

4.2.1.2 Requirement (RSS-247; 6.2)

Frequency band 5150-5250 MHz

LE-LAN devices are restricted to indoor operation only in the band 5150-5250 MHz. The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

Frequency band 5250-5350 MHz

The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;

The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Frequency bands 5470-5600 MHz and 5650-5725 MHz

The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Frequency band 5725-5850 MHz

The maximum conducted output power shall not exceed 1 W. The output power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint^{Footnote3} systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

4.2.2 Procedure

The Procedure, described in the FCC Publication 789033 D02 General U-NII Test Procedures New Rules v02r01, was used. Specifically, Section E (3) for Maximum Conducted Output Power.

The Procedure, described in the FCC Publication 789033 D02 General U-NII Test Procedures New Rules v02r01, was used. Specifically, procedure from Section F was utilized for Maximum Power Spectral Density (PSD).

Each antenna port of the EUT was connected to the input of a spectrum analyzer to measure the Maximum Conducted Transmitter Output Power & Peak Power Spectral Density (PPSD).

4.2.3 Test Results

Refer to the following plots for the test result:

Mode	Channel	Frequency MHz	99% OBW	Antenna Gain 1	Antenna Gain 2	Output Power Antenna 1	Output Power Antenna 2
			MHz	dBi	dBi	dBm	dBm
802.11a	36	5180	17.857	2	4.8	12.5	12.4
	44	5220	17.634	2	4.8	12.5	12.5
	48	5240	16.875	2	4.8	12.5	12.5
	52	5260	16.968	2	4.8	12.8	12.8
	60	5300	17.657	2.8	4.8	12.5	12.5
	64	5320	17.816	2.8	4.8	12.5	12.5
	100	5500	17.864	2.8	4.8	12.5	12.4
	116	5580	17.482	2.8	4.8	12.6	12.4
	140	5700	16.771	2.8	4.8	12.7	12.8
	144	5720	17.533	2.8	4.8	12.4	12.5
	149	5745	17.366	2.8	4.8	12.8	12.5
	157	5785	16.866	2.8	4.8	12.5	12.6
	165	5825	17.539	2.8	4.8	12.5	12.7
802.11n	36	5180	18.428	2	4.8	10.9	11.7
	44	5220	18.423	2	4.8	13.2	13.2
	48	5240	17.598	2	4.8	11.5	12.6
	52	5260	17.597	2.8	4.8	13.3	13.1
	60	5300	18.376	2.8	4.8	13.2	13.1
	64	5320	18.353	2.8	4.8	13.3	13.2
	100	5500	18.274	2.8	4.8	13.5	13.5
	116	5580	18.287	2.8	4.8	11.7	13.0
	140	5700	17.581	2.8	4.8	13.3	13.3
	144	5720	18.876	2.8	4.8	13.3	13.3
	149	5745	18.327	2.8	4.8	13.4	13.2
	157	5785	17.583	2.8	4.8	13.1	13.2
	165	5825	18.271	2.8	4.8	13.1	13.5
802.11n 40MHz BW	38	5190	36.763	2	4.8	13.1	13.0
	44	5230	36.703	2	4.8	13.0	13.0
	54	5270	36.796	2	4.8	13.1	13.1
	62	5310	36.672	2.8	4.8	13.1	13.1
	102	5510	36.736	2.8	4.8	13.1	13.0
	110	5550	36.813	2.8	4.8	13.0	13.0
	134	5670	36.781	2.8	4.8	13.1	13.1
	142	5710	36.683	2.8	4.8	13.1	13.1
	151	5755	36.813	2.8	4.8	13.0	13.1
	159	5795	36.763	2.8	4.8	13.0	13.1
802.11ac	36	5180	19.371	2	4.8	13.1	13.1
	44	5220	18.765	2	4.8	13.1	13.1
	48	5240	17.514	2	4.8	13.1	13.1
	52	5260	17.528	2	4.8	13.1	13.1
	60	5300	18.788	2.8	4.8	13.2	13.1

	64	5320	18.732	2.8	4.8	13.0	13.1
	100	5500	18.903	2.8	4.8	13.2	13.1
	116	5580	18.785	2.8	4.8	13.1	13.2
	140	5700	17.519	2.8	4.8	13.1	13.1
	144	5720	18.757	2.8	4.8	13.0	13.1
	149	5745	18.747	2.8	4.8	13.1	13.1
	157	5785	17.531	2.8	4.8	13.1	13.2
	165	5825	18.771	2.8	4.8	13.2	13.1
802.11ac 40MHz BW	38	5190	36.846	2	4.8	13.5	13.5
	44	5230	36.816	2	4.8	13.4	13.5
	54	5270	36.775	2	4.8	13.4	13.5
	62	5310	36.754	2.8	4.8	13.5	13.5
	102	5510	36.83	2.8	4.8	13.5	13.5
	110	5550	36.694	2.8	4.8	13.6	13.5
	134	5670	36.818	2.8	4.8	13.5	13.5
	144	5710	36.837	2.8	4.8	13.5	13.6
	151	5755	36.779	2.8	4.8	13.5	13.5
802.11ac 80MHz BW	159	5795	36.738	2.8	4.8	13.5	13.5
	42	5210	76.680	2	4.8	11.2	11.1
	58	5290	76.700	2	4.8	11.2	11.1
	106	5530	76.737	2.8	4.8	11.1	11.2
	122	5610	76.613	2.8	4.8	11.3	11.3
	138	5690	76.682	2.8	4.8	11.2	11.2
	155	5775	76.829	2.8	4.8	11.2	11.5

Mode	Channel	Frequency MHz	99% OBW	Output Power Sum	Output Power Limit	EIRP	EIRP Limit
			MHz	dBm	dBm	dBm	dBm
802.11a	36	5180	17.857	15.4	22.5	19.1	22.5
	44	5220	17.634	15.5	22.5	19.1	22.5
	48	5240	16.875	15.5	22.3	19.1	22.3
	52	5260	16.968	15.8	23.3	19.4	29.3
	60	5300	17.657	15.5	23.5	19.4	29.5
	64	5320	17.816	15.5	23.5	19.4	29.5
	100	5500	17.864	15.4	23.5	19.4	29.5
	116	5580	17.482	15.5	23.4	19.4	29.4
	140	5700	16.771	15.7	23.2	19.7	29.2
	144	5720	17.533	15.4	23.2	19.4	29.2
	149	5745	17.366	15.7	29.2	19.4	30
	157	5785	16.866	15.6	29.2	19.5	30
	165	5825	17.539	15.6	29.2	19.5	30
802.11n	36	5180	18.428	16.2	22.7	18.0	22.7
	44	5220	18.423	16.2	22.7	18.8	22.7
	48	5240	17.598	16.1	22.5	19.7	22.5
	52	5260	17.597	16.2	23.5	19.8	29.5
	60	5300	18.376	16.2	23.6	20.1	29.6
	64	5320	18.353	16.2	23.6	20.2	29.6
	100	5500	18.274	16.5	23.6	20.4	29.6

	116	5580	18.287	16.4	23.6	19.5	29.6
	140	5700	17.581	16.3	23.5	20.3	29.5
	144	5720	18.876	16.3	23.5	20.02	29.5
	149	5745	18.327	16.3	29.2	20.2	30
	157	5785	17.583	16.2	29.2	20.1	30
	165	5825	18.271	16.3	29.2	20.3	30
802.11n 40MHz BW	38	5190	36.763	16.0	23.0	19.7	23.0
	44	5230	36.703	16.0	23.0	19.7	23.0
	54	5270	36.796	16.1	24.0	19.7	30.0
	62	5310	36.672	16.1	24.0	19.7	30.0
	102	5510	36.736	16.0	24.0	20.0	30.0
	110	5550	36.813	16.0	24.0	20.0	30.0
	134	5670	36.781	16.1	24.0	20.0	30.0
	144	5710	36.683	16.1	24.0	20.0	30.0
	151	5755	36.813	16.1	29.2	20.0	30
	159	5795	36.763	16.1	29.2	20.0	30
802.11ac	36	5180	19.371	16.1	22.9	19.7	22.9
	44	5220	18.765	16.1	22.7	18.5	22.7
	48	5240	17.514	16.1	22.4	19.7	22.4
	52	5260	17.528	16.1	23.4	19.7	22.4
	60	5300	18.788	16.1	23.7	20.1	22.7
	64	5320	18.732	16.1	23.7	20.0	22.7
	100	5500	18.903	16.2	23.8	20.1	22.8
	116	5580	18.785	16.2	23.7	20.1	22.7
	140	5700	17.519	16.1	23.4	20.0	22.4
	144	5720	18.757	16.0	23.4	20.1	22.4
	149	5745	18.747	16.1	29.2	20.0	30
	157	5785	17.531	16.1	29.2	20.0	30
	165	5825	18.771	16.1	29.2	20.1	30
	38	5190	36.846	16.4	23.0	20.1	23.0
802.11ac 40MHz BW	44	5230	36.816	16.4	24.0	20.1	30.0
	54	5270	36.775	16.5	24.0	20.1	30.0
	62	5310	36.754	16.5	24.0	20.1	30.0
	102	5510	36.83	16.5	24.0	20.4	30.0
	110	5550	36.694	16.5	24.0	20.4	30.0
	134	5670	36.818	16.5	29.2	20.4	30
	144	5710	36.837	16.5	24.0	20.4	30.0
	151	5755	36.779	16.5	29.2	20.4	30
	159	5795	36.738	16.4	29.2	20.4	30
	42	5210	76.680	14.1	23.0	17.7	23.0
802.11ac 80MHz BW	58	5290	76.700	14.2	24.0	17.8	30.0
	106	5530	76.737	14.1	24.0	18.1	30.0
	122	5610	76.613	14.3	24.0	17.9	30.0
	138	5690	76.682	14.2	24.0	18.1	30.0
	155	5775	76.829	14.3	29.2	18.3	30

Mode	Channel	Frequency MHz	99% OBW	Antenna Gain	Antenna Gain	PSD Antenna 1	PSD Antenna 2
			MHz	dBi	dBi	dBm	dBm
802.11a	36	5180	17.857	2	4.8	1.95	3.35
	40	5220	17.634	2	4.8	1.91	3.26
	48	5240	16.875	2	4.8	2.26	3.08
	52	5260	16.968	2	4.8	2.03	3.27
	60	5300	17.657	2.8	4.8	2.27	3.21
	64	5320	17.816	2.8	4.8	2.16	3.26
	100	5500	17.864	2.8	4.8	2.77	3.89
	116	5580	17.482	2.8	4.8	3.03	3.90
	140	5700	16.771	2.8	4.8	3.56	3.66
	144	5720	17.533	2.8	4.8	3.06	4.02
	149	5745	17.366	2.8	4.8	2.84	3.81
	157	5785	16.866	2.8	4.8	2.91	3.58
	165	5825	17.539	2.8	4.8	3.13	3.52
802.11n	36	5180	18.428	2	4.8	2.35	3.52
	40	5220	18.423	2	4.8	2.71	3.16
	48	5240	17.598	2	4.8	2.39	3.45
	52	5260	17.597	2	4.8	2.35	3.81
	60	5300	18.376	2.8	4.8	2.64	4.22
	64	5320	18.353	2.8	4.8	3.07	4.21
	100	5500	18.274	2.8	4.8	3.33	4.13
	116	5580	18.287	2.8	4.8	2.95	3.63
	140	5700	17.581	2.8	4.8	4.17	3.92
	144	5720	18.876	2.8	4.8	3.06	4.02
	149	5745	18.327	2.8	4.8	3.52	4.48
	157	5785	17.583	2.8	4.8	3.44	4.01
	165	5825	18.271	2.8	4.8	3.28	4.23
802.11n 40MHz BW	38	5190	36.763	2	4.8	-0.08	0.76
	46	5210	36.703	2	4.8	-0.28	0.48
	54	5270	36.796	2	4.8	-0.71	0.57
	62	5310	36.672	2.8	4.8	-0.52	0.78
	102	5510	36.736	2.8	4.8	0.39	0.94
	110	5550	36.813	2.8	4.8	0.47	0.13
	134	5670	36.781	2.8	4.8	0.87	0.73
	142	5710	36.683	2.8	4.8	0.9	0.86
	151	5755	36.813	2.8	4.8	0.46	0.78
	159	5795	36.763	2.8	4.8	0.51	1.17
802.11ac	36	5180	19.371	2	4.8	2.12	3.87
	44	5220	18.765	2	4.8	1.73	3.44
	48	5240	17.514	2	4.8	2.80	3.46
	52	5260	17.528	2	4.8	2.10	3.54
	60	5300	18.788	2.8	4.8	2.61	3.84
	64	5320	18.732	2.8	4.8	2.47	3.92
	100	5500	18.903	2.8	4.8	3.17	3.96
	116	5580	18.785	2.8	4.8	3.73	3.81
	140	5700	17.519	2.8	4.8	3.77	4.17
	144	5720	18.757	2.8	4.8	3.01	3.55
	149	5745	18.747	2.8	4.8	3.33	3.91

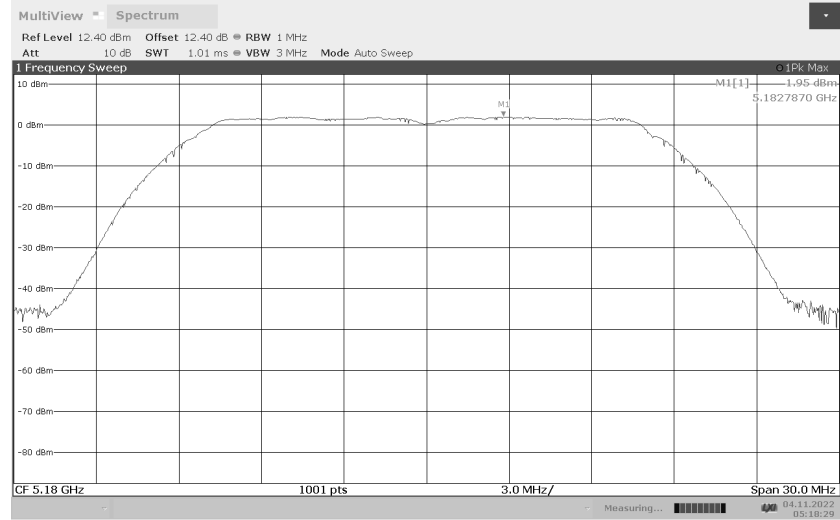
	157	5785	17.531	2.8	4.8	3.18	4.48
	165	5825	18.771	2.8	4.8	3.28	3.84
802.11ac 40MHz BW	38	5190	36.846	2	4.8	0.91	1.40
	44	5230	36.816	2	4.8	1.19	1.81
	54	5270	36.775	2	4.8	0.90	1.79
	62	5310	36.754	2.8	4.8	1.06	2.02
	102	5510	36.83	2.8	4.8	1.27	2.31
	110	5550	36.694	2.8	4.8	1.87	2.45
	134	5670	36.818	2.8	4.8	1.87	2.24
	142	5710	36.837	2.8	4.8	1.68	1.87
	151	5755	36.779	2.8	4.8	1.62	2.23
	159	5795	36.738	2.8	4.8	1.75	2.62
802.11ac 80MHz BW	42	5210	76.680	2	4.8	-3.66	-4.61
	58	5290	76.700	2	4.8	-3.43	-3.71
	106	5530	76.737	2.8	4.8	-3.25	-3.66
	122	5610	76.613	2.8	4.8	-3.75	-3.16
	138	5690	76.682	2.8	4.8	-3.44	-3.66
	155	5775	76.829	2.8	4.8	-3.79	-3.71

Mode	Channel	Frequency MHz	99% OBW	PSD Sum	PSD Limit	PSD EIRP	PSD EIRP Limit
			MHz	dBm	dBm	dBm	dBm
802.11a	36	5180	17.857	5.7	10	9.5	10
	44	5220	17.634	5.6	10	9.5	10
	48	5240	16.875	5.7	10	9.4	10
	52	5260	16.968	5.7	11	9.5	11
	60	5300	17.657	5.8	11	9.8	11
	64	5320	17.816	5.8	11	9.8	11
	100	5500	17.864	6.4	11	10.4	11
	116	5580	17.482	6.5	11	10.5	11
	140	5700	16.771	6.6	11	10.5	11
	144	5720	17.533	5.9	11	9.9	11
	149	5745	17.366	6.4	29.2	10.4	30
	157	5785	16.866	6.3	29.2	10.3	30
	165	5825	17.539	6.3	29.2	10.0	30
802.11n	36	5180	18.428	6.0	10	9.8	11
	44	5220	18.423	6.0	10	9.6	11
	48	5240	17.598	6.0	10	9.7	11
	52	5260	17.597	6.2	11	10.0	11
	60	5300	18.376	6.5	11	10.6	11
	64	5320	18.353	6.7	11	10.7	11
	100	5500	18.274	6.8	11	10.8	11
	116	5580	18.287	6.3	11	10.3	11
	140	5700	17.581	7.1	11	10.9	11
	144	5720	18.876	6.6	11	10.6	11
	149	5745	18.327	7.0	29.2	11.1	30
	157	5785	17.583	6.7	29.2	10.7	30
	165	5825	18.271	6.8	29.2	10.6	30
802.11n 40MHz BW	38	5190	36.763	3.4	10	7.1	11
	46	5210	36.703	3.1	10	6.9	11
	54	5270	36.796	3.0	11	6.8	11
	62	5310	36.672	3.2	11	7.0	11
	102	5510	36.736	3.7	11	7.7	11
	110	5550	36.813	3.3	11	7.2	11
	134	5670	36.781	3.8	11	7.7	11
	142	5710	36.683	3.89	11	7.8	30
	151	5755	36.813	3.63	29.2	7.6	30
	159	5795	36.763	3.9	10	7.9	30
802.11ac	36	5180	19.371	6.1	10	9.98	11
	44	5220	18.765	5.7	10	9.6	11
	48	5240	17.514	6.2	10	9.9	11
	52	5260	17.528	5.9	11	9.7	11
	60	5300	18.788	6.3	11	10.3	11
	64	5320	18.732	6.3	11	10.3	11
	100	5500	18.903	6.6	11	10.6	11
	116	5580	18.785	6.8	11	10.7	11
	140	5700	17.519	7.0	11	10.9	11
	144	5720	18.757	6.3	11	10.3	11
	149	5745	18.747	6.6	29.2	10.6	30
	157	5785	17.531	6.9	29.2	10.9	30
	165	5825	18.771	6.6	29.2	10.3	30

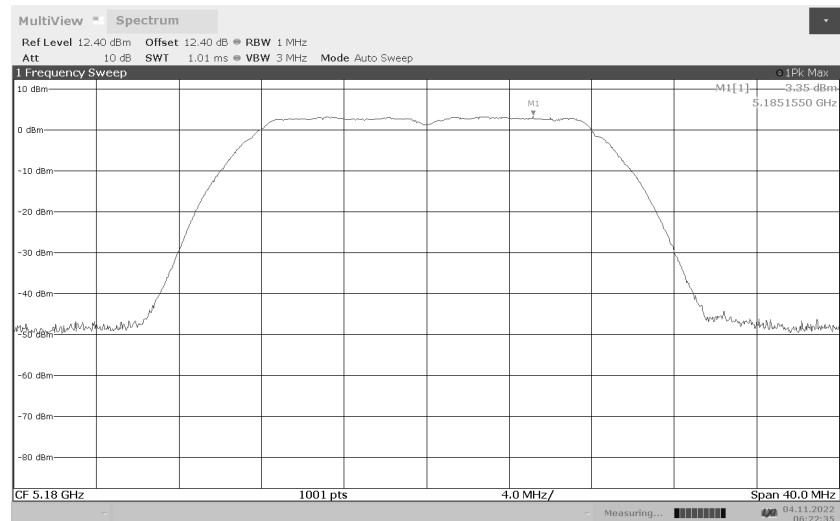
802.11ac 40MHz BW	38	5190	36.846	4.2	10	7.9	11
	44	5230	36.816	4.5	10	8.2	11
	54	5270	36.775	4.4	11	8.1	11
	62	5310	36.754	4.6	11	8.3	11
	102	5510	36.83	4.8	11	8.9	11
	110	5550	36.694	5.2	11	9.2	11
	134	5670	36.818	5.1	11	9.0	11
	142	5710	36.837	4.79	11	8.7	11
	151	5755	36.779	4.95	29.2	8.9	30
	159	5795	36.738	5.2	29.2	9.2	30
802.11ac 80MHz BW	42	5210	76.680	-1.1	10	2.4	11
	58	5290	76.700	-0.6	11	3.0	11
	106	5530	76.737	-0.4	11	3.4	11
	122	5610	76.613	-0.4	11	3.5	11
	138	5690	76.682	-0.5	11	3.4	11
	155	5775	76.829	-3.7	29.2	1.1	30

Ant. 1

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11a 5180MHz

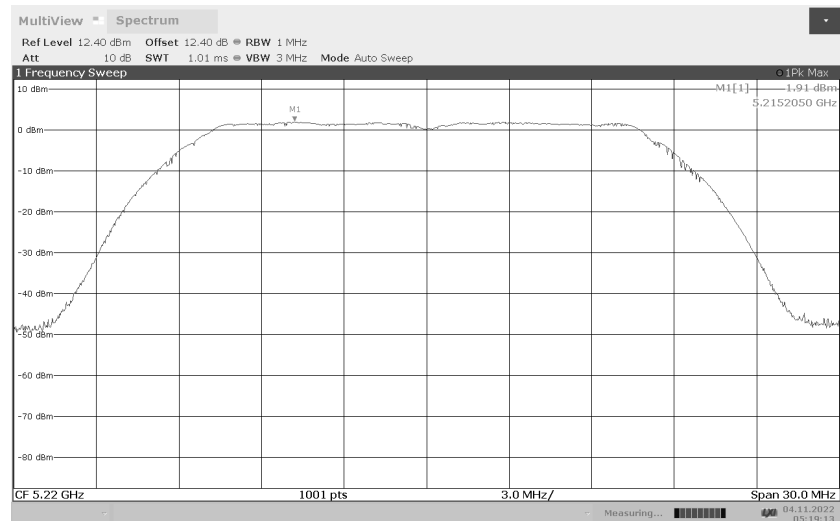


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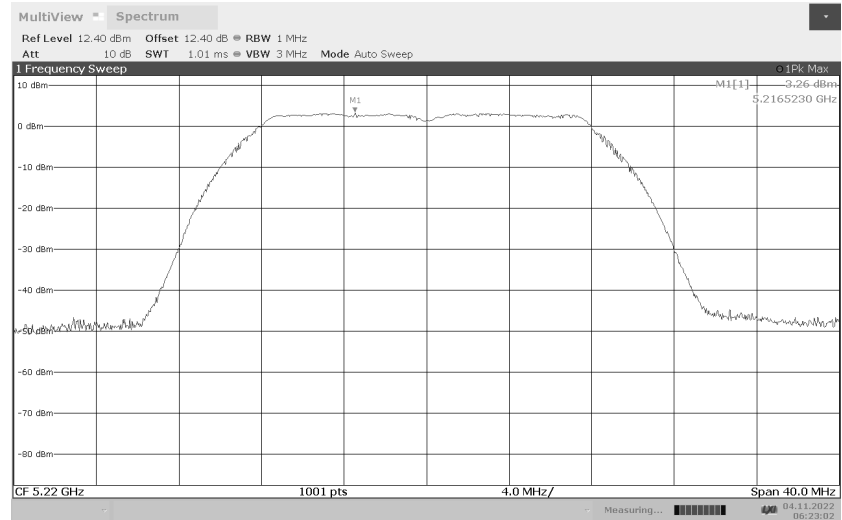


