

Fig.47 Conducted Spurious Emission (1GHz-26.5GHz, 802.11g, CH6)

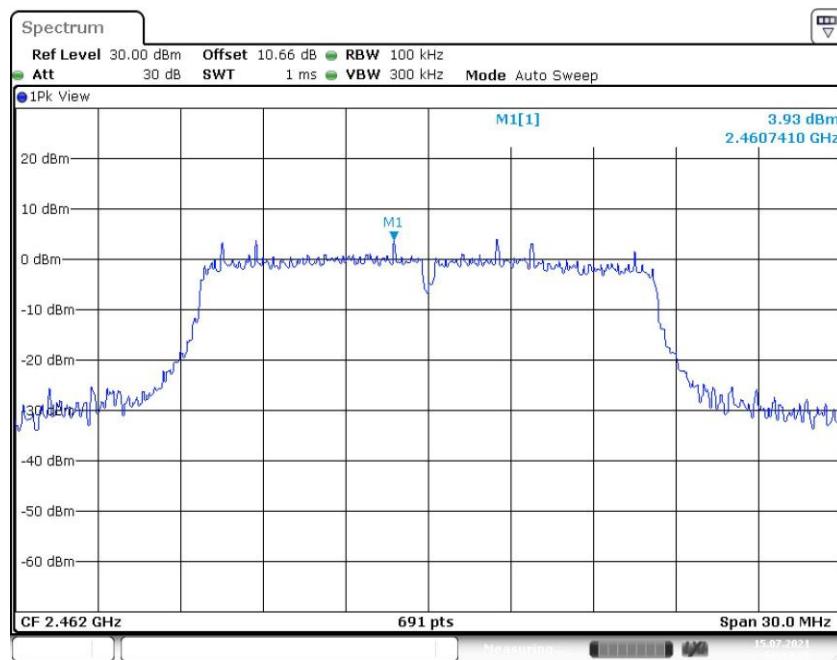


Fig.48 Conducted Spurious Emission (Center Frequency, 802.11g, CH11)

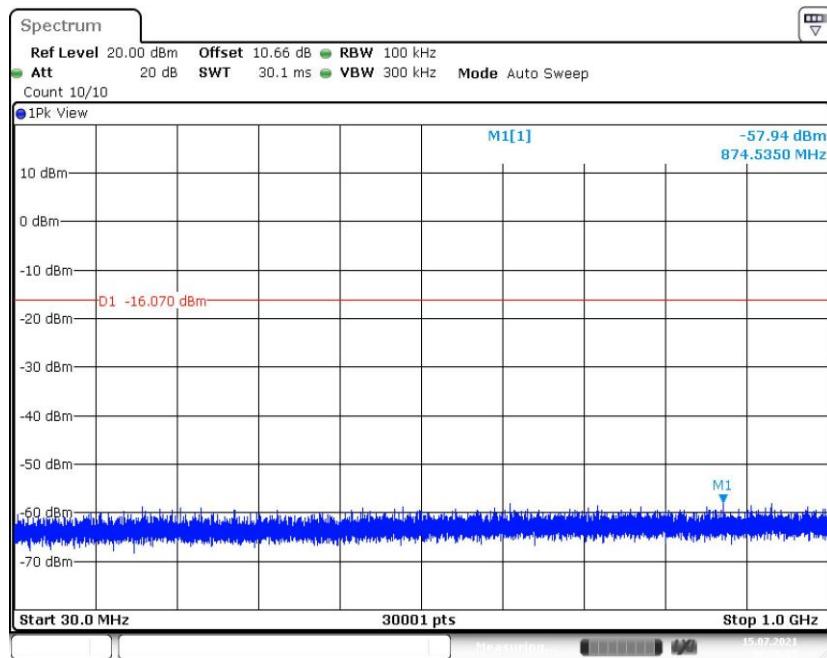


Fig.49 Conducted Spurious Emission (30MHz -1GHz, 802.11g, CH11)

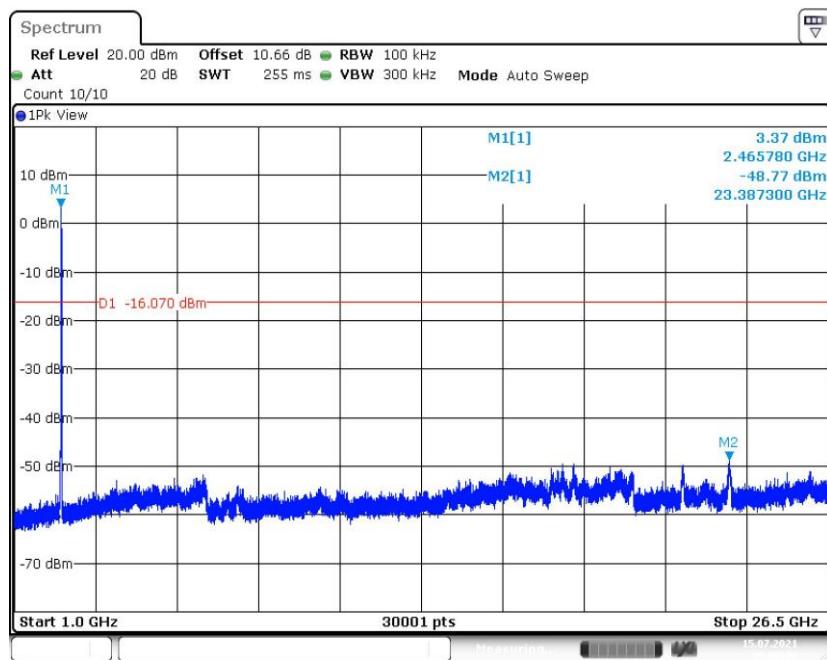


Fig.50 Conducted Spurious Emission (1GHz-26.5GHz, 802.11g, CH11)

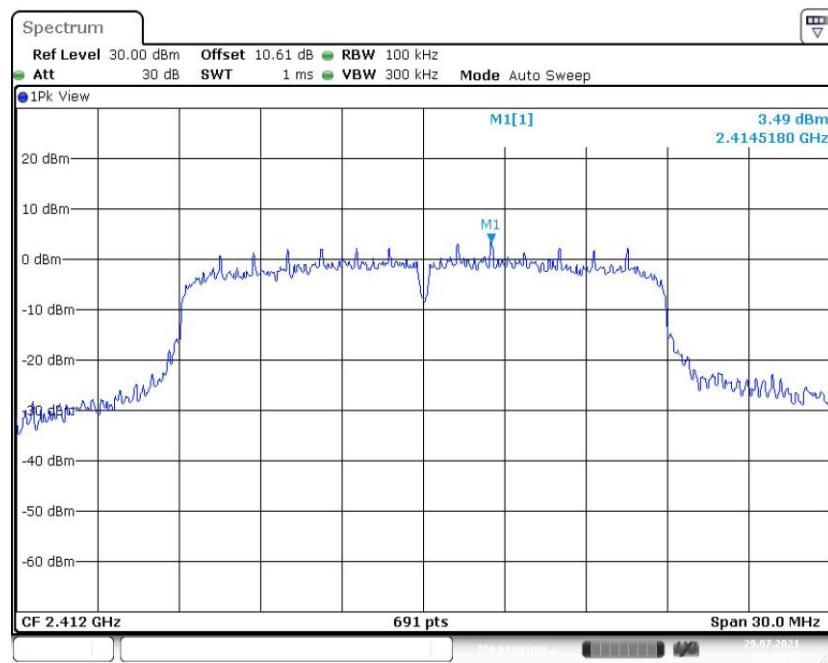


Fig.51 Conducted Spurious Emission (Center Frequency, 802.11n-HT20, CH1)

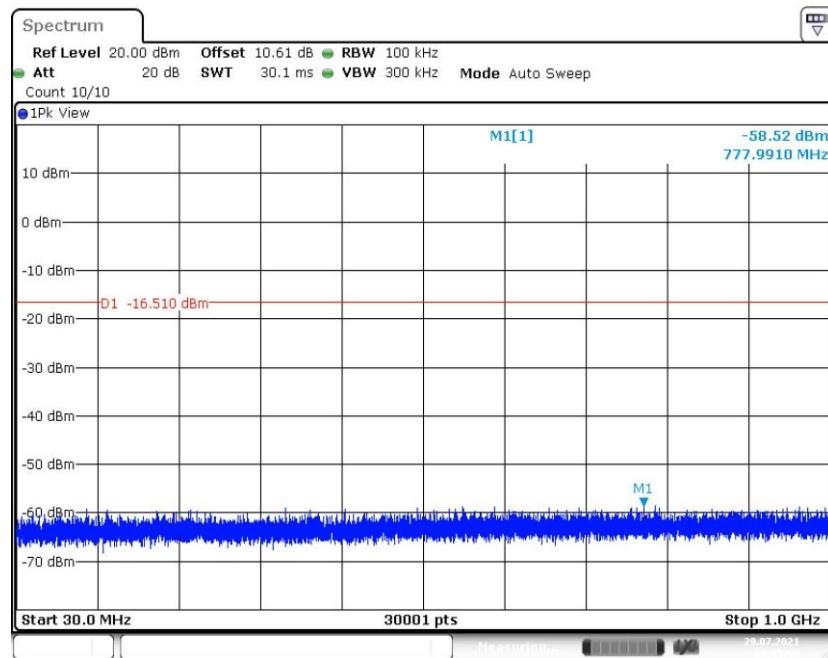
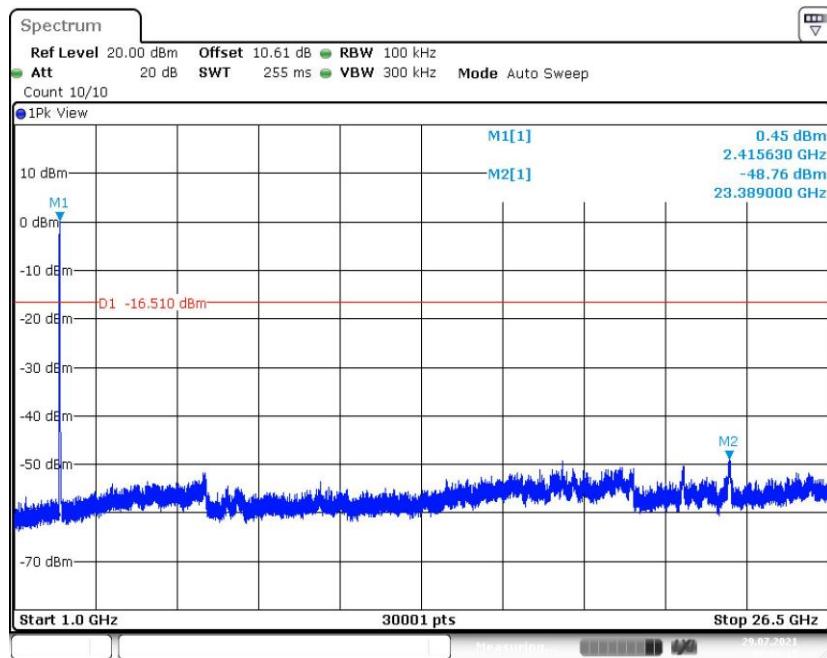
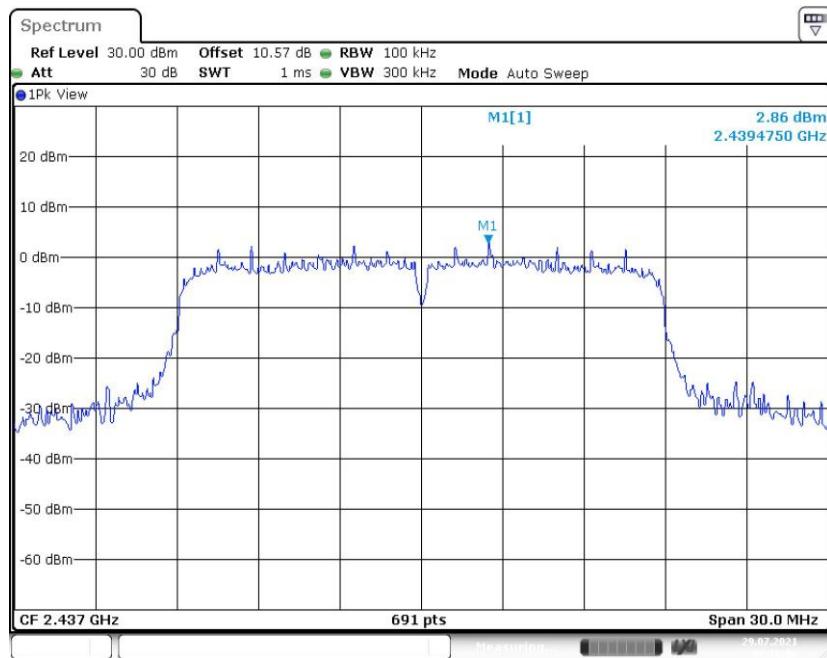


