

Annex D

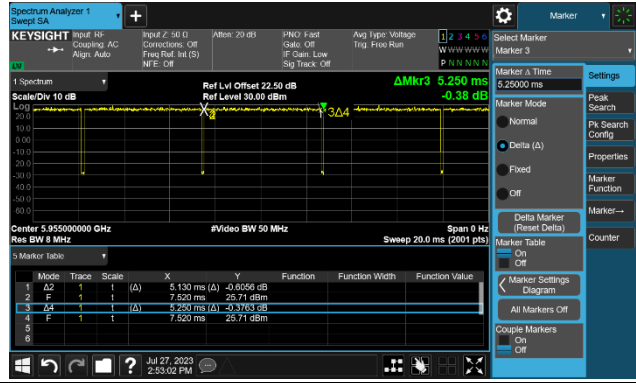
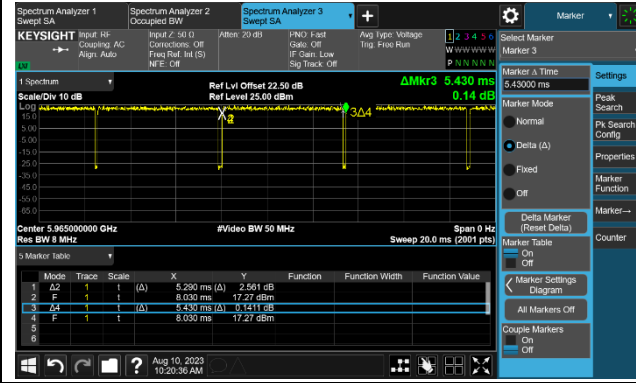
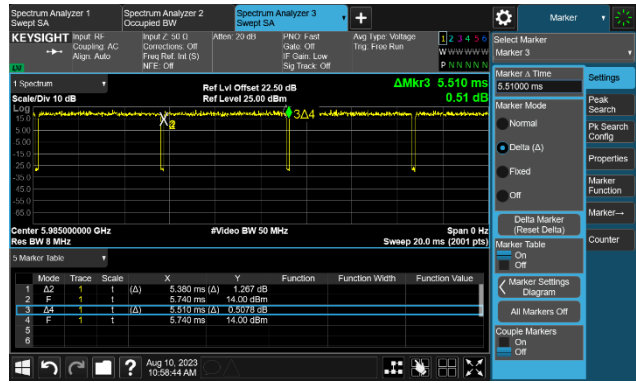
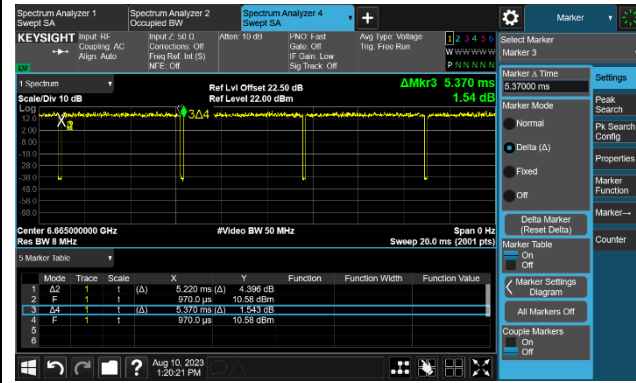
WLAN 802.11ax Test Result

Model No.: APEX0679

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1. Duty Cycle Test Result

Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2023-07-27~2023-08-10		

Test Mode	Duty Cycle
802.11ax-HE20	97.71%
802.11ax-HE40	97.42%
802.11ax-HE80	97.64%
802.11ax-HE160	97.21%
Duty Cycle (T = Transmission Duration)	
802.11ax-HE20 (T = 5.130ms)	802.11ax-HE40 (T = 5.290ms)
	
802.11ax-HE80 (T = 5.380ms)	802.11ax-HE160 (T = 5.220ms)
	

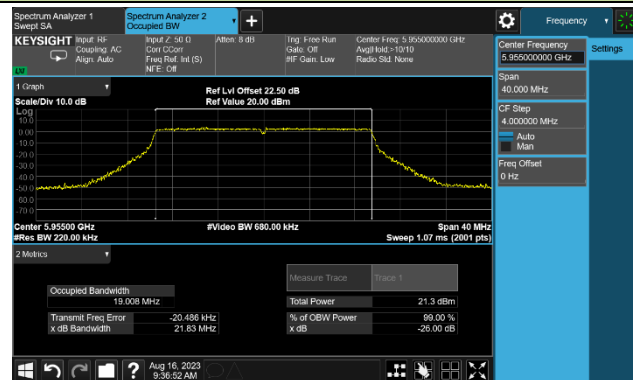
2. 26dB Bandwidth Test Result

Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2023-08-16~2023-10-09		

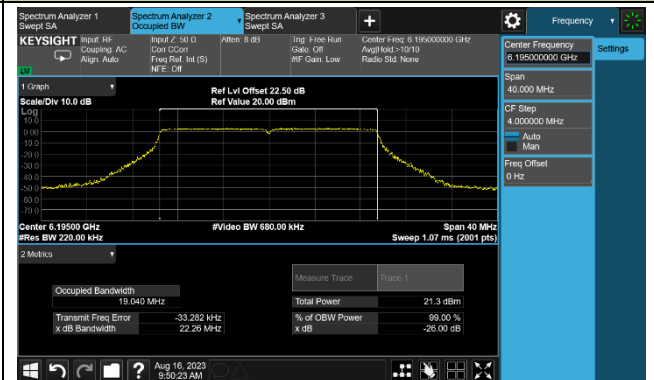
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Test Result
802.11ax-HE20	MCS0	1	5955	21.83	19.008	Pass
802.11ax-HE20	MCS0	49	6195	22.26	19.040	Pass
802.11ax-HE20	MCS0	93	6415	22.00	19.018	Pass
802.11ax-HE20	MCS0	117	6535	22.29	19.030	Pass
802.11ax-HE20	MCS0	153	6715	22.77	19.034	Pass
802.11ax-HE20	MCS0	181	6855	22.08	18.979	Pass
802.11ax-HE40	MCS0	3	5965	43.26	37.893	Pass
802.11ax-HE40	MCS0	51	6205	42.61	37.902	Pass
802.11ax-HE40	MCS0	91	6405	43.51	37.874	Pass
802.11ax-HE40	MCS0	123	6565	43.06	37.898	Pass
802.11ax-HE40	MCS0	147	6685	43.30	37.897	Pass
802.11ax-HE40	MCS0	179	6845	42.86	37.914	Pass
802.11ax-HE80	MCS0	7	5985	88.34	77.637	Pass
802.11ax-HE80	MCS0	55	6225	88.99	77.711	Pass
802.11ax-HE80	MCS0	87	6385	87.57	77.749	Pass
802.11ax-HE80	MCS0	135	6625	88.50	77.773	Pass
802.11ax-HE80	MCS0	151	6705	88.22	77.588	Pass
802.11ax-HE80	MCS0	167	6785	87.59	77.752	Pass
802.11ax-HE160	MCS0	15	6025	170.70	157.07	Pass
802.11ax-HE160	MCS0	47	6185	170.10	157.07	Pass
802.11ax-HE160	MCS0	79	6345	171.60	157.25	Pass
802.11ax-HE160	MCS0	143	6665	170.30	156.78	Pass

