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Appendix B:
802.11ax
Test Plot

FCC ID
A3LSMS911B

REVISION HISTORY

The revision history for this document is shown in table.

Revision No.	Date of Issue	Description
0	October 21, 2022	Initial Release
1	November 07, 2022	Revised Typo

Note:

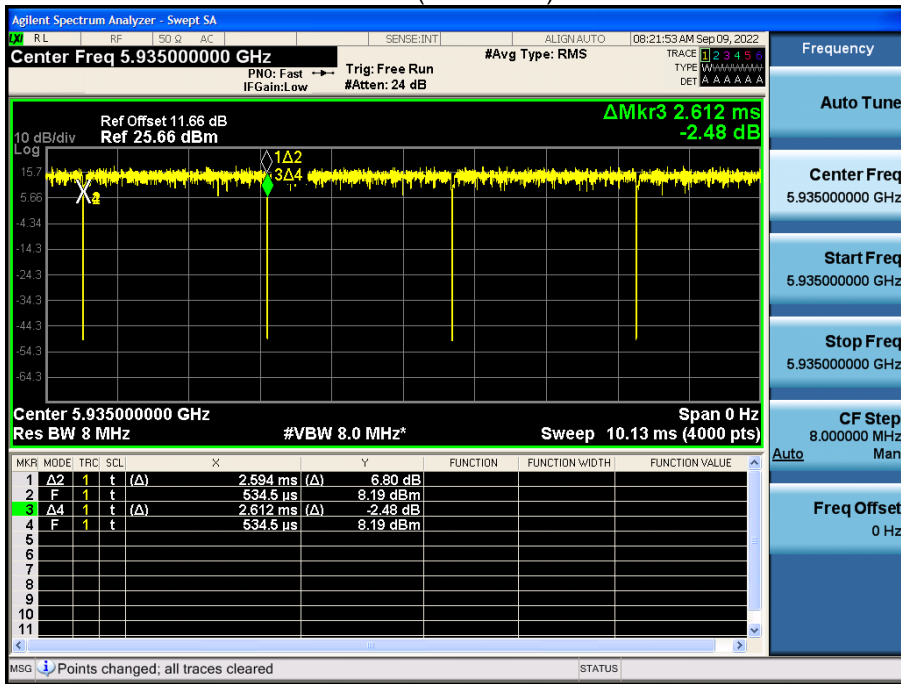
In order to simplify the report, attached plots were only the most lowest datarate.

1. Duty Cycle

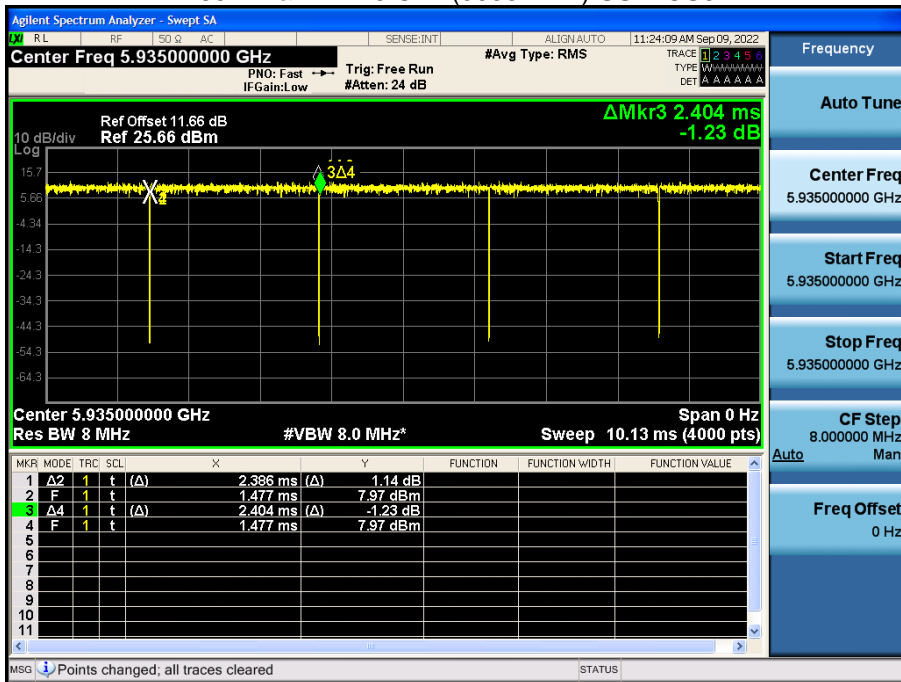
Note:

In order to simplify the report, attached plots were only the most lowest datarate .

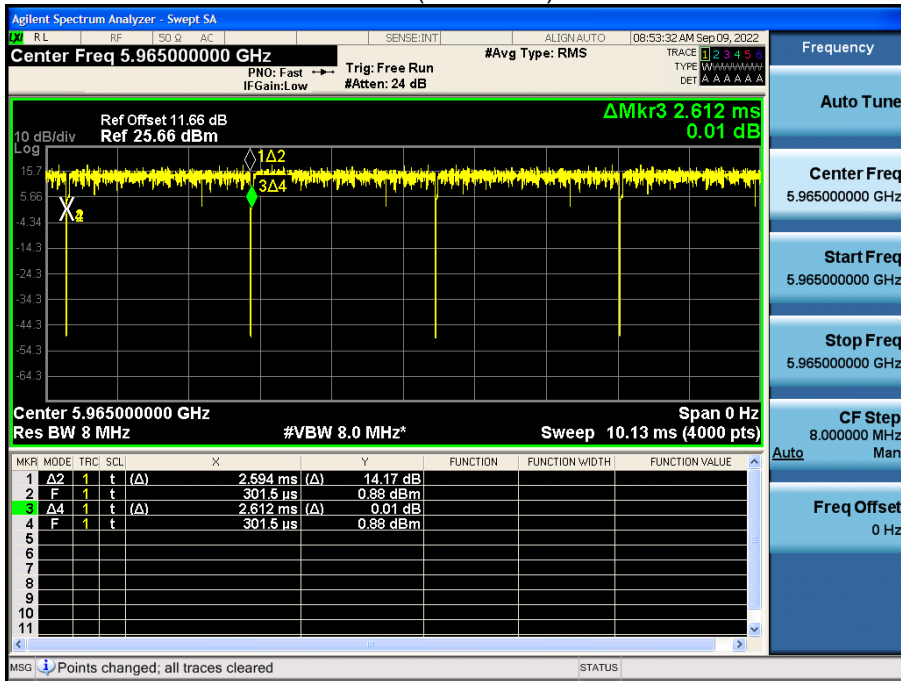
802.11ax HE 20 Ch.2(5935 MHz) 26 Tones MCS0



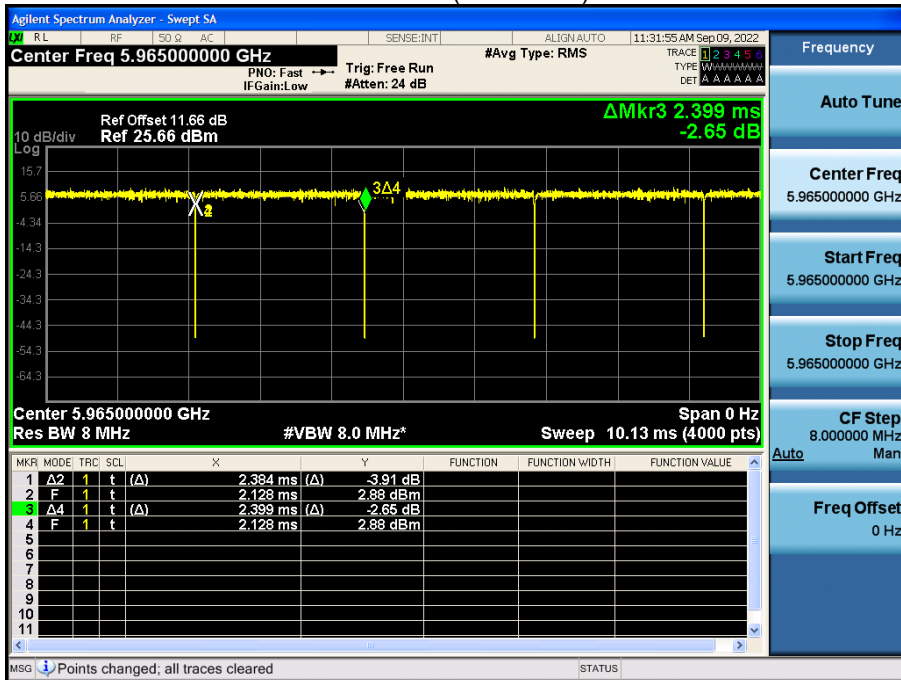
802.11ax HE 20 Ch.2(5935 MHz) SU MCS0



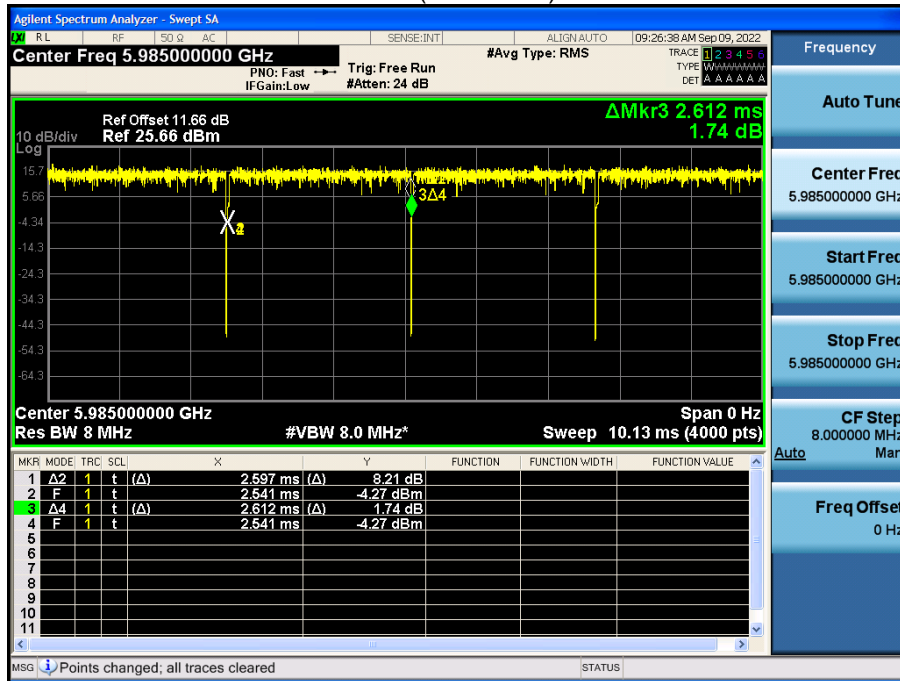
802.11ax HE 40 Ch.3(5965 MHz) 26 Tones MCS0



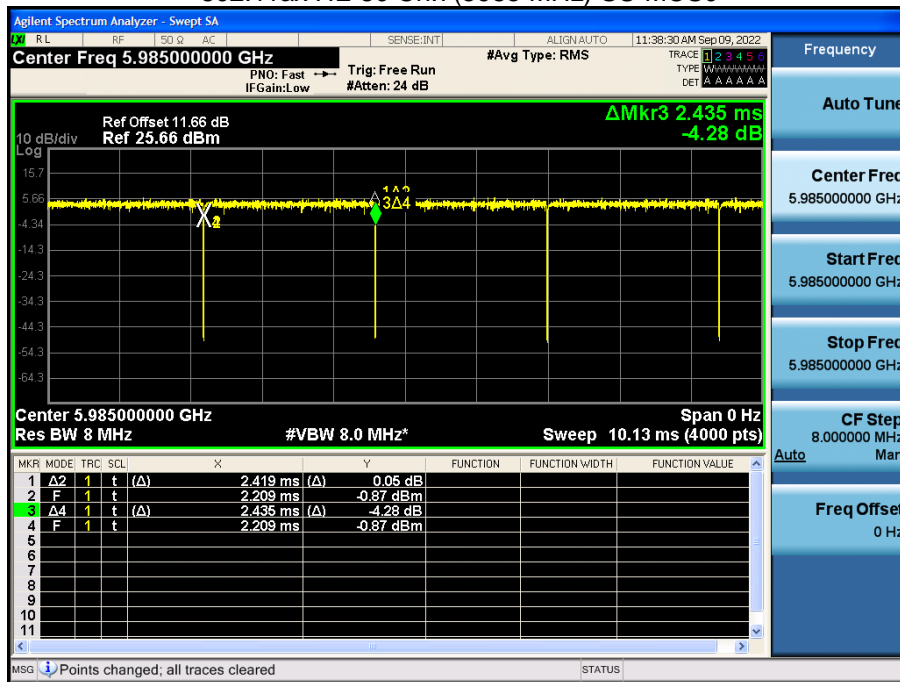
802.11ax HE 40 Ch.3(5965 MHz) SU MCS0



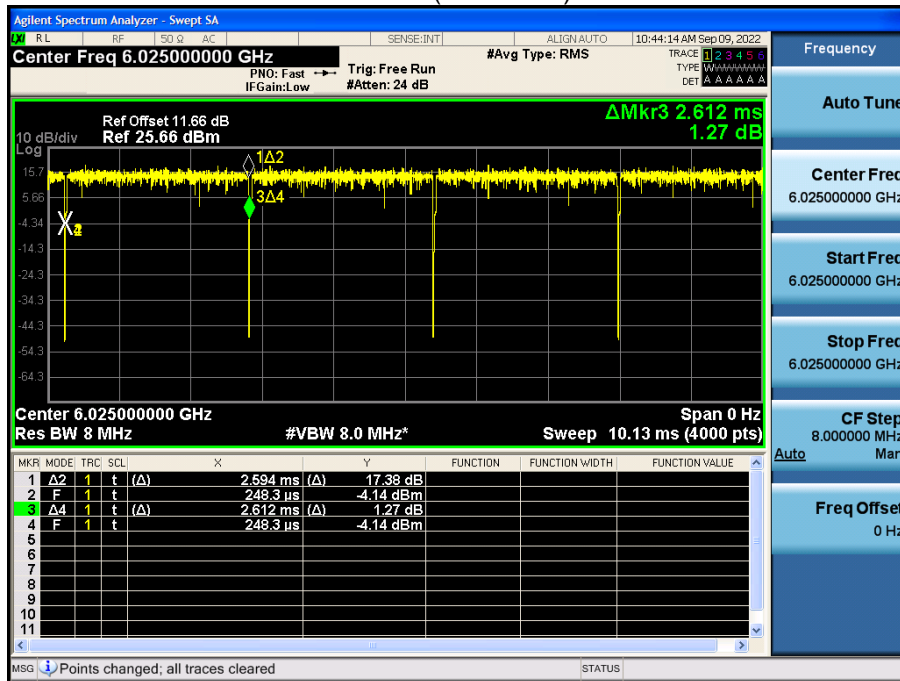
802.11ax HE 80 Ch.7(5985 MHz) 26 Tones MCS0



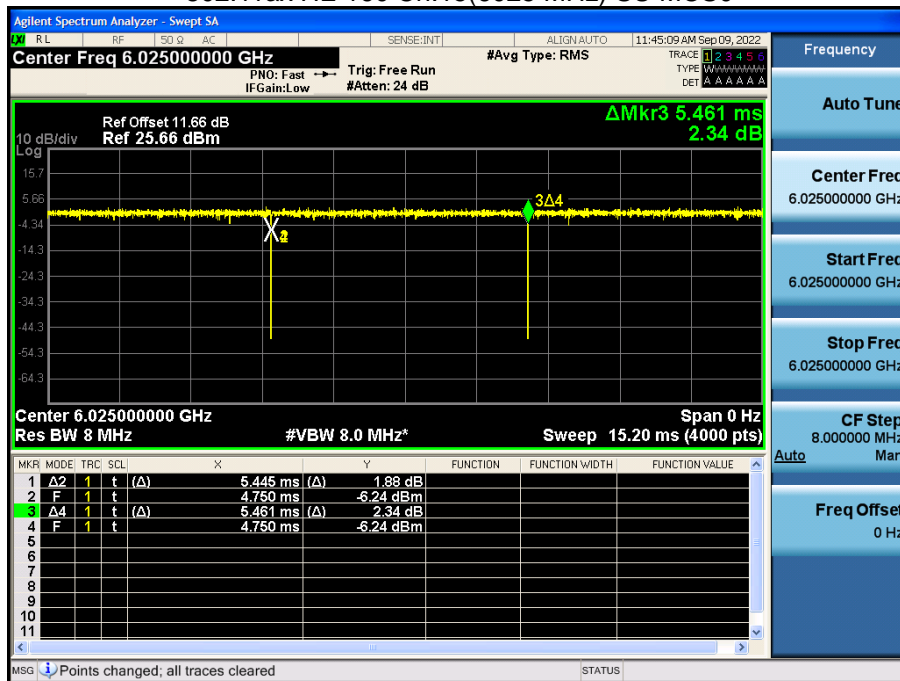
802.11ax HE 80 Ch.7(5985 MHz) SU MCS0



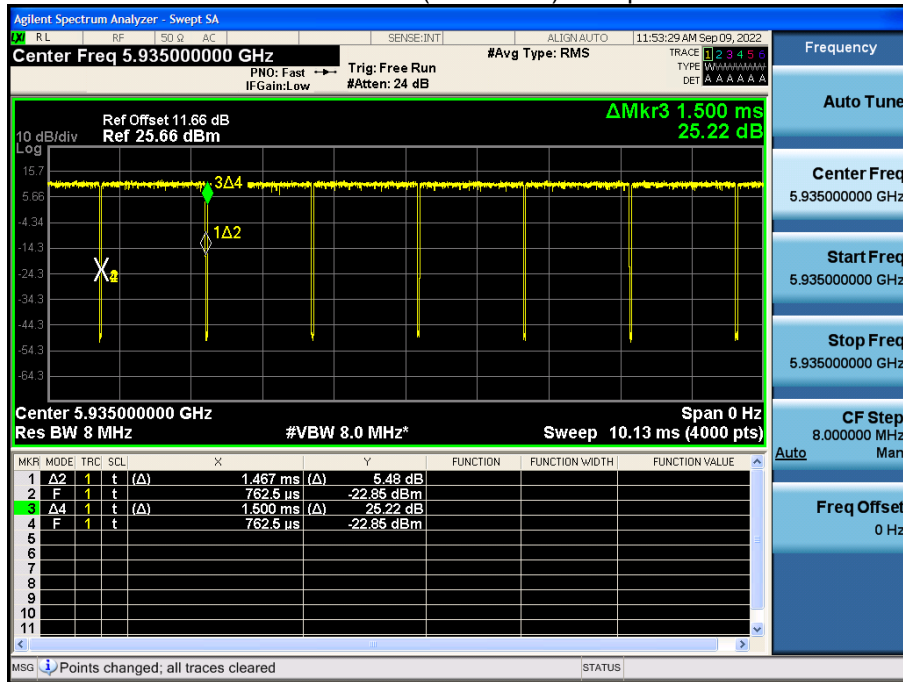
802.11ax HE 160 Ch.15(6025 MHz) 26 Tones MCS0



802.11ax HE 160 Ch.15(6025 MHz) SU MCS0



802.11a Ch.1(5955 MHz) 6 Mbps



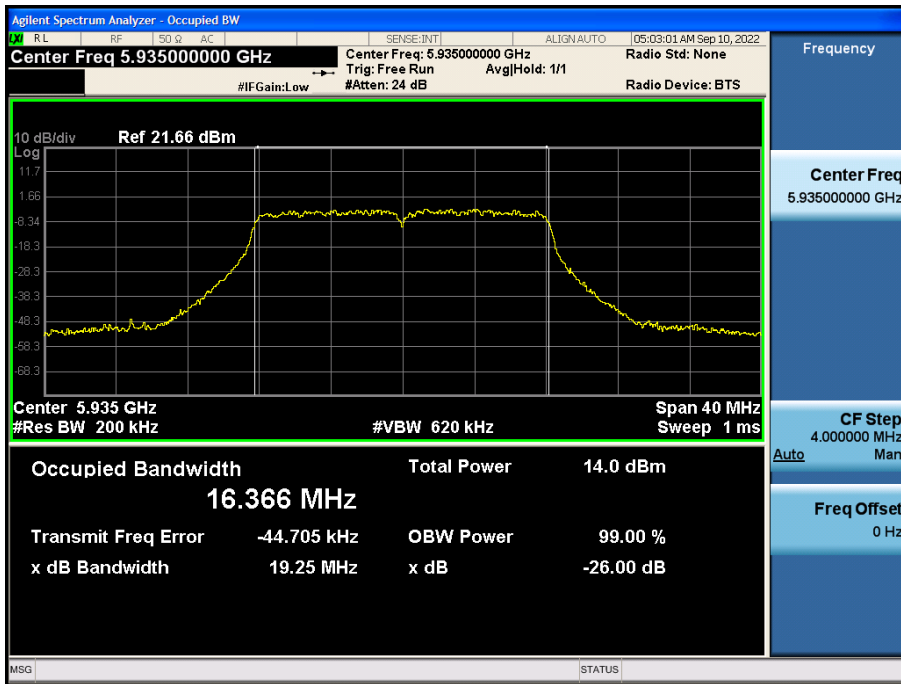
2. 26dB Bandwidth

2.1 Indoor client

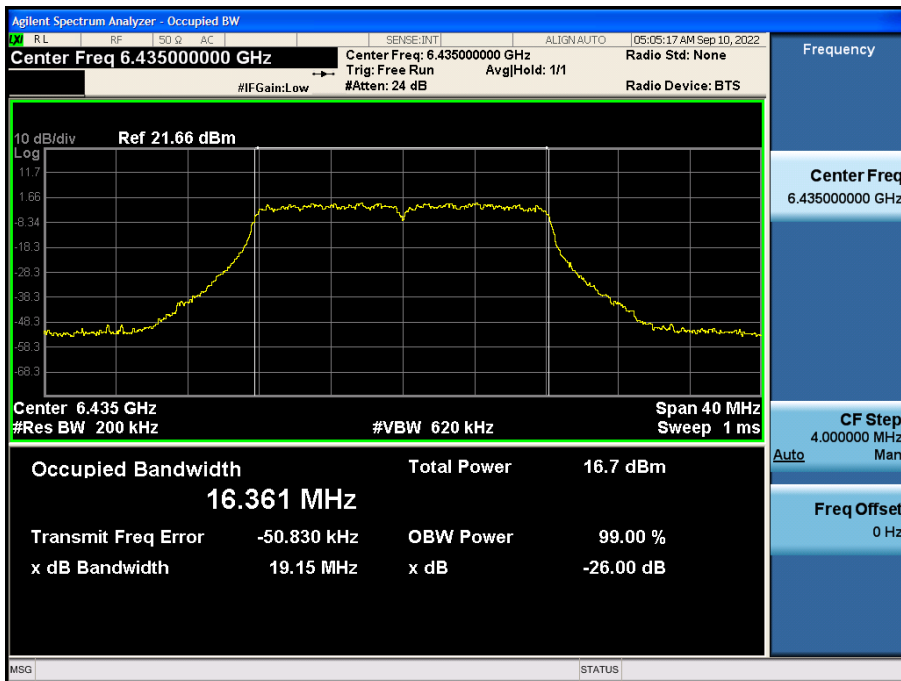
Note:

1. In order to simplify the report, attached plots were only Ant.1 (Worst Case: Ant.1).
2. In order to simplify the report, attached plots were only the most wide channel.

