

Fig. 71 Band Edges (802.11ac-VHT40, CH102 5510MHz)

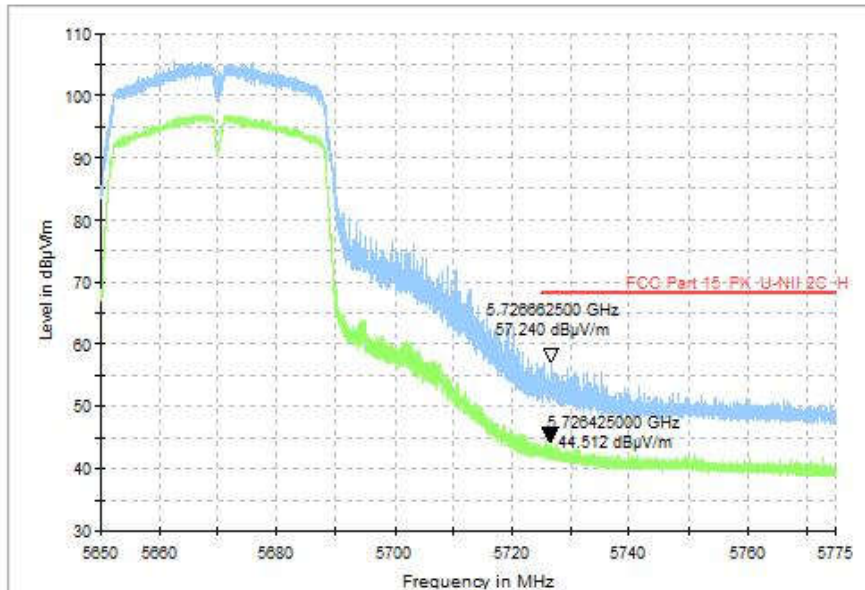


Fig. 72 Band Edges (802.11ac-VHT40, CH134 5670MHz)

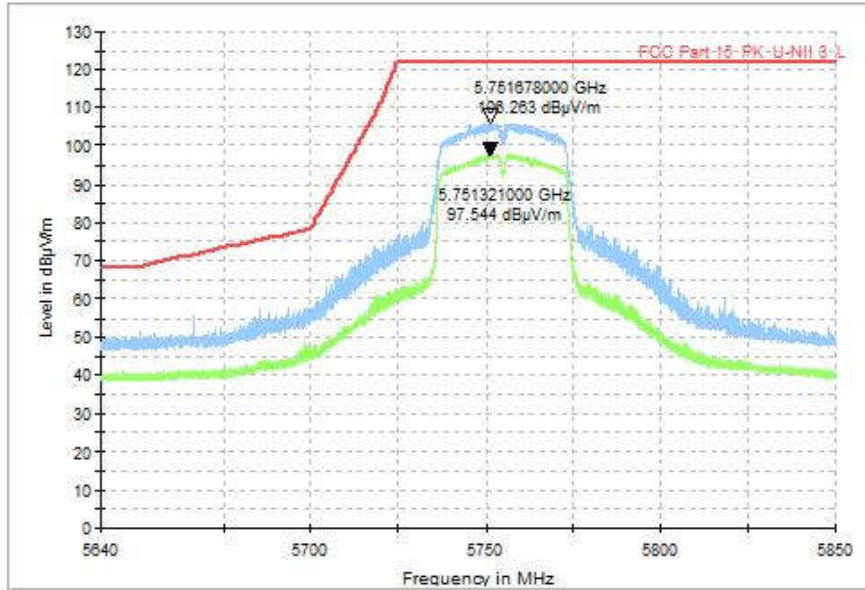


Fig. 73 Band Edges (802.11ac-VHT40, CH151 5755MHz)

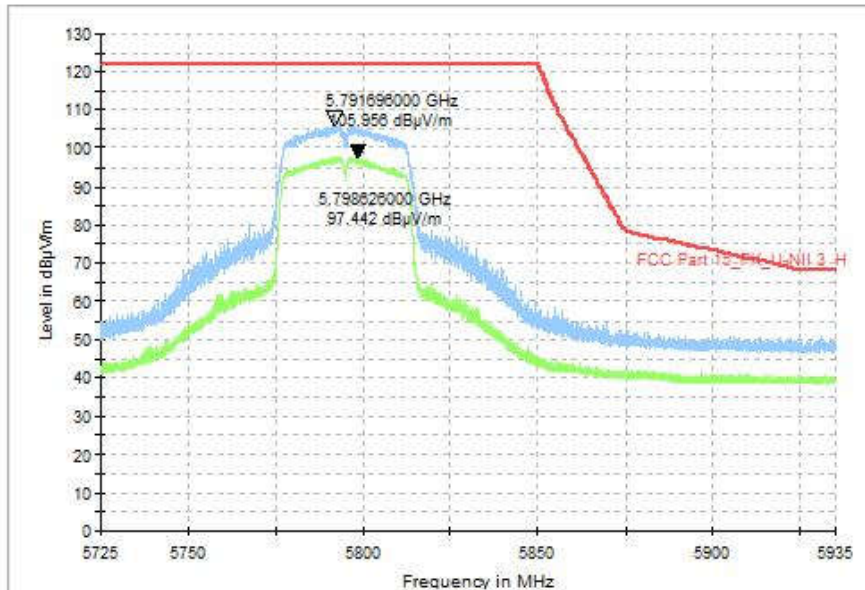


Fig. 74 Band Edges (802.11ac-VHT40, CH159 5795MHz)

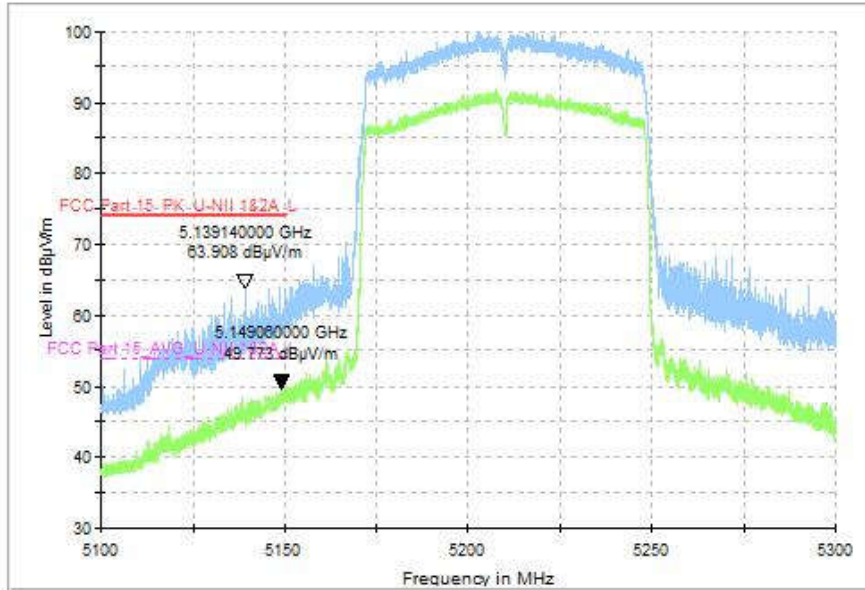


Fig. 75 Band Edges (802.11ac-VHT80, CH42 5210MHz)

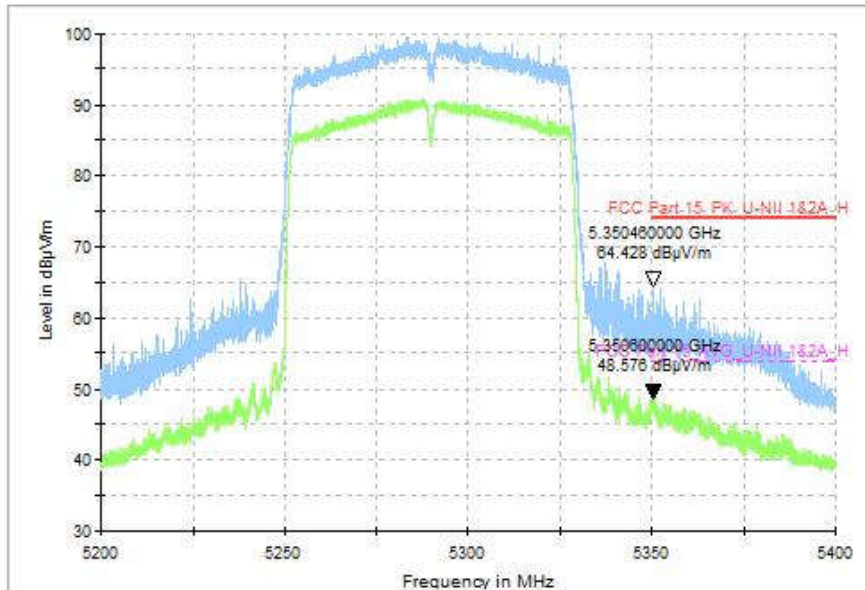


Fig. 76 Band Edges (802.11ac-VHT80, CH58 5290MHz)

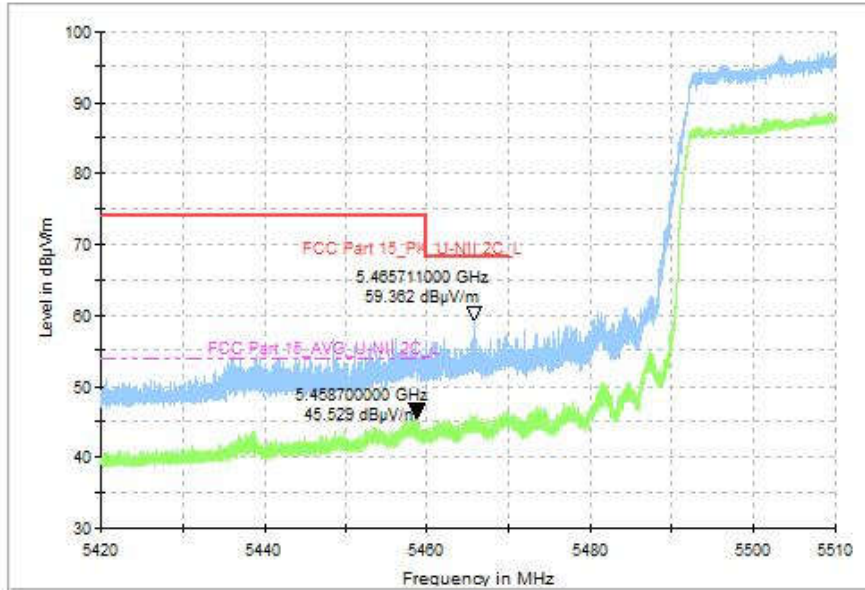


Fig. 77 Band Edges (802.11ac-VHT80, CH106 5530MHz)