802.11ax-HE20 26dB Bandwidth

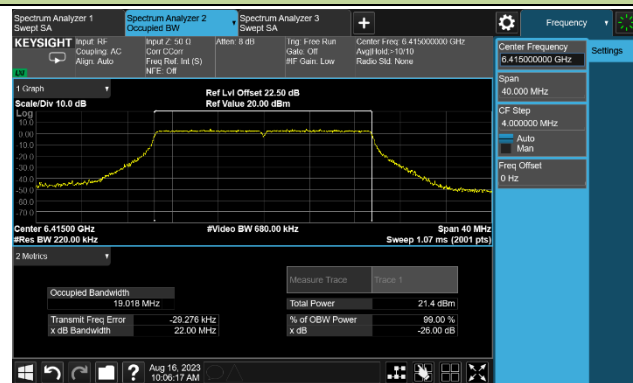
Channel 1 (5955MHz)



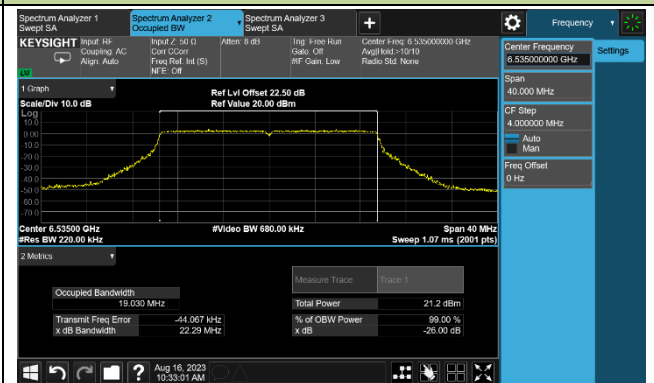
Channel 49 (6195MHz)



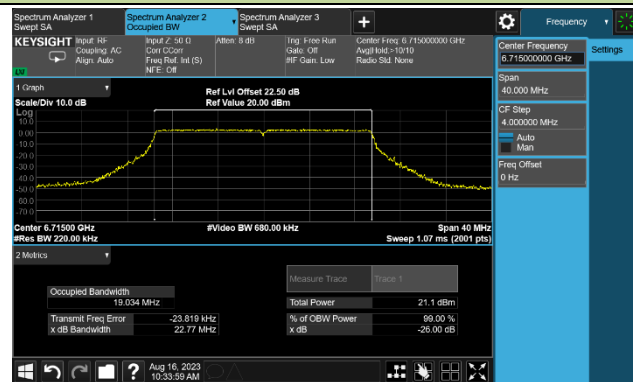
Channel 93 (6415MHz)



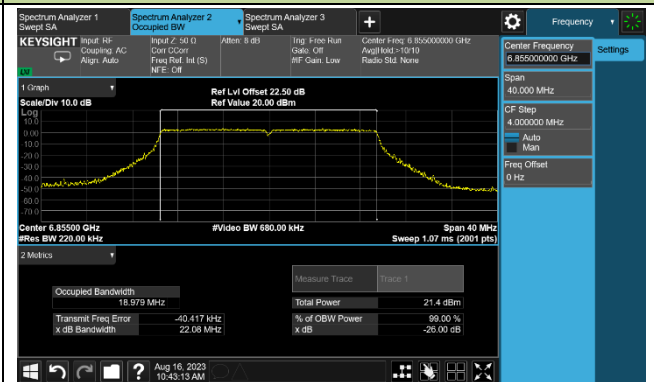
Channel 117 (6535MHz)



Channel 153 (6715MHz)

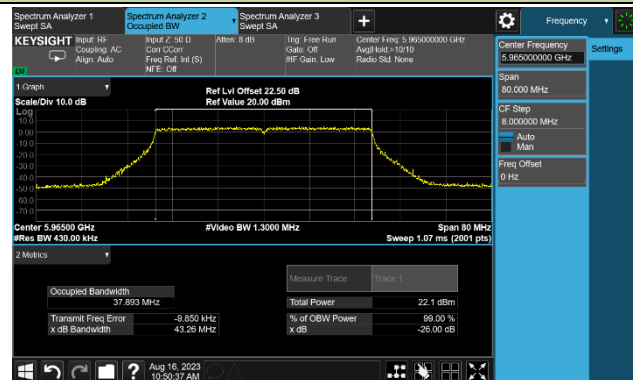


Channel 181 (6855MHz)

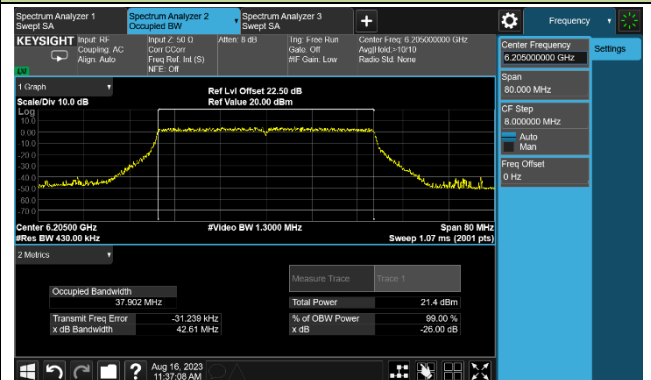


802.11ax-HE40 26dB Bandwidth

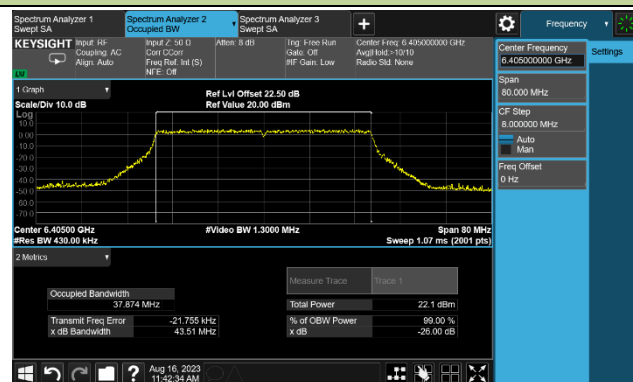
Channel 3 (5965MHz)



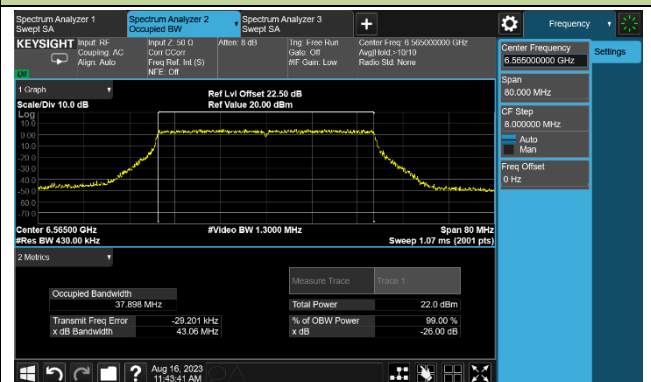
Channel 51 (6205MHz)



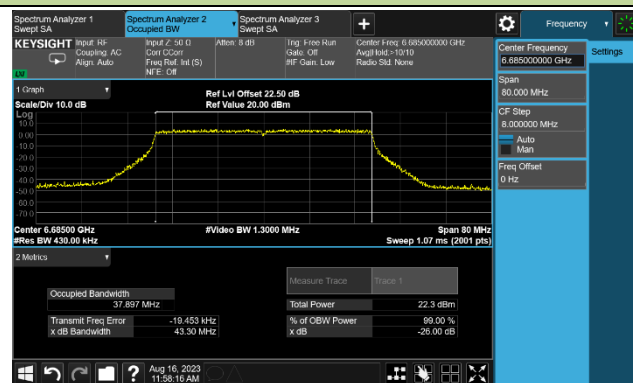
Channel 91 (6405MHz)