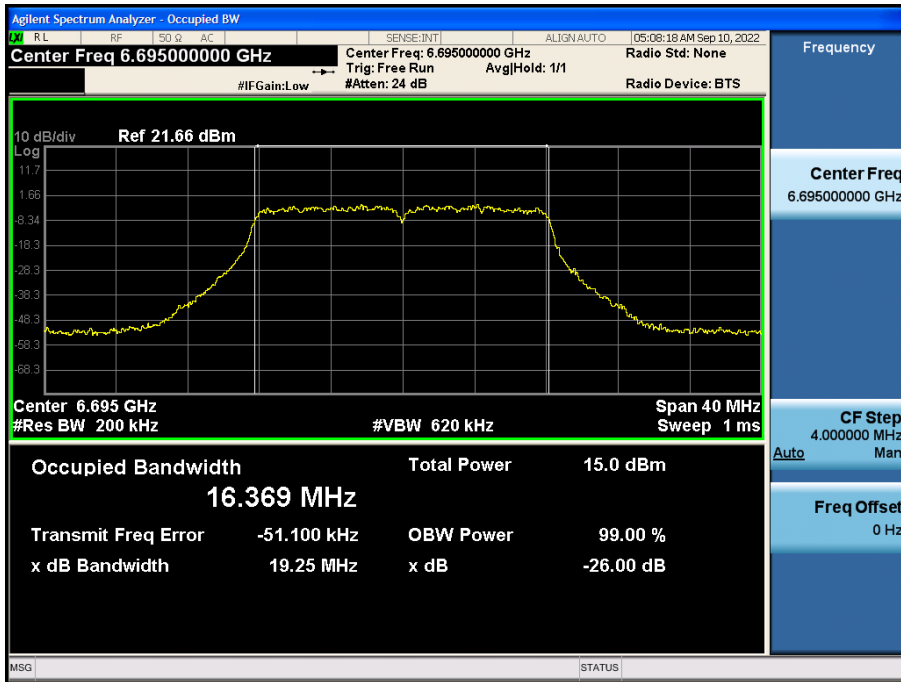
802.11a Ch.2(5935 MHz)



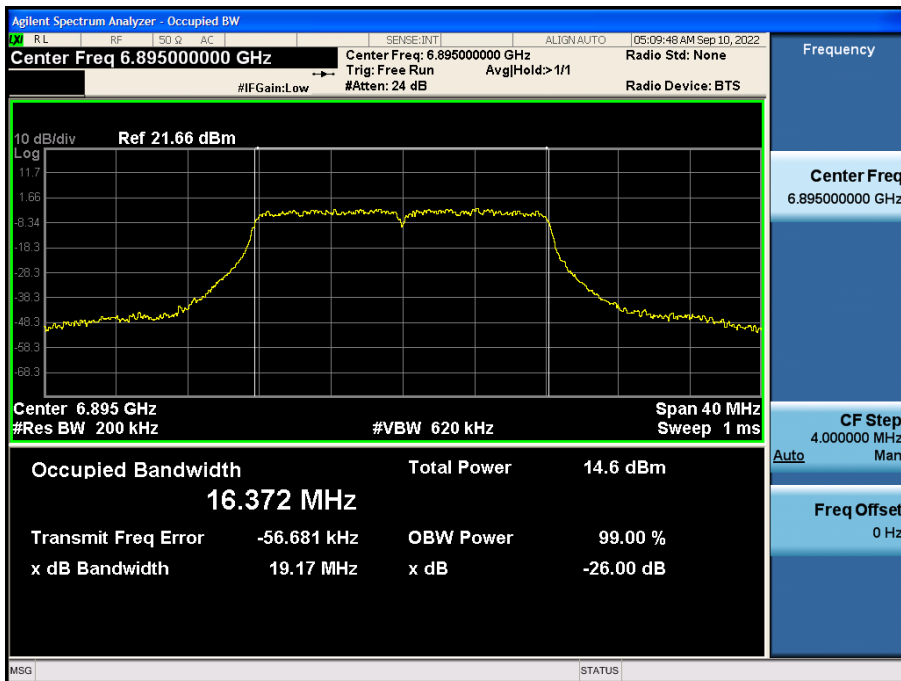
802.11a Ch.97(6435 MHz)



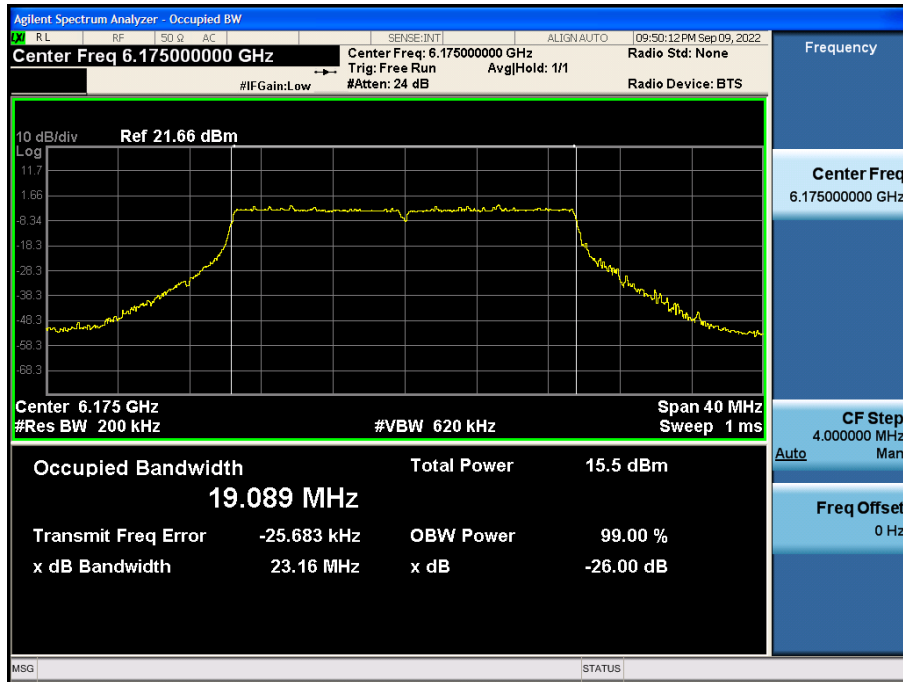
802.11a Ch.149(6695 MHz)



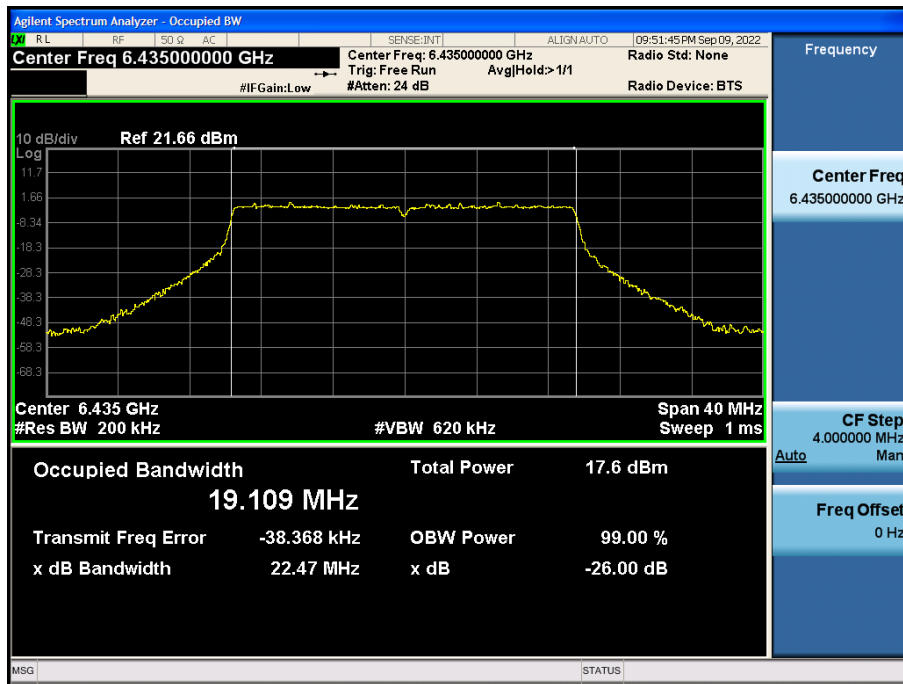
802.11a Ch.189(6895 MHz)



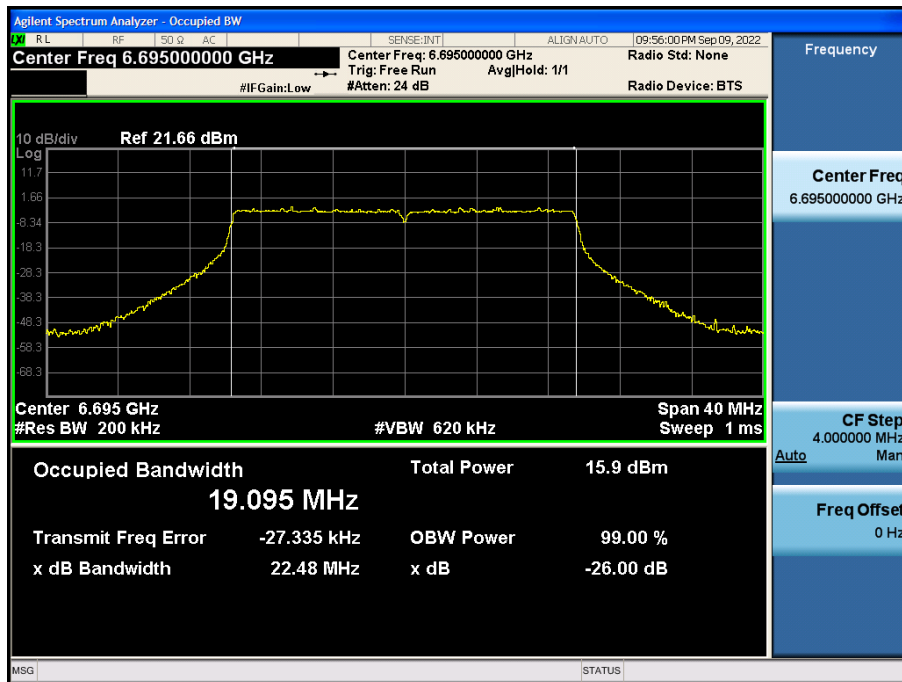
802.11ax HE20 Ch.45(6175 MHz) 242 Tones 61 RU



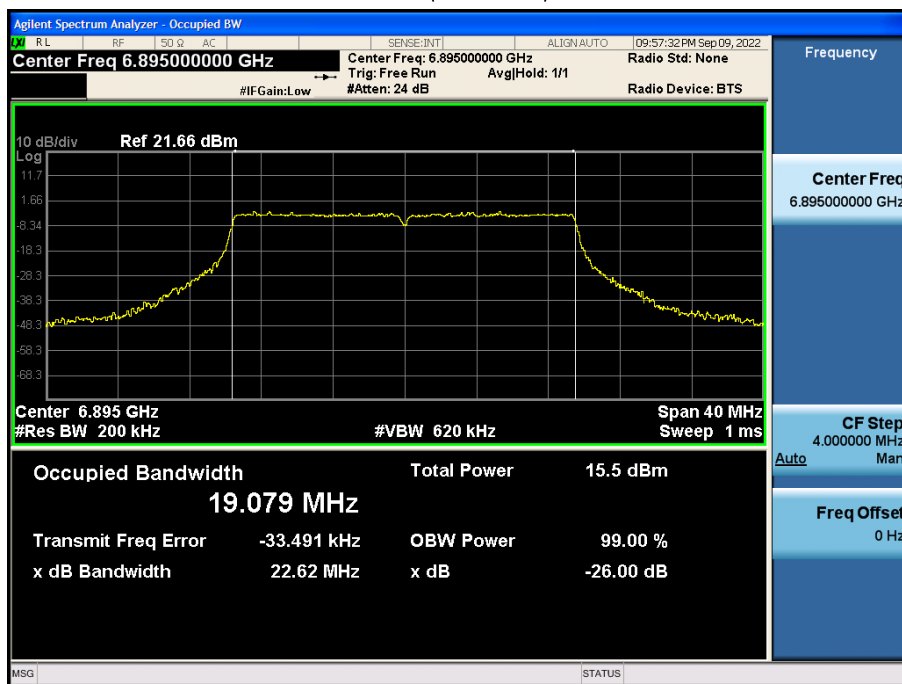
802.11ax HE20 Ch.97(6435 MHz) 242 Tones 61 RU



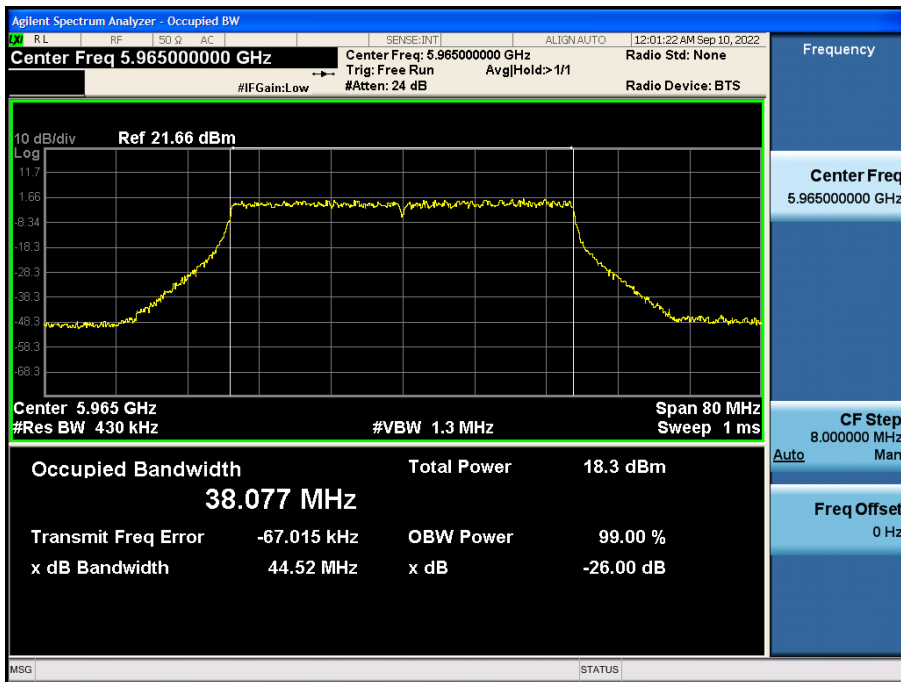
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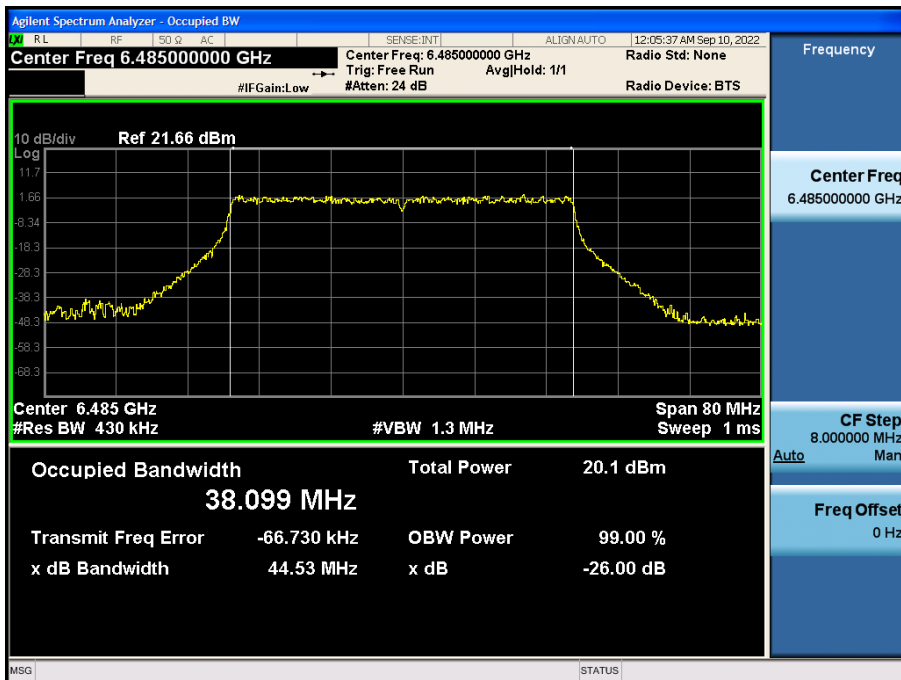
802.11ax HE20 Ch.189(6895 MHz) 242 Tones 61 RU



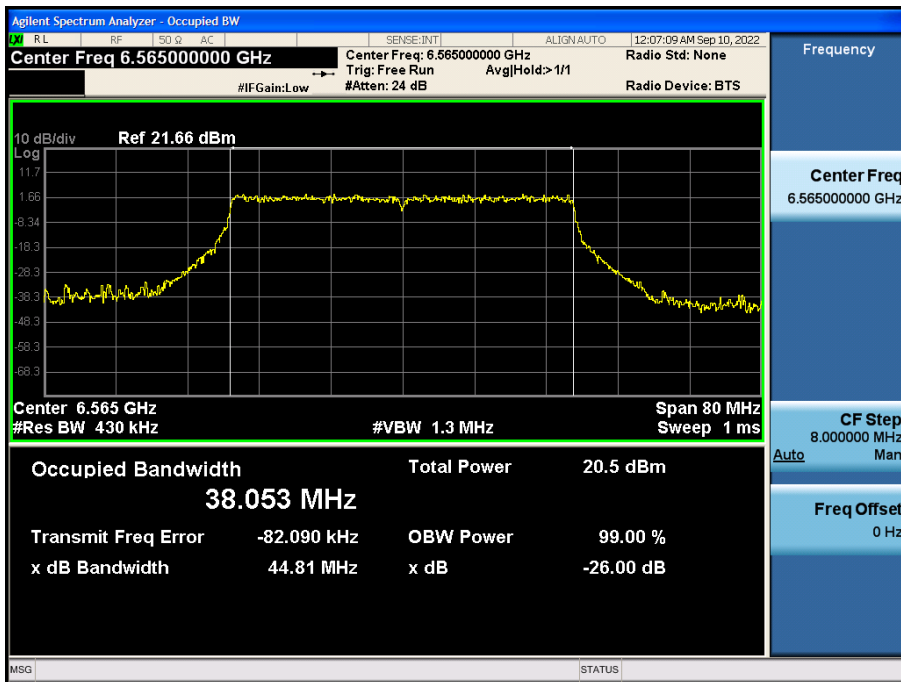
802.11ax HE40 Ch.3(5965 MHz) 484 Tones 65 RU



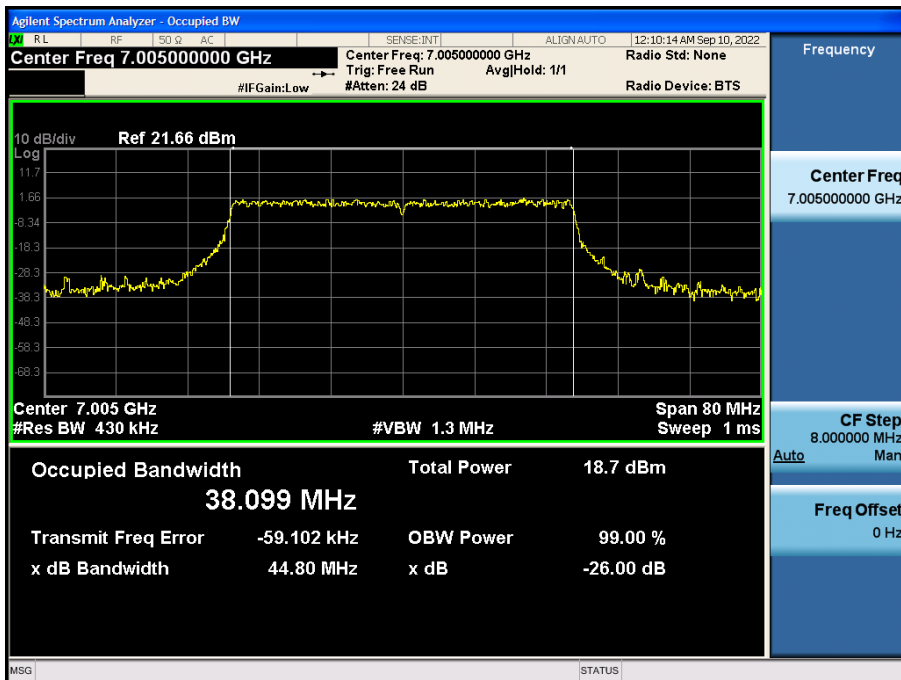
802.11ax HE40 Ch.107(6485 MHz) 484 Tones 65 RU



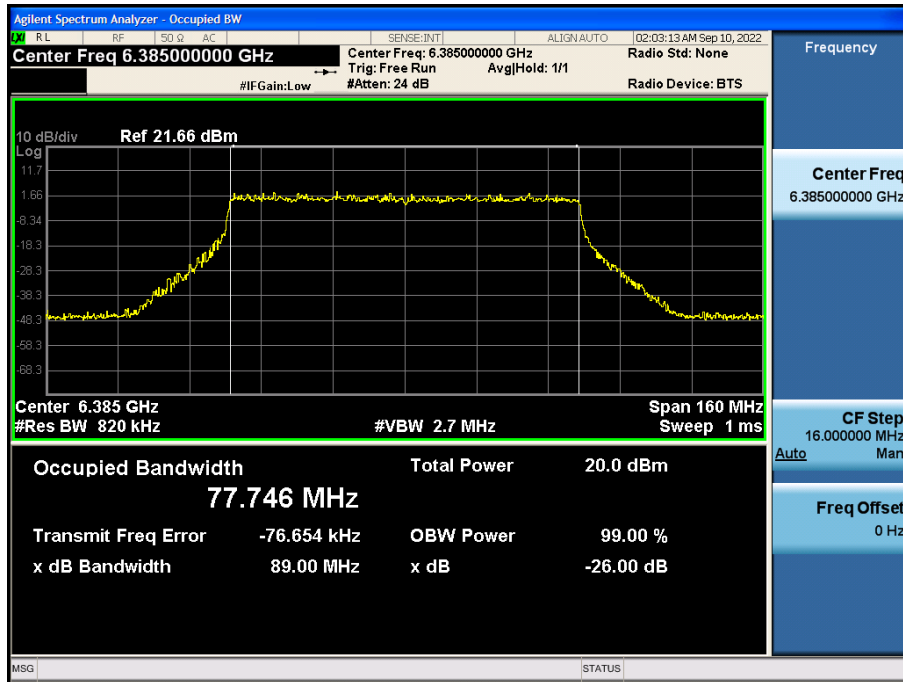
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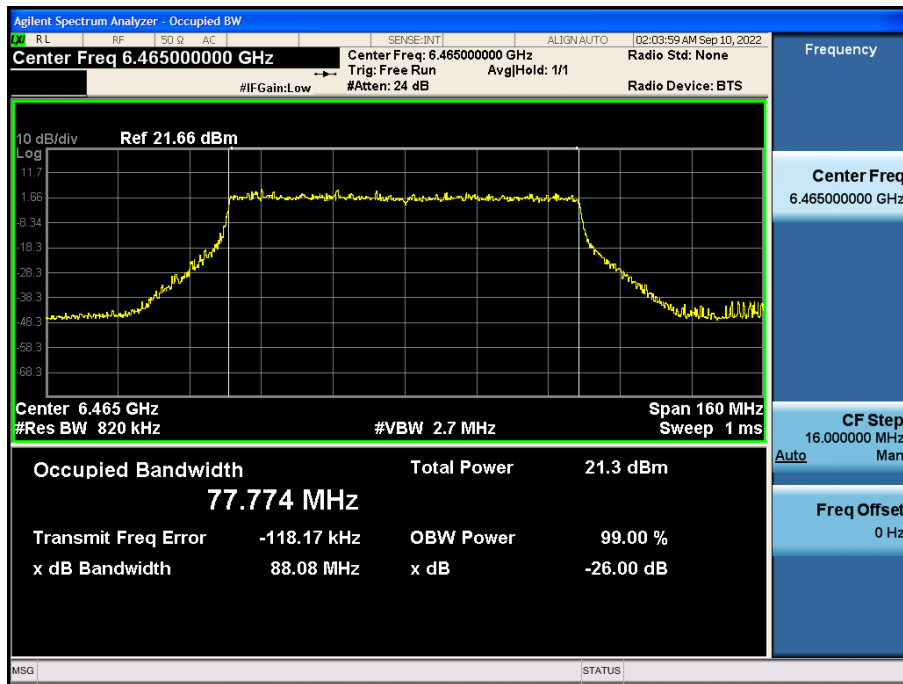
802.11ax HE40 Ch.211(7005 MHz) 484 Tones 65 RU



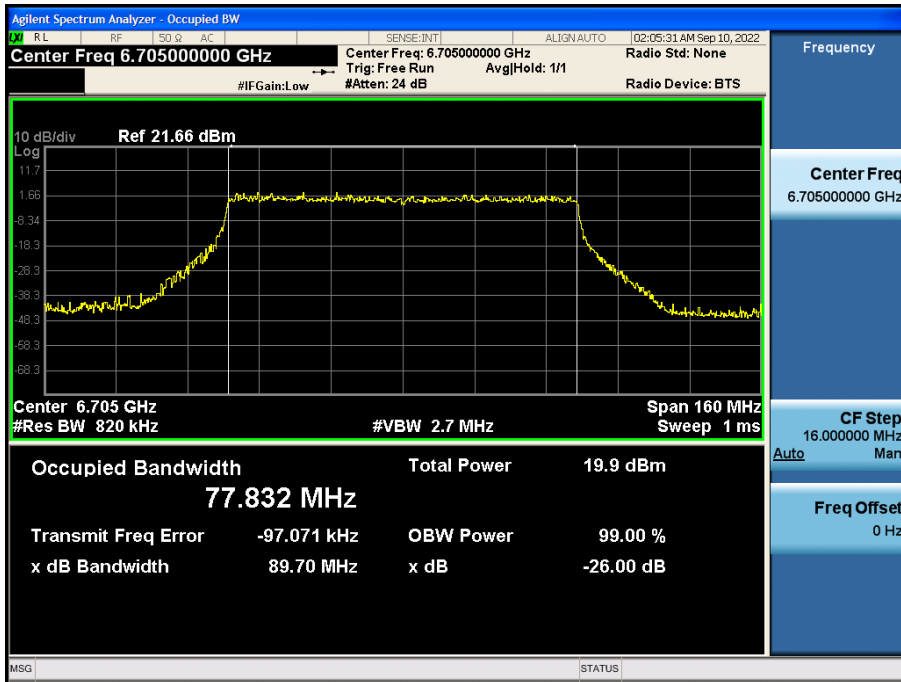
802.11ax HE80 Ch.87(6385 MHz) 996 Tones 67 RU



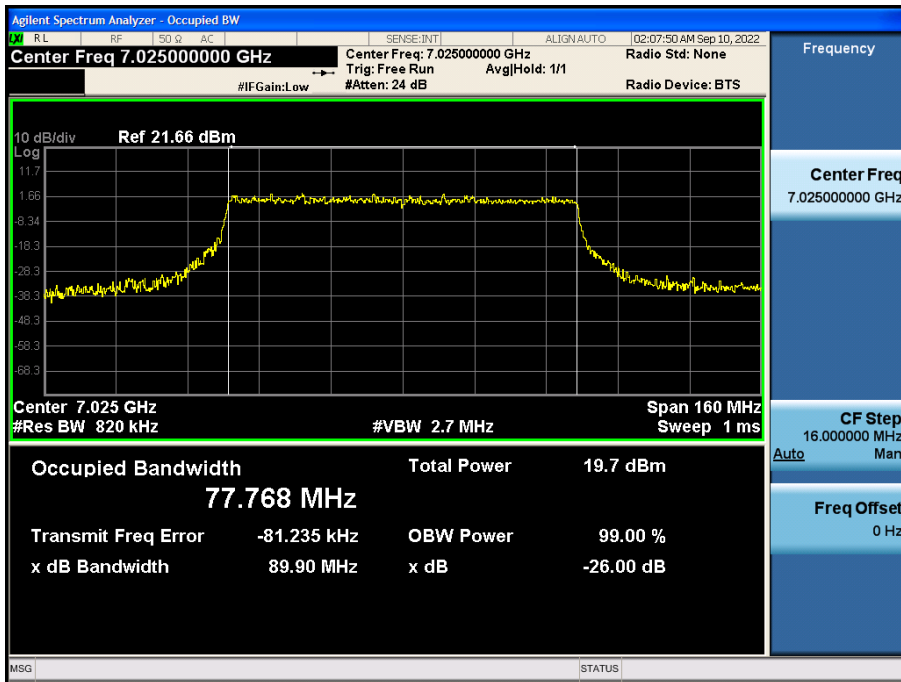
802.11ax HE80 Ch.103(6465 MHz) 996 Tones 67 RU



