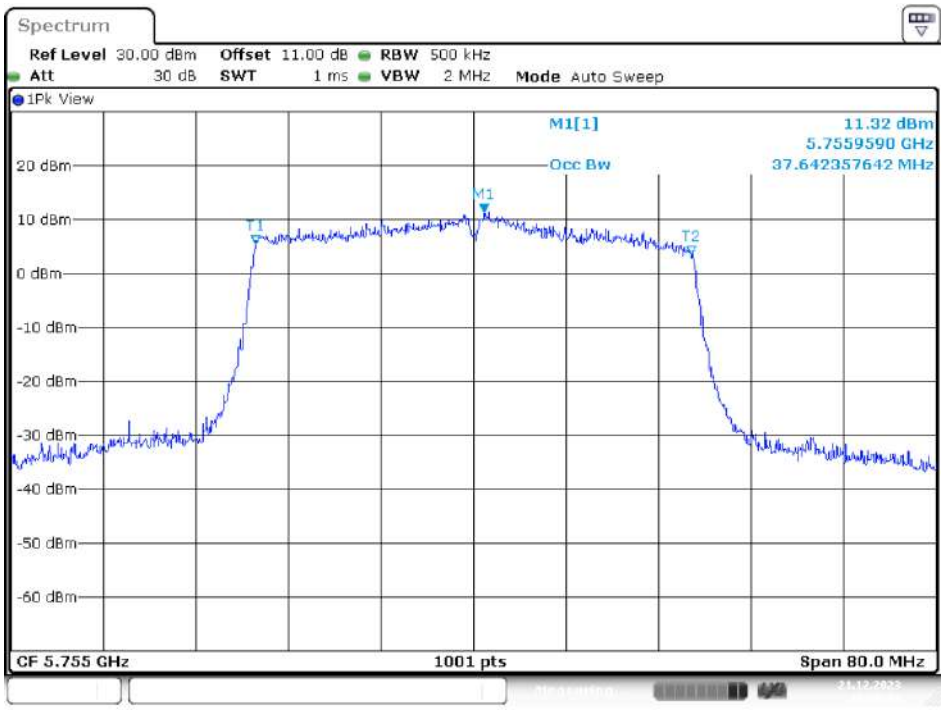
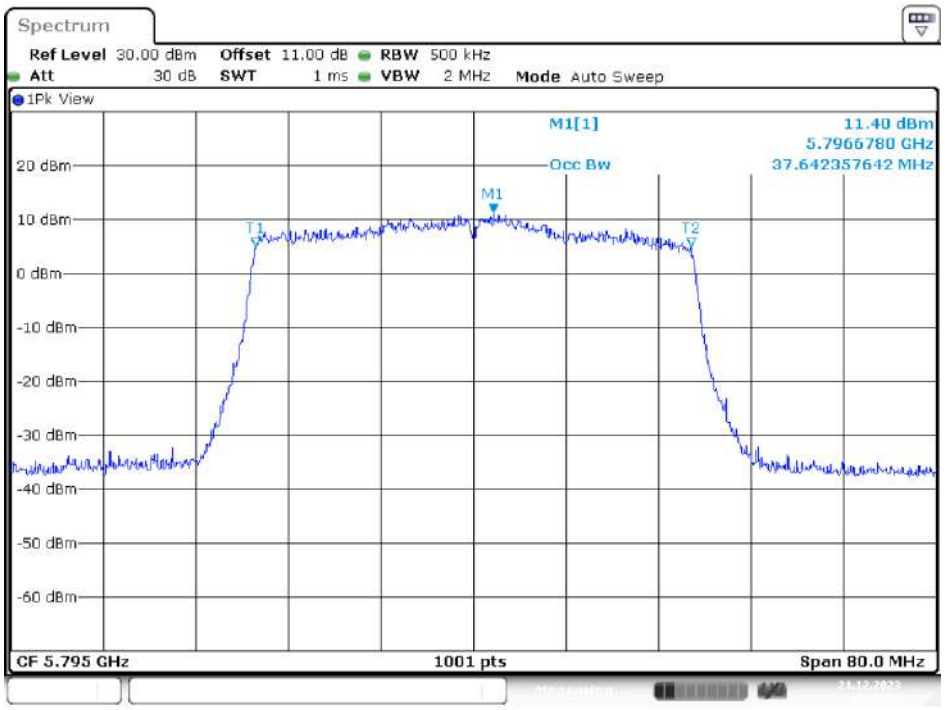
IEEE 802.11ax HE40 Mode / 5725 ~ 5850MHz (Chain 0)

5755MHz



Date: 21.DEC.2023 19:20:10

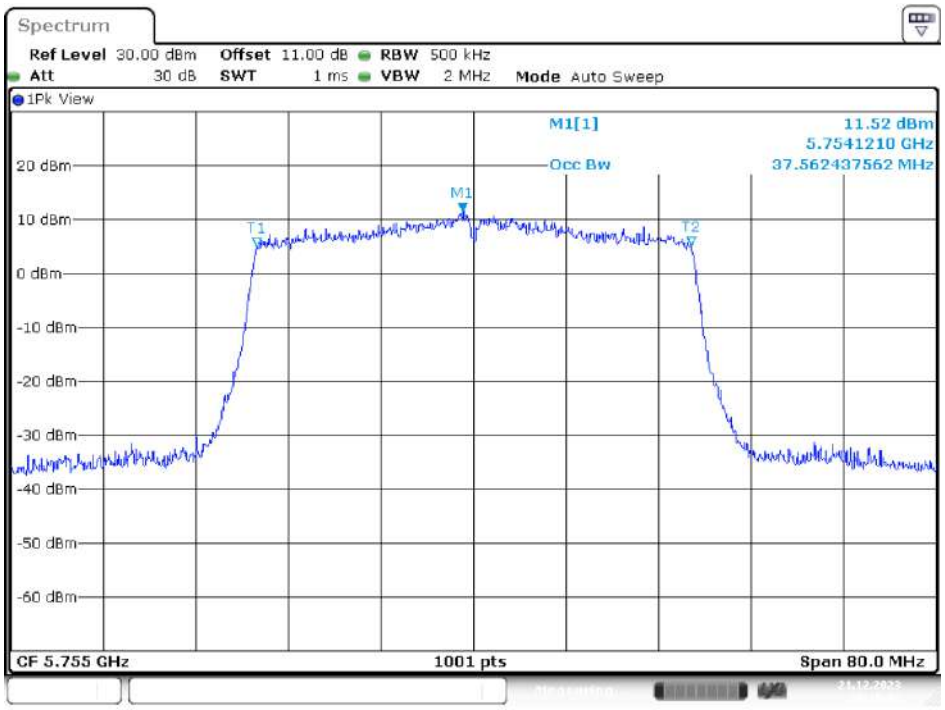
5795MHz



Date: 21.DEC.2023 19:22:15

IEEE 802.11ax HE40 Mode / 5725 ~ 5850MHz (Chain 1)

5755MHz



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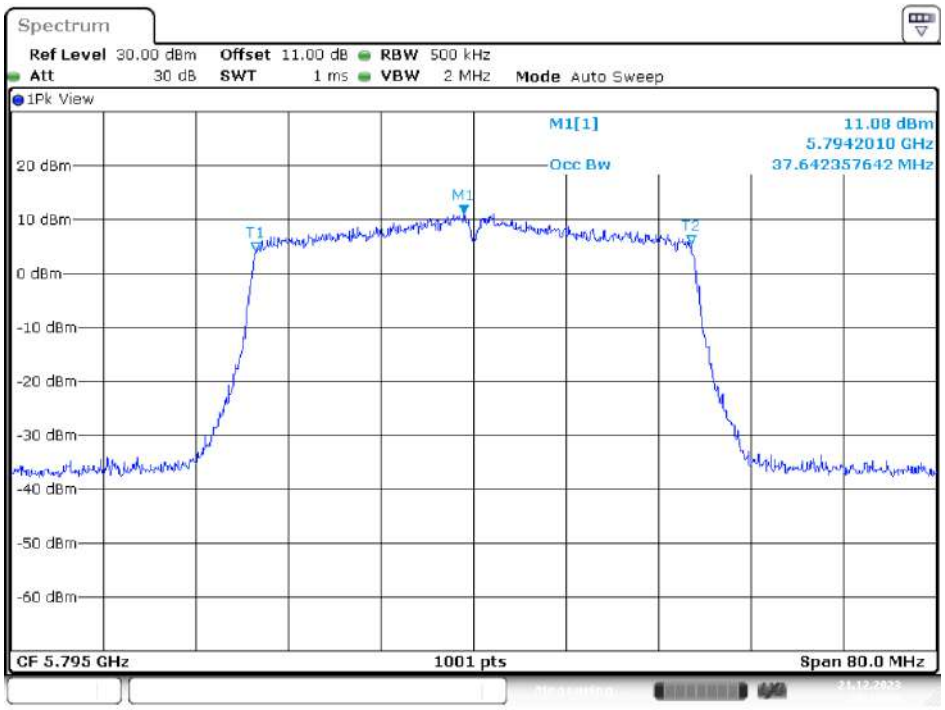
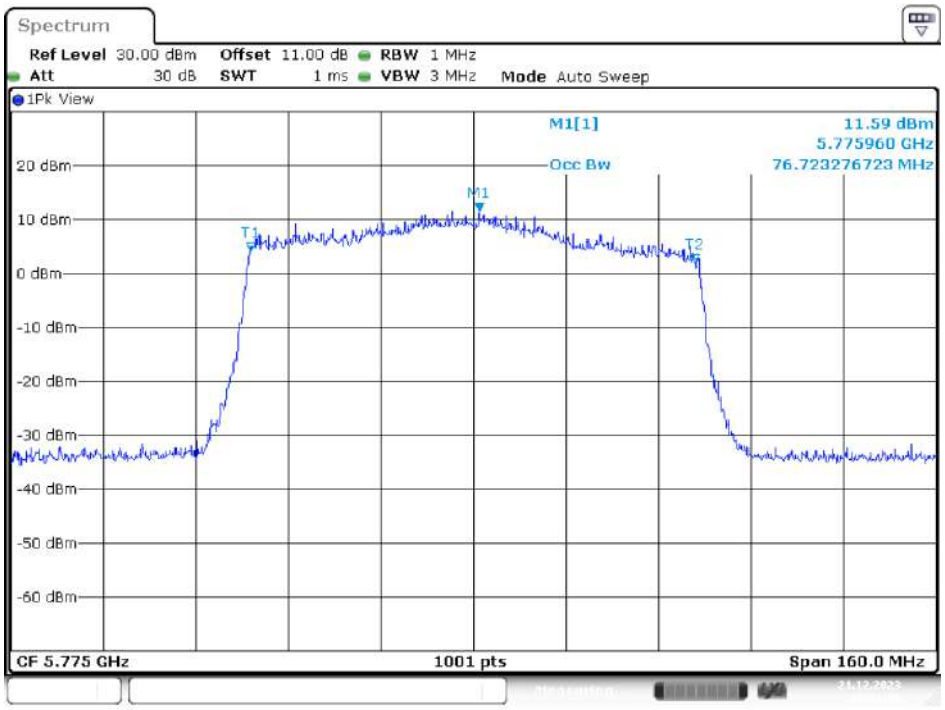
5795MHz



Date: 21.DEC.2023 20:17:00

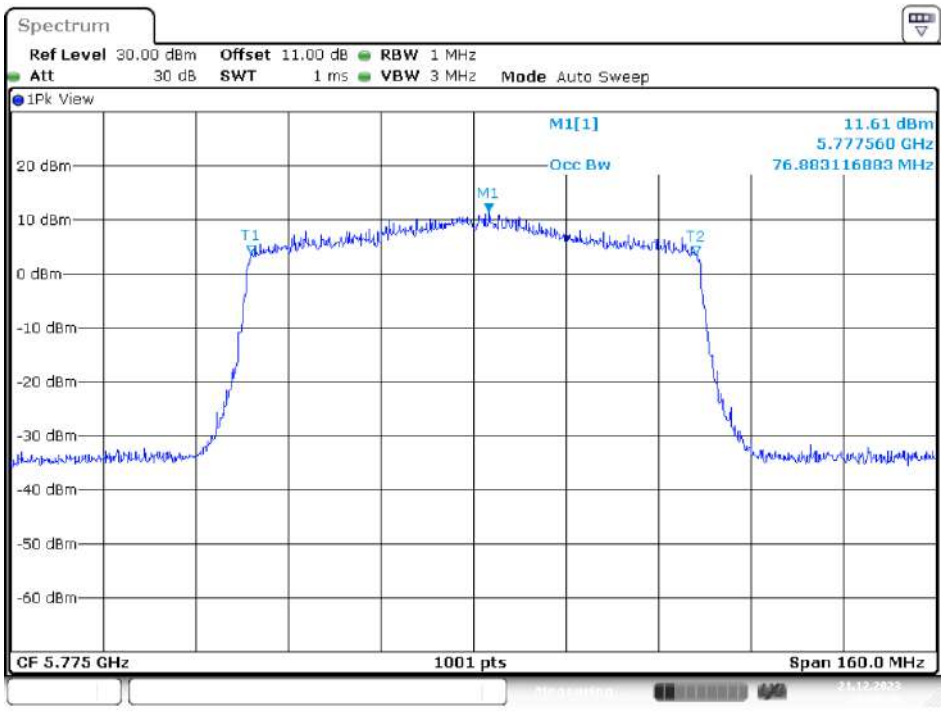
IEEE 802.11ax HE80 Mode / 5725 ~ 5850MHz (Chain 0)

5775MHz



IEEE 802.11ax HE80 Mode / 5725 ~ 5850MHz (Chain 1)

5775MHz



12 FCC §15.407(a) & RSS-247 §6.2 – Maximum Output Power

12.1 Applicable Standard

According to FCC §15.407(a):

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over thefrequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral densityshall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gaingreater than 6 dBi are used, both the maximum conducted output power and the maximum powerspectral density shall bereduced by the amount in dB that the directional gain of the antennaexceeds 6 dBi

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum 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 maximum 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 U-NII 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 systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

According to RSS-247 §6.2:

For the 5.15-5.25 GHz band

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, 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.

For the 5.25-5.35 GHz band

Devices, other than devices installed in vehicles, shall comply with the following:

a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;

b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, 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.

For the 5.47-5.725 GHz bands

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, 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 log10B, 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.

For the 5.725-5.85 GHz bands

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.

12.2 Test Procedure

According to ANSI C63.10-2013 Section 12.3.3.1

The use Power Meter

1. Place the EUT on a bench and set it in transmitting mode.

2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a Power sensor.

12.3 Test Results

Test Mode: Transmitting

5150-5250MHz

Test Modes	Channel	Frequency (MHz)	Maximum Conducted Average Output Power (dBm)			Duty Factor (dB)	Total Maximum Conducted Average Output Power With Duty Factor (dBm)	FCC Limit (dBm)	EIRP Power (dBm)	RSS-247 EIRP Limit (dBm)
			Chain 0	Chain 1	Total					
802.11a	36	5180	10.25	11.45	13.90	0.32	14.22	30	19.58	22.10
	40	5200	10.18	11.43	13.86	0.32	14.18	30	19.54	22.11
	48	5240	10.38	10.88	13.65	0.32	13.97	30	19.33	22.11
802.11ac VHT20	36	5180	10.95	11.98	14.51	0.41	14.92	30	20.28	22.42
	40	5200	10.58	11.55	14.10	0.41	14.51	30	19.87	22.42
	48	5240	10.55	11.78	14.22	0.41	14.63	30	19.99	22.42
802.11ac VHT40	38	5190	12.85	13.85	16.39	0.51	16.90	30	22.26	23
	46	5230	12.88	13.98	16.48	0.51	16.99	30	22.35	23
802.11ac VHT80	42	5210	13.25	14.35	16.85	0.51	17.36	30	22.72	23
802.11ac VHT160	50	5250	13.25	14.25	16.79	0.51	17.30	30	22.74	23
802.11ax HE20	36	5180	11.22	12.45	14.89	0.41	15.30	30	20.66	22.75
	40	5200	10.95	11.95	14.49	0.41	14.90	30	20.26	22.75
	48	5240	10.72	11.98	14.41	0.41	14.82	30	20.18	22.75
802.11ax HE40	38	5190	12.68	13.95	16.37	0.46	16.83	30	22.19	23
	46	5230	12.59	13.78	16.24	0.46	16.70	30	22.06	23
802.11ax HE80	42	5210	13.15	14.25	16.75	0.46	17.21	30	22.57	23
802.11ax HE160	50	5250	13.35	14.35	16.89	0.56	17.45	30	22.89	23

Note: The device is a indoor access point device.

The maximum antenna gain is 5.36 dBi.

For Bandwidth 160MHz maximum antenna gain is 5.44 dBi.

5250-5350MHz

Test Modes	Channel	Frequency (MHz)	Maximum Conducted Average Output Power (dBm)			Duty Factor (dB)	Total Maximum Conducted Average Output Power With Duty Factor (dBm)	FCC Limit (dBm)	RSS-247 Limit (dBm)	EIRP Power (dBm)	RSS-247 EIRP Limit (dBm)
			Chain 0	Chain 1	Total						
802.11a	52	5260	15.21	15.97	18.62	0.32	18.94	23.93	23.11	24.38	29.11
	60	5300	15.04	15.54	18.31	0.32	18.63	23.92	23.10	24.07	29.10
	64	5320	15.44	15.42	18.44	0.32	18.76	23.80	23.10	24.20	29.10
802.11ac VHT20	52	5260	15.17	16.02	18.63	0.41	19.04	24	23.42	24.48	29.42
	60	5300	15.46	16.12	18.81	0.41	19.22	24	23.42	24.66	29.42
	64	5320	15.41	15.43	18.43	0.41	18.84	24	23.43	24.28	29.43
802.11ac VHT40	54	5270	16.61	17.25	19.95	0.51	20.46	24	24	25.90	30
	62	5310	16.31	16.91	19.63	0.51	20.14	24	24	25.58	30
802.11ac VHT80	58	5290	16.07	16.52	19.31	0.51	19.82	24	24	25.26	30
802.11ac VHT160	50	5250	13.25	14.25	16.79	0.51	17.30	24	24	22.74	30
802.11ax HE20	52	5260	14.53	15.13	17.85	0.41	18.26	24	23.75	23.70	29.75
	60	5300	14.21	14.69	17.47	0.41	17.88	24	23.75	23.32	29.75
	64	5320	14.36	14.57	17.48	0.41	17.89	24	23.75	23.33	29.75
802.11ax HE40	54	5270	15.39	15.87	18.65	0.46	19.11	24	24	24.55	30
	62	5310	15.04	15.41	18.24	0.46	18.70	24	24	24.14	30
802.11ax HE80	58	5290	16.05	16.52	19.30	0.46	19.76	24	24	25.20	30
802.11ax HE160	50	5250	13.35	14.35	16.89	0.56	17.45	24	24	22.89	30

Note: The maximum antenna gain is 5.44 dBi.

5470-5725MHz

Test Modes	Channel	Frequency (MHz)	Maximum Conducted Average Output Power (dBm)			Duty Factor (dB)	Total Maximum Conducted Average Output Power With Duty Factor (dBm)	FCC Limit (dBm)	RSS-247 Limit (dBm)	EIRP Power (dBm)	RSS-247 EIRP Limit (dBm)
			Chain 0	Chain 1	Total						
802.11a	100	5500	15.09	15.84	18.49	0.32	18.81	23.93	23.10	24.34	29.10
	116	5580	15.03	15.79	18.44	0.32	18.76	23.81	23.10	24.29	29.10
	140	5700	15.22	15.96	18.62	0.32	18.94	23.95	23.10	24.47	29.10
802.11ac VHT20	100	5500	15.07	15.82	18.47	0.41	18.88	24	23.43	24.41	29.43
	116	5580	14.97	15.77	18.40	0.41	18.81	24	23.42	24.34	29.42
	140	5700	15.27	15.97	18.64	0.41	19.05	24	23.42	24.58	29.42
802.11ac VHT40	102	5510	16.32	17.13	19.75	0.51	20.26	24	24	25.79	30
	110	5550	16.80	17.66	20.26	0.51	20.77	24	24	26.30	30
	134	5670	16.93	17.85	20.42	0.51	20.93	24	24	26.46	30
802.11ac VHT80	106	5530	15.93	16.62	19.30	0.51	19.81	24	24	25.34	30
	122	5610	16.36	17.32	19.88	0.51	20.39	24	24	25.92	30
802.11ac VHT160	114	5570	16.21	17.13	19.70	0.51	20.21	24	24	25.74	30
802.11ax HE20	100	5500	14.19	14.92	17.58	0.41	17.99	24	23.76	23.52	29.76
	116	5580	14.15	14.96	17.58	0.41	17.99	24	23.76	23.52	29.76
	140	5700	14.54	15.21	17.90	0.41	18.31	24	23.75	23.84	29.75
802.11ax HE40	102	5510	15.01	15.78	18.42	0.46	18.88	24	24	24.41	30
	110	5550	15.63	16.35	19.02	0.46	19.48	24	24	25.01	30
	134	5670	15.79	16.51	19.18	0.46	19.64	24	24	25.17	30
802.11ax HE80	106	5530	15.95	16.59	19.29	0.46	19.75	24	24	25.28	30
	122	5610	17.33	16.37	19.89	0.46	20.35	24	24	25.88	30
802.11ax HE160	114	5570	16.36	17.19	19.81	0.56	20.37	24	24	25.90	30

Note: The maximum antenna gain is 5.53 dBi.

5725-5850MHz

Test Modes	Channel	Frequency (MHz)	Maximum Conducted Average Output Power (dBm)			Duty Factor (dB)	Total Maximum Conducted Average Output Power With Duty Factor (dBm)	FCC / RSS-247 Limit (dBm)
			Chain 0	Chain 1	Total			
802.11a	149	5745	16.13	16.17	19.16	0.32	19.48	30
	157	5785	16.11	16.18	19.16	0.32	19.48	30
	165	5825	15.94	16.24	19.10	0.32	19.42	30
802.11ac VHT20	149	5745	15.56	15.69	18.64	0.41	19.05	30
	157	5785	15.59	15.64	18.63	0.41	19.04	30
	165	5825	15.42	15.75	18.60	0.41	19.01	30
802.11ac VHT40	151	5755	16.40	16.37	19.40	0.51	19.91	30
	159	5795	16.52	16.37	19.46	0.51	19.97	30
802.11ac VHT80	155	5775	15.77	15.67	18.73	0.51	19.24	30
802.11ax HE20	149	5745	14.88	14.92	17.91	0.41	18.32	30
	157	5785	15.06	14.94	18.01	0.41	18.42	30
	165	5825	14.46	14.95	17.72	0.41	18.13	30
802.11ax HE40	151	5755	15.16	15.12	18.15	0.46	18.61	30
	159	5795	15.22	15.18	18.21	0.46	18.67	30
802.11ax HE80	155	5775	15.88	15.65	18.78	0.46	19.24	30

Note:

The device employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01

Multiple Transmitter Output v02r01, for power measurements on IEEE 802.11 devices:

Array Gain = 0 dB (i.e., no array gain) for NANT $\leqslant$ 4

13 FCC §15.407(a) & RSS-247 §6.2 – Power Spectral Density

13.1 Applicable Standard

According to FCC §15.407(a):

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

According to RSS-247 §6.2:

For the 5.15-5.25 GHz band

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log10B, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, 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.

For the 5.25-5.35 GHz band

Devices, other than devices installed in vehicles, shall comply with the following:

a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;

b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, 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.

For the 5.47-5.725 GHz bands

The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, 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 log10B, 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.

For the 5.725-5.85 GHz bands

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.

13.2 Test Procedure

The measurements are base on FCC KDB 789033 D02 General UNII Test Procedyres New Rules v02r01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section F: Maximum power spectral density.

Duty cycle <98%, duty cycle variations are less than ±2%

Method SA-2 was used.

13.3 Test Results

Test Mode: Transmitting

5150-5250MHz

Mode	Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)			Duty Factor (dB)	Power Spectral Density with duty factor (dBm/MHz)	Limit (dBm/MHz)	EIRP Power Spectral Density (dBm/MHz)	
			Chain 0	Chain 1	Total				Result	Limit
802.11a	36	5180	0.10	1.15	3.67	0.32	3.99	14.78	9.35	10
	40	5200	0.11	1.16	3.68	0.32	4.00	14.78	9.36	10
	48	5240	0.18	0.72	3.47	0.32	3.79	14.78	9.15	10
802.11ac 20	36	5180	0.38	1.58	4.03	0.41	4.44	14.78	9.80	10
	40	5200	0.32	1.27	3.83	0.41	4.24	14.78	9.60	10
	48	5240	0.17	1.35	3.81	0.41	4.22	14.78	9.58	10
802.11ac 40	38	5190	-0.63	0.28	2.86	0.51	3.37	14.78	8.73	10
	46	5230	-0.69	0.31	2.85	0.51	3.36	14.78	8.72	10
802.11ac 80	42	5210	-2.66	-1.73	0.84	0.51	1.35	14.78	6.71	10
802.11ac 160	50	5250	-5.37	-4.15	-1.71	0.51	-1.20	14.78	4.16	10
802.11ax 20	36	5180	0.34	1.43	3.93	0.41	4.34	14.78	9.70	10
	40	5200	0.26	1.24	3.79	0.41	4.20	14.78	9.56	10
	48	5240	0.11	1.26	3.73	0.41	4.14	14.78	9.50	10
802.11ax 40	38	5190	-0.97	0.03	2.57	0.46	3.03	14.78	8.39	10
	46	5230	-1.51	0.18	2.43	0.46	2.89	14.78	8.25	10
802.11ax 80	42	5210	-2.76	-1.76	0.78	0.46	1.24	14.78	6.60	10
802.11ax 160	50	5250	-5.36	-4.17	-1.71	0.56	-1.15	14.78	4.21	10

Note: The device is a indoor access point device.

The maximum antenna gain is 5.36 dBi.

5250-5350MHz

Mode	Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)			Duty Factor (dB)	Power Spectral Density with duty factor (dBm/MHz)	Limit (dBm/MHz)
			Chain 0	Chain 1	Total			
802.11a	52	5260	4.78	5.51	8.17	0.32	8.49	8.63
	60	5300	4.61	5.04	7.84	0.32	8.16	8.63
	64	5320	4.79	4.86	7.84	0.32	8.16	8.63
802.11ac 20	52	5260	4.12	5.15	7.68	0.41	8.09	8.63
	60	5300	4.52	5.40	7.99	0.41	8.40	8.63
	64	5320	4.60	4.98	7.80	0.41	8.21	8.63
802.11ac 40	54	5270	2.98	3.73	6.38	0.51	6.89	8.63
	62	5310	2.84	3.40	6.14	0.51	6.65	8.63
802.11ac 80	58	5290	0.17	0.63	3.42	0.51	3.93	8.63
802.11ac 160	50	5250	-5.37	-4.15	-1.71	0.51	-1.2	8.63
802.11ax 20	52	5260	4.46	5.42	7.98	0.41	8.39	8.63
	60	5300	4.83	5.54	8.21	0.41	8.62	8.63
	64	5320	4.93	5.35	8.16	0.41	8.57	8.63
802.11ax 40	54	5270	2.40	3.49	5.99	0.46	6.45	8.63
	62	5310	1.61	3.41	5.61	0.46	6.07	8.63
802.11ax 80	58	5290	0.39	1.05	3.74	0.46	4.20	8.63
802.11ax 160	50	5250	-5.36	-4.17	-1.71	0.56	-1.15	8.63

5470-5725MHz

Mode	Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)			Duty Factor (dB)	Power Spectral Density with duty factor (dBm/MHz)	Limit (dBm/MHz)
			Chain 0	Chain 1	Total			
802.11a	100	5500	4.71	5.28	8.01	0.32	8.33	8.59
	116	5580	4.93	5.41	8.19	0.32	8.51	8.59
	140	5700	5.07	5.44	8.27	0.32	8.59	8.59
802.11ac 20	100	5500	4.74	5.23	8.00	0.41	8.41	8.59
	116	5580	4.68	5.16	7.94	0.41	8.35	8.59
	140	5700	4.92	5.30	8.12	0.41	8.53	8.59
802.11ac 40	102	5510	3.06	3.62	6.36	0.51	6.87	8.59
	110	5550	3.61	3.89	6.76	0.51	7.27	8.59
	134	5670	4.09	4.43	7.27	0.51	7.78	8.59
802.11ac 80	106	5530	0.47	0.87	3.68	0.51	4.19	8.59
	122	5610	0.68	0.96	3.83	0.51	4.34	8.59
802.11ac 160	114	5570	-2.81	-1.04	1.17	0.51	1.68	8.59
802.11ax 20	100	5500	4.81	5.48	8.17	0.41	8.58	8.59
	116	5580	4.83	5.31	8.09	0.41	8.50	8.59
	140	5700	4.90	5.39	8.16	0.41	8.57	8.59
802.11ax 40	102	5510	2.03	3.48	5.83	0.46	6.29	8.59
	110	5550	3.22	3.63	6.44	0.46	6.90	8.59
	134	5670	3.18	4.25	6.76	0.46	7.22	8.59
802.11ax 80	106	5530	0.67	1.00	3.85	0.46	4.31	8.59
	122	5610	1.00	1.80	4.43	0.46	4.89	8.59
802.11ax 160	114	5570	-2.97	-1.05	1.11	0.56	1.67	8.59

5725-5850MHz

Mode	Channel	Frequency (MHz)	Power Spectral Density (dBm/500kHz)			Duty Factor (dB)	Power Spectral Density with duty factor (dBm/500kHz)	Limit (dBm/500kHz)
			Chain 0	Chain 1	Total			
802.11a	149	5745	2.90	-0.95	4.40	0.32	4.72	27.66
	157	5785	2.62	-0.30	4.41	0.32	4.73	27.66
	165	5825	2.27	-0.30	4.18	0.32	4.50	27.66
802.11ac 20	149	5745	1.99	2.55	5.29	0.41	5.70	27.66
	157	5785	1.87	2.37	5.14	0.41	5.55	27.66
	165	5825	1.17	2.25	4.75	0.41	5.16	27.66
802.11ac 40	151	5755	0.05	0.32	3.20	0.51	3.71	27.66
	159	5795	-0.24	0.28	3.04	0.51	3.55	27.66
802.11ac 80	155	5775	-3.20	-2.70	0.07	0.51	0.58	27.66
802.11ax 20	149	5745	1.92	2.48	5.22	0.41	5.63	27.66
	157	5785	1.68	2.27	5.00	0.41	5.41	27.66
	165	5825	1.08	2.13	4.65	0.41	5.06	27.66
802.11ax 40	151	5755	-0.47	0.00	2.78	0.46	3.24	27.66
	159	5795	-0.69	-0.03	2.66	0.46	3.12	27.66
802.11ax 80	155	5775	-3.30	-2.71	0.02	0.46	0.48	27.66

The device employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01

Multiple Transmitter Output v02r01, for Power spectral density (PSD) measurements on the devices:

Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/N_{ANT}]$ dBi.

