

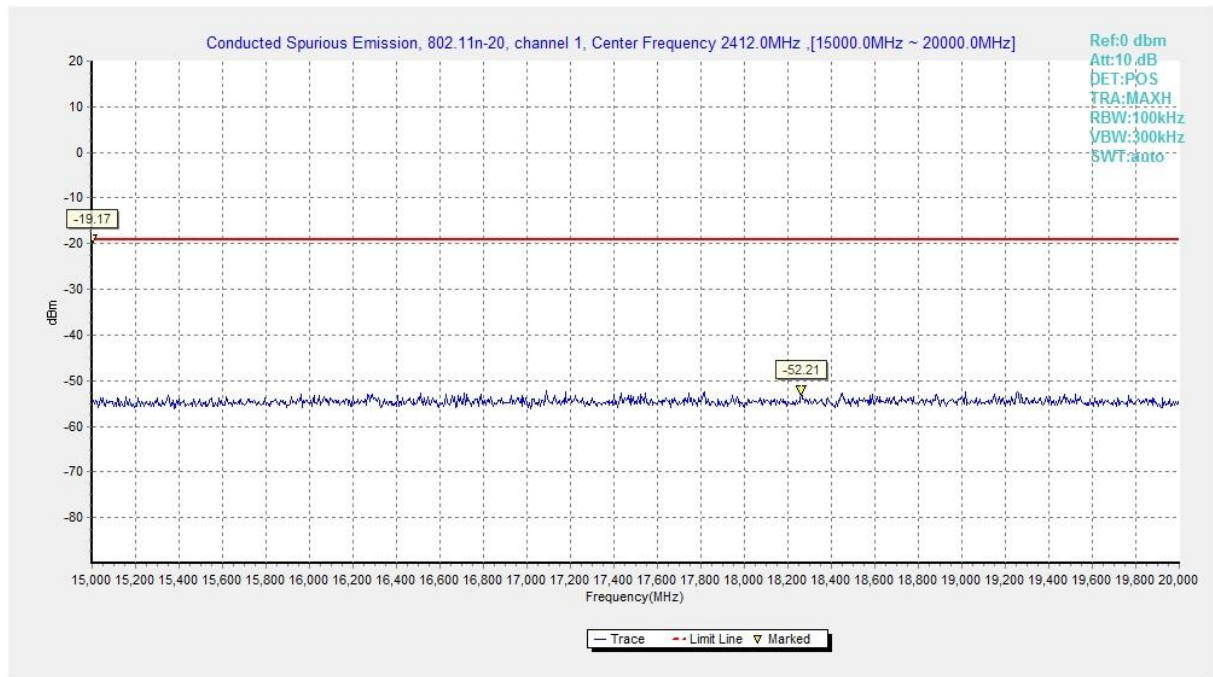


Fig.A.6.1.55 Conducted Spurious Emission (802.11n-HT20, Ch1, 15 GHz-20 GHz)

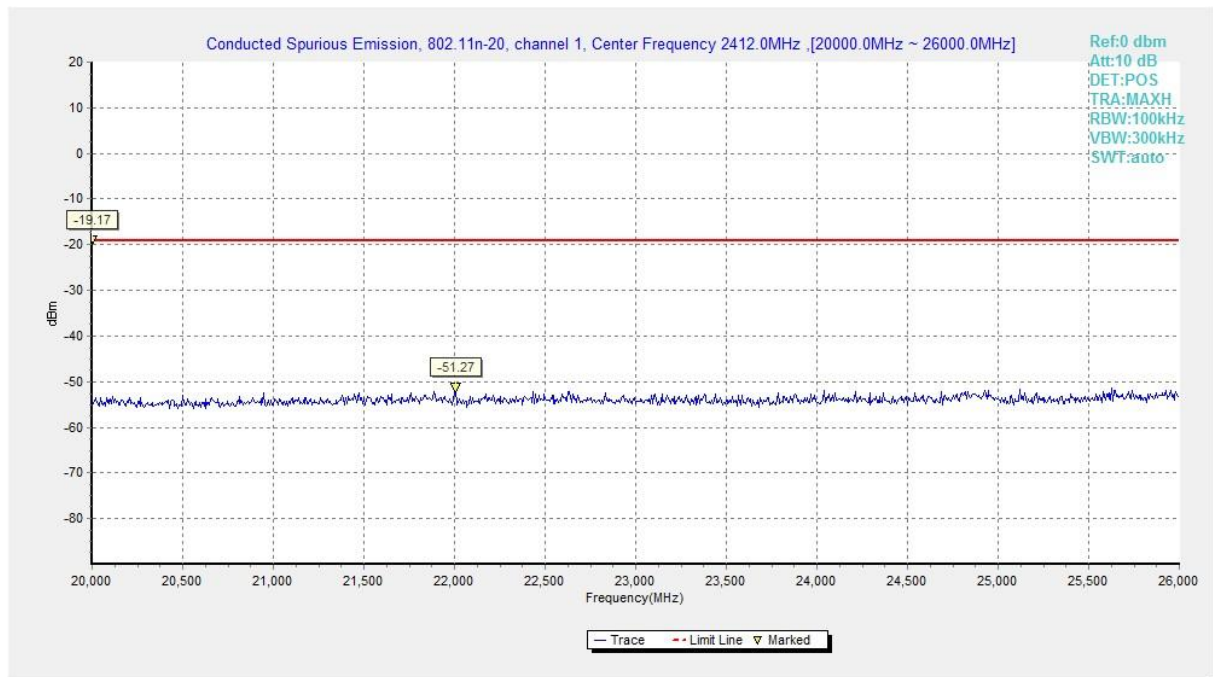


Fig.A.6.1.56 Conducted Spurious Emission (802.11n-HT20, Ch1, 20 GHz-26 GHz)

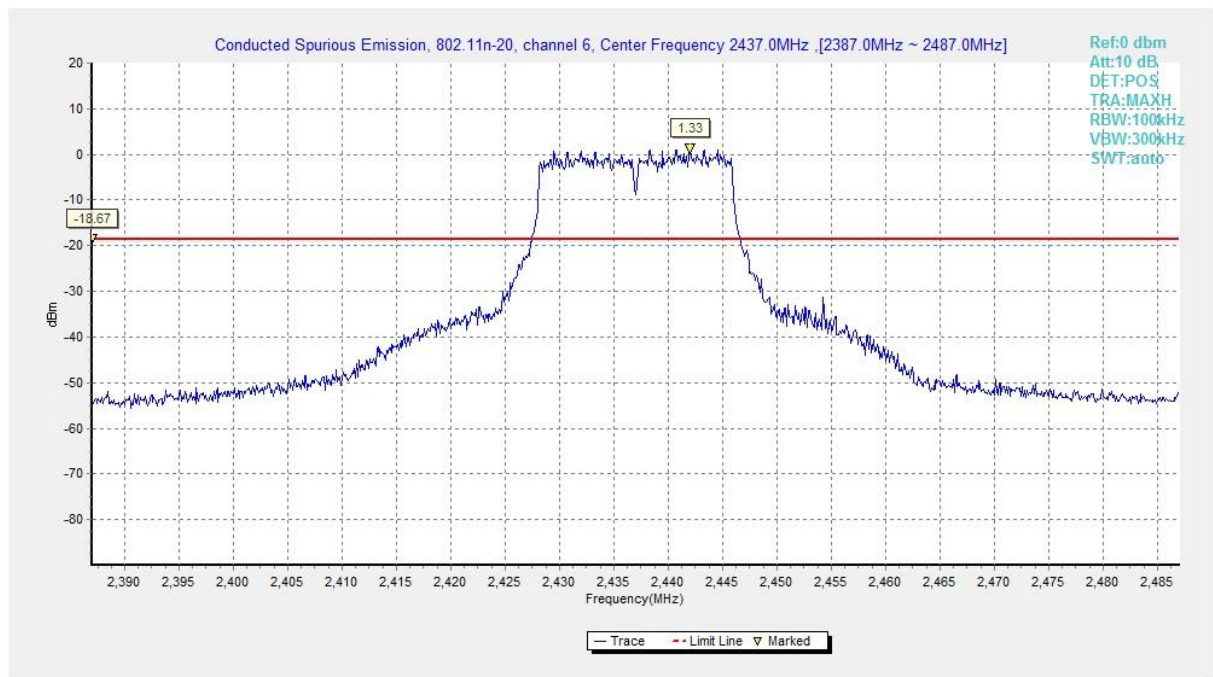


Fig.A.6.1.57 Conducted Spurious Emission (802.11n-HT20, Ch6, Center Frequency)

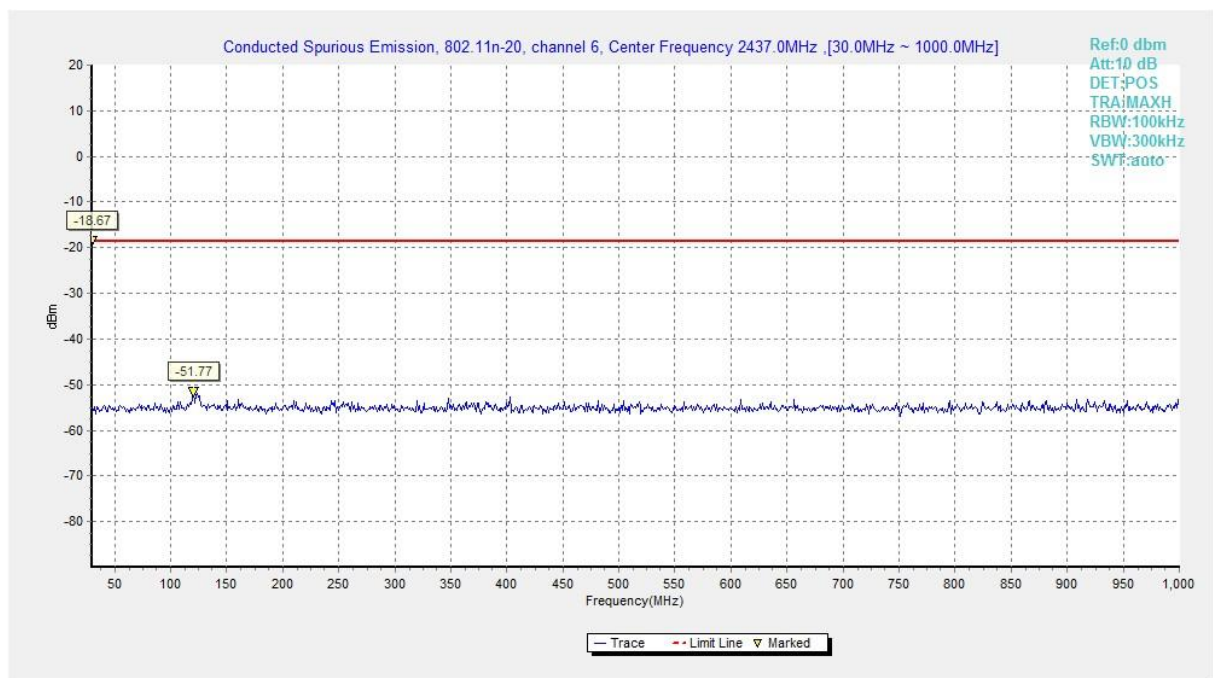


Fig.A.6.1.58 Conducted Spurious Emission (802.11n-HT20, Ch6, 30 MHz-1 GHz)

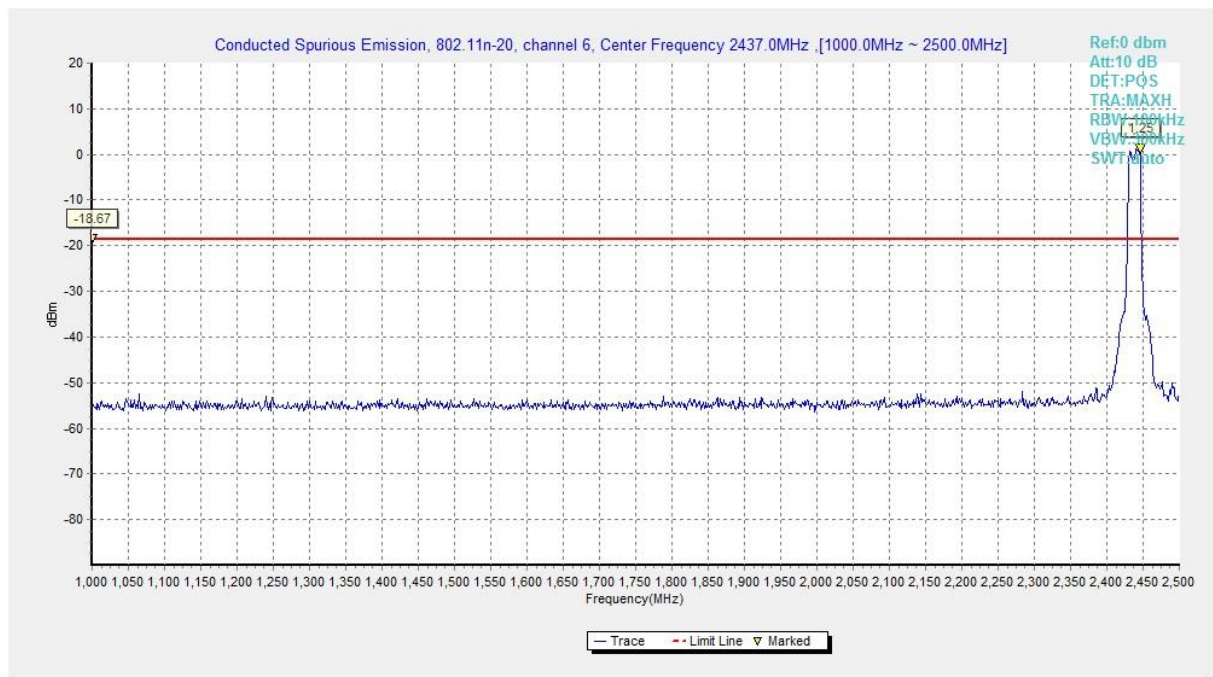


Fig.A.6.1.59 Conducted Spurious Emission (802.11n-HT20, Ch6, 1 GHz-2.5 GHz)

