

OFDM: 802.11ac_VHT40 (Band 3)

A. Low Channel (5 755 MHz)

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 648.38	37.69	Peak	H	34.10	-21.29	50.50	68.23	17.73
5 692.46	39.62	Peak	H	34.10	-22.17	51.55	99.65	48.10
5 717.26	42.07	Peak	H	34.17	-21.86	54.38	110.06	55.68
5 724.23	43.65	Peak	H	34.20	-21.61	56.24	120.47	64.24

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	DF (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

B. High Channel (5 795 MHz)

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 853.60	41.43	Peak	H	34.41	-21.79	54.05	114.02	59.97
5 856.60	40.86	Peak	H	34.43	-21.80	53.49	110.38	56.89
5 875.00	39.28	Peak	H	34.50	-21.87	51.91	105.23	53.32
5 948.80	37.90	Peak	H	34.70	-22.21	50.39	68.23	17.84

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	DF (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

OFDM: 802.11ac_VHT80 (Band 1)

A. Middle Channel (5 210 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	DF (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*4 500.00	34.05	Peak	H	32.00	-24.03	-	42.02	74.00	31.98
*4 500.00	25.80	Average	H	32.00	-24.03	1.85	35.62	54.00	18.38
*5 137.73	43.54	Peak	H	33.60	-22.84	-	54.30	74.00	19.70
*5 142.71	30.30	Average	H	33.60	-22.87	1.85	42.88	54.00	11.12
*5 150.00	41.61	Peak	H	33.60	-22.91	-	52.30	74.00	21.70
*5 150.00	29.81	Average	H	33.60	-22.91	1.85	42.35	54.00	11.65

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	DF (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

OFDM: 802.11ac_VHT80 (Band 3)

A. Middle Channel (5 775 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	DF (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 649.64	39.52	Peak	H	34.10	-21.28		52.34	68.23	15.89
5 683.66	41.18	Peak	H	34.10	-21.83		53.45	93.14	39.69
5 716.60	41.23	Peak	H	34.17	-21.88		53.52	109.88	56.36
5 724.04	42.58	Peak	H	34.20	-21.61		55.17	120.04	64.87
5 852.18	40.92	Peak	H	34.41	-21.79		53.54	117.26	63.72
5 861.61	39.66	Peak	H	34.45	-21.82		52.29	108.98	56.69
5 875.41	39.93	Peak	H	34.50	-21.86		52.57	104.92	52.35
5 934.06	39.20	Peak	H	34.67	-21.76		52.11	68.23	16.12

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	DF (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

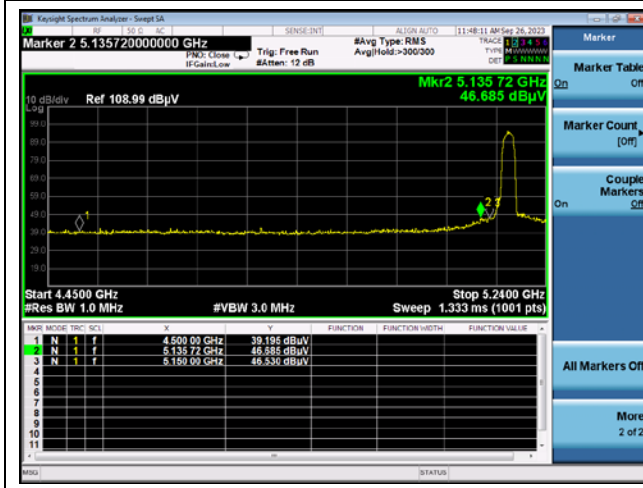
Remark;

1. “*” means the restricted band.
2. Radiated emissions measured in frequency above 1 000 MHz were made with an instrument using Peak / average detector mode if frequency was in restricted band. Otherwise the frequency was out of restricted band, only peak detector should be used.
3. Actual = Reading + AF + CL + (DF) or Reading + AF + AMP + CL + (DF).
4. If frequency was out of restricted band, the calculation method for peak limit is same as below.
 $68.23 \text{ dB}\mu\text{V/m} = \text{EIRP} - 20 \log(d) + 104.77 = -27 - 20 \log(3) + 104.77$
5. In case of the emissions within $\pm 75 \text{ MHz}$ from band edge of band 3, limit should be adjusted to emission mask of 15.407(4)(i).
6. According to § 15.31(o), emission levels are not reported much lower than the limits by over 20 dB.
7. The maximized peak measured value complies with the average limit, to perform an average measurement is unnecessary.

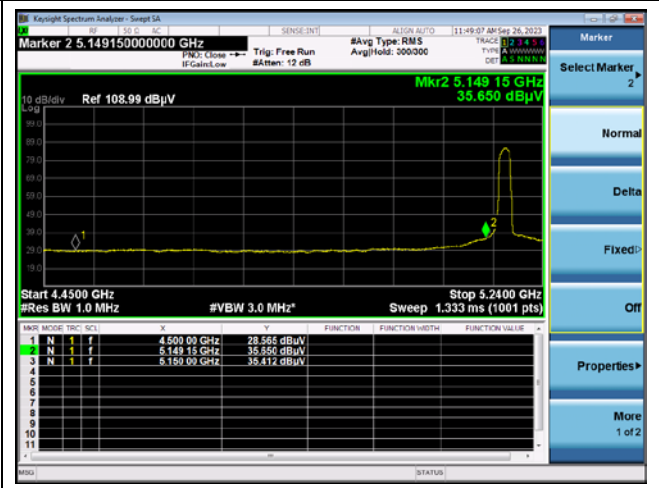
- Test plots

SISO_Core 0
802.11a

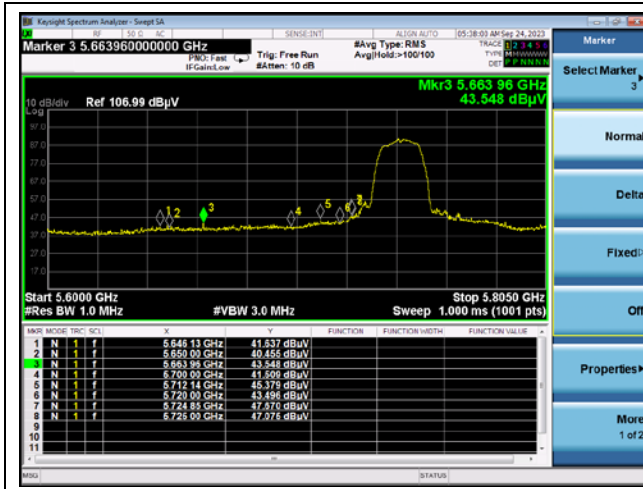
Low channel Band edge (Peak) - Band 1



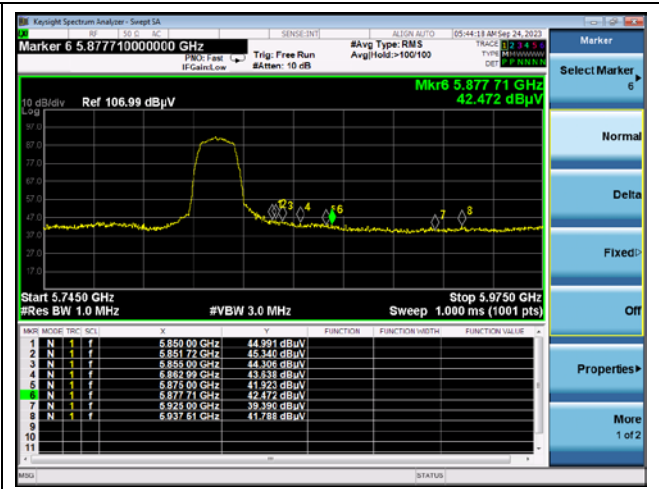
Low channel Band edge (Average) - Band 1



