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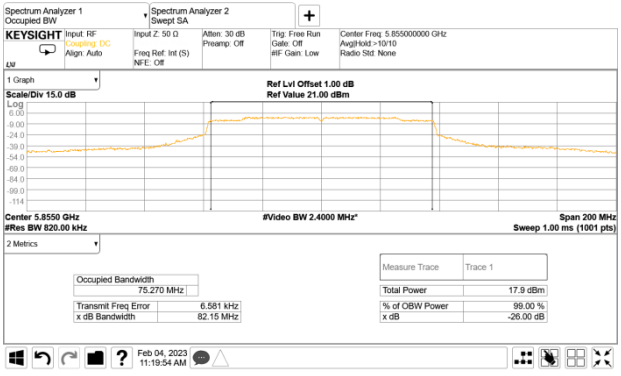
802.11ac-VHT80	
AUX	Main
	

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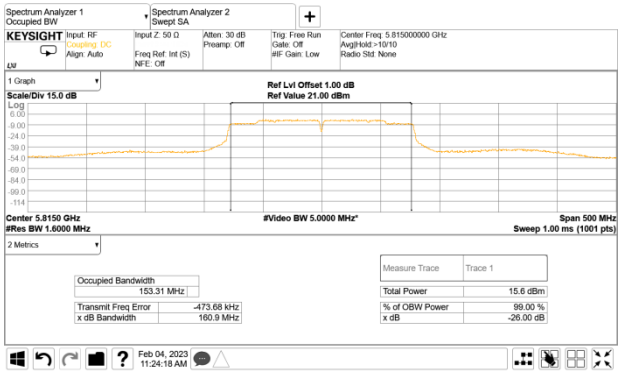	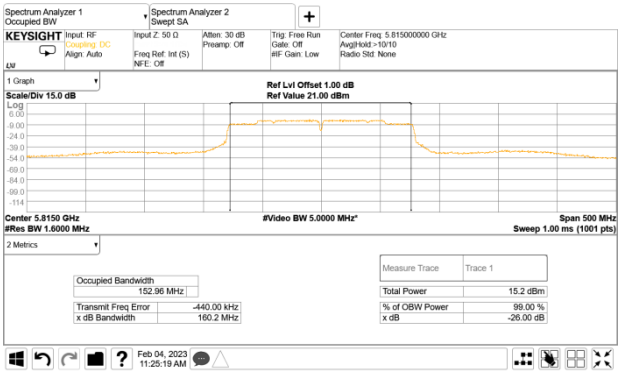

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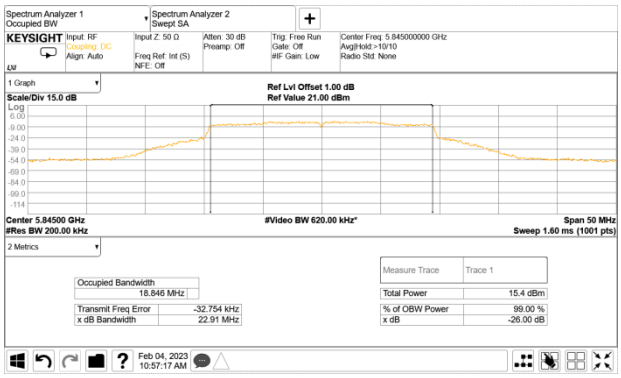
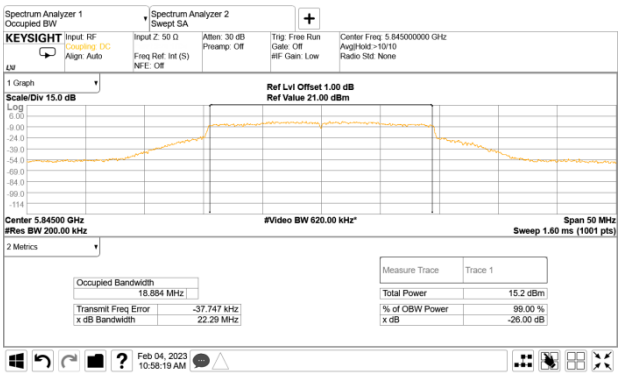
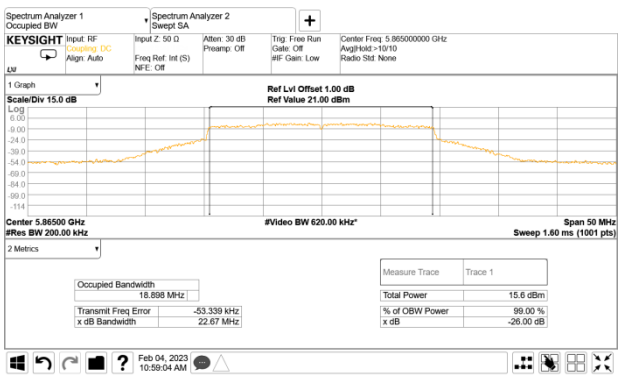
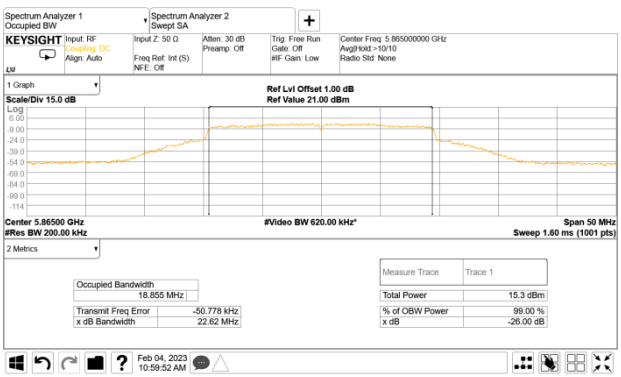
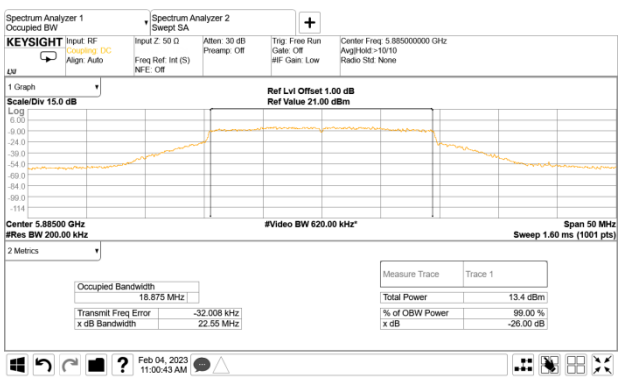
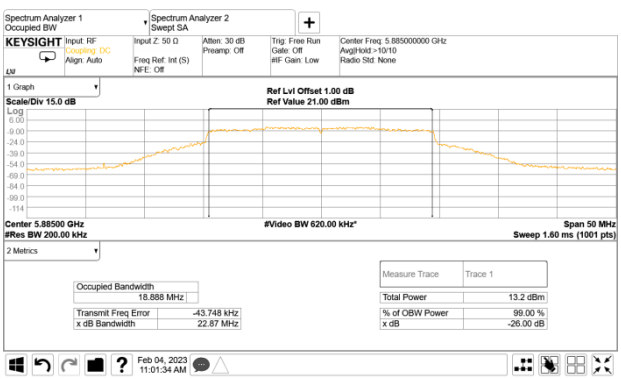
802.11ax-HE20	
AUX	Main
	
	
	

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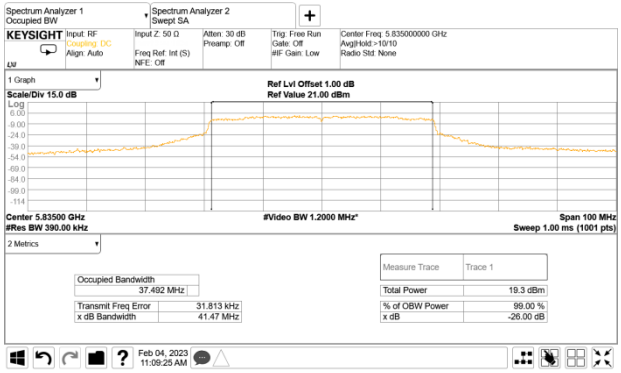
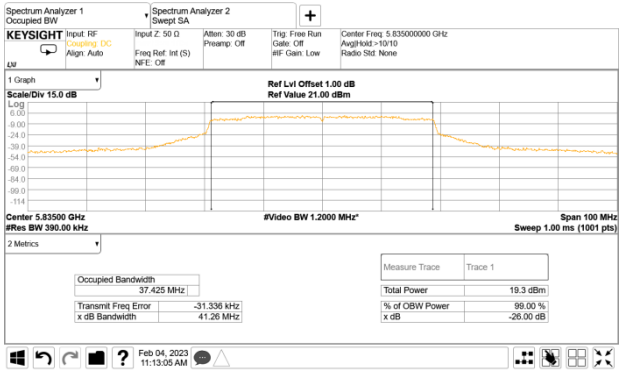
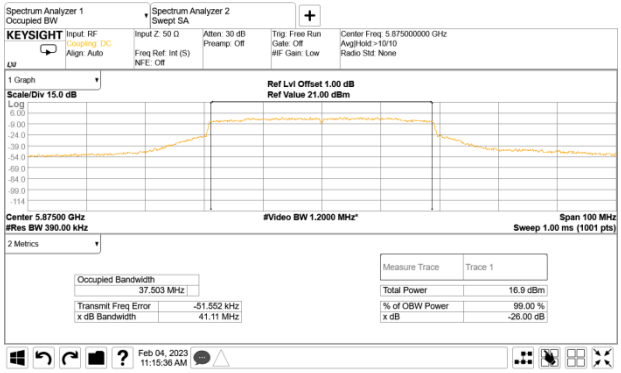
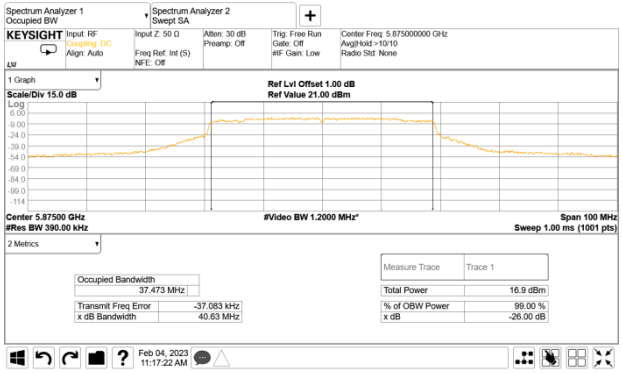
802.11ax-HE40	
AUX	Main
	
