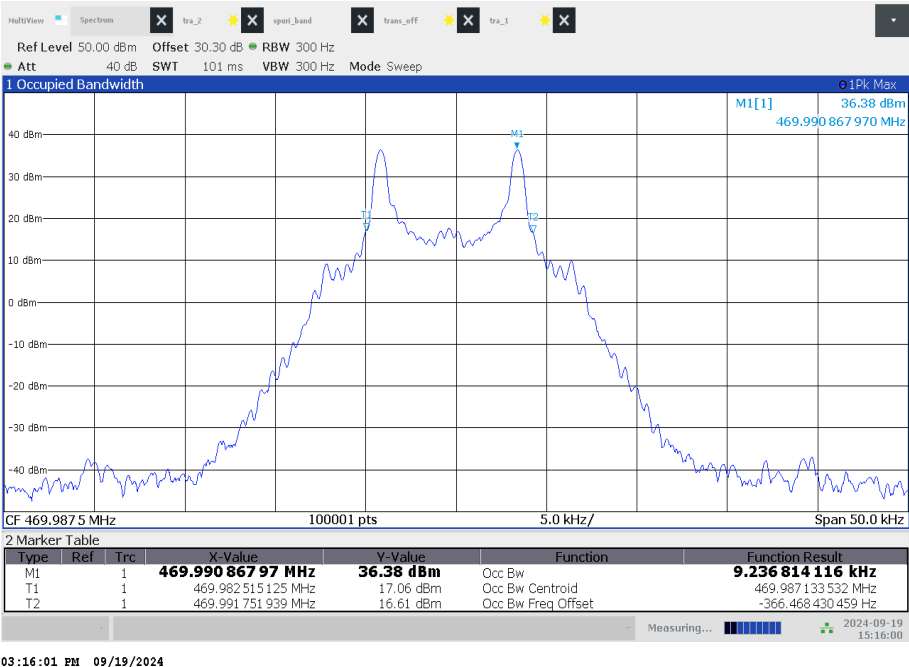


Plot 21: 469.9875 MHz – carrier



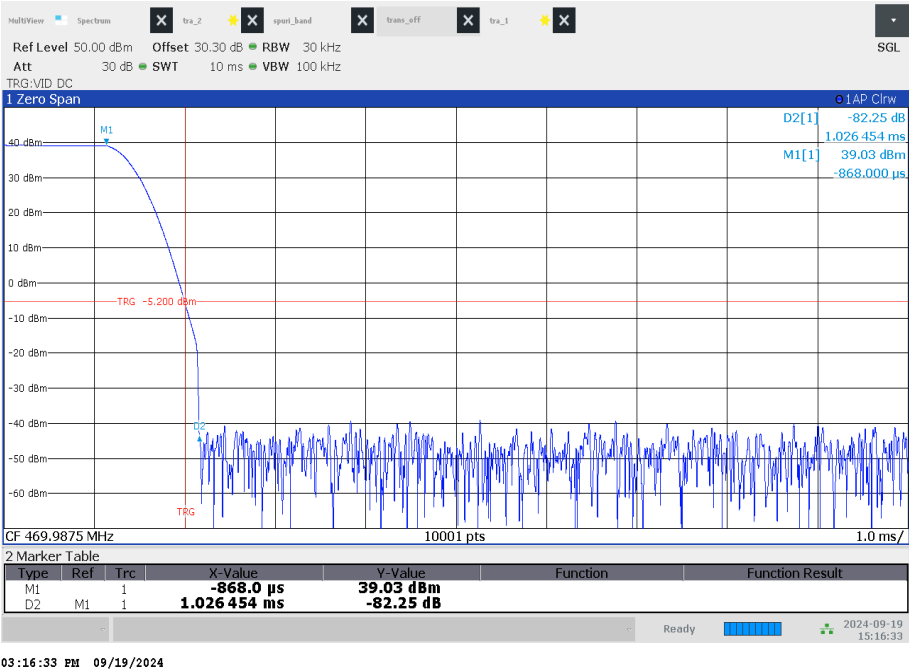
Plot 22: 469.9875 MHz – switch on (zoomed)



Plot 23: 469.9875 MHz – operating



Plot 24: 469.9875 MHz – switch off (zoomed)



13.7 Frequency stability

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	10 Hz
Video bandwidth:	100 Hz
Span:	50 kHz
Trace-Mode:	Max. hold

Limits:

FCC	IC
FCC 47 CFR § 2.1055 (a)(1) § 90.213	RSS 119 Issue 12 5.3
150–174 MHz band: 421–512 MHz band:	5 ppm for 7.5 kHz channel spacing 2.5 ppm for 12.5 kHz channel spacing

Results:

Temperature	Deviation (Hz)	Deviation (ppm)	Deviation (Hz)	Deviation (ppm)	Deviation (Hz)	Deviation (ppm)
	421.2125 MHz		425.6125 MHz		429.9875 MHz	
-20 °C	-390	0.92	-395	0.93	-405	0.94
-10 °C	-310	0.74	-305	0.72	-315	0.73
0 °C	-200	0.47	-200	0.47	-205	0.48
10 °C	-175	0.42	-200	0.47	-210	0.49
20 °C (V nom)	-225	0.53	-250	0.59	-250	0.58
30 °C	-265	0.63	-285	0.67	-270	0.63
40 °C	-305	0.72	-340	0.80	-345	0.80
50 °C	-360	0.85	-375	0.88	-385	0.89
Voltage	Deviation (Hz)	Deviation (ppm)	Deviation (Hz)	Deviation (ppm)	Deviation (Hz)	Deviation (ppm)
85 %	-358	0.85	-363	0.85	-365	0.85
115 %	-360	0.85	-360	0.85	-365	0.85

Temperature	Deviation (Hz)	Deviation (ppm)	Deviation (Hz)	Deviation (ppm)	Deviation (Hz)	Deviation (ppm)
	450.0125 MHz		460.0000 MHz		469.9875 MHz	
-20 °C	-445	0.99	-445	0.97	-470	1.00
-10 °C	-360	0.80	-360	0.78	-380	0.81
0 °C	-230	0.51	-230	0.50	-250	0.53
10 °C	-195	0.43	-205	0.45	-210	0.45
20 °C (V nom)	-255	0.57	-265	0.58	-270	0.57
30 °C	-290	0.64	-300	0.65	-305	0.65
40 °C	-330	0.73	-340	0.74	-350	0.74
50 °C	-395	0.88	-405	0.88	-415	0.88
Voltage	Deviation (Hz)	Deviation (ppm)	Deviation (Hz)	Deviation (ppm)	Deviation (Hz)	Deviation (ppm)
85 %	-400	0.89	-392	0.85	-328	0.70
115 %	-402	0.89	-402	0.87	-332	0.71

13.8 Transmitter spurious emissions conducted

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Video bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Span:	See plots
Trace-Mode:	Max. hold

Limits:

FCC	IC
FCC 47 CFR § 2.1051 § 90.210	RSS 119 Issue 12 5.8
Emission Mask E 7.5 kHz channel spacing 65 dB or $55 + 10\log_{10}(P_{\text{Watts}})$ – whichever is the lesser	Emission Mask E 7.5 kHz channel spacing 57 dB or $55 + 10\log_{10}(P_{\text{Watts}})$ – whichever is the lesser
Emission Mask D 12.5 kHz channel spacing 70 dB or $50 + 10\log_{10}(P_{\text{Watts}})$ – whichever is the lesser	
Emission Mask G 20/25 kHz channel spacing 70 dB or $116 \log_{10}(fd/6.11)$ or $50 + 10 \log_{10}(p)$ – whichever is the lesser	

Emission Masks D, E, F and Y

In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak mode. For emissions beyond 50 kHz from the edge of the authorized bandwidth, the resolution bandwidth shall be 100 kHz for frequencies at or below 1 GHz, and 1 MHz for frequencies above 1 GHz.

Emission Masks B, C, G, I and J

Unwanted emission measurements can be in peak or averaging mode, provided that the same parameter, peak power or average power, used for the transmitter's output power measurement is also used for the unwanted emission measurements.

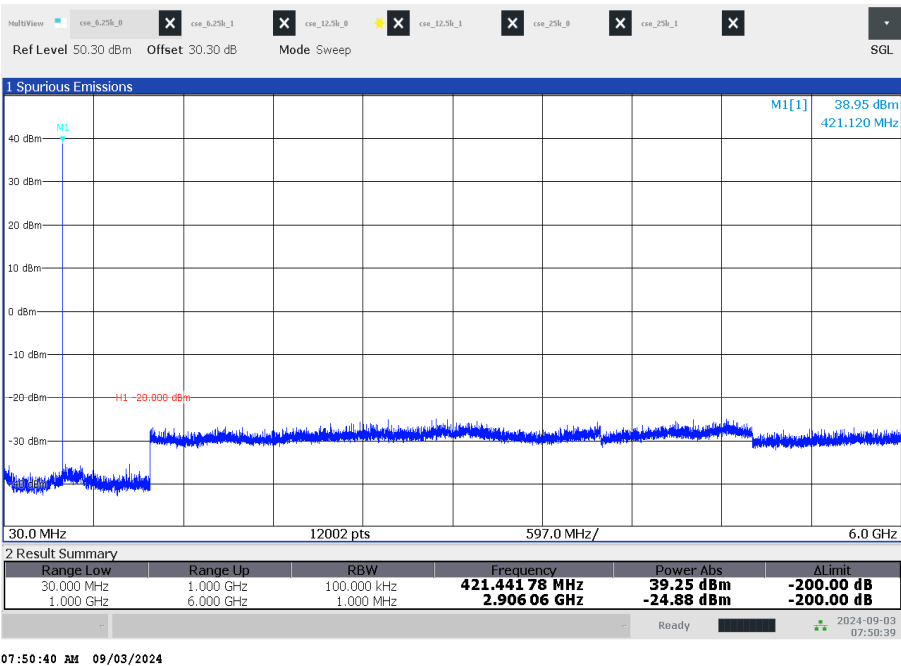
Except where otherwise stated, on any frequency removed from the carrier frequency by more than 250% of the authorized bandwidth, a resolution bandwidth of at least 100 kHz must be used for frequencies to be measured at or below 1 GHz, and a resolution bandwidth of at least 1 MHz must be used for frequencies to be measured above 1 GHz. If a narrower resolution bandwidth is used, power integration shall be applied.

Results: see 13.4 and plots below

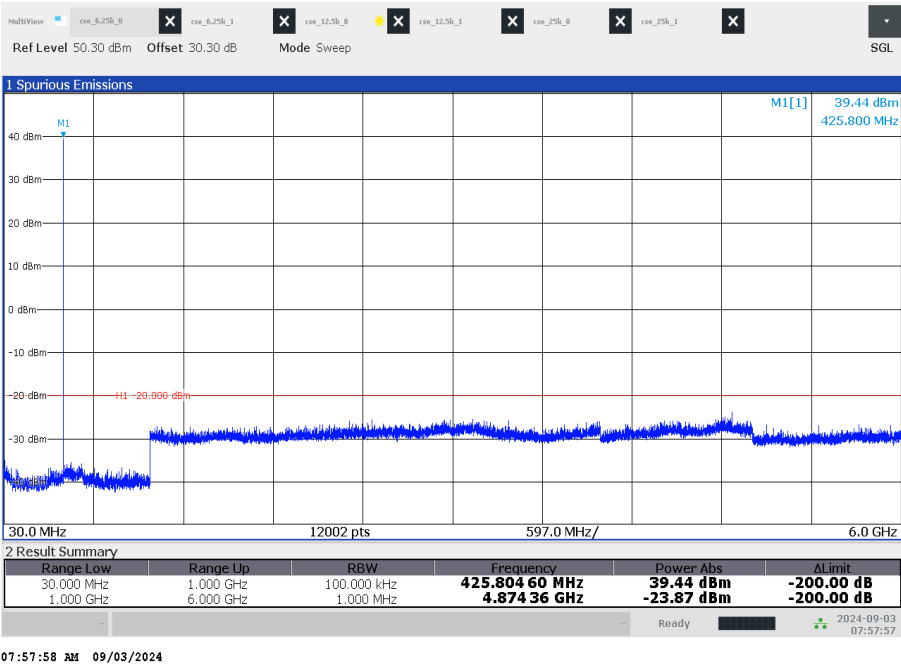
13.8.1 Plots 6.25 kHz bandwidth

Plots of the measurements with low power setting (10 W)

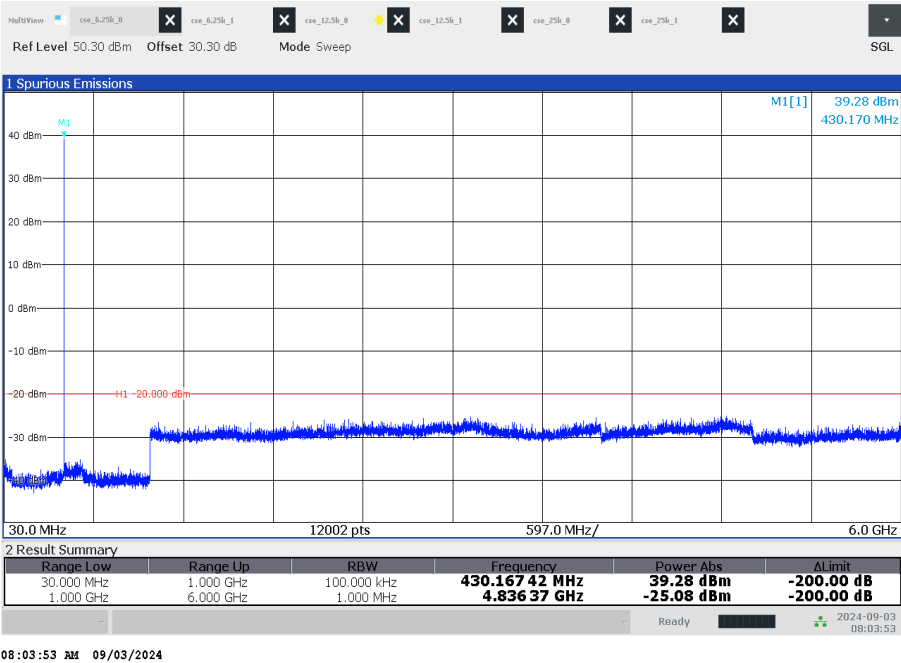
Plot 1: tx@421.2125 MHz, bandwidth 6.25 kHz, low power, 30 MHz – 6 GHz:



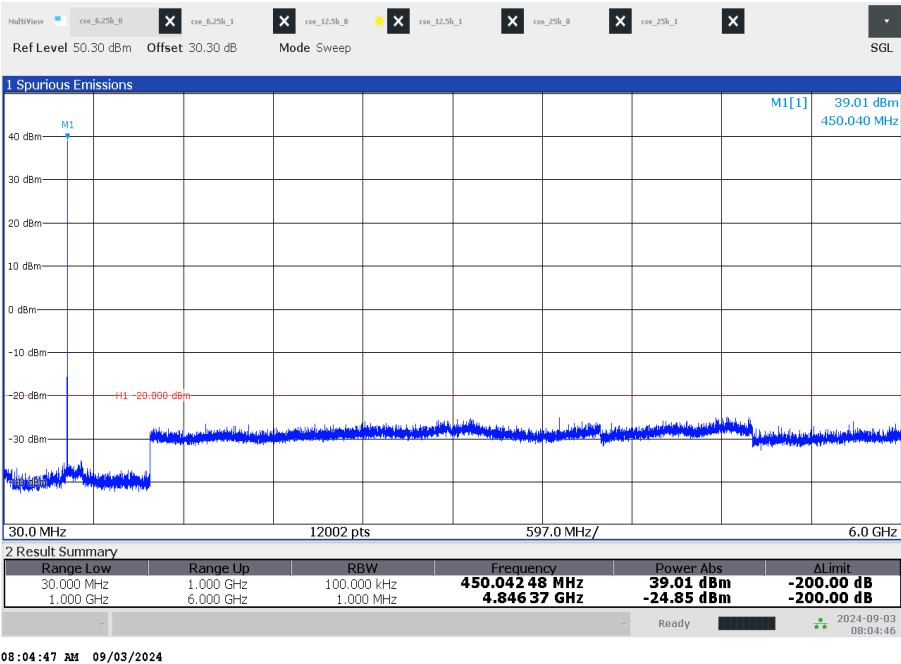
Plot 2: tx@425.6125 MHz, bandwidth 6.25 kHz, low power, 30 MHz – 6 GHz:



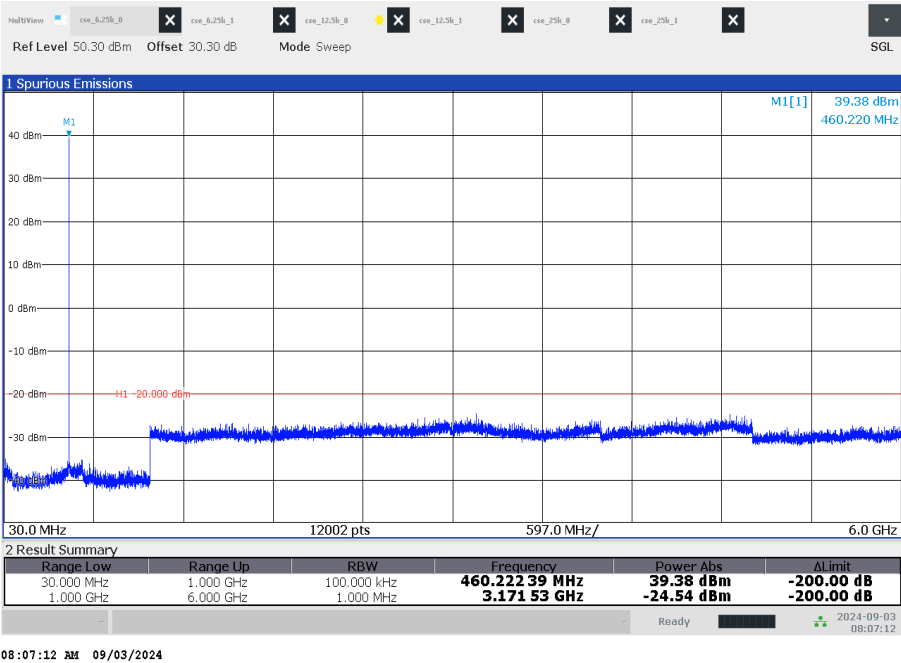
Plot 3: tx@429.9875 MHz, bandwidth 6.25 kHz, low power, 30 MHz – 6 GHz:



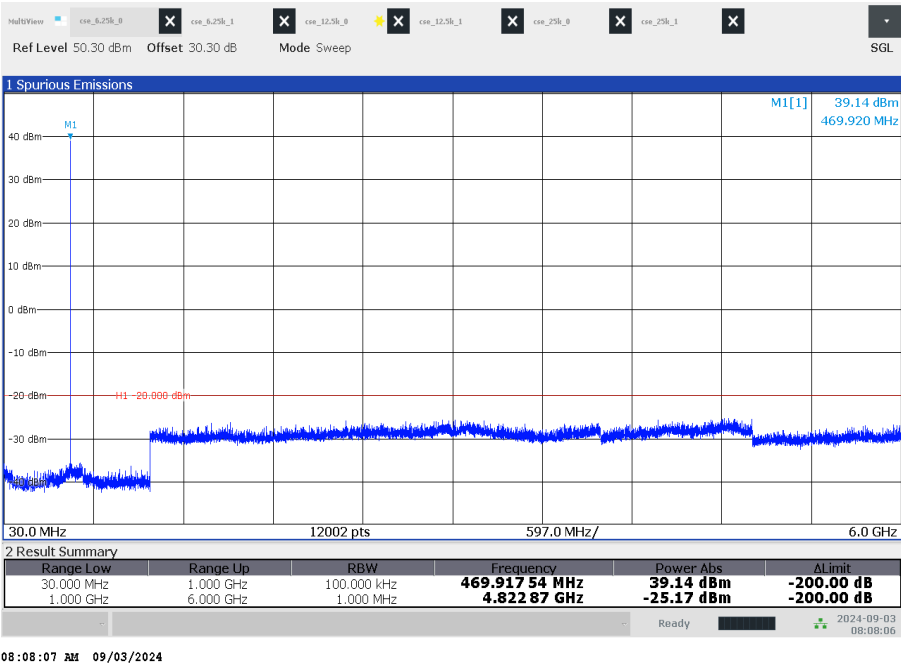
Plot 4: tx@450.0125 MHz, bandwidth 6.25 kHz, low power, 30 MHz – 6 GHz:



Plot 5: tx@460.0 MHz, bandwidth 6.25 kHz, low power, 30 MHz – 6 GHz:

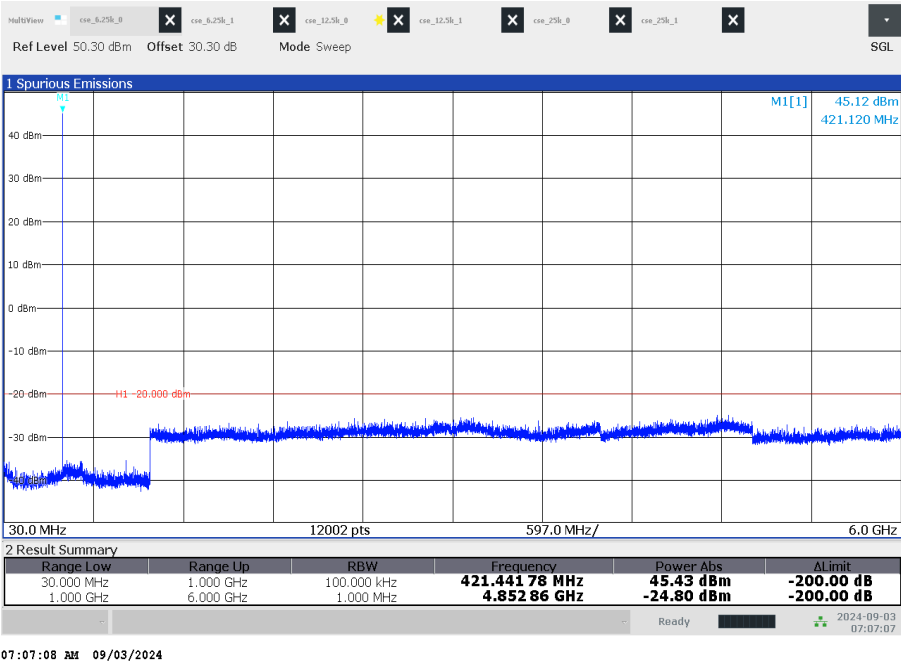


Plot 6: tx@469.9875 MHz, bandwidth 6.25 kHz, low power, 30 MHz – 6 GHz:

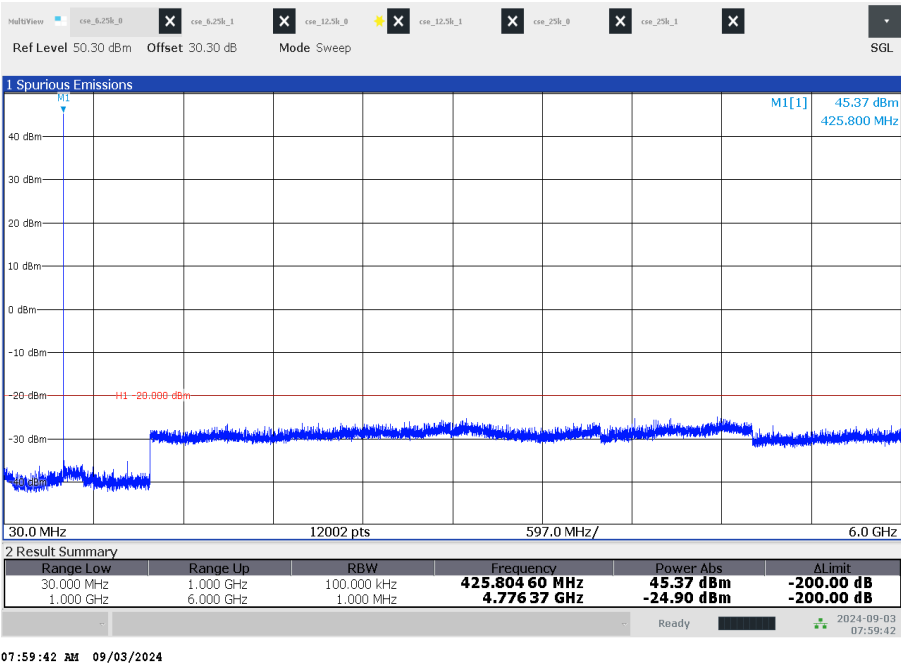


Plots of the measurements with high power setting (40 W):

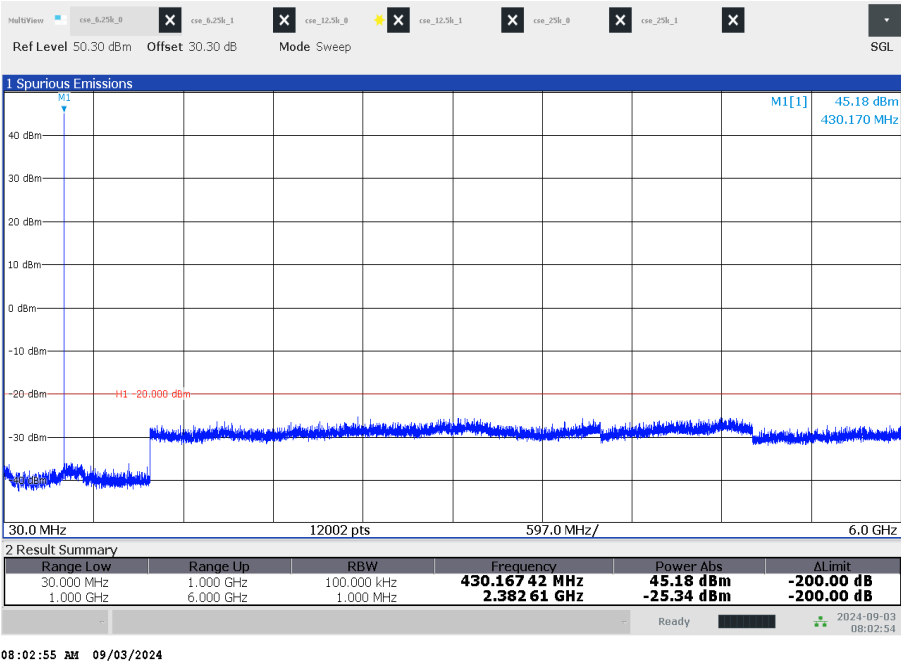
Plot 1: tx@421.2125 MHz, bandwidth 6.25 kHz, high power, 30 MHz – 6 GHz:



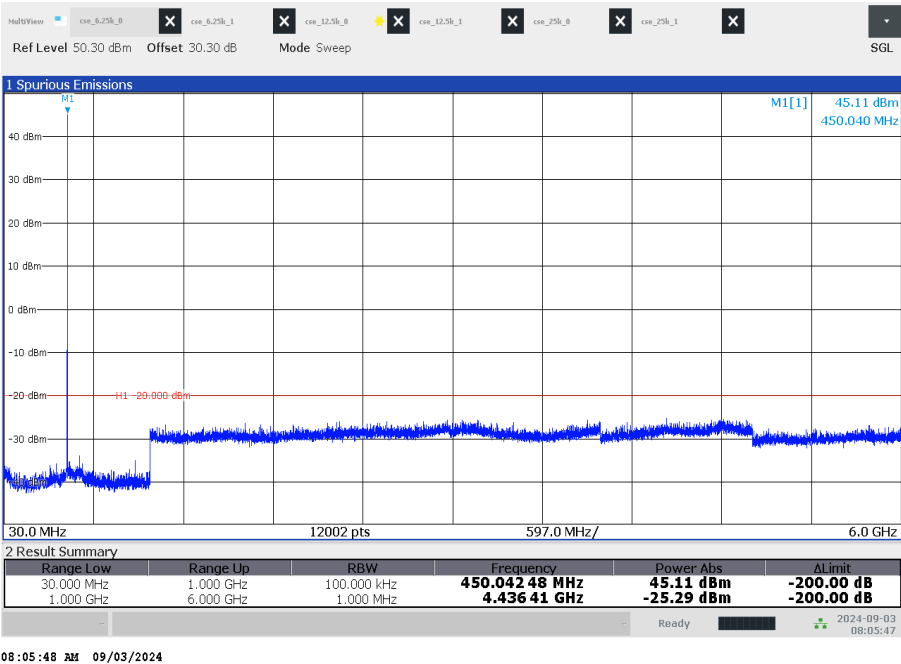
Plot 2: tx@425.6125 MHz, bandwidth 6.25 kHz, high power, 30 MHz – 6 GHz:



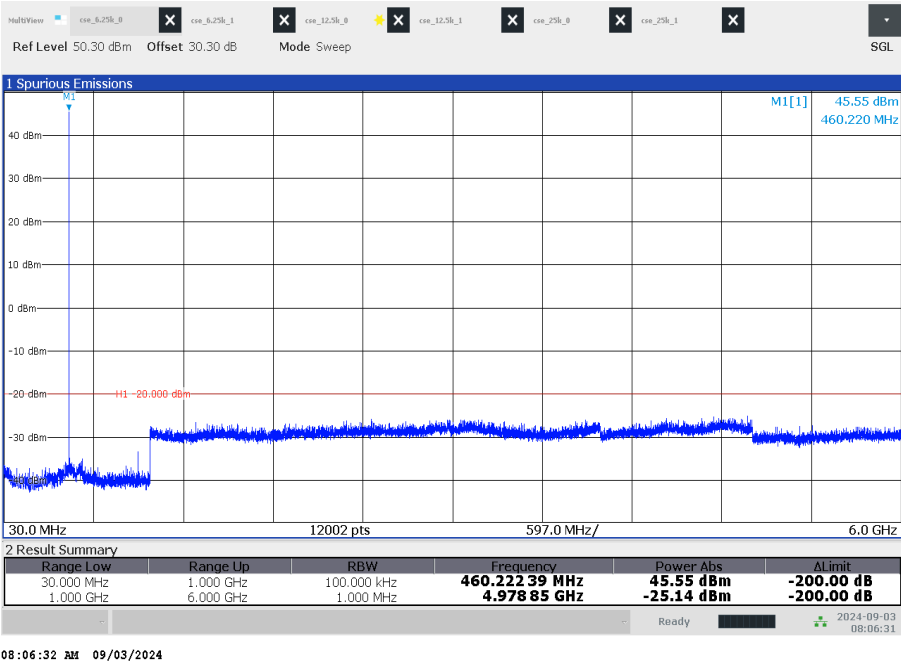
Plot 3: tx@429.9875 MHz, bandwidth 6.25 kHz, high power, 30 MHz – 6 GHz:



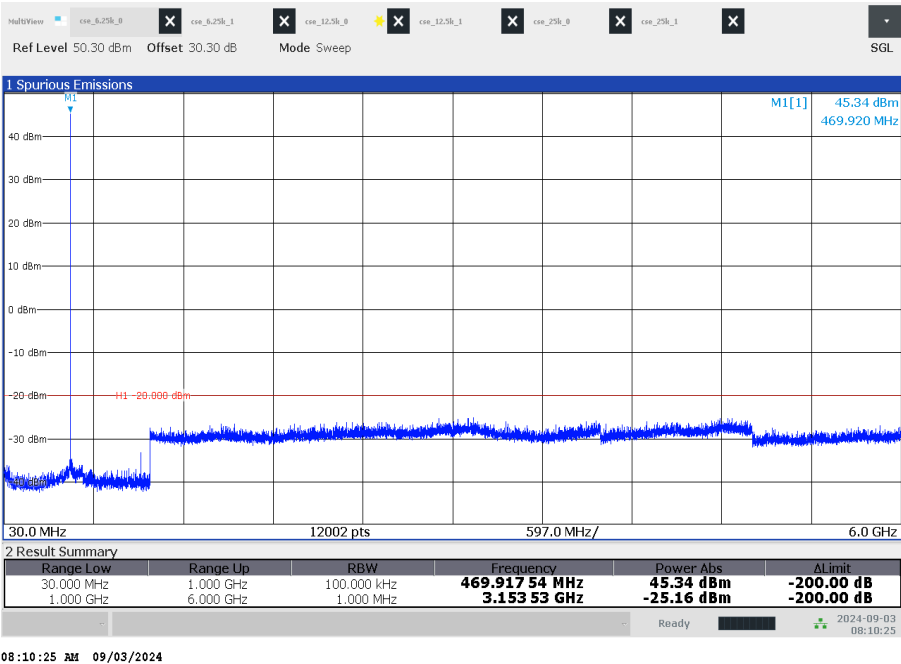
Plot 4: tx@450.0125 MHz, bandwidth 6.25 kHz, high power, 30 MHz – 6 GHz:



Plot 5: tx@460.0 MHz, bandwidth 6.25 kHz, high power, 30 MHz – 6 GHz:



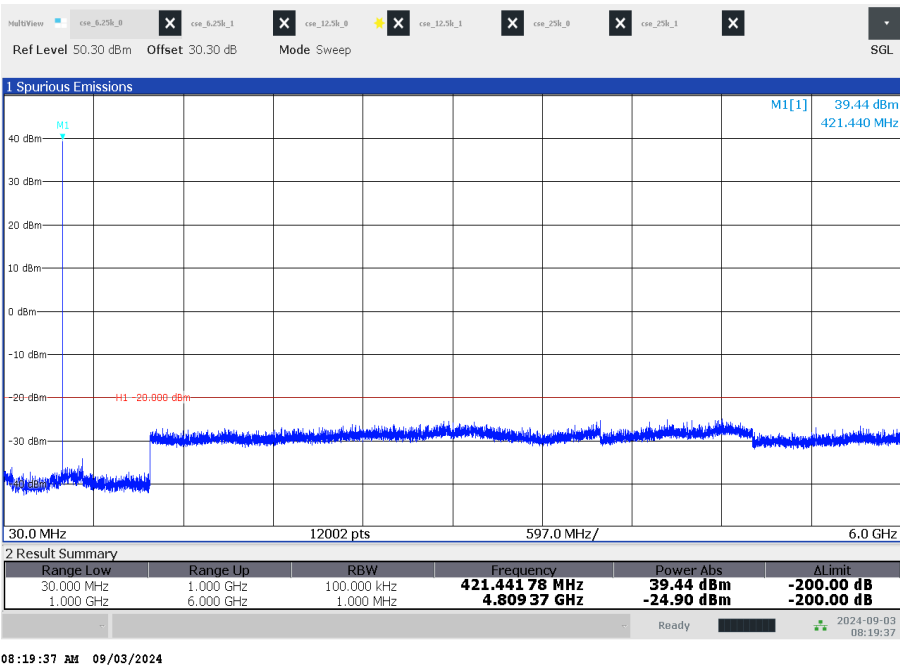
Plot 6: tx@469.9875 MHz, bandwidth 6.25 kHz, high power, 30 MHz – 6 GHz:



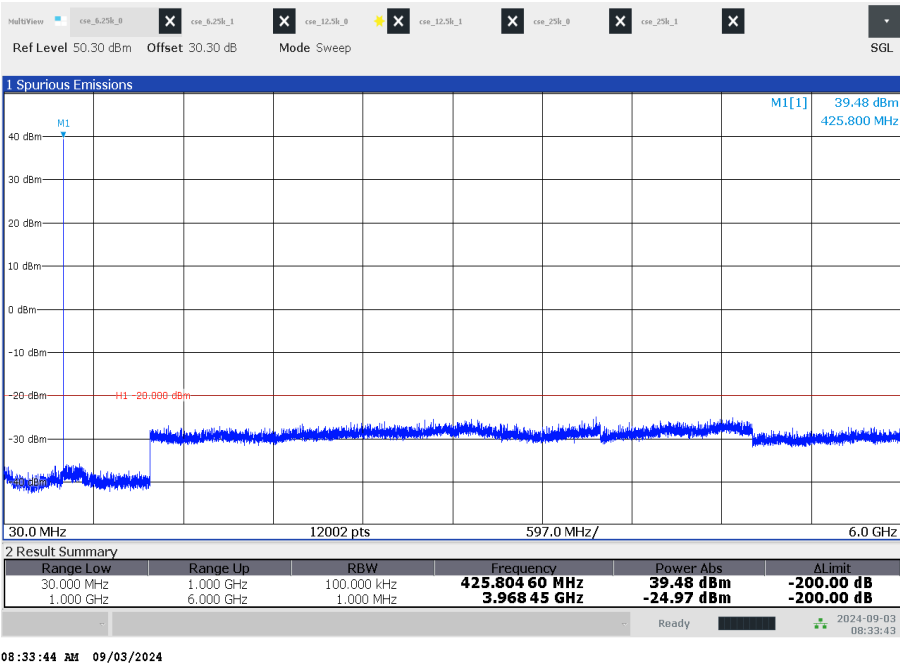
13.8.2 Plots 12.5 kHz bandwidth

Plots of the measurements with low power setting (10 W)

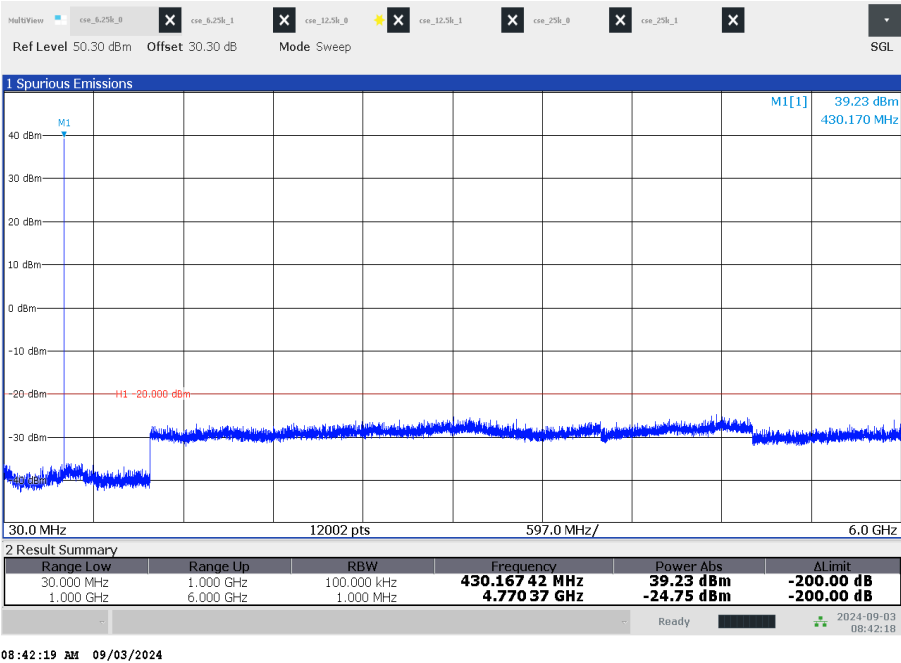
Plot 1: tx@421.2125 MHz, bandwidth 12.5 kHz, low power, 30 MHz – 6 GHz:



