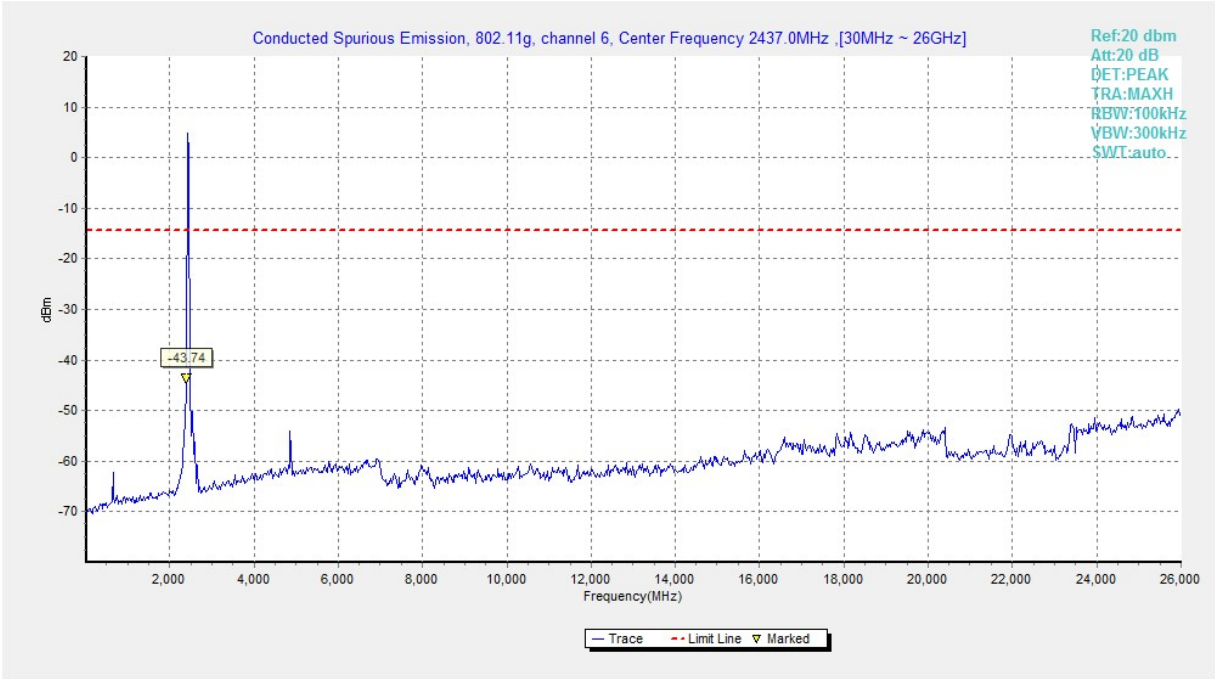

Fig.37 Conducted Spurious Emission (802.11g, CH6)

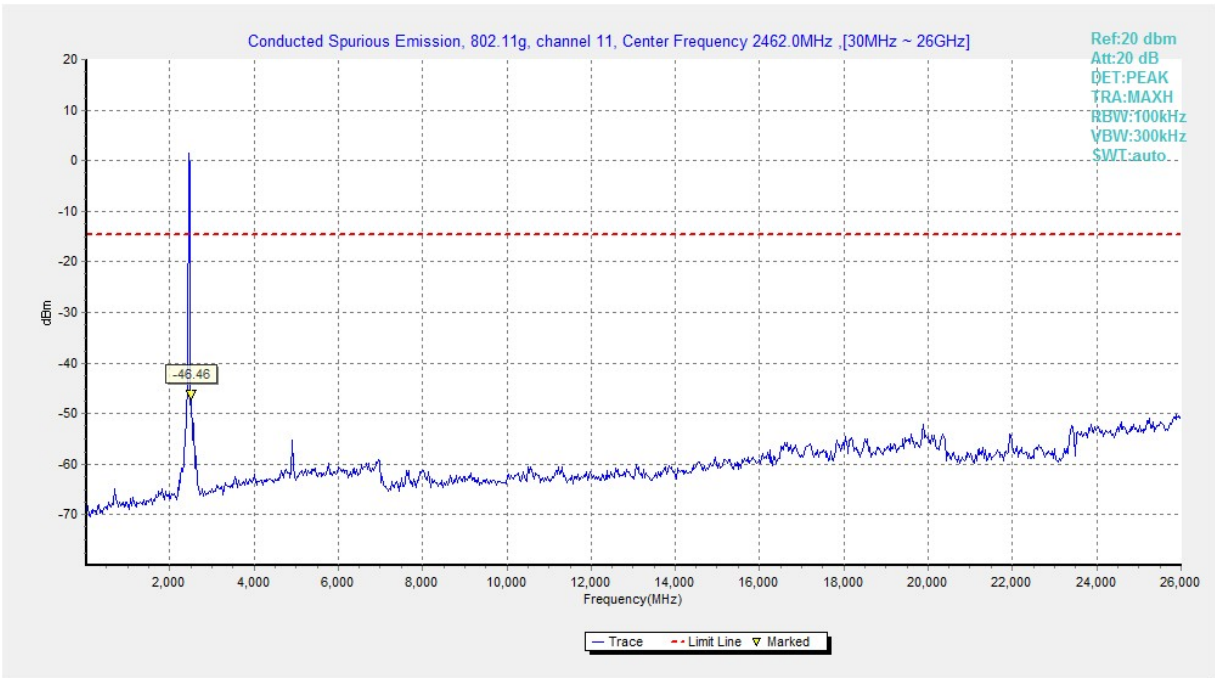

Fig.38 Conducted Spurious Emission (802.11g, CH11)

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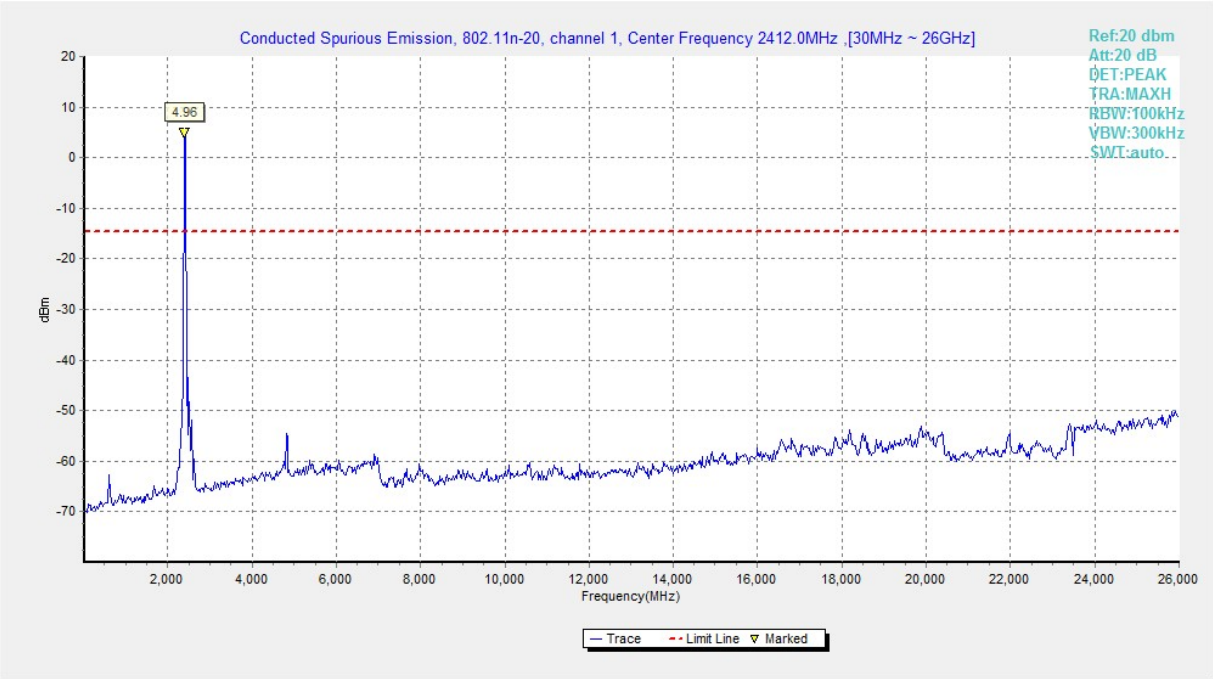

Fig.39 Conducted Spurious Emission (802.11n HT20, CH1)

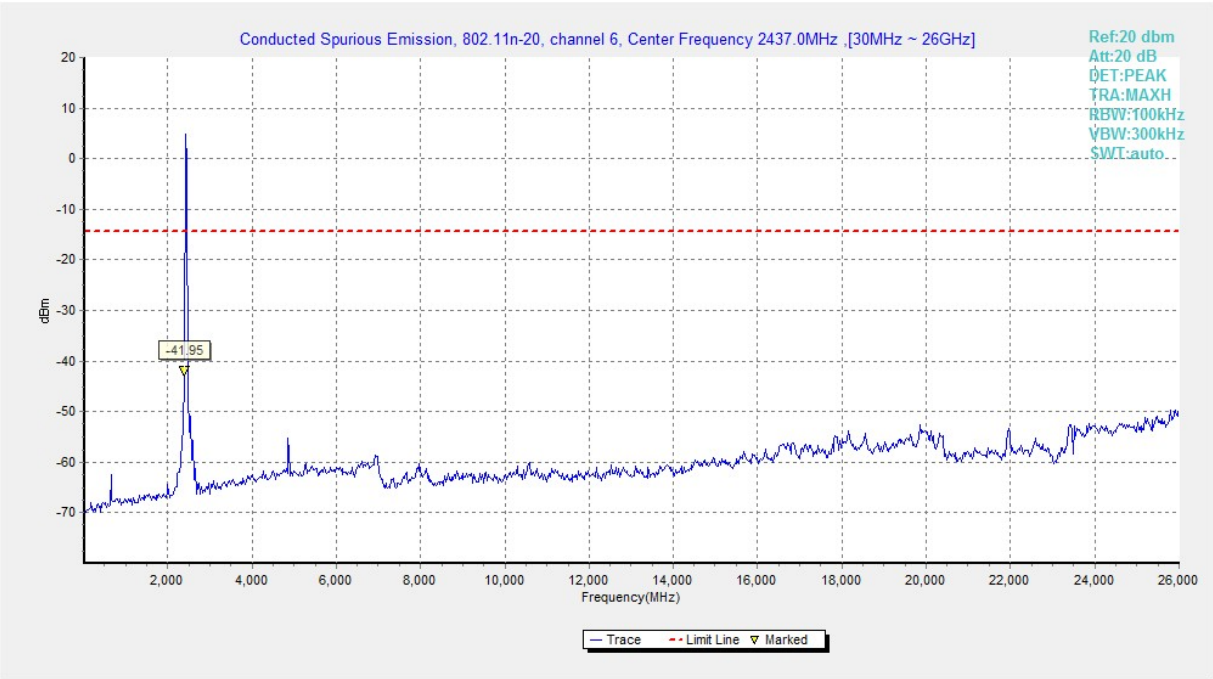

Fig.40 Conducted Spurious Emission (802.11n HT20, CH6)

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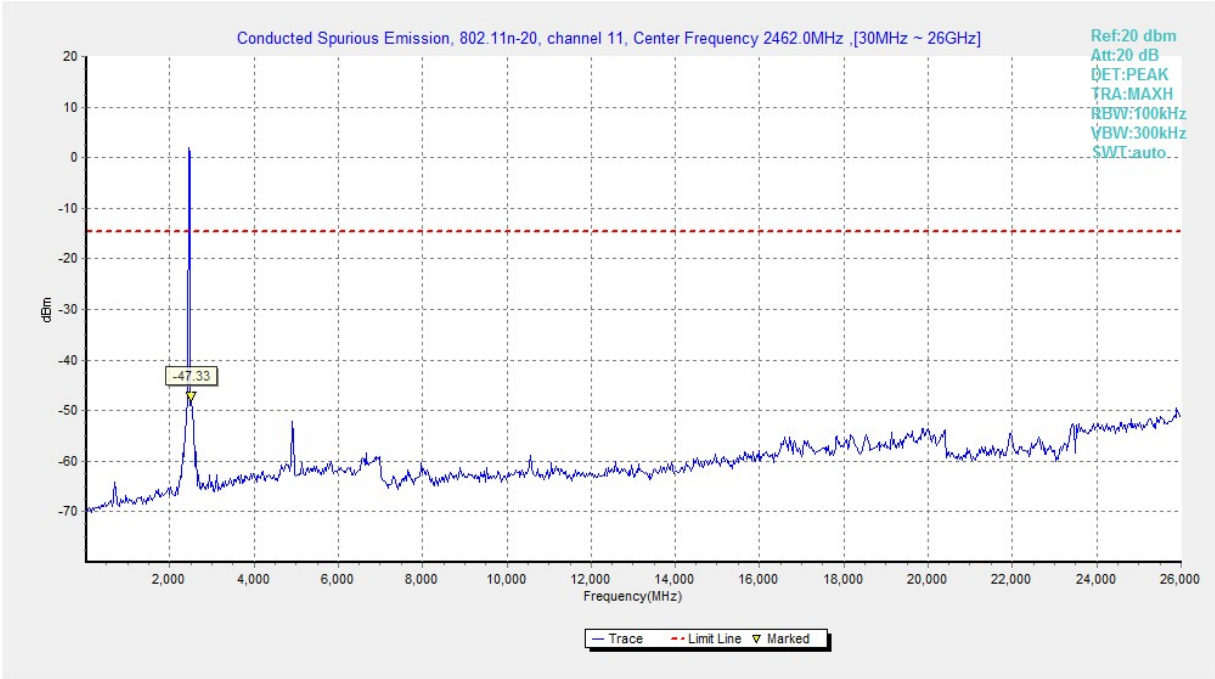

Fig.41 Conducted Spurious Emission (802.11n HT20, CH11)