06:22:35 04.11.2022

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11a 5220MHz

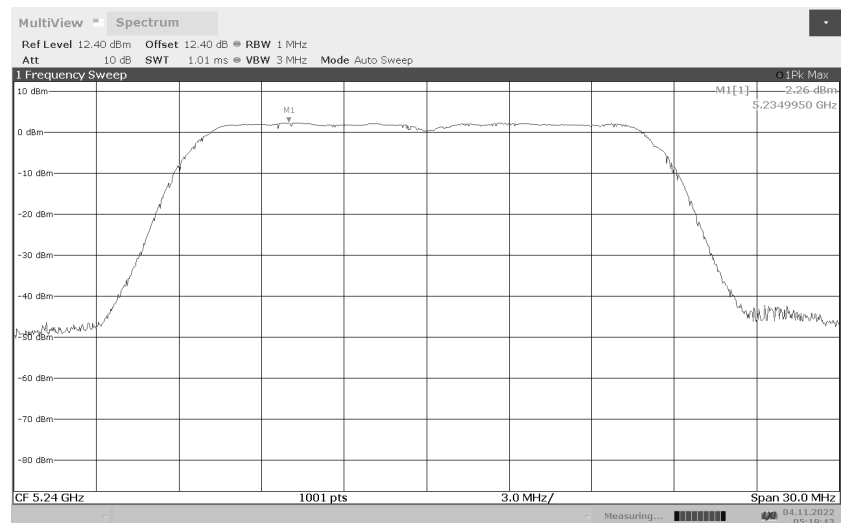


05:19:13 04.11.2022

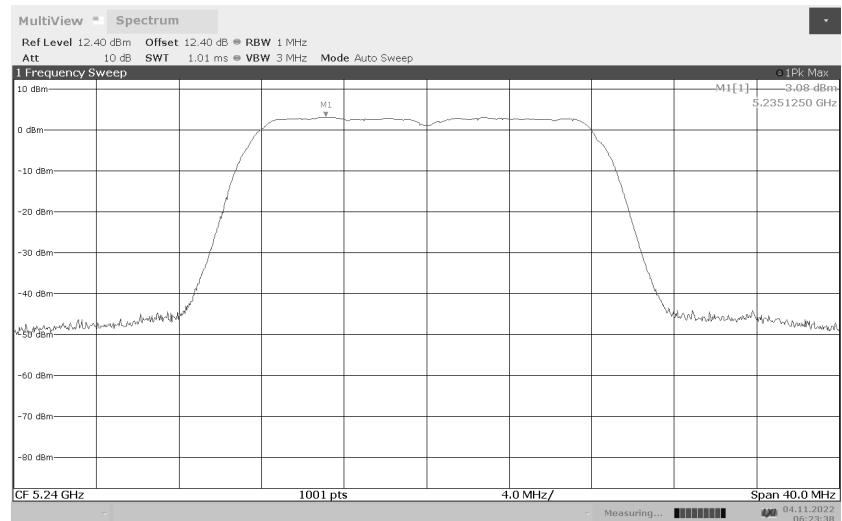


06:23:03 04.11.2022

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11a 5240MHz

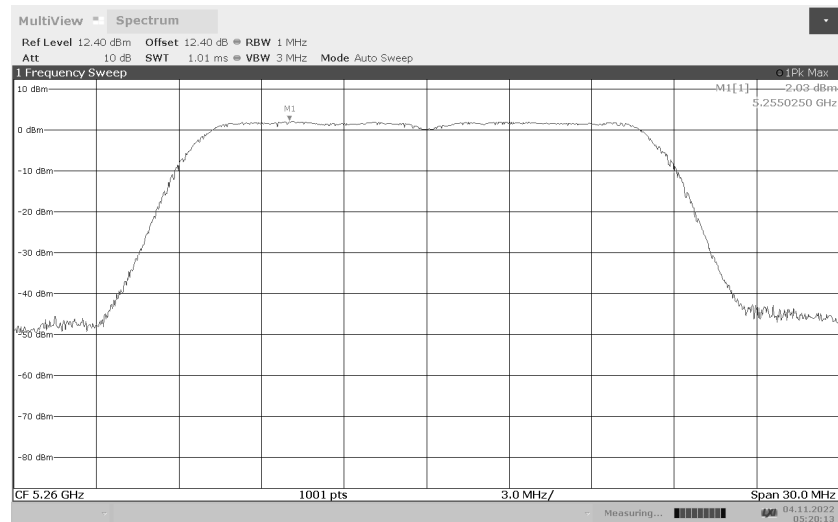


05:19:43 04.11.2022

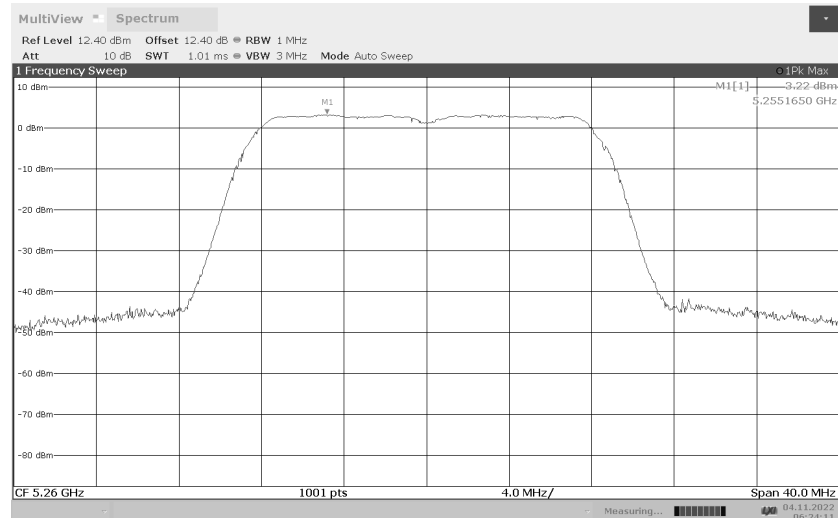


06:23:38 04.11.2022

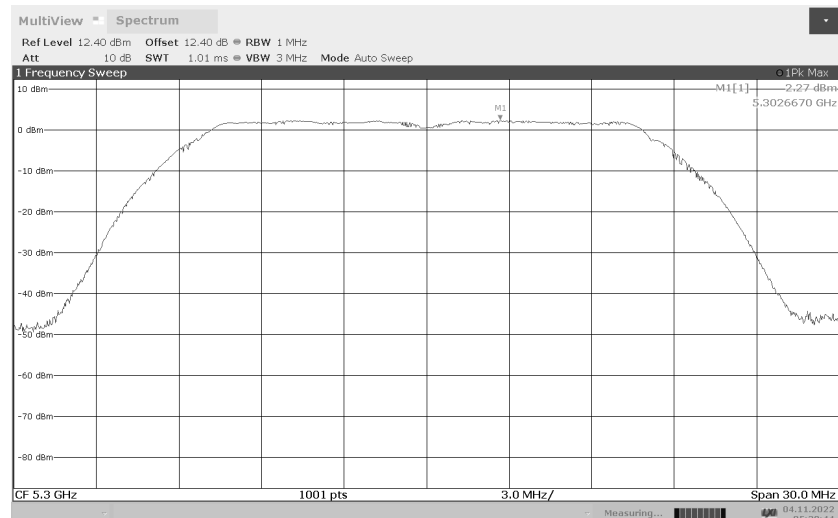
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11a 5260MHz



05:20:13 04.11.2022



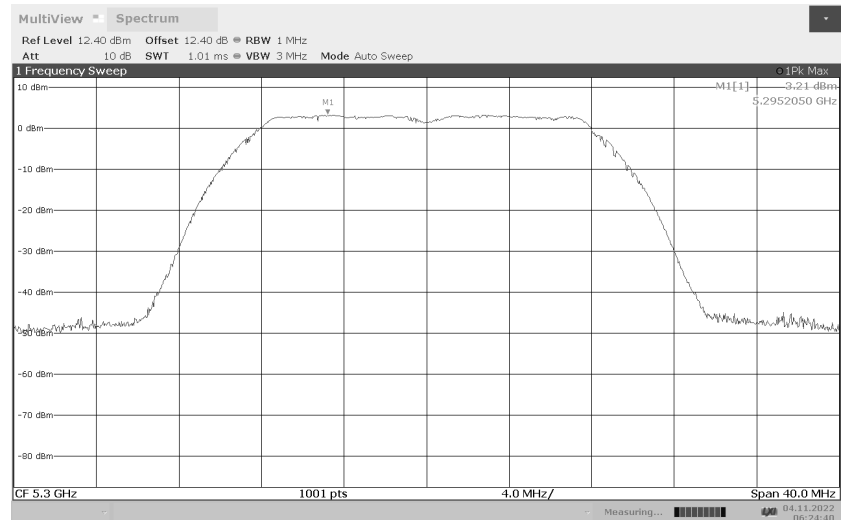
06:24:12 04.11.2022



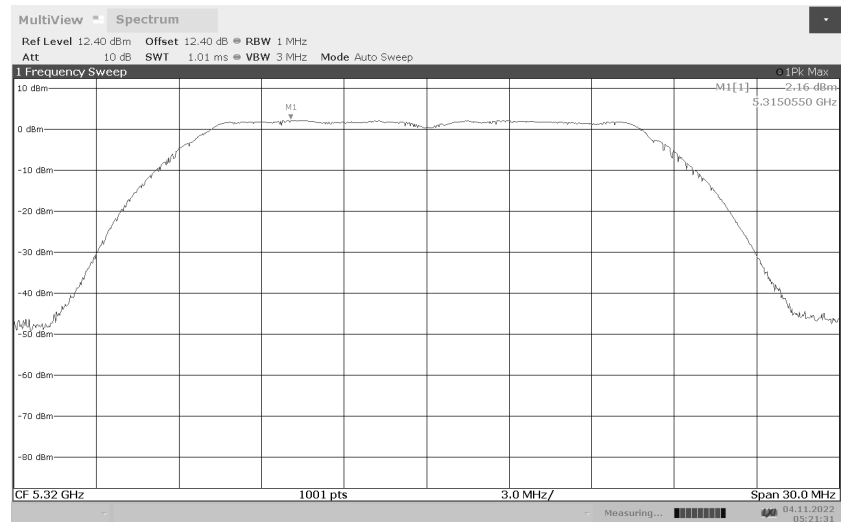
05:20:44 04.11.2022

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11a 5300MHz

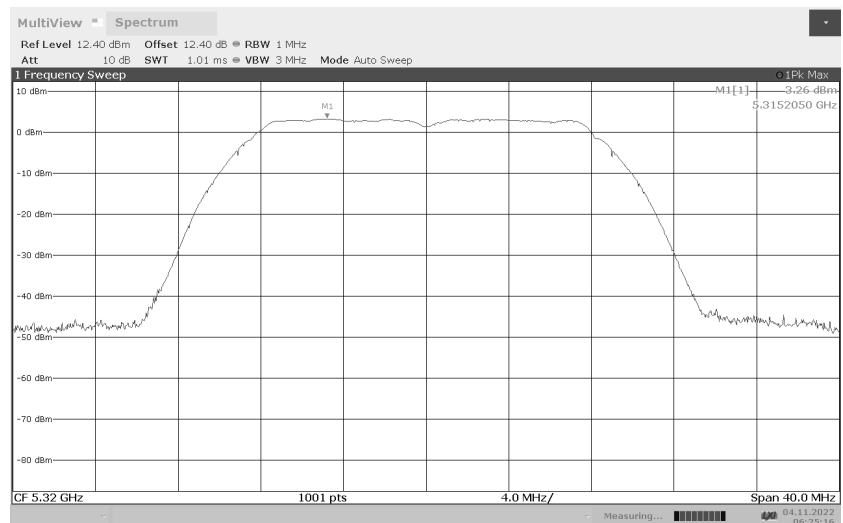
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11a 5320MHz



06:24:40 04.11.2022

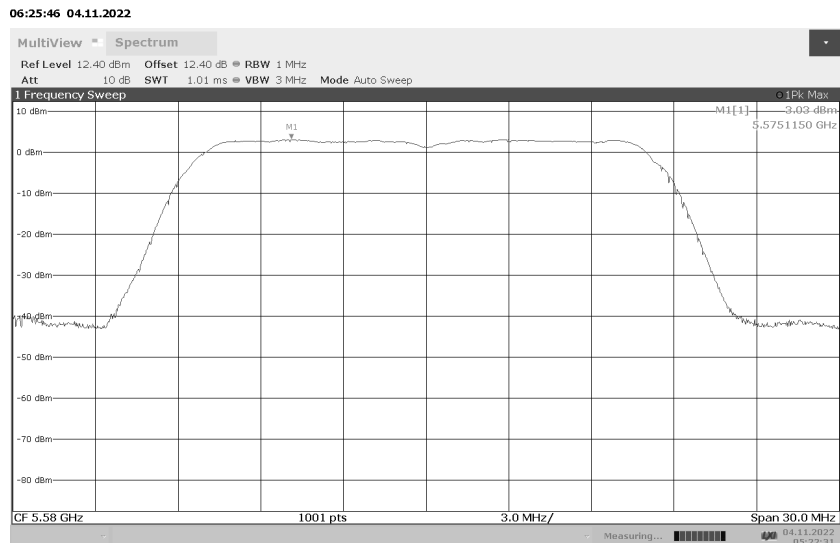
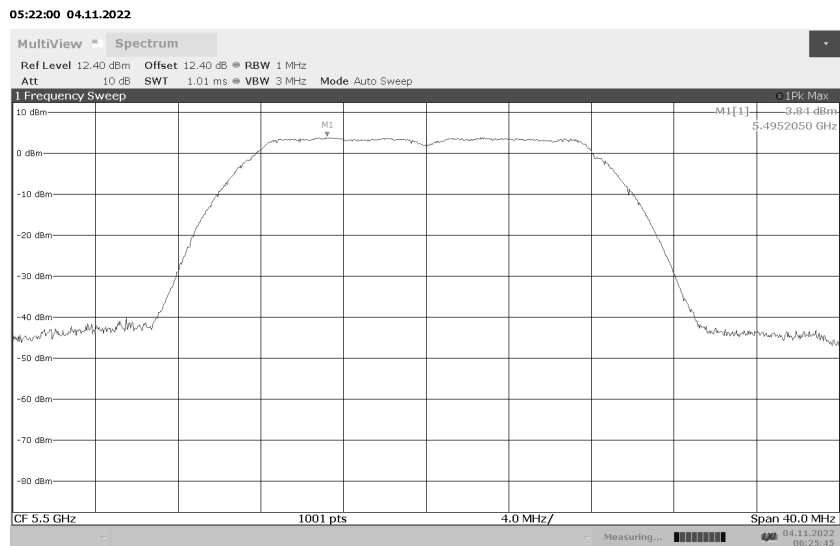
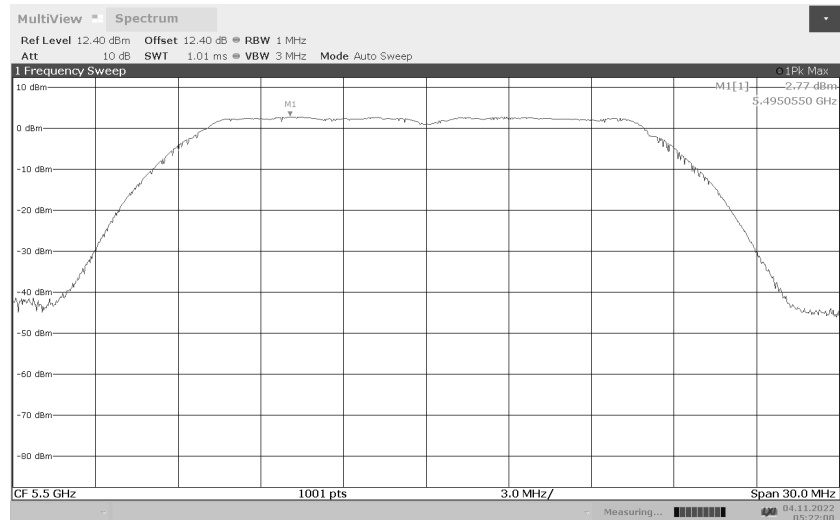


05:21:31 04.11.2022

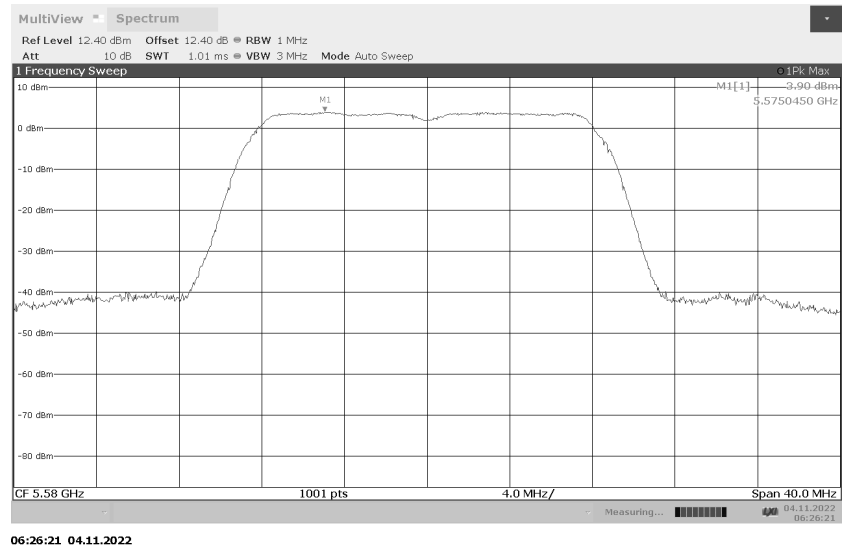


06:25:17 04.11.2022

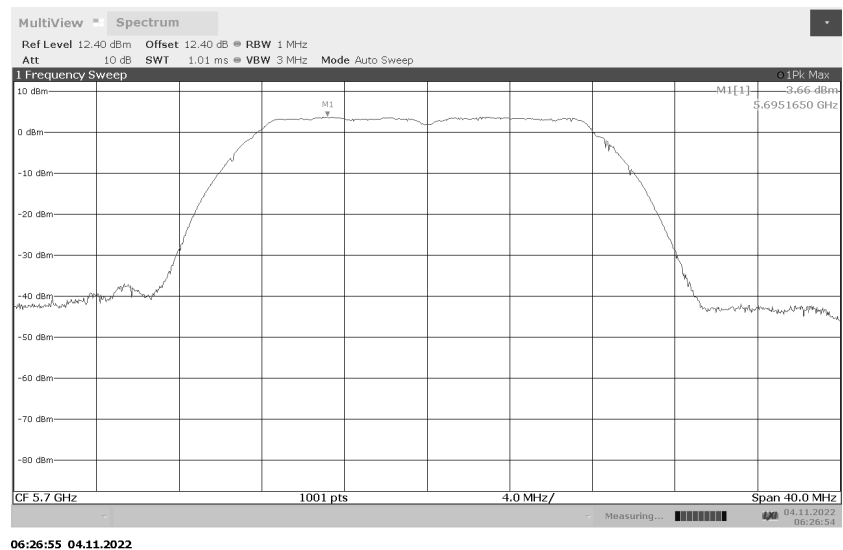
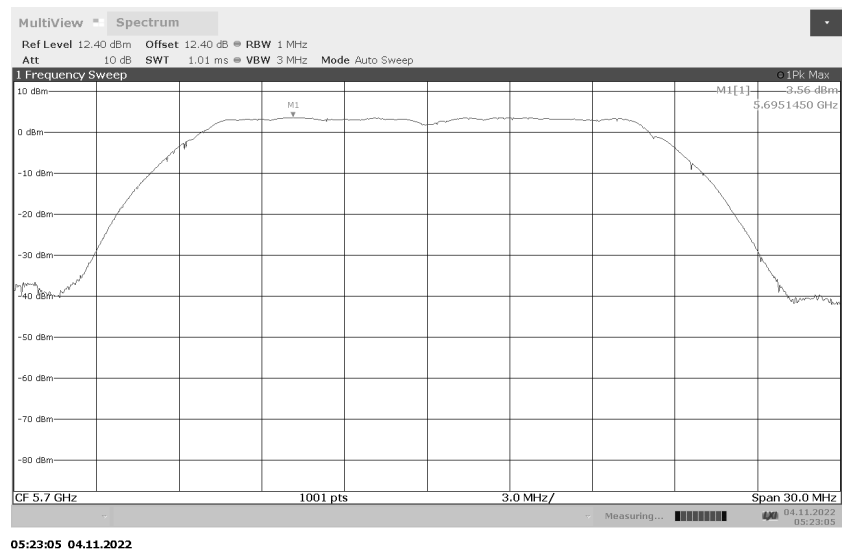
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11a 5500MHz



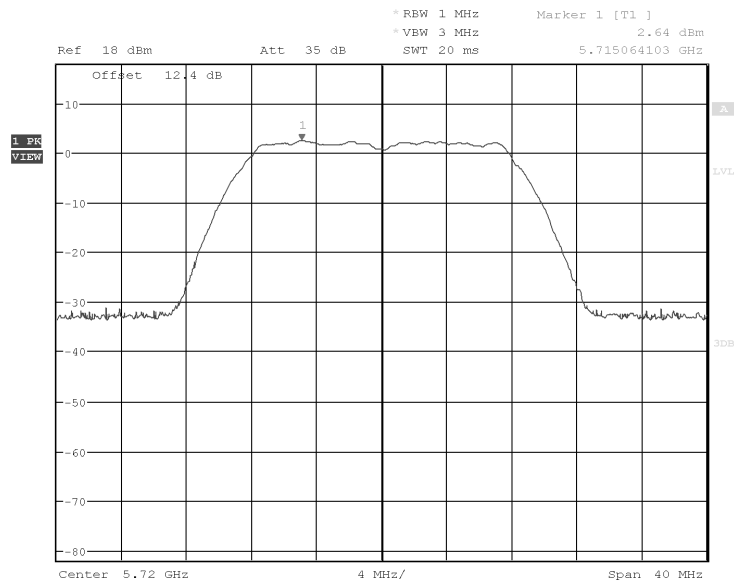
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11a 5580MHz



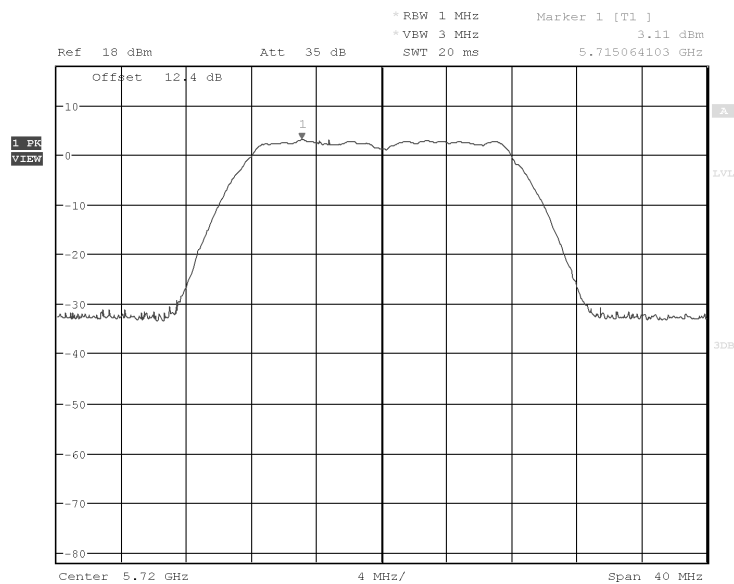
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11a 5700MHz



Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11a 5720MHz

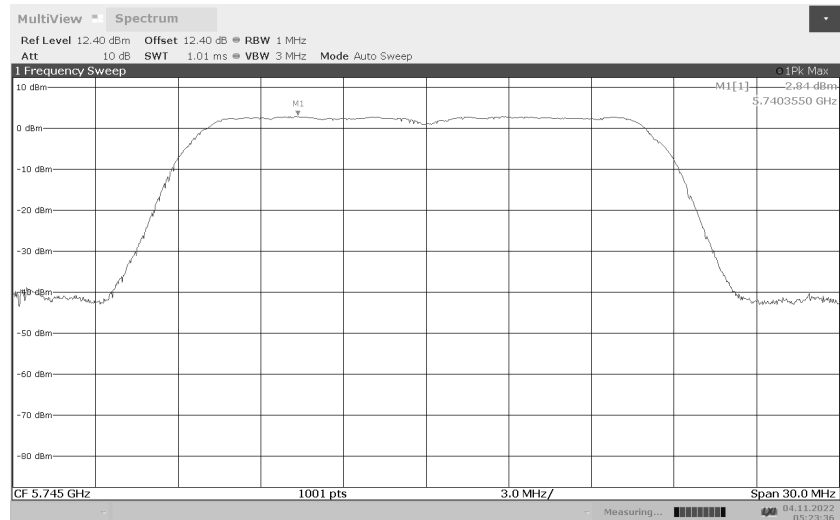


Date: 9.NOV.2022 20:51:34

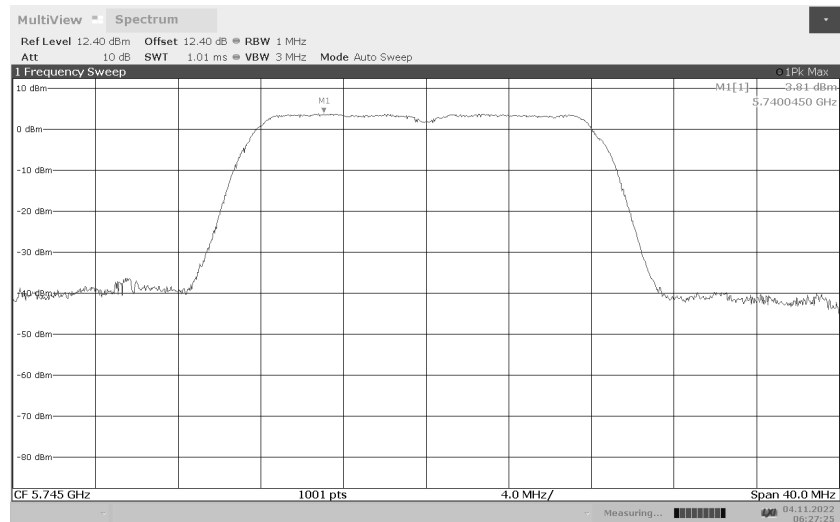


Date: 9.NOV.2022 20:44:38

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11a 5745MHz

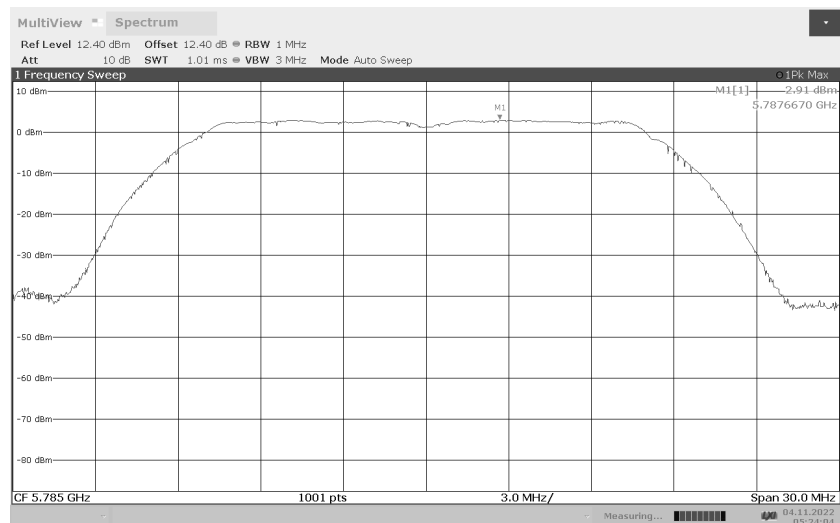


05:23:36 04.11.2022

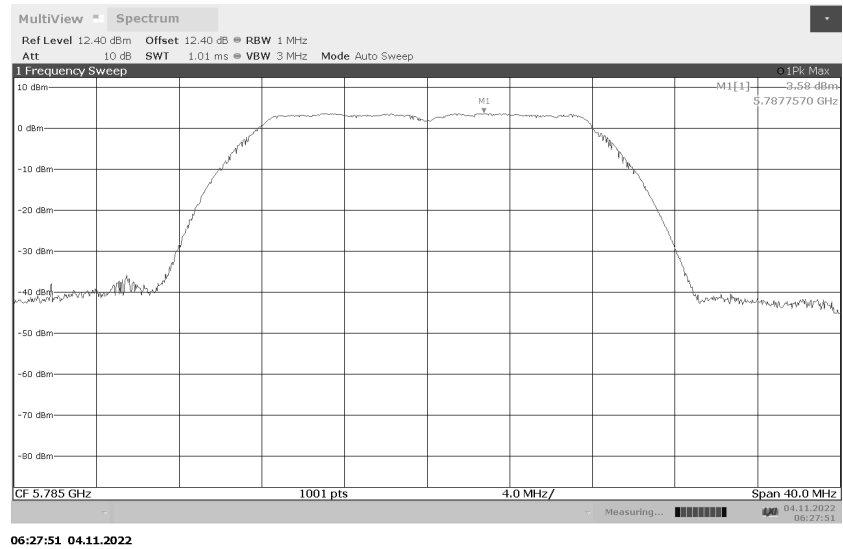


06:27:25 04.11.2022

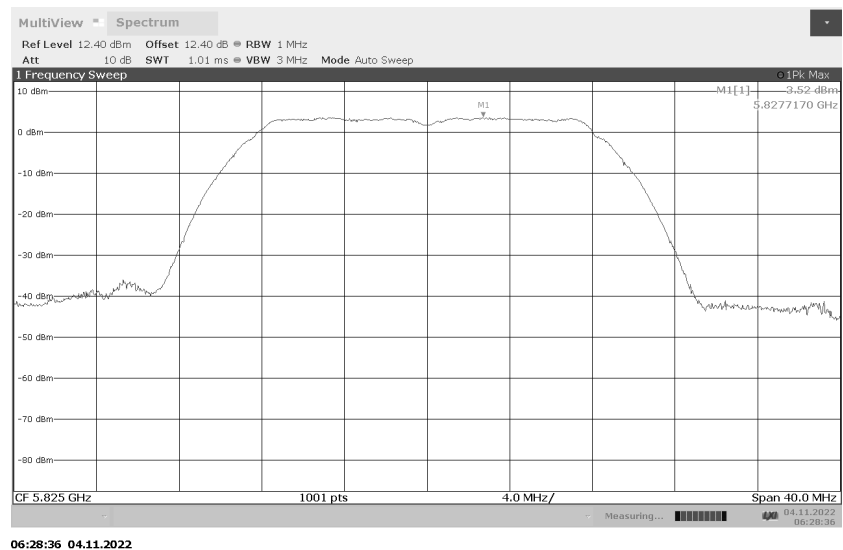
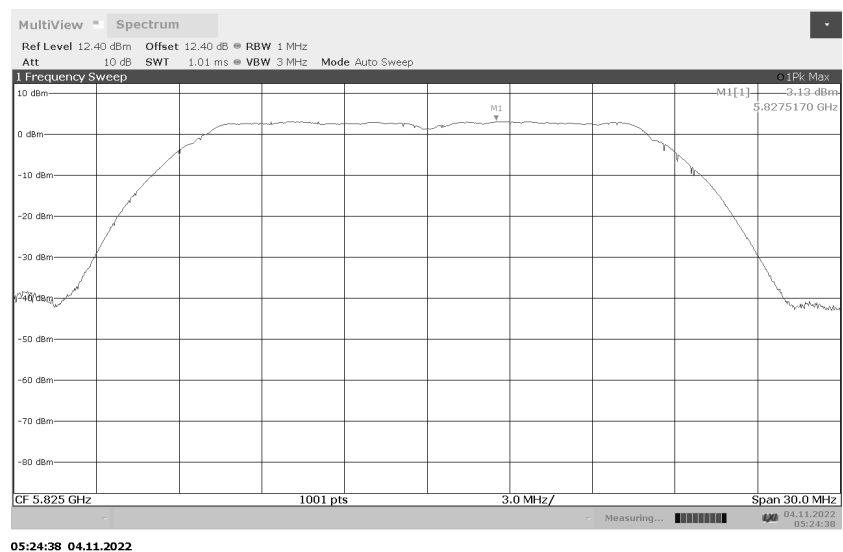
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11a 5785MHz



