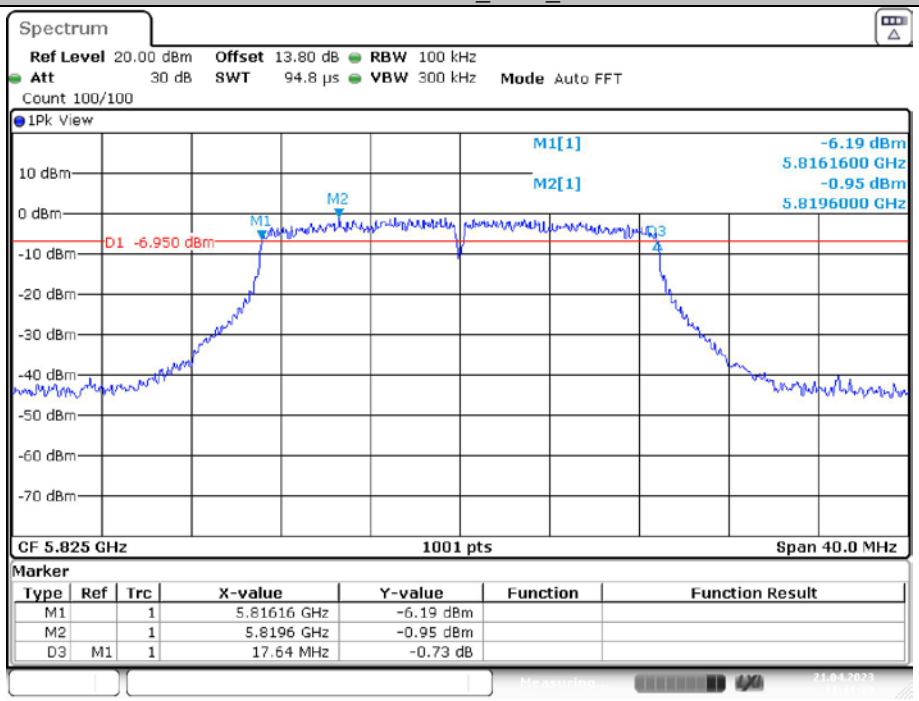
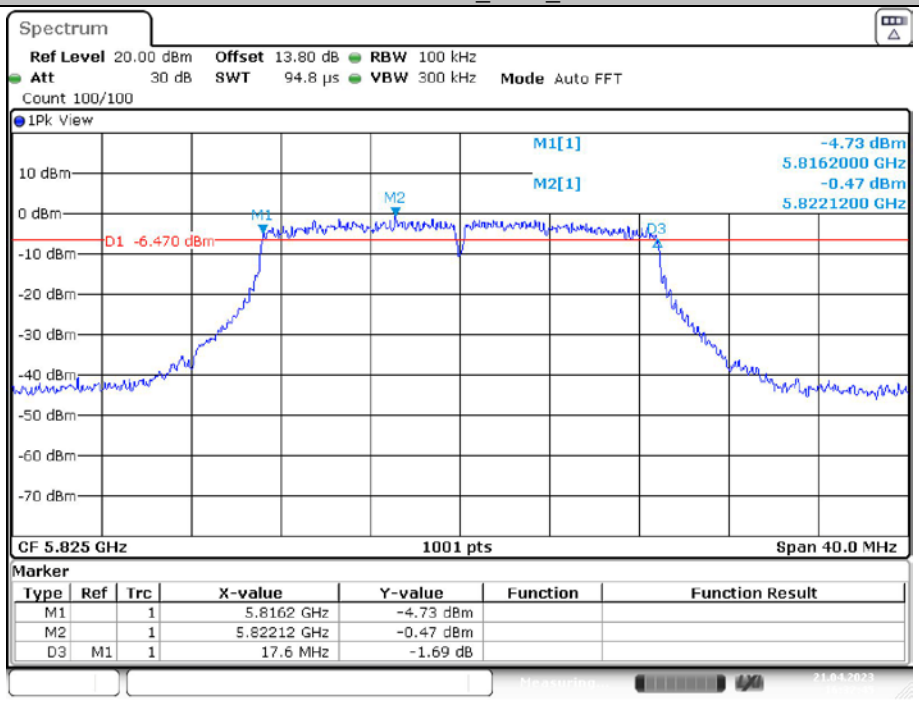
11AC20MIMO_Ant1_5825



