

Fig.A.6.1.85 Conducted Spurious Emission (802.11n-HT40, Ch6, 7.5 GHz-10 GHz)

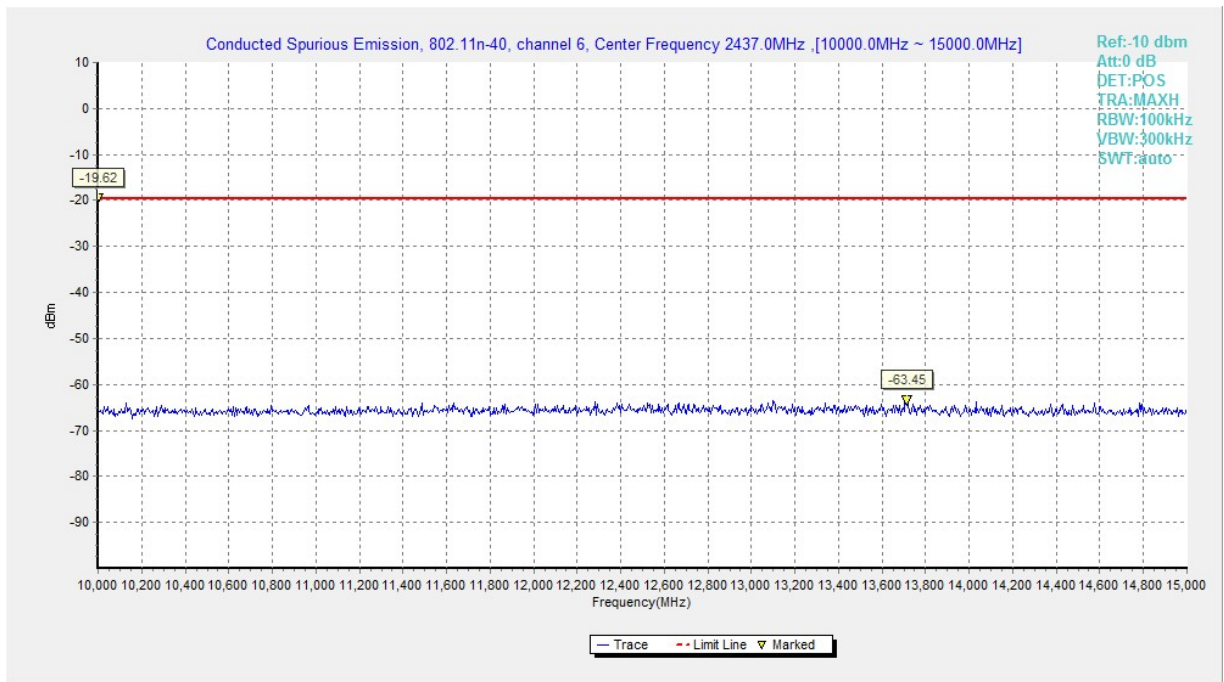


Fig.A.6.1.86 Conducted Spurious Emission (802.11n-HT40, Ch6, 10 GHz-15 GHz)

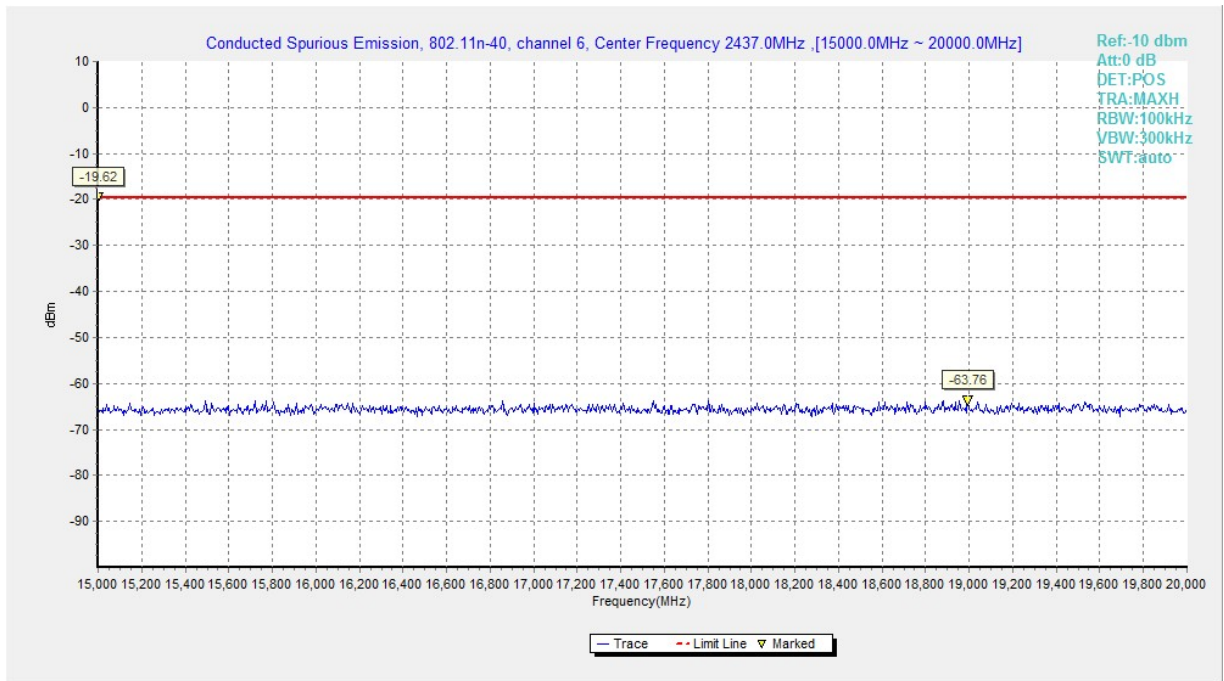


Fig.A.6.1.87 Conducted Spurious Emission (802.11n-HT40, Ch6, 15 GHz-20 GHz)

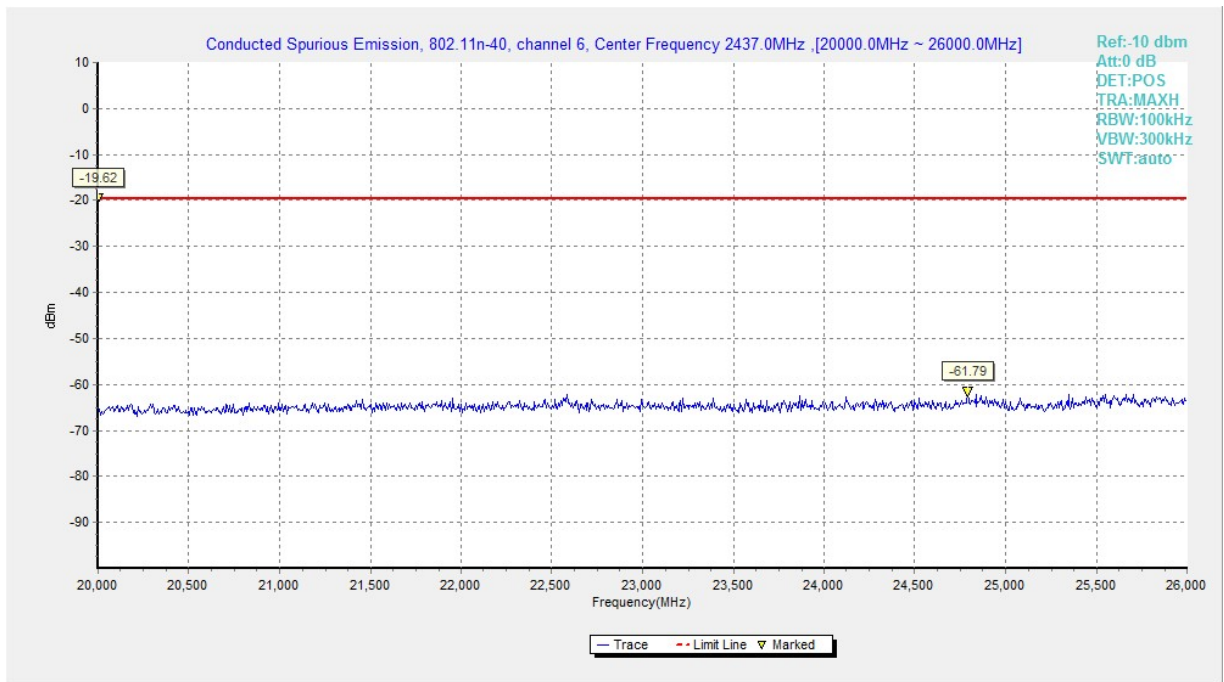


Fig.A.6.1.88 Conducted Spurious Emission (802.11n-HT40, Ch6, 20 GHz-26 GHz)

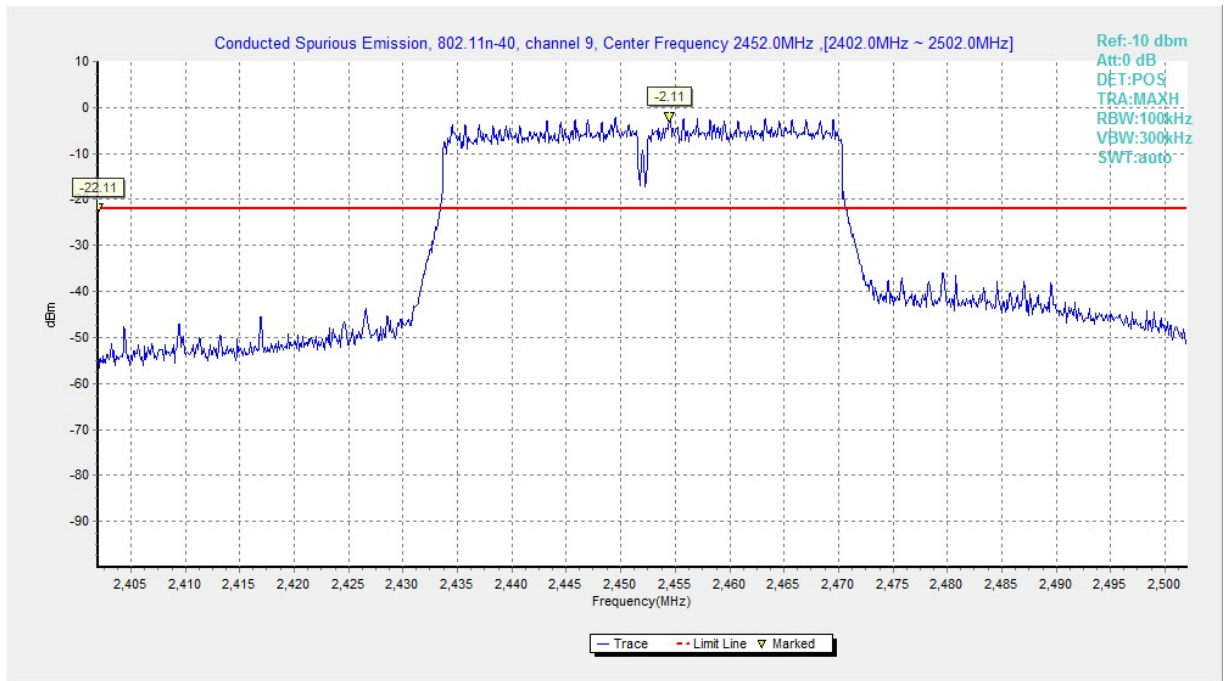


Fig.A.6.1.89 Conducted Spurious Emission (802.11n-HT40, Ch9, Center Frequency)

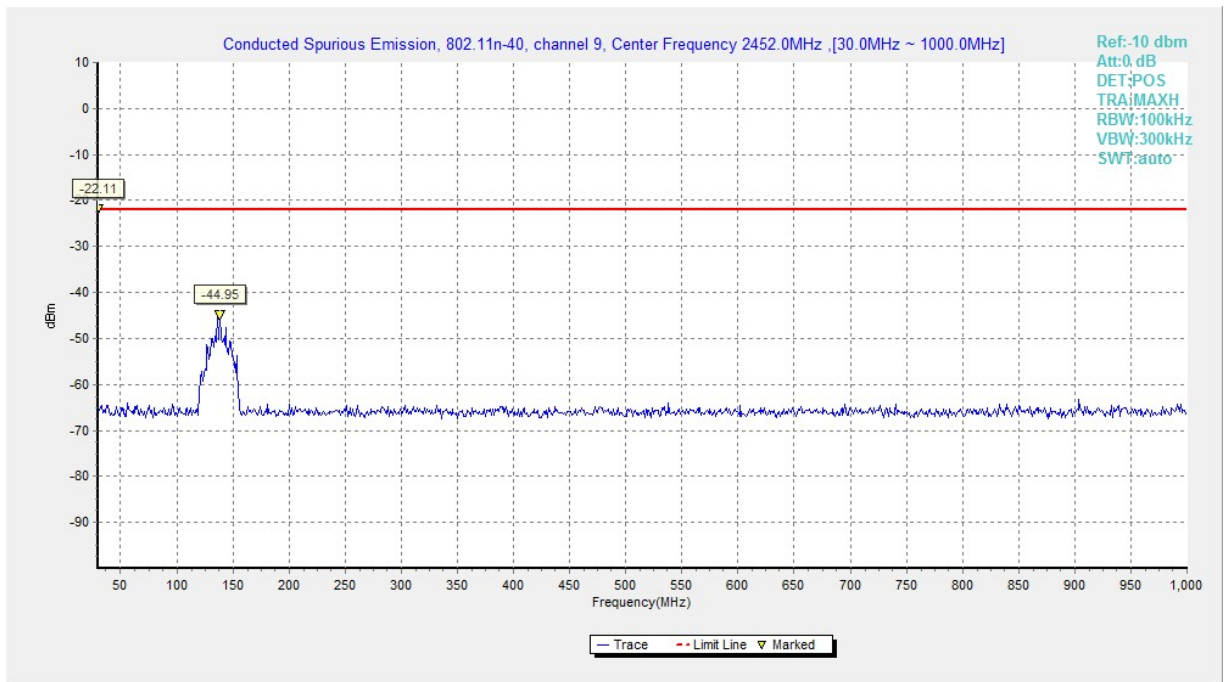


Fig.A.6.1.90 Conducted Spurious Emission (802.11n-HT40, Ch9, 30 MHz-1 GHz)

