

Fig.25 Band Edges (802.11b, CH 1)

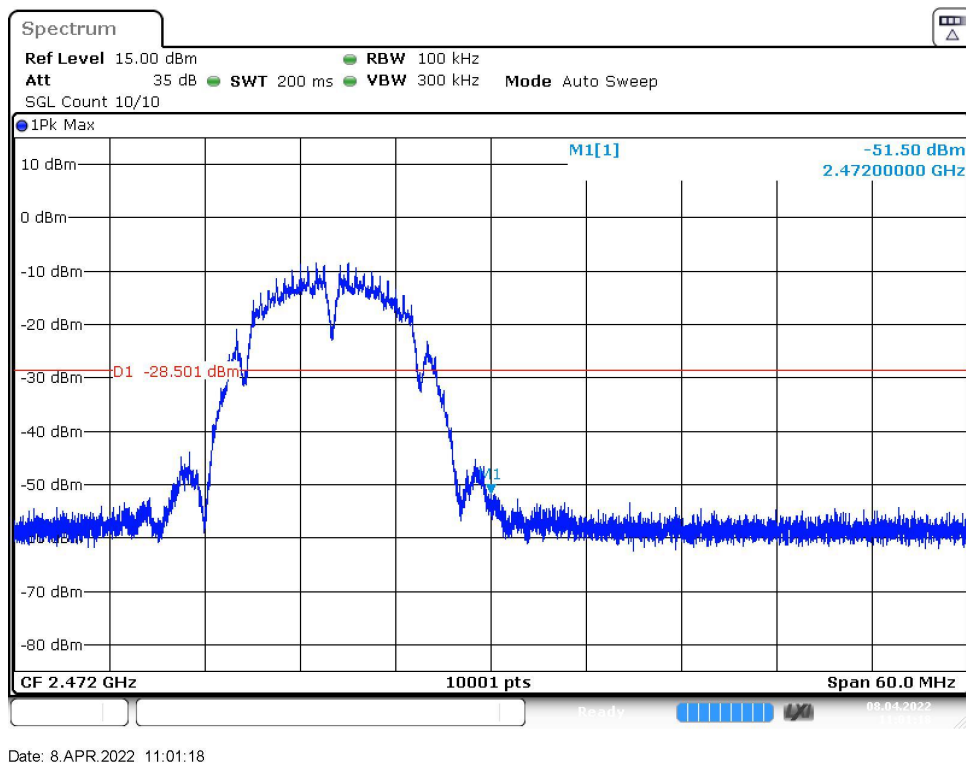
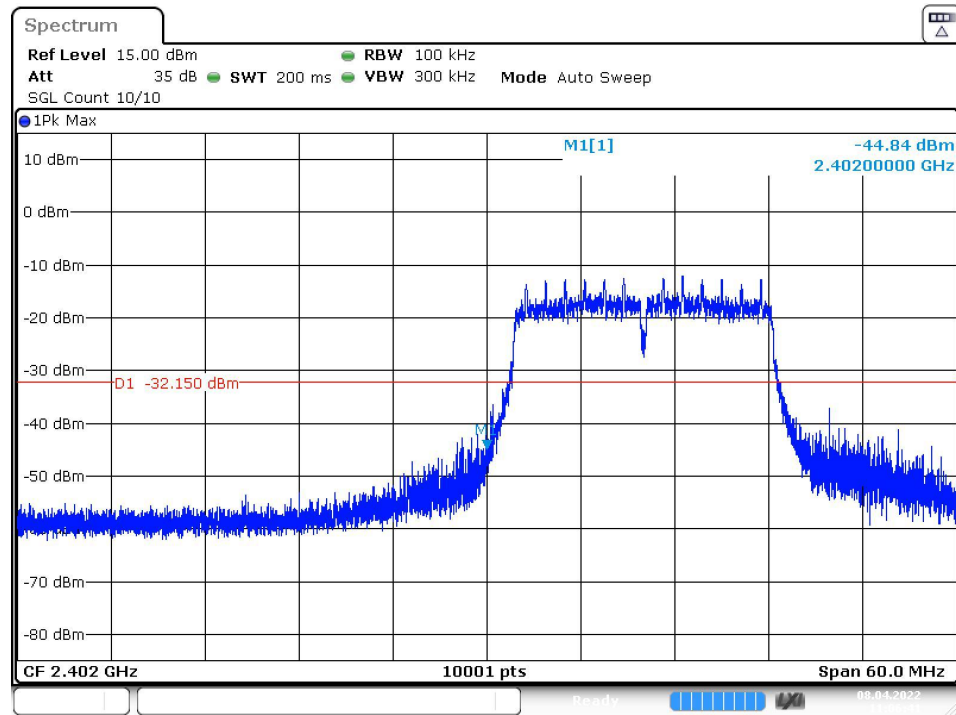
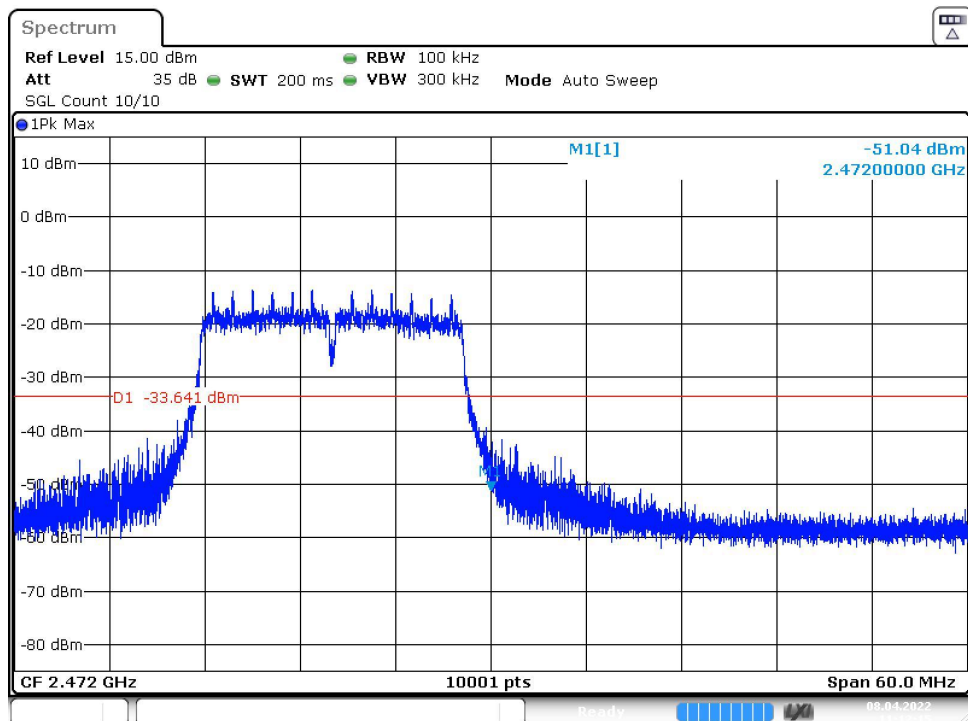


Fig.26 Band Edges (802.11b, CH 11)



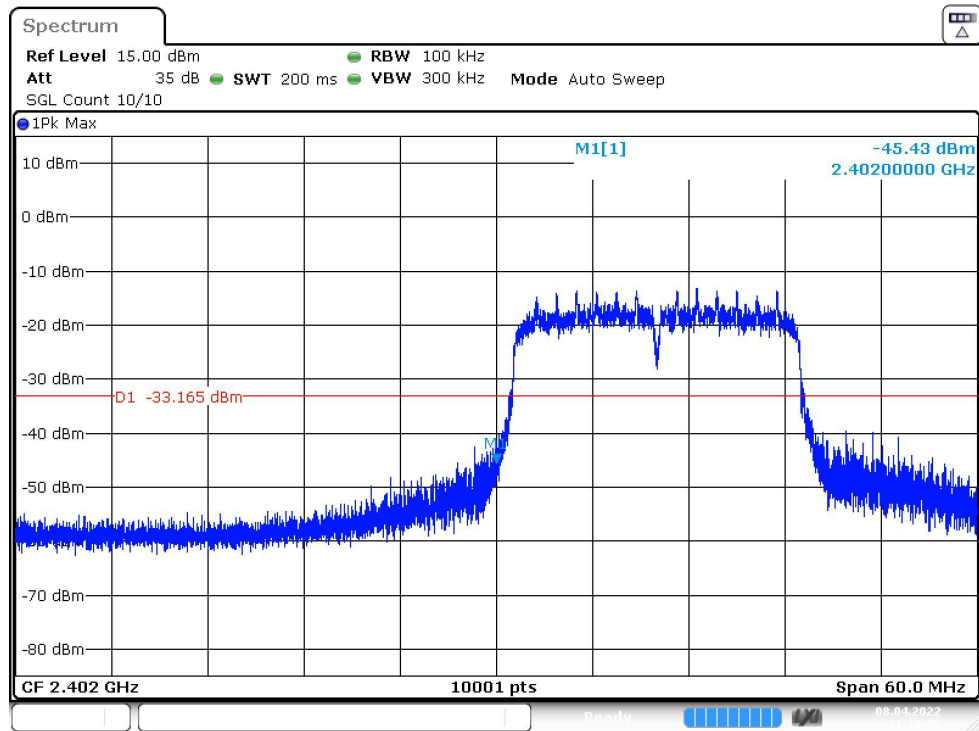
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Fig.27 Band Edges (802.11g, CH 1)



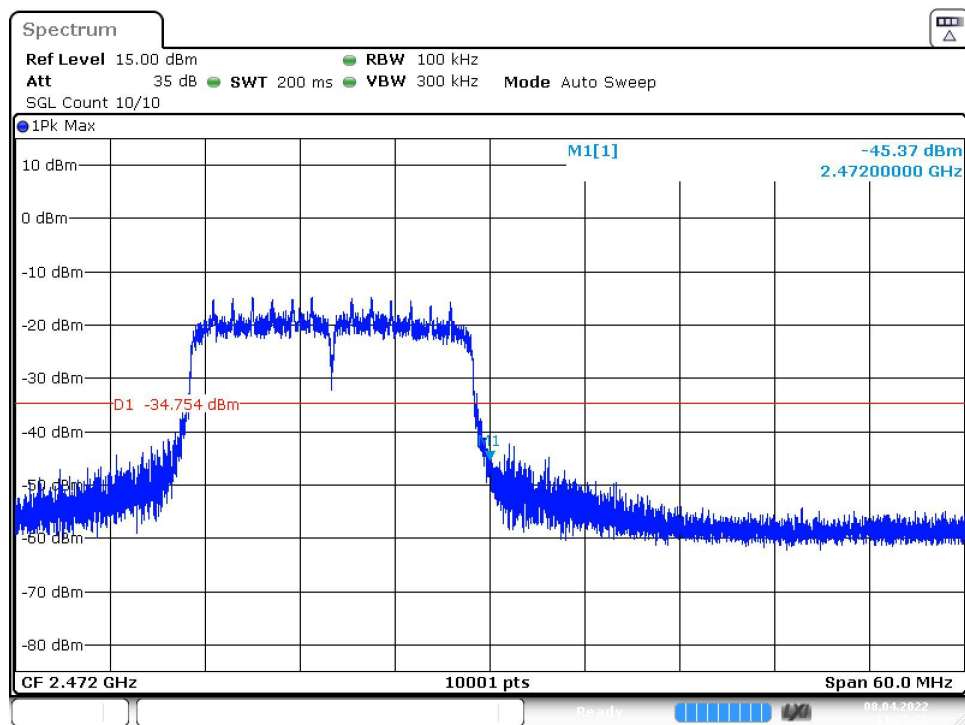
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Fig.28 Band Edges (802.11g, CH 11)