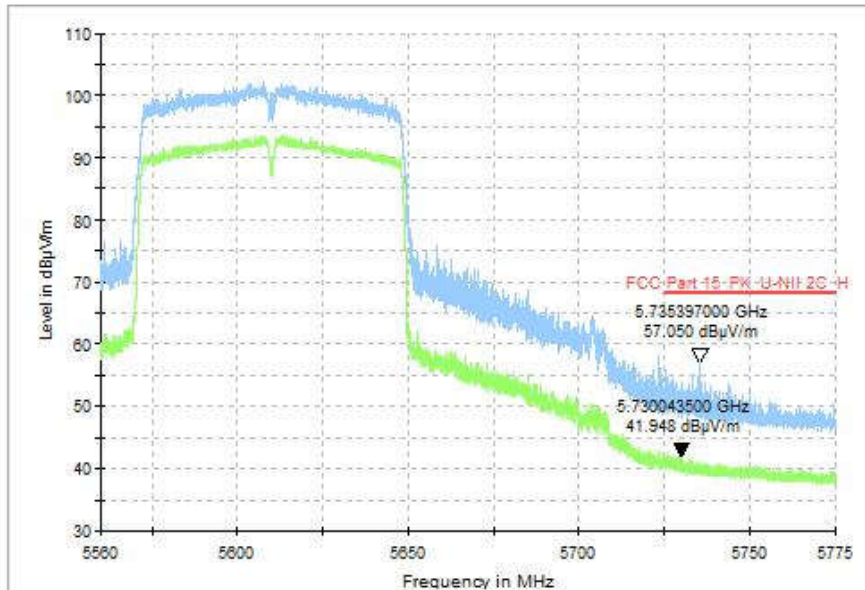


Fig. 78 Band Edges (802.11ac-VHT80, CH122 5610MHz)

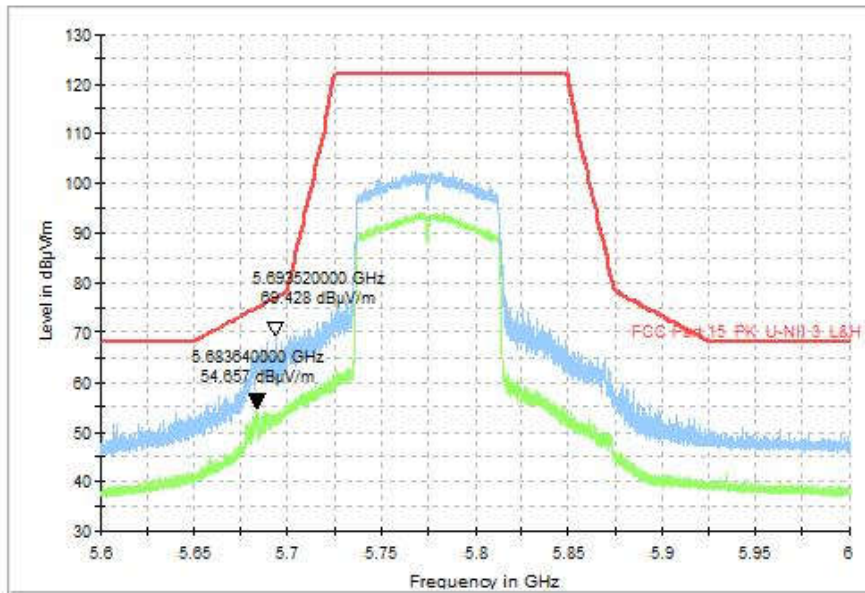


Fig. 79 Band Edges (802.11ac-VHT80, CH155 5775MHz)



A.9. Transmitter Spurious Emission

Measurement of method: See KDB 789033 D02 v02r01, Section G.3, G.4, G.5 and G.6.

Measurement Limit:

Standard	Limit (dBµV/m)	
FCC 47 CFR Part 15.209	Peak	74
	Average	54

The measurement is made according to KDB 789033.

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 (dBµV/m)	Measurement distance (m)
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

Note: For frequency range below 960MHz, the limit in 15.209 is defined in 10m test distance. The limit used above is calculated from 10m to 3m.

The measurement results include the horizontal polarization and vertical polarization measurements. For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

Measurement Result:

Mode	Frequency (MHz)	Frequency Range	Test Results	Conclusion
802.11a	5180MHz(Ch36)	1 GHz ~18 GHz	Fig.80	P
	5200MHz(Ch40)	1 GHz ~18 GHz	Fig.81	P
	5240MHz(Ch48)	1 GHz ~18 GHz	Fig.82	P
	5260MHz(Ch52)	1 GHz ~18 GHz	Fig.83	P
	5280MHz(Ch56)	1 GHz ~18 GHz	Fig.84	P
	5320MHz(Ch64)	1 GHz ~18 GHz	Fig.85	P
	5500MHz(Ch100)	1 GHz ~18 GHz	Fig.86	P
	5600MHz(Ch120)	1 GHz ~18 GHz	Fig.87	P
	5700MHz(Ch140)	1 GHz ~18 GHz	Fig.88	P
	5745MHz(Ch149)	1 GHz ~18 GHz	Fig.89	P
	5785MHz(Ch157)	1 GHz ~18 GHz	Fig.90	P
5825MHz(Ch165)	1 GHz ~18 GHz	Fig.91	P	
802.11ac -VHT40	5190MHz(Ch38)	1 GHz ~18 GHz	Fig.92	P
	5230MHz(Ch46)	1 GHz ~18 GHz	Fig.93	P
	5270MHz(Ch54)	1 GHz ~18 GHz	Fig.94	P
	5310MHz(Ch62)	1 GHz ~18 GHz	Fig.95	P



	5510MHz(Ch102)	1 GHz ~18 GHz	Fig.96	P
	5580MHz(Ch118)	1 GHz ~18 GHz	Fig.97	P
	5670MHz(Ch134)	1 GHz ~18 GHz	Fig.98	P
	5755MHz(Ch151)	1 GHz ~18 GHz	Fig.99	P
	5795MHz(Ch159)	1 GHz ~18 GHz	Fig.100	P
802.11ac -VHT80	5210MHz(Ch42)	1 GHz ~18 GHz	Fig.101	P
	5290MHz(Ch58)	1 GHz ~18 GHz	Fig.102	P
	5530MHz(Ch106)	1 GHz ~18 GHz	Fig.103	P
	5610MHz(Ch122)	1 GHz ~18 GHz	Fig.104	P
	5775MHz(Ch155)	1 GHz ~18 GHz	Fig.105	P
All channels		30 MHz ~1 GHz	Fig.106	P
		18 GHz ~26.5 GHz	Fig.107	P
		26.5GHz~40GHz	Fig.108	P

Worst Case Result:

802.11a CH48

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
7454.769231	43.70	74.00	30.30	V	5.7
8383.846154	47.13	74.00	24.87	V	6.0
10770.923077	46.76	74.00	27.24	H	9.0
11646.923077	47.54	74.00	26.46	V	9.9
15874.615385	50.79	74.00	23.22	H	14.0
17874.000000	52.77	74.00	21.23	H	18.8

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
7454.769231	33.34	54.00	20.66	V	5.7
8383.846154	41.21	54.00	10.79	V	6.0
10770.923077	34.74	54.00	19.26	H	9.0
11646.923077	36.45	54.00	17.55	V	9.9
15874.615385	40.66	54.00	13.34	H	14.0
17874.000000	42.51	54.00	11.49	H	18.8

802.11ac-VHT40 CH46

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
8367.692308	52.22	74.00	21.78	H	6.0
10873.846154	46.04	74.00	27.96	H	9.3
11624.769231	47.07	74.00	26.93	V	9.9
12471.230769	47.07	74.00	26.93	V	11.3
15865.846154	51.23	74.00	22.77	V	14.0
17982.000000	54.78	74.00	19.22	V	19.2



Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
8367.692308	47.94	54.00	6.06	H	6.0
10873.846154	36.01	54.00	17.99	H	9.3
11624.769231	36.46	54.00	17.54	V	9.9
12471.230769	36.81	54.00	17.19	V	11.3
15865.846154	40.67	54.00	13.33	V	14.0
17982.000000	43.47	54.00	10.53	V	19.2

802.11ac-VHT80 CH155

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
7483.846154	45.00	74.00	29.00	H	5.7
8249.076923	44.60	74.00	29.40	V	5.9
11222.769231	45.92	74.00	28.08	V	9.7
12266.769231	47.48	74.00	26.52	H	11.0
15885.692308	51.46	74.00	22.54	V	14.0
17916.000000	54.36	74.00	19.64	H	18.9

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
7483.846154	33.29	54.00	20.71	H	5.7
8249.076923	33.79	54.00	20.21	V	5.9
11222.769231	35.41	54.00	18.59	V	9.7
12266.769231	36.63	54.00	17.37	H	11.0
15885.692308	40.52	54.00	13.48	V	14.0
17916.000000	43.44	54.00	10.56	H	18.9

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:

$$\text{Result} = P_{Mea} + A_{Rpl} = P_{Mea} + \text{Cable Loss} + \text{Antenna Factor}$$

See below for test graphs.