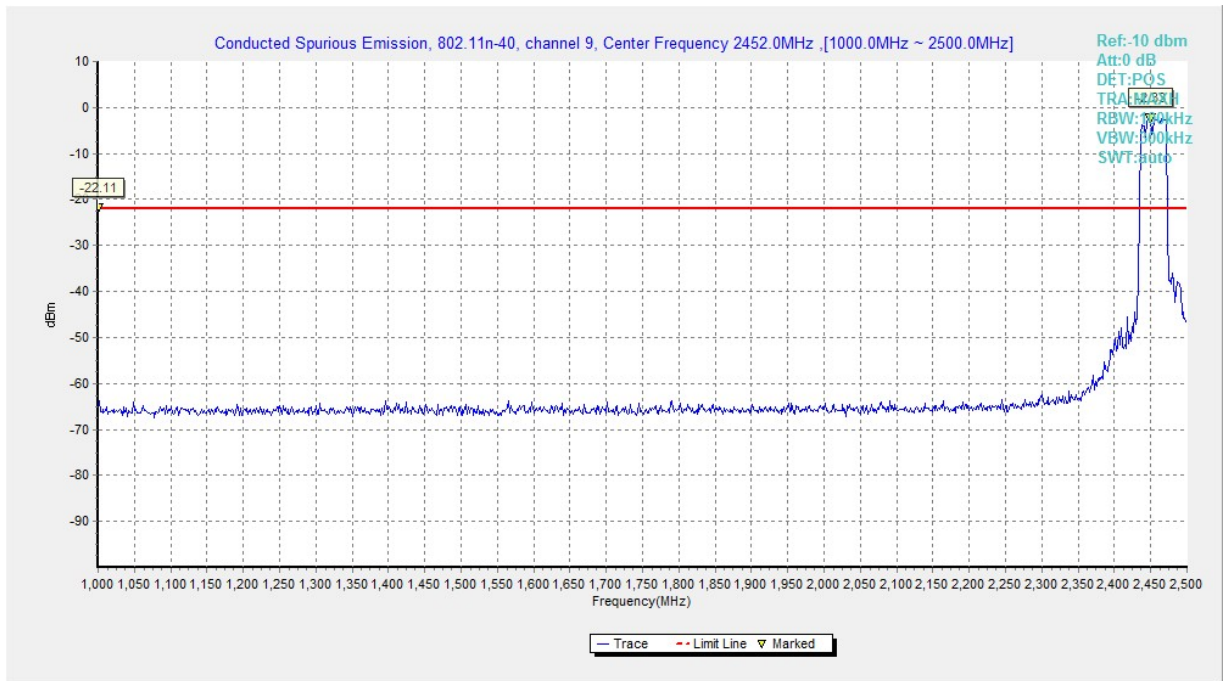


Fig.A.6.1.91 Conducted Spurious Emission (802.11n-HT40, Ch9, 1 GHz-2.5 GHz)

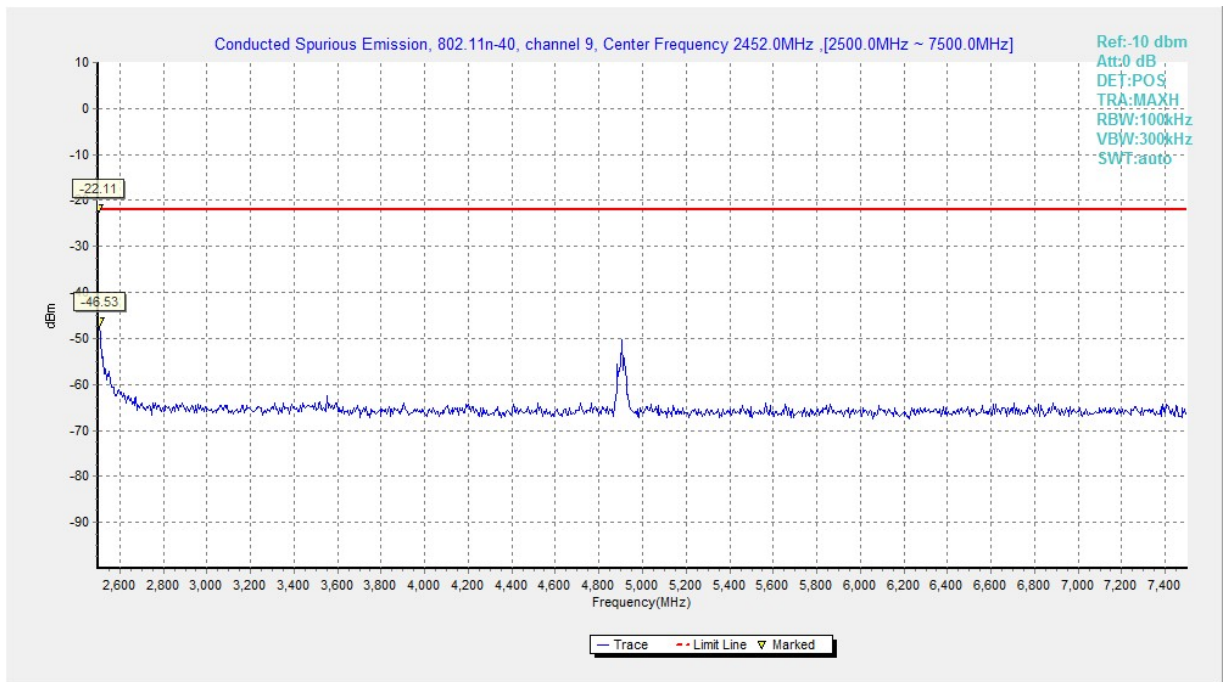


Fig.A.6.1.92 Conducted Spurious Emission (802.11n-HT40, Ch9, 2.5 GHz-7.5 GHz)

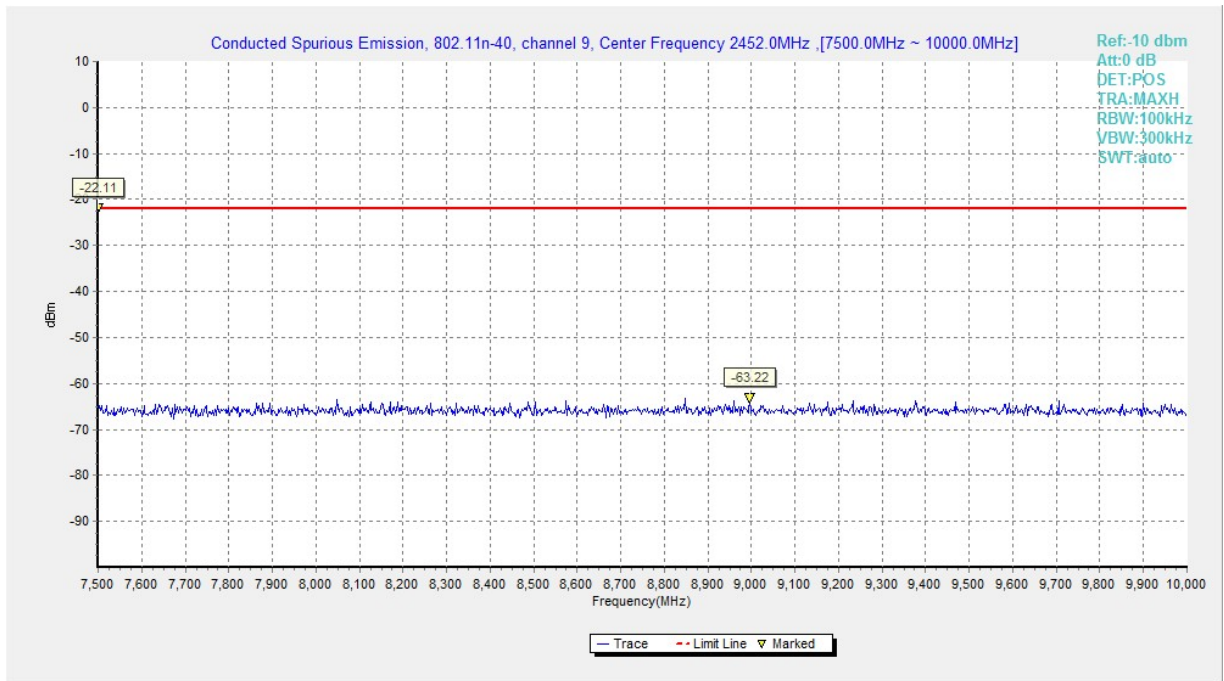


Fig.A.6.1.93 Conducted Spurious Emission (802.11n-HT40, Ch9, 7.5 GHz-10 GHz)

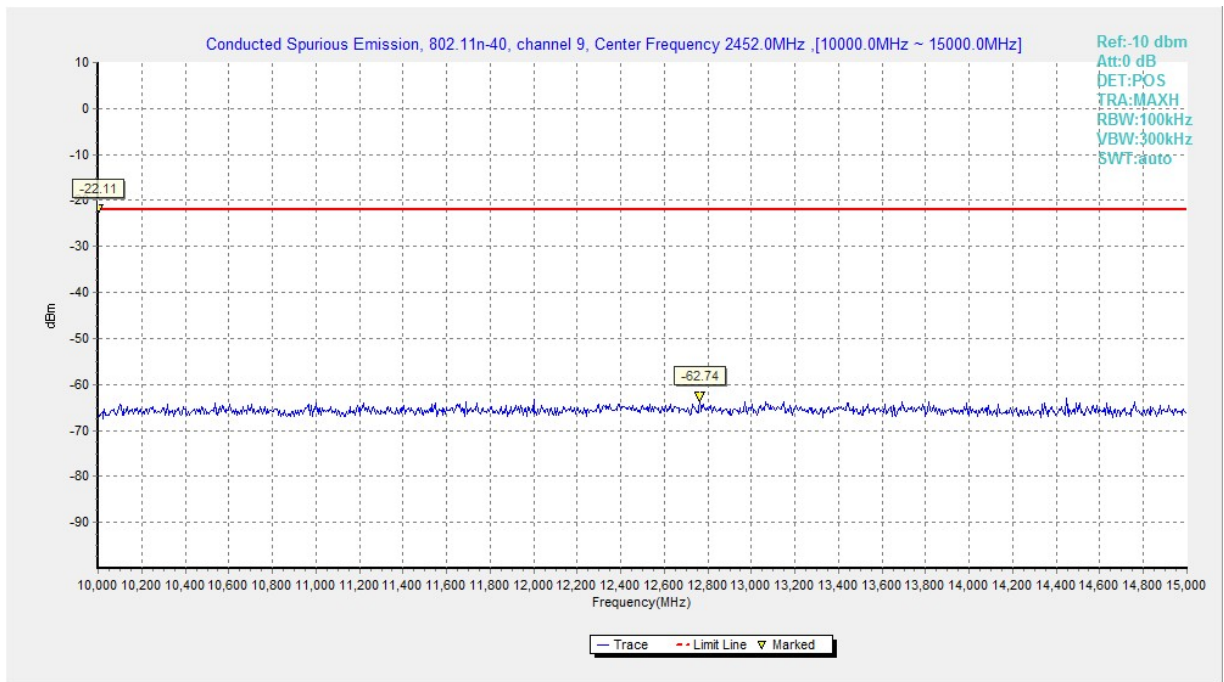


Fig.A.6.1.94 Conducted Spurious Emission (802.11n-HT40, Ch9, 10 GHz-15 GHz)

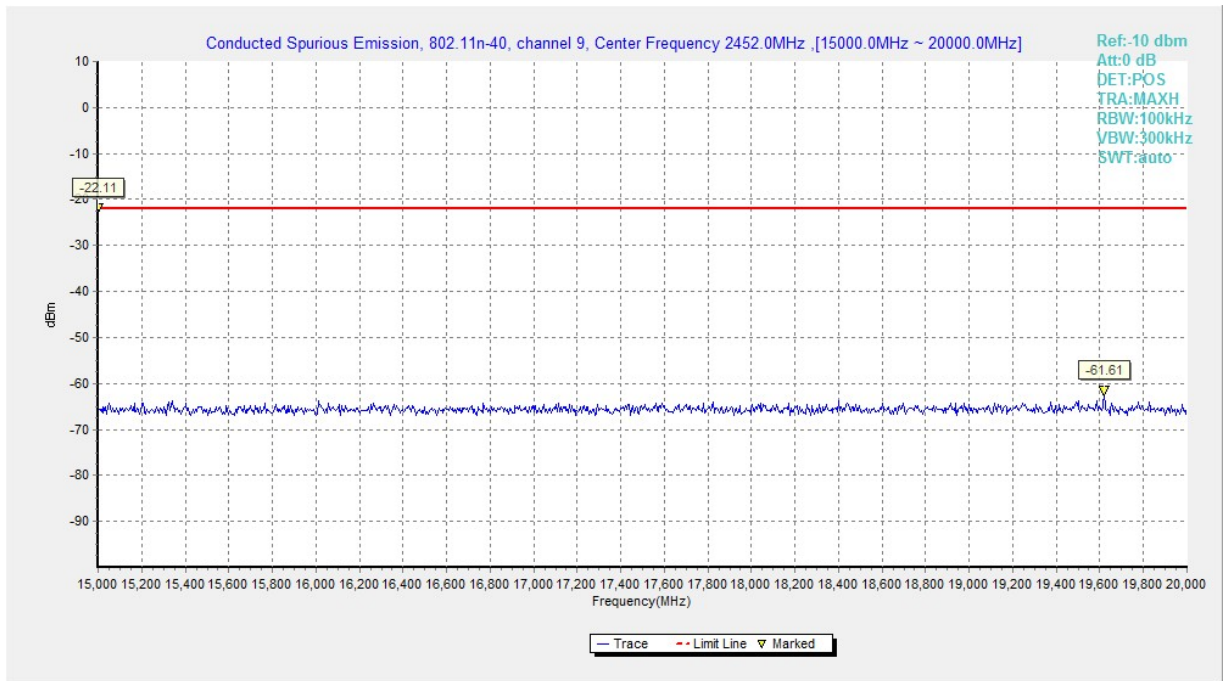


Fig.A.6.1.95 Conducted Spurious Emission (802.11n-HT40, Ch9, 15 GHz-20 GHz)

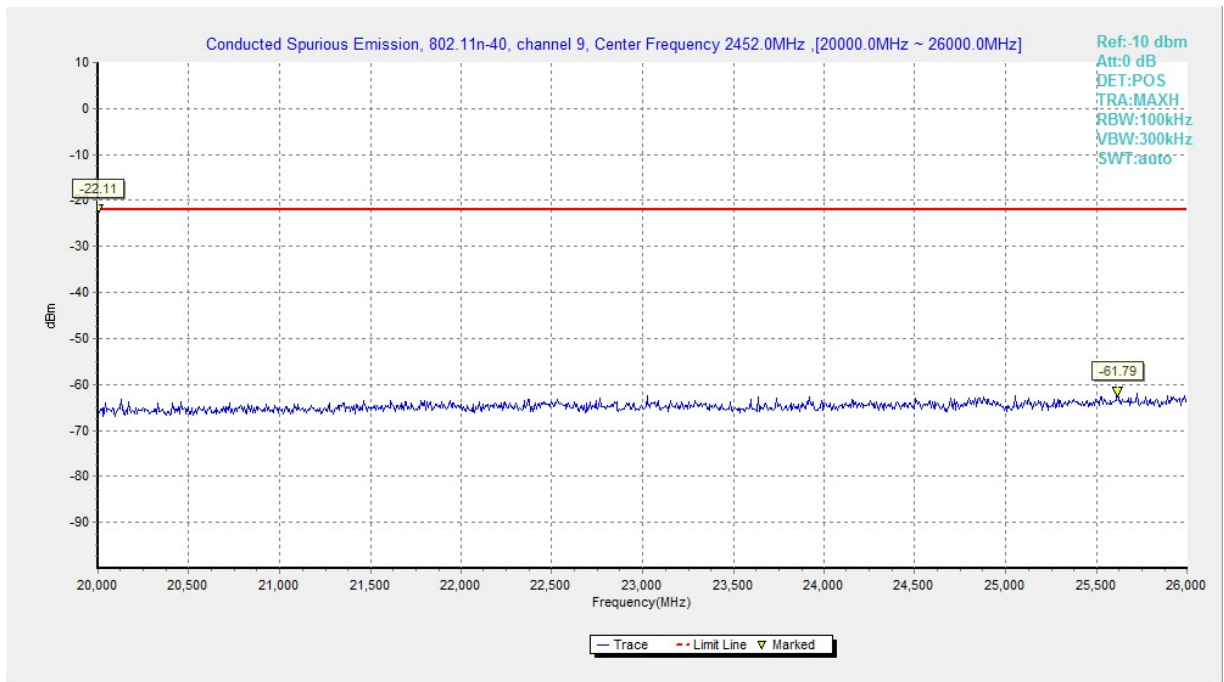


Fig.A.6.1.96 Conducted Spurious Emission (802.11n-HT40, Ch9, 20 GHz-26 GHz)

A.6.2 Transmitter Spurious Emission - Radiated

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247, 15.205, 15.209	20dB below peak output power

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)).