	

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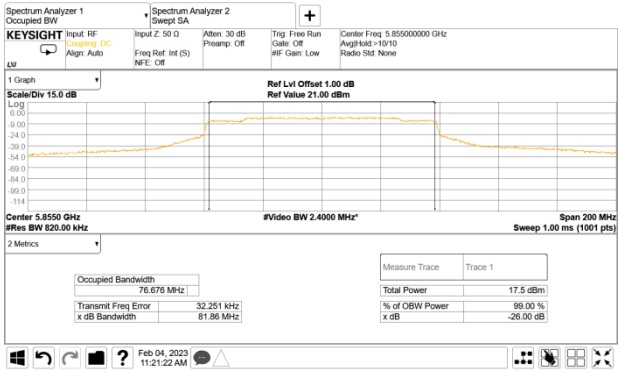
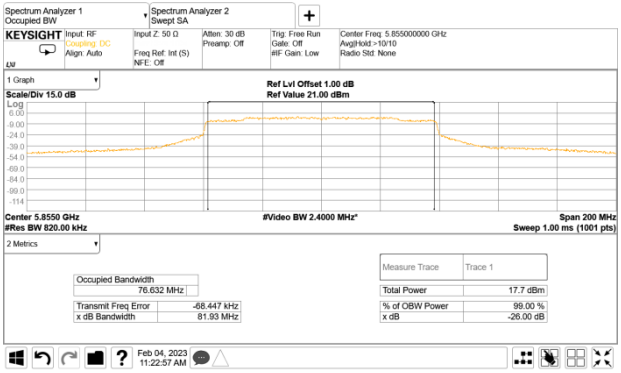
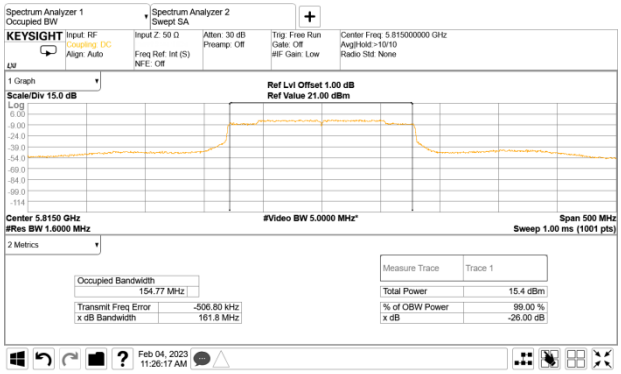
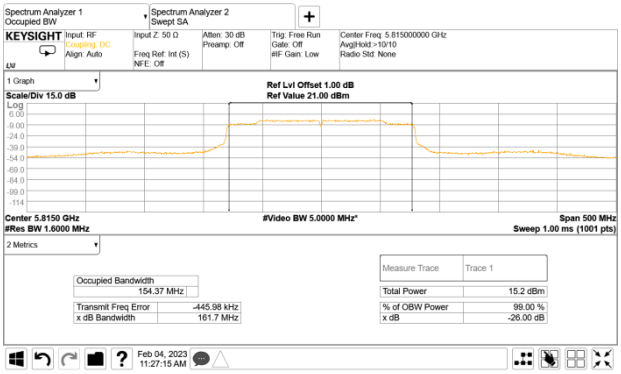
802.11ax-HE80	
AUX	Main
	

802.11ax-HE160	
AUX	Main
	

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A.4 POWER SPECTRAL DENSITY

Test Date	2023/02/03 ~ 04	Temp./Hum.	20~21℃/63~68%
Cable Loss	1.00dB	Tested By	Sam Chang
Test Voltage	AC 120V 60Hz (Via AC Adapter)		

A.4.1 Power Spectral Density Result

Mode	U-NII Band	Centre Frequency (MHz)	Power Spectral Density (dBm/1MHz)		Duty Cycle Factor 10log(1/X)	Antenna Gain (dBi)		Max. Power Spectral Density (dBm/1MHz)Note 2	Limit
			AUX	Main		AUX	Main		
802.11a	4	5845	8.424	8.429	N/A	1.10	1.30	9.729	14dBm/MHz (E.I.R.P.)
		5865	8.376	7.976		1.10	1.30	9.476	
		5885	6.689	6.398		1.10	1.30	7.789	

Mode	U-NII Band	Centre Frequency (MHz)	Power Spectral Density (dBm/1MHz)		Duty Cycle Factor 10log(1/X)	Directional Gain (dBi) Note 4	Total Power Spectral Density (dBm/1MHz)Note 3	Limit
802.11n-HT20	4	5845	5.097	4.944	N/A	1.20	9.231	14dBm/MHz (E.I.R.P.)
		5865	5.756	5.262		1.20	9.726	
		5885	3.106	3.091		1.20	7.309	

Note :1. All results have been included cable loss.

2. Max. Power Spectral Density (dBm/1MHz) (EIRP) = Max of each PSD (dBm/1MHz) (AUX or Main) + Antenna Gain (dBi) + Duty Cycle Factor(dB) when duty cycle is less than 98%.
3. According to KDB 662911 D01 E)2)a), Total Power Spectral Density (dBm/1MHz) (EIRP)= Sum to individual PSD (dBm/1MHz) + Directional Gain (dBi) + Duty Cycle Factor (dB) when duty cycle is less than 98%.
4. According to KDB 662911 D01 d) ii), transmit signals are completely uncorrelated, then
   Directional gain = 10 log[($10^{G1/10}$ + $10^{G2/10}$ + … + $10^{GN/10}$)/N_{ANT}] dBi
   5850MHz: Directional gain = 10 log[($10^{1.3/10}$ +$10^{1.1/10}$)/2]= 1.20dBi
   The MIMO is uncorrelated and supported SDM(Spatial Division Multiplexing) mode only. This radio device doesn't support beamforming and Cyclic Delay Diversity (CDD).

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Mode	U-NII Band	Centre Frequency (MHz)	Power Spectral Density (dBm/1MHz)		Duty Cycle Factor 10log(1/X)	Directional Gain (dBi) Note 3	Total Power Spectral Density (dBm/1MHz) Note 2	Limit
802.11n-HT40	4	5835	5.573	5.504	N/A	1.20	9.749	14dBm/MHz (E.I.R.P.)
		5875	3.263	3.449		1.20	7.567	

Mode	U-NII Band	Centre Frequency (MHz)	Power Spectral Density (dBm/1MHz)		Duty Cycle Factor 10log(1/X)	Directional Gain (dBi) Note 3	Total Power Spectral Density (dBm/1MHz) Note 2	Limit
802.11ac-VHT80	4	5855	0.841	0.893	N/A	1.20	5.077	14dBm/MHz (E.I.R.P.)

Mode	U-NII Band	Centre Frequency (MHz)	Power Spectral Density (dBm/1MHz)		Duty Cycle Factor 10log(1/X)	Directional Gain (dBi) Note 3	Total Power Spectral Density (dBm/1MHz) Note 2	Limit
802.11ac-VHT160	4	5815	-4.329	-4.583	N/A	1.20	-0.244	14dBm/MHz (E.I.R.P.)

Note :1. All results have been included cable loss.

2. According to KDB 662911 D01 E)2)a), Total Power Spectral Density (dBm/1MHz) (EIRP)= Sum to individual PSD (dBm/1MHz) + Directional Gain (dBi) + Duty Cycle Factor (dB) when duty cycle is less than 98%.
3. According to KDB 662911 D01 d) ii), transmit signals are completely uncorrelated, then
Directional gain = 10 log[($10^{G1/10}$ + $10^{G2/10}$ + … + $10^{GN/10}$)/N_{ANT}] dBi
5850MHz: Directional gain = 10 log[($10^{1.3/10}$ +$10^{1.1/10}$)/2]= 1.20dBi
The MIMO is uncorrelated and supported SDM(Spatial Division Multiplexing) mode only. This radio device doesn't support beamforming and Cyclic Delay Diversity (CDD).

