch 525000*

Test data, Band edges, continued

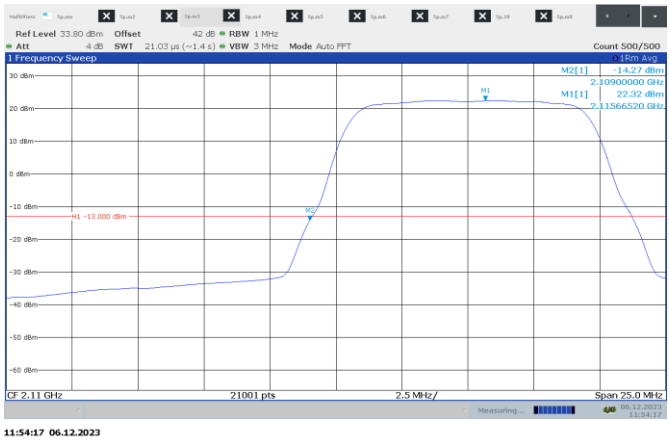

Figure 7.2-21: *Conducted band edge, n66, ch 423020*

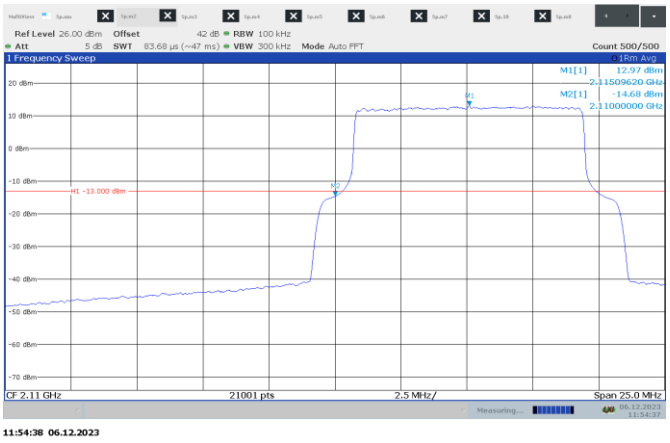

Figure 7.2-22: *Conducted band edge (RBW 1% of EBW), n66, ch 423020*

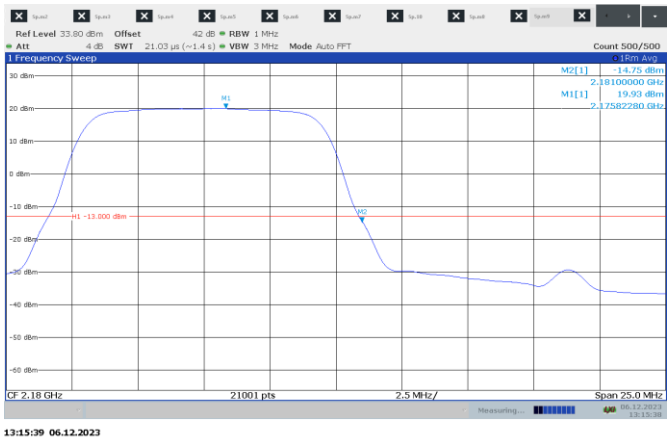

Figure 7.2-23: *Conducted band edge, n66, ch 435000*

Figure 7.2-24 : *Conducted band edge (RBW 1% of EBW), n66, ch 435000*

Test data, Band edges, continued

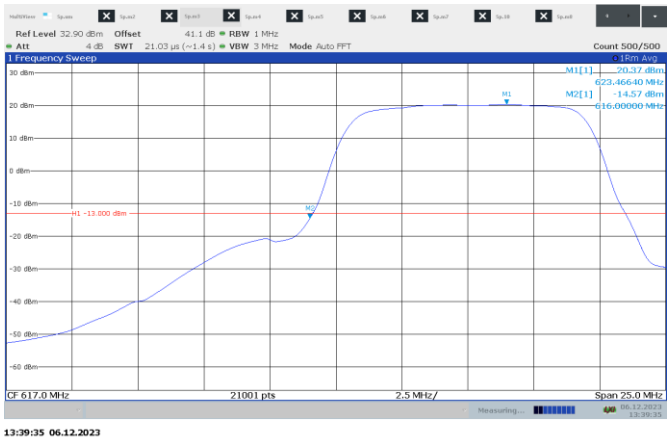

Figure 7.2-25: *Conducted band edge, n71, ch 124400*

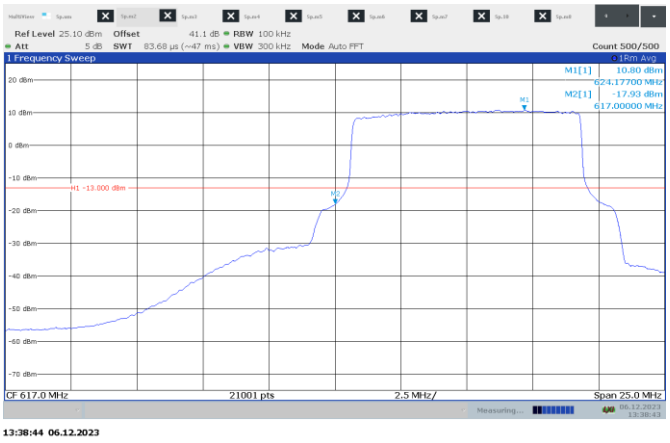

Figure 7.2-26: *Conducted band edge (RBW 1% of EBW), n71, ch 124400*

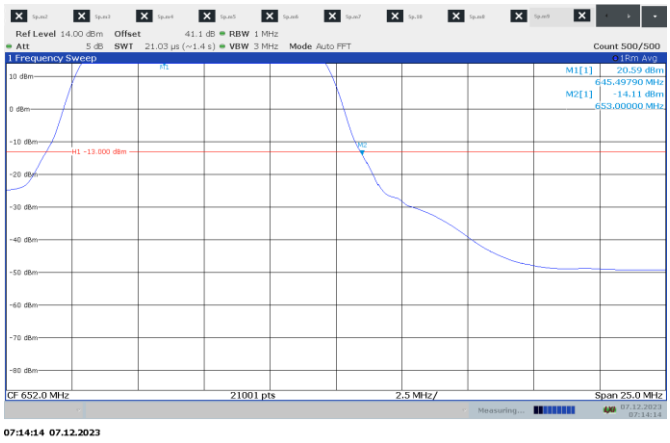

Figure 7.2-27: *Conducted band edge, n71, ch 129400*

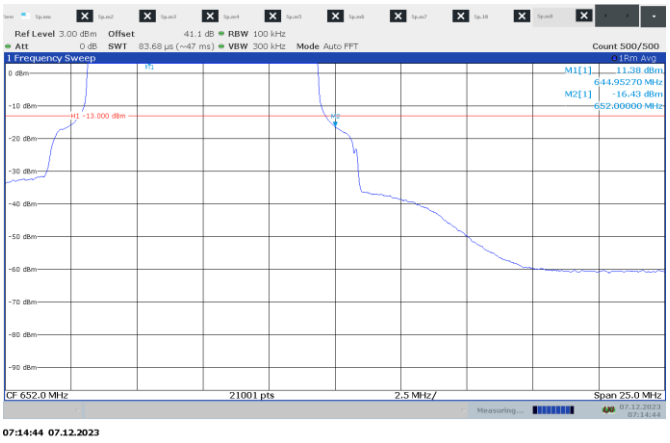

Figure 7.2-28 : *Conducted band edge (RBW 1% of EBW), n71, ch 129400*

Test data, Band edges, continued

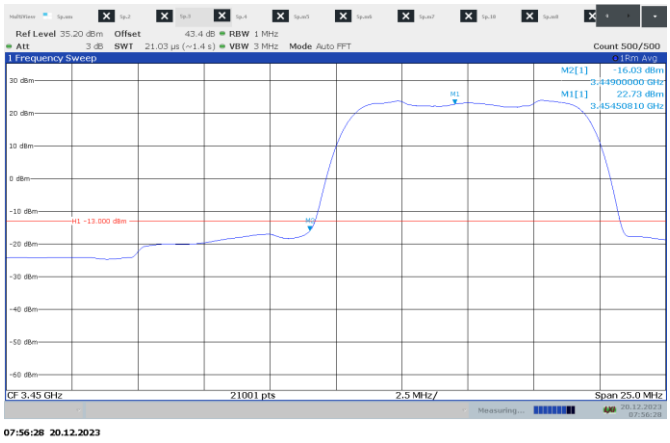

Figure 7.2-29: *Conducted band edge, n77, ch 630334*

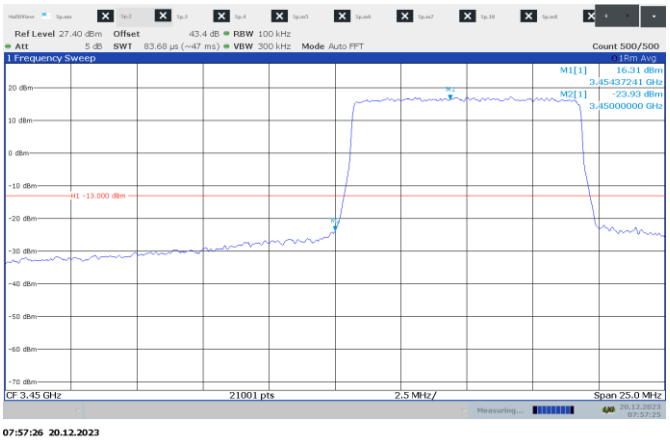

Figure 7.2-30 : *Conducted band edge (RBW 1% of EBW), n77, ch 630334*

Figure 7.2-31: *Conducted band edge, n77, ch 659666*

Figure 7.2-32 : *Conducted band edge (RBW 1% of EBW), n77, ch 659666*

Test data, Band edges, continued

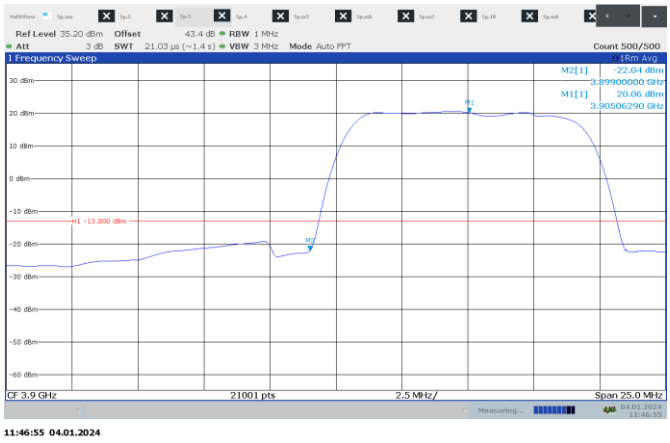

Figure 7.2-33: *Conducted band edge, n77, ch 660334*

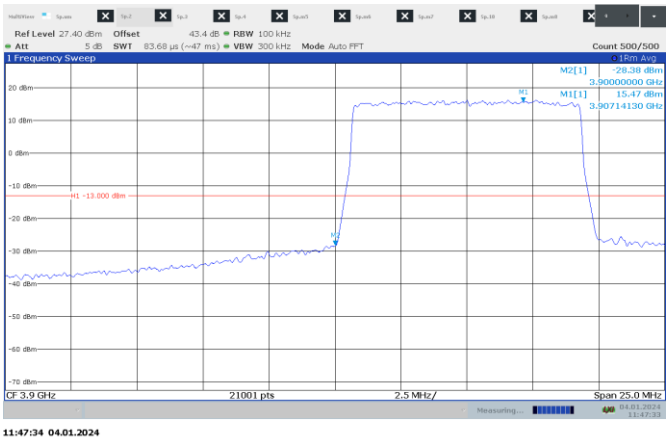

Figure 7.2-34 : *Conducted band edge (RBW 1% of EBW), n77, ch 660334*

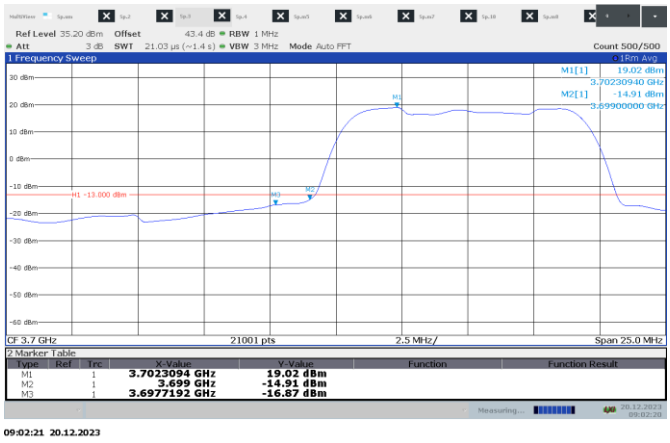

Figure 7.2-35: *Conducted band edge, n77, ch 647000 (FCC)*

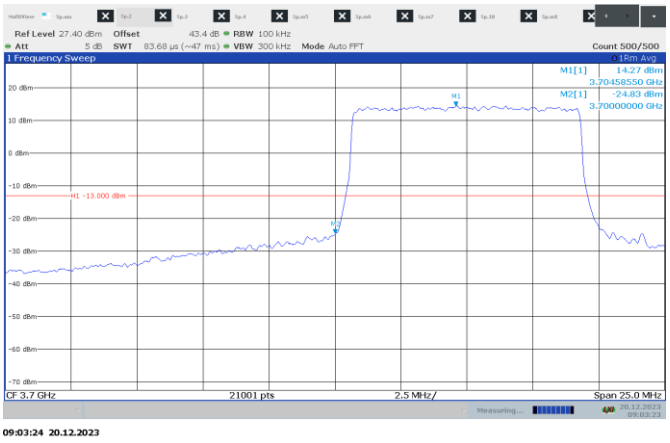

Figure 7.2-36 : *Conducted band edge (RBW 1% of EBW), n77, ch 647000 (FCC)*

Test data, Band edges, continued

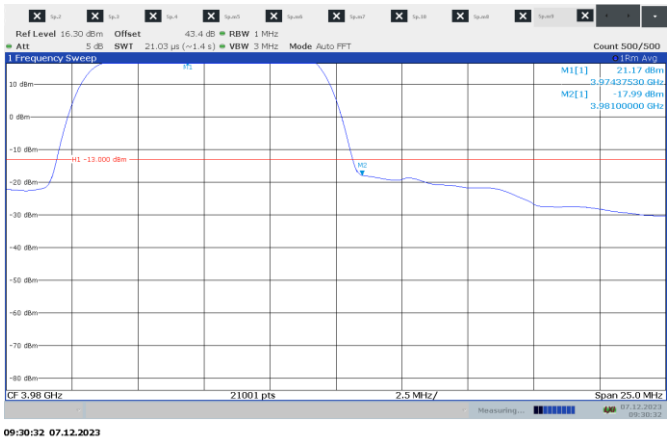

Figure 7.2-37: *Conducted band edge, n77, ch 665000*

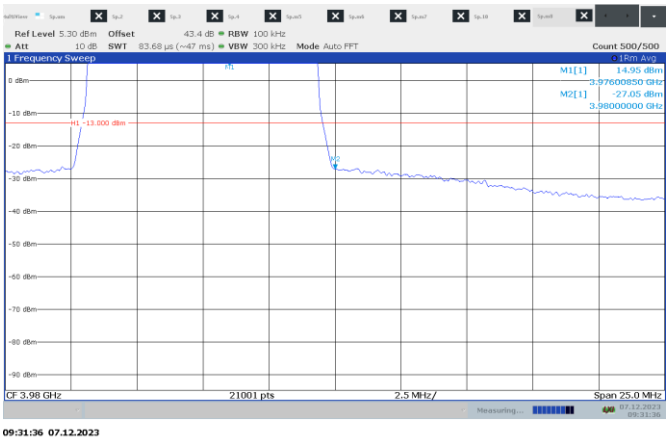

Figure 7.2-38 : *Conducted band edge (RBW 1% of EBW), n77, ch 665000*

Test data, Band edges, continued

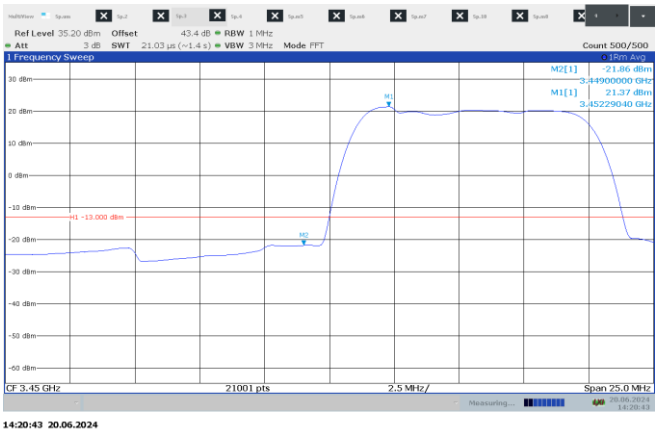

Figure 7.2-39: *Conducted band edge, n78, ch 630380*

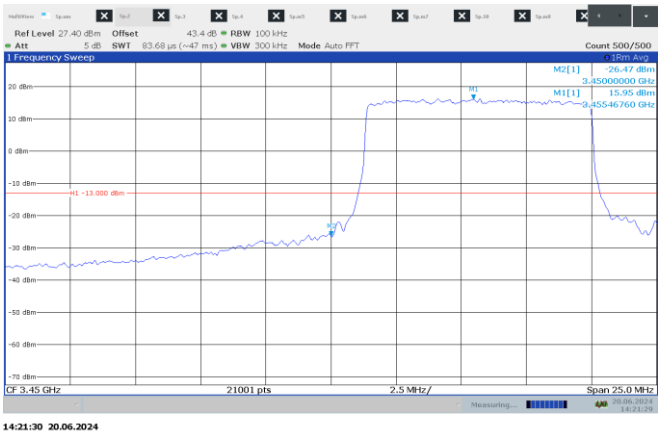

Figure 7.2-40 : *Conducted band edge (RBW 1% of EBW), n78, ch 630380*

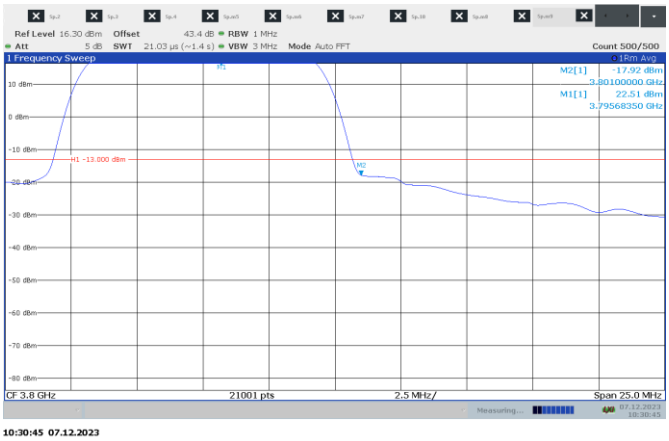

Figure 7.2-41: *Conducted band edge, n78, ch 653000*

Figure 7.2-42 : *Conducted band edge (RBW 1% of EBW), n78, ch 653000*

Test data, Conducted Spurious Emissions