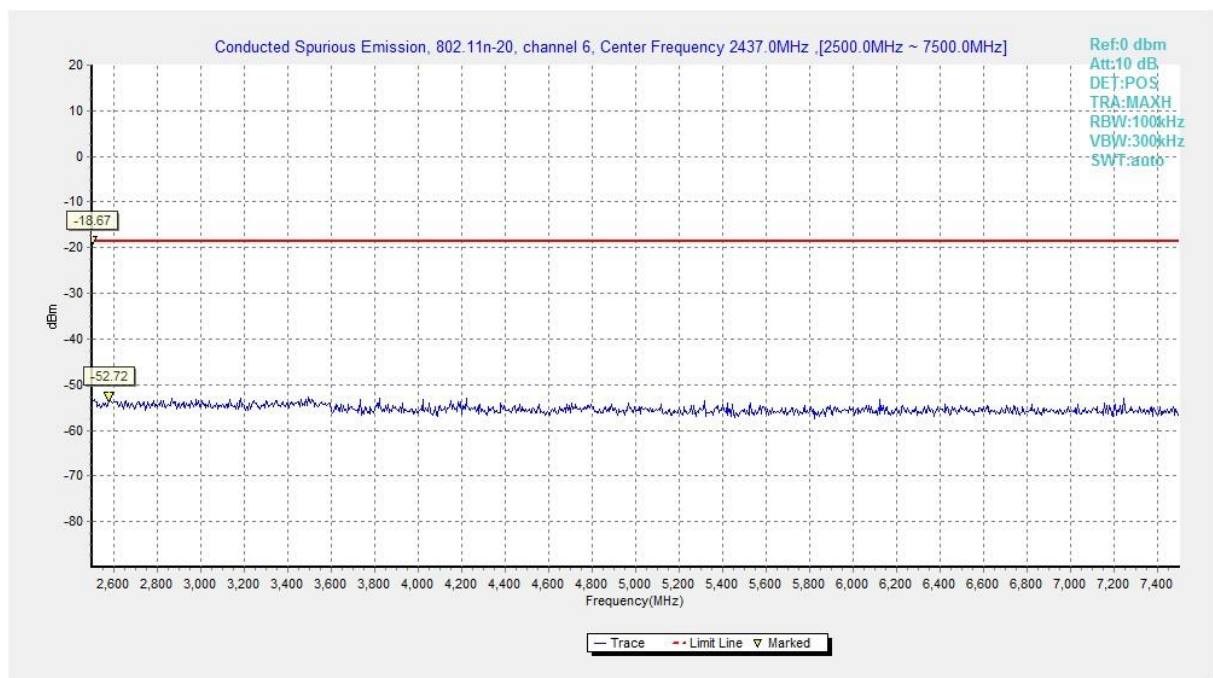


Fig.A.6.1.60 Conducted Spurious Emission (802.11n-HT20, Ch6, 2.5 GHz-7.5 GHz)

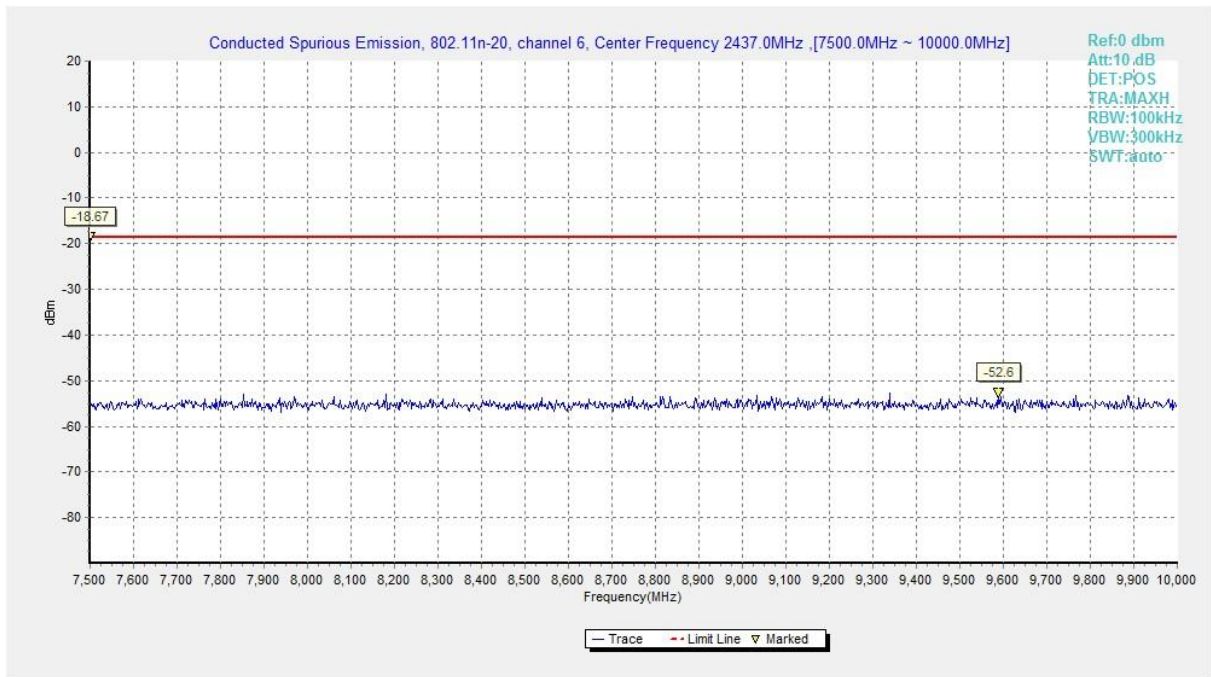


Fig.A.6.1.61 Conducted Spurious Emission (802.11n-HT20, Ch6, 7.5 GHz-10 GHz)

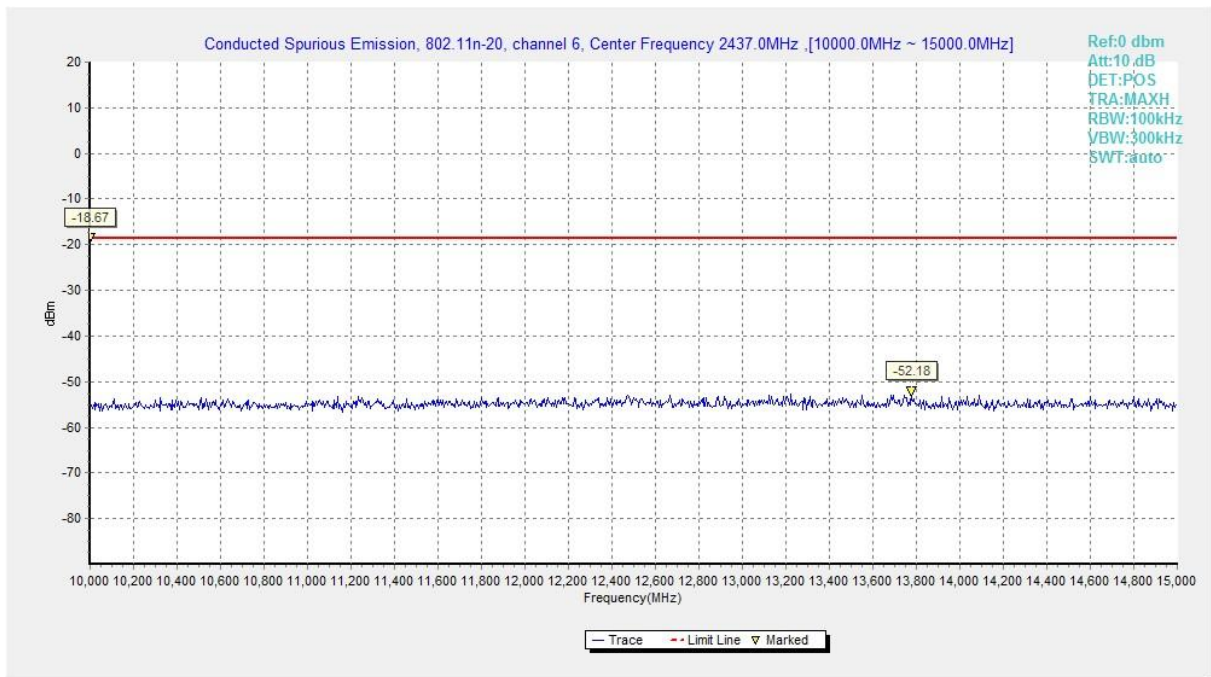


Fig.A.6.1.62 Conducted Spurious Emission (802.11n-HT20, Ch6, 10 GHz-15 GHz)

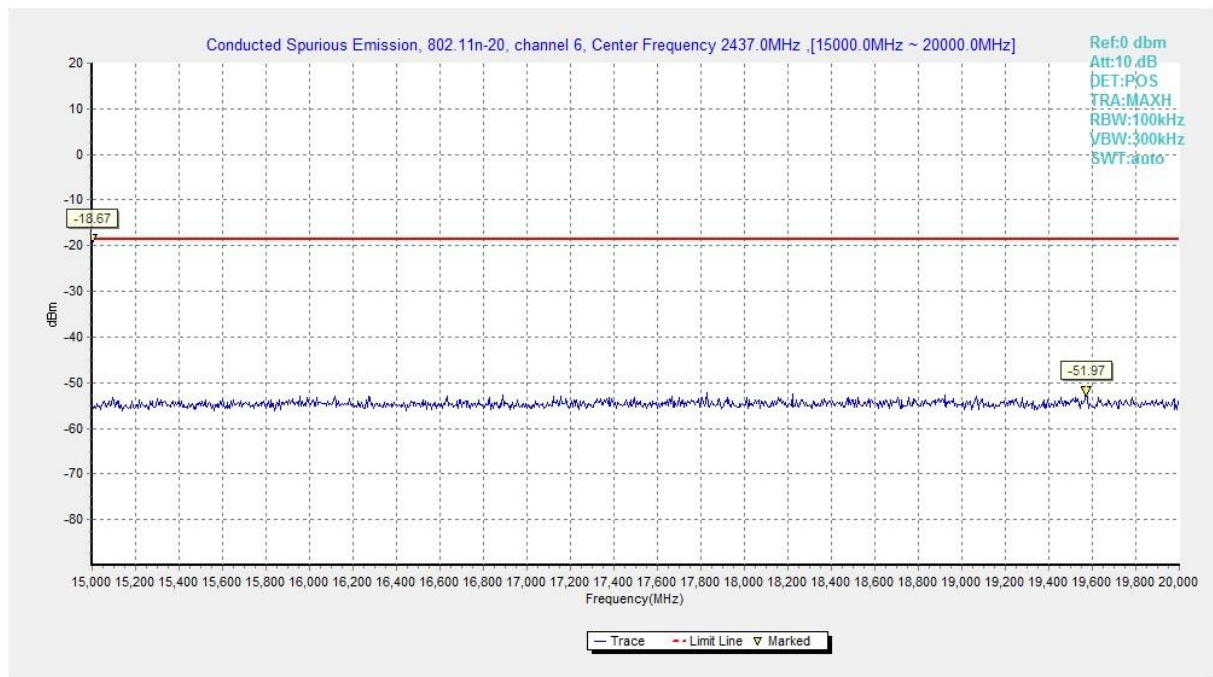


Fig.A.6.1.63 Conducted Spurious Emission (802.11n-HT20, Ch6, 15 GHz-20 GHz)

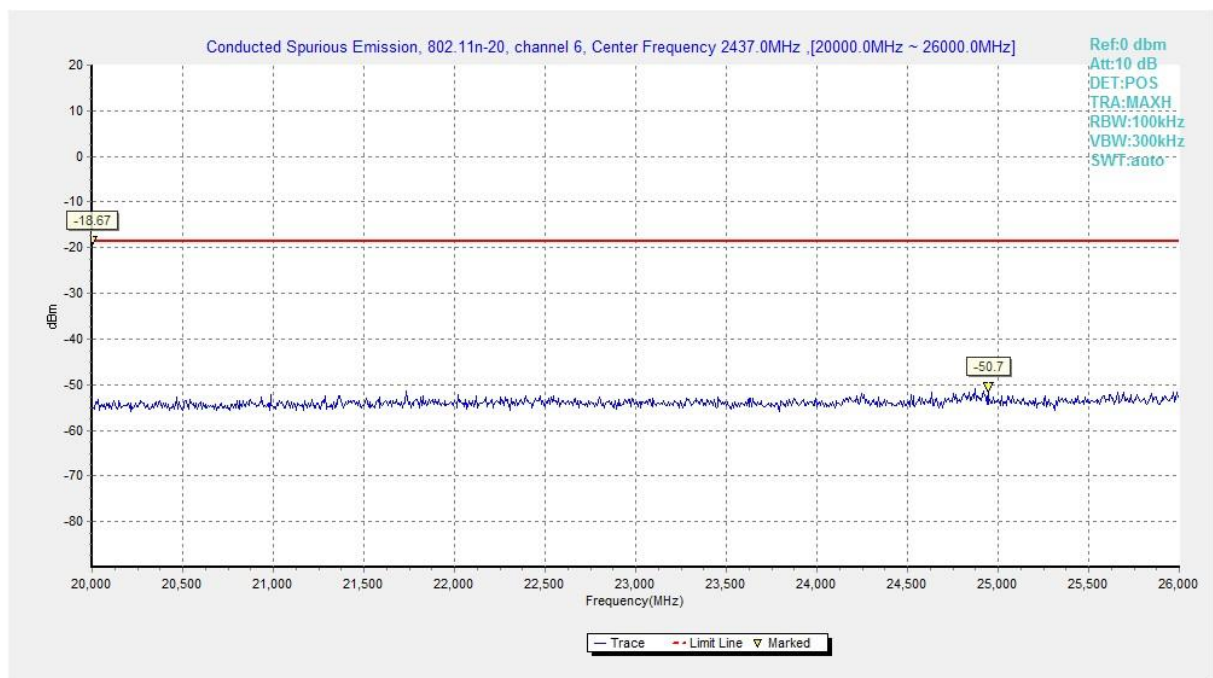


Fig.A.6.1.64 Conducted Spurious Emission (802.11n-HT20, Ch6, 20 GHz-26 GHz)

