

Fig.A.6.1.83 Conducted Spurious Emission (802.11n-HT40, Ch6, 1 GHz-2.5 GHz)

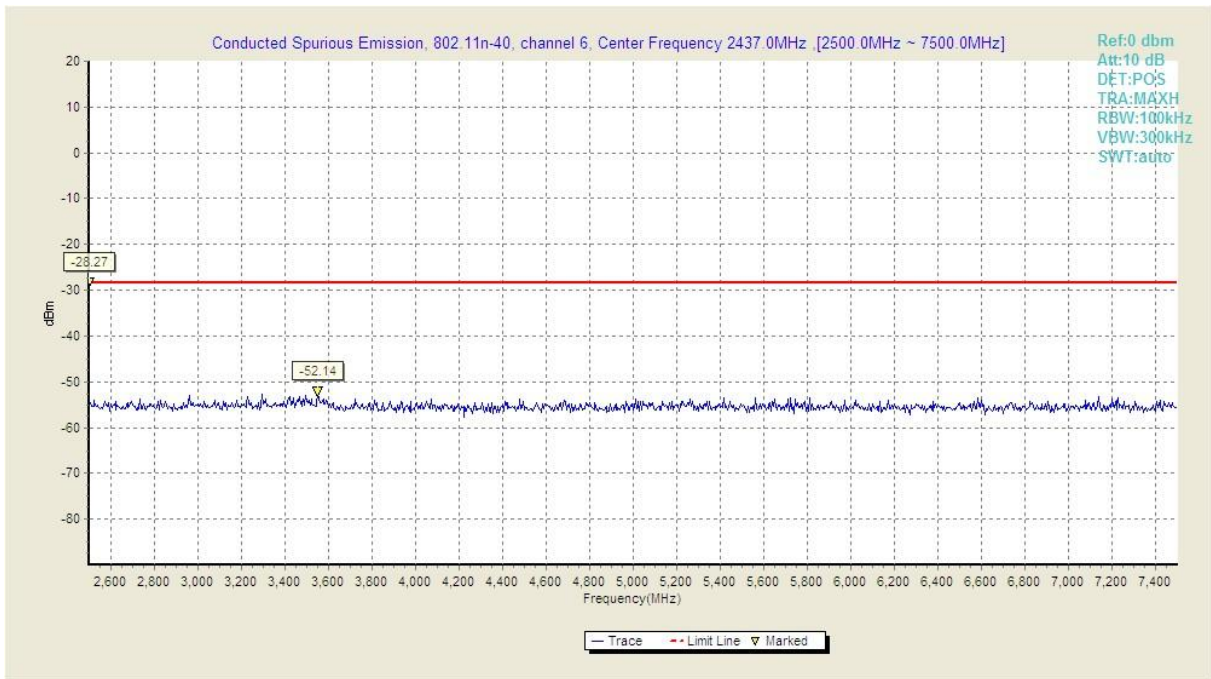


Fig.A.6.1.84 Conducted Spurious Emission (802.11n-HT40, Ch6, 2.5 GHz-7.5 GHz)

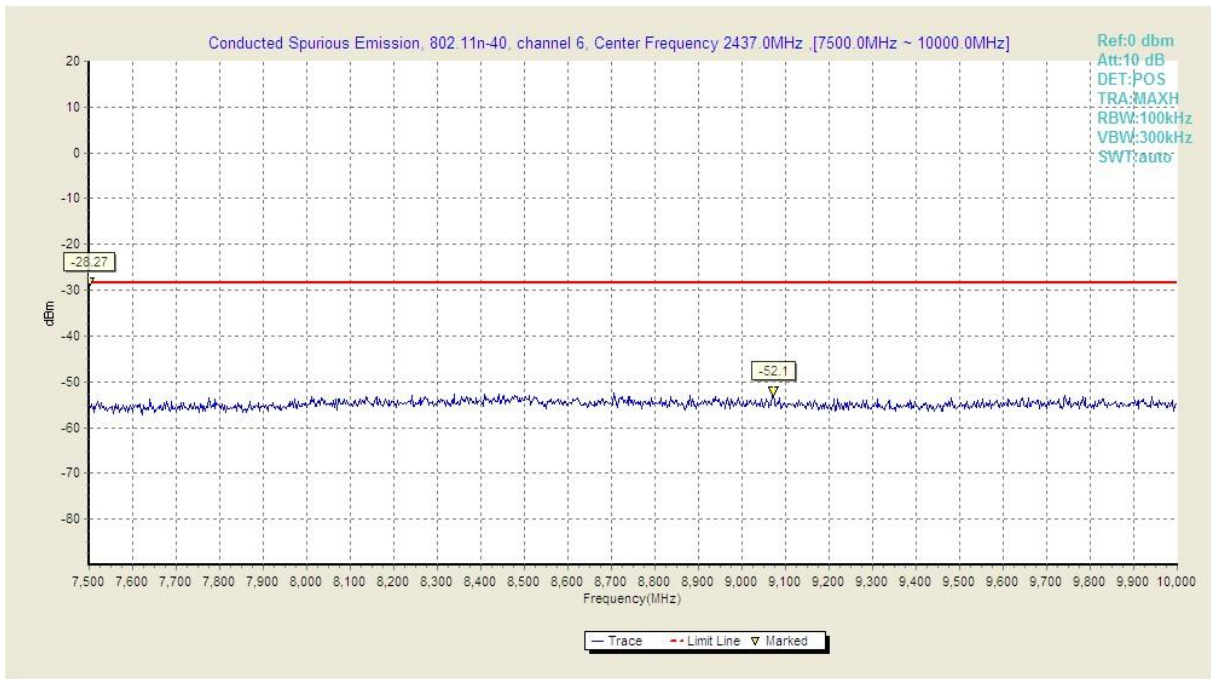


Fig.A.6.1.85 Conducted Spurious Emission (802.11n-HT40, Ch6, 7.5 GHz-10 GHz)

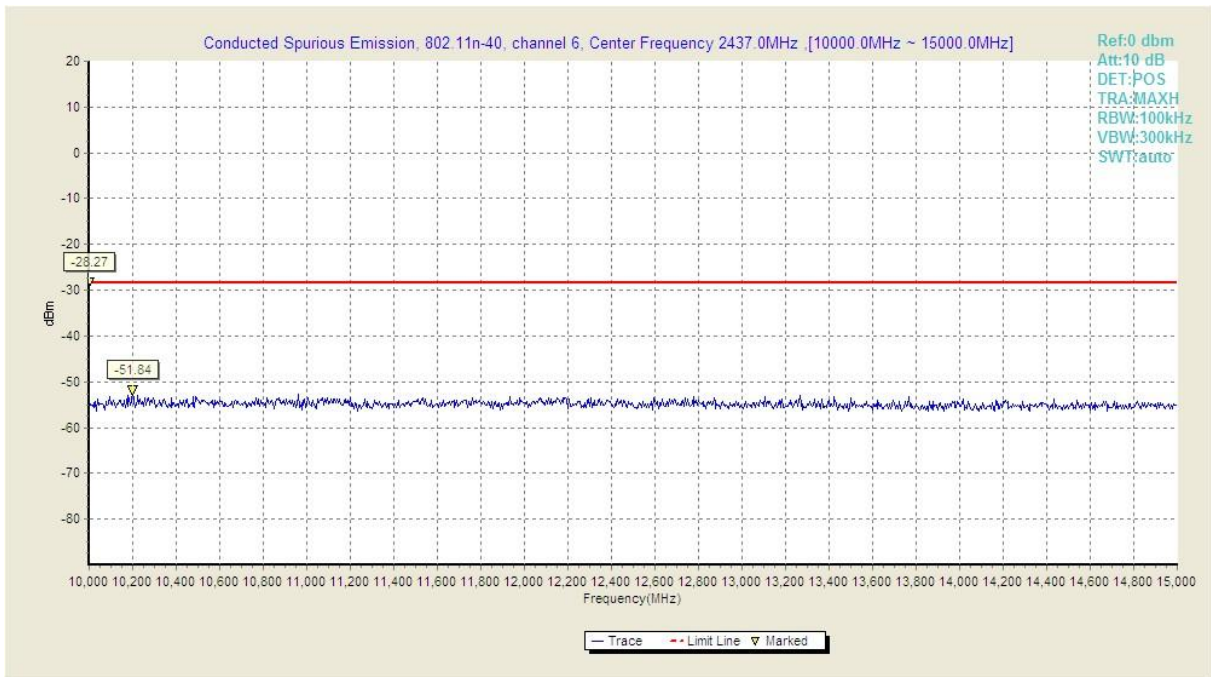


Fig.A.6.1.86 Conducted Spurious Emission (802.11n-HT40, Ch6, 10 GHz-15 GHz)

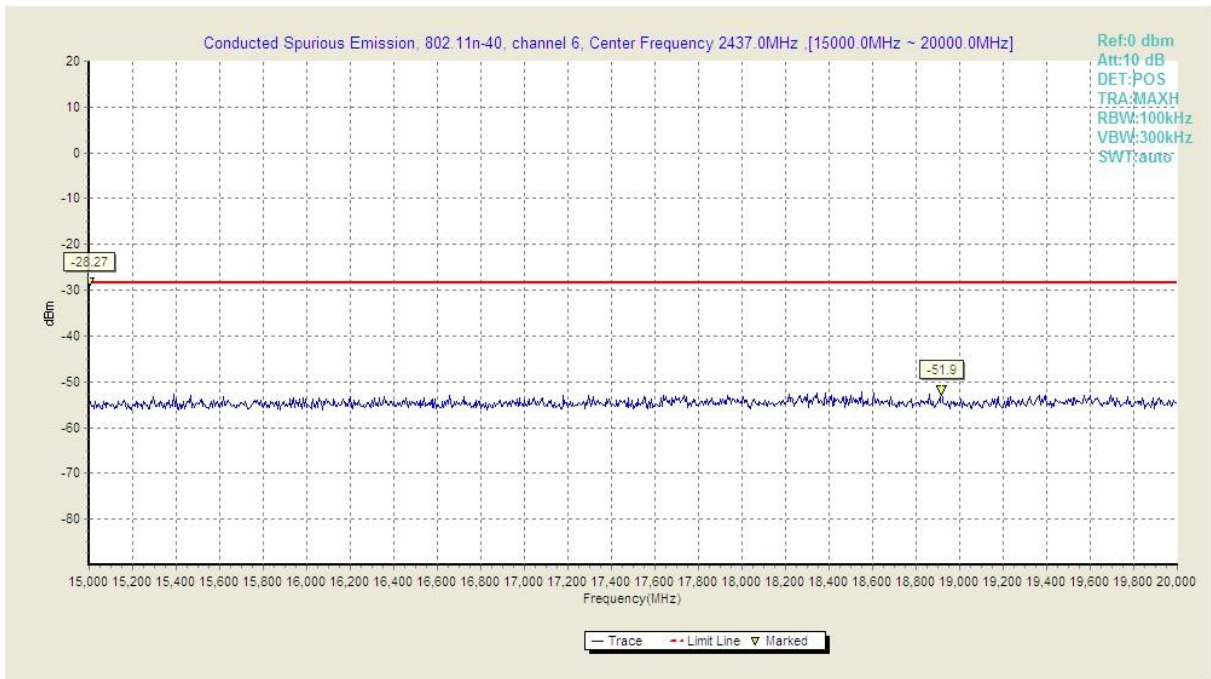


Fig.A.6.1.87 Conducted Spurious Emission (802.11n-HT40, Ch6, 15 GHz-20 GHz)

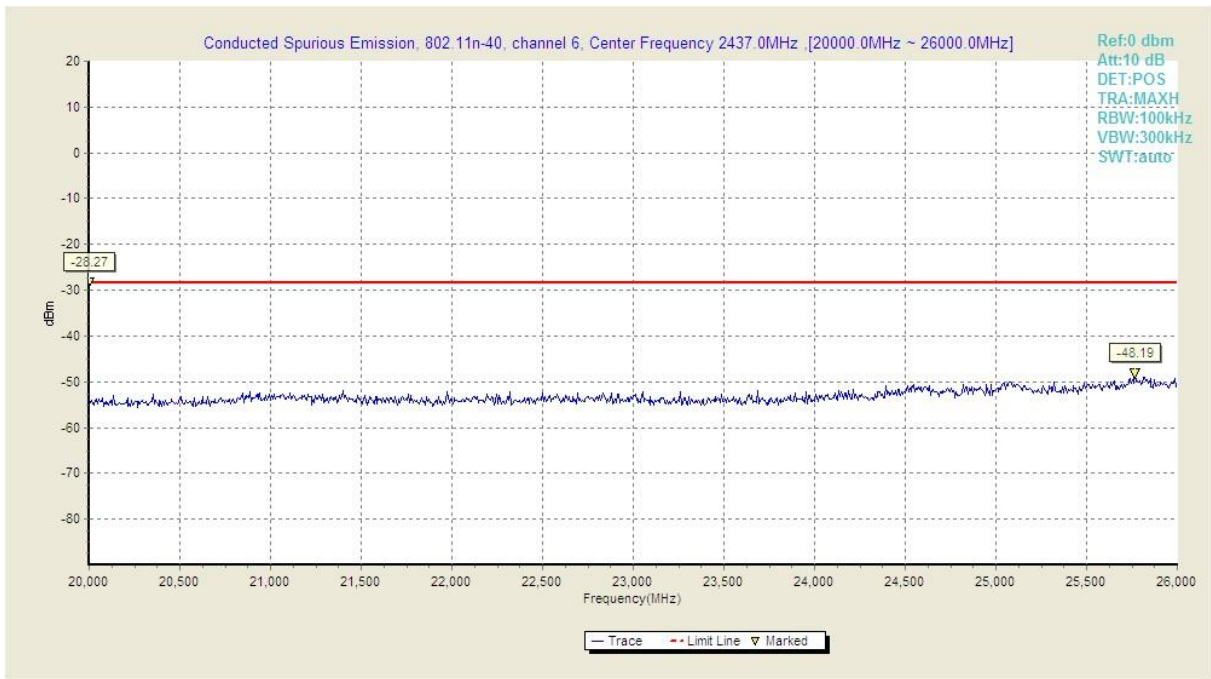


Fig.A.6.1.88 Conducted Spurious Emission (802.11n-HT40, Ch6, 20 GHz-26 GHz)

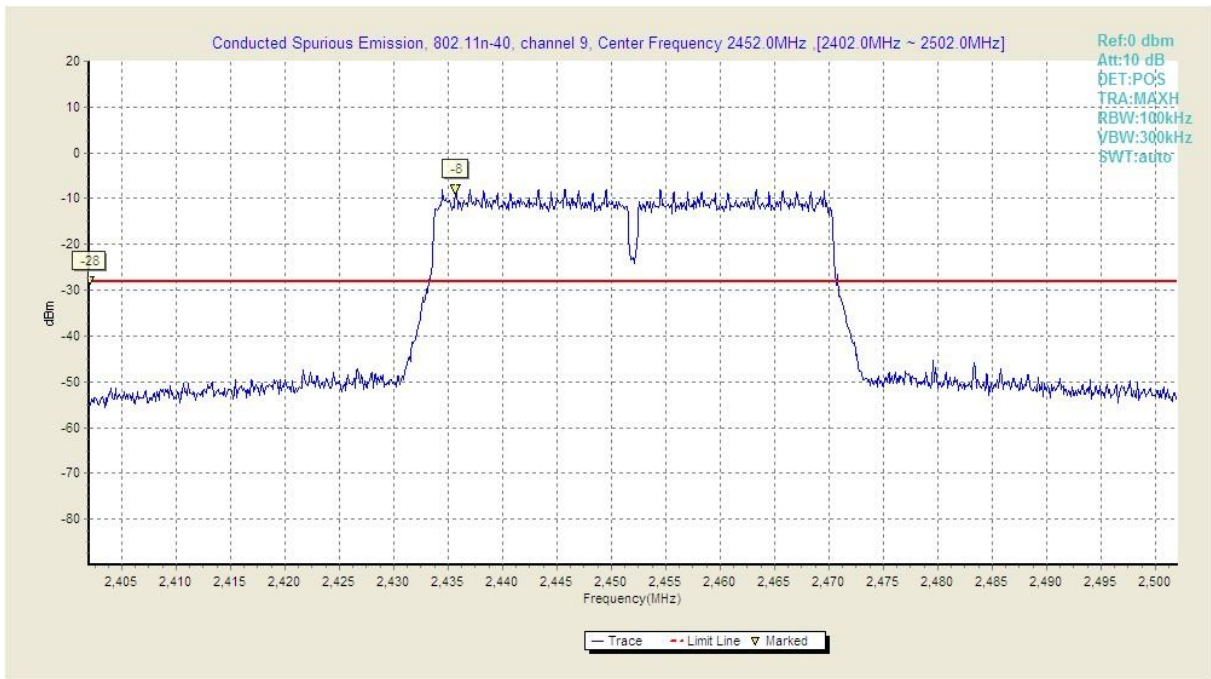


Fig.A.6.1.89 Conducted Spurious Emission (802.11n-HT40, Ch9, Center Frequency)

