

Fig.A.6.1.35 Conducted Spurious Emission (802.11g, Ch6, 1 GHz-2.5 GHz)

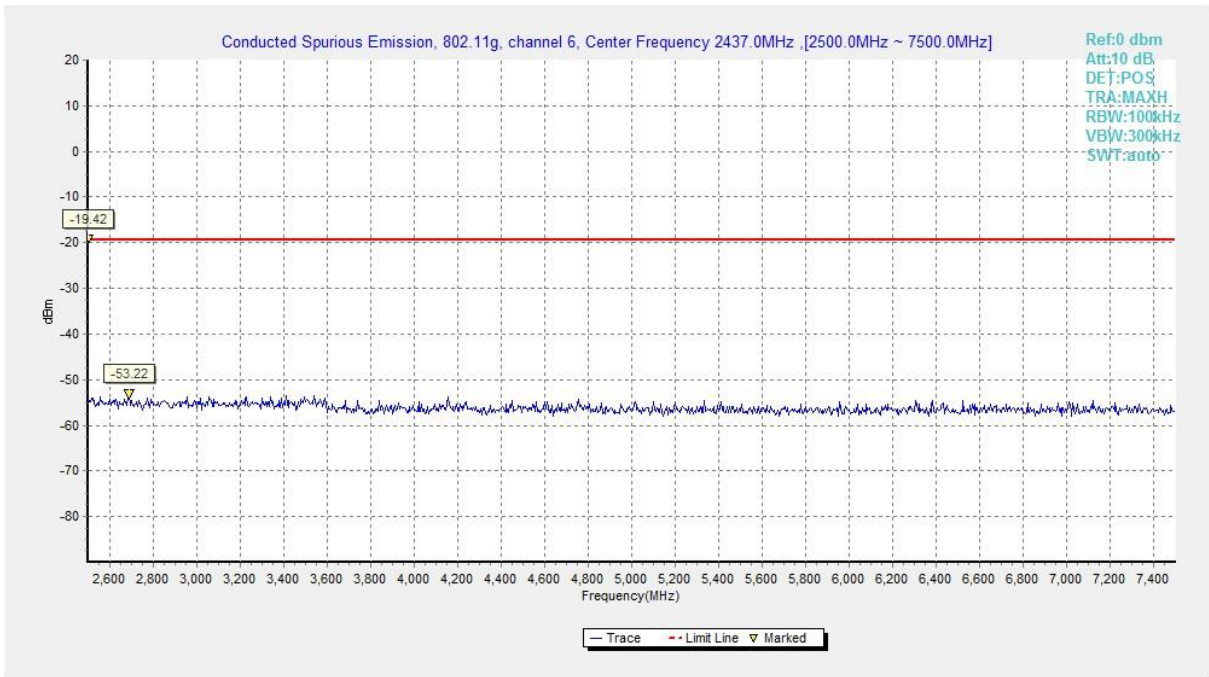


Fig.A.6.1.36 Conducted Spurious Emission (802.11g, Ch6, 2.5 GHz-7.5 GHz)

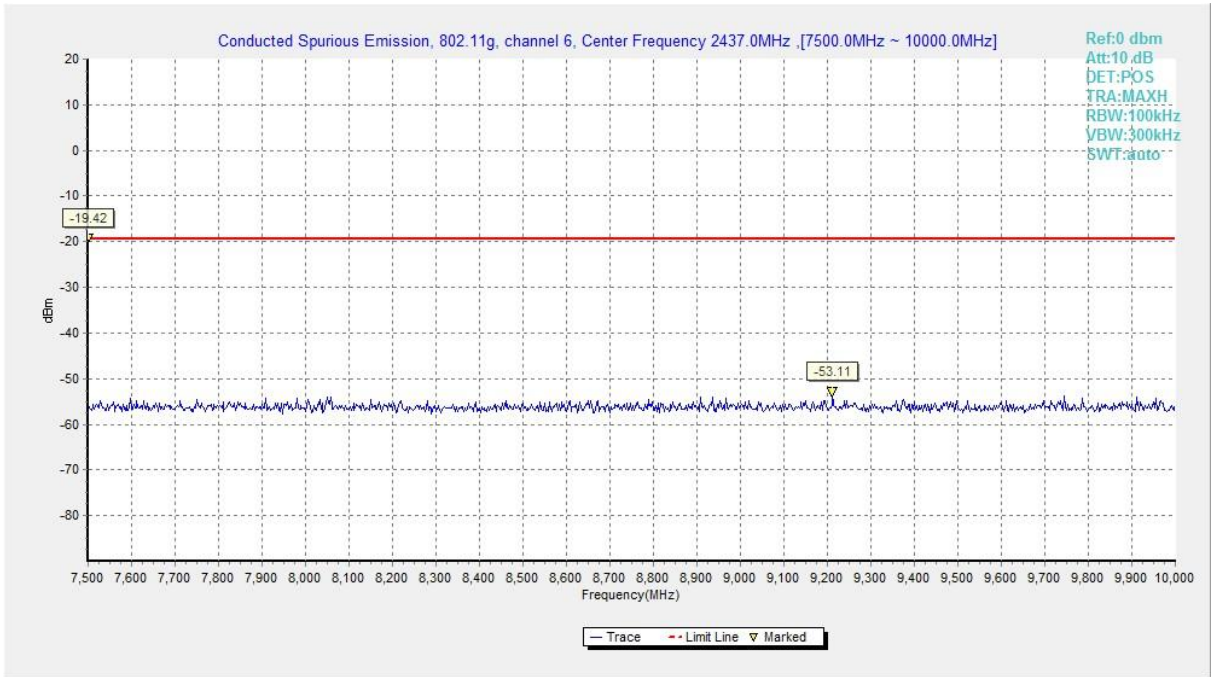


Fig.A.6.1.37 Conducted Spurious Emission (802.11g, Ch6, 7.5 GHz-10 GHz)

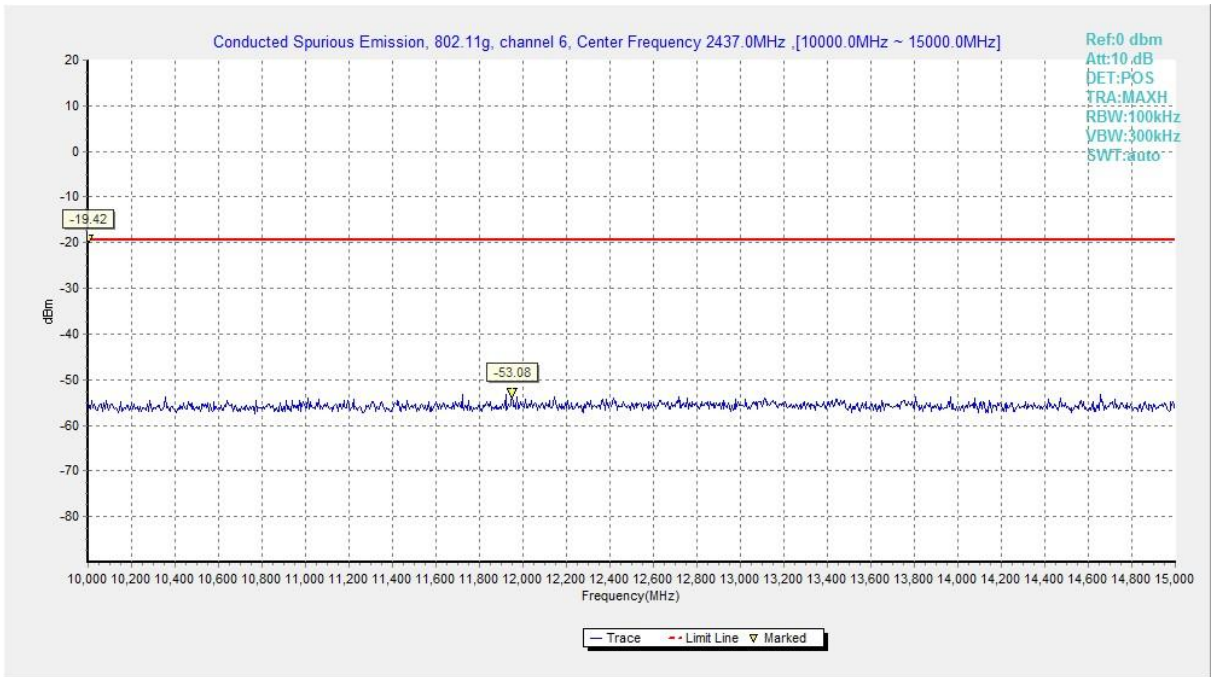


Fig.A.6.1.38 Conducted Spurious Emission (802.11g, Ch6, 10 GHz-15 GHz)

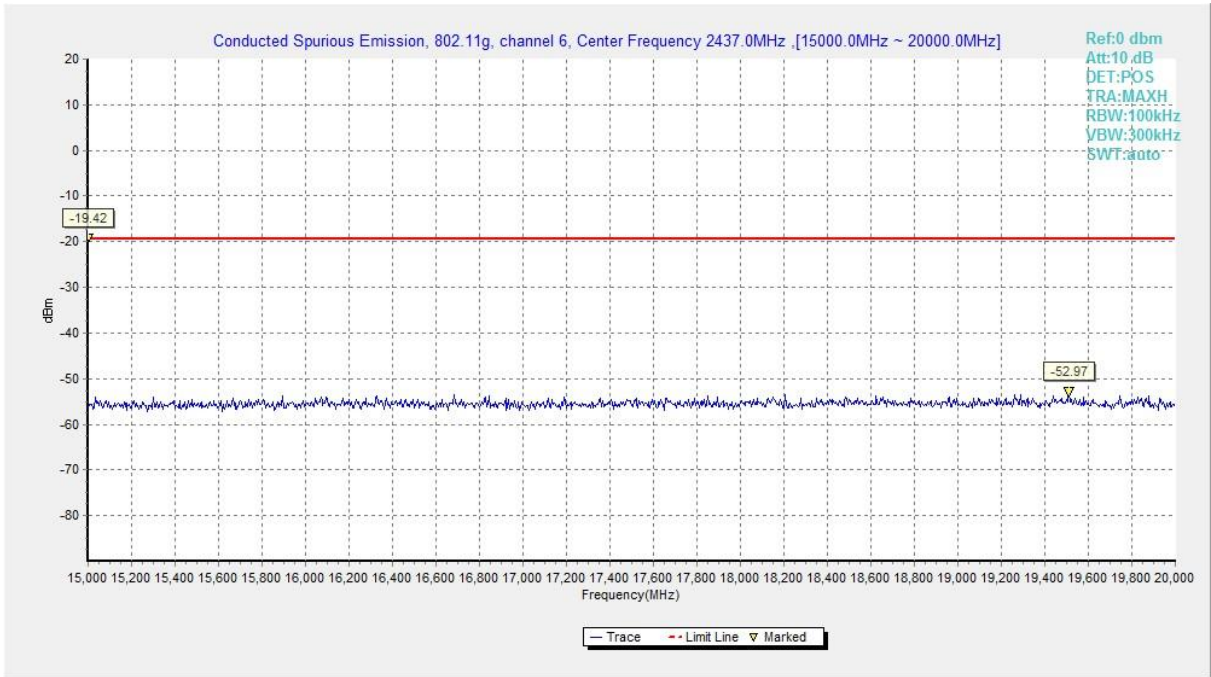


Fig.A.6.1.39 Conducted Spurious Emission (802.11g, Ch6, 15 GHz-20 GHz)

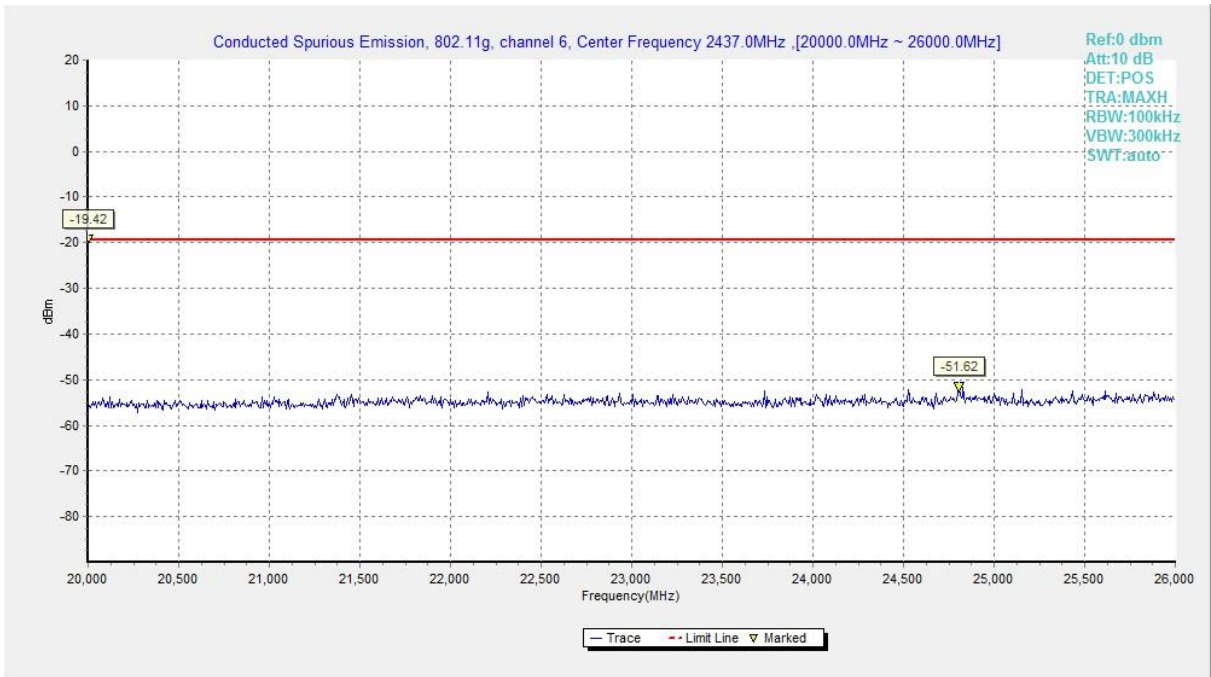


Fig.A.6.1.40 Conducted Spurious Emission (802.11g, Ch6, 20 GHz-26 GHz)

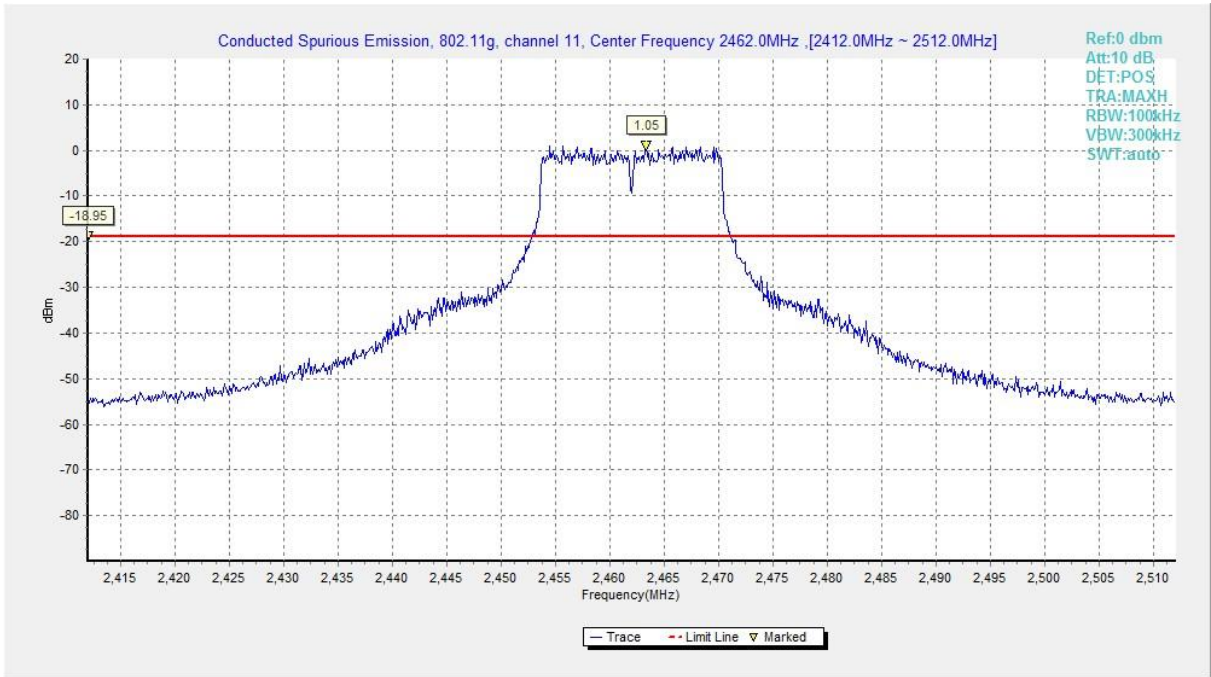


Fig.A.6.1.41 Conducted Spurious Emission (802.11g, Ch11, Center Frequency)

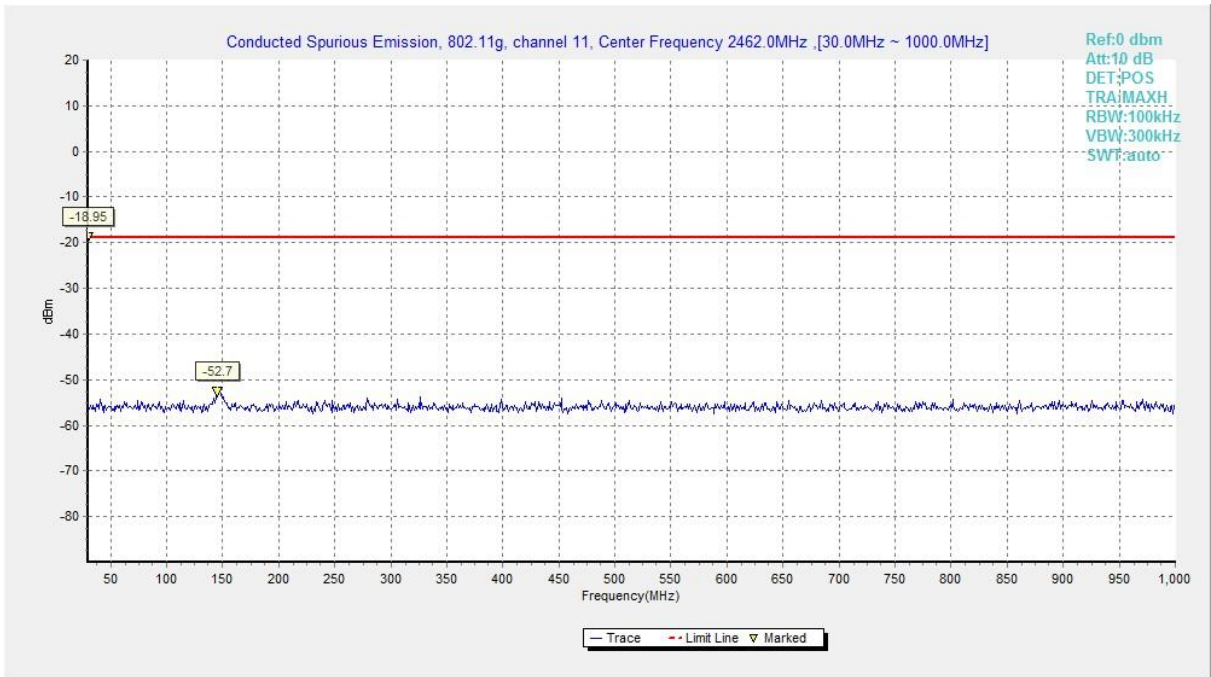


Fig.A.6.1.42 Conducted Spurious Emission (802.11g, Ch11, 30 MHz-1 GHz)

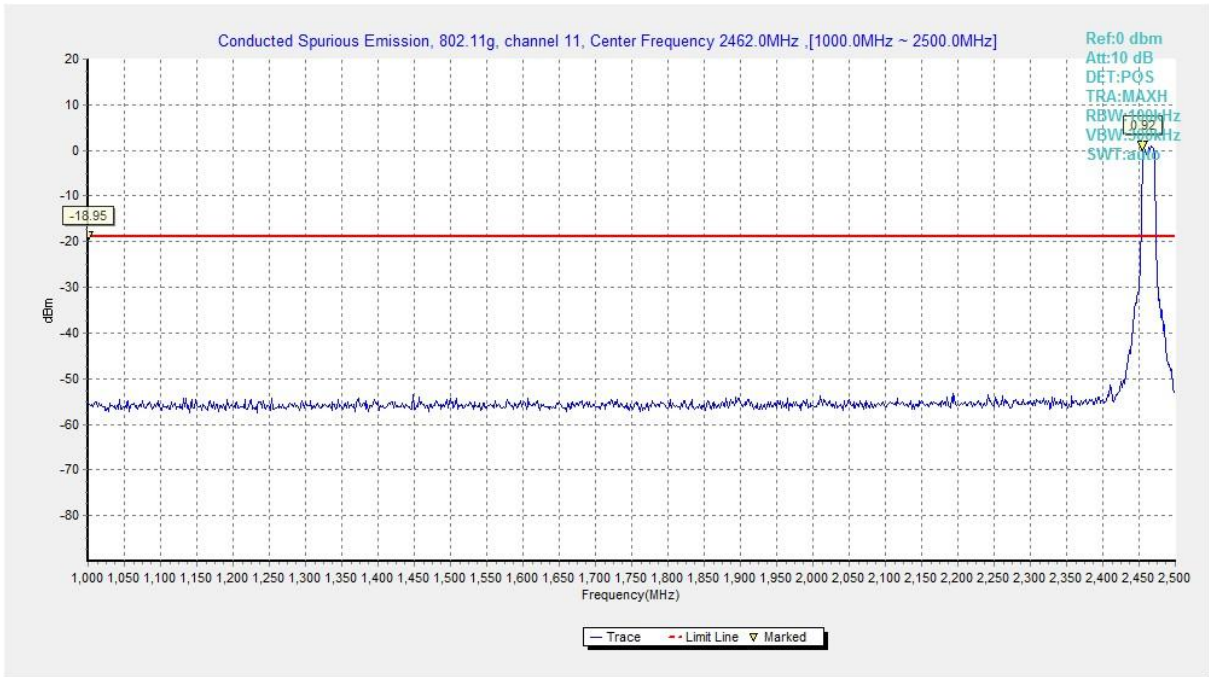


Fig.A.6.1.43 Conducted Spurious Emission (802.11g, Ch11, 1 GHz-2.5 GHz)