Low channel Band edge (Peak) - Band 3

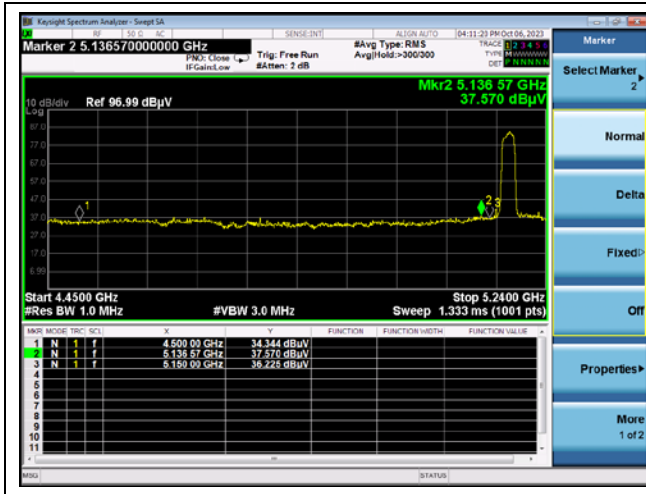


High channel Band edge (Peak) - Band 3

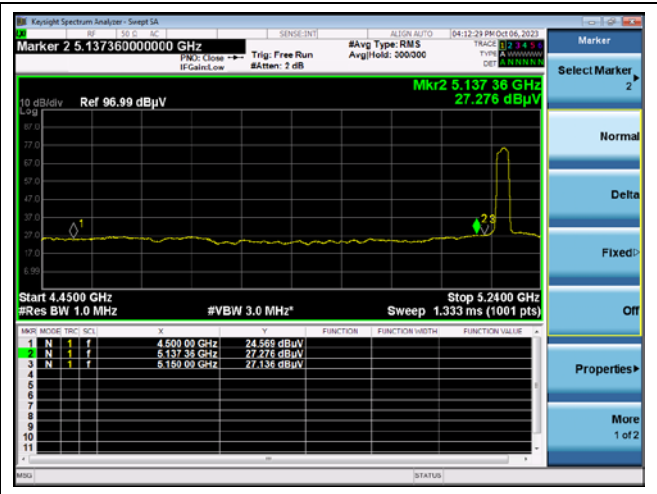


802.11ac_VHT20

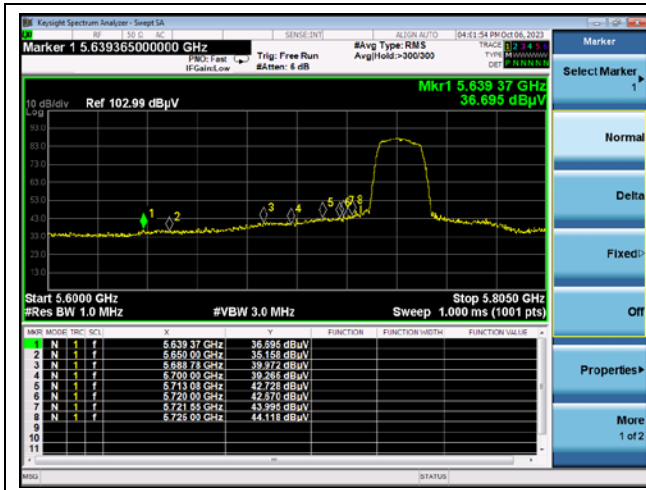
Low channel Band edge (Peak) - Band 1



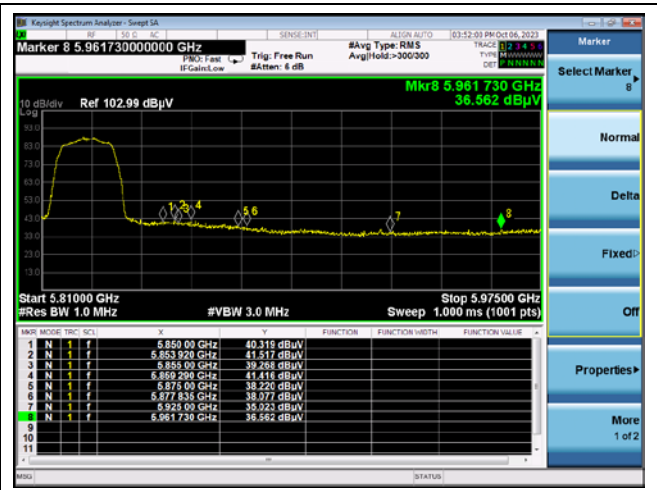
Low channel Band edge (Average) - Band 1



Low channel Band edge (Peak) - Band 3

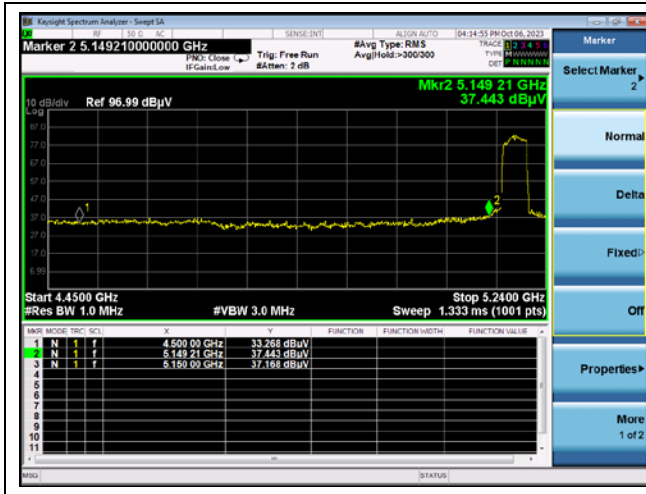


High channel Band edge (Peak) - Band 3

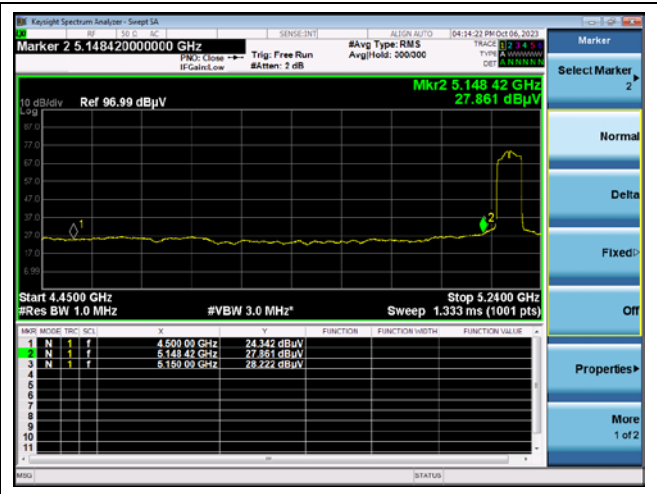


802.11ac_VHT40

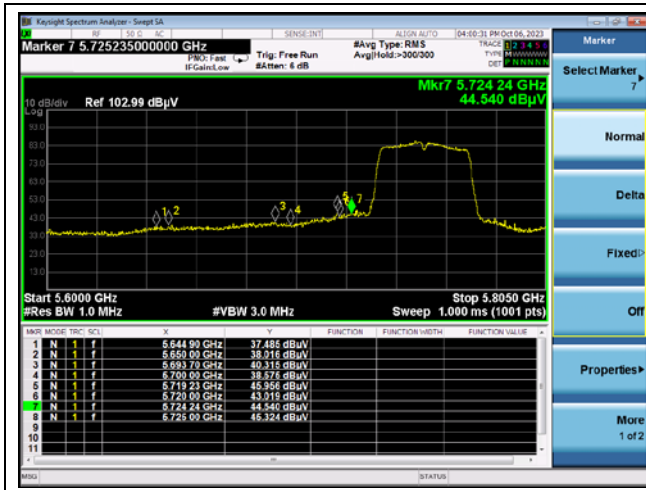
Low channel Band edge (Peak) - Band 1



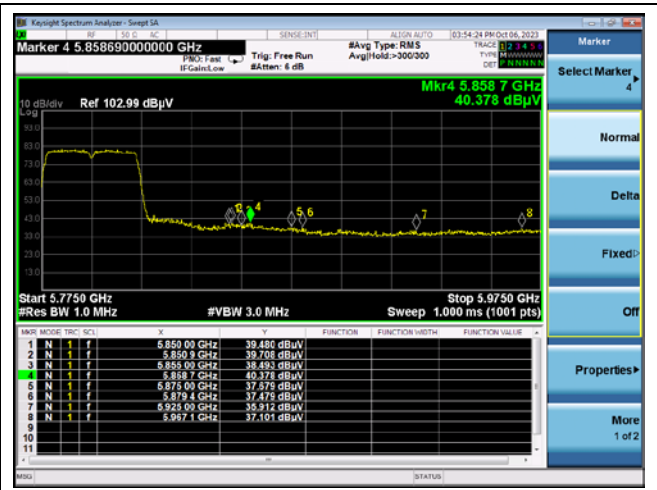
Low channel Band edge (Average) - Band 1



