

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 ANSI C63.10.

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

Measurement Results:

802.11b/g mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11b	Power	2.38GHz ~2.43GHz	Fig.43	P
	1	30 MHz ~1 GHz	Fig.44	P
		1 GHz ~ 4 GHz	Fig.45	P
		4 GHz ~ 18 GHz	Fig.46	P
	6	30 MHz ~1 GHz	Fig.47	P
		1 GHz ~ 4 GHz	Fig.48	P
		4 GHz ~ 18 GHz	Fig.49	P
	Power	2.45GHz ~2.5GHz	Fig.50	P
	11	30 MHz ~1 GHz	Fig.51	P
		1 GHz ~ 4 GHz	Fig.52	P
		4 GHz ~ 18 GHz	Fig.53	P
	802.11g	Power	2.38GHz ~2.43GHz	Fig.54
1		30 MHz ~1 GHz	Fig.55	P
		1 GHz ~ 4 GHz	Fig.56	P
		4 GHz ~ 18 GHz	Fig.57	P
6		30 MHz ~1 GHz	Fig.58	P
		1 GHz ~ 4 GHz	Fig.59	P
		4 GHz ~ 18 GHz	Fig.60	P
Power		2.45GHz ~2.5GHz	Fig.61	P
11		30 MHz ~1 GHz	Fig.62	P
		1 GHz ~ 4 GHz	Fig.63	P
		4 GHz ~ 18 GHz	Fig.64	P

802.11n mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (20MHz)	Power	2.38GHz ~2.43GHz	Fig.65	P
	1	30 MHz ~1 GHz	Fig.66	P
		1 GHz ~ 4 GHz	Fig.67	P
		4 GHz ~ 18 GHz	Fig.68	P
	6	30 MHz ~1 GHz	Fig.69	P
		1 GHz ~ 4 GHz	Fig.70	P
		4 GHz ~ 18 GHz	Fig.71	P
	Power	2.45GHz ~2.5GHz	Fig.72	P
	11	30 MHz ~1 GHz	Fig.73	P
		1 GHz ~ 4 GHz	Fig.74	P
		4 GHz ~ 18 GHz	Fig.75	P
	802.11n (40MHz)	Power	/	/
/		/	/	/
		/	/	/

		/	/	/
	/	/	/	/
	/	/	/	/
	/	/	/	/
	Power	/	/	/
	/	/	/	/
	/	/	/	/
	/	/	/	/
/	All channels	18 GHz~ 26.5 GHz	Fig.76	P

Conclusion: PASS

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	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2410.822	92.37	-18.7	27.5	83.57	HORIZONTAL
2414.83	92.28	-18.7	27.5	83.48	HORIZONTAL
2406.814	84.81	-18.7	27.5	76.01	HORIZONTAL
2418.838	80.4	-18.7	27.5	71.6	HORIZONTAL
2402.806	56.59	-18.7	27.5	47.79	HORIZONTAL
2422.846	49.72	-18.8	27.5	41.02	HORIZONTAL

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2438.878	93.61	-18.9	27.5	85.01	HORIZONTAL
2434.87	93.28	-18.9	27.5	84.68	HORIZONTAL
2442.886	86.11	-18.9	27.5	77.51	HORIZONTAL
2430.862	80.8	-18.9	27.5	72.2	HORIZONTAL
2446.894	60.91	-18.9	27.5	52.31	HORIZONTAL
2426.854	50.34	-18.8	27.5	41.64	HORIZONTAL

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2462.926	93.19	-18.6	27.5	84.29	HORIZONTAL
2458.918	91.37	-18.7	27.5	82.57	HORIZONTAL
2466.934	88.68	-18.6	27.5	79.78	HORIZONTAL
2454.91	74.18	-18.7	27.5	65.38	HORIZONTAL
2470.942	67.92	-18.4	27.5	58.82	HORIZONTAL
2450.902	50.01	-18.7	27.5	41.21	HORIZONTAL

802.11g

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2418.838	90.77	-18.7	27.5	81.97	VERTICAL
2414.83	90.61	-18.7	27.5	81.81	HORIZONTAL
2406.814	90.52	-18.7	27.5	81.72	VERTICAL
2410.822	89.84	-18.7	27.5	81.04	VERTICAL
2402.806	80.82	-18.7	27.5	72.02	HORIZONTAL
2422.846	72.14	-18.8	27.5	63.44	VERTICAL

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2434.87	91.13	-18.9	27.5	82.53	VERTICAL
2442.886	90.97	-18.9	27.5	82.37	HORIZONTAL
2430.862	90.91	-18.9	27.5	82.31	VERTICAL
2438.878	90.61	-18.9	27.5	82.01	VERTICAL
2446.894	81.82	-18.9	27.5	73.22	HORIZONTAL
2426.854	71.6	-18.8	27.5	62.9	HORIZONTAL

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2458.918	89.79	-18.7	27.5	80.99	HORIZONTAL
2466.934	89.25	-18.6	27.5	80.35	VERTICAL
2462.926	88.84	-18.6	27.5	79.94	VERTICAL
2454.91	88.23	-18.7	27.5	79.43	HORIZONTAL
2470.942	84.49	-18.4	27.5	75.39	HORIZONTAL
2450.902	59.42	-18.7	27.5	50.62	VERTICAL

802.11n-20MHz

Ch1

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2418.838	90.69	-18.7	27.5	81.89	VERTICAL
2406.814	90.18	-18.7	27.5	81.38	HORIZONTAL
2414.83	90.16	-18.7	27.5	81.36	HORIZONTAL
2410.822	89.57	-18.7	27.5	80.77	VERTICAL
2402.806	83.72	-18.7	27.5	74.92	HORIZONTAL
2422.846	77.58	-18.8	27.5	68.88	VERTICAL

Ch6

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2430.862	90.73	-18.9	27.5	82.13	HORIZONTAL
2434.87	90.25	-18.9	27.5	81.65	HORIZONTAL
2442.886	90.17	-18.9	27.5	81.57	VERTICAL
2438.878	89.6	-18.9	27.5	81	HORIZONTAL
2446.894	84.35	-18.9	27.5	75.75	VERTICAL
2426.854	77.43	-18.8	27.5	68.73	VERTICAL

Ch11

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P _{Mea} (dBuV/m)	Polarization
2458.918	89.66	-18.7	27.5	80.86	VERTICAL
2454.91	89.52	-18.7	27.5	80.72	HORIZONTAL
2466.934	89.23	-18.6	27.5	80.33	VERTICAL
2462.926	88.96	-18.6	27.5	80.06	VERTICAL
2470.942	86.4	-18.4	27.5	77.3	HORIZONTAL
2450.902	65.59	-18.7	27.5	56.79	HORIZONTAL

Test graphs as below:

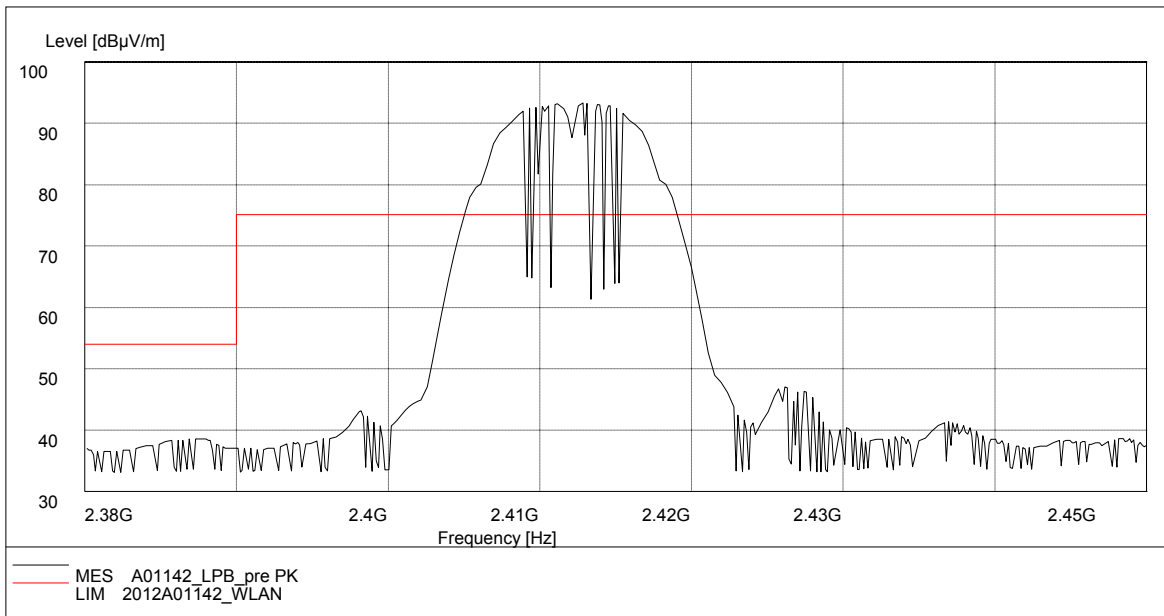


Fig. 43 Radiated Spurious Emission (Power): 802.11b, ch1, 2.38 GHz - 245GHz

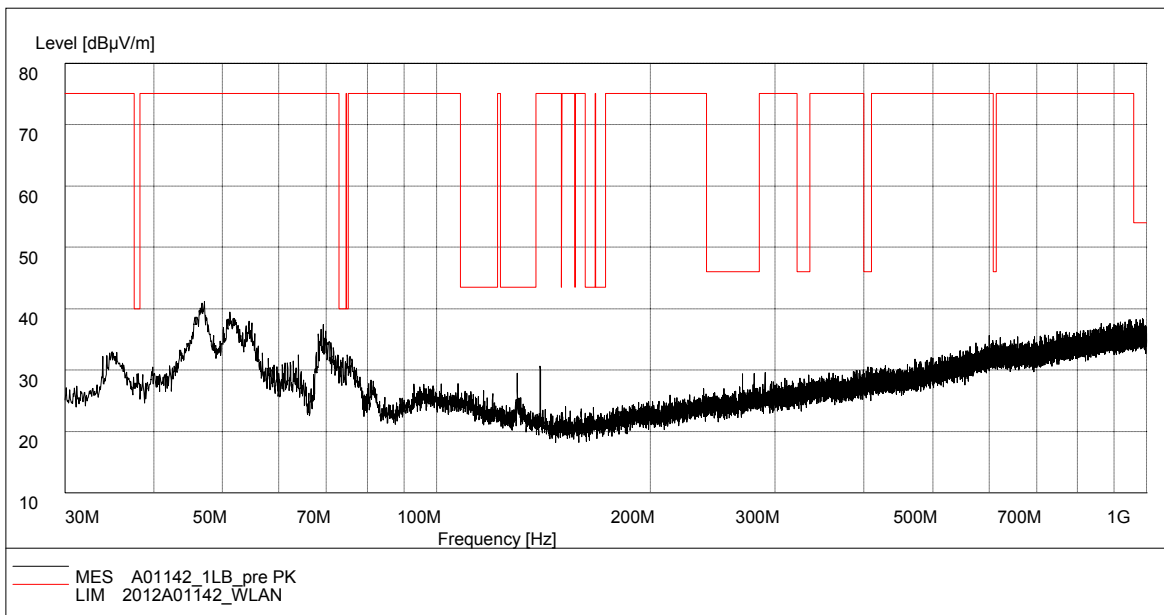


Fig. 44 Radiated Spurious Emission (802.11b, Ch1, 30 MHz-1 GHz)

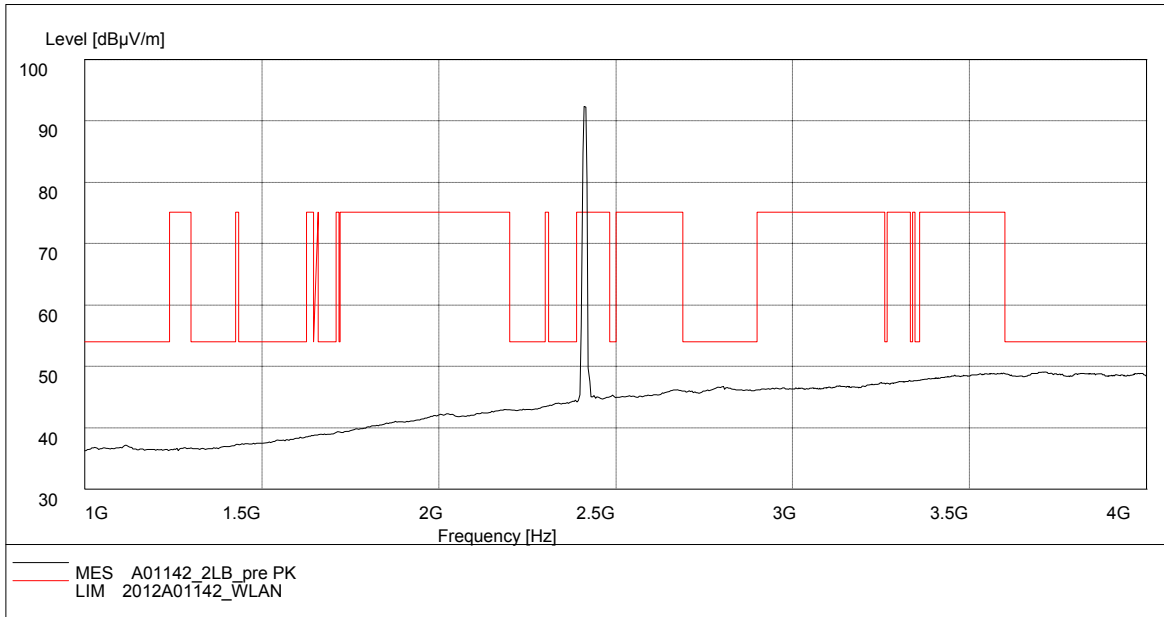


Fig. 45 Radiated Spurious Emission (802.11b, Ch1, 1 GHz-4 GHz)