Conclusion: PASS

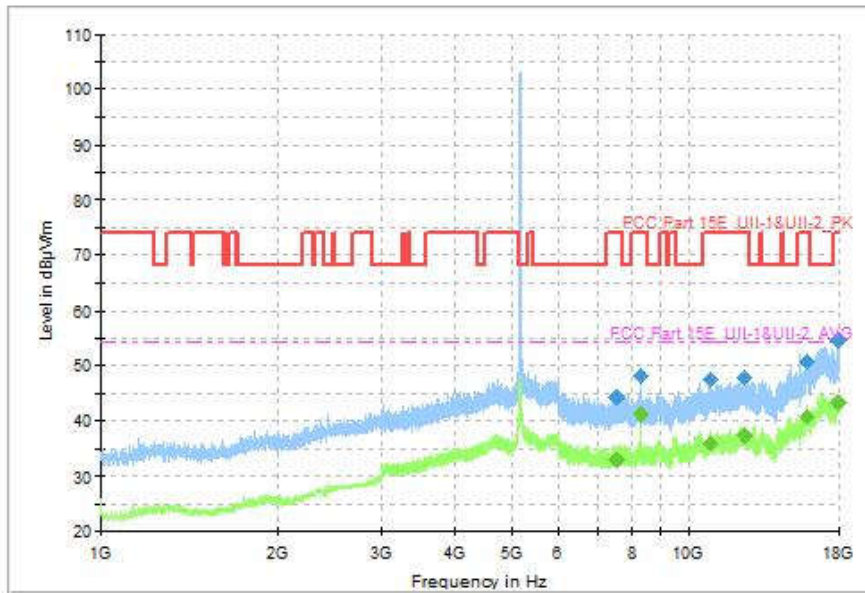


Fig. 80 Transmitter Spurious Emission (802.11a, CH36 5180MHz, 1GHz-18GHz)

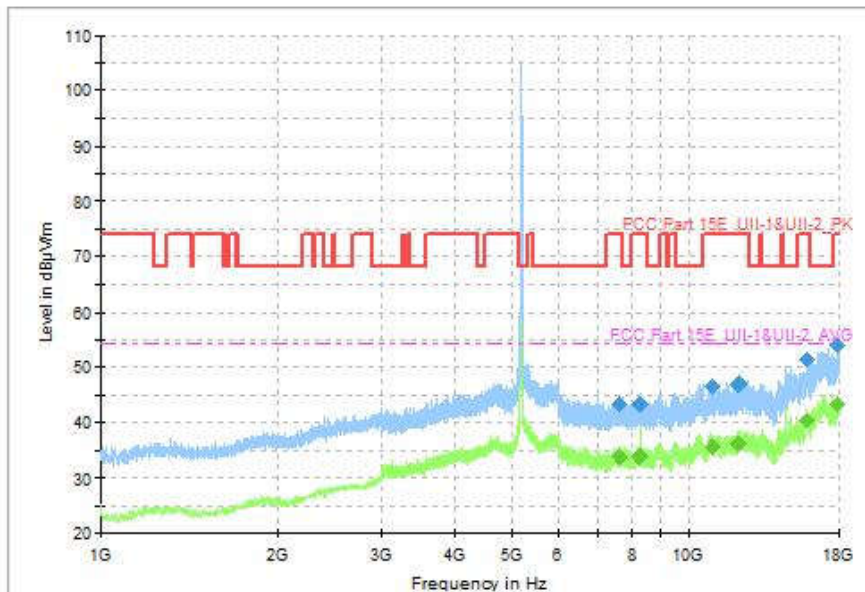


Fig. 81 Transmitter Spurious Emission (802.11a, CH40 5200MHz, 1GHz-18GHz)

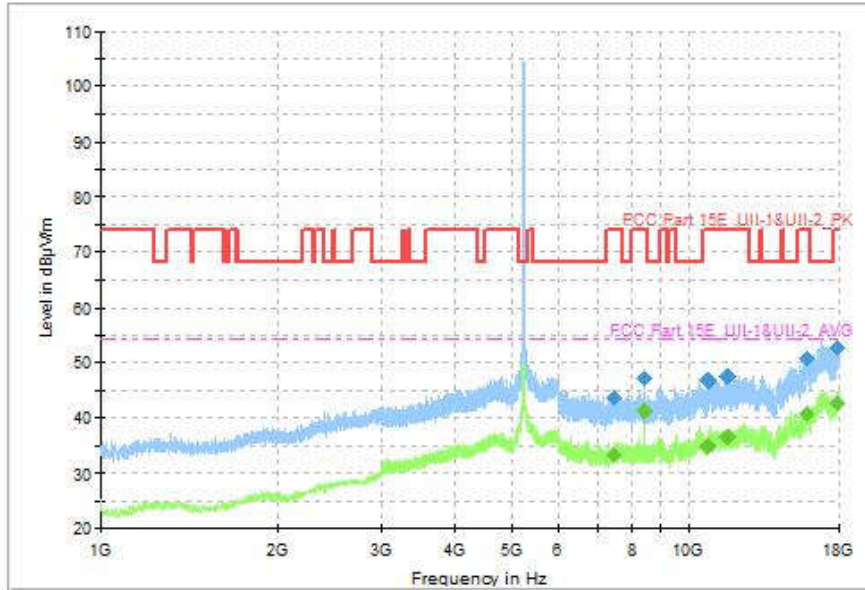


Fig. 82 Transmitter Spurious Emission (802.11a, CH48 5240MHz, 1GHz-18GHz)

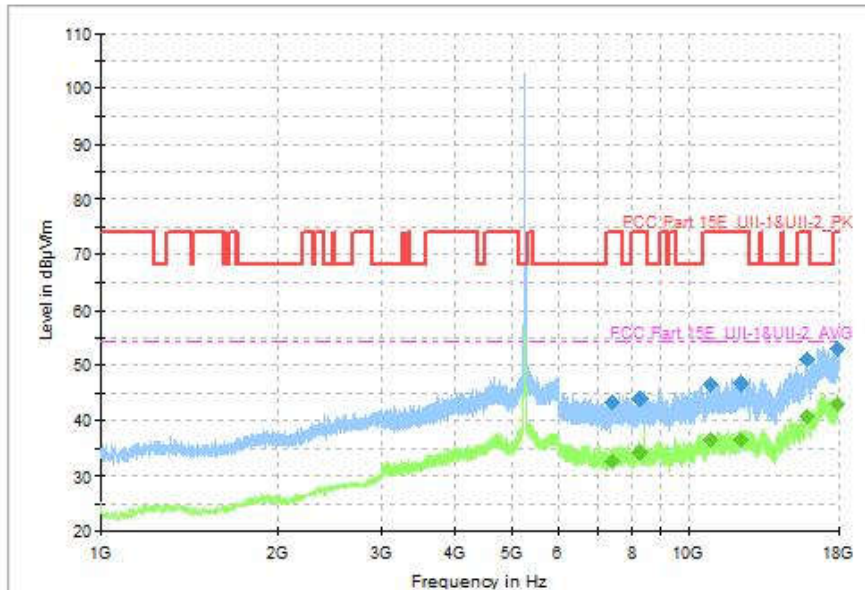


Fig. 83 Transmitter Spurious Emission (802.11a, CH52 5260MHz, 1GHz-18GHz)

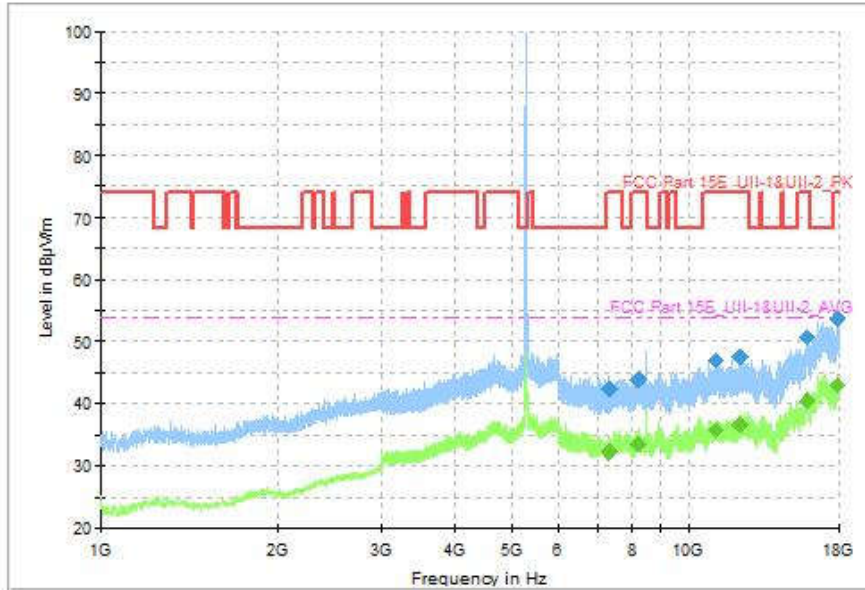


Fig. 84 Transmitter Spurious Emission (802.11a, CH56 5280MHz, 1GHz-18GHz)

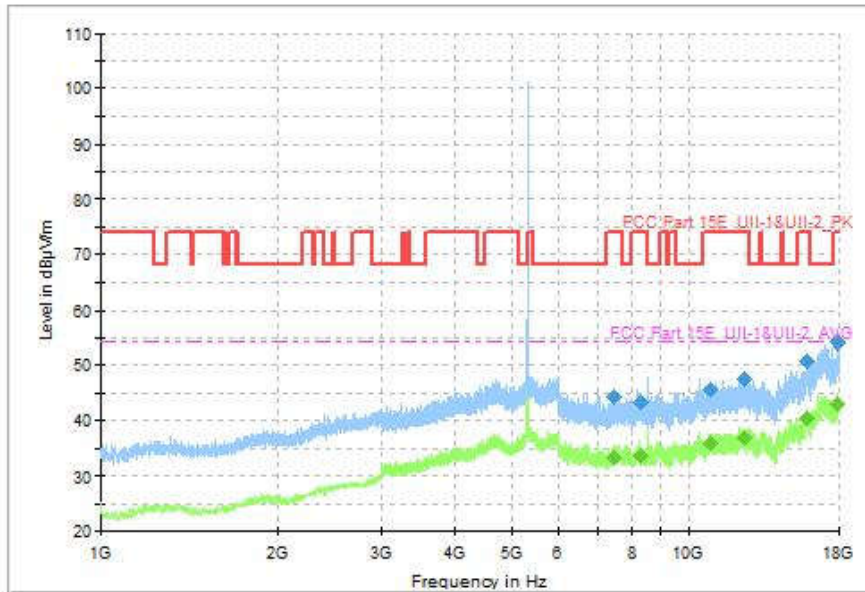


Fig. 85 Transmitter Spurious Emission (802.11a, CH64 5320MHz, 1GHz-18GHz)