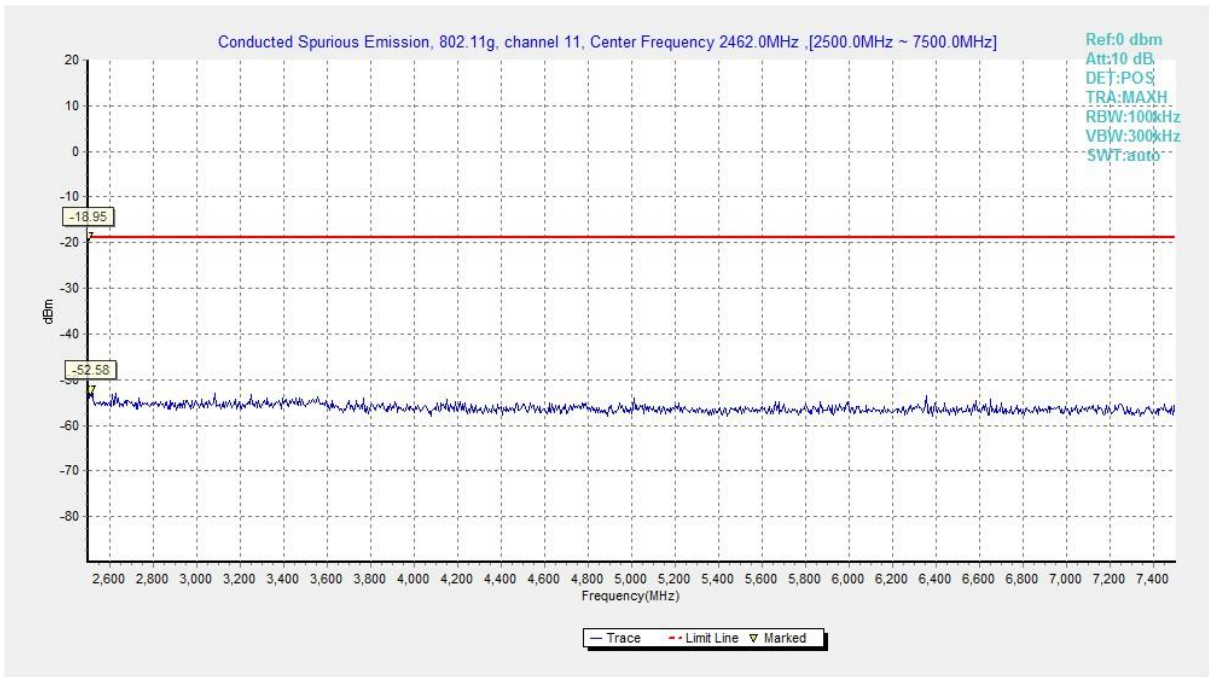


Fig.A.6.1.44 Conducted Spurious Emission (802.11g, Ch11, 2.5 GHz-7.5 GHz)

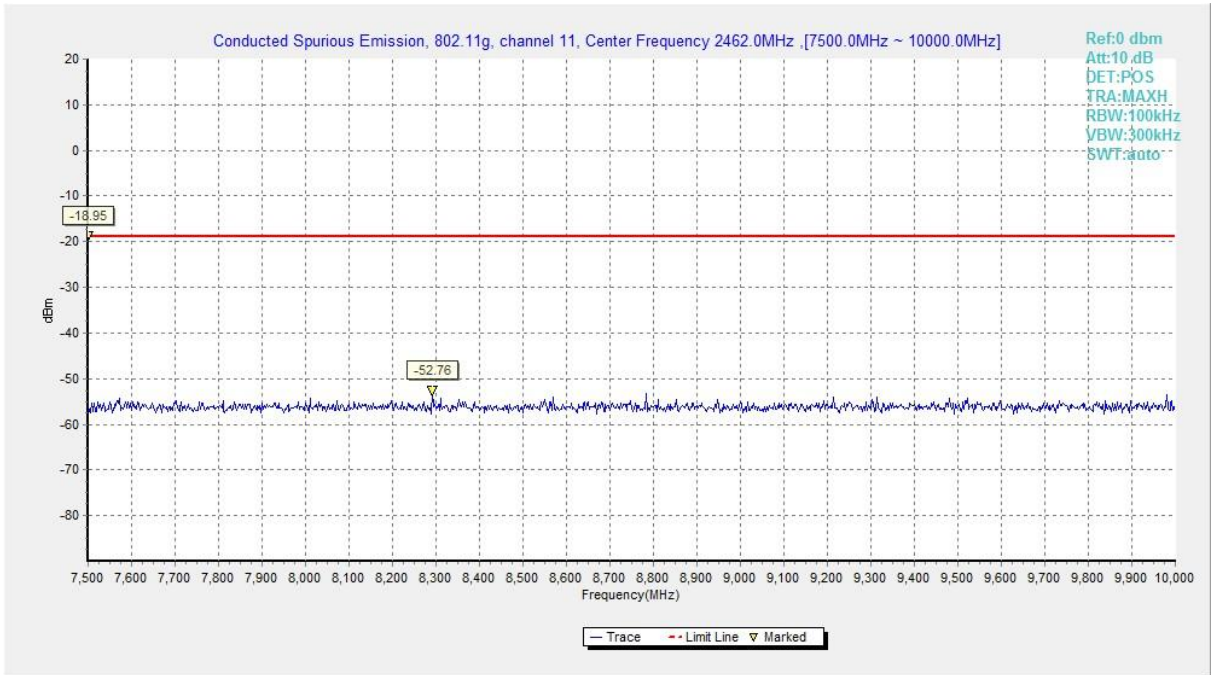


Fig.A.6.1.45 Conducted Spurious Emission (802.11g, Ch11, 7.5 GHz-10 GHz)

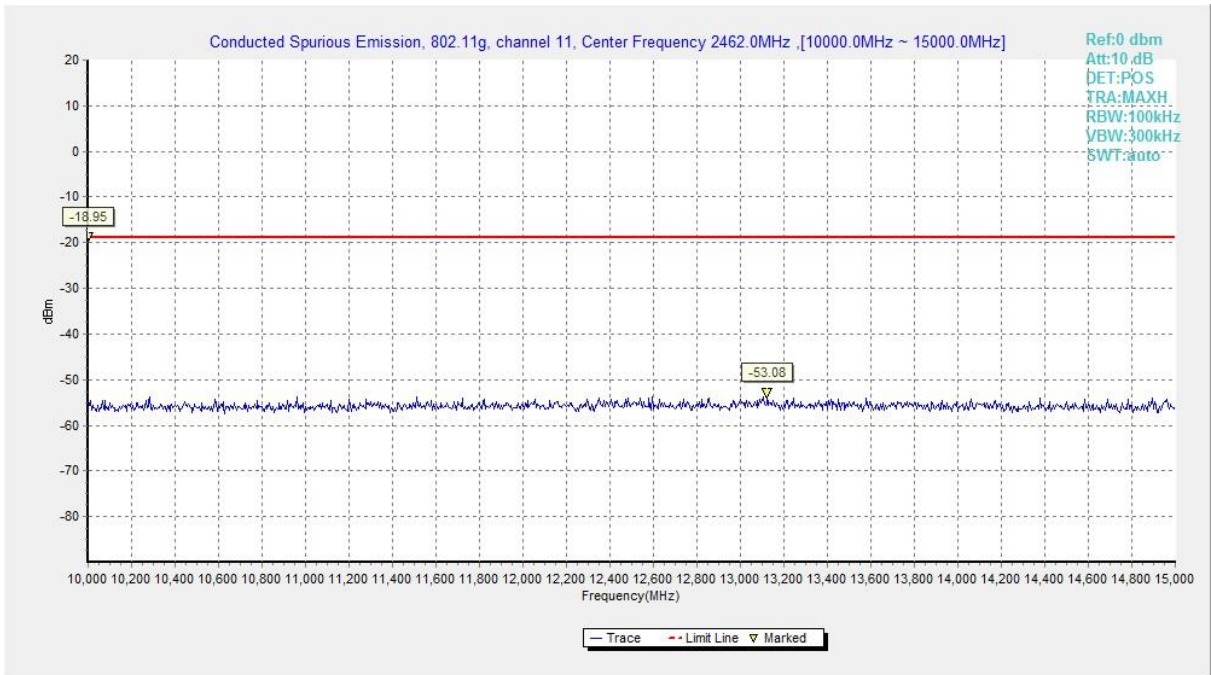


Fig.A.6.1.46 Conducted Spurious Emission (802.11g, Ch11, 10 GHz-15 GHz)

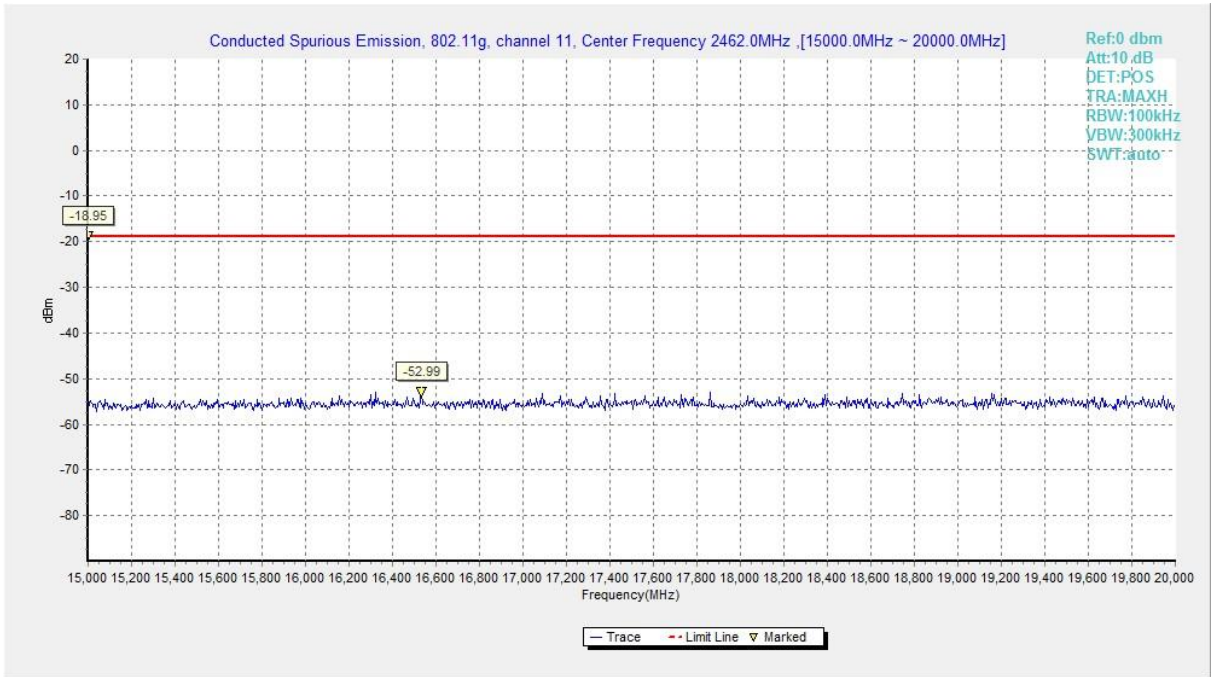


Fig.A.6.1.47 Conducted Spurious Emission (802.11g, Ch11, 15 GHz-20 GHz)

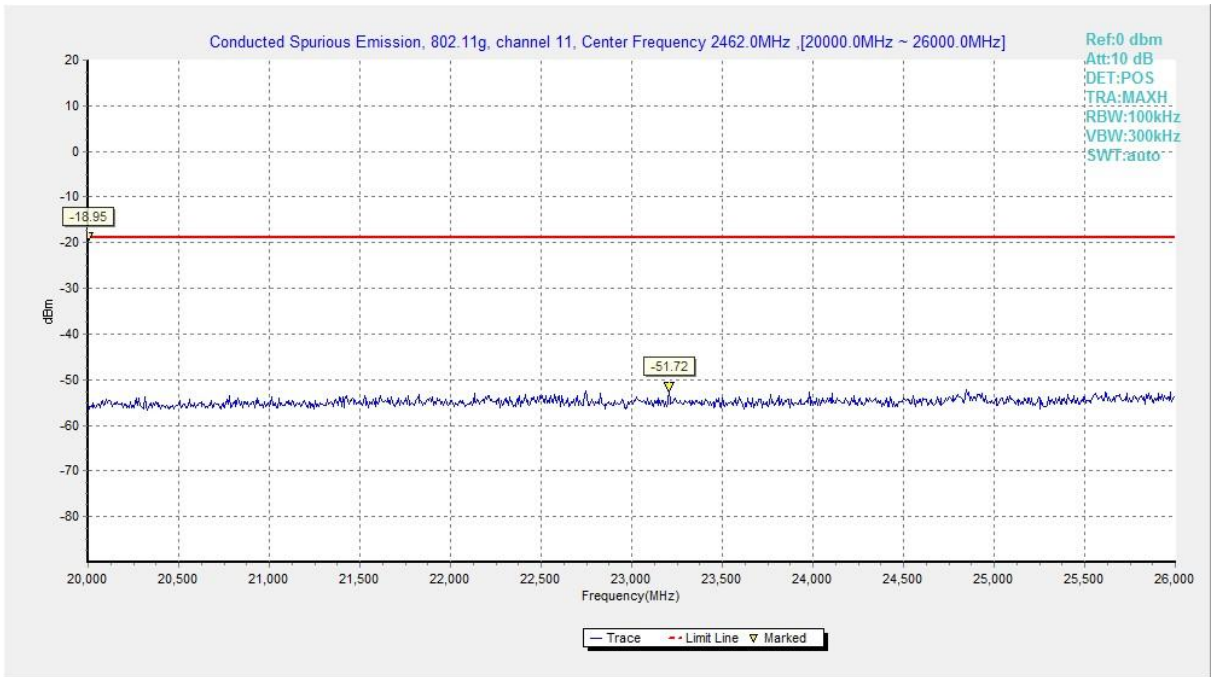


Fig.A.6.1.48 Conducted Spurious Emission (802.11g, Ch11, 20 GHz-26 GHz)

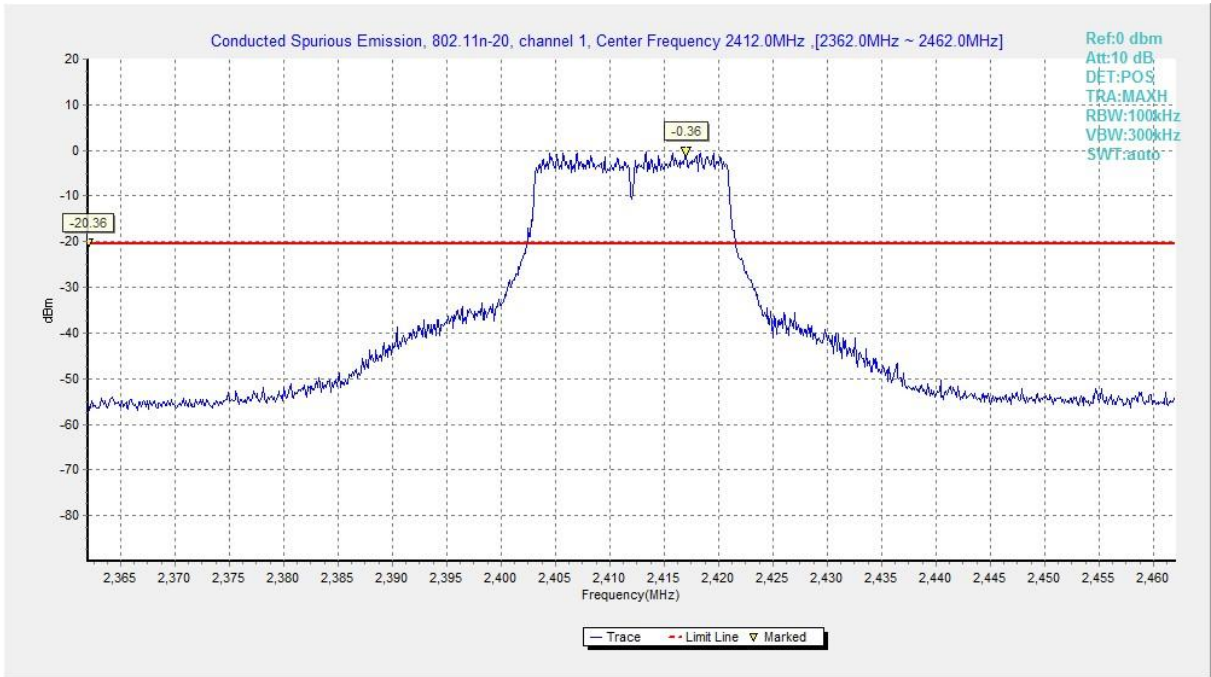


Fig.A.6.1.49 Conducted Spurious Emission (802.11n-HT20, Ch1, Center Frequency)

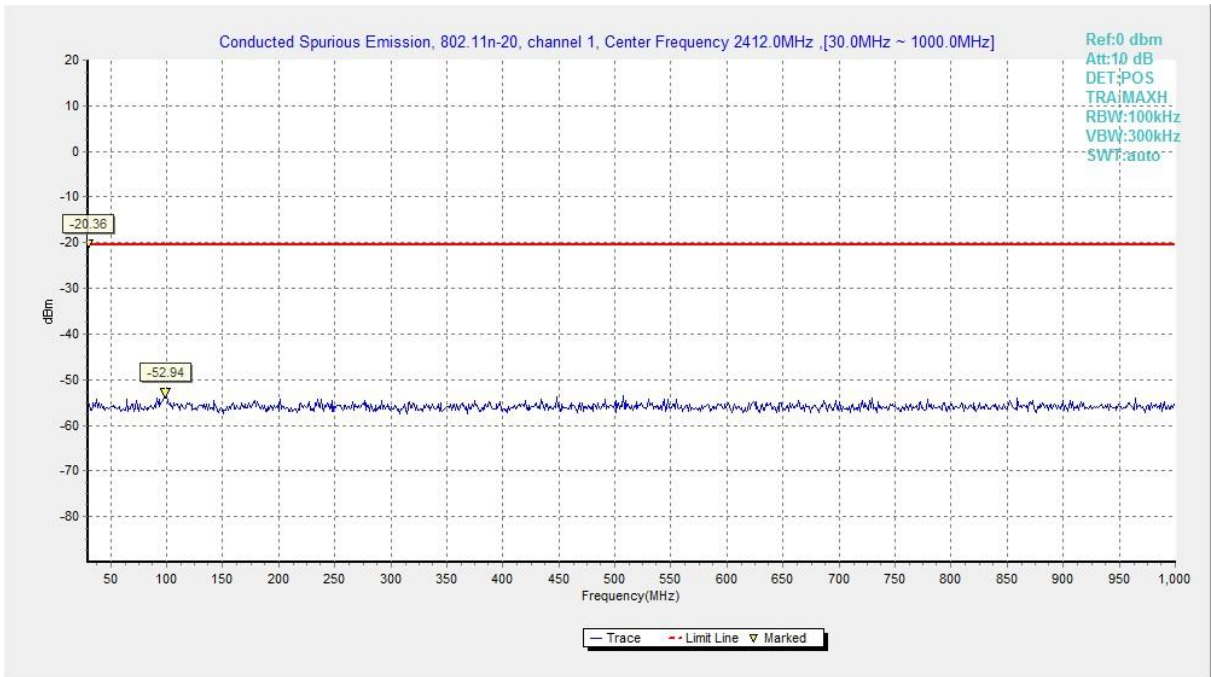


Fig.A.6.1.50 Conducted Spurious Emission (802.11n-HT20, Ch1, 30 MHz-1 GHz)