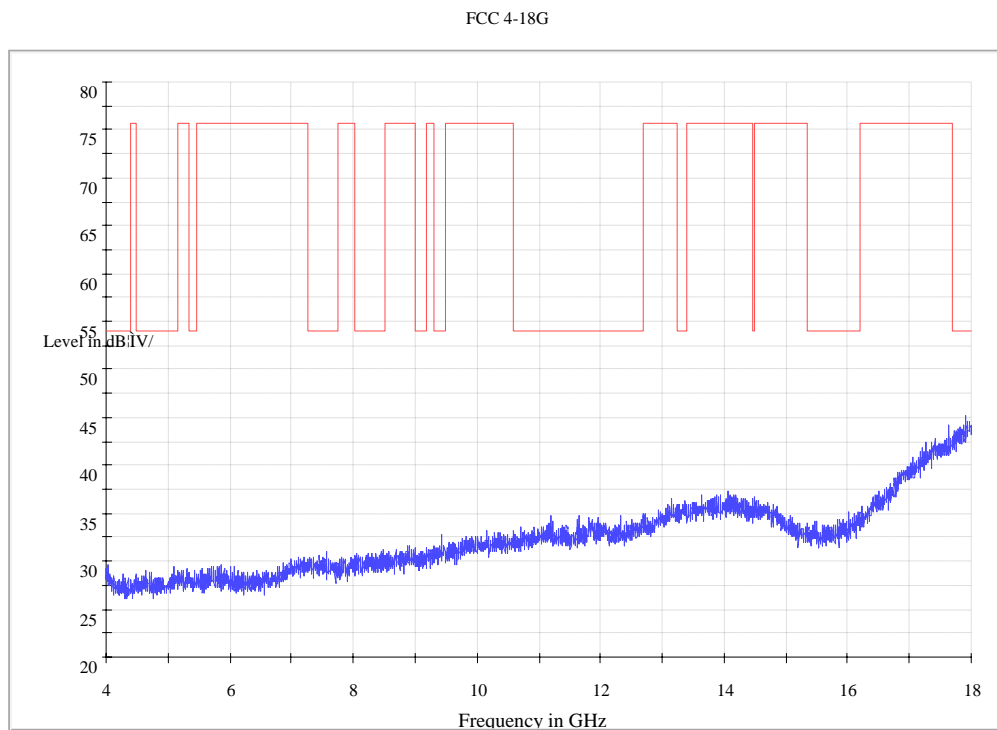


Fig. 46 Radiated Spurious Emission (802.11b, Ch1, 4 GHz-18 GHz)

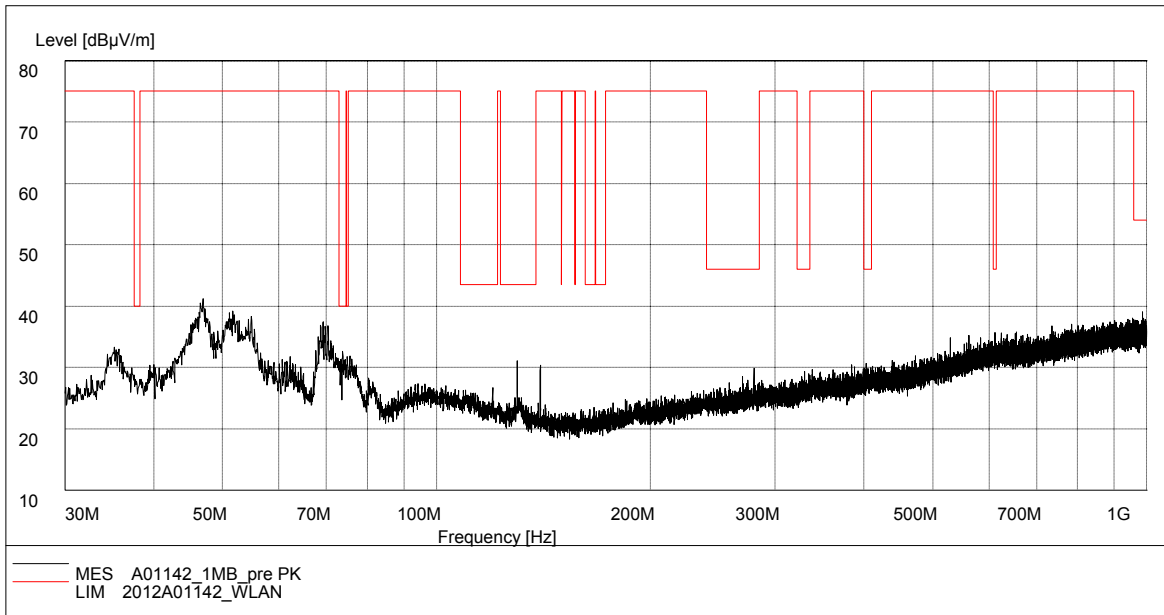


Fig. 47 Radiated Spurious Emission (802.11b, Ch6, 30 MHz-1 GHz)

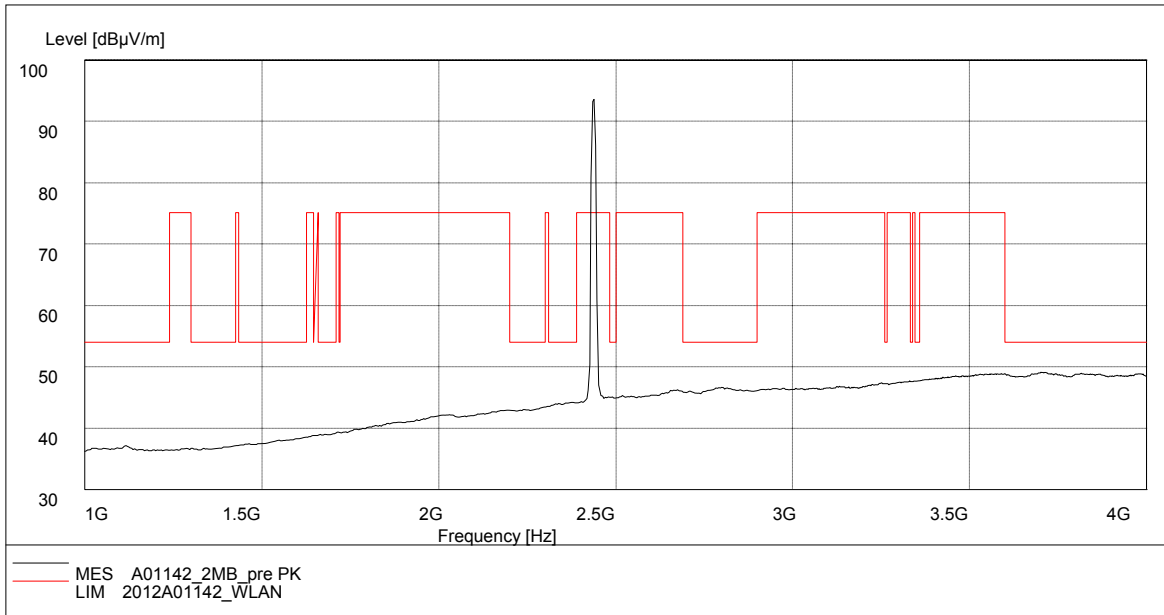


Fig. 48 Radiated Spurious Emission (802.11b, Ch6, 1 GHz-4 GHz)

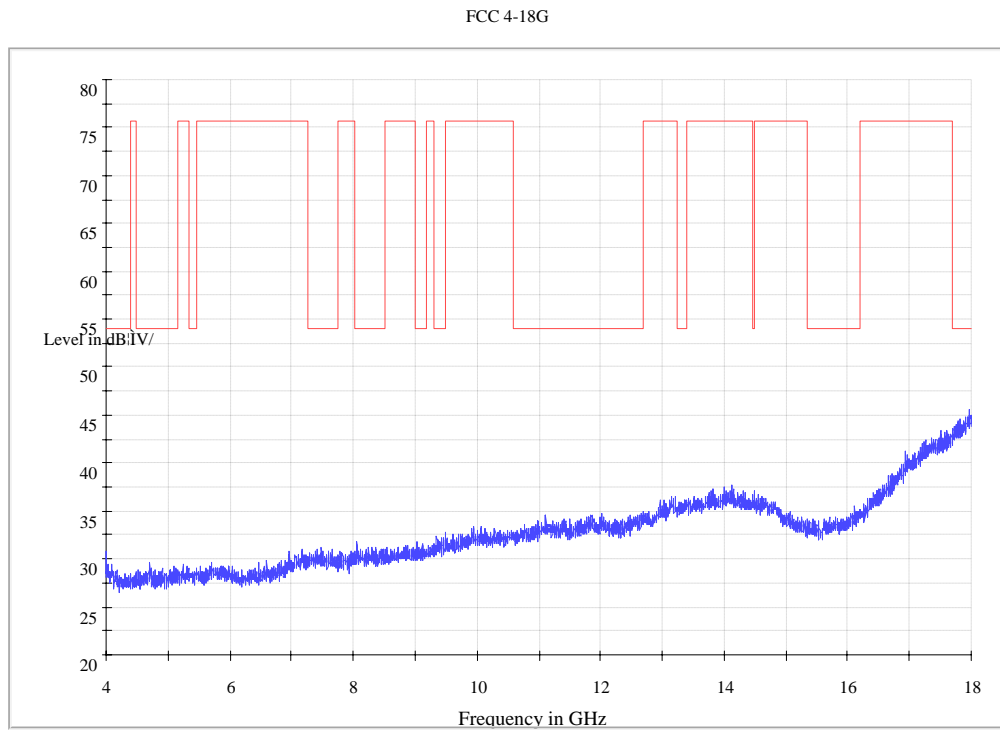


Fig. 49 Radiated Spurious Emission (802.11b, Ch6, 4 GHz-18 GHz)