Low channel Band edge (Peak) - Band 3

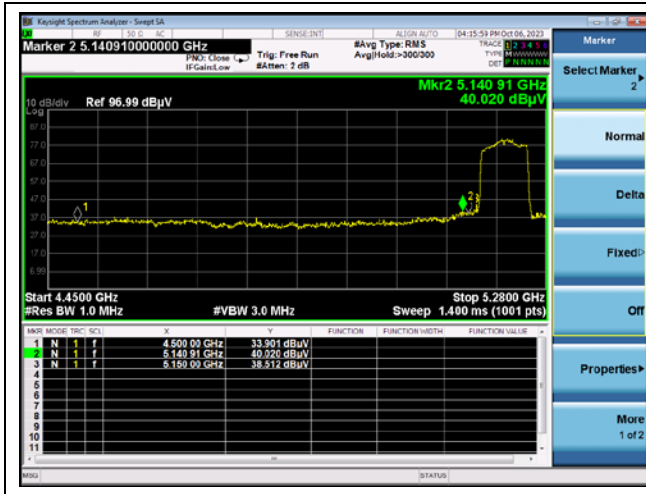


High channel Band edge (Peak) - Band 3

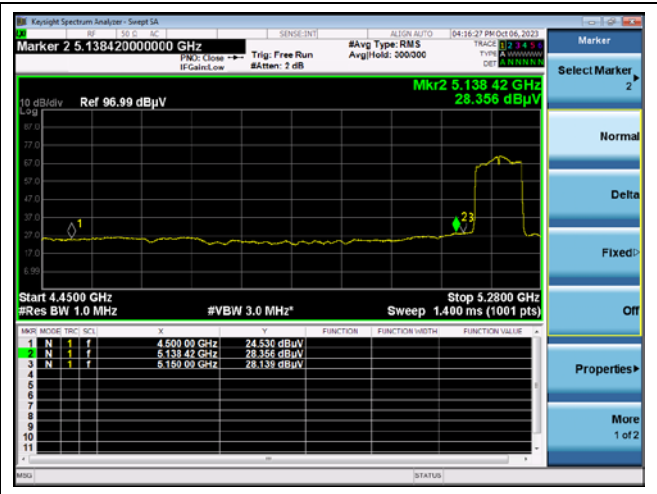


802.11ac_VHT80

Middle channel Band edge (Peak) - Band 1



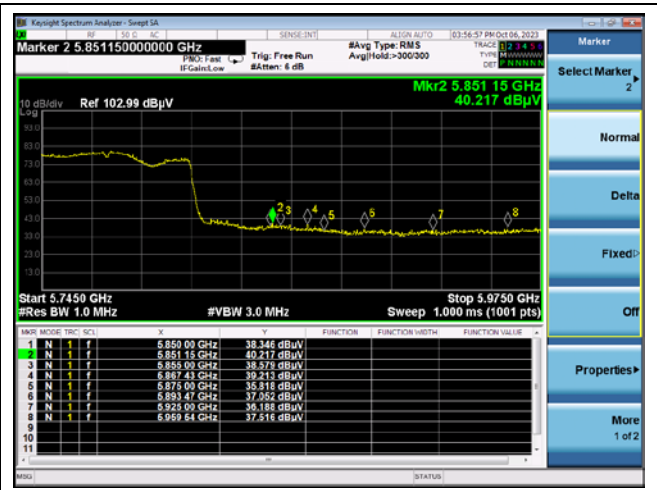
Middle channel Band edge (Average) - Band 1



Middle channel Band edge (Peak) - Band 3

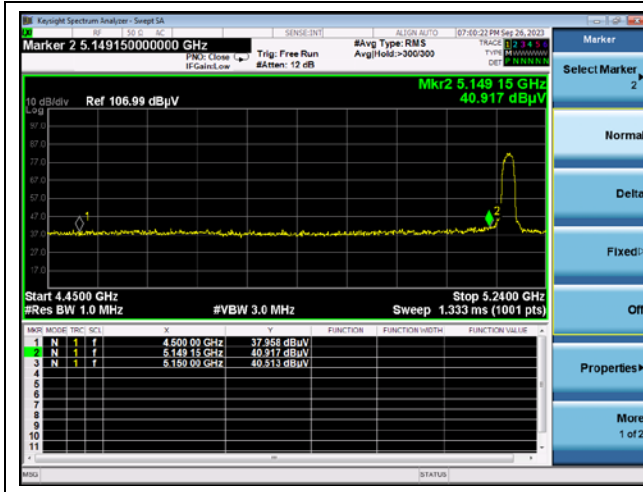


Middle channel Band edge (Peak) - Band 3

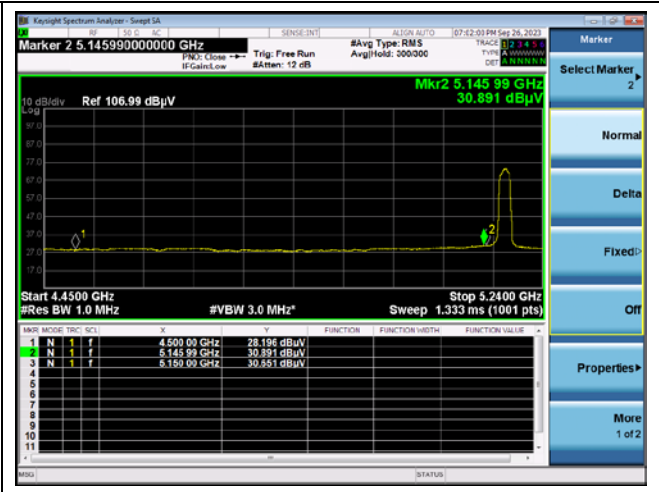


SISO_Core 1
802.11a

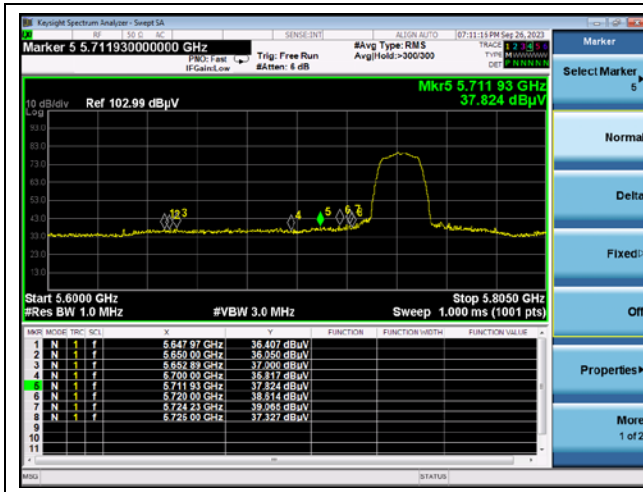
Low channel Band edge (Peak) - Band 1



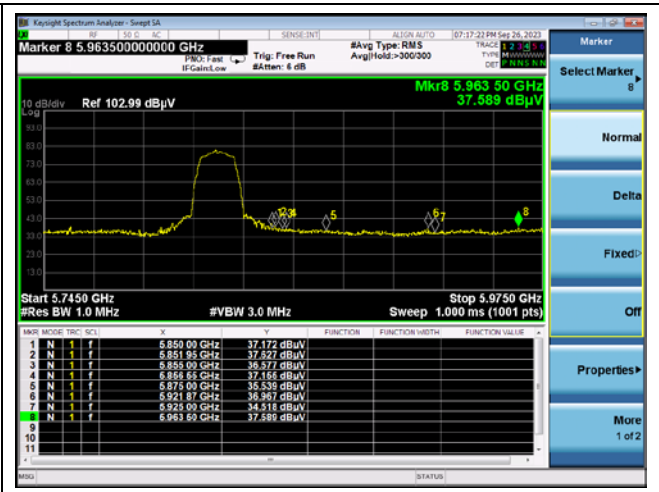
Low channel Band edge (Average) - Band 1