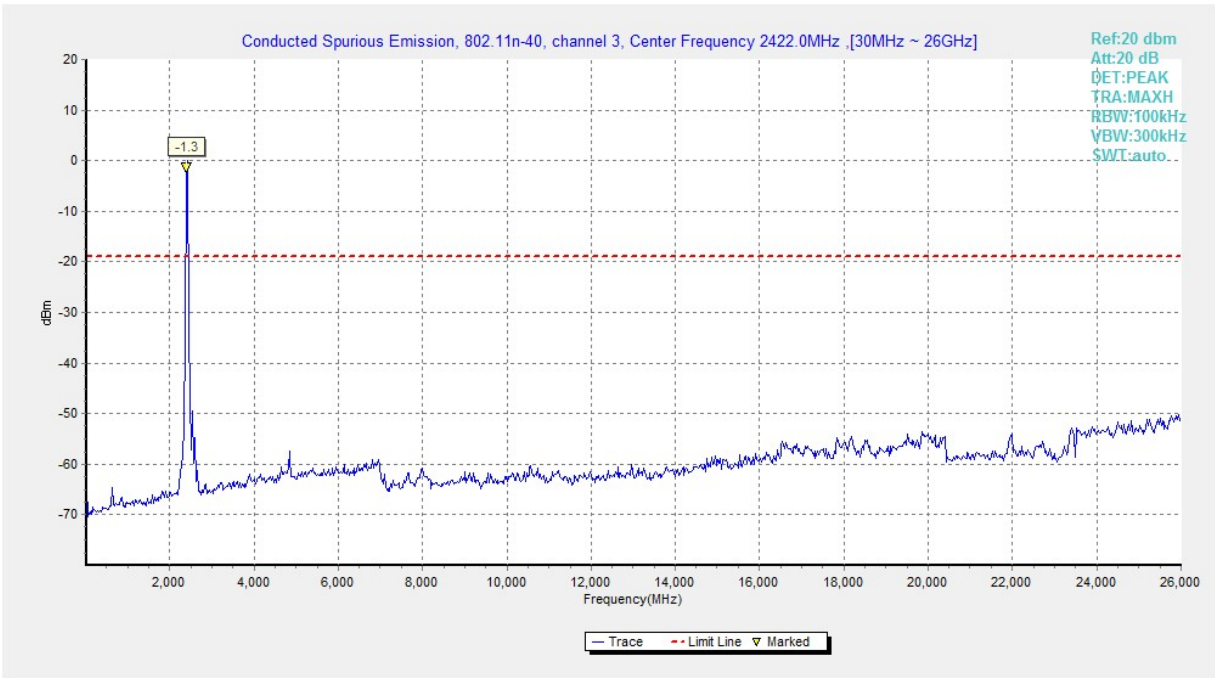

Fig.42 Conducted Spurious Emission (802.11n HT40, CH3)

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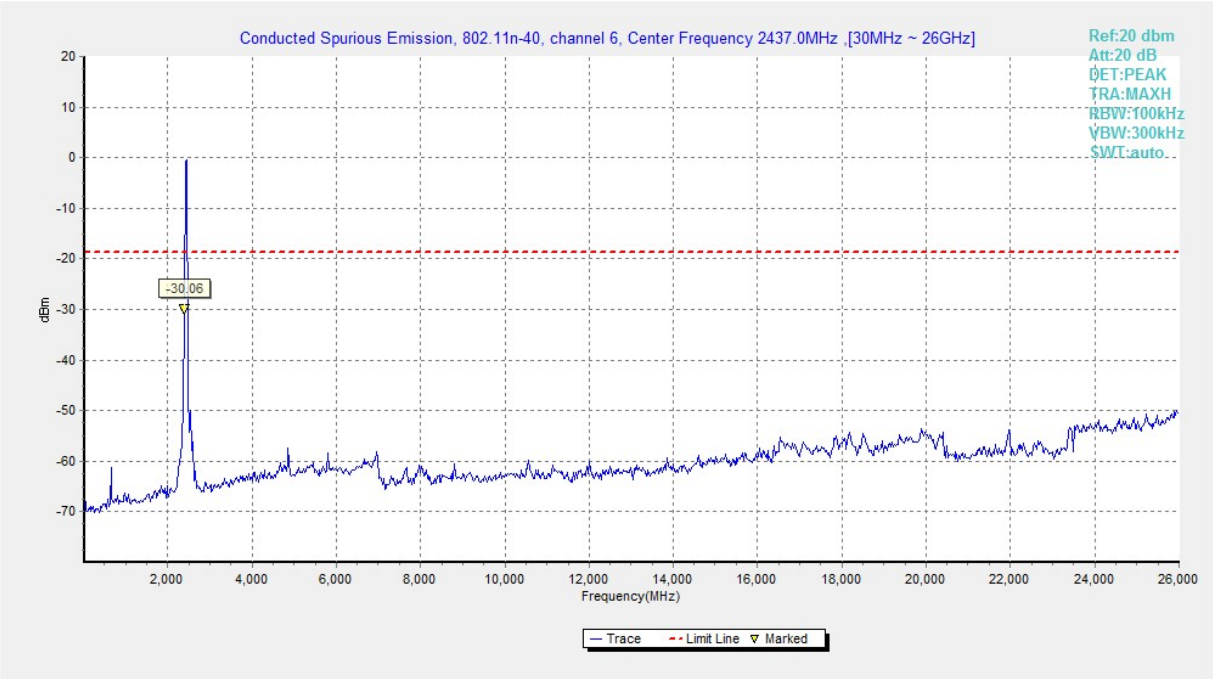

Fig.43 Conducted Spurious Emission (802.11n HT40, CH6)

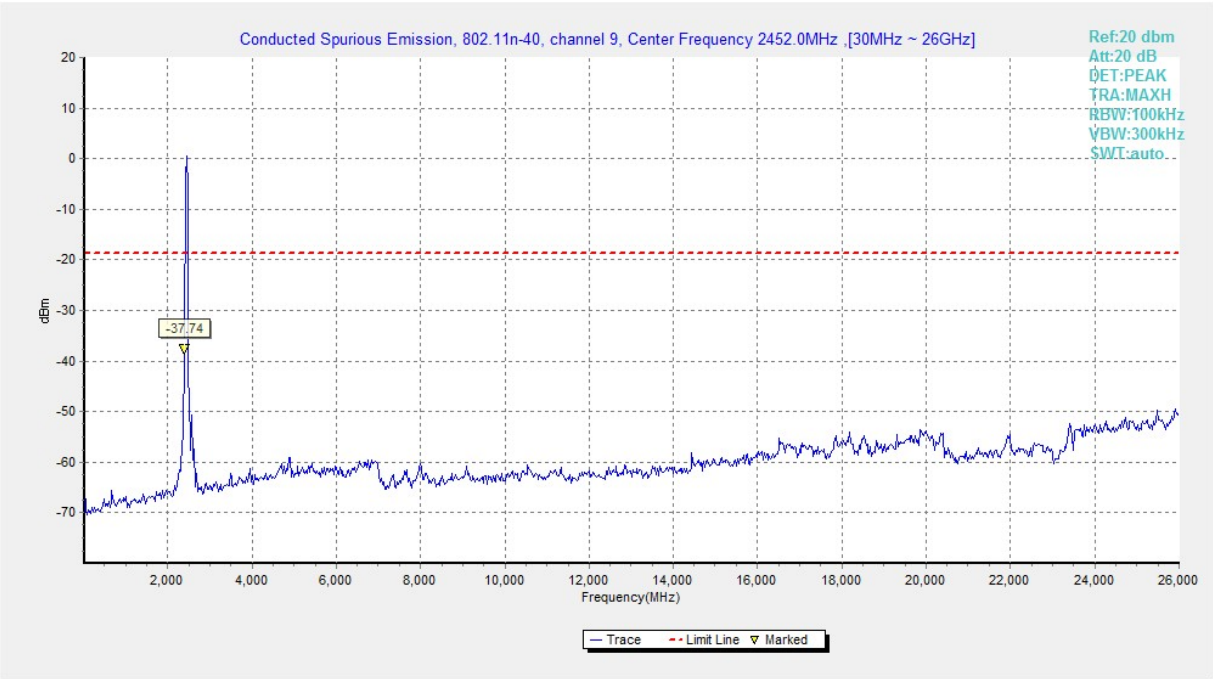

Fig.44 Conducted Spurious Emission (802.11n HT40, CH9)

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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.

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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**

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Worst-Case Result:

802.11b CH1 (1-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
4824.000000	44.33	74.00	29.67	H	-1.1
9439.500000	45.11	74.00	28.89	V	3.5
11487.000000	45.99	74.00	28.01	V	5.9
13139.000000	47.48	74.00	26.52	V	8.6
14565.500000	49.22	74.00	24.78	V	11.4
17784.000000	51.57	74.00	22.43	V	16.1

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
4824.000000	37.88	54.00	16.12	H	-1.1
11470.500000	33.99	54.00	20.01	H	5.8
12943.500000	35.63	54.00	18.37	H	8.6
14507.500000	37.37	54.00	16.63	H	11.5
16484.000000	38.44	54.00	15.56	V	14.7
17891.000000	39.62	54.00	14.38	H	16.2

802.11g CH1 (1GHz-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
7980.000000	44.68	74.00	29.32	V	2.8
9807.000000	45.26	74.00	28.74	V	4.3
10764.000000	45.67	74.00	28.33	H	5.0
13319.000000	47.18	74.00	26.82	H	8.9
15335.000000	48.81	74.00	25.19	V	11.5
17993.000000	51.53	74.00	22.47	V	15.9

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
7978.000000	32.20	54.00	21.80	H	2.7
9820.000000	33.31	54.00	20.69	H	4.4
11490.500000	33.96	54.00	20.04	V	6.0
12934.500000	35.46	54.00	18.54	H	8.6
14509.500000	37.55	54.00	16.45	V	11.5
17873.500000	39.53	54.00	14.47	V	16.3

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802.11n HT20 CH6 (1GHz-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
6371.000000	44.85	74.00	29.15	H	1.8
9805.500000	44.98	74.00	29.02	H	4.3
11015.500000	46.49	74.00	27.51	H	5.1
12964.000000	47.88	74.00	26.12	H	8.5
15305.000000	49.78	74.00	24.22	V	11.5
17770.500000	51.57	74.00	22.43	H	16.2

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
6397.500000	32.17	54.00	21.83	H	2.0
9830.000000	33.49	54.00	20.51	V	4.5
11472.000000	33.92	54.00	20.08	H	5.9
12956.000000	35.59	54.00	18.41	V	8.5
14509.000000	37.44	54.00	16.56	V	11.5
17878.000000	39.67	54.00	14.33	H	16.3

802.11n HT40 CH6 (1GHz-18GHz)

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
8286.500000	45.08	74.00	28.92	V	3.2
9756.000000	45.66	74.00	28.34	V	4.0
10224.000000	45.86	74.00	28.14	H	5.1
12936.500000	47.15	74.00	26.85	H	8.6
14569.500000	48.47	74.00	25.53	V	11.4
17112.500000	51.36	74.00	22.64	H	15.0

Frequency (MHz)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol	Corr. (dB)
7438.000000	32.13	54.00	21.87	H	2.2
9837.000000	33.34	54.00	20.66	H	4.5
11480.500000	34.27	54.00	19.73	V	5.9
12935.000000	35.57	54.00	18.43	V	8.6
14517.000000	37.45	54.00	16.55	H	11.5
17874.500000	39.71	54.00	14.29	H	16.3

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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

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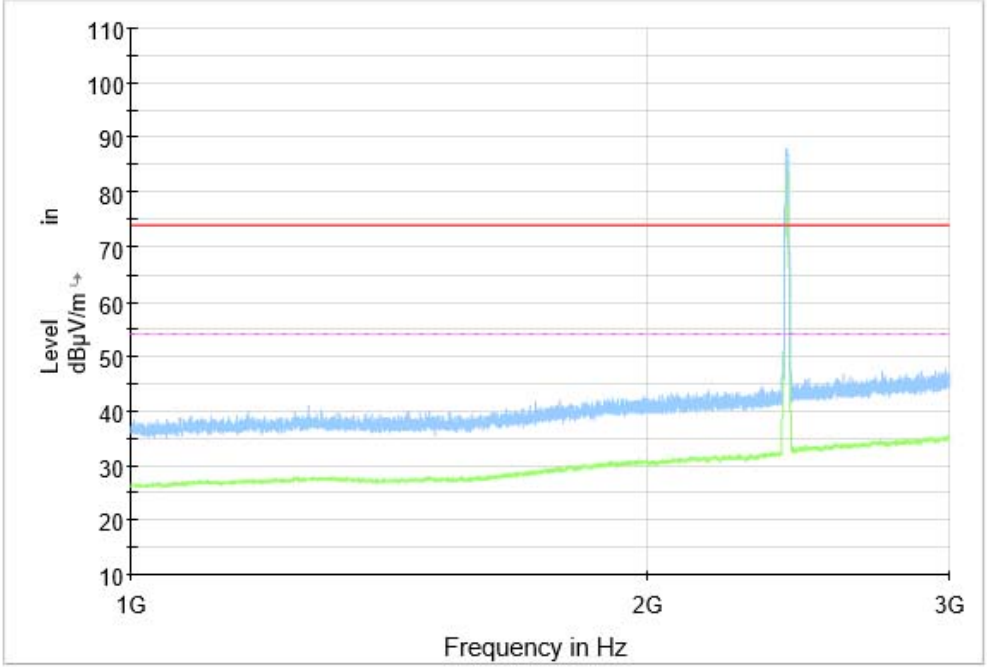

Fig.45 Radiated Spurious Emission (802.11b, CH1, 1 GHz-3GHz)

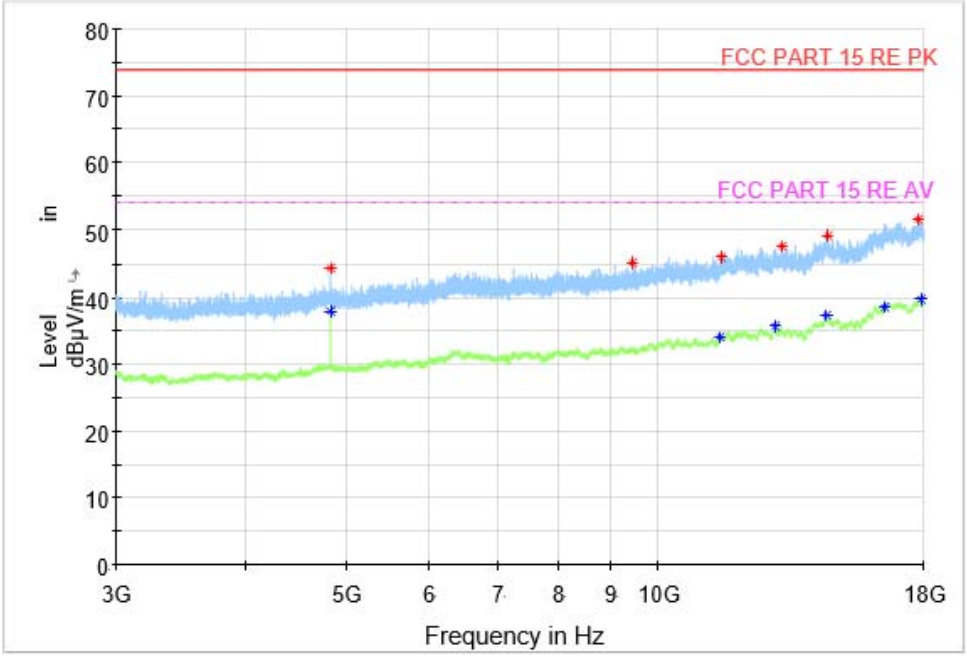

Fig.46 Radiated Spurious Emission (802.11b, CH1, 3 GHz-18GHz)