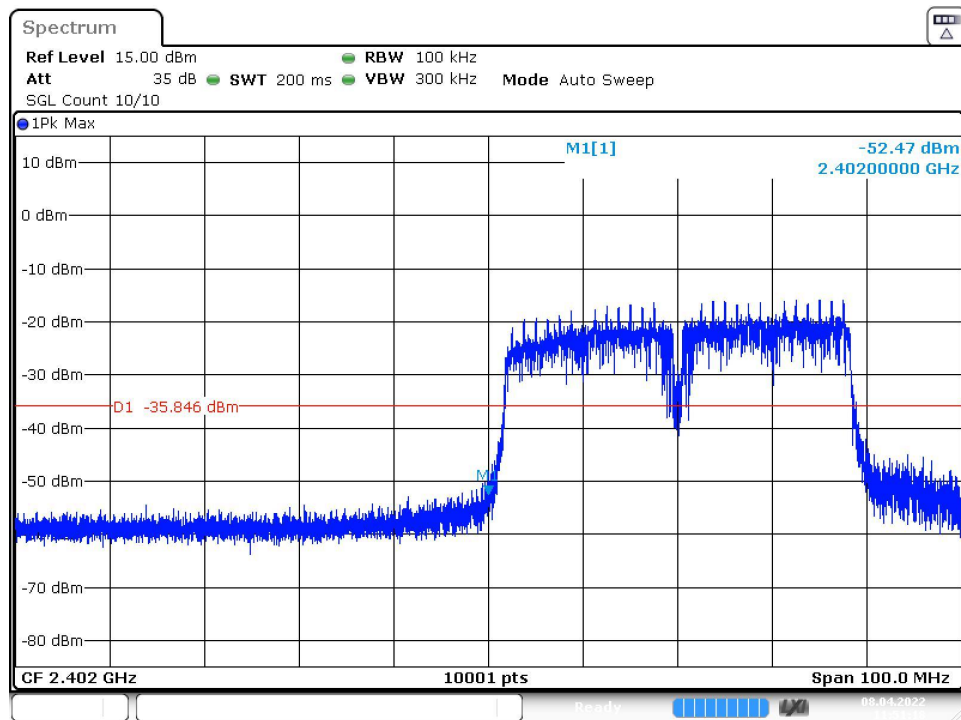
Date: 8.APR.2022 11:18:35

Fig.29 Band Edges (802.11n-HT20, CH 1)



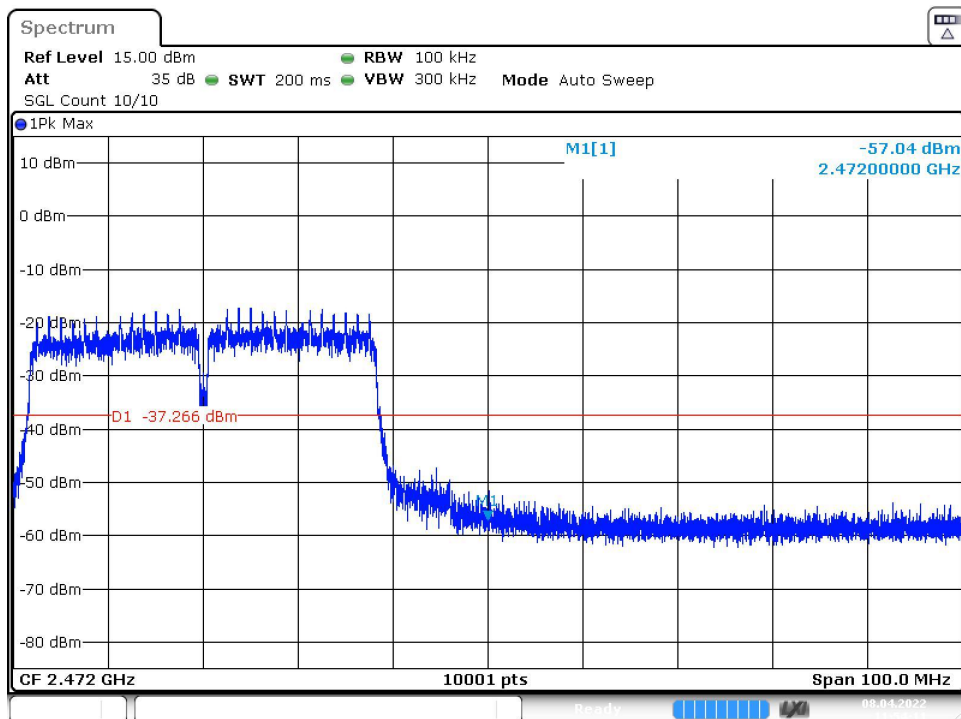
Date: 8.APR.2022 11:25:26

Fig.30 Band Edges (802.11n-HT20, CH 11)



Date: 8.APR.2022 11:51:18

Fig.31 Band Edges (802.11n-HT40, CH 3)



Date: 8.APR.2022 11:54:12

Fig.32 Band Edges (802.11n-HT40, CH 9)



A.5 Conducted Emission

Method of Measurement: See ANSI C63.10-clause 11.11.2&11.11.3

Measurement Limit:

Standard	Limit (dBm)
FCC 47 CFR Part 15.247 (d)	30dBm below peak output power in 100kHz bandwidth

Measurement Results:

Mode	Channel	Frequency (MHz)	Frequency Range	Test Results	Conclusion
802.11b	CH 1	2412	30MHz-25GHz	Fig.33	P
	CH 6	2437	30MHz-25GHz	Fig.34	P
	CH 11	2462	30MHz-25GHz	Fig.35	P
802.11g	CH 1	2412	30MHz-25GHz	Fig.36	P
	CH 6	2437	30MHz-25GHz	Fig.37	P
	CH 11	2462	30MHz-25GHz	Fig.38	P
802.11n-HT20	CH 1	2412	30MHz-25GHz	Fig.39	P
	CH 6	2437	30MHz-25GHz	Fig.40	P
	CH 11	2462	30MHz-25GHz	Fig.41	P
802.11n-HT40	CH 3	2422	30MHz-25GHz	Fig.42	P
	CH 6	2437	30MHz-25GHz	Fig.43	P
	CH 9	2452	30MHz-25GHz	Fig.44	P

See below for test graphs.

Conclusion: PASS

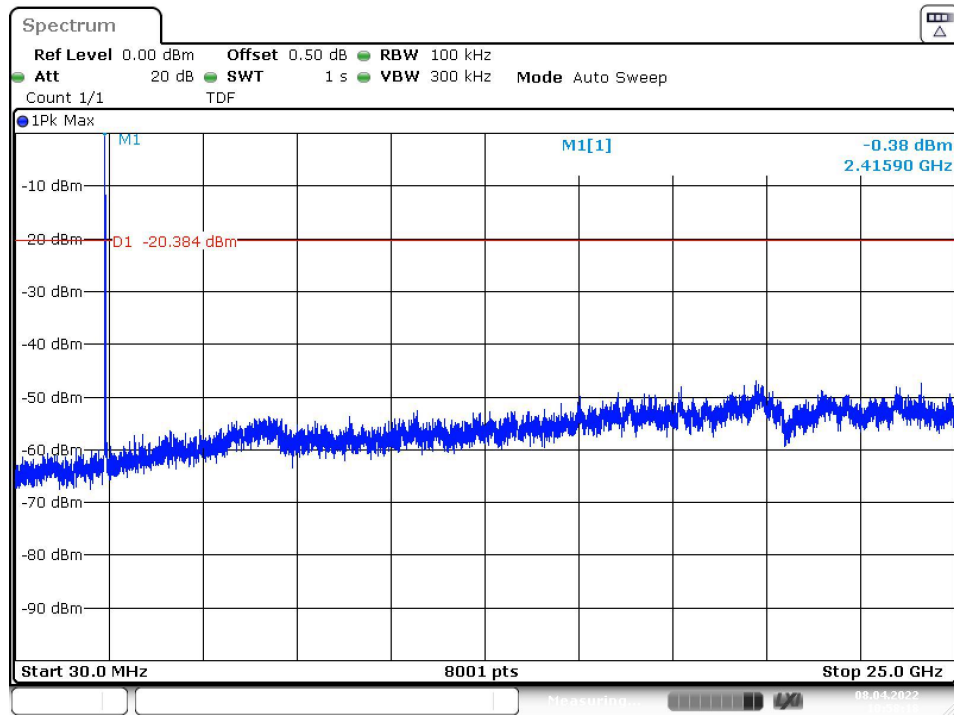


Fig.33 Conducted Spurious Emission (802.11b, CH1)

