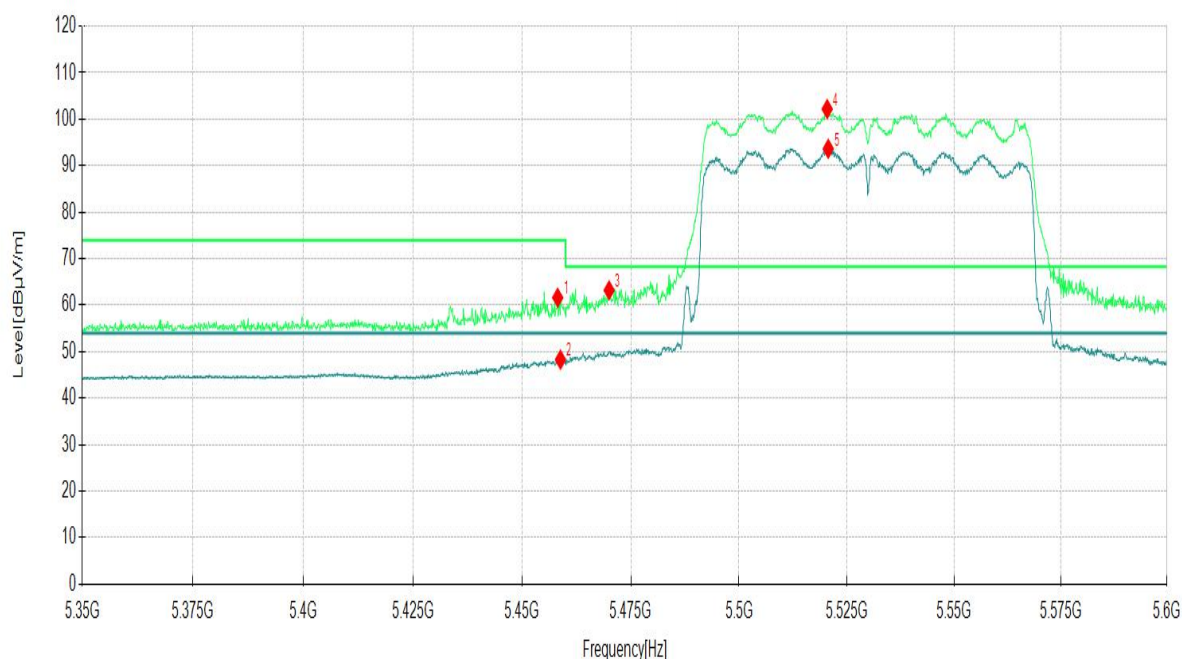




NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity
1	5458.179	51.67	9.94	61.61	74.00	12.39	104	202	PK	Vertical
2	5458.804	38.33	9.96	48.29	54.00	5.71	180	223	AV	Vertical
3	#5470.00	54.35	9.94	64.29	68.20	3.91	195	176	PK	Vertical
4	*5520.460	92.65	9.53	102.18			129	215	PK	Vertical
5	*5520.710	84.13	9.51	93.64			140	215	AV	Vertical
6	11060.00	37.81	15.05	52.86	74.00	21.14	189	252	PK	Vertical
7	11060.00	28.23	15.05	43.28	54.00	10.72	164	248	AV	Vertical
8	#16590.0	21.37	23.82	45.19	68.20	23.01	179	1	PK	Vertical

**REMARKS:**

1. Level (dBμV/m) = Reading (dBμV) + Factor (dB/m).
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin = Limit – Level
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.



CHANNEL	TX Channel 138	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity
1	11380.00	24.79	15.04	39.83	74.00	34.17	139	92	PK	Horizontal
2	11380.00	16.37	15.04	31.41	54.00	22.59	129	330	AV	Horizontal
3	#17070.0	19.97	25.86	45.83	68.20	22.37	189	82	PK	Horizontal

NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector	Polarity
1	11380.00	25.23	15.04	40.27	74.00	33.73	178	162	PK	Vertical
2	11380.00	16.76	15.04	31.80	54.00	22.20	112	282	AV	Vertical
3	#17070.0	19.18	25.86	45.04	68.20	23.16	145	181	PK	Vertical

REMARKS:

1. Level (dBμV/m) = Reading (dBμV) + Factor (dB/m).
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were less than 20dB margin against the limit.
4. Margin = Limit – Level
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

3.2 CONDUCTED EMISSION MEASUREMENT

3.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

3.2.2 TEST PROCEDURES

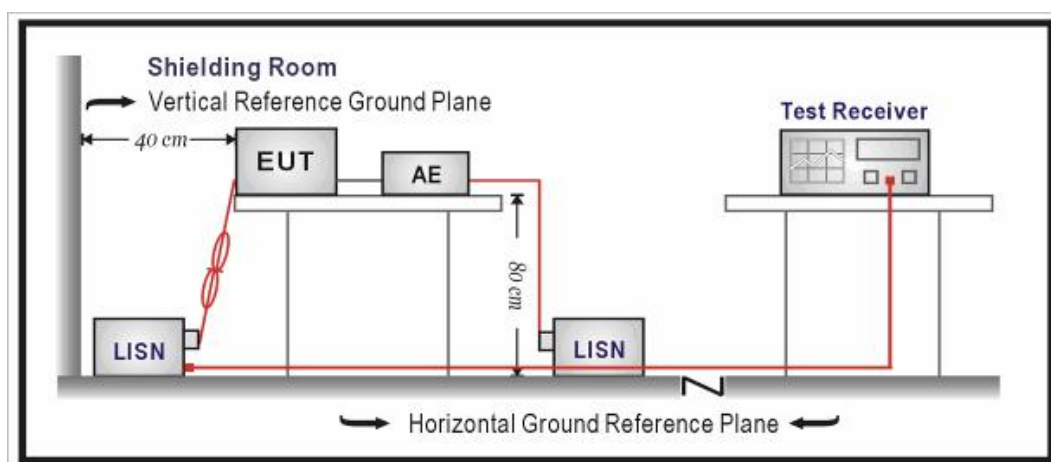
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

3.2.3 TEST SETUP



NOTE: For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.2.4 TEST RESULTS

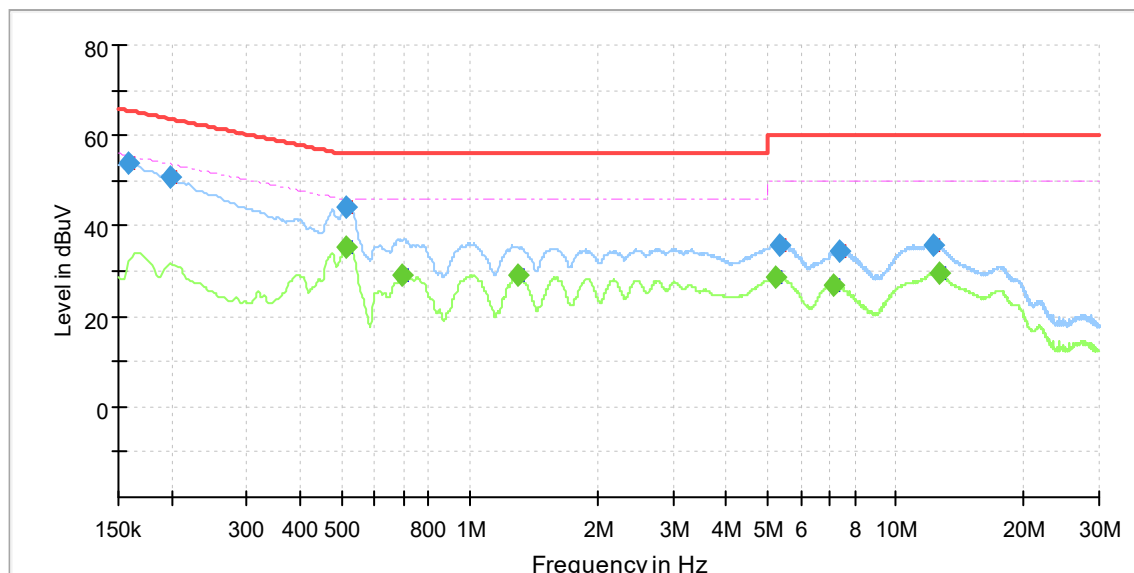
CONDUCTED WORST-CASE DATA: 802.11a

PHASE	Line	6dB BANDWIDTH	9kHz
-------	------	---------------	------

Frequency (MHz)	Emission Level		Limit (dBuV)	Margin (dB)	Correction Factor (dB)
	QuasiPeak (dBuV)	Average (dBuV)			
0.159	53.7	---	65.5	11.8	19.5
0.200	50.8	---	63.6	12.9	19.5
0.512	---	35.5	46.0	10.5	19.5
0.515	44.3	---	56.0	11.7	19.5
0.697	---	29.3	46.0	16.7	19.6
1.295	---	29.0	46.0	17.0	19.5
5.224	---	28.6	50.0	21.4	19.6
5.345	35.9	---	60.0	24.1	19.6
7.105	---	26.9	50.0	23.1	19.7
7.339	34.6	---	60.0	25.4	19.7
12.273	35.9	---	60.0	24.1	19.8
12.588	---	29.5	50.0	20.5	19.9

REMARKS:

1. The emission levels of other frequencies were very low against the limit.
2. Margin value = Limit - Emission level
3. Factor = Insertion loss + Cable loss

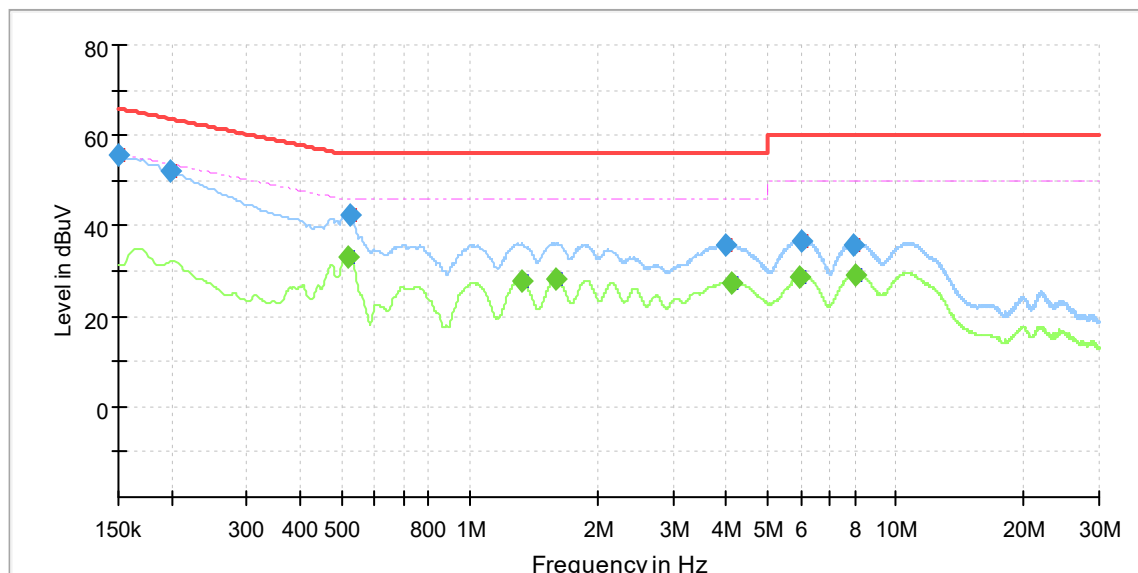


PHASE	Neutral	6dB BANDWIDTH	9kHz
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Frequency (MHz)	Emission Level		Limit (dBuV)	Margin (dB)	Correction Factor (dB)
	QuasiPeak (dBuV)	Average (dBuV)			
0.150	55.8	---	66.0	10.2	19.5
0.200	52.2	---	63.6	11.5	19.5
0.521	---	33.3	46.0	12.7	19.6
0.526	42.6	---	56.0	13.4	19.6
1.322	---	28.0	46.0	18.0	19.6
1.601	---	28.2	46.0	17.8	19.6
3.975	35.6	---	56.0	20.4	19.6
4.133	---	27.3	46.0	18.7	19.7
5.964	---	28.8	50.0	21.2	19.7
5.996	36.8	---	60.0	23.2	19.7
7.962	35.7	---	60.0	24.3	19.8
8.030	---	29.1	50.0	20.9	19.8