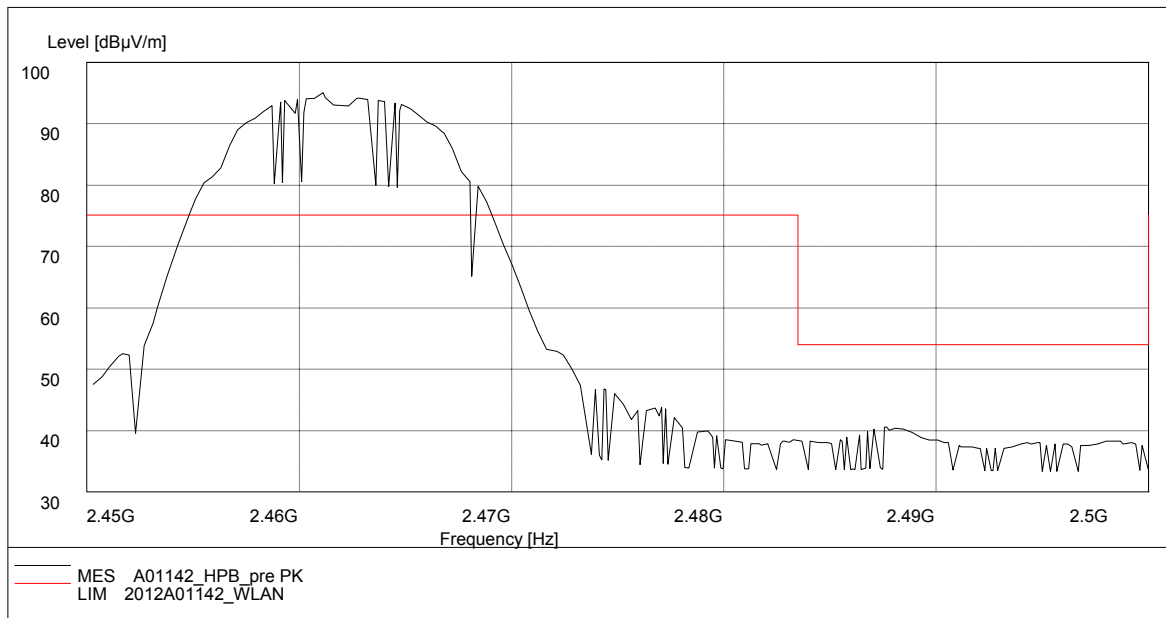


Fig. 50 Radiated Spurious Emission (Power): 802.11b, ch11, 2.45 GHz - 2.50GHz

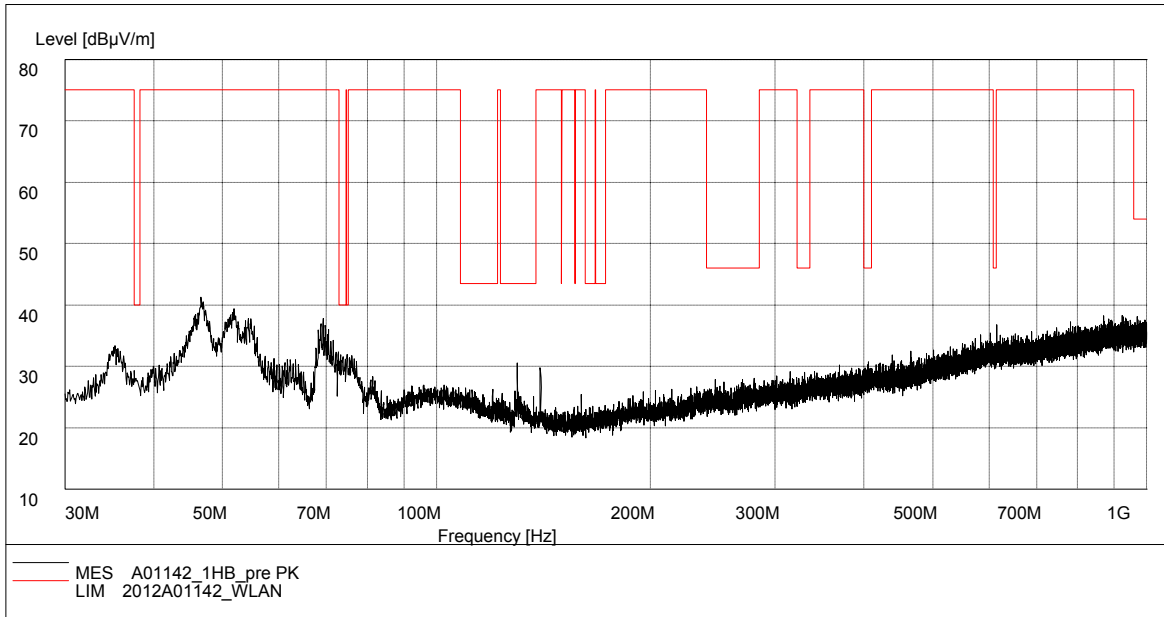


Fig. 51 Radiated Spurious Emission (802.11b, Ch11, 30 MHz-1 GHz)

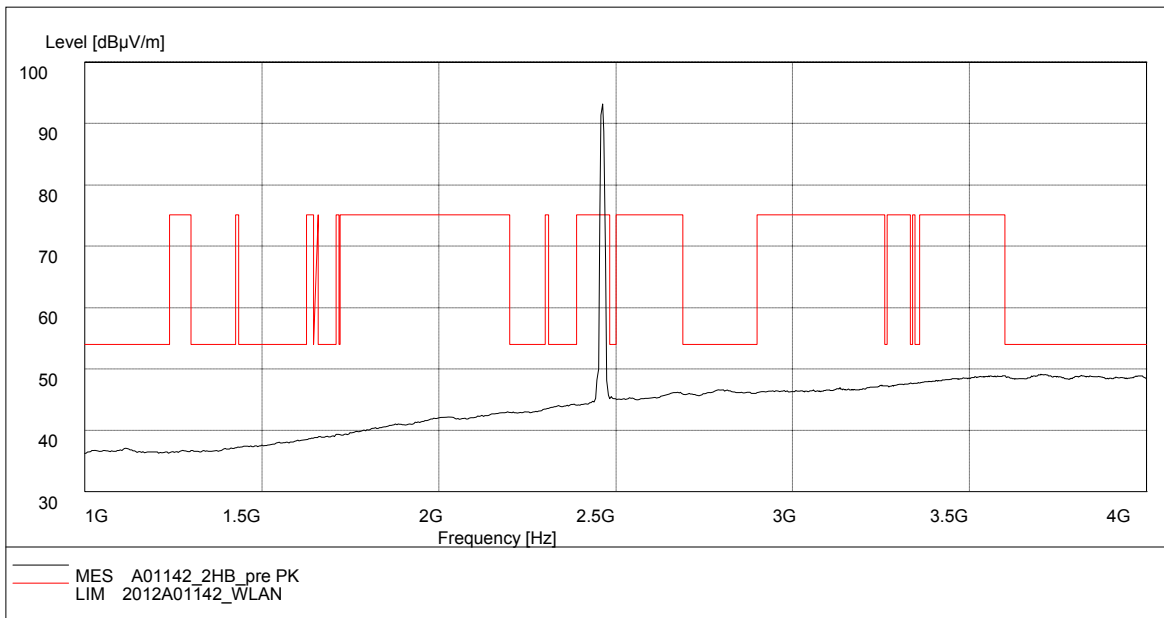


Fig. 52 Radiated Spurious Emission (802.11b, Ch11, 1 GHz-4 GHz)

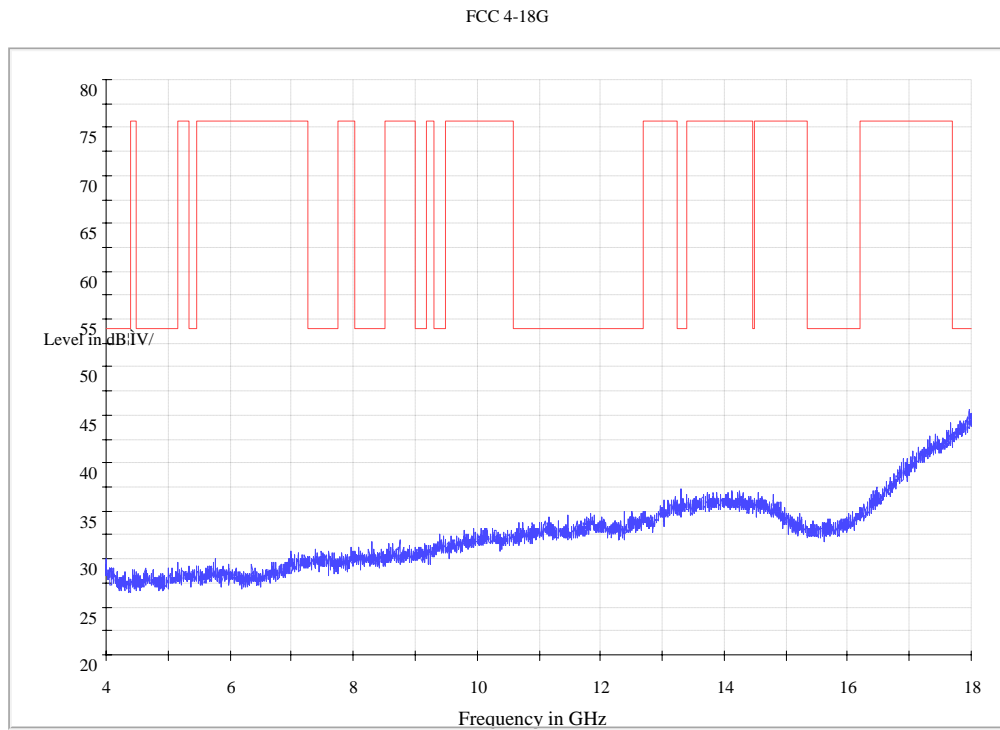


Fig. 53 Radiated Spurious Emission (802.11b, Ch11, 4 GHz-18 GHz)

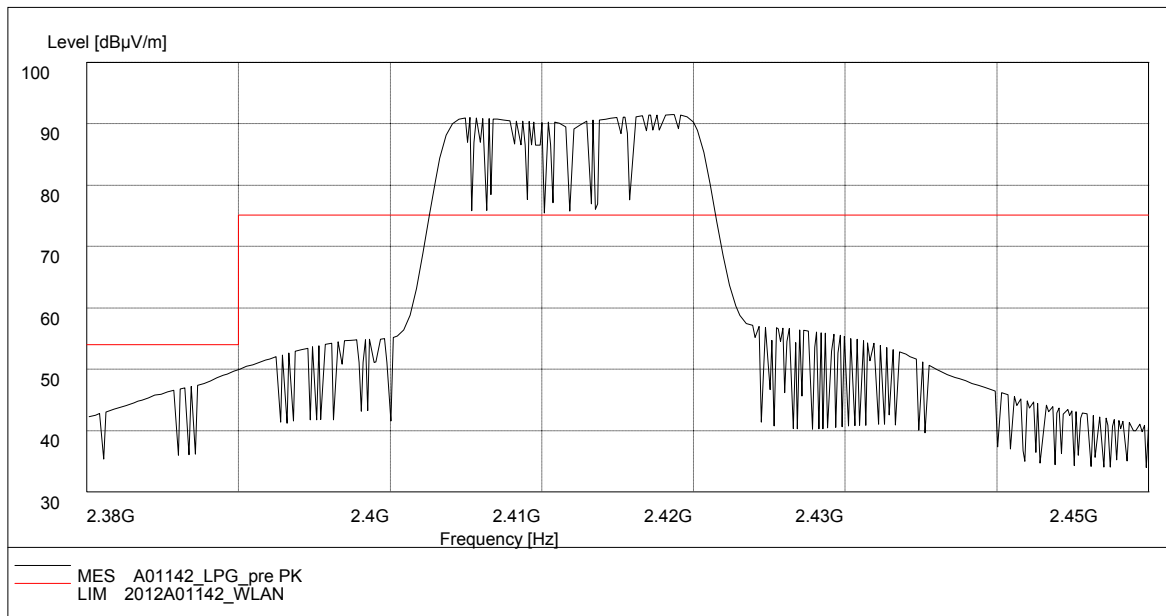


Fig. 54 Radiated Spurious Emission (Power): 802.11g, ch1, 2.38 GHz - 2.45GHz

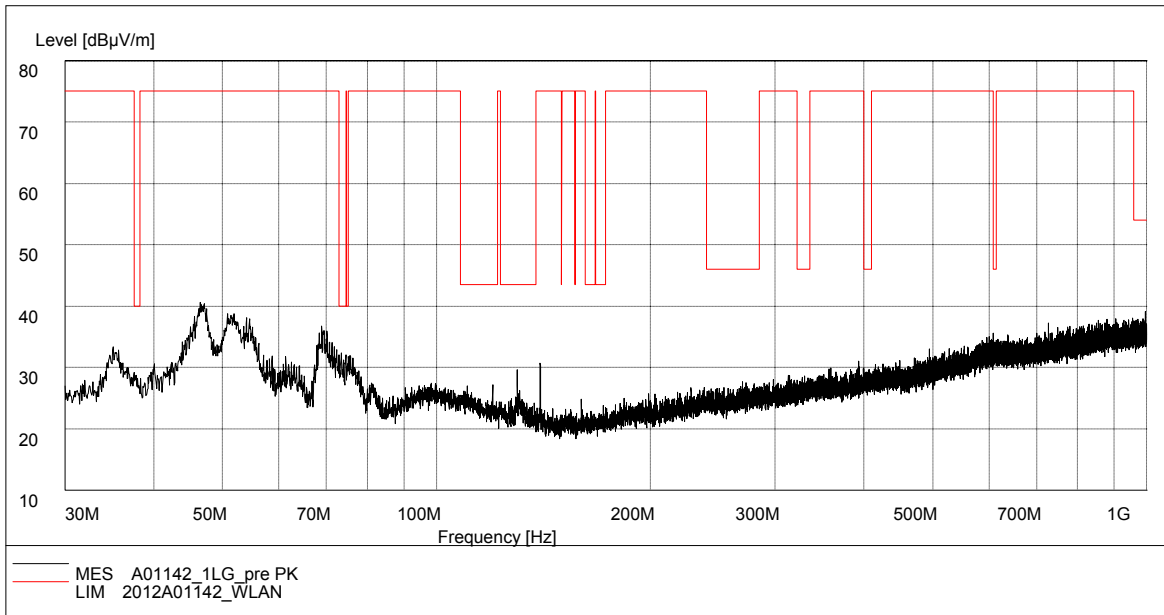


Fig. 55 Radiated Spurious Emission (802.11g, Ch1, 30 MHz-1 GHz)

