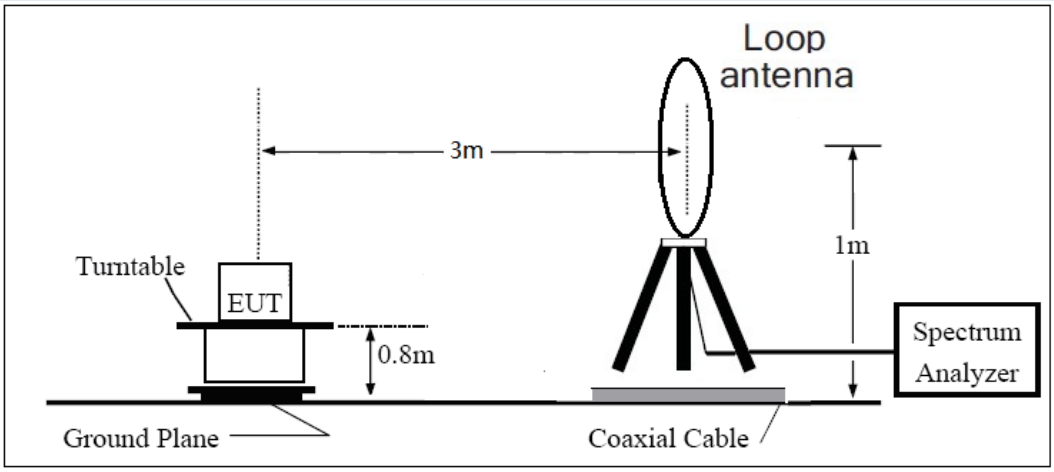
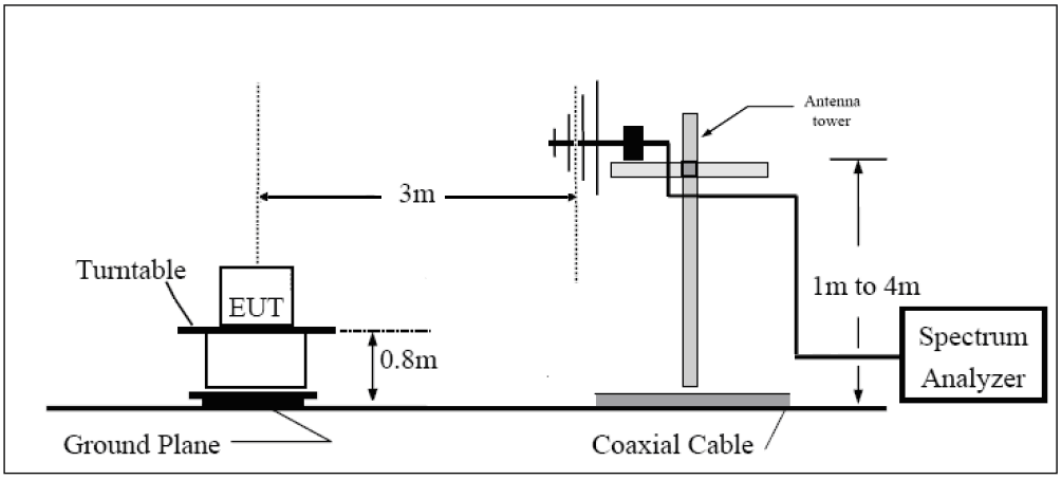
Test setup

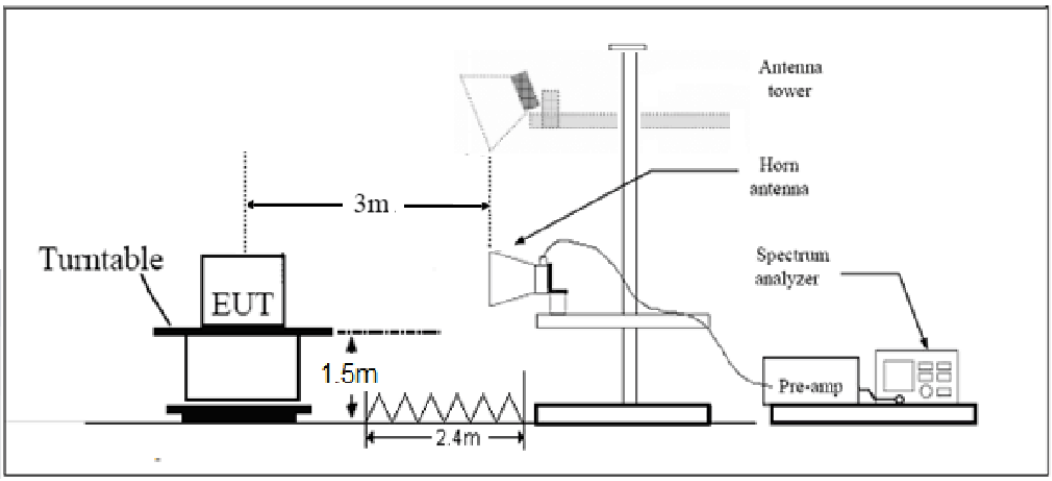
9KHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

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Limits

Rule Part 15.247(d) specifies that "In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c))."

Limit in restricted band

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
0.009–0.490	2400/F(kHz)	/
0.490–1.705	24000/F(kHz)	/
1.705–30.0	30	/
30-88	100	40
88-216	150	43.5
216-960	200	46
Above960	500	54

§15.35(b)

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

Peak Limit=74 dBuV/m

Average Limit=54 dBuV/m

Spurious Radiated Emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor *k* = 1.96.

Frequency	Uncertainty
9KHz-30MHz	3.55 dB
30MHz-200MHz	4.17 dB
200MHz-1GHz	4.84 dB
1-18GHz	4.35 dB
18-26.5GHz	5.90 dB
26.5GHz~40GHz	5.92 dB

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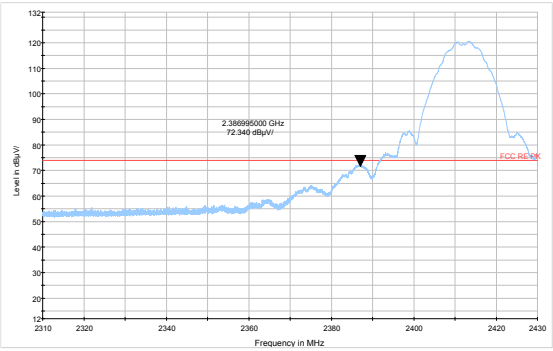
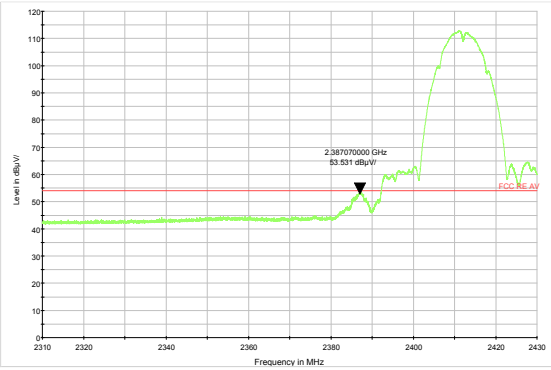
Test Results:

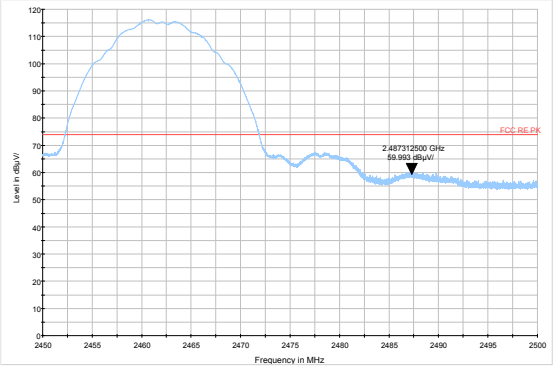
MIMO Antenna



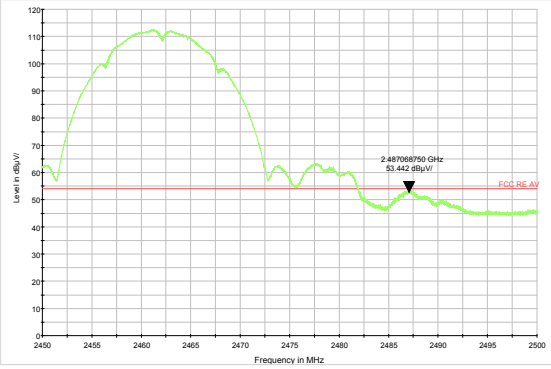
802.11b-Channel 1 Peak



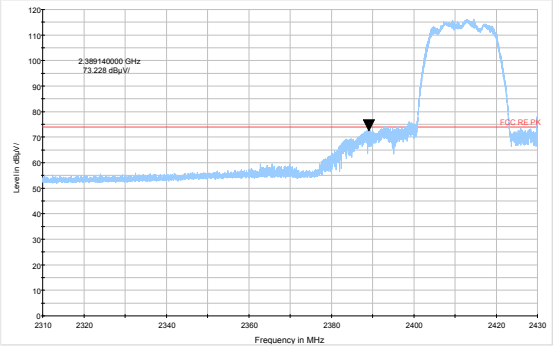
802.11b-Channel 1 Average



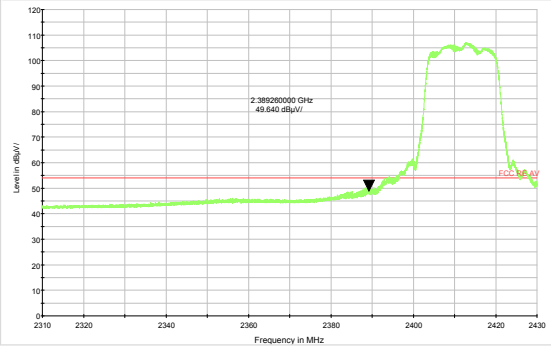
802.11b-Channel 11 Peak



802.11b-Channel 11Average



802.11g-Channel 1 Peak



802.11g-Channel 1 Average

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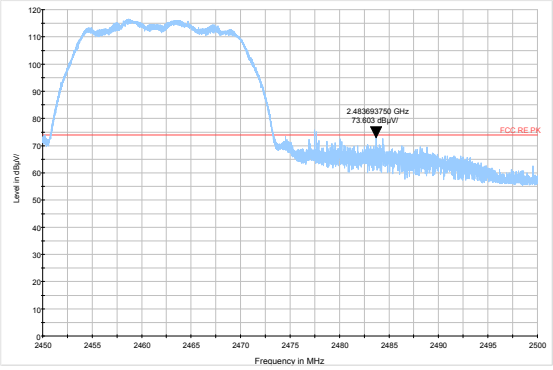
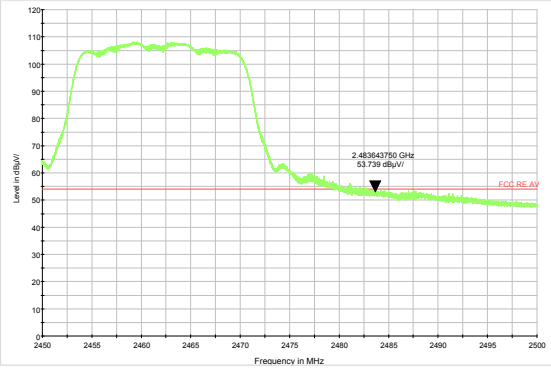
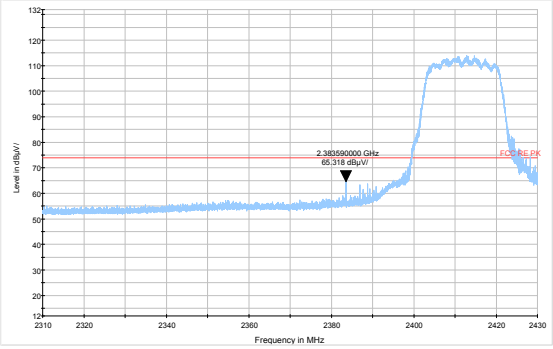


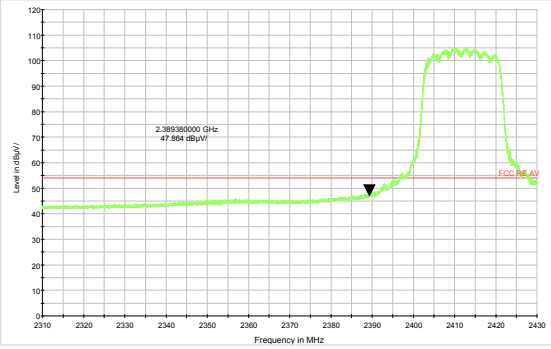
802.11g-Channel 11 Peak



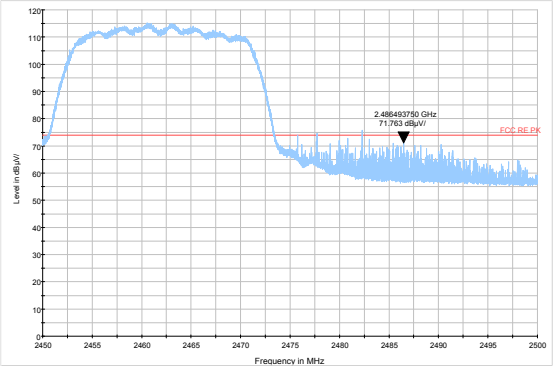
802.11g-Channel 11 Average



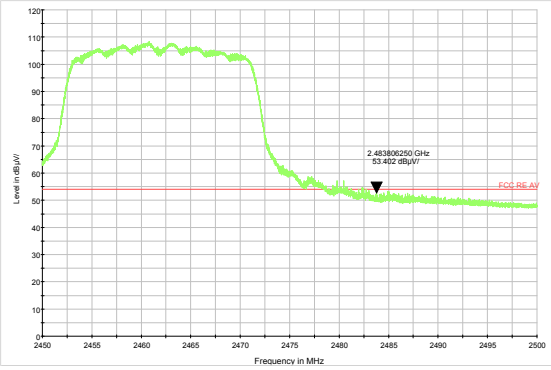
802.11n HT20 -Channel 1 Peak



802.11n HT20 -Channel 1 Average



802.11n HT20 -Channel 11 Peak



802.11n HT20 -Channel 11 Average

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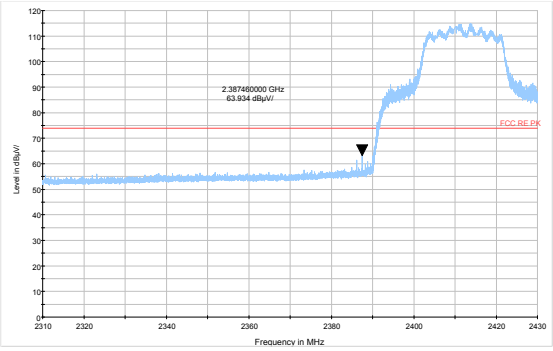
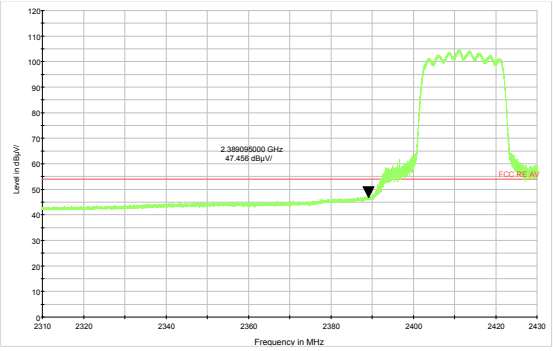
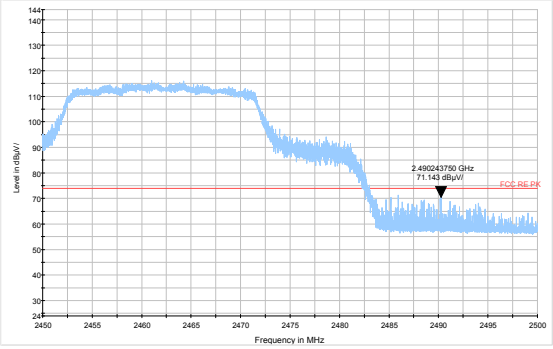