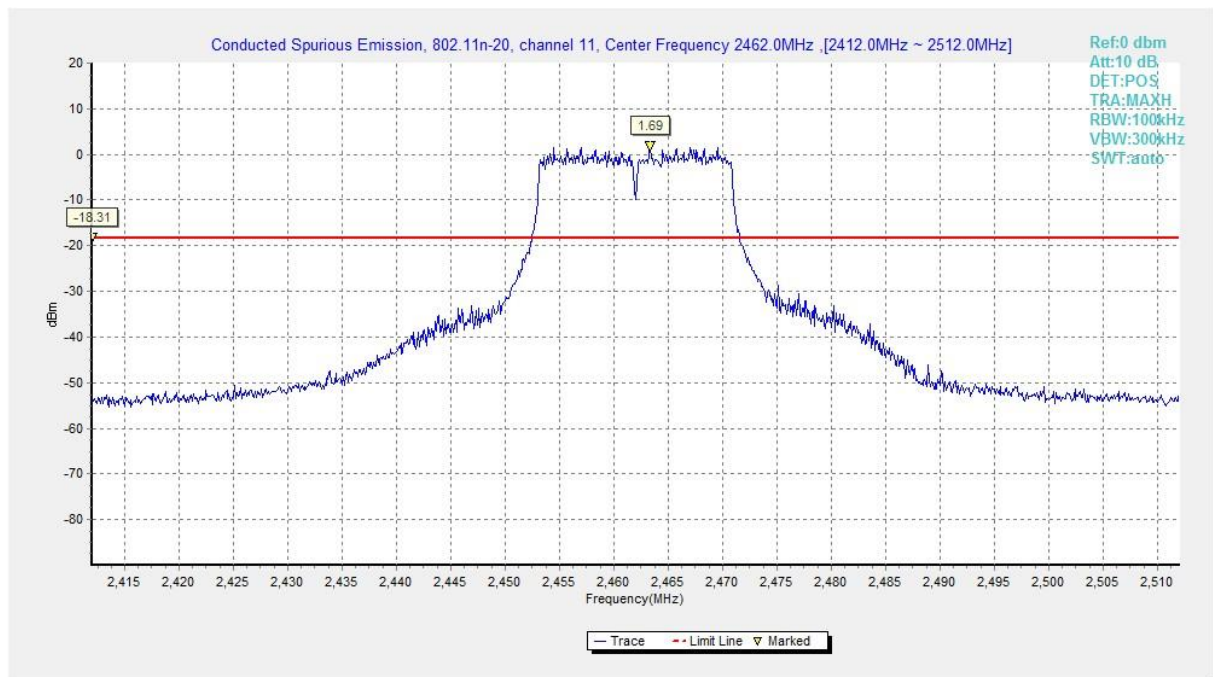


Fig.A.6.1.65 Conducted Spurious Emission (802.11n-HT20, Ch11, Center Frequency)

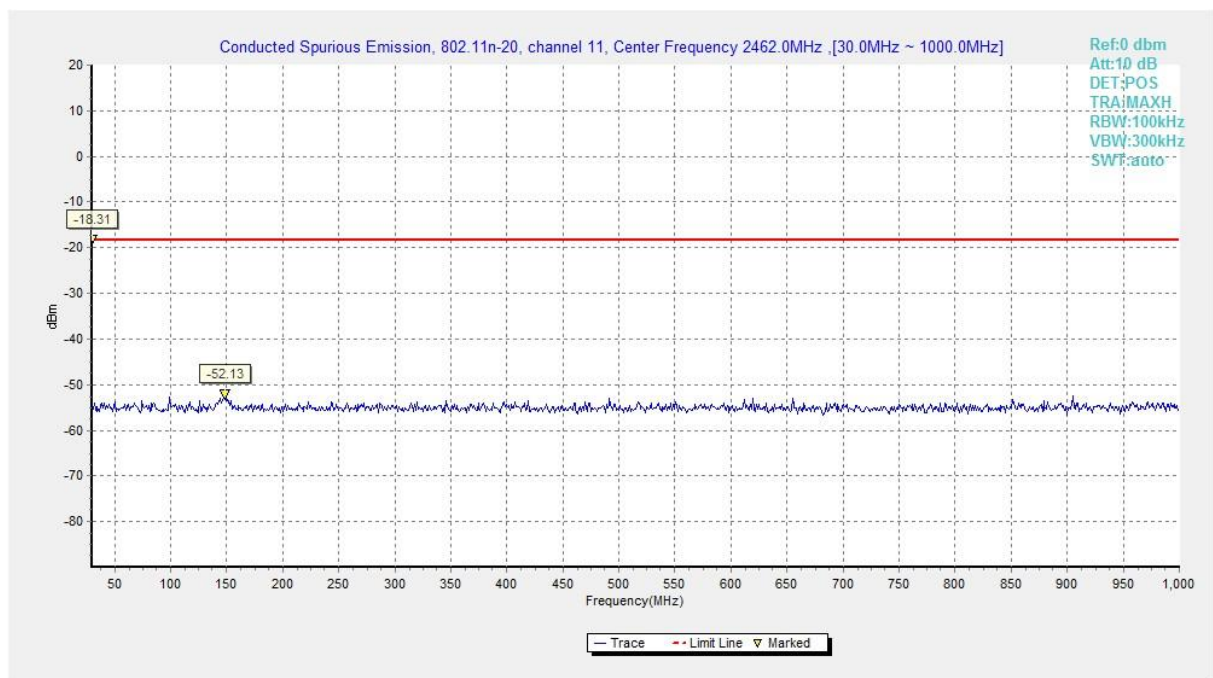


Fig.A.6.1.66 Conducted Spurious Emission (802.11n-HT20, Ch11, 30 MHz-1 GHz)

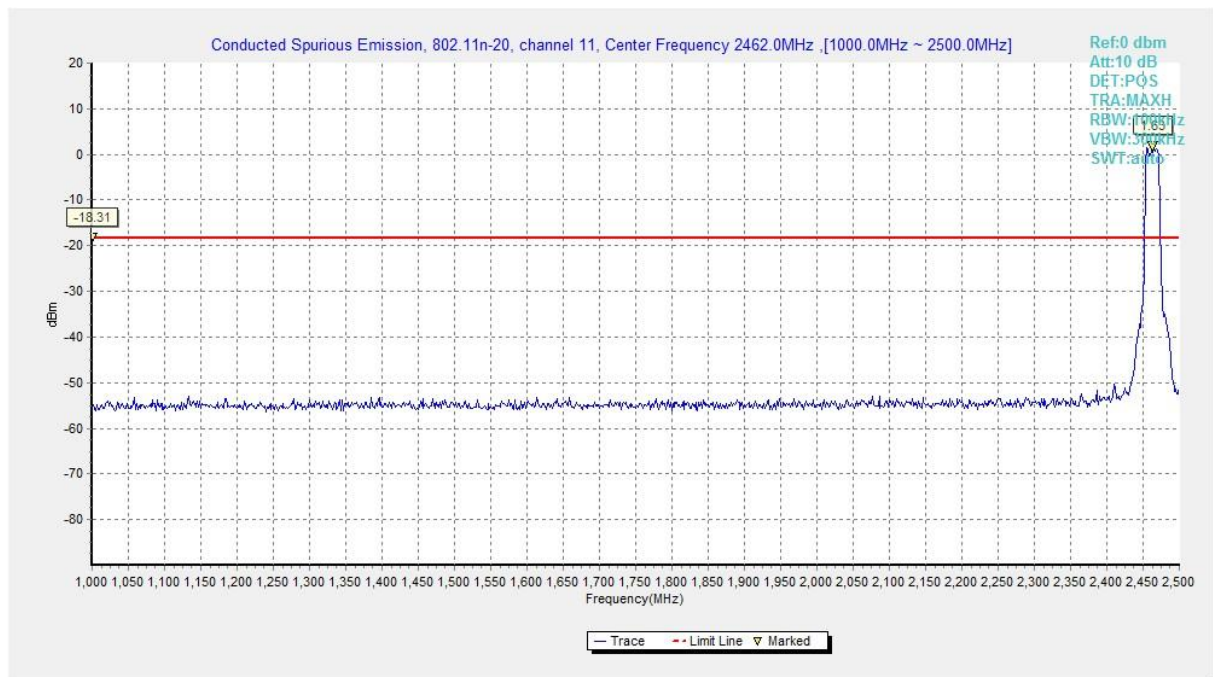


Fig.A.6.1.67 Conducted Spurious Emission (802.11n-HT20, Ch11, 1 GHz-2.5 GHz)

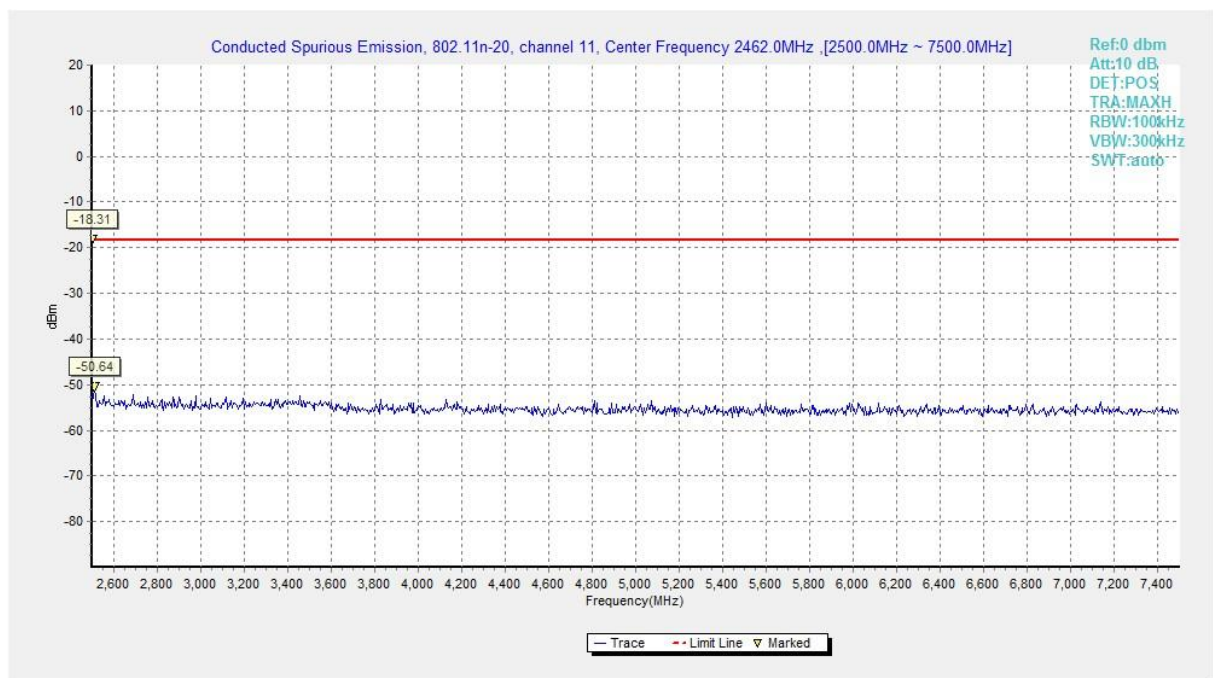


Fig.A.6.1.68 Conducted Spurious Emission (802.11n-HT20, Ch11, 2.5 GHz-7.5 GHz)

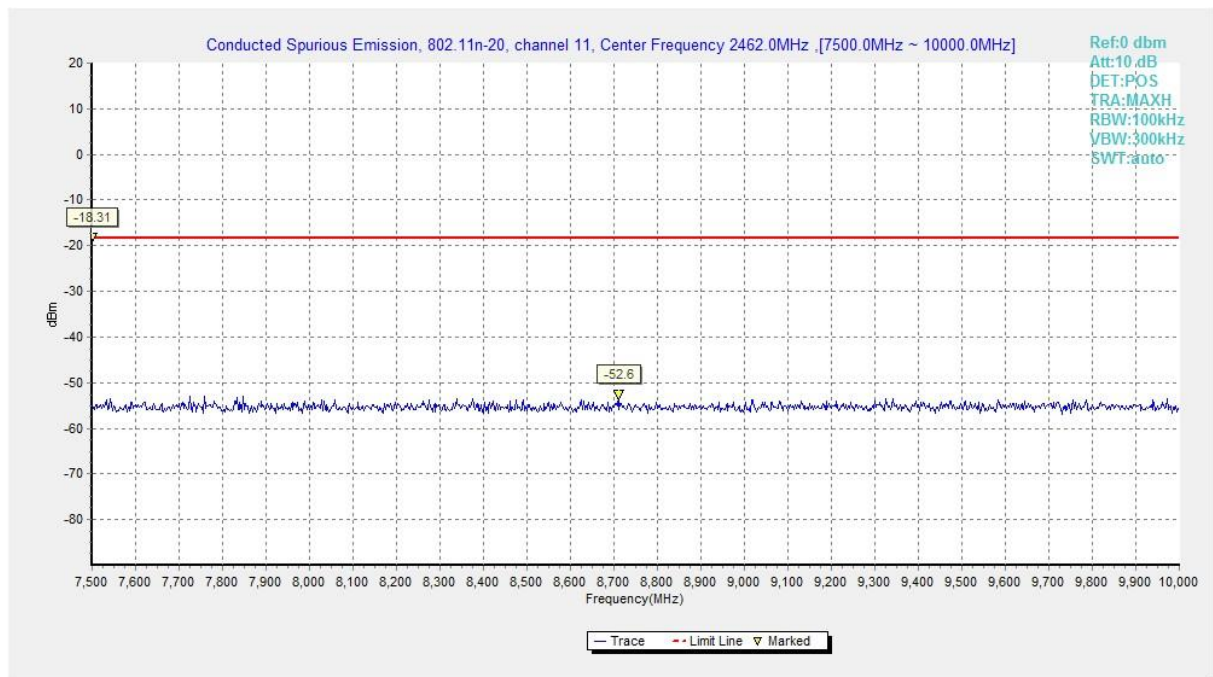


Fig.A.6.1.69 Conducted Spurious Emission (802.11n-HT20, Ch11, 7.5 GHz-10 GHz)