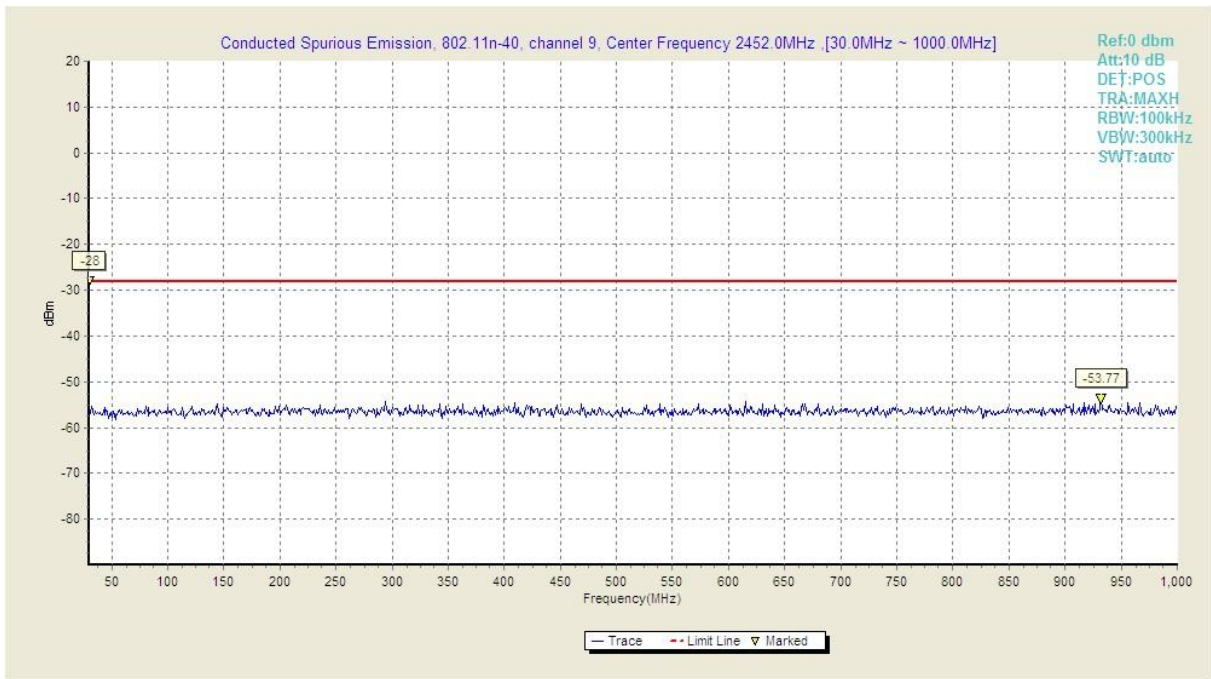


Fig.A.6.1.90 Conducted Spurious Emission (802.11n-HT40, Ch9, 30 MHz-1 GHz)

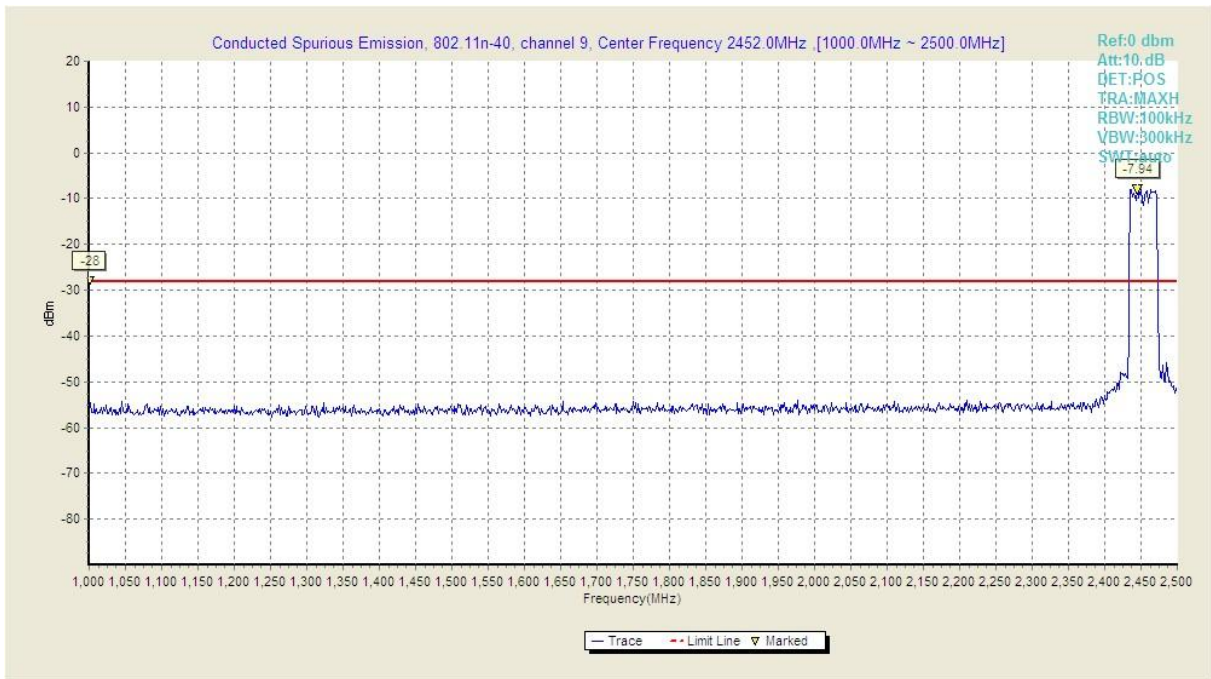


Fig.A.6.1.91 Conducted Spurious Emission (802.11n-HT40, Ch9, 1 GHz-2.5 GHz)

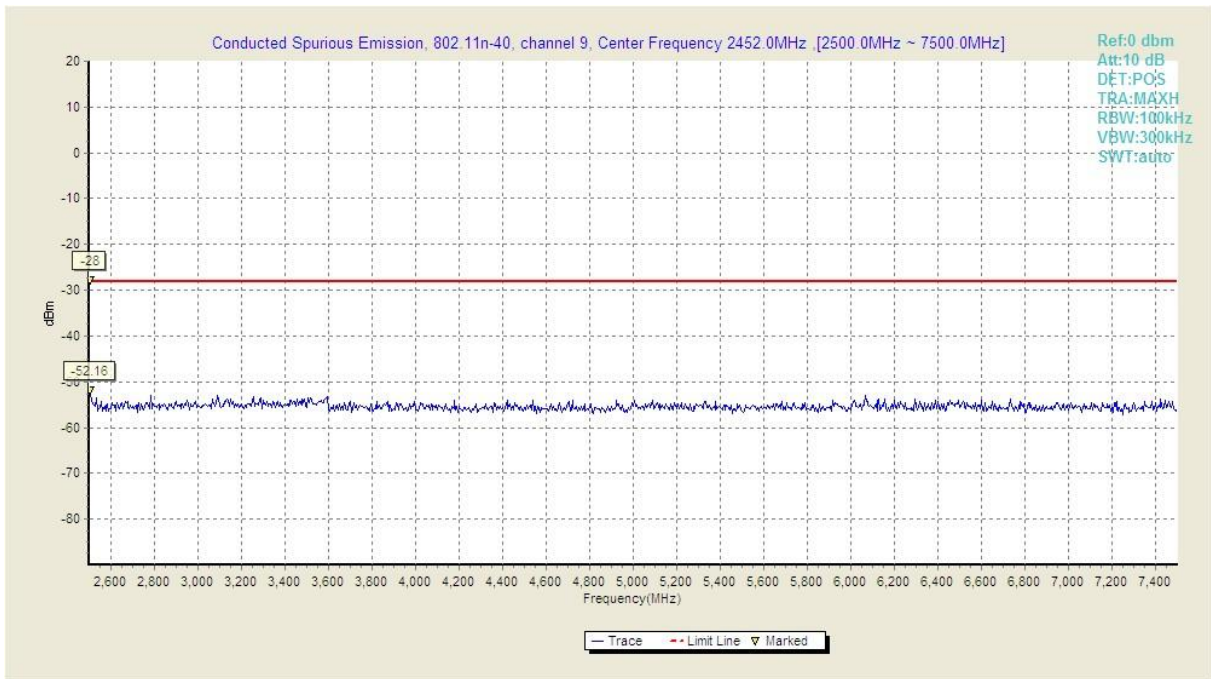


Fig.A.6.1.92 Conducted Spurious Emission (802.11n-HT40, Ch9, 2.5 GHz-7.5 GHz)

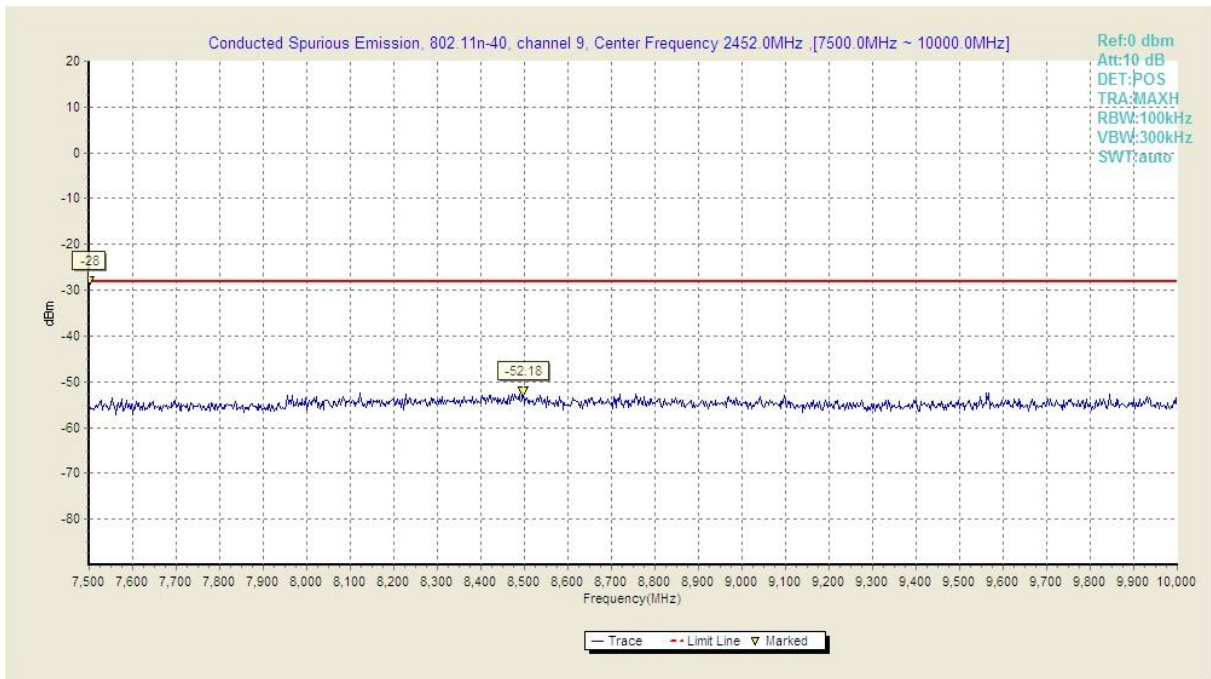


Fig.A.6.1.93 Conducted Spurious Emission (802.11n-HT40, Ch9, 7.5 GHz-10 GHz)

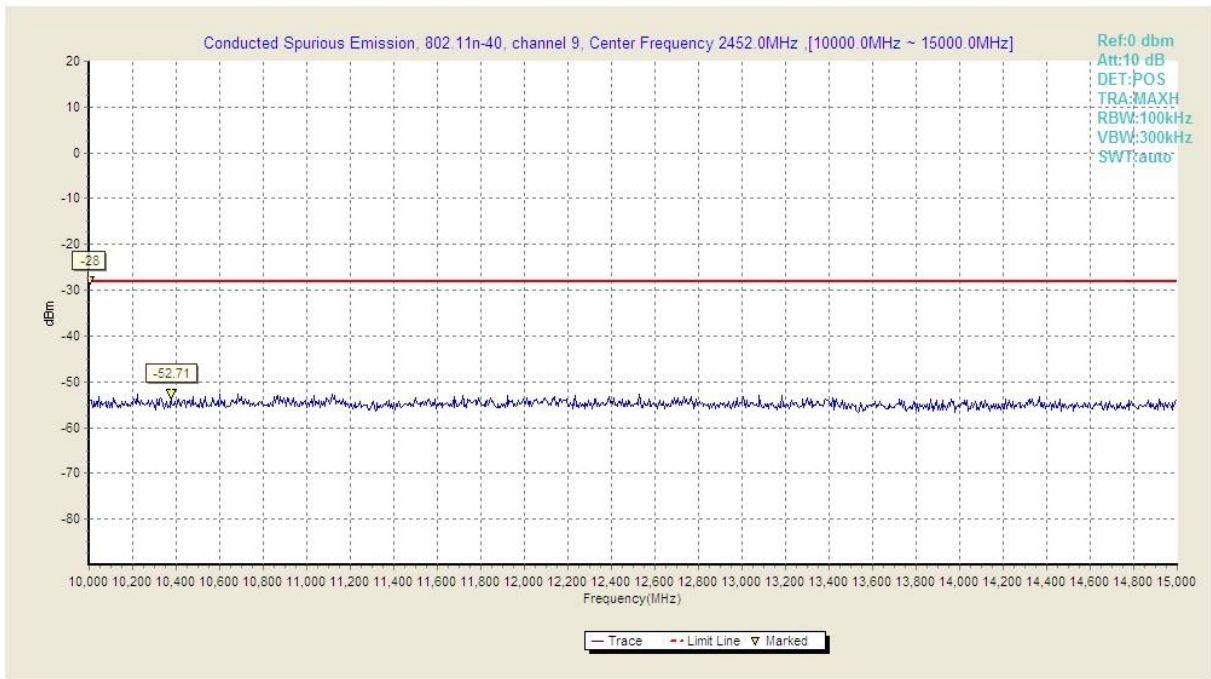


Fig.A.6.1.94 Conducted Spurious Emission (802.11n-HT40, Ch9, 10 GHz-15 GHz)

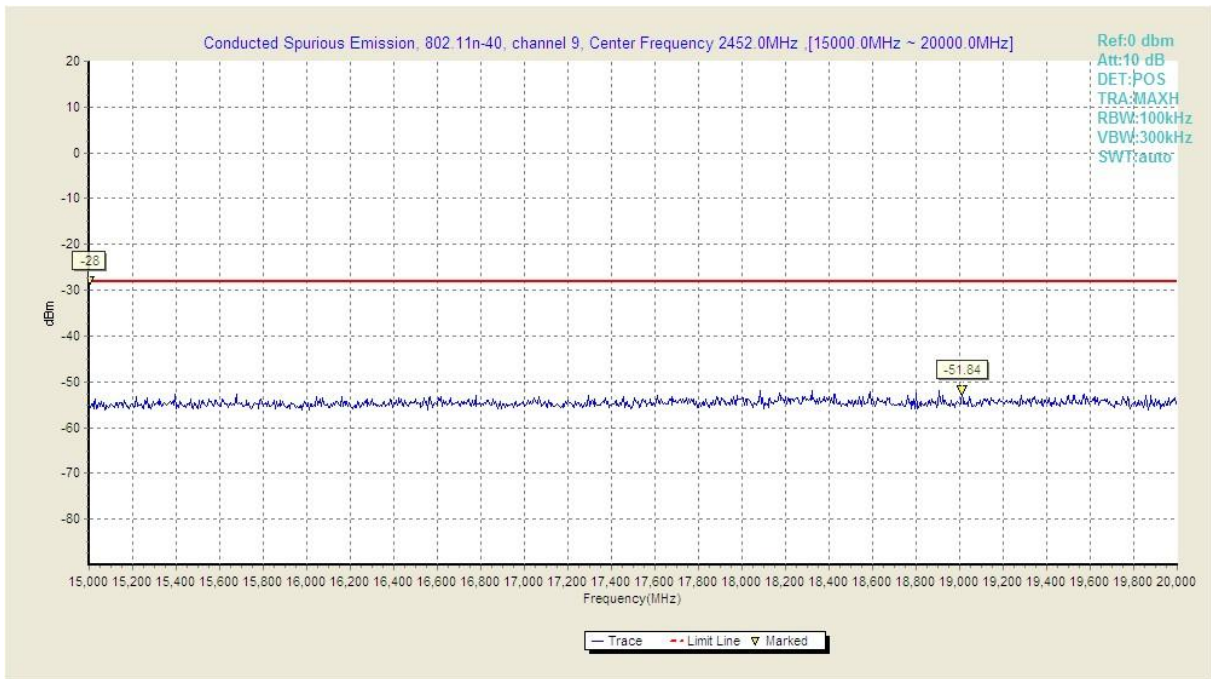


Fig.A.6.1.95 Conducted Spurious Emission (802.11n-HT40, Ch9, 15 GHz-20 GHz)

