



3.6 POWER SPECTRAL DENSITY MEASUREMENT

3.6.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
		Indoor Access Point	
	√	Mobile and Portable client device	11dBm/ MHz
U-NII-2A	√		11dBm/ MHz
U-NII-2C	√		11dBm/ MHz
U-NII-3	√		30dBm/ 500kHz

Note:

Directional gain and the maximum output power limit:

Operation Band	Chain 0 Antenna Gain(dBi)	Chain 1 Antenna Gain(dBi)	DG For Power (dBi)	Power Limit Reduction
U-NII-1	3.37	3.37	6.38	0.38
U-NII-2A	3.37	3.37	6.38	0.38
U-NII-2C	3.37	3.37	6.38	0.38
U-NII-3	3.37	3.37	6.38	0.38

Refer to KDB662911 D01 Multiple Transmitter Output v02r01.

d) *Unequal antenna gains, with equal transmit powers.* For antenna gains given by G_1, G_2, \dots, G_N dBi

(i) If transmit signals are *correlated*, then

Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{\text{ANT}}]$ dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

(ii) If all transmit signals are *completely uncorrelated*, then

Directional gain = $10 \log[(10^{G_1/10} + 10^{G_2/10} + \dots + 10^{G_N/10}) / N_{\text{ANT}}]$ dBi

3.6.2 TEST PROCEDURE

For U-NII-1, U-NII-2A, U-NII-2C band:

Using method SA-2

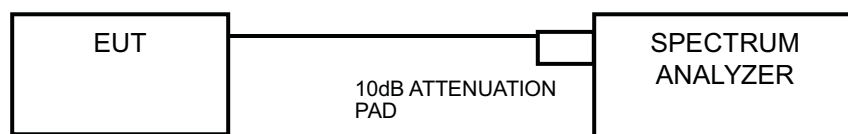
- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 1MHz, Set VBW = 3 MHz, Detector = AV
- 3) Set Channel power measure = 1MHz
- 4) Sweep time = auto, trigger set to "free run".
- 5) Trace average at least 100 traces in power averaging mode.
- 6) Record the max value and add 10 log (1/duty cycle)

For U-NII-3 band:

Using method SA-2

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 300 kHz, Set VBW = 1 MHz, Detector = AV
- 3) Set Channel power measure = 1MHz
- 4) Sweep time = auto, trigger set to "free run".
- 5) Trace average at least 100 traces in power averaging mode.
- 6) Record the max value and add 10 log (1/duty cycle)

3.6.3 TEST SETUP



3.6.4 TEST RESULT

Refer to Appendix E

3.7 FREQUENCY STABILITY

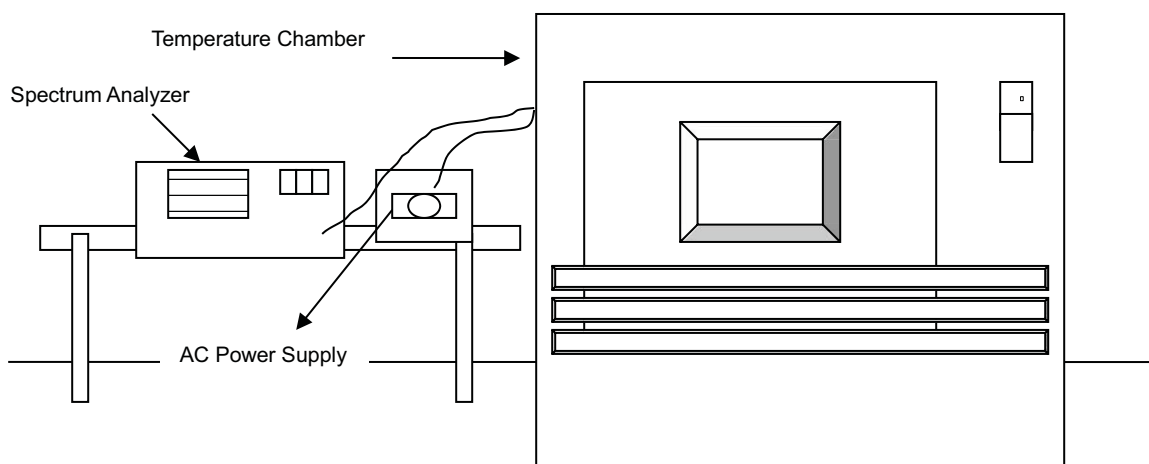
3.7.1 LIMITS OF FREQUENCY STABILITY

The frequency of the carrier signal shall be maintained within band of operation.

3.7.2 TEST PROCEDURES

- The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

3.7.3 TEST SETUP





3.7.4 TEST RESULTS

Refer to Appendix F



4 PHOTOGRAPHS OF TEST SETUP

Please refer to the attached file (Test Setup Photo).



5 Appendix

5.1 Appendix A: 26DB EMISSION BANDWIDTH

5.1.1 Test Result

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	26.36	5167.72	5194.08	---	---
	Ant2	5180	27.64	5165.52	5193.16	---	---
	Ant1	5200	28.68	5184.84	5213.52	---	---
	Ant2	5200	29.40	5184.76	5214.16	---	---
	Ant1	5240	28.24	5224.92	5253.16	---	---
	Ant2	5240	27.84	5225.72	5253.56	---	---
	Ant1	5260	29.32	5245.40	5274.72	---	---
	Ant2	5260	28.72	5245.52	5274.24	---	---
	Ant1	5280	28.04	5265.52	5293.56	---	---
	Ant2	5280	26.56	5265.96	5292.52	---	---
	Ant1	5320	26.96	5305.52	5332.48	---	---
	Ant2	5320	28.76	5305.44	5334.20	---	---
	Ant1	5500	29.48	5484.64	5514.12	---	---
	Ant2	5500	26.96	5487.20	5514.16	---	---
	Ant1	5580	29.04	5565.08	5594.12	---	---
	Ant2	5580	29.16	5564.60	5593.76	---	---
	Ant1	5700	27.96	5685.52	5713.48	---	---
	Ant2	5700	27.08	5685.52	5712.60	---	---
	Ant1	5720	27.68	5704.92	5732.60	---	---
	Ant2	5720	27.72	5705.72	5733.44	---	---
	Ant1	5720_UNII-2C	20.08	5704.92	5725	---	---
	Ant2	5720_UNII-2C	19.28	5705.72	5725	---	---
	Ant1	5720_UNII-3	7.6	5725	5732.60	---	---
	Ant2	5720_UNII-3	8.44	5725	5733.44	---	---
	Ant1	5745	27.96	5731.20	5759.16	---	---
	Ant2	5745	27.32	5731.80	5759.12	---	---
	Ant1	5785	28.92	5770.16	5799.08	---	---
	Ant2	5785	26.72	5770.84	5797.56	---	---
	Ant1	5825	28.32	5810.00	5838.32	---	---
	Ant2	5825	28.52	5810.56	5839.08	---	---
11N20MIMO	Ant1	5180	28.52	5167.04	5195.56	---	---
	Ant2	5180	29.72	5165.72	5195.44	---	---
	Ant1	5200	31.32	5185.24	5216.56	---	---
	Ant2	5200	29.84	5184.64	5214.48	---	---
	Ant1	5240	29.40	5225.56	5254.96	---	---
	Ant2	5240	27.52	5225.96	5253.48	---	---
	Ant1	5260	29.36	5245.68	5275.04	---	---
	Ant2	5260	29.20	5245.72	5274.92	---	---
	Ant1	5280	28.12	5265.84	5293.96	---	---
	Ant2	5280	26.52	5266.16	5292.68	---	---
	Ant1	5320	28.28	5306.16	5334.44	---	---
	Ant2	5320	28.96	5306.16	5335.12	---	---
	Ant1	5500	28.92	5486.48	5515.40	---	---
	Ant2	5500	28.56	5486.40	5514.96	---	---
	Ant1	5580	30.16	5565.52	5595.68	---	---
	Ant2	5580	30.52	5565.16	5595.68	---	---
	Ant1	5700	28.40	5686.40	5714.80	---	---

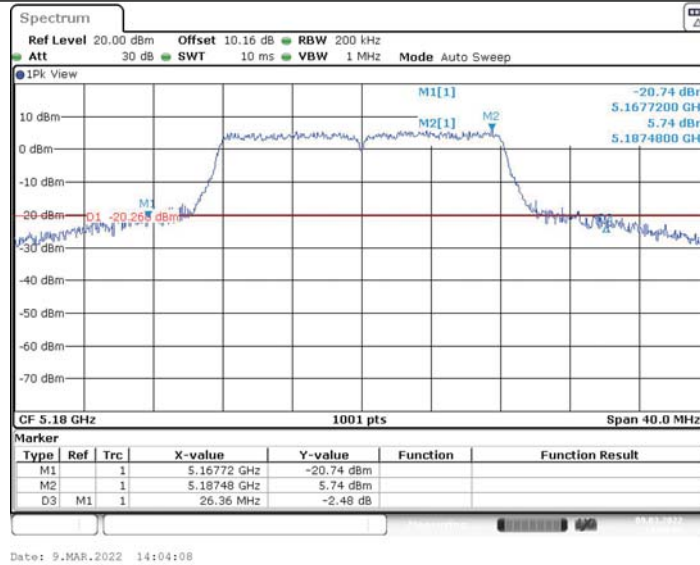


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	Ant1	5720	29.96	5705.40	5735.36	---	---
	Ant2	5720	29.96	5705.20	5735.16	---	---
	Ant1	5720_UNII-2C	19.6	5705.40	5725	---	---
	Ant2	5720_UNII-2C	19.8	5705.20	5725	---	---
	Ant1	5720_UNII-3	10.36	5725	5735.36	---	---
	Ant2	5720_UNII-3	10.16	5725	5735.16	---	---
	Ant1	5745	26.80	5731.44	5758.24	---	---
	Ant2	5745	26.68	5732.04	5758.72	---	---
	Ant1	5785	29.00	5771.40	5800.40	---	---
	Ant2	5785	28.24	5770.80	5799.04	---	---
	Ant1	5825	30.72	5808.96	5839.68	---	---
	Ant2	5825	27.76	5810.80	5838.56	---	---
11N40MIMO	Ant1	5190	60.24	5158.56	5218.80	---	---
	Ant2	5190	54.08	5164.40	5218.48	---	---
	Ant1	5230	59.68	5201.28	5260.96	---	---
	Ant2	5230	53.92	5196.40	5250.32	---	---
	Ant1	5270	57.44	5242.00	5299.44	---	---
	Ant2	5270	50.24	5240.24	5290.48	---	---
	Ant1	5310	58.72	5278.32	5337.04	---	---
	Ant2	5310	49.92	5289.12	5339.04	---	---
	Ant1	5510	60.96	5476.00	5536.96	---	---
	Ant2	5510	48.64	5490.16	5538.80	---	---
	Ant1	5550	60.56	5520.40	5580.96	---	---
	Ant2	5550	49.60	5520.24	5569.84	---	---
	Ant1	5670	60.24	5640.40	5700.64	---	---
	Ant2	5670	50.80	5650.48	5701.28	---	---
	Ant1	5710	58.64	5682.08	5740.72	---	---
	Ant2	5710	47.36	5681.84	5729.20	---	---
	Ant1	5710_UNII-2C	42.92	5682.08	5725	---	---
	Ant2	5710_UNII-2C	43.16	5681.84	5725	---	---
	Ant1	5710_UNII-3	15.72	5725	5740.72	---	---
	Ant2	5710_UNII-3	4.2	5725	5729.20	---	---
	Ant1	5755	60.16	5725.80	5785.96	---	---
	Ant2	5755	52.08	5729.16	5781.24	---	---
	Ant1	5795	59.28	5764.92	5824.20	---	---
	Ant2	5795	52.72	5768.76	5821.48	---	---
11AC80MIMO	Ant1	5210	88.80	5165.20	5254.00	---	---
	Ant2	5210	84.32	5168.56	5252.88	---	---
	Ant1	5290	93.60	5241.36	5334.96	---	---
	Ant2	5290	87.52	5245.36	5332.88	---	---
	Ant1	5530	88.64	5486.64	5575.28	---	---
	Ant2	5530	84.32	5488.88	5573.20	---	---
	Ant1	5610	94.24	5565.20	5659.44	---	---
	Ant2	5610	87.20	5565.84	5653.04	---	---
	Ant1	5690	90.56	5645.84	5736.40	---	---
	Ant2	5690	88.16	5647.12	5735.28	---	---
	Ant1	5690_UNII-2C	79.16	5645.84	5725	---	---
	Ant2	5690_UNII-2C	77.88	5647.12	5725	---	---
	Ant1	5690_UNII-3	11.4	5725	5736.40	---	---
	Ant2	5690_UNII-3	10.28	5725	5735.28	---	---
	Ant1	5775	89.92	5730.04	5819.96	---	---
	Ant2	5775	83.36	5734.20	5817.56	---	---

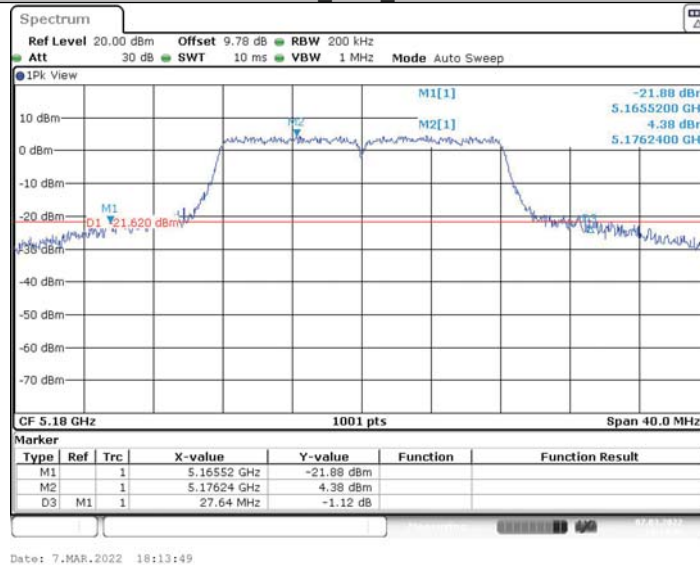


5.1.2 Test Graphs

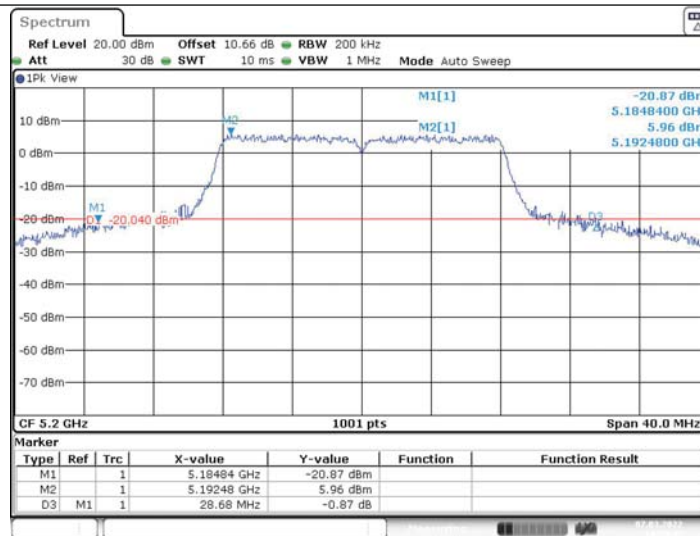
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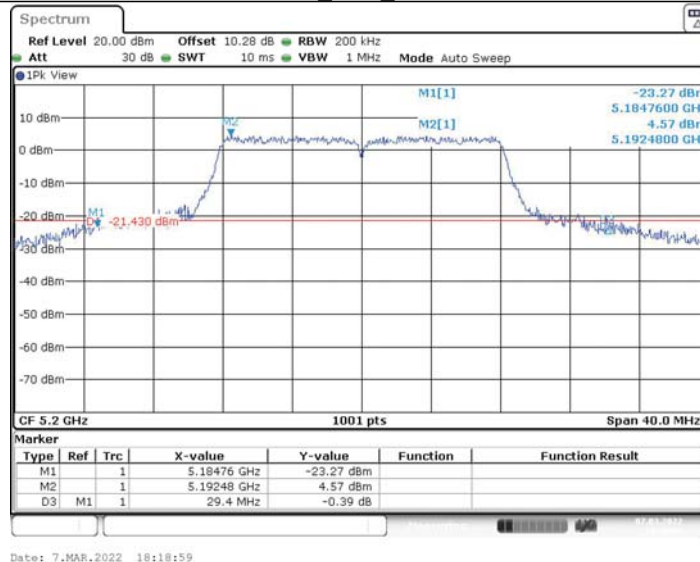
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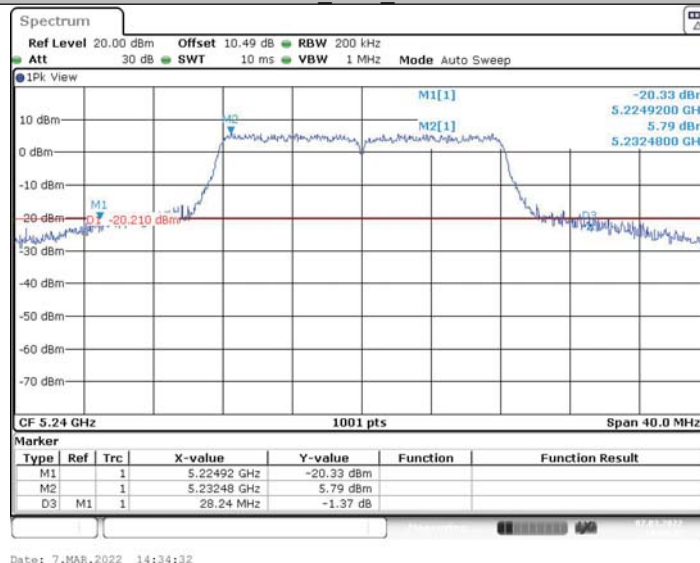
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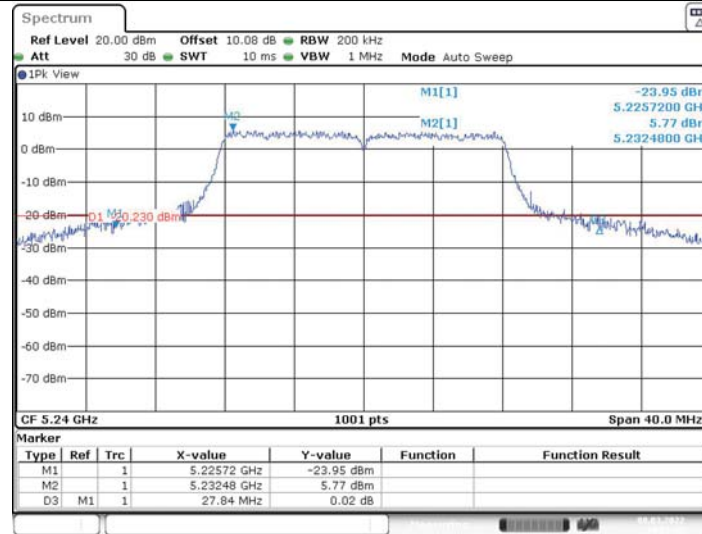


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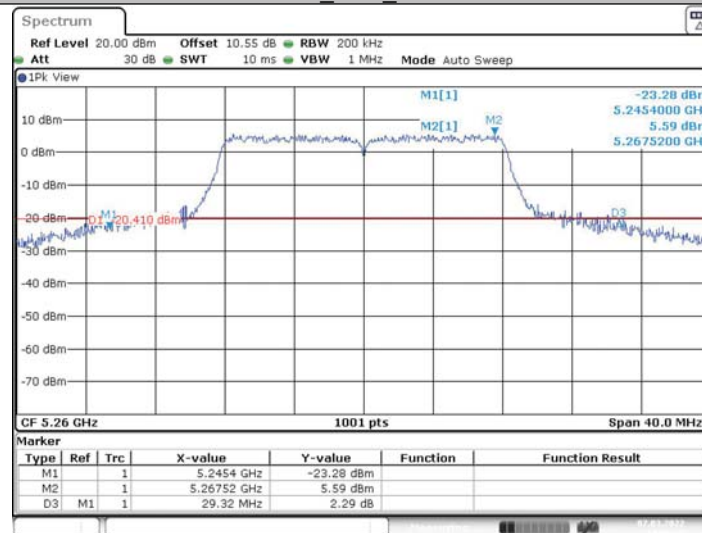