REMARKS:

1. The emission levels of other frequencies were very low against the limit.
2. Margin value = Limit - Emission level
3. Factor = Insertion loss + Cable loss

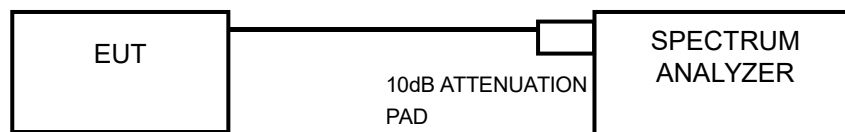


3.3 26DB EMISSION BANDWIDTH**3.3.1 LIMITS OF 26DB EMISSION BANDWIDTH**

This section is for reporting purpose only, there is on restriction limit of bandwidth

3.3.2 TEST PROCEDURES**FOR 26dB BANDWIDTH**

- 1) Set RBW = approximately 1% of the emission bandwidth.
- 2) Set the VBW > RBW.
- 3) Detector = Peak
- 4) Trace mode = max hold.
- 5) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

3.3.3 TEST SETUP**FOR 26dB BANDWIDTH****3.3.4 TEST RESULTS**

Refer to Appendix A

3.4 6DB EMISSION BANDWIDTH

3.4.1 LIMITS OF 6DB EMISSION BANDWIDTH

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

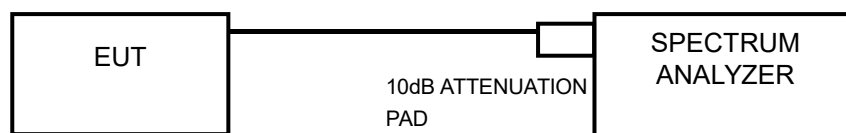
3.4.2 TEST PROCEDURES

FOR 6dB BANDWIDTH

- 1) Set RBW = 100 kHz.
- 2) Set the video bandwidth (VBW) ≥ 3 RBW.
- 3) Detector = Peak.
- 4) Trace mode = max hold.
- 5) Sweep = auto couple.
- 6) Allow the trace to stabilize.
- 7) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

3.4.3 TEST SETUP

FOR 6dB BANDWIDTH



3.4.4 TEST RESULTS

Refer to Appendix B



3.5 TRANSMIT POWER MEASUREMENT

3.5.1 LIMITS OF TRANSMIT POWER MEASUREMENT

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
		Mobile and Portable client device	250mW (24 dBm)
U-NII-2A	$\sqrt{\quad}$		250mW(24dBm) or 11 dBm+10LogB*
U-NII-2C	$\sqrt{\quad}$		250mW(24dBm) or 11 dBm+10LogB*
U-NII-3			1 Watt (30 dBm)

NOTE: 1. Where B is the 26dB emission bandwidth in MHz.

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-2A	4.95	4.95	4.95	0
U-NII-2C	4.95	4.95	4.95	0

MIMO mode:

FCC KDB 662911 D01 Multiple Transmitter Output V02r01

For CDD transmissions, directional gain is calculated as

Directional Gain= GANT+ Array Gain, where Array Gain is as follows.

For power spectral density(PSD) measurements on all devices.

Array Gain=10 log($N_{ANT}/N_{SS}=1$)

For power measurements on IEEE802.11 devices,

Array Gain=0 dB (i.e, no array gain) for $N_{ANT} \leq 4$.

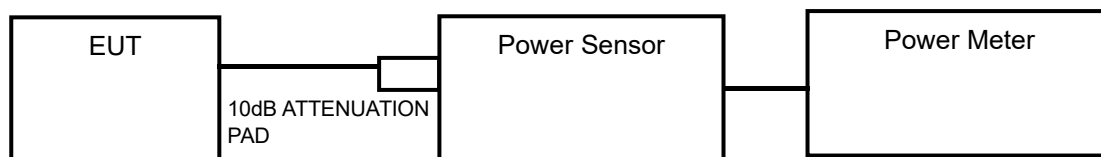
The EUT support CDD mode, for Power and PSD, the directional gain is following F)2)f)i)

The directional gain "DG" is calculated as following table.

3.5.2 TEST PROCEDURES

FOR AVERAGE POWER MEASUREMENT

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

3.5.3 TEST SETUP**3.5.4 EST RESULTS**

Refer to Appendix C



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

Directional gain and the maximum output power limit:

Operation Band	Chain 0 Antenna Gain(dBi)	Chain 1 Antenna Gain(dBi)	DG For PSD (dBi)	PSD Limit Reduction
U-NII-2A	4.95	4.95	7.96	1.96
U-NII-2C	4.95	4.95	7.96	1.96

MIMO mode:

FCC KDB 662911 D01 Multiple Transmitter Output V02r01

For CDD transmissions, directional gain is calculated as

Directional Gain= GANT+ Array Gain, where Array Gain is as follows.

For power spectral density(PSD) measurements on all devices.

Array Gain=10 log($N_{ANT}/N_{SS}=1$)

For power measurements on IEEE802.11 devices,

Array Gain=0 dB (i.e., no array gain) for $N_{ANT} \leq 4$.

The EUT support CDD mode, for Power and PSD, the directional gain is following F)2)f)i)

The directional gain "DG" is calculated as following table.

3.6.2 TEST PROCEDURE**For U-NII-1, U-NII-2A, U-NII-2C band:**

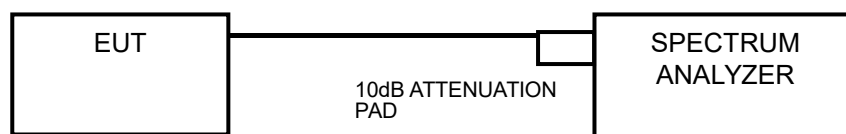
Using method SA-2

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 1MHz, Set VBW =3 MHz, Detector = RMS
- 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 = RMS
- 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 D

3.7 FREQUENCY STABILITY

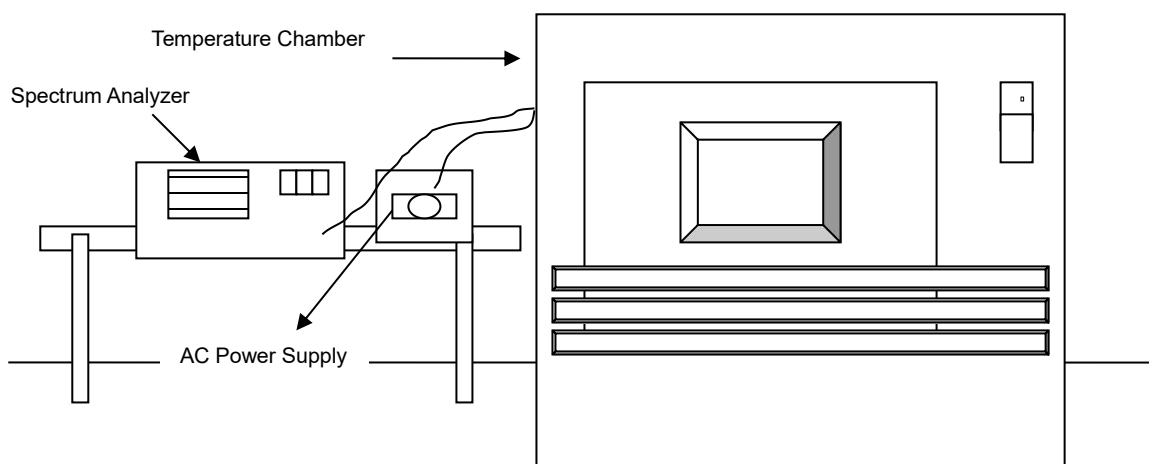
3.7.1 LIMITS OF FREQUENCY STABILITY

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 E



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	Channel	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5260	25.640	5247.600	5273.240	---	PASS
	Ant2	5260	20.720	5249.800	5270.520	---	PASS
	Ant1	5280	21.200	5269.720	5290.920	---	PASS
	Ant2	5280	20.560	5269.760	5290.320	---	PASS
	Ant1	5320	21.440	5309.200	5330.640	---	PASS
	Ant2	5320	20.760	5309.880	5330.640	---	PASS
	Ant1	5500	20.760	5489.920	5510.680	---	PASS
	Ant2	5500	20.840	5489.400	5510.240	---	PASS
	Ant1	5580	21.120	5569.400	5590.520	---	PASS
	Ant2	5580	23.440	5567.400	5590.840	---	PASS
	Ant1	5700	21.800	5689.440	5711.240	---	PASS
	Ant2	5700	23.120	5687.920	5711.040	---	PASS
	Ant1	5720	22.160	5708.880	5714.960	---	PASS
	Ant2	5720	21.320	5709.320	5714.960	---	PASS
11N20MIMO	Ant1	5260	20.840	5249.680	5270.520	---	PASS
	Ant2	5260	21.160	5249.480	5270.640	---	PASS
	Ant1	5280	20.800	5269.720	5290.520	---	PASS
	Ant2	5280	20.640	5269.720	5290.360	---	PASS
	Ant1	5320	20.880	5309.400	5330.280	---	PASS
	Ant2	5320	20.840	5309.560	5330.400	---	PASS
	Ant1	5500	21.160	5489.520	5510.680	---	PASS
	Ant2	5500	21.040	5489.600	5510.640	---	PASS
	Ant1	5580	21.000	5569.440	5590.440	---	PASS
	Ant2	5580	20.920	5569.480	5590.400	---	PASS
	Ant1	5700	23.000	5688.000	5711.000	---	PASS
	Ant2	5700	21.400	5689.360	5710.760	---	PASS
	Ant1	5720	21.040	5709.630	5714.960	---	PASS
	Ant2	5720	22.200	5708.240	5714.960	---	PASS
11N40MIMO	Ant1	5270	43.120	5248.080	5291.200	---	PASS
	Ant2	5270	43.600	5247.840	5291.440	---	PASS
	Ant1	5310	44.000	5288.160	5332.160	---	PASS
	Ant2	5310	44.080	5288.080	5332.160	---	PASS
	Ant1	5510	43.200	5488.320	5531.520	---	PASS
	Ant2	5510	43.200	5488.080	5531.280	---	PASS
	Ant1	5550	49.840	5527.840	5577.680	---	PASS
	Ant2	5550	42.800	5528.160	5570.960	---	PASS
	Ant1	5670	49.680	5647.920	5697.600	---	PASS
	Ant2	5670	55.920	5637.360	5693.280	---	PASS
	Ant1	5710	43.680	5687.680	5694.400	---	PASS
	Ant2	5710	42.800	5688.480	5706.000	---	PASS



11AC80MIM O	Ant1	5290	81.280	5249.360	5330.640	---	PASS
	Ant2	5290	80.800	5249.360	5330.160	---	PASS
	Ant1	5530	80.960	5489.200	5570.160	---	PASS
	Ant2	5530	82.080	5489.200	5571.280	---	PASS
	Ant1	5610	81.600	5568.560	5650.160	---	PASS
	Ant2	5610	81.600	5569.200	5650.800	---	PASS
	Ant1	5690	81.760	5649.200	5699.440	---	PASS
	Ant2	5690	80.640	5649.360	5653.840	---	PASS