Low channel Band edge (Peak) - Band 3

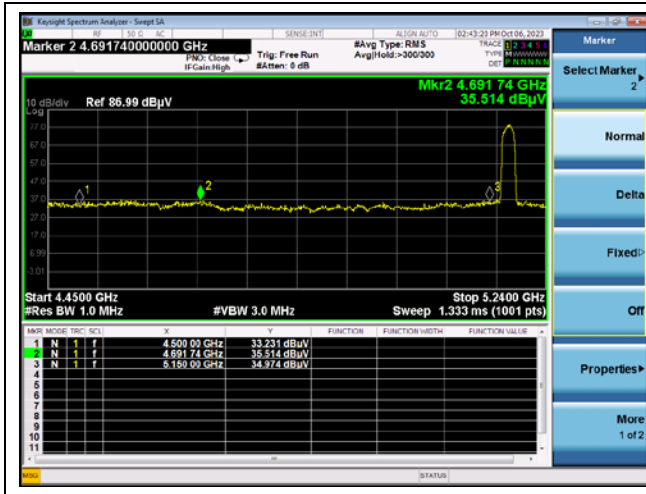


High channel Band edge (Peak) - Band 3

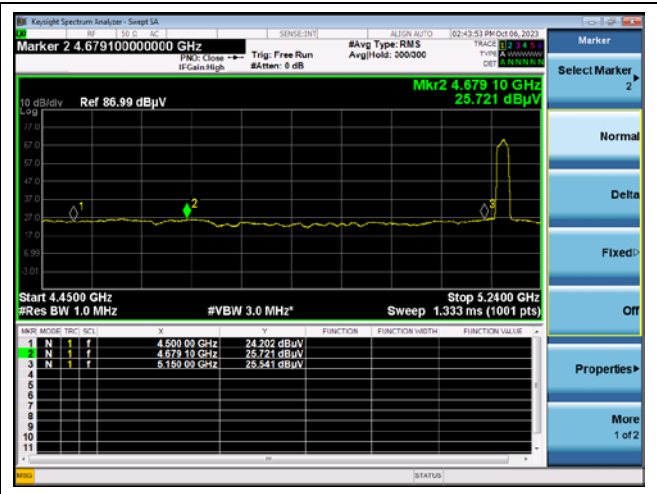


802.11ac_VHT20

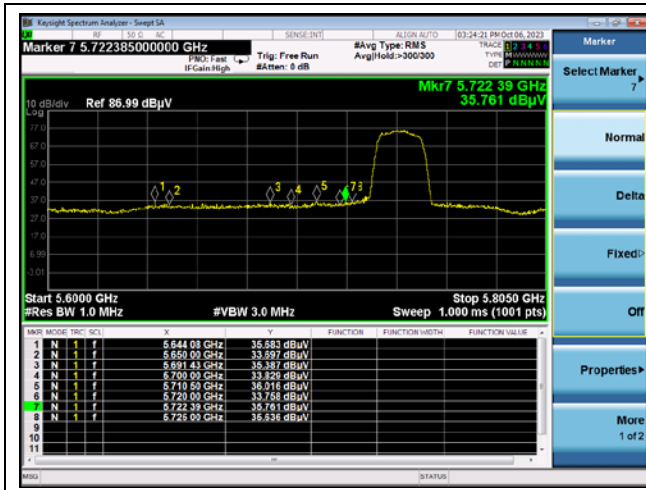
Low channel Band edge (Peak) - Band 1



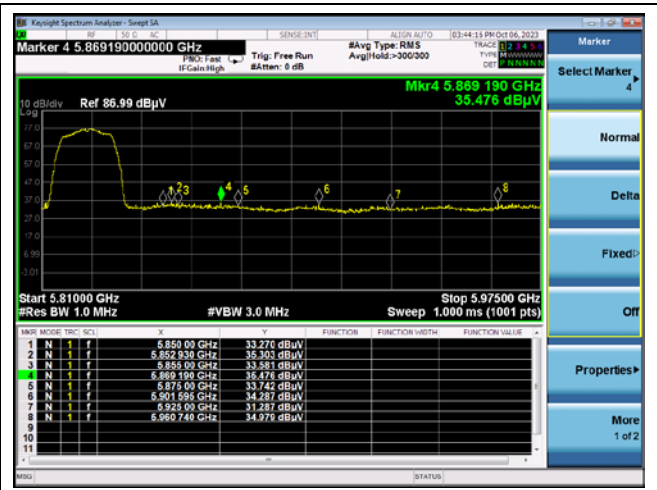
Low channel Band edge (Average) - Band 1