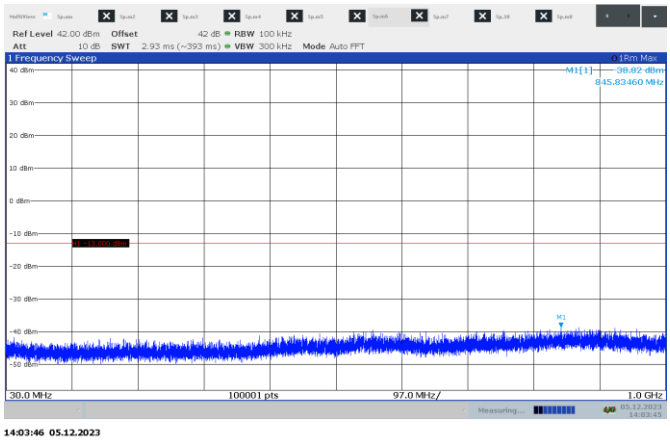

Figure 7.2-43: *Conducted sp. emissions below 1GHz, n2, ch 392000*

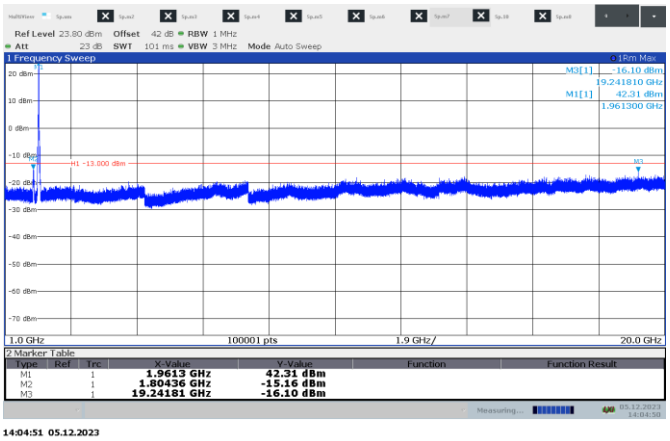

Figure 7.2-44: *Conducted sp. emissions above 1 GHz, n2, ch 392000*

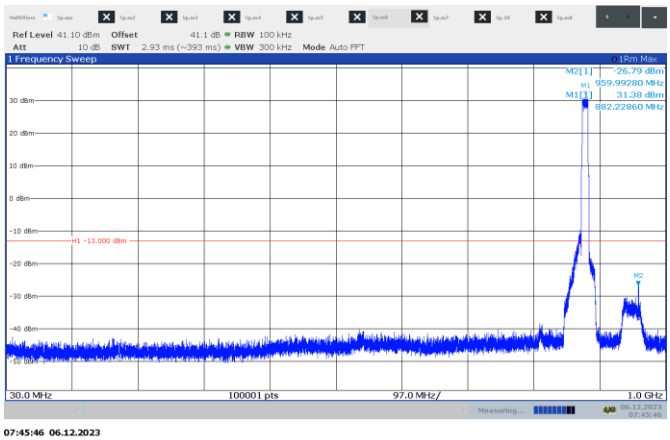

Figure 7.2-45: *Conducted sp. emissions below 1GHz, n5, ch 176300*

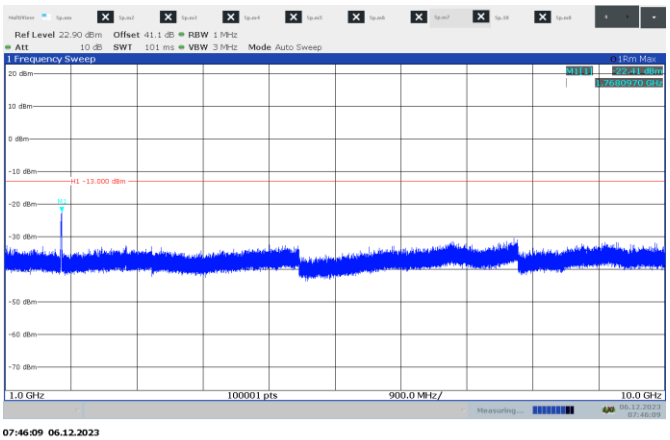

Figure 7.2-46: *Conducted sp. emissions above 1 GHz, n5, ch 176300*

Test data, Conducted Spurious Emissions, continued

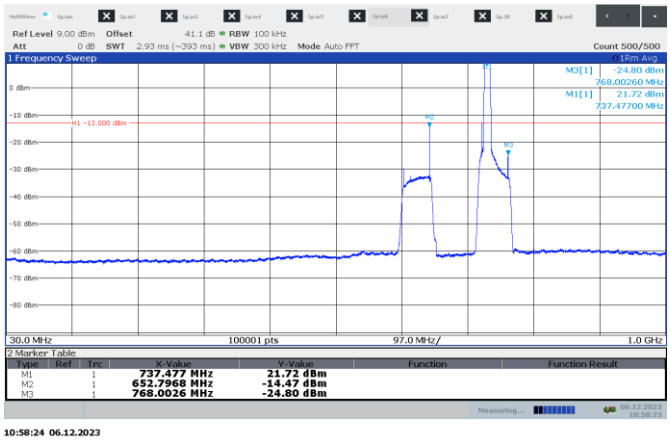

Figure 7.2-47: *Conducted sp. emissions below 1GHz, n12, ch 147500*

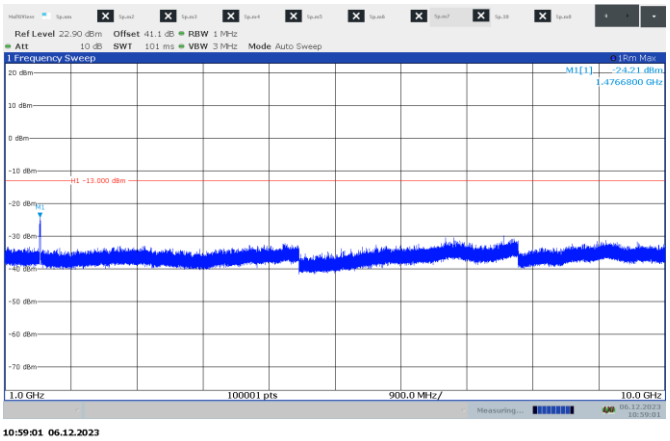

Figure 7.2-48: *Conducted sp. emissions above 1 GHz, n12, ch 147500*

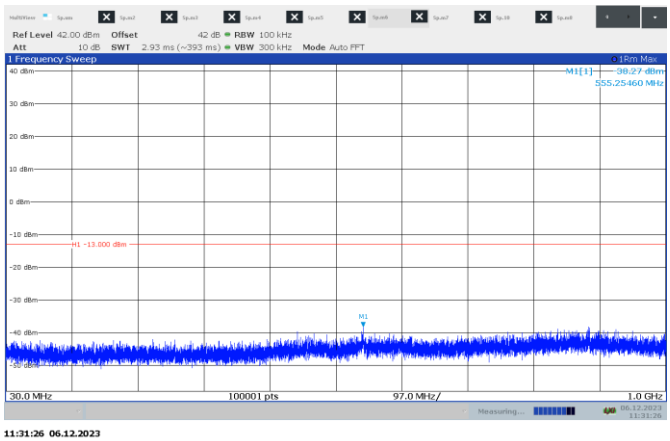

Figure 7.2-49: *Conducted sp. emissions below 1GHz, n25, ch 392500*

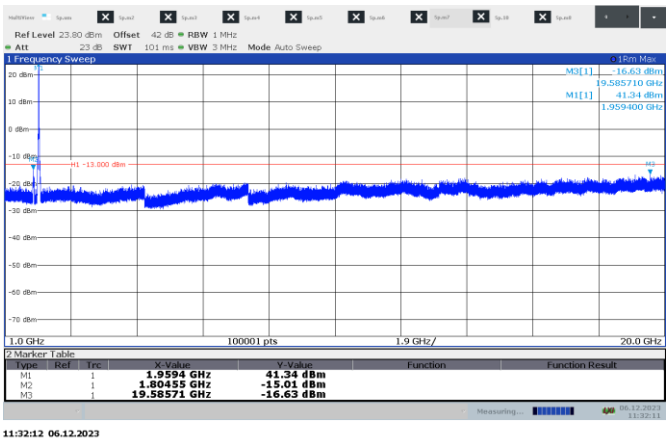

Figure 7.2-50: *Conducted sp. emissions above 1 GHz, n25, ch 392500*

Test data, Conducted Spurious Emissions, continued

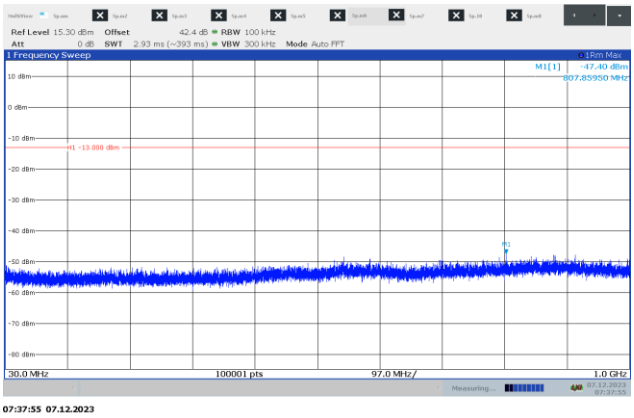

Figure 7.2-51: *Conducted sp. emissions below 1GHz, n41, ch 518598*

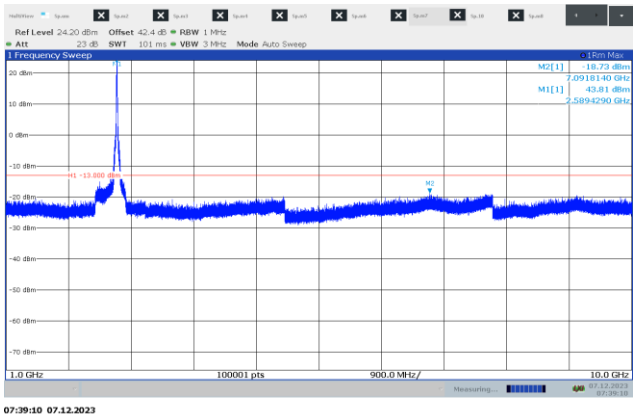

Figure 7.2-52: *Conducted sp. emissions 1-10 GHz, n41, ch 518598*

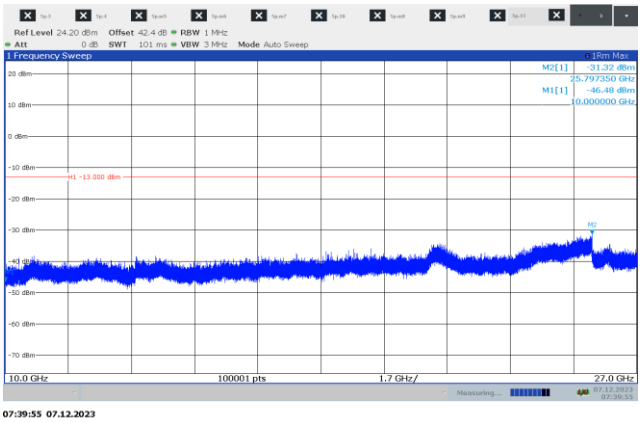

Figure 7.2-53: *Conducted sp. emissions above 10 GHz, n41, ch 518598*

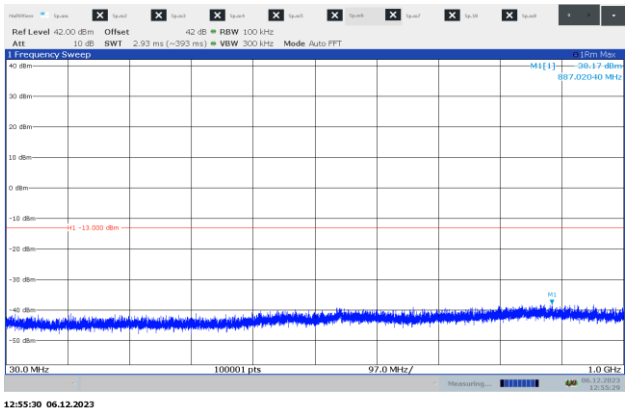

Figure 7.2-54: *Conducted sp. emissions below 1GHz, n66, ch 431000*

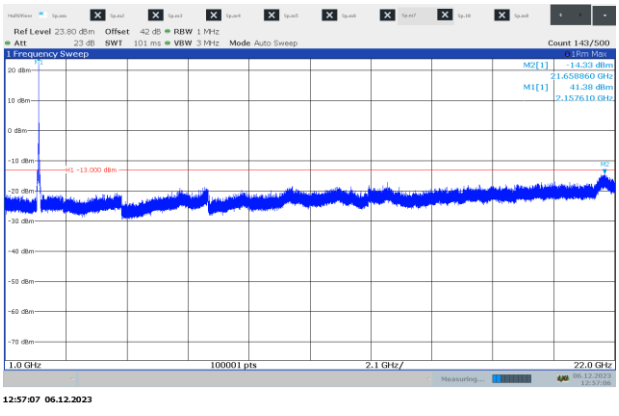

Figure 7.2-55: *Conducted sp. emissions above 1 GHz, n66, ch 431000*

Test data, Conducted Spurious Emissions, continued

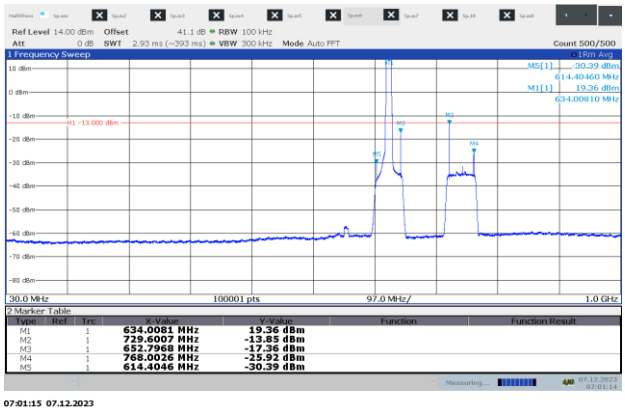

Figure 7.2-56: *Conducted sp. emissions below 1GHz, n71, ch 126800*

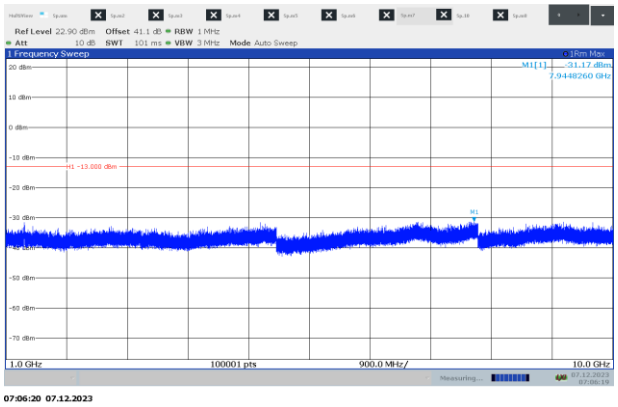

Figure 7.2-57: *Conducted sp. emissions above 1 GHz, n71, ch 126800*

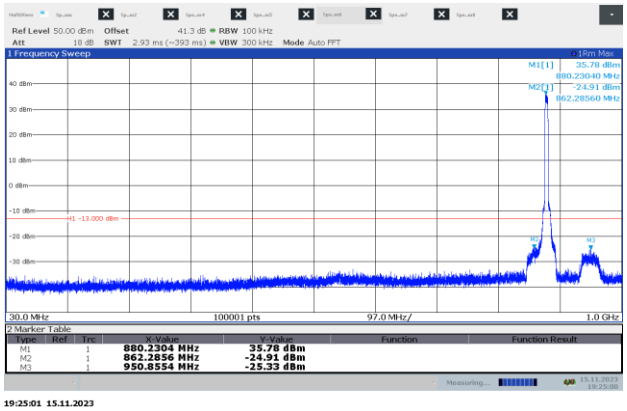

Figure 7.2-58: *Conducted sp. emissions below 1GHz, n77, ch 633333*

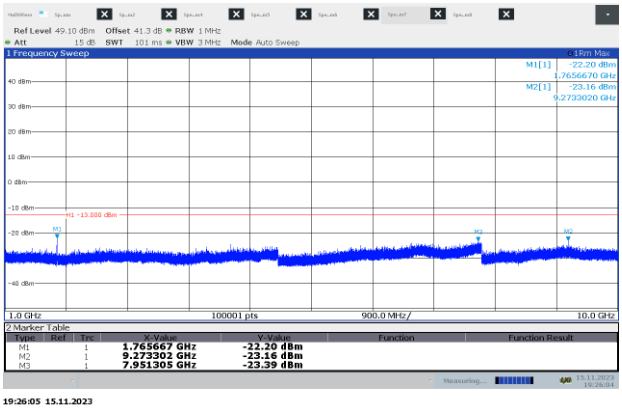

Figure 7.2-59: *Conducted sp. emissions 1-10 GHz, n77, ch 633333*

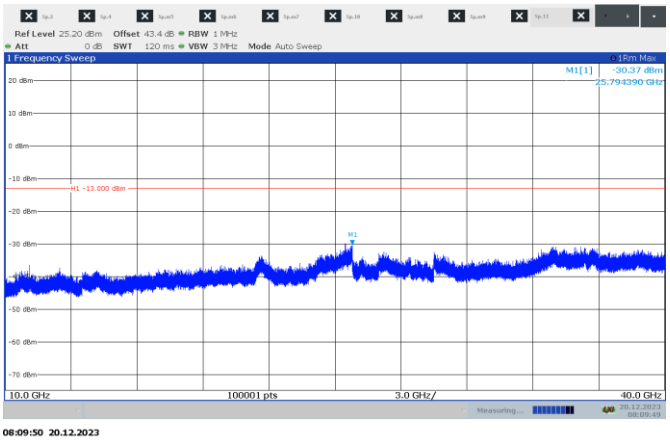

Figure 7.2-60: *Conducted sp. emissions above 10 GHz, n77, ch 633333*

Test data, Conducted Spurious Emissions, continued

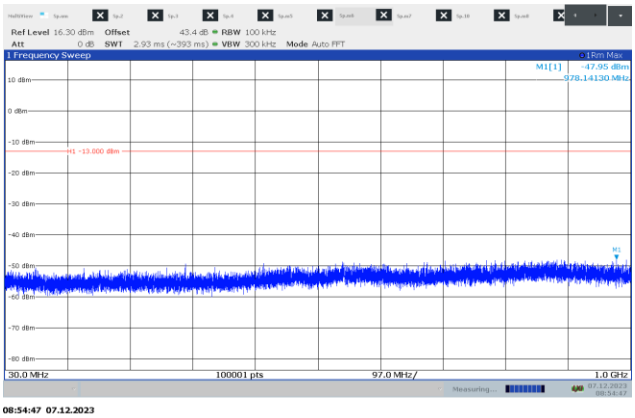

Figure 7.2-61: *Conducted sp. emissions below 1GHz, n77, ch 656000*

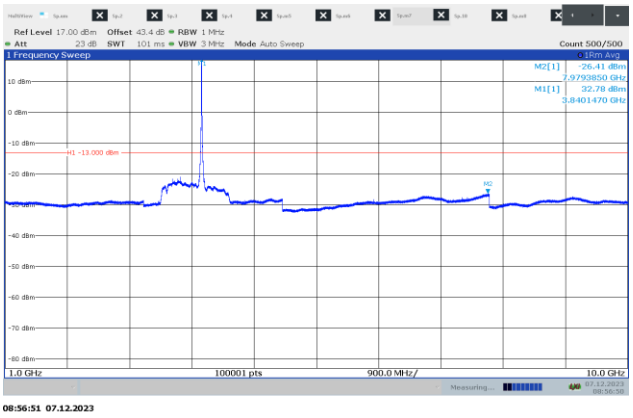

