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

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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			

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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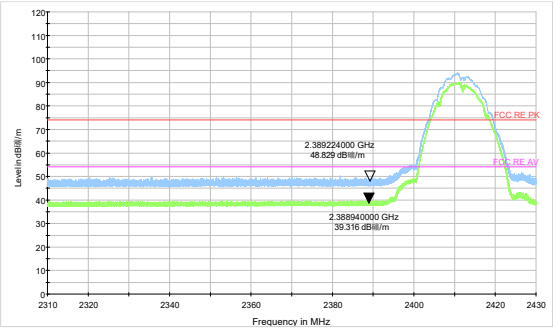
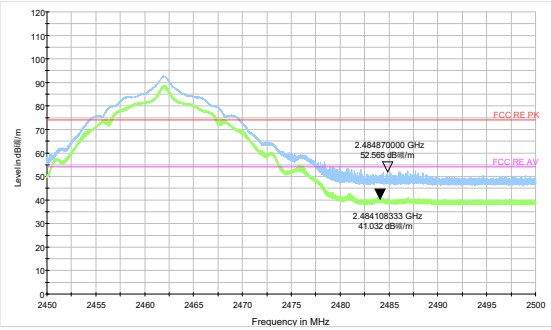
Test Results:

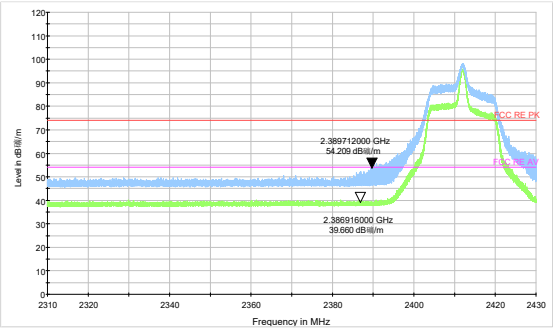
Note: A font (dB礦/m)in the test plot =(dB μ V/m)



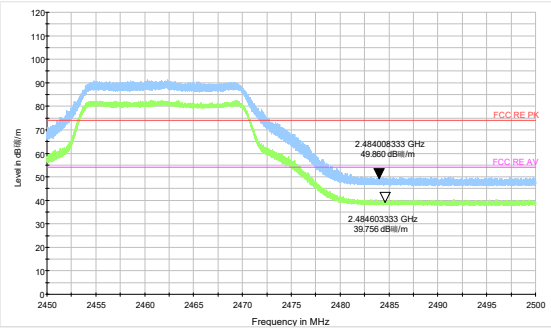
802.11b-Channel 1 Peak+ Average



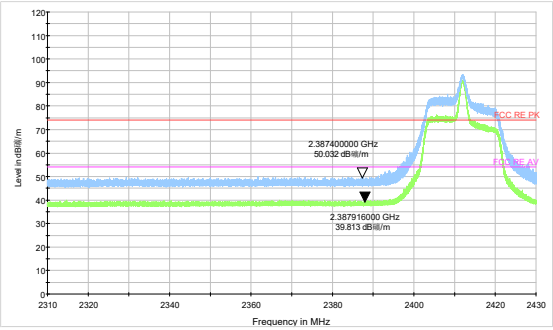
802.11b-Channel 11 Peak+ Average



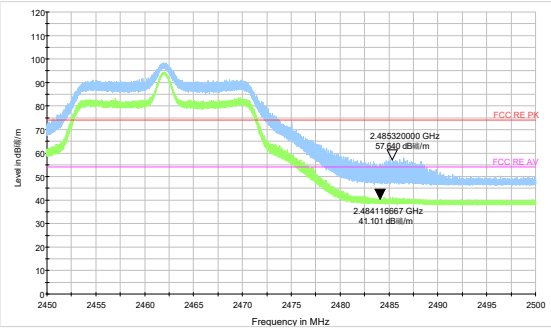
802.11g-Channel 1 Peak+ Average



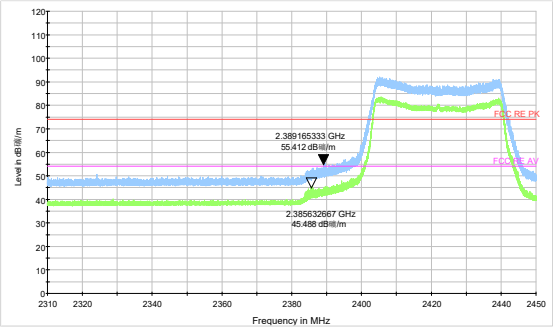
802.11g-Channel 11 Peak+ Average



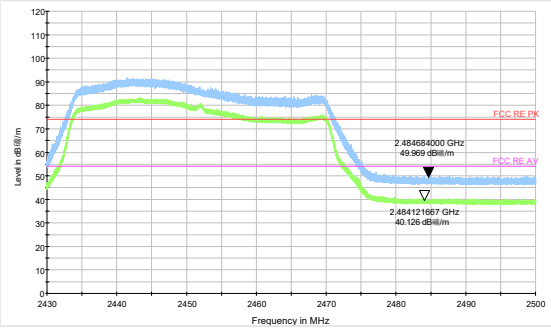
802.11n HT20 -Channel 1 Peak+ Average



802.11n HT20 -Channel 11 Peak+ Average



802.11n HT40 –Channel 3 Peak+ Average



802.11n HT40 –Channel 9 Peak+ Average

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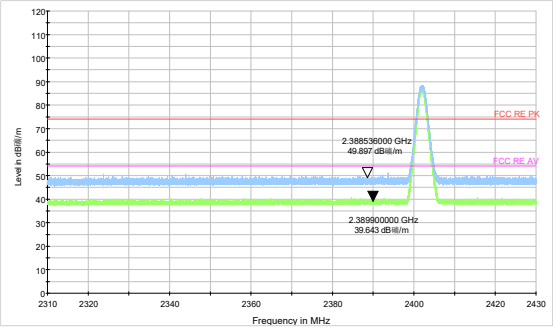
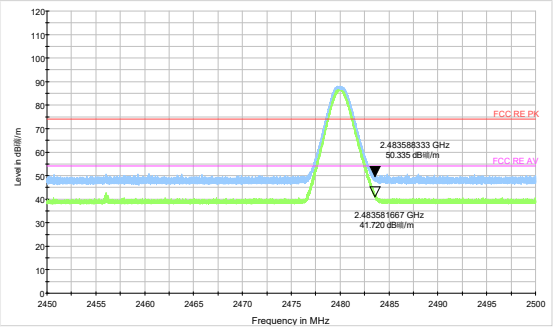


Bluetooth LE Channel 0 Peak+ Average



Bluetooth LE Channel 39 Peak+Average

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Result of RE

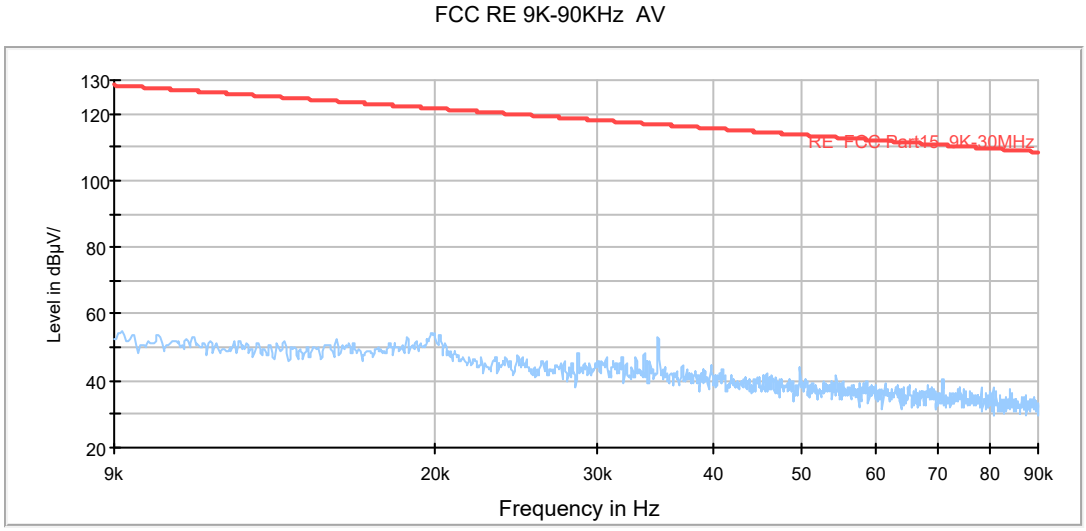
Test result

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.
According to RF Output power results in chapter 5.1, MIMO was selected as the worst antenna

During the test, the Radiates Emission from 30MHz to 1GHz was performed in all modes with all channels, Bluetooth LE Channel 39 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.
A font (Level in dB V/)in the test plot =(level in dB μ V/m)
A font (Level in dB礦/m)in the test plot =(level in dB μ V/m)

Continuous TX mode:



Radiates Emission from 9KHz to 90KHz

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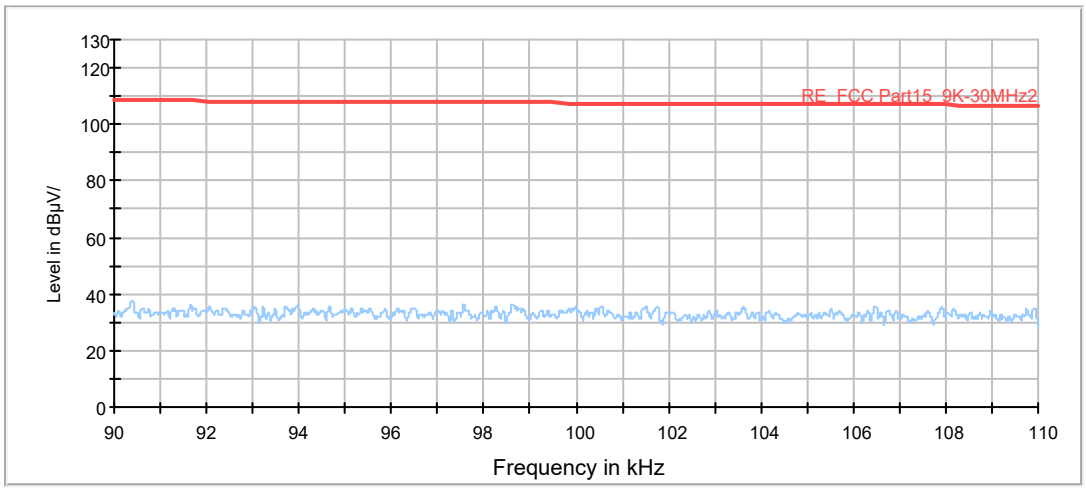
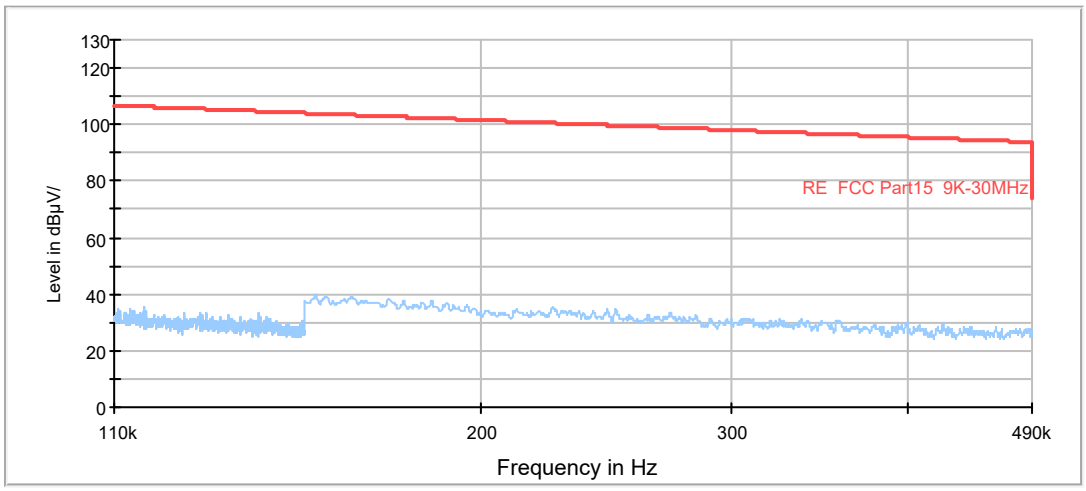
FCC RE 90K-110KHz QP