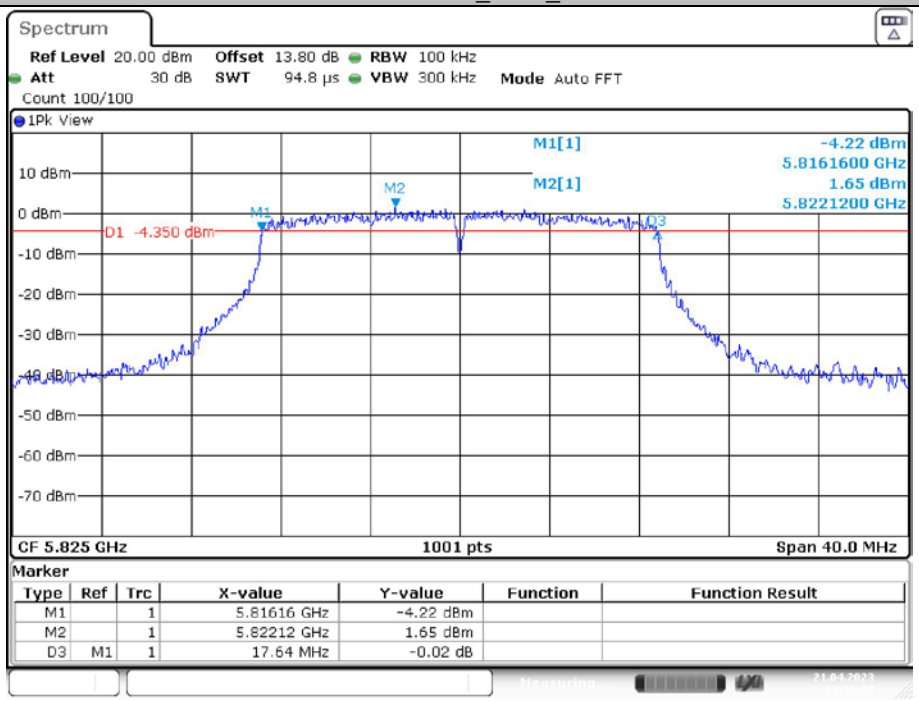
Date: 21.APR.2023 11:11:30

11AC20MIMO_Ant2_5825



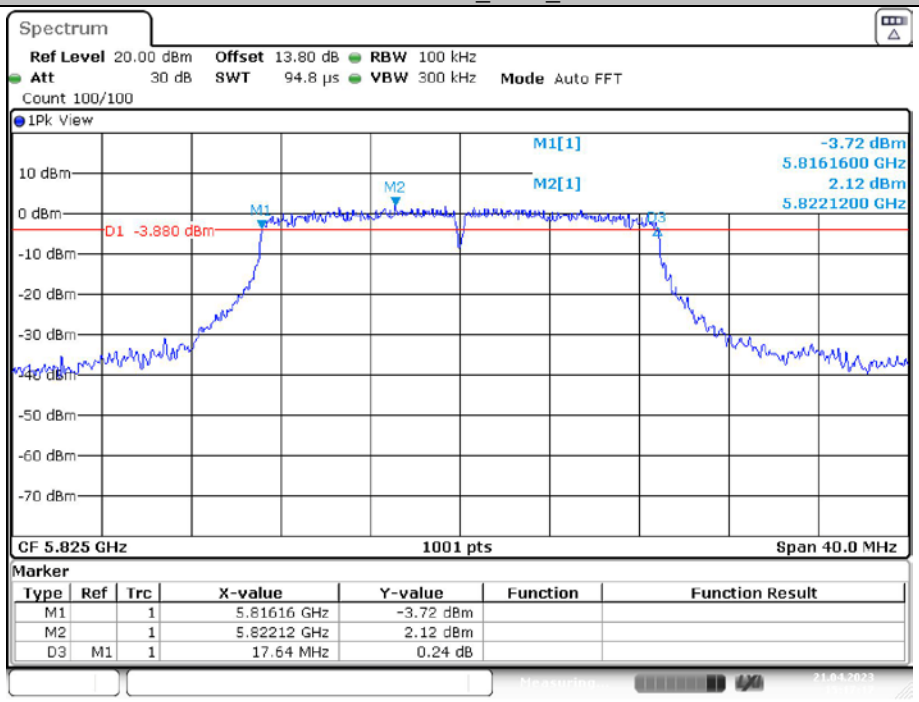
Date: 21.APR.2023 16:32:45

11AC20MIMO_Ant3_5825



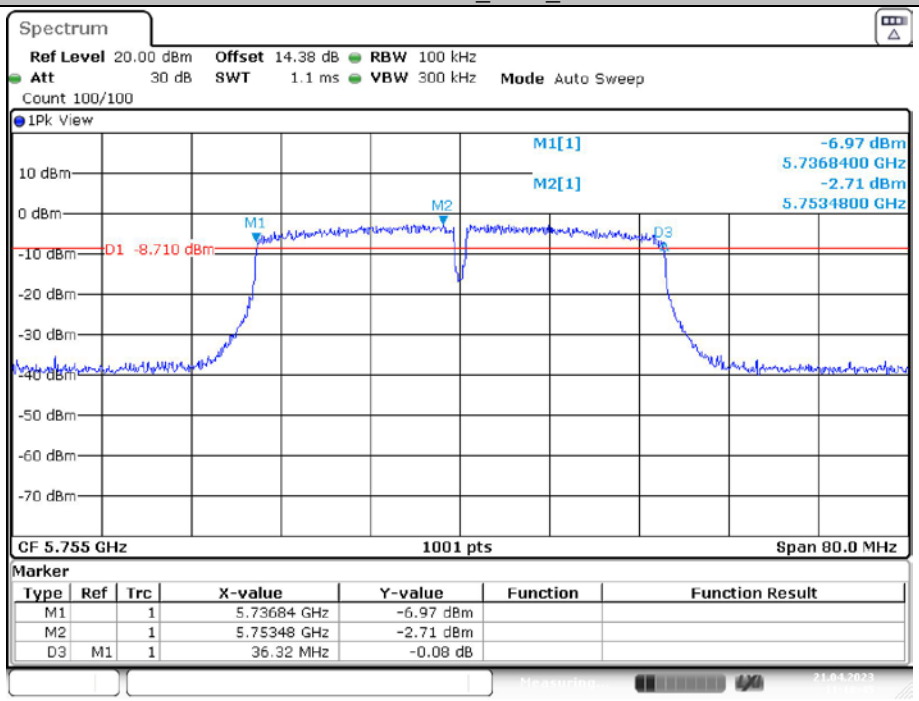
Date: 21.APR.2023 13:55:59

11AC20MIMO_Ant4_5825



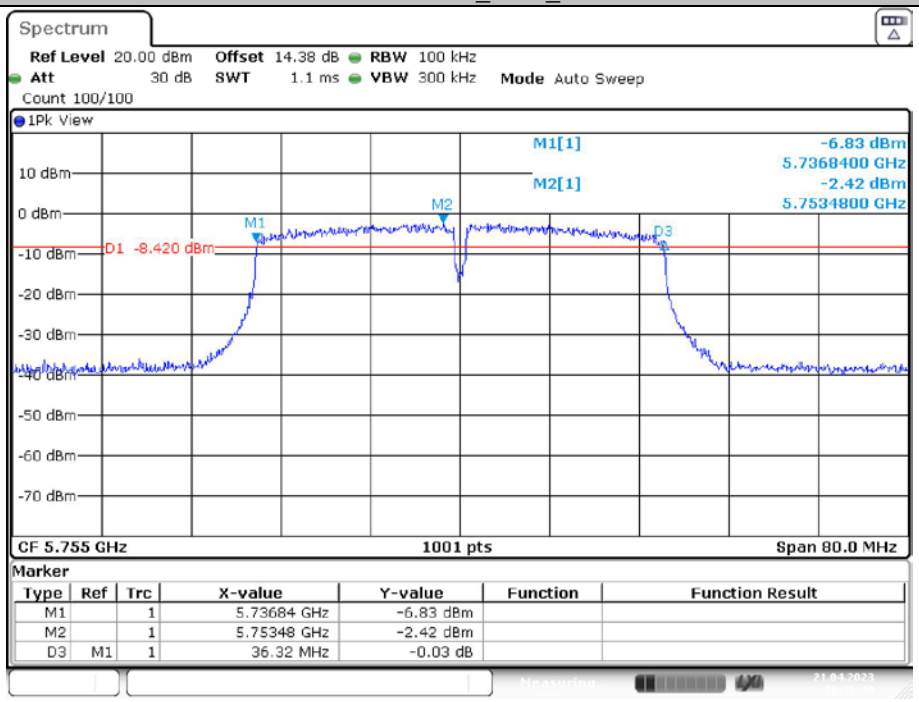
Date: 21.APR.2023 15:17:18

11AC40MIMO_Ant1_5755



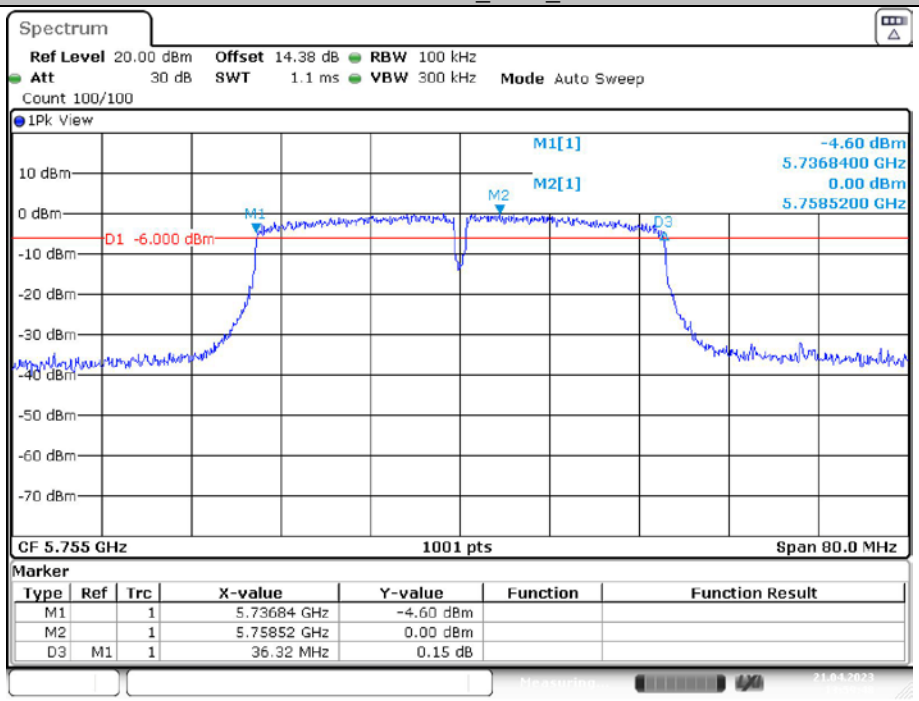
Date: 21.APR.2023 11:18:45

11AC40MIMO_Ant2_5755



Date: 21.APR.2023 16:36:49

11AC40MIMO_Ant3_5755



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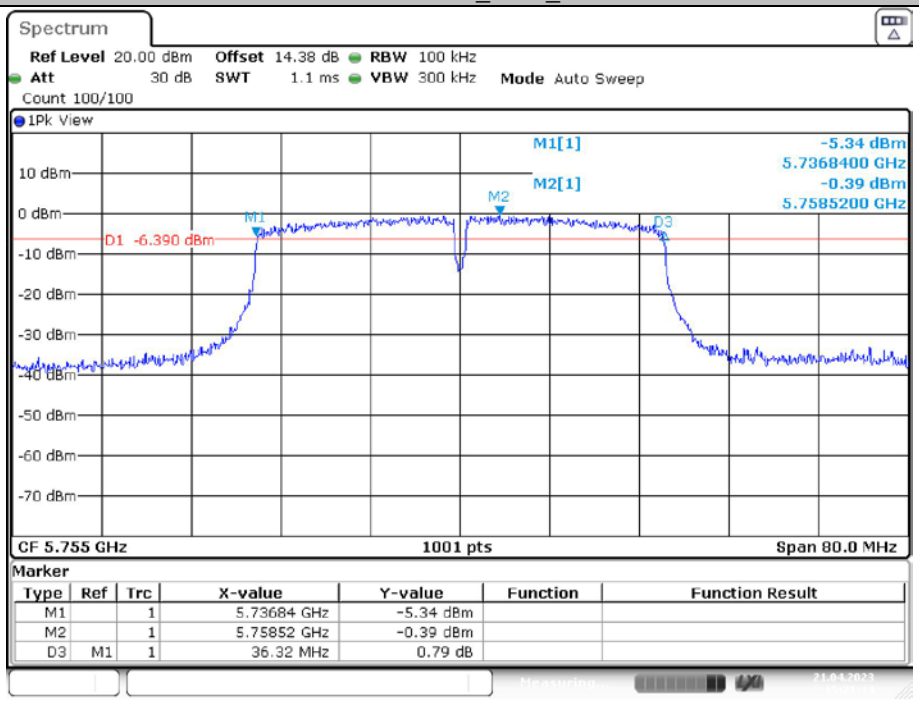
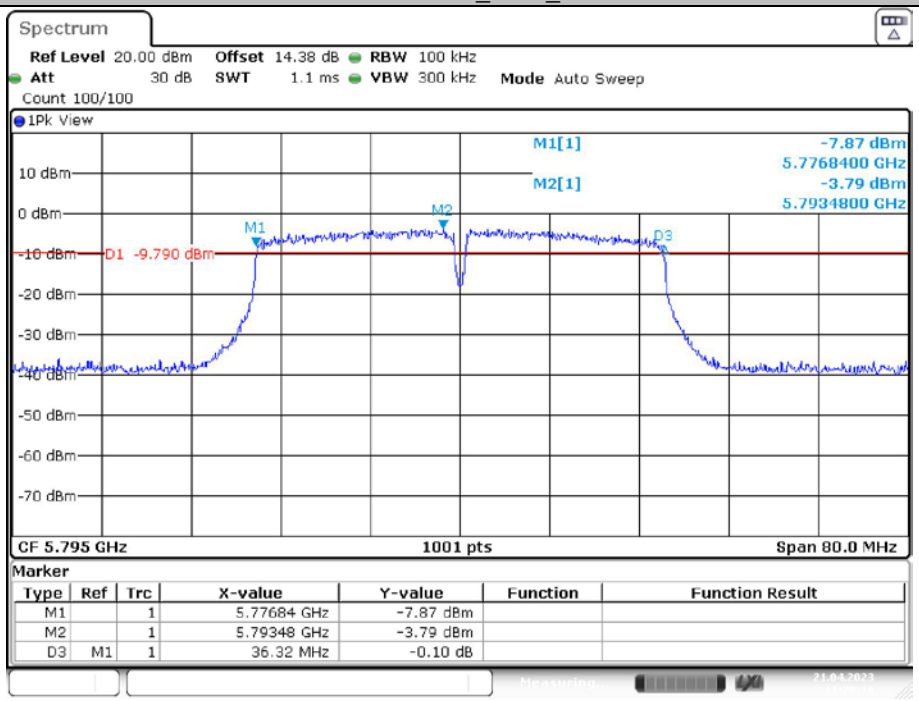
11AC40MIMO_Ant4_5755



