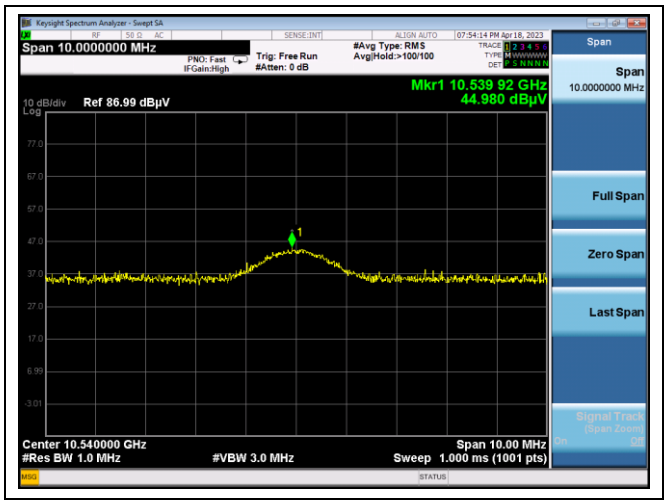
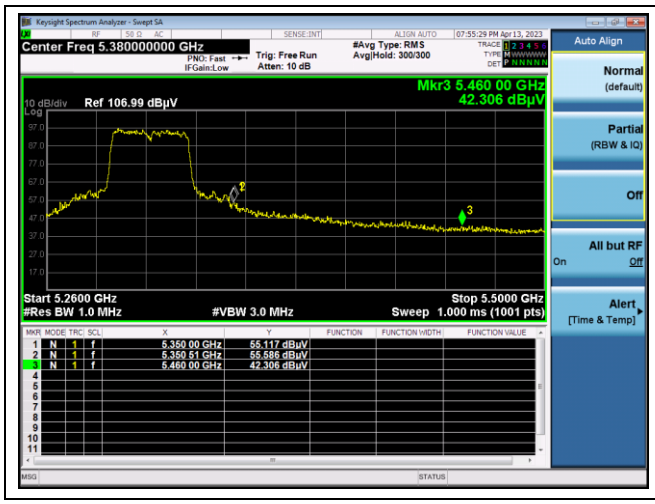
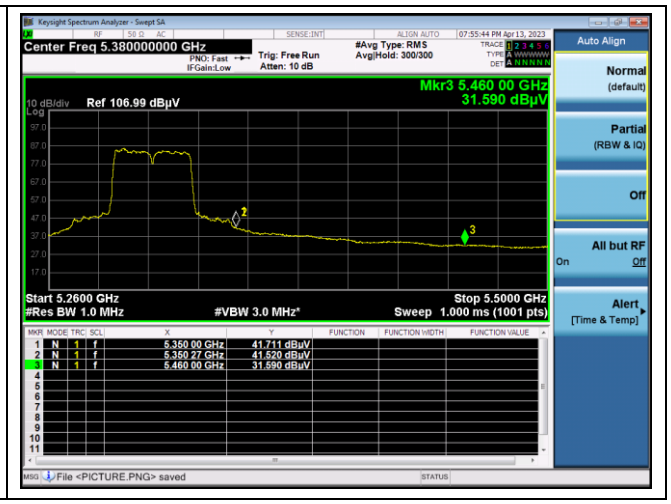
Low channel 2nd Spurious (Peak) - Band 2A



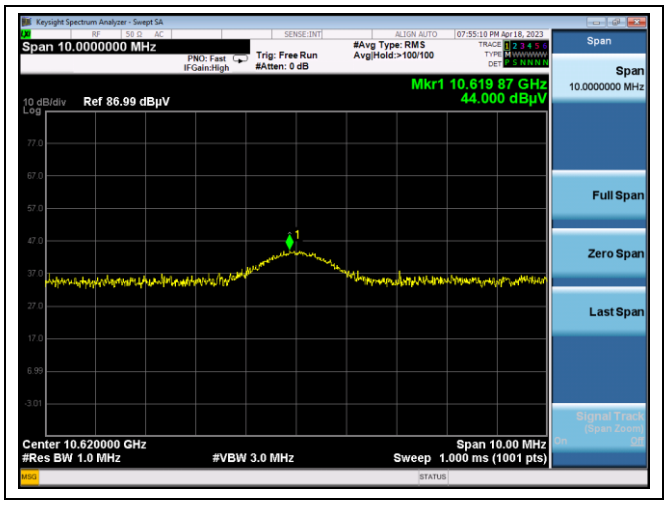
High channel Band edge (Peak) - Band 2A



High channel Band edge (Average) - Band 2A

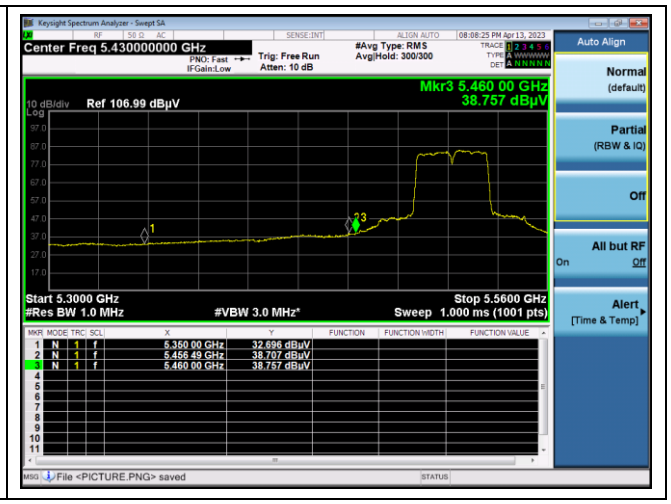


High channel 2nd Spurious (Peak) - Band 2A

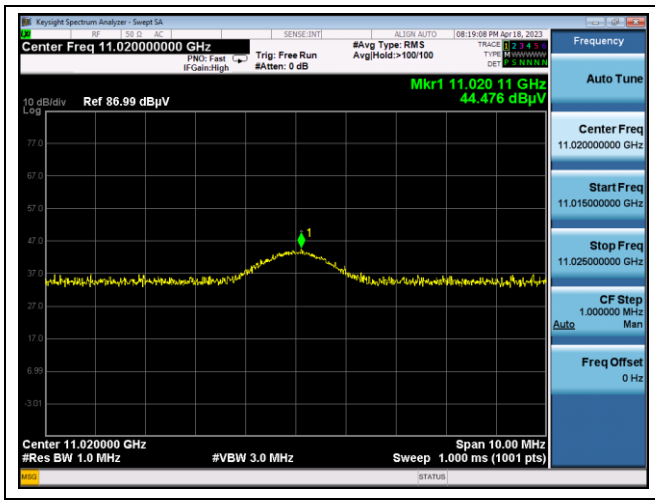


Low channel Band edge (Peak) - Band 2C

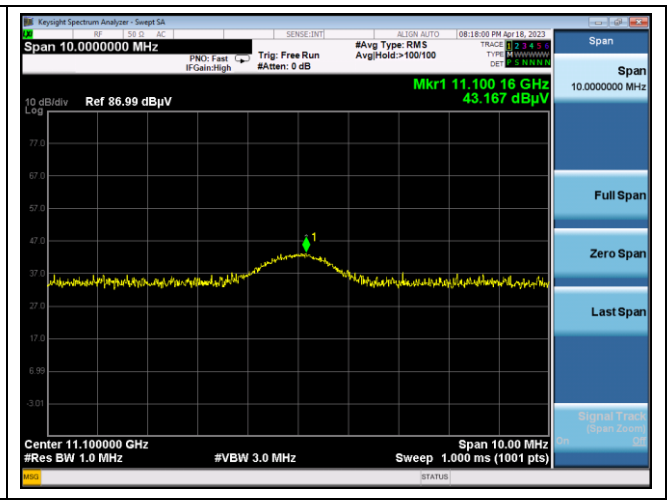
Low channel Band edge (Average) - Band 2C