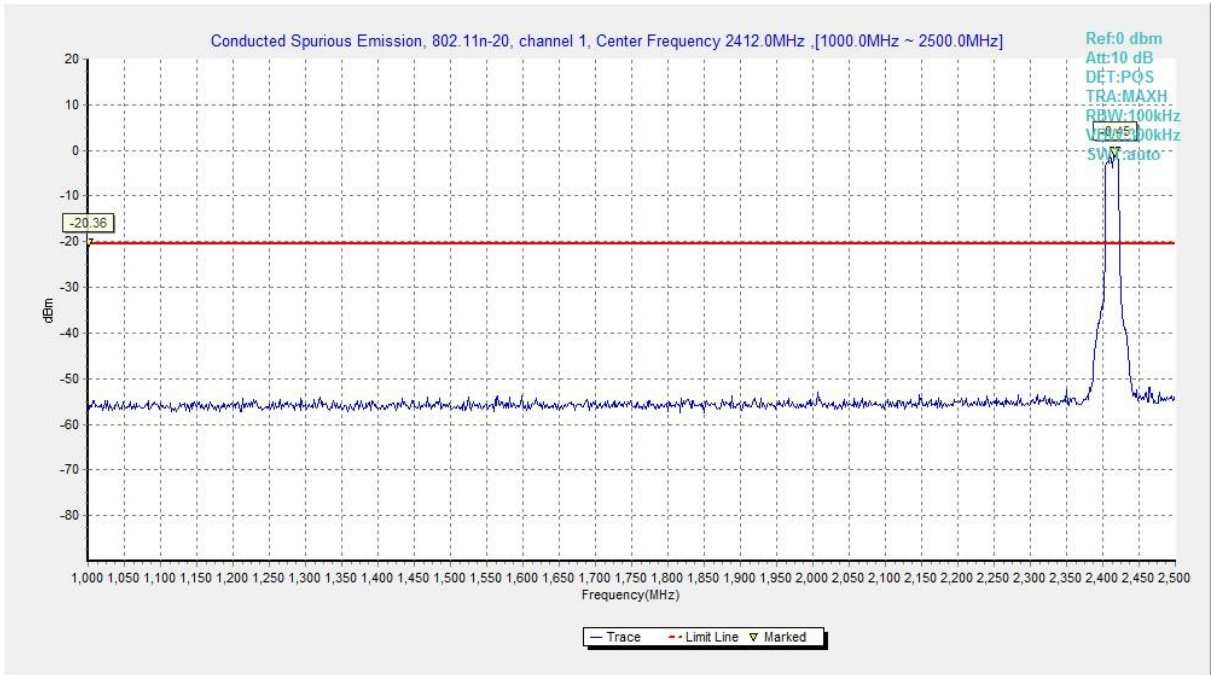


Fig.A.6.1.51 Conducted Spurious Emission (802.11n-HT20, Ch1, 1 GHz-2.5 GHz)

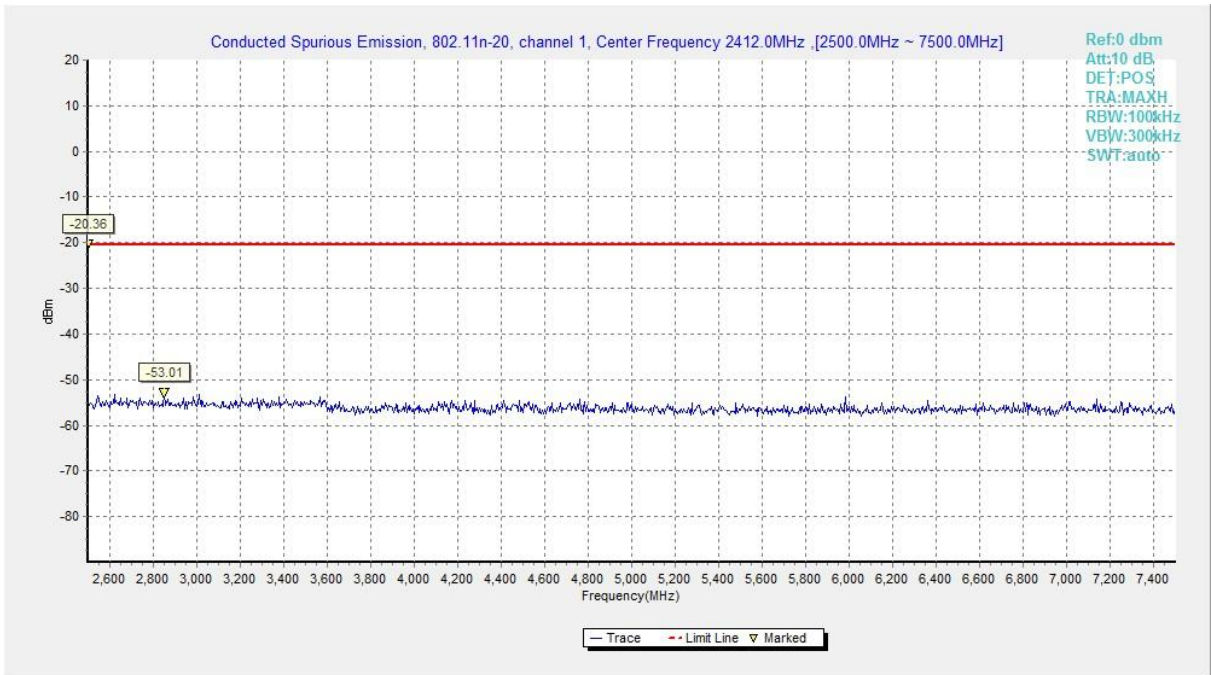


Fig.A.6.1.52 Conducted Spurious Emission (802.11n-HT20, Ch1, 2.5 GHz-7.5 GHz)

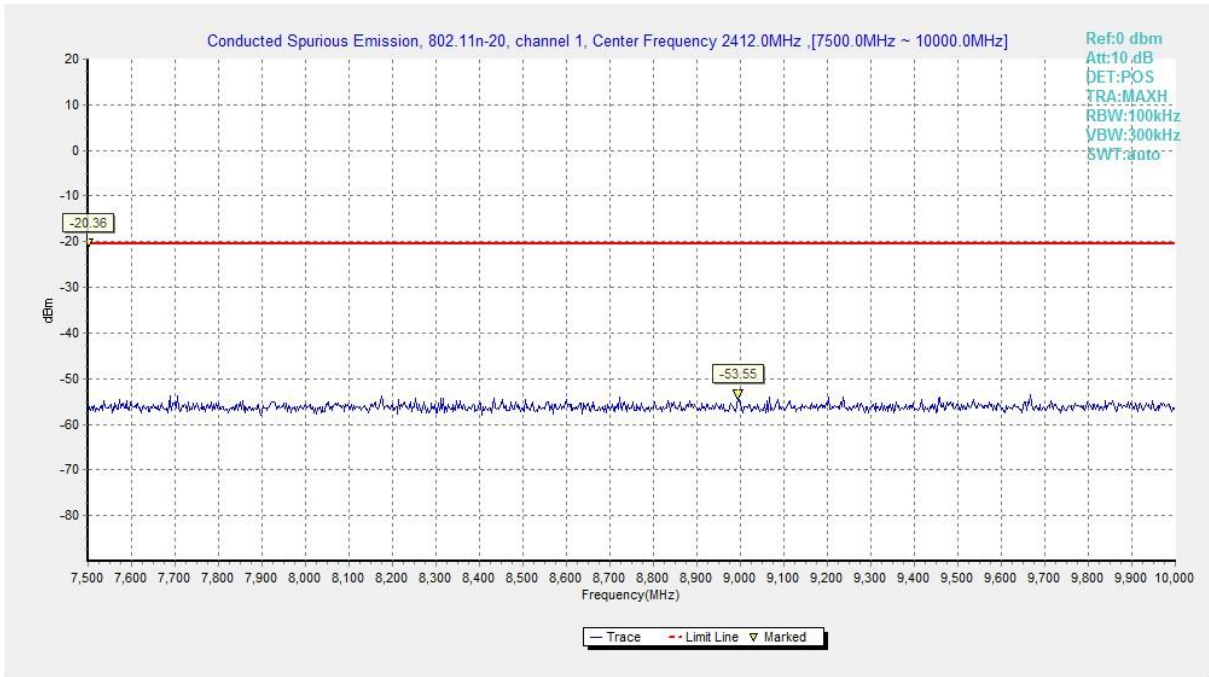


Fig.A.6.1.53 Conducted Spurious Emission (802.11n-HT20, Ch1, 7.5 GHz-10 GHz)

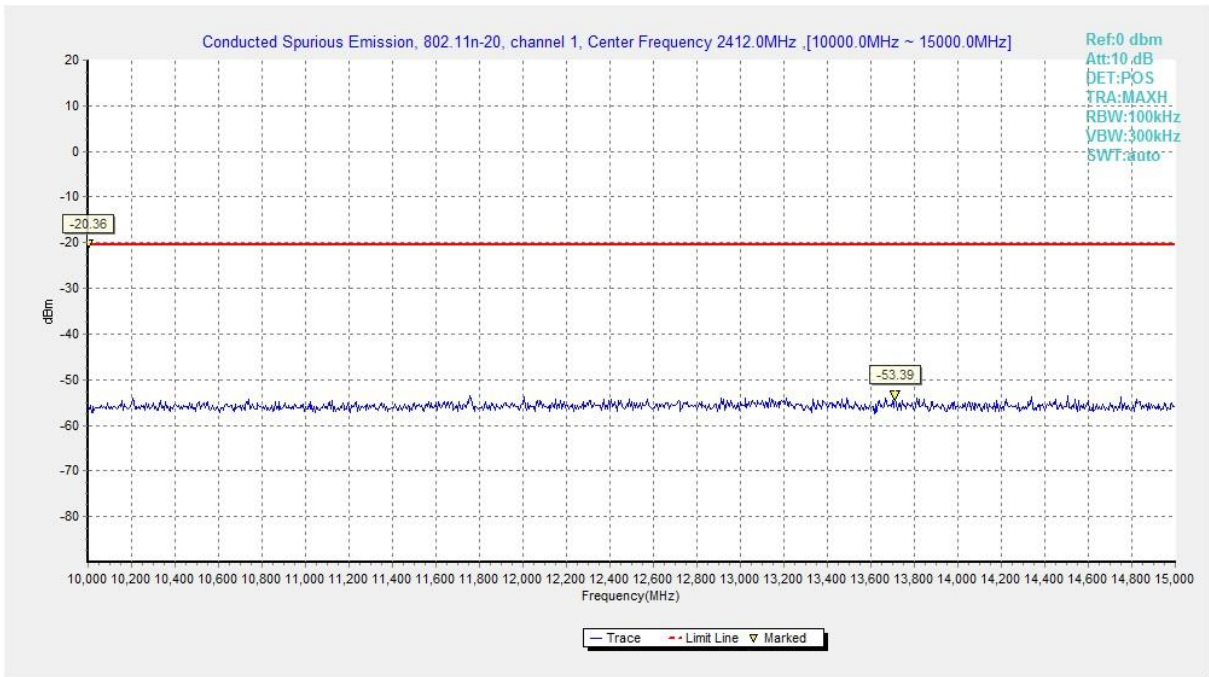


Fig.A.6.1.54 Conducted Spurious Emission (802.11n-HT20, Ch1, 10 GHz-15 GHz)

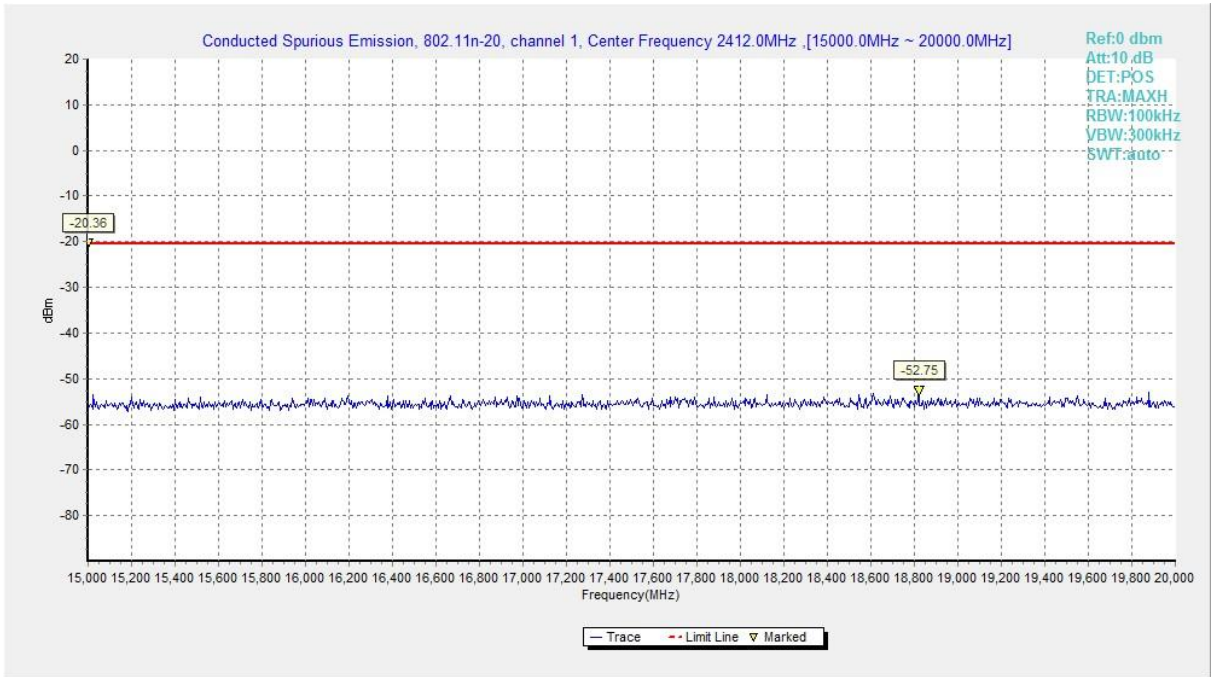


Fig.A.6.1.55 Conducted Spurious Emission (802.11n-HT20, Ch1, 15 GHz-20 GHz)

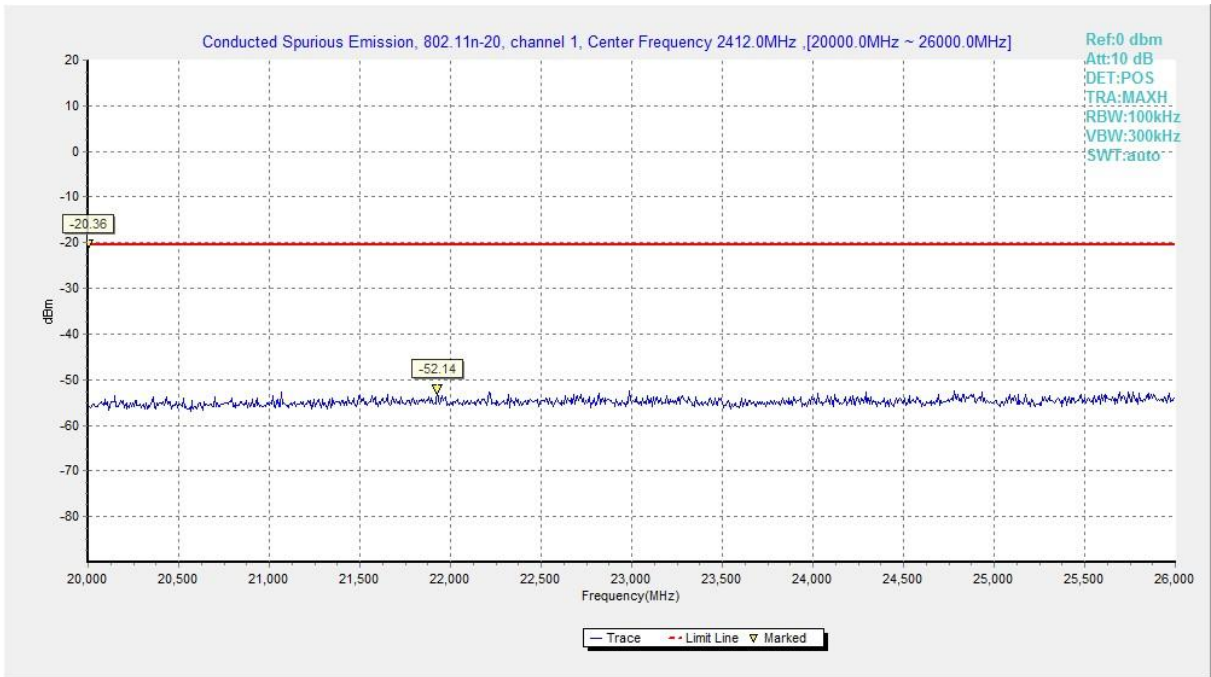


Fig.A.6.1.56 Conducted Spurious Emission (802.11n-HT20, Ch1, 20 GHz-26 GHz)

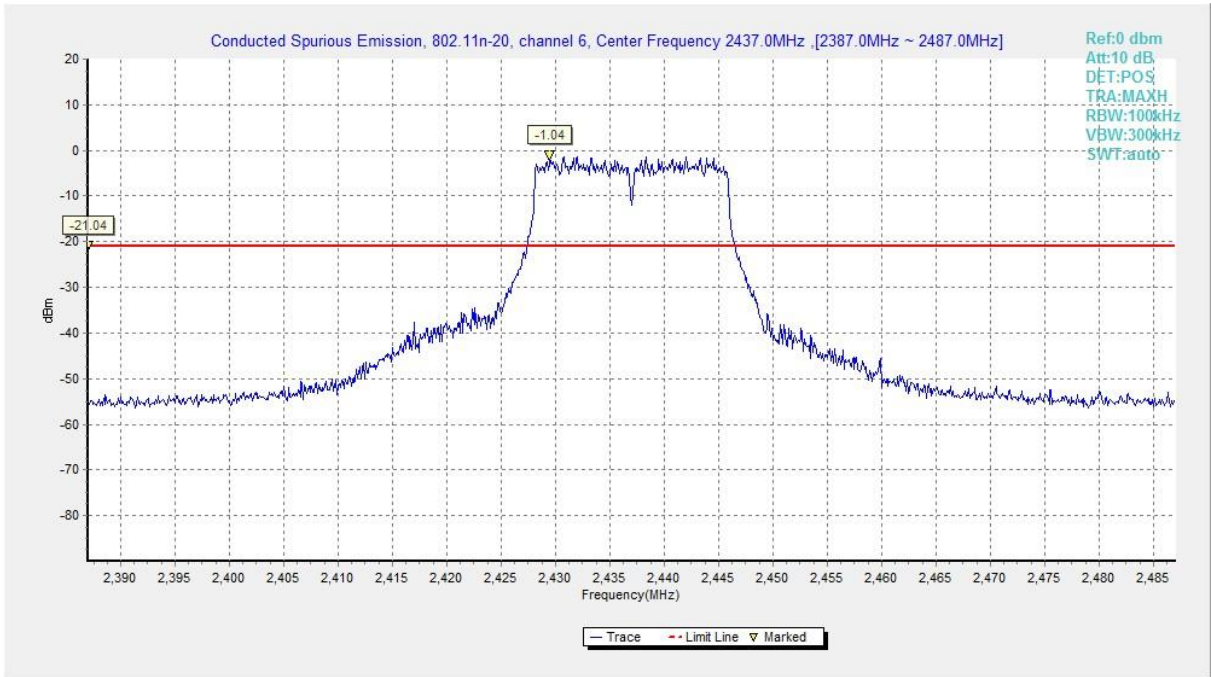


Fig.A.6.1.57 Conducted Spurious Emission (802.11n-HT20, Ch6, Center Frequency)

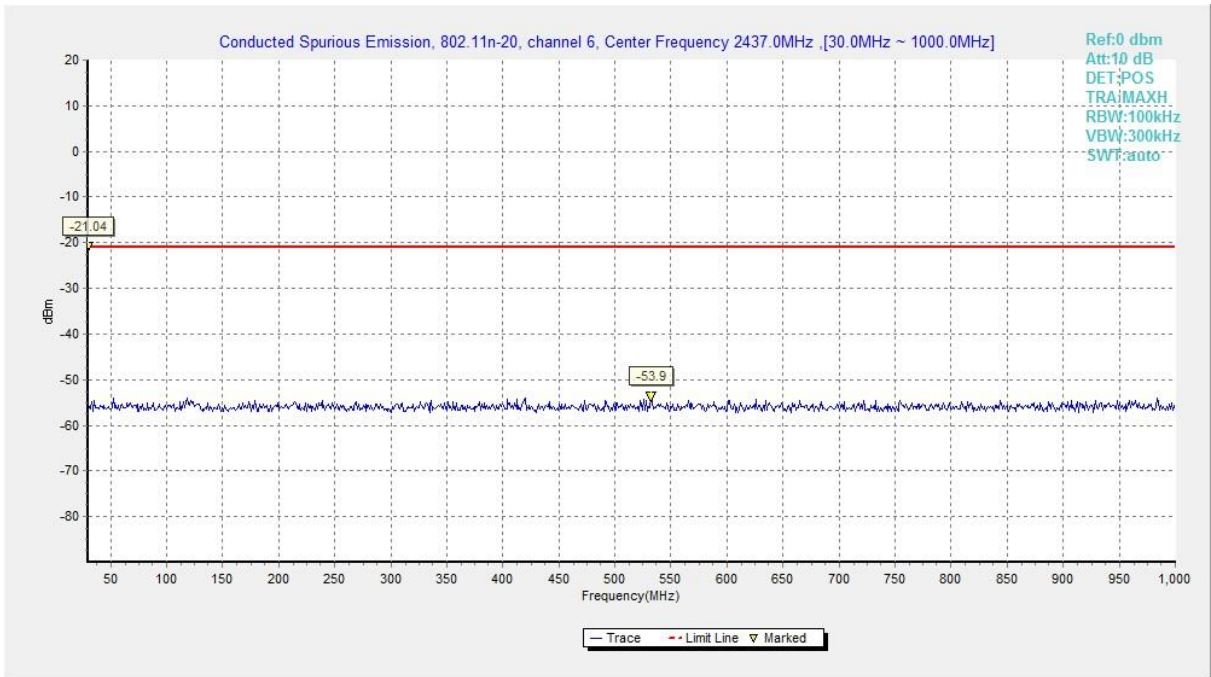


Fig.A.6.1.58 Conducted Spurious Emission (802.11n-HT20, Ch6, 30 MHz-1 GHz)