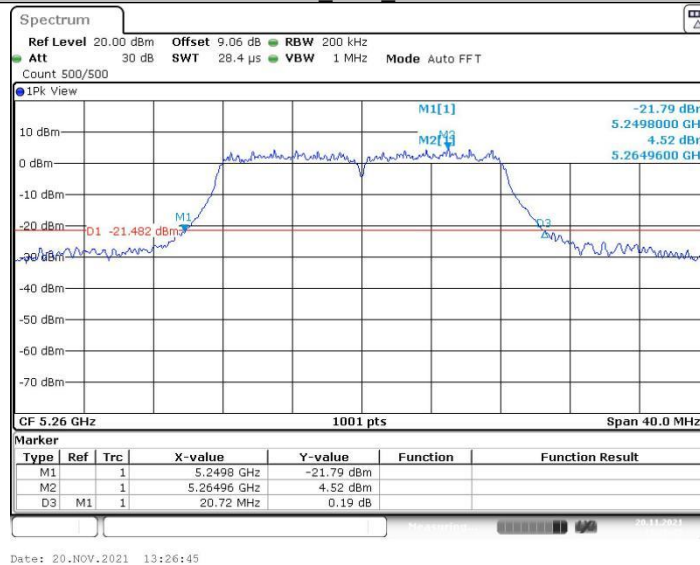


5.1.2 Test Graphs

11A_Ant1_5260

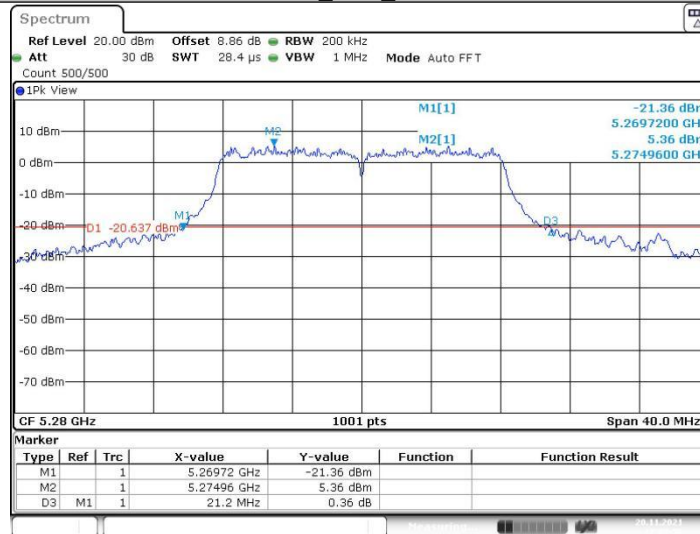


11A_Ant2_5260



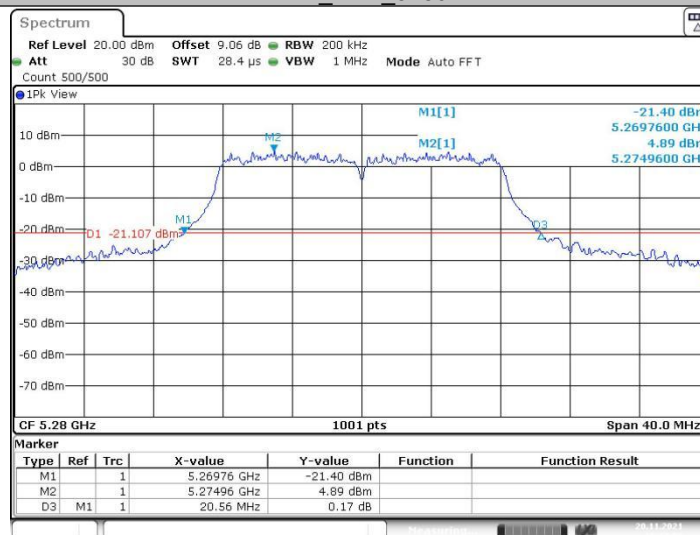


11A_Ant1_5280



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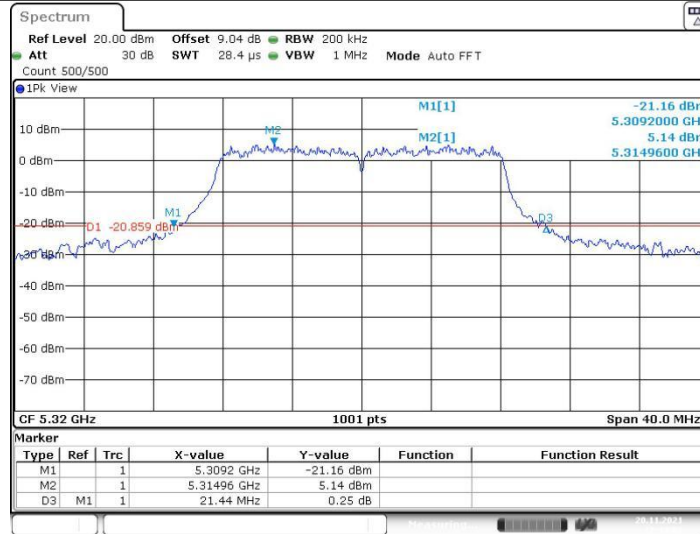
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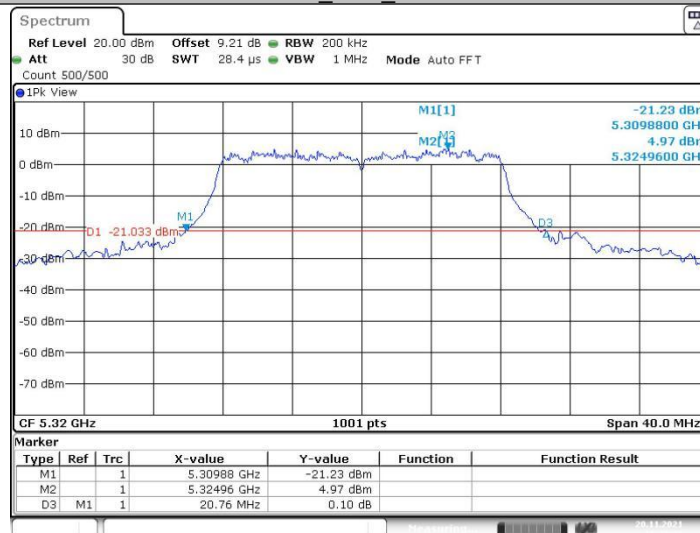


11A_Ant1_5320



Date: 20.NOV.2021 12:14:08

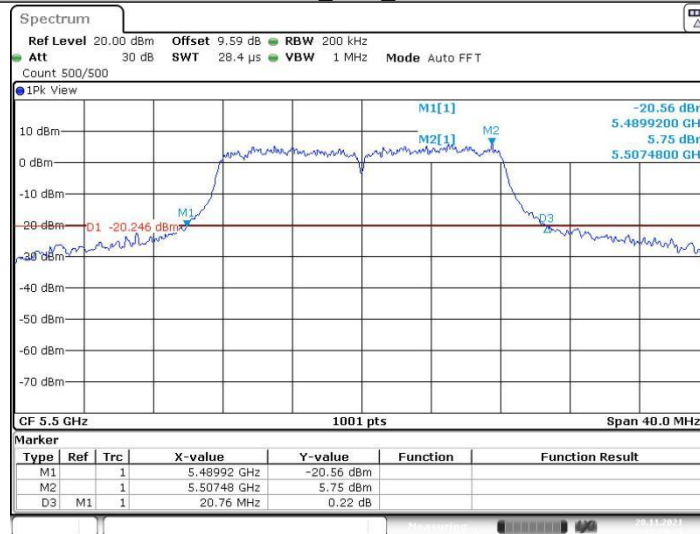
11A_Ant2_5320



Date: 20.NOV.2021 13:28:38

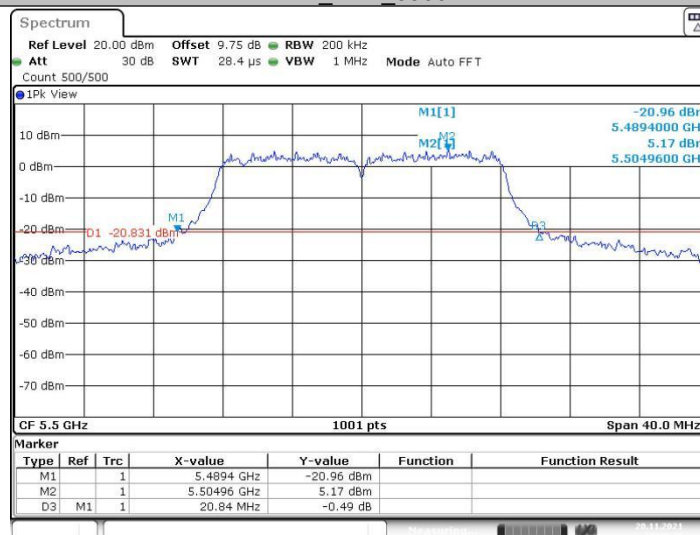


11A_Ant1_5500



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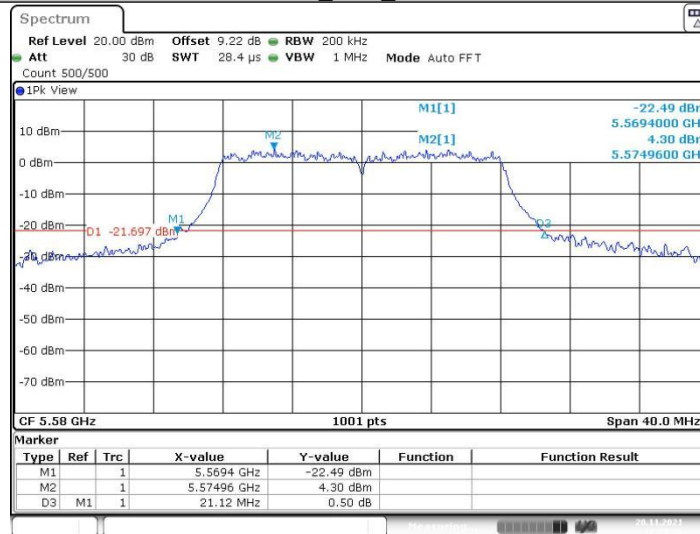
11A_Ant2_5500



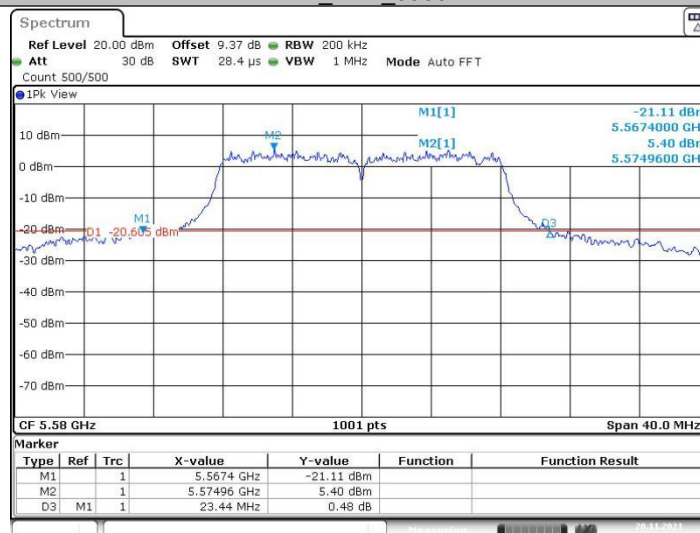
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11A_Ant1_5580

