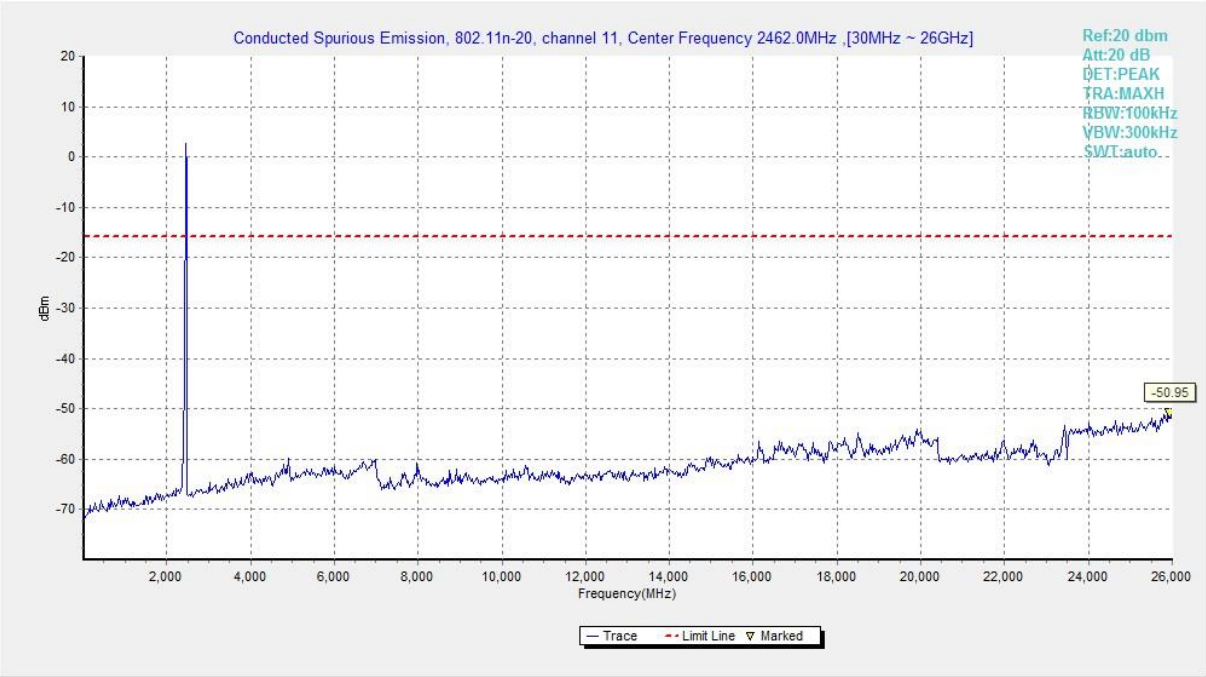

Fig.41 Conducted Spurious Emission (802.11n HT20, CH11)

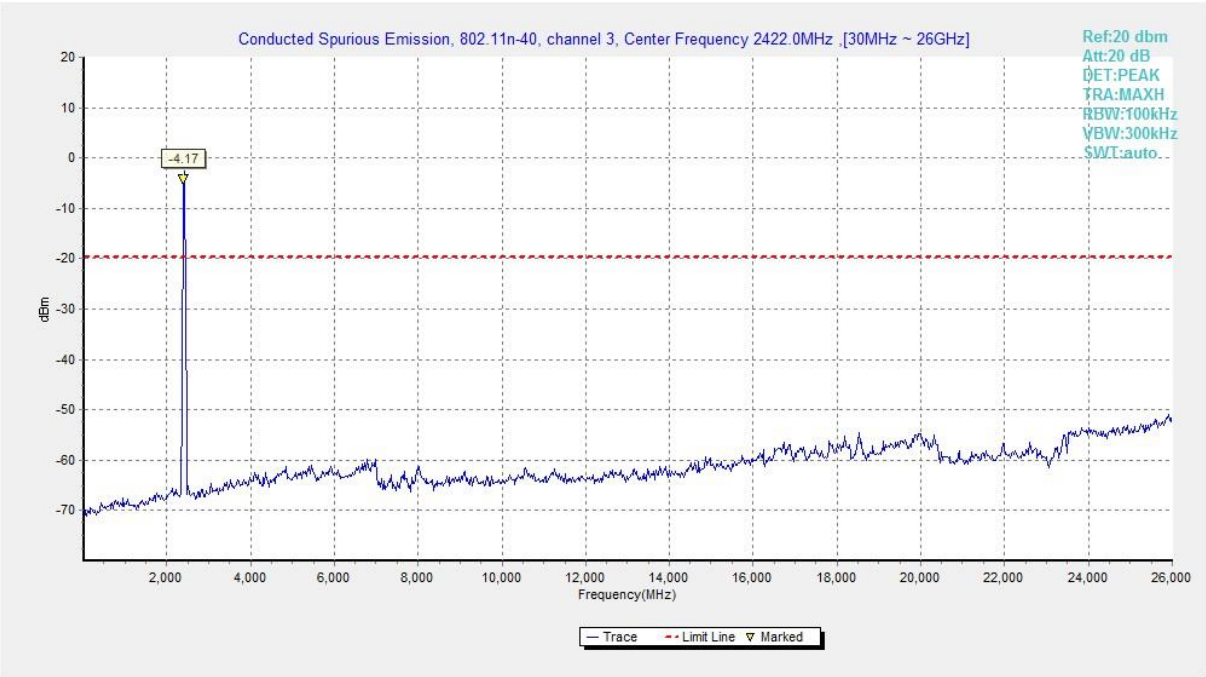

Fig.42 Conducted Spurious Emission (802.11n HT40, CH3)

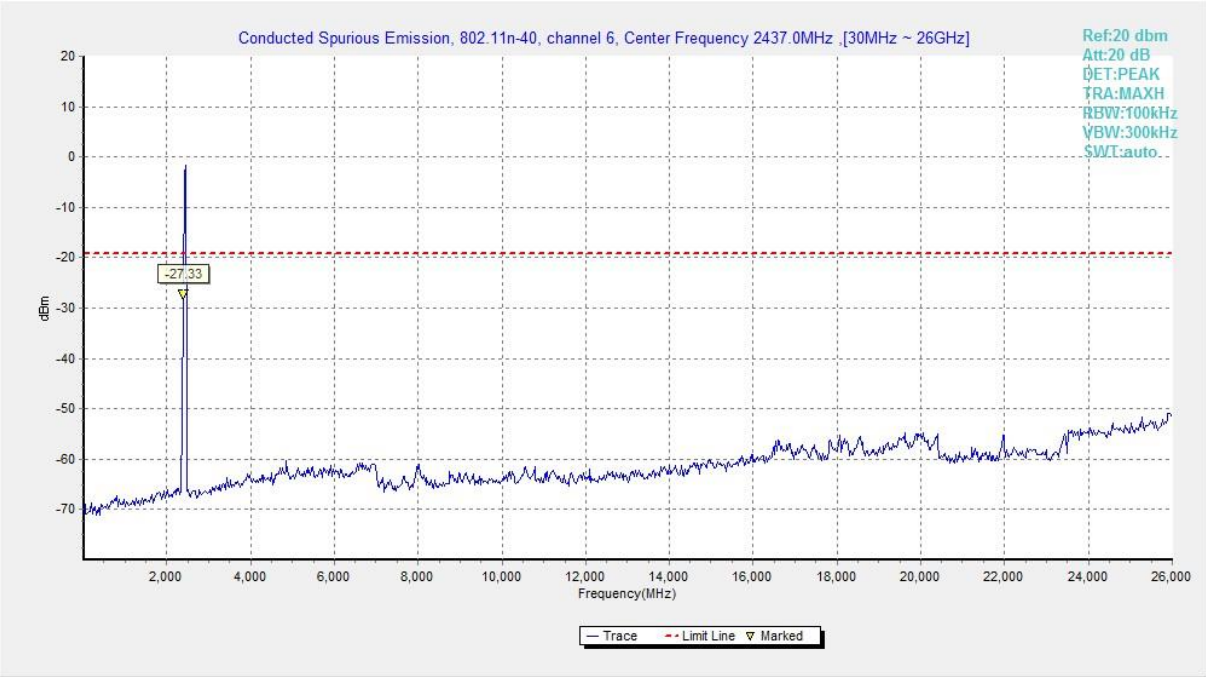

Fig.43 Conducted Spurious Emission (802.11n HT40, CH6)

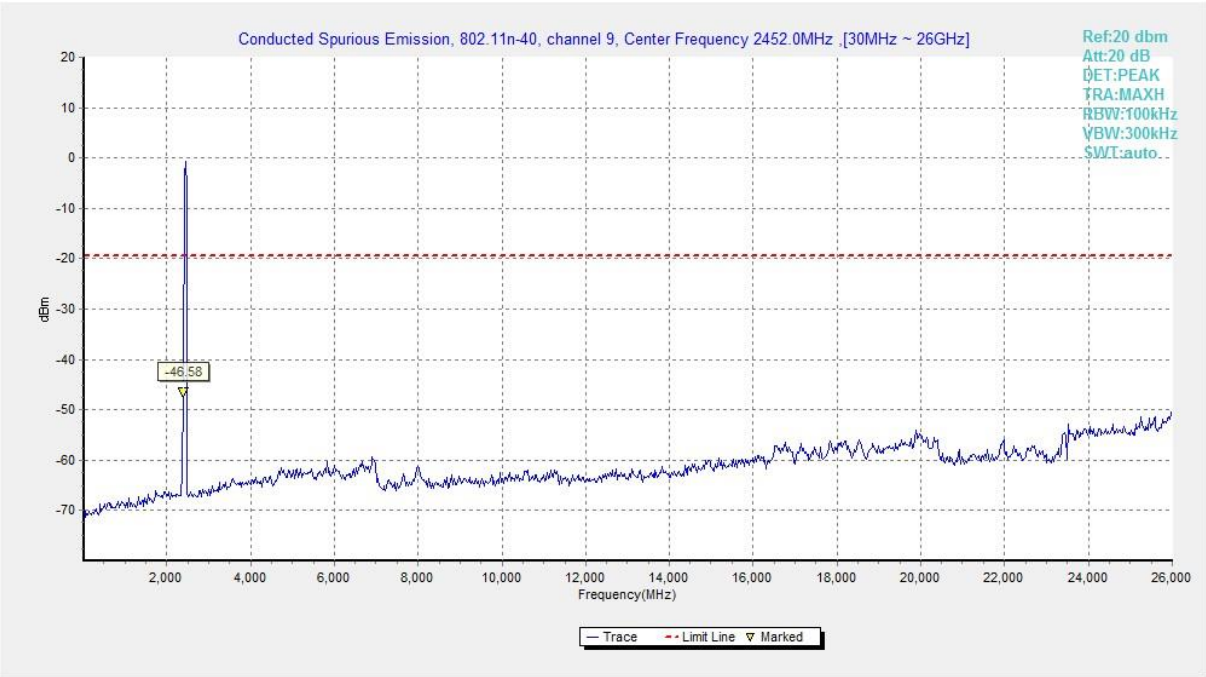

Fig.44 Conducted Spurious Emission (802.11n HT40, CH9)

A.6 Radiated Emission

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)).

Limit in restricted band:

Frequency of emission (MHz)	Field strength(μV/m)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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	120kHz/300kHz	5
1000-4000	1MHz/3MHz	15
4000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

Note:

According to the performance evaluation, the radiated emission margin of EUT is over 20dB in the band below 30MHz. Therefore, the measurement starts from 30MHz to tenth harmonic.

The measurement results include the horizontal polarization and vertical polarization measurements.