Low channel Band edge (Peak) - Band 3

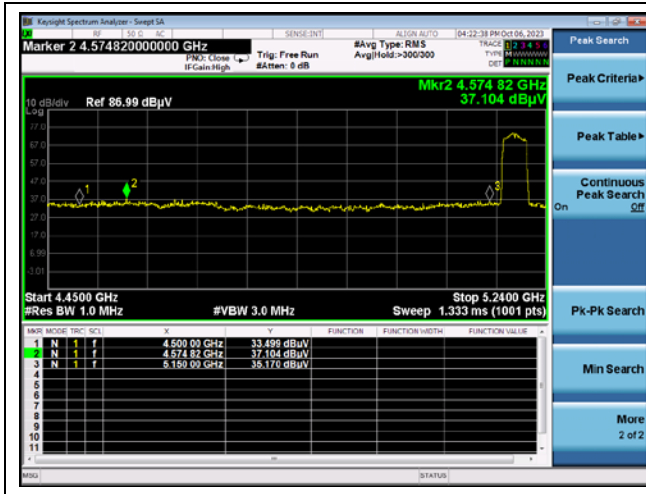


High channel Band edge (Peak) - Band 3

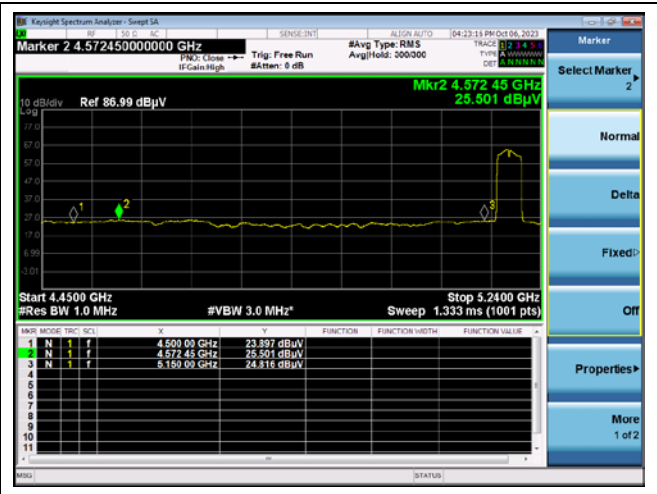


802.11ac_VHT40

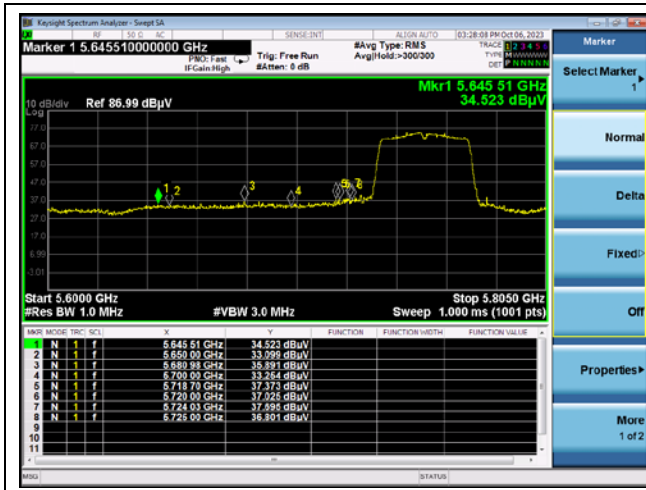
Low channel Band edge (Peak) - Band 1



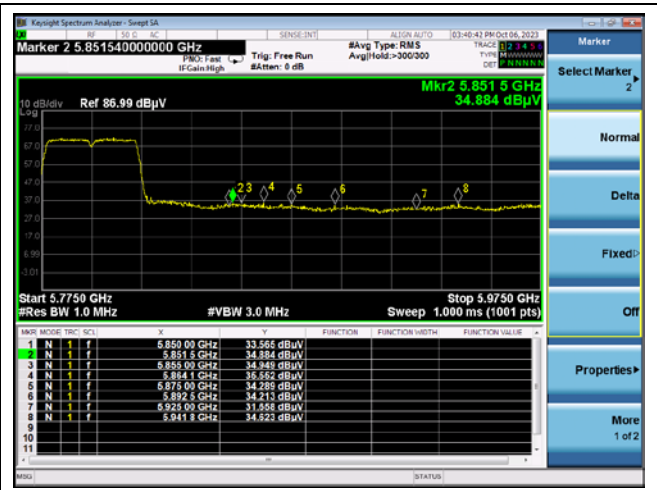
Low channel Band edge (Average) - Band 1



Low channel Band edge (Peak) - Band 3

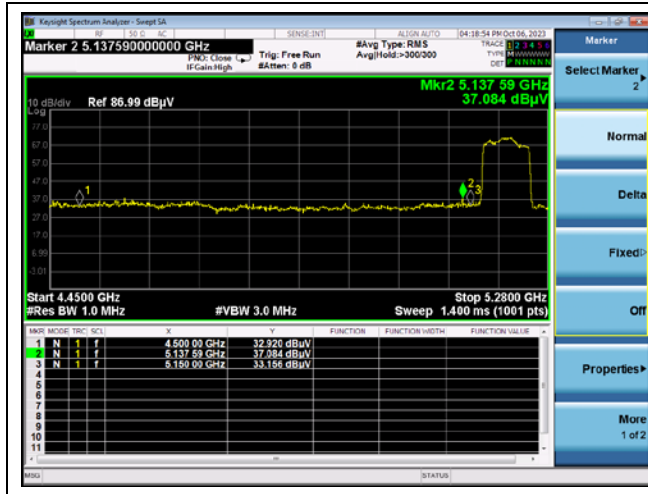


High channel Band edge (Peak) - Band 3

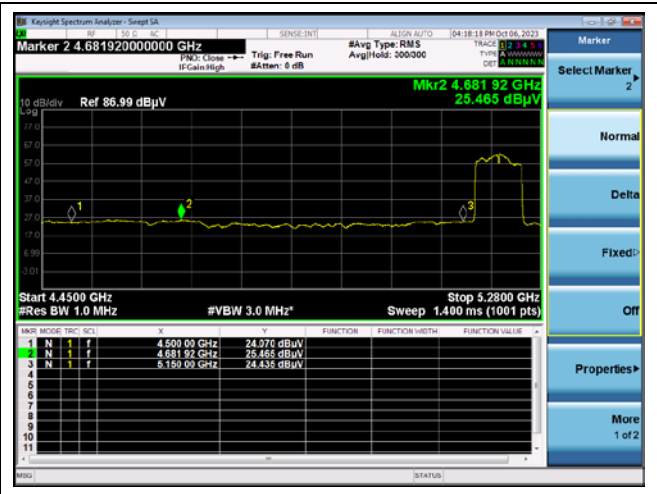


802.11ac_VHT80

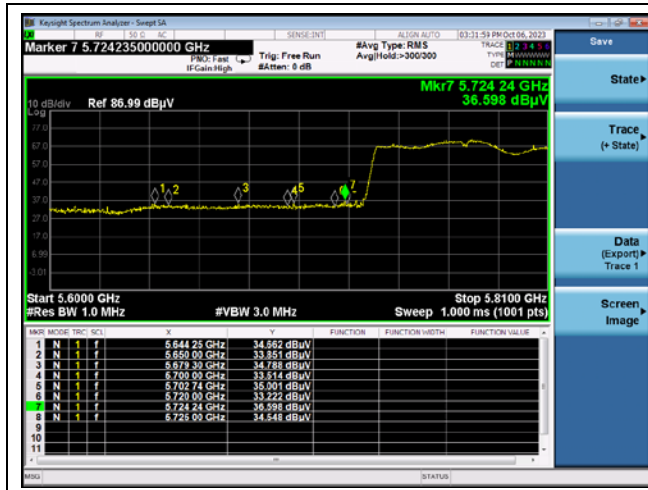
Middle channel Band edge (Peak) - Band 1