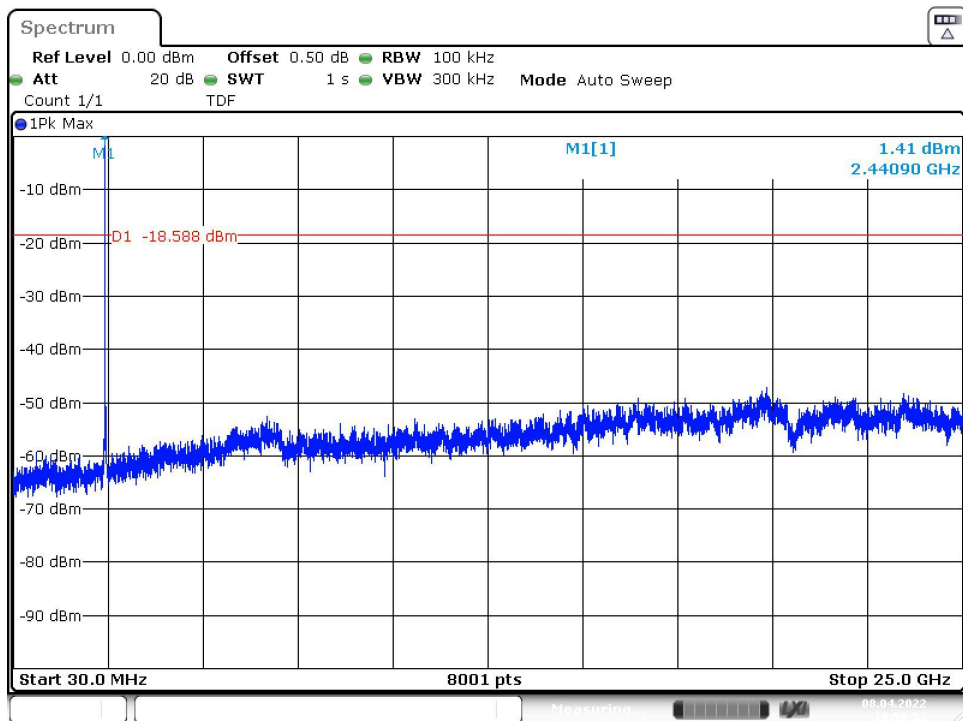
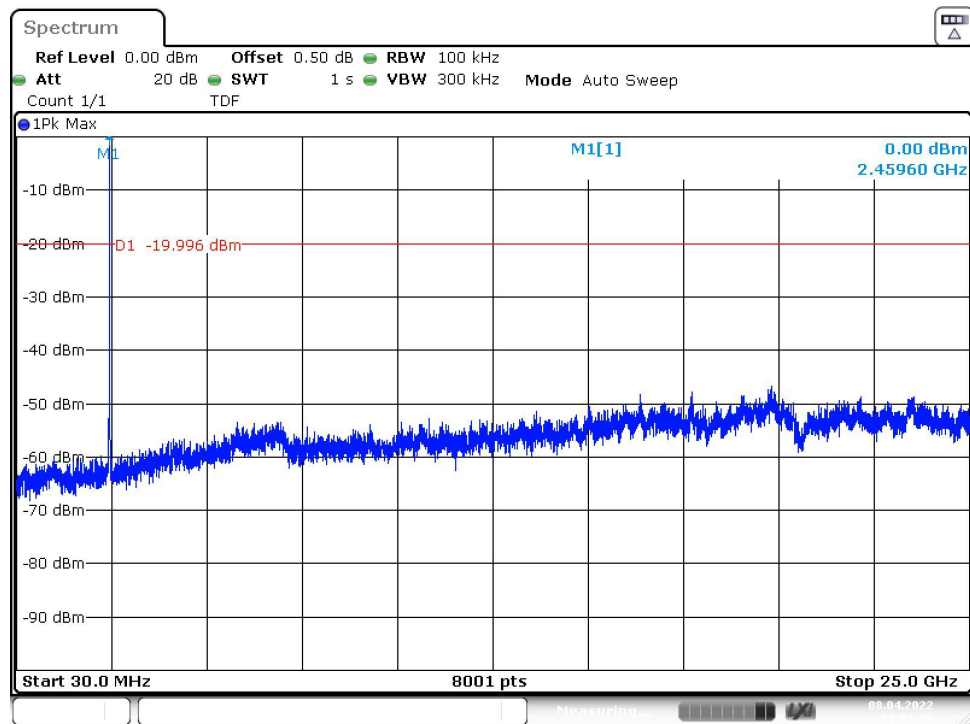
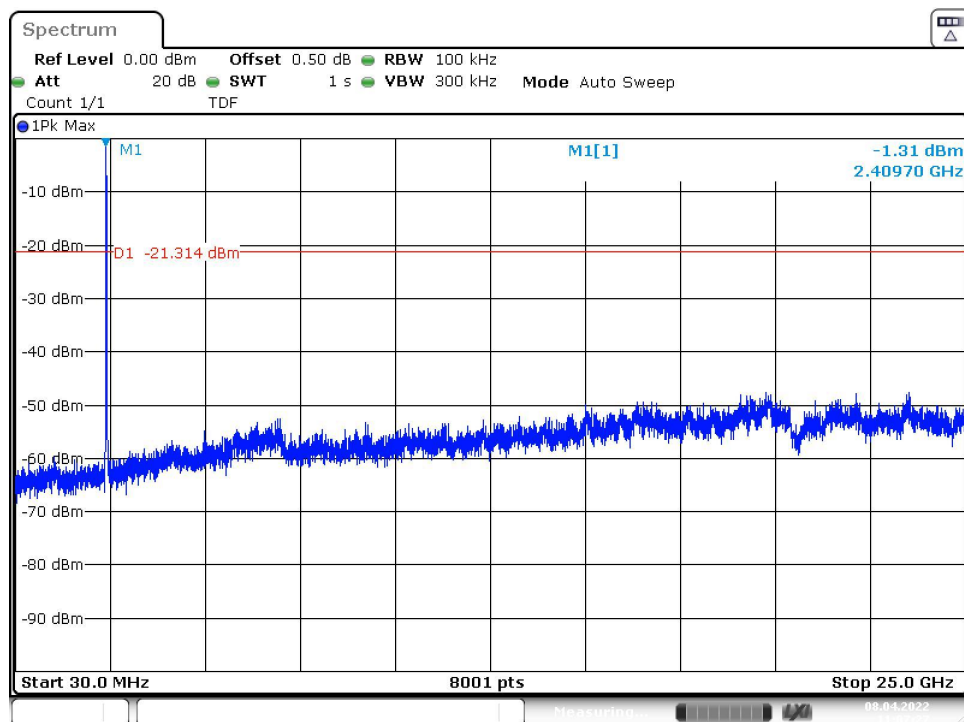


Fig.34 Conducted Spurious Emission (802.11b, CH6)



Date: 8.APR.2022 11:01:33

Fig.35 Conducted Spurious Emission (802.11b, CH11)



Date: 8.APR.2022 11:07:27

Fig.36 Conducted Spurious Emission (802.11g, CH1)

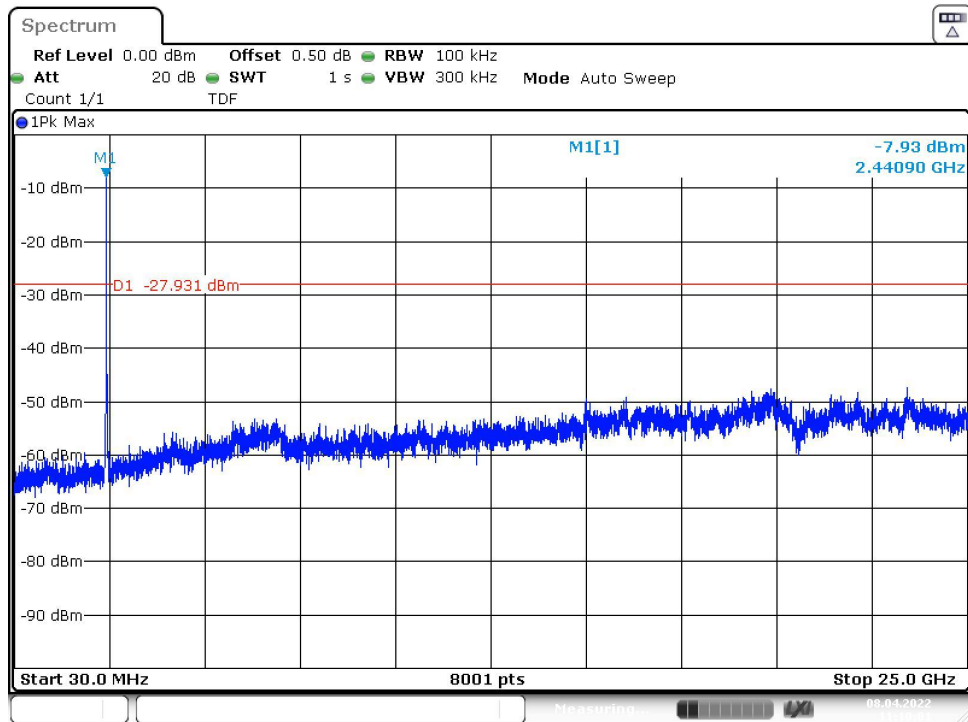


Fig.37 Conducted Spurious Emission (802.11g, CH6)

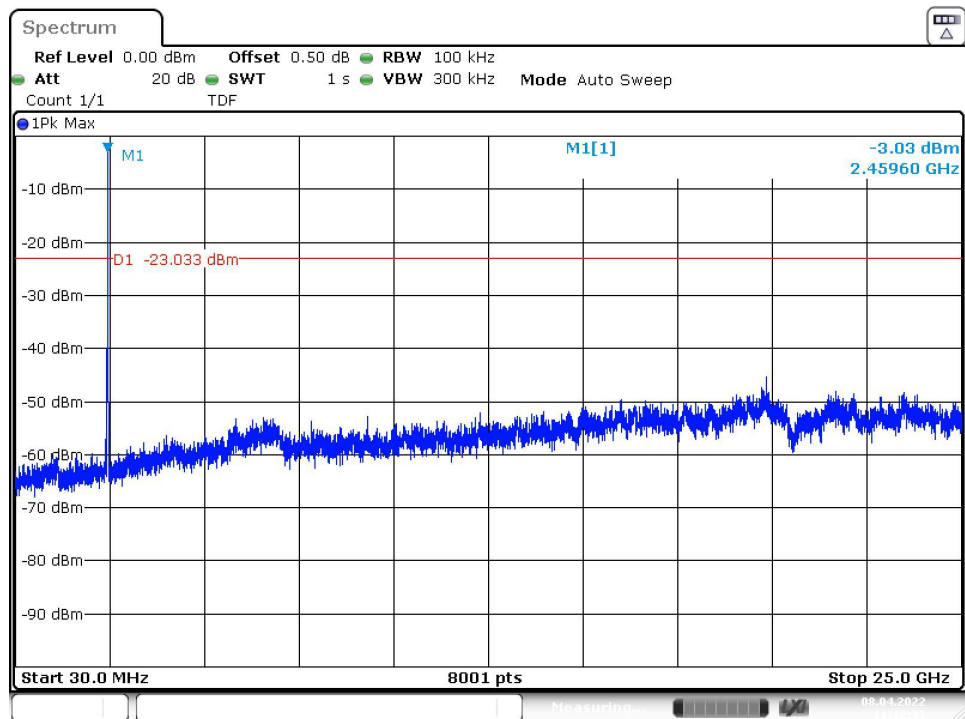


Fig.38 Conducted Spurious Emission (802.11g, CH11)