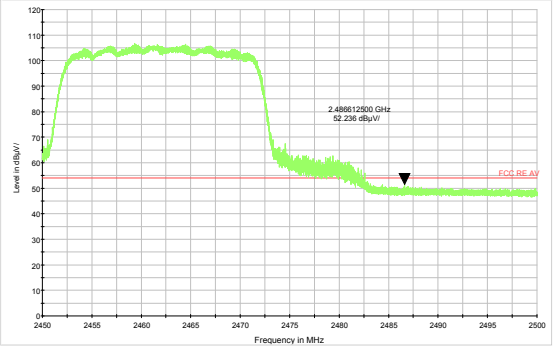
802.11ax HE20 -Channel 1 Peak



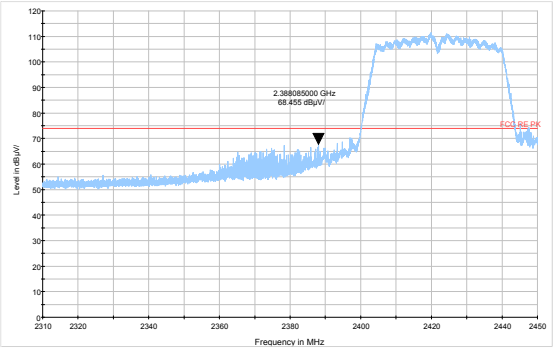
802.11ax HE20 -Channel 1 Average



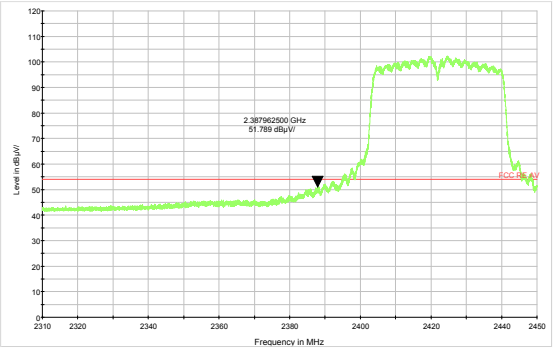
802.11ax HE20 -Channel 11 Peak



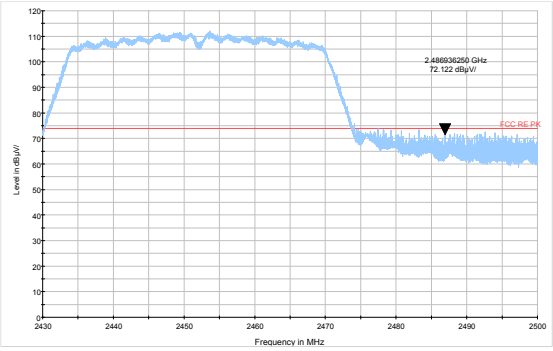
802.11ax HE20 -Channel 11 Average



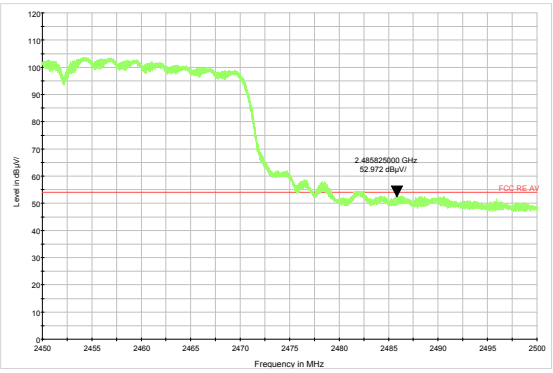
802.11n HT40 –Channel 3 Peak



802.11n HT40 -Channel 3 Average



802.11n HT40 -Channel 9 Peak



802.11n HT40 -Channel 9 Average

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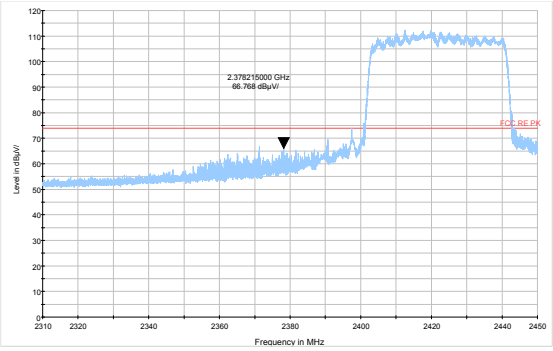
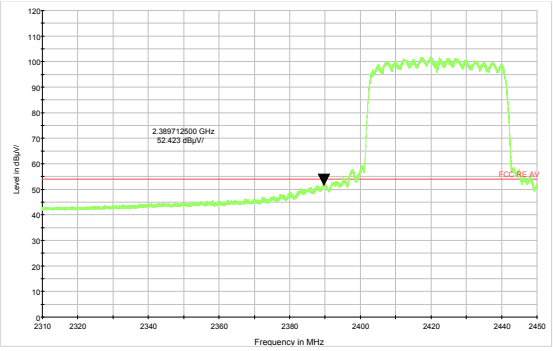
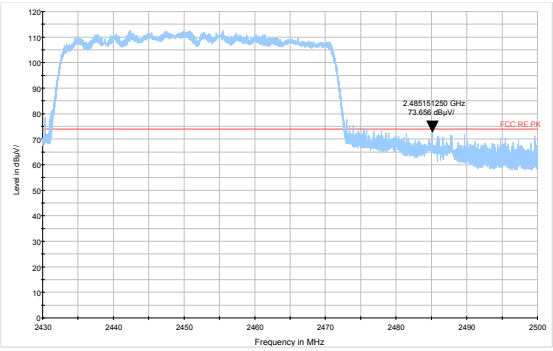


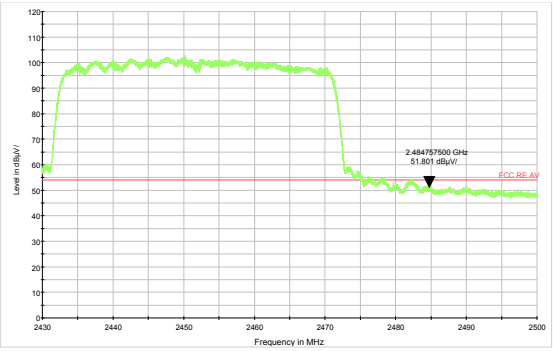
802.11ax HE40 –Channel 3 Peak



802.11ax HE40 -Channel 3 Average



802.11ax HE40 -Channel 9 Peak



802.11ax HE40 -Channel 9 Average

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Result of RE

Test result

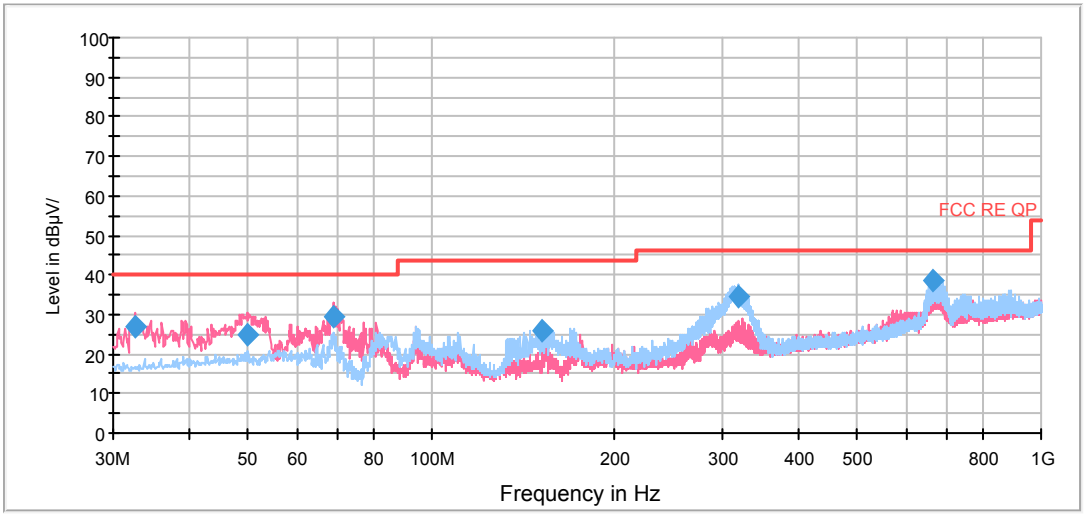
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the Emissions in the frequency band 9kHz-30MHz and 18GHz-26.5GHz are more than 20dB below the limit are not reported.

The following graphs display the maximum values of horizontal and vertical by software.
For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.

During the test, the Radiates Emission from 30MHz to 1GHz was performed in all modes with all channels, 802.11ax HE40, Channel 6 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

MIMO antenna:

Continuous TX mode:



Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
32.586250	27.0	100.0	V	119.0	12.7	13.0	40.0
49.843750	24.8	100.0	V	0.0	14.6	15.2	40.0
69.002500	29.7	114.0	V	279.0	11.1	10.3	40.0
151.573750	26.0	202.0	H	280.0	9.8	17.5	43.5
318.005000	34.5	100.0	H	128.0	16.2	11.5	46.0
664.827500	38.3	125.0	H	224.0	23.1	7.7	46.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)
2. Margin = Limit – Quasi-Peak

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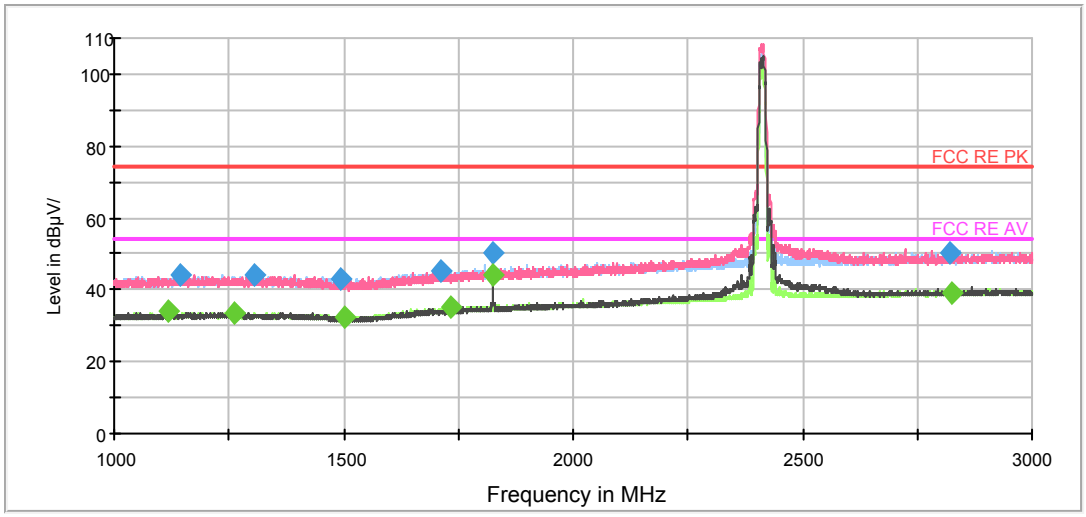
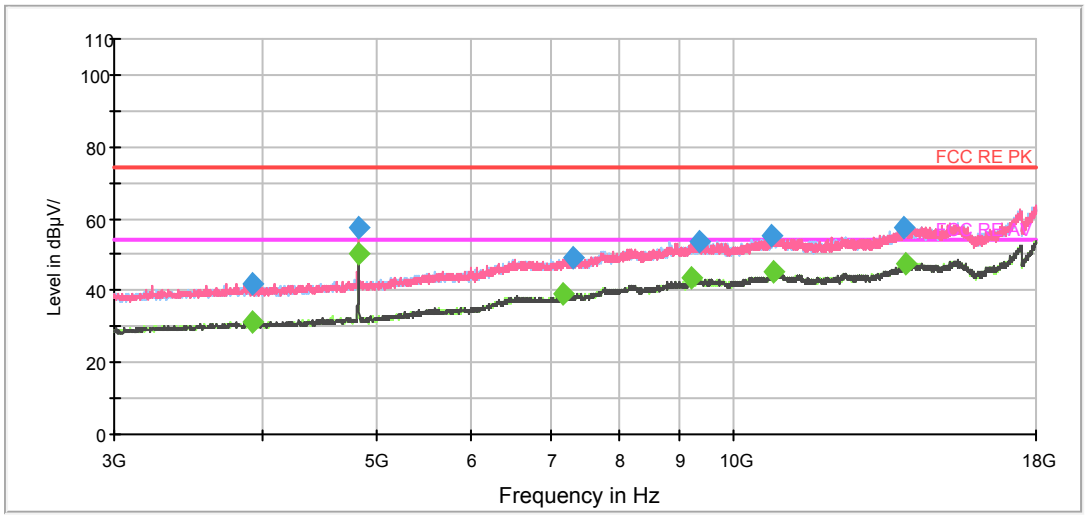
802.11b CH1