Directional gain = Band 1: 8.22 dBi , Band 2: 8.37 dBi , Band 3: 8.41 dBi , Band 4: 8.34 dBi

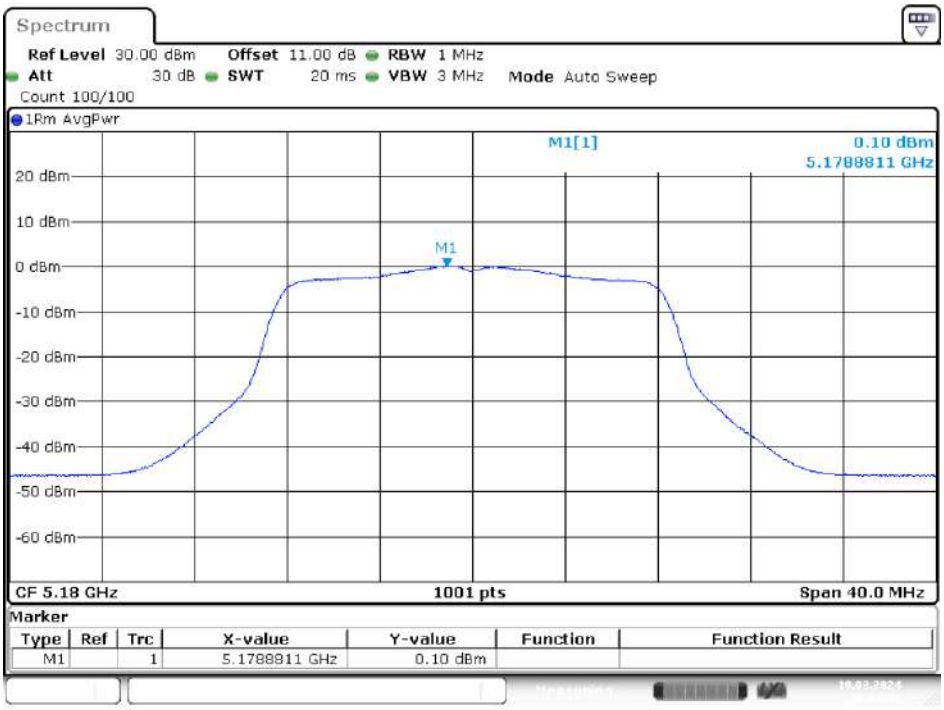
The Power density Limits was reduce Band 1: 2.22 dBi , Band 2: 2.37 dBi , Band 3: 2.41 dBi , Band 4: 2.34 dBi

Please refer to the following plots

UNII-1 Band I / PSD

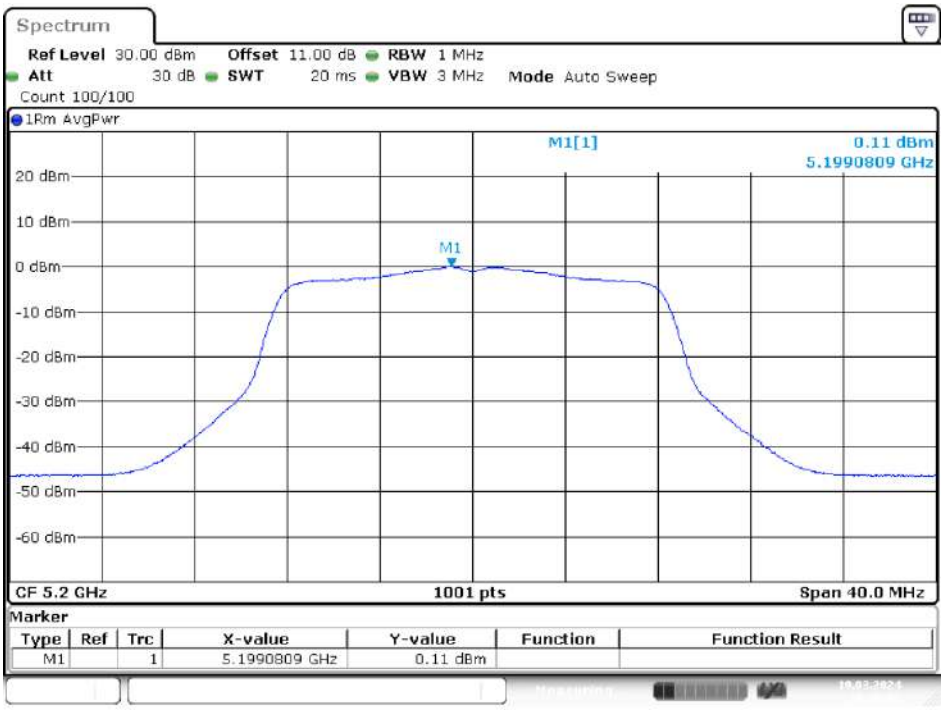
IEEE 802.11a Mode / 5150 ~ 5250MHz (Chain 0)

5180MHz



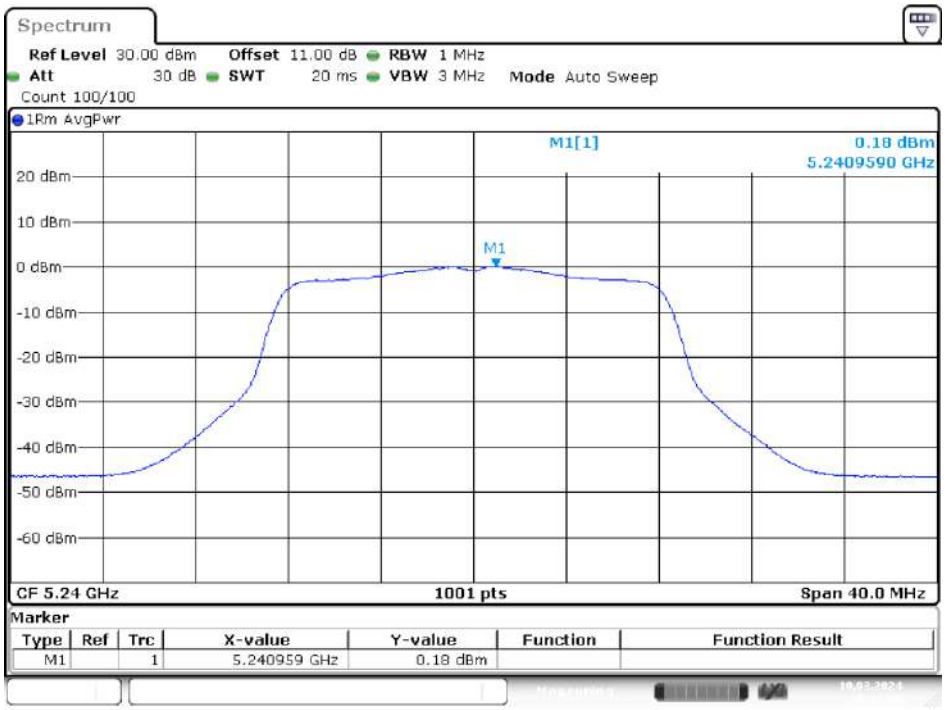
Date: 19.MAR.2024 10:04:42

5200MHz



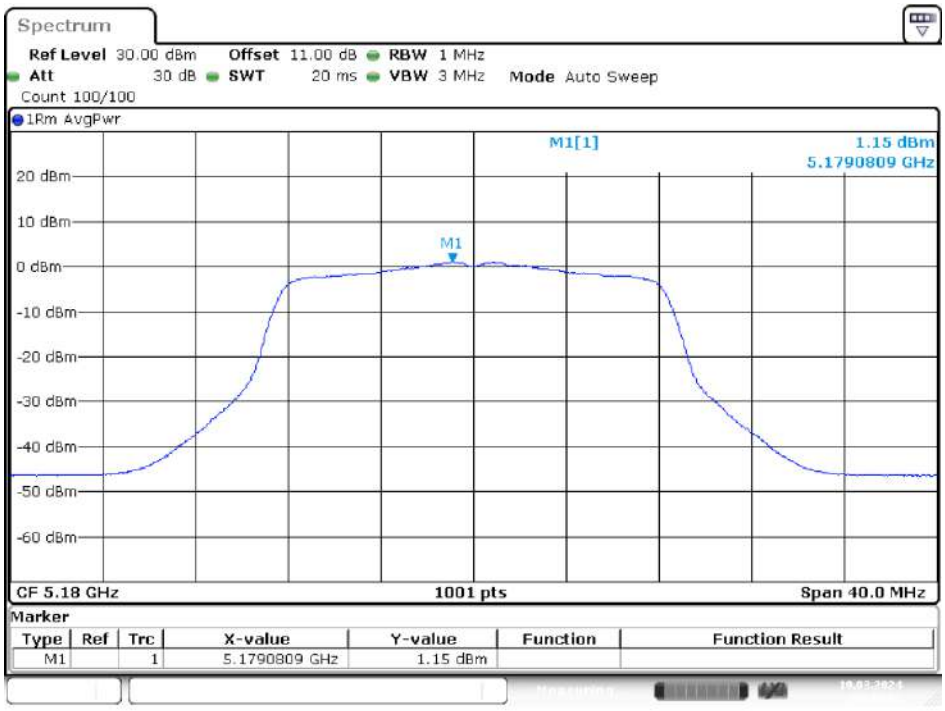
Date: 19.MAR.2024 10:16:03

5240MHz

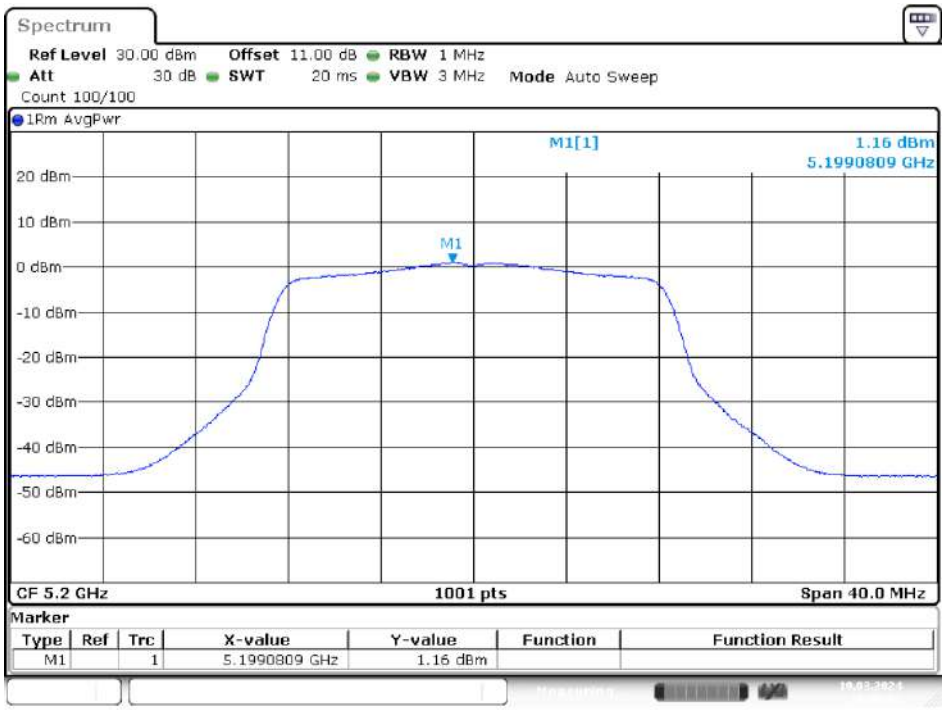


IEEE 802.11a Mode / 5150 ~ 5250MHz (Chain 1)

5180MHz

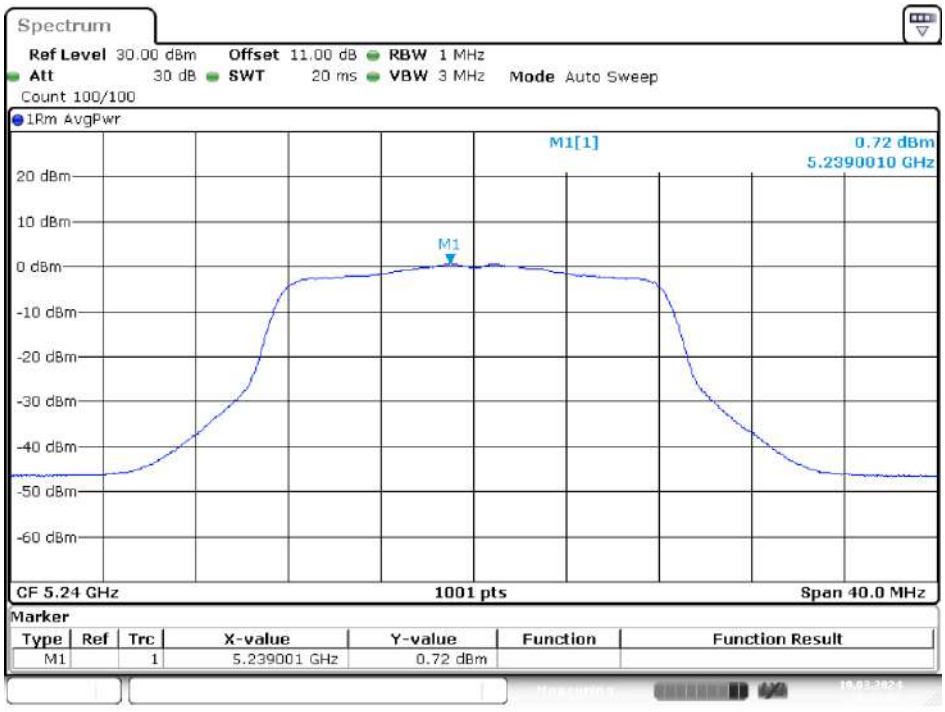


5200MHz



Date: 19.MAR.2024 10:06:52

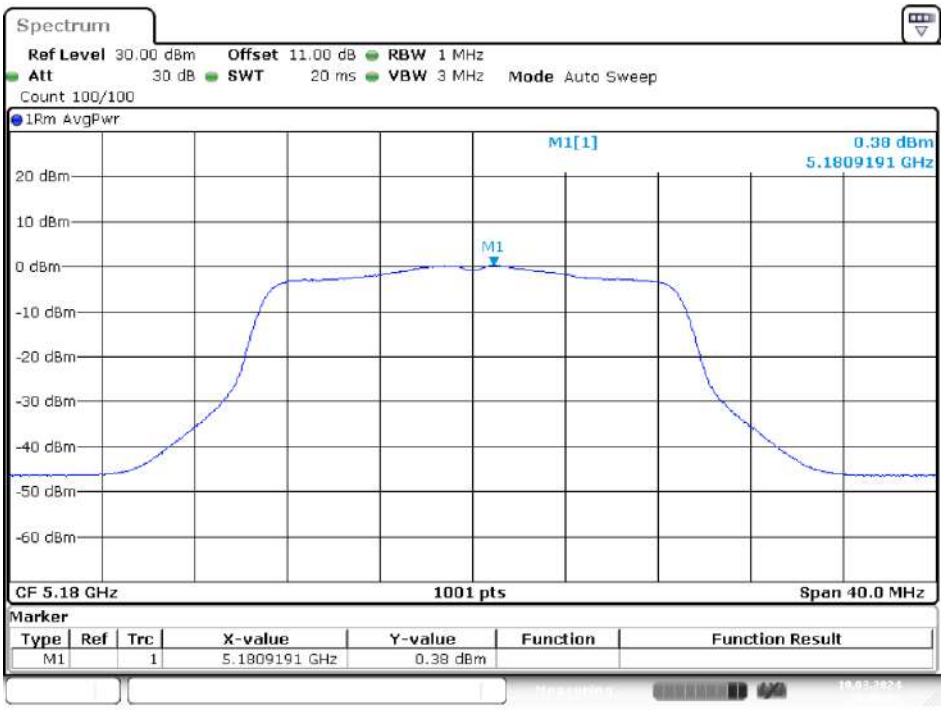
5240MHz



Date: 19.MAR.2024 10:13:51

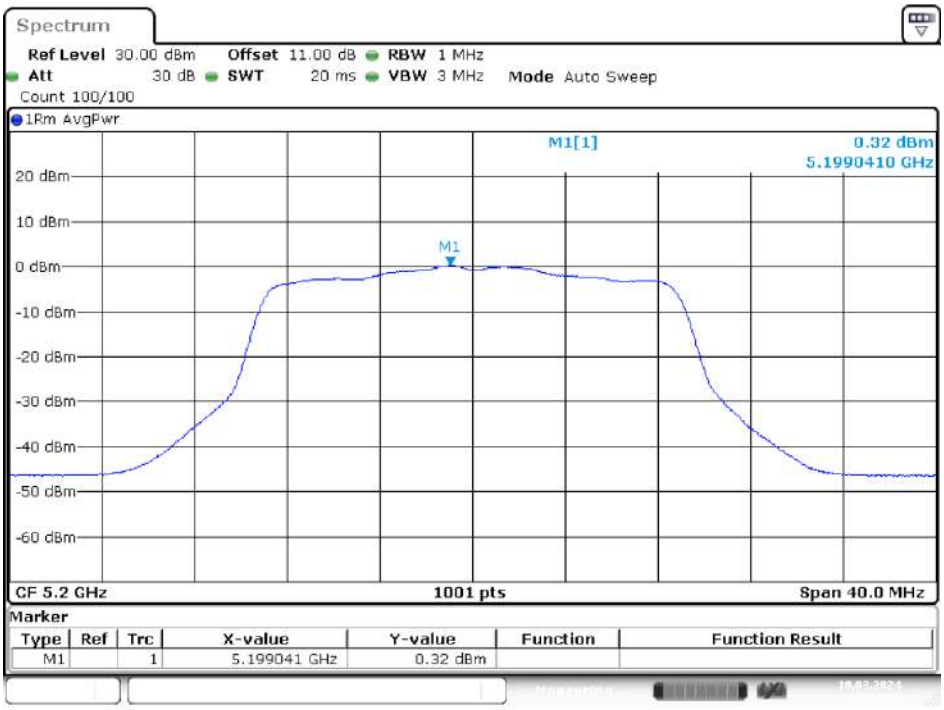
IEEE 802.11ac VHT20 Mode / 5150 ~ 5250MHz (Chain 0)

5180MHz



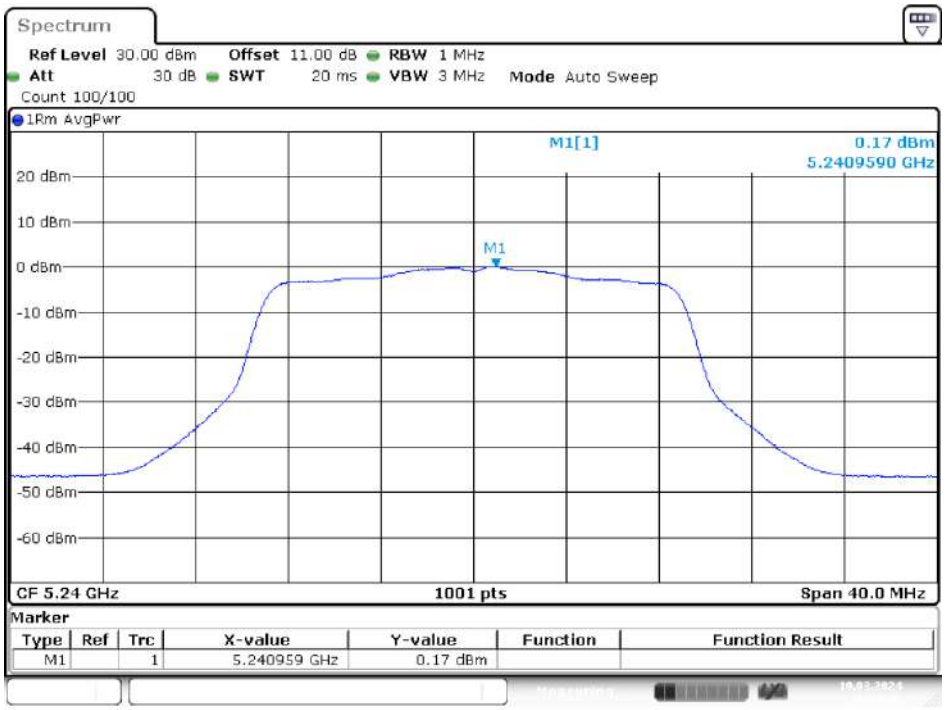
Date: 19.MAR.2024 10:36:07

5200MHz



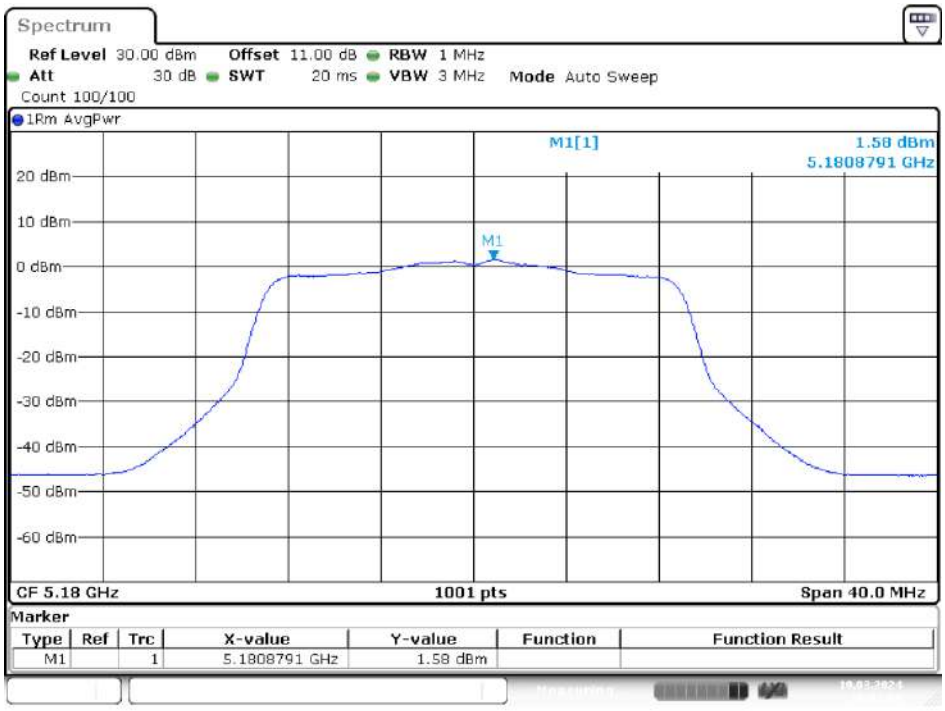
Date: 19.MAR.2024 10:30:26

5240MHz

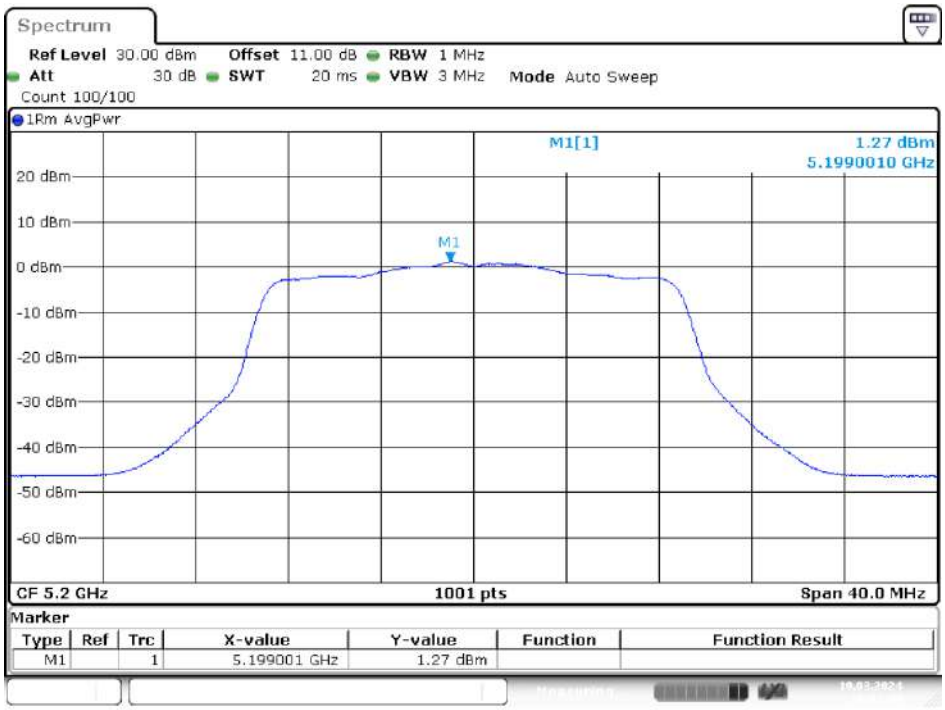


IEEE 802.11ac VHT20 Mode / 5150 ~ 5250MHz (Chain 1)