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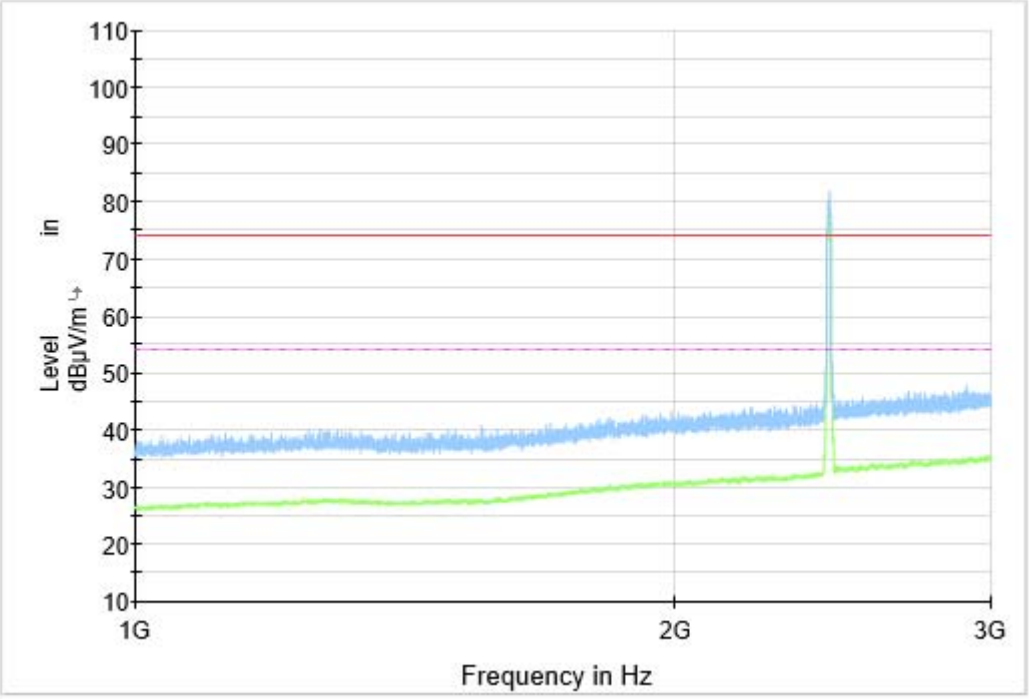

Fig.47 Radiated Spurious Emission (802.11b, CH6, 1 GHz-3GHz)

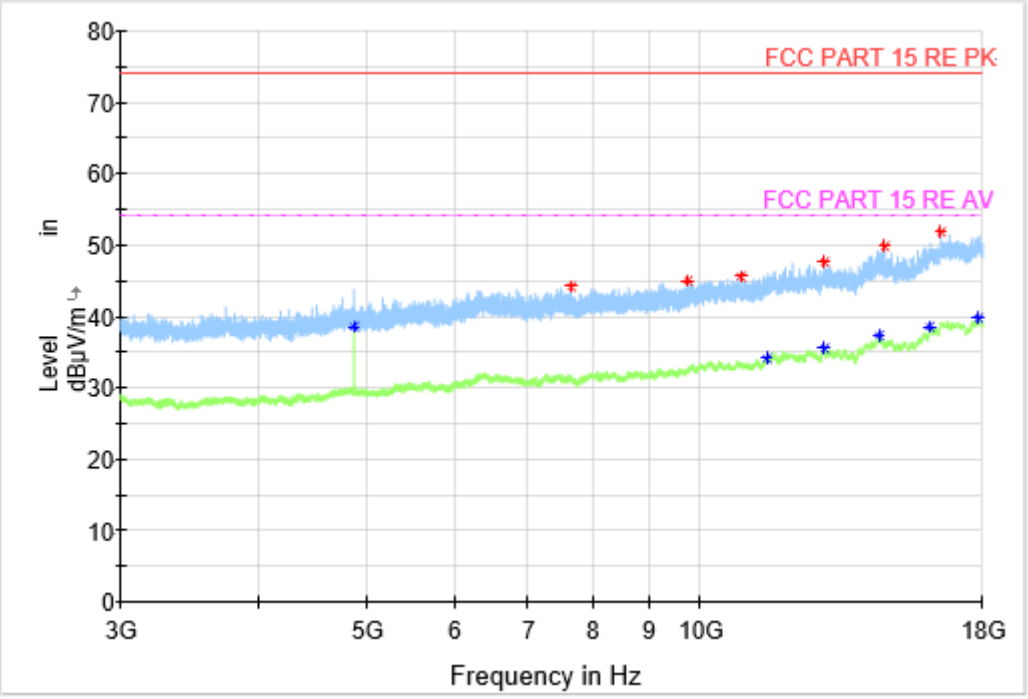

Fig.48 Radiated Spurious Emission (802.11b, CH6, 3 GHz-18GHz)

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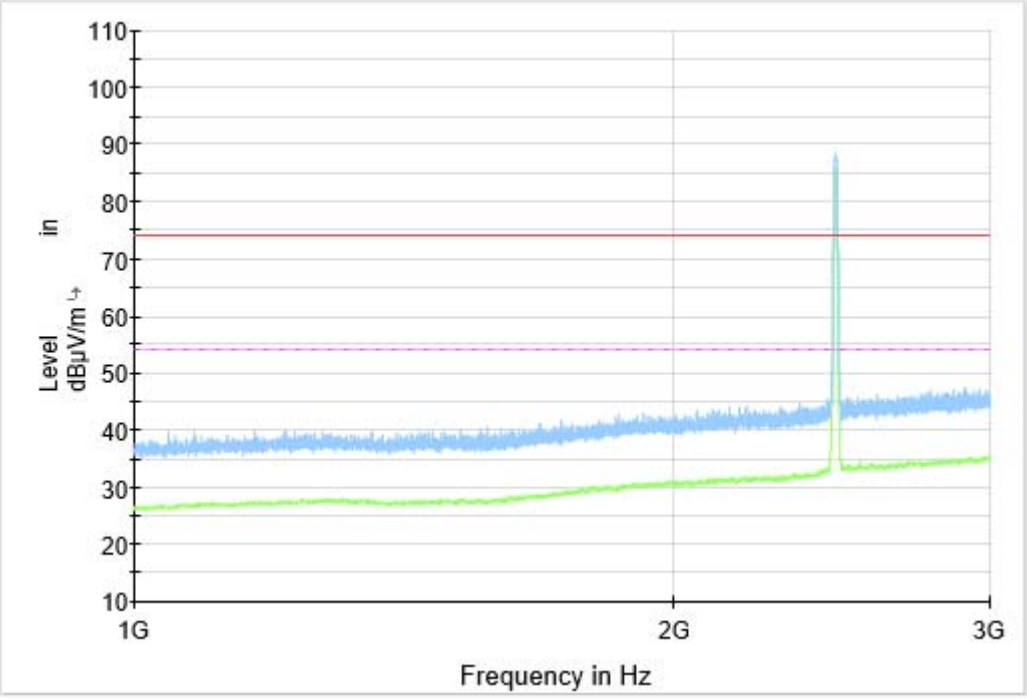

Fig.49 Radiated Spurious Emission (802.11b, CH11, 1 GHz-3GHz)

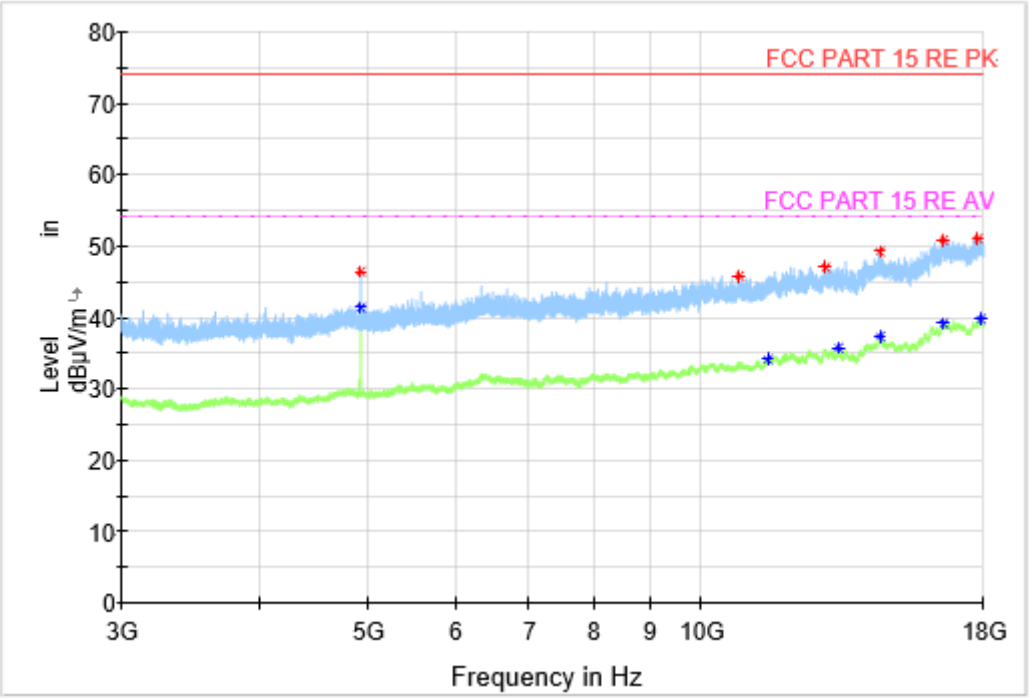

Fig.50 Radiated Spurious Emission (802.11b, CH11, 3 GHz-18GHz)

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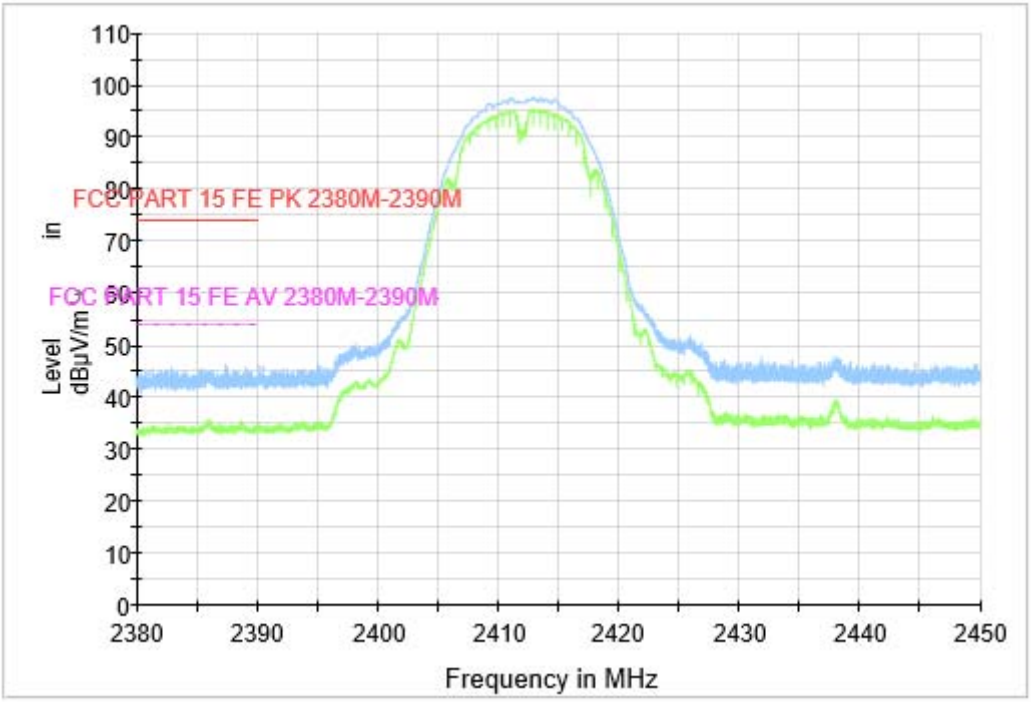

Fig.51 Radiated Restricted Band (802.11b, CH1, 2.38GHz~2.45GHz)

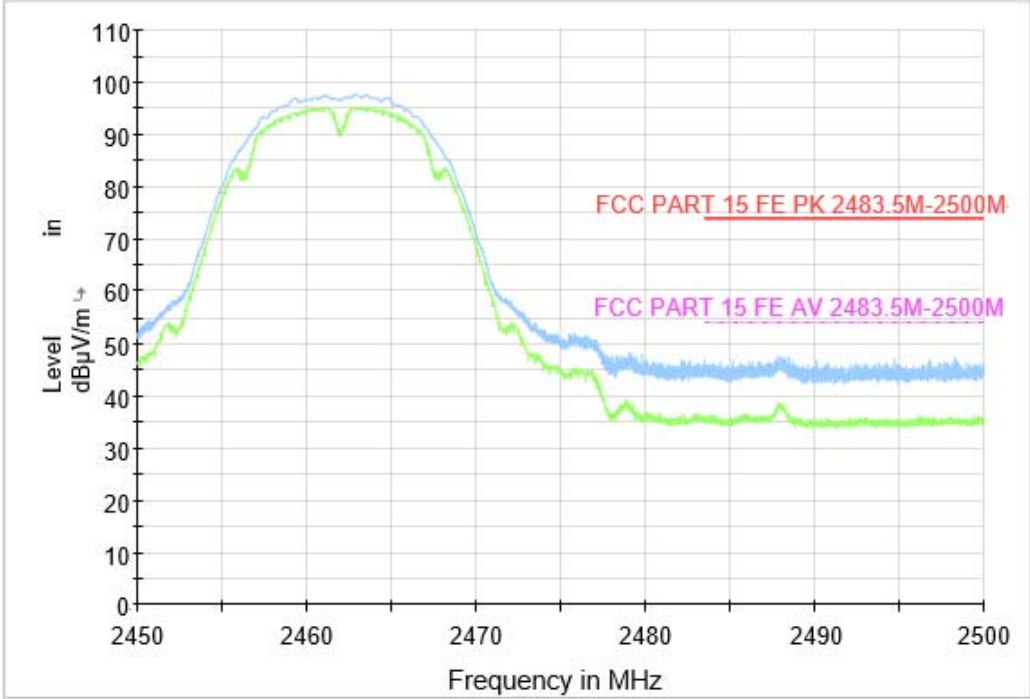

Fig.52 Radiated Restricted Band (802.11b, CH11, 2.45GHz~2.5GHz)