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1142.250000	44.0	200.0	H	198.0	-1.3	30.0	74.0
1305.250000	44.1	100.0	H	182.0	-1.0	29.9	74.0
1492.000000	42.9	200.0	V	153.0	-0.4	31.1	74.0
1711.500000	45.3	100.0	V	90.0	0.4	28.7	74.0
1825.750000	50.1	200.0	V	356.0	0.7	23.9	74.0
2822.250000	50.2	100.0	H	132.0	4.4	23.8	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1117.000000	33.8	200.0	H	6.0	-1.4	20.2	54.0
1261.750000	33.7	100.0	H	142.0	-1.1	20.3	54.0
1503.750000	32.5	100.0	V	12.0	-0.4	21.5	54.0
1731.750000	34.9	100.0	H	309.0	0.5	19.1	54.0
1826.000000	44.2	200.0	V	355.0	0.7	9.8	54.0
2824.750000	39.1	100.0	H	0.0	4.4	14.9	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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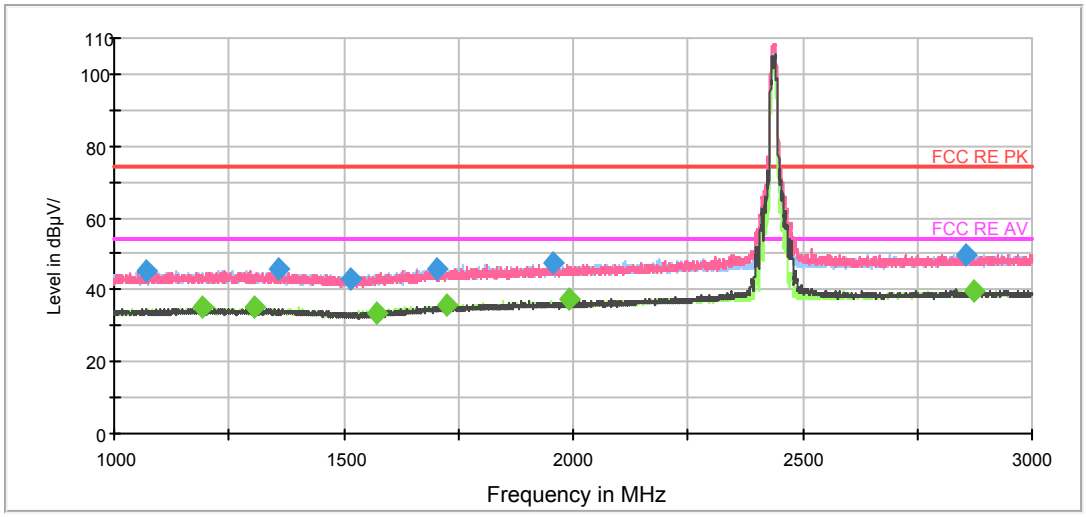
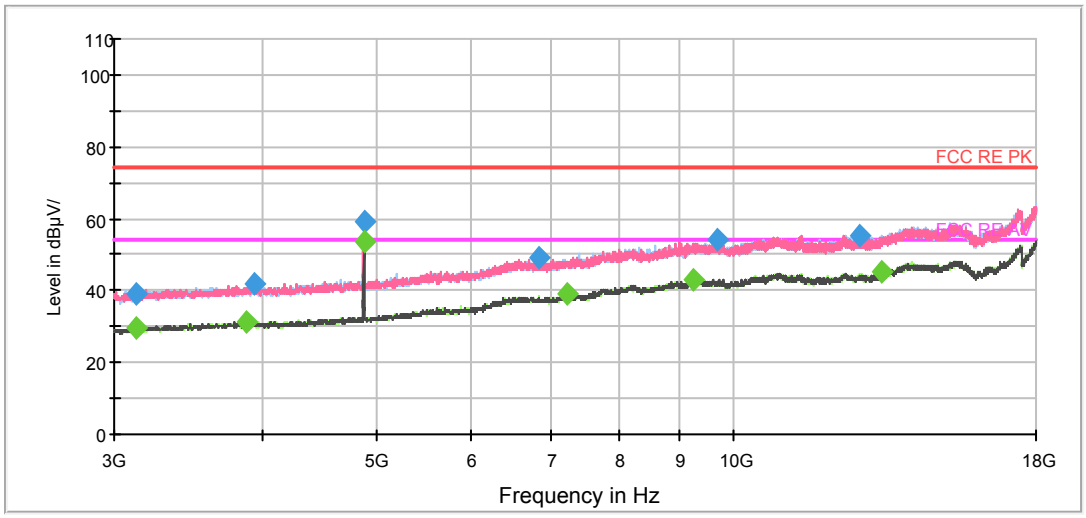
802.11b CH6



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1068.500000	45.2	100.0	V	1.0	-1.5	28.8	74.0
1356.250000	45.5	100.0	H	337.0	-0.9	28.5	74.0
1513.500000	42.9	100.0	H	173.0	-0.4	31.1	74.0
1705.000000	46.0	100.0	H	241.0	0.4	28.0	74.0
1958.500000	47.7	100.0	V	278.0	1.0	26.3	74.0
2857.500000	49.7	100.0	H	358.0	4.4	24.3	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1190.250000	35.0	100.0	H	270.0	-1.2	19.0	54.0
1305.500000	35.0	100.0	V	117.0	-1.0	19.0	54.0
1573.250000	33.6	100.0	H	355.0	-0.1	20.4	54.0
1724.750000	35.7	100.0	V	88.0	0.4	18.3	54.0
1990.500000	37.4	100.0	H	320.0	1.1	16.6	54.0
2872.750000	39.4	100.0	H	212.0	4.5	14.6	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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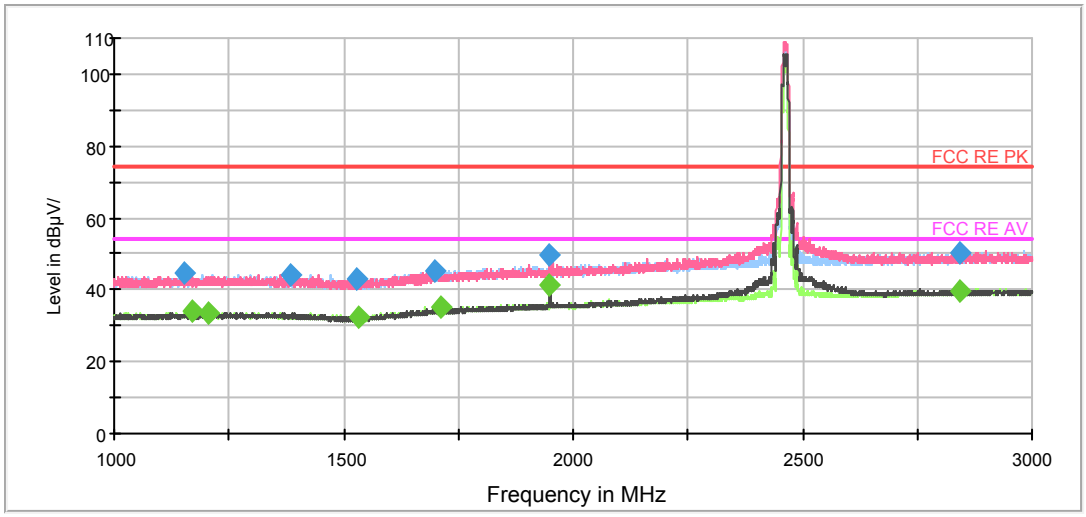
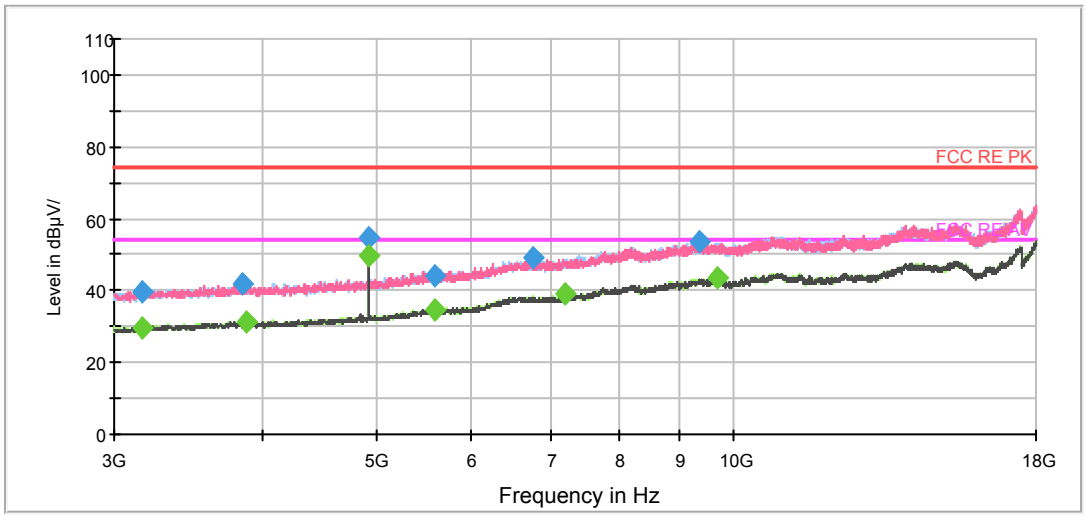
802.11b CH11



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1151.000000	44.7	100.0	H	231.0	-1.3	29.3	74.0
1383.500000	44.2	100.0	H	231.0	-0.7	29.8	74.0
1529.750000	42.9	200.0	V	0.0	-0.3	31.1	74.0
1696.750000	45.2	100.0	H	112.0	0.4	28.8	74.0
1949.500000	49.5	200.0	V	341.0	1.0	24.5	74.0
2840.750000	50.2	200.0	H	2.0	4.4	23.8	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1170.000000	34.2	100.0	H	192.0	-1.3	19.8	54.0
1206.750000	33.8	100.0	V	271.0	-1.2	20.2	54.0
1532.250000	32.4	200.0	H	148.0	-0.3	21.6	54.0
1712.750000	35.0	200.0	H	167.0	0.4	19.0	54.0
1949.250000	41.6	200.0	V	341.0	1.0	12.4	54.0
2841.500000	39.5	100.0	V	43.0	4.4	14.5	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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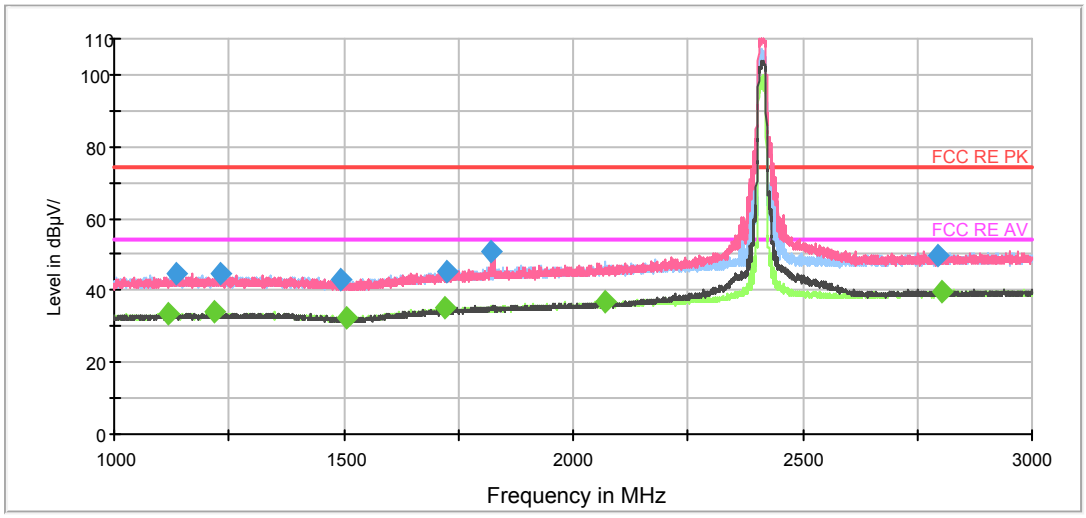
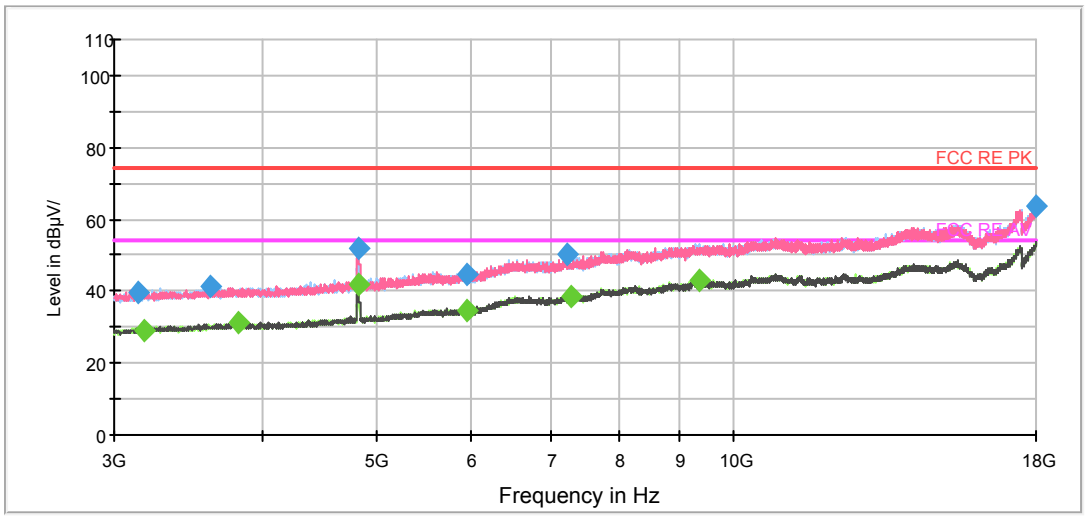
802.11g CH1