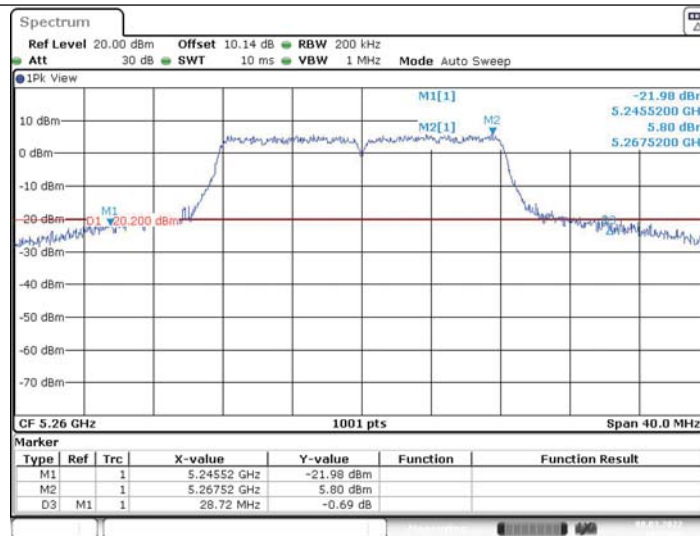
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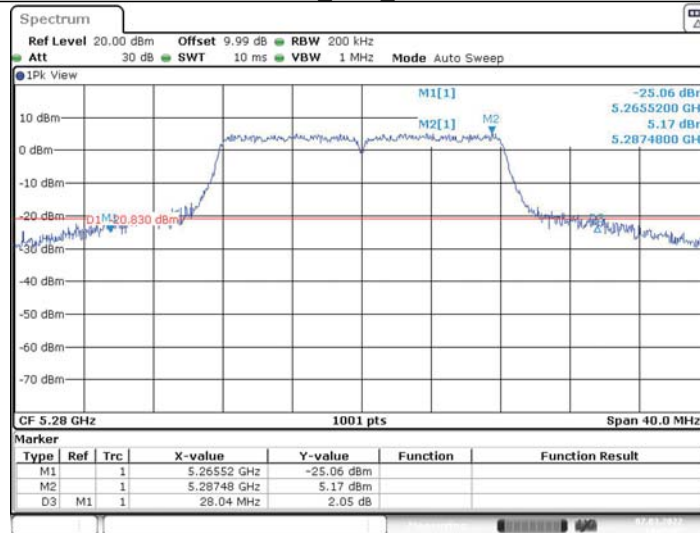
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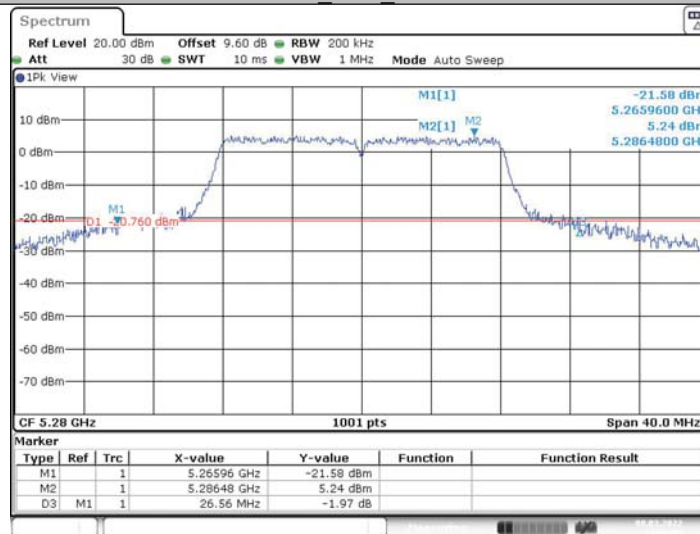
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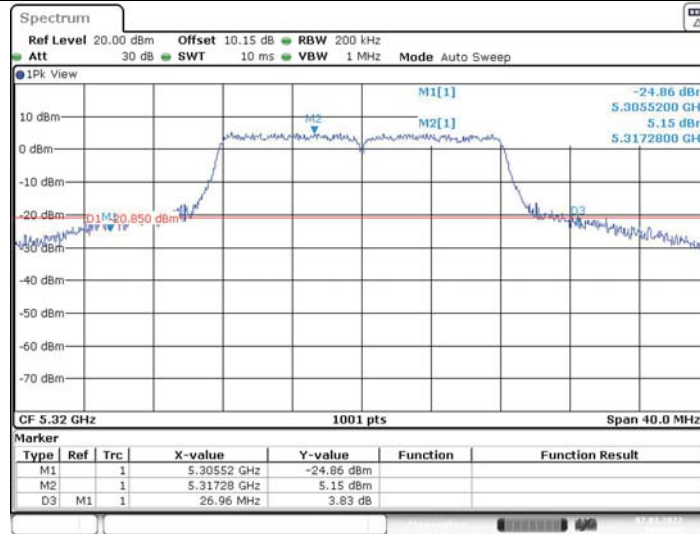


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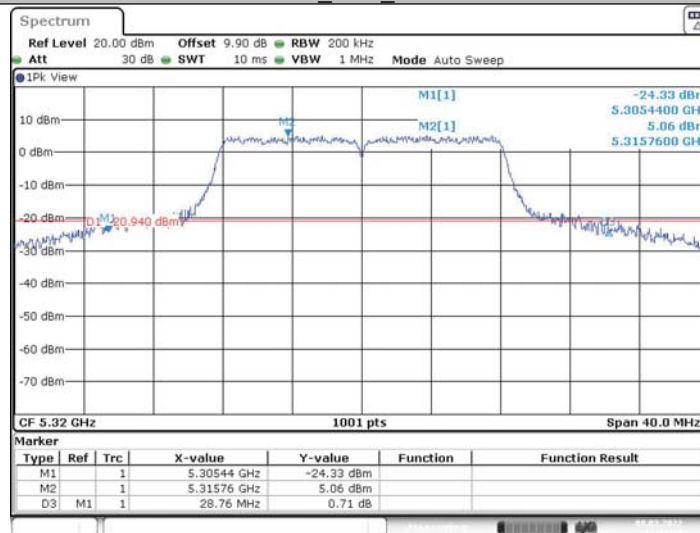


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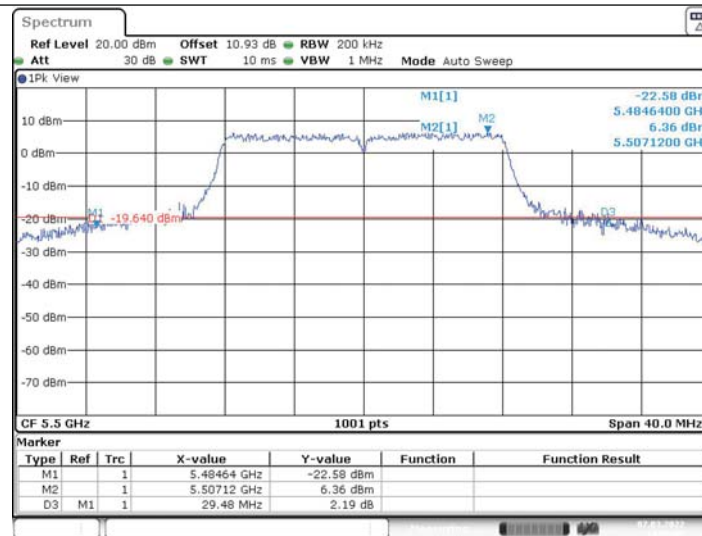
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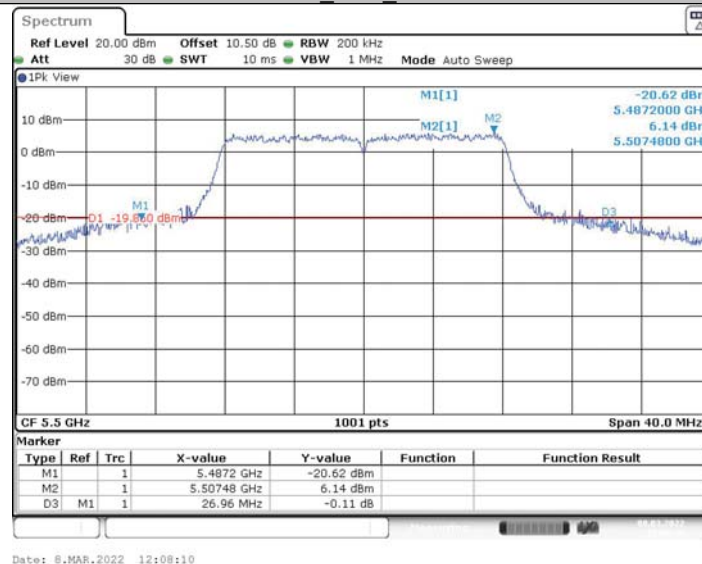


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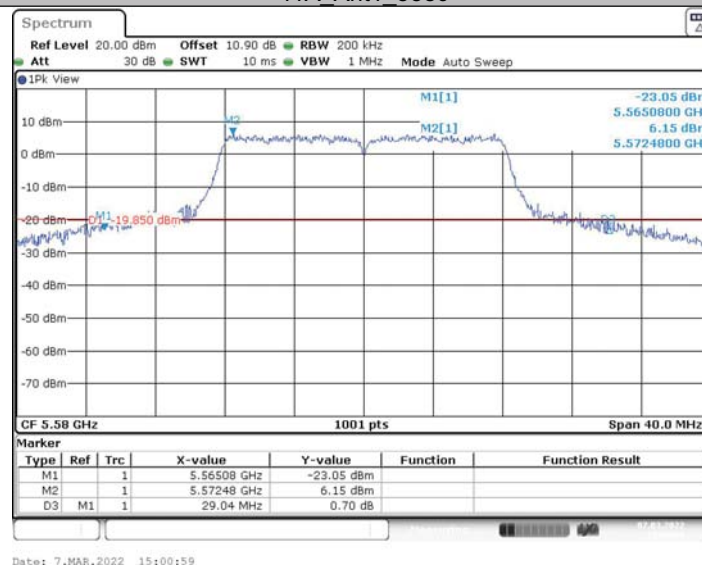
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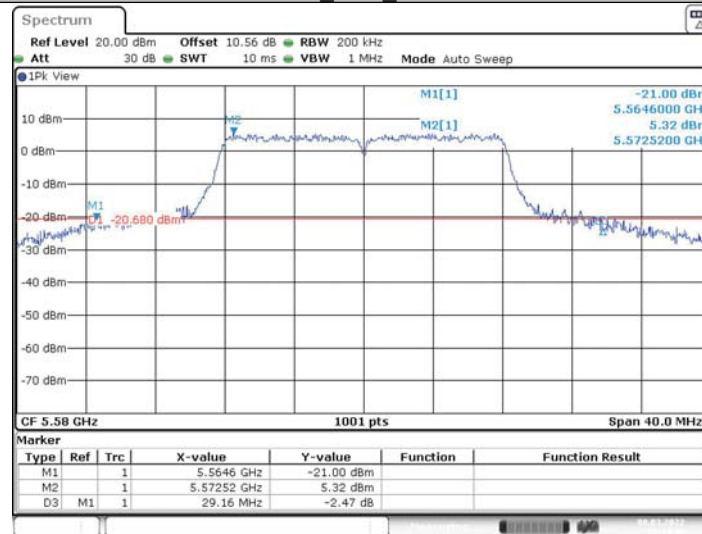


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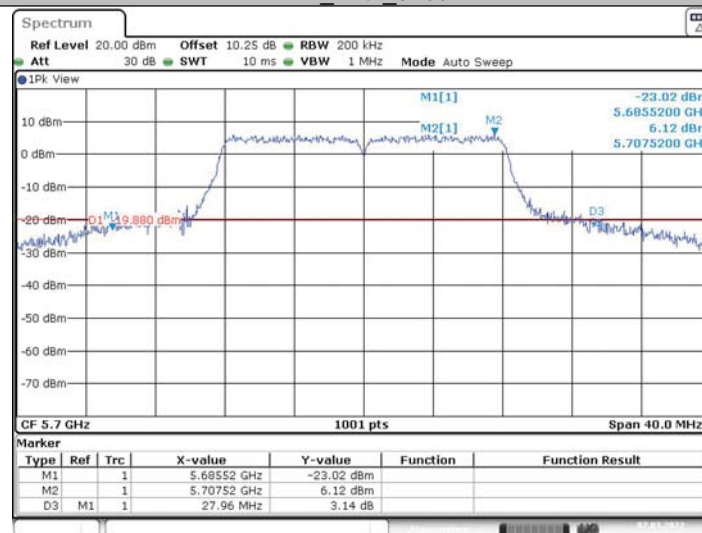


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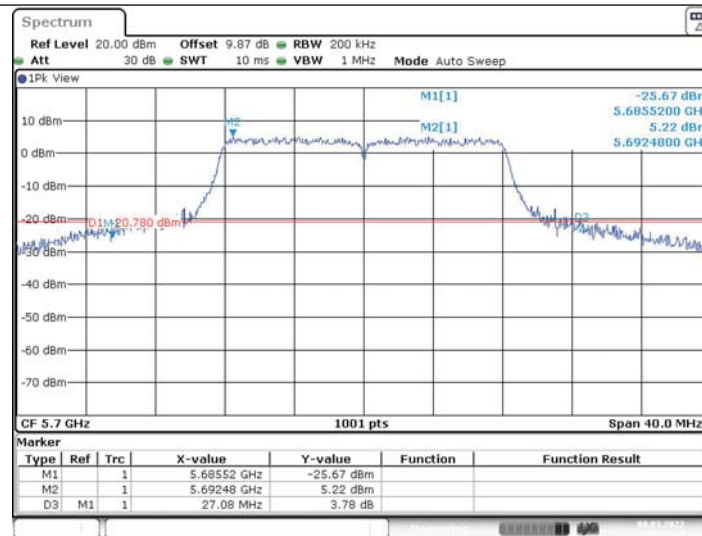
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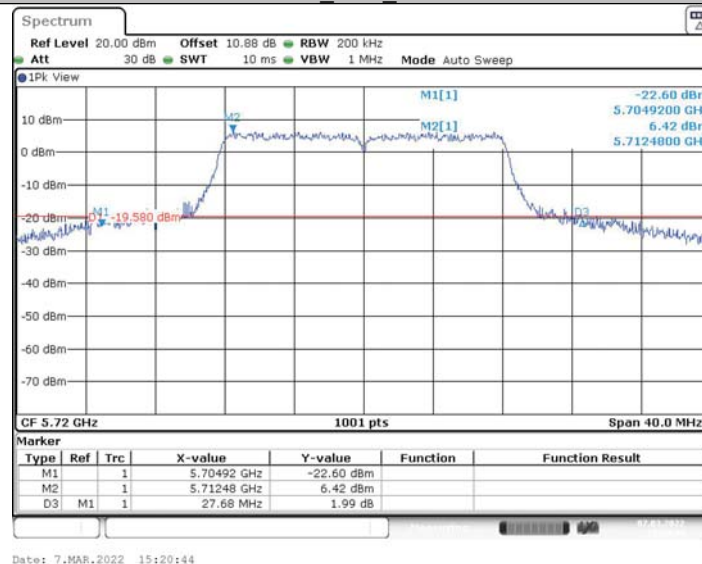


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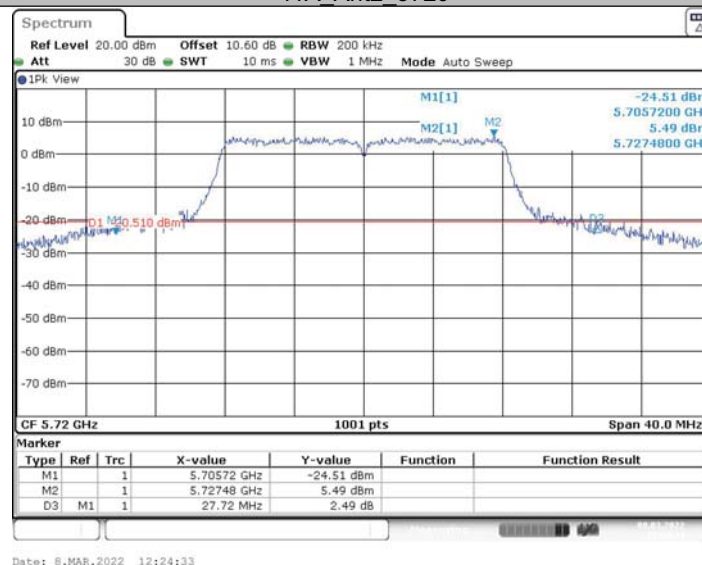
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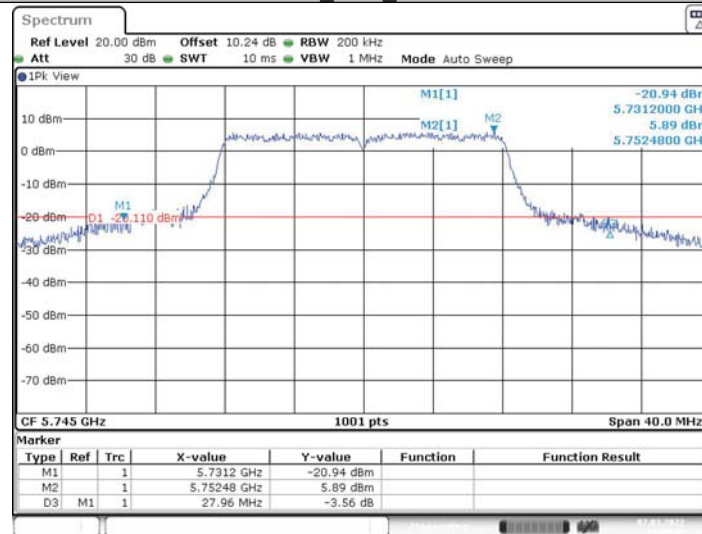


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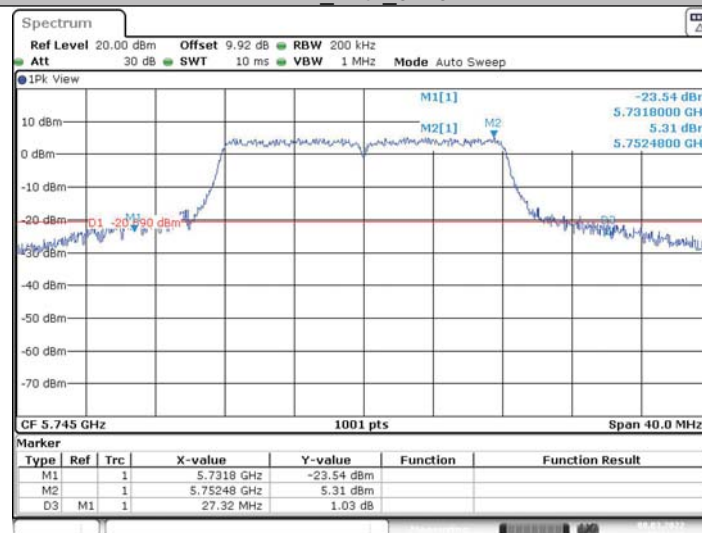


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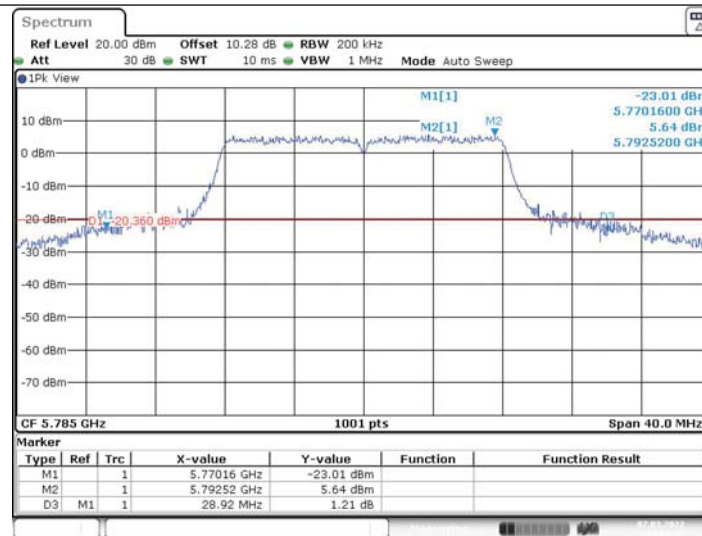
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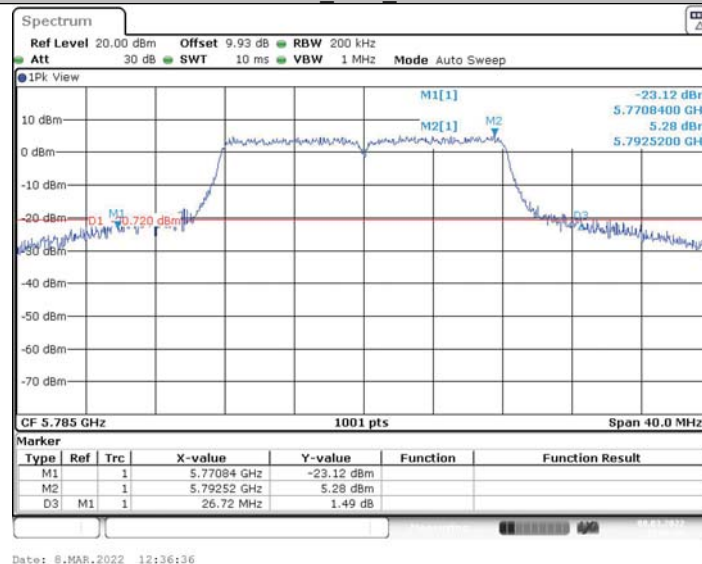