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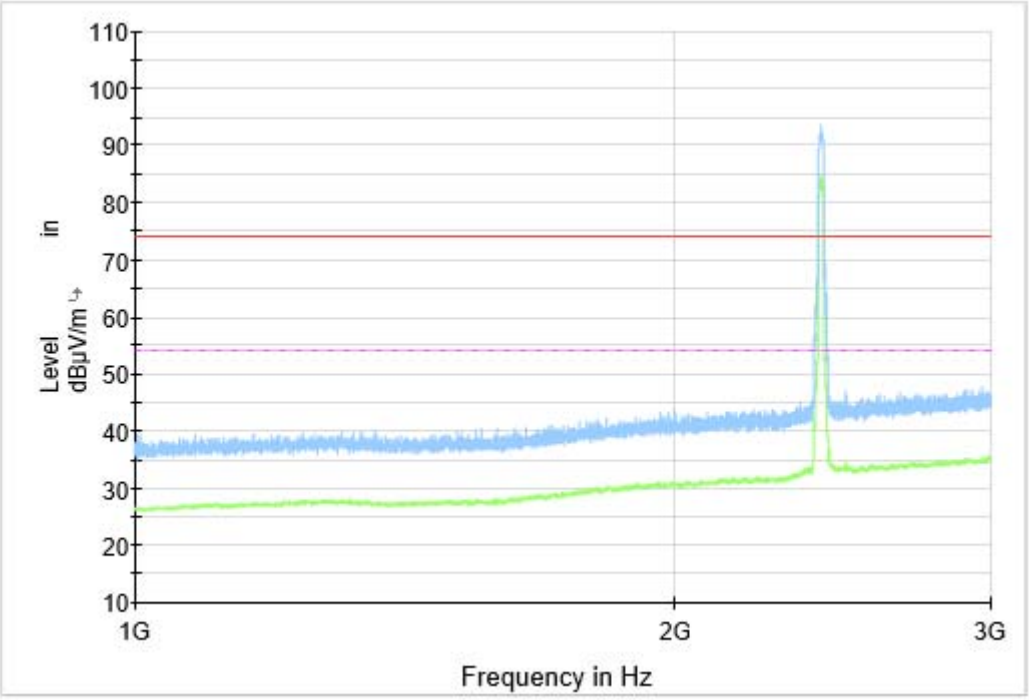

Fig.53 Radiated Spurious Emission (802.11g, CH1, 1 GHz-3 GHz)

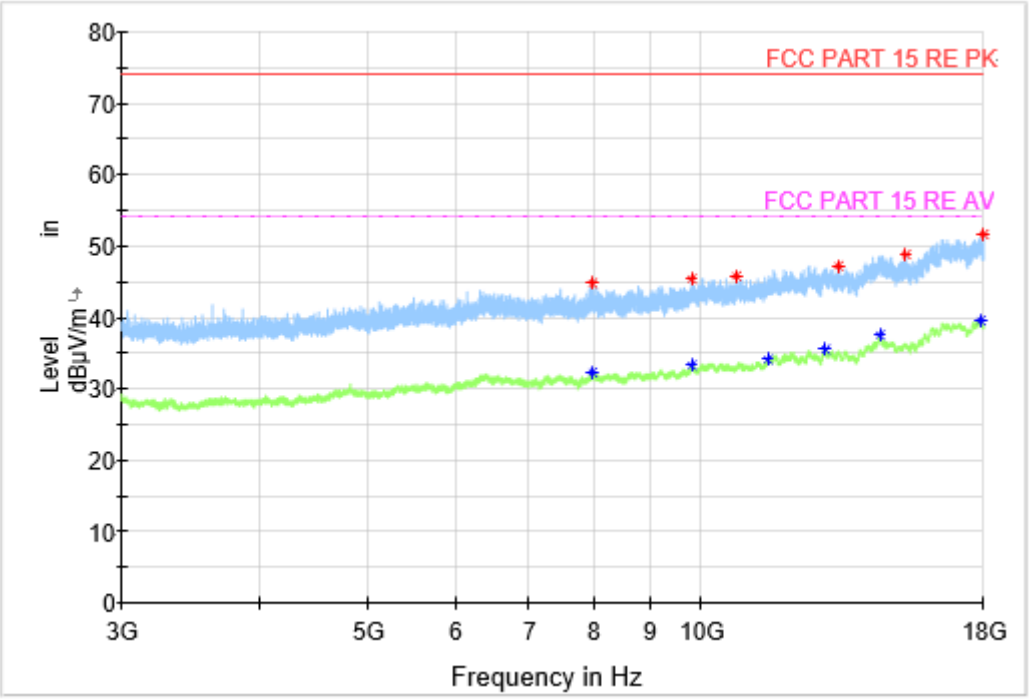

Fig.54 Radiated Spurious Emission (802.11g, CH1, 3 GHz-18 GHz)

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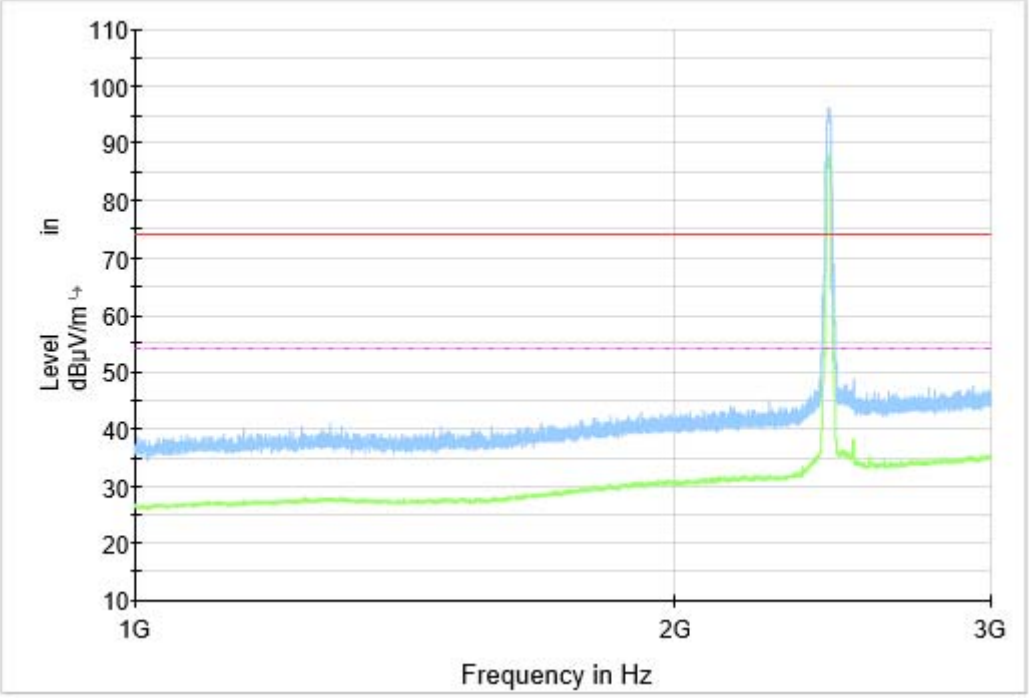

Fig.55 Radiated Spurious Emission (802.11g, CH6, 1 GHz-3 GHz)

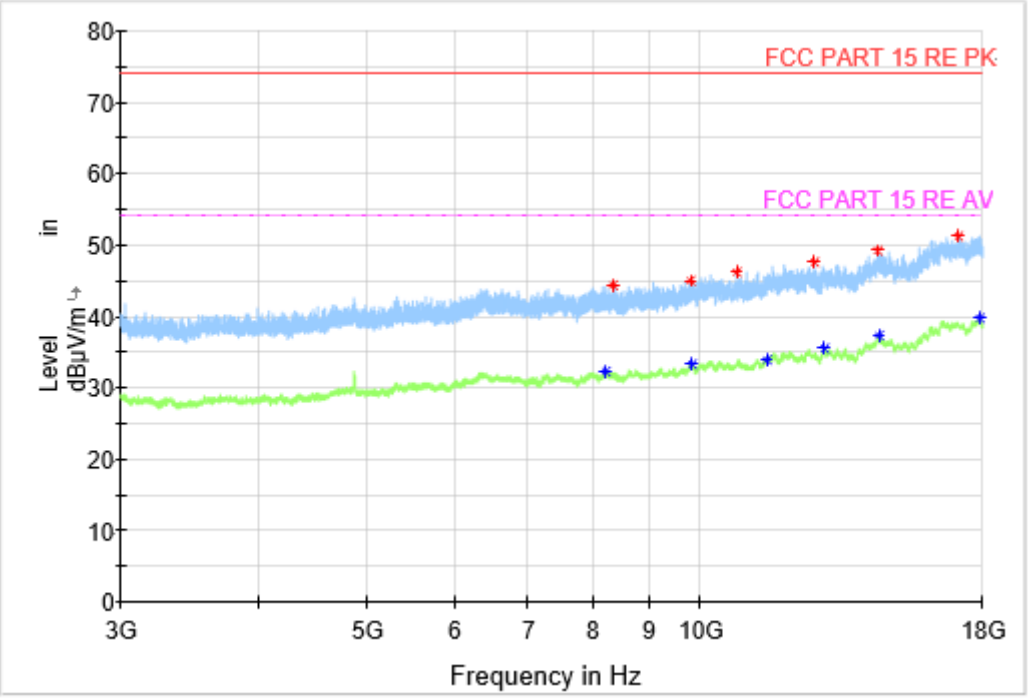

Fig.56 Radiated Spurious Emission (802.11g, CH6, 3 GHz-18 GHz)

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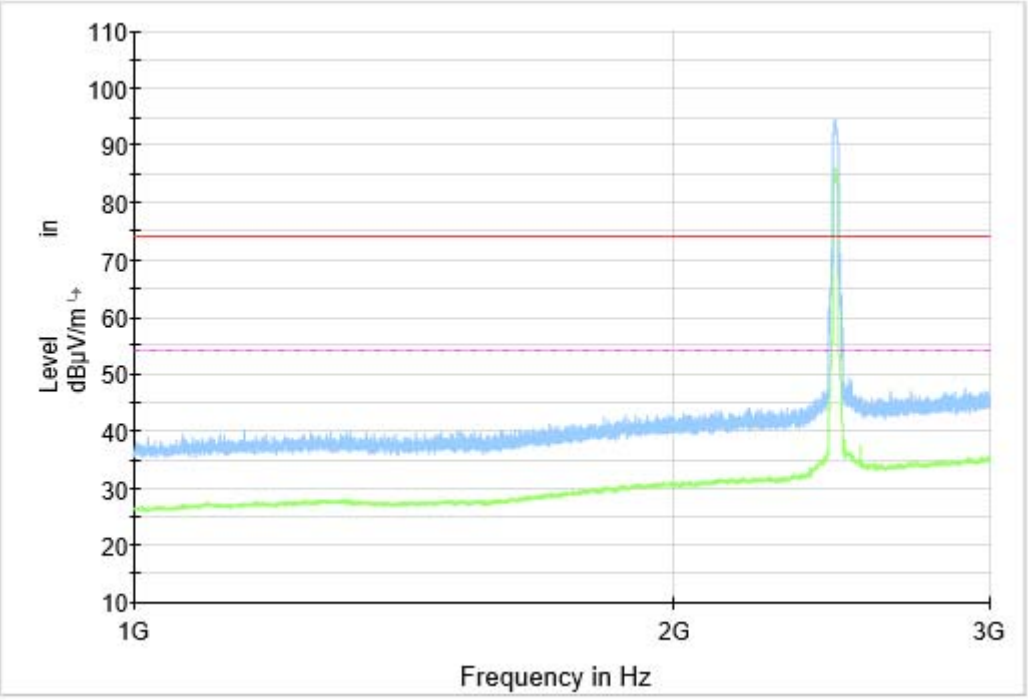

Fig.57 Radiated Spurious Emission (802.11g, CH11, 1 GHz-3 GHz)

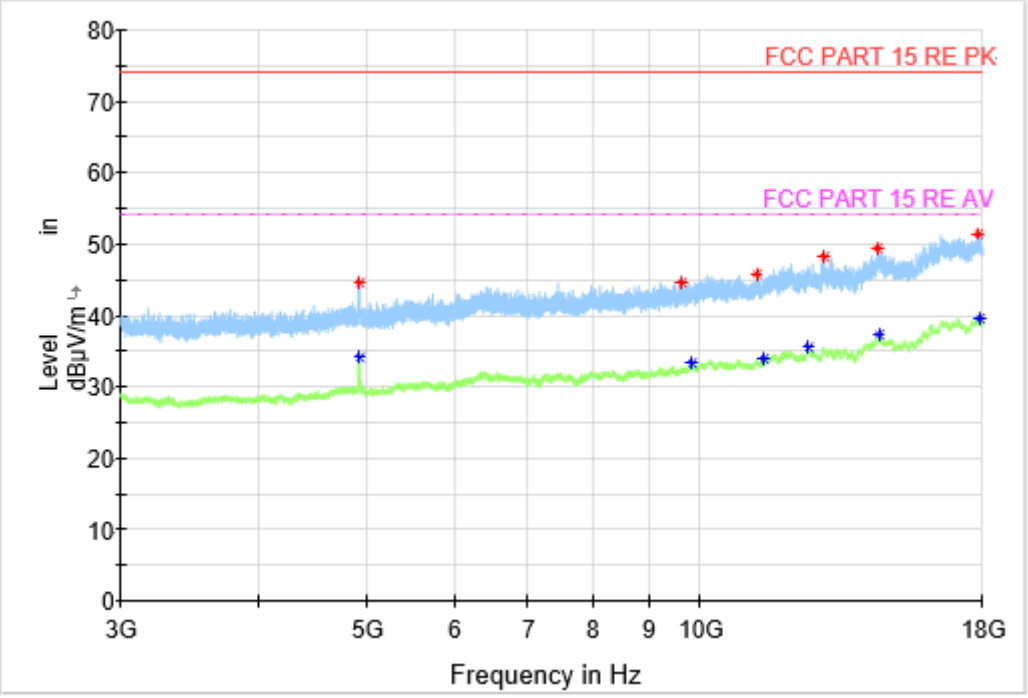

Fig.58 Radiated Spurious Emission (802.11g, CH11, 3 GHz-18 GHz)

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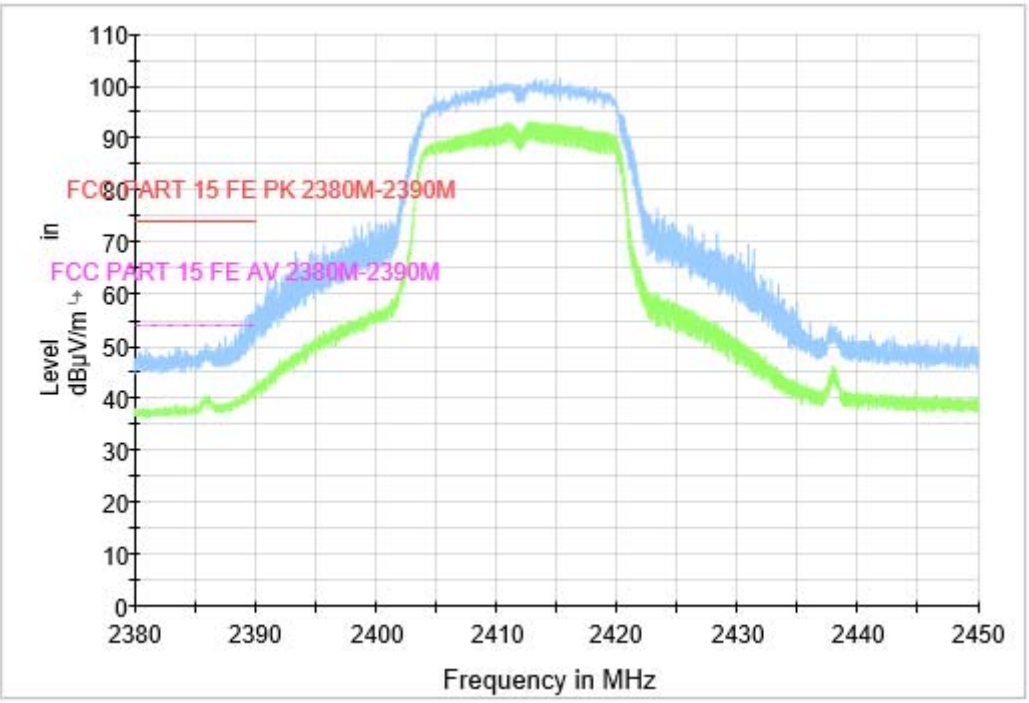