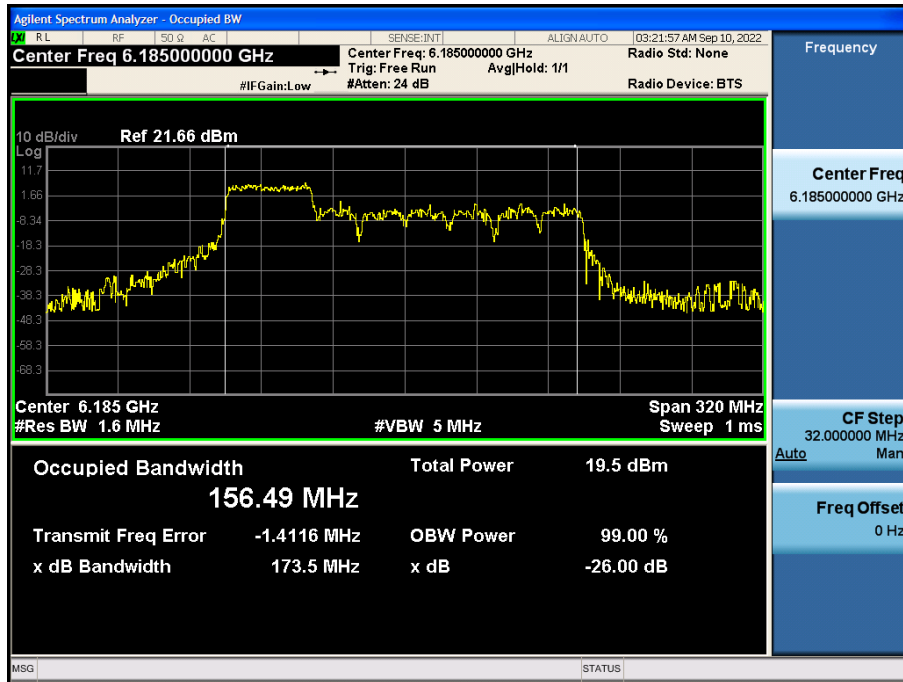
802.11ax HE80 Ch.151(6705 MHz) 996 Tones 67 RU



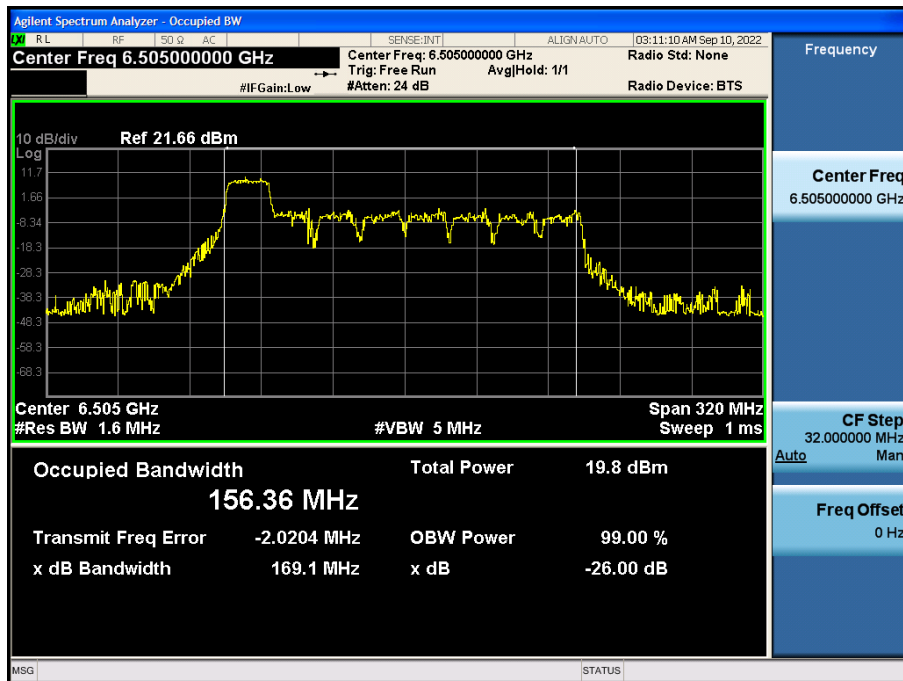
802.11ax HE80 Ch.215(7025 MHz) 996 Tones 67 RU



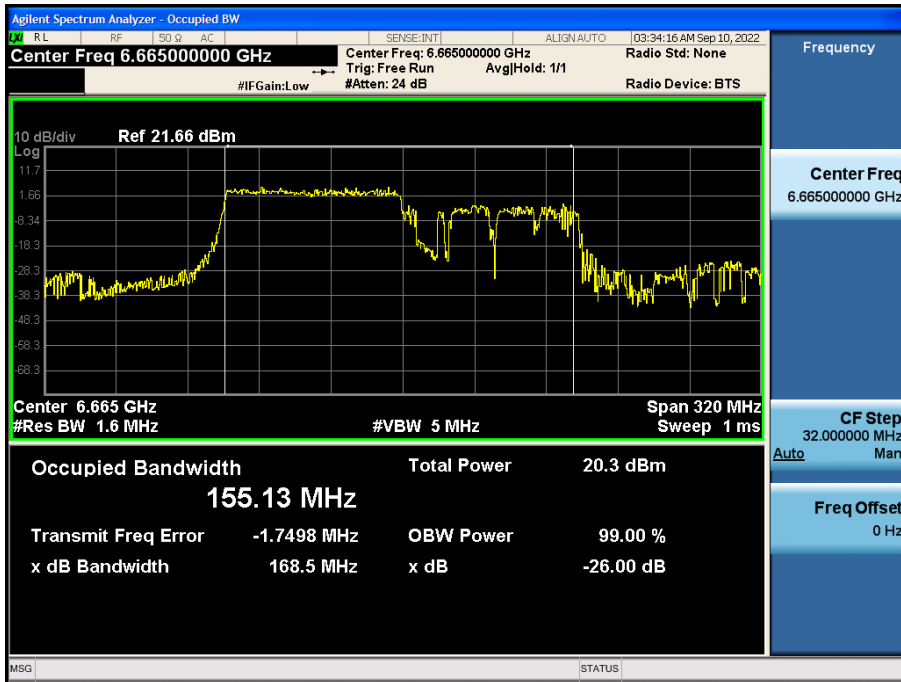
802.11ax HE160, 80_L Ch.47(6185MHz) 484 Tones 65 RU



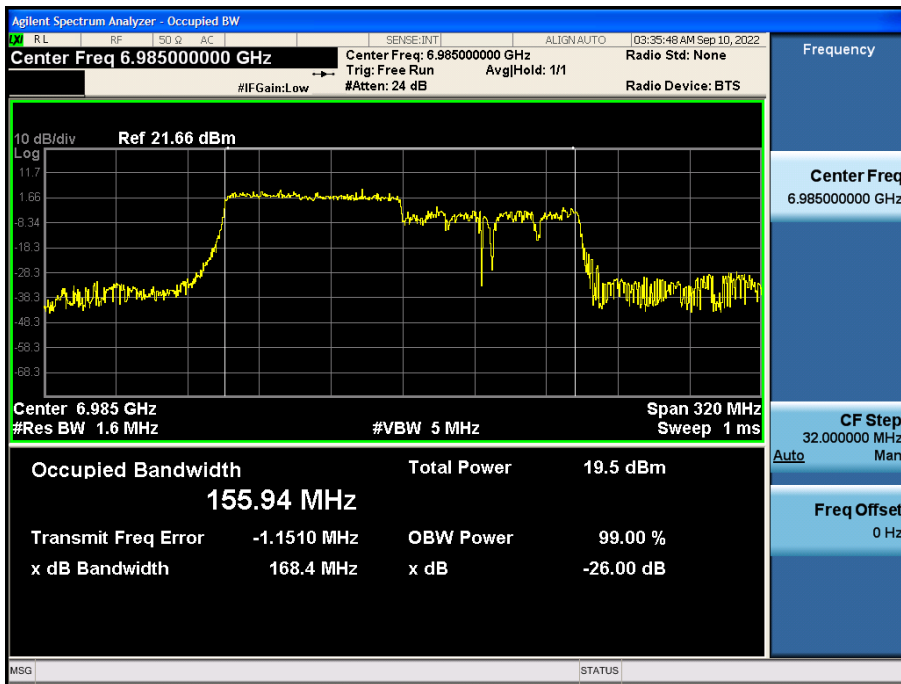
802.11ax HE160, 80_L Ch.111(6505MHz) 242 Tones 61 RU



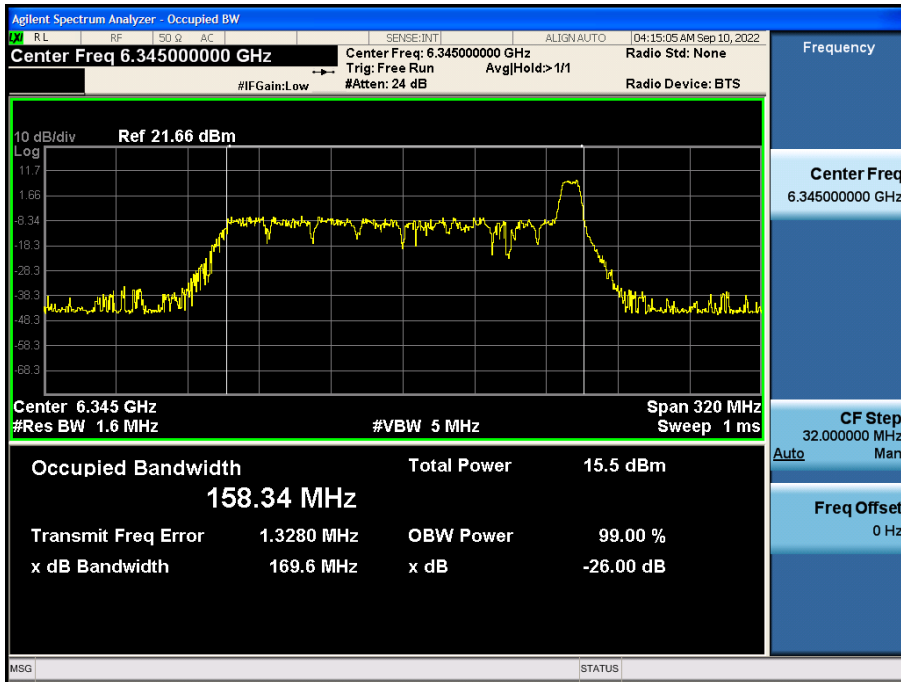
Bandwidth 160M, 80_L Ch.143(6665MHz) 996 Tones 67 RU



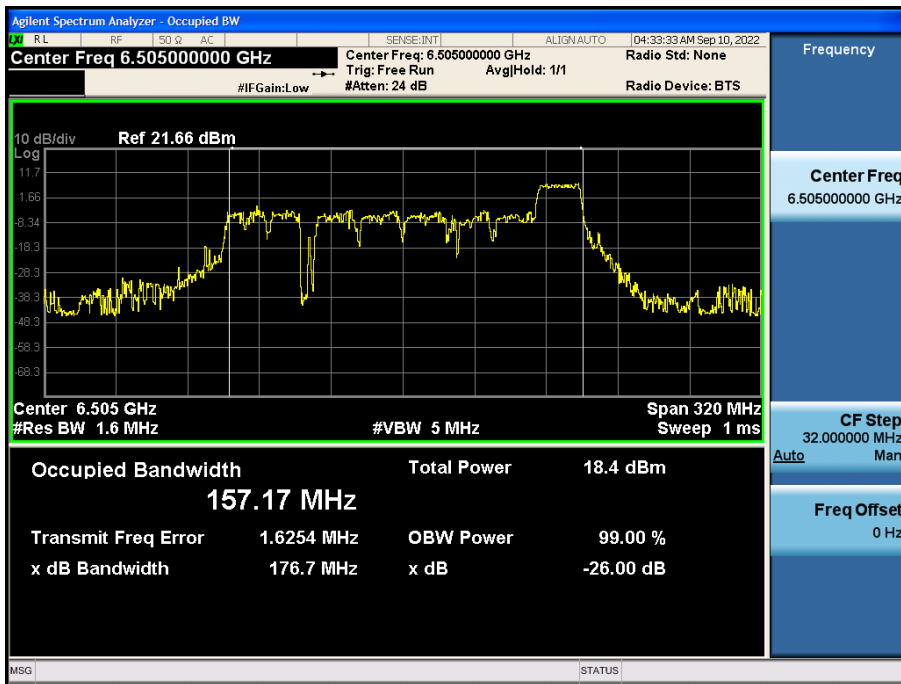
802.11ax HE160, 80_L Ch.207(6985MHz) 996 Tones 67 RU



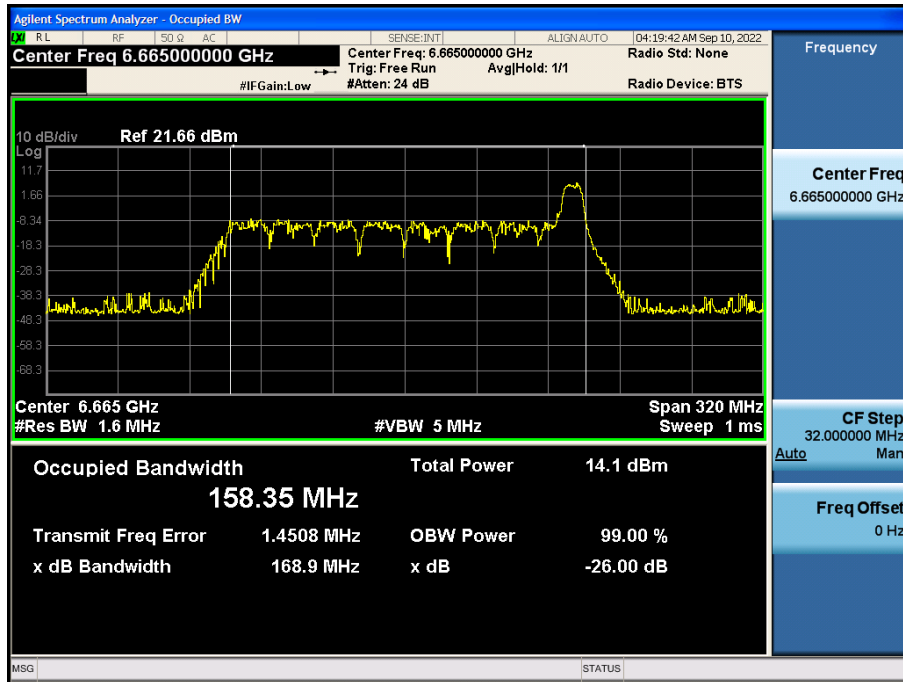
802.11ax HE160, 80_U Ch.79(6345MHz) 106 Tones 60 RU



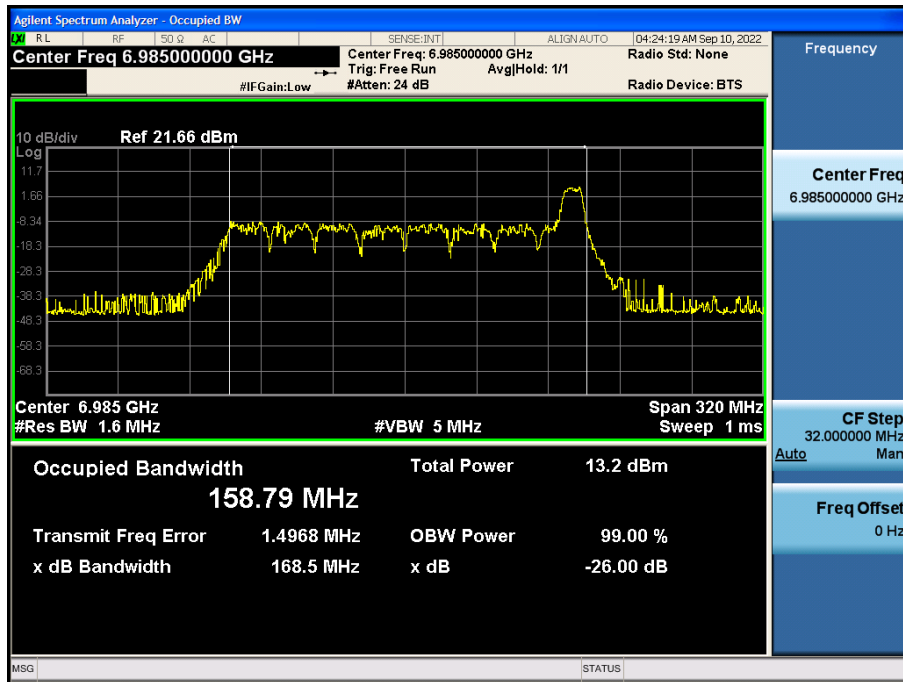
802.11ax HE160, 80_U Ch.111(6505MHz) 242 Tones 64 RU



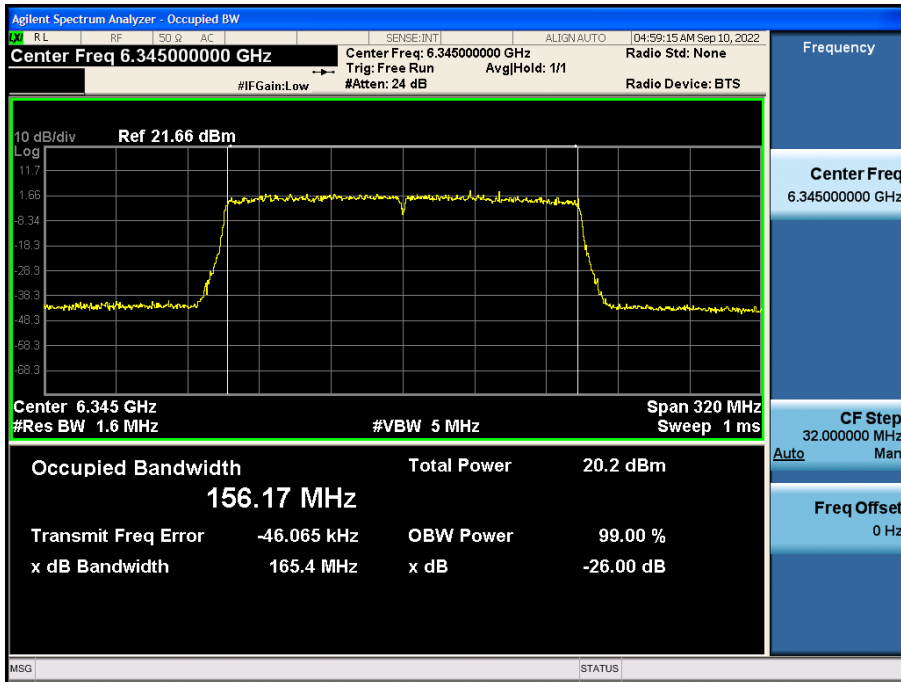
802.11ax HE160, 80_U Ch. 143(6665 MHz) 106 Tones 60 RU



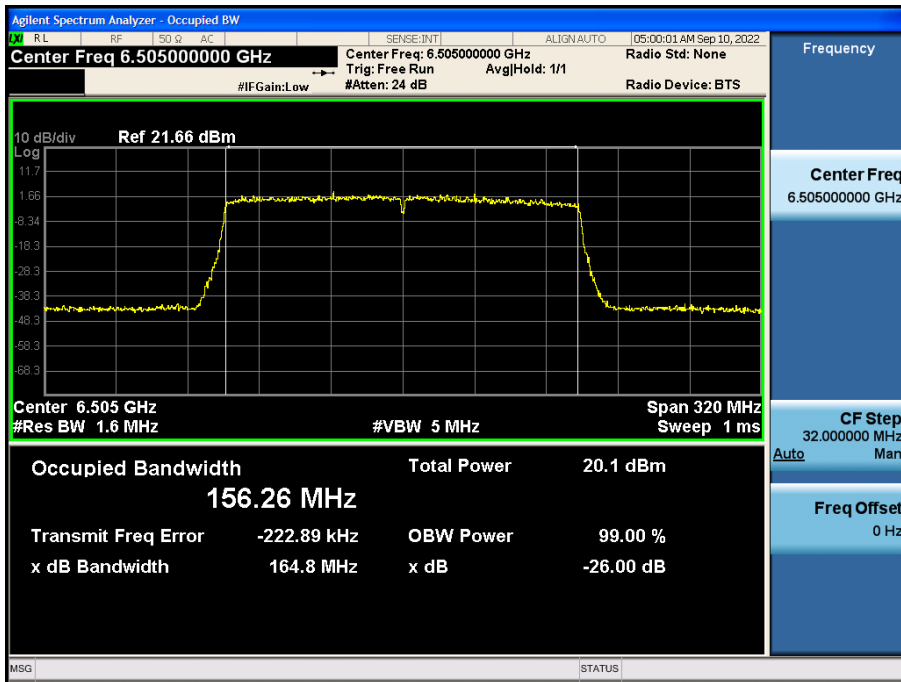
802.11ax HE160, 80_U Ch. 207(6985 MHz) 106 Tones 60 RU