5180MHz

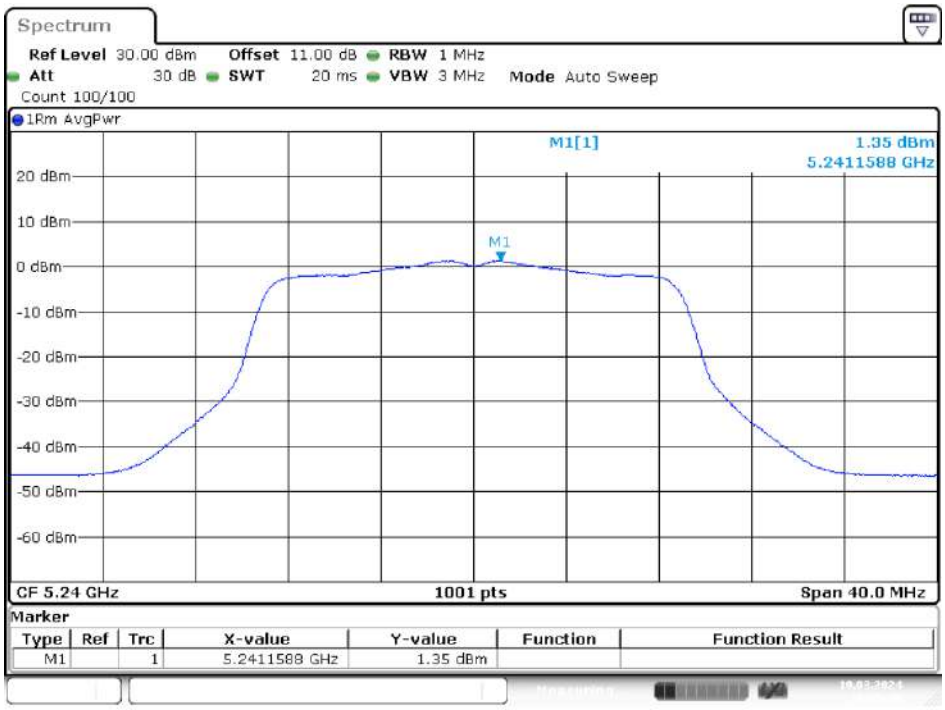


5200MHz



Date: 19.MAR.2024 10:31:44

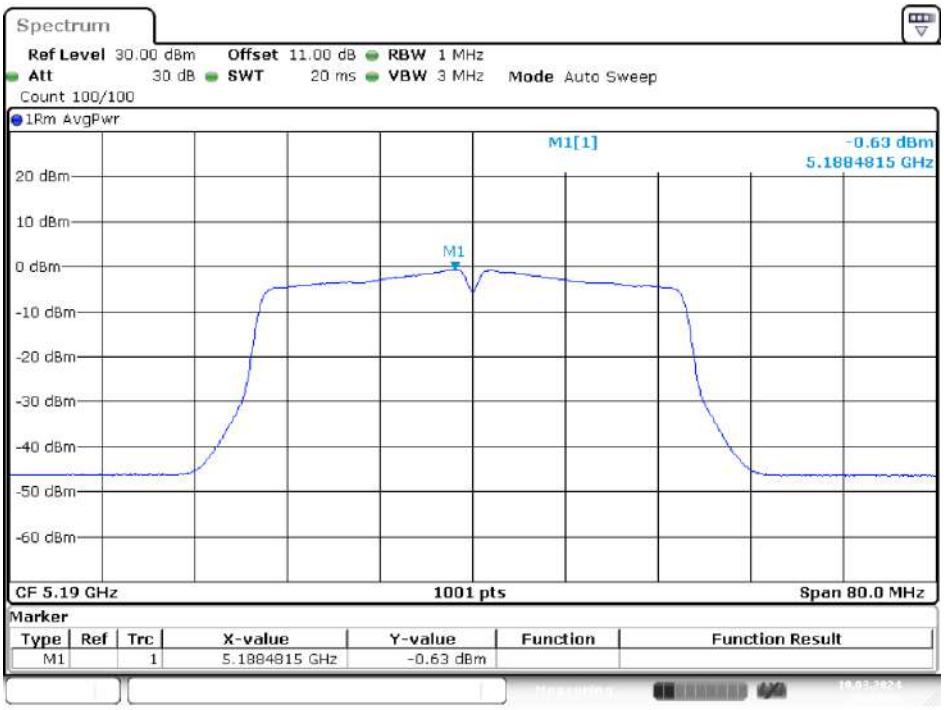
5240MHz



Date: 19.MAR.2024 10:25:40

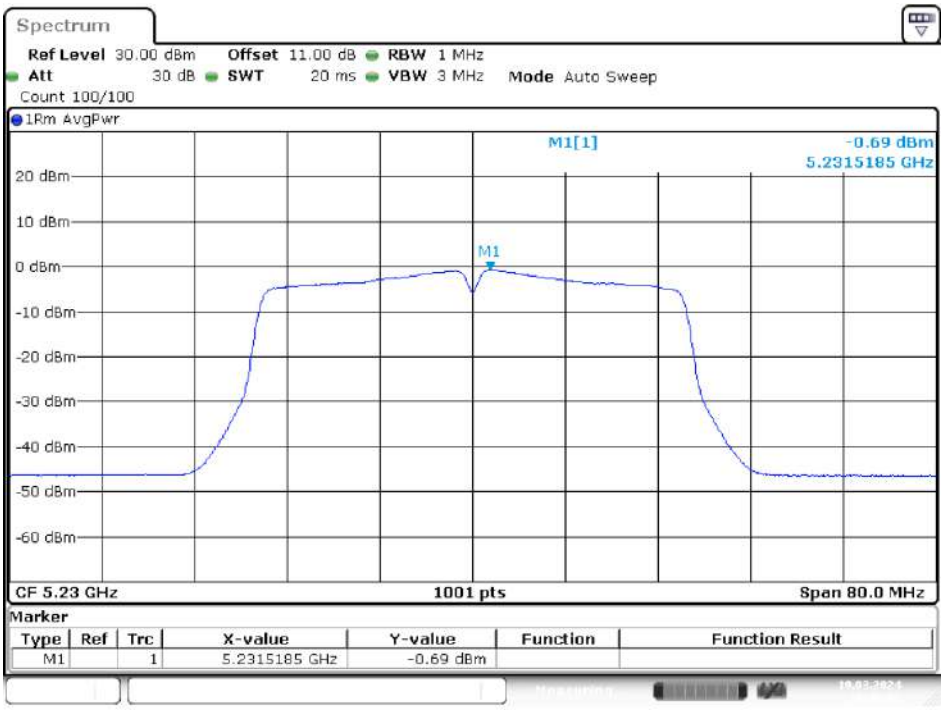
IEEE 802.11ac VHT40 Mode / 5150 ~ 5250MHz (Chain 0)

5190MHz



Date: 19.MAR.2024 10:49:56

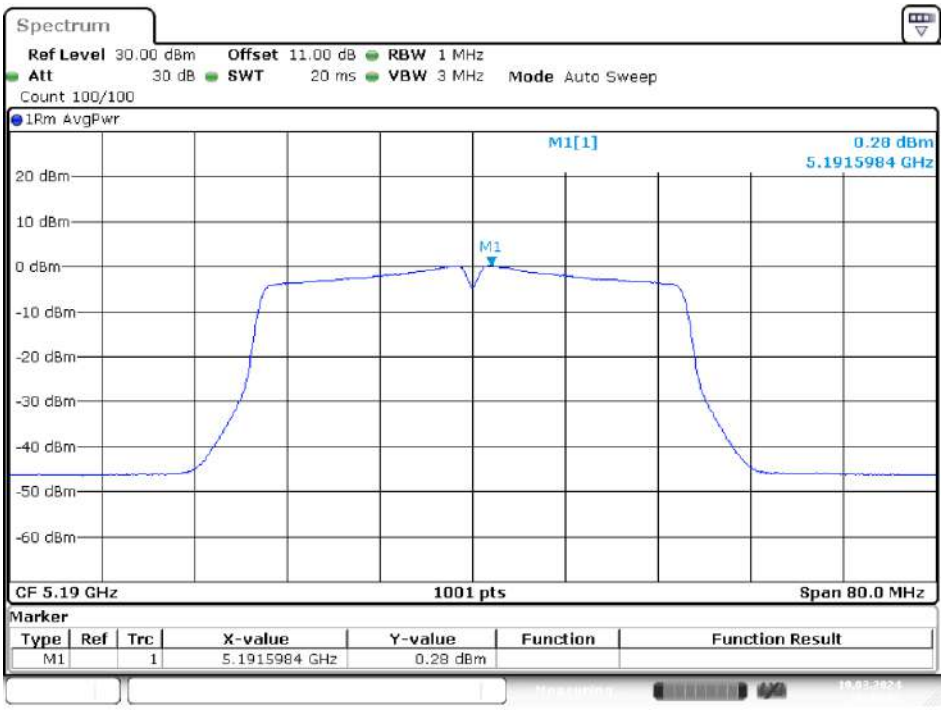
5230MHz



Date: 19.MAR.2024 10:46:51

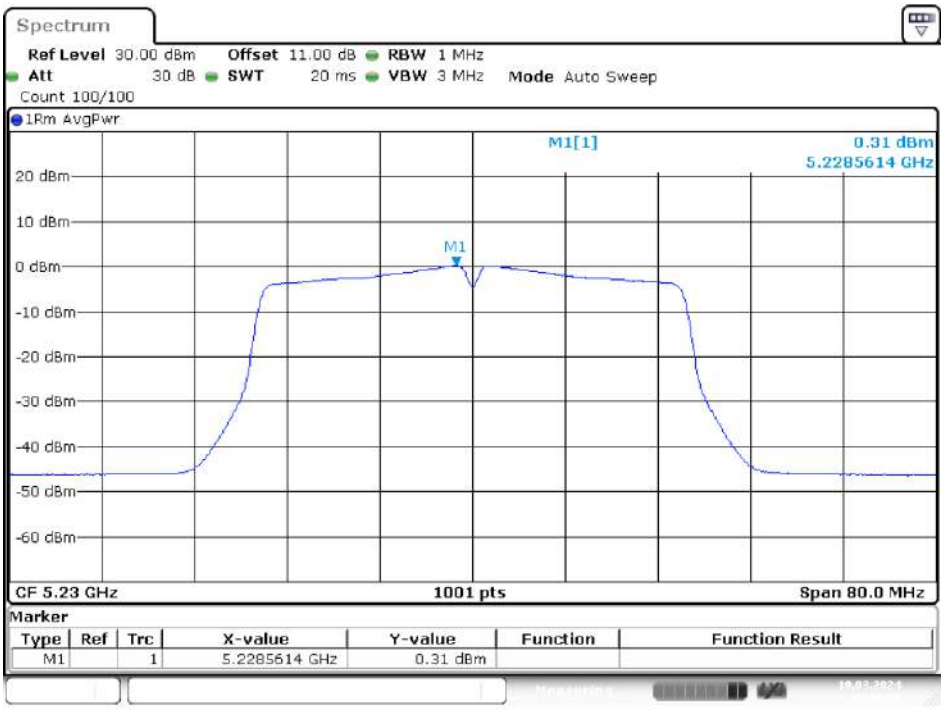
IEEE 802.11ac VHT40 Mode / 5150 ~ 5250MHz (Chain 1)

5190MHz



Date: 19.MAR.2024 10:43:01

5230MHz



Date: 19.MAR.2024 10:48:09

IEEE 802.11ac VHT80 Mode / 5150 ~ 5250MHz (Chain 0)

5210MHz

Date: 19.MAR.2024 10:52:51

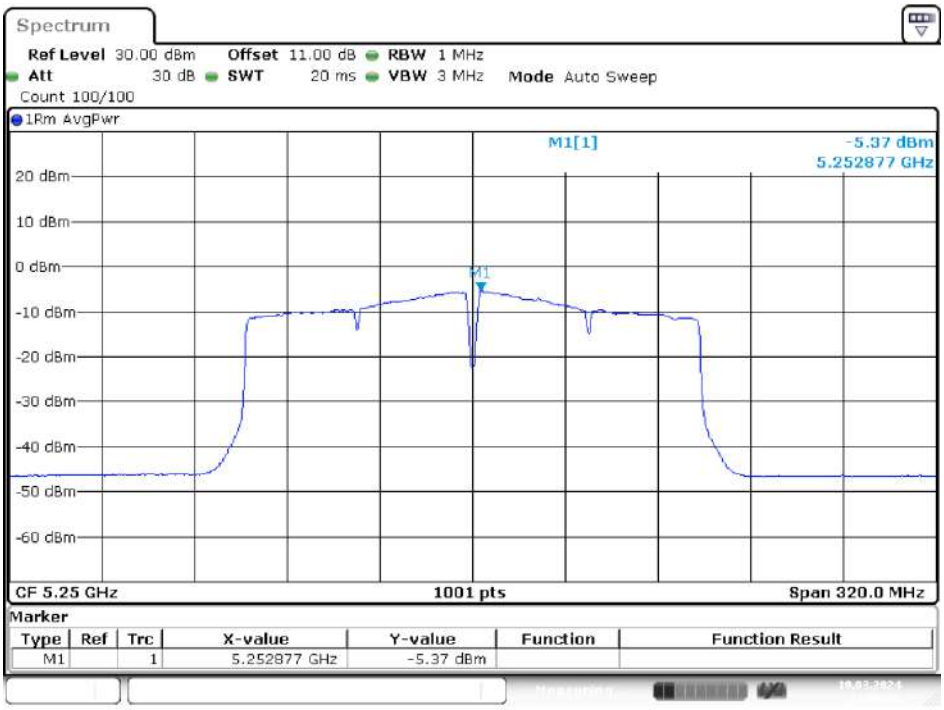
IEEE 802.11ac VHT80 Mode / 5150 ~ 5250MHz (Chain 1)

5210MHz

Date: 19.MAR.2024 10:55:00

IEEE 802.11ac VHT160 Mode / 5150 ~ 5250MHz (Chain 0)

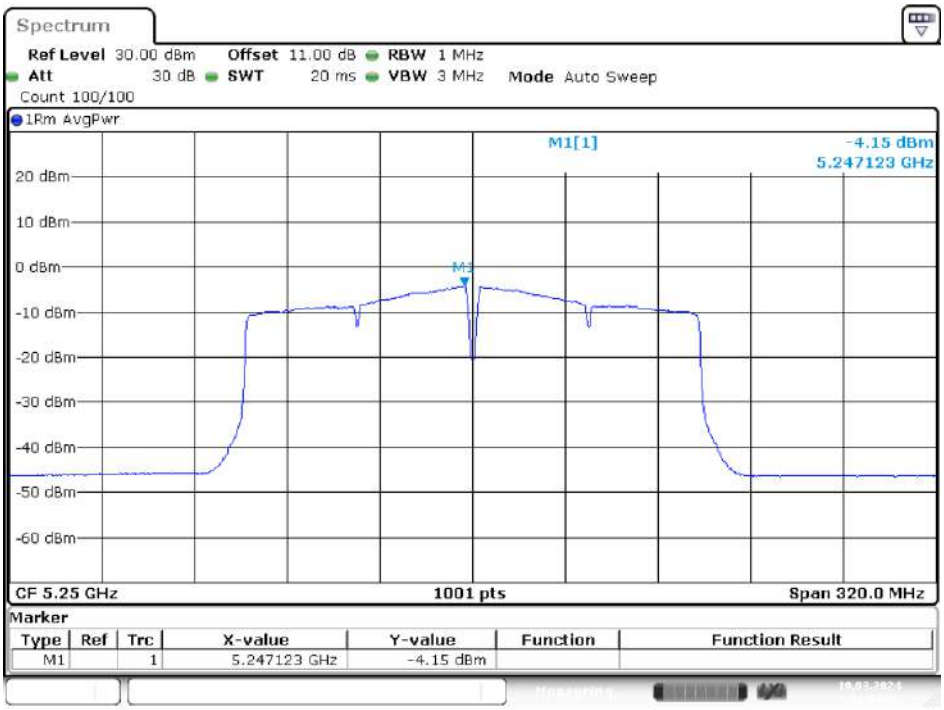
5250MHz



Date: 19.MAR.2024 11:56:24

IEEE 802.11ac VHT160 Mode / 5150 ~ 5250MHz (Chain 1)

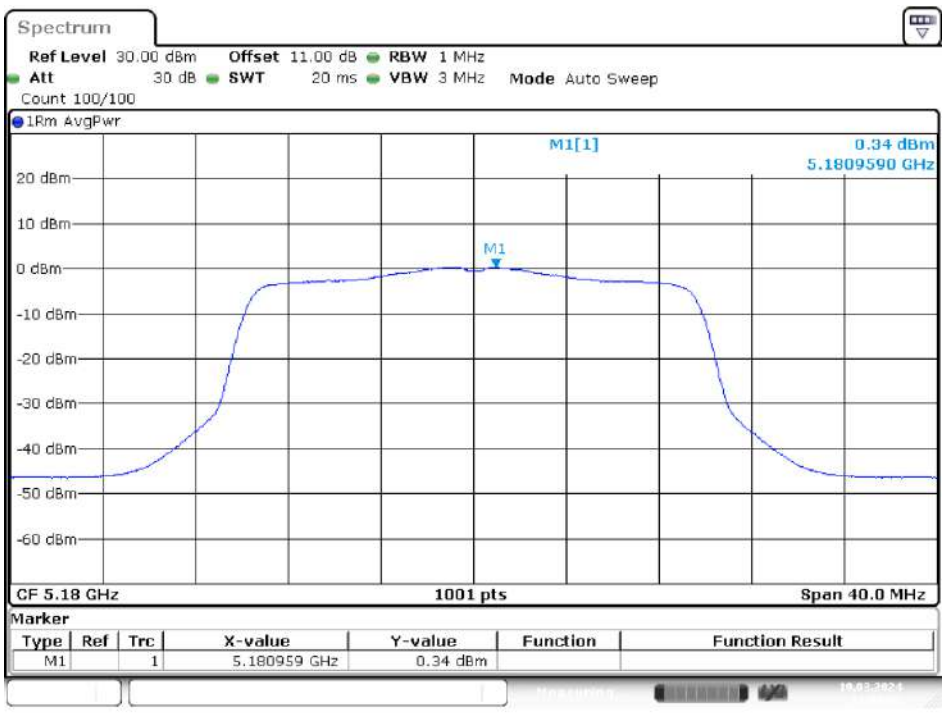
5250MHz



Date: 19.MAR.2024 11:54:34

IEEE 802.11ax HE20 Mode / 5150 ~ 5250MHz (Chain 0)

5180MHz

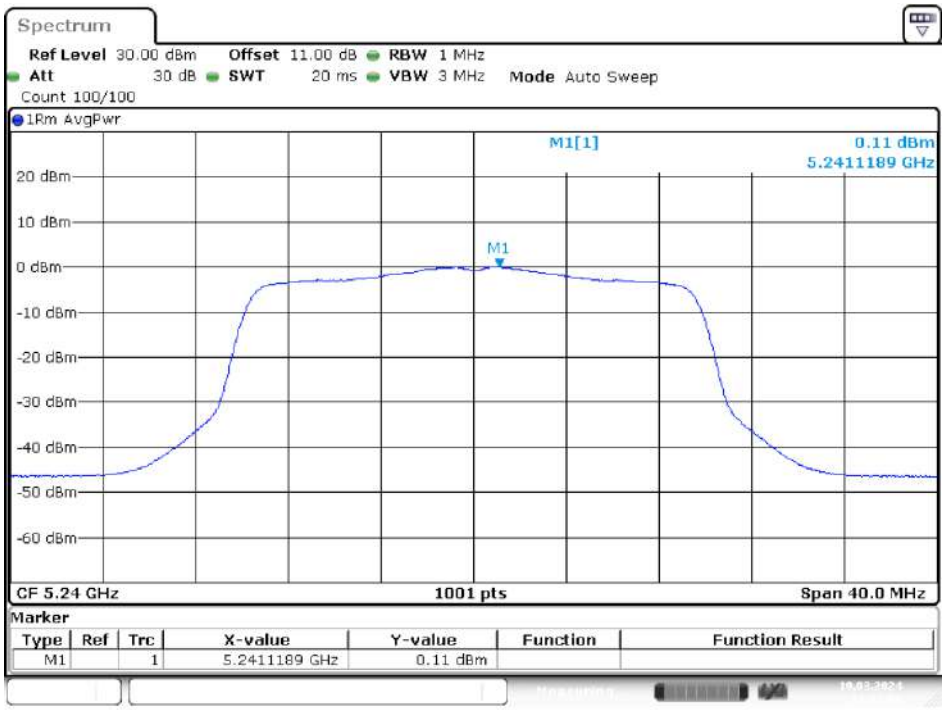


Date: 19.MAR.2024 11:00:23

5200MHz

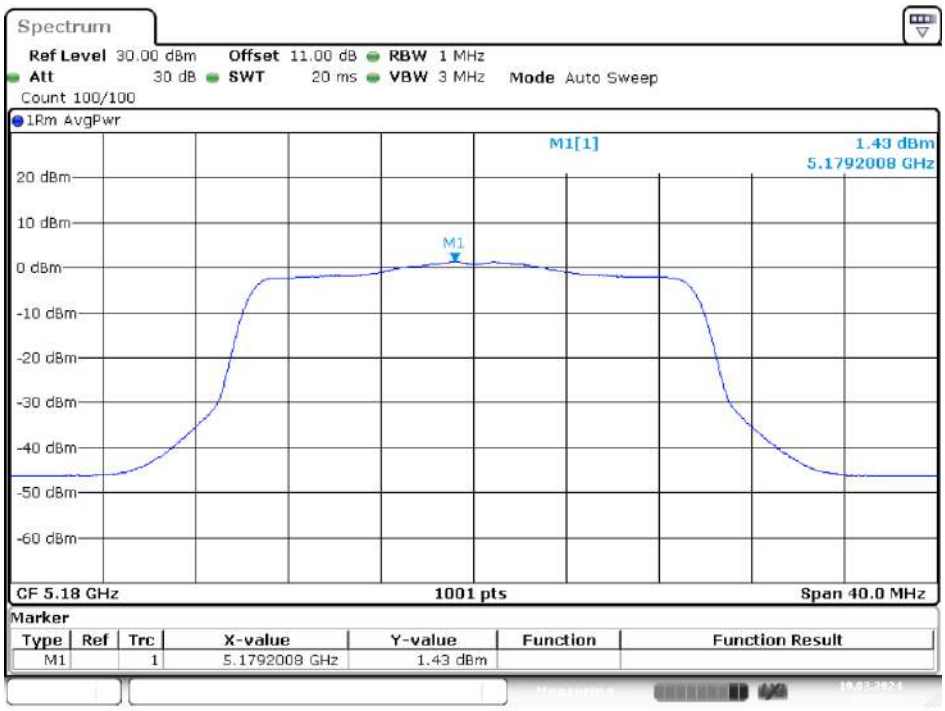
Date: 19.MAR.2024 11:04:27

5240MHz

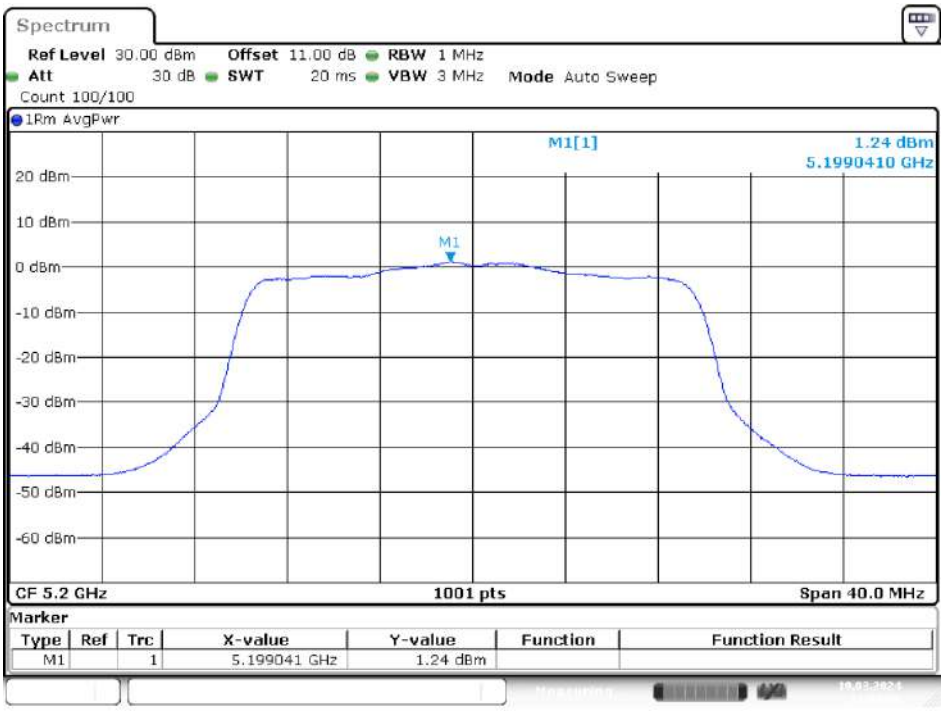


IEEE 802.11ax HE20 Mode / 5150 ~ 5250MHz (Chain1)

5180MHz

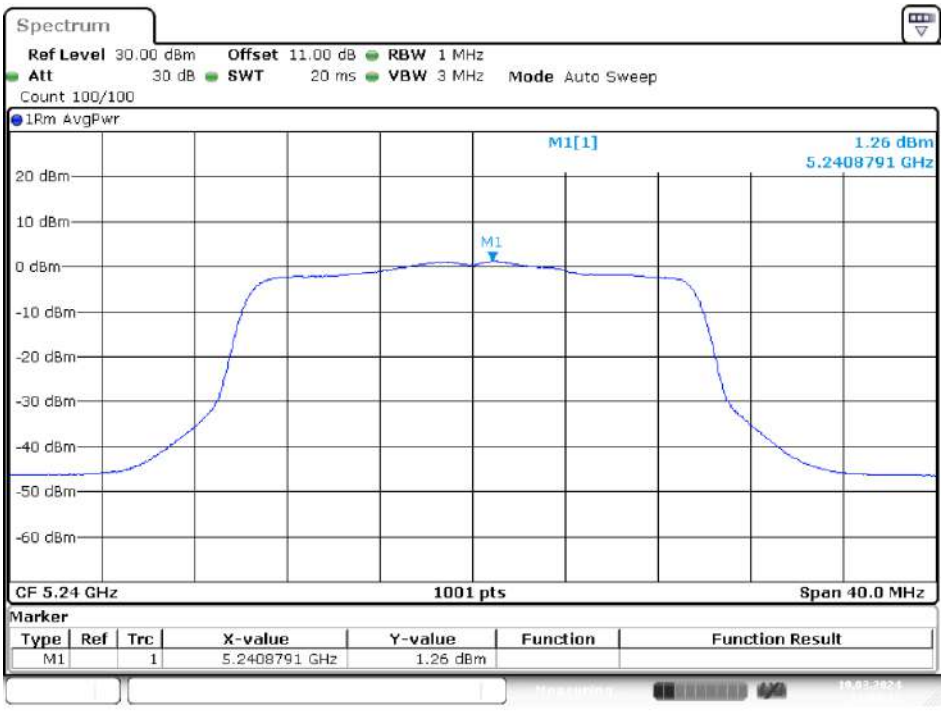


5200MHz



Date: 19.MAR.2024 11:03:27

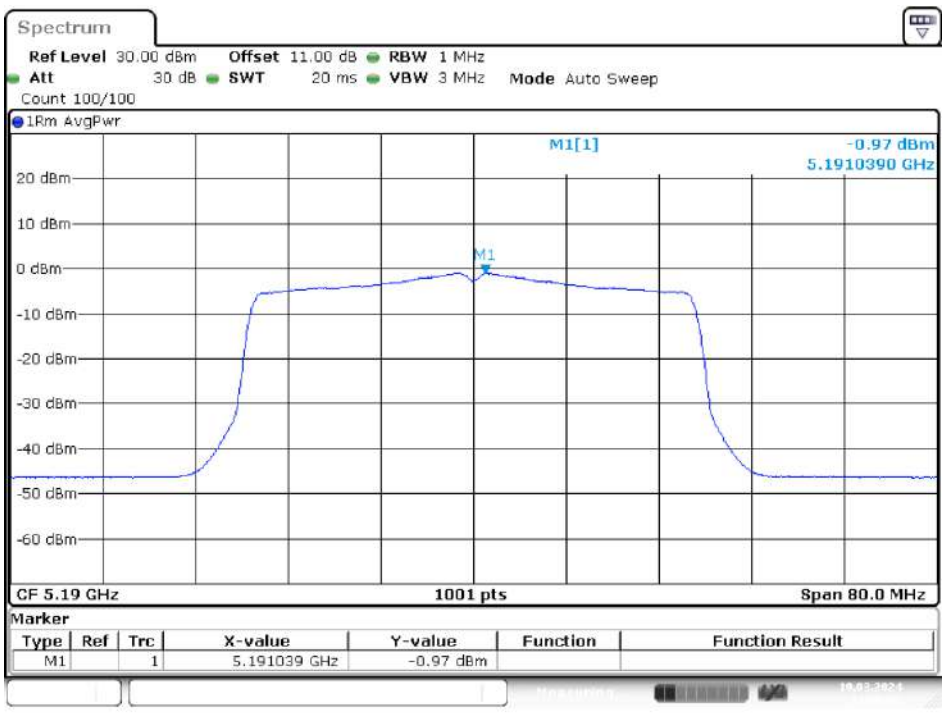
5240MHz



Date: 19.MAR.2024 11:09:12

IEEE 802.11ax HE40 Mode / 5150 ~ 5250MHz (Chain 0)

5190MHz



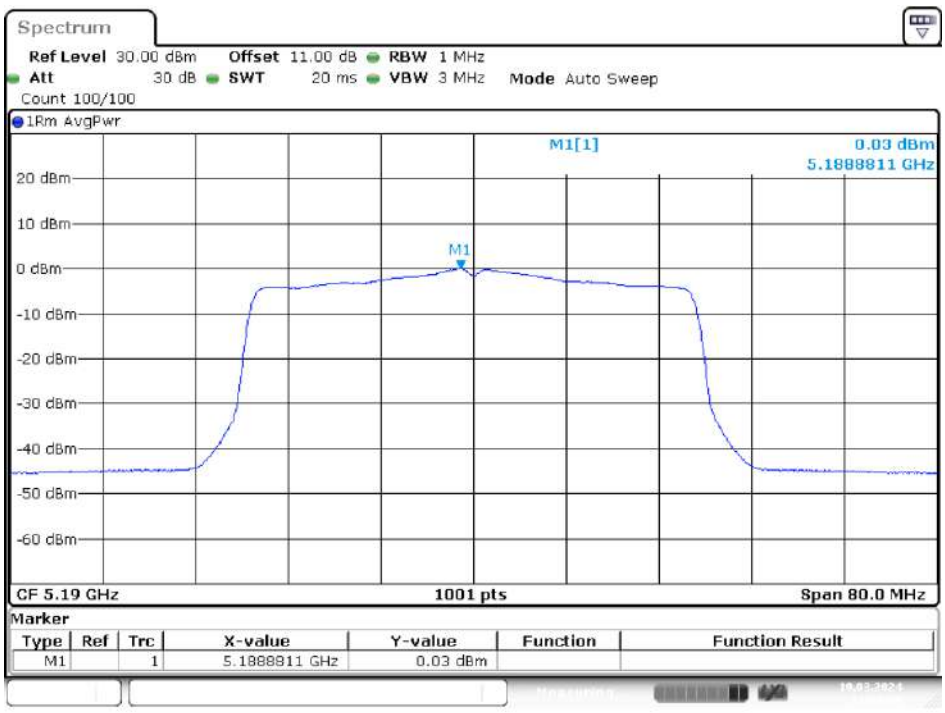
Date: 19.MAR.2024 11:26:22

5230MHz

Date: 19.MAR.2024 11:35:26

IEEE 802.11ax HE40 Mode / 5150 ~ 5250MHz (Chain1)