The measurement is made according to KDB558074.

Limit in restricted band:

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Condition

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100KHz/300KHz	5
1000-4000	1MHz/1MHz	15
4000-18000	1MHz/1MHz	40
18000-26500	1MHz/1MHz	20

EUT ID:EUT1

Modulation type and data rate tested:

802.11b	802.11g	802.11n-HT20	802.11n-HT40
11Mbps(CCK)	54Mbps(OFDM)	MCS5(OFDM)	MCS5(OFDM)

Measurement Results:

802.11b mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11b	Power	2.38GHz ~2.45GHz	Fig.A.6.2.1	P
	1	1 GHz ~ 3 GHz	Fig.A.6.2.2	P
		3 GHz ~ 18 GHz	Fig.A.6.2.3	P
	6	30 MHz ~1 GHz	Fig.A.6.2.4	P
		1 GHz ~ 3 GHz	Fig.A.6.2.5	P
		3 GHz ~ 18 GHz	Fig.A.6.2.6	P
		18 GHz~ 26.5 GHz	Fig.A.6.2.7	P
	Power	2.45GHz ~2.5GHz	Fig.A.6.2.8	P
	11	1 GHz ~ 3 GHz	Fig.A.6.2.9	P
		3 GHz ~ 18 GHz	Fig.A.6.2.10	P

802.11g mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11g	Power	2.38GHz ~2.43GHz	Fig.A.6.2.11	P
	1	1 GHz ~ 3 GHz	Fig.A.6.2.12	P
		3 GHz ~ 18 GHz	Fig.A.6.2.13	P
	6	30 MHz ~1 GHz	Fig.A.6.2.14	P
		1 GHz ~ 3 GHz	Fig.A.6.2.15	P
		3 GHz ~ 18 GHz	Fig.A.6.2.16	P
		18 GHz~ 26.5 GHz	Fig.A.6.2.17	P
	Power	2.45GHz ~2.5GHz	Fig.A.6.2.18	P
	11	1 GHz ~ 3 GHz	Fig.A.6.2.19	P
		3 GHz ~ 18 GHz	Fig.A.6.2.20	P

802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	Power	2.38GHz ~2.45GHz	Fig.A.6.2.21	P
	1	1 GHz ~ 3 GHz	Fig.A.6.2.22	P
		3 GHz ~ 18 GHz	Fig.A.6.2.23	P
	6	30 MHz ~1 GHz	Fig.A.6.2.24	P
		1 GHz ~ 3 GHz	Fig.A.6.2.25	P
		3 GHz ~ 18 GHz	Fig.A.6.2.26	P
		18 GHz~ 26.5 GHz	Fig.A.6.2.27	P
	Power	2.45GHz ~2.5GHz	Fig.A.6.2.28	P
	11	1 GHz ~ 3 GHz	Fig.A.6.2.29	P
		3 GHz ~ 18 GHz	Fig.A.6.2.30	P

802.11n-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT40)	Power	2.38GHz ~2.45GHz	Fig.A.6.2.31	P
	3	1 GHz ~ 3 GHz	Fig.A.6.2.32	P
		3 GHz ~ 18 GHz	Fig.A.6.2.33	P
	6	30 MHz ~1 GHz	Fig.A.6.2.34	P
		1 GHz ~ 3 GHz	Fig.A.6.2.35	P
		3 GHz ~ 18 GHz	Fig.A.6.2.36	P
		18 GHz~ 26.5 GHz	Fig.A.6.2.37	P
	Power	2.45GHz ~2.5GHz	Fig.A.6.2.38	P
	9	1 GHz ~ 3 GHz	Fig.A.6.2.39	P
		3 GHz ~ 18 GHz	Fig.A.6.2.40	P

Conclusion: Pass

Measurement Uncertainty:

Frequency Range	Uncertainty(dB)
$f \leq 1\text{GHz}$	3.9
$f > 1\text{GHz}$	4.3

Note:

A "reference path loss" is established and the A_{Rpl} is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

P_{Mea} is the field strength recorded from the instrument.

The measurement results are obtained as described below:

$$\text{Result} = P_{Mea} + A_{Rpl} = P_{Mea} + \text{Cable Loss} + \text{Antenna Factor}$$

802.11b

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
2389.475	47.4	-38.8	27.7	58.500	V
17994.000	56.0	-17.7	45.6	28.100	V
18000.000	55.3	-17.7	44.5	28.500	H
17952.000	55.2	-17.7	45.6	27.300	V
17959.500	55.1	-17.7	45.6	27.200	V
17793.000	54.7	-18.5	45.6	27.600	V

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17958.000	55.3	-17.7	45.6	27.400	V
17991.000	55.0	-17.7	45.6	27.100	V
17688.000	54.9	-18.9	45.6	28.200	V
17979.000	54.8	-17.7	45.6	26.900	V
17905.500	54.7	-18.5	45.6	27.600	V
17983.500	54.7	-17.7	45.6	26.800	V

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2494.700	48.9	-38.9	27.7	60.100	V
17988.000	55.9	-17.7	45.6	28.000	V
17946.000	55.8	-17.7	45.6	27.900	V
17994.000	55.5	-17.7	45.6	27.600	V
17992.500	55.2	-17.7	45.6	27.300	H
17656.500	55.1	-18.9	45.6	28.400	V

802.11g

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2389.960	64.6	-38.8	27.7	75.700	V
17980.500	55.8	-17.7	45.6	27.900	V
17988.000	55.6	-17.7	45.6	27.700	H
17955.000	55.6	-17.7	45.6	27.700	V
17977.500	55.3	-17.7	45.6	27.400	V
17967.000	54.9	-17.7	45.6	27.000	V

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17988.000	55.3	-17.7	45.6	27.400	V
17916.000	55.1	-17.7	45.6	27.200	V
17910.000	55.1	-18.5	45.6	28.000	V
17946.000	55.1	-17.7	45.6	27.200	V
17997.000	55.0	-17.7	45.6	27.100	V
17964.000	54.9	-17.7	45.6	27.000	V

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2483.600	73.4	-38.9	27.7	84.600	V
17974.500	55.5	-17.7	45.6	27.600	V
17991.000	55.2	-17.7	45.6	27.300	H
17814.000	55.1	-18.5	45.6	28.000	H
17995.500	55.0	-17.7	45.6	27.100	V
17959.500	54.9	-17.7	45.6	27.000	V

802.11n-HT20

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2389.640	69.2	-38.8	27.7	80.300	V
17959.500	56.0	-17.7	45.6	28.100	V
17829.000	55.6	-18.5	45.6	28.500	V
17986.500	55.2	-17.7	45.6	27.300	V
17977.500	55.1	-17.7	45.6	27.200	V
17947.500	55.1	-17.7	45.6	27.200	V

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17997.000	55.3	-17.7	45.6	27.400	V
17802.000	55.2	-18.5	45.6	28.100	V
18000.000	54.9	-17.7	44.5	28.100	V
17776.500	54.8	-18.5	45.6	27.700	V
17979.000	54.7	-17.7	45.6	26.800	V
17950.500	54.6	-17.7	45.6	26.700	V

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2484.010	70.7	-38.9	27.7	81.900	V
17995.500	55.5	-17.7	45.6	27.600	V
17824.500	54.8	-18.5	45.6	27.700	V
17964.000	54.7	-17.7	45.6	26.800	V
17737.500	54.6	-18.5	45.6	27.500	V
17986.500	54.6	-17.7	45.6	26.700	V

802.11n-HT40

Ch3

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2389.760	70.2	-38.8	27.7	81.300	V
17997.000	55.5	-17.7	45.6	27.600	V
17983.500	55.5	-17.7	45.6	27.600	H
17979.000	55.5	-17.7	45.6	27.600	V
17989.500	55.3	-17.7	45.6	27.400	H
17985.000	55.2	-17.7	45.6	27.300	V

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17991.000	55.7	-17.7	45.6	27.800	V
17986.500	55.5	-17.7	45.6	27.600	V
17988.000	55.5	-17.7	45.6	27.600	H
17959.500	55.3	-17.7	45.6	27.400	H
17964.000	55.2	-17.7	45.6	27.300	V
17983.500	55.2	-17.7	45.6	27.300	V

Ch9

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2483.500	67.8	-38.9	27.7	79.000	V
17977.500	56.0	-17.7	45.6	28.100	V
17991.000	55.6	-17.7	45.6	27.700	V
17772.000	55.5	-18.5	45.6	28.400	V
17974.500	55.4	-17.7	45.6	27.500	V
17866.500	55.0	-18.5	45.6	27.900	V

Test graphs as below:

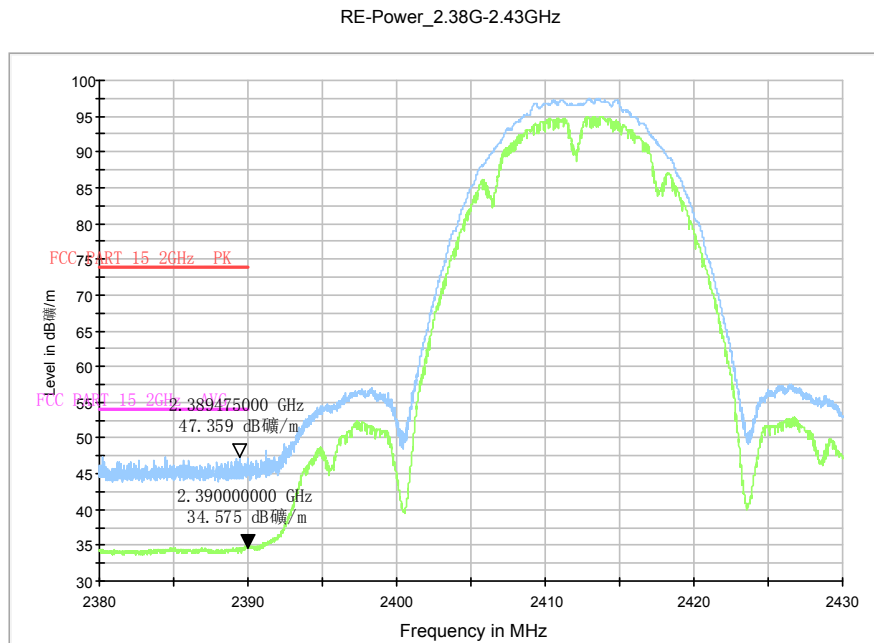


Fig.A.6.2.1 Radiated Spurious Emission (Power): 802.11b, ch1, 2.38 GHz – 2.45GHz

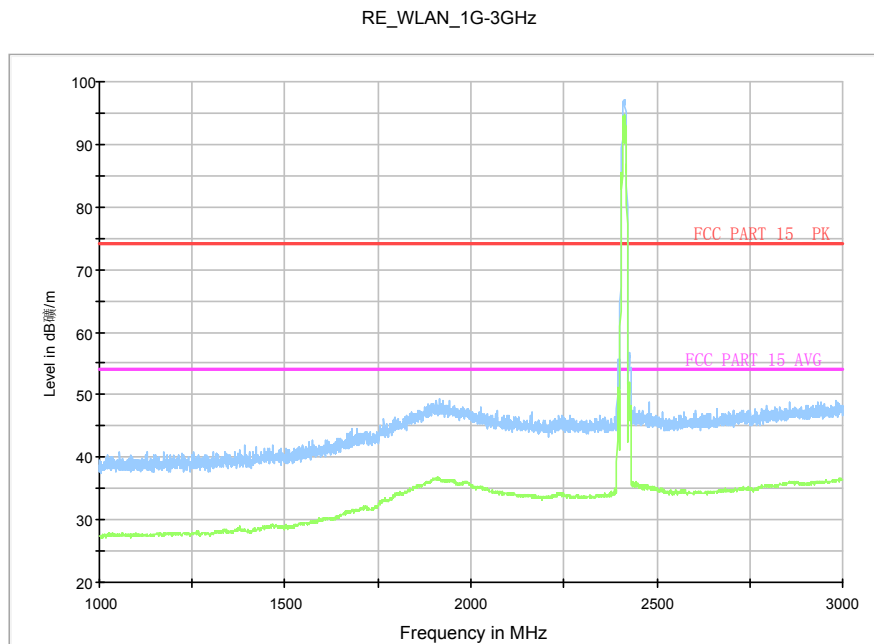


Fig.A.6.2.2 Radiated Spurious Emission (802.11b, Ch1, 1 GHz-3 GHz)

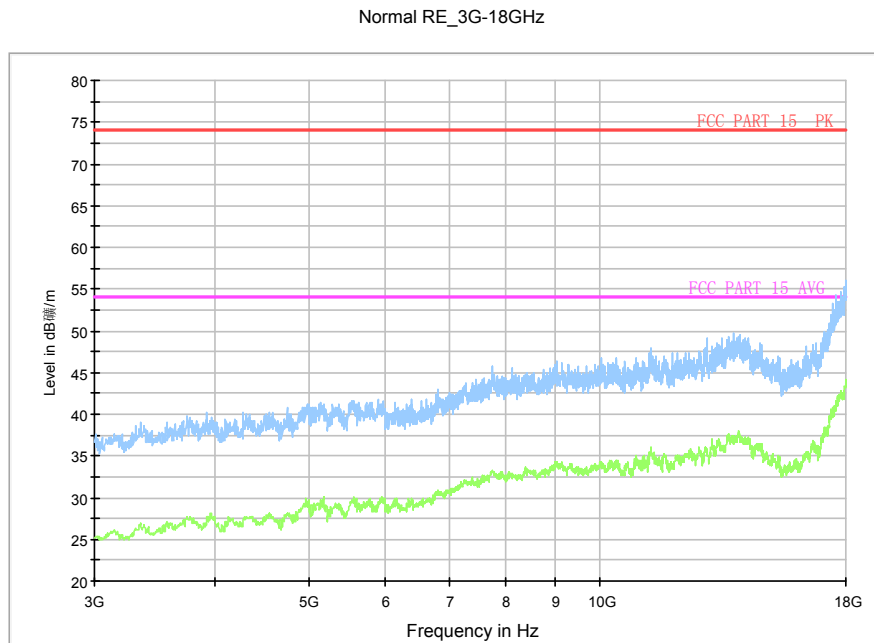


Fig.A.6.2.3 Radiated Spurious Emission (802.11b, Ch1, 3 GHz-18 GHz)

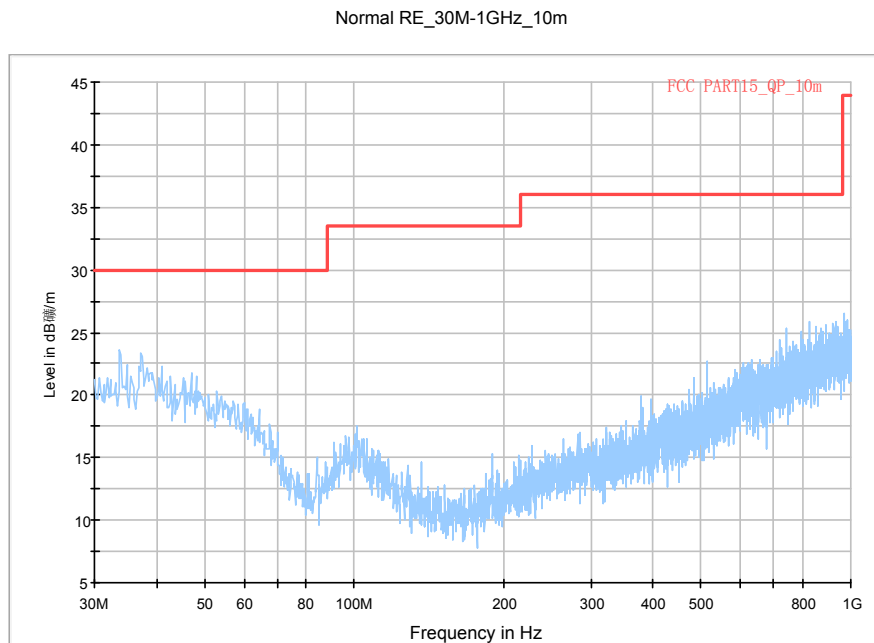


Fig.A.6.2.4 Radiated Spurious Emission (802.11b, Ch6, 30 MHz-1 GHz)

