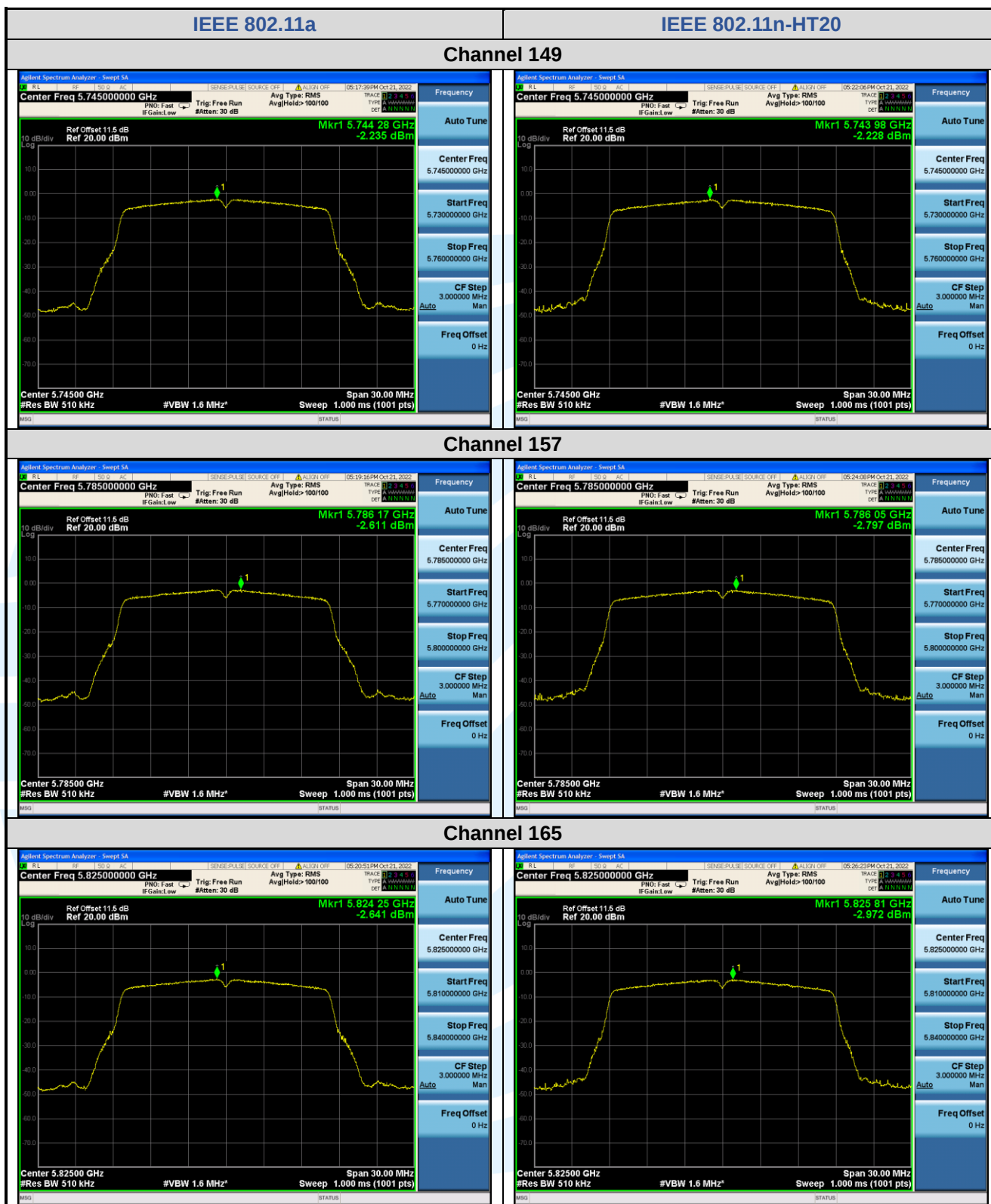
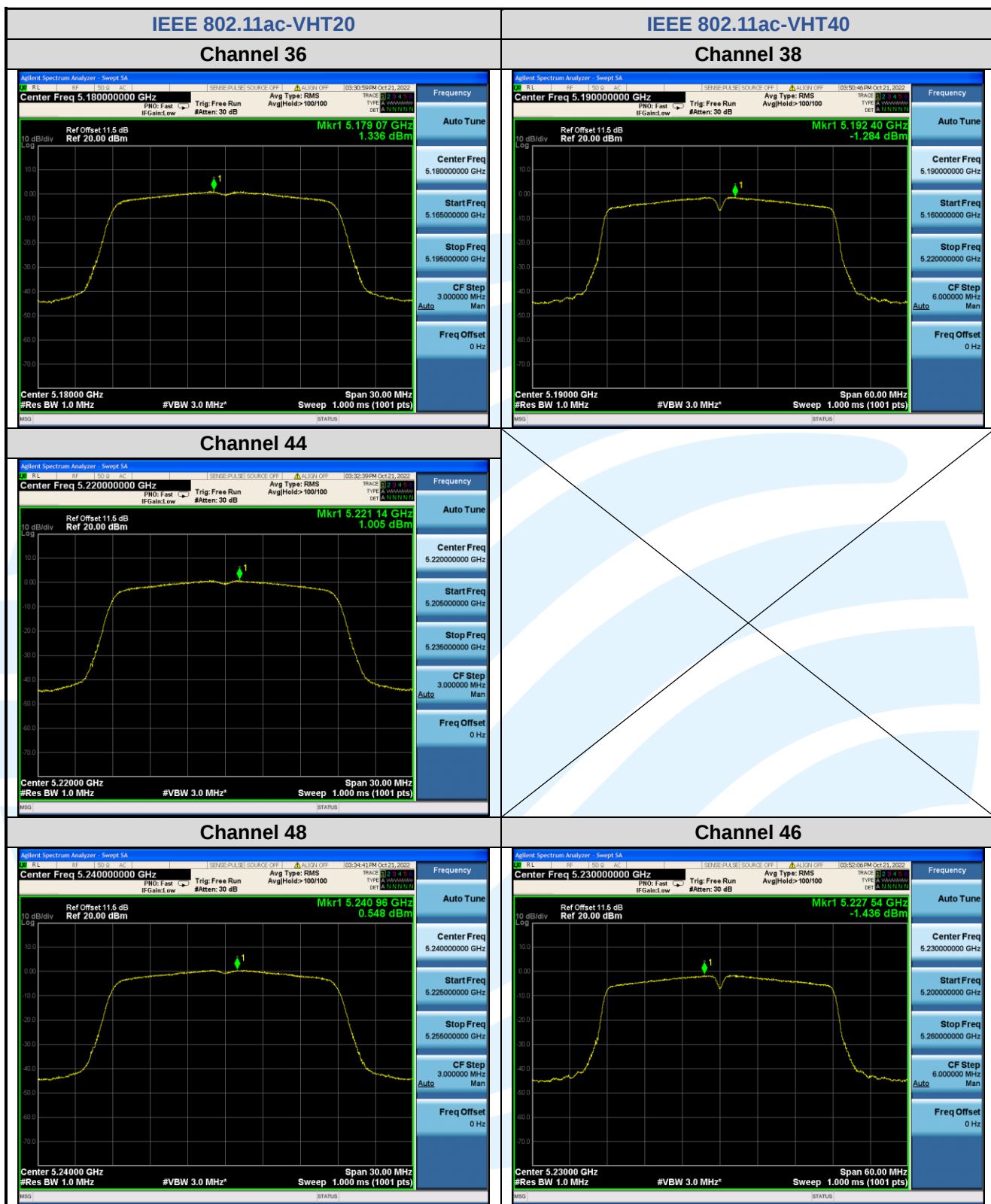