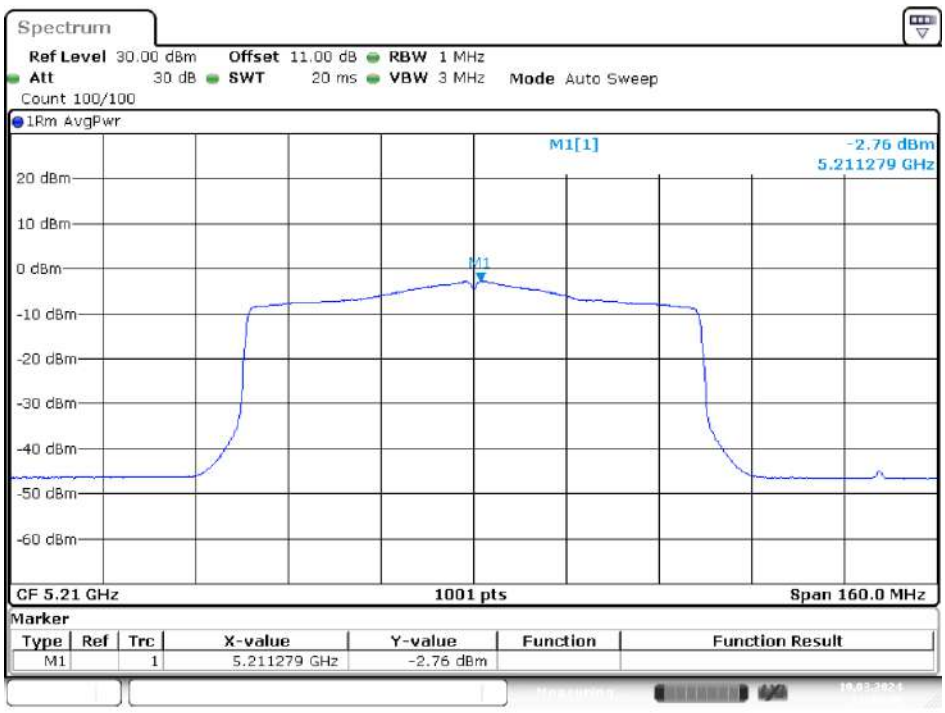
5190MHz



5230MHz

IEEE 802.11ax HE80 Mode / 5150 ~ 5250MHz (Chain 0)

5210MHz

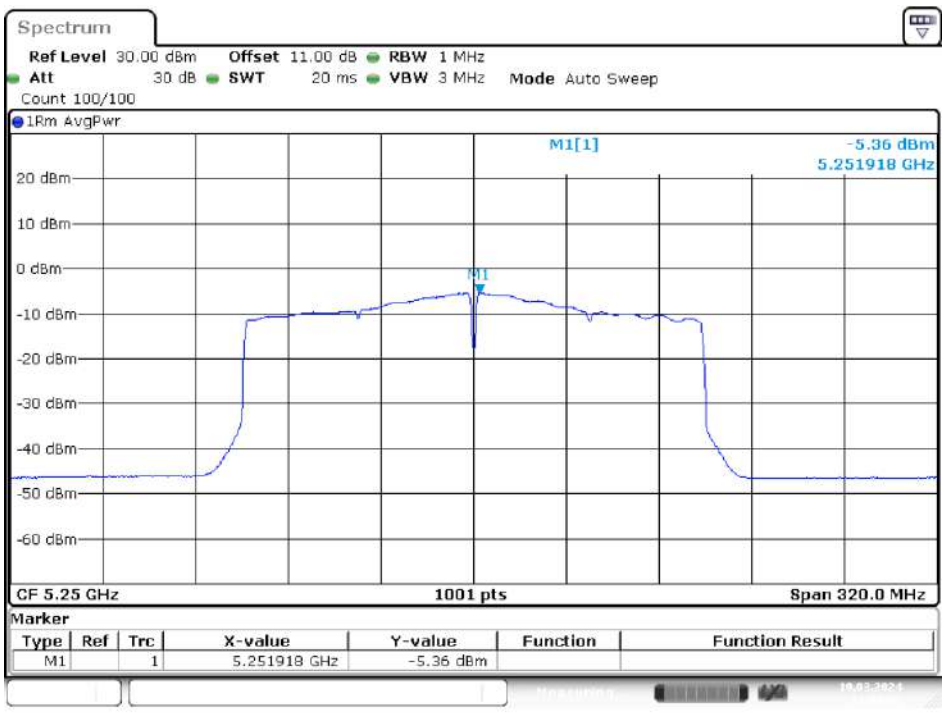


IEEE 802.11ax HE80 Mode / 5150 ~ 5250MHz (Chain 1)

5210MHz

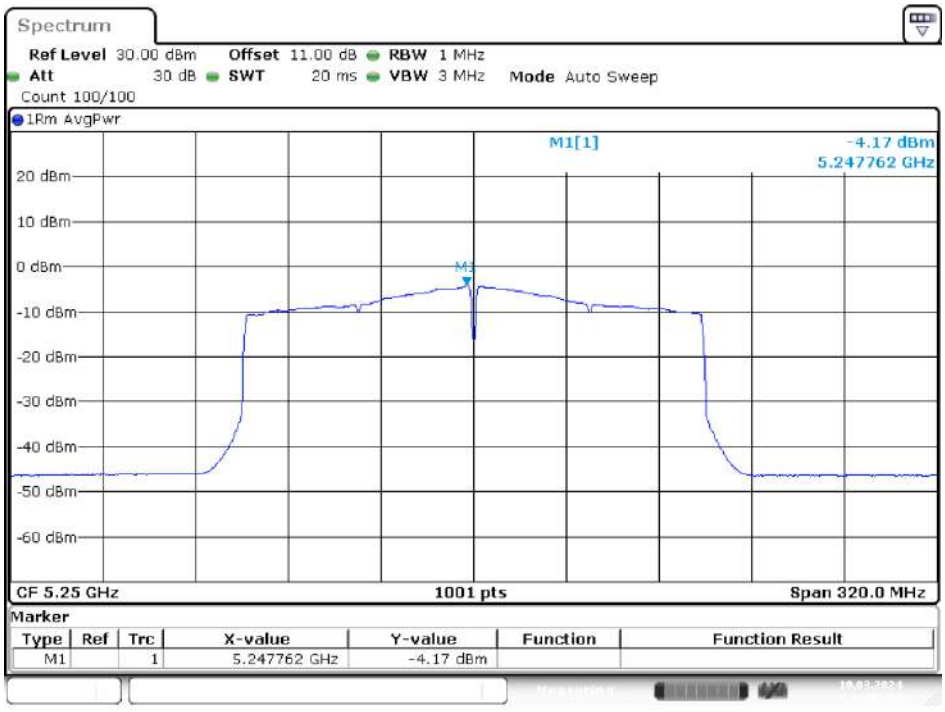
IEEE 802.11ax HE160 Mode / 5150 ~ 5250MHz (Chain 0)

5250MHz



IEEE 802.11ax HE160 Mode / 5150 ~ 5250MHz (Chain 1)

5250MHz



UNII-2A Band II / PSD

IEEE 802.11a Mode / 5250 ~ 5350MHz (Chain 0)

5260MHz

Date: 20.DEC.2023 17:24:15

5300MHz

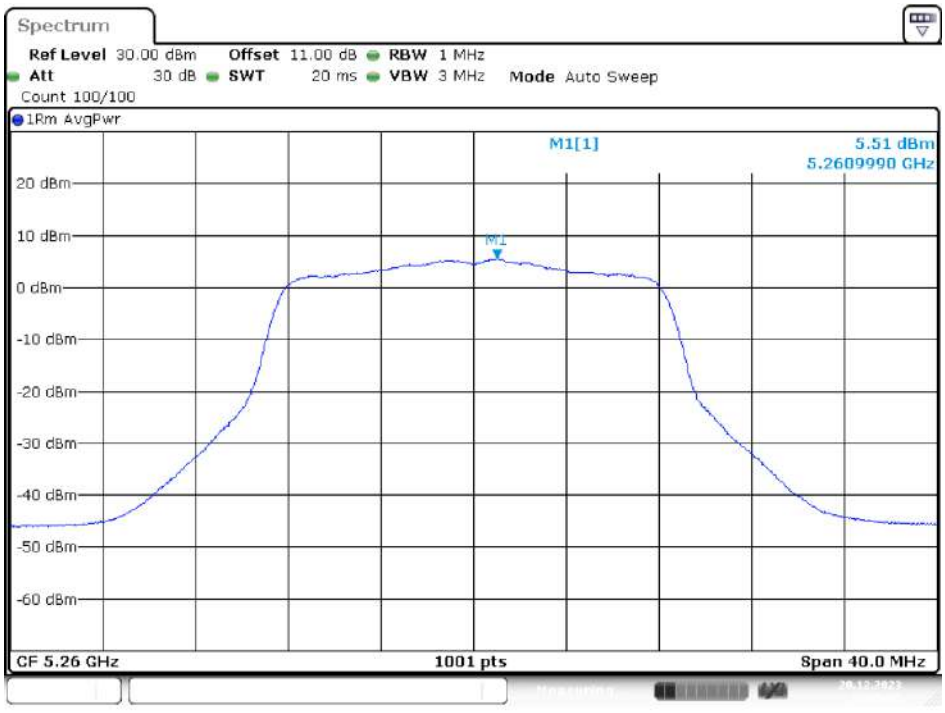
Date: 20.DEC.2023 17:27:47

5320MHz

Date: 20.DEC.2023 17:28:46

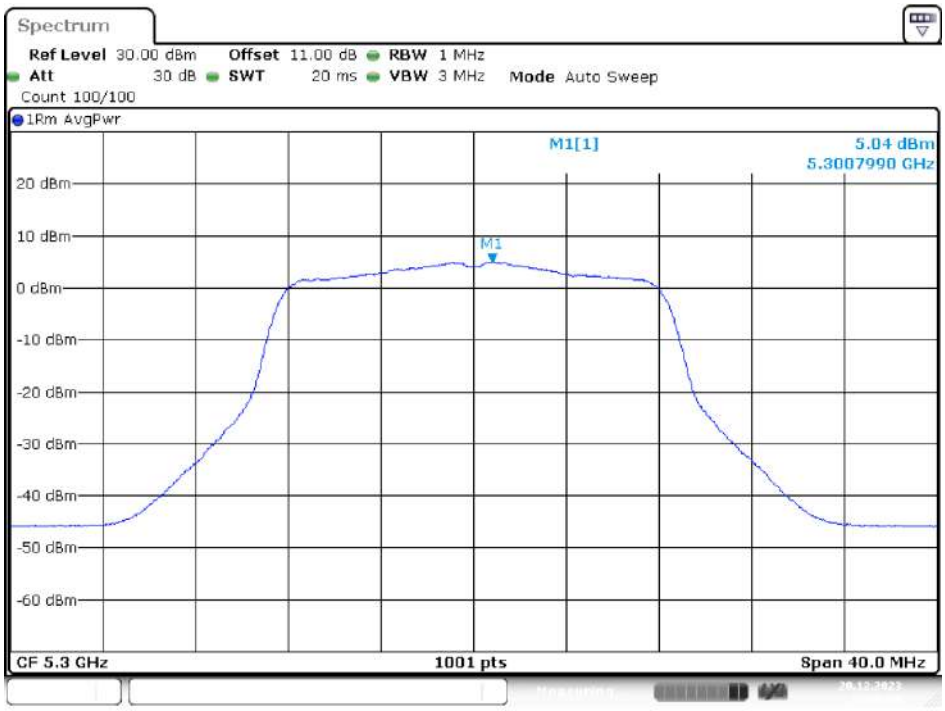
IEEE 802.11a Mode / 5250 ~ 5350MHz (Chain 1)

5260MHz



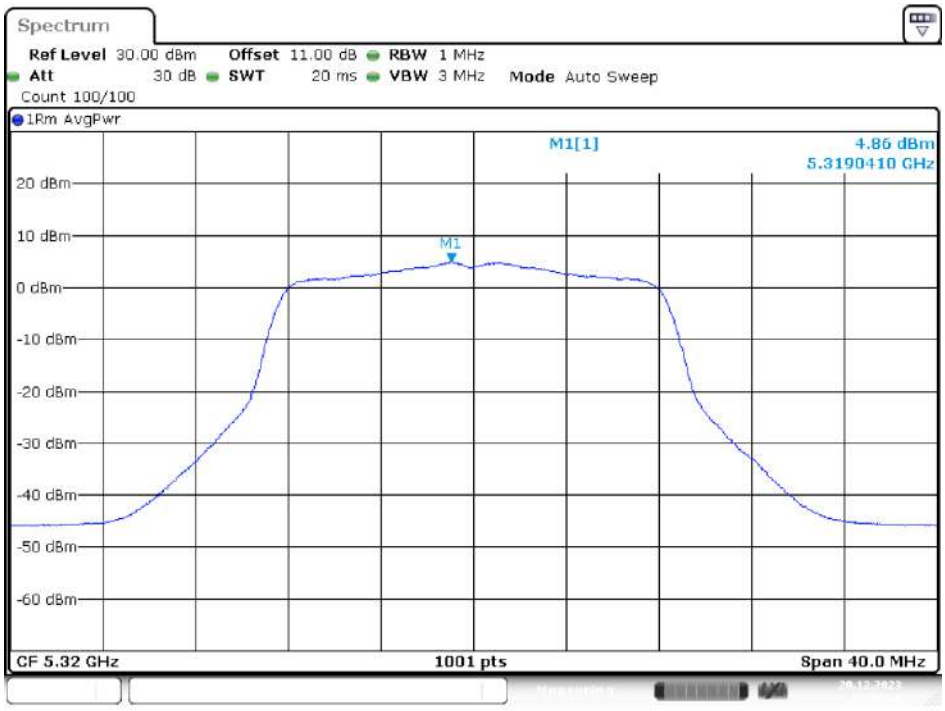
Date: 20.DEC.2023 17:25:25

5300MHz



Date: 20.DEC.2023 17:26:51

5320MHz



Date: 20.DEC.2023 17:30:19

IEEE 802.11ac VHT20 Mode / 5250 ~ 5350MHz (Chain 0)

5260MHz

Date: 21.DEC.2023 09:37:53

5300MHz

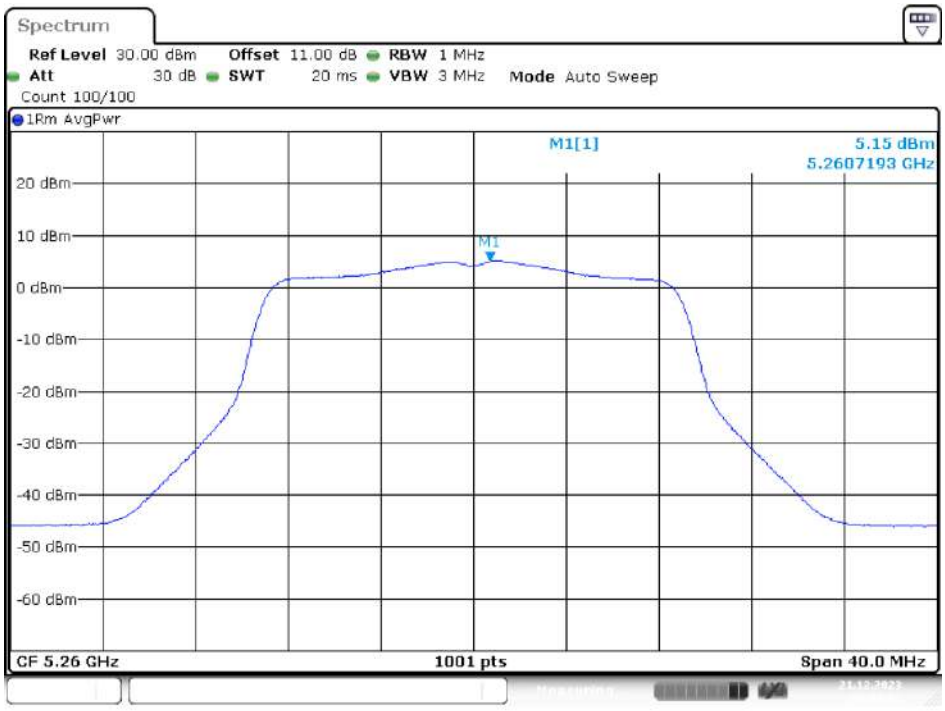
Date: 20.DEC.2023 15:03:31

5320MHz

Date: 21.DEC.2023 09:44:09

IEEE 802.11ac VHT20 Mode / 5250 ~ 5350MHz (Chain 1)

5260MHz



Date: 21.DEC.2023 09:39:51

5300MHz

Date: 20.DEC.2023 14:33:48

5320MHz

Date: 21.DEC.2023 09:43:02

IEEE 802.11ac VHT40 Mode / 5250 ~ 5350MHz (Chain 0)

5270MHz

Date: 20.DEC.2023 15:42:54

5310MHz

Date: 20.DEC.2023 15:43:51

IEEE 802.11ac VHT40 Mode / 5250 ~ 5350MHz (Chain 1)

5270MHz

Date: 20.DEC.2023 16:08:53

5310MHz

Date: 20.DEC.2023 16:09:51

IEEE 802.11ac VHT80 Mode / 5250 ~ 5350MHz (Chain 0)

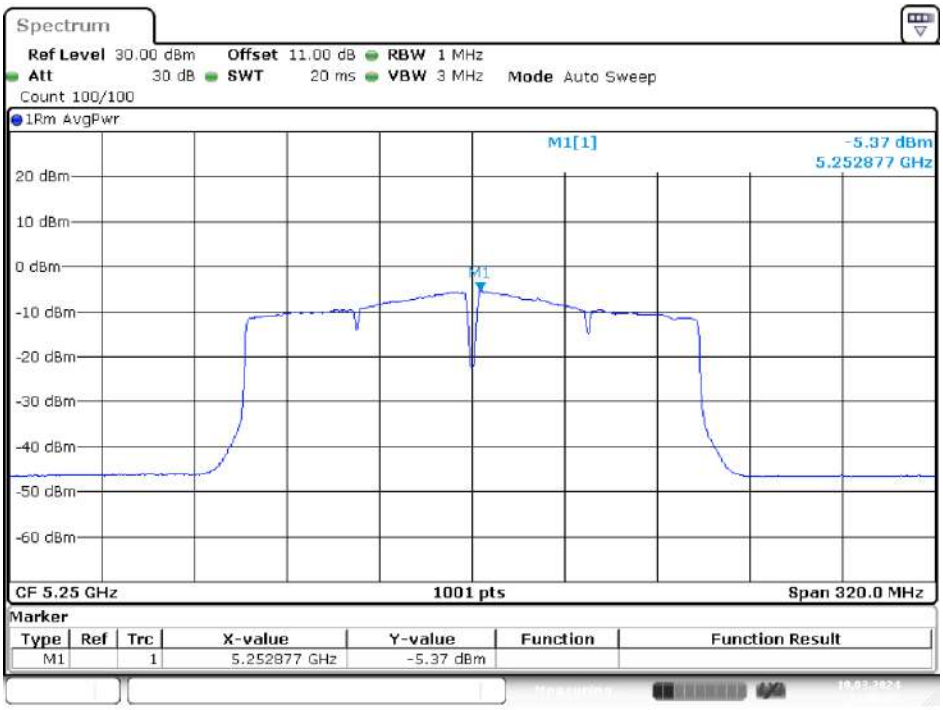
5290MHz

IEEE 802.11ac VHT80 Mode / 5250 ~ 5350MHz (Chain 1)

5290MHz

IEEE 802.11ac VHT160 Mode / 5250 ~ 5350MHz (Chain 0)

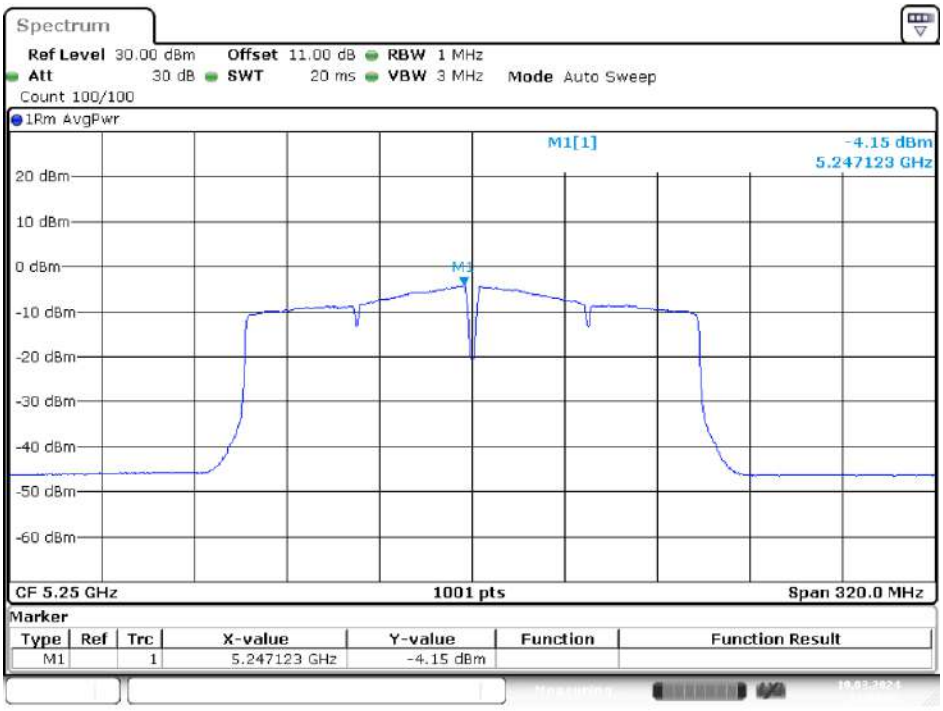
5250MHz



Date: 19.MAR.2024 11:56:24

IEEE 802.11ac VHT160 Mode / 5250 ~ 5350MHz (Chain 1)

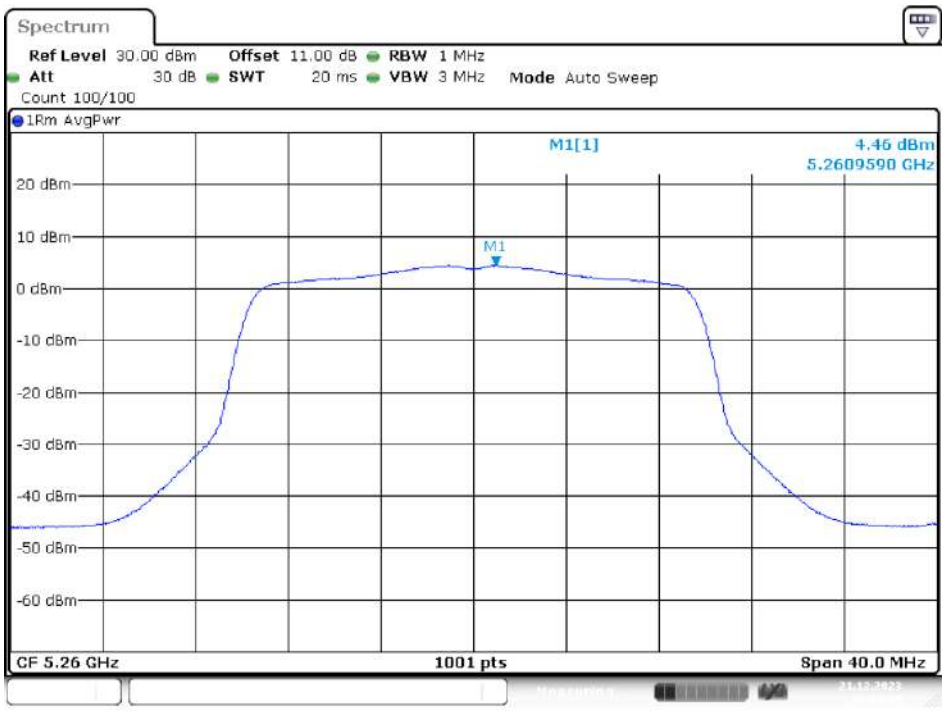
5250MHz



Date: 19.MAR.2024 11:54:34

IEEE 802.11ax HE20 Mode / 5250 ~ 5350MHz (Chain 0)

5260MHz



Date: 21.DEC.2023 12:54:10

5300MHz

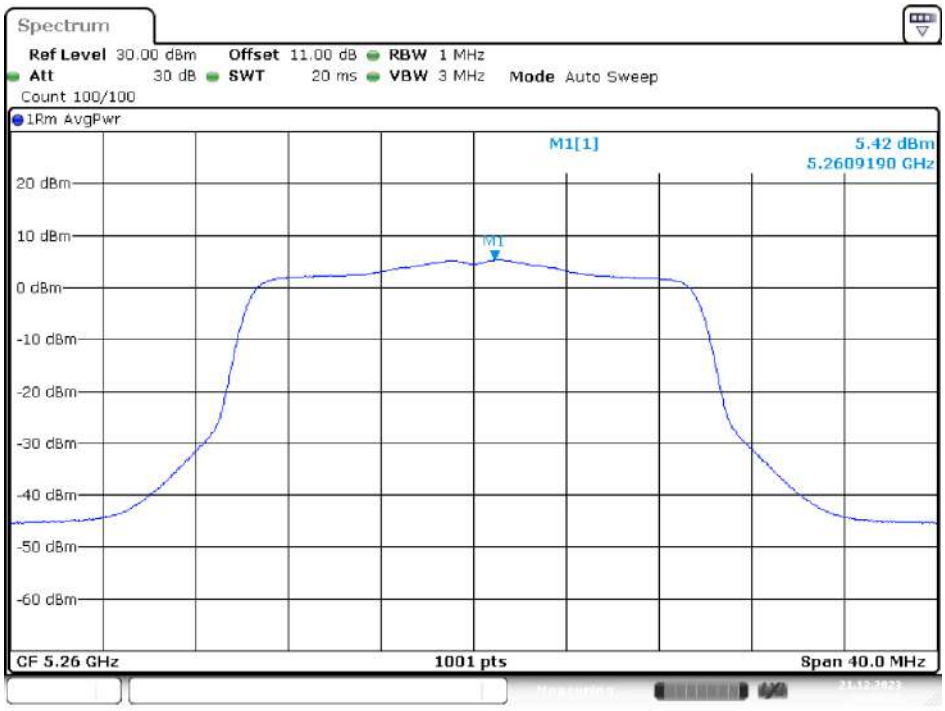
Date: 21.DEC.2023 14:12:34

5320MHz

Date: 21.DEC.2023 14:16:11

IEEE 802.11ax HE20 Mode / 5250 ~ 5350MHz (Chain1)

5260MHz

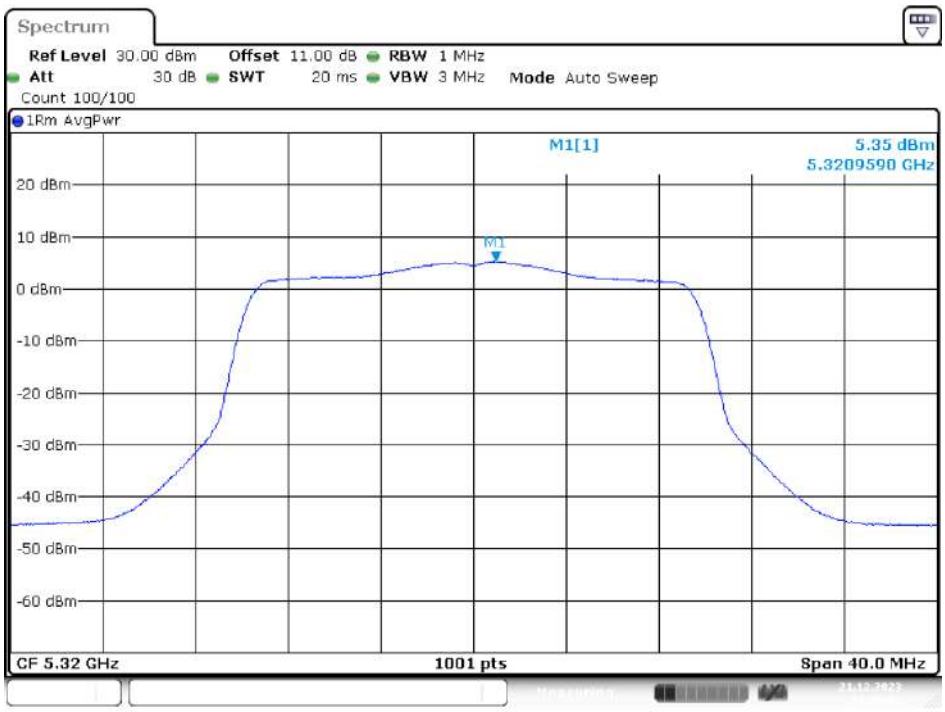


Date: 21.DEC.2023 12:53:15

5300MHz

Date: 21.DEC.2023 14:13:25

5320MHz



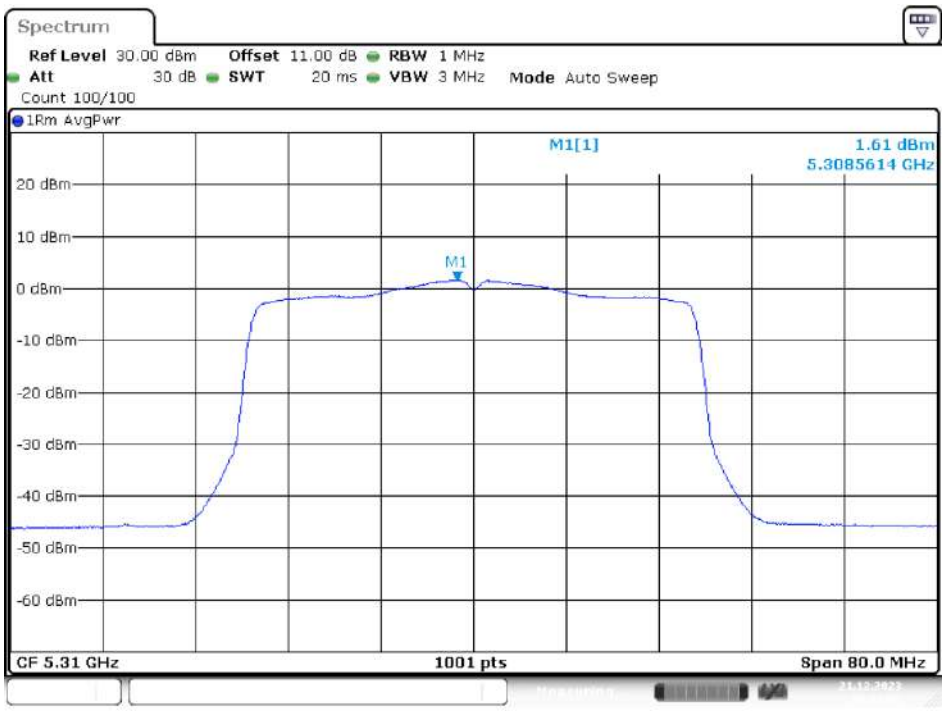
Date: 21.DEC.2023 14:15:02

IEEE 802.11ax HE40 Mode / 5250 ~ 5350MHz (Chain 0)