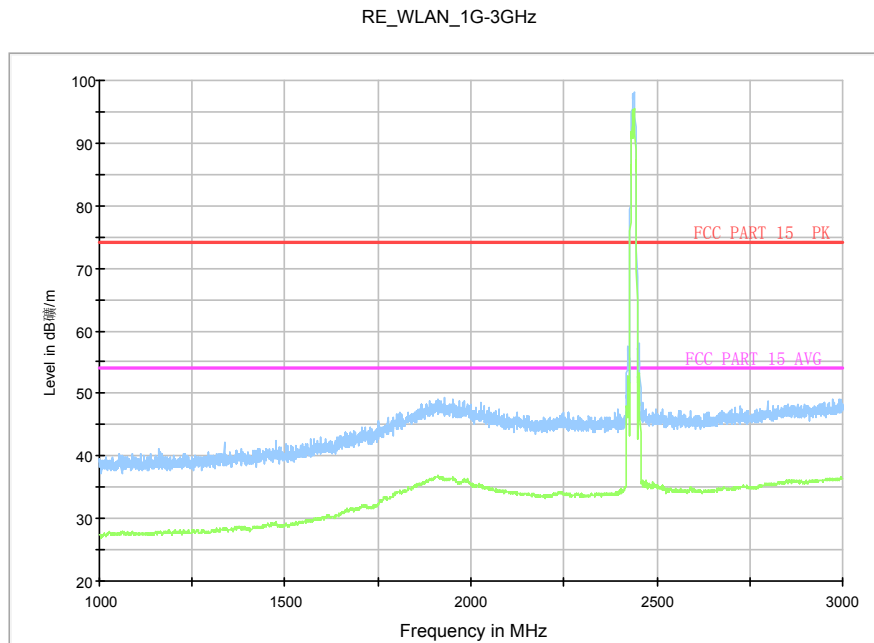


Fig.A.6.2.5 Radiated Spurious Emission (802.11b, Ch6, 1 GHz-3 GHz)

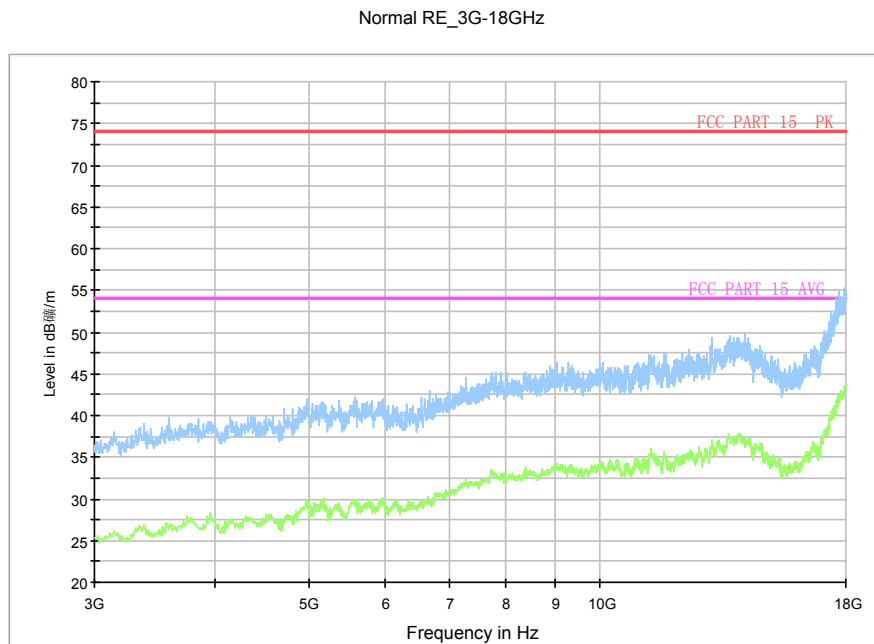


Fig.A.6.2.6 Radiated Spurious Emission (802.11b, Ch6, 3 GHz-18 GHz)

Normal RE_18G-26.5GHz

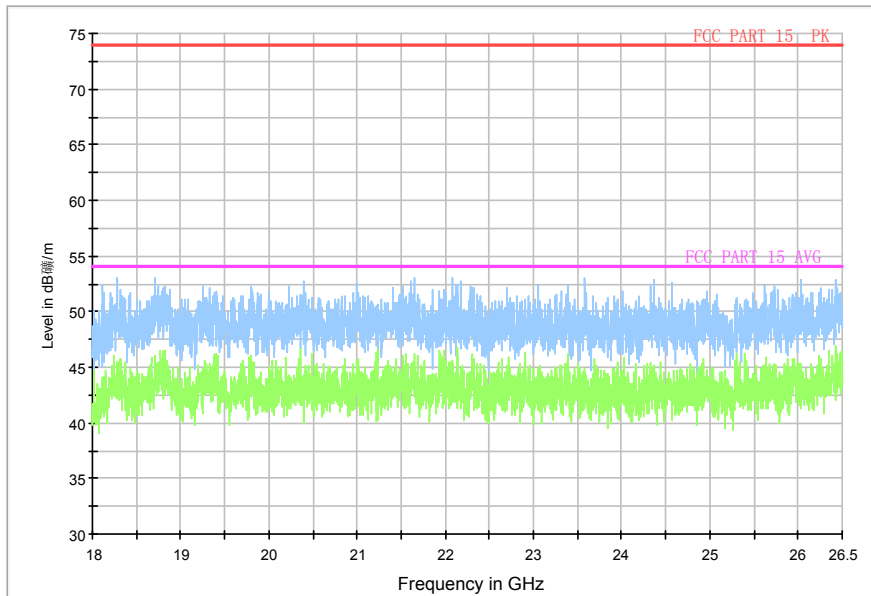


Fig.A.6.2.7 Radiated Spurious Emission (802.11b, Ch6, 18GHz – 26.5GHz)

RE-Power_2.45G-2.5GHz

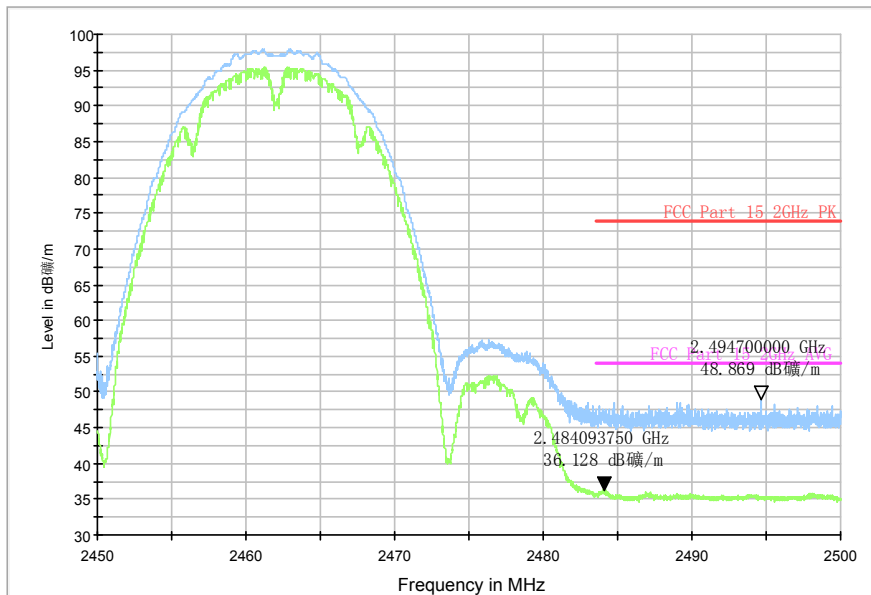


Fig.A.6.2.8 Radiated Spurious Emission (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz

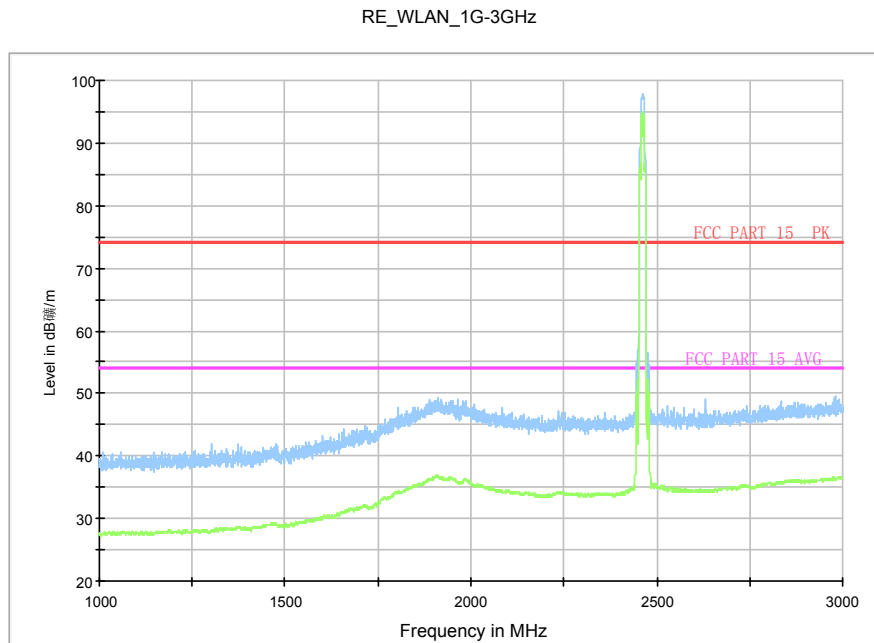


Fig.A.6.2.9 Radiated Spurious Emission (802.11b, Ch11, 1 GHz-3 GHz)

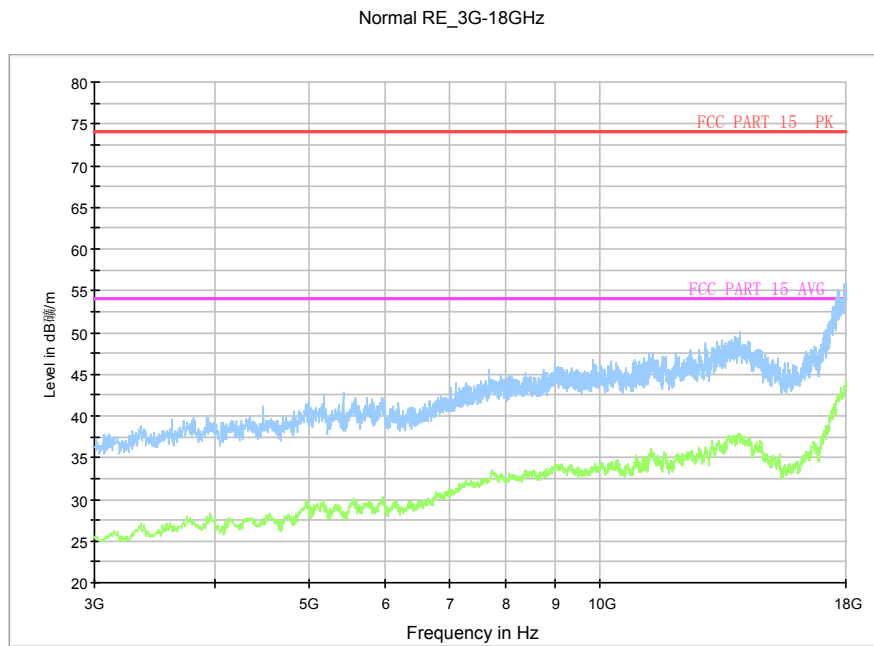


Fig.A.6.2.10 Radiated Spurious Emission (802.11b, Ch11, 3 GHz-18 GHz)

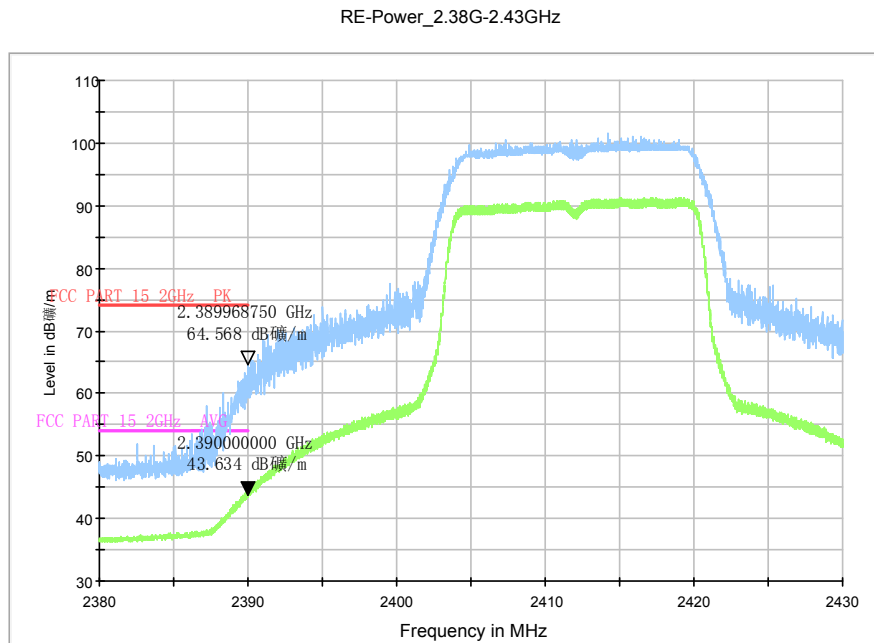


Fig.A.6.2.11 Radiated Spurious Emission (Power): 802.11g, ch1, 2.38 GHz - 2.45GHz

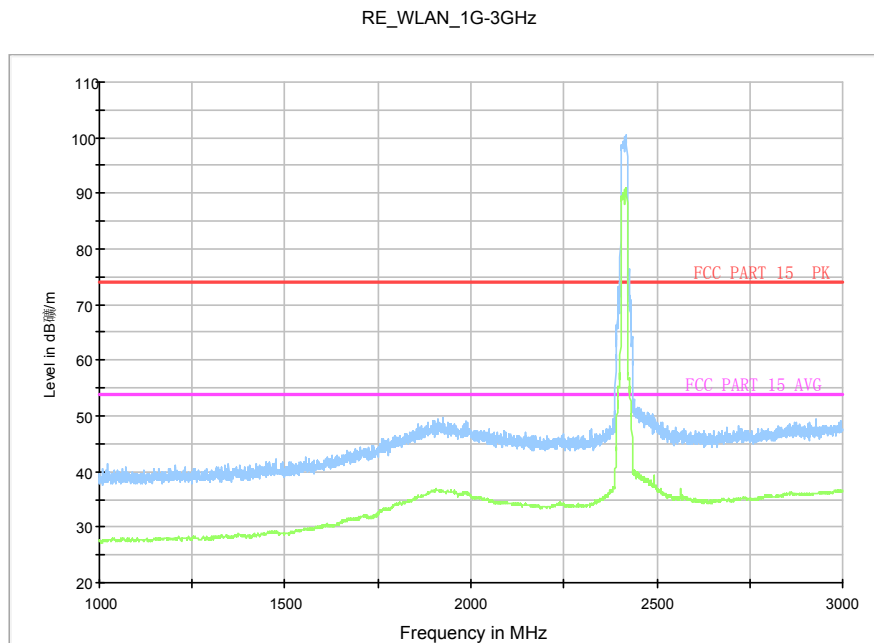


Fig.A.6.2.12 Radiated Spurious Emission (802.11g, Ch1, 1 GHz-3 GHz)