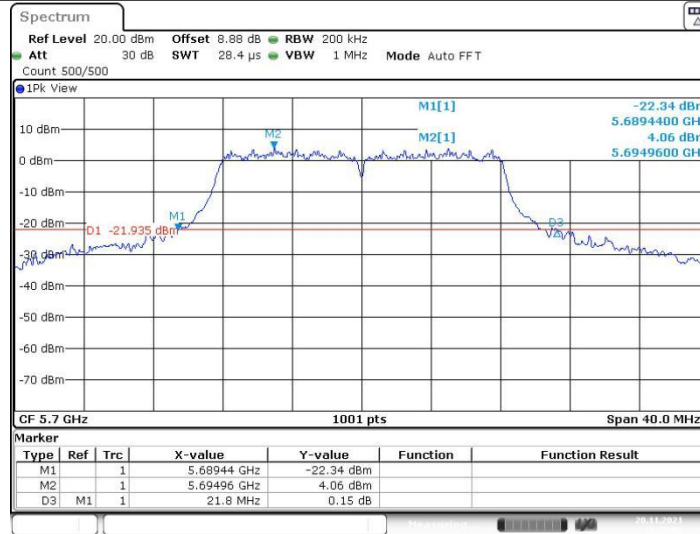


11A_Ant2_5580



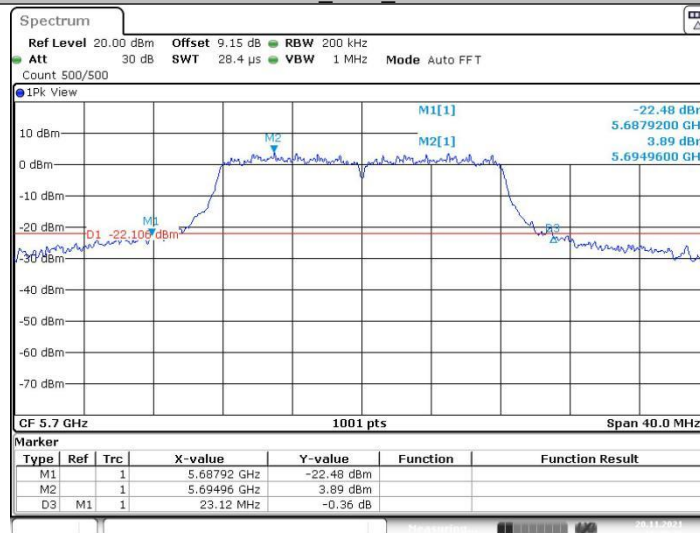


11A_Ant1_5700



Date: 20.NOV.2021 12:29:02

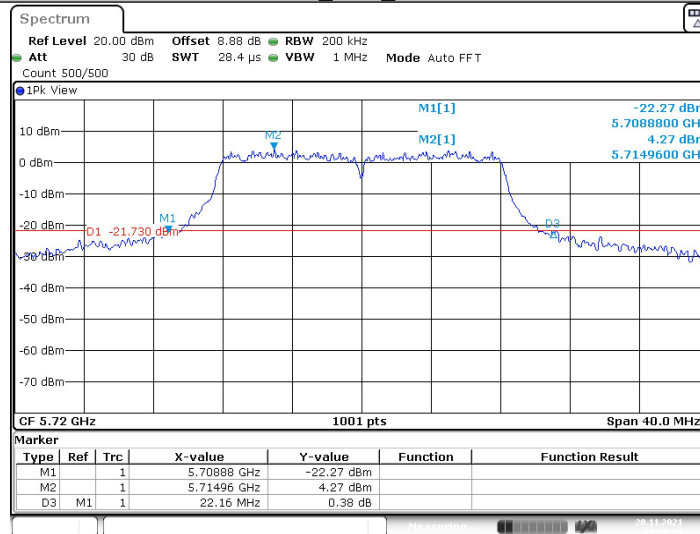
11A_Ant2_5700



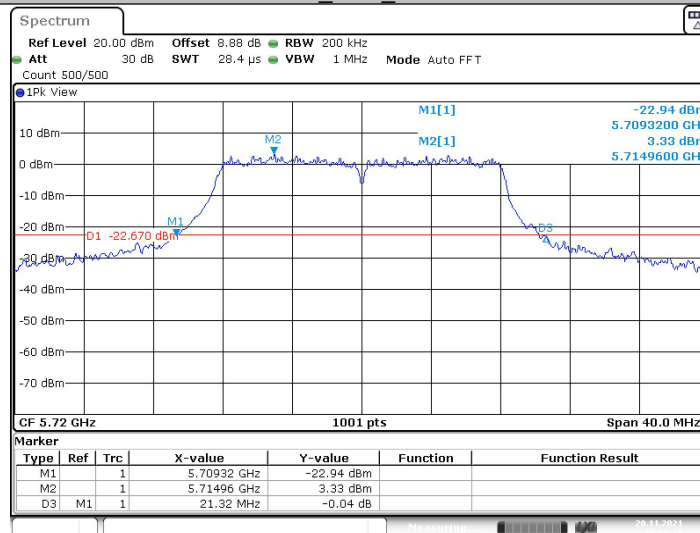
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11A_Ant1_5720