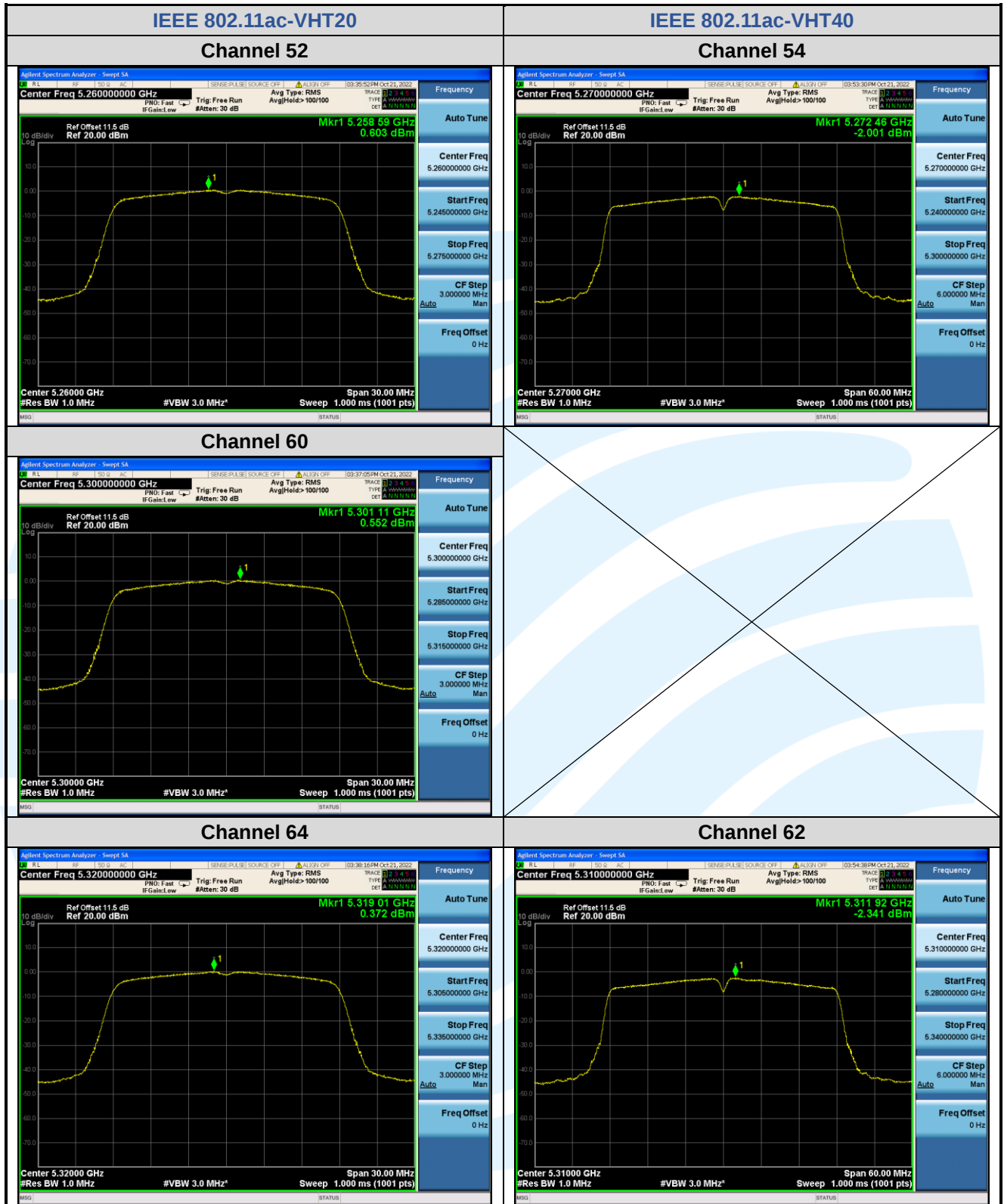