Measurement Results:

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11b	CH 1	1 GHz ~3 GHz	Fig.45	**P**
		3 GHz ~18 GHz	Fig.46	**P**
	CH 6	1 GHz ~3 GHz	Fig.47	**P**
		3 GHz ~18 GHz	Fig.48	**P**
	CH 11	1 GHz ~3 GHz	Fig.49	**P**
		3 GHz ~18 GHz	Fig.50	**P**
	Restricted Band (CH1)	2.38 GHz ~ 2.45 GHz	Fig.51	**P**
	Restricted Band (CH11)	2.45 GHz ~ 2.5 GHz	Fig.52	**P**
802.11g	CH 1	1 GHz ~3 GHz	Fig.53	**P**
		3 GHz ~18 GHz	Fig.54	**P**
	CH 6	1 GHz ~3 GHz	Fig.55	**P**
		3 GHz ~18 GHz	Fig.56	**P**
	CH 11	1 GHz ~3 GHz	Fig.57	**P**
		3 GHz ~18 GHz	Fig.58	**P**
	Restricted Band (CH1)	2.38 GHz ~ 2.45 GHz	Fig.59	**P**
	Restricted Band (CH11)	2.45 GHz ~ 2.5 GHz	Fig.60	**P**
802.11n HT20	CH 1	1 GHz ~3 GHz	Fig.61	**P**
		3 GHz ~18 GHz	Fig.62	**P**
	CH 6	1 GHz ~3 GHz	Fig.63	**P**
		3 GHz ~18 GHz	Fig.64	**P**
	CH 11	1 GHz ~3 GHz	Fig.65	**P**
		3 GHz ~18 GHz	Fig.66	**P**
	Restricted Band (CH1)	2.38 GHz ~ 2.45 GHz	Fig.67	**P**
	Restricted Band (CH11)	2.45 GHz ~ 2.5 GHz	Fig.68	**P**
802.11n HT40	CH 3	1 GHz ~3 GHz	Fig.69	**P**
		3 GHz ~18 GHz	Fig.70	**P**
	CH 6	1 GHz ~3 GHz	Fig.71	**P**
		3 GHz ~18 GHz	Fig.72	**P**
	CH 9	1 GHz ~3 GHz	Fig.73	**P**
		3 GHz ~18 GHz	Fig.74	**P**
	Restricted Band (CH3)	2.38 GHz ~ 2.45 GHz	Fig.75	**P**
	Restricted Band (CH9)	2.45 GHz ~ 2.5 GHz	Fig.76	**P**
/	All Channels	9 kHz ~30 MHz	Fig.77	**P**
		30 MHz ~1 GHz	Fig.78	**P**
		18 GHz ~26.5 GHz	Fig.79	**P**

Worst-Case Result:

802.11b CH1 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
11128.50	45.70	---	74.00	28.30	V	5.0
12541.00	47.27	---	74.00	26.73	H	8.1
4824.00	47.89	---	74.00	26.11	V	-1.1
14060.50	48.01	---	74.00	25.99	V	9.8
15897.00	50.15	---	74.00	23.85	H	13.2
17921.50	51.85	---	74.00	22.15	V	16.2
4827.000	---	37.67	54.00	16.33	V	5.0
11572.500	---	36.79	54.00	17.21	V	8.1
12939.50	---	38.10	54.00	15.90	V	-1.1
14459.00	---	39.40	54.00	14.60	V	9.8
16326.50	---	41.10	54.00	12.90	V	13.2
17845.50	---	41.58	54.00	12.42	V	16.2

802.11g CH1 (1GHz-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
4832.00	45.28	---	74.00	28.72	V	-1.1
11727.00	46.57	---	74.00	27.43	H	6.9
13309.00	47.53	---	74.00	26.47	H	9
14843.50	48.65	---	74.00	25.35	V	10.8
16194.00	50.13	---	74.00	23.87	H	14.4
17128.00	51.46	---	74.00	22.54	V	15
4833.50	---	35.55	54.00	18.45	V	-1.1
11699.00	---	36.90	54.00	17.10	H	7
12923.00	---	37.55	54.00	16.45	V	8.6
14481.00	---	39.23	54.00	14.77	V	11.3
16236.00	---	40.25	54.00	13.75	V	14.3
17600.00	---	41.09	54.00	12.91	V	15.5

802.11n HT20 CH1 (1GHz-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
6431.00	44.72	---	74.00	29.28	H	2
4833.00	44.80	---	74.00	29.20	V	-1.1
10237.00	45.68	---	74.00	28.32	H	5.2
12024.00	47.01	---	74.00	26.99	H	7.2
14484.00	48.71	---	74.00	25.29	H	11.3
16563.50	52.27	---	74.00	21.73	H	14.8
4832.00	---	35.52	54.00	18.48	V	-1.1
6375.50	---	34.47	54.00	19.53	H	1.9
10418.00	---	35.98	54.00	18.02	H	5.1
11690.50	---	37.17	54.00	16.83	H	7.1
14519.00	---	39.44	54.00	14.56	H	11.5
16733.50	---	41.36	54.00	12.64	H	14.9

802.11n HT40 CH6 (1GHz-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
4889.50	44.34	---	74.00	29.66	V	-0.9
6444.50	44.01	---	74.00	29.99	V	1.9
12961.50	47.51	---	74.00	26.49	H	8.5
14470.50	48.08	---	74.00	25.92	H	11.3
17060.00	51.59	---	74.00	22.41	H	15
17981.00	51.94	---	74.00	22.06	V	15.8
4853.00	---	34.15	54.00	19.85	V	-1
6417.50	---	34.52	54.00	19.48	V	2
12644.00	---	37.02	54.00	16.98	H	7.6
14447.00	---	39.13	54.00	14.87	V	11.1
16740.50	---	40.98	54.00	13.02	V	14.9
17897.00	---	41.48	54.00	12.52	V	16.3

Note:

A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and Antenna Factor, 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:

Result= P_{Mea} +Cable Loss +Antenna Factor-Gain of the preamplifier.

See below for test graphs.

Conclusion: PASS

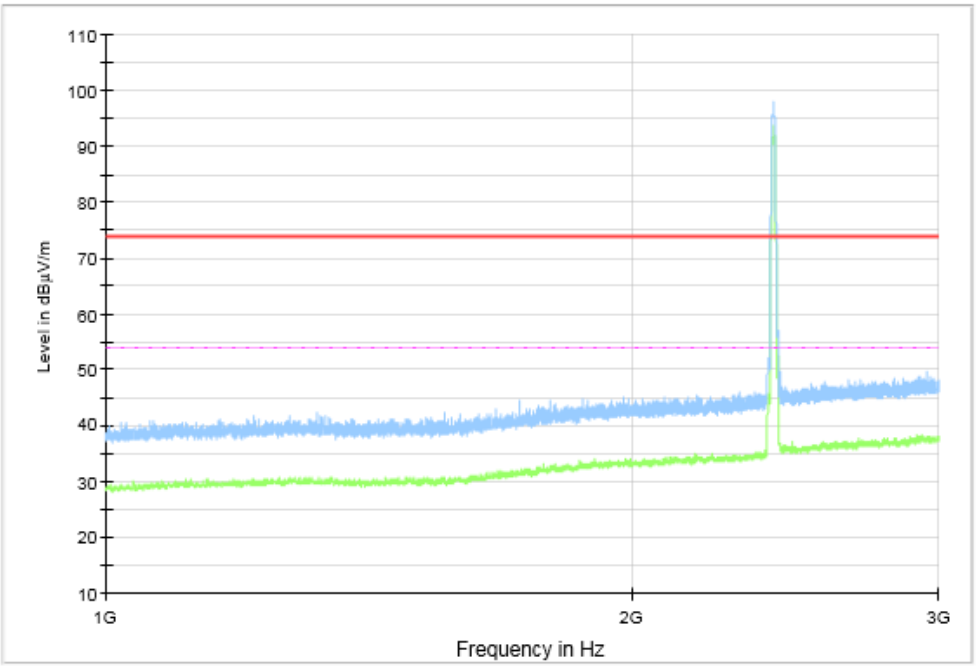

Fig.45 Radiated Spurious Emission (802.11b, CH1, 1 GHz-3GHz)

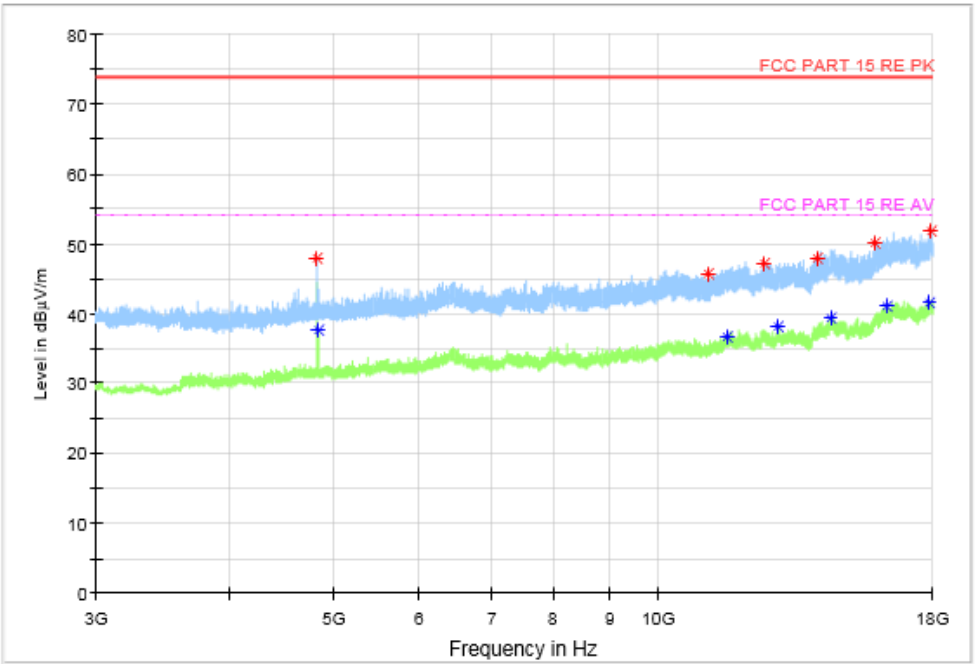

Fig.46 Radiated Spurious Emission (802.11b, CH1, 3 GHz-18GHz)

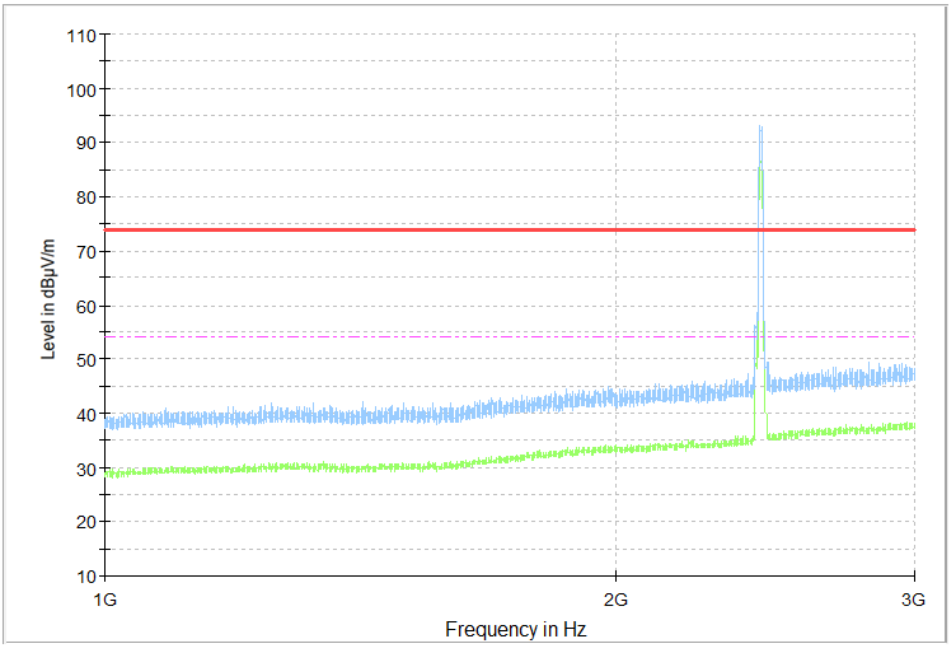

Fig.47 Radiated Spurious Emission (802.11b, CH6, 1 GHz-3GHz)