Figure 7.2-62: *Conducted sp. emissions 1-10 GHz, n77, ch 656000*

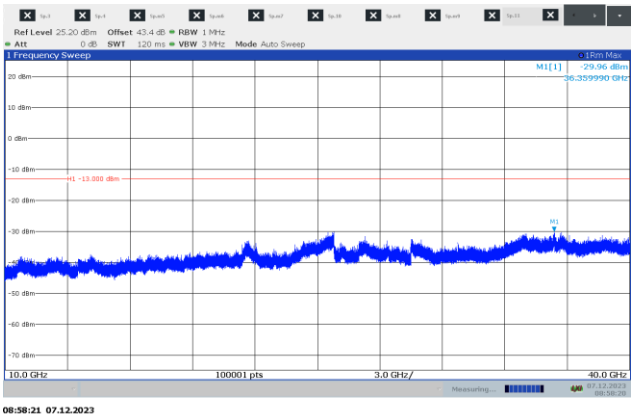

Figure 7.2-63: *Conducted sp. emissions above 10 GHz, n77, ch 656000*

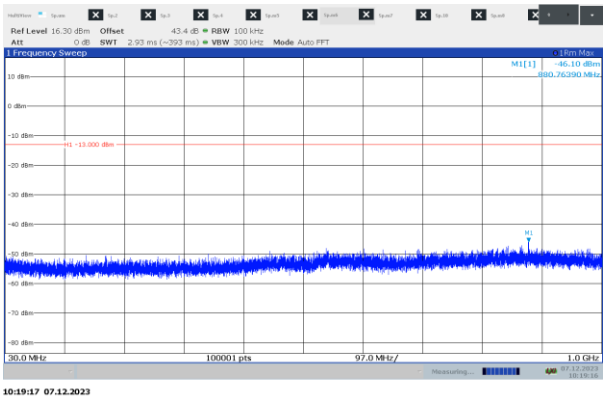

Figure 7.2-64: *Conducted sp. emissions below 1GHz, n78, ch 636666*

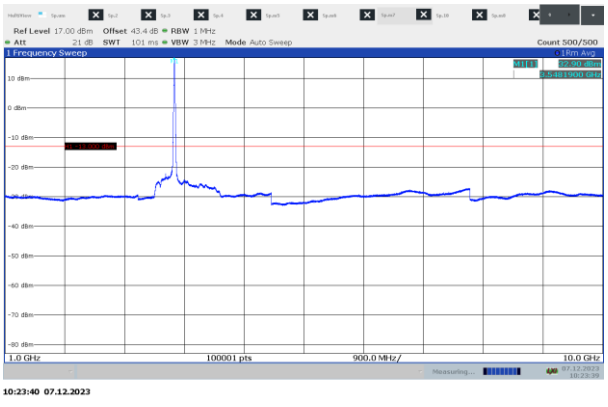

Figure 7.2-65: *Conducted sp. emissions 1-10 GHz, n78, ch 636666*

Test data, Conducted Spurious Emissions, continued

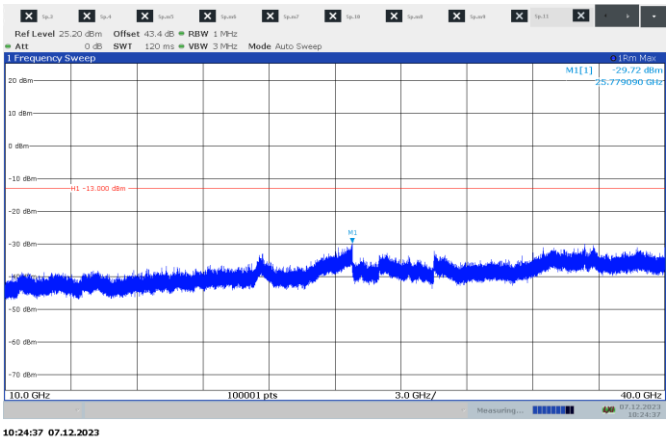

Figure 7.2-66: *Conducted sp. emissions above 10 GHz, n78, ch 636666*

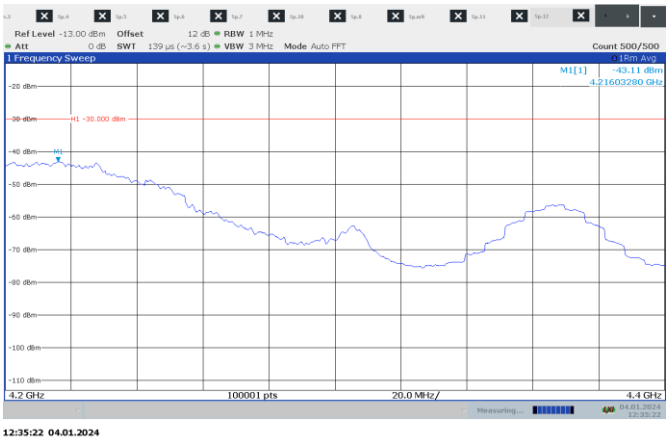

Figure 7.2-67: *Conducted sp. emissions above 4.2-4.4 GHz, n77, ch 630334*

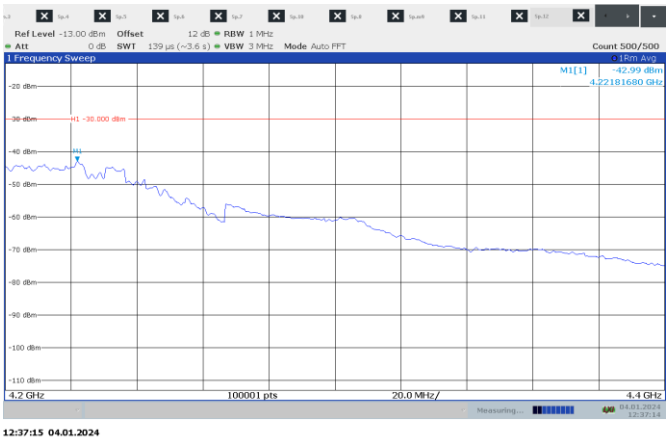

Figure 7.2-68: *Conducted sp. emissions above 4.2-4.4 GHz, n77, ch 633333*

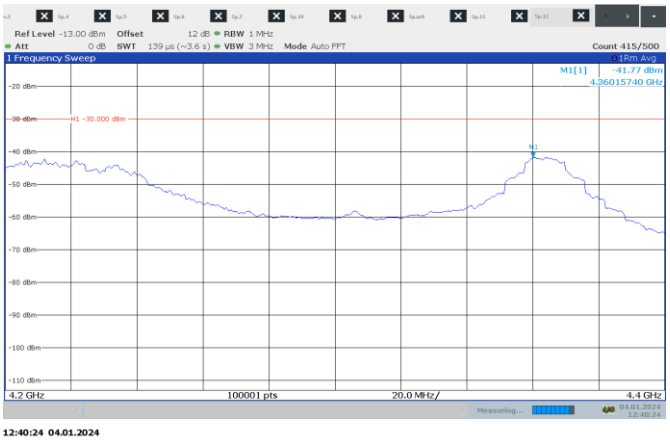

Figure 7.2-69: *Conducted sp. emissions above 4.2-4.4 GHz, n77, ch 636333*

Test data, Conducted Spurious Emissions, continued

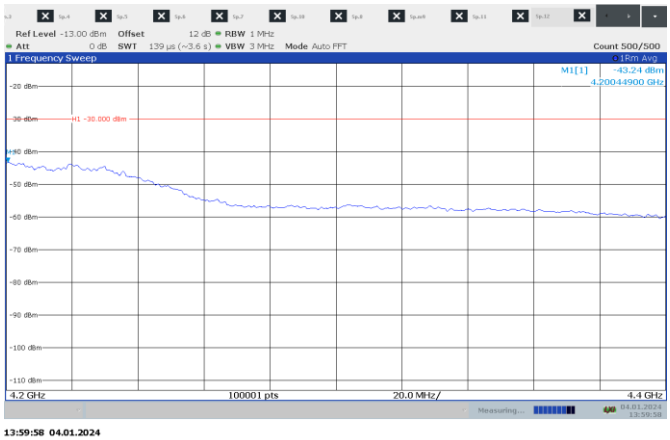

Figure 7.2-70: *Conducted sp. emissions above 4.2-4.4 GHz, n77, ch 647000*

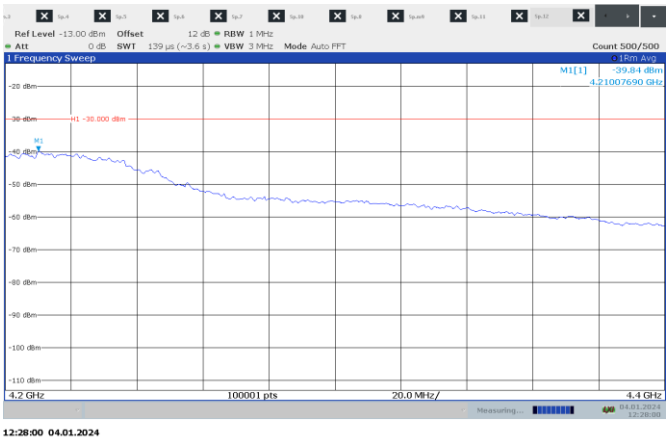

Figure 7.2-71: *Conducted sp. emissions above 4.2-4.4 GHz, n77, ch 650000*

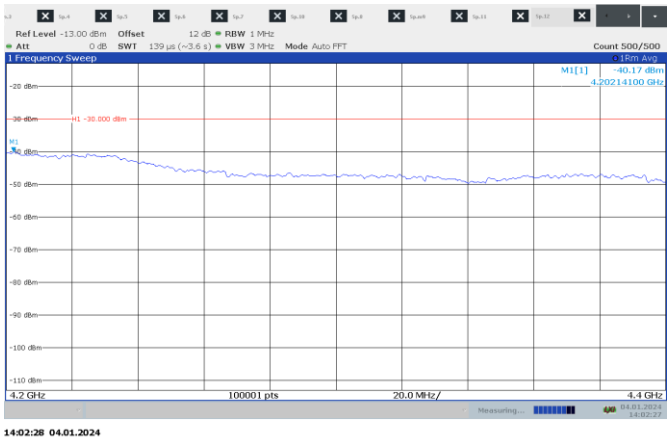

Figure 7.2-72: *Conducted sp. emissions above 4.2-4.4 GHz, n77, ch 656000*

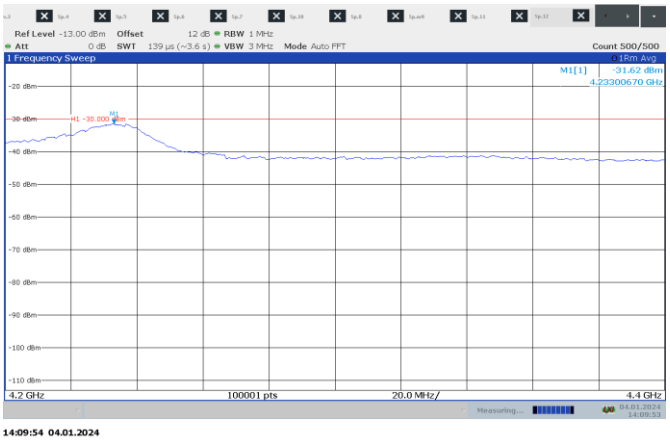

Figure 7.2-73: *Conducted sp. emissions above 4.2-4.4 GHz, n77, ch 659666*

Test data, Conducted Spurious Emissions, continued

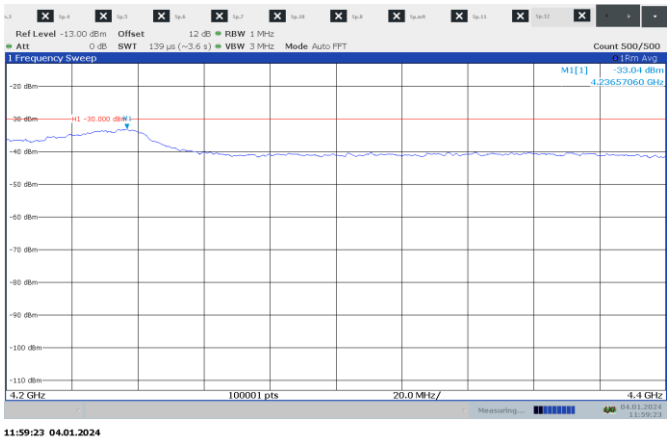

Figure 7.2-74: *Conducted sp. emissions above 4.2-4.4 GHz, n77, ch 660334*

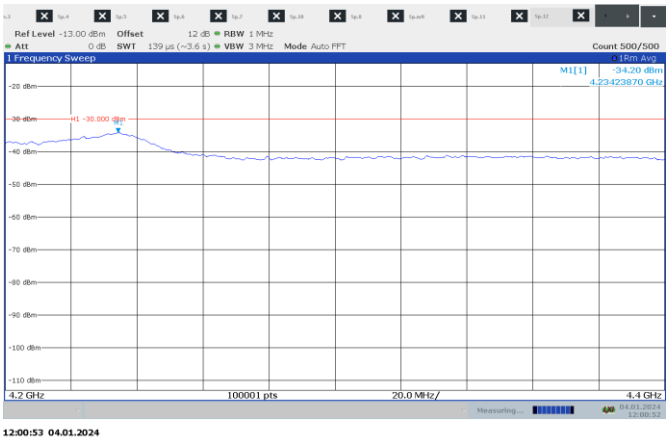

Figure 7.2-75: *Conducted sp. emissions above 4.2-4.4 GHz, n77, ch 664800*

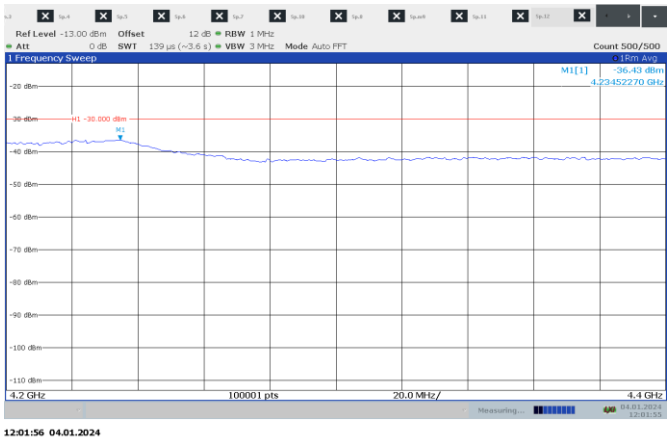

Figure 7.2-76: *Conducted sp. emissions above 4.2-4.4 GHz, n77, ch 664900*

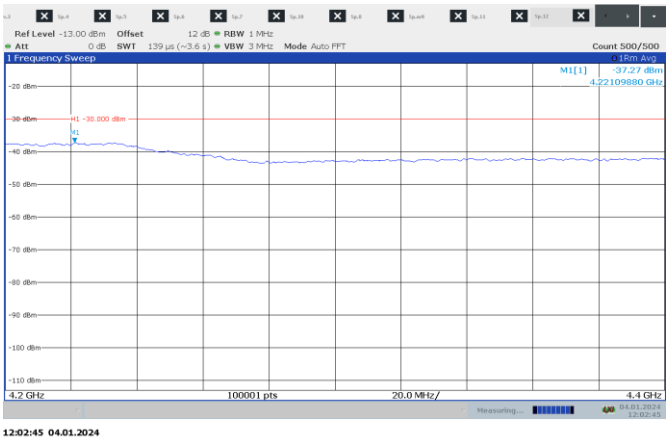

Figure 7.2-77: *Conducted sp. emissions above 4.2-4.4 GHz, n77, ch 665000*

Test data, Radiated Cabinet Spurious Emissions

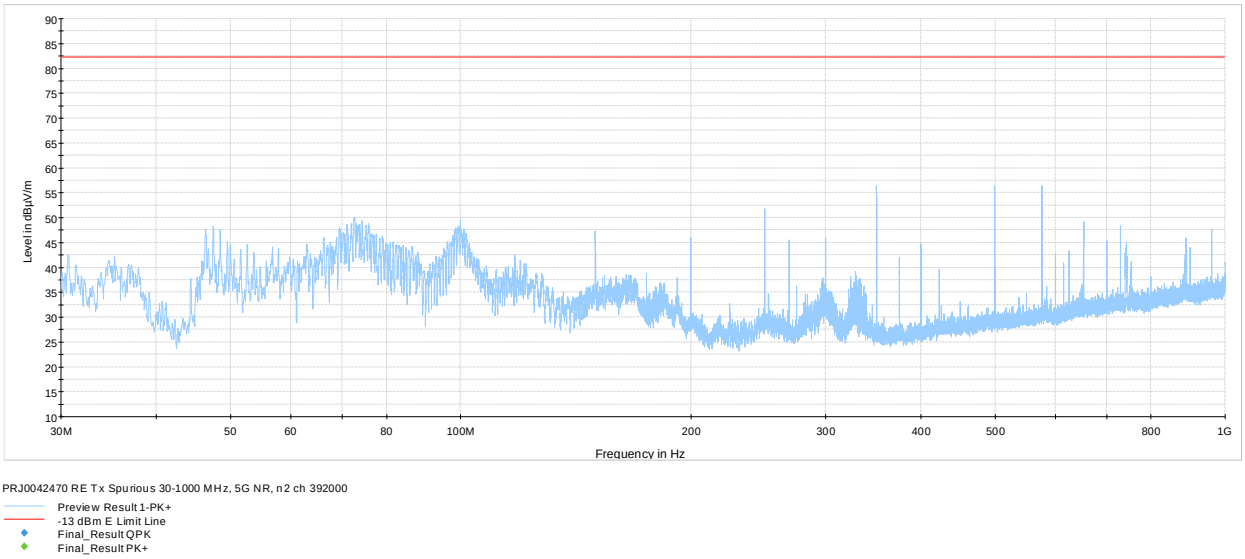

Figure 7.2 78: *Radiated Cabinet sp. emissions below 1GHz, n2, ch 392000*

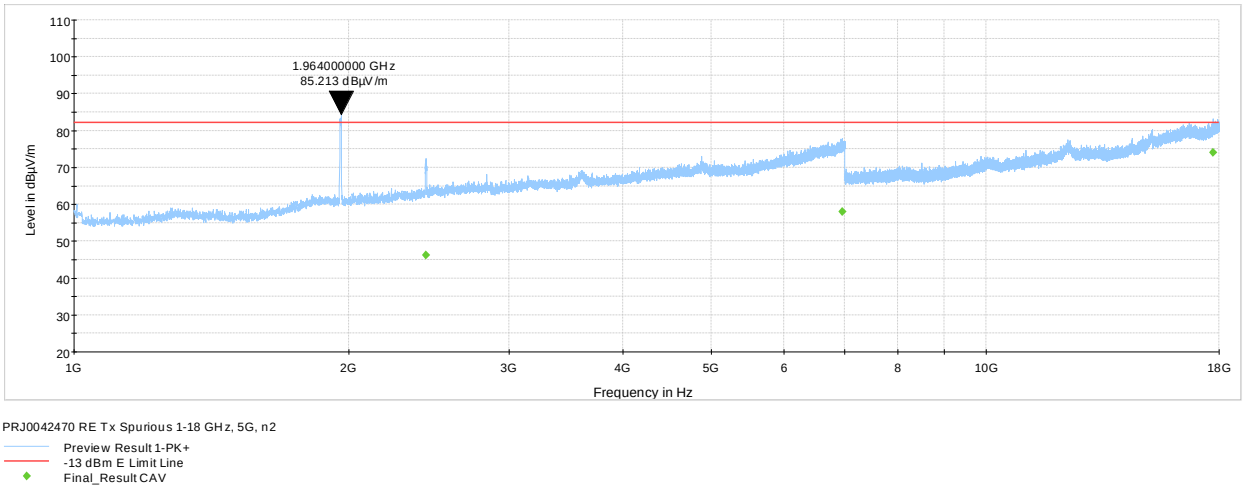

Figure 7.2 79: *Radiated Cabinet sp. emissions 1 – 18 GHz, n2, ch 392000*

Test data, Radiated Cabinet Spurious Emissions, continued

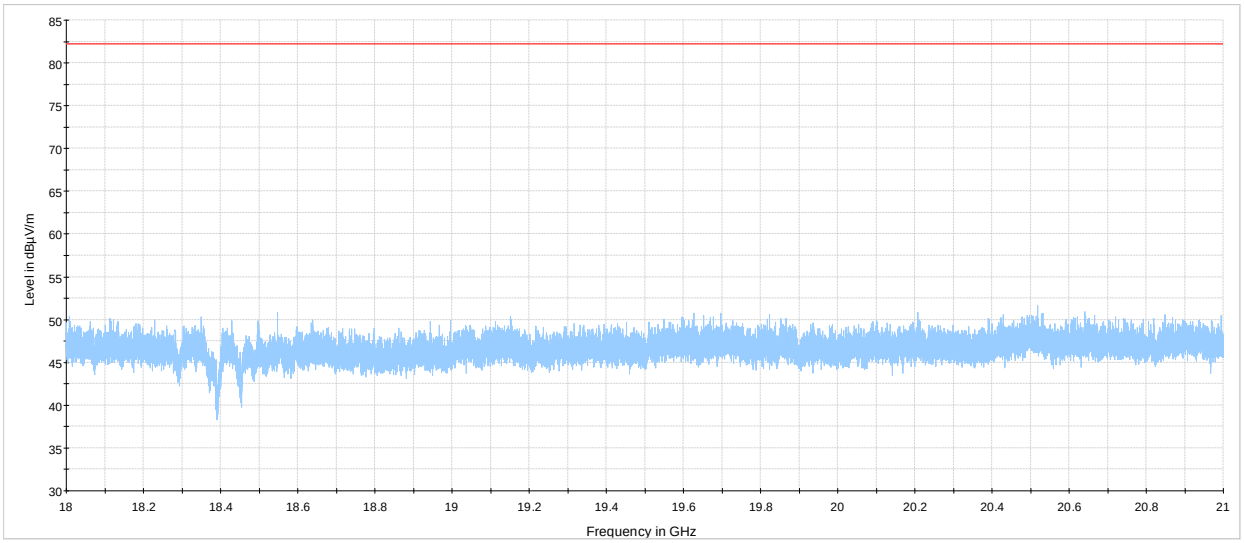

Figure 7.2-80: *Radiated Cabinet sp. emissions above 18 GHz, n2, ch 392000*