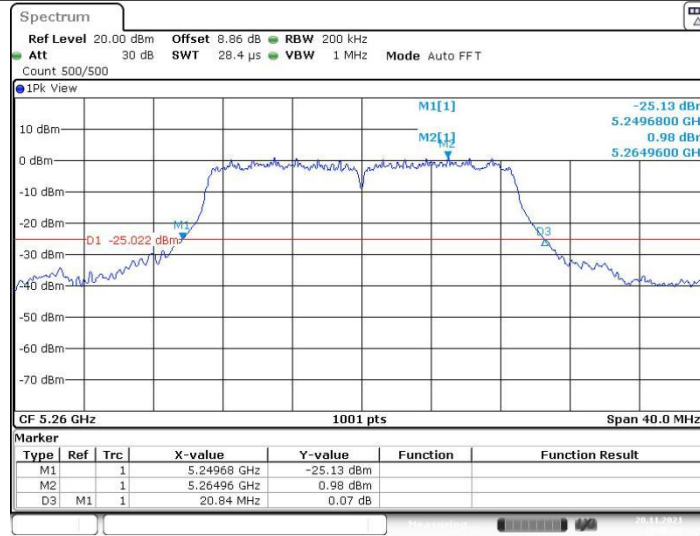


11A_Ant2_5720

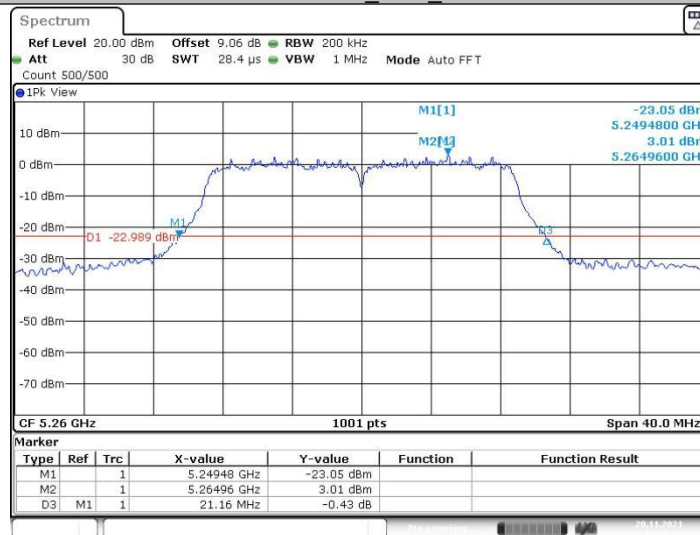




11N20MIMO_Ant1_5260

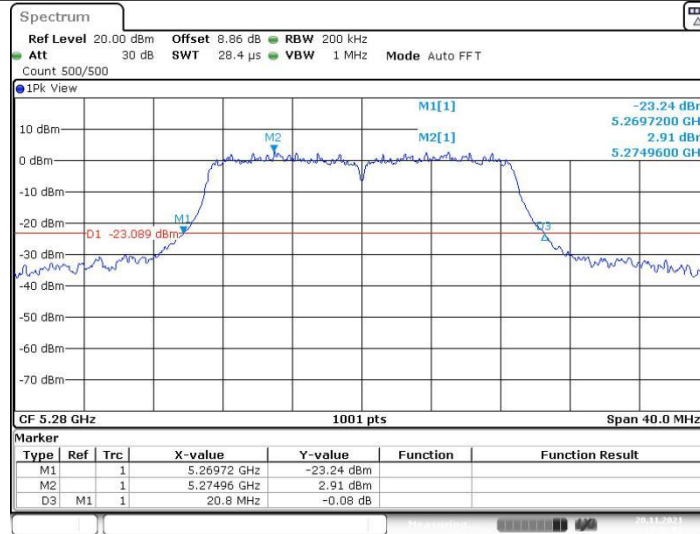


11N20MIMO_Ant2_5260



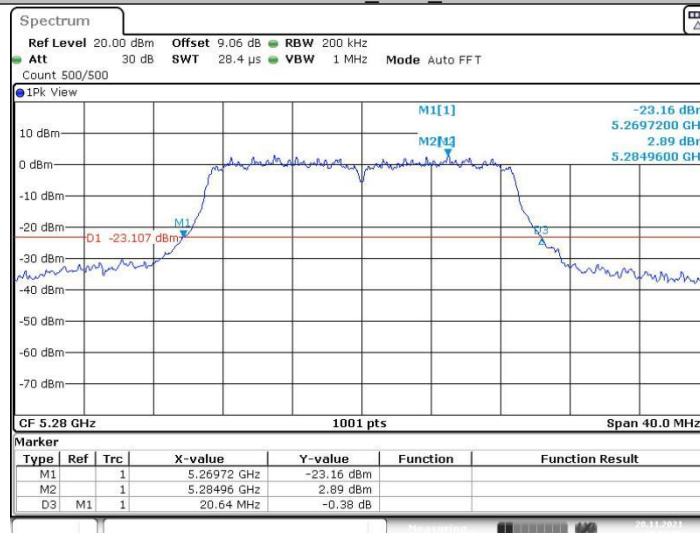


11N20MIMO_Ant1_5280



Date: 20.NOV.2021 13:52:02

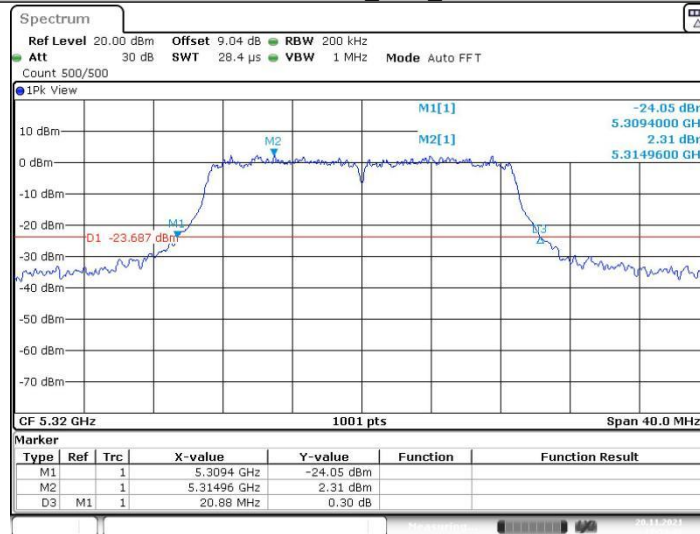
11N20MIMO_Ant2_5280



Date: 20.NOV.2021 13:53:06

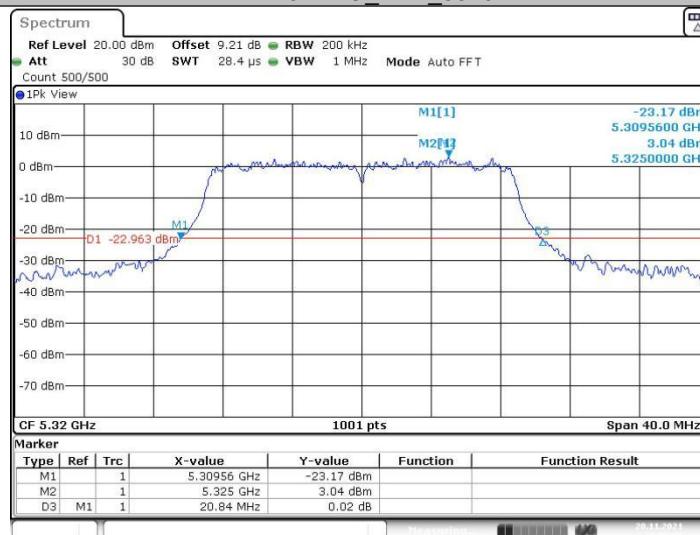


11N20MIMO_Ant1_5320



Date: 20.NOV.2021 13:54:43

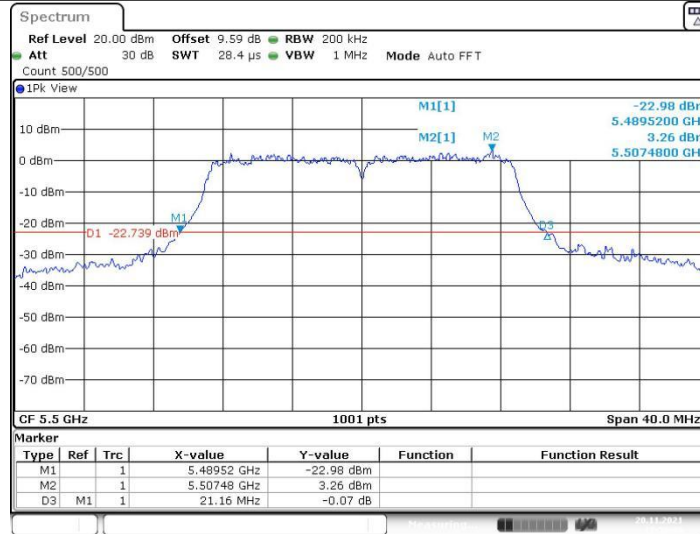
11N20MIMO_Ant2_5320



Date: 20.NOV.2021 13:55:59

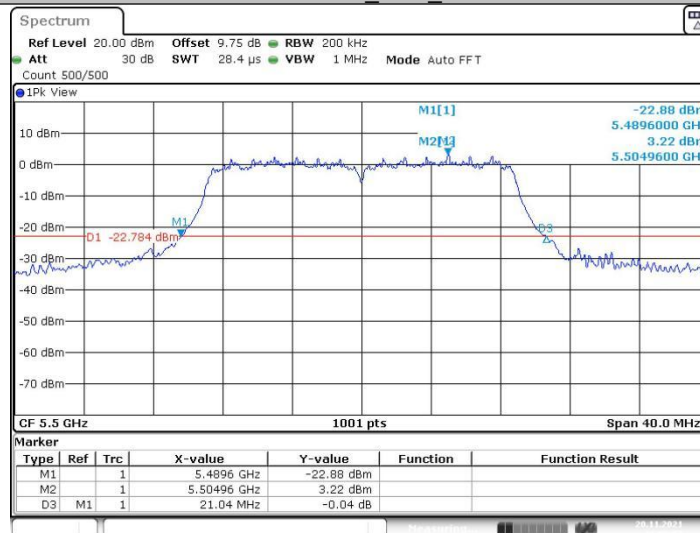


11N20MIMO_Ant1_5500



Date: 20.NOV.2021 13:58:45

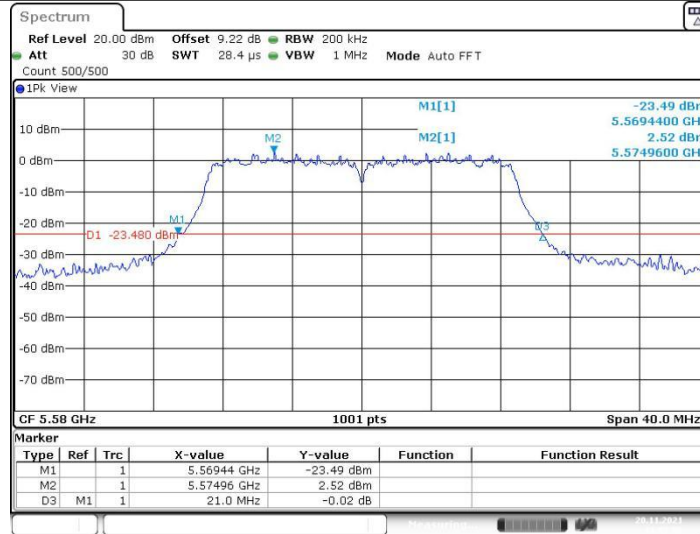
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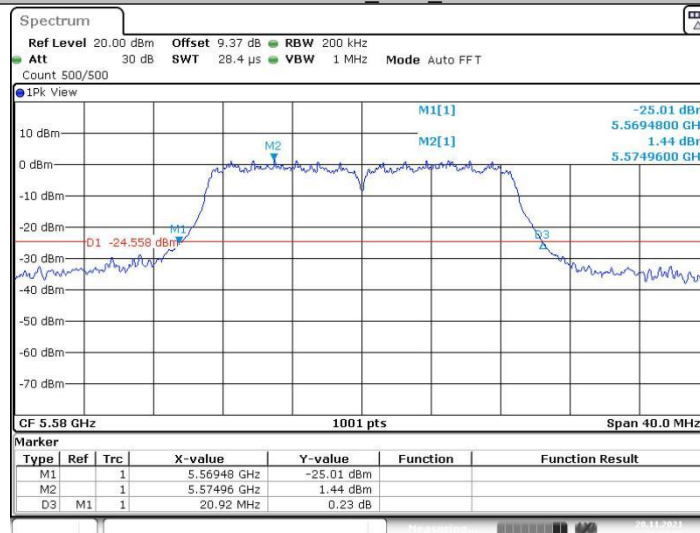
Date: 20.NOV.2021 14:00:08