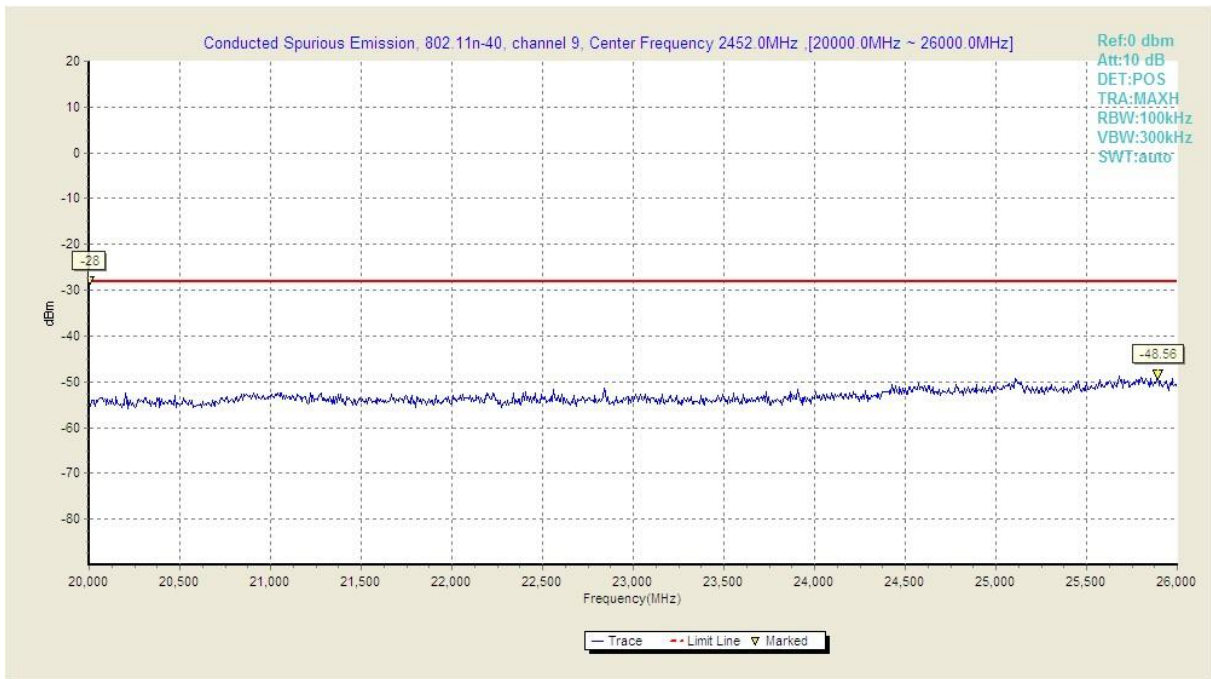


Fig.A.6.1.96 Conducted Spurious Emission (802.11n-HT40, Ch9, 20 GHz-26 GHz)

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

Modulation type and data rate tested:

802.11b	802.11g	802.11n-HT20	802.11n-HT40
11Mbps(CCK)	24Mbps(OFDM)	MCS3(OFDM)	MCS3(OFDM)

Measurement Results:

802.11b/g mode

Mode	Channel	Frequency Range	Test Results	Conclusion	
802.11b	Power	2.38GHz ~2.45GHz	Fig.A.6.2.1	P	
	1	30 MHz ~1 GHz	Fig.A.6.2.2	P	
		1 GHz ~ 3 GHz	Fig.A.6.2.3	P	
		3 GHz ~ 18 GHz	Fig.A.6.2.4	P	
	6	30 MHz ~1 GHz	Fig.A.6.2.5	P	
		1 GHz ~ 3 GHz	Fig.A.6.2.6	P	
		3 GHz ~ 18 GHz	Fig.A.6.2.7	P	
	Power	2.45GHz ~2.5GHz	Fig.A.6.2.8	P	
	11	30 MHz ~1 GHz	Fig.A.6.2.9	P	
		1 GHz ~ 3 GHz	Fig.A.6.2.10	P	
		3 GHz ~ 18 GHz	Fig.A.6.2.11	P	
	802.11g	Power	2.38GHz ~2.43GHz	Fig.A.6.2.12	P
		1	30 MHz ~1 GHz	Fig.A.6.2.13	P
1 GHz ~ 3 GHz			Fig.A.6.2.14	P	
3 GHz ~ 18 GHz			Fig.A.6.2.15	P	
6		30 MHz ~1 GHz	Fig.A.6.2.16	P	
		1 GHz ~ 3 GHz	Fig.A.6.2.17	P	
		3 GHz ~ 18 GHz	Fig.A.6.2.18	P	
Power		2.45GHz ~2.5GHz	Fig.A.6.2.19	P	
11		30 MHz ~1 GHz	Fig.A.6.2.20	P	
		1 GHz ~ 3 GHz	Fig.A.6.2.21	P	
		3 GHz ~ 18 GHz	Fig.A.6.2.22	P	

802.11n mode

Mode	Channel	Frequency Range	Test Results	Conclusion	
802.11n (HT20)	Power	2.38GHz ~2.45GHz	Fig.A.6.2.23	P	
	1	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	
	6	30 MHz ~1 GHz	Fig.A.6.2.27	P	
		1 GHz ~ 3 GHz	Fig.A.6.2.28	P	
		3 GHz ~ 18 GHz	Fig.A.6.2.29	P	
	Power	2.45GHz ~2.5GHz	Fig.A.6.2.30	P	
	11	30 MHz ~1 GHz	Fig.A.6.2.31	P	
		1 GHz ~ 3 GHz	Fig.A.6.2.32	P	
		3 GHz ~ 18 GHz	Fig.A.6.2.33	P	
	802.11n (HT40)	Power	2.38GHz ~2.45GHz	Fig.A.6.2.34	P
		3	30 MHz ~1 GHz	Fig.A.6.2.35	P
1 GHz ~ 3 GHz			Fig.A.6.2.36	P	
3 GHz ~ 18 GHz			Fig.A.6.2.37	P	
6		30 MHz ~1 GHz	Fig.A.6.2.38	P	
		1 GHz ~ 3 GHz	Fig.A.6.2.39	P	
		3 GHz ~ 18 GHz	Fig.A.6.2.40	P	
Power		2.45GHz ~2.5GHz	Fig.A.6.2.41	P	
9		30 MHz ~1 GHz	Fig.A.6.2.42	P	
		1 GHz ~ 3 GHz	Fig.A.6.2.43	P	
		3 GHz ~ 18 GHz	Fig.A.6.2.44	P	
/		All channels	18 GHz~ 26.5 GHz	Fig.A.6.2.45	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
17407.500	57.9	-23.7	42.7	38.913	HORIZONTAL
17944.500	57.6	-22.9	42.4	38.093	VERTICAL
17715.750	57.6	-22.8	42.8	37.611	HORIZONTAL
17369.250	57.6	-23.7	43.0	38.353	VERTICAL
17516.250	57.4	-22.8	42.8	37.415	HORIZONTAL
17671.500	57.4	-22.8	42.7	37.571	VERTICAL

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17909.250	58.1	-22.9	42.7	38.333	VERTICAL
17439.000	58.0	-23.7	42.7	38.983	HORIZONTAL
17979.000	57.4	-22.9	42.3	38.023	VERTICAL
17501.250	57.4	-22.8	42.8	37.415	HORIZONTAL
17553.750	57.4	-22.8	42.3	37.925	VERTICAL
17738.250	57.3	-22.8	42.1	38.061	VERTICAL

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17758.500	58.2	-22.8	42.2	38.871	VERTICAL
17421.750	58.0	-23.7	42.7	39.013	VERTICAL
17982.750	58.0	-22.9	42.3	38.623	HORIZONTAL
17734.500	57.8	-22.8	42.1	38.561	VERTICAL
17372.250	57.5	-23.7	43.0	38.253	HORIZONTAL
17106.750	57.5	-23.9	42.6	38.780	VERTICAL

802.11g

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17501.250	58.3	-22.8	42.8	38.315	HORIZONTAL
17745.000	57.9	-22.8	42.1	38.661	HORIZONTAL
17478.000	57.7	-22.8	43.0	37.445	VERTICAL
17548.500	57.6	-22.8	42.9	37.455	VERTICAL
17028.000	57.6	-23.9	43.6	37.830	HORIZONTAL
17410.500	57.4	-23.7	42.7	38.413	HORIZONTAL

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17535.750	57.7	-22.8	42.9	37.555	VERTICAL
17468.250	57.6	-22.8	42.6	37.785	VERTICAL
17624.250	57.6	-22.8	42.8	37.625	HORIZONTAL
17472.750	57.5	-22.8	42.6	37.685	HORIZONTAL
17574.000	57.4	-22.8	42.3	37.925	VERTICAL
17654.250	57.3	-22.8	42.7	37.471	HORIZONTAL

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17578.500	57.9	-22.8	42.7	37.975	HORIZONTAL
17462.250	57.8	-22.8	42.6	37.985	VERTICAL
17469.750	57.8	-22.8	42.6	37.985	HORIZONTAL
17500.500	57.7	-22.8	42.8	37.715	HORIZONTAL
17556.750	57.5	-22.8	42.3	38.025	VERTICAL
17871.000	57.4	-22.9	42.7	37.553	VERTICAL

802.11n-HT20

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17475.750	58.2	-22.8	43.0	37.945	VERTICAL
17078.250	57.8	-23.9	42.8	38.900	VERTICAL
17558.250	57.7	-22.8	42.3	38.225	HORIZONTAL
17470.500	57.6	-22.8	42.6	37.785	VERTICAL
17033.250	57.5	-23.9	43.6	37.730	HORIZONTAL
17508.750	57.4	-22.8	42.8	37.415	VERTICAL

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17526.750	58.6	-22.8	42.9	38.455	HORIZONTAL
17467.500	58.3	-22.8	42.6	38.485	HORIZONTAL
17984.250	57.7	-22.9	42.3	38.323	HORIZONTAL
17868.750	57.6	-22.9	42.7	37.753	HORIZONTAL
17451.750	57.6	-23.7	42.6	38.723	VERTICAL
17869.500	57.4	-22.9	42.7	37.553	HORIZONTAL

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17580.000	58.4	-22.8	42.7	38.475	HORIZONTAL
17019.000	57.9	-23.9	43.2	38.600	VERTICAL
17898.000	57.7	-22.9	42.5	38.093	HORIZONTAL
17513.250	57.5	-22.8	42.8	37.515	VERTICAL
17800.500	57.5	-22.8	42.9	37.401	VERTICAL
17772.000	57.4	-22.8	42.2	38.071	VERTICAL

802.11n-HT40

Ch3

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17981.250	58.4	-22.9	42.3	39.023	VERTICAL
17457.000	58.0	-23.7	42.6	39.123	VERTICAL
17478.000	57.8	-22.8	43.0	37.545	VERTICAL
17481.750	57.7	-22.8	43.0	37.445	HORIZONTAL
17827.500	57.4	-22.9	42.3	37.973	HORIZONTAL
17586.750	57.4	-22.8	42.7	37.475	HORIZONTAL

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17988.750	57.7	-22.5	42.3	37.967	VERTICAL
17472.000	57.6	-22.8	42.6	37.785	HORIZONTAL
17228.250	57.5	-23.7	42.8	38.363	VERTICAL
17472.750	57.5	-22.8	42.6	37.685	VERTICAL
17475.750	57.3	-22.8	43.0	37.045	HORIZONTAL
17627.250	57.3	-22.8	42.7	37.415	VERTICAL

Ch9

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17742.750	57.5	-22.8	42.1	38.261	VERTICAL
17767.500	57.4	-22.8	42.2	38.071	HORIZONTAL
17459.250	57.3	-22.8	42.6	37.485	VERTICAL
17624.250	57.3	-22.8	42.8	37.325	HORIZONTAL
17968.500	57.3	-22.9	42.7	37.483	VERTICAL
17979.000	57.2	-22.9	42.3	37.823	HORIZONTAL

Test graphs as below:

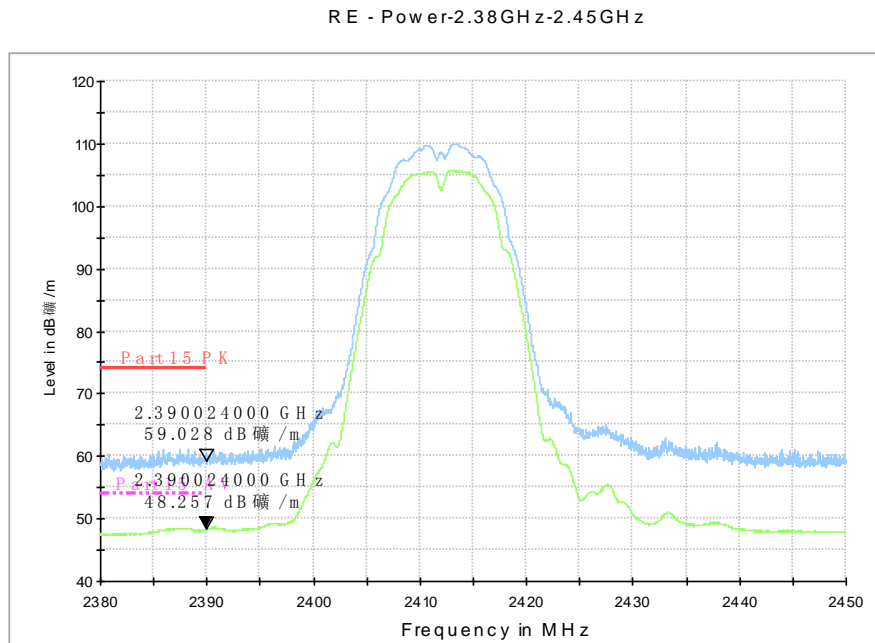


Fig.A.6.2.1 Radiated Spurious Emission (Power): 802.11b, ch1, 2.38 GHz – 2.45GHz

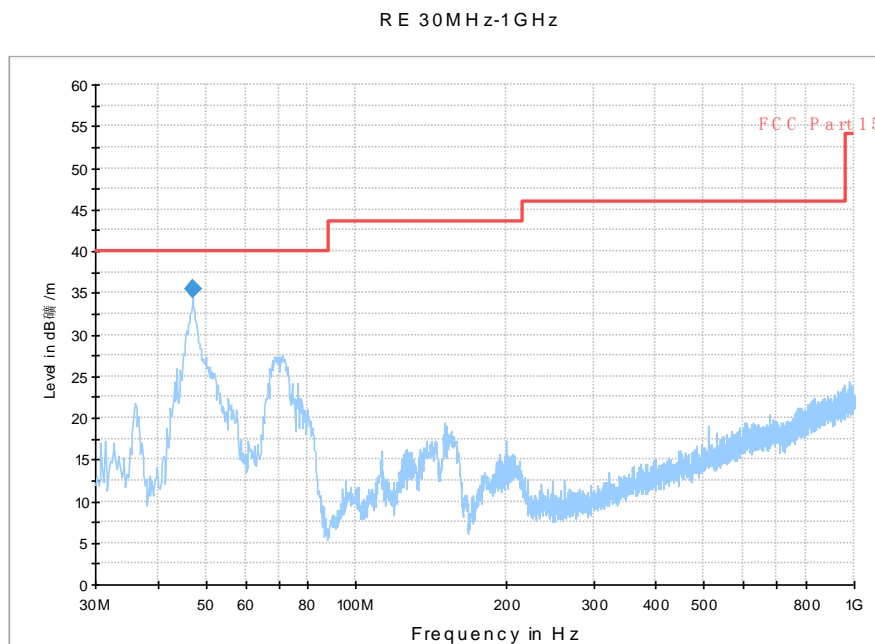


Fig.A.6.2.2 Radiated Spurious Emission (802.11b, Ch1, 30 MHz-1 GHz)

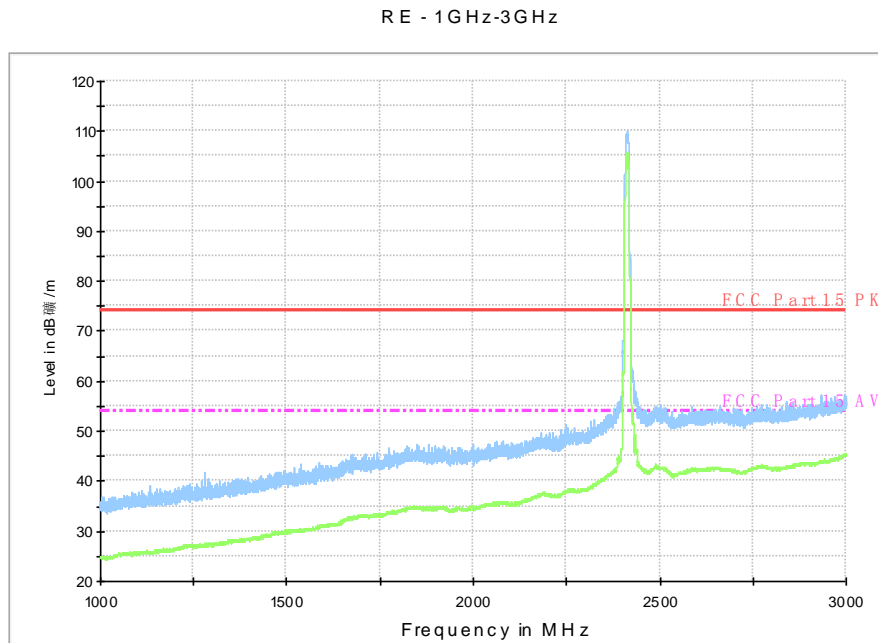


Fig.A.6.2.3 Radiated Spurious Emission (802.11b, Ch1, 1 GHz-3 GHz)