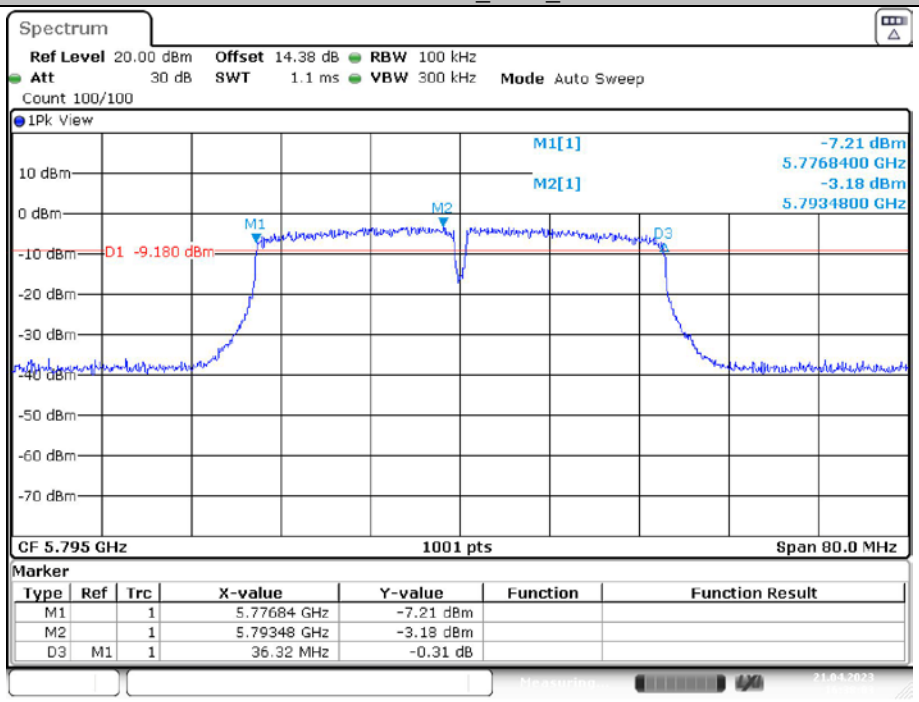
Date: 21.APR.2023 15:21:15

11AC40MIMO_Ant1_5795



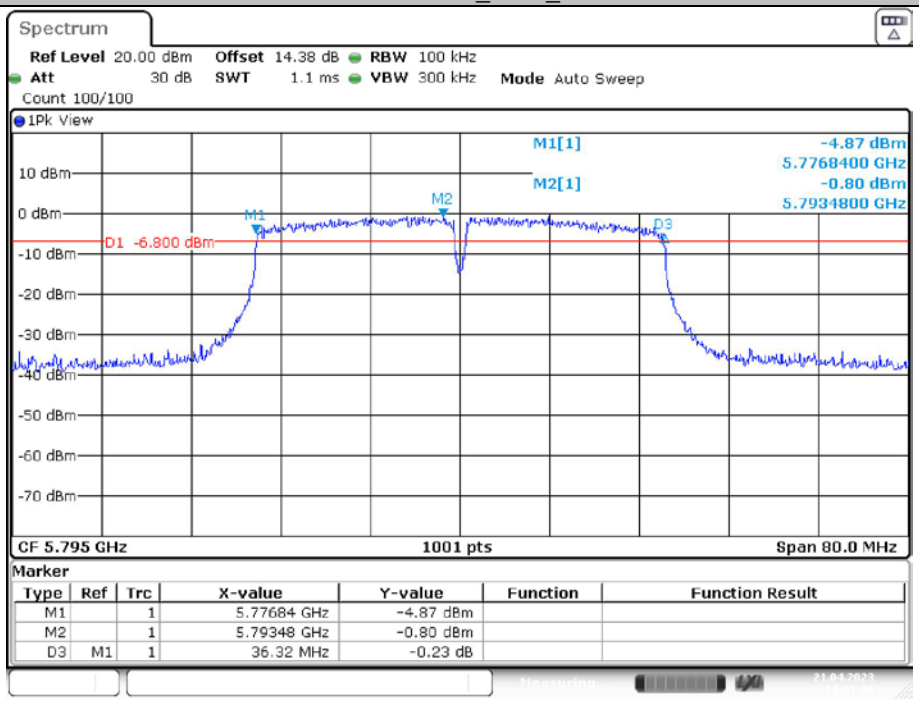
Date: 21.APR.2023 11:20:19

11AC40MIMO_Ant2_5795



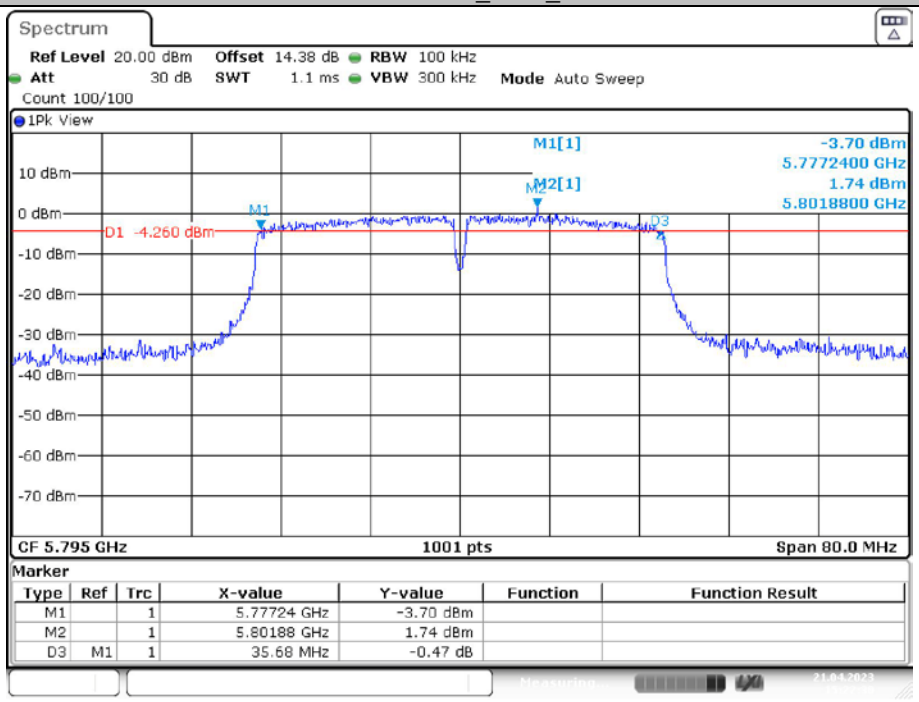
Date: 21.APR.2023 16:38:04

11AC40MIMO_Ant3_5795



Date: 21.APR.2023 14:01:07

11AC40MIMO_Ant4_5795



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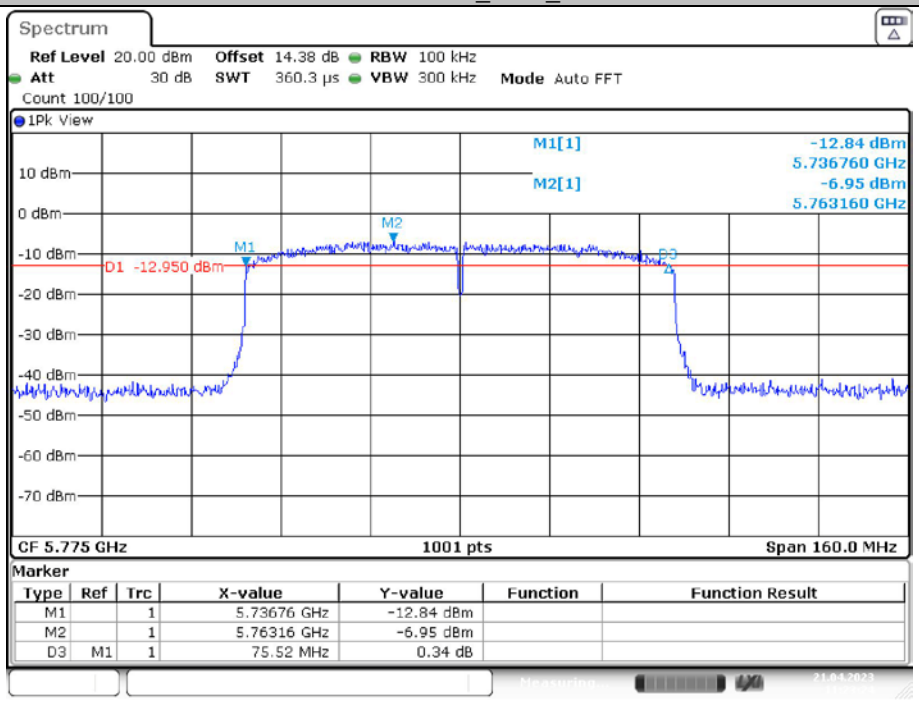
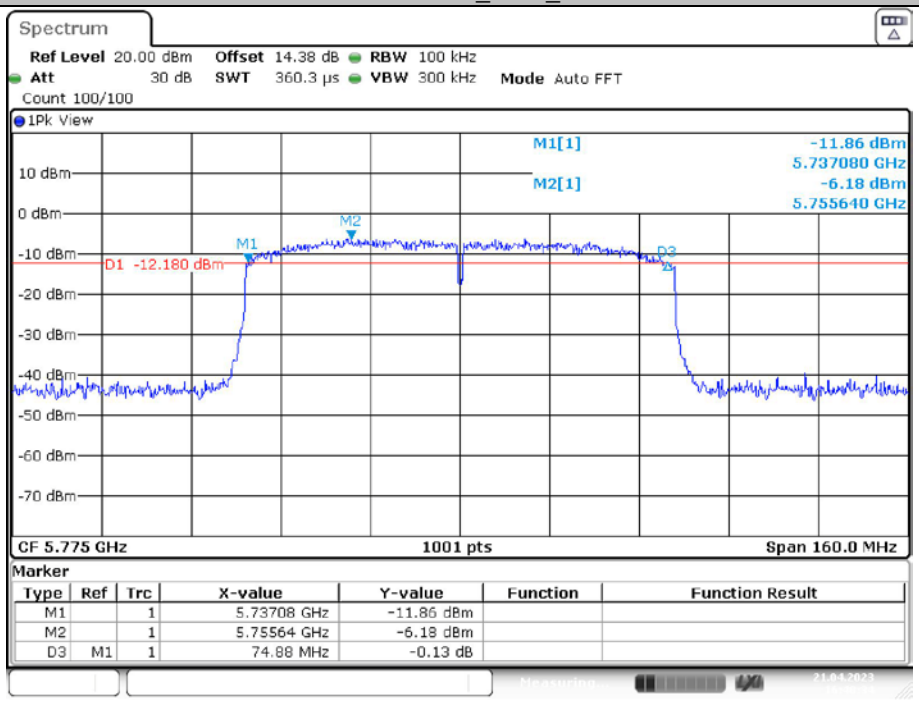
11AC80MIMO_Ant1_5775