11N20MIMO_Ant1_5580

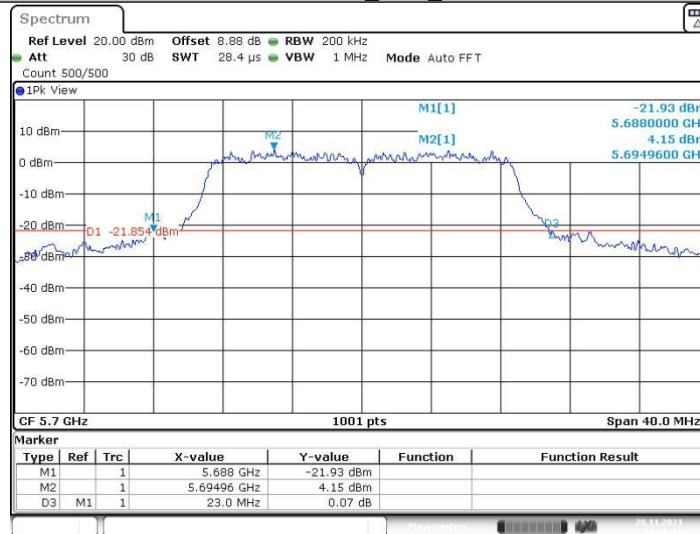


11N20MIMO_Ant2_5580



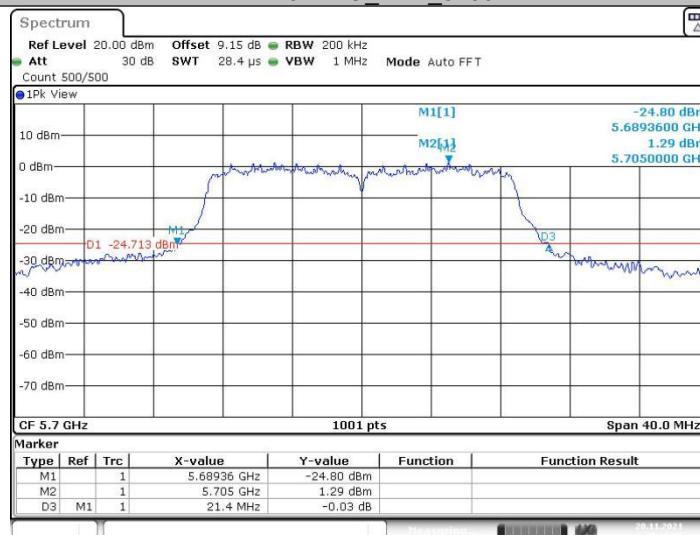


11N20MIMO_Ant1_5700



Date: 20.NOV.2021 14:11:42

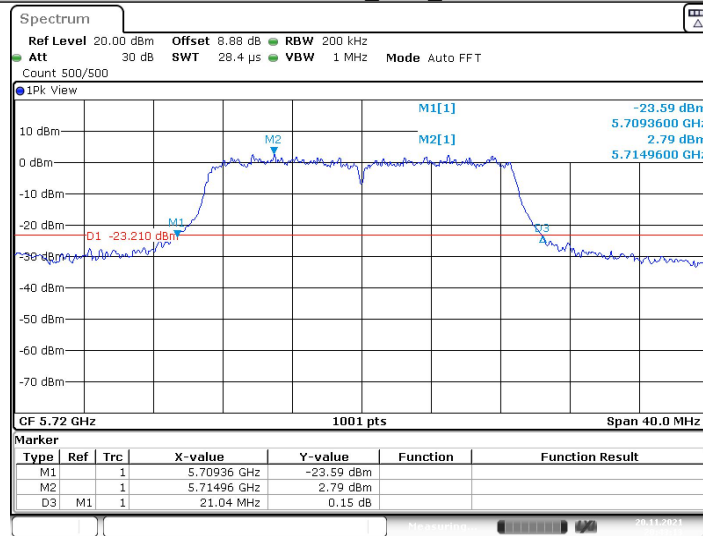
11N20MIMO_Ant2_5700



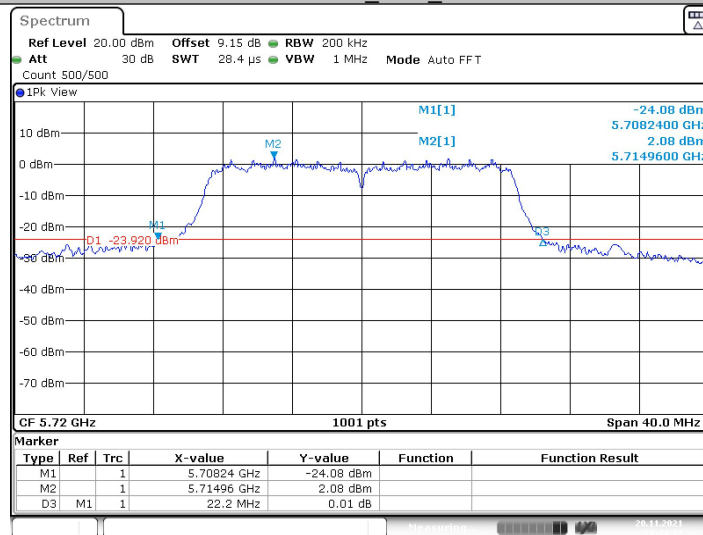
Date: 20.NOV.2021 14:13:06



11N20MIMO_Ant1_5720

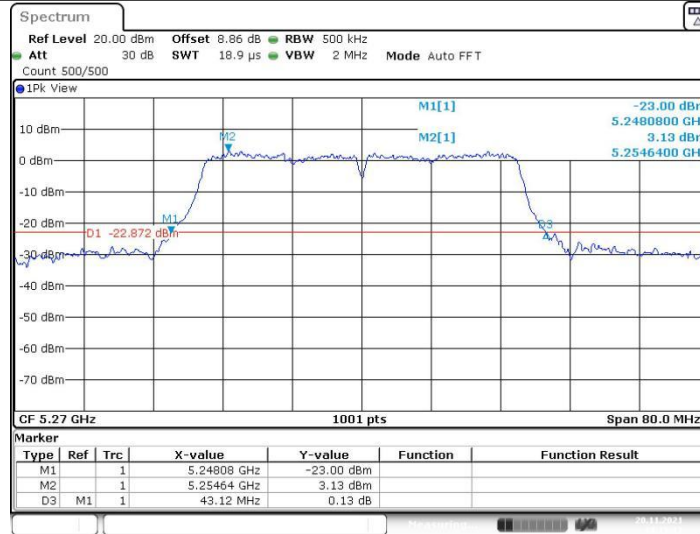


11N20MIMO_Ant2_5720



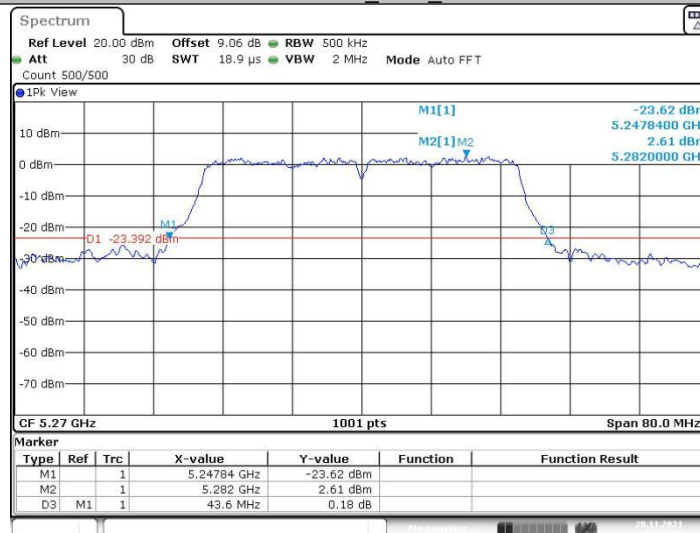


11N40MIMO_Ant1_5270



Date: 20.NOV.2021 14:15:12

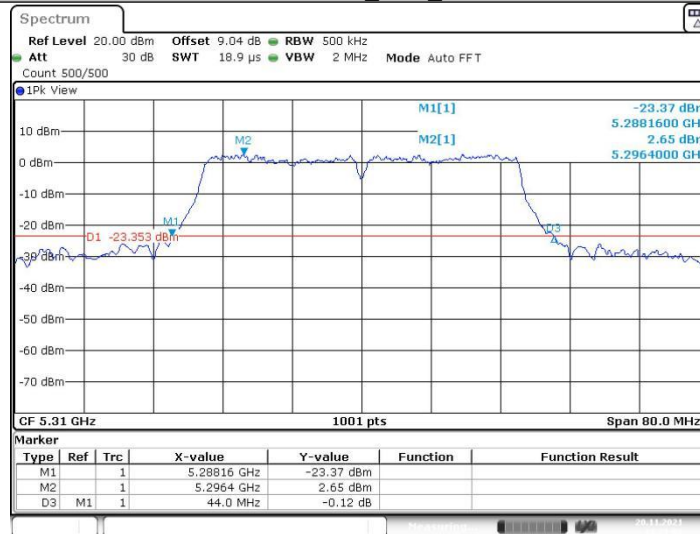
11N40MIMO_Ant2_5270



Date: 20.NOV.2021 14:18:05

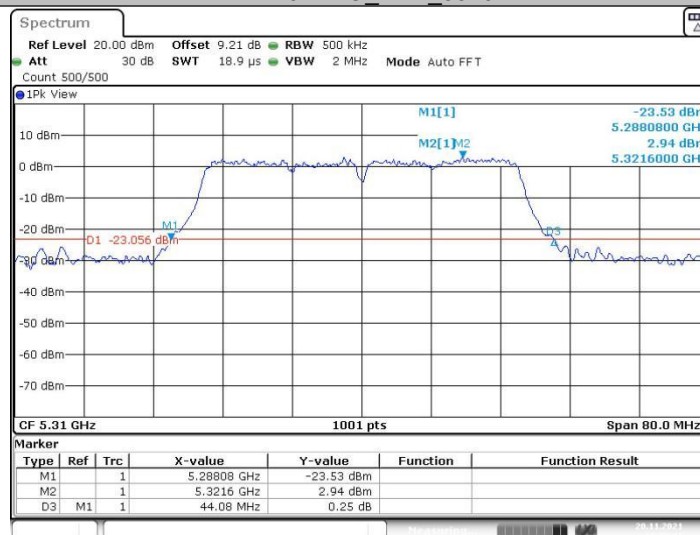


11N40MIMO_Ant1_5310



Date: 20.NOV.2021 14:21:08

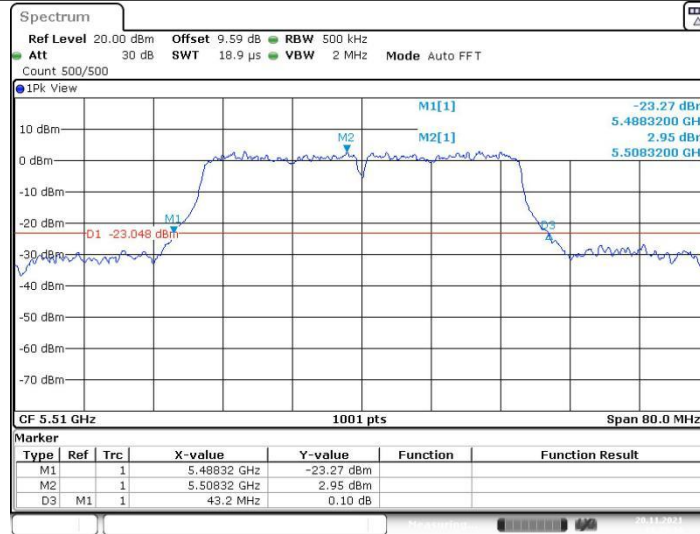
11N40MIMO_Ant2_5310



Date: 20.NOV.2021 14:22:42

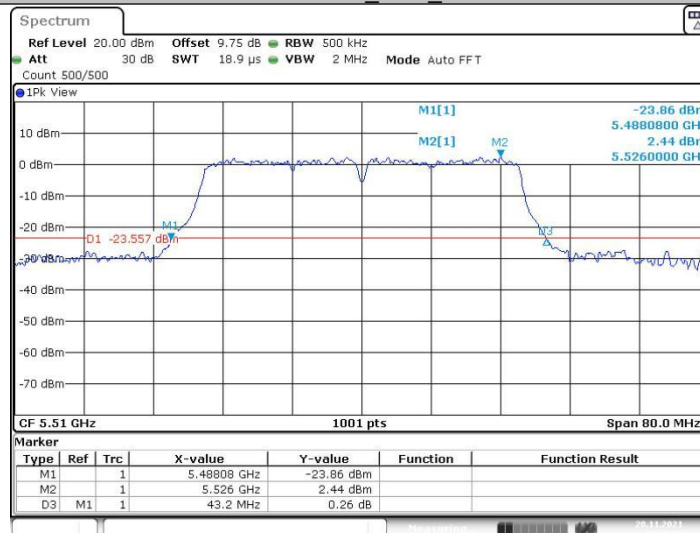


11N40MIMO_Ant1_5510



Date: 20.NOV.2021 14:29:14

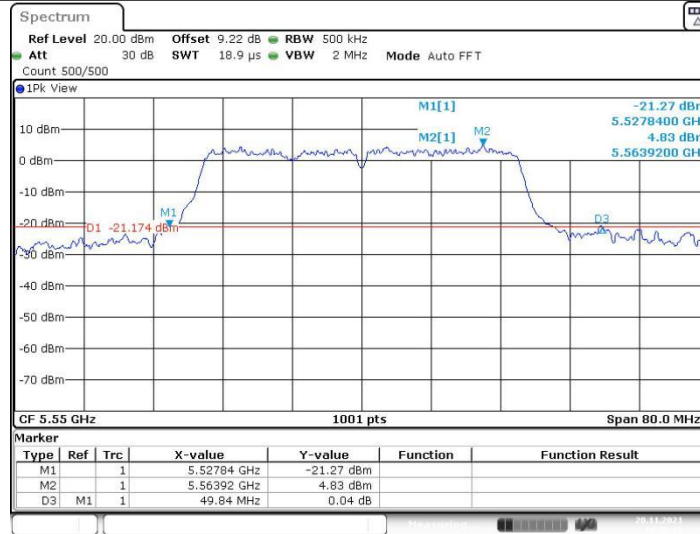
11N40MIMO_Ant2_5510



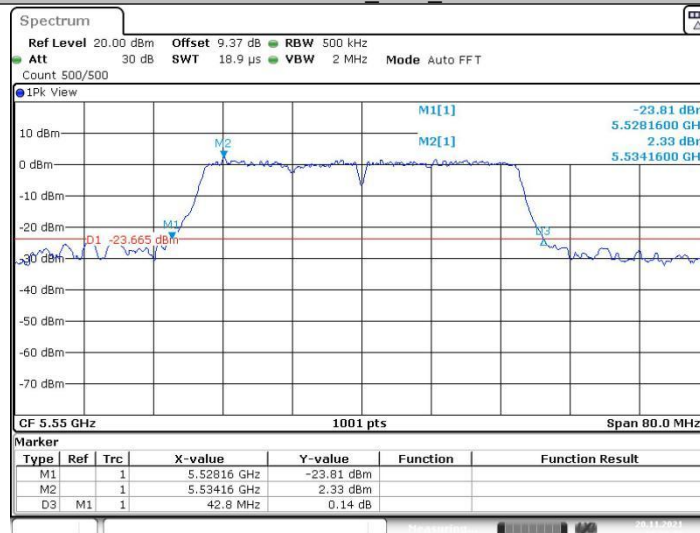