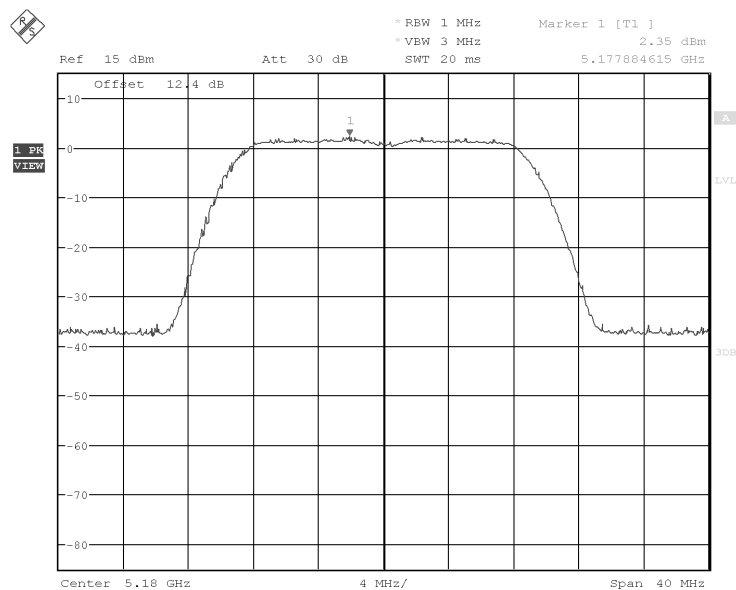
05:24:05 04.11.2022



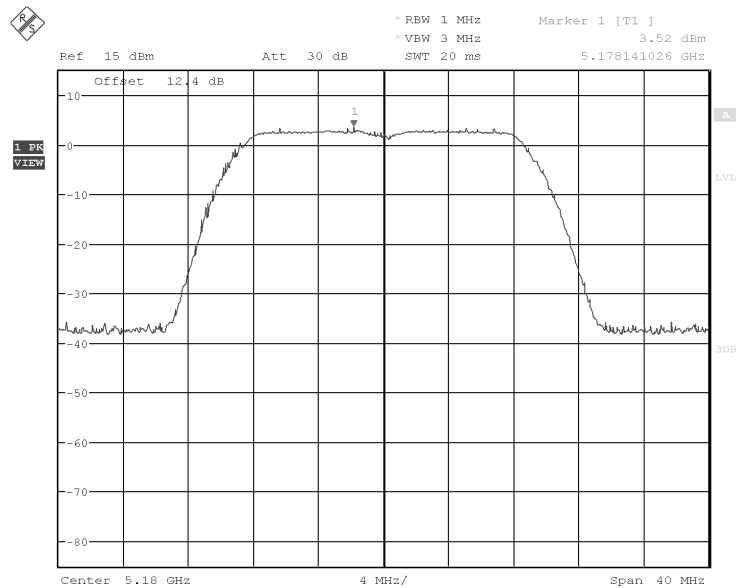
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11a 5825MHz



Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 5180MHz

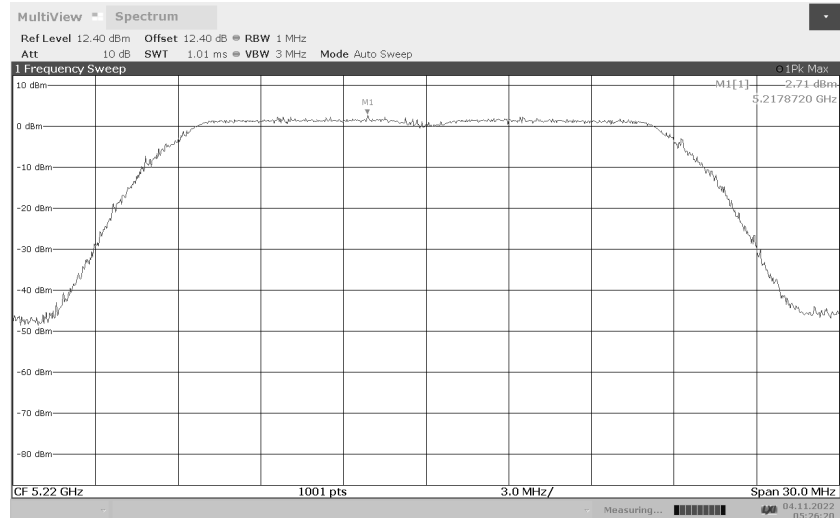


Date: 8.NOV.2022 00:40:15

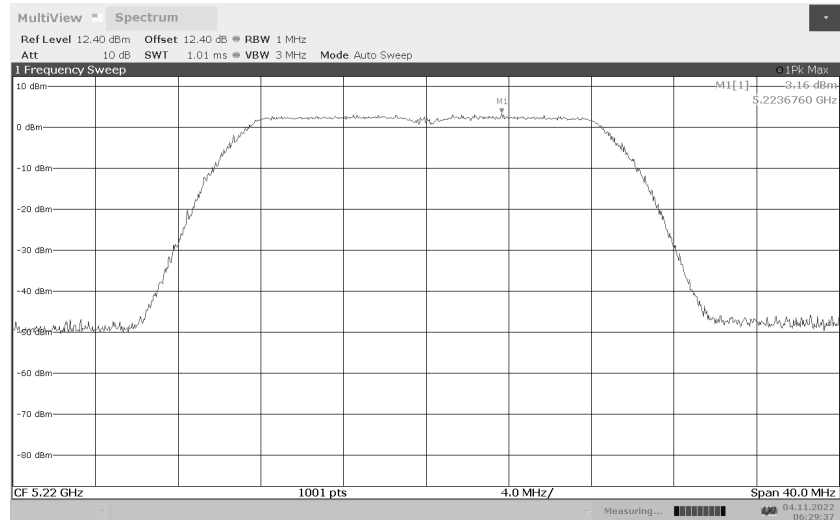


Date: 8.NOV.2022 00:44:29

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 5220MHz

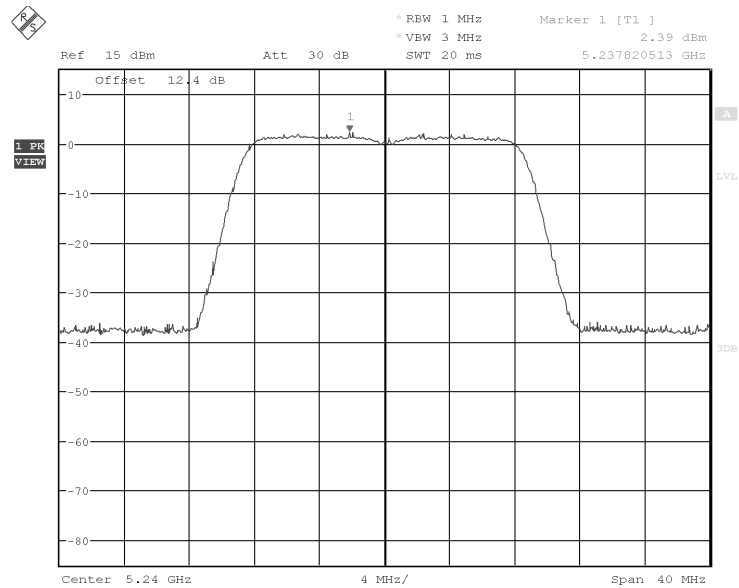


05:26:21 04.11.2022

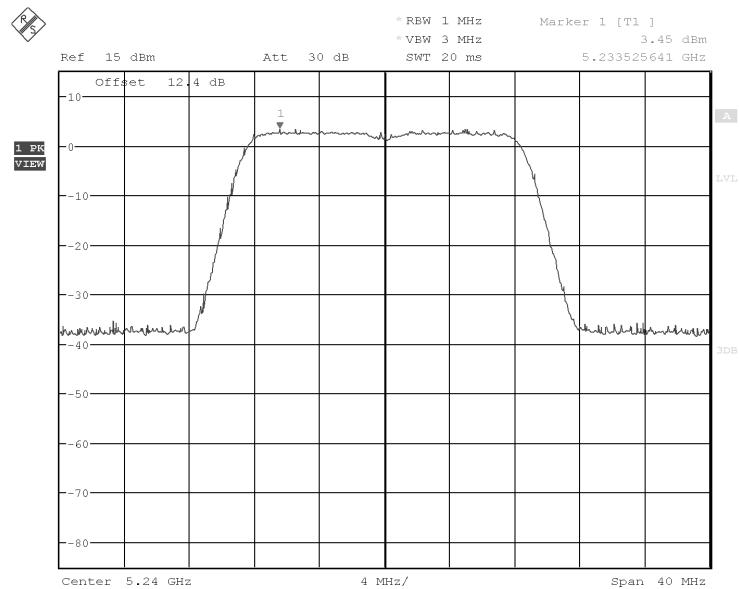


06:29:37 04.11.2022

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 5240MHz

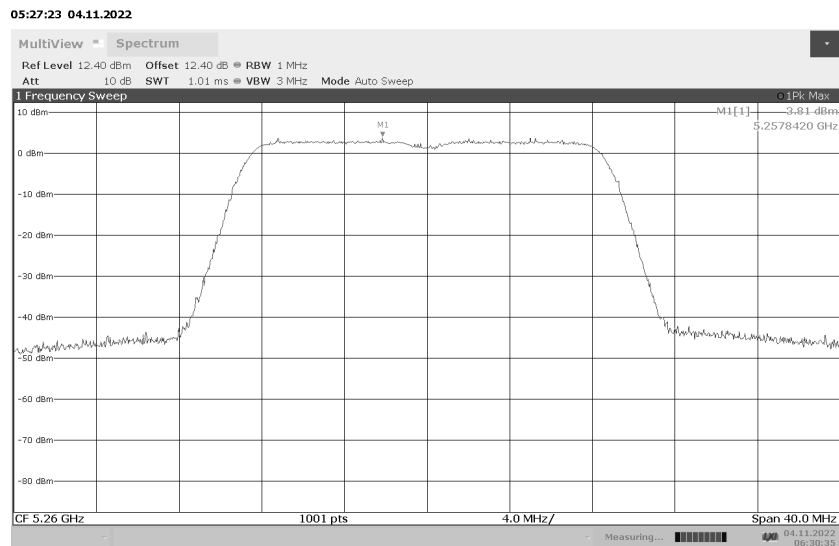
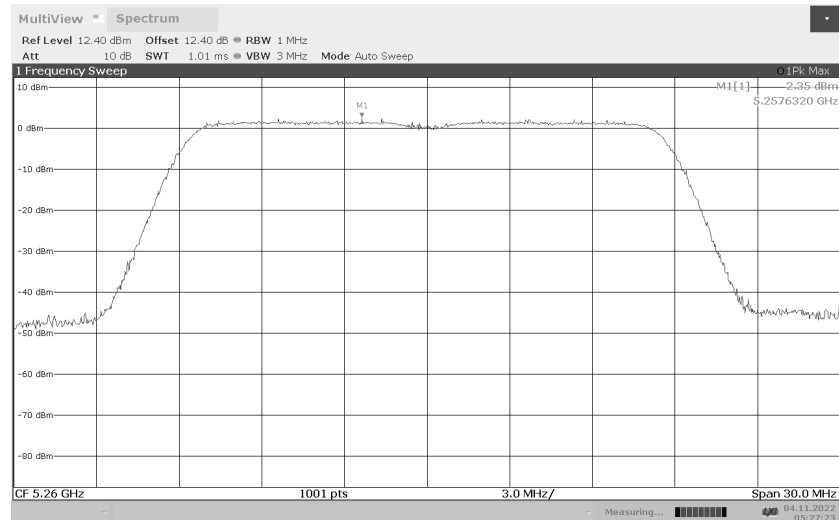