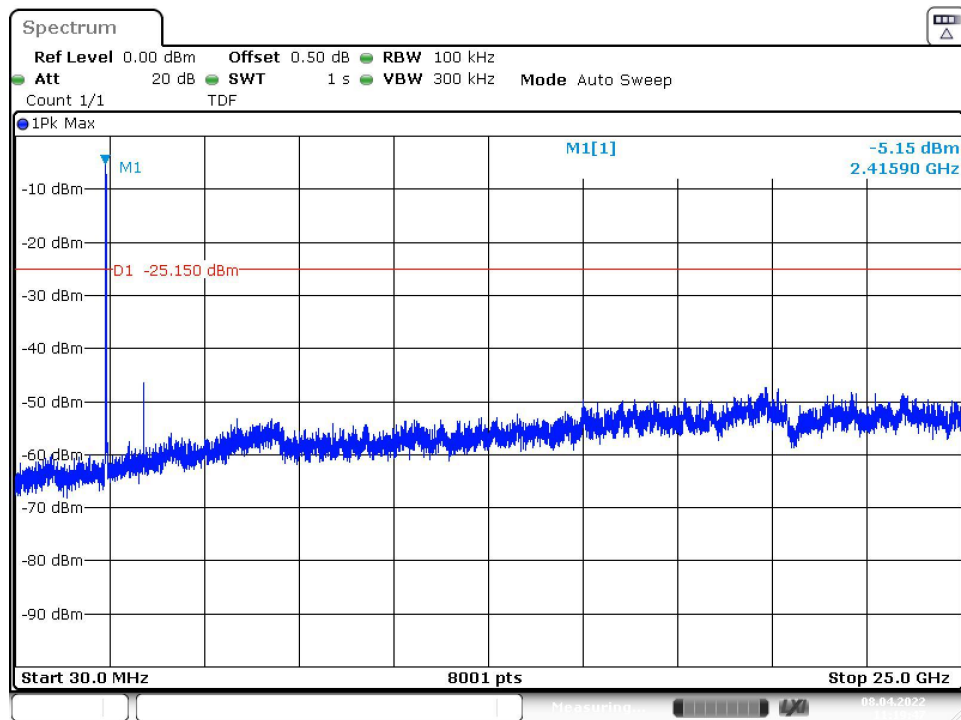


Fig.39 Conducted Spurious Emission (802.11n-HT20, CH1)

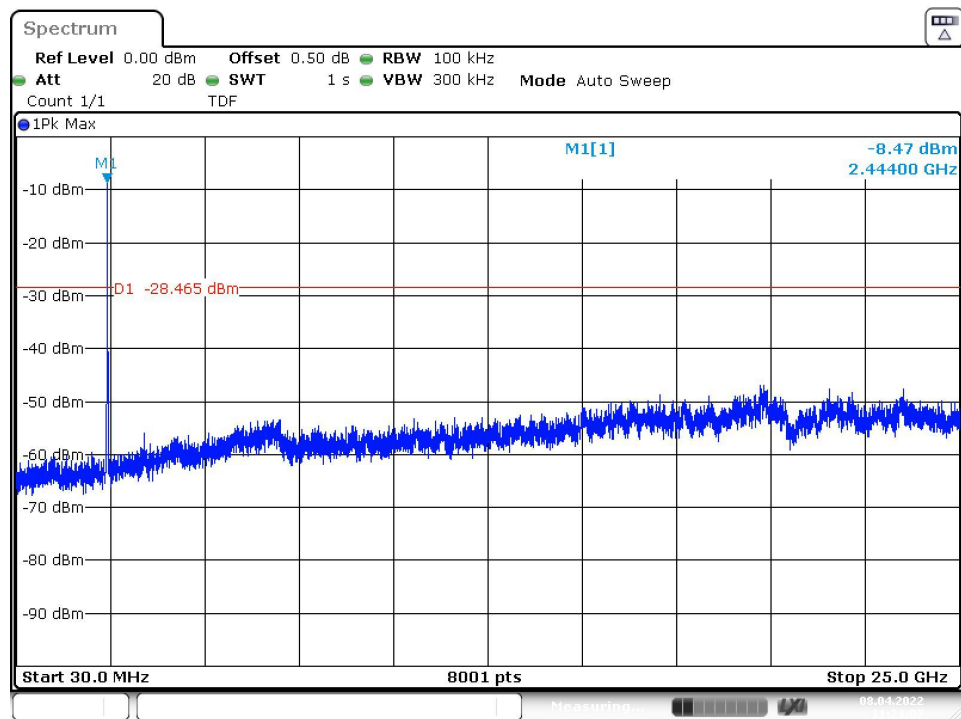


Fig.40 Conducted Spurious Emission (802.11n-HT20, CH6)

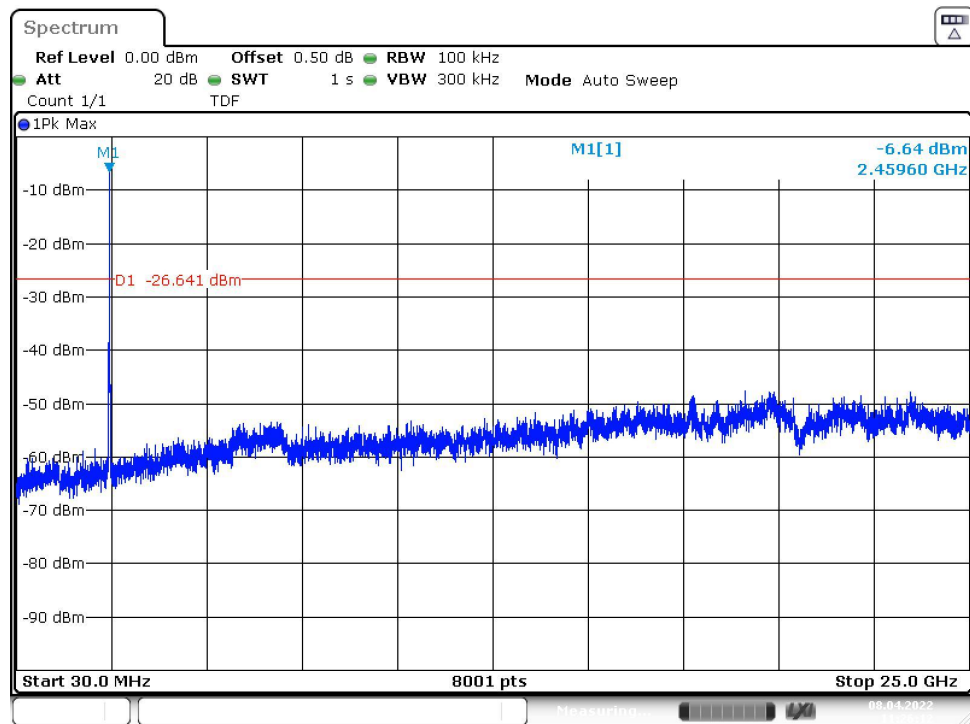


Fig.41 Conducted Spurious Emission (802.11n-HT20, CH11)

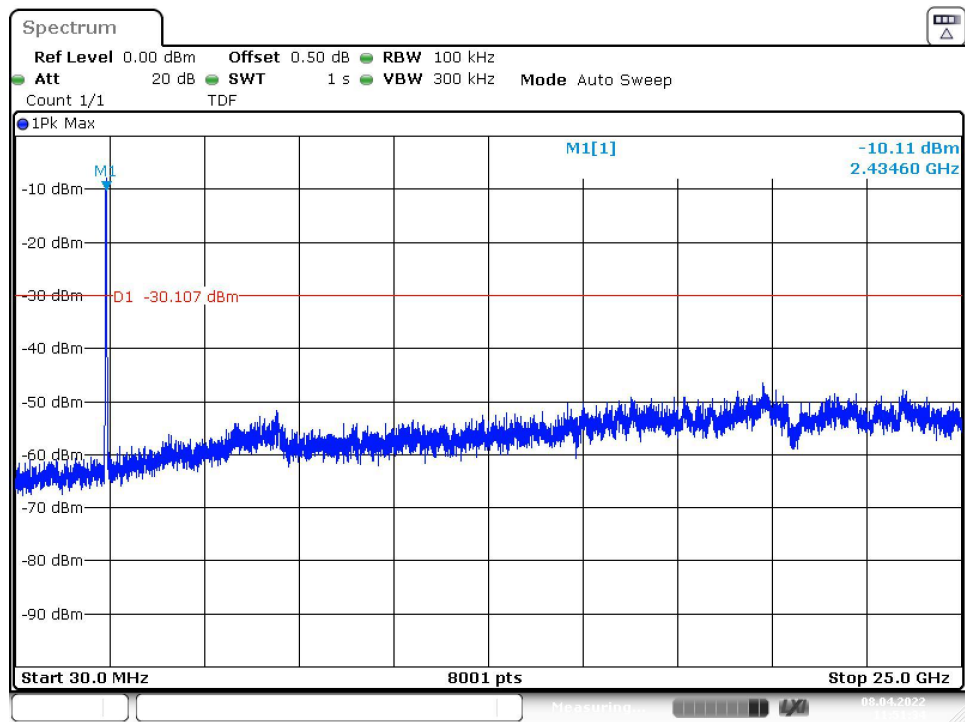
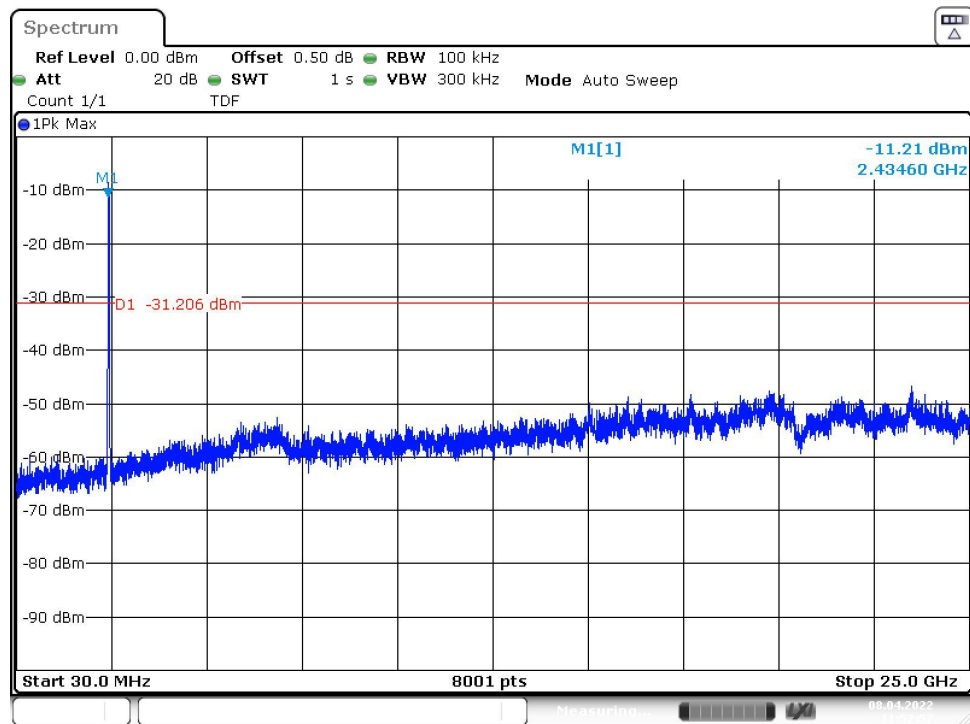
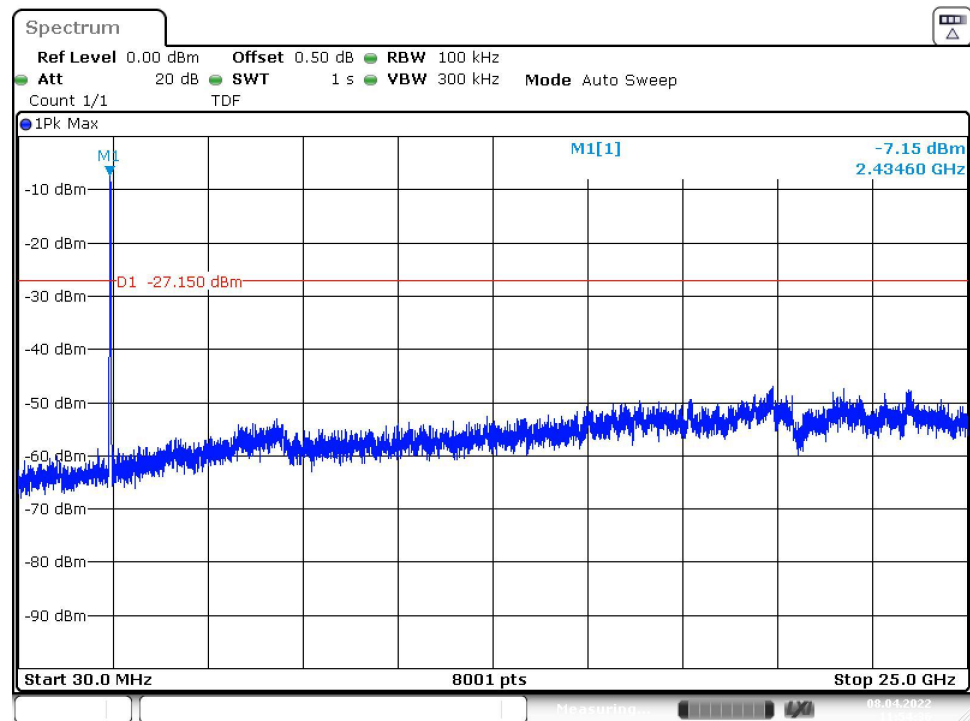