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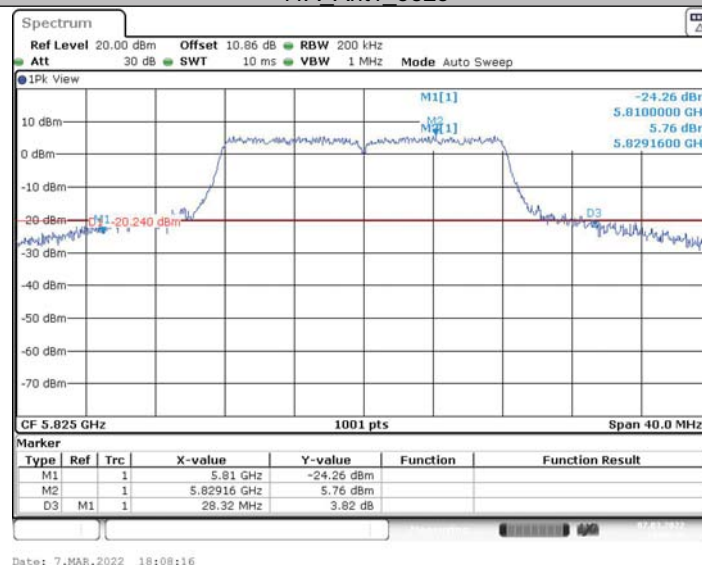
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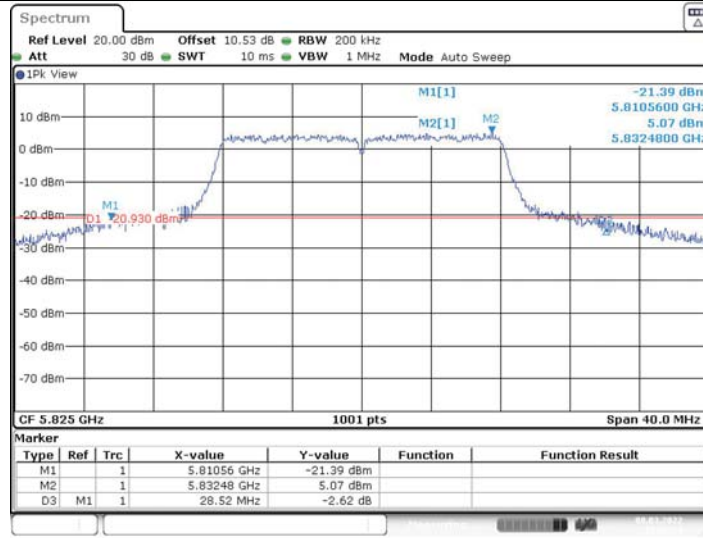


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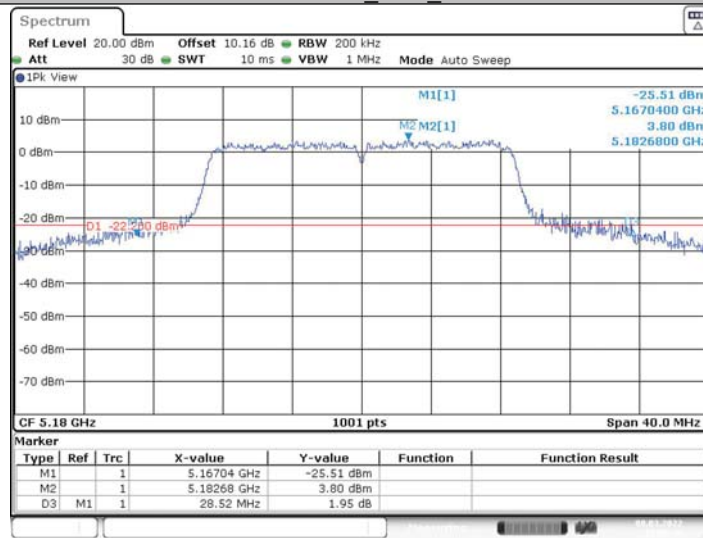




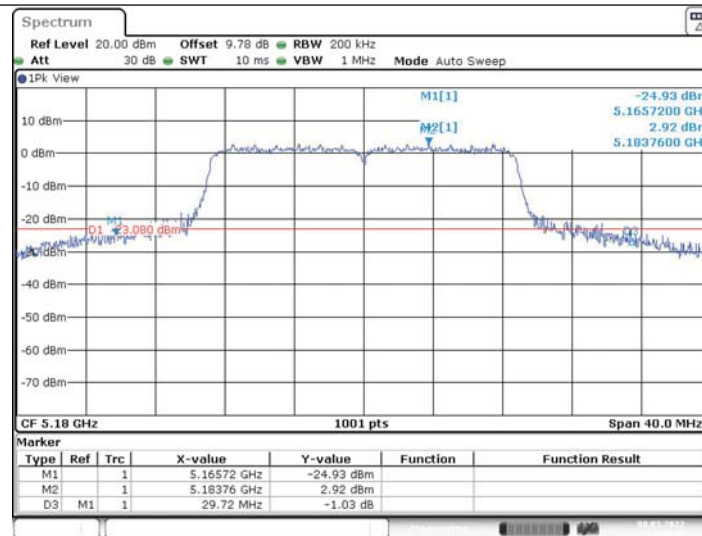
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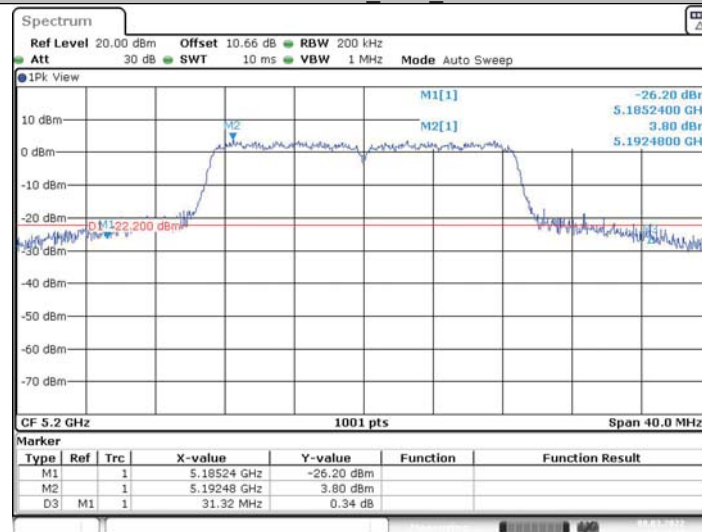


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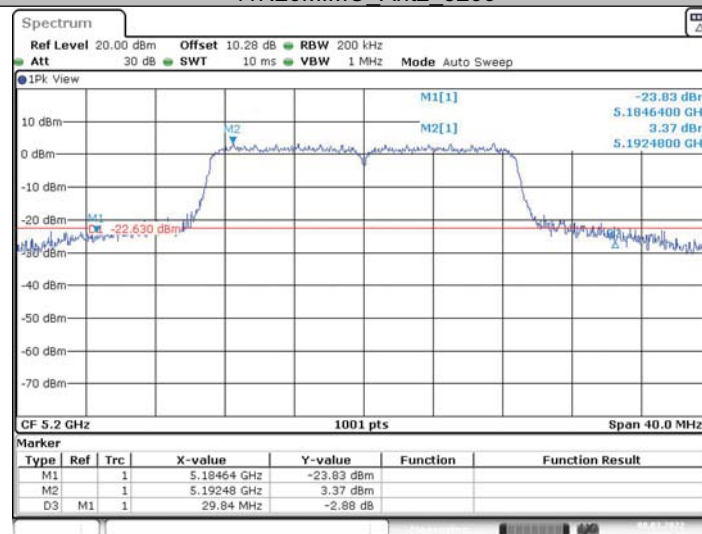
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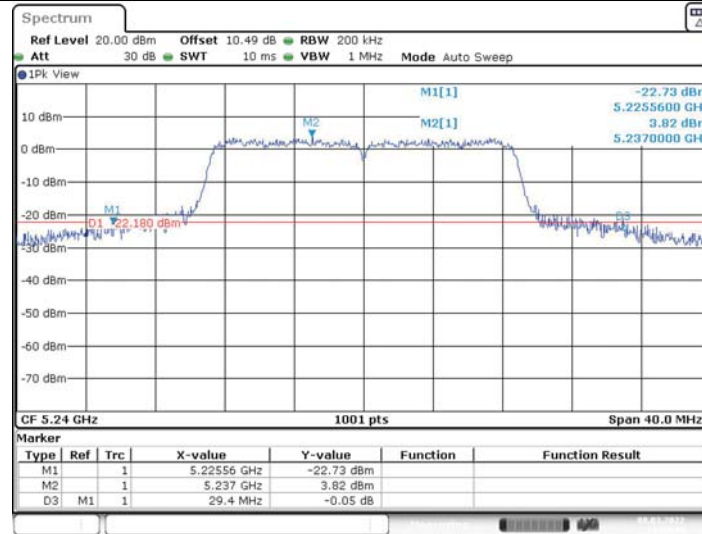
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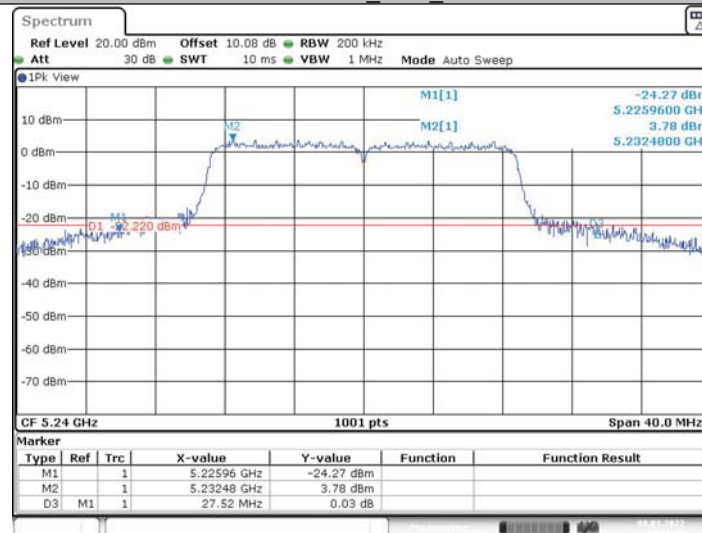


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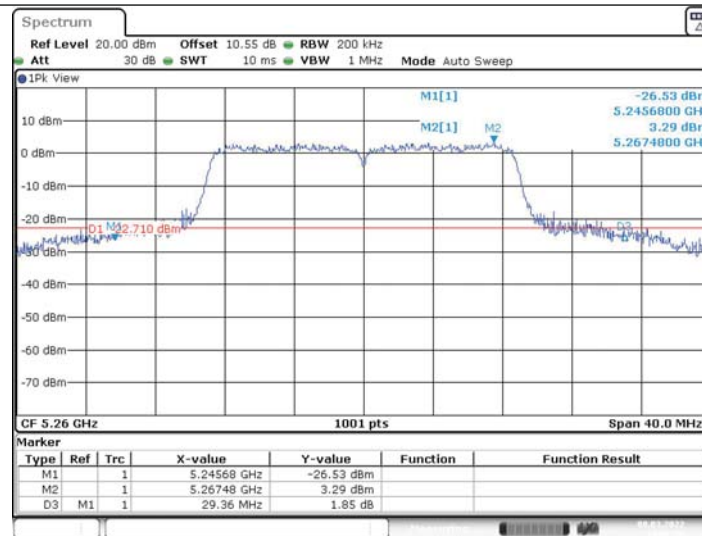
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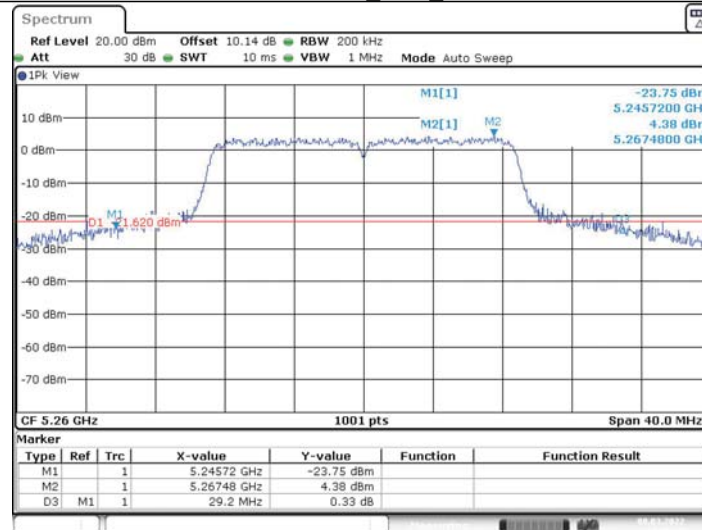
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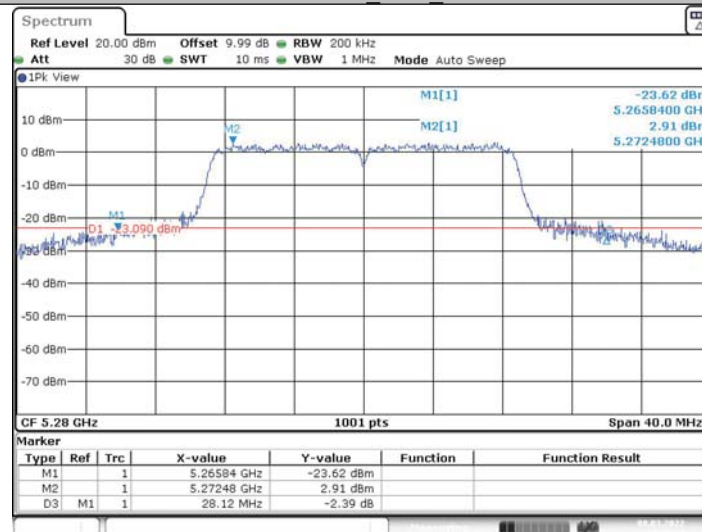
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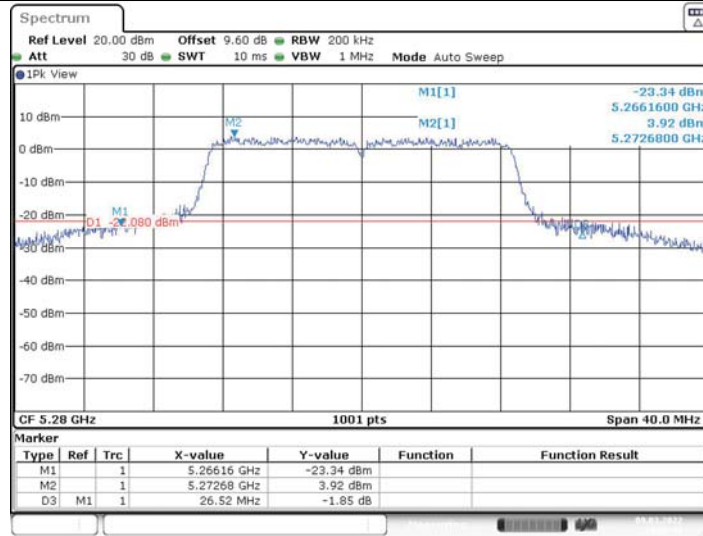
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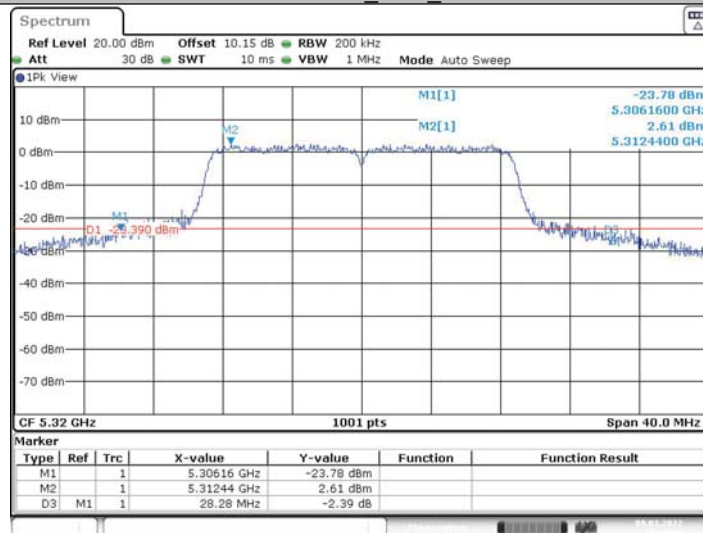


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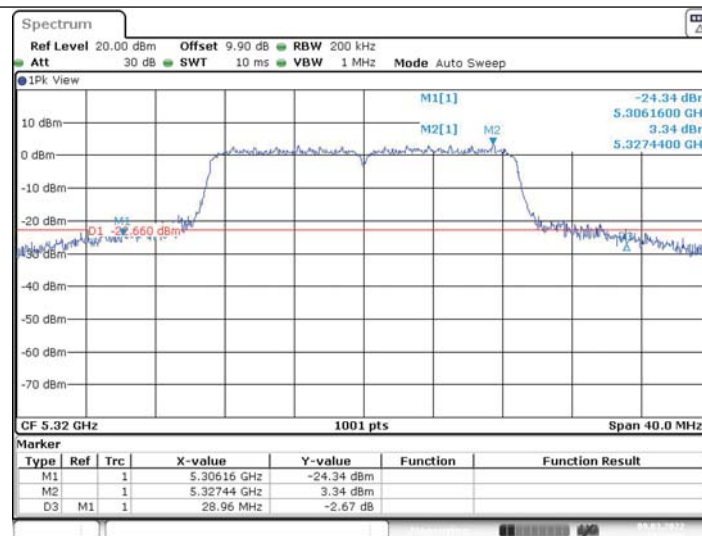
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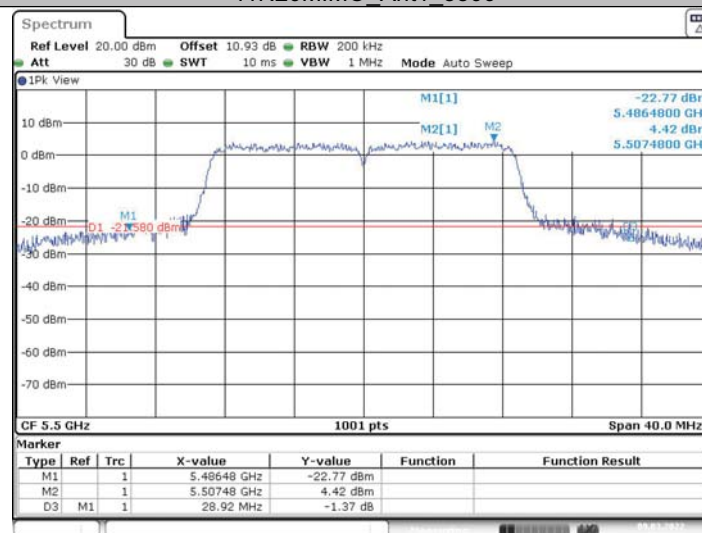
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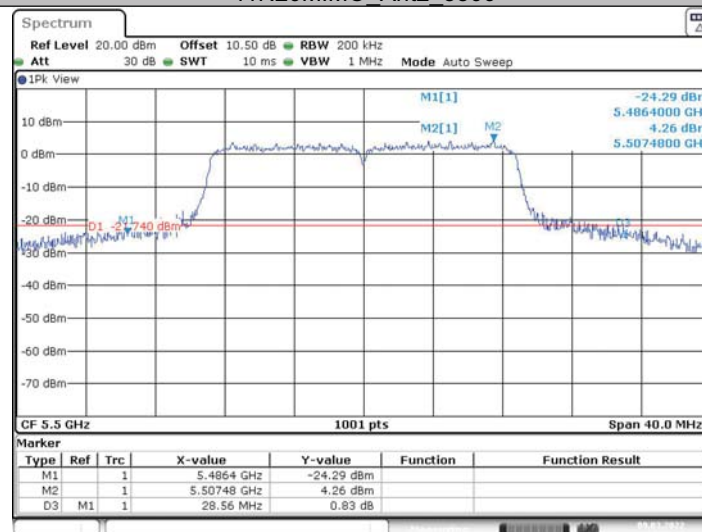
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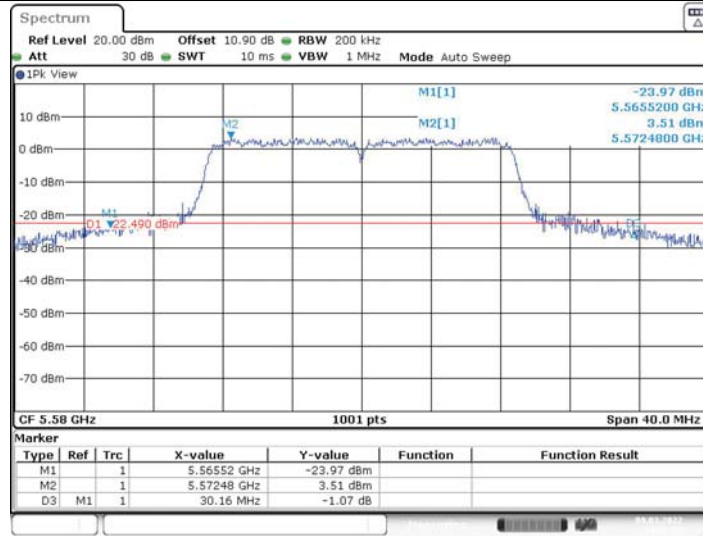
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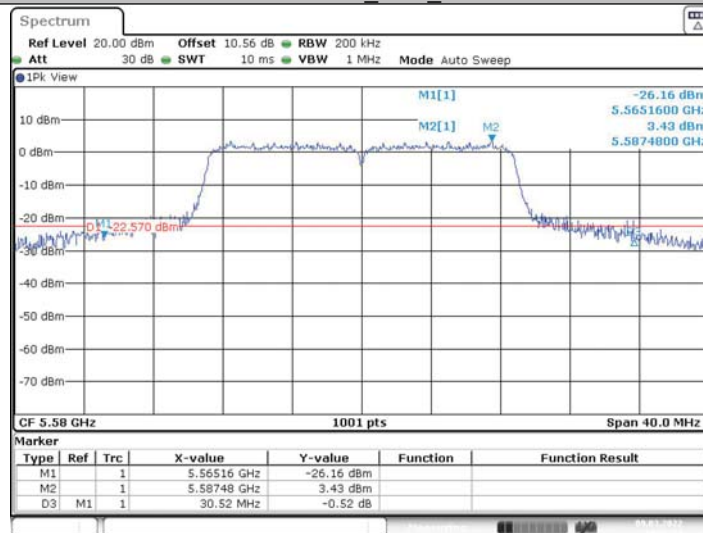