Date: 8.NOV.2022 00:37:06

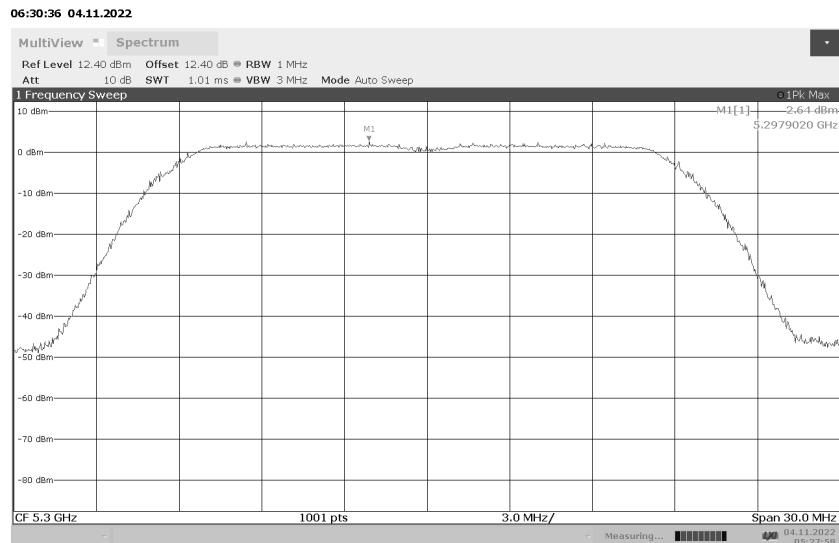


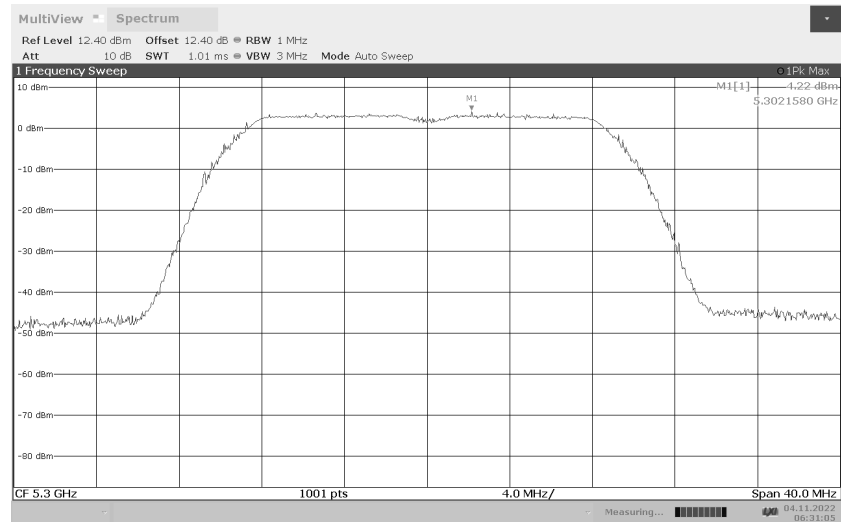
Date: 8.NOV.2022 00:45:34

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 5260MHz

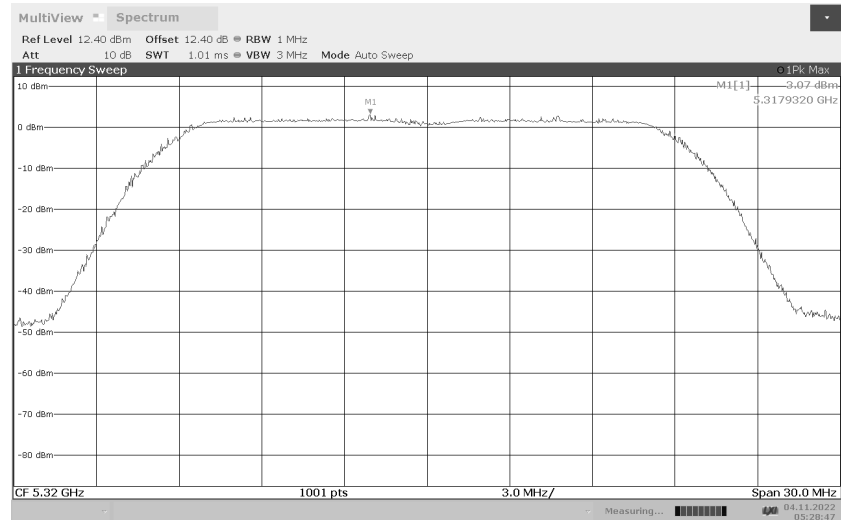


Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 5300MHz

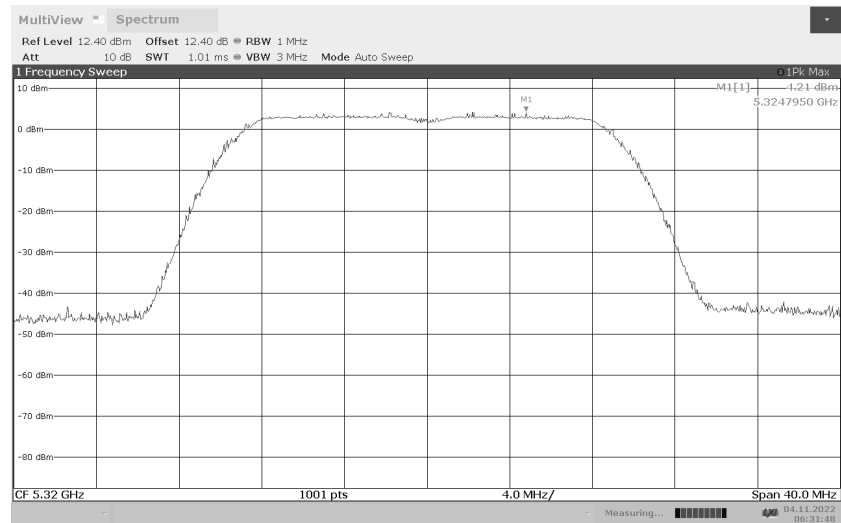




06:31:05 04.11.2022



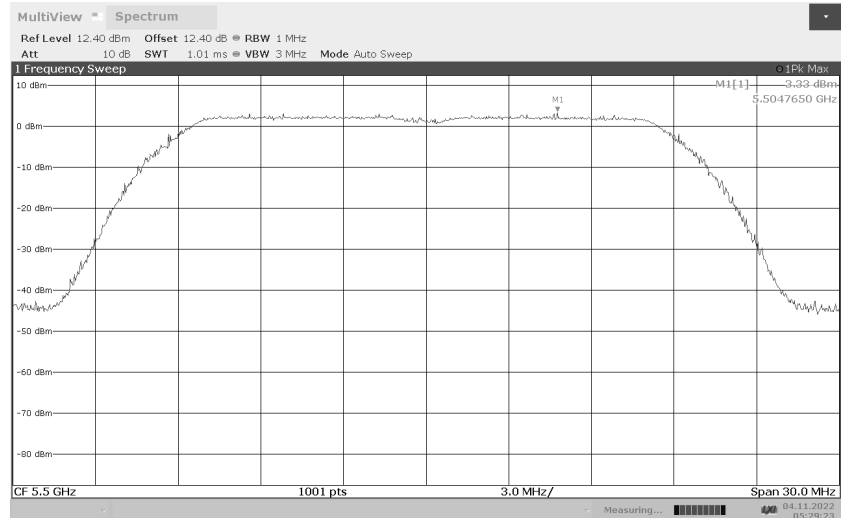
05:28:47 04.11.2022



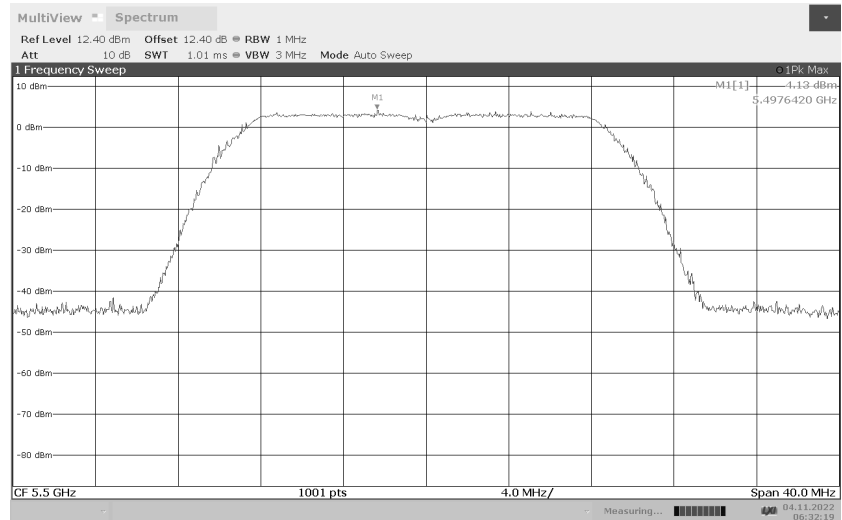
06:31:49 04.11.2022

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 5320MHz

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 5500MHz

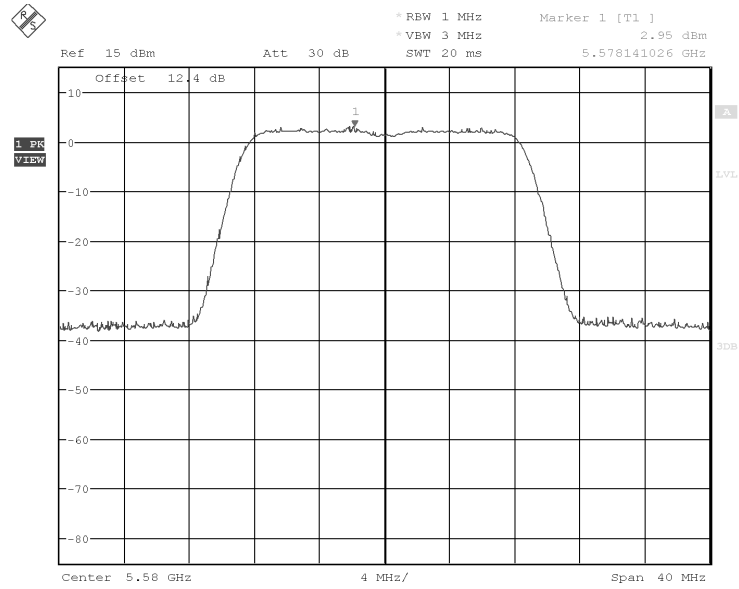


05:29:23 04.11.2022

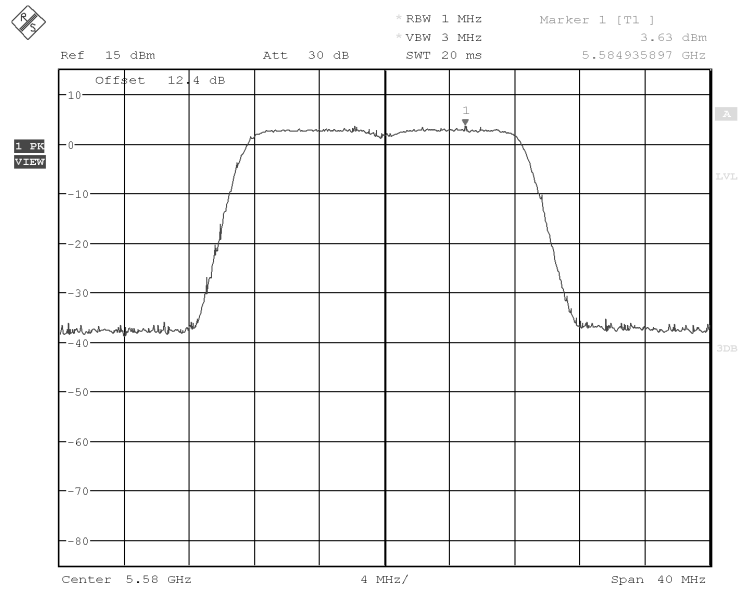


06:32:20 04.11.2022

**Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 5580MHz**

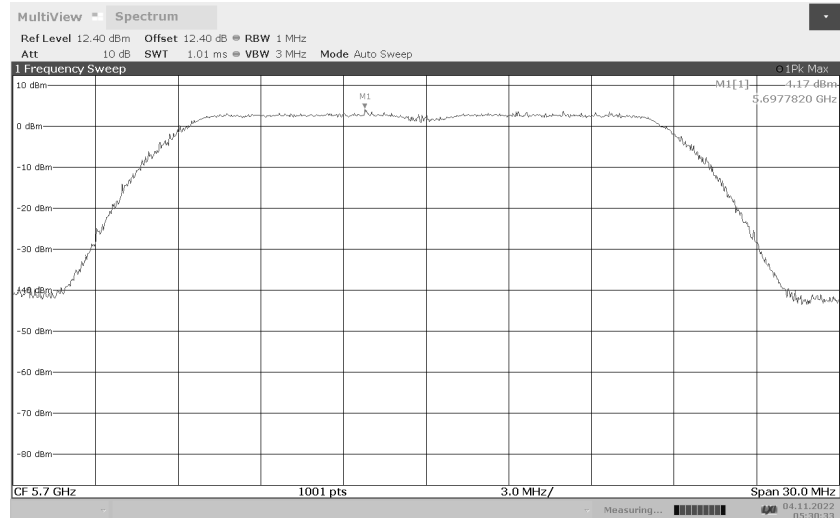


Date: 8.NOV.2022 00:38:47

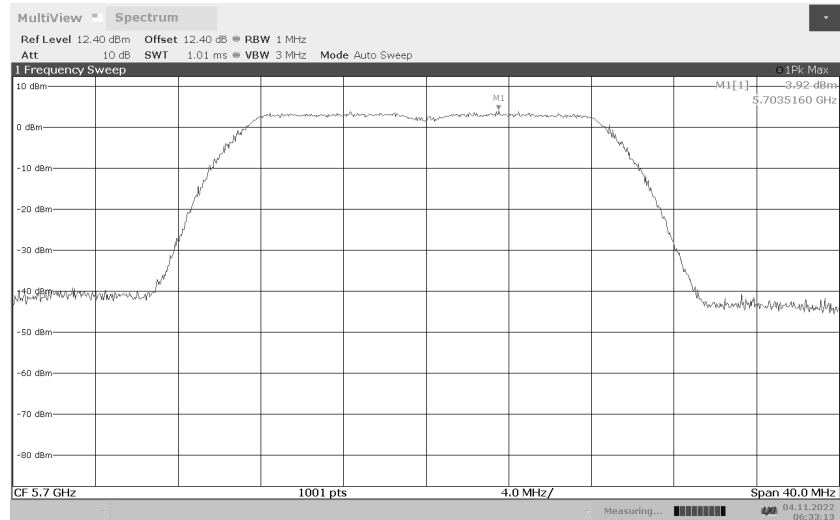


Date: 8.NOV.2022 00:48:25

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 5700MHz

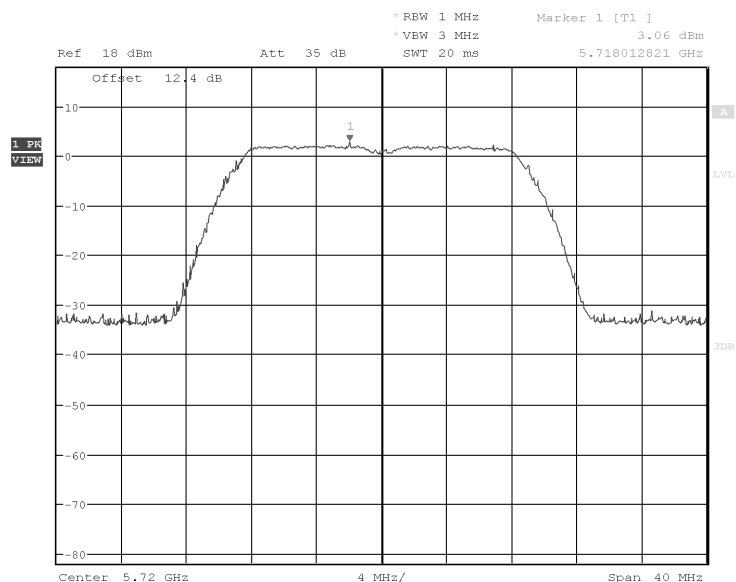


05:30:33 04.11.2022

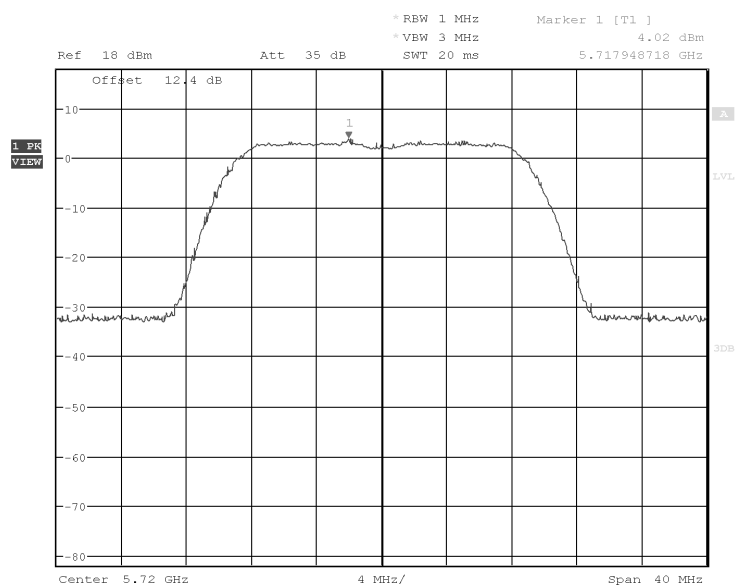


06:33:14 04.11.2022

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 5720MHz

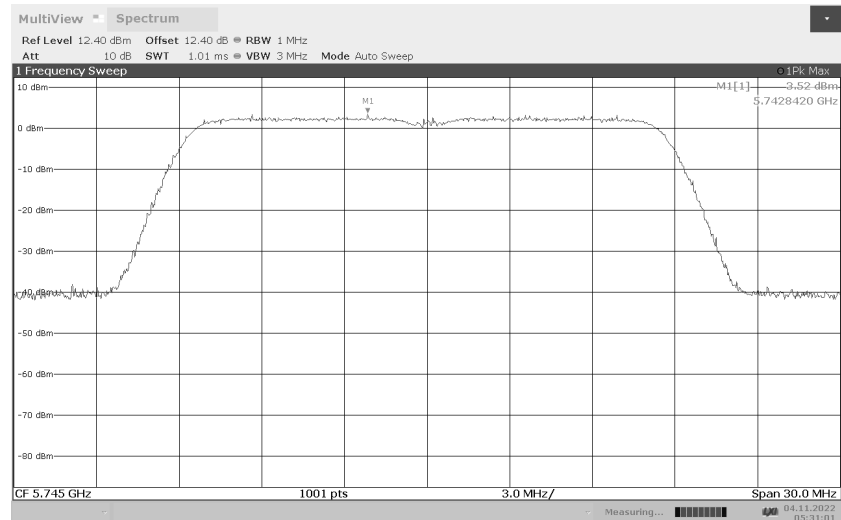


Date: 9.NOV.2022 20:50:00

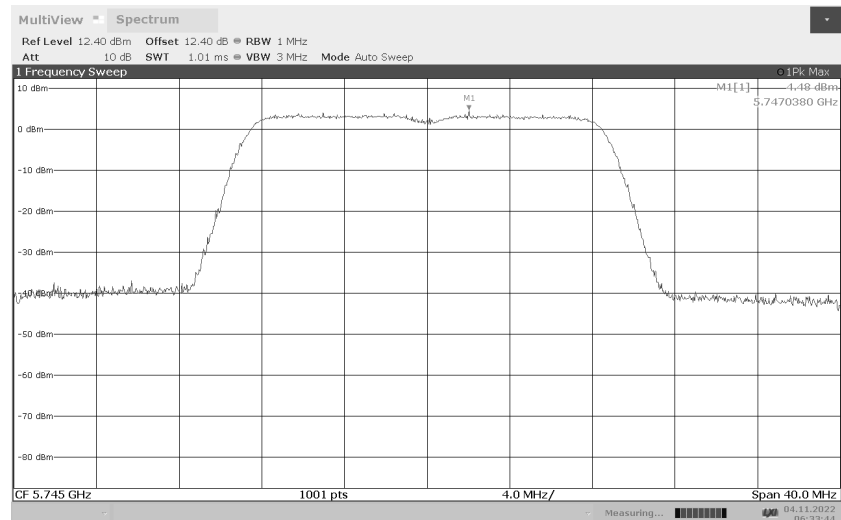


Date: 9.NOV.2022 20:46:17

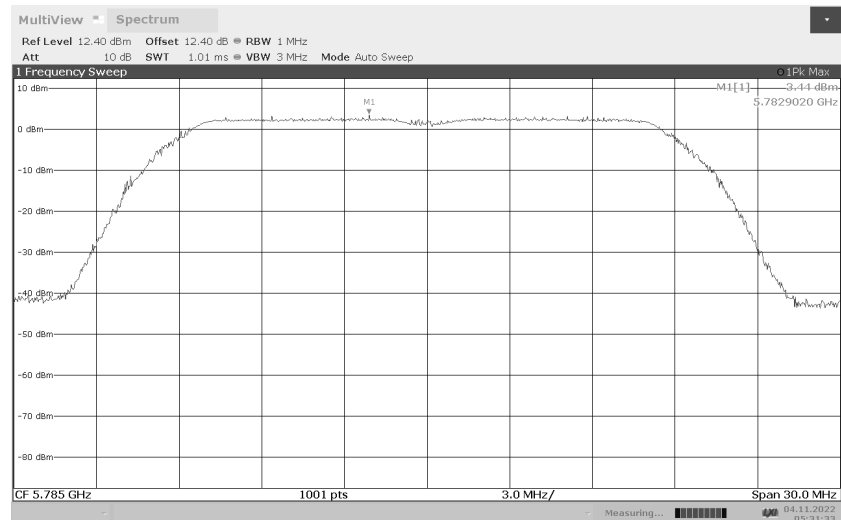
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 5745MHz



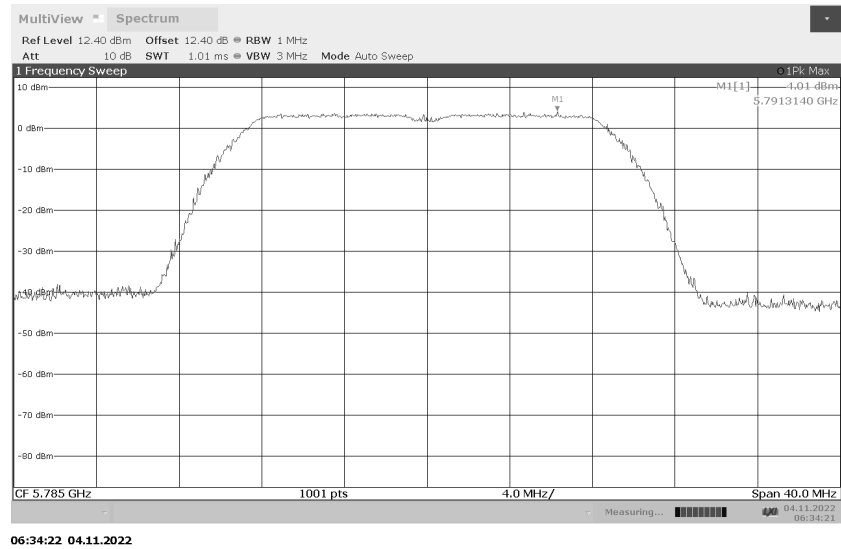
05:31:02 04.11.2022



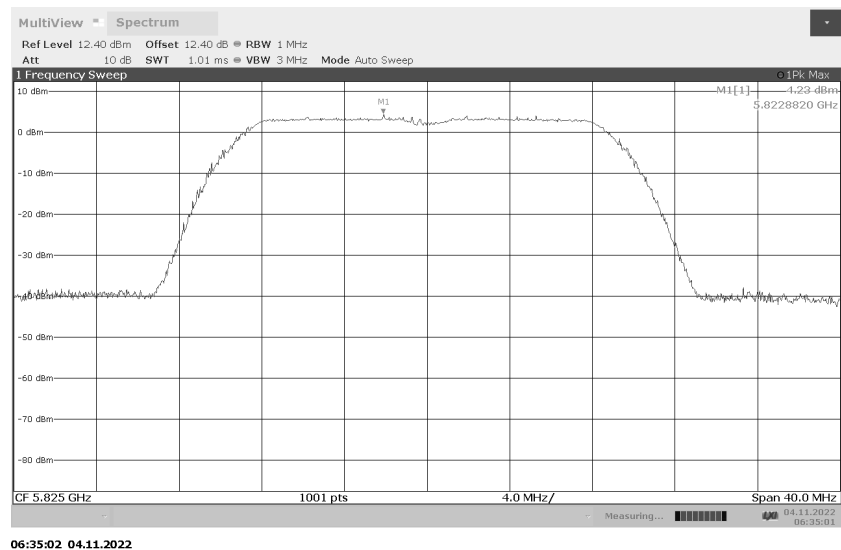
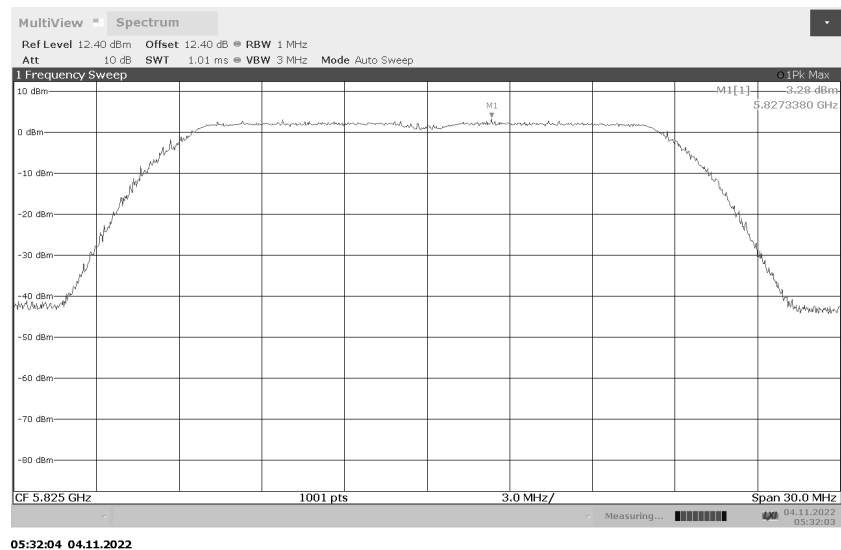
06:33:45 04.11.2022



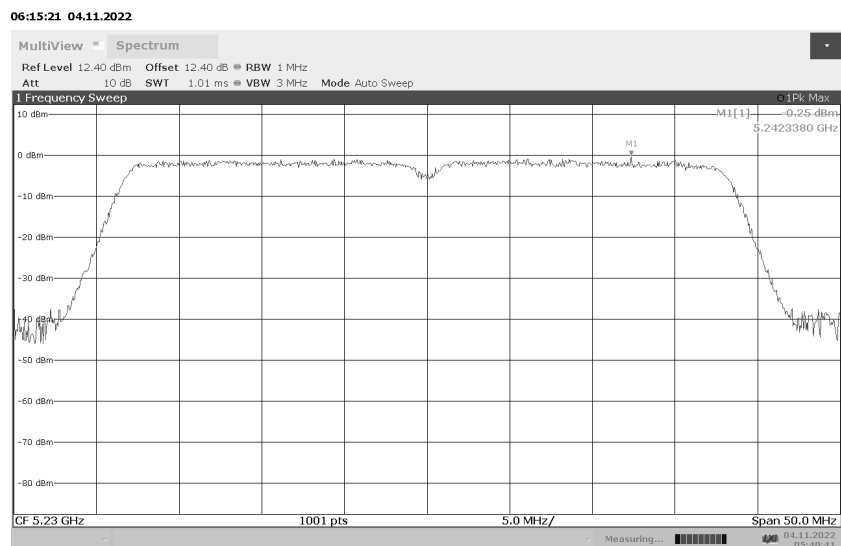
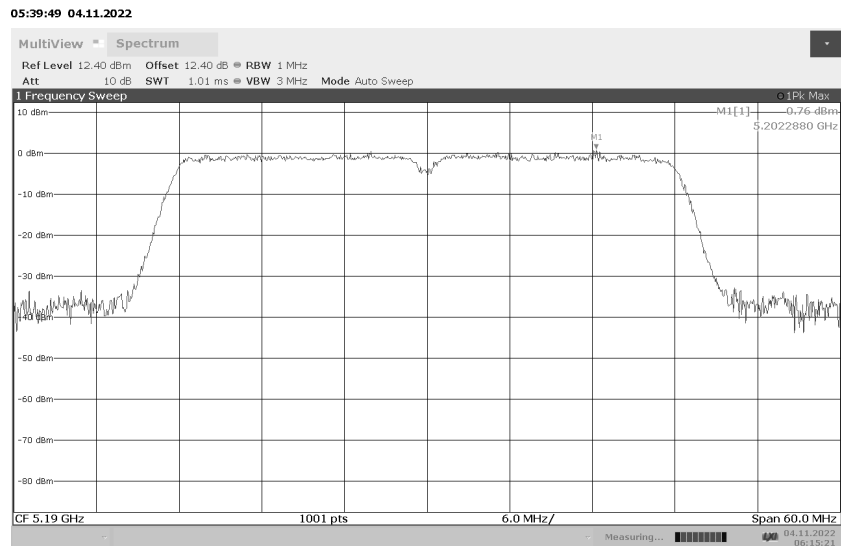
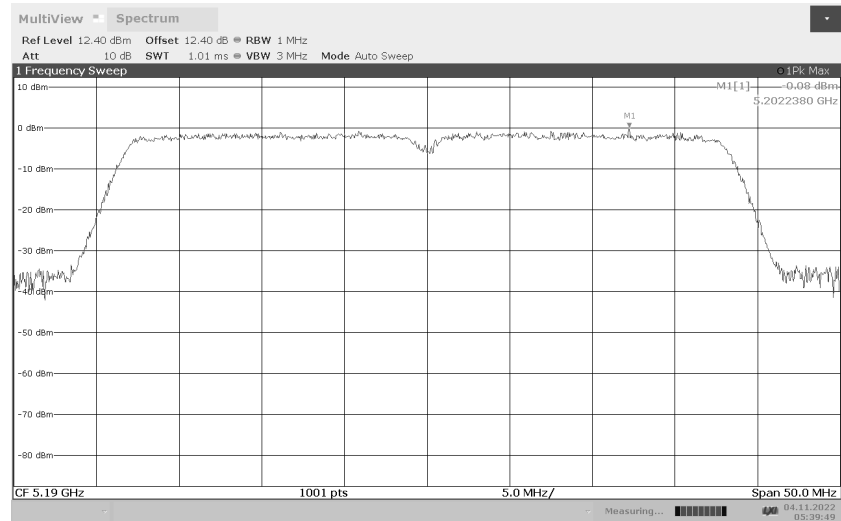
05:31:33 04.11.2022



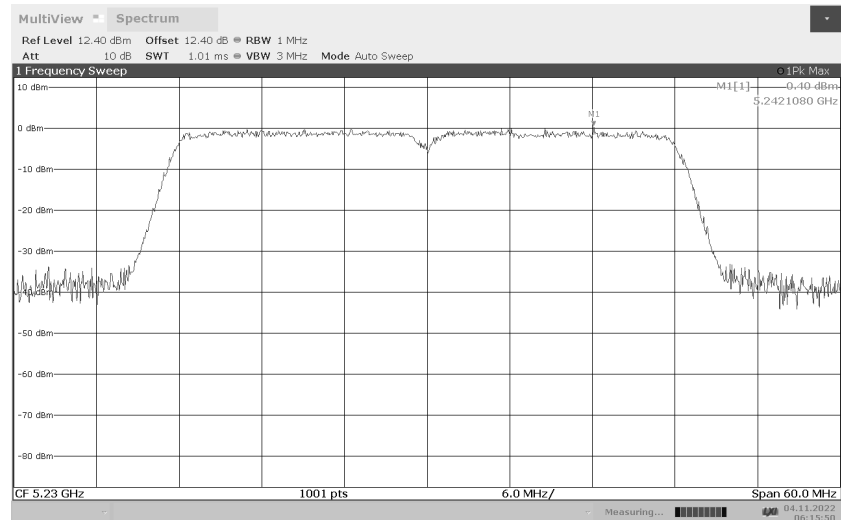
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 5825MHz



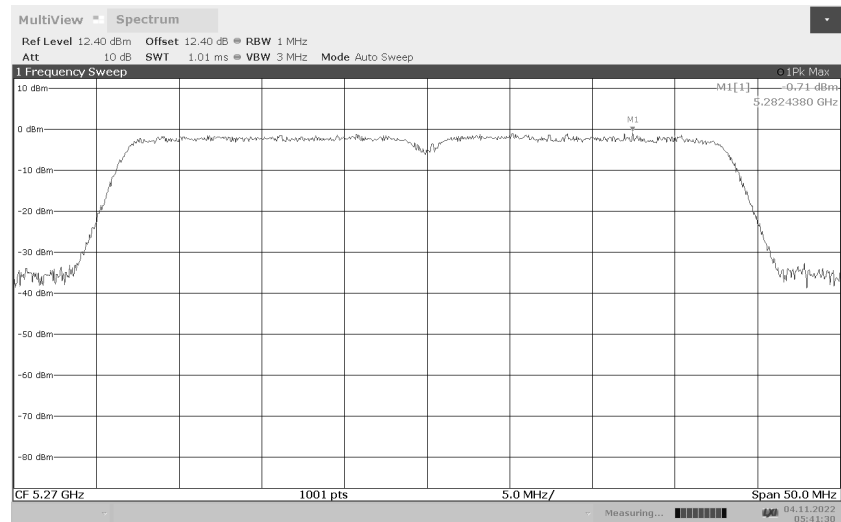
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 40MHz
5190MHz



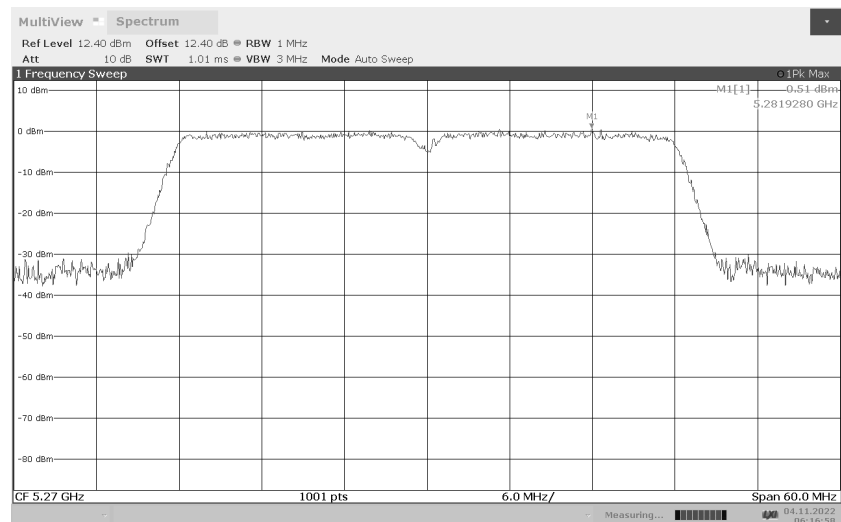
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 40MHz
5230MHz