Fig.59 Radiated Restricted Band (802.11g, CH1, 2.38GHz~2.45GHz)

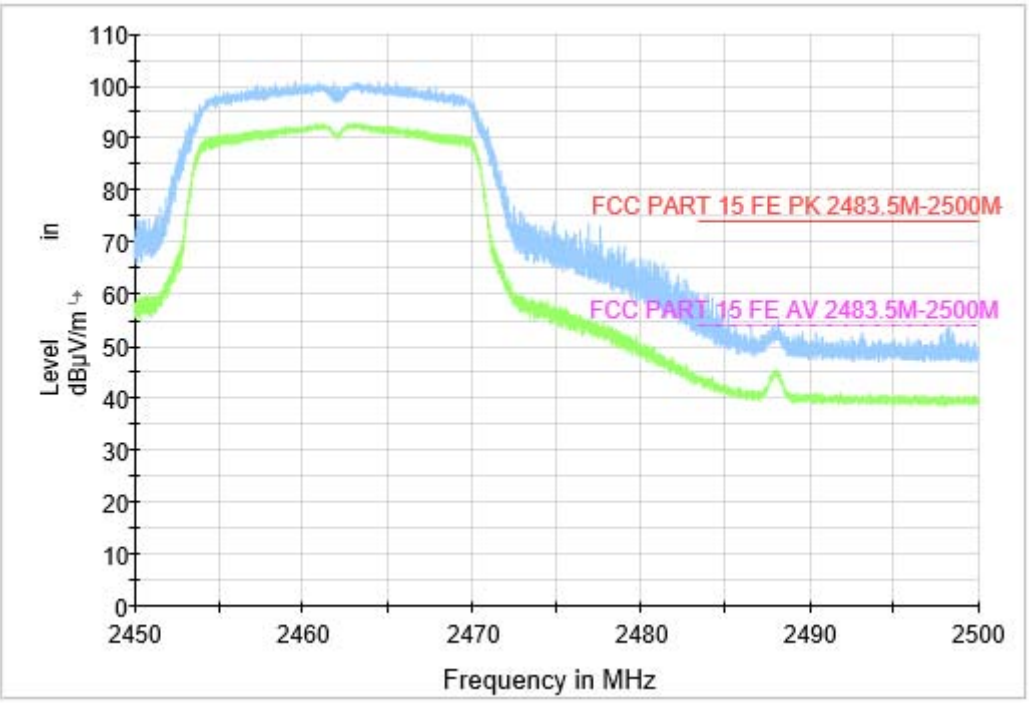

Fig.60 Radiated Restricted Band (802.11g, CH11, 2.45GHz~2.5GHz)

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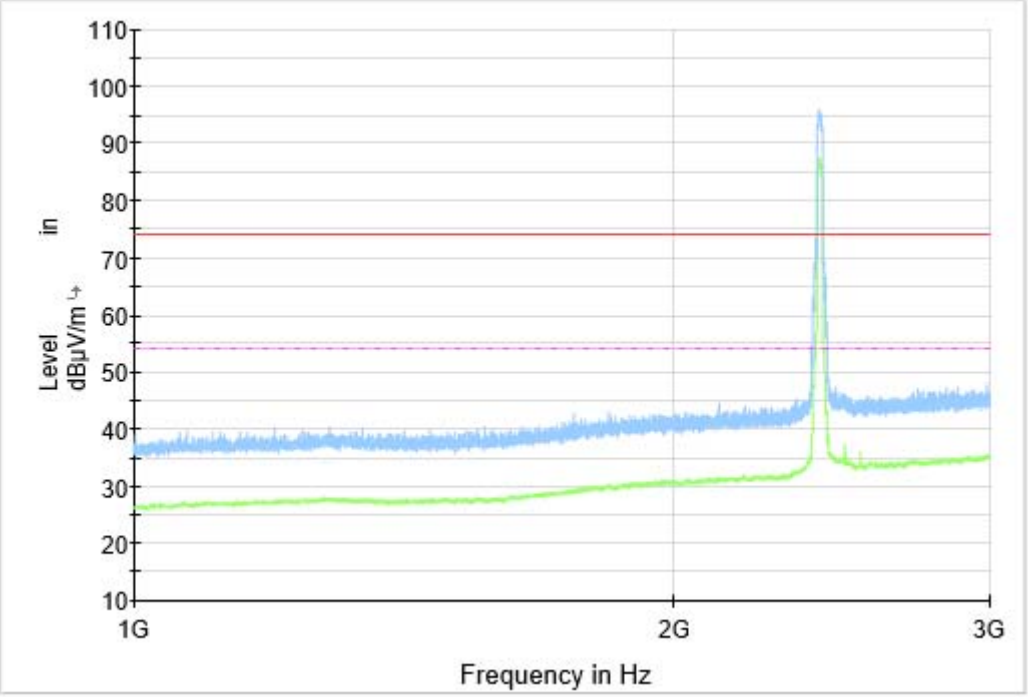

Fig.61 Radiated Spurious Emission (802.11n HT20, CH1, 1 GHz-3 GHz)

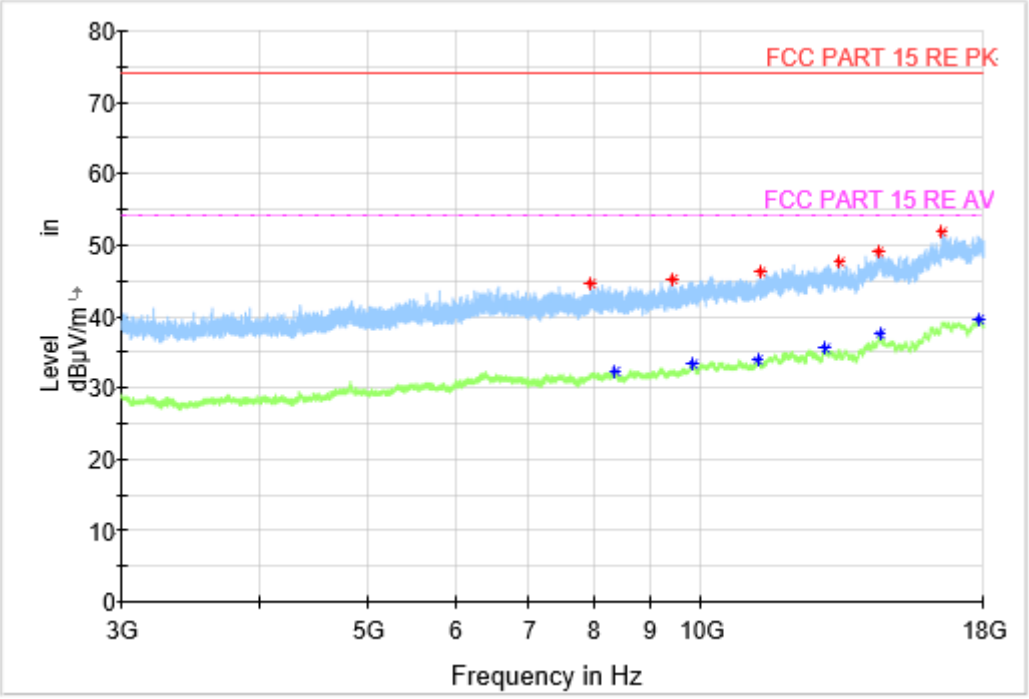

Fig.62 Radiated Spurious Emission (802.11n HT20, CH1, 3 GHz-18 GHz)

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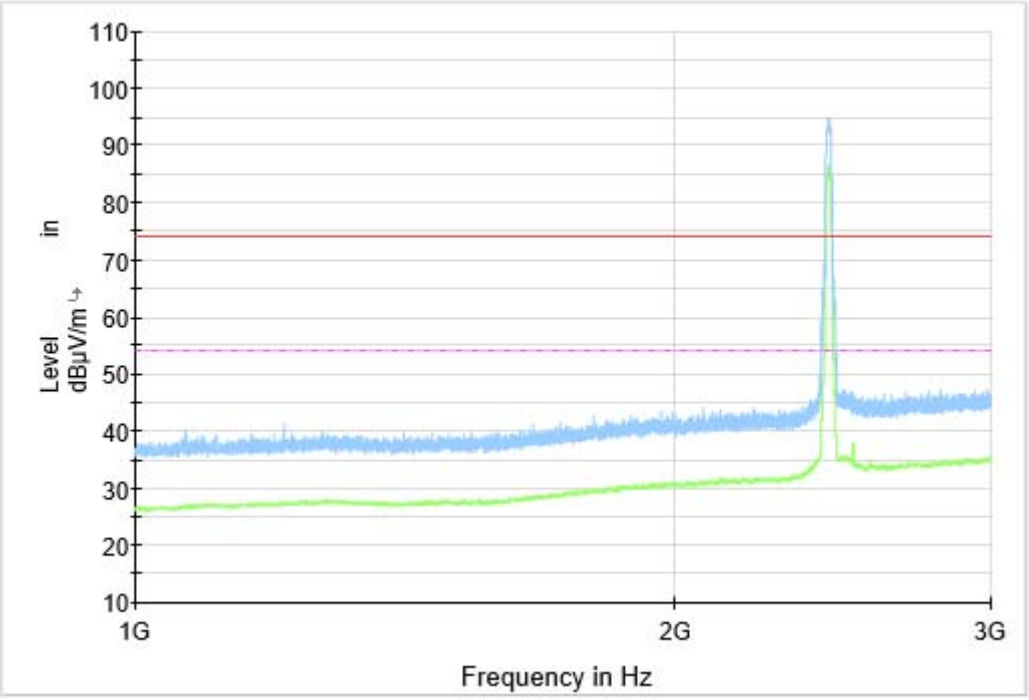

Fig.63 Radiated Spurious Emission (802.11n HT20, CH6, 1 GHz-3 GHz)

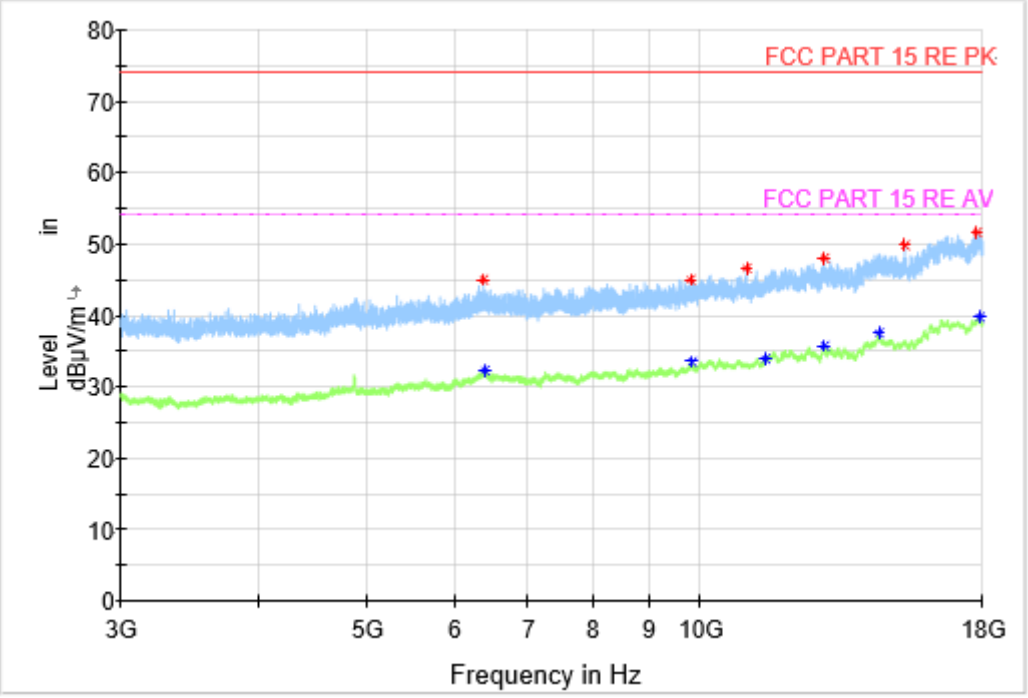

Fig.64 Radiated Spurious Emission (802.11n HT20, CH6, 3 GHz-18 GHz)

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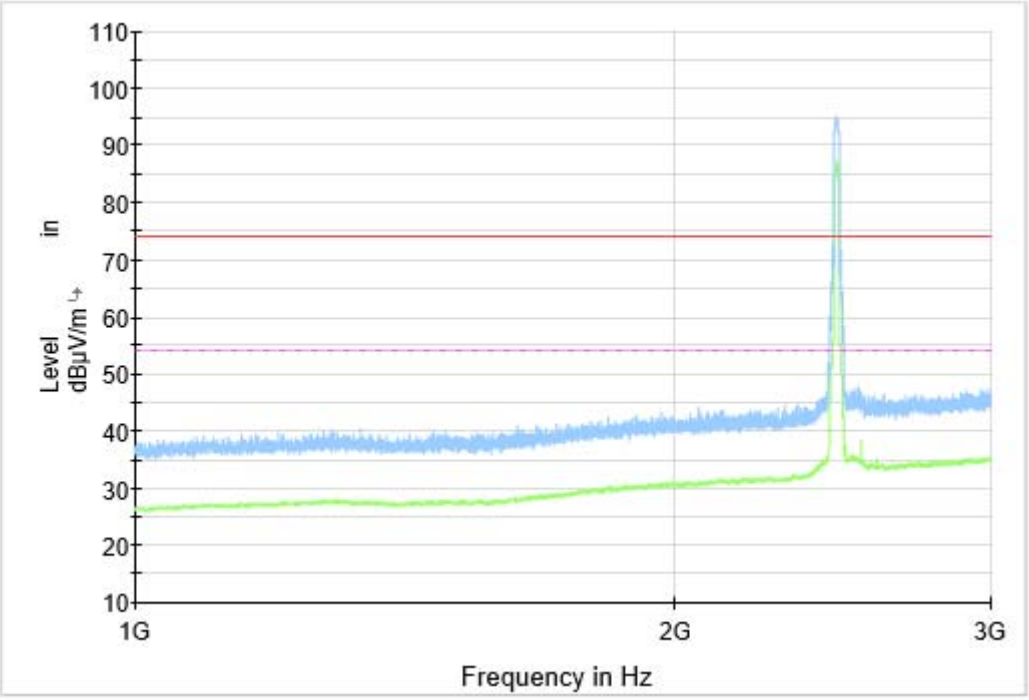

Fig.65 Radiated Spurious Emission (802.11n HT20, CH11, 1 GHz-3 GHz)