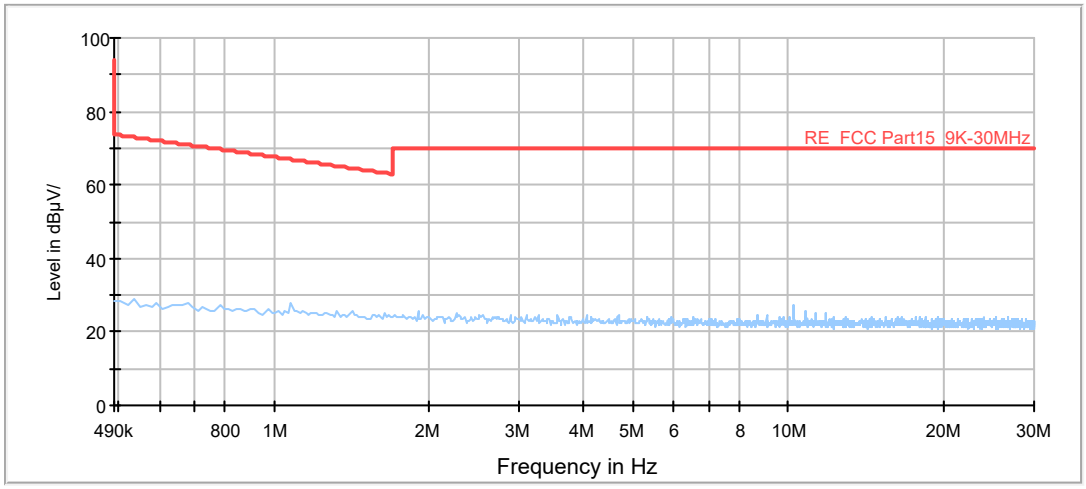
Radiates Emission from 90KHz to 110KHz

FCC RE 110K-490KHz AV



Radiates Emission from 110KHz to 490KHz

FCC RE 490K-30MHz QP



Radiates Emission from 490KHz to 30MHz

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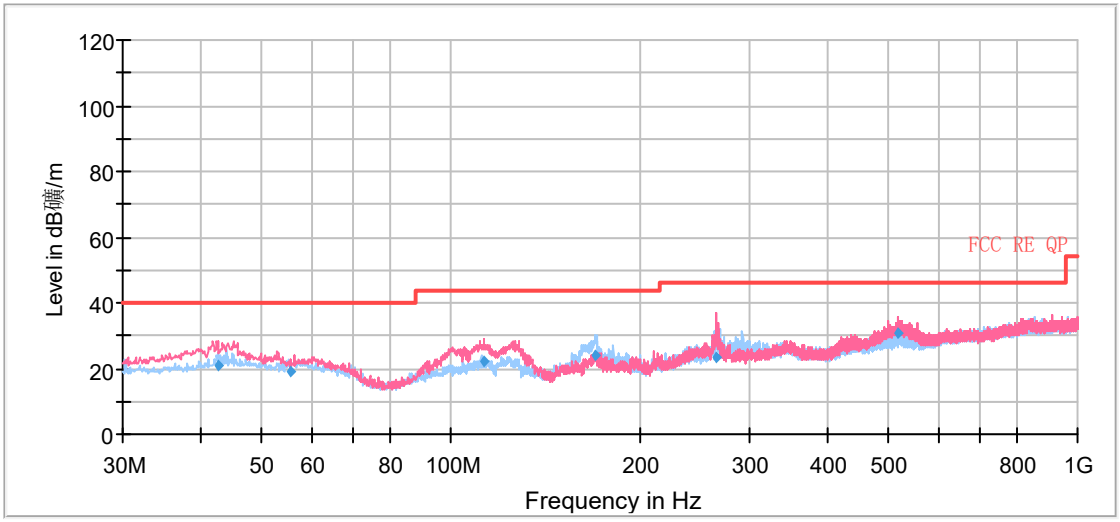

Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Bandwidth (kHz)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
42.690000	20.73	118.0	V	105.0	120.000	14	19.27	40.00
55.432500	19.29	220.0	V	130.0	120.000	14	20.71	40.00
112.853750	21.86	100.0	V	28.0	120.000	12	21.64	43.50
170.043750	23.94	180.0	H	142.0	120.000	10	19.56	43.50
265.792500	23.53	221.0	V	328.0	120.000	14	22.47	46.00
518.310000	30.68	100.0	V	150.0	120.000	20	15.32	46.00

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

2. Margin = Limit – Quasi-Peak

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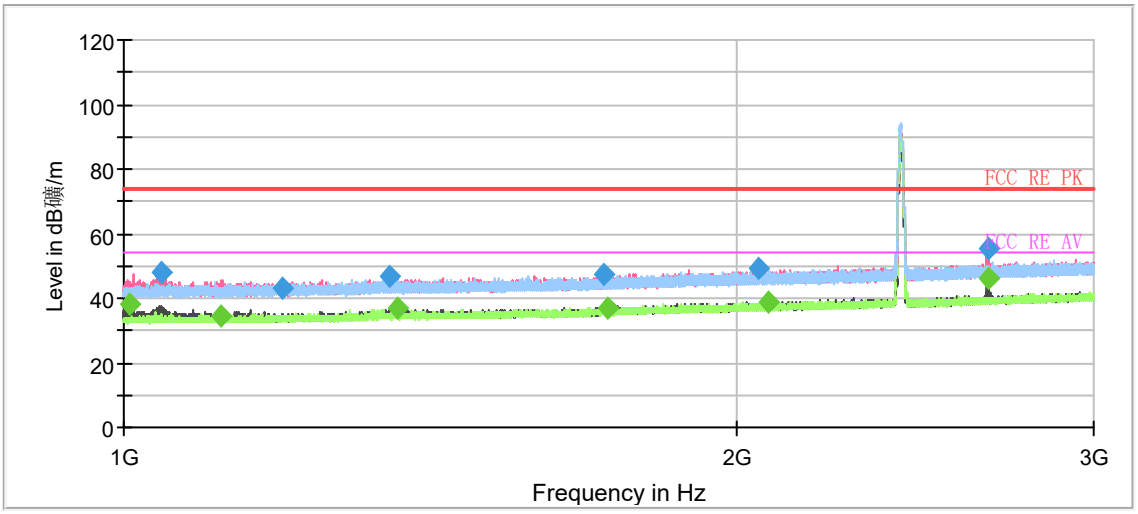
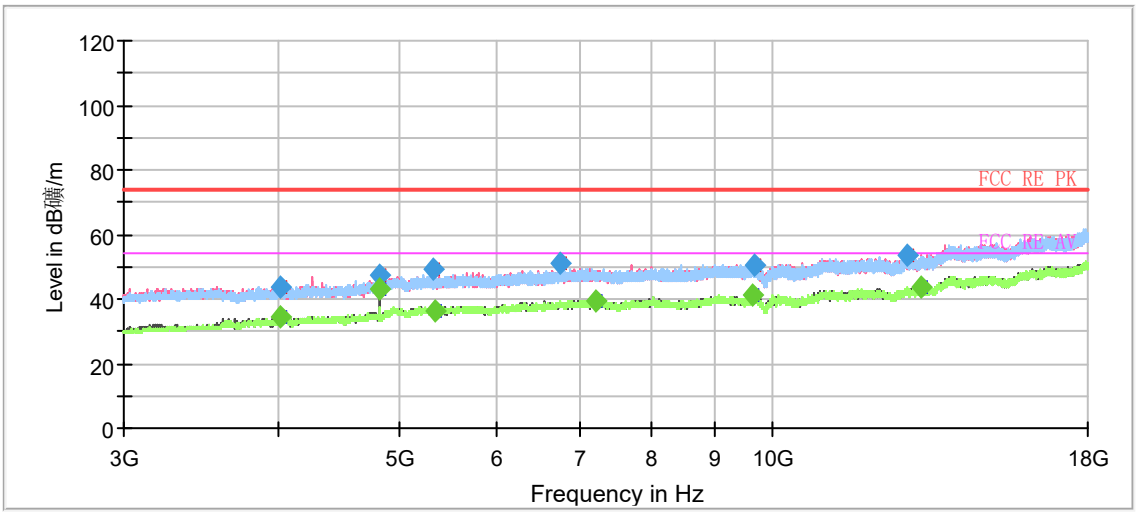
802.11b CH1



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)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1006.200000	---	37.95	54.00	16.05	100.0	V	74.0	-17.0
1043.866667	48.06	---	74.00	25.94	100.0	V	85.0	-16.9
1116.466667	---	34.65	54.00	19.35	200.0	V	80.0	-16.6
1196.000000	42.82	---	74.00	31.18	200.0	V	287.0	-16.1
1350.666667	46.85	---	74.00	27.15	100.0	V	97.0	-15.5
1362.533333	---	37.11	54.00	16.89	200.0	H	114.0	-15.5
1722.866667	47.30	---	74.00	26.70	200.0	V	331.0	-13.8
1730.200000	---	37.18	54.00	16.82	200.0	H	80.0	-13.8
2051.533333	49.08	---	74.00	24.92	200.0	V	183.0	-12.4
2075.133333	---	38.59	54.00	15.41	200.0	V	231.0	-12.3
2665.000000	---	45.95	54.00	8.05	200.0	V	331.0	-10.5
2665.000000	55.16	---	74.00	18.84	200.0	V	331.0	-10.5

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

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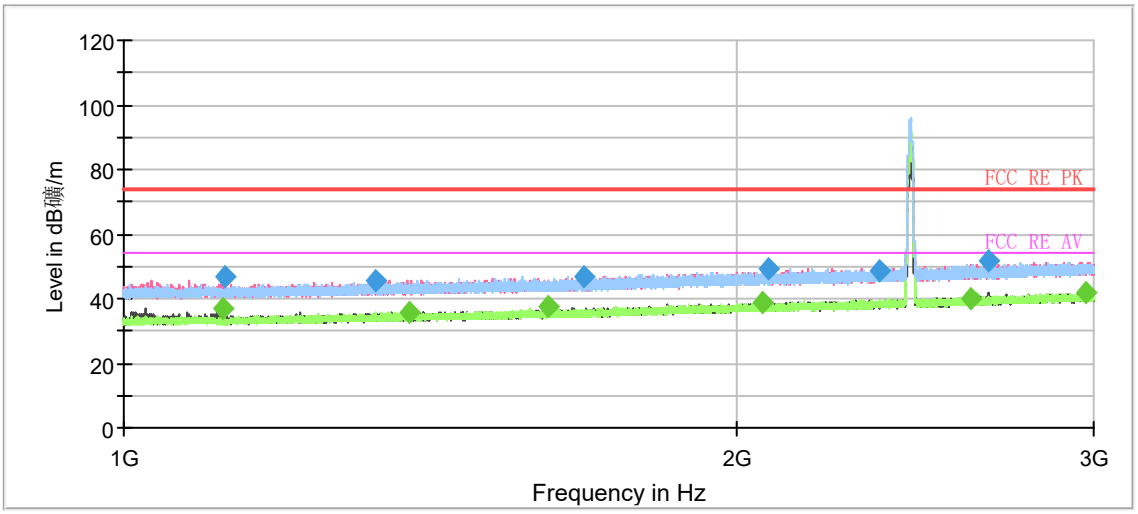
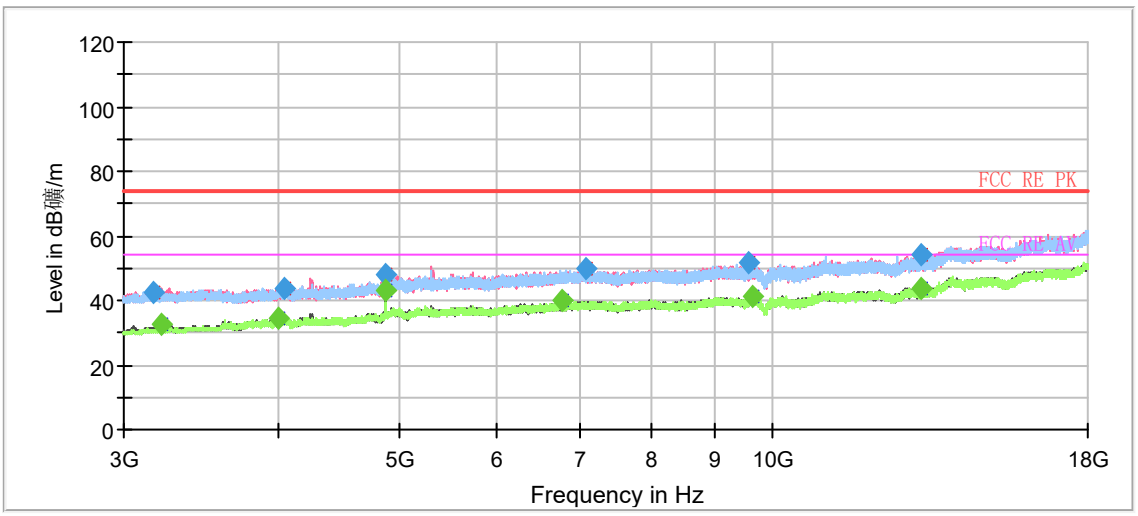
802.11b CH6