Fig.52 Conducted Spurious Emission (30MHz -1GHz, 802.11n-HT20, CH1)



**Fig.53 Conducted Spurious Emission (1GHz-26.5GHz, 802.11n-HT20, CH1)**



**Fig.54 Conducted Spurious Emission (Center Frequency, 802.11n-HT20, CH6)**

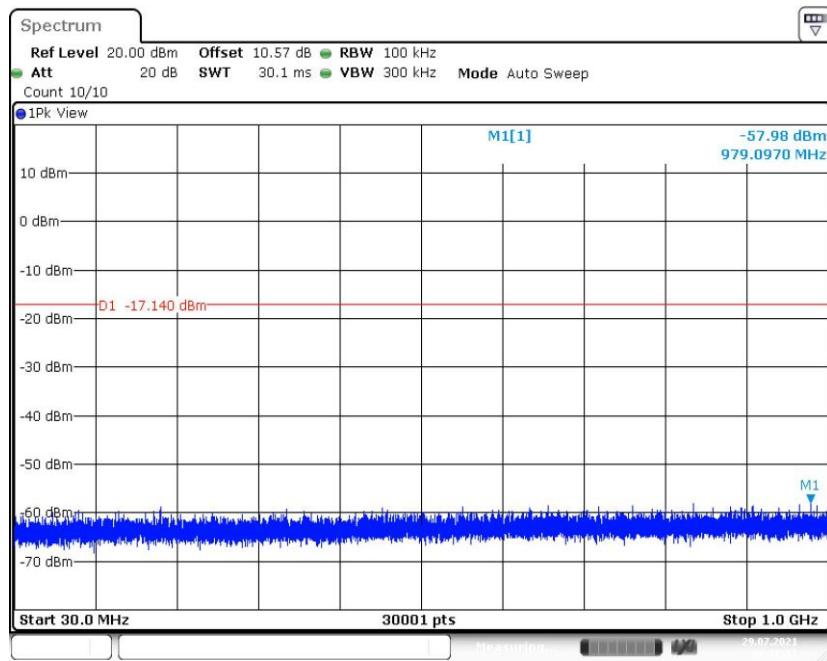


Fig.55 Conducted Spurious Emission (30MHz -1GHz, 802.11n-HT20, CH6)

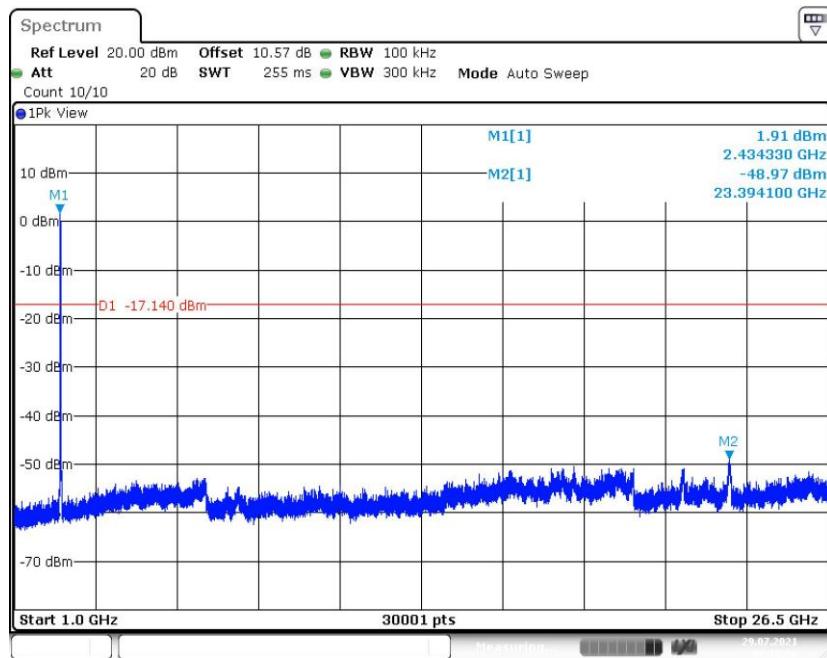
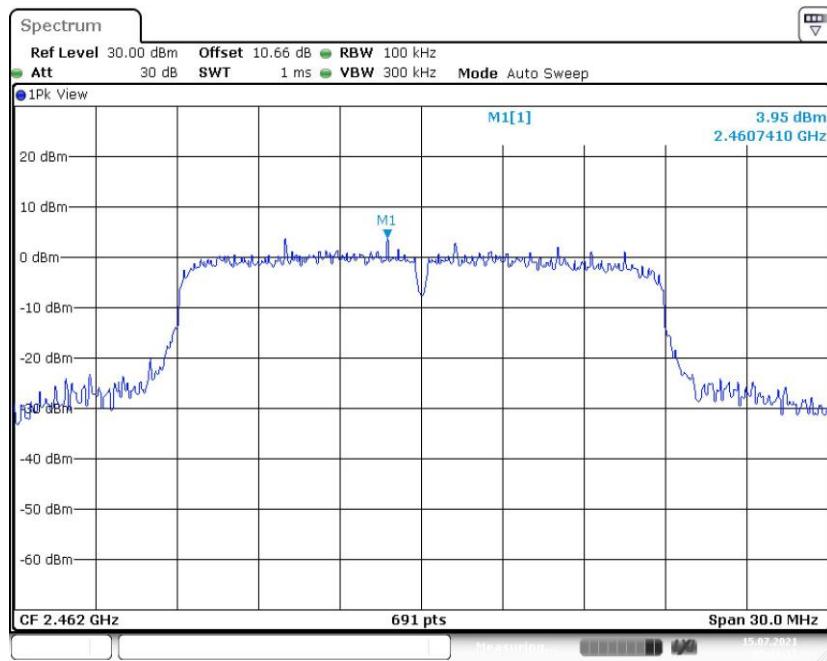
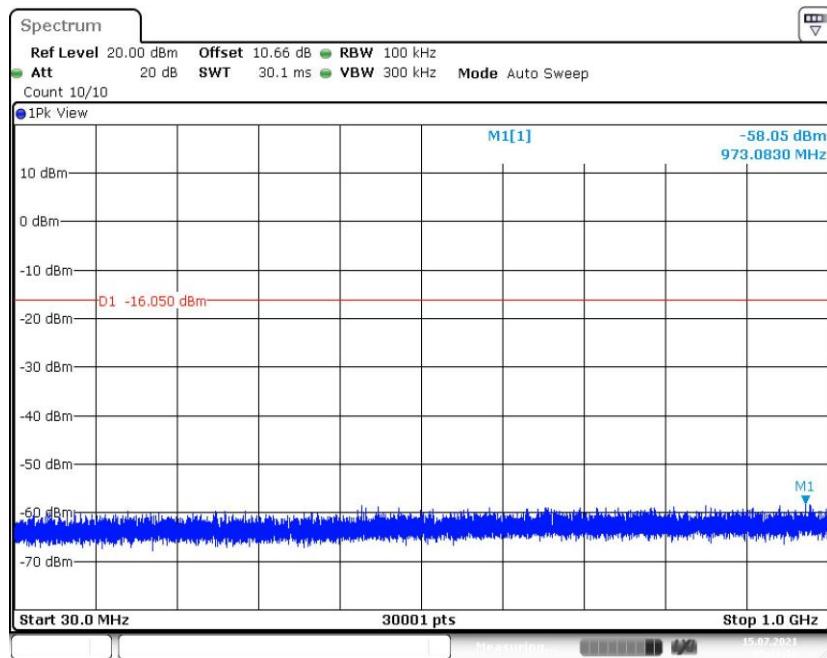


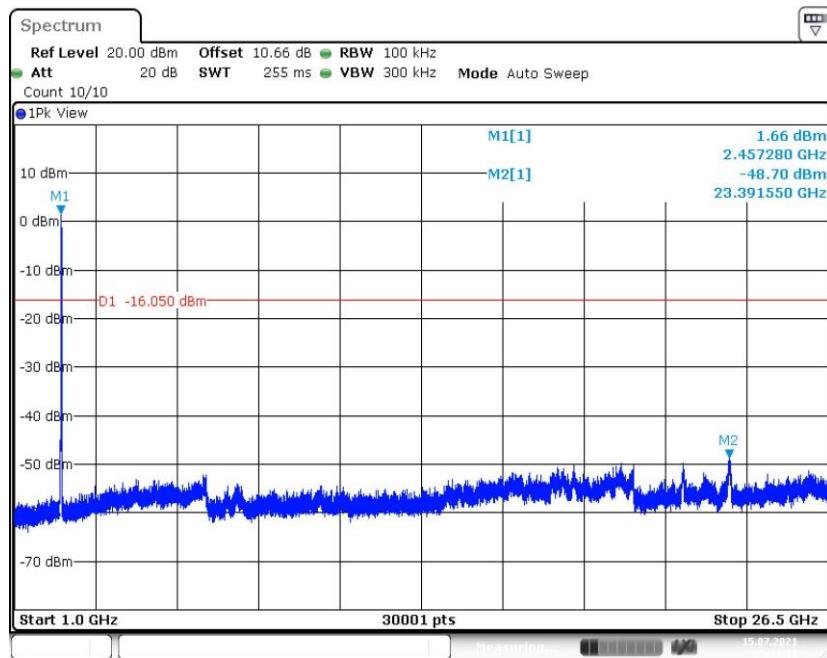
Fig.56 Conducted Spurious Emission (1GHz-26.5GHz, 802.11n-HT20, CH6)