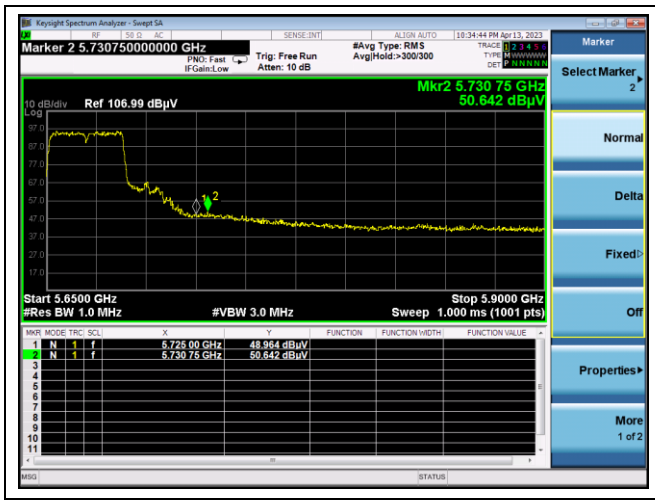
Low channel 2nd Spurious (Peak) - Band 2C



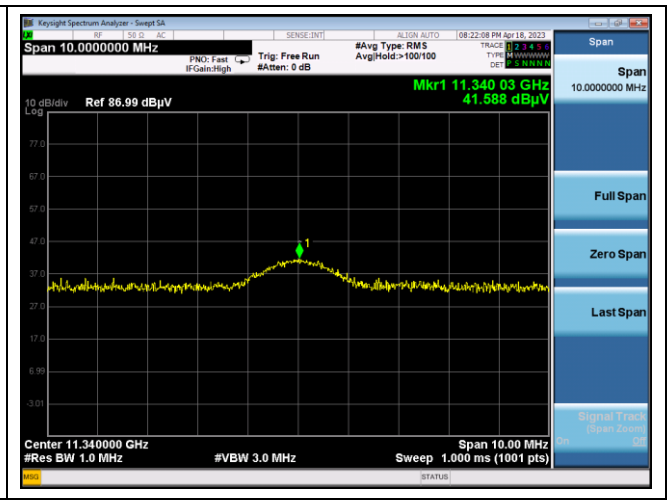
Middle channel 2nd Spurious (Peak) - Band 2C



High channel Band edge (Peak) - Band 2C

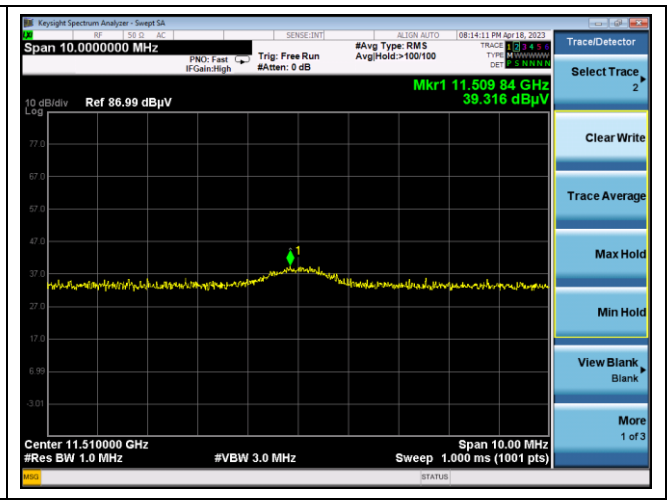


High channel 2nd Spurious (Peak) - Band 2C



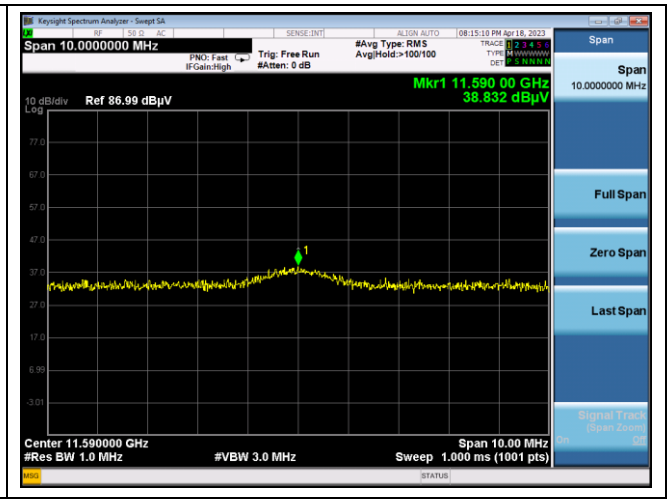
Low channel Band edge (Peak) - Band 3

Low channel 2nd Spurious (Peak) - Band 3



High channel Band edge (Peak) - Band 3

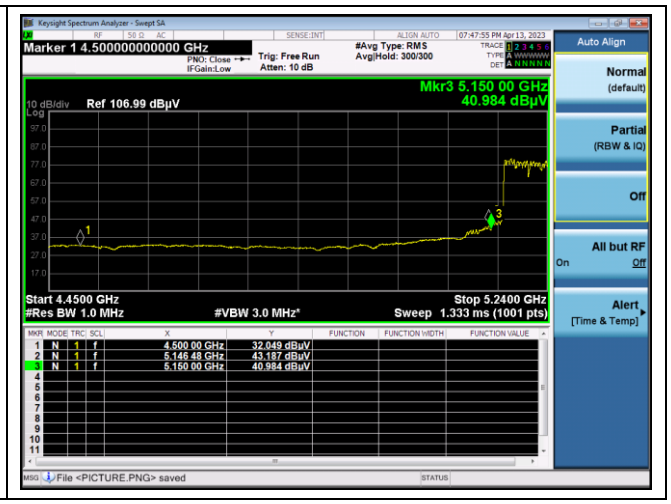
High channel 2nd Spurious (Peak) - Band 3