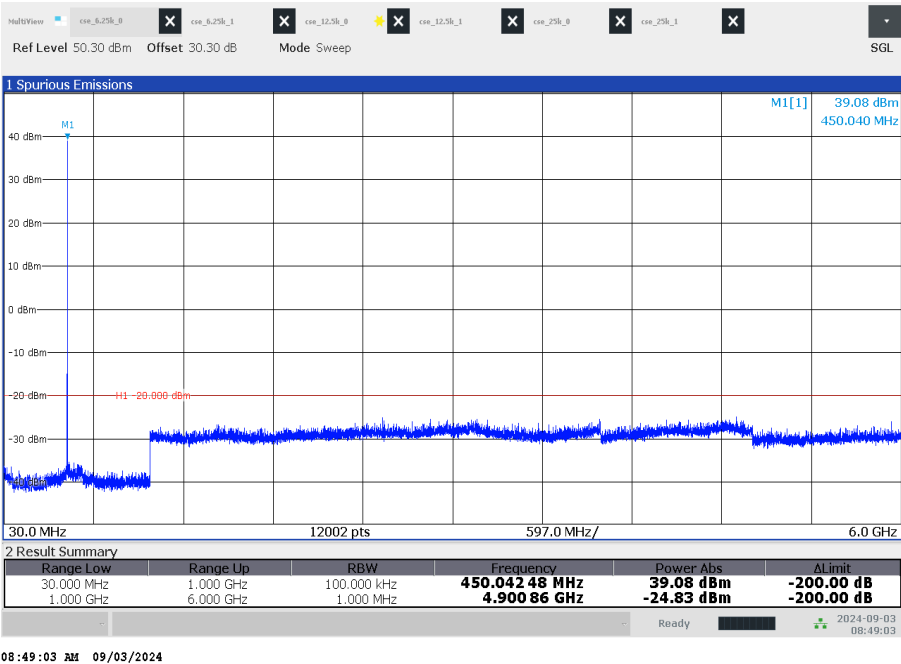
Plot 2: tx@425.6125 MHz, bandwidth 12.5 kHz, low power, 30 MHz – 6 GHz:



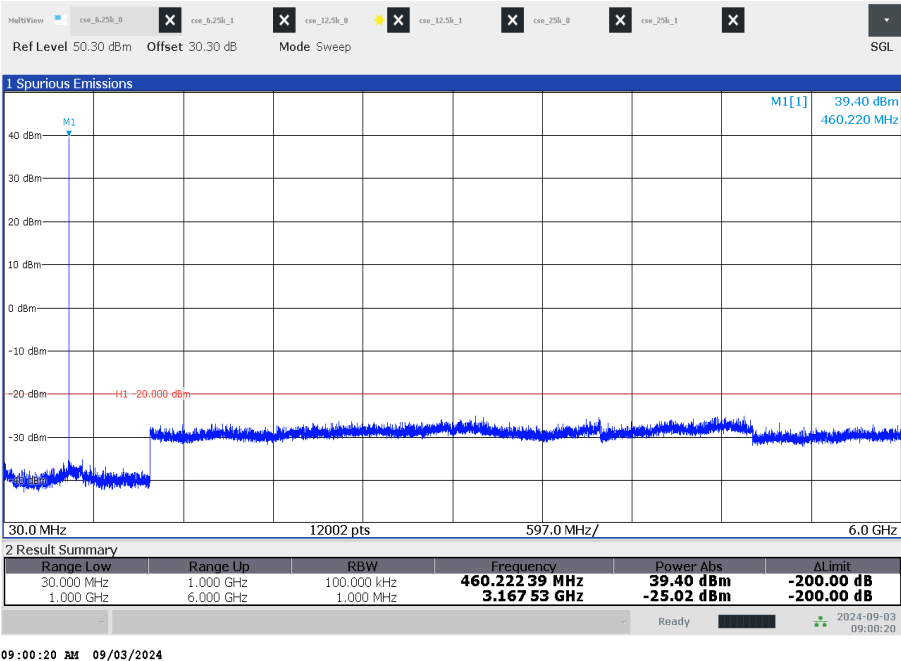
Plot 3: tx@429.9875 MHz, bandwidth 12.5 kHz, low power, 30 MHz – 6 GHz:



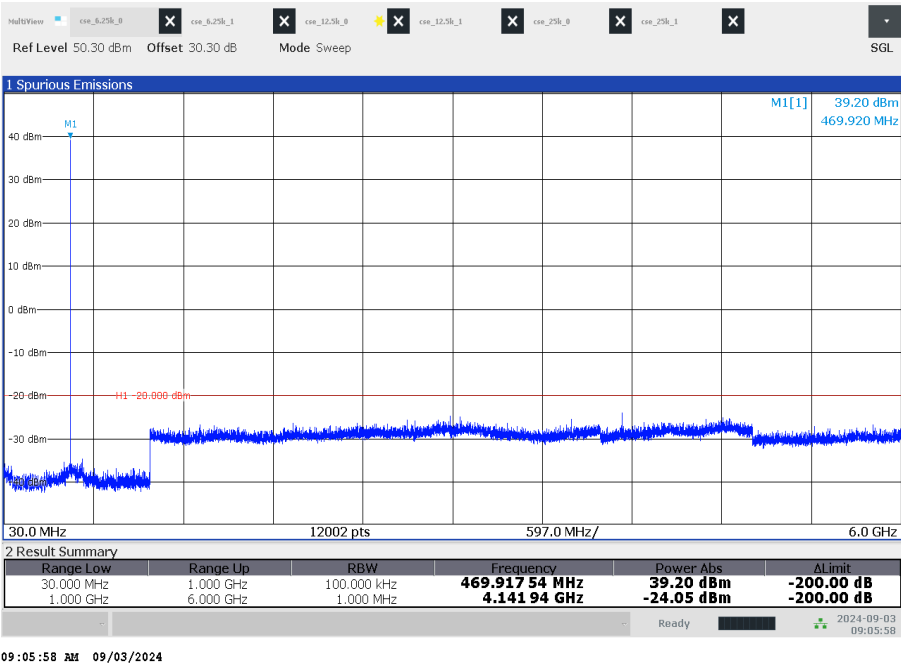
Plot 4: tx@450.0125 MHz, bandwidth 12.5 kHz, low power, 30 MHz – 6 GHz:



Plot 5: tx@460.0 MHz, bandwidth 12.5 kHz, low power, 30 MHz – 6 GHz:

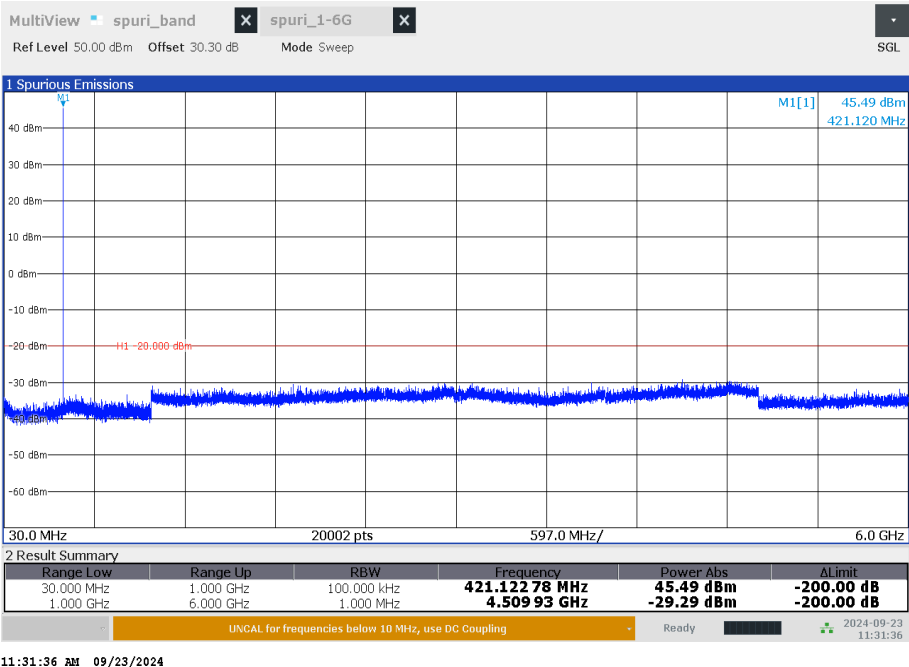


Plot 6: tx@469.9875 MHz, bandwidth 12.5 kHz, low power, 30 MHz – 6 GHz:

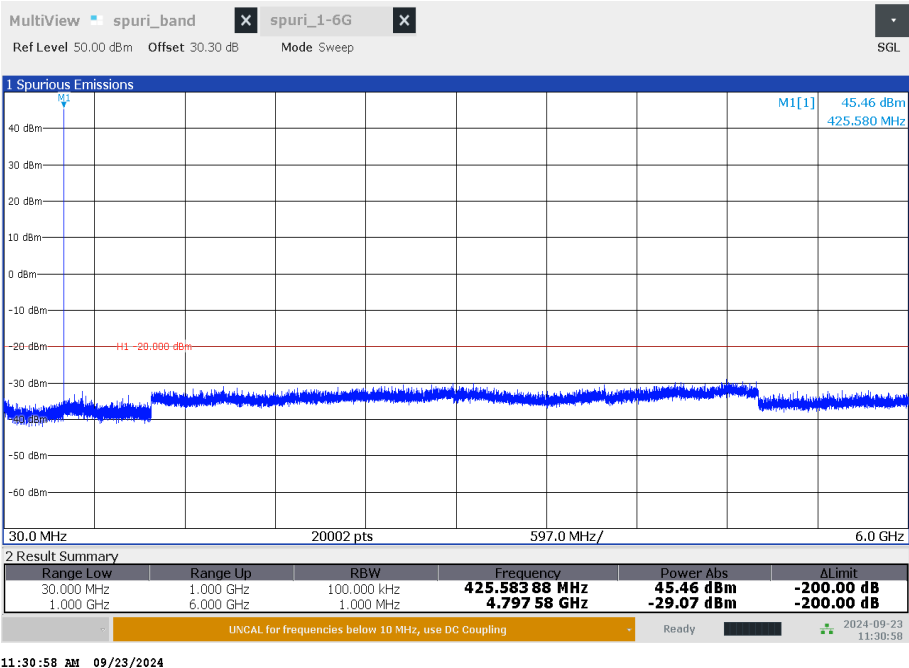


Plots of the measurements with high power setting (40 W)

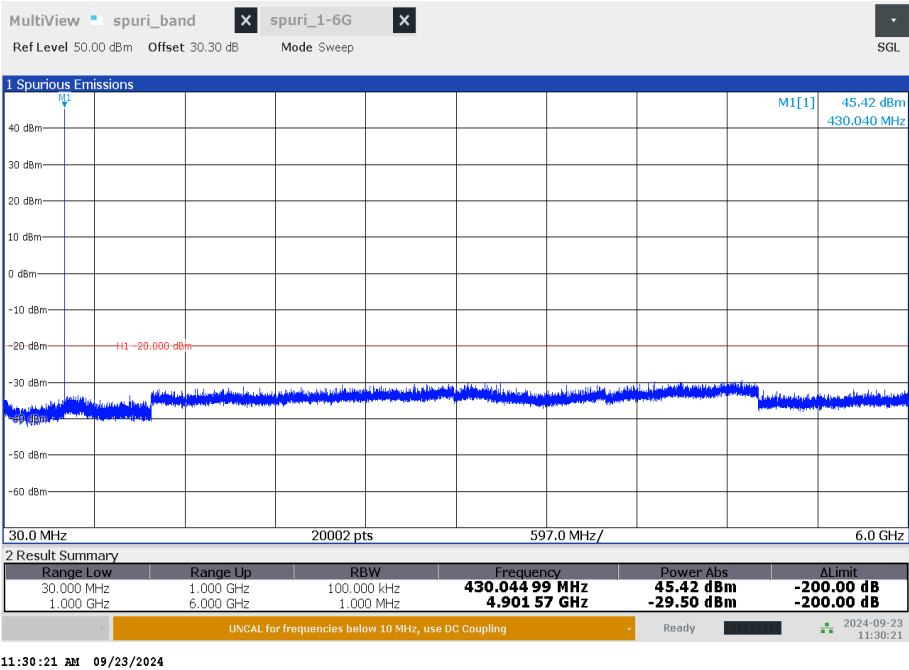
Plot 1: tx@421.2125 MHz, bandwidth 12.5 kHz, high power, 30 MHz – 6 GHz:



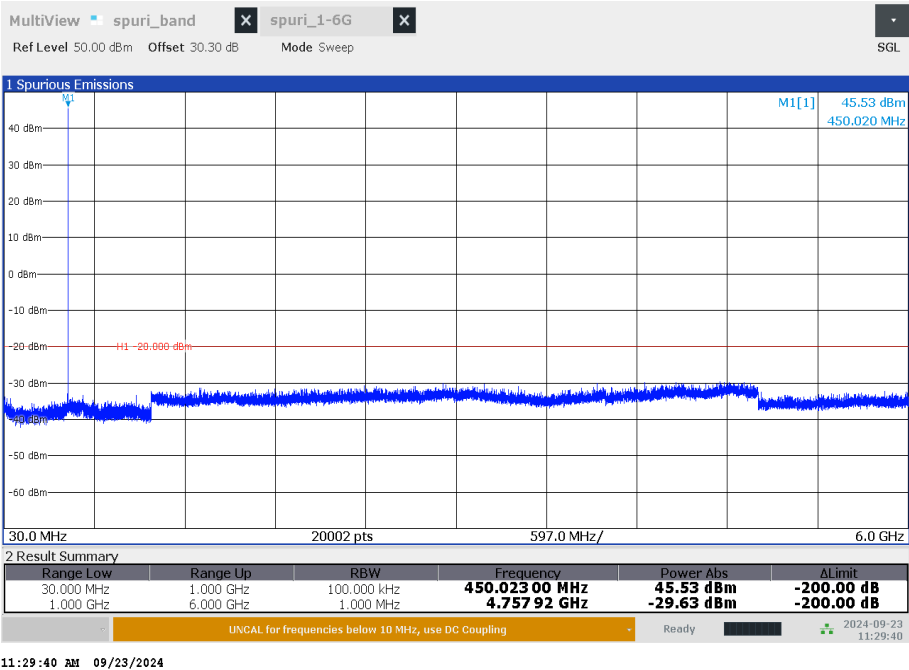
Plot 2: tx@425.6125 MHz, bandwidth 12.5 kHz, high power, 30 MHz – 6 GHz:



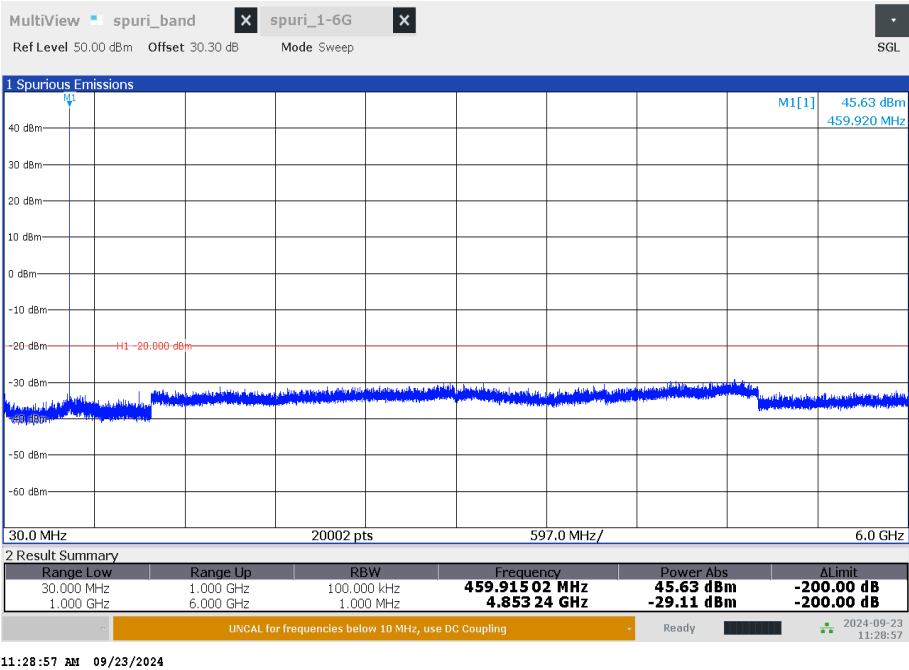
Plot 3: tx@429.9875 MHz, bandwidth 12.5 kHz, high power, 30 MHz – 6 GHz:



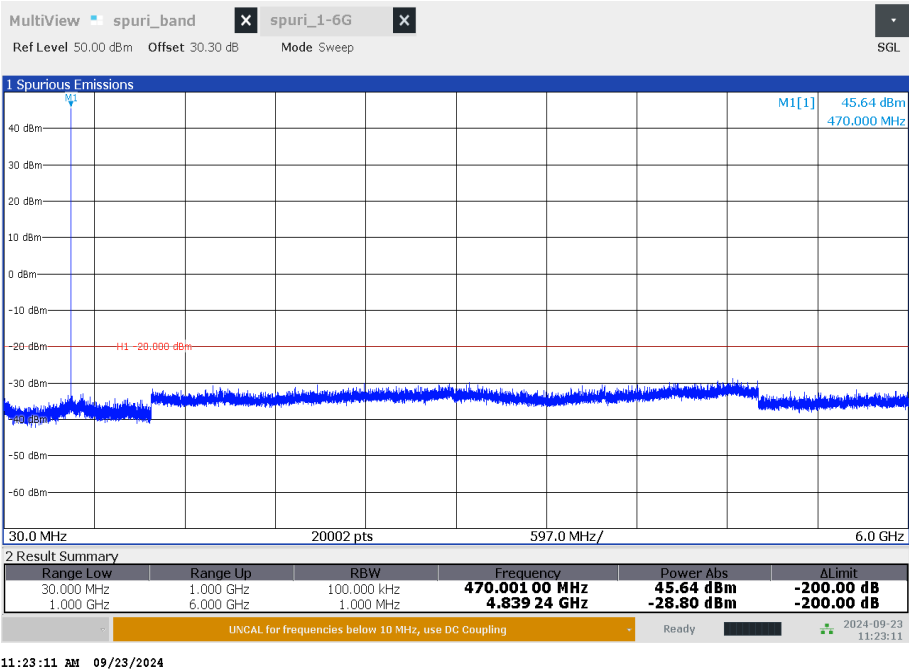
Plot 4: tx@450.0125 MHz, bandwidth 12.5 kHz, high power, 30 MHz – 6 GHz:



Plot 5: tx@460.0 MHz, bandwidth 12.5 kHz, high power, 30 MHz – 6 GHz:



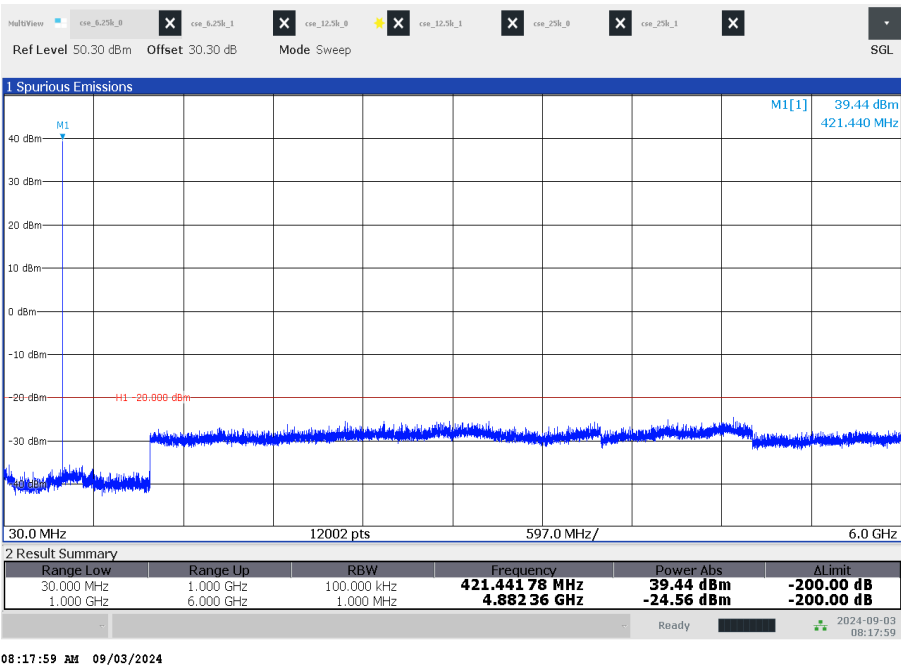
Plot 6: tx@469.9875 MHz, bandwidth 12.5 kHz, high power, 30 MHz – 6 GHz:



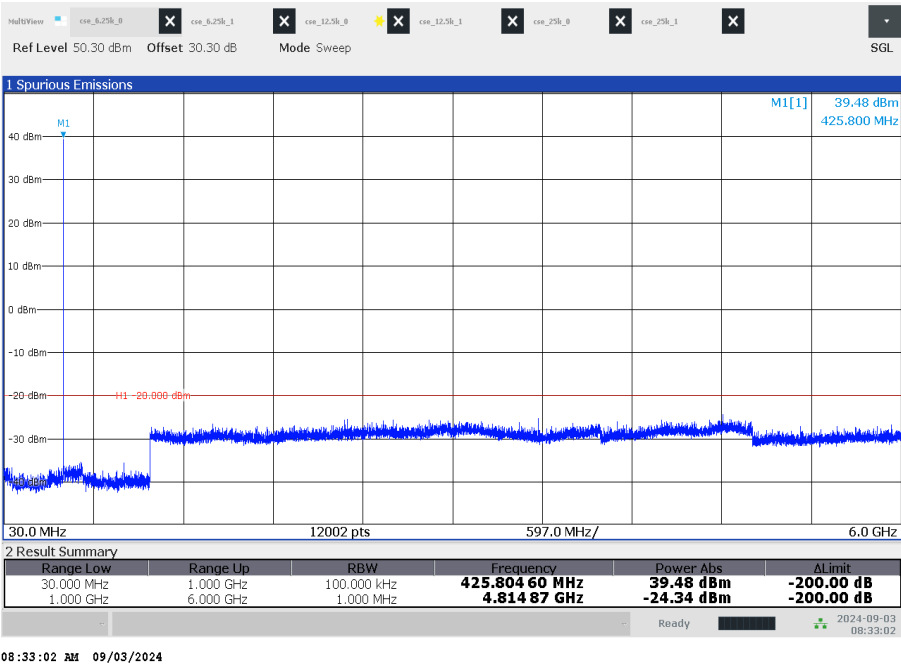
13.8.3 Plots 20 kHz bandwidth

Plots of the measurements with low power setting (10 W)

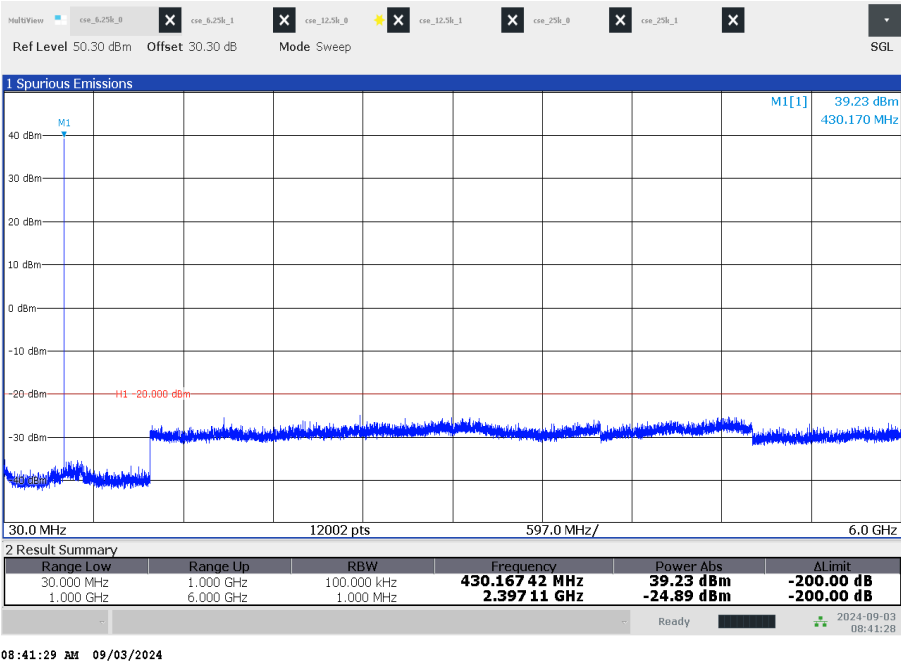
Plot 1: tx@421.2125 MHz, bandwidth 20 kHz, low power, 30 MHz – 6 GHz:



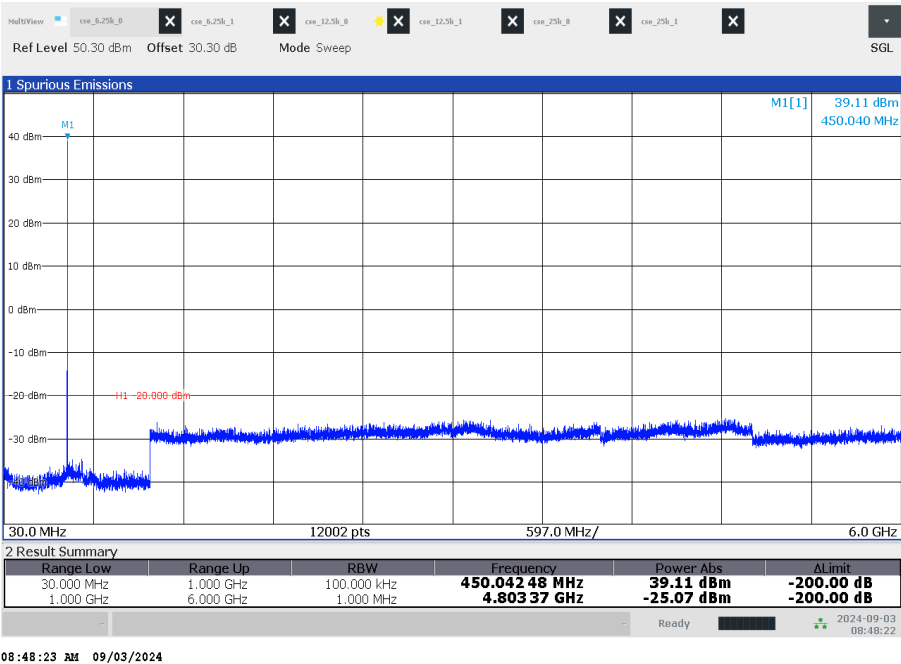
Plot 2: tx@425.6125 MHz, bandwidth 20 kHz, low power, 30 MHz – 6 GHz:



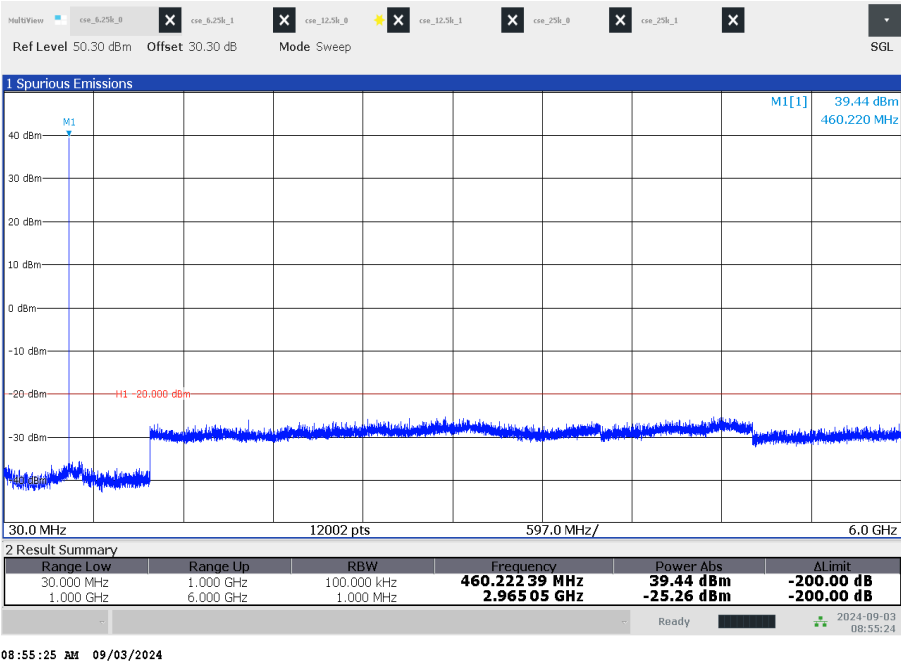
Plot 3: tx@429.9875 MHz, bandwidth 20 kHz, low power, 30 MHz – 6 GHz:



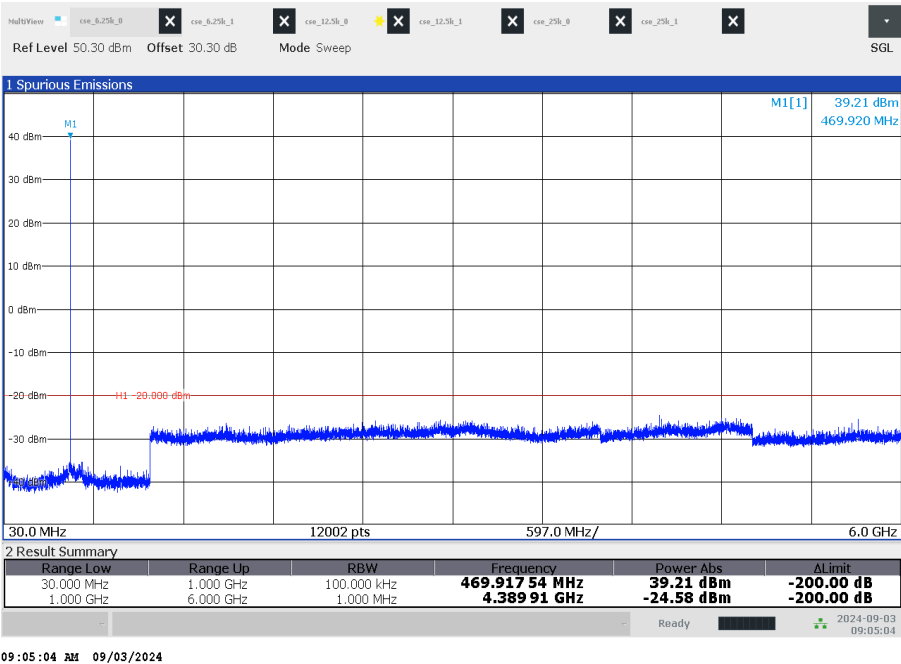
Plot 4: tx@450.0125 MHz, bandwidth 20 kHz, low power, 30 MHz – 6 GHz:



Plot 5: tx@460.0 MHz, bandwidth 20 kHz, low power, 30 MHz – 6 GHz:

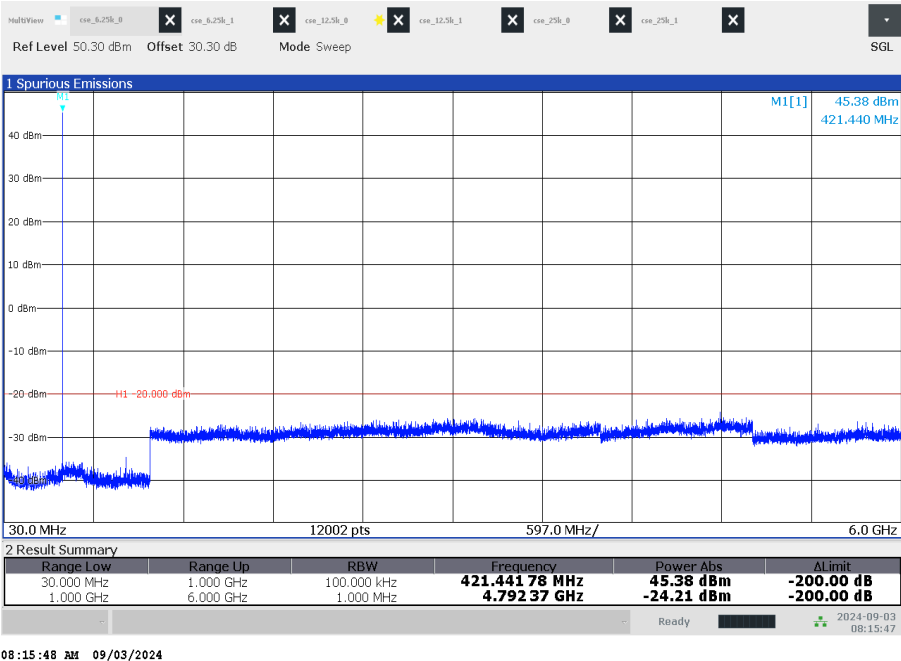


Plot 6: tx@469.9875 MHz, bandwidth 20 kHz, low power, 30 MHz – 6 GHz:

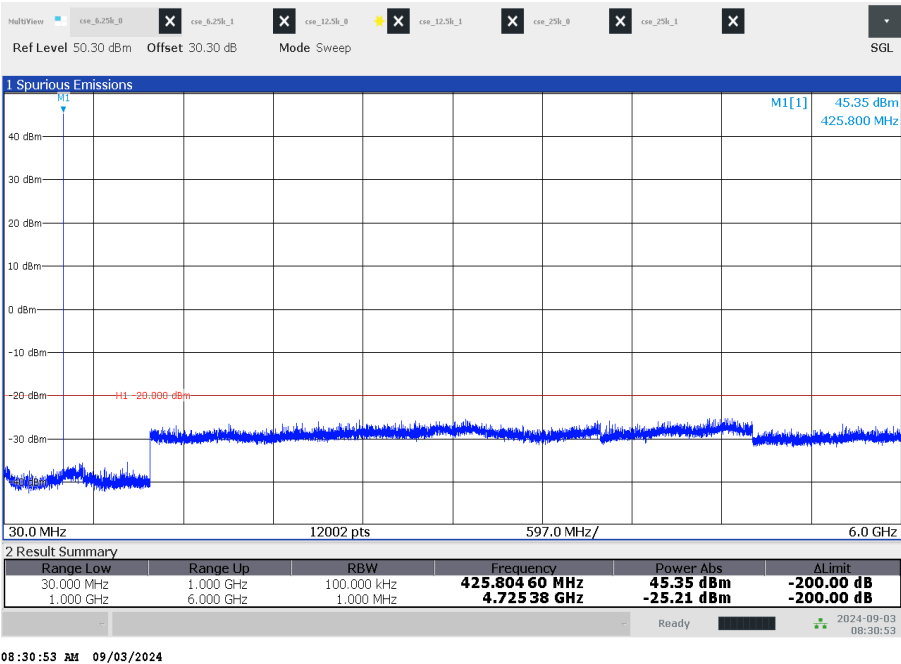


Plots of the measurements with high power setting (40 W)

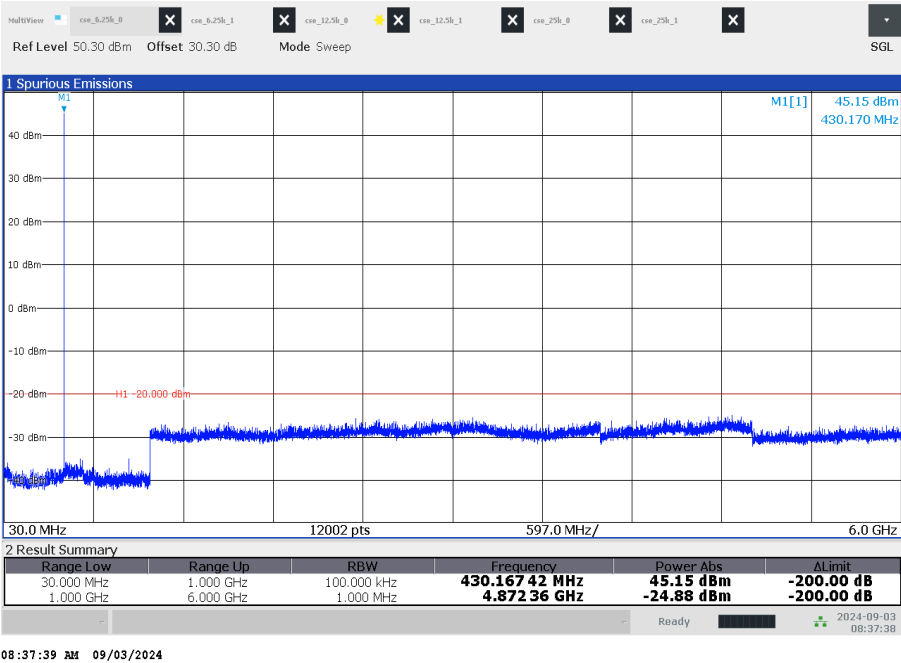
Plot 1: tx@421.2125 MHz, bandwidth 20 kHz, high power, 30 MHz – 6 GHz:



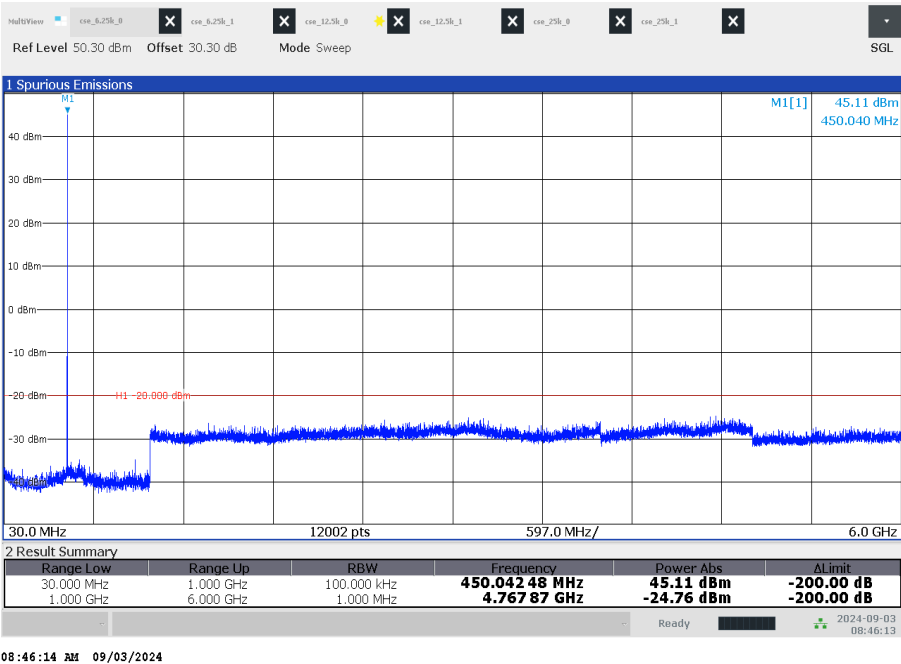
Plot 2: tx@425.6125 MHz, bandwidth 20 kHz, high power, 30 MHz – 6 GHz:



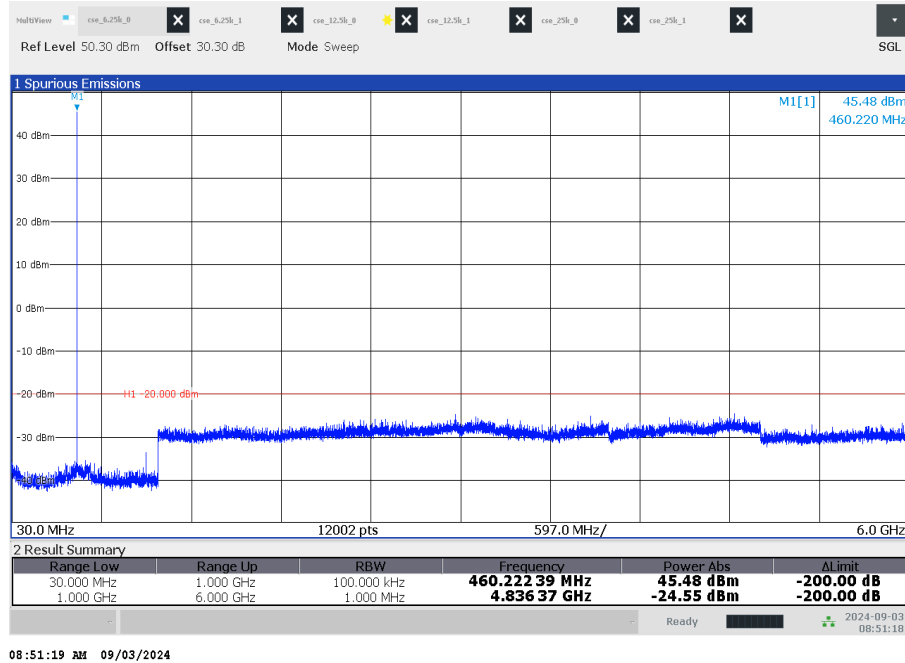
Plot 3: tx@429.9875 MHz, bandwidth 20 kHz, high power, 30 MHz – 6 GHz:



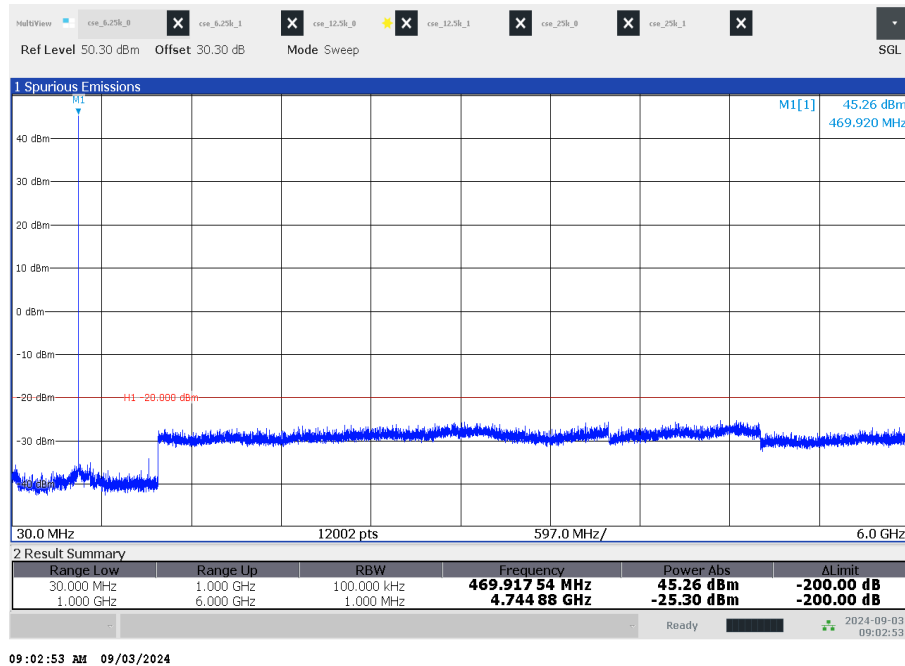
Plot 4: tx@450.0125 MHz, bandwidth 20 kHz, high power, 30 MHz – 6 GHz:



Plot 5: tx@460.0 MHz, bandwidth 20 kHz, high power, 30 MHz – 6 GHz:



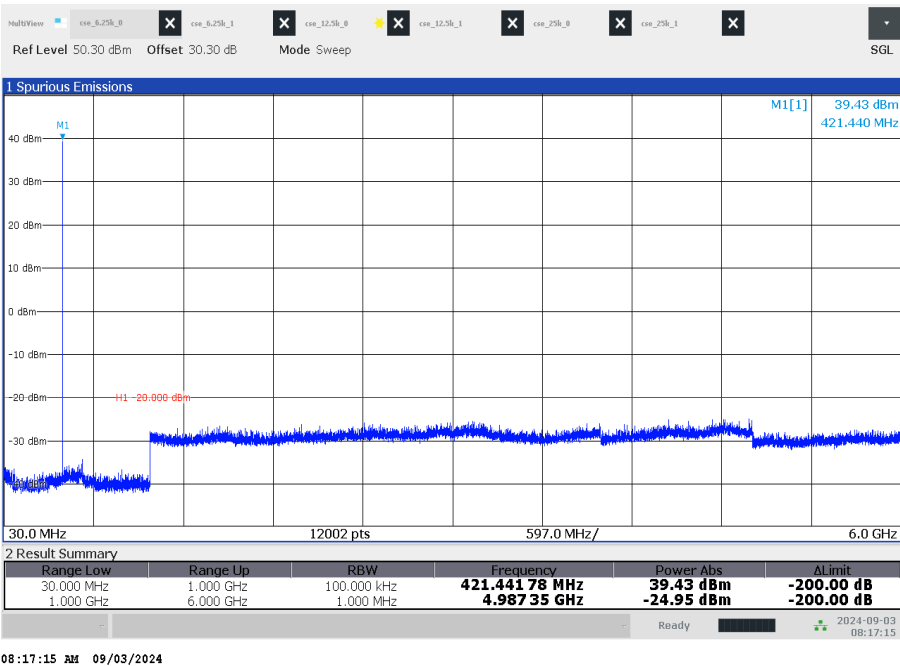
Plot 6: tx@469.9875 MHz, bandwidth 20 kHz, high power, 30 MHz – 6 GHz:



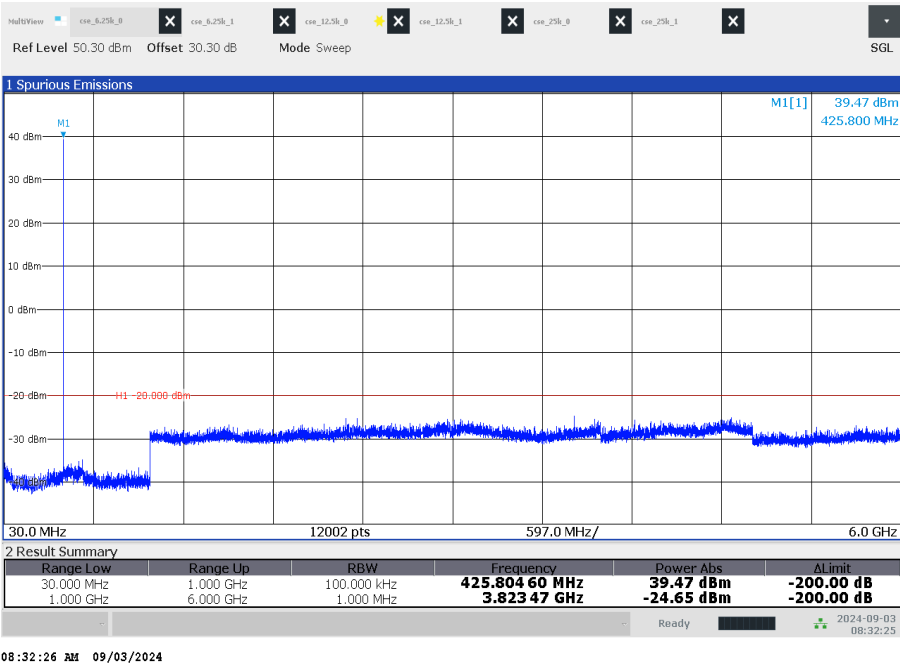
13.8.4 Plots 25 kHz bandwidth

Plots of the measurements with low power setting (10 W)

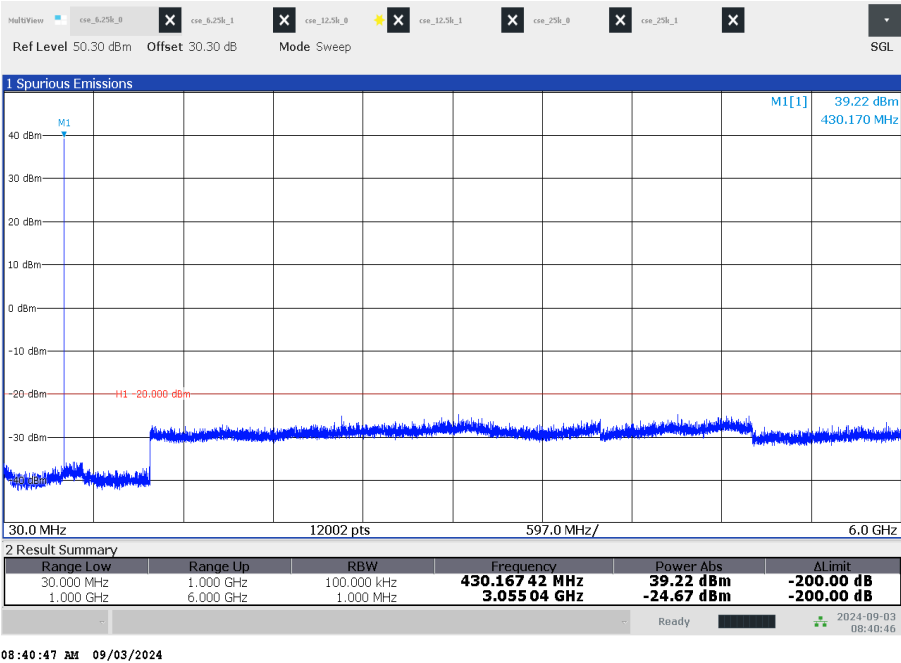
Plot 1: tx@421.2125 MHz, bandwidth 25 kHz, low power, 30 MHz – 6 GHz:



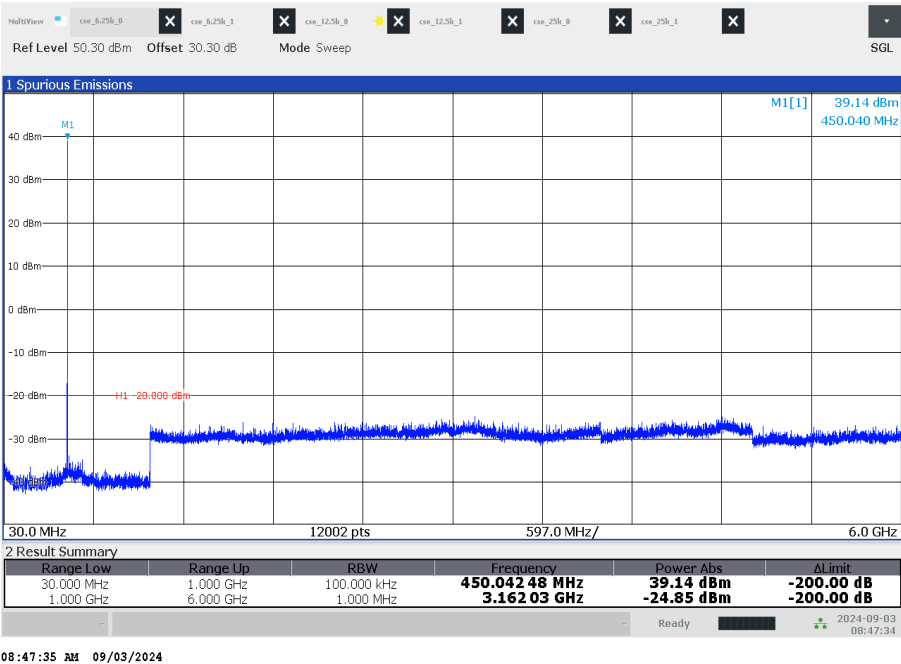
Plot 2: tx@425.6125 MHz, bandwidth 25 kHz, low power, 30 MHz – 6 GHz:



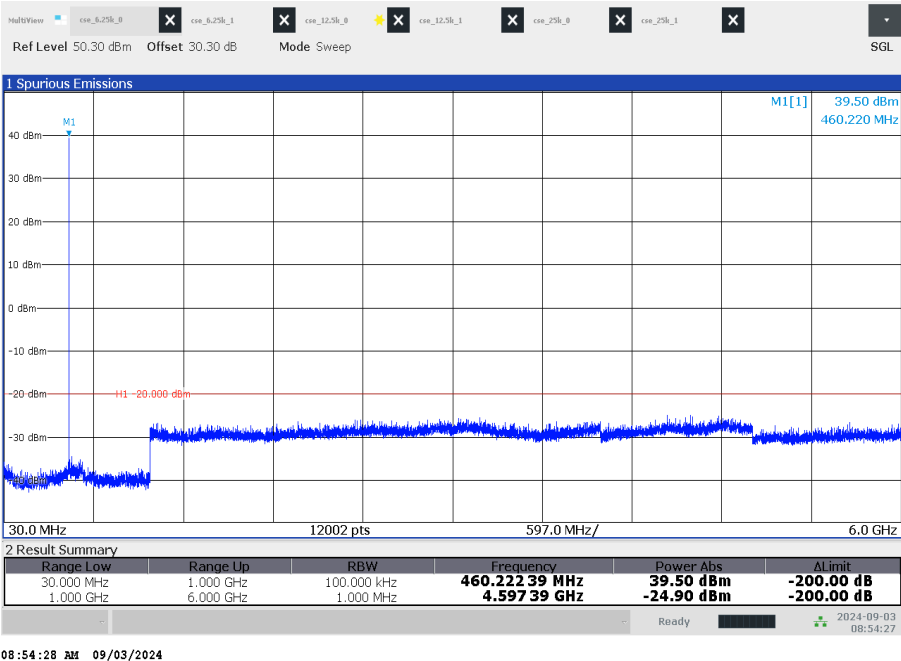
Plot 3: tx@429.9875 MHz, bandwidth 25 kHz, low power, 30 MHz – 6 GHz:



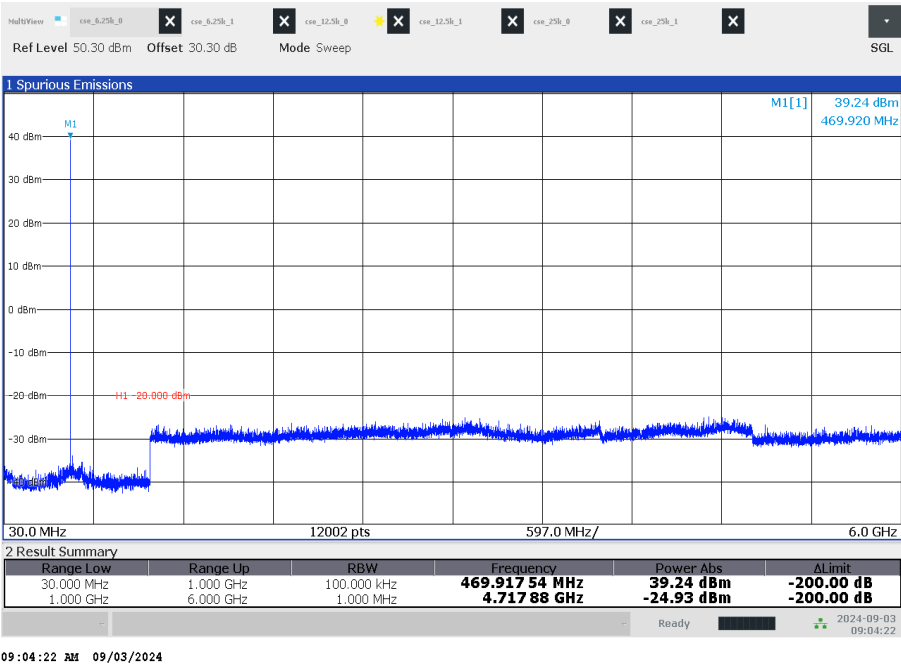
Plot 4: tx@450.0125 MHz, bandwidth 25 kHz, low power, 30 MHz – 6 GHz:



Plot 5: tx@460.0 MHz, bandwidth 25 kHz, low power, 30 MHz – 6 GHz:

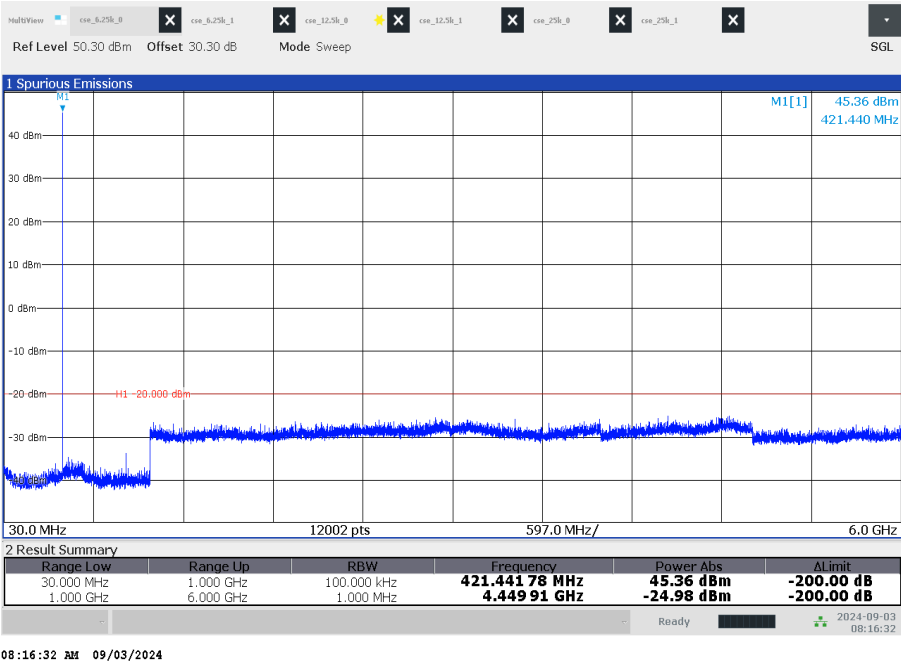


Plot 6: tx@469.9875 MHz, bandwidth 25 kHz, low power, 30 MHz – 6 GHz:

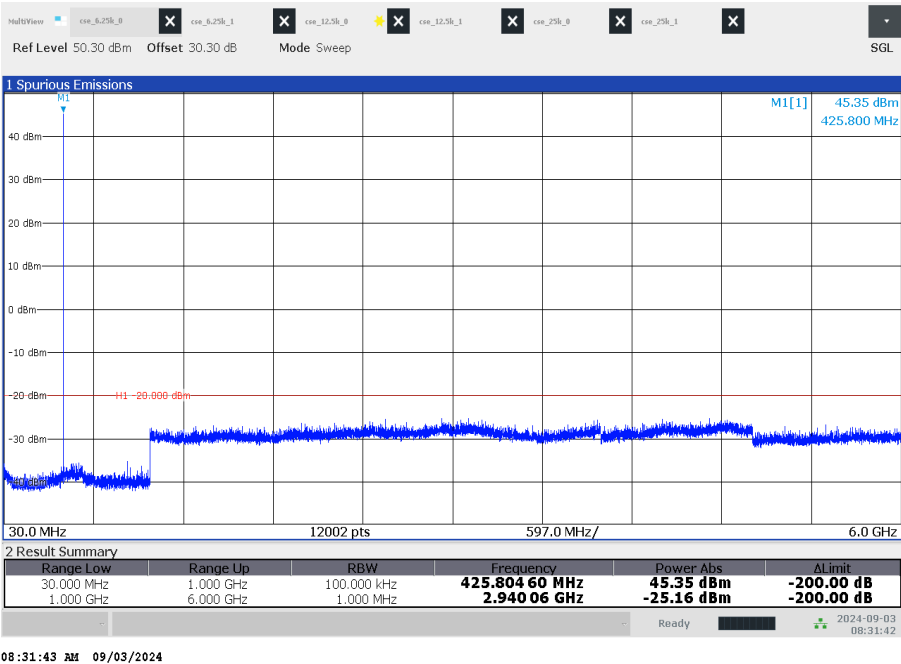


Plots of the measurements with high power setting (40 W)

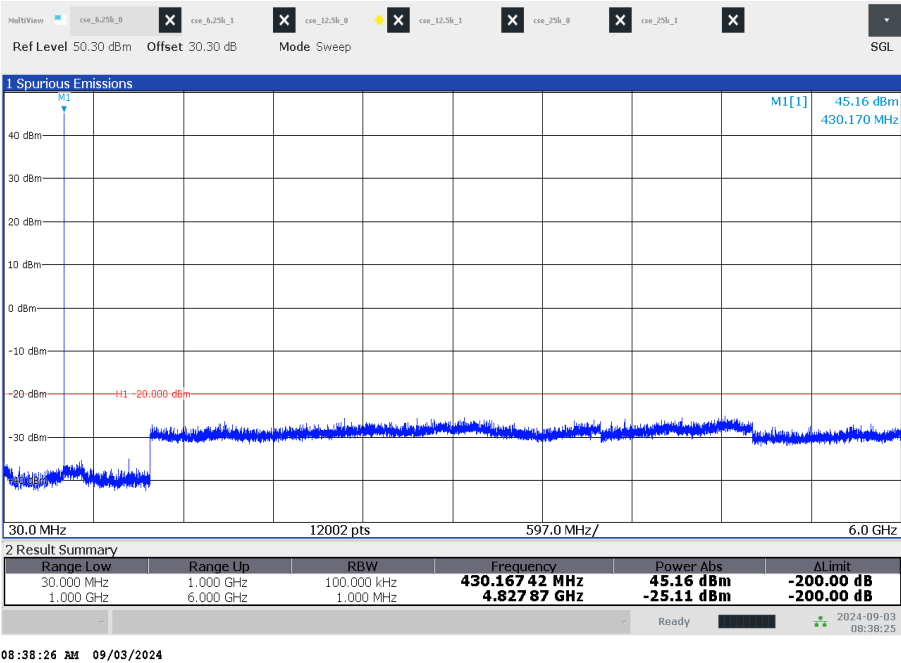
Plot 1: tx@421.2125 MHz, bandwidth 25 kHz, high power, 30 MHz – 6 GHz:



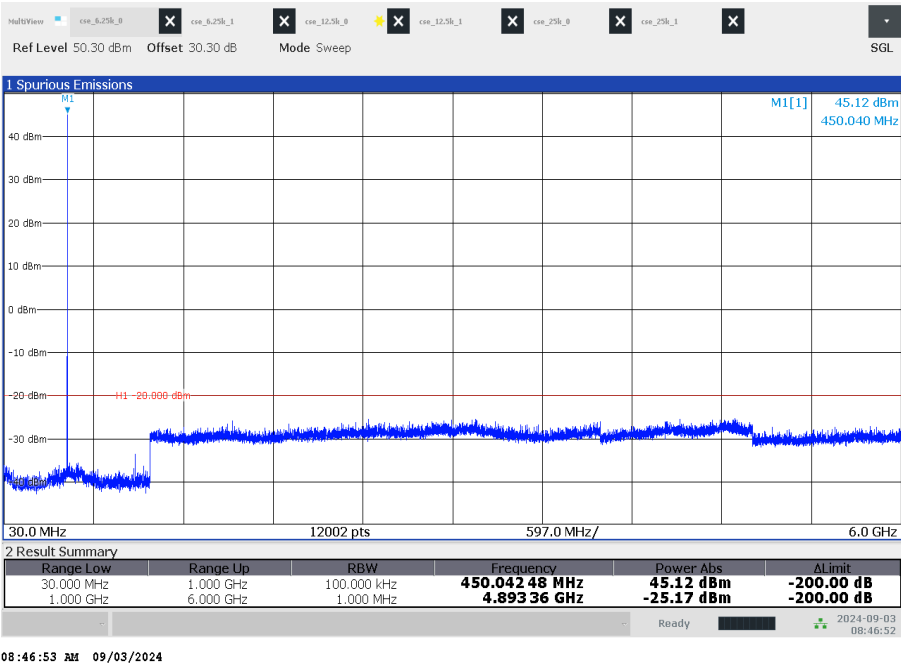
Plot 2: tx@425.6125 MHz, bandwidth 25 kHz, high power, 30 MHz – 6 GHz:



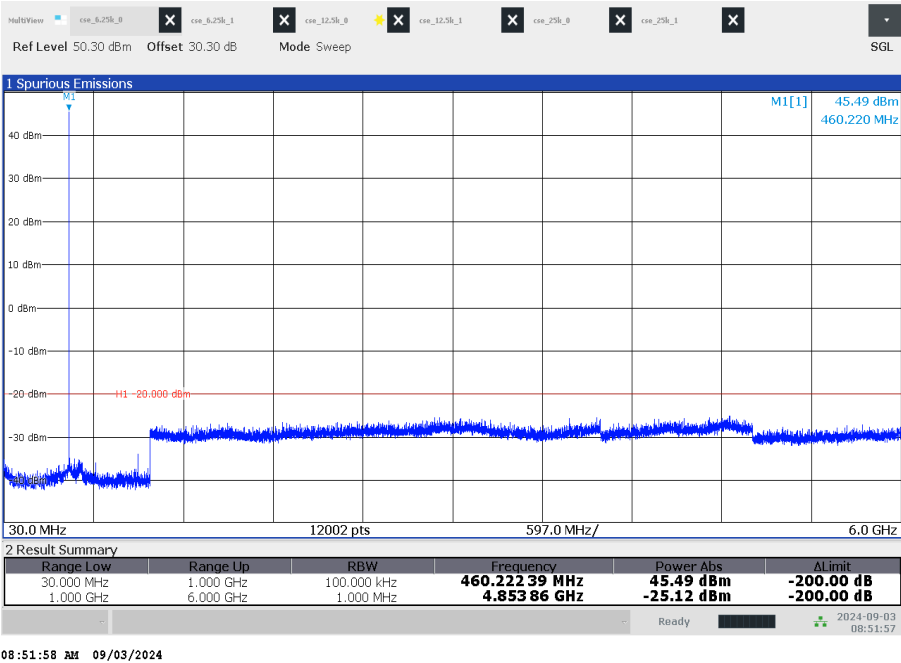
Plot 3: tx@429.9875 MHz, bandwidth 25 kHz, high power, 30 MHz – 6 GHz:



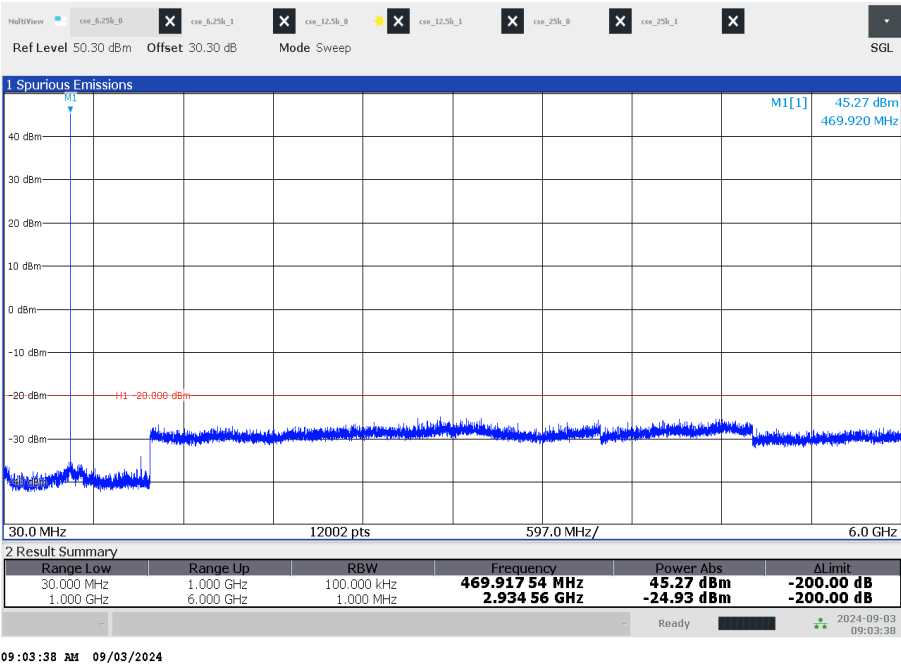
Plot 4: tx@450.0125 MHz, bandwidth 25 kHz, high power, 30 MHz – 6 GHz:



Plot 5: tx@460.0 MHz, bandwidth 25 kHz, high power, 30 MHz – 6 GHz:



Plot 6: tx@469.9875 MHz, bandwidth 25 kHz, high power, 30 MHz – 6 GHz:



13.9 Transmitter spurious emissions (radiated)

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Video bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Span:	see plots
Trace-Mode:	max. hold

Limits:

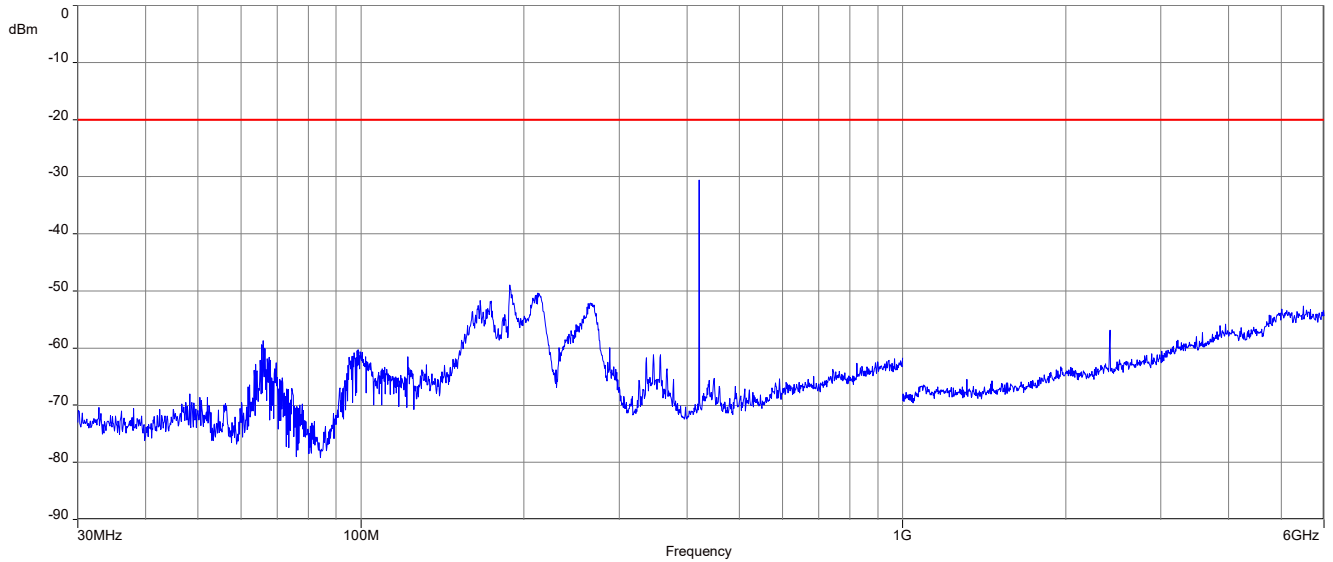
FCC	IC
FCC 47 CFR § 2.1051 § 90.210	RSS 119 Issue 12 5.8
Emission Mask E (FCC) 7.5 kHz channel spacing 65 dB or $55 + 10\log_{10}(P_{\text{Watts}})$ – whichever is the lesser	Emission Mask E (IC) 7.5 kHz channel spacing 57 dB or $55 + 10\log_{10}(P_{\text{Watts}})$ – whichever is the lesser
Emission Mask D 12.5 kHz channel spacing 70 dB or $50 + 10\log_{10}(P_{\text{Watts}})$ – whichever is the lesser	
Emission Mask Y 20/25 kHz channel spacing 57 dB or $55 + 10\log_{10}(P_{\text{Watts}})$ – whichever is the lesser	

Results:

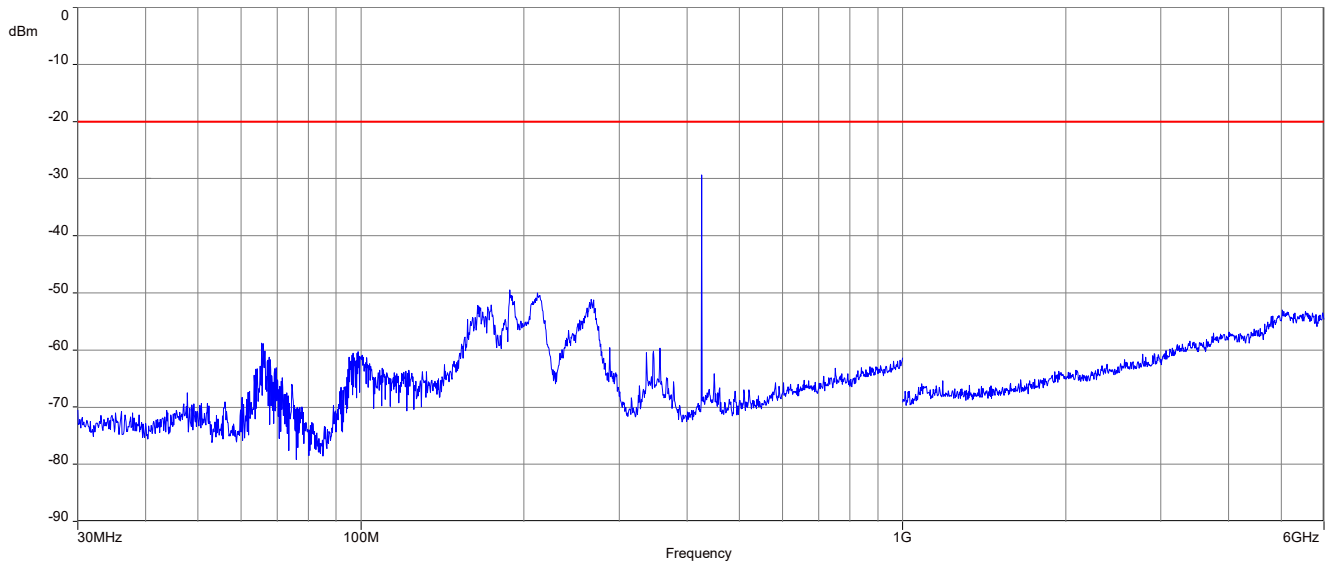
Transmitter spurious emissions (dBm)								
421.2125 MHz			425.6125 MHz			429.9875 MHz		
Frequency	Detector	Level	Frequency	Detector	Level	Frequency	Detector	Level
All detected spurious emissions are more than 10 dB below the limit.			All detected spurious emissions are more than 10 dB below the limit.			All detected spurious emissions are more than 10 dB below the limit.		
450.0125 MHz			460.0 MHz			469.9875 MHz		
Frequency	Detector	Level	Frequency	Detector	Level	Frequency	Detector	Level
All detected spurious emissions are more than 10 dB below the limit.			All detected spurious emissions are more than 10 dB below the limit.			All detected spurious emissions are more than 10 dB below the limit.		