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1137.250000	44.6	200.0	V	342.0	-1.3	29.4	74.0
1231.500000	44.6	200.0	V	288.0	-1.2	29.4	74.0
1495.000000	43.2	100.0	V	0.0	-0.4	30.8	74.0
1722.750000	45.3	200.0	H	302.0	0.4	28.7	74.0
1821.250000	50.6	200.0	V	347.0	0.7	23.4	74.0
2794.000000	49.7	200.0	V	258.0	4.3	24.3	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1120.000000	33.8	200.0	V	180.0	-1.4	20.2	54.0
1217.500000	33.9	100.0	V	19.0	-1.2	20.1	54.0
1507.750000	32.7	100.0	V	82.0	-0.4	21.3	54.0
1719.250000	35.1	200.0	H	5.0	0.4	18.9	54.0
2070.500000	37.0	200.0	V	335.0	1.5	17.0	54.0
2802.750000	39.9	100.0	V	4.0	4.3	14.1	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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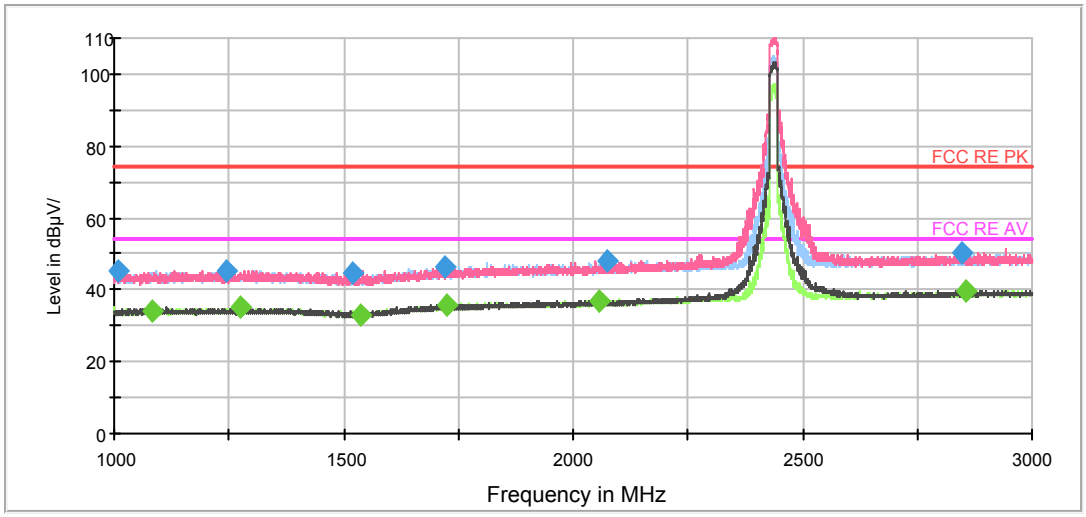
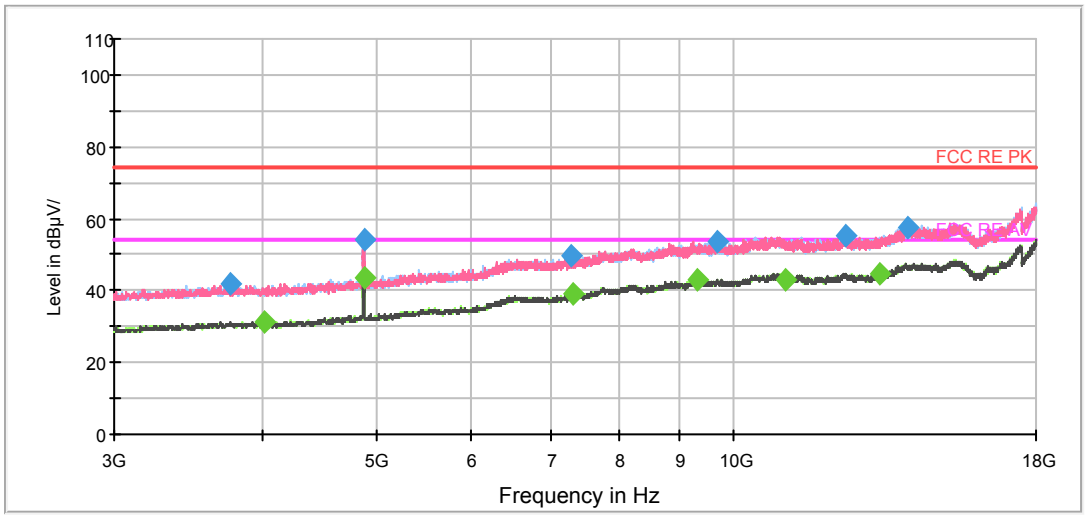
802.11g CH6



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1010.750000	45.2	100.0	V	10.0	-1.9	28.8	74.0
1246.500000	45.3	200.0	V	354.0	-1.1	28.7	74.0
1520.250000	44.5	100.0	H	355.0	-0.3	29.5	74.0
1719.250000	46.2	100.0	H	21.0	0.4	27.8	74.0
2074.500000	48.0	200.0	H	0.0	1.5	26.0	74.0
2847.000000	50.0	100.0	V	228.0	4.4	24.0	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1081.750000	34.2	200.0	H	227.0	-1.5	19.8	54.0
1274.000000	35.4	200.0	H	4.0	-1.1	18.6	54.0
1538.500000	32.9	100.0	H	91.0	-0.3	21.1	54.0
1726.000000	36.0	200.0	V	34.0	0.4	18.0	54.0
2057.750000	37.1	200.0	V	356.0	1.4	16.9	54.0
2857.250000	39.4	100.0	V	239.0	4.4	14.6	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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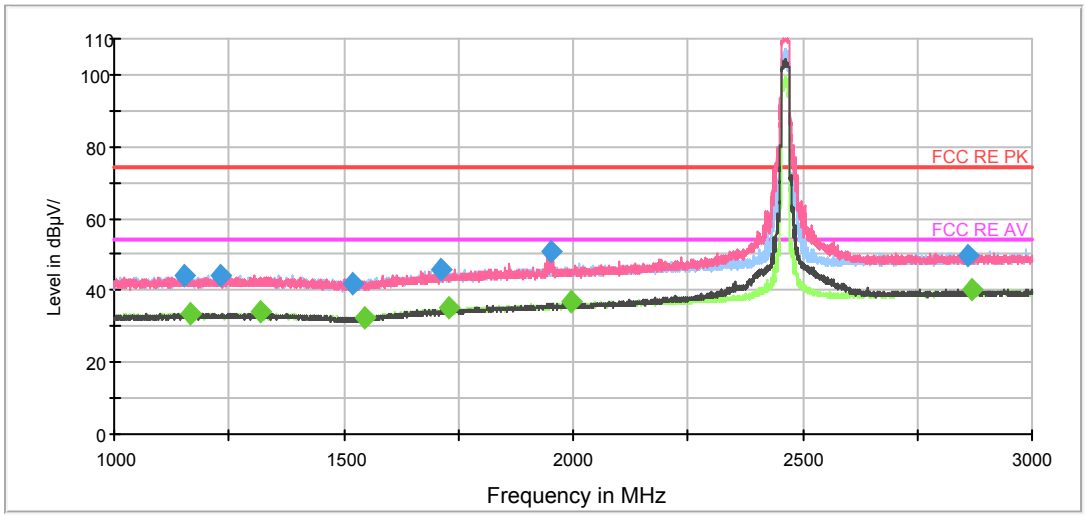
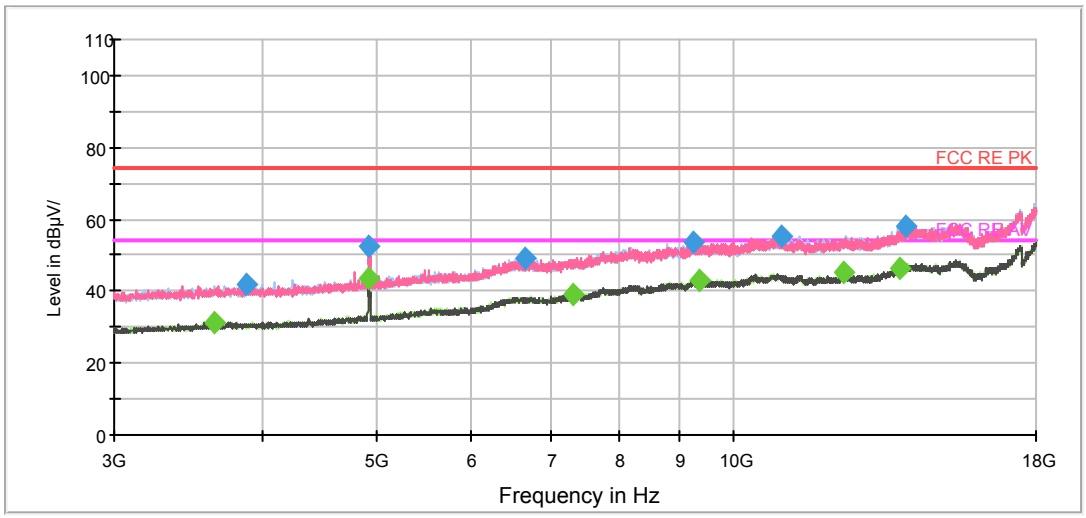
802.11g CH11



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1151.000000	44.2	200.0	V	268.0	-1.3	29.8	74.0
1230.500000	44.1	100.0	V	270.0	-1.2	29.9	74.0
1517.750000	42.0	200.0	H	137.0	-0.3	32.0	74.0
1713.500000	45.7	200.0	H	227.0	0.4	28.3	74.0
1950.750000	51.0	200.0	V	358.0	1.0	23.0	74.0
2858.750000	49.9	100.0	V	199.0	4.4	24.1	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1164.750000	33.7	200.0	V	190.0	-1.3	20.3	54.0
1318.000000	34.1	200.0	V	0.0	-0.9	19.9	54.0
1545.250000	32.5	100.0	H	354.0	-0.2	21.5	54.0
1728.750000	34.9	100.0	V	189.0	0.5	19.1	54.0
1994.750000	36.8	200.0	H	2.0	1.1	17.2	54.0
2869.000000	39.9	200.0	H	12.0	4.4	14.1	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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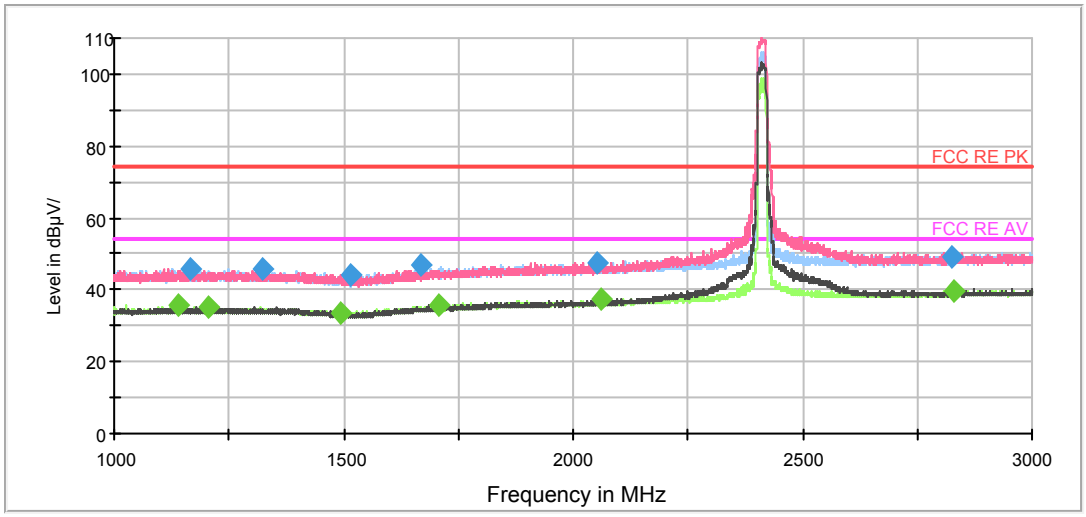
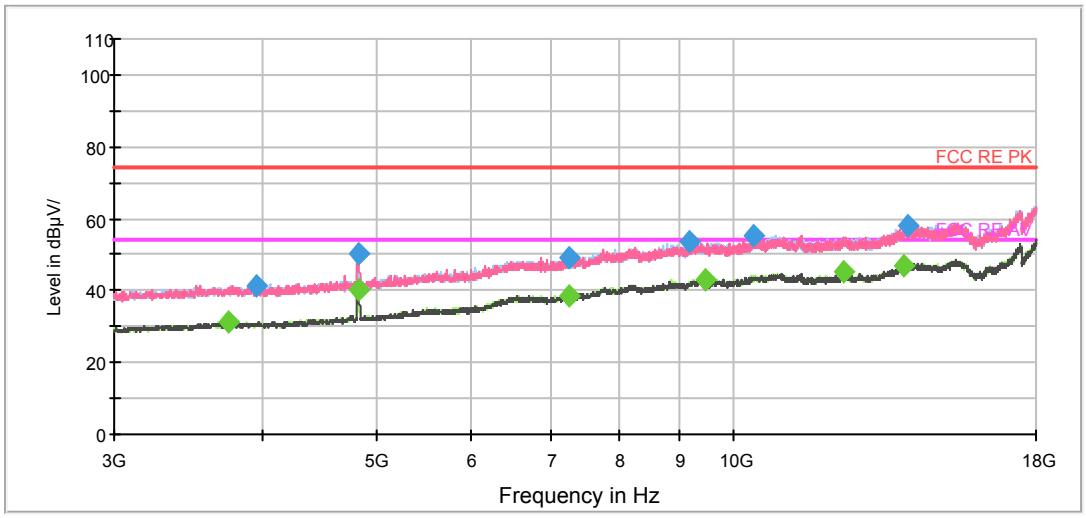
802.11n (HT20) CH1