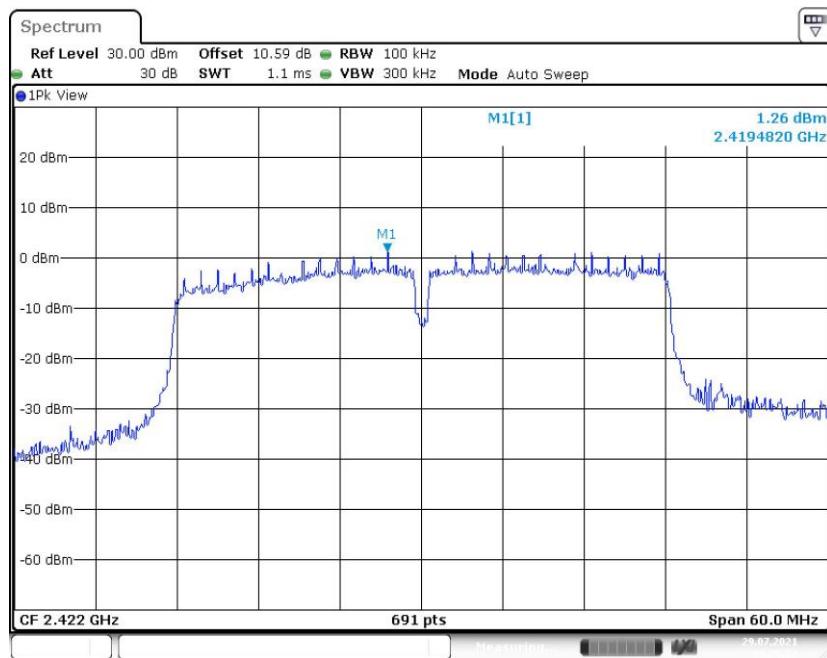
**Fig.57 Conducted Spurious Emission (Center Frequency, 802.11n-HT20, CH11)**



**Fig.58 Conducted Spurious Emission (30MHz -1GHz, 802.11n-HT20, CH11)**



**Fig.59 Conducted Spurious Emission (1GHz-26.5GHz, 802.11n-HT20, CH11)**



**Fig.60 Conducted Spurious Emission (Center Frequency, 802.11n-HT40, CH3)**

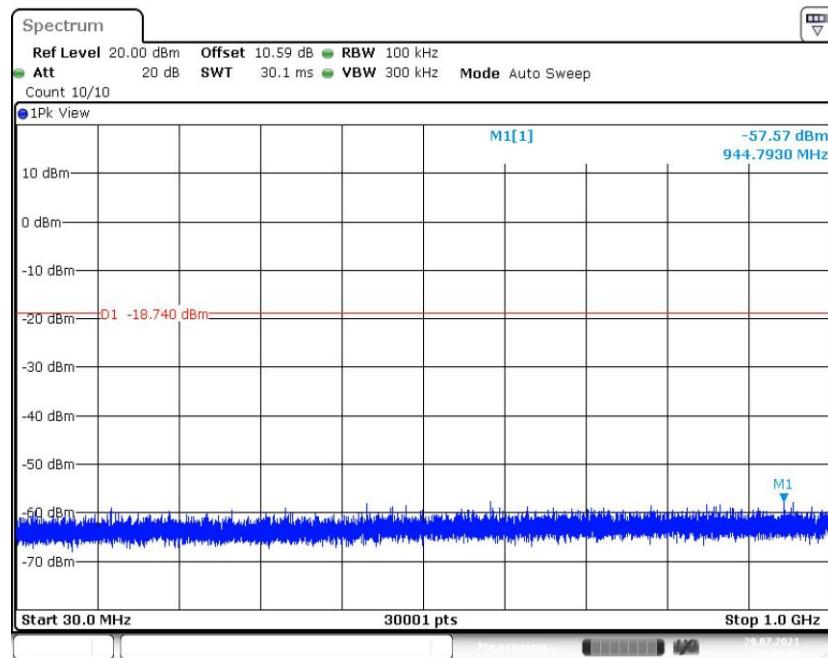


Fig.61 Conducted Spurious Emission (30MHz -1GHz, 802.11n-HT40, CH3)

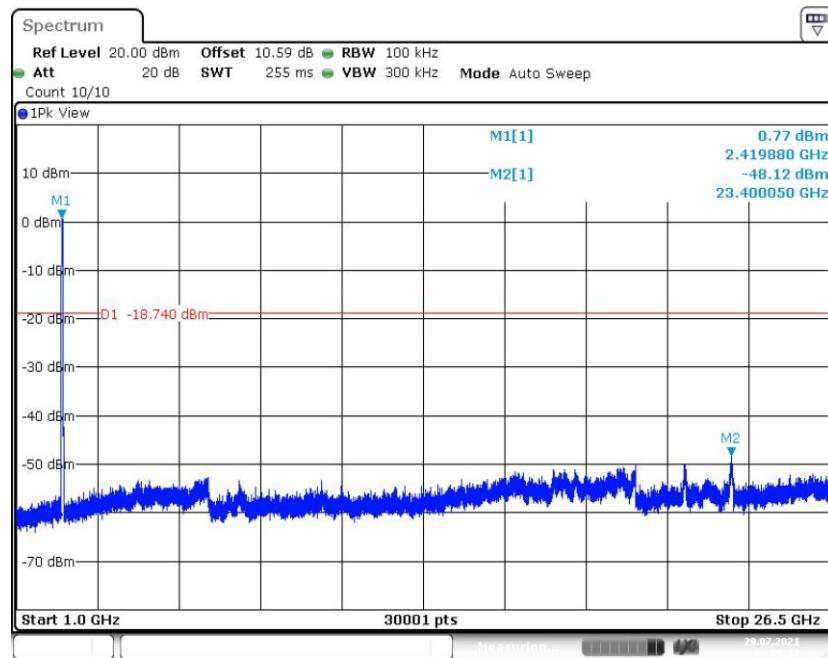


Fig.62 Conducted Spurious Emission (1GHz-26.5GHz, 802.11n-HT40, CH3)

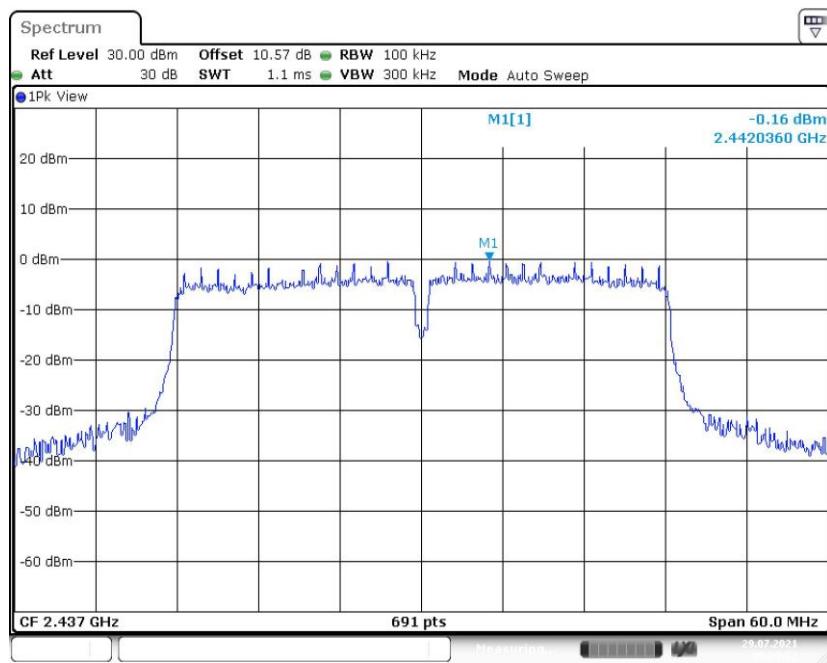


Fig.63 Conducted Spurious Emission (Center Frequency, 802.11n-HT40, CH6)

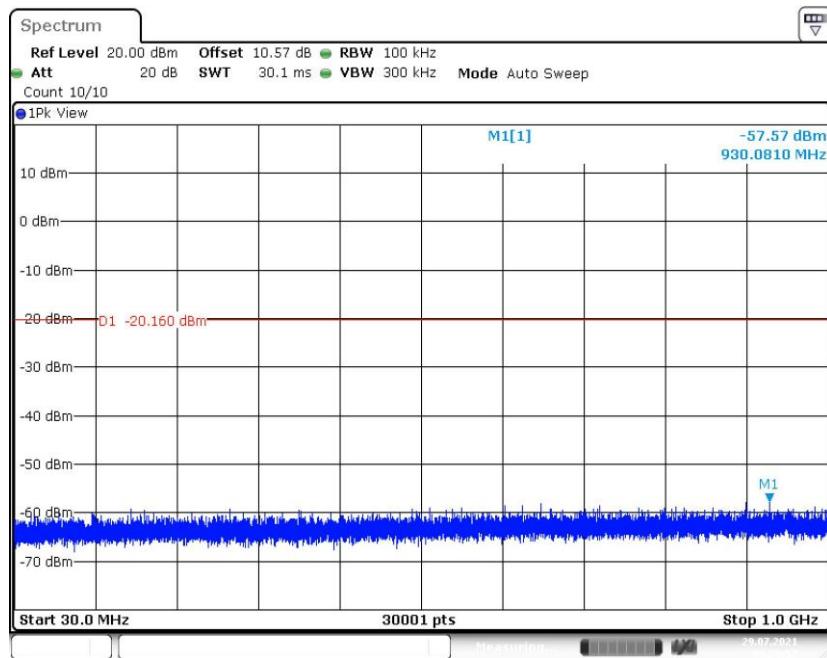
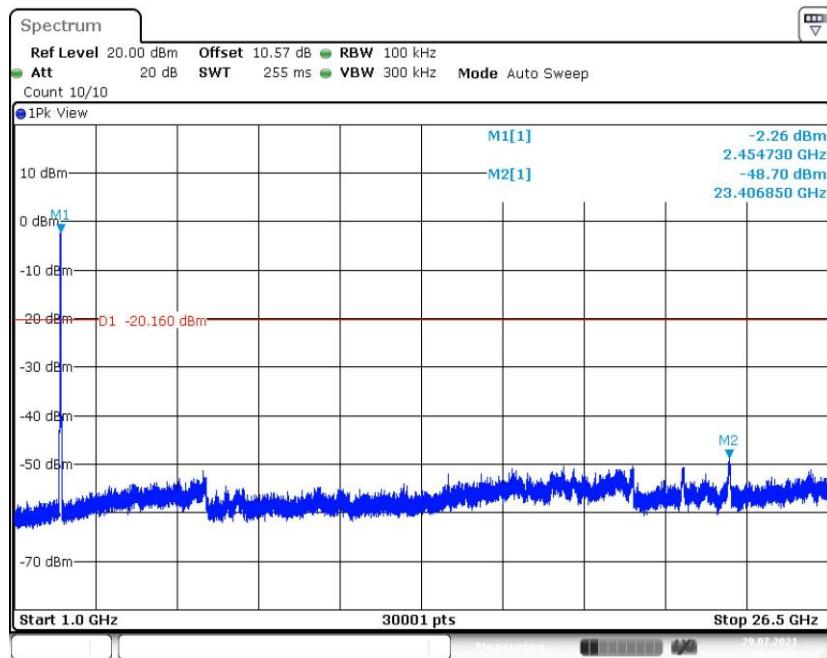
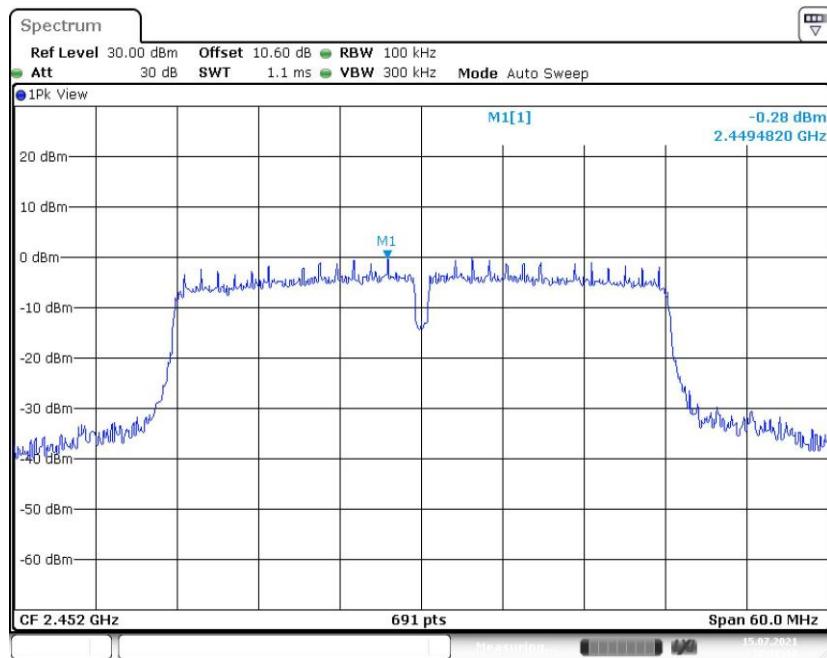