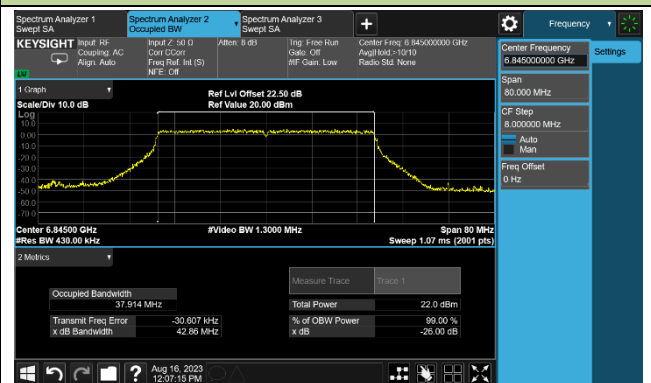
Channel 123 (6565MHz)



Channel 147 (6685MHz)

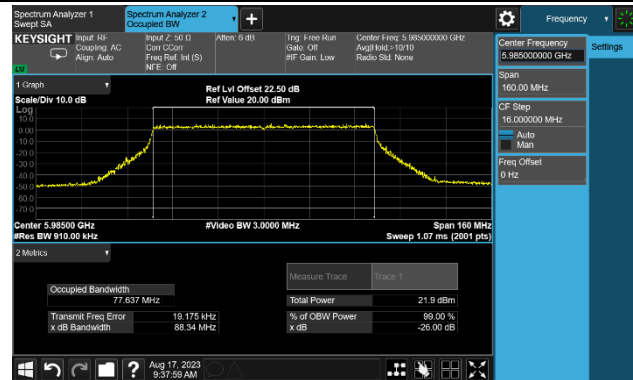


Channel 179 (6845MHz)

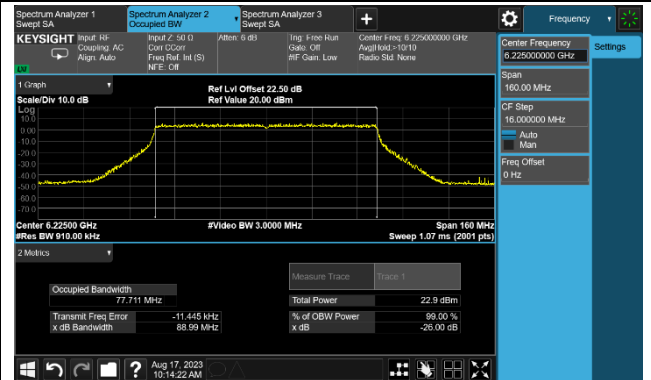


802.11ax-HE80 26dB Bandwidth

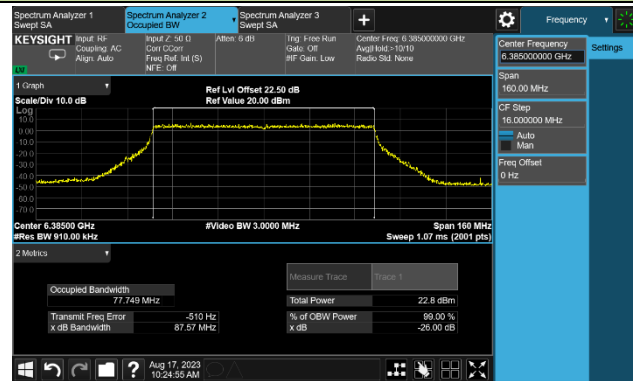
Channel 7 (5985MHz)



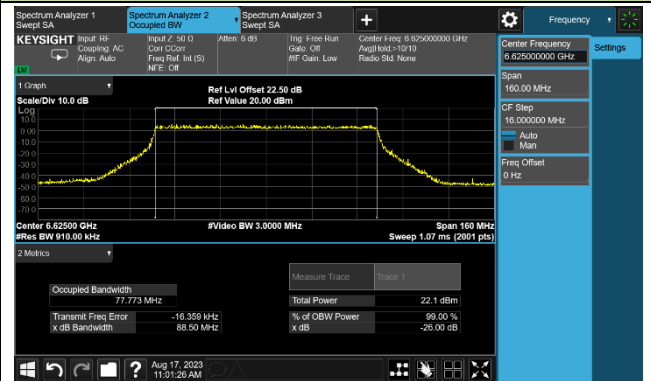
Channel 55 (6225MHz)



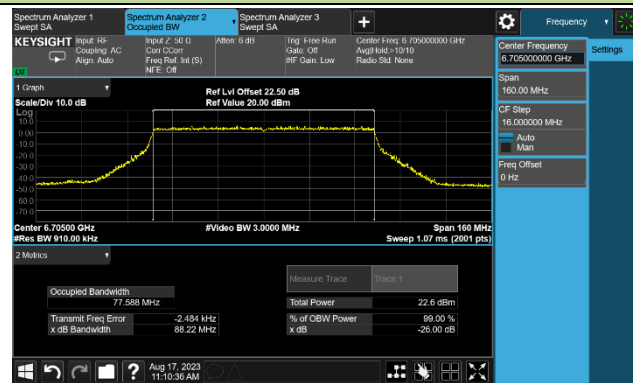
Channel 87 (6385MHz)



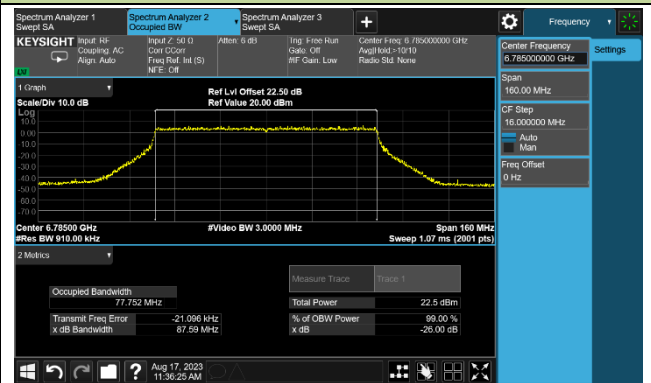
Channel 135 (6625MHz)



Channel 151 (6705MHz)

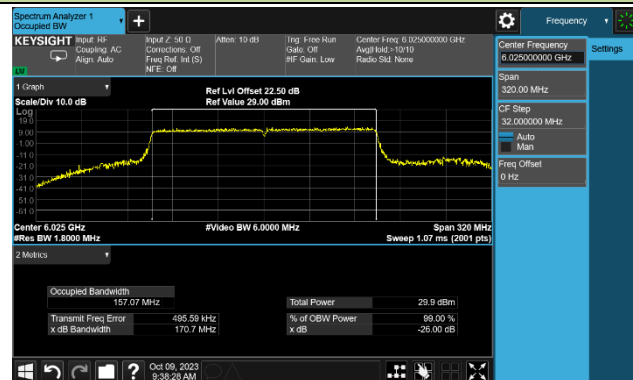


Channel 167 (6785MHz)

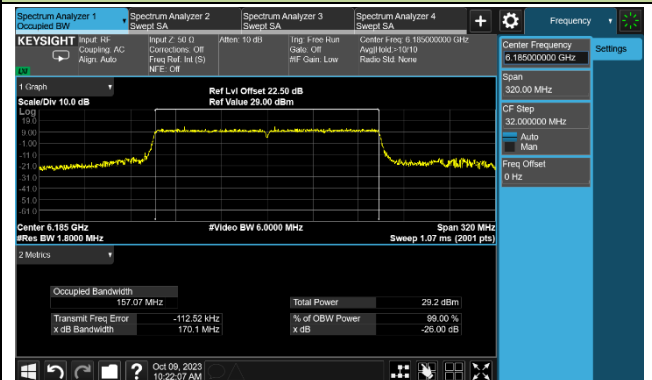


802.11ax-HE160 26dB Bandwidth

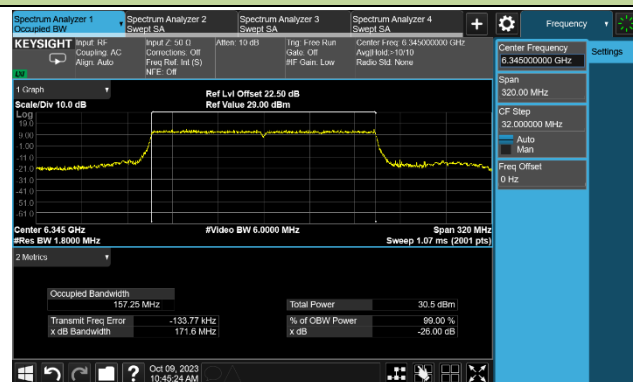
Channel 15 (6025MHz)