Fig.42 Conducted Spurious Emission (802.11n-HT40, CH3)



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



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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($\mu\text{V/m}$)	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.

All modes have been evaluated and tested, the worst results of **11b** and **11n-HT40** mode were selected and showed in this test case.

Measurement Results:

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11b	CH 1	1 GHz ~18 GHz	Fig.45	P
	CH 6	1 GHz ~18 GHz	Fig.46	P
	CH 11	1 GHz ~18 GHz	Fig.47	P
	Restricted Band (CH1)	2.38 GHz ~ 2.45 GHz	Fig.48	P
	Restricted Band (CH11)	2.45 GHz ~ 2.5 GHz	Fig.49	P
802.11n -HT40	CH 3	1 GHz ~18 GHz	Fig.50	P
	CH 6	1 GHz ~18 GHz	Fig.51	P
	CH 9	1 GHz ~18 GHz	Fig.52	P
	Restricted Band (CH3)	2.38 GHz ~ 2.45 GHz	Fig.53	P
	Restricted Band (CH9)	2.45 GHz ~ 2.5 GHz	Fig.54	P
/	All Channels	9 kHz ~30 MHz	Fig.55	P
		30 MHz ~1 GHz	Fig.56	P
		18 GHz ~26.5 GHz	Fig.57	P

See below for test graphs.

Conclusion: PASS

802.11b CH1 (1-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
7237.714286	48.00	74.00	26.00	H	5.1
12259.714286	48.73	74.00	25.27	V	10.9
13409.142857	47.77	74.00	26.23	V	11.5
15905.142857	50.77	74.00	23.23	H	14.1
17023.285714	53.91	74.00	20.09	V	18.4
17908.285714	52.40	74.00	21.60	V	18.9

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
7237.714286	42.16	54.00	11.84	H	5.1
12259.714286	38.42	54.00	15.58	V	10.9
13409.142857	38.12	54.00	15.88	V	11.5
15905.142857	41.76	54.00	12.24	H	14.1
17023.285714	44.42	54.00	9.58	V	18.4
17908.285714	44.61	54.00	9.39	V	18.9

802.11b CH6 (1GHz-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
7311.000000	48.09	74.00	25.91	V	5.1
8928.000000	45.65	74.00	28.35	H	6.5
10890.428572	47.71	74.00	26.29	V	9.3
14242.714286	49.19	74.00	24.81	H	11.3
16947.857143	54.71	74.00	19.29	H	18.2
17926.285714	54.44	74.00	19.56	H	18.9

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
7311.000000	41.33	54.00	12.67	V	5.1
8928.000000	35.44	54.00	18.56	H	6.5
10890.428572	37.44	54.00	16.56	V	9.3
14242.714286	38.50	54.00	15.50	H	11.3
16947.857143	44.22	54.00	9.78	H	18.2
17926.285714	44.39	54.00	9.61	H	18.9

802.11b CH11 (1GHz-18GHz)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
8260.285714	44.83	74.00	29.17	V	5.9
10462.714286	45.38	74.00	28.62	V	9.0
12457.285714	46.61	74.00	27.39	H	11.4
14830.285714	48.91	74.00	25.09	H	12.9
16928.571429	52.35	74.00	21.65	V	18.2
17940.428571	53.63	74.00	20.37	H	19.0

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
8260.285714	33.32	54.00	20.68	V	5.9
10462.714286	35.15	54.00	18.85	V	9.0
12457.285714	36.45	54.00	17.55	H	11.4
14830.285714	38.56	54.00	15.44	H	12.9
16928.571429	42.29	54.00	11.71	V	18.2
17940.428571	42.61	54.00	11.39	H	19.0

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.

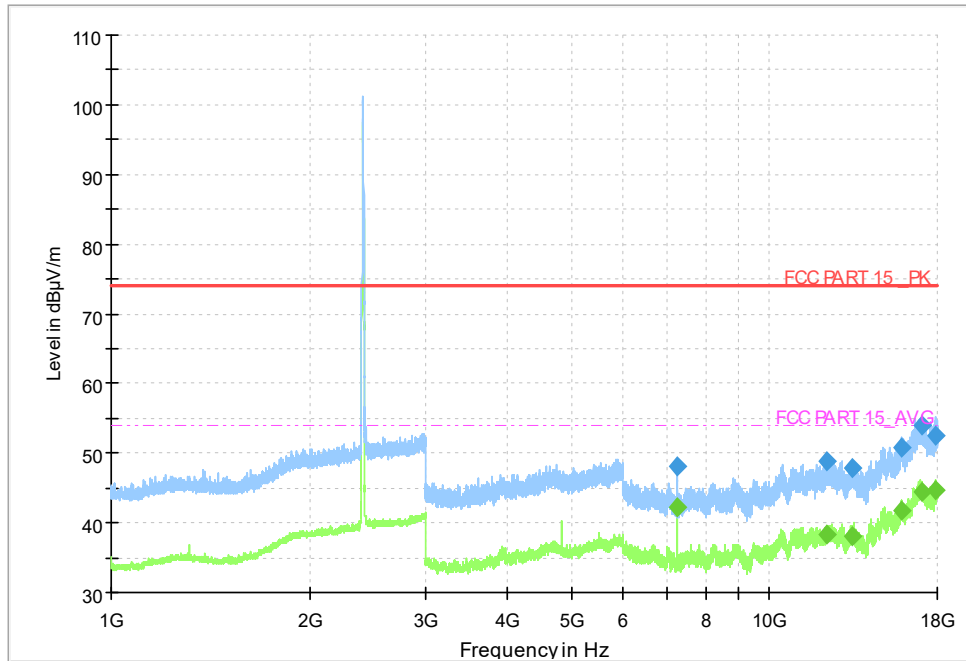


Fig.45 Radiated Spurious Emission (802.11b, CH1, 1 GHz ~18 GHz)

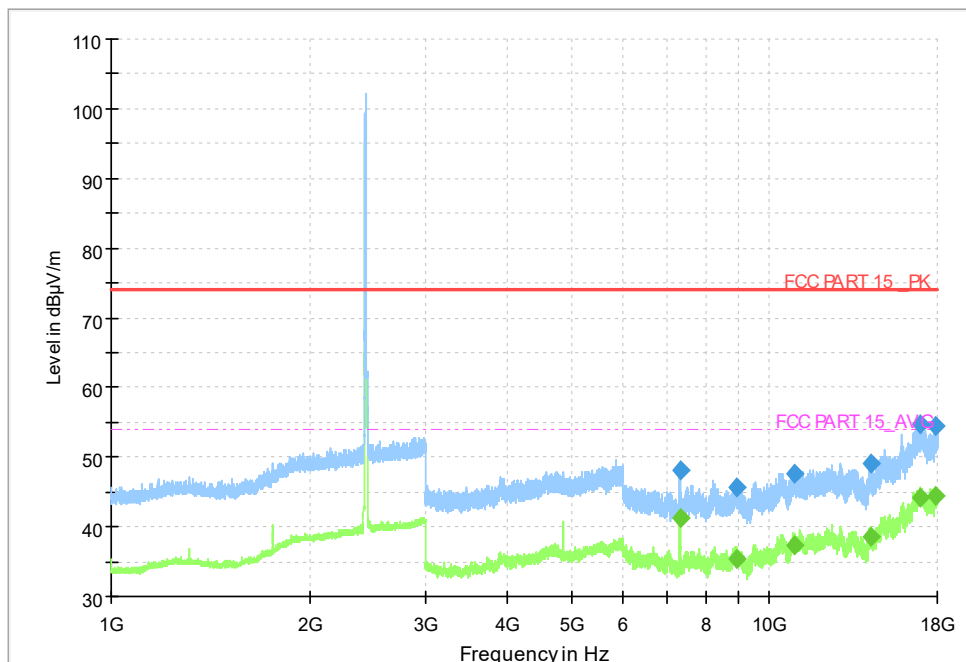


Fig.46 Radiated Spurious Emission (802.11b, CH6, 1 GHz ~18 GHz)