11N20MIMO_Ant1_5580



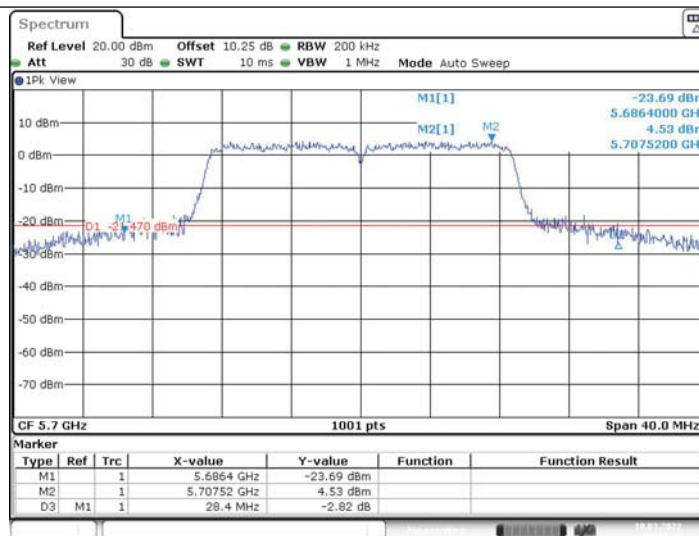
Date: 9.MAR.2022 18:17:52

11N20MIMO_Ant2_5580



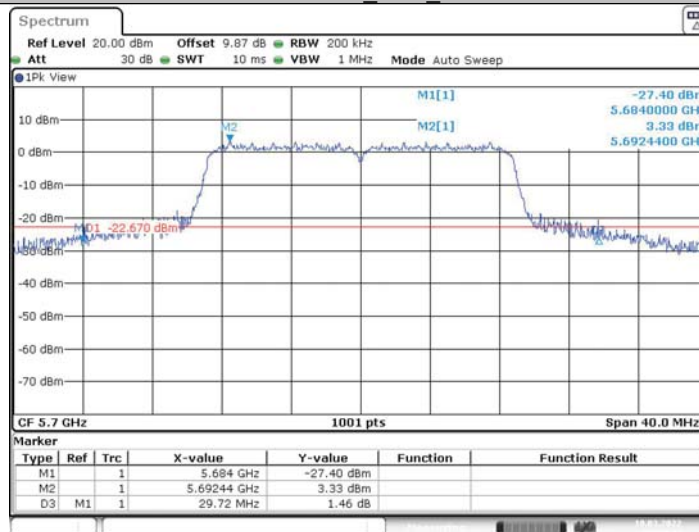
Date: 9.MAR.2022 18:22:53

11N20MIMO_Ant1_5700



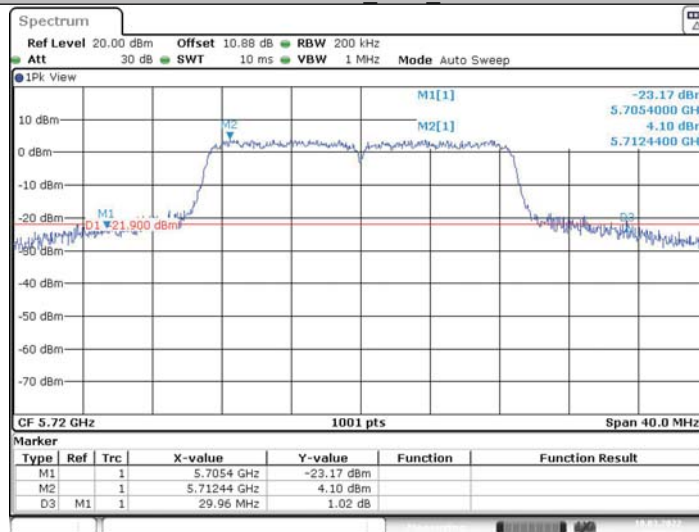
Date: 10.MAR.2022 09:43:34

11N20MIMO_Ant2_5700



Date: 10.MAR.2022 09:49:43

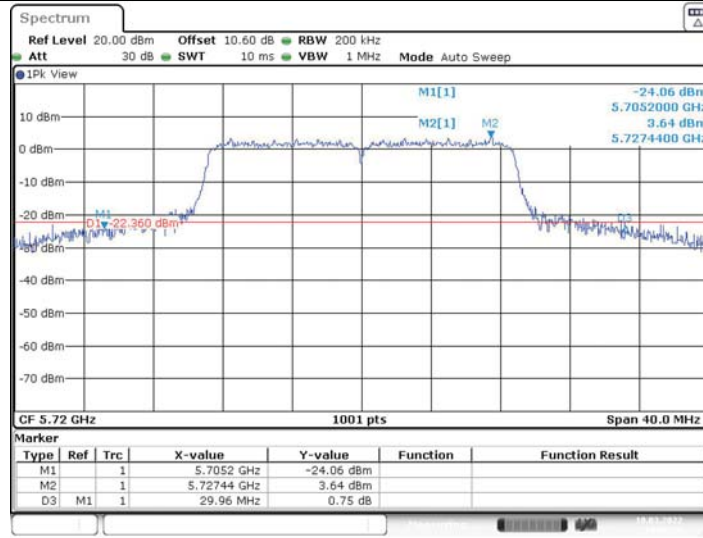
11N20MIMO_Ant1_5720



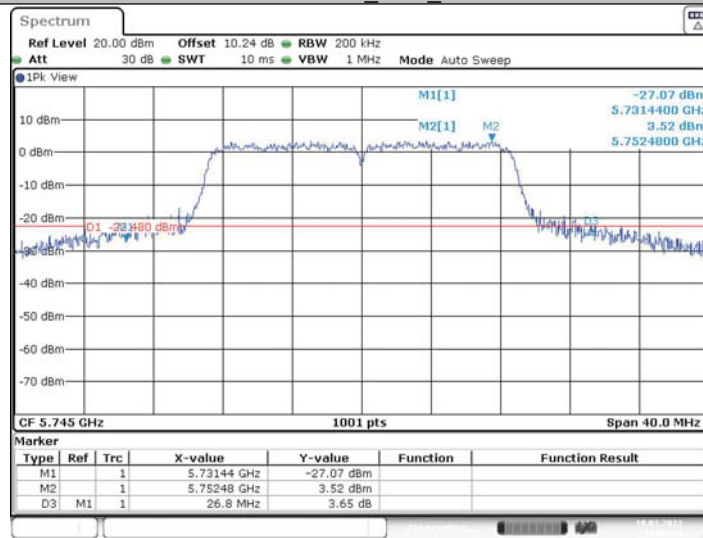
Date: 10.MAR.2022 09:56:19



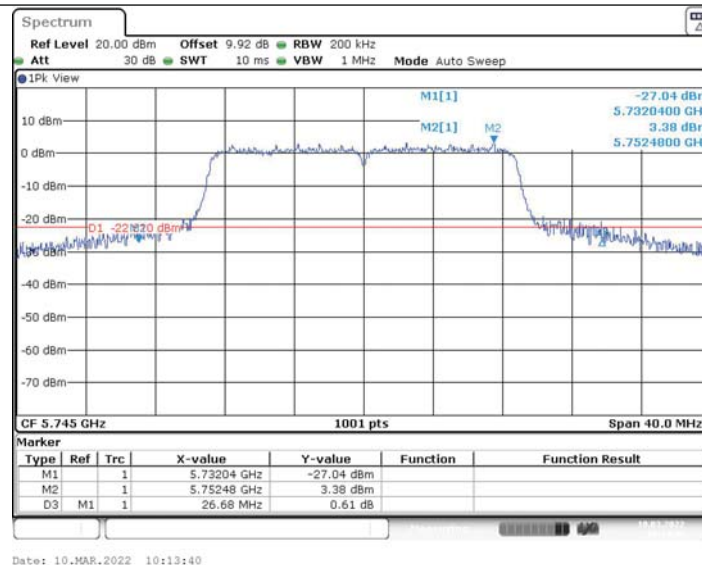
11N20MIMO_Ant2_5720



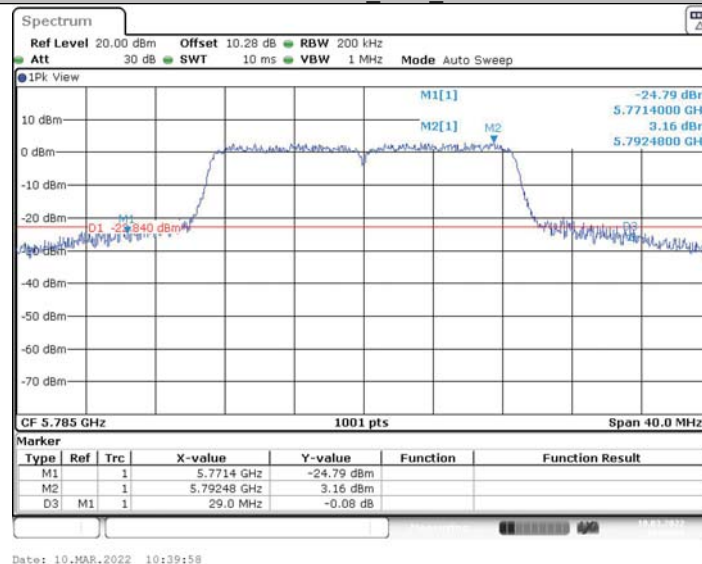
11N20MIMO_Ant1_5745



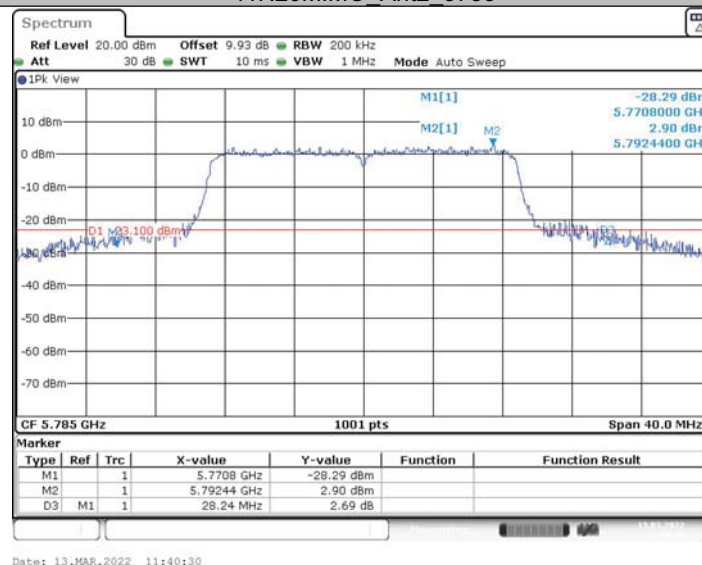
11N20MIMO_Ant2_5745



11N20MIMO_Ant1_5785

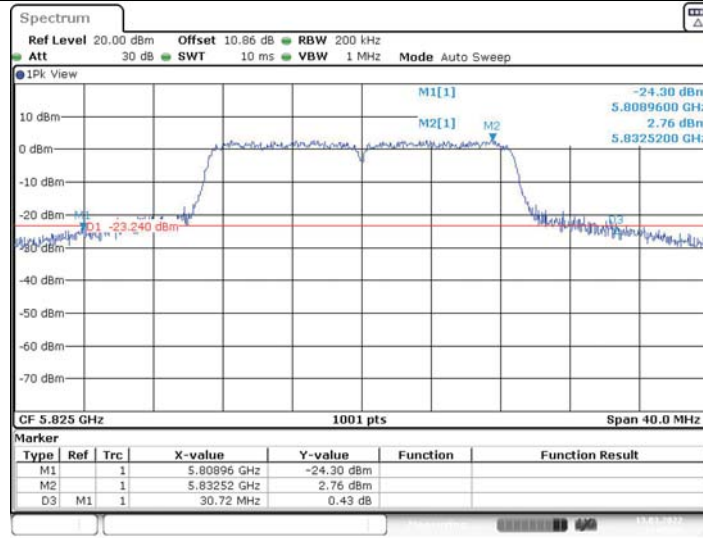


11N20MIMO_Ant2_5785

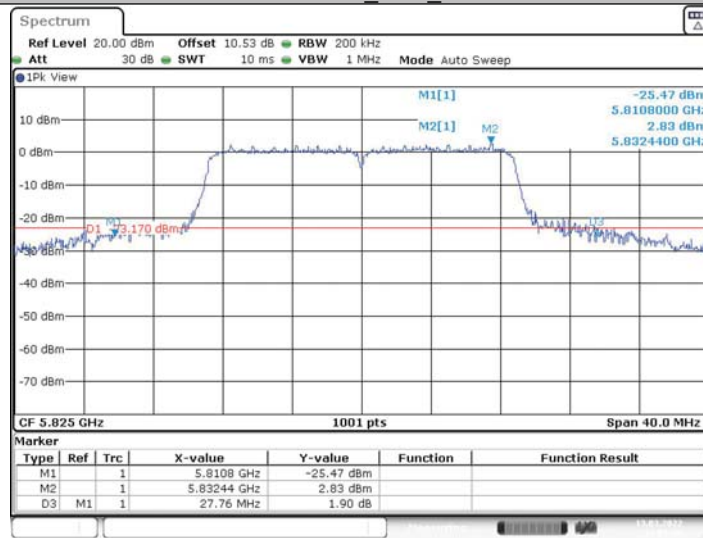




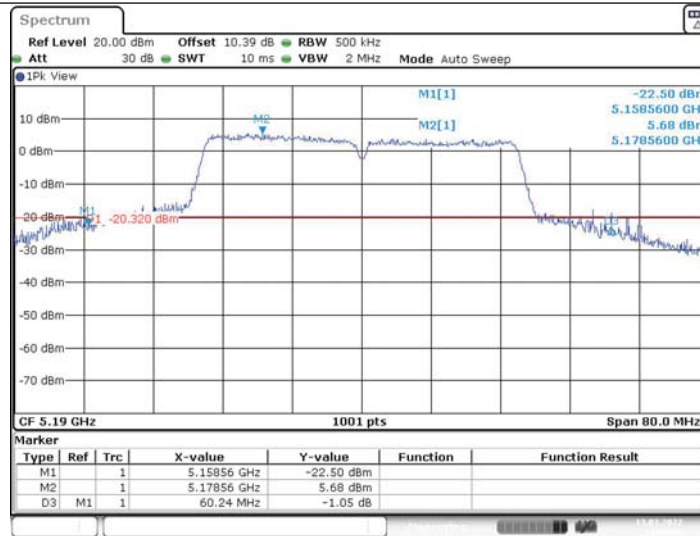
11N20MIMO_Ant1_5825



11N20MIMO_Ant2_5825

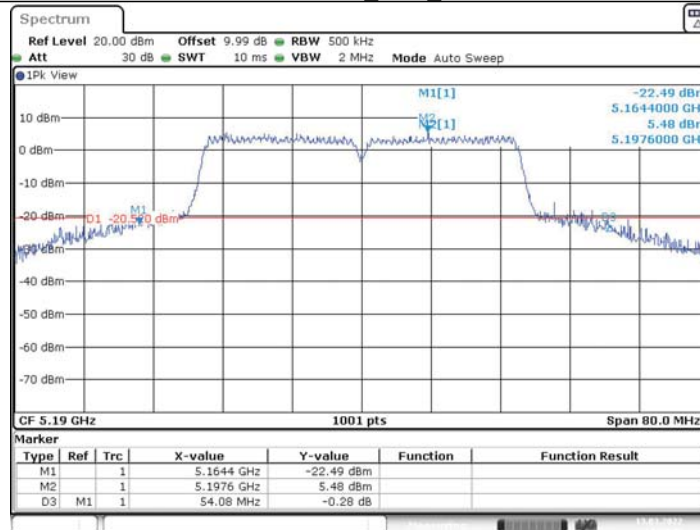


11N40MIMO_Ant1_5190



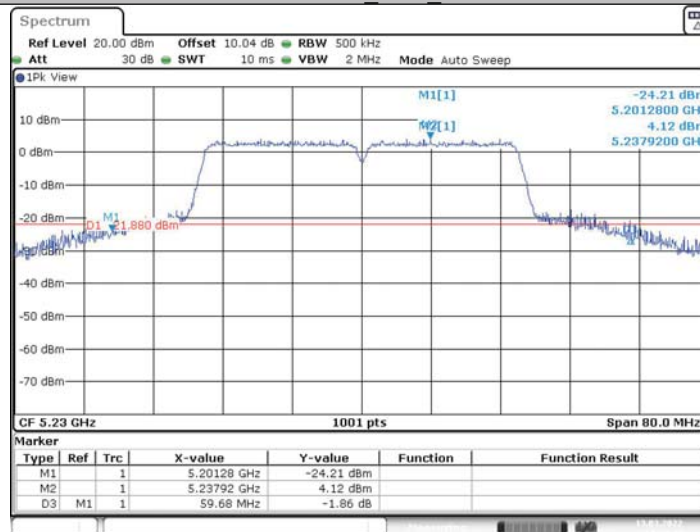
Date: 13.MAR.2022 14:09:10

11N40MIMO_Ant2_5190



Date: 13.MAR.2022 14:10:46

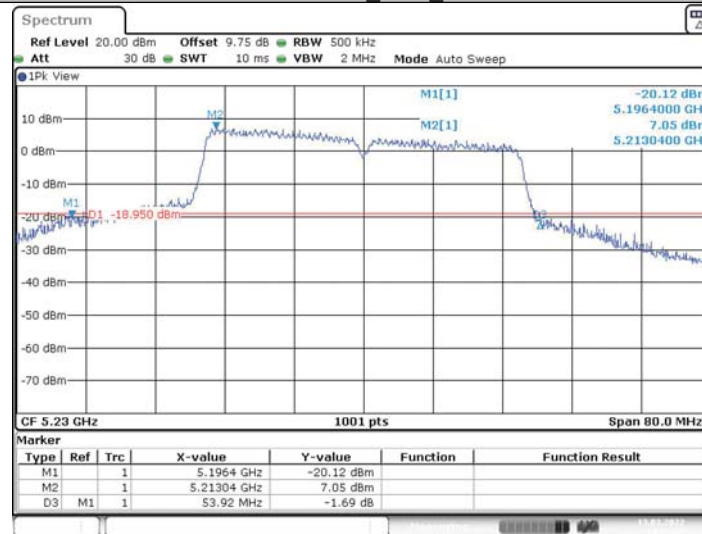
11N40MIMO_Ant1_5230



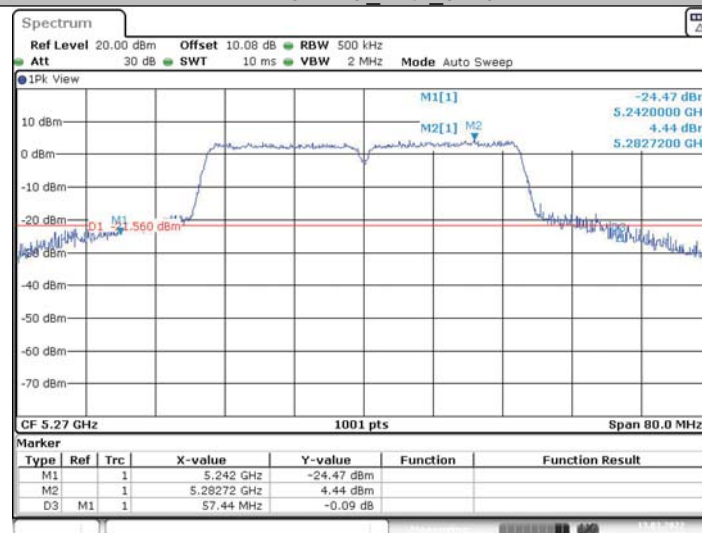
Date: 13.MAR.2022 14:14:14



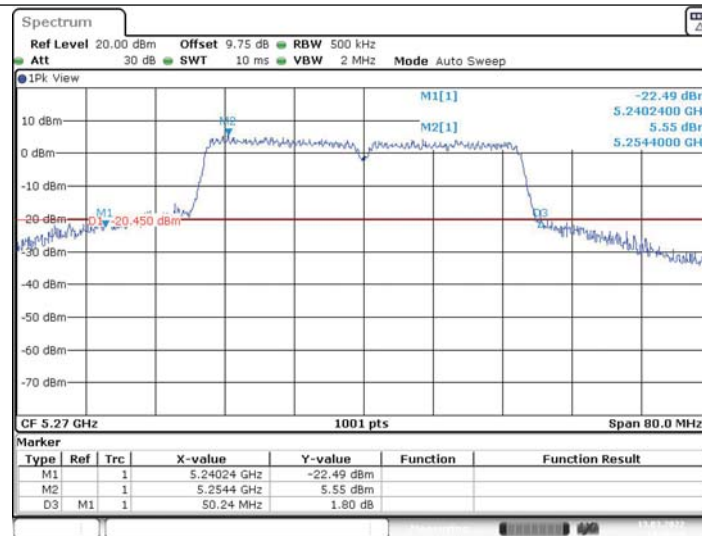
11N40MIMO_Ant2_5230



11N40MIMO_Ant1_5270

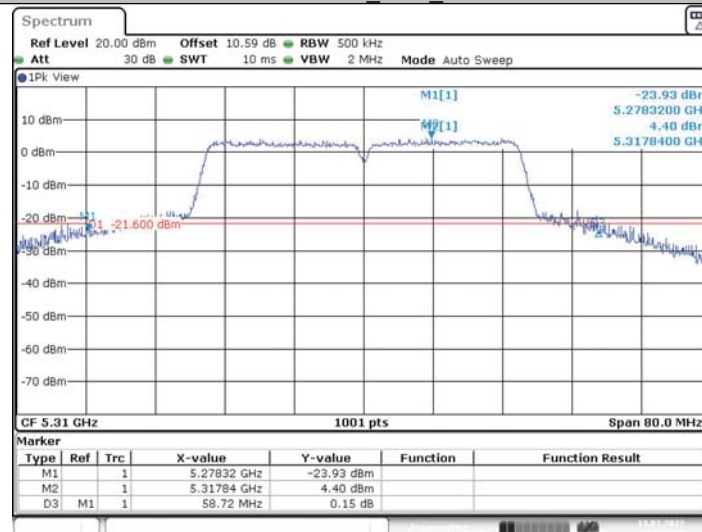


11N40MIMO_Ant2_5270



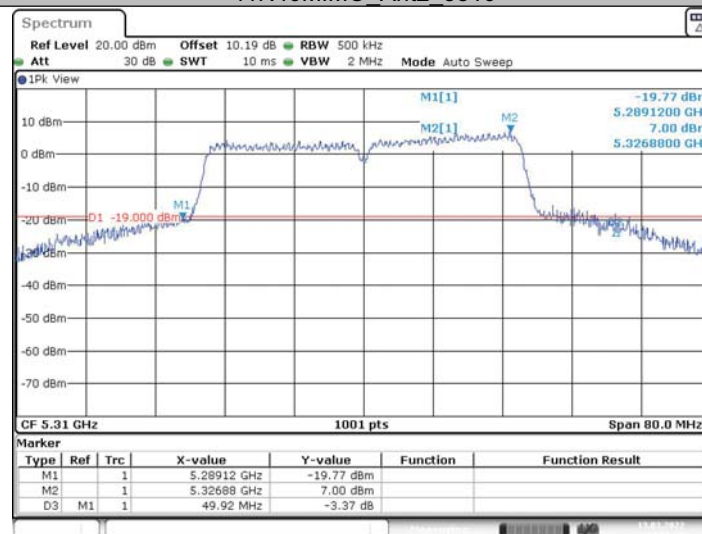