5270MHz

Date: 21.DEC.2023 15:11:03

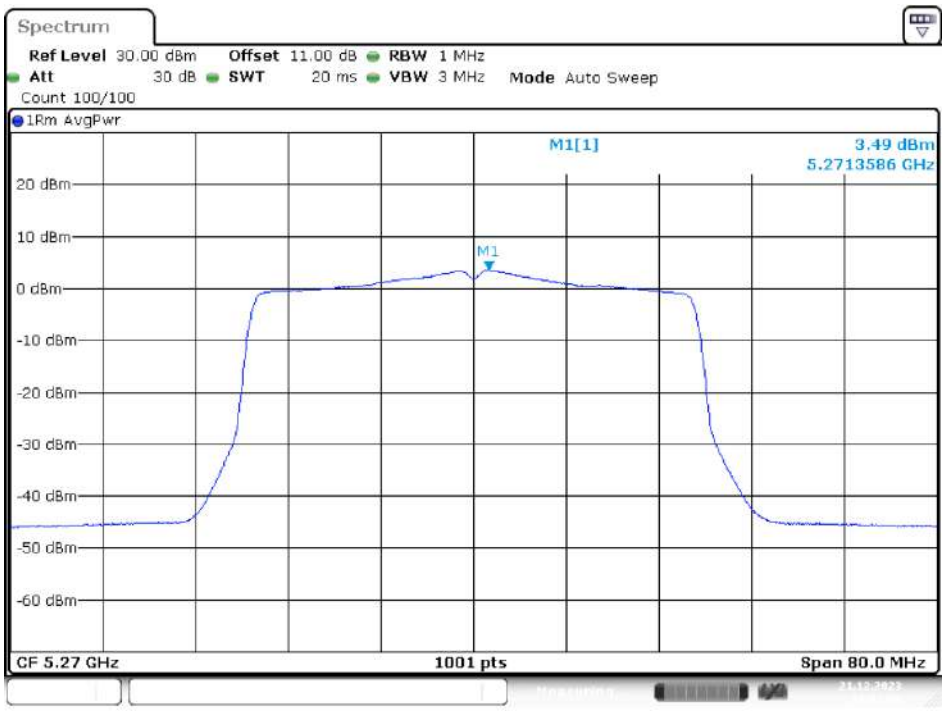
5310MHz



Date: 21.DEC.2023 15:12:37

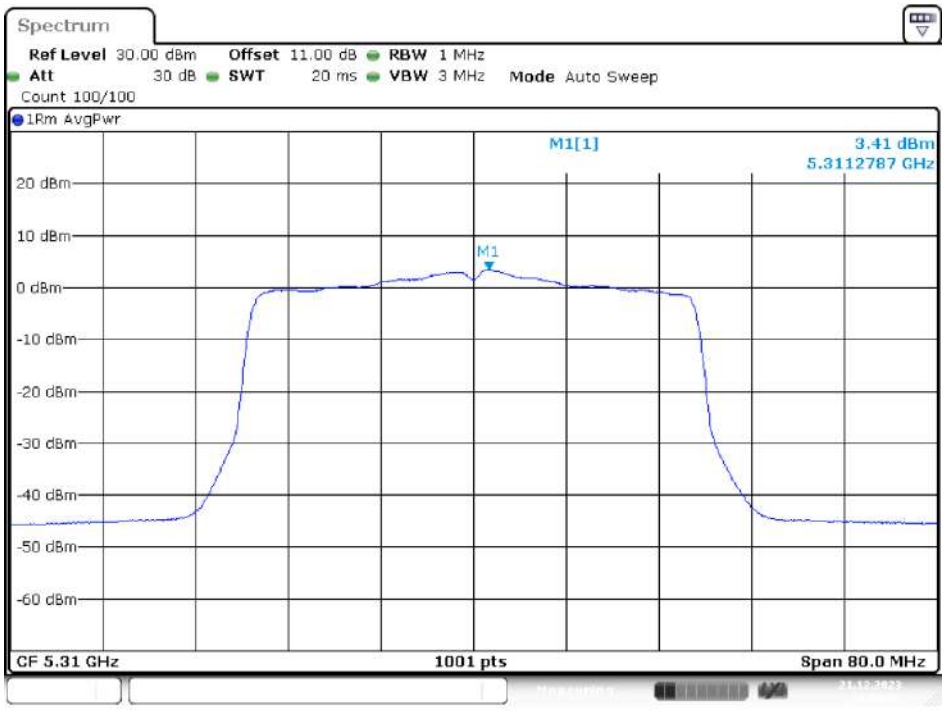
IEEE 802.11ax HE40 Mode / 5250 ~ 5350MHz (Chain1)

5270MHz



Date: 21.DEC.2023 14:57:56

5310MHz



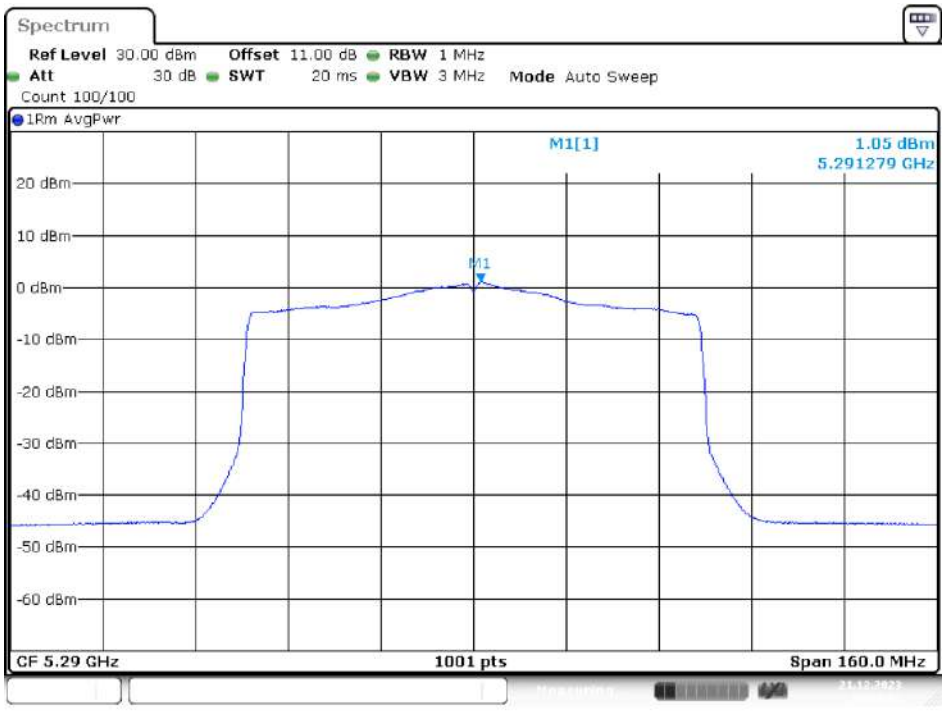
Date: 21.DEC.2023 14:59:04

IEEE 802.11ax HE80 Mode / 5250 ~ 5350MHz (Chain 0)

5290MHz

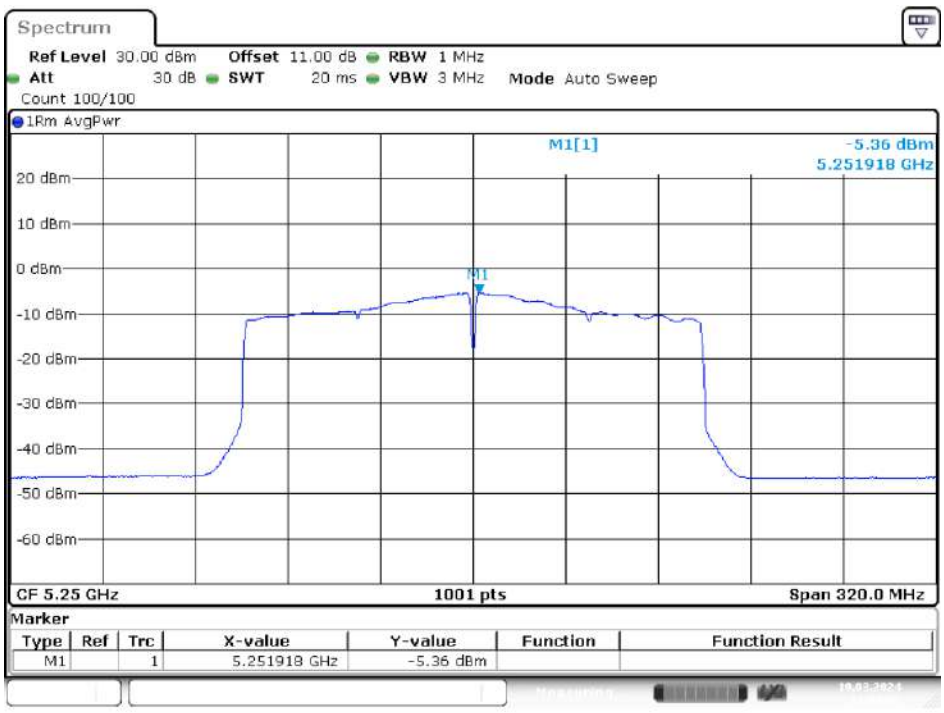
IEEE 802.11ax HE80 Mode / 5250 ~ 5350MHz (Chain 1)

5290MHz



IEEE 802.11ax HE160 Mode / 5250 ~ 5350MHz (Chain 0)

5250MHz



IEEE 802.11ax HE160 Mode / 5250 ~ 5350MHz (Chain 1)

5250MHz

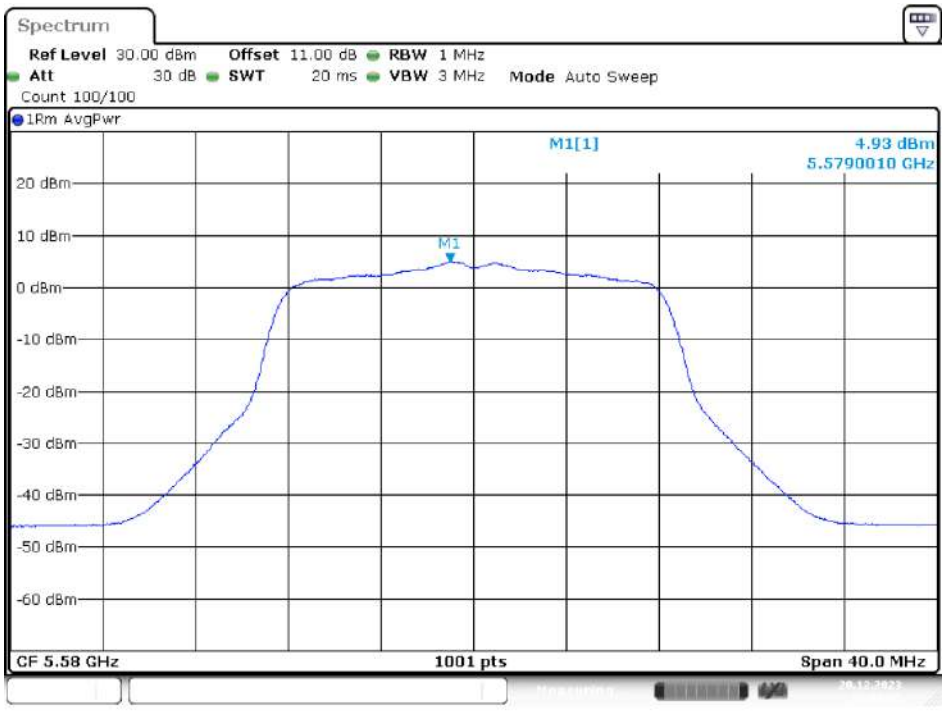
UNII-2C Band III / PSD

IEEE 802.11a Mode / 5470 ~ 5725MHz (Chain 0)

5500MHz

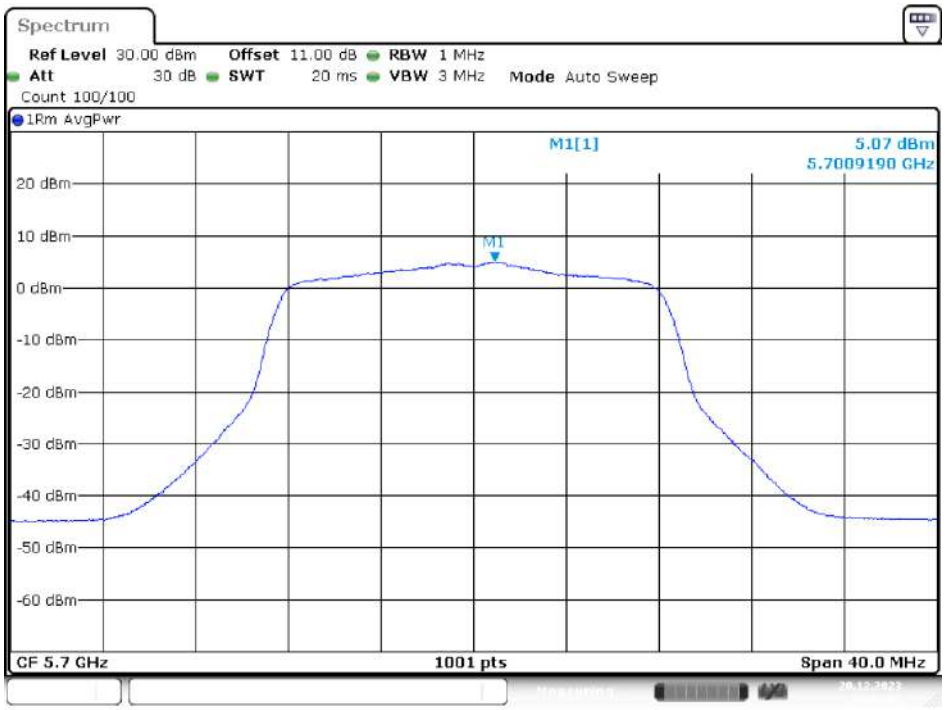
Date: 20.DEC.2023 17:32:42

5580MHz



Date: 20.DEC.2023 17:39:25

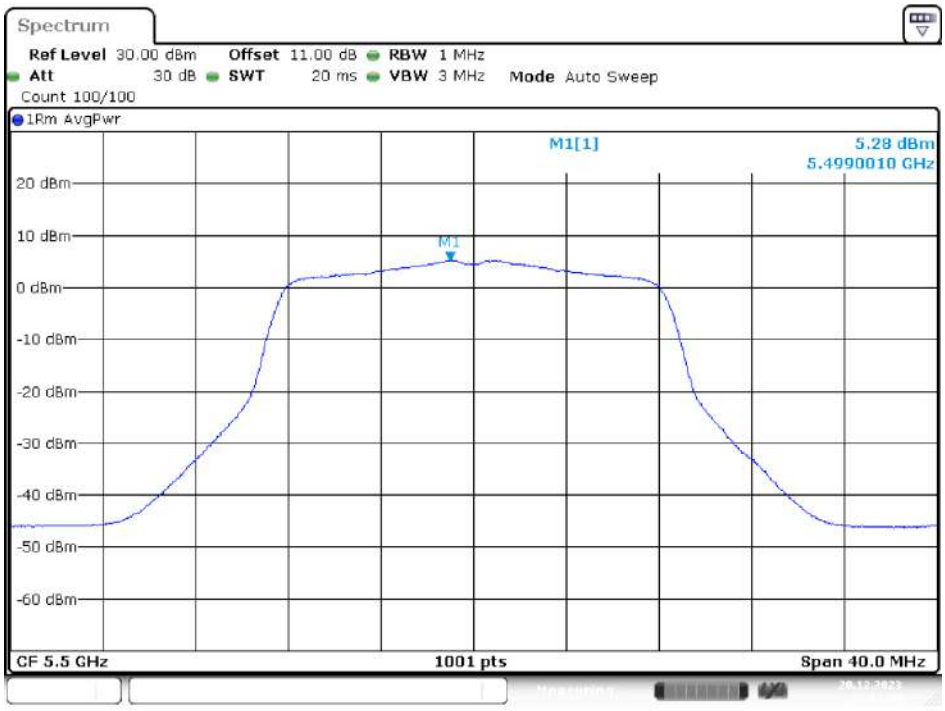
5700MHz



Date: 20.DEC.2023 17:41:07

IEEE 802.11a Mode / 5470 ~ 5725MHz (Chain 1)

5500MHz



Date: 20.DEC.2023 17:31:44

5580MHz

Date: 20.DEC.2023 17:38:25

5700MHz

Date: 20.DEC.2023 17:46:16

IEEE 802.11ac VHT20 Mode / 5470 ~ 5725MHz (Chain 0)

5500MHz

Date: 21.DEC.2023 09:47:42

5580MHz

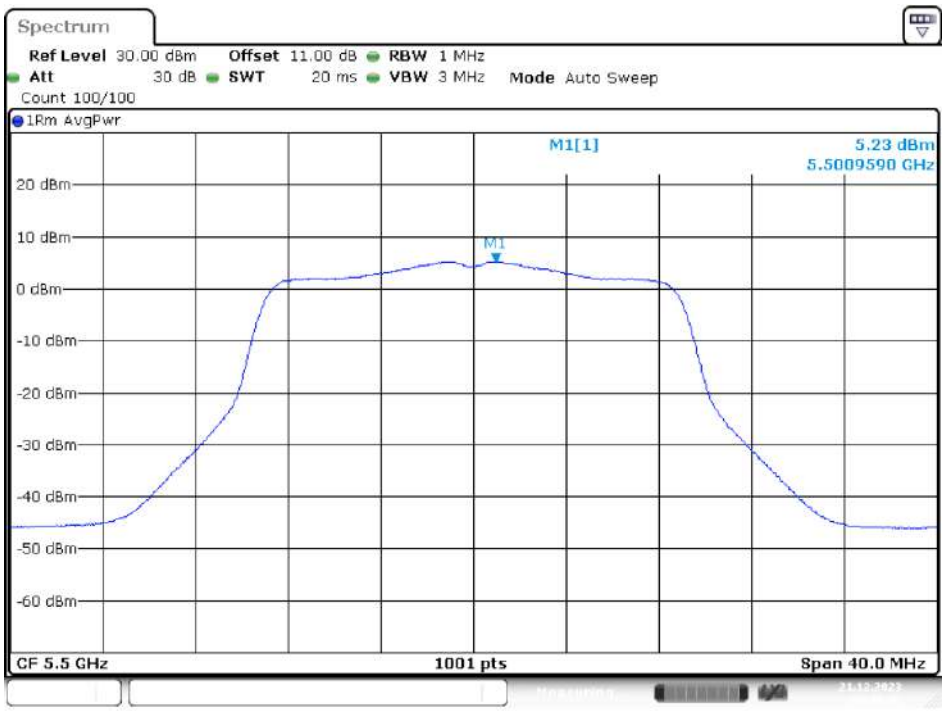
Date: 21.DEC.2023 09:51:22

5700MHz

Date: 21.DEC.2023 09:52:43

IEEE 802.11ac VHT20 Mode / 5470 ~ 5725MHz (Chain 1)

5500MHz

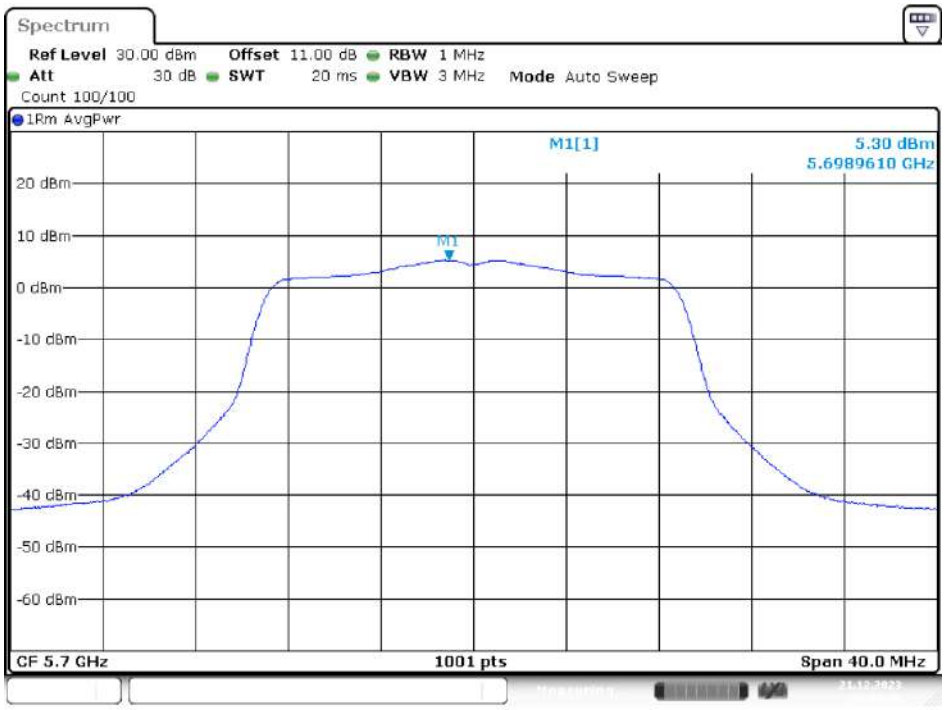


Date: 21.DEC.2023 09:48:47

5580MHz

Date: 21.DEC.2023 09:50:33

5700MHz



Date: 21.DEC.2023 09:53:46

IEEE 802.11ac VHT40 Mode / 5470 ~ 5725MHz (Chain 0)

5510MHz

Date: 20.DEC.2023 15:47:11

5550MHz

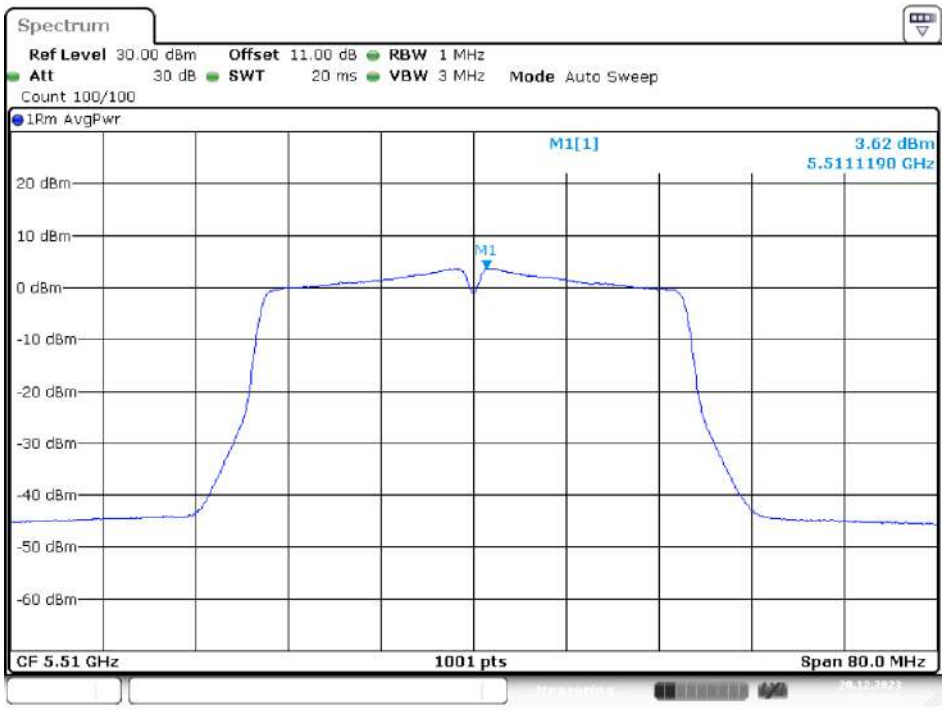
Date: 30.JAN.2024 19:50:10

5670MHz

Date: 20.DEC.2023 15:52:16

IEEE 802.11ac VHT40 Mode / 5470 ~ 5725MHz (Chain 1)

5510MHz



Date: 20.DEC.2023 16:13:16

5550MHz

Date: 30.JAN.2024 19:44:19

5670MHz

Date: 20.DEC.2023 16:17:48

IEEE 802.11ac VHT80 Mode / 5470 ~ 5725MHz (Chain 0)

5530MHz

Date: 20.DEC.2023 16:52:36

5610MHz

Date: 20.DEC.2023 16:53:54

IEEE 802.11ac VHT80 Mode / 5470 ~ 5725MHz (Chain 1)

5530MHz

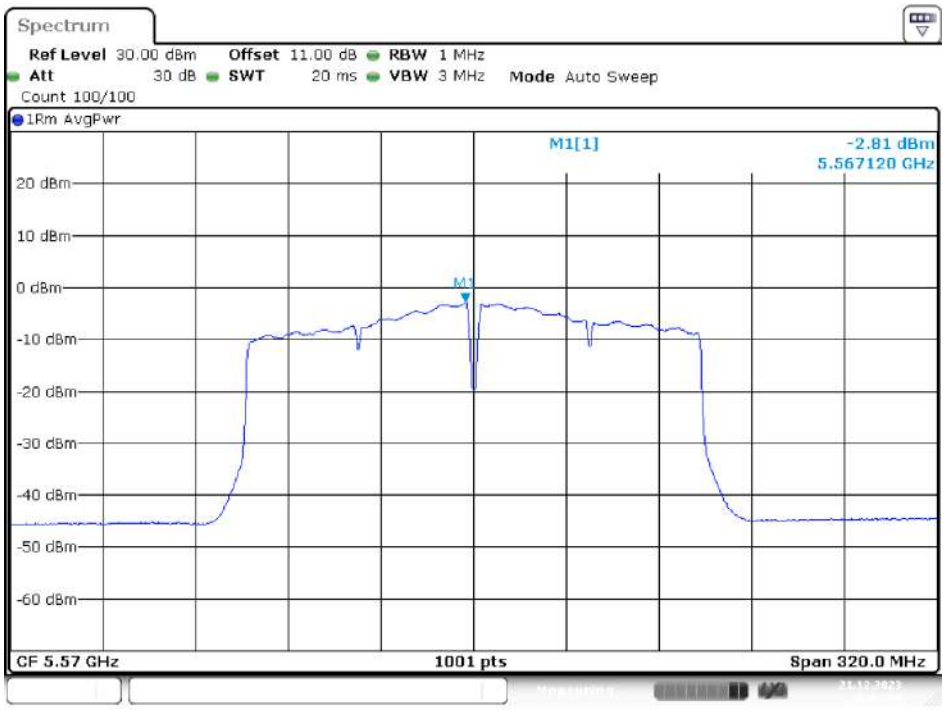
Date: 20.DEC.2023 16:35:57

5610MHz

Date: 20.DEC.2023 16:37:11

IEEE 802.11ac VHT160 Mode / 5470 ~ 5725MHz (Chain 0)