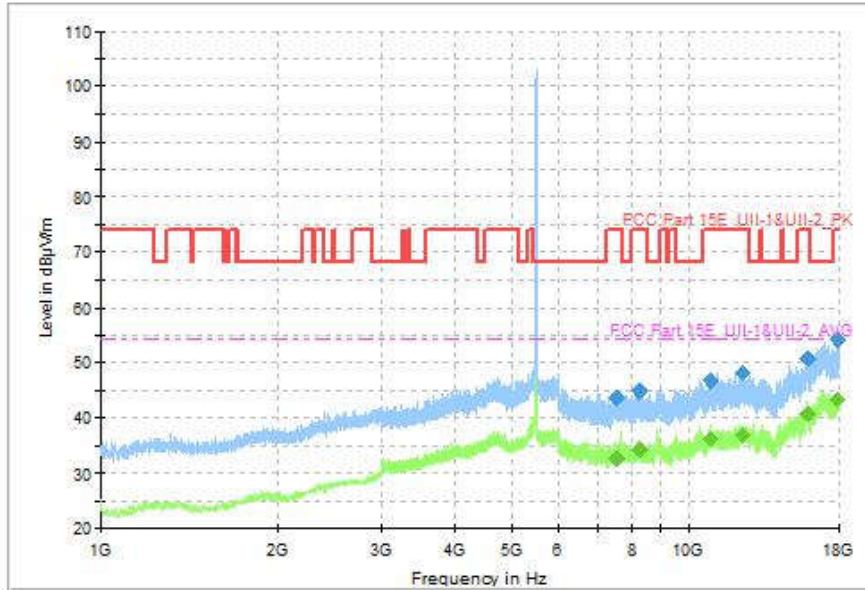


Fig. 86 Transmitter Spurious Emission (802.11a, CH100 5500MHz, 1GHz-18GHz)

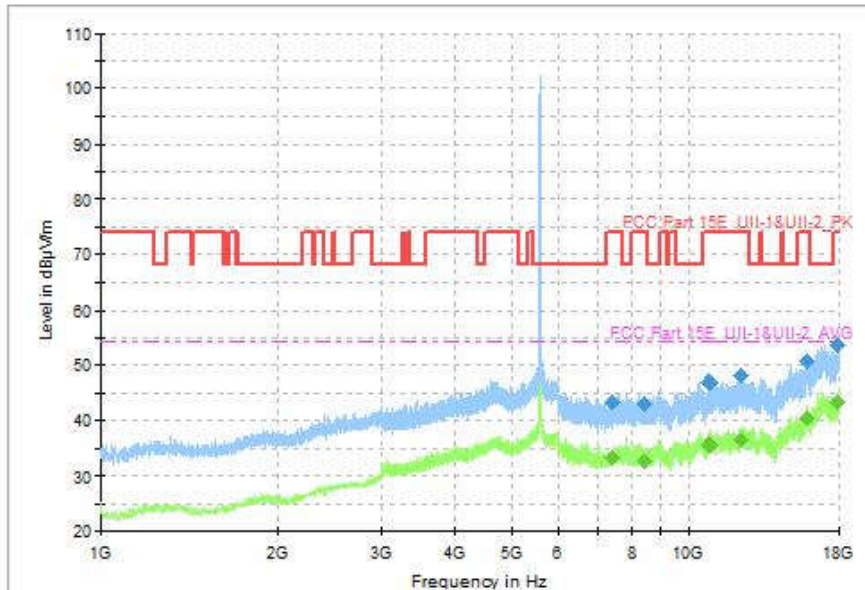


Fig. 87 Transmitter Spurious Emission (802.11a, CH120 5600MHz, 1GHz-18GHz)

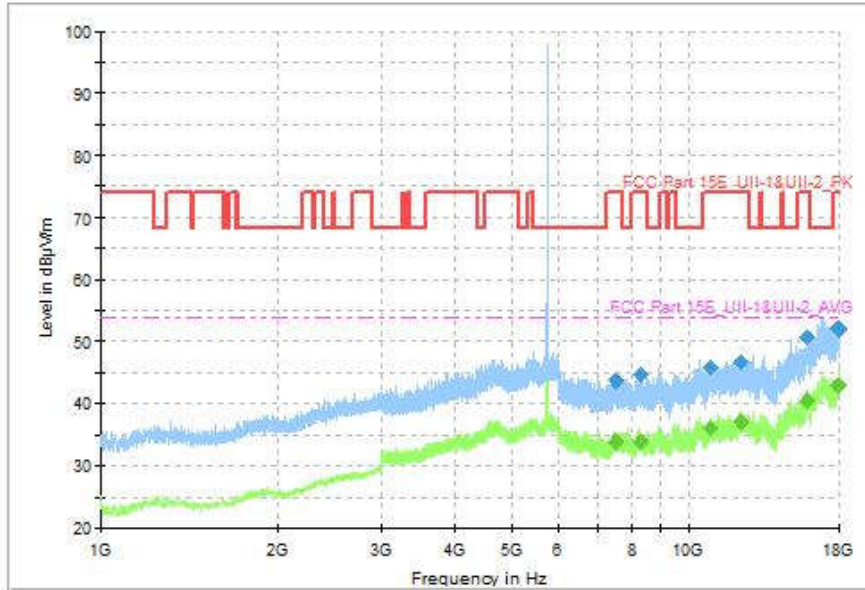


Fig. 88 Transmitter Spurious Emission (802.11a, CH140 5700MHz, 1GHz-18GHz)

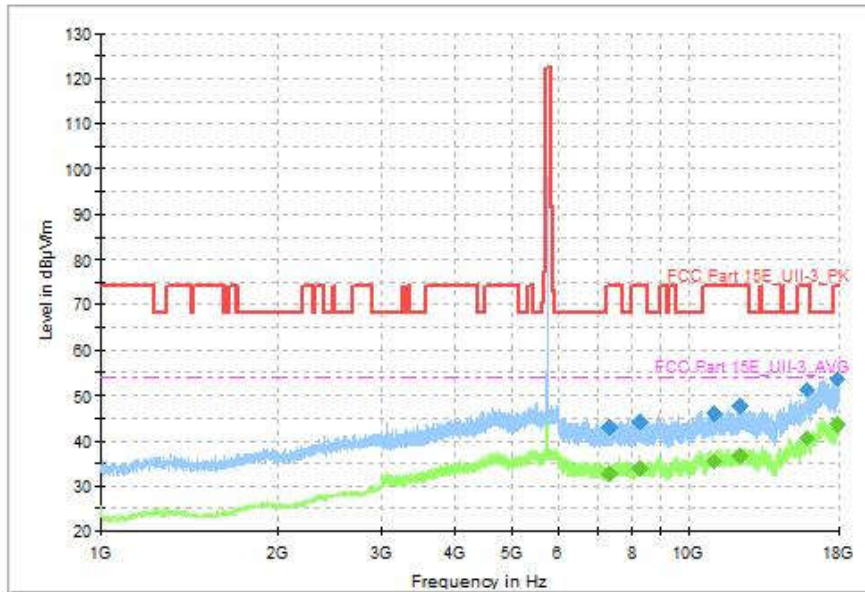


Fig. 89 Transmitter Spurious Emission (802.11a, CH149 5745MHz, 1GHz-18GHz)

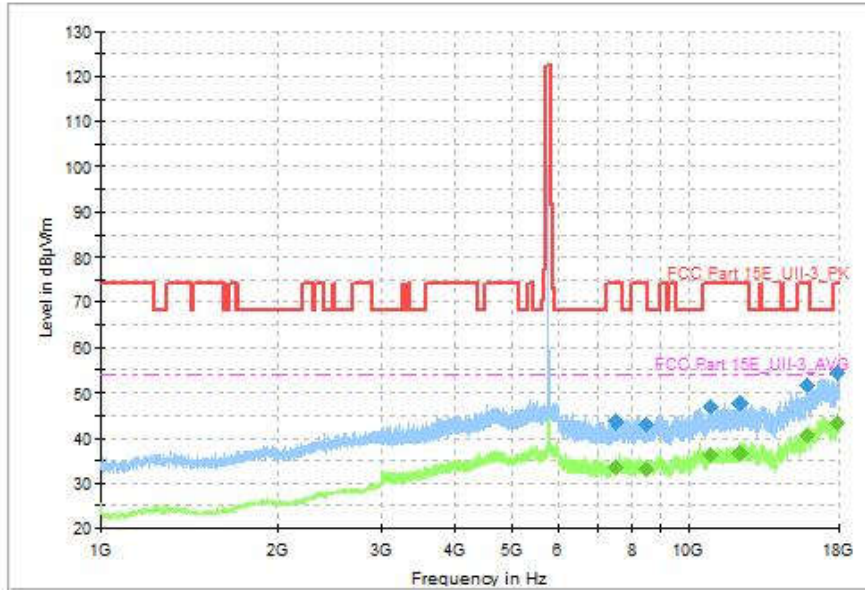


Fig. 90 Transmitter Spurious Emission (802.11a, CH157 5785MHz, 1GHz-18GHz)