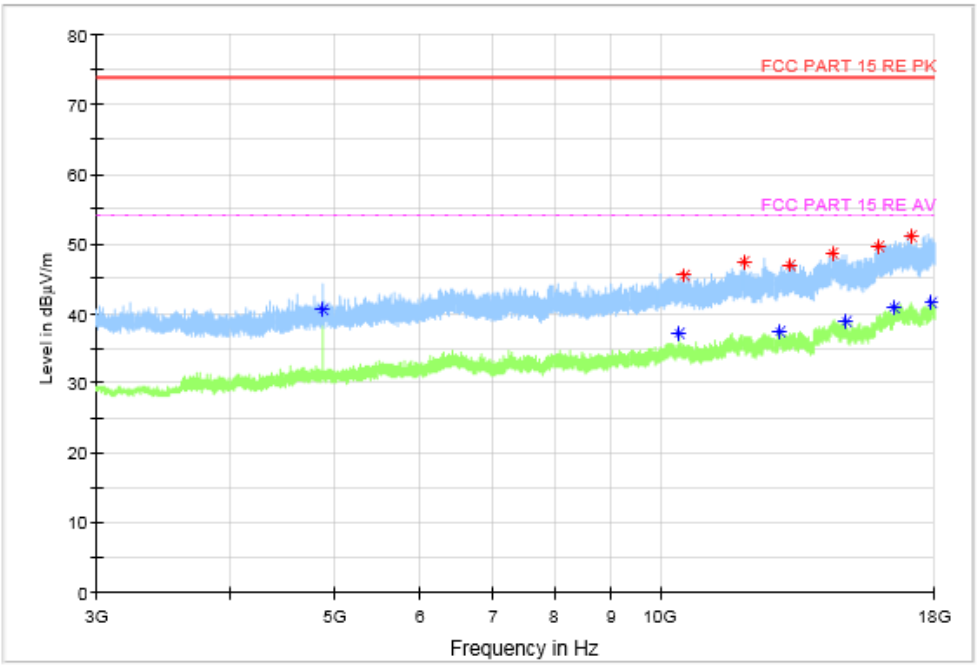

Fig.48 Radiated Spurious Emission (802.11b, CH6, 3 GHz-18GHz)

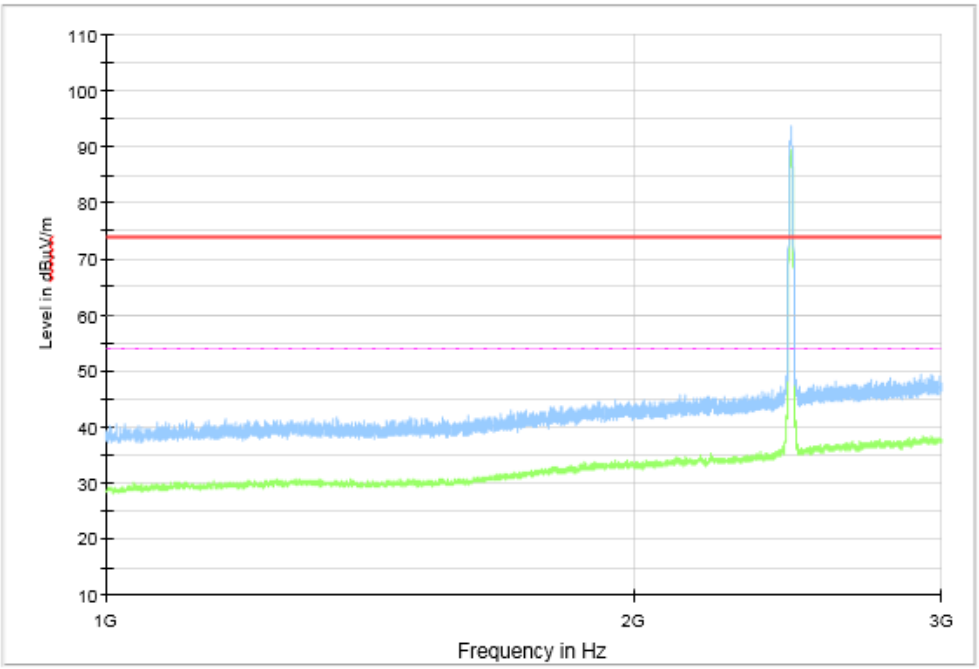

Fig.49 Radiated Spurious Emission (802.11b, CH11, 1 GHz-3GHz)

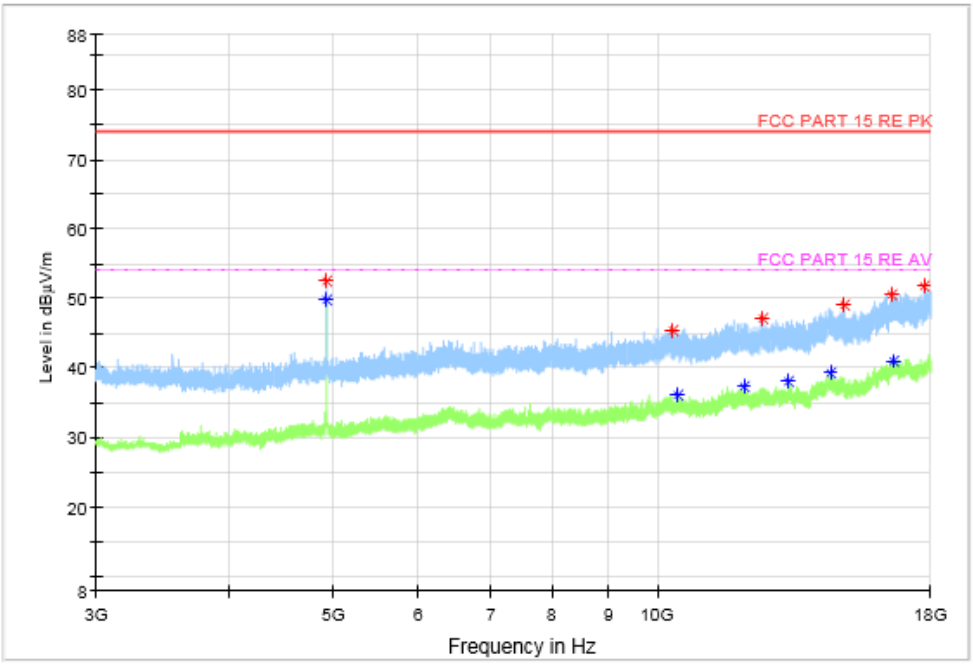

Fig.50 Radiated Spurious Emission (802.11b, CH11, 3 GHz-18GHz)

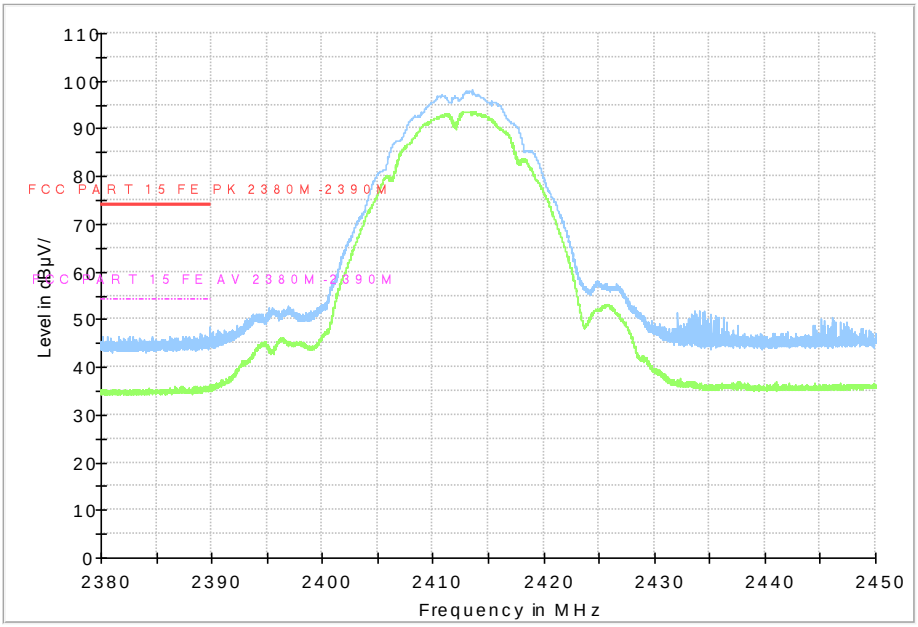

Fig.51 Radiated Restricted Band (802.11b, CH1, 2.38GHz~2.45GHz)

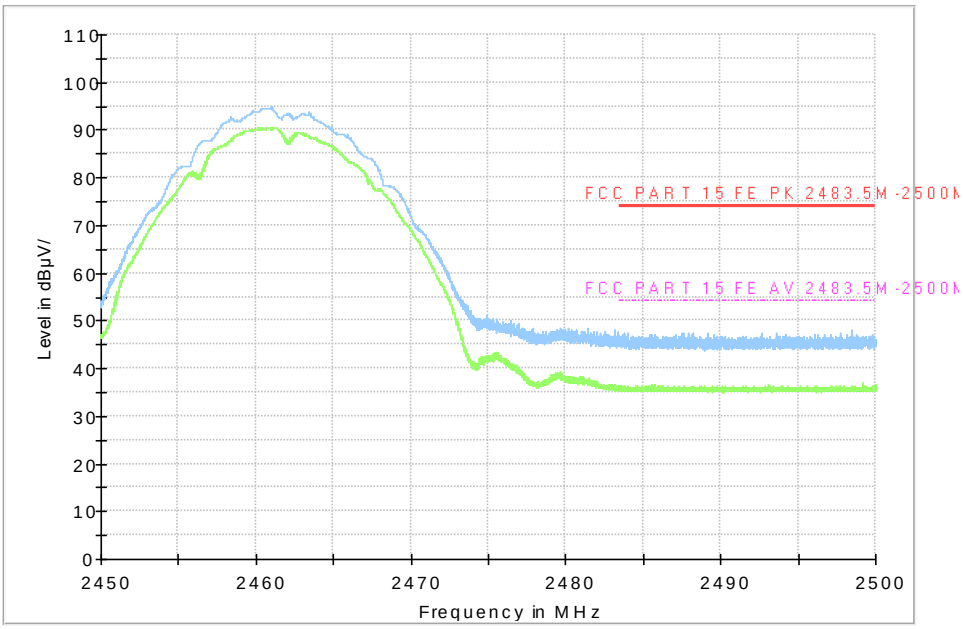

Fig.52 Radiated Restricted Band (802.11b, CH11, 2.45GHz~2.5GHz)

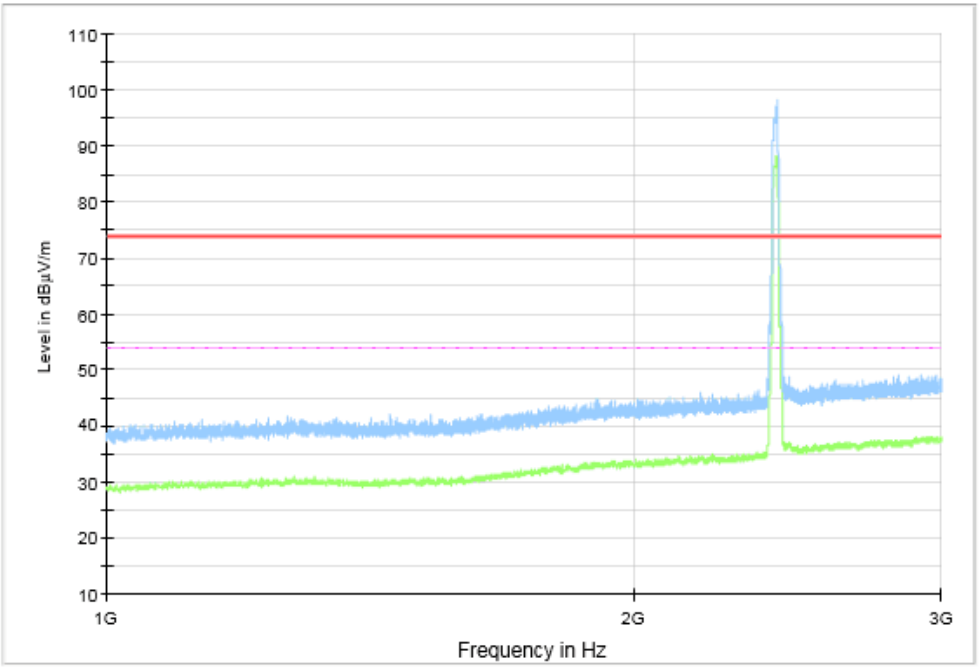

Fig.53 Radiated Spurious Emission (802.11g, CH1, 1 GHz-3 GHz)