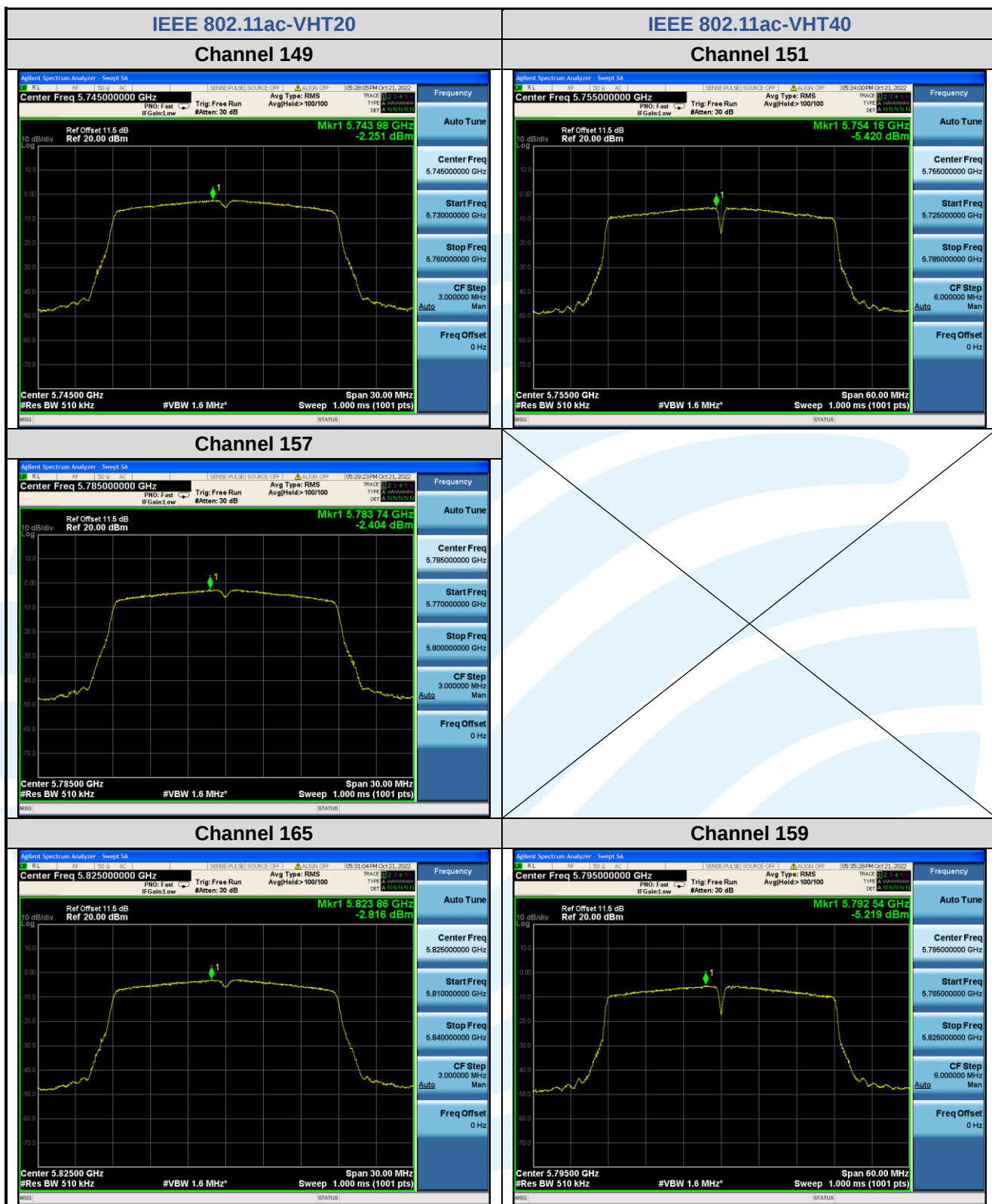




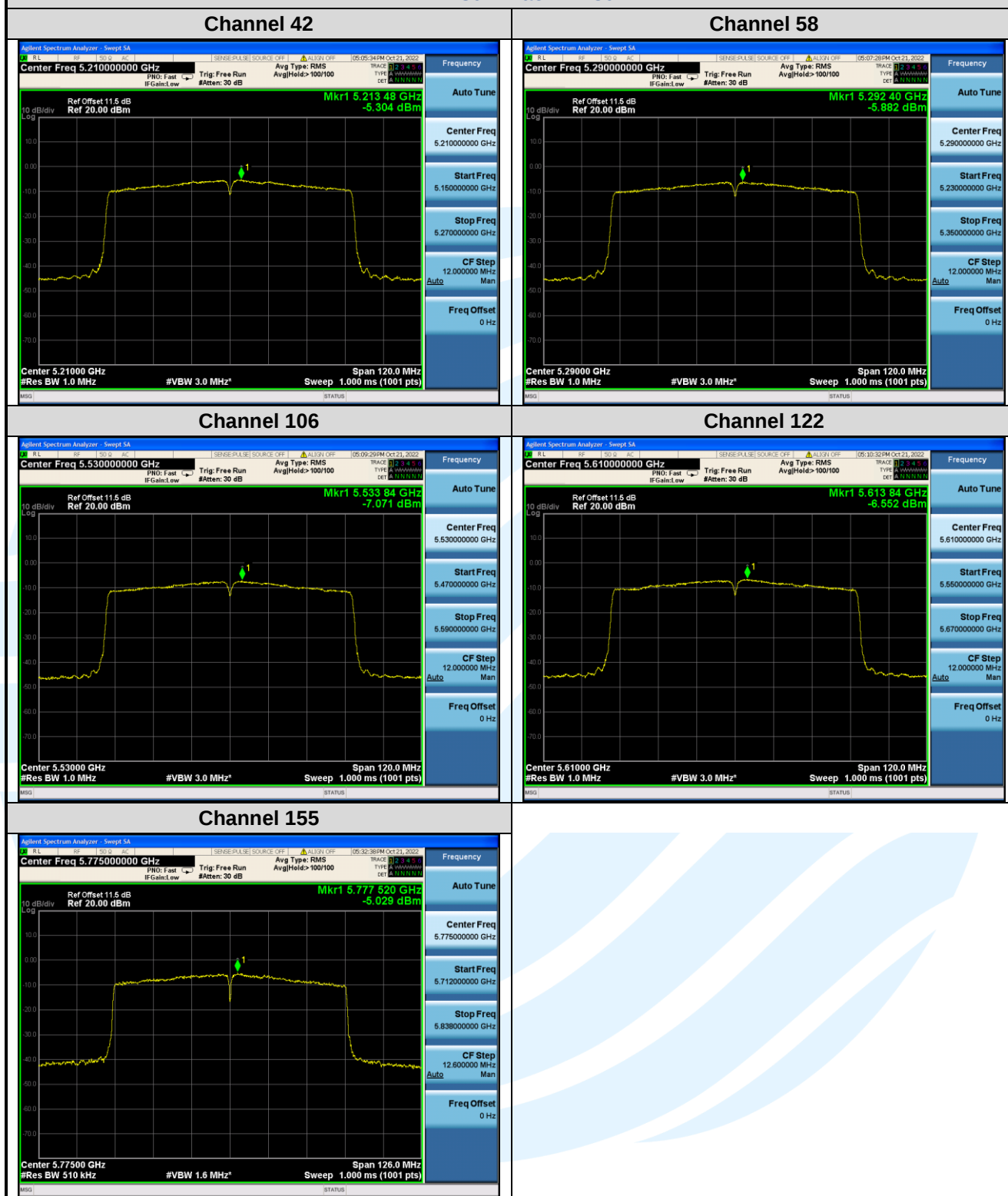








IEEE 802.11ac-VHT80



5.7 RADIATED EMISSIONS AND BAND EDGE MEASUREMENT

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (b)(1)(2)(3)(4)(6)
FCC 47 CFR Part 15 Subpart C Section 15.209/205

Test Method: KDB 789033 D02 v02r01 Section G.3, G.4, G.5, and G.6

Receiver Setup:

Frequency	RBW
0.009 MHz-0.150 MHz	200/300 kHz
0.150 MHz -30 MHz	9/10 kHz
30 MHz-1 GHz	100/120 kHz
Above 1 GHz	1 MHz

Limits:

1. Limits of Radiated Emission and Band edge Measurement

Radiated emissions that fall in the restricted bands must comply with the general emissions limits in 15.209(a) as below table. Other emissions shall be at least 20 dB below the highest level of the desired power.

Frequency	Field strength (microvolt/meter)	Limit (dBμV/m)	Remark	Measurement distance (m)
0.009 MHz-0.490 MHz	2400/F(kHz)	--	--	300
0.490 MHz-1.705 MHz	24000/F(kHz)	--	--	30
1.705 MHz-30 MHz	30	--	--	30
30 MHz-88 MHz	100	40.0	Quasi-peak	3
88 MHz-216 MHz	150	43.5	Quasi-peak	3
216 MHz-960 MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1 GHz	500	54.0	Average	3

Remark:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

2. Limits of Unwanted Emission Out of the Restricted Bands

Applicable To	Limit	
789033 D02 General U-NII Test Procedures New Rules v01r04	Field Strength at 3 m	
	PK: 74 (dBμV/m)	AV: 54 (dBμV/m)
Applicable To	EIRP Limit	Equivalent Field Strength at 3 m
FCC Part 15.407 (b)(1)	PK: -27 (dBm/MHz)	PK: 74 (dBμV/m)
FCC Part 15.407 (b)(2)	PK: -27 (dBm/MHz)	PK: 74 (dBμV/m)
FCC Part 15.407 (b)(3)	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m)
FCC Part 15.407 (b)(4)	27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;	PK: 68.2 (dBμV/m)
	15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;	
	10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges;	
	-27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.	

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Test Setup: Refer to section 4.5.1 for details.