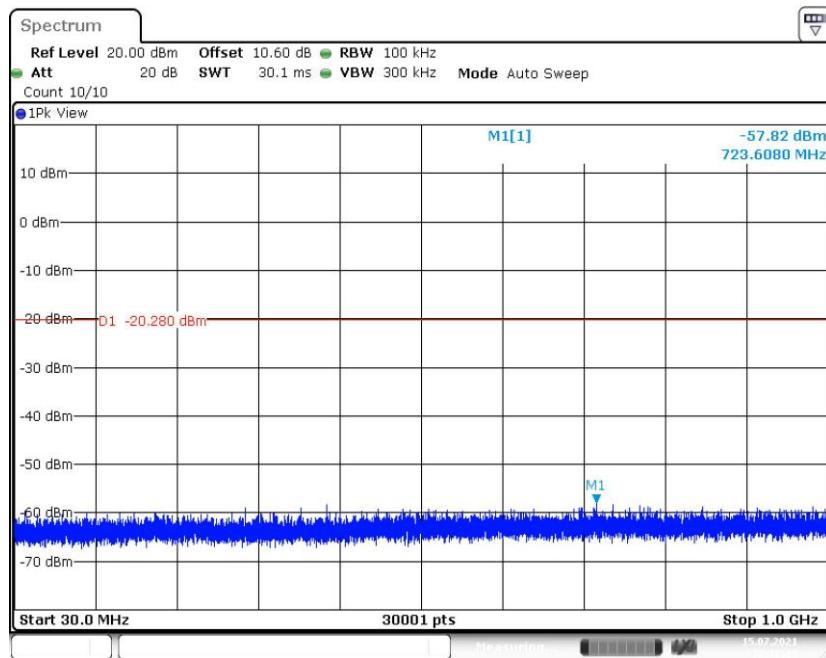
Fig.64 Conducted Spurious Emission (30MHz -1GHz, 802.11n-HT40, CH6)



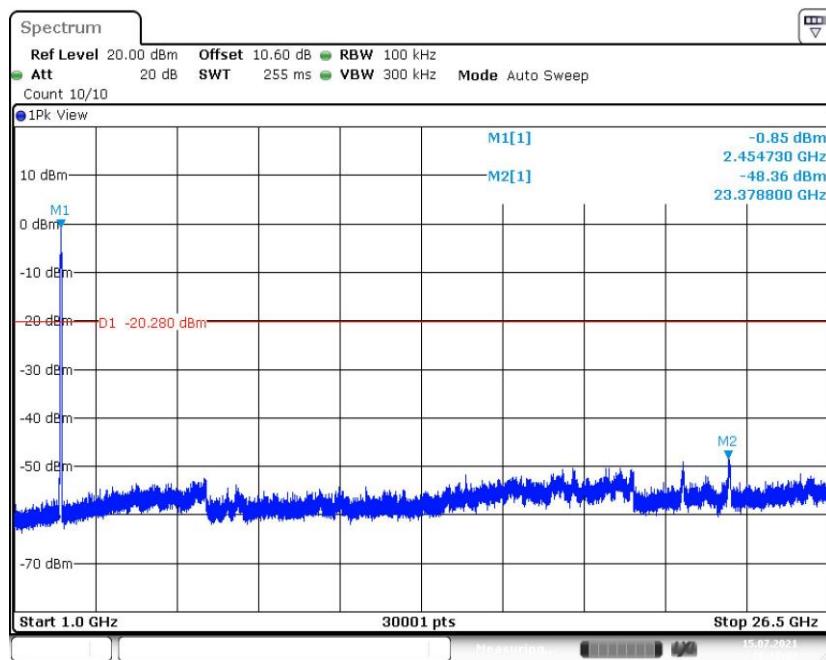
**Fig.65 Conducted Spurious Emission (1GHz-26.5GHz, 802.11n-HT40, CH6)**



**Fig.66 Conducted Spurious Emission (Center Frequency, 802.11n-HT40, CH9)**



**Fig.67 Conducted Spurious Emission (30MHz -1GHz, 802.11n-HT40, CH9)**



**Fig.68 Conducted Spurious Emission (1GHz-26.5GHz, 802.11n-HT40, CH9)**

## A.6 Radiated Emission

### Measurement Limit:

Standard	Limit (dBm)
FCC 47 CFR Part 15.247, 15.205, 15.209	20dBm 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 ~18 GHz	Fig.69	P
	CH 6	1 GHz ~18 GHz	Fig.70	P
	CH 11	1 GHz ~18 GHz	Fig.71	P
	Restricted Band (CH1)	2.38 GHz ~ 2.45 GHz	Fig.72	P
	Restricted Band (CH11)	2.45 GHz ~ 2.5 GHz	Fig.73	P
802.11g	CH 1	1 GHz ~18 GHz	Fig.74	P
	CH 6	1 GHz ~18 GHz	Fig.75	P
	CH 11	1 GHz ~18 GHz	Fig.76	P
	Restricted Band (CH1)	2.38 GHz ~ 2.45 GHz	Fig.77	P
	Restricted Band (CH11)	2.45 GHz ~ 2.5 GHz	Fig.78	P
802.11n -HT20	CH 1	1 GHz ~18 GHz	Fig.79	P
	CH 6	1 GHz ~18 GHz	Fig.80	P
	CH 11	1 GHz ~18 GHz	Fig.81	P
	Restricted Band (CH1)	2.38 GHz ~ 2.45 GHz	Fig.82	P
	Restricted Band (CH11)	2.45 GHz ~ 2.5 GHz	Fig.83	P
802.11n -HT40	CH 3	1 GHz ~18 GHz	Fig.84	P
	CH 6	1 GHz ~18 GHz	Fig.85	P
	CH 9	1 GHz ~18 GHz	Fig.86	P
	Restricted Band (CH3)	2.38 GHz ~ 2.45 GHz	Fig.87	P
	Restricted Band (CH9)	2.45 GHz ~ 2.5 GHz	Fig.88	P
/	All Channels	9 kHz ~30 MHz	Fig.89	P
		30 MHz ~1 GHz	Fig.90	P
		18 GHz ~26.5 GHz	Fig.91	P

**Worst-Case Result:**
**802.11b CH1 (1-18GHz)**

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)
4824.000000	56.01	74.00	17.99	H	3.9
7235.571429	49.06	74.00	24.94	H	5.1
14894.571429	51.67	74.00	22.33	V	13.0
15864.000000	53.26	74.00	20.74	H	14.0
16957.714286	54.73	74.00	19.27	H	18.2
17900.571429	55.33	74.00	18.67	V	18.8

Frequency (MHz)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)
4824.000000	51.23	54.00	2.77	H	3.9
7235.571429	40.43	54.00	13.57	H	5.1
14894.571429	39.36	54.00	14.64	V	13.0
15864.000000	40.41	54.00	13.59	H	14.0
16957.714286	42.72	54.00	11.28	H	18.2
17900.571429	42.83	54.00	11.17	V	18.8

**802.11g CH11 (1GHz-18GHz)**

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)
4927.200000	58.72	74.00	15.28	H	3.6
7379.571429	52.39	74.00	21.61	H	5.5
14852.142857	52.67	74.00	21.33	H	13.0
15889.285714	52.67	74.00	21.33	V	14.0
16850.571429	54.57	74.00	19.43	H	17.9
17910.428571	55.41	74.00	18.59	H	18.9

Frequency (MHz)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)
4927.200000	43.92	54.00	10.08	H	3.6
7379.571429	38.52	54.00	15.48	H	5.5
14852.142857	39.33	54.00	14.67	H	13.0
15889.285714	40.50	54.00	13.50	V	14.0
16850.571429	42.52	54.00	11.48	H	17.9
17910.428571	43.11	54.00	10.89	H	18.9

**802.11n-HT20 CH11 (1GHz-18GHz)**

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)
4927.800000	59.62	74.00	14.38	H	3.6
7387.285714	53.45	74.00	20.55	H	5.5
14851.285714	51.75	74.00	22.25	H	13.0
15963.428571	51.98	74.00	22.02	H	14.1
16945.285714	54.91	74.00	19.09	V	18.2
17933.571429	56.15	74.00	17.85	H	19.0

Frequency (MHz)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)
4927.800000	44.34	54.00	9.66	H	3.6
7387.285714	38.39	54.00	15.61	H	5.5
14851.285714	39.30	54.00	14.70	H	13.0
15963.428571	39.89	54.00	14.11	H	14.1
16945.285714	42.40	54.00	11.60	V	18.2
17933.571429	43.19	54.00	10.81	H	19.0

**802.11n-HT40 CH3 (1GHz-18GHz)**

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)
4824.300000	50.79	74.00	23.21	H	3.9
7260.428572	52.79	74.00	21.21	V	5.0
14818.714286	51.24	74.00	22.76	V	12.9
15854.571429	54.15	74.00	19.85	H	14.0
16995.000000	55.05	74.00	18.95	V	18.3
17922.857143	55.79	74.00	18.21	H	18.9

Frequency (MHz)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)
4824.300000	36.80	54.00	17.20	H	3.9
7260.428572	38.42	54.00	15.58	V	5.0
14818.714286	38.89	54.00	15.11	V	12.9
15854.571429	40.57	54.00	13.43	H	14.0
16995.000000	42.49	54.00	11.51	V	18.3
17922.857143	43.31	54.00	10.69	H	18.9

**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**

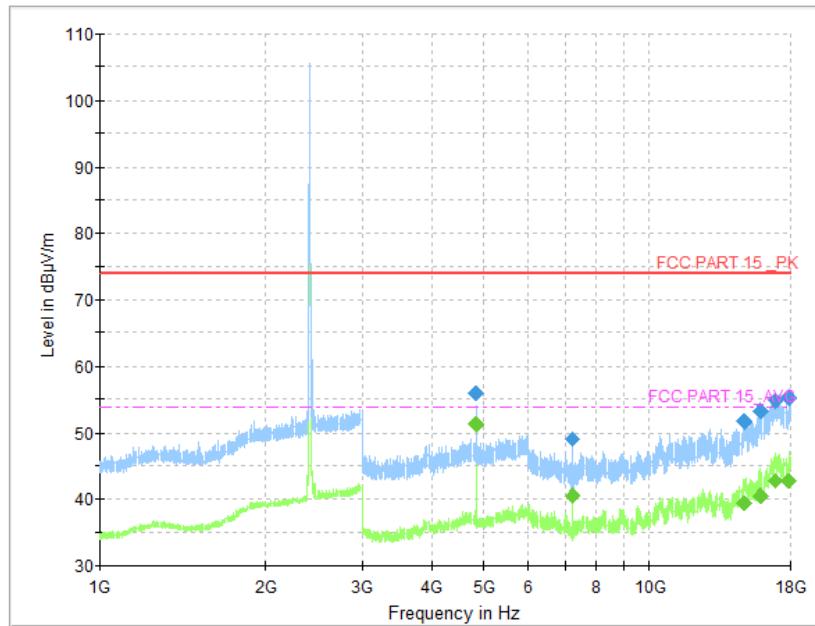


Fig.69 Radiated Spurious Emission (802.11b, CH1, 1 GHz-18GHz)