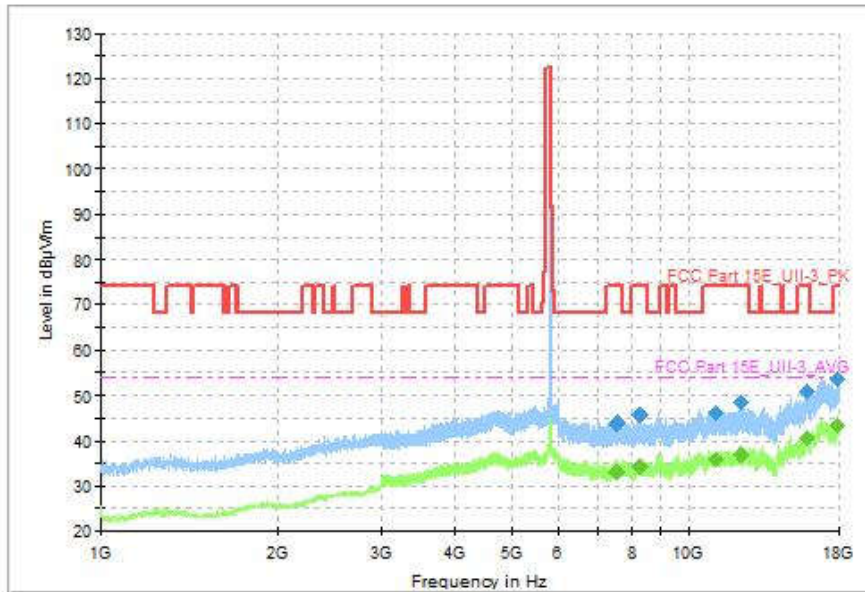


Fig. 91 Transmitter Spurious Emission (802.11a, CH165 5825MHz, 1GHz-18GHz)

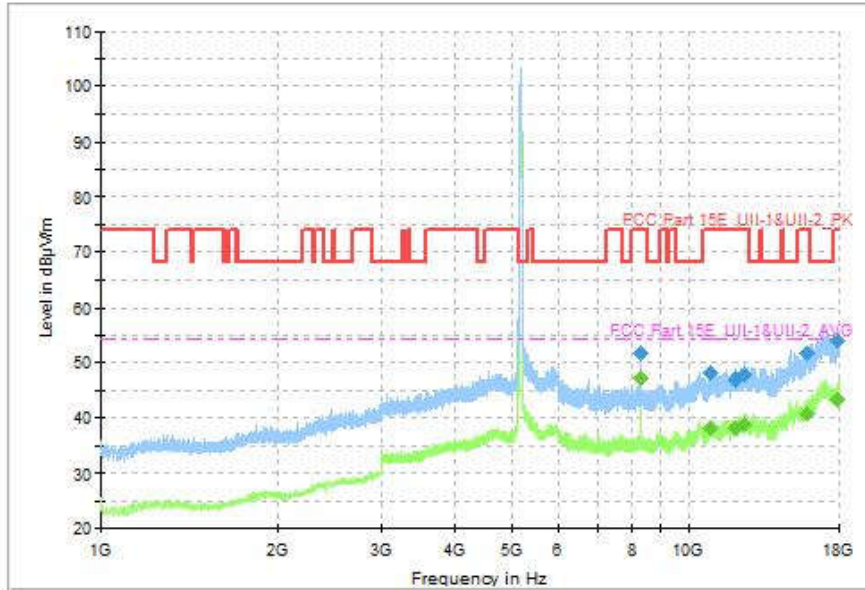


Fig. 92 Transmitter Spurious Emission (802.11ac-VHT40, CH38 5190MHz, 1GHz-18GHz)

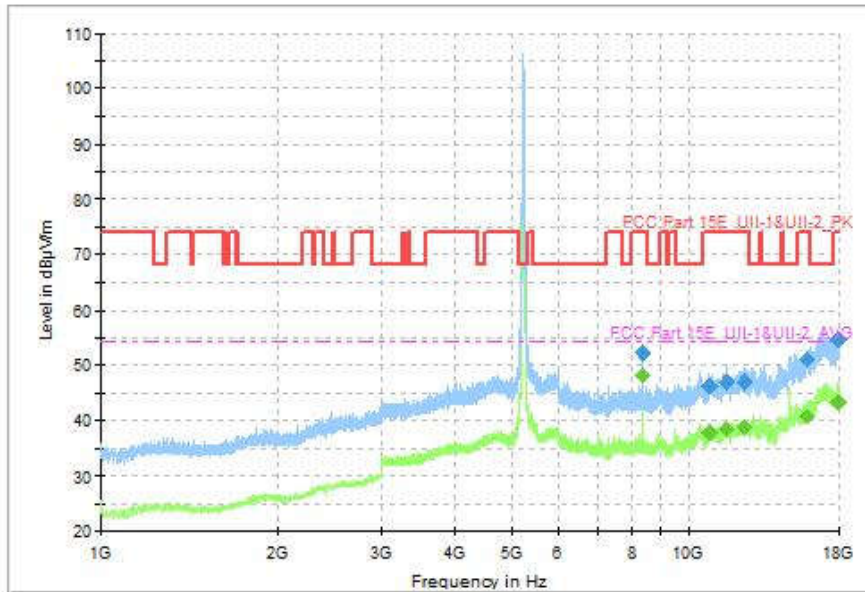


Fig. 93 Transmitter Spurious Emission (802.11ac-VHT40, CH46 5230MHz, 1GHz-18GHz)

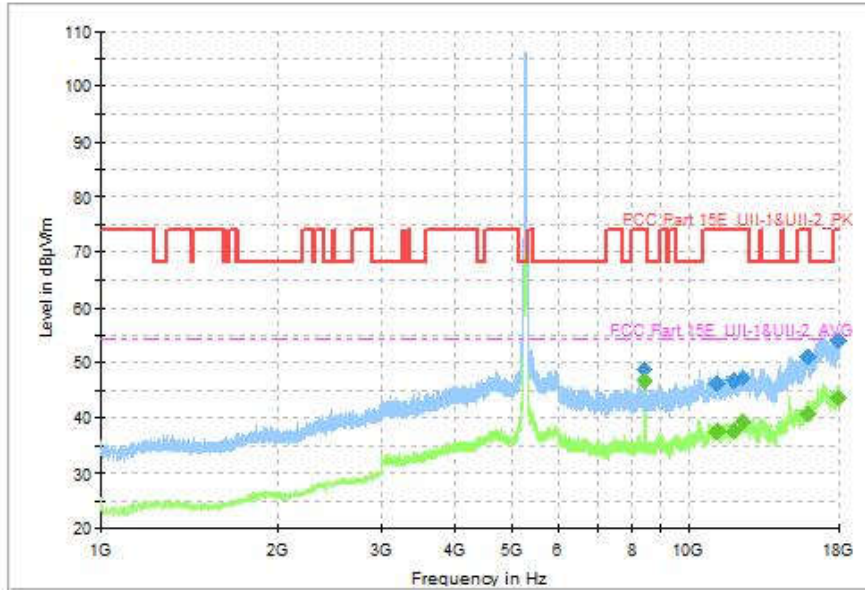


Fig. 94 Transmitter Spurious Emission (802.11ac-VHT40, CH54 5270MHz, 1GHz-18GHz)

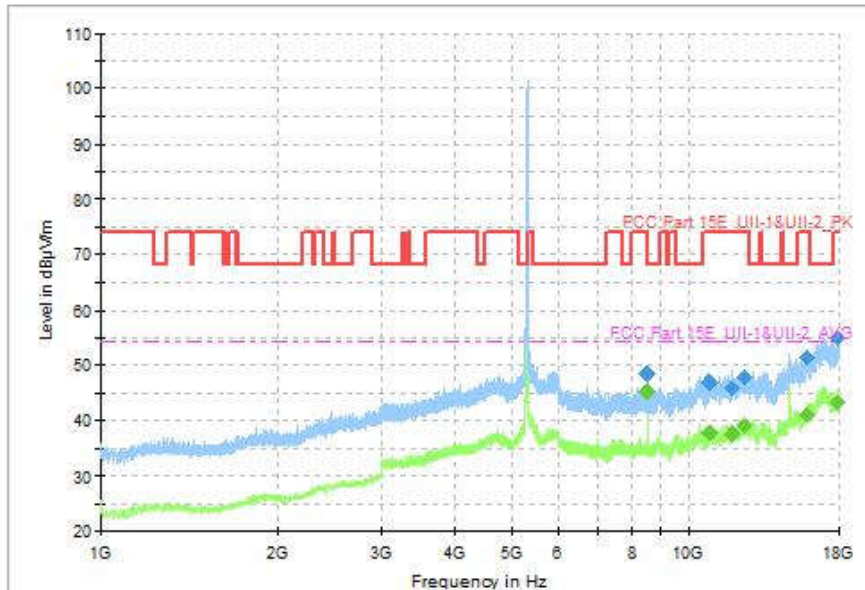


Fig. 95 Transmitter Spurious Emission (802.11ac-VHT40, CH62 5310MHz, 1GHz-18GHz)

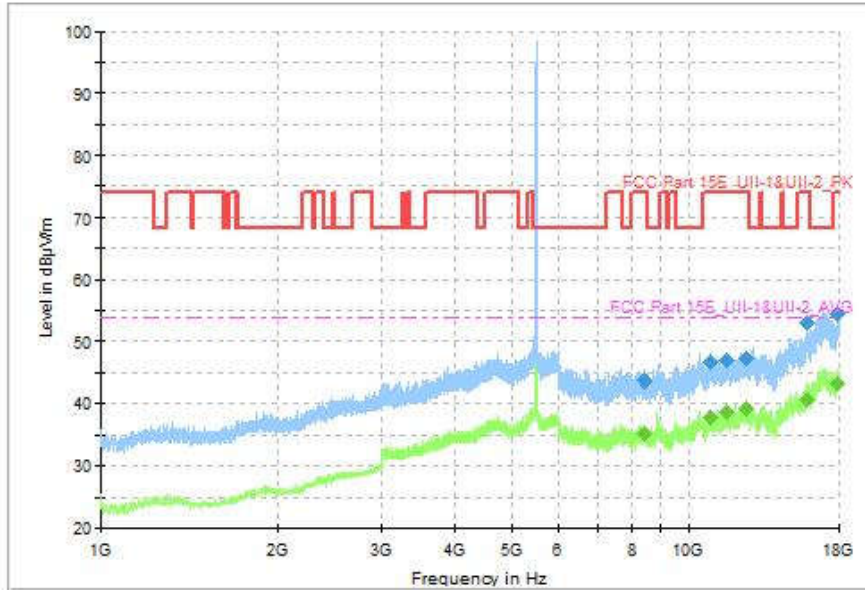


Fig. 96 Transmitter Spurious Emission (802.11ac-VHT40, CH102 5510MHz, 1GHz-18GHz)