Date: 20.NOV.2021 14:30:33



11N40MIMO_Ant1_5550

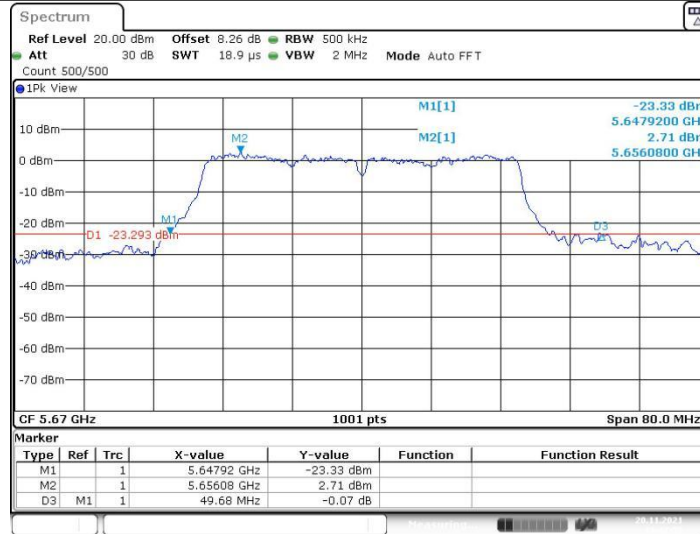


11N40MIMO_Ant2_5550

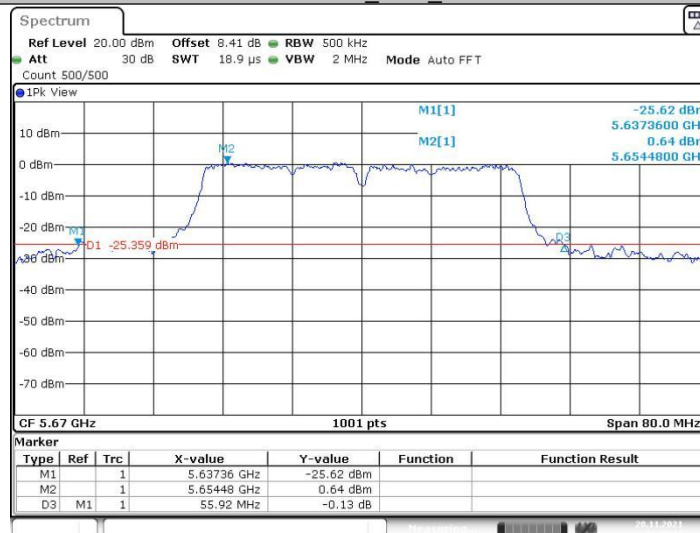




11N40MIMO_Ant1_5670

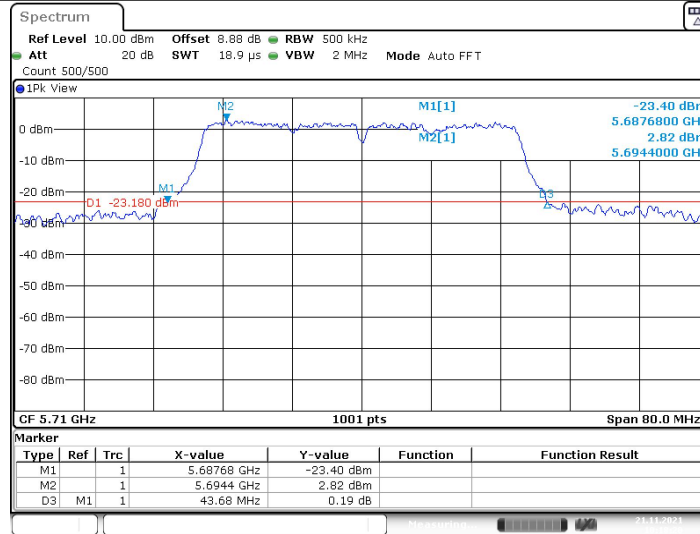


11N40MIMO_Ant2_5670

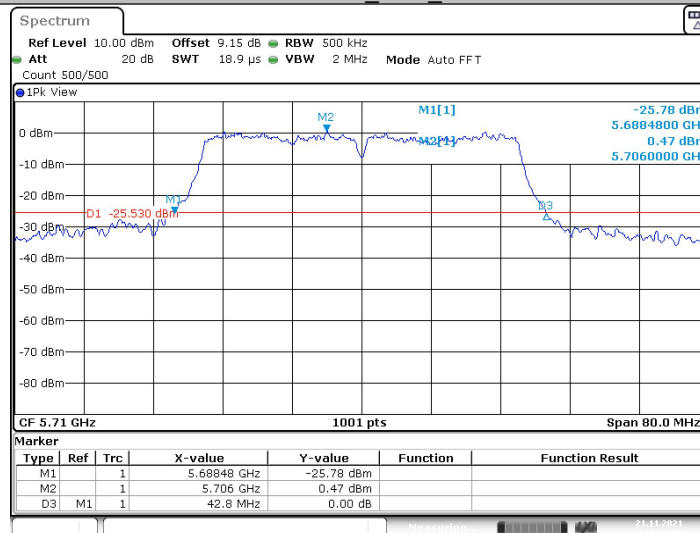




11N40MIMO_Ant1_5710

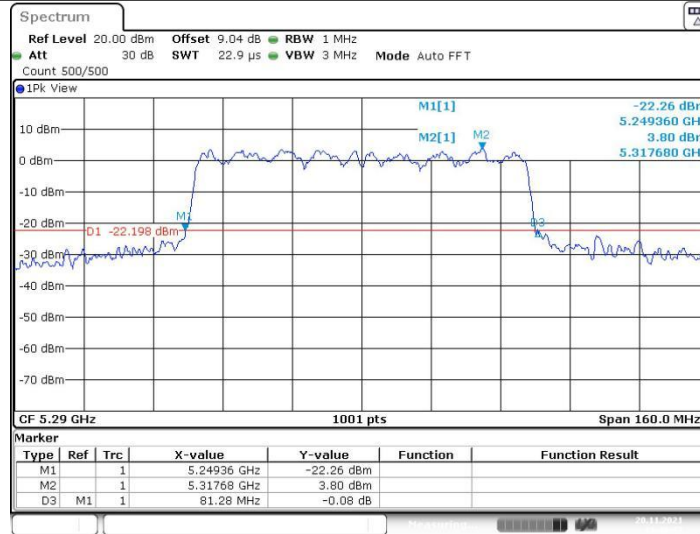


11N40MIMO_Ant2_5710

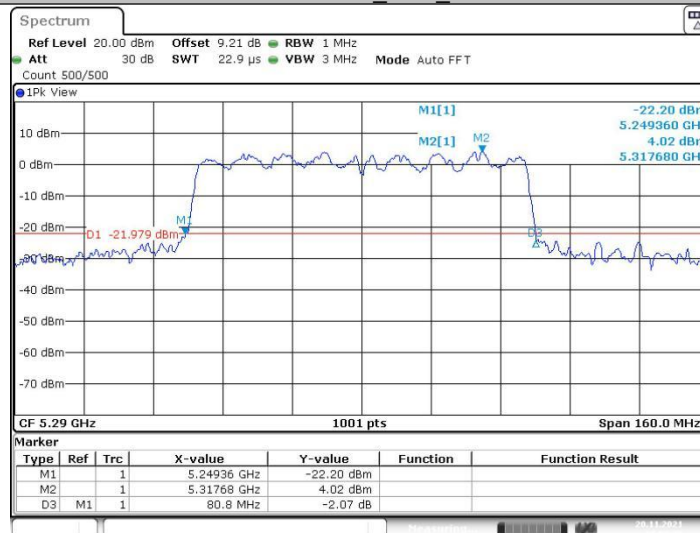




11AC80MIMO_Ant1_5290

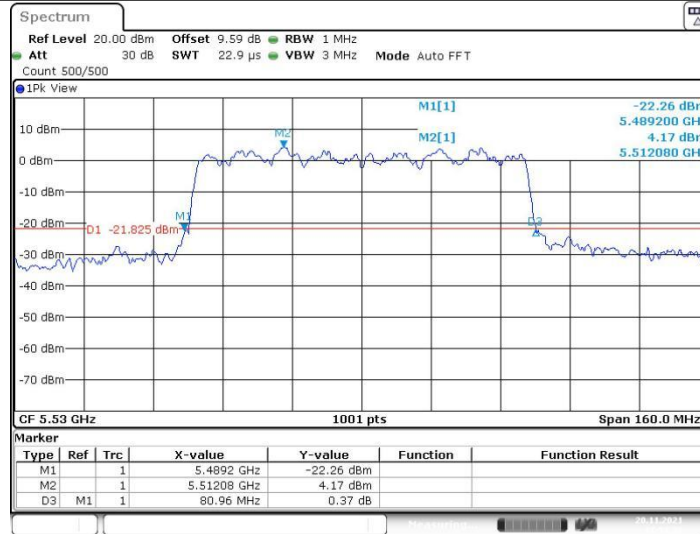


11AC80MIMO_Ant2_5290



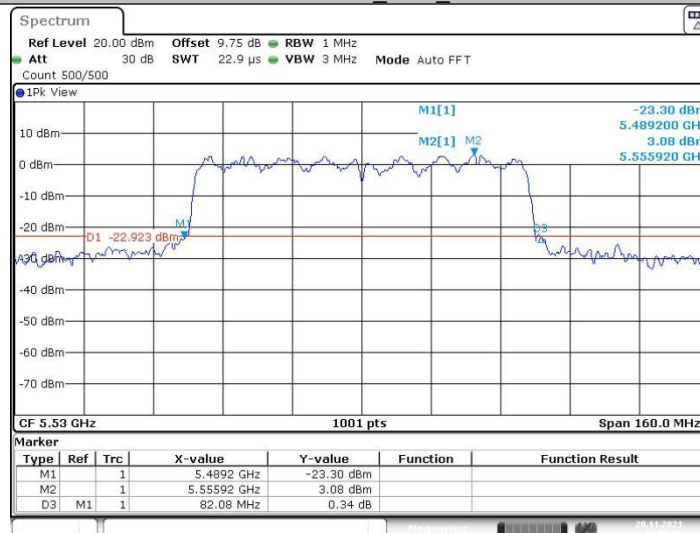


11AC80MIMO_Ant1_5530



Date: 20.NOV.2021 14:54:33

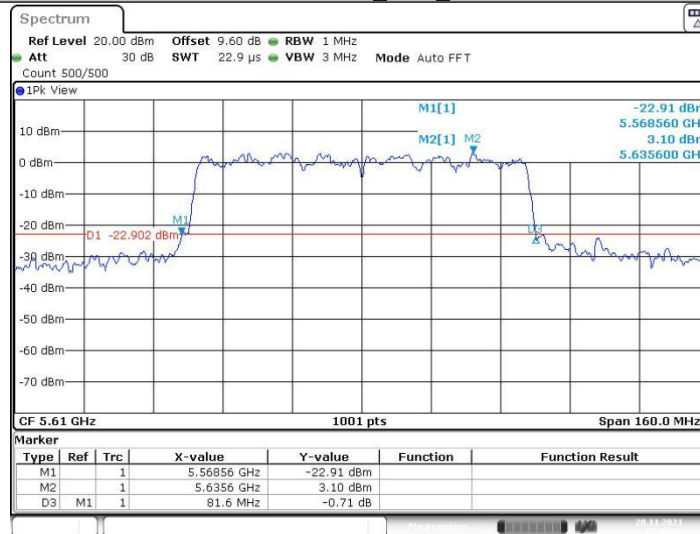
11AC80MIMO_Ant2_5530



Date: 20.NOV.2021 14:56:32

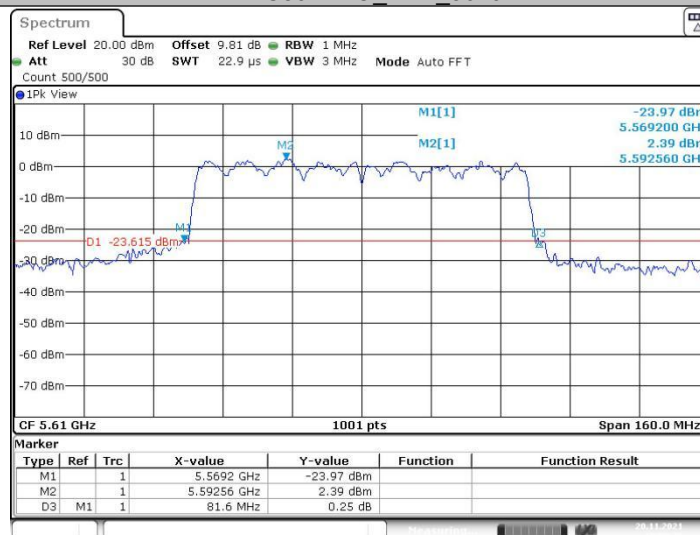


11AC80MIMO_Ant1_5610



Date: 20.NOV.2021 14:58:42

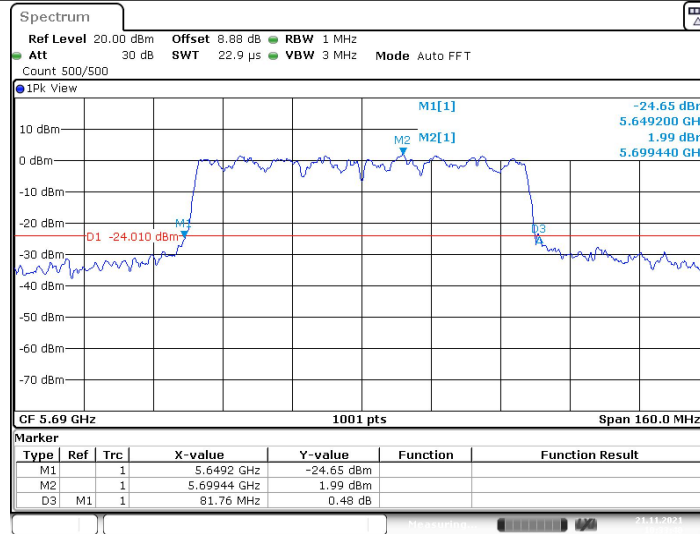
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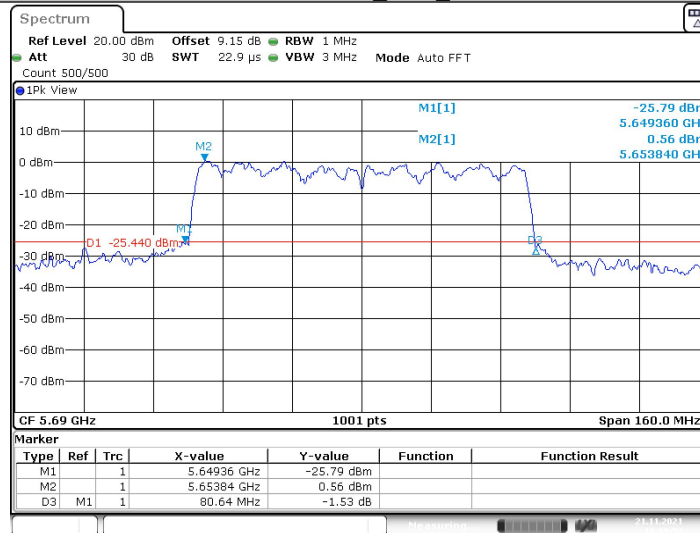
Date: 20.NOV.2021 15:00:23