06:15:51 04.11.2022



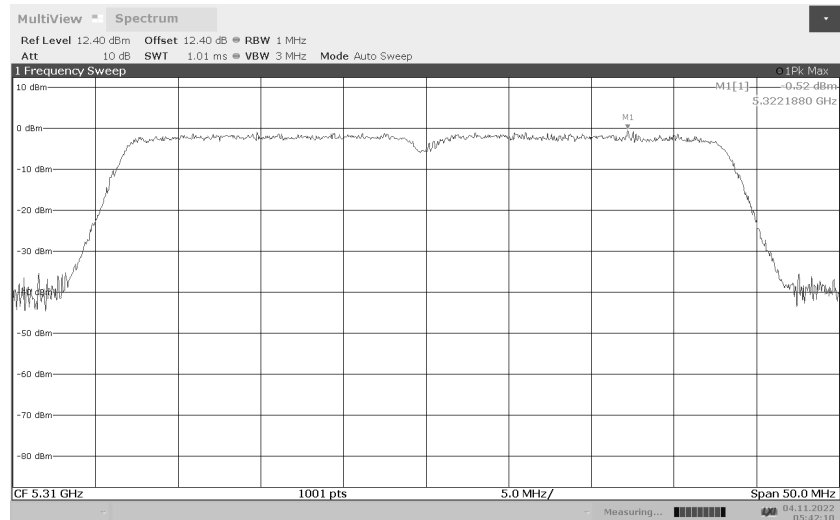
05:41:30 04.11.2022



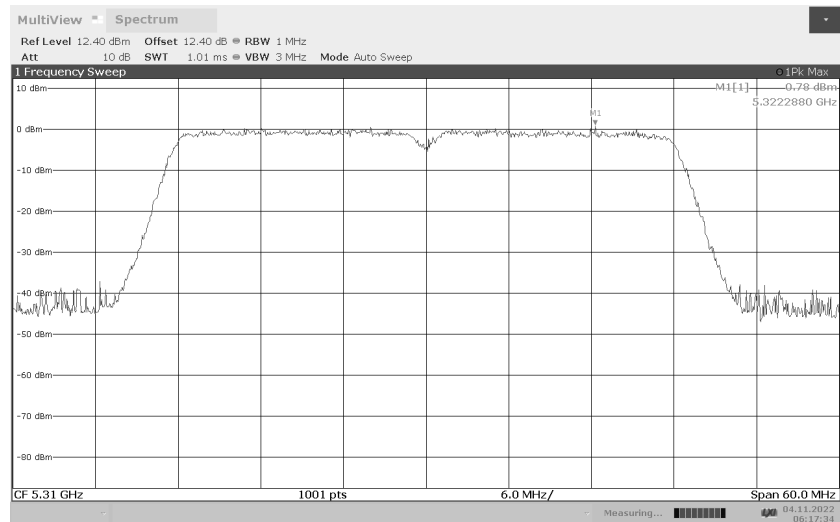
06:16:59 04.11.2022

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 40MHz
5270MHz

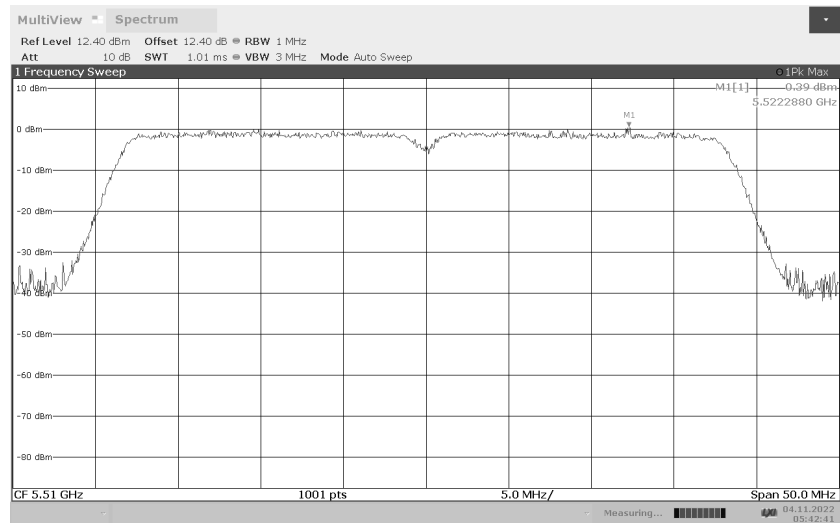
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 40MHz
5310MHz



05:42:11 04.11.2022

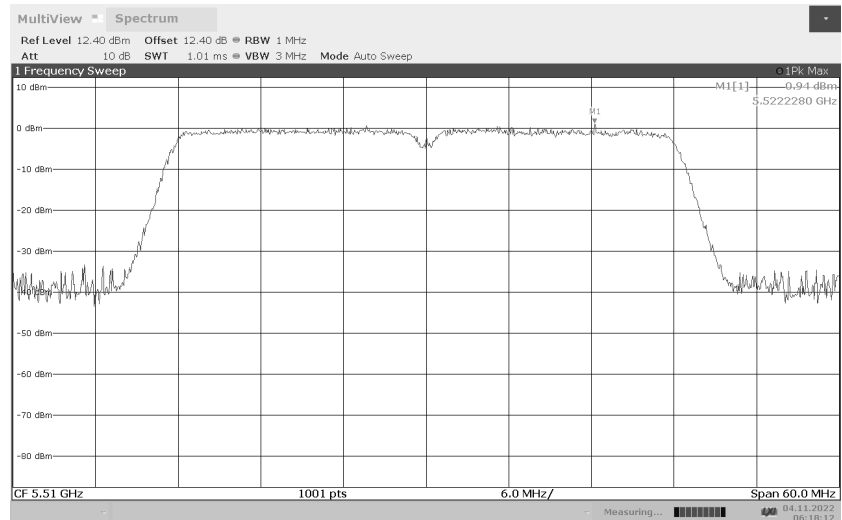


06:17:34 04.11.2022

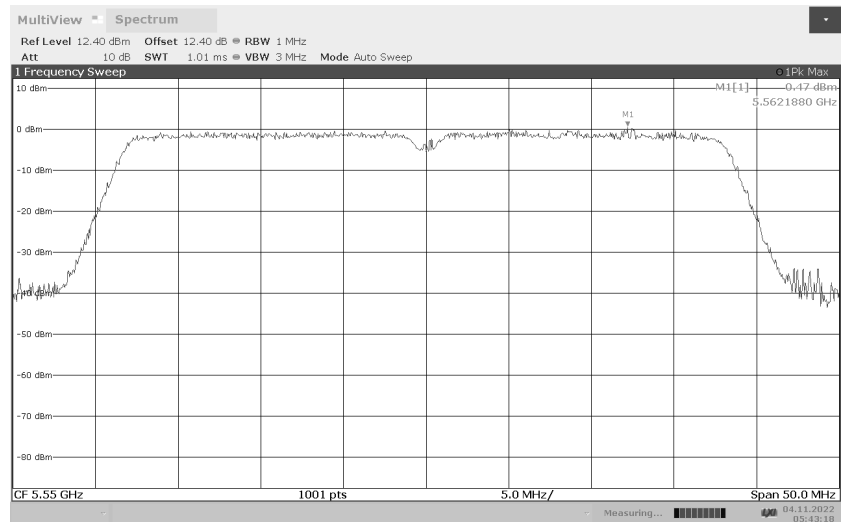


05:42:41 04.11.2022

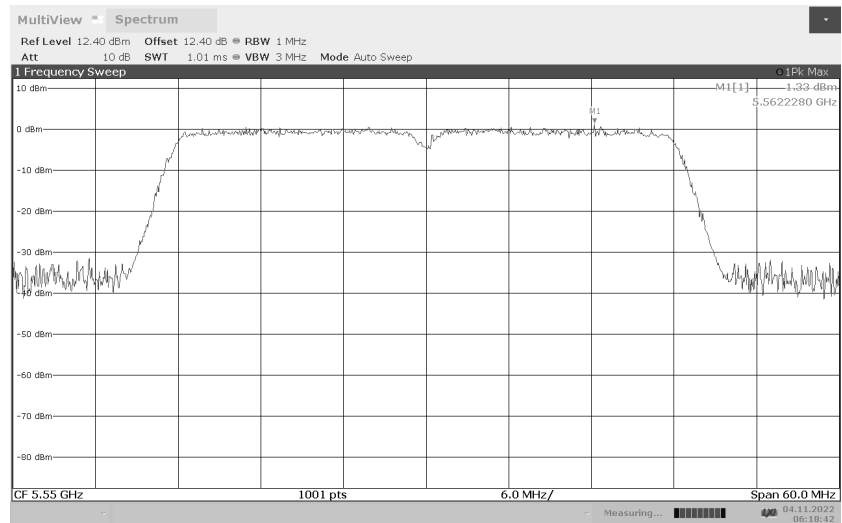
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 40MHz
5510MHz



06:18:13 04.11.2022



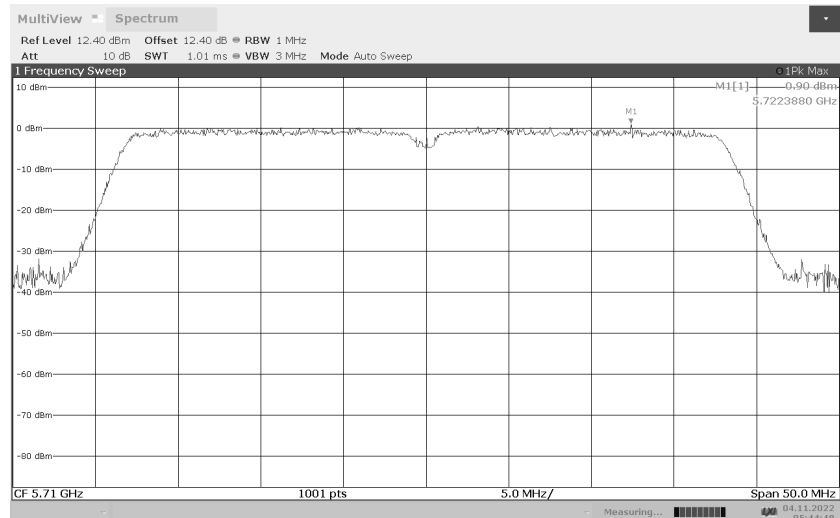
05:43:18 04.11.2022



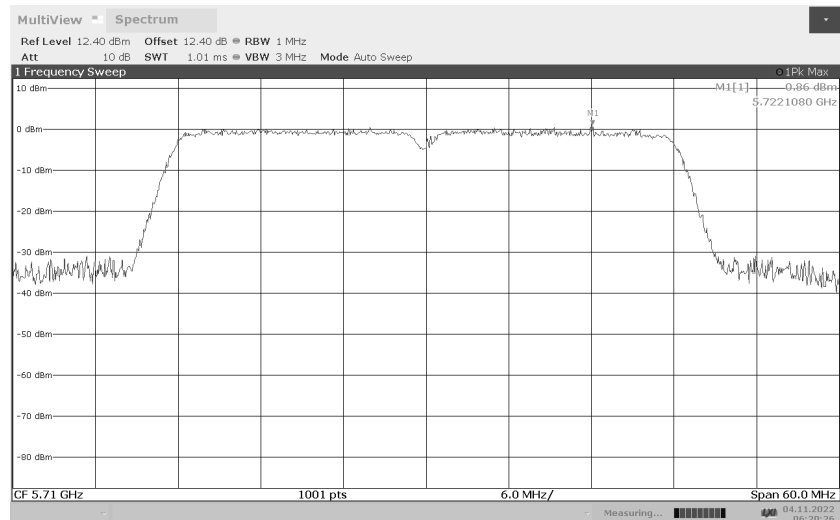
06:18:42 04.11.2022

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 40MHz
5550MHz

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 40MHz
5710MHz

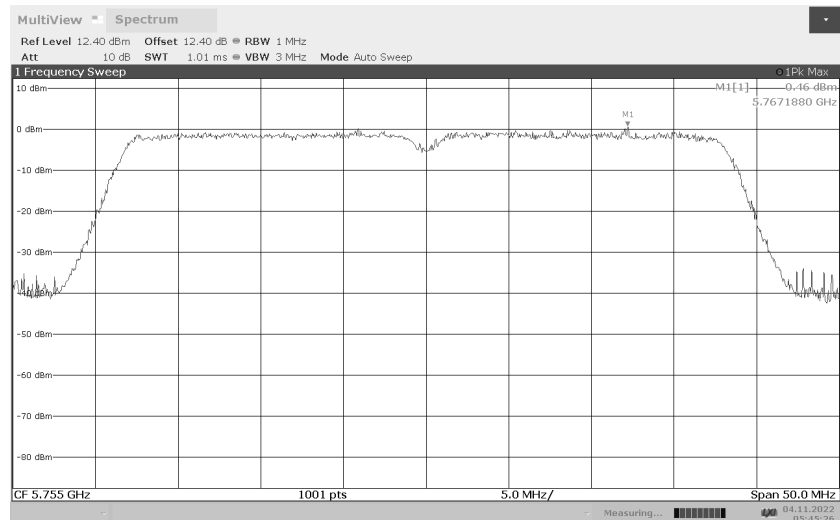


05:44:48 04.11.2022

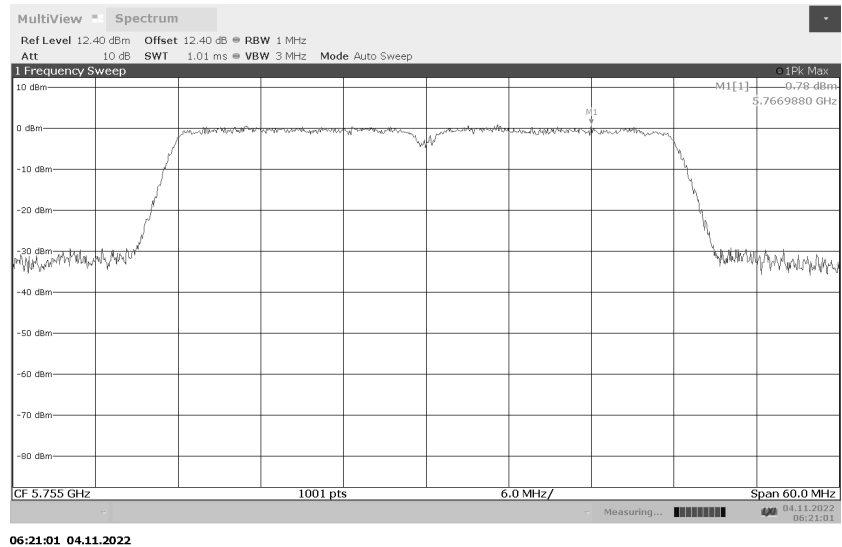


06:20:26 04.11.2022

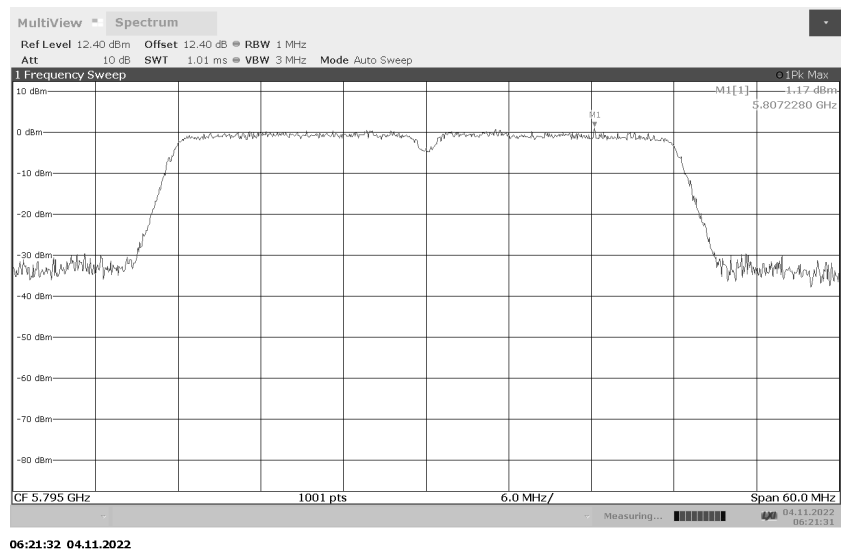
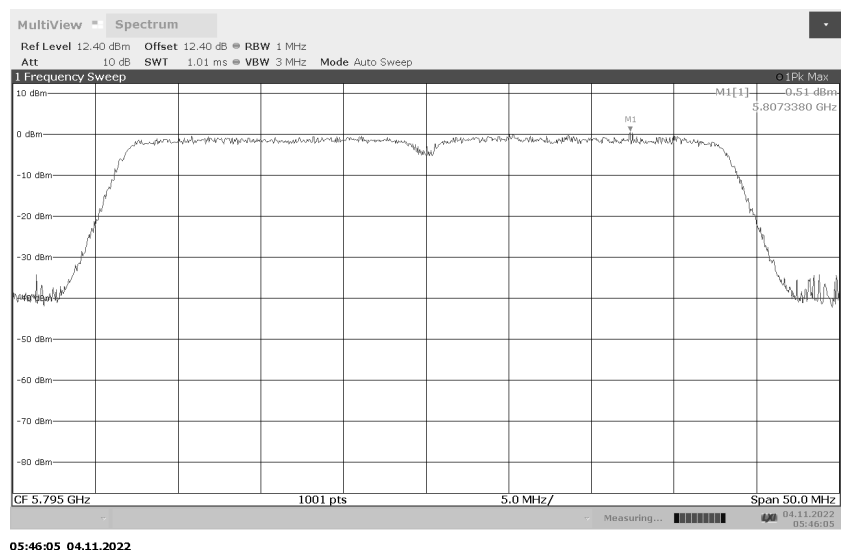
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 40MHz
5755MHz



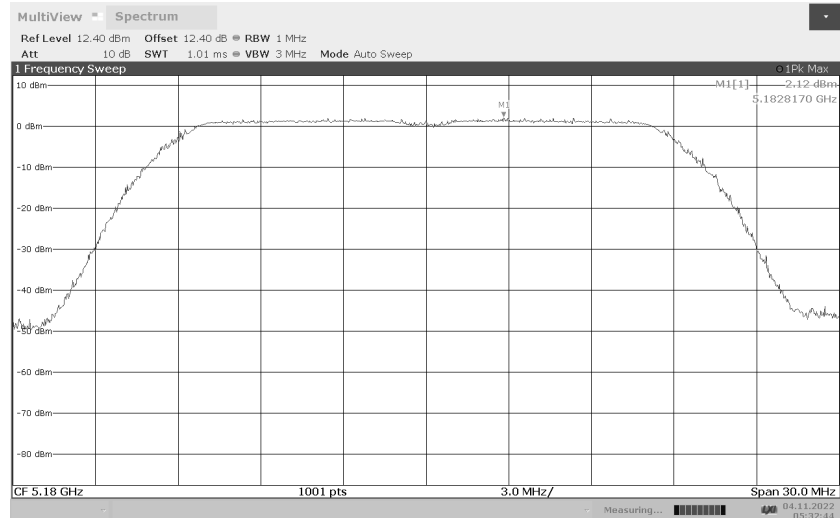
05:45:27 04.11.2022



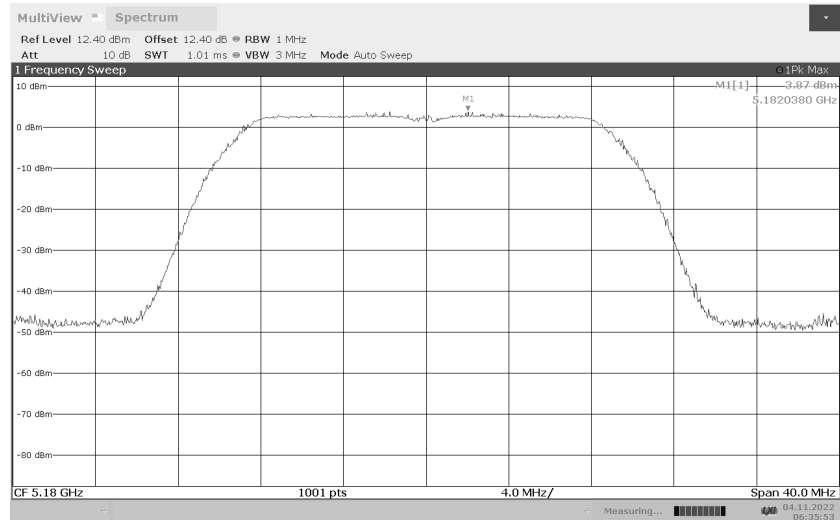
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11n 40MHz
5795MHz



Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 5180MHz

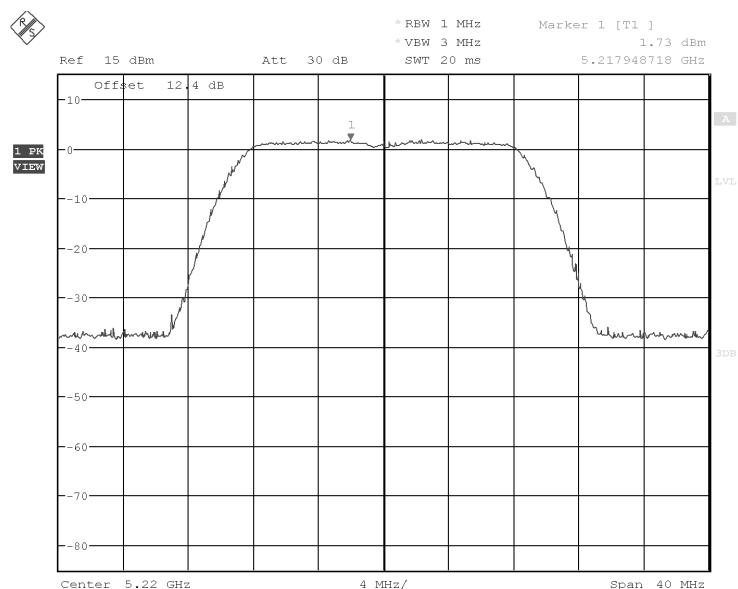


05:32:44 04.11.2022

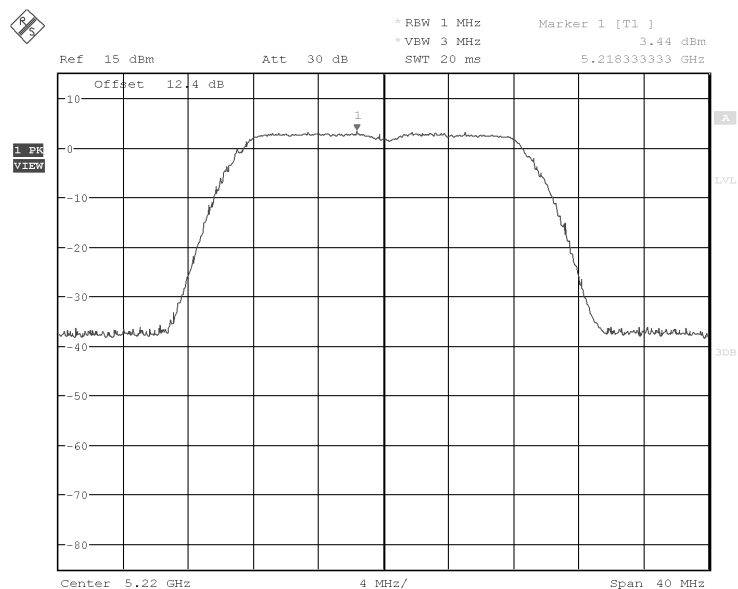


06:35:54 04.11.2022

Output Power & Power
Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 5220MHz