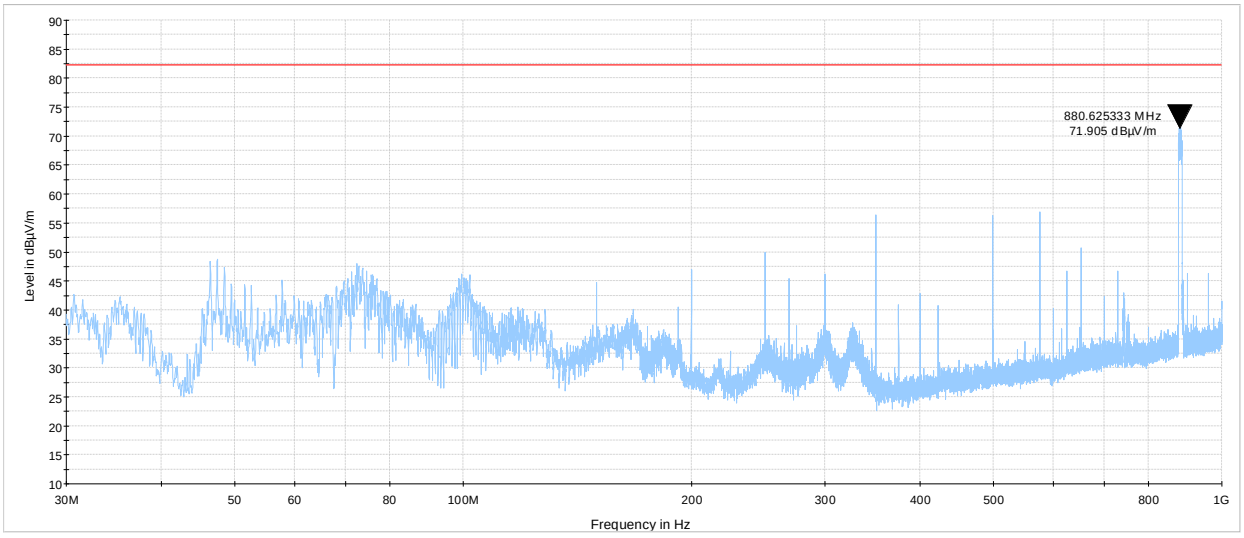

Figure 7.2 81: *Radiated Cabinet sp. emissions below 1GHz, n5, ch 176300*

Test data, Radiated Cabinet Spurious Emissions, continued

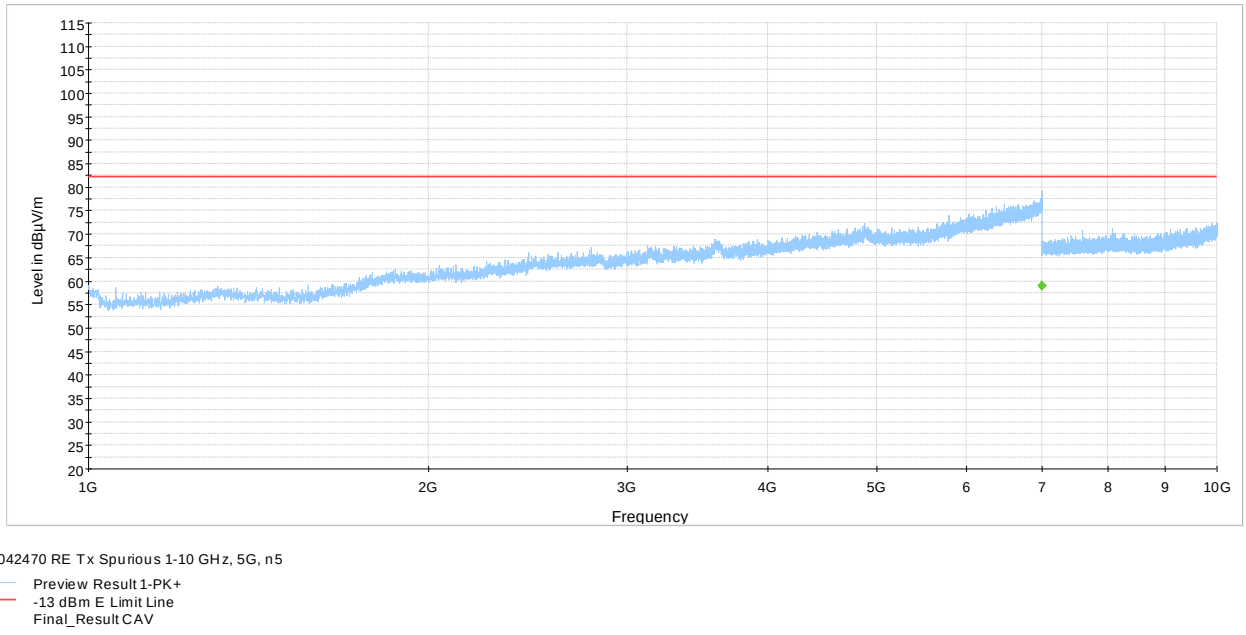

Figure 7.2 82: *Radiated Cabinet sp. emissions above 1 GHz, n5, ch 176300*

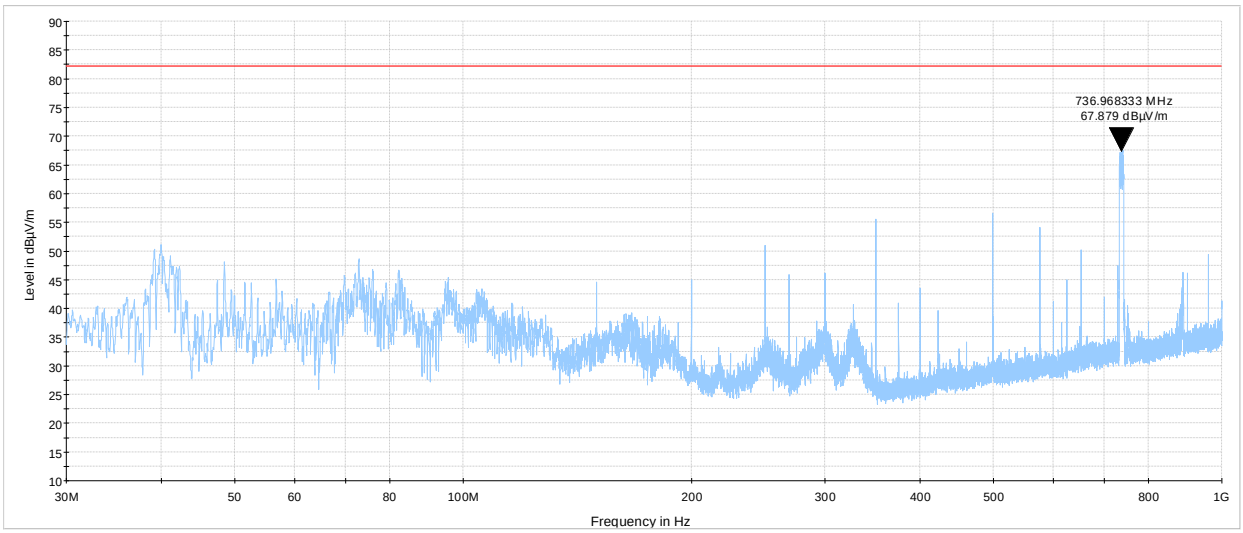

Figure 7.2 83: *Radiated Cabinet sp. emissions below 1GHz, n12, ch 147500*

Test data, Radiated Cabinet Spurious Emissions, continued

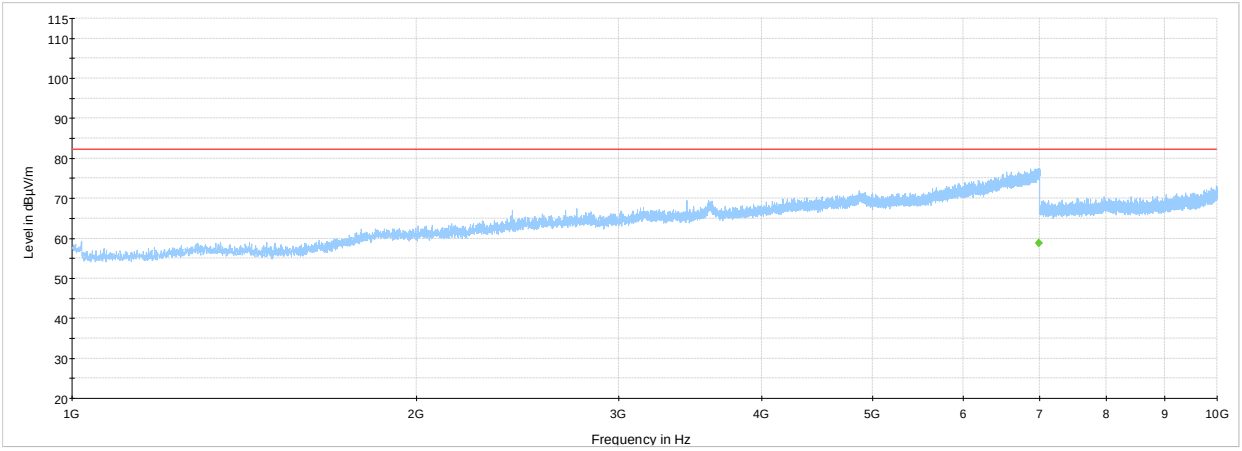

Figure 7.2 84: *Radiated Cabinet sp. emissions above 1 GHz, n12, ch 147500*

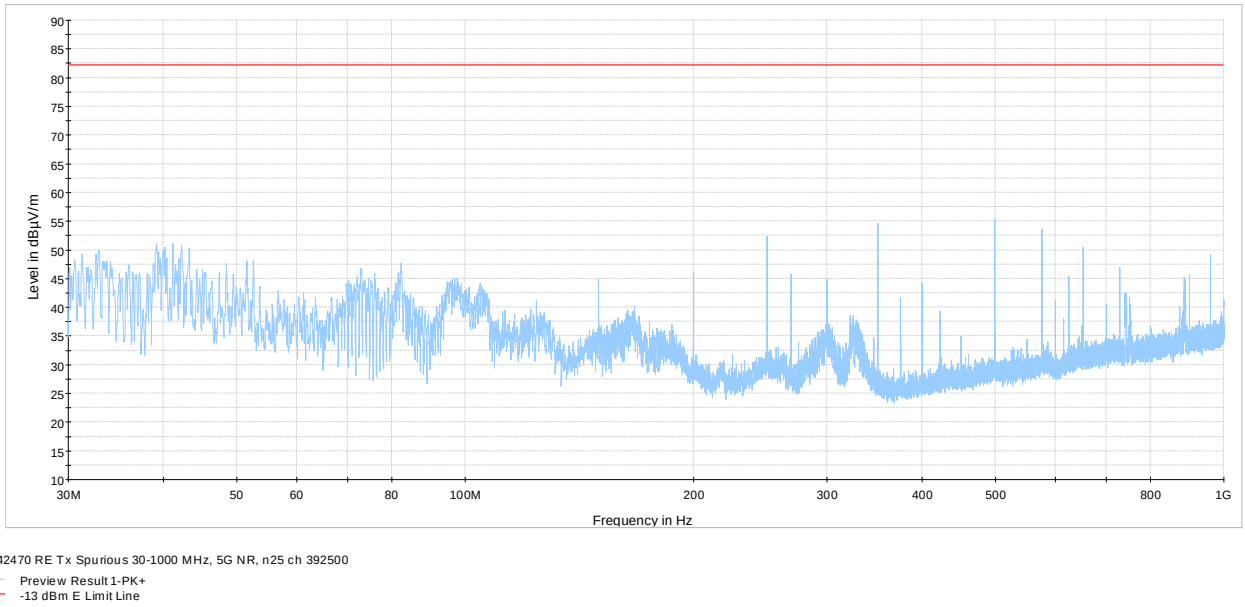

Figure 7.2 85: *Radiated Cabinet sp. emissions below 1GHz, n25, ch 392500*

Test data, Radiated Cabinet Spurious Emissions, continued

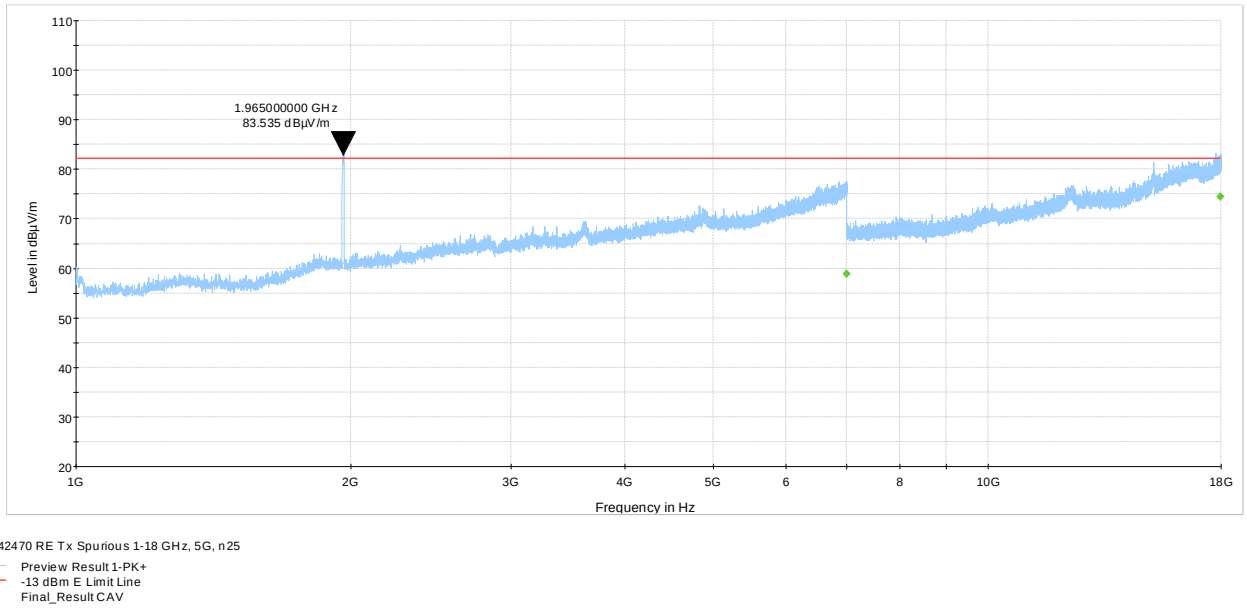

Figure 7.2 86: *Radiated Cabinet sp. emissions 1-18 GHz, n25, ch 392500*

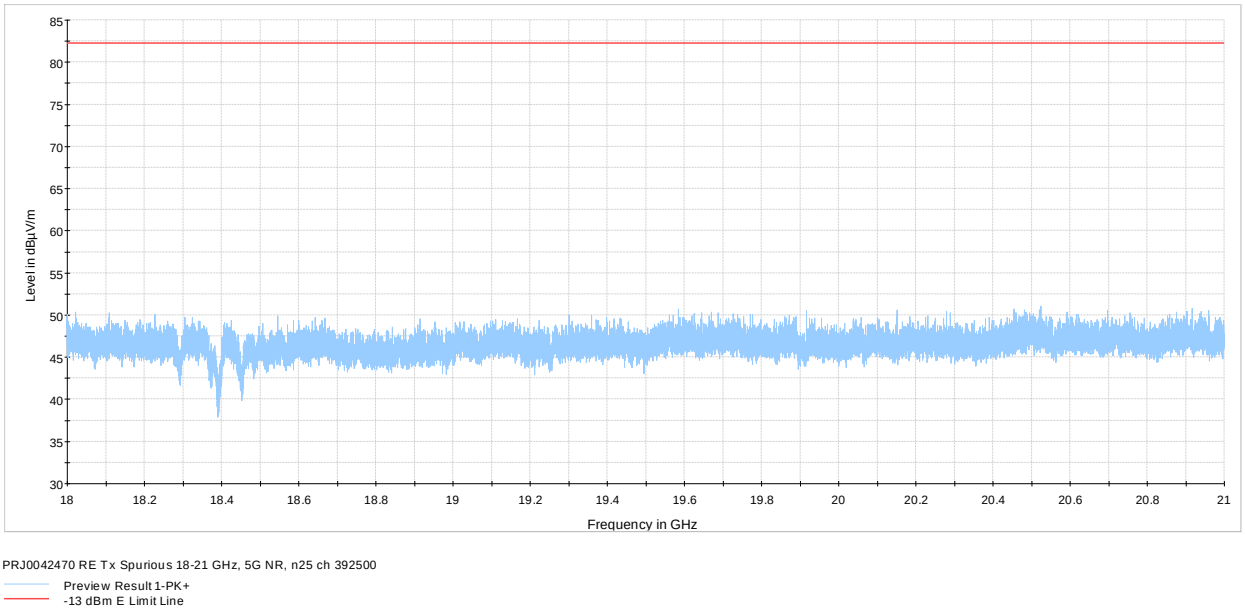

Figure 7.2 87: *Radiated Cabinet sp. emissions above 18 GHz, n25, ch 392500*

Test data, Radiated Cabinet Spurious Emissions

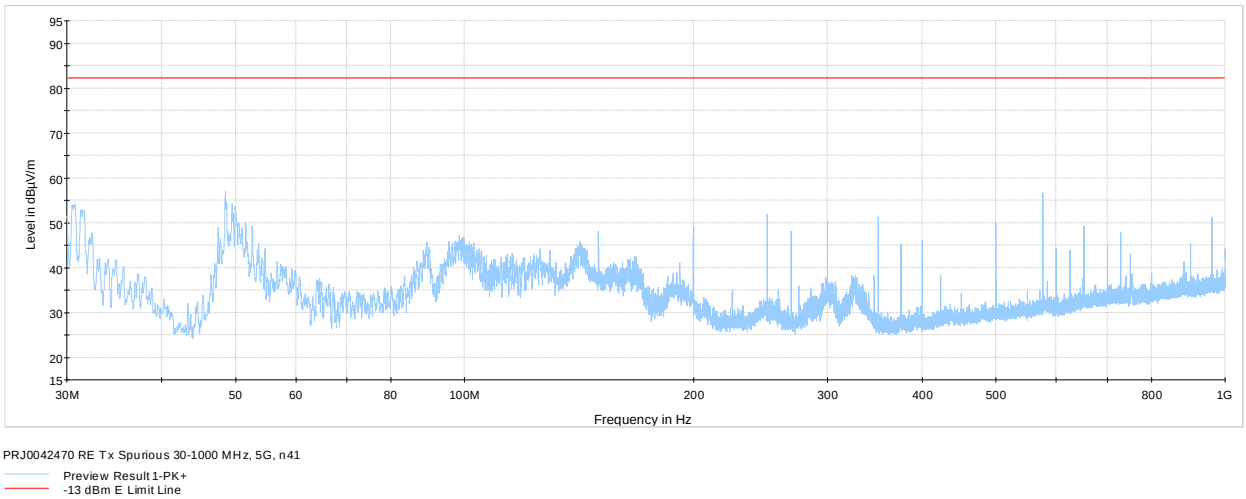

Figure 7.2 88: *Radiated Cabinet sp. emissions below 1GHz, n41, ch 518598*

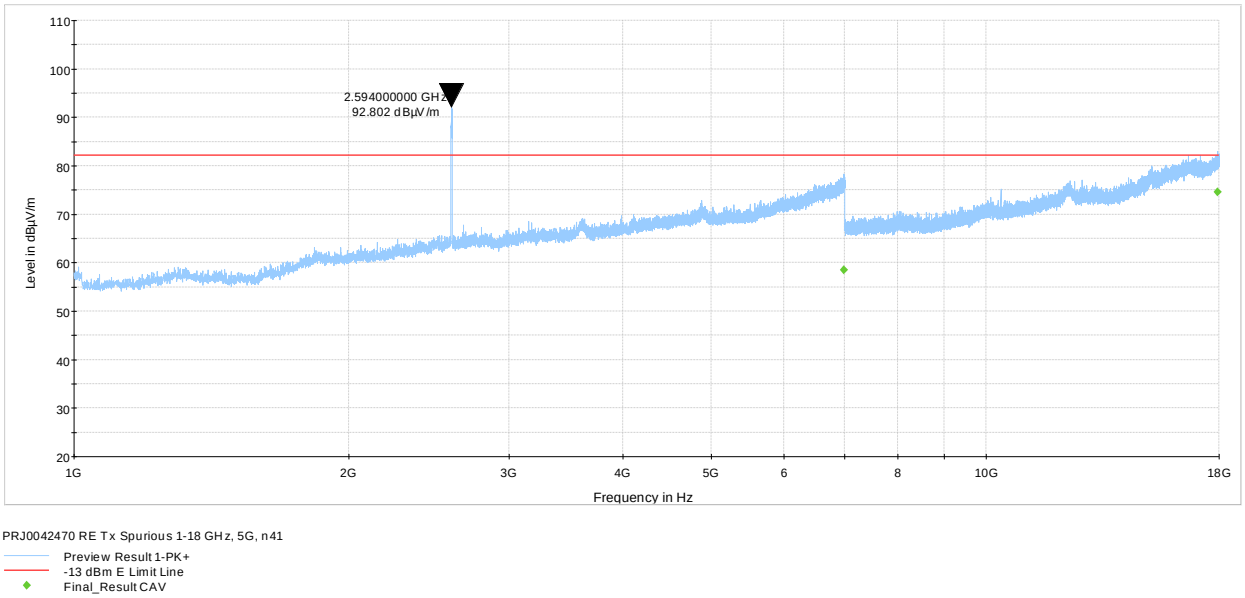

Figure 7.2 89: *Radiated Cabinet sp. emissions 1-18 GHz, n41, ch 518598*

Test data, Radiated Cabinet Spurious Emissions

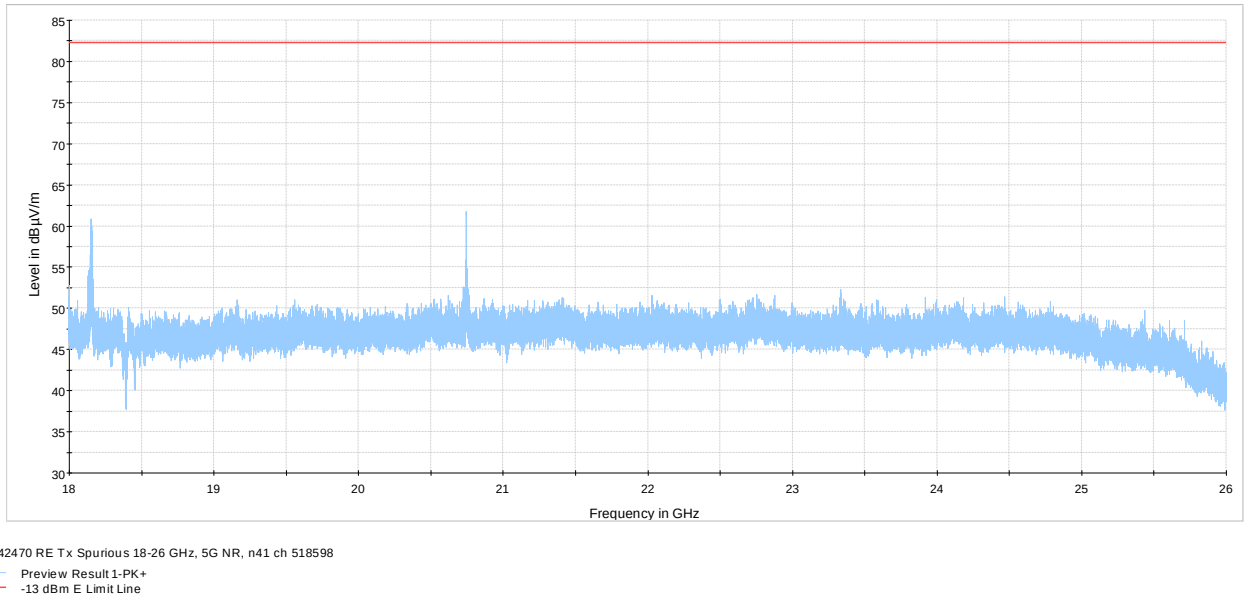

Figure 7.2 90: *Radiated Cabinet sp. emissions above 18 GHz, n41, ch 518598*

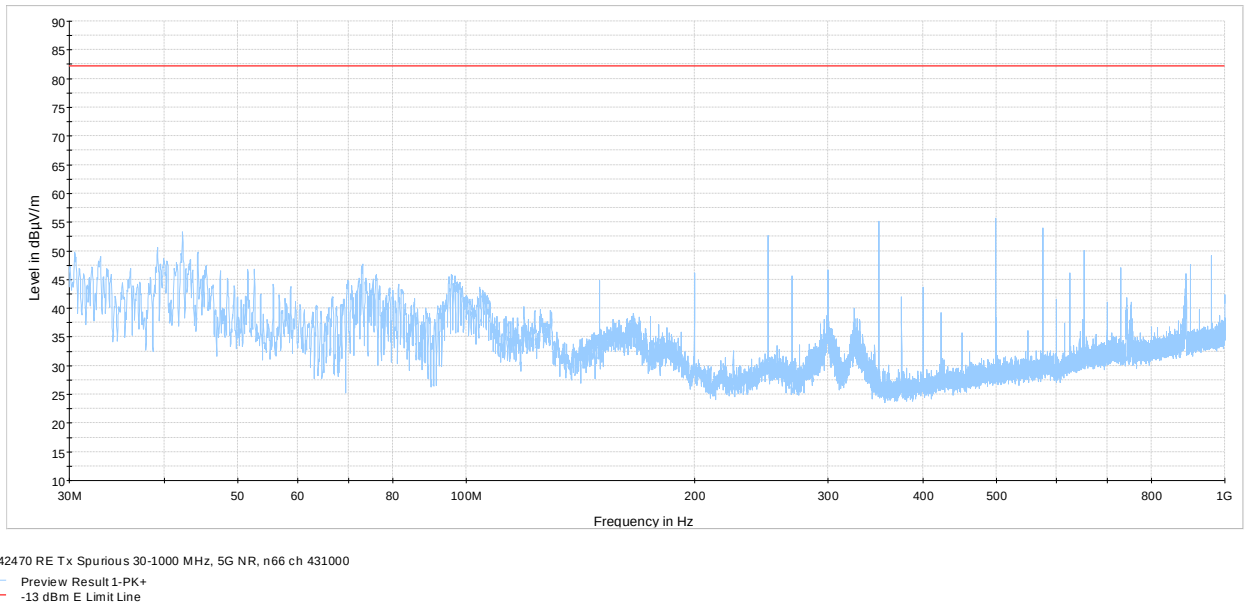

Figure 7.2 91: *Radiated Cabinet sp. emissions below 1GHz, n66, ch 431000*

Test data, Radiated Cabinet Spurious Emissions, continued

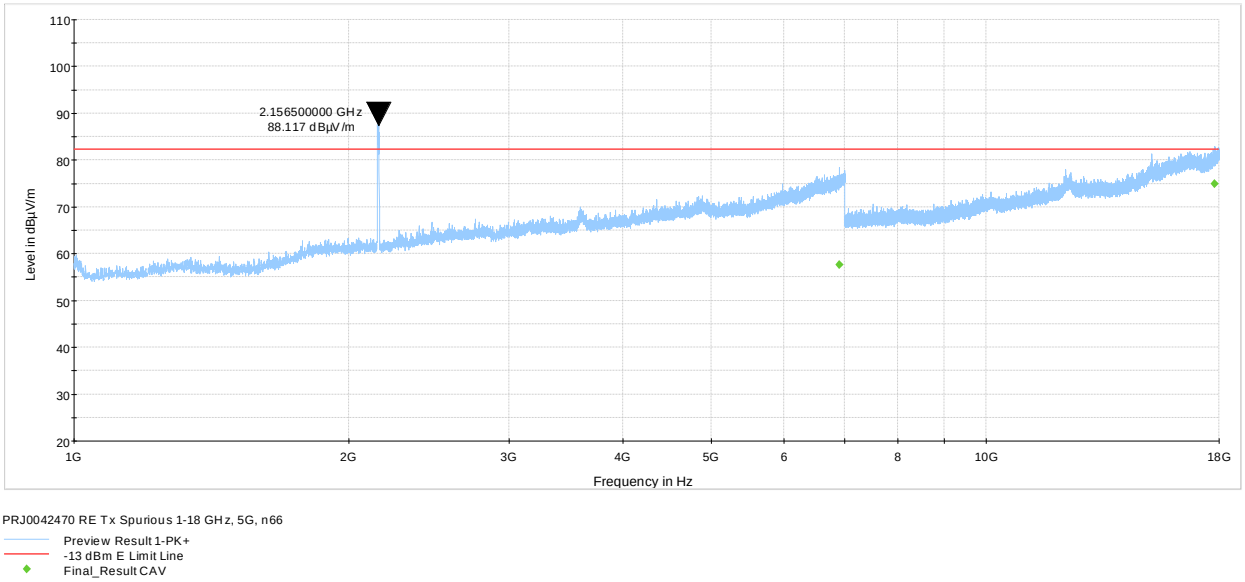

Figure 7.2 92: *Radiated Cabinet sp. emissions 1-18 GHz, n66, ch 431000*

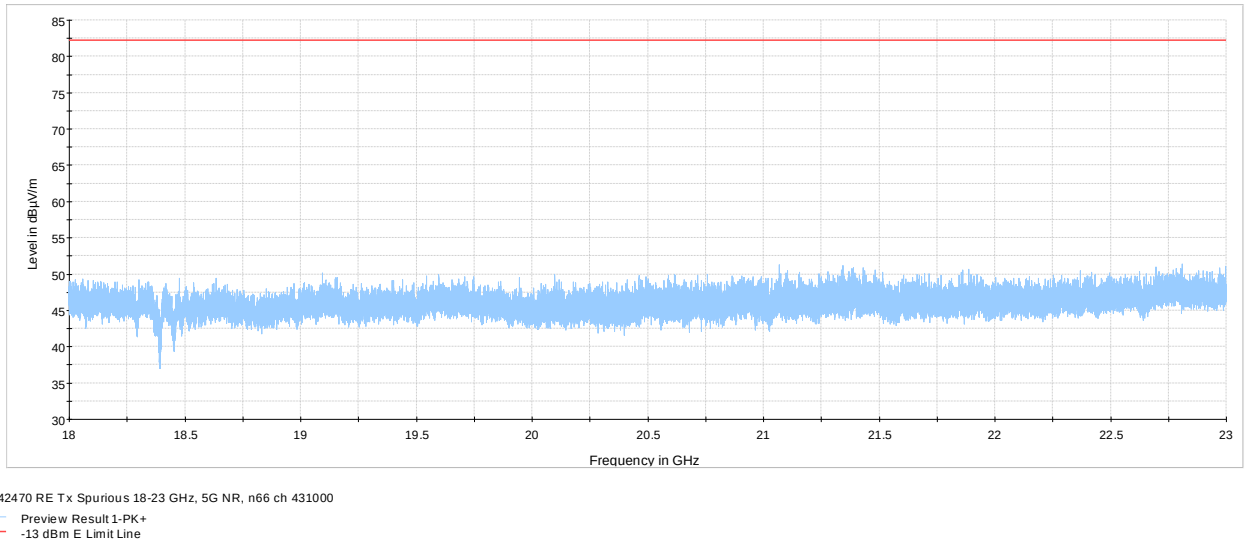

Figure 7.2 93: *Radiated Cabinet sp. emissions above 18 GHz, n66, ch 431000*

Test data, Radiated Cabinet Spurious Emissions, continued

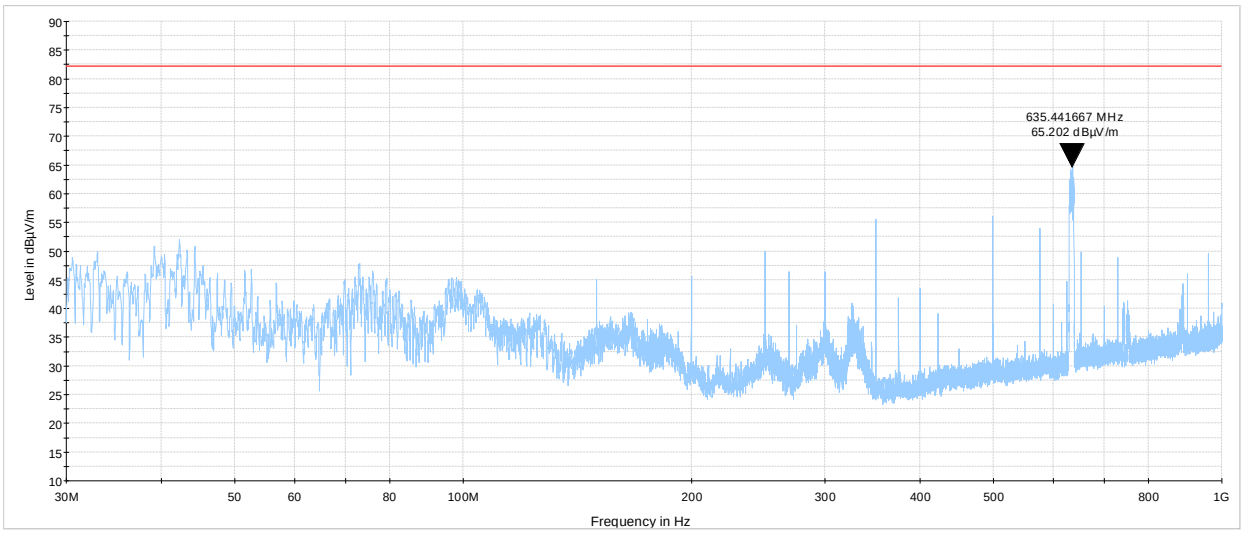

Figure 7.2 94: *Radiated Cabinet sp. emissions below 1GHz, n71, ch 126800*

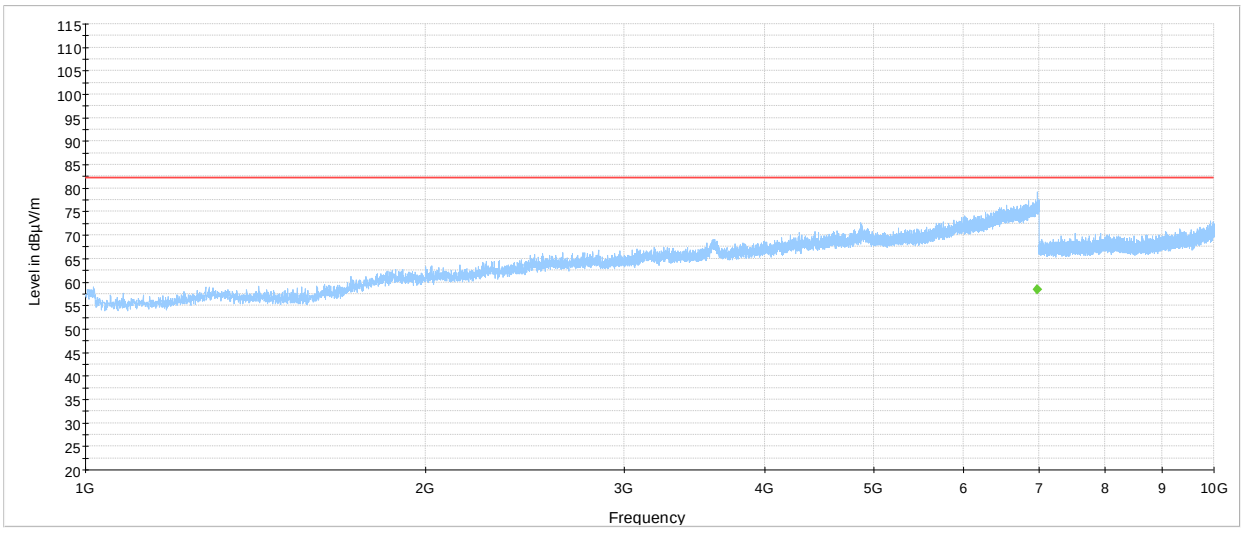

Figure 7.2 95: *Radiated Cabinet sp. emissions above 1 GHz, n71, ch 126800*

Test data, Radiated Cabinet Spurious Emissions, continued

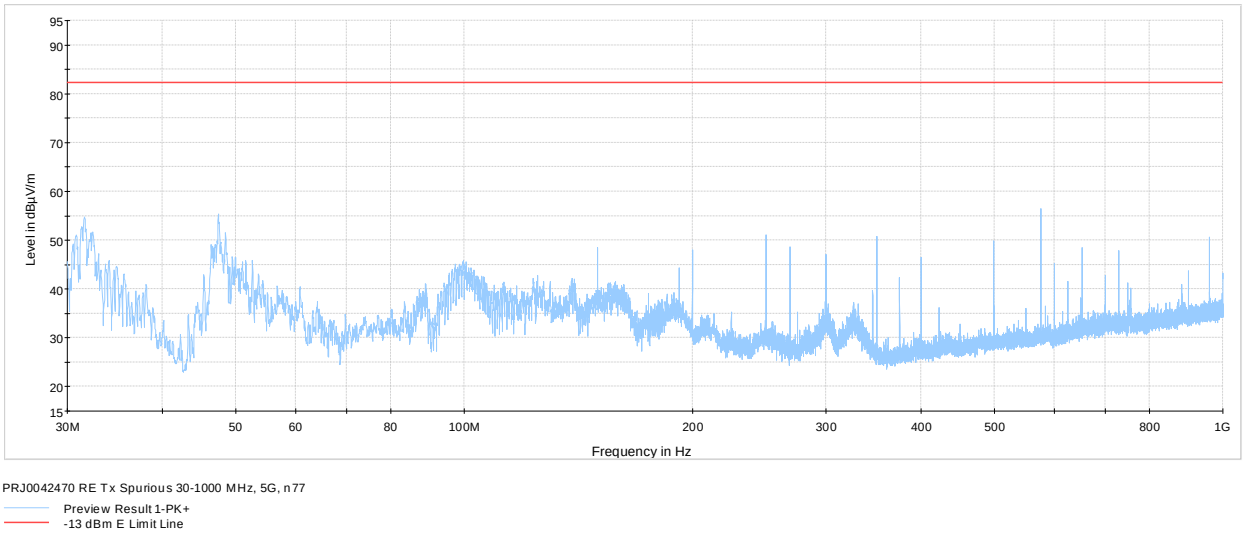

Figure 7.2 96: *Radiated Cabinet sp. emissions below 1GHz, n77, ch 633333*

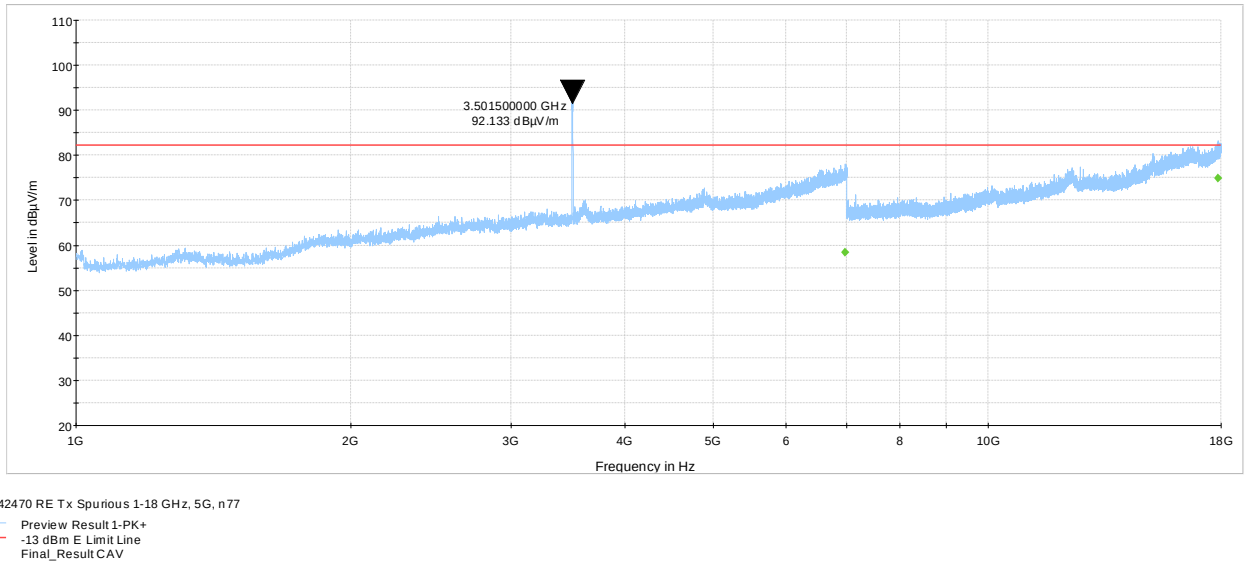