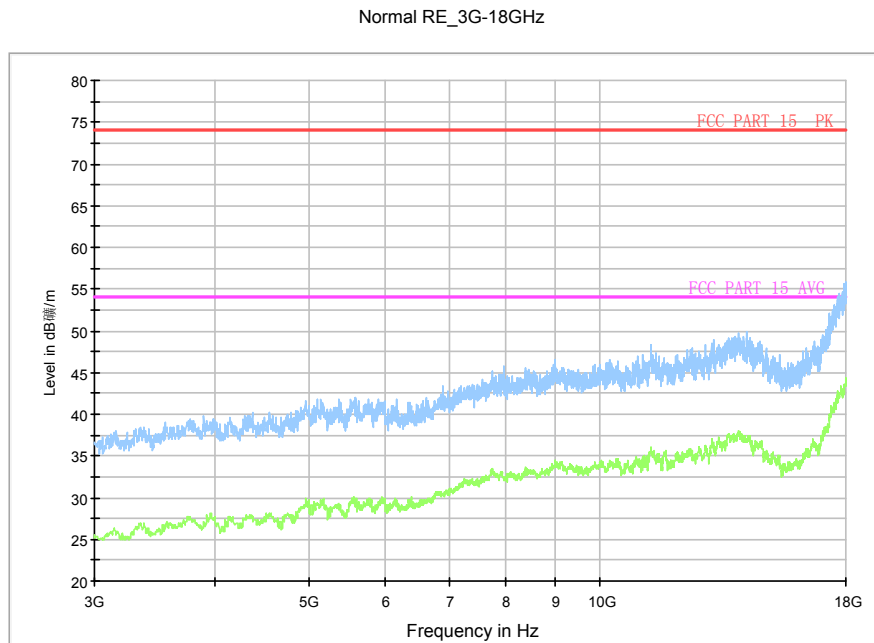


Fig.A.6.2.13 Radiated Spurious Emission (802.11g, Ch1, 3 GHz-18 GHz)

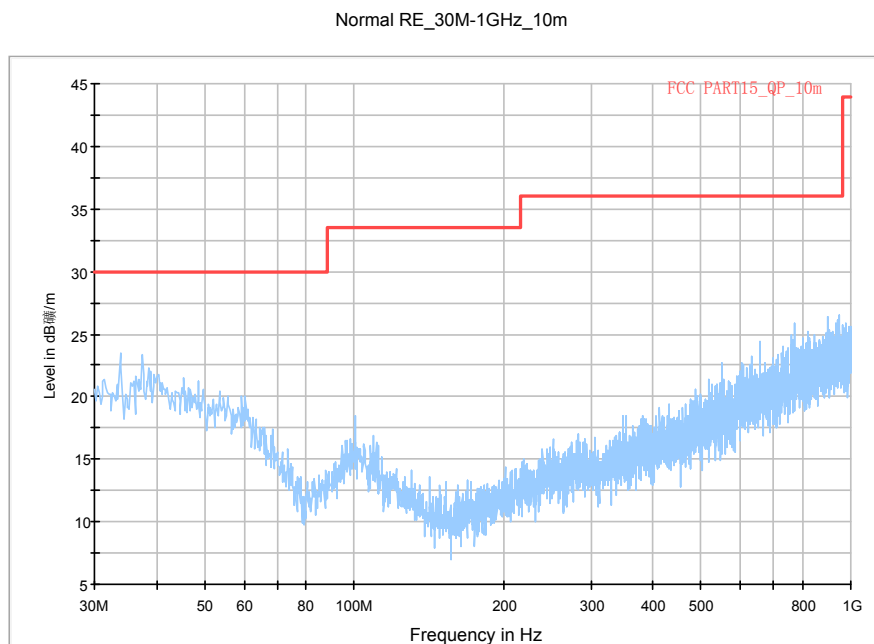


Fig.A.6.2.14 Radiated Spurious Emission (802.11g, Ch6, 30 MHz-1 GHz)

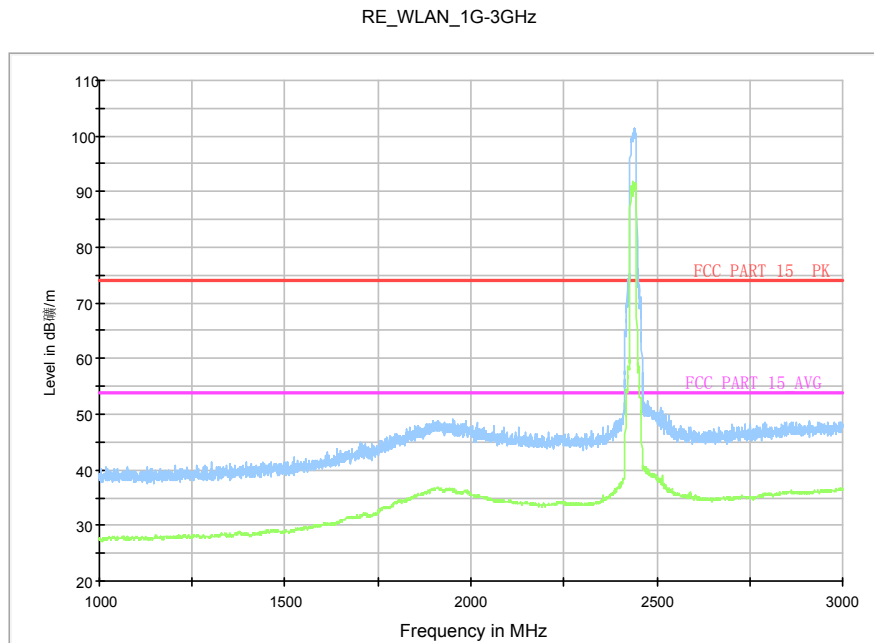


Fig.A.6.2.15 Radiated Spurious Emission (802.11g, Ch6, 1 GHz-3 GHz)

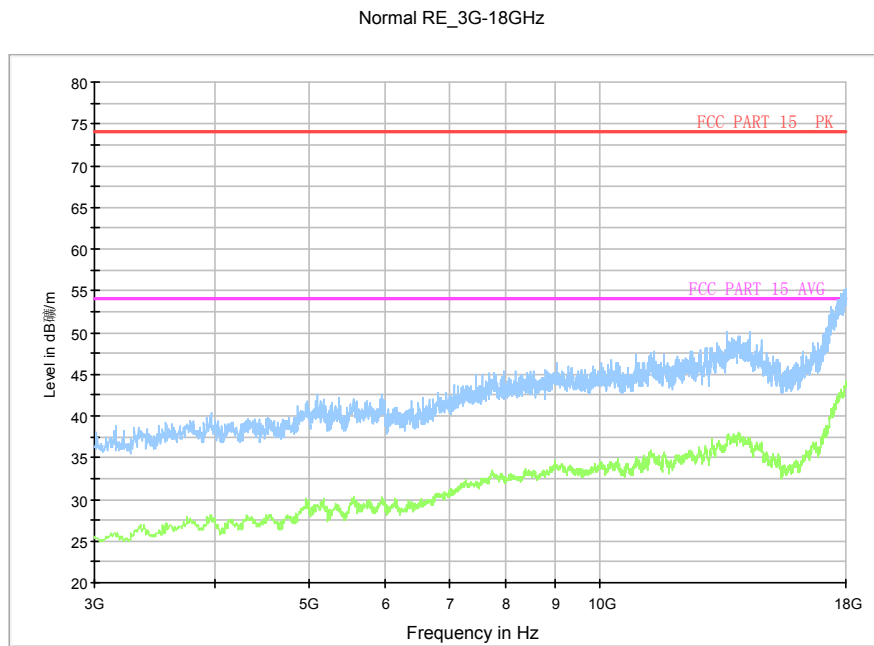


Fig.A.6.2.16 Radiated Spurious Emission (802.11g, Ch6, 3 GHz-18 GHz)

Normal RE_18G-26.5GHz

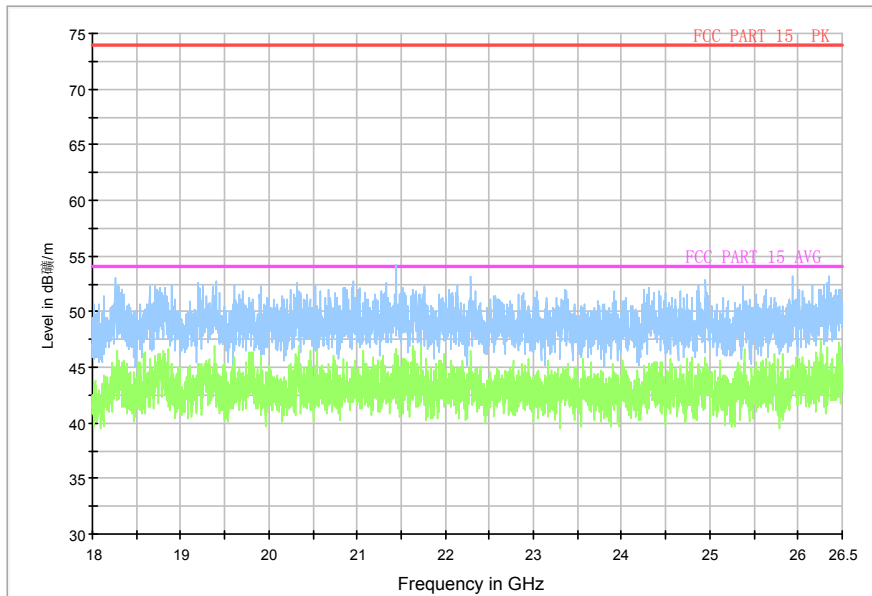


Fig.A.6.2.17 Radiated Spurious Emission (802.11g, Ch6, 18GHz – 26.5GHz)

RE-BT-Power_2.45G-2.5GHz

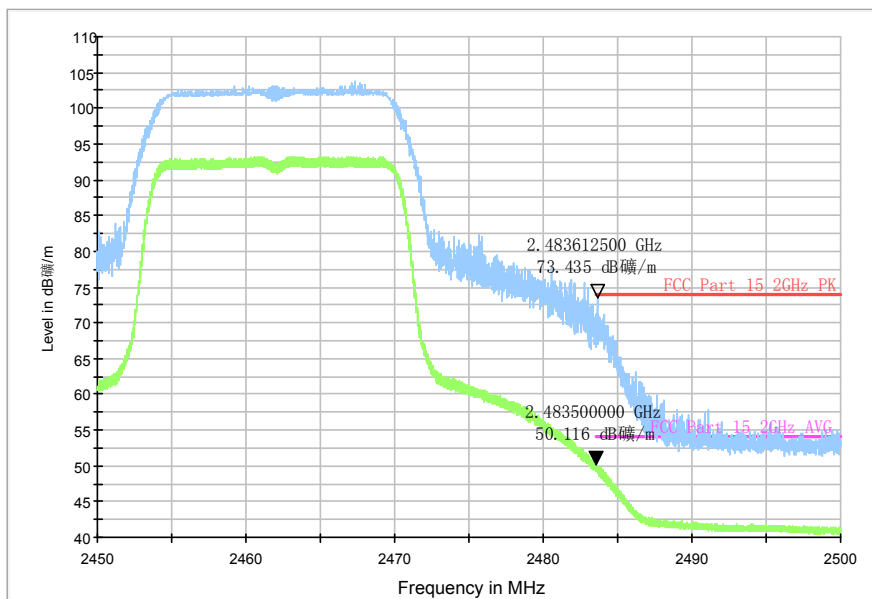


Fig.A.6.2.18 Radiated Spurious Emission (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz

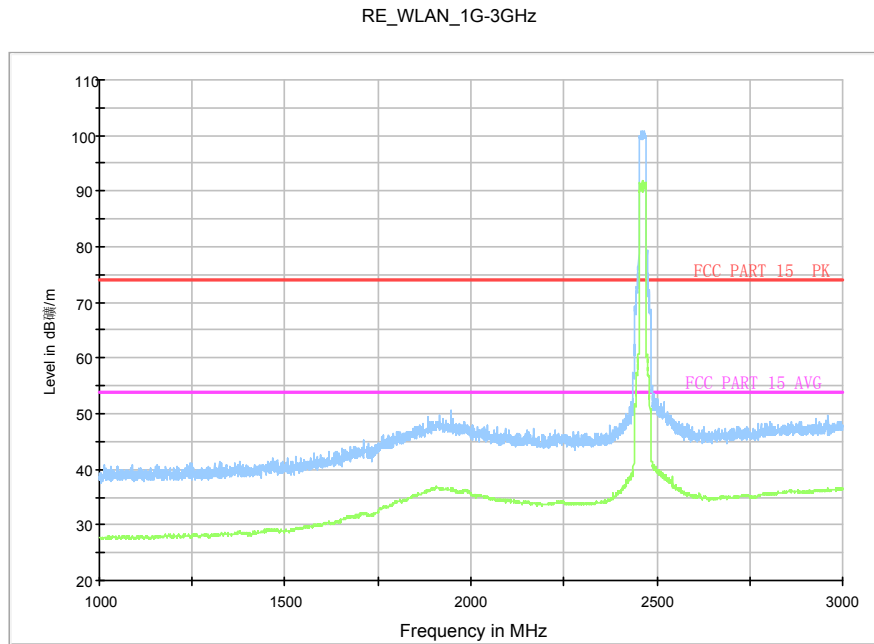


Fig.A.6.2.19 Radiated Spurious Emission (802.11g, Ch11, 1 GHz-3 GHz)

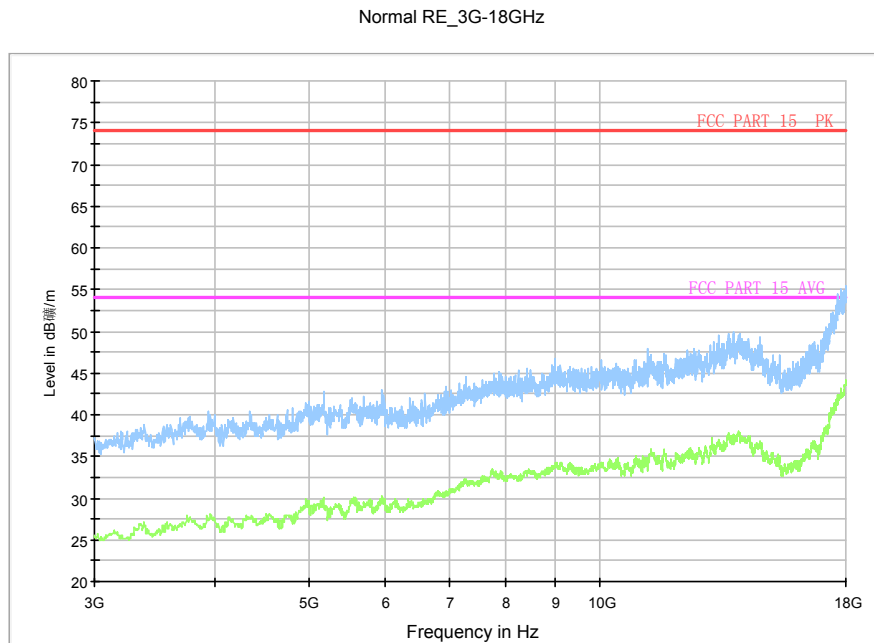


Fig.A.6.2.20 Radiated Spurious Emission (802.11g, Ch11, 3 GHz-18 GHz)