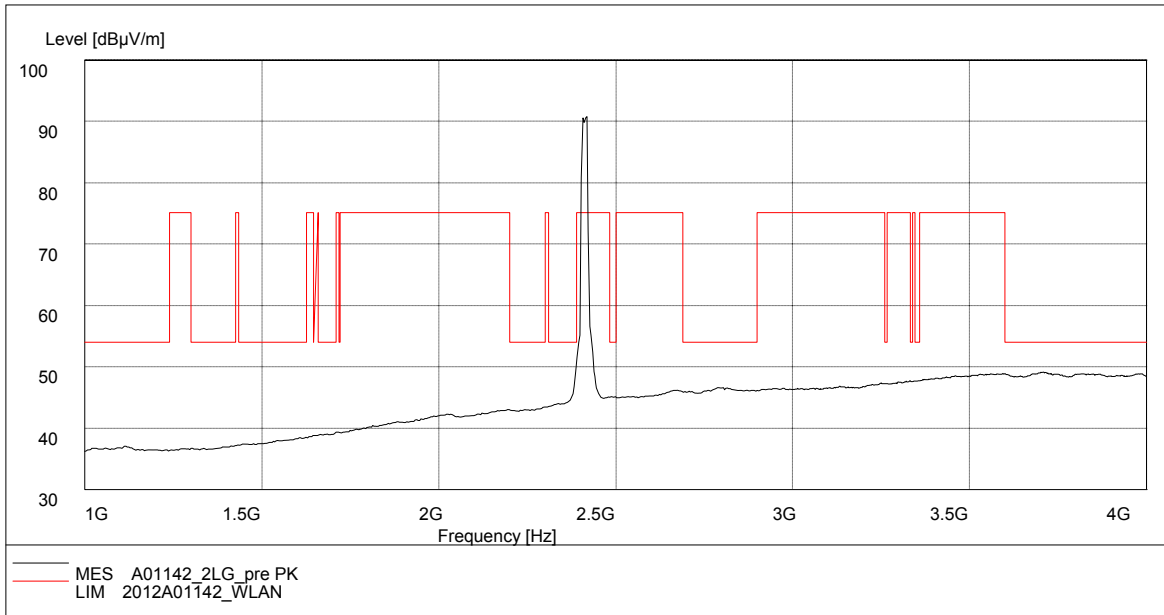


Fig. 56 Radiated Spurious Emission (802.11g, Ch1, 1 GHz-4 GHz)

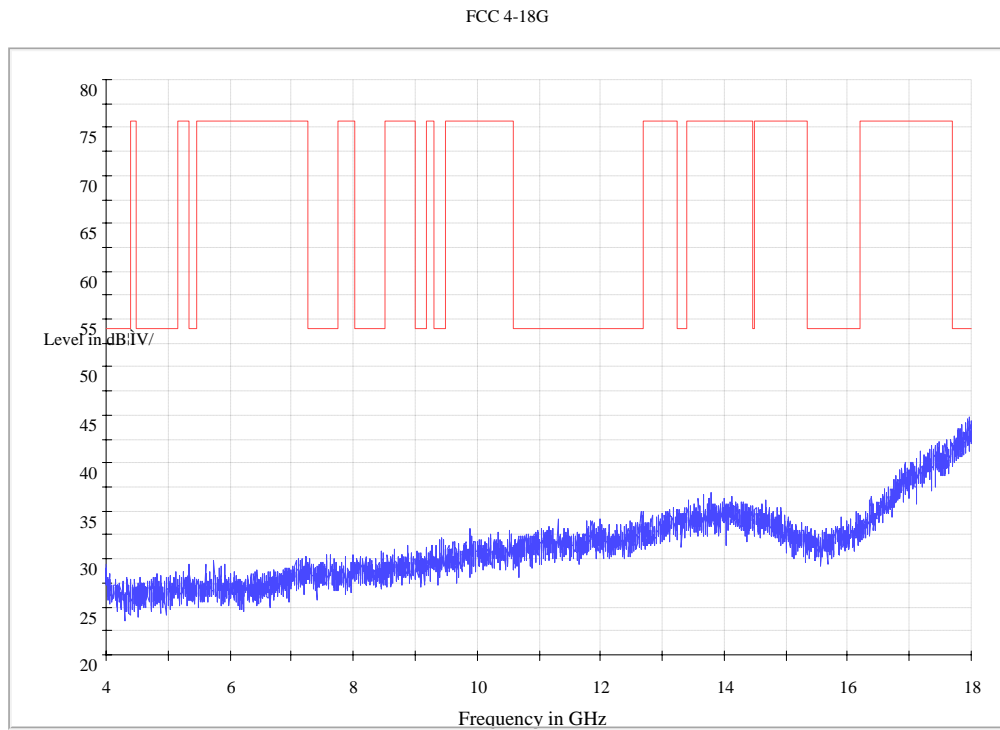


Fig. 57 Radiated Spurious Emission (802.11g, Ch1, 4 GHz-18 GHz)

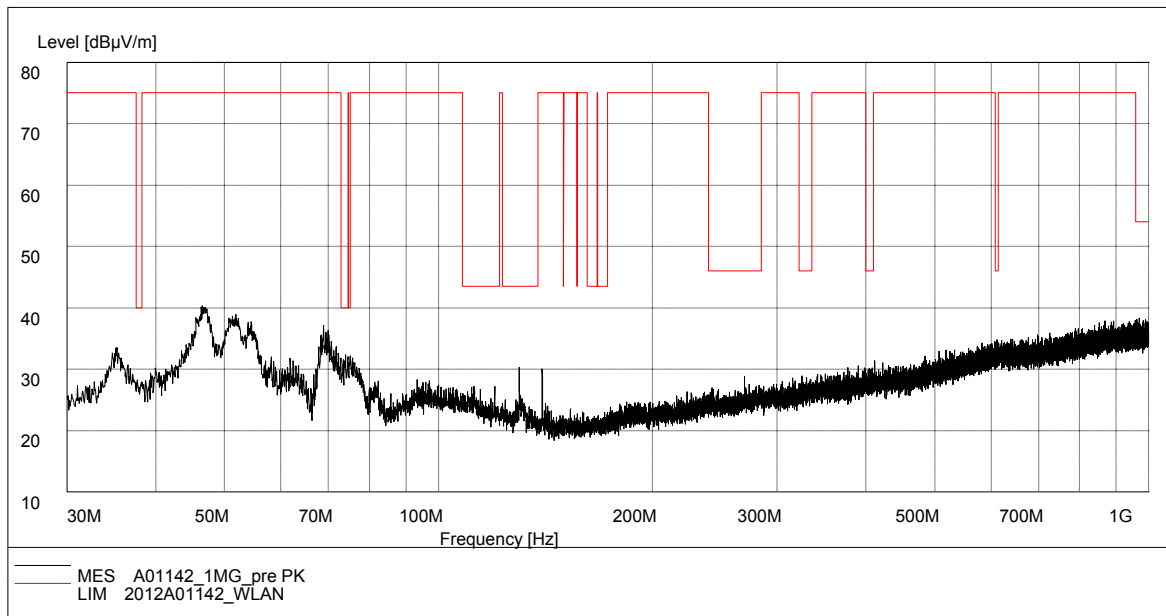


Fig. 58 Radiated Spurious Emission (802.11g, Ch6, 30 MHz-1 GHz)

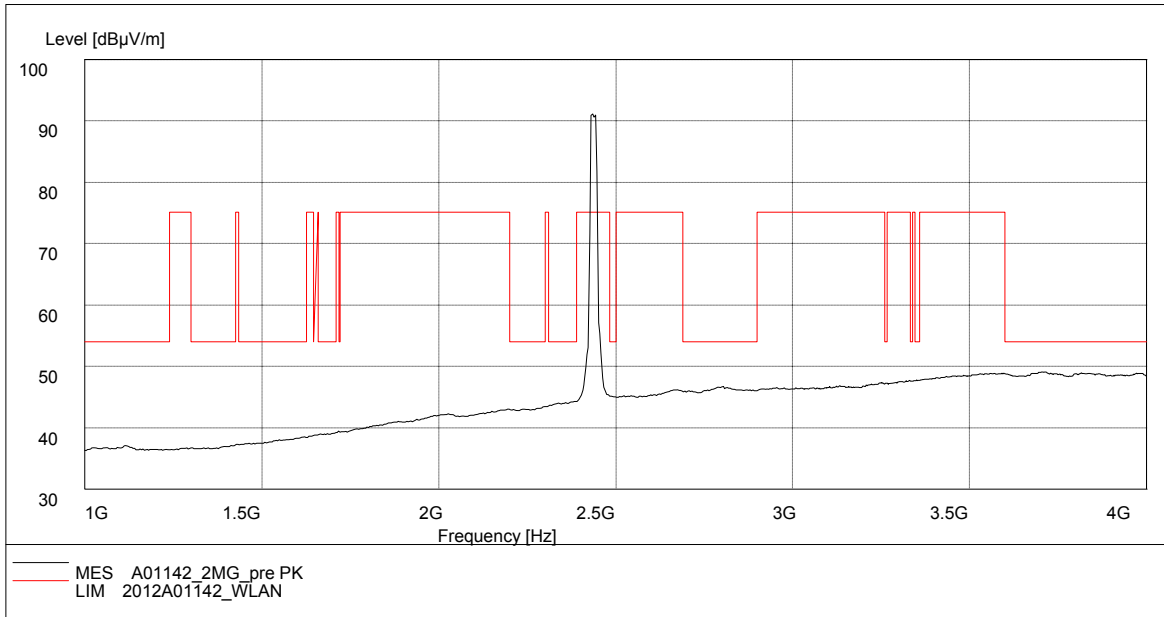


Fig. 59 Radiated Spurious Emission (802.11g, Ch6, 1 GHz-4 GHz)

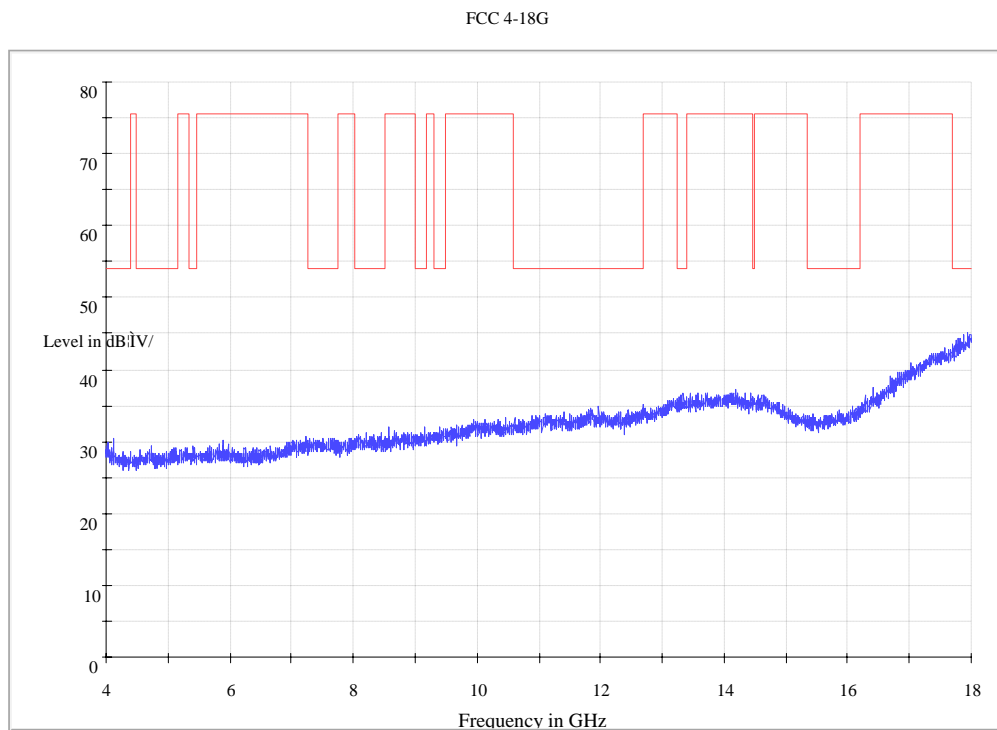


Fig. 60 Radiated Spurious Emission (802.11g, Ch6, 4 GHz-18 GHz)