Figure 7.2 97: *Radiated Cabinet sp. emissions 1-18 GHz, n77, ch 633333*

Test data, Radiated Cabinet Spurious Emissions

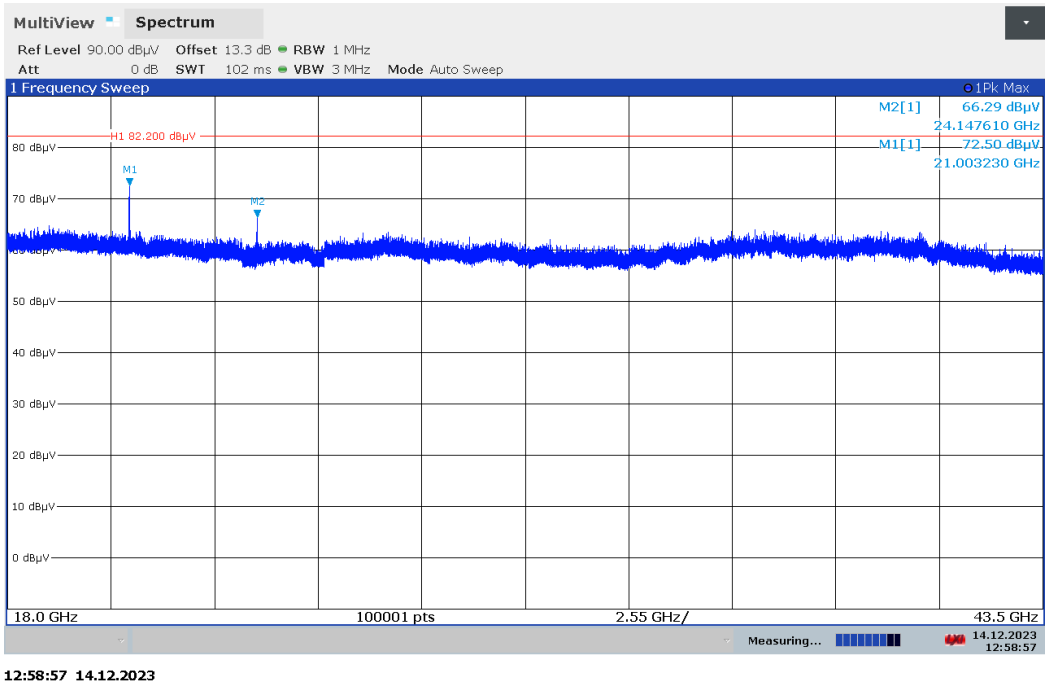

Figure 7.2 98: *Radiated Cabinet sp. emissions above 18 GHz, n77, ch 633333*

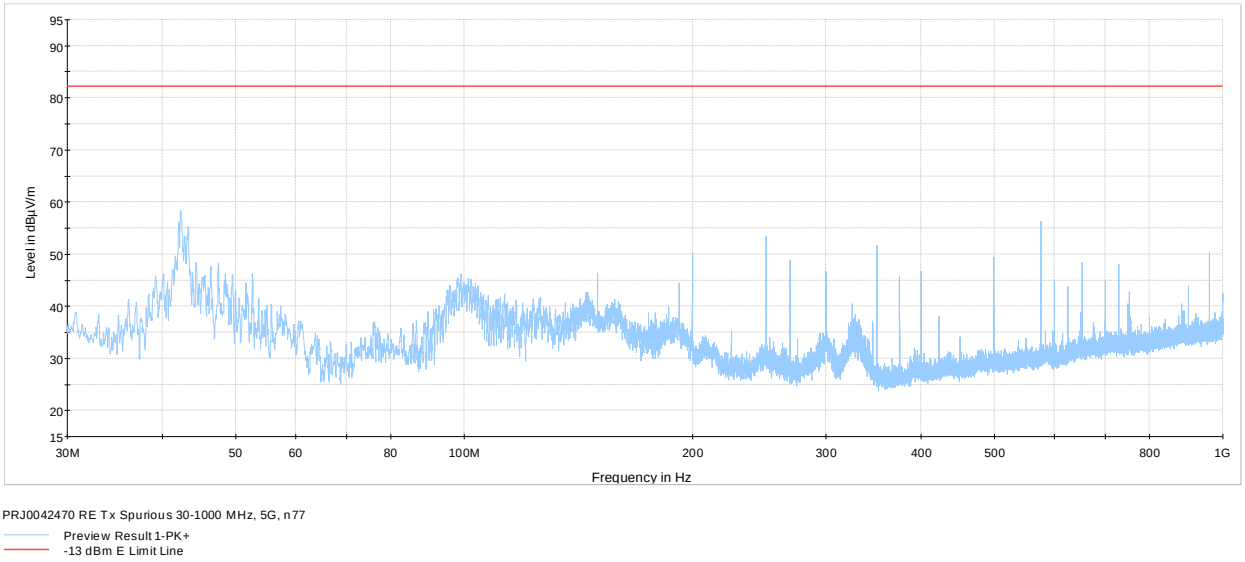

Figure 7.2 99: *Radiated Cabinet sp. emissions below 1GHz, n77, ch 656000*

Test data, Radiated Cabinet Spurious Emissions, continued

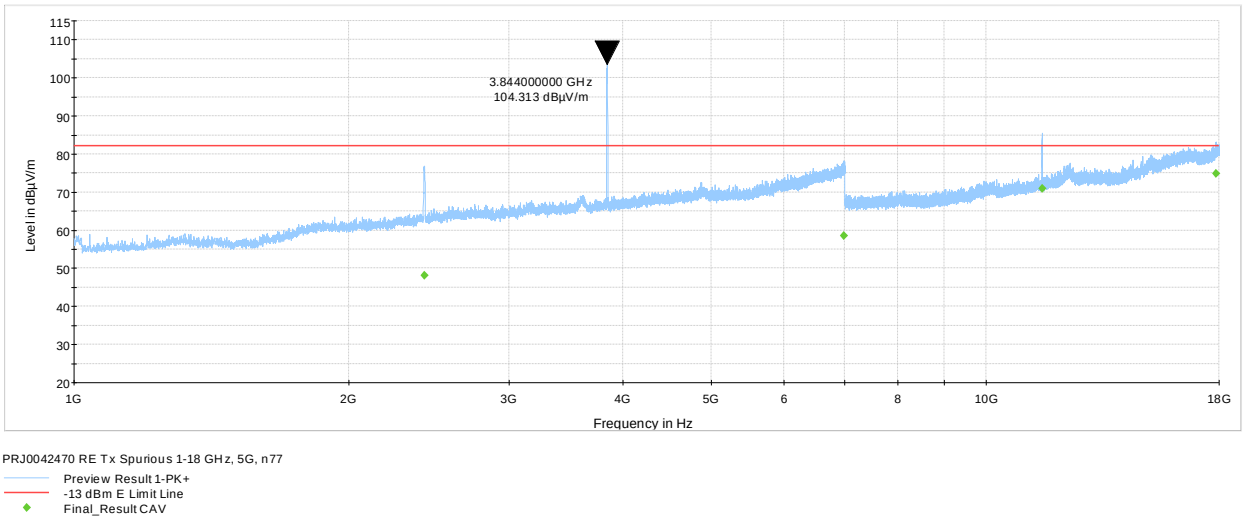

Figure 7.2 100: *Radiated Cabinet sp. emissions 1-18 GHz, n77, ch 656000*

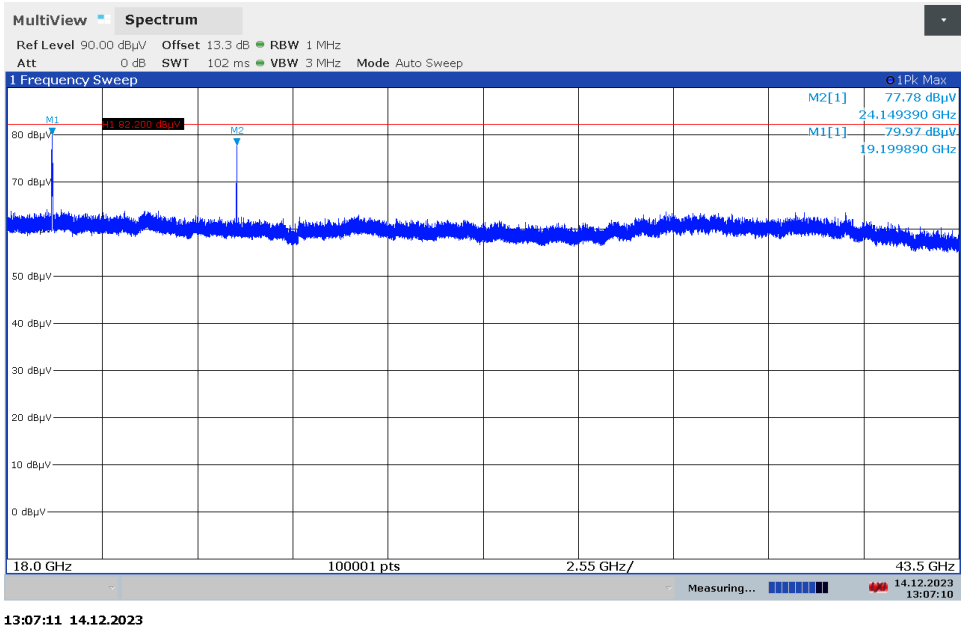

Figure 7.2 101: *Radiated Cabinet sp. emissions above 18 GHz, n77, ch 656000*

Test data, Radiated Cabinet Spurious Emissions

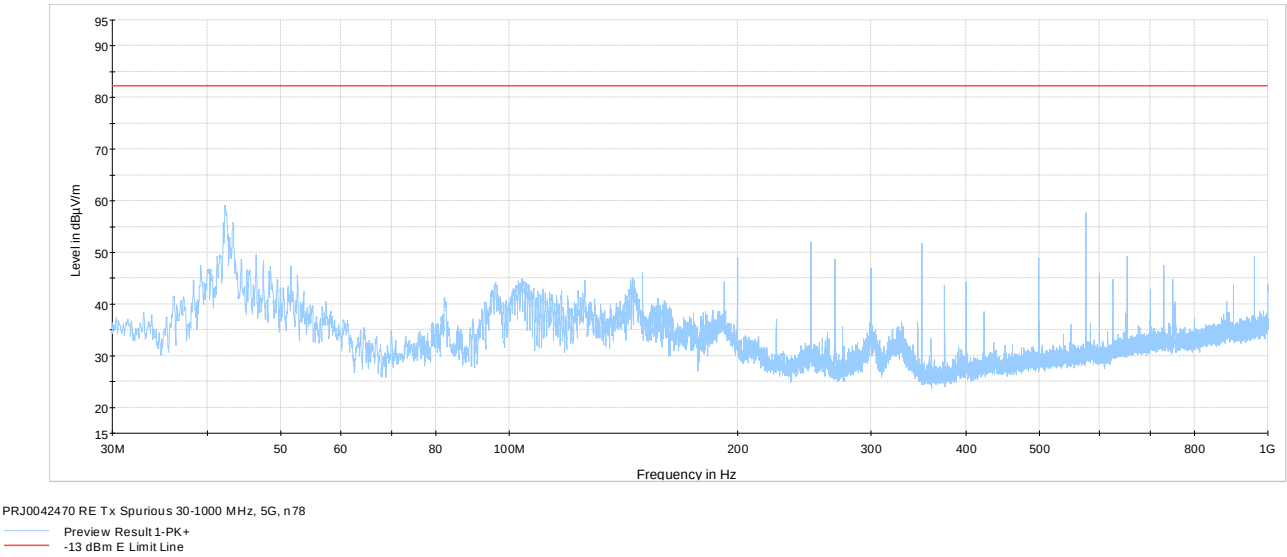

Figure 7.2 102: *Radiated Cabinet sp. emissions below 1GHz, n78, ch 636666*

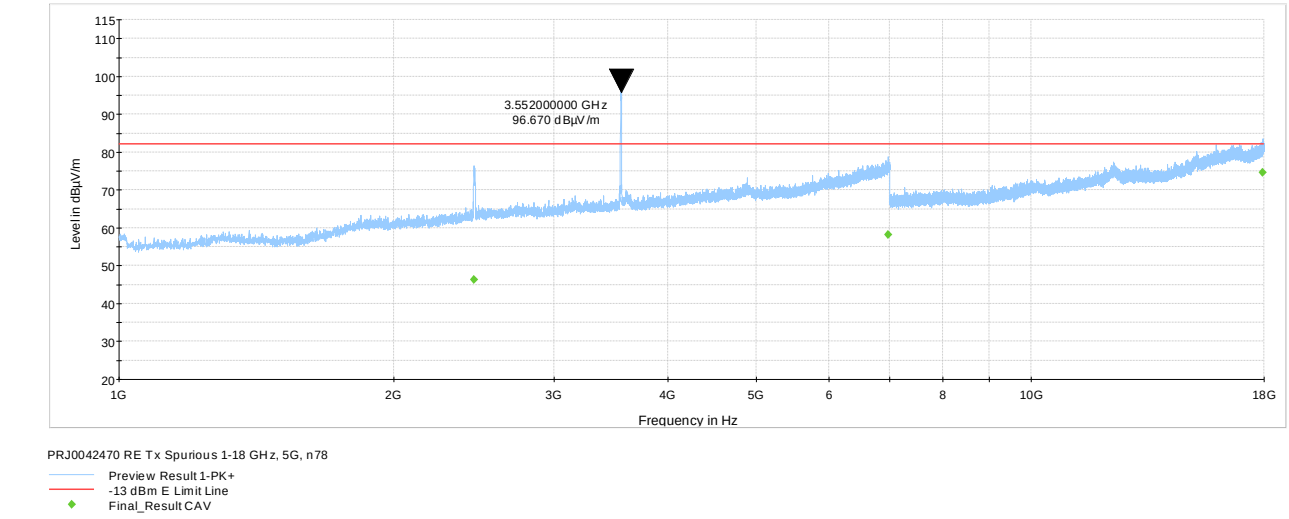

Figure 7.2 103: *Radiated Cabinet sp. emissions 1-18 GHz, n78, ch 636666*

Test data, Radiated Cabinet Spurious Emissions

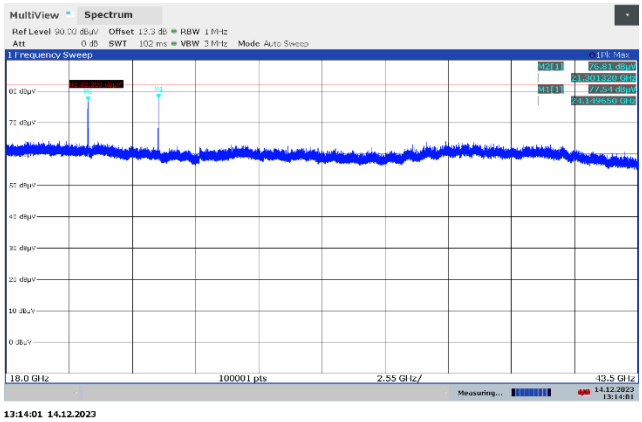

Figure 7.2 104: *Radiated Cabinet sp. Emissions above 18 GHz, n78, ch 636666*

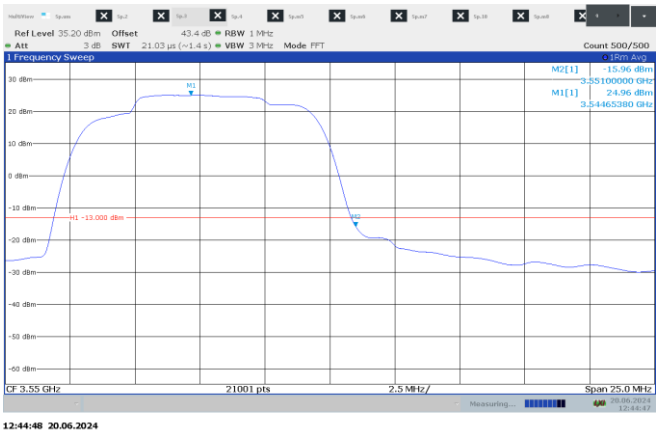

Figure 7.2-105: *Conducted band edge,n77, ch 636333 (FCC)*

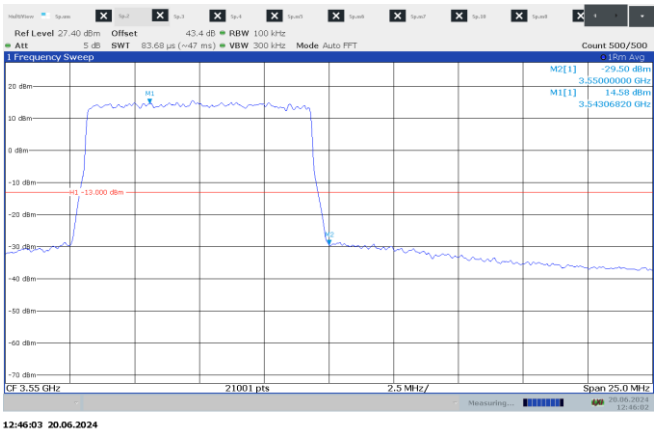

Figure 7.2-106: *Conducted band edge (RBW 1% of EBW), n77, ch 636333 (FCC)*

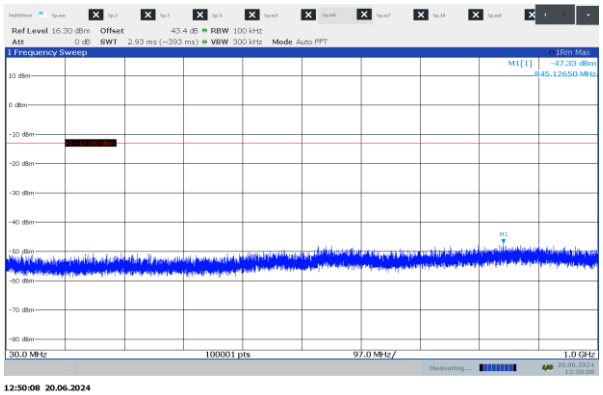

Figure 7.2-107: *Conducted sp. emissions below 1GHz, n77, ch 636333 (FCC)*

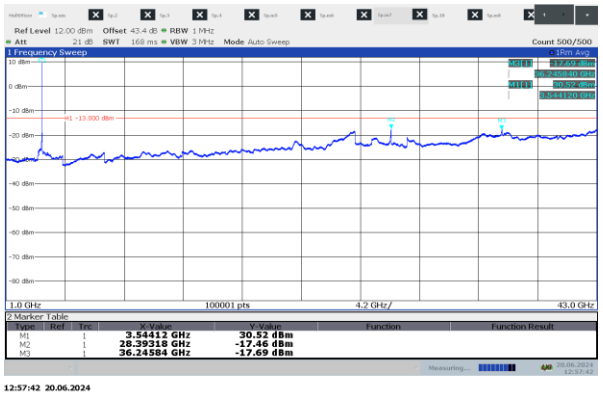

Figure 7.2-108: *Conducted sp. emissions above 1 GHz, n77, ch 636333 (FCC)*

7.3 Transmitter frequency stability

References, definitions and limits

FCC §22.355
Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within 1.5 (ppm)

FCC §24.235
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

FCC § 27.54
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

RSS-130, Clause 4.5
The frequency stability shall be sufficient to ensure that the occupied bandwidth remains within each frequency block range when tested at the temperature and supply voltage variations specified in RSS-Gen.

RSS-132, Clause 5.3
The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within each of the sub-bands when tested at the temperature and supply voltage variations specified in RSS-Gen.

RSS-133, Clause 6.3
The test report may show that the frequency stability is sufficient to ensure that the emission bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