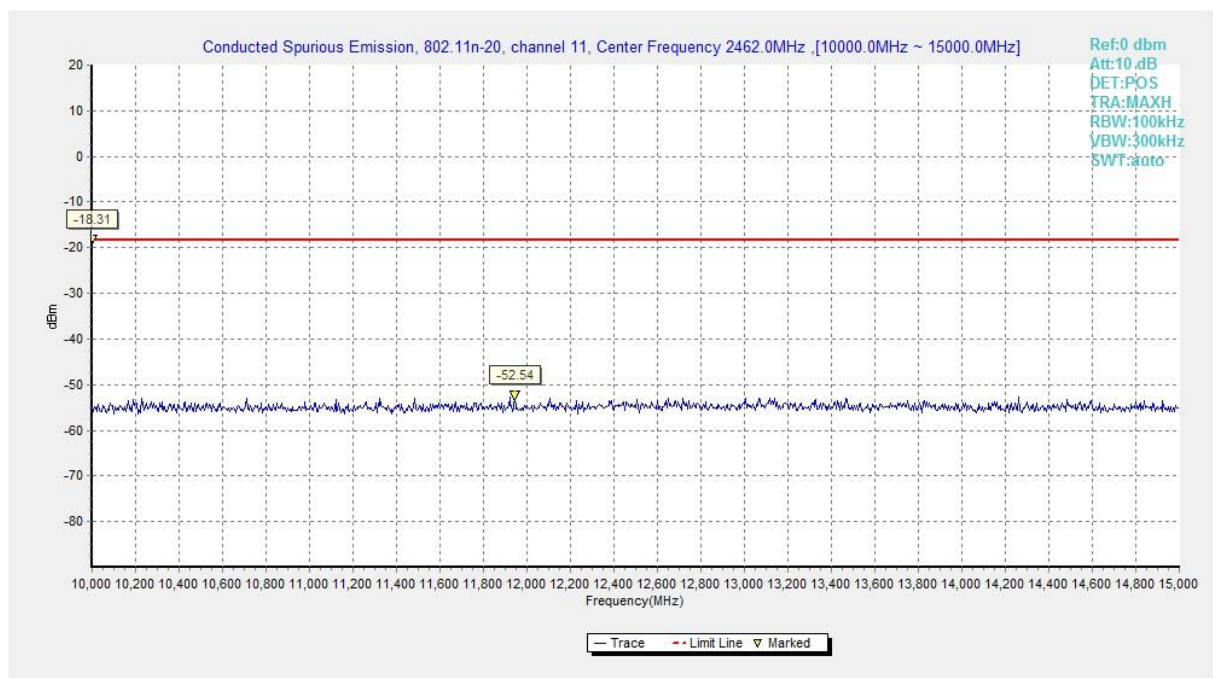


Fig.A.6.1.70 Conducted Spurious Emission (802.11n-HT20, Ch11, 10 GHz-15 GHz)

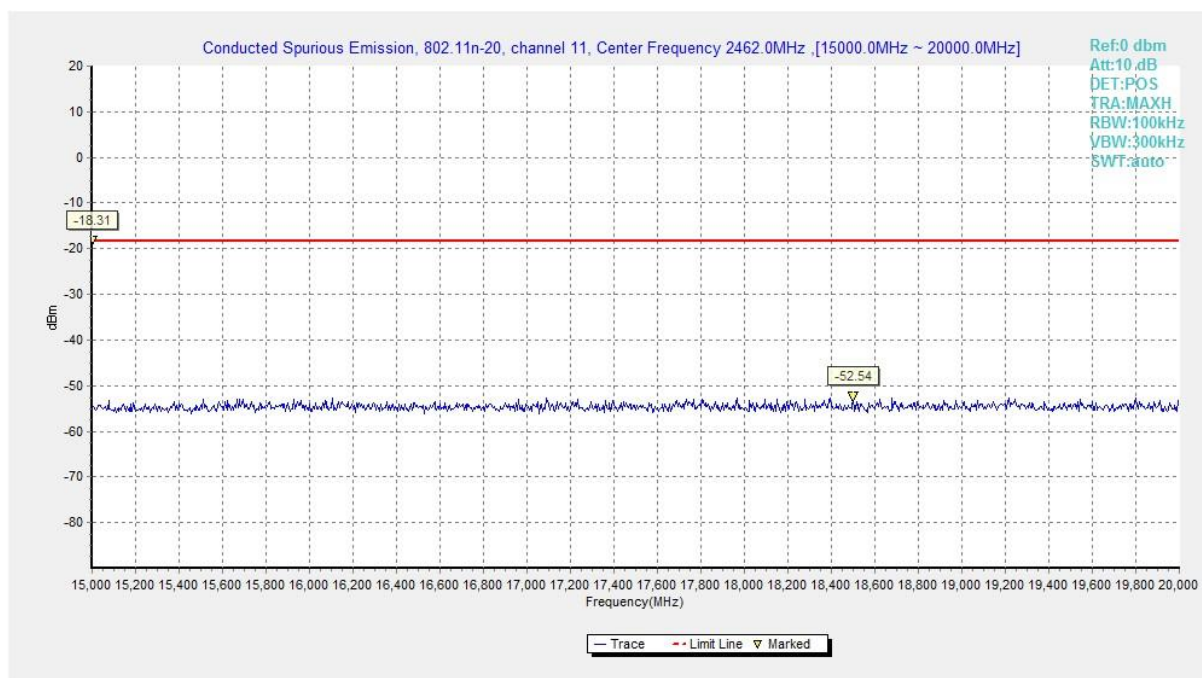


Fig.A.6.1.71 Conducted Spurious Emission (802.11n-HT20, Ch11, 15 GHz-20 GHz)

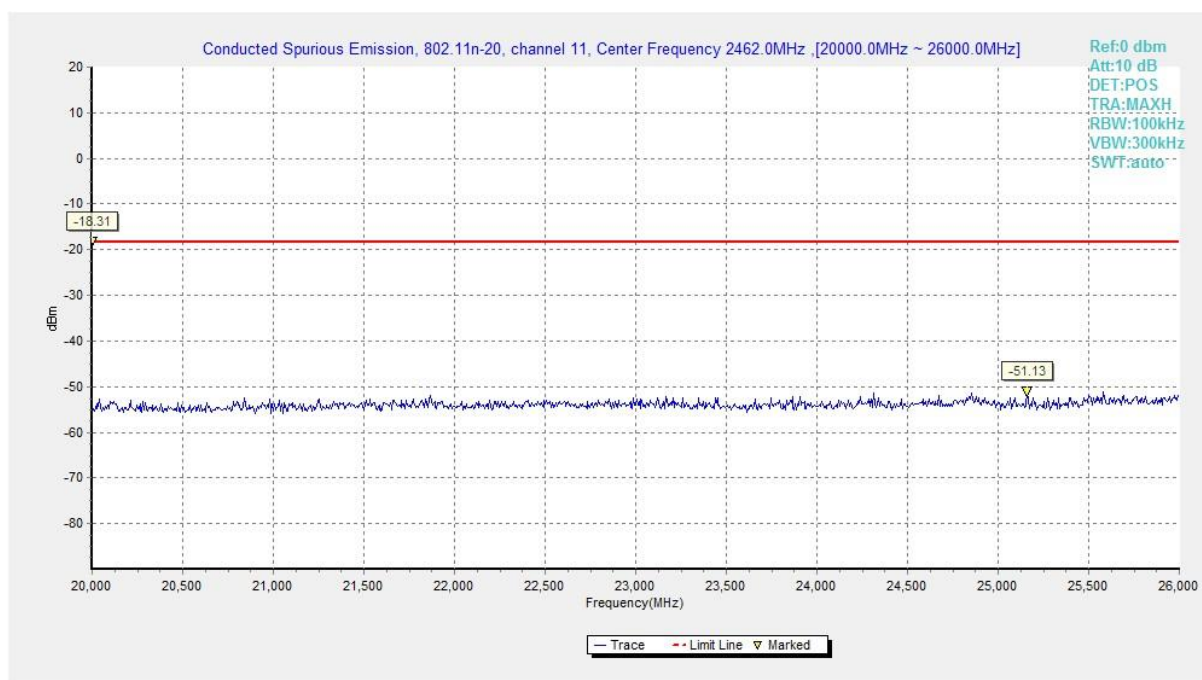


Fig.A.6.1.72 Conducted Spurious Emission (802.11n-HT20, Ch11, 20 GHz-26 GHz)

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/g 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
	Power	2.45GHz ~2.5GHz	Fig.A.6.2.7	P
	11	1 GHz ~ 3 GHz	Fig.A.6.2.8	P
		3 GHz ~ 18 GHz	Fig.A.6.2.9	P
802.11g	Power	2.38GHz ~2.43GHz	Fig.A.6.2.10	P
	1	1 GHz ~ 3 GHz	Fig.A.6.2.11	P
		3 GHz ~ 18 GHz	Fig.A.6.2.12	P
	6	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
	Power	2.45GHz ~2.5GHz	Fig.A.6.2.16	P
	11	1 GHz ~ 3 GHz	Fig.A.6.2.17	P
		3 GHz ~ 18 GHz	Fig.A.6.2.18	P

802.11n mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	Power	2.38GHz ~2.45GHz	Fig.A.6.2.19	P
	1	1 GHz ~ 3 GHz	Fig.A.6.2.20	P
		3 GHz ~ 18 GHz	Fig.A.6.2.21	P
	6	30 MHz ~1 GHz	Fig.A.6.2.22	P
		1 GHz ~ 3 GHz	Fig.A.6.2.23	P
		3 GHz ~ 18 GHz	Fig.A.6.2.24	P
	Power	2.45GHz ~2.5GHz	Fig.A.6.2.25	P
	11	1 GHz ~ 3 GHz	Fig.A.6.2.26	P
		3 GHz ~ 18 GHz	Fig.A.6.2.27	P
/	All channels	18 GHz~ 26.5 GHz	Fig.A.6.2.28	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
2387.518	46.0	-38.8	27.7	57.100	H
17703.000	55.6	-18.9	45.6	28.900	V
17658.000	55.4	-18.9	45.6	28.700	H
17989.500	55.0	-17.7	45.6	27.100	V
17886.000	54.9	-18.5	45.6	27.800	H
17952.000	54.7	-17.7	45.6	26.800	H

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17677.500	55.7	-45.6	44.5	53.366	H
17713.500	55.0	-18.5	45.6	23.900	V
17982.000	55.0	-18.5	45.6	23.800	V
17683.500	54.7	-18.5	45.6	23.700	H
17950.500	54.5	-18.5	45.6	23.300	V
17992.500	54.5	-18.5	45.6	23.300	V

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
2486.044	63.8	-38.9	27.7	75.000	V
17989.500	55.7	-17.7	45.6	27.800	H
17676.000	55.6	-18.9	45.6	28.900	H
17686.500	55.1	-18.9	45.6	28.400	V
17935.500	54.9	-17.7	45.6	27.000	V
17568.000	54.9	-18.9	45.6	28.200	H

802.11g
Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2389.791	56.0	-38.8	27.7	67.100	H
17677.500	55.5	-18.9	45.6	28.800	V
17776.500	55.2	-18.5	45.6	28.100	H
17985.000	55.1	-17.7	45.6	27.200	V
17638.500	54.9	-18.9	45.6	28.200	V
17958.000	54.8	-17.7	45.6	26.900	V

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17947.500	55.1	-17.7	45.6	27.200	H
17976.000	55.1	-17.7	45.6	27.200	V
17997.000	55.0	-17.7	45.6	27.100	V
17745.000	54.8	-18.5	45.6	27.700	H
17974.500	54.8	-17.7	45.6	26.900	V
17695.500	54.8	-18.9	45.6	28.100	H

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17725.500	55.7	-18.9	45.6	29.000	H
17812.500	55.3	-18.5	45.6	28.200	H
17952.000	55.3	-17.7	45.6	27.400	V
17685.000	55.0	-18.9	45.6	28.300	V
17992.500	54.9	-17.7	45.6	27.000	V
17902.500	54.9	-18.5	45.6	27.800	V

802.11n-HT20

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2389.790	56.0	-38.8	27.7	62.800	V
17952.000	55.6	-17.7	45.6	25.200	V
17986.500	55.5	-18.5	45.6	23.400	H
17680.500	55.5	-18.5	45.6	23.200	V
17908.500	55.3	-18.5	45.6	23.200	V
17673.000	55.3	-17.7	45.6	22.100	V

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
17982.000	55.5	-17.7	45.6	27.600	V
17983.500	55.0	-17.7	45.6	27.100	H
17880.000	55.0	-18.5	45.6	27.900	V
17989.500	54.9	-17.7	45.6	27.000	H
17956.500	54.8	-17.7	45.6	26.900	V
17940.000	54.7	-17.7	45.6	26.800	H

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss(dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2484.456	57.5	-38.9	27.7	68.700	V
17947.500	55.6	-17.7	45.6	27.700	H
17701.500	55.4	-18.9	45.6	28.700	H
17958.000	55.2	-17.7	45.6	27.300	V
17989.500	55.0	-17.7	45.6	27.100	V
17872.500	55.0	-18.5	45.6	27.900	V

Test graphs as below:

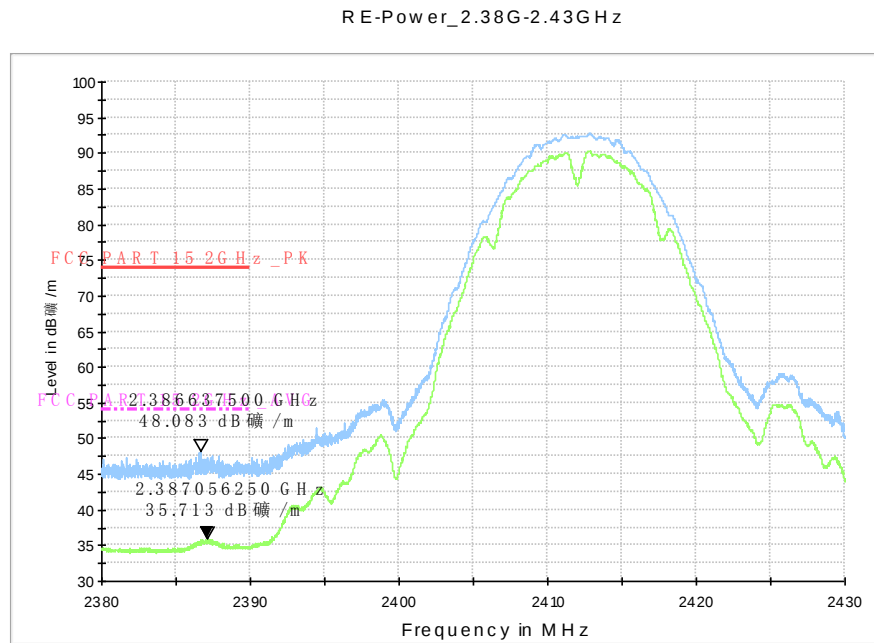


Fig.A.6.2.1 Radiated Spurious Emission (Power): 802.11b, ch1, 2.38 GHz – 2.45GHz

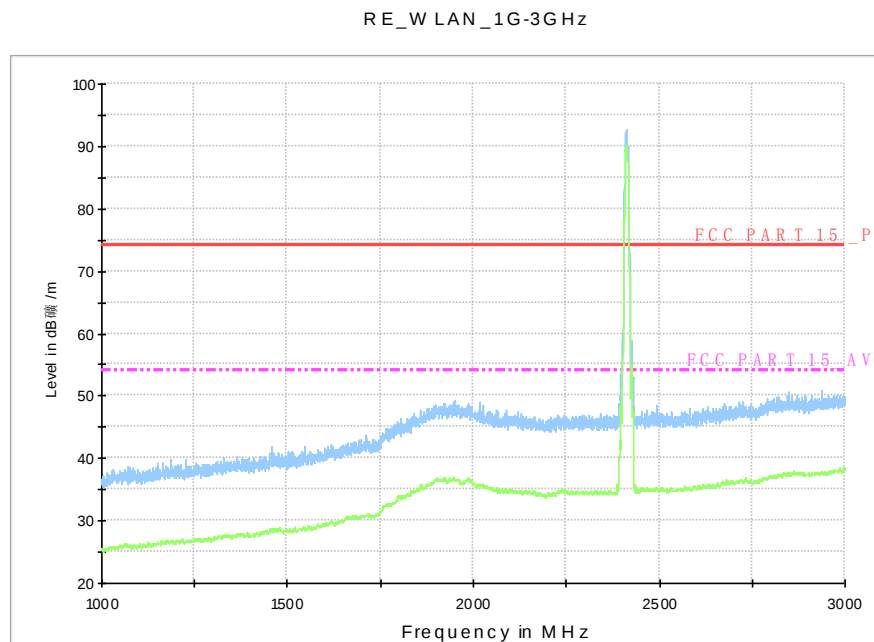


Fig.A.6.2.2 Radiated Spurious Emission (802.11b, Ch1, 1 GHz-3 GHz)