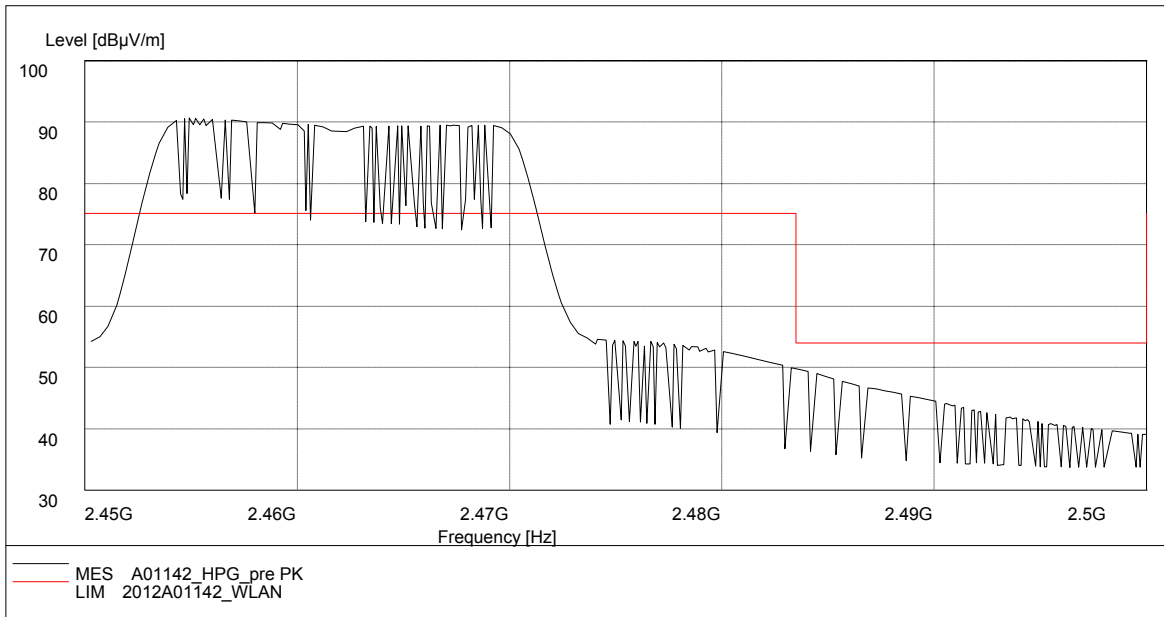


Fig. 61 Radiated Spurious Emission (Power): 802.11g, ch11, 2.45 GHz - 2.50GHz

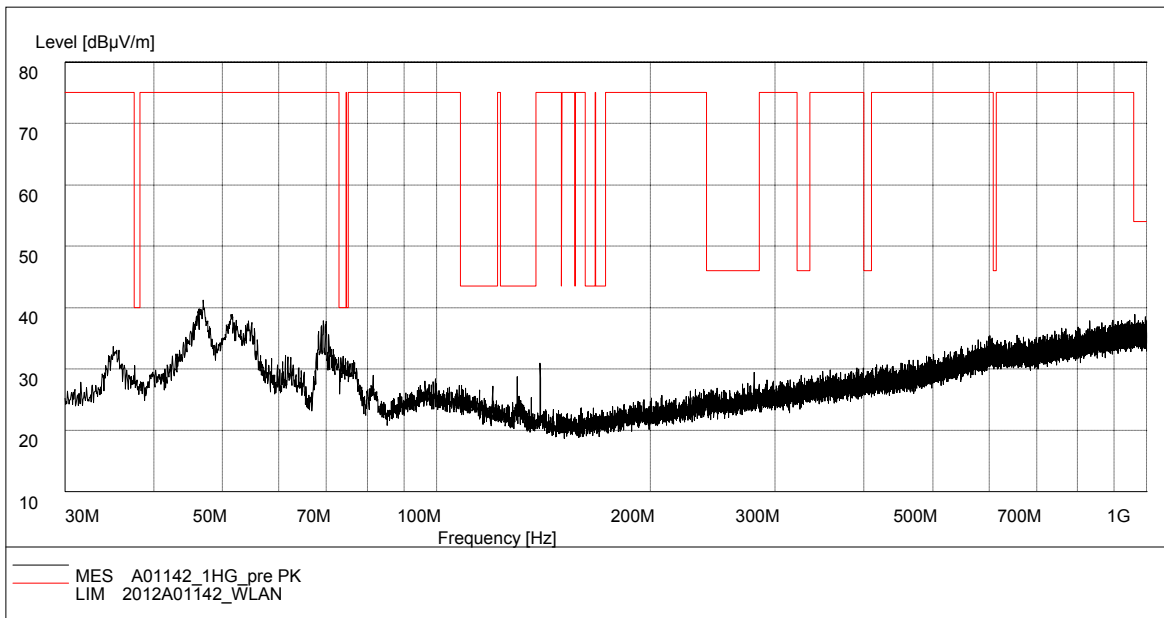


Fig. 62 Radiated Spurious Emission (802.11g, Ch11, 30 MHz-1 GHz)

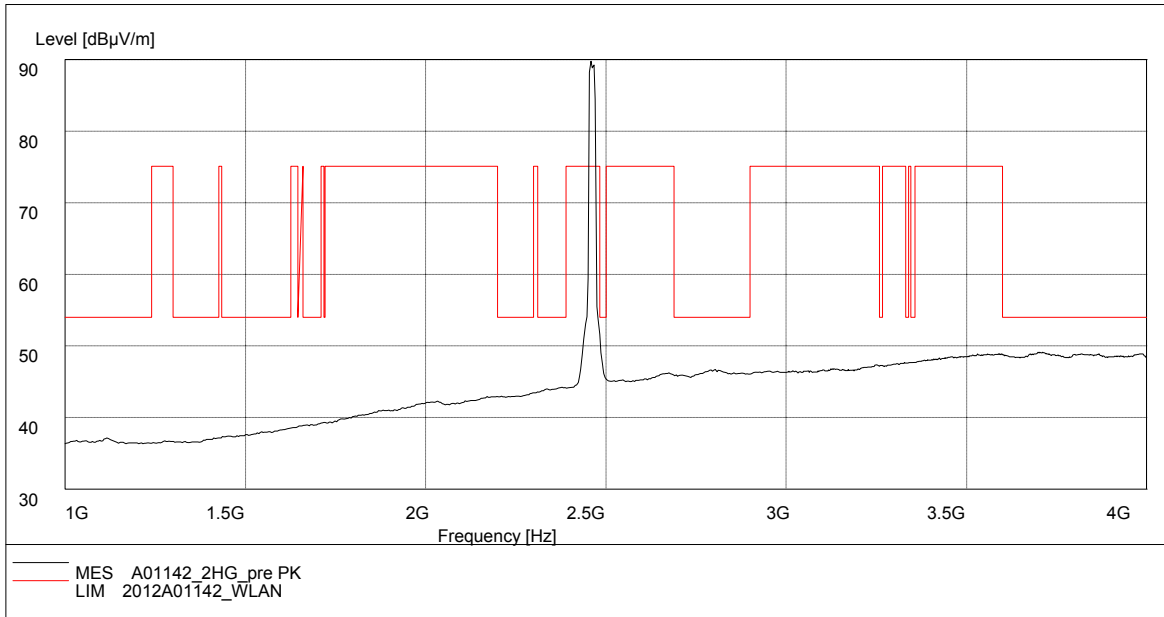


Fig. 63 Radiated Spurious Emission (802.11g, Ch11, 1 GHz-4 GHz)

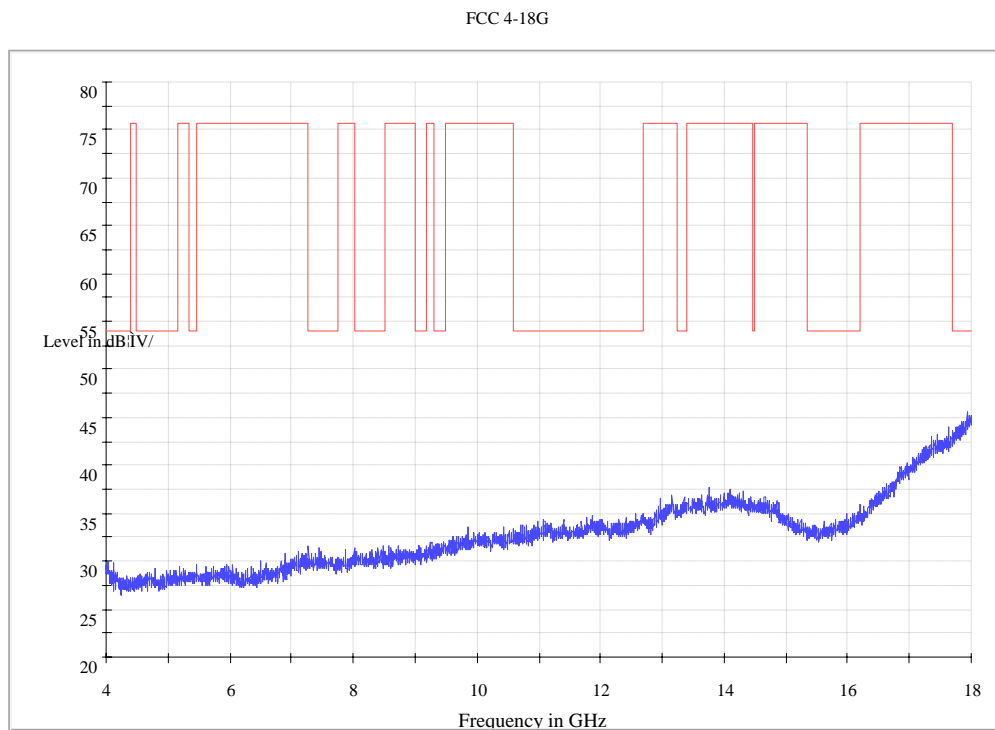


Fig. 64 Radiated Spurious Emission (802.11g, Ch11, 4 GHz-18 GHz)

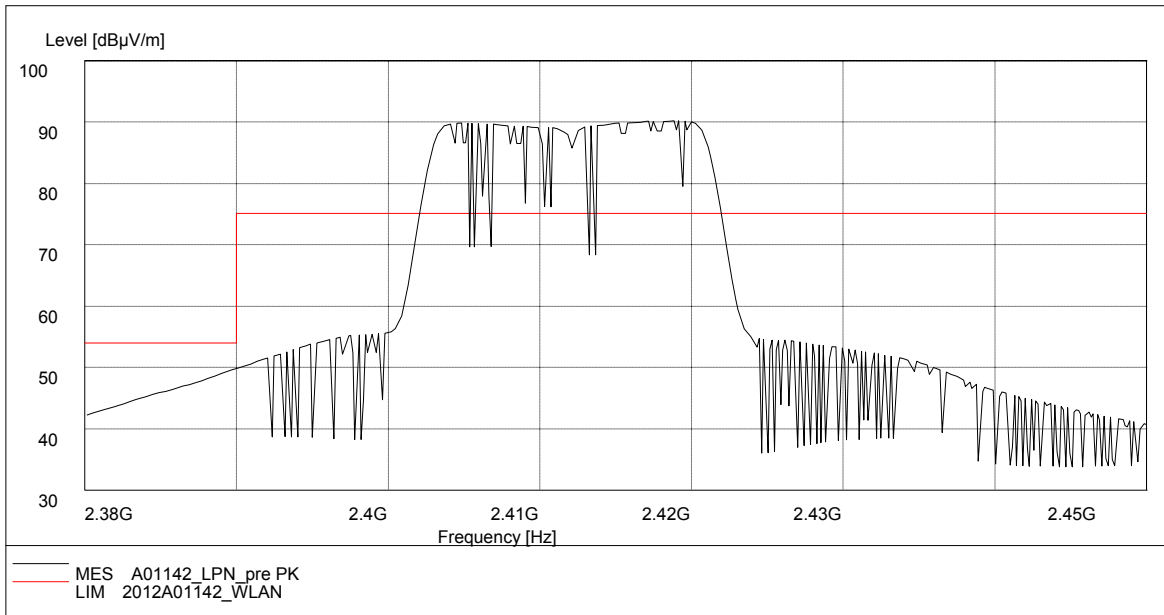


Fig. 65 Radiated Spurious Emission (Power): 802.11n-20MHz, ch1, 2.38 GHz - 2.45GHz