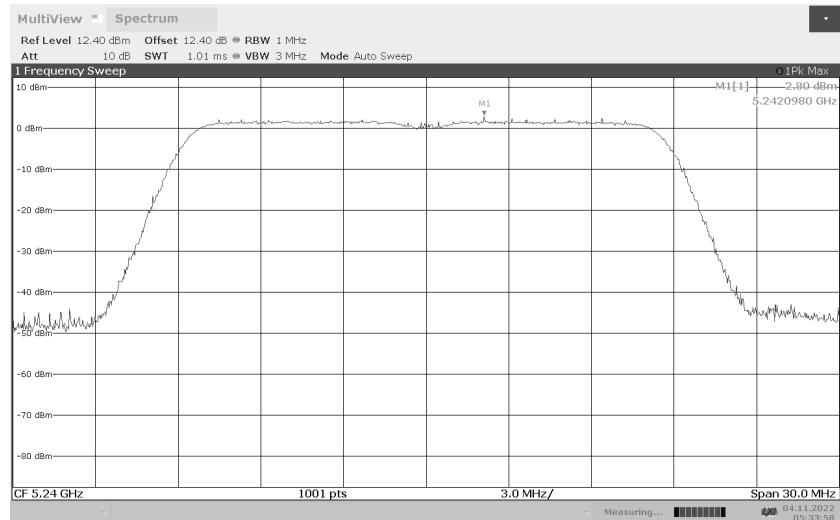


Date: 8.NOV.2022 00:41:50

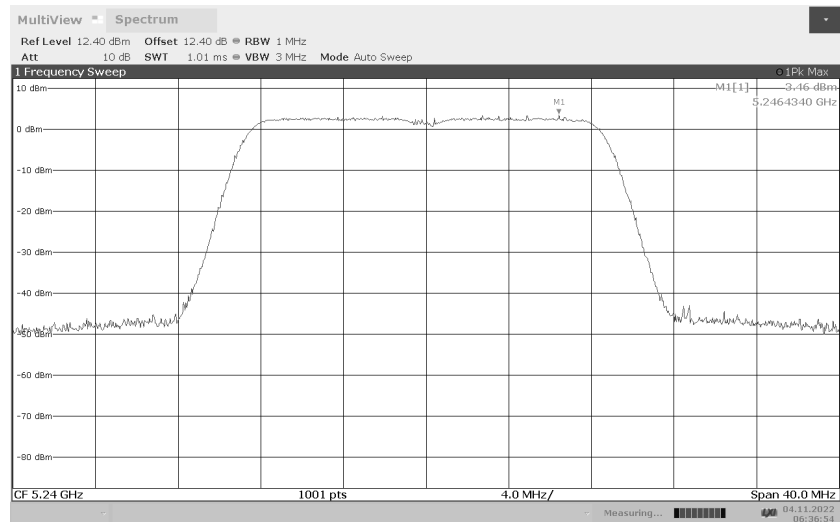


Date: 8.NOV.2022 00:43:24

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 5240MHz

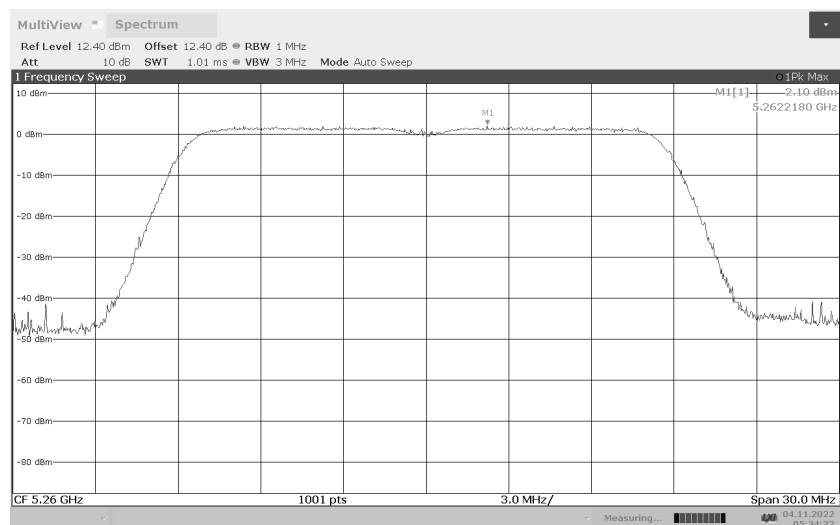


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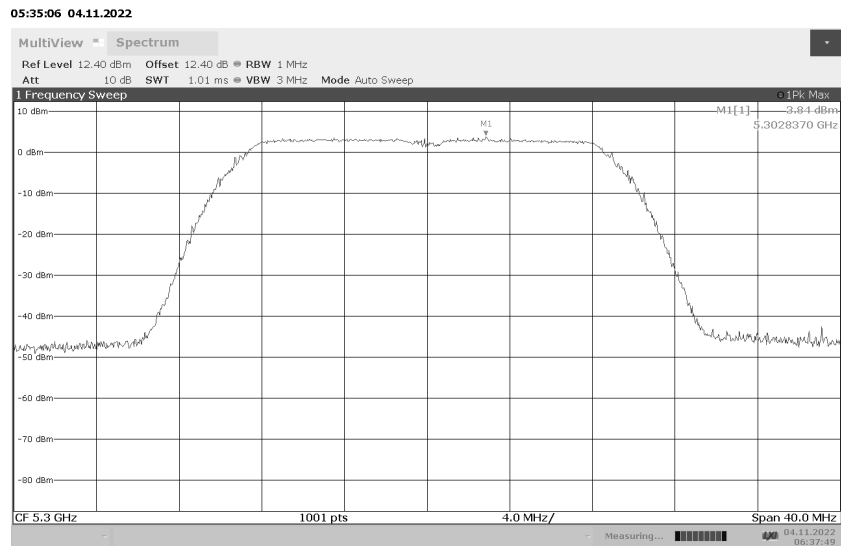
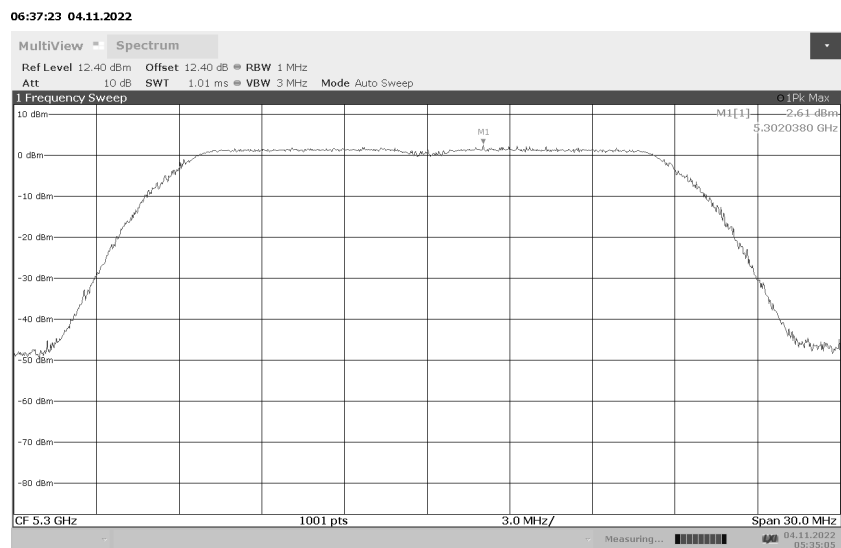
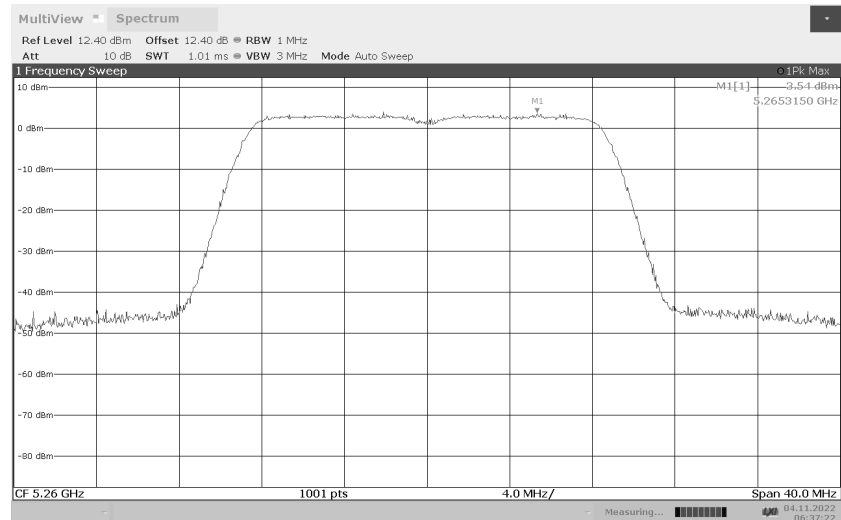


06:36:54 04.11.2022

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 5260MHz

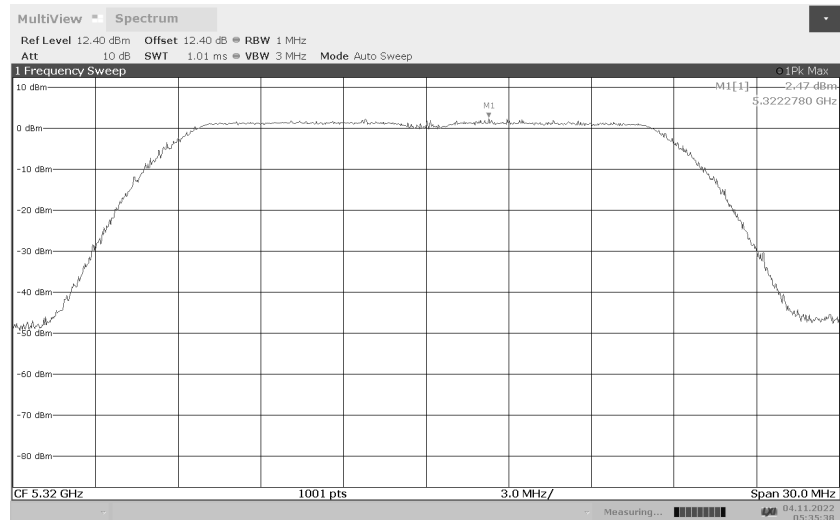


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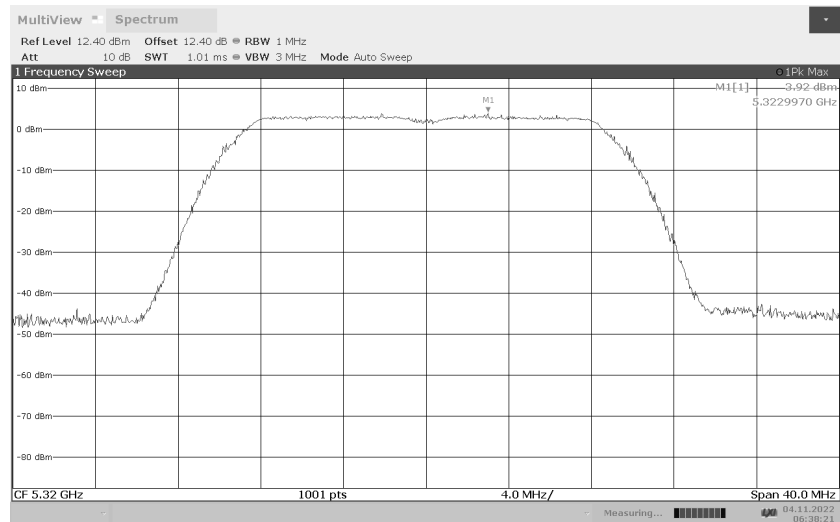


Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 5300MHz

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 5320MHz

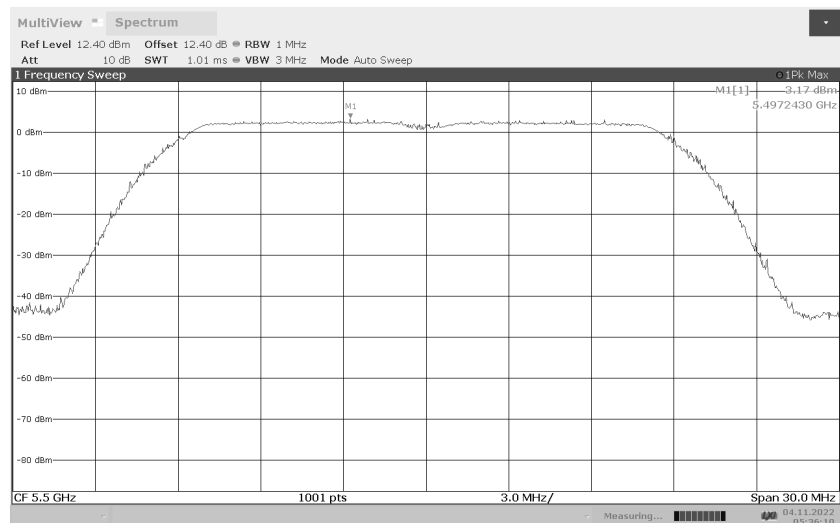


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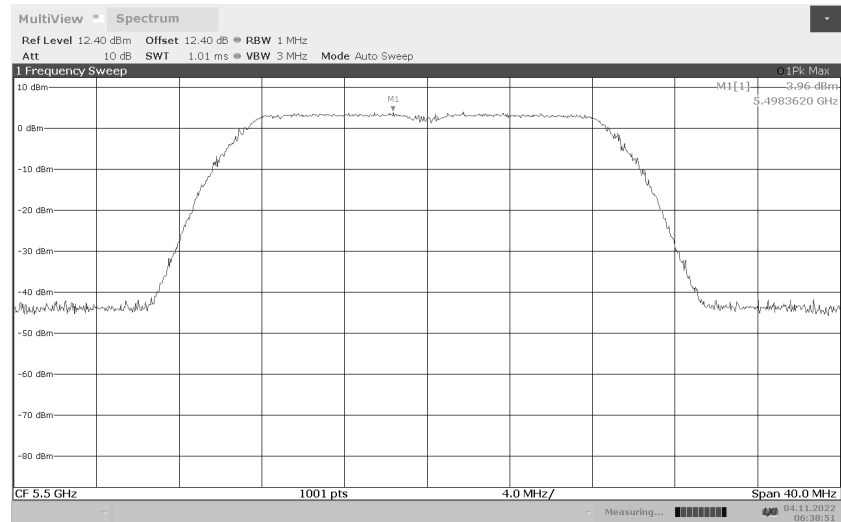


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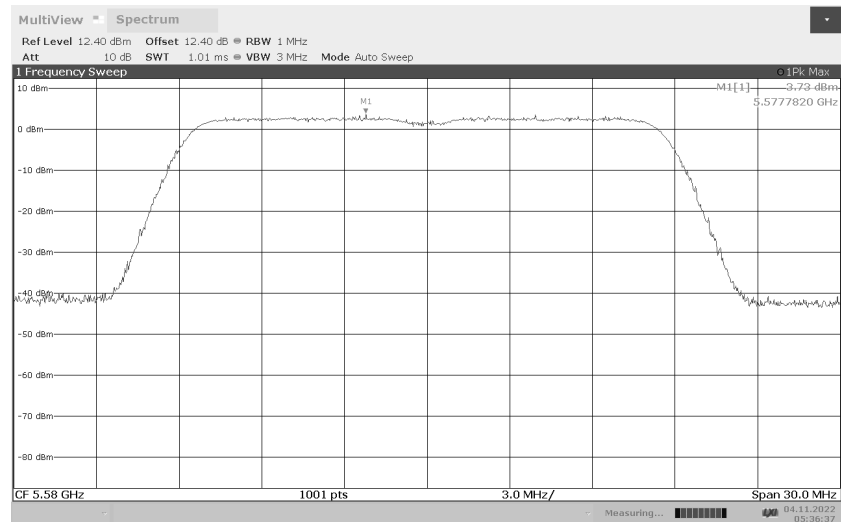
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 5500MHz



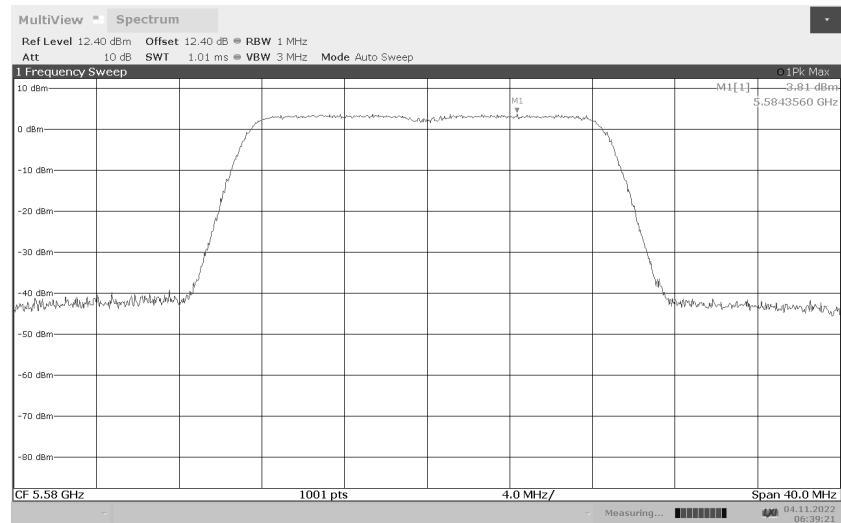
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06:38:52 04.11.2022



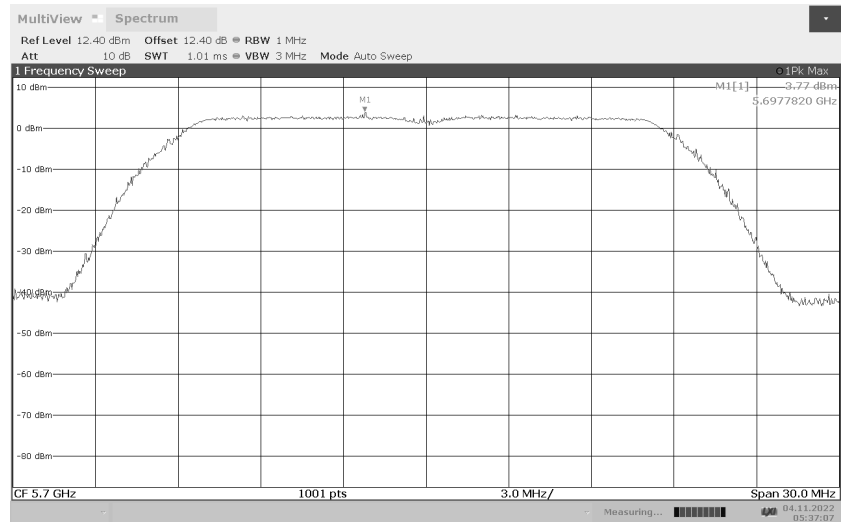
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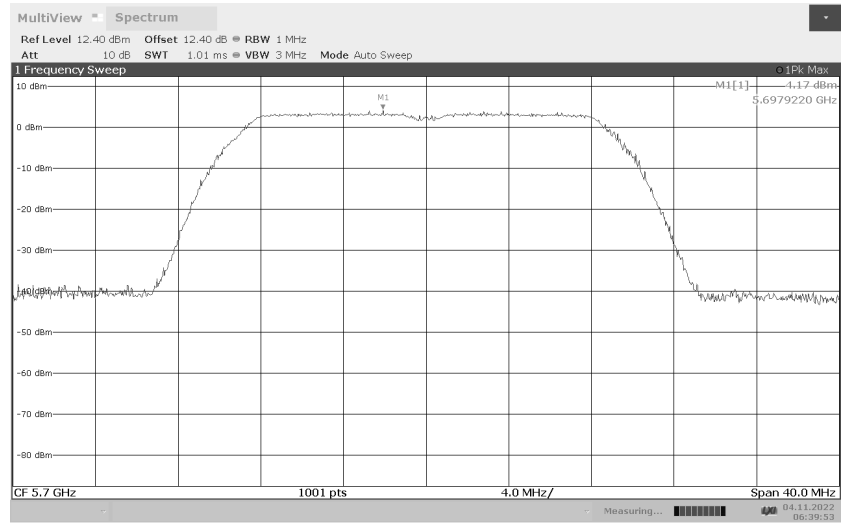
06:39:21 04.11.2022

Power Spectral Density
(Antenna 1 on top,
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802.11ac 5580MHz

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 5700MHz

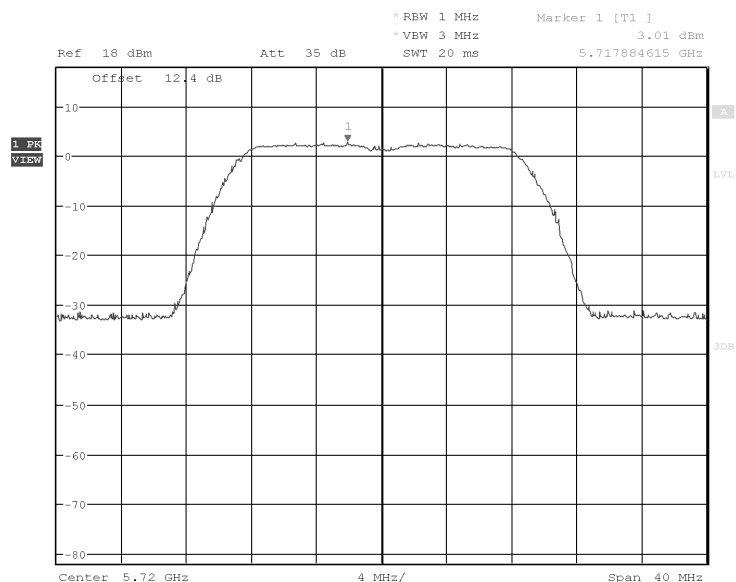


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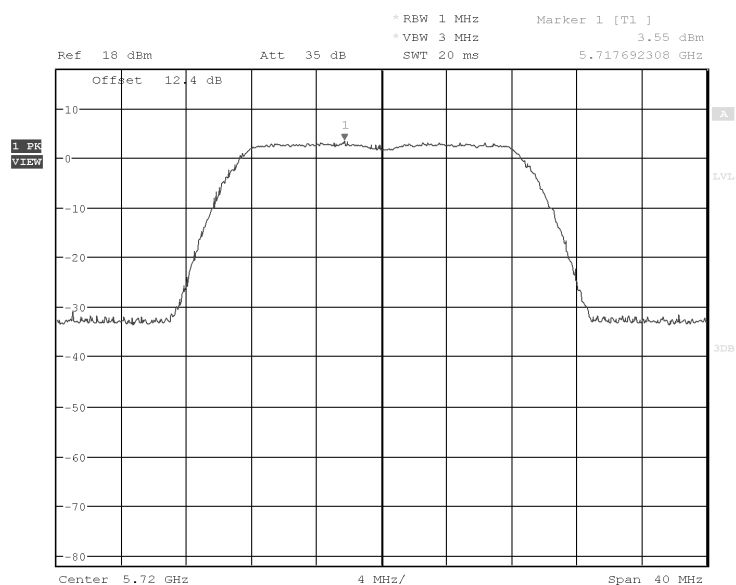


06:39:53 04.11.2022

Power Spectral Density
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Antenna 2 on bottom)
802.11ac 5720MHz

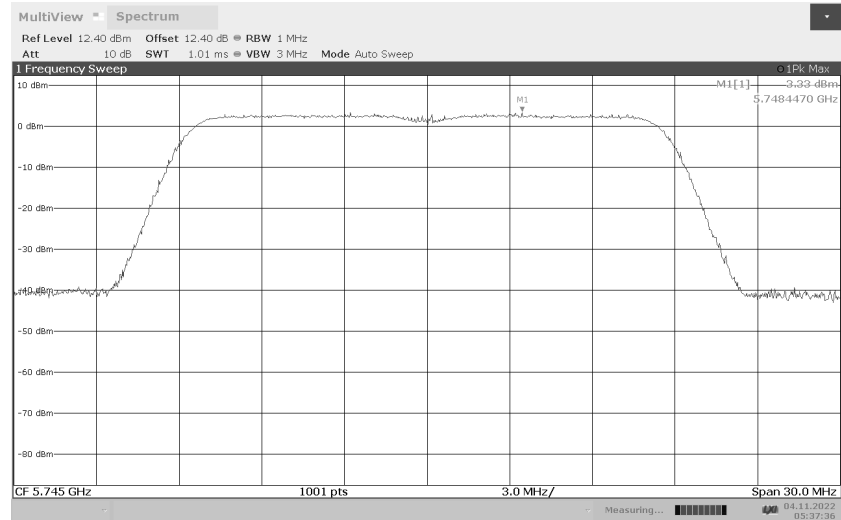


Date: 9.NOV.2022 20:48:42

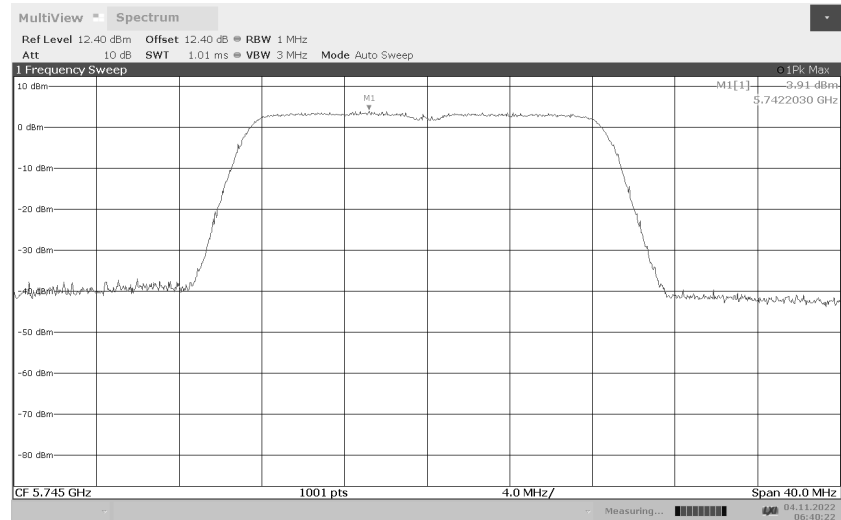


Date: 9.NOV.2022 20:54:27

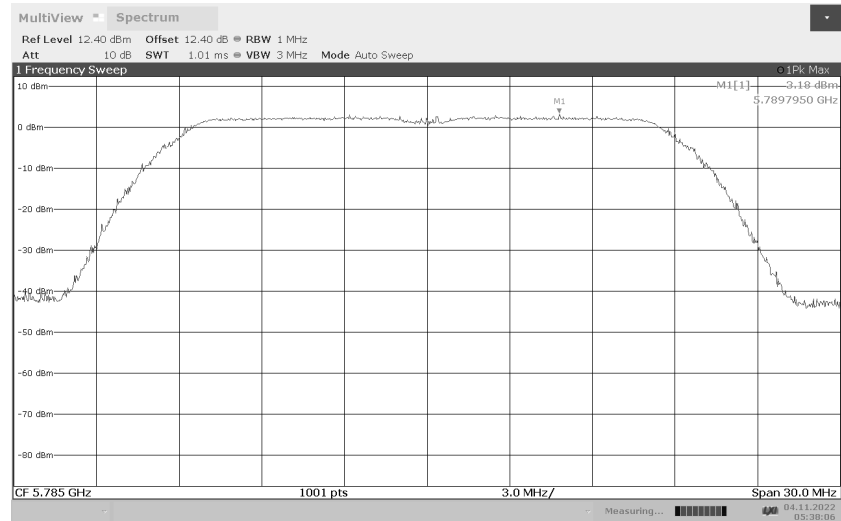
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 5745MHz



05:37:36 04.11.2022

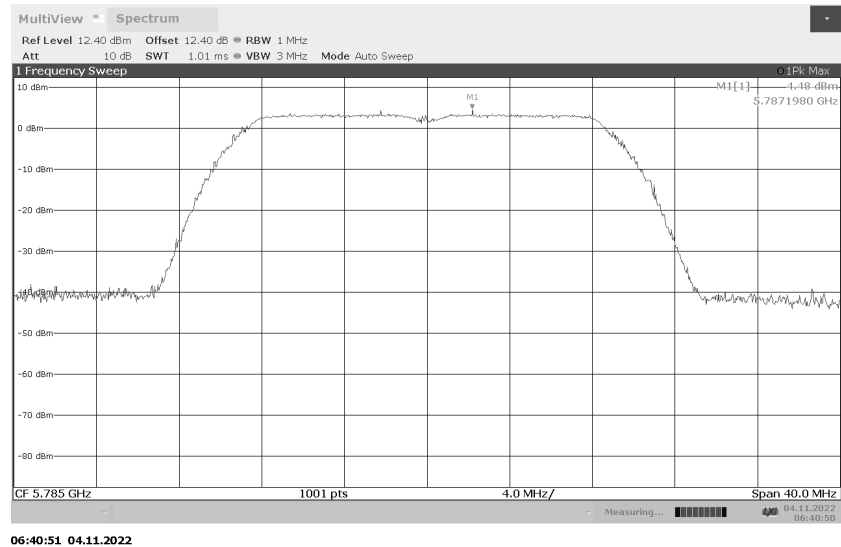


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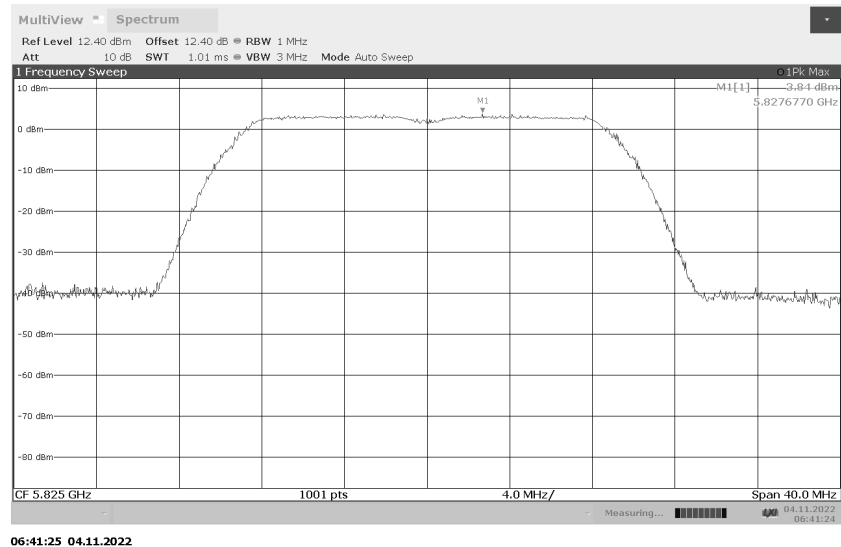
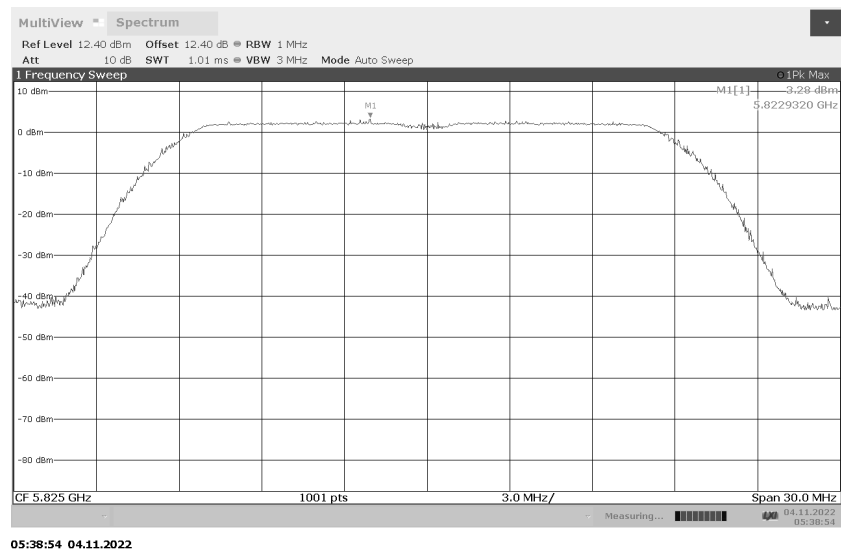