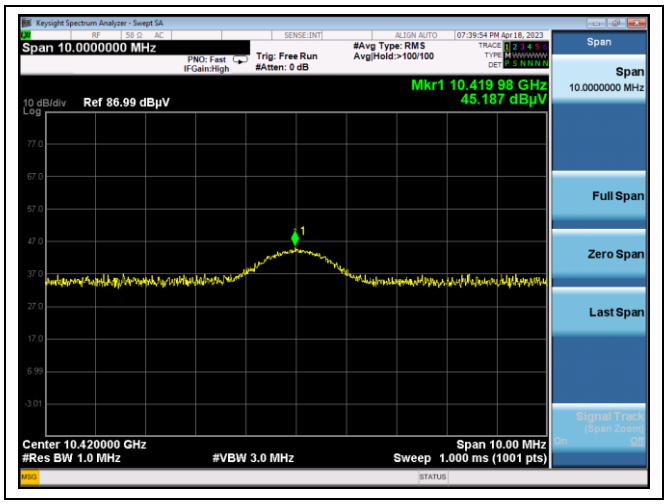
802.11ac_VHT80

Middle channel Band edge (Peak) - Band 1

Middle channel Band edge (Average) - Band 1

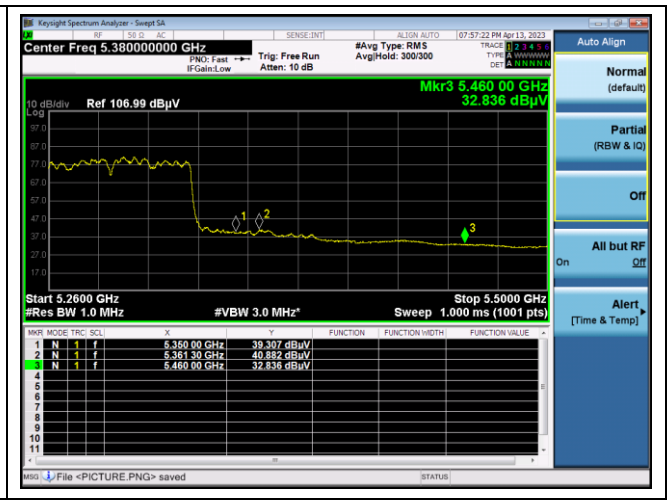


Middle channel 2nd Spurious (Peak) - Band 1

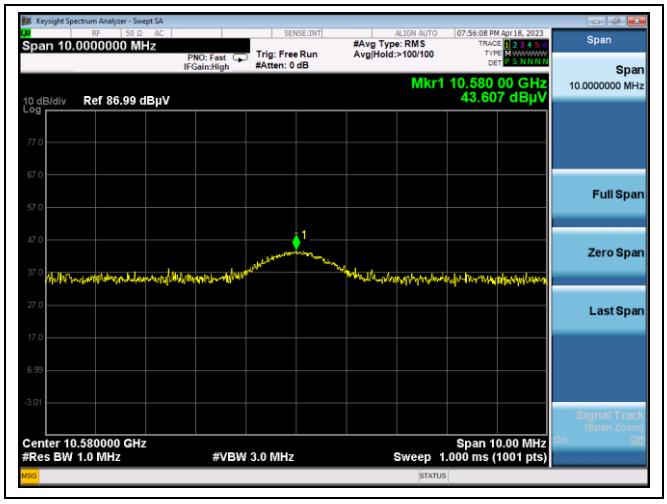


Middle channel Band edge (Peak) - Band 2A

Middle channel Band edge (Average) - Band 2A

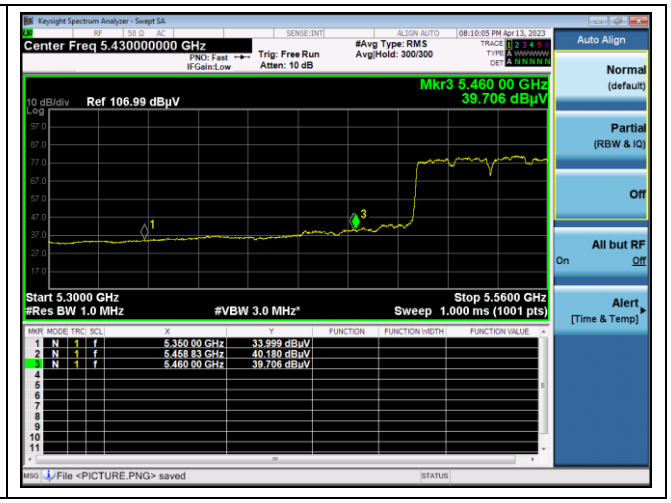


Middle channel 2nd Spurious (Peak) - Band 2A

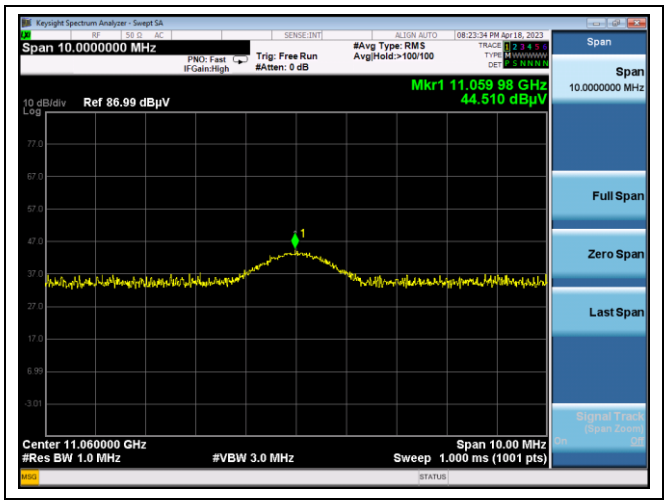


Low channel Band edge (Peak) - Band 2C

Low channel Band edge (Average) - Band 2C

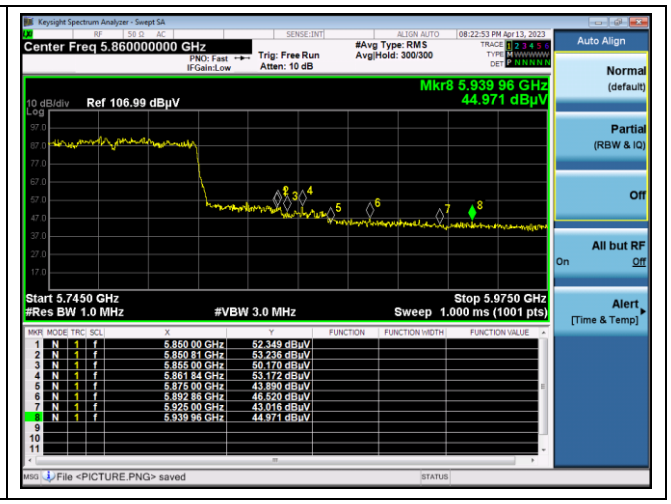


Low channel 2nd Spurious (Peak) - Band 2C

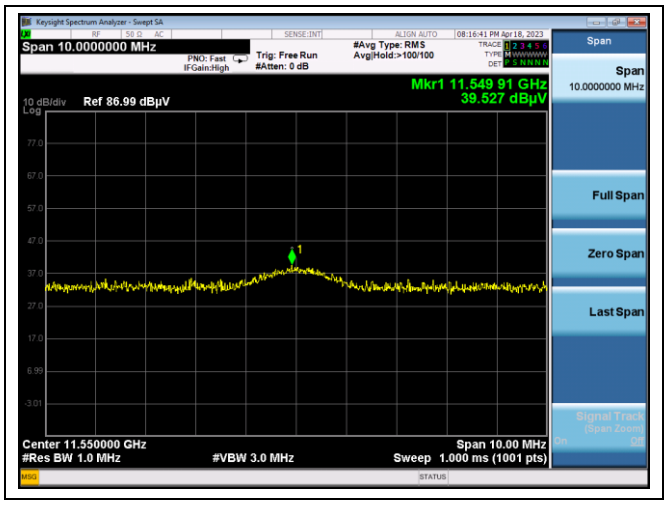


Middle channel Band edge (Peak) - Band 3

Middle channel Band edge (Peak) - Band 3

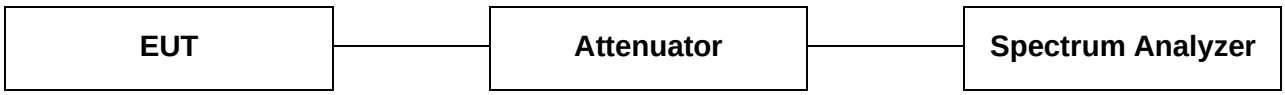


Middle channel 2nd Spurious (Peak) - Band 3



3. 26 ㏈ Bandwidth & 99 % Bandwidth

3.1. Test Setup



3.2. Limit

None; for reporting purpose only.

3.3. Test Procedure

3.3.1. 26 ㏈ Bandwidth

1. This measurement settings are specified in section Ⅱ.C.1 of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set RBW = approximately 1 % of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 ㏈ 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 %.

Remark;

In case of band crossing channels 138, 142 and 144, the measurement is complied with section Ⅲ.A of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

3.3.2. 99 % Bandwidth

3.3.2.1 FCC

1. This measurement settings are specified in section Ⅱ.D of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set center frequency to the nominal EUT channel center frequency.
3. Set span = 1.5 times to 5.0 times the OBW.
4. Set RBW = 1 % to 5 % of the OBW.
5. Set VBW ≥ 3 x RBW.
6. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
7. Use the 99 % power bandwidth function of the instrument (if available).
8. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99 % occupied bandwidth is the difference between these two frequencies.

In the result,

- DFS requirements are not applicable in the 5 150 ㎒ ~ 5 250 ㎒.

3.3.2.2 IC

● The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.

● The detector of the spectrum analyzer shall be set to “Sample”. However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or “Max Hold”) may be necessary to determine the occupied / x ㏈ bandwidth if the device is not transmitting continuously.

● The resolution bandwidth (RBW) shall be in the range of 1 % to 5 % of the actual occupied / x ㏈ bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99 % emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99 % emission bandwidth).