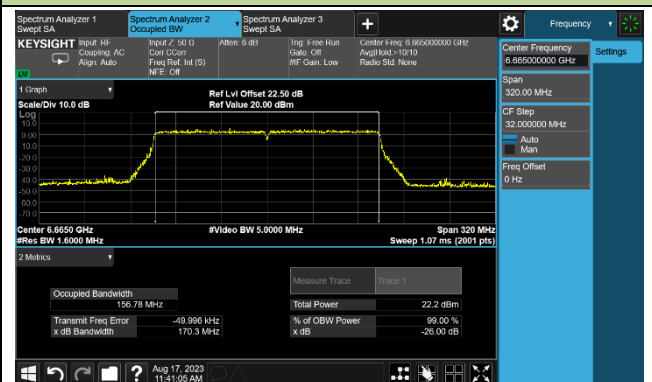
Channel 47 (6185MHz)



Channel 79 (6345MHz)



Channel 143 (6665MHz)



3. Output Power Measurement Test Result

Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2023-08-06	Test Mode	Switch off

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Power (dBm)	30 Degree EIRP (dBm)	Limit (dBm)	Result
802.11ax-HE20	MCS0	1	5955	7.46	7.21	10.35	20.45	≤ 21.00	Pass
802.11ax-HE20	MCS0	49	6195	6.96	7.50	10.25	20.35	≤ 21.00	Pass
802.11ax-HE20	MCS0	93	6415	7.48	7.37	10.44	20.54	≤ 21.00	Pass
802.11ax-HE20	MCS0	117	6535	7.36	7.52	10.45	20.55	≤ 21.00	Pass
802.11ax-HE20	MCS0	153	6715	7.20	7.62	10.43	20.53	≤ 21.00	Pass
802.11ax-HE20	MCS0	181	6855	7.13	7.22	10.19	20.29	≤ 21.00	Pass
802.11ax-HE40	MCS0	3	5965	7.39	7.42	10.42	20.52	≤ 21.00	Pass
802.11ax-HE40	MCS0	51	6205	7.38	7.77	10.59	20.69	≤ 21.00	Pass
802.11ax-HE40	MCS0	91	6405	7.24	7.41	10.34	20.44	≤ 21.00	Pass
802.11ax-HE40	MCS0	123	6565	7.44	7.31	10.39	20.49	≤ 21.00	Pass
802.11ax-HE40	MCS0	147	6685	7.06	7.33	10.21	20.31	≤ 21.00	Pass
802.11ax-HE40	MCS0	179	6845	7.29	7.24	10.28	20.38	≤ 21.00	Pass
802.11ax-HE80	MCS0	7	5985	7.58	7.52	10.56	20.66	≤ 21.00	Pass
802.11ax-HE80	MCS0	55	6225	6.79	7.52	10.18	20.28	≤ 21.00	Pass
802.11ax-HE80	MCS0	87	6385	7.42	7.33	10.39	20.49	≤ 21.00	Pass
802.11ax-HE80	MCS0	135	6625	7.61	7.53	10.58	20.68	≤ 21.00	Pass
802.11ax-HE80	MCS0	151	6705	7.16	7.57	10.38	20.48	≤ 21.00	Pass
802.11ax-HE80	MCS0	167	6785	7.31	7.33	10.33	20.43	≤ 21.00	Pass
802.11ax-HE160	MCS0	15	6025	8.00	7.12	10.59	20.69	≤ 21.00	Pass
802.11ax-HE160	MCS0	47	6185	7.58	7.45	10.53	20.63	≤ 21.00	Pass
802.11ax-HE160	MCS0	79	6345	7.77	6.90	10.37	20.47	≤ 21.00	Pass
802.11ax-HE160	MCS0	143	6665	7.53	7.47	10.51	20.61	≤ 21.00	Pass

Note 1: Total Average Power (dBm) = $10 \cdot \log\{10^{(\text{Ant 0 Average Power}/10)} + 10^{(\text{Ant 1 Average Power}/10)}\}$.

Note 2: EIRP Above 30 Degree Angle (dBm) = Total Power (dBm) + 30 Degree Antenna Gain (dBi).

Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2023-08-06	Test Mode	Switch on

Test Mode	Data Rate/MCS	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Power (dBm)	30 Degree EIRP (dBm)	Limit (dBm)	Result
802.11ax-HE20	MCS0	1	5955	9.61	9.50	12.57	20.67	≤ 21.00	Pass
802.11ax-HE20	MCS0	49	6195	9.29	9.56	12.44	20.54	≤ 21.00	Pass
802.11ax-HE20	MCS0	93	6415	9.40	9.20	12.31	20.41	≤ 21.00	Pass
802.11ax-HE20	MCS0	117	6535	9.43	9.39	12.42	20.52	≤ 21.00	Pass
802.11ax-HE20	MCS0	153	6715	9.57	9.51	12.55	20.65	≤ 21.00	Pass
802.11ax-HE20	MCS0	181	6855	9.29	9.59	12.45	20.55	≤ 21.00	Pass
802.11ax-HE40	MCS0	3	5965	9.21	9.08	12.16	20.26	≤ 21.00	Pass
802.11ax-HE40	MCS0	51	6205	9.51	9.65	12.59	20.69	≤ 21.00	Pass
802.11ax-HE40	MCS0	91	6405	9.53	9.21	12.38	20.48	≤ 21.00	Pass
802.11ax-HE40	MCS0	123	6565	9.60	9.26	12.44	20.54	≤ 21.00	Pass
802.11ax-HE40	MCS0	147	6685	9.52	9.38	12.46	20.56	≤ 21.00	Pass
802.11ax-HE40	MCS0	179	6845	9.39	9.48	12.45	20.55	≤ 21.00	Pass
802.11ax-HE80	MCS0	7	5985	9.38	9.59	12.50	20.60	≤ 21.00	Pass
802.11ax-HE80	MCS0	55	6225	9.37	9.57	12.48	20.58	≤ 21.00	Pass
802.11ax-HE80	MCS0	87	6385	9.56	9.12	12.36	20.46	≤ 21.00	Pass
802.11ax-HE80	MCS0	135	6625	9.60	9.39	12.51	20.61	≤ 21.00	Pass
802.11ax-HE80	MCS0	151	6705	9.43	9.37	12.41	20.51	≤ 21.00	Pass
802.11ax-HE80	MCS0	167	6785	9.27	9.55	12.42	20.52	≤ 21.00	Pass
802.11ax-HE160	MCS0	15	6025	9.76	9.17	12.49	20.59	≤ 21.00	Pass
802.11ax-HE160	MCS0	47	6185	9.83	9.19	12.53	20.63	≤ 21.00	Pass
802.11ax-HE160	MCS0	79	6345	10.05	8.90	12.52	20.62	≤ 21.00	Pass
802.11ax-HE160	MCS0	143	6665	9.70	9.40	12.56	20.66	≤ 21.00	Pass

Note 1: Total Average Power (dBm) = $10 \cdot \log\{10^{(\text{Ant 0 Average Power}/10)} + 10^{(\text{Ant 1 Average Power}/10)}\}$.