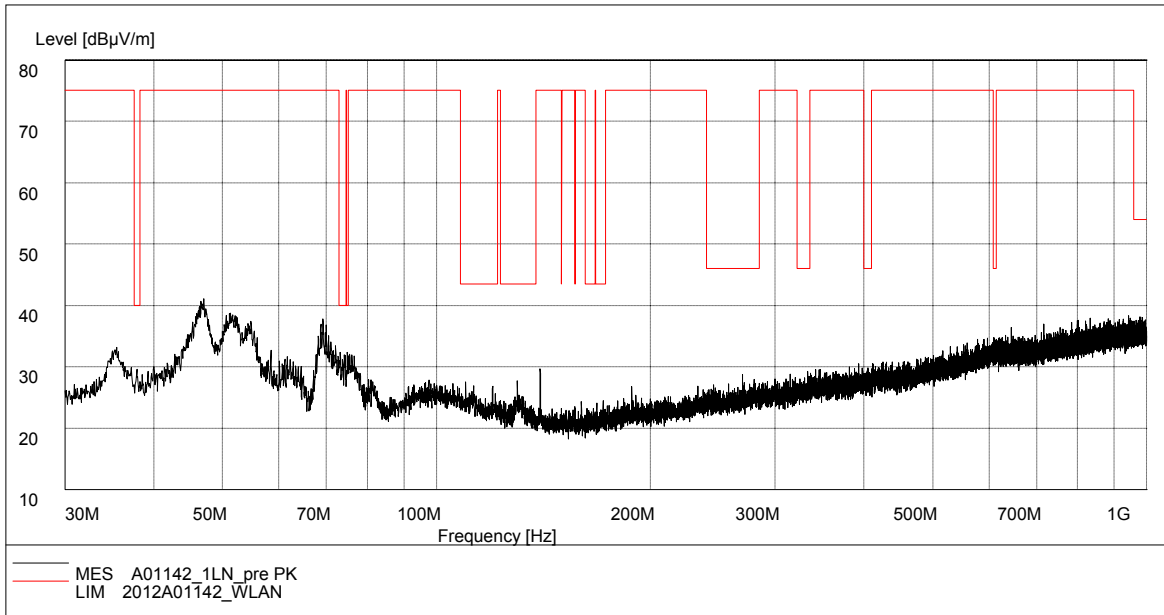


Fig. 66 Radiated Spurious Emission (802.11n-20MHz, Ch1, 30 MHz-1 GHz)

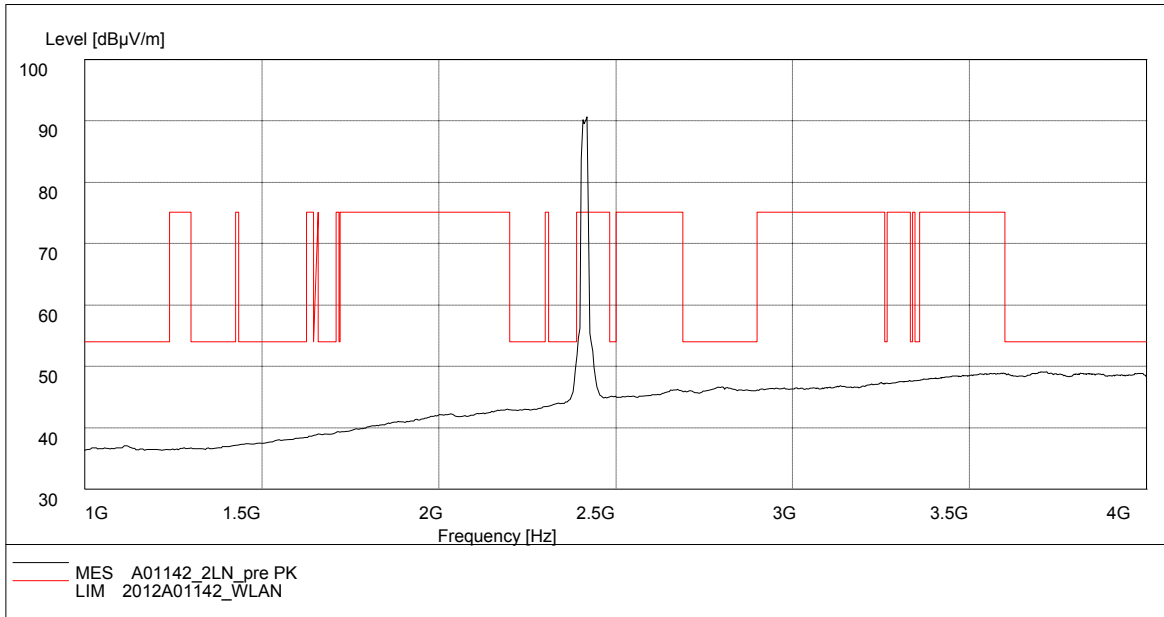


Fig. 67 Radiated Spurious Emission (802.11n-20MHz, Ch1, 1 GHz-4 GHz)

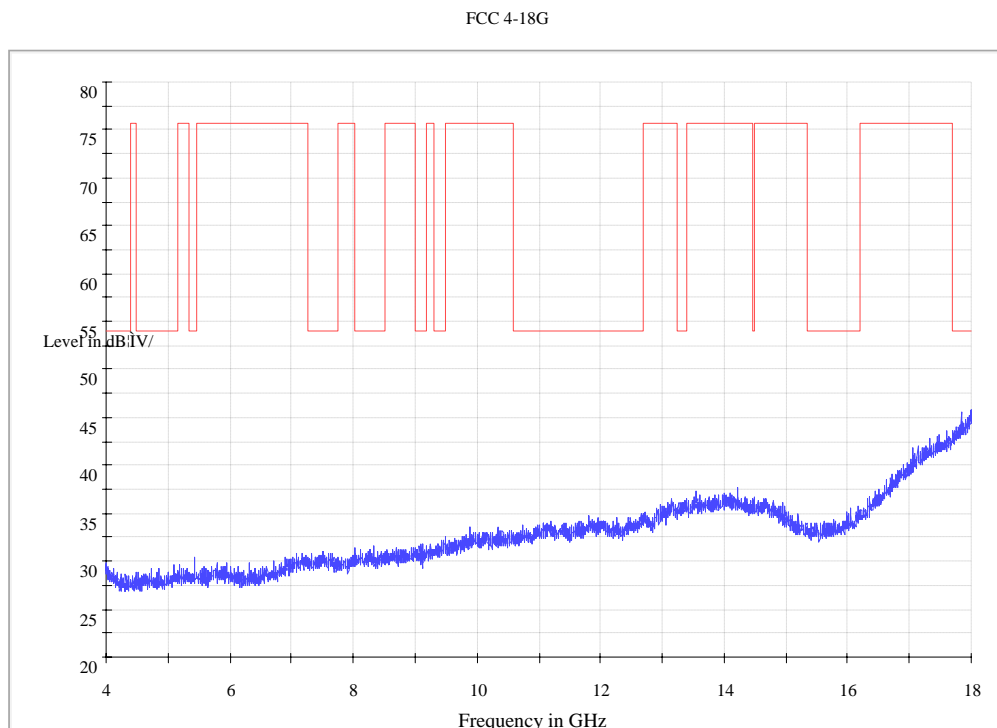


Fig. 68 Radiated Spurious Emission (802.11n-20MHz, Ch1, 4 GHz-18 GHz)

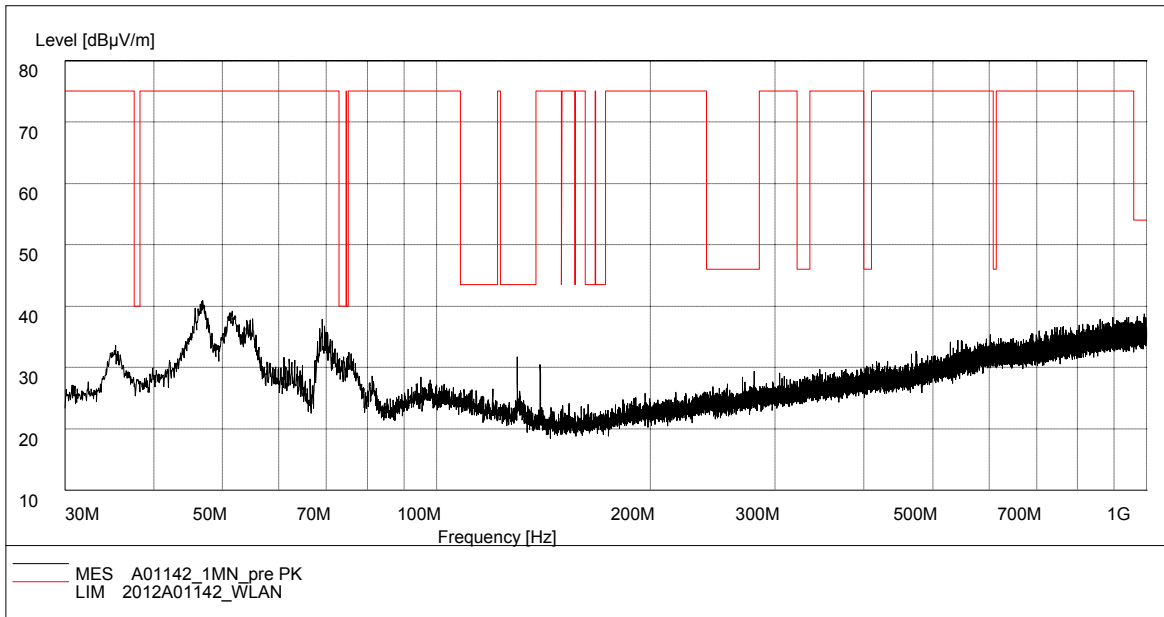


Fig. 69 Radiated Spurious Emission (802.11n-20MHz, Ch6, 30 MHz-1 GHz)

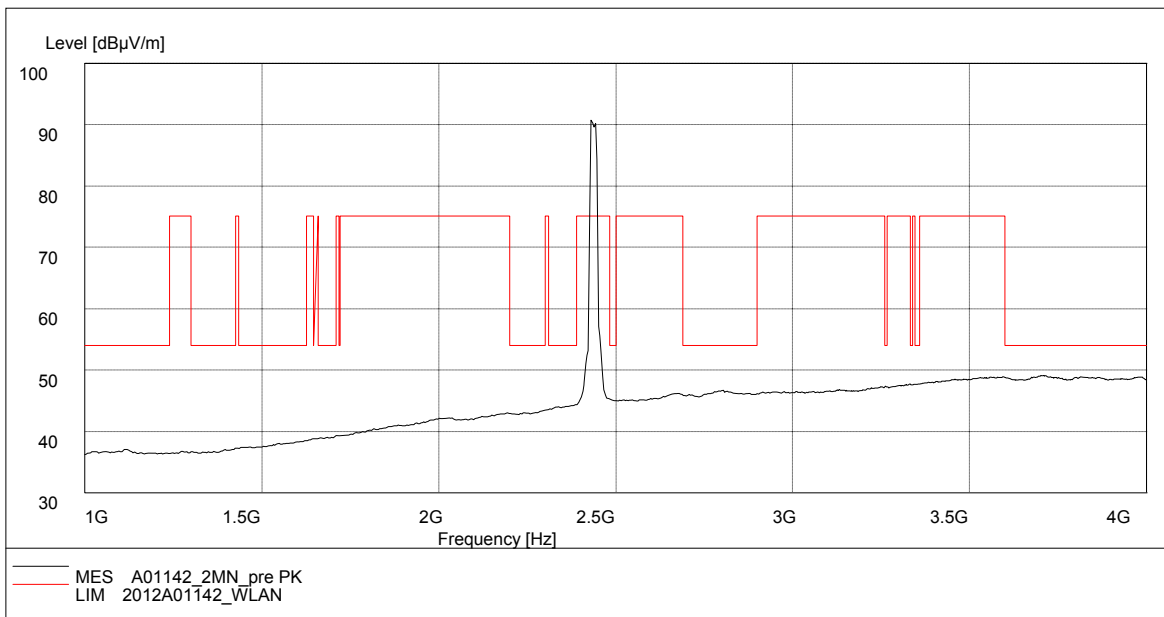


Fig. 70 Radiated Spurious Emission (802.11n-20MHz, Ch6, 1 GHz-4 GHz)

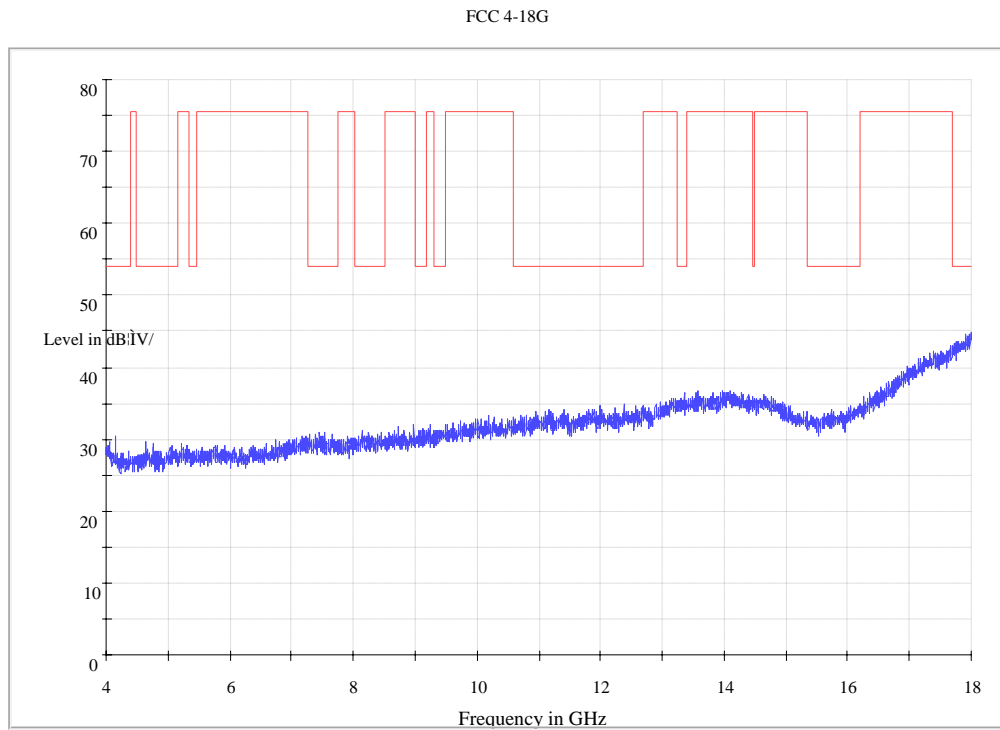


Fig. 71 Radiated Spurious Emission (802.11n-20MHz, Ch6, 4 GHz-18 GHz)