3.4. Test Result

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

- SISO_Core 0

Test mode: 11a

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)	99 % Bandwidth (㎒)
U-NII 1	5 180	36	9	21.139	16.961
	5 220	44		21.099	17.019
	5 240	48		21.179	17.019
U-NII 2A	5 260	52		21.059	16.961
	5 300	60		21.259	16.961
	5 320	64		21.179	16.961
U-NII 2C	5 500	100		21.139	17.019
	5 580	116		21.179	17.019
	5 700	140		21.059	17.019
U-NII 3	5 745	149		21.259	17.019
	5 785	157		21.179	17.019
	5 825	165		21.219	17.019

Test mode: 11n_HT20

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)	99 % Bandwidth (㎒)
U-NII 1	5 180	36	MCS2	21.299	17.887
	5 220	44		21.339	17.945
	5 240	48		21.139	18.003
U-NII 2A	5 260	52		21.259	17.945
	5 300	60		21.419	17.945
	5 320	64		21.379	17.945
U-NII 2C	5 500	100		21.419	17.887
	5 580	116		21.379	17.945
	5 700	140		21.179	18.003
U-NII 3	5 745	149		21.379	17.945
	5 785	157		21.459	17.887
	5 825	165		21.339	17.945

Test mode: 11n_HT40

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)	99 % Bandwidth (㎒)
U-NII 1	5 190	38	MCS0	39.960	36.237
	5 230	46		40.120	36.237
U-NII 2A	5 270	54		40.040	36.237
	5 310	62		40.040	36.353
U-NII 2C	5 510	102		40.120	36.237
	5 550	110		40.440	36.353
	5 670	134		40.120	36.237
U-NII 3	5 755	151		40.200	36.237
	5 795	159		40.120	36.353

Test mode: 11ac_VHT80

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)	99 % Bandwidth (㎒)
U-NII 1	5 210	42	MCS2	81.359	75.716
U-NII 2A	5 290	58		81.998	75.716
U-NII 2C	5 530	106		81.518	75.716
U-NII 3	5 775	155		81.678	75.716

Band-crossing channel

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)
11a	5 720	144	9	15.589
11n_HT20	5 720	144	MCS2	15.629
11n_HT40	5 710	142	MCS0	34.980
11ac_VHT80	5 690	138	MCS2	75.759

- SISO_Core 1

Test mode: 11a

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)	99 % Bandwidth (㎒)
U-NII 1	5 180	36	6	20.939	17.019
	5 220	44		20.939	17.019
	5 240	48		20.939	17.019
U-NII 2A	5 260	52		21.019	17.019
	5 300	60		21.099	17.019
	5 320	64		20.859	17.019
U-NII 2C	5 500	100		20.859	17.019
	5 580	116		21.019	17.019
	5 700	140		21.099	17.019
U-NII 3	5 745	149		20.859	17.019
	5 785	157		20.899	17.019
	5 825	165		21.019	17.019

Test mode: 11ac_VHT20

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)	99 % Bandwidth (㎒)
U-NII 1	5 180	36	MCS2	21.499	18.003
	5 220	44		21.299	18.003
	5 240	48		21.219	17.945
U-NII 2A	5 260	52		21.219	17.945
	5 300	60		21.379	17.945
	5 320	64		21.499	17.945
U-NII 2C	5 500	100		21.459	17.945
	5 580	116		21.379	17.945
	5 700	140		21.299	18.003
U-NII 3	5 745	149		21.499	18.003
	5 785	157		21.179	17.945
	5 825	165		21.339	18.003

Test mode: 11n_HT40

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)	99 % Bandwidth (㎒)
U-NII 1	5 190	38	MCS2	39.720	36.122
	5 230	46		39.800	36.237
U-NII 2A	5 270	54		39.960	36.122
	5 310	62		39.720	36.237
U-NII 2C	5 510	102		39.880	36.237
	5 550	110		39.640	36.122
	5 670	134		39.800	36.237
U-NII 3	5 755	151		39.880	36.237
	5 795	159		40.040	36.237

Test mode: 11ac_VHT80

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)	99 % Bandwidth (㎒)
U-NII 1	5 210	42	MCS1	81.518	75.716
U-NII 2A	5 290	58		81.838	75.716
U-NII 2C	5 530	106		81.838	75.716
U-NII 3	5 775	155		81.678	75.716

Band-crossing channel

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)
11a	5 720	144	6	15.470
11ac_VHT20	5 720	144	MCS2	15.709
11n_HT40	5 710	142	MCS2	34.820
11ac_VHT80	5 690	138	MCS1	76.079

- MIMO

Test mode: 11n_HT20

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)		99 % Bandwidth (㎒)	
				Core 0	Core 1	Core 0	Core 1
U-NII 1	5 180	36	MCS13	21.019	21.179	18.061	18.003
	5 220	44		21.219	21.299	18.061	18.061
	5 240	48		21.339	21.179	18.061	18.003
U-NII 2A	5 260	52		20.579	21.179	18.003	18.061
	5 300	60		20.420	21.339	18.003	18.003
	5 320	64		20.500	21.339	18.003	18.061
U-NII 2C	5 500	100		21.179	21.259	18.003	18.061
	5 580	116		21.299	21.219	18.003	18.003
	5 700	140		21.339	21.259	18.061	18.061
U-NII 3	5 745	149		21.099	21.099	18.061	18.003
	5 785	157		21.299	21.419	18.061	18.061
	5 825	165		21.499	21.259	18.061	18.061

Test mode: 11ac_VHT40

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)		99 % Bandwidth (㎒)	
				Core 0	Core 1	Core 0	Core 1
U-NII 1	5 190	38	MCS3	39.880	40.040	36.469	36.469
	5 230	46		39.720	40.200	36.353	36.469
U-NII 2A	5 270	54		39.880	39.800	36.353	36.353
	5 310	62		40.040	39.800	36.585	36.353
U-NII 2C	5 510	102		40.200	39.960	36.469	36.469
	5 550	110		40.120	40.200	36.469	36.469
	5 670	134		40.040	39.880	36.469	36.469
U-NII 3	5 755	151		40.120	39.880	36.353	36.353
	5 795	159		40.040	39.880	36.469	36.469

Test mode: 11ac_VHT80

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)		99 % Bandwidth (㎒)	
				ANT 1	ANT 2	ANT 1	ANT 2
U-NII 1	5 210	42	MCS6	82.158	81.199	75.948	75.948
U-NII 2A	5 290	58		82.318	81.518	75.716	75.948
U-NII 2C	5 530	106		82.158	81.359	75.948	75.716
U-NII 3	5 775	155		81.838	81.998	75.948	75.716

Band-crossing channel

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)	
				Core 0	Core 1
11n_HT20	5 720	144	MCS13	15.829	15.589
11ac_VHT40	5 710	142	MCS3	35.220	34.900
11ac_VHT80	5 690	138	MCS6	75.919	75.919

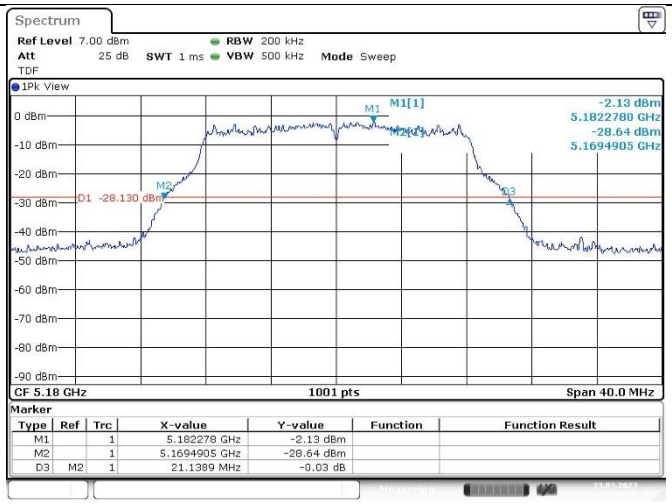
- Test plots

- SISO_Core 0

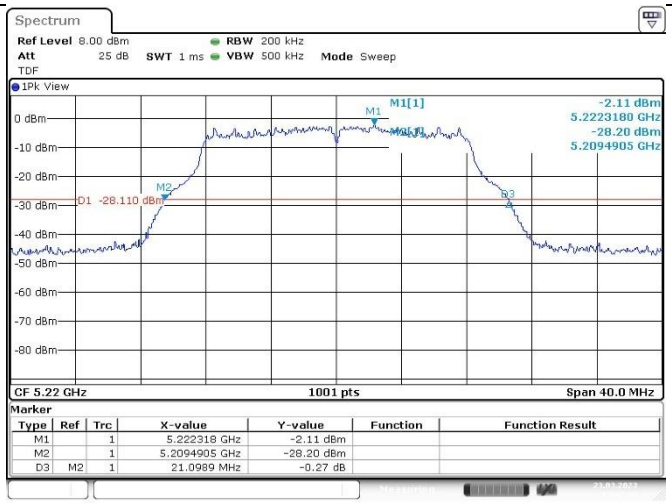
26 dB Bandwidth

802.11a (Band 1)