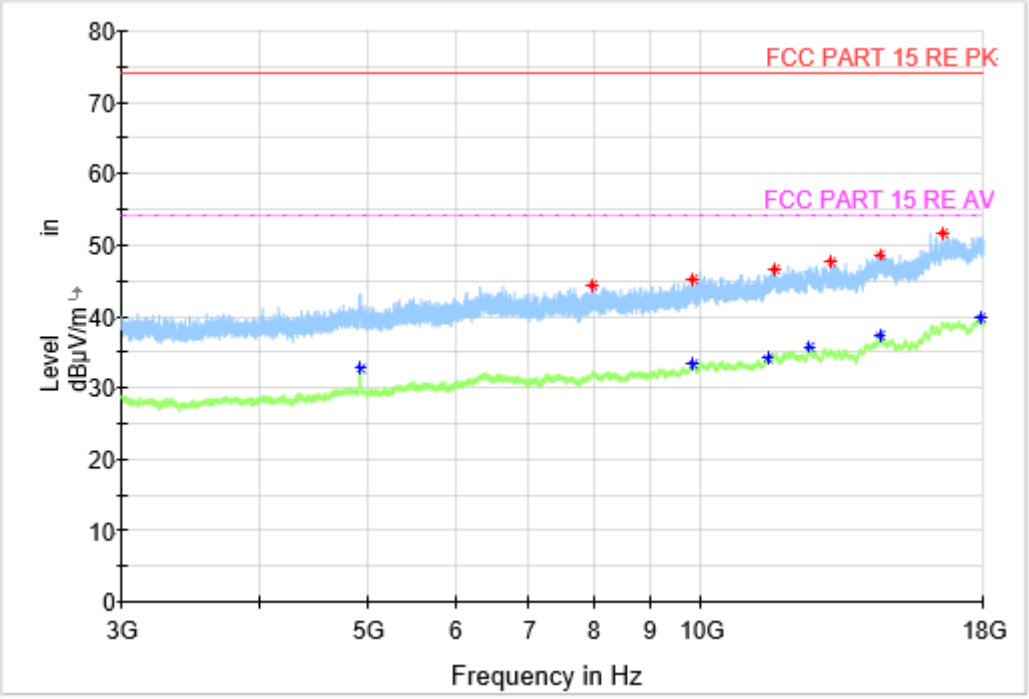

Fig.66 Radiated Spurious Emission (802.11n HT20, CH11, 3 GHz-18 GHz)

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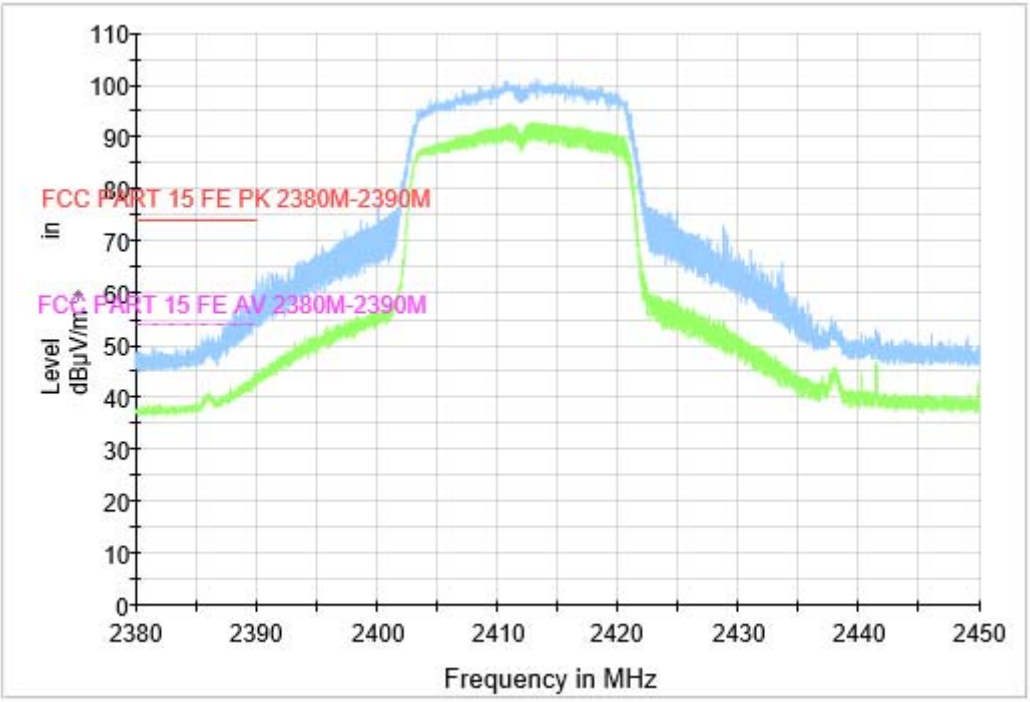

Fig.67 Radiated Restricted Band (802.11n HT20, CH1, 2.38GHz~2.45GHz)

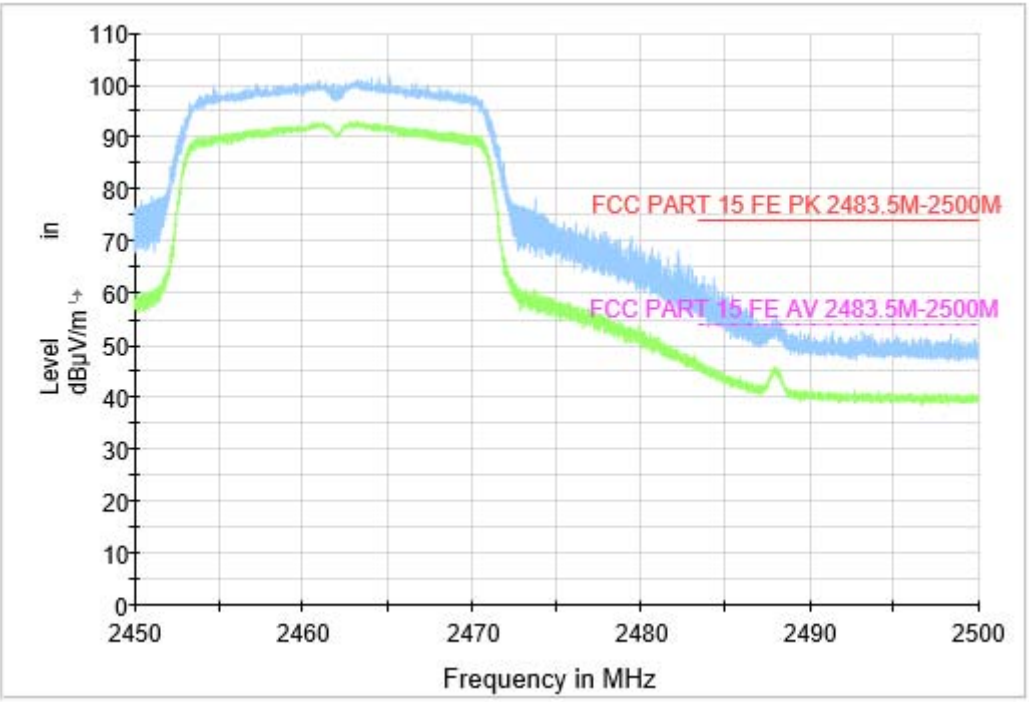

Fig.68 Radiated Restricted Band (802.11n HT20, CH11, 2.45GHz~2.5GHz)

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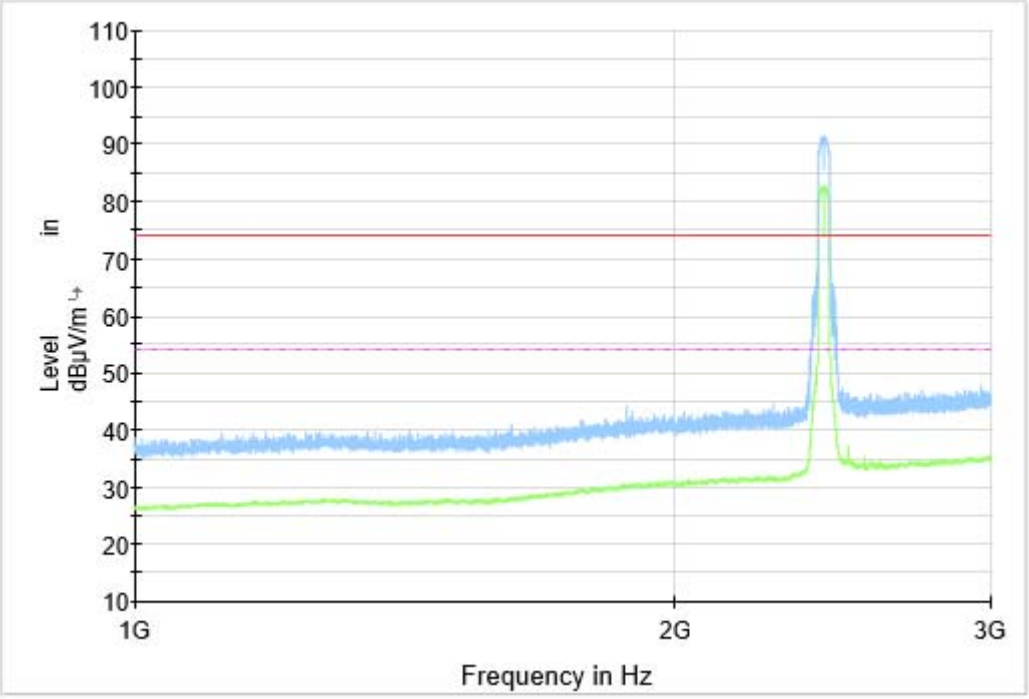

Fig.69 Radiated Spurious Emission (802.11n HT40, CH3, 1 GHz-3 GHz)

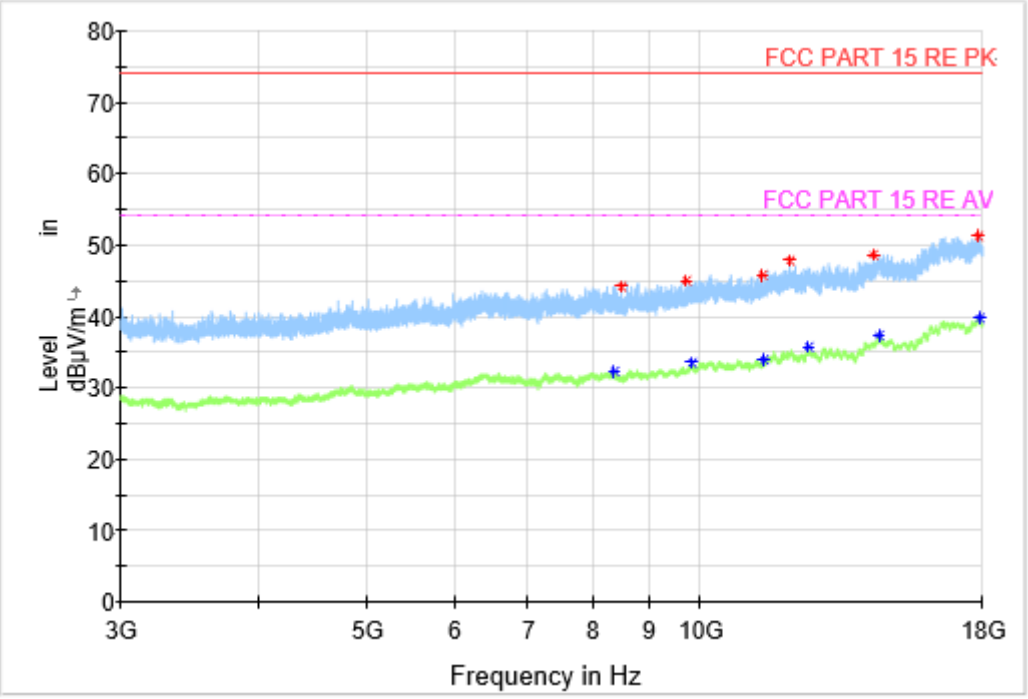

Fig.70 Radiated Spurious Emission (802.11n HT40, CH3, 3 GHz-18 GHz)

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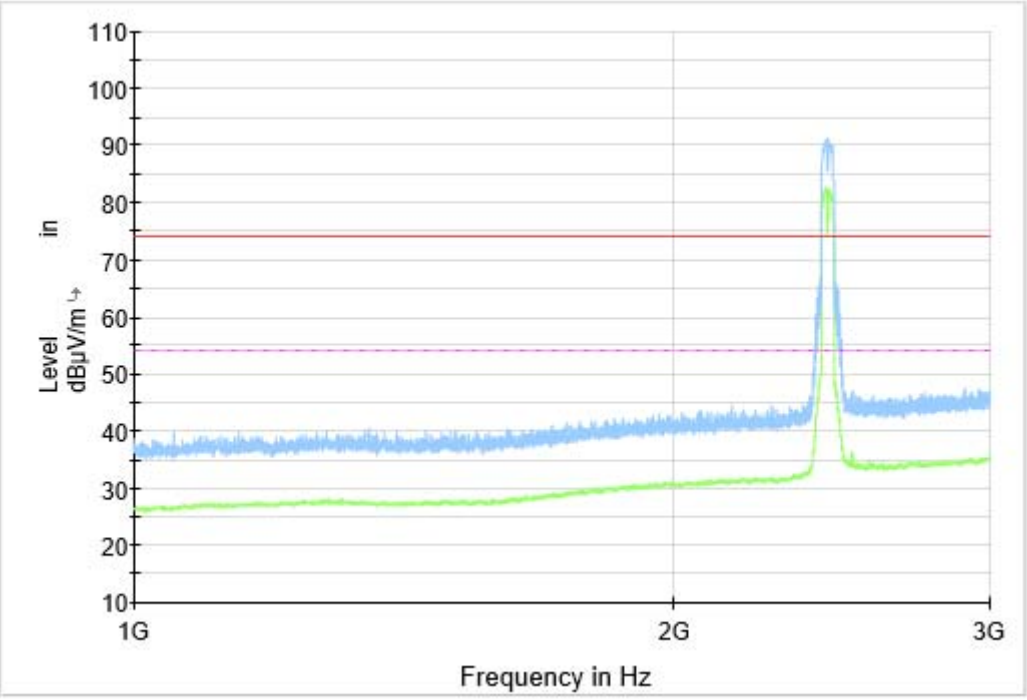

Fig.71 Radiated Spurious Emission (802.11n HT40, CH6, 1 GHz-3 GHz)