Plots of the measurements 6.25 kHz Bandwidth, 10 W

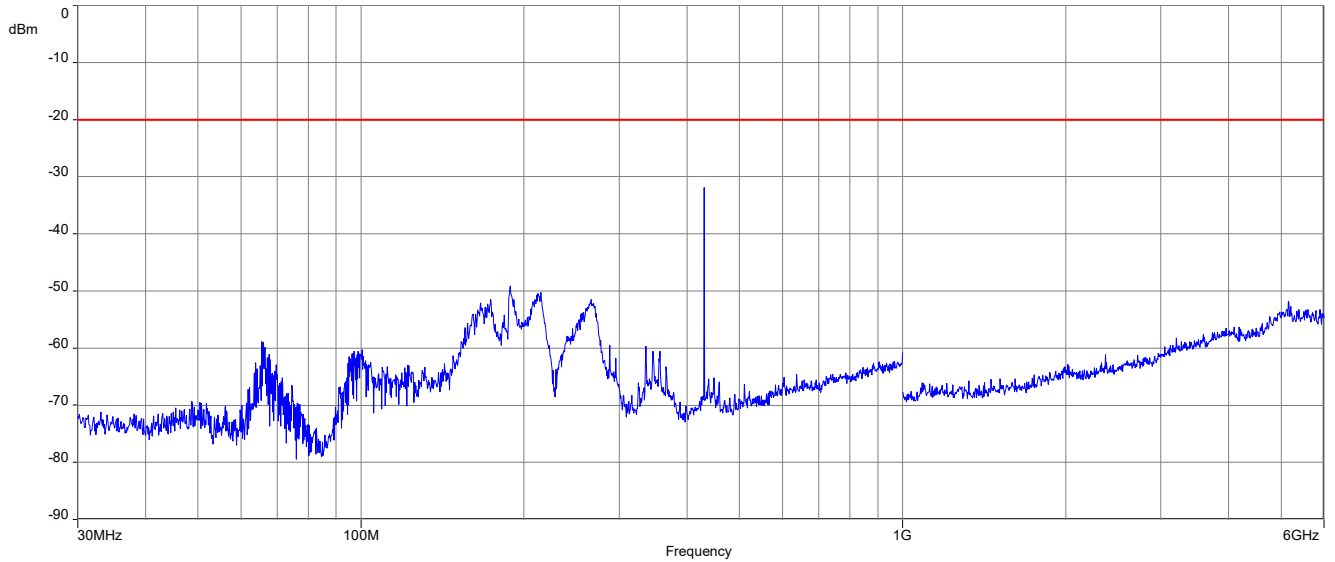
Plot 1: 30 MHz – 6 GHz, tx@421.2125 MHz, antenna vertical/horizontal, low power



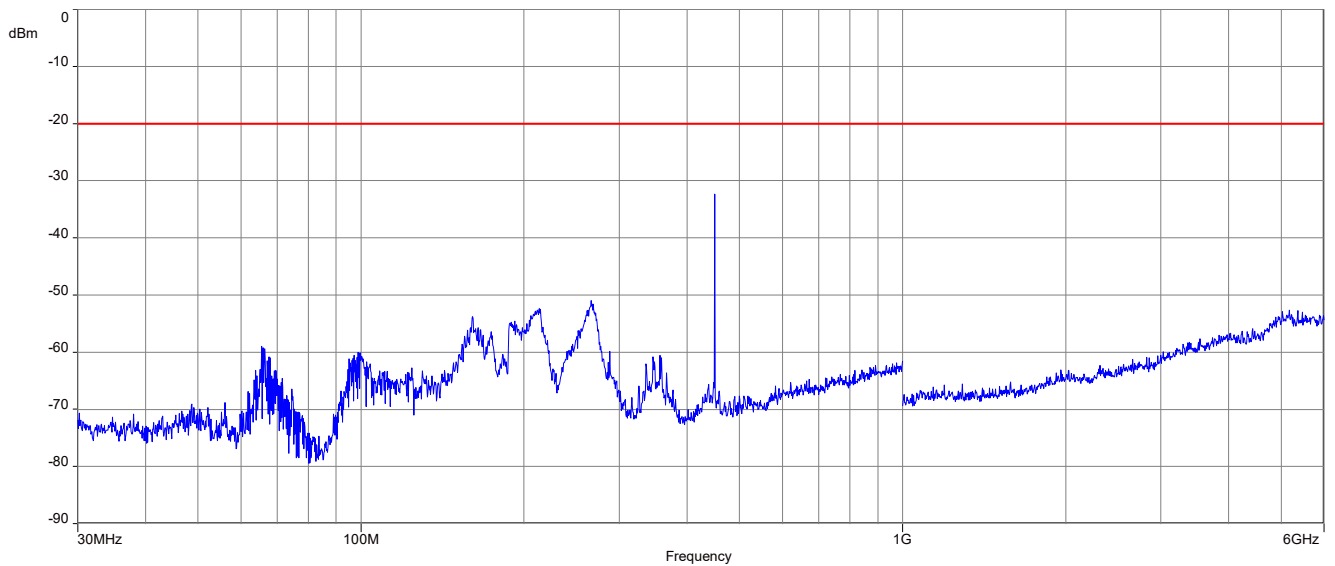
Plot 2: 30 MHz – 6 GHz, tx@425.6125 MHz, antenna vertical/horizontal, low power



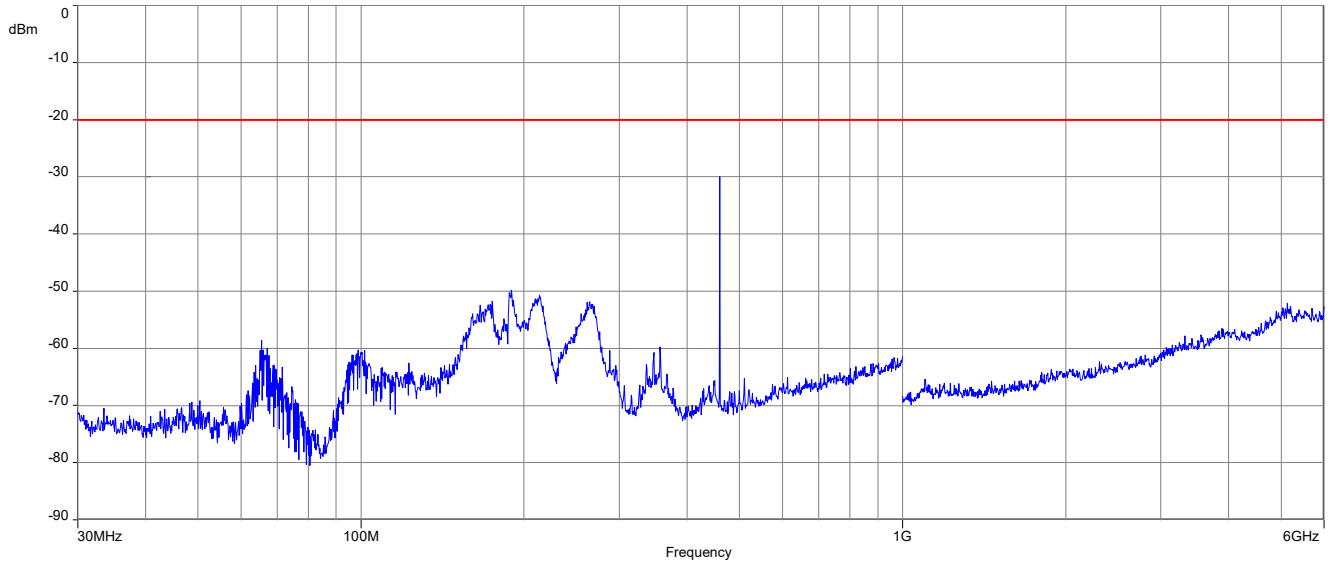
Plot 3: 30 MHz – 6 GHz, tx@429.9875 MHz, antenna vertical/horizontal, low power



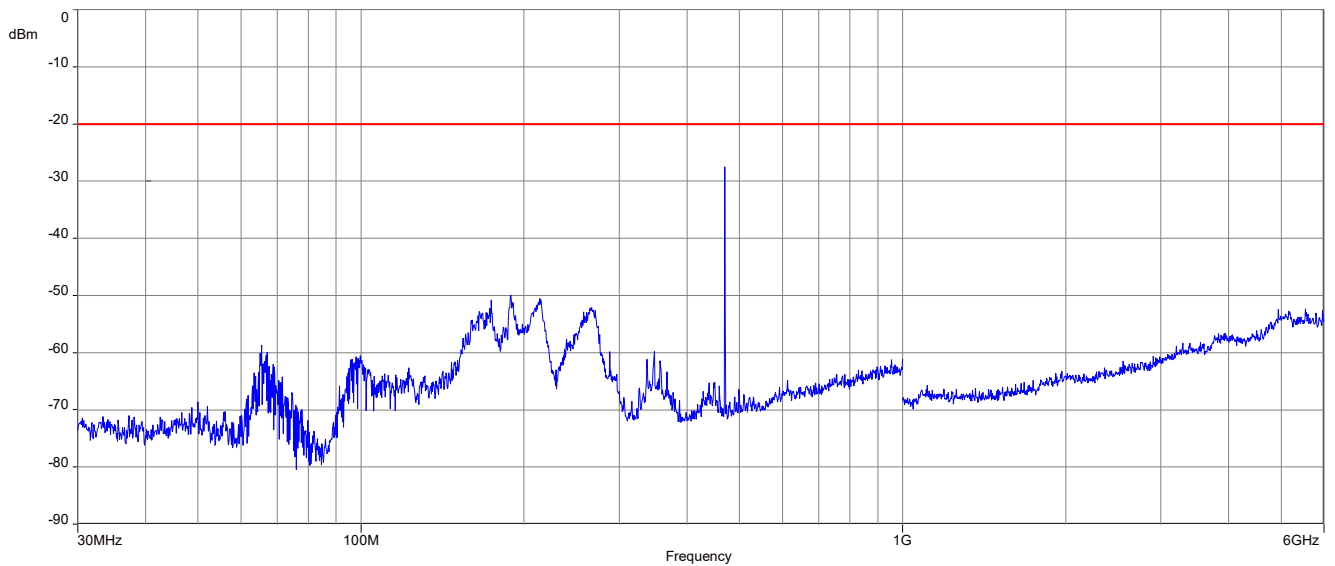
Plot 4: 30 MHz – 6 GHz, tx@450.0125 MHz, antenna vertical/horizontal, low power



Plot 5: 30 MHz – 6 GHz, tx@460.0 MHz, antenna vertical/horizontal, low power

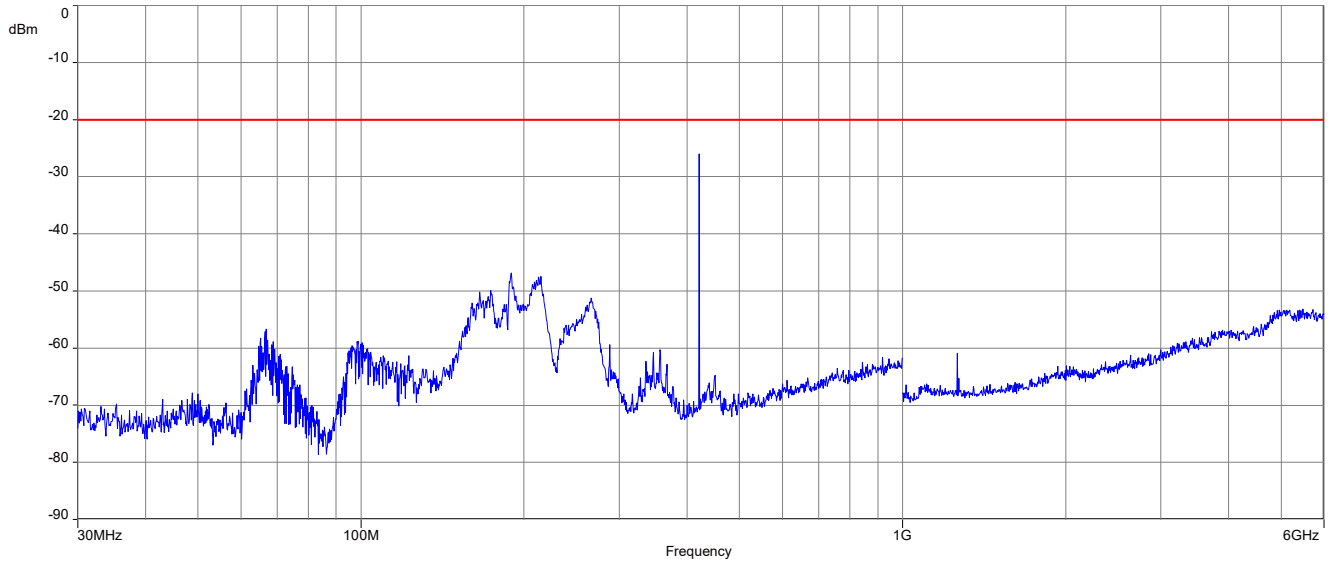


Plot 6: 30 MHz – 6 GHz, tx@469.987 5MHz, antenna vertical/horizontal, low power

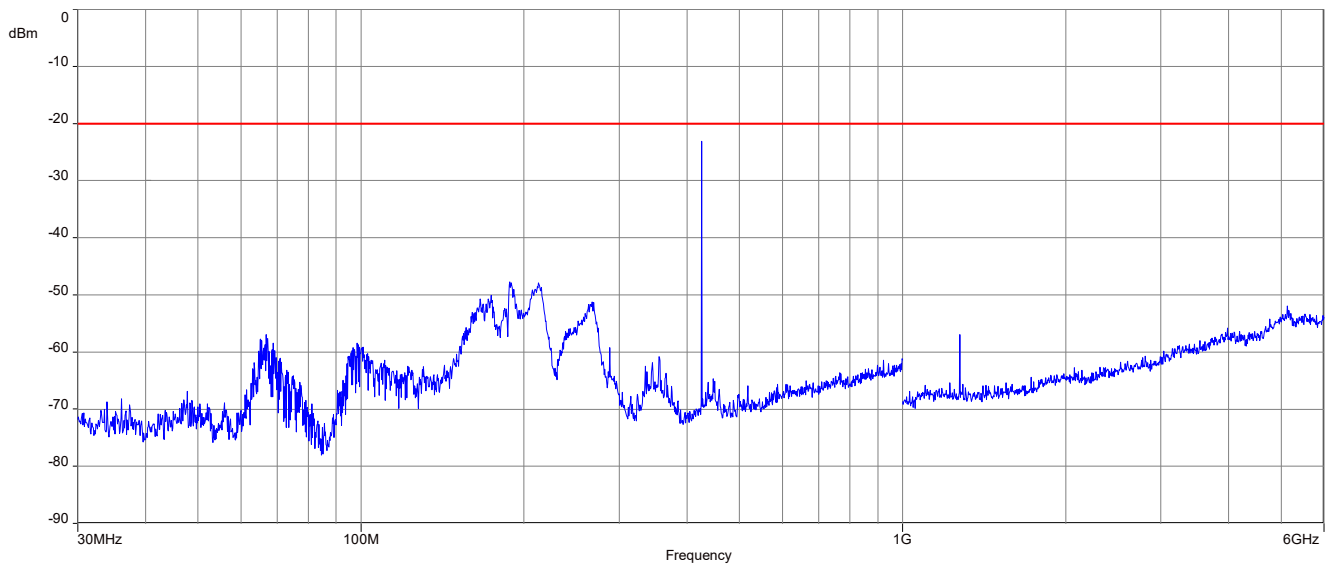


6.25 kHz Bandwidth, 40 W

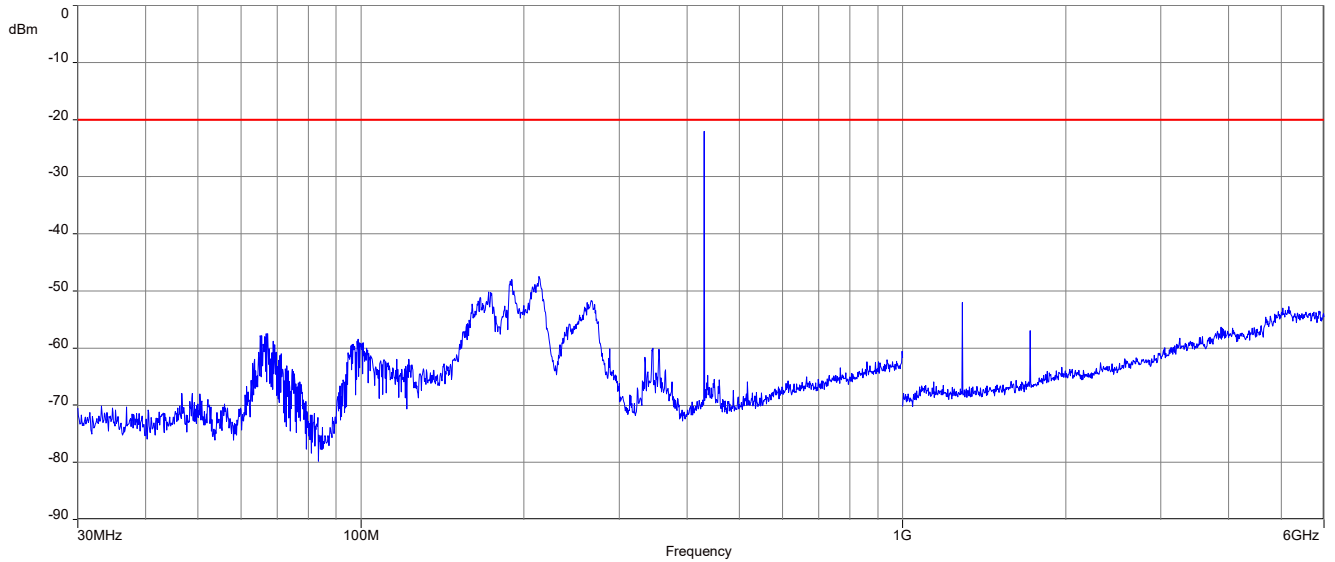
Plot 1: 30 MHz – 6 GHz, tx@421.2125 MHz, antenna vertical/horizontal, high power



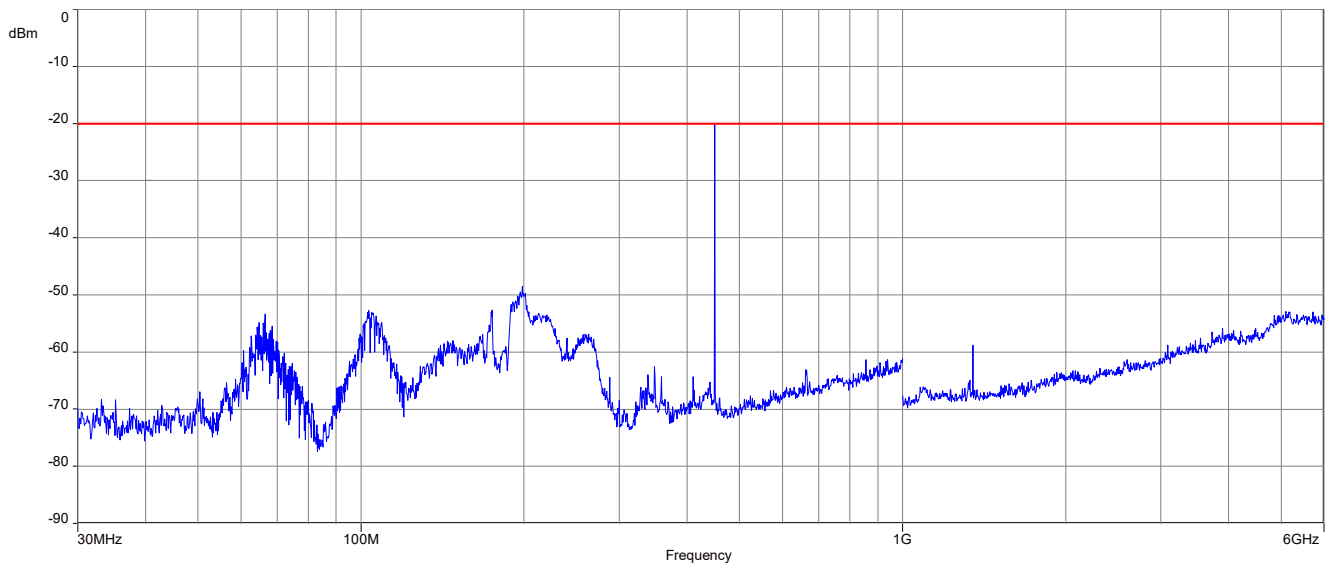
Plot 2: 30 MHz – 6 GHz, tx@425.6125 MHz, antenna vertical/horizontal, high power



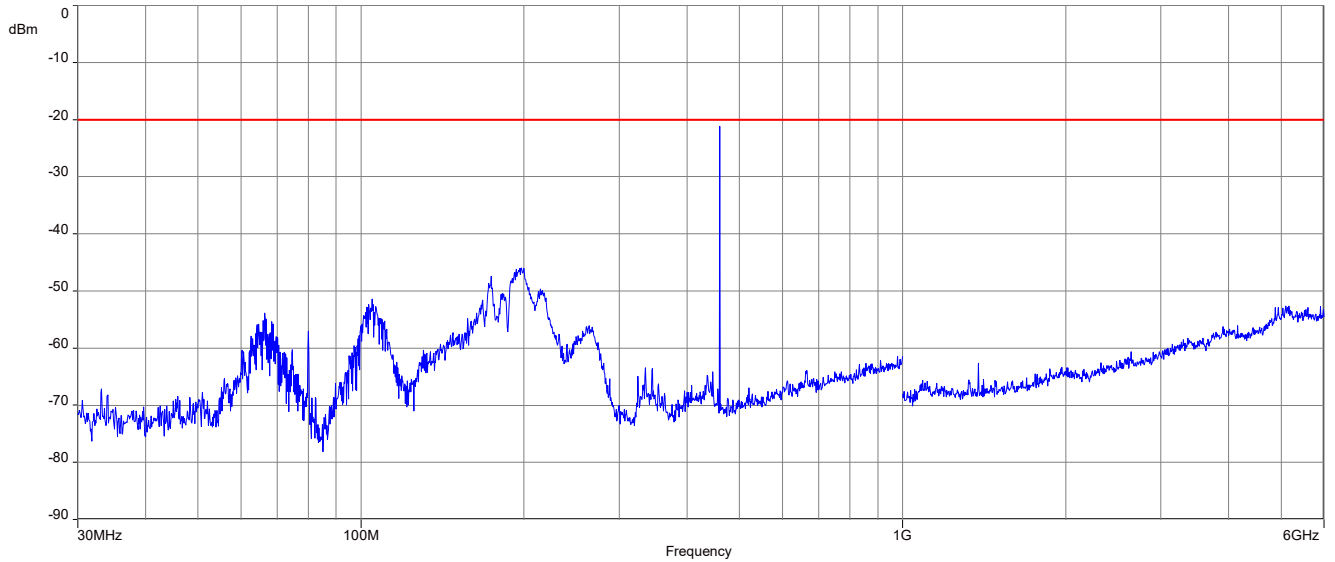
Plot 3: 30 MHz – 6 GHz, tx@429.9875 MHz, antenna vertical/horizontal, high power



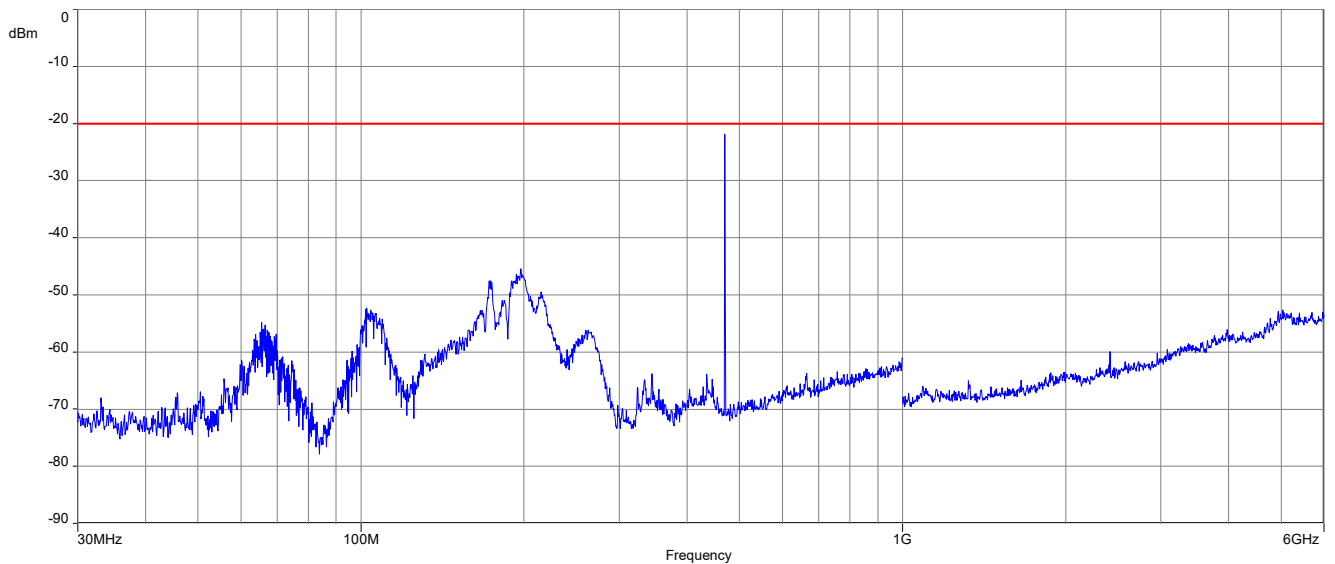
Plot 4: 30 MHz – 6 GHz, tx@450.0125 MHz, antenna vertical/horizontal, high power



Plot 5: 30 MHz – 6 GHz, tx@460.0 MHz, antenna vertical/horizontal, high power

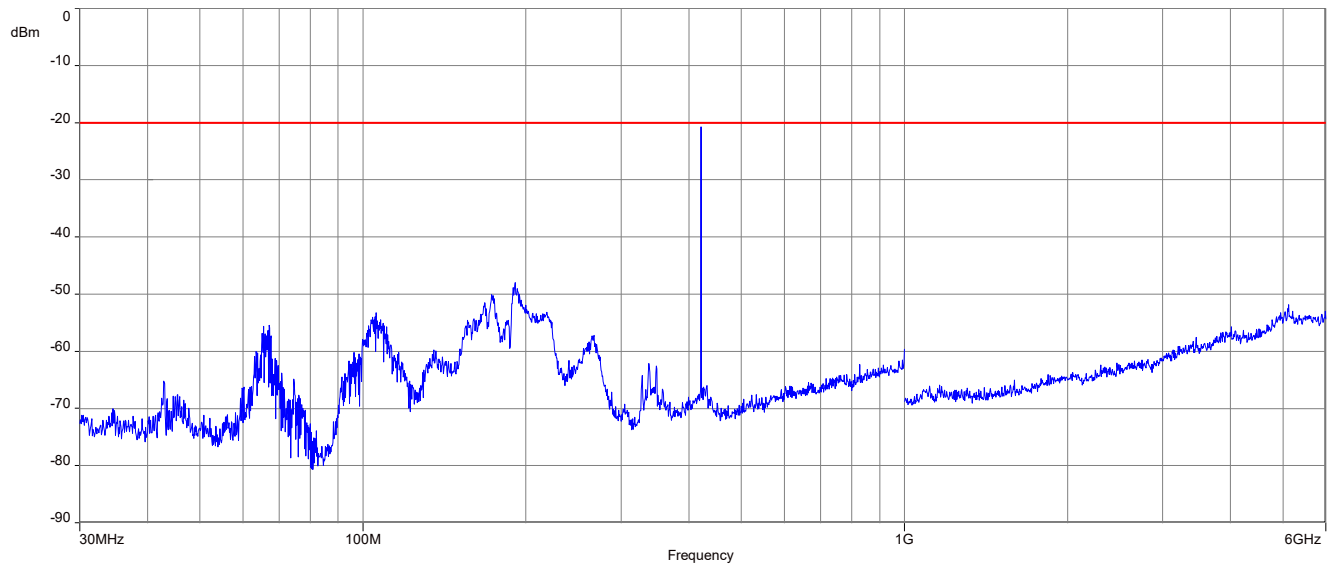


Plot 6: 30 MHz – 6 GHz, tx@469.9875 MHz, antenna vertical/horizontal, high power

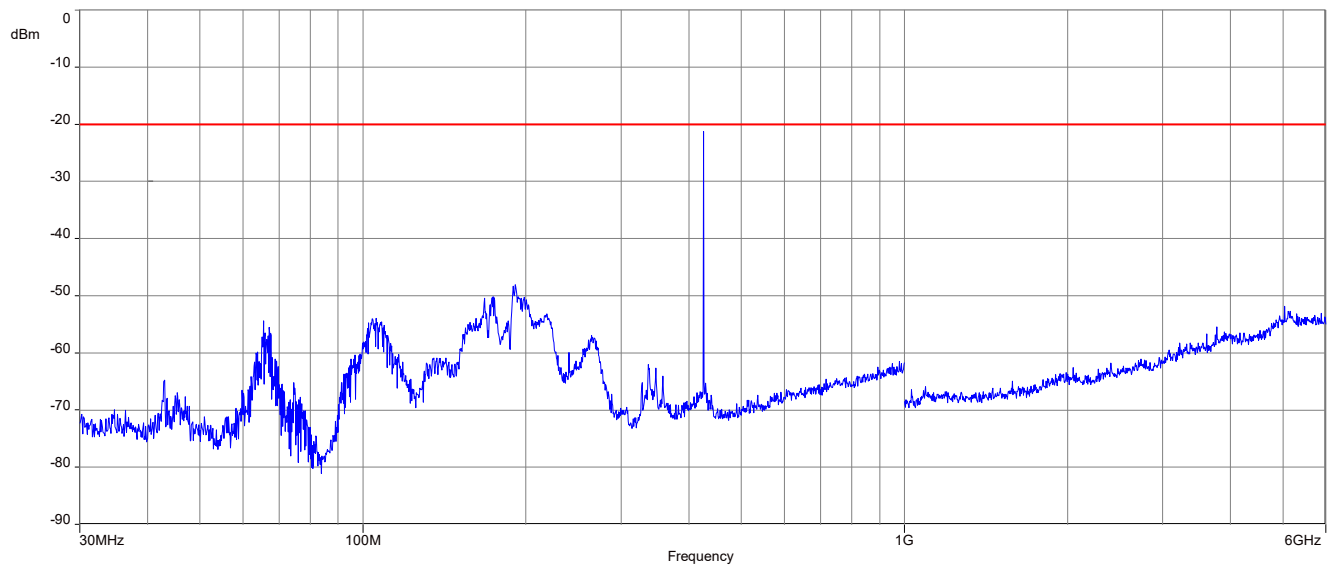


25 kHz Bandwidth, 10 W

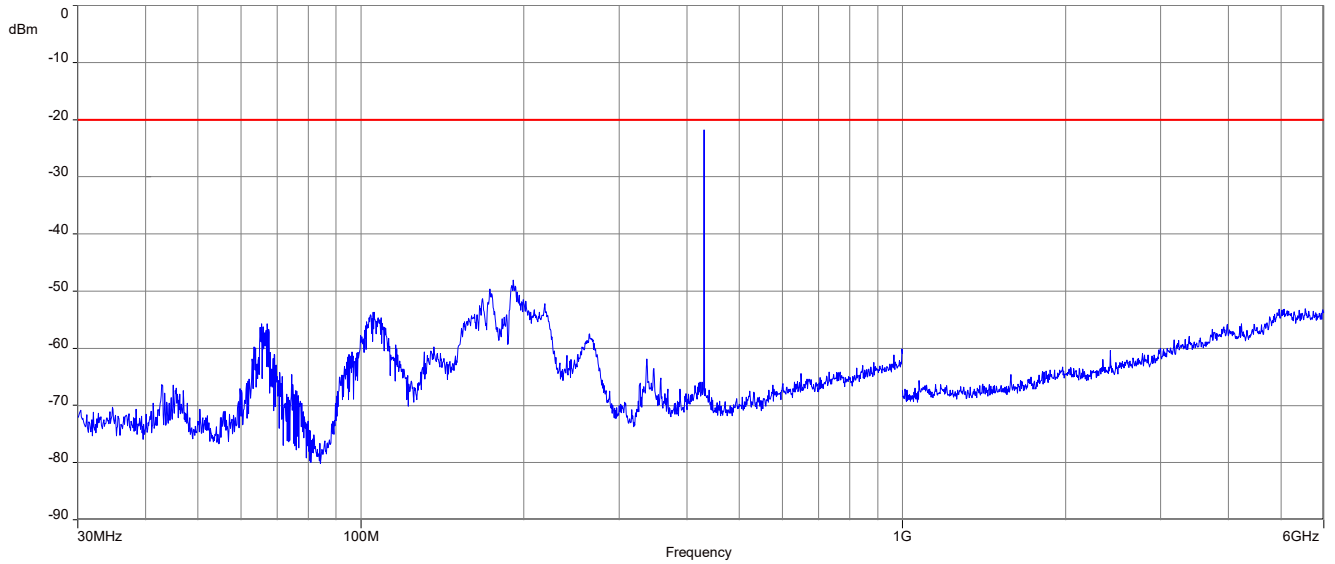
Plot 1: 30 MHz – 6 GHz, tx@421.2125 MHz, antenna vertical/horizontal, low power



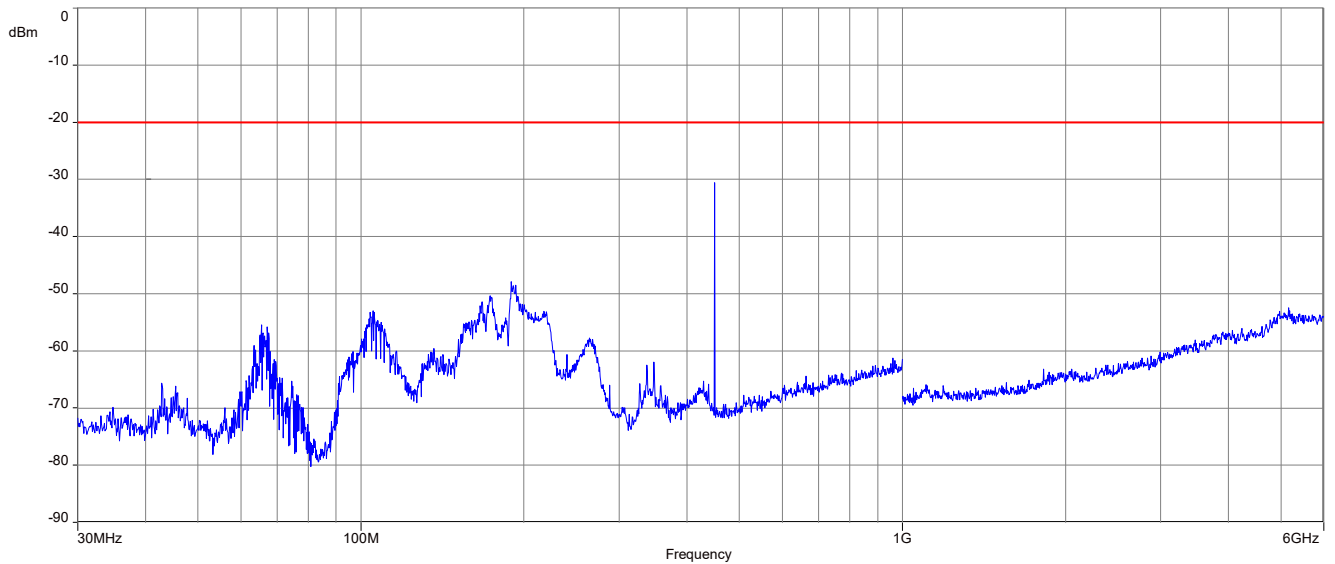
Plot 2: 30 MHz – 6 GHz, tx@425.6125 MHz, antenna vertical/horizontal, low power



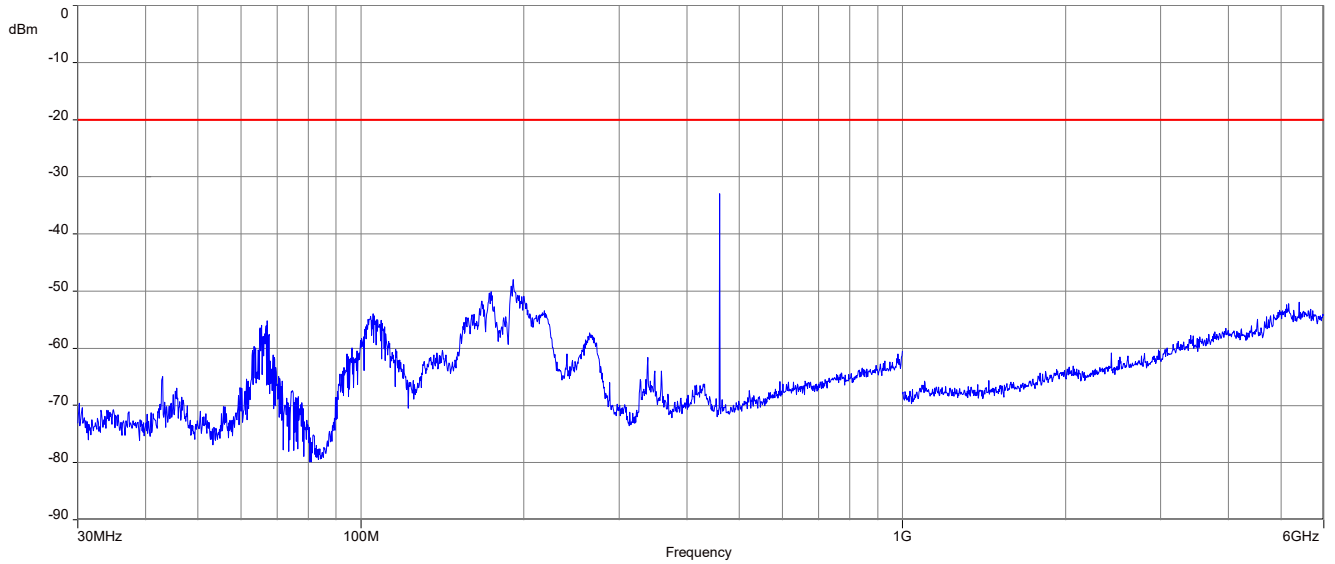
Plot 3: 30 MHz – 6 GHz, tx@429.9875 MHz, antenna vertical/horizontal, low power