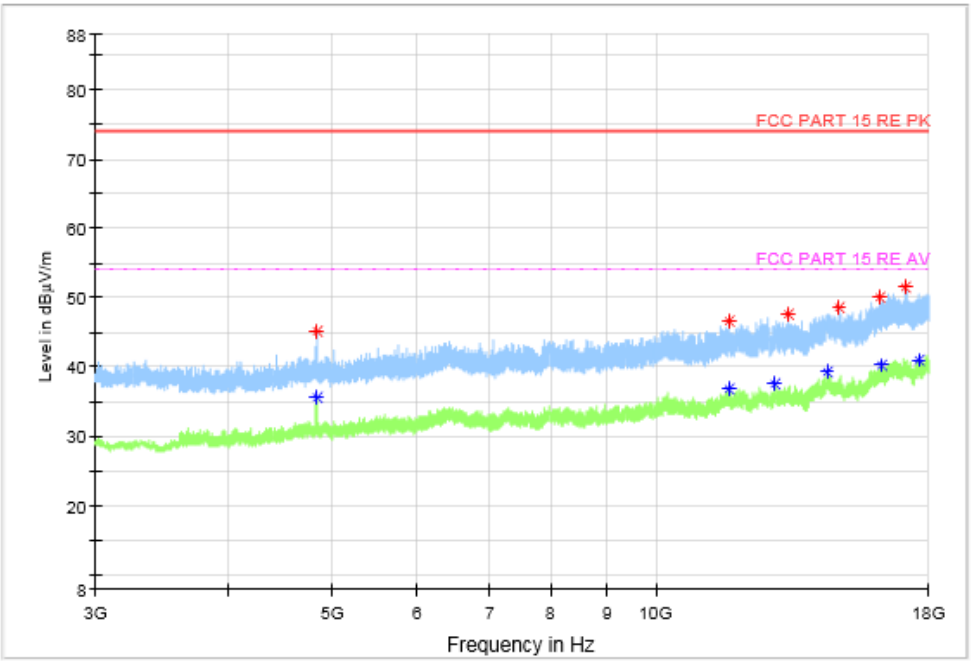

Fig.54 Radiated Spurious Emission (802.11g, CH1, 3 GHz-18 GHz)

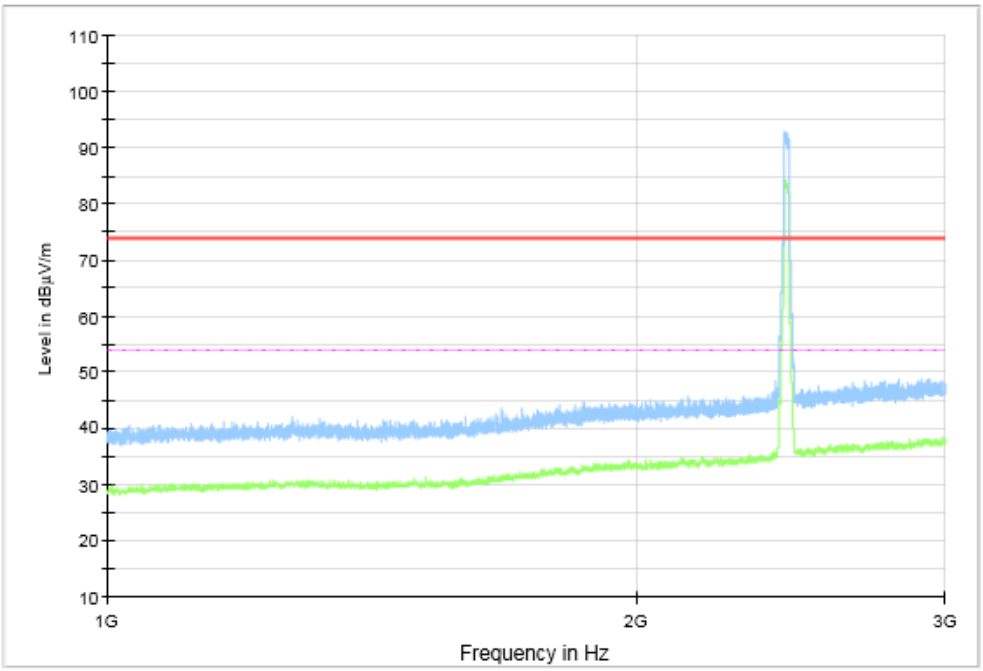

Fig.55 Radiated Spurious Emission (802.11g, CH6, 1 GHz-3 GHz)

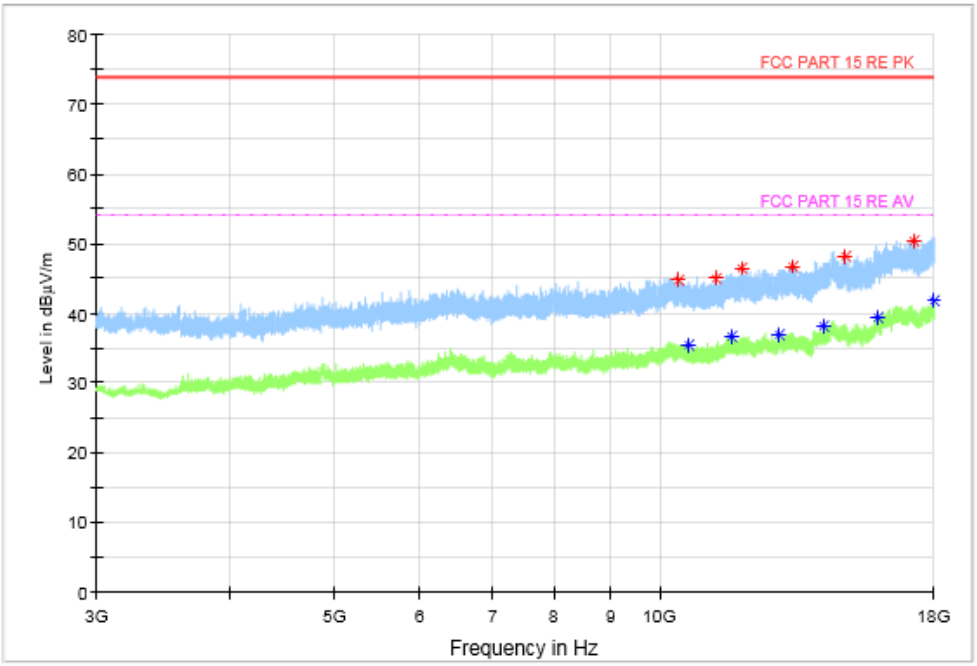

Fig.56 Radiated Spurious Emission (802.11g, CH6, 3 GHz-18 GHz)

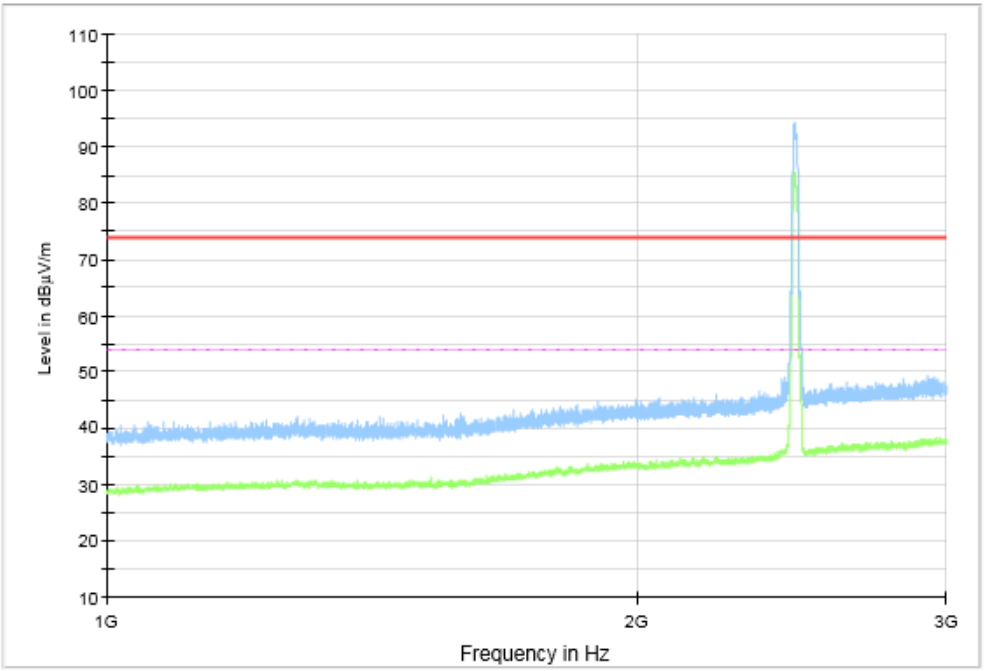

Fig.57 Radiated Spurious Emission (802.11g, CH11, 1 GHz-3 GHz)

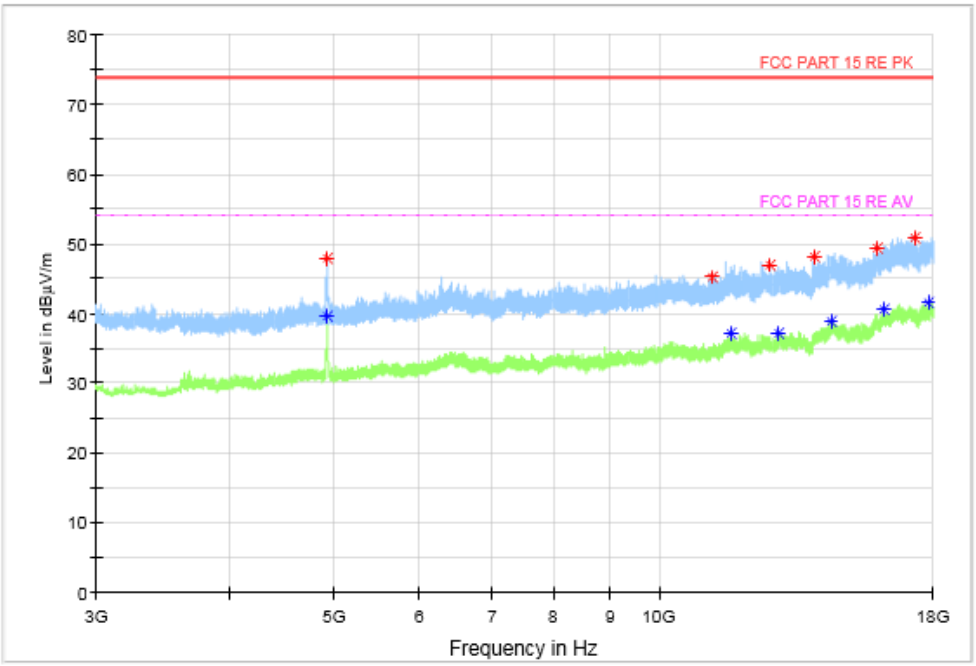

Fig.58 Radiated Spurious Emission (802.11g, CH11, 3 GHz-18 GHz)

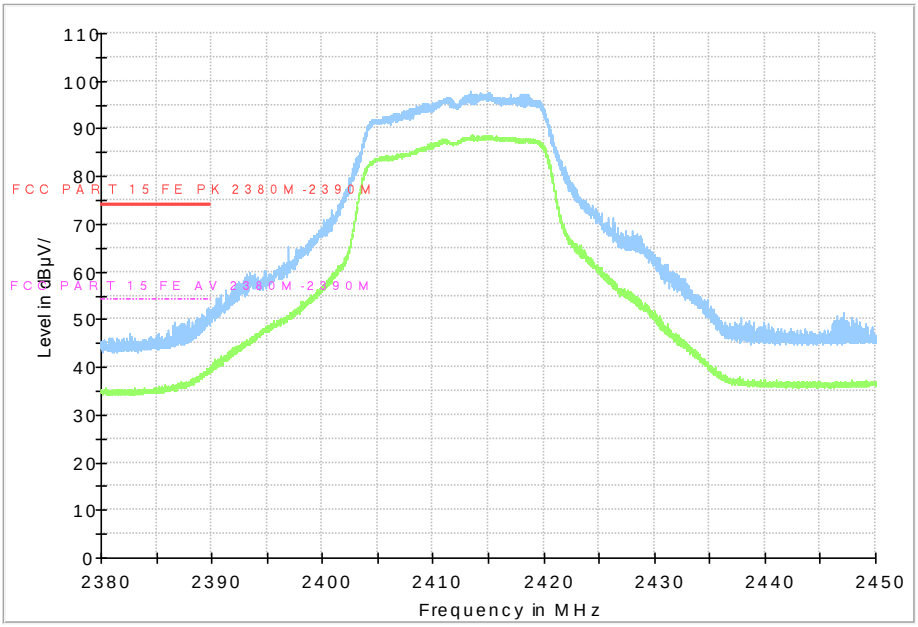

Fig.59 Radiated Restricted Band (802.11g, CH1, 2.38GHz~2.45GHz)