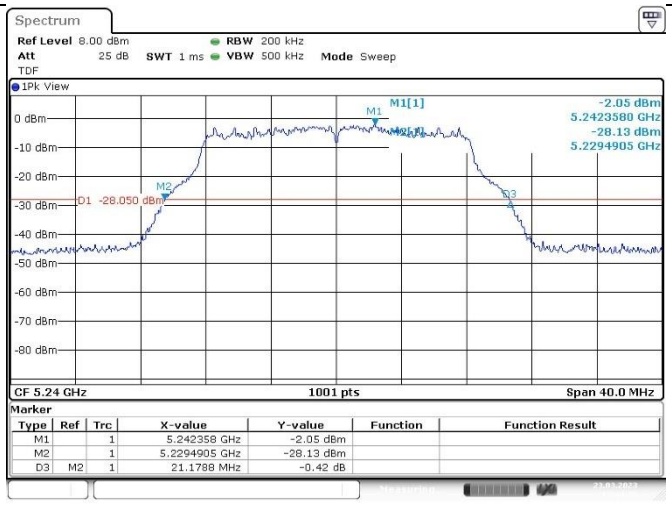
Low Channel
(5 180 ㎒)



Middle Channel
(5 220 ㎒)

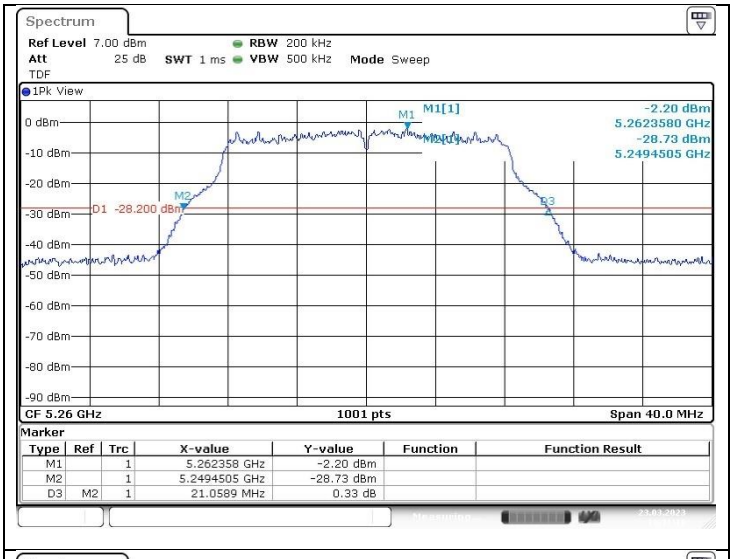


High Channel
(5 240 ㎒)

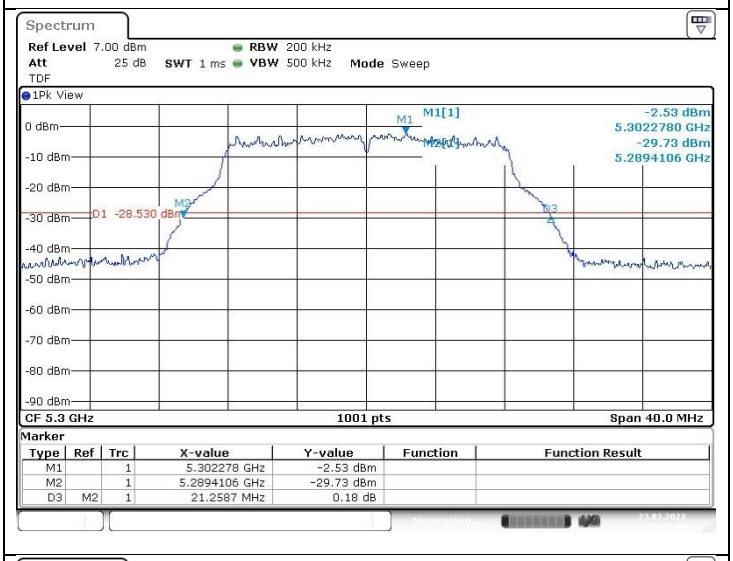


802.11a (Band 2A)

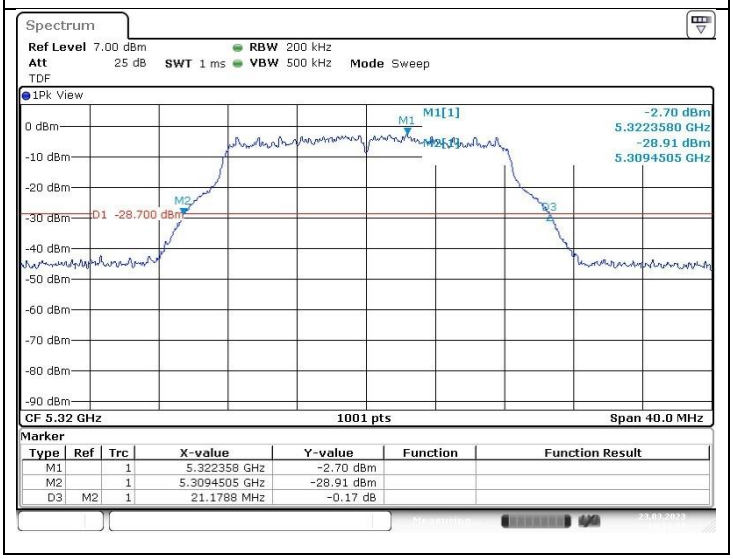
Low Channel
(5 260 ㎒)



Middle Channel
(5 300 ㎒)

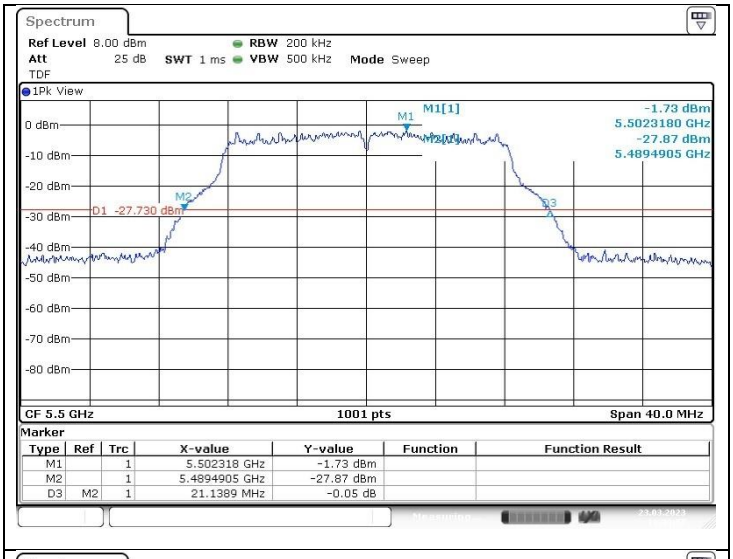


High Channel
(5 320 ㎒)

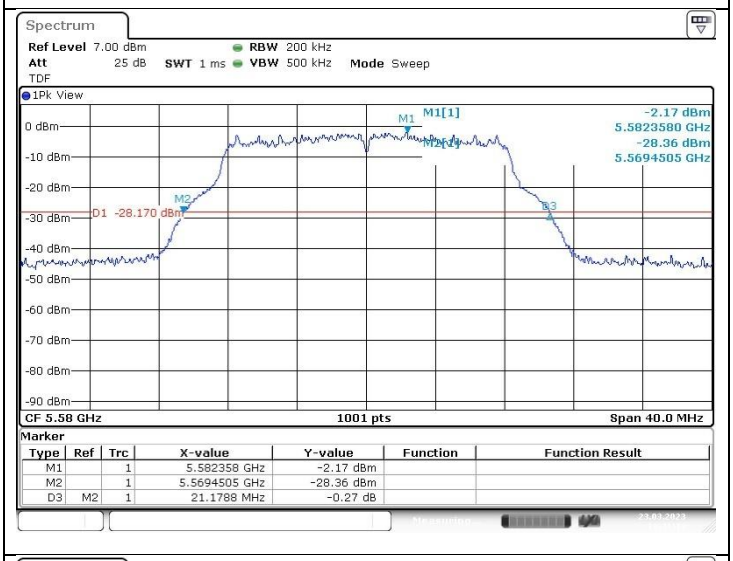


802.11a (Band 2C)