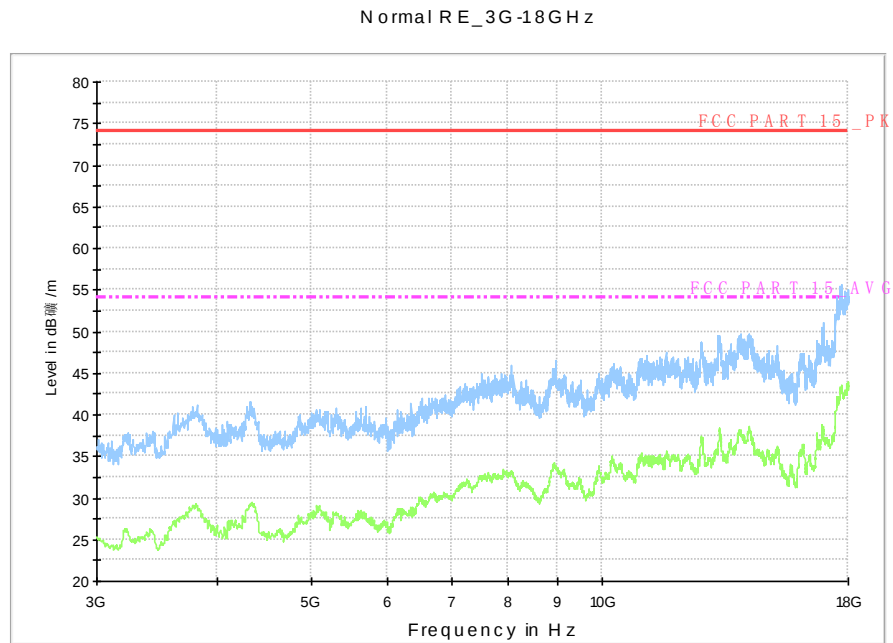


Fig.A.6.2.3 Radiated Spurious Emission (802.11b, Ch1, 3 GHz-18 GHz)

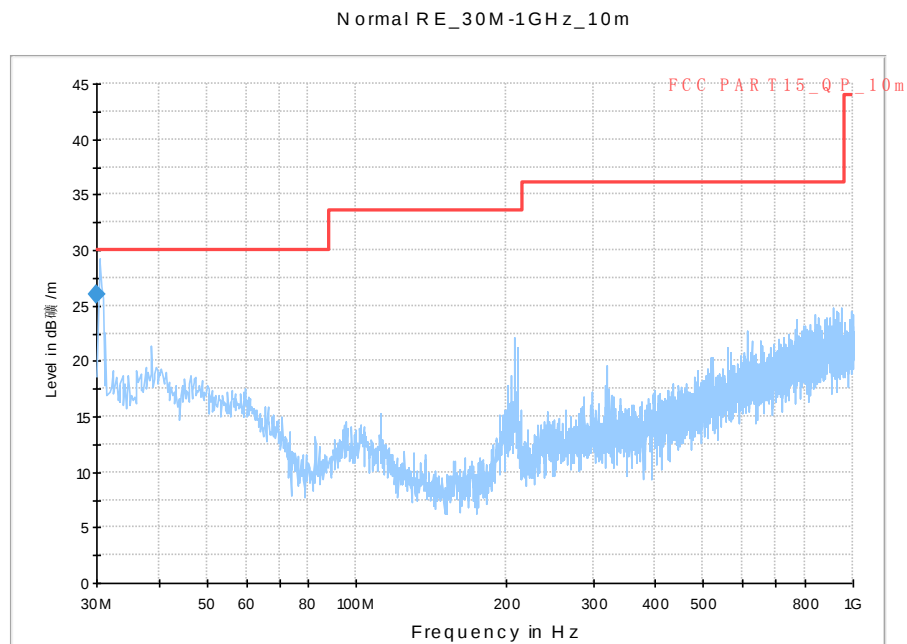


Fig.A.6.2.4 Radiated Spurious Emission (802.11b, Ch6, 30 MHz-1 GHz)

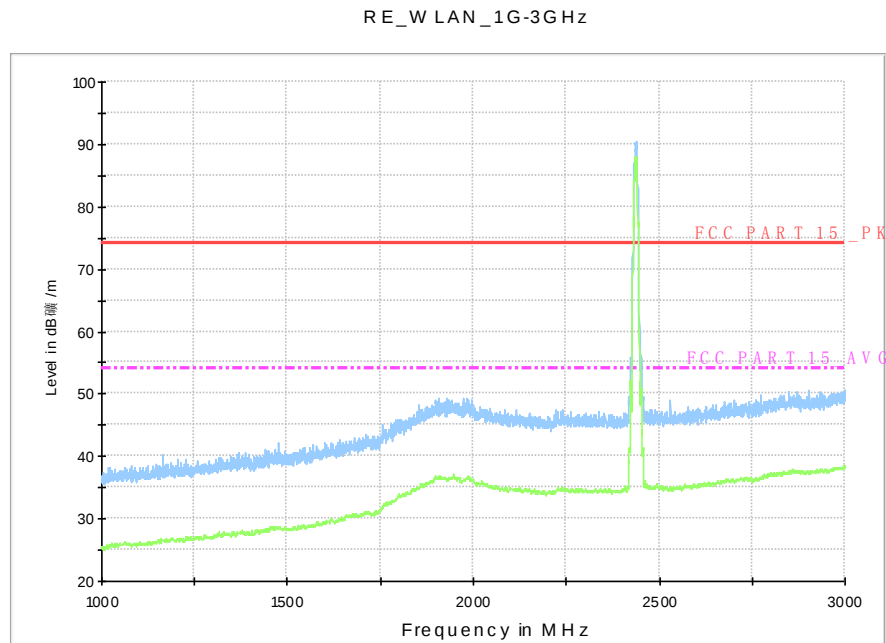


Fig.A.6.2.5 Radiated Spurious Emission (802.11b, Ch6, 1 GHz-3 GHz)

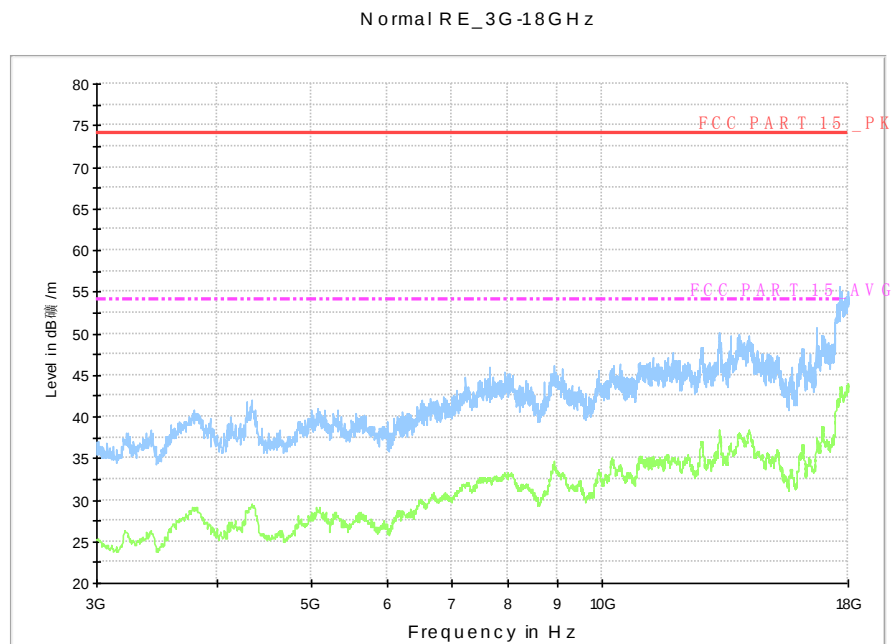


Fig.A.6.2.6 Radiated Spurious Emission (802.11b, Ch6, 3 GHz-18 GHz)

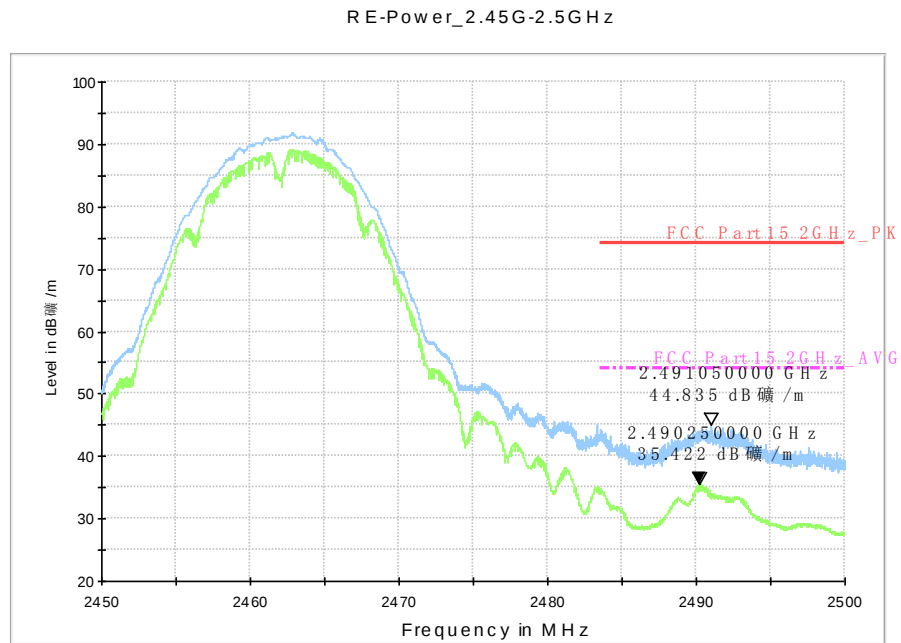


Fig.A.6.2.7 Radiated Spurious Emission (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz

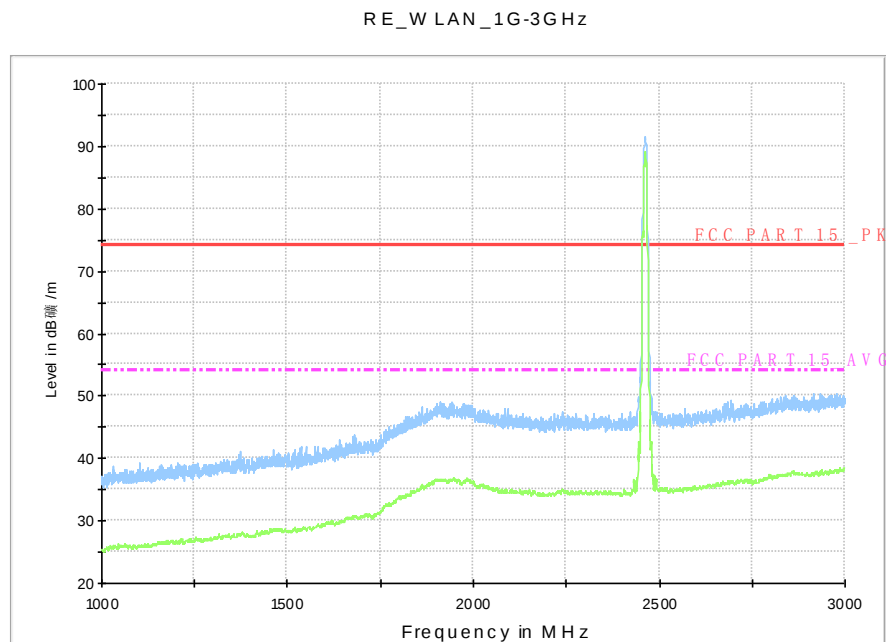


Fig.A.6.2.8 Radiated Spurious Emission (802.11b, Ch11, 1 GHz-3 GHz)

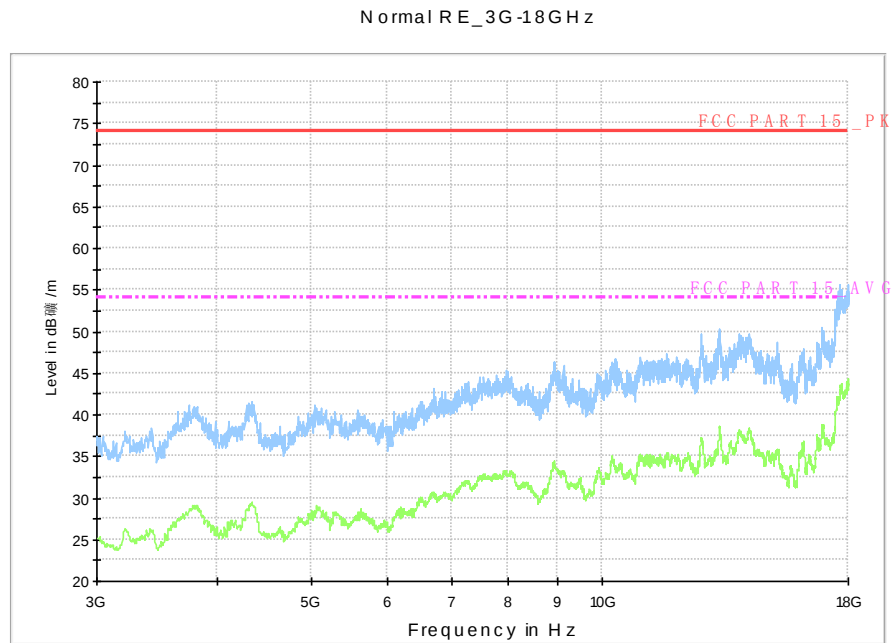


Fig.A.6.2.9 Radiated Spurious Emission (802.11b, Ch11, 3 GHz-18 GHz)