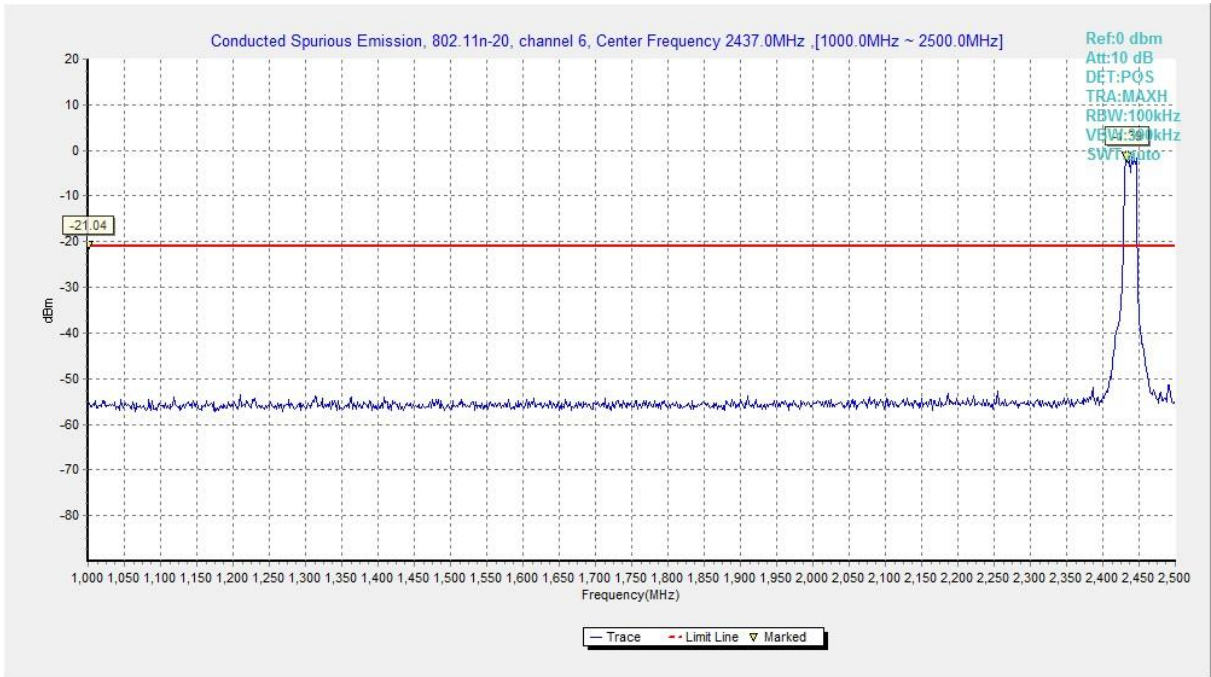


Fig.A.6.1.59 Conducted Spurious Emission (802.11n-HT20, Ch6, 1 GHz-2.5 GHz)

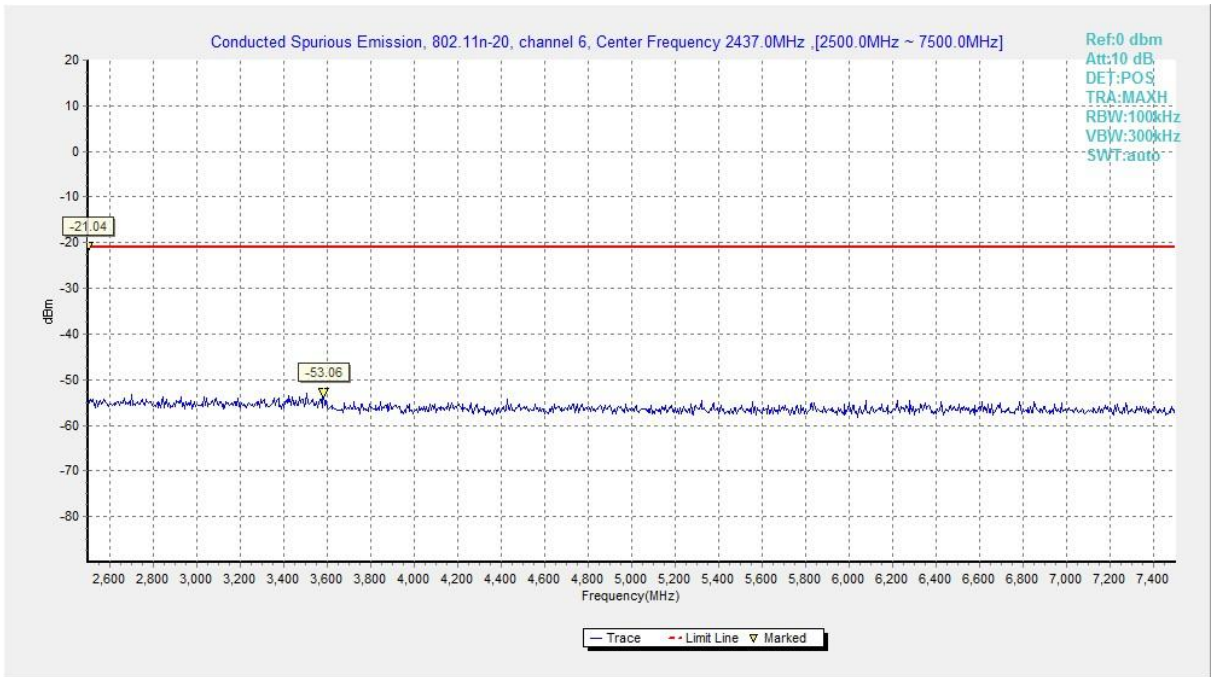


Fig.A.6.1.60 Conducted Spurious Emission (802.11n-HT20, Ch6, 2.5 GHz-7.5 GHz)

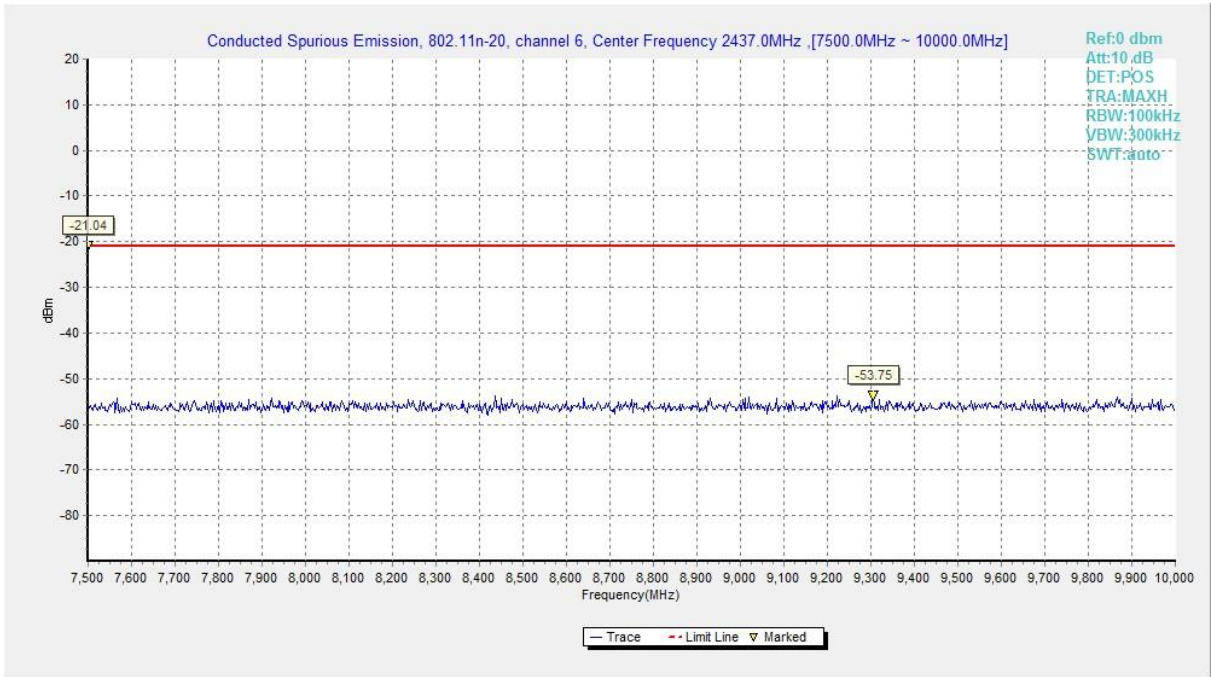


Fig.A.6.1.61 Conducted Spurious Emission (802.11n-HT20, Ch6, 7.5 GHz-10 GHz)

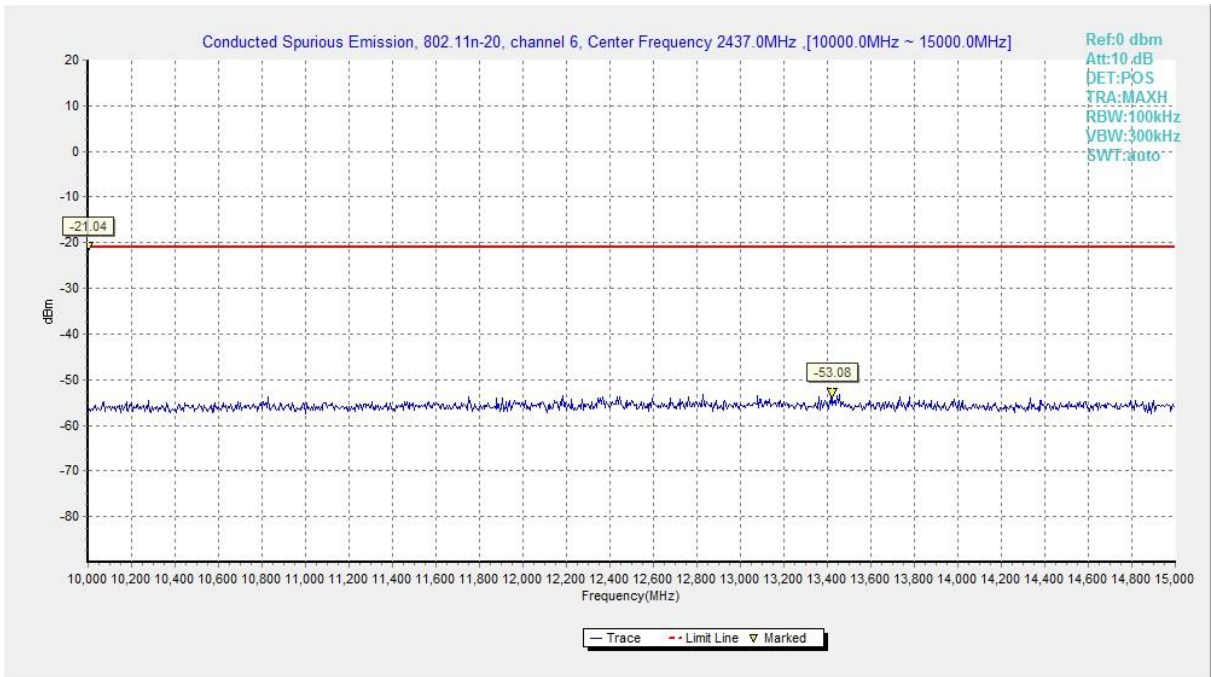


Fig.A.6.1.62 Conducted Spurious Emission (802.11n-HT20, Ch6, 10 GHz-15 GHz)

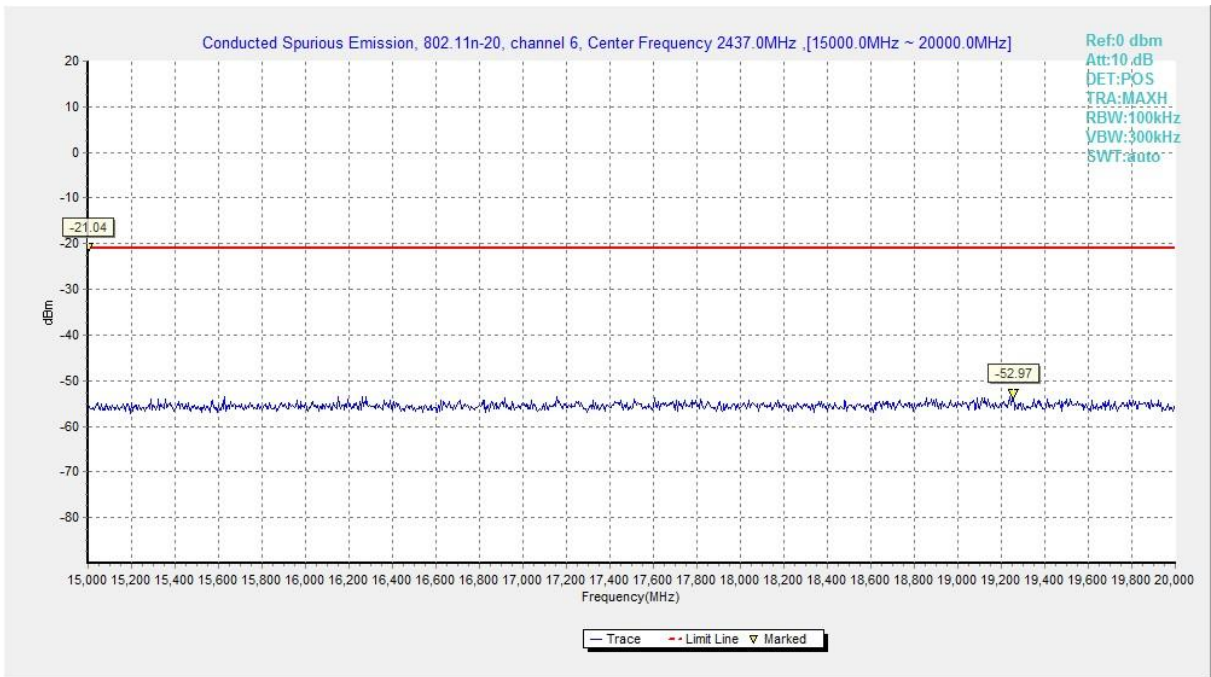


Fig.A.6.1.63 Conducted Spurious Emission (802.11n-HT20, Ch6, 15 GHz-20 GHz)

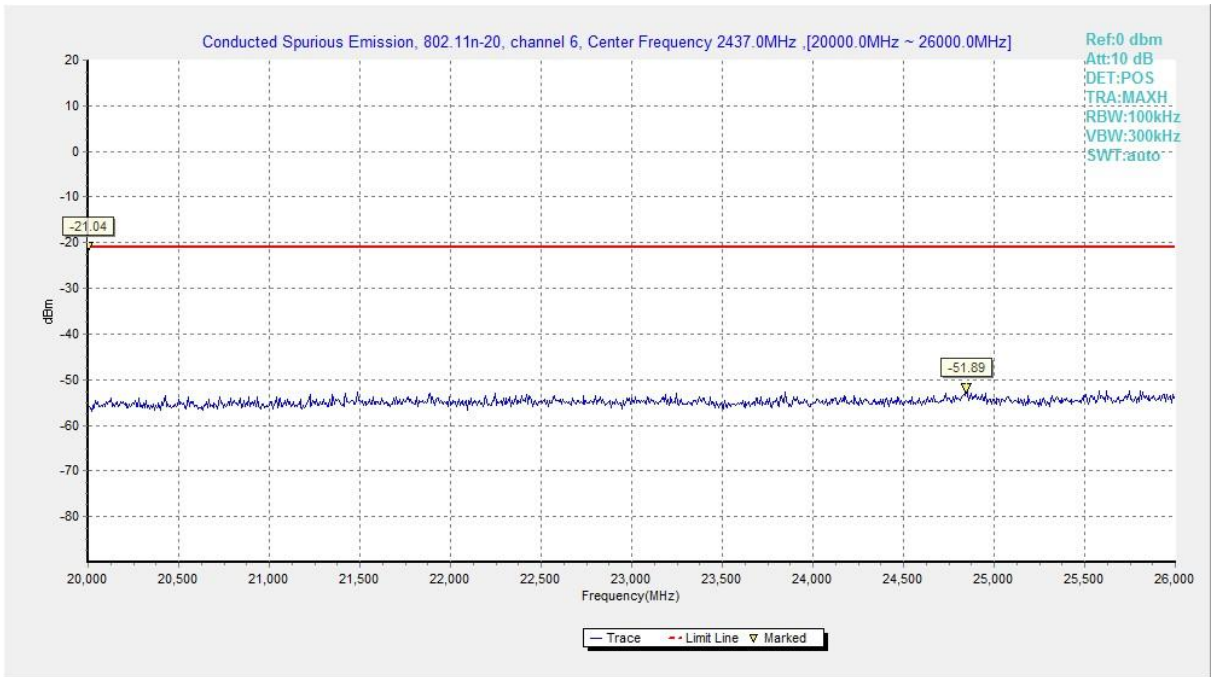


Fig.A.6.1.64 Conducted Spurious Emission (802.11n-HT20, Ch6, 20 GHz-26 GHz)

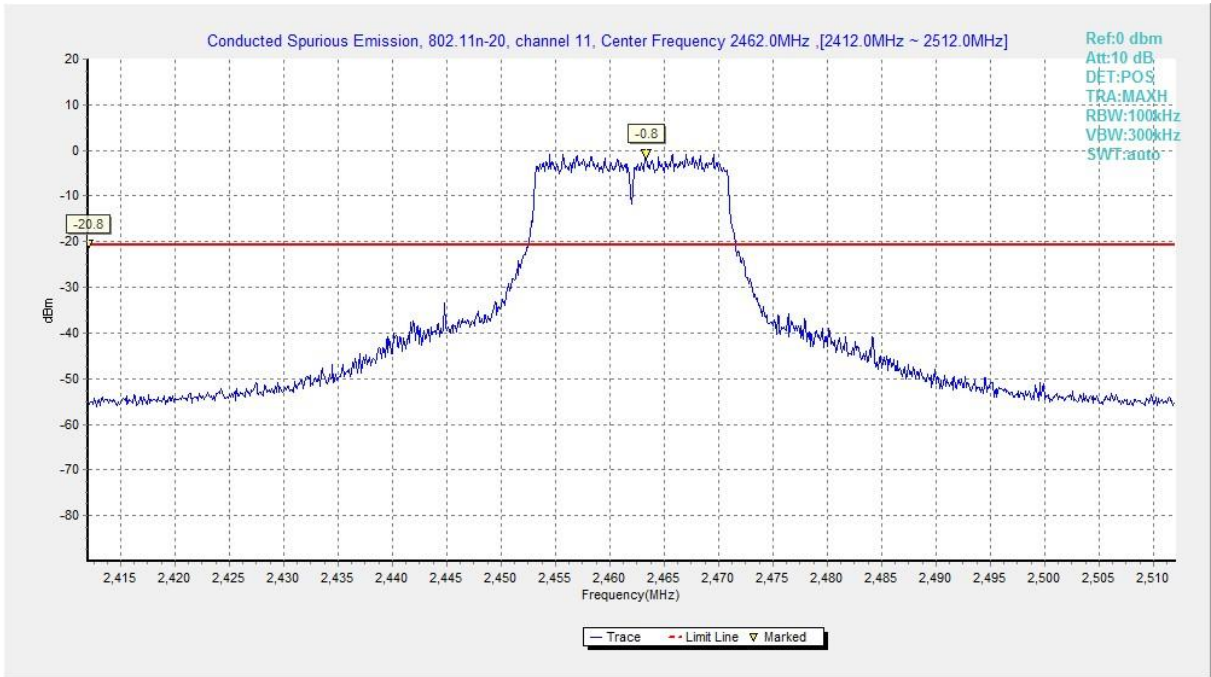


Fig.A.6.1.65 Conducted Spurious Emission (802.11n-HT20, Ch11, Center Frequency)

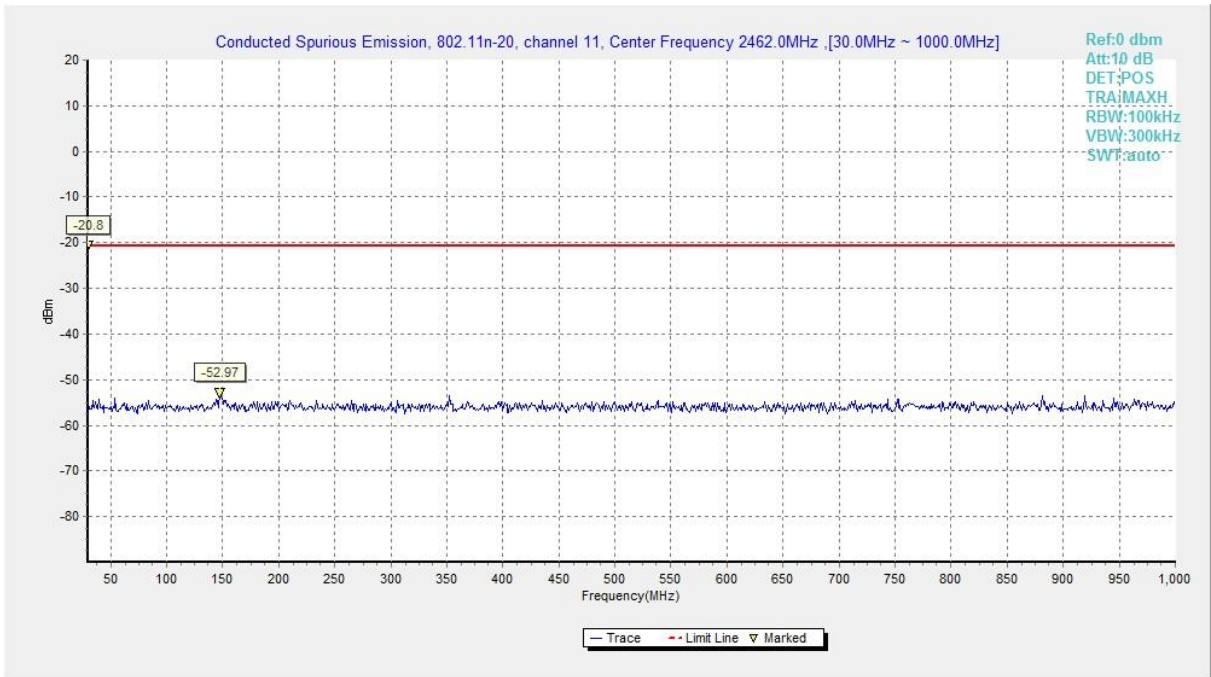


Fig.A.6.1.66 Conducted Spurious Emission (802.11n-HT20, Ch11, 30 MHz-1 GHz)