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)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1118.866667	---	36.89	54.00	17.11	200.0	V	82.0	-16.6
1121.533333	46.68	---	74.00	27.32	200.0	V	82.0	-16.5
1330.333333	45.71	---	74.00	28.29	100.0	H	134.0	-15.6
1383.200000	---	35.68	54.00	18.32	200.0	V	118.0	-15.4
1617.600000	---	37.27	54.00	16.73	100.0	H	0.0	-14.3
1684.533333	47.02	---	74.00	26.98	200.0	V	57.0	-14.0
2059.333333	---	38.85	54.00	15.15	100.0	V	7.0	-12.4
2073.866667	49.22	---	74.00	24.78	100.0	H	146.0	-12.3
2352.666667	48.46	---	74.00	25.54	100.0	V	224.0	-11.7
2611.933333	---	39.81	54.00	14.19	200.0	V	264.0	-10.7
2662.800000	51.81	---	74.00	22.19	200.0	V	354.0	-10.5
2972.600000	---	42.14	54.00	11.86	100.0	H	99.0	-9.0

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

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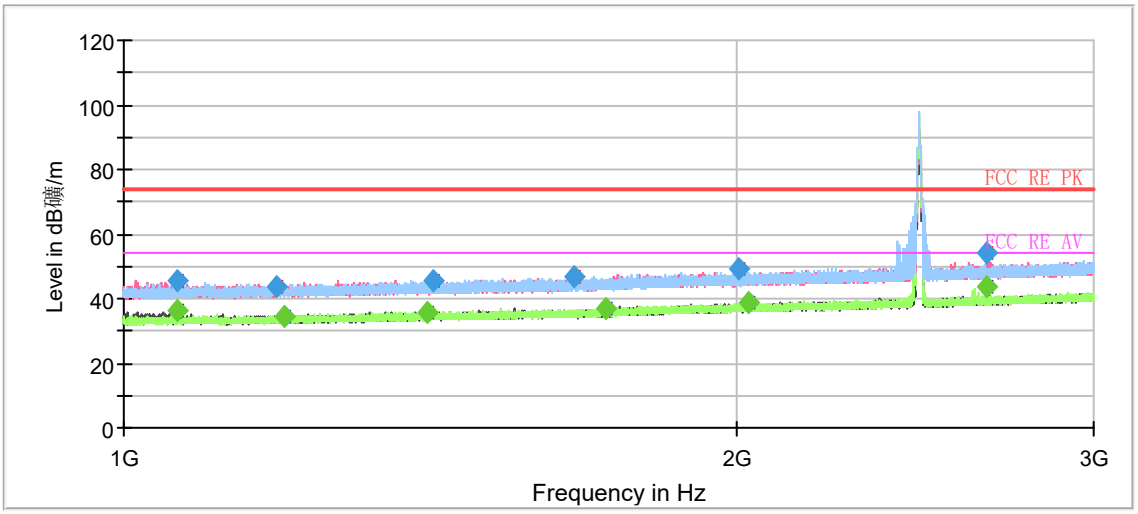
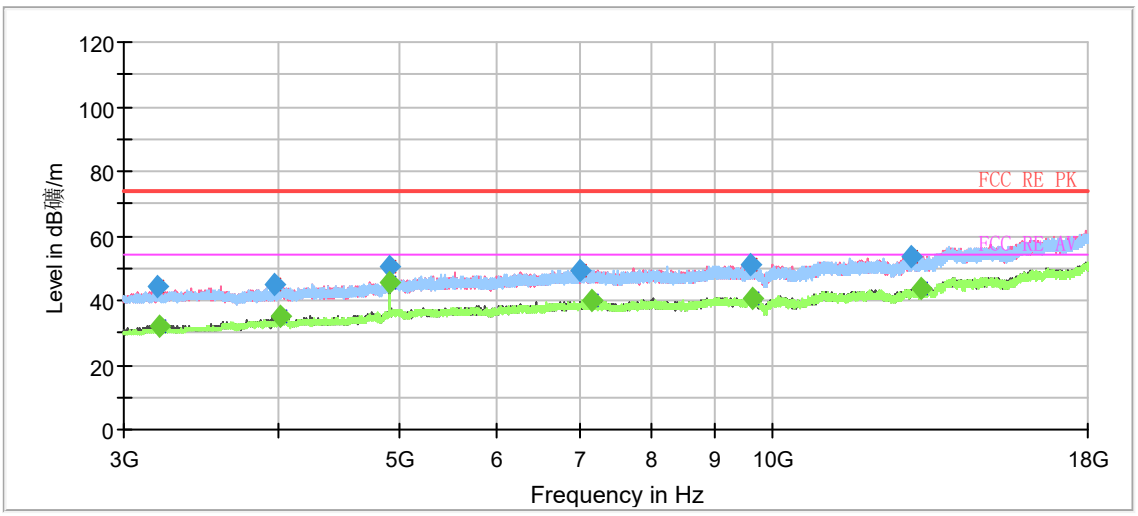
802.11b CH11



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)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1062.266667	45.83	---	74.00	28.17	200.0	V	89.0	-16.9
1063.000000	---	36.52	54.00	17.48	200.0	V	89.0	-16.9
1189.466667	43.59	---	74.00	30.41	100.0	V	62.0	-16.2
1199.866667	---	34.49	54.00	19.51	100.0	V	127.0	-16.1
1411.000000	---	35.81	54.00	18.19	100.0	H	37.0	-15.3
1420.800000	45.74	---	74.00	28.26	100.0	V	5.0	-15.2
1664.800000	47.00	---	74.00	27.00	100.0	H	0.0	-14.1
1727.466667	---	37.22	54.00	16.78	100.0	V	225.0	-13.8
2007.733333	48.94	---	74.00	25.06	200.0	H	32.0	-12.5
2031.400000	---	38.49	54.00	15.51	100.0	V	17.0	-12.5
2659.866667	54.22	---	74.00	19.78	200.0	V	52.0	-10.5
2659.933333	---	43.48	54.00	10.52	200.0	V	52.0	-10.5

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

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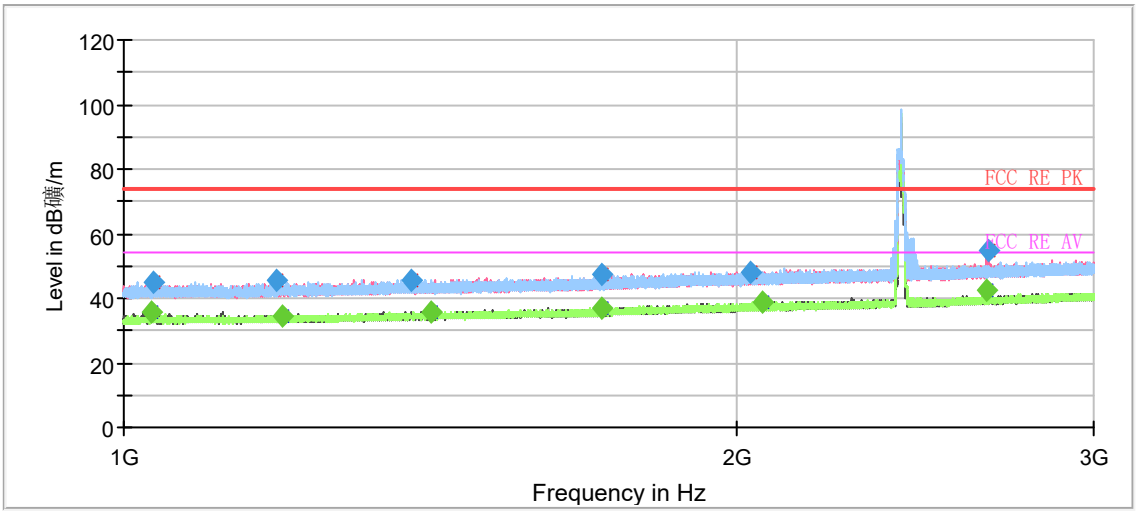
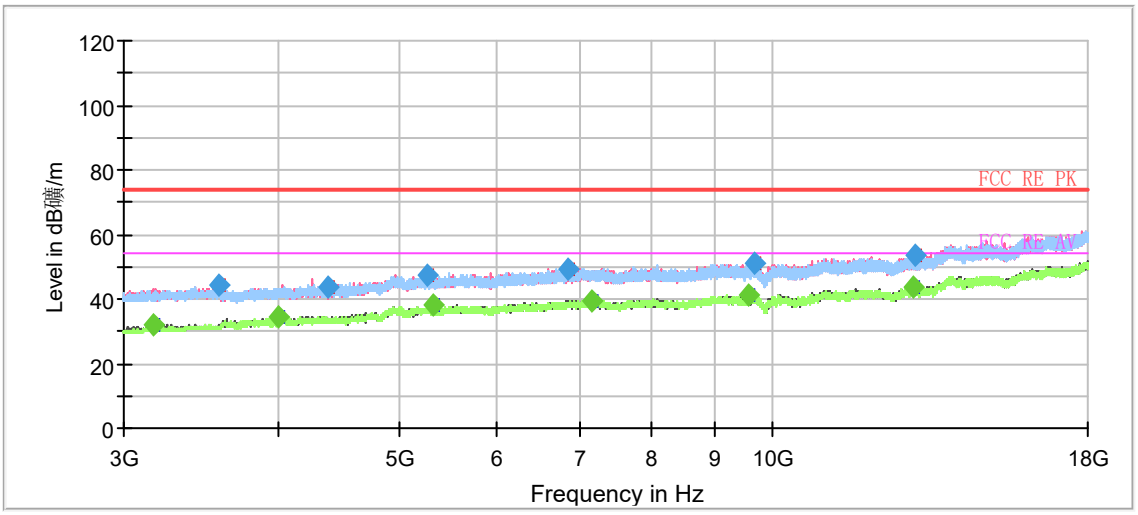
802.11g CH1



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)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1031.133333	---	35.62	54.00	18.38	100.0	V	78.0	-16.9
1034.400000	44.99	---	74.00	29.01	100.0	V	78.0	-16.9
1190.133333	45.38	---	74.00	28.62	100.0	H	110.0	-16.2
1195.866667	---	34.26	54.00	19.74	200.0	H	265.0	-16.1
1386.400000	45.77	---	74.00	28.23	200.0	V	53.0	-15.4
1416.600000	---	35.57	54.00	18.43	100.0	V	193.0	-15.2
1718.133333	47.36	---	74.00	26.64	100.0	H	276.0	-13.8
1720.200000	---	36.94	54.00	17.06	100.0	H	132.0	-13.8
2034.066667	48.31	---	74.00	25.69	200.0	H	0.0	-12.5
2061.533333	---	38.73	54.00	15.27	200.0	H	242.0	-12.4
2657.533333	---	42.62	54.00	11.38	200.0	V	0.0	-10.5
2661.666667	54.86	---	74.00	19.14	200.0	V	0.0	-10.5