05:38:06 04.11.2022

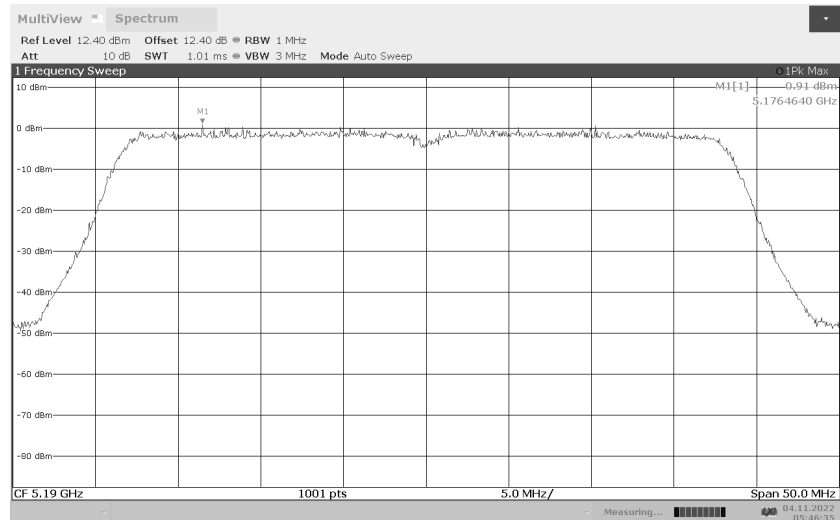
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 5785MHz



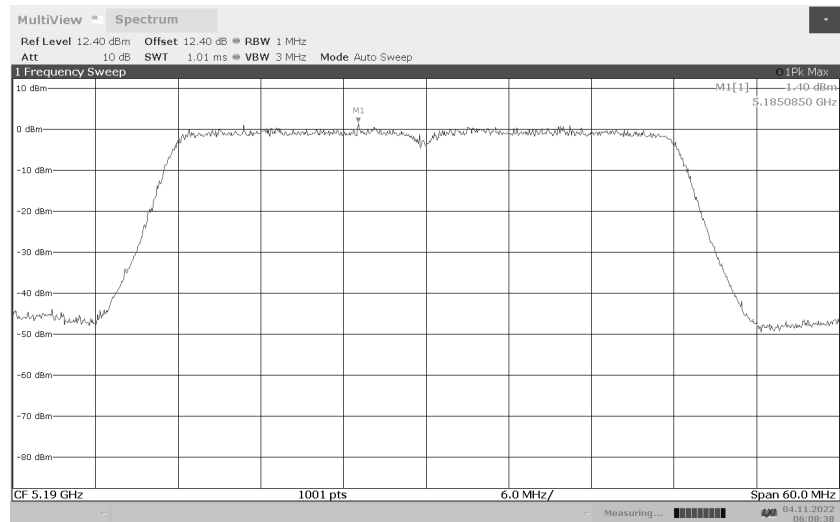
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 5825MHz



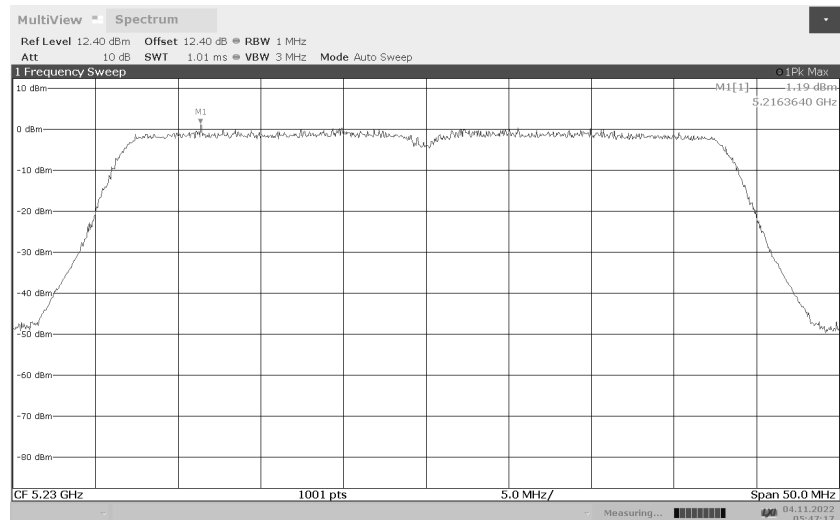
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 40MHz
5190MHz



05:46:35 04.11.2022



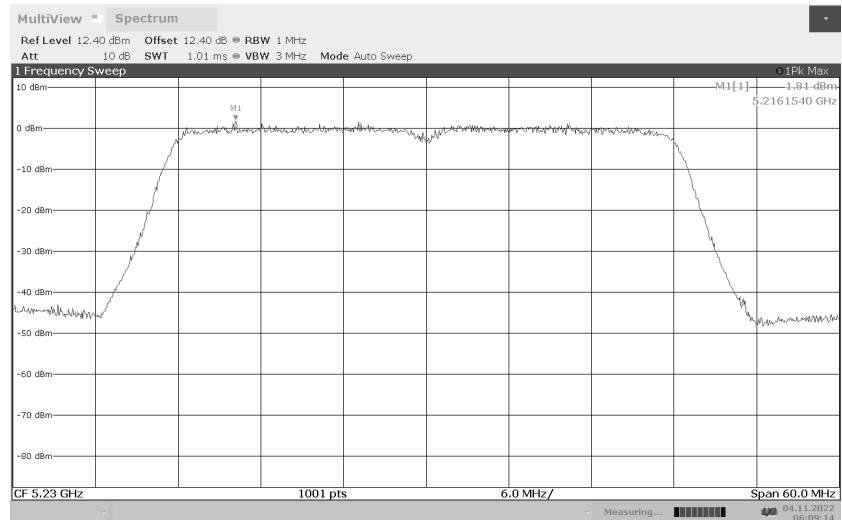
06:08:38 04.11.2022



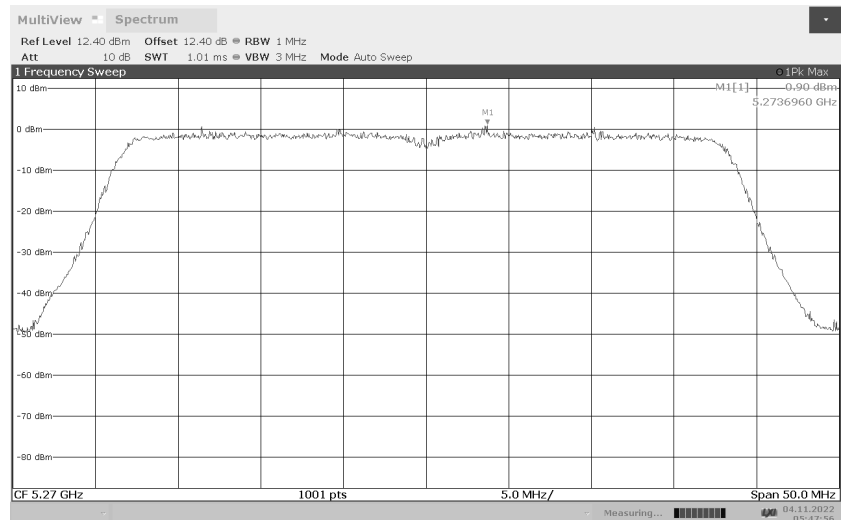
05:47:17 04.11.2022

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 40MHz
5230MHz

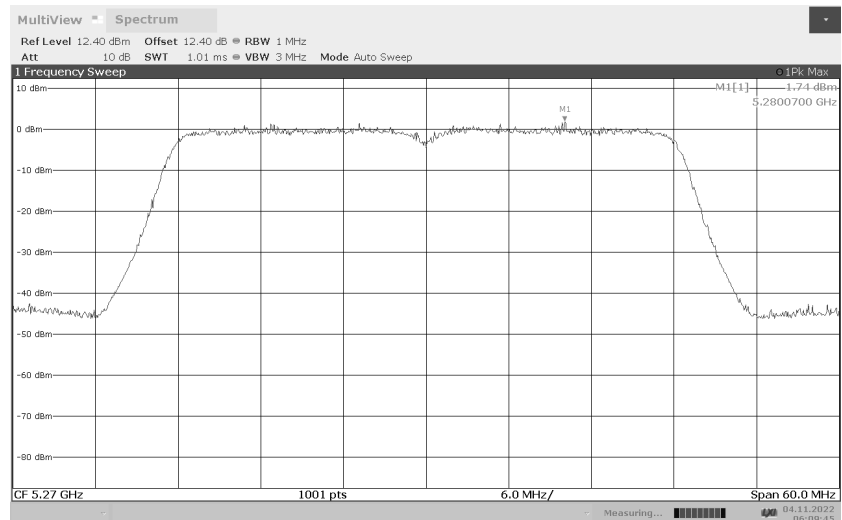
Power Spectral Density
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06:09:15 04.11.2022

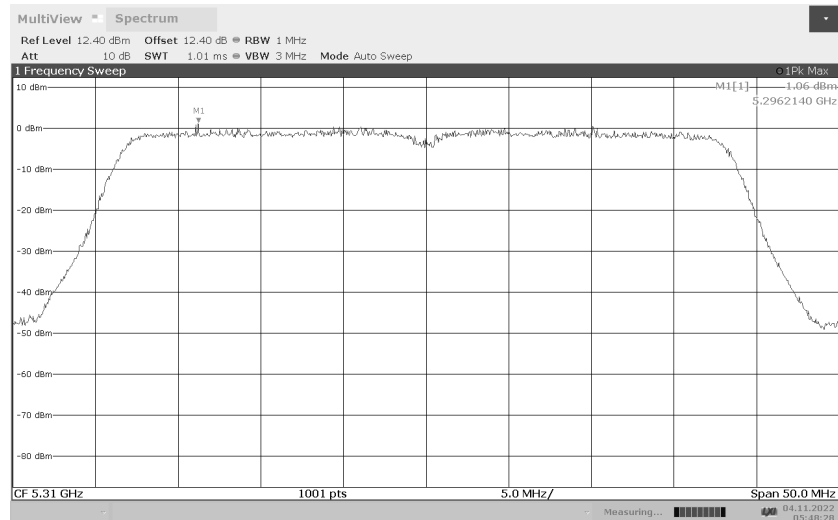


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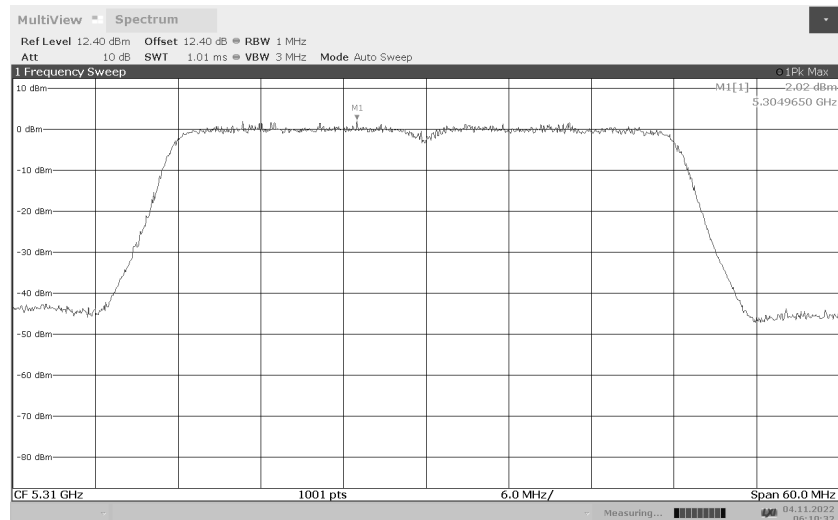


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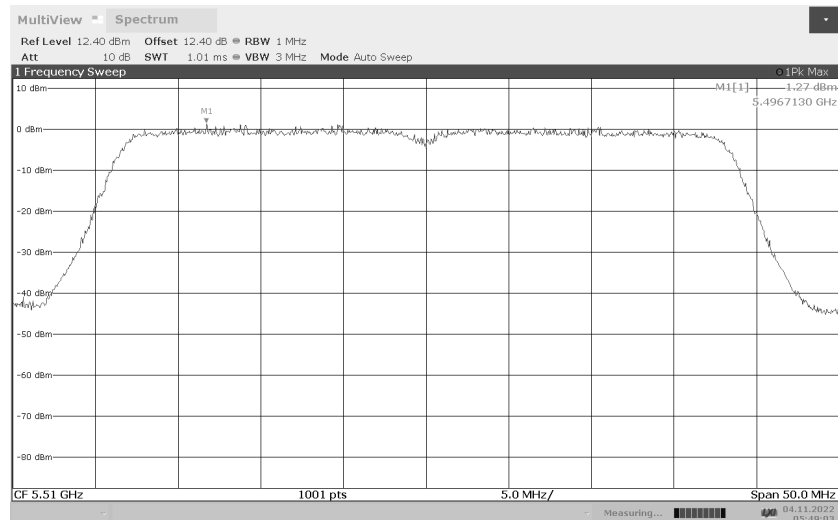
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 40MHz
5310MHz



05:48:28 04.11.2022

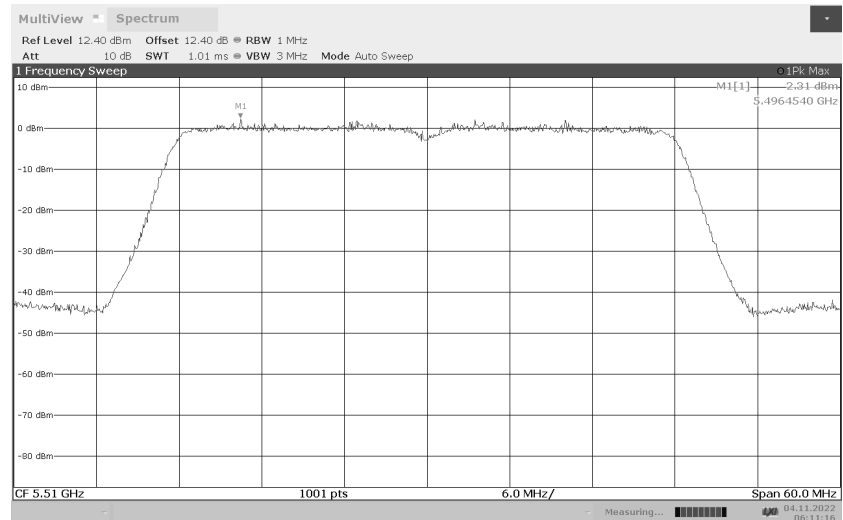


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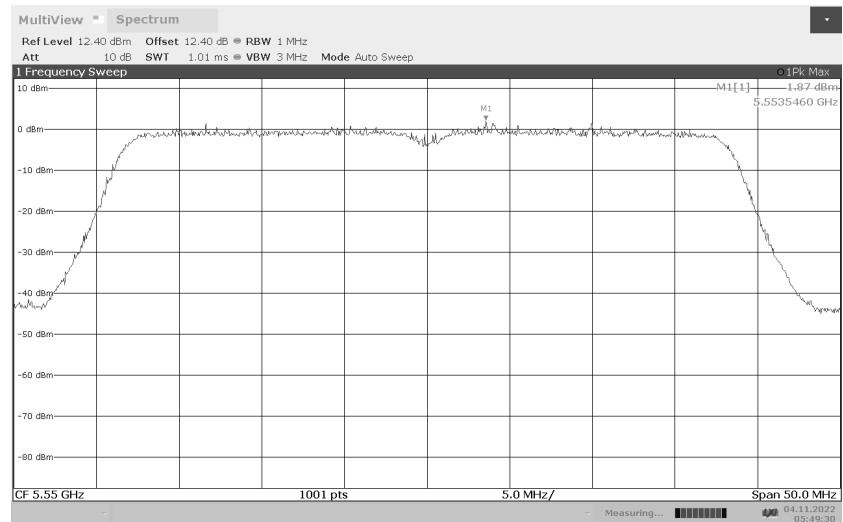


05:49:03 04.11.2022

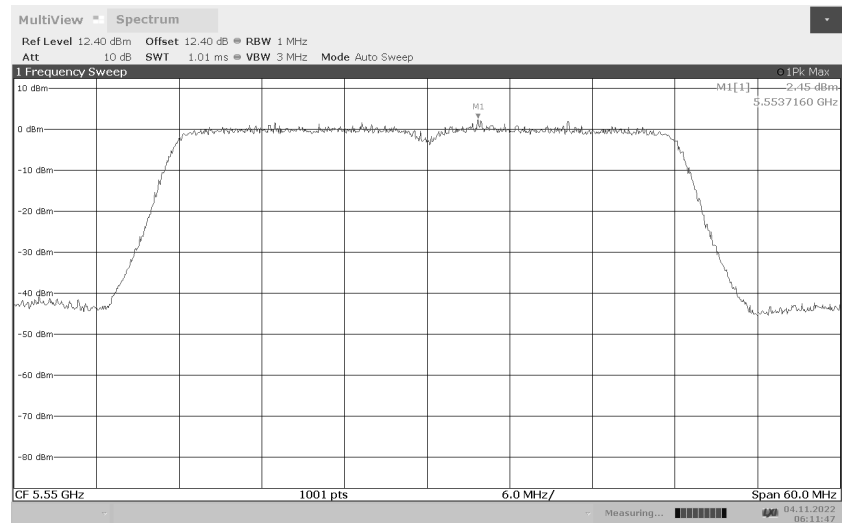
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 40MHz
5510MHz



06:11:17 04.11.2022



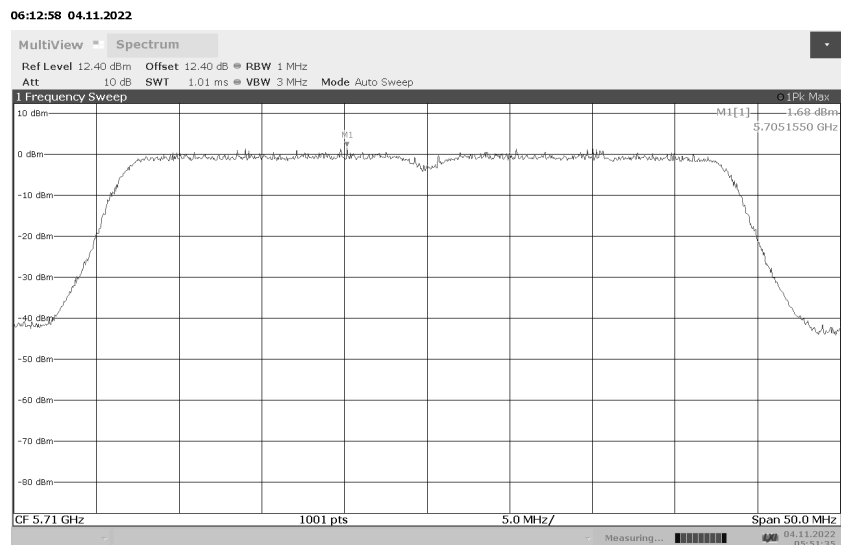
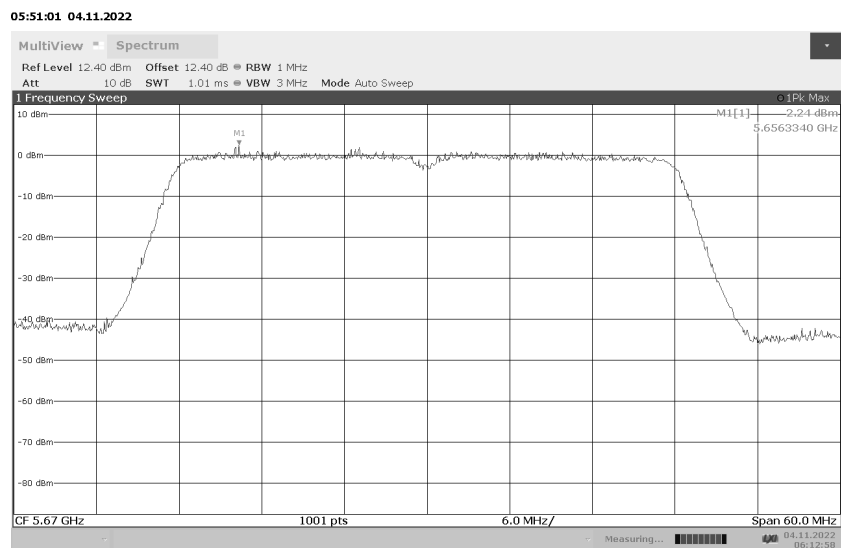
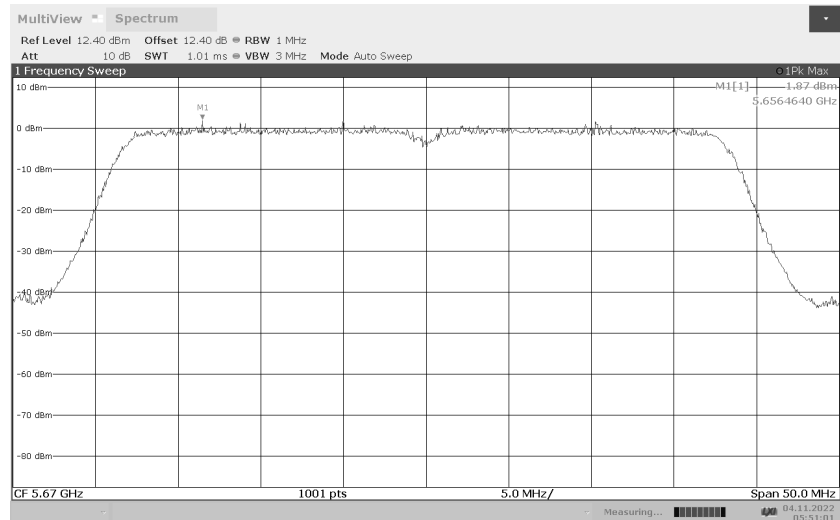
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06:11:47 04.11.2022

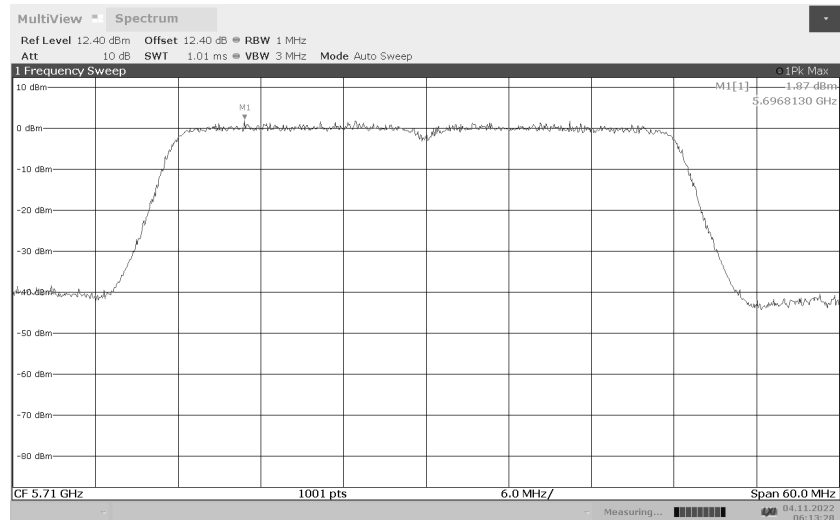
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 40MHz
5550MHz

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 40MHz
5670MHz

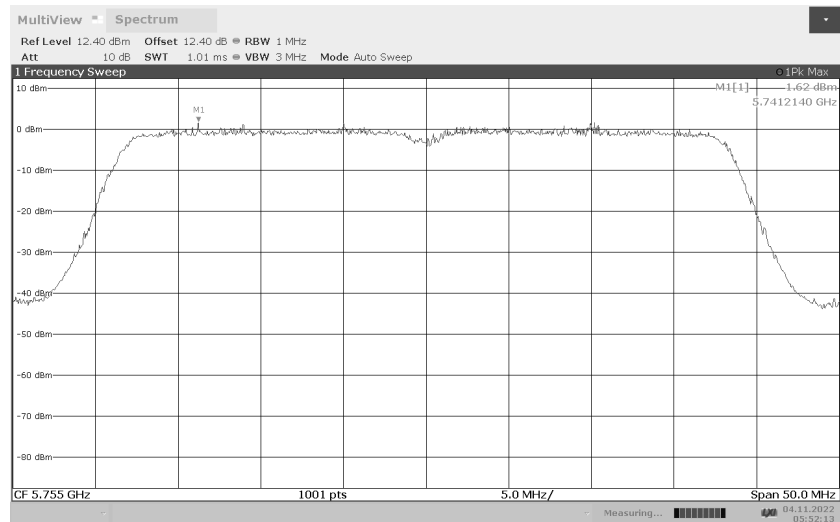


Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 40MHz
5710MHz

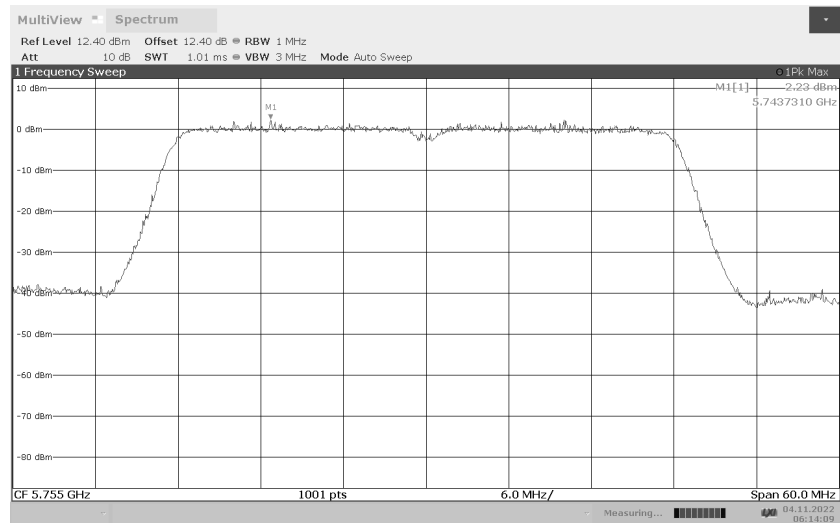
Power Spectral Density
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Antenna 2 on bottom)
802.11ac 40MHz
5755MHz