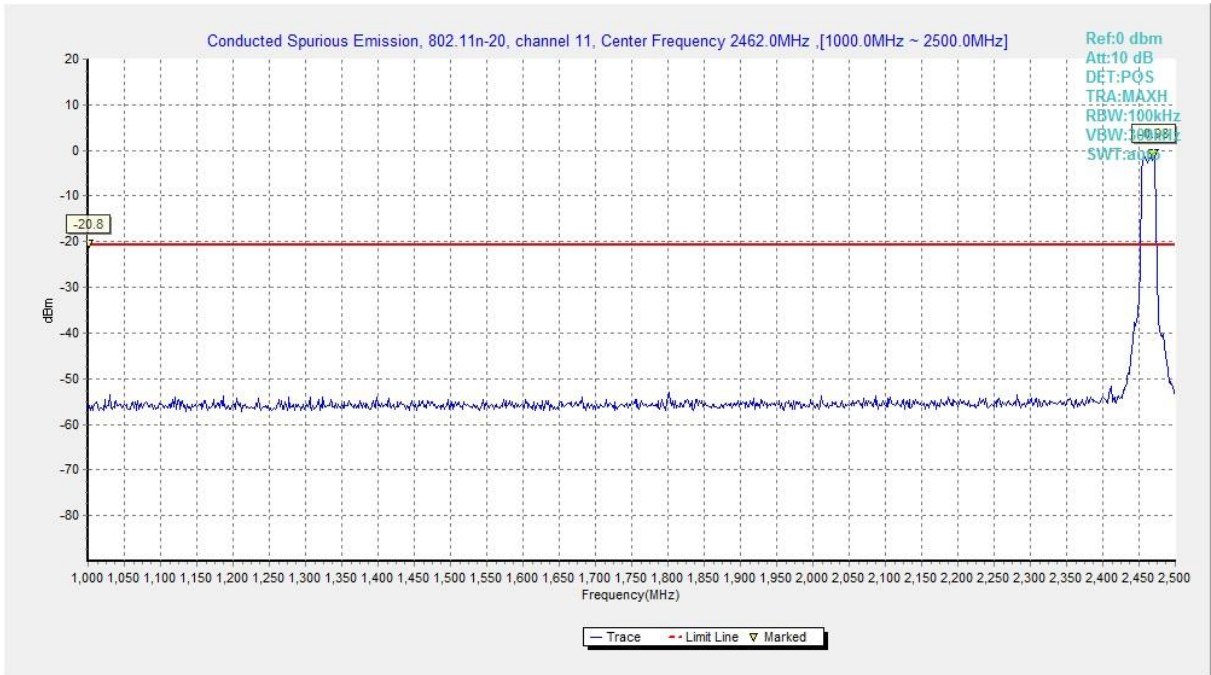


Fig.A.6.1.67 Conducted Spurious Emission (802.11n-HT20, Ch11, 1 GHz-2.5 GHz)

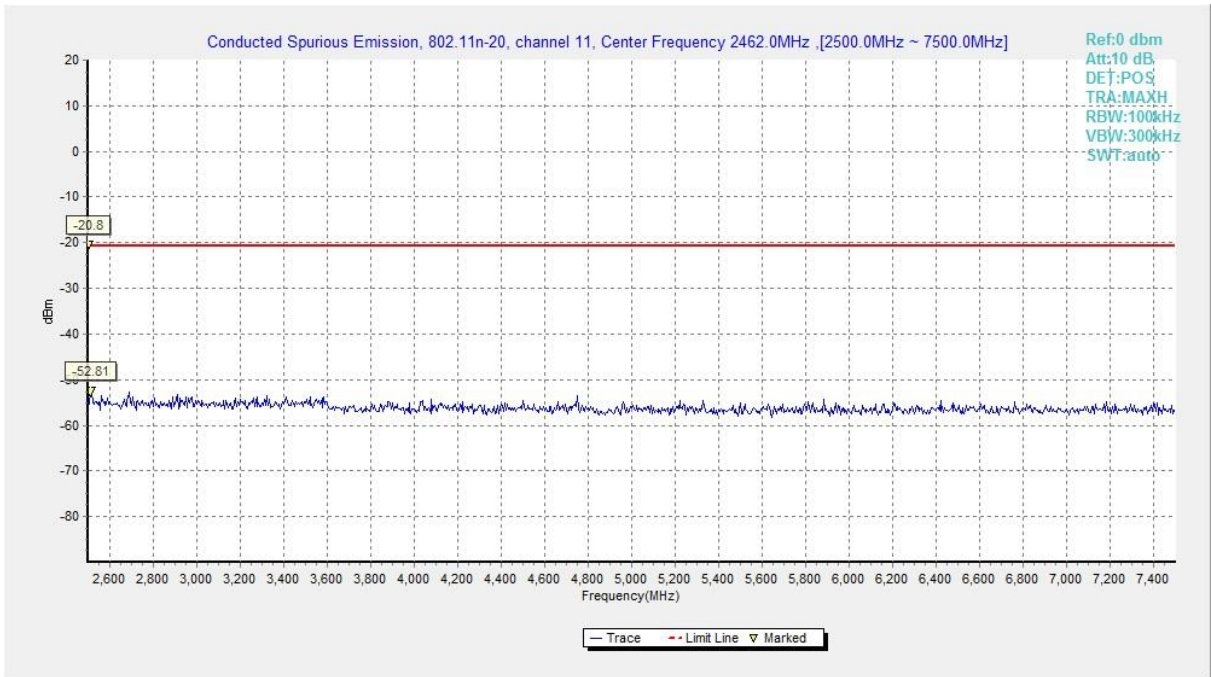


Fig.A.6.1.68 Conducted Spurious Emission (802.11n-HT20, Ch11, 2.5 GHz-7.5 GHz)

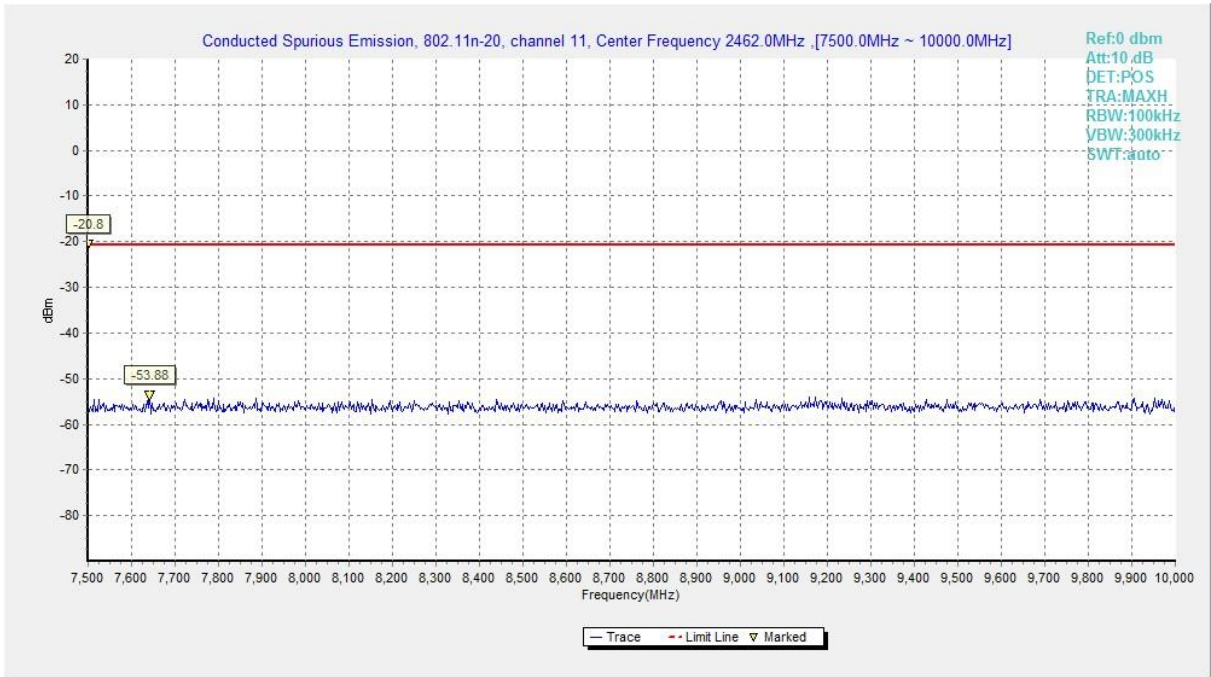


Fig.A.6.1.69 Conducted Spurious Emission (802.11n-HT20, Ch11, 7.5 GHz-10 GHz)

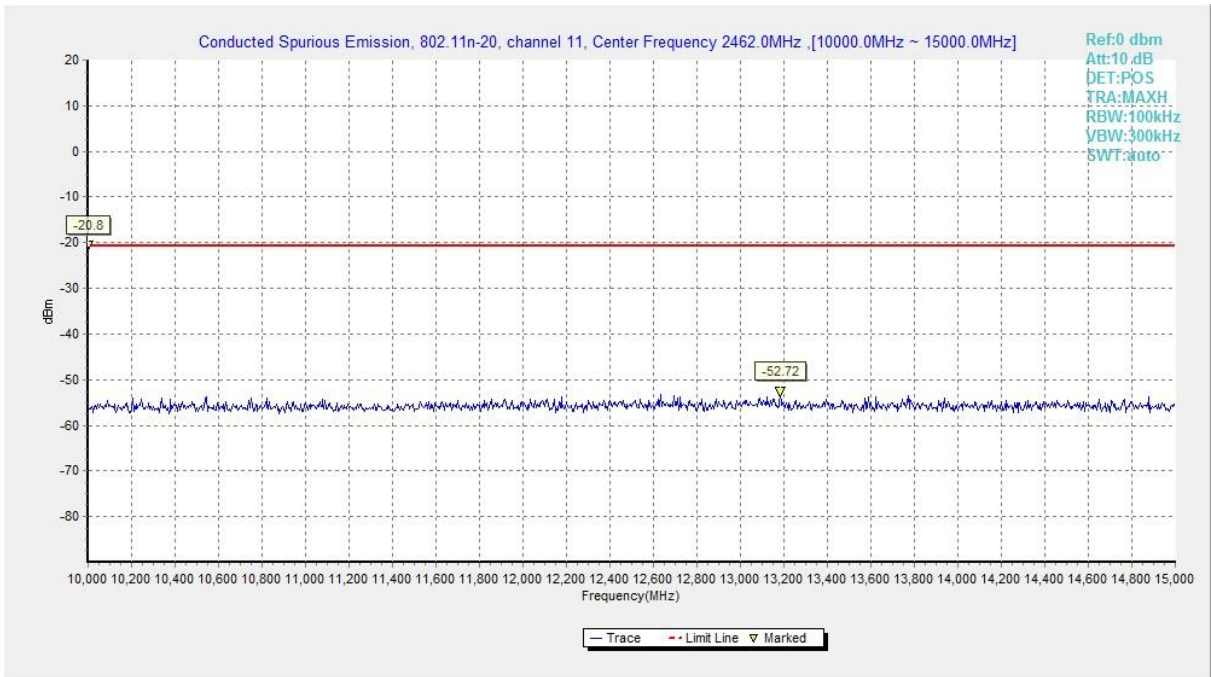


Fig.A.6.1.70 Conducted Spurious Emission (802.11n-HT20, Ch11, 10 GHz-15 GHz)

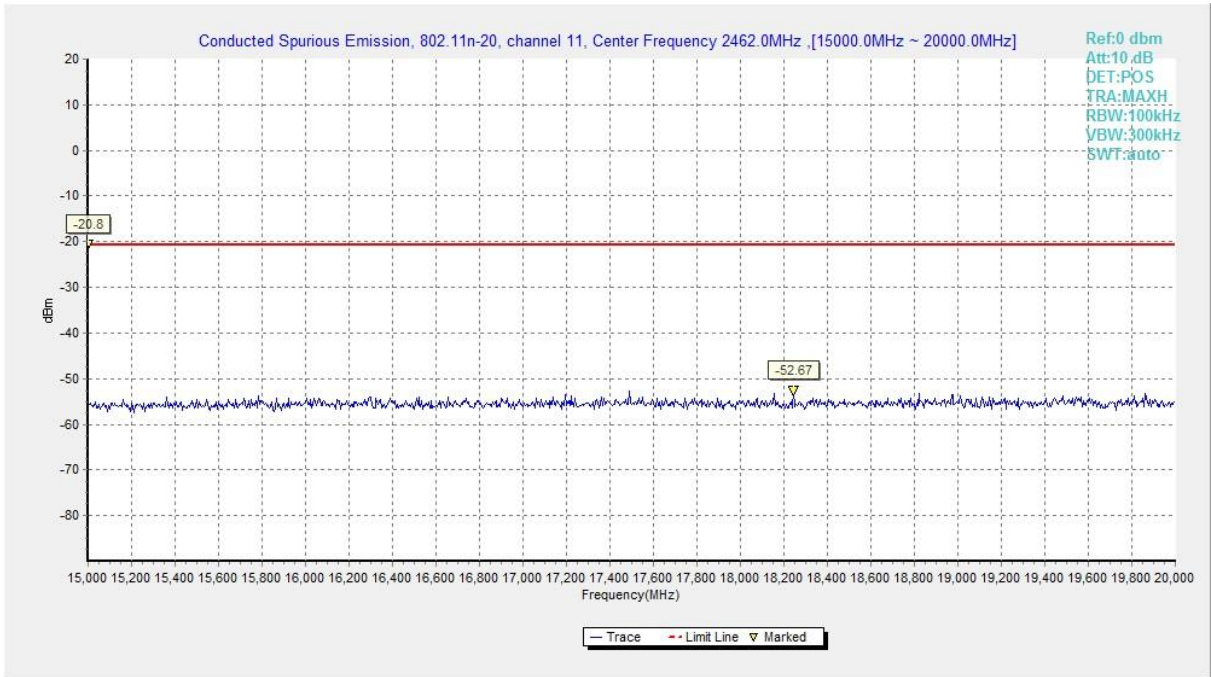


Fig.A.6.1.71 Conducted Spurious Emission (802.11n-HT20, Ch11, 15 GHz-20 GHz)

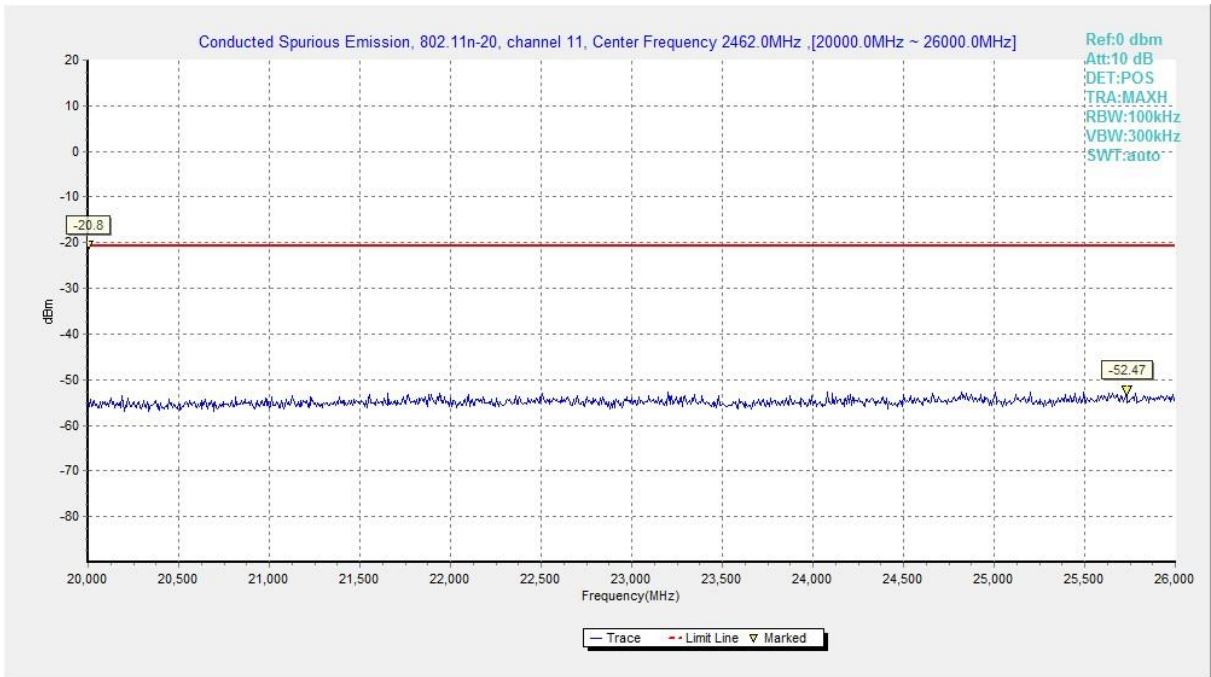


Fig.A.6.1.72 Conducted Spurious Emission (802.11n-HT20, Ch11, 20 GHz-26 GHz)

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
11Mbps(CCK)	54Mbps(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

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
2387.200	55.9	-38.8	27.7	67.000	H
17685.000	52.0	-18.9	45.6	25.300	V
17655.000	52.0	-18.9	45.6	25.300	H
17982.000	51.8	-17.7	45.6	23.900	V
17911.500	51.7	-18.5	45.6	24.600	H
18000.000	51.7	-45.6	44.5	52.766	V

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17574.000	53.3	-18.9	45.6	26.600	H
17872.500	53.1	-18.5	45.6	26.000	V
17761.500	52.9	-18.5	45.6	25.800	H
17979.000	52.7	-17.7	45.6	24.800	V
17734.500	52.5	-18.9	45.6	25.800	H
18000.000	52.5	-45.6	44.5	53.566	V

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
2485.900	55.0	-38.9	27.7	66.200	V
17947.500	53.1	-17.7	45.6	25.200	H
17749.500	53.0	-18.5	45.6	25.900	H
17712.000	52.7	-18.9	45.6	26.000	V
17958.000	52.7	-17.7	45.6	24.800	V
17979.000	52.7	-17.7	45.6	24.800	V

802.11g

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2389.800	56.1	-38.8	27.7	67.200	H
17938.500	53.2	-17.7	45.6	25.300	V
17998.500	53.0	-17.7	45.6	25.100	V
17718.000	52.9	-18.9	45.6	26.200	V
17632.500	52.8	-18.9	45.6	26.100	V
17928.000	52.7	-17.7	45.6	24.800	H

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17814.000	53.4	-18.5	45.6	26.300	H
17833.500	53.3	-18.5	45.6	26.200	V
17946.000	53.3	-17.7	45.6	25.400	H
17979.000	53.3	-17.7	45.6	25.400	V
17962.500	53.2	-17.7	45.6	25.300	V
17992.500	53.0	-17.7	45.6	25.100	H

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2483.700	57.0	-38.9	27.7	68.200	H
17971.500	53.6	-17.7	45.6	25.700	V
17811.000	53.5	-18.5	45.6	26.400	H
17761.500	53.4	-18.5	45.6	26.300	V
17989.500	53.1	-17.7	45.6	25.200	V
17995.500	52.9	-17.7	45.6	25.000	H

802.11n-HT20

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2389.700	52.6	-38.8	27.7	63.700	V
17986.500	53.6	-17.7	45.6	25.700	V
17973.000	53.5	-17.7	45.6	25.600	H
17982.000	53.3	-17.7	45.6	25.400	V
17823.000	53.1	-18.5	45.6	26.000	V
17890.500	53.1	-18.5	45.6	26.000	H

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17733.000	53.6	-18.9	45.6	26.900	V
17799.000	53.4	-18.5	45.6	26.300	V
17776.500	53.2	-18.5	45.6	26.100	V
17958.000	53.0	-17.7	45.6	25.100	V
17995.500	53.0	-17.7	45.6	25.100	H
17998.500	52.9	-17.7	45.6	25.000	V

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2485.880	54.2	-38.9	27.7	65.400	V
17998.500	53.9	-17.7	45.6	26.000	V
17989.500	53.2	-17.7	45.6	25.300	H
17971.500	53.0	-17.7	45.6	25.100	H
17800.500	52.9	-18.5	45.6	25.800	V
17766.000	52.7	-18.5	45.6	25.600	V