11AC80MIMO_Ant1_5690



11AC80MIMO_Ant2_5690





5.2 Appendix B: 6DB EMISSION BANDWIDTH

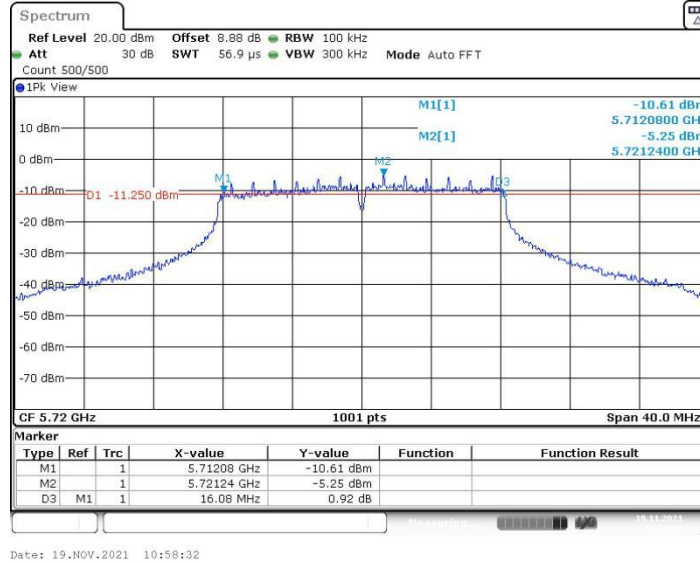
5.2.1 Test Result

TestMode	Antenna	Channel	6db EBW [MHz]	Limit[MHz]	Verdict
11A	Ant1	5720_UNII-3	3.16	0.5	PASS
	Ant2	5720_UNII-3	2.88	0.5	PASS
11N20MIMO	Ant1	5720_UNII-3	3.80	0.5	PASS
	Ant2	5720_UNII-3	3.52	0.5	PASS
11N40MIMO	Ant1	5710_UNII-3	2.52	0.5	PASS
	Ant2	5710_UNII-3	2.52	0.5	PASS
11AC80MIMO	Ant1	5690_UNII-3	2.60	0.5	PASS
	Ant2	5690_UNII-3	3.24	0.5	PASS

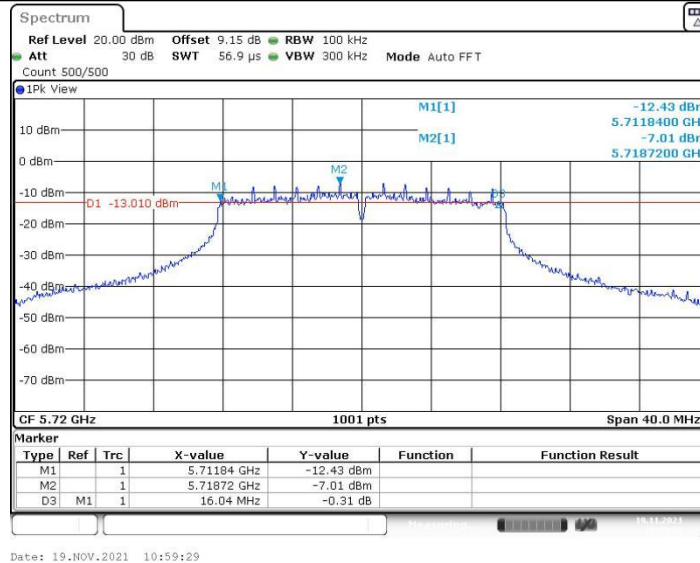


5.2.2 Test Graphs

11A_Ant1_5720_UNII-3

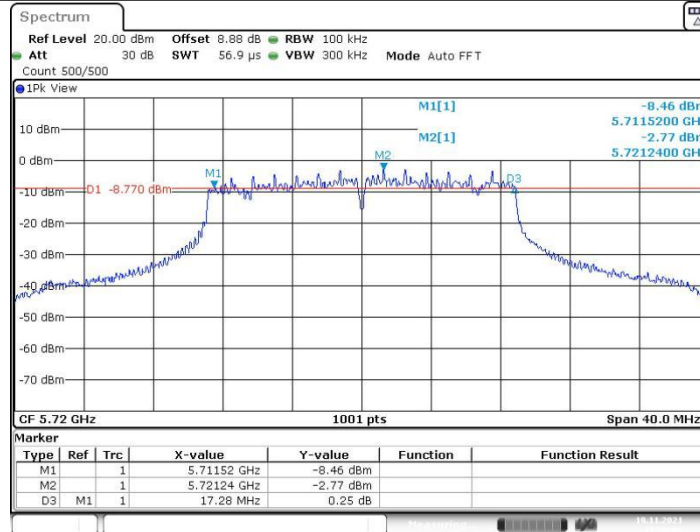


11A_Ant2_5720_UNII-3

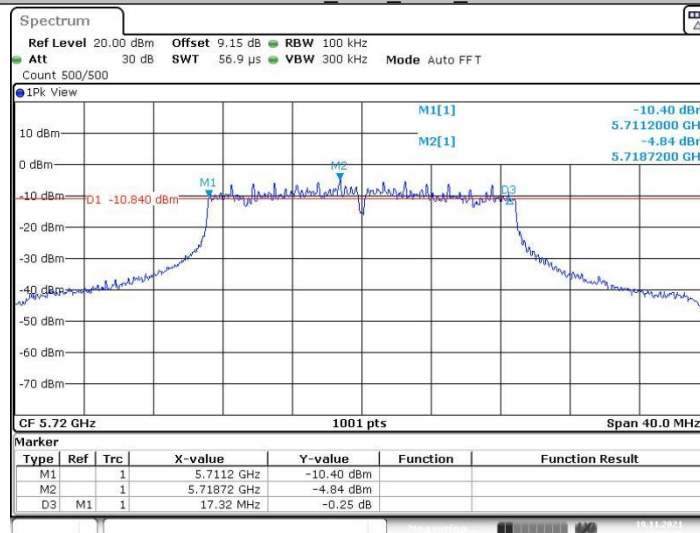




11N20MIMO_Ant1_5720_UNII-3

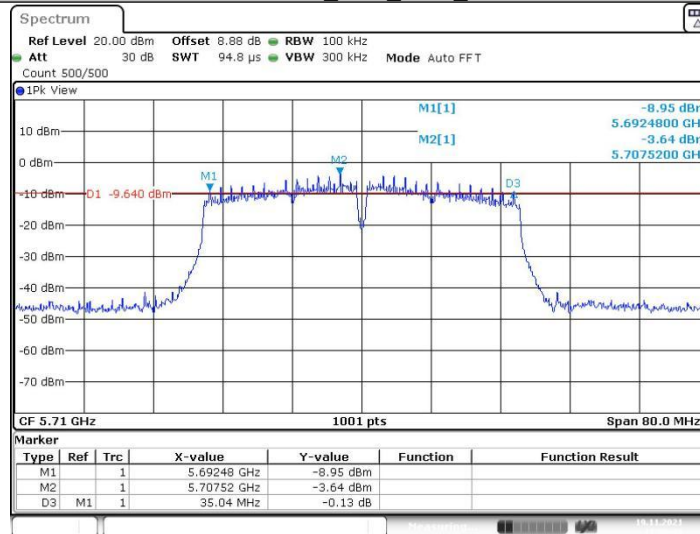


11N20MIMO_Ant2_5720_UNII-3



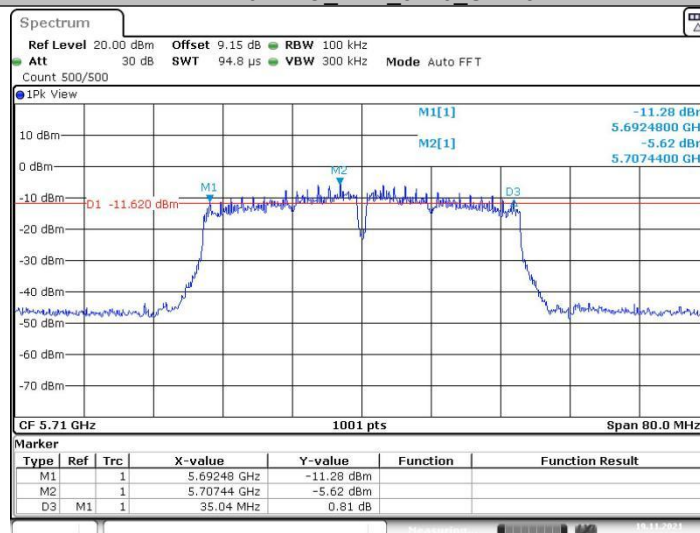


11N40MIMO_Ant1_5710_UNII-3



Date: 19.NOV.2021 11:00:49

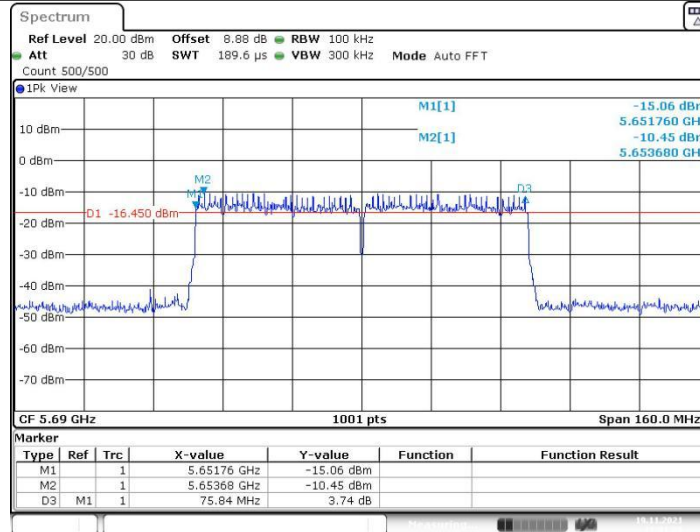
11N40MIMO_Ant2_5710_UNII-3



Date: 19.NOV.2021 11:01:04

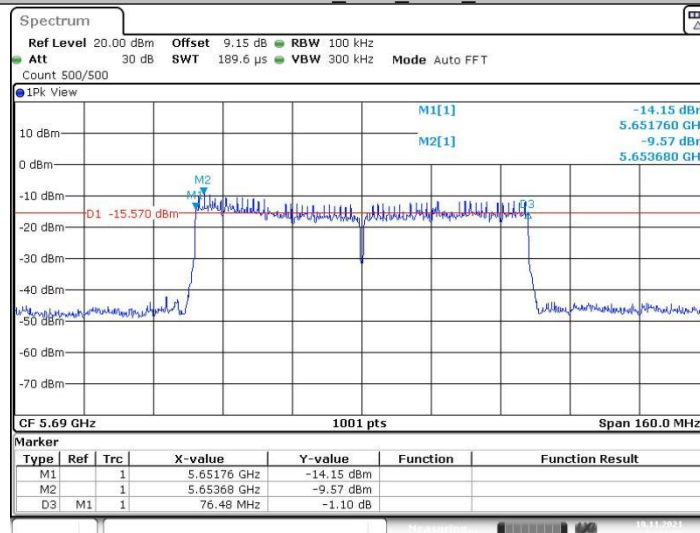


11AC80MIMO_Ant1_5690_UNII-3



Date: 19.NOV.2021 11:01:20

11AC80MIMO_Ant2_5690_UNII-3



Date: 19.NOV.2021 11:01:36