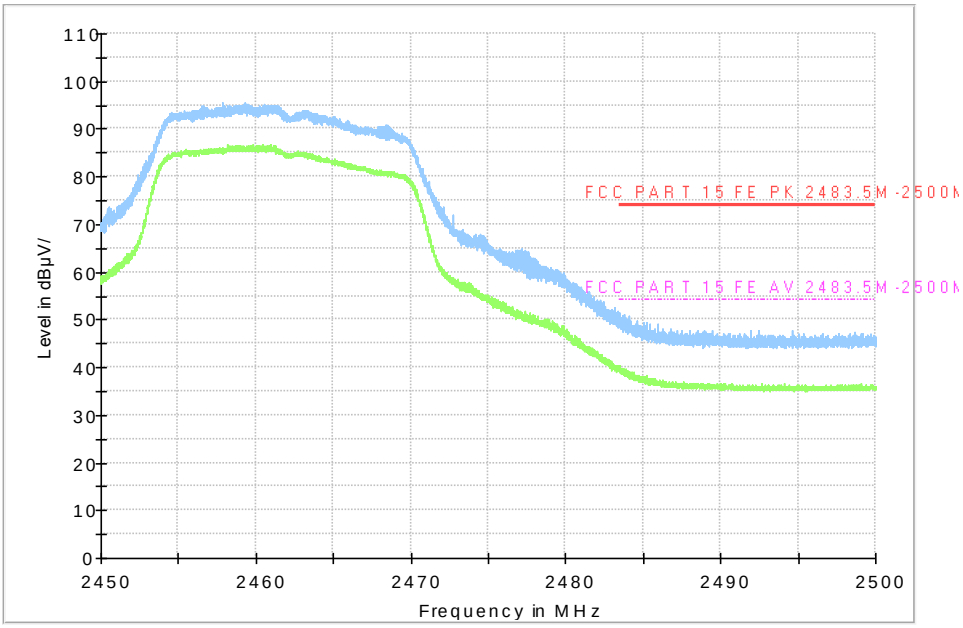

Fig.60 Radiated Restricted Band (802.11g, CH11, 2.45GHz~2.5GHz)

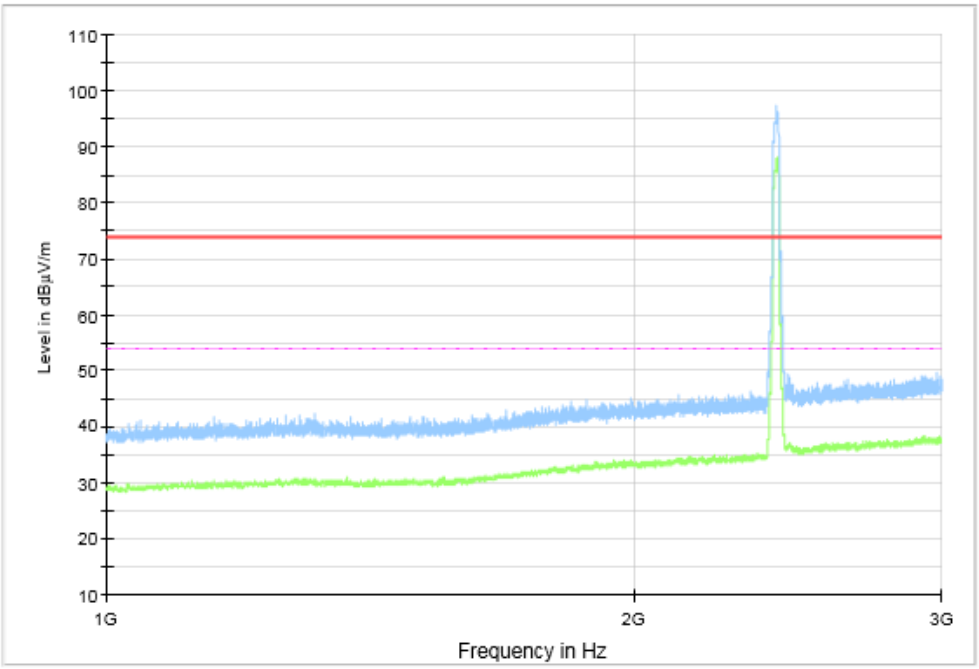

Fig.61 Radiated Spurious Emission (802.11n HT20, CH1, 1 GHz-3 GHz)

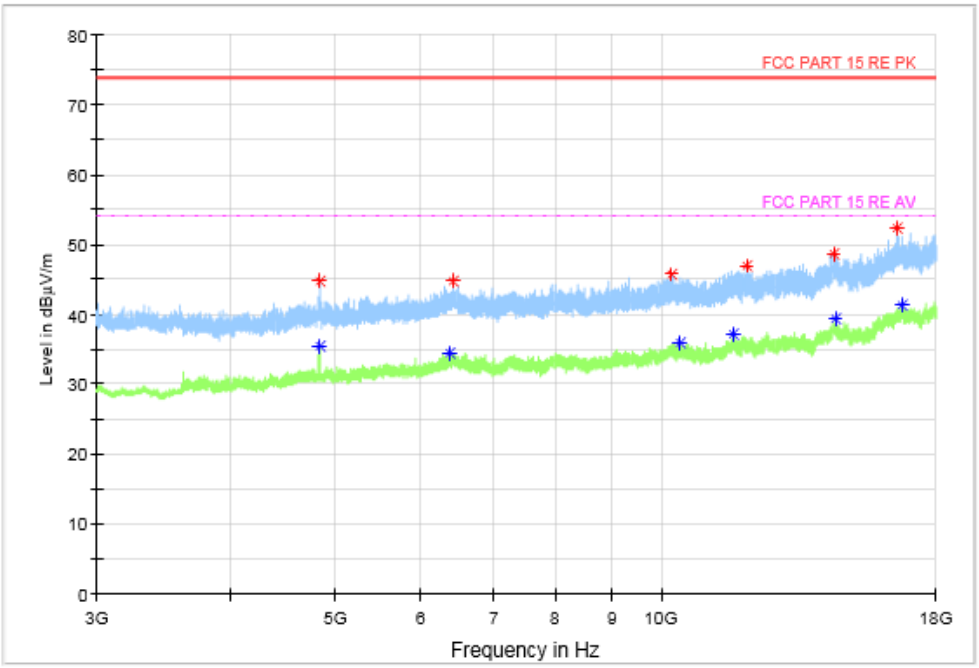

Fig.62 Radiated Spurious Emission (802.11n HT20, CH1, 3 GHz-18 GHz)

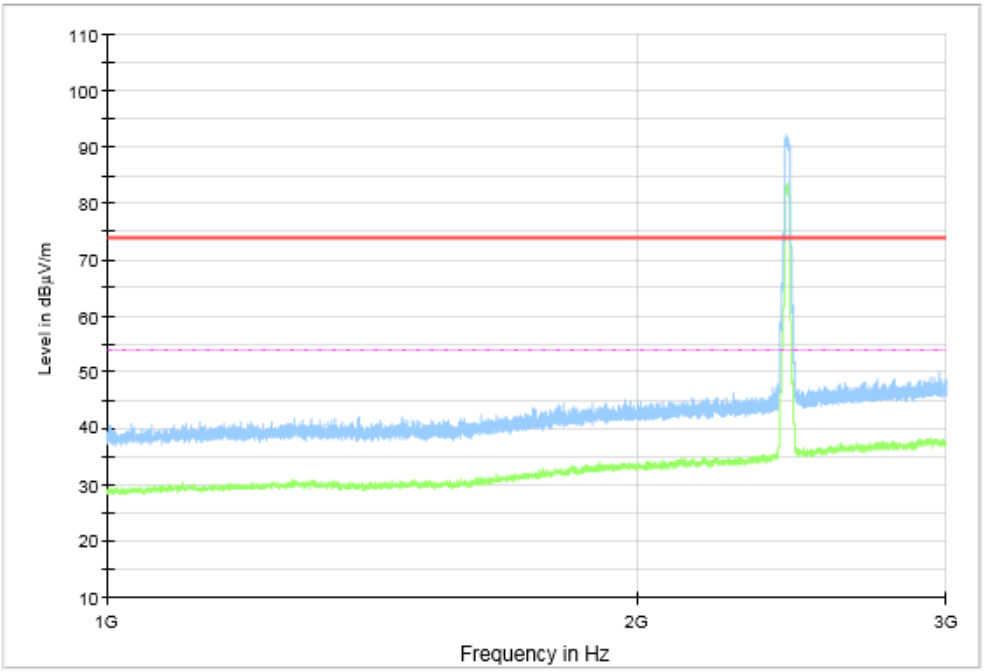

Fig.63 Radiated Spurious Emission (802.11n HT20, CH6, 1 GHz-3 GHz)

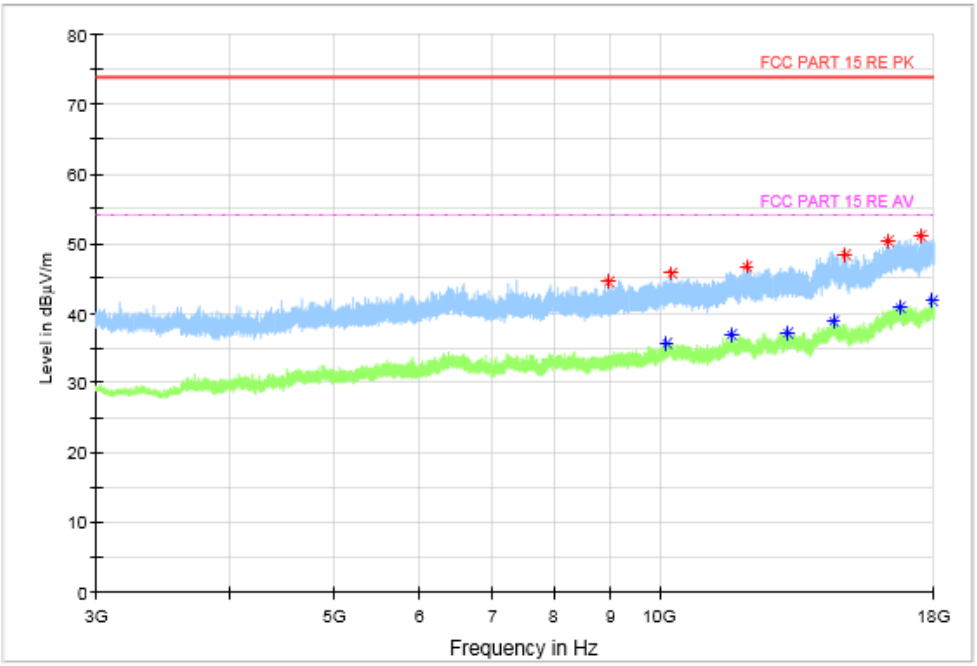

Fig.64 Radiated Spurious Emission (802.11n HT20, CH6, 3 GHz-18 GHz)