Test Procedures:

1. The EUT was placed on the top of a rotating table 0.8 meters (for below 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
6. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Remark:

- a) The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
- b) The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
- c) The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for RMS Average (Duty cycle < 98 %) for Average detection (AV) at frequency above 1 GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
- d) The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz (Duty cycle $\geq 98 \%$) or $\geq 1/T$ (duty cycle is < 98%) for Average detection (AV) at frequency above 1 GHz.
- e) All modes of operation were investigated and the worst-case emissions are reported.

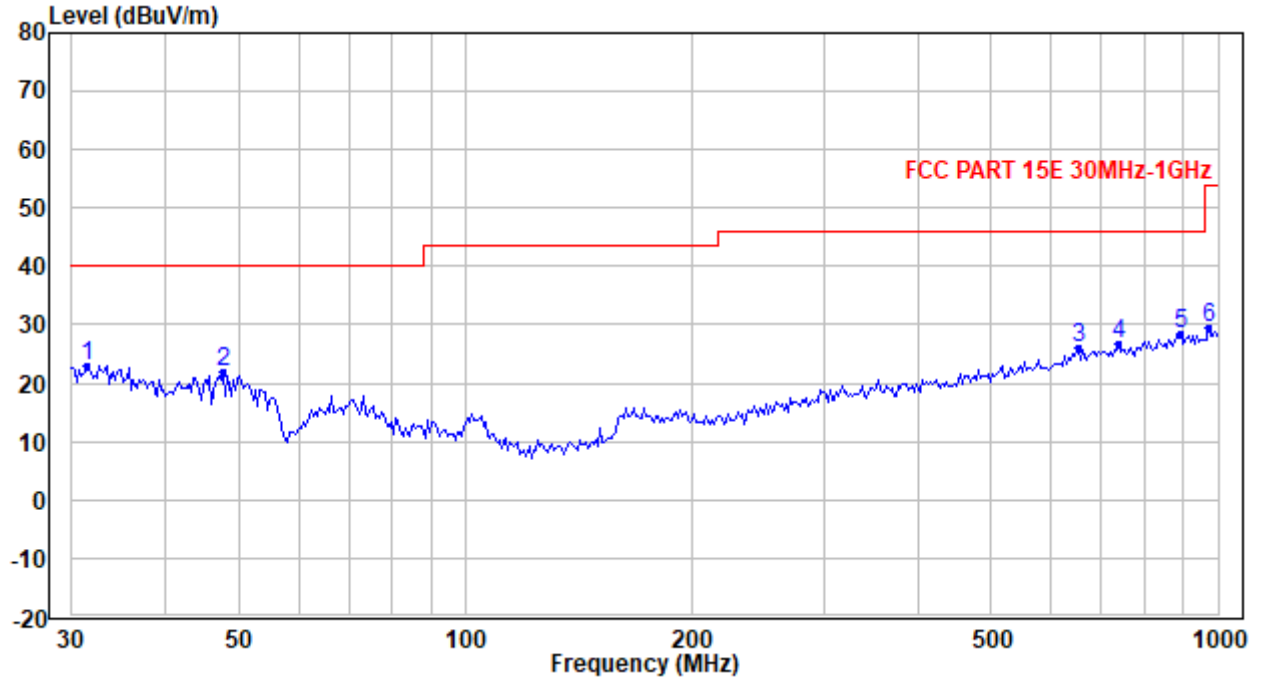
Equipment Used: Refer to section 3 for details.

Test Result: Pass

The measurement data as follows:

Radiated Emission Test Data (9 kHz ~ 30 MHz):

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

Radiated Emission Test Data (30 MHz ~ 1 GHz):
Worst-Case Configuration
Horizontal


No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	31.513	27.7	-4.7	23.1	40.0	-16.9	QP
2	47.703	34.9	-13.0	21.8	40.0	-18.2	QP
3	651.383	25.6	0.4	25.9	46.0	-20.1	QP
4	739.214	24.7	2.0	26.7	46.0	-19.3	QP
5	893.656	24.4	4.3	28.6	46.0	-17.4	QP
6	972.283	24.5	4.8	29.3	54.0	-24.7	QP