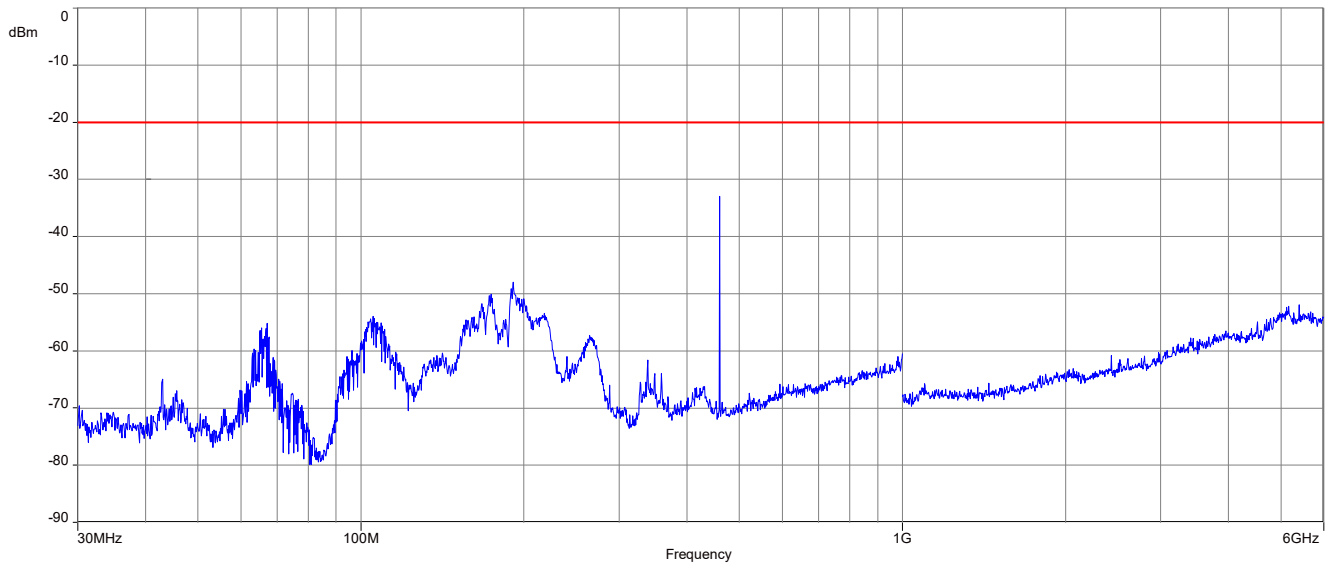
Plot 4: 30 MHz – 6 GHz, tx@450.0125 MHz, antenna vertical/horizontal, low power



Plot 5: 30 MHz – 6 GHz, tx@460.0000 MHz, antenna vertical/horizontal, low power

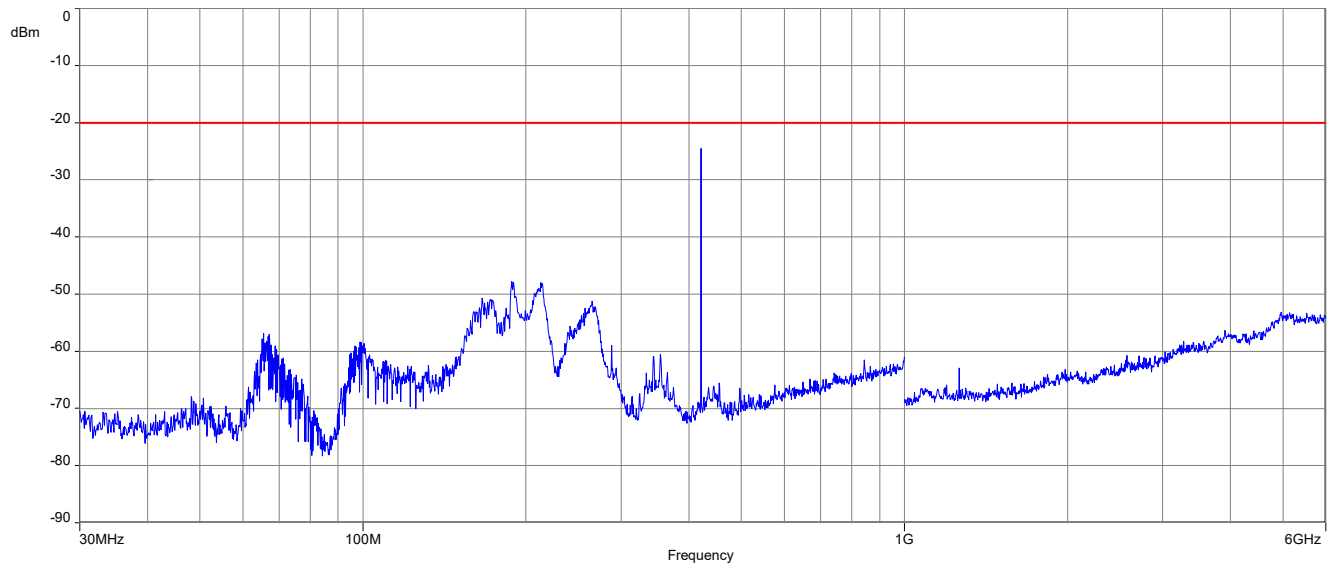


Plot 6: 30 MHz – 6 GHz, tx@469.9875 MHz, antenna vertical/horizontal, low power

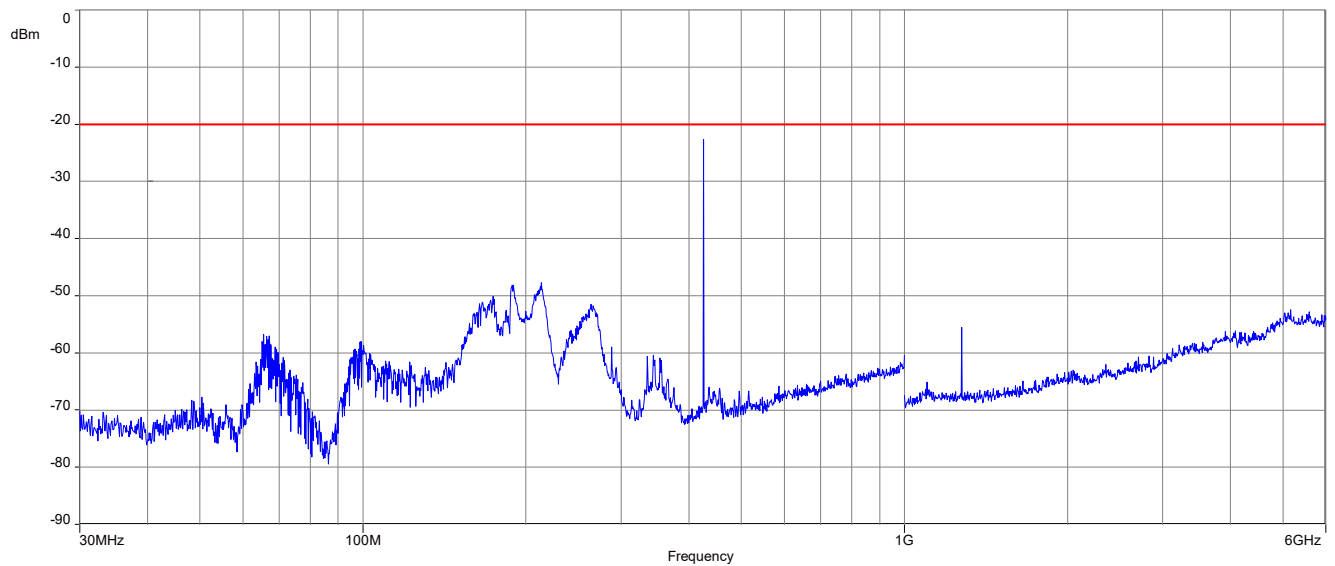


25 kHz Bandwidth, 40 W

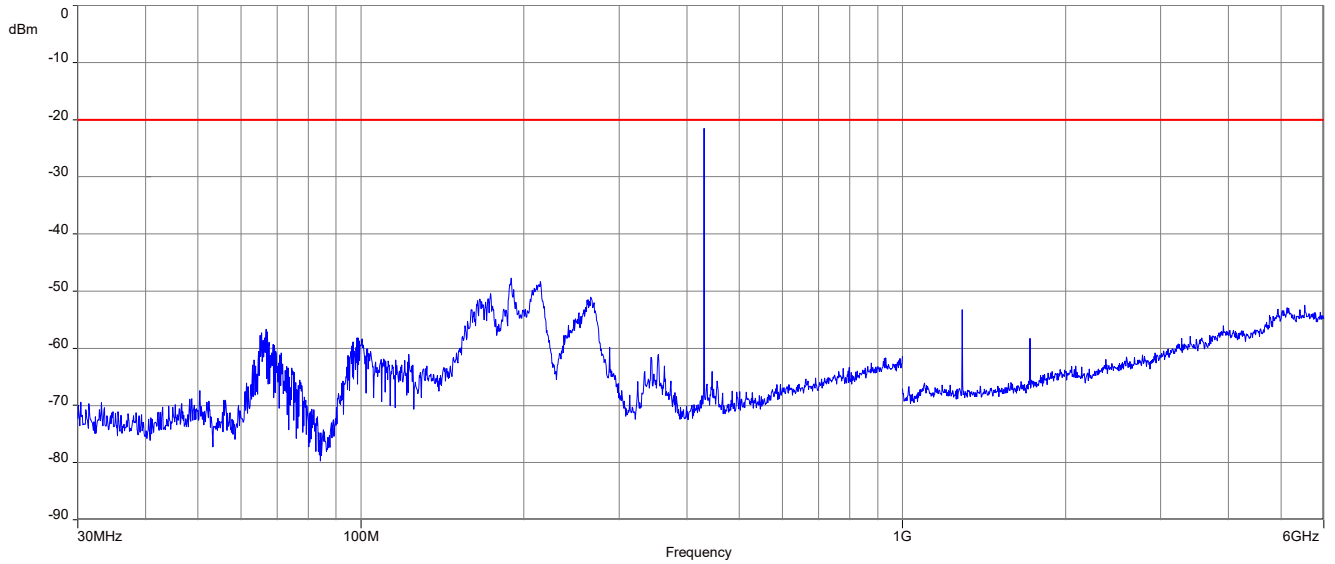
Plot 1: 30 MHz – 6 GHz, tx@421.2125 MHz, antenna vertical/horizontal, high power



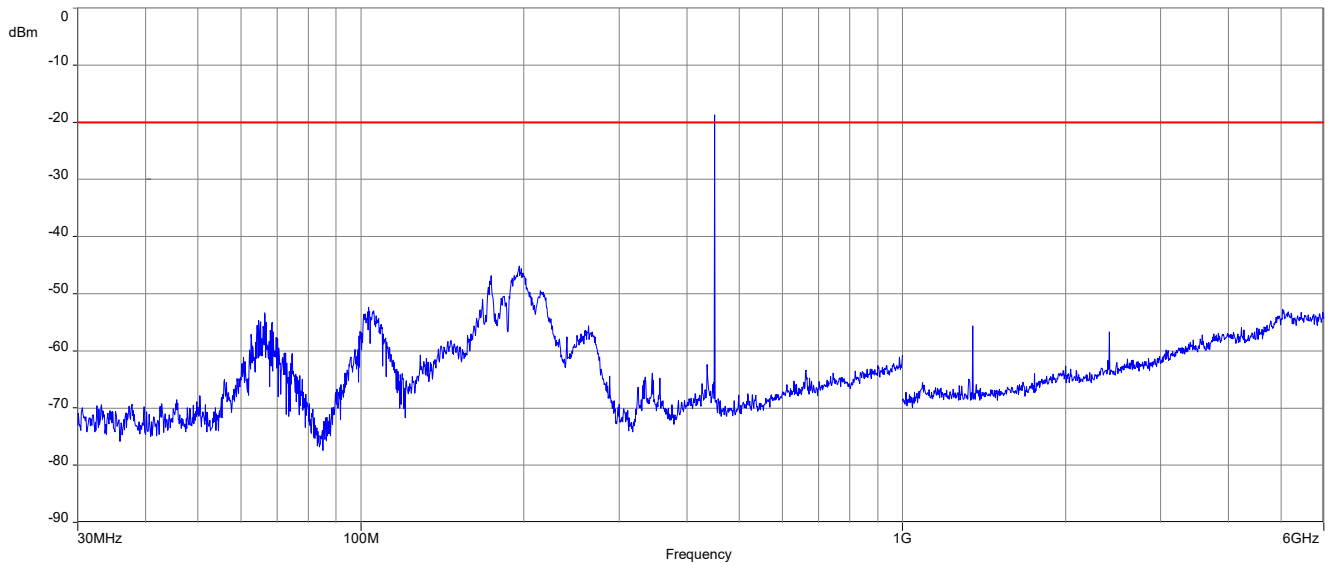
Plot 2: 30 MHz – 6 GHz, tx@425.6125 MHz, antenna vertical/horizontal, high power



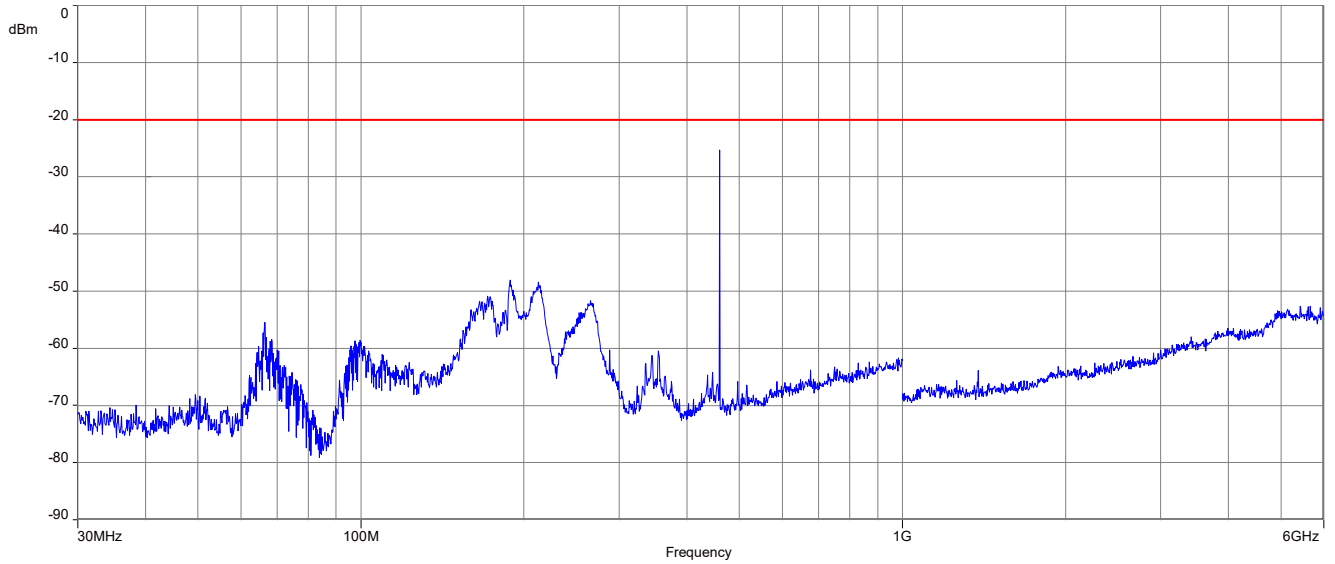
Plot 3: 30 MHz – 6 GHz, tx@429.9875 MHz, antenna vertical/horizontal, high power



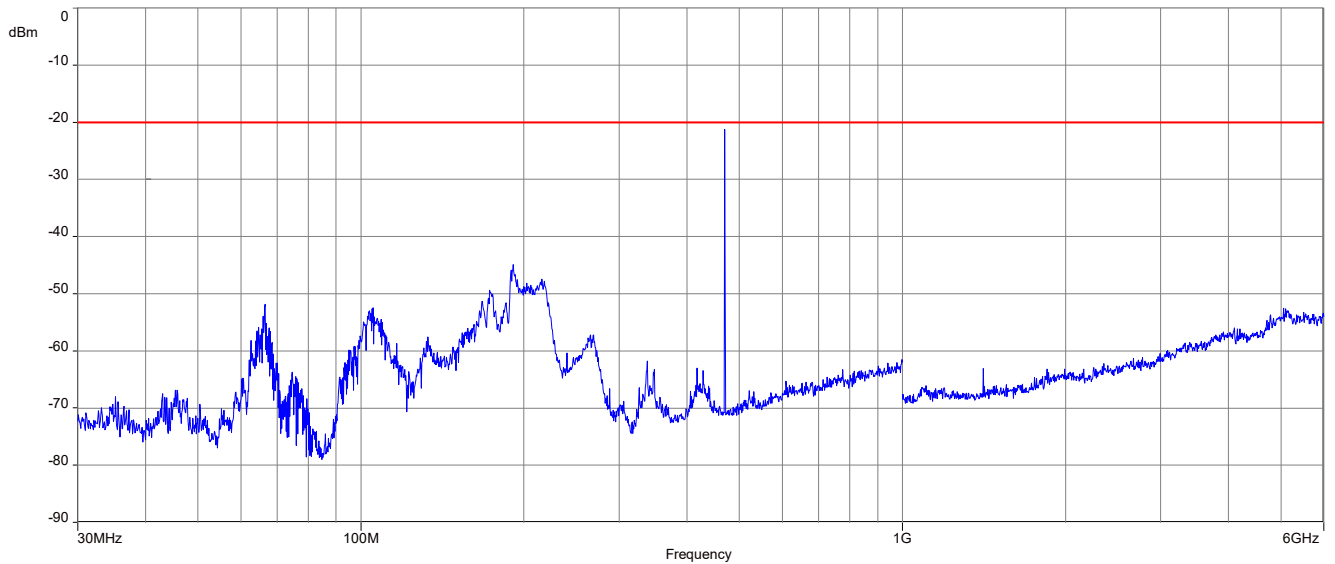
Plot 4: 30 MHz – 6 GHz, tx@450.0125 MHz, antenna vertical/horizontal, high power



Plot 5: 30 MHz – 6 GHz, tx@460.0000 MHz, antenna vertical/horizontal, high power



Plot 6: 30 MHz – 6 GHz, tx@469.9875 MHz, antenna vertical/horizontal, high power



13.10 Spurious emissions radiated < 30 MHz

Description:

Measurement of the radiated spurious emissions in transmit mode below 30 MHz. The EUT is set to channel 6. This measurement is representative for all channels and modes. If peaks are found channel 1 and channel 11 will be measured too. The measurement is performed with the data rate producing the highest output power. The limits are recalculated to a measurement distance of 3 m with 40 dB/decade according CFR Part 2.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak
Sweep time:	Auto
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold
Used equipment:	See chapter 7.2 A
Measurement uncertainty:	See chapter 9

Limits:

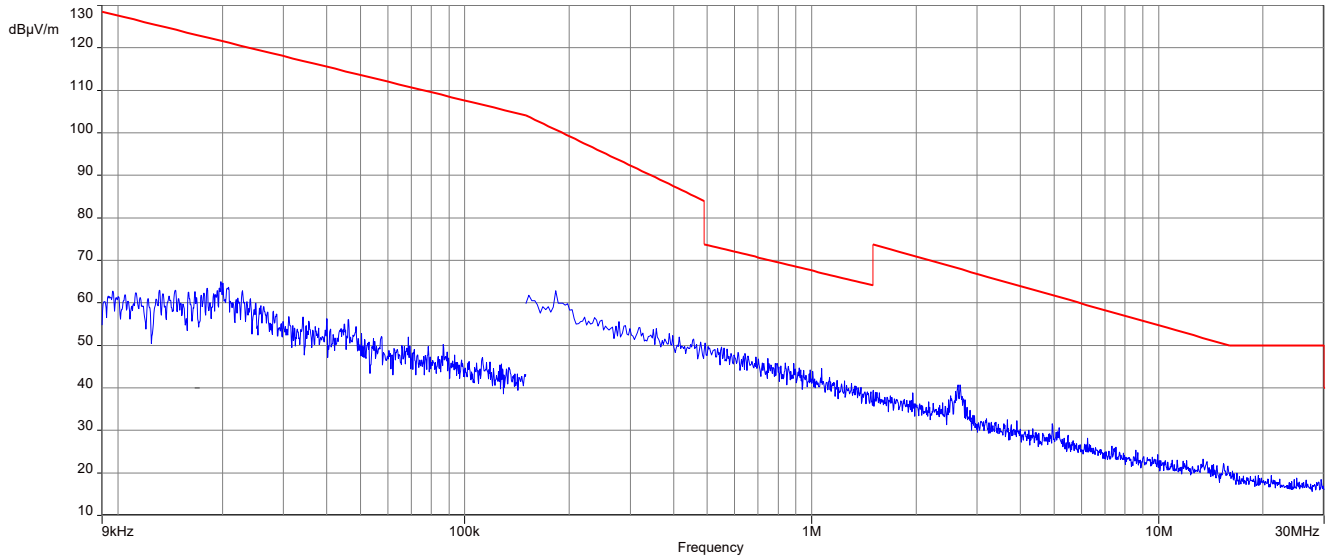
FCC		
Frequency (MHz)	Field strength (μV/m)	Measurement distance (m)
0.009 – 0.490	2400/(F/kHz)	300
0.490 – 1.705	24000/(F/kHz)	30
1.705 – 30	30 (29.5 dBμV/m)	30

IC		
Frequency (MHz)	Field strength (μA/m)	Measurement distance (m)
0.009 – 0.490	6.37/F (F in kHz)	300
0.490 – 1.705	63.7/F (F in kHz)	30
1.705 – 30	0.08 (-22 dBμA/m)	30

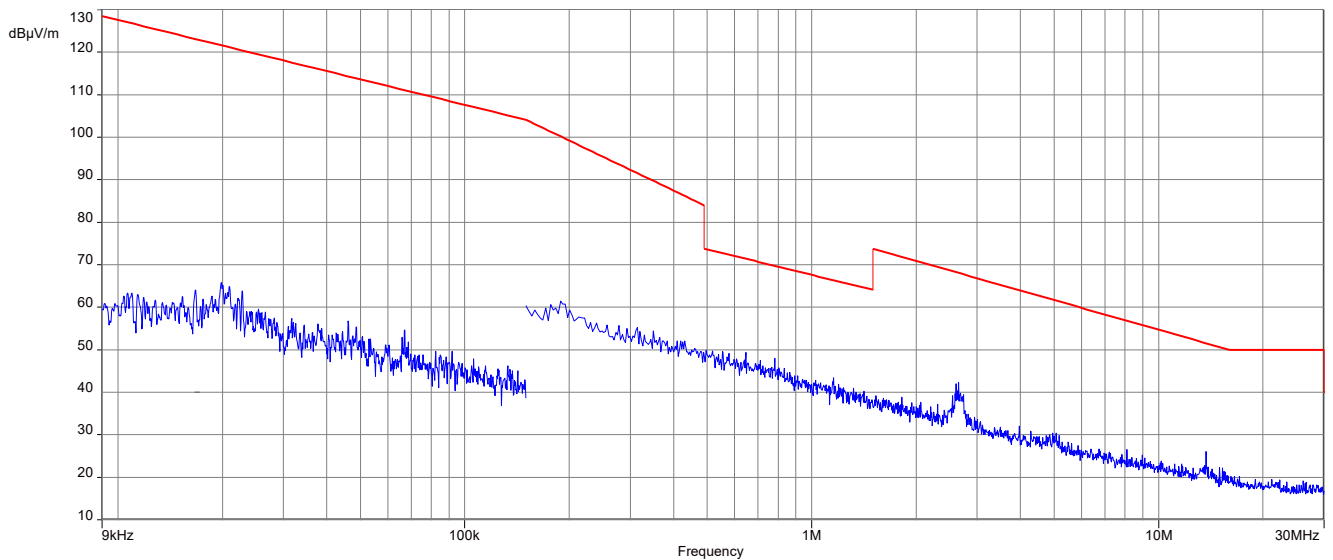
Results: for all power settings, frequencies and data rates -> no peaks closer 10 dB to the limit detected!

Plots 6.25 kHz bandwidth, 10 W:

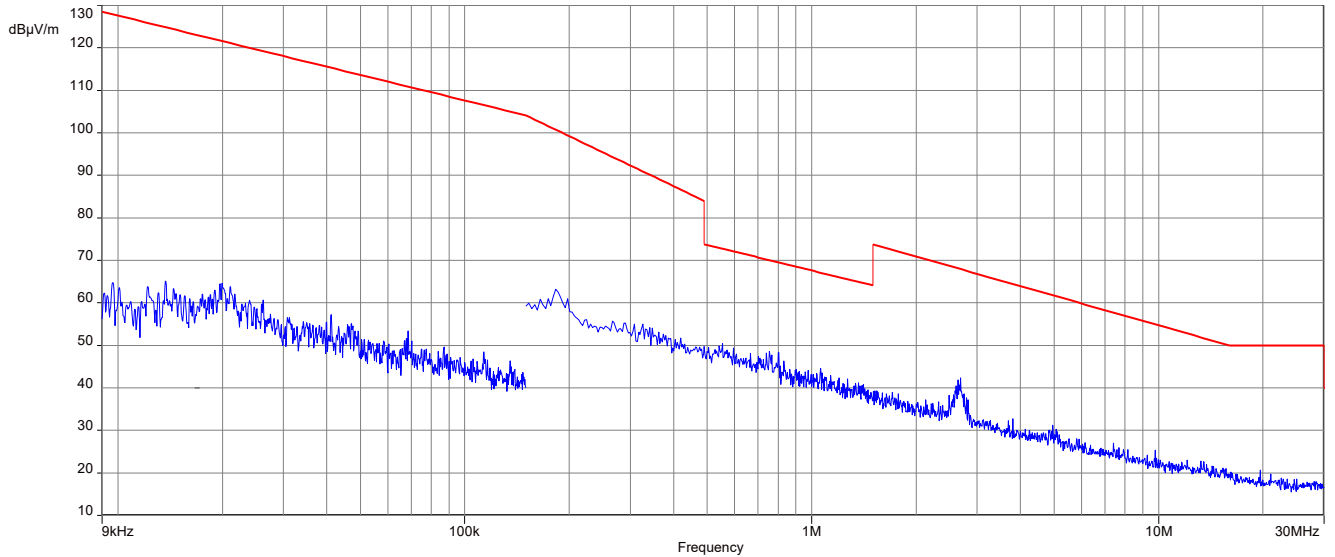
Plot 1: tx@421.2125 MHz, low power, FCC



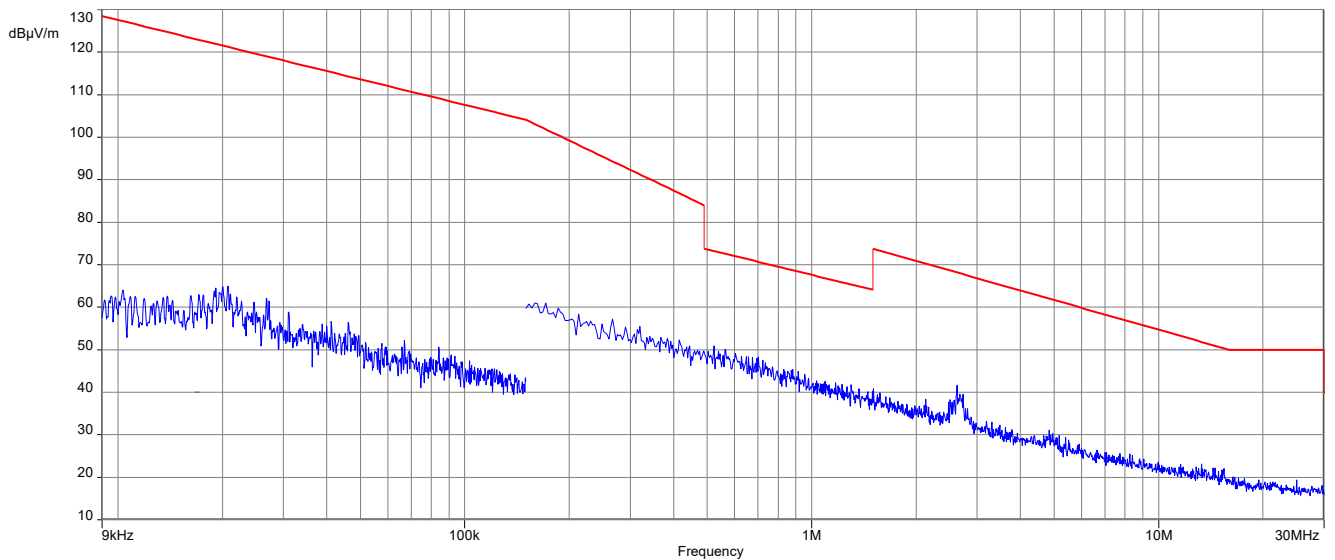
Plot 2: tx@425.6125 MHz, low power, FCC



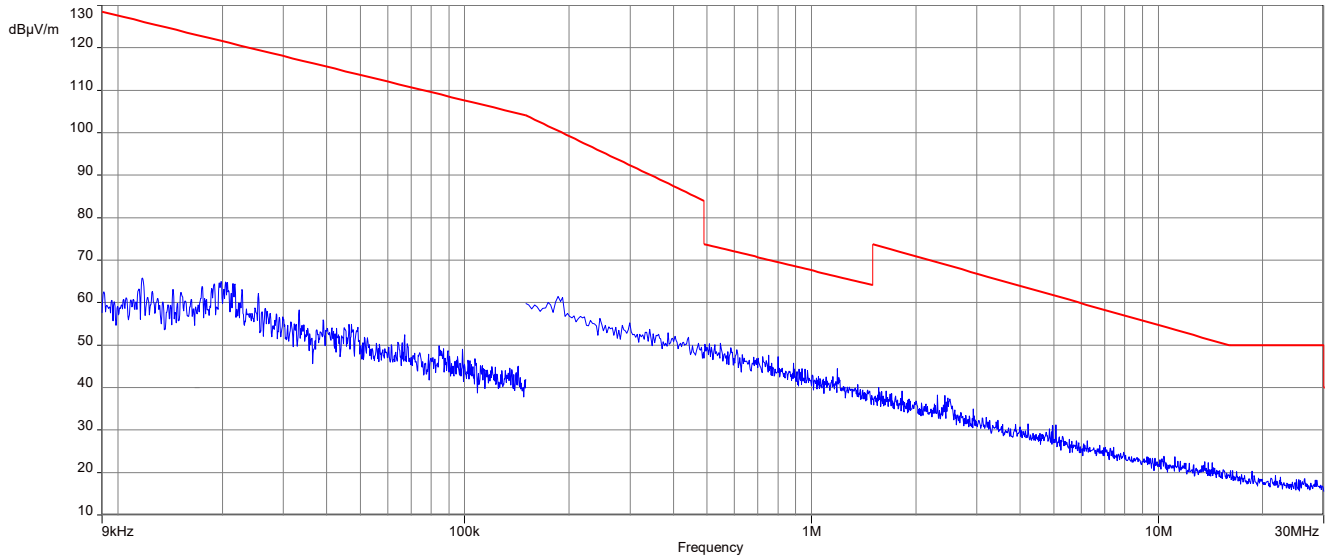
Plot 3: tx@429.9875 MHz, low power, FCC



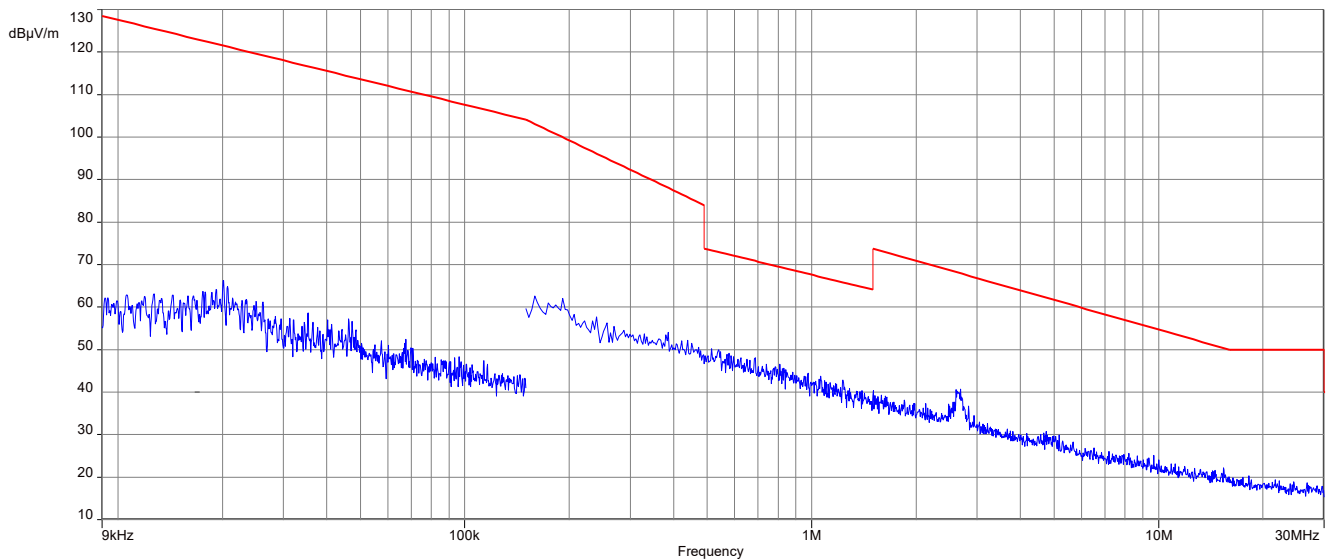
Plot 4: tx@450.0125 MHz, low power, FCC



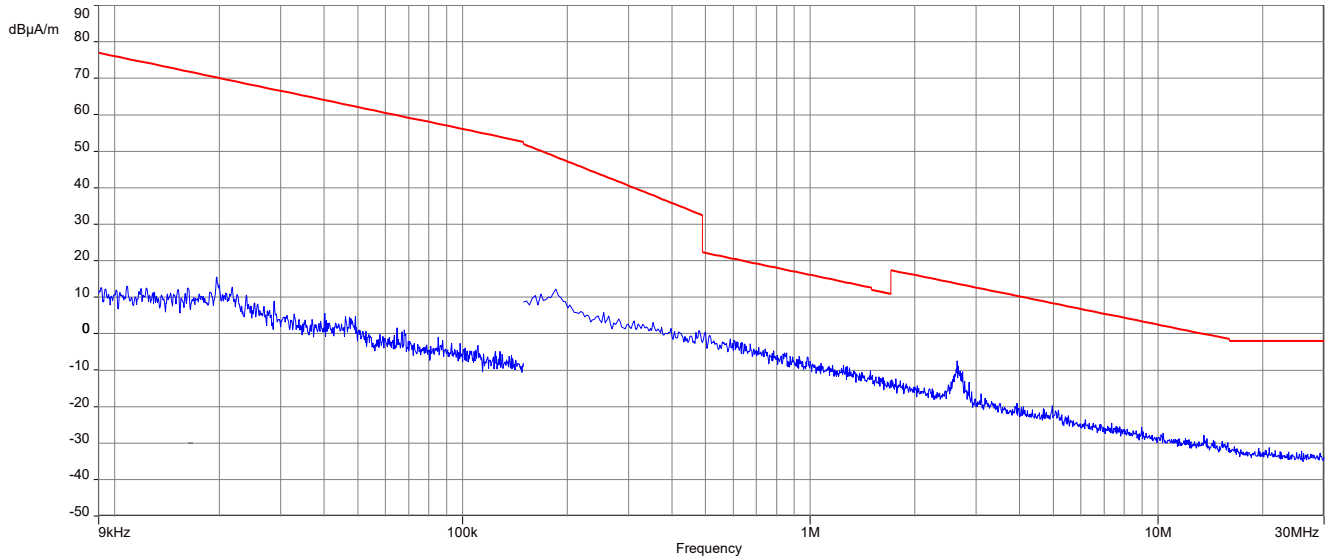
Plot 5: tx@460.0000 MHz, low power, FCC



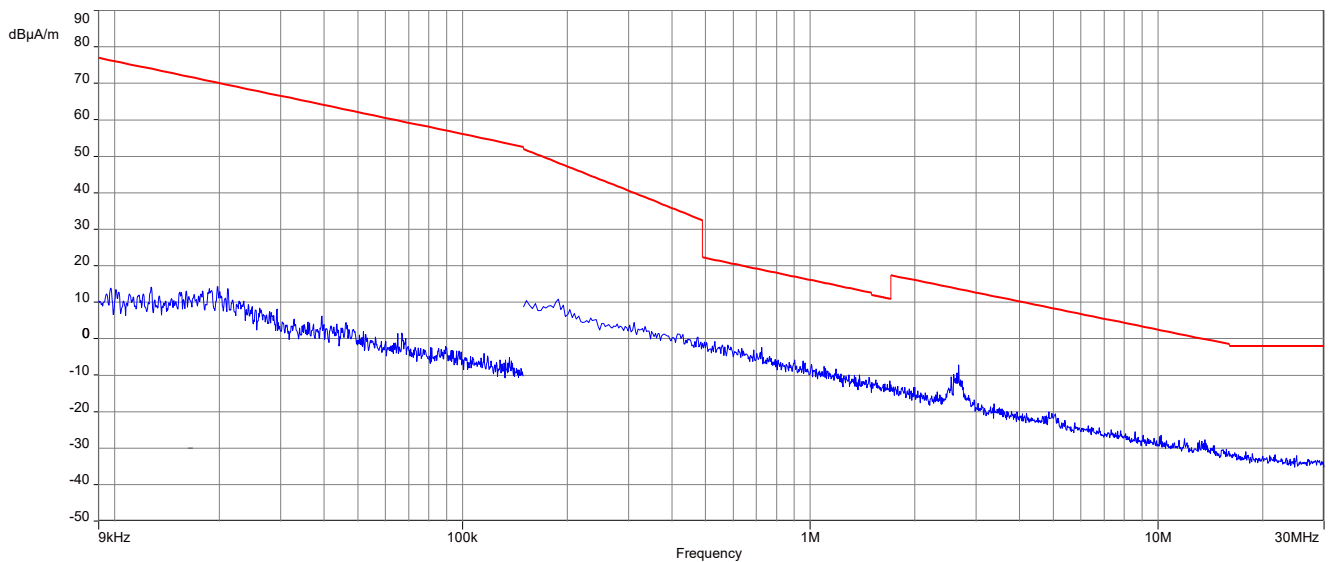
Plot 6: tx@469.9875 MHz, low power, FCC



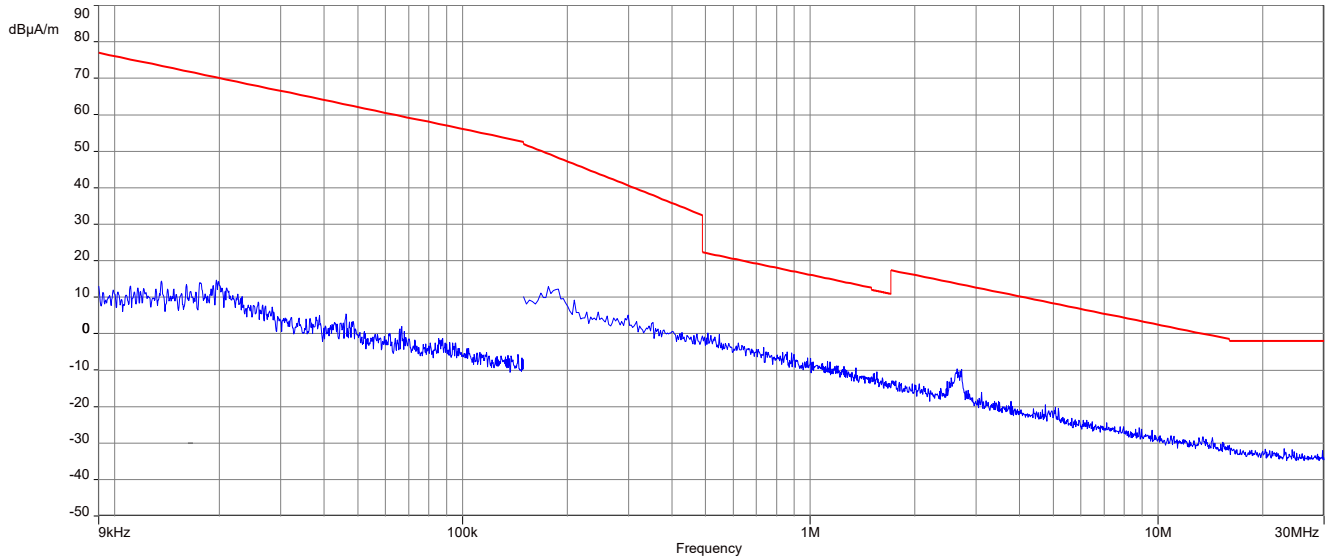
Plot 7: tx@421.2125 MHz, low power, IC



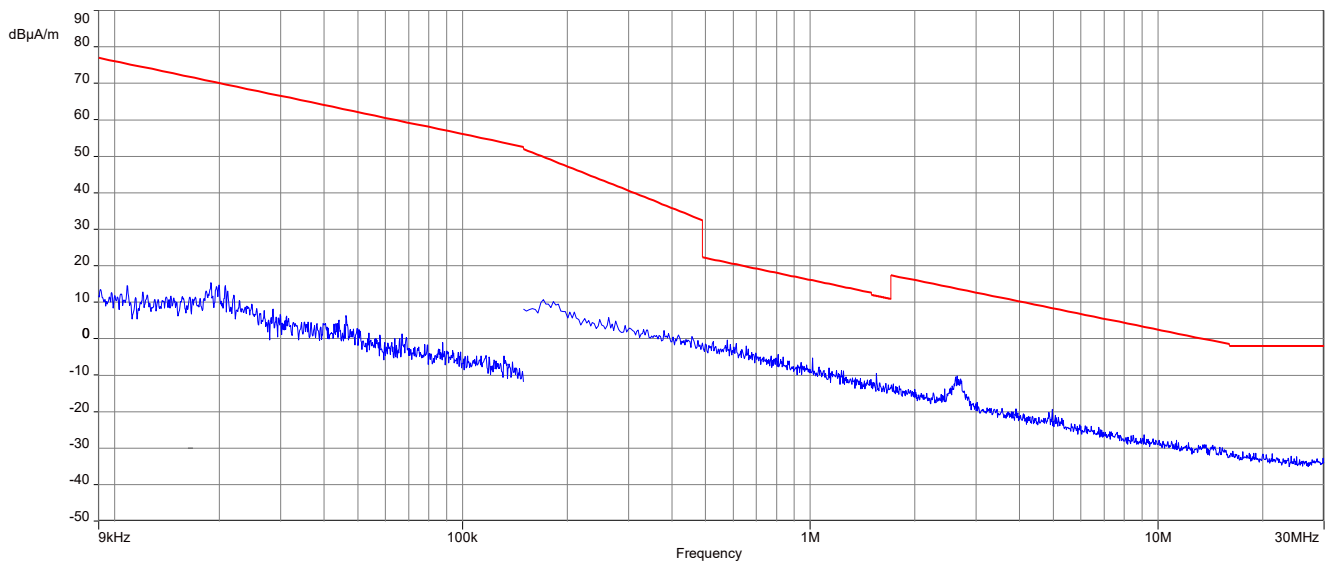
Plot 8: tx@425.6125 MHz, low power, IC



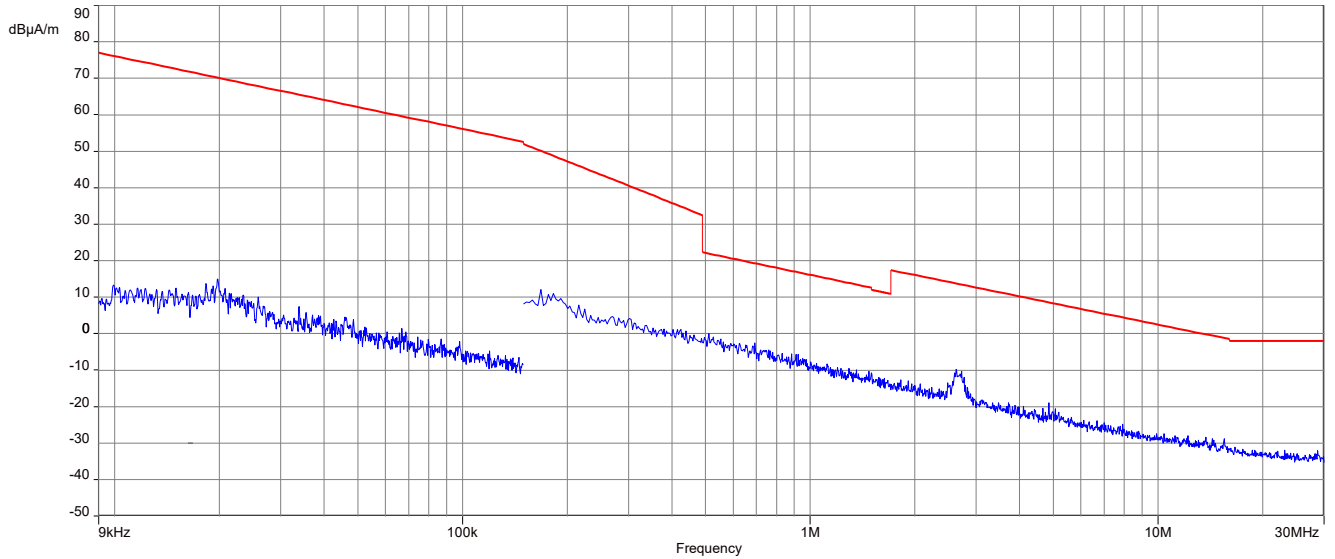
Plot 9: tx@429.9875 MHz, low power, IC



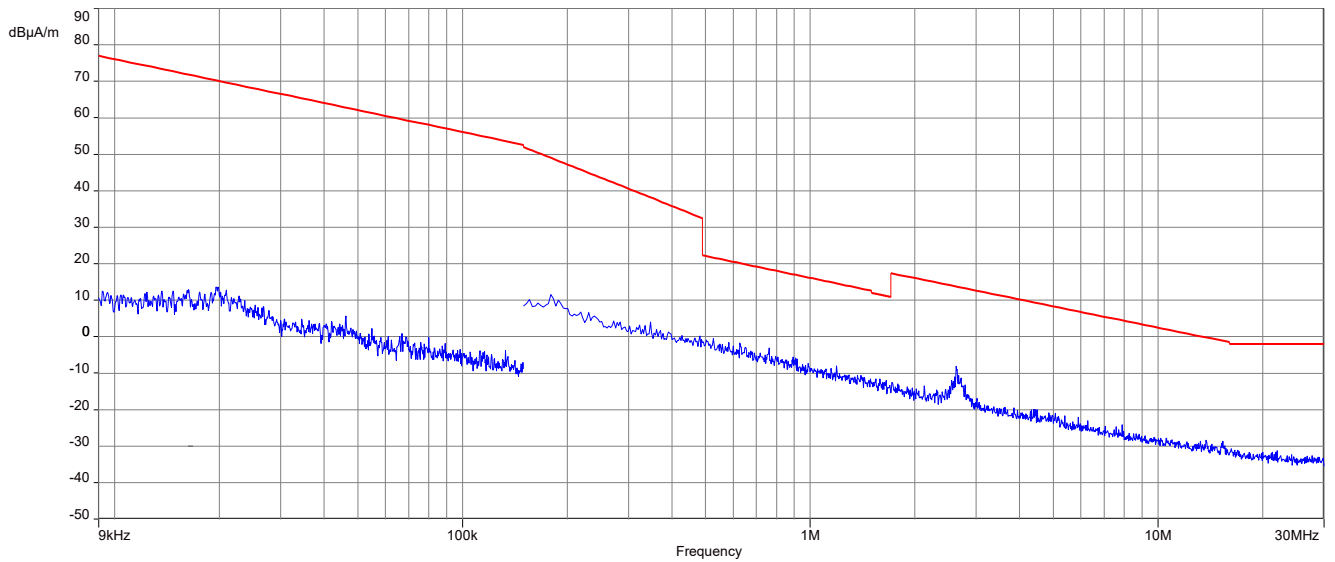
Plot 10: tx@450.0125 MHz, low power, IC



Plot 11: tx@460.0000 MHz, low power, IC

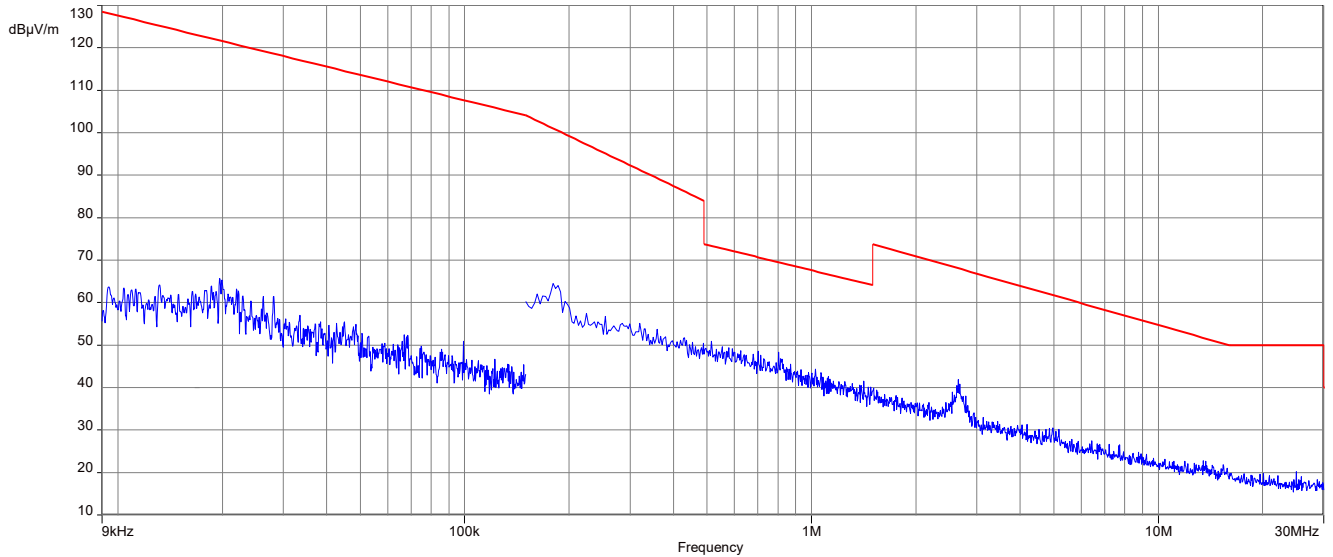


Plot 12: tx@469.9875 MHz, low power, IC

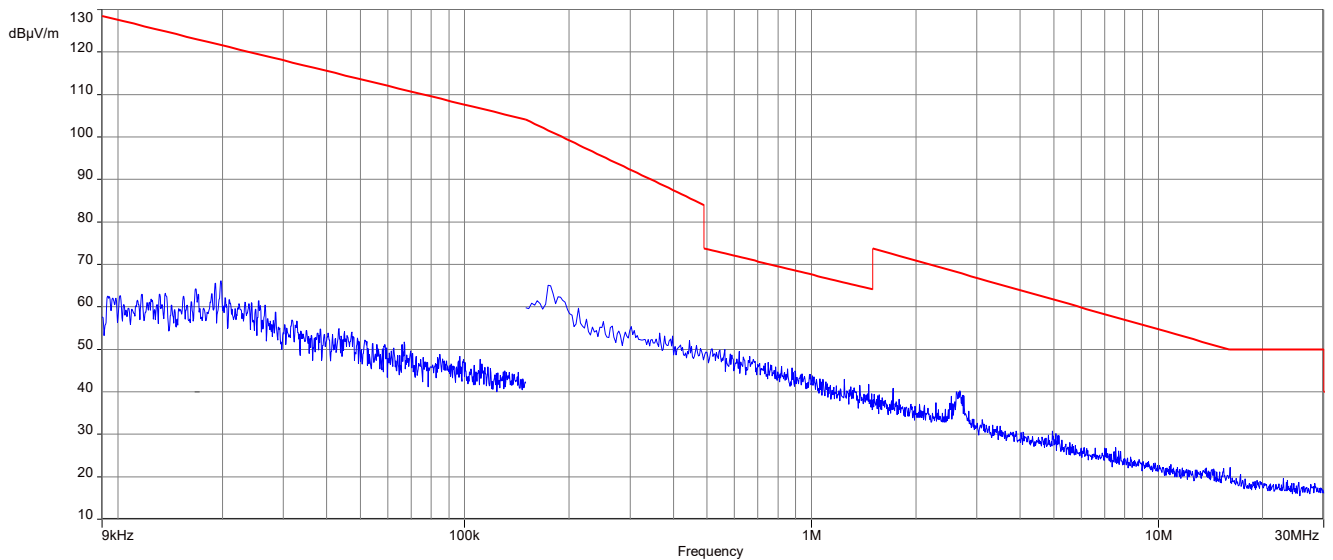


Plots 6.25 kHz bandwidth, 40 W:

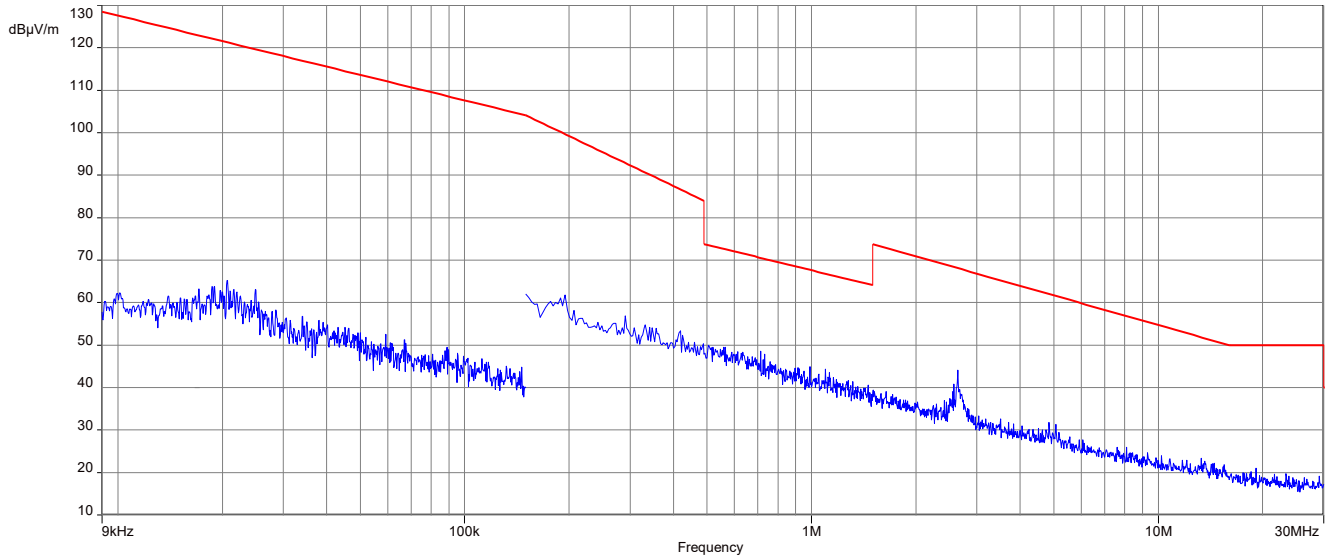
Plot 1: tx@421.2125 MHz, high power, FCC



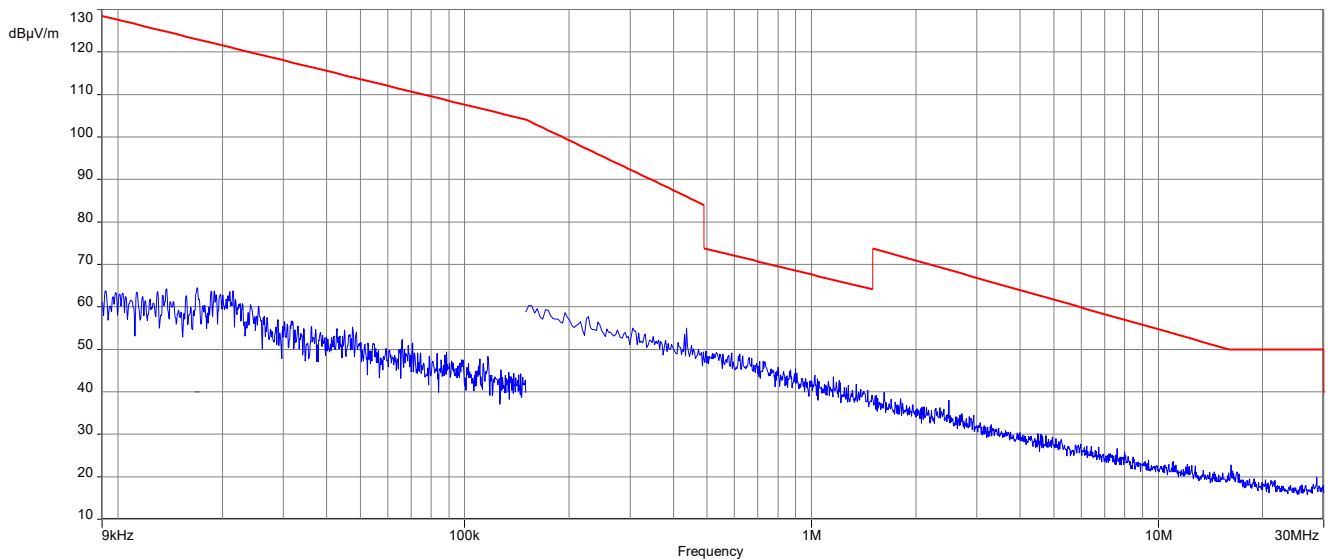
Plot 2: tx@425.6125 MHz, high power, FCC



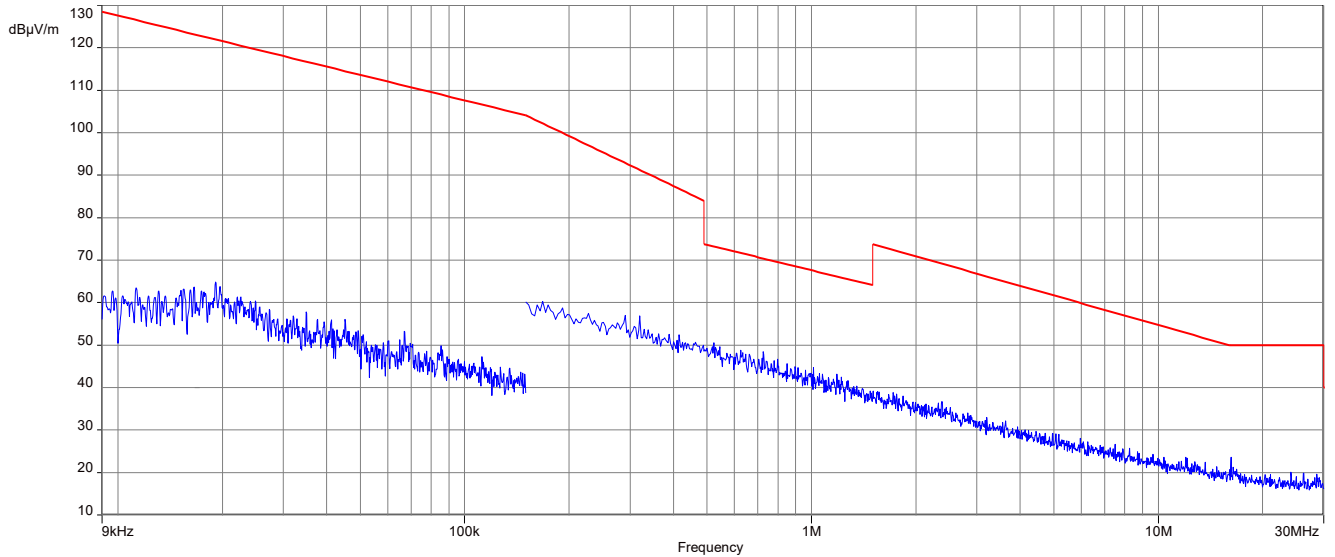
Plot 3: tx@429.9875 MHz, high power, FCC



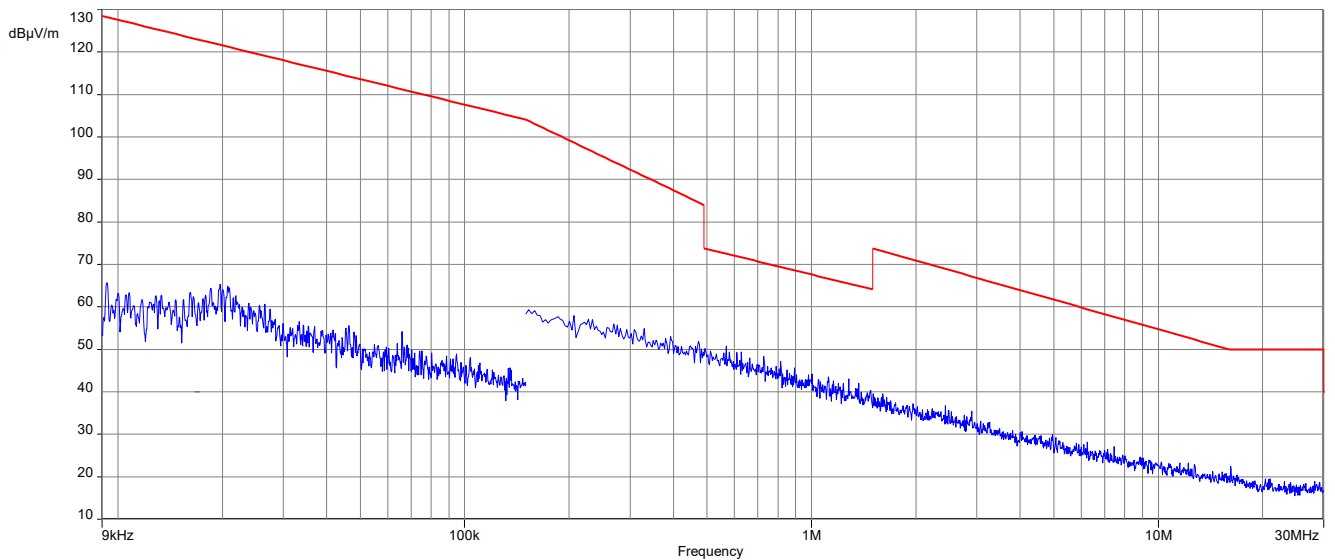
Plot 4: tx@450.0125 MHz, high power, FCC



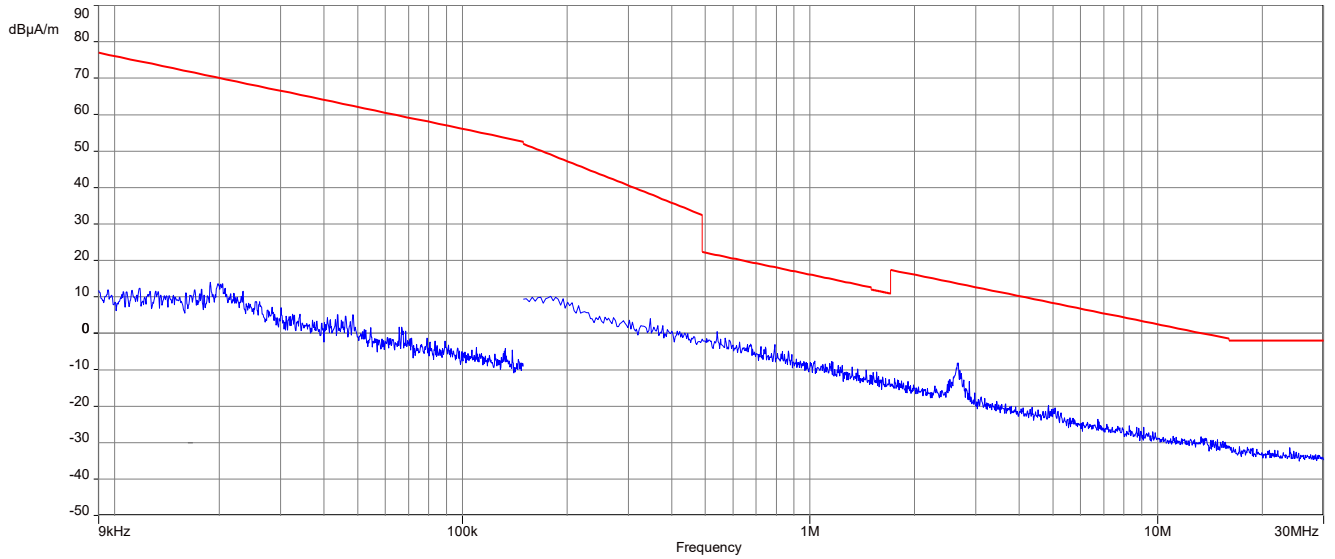
Plot 5: tx@460.0000 MHz, high power, FCC



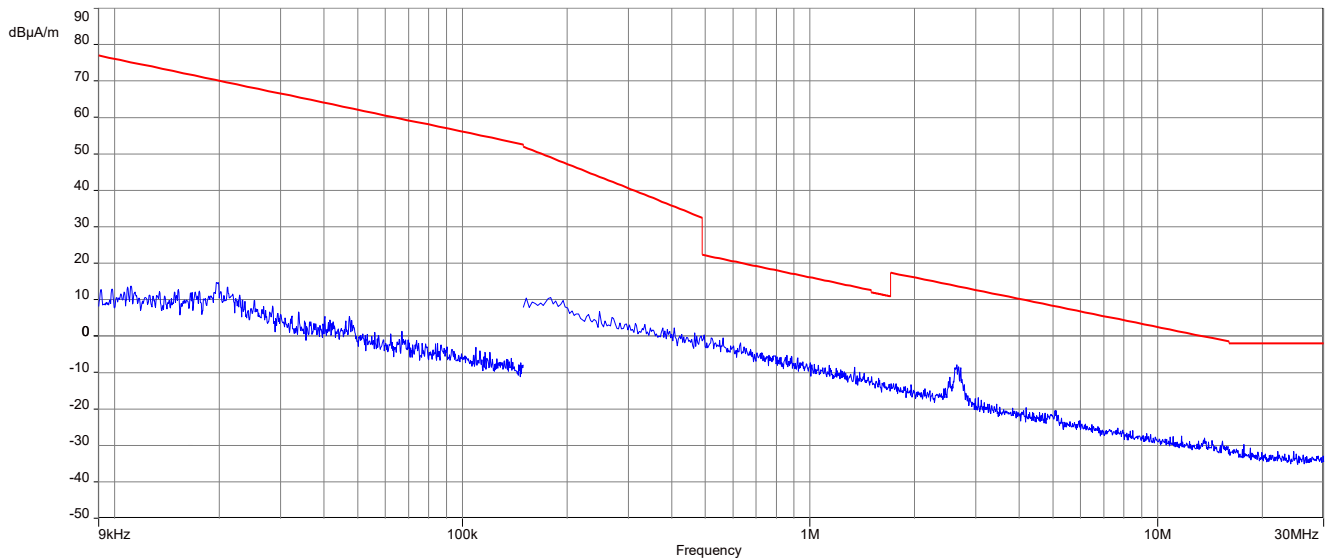
Plot 6: tx@469.9875 MHz, high power, FCC



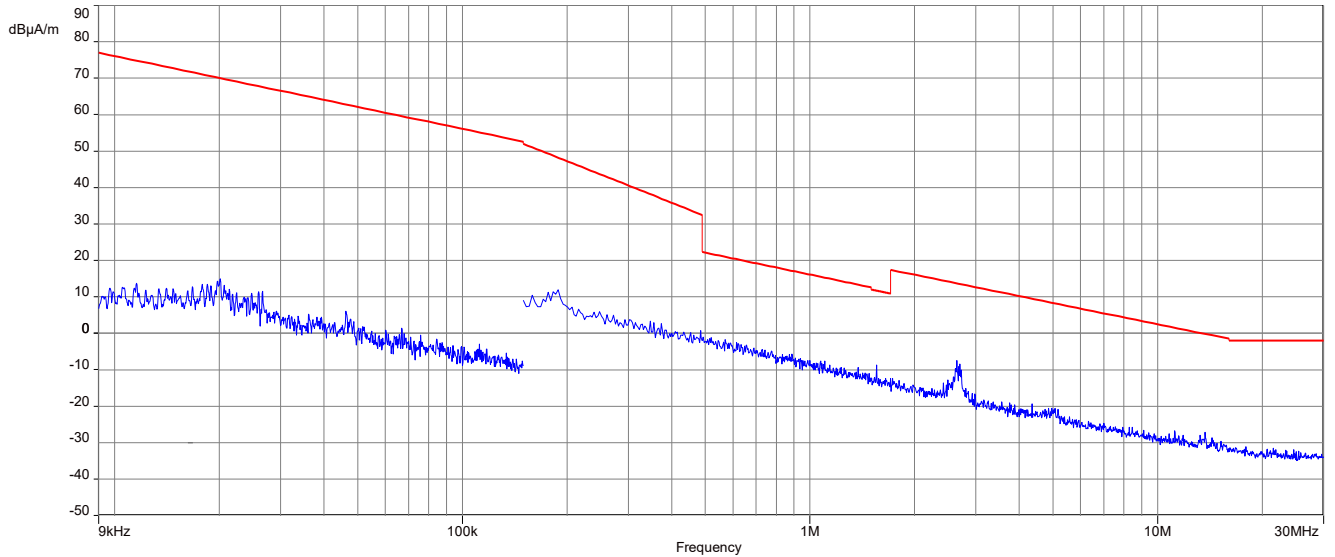
Plot 7: tx@421.2125 MHz, high power, IC



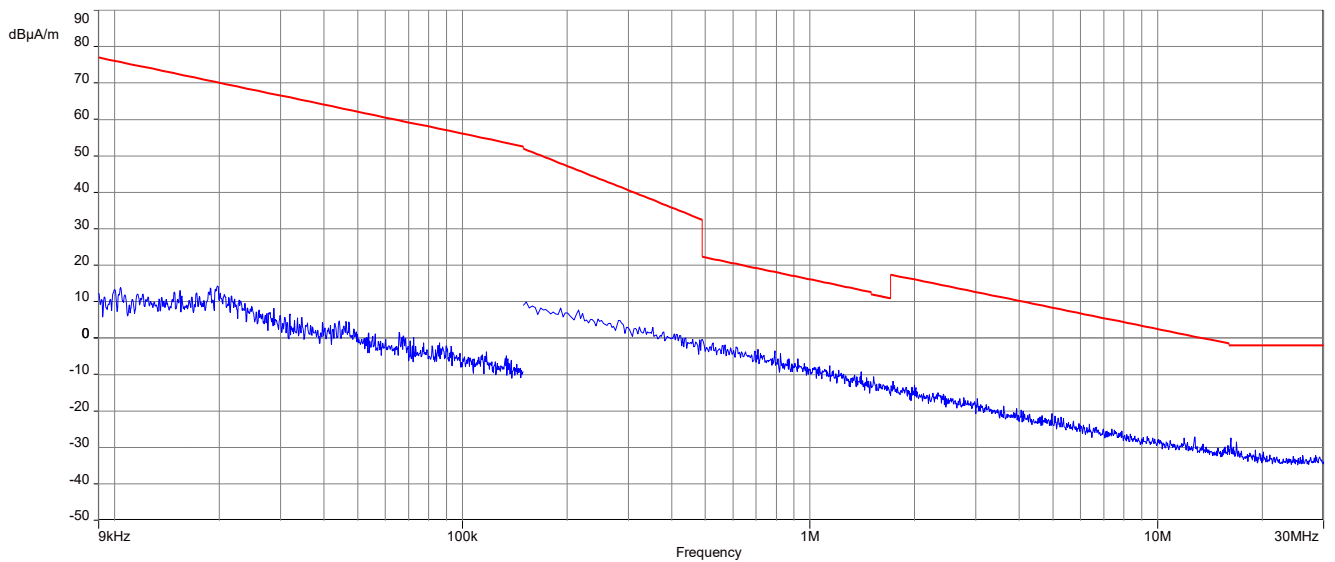
Plot 8: tx@425.6125 MHz, high power, IC



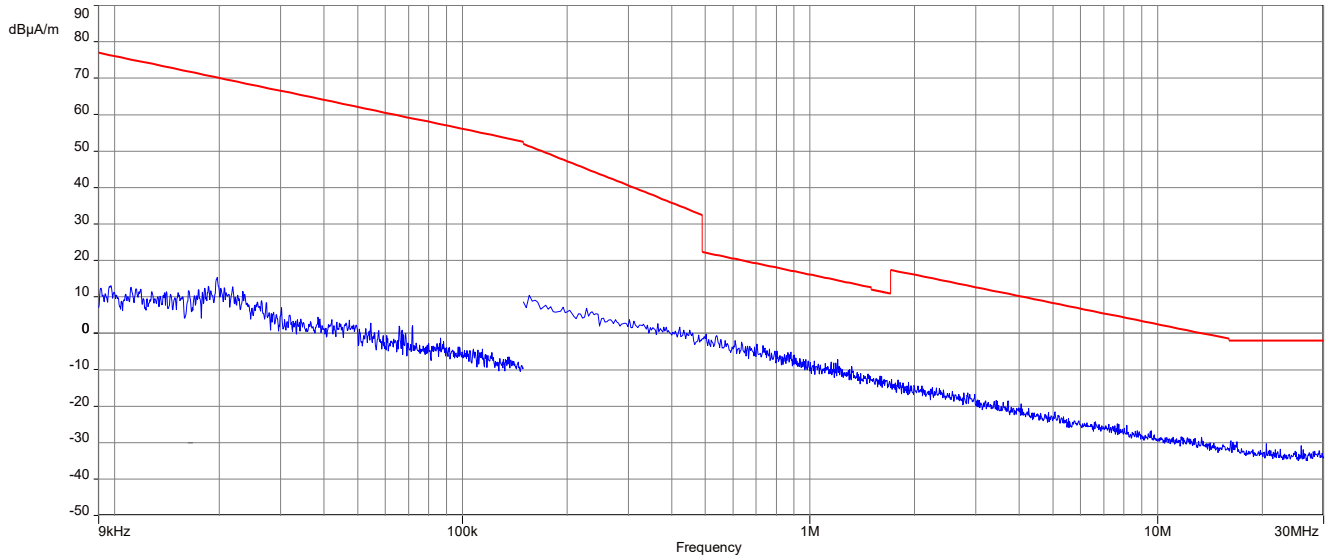
Plot 9: tx@429.9875 MHz, high power, IC



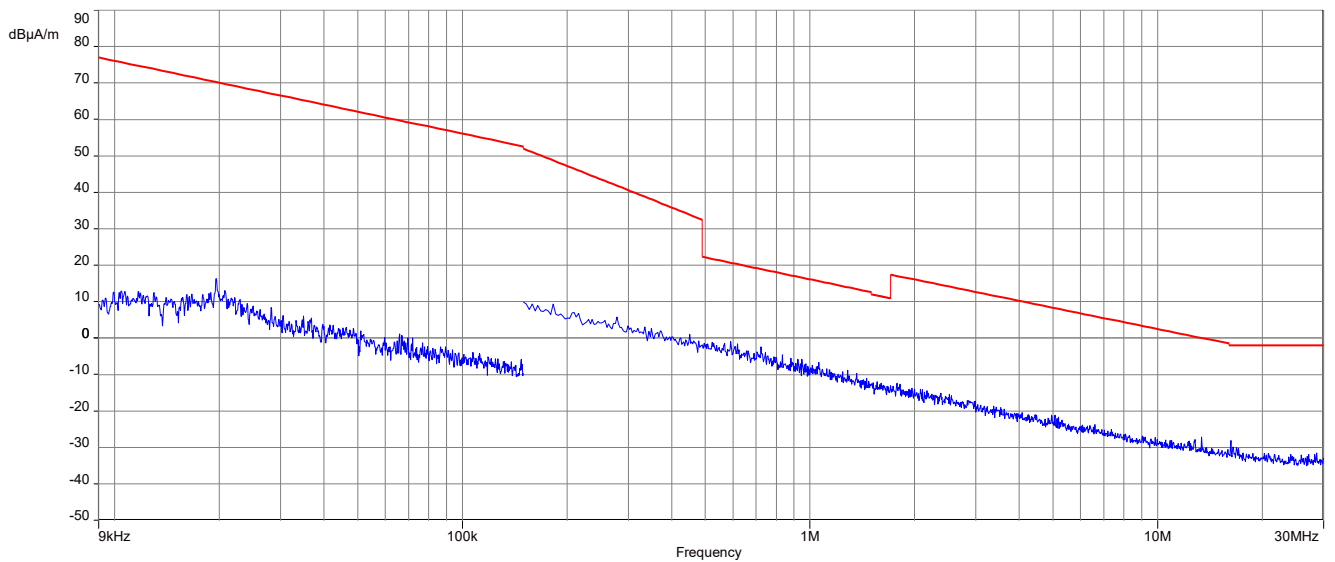
Plot 10: tx@450.0125 MHz, high power, IC