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

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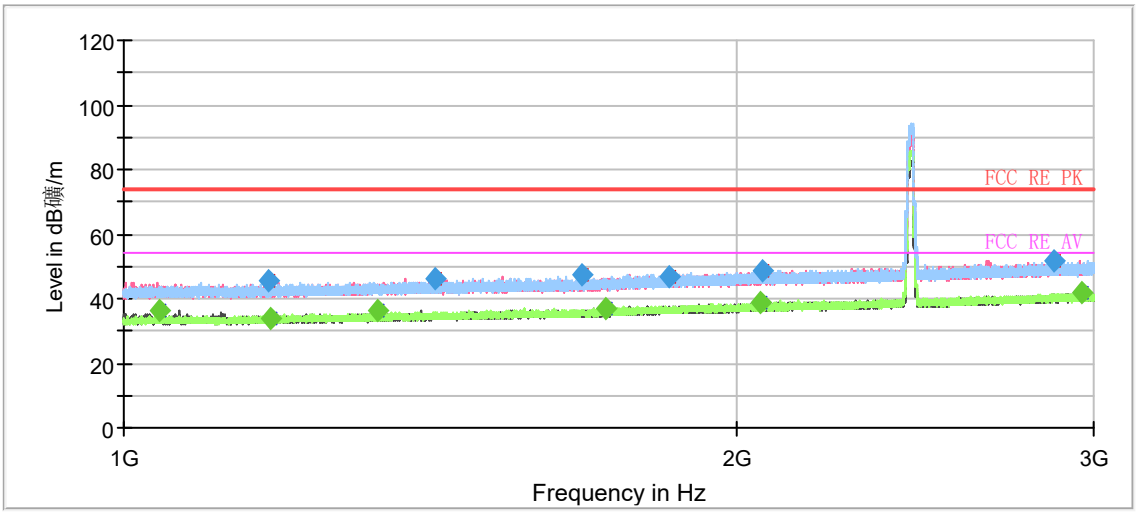
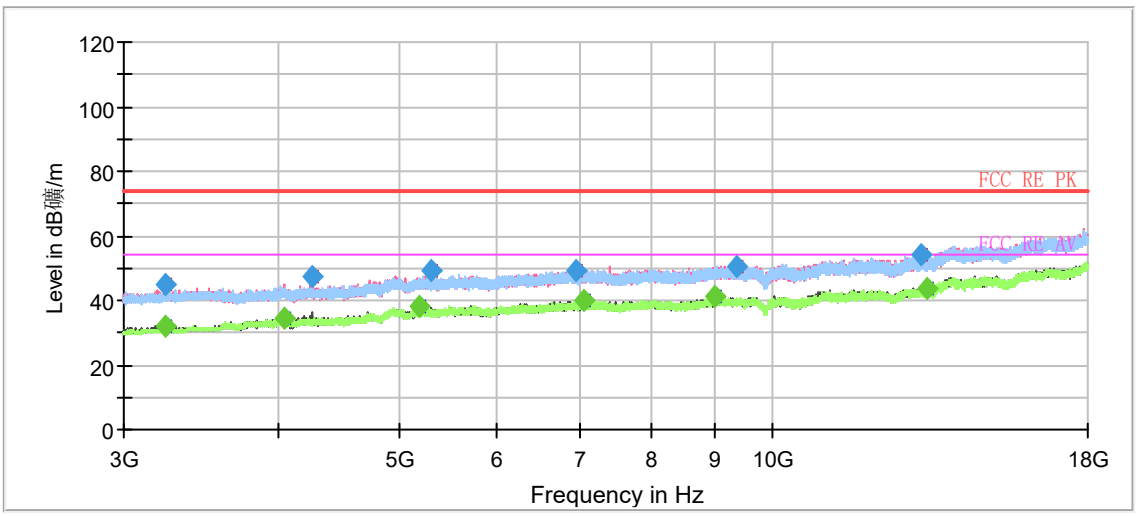
802.11g CH6



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)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1040.400000	---	36.60	54.00	17.40	200.0	V	74.0	-16.9
1178.066667	45.37	---	74.00	28.63	100.0	V	253.0	-16.3
1180.933333	---	33.79	54.00	20.21	100.0	V	276.0	-16.2
1332.533333	---	36.51	54.00	17.49	200.0	V	0.0	-15.6
1423.733333	46.33	---	74.00	27.67	100.0	V	354.0	-15.2
1681.466667	47.16	---	74.00	26.84	100.0	H	150.0	-14.0
1727.933333	---	37.02	54.00	16.98	100.0	V	66.0	-13.8
1854.200000	46.61	---	74.00	27.39	200.0	V	41.0	-13.2
2055.000000	---	38.67	54.00	15.33	100.0	H	172.0	-12.4
2060.533333	48.90	---	74.00	25.10	100.0	V	354.0	-12.4
2867.733333	51.68	---	74.00	22.32	200.0	H	255.0	-9.6
2958.200000	---	41.88	54.00	12.12	200.0	V	0.0	-9.0

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

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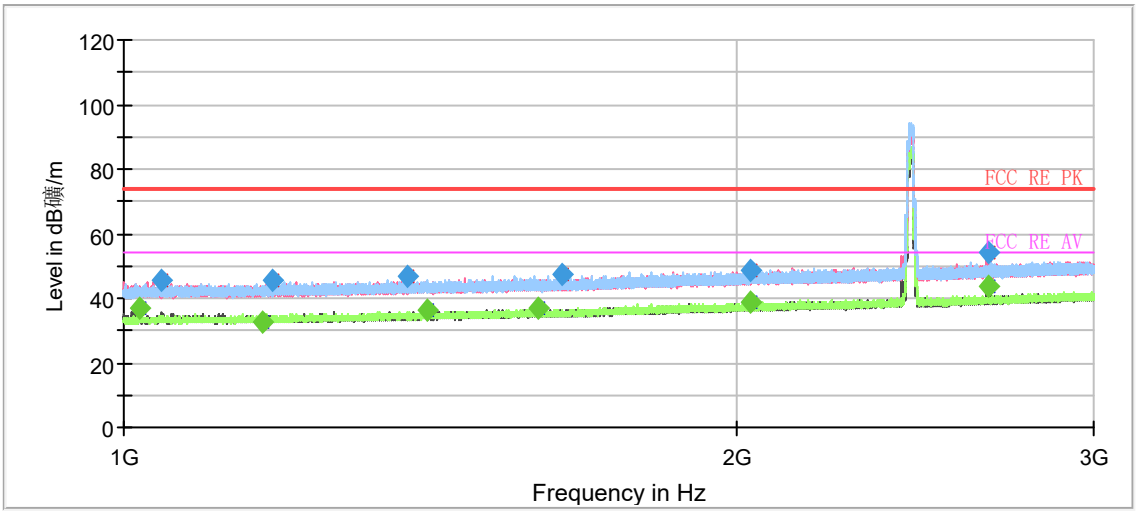
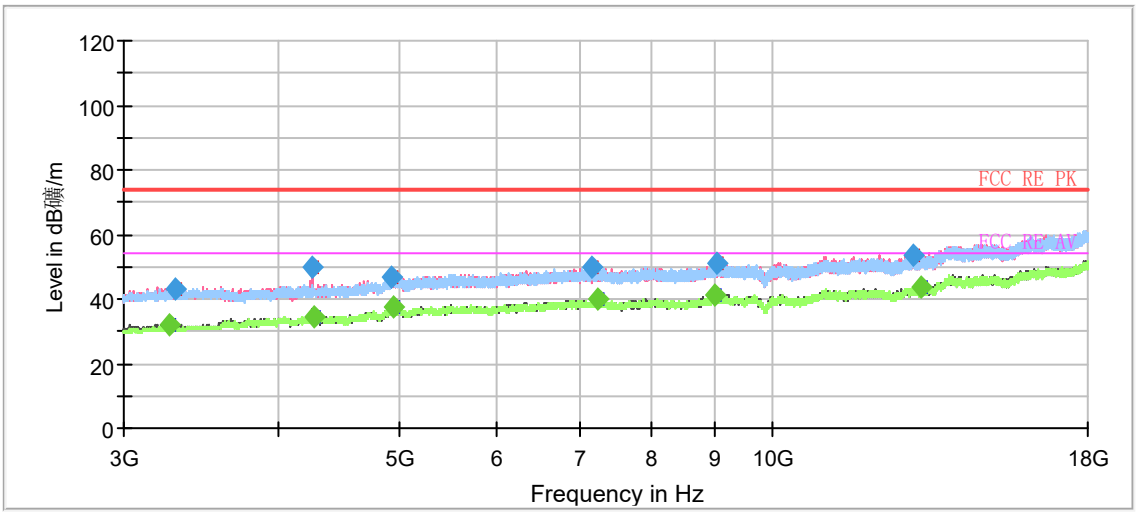
802.11g CH11



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)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1017.066667	---	37.01	54.00	16.99	200.0	V	88.0	-17.0
1042.466667	45.33	---	74.00	28.67	200.0	V	88.0	-16.9
1169.600000	---	32.61	54.00	21.39	100.0	V	254.0	-16.3
1182.733333	45.45	---	74.00	28.55	100.0	H	350.0	-16.2
1379.800000	47.06	---	74.00	26.94	200.0	V	1.0	-15.4
1409.666667	---	36.07	54.00	17.93	100.0	H	184.0	-15.3
1599.666667	---	37.02	54.00	16.98	100.0	V	220.0	-14.4
1643.066667	47.28	---	74.00	26.72	100.0	H	253.0	-14.2
2032.133333	48.43	---	74.00	25.57	100.0	H	0.0	-12.5
2033.733333	---	39.03	54.00	14.97	100.0	H	12.0	-12.5
2665.466667	---	43.51	54.00	10.49	200.0	V	0.0	-10.5
2665.466667	54.45	---	74.00	19.55	200.0	V	0.0	-10.5

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

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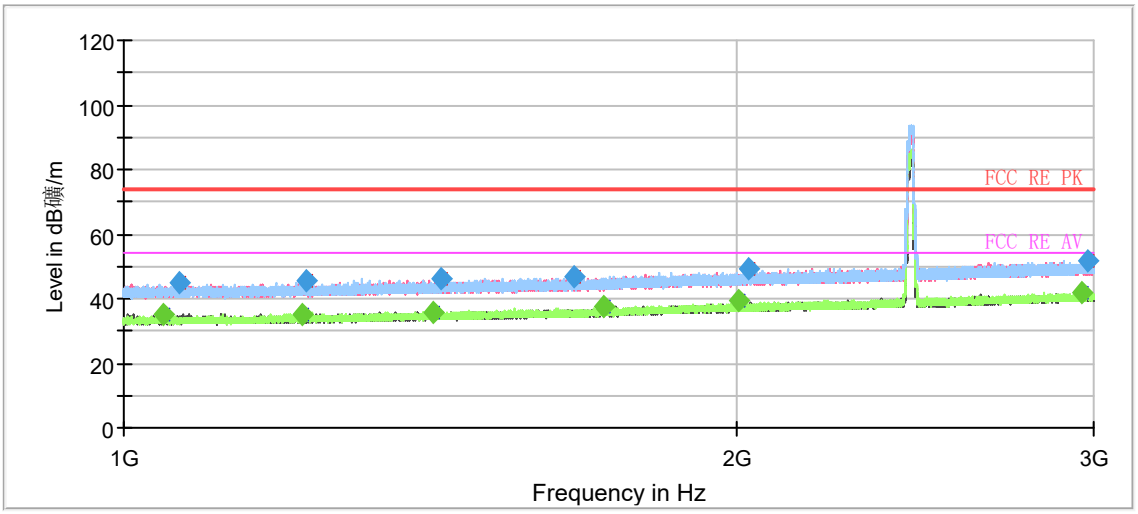
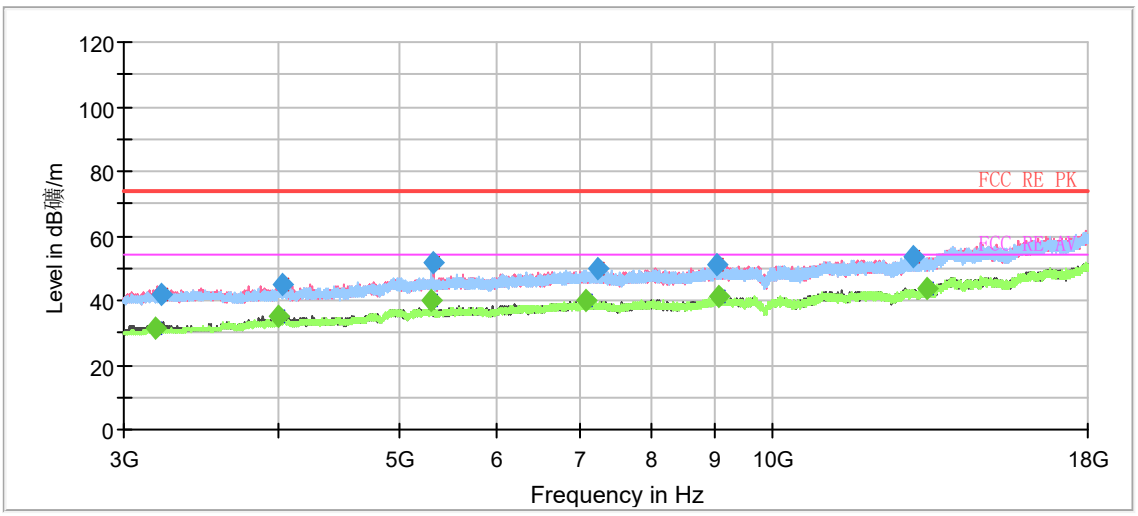
802.11n (HT20) CH1



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)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1045.200000	---	35.31	54.00	18.69	100.0	V	78.0	-16.9
1064.533333	45.01	---	74.00	28.99	200.0	V	77.0	-16.9
1224.466667	---	35.13	54.00	18.87	200.0	H	101.0	-16.1
1229.400000	45.37	---	74.00	28.63	100.0	H	0.0	-16.1
1421.133333	---	35.91	54.00	18.09	100.0	H	125.0	-15.2
1431.733333	46.07	---	74.00	27.93	200.0	V	122.0	-15.2
1666.400000	46.48	---	74.00	27.52	200.0	H	183.0	-14.1
1721.400000	---	37.27	54.00	16.73	100.0	H	31.0	-13.8
2007.466667	---	39.24	54.00	14.76	100.0	H	253.0	-12.5
2029.800000	48.93	---	74.00	25.07	100.0	H	312.0	-12.5
2957.866667	---	42.03	54.00	11.97	100.0	H	288.0	-9.0
2981.066667	51.83	---	74.00	22.17	100.0	V	0.0	-9.0