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1165.000000	46.1	100.0	H	202.0	-1.3	27.9	74.0
1322.750000	46.1	200.0	V	260.0	-0.9	27.9	74.0
1514.750000	43.9	200.0	V	90.0	-0.4	30.1	74.0
1667.500000	46.7	100.0	H	343.0	0.2	27.3	74.0
2053.000000	47.7	200.0	H	21.0	1.4	26.3	74.0
2827.500000	49.1	100.0	V	71.0	4.4	24.9	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1138.250000	35.7	100.0	H	262.0	-1.3	18.3	54.0
1203.500000	35.4	100.0	H	192.0	-1.2	18.6	54.0
1493.750000	33.3	100.0	H	281.0	-0.4	20.7	54.0
1705.500000	35.9	100.0	H	301.0	0.4	18.1	54.0
2061.000000	37.2	200.0	V	191.0	1.4	16.8	54.0
2830.500000	39.7	100.0	H	343.0	4.4	14.3	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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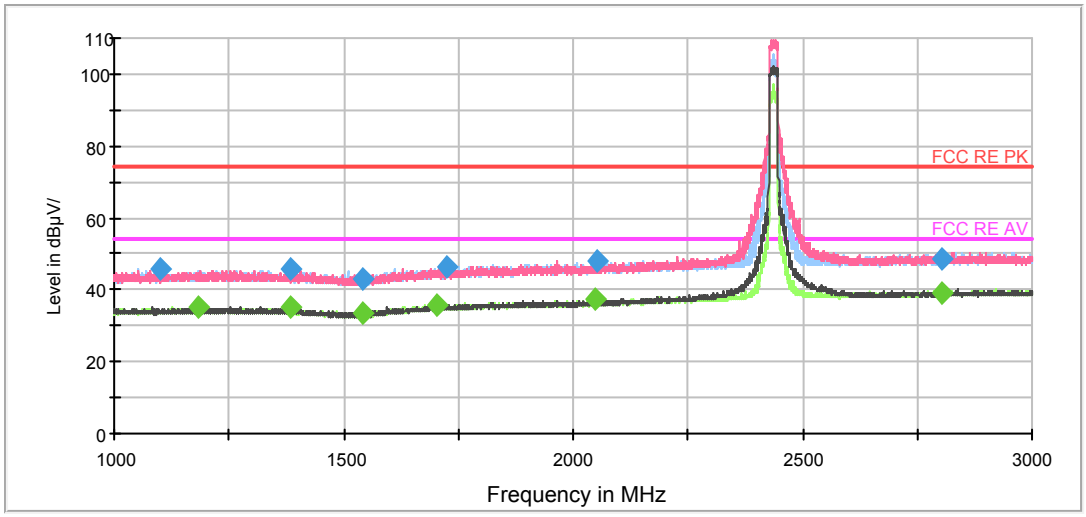
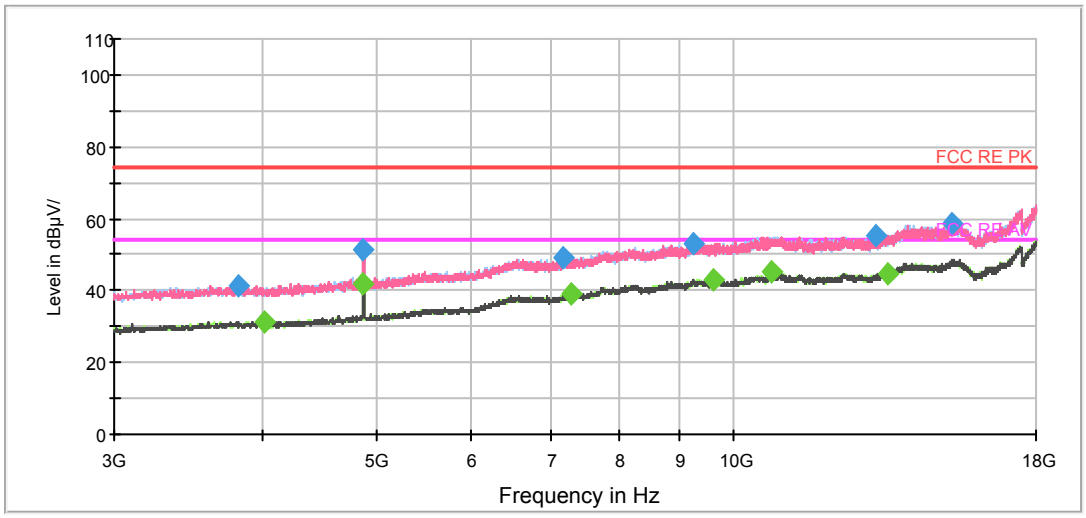
802.11n (HT20) CH6



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1098.500000	45.7	100.0	V	6.0	-1.4	28.3	74.0
1384.750000	45.6	200.0	V	226.0	-0.7	28.4	74.0
1543.500000	43.1	100.0	V	0.0	-0.2	30.9	74.0
1725.000000	46.1	100.0	H	266.0	0.4	27.9	74.0
2054.500000	48.0	200.0	V	332.0	1.4	26.0	74.0
2802.500000	48.7	200.0	V	0.0	4.3	25.3	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1184.750000	35.0	200.0	V	346.0	-1.3	19.0	54.0
1382.750000	35.1	200.0	V	123.0	-0.7	18.9	54.0
1542.000000	33.3	200.0	H	0.0	-0.3	20.7	54.0
1703.500000	35.7	200.0	V	226.0	0.4	18.3	54.0
2047.250000	37.6	100.0	H	0.0	1.4	16.4	54.0
2803.750000	39.1	200.0	H	216.0	4.3	14.9	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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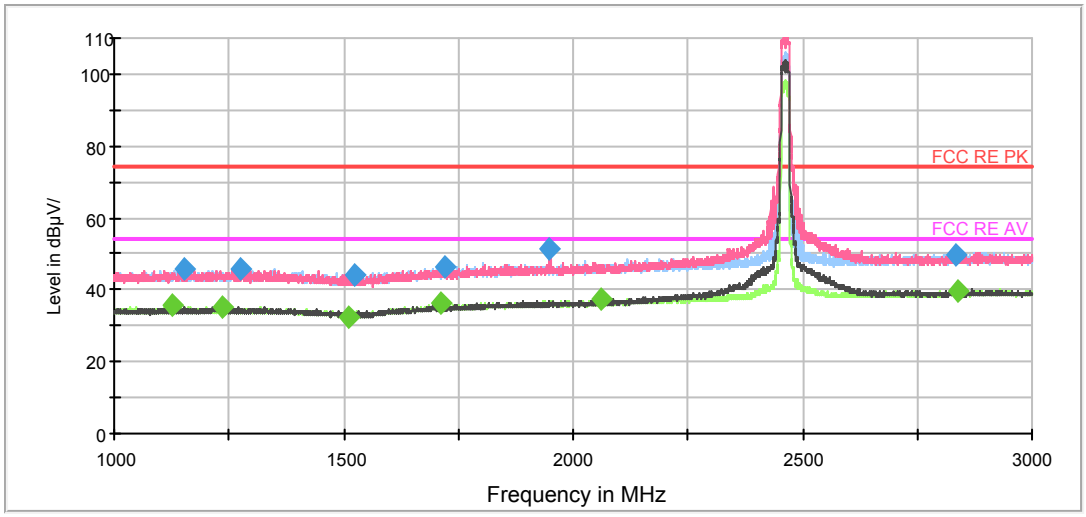
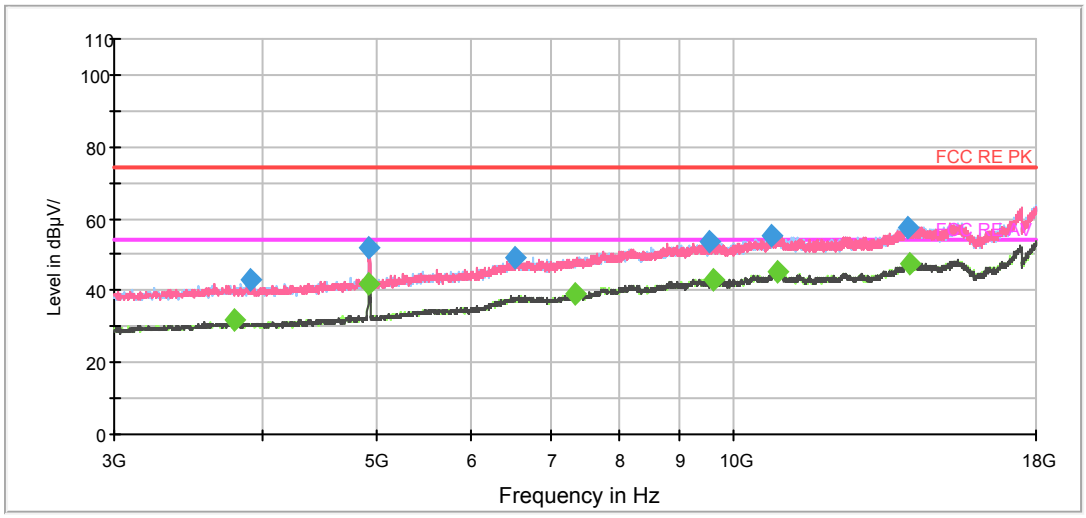
802.11n (HT20) CH11



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1151.250000	45.8	100.0	H	207.0	-1.3	28.2	74.0
1274.500000	45.7	200.0	V	312.0	-1.1	28.3	74.0
1525.750000	43.8	100.0	H	276.0	-0.3	30.2	74.0
1719.000000	46.2	200.0	H	59.0	0.4	27.8	74.0
1947.750000	51.3	200.0	V	359.0	1.0	22.7	74.0
2834.500000	49.7	100.0	V	6.0	4.4	24.3	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1126.500000	35.7	100.0	H	256.0	-1.3	18.3	54.0
1236.750000	35.2	100.0	H	354.0	-1.1	18.8	54.0
1512.000000	32.5	100.0	H	168.0	-0.4	21.5	54.0
1712.500000	36.1	200.0	H	30.0	0.4	17.9	54.0
2062.500000	37.2	100.0	H	0.0	1.5	16.8	54.0
2839.250000	39.8	100.0	V	74.0	4.4	14.2	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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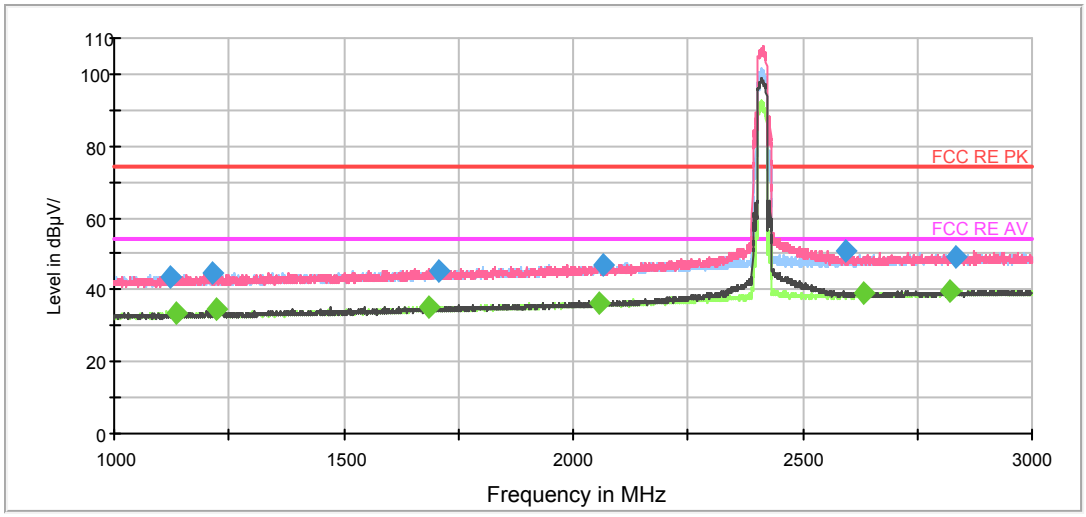
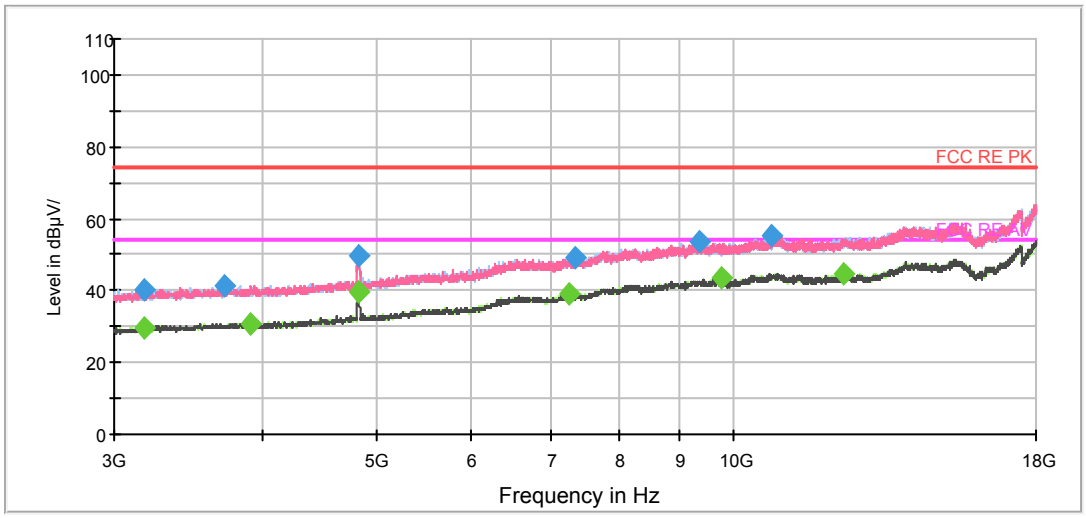
802.11ax (HE20) CH1



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1121.030000	43.5	100.0	H	358.0	-1.4	30.5	74.0
1214.756250	44.6	100.0	V	184.0	-1.2	29.4	74.0
1705.571250	45.0	200.0	H	160.0	0.4	29.0	74.0
2063.502500	47.1	200.0	V	352.0	1.5	26.9	74.0
2594.032500	50.6	200.0	V	359.0	3.8	23.4	74.0
2832.720000	49.3	200.0	H	60.0	4.4	24.7	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1137.461250	33.5	100.0	H	181.0	-1.3	12.8	54.0
1223.192500	34.5	200.0	H	204.0	-1.2	13.2	54.0
1686.136250	35.4	100.0	H	8.0	0.3	13.1	54.0
2058.206250	36.5	100.0	H	88.0	1.4	10.1	54.0
2631.457500	39.0	100.0	H	172.0	3.9	8.8	54.0
2822.436250	39.6	100.0	V	256.0	4.4	7.8	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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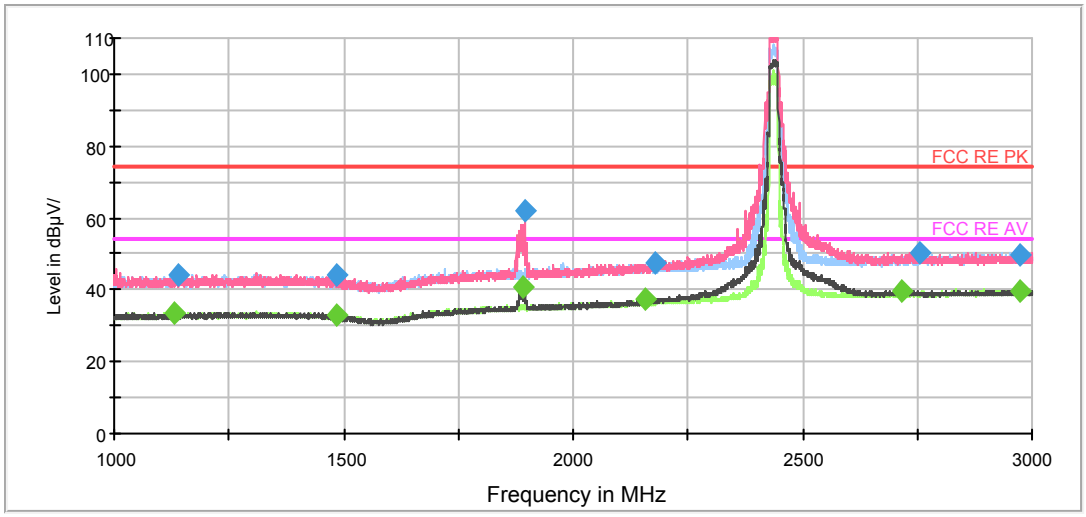
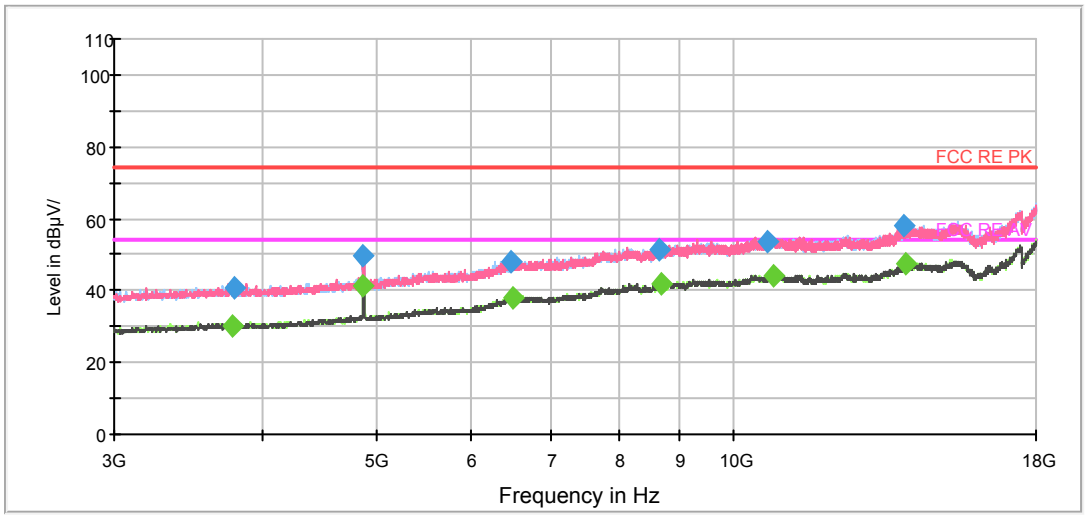
802.11ax (HE20) CH6