Plot 11: tx@460.0000 MHz, high power, IC

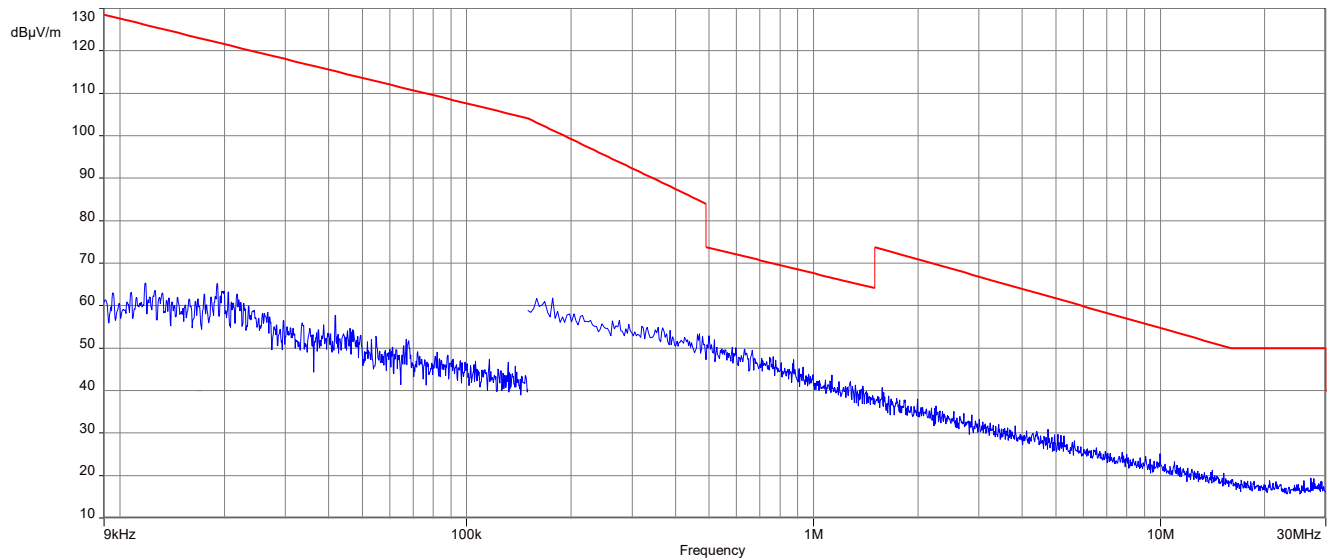


Plot 12: tx@469.9875 MHz, high power, IC

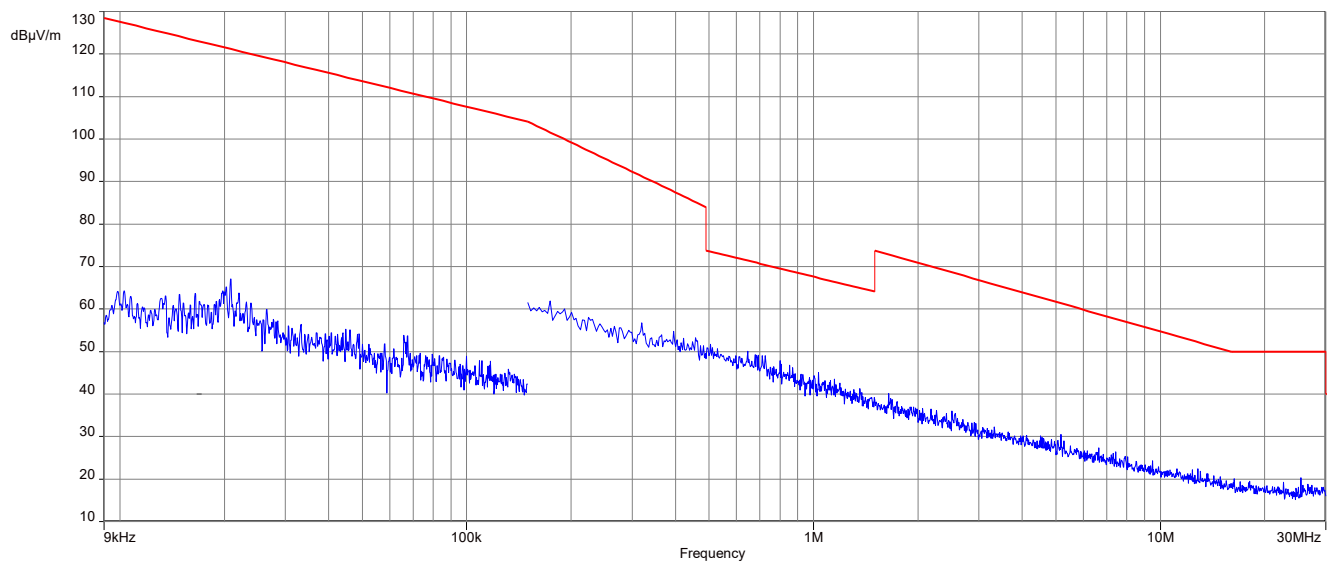


Plots 25 kHz bandwidth, 10 W:

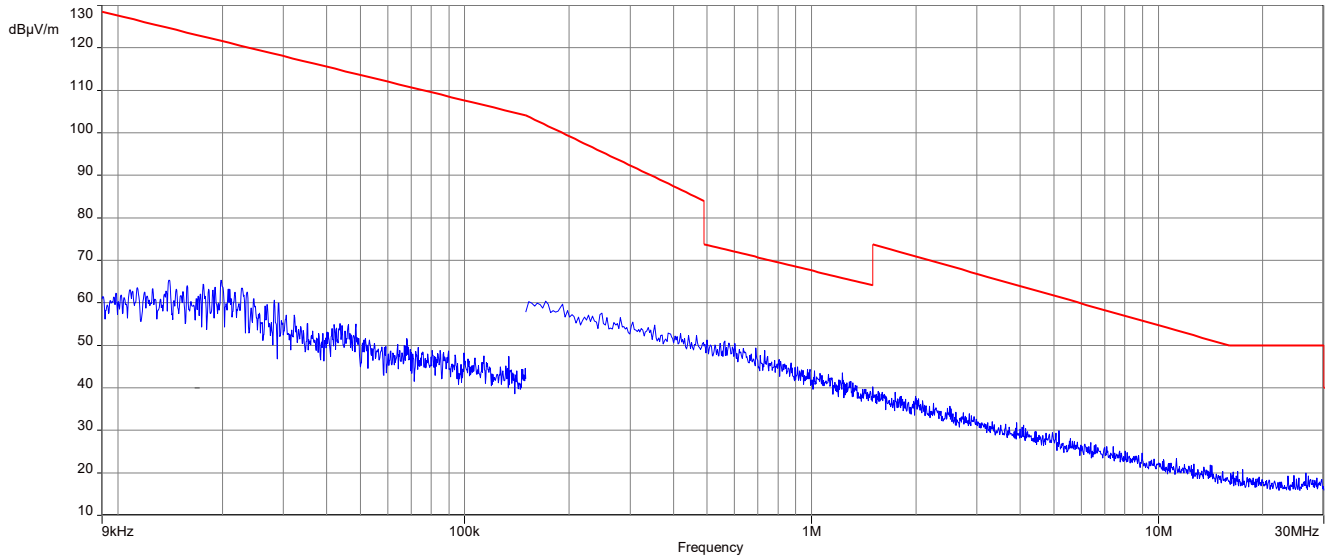
Plot 1: tx@421.2125 MHz, low power, FCC



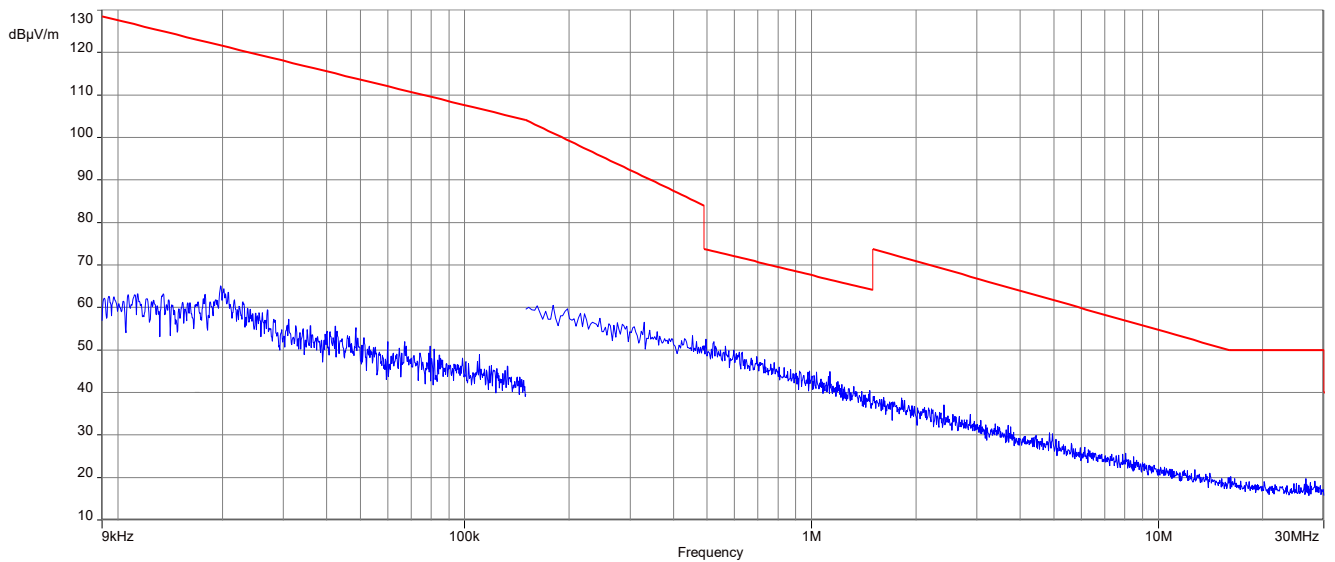
Plot 2: tx@425.6125 MHz, low power, FCC



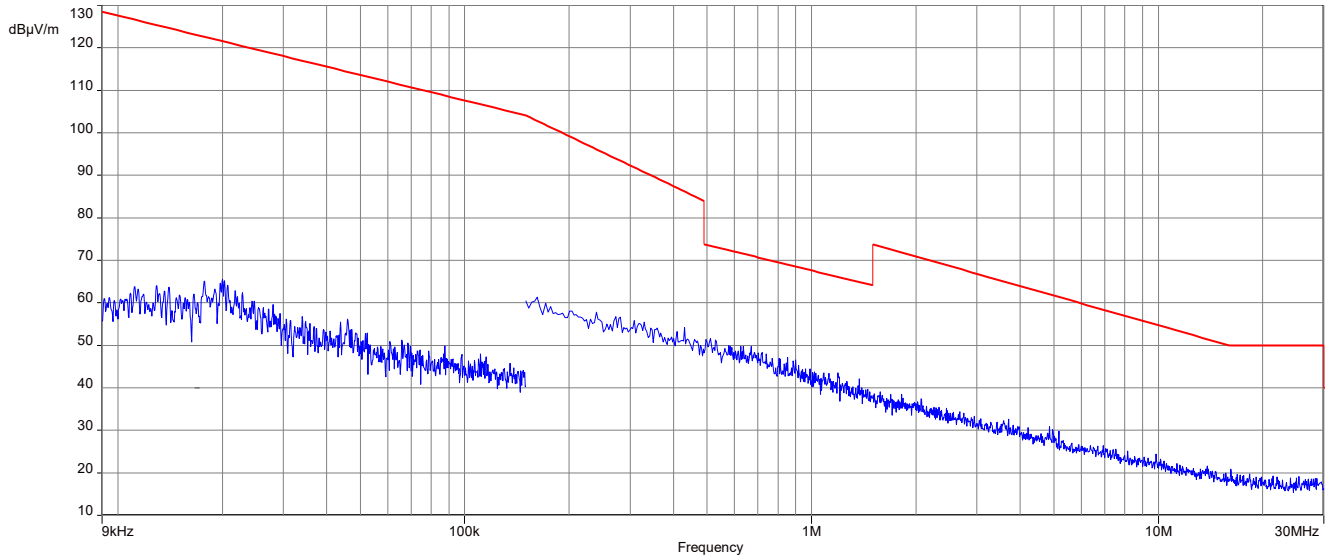
Plot 3: tx@429.9875 MHz, low power, FCC



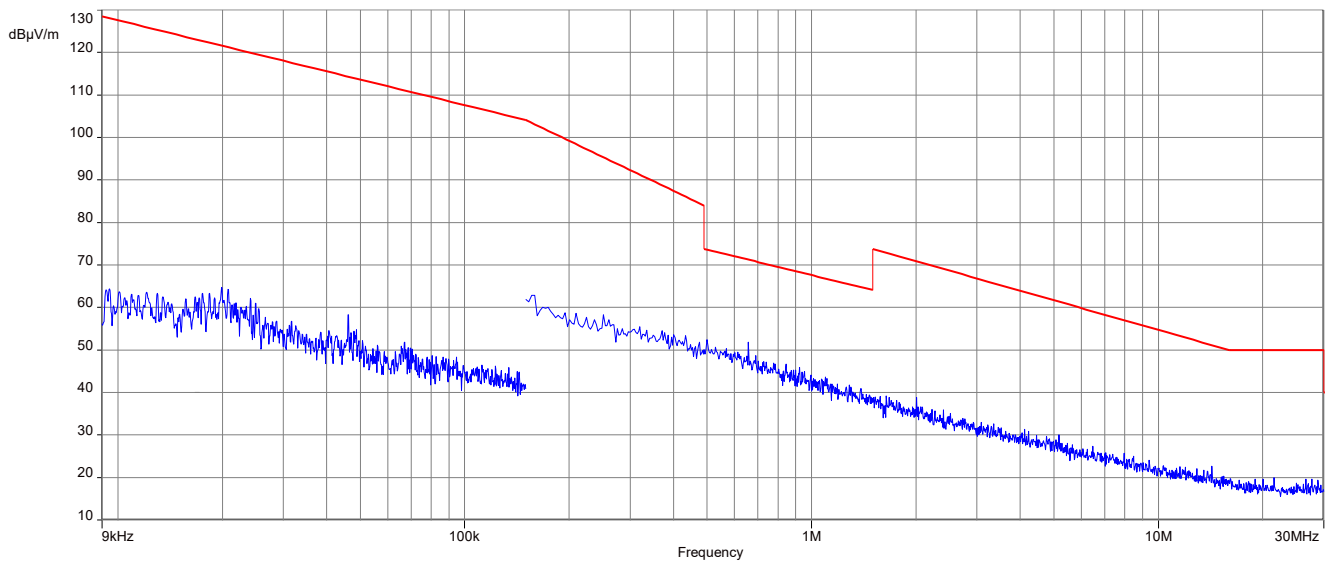
Plot 4: tx@450.0125 MHz, low power, FCC



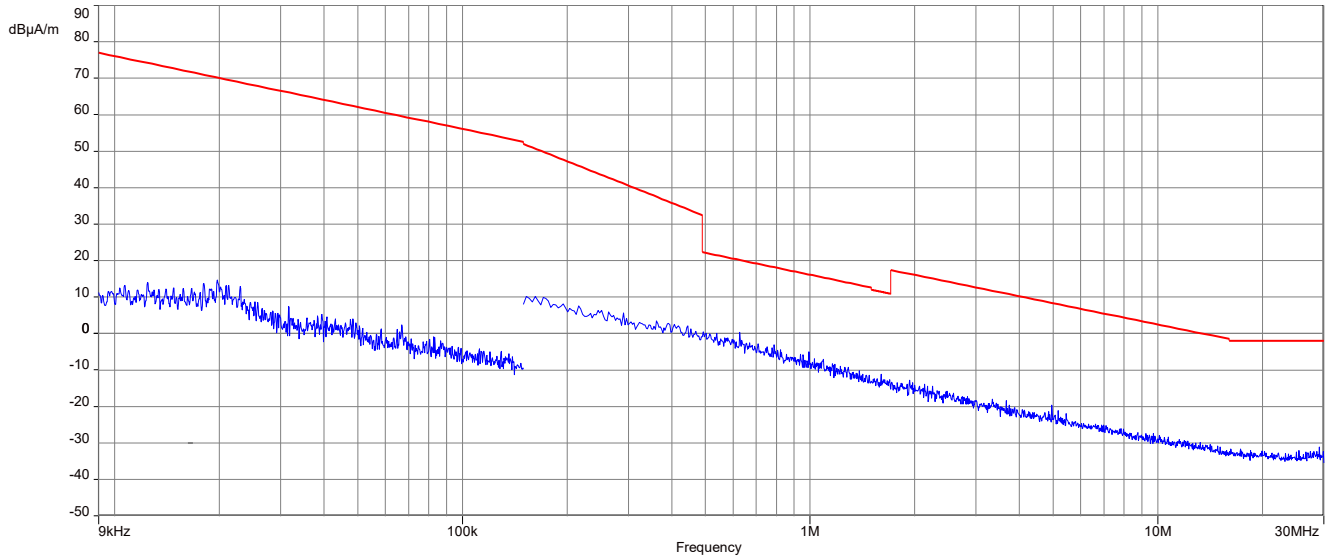
Plot 5: tx@460.0000 MHz, low power, FCC



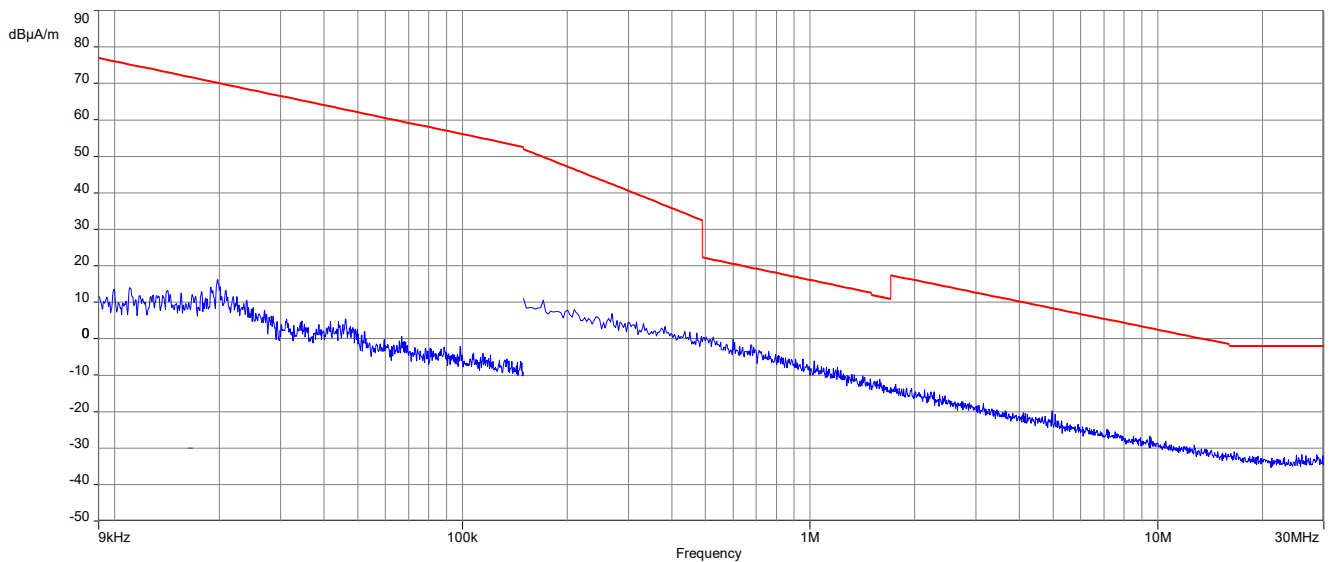
Plot 6: tx@469.9875 MHz, low power, FCC



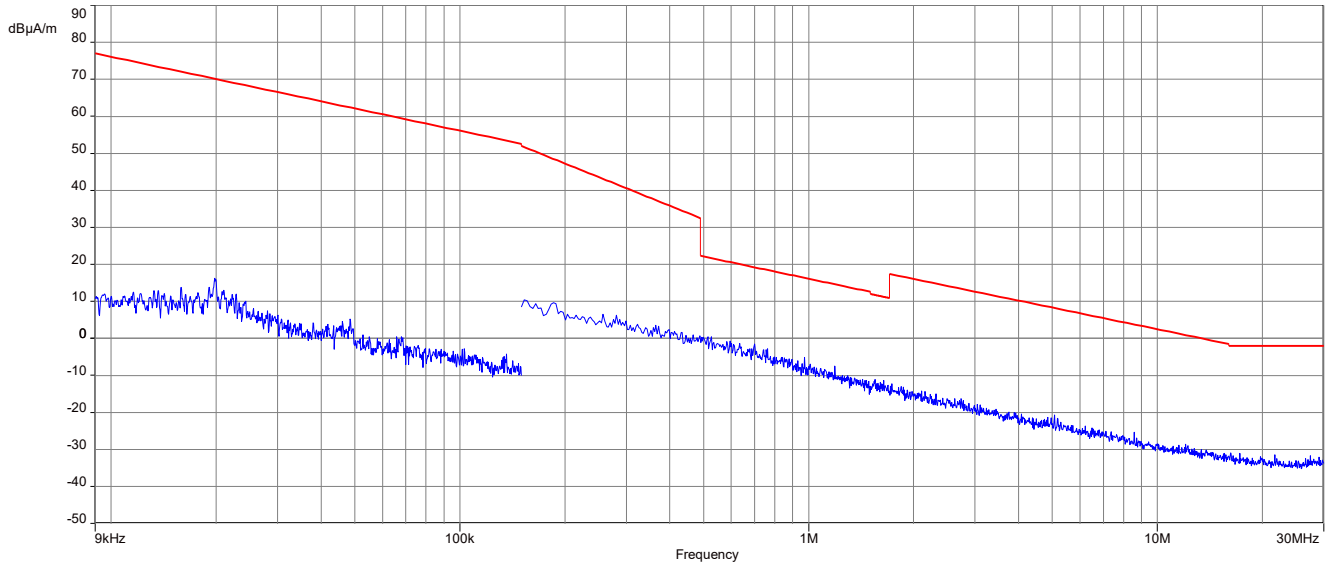
Plot 7: tx@421.2125 MHz, low power, IC



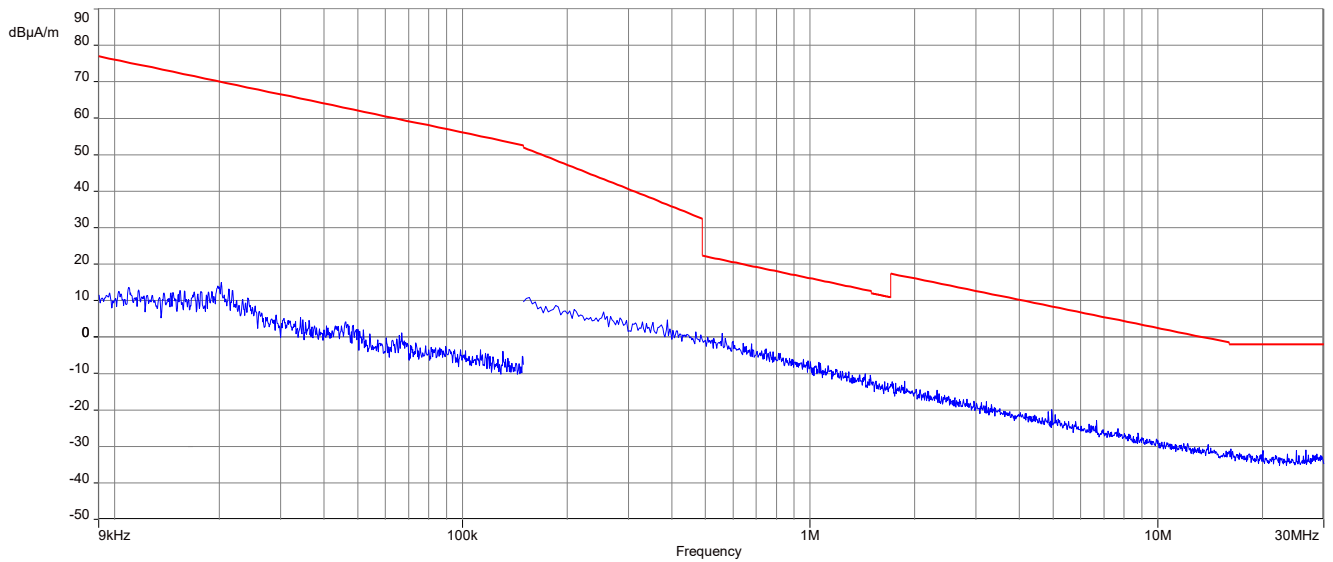
Plot 8: tx@425.6125 MHz, low power, IC



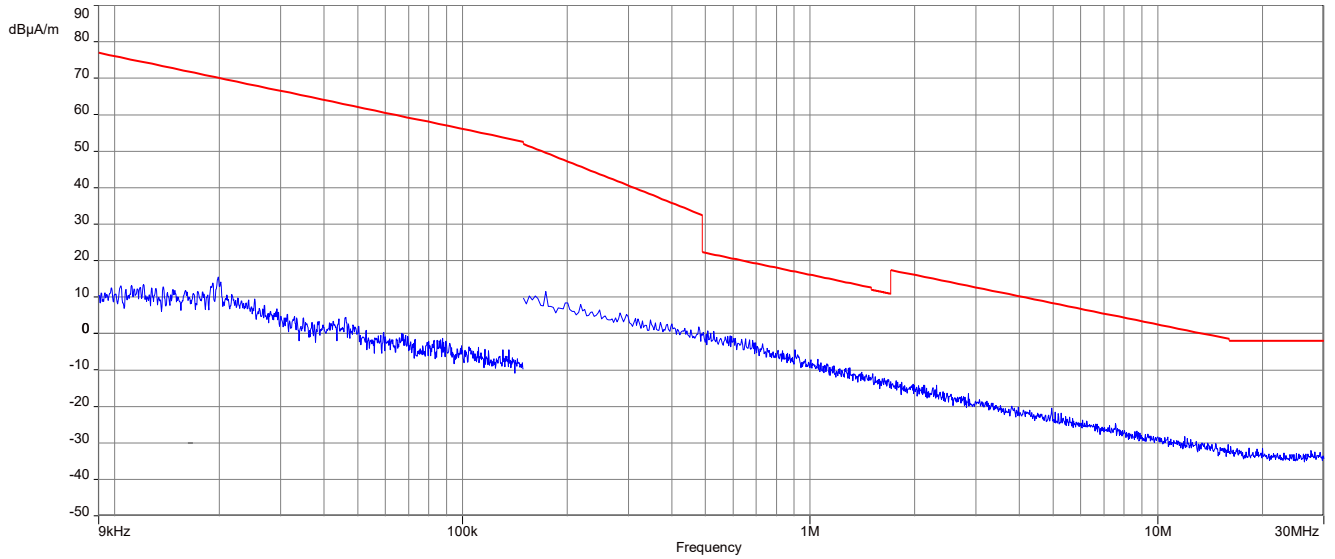
Plot 9: tx@429.9875 MHz, low power, IC



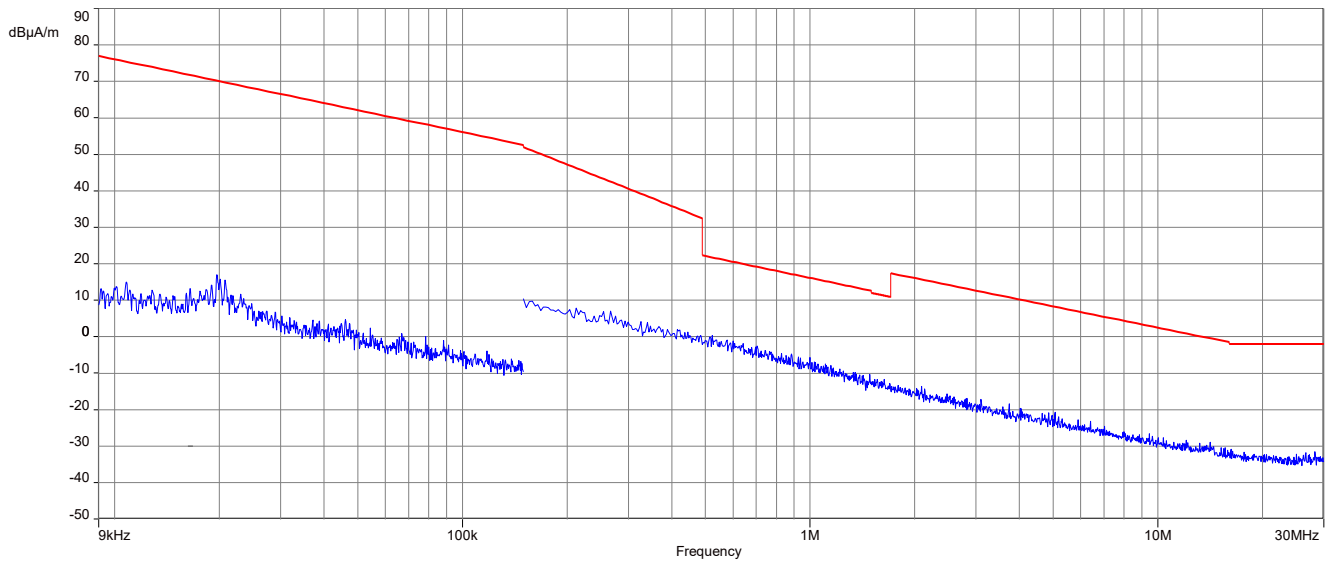
Plot 10: tx@450.0125 MHz, low power, IC



Plot 11: tx@460.0000 MHz, low power, IC

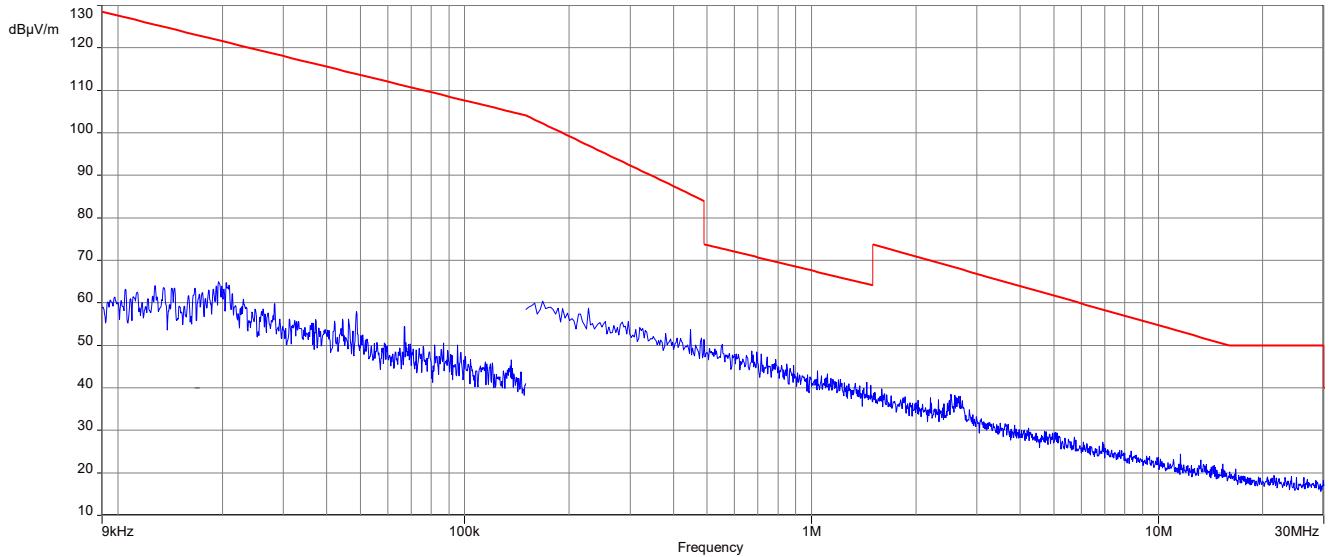


Plot 12: tx@469.9875 MHz, low power, IC

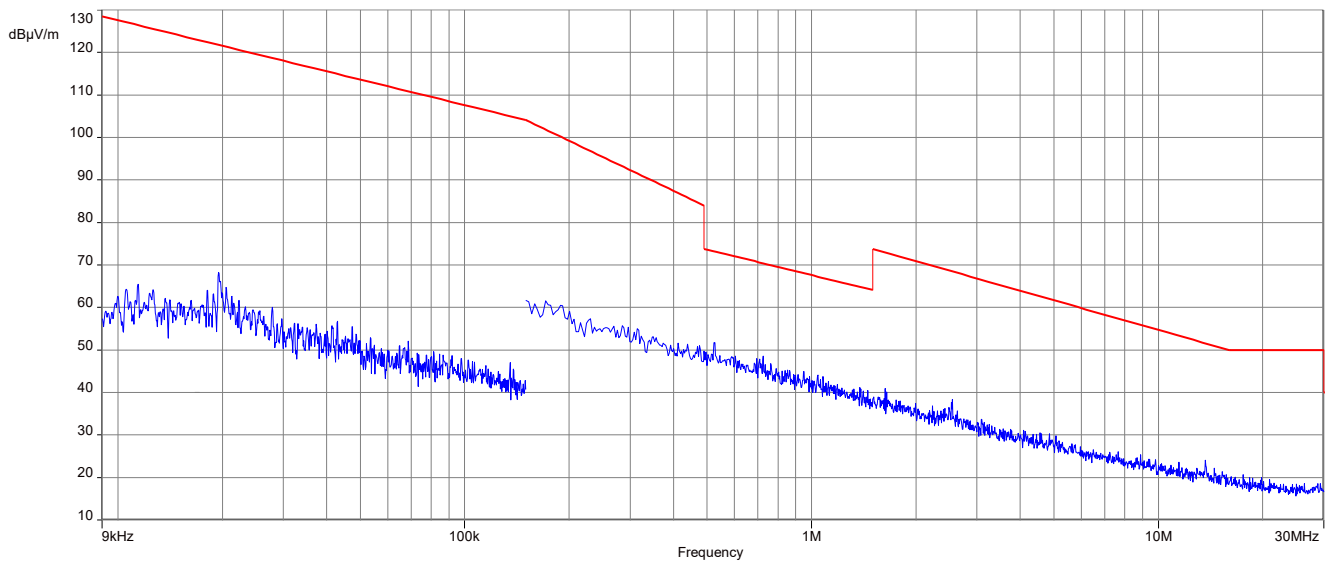


Plots 25 kHz bandwidth, 40 W:

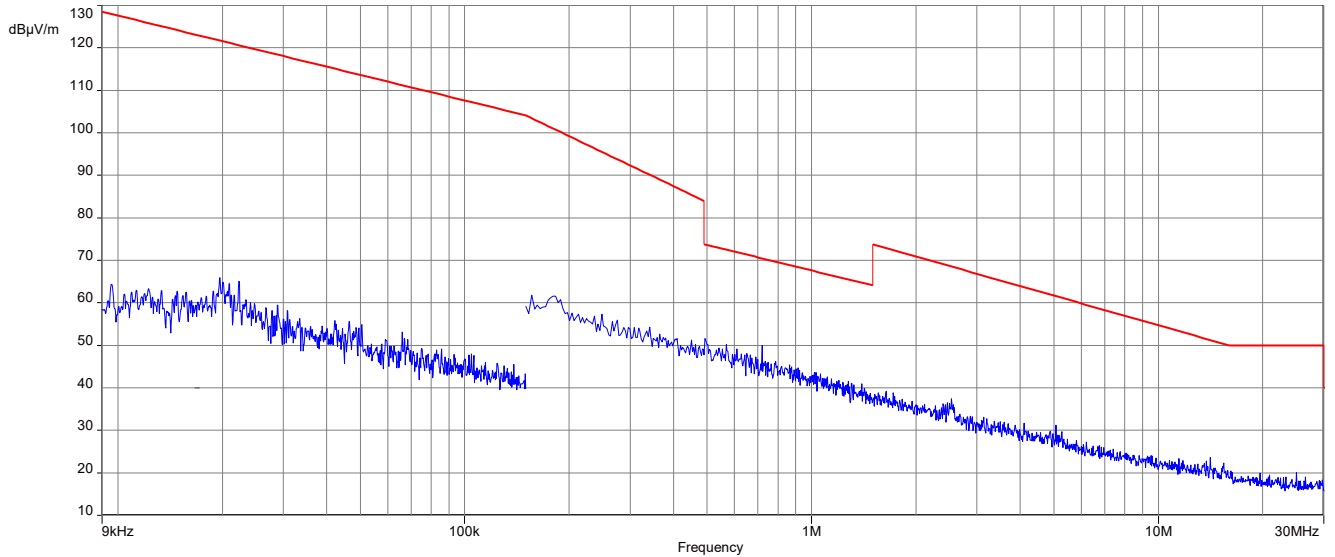
Plot 1: tx@421.2125 MHz, high power, FCC