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

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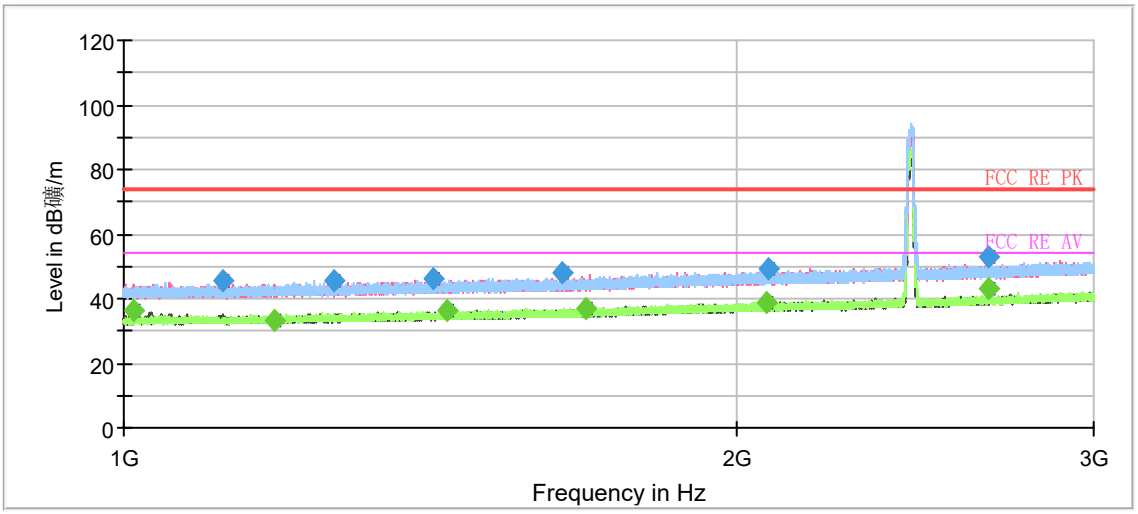
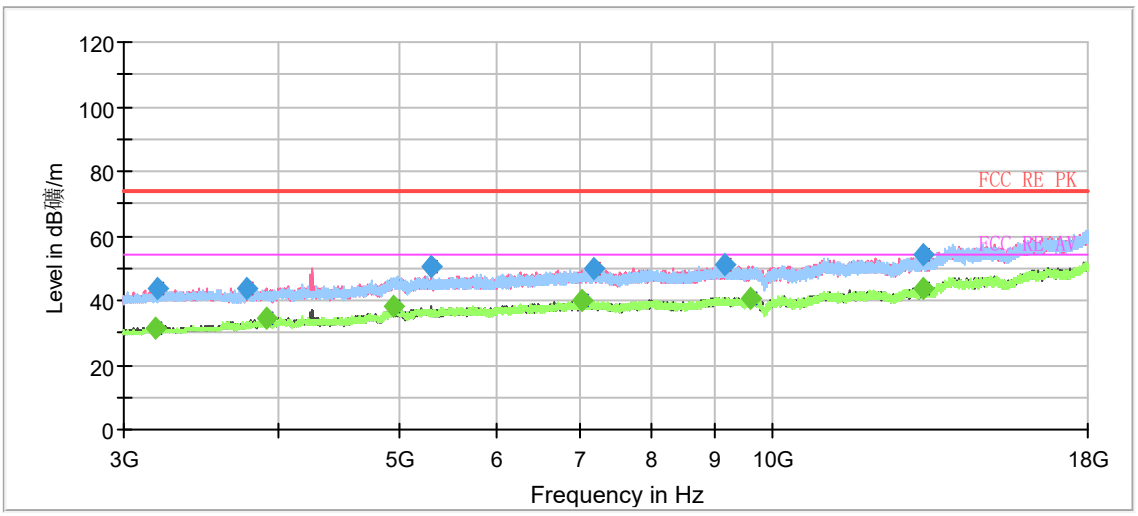
802.11n (HT20) CH6



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)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1010.933333	---	36.43	54.00	17.57	100.0	V	78.0	-17.0
1120.133333	45.64	---	74.00	28.36	200.0	V	89.0	-16.6
1187.333333	---	33.34	54.00	20.66	100.0	V	78.0	-16.2
1268.800000	45.32	---	74.00	28.68	100.0	H	152.0	-15.9
1419.866667	45.88	---	74.00	28.12	100.0	H	93.0	-15.2
1442.200000	---	36.33	54.00	17.67	100.0	H	118.0	-15.1
1644.666667	47.72	---	74.00	26.28	200.0	V	309.0	-14.2
1688.466667	---	37.01	54.00	16.99	100.0	H	152.0	-14.0
2070.933333	---	38.64	54.00	15.36	100.0	H	152.0	-12.4
2074.666667	49.12	---	74.00	24.88	100.0	H	174.0	-12.3
2664.533333	---	42.92	54.00	11.08	200.0	V	0.0	-10.5
2664.666667	52.87	---	74.00	21.13	200.0	V	0.0	-10.5

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

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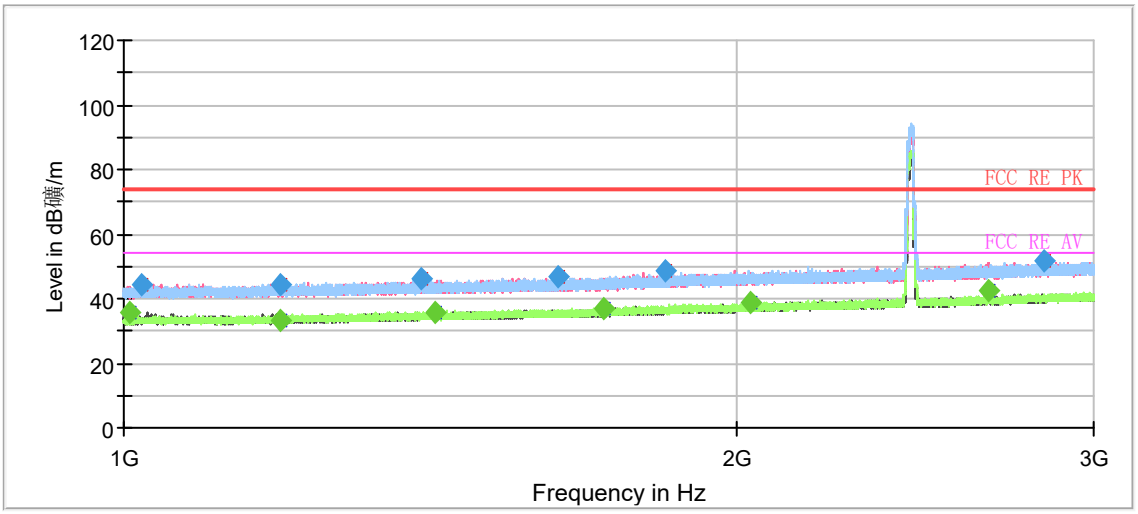
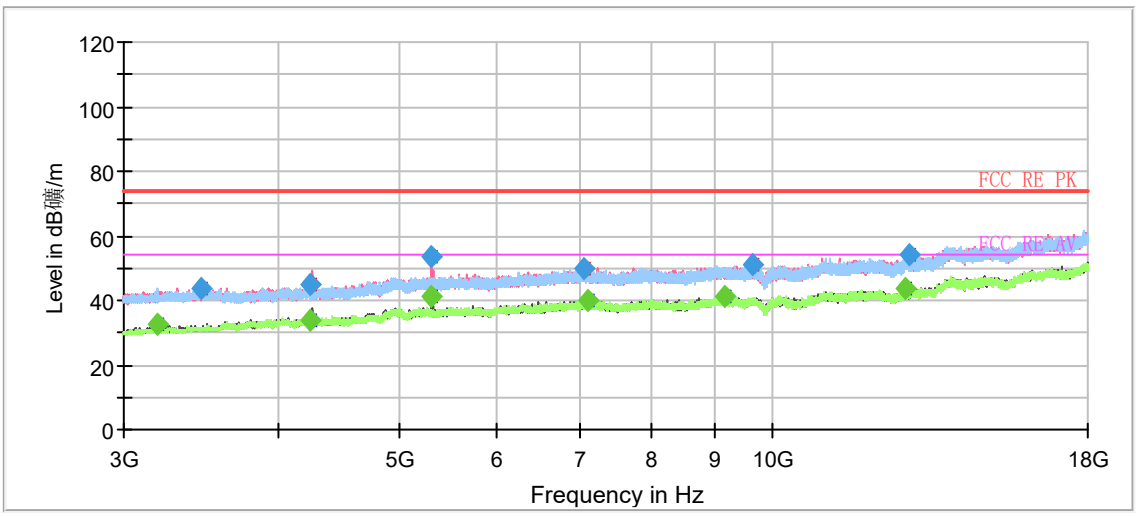
802.11n (HT20) CH11



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)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1007.133333	---	35.78	54.00	18.22	200.0	V	64.0	-17.0
1020.800000	44.45	---	74.00	29.55	100.0	V	78.0	-17.0
1193.800000	44.39	---	74.00	29.61	100.0	H	137.0	-16.1
1195.533333	---	33.34	54.00	20.66	100.0	V	318.0	-16.1
1400.400000	46.02	---	74.00	27.98	200.0	V	293.0	-15.4
1423.066667	---	35.74	54.00	18.26	100.0	H	227.0	-15.2
1636.400000	46.76	---	74.00	27.24	100.0	H	262.0	-14.2
1723.000000	---	37.19	54.00	16.81	200.0	H	184.0	-13.8
1848.066667	48.54	---	74.00	25.46	100.0	H	126.0	-13.3
2034.400000	---	38.87	54.00	15.13	100.0	H	114.0	-12.5
2665.266667	---	42.18	54.00	11.82	200.0	V	0.0	-10.5
2838.466667	51.48	---	74.00	22.52	200.0	V	53.0	-9.7

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

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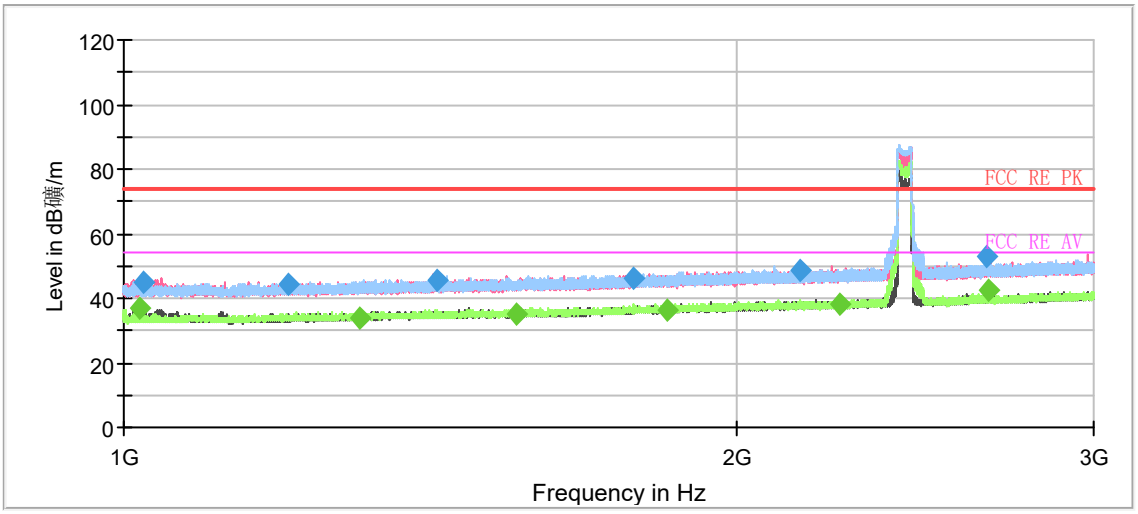
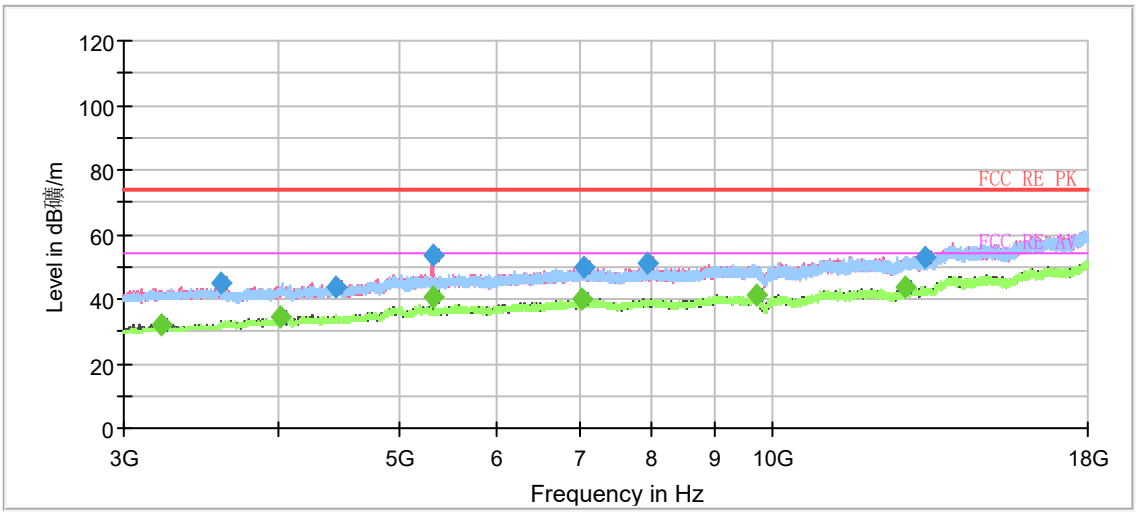
802.11n (HT40) CH3