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1138.750000	43.9	200.0	V	253.0	-1.3	30.1	74.0
1486.000000	44.0	100.0	V	27.0	-0.5	30.0	74.0
1896.250000	62.0	200.0	V	356.0	0.9	12.0	74.0
2177.500000	47.3	200.0	H	196.0	2.1	26.7	74.0
2755.500000	50.5	100.0	H	358.0	4.2	23.5	74.0
2972.250000	49.6	100.0	H	0.0	4.7	24.4	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1130.250000	33.4	200.0	H	206.0	-1.3	20.6	54.0
1483.250000	33.0	200.0	H	2.0	-0.5	21.0	54.0
1890.750000	40.8	200.0	V	0.0	0.8	13.2	54.0
2158.000000	37.4	100.0	V	20.0	2.0	16.6	54.0
2715.750000	39.6	100.0	V	6.0	4.1	14.4	54.0
2975.500000	39.7	100.0	H	0.0	4.7	14.3	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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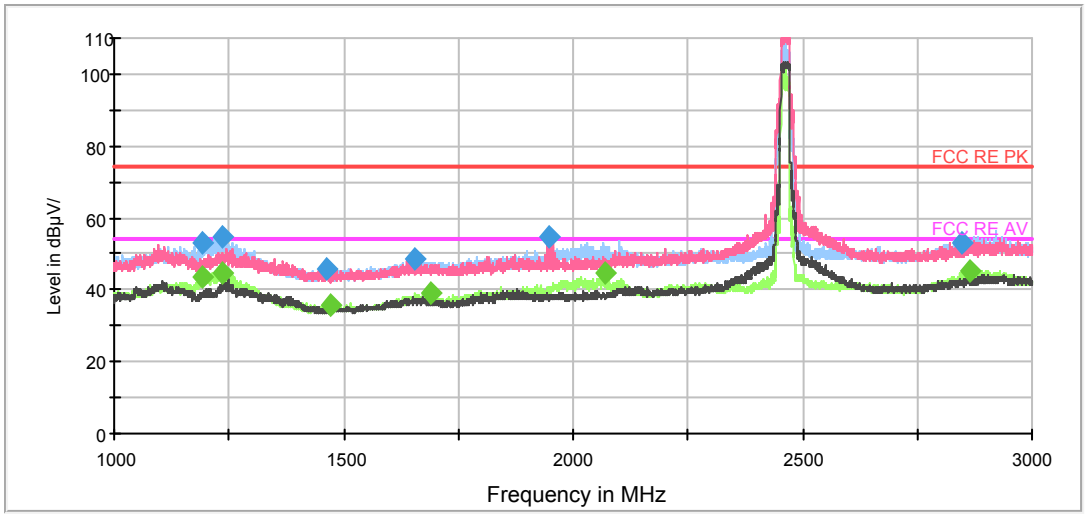
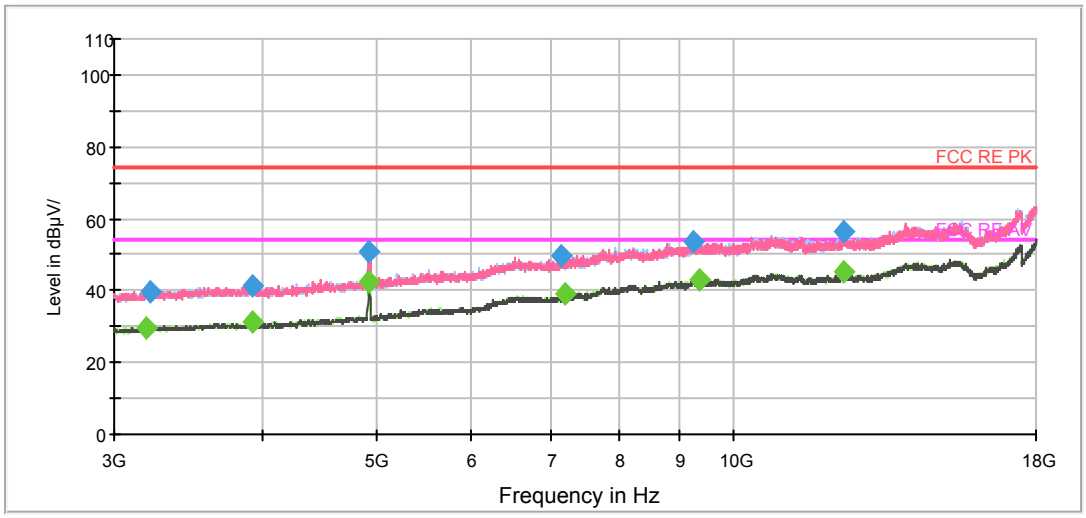
802.11ax (HE20) CH11



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1193.000000	52.9	200.0	H	182.0	-1.2	21.1	74.0
1237.750000	54.6	100.0	H	184.0	-1.1	19.4	74.0
1461.500000	45.6	100.0	V	205.0	-0.5	28.4	74.0
1654.000000	48.6	200.0	H	204.0	0.2	25.4	74.0
1948.500000	54.5	100.0	V	35.0	1.0	19.5	74.0
2846.000000	53.1	100.0	H	327.0	4.4	20.9	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1194.000000	43.4	200.0	H	182.0	-1.2	10.6	54.0
1235.250000	44.6	200.0	H	204.0	-1.1	9.4	54.0
1472.000000	35.5	200.0	H	163.0	-0.5	18.5	54.0
1689.750000	39.2	100.0	H	207.0	0.4	14.8	54.0
2070.750000	44.6	100.0	H	207.0	1.5	9.4	54.0
2865.500000	45.0	100.0	H	336.0	4.4	9.0	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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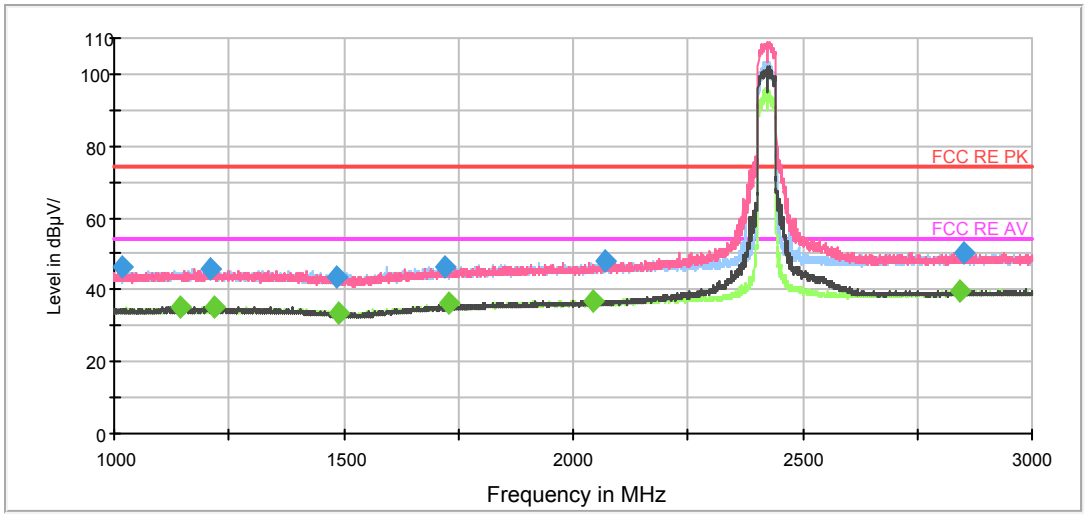
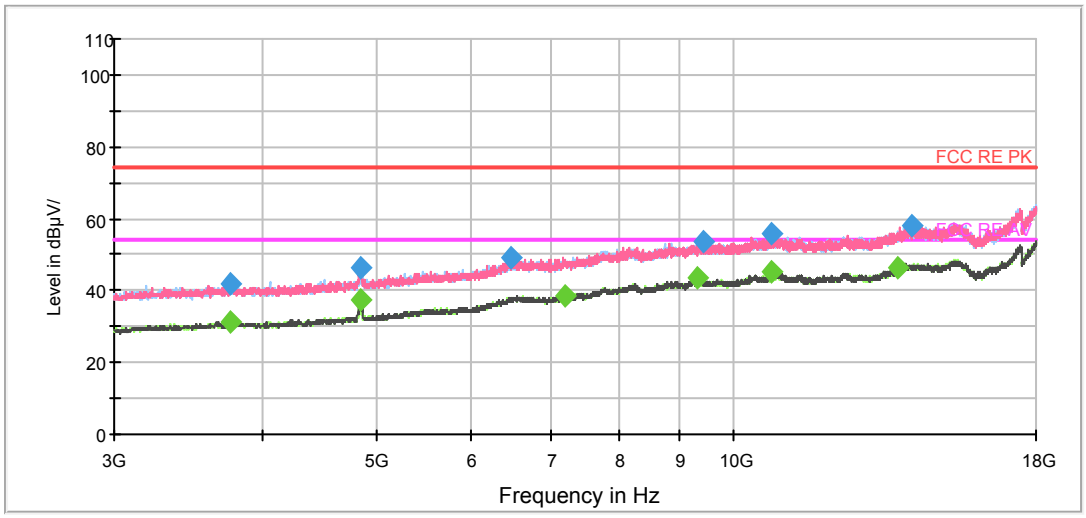
802.11n (HT40) CH3



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1018.000000	46.2	200.0	H	202.0	-1.8	27.8	74.0
1210.500000	45.6	100.0	V	164.0	-1.2	28.4	74.0
1485.750000	43.5	200.0	H	192.0	-0.5	30.5	74.0
1722.500000	46.5	200.0	H	113.0	0.4	27.5	74.0
2071.750000	47.9	100.0	H	357.0	1.5	26.1	74.0
2853.000000	50.1	100.0	H	267.0	4.4	23.9	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1145.750000	35.3	200.0	H	103.0	-1.3	18.7	54.0
1218.500000	35.3	100.0	H	286.0	-1.2	18.7	54.0
1488.000000	33.3	200.0	H	6.0	-0.4	20.7	54.0
1730.750000	36.4	200.0	V	230.0	0.5	17.6	54.0
2044.500000	37.0	100.0	V	312.0	1.4	17.0	54.0
2841.750000	39.5	100.0	H	267.0	4.4	14.5	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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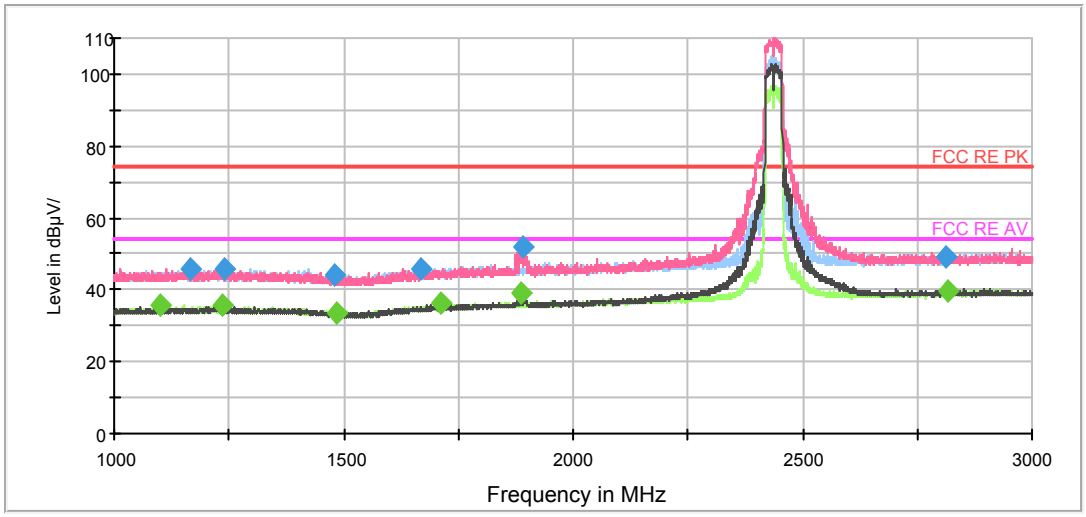
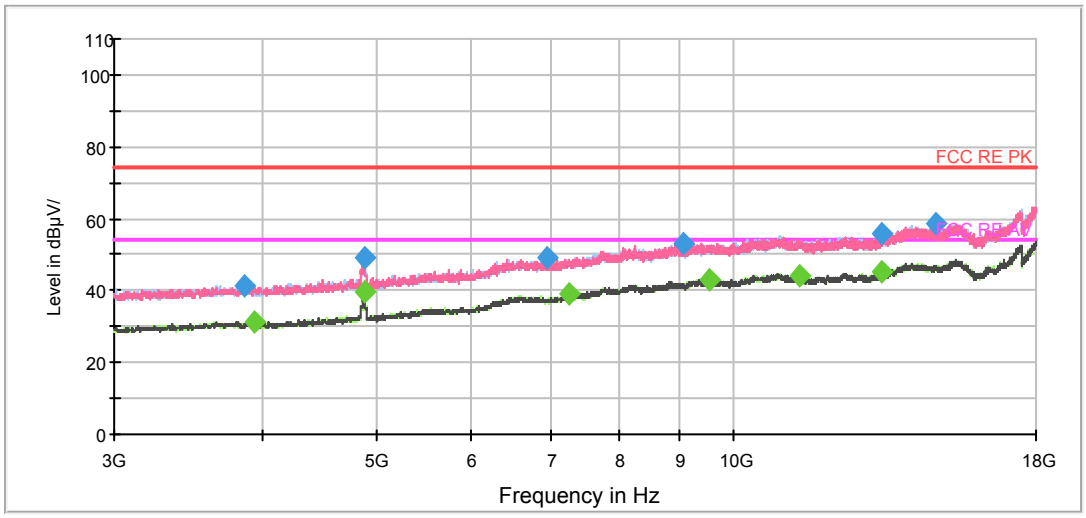
802.11n (HT40) CH6