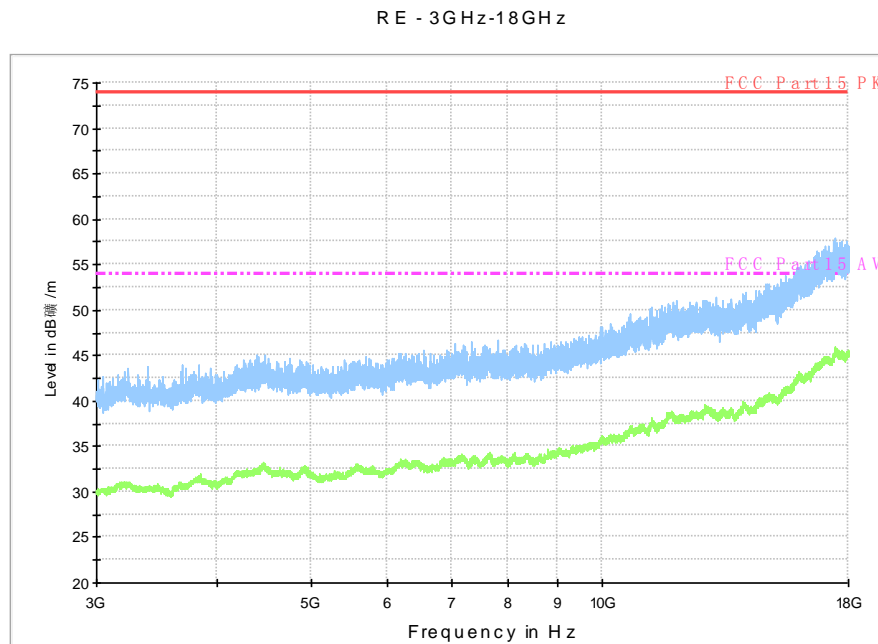


Fig.A.6.2.4 Radiated Spurious Emission (802.11b, Ch1, 3 GHz-18 GHz)

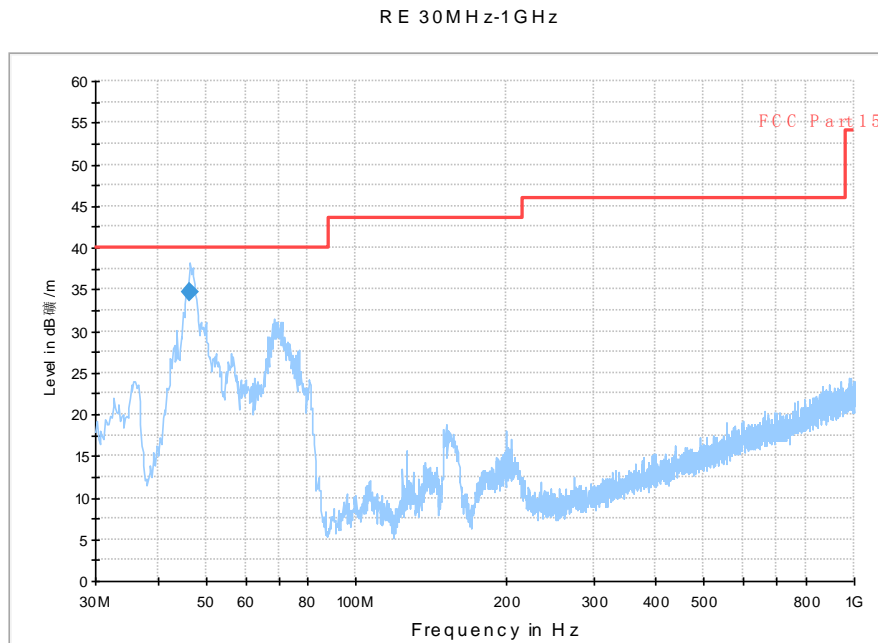


Fig.A.6.2.5 Radiated Spurious Emission (802.11b, Ch6, 30 MHz-1 GHz)

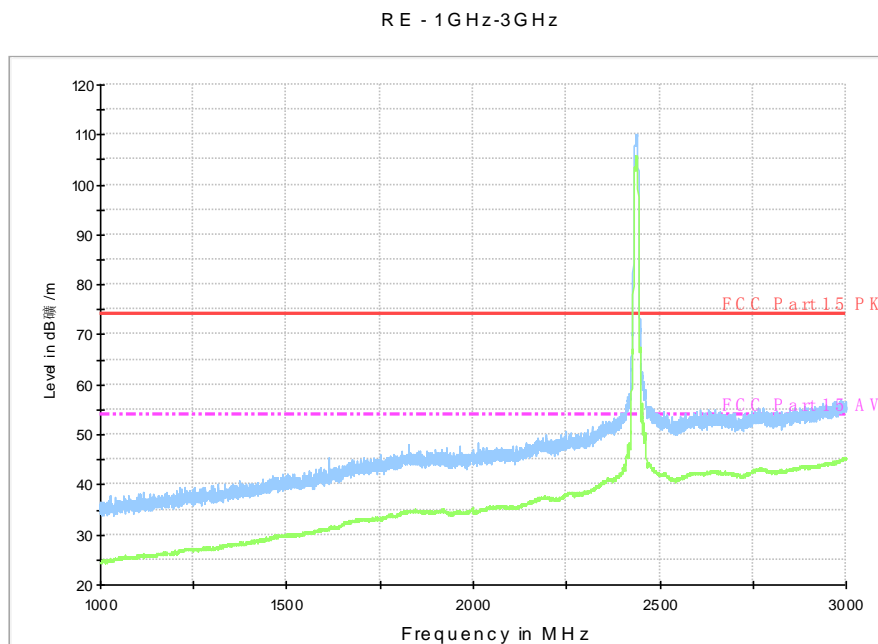


Fig.A.6.2.6 Radiated Spurious Emission (802.11b, Ch6, 1 GHz-3 GHz)

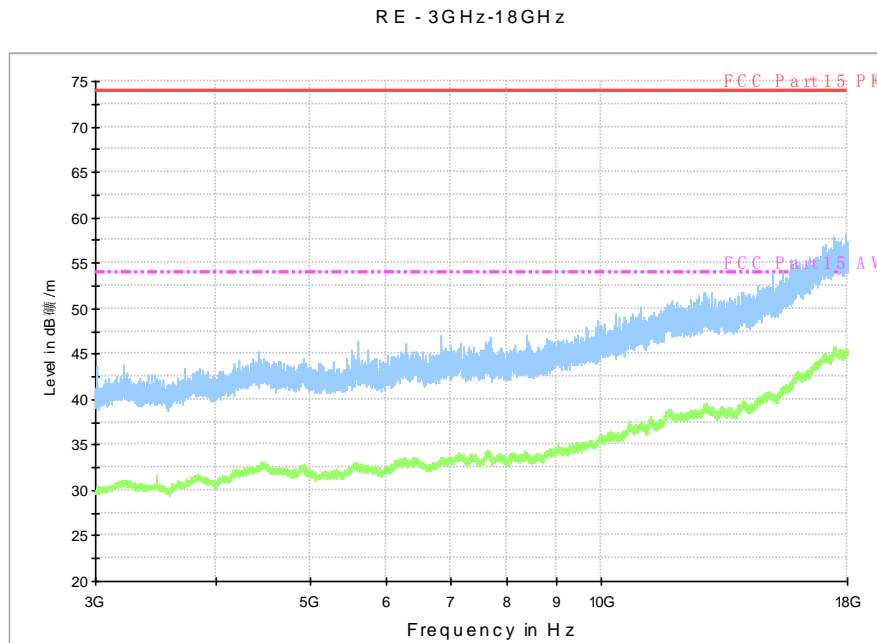


Fig.A.6.2.7 Radiated Spurious Emission (802.11b, Ch6, 3 GHz-18 GHz)

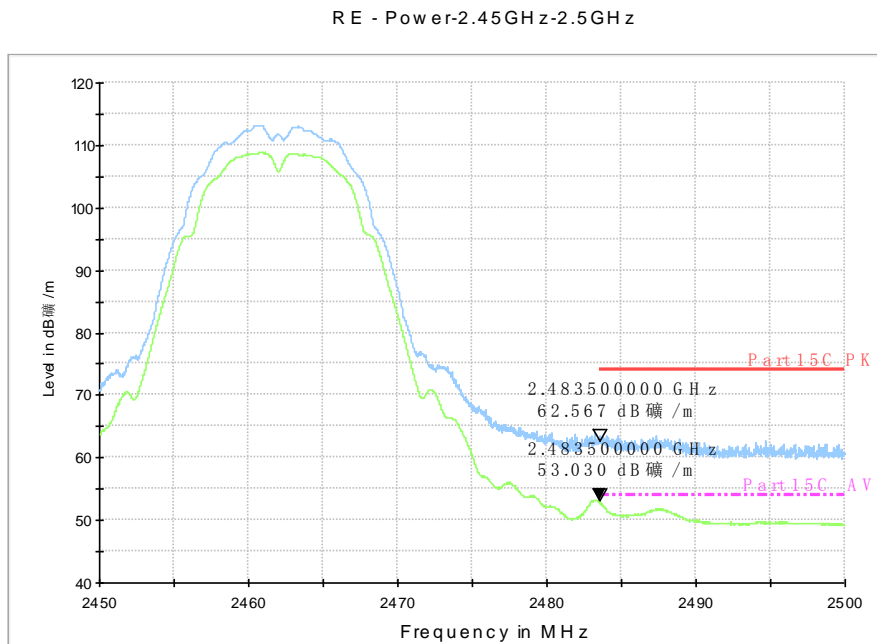


Fig.A.6.2.8 Radiated Spurious Emission (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz

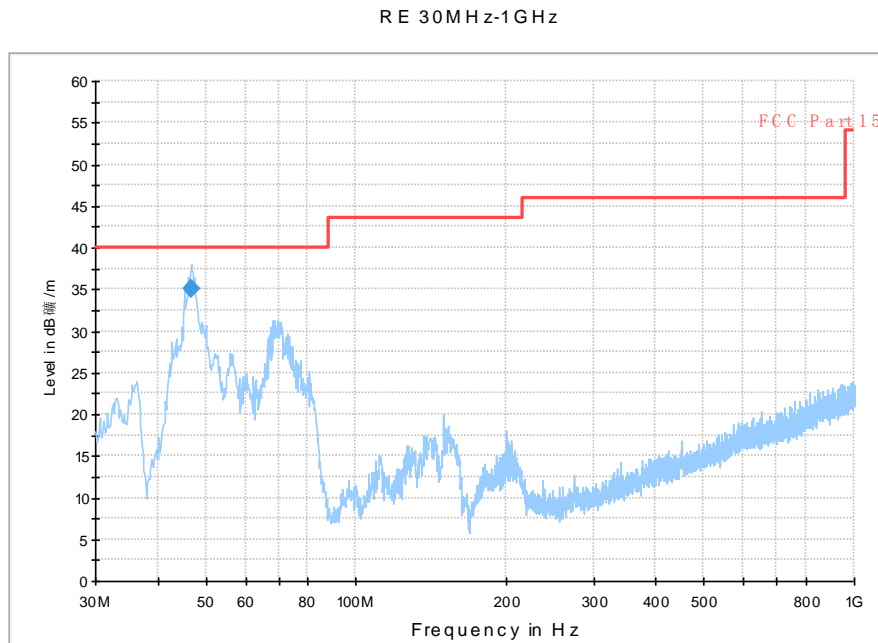


Fig.A.6.2.9 Radiated Spurious Emission (802.11b, Ch11, 30 MHz-1 GHz)

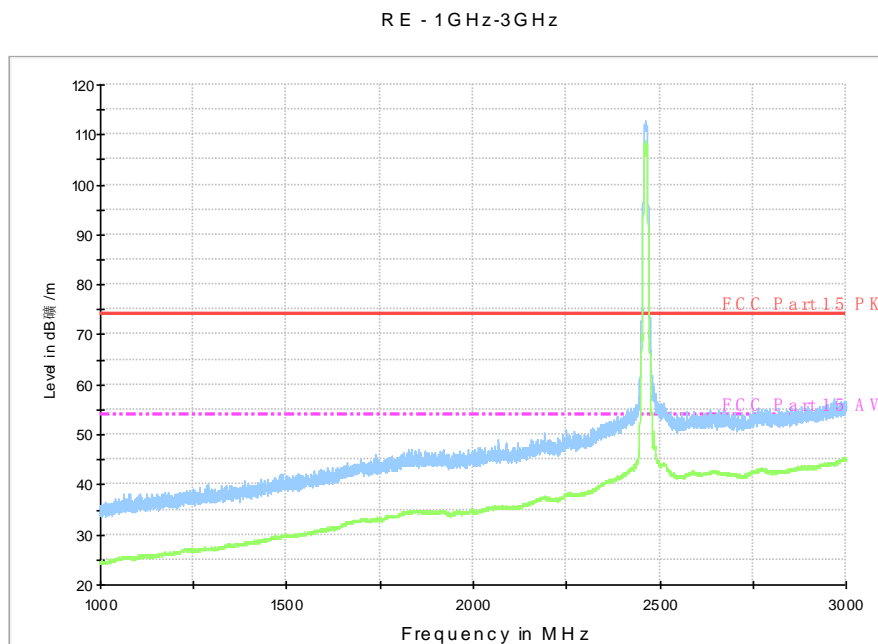


Fig.A.6.2.10 Radiated Spurious Emission (802.11b, Ch11, 1 GHz-3 GHz)

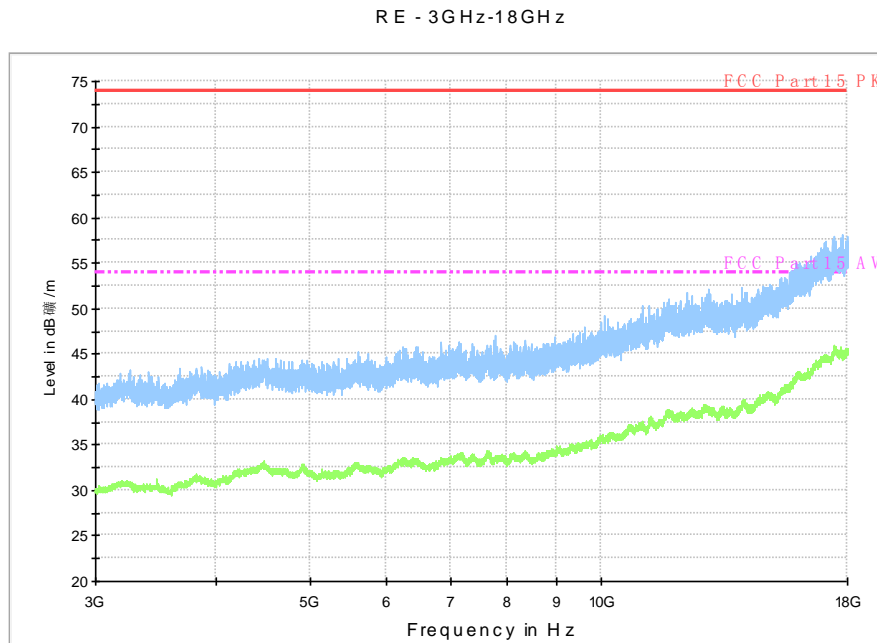


Fig.A.6.2.11 Radiated Spurious Emission (802.11b, Ch11, 3 GHz-18 GHz)