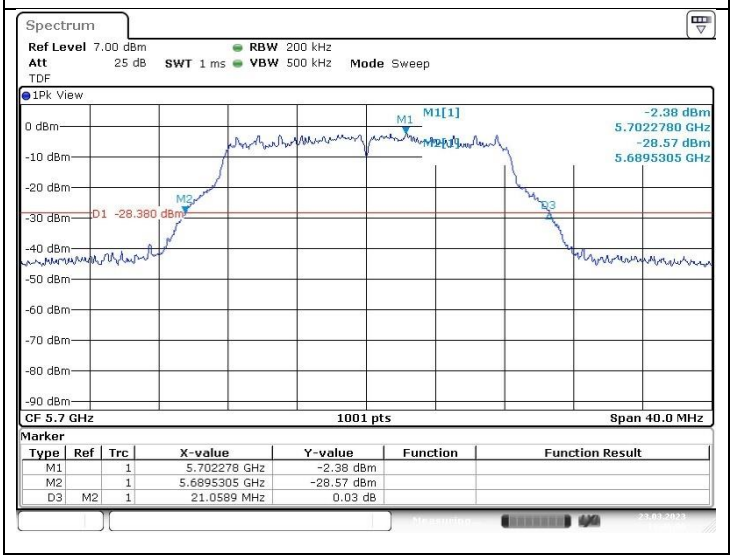
Low Channel
(5 500 ㎒)



Middle Channel
(5 580 ㎒)

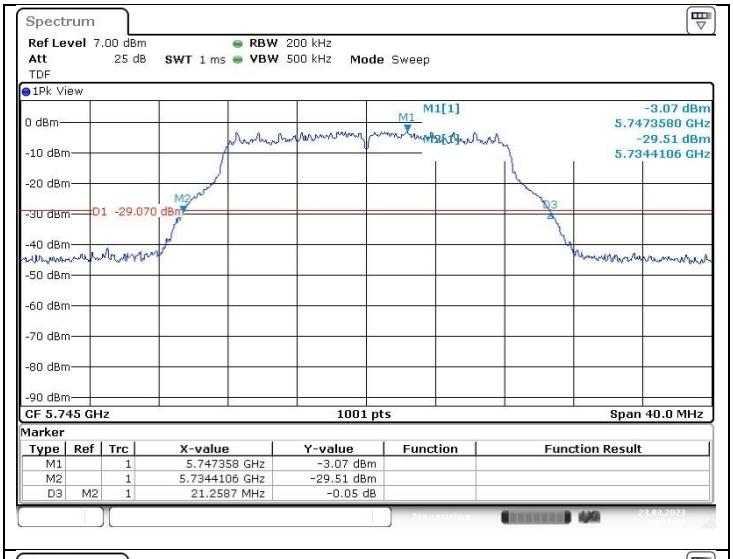


High Channel
(5 700 ㎒)

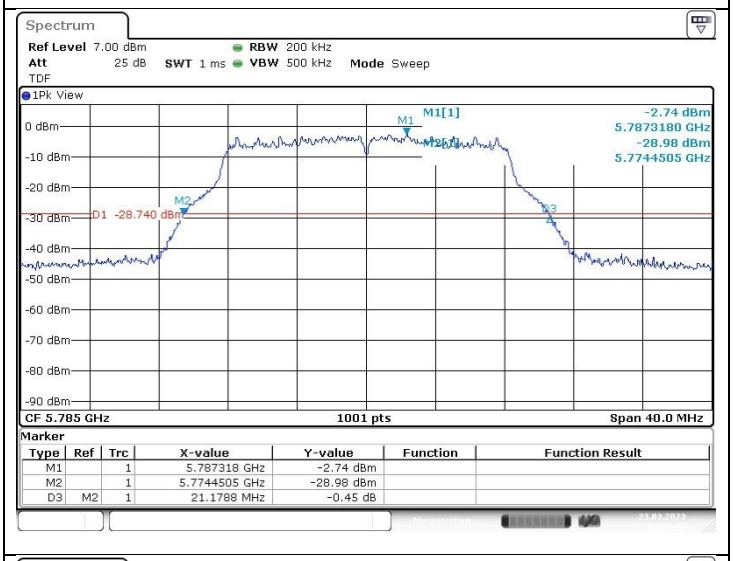


802.11a (Band 3)

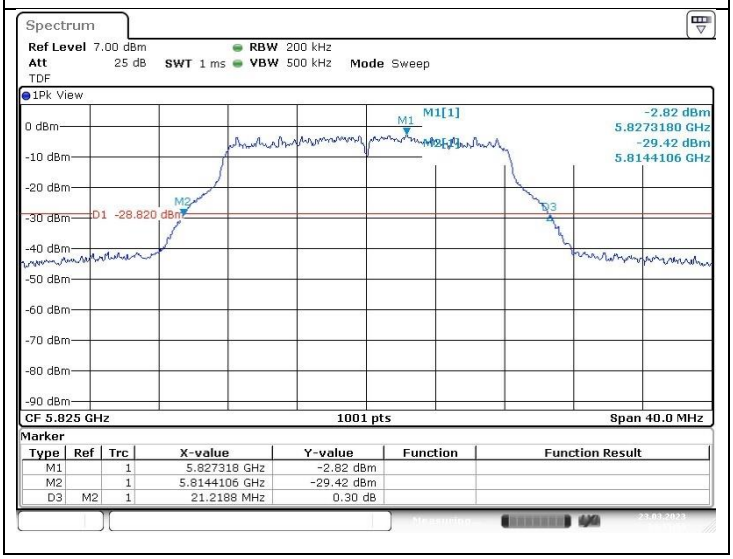
Low Channel
(5 745 ㎒)



Middle Channel
(5 785 ㎒)

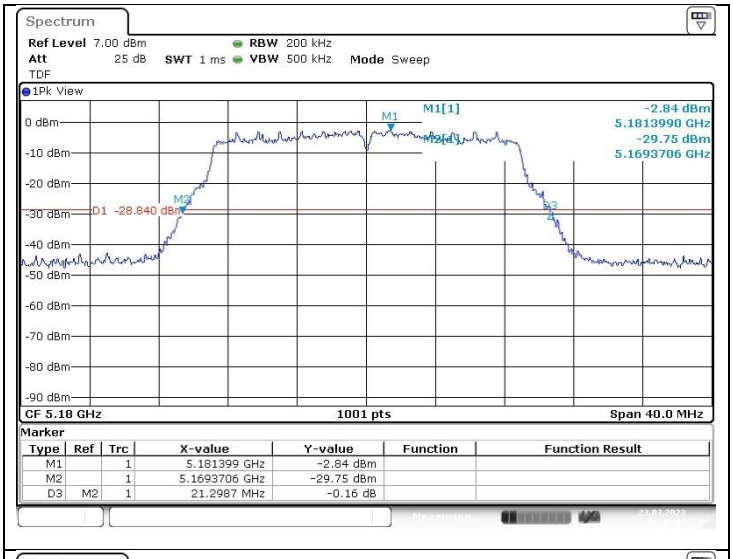


High Channel
(5 825 ㎒)

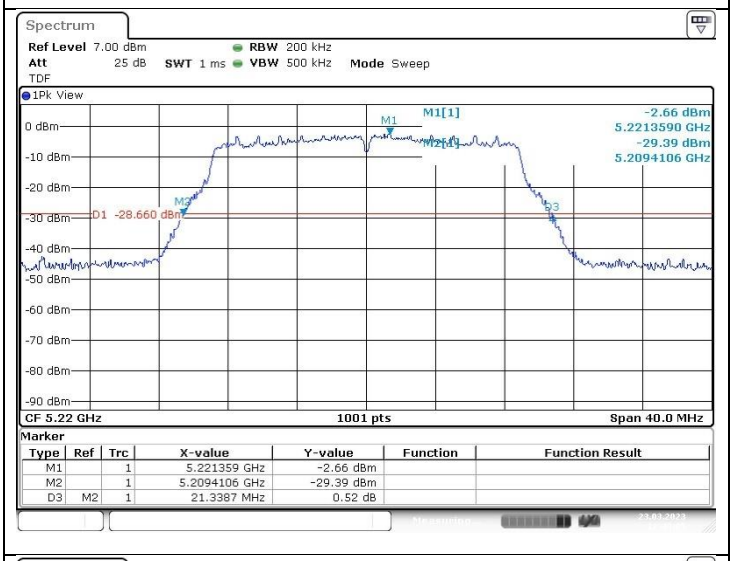


802.11n_HT20 (Band 1)