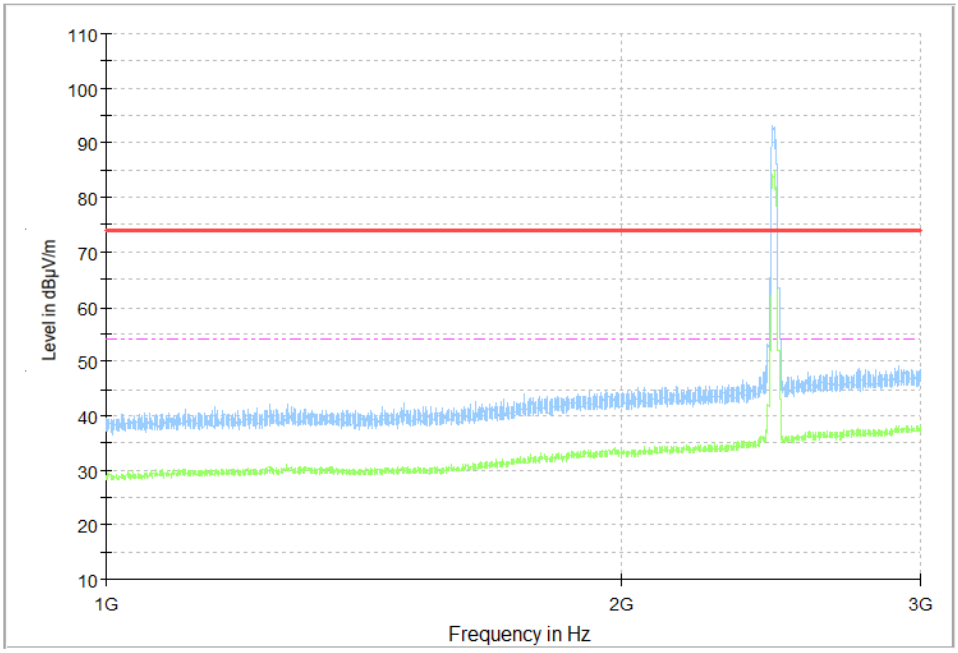

Fig.65 Radiated Spurious Emission (802.11n HT20, CH11, 1 GHz-3 GHz)

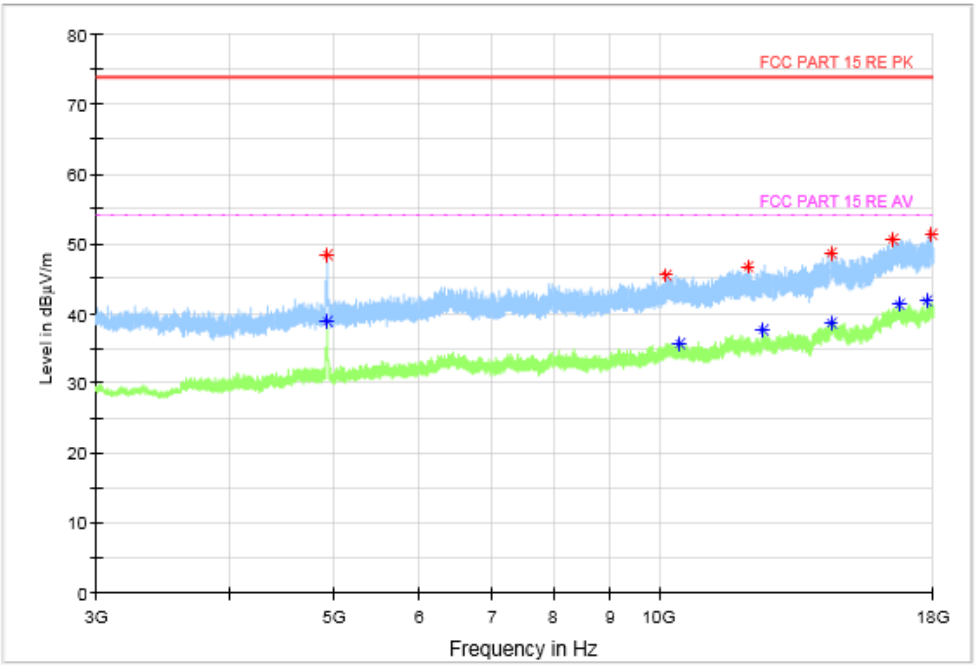

Fig.66 Radiated Spurious Emission (802.11n HT20, CH11, 3 GHz-18 GHz)

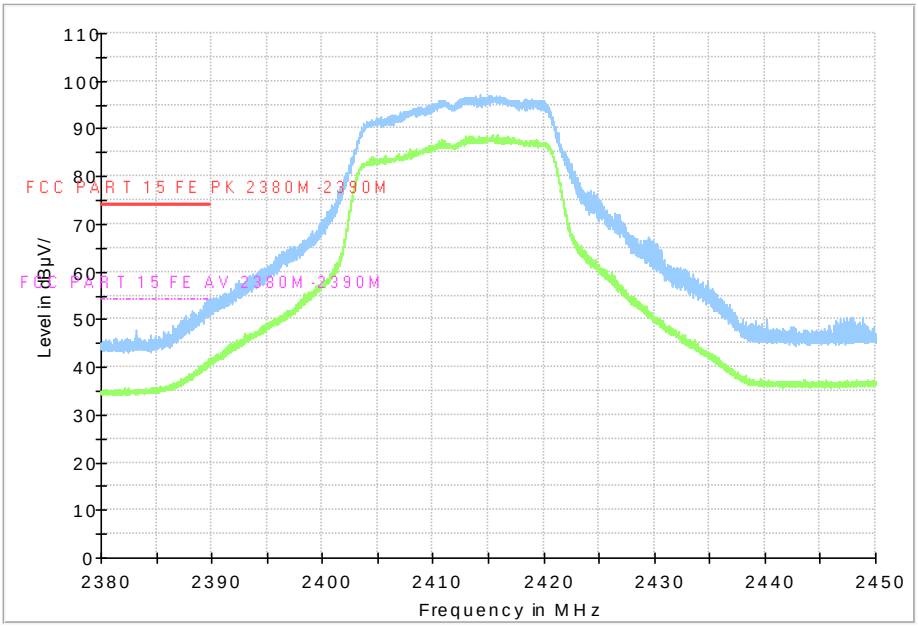

Fig.67 Radiated Restricted Band (802.11n HT20, CH1, 2.38GHz~2.45GHz)

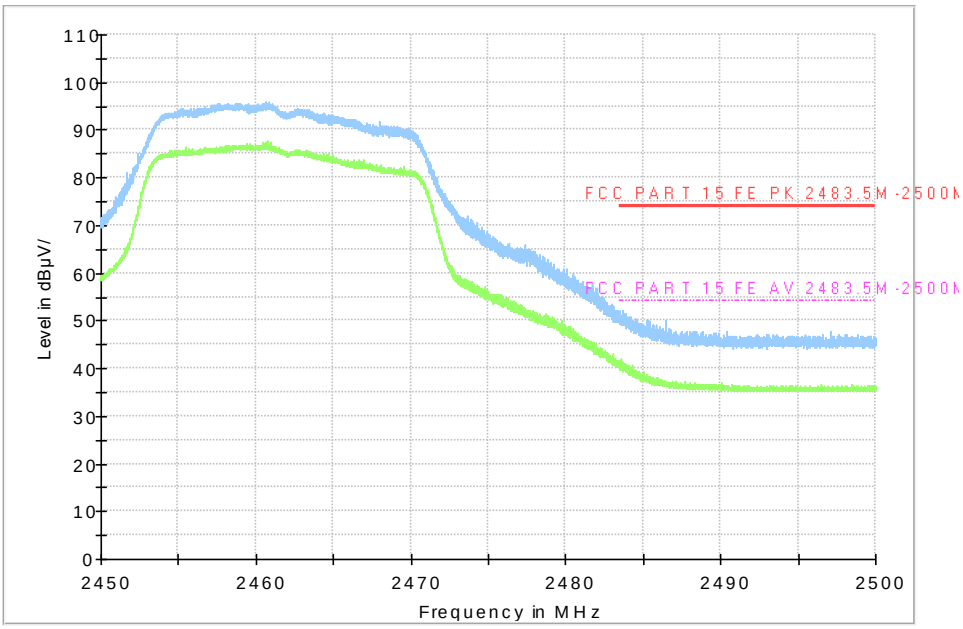

Fig.68 Radiated Restricted Band (802.11n HT20, CH11, 2.45GHz~2.5GHz)

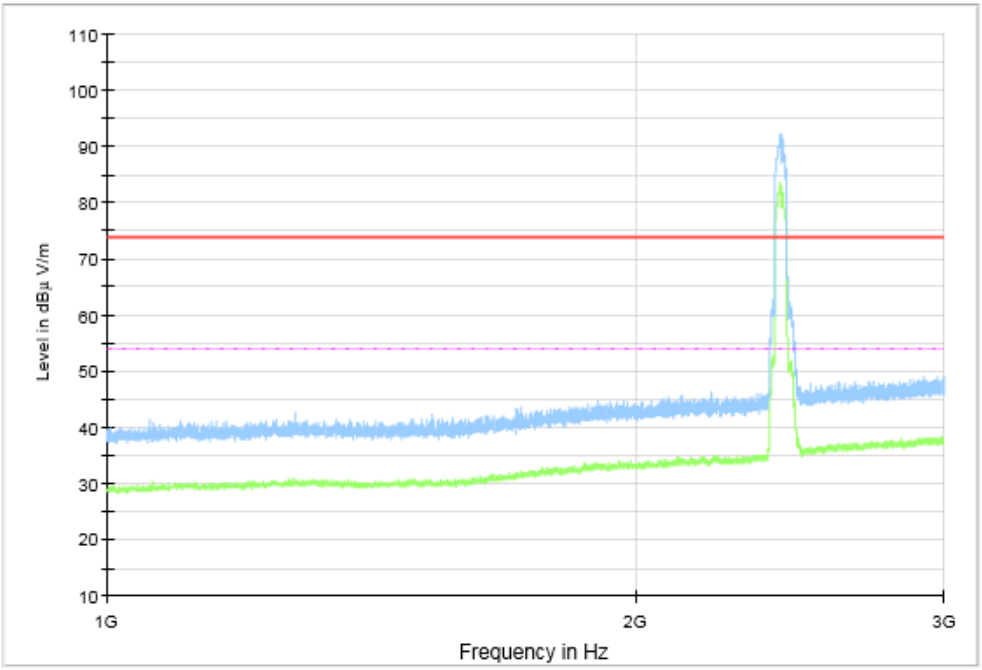

Fig.69 Radiated Spurious Emission (802.11n HT40, CH3, 1 GHz-3 GHz)

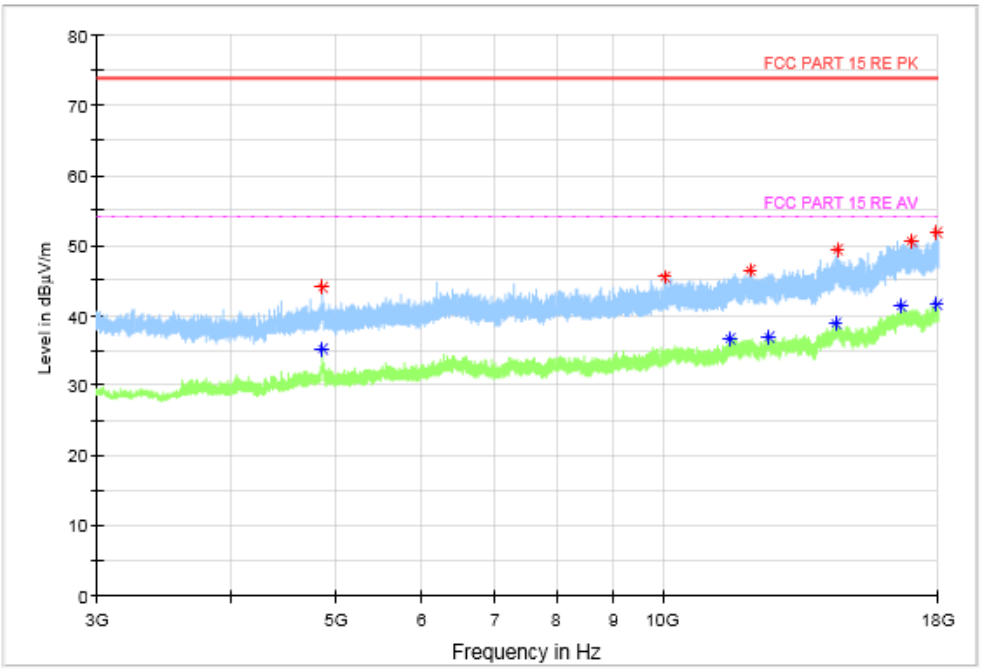

Fig.70 Radiated Spurious Emission (802.11n HT40, CH3, 3 GHz-18 GHz)