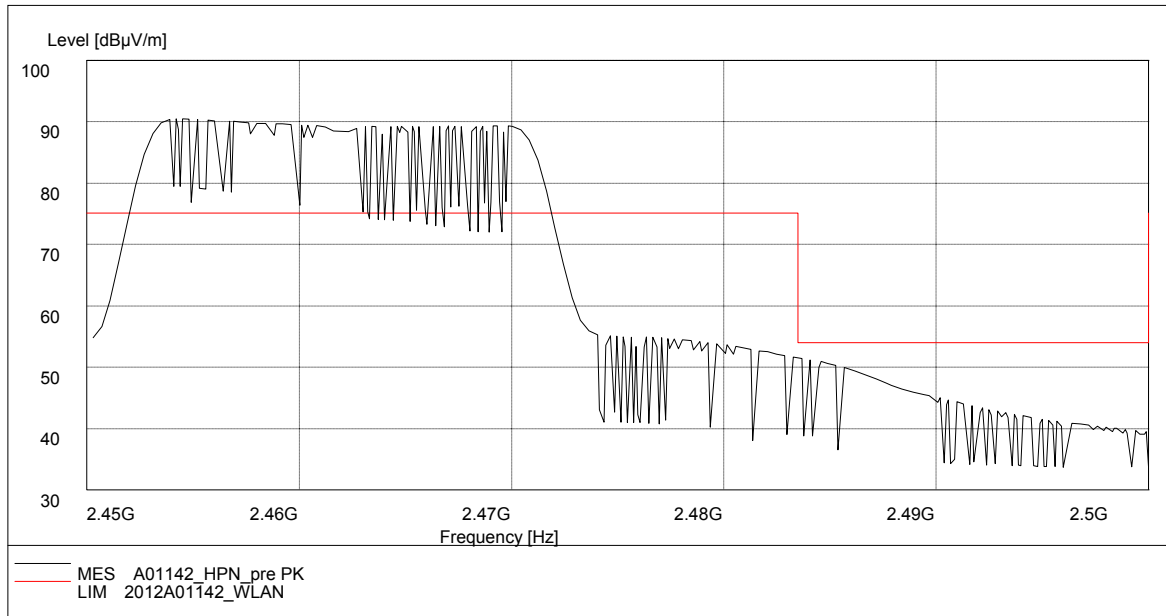


Fig. 72 Radiated Spurious Emission (Power): 802.11n-20MHz, ch11, 2.45 GHz - 2.50GHz

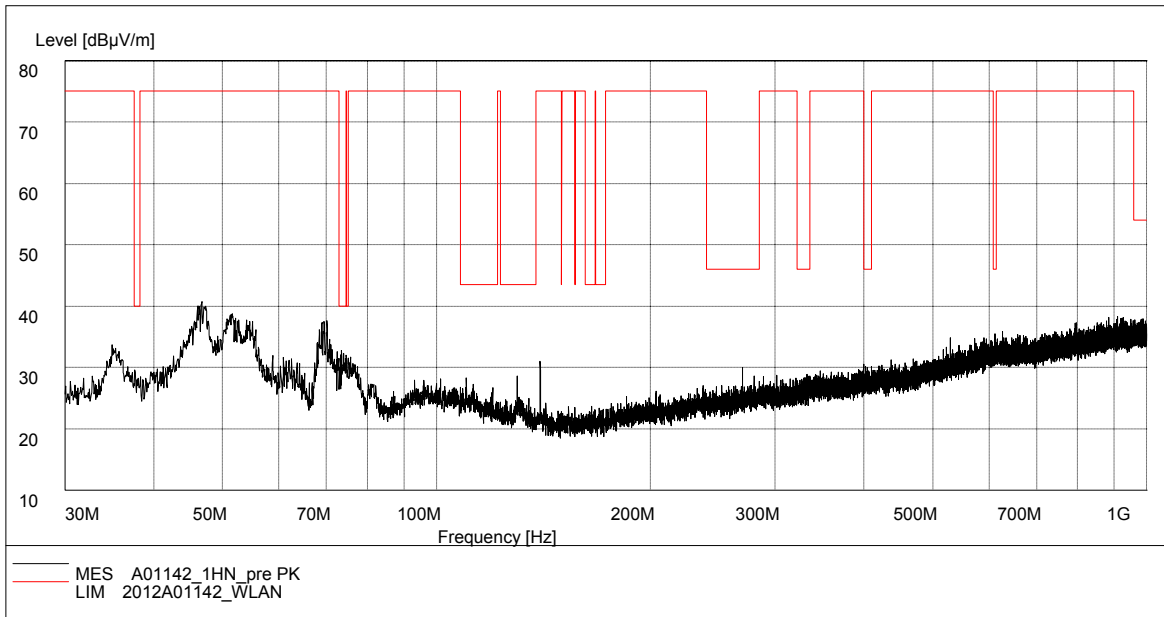


Fig. 73 Radiated Spurious Emission (802.11n-20MHz, Ch11, 30 MHz-1 GHz)

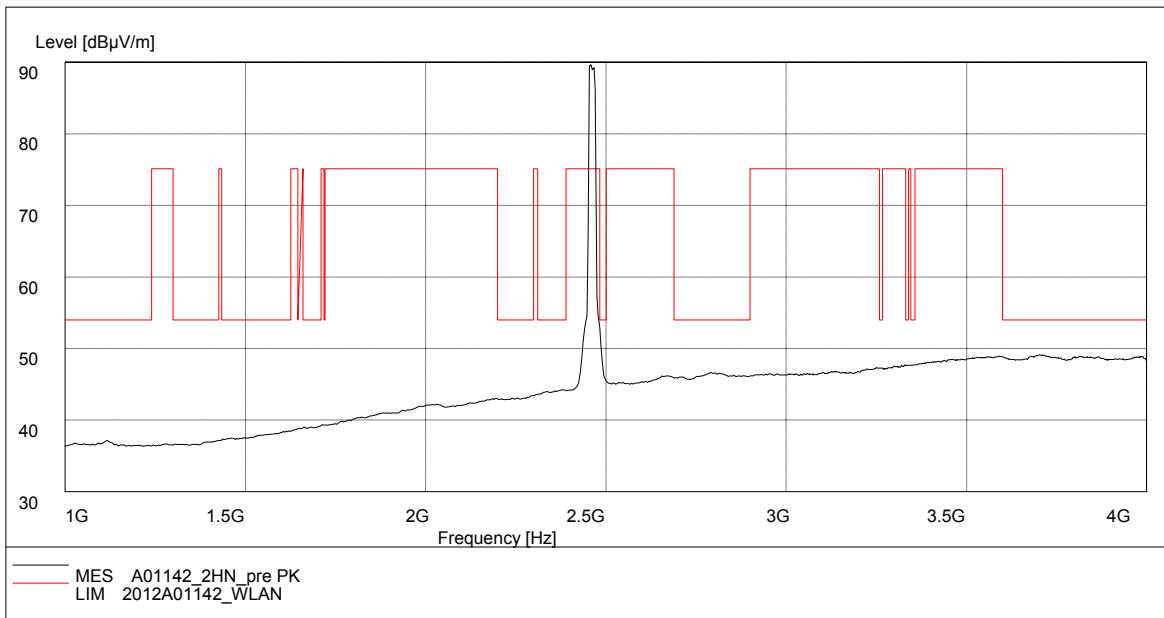


Fig. 74 Radiated Spurious Emission (802.11n-20MHz, Ch11, 1 GHz-4 GHz)

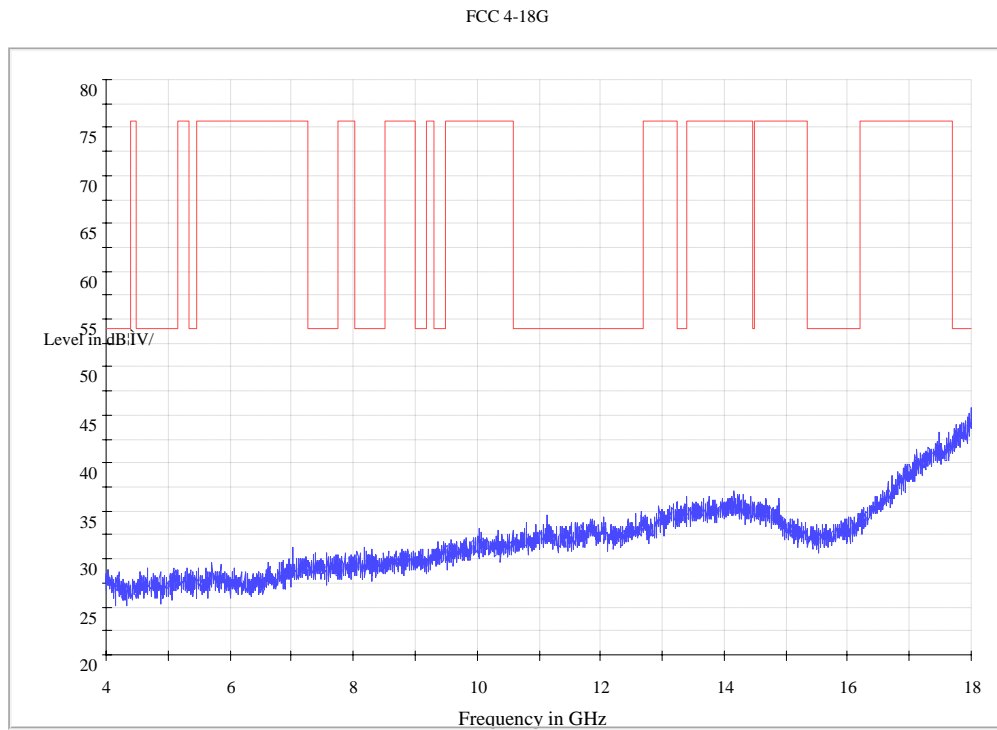


Fig. 75 Radiated Spurious Emission (802.11n-20MHz, Ch11, 4 GHz-18 GHz)

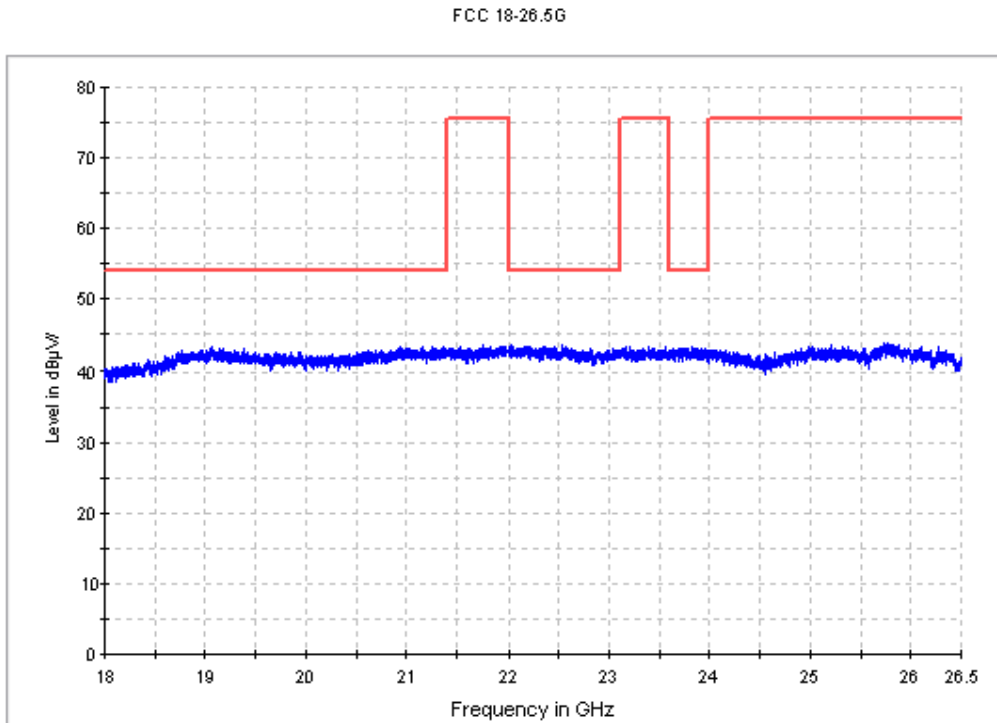


Fig. 76 Radiated emission: 18 GHz - 26.5 GHz

A.7. AC Powerline Conducted Emission

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)			Conclusion
		With charger			
		11b mode	11g mode	11n mode	
0.15 to 0.5	66 to 56	Fig. 77	Fig.78	Fig.79	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			
		11b mode	11g mode	11n mode	
0.15 to 0.5	56 to 46	Fig.77	Fig.78	Fig.79	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 ANSI C63.10