RSS-139, Clause 5.4
The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block or frequency block group when tested to the temperature and supply voltage variations specified in RSS-Gen.

RSS-192, Clause 5.4
The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block or frequency block group when tested at the temperature and supply voltage variations specified in RSS-Gen.

RSS-198, Clause 5.4
The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block or frequency block group when tested at the temperature and supply voltage variations specified in RSS-Gen.

RSS-199, Clause 5.4
The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block or frequency block group when tested to the temperature and supply voltage variations specified in RSS-Gen.

Test summary

Verdict	Pass		
Test date	December 22, 2023	Temperature	21 °C
Tested by	Ketav Jani	Air pressure	974 mbar
Test location	Cambridge	Relative humidity	33 %

Observations, settings and special notes

Testing was performed per ANSI C63.26 Paragraphs 5.6.

Test data

Table 7.3-1: *Transmitter frequency stability results – n2, ch 392000*

Test conditions	Frequency, GHz	Drift, Hz	Drift, ppm
+50 °C, Nominal	1.95995543	959	0.49
+40 °C, Nominal	1.95995687	2395	1.22
+30 °C, Nominal	1.95995841	3941	2.01
+20 °C, Nominal, 138 VAC, 60 Hz	1.95995938	4903	2.50
+20 °C, Nominal	***1.95995447***	***Reference***	***Reference***
+20 °C, Nominal, 98 VAC, 60 Hz	1.95995781	3340	1.70
+10 °C, Nominal	1.95993216	-22313	-11.38
0 °C, Nominal	1.95993894	-15528	-7.92

Table 7.3-2: *Transmitter frequency stability results – n5, ch 176300*

Test conditions	Frequency, MHz	Drift, Hz	Drift, ppm	Limit ±ppm	Margin, ±ppm
+50 °C, Nominal	881.44675009	-648	-0.7346	1.5	0.77
+40 °C, Nominal	881.44674734	-650	-0.7378	1.5	0.76
+30 °C, Nominal	881.44700448	-393	-0.4460	1.5	1.05
+20 °C, Nominal, 138 VAC, 60 Hz	881.44700457	-393	-0.4459	1.5	1.05
+20 °C, Nominal	***881.44739763***	***Reference***	***Reference***	***Reference***	***Reference***
+20 °C, Nominal, 98 VAC, 60 Hz	881.44739090	-7	-0.0076	1.5	1.49
+10 °C, Nominal	881.44807925	682	0.7733	1.5	0.73
0 °C, Nominal	881.44775587	358	0.4064	1.5	1.09

Table 7.3-3: *Transmitter frequency stability results – n12, ch 147500*

Test conditions	Frequency, GHz	Drift, Hz	Drift, ppm
+50 °C, Nominal	737.48011597	13118	17.7885
+40 °C, Nominal	737.46873006	1733	2.3493