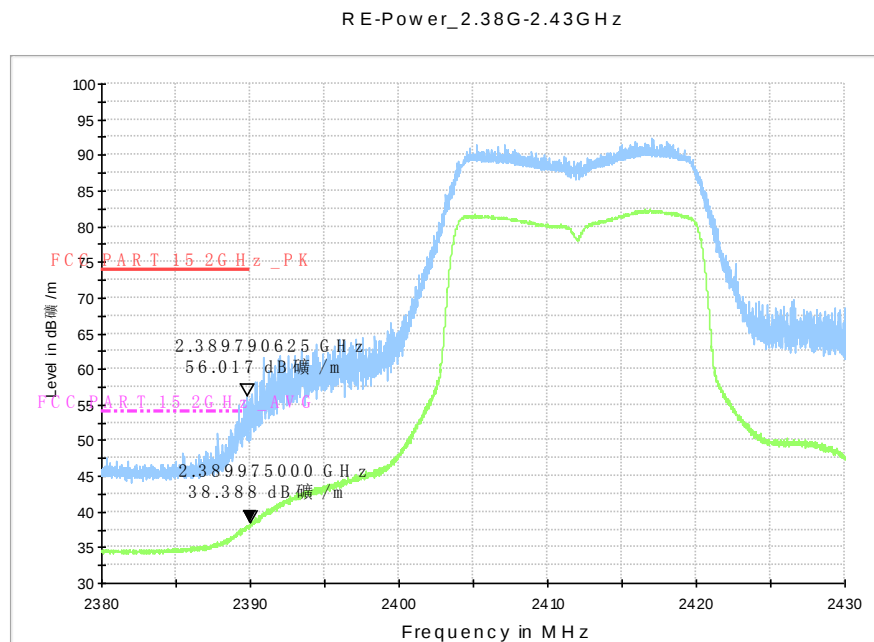


Fig.A.6.2.10 Radiated Spurious Emission (Power): 802.11g, ch1, 2.38 GHz - 2.45GHz

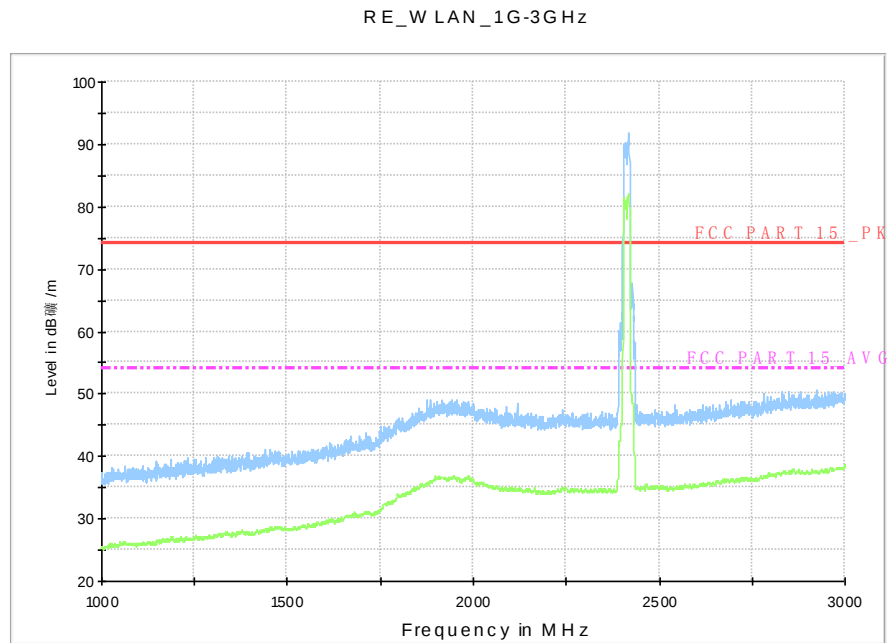


Fig.A.6.2.11 Radiated Spurious Emission (802.11g, Ch1, 1 GHz-3 GHz)

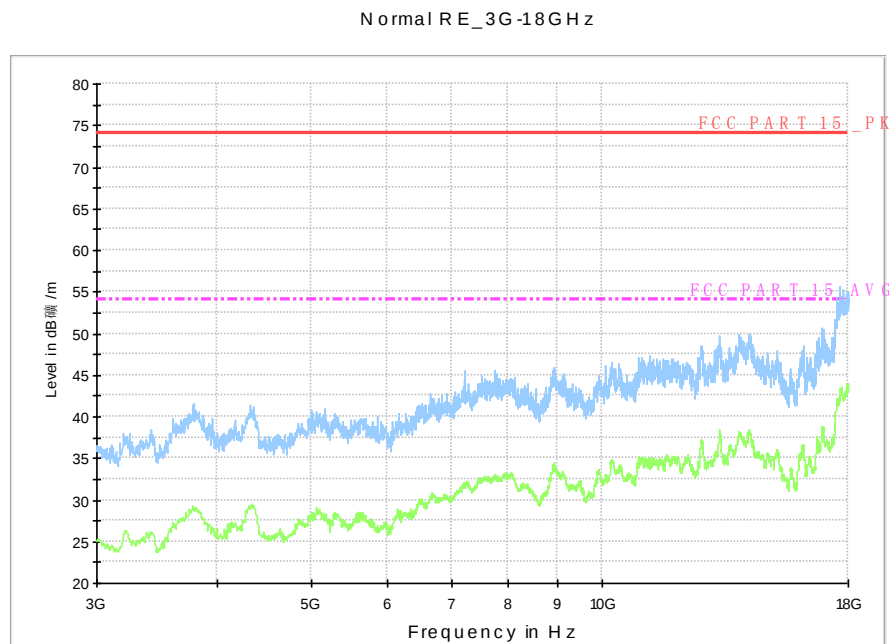


Fig.A.6.2.12 Radiated Spurious Emission (802.11g, Ch1, 3 GHz-18 GHz)

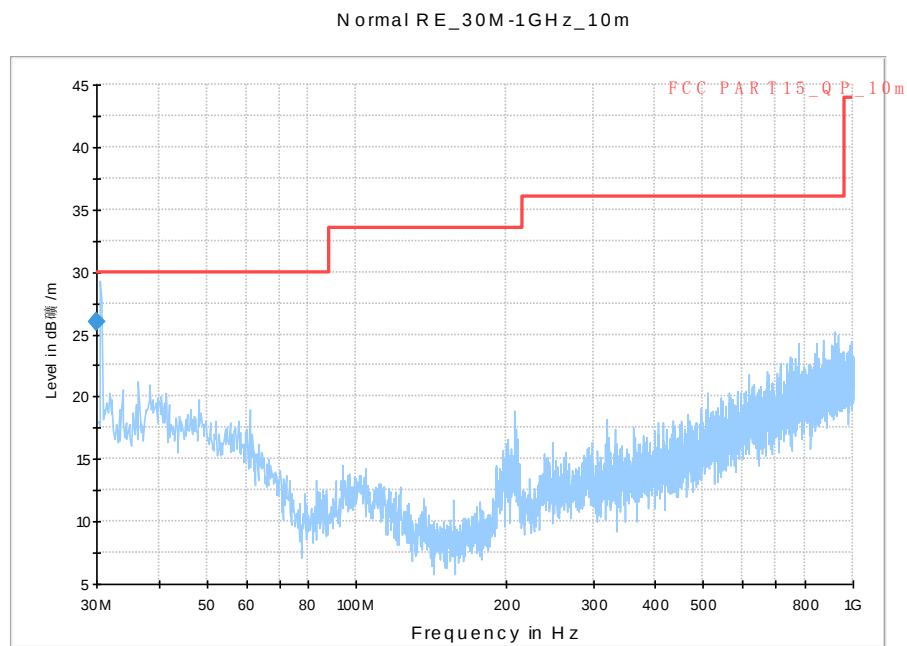


Fig.A.6.2.13 Radiated Spurious Emission (802.11g, Ch6, 30 MHz-1 GHz)

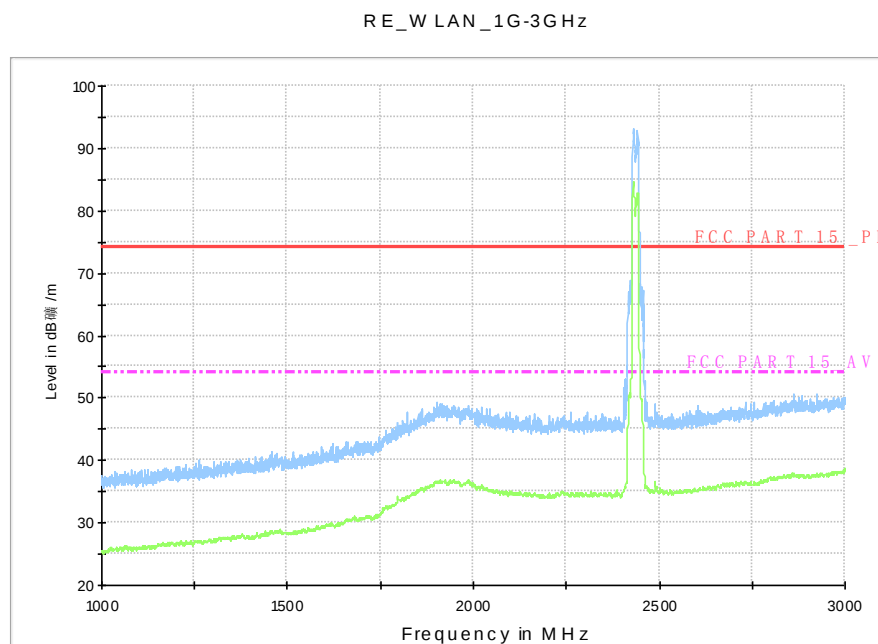


Fig.A.6.2.14 Radiated Spurious Emission (802.11g, Ch6, 1 GHz-3 GHz)

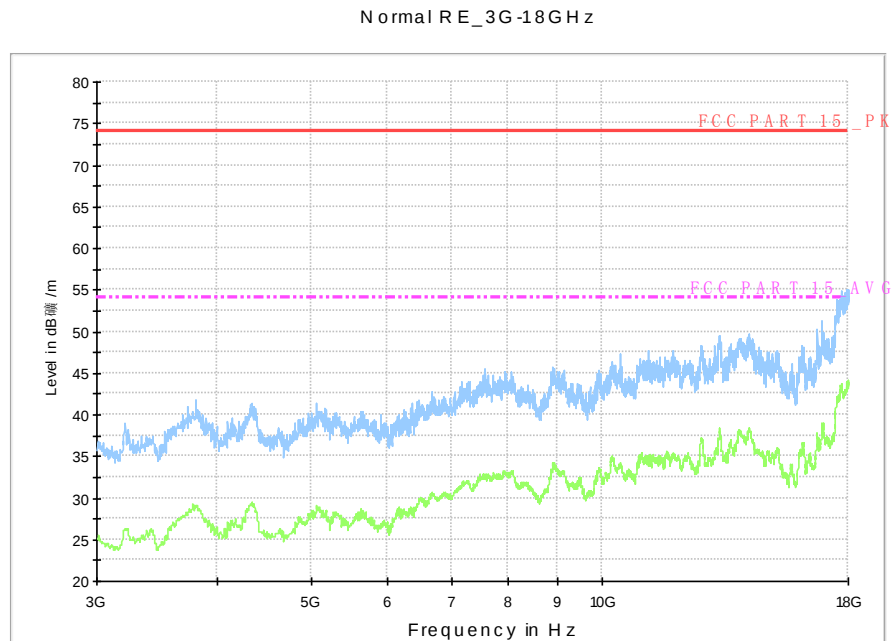


Fig.A.6.2.15 Radiated Spurious Emission (802.11g, Ch6, 3 GHz-18 GHz)

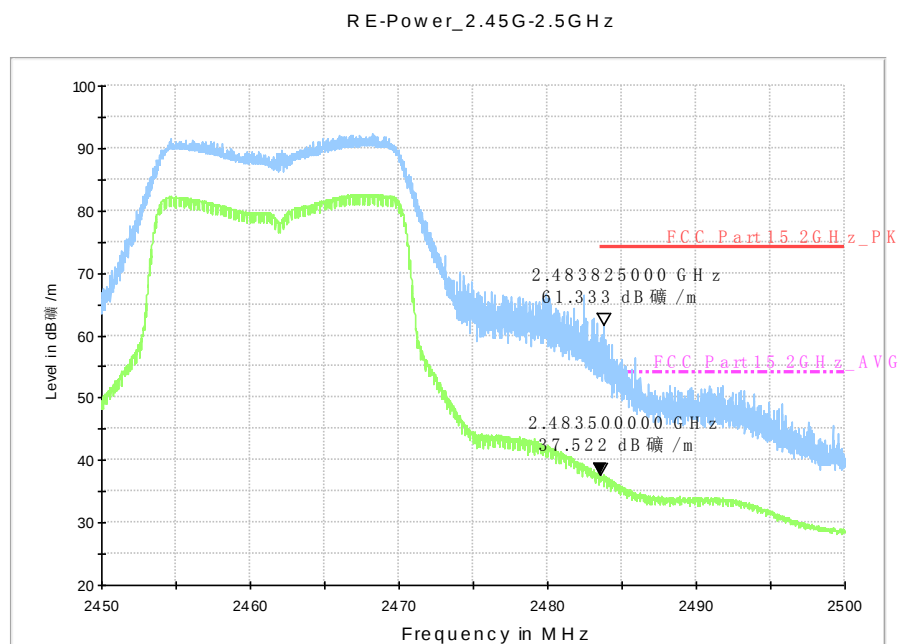


Fig.A.6.2.16 Radiated Spurious Emission (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz