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Mode	U-NII Band	Centre Frequency (MHz)	Power Spectral Density (dBm/1MHz)		Duty Cycle Factor 10log(1/X)	Directional Gain (dBi) Note 3	Total Power Spectral Density (dBm/1MHz) Note 2	Limit
802.11ax-HE20	4	5845	5.220	4.916	N/A	1.20	9.281	14dBm/MHz (E.I.R.P.)
		5865	5.355	5.107		1.20	9.443	
		5885	3.341	3.057		1.20	7.412	

Mode	U-NII Band	Centre Frequency (MHz)	Power Spectral Density (dBm/1MHz)		Duty Cycle Factor 10log(1/X)	Directional Gain (dBi) Note 3	Total Power Spectral Density (dBm/1MHz) Note 2	Limit
802.11ax-HE40	4	5835	5.124	5.237	N/A	1.20	9.391	14dBm/MHz (E.I.R.P.)
		5875	2.791	3.024		1.20	7.119	

Mode	U-NII Band	Centre Frequency (MHz)	Power Spectral Density (dBm/1MHz)		Duty Cycle Factor 10log(1/X)	Directional Gain (dBi) Note 3	Total Power Spectral Density (dBm/1MHz) Note 2	Limit
802.11ax-HE80	4	5855	0.620	0.606	N/A	1.20	4.823	14dBm/MHz (E.I.R.P.)

Mode	U-NII Band	Centre Frequency (MHz)	Power Spectral Density (dBm/1MHz)		Duty Cycle Factor 10log(1/X)	Directional Gain (dBi) Note 3	Total Power Spectral Density (dBm/1MHz) Note 2	Limit
802.11ax-HE160	4	5815	-4.498	-4.853	0.092	1.20	-0.370	14dBm/MHz (E.I.R.P.)

Note :1. All results have been included cable loss.

2. According to KDB 662911 D01 E)2)a), Total Power Spectral Density (dBm/1MHz) (EIRP)= Sum to individual PSD (dBm/1MHz) + Directional Gain (dBi) + Duty Cycle Factor (dB) when duty cycle is less than 98%.
3. According to KDB 662911 D01 d) ii), transmit signals are completely uncorrelated, then
Directional gain = 10 log[$(10^{G1/10} + 10^{G2/10} + \ldots + 10^{GN/10})/N_{ANT}$] dBi
5850MHz: Directional gain = 10 log[$(10^{1.3/10} + 10^{1.1/10})/2$]= 1.20dBi
The MIMO is uncorrelated and supported SDM(Spatial Division Multiplexing) mode only. This radio device doesn't support beamforming and Cyclic Delay Diversity (CDD).

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Mode	U-NII Band	Centre Frequency (MHz)	RU Configuration	Power Spectral Density (dBm/1MHz)		Duty Cycle Factor 10log(1/X)	Directional Gain (dBi) Note 3	Total Power Spectral Density (dBm/1MHz) Note 2	Limit
802.11ax-HE20	4	5845	26/0	2.386	2.592	0.269	1.20	6.97	14dBm/MHz (E.I.R.P.)
			52/37	9.348	9.026	0.132	1.20	13.53	
			106/53	9.447	9.106	N/A	1.20	13.49	
		5885	26/0	1.761	1.377	0.269	1.20	6.05	
			52/37	1.504	1.363	0.132	1.20	5.78	
			106/53	3.093	2.782	N/A	1.20	7.15	

Mode	U-NII Band	Centre Frequency (MHz)	RU Configuration	Power Spectral Density (dBm/1MHz)		Duty Cycle Factor 10log(1/X)	Directional Gain (dBi) Note 3	Total Power Spectral Density (dBm/1MHz) Note 2	Limit
802.11ax-HE40	4	5835	242/61	9.119	9.052	0.150	1.20	13.45	14dBm/MHz (E.I.R.P.)
		5875	242/62	3.094	3.163	0.150	1.20	7.49	

Mode	U-NII Band	Centre Frequency (MHz)	RU Configuration	Power Spectral Density (dBm/1MHz)		Duty Cycle Factor 10log(1/X)	Directional Gain (dBi) Note 3	Total Power Spectral Density (dBm/1MHz) Note 2	Limit
802.11ax-HE80	4	5855	484/65	5.401	5.098	0.092	1.20	9.55	14dBm/MHz (E.I.R.P.)
			484/66	2.973	2.817	0.092	1.20	7.20	

Mode	U-NII Band	Centre Frequency (MHz)	RU Configuration	Power Spectral Density (dBm/1MHz)		Duty Cycle Factor 10log(1/X)	Directional Gain (dBi) Note 3	Total Power Spectral Density (dBm/1MHz) Note 2	Limit
802.11ax-HE160	4	5815	996/67	1.811	1.920	0.191	1.20	6.27	14dBm/MHz (E.I.R.P.)
			996/S67	1.786	1.979	0.191	1.20	6.28	

Note :1. All results have been included cable loss.

2. According to KDB 662911 D01 E)2)a), Total Power Spectral Density (dBm/1MHz) (EIRP)= Sum to individual PSD (dBm/1MHz) + Directional Gain (dBi) + Duty Cycle Factor (dB) when duty cycle is less than 98%.

3. According to KDB 662911 D01 d) ii), transmit signals are completely uncorrelated, then
Directional gain = 10 log[($10^{G1/10}$ + $10^{G2/10}$ + … + $10^{GN/10}$)/N_{ANT}] dBi
5850MHz: Directional gain = 10 log[($10^{1.3/10}$ +$10^{1.1/10}$)/2]= 1.20dBi
The MIMO is uncorrelated and supported SDM(Spatial Division Multiplexing) mode only. This radio device doesn't support beamforming and Cyclic Delay Diversity (CDD).

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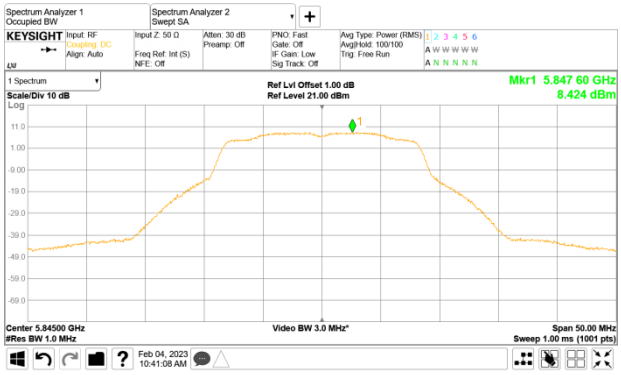
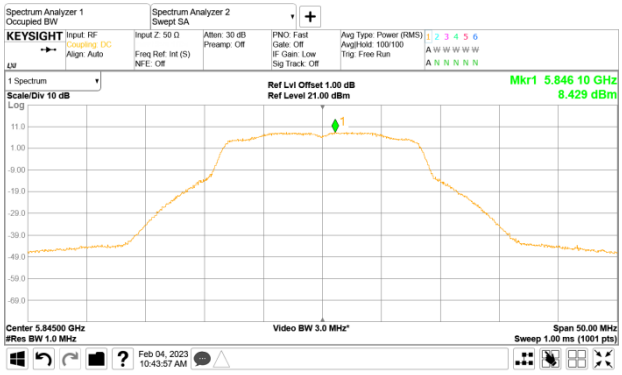
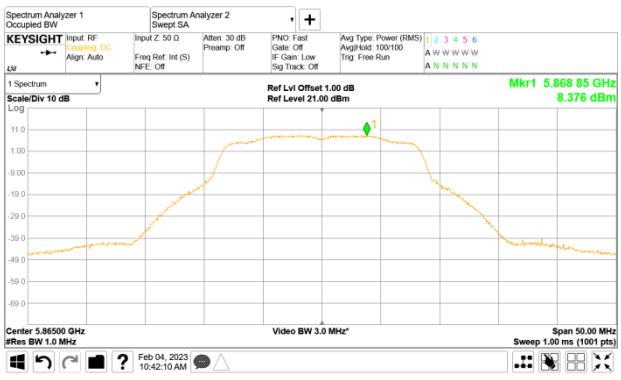
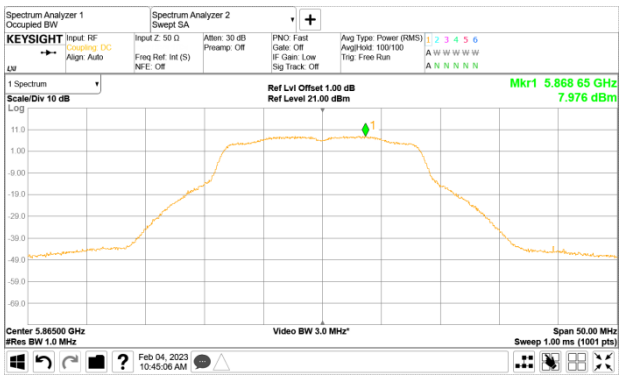
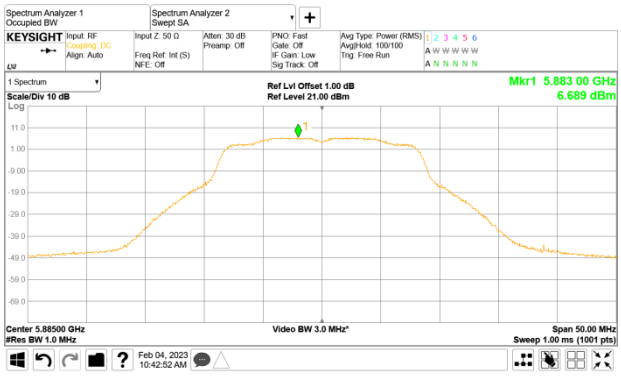
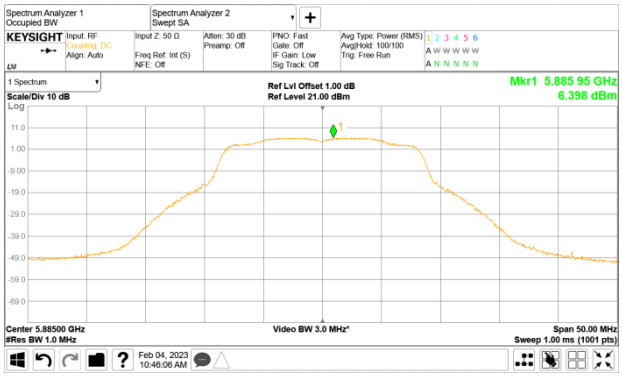
A.4.2 Measurement Plots