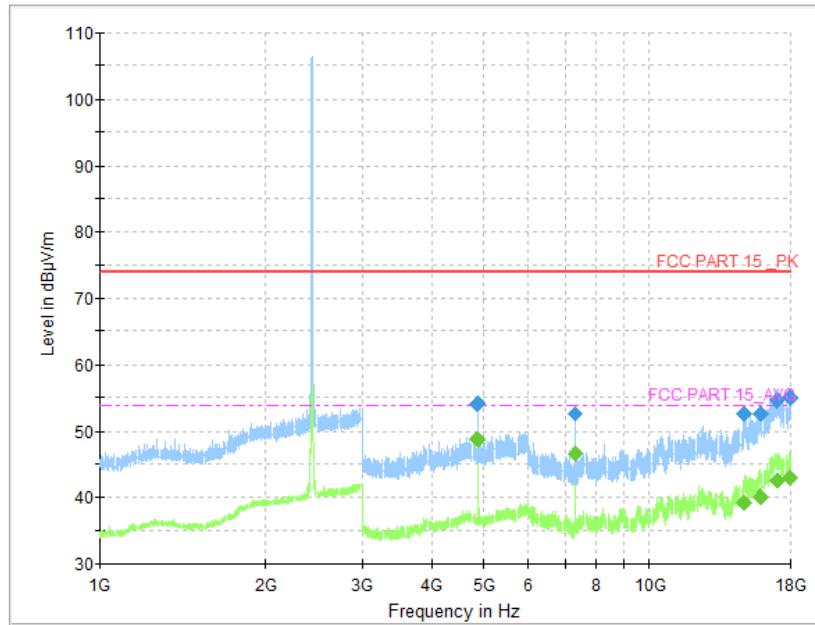


Fig.70 Radiated Spurious Emission (802.11b, CH6, 1 GHz-18GHz)

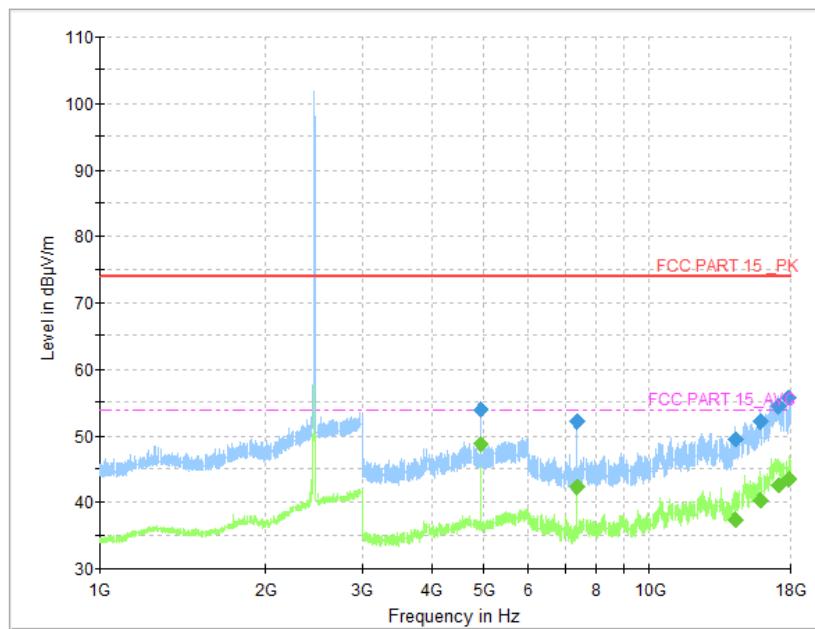


Fig.71 Radiated Spurious Emission (802.11b, CH11, 1 GHz-18GHz)

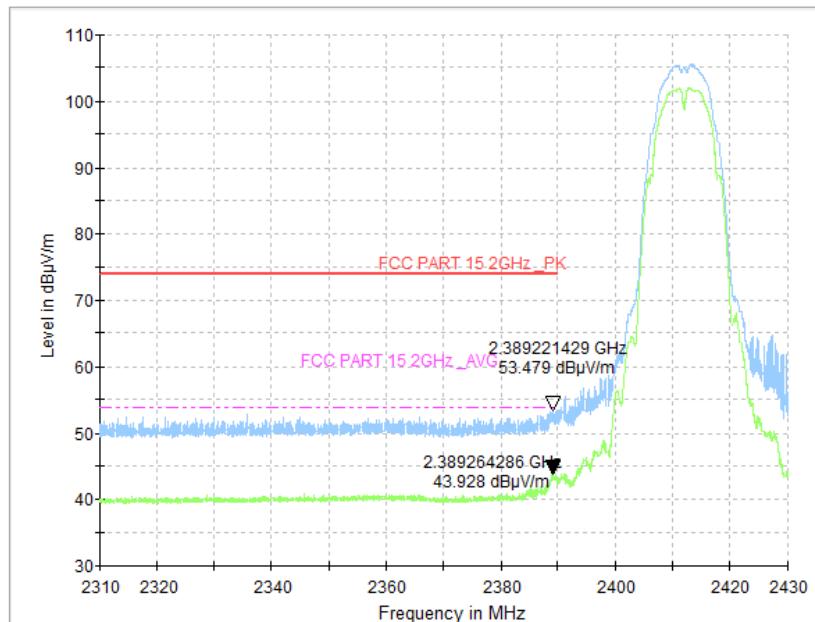


Fig.72 Radiated Restricted Band (802.11b, CH1, 2.38GHz~2.45GHz)

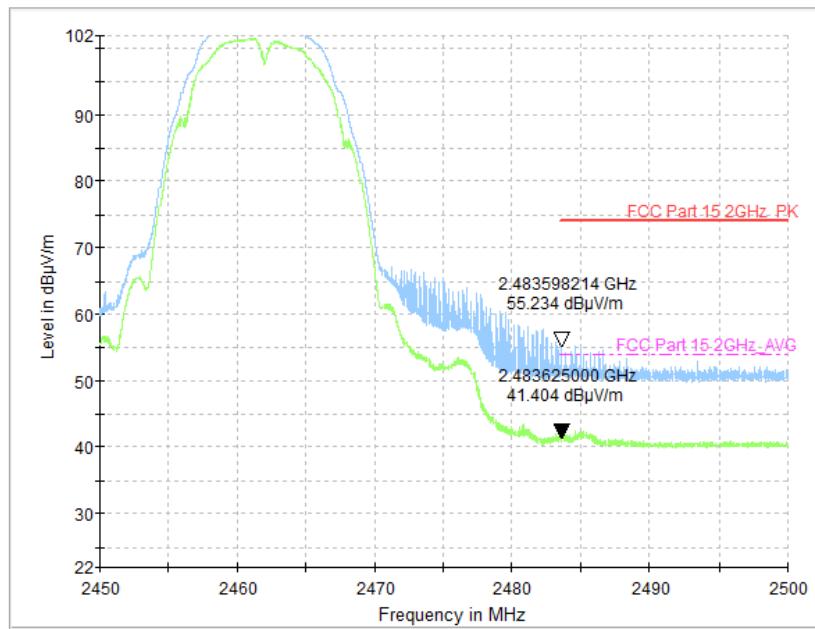


Fig.73 Radiated Restricted Band (802.11b, CH11, 2.45GHz~2.5GHz)

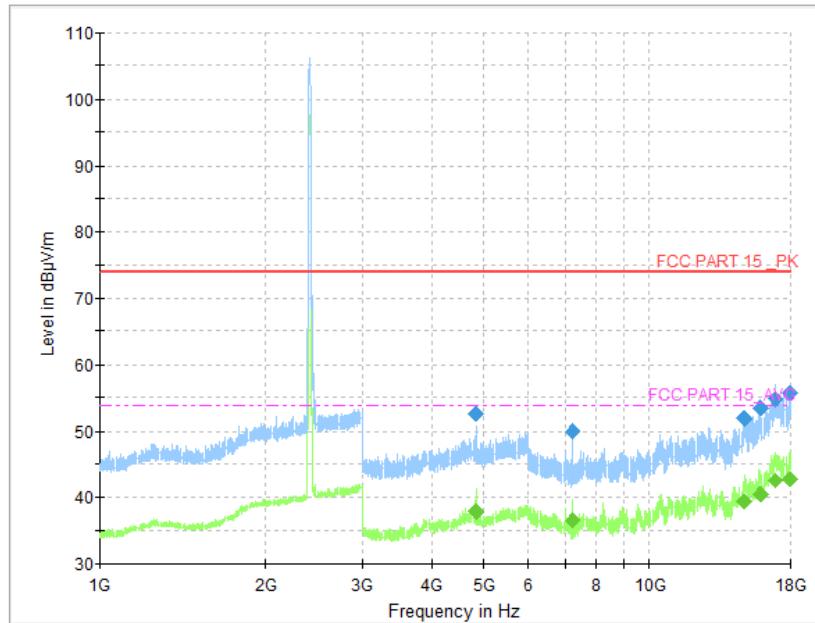


Fig.74 Radiated Spurious Emission (802.11g, CH1, 1 GHz-18 GHz)

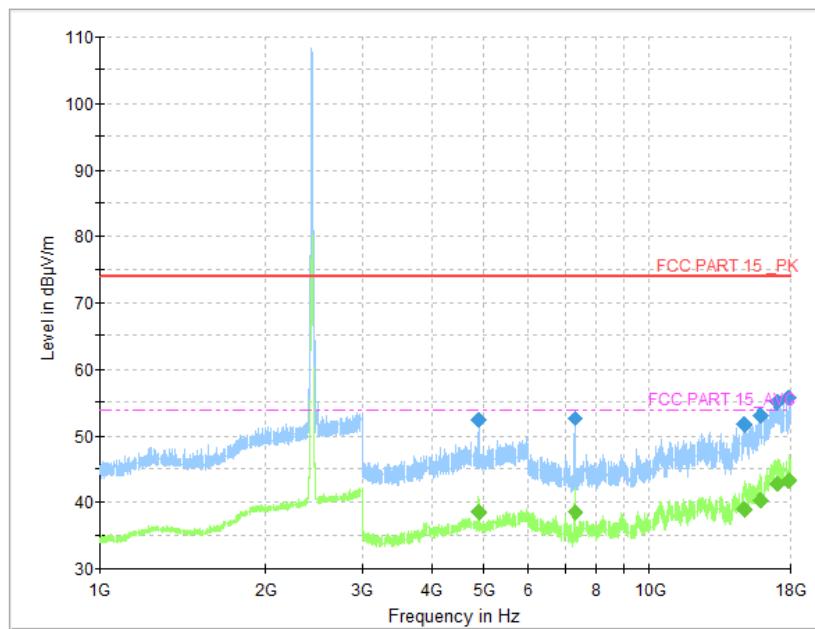


Fig.75 Radiated Spurious Emission (802.11g, CH6, 1 GHz-18 GHz)