Middle channel Band edge (Average) - Band 1



Middle channel Band edge (Peak) - Band 3

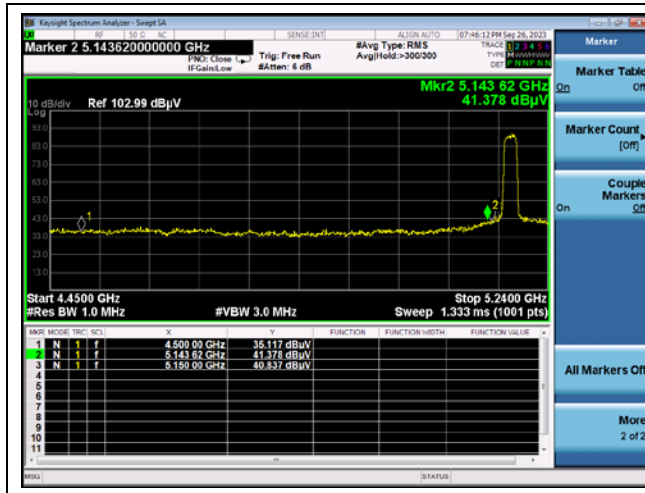


Middle channel Band edge (Peak) - Band 3

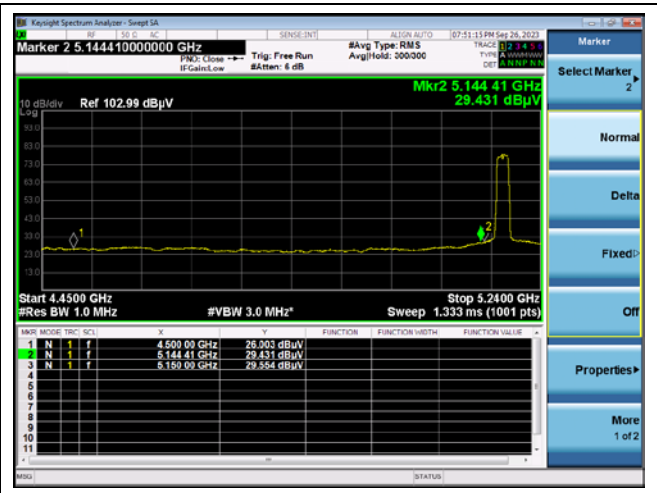


MIMO_Core 0 + Core 1
802.11ac_VHT20

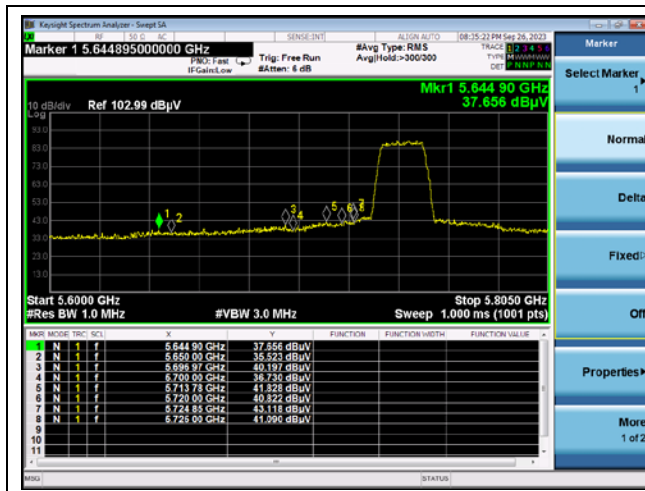
Low channel Band edge (Peak) - Band 1



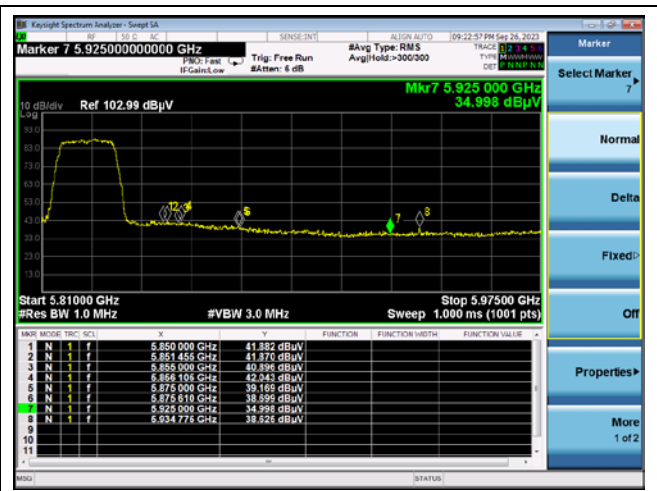
Low channel Band edge (Average) - Band 1



Low channel Band edge (Peak) - Band 3

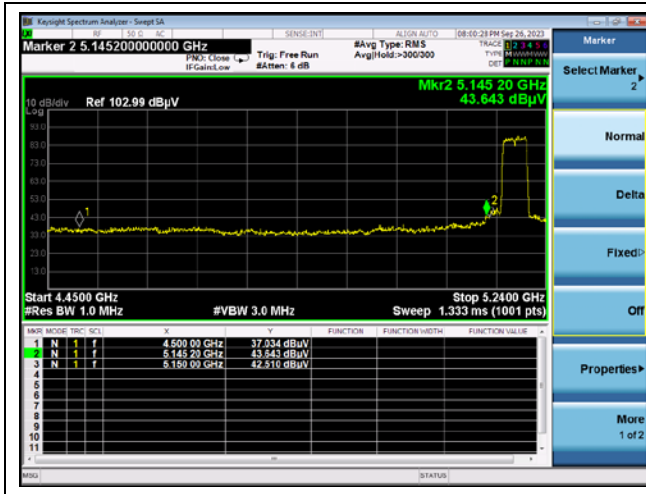


High channel Band edge (Peak) - Band 3

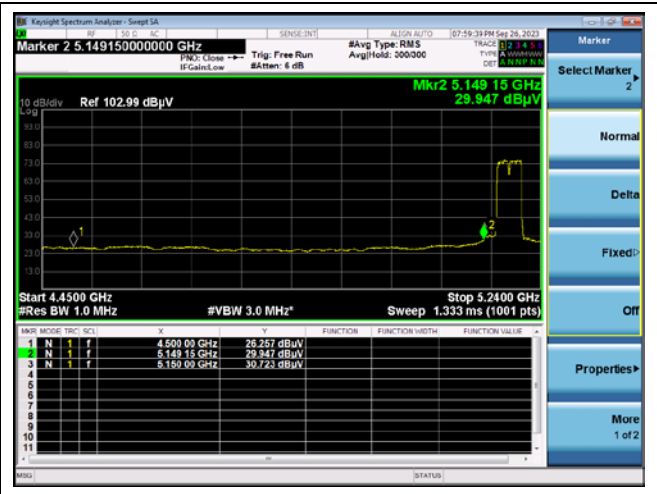


802.11ac_VHT40

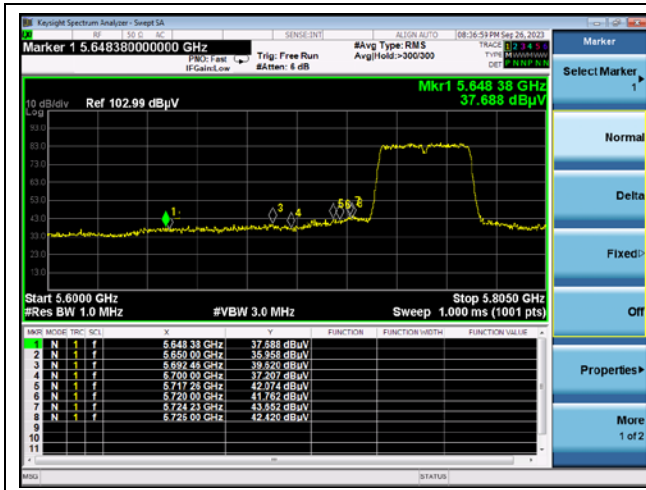
Low channel Band edge (Peak) - Band 1



Low channel Band edge (Average) - Band 1



Low channel Band edge (Peak) - Band 3

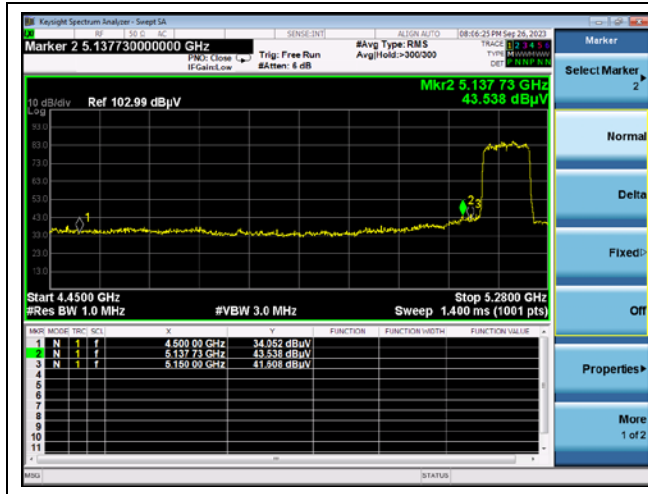


High channel Band edge (Peak) - Band 3

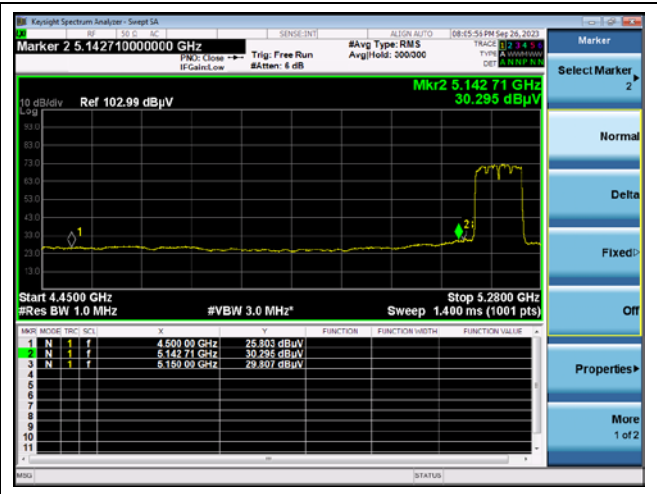


802.11ac_VHT80

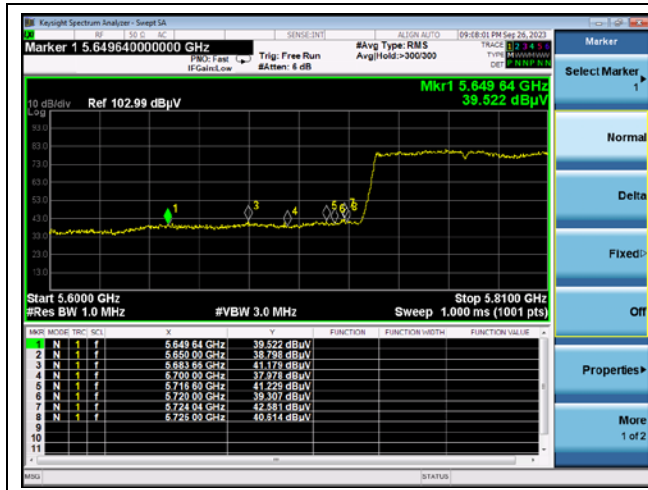
Middle channel Band edge (Peak) - Band 1