5570MHz



Date: 21.DEC.2023 16:02:09

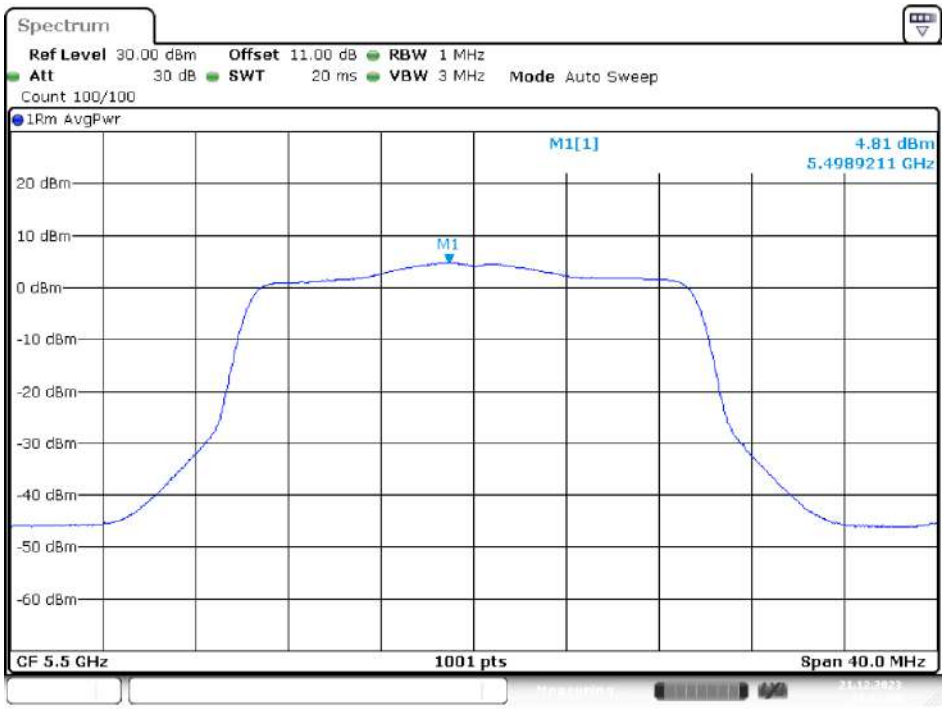
IEEE 802.11ac VHT160 Mode / 5470 ~ 5725MHz (Chain 1)

5570MHz

Date: 21.DEC.2023 16:03:11

IEEE 802.11ax HE20 Mode / 5470 ~ 5725MHz (Chain 0)

5500MHz



Date: 21.DEC.2023 14:17:30

5580MHz

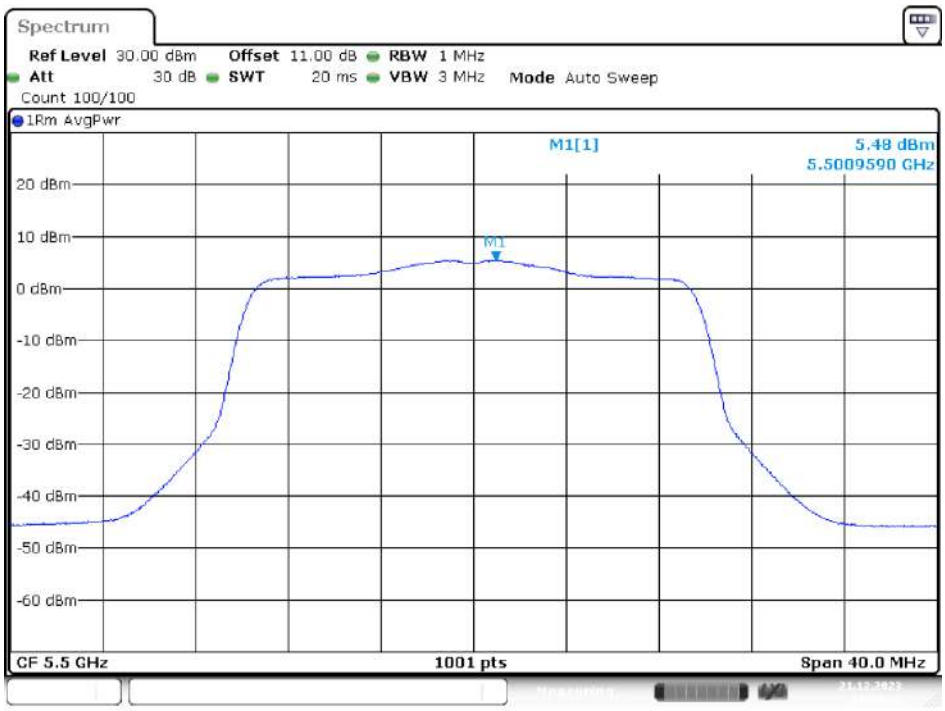
Date: 21.DEC.2023 14:23:46

5700MHz

Date: 21.DEC.2023 14:30:15

IEEE 802.11ax HE20 Mode / 5470 ~ 5725MHz (Chain1)

5500MHz

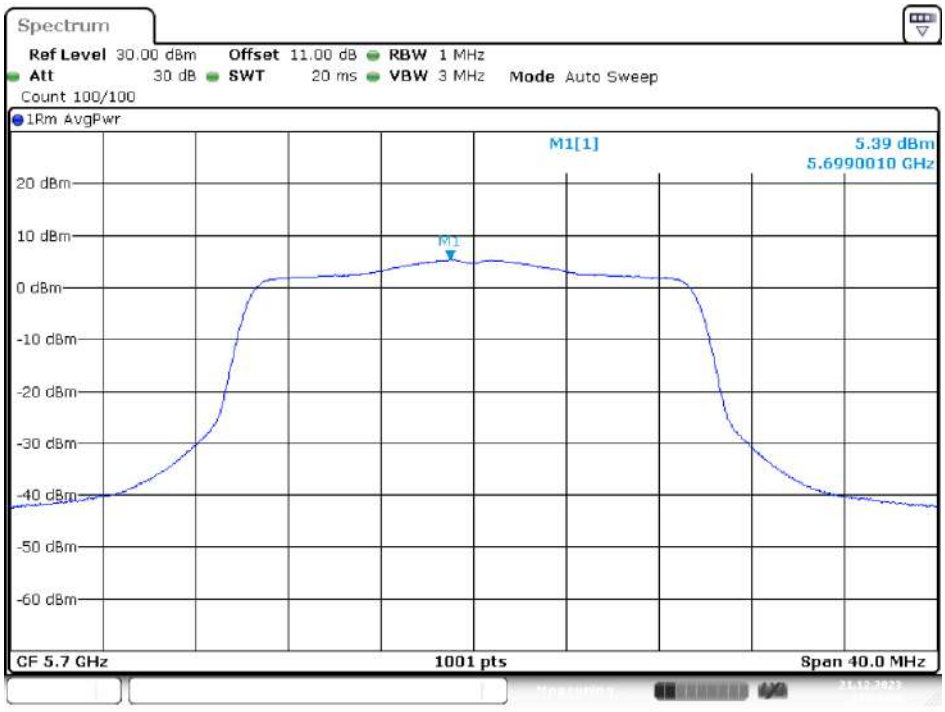


Date: 21.DEC.2023 14:20:13

5580MHz

Date: 21.DEC.2023 14:25:05

5700MHz



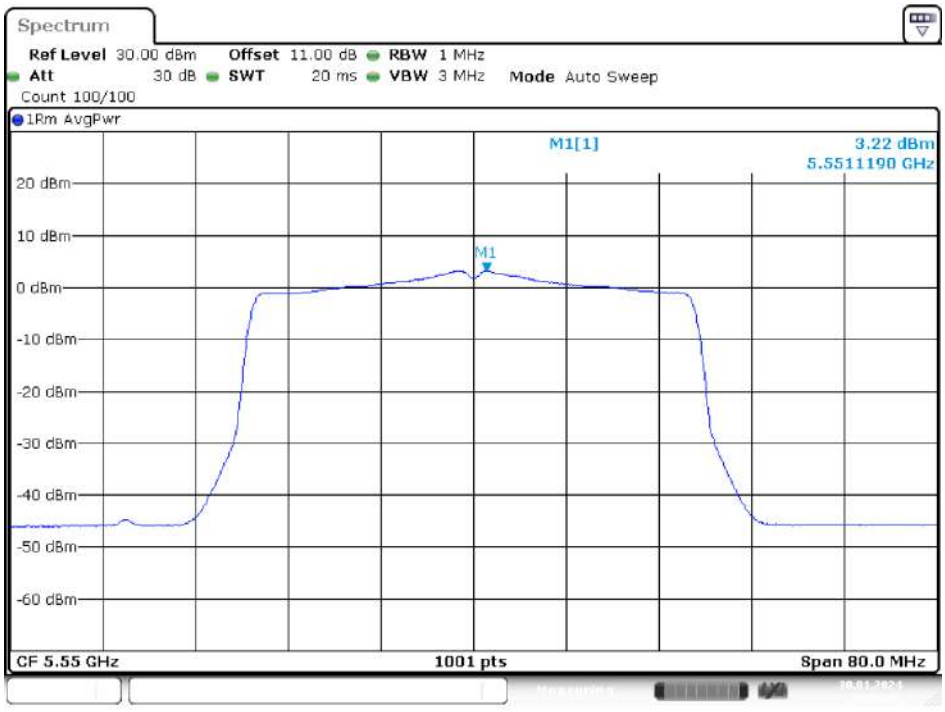
Date: 21.DEC.2023 14:29:20

IEEE 802.11ax HE40 Mode / 5470 ~ 5725MHz (Chain 0)

5510MHz

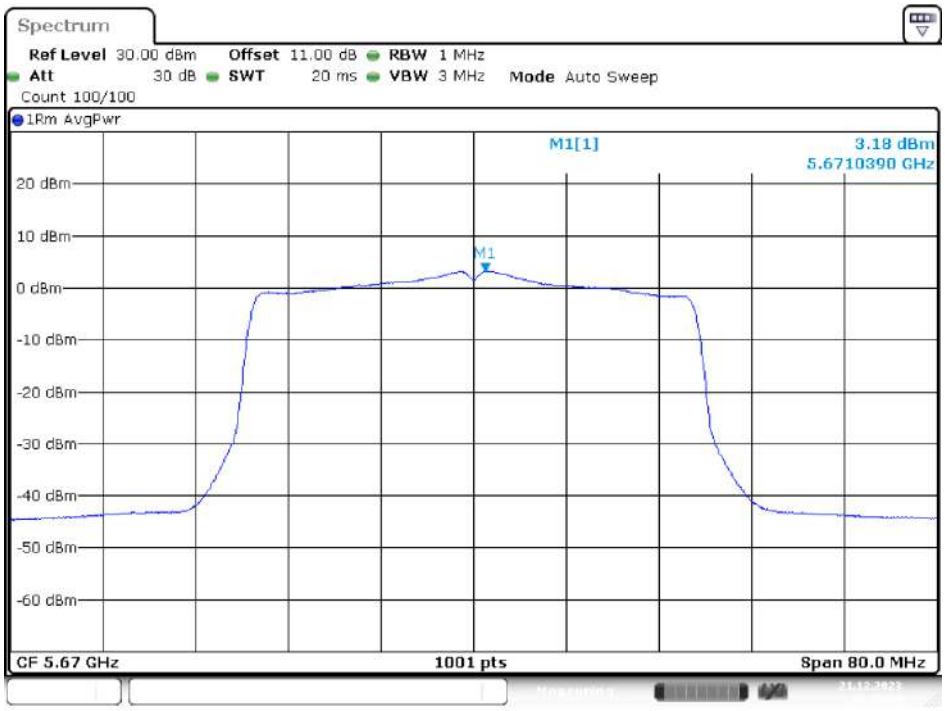
Date: 21.DEC.2023 15:13:55

5550MHz



Date: 30.JAN.2024 19:58:48

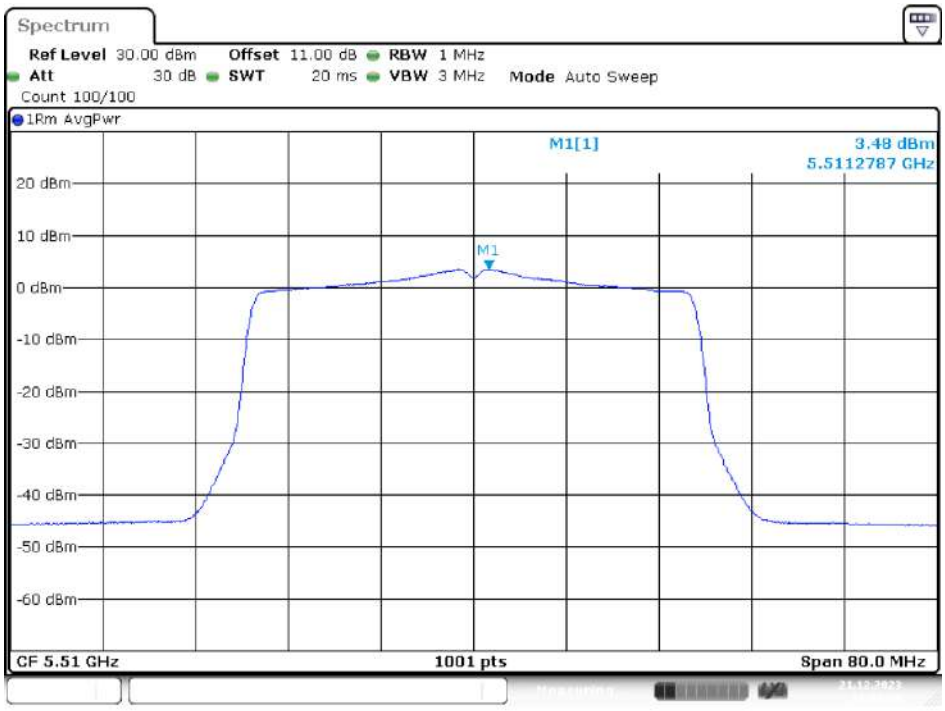
5670MHz



Date: 21.DEC.2023 15:15:55

IEEE 802.11ax HE40 Mode / 5470 ~ 5725MHz (Chain1)

5510MHz



Date: 21.DEC.2023 14:59:59

5550MHz

Date: 30.JAN.2024 20:00:30

5670MHz

Date: 21.DEC.2023 15:02:16

IEEE 802.11ax HE80 Mode / 5470 ~ 5725MHz (Chain 0)

5530MHz

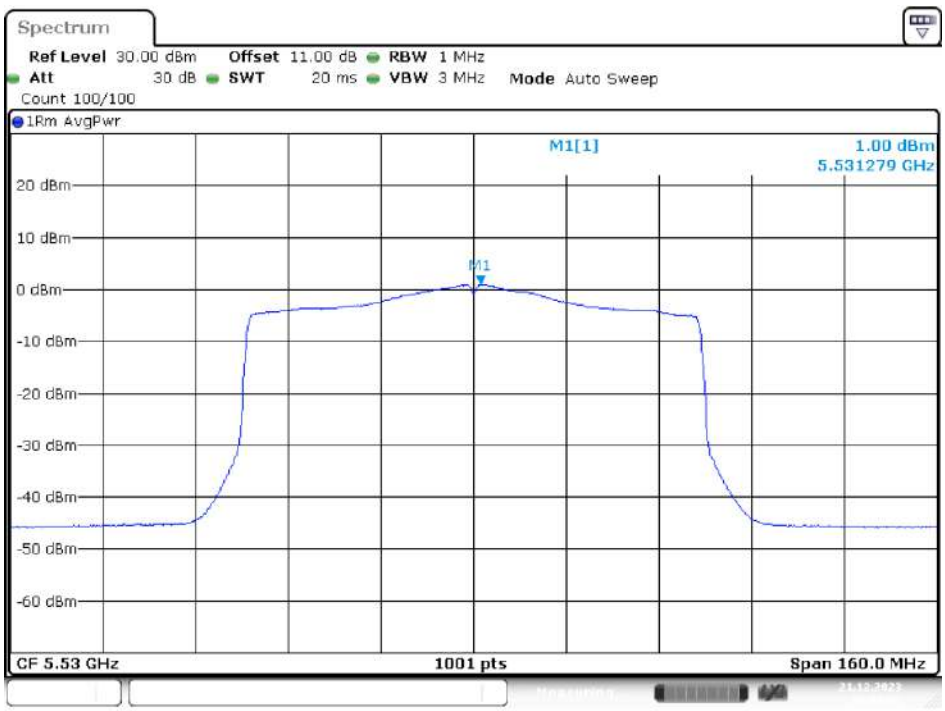
Date: 21.DEC.2023 15:21:11

5610MHz

Date: 21.DEC.2023 15:23:15

IEEE 802.11ax HE80 Mode / 5470 ~ 5725MHz (Chain 1)

5530MHz



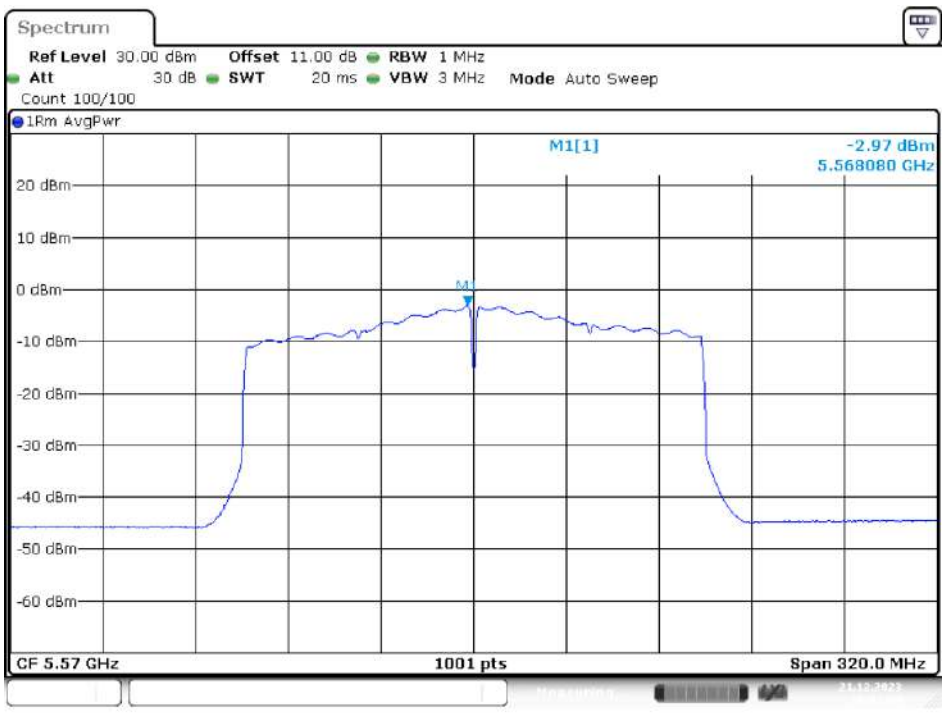
Date: 21.DEC.2023 15:30:37

5610MHz

Date: 21.DEC.2023 15:31:37

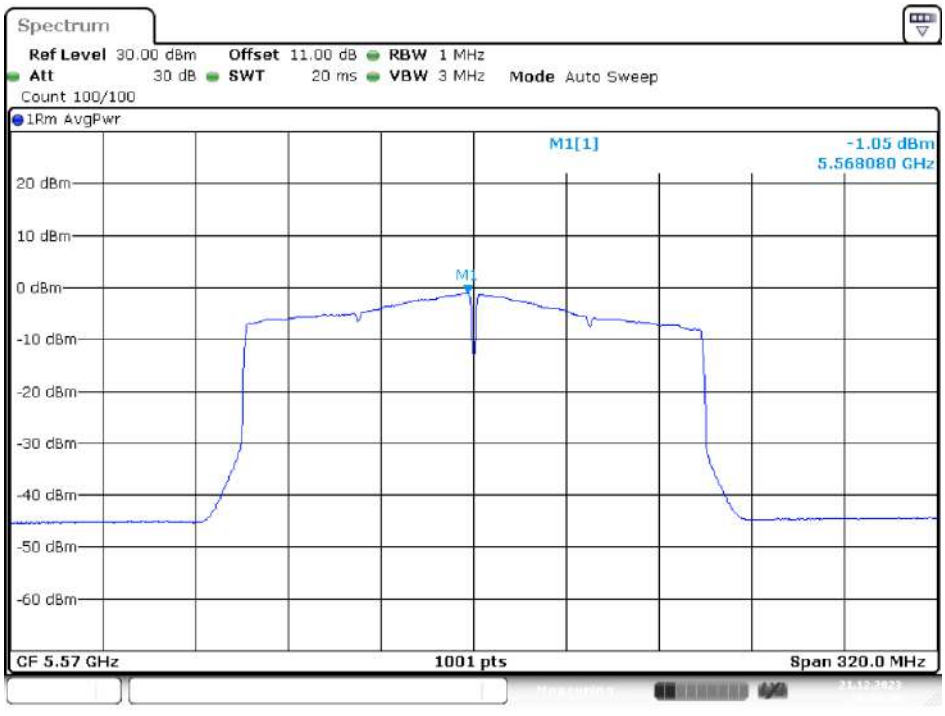
IEEE 802.11ax HE160 Mode / 5470 ~ 5725MHz (Chain 0)

5570MHz



IEEE 802.11ax HE160 Mode / 5470 ~ 5725MHz (Chain 1)

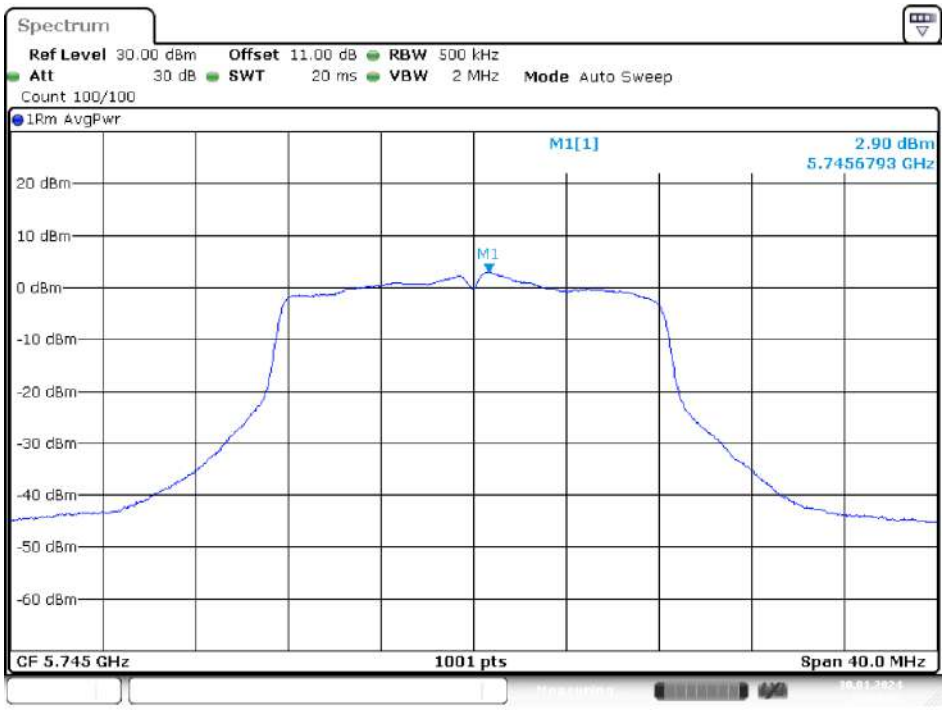
5570MHz



UNII-3 Band IV / PSD

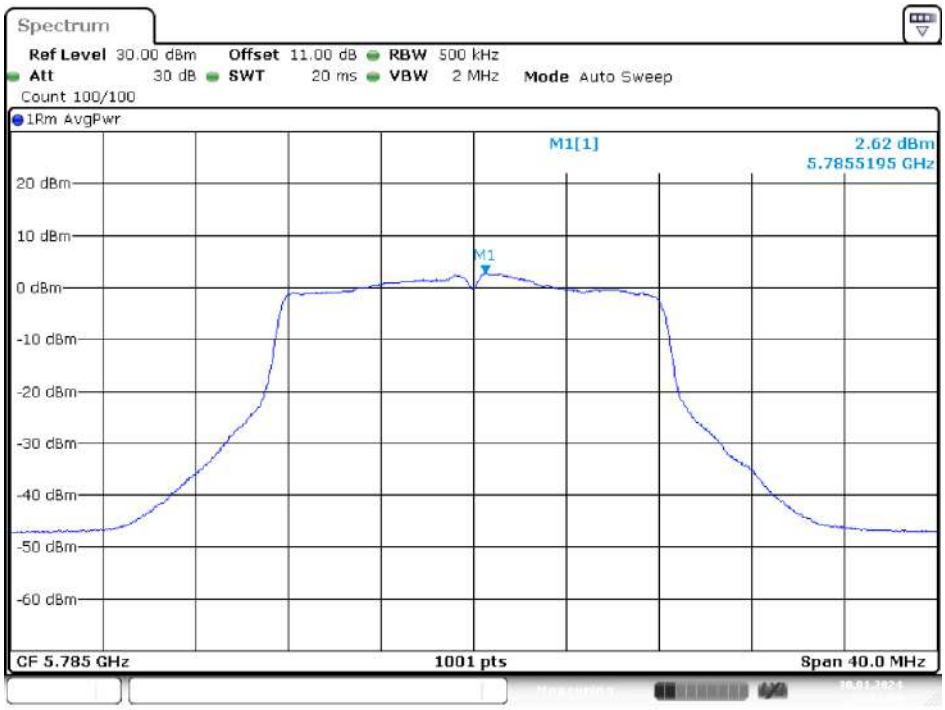
IEEE 802.11a Mode / 5725 ~ 5850MHz (Chain 0)

5745MHz



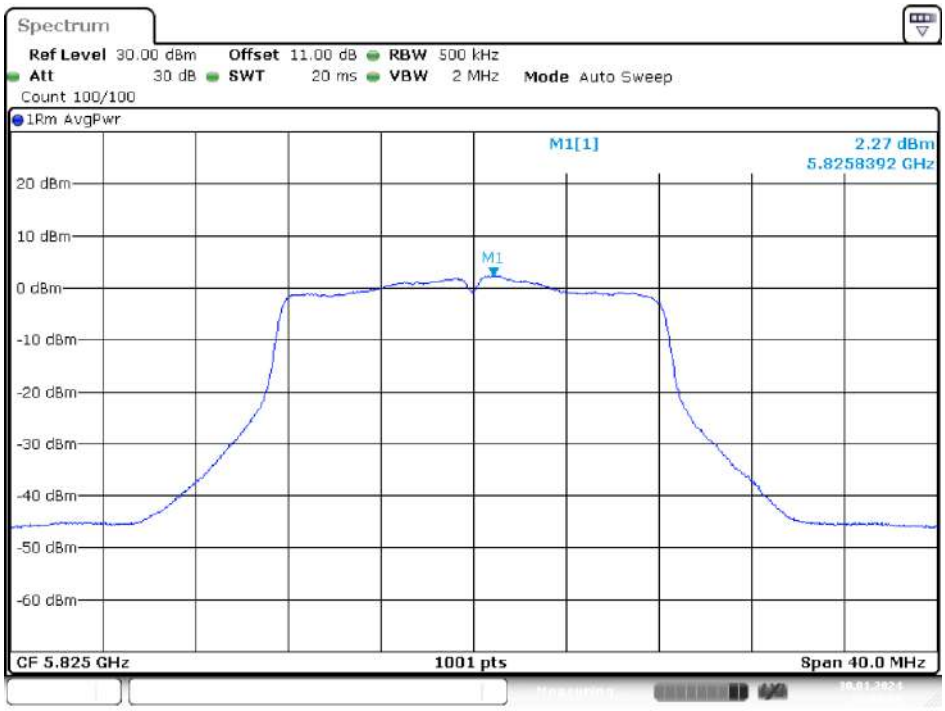
Date: 30.JAN.2024 17:29:32

5785MHz



Date: 30.JAN.2024 17:37:55

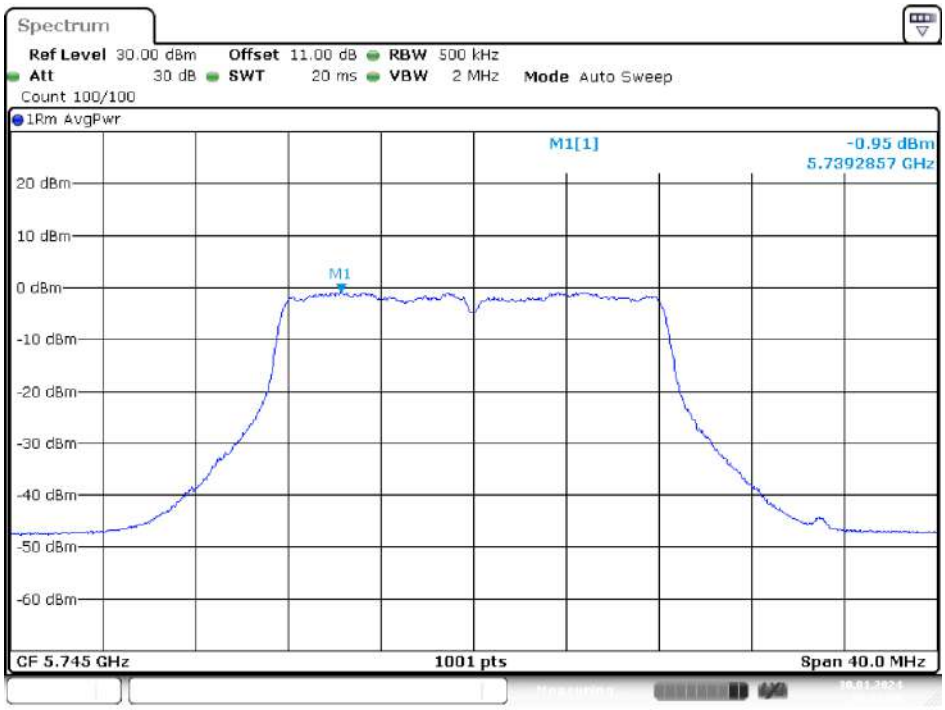
5825MHz



Date: 30.JAN.2024 17:39:10

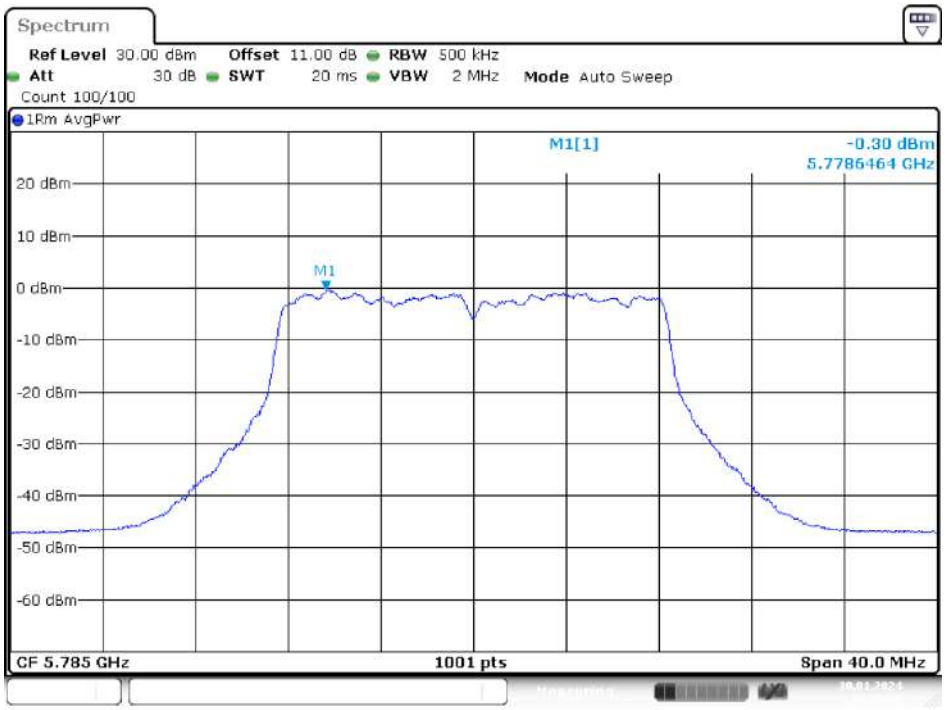
IEEE 802.11a Mode / 5725 ~ 5850MHz (Chain 1)