802.11a	
AUX	Main
	
	
	

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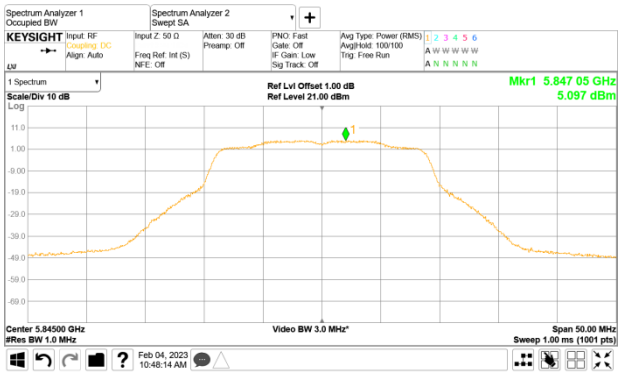
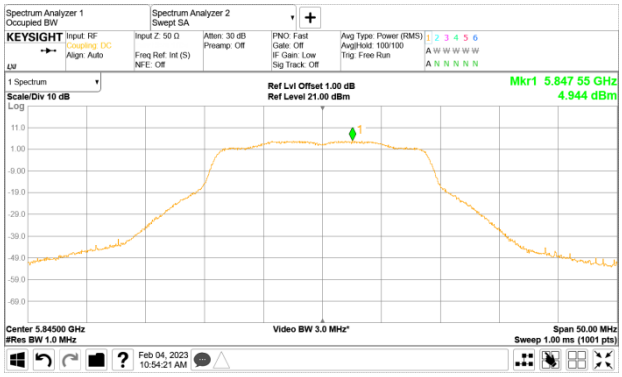
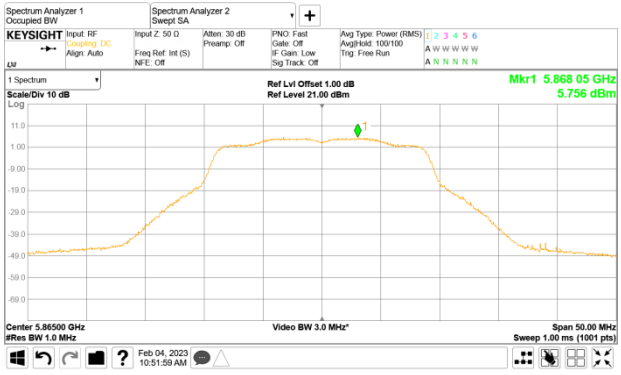
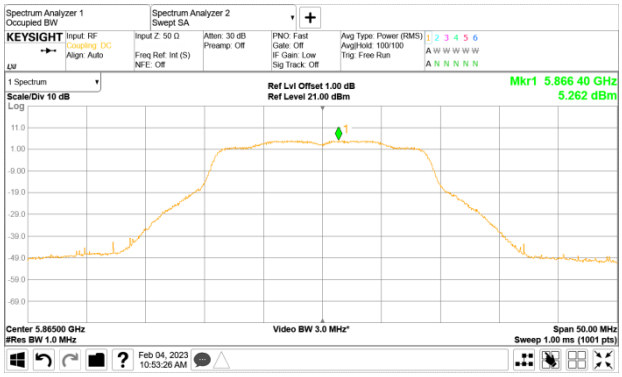
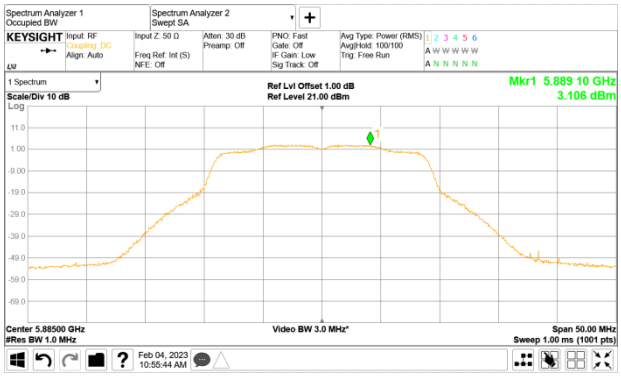
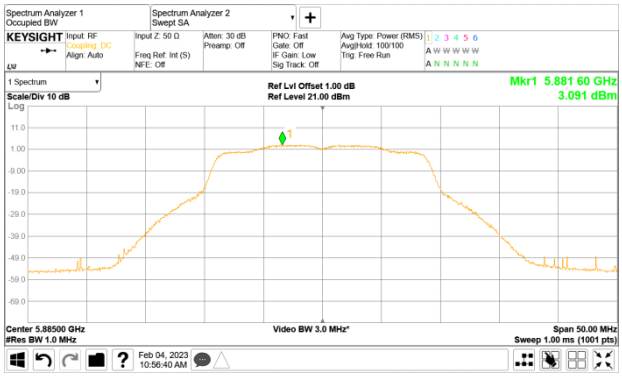
802.11n-HT20	
AUX	Main
	
	
	

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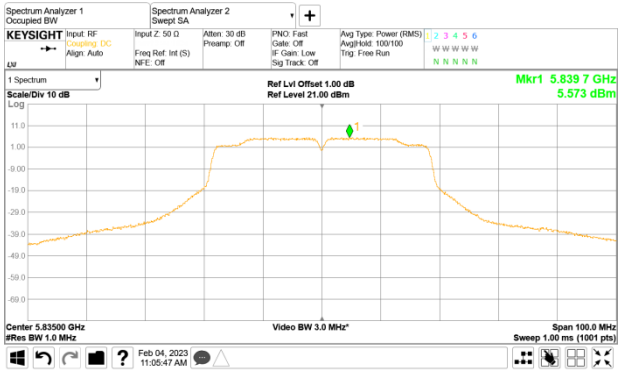
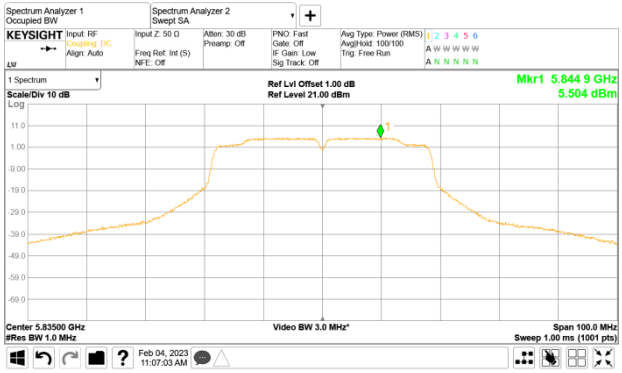
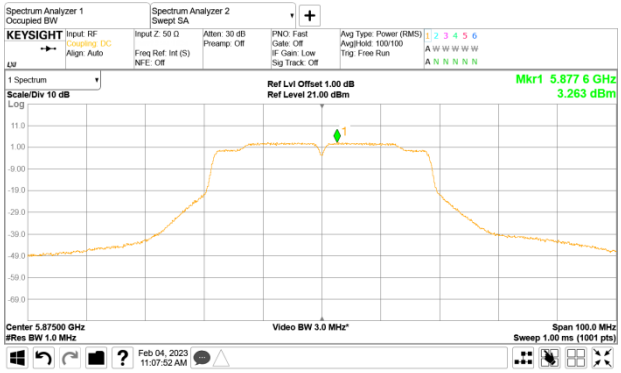
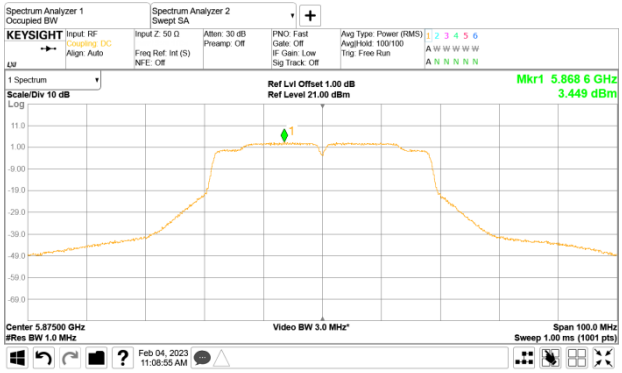
802.11n-HT40	
AUX	Main
	