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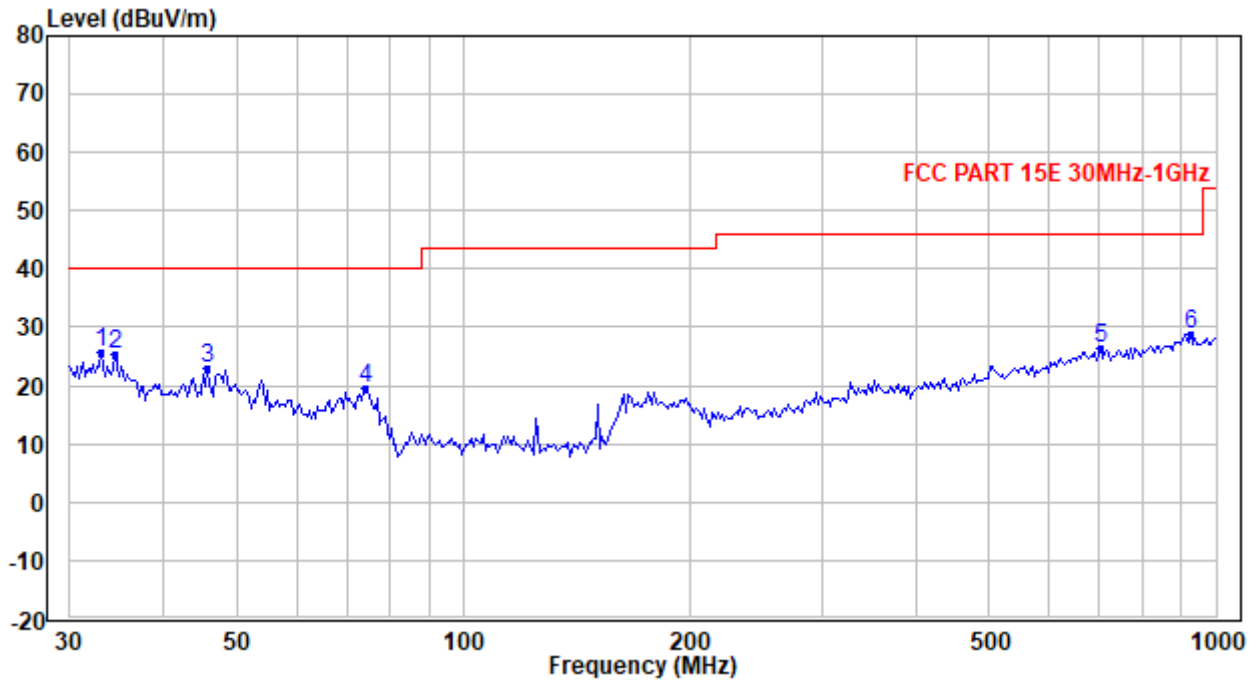
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Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	33.101	30.6	-4.8	25.8	40.0	-14.2	QP
2	34.527	30.0	-4.6	25.4	40.0	-14.6	QP
3	45.733	34.5	-11.7	22.8	40.0	-17.2	QP
4	74.27	37.0	-17.5	19.6	40.0	-20.4	QP
5	703.731	24.9	1.5	26.4	46.0	-19.6	QP
6	925.613	24.4	4.5	28.8	46.0	-17.2	QP

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Radiated Emission Test Data (Above 1GHz): Worst-Case Configuration								
No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
IEEE 802.11a_Channel 36								
1	10360	37.3	6.2	43.5	68.2	-24.7	Peak	Horizontal
2	10360	25.9	6.2	32.1	54	-21.9	Average	Horizontal
3	15540	35.2	11.3	46.4	74	-27.6	Peak	Horizontal
4	15540	23.7	11.3	34.9	54	-19.1	Average	Horizontal
5	10360	37.8	6.2	44.0	68.2	-24.2	Peak	Vertical
6	10360	25.9	6.2	32.1	54	-21.9	Average	Vertical
7	15540	36.0	11.3	47.2	74	-26.8	Peak	Vertical
8	15540	23.7	11.3	34.9	54	-19.1	Average	Vertical
IEEE 802.11a_Channel 44								
1	10440	37.4	6.3	43.7	68.2	-24.5	Peak	Horizontal
2	10440	25.1	6.3	31.4	54	-22.6	Average	Horizontal
3	15660	37.3	11.4	48.7	74	-25.3	Peak	Horizontal
4	15660	23.9	11.4	35.3	54	-18.7	Average	Horizontal
5	10440	39.6	6.3	45.9	68.2	-22.3	Peak	Vertical
6	10440	25.2	6.3	31.5	54	-22.5	Average	Vertical
7	15660	35.1	11.4	46.5	74	-27.5	Peak	Vertical
8	15660	24.0	11.4	35.4	54	-18.6	Average	Vertical
IEEE 802.11a_Channel 48								
1	10480	37.9	6.3	44.3	68.2	-23.9	Peak	Horizontal
2	10480	24.0	6.3	30.3	54	-23.7	Average	Horizontal
3	15720	37.6	11.5	49.1	74	-24.9	Peak	Horizontal
4	15720	23.9	11.5	35.3	54	-18.7	Average	Horizontal
5	10480	39.1	6.3	45.5	68.2	-22.7	Peak	Vertical
6	10480	24.0	6.3	30.3	54	-23.7	Average	Vertical
7	15720	35.7	11.5	47.2	74	-26.8	Peak	Vertical
8	15720	23.9	11.5	35.4	54	-18.6	Average	Vertical
IEEE 802.11a_Channel 52								
1	10520	39.1	6.4	45.5	68.2	-22.7	Peak	Horizontal
2	10520	26.9	6.4	33.3	54	-20.7	Average	Horizontal
3	15780	35.6	11.6	47.1	74	-26.9	Peak	Horizontal
4	15780	23.8	11.6	35.3	54	-18.7	Average	Horizontal
5	10520	39.1	6.4	45.5	68.2	-22.7	Peak	Vertical
6	10520	27.0	6.4	33.3	54	-20.7	Average	Vertical
7	15780	35.6	11.6	47.1	74	-26.9	Peak	Vertical
8	15780	23.8	11.6	35.3	54	-18.7	Average	Vertical