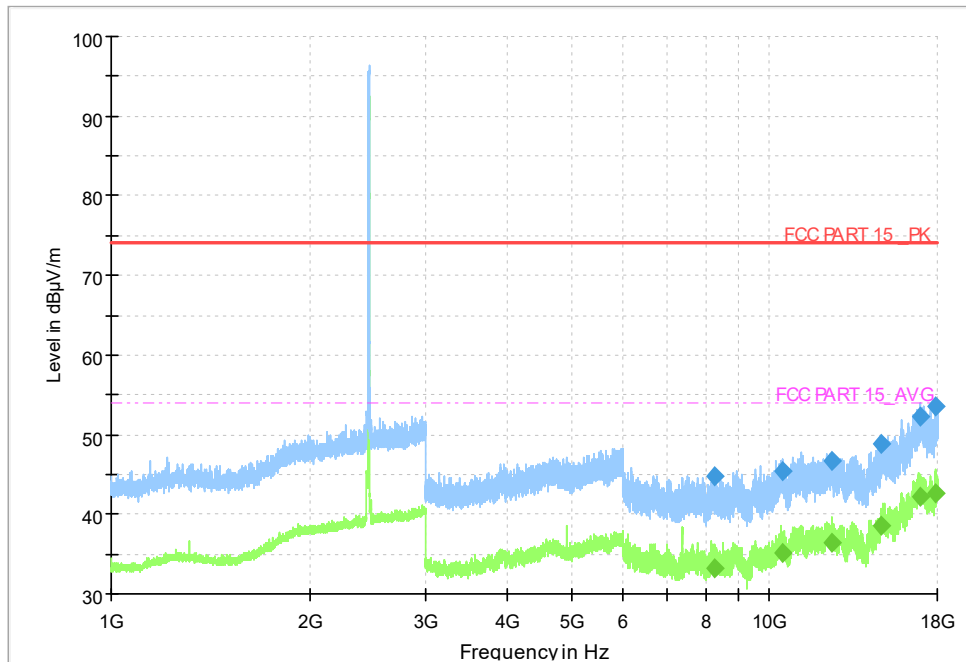


Fig.47 Radiated Spurious Emission (802.11b, CH11, 1 GHz ~18 GHz)

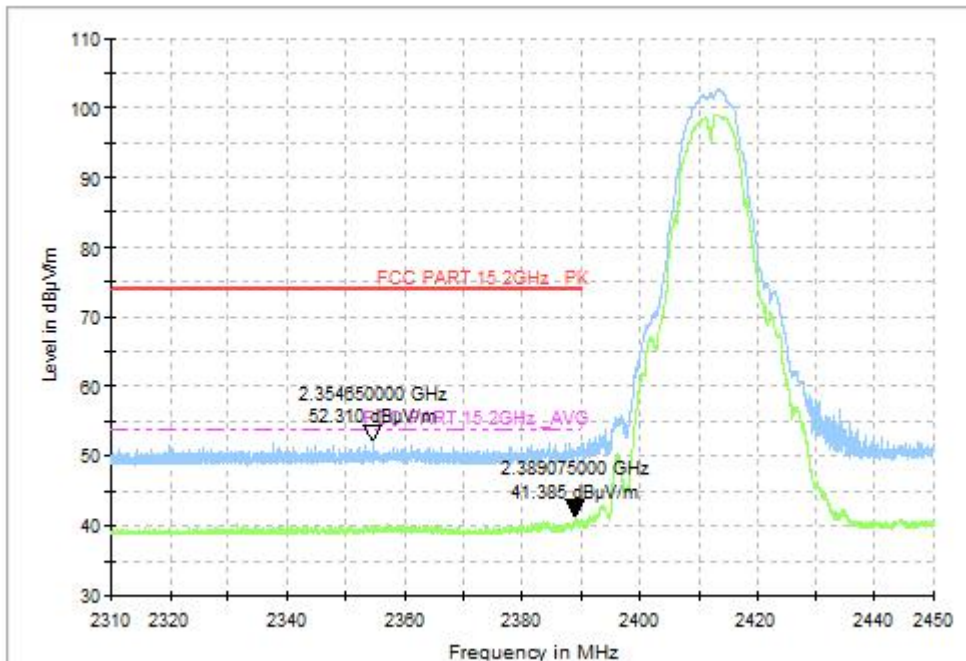


Fig.48 Radiated Restricted Band (802.11b, CH1, 2.38GHz~2.45GHz)

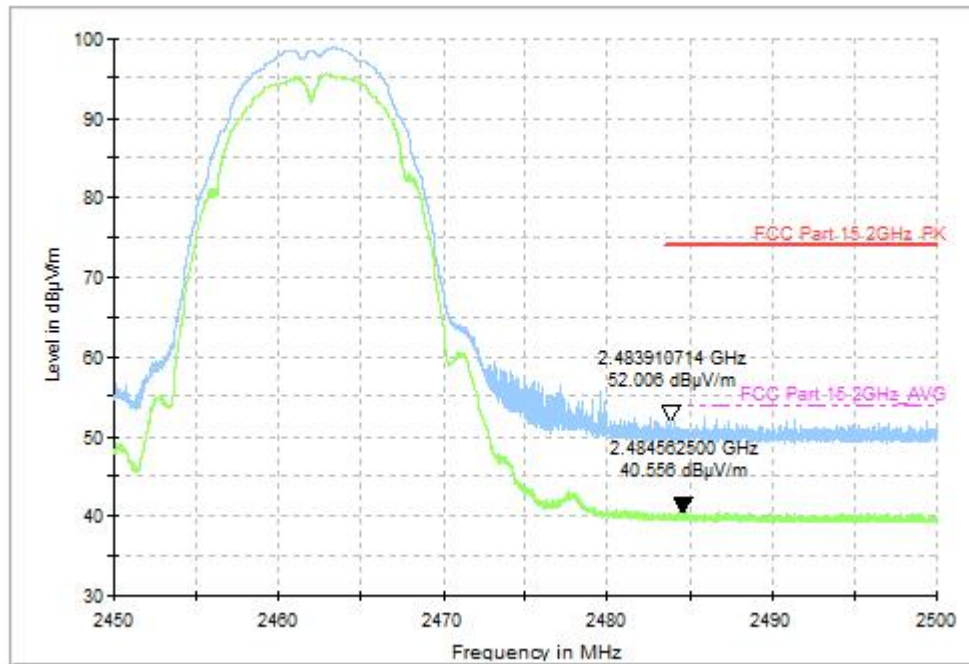


Fig.49 Radiated Restricted Band (802.11b, CH11, 2.45GHz~2.5GHz)

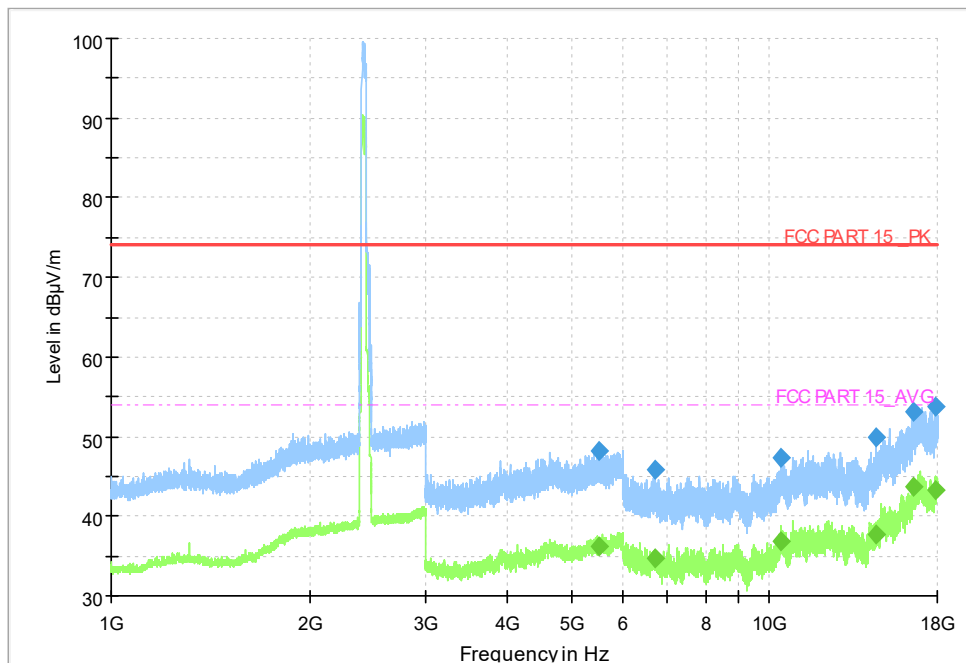


Fig.50 Radiated Spurious Emission (802.11n-HT40, CH3, 1 GHz ~18 GHz)

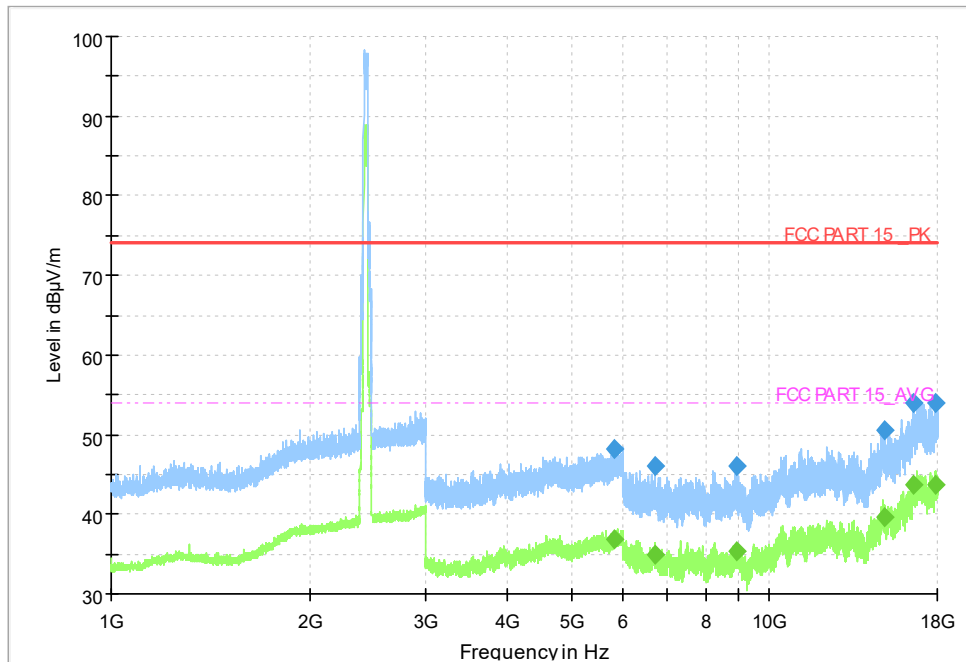


Fig.51 Radiated Spurious Emission (802.11n-HT40, CH6, 1 GHz ~18 GHz)