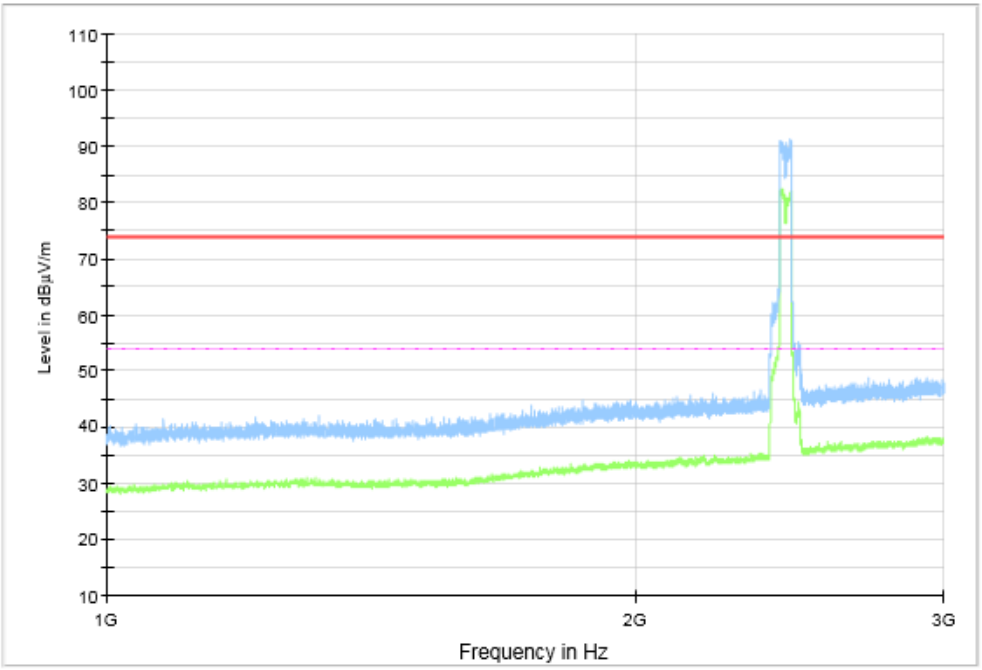

Fig.71 Radiated Spurious Emission (802.11n HT40, CH6, 1 GHz-3 GHz)

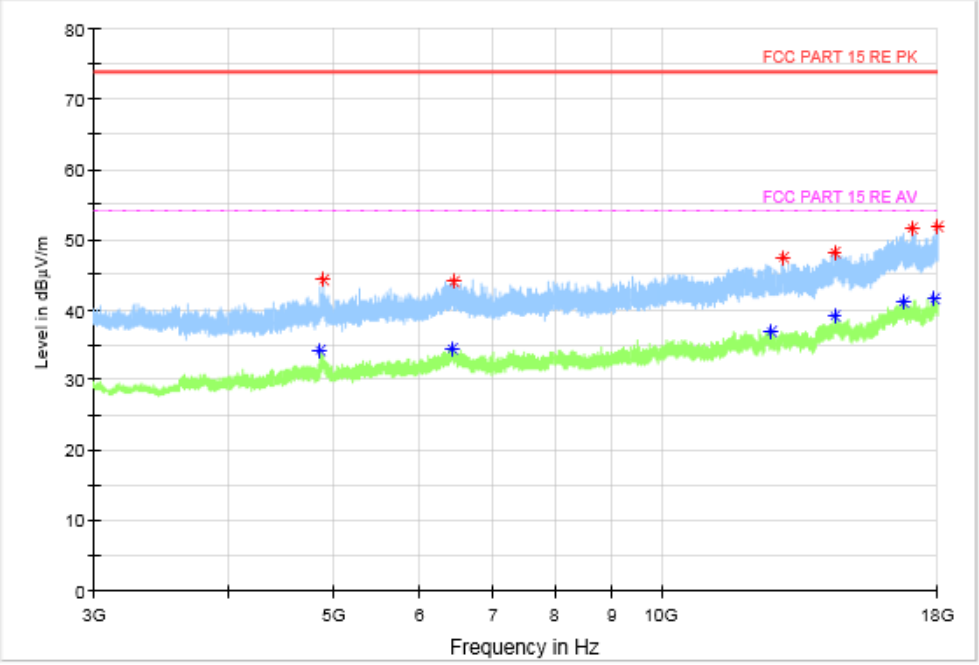

Fig.72 Radiated Spurious Emission (802.11n HT40, CH6, 3 GHz-18 GHz)

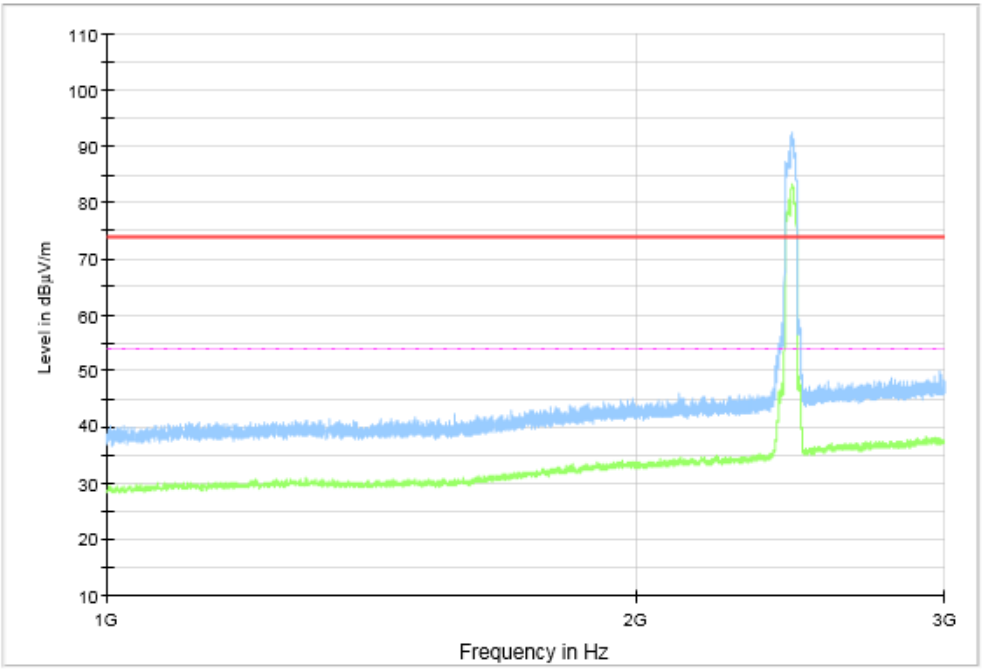

Fig.73 Radiated Spurious Emission (802.11n HT40, CH9, 1 GHz-3 GHz)

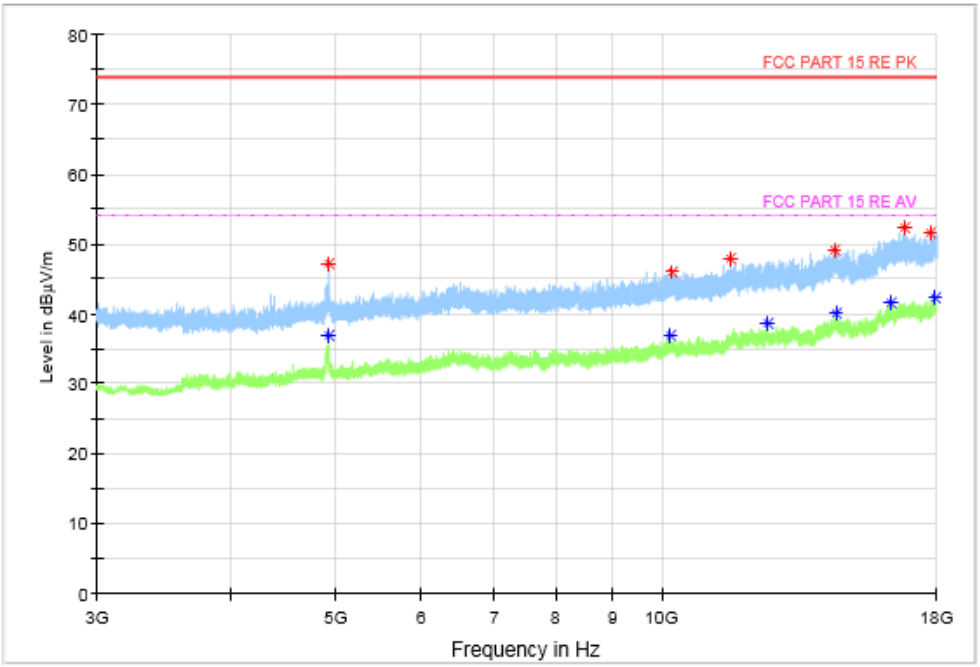

Fig.74 Radiated Spurious Emission (802.11n HT40, CH9, 3 GHz-18 GHz)

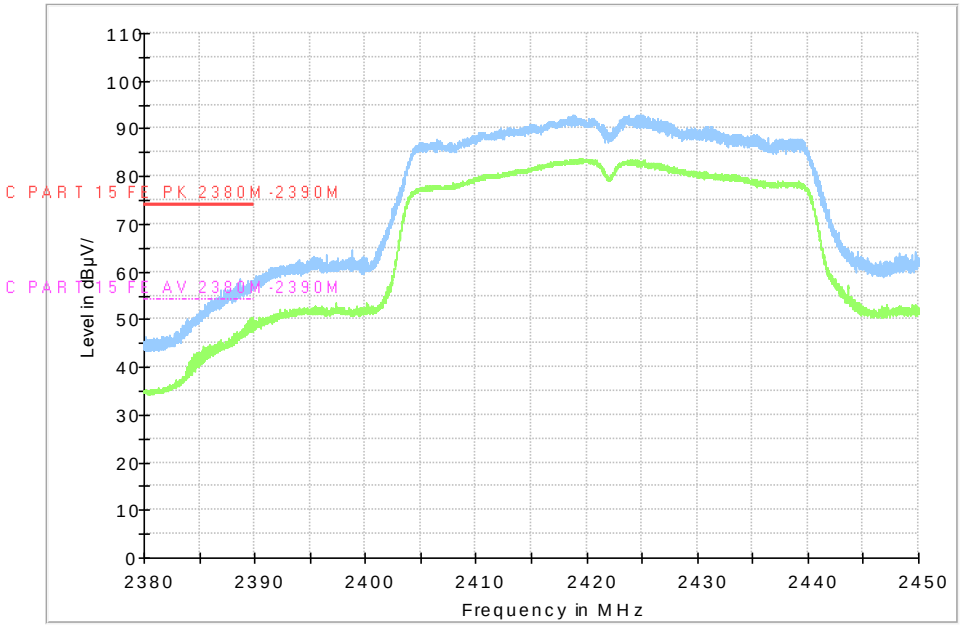

Fig.75 Radiated Restricted Band (802.11n HT40, CH3, 2.38GHz~2.45GHz)

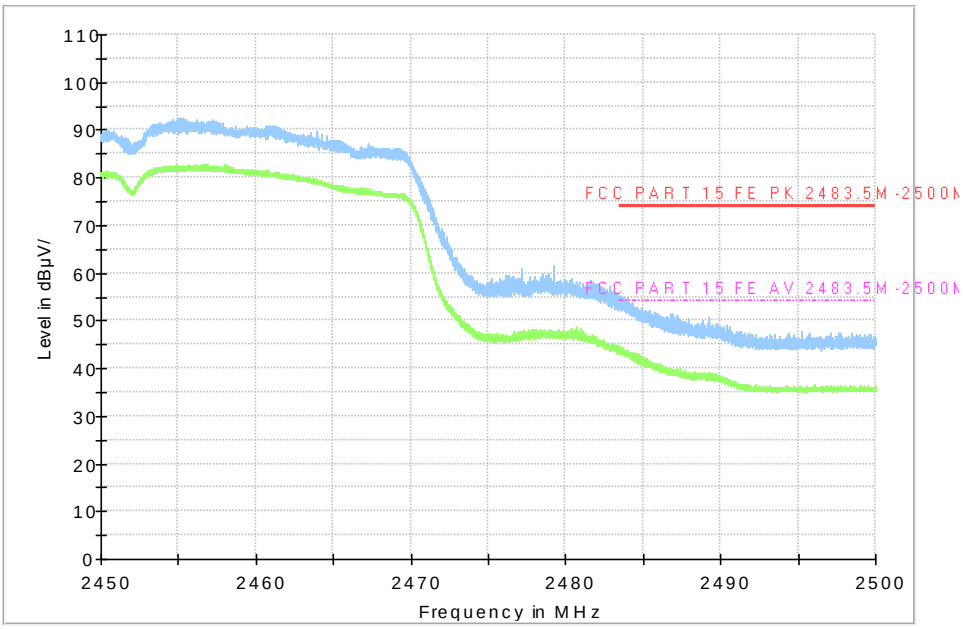

Fig.76 Radiated Restricted Band (802.11n HT40, CH9, 2.45GHz~2.5GHz)