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No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
IEEE 802.11a_Channel 60								
1	10600	39.6	6.6	46.2	74	-27.8	Peak	Horizontal
2	10600	27.2	6.6	33.7	54	-20.3	Average	Horizontal
3	15900	35.7	11.7	47.4	74	-26.6	Peak	Horizontal
4	15900	24.2	11.7	35.9	54	-18.1	Average	Horizontal
5	10600	39.0	6.6	45.6	74	-28.5	Peak	Vertical
6	10600	23.1	6.6	29.6	54	-24.4	Average	Vertical
7	15900	35.2	11.7	46.9	74	-27.1	Peak	Vertical
8	15900	24.2	11.7	35.9	54	-18.1	Average	Vertical
IEEE 802.11a_Channel 64								
1	10640	37.0	6.6	43.7	74	-30.4	Peak	Horizontal
2	10640	23.1	6.6	29.7	54	-24.3	Average	Horizontal
3	15960	34.7	11.8	46.5	74	-27.5	Peak	Horizontal
4	15960	24.2	11.8	36.0	54	-18.0	Average	Horizontal
5	10640	38.8	6.6	45.4	74	-28.6	Peak	Vertical
6	10640	23.1	6.6	29.7	54	-24.3	Average	Vertical
7	15960	34.7	11.8	46.5	74	-27.5	Peak	Vertical
8	15960	24.3	11.8	36.1	54	-17.9	Average	Vertical
IEEE 802.11a_Channel 100								
1	11000	38.1	7.4	45.6	74	-28.4	Peak	Horizontal
2	11000	26.7	7.4	34.1	54	-19.9	Average	Horizontal
3	16500	36.8	12.4	49.1	68.2	-19.1	Peak	Horizontal
4	16500	23.8	12.4	36.2	54	-17.8	Average	Horizontal
5	11000	37.7	7.4	45.1	74	-28.9	Peak	Vertical
6	11000	26.7	7.4	34.1	54	-19.9	Average	Vertical
7	16500	36.2	12.4	48.6	68.2	-19.6	Peak	Vertical
8	16500	23.7	12.4	36.1	54	-17.9	Average	Vertical
IEEE 802.11a_Channel 120								
1	11200	40.3	7.3	47.6	74	-26.4	Peak	Horizontal
2	11200	25.4	7.3	32.7	54	-21.3	Average	Horizontal
3	16800	35.1	12.6	47.7	68.2	-20.5	Peak	Horizontal
4	16800	24.3	12.6	36.9	54	-17.1	Average	Horizontal
5	11200	38.9	7.3	46.2	74	-27.8	Peak	Vertical
6	11200	25.5	7.3	32.8	54	-21.2	Average	Vertical
7	16800	36.5	12.6	49.1	68.2	-19.1	Peak	Vertical
8	16800	24.3	12.6	37.0	54	-17.0	Average	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
IEEE 802.11a_Channel 140								
1	11400	39.2	7.2	46.4	74	-27.6	Peak	Horizontal
2	11400	25.0	7.2	32.2	54	-21.8	Average	Horizontal
3	17100	33.6	12.9	46.5	68.2	-21.7	Peak	Horizontal
4	17100	22.5	12.9	35.4	54	-18.6	Average	Horizontal
5	11400	37.7	7.2	44.8	74	-29.2	Peak	Vertical
6	11400	25.0	7.2	32.1	54	-21.9	Average	Vertical
7	17100	35.5	12.9	48.4	68.2	-19.8	Peak	Vertical
8	17100	22.5	12.9	35.4	54	-18.6	Average	Vertical
IEEE 802.11a_Channel 149								
1	11490	37.2	7.1	44.2	74	-29.8	Peak	Horizontal
2	11490	25.5	7.1	32.6	54	-21.4	Average	Horizontal
3	17235	36.0	13.1	49.1	68.2	-19.1	Peak	Horizontal
4	17235	23.2	13.1	36.3	54	-17.7	Average	Horizontal
5	11490	37.6	7.1	44.7	74	-29.3	Peak	Vertical
6	11490	25.4	7.1	32.5	54	-21.5	Average	Vertical
7	17235	34.6	13.1	47.7	68.2	-20.5	Peak	Vertical
8	17235	23.2	13.1	36.3	54	-17.7	Average	Vertical
IEEE 802.11a_Channel 157								
1	11570	38.1	7.2	45.3	74	-28.7	Peak	Horizontal
2	11570	25.0	7.2	32.2	54	-21.8	Average	Horizontal
3	17355	35.7	13.3	49.0	68.2	-19.2	Peak	Horizontal
4	17355	23.4	13.3	36.7	54	-17.3	Average	Horizontal
5	11570	37.6	7.2	44.8	74	-29.2	Peak	Vertical
6	11570	26.9	7.2	34.1	54	-19.9	Average	Vertical
7	17355	33.5	13.3	46.8	68.2	-21.4	Peak	Vertical
8	17355	23.5	13.3	36.8	54	-17.2	Average	Vertical
IEEE 802.11a_Channel 165								
1	11650	37.7	7.3	45.0	74	-29.0	Peak	Horizontal
2	11650	25.8	7.3	33.1	54	-20.9	Average	Horizontal
3	17475	35.2	13.5	48.7	68.2	-19.5	Peak	Horizontal
4	17475	23.0	13.5	36.5	54	-17.5	Average	Horizontal
5	11650	39.1	7.3	46.4	74	-27.6	Peak	Vertical
6	11650	26.3	7.3	33.6	54	-20.4	Average	Vertical
7	17475	35.7	13.5	49.2	68.2	-19.0	Peak	Vertical