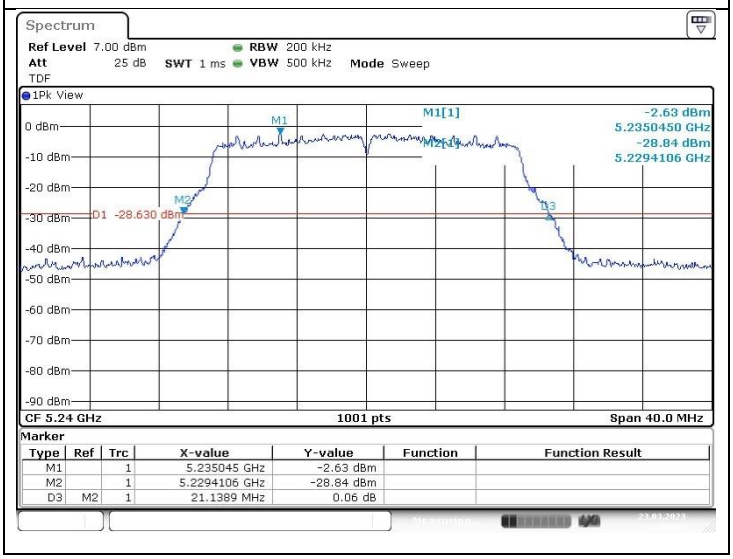
Low Channel
(5 180 ㎒)



Middle Channel
(5 220 ㎒)

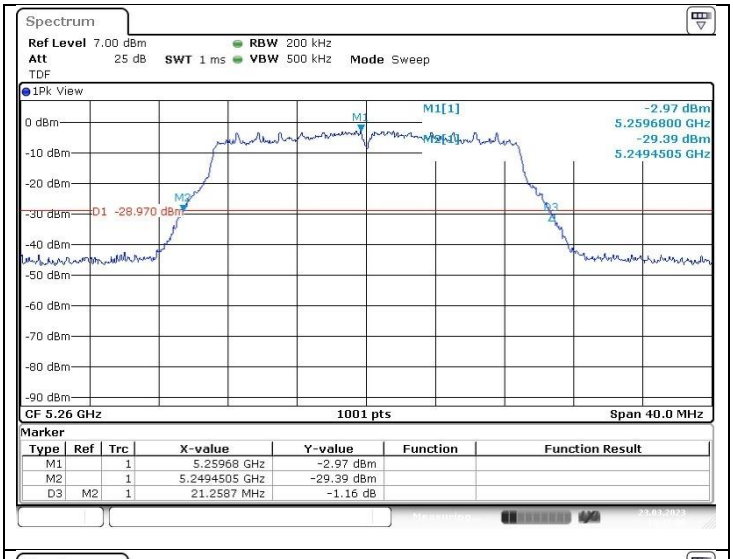


High Channel
(5 240 ㎒)

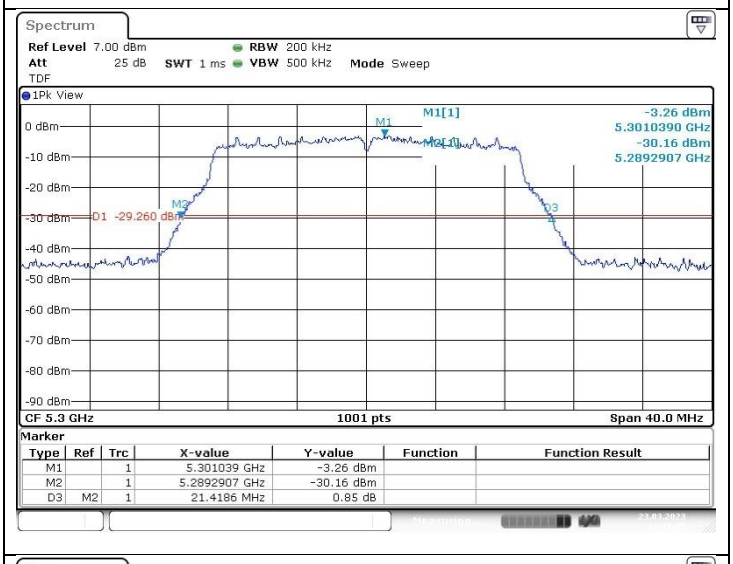


802.11n_HT20 (Band 2A)

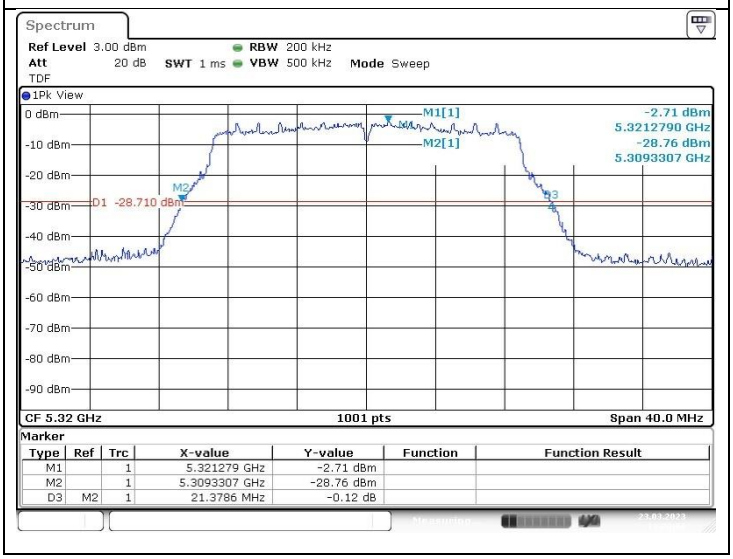
Low Channel
(5 260 ㎒)



Middle Channel
(5 300 ㎒)

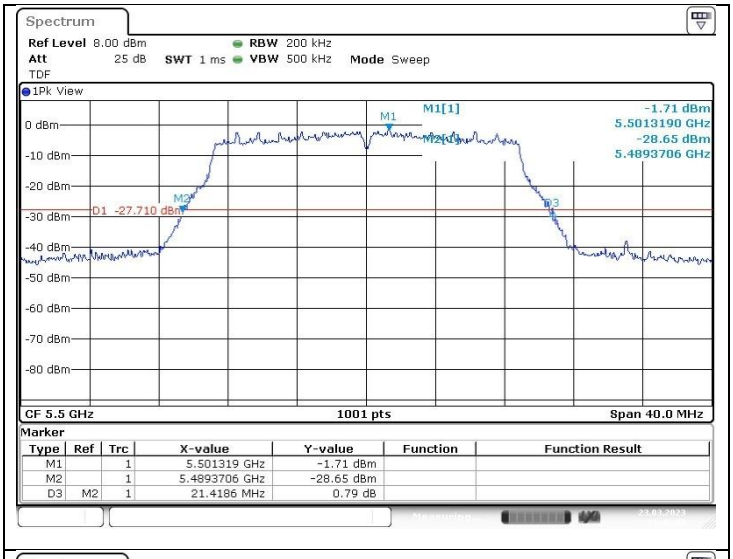


High Channel
(5 320 ㎒)

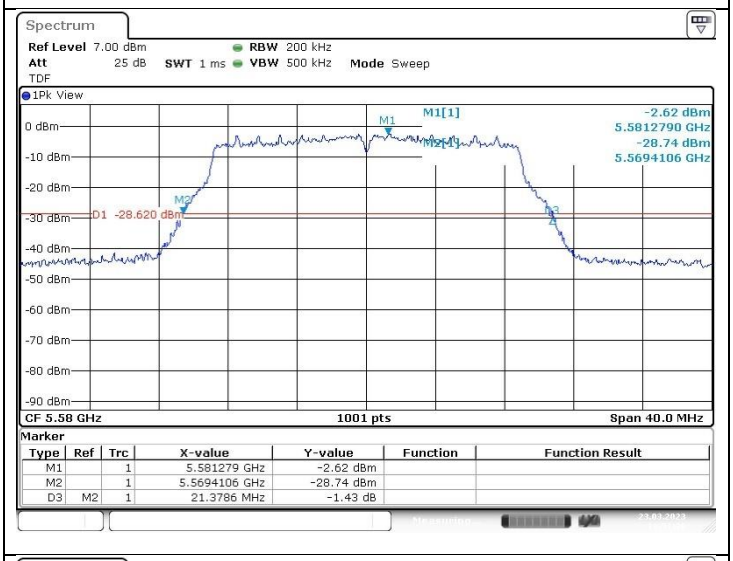


802.11n_HT20 (Band 2C)