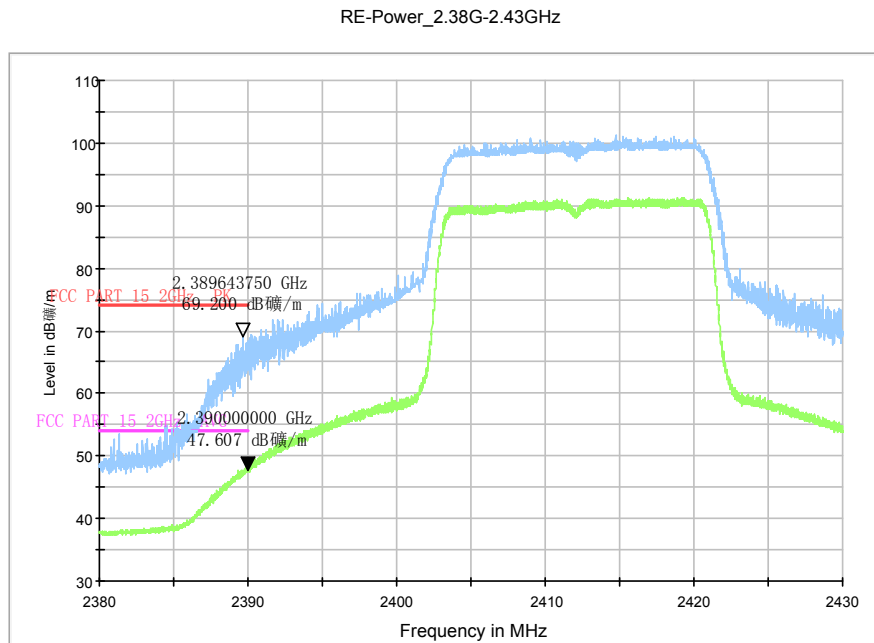


Fig.A.6.2.21 Radiated Spurious Emission (Power): 802.11n-HT20, ch1, 2.38 GHz - 2.45GHz

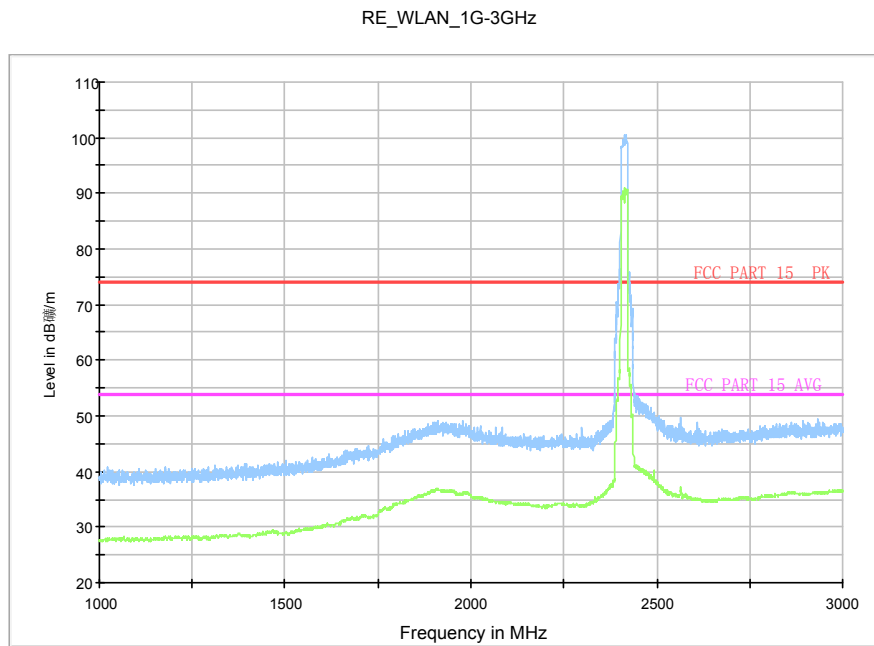


Fig.A.6.2.22 Radiated Spurious Emission (802.11n-HT20, Ch1, 1 GHz-3 GHz)

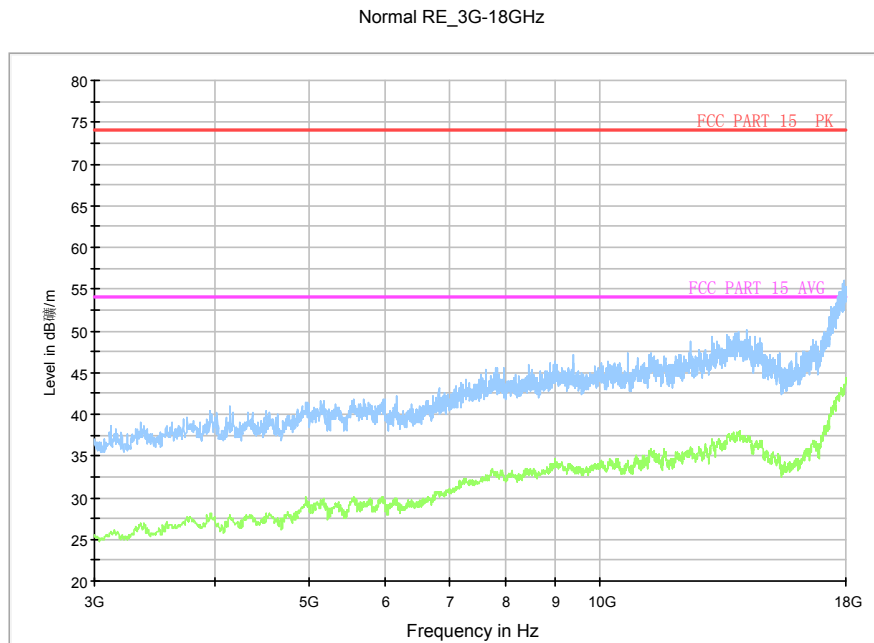


Fig.A.6.2.23 Radiated Spurious Emission (802.11n-HT20, Ch1, 3 GHz-18 GHz)

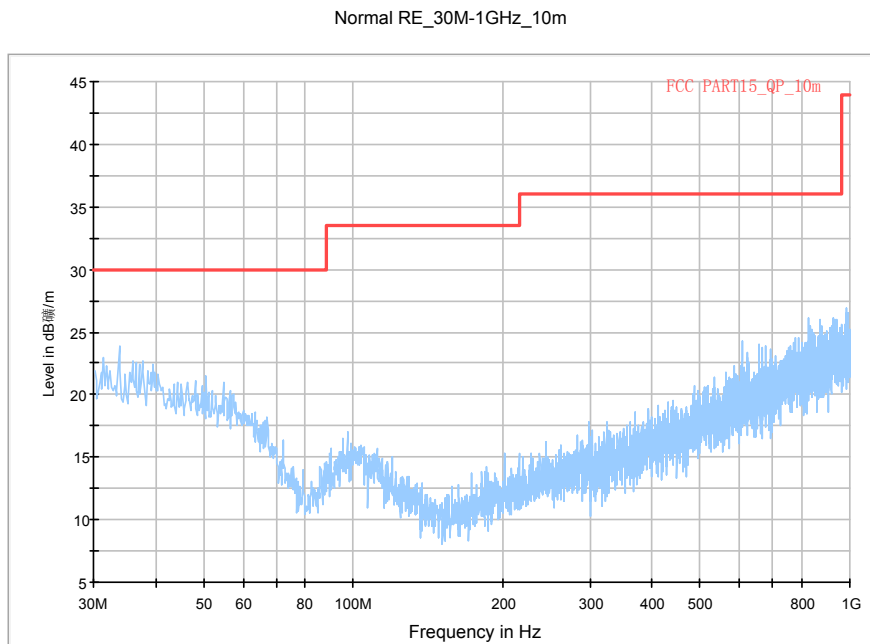


Fig.A.6.2.24 Radiated Spurious Emission (802.11n-HT20, Ch6, 30 MHz-1 GHz)

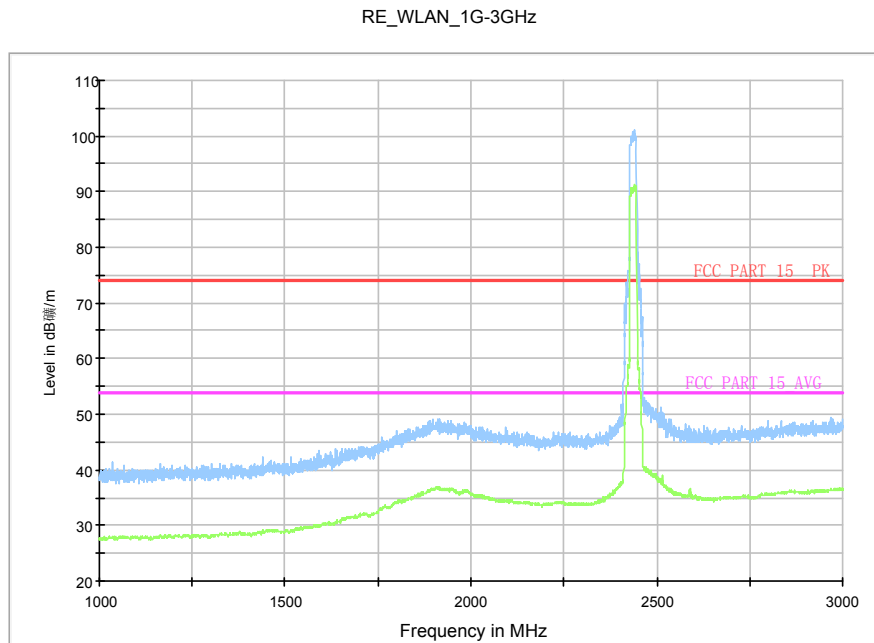


Fig.A.6.2.25 Radiated Spurious Emission (802.11n-HT20, Ch6, 1 GHz-3 GHz)

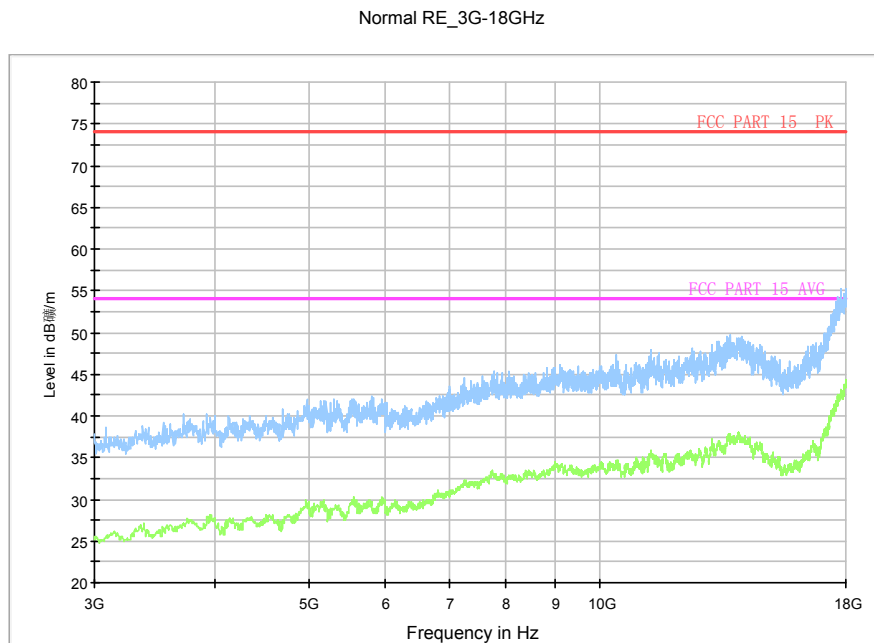


Fig.A.6.2.26 Radiated Spurious Emission (802.11n-HT20, Ch6, 3 GHz-18 GHz)

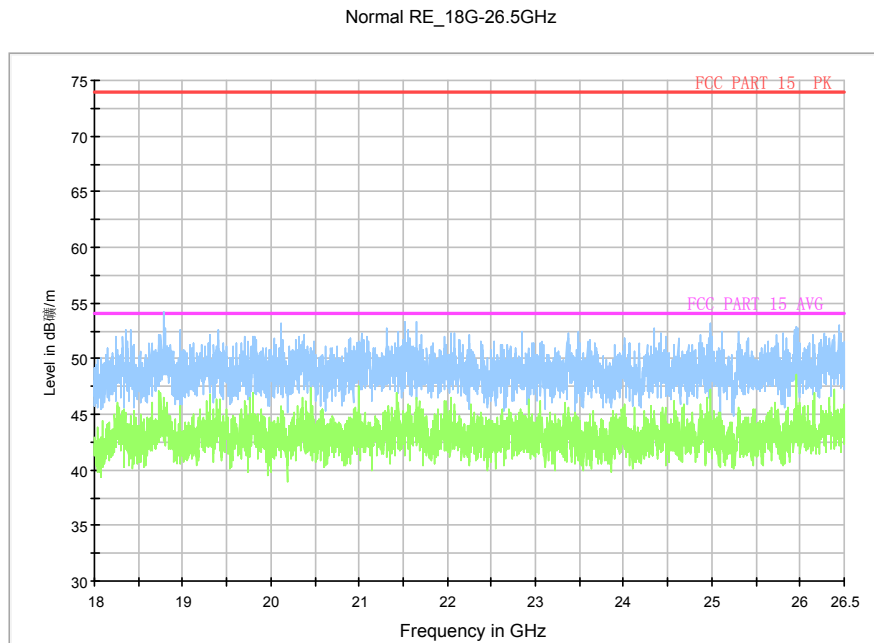


Fig.A.6.2.27 Radiated Spurious Emission (802.11n-HT20, Ch6, 18GHz – 26.5GHz)

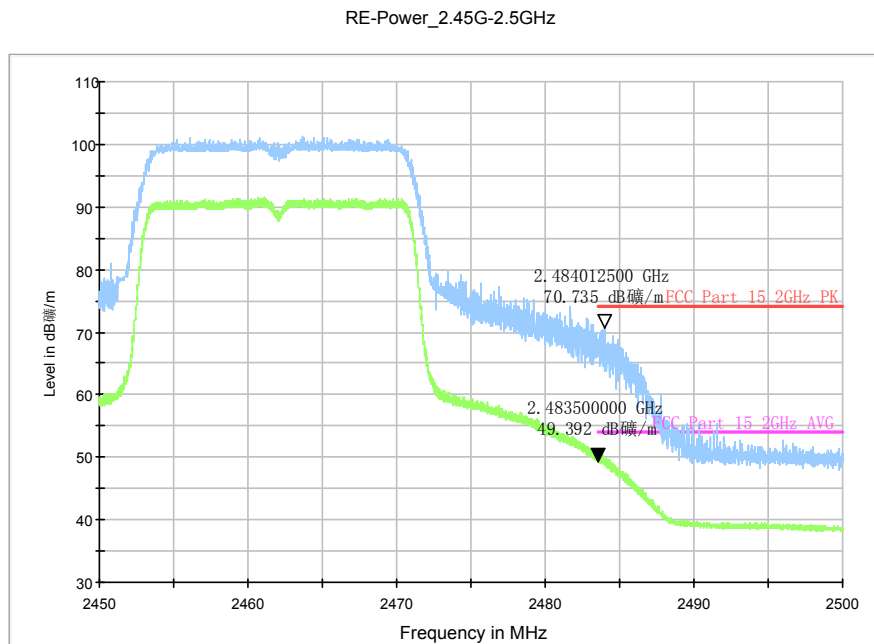


Fig.A.6.2.28 Radiated Spurious Emission (Power): 802.11n-HT20, ch11, 2.45 GHz - 2.50GHz