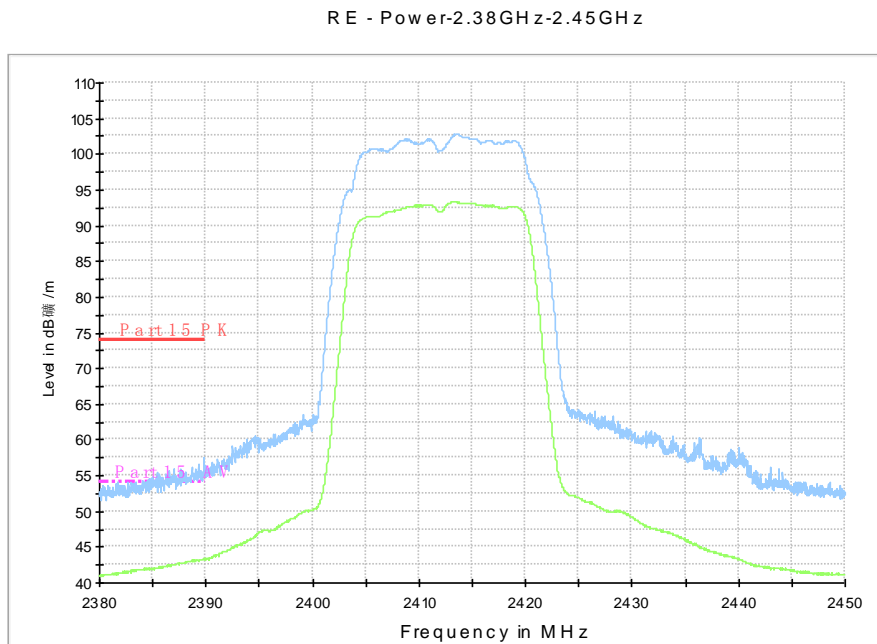


Fig.A.6.2.12 Radiated Spurious Emission (Power): 802.11g, ch1, 2.38 GHz - 2.45GHz

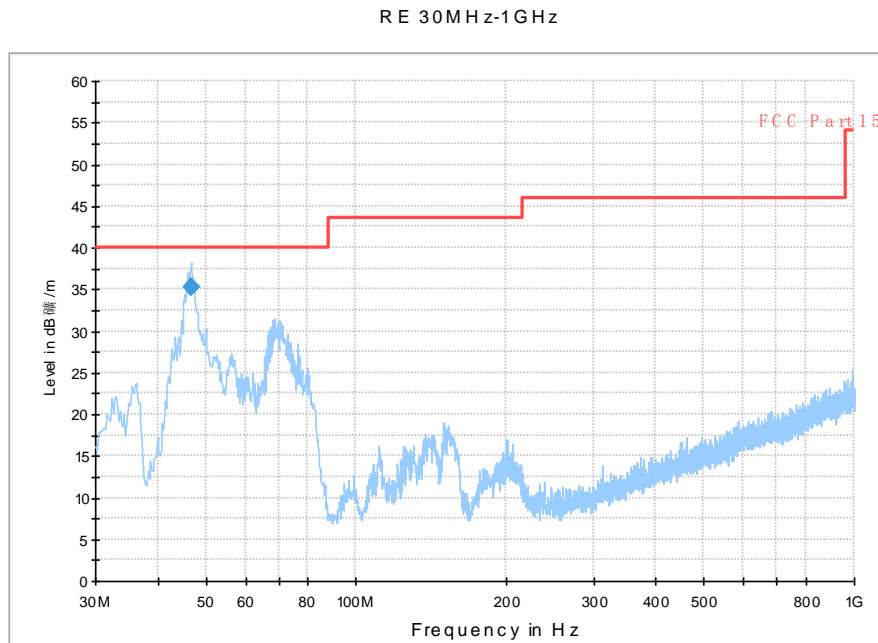


Fig.A.6.2.13 Radiated Spurious Emission (802.11g, Ch1, 30 MHz-1 GHz)

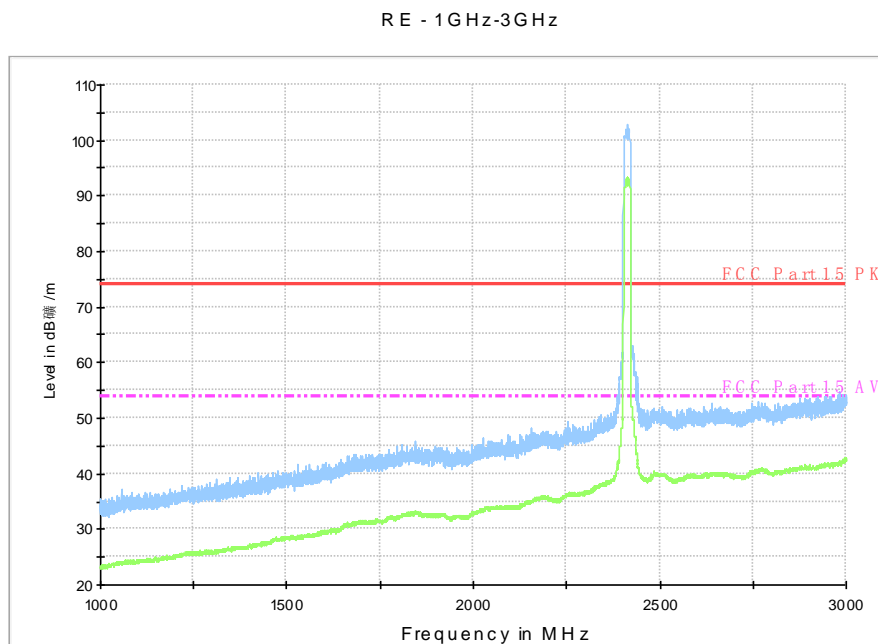


Fig.A.6.2.14 Radiated Spurious Emission (802.11g, Ch1, 1 GHz-3 GHz)

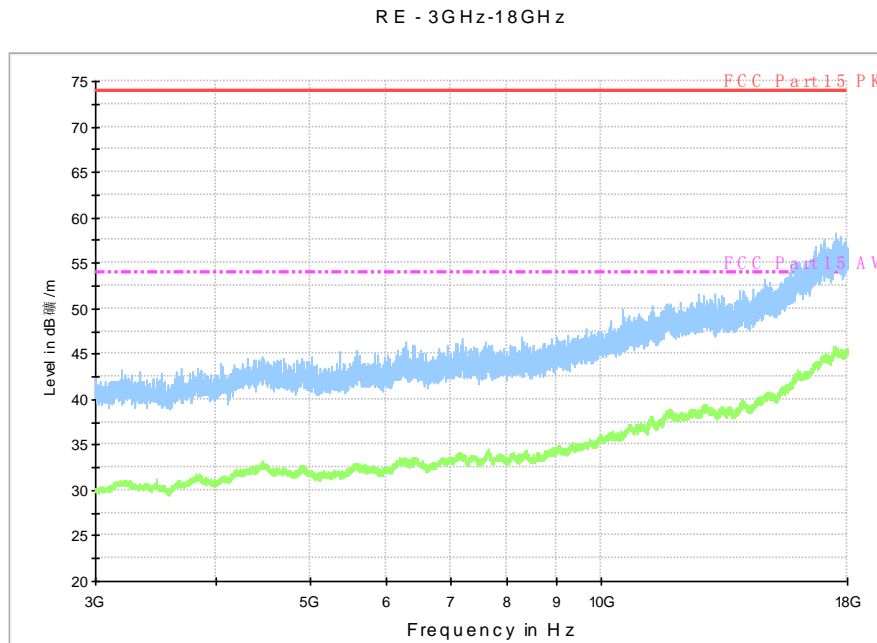


Fig.A.6.2.15 Radiated Spurious Emission (802.11g, Ch1, 3 GHz-18 GHz)

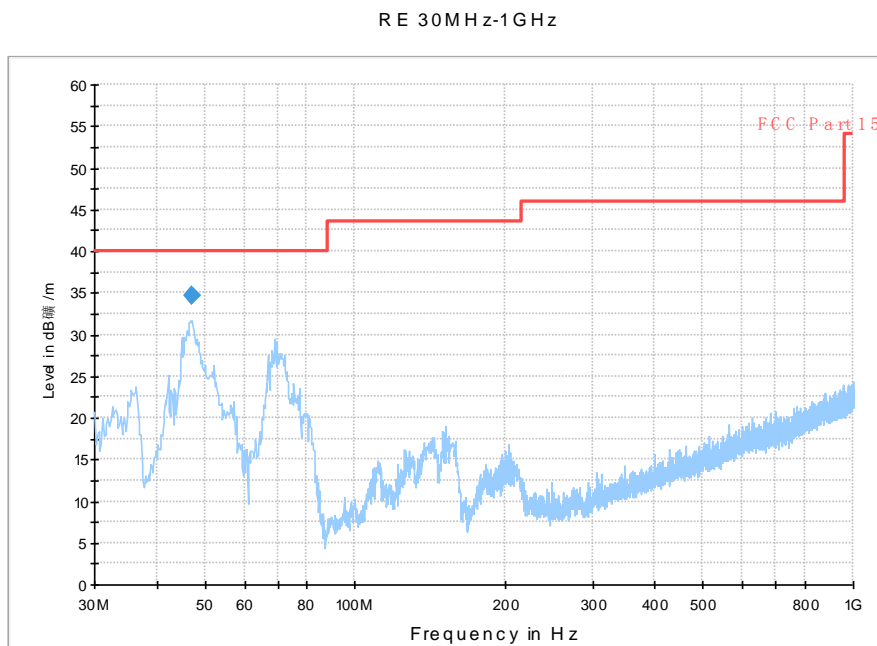


Fig.A.6.2.16 Radiated Spurious Emission (802.11g, Ch6, 30 MHz-1 GHz)

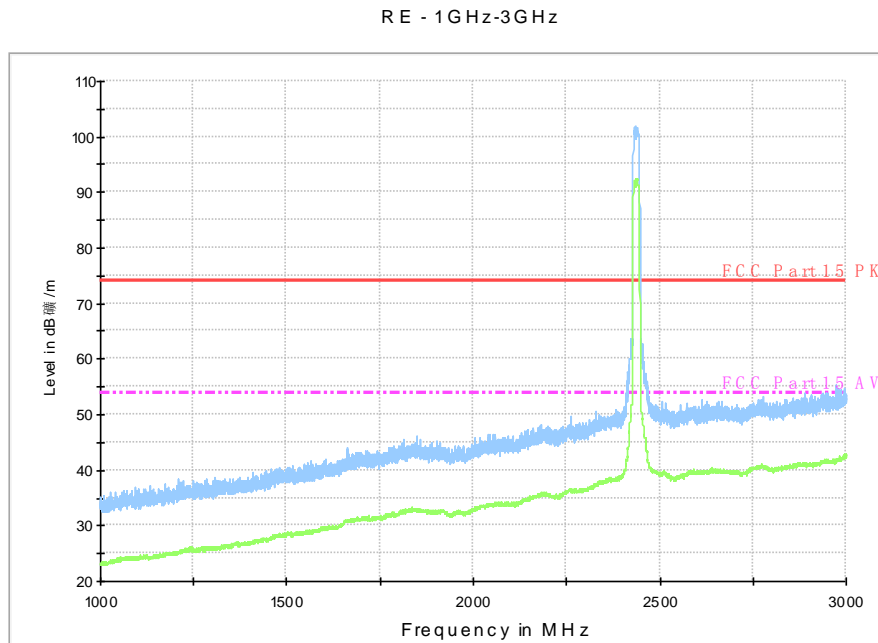


Fig.A.6.2.17 Radiated Spurious Emission (802.11g, Ch6, 1 GHz-3 GHz)

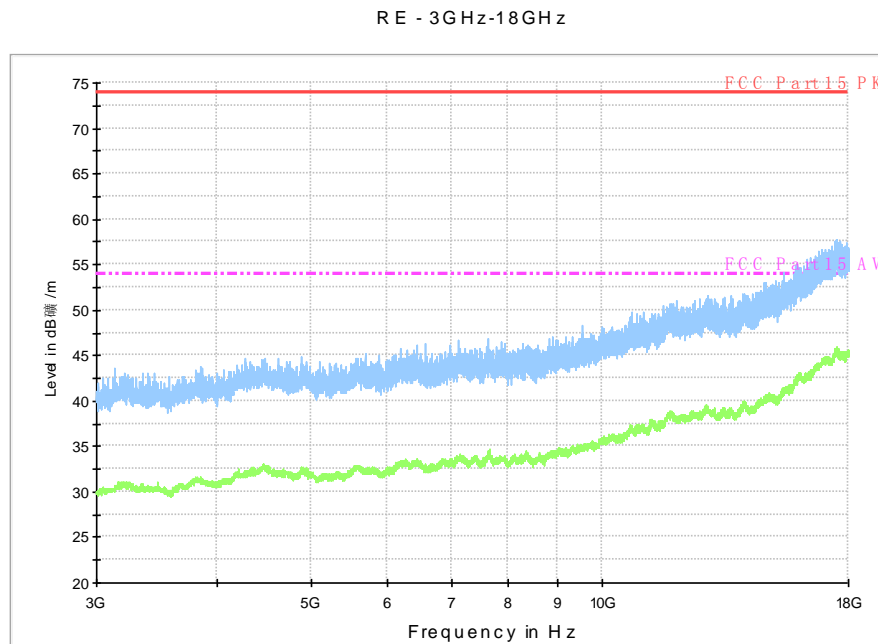


Fig.A.6.2.18 Radiated Spurious Emission (802.11g, Ch6, 3 GHz-18 GHz)

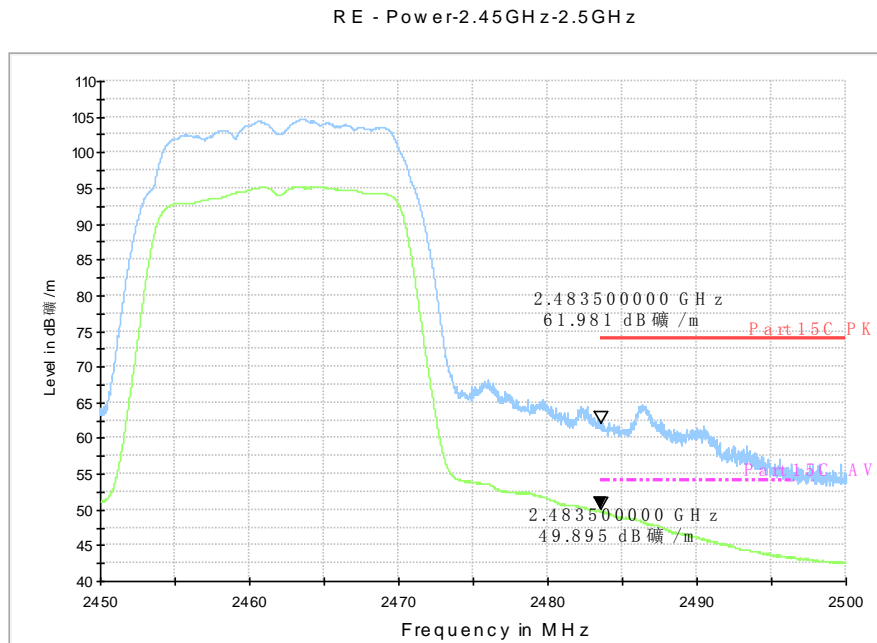


Fig.A.6.2.19 Radiated Spurious Emission (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz

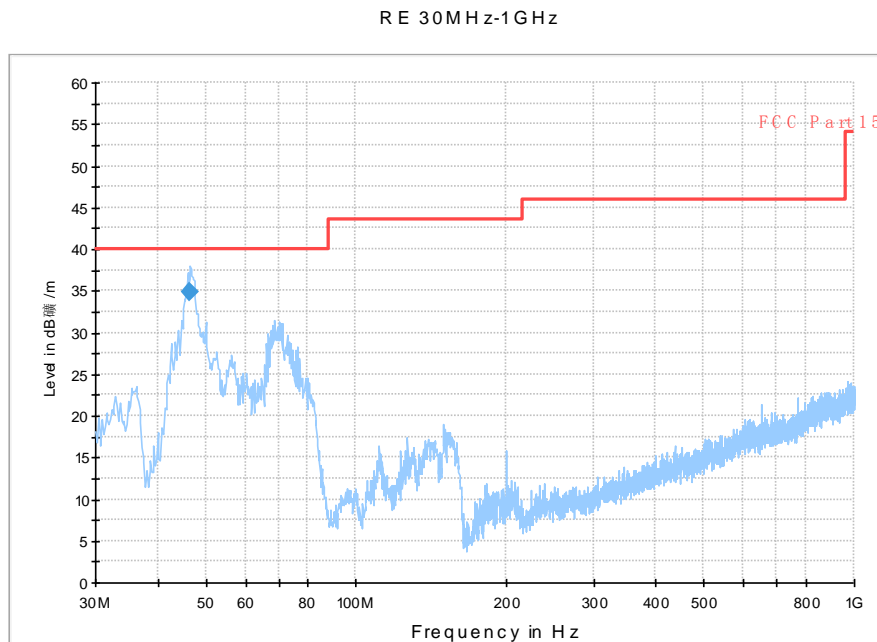


Fig.A.6.2.20 Radiated Spurious Emission (802.11g, Ch11, 30 MHz-1 GHz)