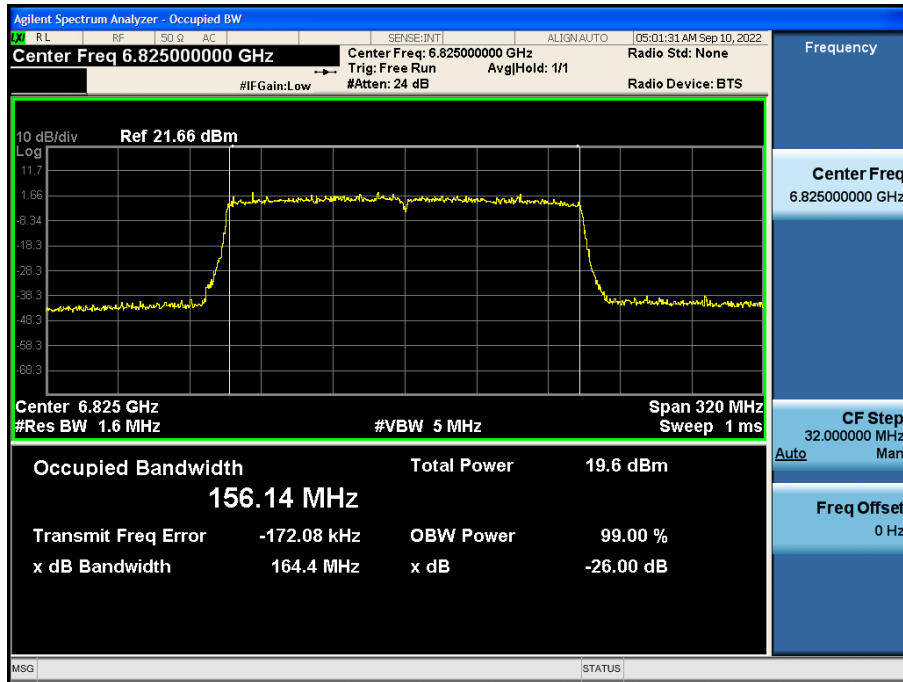
Bandwidth 160M, SU Ch. 79(6345 MHz) SU



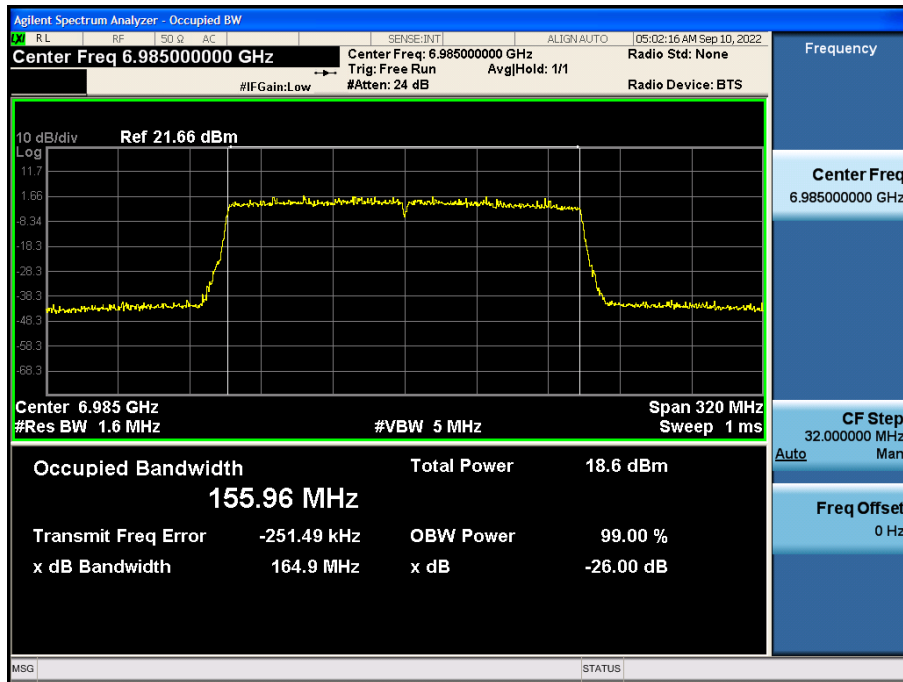
Bandwidth 160M, SU Ch. 111(6505 MHz) SU



Bandwidth 160M, SU Ch. 175(6825 MHz) SU



Bandwidth 160M, SU Ch. 207(6985 MHz) SU

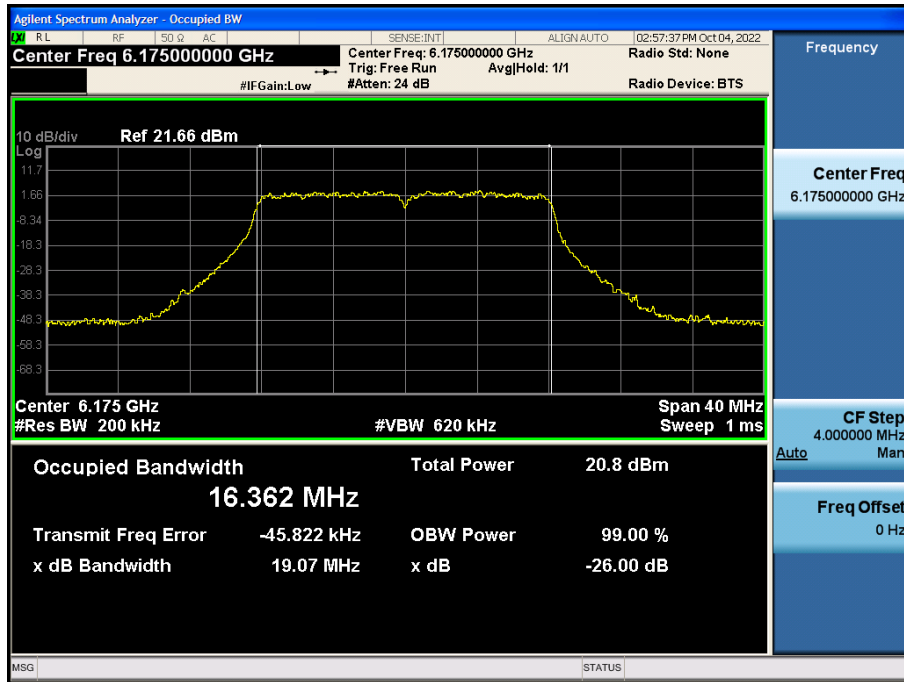


2.2 Standard client

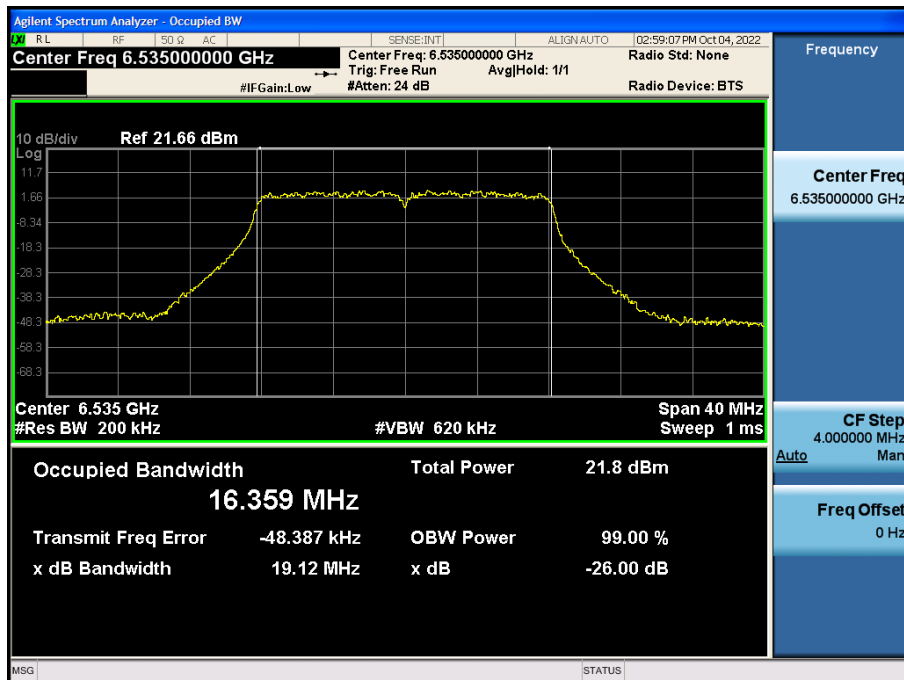
Note:

1. In order to simplify the report, attached plots were only Ant.1 (Worst Case: Ant.1).
2. In order to simplify the report, attached plots were only the most wide channel.

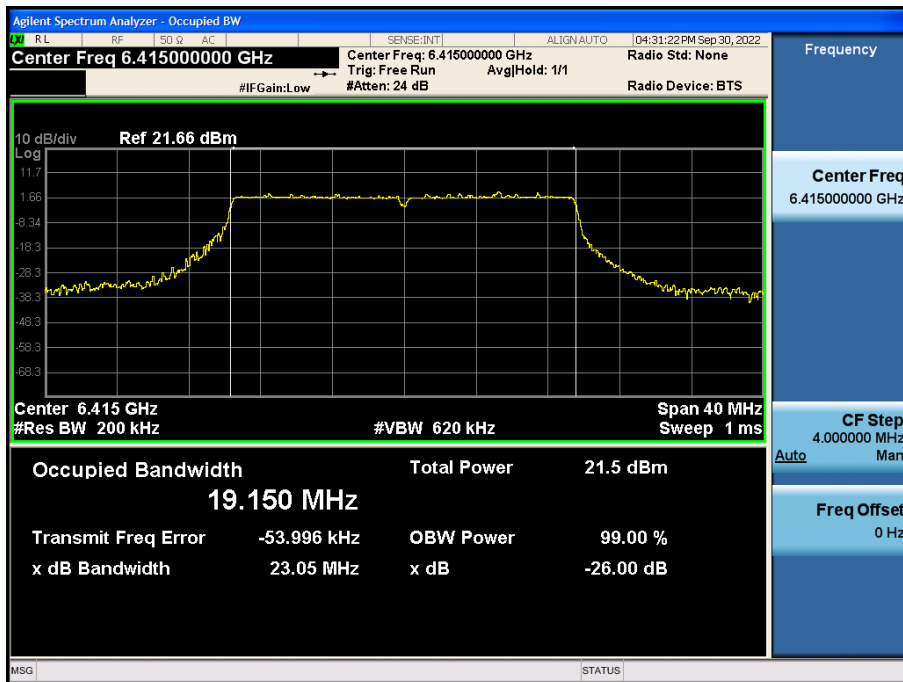
802.11a Ch.45(6175 MHz)



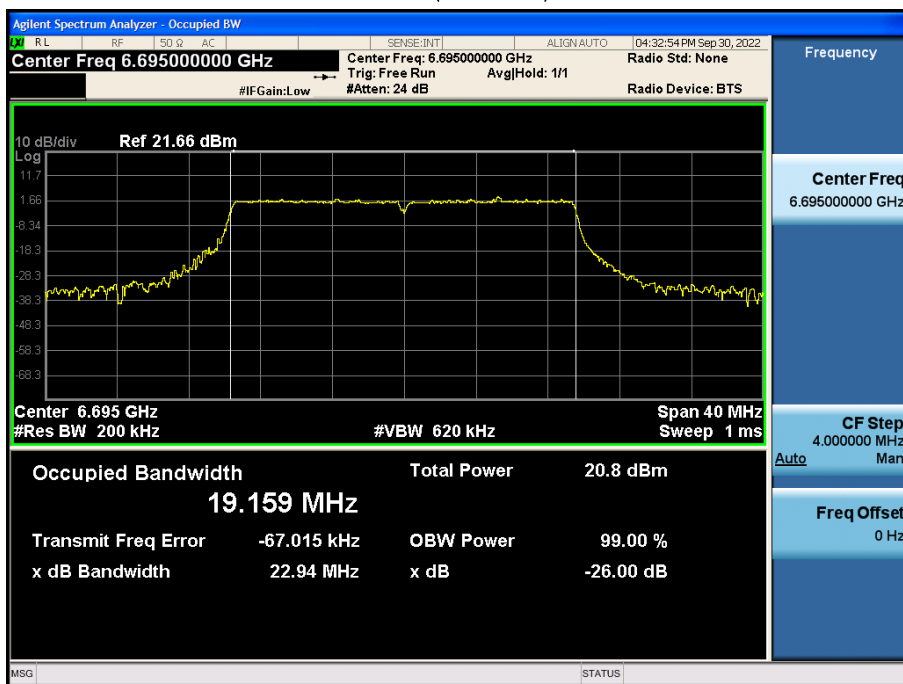
802.11a Ch.117(6535 MHz)



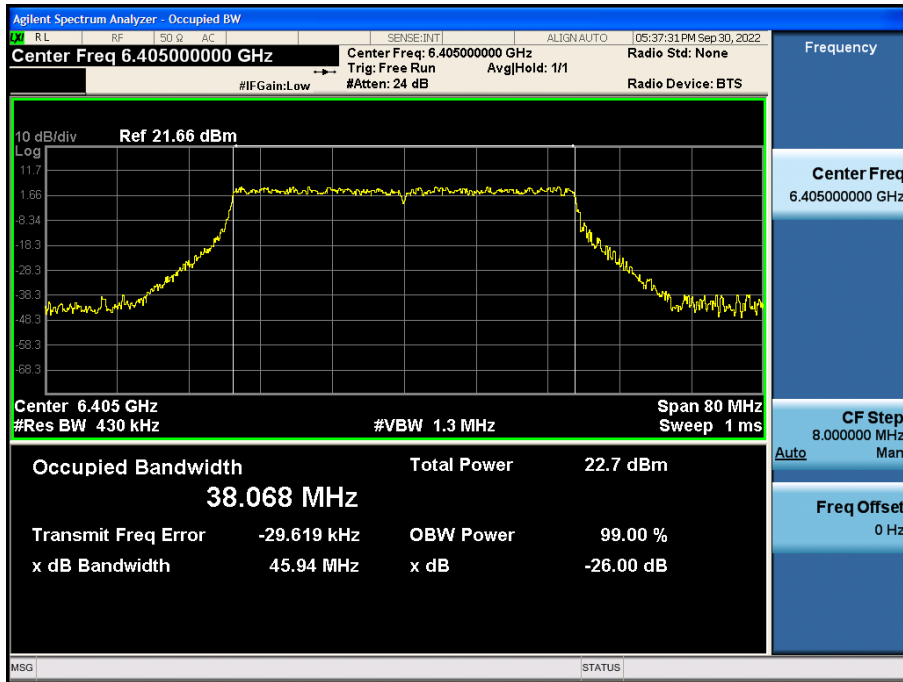
802.11ax HE20 Ch.93(6415MHz) 242 Tones 61 RU



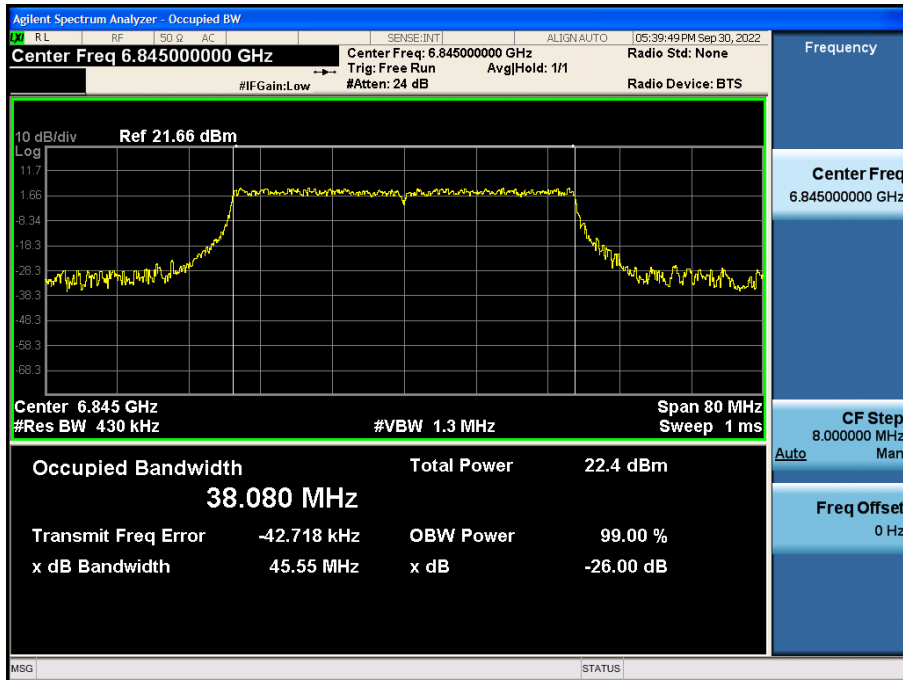
802.11ax HE20 Ch.149(6695MHz)242 Tones 61 RU



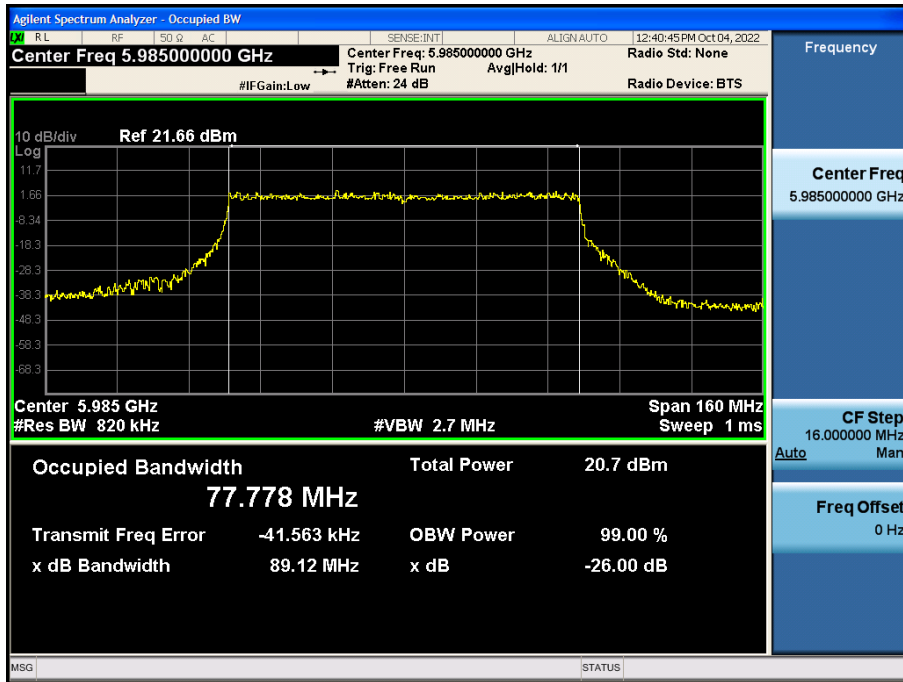
802.11ax HE40 Ch.91(6405MHz)484 Tones 65 RU



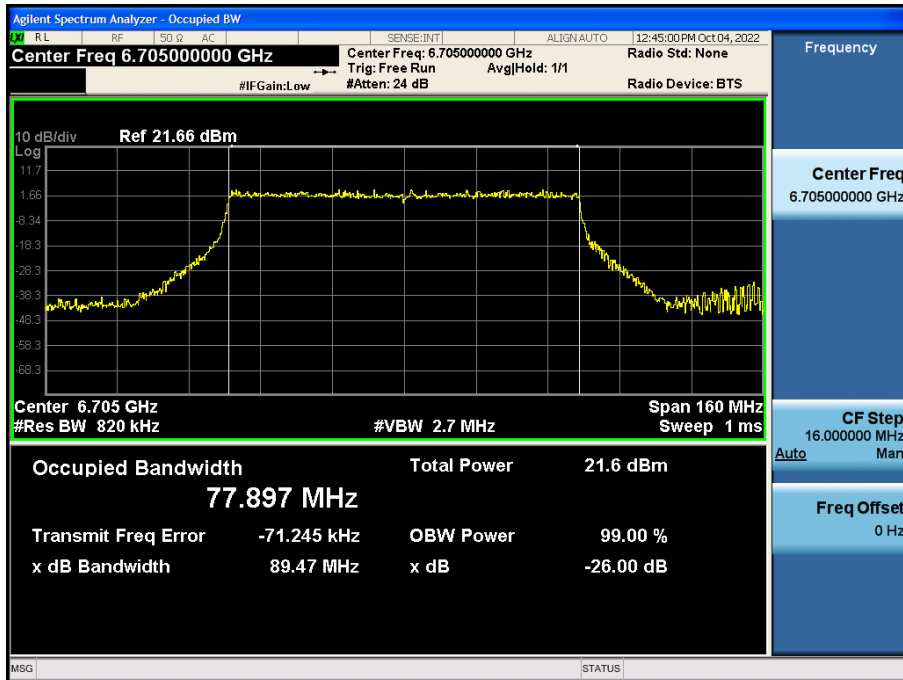
802.11ax HE40 Ch.179(6845MHz) 484 Tones 65 RU



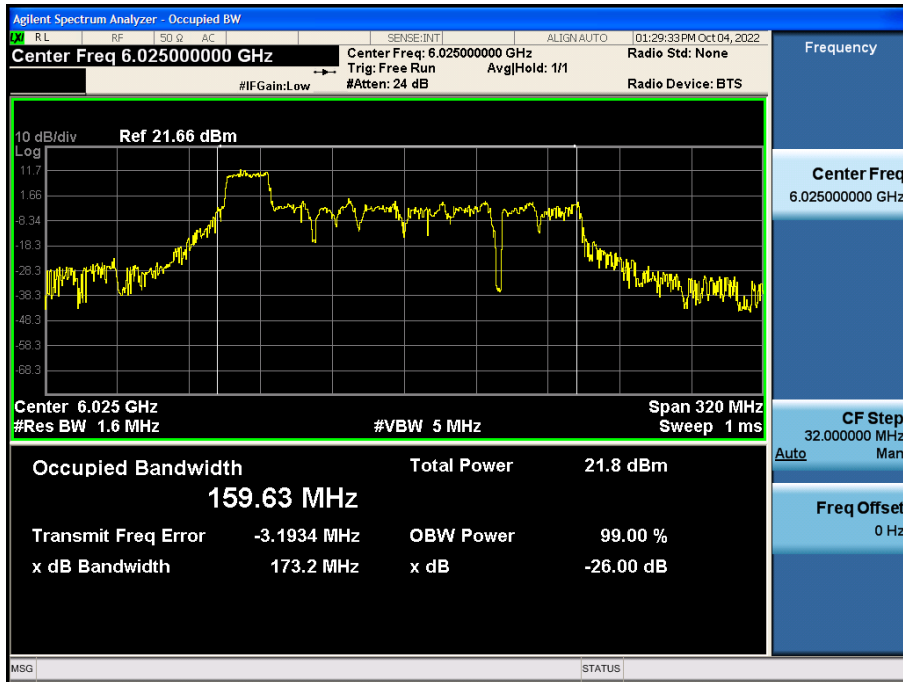
802.11ax HE80 Ch.7(5985MHz) 996 Tones 67 RU



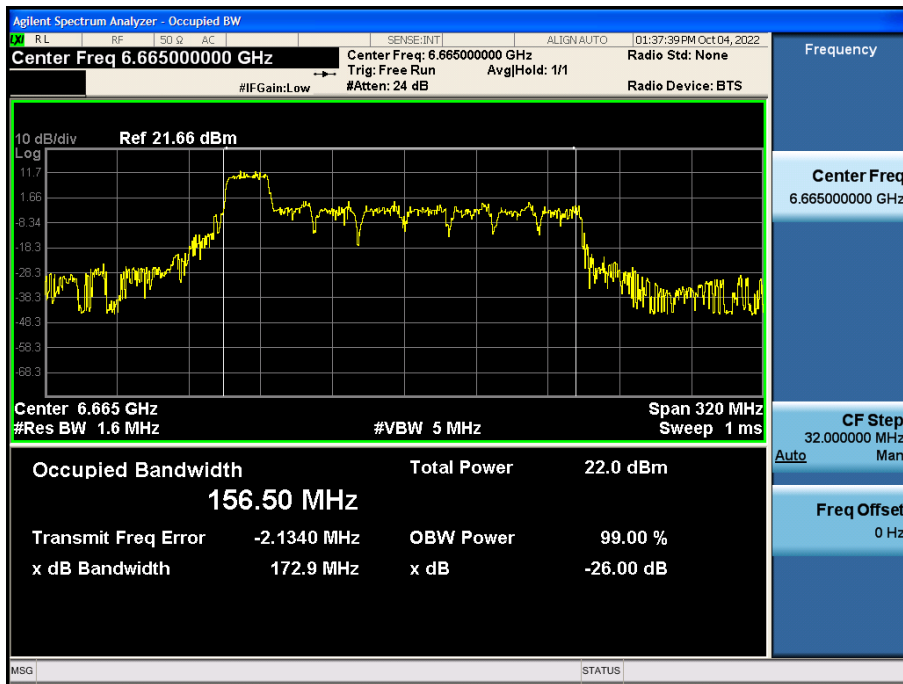
802.11ax HE80 Ch.151(6705MHz) 996 Tones 67 RU



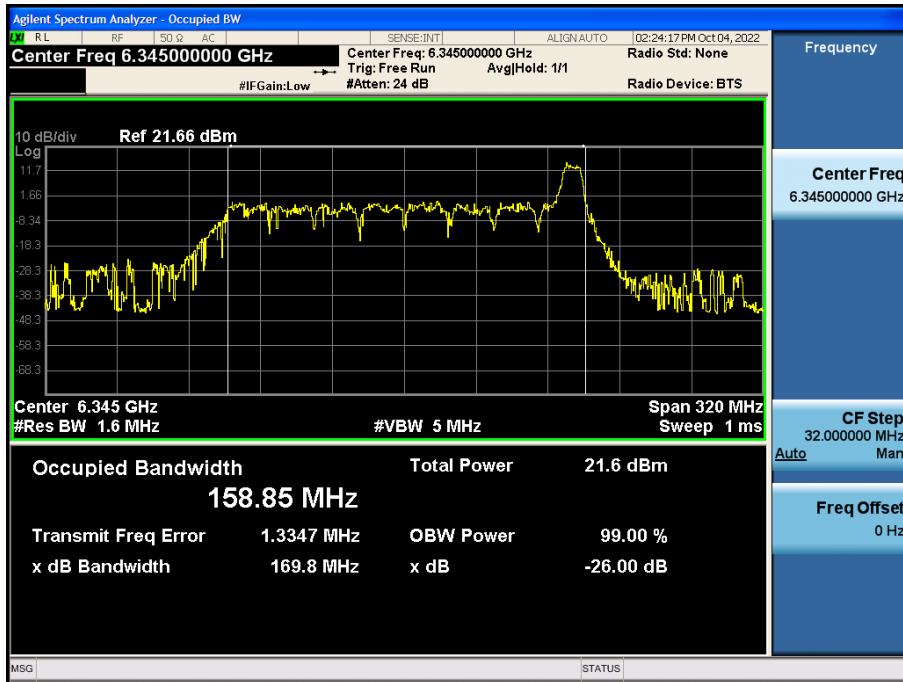
802.11ax HE160, 80_L Ch.15(6025MHz) 242 Tones 61 RU



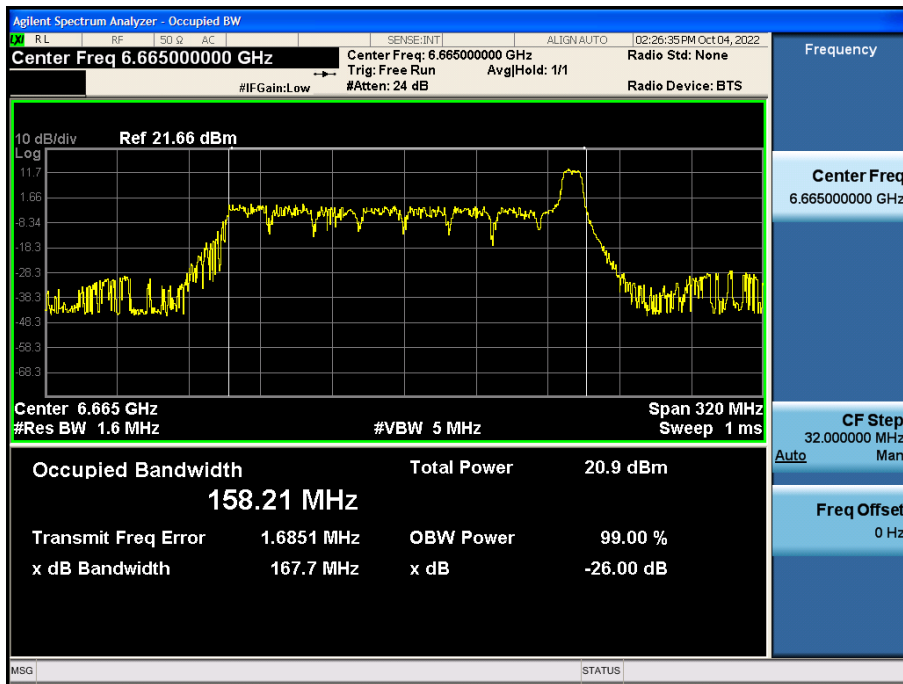
802.11ax HE160, 80_L Ch.143(6665MHz) 242 Tones 61 RU