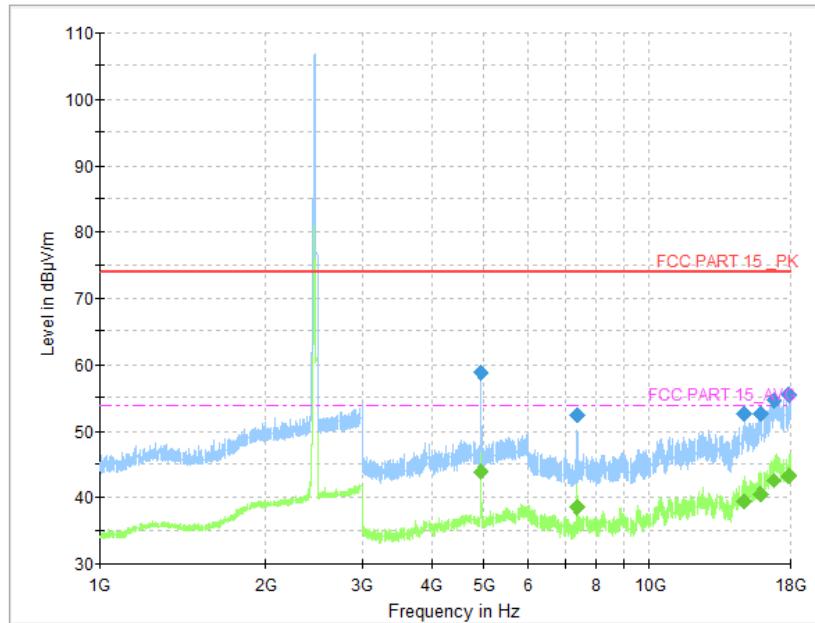
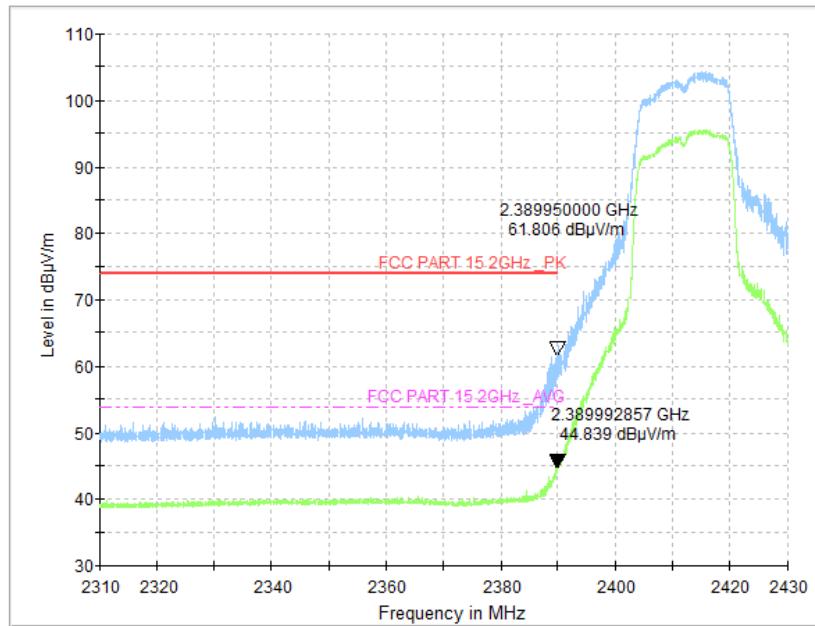
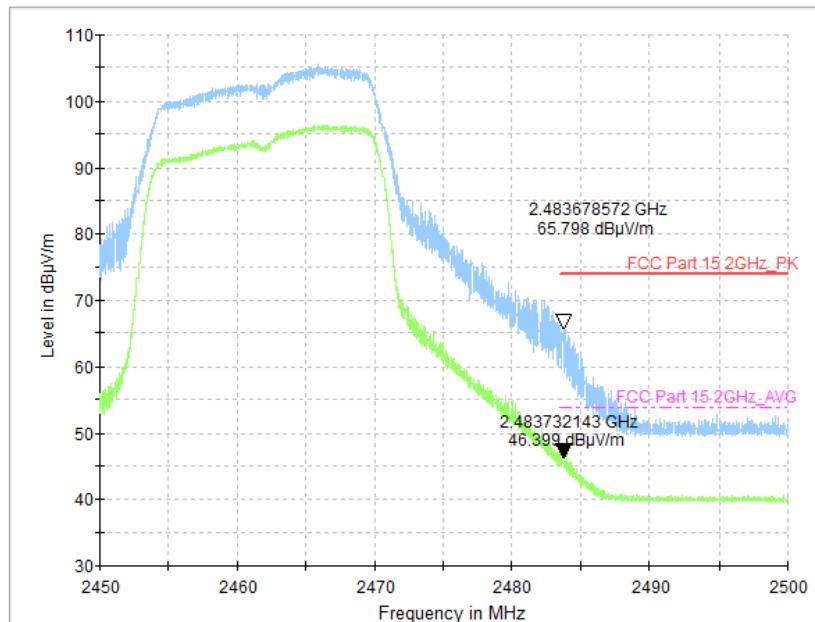


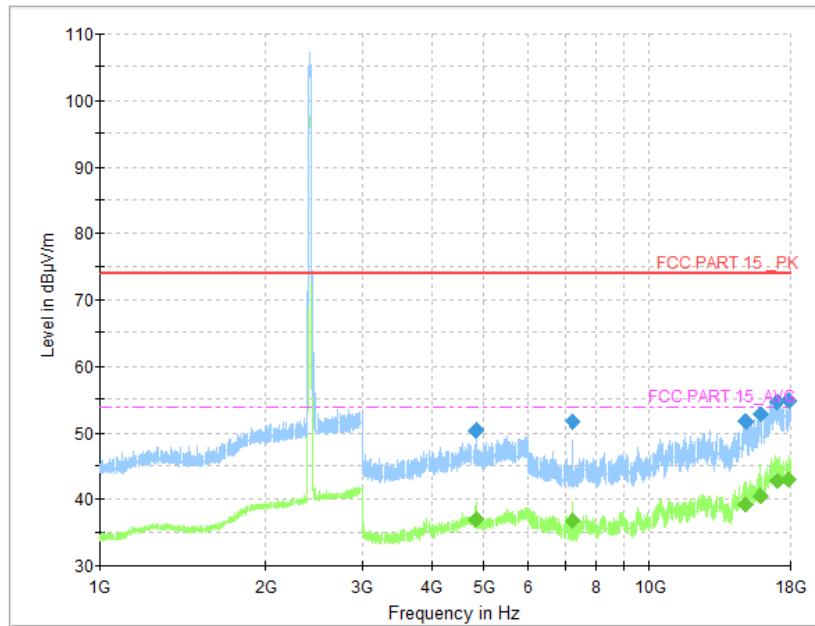
Fig.76 Radiated Spurious Emission (802.11g, CH11, 1 GHz-18 GHz)



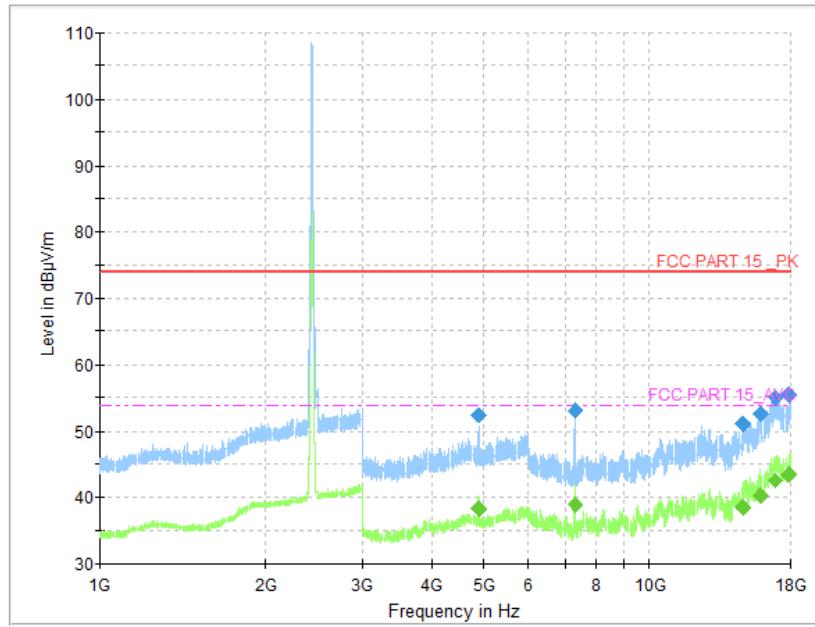
**Fig.77 Radiated Restricted Band (802.11g, CH1, 2.38GHz~2.45GHz)**



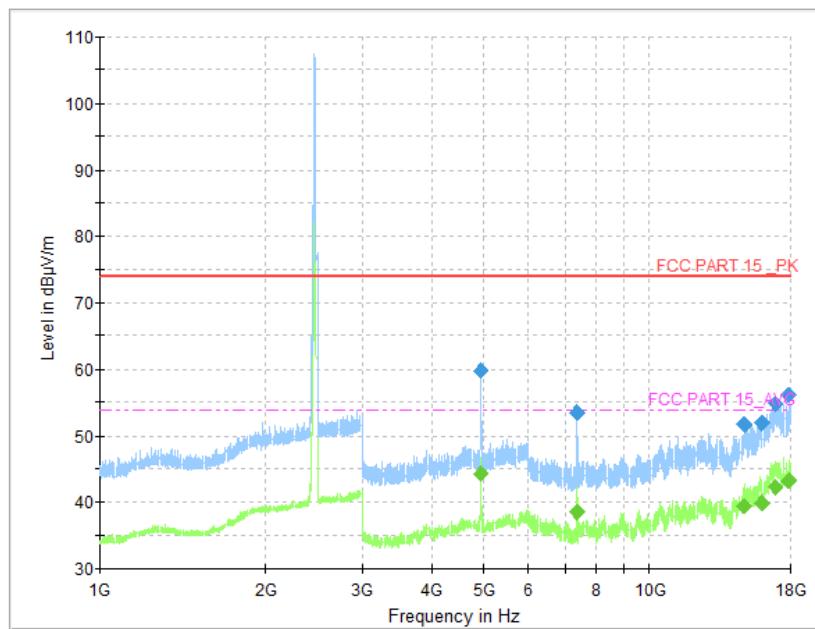
**Fig.78 Radiated Restricted Band (802.11g, CH11, 2.45GHz~2.5GHz)**



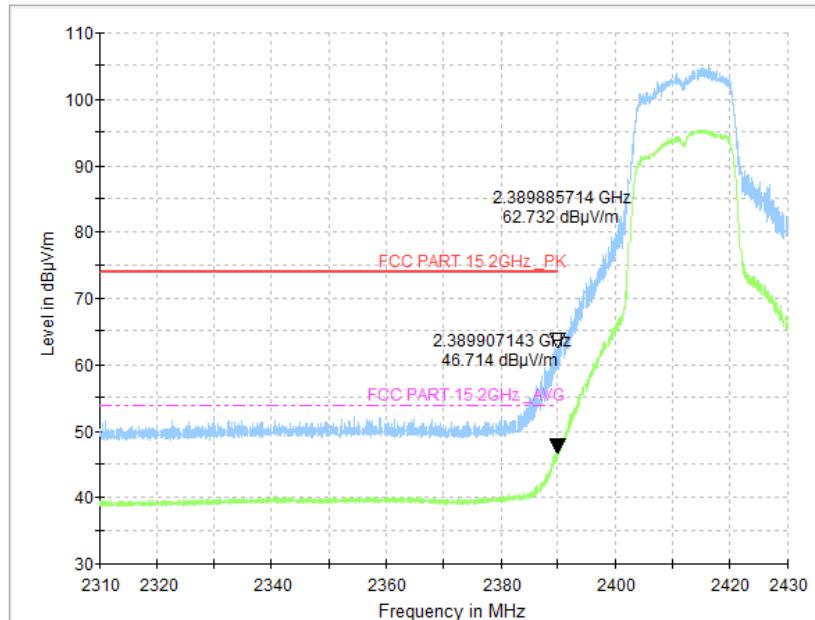
**Fig.79 Radiated Spurious Emission (802.11n-HT20, CH1, 1 GHz-18 GHz)**