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)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1018.800000	---	36.84	54.00	17.16	200.0	V	0.0	-17.0
1022.666667	44.94	---	74.00	29.06	200.0	V	73.0	-16.9
1205.866667	44.40	---	74.00	29.60	100.0	H	335.0	-16.1
1305.066667	---	34.12	54.00	19.88	100.0	V	105.0	-15.7
1427.533333	45.37	---	74.00	28.63	200.0	V	0.0	-15.2
1558.933333	---	35.36	54.00	18.64	200.0	V	0.0	-14.5
1781.733333	46.24	---	74.00	27.76	200.0	V	269.0	-13.4
1849.666667	---	36.54	54.00	17.46	200.0	V	62.0	-13.2
2152.200000	48.57	---	74.00	25.43	100.0	H	324.0	-12.1
2249.333333	---	38.41	54.00	15.59	100.0	V	253.0	-11.9
2655.400000	53.23	---	74.00	20.77	100.0	V	0.0	-10.5
2665.133333	---	42.44	54.00	11.56	100.0	V	0.0	-10.5

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

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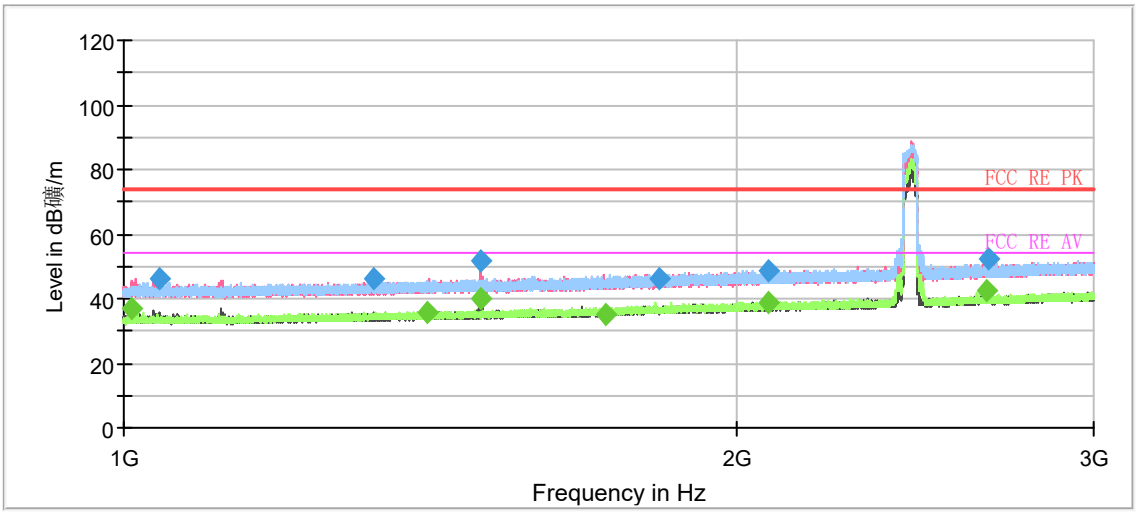
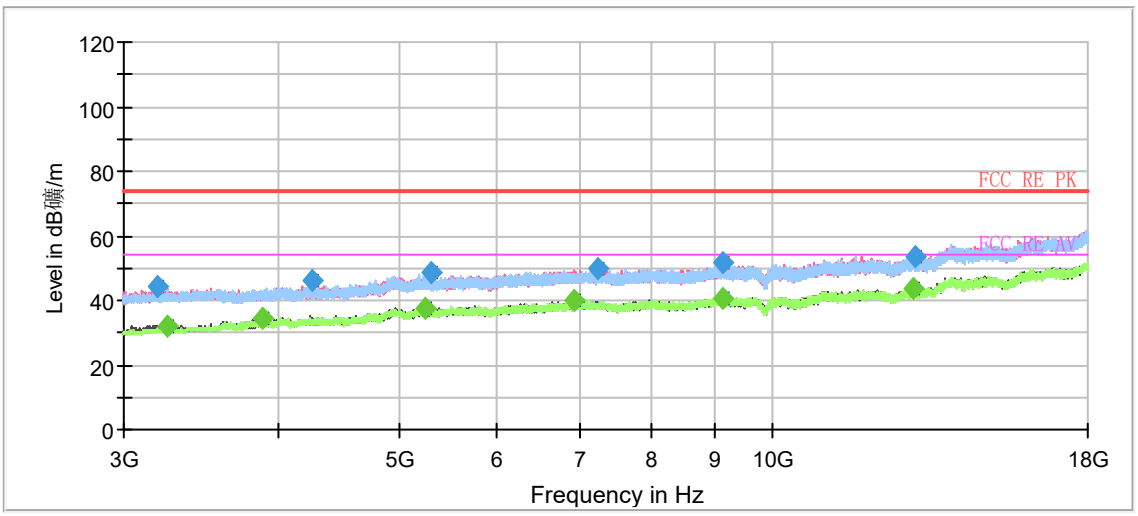
802.11n (HT40) CH6



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)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1009.466667	---	36.78	54.00	17.22	200.0	V	62.0	-17.0
1042.133333	46.36	---	74.00	27.64	100.0	V	70.0	-16.9
1327.066667	45.92	---	74.00	28.08	100.0	H	74.0	-15.6
1410.133333	---	35.97	54.00	18.03	200.0	V	62.0	-15.3
1498.933333	51.88	---	74.00	22.12	100.0	V	25.0	-14.8
1499.600000	---	39.81	54.00	14.19	100.0	V	25.0	-14.8
1727.333333	---	35.38	54.00	18.62	100.0	V	0.0	-13.8
1833.000000	46.34	---	74.00	27.66	200.0	H	0.0	-13.3
2074.133333	48.78	---	74.00	25.22	200.0	H	3.0	-12.3
2076.733333	---	38.97	54.00	15.03	100.0	H	143.0	-12.3
2658.666667	---	42.44	54.00	11.56	100.0	V	0.0	-10.5
2660.333333	52.61	---	74.00	21.39	100.0	V	359.0	-10.5

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

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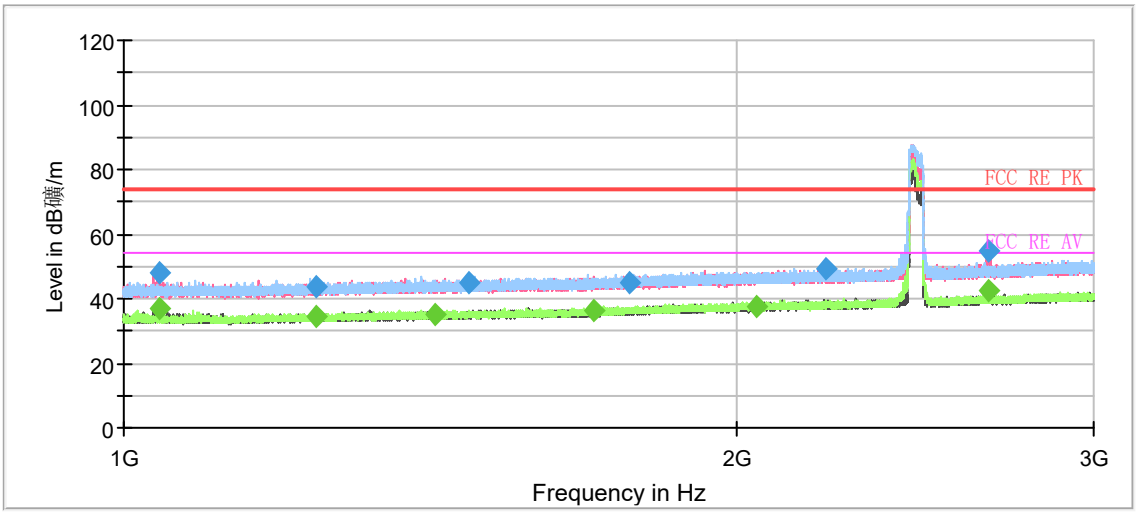
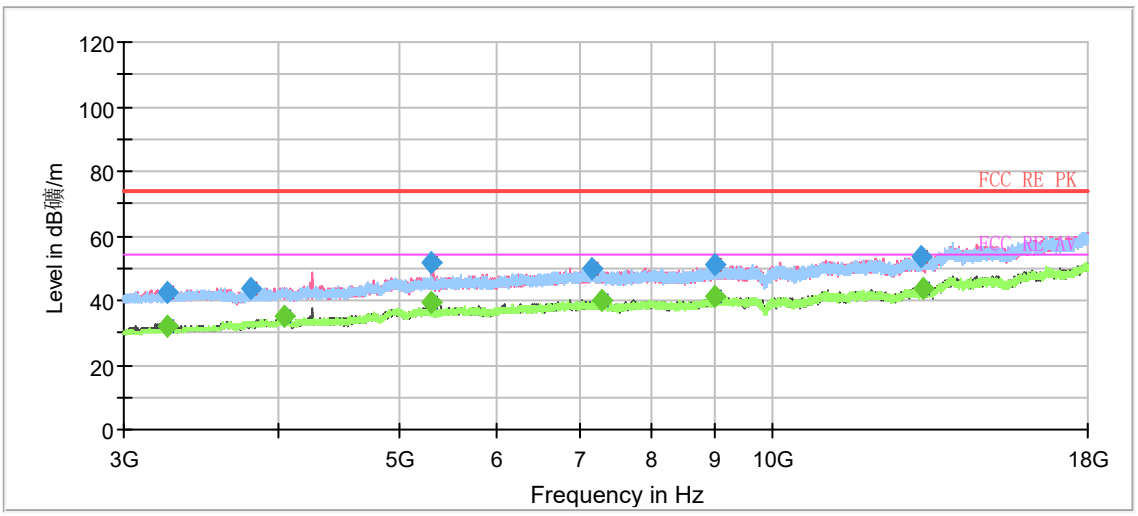
802.11n (HT40) CH9



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)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1041.400000	47.73	---	74.00	26.27	100.0	V	73.0	-16.9
1041.400000	---	36.85	54.00	17.15	100.0	V	73.0	-16.9
1242.533333	43.95	---	74.00	30.05	200.0	V	168.0	-16.0
1243.600000	---	34.76	54.00	19.24	200.0	H	50.0	-16.0
1424.333333	---	35.18	54.00	18.82	200.0	V	212.0	-15.2
1479.466667	44.90	---	74.00	29.10	200.0	V	179.0	-14.9
1701.533333	---	36.26	54.00	17.74	200.0	H	276.0	-14.0
1772.866667	44.89	---	74.00	29.11	200.0	V	64.0	-13.5
2046.733333	---	37.27	54.00	16.73	200.0	V	357.0	-12.5
2217.600000	49.09	---	74.00	24.91	100.0	H	177.0	-12.0
2660.733333	54.94	---	74.00	19.06	200.0	V	345.0	-10.5
2665.666667	---	42.54	54.00	11.46	200.0	V	0.0	-10.5