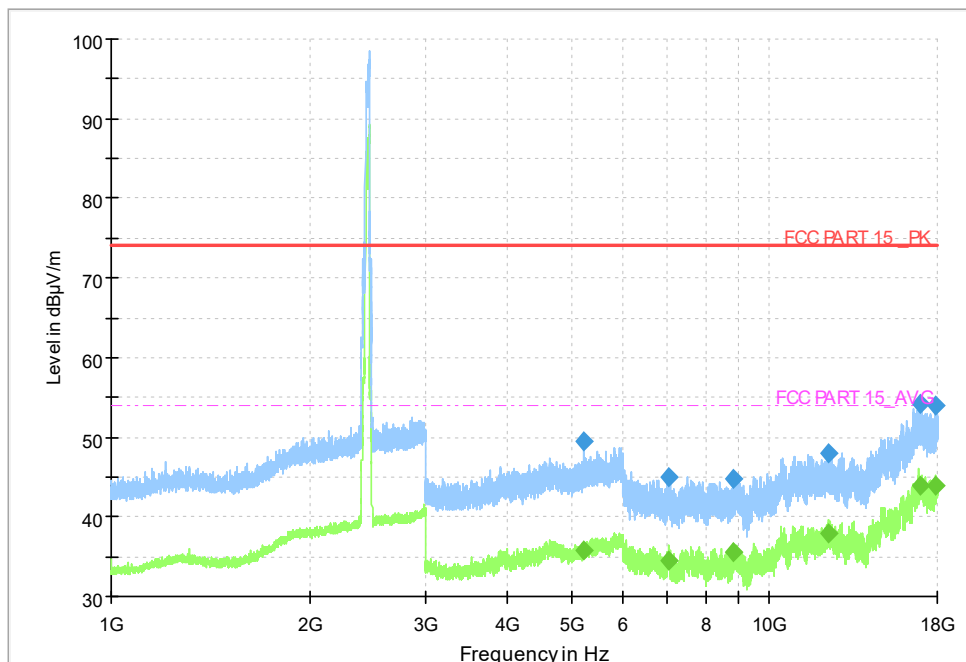


Fig.52 Radiated Spurious Emission (802.11n-HT40, CH9, 1 GHz ~18 GHz)

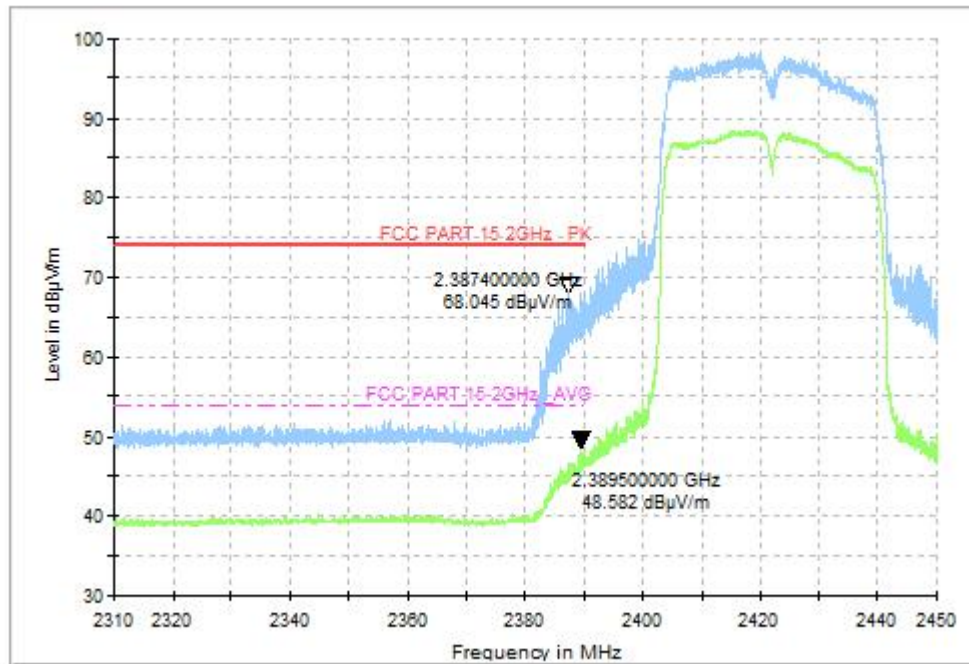


Fig.53 Radiated Restricted Band (802.11n-HT40, CH3, 2.38GHz~2.45GHz)

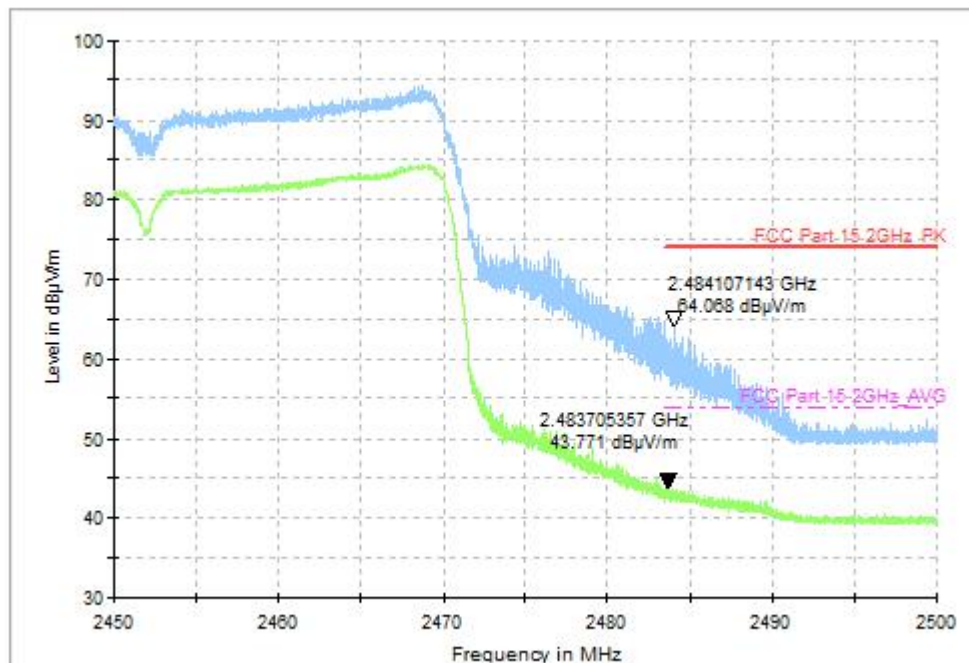


Fig.54 Radiated Restricted Band (802.11n-HT40, CH9, 2.45GHz~2.5GHz)

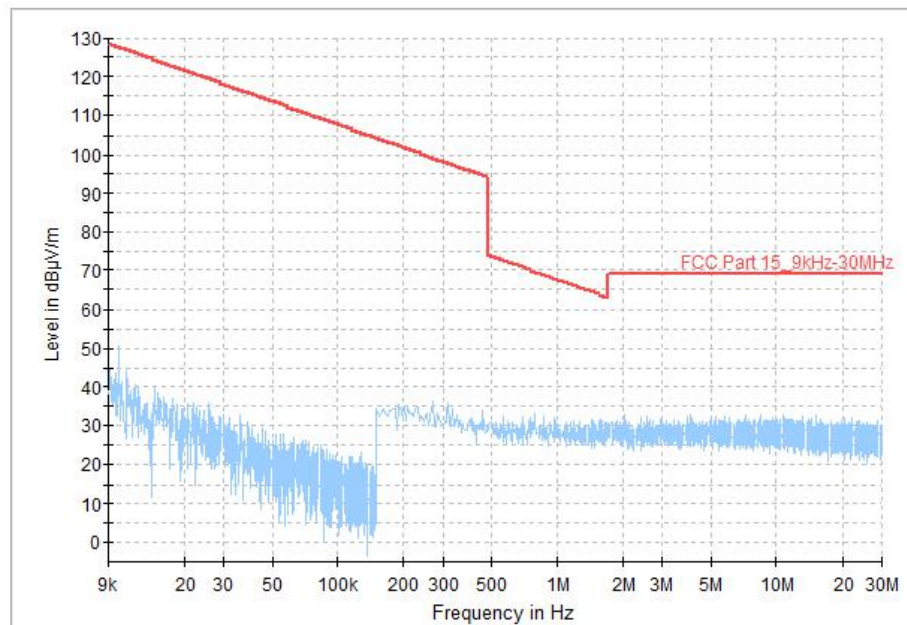


Fig.55 Radiated Spurious Emission (All Channels, 9 kHz-30 MHz)

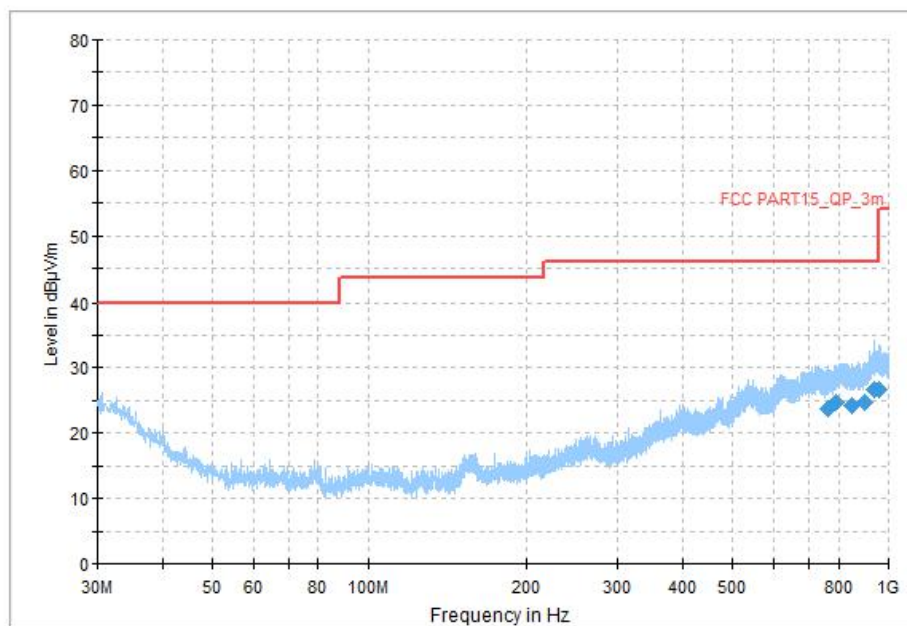


Fig.56 Radiated Spurious Emission (All Channels, 30MHz-1 GHz)