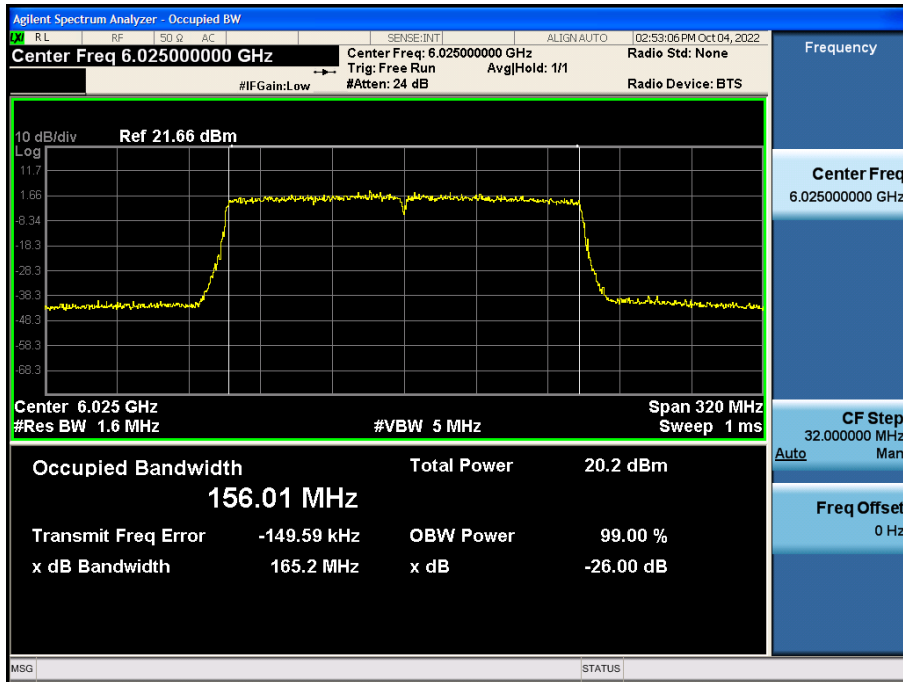
Bandwidth 160M, 80_U Ch.79(6345MHz) 106 Tones 60 RU



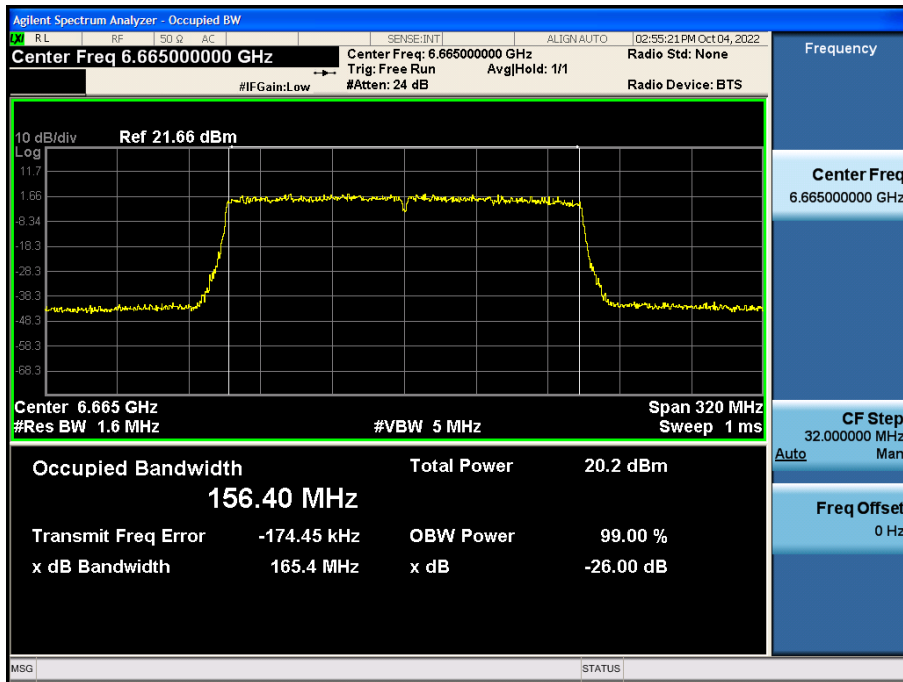
802.11ax HE160, 80_U Ch.143(6665MHz) 106 Tones 60 RU



Bandwidth 160M, SU Ch.15(6025MHz) SU



Bandwidth 160M, SU Ch.143(6665MHz) SU



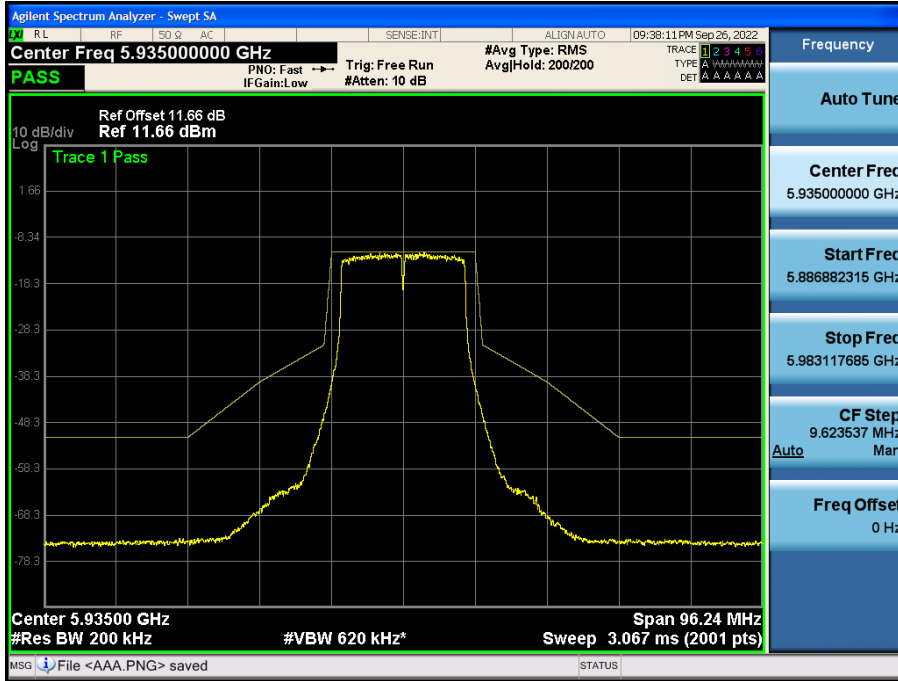
3. In-Band Emission (Emission Mask)

3.1 Indoor client

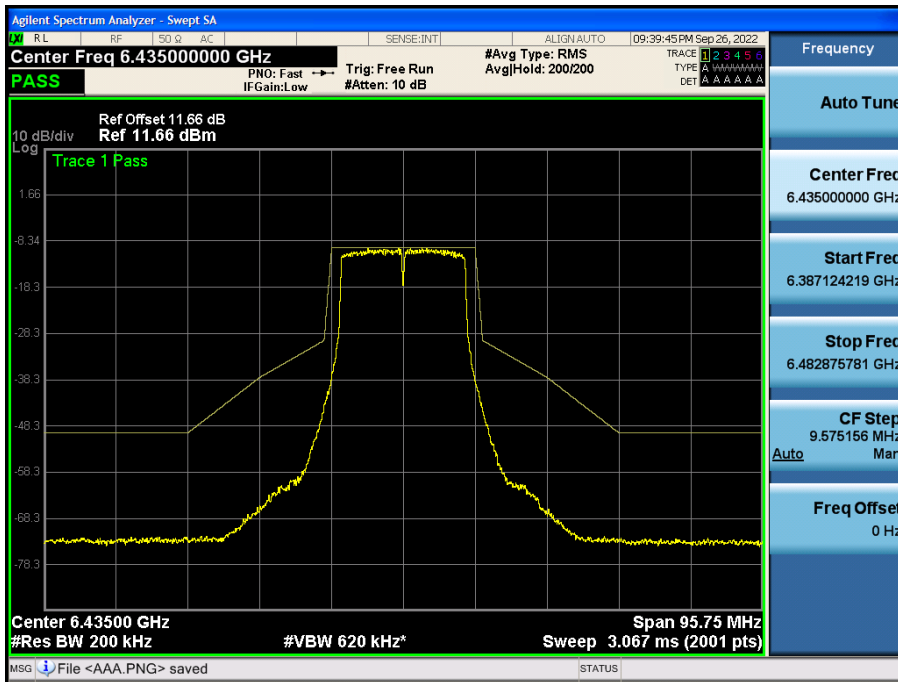
Note:

1. In order to simplify the report, attached plots were only Ant.1 (Worst Case: Ant.1).
2. In order to simplify the report, attached plots were only the most wide channel.

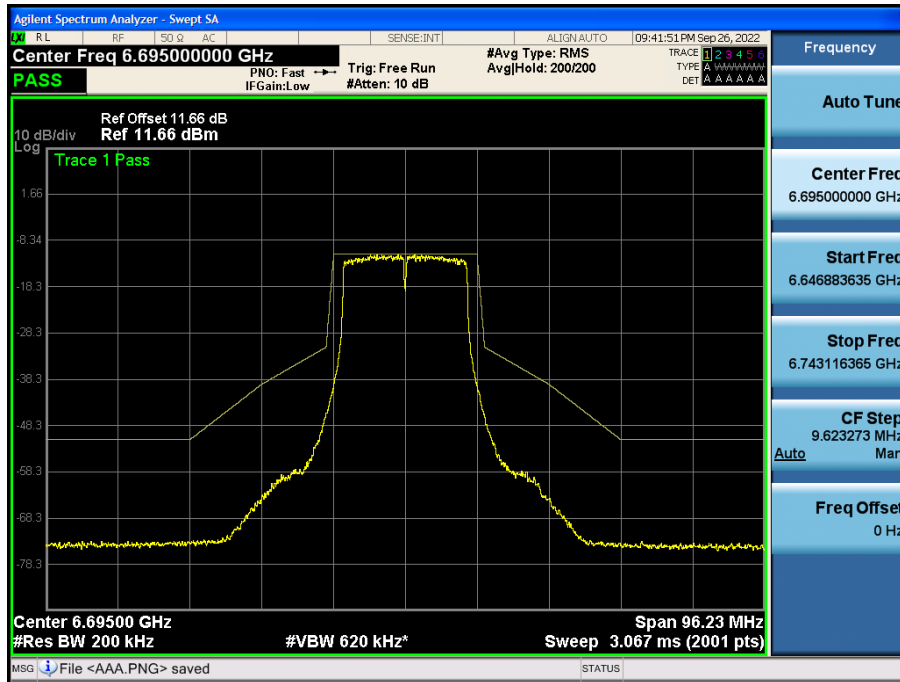
802.11a Ch.2(5935 MHz)



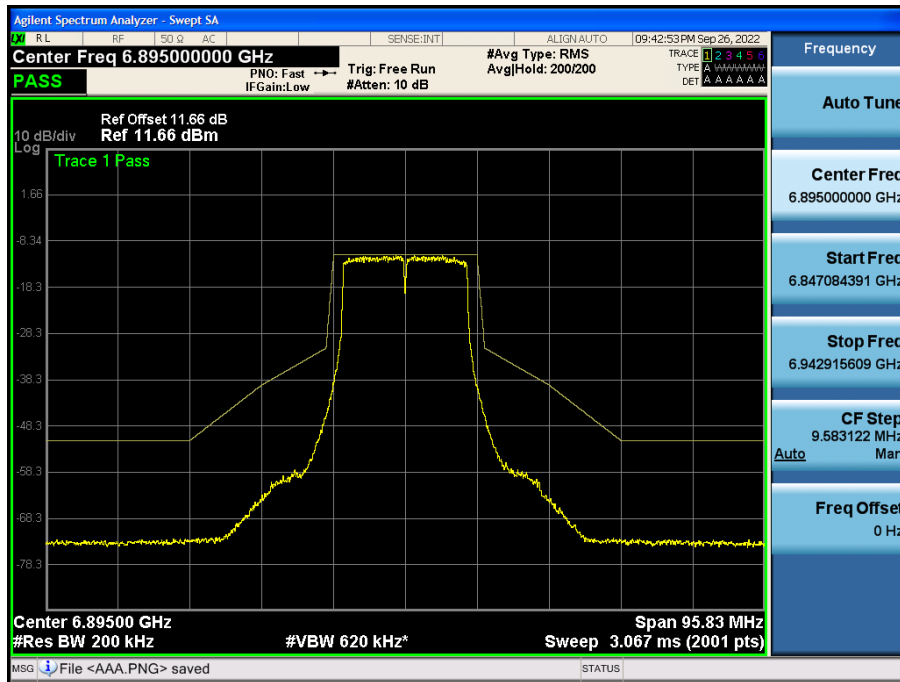
802.11a Ch.97(6435 MHz)



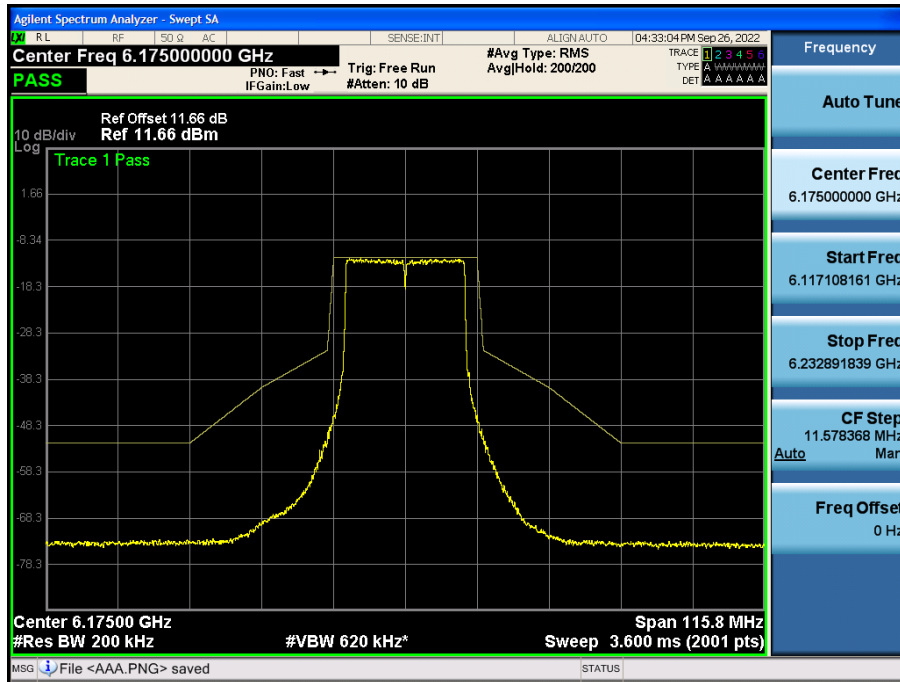
802.11a Ch.149(6695 MHz)



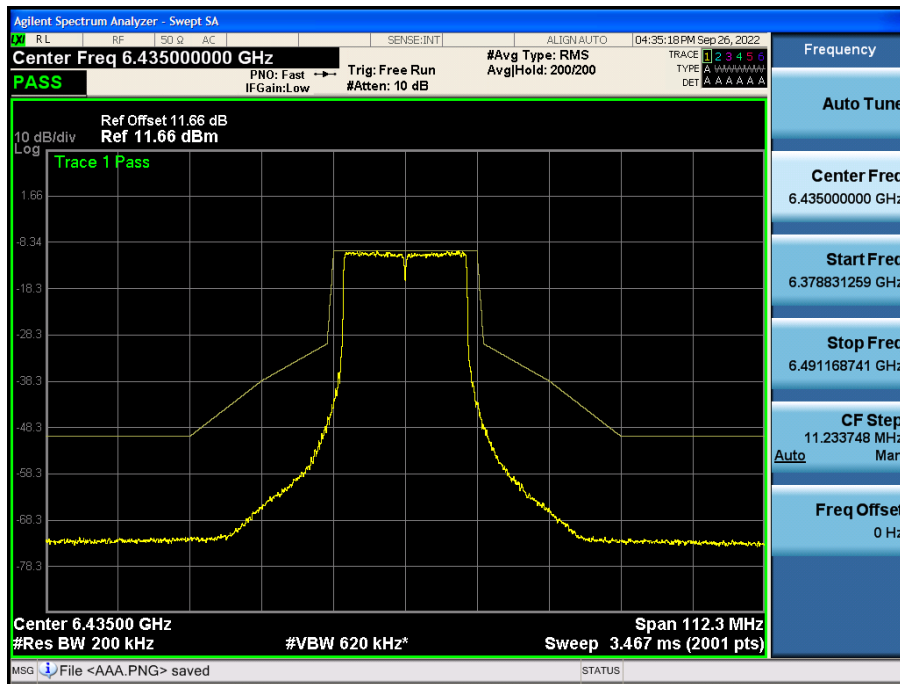
802.11a Ch.189(6895 MHz)



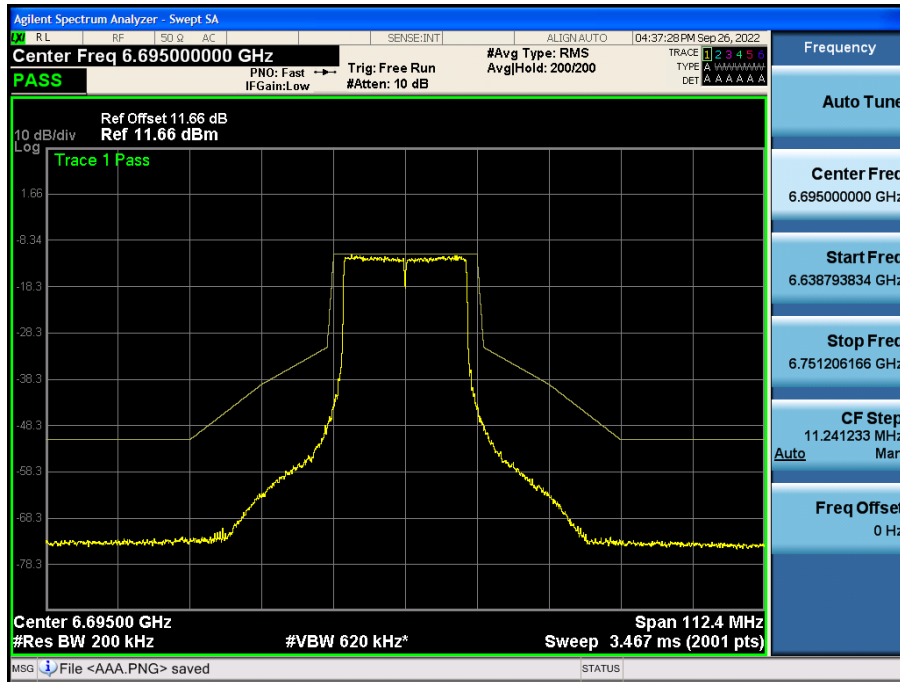
802.11ax HE20 Ch.45(6175 MHz) 242 Tones 61 RU



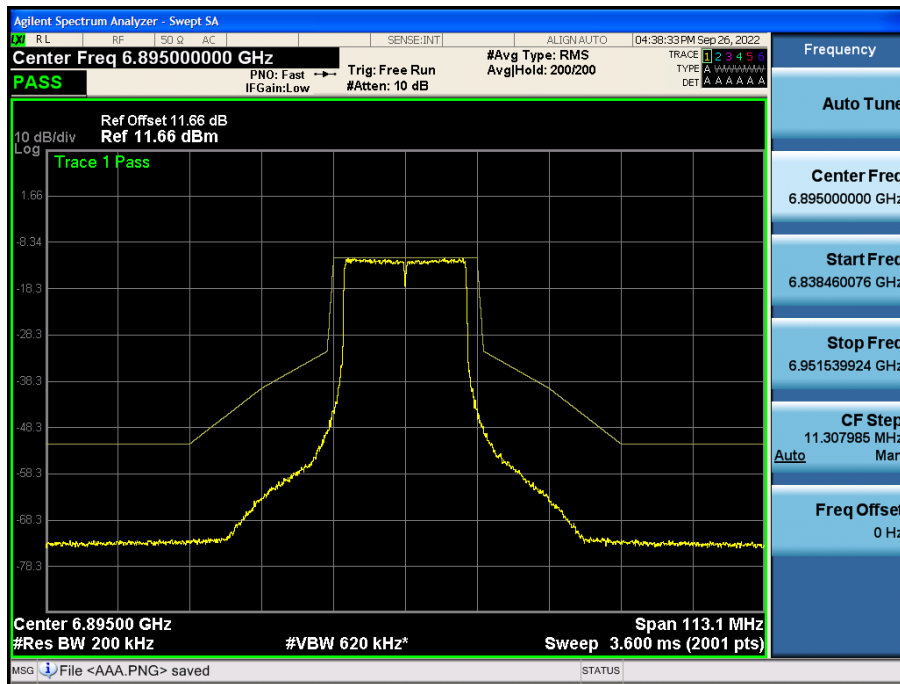
802.11ax HE20 Ch.97(6435 MHz) 242 Tones 61 RU



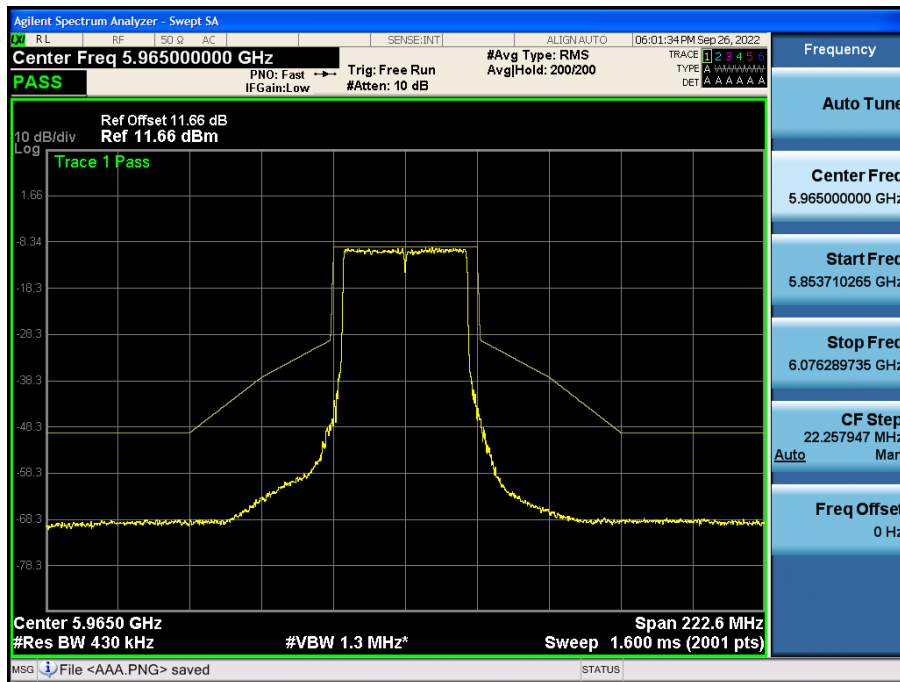
802.11ax HE20 Ch.149(6695 MHz) 242 Tones 61 RU



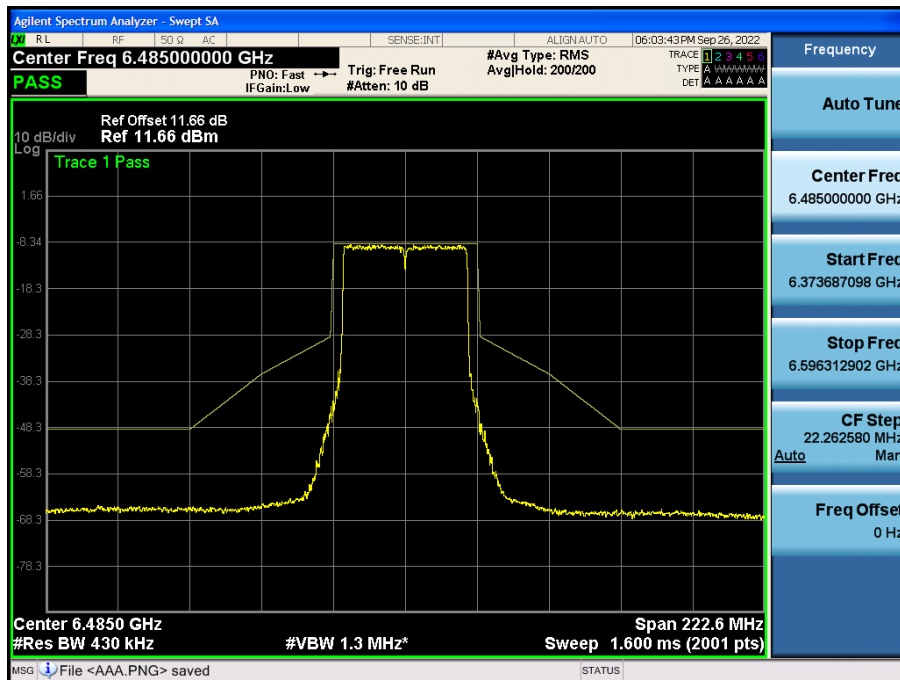
802.11ax HE20 Ch.189(6895 MHz) 242 Tones 61 RU