	

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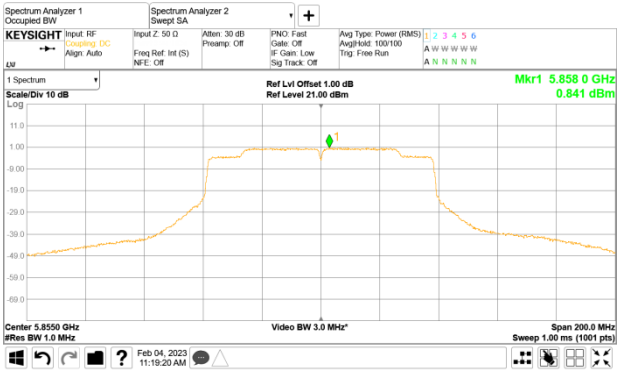
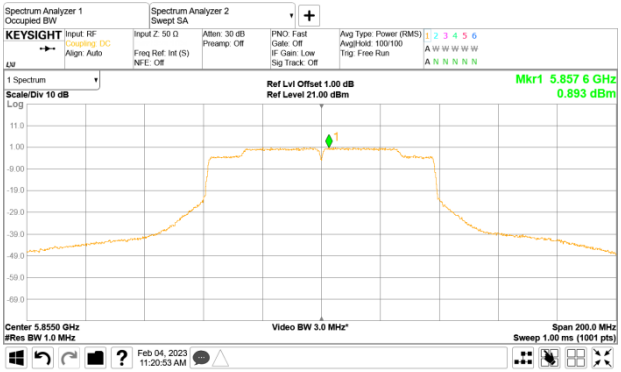
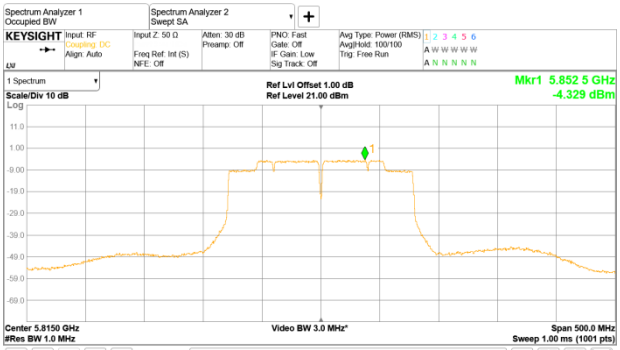
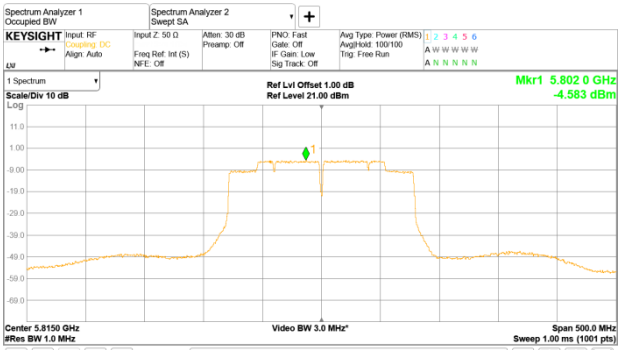
802.11ac-VHT80	
AUX	Main
	

802.11ac-VHT60	
AUX	Main
	

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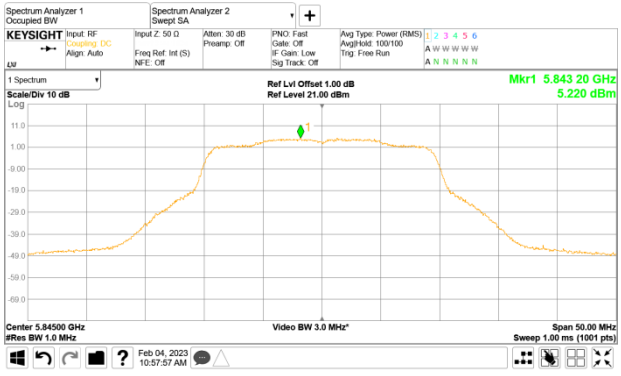
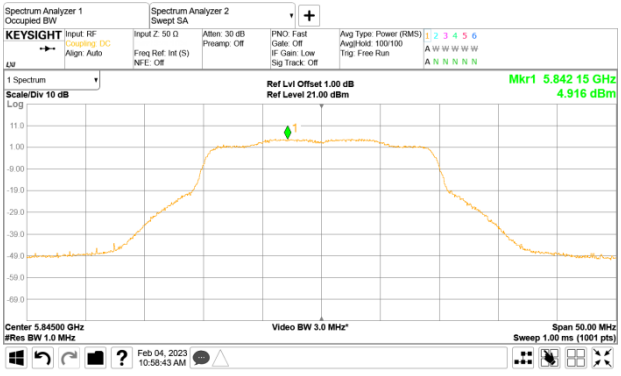
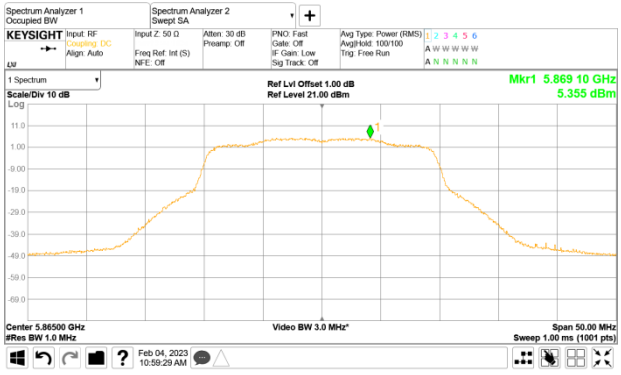
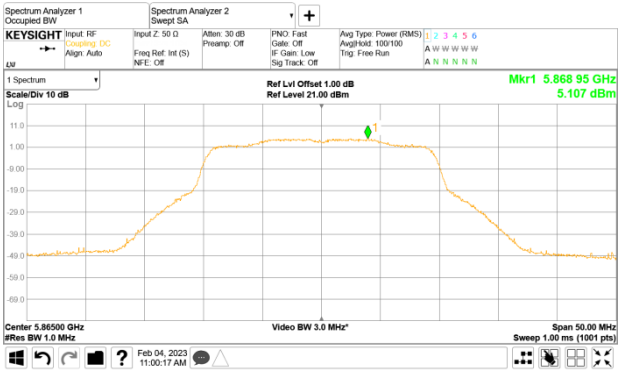
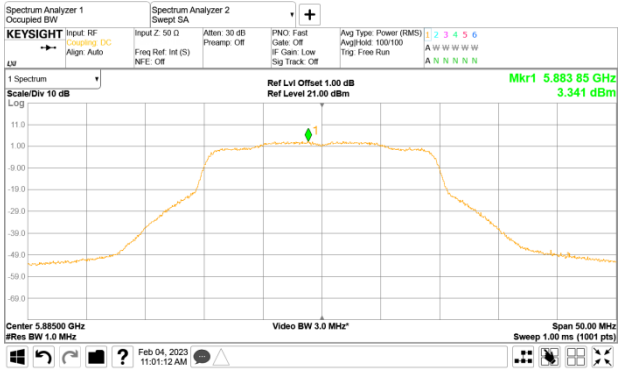
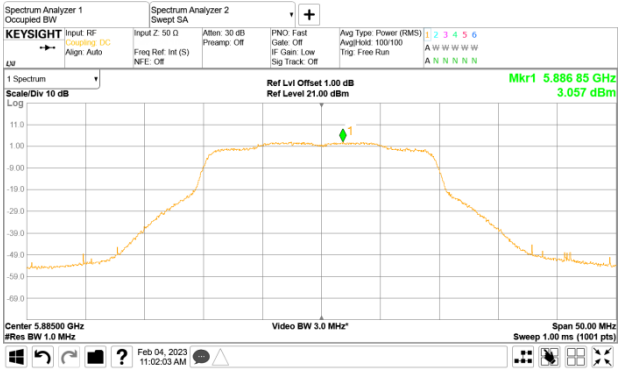
802.11ax-HE20	
AUX	Main
	
	
	