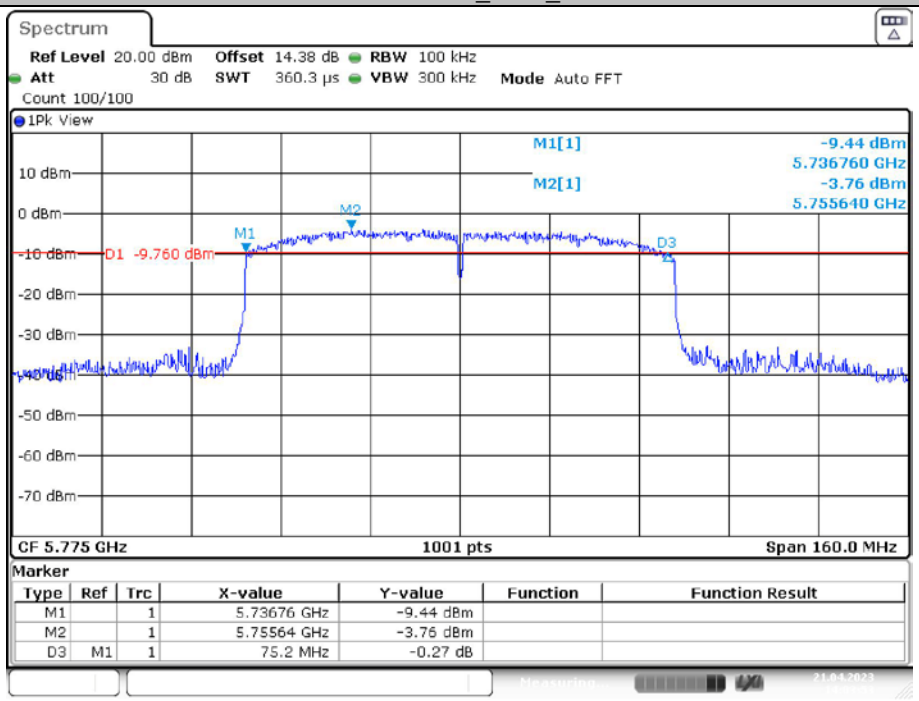
Date: 21.APR.2023 11:23:25

11AC80MIMO_Ant2_5775



Date: 21.APR.2023 16:40:34

11AC80MIMO_Ant3_5775



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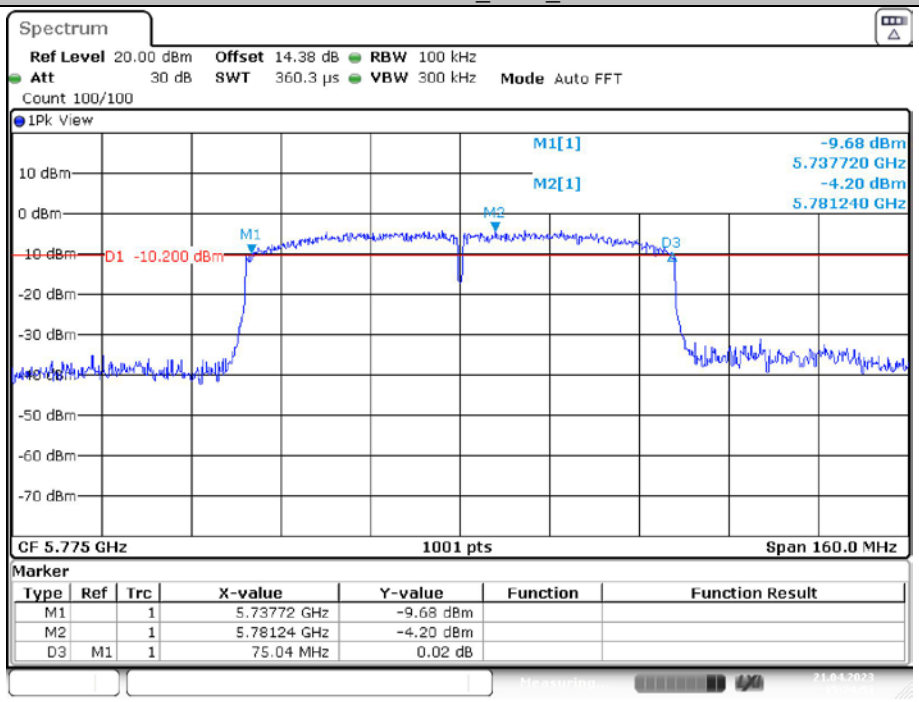
11AC80MIMO_Ant4_5775



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Appendix B: Maximum conducted Average output power

5150-5250 MHz

Test Mode	Channel	Antenna	Result[dBm]	Limit[MHz]	Verdict
11A MIMO	5180	Ant1	11.24	<=30	PASS
		Ant2	11.49	<=30	PASS
		Ant3	14.62	<=30	PASS
		Ant4	15.53	<=30	PASS
		Total	19.64	<=30	PASS
	5200	Ant1	12.02	<=30	PASS
		Ant2	11.69	<=30	PASS
		Ant3	14.14	<=30	PASS
		Ant4	14.81	<=30	PASS
		Total	19.39	<=30	PASS
	5240	Ant1	12.64	<=30	PASS
		Ant2	12.08	<=30	PASS
		Ant3	14.87	<=30	PASS
		Ant4	15.01	<=30	PASS
		Total	**19.86**	<=30	PASS
11N20MIMO	5180	Ant1	11.29	<=30	PASS
		Ant2	11.99	<=30	PASS
		Ant3	14.48	<=30	PASS
		Ant4	14.47	<=30	PASS
		Total	19.31	<=30	PASS
	5200	Ant1	11.44	<=30	PASS
		Ant2	11.56	<=30	PASS
		Ant3	13.95	<=30	PASS
		Ant4	14.53	<=30	PASS
		Total	19.11	<=30	PASS
	5240	Ant1	12.47	<=30	PASS
		Ant2	12.58	<=30	PASS
		Ant3	14.83	<=30	PASS
		Ant4	14.78	<=30	PASS
		Total	**19.83**	<=30	PASS

Test Mode	Channel	Antenna	Result[dBm]	Limit[MHz]	Verdict
11N40MIMO	5190	Ant1	11.63	<=30	PASS
		Ant2	11.96	<=30	PASS
		Ant3	14.40	<=30	PASS
		Ant4	15.07	<=30	PASS
		Total	19.54	<=30	PASS
	5230	Ant1	12.29	<=30	PASS
		Ant2	12.43	<=30	PASS
		Ant3	14.84	<=30	PASS
		Ant4	14.60	<=30	PASS
		Total	**19.72**	<=30	PASS
11AC20MIMO	5180	Ant1	11.80	<=30	PASS
		Ant2	11.37	<=30	PASS
		Ant3	14.64	<=30	PASS
		Ant4	15.28	<=30	PASS
		Total	19.62	<=30	PASS
	5200	Ant1	12.21	<=30	PASS
		Ant2	11.52	<=30	PASS
		Ant3	14.59	<=30	PASS
		Ant4	14.59	<=30	PASS
		Total	19.46	<=30	PASS
	5240	Ant1	12.46	<=30	PASS
		Ant2	12.61	<=30	PASS
		Ant3	14.65	<=30	PASS
		Ant4	14.66	<=30	PASS
		Total	**19.74**	<=30	PASS
11AC40MIMO	5190	Ant1	11.93	<=30	PASS
		Ant2	11.31	<=30	PASS
		Ant3	14.39	<=30	PASS
		Ant4	15.08	<=30	PASS
		Total	19.48	<=30	PASS
	5230	Ant1	12.54	<=30	PASS
		Ant2	11.78	<=30	PASS
		Ant3	14.84	<=30	PASS
		Ant4	14.58	<=30	PASS
		Total	**19.65**	<=30	PASS

Test Mode	Channel	Antenna	Result[dBm]	Limit[MHz]	Verdict
11AC80MIMO	5210	Ant1	12.27	<=30	PASS
		Ant2	11.70	<=30	PASS
		Ant3	14.60	<=30	PASS
		Ant4	14.54	<=30	PASS
		Total	**19.49**	<=30	PASS

Note 1: The device is an indoor access point.
Note 2: The maximum antenna gain is 5.31 dBi.

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 = 0dB (i.e., no array gain) For $N_{ANT} \leqslant 4$;

So: Directional gain=5.31dBi <6dBi

5725-5850 MHz

Test Mode	Channel	Antenna	Result[dBm]	Limit[MHz]	Verdict
11A MIMO	5745	Ant1	14.02	<=30	PASS
		Ant2	14.91	<=30	PASS
		Ant3	17.08	<=30	PASS
		Ant4	16.93	<=30	PASS
		Total	**21.95**	<=30	PASS
	5785	Ant1	13.61	<=30	PASS
		Ant2	14.32	<=30	PASS
		Ant3	16.10	<=30	PASS
		Ant4	16.62	<=30	PASS
		Total	21.05	<=30	PASS
	5825	Ant1	13.06	<=30	PASS
		Ant2	13.21	<=30	PASS
		Ant3	15.39	<=30	PASS
		Ant4	16.16	<=30	PASS
		Total	20.68	<=30	PASS
11N20MIMO	5745	Ant1	14.56	<=30	PASS
		Ant2	14.92	<=30	PASS
		Ant3	17.18	<=30	PASS
		Ant4	16.82	<=30	PASS
		Total	**22.04**	<=30	PASS
	5785	Ant1	13.63	<=30	PASS
		Ant2	14.24	<=30	PASS
		Ant3	16.70	<=30	PASS
		Ant4	16.52	<=30	PASS
		Total	21.50	<=30	PASS
	5825	Ant1	13.18	<=30	PASS
		Ant2	13.14	<=30	PASS
		Ant3	15.43	<=30	PASS
		Ant4	16.03	<=30	PASS
		Total	20.66	<=30	PASS

Test Mode	Channel	Antenna	Result[dBm]	Limit[MHz]	Verdict
11N40MIMO	5755	Ant1	14.42	<=30	PASS
		Ant2	14.59	<=30	PASS
		Ant3	16.99	<=30	PASS
		Ant4	16.57	<=30	PASS
		Total	**21.81**	<=30	PASS
	5795	Ant1	13.41	<=30	PASS
		Ant2	14.02	<=30	PASS
		Ant3	15.87	<=30	PASS
		Ant4	16.83	<=30	PASS
		Total	21.27	<=30	PASS
11AC20MIMO	5745	Ant1	14.00	<=30	PASS
		Ant2	14.87	<=30	PASS
		Ant3	16.58	<=30	PASS
		Ant4	16.84	<=30	PASS
		Total	**21.75**	<=30	PASS
	5785	Ant1	13.70	<=30	PASS
		Ant2	14.31	<=30	PASS
		Ant3	16.10	<=30	PASS
		Ant4	16.51	<=30	PASS
		Total	21.33	<=30	PASS
	5825	Ant1	13.25	<=30	PASS
		Ant2	13.13	<=30	PASS
		Ant3	15.34	<=30	PASS
		Ant4	16.08	<=30	PASS
		Total	20.66	<=30	PASS
11AC40MIMO	5755	Ant1	14.46	<=30	PASS
		Ant2	14.62	<=30	PASS
		Ant3	16.99	<=30	PASS
		Ant4	16.59	<=30	PASS
		Total	**21.82**	<=30	PASS
	5795	Ant1	13.35	<=30	PASS
		Ant2	13.99	<=30	PASS
		Ant3	16.40	<=30	PASS
		Ant4	16.85	<=30	PASS
		Total	21.42	<=30	PASS

Test Mode	Channel	Antenna	Result[dBm]	Limit[MHz]	Verdict
11AC80MIMO	5775	Ant1	13.52	<=30	PASS
		Ant2	14.28	<=30	PASS
		Ant3	16.54	<=30	PASS
		Ant4	16.35	<=30	PASS
		Total	**21.38**	<=30	PASS

Note: The maximum antenna gain is 5.25 dBi.