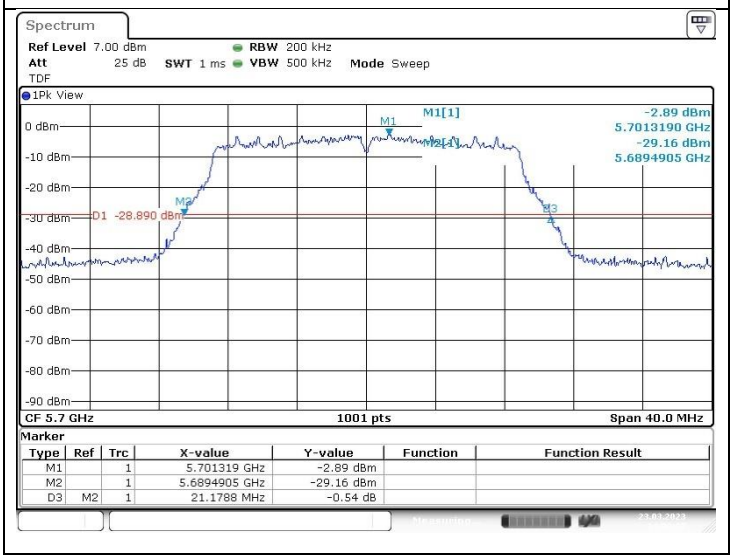
Low Channel
(5 500 ㎒)



Middle Channel
(5 580 ㎒)

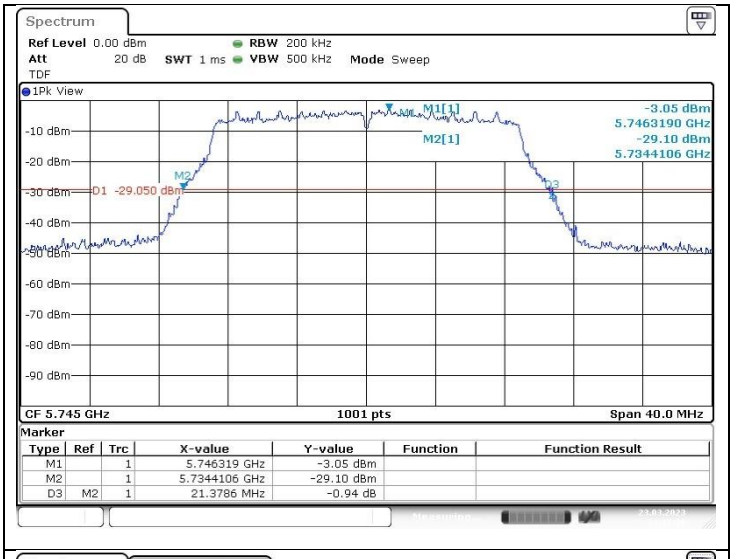


High Channel
(5 700 ㎒)

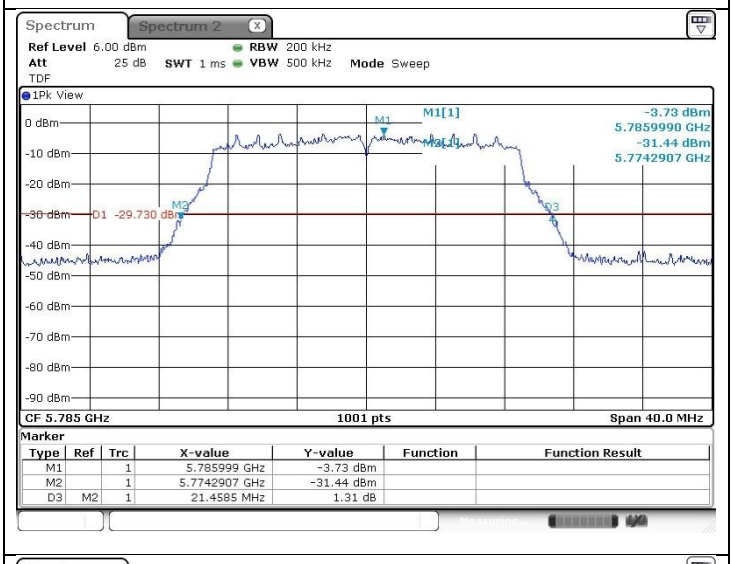


802.11n_HT20 (Band 3)

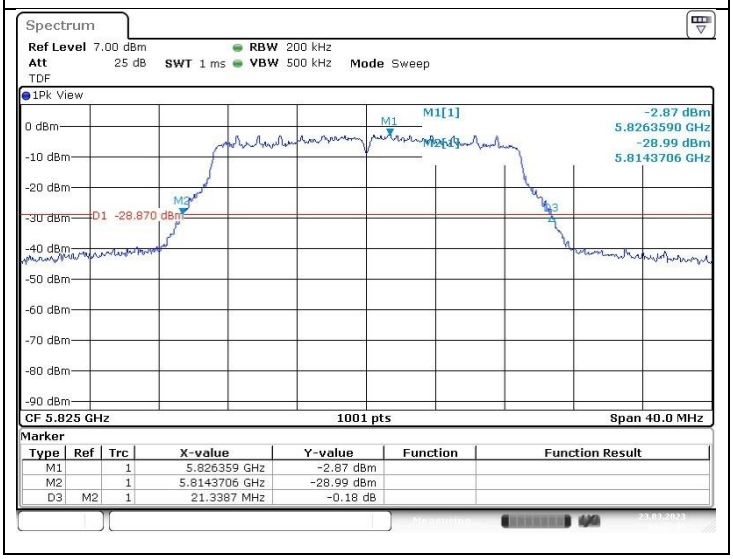
Low Channel
(5 745 ㎒)



Middle Channel
(5 785 ㎒)

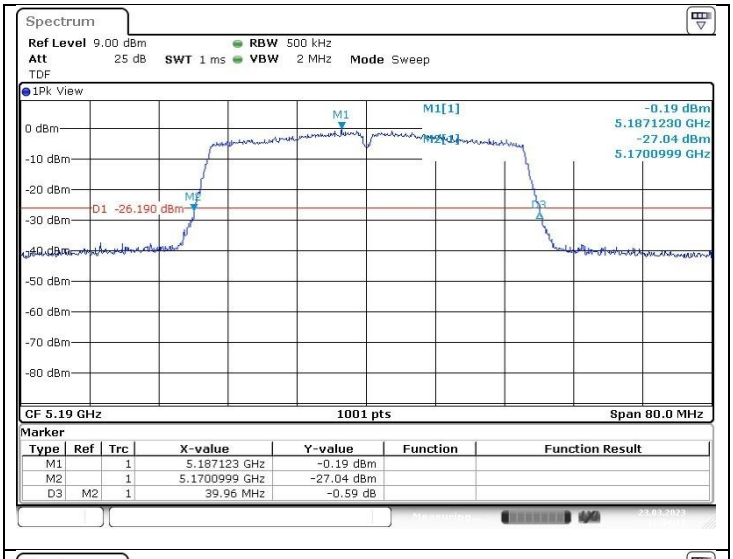
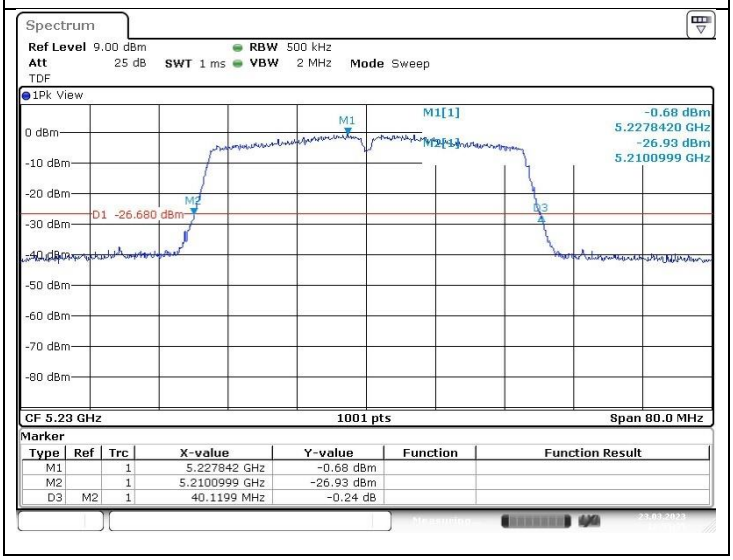


High Channel
(5 825 ㎒)



802.11n_HT40 (Band 1)

Low Channel
(5 190 ㎒)



High Channel
(5 230 ㎒)