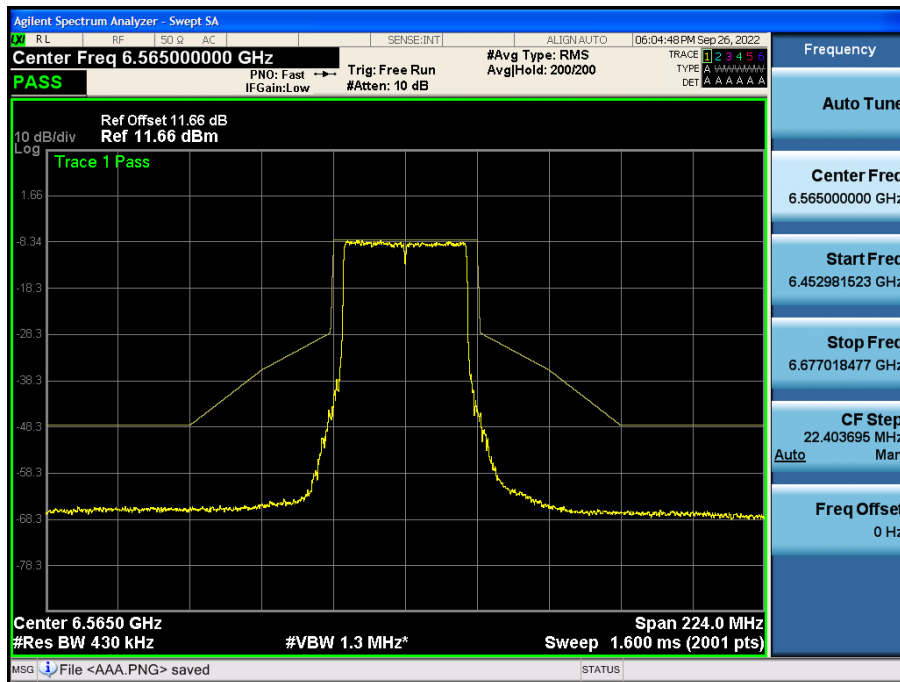
802.11ax HE40 Ch.3(5965 MHz) 484 Tones 65 RU



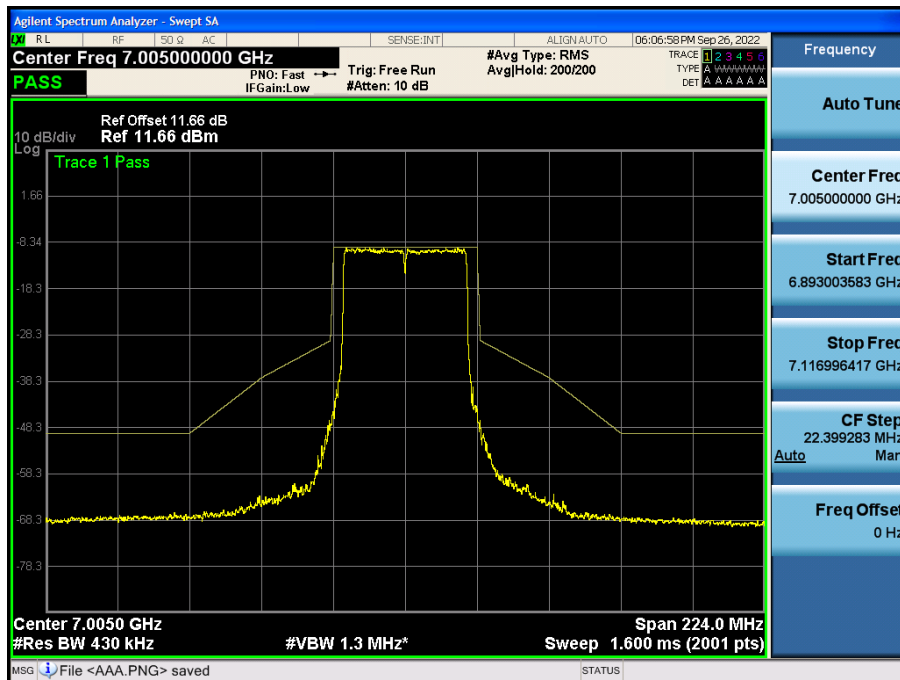
802.11ax HE40 Ch.107(6485 MHz) 484 Tones 65 RU



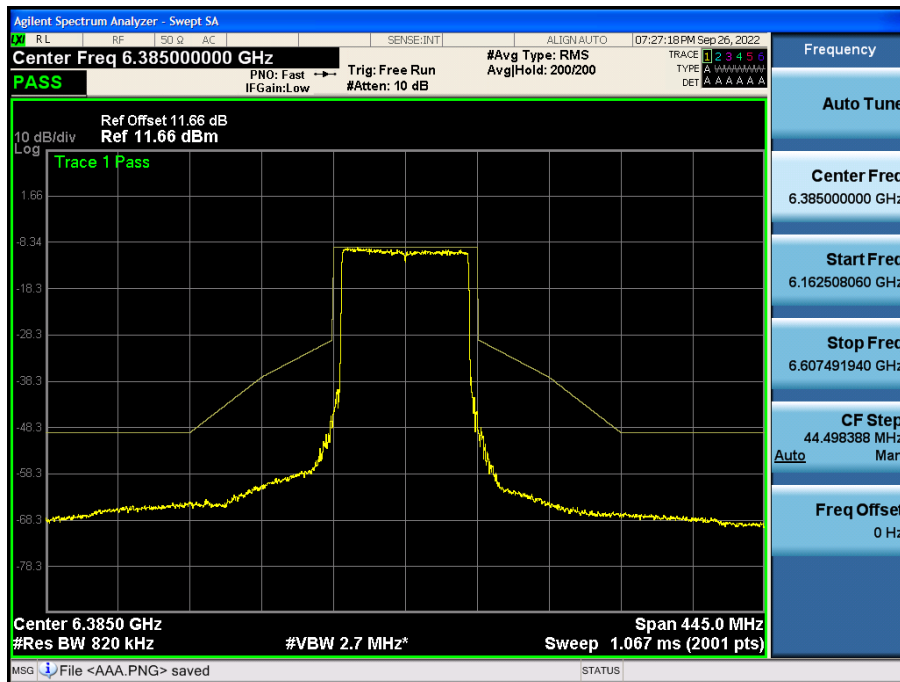
802.11ax HE40 Ch.123(6565 MHz) 484 Tones 65 RU



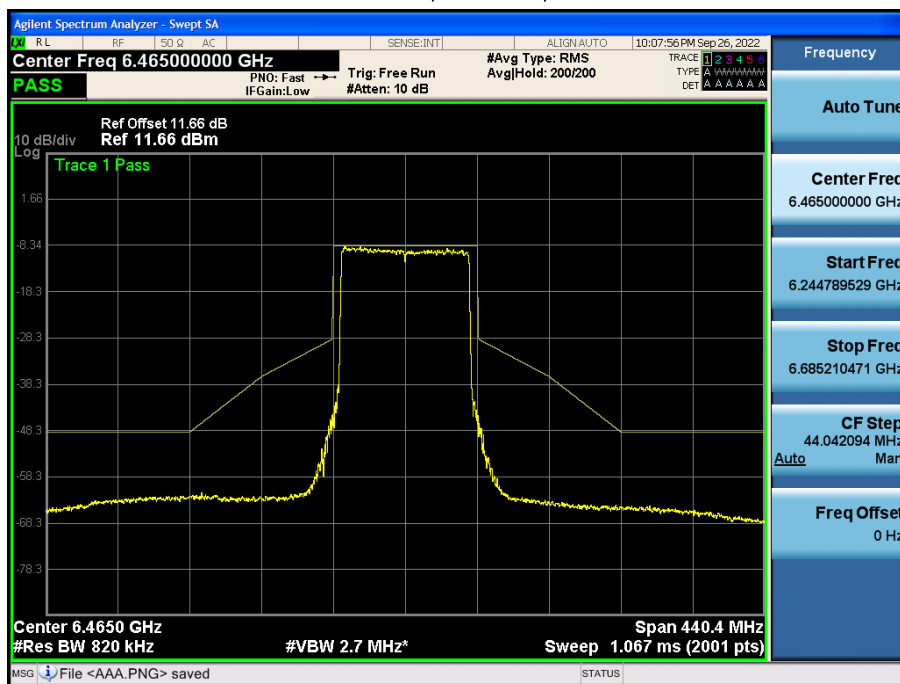
802.11ax HE40 Ch.211(7005 MHz) 484 Tones 65 RU



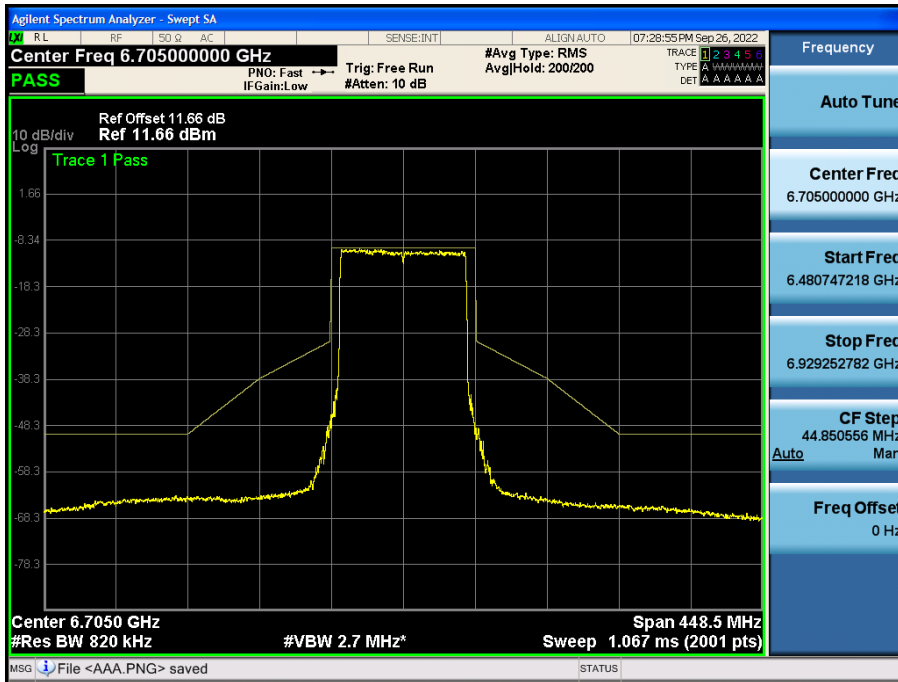
802.11ax HE80 Ch.87(6385 MHz) 996 Tones 67 RU



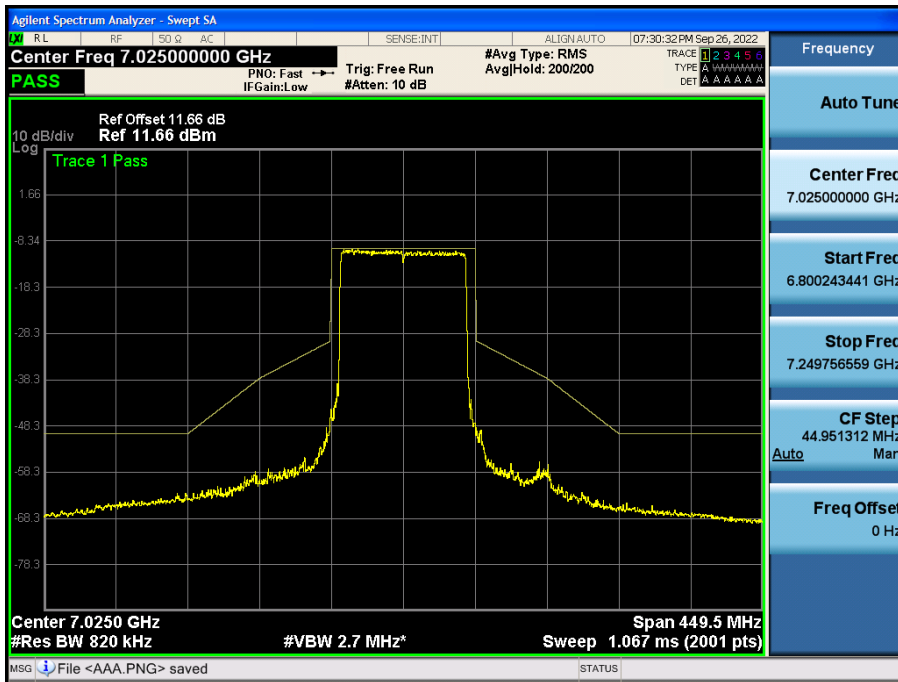
802.11ax HE80 Ch.103(6465 MHz) 996 Tones 67 RU



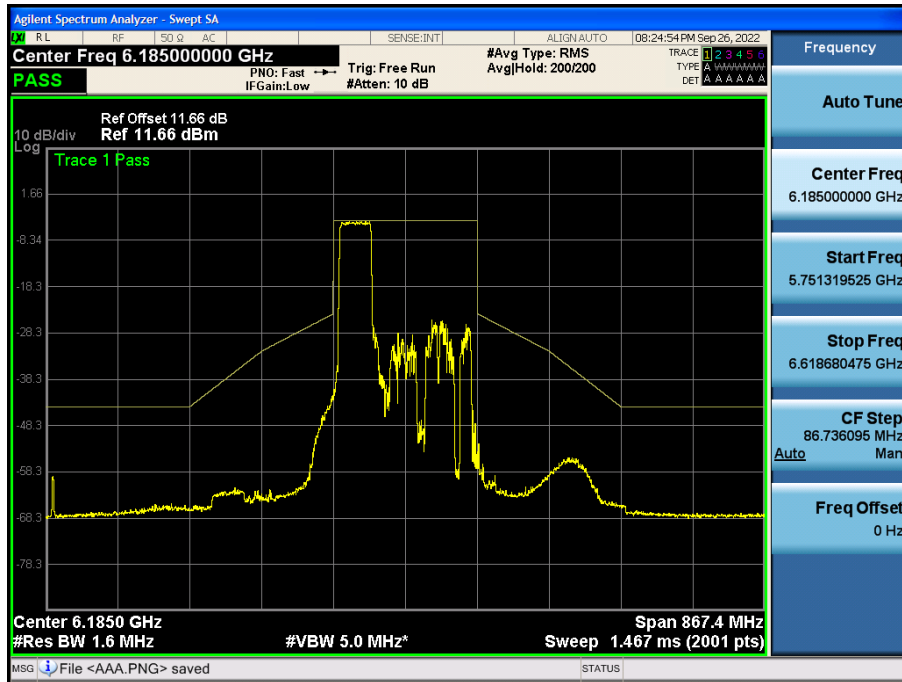
802.11ax HE80 Ch.151(6705 MHz) 996 Tones 67 RU



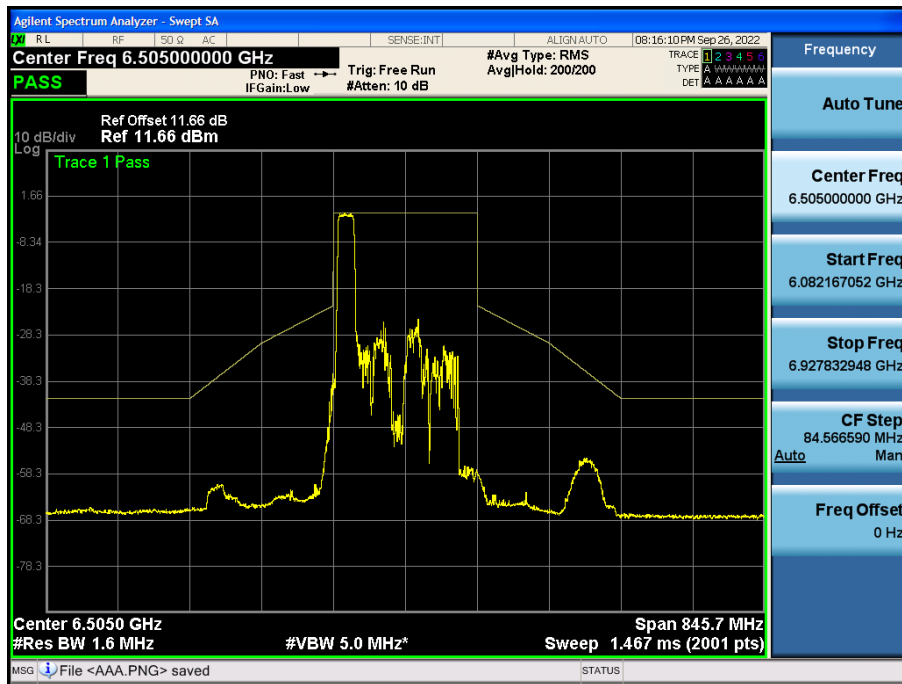
802.11ax HE80 Ch.215(7025 MHz) 996 Tones 67 RU



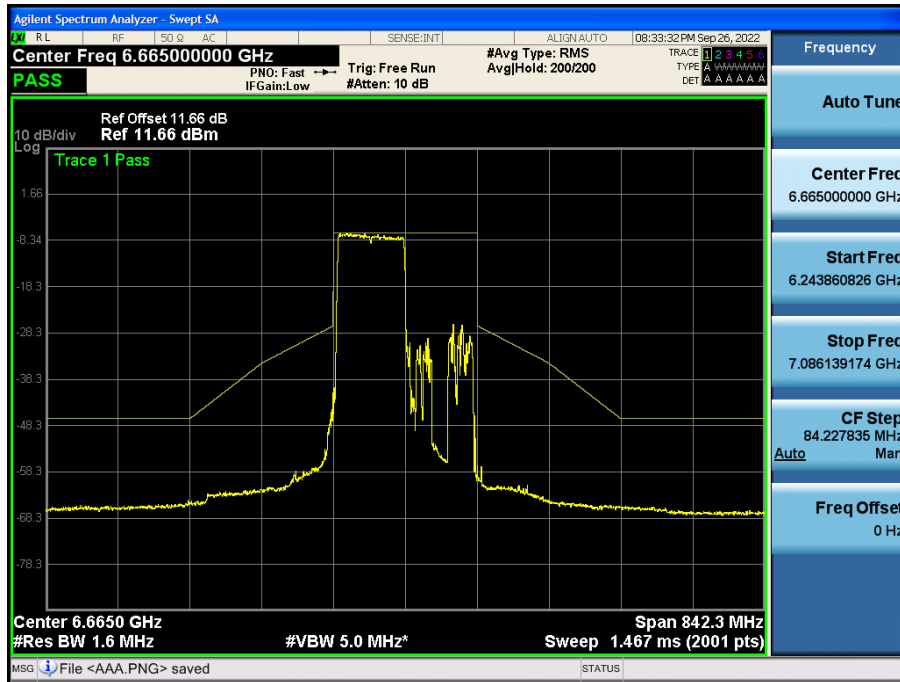
802.11ax HE160, 80_L Ch.47(6185MHz) 484 Tones 65 RU



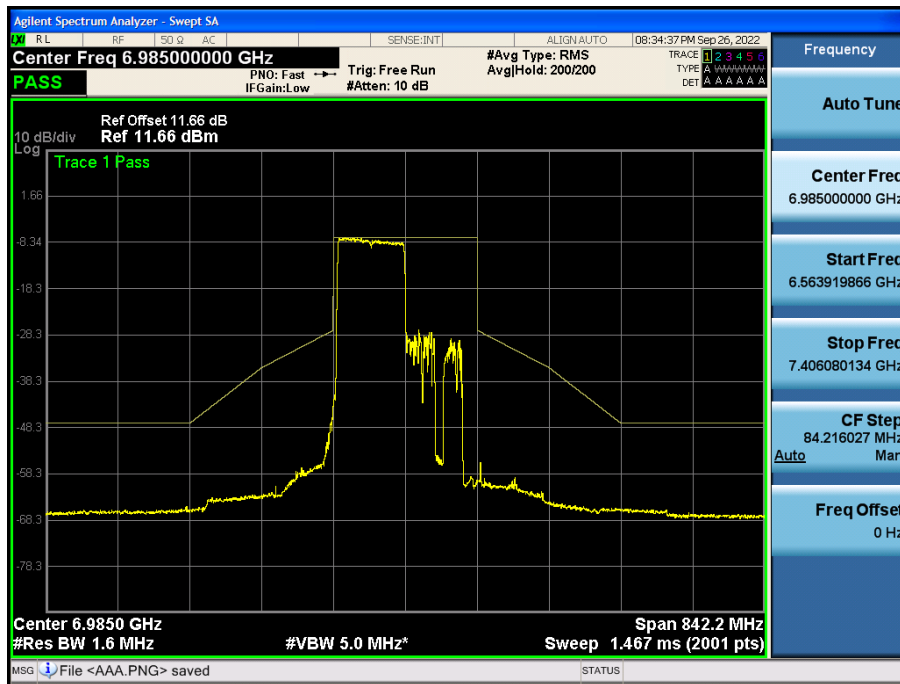
802.11ax HE160, 80_L Ch.111(6505MHz) 242 Tones 61 RU



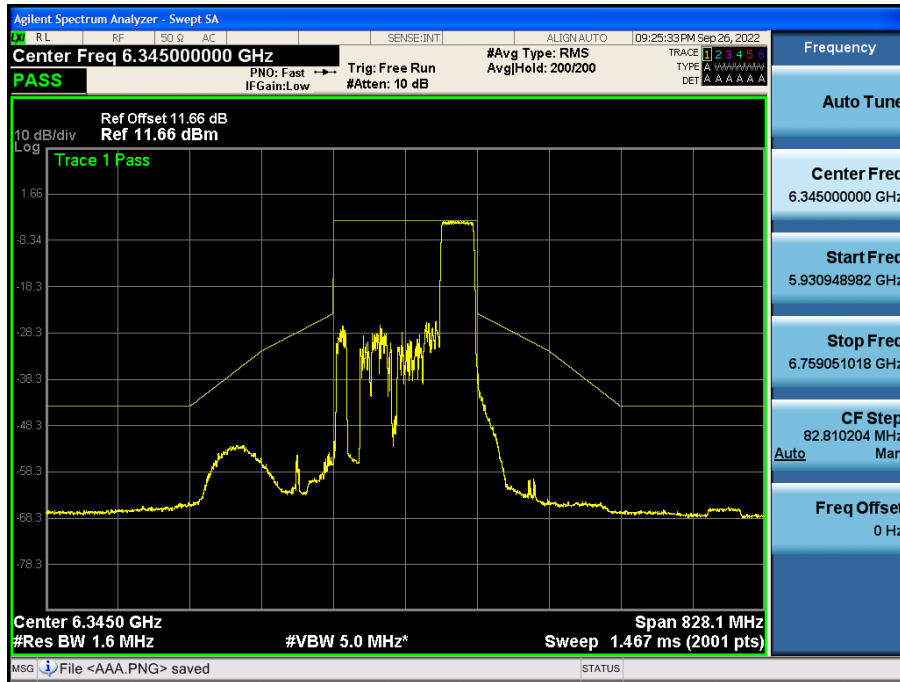
Bandwidth 160M, 80_L Ch.143(6665MHz) 996 Tones 67 RU



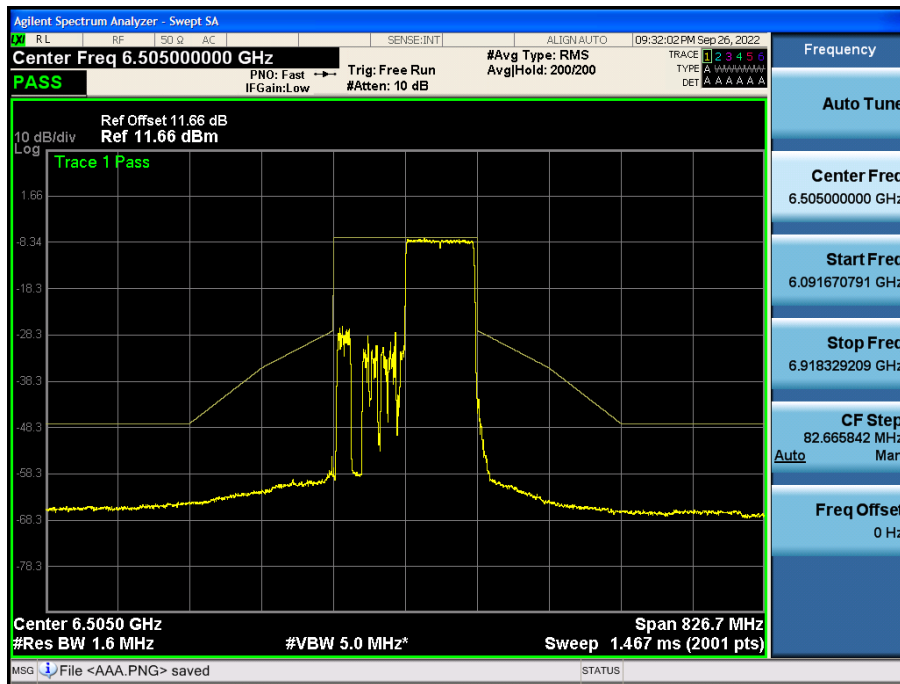
802.11ax HE160, 80_L Ch.207(6985MHz) 996 Tones 67 RU



802.11ax HE160, 80_U Ch.79(6345MHz) 106 Tones 66 RU



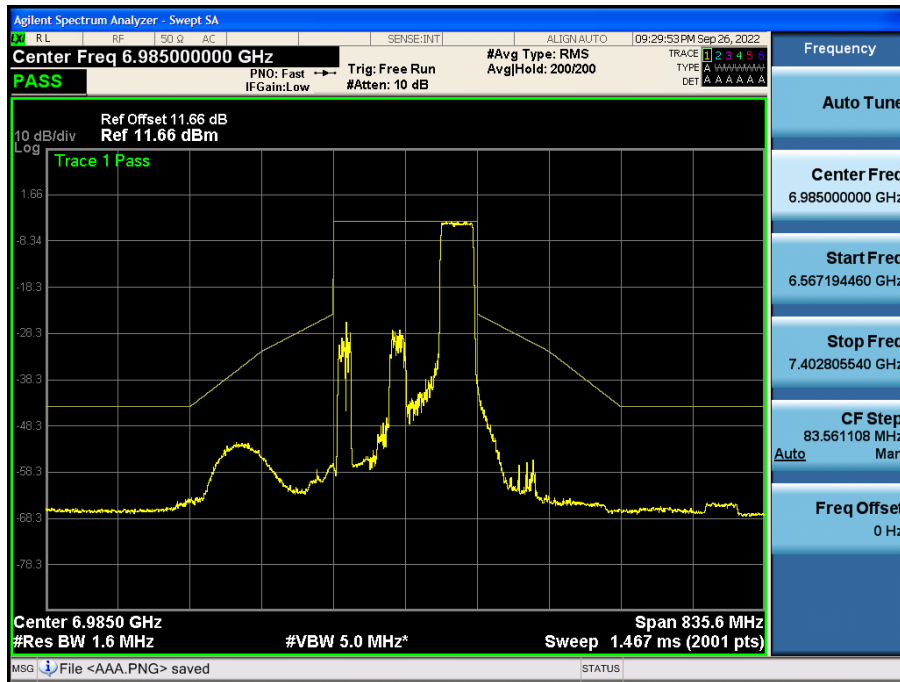
802.11ax HE160, 80_U Ch.111(6505MHz) 242 Tones 67 RU