**Fig.80 Radiated Spurious Emission (802.11n-HT20, CH6, 1 GHz-18 GHz)**



**Fig.81 Radiated Spurious Emission (802.11n-HT20, CH11, 1 GHz-18 GHz)**



**Fig.82 Radiated Restricted Band (802.11n-HT20, CH1, 2.38GHz~2.45GHz)**

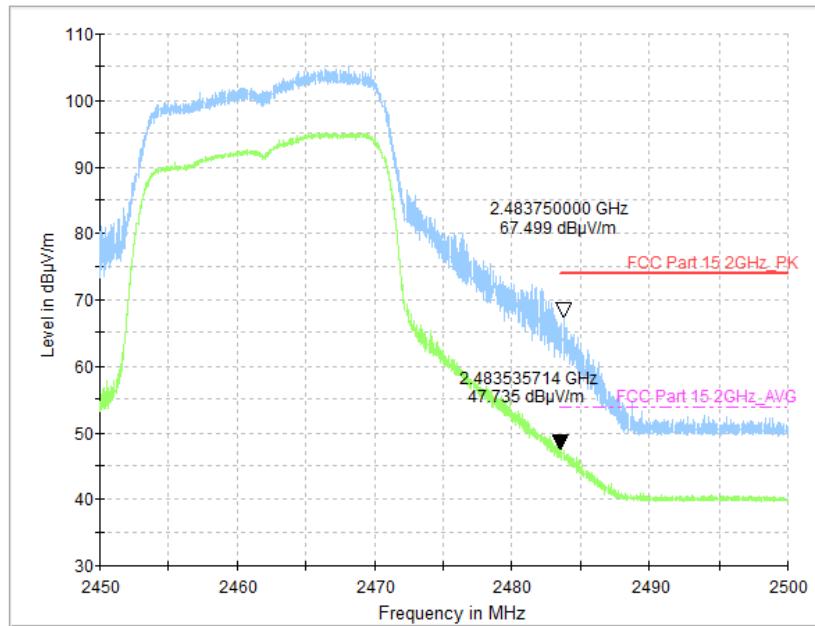


Fig.83 Radiated Restricted Band (802.11n-HT20, CH11, 2.45GHz~2.5GHz)

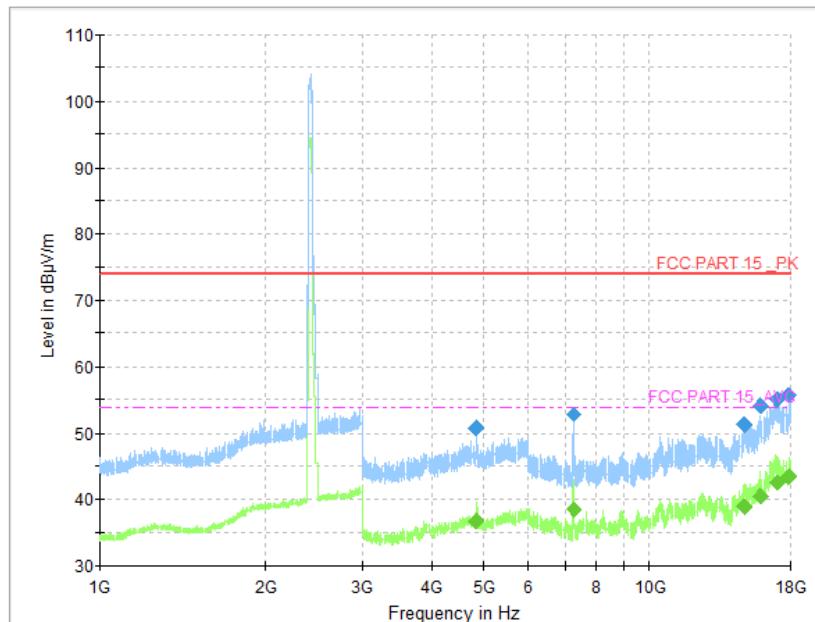


Fig.84 Radiated Spurious Emission (802.11n-HT40, CH3, 1 GHz-18 GHz)

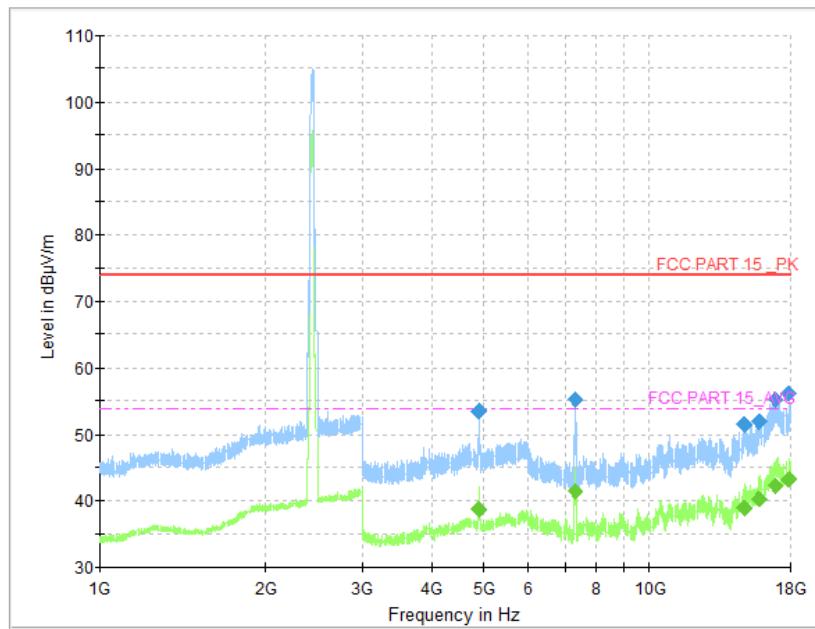


Fig.85 Radiated Spurious Emission (802.11n-HT40, CH6, 1 GHz-18 GHz)

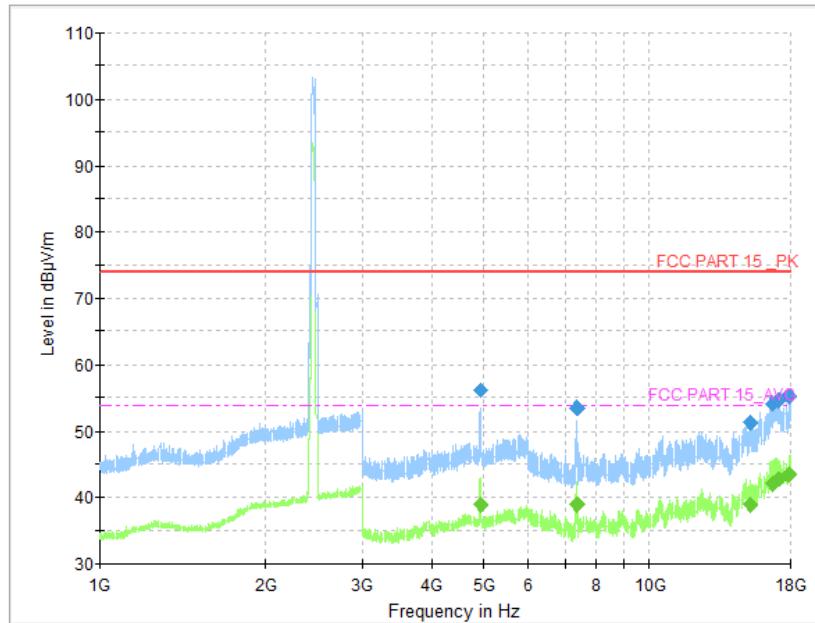
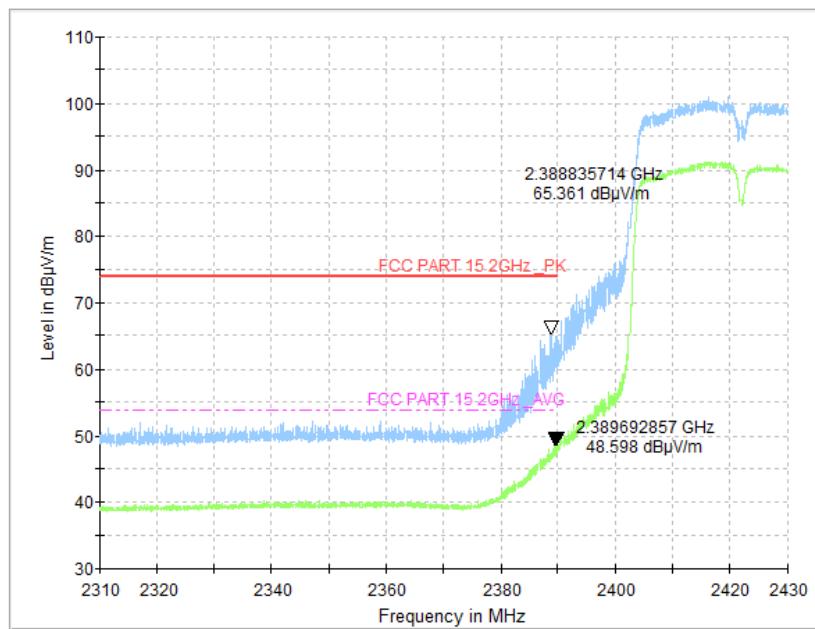
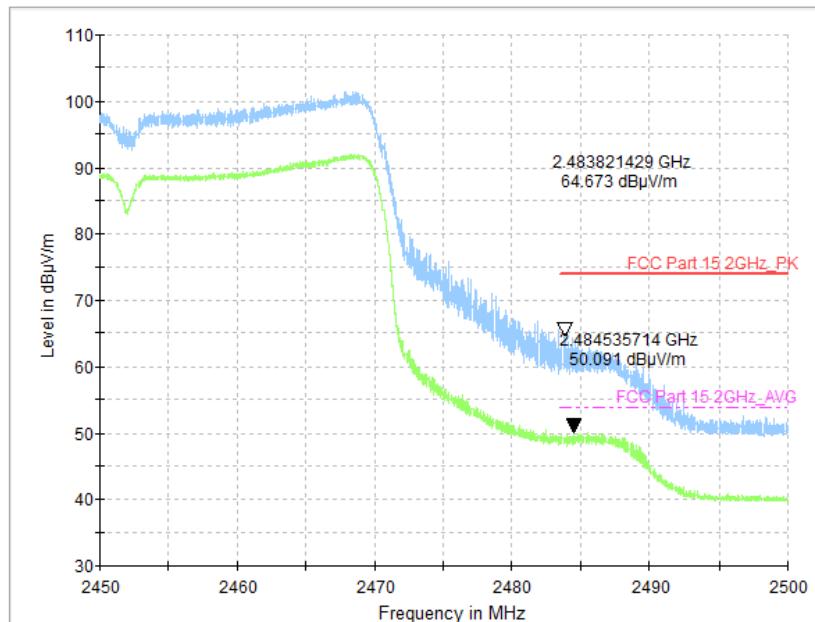


Fig.86 Radiated Spurious Emission (802.11n-HT40, CH9, 1 GHz-18 GHz)