Test graphs as below:

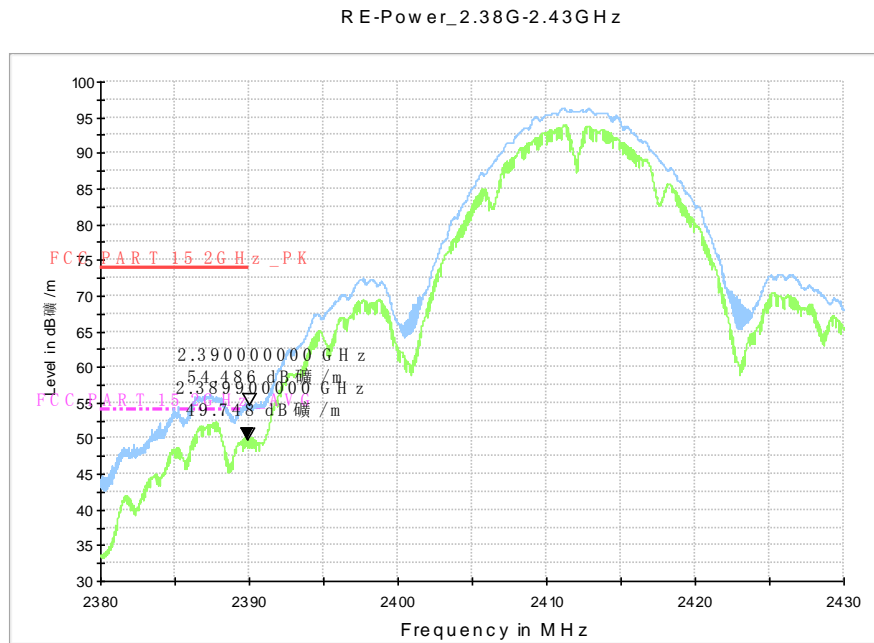


Fig.A.6.2.1 Radiated Spurious Emission (Power): 802.11b, ch1, 2.38 GHz – 2.45GHz

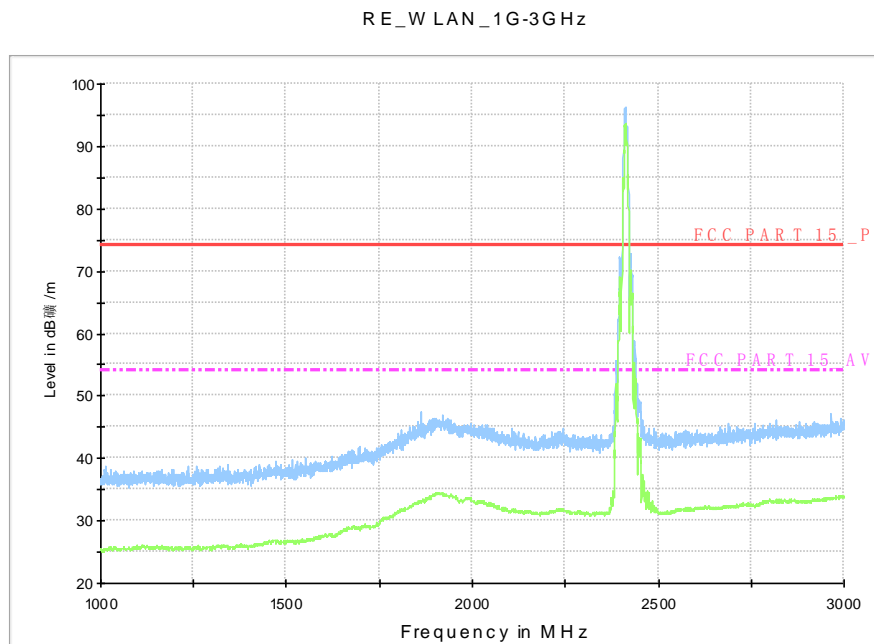


Fig.A.6.2.2 Radiated Spurious Emission (802.11b, Ch1, 1 GHz-3 GHz)

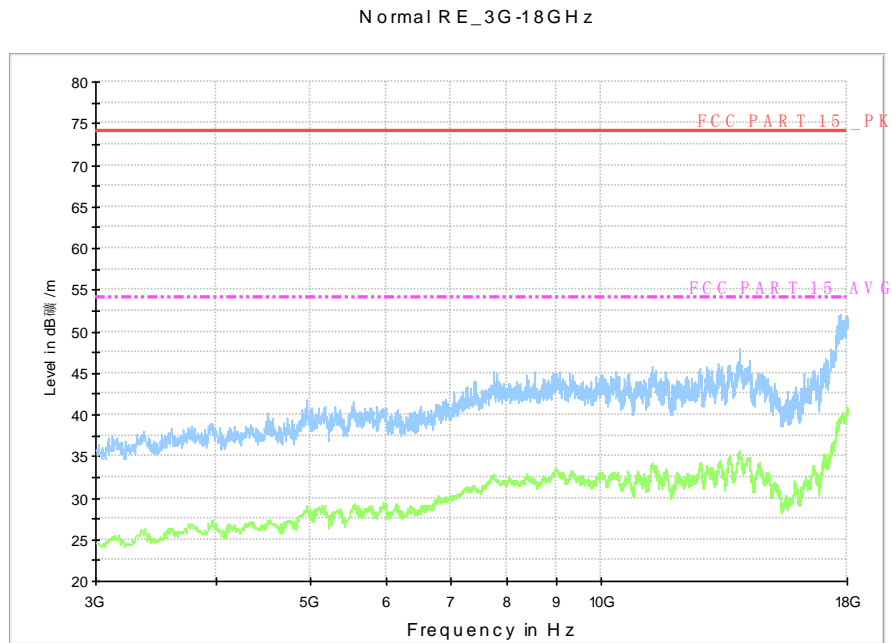


Fig.A.6.2.3 Radiated Spurious Emission (802.11b, Ch1, 3 GHz-18 GHz)

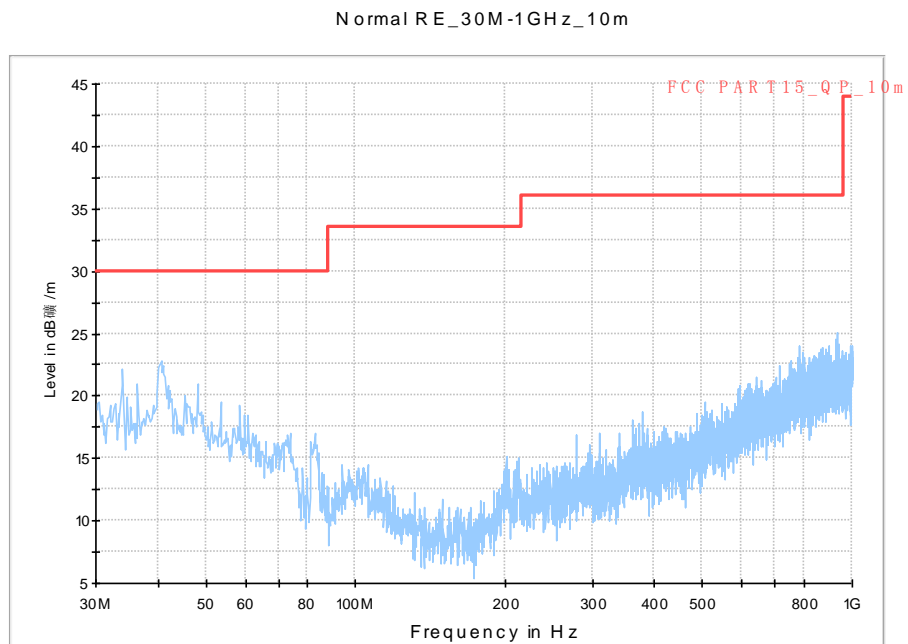


Fig.A.6.2.4 Radiated Spurious Emission (802.11b, Ch6, 30 MHz-1 GHz)

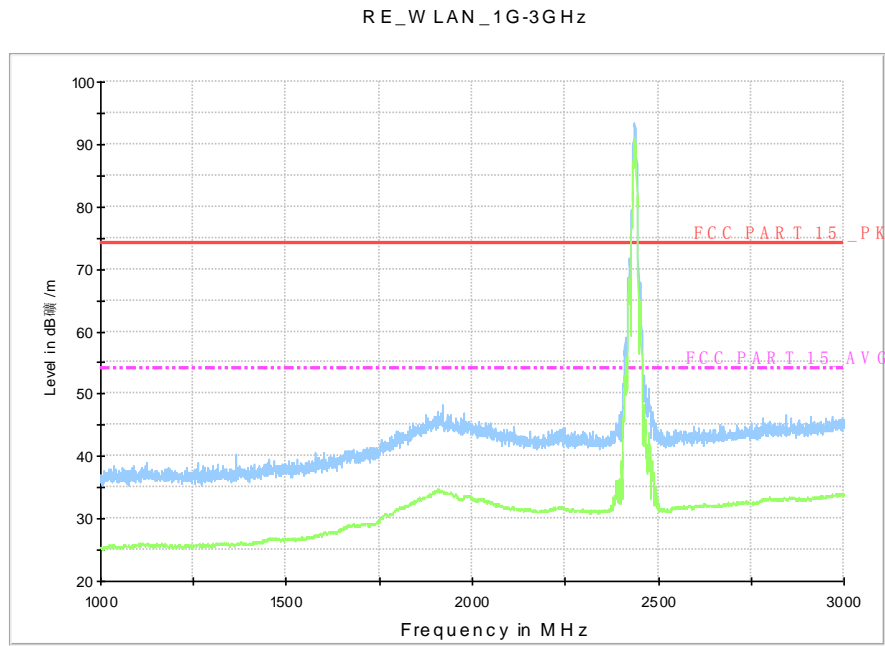


Fig.A.6.2.5 Radiated Spurious Emission (802.11b, Ch6, 1 GHz-3 GHz)

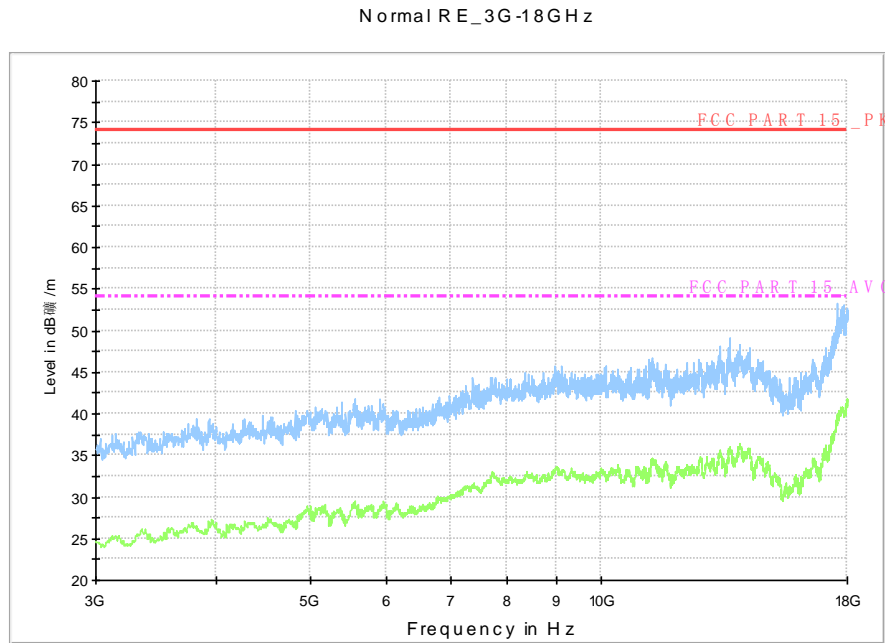


Fig.A.6.2.6 Radiated Spurious Emission (802.11b, Ch6, 3 GHz-18 GHz)

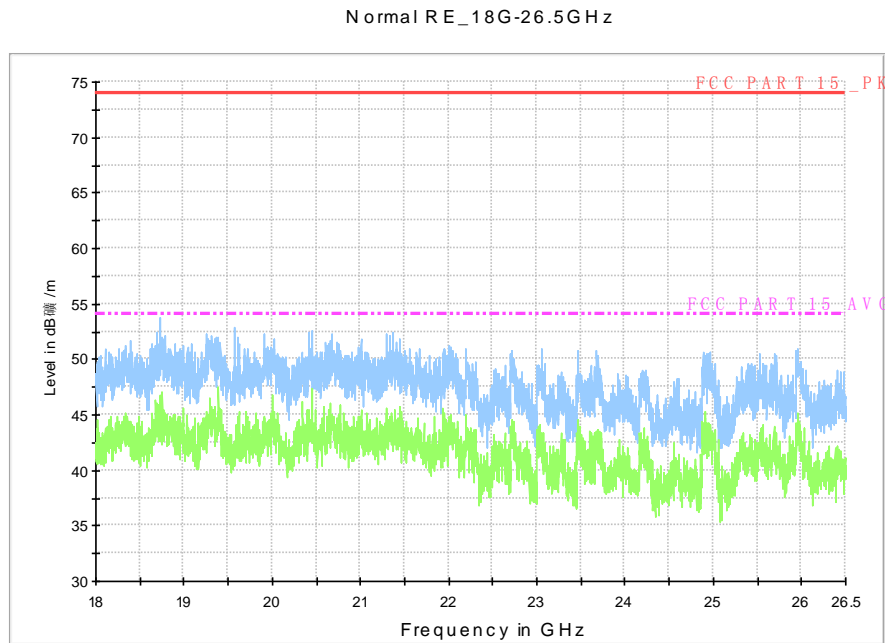


Fig.A.6.2.7 Radiated Spurious Emission (802.11b, Ch6, 18GHz – 26.5GHz)

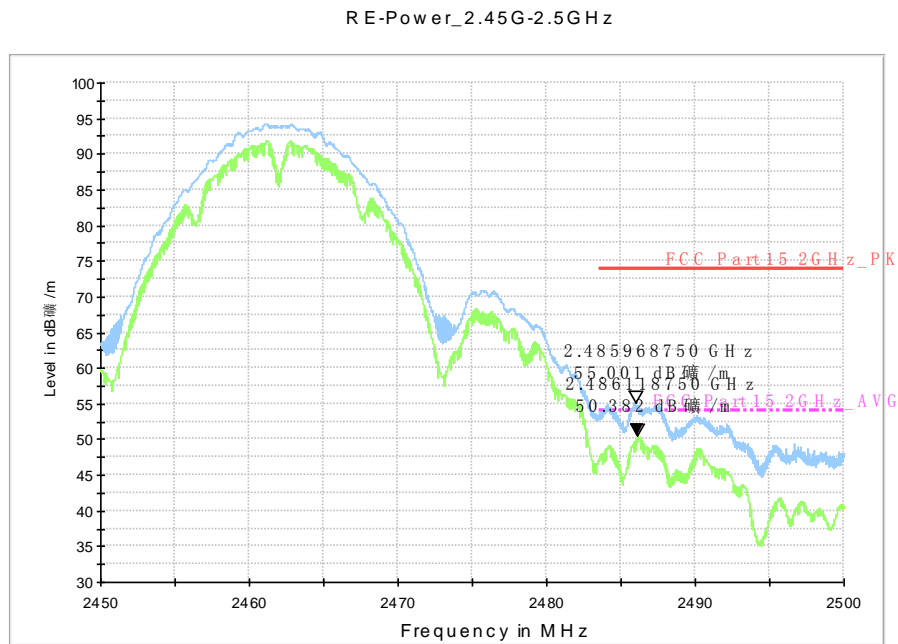


Fig.A.6.2.8 Radiated Spurious Emission (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz

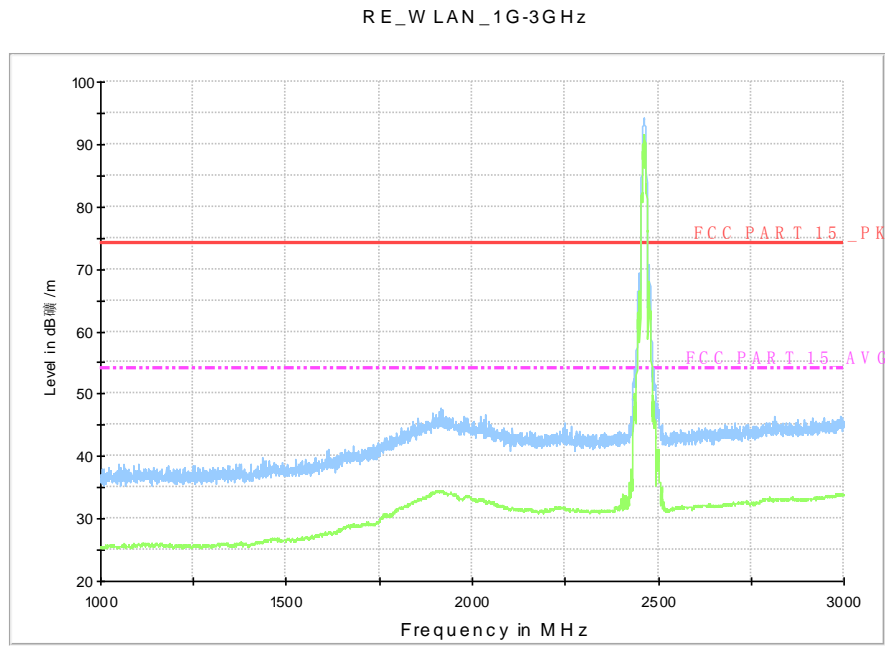


Fig.A.6.2.9 Radiated Spurious Emission (802.11b, Ch11, 1 GHz-3 GHz)

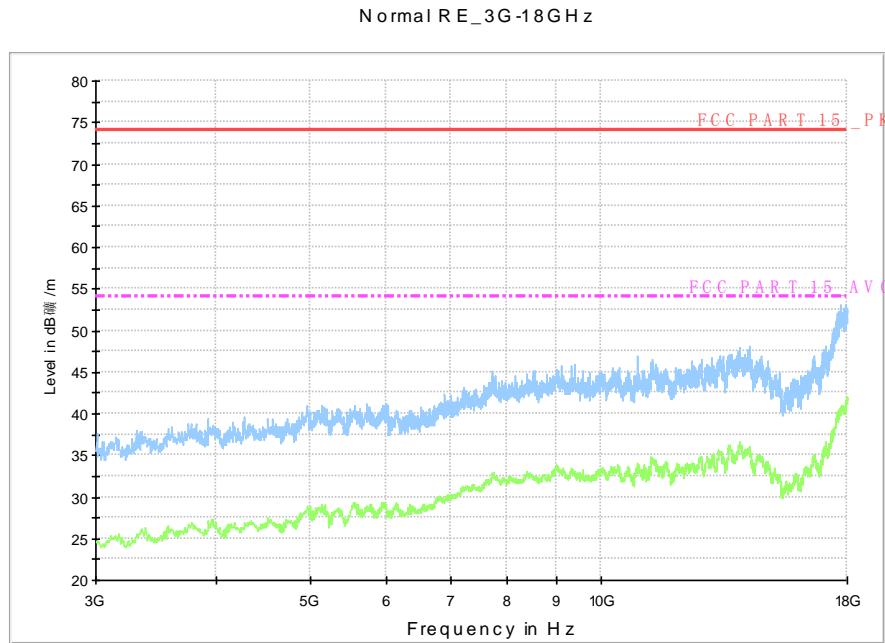


Fig.A.6.2.10 Radiated Spurious Emission (802.11b, Ch11, 3 GHz-18 GHz)

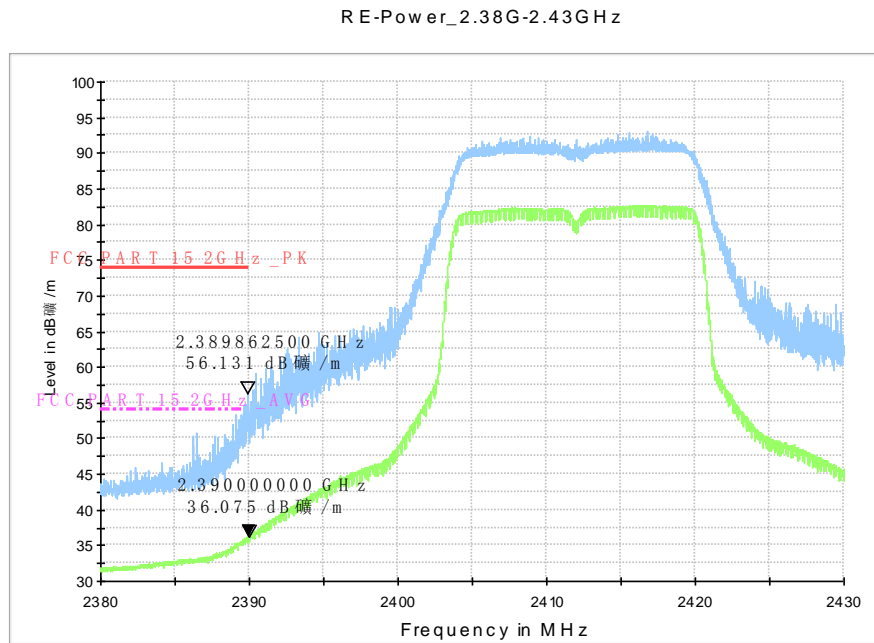


Fig.A.6.2.11 Radiated Spurious Emission (Power): 802.11g, ch1, 2.38 GHz - 2.45GHz