Conclusion: PASS

Test graphs as below:

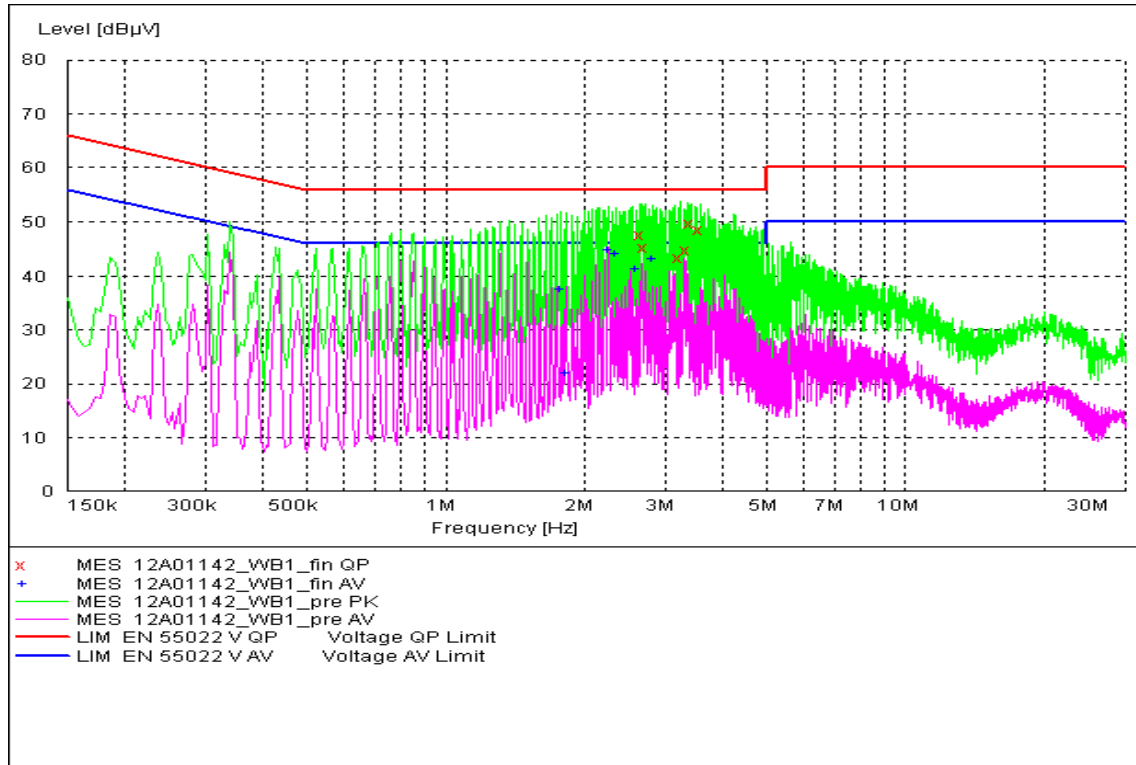


Fig. 77 AC Powerline Conducted Emission-802.11b

MEASUREMENT RESULT: "12A01142_WB1_fin QP "

Frequency (MHz)	Level (dBµV)	Transd (dB)	Limit (dBµV)	Margin (dB)	Line	PE
2.661425	47.60	10.1	56	8.4	L1	GND
2.709715	45.20	10.1	56	10.8	L1	GND
3.243535	43.30	10.1	56	12.7	N	GND
3.362309	44.70	10.1	56	11.3	L1	GND
3.430163	49.70	10.1	56	6.3	L1	GND
3.577148	48.50	10.1	56	7.5	L1	GND

MEASUREMENT RESULT: "12A01142_WB1_fin AV "

Frequency (MHz)	Level (dBµV)	Transd (dB)	Limit (dBµV)	Margin (dB)	Line	PE
1.788000	37.50	10.1	46	8.5	L1	GND
1.824000	22.00	10.1	46	24.0	L1	GND
2.259233	44.80	10.1	46	1.2	L1	GND
2.351340	44.20	10.1	46	1.8	L1	GND
2.588011	41.40	10.1	46	4.6	L1	GND
2.820188	43.20	10.1	46	2.8	L1	GND

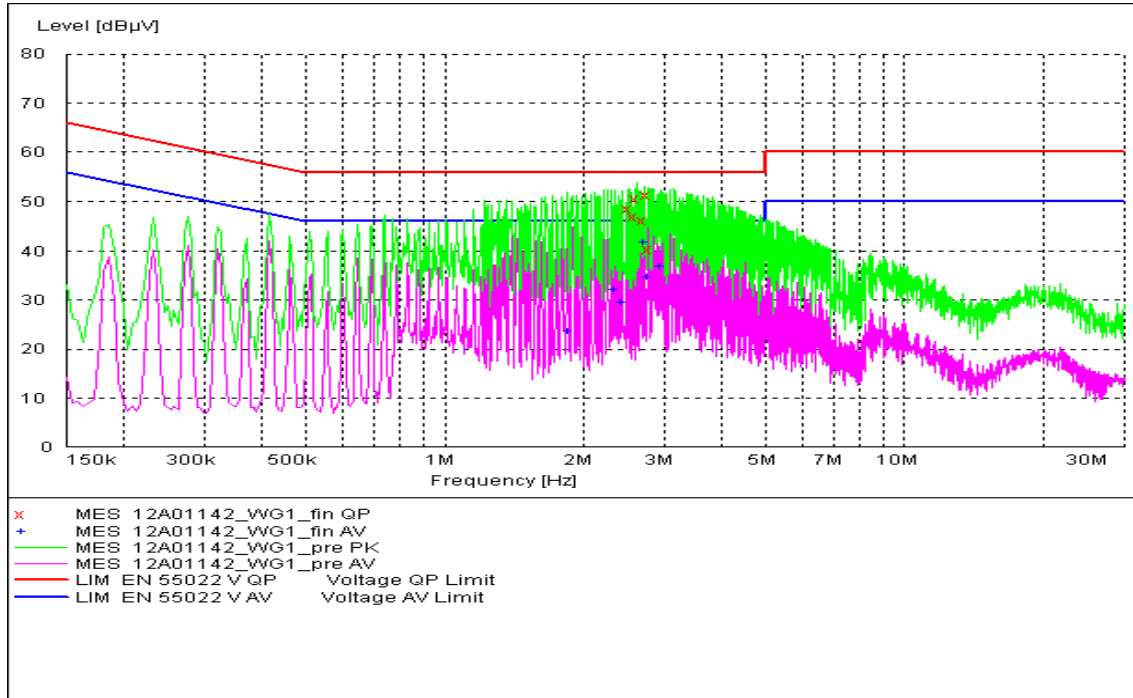


Fig. 78 AC Powerline Conducted Emission-802.11g

MEASUREMENT RESULT: "12A01142_WG1_fin QP "

Frequency (MHz)	Level (dBµV)	Transd (dB)	Limit (dBµV)	Margin (dB)	Line	PE
2.536815	48.60	10.1	56	7.4	N	GND
2.582845	47.00	10.1	56	9.0	N	GND
2.624461	50.60	10.1	56	5.4	L1	GND
2.720565	46.20	10.1	56	9.8	L1	GND
2.769929	51.30	10.1	56	4.7	L1	GND
2.797739	40.30	10.1	56	15.7	N	GND

MEASUREMENT RESULT: "12A01142_WG1_fin AV "

Frequency (MHz)	Level (dBµV)	Transd (dB)	Limit (dBµV)	Margin (dB)	Line	PE
1.851000	23.60	10.1	46	22.4	L1	GND
2.351340	32.00	10.1	46	14.0	L1	GND
2.427722	29.50	10.1	46	16.5	L1	GND
2.720565	41.80	10.1	46	4.2	L1	GND
2.769929	34.70	10.1	46	11.3	N	GND
2.952811	36.70	10.1	46	9.3	N	GND

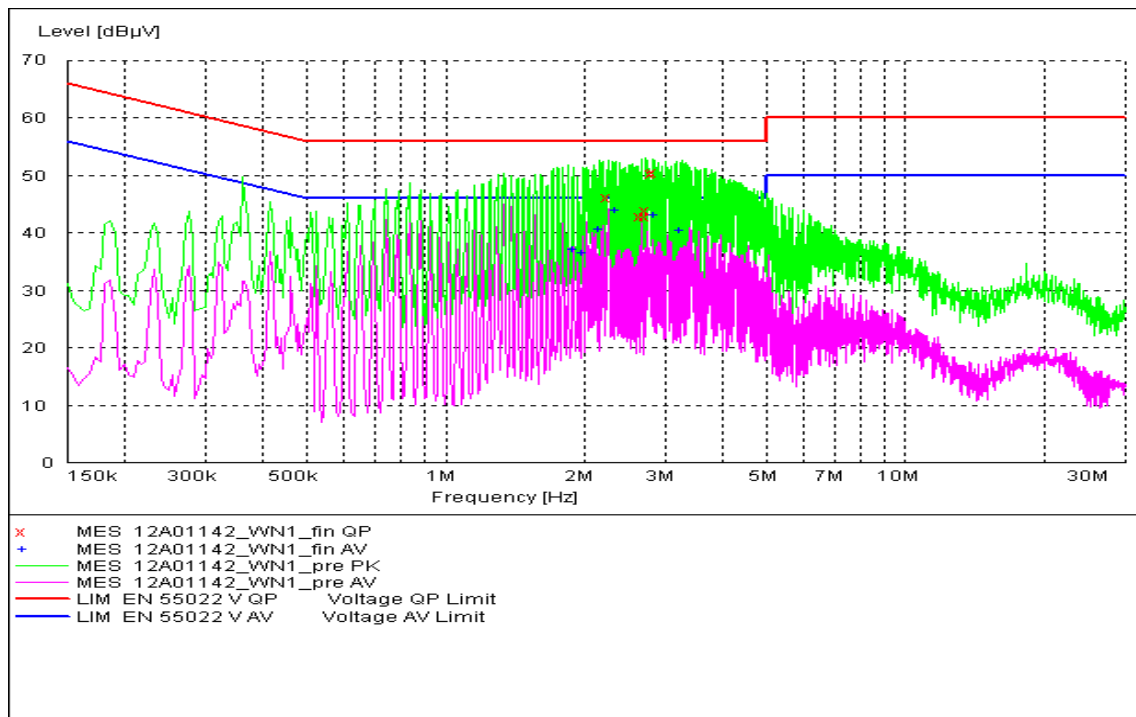


Fig. 79 AC Powerline Conducted Emission-802.11n-20MHz

MEASUREMENT RESULT: "12A01142_WN1_fin QP "

Frequency (MHz)	Level (dBµV)	Transd (dB)	Limit (dBµV)	Margin (dB)	Line	PE
2.259233	46.20	10.1	56	9.8	L1	GND
2.677425	43.00	10.1	56	13.0	N	GND
2.726006	43.00	10.1	56	13.0	N	GND
2.747880	43.90	10.1	56	12.1	L1	GND
2.808941	50.20	10.1	56	5.8	L1	GND
2.859909	50.50	10.1	56	5.5	L1	GND

MEASUREMENT RESULT: "12A01142_WN1_fin AV "

Frequency (MHz)	Level (dBµV)	Transd (dB)	Limit (dBµV)	Margin (dB)	Line	PE
1.891500	37.10	10.1	46	8.9	N	GND
1.981500	36.50	10.1	46	9.5	L1	GND
2.166401	40.60	10.1	46	5.4	L1	GND
2.351340	44.00	10.1	46	2.0	L1	GND
2.859909	43.10	10.1	46	2.9	L1	GND
3.224152	40.50	10.1	46	5.5	L1	GND

*** END OF REPORT BODY ***