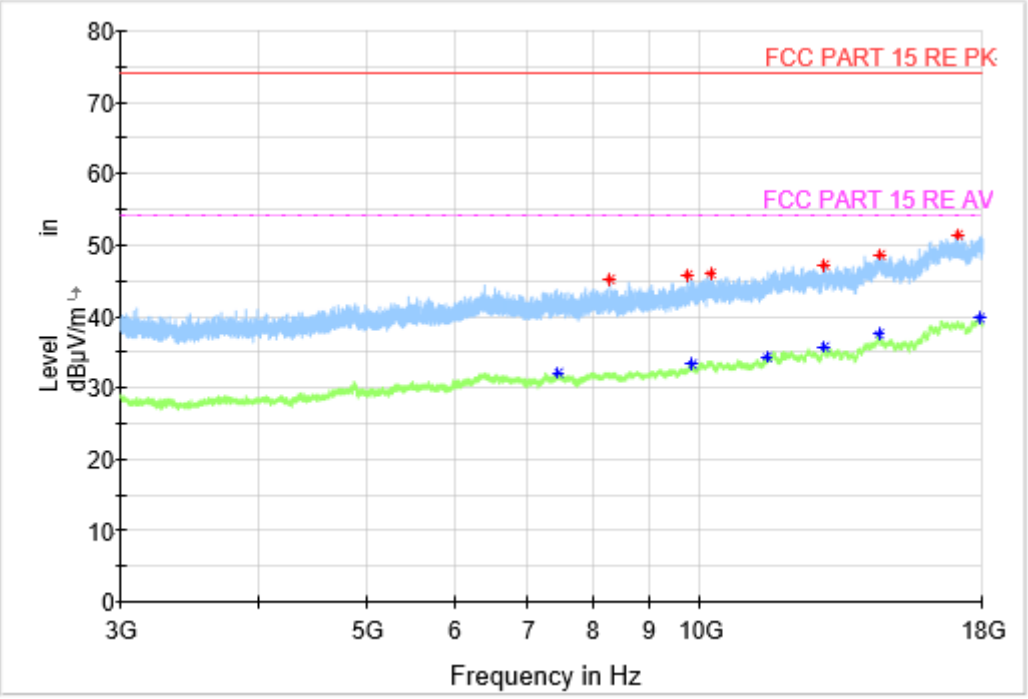

Fig.72 Radiated Spurious Emission (802.11n HT40, CH6, 3 GHz-18 GHz)

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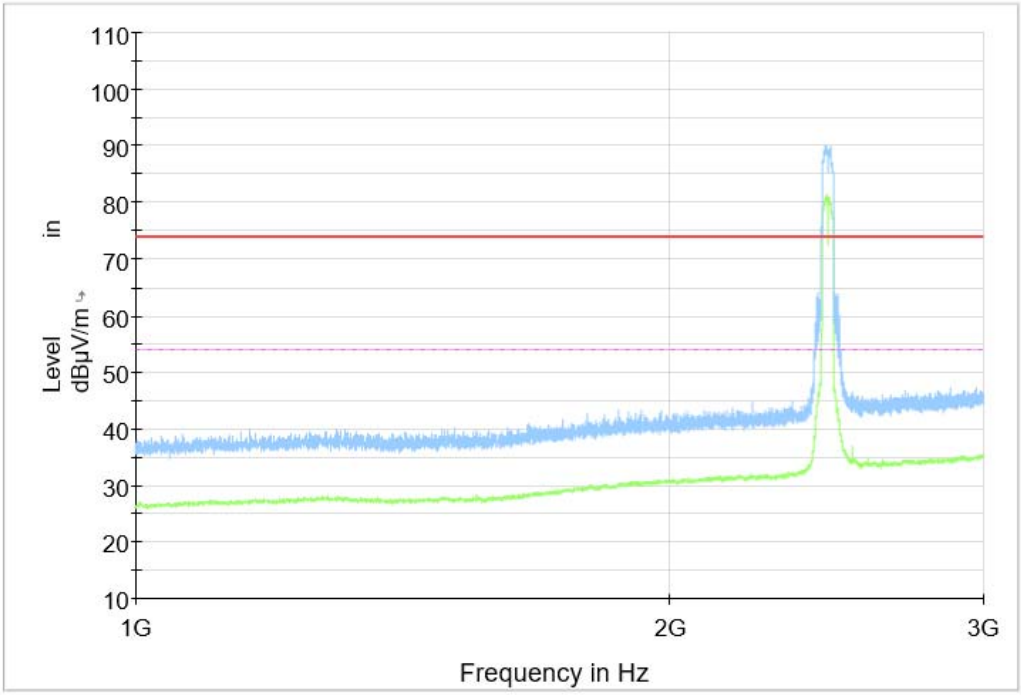

Fig.73 Radiated Spurious Emission (802.11n HT40, CH9, 1 GHz-3 GHz)

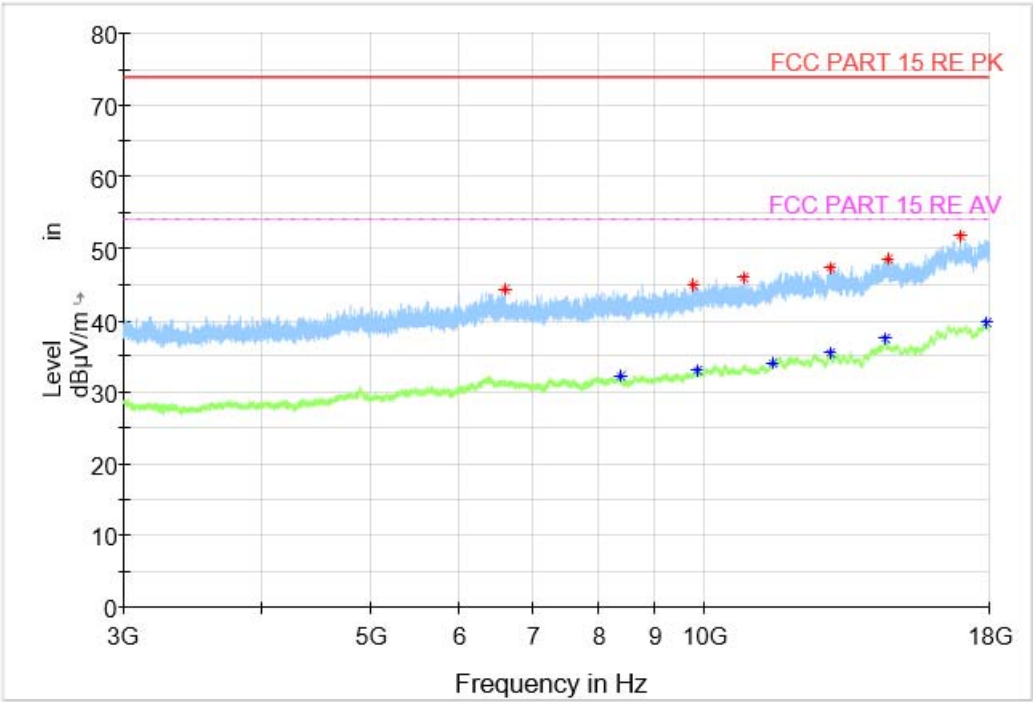

Fig.74 Radiated Spurious Emission (802.11n HT40, CH9,, 3 GHz-18 GHz)

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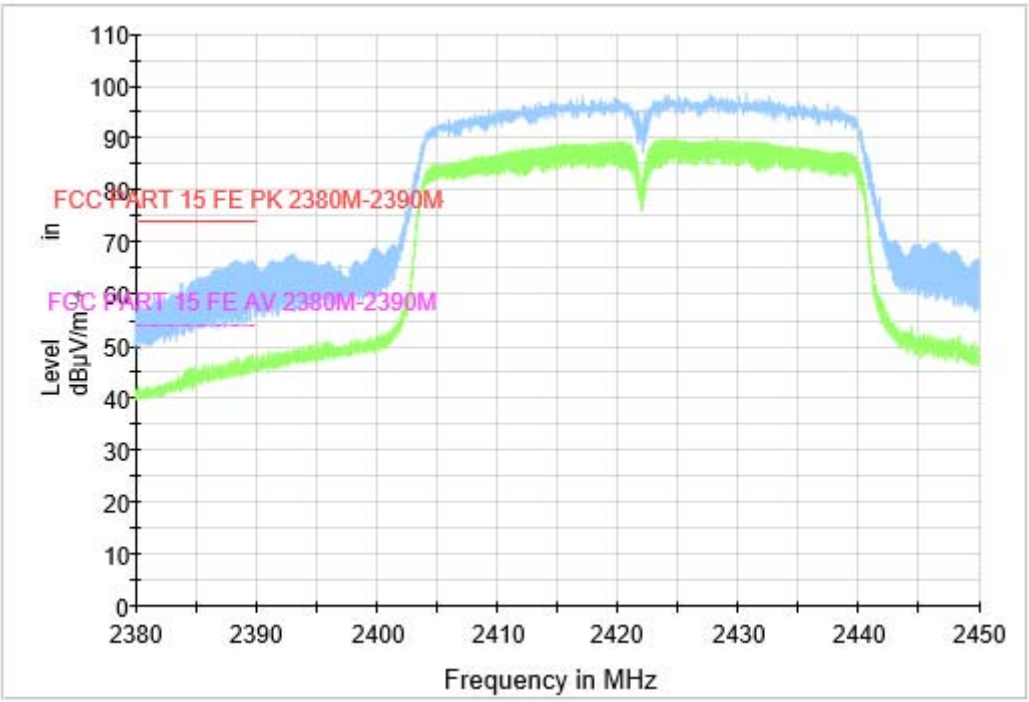

Fig.75 Radiated Restricted Band (802.11n HT40, CH3, 2.38GHz~2.45GHz)

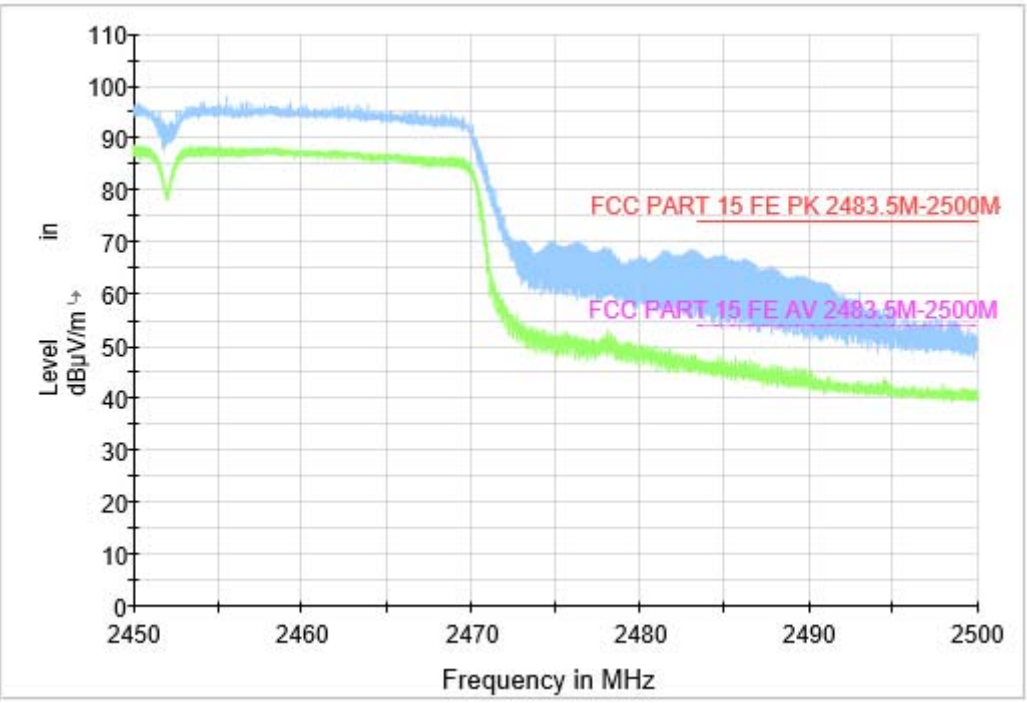

Fig.76 Radiated Restricted Band (802.11n HT40, CH9,, 2.45GHz~2.5GHz)

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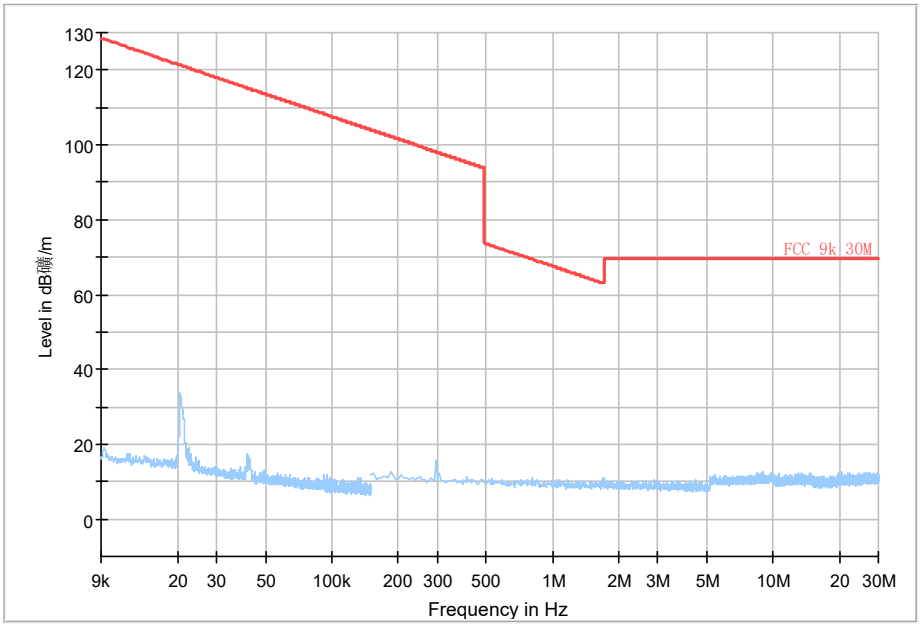

Fig.77 Radiated Spurious Emission (All Channels, 9KHz-30 MHz)

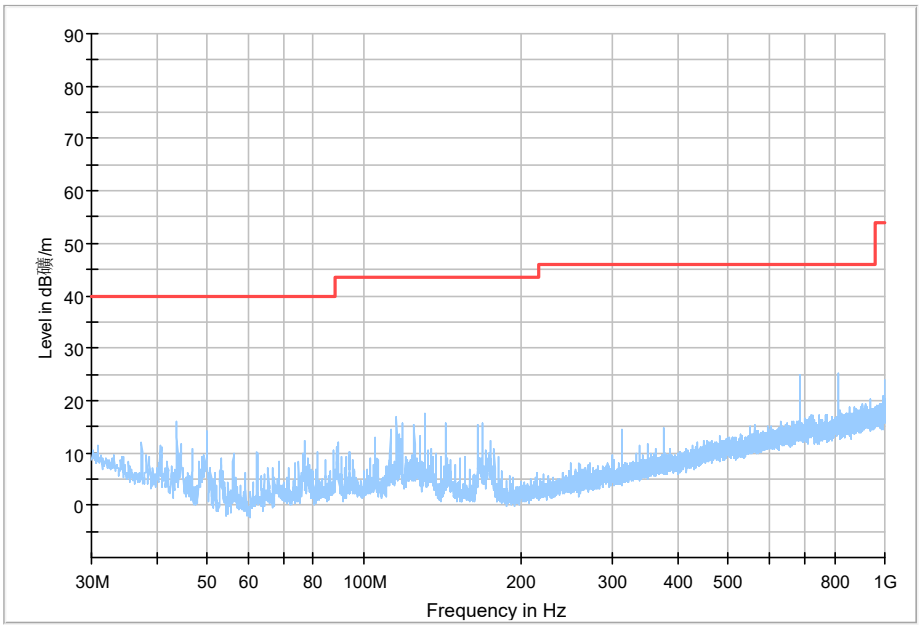

Fig.78 Radiated Spurious Emission (All Channels, 30MHz-1 GHz)