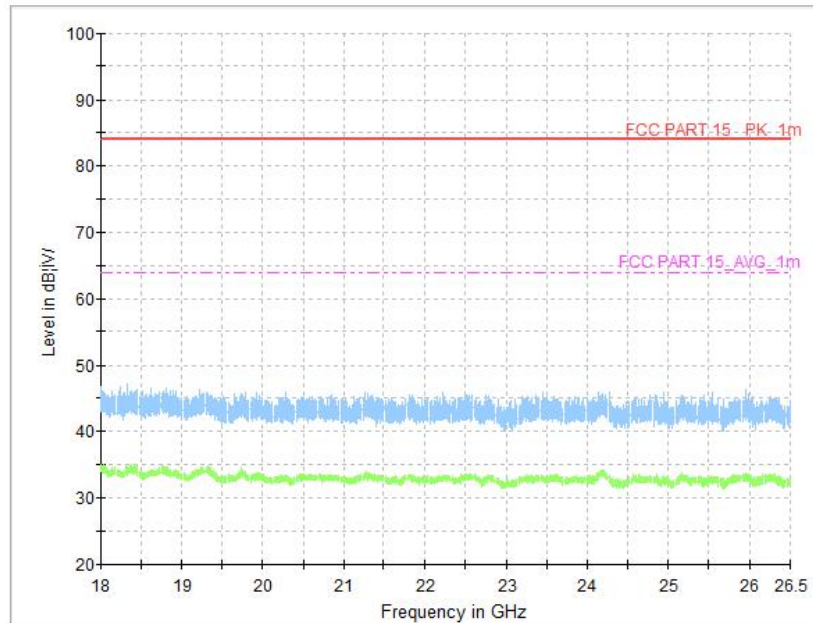


Fig.57 Radiated Spurious Emission (All Channels, 18 GHz-26.5 GHz)

A.7 AC Power line Conducted Emission

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Result and limit:

WLAN -AE1,AE2

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Average-peak Limit (dB μ V)	Result (dB μ V)		Conclusion
			Traffic	Idle	
0.15 to 0.5	66 to 56	56 to 46	Fig.58	Fig.59	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

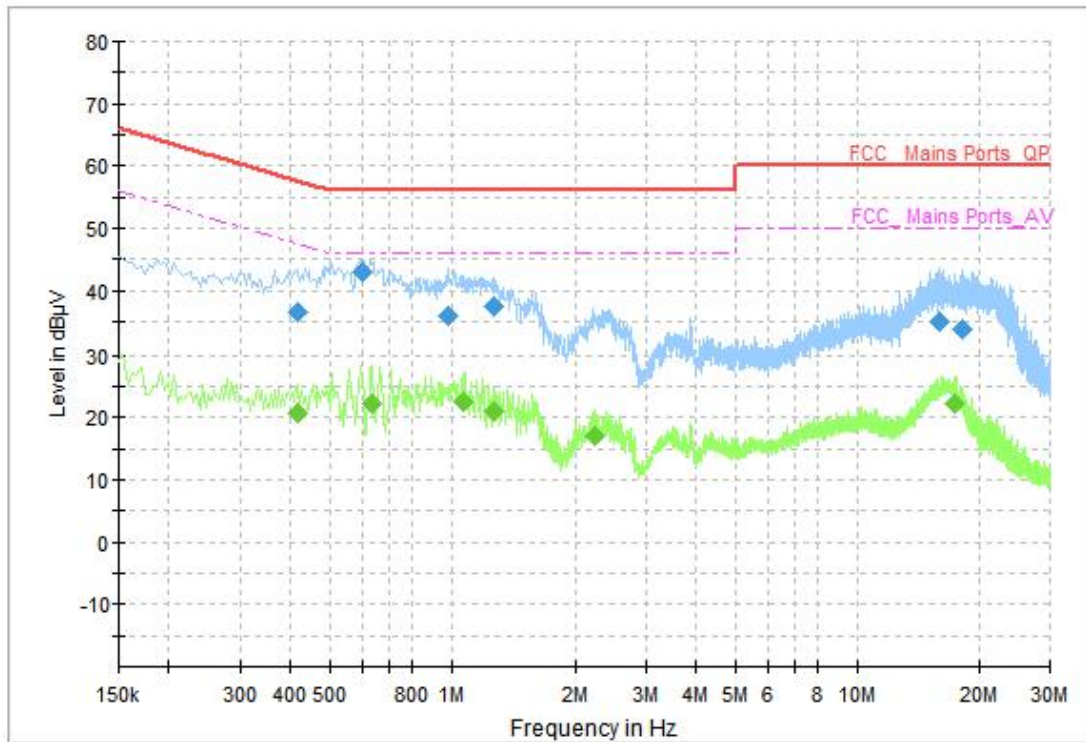


Fig.58 AC Power line Conducted Emission (Traffic)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
0.418000	36.62	57.49	20.87	N	ON	10
0.602000	42.93	56.00	13.07	L1	ON	10
0.978000	36.05	56.00	19.95	N	ON	10
1.270000	37.38	56.00	18.62	N	ON	10
15.946000	34.94	60.00	25.06	N	ON	11
18.186000	33.87	60.00	26.13	N	ON	10

Measurement Results: Average

Frequency (MHz)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
0.418000	20.67	47.49	26.82	N	ON	10
0.638000	22.28	46.00	23.72	N	ON	10
1.070000	22.56	46.00	23.44	N	ON	10
1.274000	21.11	46.00	24.89	N	ON	10
2.238000	17.01	46.00	28.99	N	ON	10
17.486000	22.07	50.00	27.93	N	ON	11

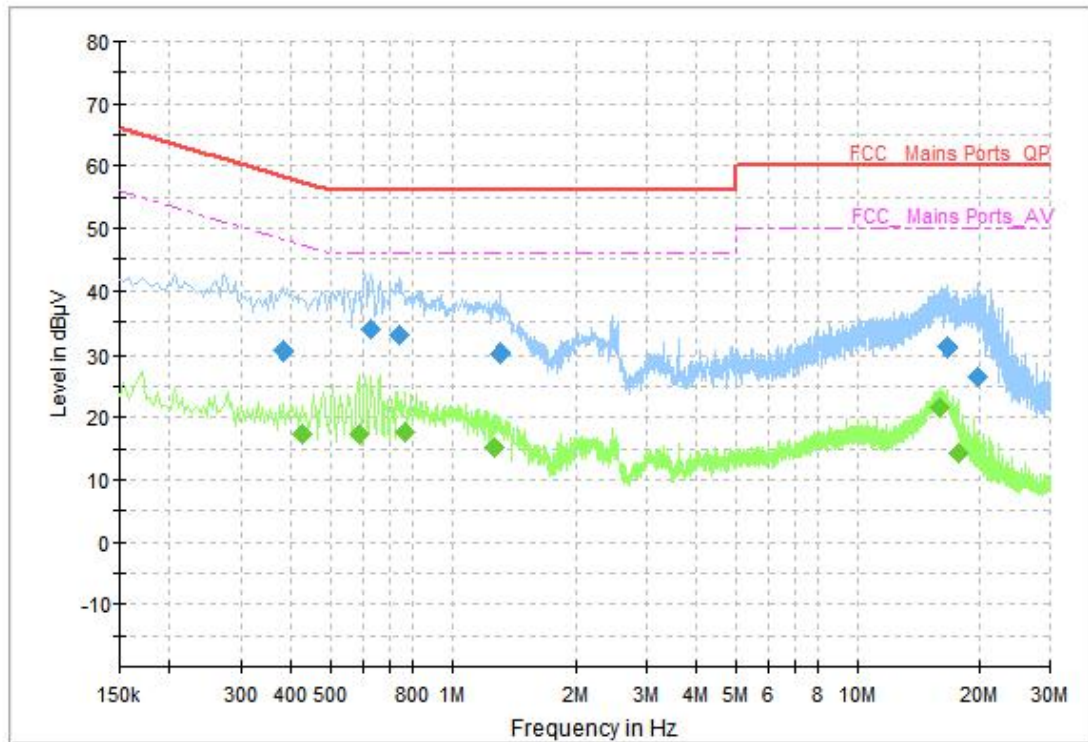


Fig.59 AC Power line Conducted Emission (Idle)

Measurement Results: Quasi Peak

Frequency (MHz)	Quasi Peak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
0.382000	30.55	58.24	27.69	L1	ON	10
0.626000	33.74	56.00	22.26	N	ON	10
0.742000	32.82	56.00	23.18	N	ON	10
1.318000	30.15	56.00	25.85	N	ON	10
16.706000	30.97	60.00	29.03	N	ON	11
19.962000	26.40	60.00	33.60	N	ON	10

Measurement Results: Average

Frequency (MHz)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
0.426000	17.37	47.33	29.96	N	ON	10
0.586000	17.32	46.00	28.68	L1	ON	10
0.762000	17.69	46.00	28.31	L1	ON	10
1.270000	15.16	46.00	30.84	N	ON	10
16.038000	21.50	50.00	28.50	N	ON	11
17.890000	14.13	50.00	35.87	L1	ON	10

END OF REPORT



ANNEX- Spot Check of Output Power

Company Name: HMD Global Oy

Product Name: Smart Phone

Model Name: TA-1413 (FCC ID:2AJOTTA-1413); TA-1429 (FCC ID:2AJOTTA-1429)

Differences between models

TA-1429 is the variant of the initial certified product TA-1413, TA-1413 supports 2 SIM slots and TA-1429 supports 1 SIM slot.

Spot Check of Different Mode

Model	Mode	Frequency (MHz)	Conducted Output Power (dBm)
TA-1413	LE 1M	2440(CH19)	7.66
	EDR(8DPSK)	2441(CH39)	10.23
	802.11b	2412 (CH1)	15.67
	802.11a	5320 (CH64)	14.65
TA-1429	LE 1M	2440(CH19)	7.69
	EDR(8DPSK)	2441(CH39)	10.15
	802.11b	2412 (CH1)	15.52
	802.11a	5320 (CH64)	14.59

Note: Spot check test data included for the variants based on worst-case results reported in the original.

From the above data, it can be concluded that the conducted output power of the variant is less than or near to the original. And the variant conducted test data can refer to the original report (**I22N00716**).

This condition applies to the reports **I22N00718**.