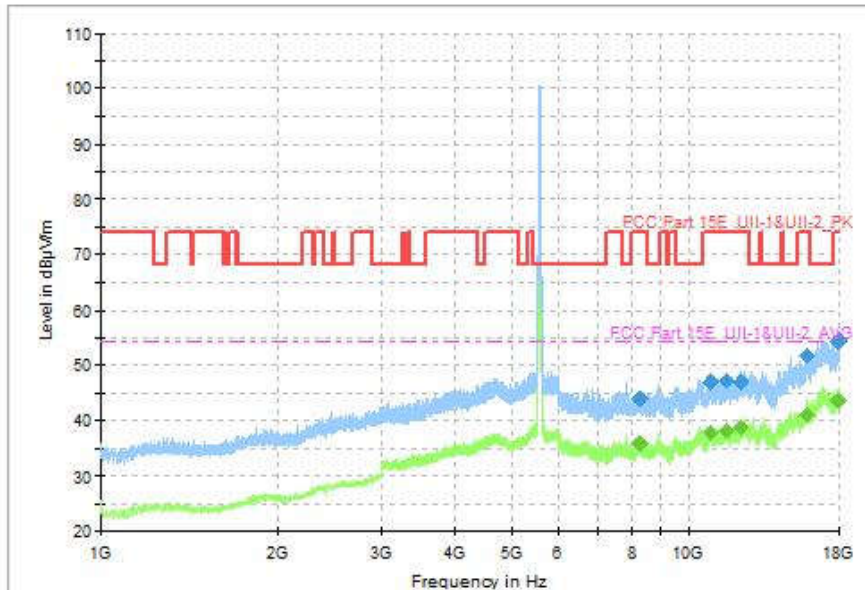


Fig. 97 Transmitter Spurious Emission (802.11ac-VHT40, CH118 5580MHz, 1GHz-18GHz)

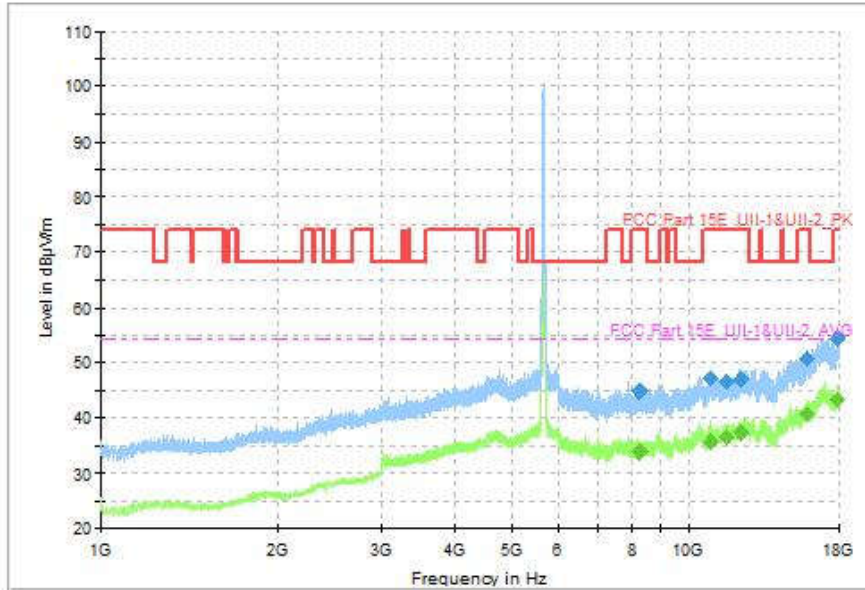


Fig. 98 Transmitter Spurious Emission (802.11ac-VHT40, CH134 5670MHz, 1GHz-18GHz)

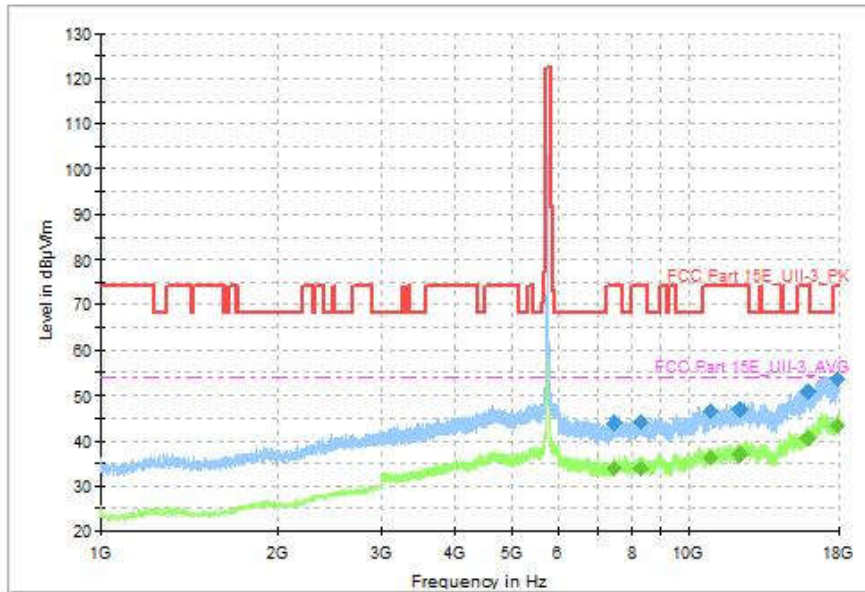


Fig. 99 Transmitter Spurious Emission (802.11ac-VHT40, CH151 5755MHz, 1GHz-18GHz)

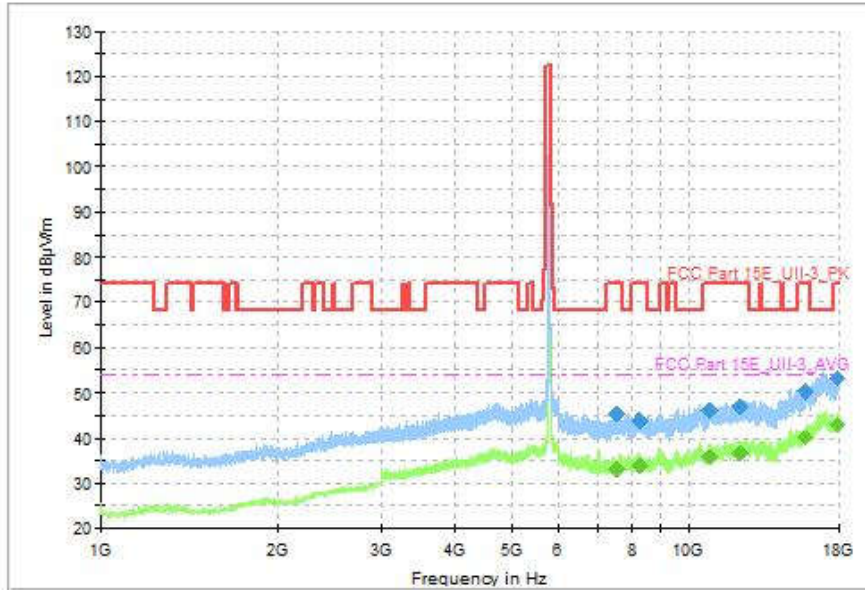


Fig. 100 Transmitter Spurious Emission (802.11ac-VHT40, CH159 5795MHz, 1GHz-18GHz)

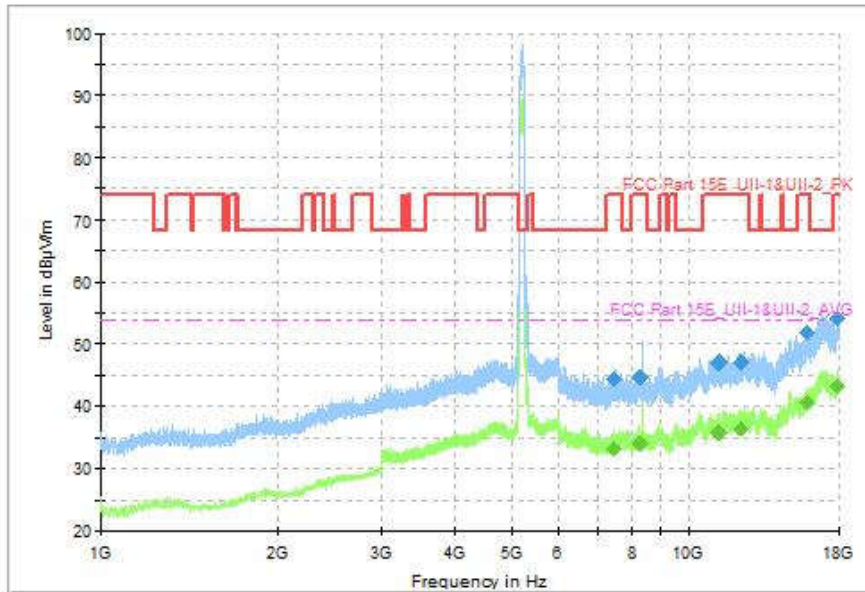


Fig. 101 Transmitter Spurious Emission (802.11ac-VHT80, CH42 5210MHz, 1GHz-18GHz)