06:13:28 04.11.2022

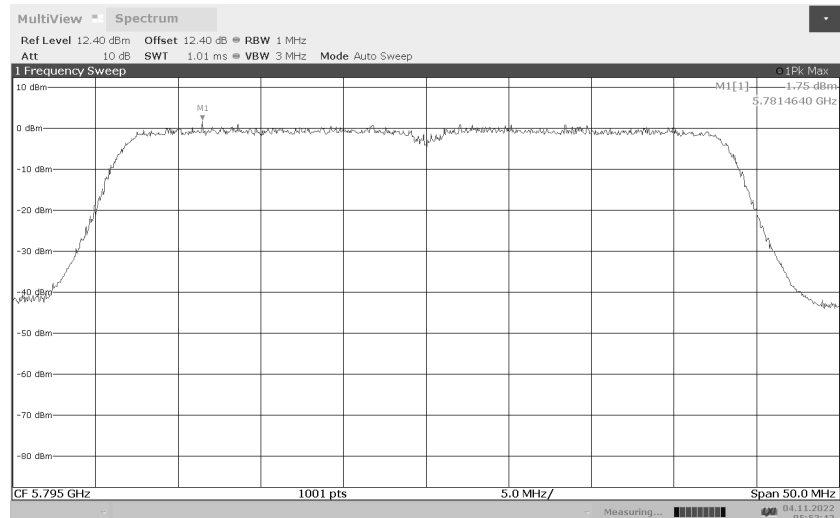


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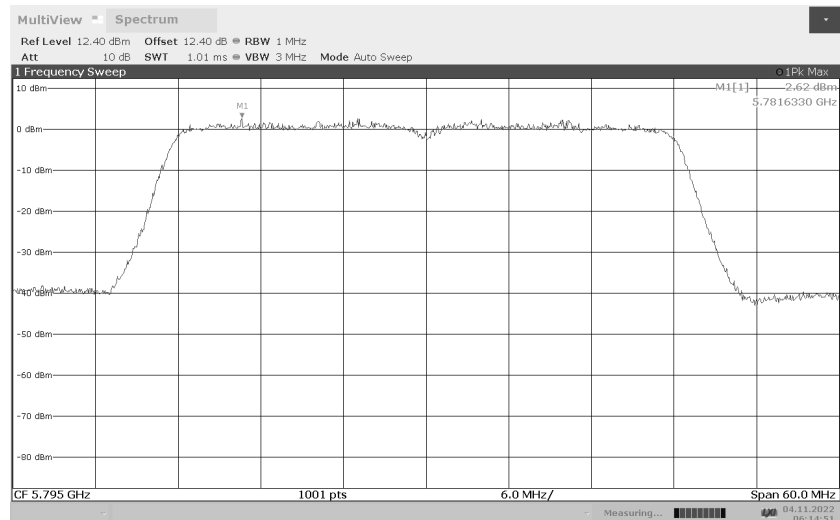


06:14:10 04.11.2022

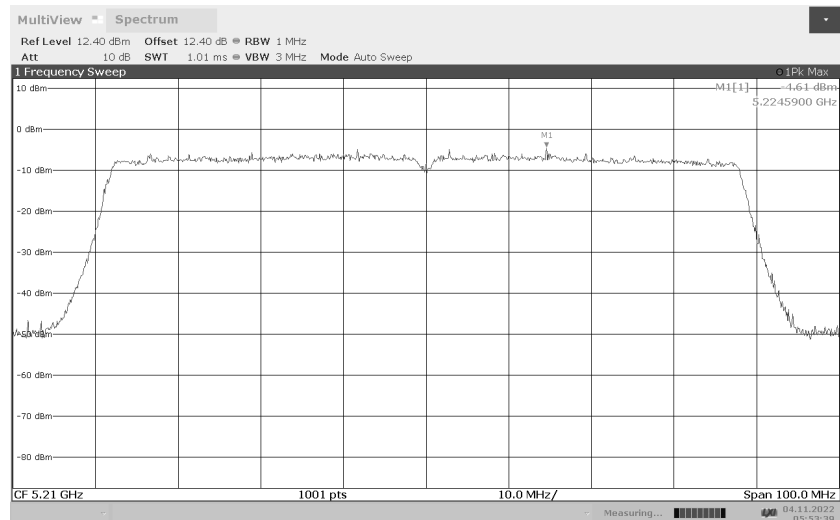
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 40MHz
5795MHz



05:52:43 04.11.2022



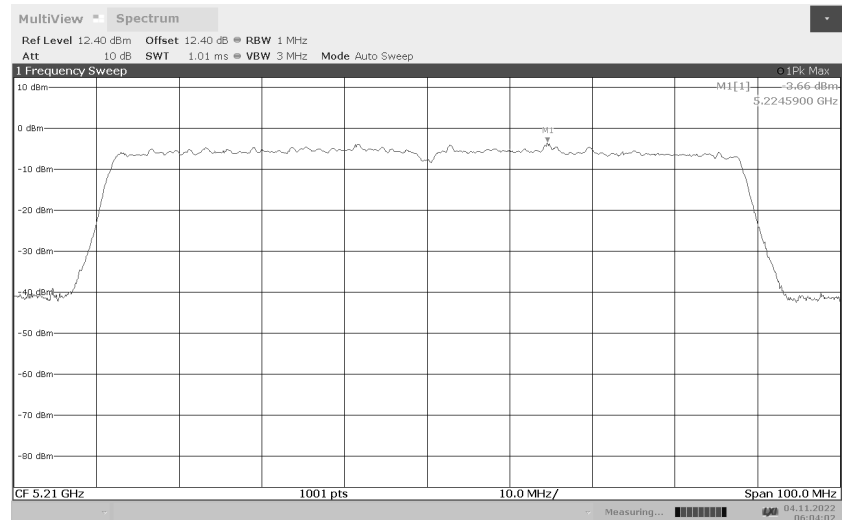
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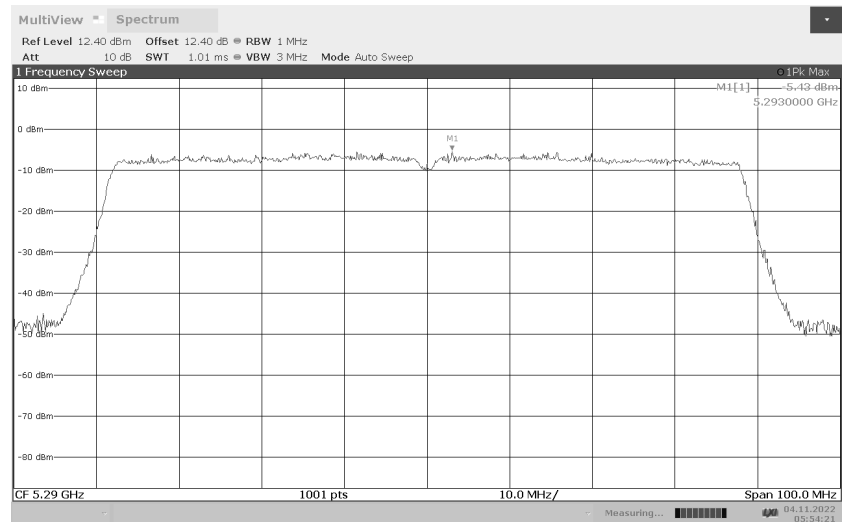
05:53:39 04.11.2022

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 80MHz
5210MHz

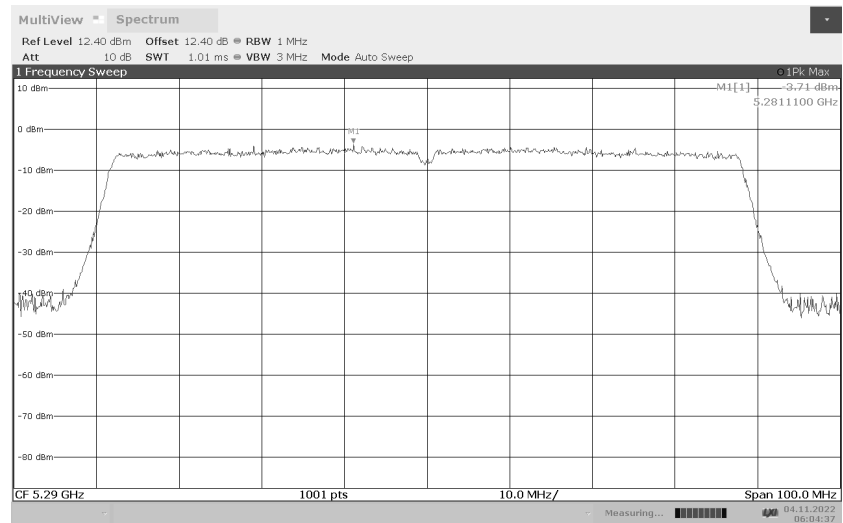
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 80MHz
5290MHz



06:04:03 04.11.2022

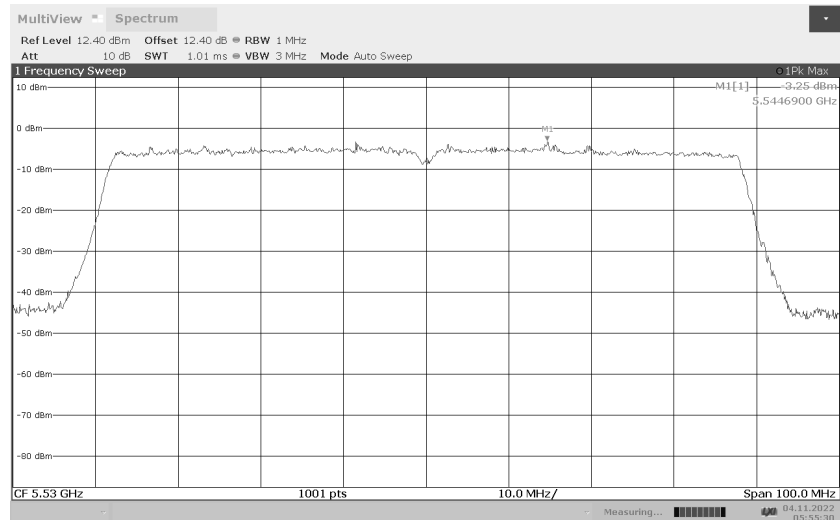


05:54:22 04.11.2022

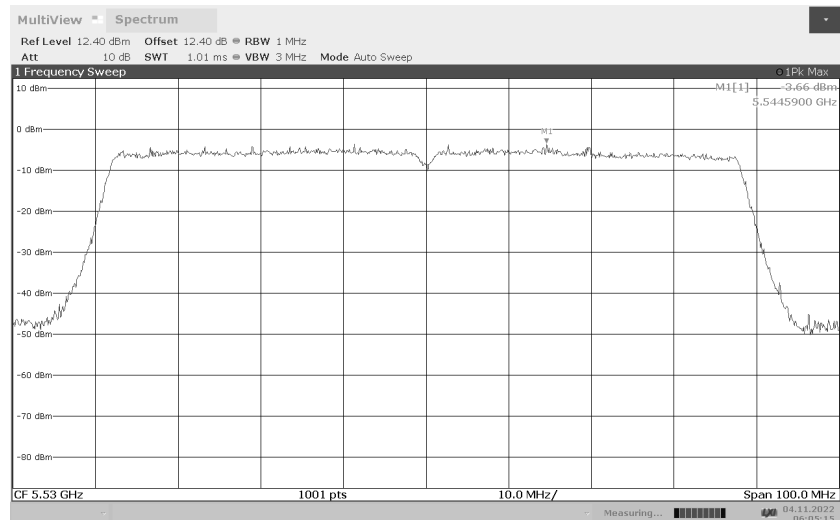


06:04:38 04.11.2022

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 80MHz
5530MHz

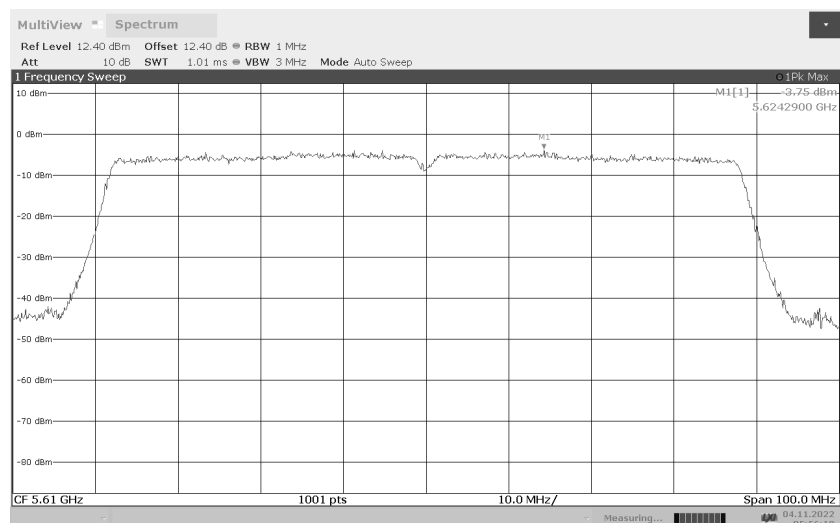


05:55:31 04.11.2022

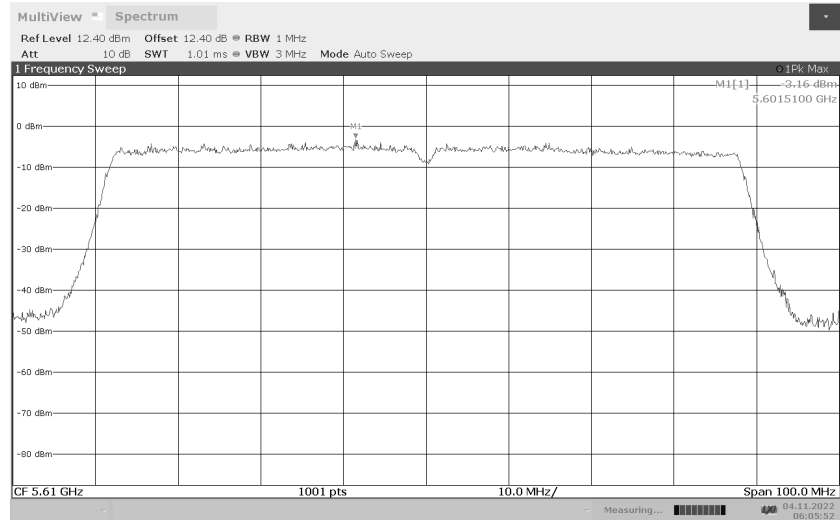


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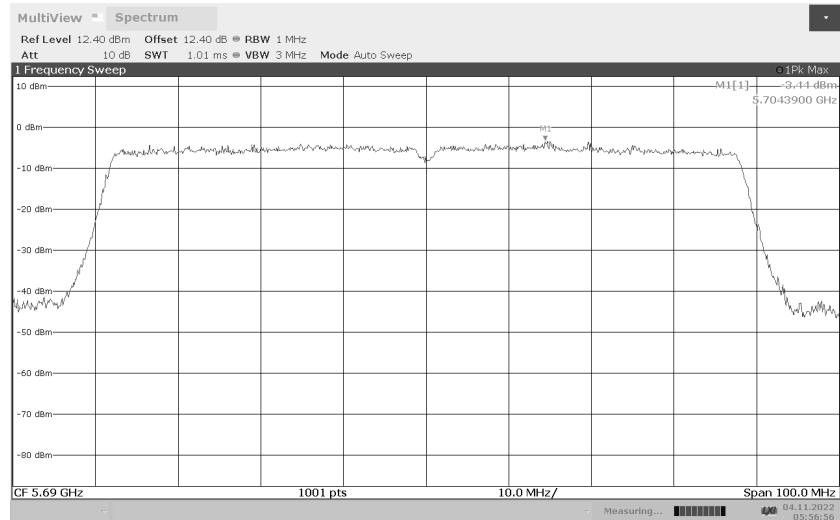
Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 80MHz
5610MHz



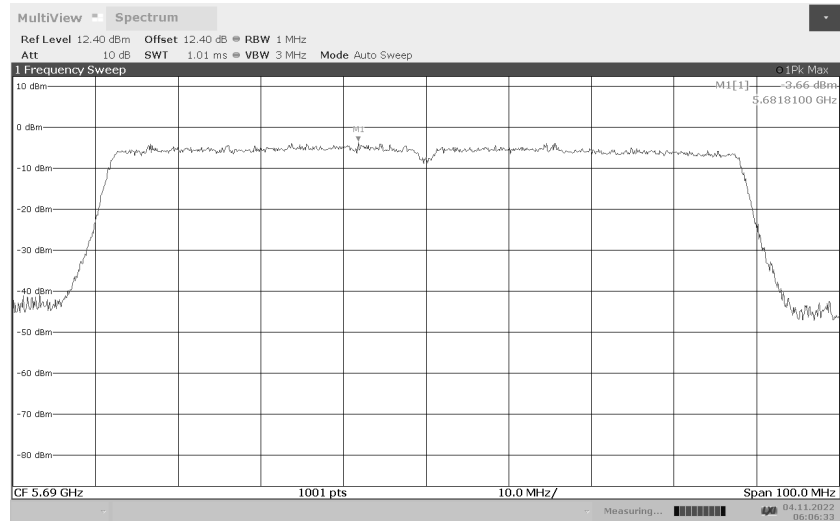
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06:05:52 04.11.2022



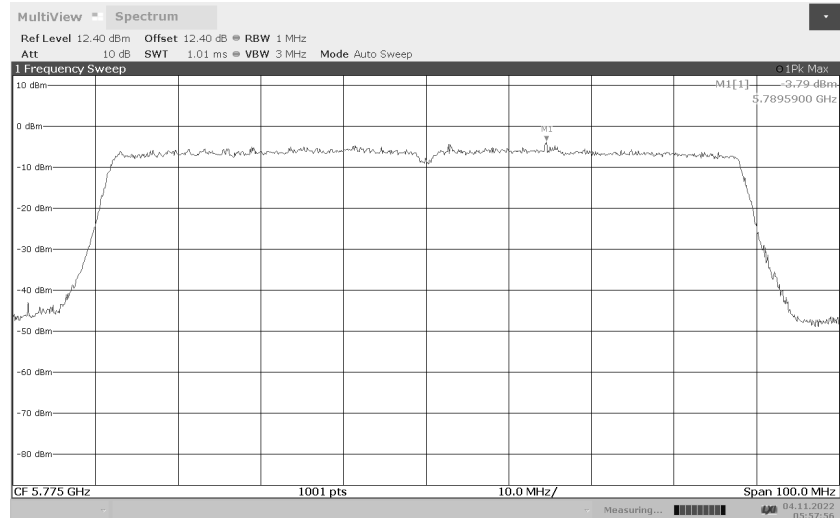
05:56:56 04.11.2022



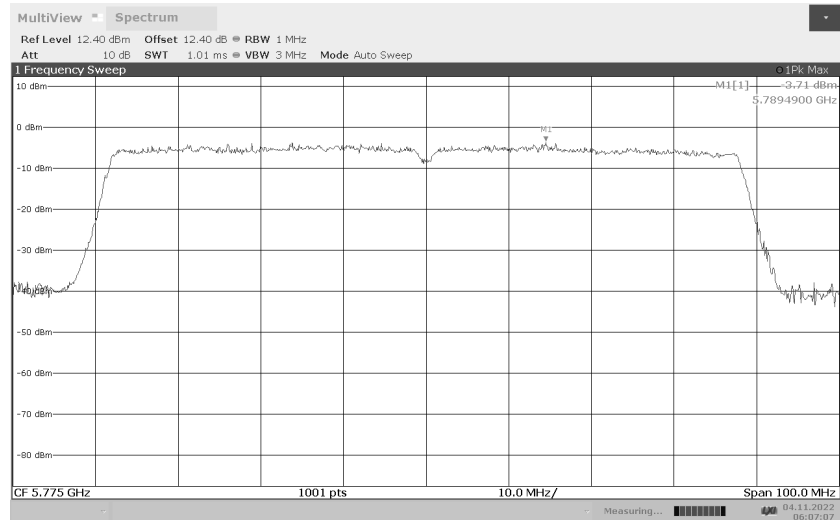
06:06:33 04.11.2022

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 80MHz
5690MHz

Power Spectral Density
(Antenna 1 on top,
Antenna 2 on bottom)
802.11ac 80MHz
5775MHz



05:57:57 04.11.2022



06:07:08 04.11.2022

4.3 Transmitter Radiated Emissions
FCC Rule 15.407(b) (1-8) 15.209, 15.205

4.3.1 Requirement

(b) Undesirable emission limits. Except as shown in paragraph (b) (7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(7) The provisions of §15.205 apply to intentional radiators operating under this section.

(8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

Emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

4.3.2 Procedure

Radiated emission measurements were performed from 9 kHz to 40 GHz according to the procedure described in ANSI C63.10: 2013. Spectrum Analyzer Resolution Bandwidth is 200Hz or greater for frequencies 9kHz to 30MHz, 100 kHz or greater for frequencies 30 MHz to 1000 MHz, 1 MHz for frequencies above 1000 MHz. Above 1000 MHz Peak and Average measurements were performed.

The EUT is placed on a plastic turntable that is 80 cm in height for below 1000MHz and 1.5m in height for above 1GHz. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). During testing, all cables were manipulated to produce worst-case emissions. The signal is maximized through rotation. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

Radiated emissions are taken at 3 meters for frequencies above 1 GHz and at 10 meters for frequencies below 1 GHz.

Measurements made from 1 GHz to 18GHz had a 5GHz notch filter in place. A preamp was used from 9kHz to 40GHz.

All measurements were made with a Peak Detector and compared to QP limits for 9 kHz – 1GHz and Average limits for 1GHz – 40 GHz.

Correlation measurements were performed below 30MHz between 10m ALSE and Open Field site according to FCC KDB 414788 D01 Radiated Test Site v01r01 section 2. All readings were within the acceptable tolerance.

Data is included of the worst-case configuration (the configuration which resulted in the highest emission levels).

ANSI C63.10-2013; 5.6.2.2

Determining worst-case mode for Spurious emissions:

For devices with multiple operating modes, measurements on the middle channel can be used to determine

the worst-case mode(s). The worst-case modes are as follows:

Measure the mode with the highest output power and the mode with the highest output power spectral density for each modulation family (e.g., OFDM and direct sequence spread spectrum).

The highest output power and the highest output power spectral density were found in the middle channels of 802.11n, therefore Spurious emissions were measured using 802.11n.

4.3.3 Field Strength Calculation

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$FS = RA + AF + CF - AG$; if measurement is performed at a distance other than specified in the rule, a Distance Correction Factor (DCF) shall be added.

Where FS = Field Strength in $dB(\mu V/m)$

RA = Receiver Amplitude (including preamplifier) in $dB(\mu V)$; AF = Antenna Factor in $dB(1/m)$

CF = Cable Attenuation Factor in dB ; AG = Amplifier Gain in dB

Assume a receiver reading of $52.0\text{ dB}(\mu V)$ is obtained. The antennas factor of $7.4\text{ dB}(1/m)$ and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving field strength of $32\text{ dB}(\mu V/m)$. This value in $dB(\mu V/m)$ was converted to its corresponding level in $\mu V/m$.

$RA = 52.0\text{ dB}(\mu V)$

$AF = 7.4\text{ dB}(1/m)$

$CF = 1.6\text{ dB}$

$AG = 29.0\text{ dB}$

$FS = 52.0 + 7.4 + 1.6 - 29.0 = 32\text{ dB}(\mu V/m)$.

Level in $\mu V/m$ = Common Antilogarithm $[(32\text{ dB}\mu V/m)/20] = 39.8\text{ }\mu V/m$.

4.3.4 Antenna-port conducted measurements

Antenna-port conducted measurements may also be used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case spurious emissions is required.

4.3.5 General Procedure for conducted measurements in restricted bands

- a) Measure the conducted output power (in dBm) using the detector specified for determining quasi-peak, peak, and average conducted output power, respectively.
- b) Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see 12.2.5 for guidance on determining the applicable antenna gain)
- c) Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).
- d) For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (*e.g.*, Watts, mW).
- e) Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:
$$E = \text{EIRP} - 20\log D + 104.8$$
where:
E = electric field strength in dB μ V/m,
EIRP = equivalent isotropic radiated power in dBm
D = specified measurement distance in meters.
- f) Compare the resultant electric field strength level to the applicable limit.
- g) Perform radiated spurious emission test

4.3.6 Test Results

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

All conducted antenna port plots are corrected with the consideration of the EUT's Antenna Gain.

Radiated emission measurements were performed from 9kHz up to 40GHz.

9kHz – 30MHz Data is included of the worst-case configuration (the configuration which resulted in the highest emission levels).

Test Results: 15.209/15.205 Restricted Band Emissions

Out-of-Band Spurious Emissions at the Band Edge - 802.11a, 5745 MHz