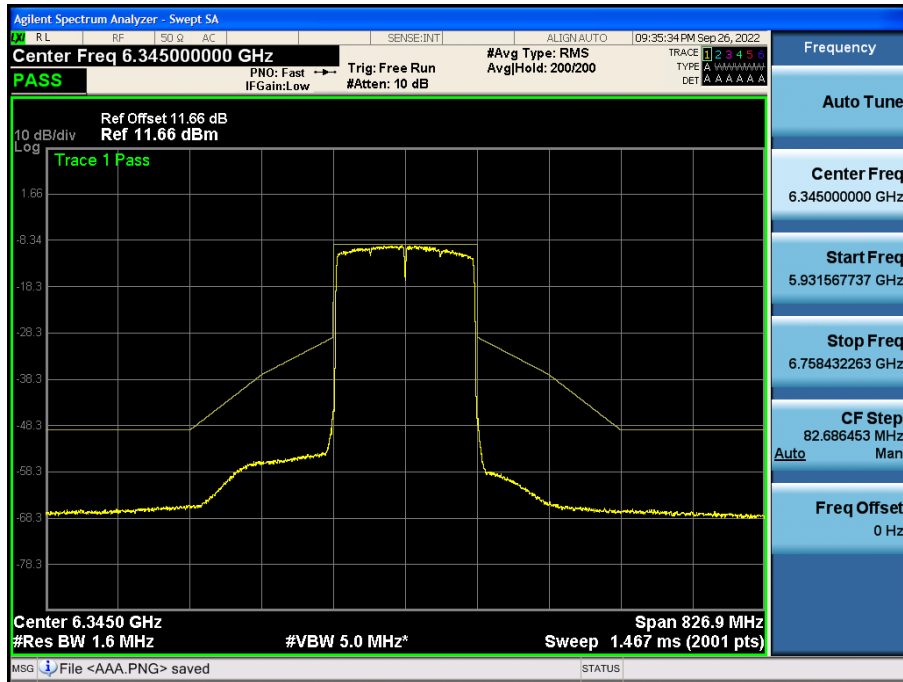
802.11ax HE160, 80_U Ch. 143(6665 MHz) 106 Tones 66 RU



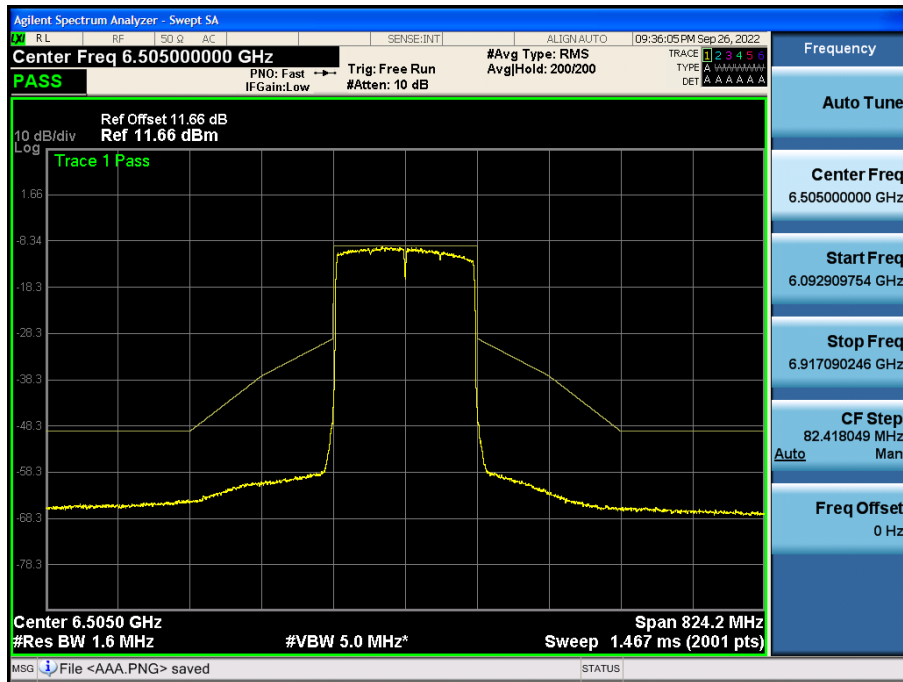
802.11ax HE160, 80_U Ch. 207(6985 MHz) 106 Tones 66 RU



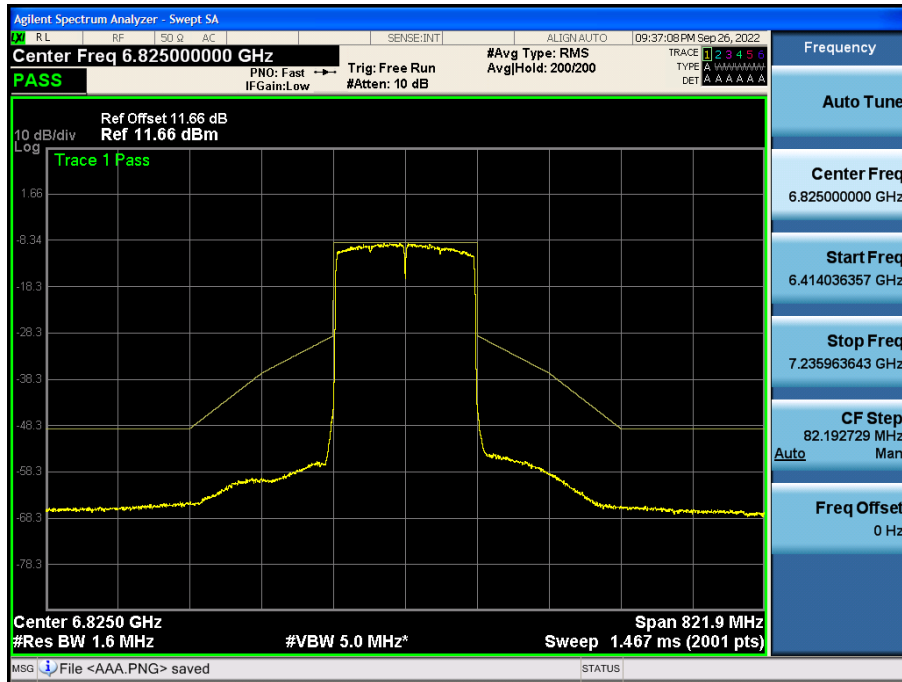
Bandwidth 160M, SU Ch. 79(6345 MHz) SU



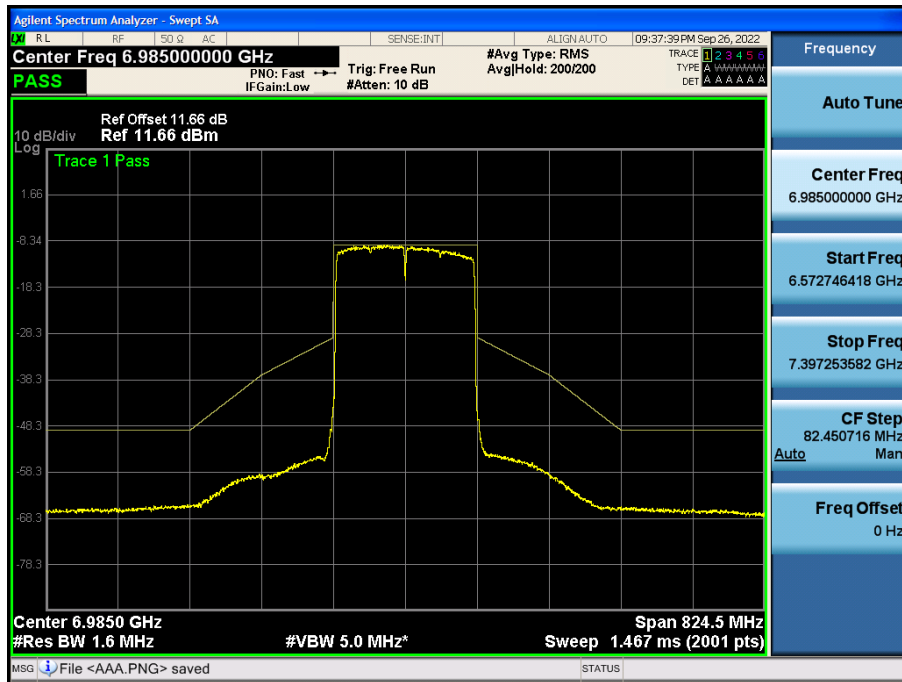
Bandwidth 160M, SU Ch. 111(6505 MHz) SU



Bandwidth 160M, SU Ch. 175(6825 MHz) SU



Bandwidth 160M, SU Ch. 207(6985 MHz) SU

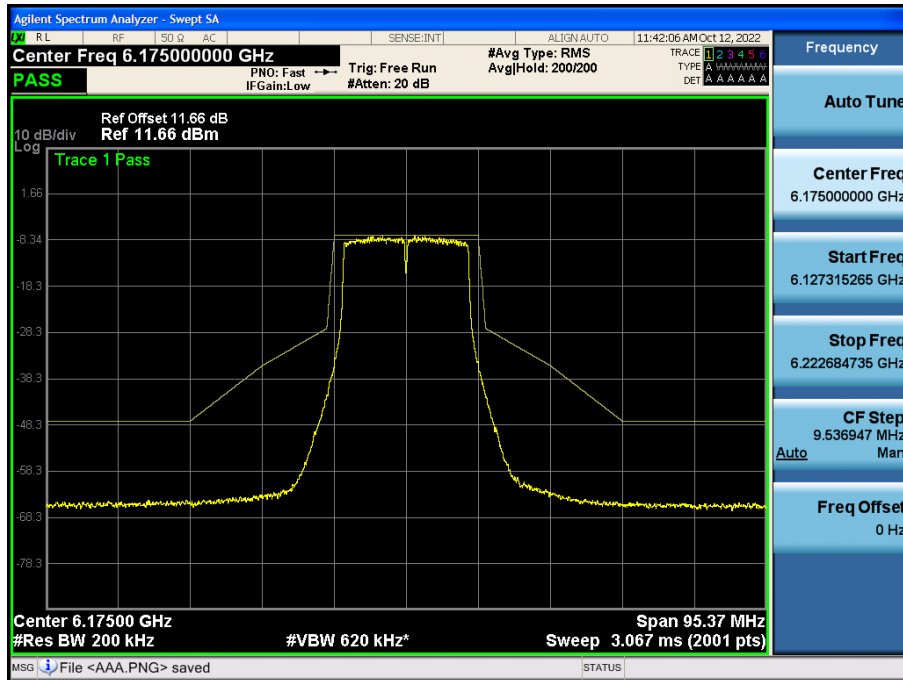


3.2 Standard client

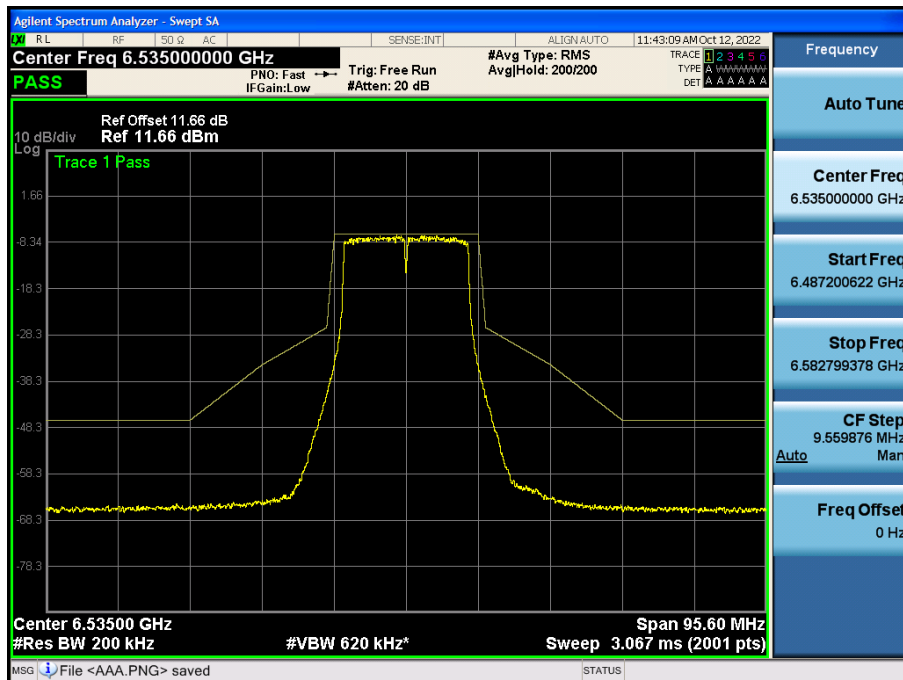
Note:

1. In order to simplify the report, attached plots were only Ant.1 (Worst Case: Ant.1).
2. In order to simplify the report, attached plots were only the most wide channel.

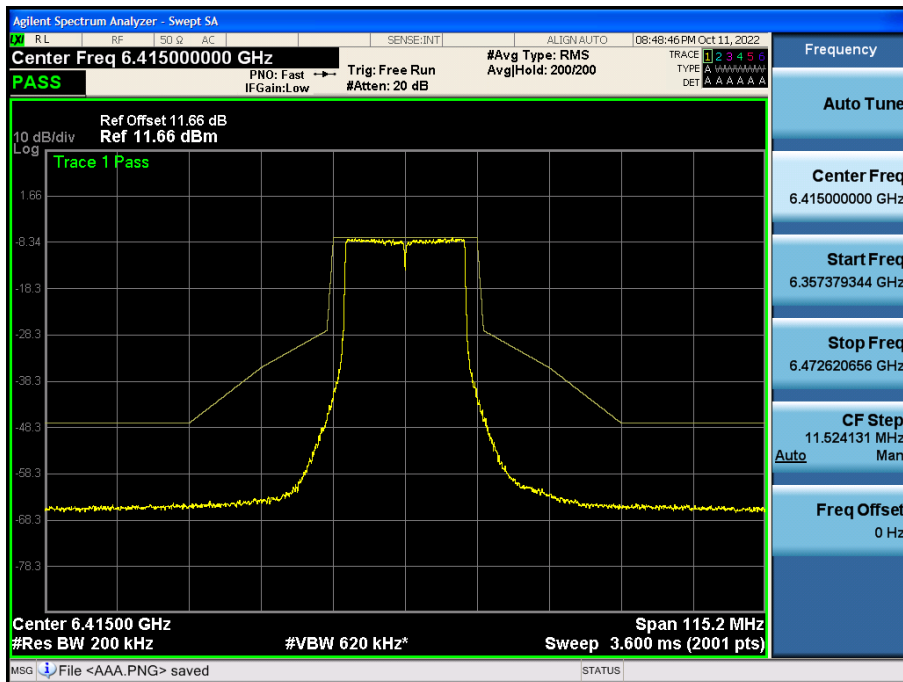
802.11a Ch.45(6175 MHz)



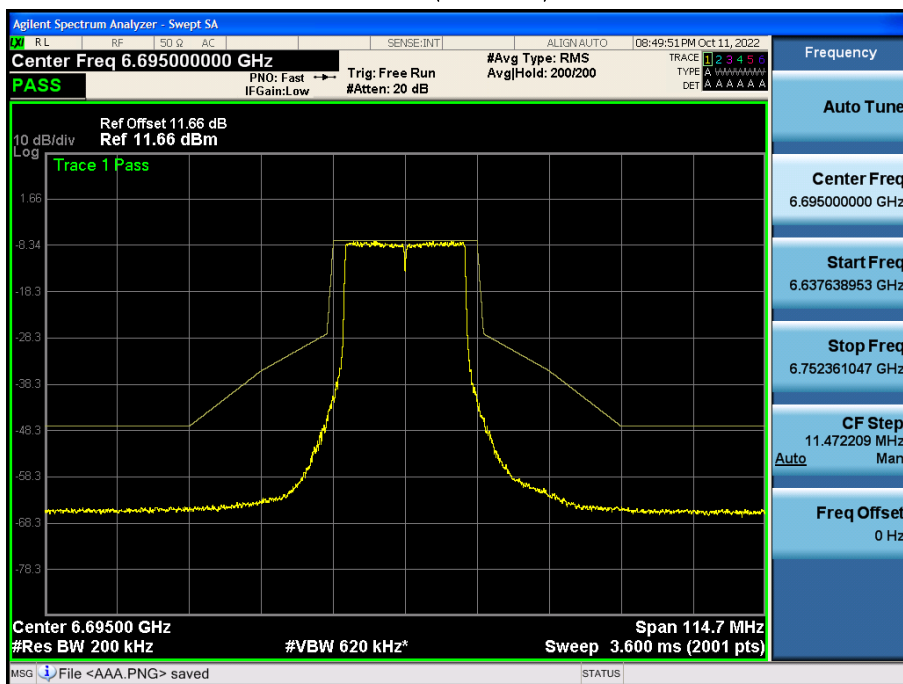
802.11a Ch.117(6535 MHz)



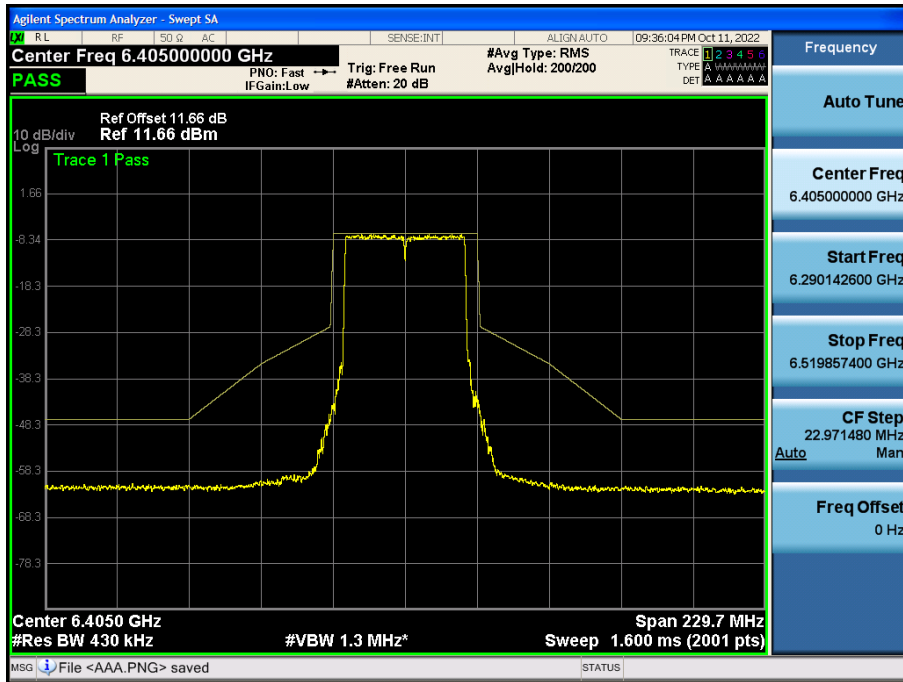
802.11ax HE20 Ch.93(6415MHz) 242 Tones 61 RU



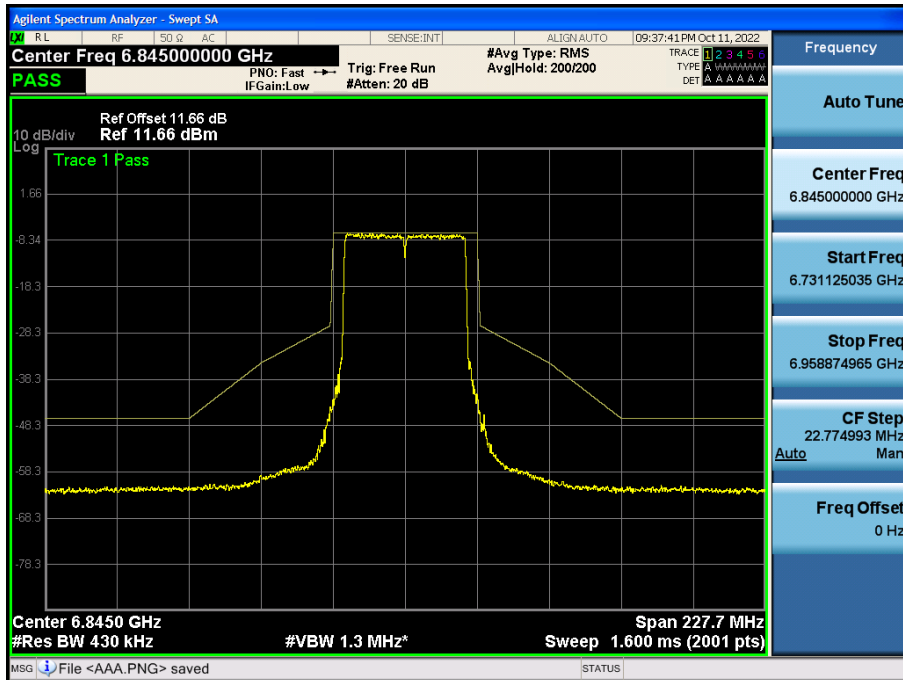
802.11ax HE20 Ch.149(6695MHz)242 Tones 61 RU



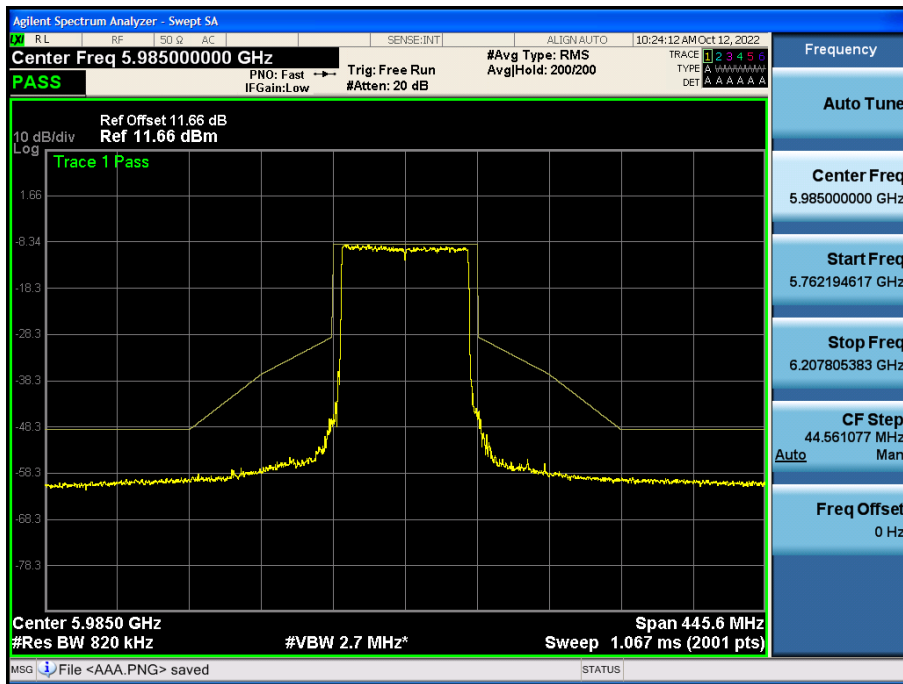
802.11ax HE40 Ch.91(6405MHz)484 Tones 65 RU



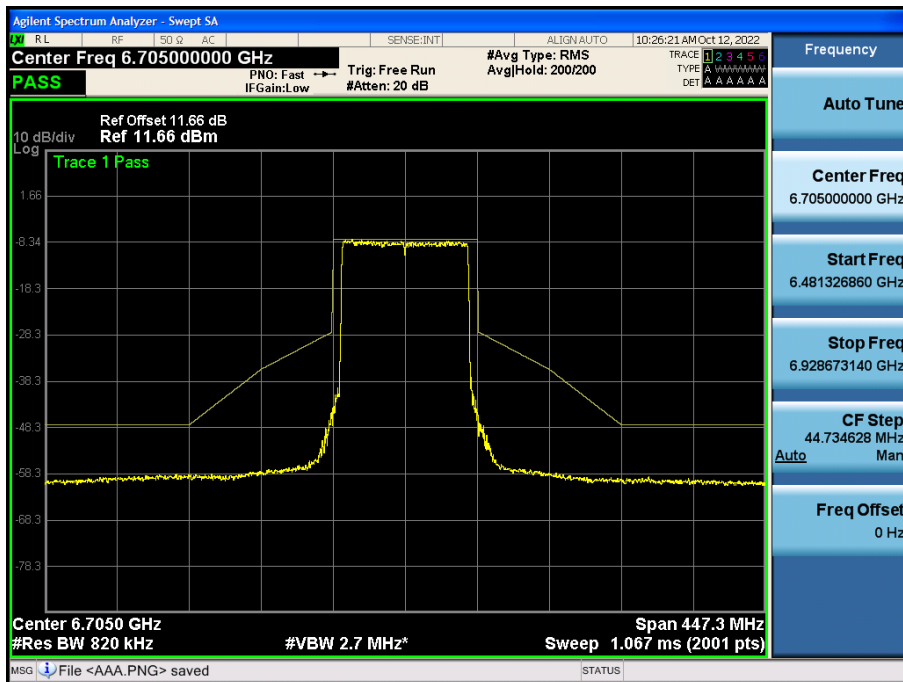
802.11ax HE40 Ch.179(6845MHz) 484 Tones 65 RU