Note 2: EIRP Above 30 Degree Angle (dBm) = Total Power (dBm) + 30 Degree Antenna Gain (dBi).

4. Power Spectral Density Measurement Test Result

Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2023-09-28~2023-10-09	Test Mode	Switch off

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	PSD (dBm/MHz)		Duty Cycle (%)	EIRP PSD (dBm/MHz)	Limit (dBm/MHz)
				Ant 0	Ant 1			
802.11ax-HE20	MCS0	1	5955	-5.460	-5.642	97.71	7.66	≤ 23.00
802.11ax-HE20	MCS0	49	6195	-5.800	-5.223	97.71	7.71	≤ 23.00
802.11ax-HE20	MCS0	93	6415	-5.526	-5.660	97.71	7.62	≤ 23.00
802.11ax-HE20	MCS0	117	6535	-5.742	-5.296	97.71	7.70	≤ 23.00
802.11ax-HE20	MCS0	153	6715	-5.728	-5.322	97.71	7.69	≤ 23.00
802.11ax-HE20	MCS0	181	6855	-5.626	-5.546	97.71	7.63	≤ 23.00
802.11ax-HE40	MCS0	3	5965	-8.262	-8.232	97.42	4.98	≤ 23.00
802.11ax-HE40	MCS0	51	6205	-8.504	-7.618	97.42	5.19	≤ 23.00
802.11ax-HE40	MCS0	91	6405	-8.495	-8.366	97.42	4.79	≤ 23.00
802.11ax-HE40	MCS0	123	6565	-8.265	-8.361	97.42	4.91	≤ 23.00
802.11ax-HE40	MCS0	147	6685	-8.595	-8.341	97.42	4.76	≤ 23.00
802.11ax-HE40	MCS0	179	6845	-8.414	-8.363	97.42	4.84	≤ 23.00
802.11ax-HE80	MCS0	7	5985	-10.603	-10.657	97.64	2.58	≤ 23.00
802.11ax-HE80	MCS0	55	6225	-11.756	-11.008	97.64	1.85	≤ 23.00
802.11ax-HE80	MCS0	87	6385	-11.328	-11.332	97.64	1.88	≤ 23.00
802.11ax-HE80	MCS0	135	6625	-10.869	-11.003	97.64	2.28	≤ 23.00
802.11ax-HE80	MCS0	151	6705	-11.391	-11.206	97.64	1.92	≤ 23.00
802.11ax-HE80	MCS0	167	6785	-11.647	-11.497	97.64	1.64	≤ 23.00
802.11ax-HE160	MCS0	15	6025	-12.838	-13.613	97.21	0.02	≤ 23.00
802.11ax-HE160	MCS0	47	6185	-13.774	-13.841	97.21	-0.57	≤ 23.00
802.11ax-HE160	MCS0	79	6345	-13.615	-14.977	97.21	-1.01	≤ 23.00
802.11ax-HE160	MCS0	143	6665	-14.165	-14.198	97.21	-0.95	≤ 23.00

Note:

When EUT duty cycle < 98%, $EIRP\ PSD\ (dBm/MHz) = 10 \cdot \log \{10^{(Ant\ 0\ PSD/10)} + 10^{(Ant\ 1\ PSD/10)}\} (dBm/MHz) + 10 \cdot \log (1/Duty\ Cycle) + Directional\ Gain\ for\ PSD\ (dBi)$.

When EUT duty cycle ≥ 98%, $EIRP\ PSD\ (dBm/MHz) = 10 \cdot \log \{10^{(Ant\ 0\ PSD/10)} + 10^{(Ant\ 1\ PSD/10)}\} (dBm/MHz) + Directional\ Gain\ for\ PSD\ (dBi)$.

802.11ax-HE20 Power Spectral Density- Ant 0

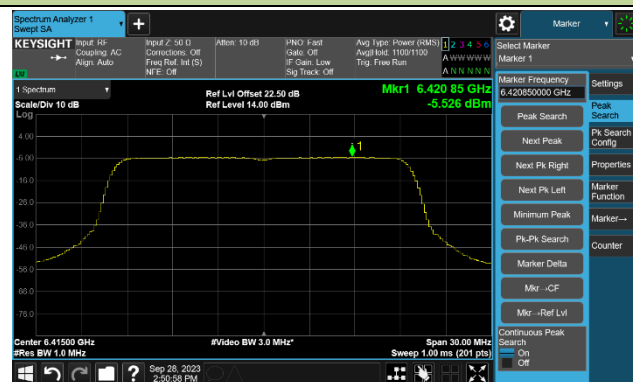
Channel 1 (5955MHz)



Channel 49 (6195MHz)



Channel 93 (6415MHz)



Channel 117 (6535MHz)



Channel 153 (6715MHz)

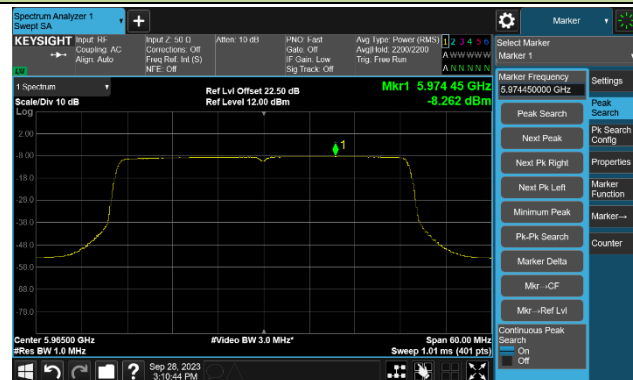


Channel 181 (6855MHz)



802.11ax-HE40 Power Spectral Density- Ant 0

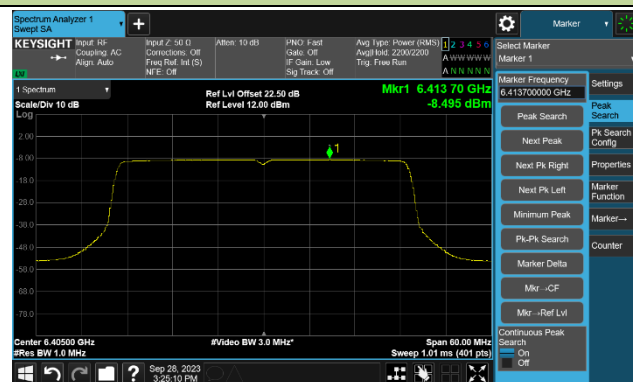
Channel 3 (5965MHz)



Channel 51 (6205MHz)



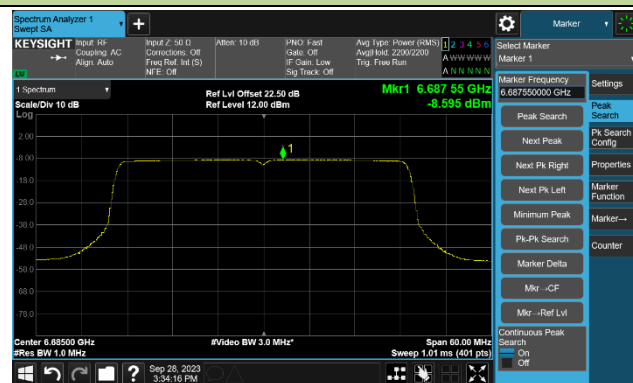
Channel 91 (6405MHz)



Channel 123 (6565MHz)



Channel 147 (6685MHz)



Channel 179 (6845MHz)