Date: 13.MAR.2022 14:18:35

11N40MIMO_Ant1_5310



Date: 13.MAR.2022 14:20:09

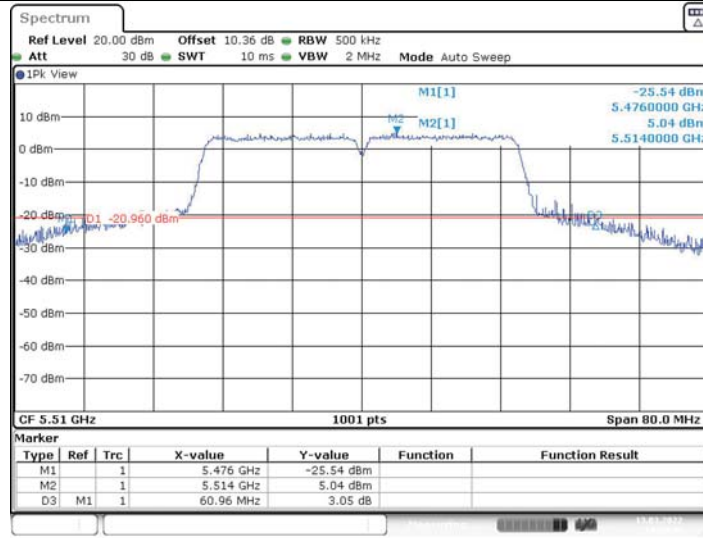
11N40MIMO_Ant2_5310



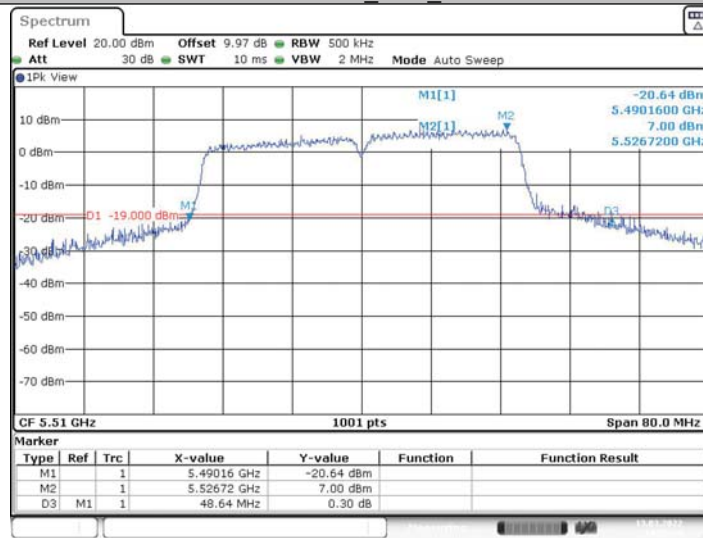
Date: 13.MAR.2022 14:21:55



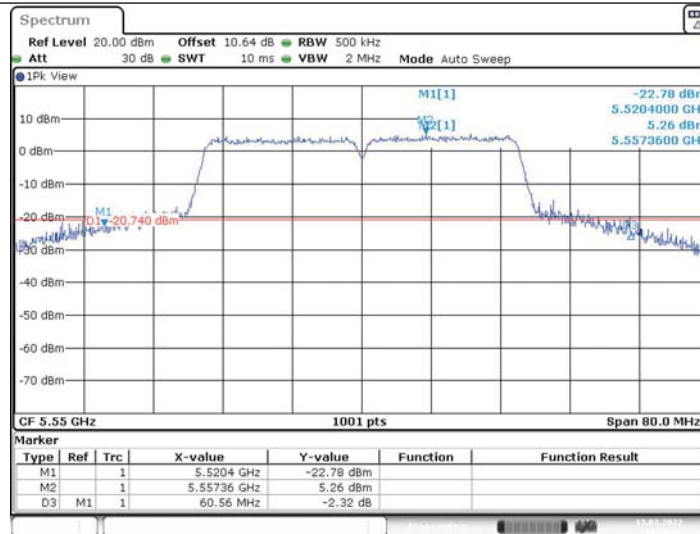
11N40MIMO_Ant1_5510



11N40MIMO_Ant2_5510

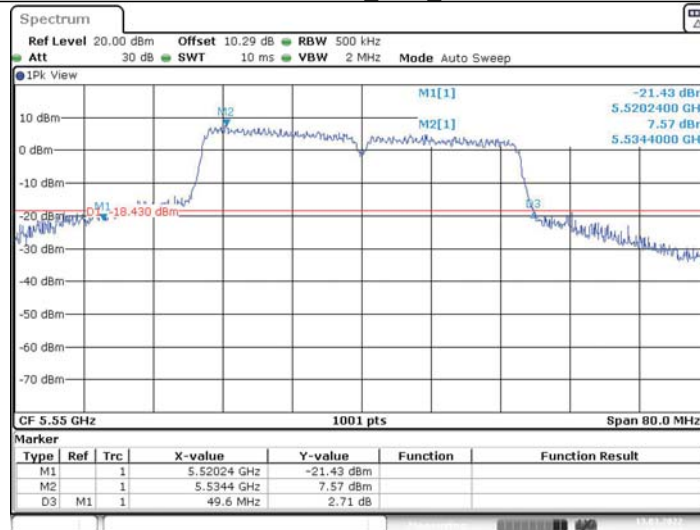


11N40MIMO_Ant1_5550



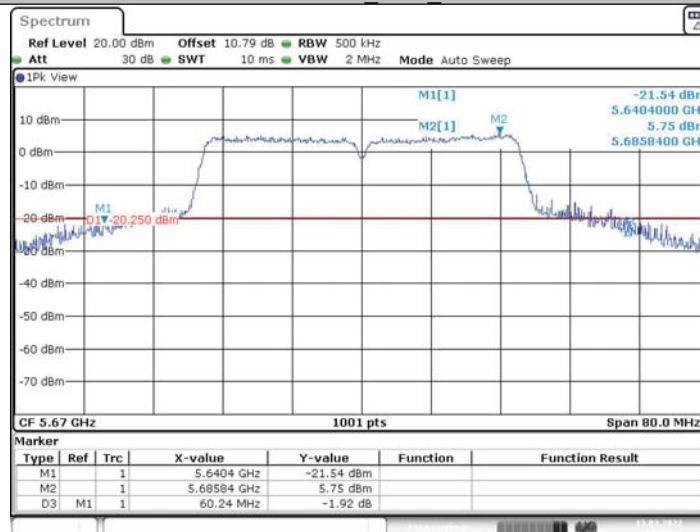
Date: 13.MAR.2022 14:27:28

11N40MIMO_Ant2_5550



Date: 13.MAR.2022 14:28:52

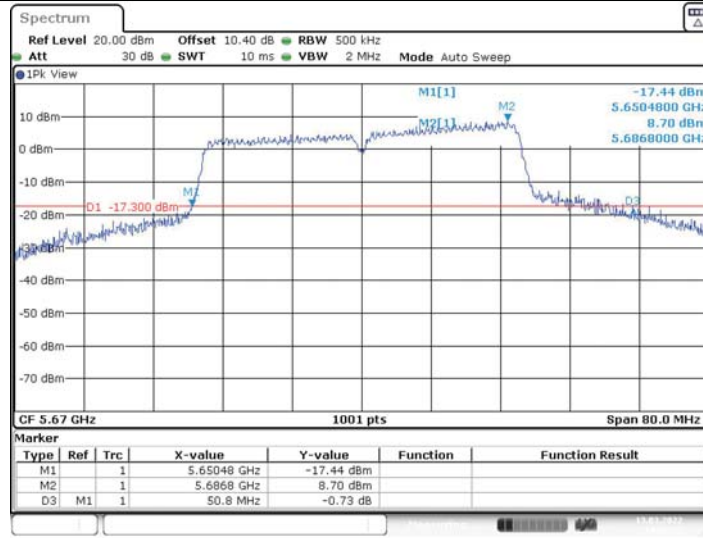
11N40MIMO_Ant1_5670



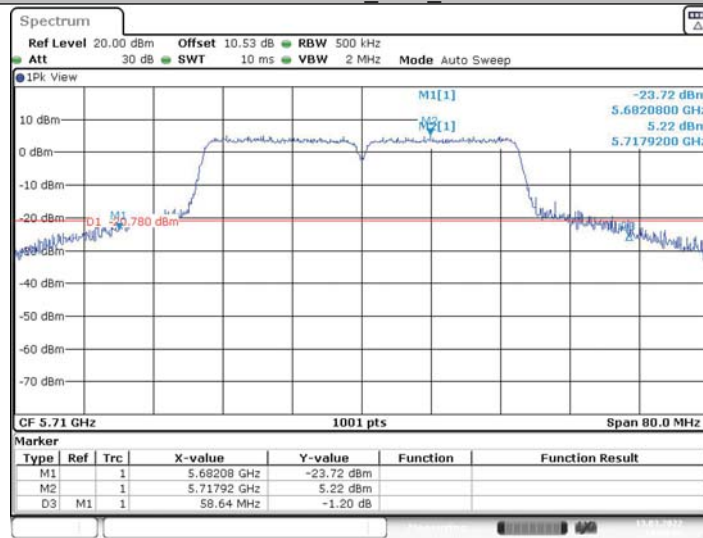
Date: 13.MAR.2022 14:30:26



11N40MIMO_Ant2_5670



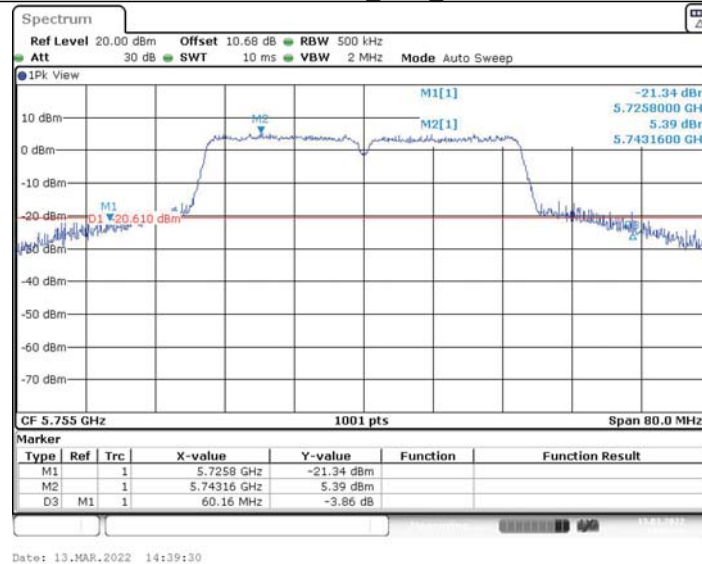
11N40MIMO_Ant1_5710



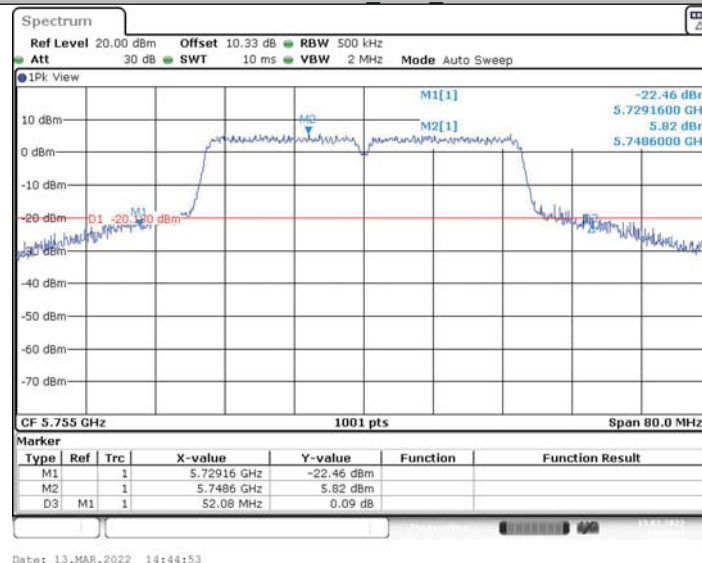
11N40MIMO_Ant2_5710



11N40MIMO_Ant1_5755

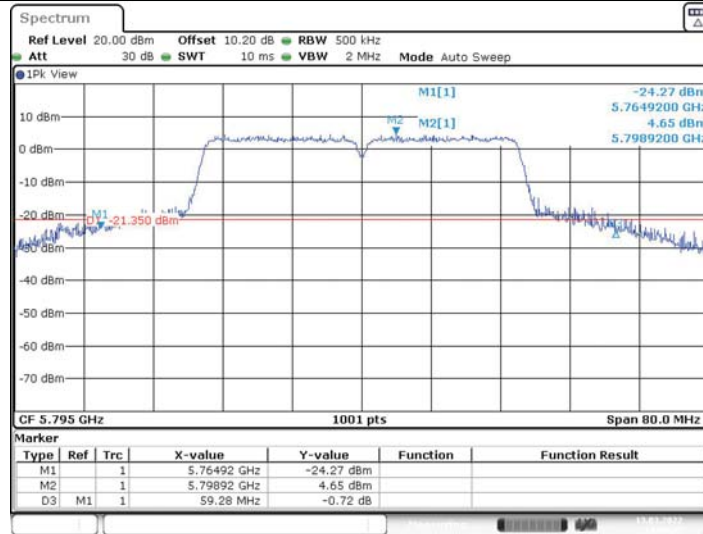


11N40MIMO_Ant2_5755

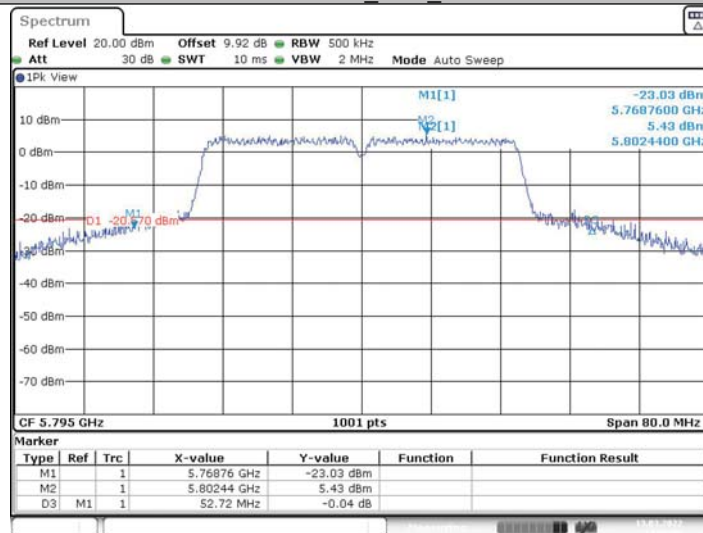




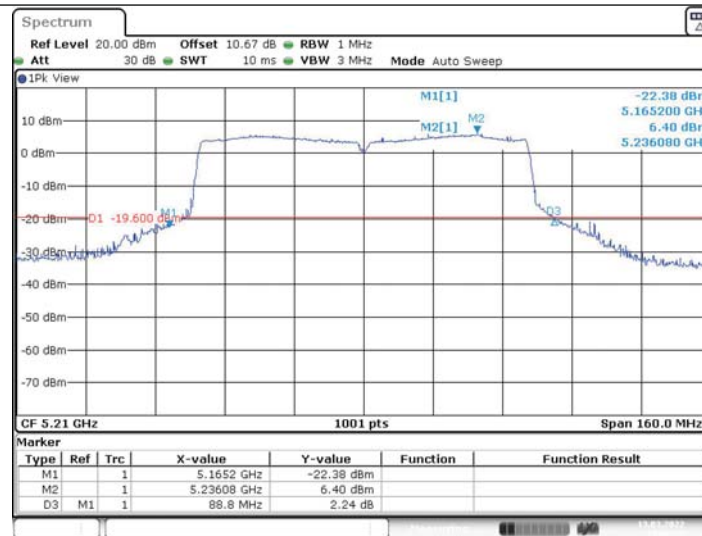
11N40MIMO_Ant1_5795



11N40MIMO_Ant2_5795



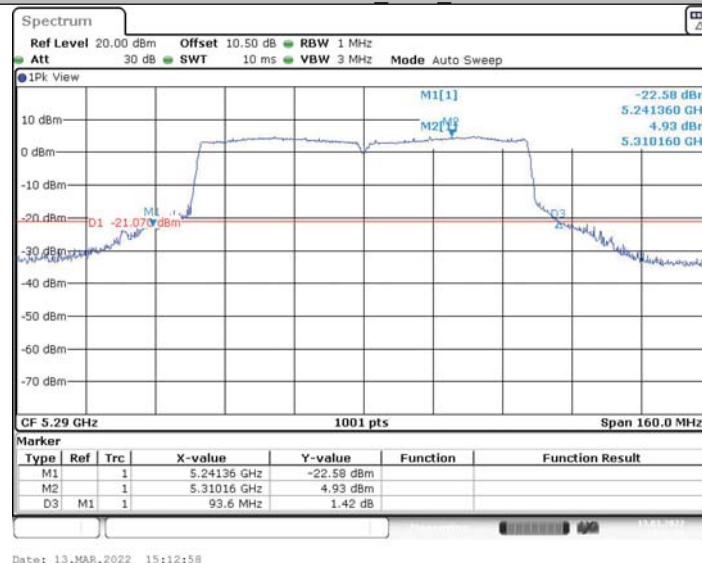
11AC80MIMO_Ant1_5210



11AC80MIMO_Ant2_5210

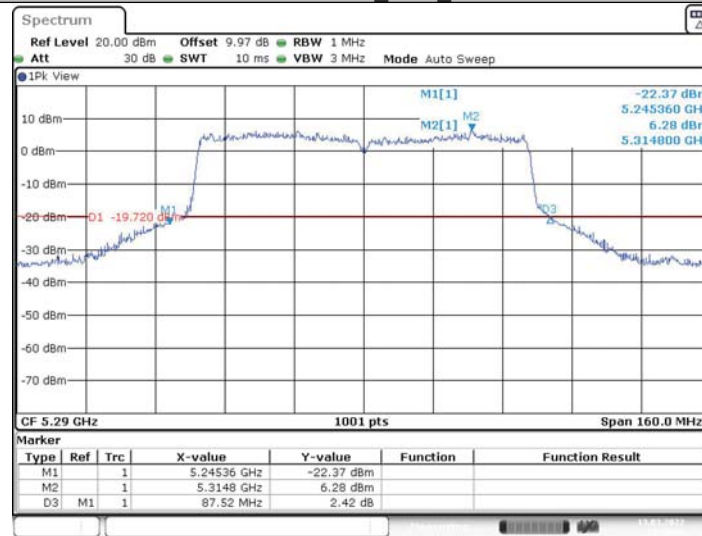


11AC80MIMO_Ant1_5290

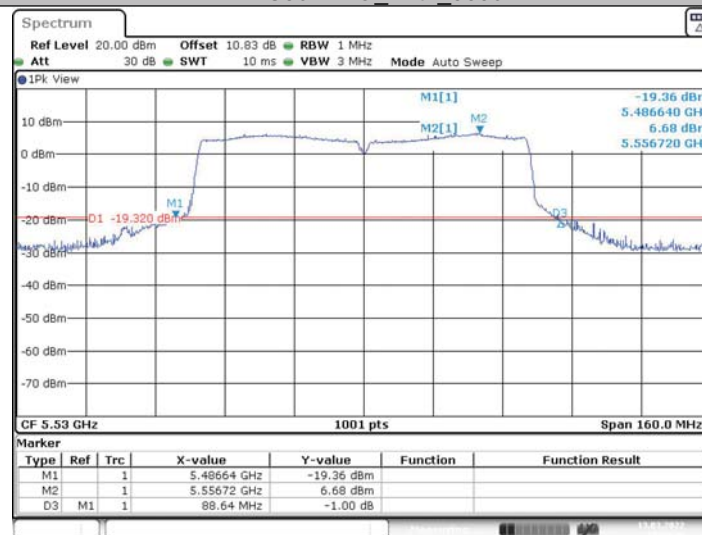




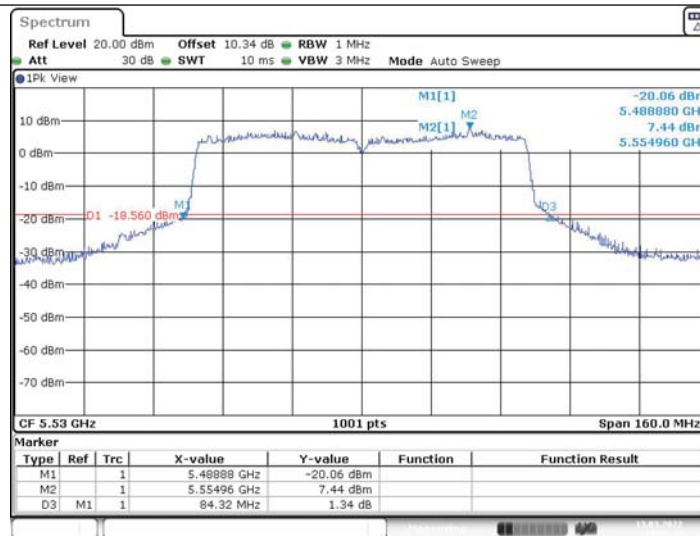
11AC80MIMO_Ant2_5290



11AC80MIMO_Ant1_5530

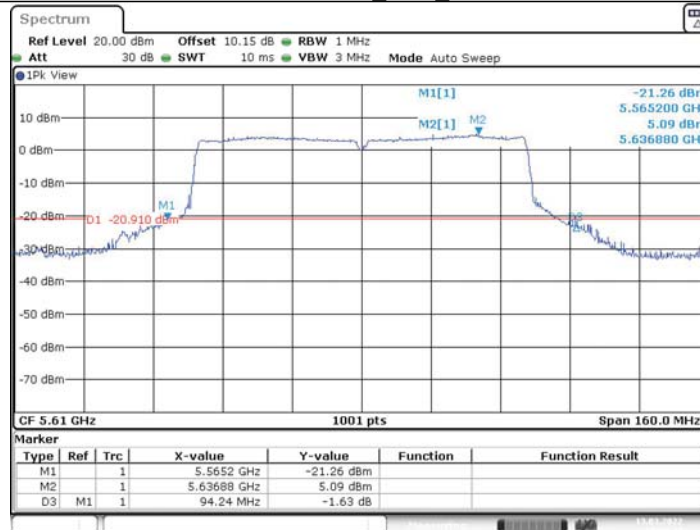


11AC80MIMO_Ant2_5530



Date: 13.MAR.2022 15:29:17