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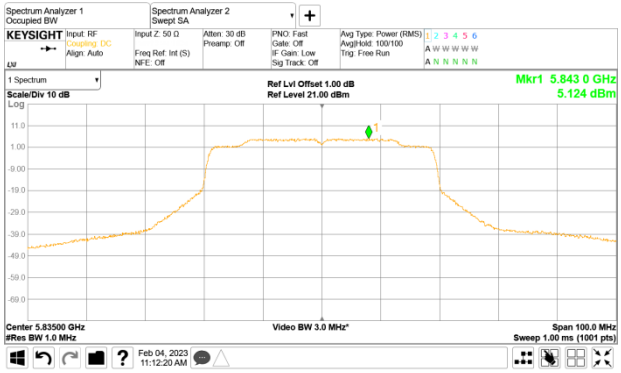
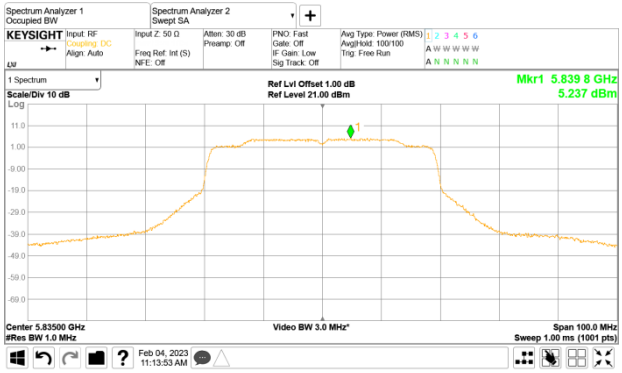
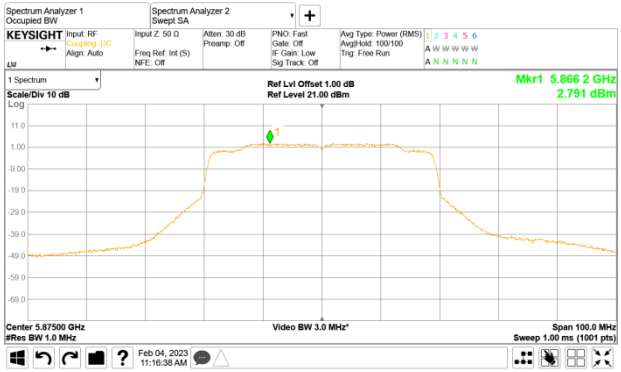
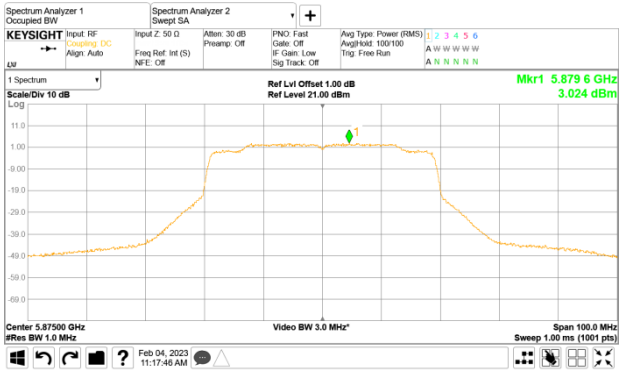
802.11ax-HE40	
AUX	Main
	
	

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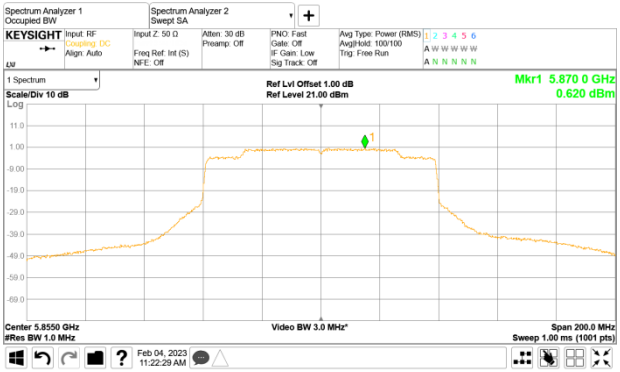
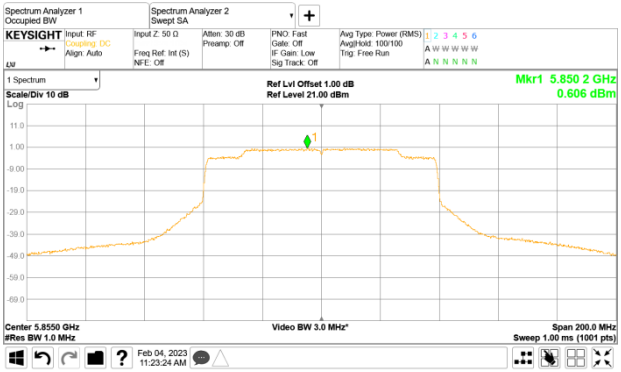
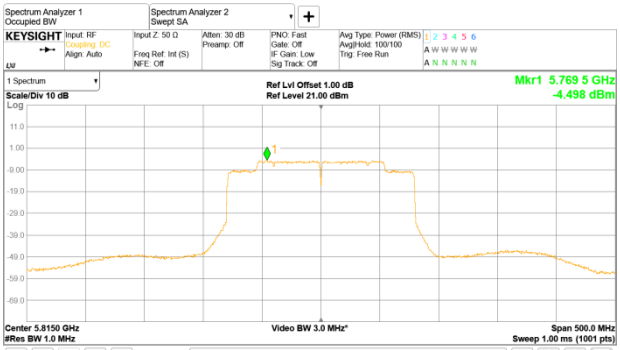
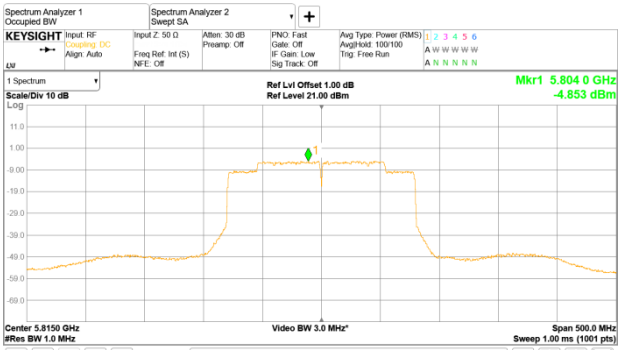
802.11ax-HE80	
AUX	Main
	

802.11ax-HE160	
AUX	Main
	

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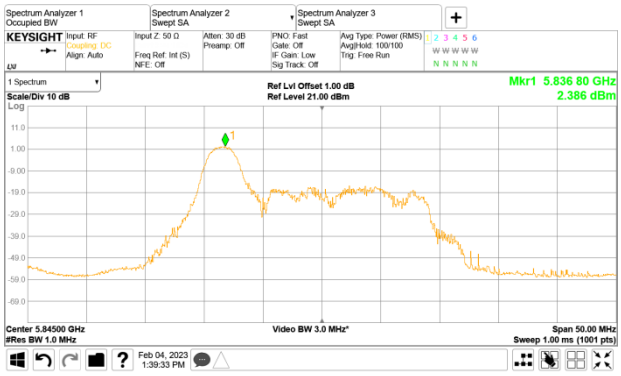
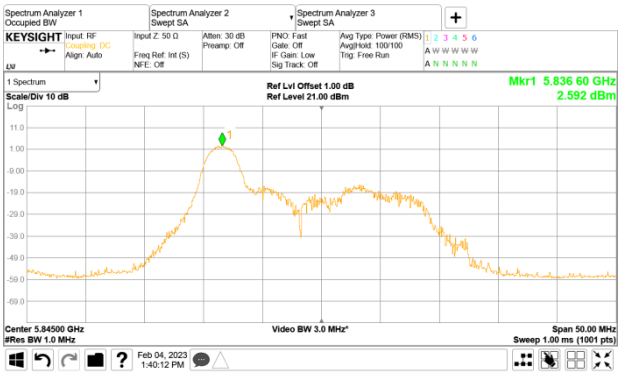
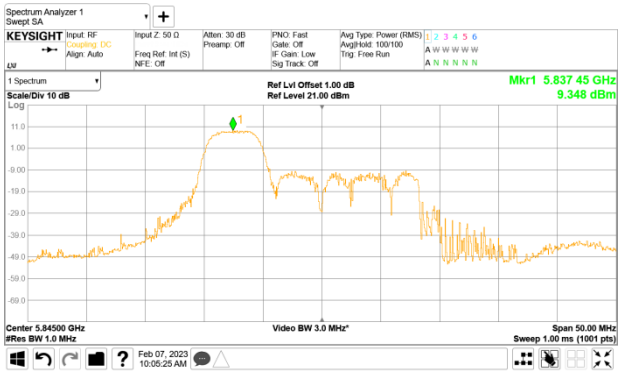
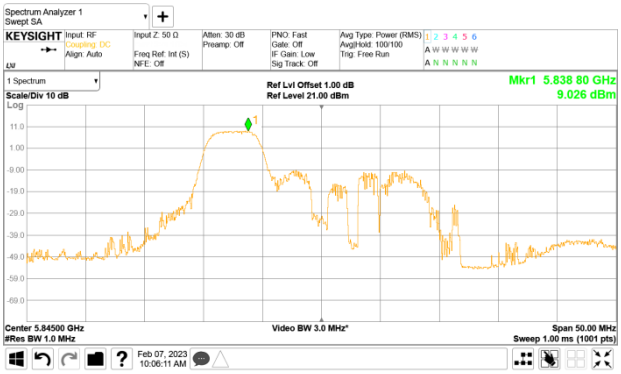
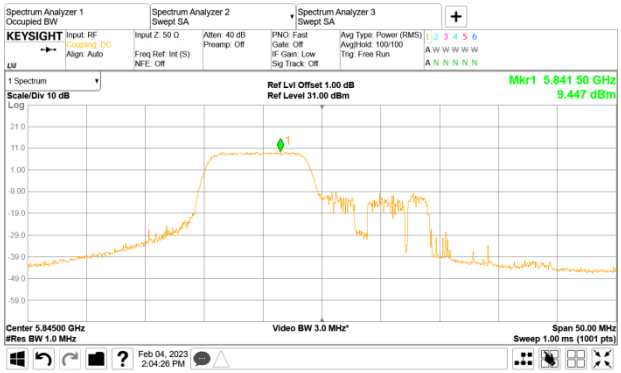
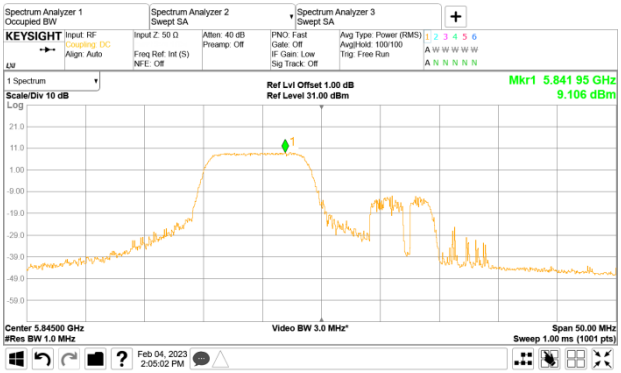
Mode: 802.11ax-HE20	
AUX	Main
5845MHz	5845MHz
RU Configuration: 26/0	RU Configuration: 26/0
	