+30 °C, Nominal	737.46988846	2891	3.9201
+20 °C, Nominal, 138 VAC, 60 Hz	737.48281250	15815	21.4450
+20 °C, Nominal	***737.46699754***	***Reference***	***Reference***
+20 °C, Nominal, 98 VAC, 60 Hz	737.48281250	15815	21.4450
+10 °C, Nominal	737.46861229	1615	2.1896
0 °C, Nominal	737.43317957	-33818	-45.8569

Test data, continued

Table 7.3-4: *Transmitter frequency stability results – n25, ch 392500*

Test conditions	Frequency, GHz	Drift, Hz	Drift, ppm
+50 °C, Nominal	1.96244094	3786	1.9292
+40 °C, Nominal	1.96244665	9497	4.8394
+30 °C, Nominal	1.96244125	4091	2.0847
+20 °C, Nominal, 138 VAC, 60 Hz	1.96247006	32908	16.7692
+20 °C, Nominal	***1.96243715***	***Reference***	***Reference***
+20 °C, Nominal, 98 VAC, 60 Hz	1.96246563	28471	14.5080
+10 °C, Nominal	1.96244626	9104	4.6391
0 °C, Nominal	1.96242533	-11827	-6.0267

Table 7.3-5: *Transmitter frequency stability results – n41, ch 518598*

Test conditions	Frequency, GHz	Drift, Hz	Drift, ppm
+50 °C, Nominal	2.59295295	2168	0.8361
+40 °C, Nominal	2.59295276	1977	0.7625
+30 °C, Nominal	2.59295095	169	0.0652
+20 °C, Nominal, 138 VAC, 60 Hz	2.59296500	14222	5.4849
+20 °C, Nominal	***2.59295078***	***Reference***	***Reference***
+20 °C, Nominal, 98 VAC, 60 Hz	2.59297125	20472	7.8953
+10 °C, Nominal	2.59295308	2303	0.8882
0 °C, Nominal	2.59295167	893	0.3444

Table 7.3-6: *Transmitter frequency stability results – n66, ch 431000*

Test conditions	Frequency, GHz	Drift, Hz	Drift, ppm
+50 °C, Nominal	2.15494575	20426	9.4788
+40 °C, Nominal	2.15494855	23219	10.7749
+30 °C, Nominal	2.15494864	23312	10.8180
+20 °C, Nominal, 138 VAC, 60 Hz	2.15496094	35610	16.5252
+20 °C, Nominal	***2.15492533***	***Reference***	***Reference***
+20 °C, Nominal, 98 VAC, 60 Hz	2.15496094	35610	16.5252
+10 °C, Nominal	2.15494007	14740	6.8401
0 °C, Nominal	2.15494971	24383	11.3150

Table 7.3-7: *Transmitter frequency stability results – n71, ch 126800*

Test conditions	Frequency GHz	Drift, Hz	Drift, ppm
+50 °C, Nominal	633.95667021	11232	17.7182
+40 °C, Nominal	633.95208450	6647	10.4846
+30 °C, Nominal	633.94908523	3647	5.7534
+20 °C, Nominal, 138 VAC, 60 Hz	633.97500000	29562	46.6320
+20 °C, Nominal	***633.94543786***	***Reference***	***Reference***
+20 °C, Nominal, 98 VAC, 60 Hz	633.97812500	32687	51.5614
+10 °C, Nominal	633.88957569	-55862	-88.1183
0 °C, Nominal	633.91569721	-29741	-46.9136

Test data, continued