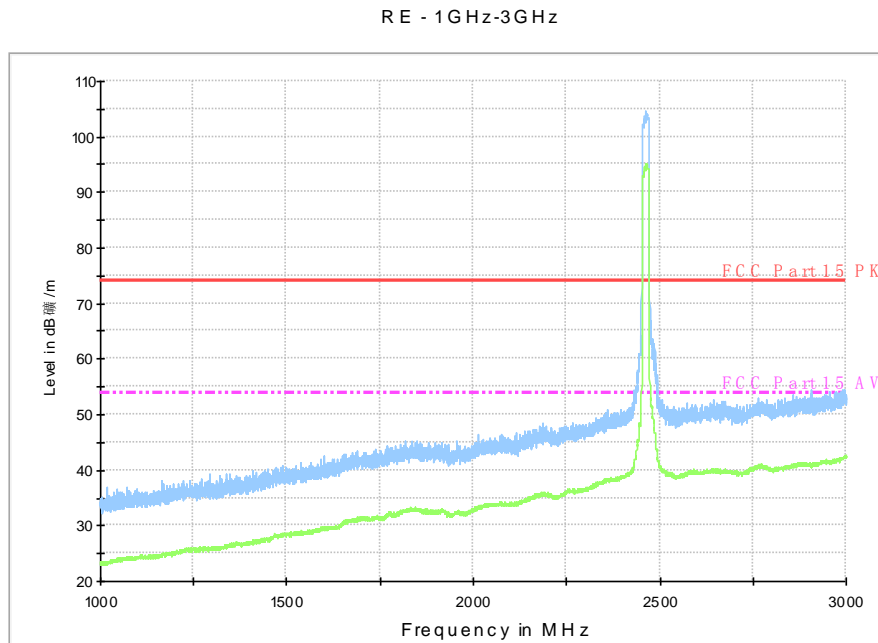


Fig.A.6.2.21 Radiated Spurious Emission (802.11g, Ch11, 1 GHz-3 GHz)

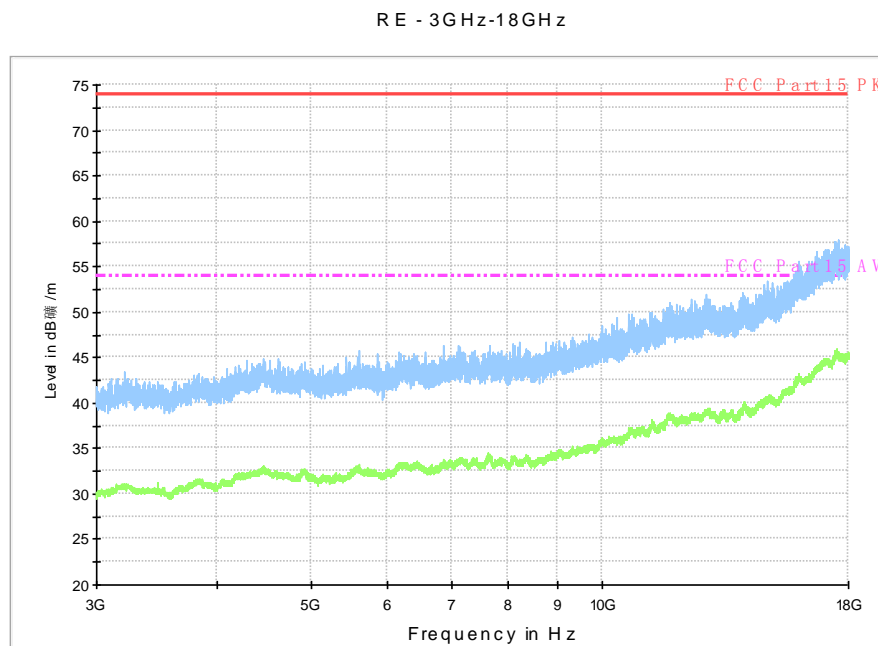


Fig.A.6.2.22 Radiated Spurious Emission (802.11g, Ch11, 3 GHz-18 GHz)

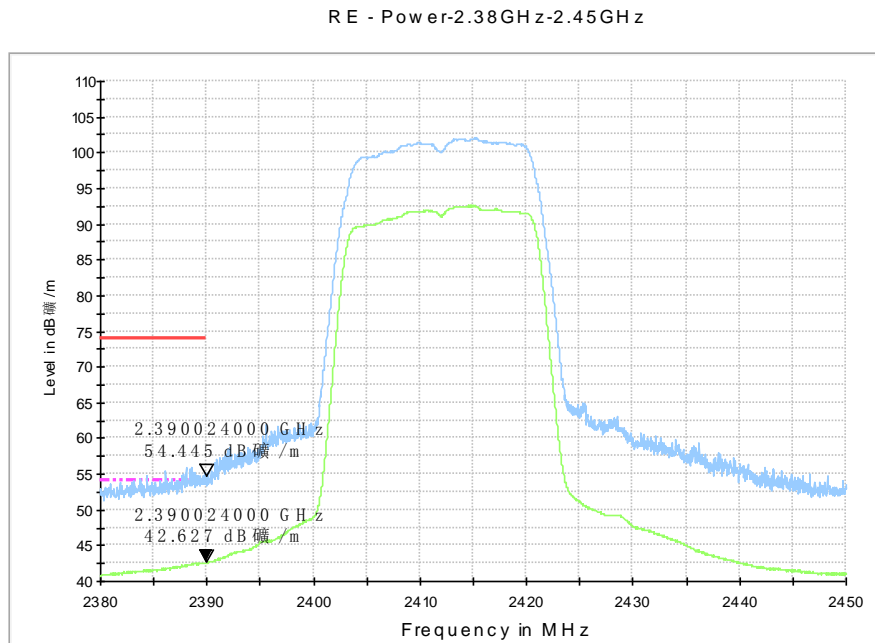


Fig.A.6.2.23 Radiated Spurious Emission (Power): 802.11n-HT20, ch1, 2.38 GHz - 2.45GHz

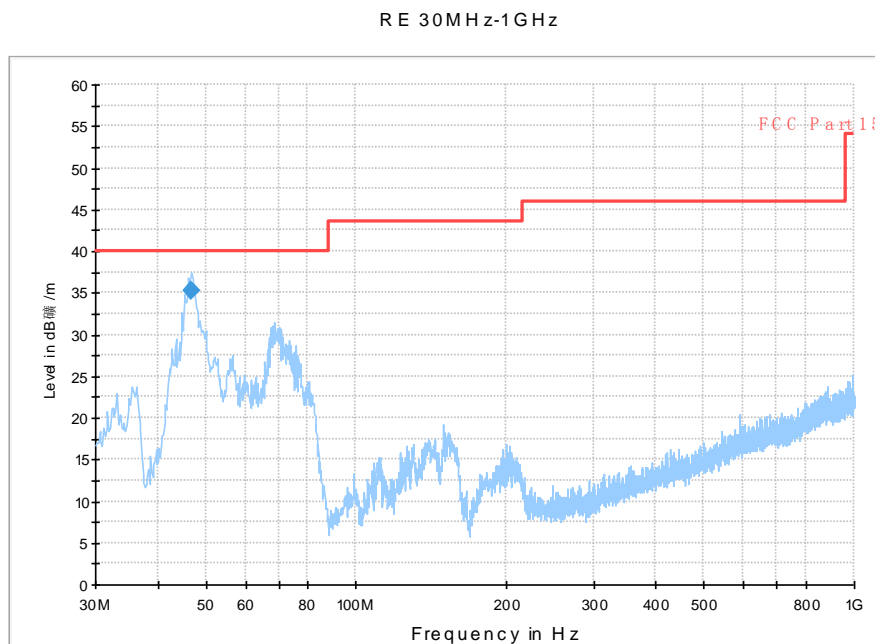


Fig.A.6.2.24 Radiated Spurious Emission (802.11n-HT20, Ch1, 30 MHz-1 GHz)

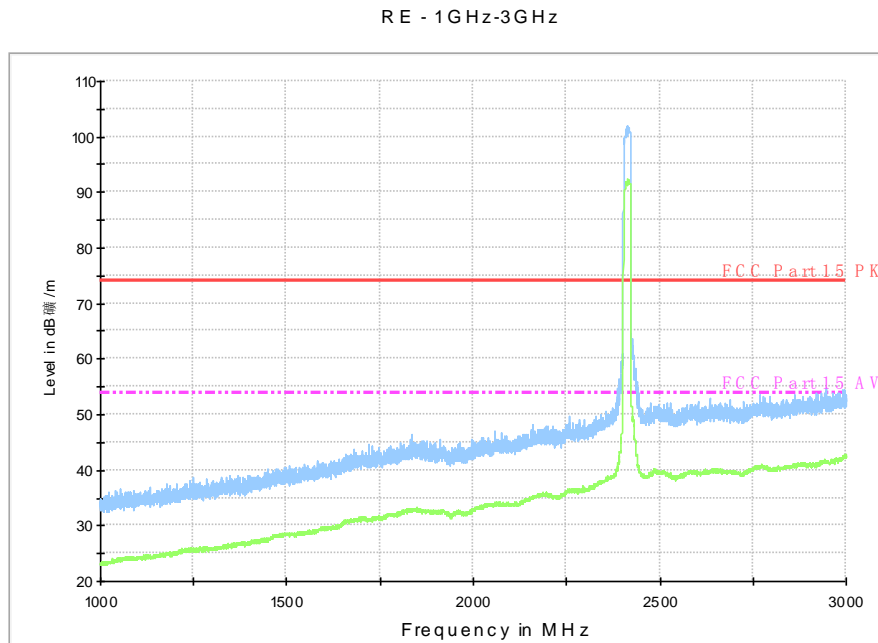


Fig.A.6.2.25 Radiated Spurious Emission (802.11n-HT20, Ch1, 1 GHz-3 GHz)

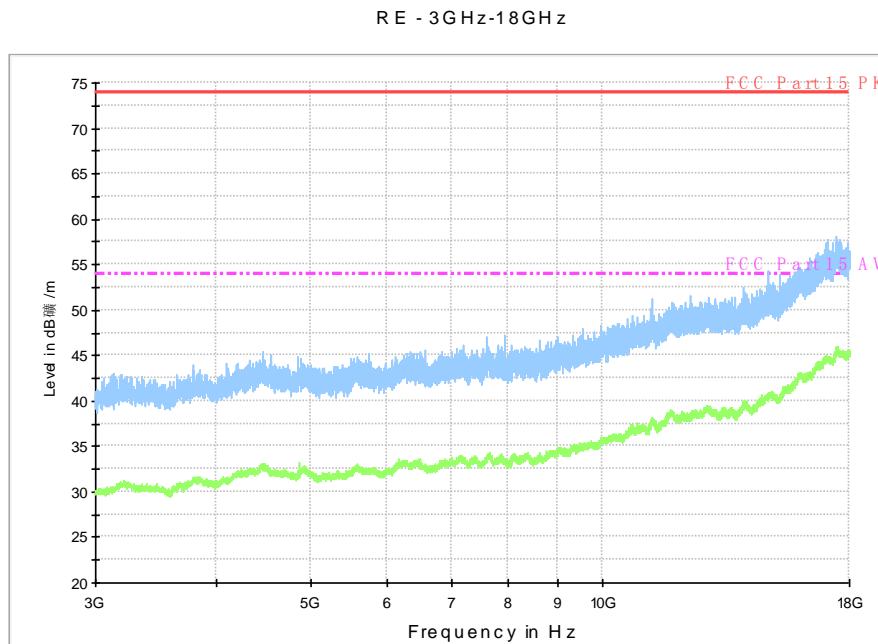


Fig.A.6.2.26 Radiated Spurious Emission (802.11n-HT20, Ch1, 3 GHz-18 GHz)

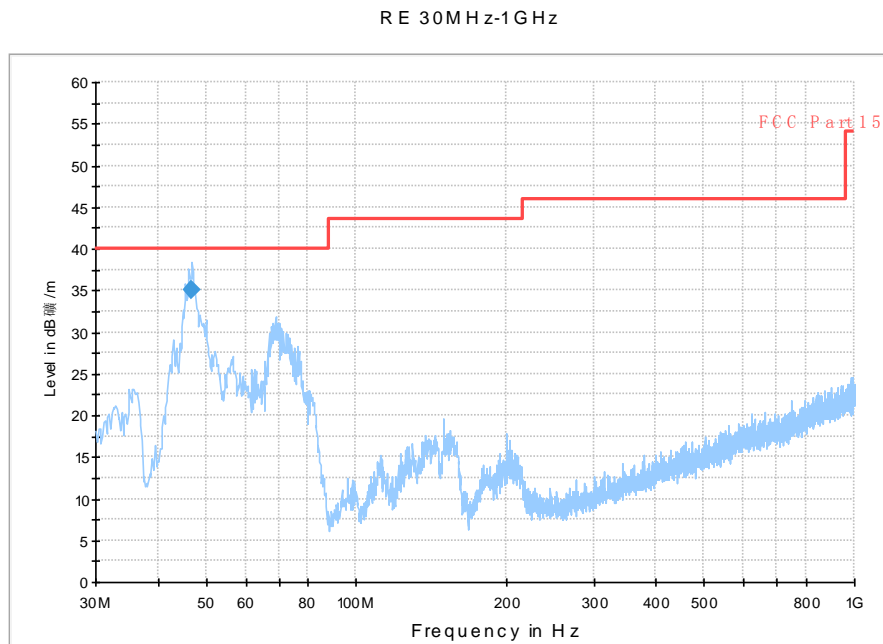


Fig.A.6.2.27 Radiated Spurious Emission (802.11n-HT20, Ch6, 30 MHz-1 GHz)

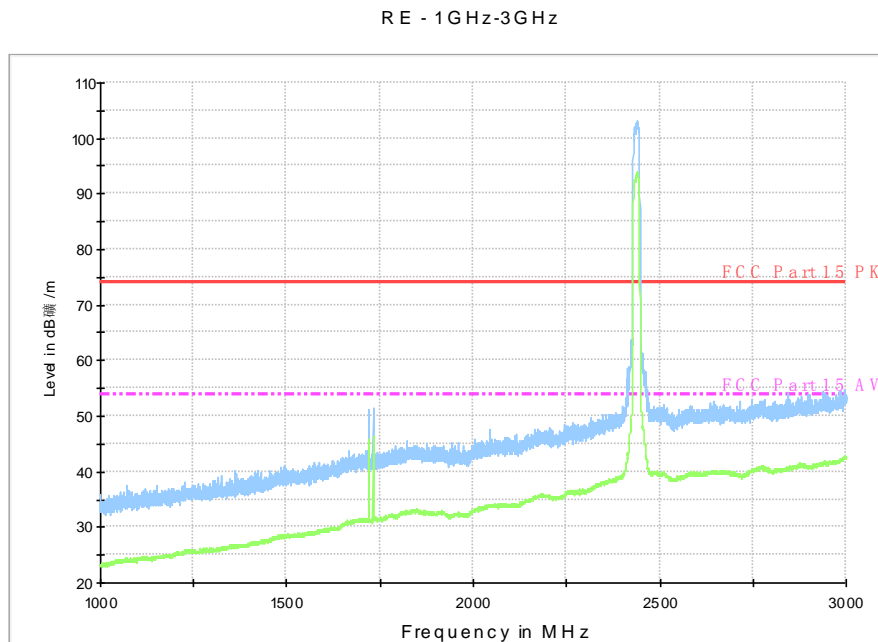


Fig.A.6.2.28 Radiated Spurious Emission (802.11n-HT20, Ch6, 1 GHz-3 GHz)

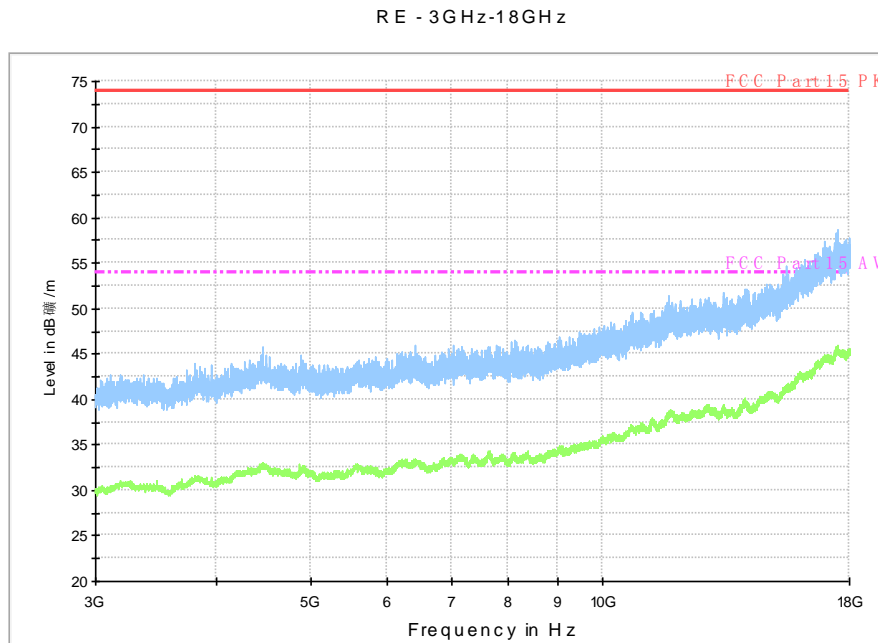


Fig.A.6.2.29 Radiated Spurious Emission (802.11n-HT20, Ch6, 3 GHz-18 GHz)