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 = 0dB (i.e., no array gain) For $N_{ANT} \leqslant 4$;

So: Directional gain=5.25dBi <6dBi

Appendix C: Maximum power spectral density

5150-5250 MHz:

Test Mode	Channel	Antenna	Result[dBm/MHz]	Limit[dBm/MHz]	Verdict
11A MIMO	5180	Ant1	0.25	<=11.67	PASS
		Ant2	0.76	<=11.67	PASS
		Ant3	3.74	<=11.67	PASS
		Ant4	4.63	<=11.67	PASS
		Total	**8.76**	<=11.67	PASS
	5200	Ant1	1.00	<=11.67	PASS
		Ant2	0.69	<=11.67	PASS
		Ant3	3.40	<=11.67	PASS
		Ant4	3.92	<=11.67	PASS
		Total	**8.50**	<=11.67	PASS
	5240	Ant1	1.78	<=11.67	PASS
		Ant2	1.26	<=11.67	PASS
		Ant3	4.09	<=11.67	PASS
		Ant4	4.08	<=11.67	PASS
		Total	**9.01**	<=11.67	PASS
11N20MIMO	5180	Ant1	-0.10	<=11.67	PASS
		Ant2	0.71	<=11.67	PASS
		Ant3	3.21	<=11.67	PASS
		Ant4	3.22	<=11.67	PASS
		Total	**8.03**	<=11.67	PASS
	5200	Ant1	0.18	<=11.67	PASS
		Ant2	0.46	<=11.67	PASS
		Ant3	2.72	<=11.67	PASS
		Ant4	3.33	<=11.67	PASS
		Total	**7.91**	<=11.67	PASS
	5240	Ant1	1.31	<=11.67	PASS
		Ant2	1.33	<=11.67	PASS
		Ant3	3.65	<=11.67	PASS
		Ant4	3.57	<=11.67	PASS
		Total	**8.63**	<=11.67	PASS

Test Mode	Channel	Antenna	Result[dBm/MHz]	Limit[dBm/MHz]	Verdict
11N40MIMO	5190	Ant1	-2.60	<=11.67	PASS
		Ant2	-2.30	<=11.67	PASS
		Ant3	0.14	<=11.67	PASS
		Ant4	0.90	<=11.67	PASS
		Total	**5.32**	<=11.67	PASS
	5230	Ant1	-1.87	<=11.67	PASS
		Ant2	-1.80	<=11.67	PASS
		Ant3	0.63	<=11.67	PASS
		Ant4	0.40	<=11.67	PASS
		Total	**5.52**	<=11.67	PASS
11AC20MIMO	5180	Ant1	0.47	<=11.67	PASS
		Ant2	0.08	<=11.67	PASS
		Ant3	3.39	<=11.67	PASS
		Ant4	3.96	<=11.67	PASS
		Total	**8.33**	<=11.67	PASS
	5200	Ant1	0.94	<=11.67	PASS
		Ant2	0.38	<=11.67	PASS
		Ant3	3.35	<=11.67	PASS
		Ant4	3.29	<=11.67	PASS
		Total	**8.21**	<=11.67	PASS
	5240	Ant1	1.22	<=11.67	PASS
		Ant2	1.55	<=11.67	PASS
		Ant3	3.37	<=11.67	PASS
		Ant4	3.31	<=11.67	PASS
		Total	**8.49**	<=11.67	PASS
11AC40MIMO	5190	Ant1	-2.27	<=11.67	PASS
		Ant2	-2.89	<=11.67	PASS
		Ant3	0.22	<=11.67	PASS
		Ant4	0.83	<=11.67	PASS
		Total	**5.28**	<=11.67	PASS
	5230	Ant1	-1.77	<=11.67	PASS
		Ant2	-2.42	<=11.67	PASS
		Ant3	0.65	<=11.67	PASS
		Ant4	0.39	<=11.67	PASS
		Total	**5.43**	<=11.67	PASS

Test Mode	Channel	Antenna	Result[dBm/MHz]	Limit[dBm/MHz]	Verdict
11AC80MIMO	5210	Ant1	-5.03	<=11.67	PASS
		Ant2	-5.69	<=11.67	PASS
		Ant3	-2.70	<=11.67	PASS
		Ant4	-2.84	<=11.67	PASS
		Total	**2.15**	<=11.67	PASS

Note: The maximum antenna gain is 5.31 dBi.

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

Array Gain = 10 log(N_{ANT}/N_{ss})dB

So:
Directional gain=G_{ANT} + Array Gain =5.31+10*log(4/1)=11.33dBi>6 dBi
The limit should be reduce (11.33-6)dB=5.33dB

5725-5850 MHz:

Test Mode	Channel	Antenna	Result[dBm/500kHz]	Limit[dBm/500kHz]	Verdict
11A MIMO	5745	Ant1	-0.07	<=24.73	PASS
		Ant2	1.12	<=24.73	PASS
		Ant3	3.23	<=24.73	PASS
		Ant4	3.00	<=24.73	PASS
		Total	**8.05**	<=24.73	PASS
	5785	Ant1	-0.49	<=24.73	PASS
		Ant2	0.42	<=24.73	PASS
		Ant3	2.48	<=24.73	PASS
		Ant4	2.77	<=24.73	PASS
		Total	**7.53**	<=24.73	PASS
	5825	Ant1	-0.88	<=24.73	PASS
		Ant2	-0.68	<=24.73	PASS
		Ant3	1.50	<=24.73	PASS
		Ant4	2.24	<=24.73	PASS
		Total	**6.78**	<=24.73	PASS
11N20MIMO	5745	Ant1	0.70	<=24.73	PASS
		Ant2	0.81	<=24.73	PASS
		Ant3	3.03	<=24.73	PASS
		Ant4	2.74	<=24.73	PASS
		Total	**7.97**	<=24.73	PASS
	5785	Ant1	-0.53	<=24.73	PASS
		Ant2	0.18	<=24.73	PASS
		Ant3	2.55	<=24.73	PASS
		Ant4	2.45	<=24.73	PASS
		Total	**7.39**	<=24.73	PASS
	5825	Ant1	-0.92	<=24.73	PASS
		Ant2	-0.94	<=24.73	PASS
		Ant3	1.30	<=24.73	PASS
		Ant4	1.93	<=24.73	PASS
		Total	**6.55**	<=24.73	PASS

Test Mode	Channel	Antenna	Result[dBm/500kHz]	Limit[dBm/500kHz]	Verdict
11N40MIMO	5755	Ant1	-2.73	<=24.73	PASS
		Ant2	-2.57	<=24.73	PASS
		Ant3	-0.08	<=24.73	PASS
		Ant4	-0.47	<=24.73	PASS
		Total	**4.72**	<=24.73	PASS
	5795	Ant1	-3.85	<=24.73	PASS
		Ant2	-3.18	<=24.73	PASS
		Ant3	-1.34	<=24.73	PASS
		Ant4	-0.37	<=24.73	PASS
		Total	**4.06**	<=24.73	PASS
11AC20MIMO	5745	Ant1	0.01	<=24.73	PASS
		Ant2	0.68	<=24.73	PASS
		Ant3	2.69	<=24.73	PASS
		Ant4	2.73	<=24.73	PASS
		Total	**7.71**	<=24.73	PASS
	5785	Ant1	-0.22	<=24.73	PASS
		Ant2	0.25	<=24.73	PASS
		Ant3	2.02	<=24.73	PASS
		Ant4	2.53	<=24.73	PASS
		Total	**7.32**	<=24.73	PASS
	5825	Ant1	-0.67	<=24.73	PASS
		Ant2	-0.88	<=24.73	PASS
		Ant3	1.29	<=24.73	PASS
		Ant4	2.07	<=24.73	PASS
		Total	**6.66**	<=24.73	PASS
11AC40MIMO	5755	Ant1	-2.70	<=24.73	PASS
		Ant2	-2.53	<=24.73	PASS
		Ant3	-0.07	<=24.73	PASS
		Ant4	-0.53	<=24.73	PASS
		Total	**4.72**	<=24.73	PASS
	5795	Ant1	-3.91	<=24.73	PASS
		Ant2	-3.20	<=24.73	PASS
		Ant3	-0.83	<=24.73	PASS
		Ant4	-0.12	<=24.73	PASS
		Total	**4.29**	<=24.73	PASS

Test Mode	Channel	Antenna	Result[dBm/500kHz]	Limit[dBm/500kHz]	Verdict
11AC80MIMO	5775	Ant1	-6.55	<=24.73	PASS
		Ant2	-5.91	<=24.73	PASS
		Ant3	-3.52	<=24.73	PASS
		Ant4	-3.98	<=24.73	PASS
		Total	**1.21**	<=24.73	PASS

Note: The maximum antenna gain is 5.25 dBi.

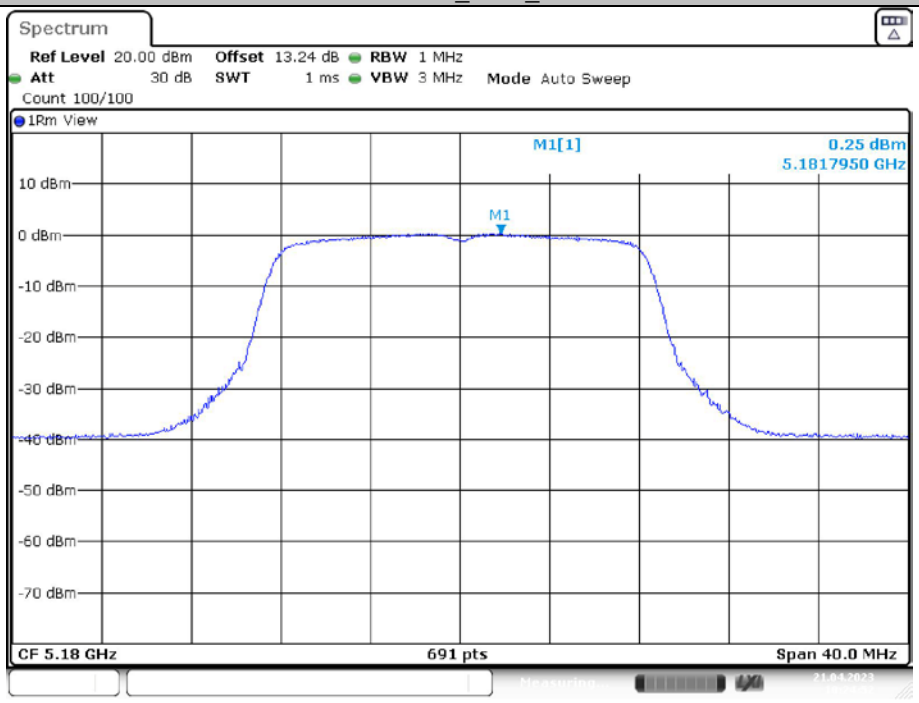
The device employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power spectral density (PSD) measurements on the devices