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1166.000000	45.8	100.0	V	148.0	-1.3	28.2	74.0
1239.000000	45.8	200.0	V	328.0	-1.1	28.2	74.0
1480.500000	44.1	100.0	H	358.0	-0.5	29.9	74.0
1668.000000	46.1	200.0	H	26.0	0.2	27.9	74.0
1889.000000	51.8	200.0	V	348.0	0.8	22.2	74.0
2813.000000	49.2	100.0	H	358.0	4.3	24.8	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1101.500000	35.6	100.0	V	217.0	-1.4	18.4	54.0
1234.500000	35.5	100.0	V	4.0	-1.2	18.5	54.0
1484.000000	33.3	200.0	H	68.0	-0.5	20.7	54.0
1710.500000	36.2	200.0	H	246.0	0.4	17.8	54.0
1884.500000	38.8	200.0	V	356.0	0.8	15.2	54.0
2815.250000	39.4	200.0	V	142.0	4.3	14.6	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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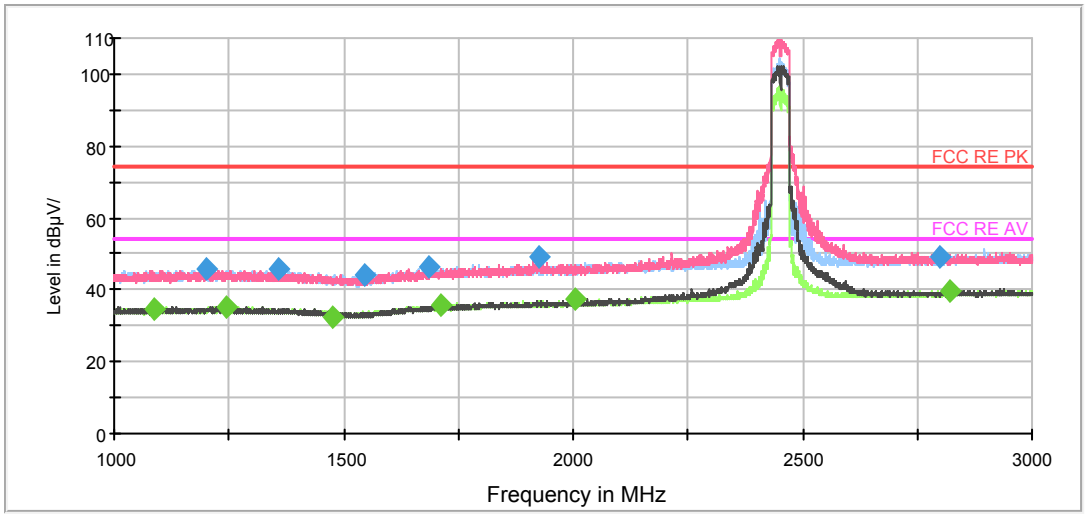
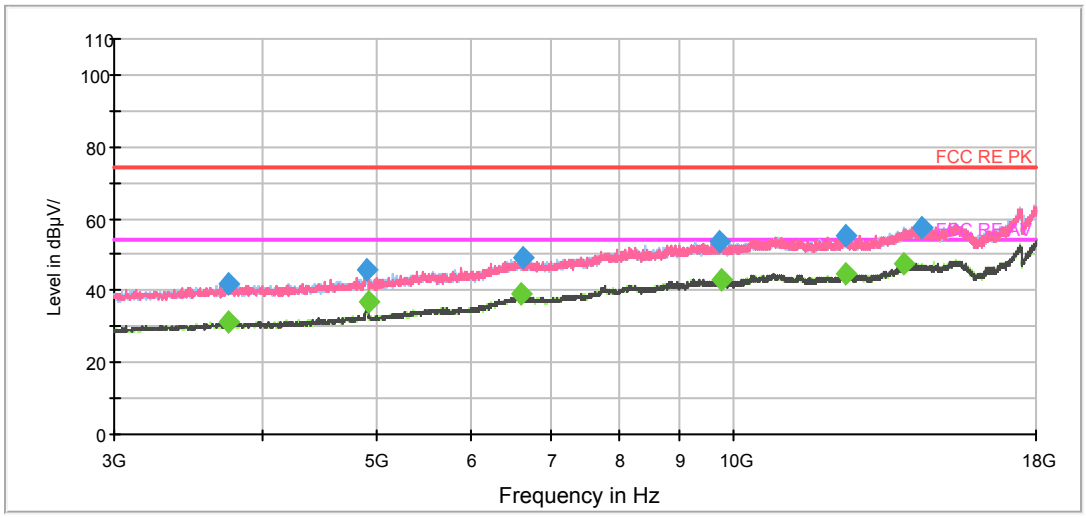
802.11n (HT40) CH9



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1200.750000	46.0	100.0	H	213.0	-1.2	28.0	74.0
1359.500000	45.8	100.0	V	228.0	-0.8	28.2	74.0
1547.750000	44.2	200.0	V	336.0	-0.2	29.8	74.0
1686.250000	46.2	200.0	V	230.0	0.3	27.8	74.0
1926.500000	48.9	200.0	V	343.0	1.0	25.1	74.0
2799.500000	48.9	100.0	V	2.0	4.3	25.1	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1088.000000	34.6	200.0	H	68.0	-1.4	19.4	54.0
1242.500000	35.3	200.0	H	196.0	-1.1	18.7	54.0
1474.250000	32.6	100.0	H	355.0	-0.5	21.4	54.0
1711.250000	35.8	100.0	H	356.0	0.4	18.2	54.0
2004.250000	37.3	100.0	H	222.0	1.1	16.7	54.0
2819.250000	39.4	100.0	V	50.0	4.4	14.6	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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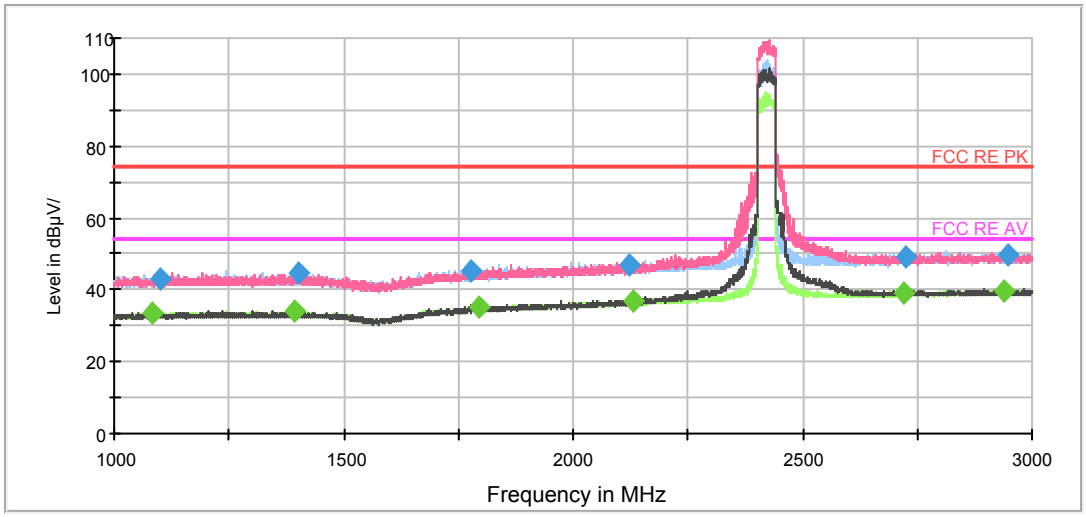
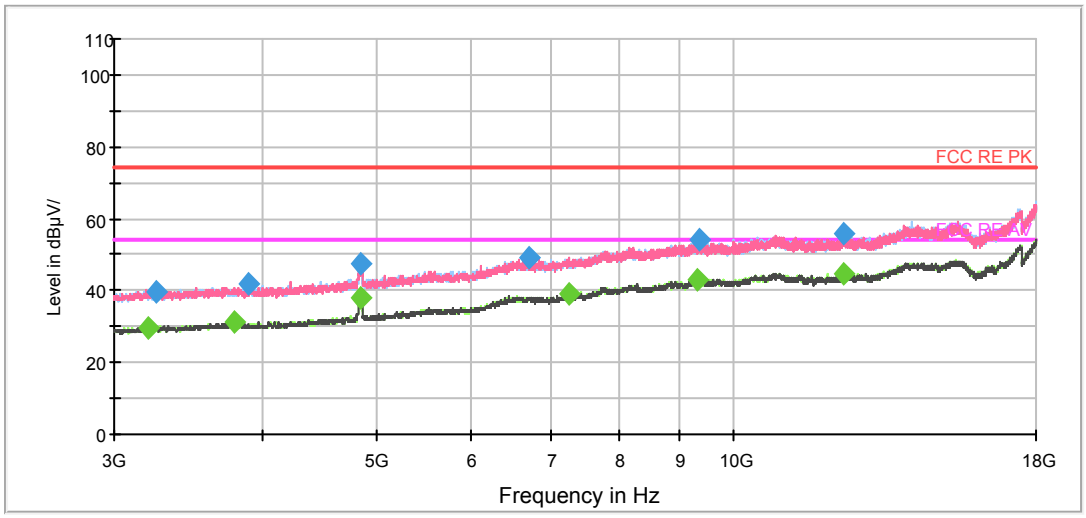
802.11ax (HE40) CH3



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1099.750000	42.9	200.0	V	296.0	-1.4	31.1	74.0
1401.750000	44.5	200.0	H	117.0	-0.7	29.5	74.0
1778.500000	45.1	100.0	H	246.0	0.6	28.9	74.0
2123.000000	46.7	100.0	H	339.0	1.8	27.3	74.0
2723.000000	49.2	100.0	H	332.0	4.1	24.8	74.0
2947.500000	49.6	200.0	V	219.0	4.7	24.4	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1082.750000	33.3	100.0	V	13.0	-1.5	20.7	54.0
1392.000000	33.8	200.0	V	219.0	-0.7	20.2	54.0
1793.750000	35.2	200.0	V	90.0	0.6	18.8	54.0
2132.750000	37.0	200.0	H	49.0	1.8	17.0	54.0
2721.250000	39.0	200.0	H	206.0	4.1	15.0	54.0
2939.500000	39.9	200.0	V	150.0	4.7	14.1	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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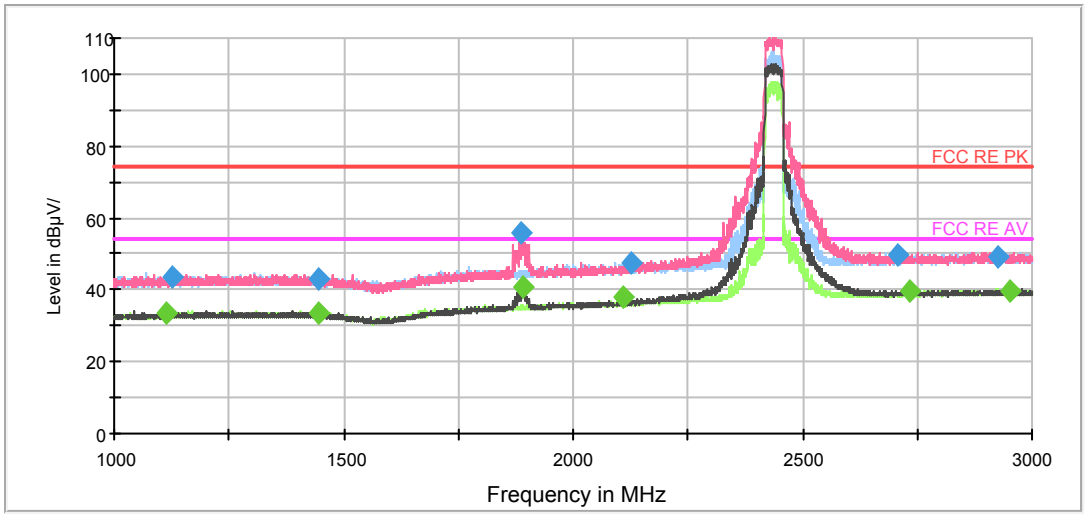
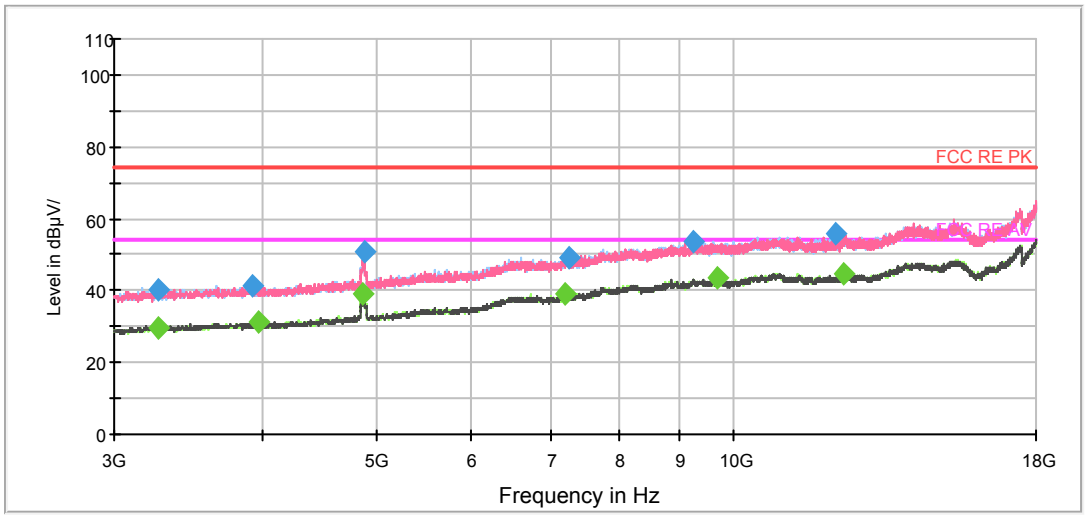
802.11ax (HE40) CH6