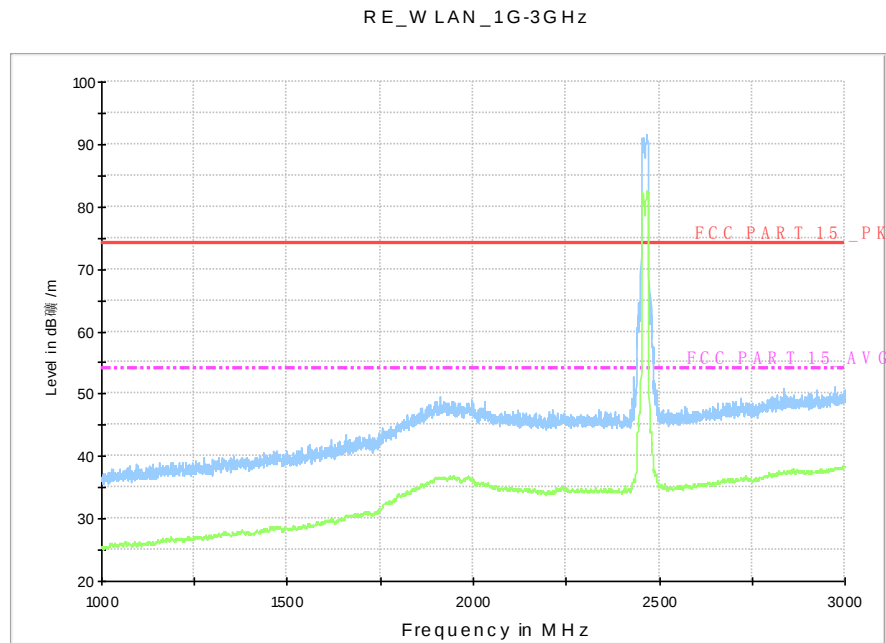


Fig.A.6.2.17 Radiated Spurious Emission (802.11g, Ch11, 1 GHz-3 GHz)

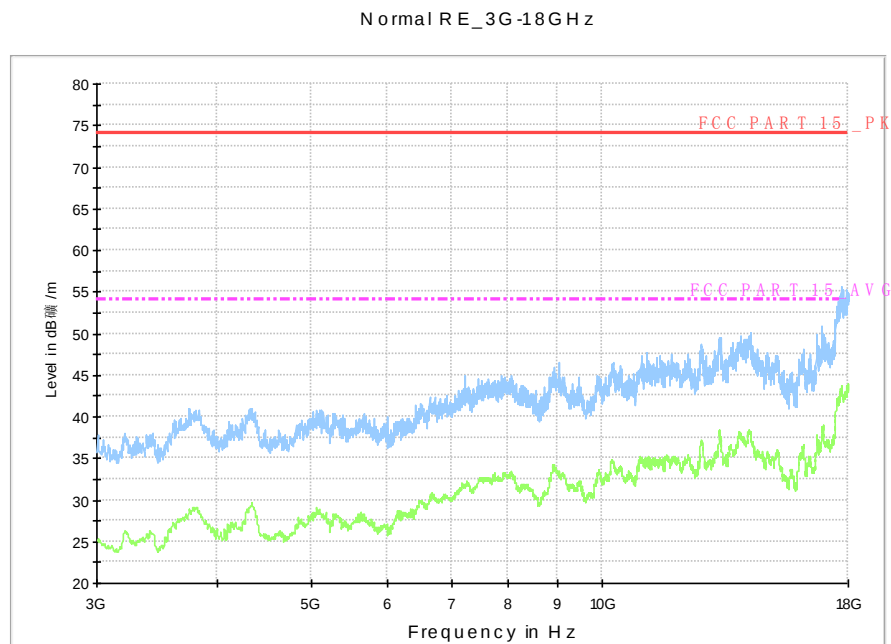


Fig.A.6.2.18 Radiated Spurious Emission (802.11g, Ch11, 3 GHz-18 GHz)

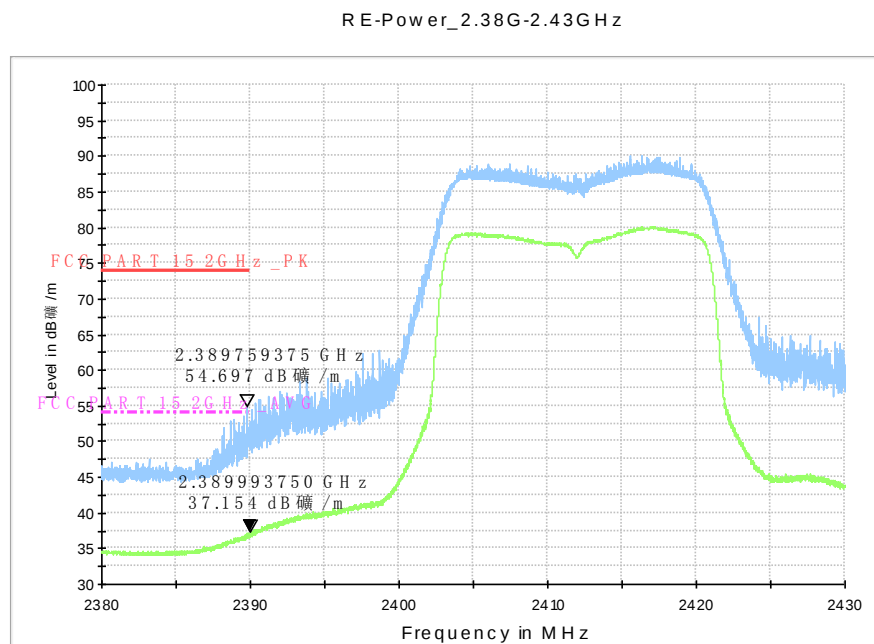


Fig.A.6.2.19 Radiated Spurious Emission (Power): 802.11n-HT20, ch1, 2.38 GHz - 2.45GHz

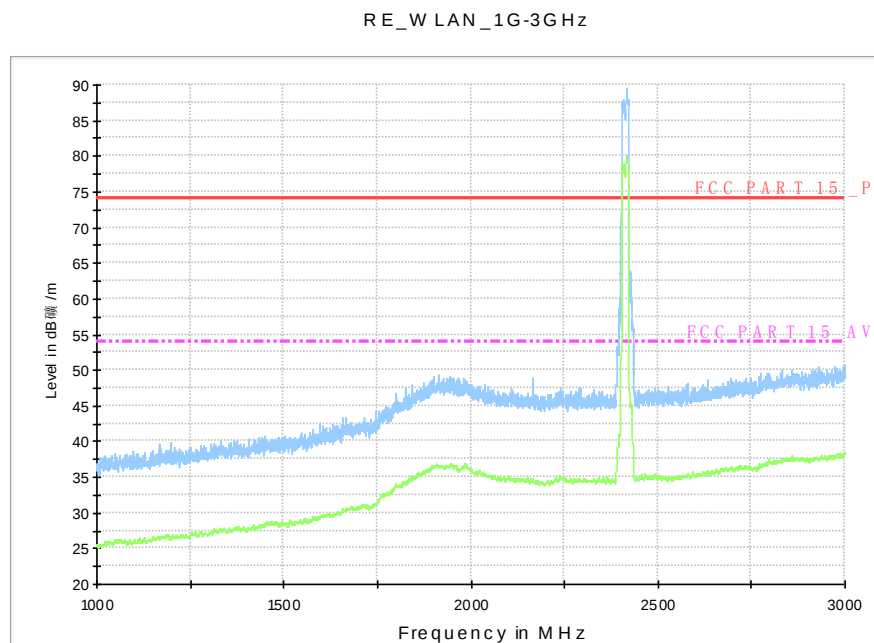


Fig.A.6.2.20 Radiated Spurious Emission (802.11n-HT20, Ch1, 1 GHz-3 GHz)

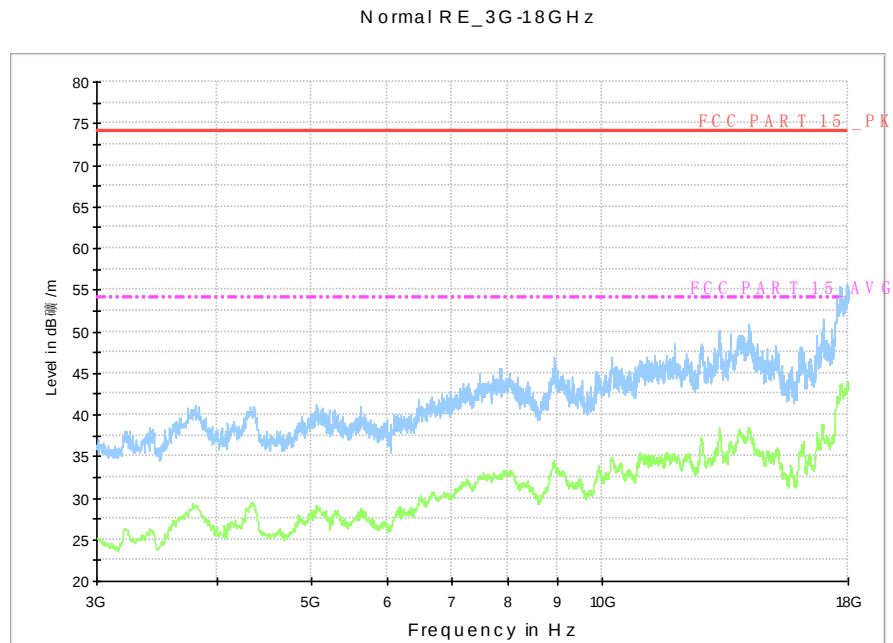


Fig.A.6.2.21 Radiated Spurious Emission (802.11n-HT20, Ch1, 3 GHz-18 GHz)

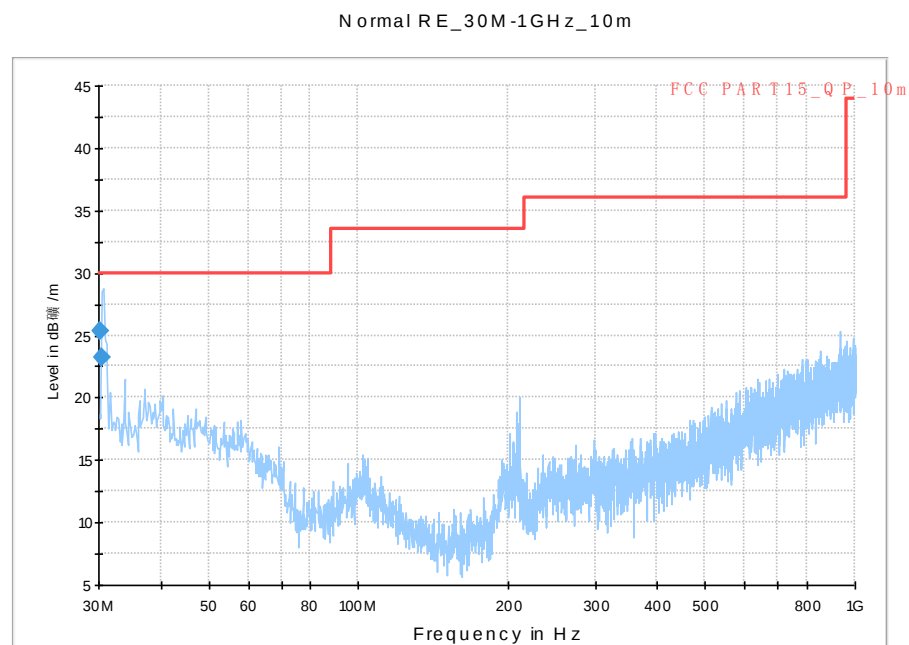


Fig.A.6.2.22 Radiated Spurious Emission (802.11n-HT20, Ch6, 30 MHz-1 GHz)

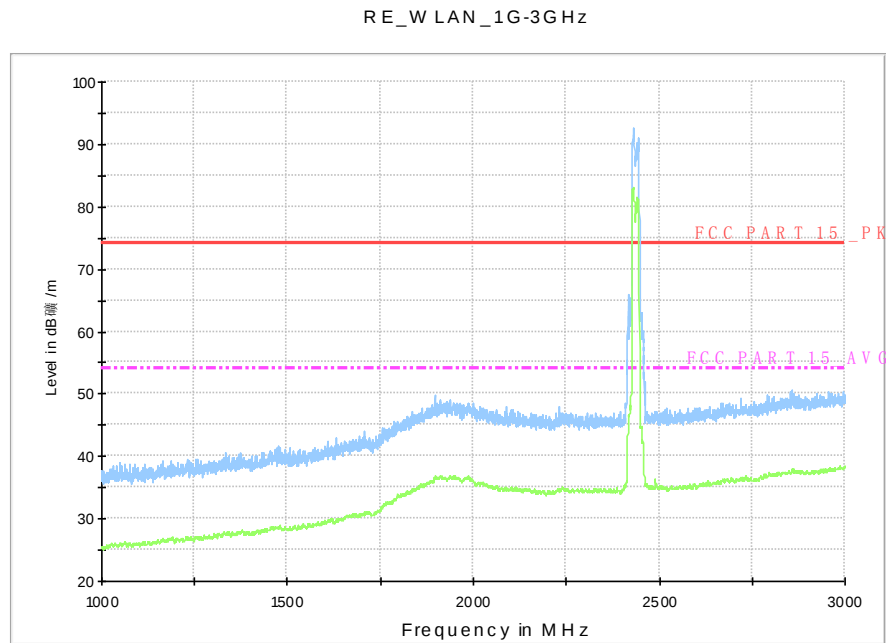


Fig.A.6.2.23 Radiated Spurious Emission (802.11n-HT20, Ch6, 1 GHz-3 GHz)