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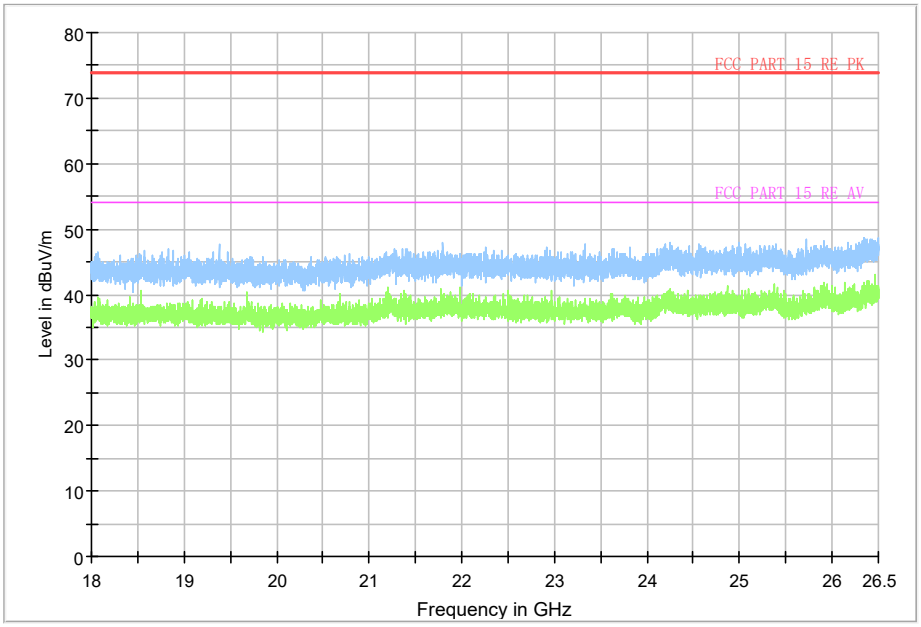

Fig.79 Radiated Spurious Emission (All Channels, 18 GHz-26.5 GHz)

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A.7 AC Power line Conducted Emission

Test Condition:

Voltage（V）	Frequency（Hz）
120	60

Measurement Result and limit:

WLAN (Quasi-peak Limit)-AE-1

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) -AE-1

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.				

WLAN (Quasi-peak Limit) -AE-2

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.16 to 0.5	66 to 56	Fig.82	Fig.83	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) -AE-2

Frequency range (MHz)	Average-peak Limit (dBμV)	Result (dBμV)		Conclusion
		Traffic	Idle	
0.15 to 0.5	56 to 46	Fig.82	Fig.83	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.

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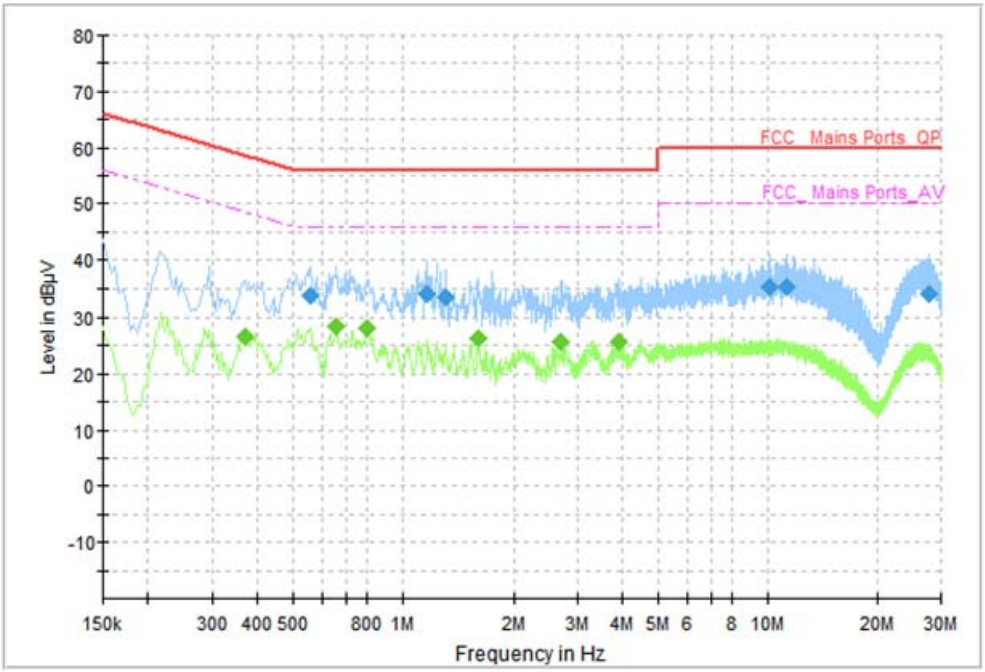

Fig.80 AC Power line Conducted Emission (Traffic)

Measurement Results: Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.558000	33.60	56.00	22.40	L1	ON	9.6
1.170000	34.05	56.00	21.95	N	ON	9.6
1.310000	33.42	56.00	22.58	L1	ON	9.7
10.114000	35.20	60.00	24.80	L1	ON	9.7
11.278000	35.19	60.00	24.81	L1	ON	9.7
27.690000	33.83	60.00	26.17	L1	ON	9.7

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.370000	26.57	48.50	21.93	L1	ON	9.6
0.658000	28.60	46.00	17.40	L1	ON	9.7
0.798000	28.28	46.00	17.72	L1	ON	9.7
1.598000	26.27	46.00	19.73	L1	ON	9.7
2.706000	25.74	46.00	20.26	L1	ON	9.7
3.878000	25.65	46.00	20.35	L1	ON	9.7

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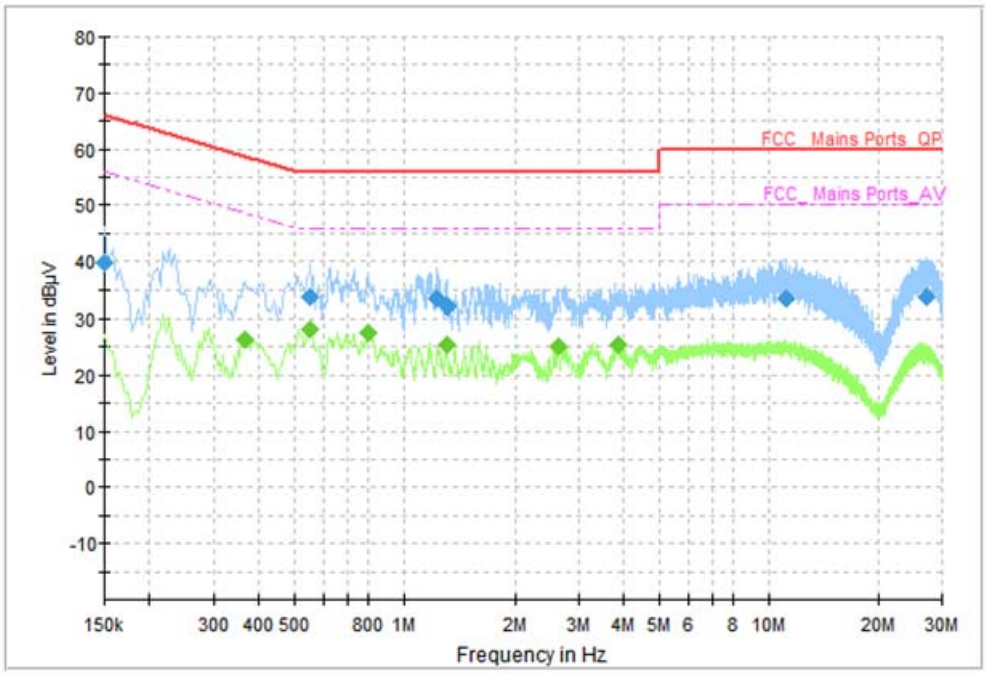

Fig.81 AC Power line Conducted Emission (Idle)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	39.83	66.00	26.17	L1	ON	9.6
0.554000	33.68	56.00	22.32	N	ON	9.6
1.234000	33.33	56.00	22.67	N	ON	9.7
1.310000	32.13	56.00	23.87	N	ON	9.7
11.206000	33.44	60.00	26.56	N	ON	9.7
27.278000	33.76	60.00	26.24	L1	ON	9.7

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.366000	26.36	48.59	22.23	L1	ON	9.6
0.550000	28.10	46.00	17.90	N	ON	9.7
0.798000	27.63	46.00	18.37	L1	ON	9.7
1.310000	25.36	46.00	20.64	L1	ON	9.7
2.634000	24.98	46.00	21.02	L1	ON	9.7
4.650	18.32	46.00	27.68	L1	ON	9.7

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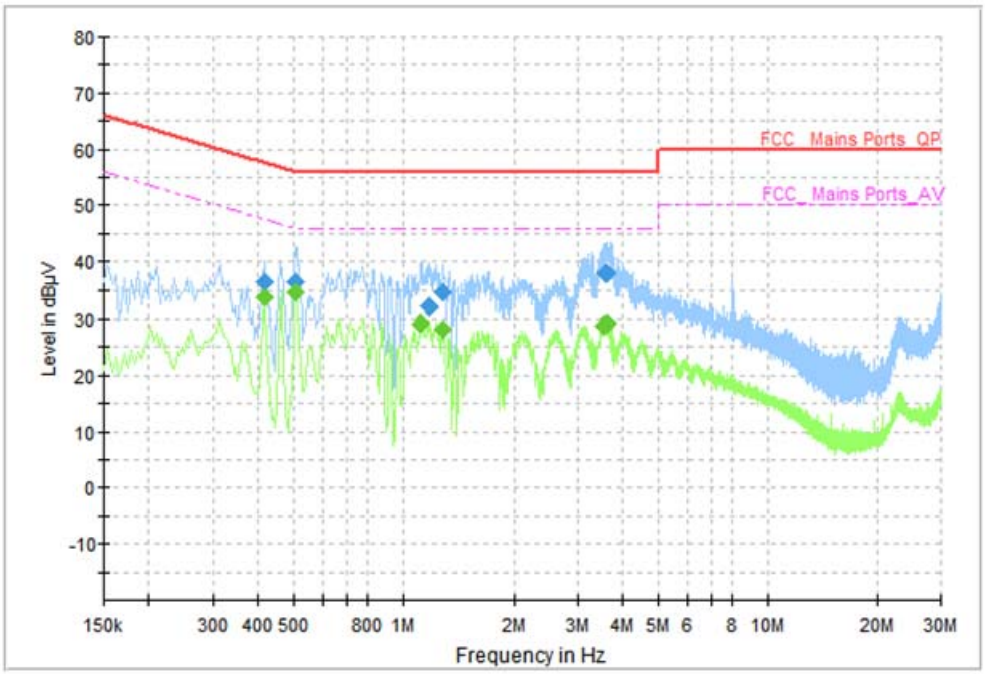

Fig.82 AC Power line Conducted Emission (Traffic)

Measurement Results: Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.414000	36.32	57.57	21.25	L1	ON	9.6
0.506000	36.31	56.00	19.69	N	ON	9.6
1.186000	31.99	56.00	24.01	L1	ON	9.7
1.290000	34.44	56.00	21.56	L1	ON	9.7
3.558000	37.93	56.00	18.07	L1	ON	9.7
3.606000	37.94	56.00	18.06	L1	ON	9.7

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.414000	33.74	47.57	13.83	L1	ON	9.6
0.506000	34.69	46.00	11.31	L1	ON	9.7
1.122000	29.19	46.00	16.81	L1	ON	9.7
1.290000	28.17	46.00	17.83	L1	ON	9.7
3.534000	28.75	46.00	17.25	L1	ON	9.7
3.630000	29.05	46.00	16.95	L1	ON	9.7

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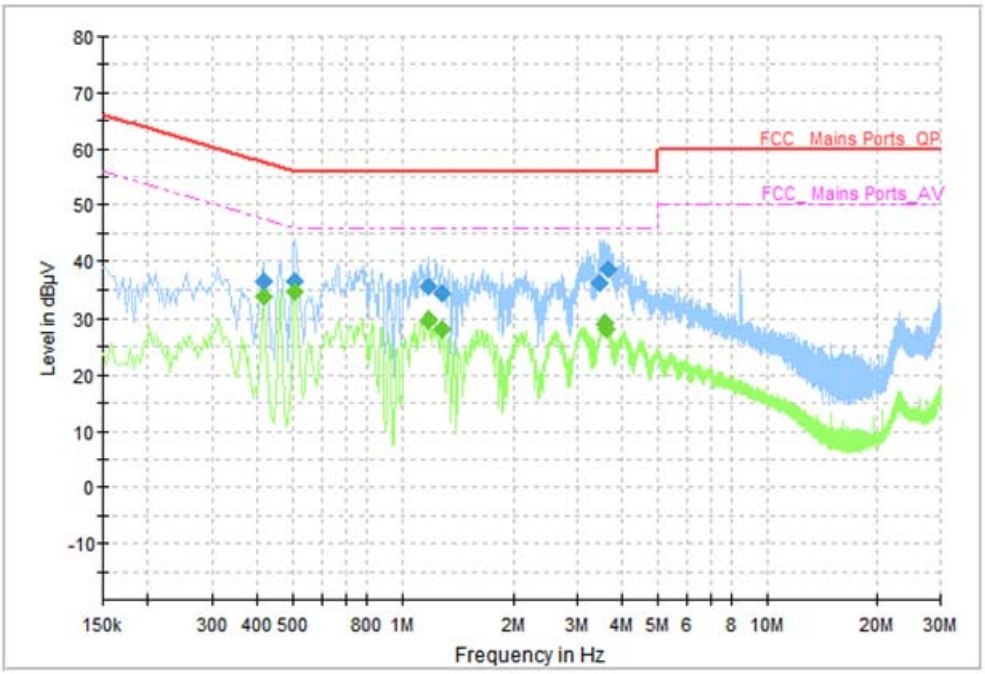

Fig.83 AC Power line Conducted Emission (Idle)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.414000	36.29	57.57	21.28	L1	ON	9.6
0.506000	36.48	56.00	19.52	N	ON	9.6
1.182000	35.54	56.00	20.46	N	ON	9.7
1.282000	34.42	56.00	21.58	N	ON	9.7
3.458000	36.09	56.00	19.91	N	ON	9.7
3.670000	38.62	56.00	17.38	L1	ON	9.7

Measurement Results: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.414000	33.65	47.57	13.91	L1	ON	9.6
0.506000	34.69	46.00	11.31	N	ON	9.6
1.182000	29.69	46.00	16.31	L1	ON	9.7
1.290000	28.24	46.00	17.76	L1	ON	9.7
3.586000	29.15	46.00	16.85	L1	ON	9.7
3.614000	28.10	46.00	17.90	L1	ON	9.7

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

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