RU Configuration: 52/37	RU Configuration: 52/37
	
RU Configuration: 106/53	RU Configuration: 106/53
	

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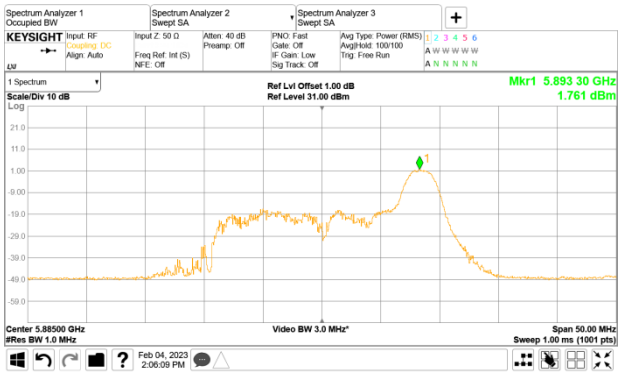
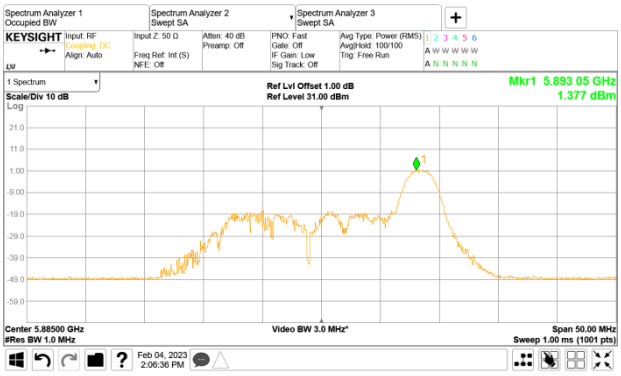
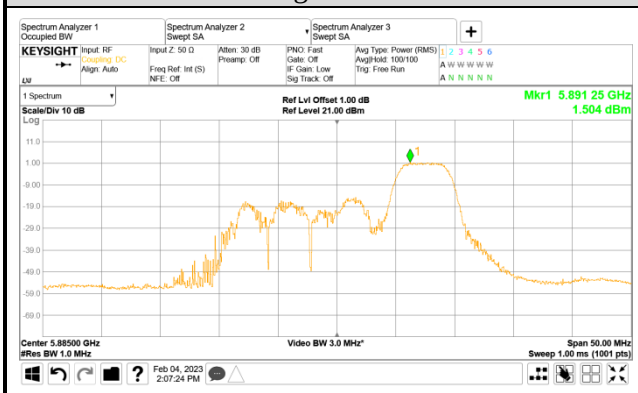
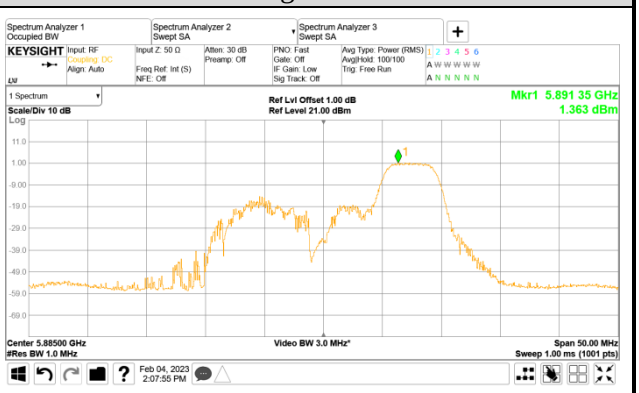
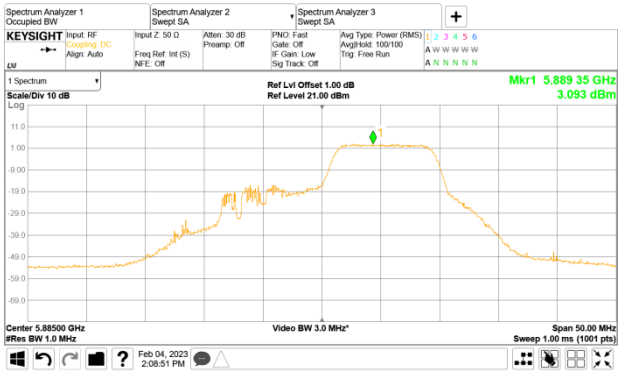
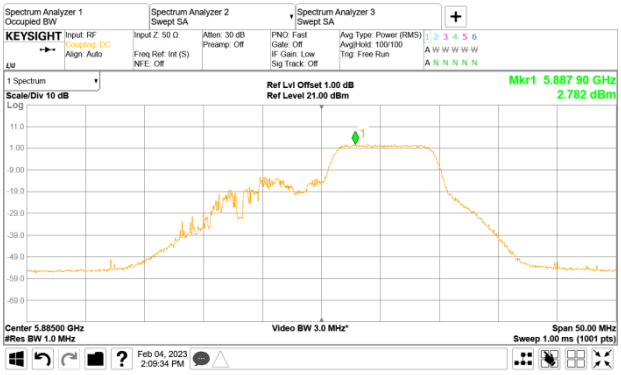
Mode: 802.11ax-HE20	
AUX	Main
5885MHz	5885MHz
RU Configuration: 26/0	RU Configuration: 26/0
	
RU Configuration: 52/37	RU Configuration: 52/37
	
RU Configuration: 106/53	RU Configuration: 106/53
	

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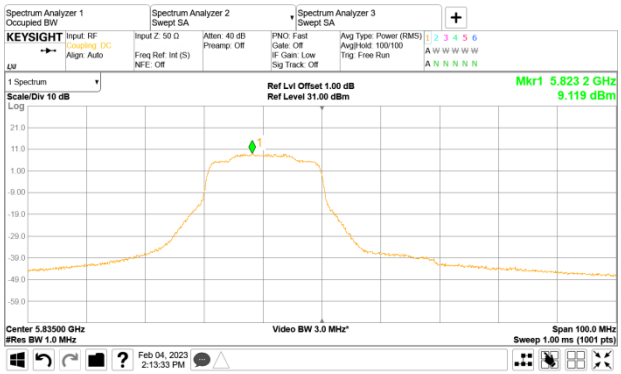
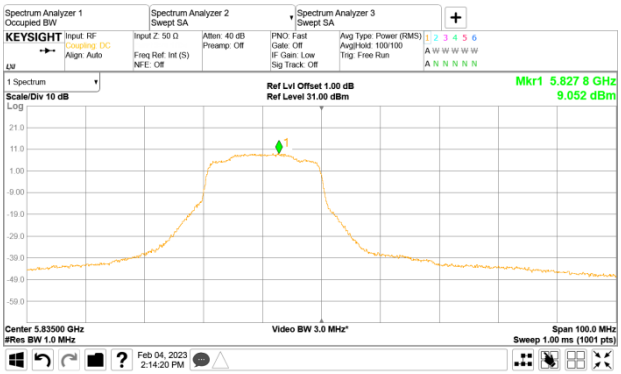
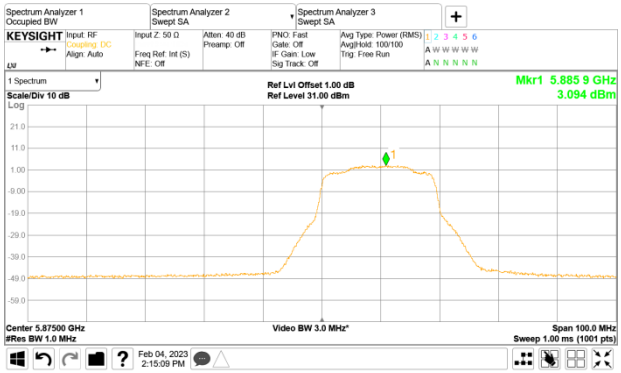
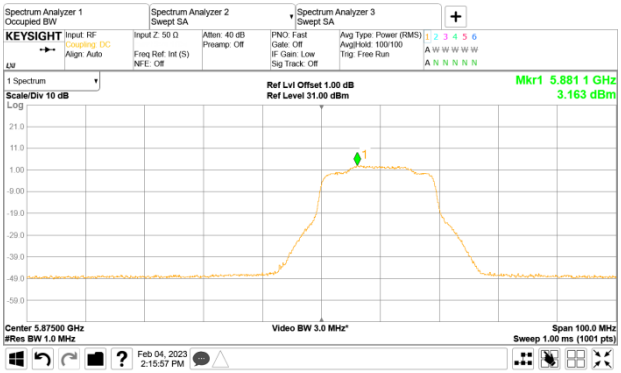
Mode: 802.11ax-HE40	
AUX	Main
5835MHz	5835MHz
RU Configuration: 242/61	RU Configuration: 242/61
	