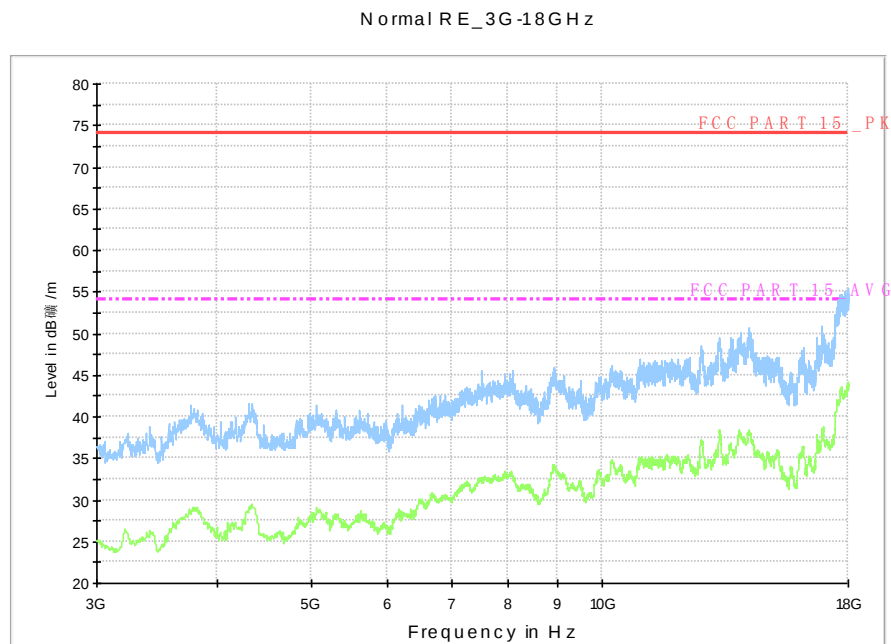


Fig.A.6.2.24 Radiated Spurious Emission (802.11n-HT20, Ch6, 3 GHz-18 GHz)

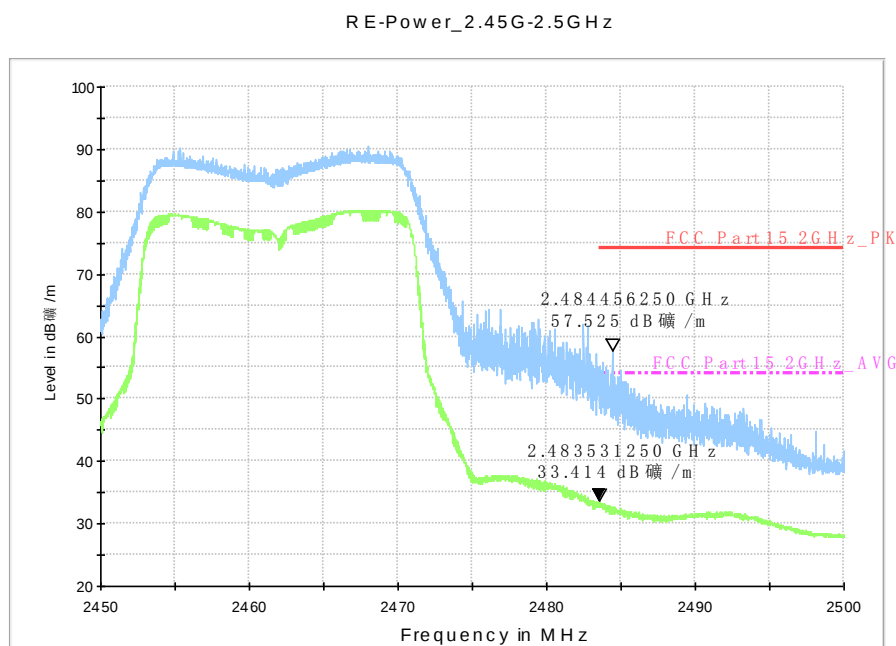


Fig.A.6.2.25 Radiated Spurious Emission (Power): 802.11n-HT20, ch11, 2.45 GHz - 2.50GHz

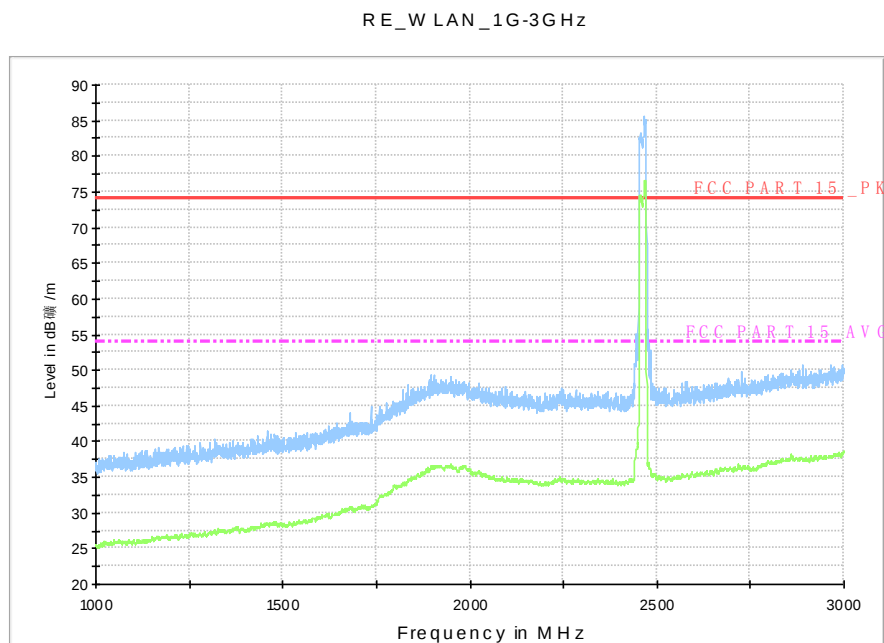


Fig.A.6.2.26 Radiated Spurious Emission (802.11n-HT20, Ch11, 1 GHz-3 GHz)

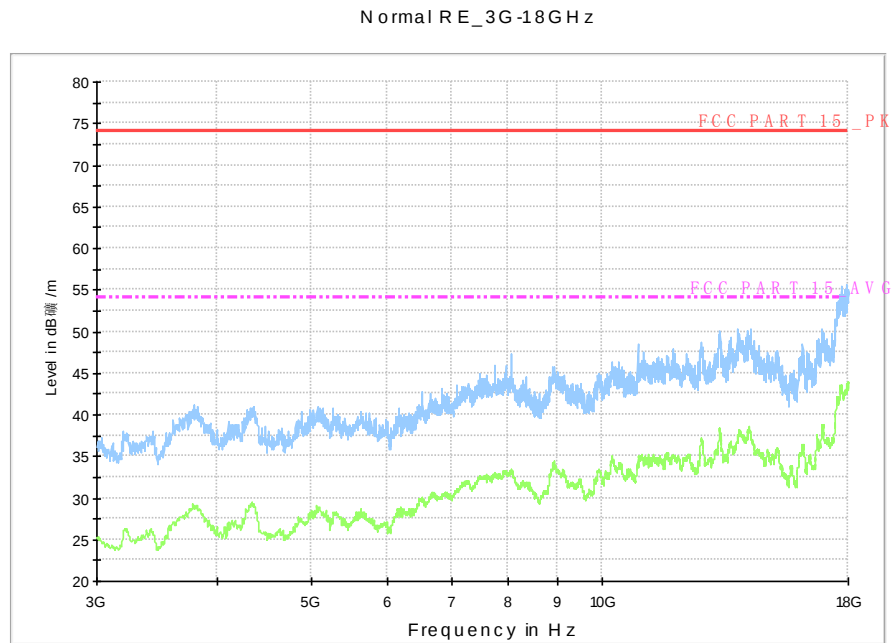


Fig.A.6.2.27 Radiated Spurious Emission (802.11n-HT20, Ch11, 3 GHz-18 GHz)

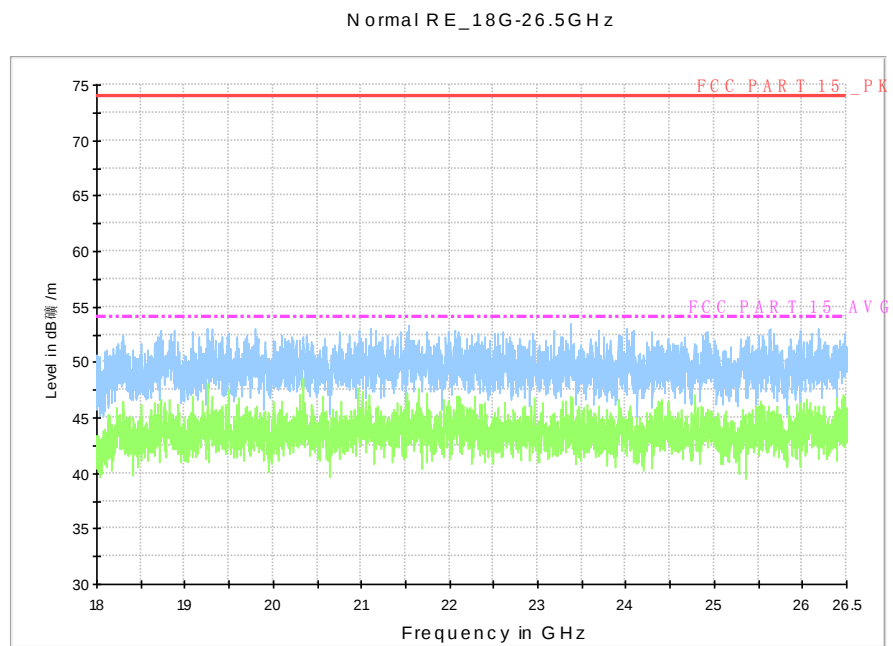


Fig.A.6.2.28 Radiated Spurious Emission (All channels): 18GHz – 26.5GHz

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 (dBμV)	Result (dBμV)		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 (dBμV)	Result (dBμV)		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 =3.2dB, k=2.

Test graphs as below:

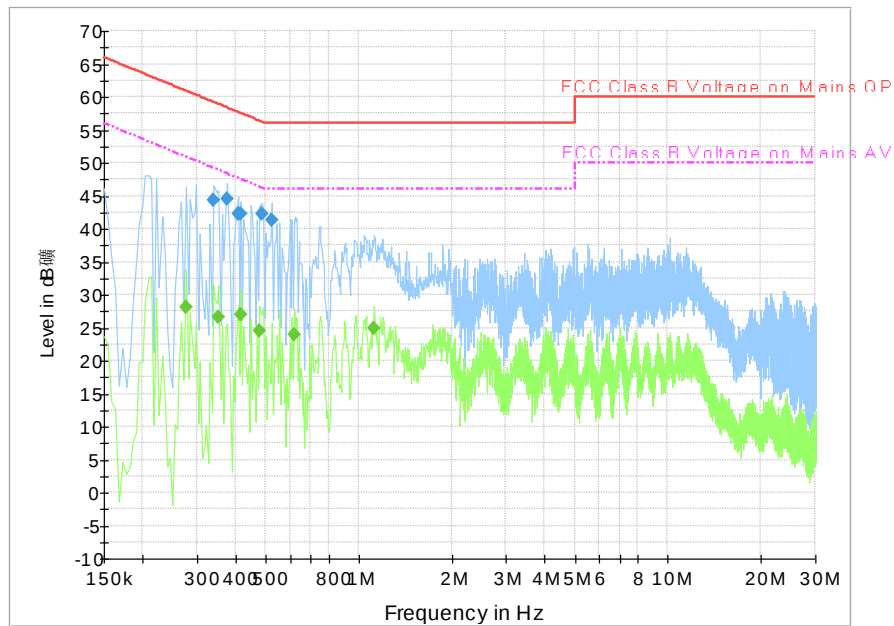


Fig.A.7.1 AC Powerline Conducted Emission-802.11b

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)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.339000	44.3	GND	N	9.8	15.0	59.2
0.375000	44.6	GND	L1	9.8	13.8	58.4
0.406500	42.3	GND	L1	9.8	15.4	57.7
0.415500	42.4	GND	N	9.8	15.2	57.5
0.487500	42.2	GND	N	9.8	14.0	56.2
0.523500	41.3	GND	N	9.8	14.7	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.276000	28.0	GND	N	9.8	22.9	50.9
0.352500	26.6	GND	L1	9.8	22.3	48.9
0.415500	26.9	GND	L1	9.8	20.6	47.5
0.478500	24.5	GND	N	9.8	21.8	46.4
0.618000	23.9	GND	N	9.8	22.1	46.0
1.122000	24.9	GND	L1	9.7	21.1	46.0

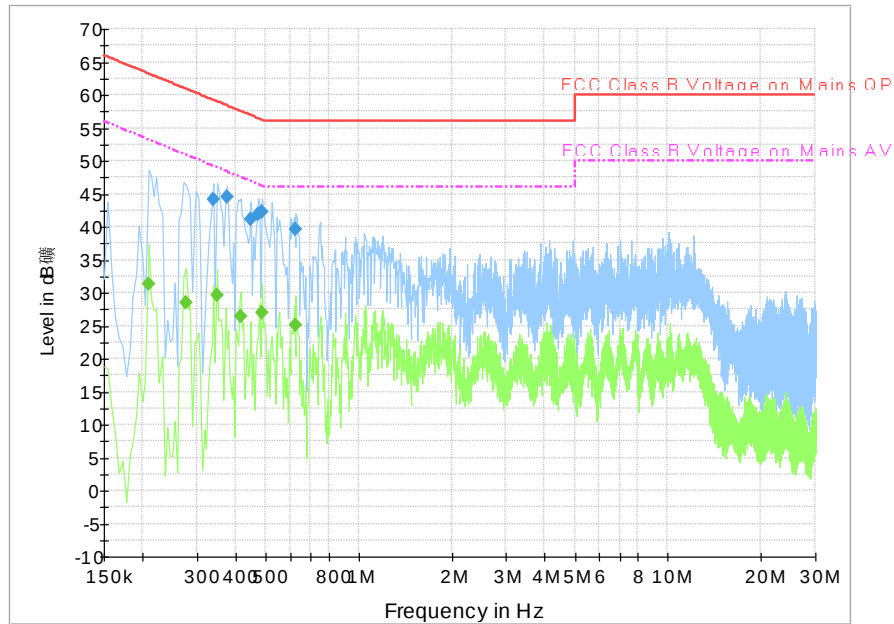


Fig.A.7.2 AC Powerline Conducted Emission-Idle

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

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.339000	44.2	GND	L1	9.8	15.0	59.2
0.375000	44.4	GND	L1	9.8	13.9	58.4
0.447000	41.2	GND	L1	9.8	15.8	56.9
0.474000	41.8	GND	N	9.8	14.6	56.4
0.487500	42.3	GND	N	9.8	13.9	56.2
0.627000	39.6	GND	N	9.8	16.4	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.208500	31.4	GND	N	9.8	21.9	53.3
0.276000	28.5	GND	L1	9.8	22.4	50.9
0.348000	29.6	GND	N	9.8	19.4	49.0
0.415500	26.5	GND	L1	9.8	21.1	47.5
0.487500	27.0	GND	N	9.8	19.2	46.2
0.627000	25.0	GND	N	9.8	21.0	46.0