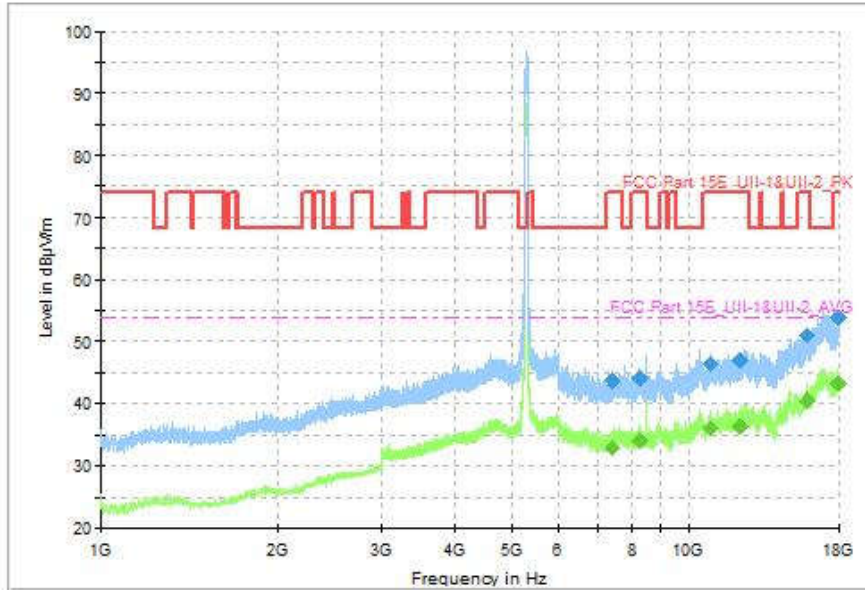


Fig. 102 Transmitter Spurious Emission (802.11ac-VHT80, CH58 5290MHz, 1GHz-18GHz)

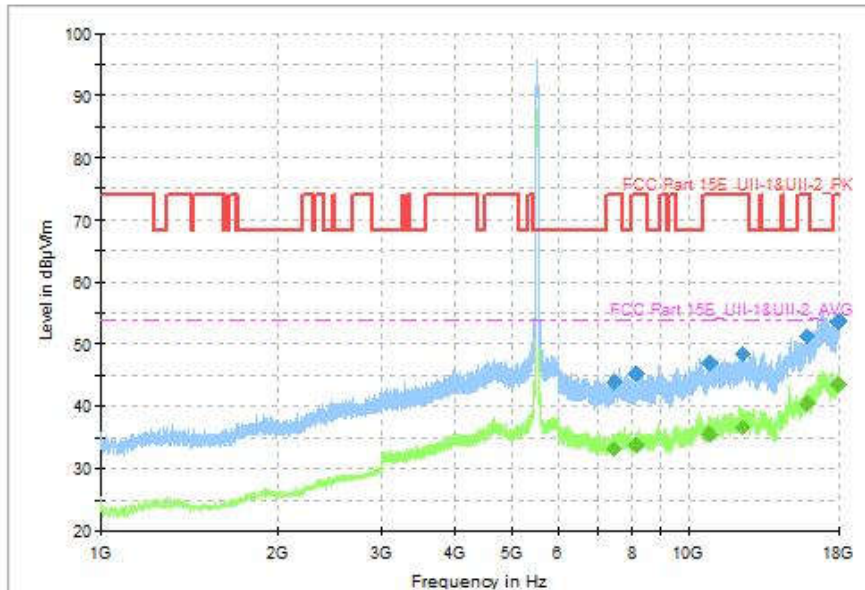


Fig. 103 Transmitter Spurious Emission (802.11ac-VHT80, CH106 5530MHz, 1GHz-18GHz)

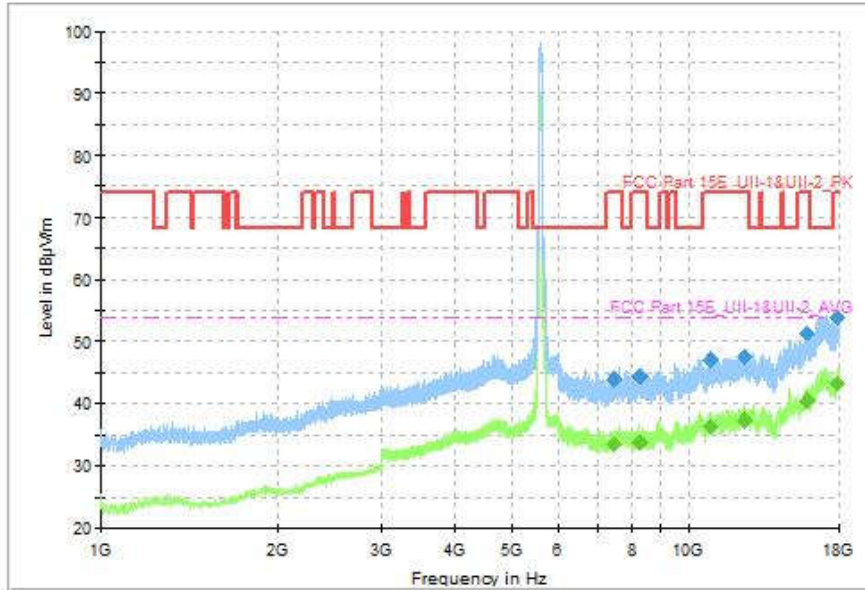


Fig. 104 Transmitter Spurious Emission (802.11ac-VHT80, CH122 5610MHz, 1GHz-18GHz)

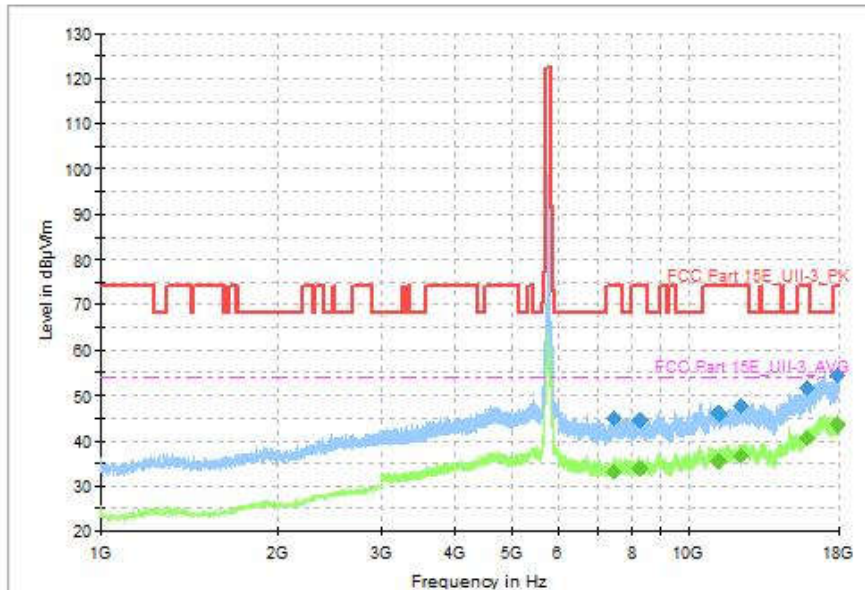


Fig. 105 Transmitter Spurious Emission (802.11ac-VHT80, CH155 5775MHz, 1GHz-18GHz)

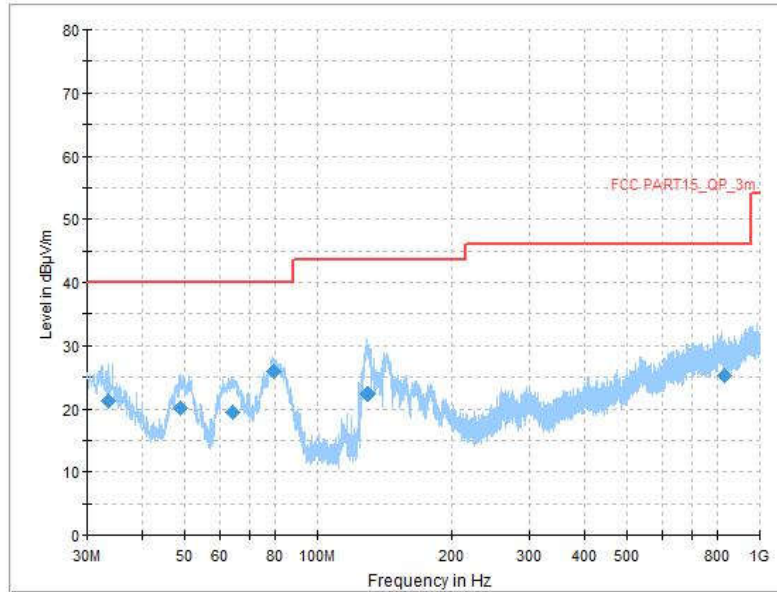


Fig. 106 Transmitter Spurious Emission (All channel, 30MHz~1GHz)

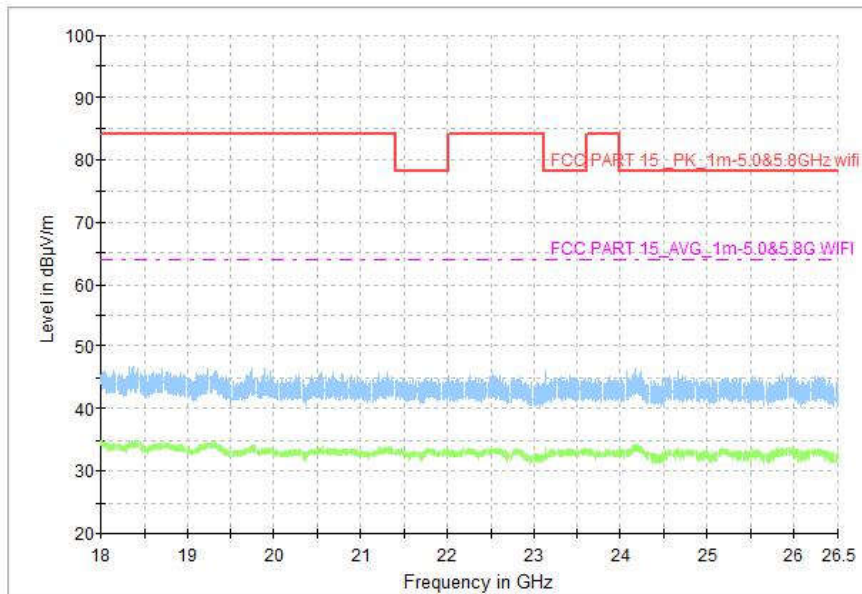


Fig. 107 Transmitter Spurious Emission (All channel, 18GHz~26.5GHz)