Middle channel Band edge (Average) - Band 1



Middle channel Band edge (Peak) - Band 3

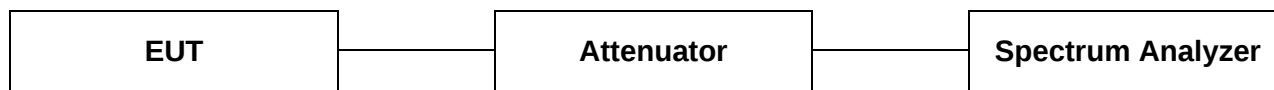


Middle channel Band edge (Peak) - Band 3



3. 26 dB Bandwidth & 99 % Bandwidth

3.1. Test Setup



3.2. Limit

None; for reporting purpose only.

3.3. Test Procedure

3.3.1. 26 dB 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 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 %.

3.3.2. 99 % Bandwidth

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 $\geq 3 \times$ 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 MHz ~ 5 250 MHz.

3.4. Test Result

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

- SISO

Test mode: 11a

Band	Frequency (MHz)	Ch.	Data Rate (Mbps)	26 dB Bandwidth (MHz)		99 % Bandwidth (MHz)	
				Core 0	Core 1	Core 0	Core 1
U-NII 1	5 180	36	6	20.779	21.259	17.063	16.983
	5 220	44		21.019	20.899	17.063	17.143
	5 240	48		21.139	20.939	17.063	17.023
U-NII 3	5 745	149		20.979	21.059	-	
	5 785	157		20.979	20.899		
	5 825	165		20.979	20.979		

Test mode: 11ac_VHT20

Band	Frequency (MHz)	Ch.	Data Rate (Mbps)	26 dB Bandwidth (MHz)		99 % Bandwidth (MHz)	
				Core 0	Core 1	Core 0	Core 1
U-NII 1	5 180	36	MCS0	21.419	21.379	18.062	18.102
	5 220	44		21.299	21.419	18.142	18.142
	5 240	48		21.339	21.339	18.142	18.142
U-NII 3	5 745	149		21.219	21.459	-	
	5 785	157		21.539	21.339		
	5 825	165		21.618	21.419		

Test mode: 11ac_VHT40

Band	Frequency (MHz)	Ch.	Data Rate (Mbps)	26 dB Bandwidth (MHz)		99 % Bandwidth (MHz)	
				Core 0	Core 1	Core 0	Core 1
U-NII 1	5 190	38	MCS0	40.280	40.040	36.204	36.364
	5 230	46		40.360	40.120	36.284	36.204
U-NII 3	5 755	151		40.360	40.120	-	
	5 795	159		40.200	40.120		

Test mode: 11ac_VHT80

Band	Frequency (MHz)	Ch.	Data Rate (Mbps)	26 dB Bandwidth (MHz)		99 % Bandwidth (MHz)	
				Core 0	Core 1	Core 0	Core 1
U-NII 1	5 210	42	MCS0	81.838	82.158	75.764	75.764
U-NII 3	5 775	155		81.678	82.478	-	

- MIMO

Test mode: 11ac_VHT20

Band	Frequency (MHz)	Ch.	Data Rate (Mbps)	26 dB Bandwidth (MHz)		99 % Bandwidth (MHz)	
				Core 0	Core 1	Core 0	Core 1
U-NII 1	5 180	36	MCS0	21.499	21.379	18.102	17.822
	5 220	44		21.219	21.219	18.142	17.822
	5 240	48		21.379	21.299	18.142	17.822
U-NII 3	5 745	149		21.339	21.379	-	
	5 785	157		21.459	21.099		
	5 825	165		21.499	21.299		

Test mode: 11ac_VHT40

Band	Frequency (MHz)	Ch.	Data Rate (Mbps)	26 dB Bandwidth (MHz)		99 % Bandwidth (MHz)	
				Core 0	Core 1	Core 0	Core 1
U-NII 1	5 190	38	MCS0	39.960	39.800	36.284	36.204
	5 230	46		39.880	39.720	36.284	36.204
U-NII 3	5 755	151		40.280	39.560	-	
	5 795	159		40.440	39.640		

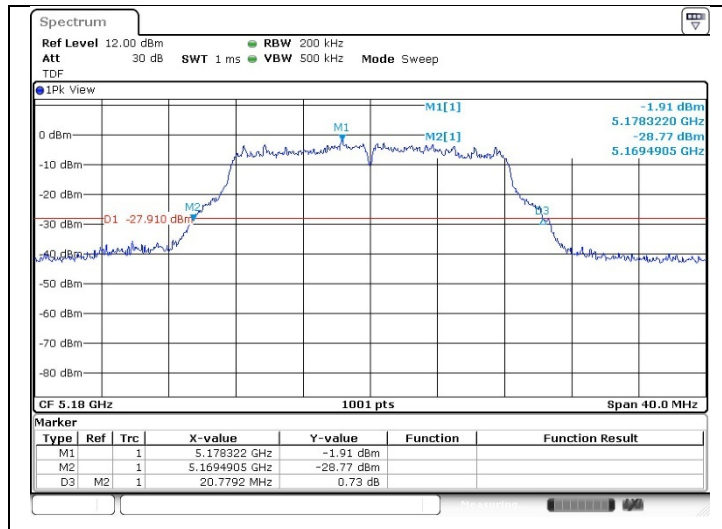
Test mode: 11ac_VHT80

Band	Frequency (MHz)	Ch.	Data Rate (Mbps)	26 dB Bandwidth (MHz)		99 % Bandwidth (MHz)	
				Core 0	Core 1	Core 0	Core 1
U-NII 1	5 210	42	MCS0	82.318	81.678	75.764	75.604
U-NII 3	5 775	155		82.478	81.678	-	

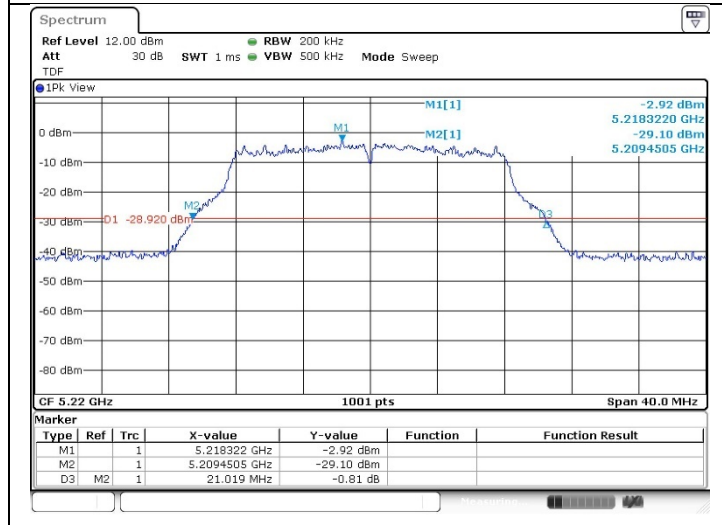
- Test plots
26 dB Bandwidth

SISO_Core 0
802.11a (Band 1)