Array Gain = 10 log(N_{ANT}/N_{ss})dB

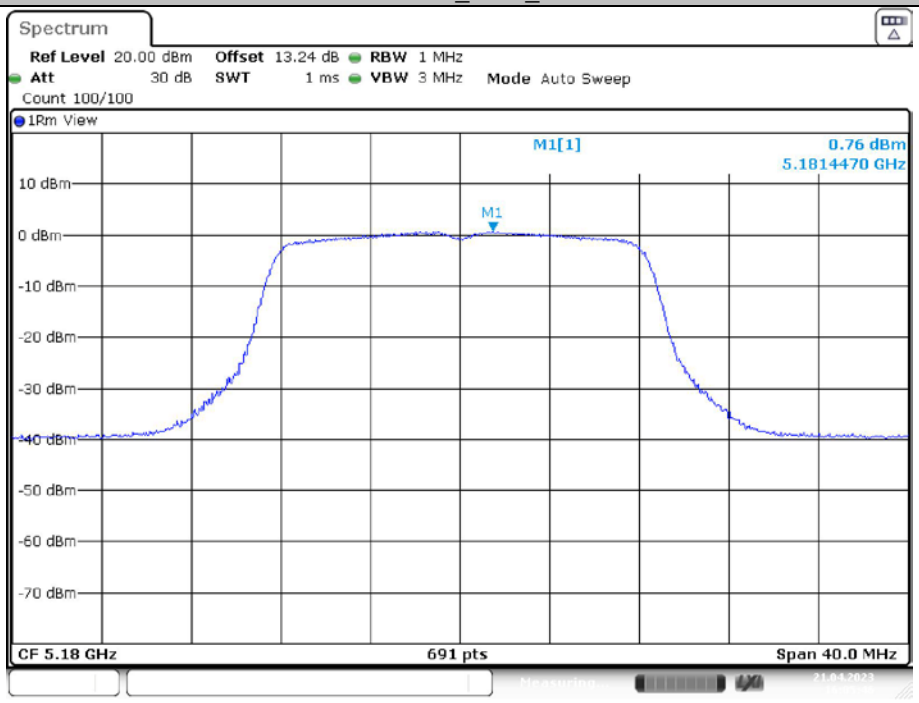
So:
Directional gain=G_{ANT} + Array Gain =5.25+10*log(4/1)=11.27dBi>6 dBi
The limit should be reduce (11.27-6)dB=5.27dB