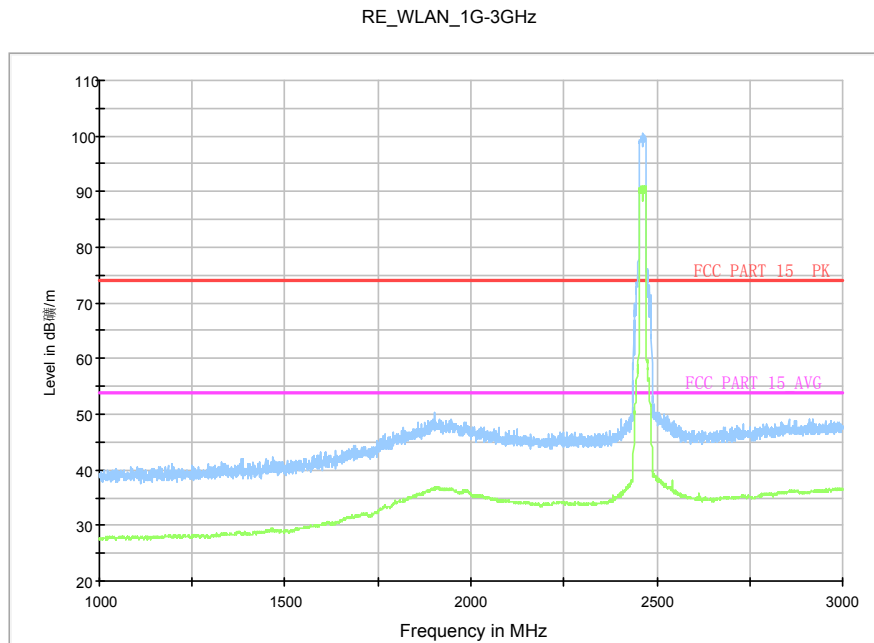


Fig.A.6.2.29 Radiated Spurious Emission (802.11n-HT20, Ch11, 1 GHz-3 GHz)

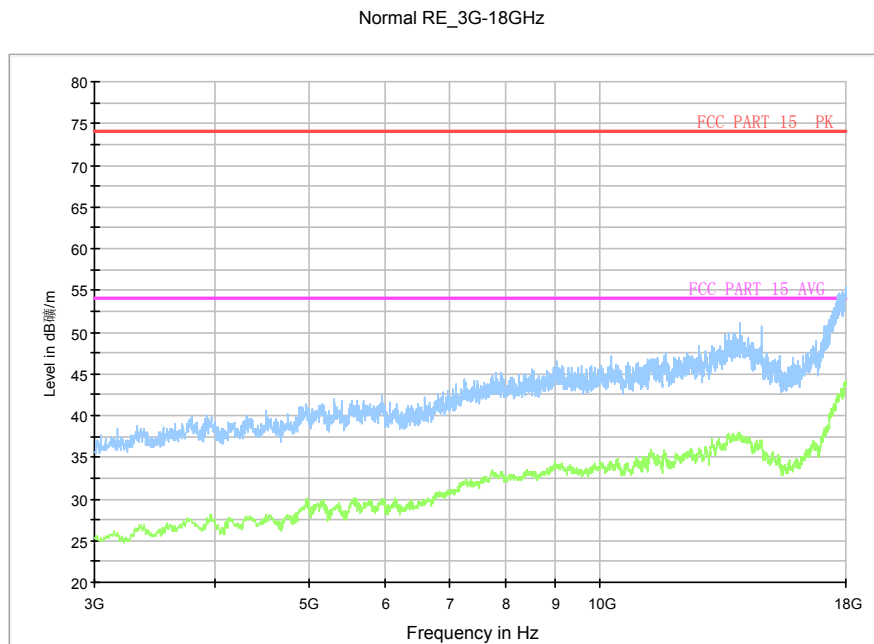


Fig.A.6.2.30 Radiated Spurious Emission (802.11n-HT20, Ch11, 3 GHz-18 GHz)

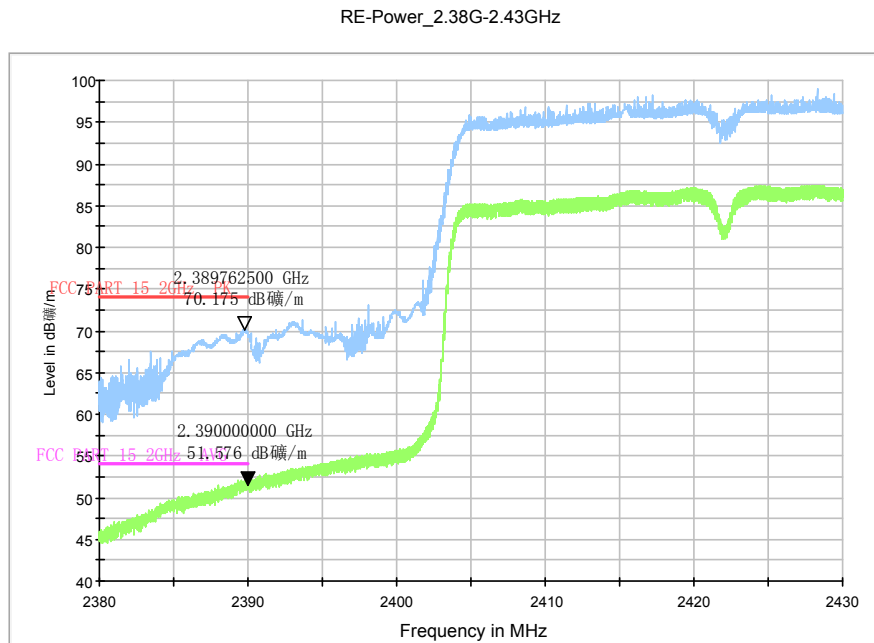


Fig.A.6.2.31 Radiated Spurious Emission (Power): 802.11n-HT40, ch3, 2.38 GHz - 2.45GHz

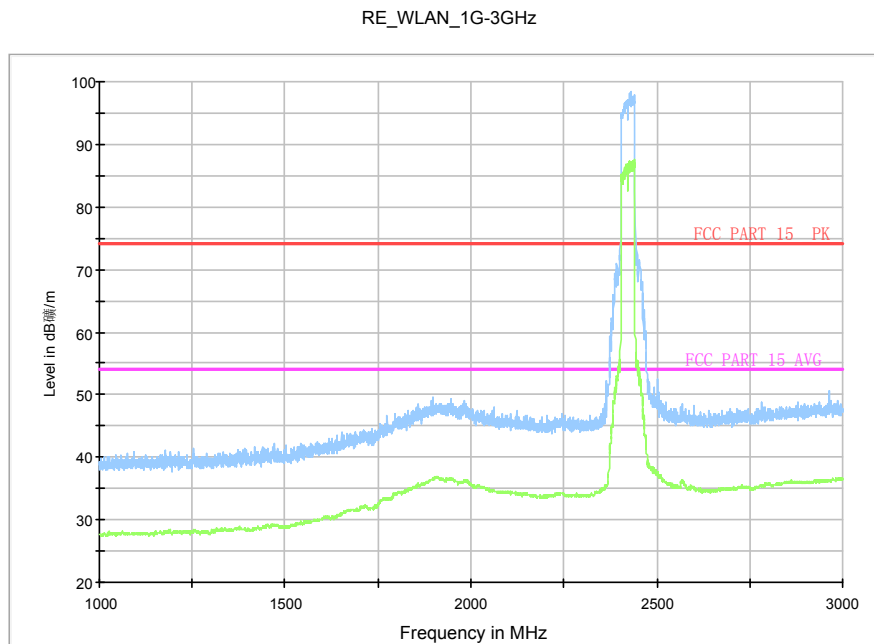


Fig.A.6.2.32 Radiated Spurious Emission (802.11n-HT40, ch3, 1 GHz-3 GHz)

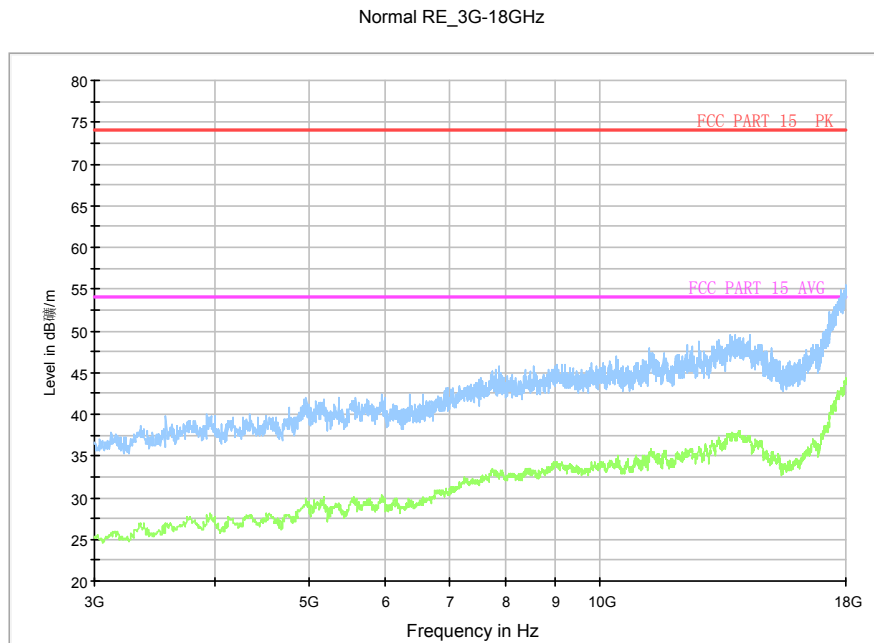


Fig.A.6.2.33 Radiated Spurious Emission (802.11n-HT40, ch3, 3 GHz-18 GHz)

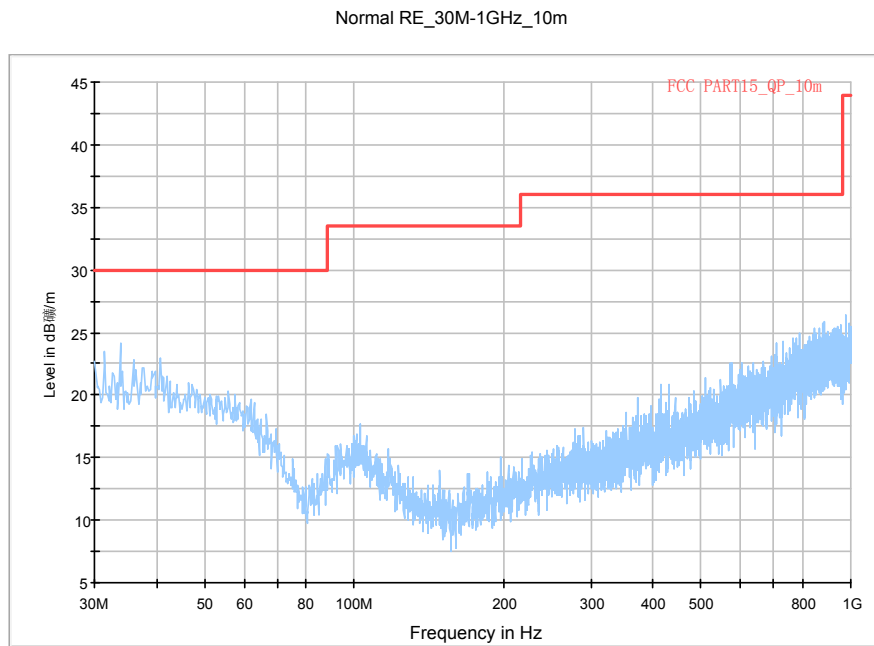


Fig.A.6.2.34 Radiated Spurious Emission (802.11n-HT40, Ch6, 30 MHz-1 GHz)

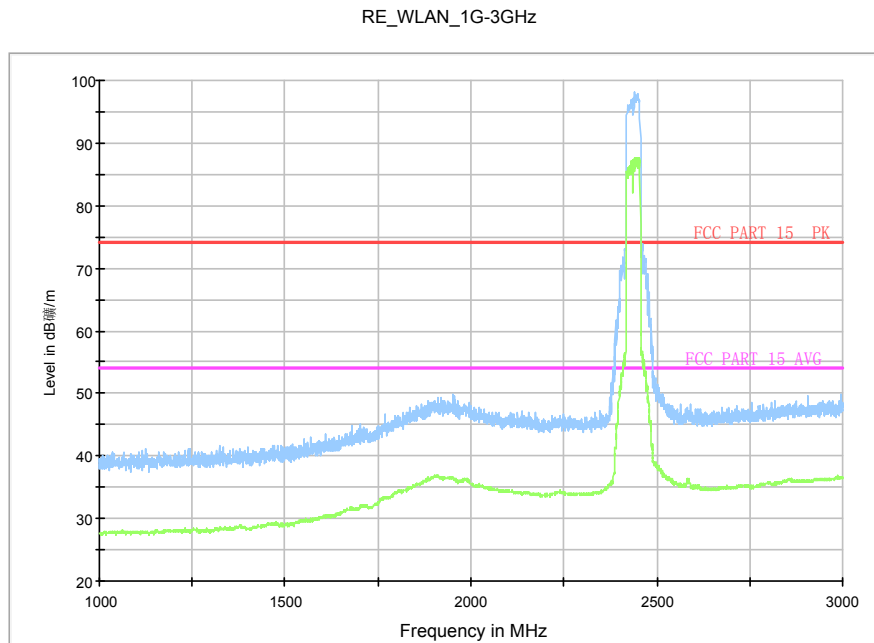


Fig.A.6.2.35 Radiated Spurious Emission (802.11n-HT40, Ch6, 1 GHz-3 GHz)

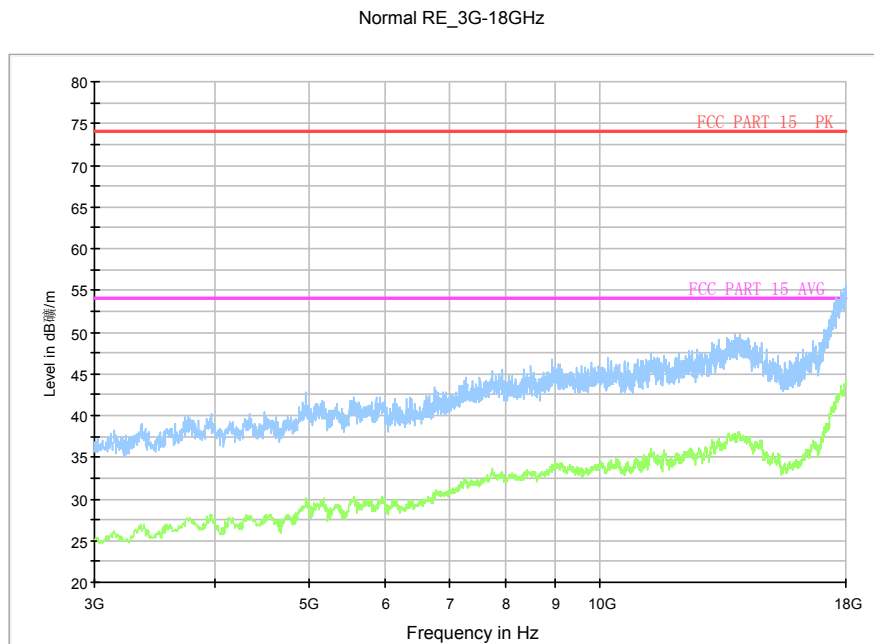


Fig.A.6.2.36 Radiated Spurious Emission (802.11n-HT40, Ch6, 3 GHz-18 GHz)