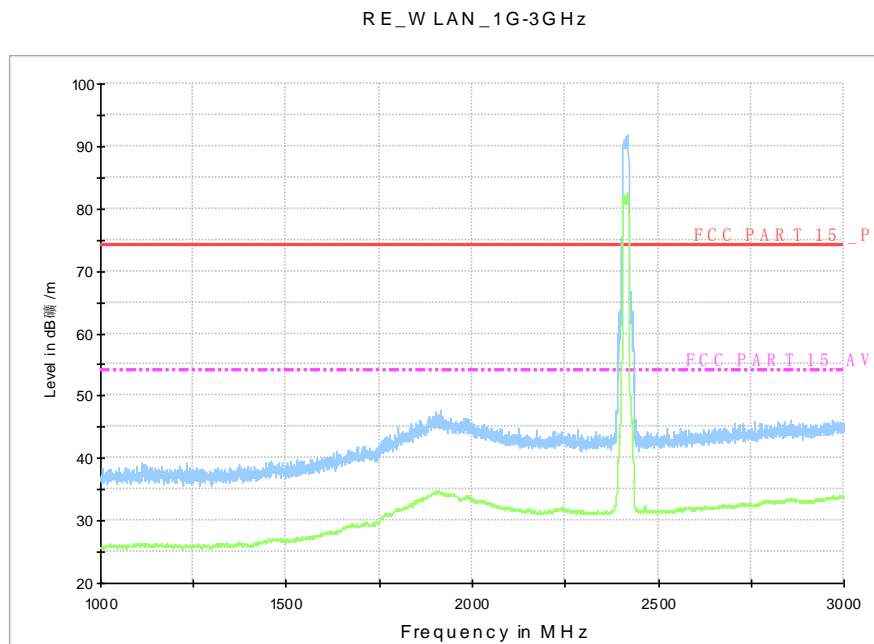


Fig.A.6.2.12 Radiated Spurious Emission (802.11g, Ch1, 1 GHz-3 GHz)

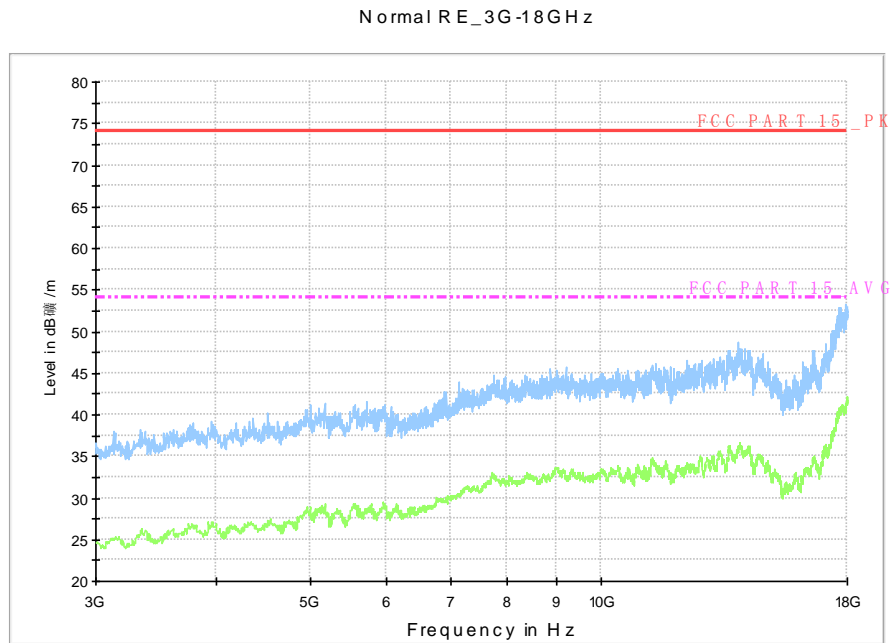


Fig.A.6.2.13 Radiated Spurious Emission (802.11g, Ch1, 3 GHz-18 GHz)

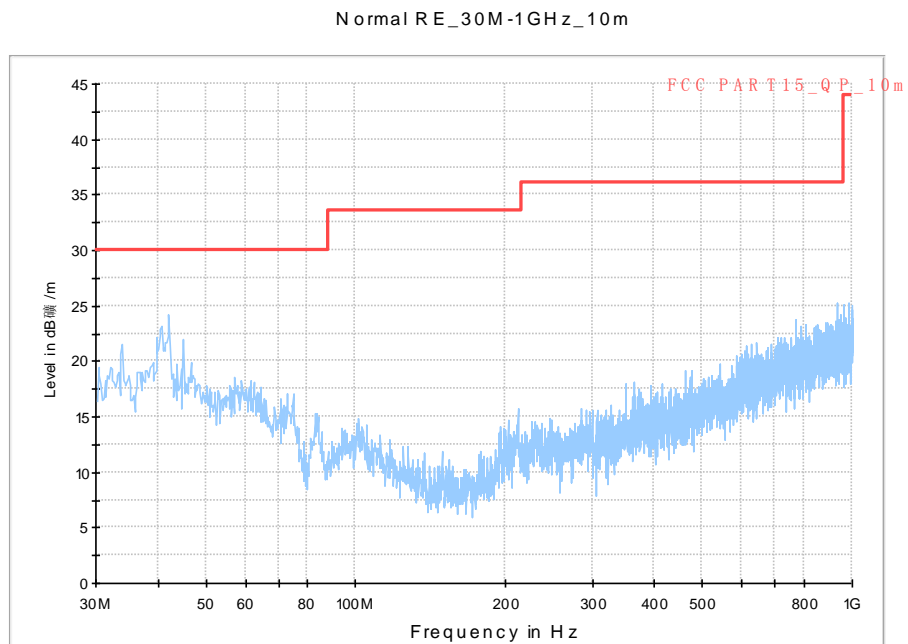


Fig.A.6.2.14 Radiated Spurious Emission (802.11g, Ch6, 30 MHz-1 GHz)

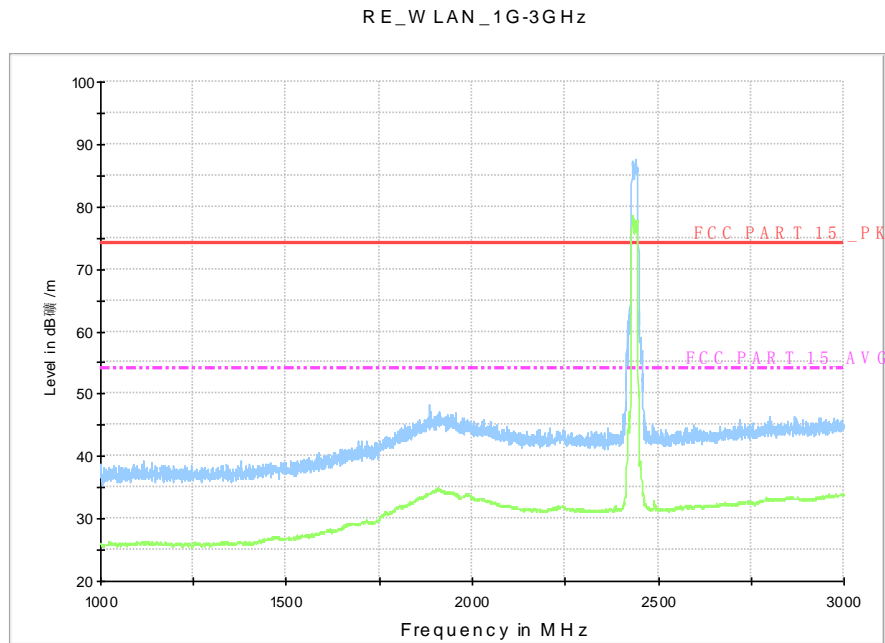


Fig.A.6.2.15 Radiated Spurious Emission (802.11g, Ch6, 1 GHz-3 GHz)

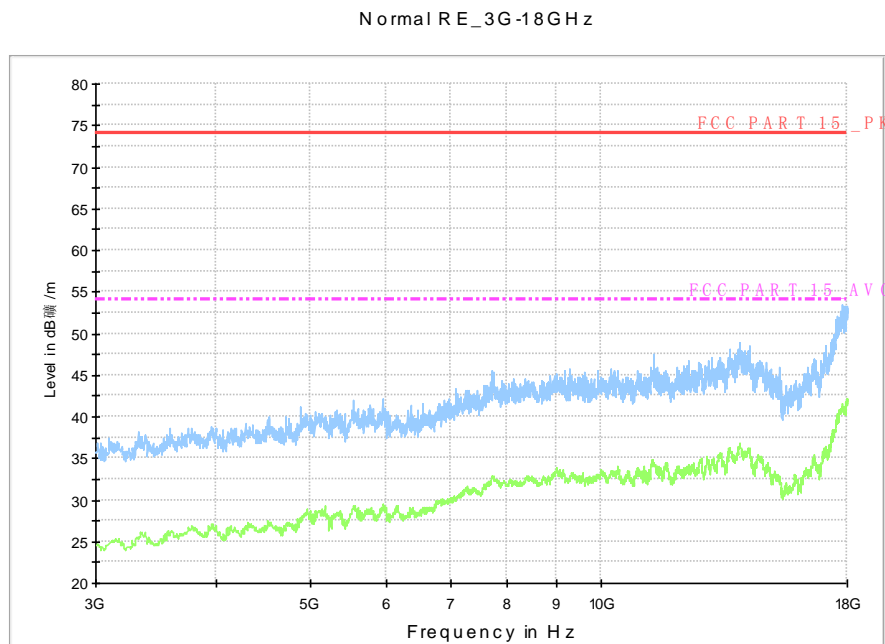


Fig.A.6.2.16 Radiated Spurious Emission (802.11g, Ch6, 3 GHz-18 GHz)

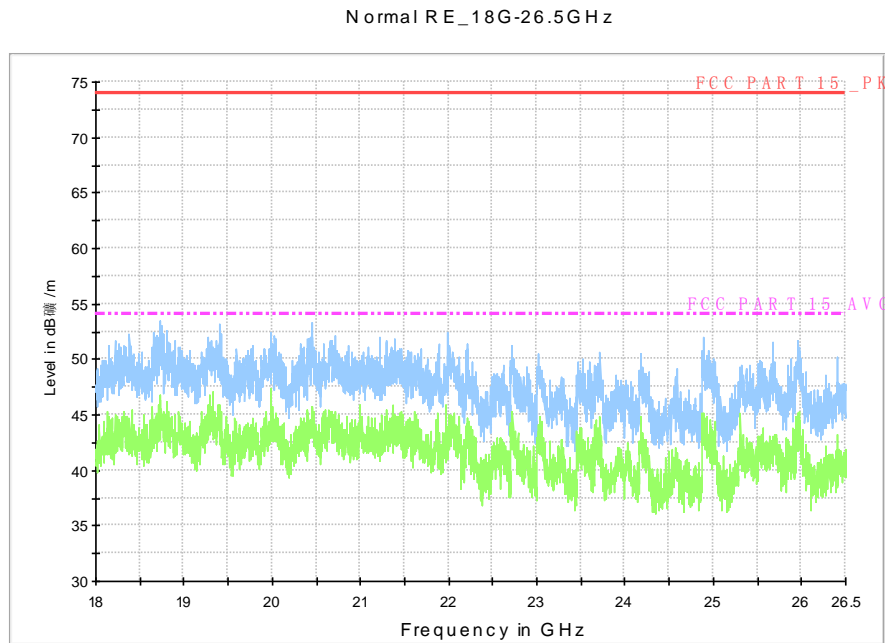


Fig.A.6.2.17 Radiated Spurious Emission (802.11g, Ch6, 18GHz – 26.5GHz)

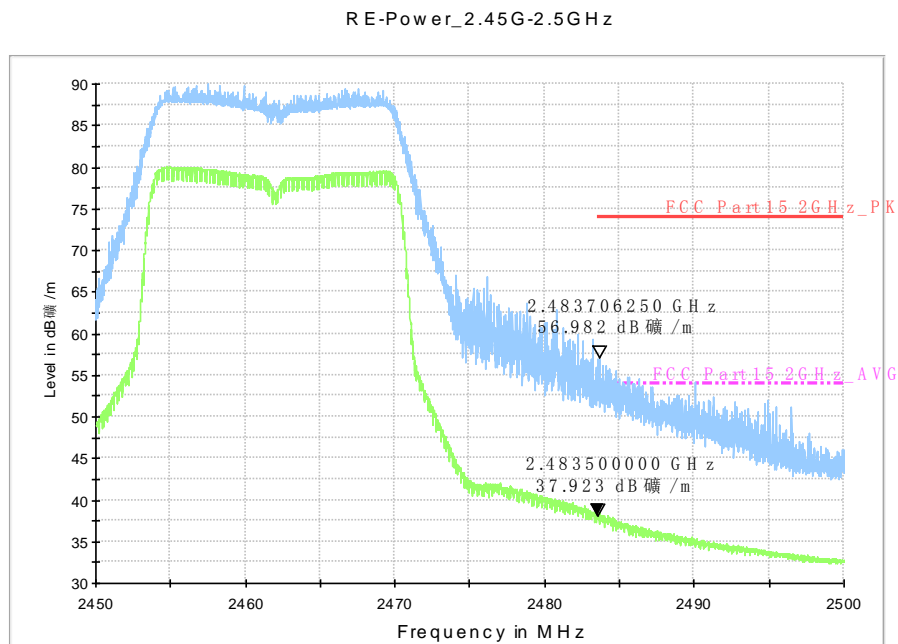


Fig.A.6.2.18 Radiated Spurious Emission (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz

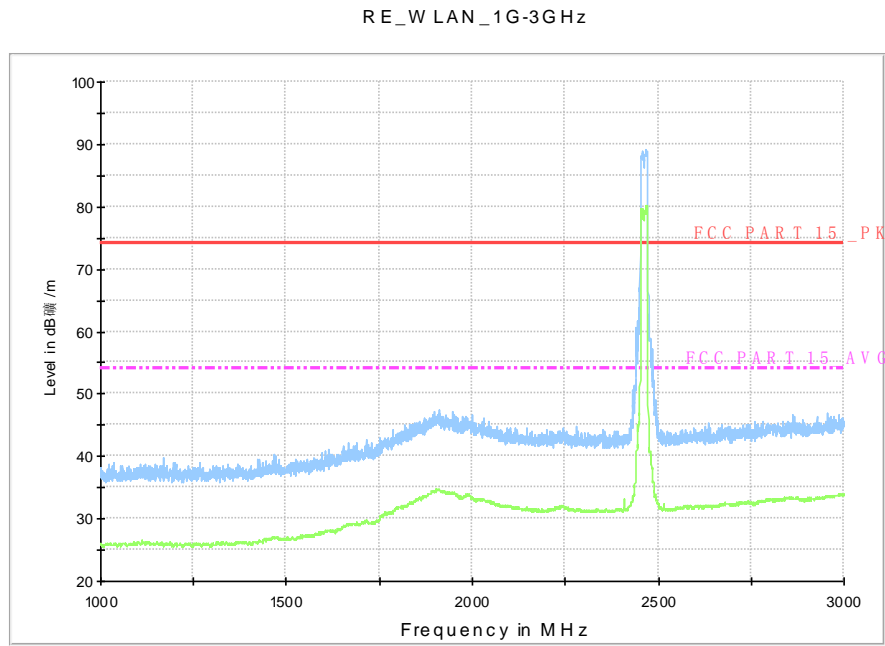


Fig.A.6.2.19 Radiated Spurious Emission (802.11g, Ch11, 1 GHz-3 GHz)

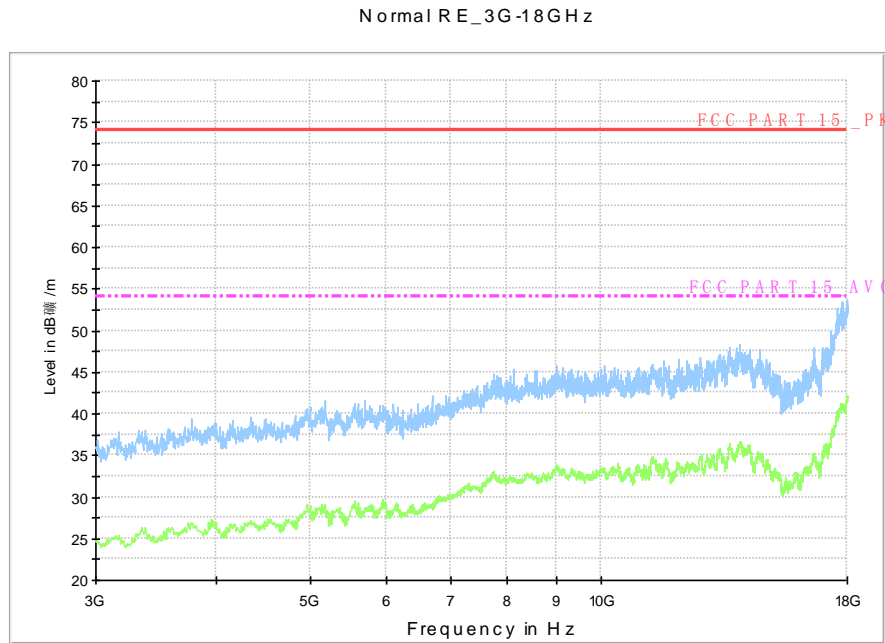


Fig.A.6.2.20 Radiated Spurious Emission (802.11g, Ch11, 3 GHz-18 GHz)

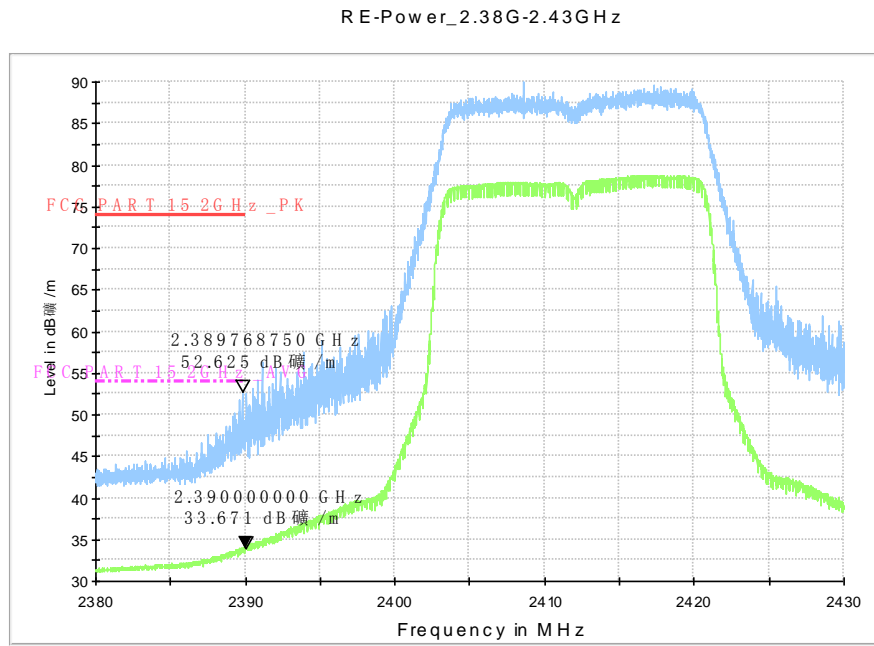


Fig.A.6.2.21 Radiated Spurious Emission (Power): 802.11n-HT20, ch1, 2.38 GHz - 2.45GHz

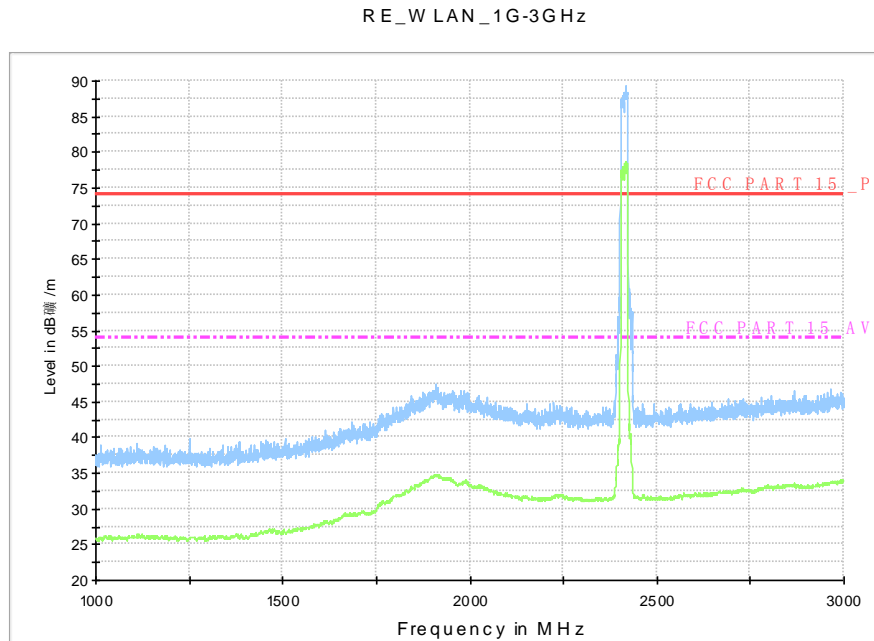


Fig.A.6.2.22 Radiated Spurious Emission (802.11n-HT20, Ch1, 1 GHz-3 GHz)