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1127.000000	43.4	100.0	V	48.0	-1.3	30.6	74.0
1446.000000	43.2	100.0	H	342.0	-0.6	30.8	74.0
1885.250000	55.8	200.0	V	0.0	0.8	18.2	74.0
2125.000000	47.6	200.0	V	0.0	1.8	26.4	74.0
2706.000000	49.9	100.0	V	4.0	4.0	24.1	74.0
2925.250000	49.2	200.0	V	351.0	4.6	24.8	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1111.750000	33.3	100.0	H	132.0	-1.4	20.7	54.0
1444.750000	33.3	100.0	H	342.0	-0.6	20.7	54.0
1889.250000	40.8	200.0	V	357.0	0.8	13.2	54.0
2107.250000	37.9	100.0	V	210.0	1.7	16.1	54.0
2735.750000	39.9	200.0	V	160.0	4.1	14.1	54.0
2953.500000	39.5	100.0	H	152.0	4.7	14.5	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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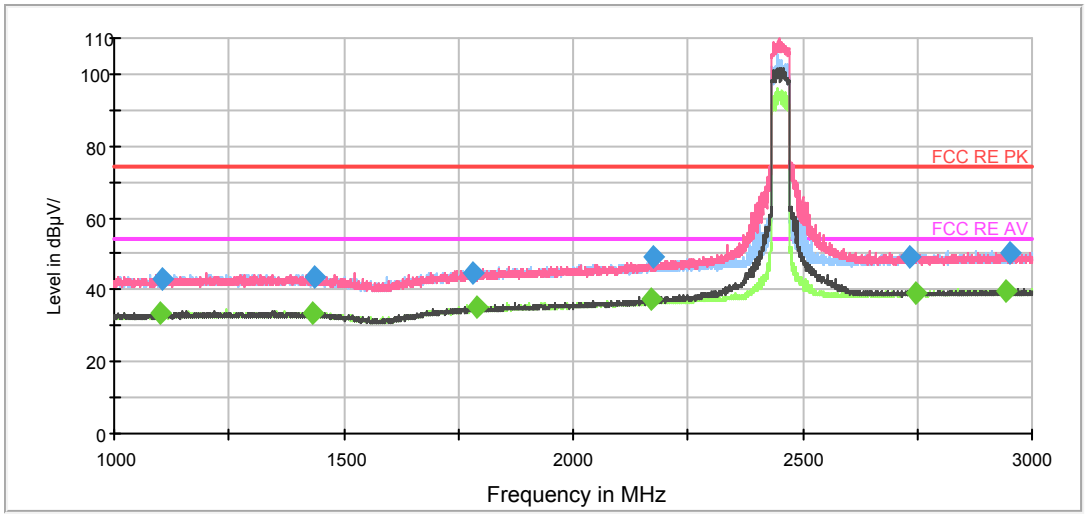
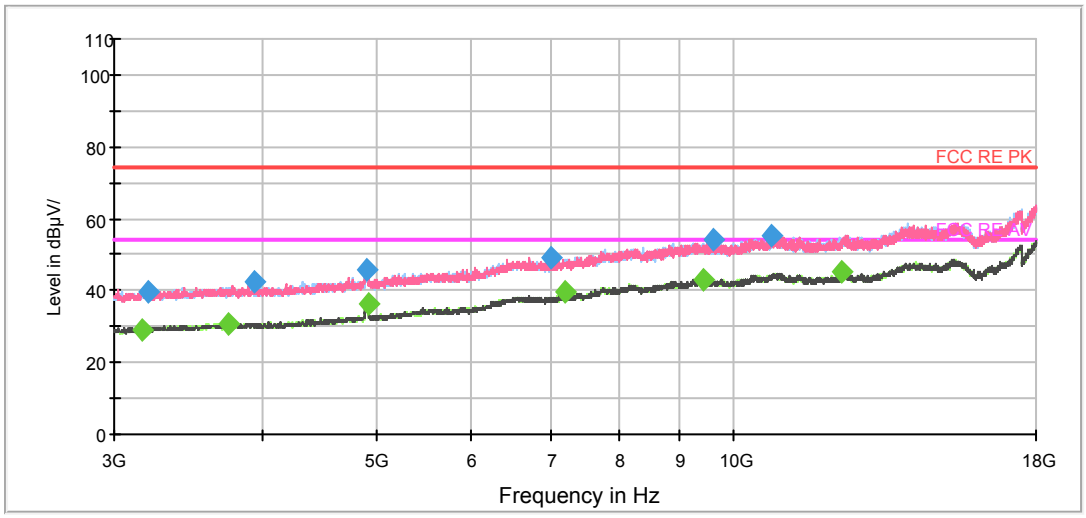
802.11ax (HE40) CH9



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1103.250000	43.1	100.0	V	8.0	-1.4	30.9	74.0
1438.750000	43.5	200.0	H	50.0	-0.6	30.5	74.0
1782.000000	44.7	100.0	V	2.0	0.6	29.3	74.0
2173.500000	48.9	200.0	V	0.0	2.1	25.1	74.0
2732.000000	49.2	100.0	V	240.0	4.1	24.8	74.0
2952.000000	50.1	100.0	H	356.0	4.7	23.9	74.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1099.000000	33.4	200.0	H	50.0	-1.4	20.6	54.0
1434.250000	33.3	200.0	H	118.0	-0.6	20.7	54.0
1789.500000	35.1	200.0	V	340.0	0.6	18.9	54.0
2169.000000	37.2	200.0	V	268.0	2.1	16.8	54.0
2747.750000	39.0	100.0	H	222.0	4.1	15.0	54.0
2941.500000	39.8	100.0	V	199.0	4.7	14.2	54.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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5.7. Conducted Emission

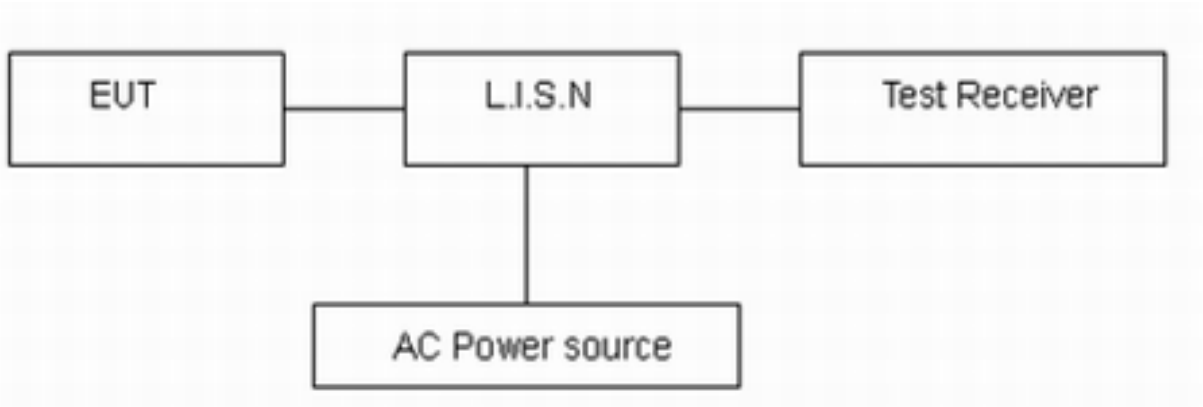
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.10-2013. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line.
The test is in transmitting mode.

Test Setup



Note: AC Power source is used to change the voltage 110V/60Hz.

Limits

Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46*
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96, U= 2.69 dB.

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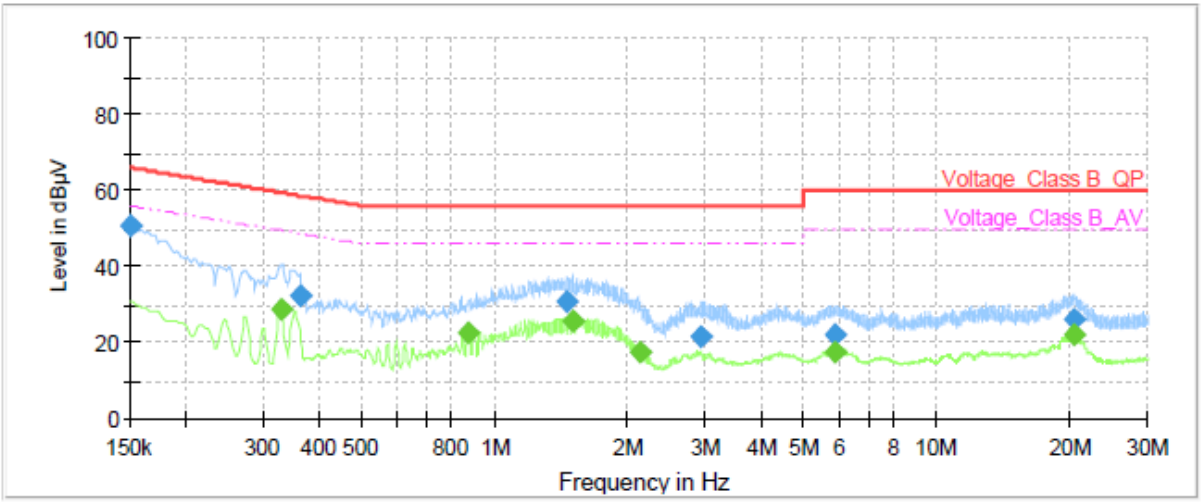
Test Results:

Following plots, Blue trace uses the peak detection and Green trace uses the average detection. During the test, the Conducted Emission was performed in all modes (WIFI 2.4G /BLE) with all channels, 802.11ax HE20, Channel 1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.15	50.55	---	66.00	15.45	1000.0	9.000	L1	ON	19
0.33	---	28.87	49.51	20.64	1000.0	9.000	L1	ON	19
0.36	32.24	---	58.64	26.41	1000.0	9.000	L1	ON	19
0.87	---	22.62	46.00	23.38	1000.0	9.000	L1	ON	19
1.46	30.96	---	56.00	25.04	1000.0	9.000	L1	ON	19
1.50	---	25.83	46.00	20.17	1000.0	9.000	L1	ON	19
2.12	---	17.60	46.00	28.40	1000.0	9.000	L1	ON	19
2.92	21.58	---	56.00	34.42	1000.0	9.000	L1	ON	19
5.88	---	17.63	50.00	32.37	1000.0	9.000	L1	ON	19
5.88	22.19	---	60.00	37.81	1000.0	9.000	L1	ON	19
20.43	26.08	---	60.00	33.92	1000.0	9.000	L1	ON	20
20.44	---	21.81	50.00	28.19	1000.0	9.000	L1	ON	20

Remark: Correct factor=cable loss + LISN factor

L line Conducted Emission from 150 KHz to 30 MHz

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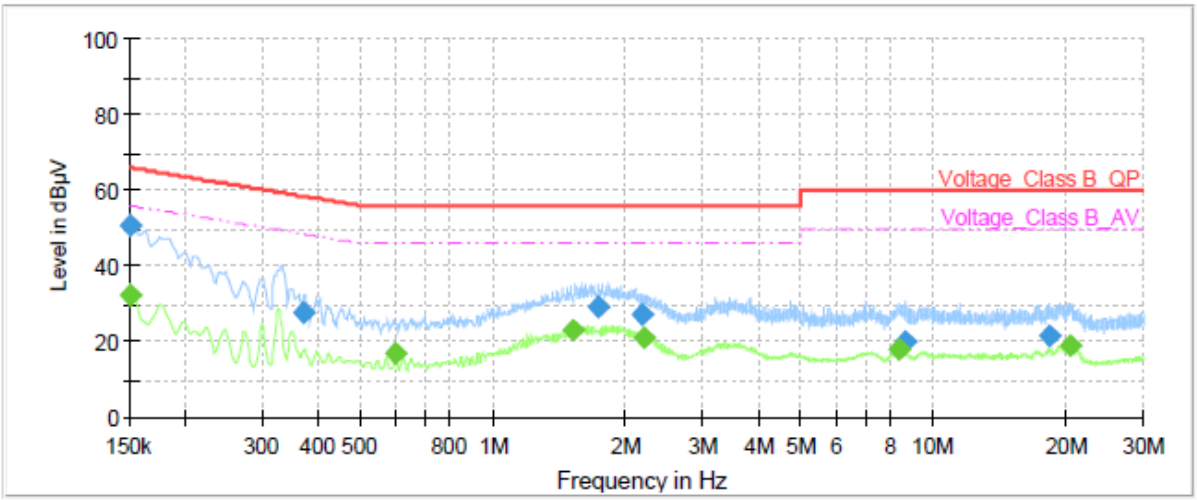

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.15	---	32.34	56.00	23.66	1000.0	9.000	N	ON	19
0.15	50.84	---	66.00	15.16	1000.0	9.000	N	ON	19
0.37	27.94	---	58.44	30.50	1000.0	9.000	N	ON	19
0.60	---	16.70	46.00	29.30	1000.0	9.000	N	ON	19
1.52	---	23.26	46.00	22.74	1000.0	9.000	N	ON	19
1.73	29.27	---	56.00	26.73	1000.0	9.000	N	ON	19
2.17	27.35	---	56.00	28.65	1000.0	9.000	N	ON	19
2.21	---	20.82	46.00	25.18	1000.0	9.000	N	ON	19
8.39	---	17.80	50.00	32.20	1000.0	9.000	N	ON	19
8.66	20.16	---	60.00	39.84	1000.0	9.000	N	ON	19
18.42	21.79	---	60.00	38.21	1000.0	9.000	N	ON	19
20.41	---	18.93	50.00	31.07	1000.0	9.000	N	ON	19

Remark: Correct factor=cable loss + LISN factor

N line Conducted Emission from 150 KHz to 30 MHz

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6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Spectrum Analyzer	R&S	FSV30	100815	2019-12-15	2020-12-14
EMI Test Receiver	R&S	ESCI	100948	2020-05-18	2021-05-17
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2017-09-26	2020-09-25
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-201	2017-11-18	2020-11-17
Horn Antenna	R&S	HF907	102723	2018-08-11	2021-08-10
Horn Antenna	ETS-Lindgren	3160-09	00102643	2018-06-20	2021-06-19
EMI Test Receiver	R&S	ESR	101667	2020-05-18	2021-05-17
LISN	R&S	ENV216	101171	2018-12-15	2021-12-14
Spectrum Analyzer	Agilent	N9010A	MY47191109	2020-05-18	2021-05-17
Power Meter	R&S	NRP2	104306	2020-05-18	2021-05-17
Power Sensor	R&S	NRP-Z21	104799	2020-05-18	2021-05-17
20dB Attenuator	Star River Highlight	UCL-TS2S-20	18013001	2019-12-15	2020-12-14
RF Cable	Agilent	SMA 15cm	0001	2020-06-12	2020-12-11
Software	R&S	EMC32	9.26.0	/	/

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