11AC80MIMO_Ant1_5610



Date: 13.MAR.2022 15:34:32

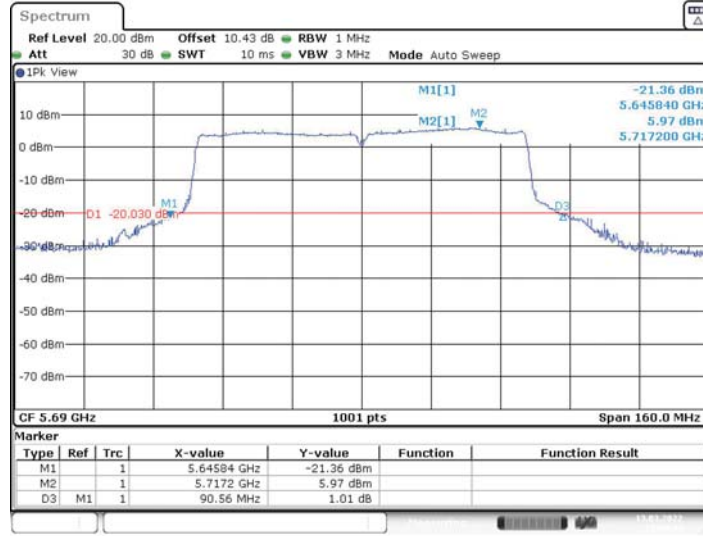
11AC80MIMO_Ant2_5610



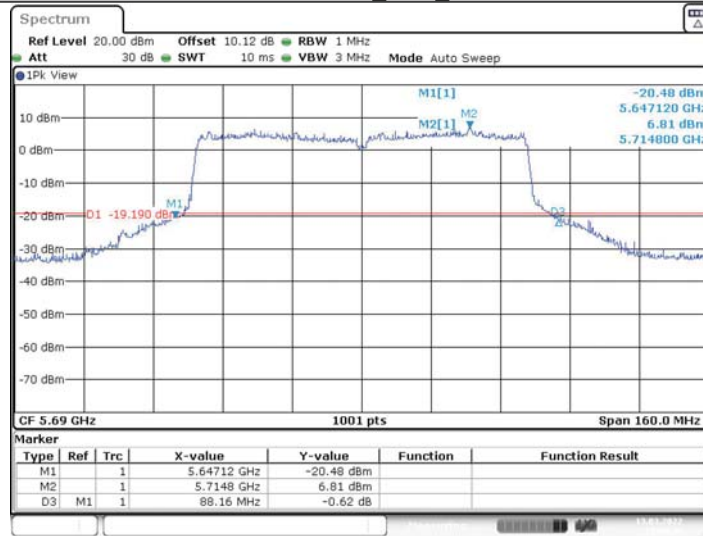
Date: 13.MAR.2022 15:39:35



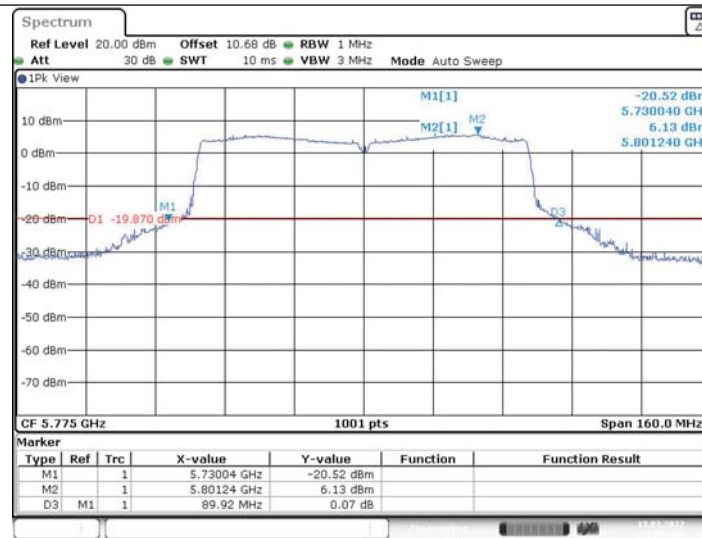
11AC80MIMO_Ant1_5690



11AC80MIMO_Ant2_5690

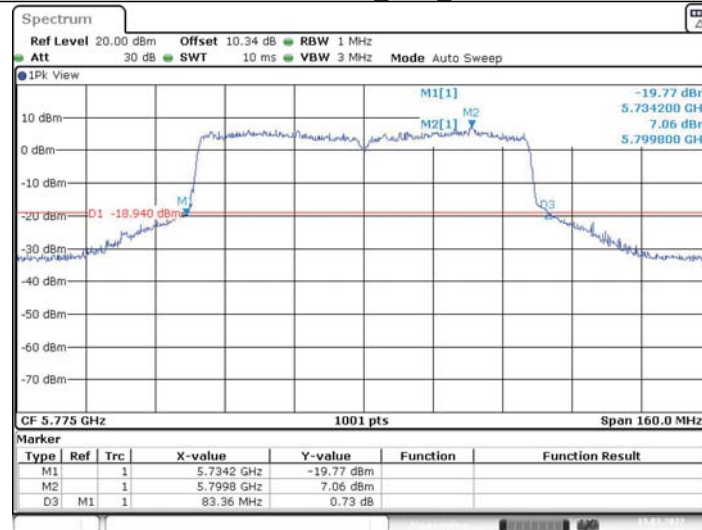


11AC80MIMO_Ant1_5775



Date: 13.MAR.2022 15:56:59

11AC80MIMO_Ant2_5775



Date: 13.MAR.2022 16:02:42



5.2 Appendix B: 6DB EMISSION BANDWIDTH

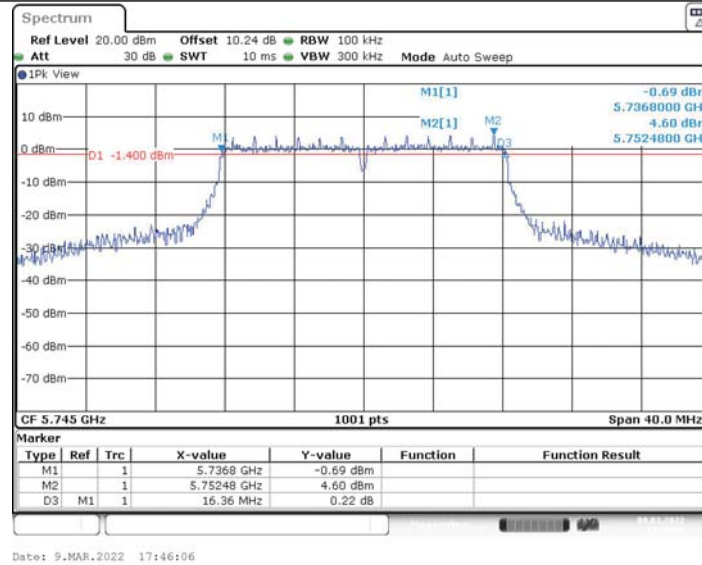
5.2.1 Test Result

TestMode	Antenna	Frequency[MHz]	6db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5745	16.36	5736.80	5753.16	0.5	PASS
	Ant2	5745	16.36	5736.80	5753.16	0.5	PASS
	Ant1	5785	16.36	5776.80	5793.16	0.5	PASS
	Ant2	5785	16.36	5776.80	5793.16	0.5	PASS
	Ant1	5825	16.36	5816.80	5833.16	0.5	PASS
	Ant2	5825	16.36	5816.80	5833.16	0.5	PASS
11N20MIMO	Ant1	5745	17.32	5736.44	5753.76	0.5	PASS
	Ant2	5745	17.56	5736.20	5753.76	0.5	PASS
	Ant1	5785	17.32	5776.44	5793.76	0.5	PASS
	Ant2	5785	17.52	5776.24	5793.76	0.5	PASS
	Ant1	5825	17.56	5816.20	5833.76	0.5	PASS
	Ant2	5825	17.56	5816.20	5833.76	0.5	PASS
11N40MIMO	Ant1	5755	36.32	5736.84	5773.16	0.5	PASS
	Ant2	5755	36.32	5736.84	5773.16	0.5	PASS
	Ant1	5795	36.32	5776.84	5813.16	0.5	PASS
	Ant2	5795	36.32	5776.84	5813.16	0.5	PASS
11AC80MIMO	Ant1	5775	75.52	5737.24	5812.76	0.5	PASS
	Ant2	5775	75.84	5737.08	5812.92	0.5	PASS