**Fig.87 Radiated Restricted Band (802.11n-HT40, CH3, 2.38GHz~2.45GHz)**



**Fig.88 Radiated Restricted Band (802.11n-HT40, CH9, 2.45GHz~2.5GHz)**

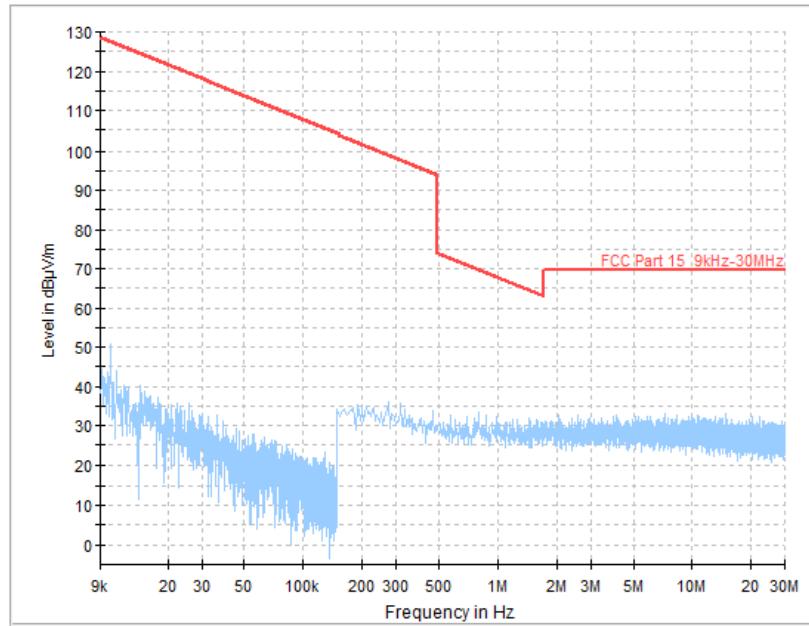


Fig.89 Radiated Spurious Emission (All Channels, 9 kHz-30 MHz)

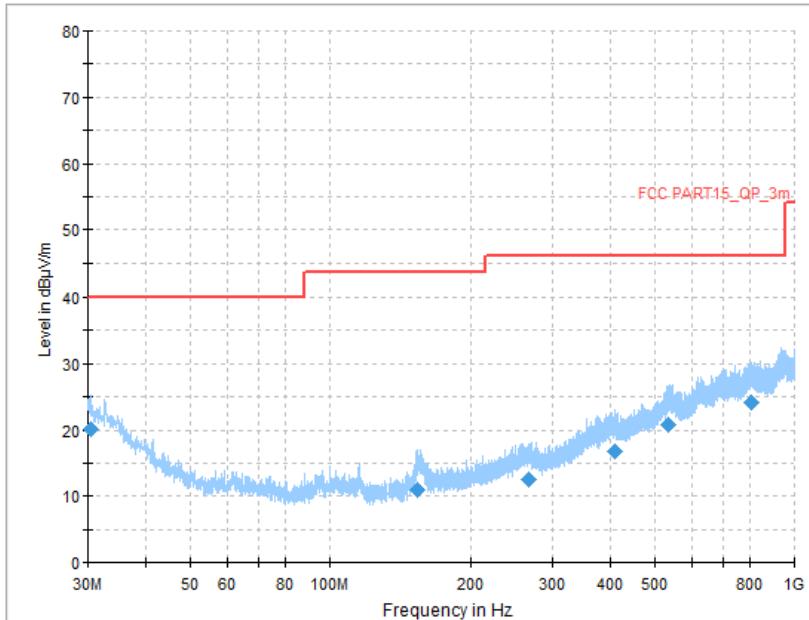
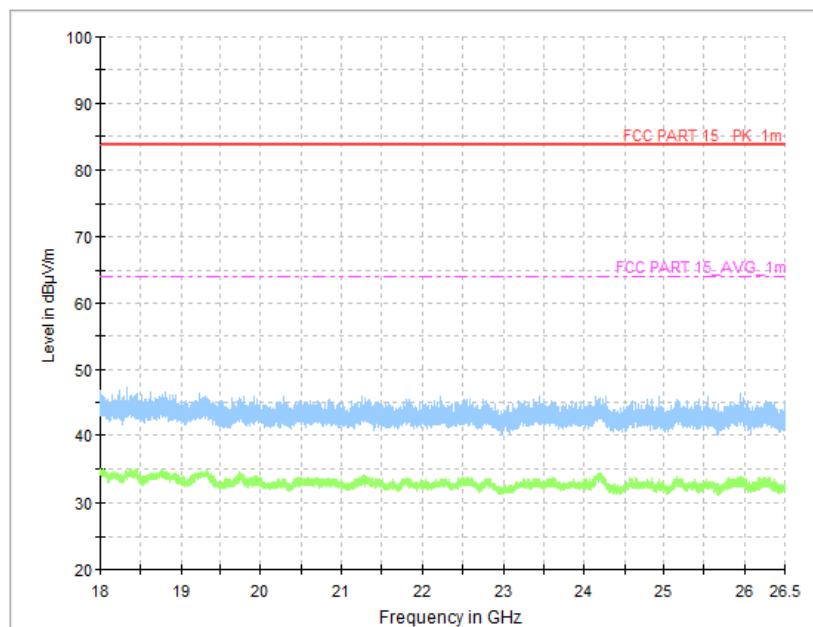


Fig.90 Radiated Spurious Emission (All Channels, 30MHz-1 GHz)



**Fig.91 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 -AE2, AE3

Frequency range (MHz)	Quasi-peak Limit (dB $\mu$ V)	Average-peak Limit (dB $\mu$ V)	Result (dB $\mu$ V)		Conclusion
			Traffic	Idle	
0.15 to 0.5	66 to 56	56 to 46	Fig.92	Fig.93	P
0.5 to 5	56	46			
5 to 30	60	50			

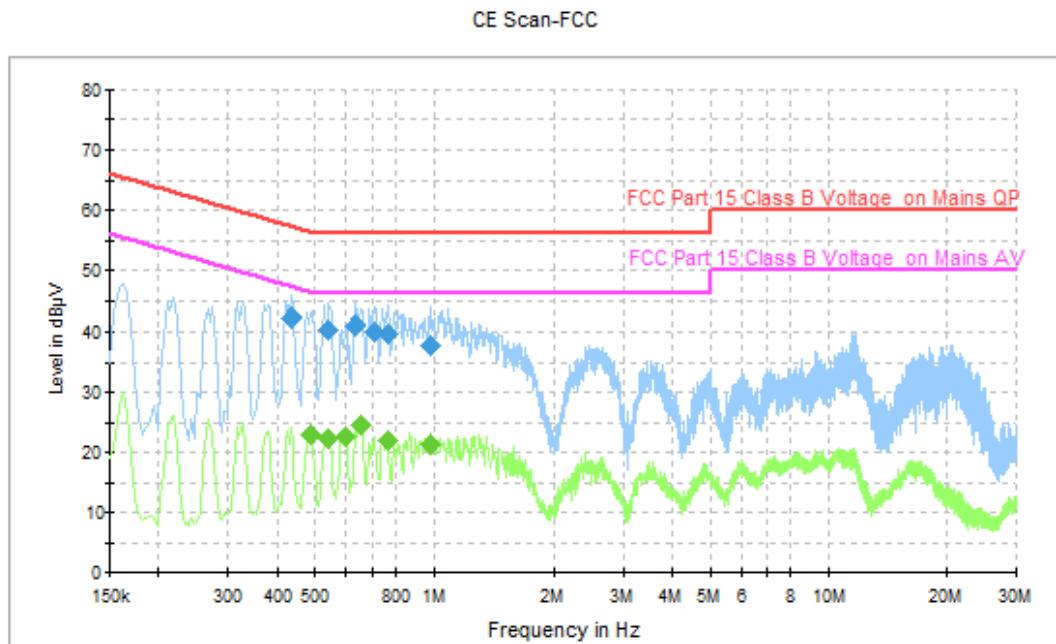
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

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

AE2 was the model with the worst results in the test.

See below for test graphs.

Conclusion: **PASS**



**Fig.92 AC Power line Conducted Emission (Traffic)**

**Measurement Results: Quasi Peak**

Frequency (MHz)	Quasi Peak (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.434000	42.2	GND	N	9.7	15.0	57.2
0.542000	40.3	GND	N	9.7	15.7	56.0
0.634000	41.0	GND	N	9.6	15.0	56.0
0.710000	40.0	GND	N	9.6	16.0	56.0
0.762000	39.8	GND	N	9.6	16.2	56.0
0.982000	37.6	GND	N	9.6	18.4	56.0

**Measurement Results: Average**

Frequency (MHz)	Average (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.486000	22.9	GND	N	9.7	23.3	46.2
0.542000	22.3	GND	N	9.7	23.7	46.0
0.594000	22.6	GND	N	9.6	23.4	46.0
0.650000	24.4	GND	N	9.6	21.6	46.0
0.762000	22.0	GND	N	9.6	24.0	46.0
0.982000	21.3	GND	N	9.6	24.7	46.0

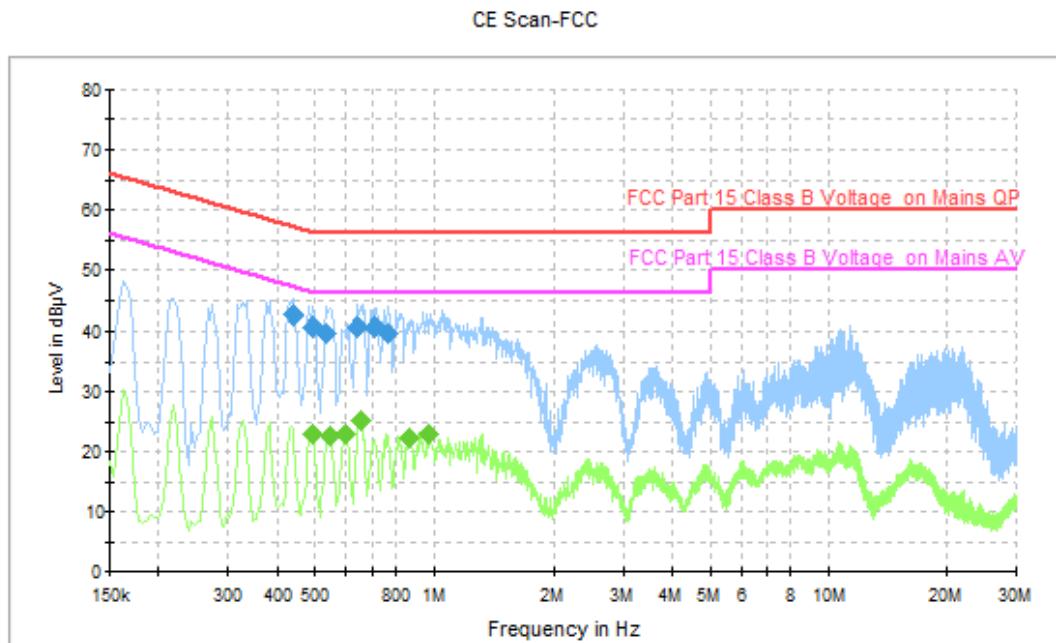


Fig.93 AC Power line Conducted Emission (Idle)

**Measurement Results: Quasi Peak**

Frequency (MHz)	Quasi Peak (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.438000	42.5	GND	N	9.7	14.6	57.1
0.490000	40.6	GND	N	9.7	15.6	56.2
0.534000	39.6	GND	N	9.7	16.4	56.0
0.642000	40.5	GND	N	9.6	15.5	56.0
0.710000	40.6	GND	N	9.6	15.4	56.0
0.766000	39.8	GND	N	9.6	16.2	56.0

**Measurement Results: Average**

Frequency (MHz)	Average (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.490000	23.0	GND	N	9.7	23.2	46.2
0.546000	22.7	GND	N	9.7	23.3	46.0
0.598000	23.0	GND	N	9.6	23.0	46.0
0.654000	25.0	GND	N	9.6	21.0	46.0
0.866000	22.2	GND	N	9.6	23.8	46.0
0.974000	22.9	GND	N	9.6	23.1	46.0

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