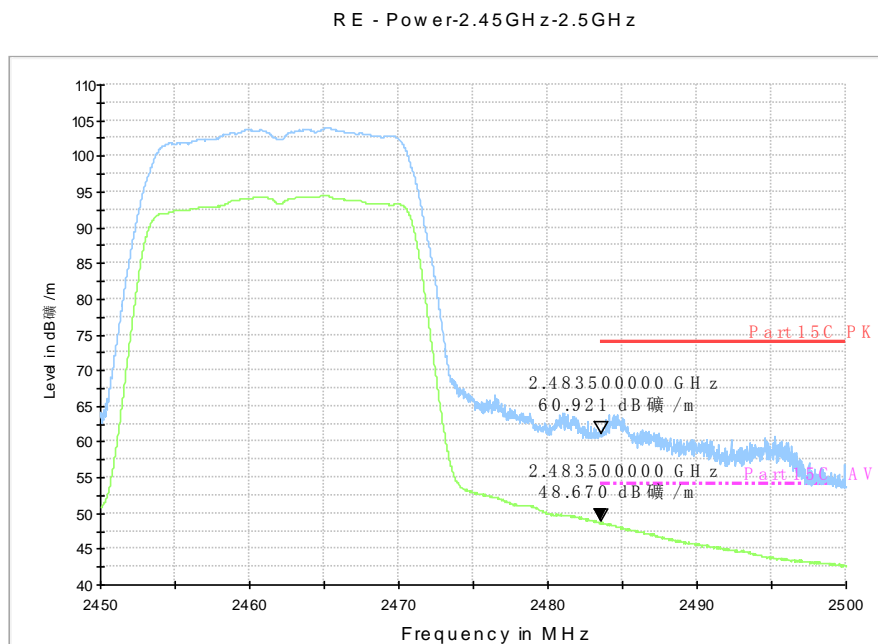


Fig.A.6.2.30 Radiated Spurious Emission (Power): 802.11n-HT20, ch11, 2.45 GHz - 2.50GHz

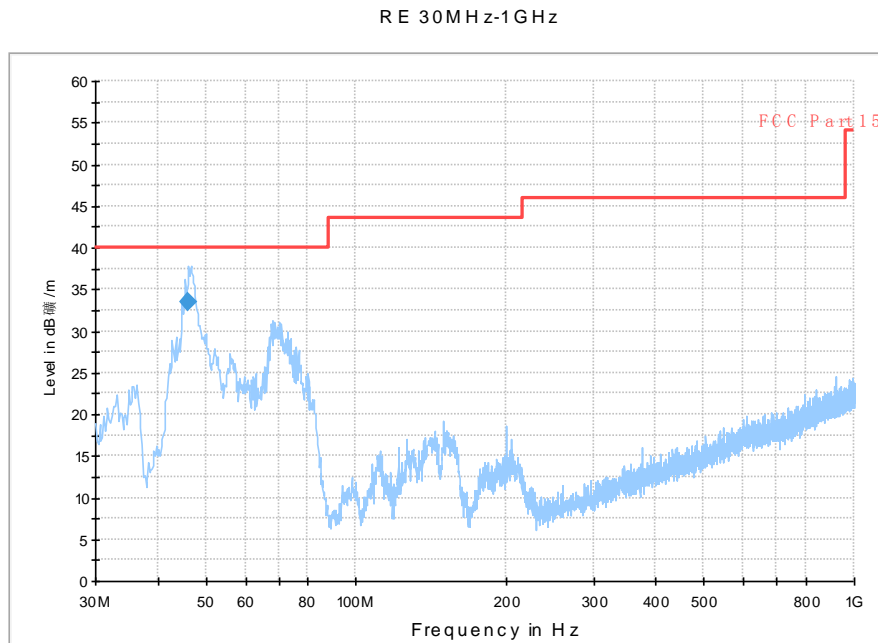


Fig.A.6.2.31 Radiated Spurious Emission (802.11n-HT20, Ch11, 30 MHz-1 GHz)

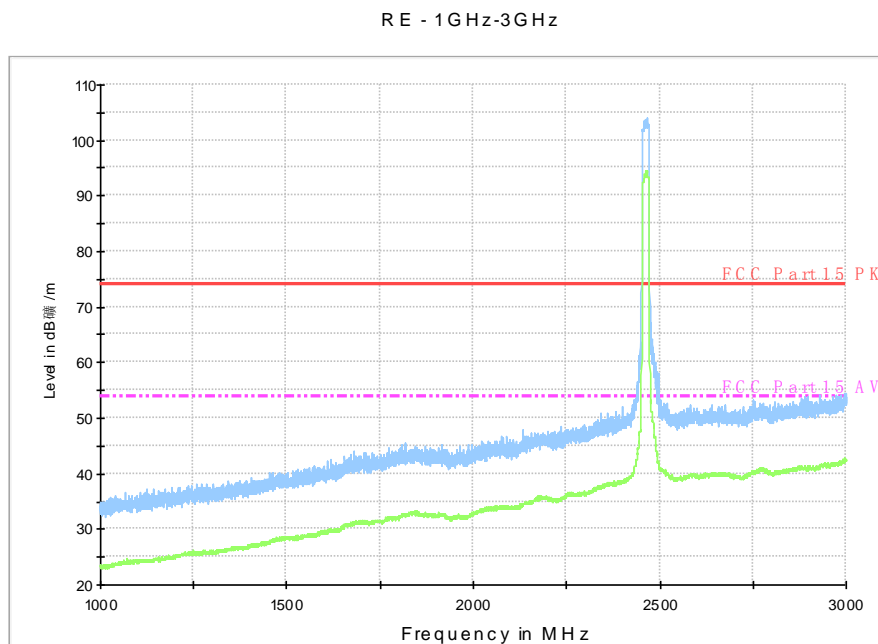


Fig.A.6.2.32 Radiated Spurious Emission (802.11n-HT20, Ch11, 1 GHz-3 GHz)

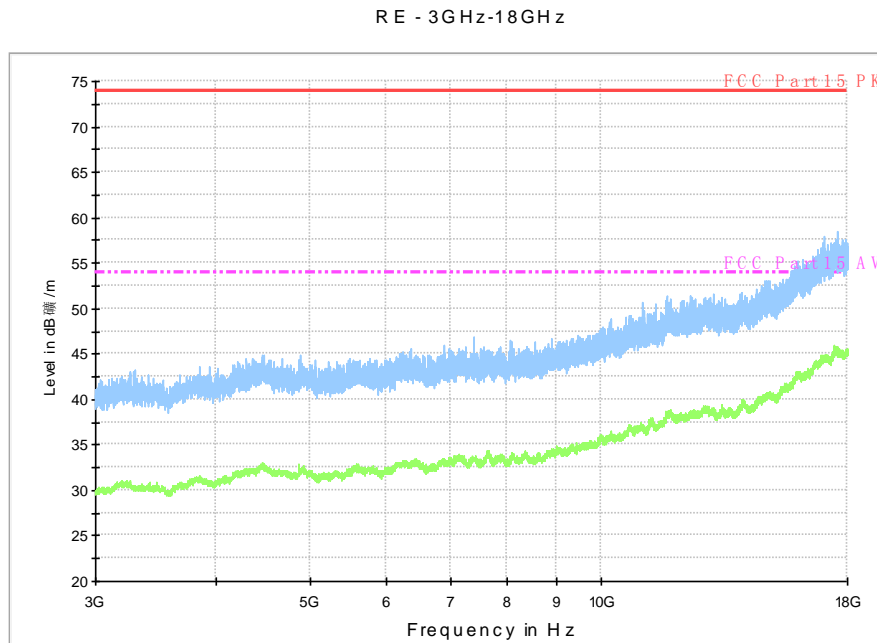


Fig.A.6.2.33 Radiated Spurious Emission (802.11n-HT20, Ch11, 3 GHz-18 GHz)

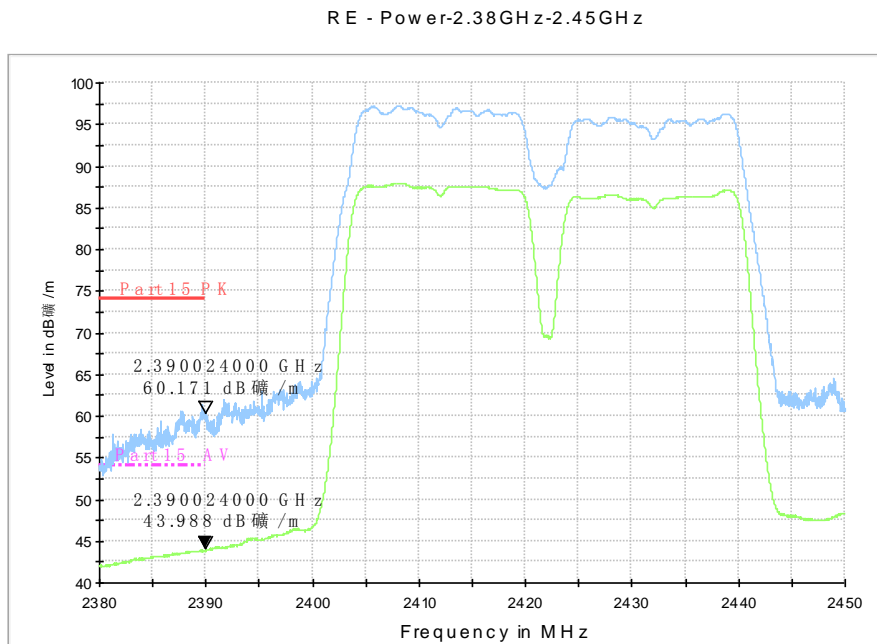


Fig.A.6.2.34 Radiated Spurious Emission (Power): 802.11n-HT40, ch3, 2.38 GHz - 2.45GHz

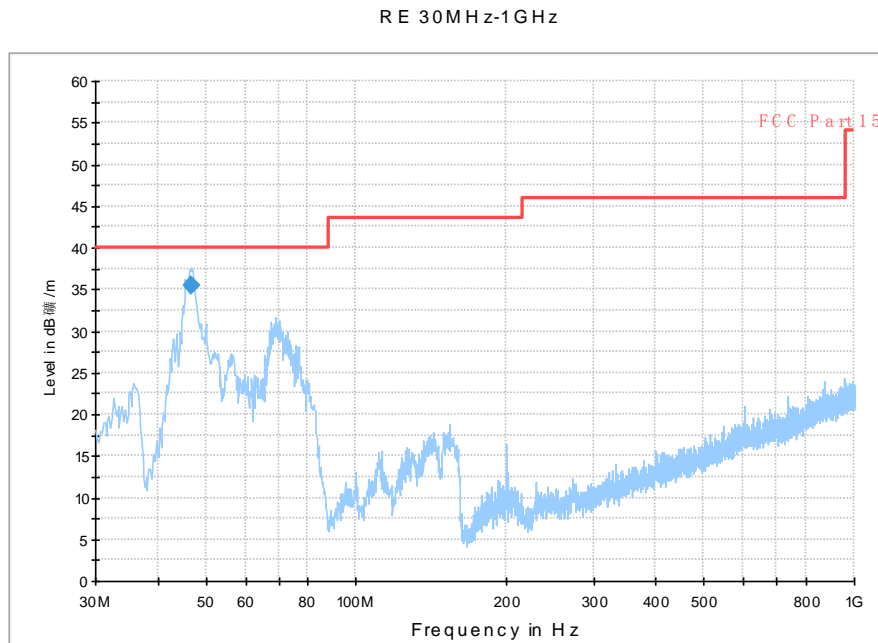


Fig.A.6.2.35 Radiated Spurious Emission (802.11n-HT40, ch3, 30 MHz-1 GHz)

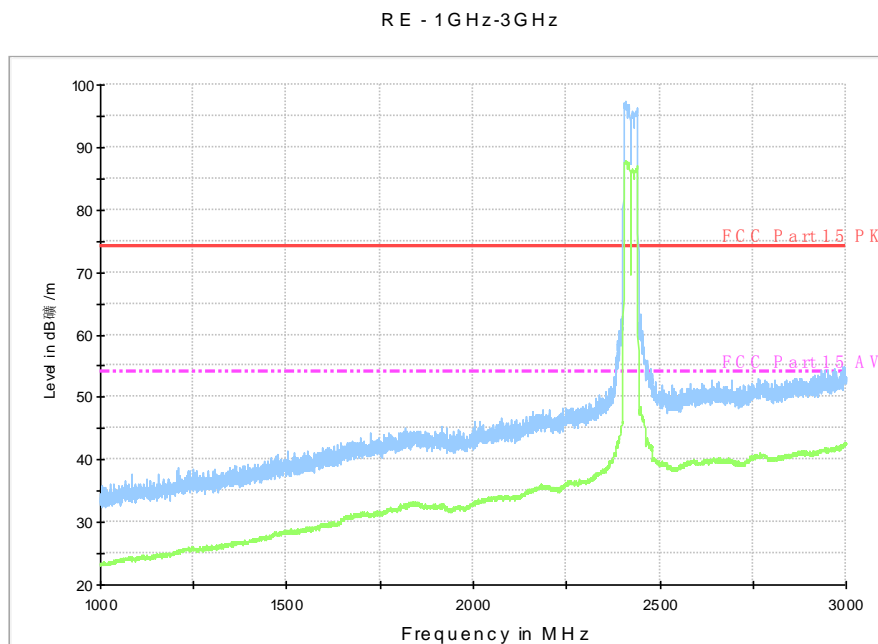


Fig.A.6.2.36 Radiated Spurious Emission (802.11n-HT40, ch3, 1 GHz-3 GHz)

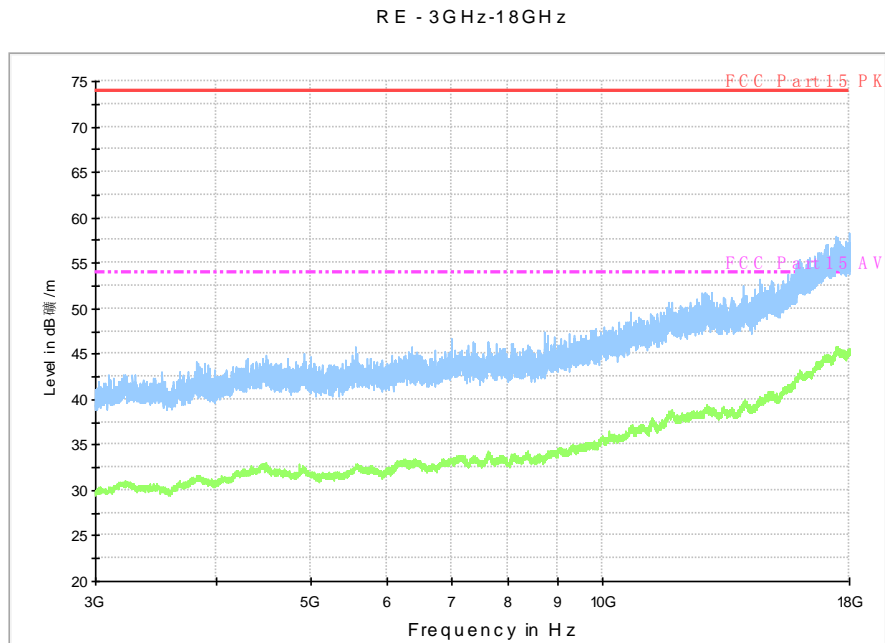


Fig.A.6.2.37 Radiated Spurious Emission (802.11n-HT40, ch3, 3 GHz-18 GHz)

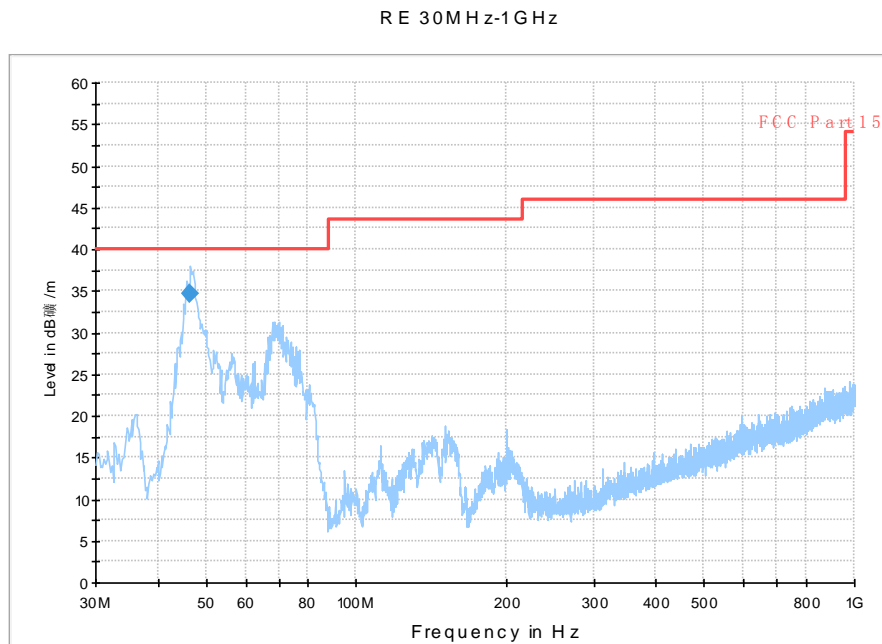


Fig.A.6.2.38 Radiated Spurious Emission (802.11n-HT40, Ch6, 30 MHz-1 GHz)