802.11ax-HE80 Power Spectral Density- Ant 0

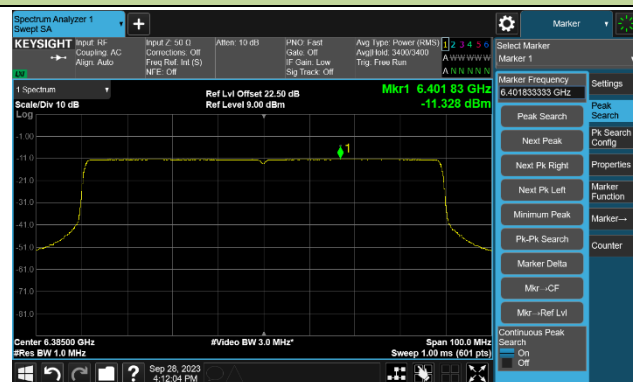
Channel 7 (5985MHz)



Channel 55 (6225MHz)



Channel 87 (6385MHz)



Channel 135 (6625MHz)



Channel 151 (6705MHz)

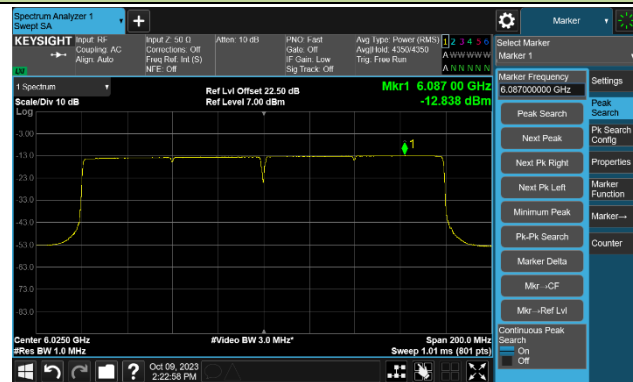


Channel 167 (6785MHz)

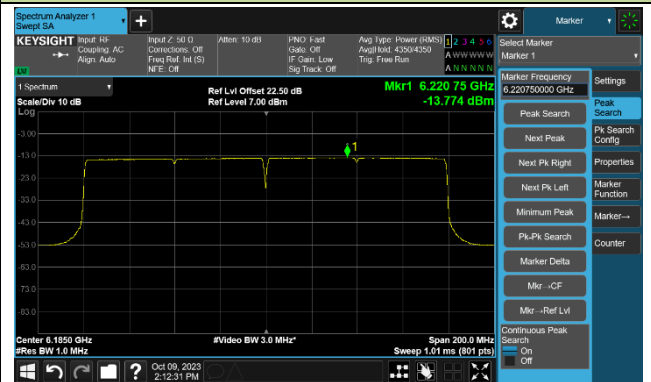


802.11ax-HE160 Power Spectral Density- Ant 0

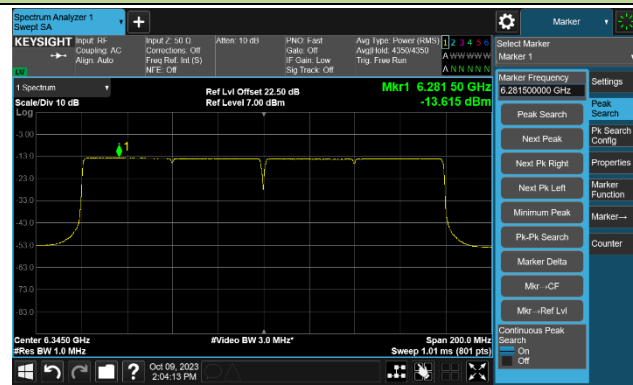
Channel 15 (6025MHz)



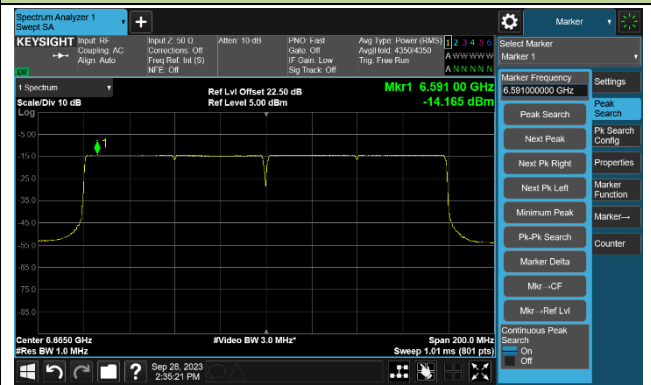
Channel 47 (6185MHz)



Channel 79 (6345MHz)



Channel 143 (6665MHz)



802.11ax-HE20 Power Spectral Density- Ant 1

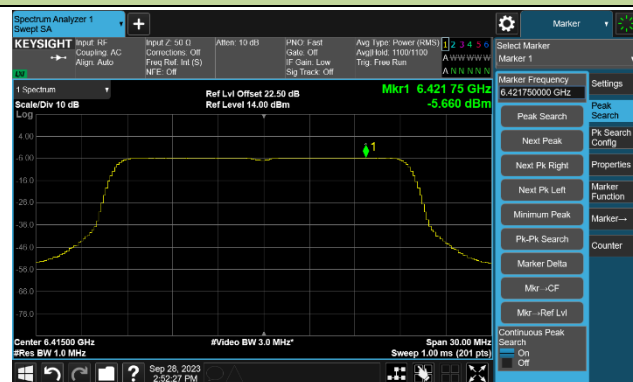
Channel 1 (5955MHz)



Channel 49 (6195MHz)



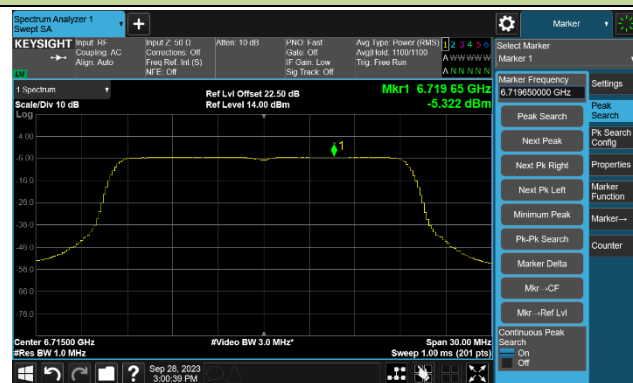
Channel 93 (6415MHz)



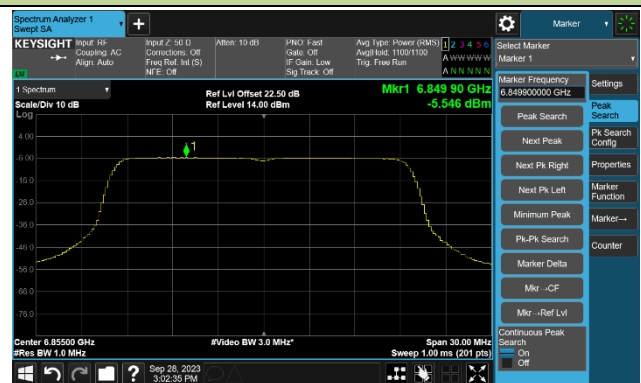
Channel 117 (6535MHz)



Channel 153 (6715MHz)

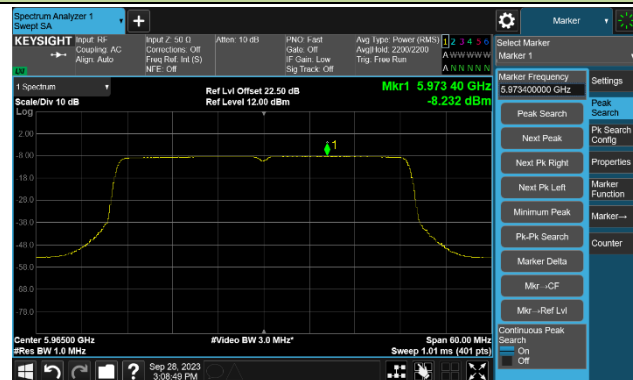


Channel 181 (6855MHz)