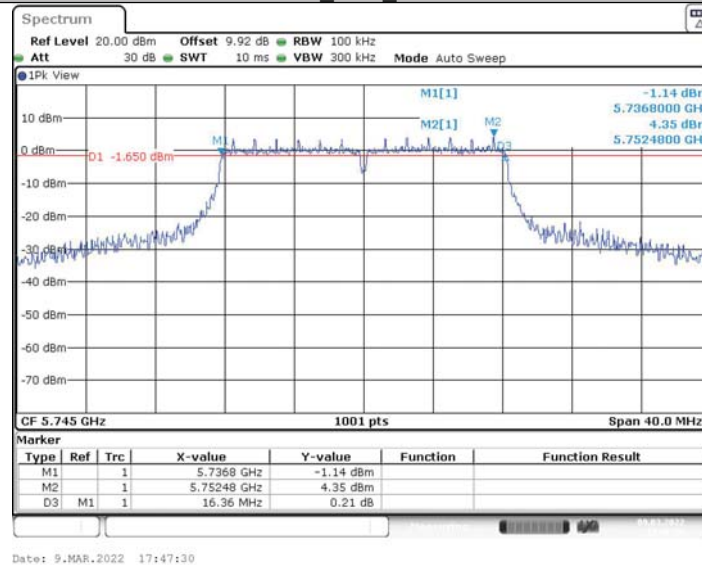


5.2.2 Test Graphs

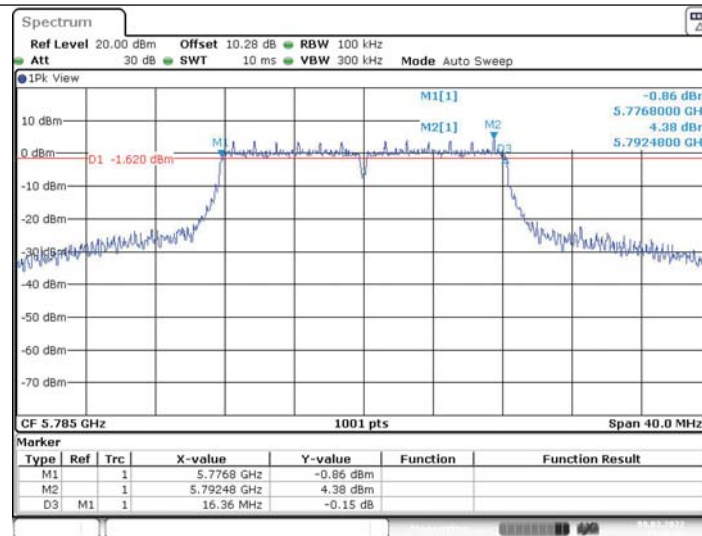
11A_Ant1_5745



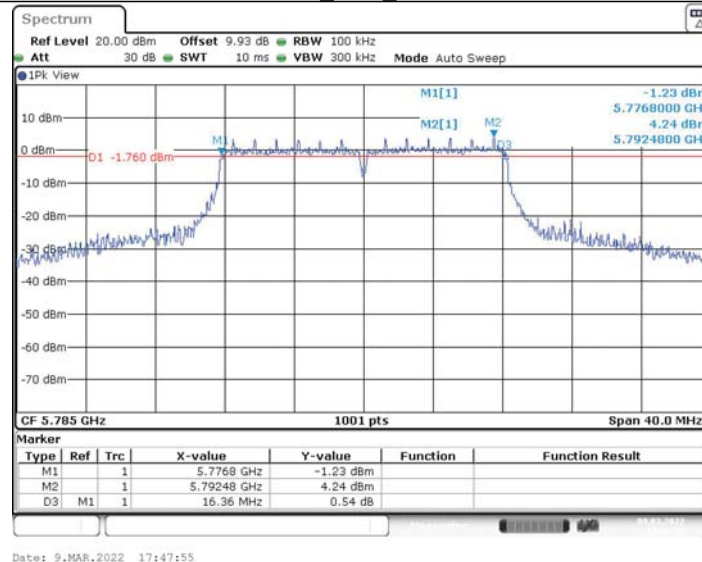
11A_Ant2_5745



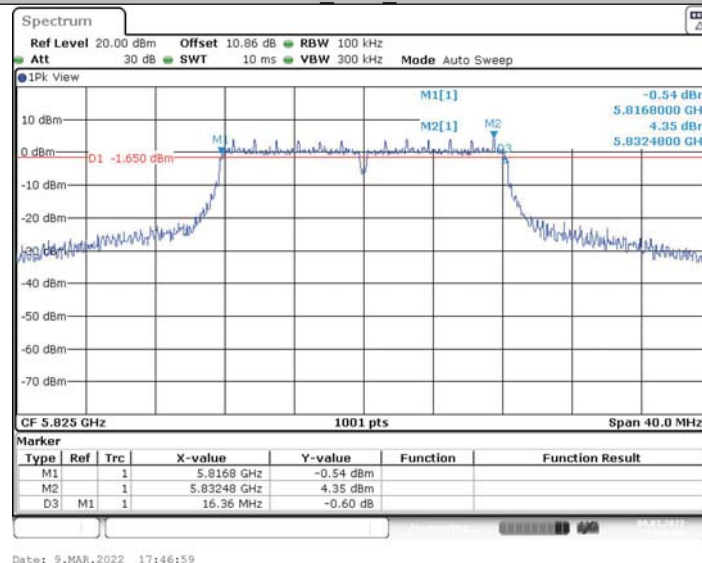
11A_Ant1_5785



11A_Ant2_5785

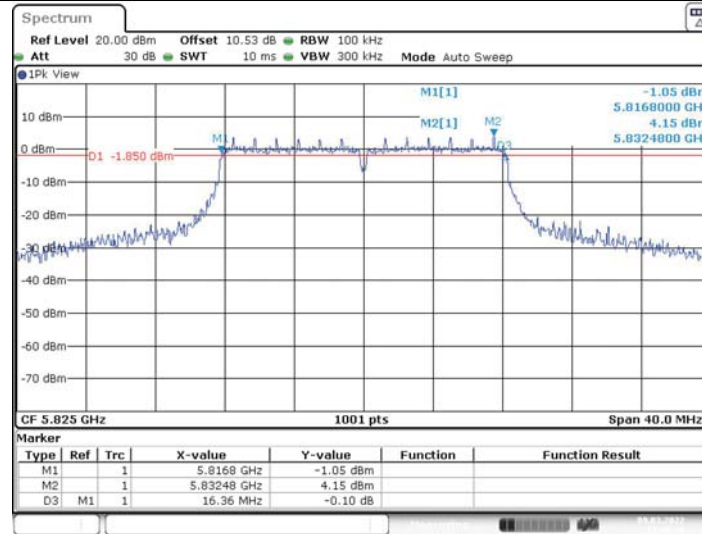


11A_Ant1_5825

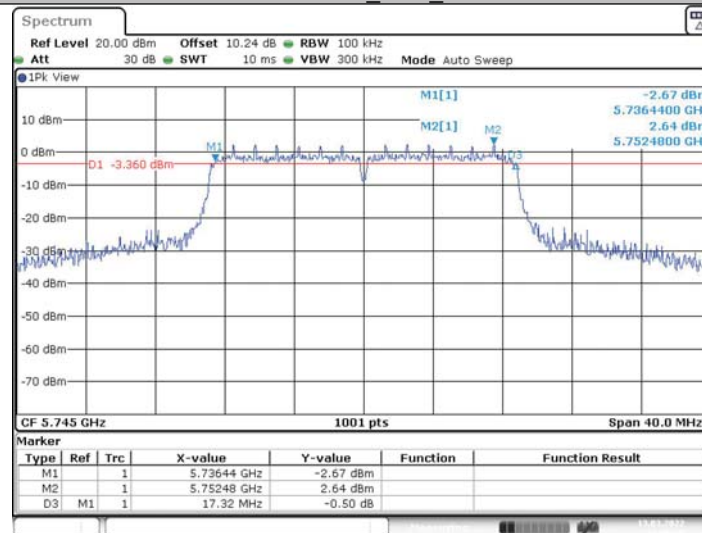




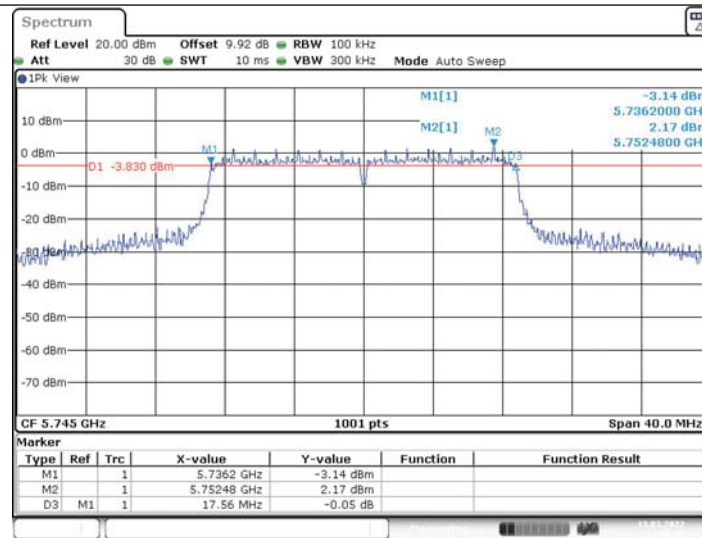
11A_Ant2_5825



11N20MIMO_Ant1_5745

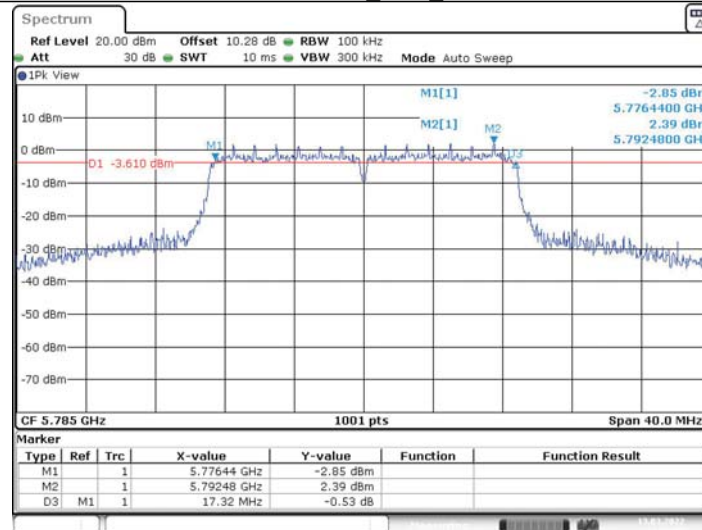


11N20MIMO_Ant2_5745



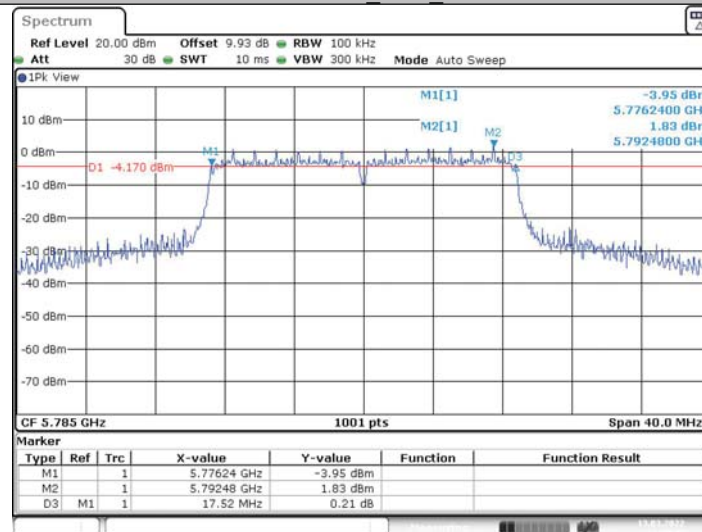
Date: 13.MAR.2022 11:36:43

11N20MIMO_Ant1_5785



Date: 13.MAR.2022 11:37:08

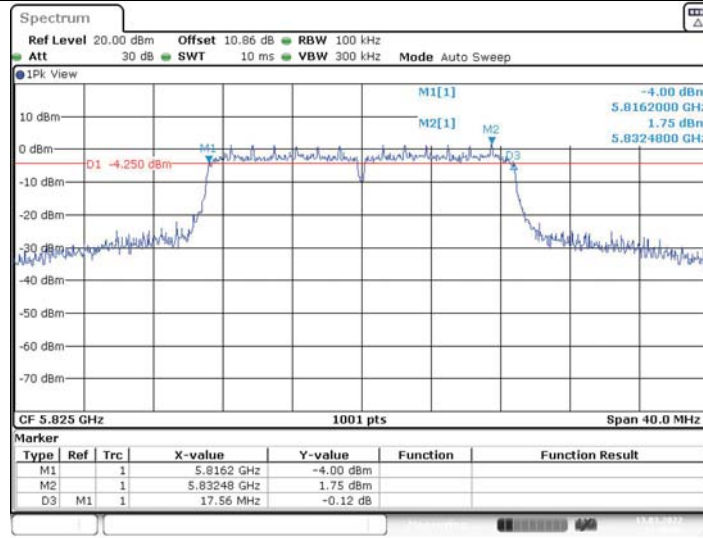
11N20MIMO_Ant2_5785



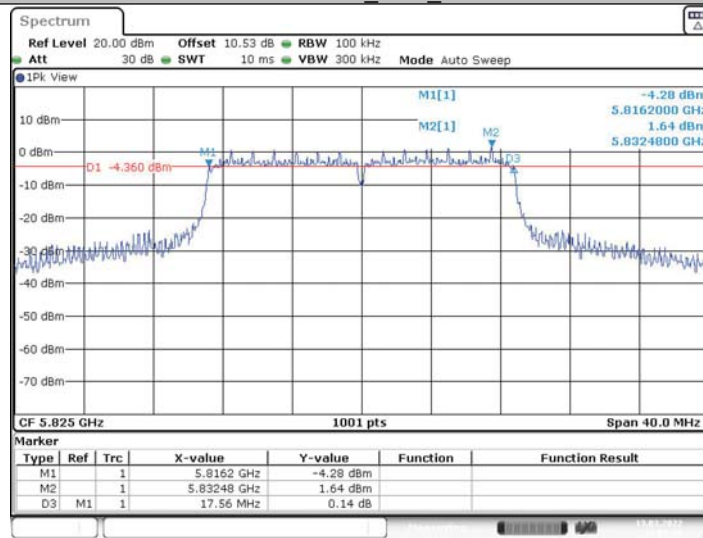
Date: 13.MAR.2022 11:40:47



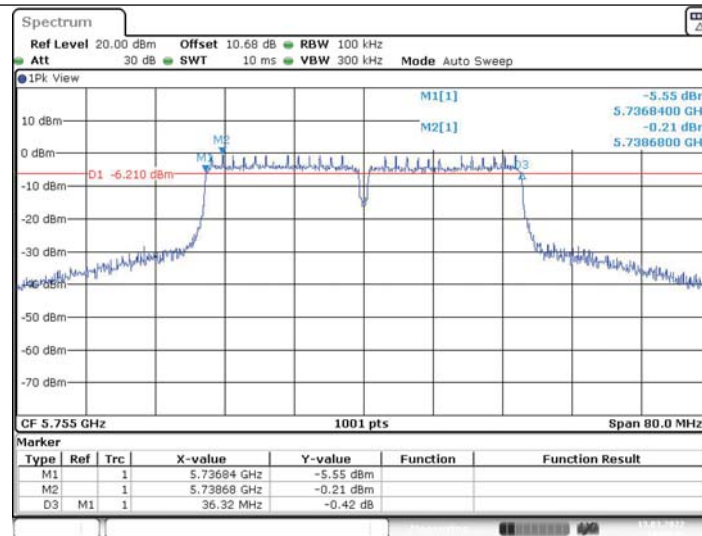
11N20MIMO_Ant1_5825



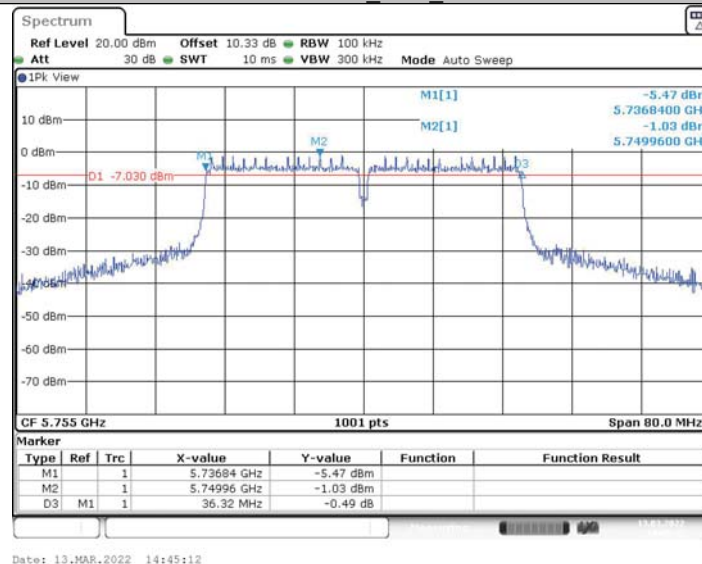
11N20MIMO_Ant2_5825



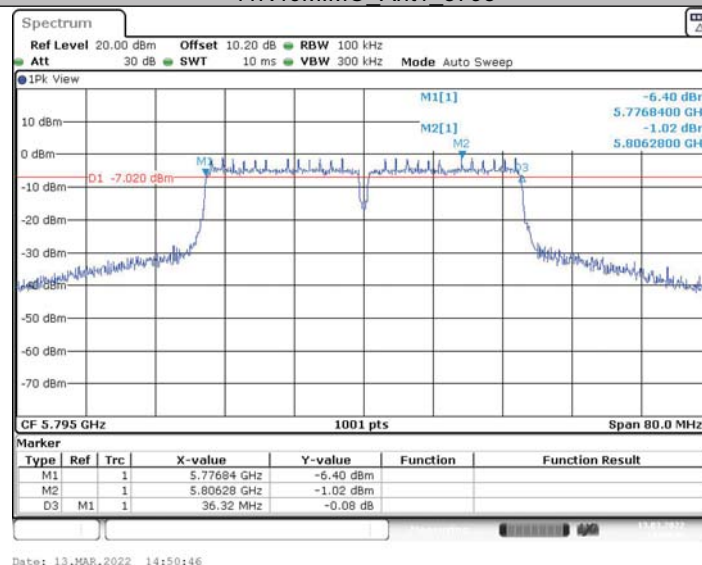
11N40MIMO_Ant1_5755



11N40MIMO_Ant2_5755

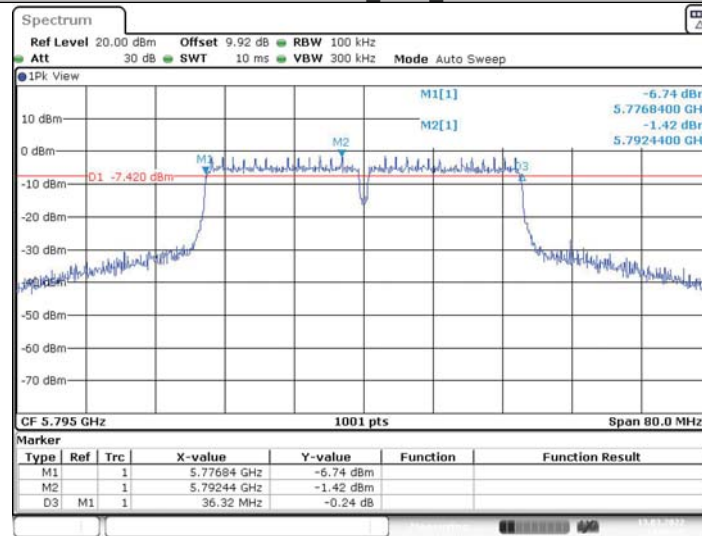


11N40MIMO_Ant1_5795

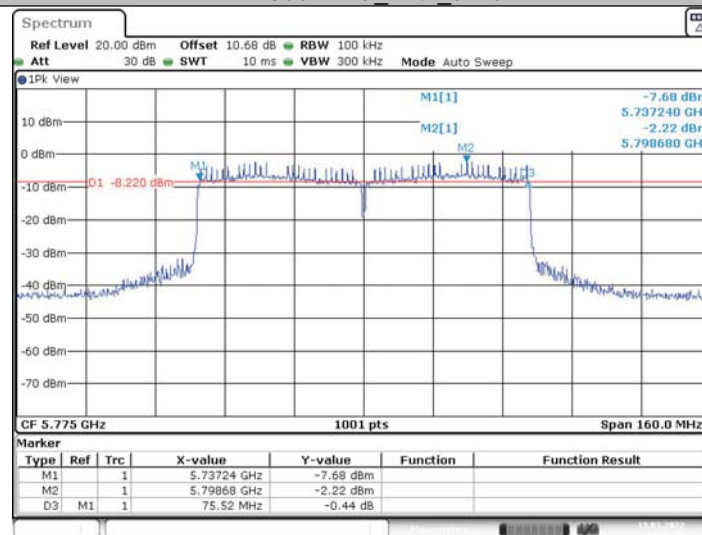




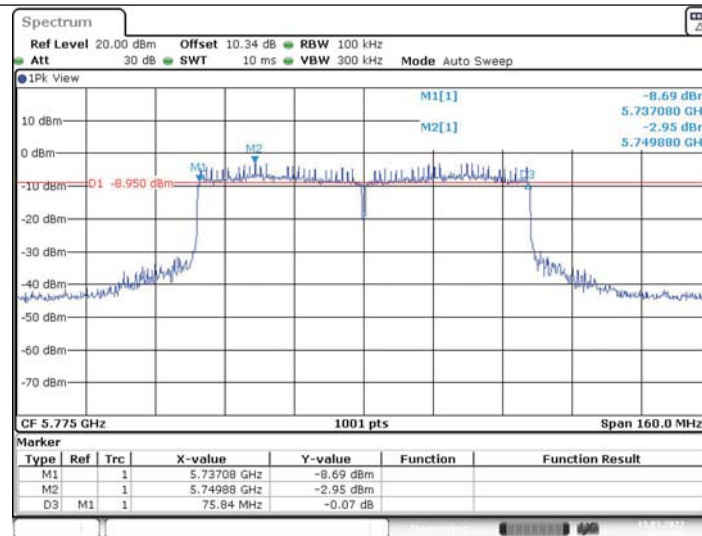
11N40MIMO_Ant2_5795



11AC80MIMO_Ant1_5775



11AC80MIMO_Ant2_5775



Date: 13.MAR.2022 16:03:01



5.3 Appendix D: TRANSMIT POWER MEASUREMENT

5.3.1 Test Result

Test Mode	Antenna	Frequency[MHz]	Set Power	Channel Power [dBm]	Limit [dBm]	Verdict
11A	Ant1	5180	---	15.70	≤23.98	PASS
	Ant2	5180	---	15.65	≤23.98	PASS
	Ant1	5200	---	15.81	≤23.98	PASS
	Ant2	5200	---	16.05	≤23.98	PASS
	Ant1	5240	---	15.68	≤23.98	PASS
	Ant2	5240	---	16.06	≤23.98	PASS
	Ant1	5260	---	15.55	≤23.98	PASS
	Ant2	5260	---	15.94	≤23.98	PASS
	Ant1	5280	---	15.08	≤23.98	PASS
	Ant2	5280	---	15.61	≤23.98	PASS
	Ant1	5320	---	15.02	≤23.98	PASS
	Ant2	5320	---	15.87	≤23.98	PASS
	Ant1	5500	---	16.48	≤23.98	PASS
	Ant2	5500	---	16.67	≤23.98	PASS
	Ant1	5580	---	16.02	≤23.98	PASS
	Ant2	5580	---	16.32	≤23.98	PASS
	Ant1	5700	---	15.97	≤23.98	PASS
	Ant2	5700	---	15.38	≤23.98	PASS
	Ant1	5720_UNII-2C	---	15.06	≤23.98	PASS
	Ant2	5720_UNII-2C	---	14.65	≤23.85	PASS
	Ant1	5720_UNII-3	---	9.09	≤30.00	PASS
	Ant2	5720_UNII-3	---	8.38	≤30.00	PASS
	Ant1	5745	---	15.82	≤30.00	PASS
	Ant2	5745	---	15.36	≤30.00	PASS
	Ant1	5785	---	15.63	≤30.00	PASS
	Ant2	5785	---	15.18	≤30.00	PASS
	Ant1	5825	---	15.66	≤30.00	PASS
	Ant2	5825	---	14.93	≤30.00	PASS
11N20MIMO	Ant1	5180	---	13.52	≤23.60	PASS
	Ant2	5180	---	13.65	≤23.60	PASS
	total	5180	---	---	≤23.60	PASS
	Ant1	5200	---	13.17	≤23.60	PASS
	Ant2	5200	---	13.45	≤23.60	PASS
	total	5200	---	---	≤23.60	PASS
	Ant1	5240	---	12.98	≤23.60	PASS
	Ant2	5240	---	13.46	≤23.60	PASS
	total	5240	---	---	≤23.60	PASS
	Ant1	5260	---	12.89	≤23.60	PASS
	Ant2	5260	---	13.09	≤23.60	PASS
	total	5260	---	---	≤23.60	PASS
	Ant1	5280	---	12.51	≤23.60	PASS
	Ant2	5280	---	12.58	≤23.60	PASS
	total	5280	---	---	≤23.60	PASS
	Ant1	5320	---	12.33	≤23.60	PASS
	Ant2	5320	---	12.88	≤23.60	PASS
	total	5320	---	---	≤23.60	PASS
	Ant1	5500	---	14.04	≤23.60	PASS
	Ant2	5500	---	13.94	≤23.60	PASS
	total	5500	---	---	≤23.60	PASS



	Ant1	5580	---	13.44	≤23.60	PASS
	Ant2	5580	---	13.23	≤23.60	PASS
	total	5580	---	---	≤23.60	PASS
	Ant1	5700	---	13.94	≤23.60	PASS
	Ant2	5700	---	13.47	≤23.60	PASS
	total	5700	---	---	≤23.60	PASS
	Ant1	5720_UNII-2C	---	12.74	≤23.60	PASS
	Ant2	5720_UNII-2C	---	12.24	≤23.60	PASS
	total	5720_UNII-2C	---	---	≤23.60	PASS
	Ant1	5720_UNII-3	---	6.65	≤29.62	PASS
	Ant2	5720_UNII-3	---	6.48	≤29.62	PASS
	total	5720_UNII-3	---	---	≤29.62	PASS
	Ant1	5745	---	13.26	≤29.62	PASS
	Ant2	5745	---	12.54	≤29.62	PASS
	total	5745	---	---	≤29.62	PASS
	Ant1	5785	---	12.72	≤29.62	PASS
	Ant2	5785	---	12.28	≤29.62	PASS
	total	5785	---	---	≤29.62	PASS
	Ant1	5825	---	12.66	≤29.62	PASS
	Ant2	5825	---	12.17	≤29.62	PASS
	total	5825	---	---	≤29.62	PASS
11N40MIMO	Ant1	5190	---	13.12	≤23.60	PASS
	Ant2	5190	---	12.25	≤23.60	PASS
	total	5190	---	---	≤23.60	PASS
	Ant1	5230	---	12.33	≤23.60	PASS
	Ant2	5230	---	12.90	≤23.60	PASS
	total	5230	---	---	≤23.60	PASS
	Ant1	5270	---	12.48	≤23.60	PASS
	Ant2	5270	---	12.00	≤23.60	PASS
	total	5270	---	---	≤23.60	PASS
	Ant1	5310	---	12.47	≤23.60	PASS
	Ant2	5310	---	12.59	≤23.60	PASS
	total	5310	---	---	≤23.60	PASS
	Ant1	5510	---	13.39	≤23.60	PASS
	Ant2	5510	---	13.33	≤23.60	PASS
	total	5510	---	---	≤23.60	PASS
	Ant1	5550	---	13.33	≤23.60	PASS
	Ant2	5550	---	13.29	≤23.60	PASS
	total	5550	---	---	≤23.60	PASS
	Ant1	5670	---	13.56	≤23.60	PASS
	Ant2	5670	---	13.79	≤23.60	PASS
	total	5670	---	---	≤23.60	PASS
	Ant1	5710_UNII-2C	---	12.89	≤23.60	PASS
	Ant2	5710_UNII-2C	---	14.08	≤23.60	PASS
	total	5710_UNII-2C	---	---	≤23.60	PASS
	Ant1	5710_UNII-3	---	2.37	≤29.62	PASS
	Ant2	5710_UNII-3	---	-1.56	≤29.62	PASS
	total	5710_UNII-3	---	---	≤29.62	PASS
	Ant1	5755	---	13.34	≤29.62	PASS
	Ant2	5755	---	12.73	≤29.62	PASS
	total	5755	---	---	≤29.62	PASS
	Ant1	5795	---	12.72	≤29.62	PASS
	Ant2	5795	---	12.28	≤29.62	PASS
	total	5795	---	---	≤29.62	PASS