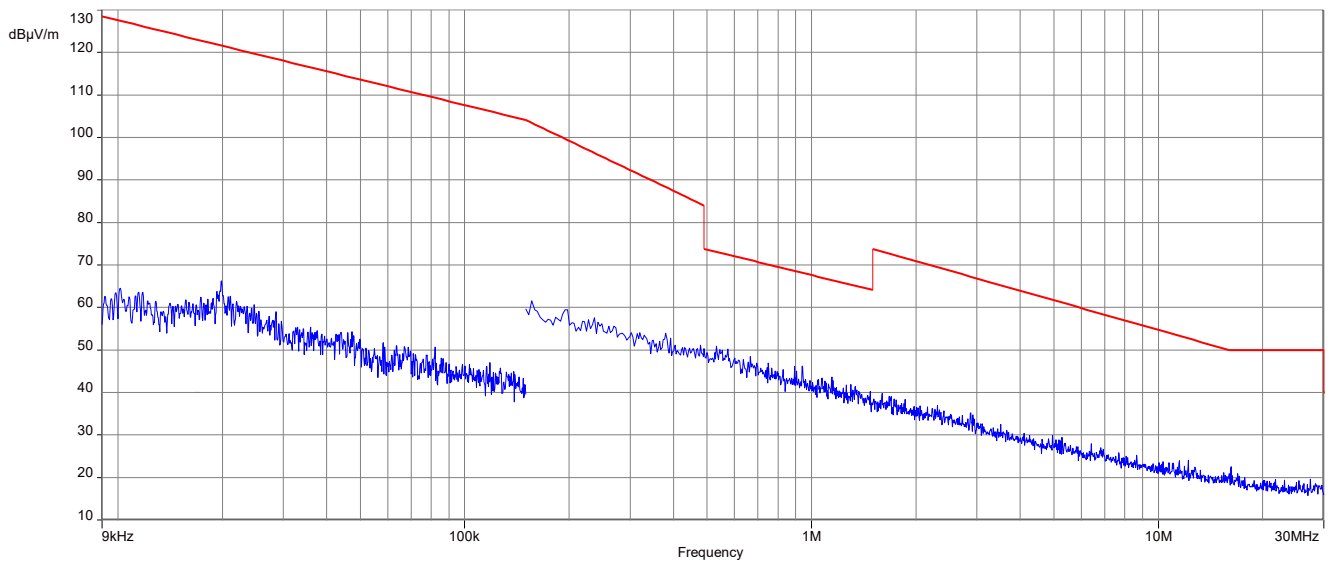
Plot 2: tx@425.6125 MHz, high power, FCC



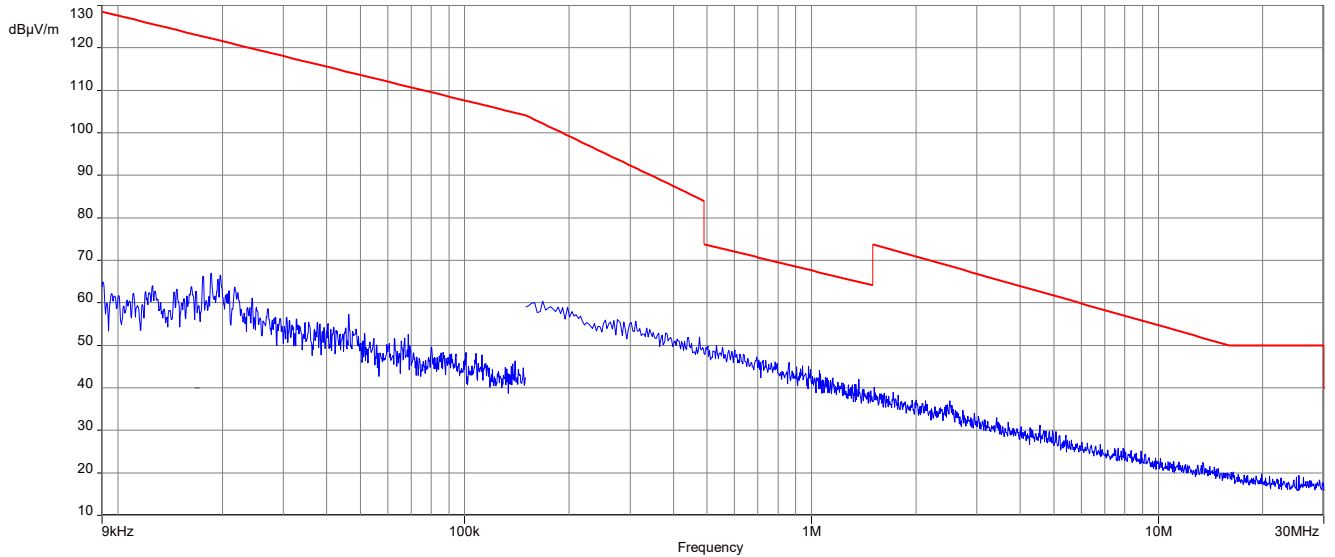
Plot 3: tx@429.9875 MHz, high power, FCC



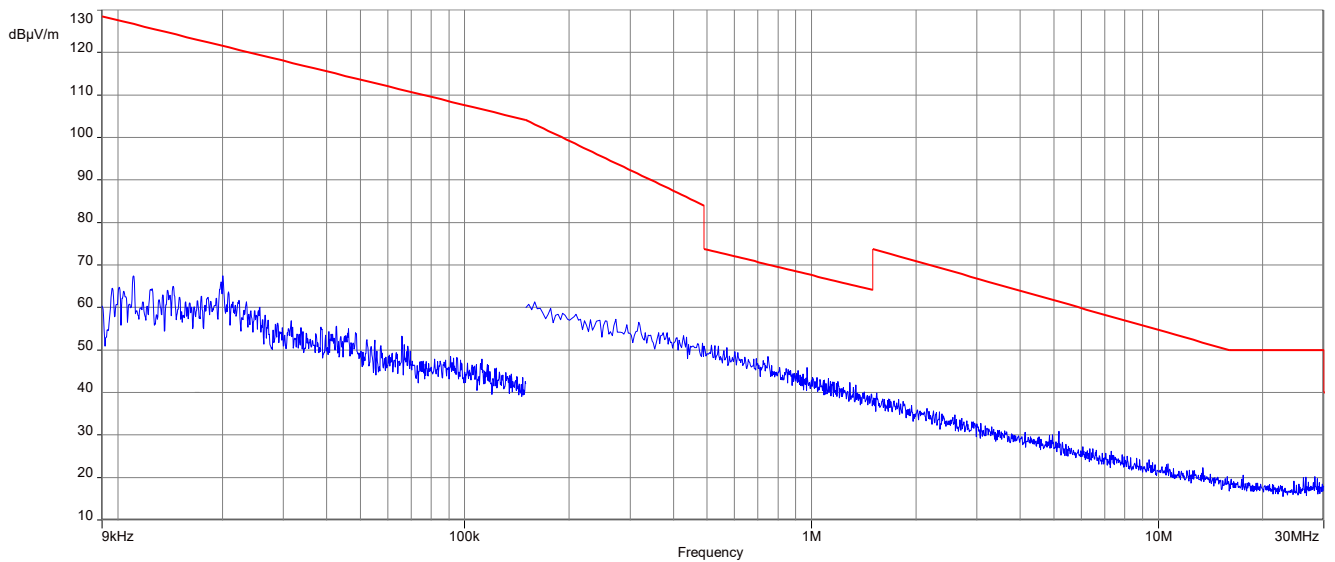
Plot 4: tx@450.0125 MHz, high power, FCC



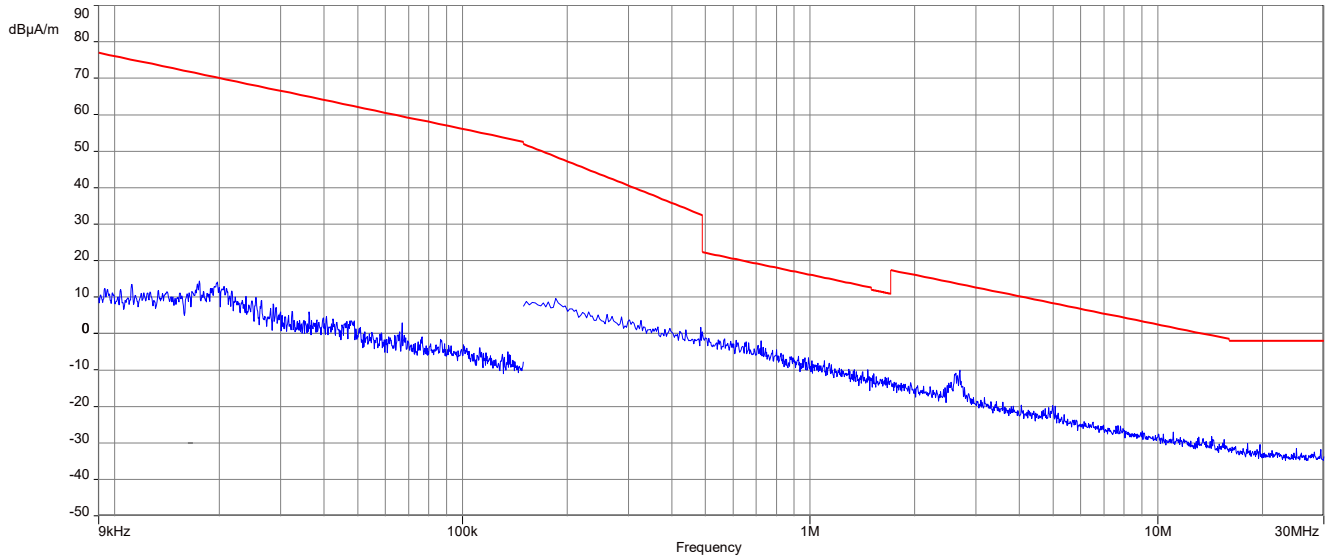
Plot 5: tx@460.0000 MHz, high power, FCC



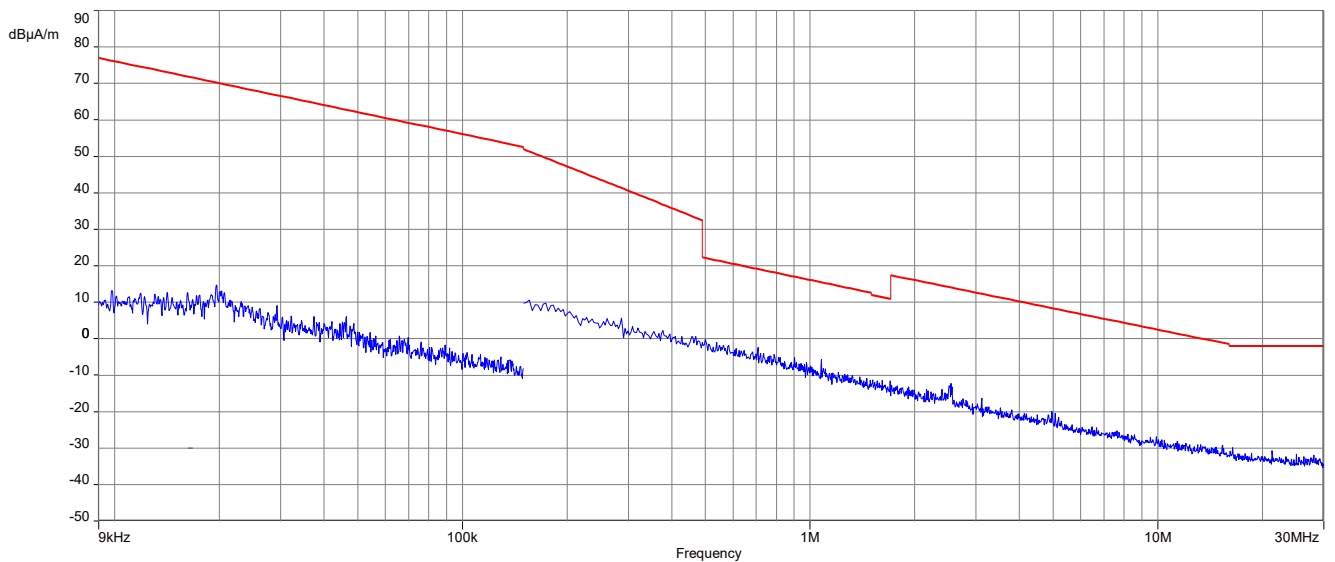
Plot 6: tx@469.9875 MHz, high power, FCC



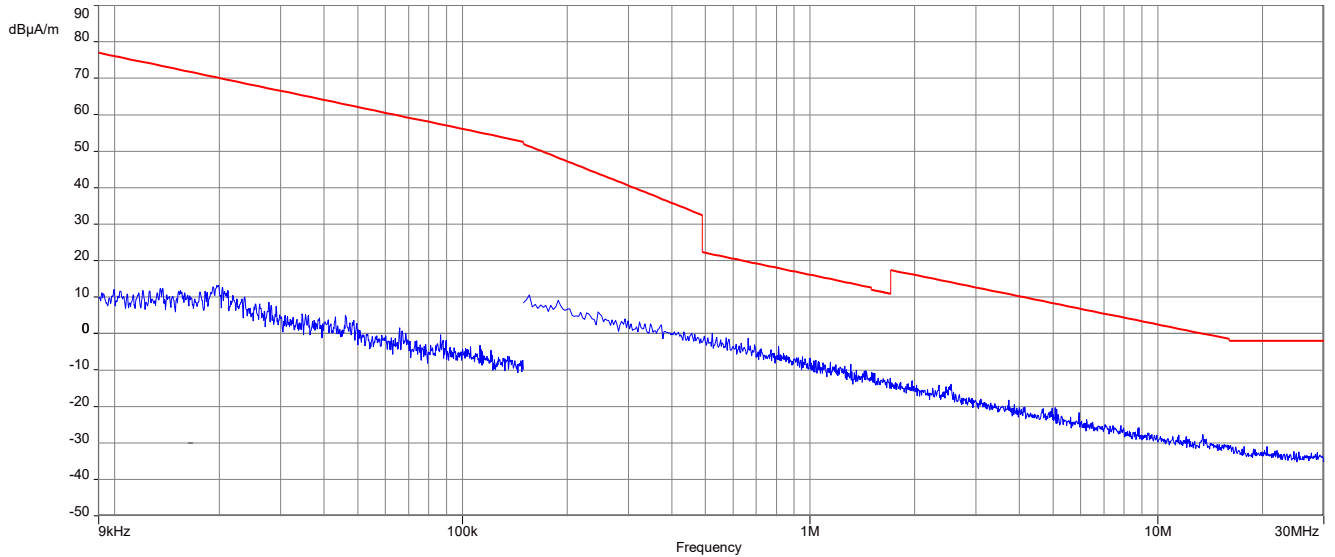
Plot 7: tx@421.2125 MHz, high power, IC



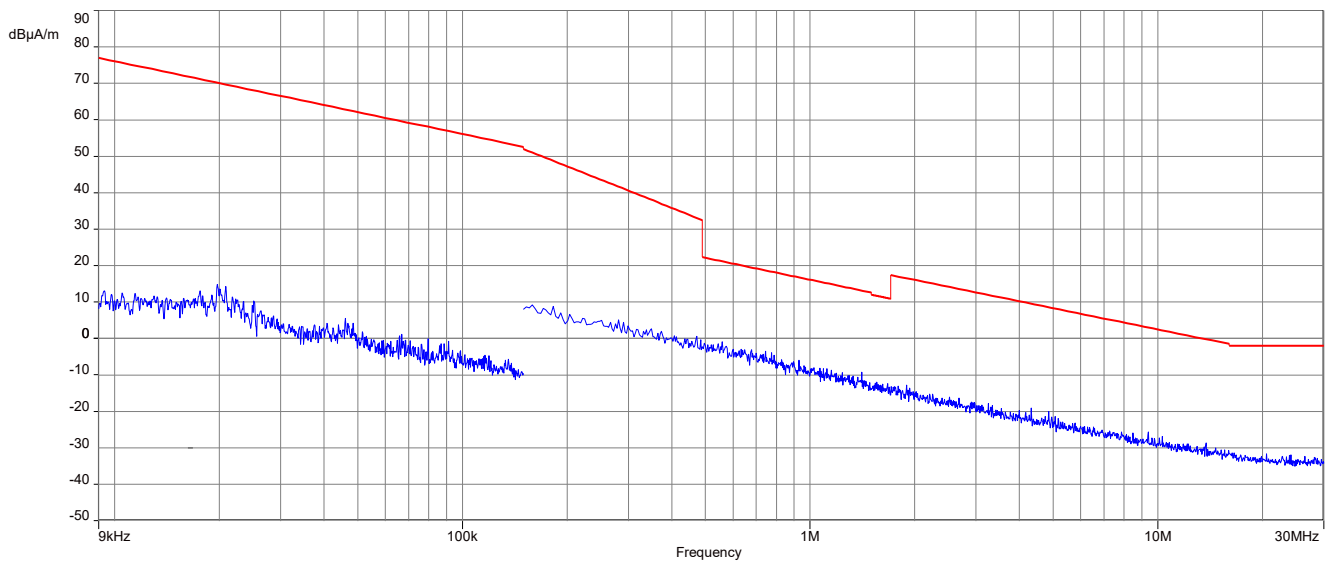
Plot 8: tx@425.6125 MHz, high power, IC



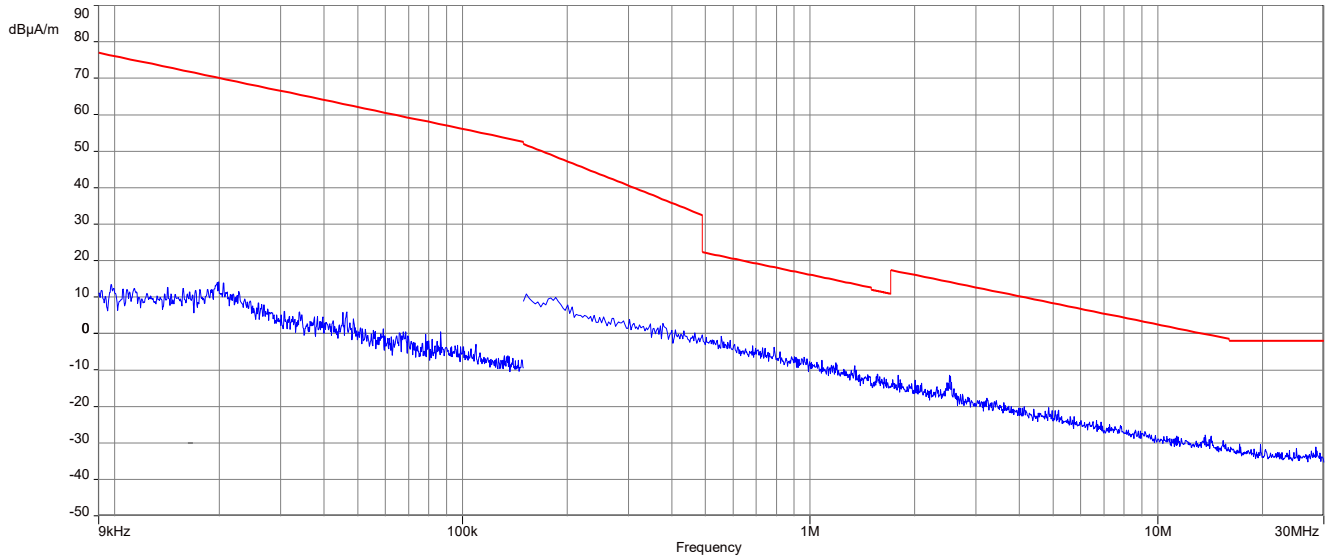
Plot 9: tx@429.9875 MHz, high power, IC



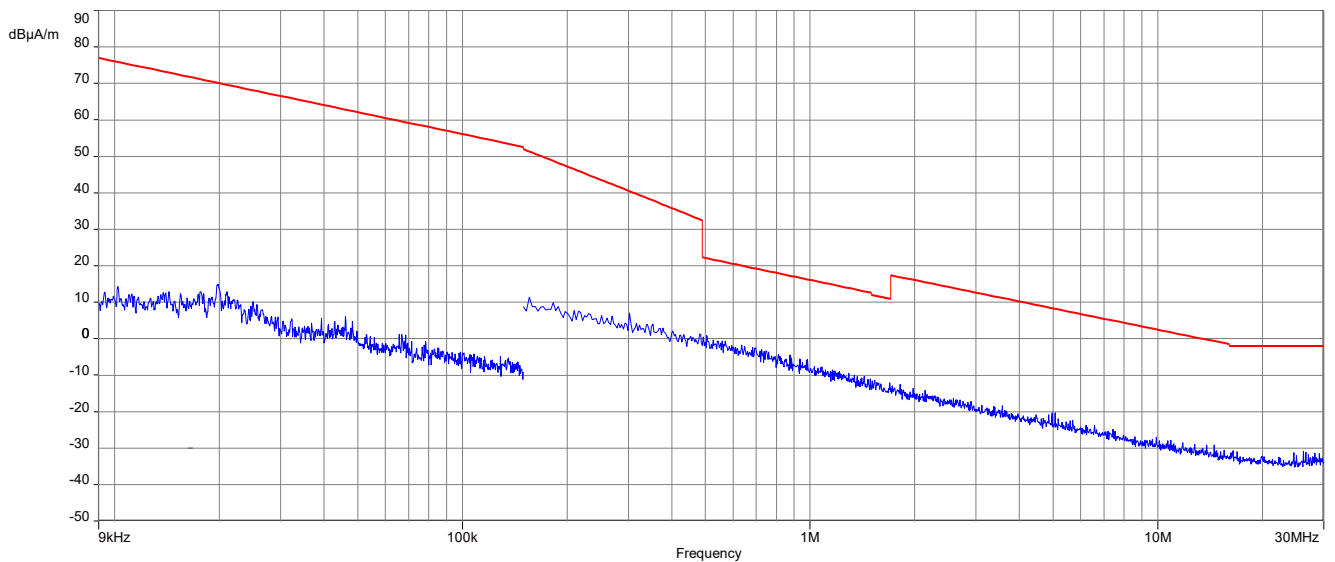
Plot 10: tx@450.0125 MHz, high power, IC



Plot 11: tx@460.0000 MHz, high power, IC



Plot 12: tx@469.9875 MHz, high power, IC



13.11 Receiver spurious emissions (radiated)

Measurement:

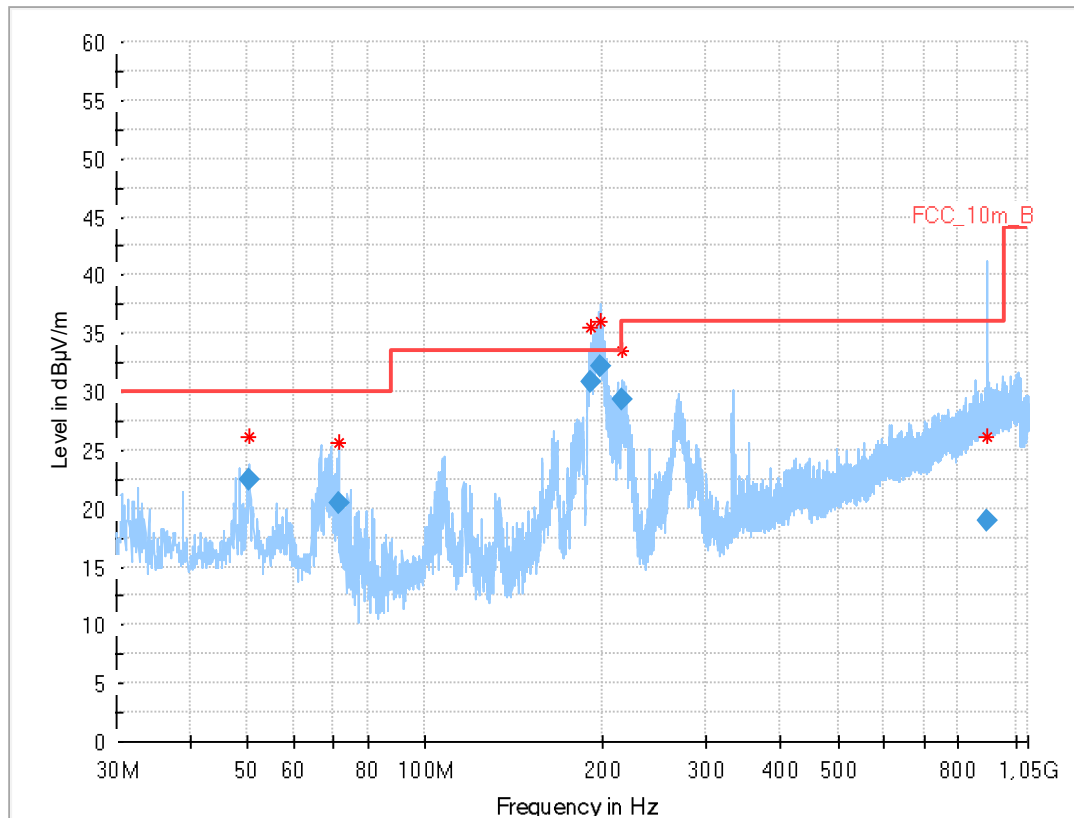
Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Video bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Resolution bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Span:	See plots
Trace-Mode:	Max. hold

Limits:

FCC		IC
FCC 47 CFR § 15.209		RSS-GEN Issue 5 Section 6
Receiver Spurious Emission (radiated)		
Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

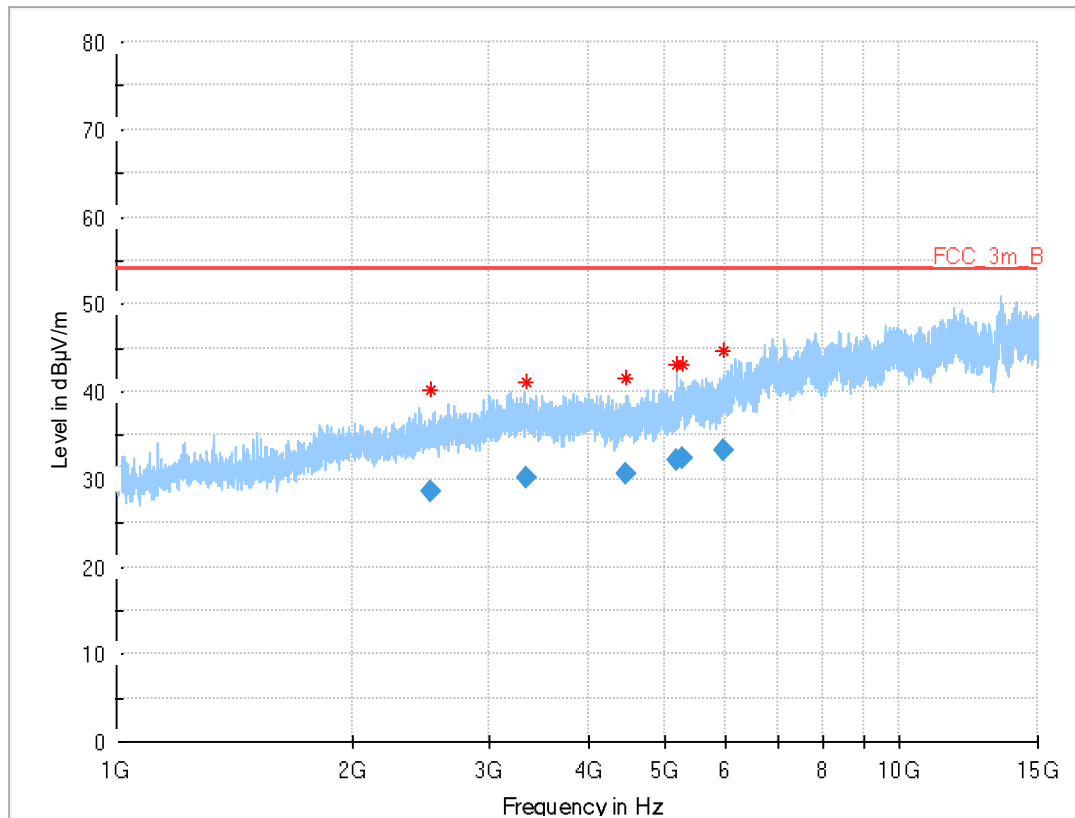
Result: see table below plots

Plot 1: 30 MHz – 1 GHz

**Final_Result:**

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
50.431	22.46	30.0	7.5	1000	120.0	175.0	V	158	15
71.573	20.41	30.0	9.6	1000	120.0	236.0	V	0	10
190.538	30.76	33.5	2.7	1000	120.0	306.0	V	85	12
198.453	32.10	33.5	1.4	1000	120.0	100.0	V	182	12
214.776	29.27	33.5	4.2	1000	120.0	142.0	V	182	13
897.540	18.91	36.0	17.1	1000	120.0	131.0	H	225	25

Plot 2: 1 GHz – 15 GHz

**Final_Result:**

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)
2512.144	28.68	54.0	25.3	1000	1000.0	H	294	-4
3330.149	30.23	54.0	23.8	1000	1000.0	H	57	-2
4473.060	30.56	54.0	23.4	1000	1000.0	V	203	-2
5201.316	32.11	54.0	21.9	1000	1000.0	H	202	-1
5266.505	32.33	54.0	21.7	1000	1000.0	V	163	0
5969.537	33.20	54.0	20.8	1000	1000.0	V	102	1

13.12 Spurious emissions AC conducted < 30 MHz

Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The measurement is performed with the data rate producing the highest output power. Both power lines, phase and neutral line, are measured. Found peaks are remeasured with average and quasi peak detection to show compliance to the limits.

Measurement:

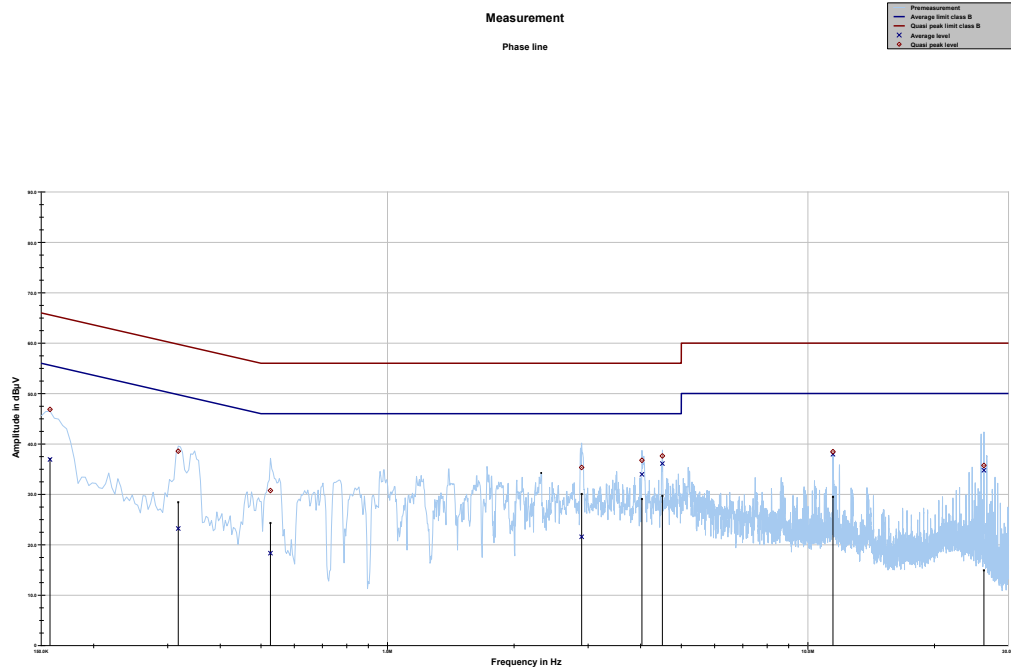
Measurement parameter	
Detector:	Peak - Quasi Peak / Average
Sweep time:	Auto
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold

Limits:

FCC		IC
TX Spurious Emissions Conducted < 30 MHz		
Frequency (MHz)	Quasi-Peak (dBµV/m)	Average (dBµV/m)
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30.0	60	50

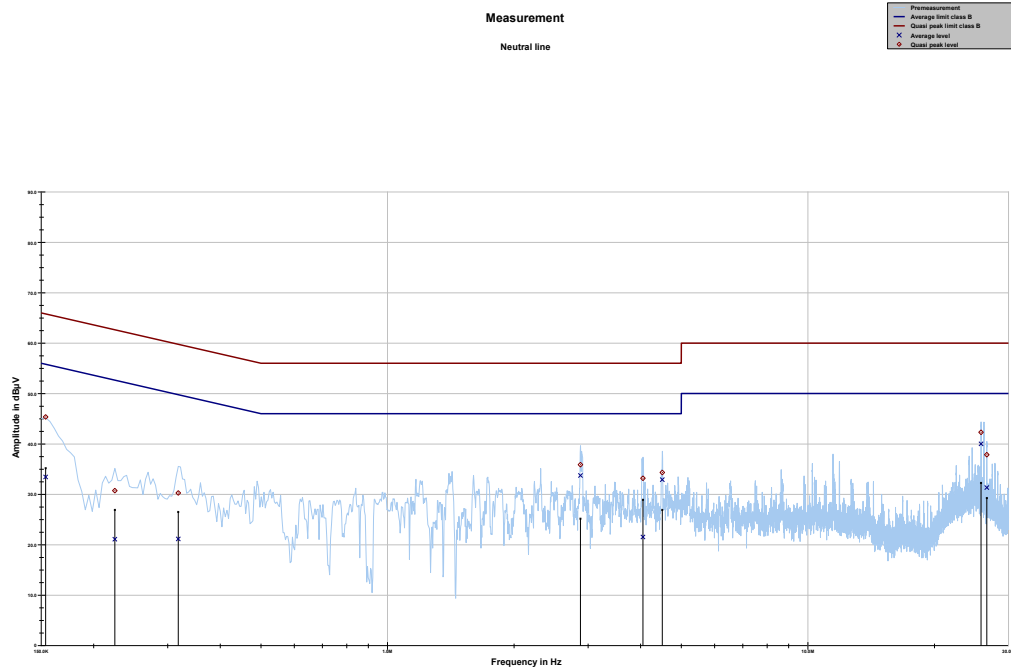
*Decreases with the logarithm of the frequency

Results: see table below plots

Plots:**Plot 1:** TX mode, 150 kHz to 30 MHz, phase line

Project ID: 1-6907/23-01-04

Frequency	Quasi peak level	Margin quasi peak	Limit QP	Average level	Margin average	Limit AV
MHz	dBμV	dB	dBμV	dBμV	dB	dBμV
0.157463	46.85	18.75	65.597	36.92	18.86	55.787
0.317906	38.57	21.20	59.761	23.21	27.99	51.203
0.526856	30.75	25.25	56.000	18.33	27.67	46.000
2.896200	35.33	20.67	56.000	21.56	24.44	46.000
4.030500	36.74	19.26	56.000	33.96	12.04	46.000
4.508100	37.62	18.38	56.000	36.11	9.89	46.000
11.474344	38.46	21.54	60.000	37.94	12.06	50.000
26.227706	35.73	24.27	60.000	34.76	15.24	50.000

Plot 2: TX mode, high power, 150 kHz to 30 MHz, neutral line

Frequency	Quasi peak level	Margin quasi peak	Limit QP	Average level	Margin Average	Limit AV
MHz	dBµV	dB	dBµV	dBµV	dB	dBµV
0.153731	45.36	20.44	65.796	33.45	22.44	55.893
0.224625	30.72	31.92	62.646	21.09	32.78	53.868
0.317906	30.27	29.50	59.761	21.16	30.05	51.203
2.877544	35.89	20.11	56.000	33.74	12.26	46.000
4.052887	33.19	22.81	56.000	21.54	24.46	46.000
4.504369	34.34	21.66	56.000	32.91	13.09	46.000
25.821000	42.30	17.70	60.000	40.01	9.99	50.000
26.649338	37.85	22.15	60.000	31.33	18.67	50.000

14 Glossary

AVG	Average
C	Compliant
C/N₀	Carrier to noise-density ratio, expressed in dB-Hz
CAC	Channel availability check
CW	Clean wave
DC	Duty cycle
DFS	Dynamic frequency selection
DSSS	Dynamic sequence spread spectrum
DUT	Device under test
EN	European Standard
ETSI	European Telecommunications Standards Institute
EMC	Electromagnetic Compatibility
EUT	Equipment under test
FCC	Federal Communications Commission
FCC ID	Company Identifier at FCC
FHSS	Frequency hopping spread spectrum
FVIN	Firmware version identification number
GNSS	Global Navigation Satellite System
GUE	GNSS User Equipment
HMN	Host marketing name
HVIN	Hardware version identification number
HW	Hardware
IC	Industry Canada
Inv. No.	Inventory number
MC	Modulated carrier
NA	Not applicable
NC	Not compliant
NOP	Non occupancy period
NP	Not performed
OBW	Occupied bandwidth
OC	Operating channel
OCW	Operating channel bandwidth
OFDM	Orthogonal frequency division multiplexing
OOB	Out of band
OP	Occupancy period
PER	Packet error rate
PMN	Product marketing name
PP	Positive peak
QP	Quasi peak
RLAN	Radio local area network
S/N or SN	Serial number
SW	Software
UUT	Unit under test
WLAN	Wireless local area network

15 Document history

Version	Applied changes	Date of release
-/-	Initial release	2024-11-04

END OF TEST REPORT