5745MHz



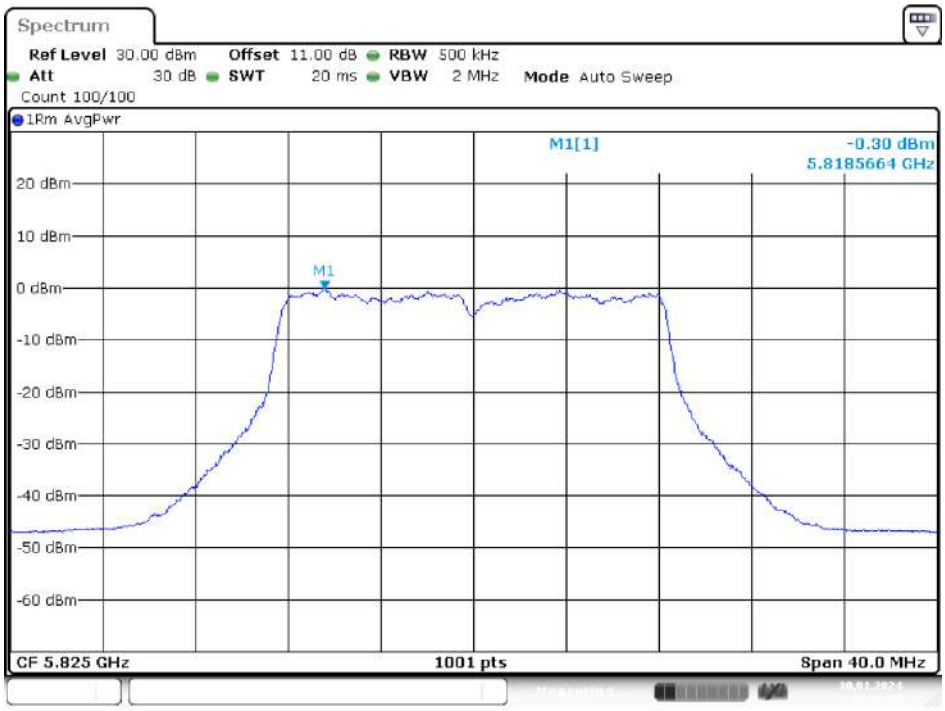
Date: 30.JAN.2024 19:13:58

5785MHz



Date: 30.JAN.2024 19:15:59

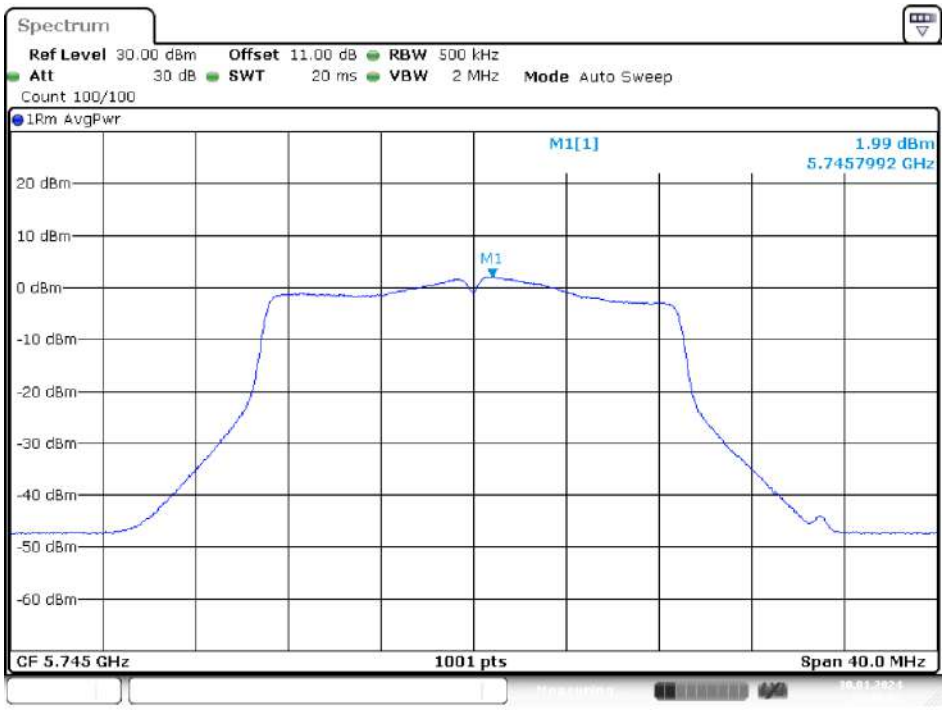
5825MHz



Date: 30.JAN.2024 19:17:19

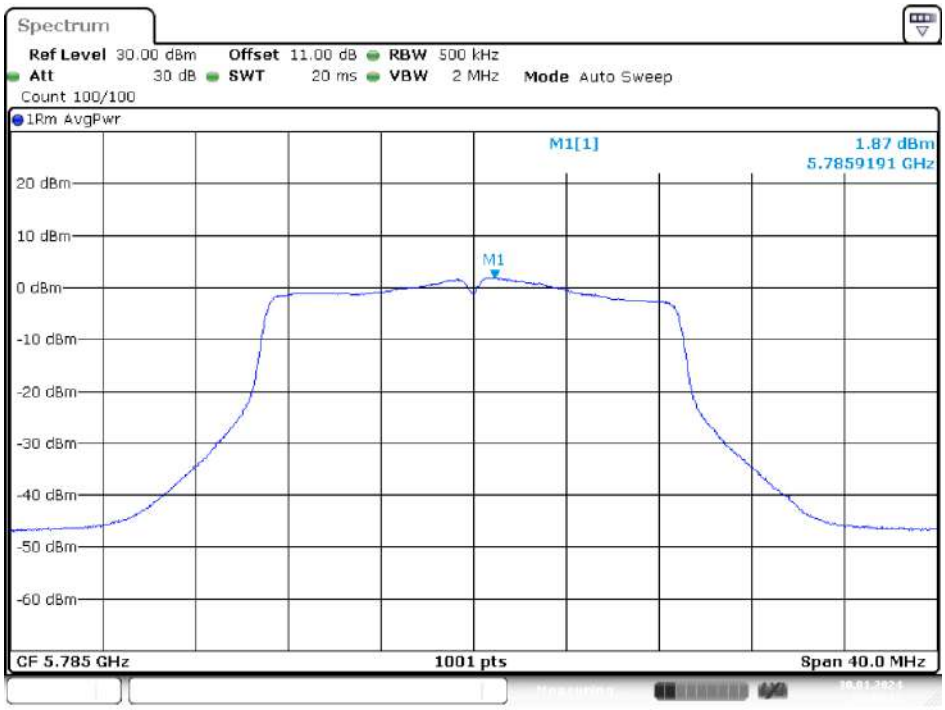
IEEE 802.11ac VHT20 Mode / 5725 ~ 5850MHz (Chain 0)

5745MHz



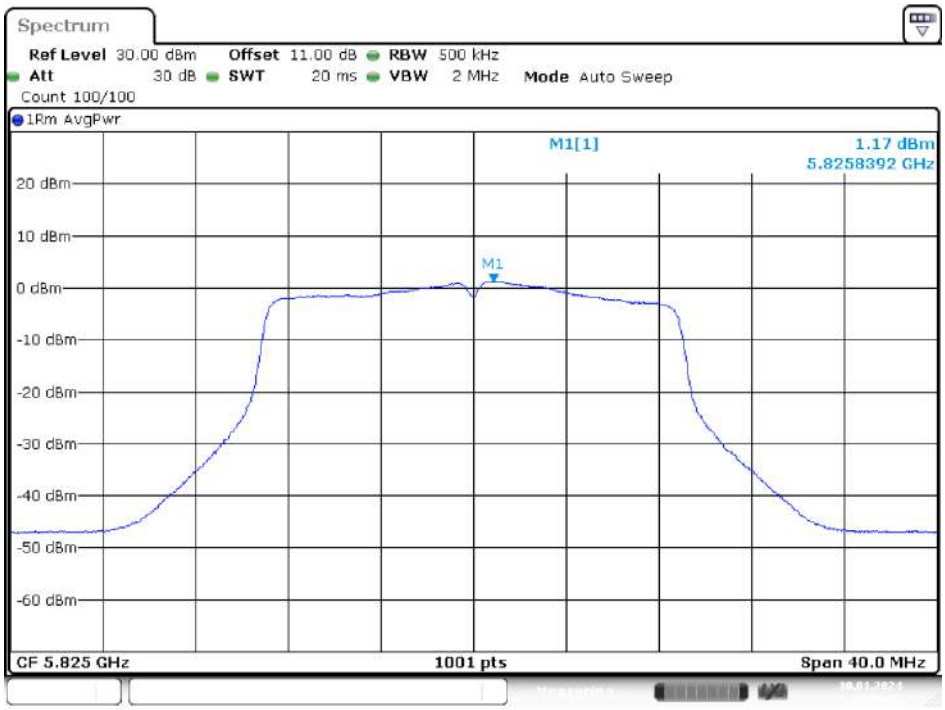
Date: 30.JAN.2024 17:48:03

5785MHz



Date: 30.JAN.2024 17:47:11

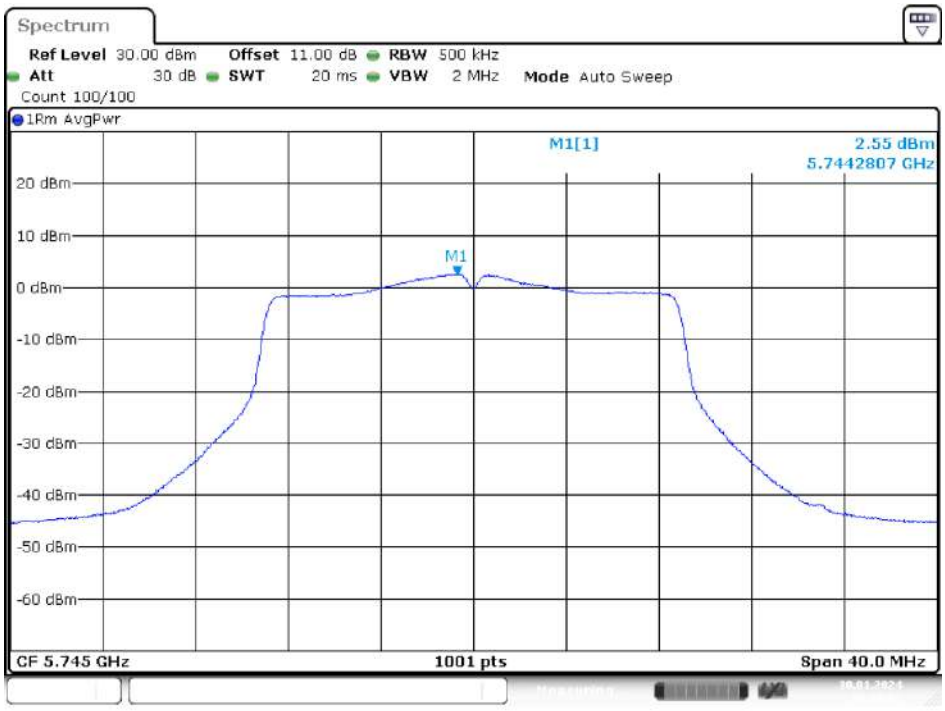
5825MHz



Date: 30.JAN.2024 17:45:54

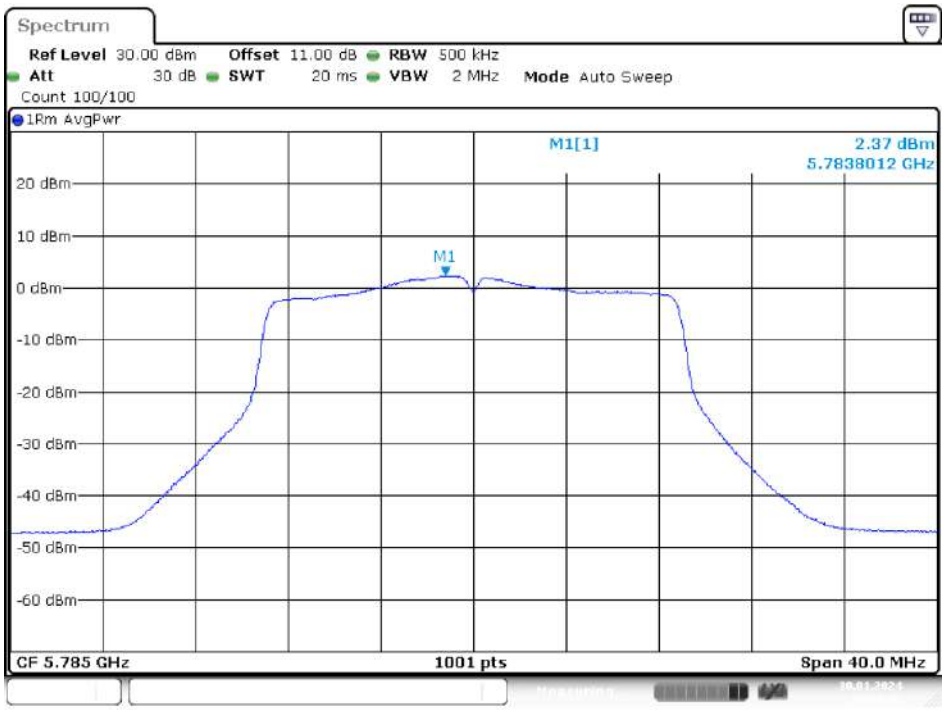
IEEE 802.11ac VHT20 Mode / 5725 ~ 5850MHz (Chain 1)

5745MHz



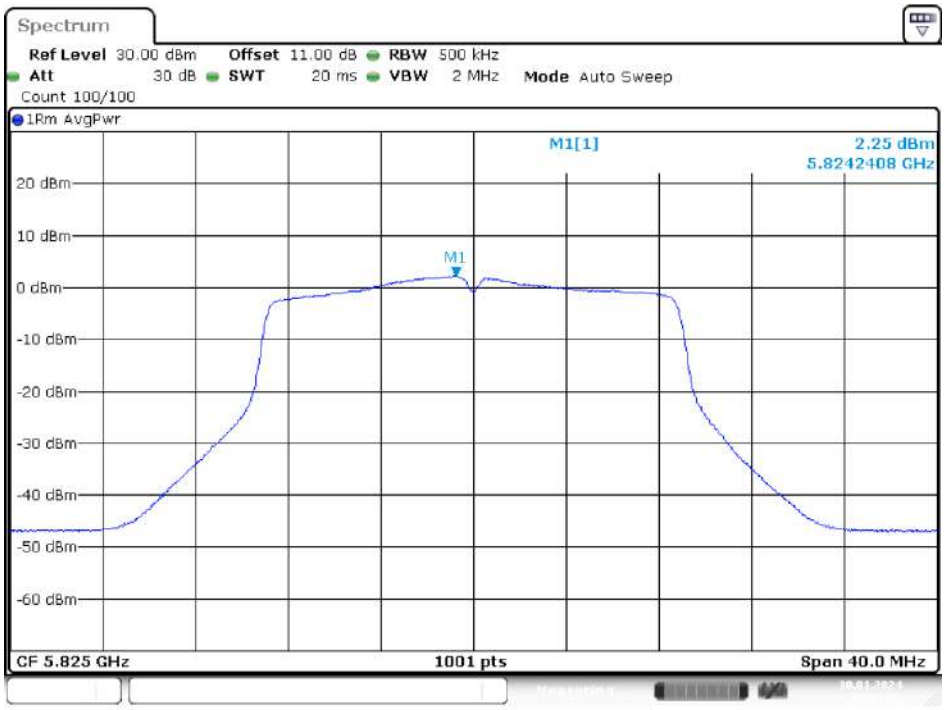
Date: 30.JAN.2024 19:19:07

5785MHz



Date: 30.JAN.2024 19:20:42

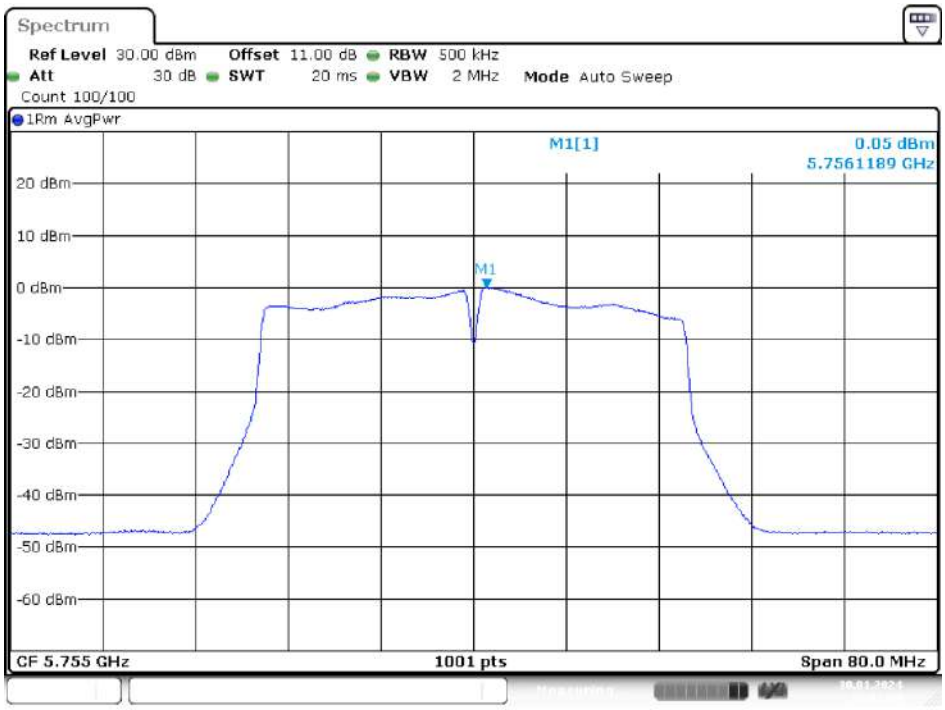
5825MHz



Date: 30.JAN.2024 19:21:38

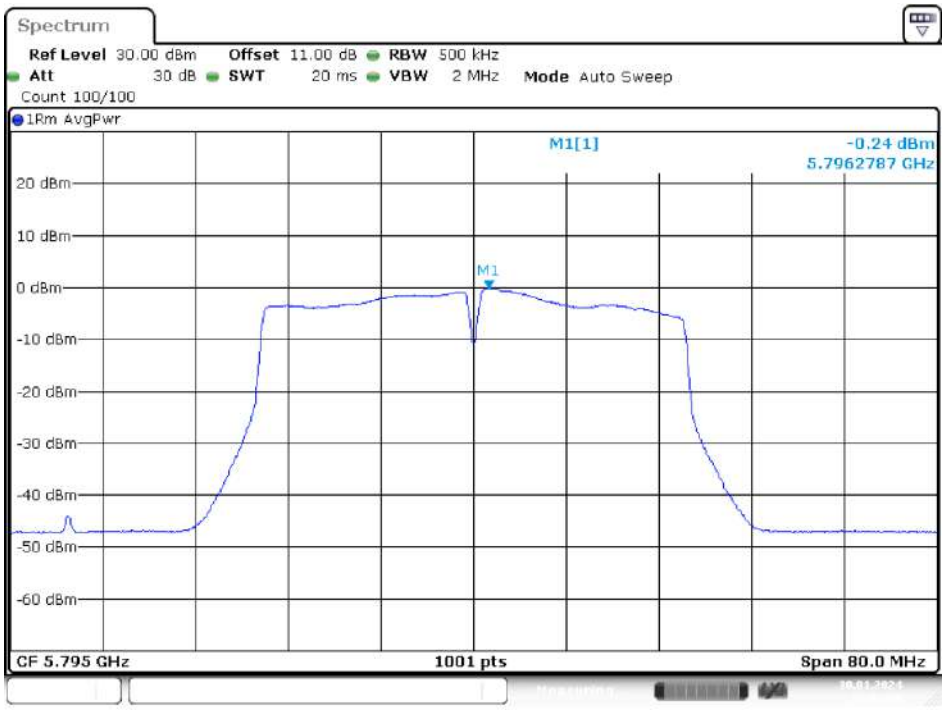
IEEE 802.11ac VHT40 Mode / 5725 ~ 5850MHz (Chain 0)

5755MHz



Date: 30.JAN.2024 17:51:24

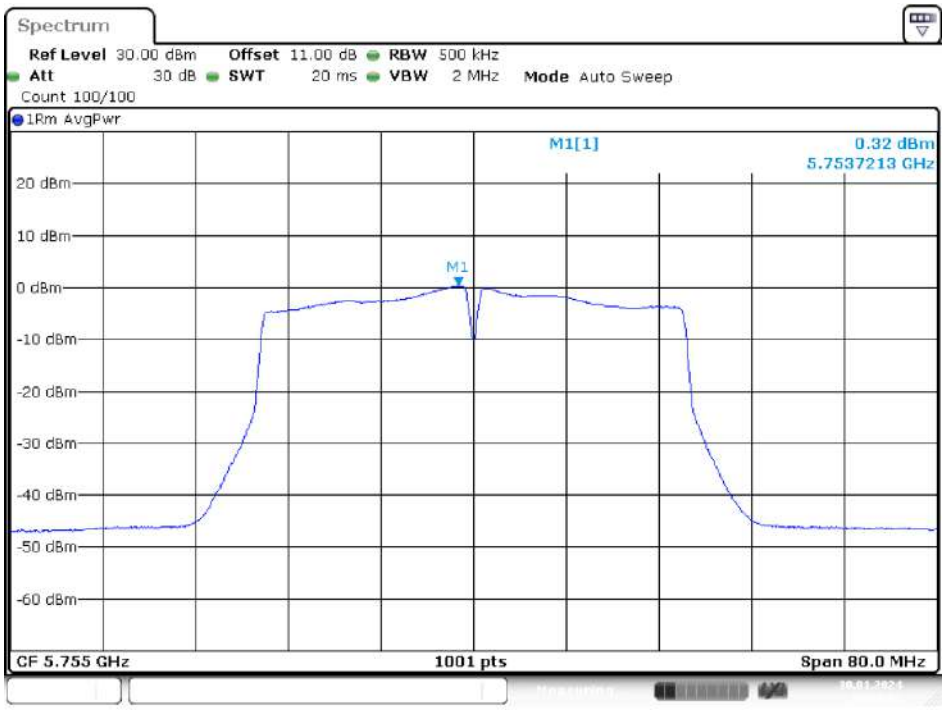
5795MHz



Date: 30.JAN.2024 17:52:21

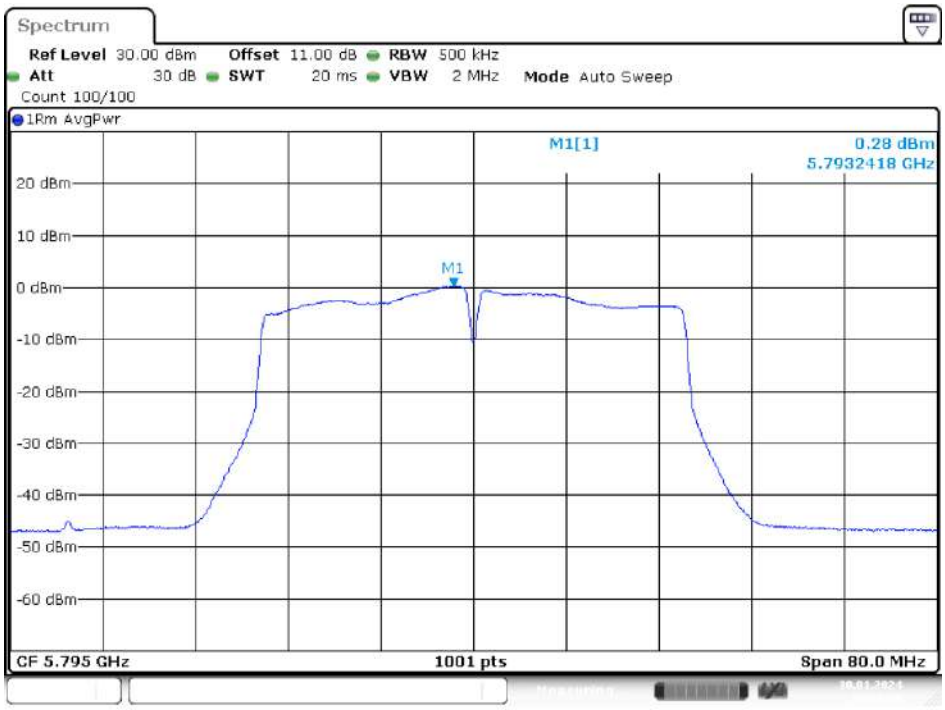
IEEE 802.11ac VHT40 Mode / 5725 ~ 5850MHz (Chain 1)

5755MHz



Date: 30.JAN.2024 19:23:02

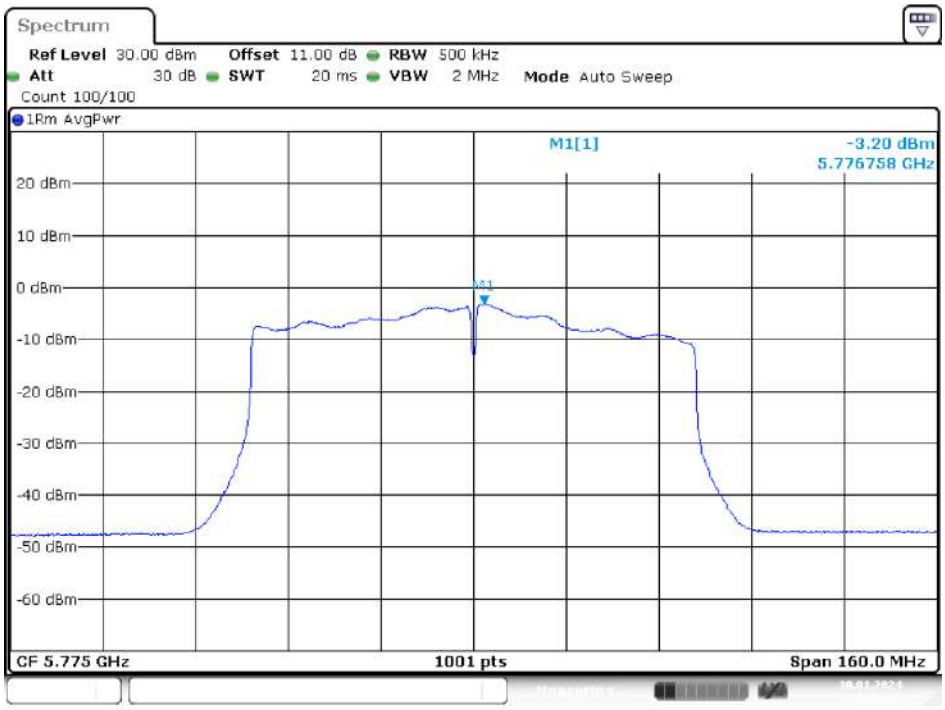
5795MHz



Date: 30.JAN.2024 19:24:20

IEEE 802.11ac VHT80 Mode / 5725 ~ 5850MHz (Chain 0)