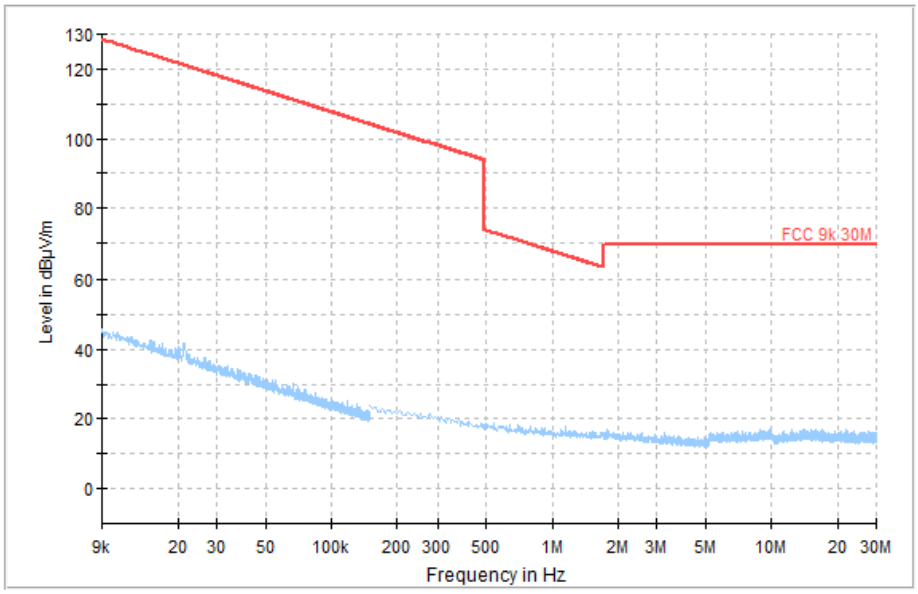

Fig.77 Radiated Spurious Emission (All Channels, 9KHz-30 MHz)

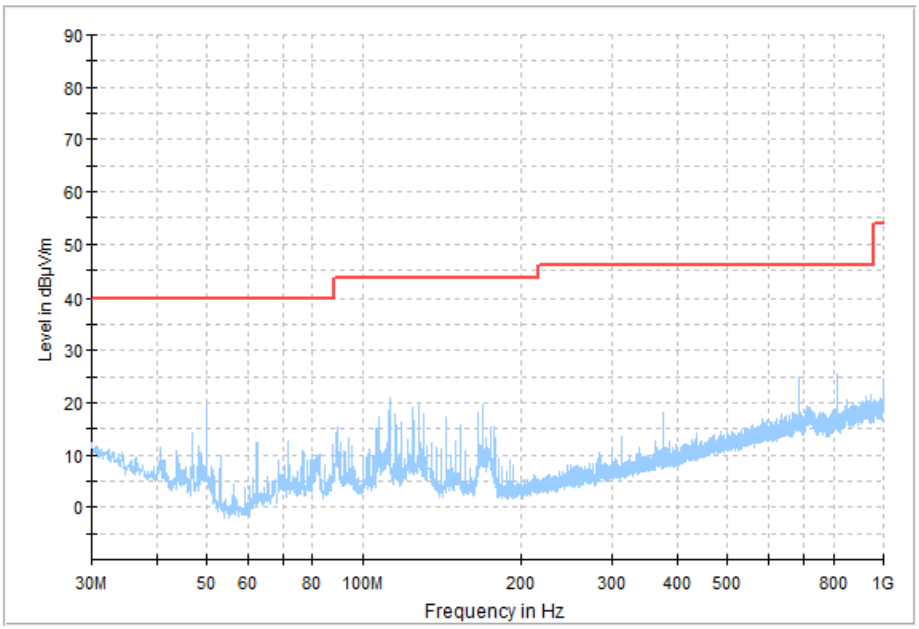

Fig.78 Radiated Spurious Emission (All Channels, 30MHz-1 GHz)

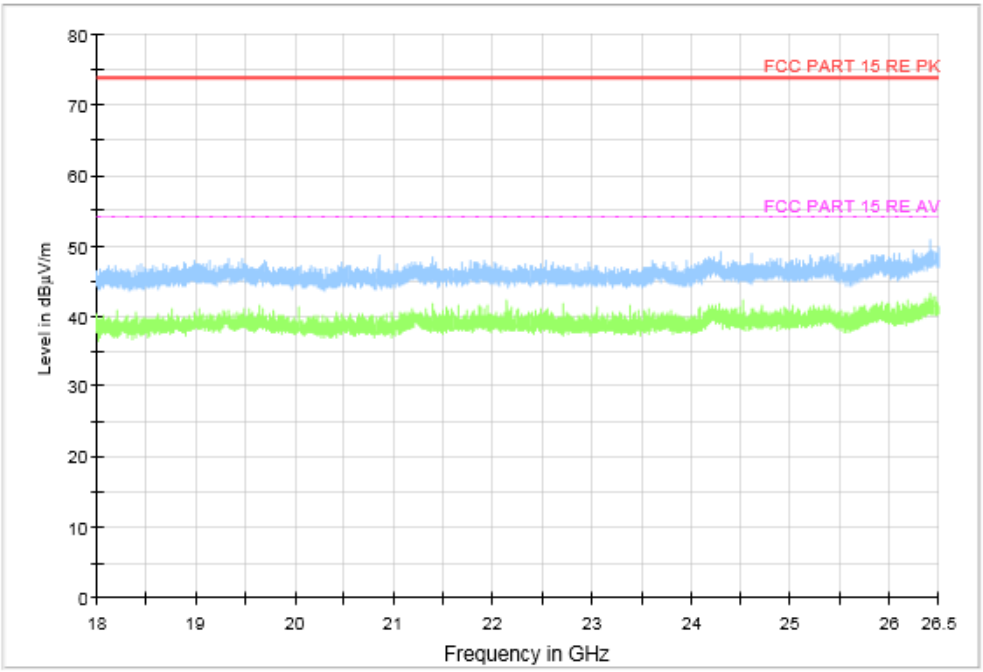

Fig.79 Radiated Spurious Emission (All Channels, 18 GHz-26.5 GHz)

A.7 AC Power line 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
		Traffic	Idle	
0.15 to 0.5	66 to 56	Fig.80	Fig.81	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-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig 80	Fig 81	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.				

Note: The measurement results include the L1 and N measurements.

See below for test graphs.

Conclusion: PASS

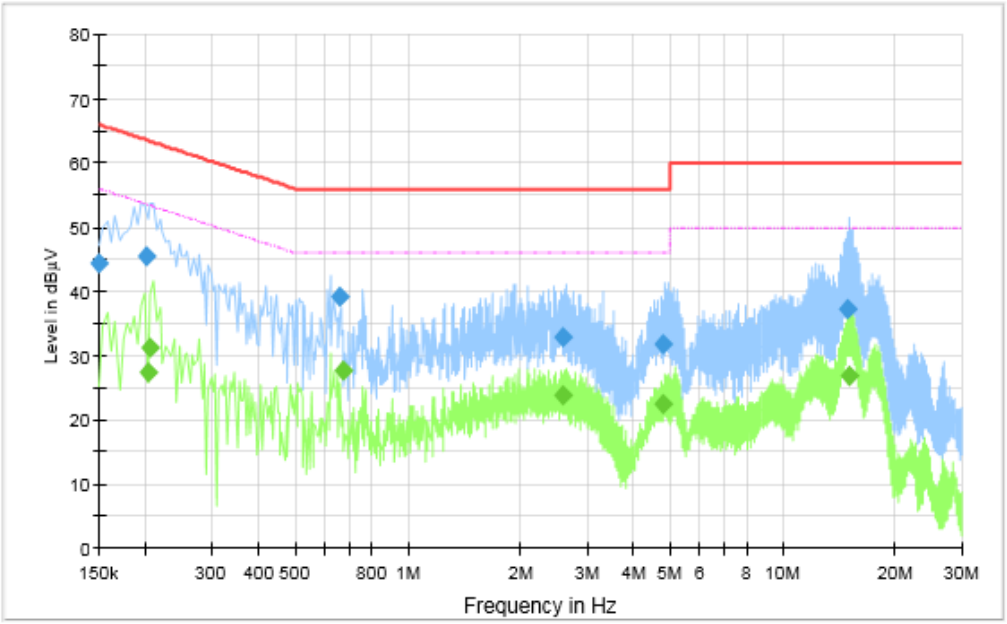

Fig.80 AC Power line Conducted Emission (Traffic)

Measurement Results: Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
4.800	31.83	56.00	24.17	N	ON	9.7
2.604	32.81	56.00	23.19	N	ON	9.7
14.956	37.28	60.00	22.72	N	ON	9.8
0.656	39.17	56.00	16.83	N	ON	9.6
0.150	44.51	66.00	21.49	N	ON	9.6
0.200	45.41	63.61	18.20	N	ON	9.6

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.204	27.48	53.45	24.97	N	ON	9.6
0.206	31.13	53.37	22.24	N	ON	9.6
0.672	27.79	46.00	18.21	N	ON	9.6
2.588	23.78	46.00	22.22	N	ON	9.7
4.788	22.39	46.00	23.61	N	ON	9.7
14.964	26.74	50.00	23.26	N	ON	9.8

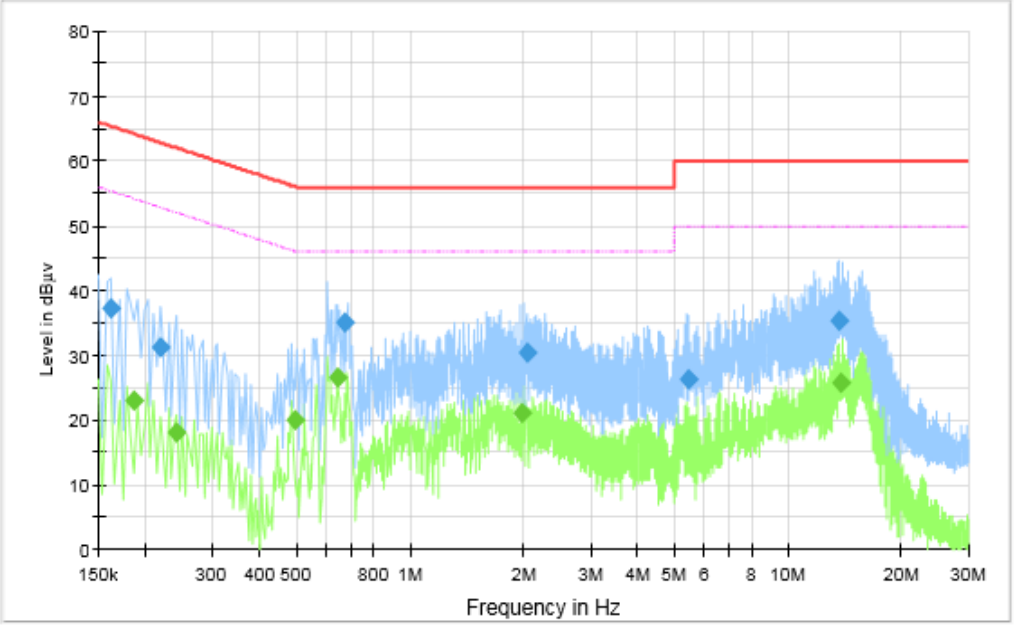

Fig.81 AC Power line Conducted Emission (Idle)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
5.456	26.43	60.00	33.57	N	ON	9.7
2.048	30.34	56.00	25.66	N	ON	9.7
0.220	31.33	62.82	31.49	L1	ON	9.6
0.672	35.16	56.00	20.84	N	ON	9.6
13.644	35.23	60.00	24.77	N	ON	9.8
0.162	37.24	65.36	28.12	N	ON	9.6

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.186	23.02	54.21	31.19	N	ON	9.6
0.240	18.06	52.10	34.03	N	ON	9.6
0.496	20.11	46.07	25.95	N	ON	9.6
0.644	26.53	46.00	19.47	N	ON	9.6
1.980	21.14	46.00	24.86	N	ON	9.7
13.860	25.76	50.00	24.24	N	ON	9.8

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