Table 7.3-8: *Transmitter frequency stability results – n77, ch 656000*

Test conditions	Frequency, GHz	Drift, Hz	Drift, ppm
+50 °C, Nominal	3.83997194	-1278	-0.3328
+40 °C, Nominal	3.83997880	5582	1.4537
+30 °C, Nominal	3.83996966	-3560	-0.9271
+20 °C, Nominal, 138 VAC, 60 Hz	3.83997802	4800	1.2500
+20 °C, Nominal	***3.83997322***	***Reference***	***Reference***
+20 °C, Nominal, 98 VAC, 60 Hz	3.83998566	12441	3.2399
+10 °C, Nominal	3.83996384	-9380	-2.4427
0 °C, Nominal	3.83997207	-1146	-0.2984

Table 7.3-9: *Transmitter frequency stability results – n78, ch 636666*

Test conditions	Frequency, GHz	Drift, Hz	Drift, ppm
+50 °C, Nominal	3.54995774	-2295	-0.6465
+40 °C, Nominal	3.54995850	-1536	-0.4327
+30 °C, Nominal	3.54996109	1057	0.2977
+20 °C, Nominal, 138 VAC, 60 Hz	3.54996813	8092	2.2795
+20 °C, Nominal	***3.54996003***	***Reference***	***Reference***
+20 °C, Nominal, 98 VAC, 60 Hz	3.54996969	9654	2.7196
+10 °C, Nominal	3.54995523	-4799	-1.3518
0 °C, Nominal	3.54995909	-947	-0.2668

7.4 Receiver spurious emissions

References, definitions and limits

RSS-133, Clause 6.6:

Receiver spurious emissions shall comply with the limits specified in RSS-Gen.

RSS-Gen, Clause 7.4:

Receiver conducted emissions limits

If the receiver has a detachable antenna of known impedance, an antenna-conducted spurious emissions measurement is permitted as an alternative to radiated measurement. However, the radiated method of section 7.3 is preferred.

The antenna-conducted test shall be performed with the antenna disconnected and with the receiver antenna port connected to a measuring instrument having equal input impedance to that specified for the antenna. The RF cable connecting the receiver under test to the measuring instrument shall also have the same impedance to that specified for the receiver's antenna.

The spurious emissions from the receiver at any discrete frequency, measured at the antenna port by the antenna-conducted method, shall not exceed 2 nW (-57 dBm) in the frequency range 30-1000 MHz and 5 nW (-53 dBm) above 1 GHz.

Test summary

Verdict	Pass		
Test date	November 30, 2023	Temperature	22 °C
Tested by	Tarek Elkholy	Air pressure	976 mbar
Test location	Cambridge	Relative humidity	42 %

Observations, settings and special notes

The spectrum was searched from 30 MHz to 22 GHz.
All measurements were performed in conducted method using an average (RMS) detector.