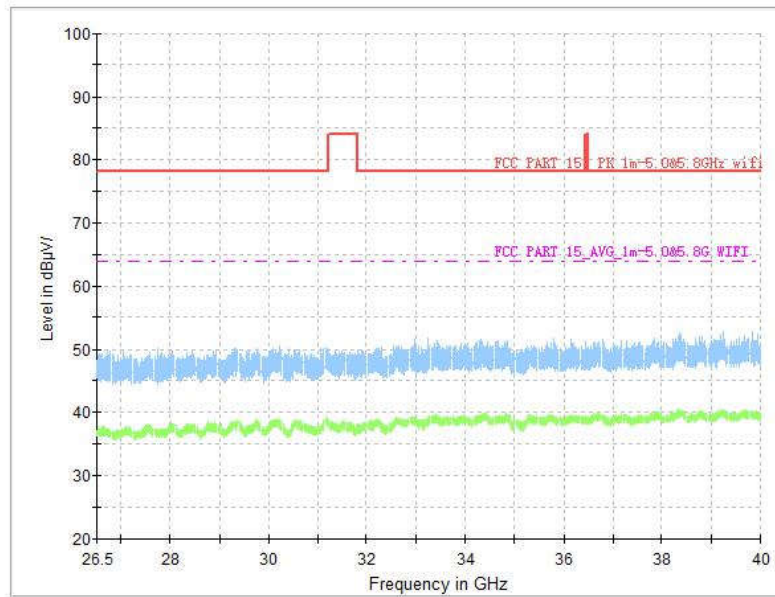


Fig. 108 Transmitter Spurious Emission (All channel, 26.5GHz~40GHz)



A.10. Radiated Spurious Emissions < 30MHz

Method of Measurement: See ANSI C63.10-clause 6.4.

Measurement Limit (15.209, 9kHz-30MHz):

Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

The measurement is made according to KDB 789033.

Note: The measurement distance during the test is 3m. The limit used in plots recalculated based on the extrapolation factor of 40 dB/decade.

Measurement Result (Worst case):

Mode	Frequency Range	Test Results	Conclusion
All Channel	9 kHz ~30 MHz	Fig.109	P

See below for test graphs.

Conclusion: PASS

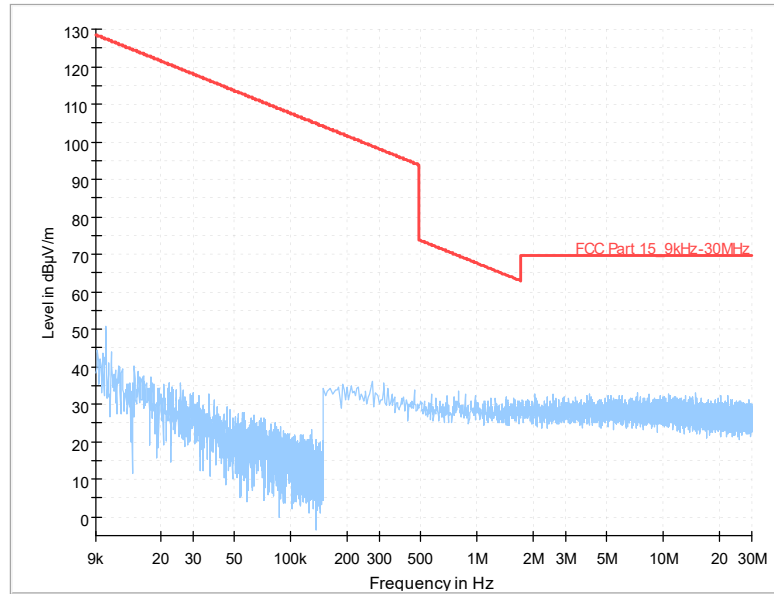


Fig. 109 Radiated Spurious Emission (All Channel, 9 kHz ~30 MHz)



A.11. AC Power Line Conducted Emission

Method of Measurement: See ANSI C63.10-clause 6.2.

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

WLAN 5GHz - A2, A3

Frequency range (MHz)	Quasi-peak Limit (dBµV)	Average-peak Limit (dBµV)	Result (dBµV)		Conclusion
			Traffic	Idle	
0.15 to 0.5	66 to 56	56 to 46	Fig.110	Fig.111	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.

See below for test graphs.

Conclusion: PASS

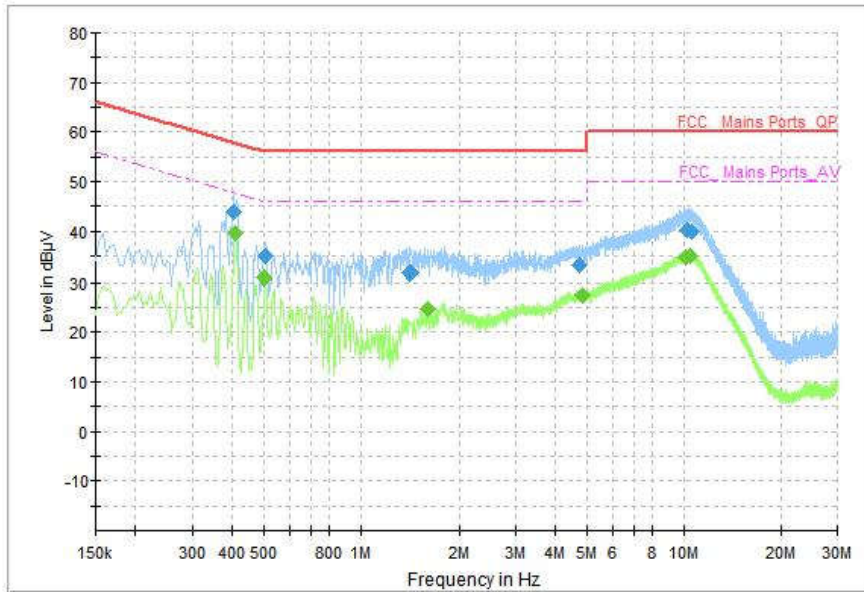


Fig. 110 AC Power line Conducted Emission (Traffic)

Measurement Result: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.402000	44.00	57.81	13.81	N	ON	10
0.506000	35.13	56.00	20.87	N	ON	10
1.426000	31.55	56.00	24.45	N	ON	10
4.714000	33.19	56.00	22.81	L1	ON	10
10.278000	40.35	60.00	19.65	L1	ON	10
10.546000	40.07	60.00	19.93	L1	ON	10

Measurement Result: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.406000	39.70	47.73	8.03	N	ON	10
0.502000	30.70	46.00	15.30	N	ON	10
1.594000	24.62	46.00	21.38	N	ON	10
4.822000	27.37	46.00	18.63	L1	ON	10
10.082000	34.85	50.00	15.15	L1	ON	10
10.518000	34.94	50.00	15.06	L1	ON	10

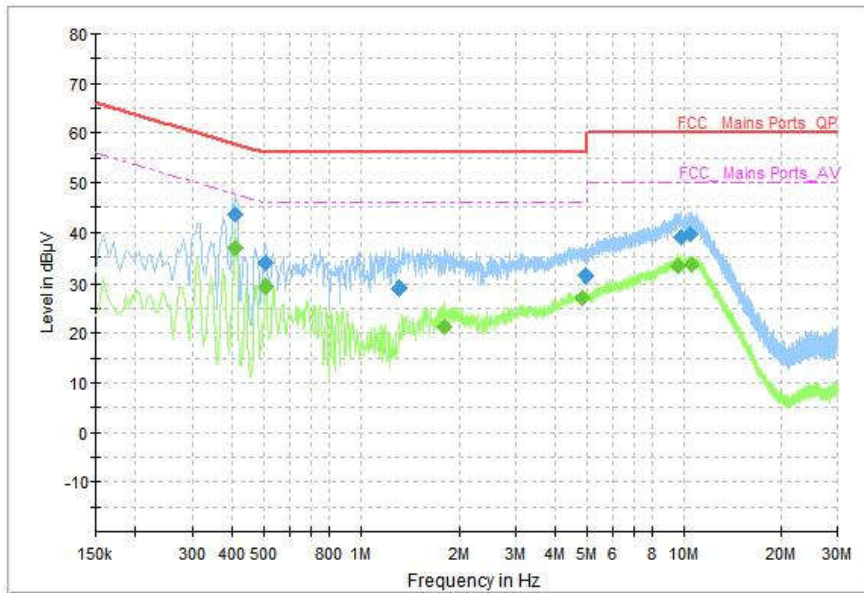


Fig. 111 AC Power line Conducted Emission (Idle)

Measurement Result: Quasi Peak

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.406000	43.50	57.73	14.23	N	ON	10
0.506000	33.88	56.00	22.12	N	ON	10
1.318000	28.87	56.00	27.13	N	ON	10
4.930000	31.48	56.00	24.52	L1	ON	10
9.786000	38.95	60.00	21.05	L1	ON	10
10.482000	39.69	60.00	20.31	L1	ON	10

Measurement Result: Average

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.406000	36.95	47.73	10.78	N	ON	10
0.506000	29.23	46.00	16.77	N	ON	10
1.794000	21.30	46.00	24.70	N	ON	10
4.838000	27.00	46.00	19.00	L1	ON	10
9.614000	33.21	50.00	16.79	L1	ON	10
10.562000	33.43	50.00	16.57	N	ON	10



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A.12. Power control

A Transmission Power Control mechanism is not required for systems with an e.i.r.p. of less than 27dBm (500mW).

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