Test Graphs

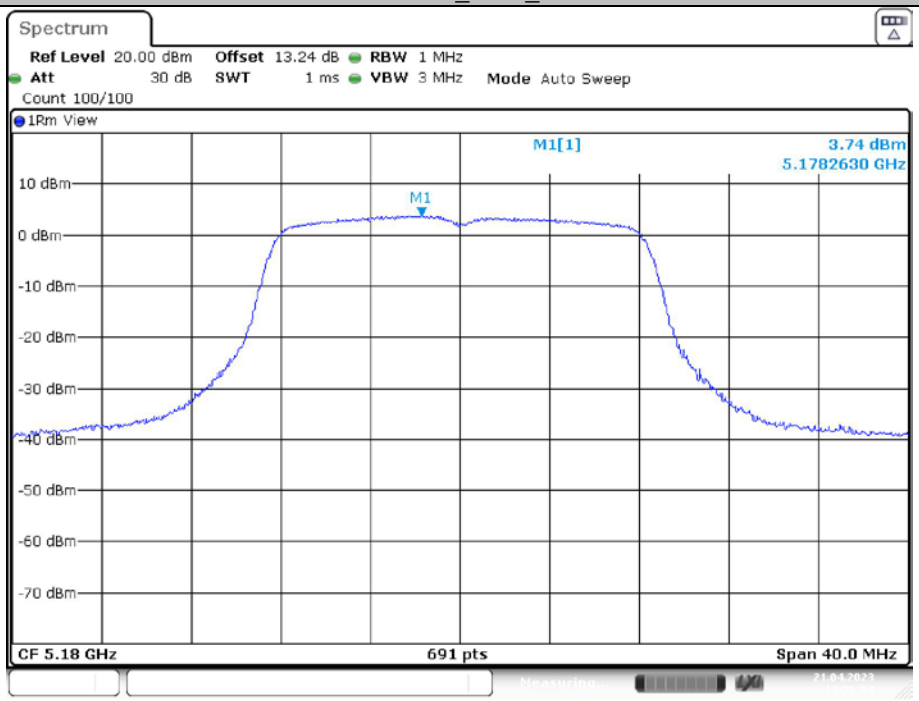
11A MIMO_Ant1_5180



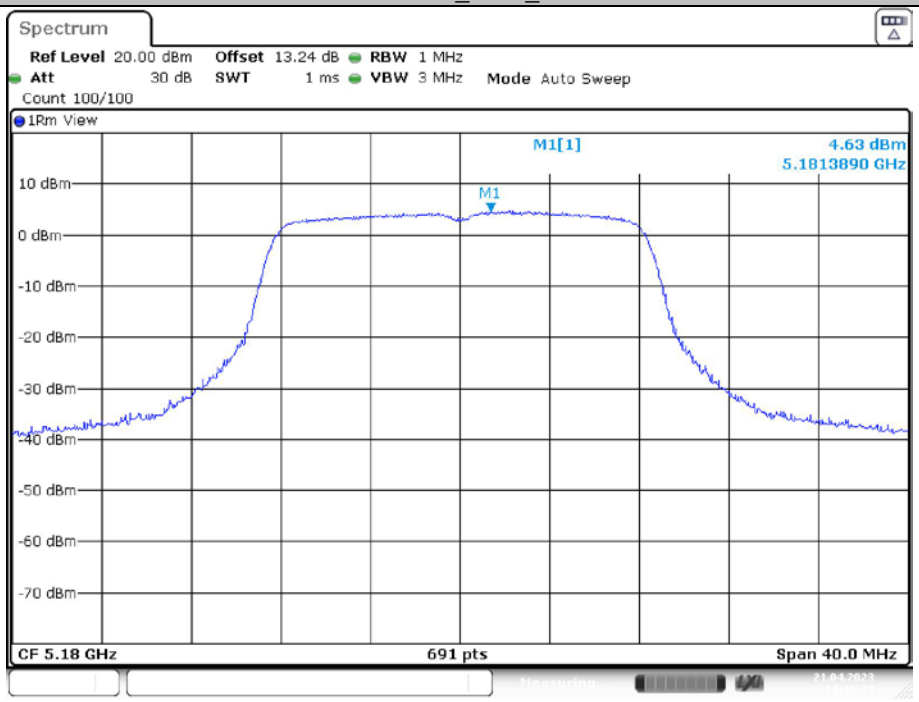
11A MIMO_Ant2_5180



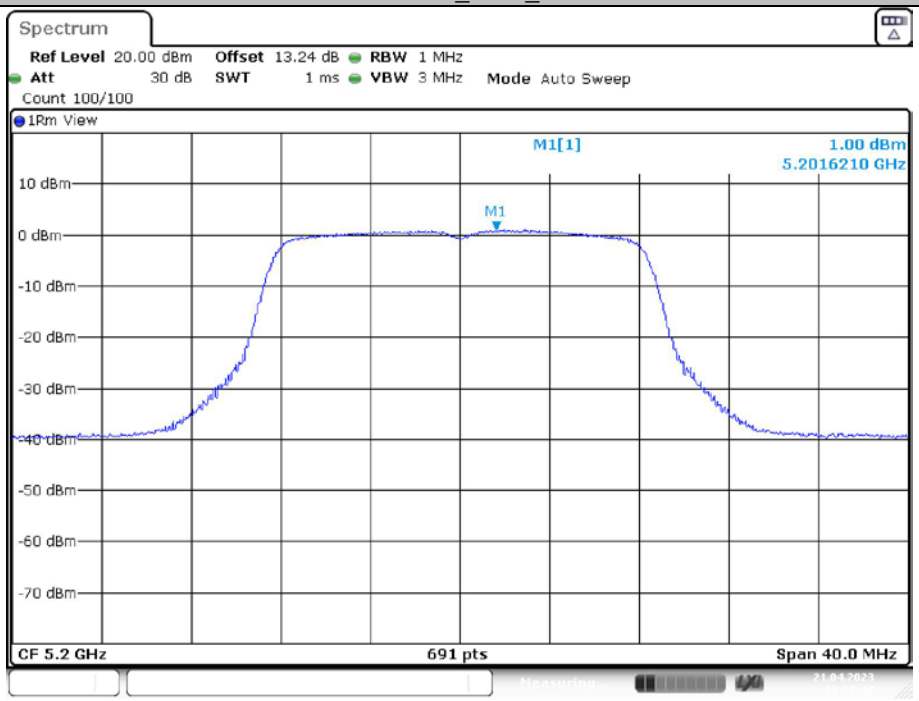
11A MIMO_Ant3_5180



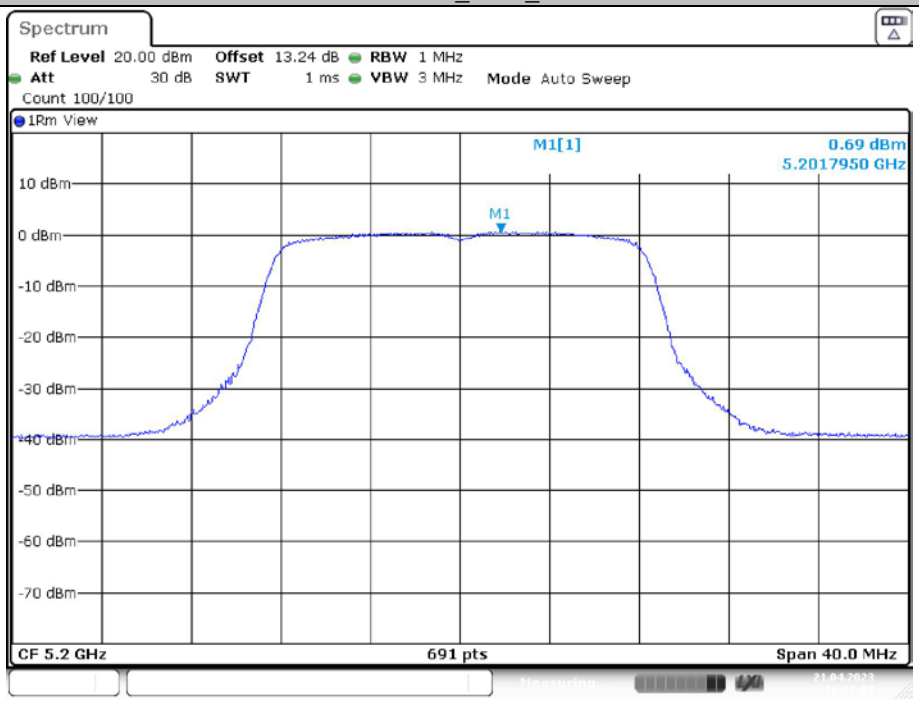
11A MIMO_Ant4_5180



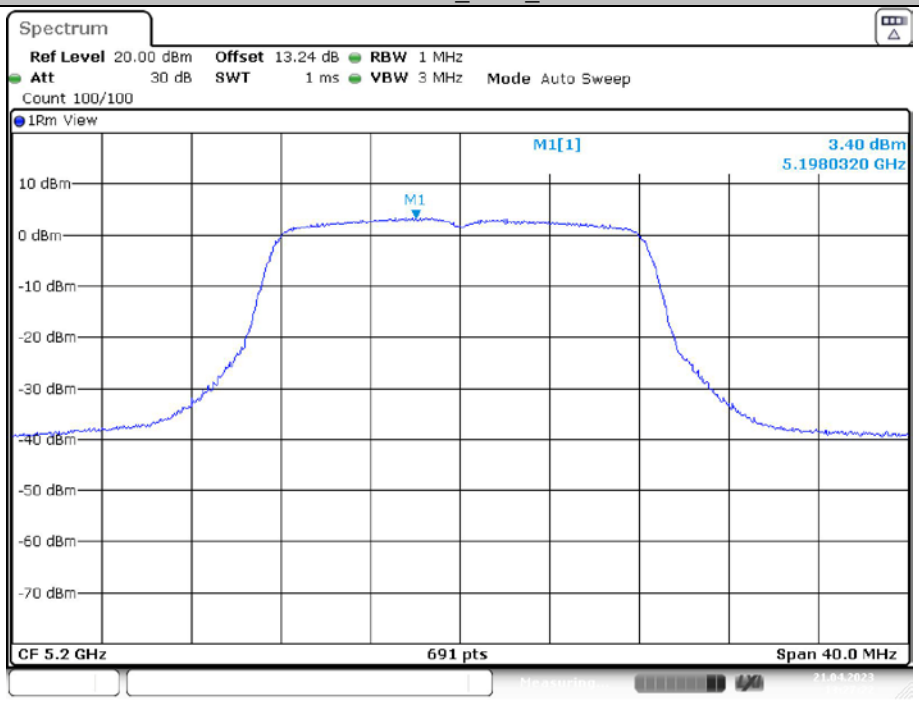
11A MIMO_Ant1_5200



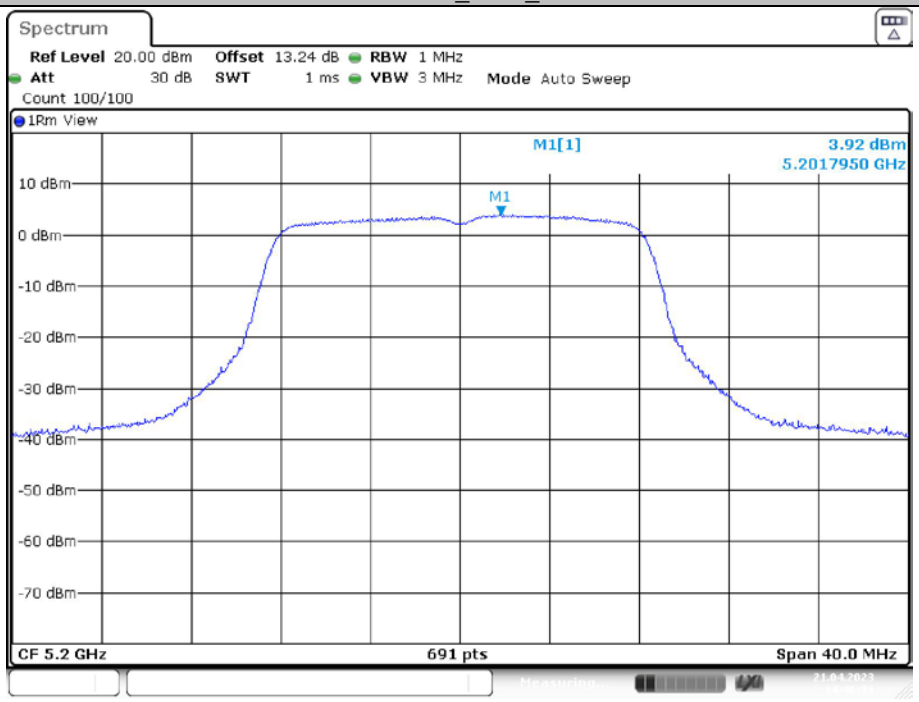
11A MIMO_Ant2_5200



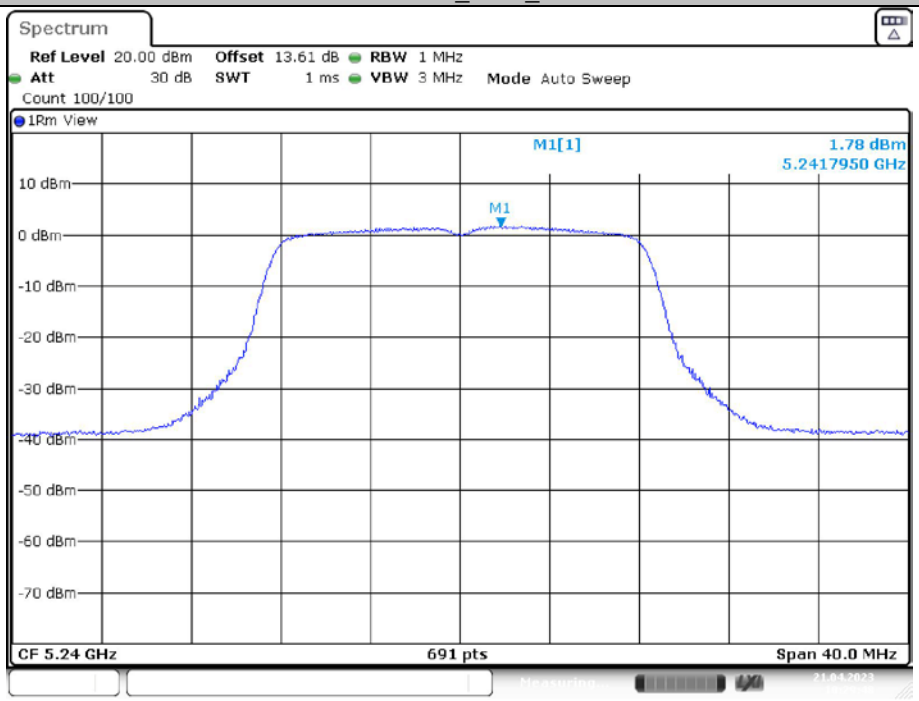
11A MIMO_Ant3_5200



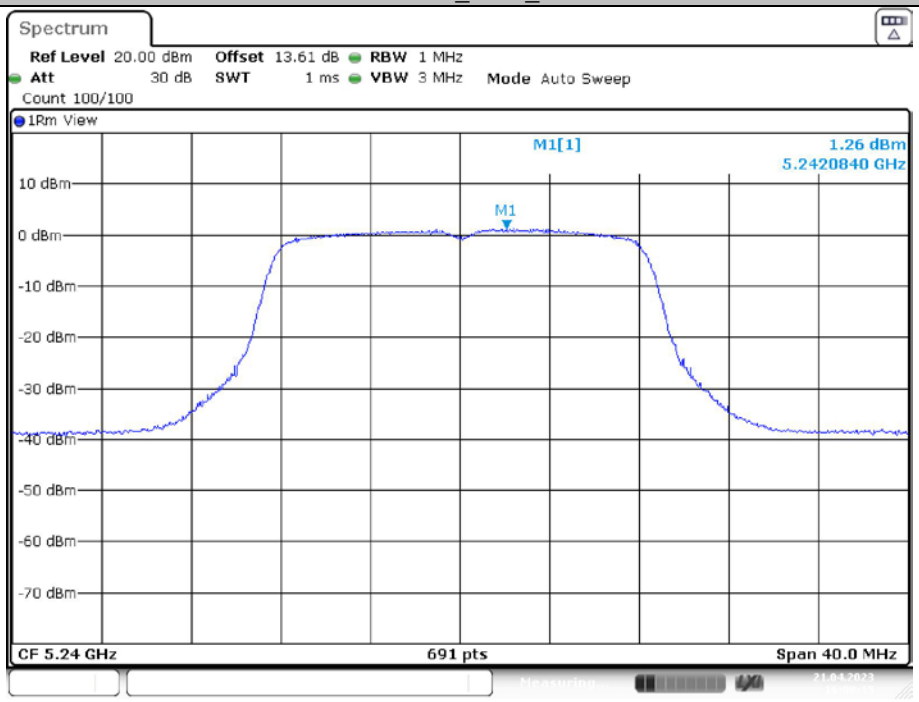
11A MIMO_Ant4_5200



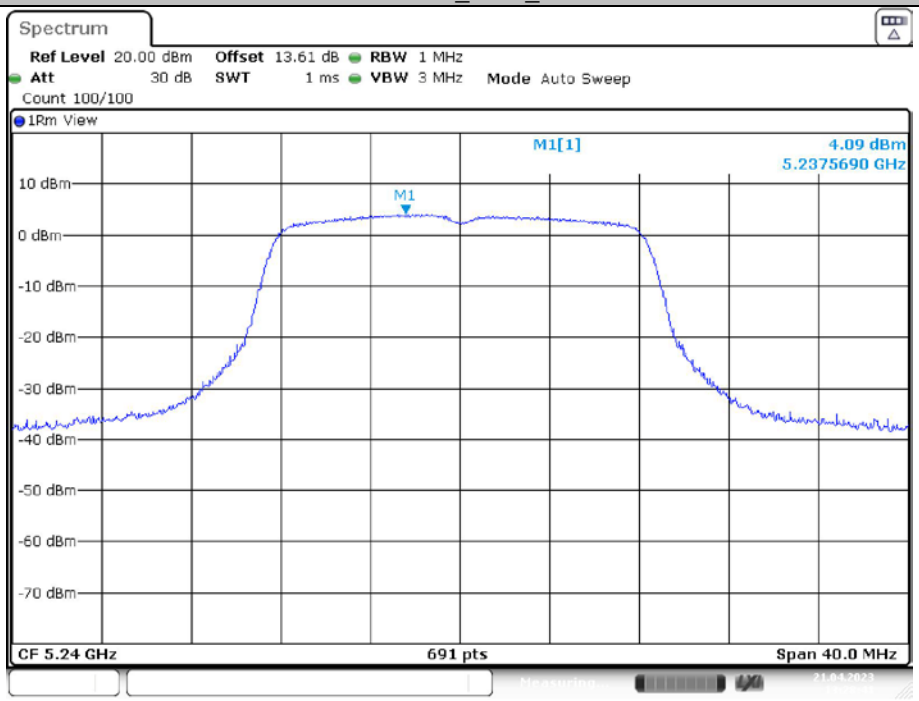
11A MIMO_Ant1_5240



11A MIMO_Ant2_5240



11A MIMO_Ant3_5240