802.11ax-HE40 Power Spectral Density- Ant 1

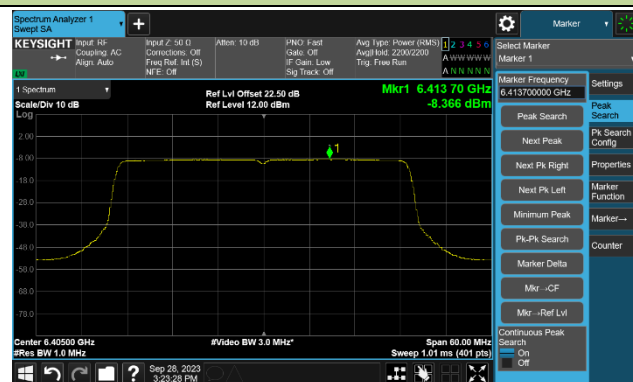
Channel 3 (5965MHz)



Channel 51 (6205MHz)



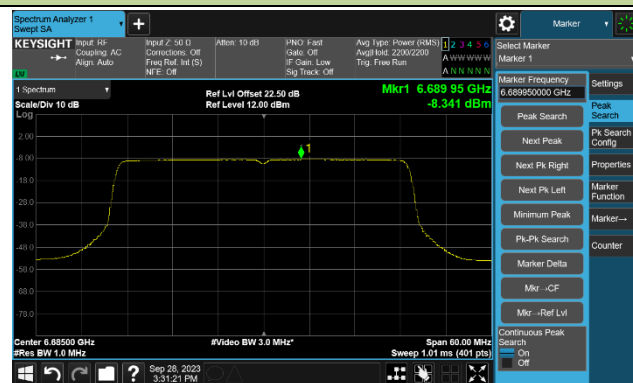
Channel 91 (6405MHz)



Channel 123 (6565MHz)



Channel 147 (6685MHz)

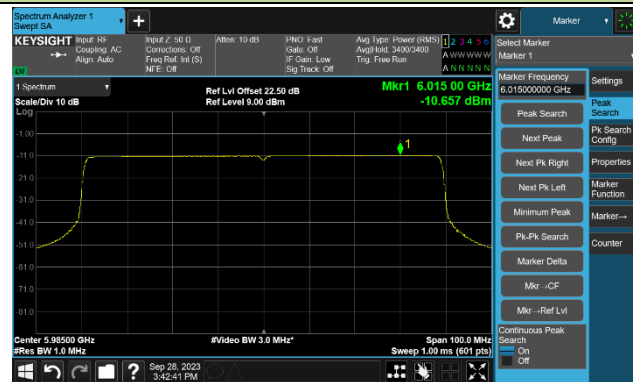


Channel 179 (6845MHz)

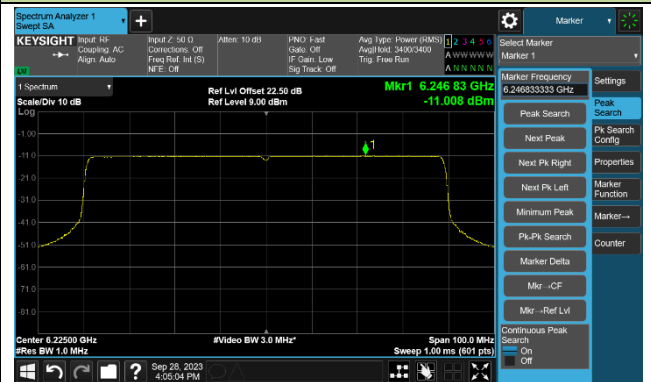


802.11ax-HE80 Power Spectral Density- Ant 1

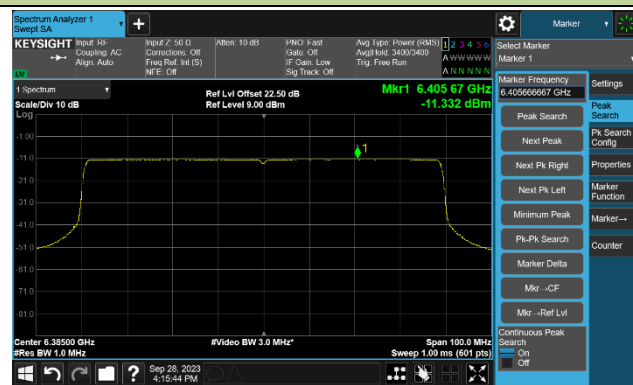
Channel 7 (5985MHz)



Channel 55 (6225MHz)



Channel 87 (6385MHz)



Channel 135 (6625MHz)



Channel 151 (6705MHz)

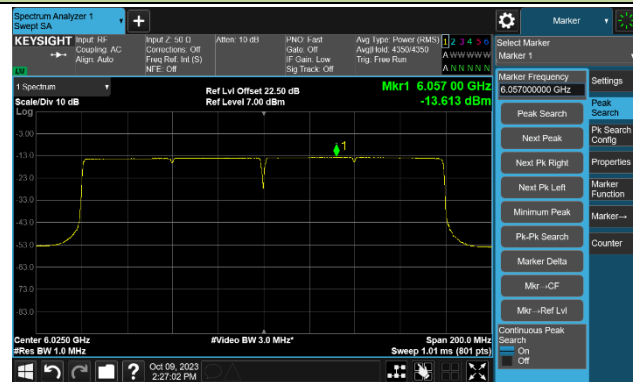


Channel 167 (6785MHz)

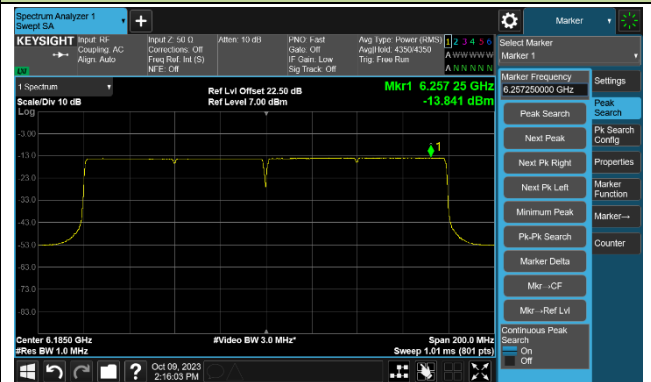


802.11ax-HE160 Power Spectral Density- Ant 1

Channel 15 (6025MHz)



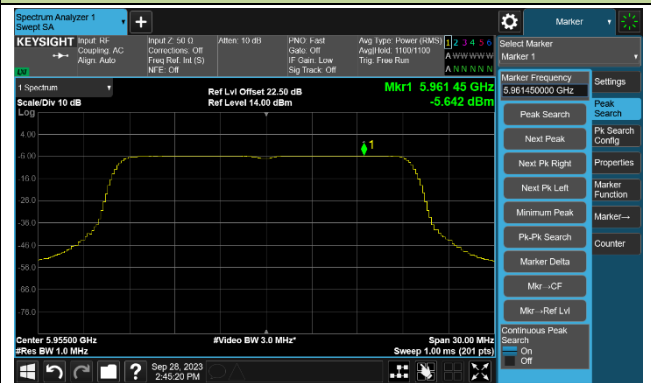
Channel 47 (6185MHz)



Channel 79 (6345MHz)



Channel 143 (6665MHz)



Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2023-09-27~2023-10-09	Test Mode	Switch on