Normal RE_18G-26.5GHz

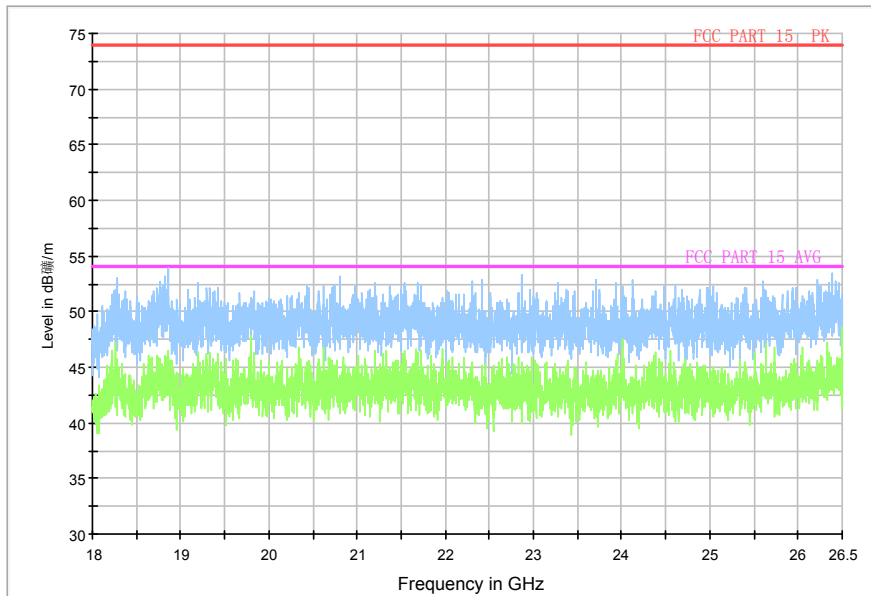


Fig.A.6.2.37 Radiated Spurious Emission (802.11n-HT40, Ch6, 18GHz – 26.5GHz)

RE-Power_2.45G-2.5GHz

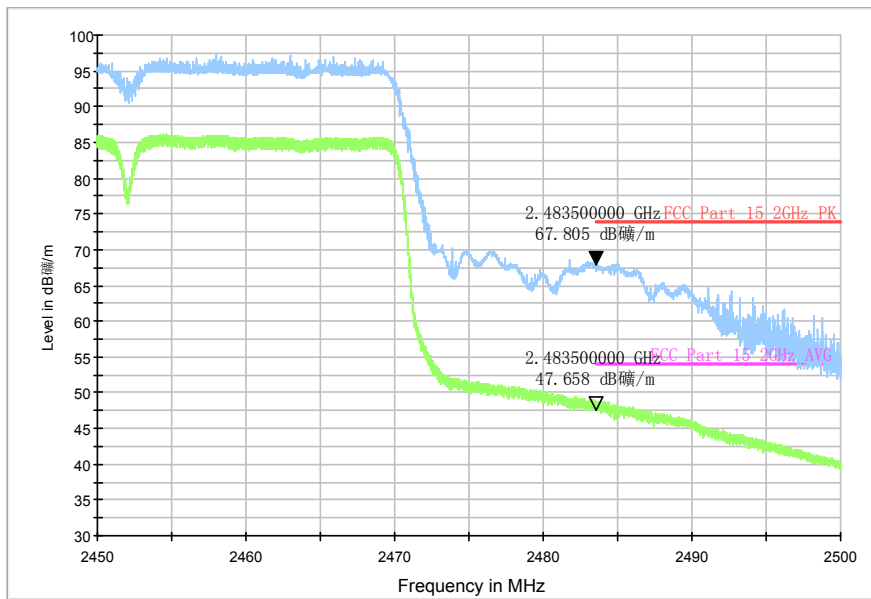


Fig.A.6.2.38 Radiated Spurious Emission (Power): 802.11n-HT40, ch9, 2.45 GHz - 2.50GHz

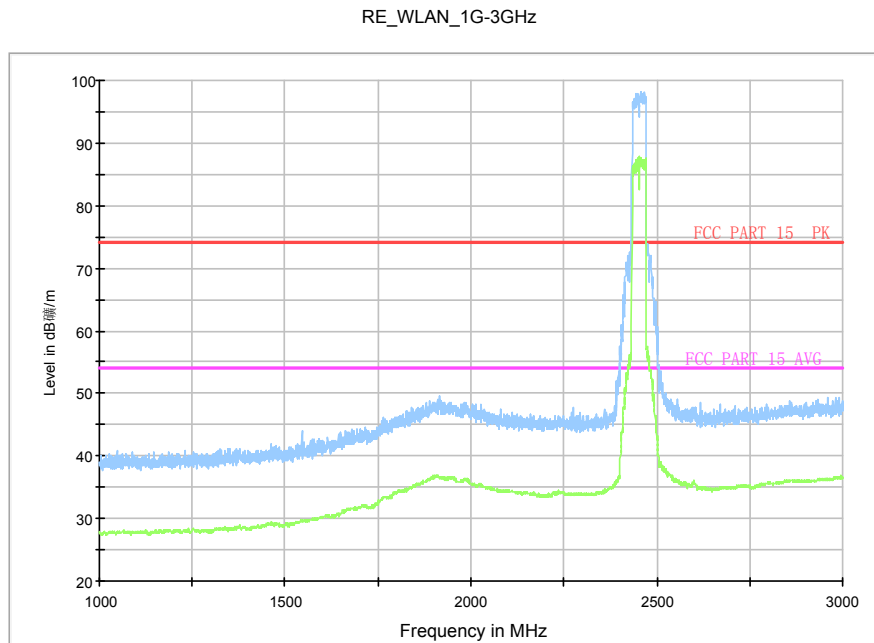


Fig.A.6.2.39 Radiated Spurious Emission (802.11n-HT40, ch9, 1 GHz-3 GHz)

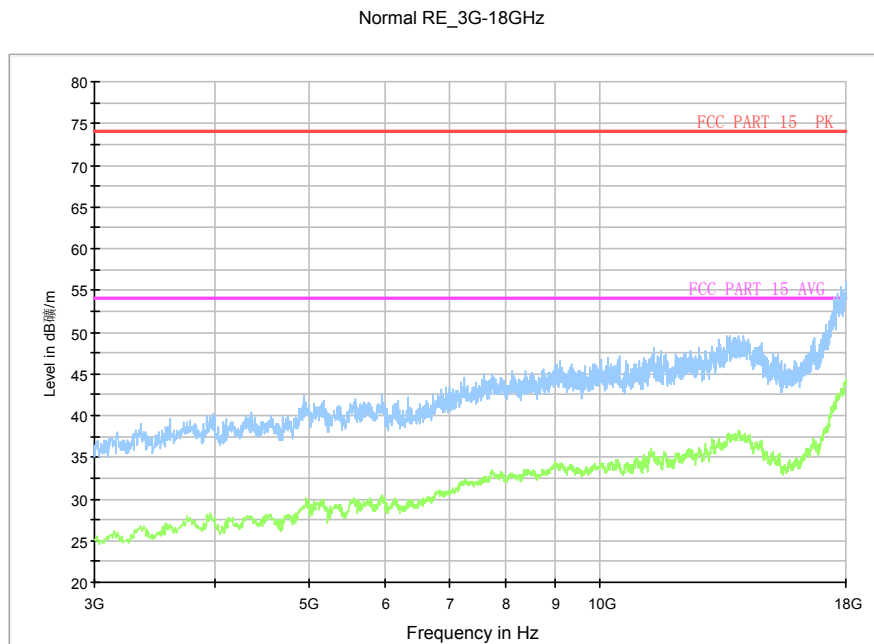


Fig.A.6.2.40 Radiated Spurious Emission (802.11n-HT40, ch9, 3 GHz-18 GHz)

A.7. Spurious Emissions Radiated < 30MHz

Measurement Limit:

Frequency (MHz)	Field strength($\mu\text{V}/\text{m}$)	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

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)).

Measurement Results:

Mode	Frequency Range	Test Results	Conclusion
802.11b	9 kHz ~30 MHz	Fig.A.7.1	P

Conclusion: PASS

Test graphs as below:

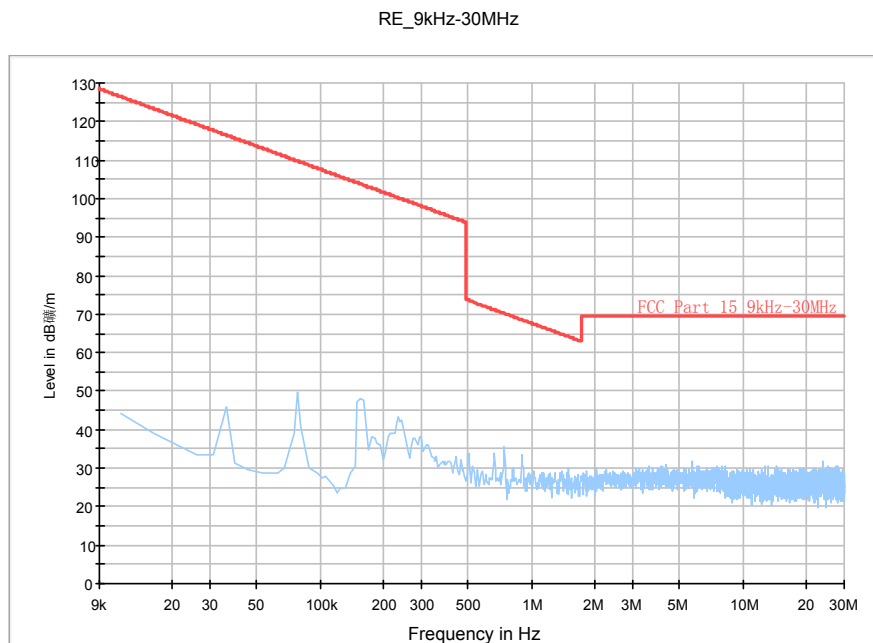


Fig.A.7.1 Radiated Spurious Emission (802.11b, 9 kHz ~30 MHz)

A.8. AC Powerline Conducted Emission

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)		Conclusion
		With charger		
		802.11b	Idle	
0.15 to 0.5	66 to 56	Fig.A.8.1	Fig.A.8.2	P
0.5 to 5	56			
5 to 30	60			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dB μ V)	Result (dB μ V)		Conclusion
		With charger		
		802.11b	Idle	
0.15 to 0.5	56 to 46	Fig.A.8.1	Fig.A.8.2	P
0.5 to 5	46			
5 to 30	50			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Conclusion: Pass

Measurement uncertainty:

Expanded measurement uncertainty for this test item is U =3.2dB, k=2.

Test graphs as below:

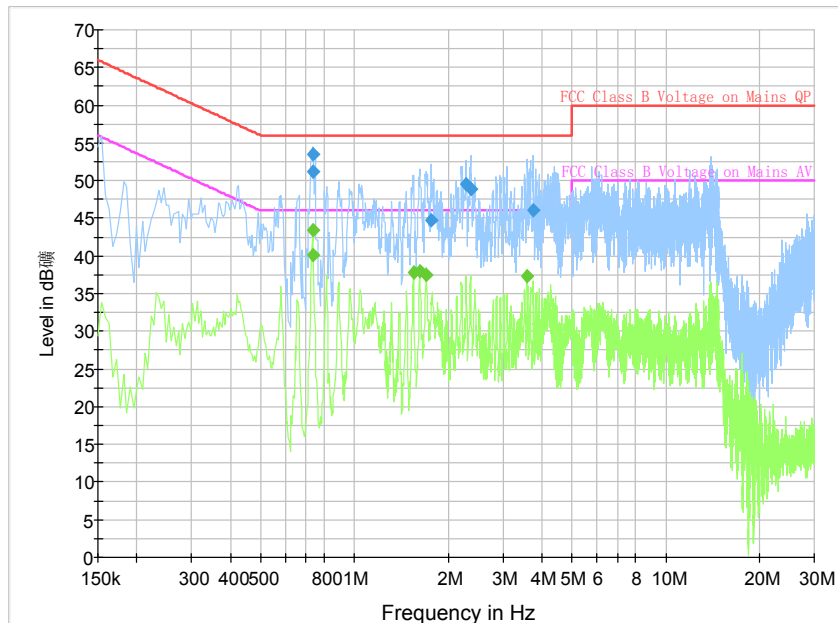


Fig.A.8.1 AC Powerline Conducted Emission-802.11b

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.735000	53.4	GND	L1	9.8	2.6	56.0
0.739500	51.1	GND	L1	9.8	4.9	56.0
1.765500	44.7	GND	L1	9.7	11.3	56.0
2.278500	49.6	GND	L1	9.7	6.4	56.0
2.359500	48.8	GND	L1	9.7	7.2	56.0
3.759000	46.1	GND	L1	9.7	9.9	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.735000	43.5	GND	L1	9.8	2.5	46.0
0.739500	40.1	GND	L1	9.8	5.9	46.0
1.549500	37.8	GND	L1	9.7	8.2	46.0
1.626000	37.9	GND	L1	9.7	8.1	46.0
1.698000	37.5	GND	L1	9.7	8.5	46.0
3.592500	37.3	GND	L1	9.7	8.7	46.0

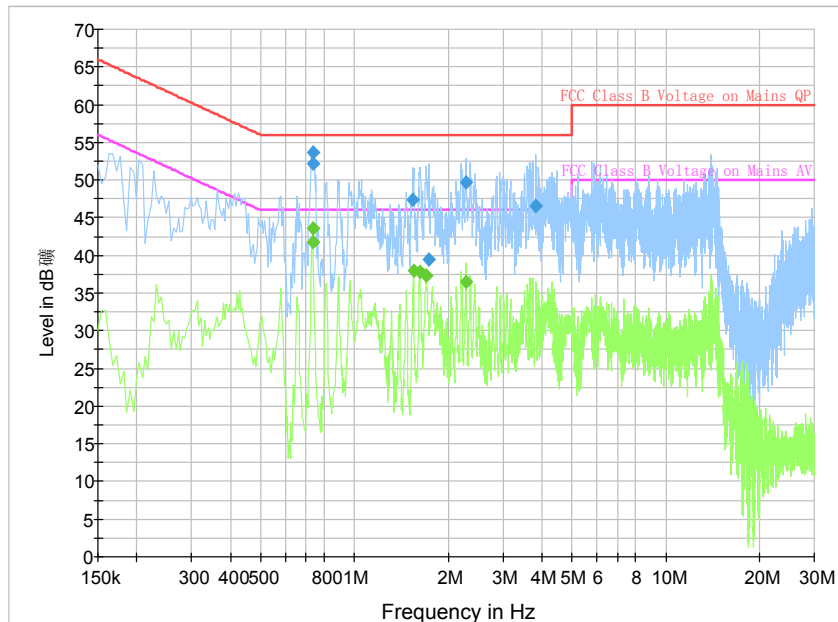


Fig.A.8.2 AC Powerline Conducted Emission-Idle

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.735000	53.7	GND	L1	9.8	2.3	56.0
0.739500	52.1	GND	L1	9.8	3.9	56.0
1.540500	47.4	GND	L1	9.7	8.6	56.0
1.738500	39.4	GND	N	9.7	16.6	56.0
2.283000	49.7	GND	L1	9.7	6.3	56.0
3.826500	46.6	GND	L1	9.7	9.4	56.0

Final Result 2

Frequency (MHz)	Average (dB μ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.735000	43.6	GND	L1	9.8	2.4	46.0
0.739500	41.8	GND	L1	9.8	4.2	46.0
1.549500	38.0	GND	L1	9.7	8.0	46.0
1.626000	37.8	GND	L1	9.7	8.2	46.0
1.702500	37.3	GND	L1	9.7	8.7	46.0
2.283000	36.5	GND	L1	9.7	9.5	46.0

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