11AC80MIMO	Ant1	5210	---	13.01	≤23.60	PASS
	Ant2	5210	---	12.18	≤23.60	PASS
	total	5210	---	---	≤23.60	PASS
	Ant1	5290	---	12.36	≤23.60	PASS
	Ant2	5290	---	11.91	≤23.60	PASS
	total	5290	---	---	≤23.60	PASS
	Ant1	5530	---	13.55	≤23.60	PASS
	Ant2	5530	---	12.73	≤23.60	PASS
	total	5530	---	---	≤23.60	PASS
	Ant1	5610	---	12.19	≤23.60	PASS
	Ant2	5610	---	11.83	≤23.60	PASS
	total	5610	---	---	≤23.60	PASS
	Ant1	5690_UNII-2C	---	12.93	≤23.60	PASS
	Ant2	5690_UNII-2C	---	12.04	≤23.60	PASS
	total	5690_UNII-2C	---	---	≤23.60	PASS
	Ant1	5690_UNII-3	---	-1.29	≤29.62	PASS
	Ant2	5690_UNII-3	---	-2.26	≤29.62	PASS
	total	5690_UNII-3	---	---	≤29.62	PASS
	Ant1	5775	---	12.92	≤29.62	PASS
	Ant2	5775	---	12.31	≤29.62	PASS
	total	5775	---	---	≤29.62	PASS

Directional gain and the maximum output power limit:

Operation Band	Chain 0 Antenna Gain(dBi)	Chain 1 Antenna Gain(dBi)	DG For Power (dBi)	Power Limit Reduction
U-NII-1	3.37	3.37	6.38	0.38
U-NII-2A	3.37	3.37	6.38	0.38
U-NII-2C	3.37	3.37	6.38	0.38
U-NII-3	3.37	3.37	6.38	0.38

Refer to KDB662911 D01 Multiple Transmitter Output v02r01.

d) *Unequal antenna gains, with equal transmit powers.* For antenna gains given by G_1, G_2, \dots, G_N dBi

(i) If transmit signals are *correlated*, then

Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{\text{ANT}}]$ dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

(ii) If all transmit signals are *completely uncorrelated*, then

Directional gain = $10 \log[(10^{G_1/10} + 10^{G_2/10} + \dots + 10^{G_N/10}) / N_{\text{ANT}}]$ dBi



5.4 Appendix E: POWER SPECTRAL DENSITY MEASUREMENT

5.4.1 Test Result

TestMode	Antenna	Frequency[MHz]	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11A	Ant1	5180	4.87	≤11.00	PASS
	Ant2	5180	4.57	≤11.00	PASS
	Ant1	5200	4.73	≤11.00	PASS
	Ant2	5200	4.82	≤11.00	PASS
	Ant1	5240	4.57	≤11.00	PASS
	Ant2	5240	5.01	≤11.00	PASS
	Ant1	5260	4.48	≤11.00	PASS
	Ant2	5260	4.89	≤11.00	PASS
	Ant1	5280	3.93	≤11.00	PASS
	Ant2	5280	4.56	≤11.00	PASS
	Ant1	5320	3.85	≤11.00	PASS
	Ant2	5320	4.76	≤11.00	PASS
	Ant1	5500	5.5	≤11.00	PASS
	Ant2	5500	5.56	≤11.00	PASS
	Ant1	5580	4.72	≤11.00	PASS
	Ant2	5580	5.02	≤11.00	PASS
	Ant1	5700	4.86	≤11.00	PASS
	Ant2	5700	4.19	≤11.00	PASS
	Ant1	5720_UNII-2C	5.03	≤11.00	PASS
	Ant2	5720_UNII-2C	4.38	≤11.00	PASS
	Ant1	5720_UNII-3	2.38	≤11.00	PASS
	Ant2	5720_UNII-3	1.51	≤11.00	PASS
	Ant1	5745	1.86	≤30.00	PASS
	Ant2	5745	1.37	≤30.00	PASS
	Ant1	5785	1.66	≤30.00	PASS
	Ant2	5785	1.22	≤30.00	PASS
	Ant1	5825	1.51	≤30.00	PASS
	Ant2	5825	0.8	≤30.00	PASS
11N20MIMO	Ant1	5180	2.09	≤10.62	PASS
	Ant2	5180	4.06	≤10.62	PASS
	total	5180	6.20	≤10.62	PASS
	Ant1	5200	1.85	≤10.62	PASS
	Ant2	5200	2.38	≤10.62	PASS
	total	5200	5.13	≤10.62	PASS
	Ant1	5240	1.58	≤10.62	PASS
	Ant2	5240	3.33	≤10.62	PASS
	total	5240	5.55	≤10.62	PASS
	Ant1	5260	1.6	≤10.62	PASS
	Ant2	5260	2.24	≤10.62	PASS
	total	5260	4.94	≤10.62	PASS
	Ant1	5280	1.11	≤10.62	PASS
	Ant2	5280	1.57	≤10.62	PASS
	total	5280	4.36	≤10.62	PASS
	Ant1	5320	0.96	≤10.62	PASS
	Ant2	5320	1.57	≤10.62	PASS
	total	5320	4.29	≤10.62	PASS
	Ant1	5500	2.88	≤10.62	PASS
	Ant2	5500	2.74	≤10.62	PASS



	total	5500	5.82	≤10.62	PASS
	Ant1	5580	2.04	≤10.62	PASS
	Ant2	5580	1.88	≤10.62	PASS
	total	5580	4.97	≤10.62	PASS
	Ant1	5700	2.69	≤10.62	PASS
	Ant2	5700	2.15	≤10.62	PASS
	total	5700	5.44	≤10.62	PASS
	Ant1	5720_UNII-2C	2.48	≤10.62	PASS
	Ant2	5720_UNII-2C	1.94	≤10.62	PASS
	total	5720_UNII-2C	5.23	≤10.62	PASS
	Ant1	5720_UNII-3	-0.71	≤10.62	PASS
	Ant2	5720_UNII-3	-0.91	≤10.62	PASS
	total	5720_UNII-3	2.20	≤10.62	PASS
	Ant1	5745	-0.95	≤29.62	PASS
	Ant2	5745	-1.57	≤29.62	PASS
	total	5745	1.76	≤29.62	PASS
	Ant1	5785	-1.36	≤29.62	PASS
	Ant2	5785	-1.72	≤29.62	PASS
	total	5785	1.47	≤29.62	PASS
	Ant1	5825	-1.53	≤29.62	PASS
	Ant2	5825	-1.95	≤29.62	PASS
	total	5825	1.28	≤29.62	PASS
11N40MIMO	Ant1	5190	0.2	≤10.62	PASS
	Ant2	5190	-1.49	≤10.62	PASS
	total	5190	2.45	≤10.62	PASS
	Ant1	5230	-1.58	≤10.62	PASS
	Ant2	5230	1.18	≤10.62	PASS
	total	5230	3.03	≤10.62	PASS
	Ant1	5270	-1.12	≤10.62	PASS
	Ant2	5270	-1.12	≤10.62	PASS
	total	5270	1.89	≤10.62	PASS
	Ant1	5310	-1.45	≤10.62	PASS
	Ant2	5310	0.24	≤10.62	PASS
	total	5310	2.49	≤10.62	PASS
	Ant1	5510	-0.56	≤10.62	PASS
	Ant2	5510	0.53	≤10.62	PASS
	total	5510	3.03	≤10.62	PASS
	Ant1	5550	-0.37	≤10.62	PASS
	Ant2	5550	1.18	≤10.62	PASS
	total	5550	3.48	≤10.62	PASS
	Ant1	5670	0.29	≤10.62	PASS
	Ant2	5670	2.16	≤10.62	PASS
	total	5670	4.34	≤10.62	PASS
	Ant1	5710_UNII-2C	-0.73	≤10.62	PASS
	Ant2	5710_UNII-2C	3.83	≤10.62	PASS
	total	5710_UNII-2C	5.13	≤10.62	PASS
	Ant1	5710_UNII-3	-3.71	≤10.62	PASS
	Ant2	5710_UNII-3	-7.4	≤10.62	PASS
	total	5710_UNII-3	-2.16	≤10.62	PASS
	Ant1	5755	-3.29	≤29.62	PASS
	Ant2	5755	-4.08	≤29.62	PASS
	total	5755	-0.66	≤29.62	PASS
	Ant1	5795	-4.2	≤29.62	PASS
	Ant2	5795	-4.72	≤29.62	PASS



	total	5795	-1.44	≤29.62	PASS
11AC80MIMO	Ant1	5210	-3.14	≤10.62	PASS
	Ant2	5210	-3.77	≤10.62	PASS
	total	5210	-0.43	≤10.62	PASS
	Ant1	5290	-3.91	≤10.62	PASS
	Ant2	5290	-4.07	≤10.62	PASS
	total	5290	-0.98	≤10.62	PASS
	Ant1	5530	-2.37	≤10.62	PASS
	Ant2	5530	-3.24	≤10.62	PASS
	total	5530	0.23	≤10.62	PASS
	Ant1	5610	-4.22	≤10.62	PASS
	Ant2	5610	-4.69	≤10.62	PASS
	total	5610	-1.44	≤10.62	PASS
	Ant1	5690_UNII-2C	-2.71	≤10.62	PASS
	Ant2	5690_UNII-2C	-3.93	≤10.62	PASS
	total	5690_UNII-2C	-0.27	≤10.62	PASS
	Ant1	5690_UNII-3	-6.43	≤10.62	PASS
	Ant2	5690_UNII-3	-7.24	≤10.62	PASS
	total	5690_UNII-3	-3.81	≤10.62	PASS
	Ant1	5775	-5.98	≤29.62	PASS
	Ant2	5775	-6.67	≤29.62	PASS
	total	5775	-3.30	≤29.62	PASS

Directional gain and the maximum output power limit:

Operation Band	Chain 0 Antenna Gain(dBi)	Chain 1 Antenna Gain(dBi)	DG For Power (dBi)	Power Limit Reduction
U-NII-1	3.37	3.37	6.38	0.38
U-NII-2A	3.37	3.37	6.38	0.38
U-NII-2C	3.37	3.37	6.38	0.38
U-NII-3	3.37	3.37	6.38	0.38

Refer to KDB662911 D01 Multiple Transmitter Output v02r01.

d) *Unequal antenna gains, with equal transmit powers.* For antenna gains given by G_1, G_2, \dots, G_N dBi

(i) If transmit signals are *correlated*, then

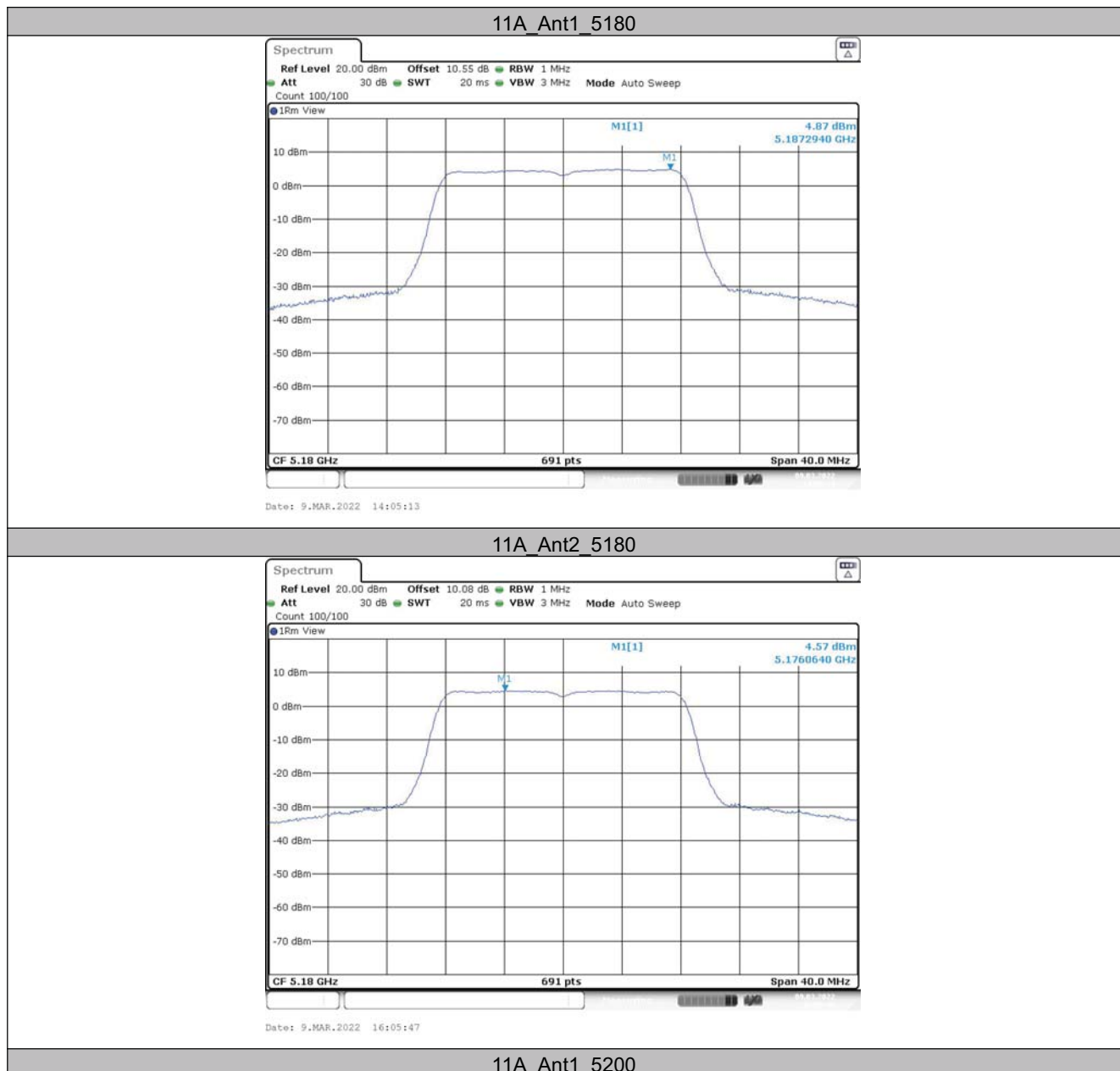
Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{\text{ANT}}]$ dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

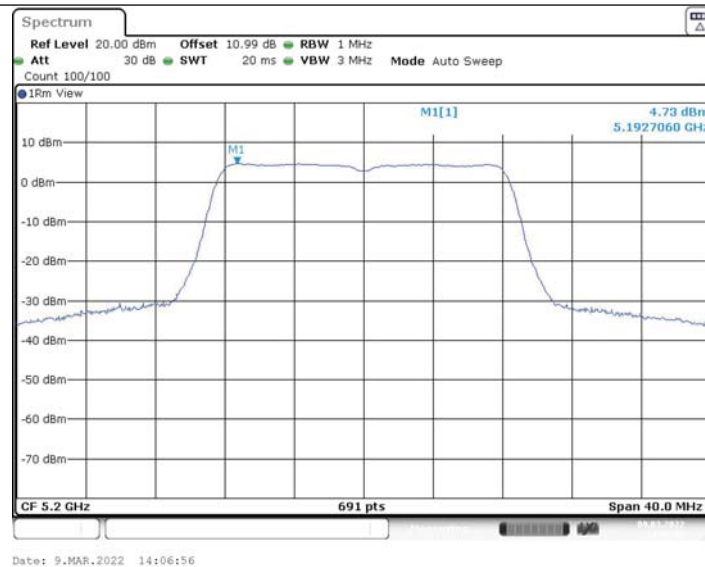
(ii) If all transmit signals are *completely uncorrelated*, then

Directional gain = $10 \log[(10^{G_1/10} + 10^{G_2/10} + \dots + 10^{G_N/10}) / N_{\text{ANT}}]$ dBi



5.4.2 Test Graphs

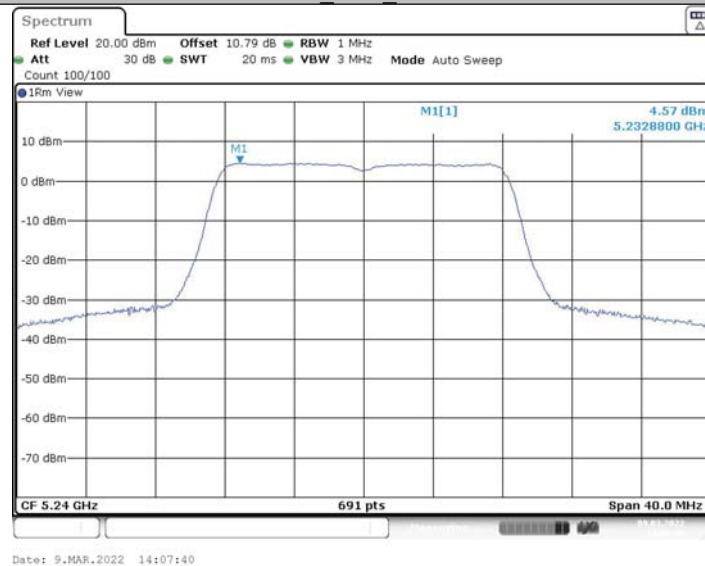




11A_Ant2_5200



11A_Ant1_5240



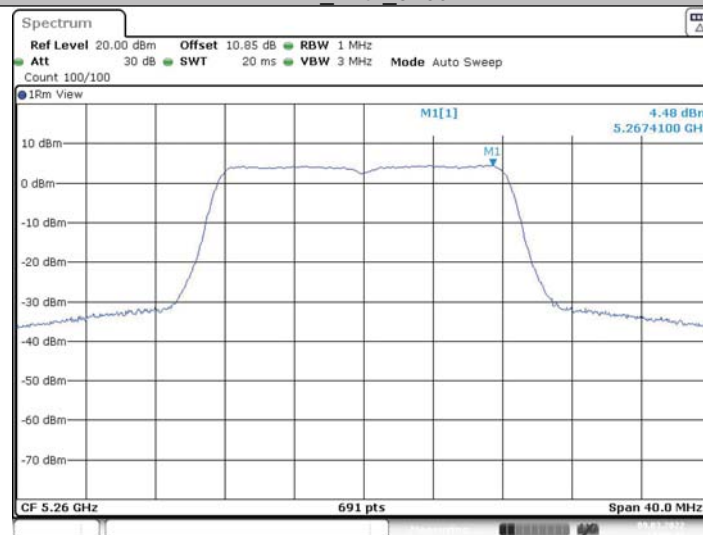


11A_Ant2_5240



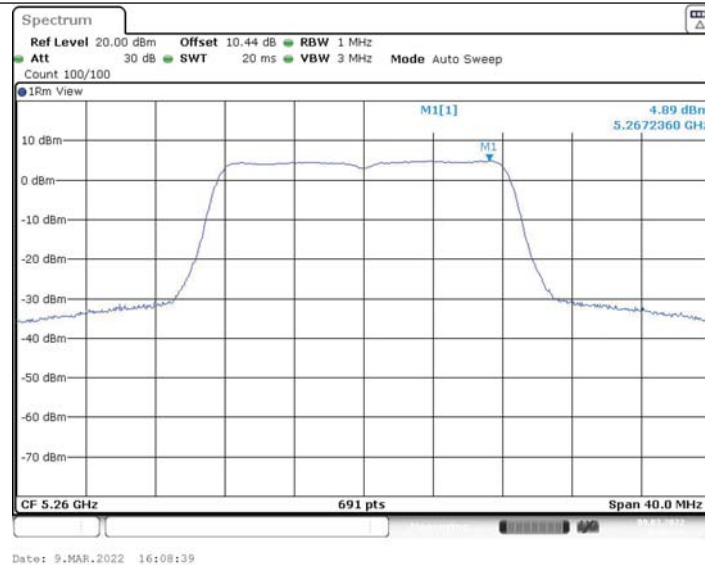
Date: 9.MAR.2022 16:07:56

11A_Ant1_5260

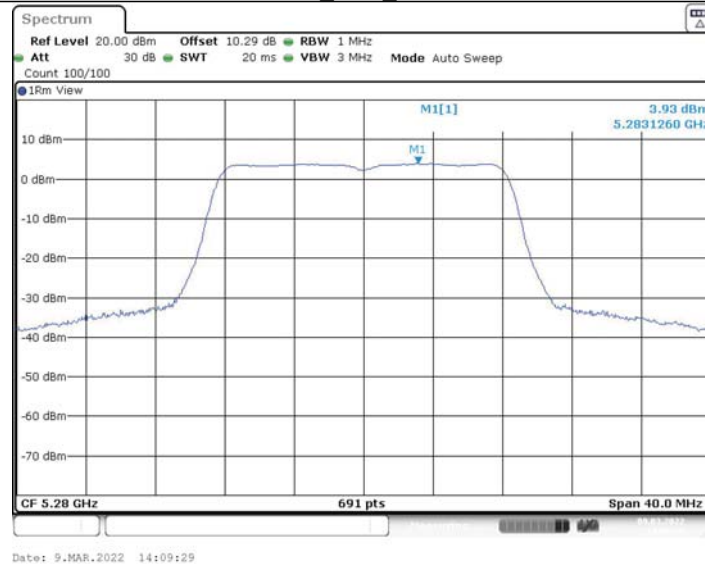


Date: 9.MAR.2022 14:08:41

11A_Ant2_5260



11A_Ant1_5280



11A_Ant2_5280