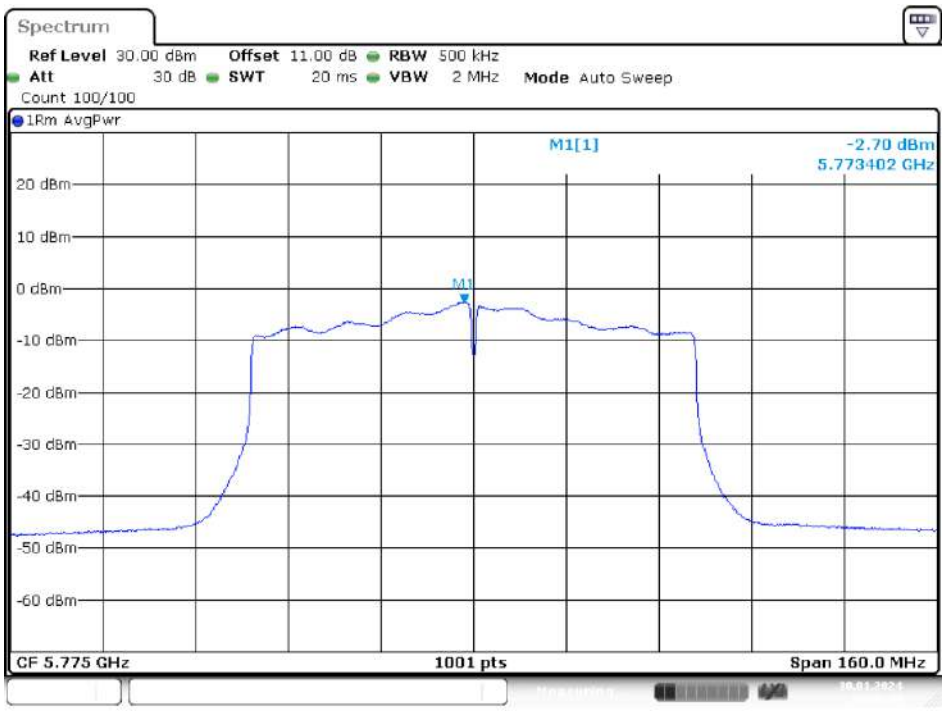
5775MHz



Date: 30.JAN.2024 18:01:34

IEEE 802.11ac VHT80 Mode / 5725 ~ 5850MHz (Chain 1)

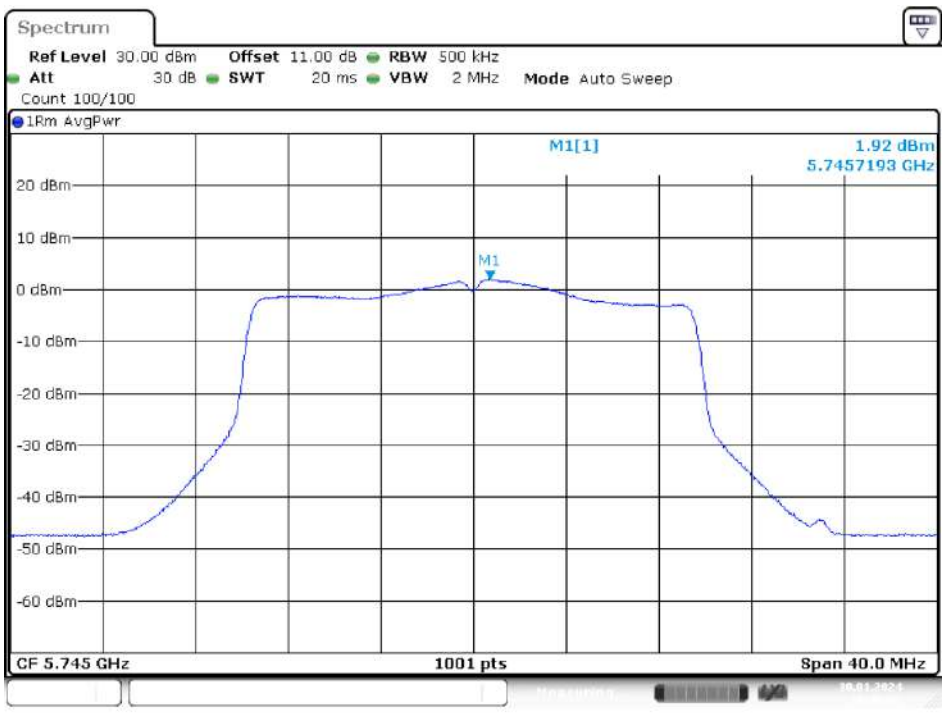
5775MHz



Date: 30.JAN.2024 19:26:44

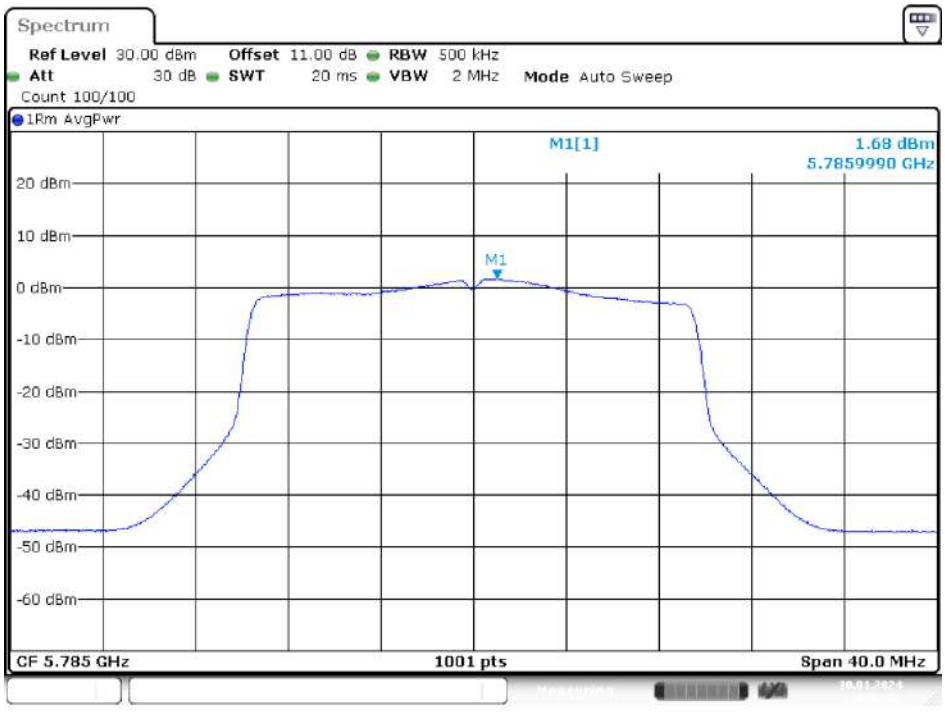
IEEE 802.11ax HE20 Mode / 5725 ~ 5850MHz (Chain 0)

5745MHz



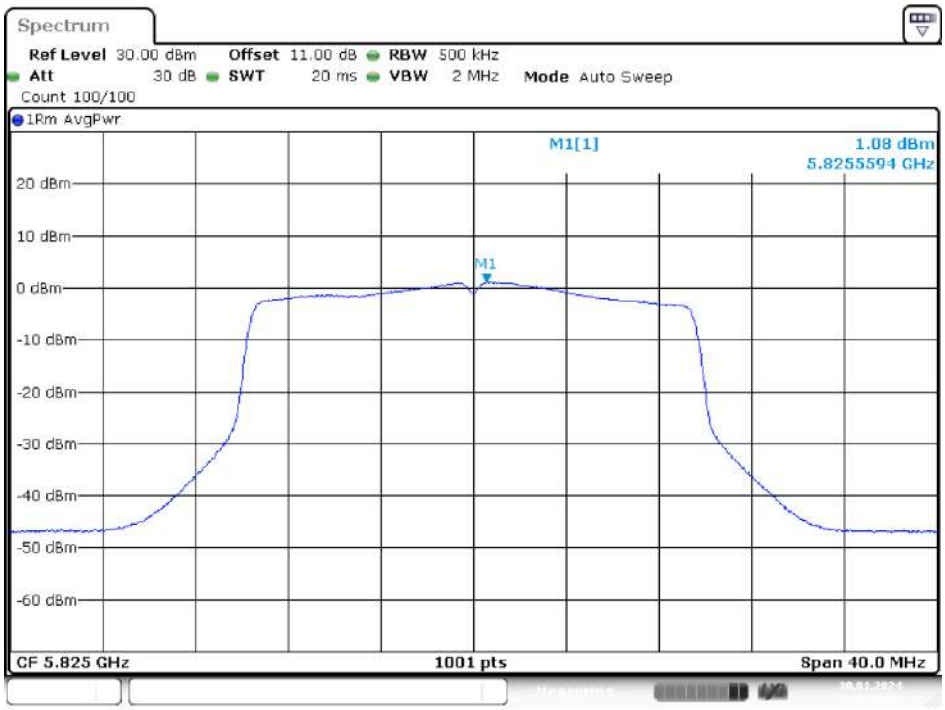
Date: 30.JAN.2024 18:46:28

5785MHz



Date: 30.JAN.2024 18:52:02

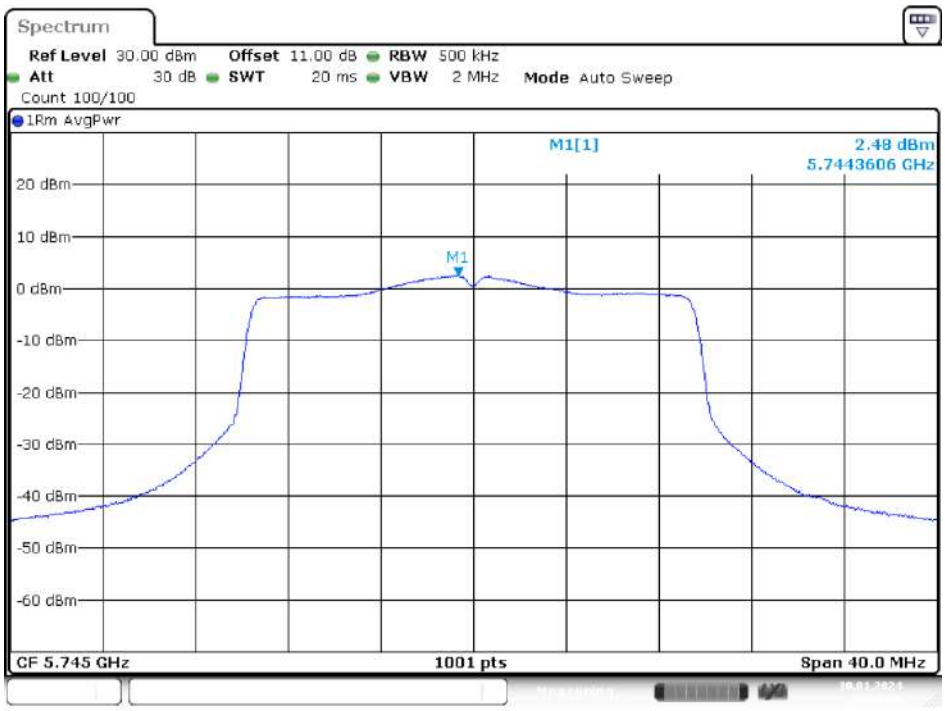
5825MHz



Date: 30.JAN.2024 18:53:22

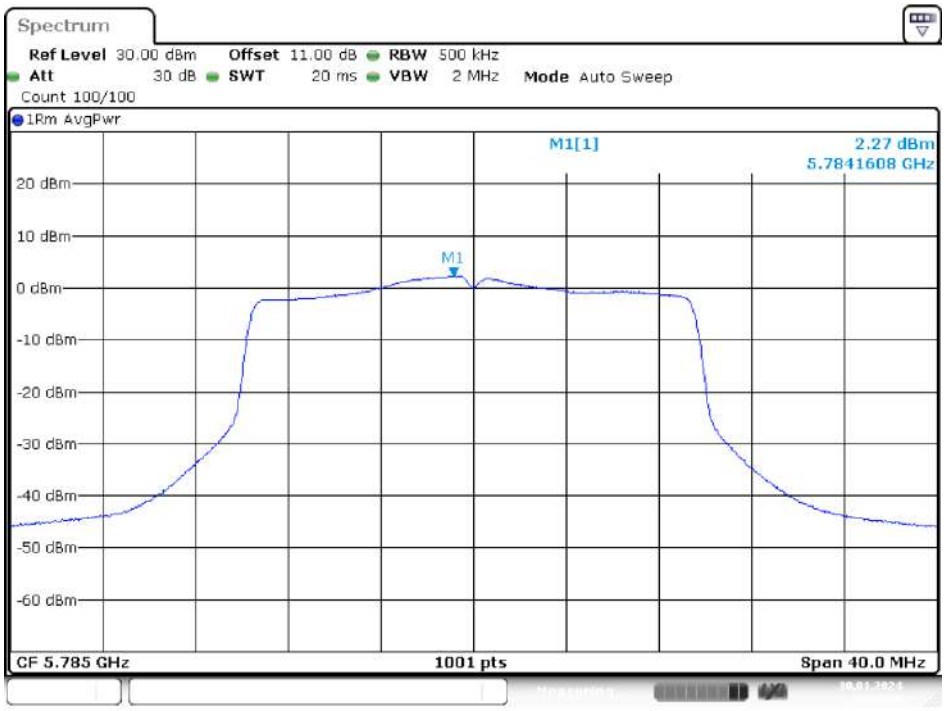
IEEE 802.11ax HE20 Mode / 5725 ~ 5850MHz (Chain1)

5745MHz



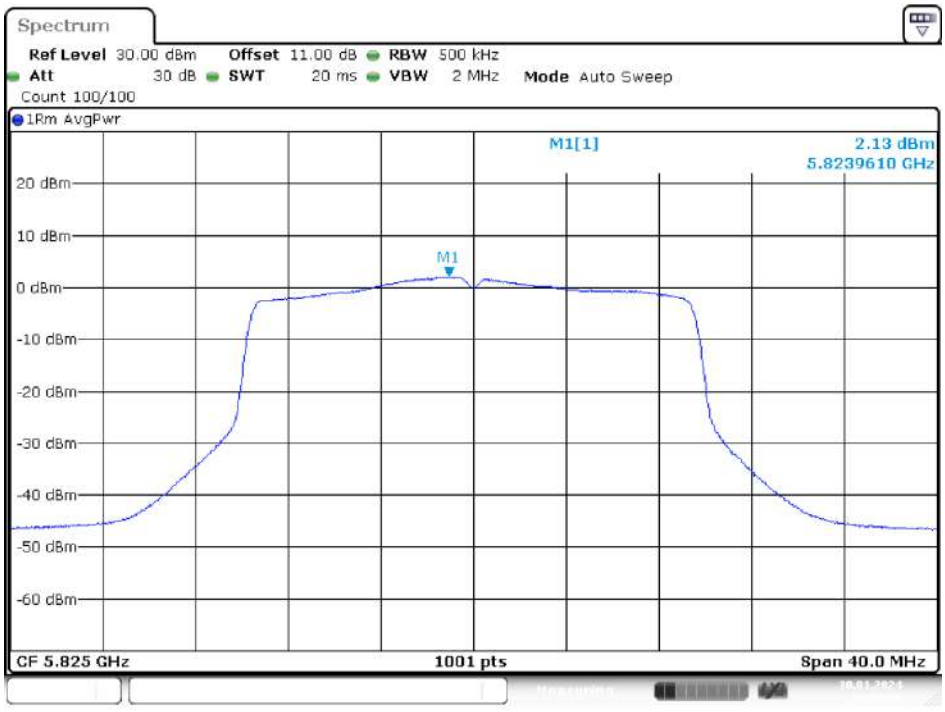
Date: 30.JAN.2024 19:28:39

5785MHz



Date: 30.JAN.2024 19:29:31

5825MHz



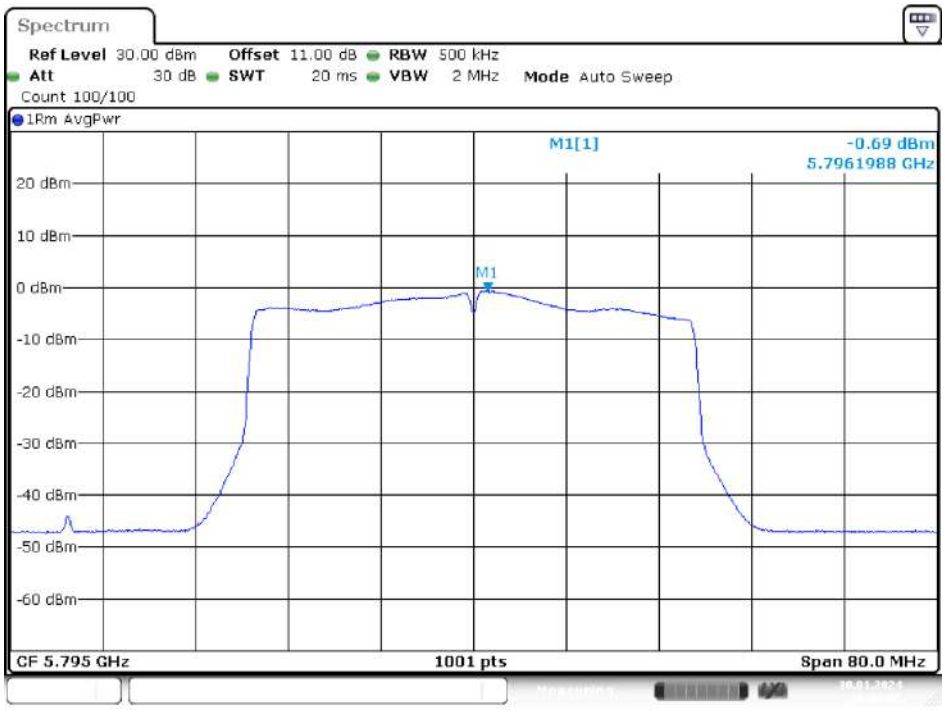
Date: 30.JAN.2024 19:30:20

IEEE 802.11ax HE40 Mode / 5725 ~ 5850MHz (Chain 0)

5755MHz

Date: 30.JAN.2024 18:58:33

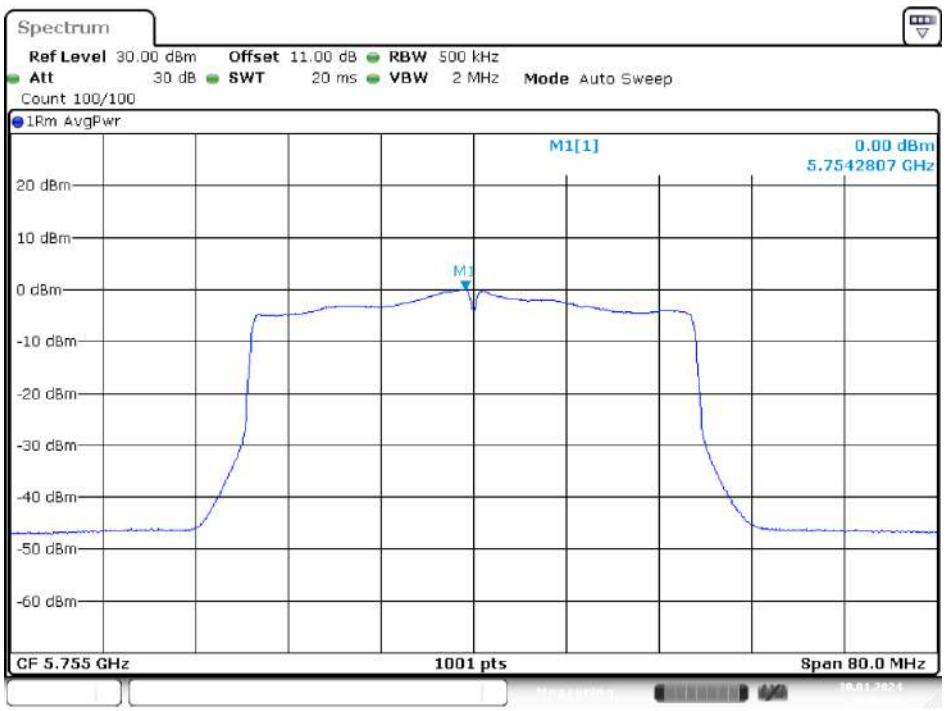
5795MHz



Date: 30.JAN.2024 18:59:36

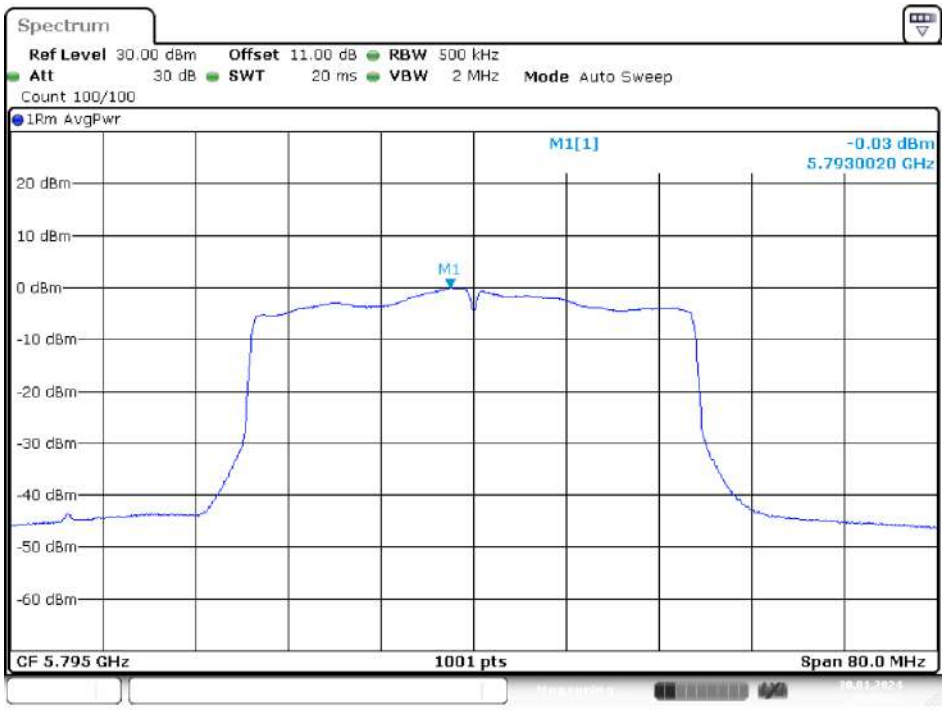
IEEE 802.11ax HE40 Mode / 5725 ~ 5850MHz (Chain1)

5755MHz



Date: 30.JAN.2024 19:32:16

5795MHz



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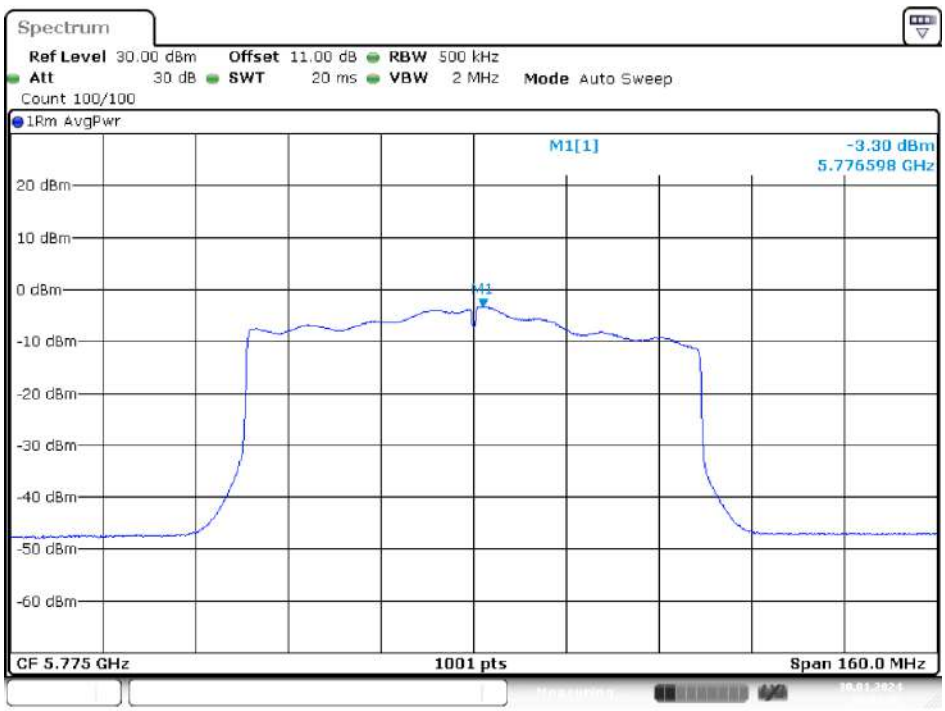
IEEE 802.11ax HE80 Mode / 5725 ~ 5850MHz (Chain 0)

5755MHz



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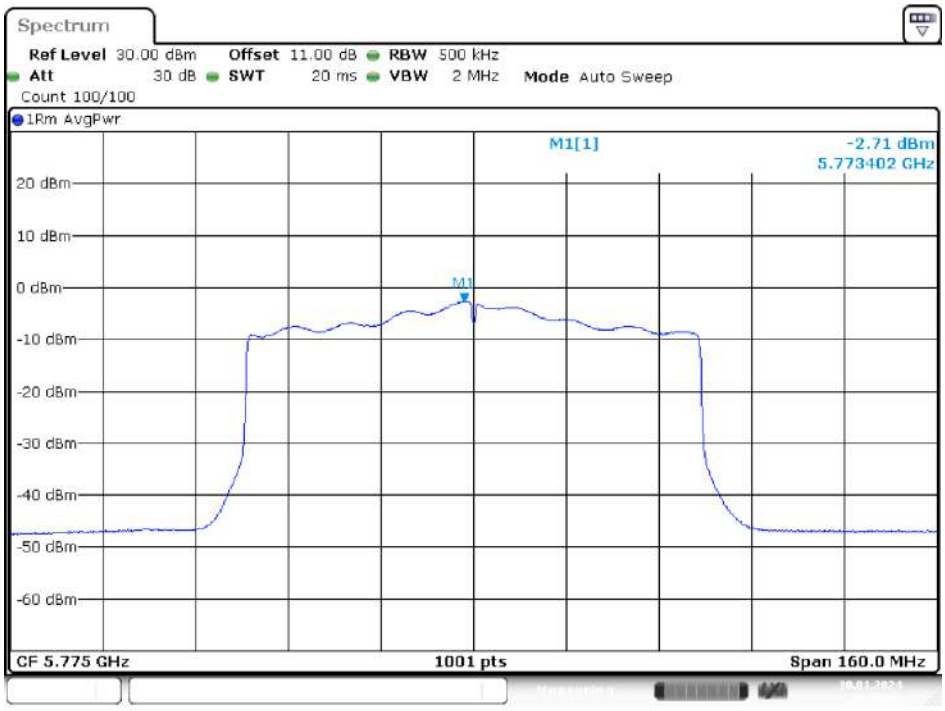
IEEE 802.11ax HE80 Mode / 5725 ~ 5850MHz (Chain 1)

5755MHz



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14 RSS-247 §6.4 – Additional requirements

14.1 Applicable Standard

According to RSS-247 Clause 6.4 Additional requirement

The following requirements shall apply:

a. The device shall automatically discontinue transmission in cases of absence of information to transmit, or operational failure. A description on how this is done shall accompany the application for equipment certification. Note that this is not intended to prohibit transmission of control or signalling information or the use of repetitive codes where required by the technology.

b. All LE-LAN devices must contain security features to protect against modification of software by unauthorized parties.

   Manufacturers must implement security features in any digitally modulated devices capable of operating in any of the frequency ranges within the 5 GHz band, so that third parties are not able to reprogram the device to operate outside the parameters for which the device was certified. The software must prevent the user from operating the transmitter with operating frequencies, output power, modulation types or other radio frequency parameters outside those that were approved for the device. Manufacturers may use various means, including the use of a private network that allows only authenticated users to download software, electronic signatures in software or coding in hardware that is decoded by software to verify that new software can be legally loaded into a device to meet these requirements and must describe the methods in their application for equipment certification.

   Manufacturers must take steps to ensure that DFS functionality cannot be disabled by the operator of the LE-LAN device.

c. The user manual for LE-LAN devices shall contain instructions related to the restrictions mentioned in the above sections, namely that:

   i. the device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;Footnote4
   ii. for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;
   iii. for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits as appropriate; and
   iv. where applicable, antenna type(s), antenna models(s), and worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in section 6.2.2.3 shall be clearly indicated.

14.2 Judgment

RSS-247 Clause 6.4 a):

The device shall automatically discontinue transmission in cases of absence of information to transmit, or operational failure.Please refer to the declaration

RSS-247 Clause 6.4 b):

The devices must contain security features to protect against modification of software by unauthorized parties. Please refer to the declaration

RSS-247 Clause 6.4 c):

i). The device operates on 5150-5250MHz is only for indoor use.

ii). The device operates on 5250-5350MHz/5470-5725MHz complies with the e.i.r.p. limit.

iii). The EIPR compliance with RSS-247 requirement.

iv). Not Applicable.

******* END OF REPORT *******