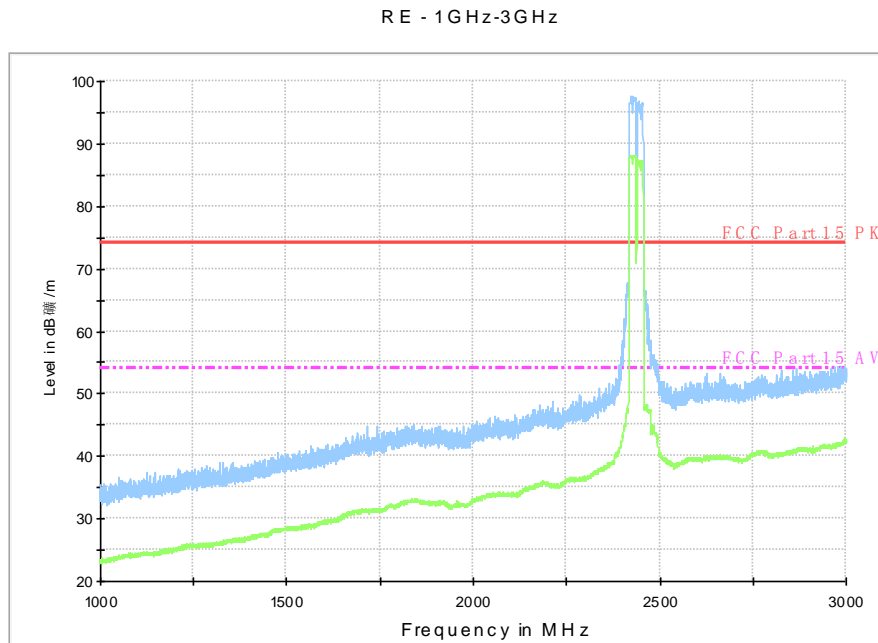


Fig.A.6.2.39 Radiated Spurious Emission (802.11n-HT40, Ch6, 1 GHz-3 GHz)

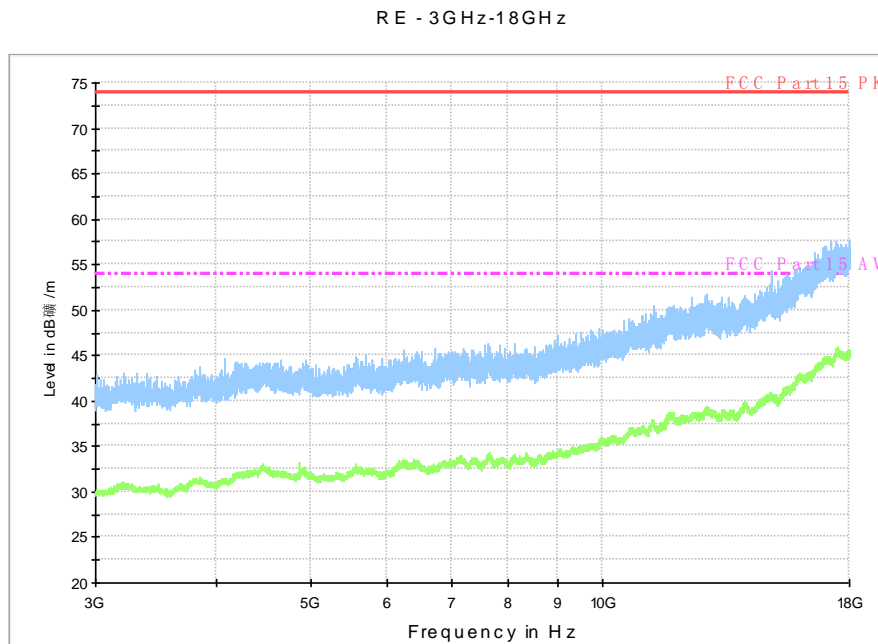


Fig.A.6.2.40 Radiated Spurious Emission (802.11n-HT40, Ch6, 3 GHz-18 GHz)

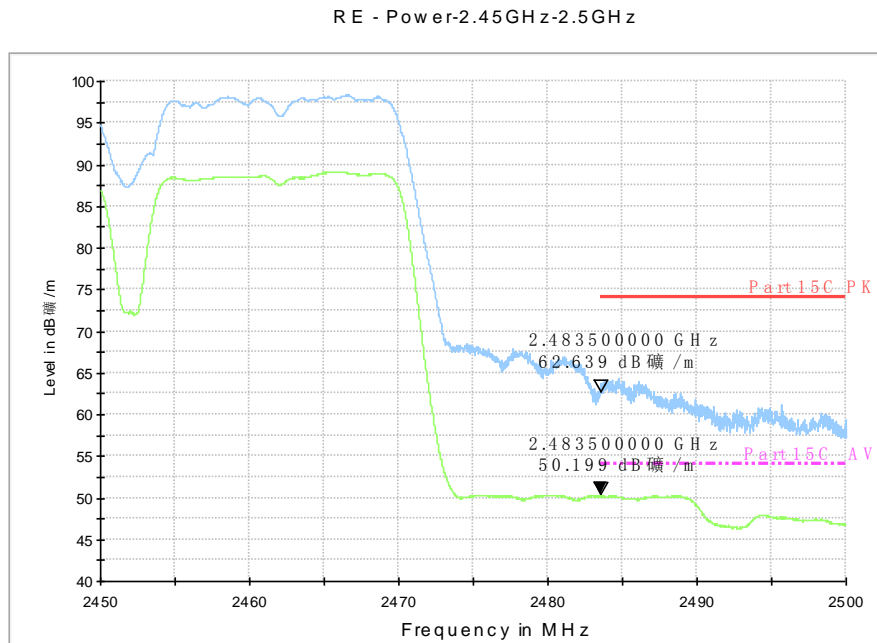


Fig.A.6.2.41 Radiated Spurious Emission (Power): 802.11n-HT40, ch9, 2.45 GHz - 2.50GHz

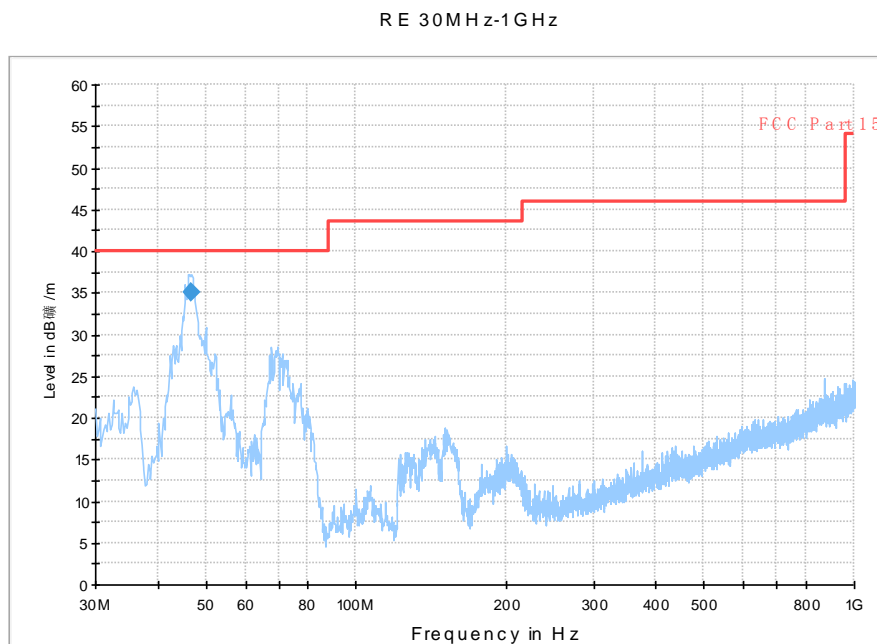


Fig.A.6.2.42 Radiated Spurious Emission (802.11n-HT40, ch9, 30 MHz-1 GHz)

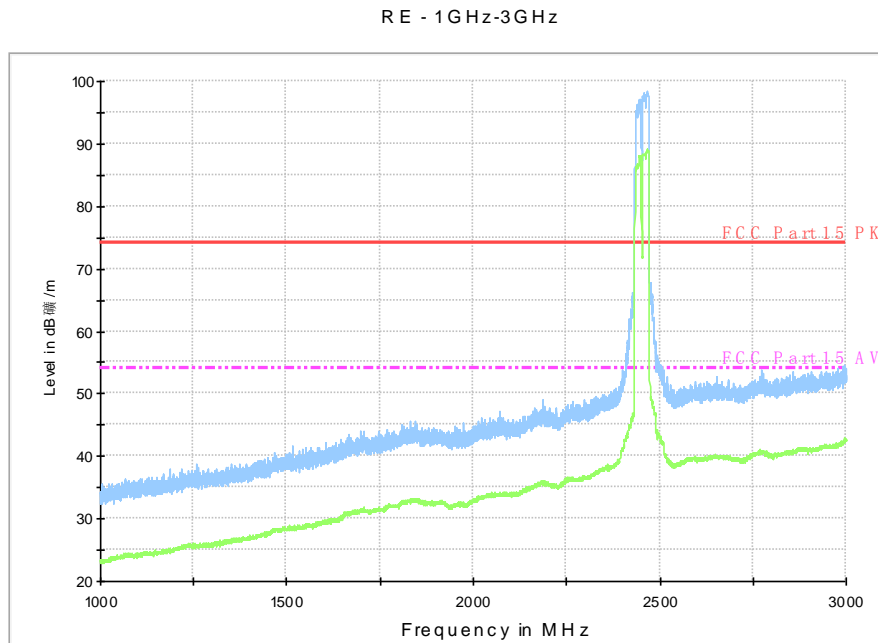


Fig.A.6.2.43 Radiated Spurious Emission (802.11n-HT40, ch9, 1 GHz-3 GHz)

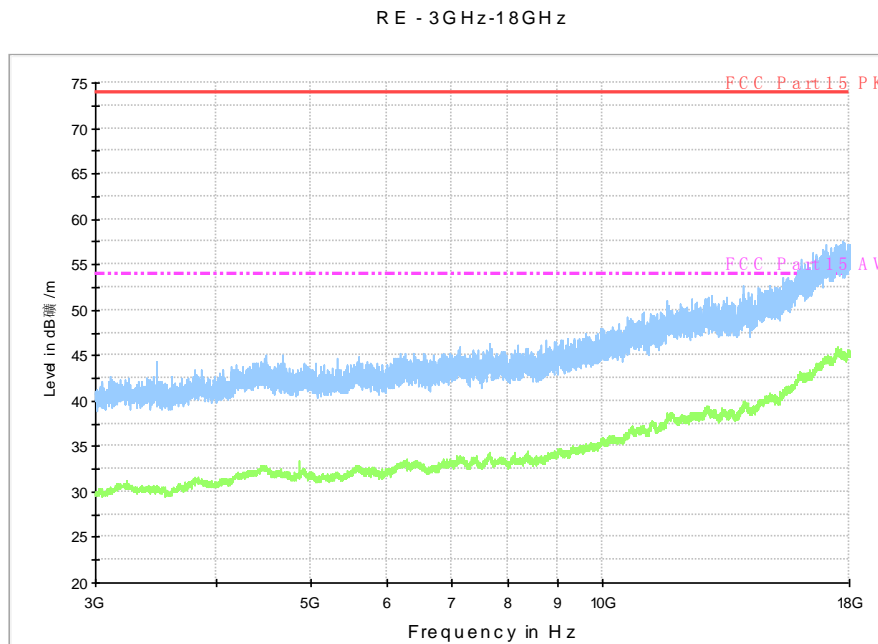


Fig.A.6.2.44 Radiated Spurious Emission (802.11n-HT40, ch9, 3 GHz-18 GHz)

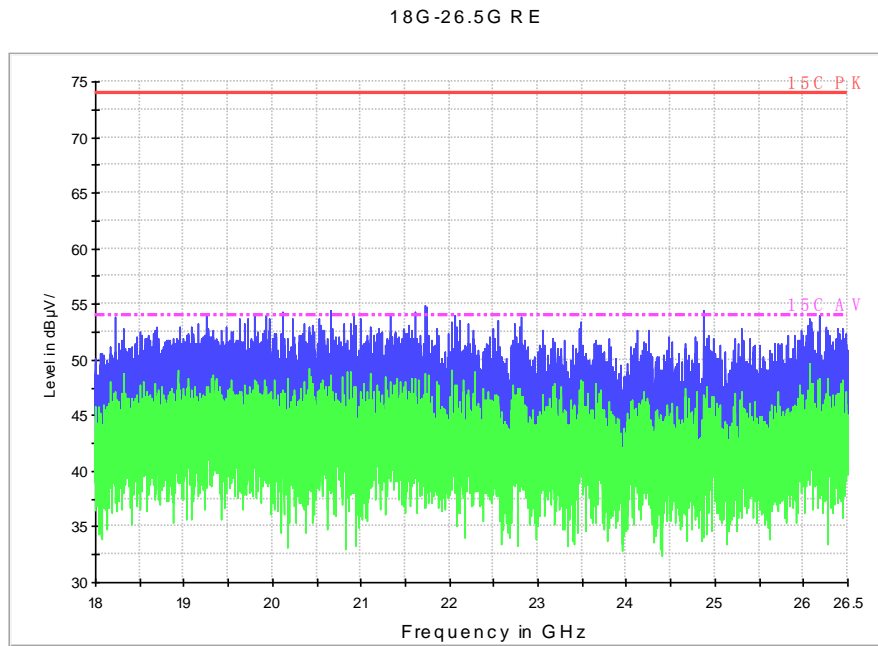


Fig.A.6.2.45 Radiated Spurious Emission (All channels): 18GHz – 26.5GHz

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.

The measurement is made according to KDB558074.

Conclusion: Pass

Measurement uncertainty:

Expanded measurement uncertainty for this test item is $U = 3.2\text{dB}$, $k=2$.

Test graphs as below:

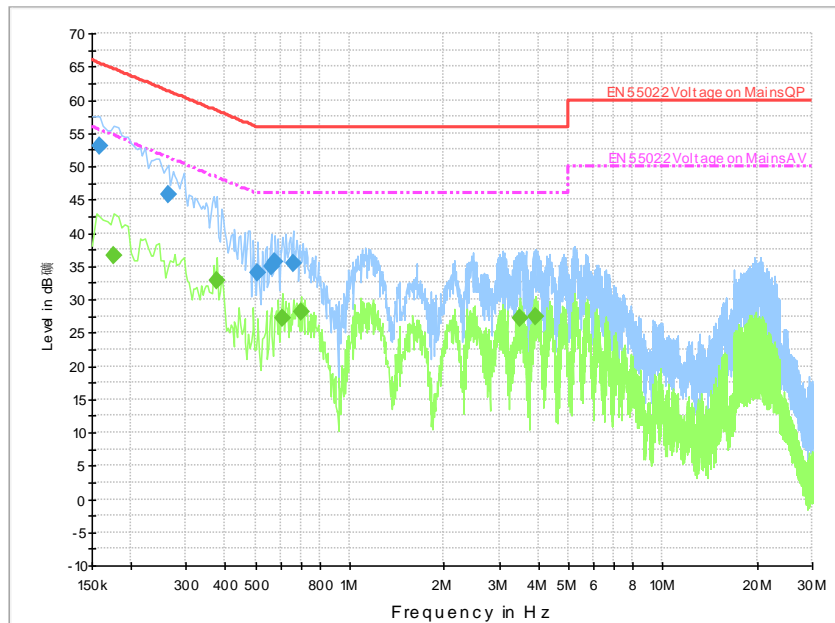


Fig.A.7.1 AC Powerline Conducted Emission-802.11b

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)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.159001	53.0	GND	N	9.9	12.5	65.5
0.262501	45.8	GND	N	9.9	15.5	61.4
0.510001	34.1	GND	N	9.9	21.9	56.0
0.559501	34.9	GND	N	9.9	21.1	56.0
0.577501	35.7	GND	N	9.9	20.3	56.0
0.658501	35.5	GND	N	9.9	20.5	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177001	36.7	GND	N	9.9	17.9	54.6
0.375001	32.7	GND	N	9.9	15.7	48.4
0.609001	27.3	GND	N	9.9	18.7	46.0
0.699001	28.1	GND	N	9.9	17.9	46.0
3.484501	27.2	GND	N	9.9	18.8	46.0
3.930001	27.5	GND	N	9.9	18.5	46.0