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

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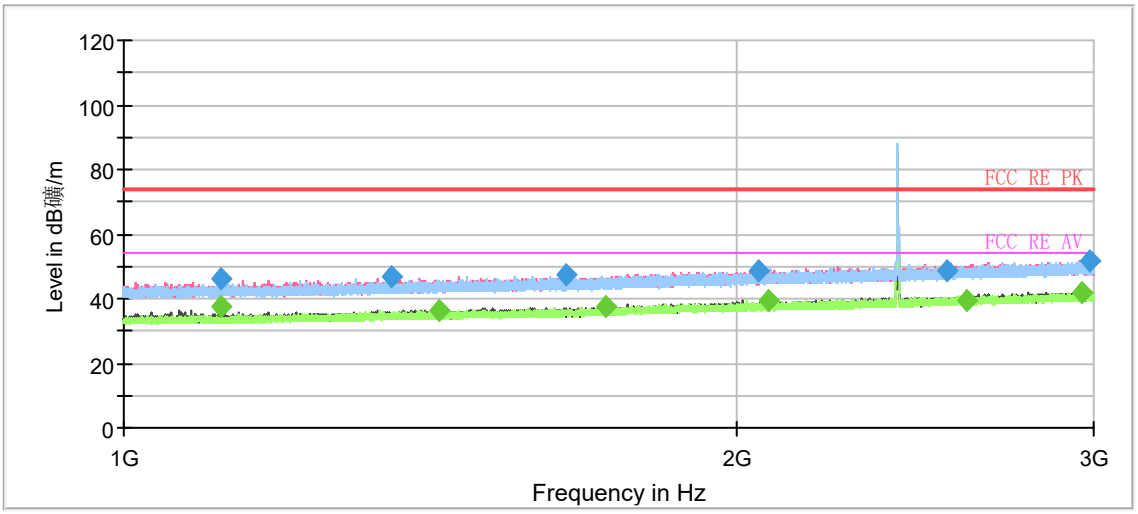
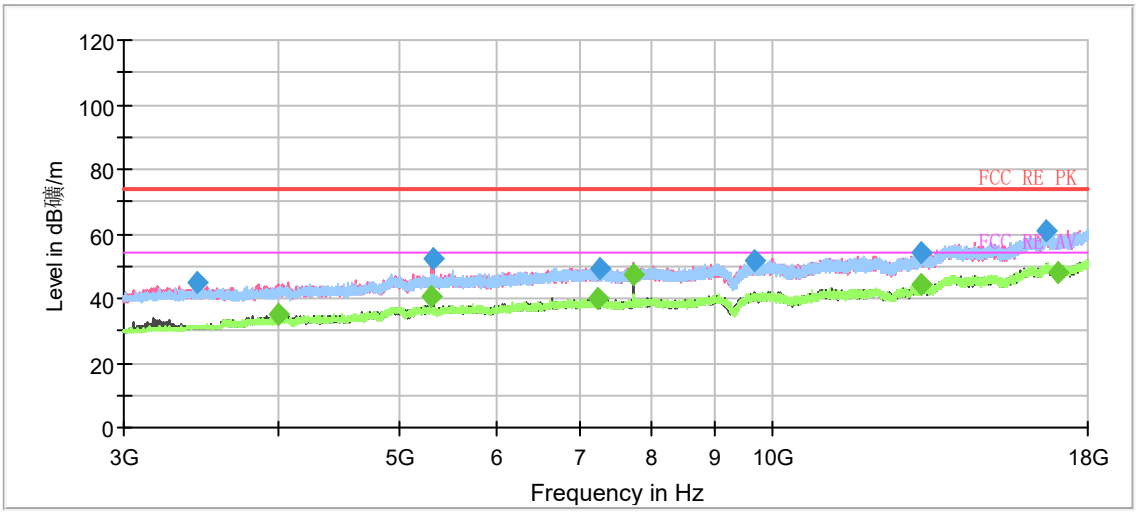
Bluetooth LE-Channel 0



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)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1116.400000	---	37.23	54.00	16.77	200.0	V	74.0	-16.6
1117.466667	45.91	---	74.00	28.09	200.0	V	74.0	-16.6
1355.266667	46.47	---	74.00	27.53	100.0	V	349.0	-15.5
1430.400000	---	36.61	54.00	17.39	100.0	H	293.0	-15.2
1649.466667	47.53	---	74.00	26.47	100.0	H	1.0	-14.2
1726.200000	---	37.27	54.00	16.73	100.0	V	241.0	-13.8
2051.733333	48.92	---	74.00	25.08	200.0	H	118.0	-12.4
2075.333333	---	39.22	54.00	14.78	100.0	V	276.0	-12.3
2538.400000	48.35	---	74.00	25.65	200.0	V	98.0	-11.1
2600.400000	---	39.15	54.00	14.85	200.0	V	359.0	-10.8
2958.400000	---	42.05	54.00	11.95	200.0	V	74.0	-9.0
2983.266667	51.95	---	74.00	22.05	100.0	H	349.0	-9.0

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

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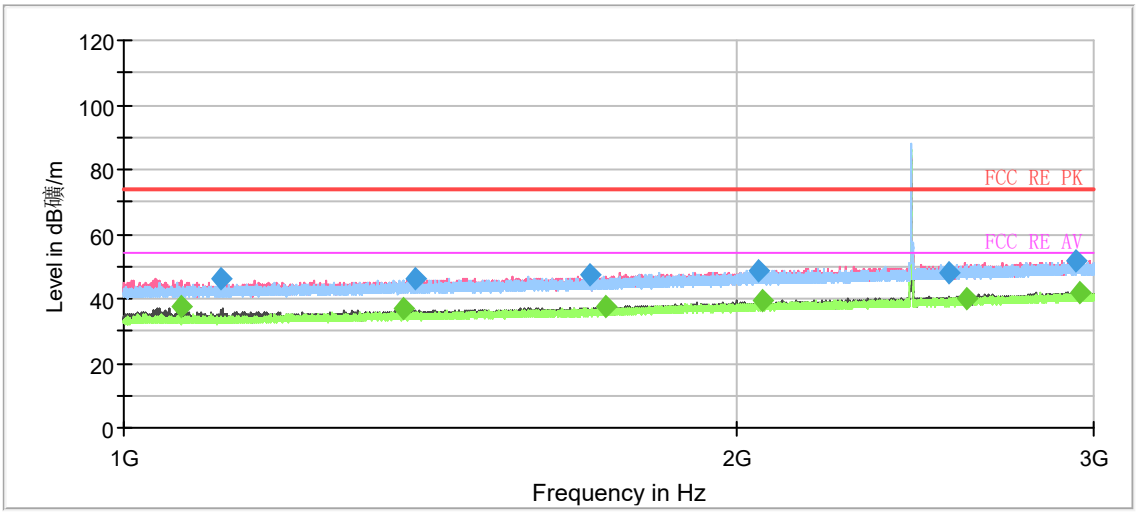
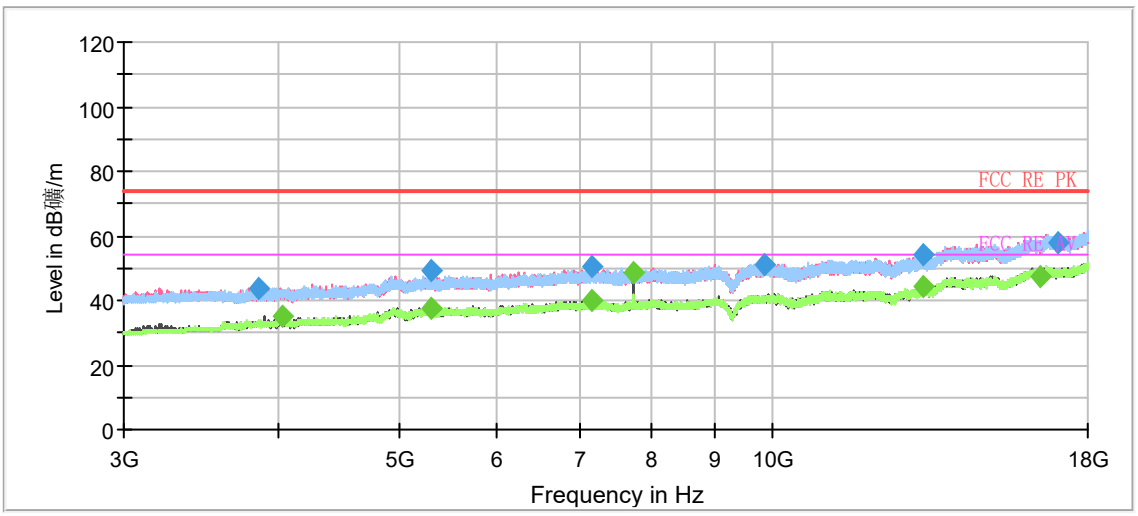
Bluetooth LE-Channel 19



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)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1066.933333	---	37.41	54.00	16.59	100.0	V	113.0	-16.8
1117.066667	46.04	---	74.00	27.96	200.0	V	98.0	-16.6
1372.133333	---	36.74	54.00	17.26	100.0	V	0.0	-15.5
1392.466667	46.32	---	74.00	27.68	100.0	V	160.0	-15.4
1696.733333	47.44	---	74.00	26.56	100.0	V	241.0	-14.0
1726.666667	---	37.37	54.00	16.63	100.0	V	68.0	-13.8
2051.466667	48.92	---	74.00	25.08	200.0	V	0.0	-12.4
2060.133333	---	39.42	54.00	14.58	100.0	V	229.0	-12.4
2544.466667	48.22	---	74.00	25.78	100.0	V	24.0	-11.0
2600.466667	---	39.99	54.00	14.01	200.0	V	166.0	-10.8
2940.933333	51.54	---	74.00	22.46	200.0	V	166.0	-9.2
2954.333333	---	41.77	54.00	12.23	200.0	V	177.0	-9.1
7726.500000	---	48.43	54.00	5.57	100.0	V	146.0	-7.5

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

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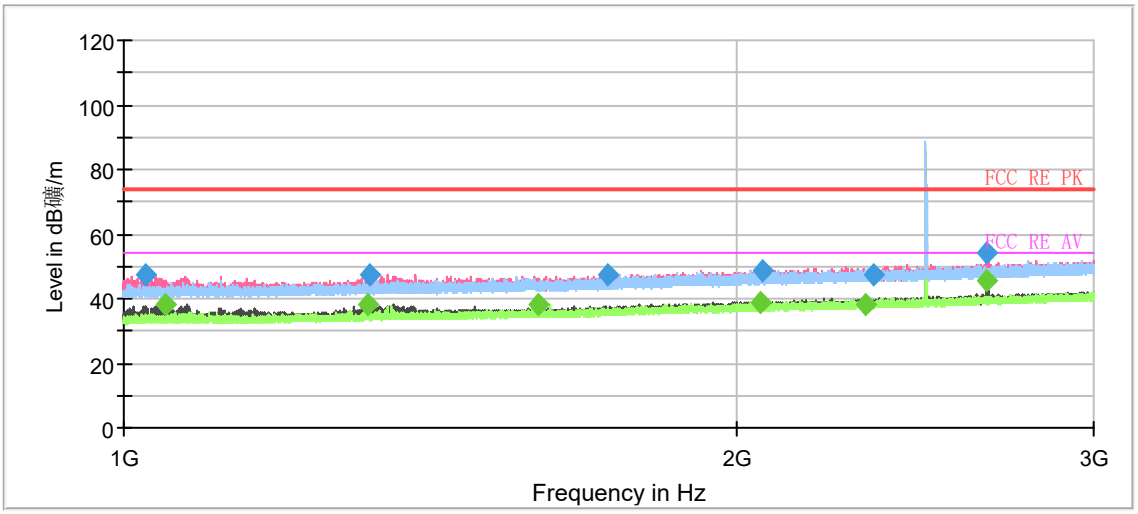
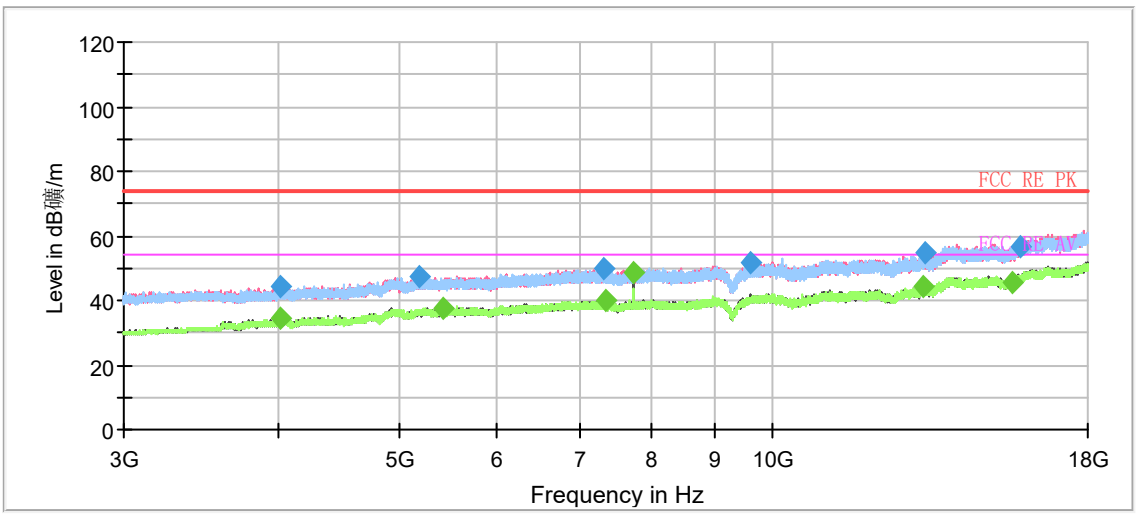
Bluetooth LE-Channel 39