5875MHz	5875MHz
RU Configuration: 242/62	RU Configuration: 242/62
	

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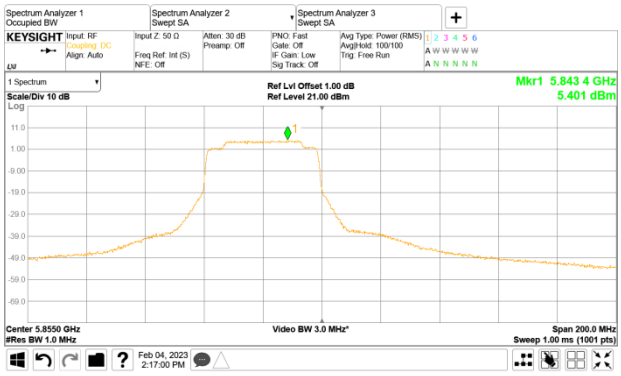
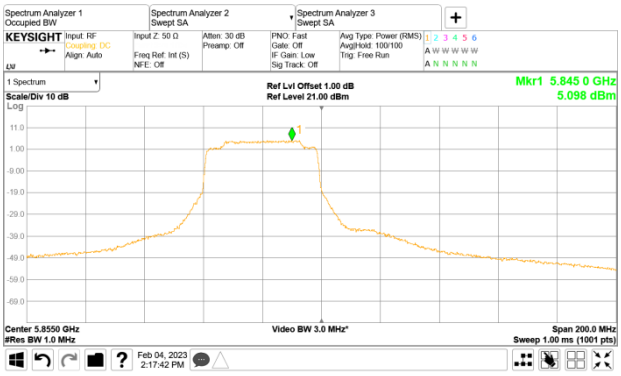
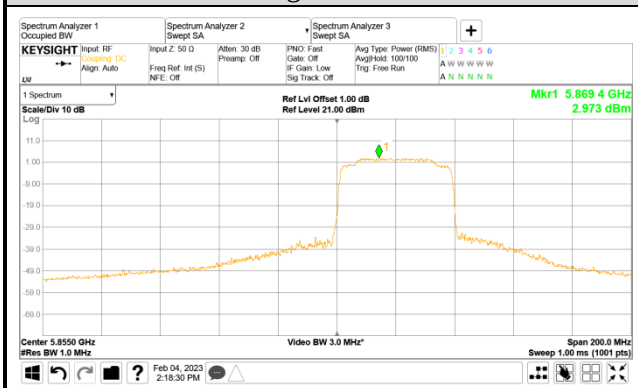
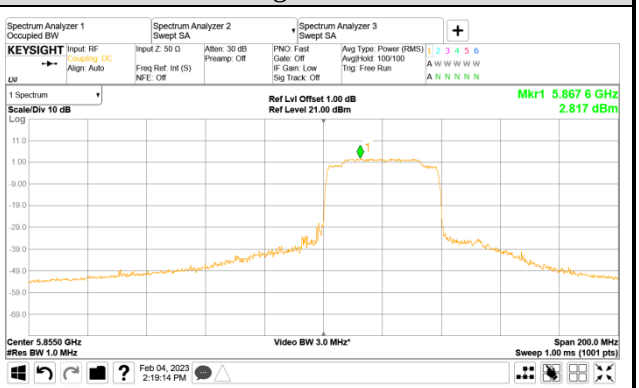
Mode: 802.11ax-HE80	
AUX	Main
5855MHz	5855MHz
RU Configuration: 484/65	RU Configuration: 484/65
	
RU Configuration: 484/66	RU Configuration: 484/66
	

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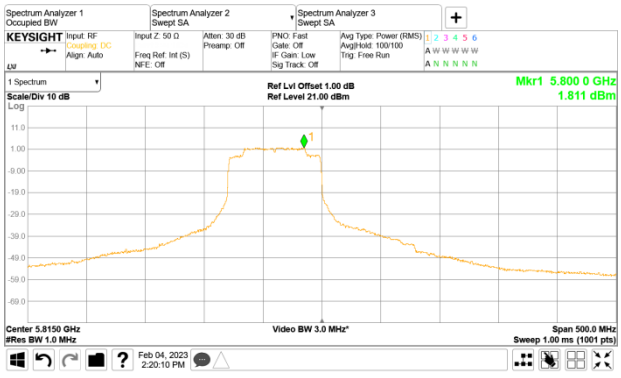
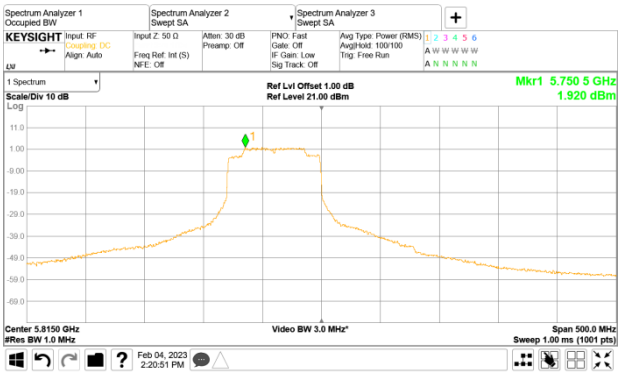
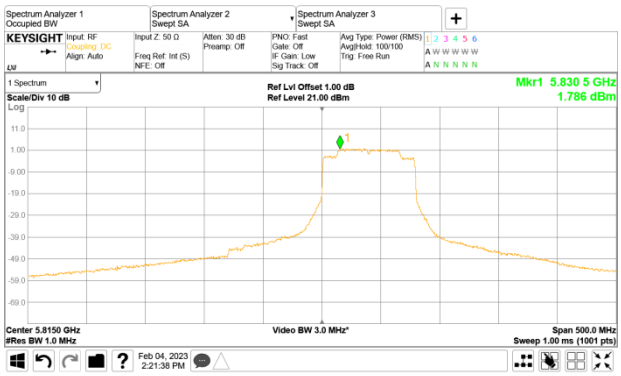
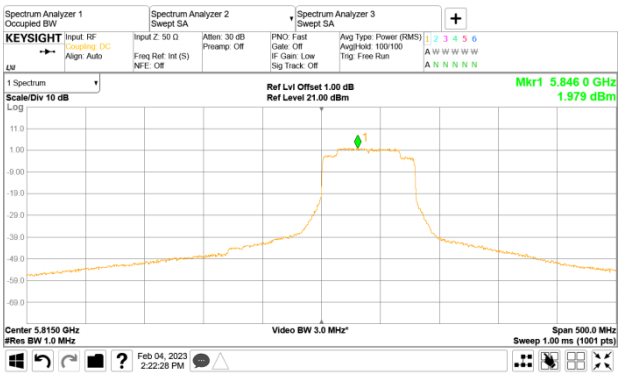
Mode: 802.11ax-HE160	
AUX	Main
5815MHz	5815MHz
RU Configuration: 996/67	RU Configuration: 996/67
	
RU Configuration: 996/S67	RU Configuration: 996/S67
	

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A.5 FREQUENCY STABILITY

Test Date	2023/02/03	Temp./Hum.	21℃/63%
Test Voltage	AC 120V 60Hz (Via AC Adapter)	Tested By	Sam Chang

A.5.1 Frequency stability Result

Temperature (℃)	Voltage (Vac)	Centre Frequency (MHz)	Measurement Value (MHz)	Frequency Stability (ppm)
25	120	5845	5845.020	3.422
-30	102		5845.023	3.935
	138		5844.98	-3.422
-20	102		5845.019	3.251
	138		5844.995	-0.855
-10	102		5845.018	3.080
	138		5844.987	-2.224
0	102		5844.975	-4.277
	138		5844.996	-0.684
10	102		5844.979	-3.593
	138		5844.973	-4.619
20	102		5845.014	2.395
	138		5844.983	-2.908
30	102		5844.997	-0.513
	138		5844.976	-4.106
40	102		5844.978	-3.764
	138		5845.029	4.962
50	102		5845.009	1.540
	138		5845.005	0.855

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