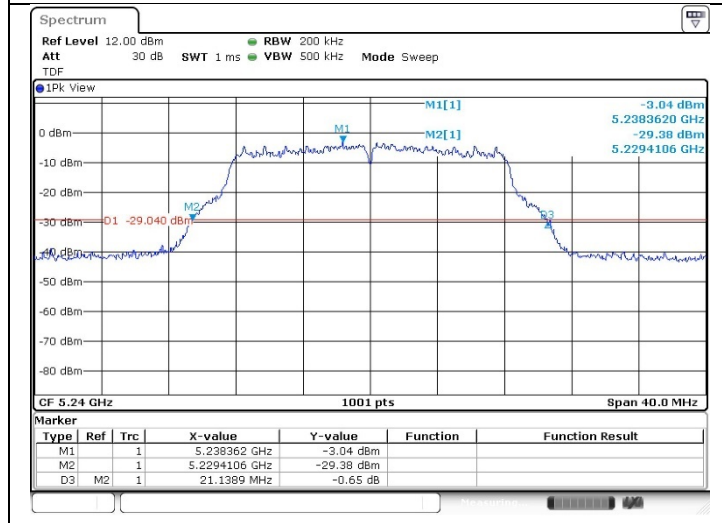
Low Channel
(5 180 MHz)



Middle Channel
(5 220 MHz)

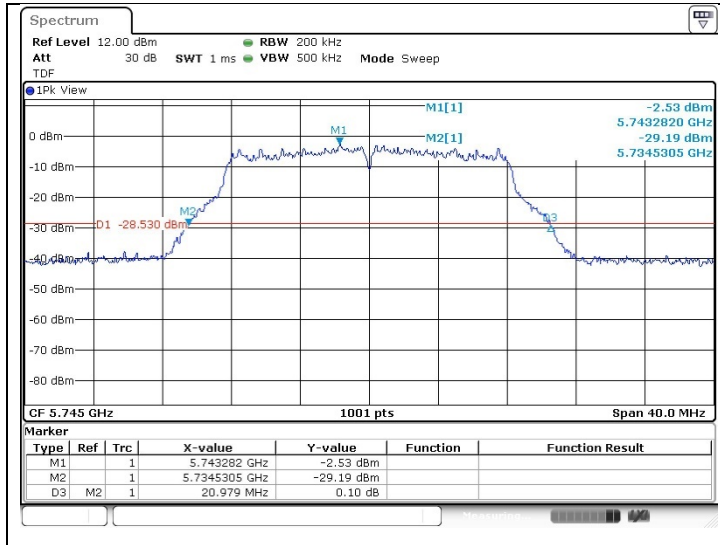


High Channel
(5 240 MHz)

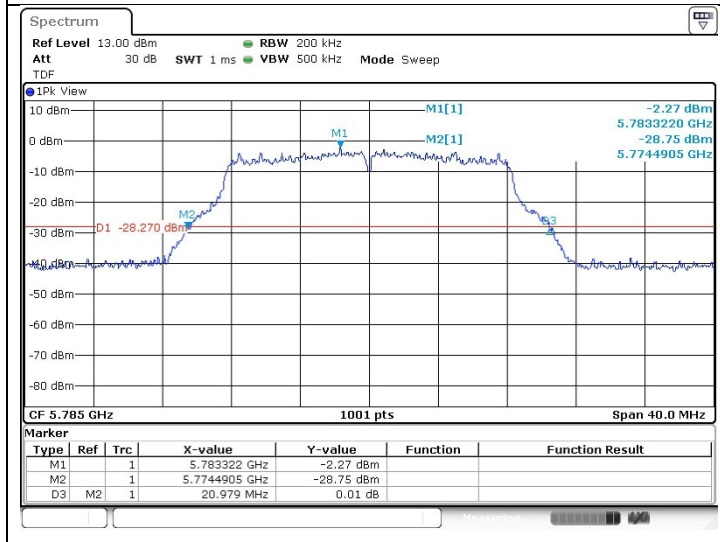


802.11a (Band 3)

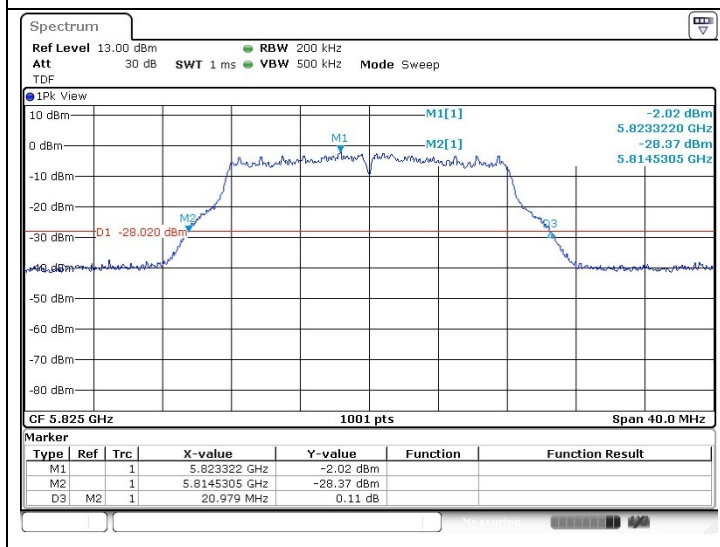
Low Channel
(5 745 MHz)



Middle Channel
(5 785 MHz)

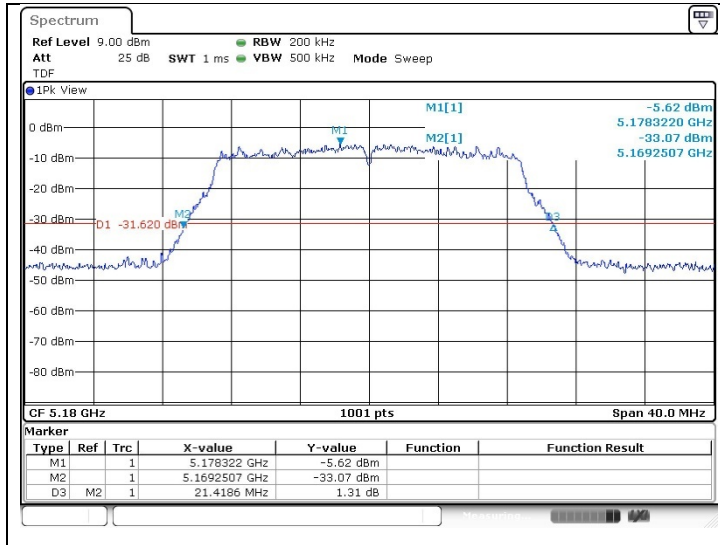


High Channel
(5 825 MHz)

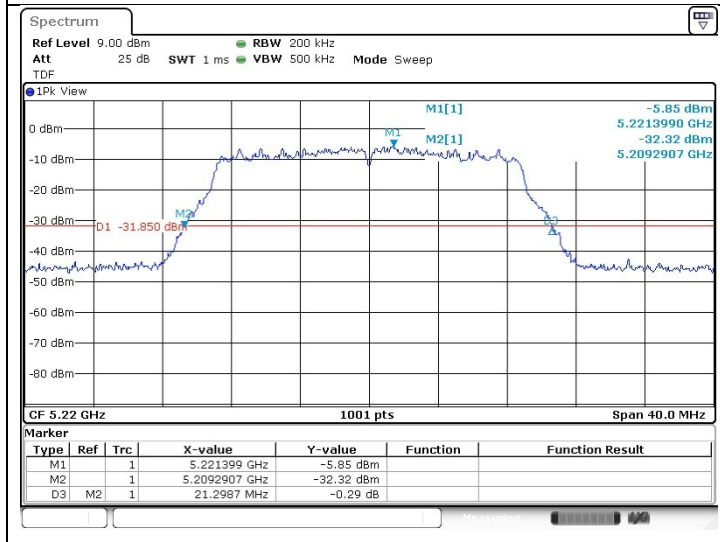


802.11ac_VHT20 (Band 1)

Low Channel
(5 180 MHz)



Middle Channel
(5 220 MHz)



High Channel
(5 240 MHz)