8	17475	22.9	13.5	36.4	54	-17.6	Average	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
IEEE 802.11n-HT20_Channel 36								
1	10360	39.0	6.2	45.2	68.2	-23.0	Peak	Horizontal
2	10360	25.6	6.2	31.8	54	-22.2	Average	Horizontal
3	15540	35.5	11.3	46.7	74	-27.3	Peak	Horizontal
4	15540	23.7	11.3	35.0	54	-19.0	Average	Horizontal
5	10360	38.1	6.2	44.3	68.2	-23.9	Peak	Vertical
6	10360	25.8	6.2	32.1	54	-21.9	Average	Vertical
7	15540	38.6	11.3	49.8	74	-24.2	Peak	Vertical
8	15540	23.8	11.3	35.1	54	-18.9	Average	Vertical
IEEE 802.11n-HT20_Channel 44								
1	10440	37.3	6.3	43.6	68.2	-24.6	Peak	Horizontal
2	10440	25.7	6.3	32.0	54	-22.0	Average	Horizontal
3	15660	35.6	11.4	47.0	74	-27.0	Peak	Horizontal
4	15660	24.2	11.4	35.6	54	-18.4	Average	Horizontal
5	10440	37.7	6.3	44.0	68.2	-24.2	Peak	Vertical
6	10440	25.6	6.3	31.9	54	-22.1	Average	Vertical
7	15660	35.7	11.4	47.1	74	-26.9	Peak	Vertical
8	15660	24.1	11.4	35.5	54	-18.5	Average	Vertical
IEEE 802.11n-HT20_Channel 48								
1	10480	40.4	6.3	46.7	68.2	-21.5	Peak	Horizontal
2	10480	27.4	6.3	33.7	54	-20.3	Average	Horizontal
3	15720	35.5	11.5	46.9	74	-27.1	Peak	Horizontal
4	15720	24.1	11.5	35.6	54	-18.4	Average	Horizontal
5	10480	37.8	6.3	44.1	68.2	-24.1	Peak	Vertical
6	10480	24.4	6.3	30.7	54	-23.3	Average	Vertical
7	15720	34.9	11.5	46.4	74	-27.6	Peak	Vertical
8	15720	24.0	11.5	35.5	54	-18.5	Average	Vertical
IEEE 802.11n-HT20_Channel 52								
1	10520	39.1	6.4	45.5	68.2	-22.7	Peak	Horizontal
2	10520	24.5	6.4	30.9	54	-23.1	Average	Horizontal
3	15780	34.1	11.6	45.6	74	-28.4	Peak	Horizontal
4	15780	24.0	11.6	35.5	54	-18.5	Average	Horizontal
5	10520	38.9	6.4	45.3	68.2	-22.9	Peak	Vertical
6	10520	24.2	6.4	30.6	54	-23.4	Average	Vertical
7	15780	34.3	11.6	45.9	74	-28.1	Peak	Vertical
8	15780	24.1	11.6	35.7	54	-18.3	Average	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
IEEE 802.11n-HT20_Channel 60								
1	10600	38.0	6.6	44.6	74	-29.4	Peak	Horizontal
2	10600	28.4	6.6	34.9	54	-19.1	Average	Horizontal
3	15900	34.8	11.7	46.5	74	-27.5	Peak	Horizontal
4	15900	24.6	11.7	36.3	54	-17.7	Average	Horizontal
5	10600	38.1	6.6	44.7	74	-29.3	Peak	Vertical
6	10600	27.2	6.6	33.7	54	-20.3	Average	Vertical
7	15900	35.2	11.7	46.9	74	-27.1	Peak	Vertical
8	15900	24.2	11.7	35.9	54	-18.1	Average	Vertical
IEEE 802.11n-HT20_Channel 64								
1	10640	38.6	6.6	45.2	74	-28.8	Peak	Horizontal
2	10640	22.8	6.6	29.4	54	-24.6	Average	Horizontal
3	15960	35.2	11.8	47.0	74	-27.0	Peak	Horizontal
4	15960	24.2	11.8	35.9	54	-18.1	Average	Horizontal
5	10640	38.5	6.6	45.1	74	-28.9	Peak	Vertical
6	10640	22.9	6.6	29.5	54	-24.5	Average	Vertical
7	15960	34.6	11.8	46.3	74	-27.7	Peak	Vertical
8	15960	24.1	11.8	35.8	54	-18.2	Average	Vertical
IEEE 802.11n-HT20_Channel 100								
1	11000	39.5	7.4	46.9	74	-27.1	Peak	Horizontal
2	11000	26.4	7.4	33.9	54	-20.1	Average	Horizontal
3	16500	35.8	12.4	48.2	68.2	-20.0	Peak	Horizontal
4	16500	23.5	12.4	35.9	54	-18.1	Average	Horizontal
5	11000	37.4	7.4	44.8	74	-29.2	Peak	Vertical
6	11000	26.4	7.4	33.8	54	-20.2	Average	Vertical
7	16500	34.8	12.4	47.2	68.2	-21.0	Peak	Vertical
8	16500	23.5	12.4	35.9	54	-18.1	Average	Vertical
IEEE 802.11n-HT20_Channel 120								
1	11200	36.3	7.3	43.6	74	-30.4	Peak	Horizontal
2	11200	25.0	7.3	32.3	54	-21.7	Average	Horizontal
3	16800	34.7	12.6	47.3	68.2	-20.9	Peak	Horizontal
4	16800	24.3	12.6	36.9	54	-17.1	Average	Horizontal
5	11200	37.2	7.3	44.5	74	-29.5	Peak	Vertical
6	11200	25.4	7.3	32.7	54	-21.3	Average	Vertical
7	16800	35.0	12.6	47.6	68.2	-20.6	Peak	Vertical
8	16800	24.0	12.6	36.6	54	-17.4	Average	Vertical