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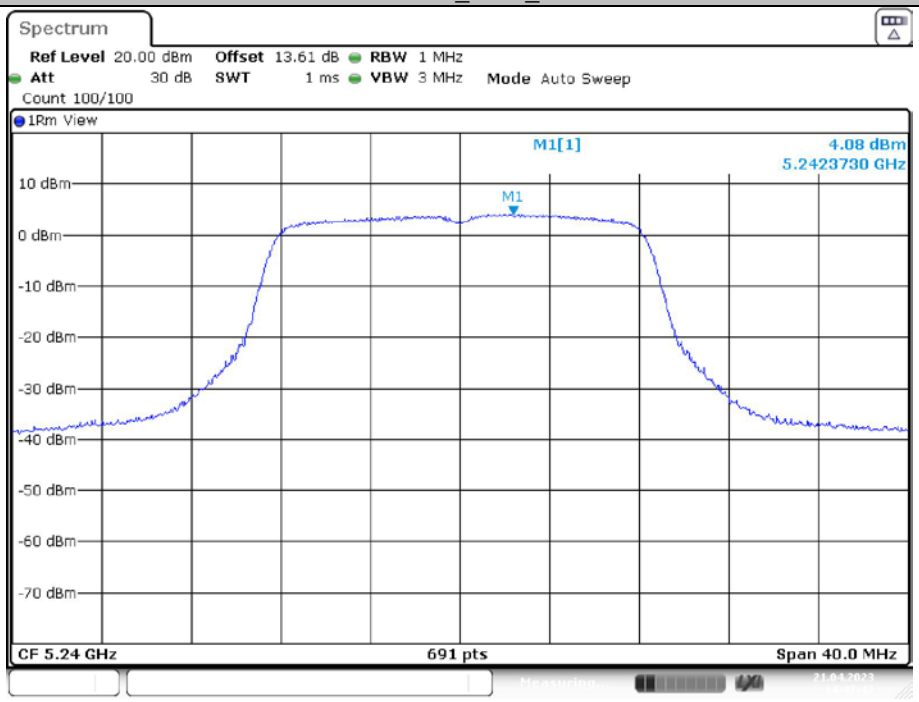
11A MIMO_Ant4_5240



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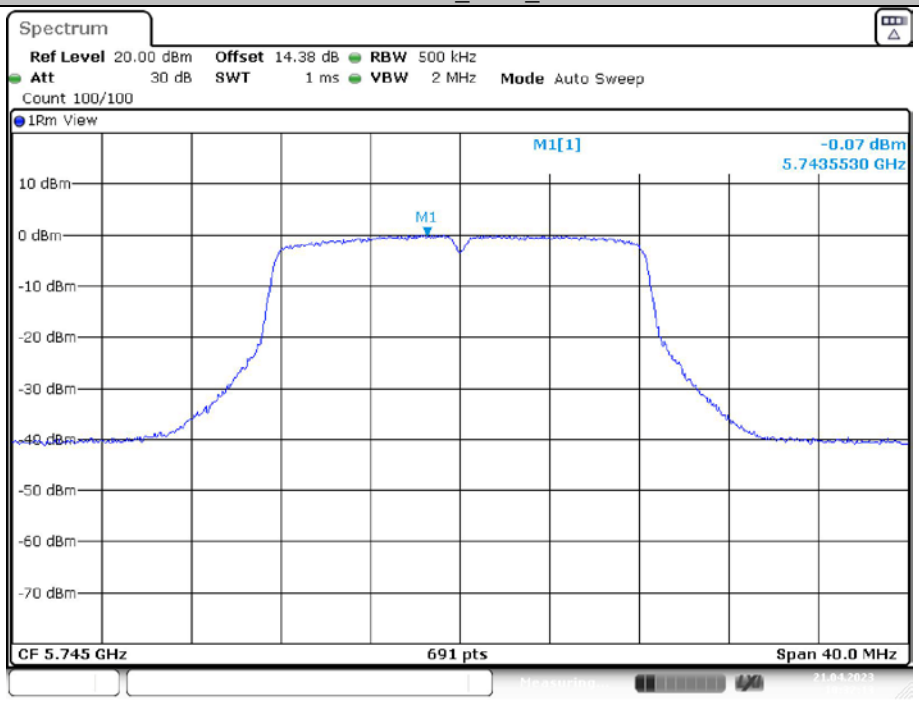
11A MIMO_Ant1_5745



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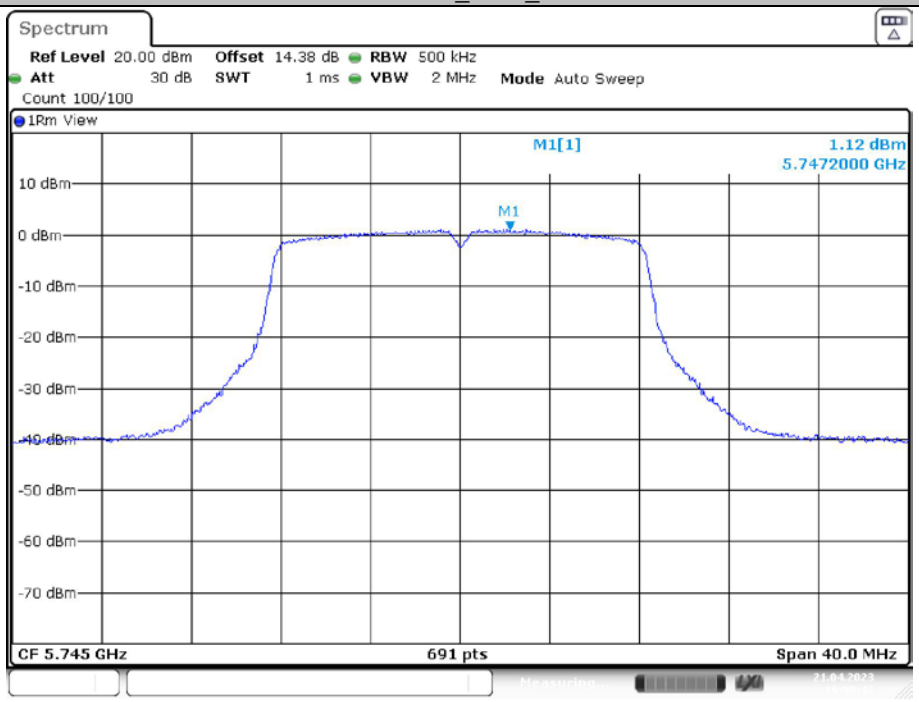
11A MIMO_Ant2_5745



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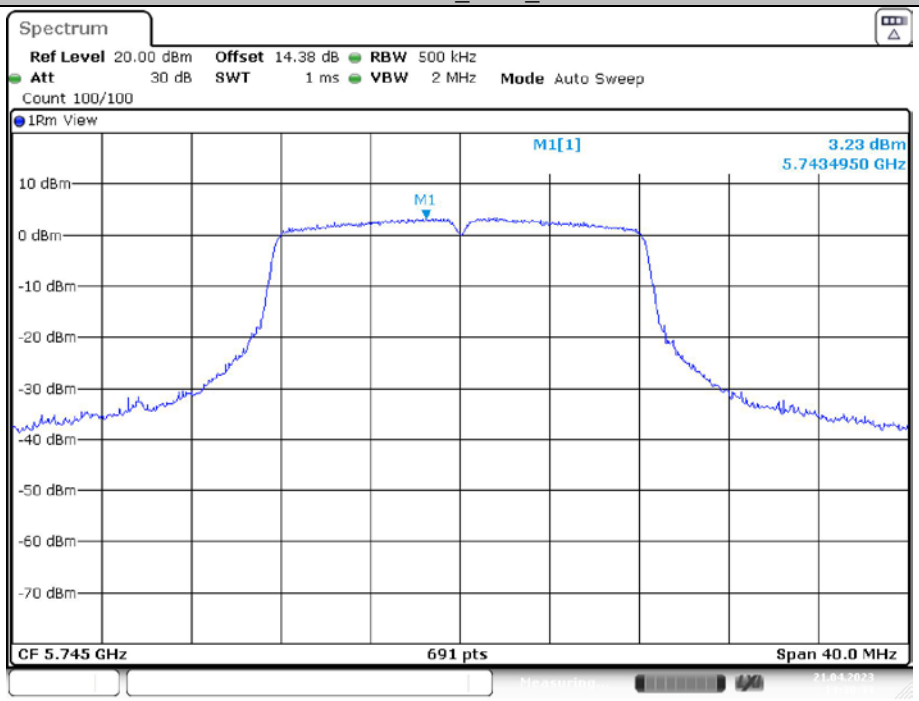
11A MIMO_Ant3_5745



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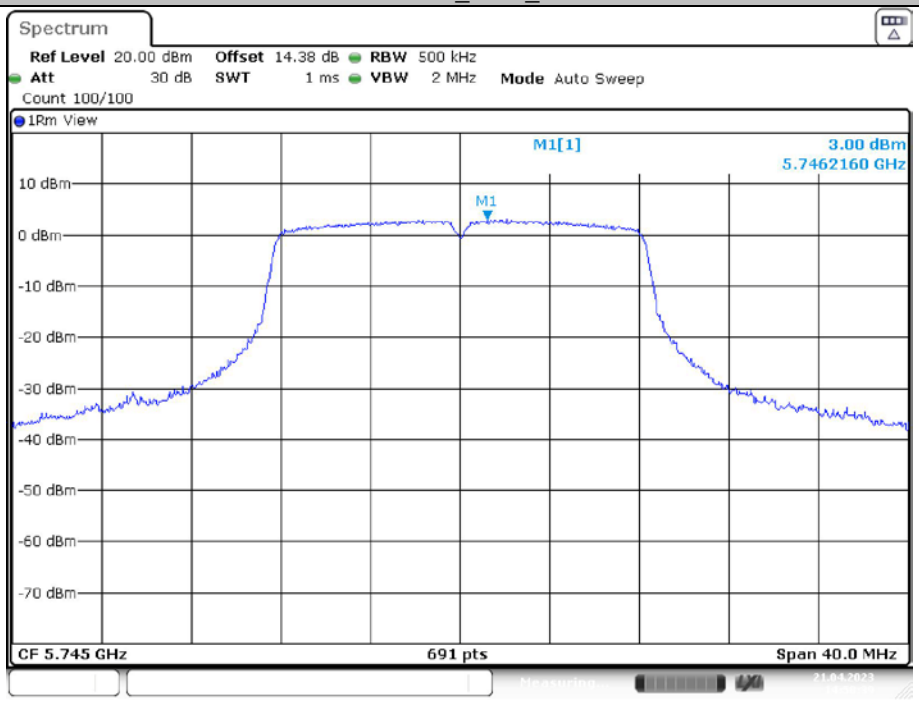
11A MIMO_Ant4_5745



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