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	PSD (dBm/MHz)		Duty Cycle (%)	EIRP PSD (dBm/MHz)	Limit (dBm/MHz)
				Ant 0	Ant 1			
802.11ax-HE20	MCS0	1	5955	-3.132	-3.339	97.71	7.98	≤ 23.00
802.11ax-HE20	MCS0	49	6195	-3.189	-2.823	97.71	8.21	≤ 23.00
802.11ax-HE20	MCS0	93	6415	-3.294	-3.587	97.71	7.77	≤ 23.00
802.11ax-HE20	MCS0	117	6535	-3.349	-3.292	97.71	7.89	≤ 23.00
802.11ax-HE20	MCS0	153	6715	-3.341	-3.279	97.71	7.90	≤ 23.00
802.11ax-HE20	MCS0	181	6855	-3.432	-3.024	97.71	7.99	≤ 23.00
802.11ax-HE40	MCS0	3	5965	-5.914	-6.142	97.42	5.20	≤ 23.00
802.11ax-HE40	MCS0	51	6205	-5.805	-5.350	97.42	5.65	≤ 23.00
802.11ax-HE40	MCS0	91	6405	-5.751	-6.136	97.42	5.28	≤ 23.00
802.11ax-HE40	MCS0	123	6565	-5.910	-5.990	97.42	5.27	≤ 23.00
802.11ax-HE40	MCS0	147	6685	-5.943	-5.966	97.42	5.27	≤ 23.00
802.11ax-HE40	MCS0	179	6845	-6.352	-5.959	97.42	5.07	≤ 23.00
802.11ax-HE80	MCS0	7	5985	-8.372	-8.713	97.64	2.67	≤ 23.00
802.11ax-HE80	MCS0	55	6225	10.030	-9.490	97.64	18.28	≤ 23.00
802.11ax-HE80	MCS0	87	6385	-10.234	-10.675	97.64	0.77	≤ 23.00
802.11ax-HE80	MCS0	135	6625	-9.193	-9.638	97.64	1.80	≤ 23.00
802.11ax-HE80	MCS0	151	6705	-9.214	-9.306	97.64	1.95	≤ 23.00
802.11ax-HE80	MCS0	167	6785	-9.514	-9.188	97.64	1.87	≤ 23.00
802.11ax-HE160	MCS0	15	6025	-11.416	-12.090	97.21	-0.51	≤ 23.00
802.11ax-HE160	MCS0	47	6185	-11.786	-11.854	97.21	-0.59	≤ 23.00
802.11ax-HE160	MCS0	79	6345	-11.427	-12.866	97.21	-0.85	≤ 23.00
802.11ax-HE160	MCS0	143	6665	-12.052	-12.195	97.21	-0.89	≤ 23.00

Note:

When EUT duty cycle < 98%, EIRP PSD (dBm/MHz) = $10 \cdot \log \{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)}\}$ (dBm/MHz) + $10 \cdot \log (1/\text{Duty Cycle})$ + Directional Gain for PSD (dBi).

When EUT duty cycle ≥ 98%, EIRP PSD (dBm/MHz) = $10 \cdot \log \{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)}\}$ (dBm/MHz) + Directional Gain for PSD (dBi).

802.11ax-HE20 Power Spectral Density- Ant 0

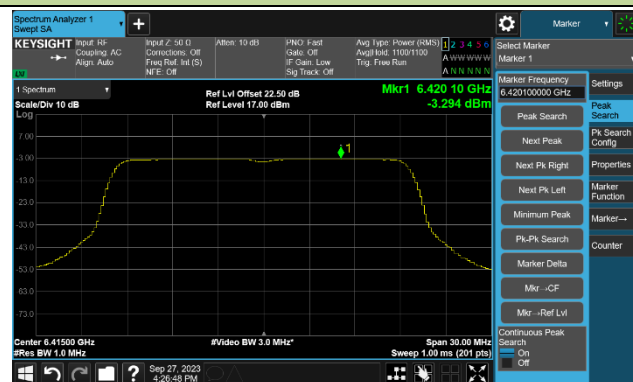
Channel 1 (5955MHz)



Channel 49 (6195MHz)



Channel 93 (6415MHz)



Channel 117 (6535MHz)



Channel 153 (6715MHz)

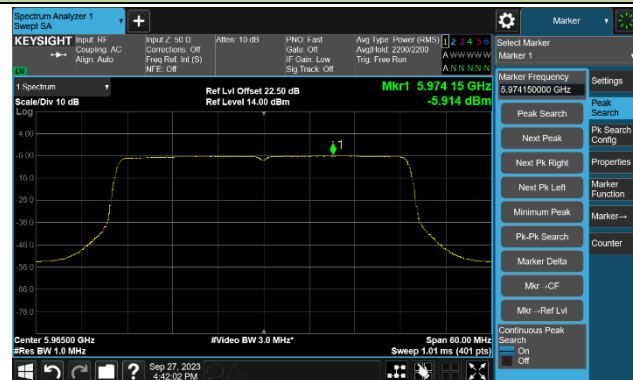


Channel 181 (6855MHz)



802.11ax-HE40 Power Spectral Density- Ant 0

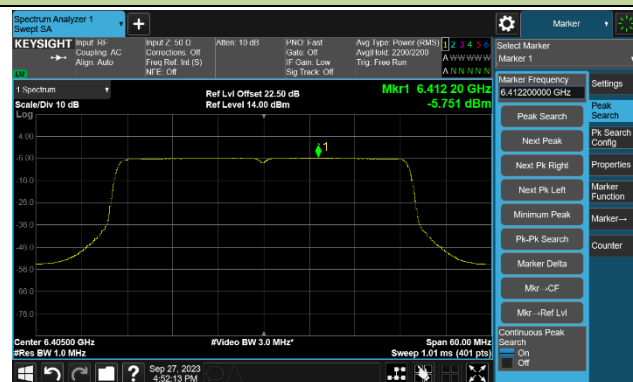
Channel 3 (5965MHz)



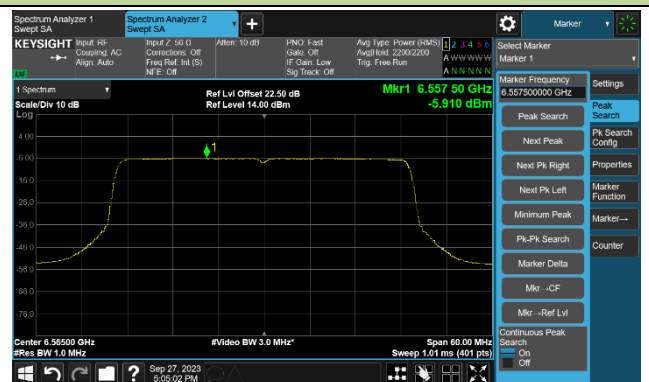
Channel 51 (6205MHz)



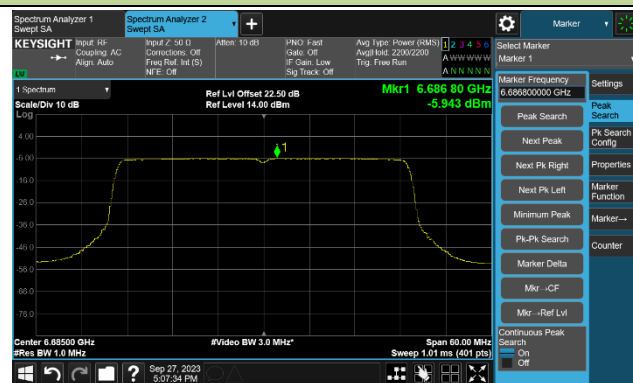
Channel 91 (6405MHz)



Channel 123 (6565MHz)



Channel 147 (6685MHz)



Channel 179 (6845MHz)