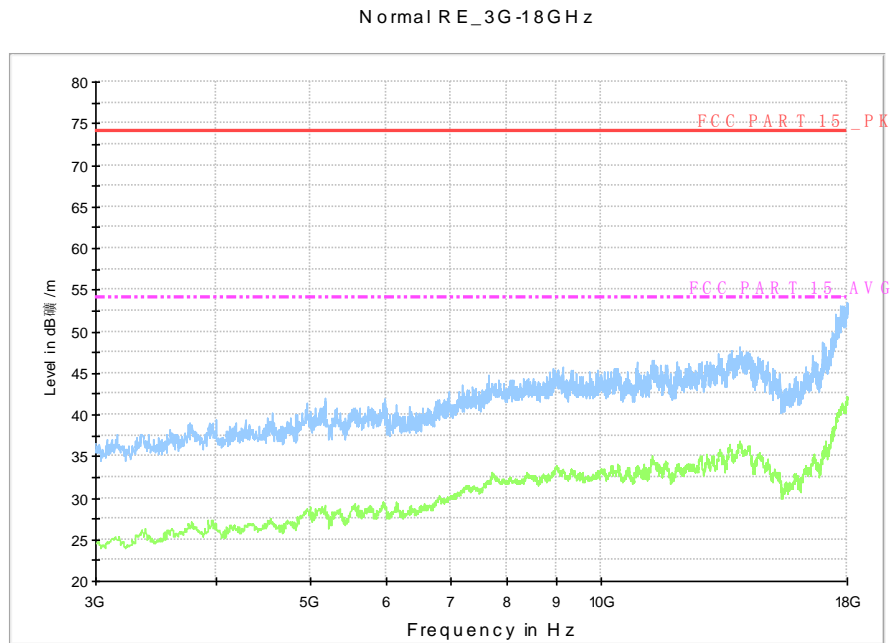


Fig.A.6.2.23 Radiated Spurious Emission (802.11n-HT20, Ch1, 3 GHz-18 GHz)

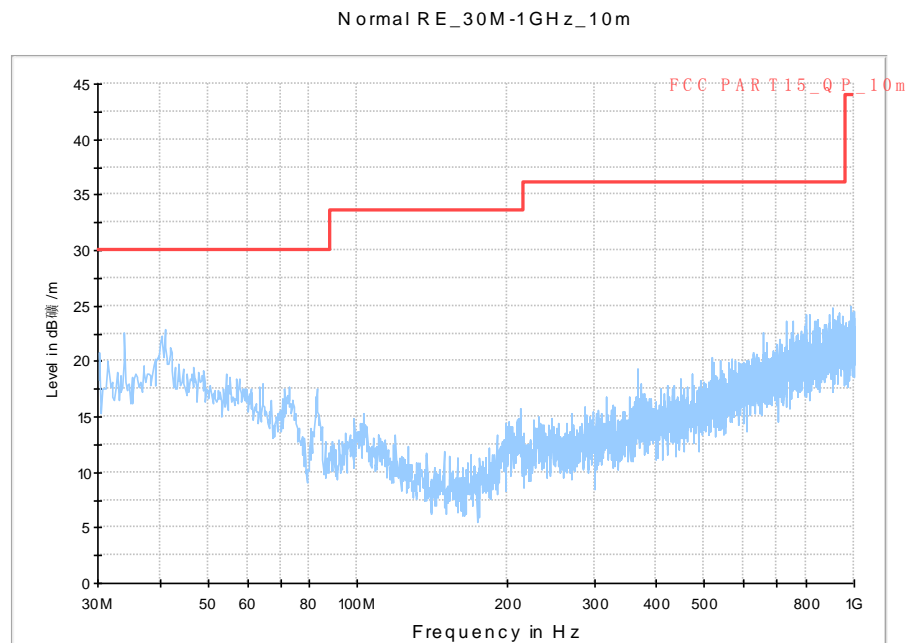


Fig.A.6.2.24 Radiated Spurious Emission (802.11n-HT20, Ch6, 30 MHz-1 GHz)

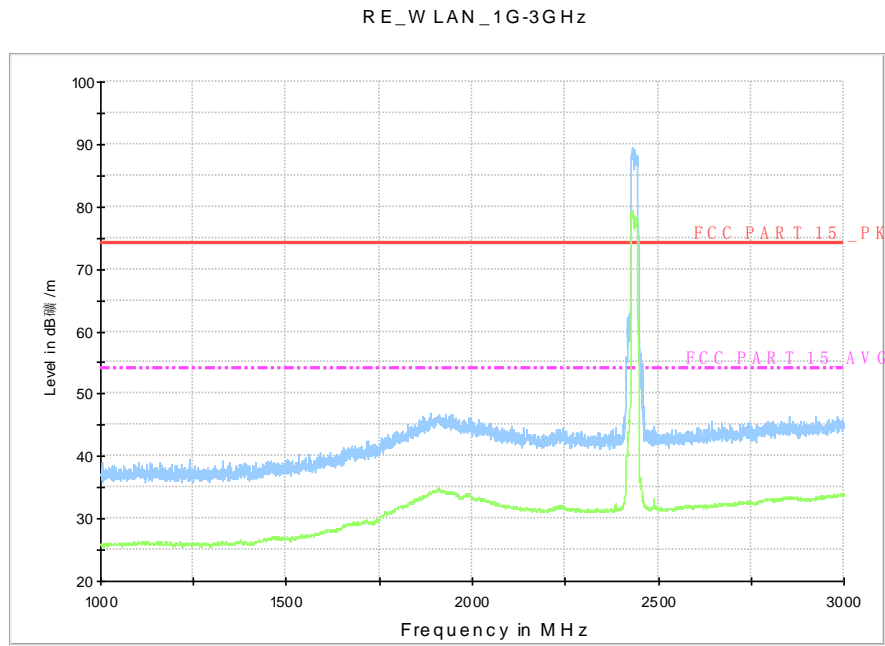


Fig.A.6.2.25 Radiated Spurious Emission (802.11n-HT20, Ch6, 1 GHz-3 GHz)

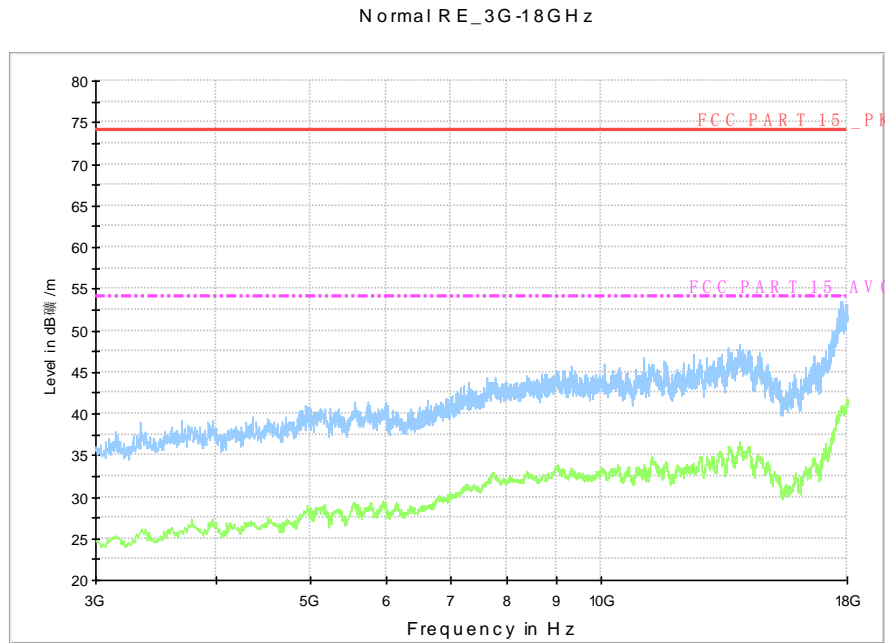


Fig.A.6.2.26 Radiated Spurious Emission (802.11n-HT20, Ch6, 3 GHz-18 GHz)

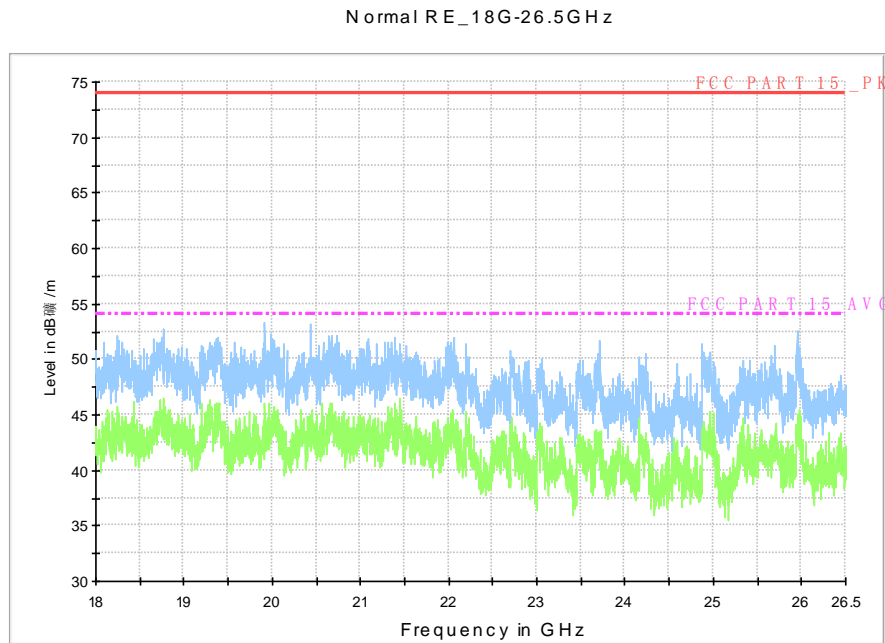


Fig.A.6.2.27 Radiated Spurious Emission (802.11n-HT20, Ch6, 18GHz – 26.5GHz)

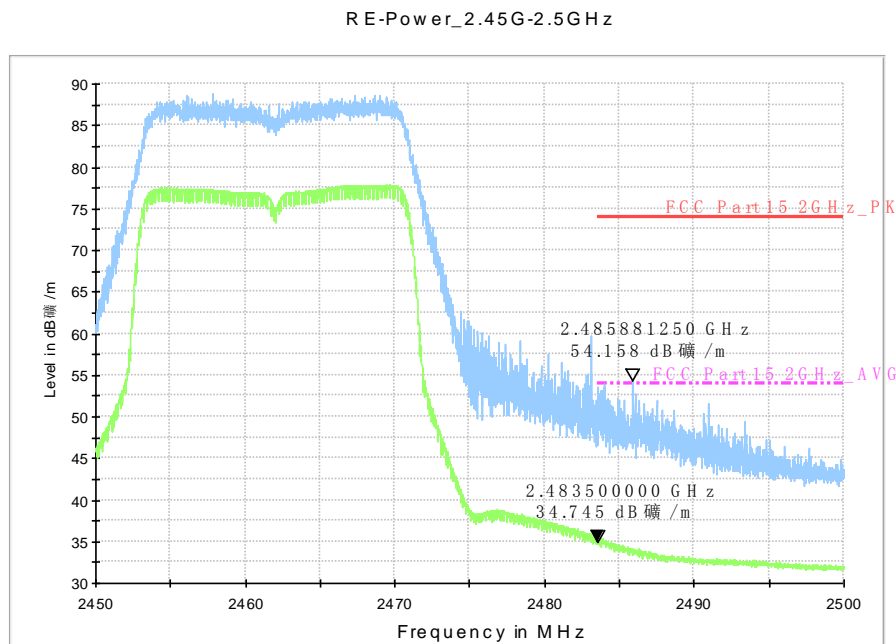


Fig.A.6.2.28 Radiated Spurious Emission (Power): 802.11n-HT20, ch11, 2.45 GHz - 2.50GHz

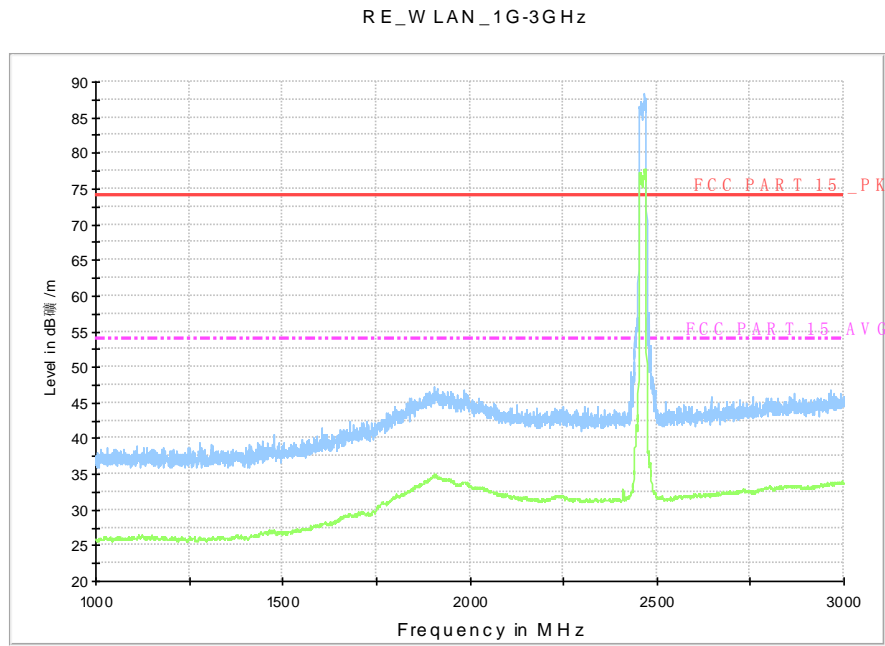


Fig.A.6.2.29 Radiated Spurious Emission (802.11n-HT20, Ch11, 1 GHz-3 GHz)

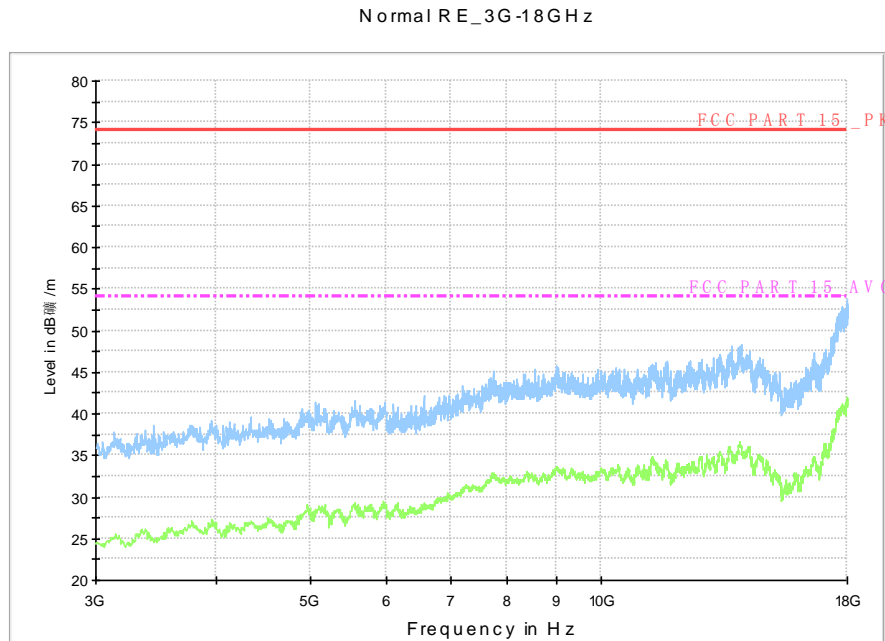


Fig.A.6.2.30 Radiated Spurious Emission (802.11n-HT20, Ch11, 3 GHz-18 GHz)

A.7. 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.7.1	Fig.A.7.2	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.7.1	Fig.A.7.2	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:

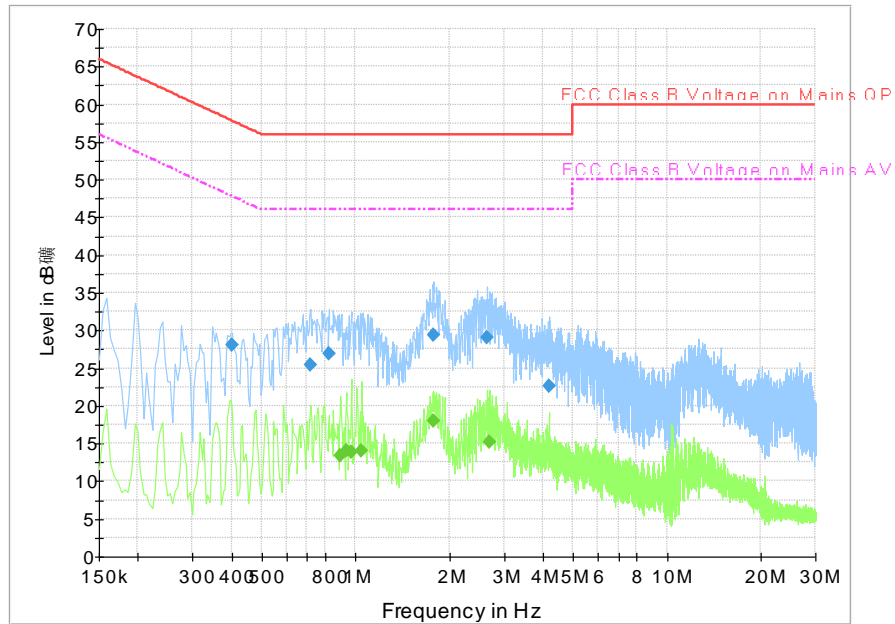


Fig.A.7.1 AC Powerline Conducted Emission-802.11b

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)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.402000	28.0	2000.0	9.000	On	N	10.1	29.8	57.8
0.717000	25.5	2000.0	9.000	On	N	10.0	30.5	56.0
0.820500	27.0	2000.0	9.000	On	L1	10.0	29.0	56.0
1.783500	29.5	2000.0	9.000	On	L1	9.9	26.5	56.0
2.652000	29.1	2000.0	9.000	On	L1	9.8	26.9	56.0
4.173000	22.5	2000.0	9.000	On	L1	9.8	33.5	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.897000	13.5	2000.0	9.000	On	L1	9.9	32.5	46.0
0.933000	14.1	2000.0	9.000	On	L1	9.9	31.9	46.0
0.969000	13.9	2000.0	9.000	On	L1	9.9	32.1	46.0
1.045500	14.0	2000.0	9.000	On	L1	9.9	32.0	46.0
1.774500	18.1	2000.0	9.000	On	L1	9.9	27.9	46.0
2.692500	15.3	2000.0	9.000	On	L1	9.8	30.7	46.0

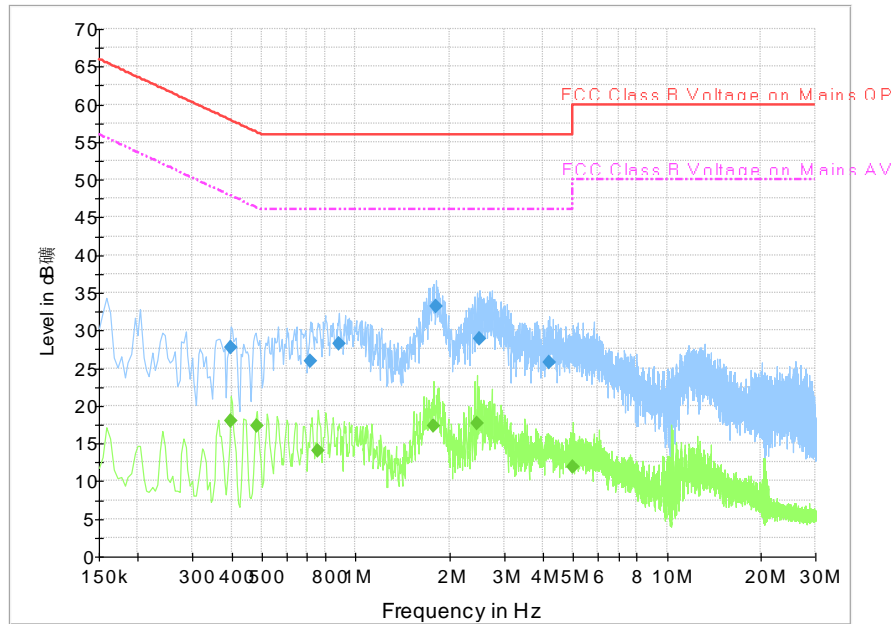


Fig.A.7.2 AC Powerline Conducted Emission-Idle

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)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.397500	27.8	2000.0	9.000	On	N	10.1	30.1	57.9
0.717000	25.9	2000.0	9.000	On	L1	10.0	30.1	56.0
0.883500	28.3	2000.0	9.000	On	N	9.9	27.7	56.0
1.810500	33.2	2000.0	9.000	On	N	9.8	22.8	56.0
2.503500	28.9	2000.0	9.000	On	N	9.8	27.1	56.0
4.200000	25.8	2000.0	9.000	On	N	9.7	30.2	56.0

Final Result 2

Frequency (MHz)	Average (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.397500	18.0	2000.0	9.000	On	N	10.1	30.0	47.9
0.483000	17.3	2000.0	9.000	On	L1	10.1	29.0	46.3
0.757500	14.0	2000.0	9.000	On	L1	10.0	32.0	46.0
1.783500	17.3	2000.0	9.000	On	L1	9.9	28.7	46.0
2.449500	17.6	2000.0	9.000	On	L1	9.8	28.4	46.0
4.992000	11.9	2000.0	9.000	On	L1	9.7	34.1	46.0

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