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)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1025.733333	47.11	---	74.00	26.89	200.0	V	121.0	-16.9
1047.600000	---	38.10	54.00	15.90	100.0	V	136.0	-16.9
1319.000000	---	38.23	54.00	15.77	100.0	V	125.0	-15.7
1320.400000	47.50	---	74.00	26.50	200.0	V	110.0	-15.7
1598.533333	---	37.97	54.00	16.03	200.0	V	74.0	-14.4
1730.133333	47.13	---	74.00	26.87	100.0	H	1.0	-13.8
2058.400000	---	39.04	54.00	14.96	200.0	H	178.0	-12.4
2062.866667	48.80	---	74.00	25.20	100.0	V	0.0	-12.4
2314.866667	---	38.26	54.00	15.74	100.0	V	359.0	-11.7
2337.266667	47.63	---	74.00	26.37	100.0	V	264.0	-11.7
2656.533333	---	45.55	54.00	8.45	200.0	V	1.0	-10.5
2656.533333	54.26	---	74.00	19.74	200.0	V	1.0	-10.5
7726.500000	---	48.74	54.00	5.26	100.0	V	148.0	-7.5

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

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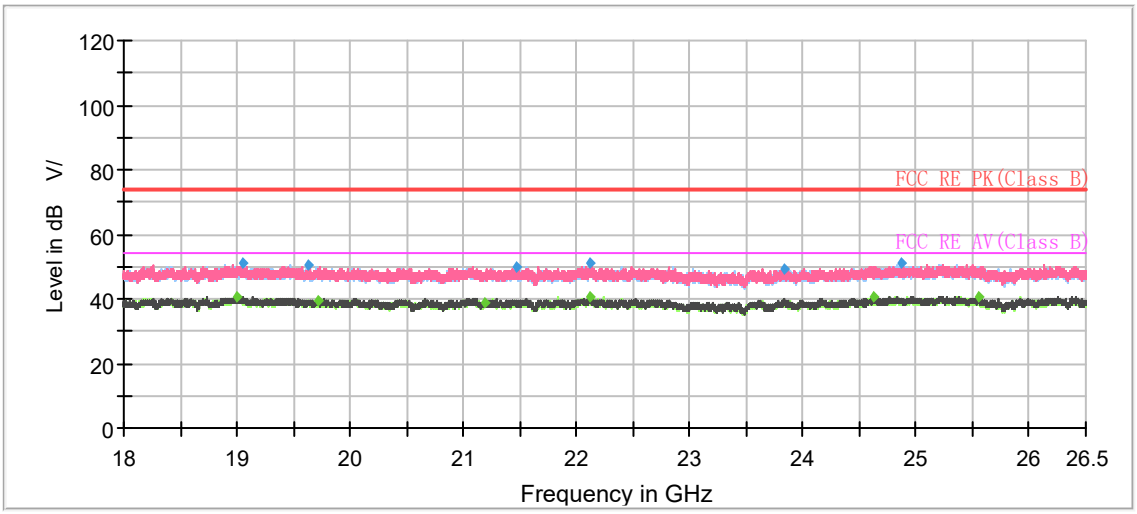
During the test, the Radiates Emission from 18GHz to 26.5GHz was performed in all modes with all channels, Bluetooth LE Channel 39 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.



Radiates Emission from 18GHz to 26.5GHz

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5.7. Conducted Emission

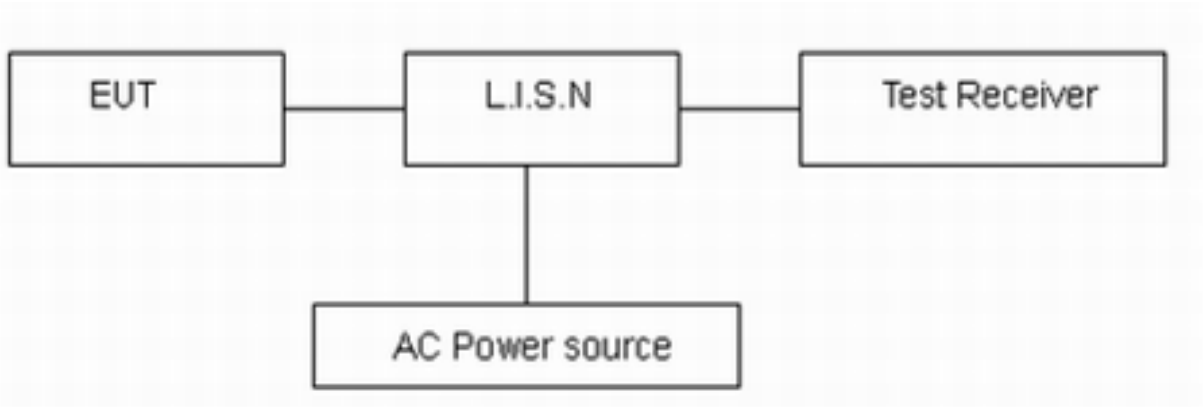
Ambient condition

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. 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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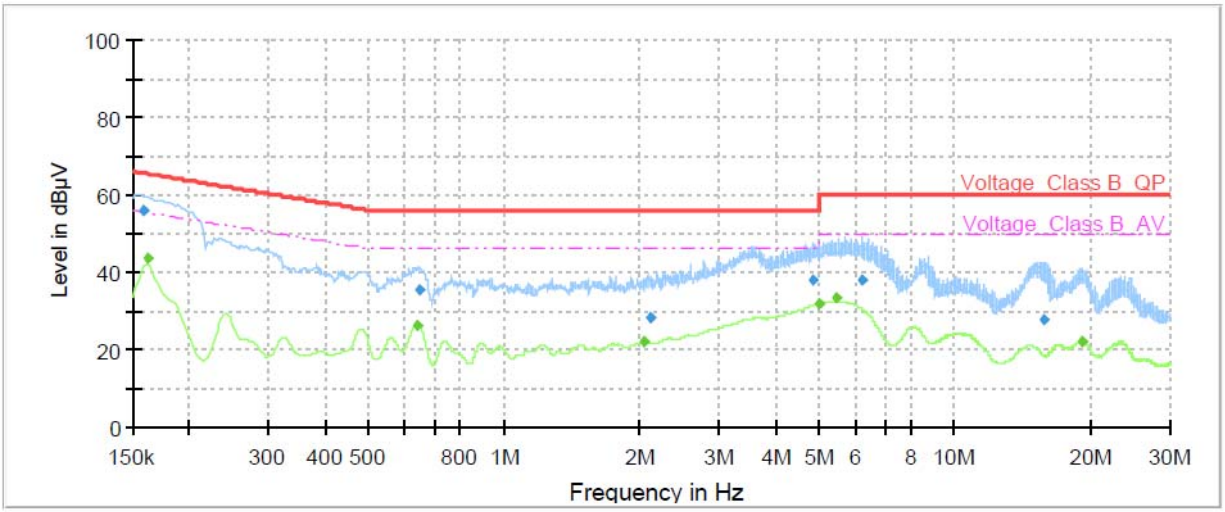
Test Results:

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 /Bluetooth LE) with all channels, Bluetooth LE Channel 39 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)
0.16	55.75	---	65.52	9.77	70.0	9.000	L1	ON	21
0.16	---	43.56	55.40	11.84	70.0	9.000	L1	ON	21
0.64	---	26.19	46.00	19.81	70.0	9.000	L1	ON	20
0.65	35.48	---	56.00	20.52	70.0	9.000	L1	ON	20
2.04	---	21.91	46.00	24.09	70.0	9.000	L1	ON	20
2.11	28.39	---	56.00	27.61	70.0	9.000	L1	ON	20
4.82	37.79	---	56.00	18.21	70.0	9.000	L1	ON	19
5.00	---	31.65	46.00	14.35	70.0	9.000	L1	ON	19
5.43	---	33.14	50.00	16.86	70.0	9.000	L1	ON	19
6.20	38.11	---	60.00	21.89	70.0	9.000	L1	ON	19
15.82	27.84	---	60.00	32.16	70.0	9.000	L1	ON	20
19.18	---	21.93	50.00	28.07	70.0	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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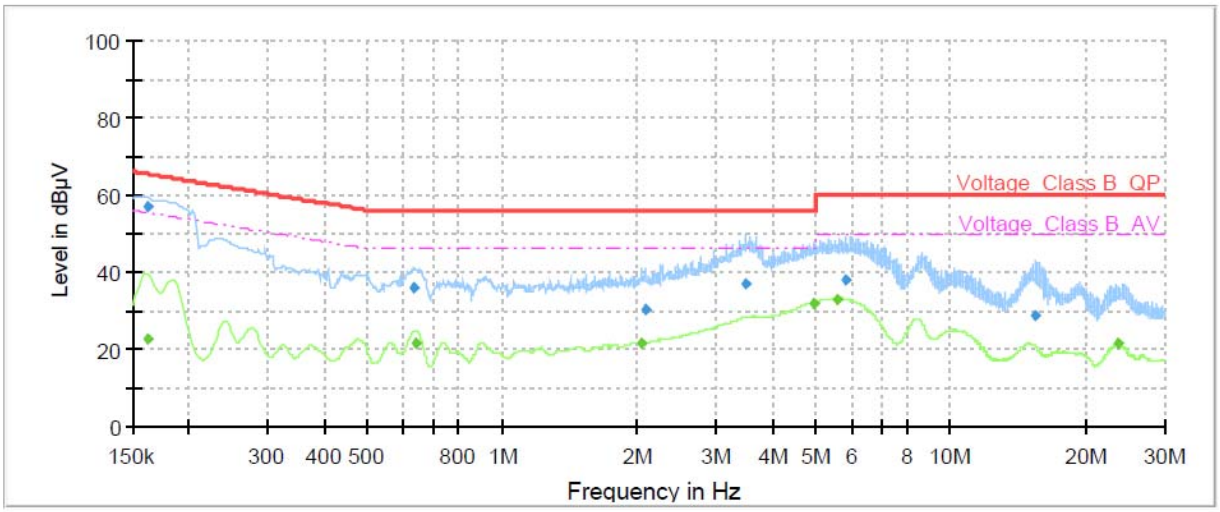

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.16	56.78	---	65.40	8.62	70.0	9.000	N	ON	21
0.16	---	22.75	55.40	32.65	70.0	9.000	N	ON	21
0.64	35.76	---	56.00	20.24	70.0	9.000	N	ON	20
0.64	---	21.61	46.00	24.39	70.0	9.000	N	ON	20
2.04	---	21.76	46.00	24.24	70.0	9.000	N	ON	20
2.08	30.07	---	56.00	25.93	70.0	9.000	N	ON	20
3.48	36.74	---	56.00	19.26	70.0	9.000	N	ON	19
4.96	---	31.59	46.00	14.41	70.0	9.000	N	ON	19
5.58	---	32.84	50.00	17.16	70.0	9.000	N	ON	19
5.81	37.97	---	60.00	22.03	70.0	9.000	N	ON	19
15.39	28.86	---	60.00	31.14	70.0	9.000	N	ON	20
23.54	---	21.74	50.00	28.26	70.0	9.000	N	ON	20

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
EMI Test Receiver	R&S	ESCI7	100936	2021-12-12	2022-12-11
Signal Analyzer	R&S	FSV40	100815	2021-05-15	2022-05-14
TRILOG Broadband Antenna	SCHWARZBECK	9163	1023	2021-06-07	2024-06-06
Horn Antenna	R&S	HF907	102723	2021-07-26	2024-07-25
Horn Antenna	ETS-Lindgren	3160-09	00102643	2020-10-10	2023-10-09
Software	R&S	EMC32	9.26.01	/	/
Artificial main network	R&S	ENV216	101171	2020-12-13	2022-12-12
EMI Test Receiver	R&S	ESR	101667	2021-05-15	2022-05-14
Software	R&S	EMC32	10.35.10	/	/
Spectrum Analyzer	KEYSIGHT	N9020A	MY54420163	2021-12-12	2022-12-11
Power probe	R&S	NRP18S	101954	2021-05-15	2022-05-14
Climate Chamber	ESPEC	SU-242	93000506	2021-12-12	2022-12-11

********END OF REPORT ********

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ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.

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ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.

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