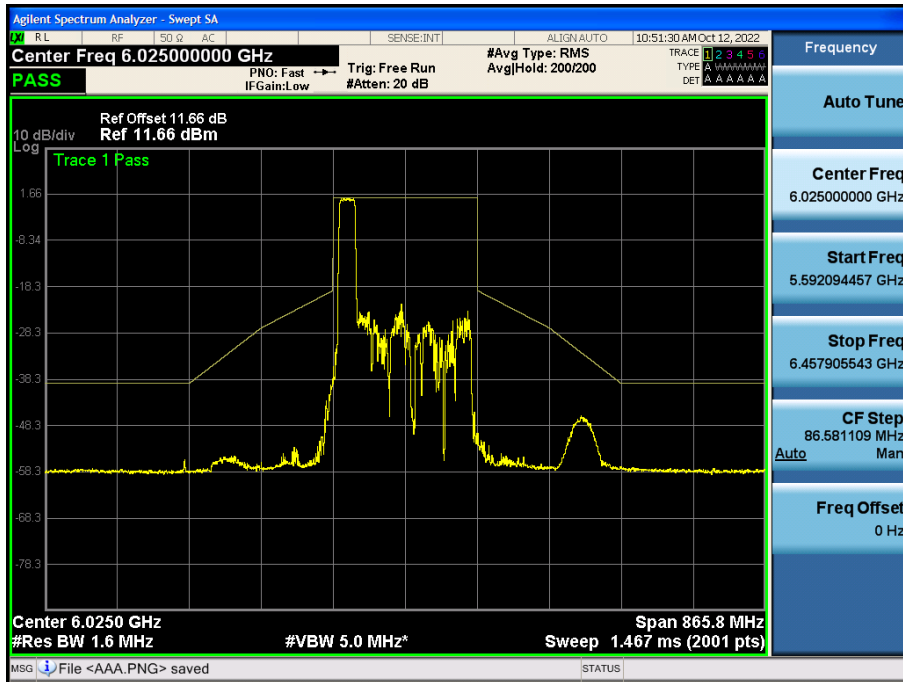
802.11ax HE80 Ch.7(5985MHz) 996 Tones 67 RU



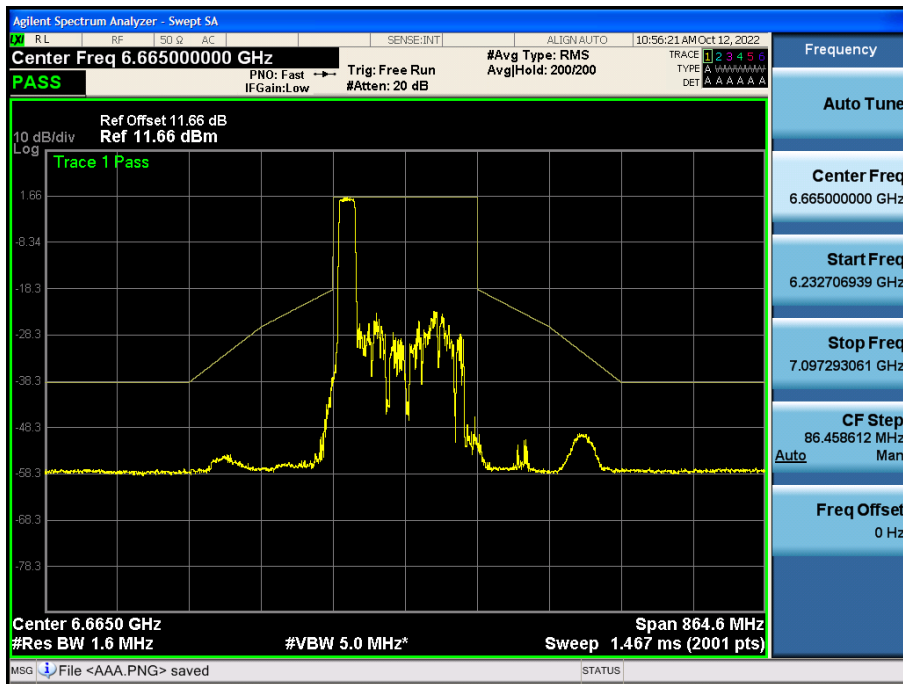
802.11ax HE80 Ch.151(6705MHz) 996 Tones 67 RU



802.11ax HE160, 80_L Ch.15(6025MHz) 242 Tones 61 RU



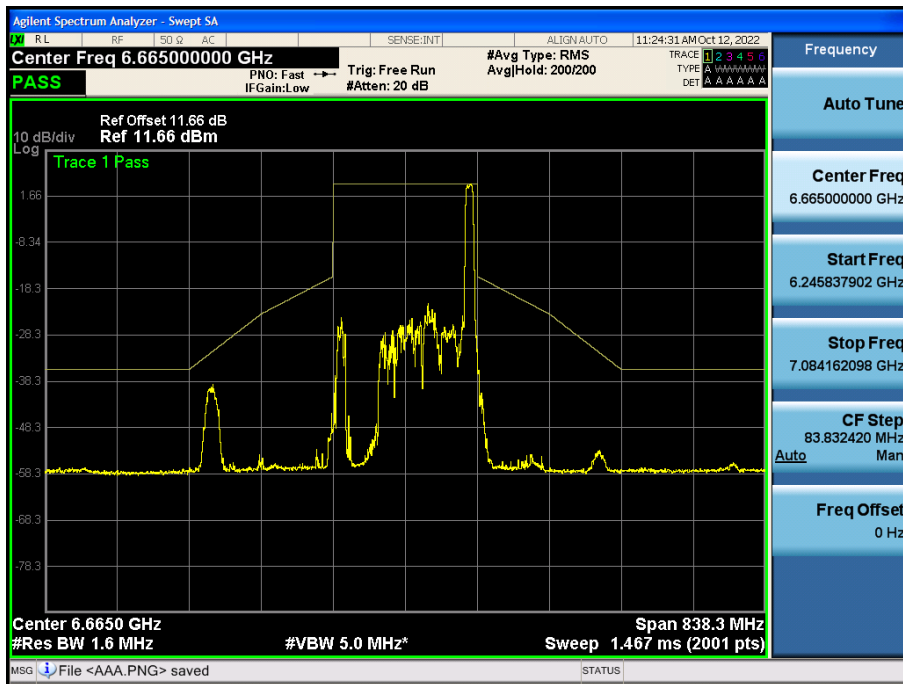
802.11ax HE160, 80_L Ch.143(6665MHz) 242 Tones 61 RU



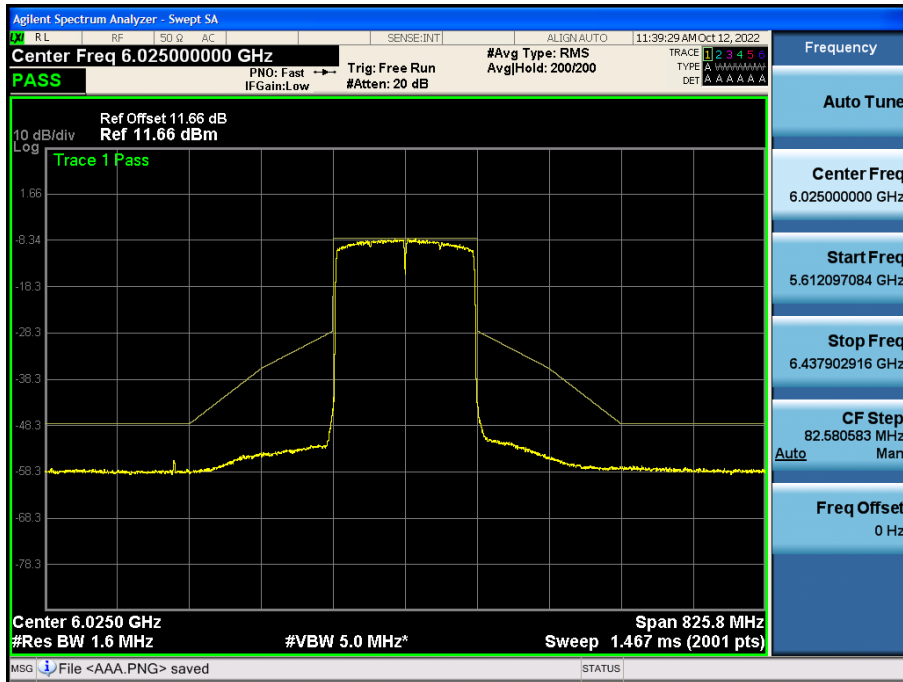
Bandwidth 160M, 80_U Ch.79(6345MHz) 106 Tones 60 RU



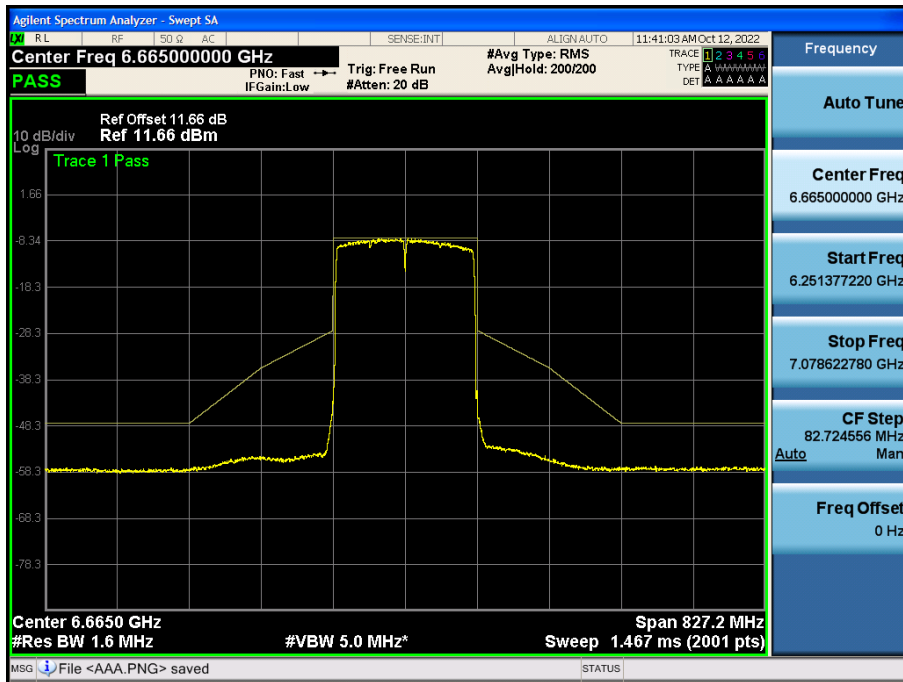
802.11ax HE160, 80_U Ch.143(6665MHz) 106 Tones 60 RU



Bandwidth 160M, SU Ch.15(6025MHz) SU



Bandwidth 160M, SU Ch.143(6665MHz) SU



4. Power Spectral Density

Note:

1. In order to simplify the report, attached plots were only channel of highest EIRP PSD.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F) 2) f) (ii)

Directional gain =

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

Band	Ant Gain (dBi)		N _{ANT} / N _{SS}	Directional Gain (dBi)
UNII 5	ANT1	-2.56	2 / 2	-0.64
	ANT2	-4.89		
UNII 6	ANT1	-4.13	2 / 2	-1.52
	ANT2	-4.96		
UNII 7	ANT1	-4.59	2 / 2	-1.77
	ANT2	-4.98		
UNII 8	ANT1	-6.71	2 / 2	-2.87
	ANT2	-5.12		

Note

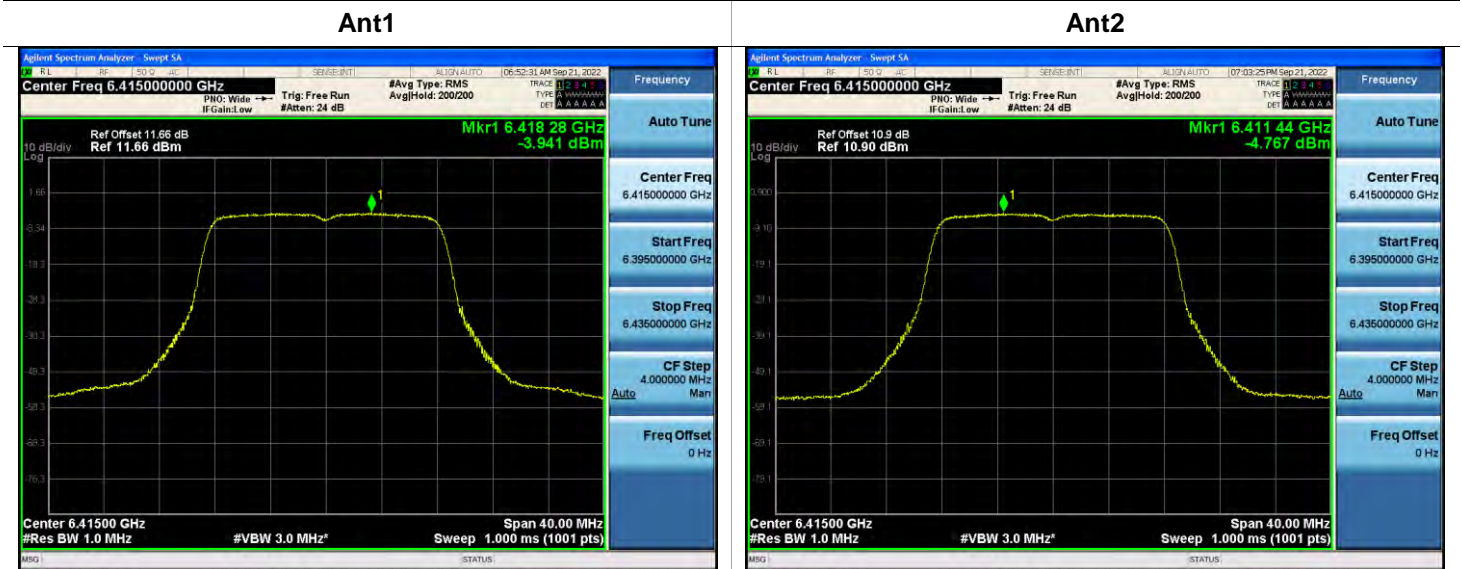
According to Ansi C63.10-2013 section 14.4.3, the directional gain is calculated using the formula, where GN is the gain of the nth antenna and NANT is the total number of antennas used.

$$Directional\ Gain = 10 \cdot \log \left(\frac{(10^{(ANT1\ Gain/20)} + 10^{(ANT2\ Gain/20)})^2}{2} \right) \text{ dBi}$$

4.1 Indoor client

[SUM (MIMO Ant 1 + MIMO Ant2)]

802.11a Ch.93(6415MHz) SU



SUM PSD (dBm/MHz)	Duty Cycle Factor (dB)	Total PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
-1.324	0.096	-1.228	-1.864

Note:

SUM PSD(dBm/MHz) = 10log(((10^(Ant 1 PSD / 10))+10^(Ant 2 PSD/10))) (dBm)
 Total PSD (dBm/MHz) = SUM PSD(dBm) + Duty Cycle Factor (dB)
 EIRP PSD(dBm/MHz) = Total PSD (dBm/MHz) + Directional Gain(dBi)

802.11ax HE20 Ch.45(6175MHz) 52 Tones RU 37

Ant1



Ant2

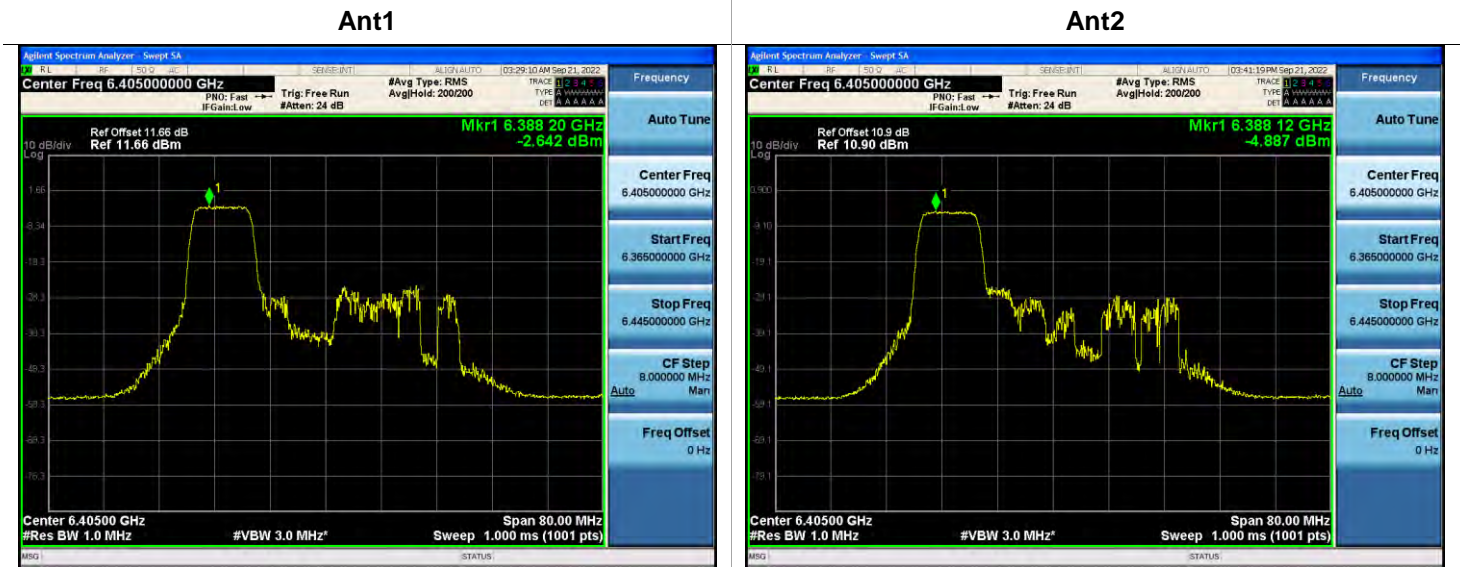


SUM PSD (dBm/MHz)	Duty Cycle Factor (dB)	Total PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
-0.906	0.030	-0.876	-1.513

Note:

SUM PSD(dBm/MHz) = 10log(((10^(Ant 1 PSD /10))+10^(Ant 2 PSD/10))) (dBm)
 Total PSD (dBm/MHz) = SUM PSD(dBm) + Duty Cycle Factor (dB)
 EIRP PSD(dBm/MHz) = Total PSD (dBm/MHz) + Directional Gain(dBi)

802.11ax HE40 Ch.91(6405MHz) 106 Tones RU 53

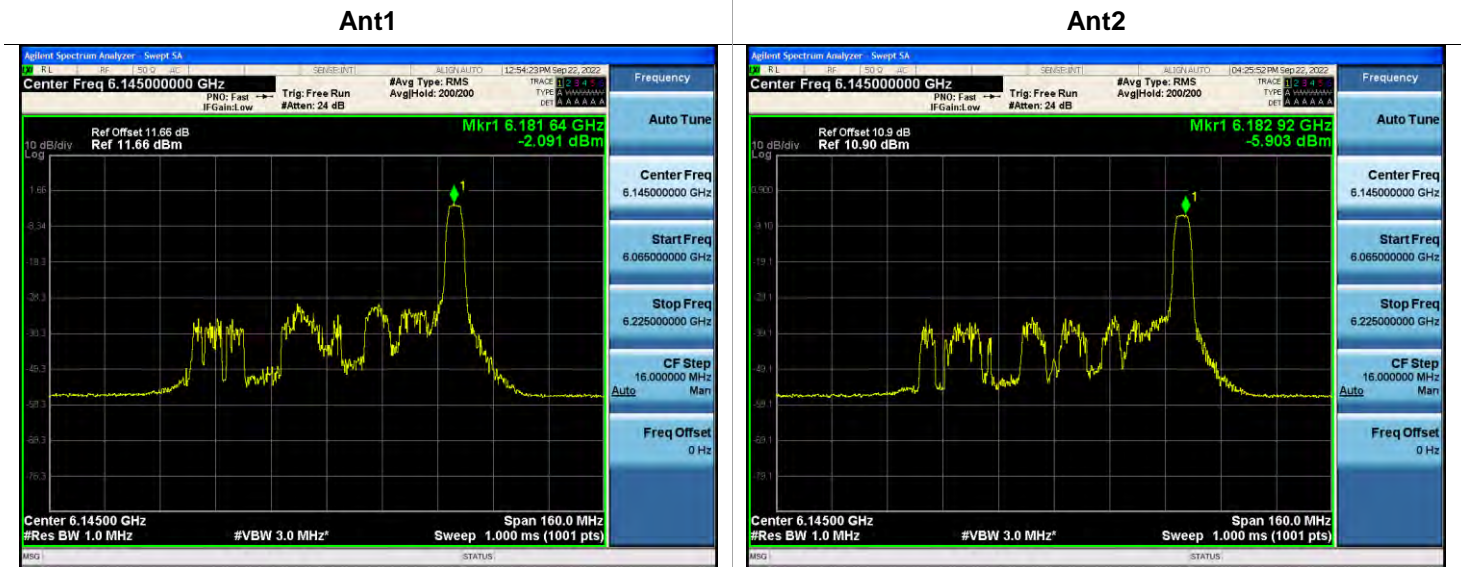


SUM PSD (dBm/MHz)	Duty Cycle Factor (dB)	Total PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
-0.611	0.027	-0.584	-1.221

Note:

SUM PSD(dBm/MHz) = 10log(((10^(Ant 1 PSD /10))+10^(Ant 2 PSD/10))) (dBm)
 Total PSD (dBm/MHz) = SUM PSD(dBm) + Duty Cycle Factor (dB)
 EIRP PSD(dBm/MHz) = Total PSD (dBm/MHz) + Directional Gain(dBi)

802.11ax HE80 Ch.39(6145 MHz) 52 Tones RU 52

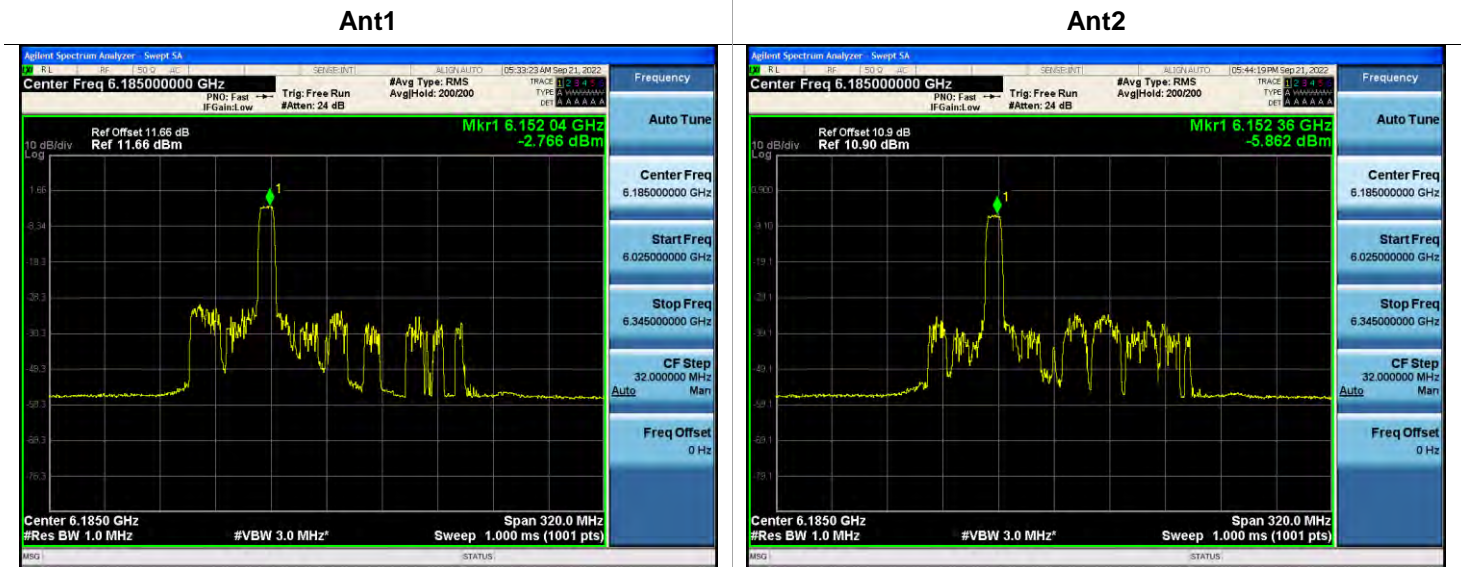


SUM PSD (dBm/MHz)	Duty Cycle Factor (dB)	Total PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
-0.581	0.030	-0.552	-1.188

Note:

SUM PSD(dBm/MHz) = 10log(((10^(Ant 1 PSD /10))+10^(Ant 2 PSD/10))) (dBm)
 Total PSD (dBm/MHz) = SUM PSD(dBm) + Duty Cycle Factor (dB)
 EIRP PSD(dBm/MHz) = Total PSD (dBm/MHz) + Directional Gain(dBi)

802.11ax HE160 80_L Ch.47(6185MHz) 106 Tones RU 57



SUM PSD (dBm/MHz)	Duty Cycle Factor (dB)	Total PSD (dBm/MHz)	EIRP PSD (dBm/MHz)
-1.033	0.027	-1.006	-1.643

Note:

SUM PSD(dBm/MHz) = 10log(((10^(Ant 1 PSD /10))+10^(Ant 2 PSD/10))) (dBm)
 Total PSD (dBm/MHz) = SUM PSD(dBm) + Duty Cycle Factor (dB)
 EIRP PSD(dBm/MHz) = Total PSD (dBm/MHz) + Directional Gain(dBi)