

Above 1G (1 GHz-26.5 GHz)**IEEE 802.11b:**

Low CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2377.536	36.63	54.00	-17.37	44.27	-7.64	Average	2374.848	36.84	54.00	-17.16	44.50	-7.66	Average
2377.536	51.13	74.00	-22.87	58.77	-7.64	Peak	2374.848	50.89	74.00	-23.11	58.55	-7.66	Peak
2411.360	87.10			94.70	-7.60	Average	2411.248	89.87			97.47	-7.60	Average
2411.360	89.76			97.36	-7.60	Peak	2411.248	92.50			100.10	-7.60	Peak
3216.000	34.38	54.00	-19.62	38.57	-4.19	Average	3216.000	40.38	54.00	-13.62	44.57	-4.19	Average
3216.000	42.50	74.00	-31.50	46.69	-4.19	Peak	3216.000	45.48	74.00	-28.52	49.67	-4.19	Peak
4824.000	44.20	54.00	-9.80	43.56	0.64	Average	4824.000	52.97	54.00	-1.03	52.33	0.64	Average
4824.000	49.40	74.00	-24.60	48.76	0.64	Peak	4824.000	54.44	74.00	-19.56	53.80	0.64	Peak
7236.000	46.65	54.00	-7.35	41.27	5.38	Average	7236.000	43.94	54.00	-10.06	38.56	5.38	Average
7236.000	53.14	74.00	-20.86	47.76	5.38	Peak	7236.000	52.23	74.00	-21.77	46.85	5.38	Peak

Middle CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2378.728	36.91	54.00	-17.09	44.56	-7.65	Average	2357.190	36.50	54.00	-17.50	44.22	-7.72	Average
2378.728	50.49	74.00	-23.51	58.14	-7.65	Peak	2357.190	50.24	74.00	-23.76	57.96	-7.72	Peak
2436.566	88.65			96.19	-7.54	Average	2436.566	91.58			99.12	-7.54	Average
2436.566	91.41			98.95	-7.54	Peak	2436.566	94.33			101.87	-7.54	Peak
2548.370	37.56	54.00	-16.44	44.70	-7.14	Average	2522.476	37.71	54.00	-16.29	44.97	-7.26	Average
2548.370	51.17	74.00	-22.83	58.31	-7.14	Peak	2522.476	51.23	74.00	-22.77	58.49	-7.26	Peak
3249.300	34.90	54.00	-19.10	38.95	-4.05	Average	3249.300	40.70	54.00	-13.30	44.75	-4.05	Average
3249.300	42.90	74.00	-31.10	46.95	-4.05	Peak	3249.300	46.37	74.00	-27.63	50.42	-4.05	Peak
4874.000	45.07	54.00	-8.93	44.28	0.79	Average	4874.000	53.39	54.00	-0.61	52.60	0.79	Average
4874.000	49.95	74.00	-24.05	49.16	0.79	Peak	4874.000	55.89	74.00	-18.11	55.10	0.79	Peak
7311.000	49.55	54.00	-4.45	43.91	5.64	Average	7311.000	47.12	54.00	-6.88	41.48	5.64	Average
7311.000	55.25	74.00	-18.75	49.61	5.64	Peak	7311.000	53.97	74.00	-20.03	48.33	5.64	Peak

High CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2462.900	89.43			96.85	-7.42	Average	2461.200	92.14			99.57	-7.43	Average
2462.900	92.12			99.54	-7.42	Peak	2461.200	94.85			102.28	-7.43	Peak
2511.300	37.63	54.00	-16.37	44.91	-7.28	Average	2527.200	38.02	54.00	-15.98	45.26	-7.24	Average
2511.300	51.52	74.00	-22.48	58.80	-7.28	Peak	2527.200	52.38	74.00	-21.62	59.62	-7.24	Peak
3282.700	35.07	54.00	-18.93	39.02	-3.95	Average	3282.700	41.19	54.00	-12.81	45.14	-3.95	Average
3282.700	43.07	74.00	-30.93	47.02	-3.95	Peak	3282.700	45.36	74.00	-28.64	49.31	-3.95	Peak
4924.000	43.74	54.00	-10.26	42.90	0.84	Average	4924.000	53.22	54.00	-0.78	52.38	0.84	Average
4924.000	49.11	74.00	-24.89	48.27	0.84	Peak	4924.000	55.83	74.00	-18.17	54.99	0.84	Peak
7386.000	48.68	54.00	-5.32	42.76	5.92	Average	7386.000	47.44	54.00	-6.56	41.52	5.92	Average
7386.000	54.43	74.00	-19.57	48.51	5.92	Peak	7386.000	53.90	74.00	-20.10	47.98	5.92	Peak

IEEE 802.11g:

Low CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2389.856	46.79	54.00	-7.21	54.42	-7.63	Average	2389.968	48.47	54.00	-5.53	56.10	-7.63	Average
2389.856	66.77	74.00	-7.23	74.40	-7.63	Peak	2389.968	68.10	74.00	-5.90	75.73	-7.63	Peak
2414.272	86.16			93.75	-7.59	Average	2414.272	89.05			96.64	-7.59	Average
2414.272	97.19			104.78	-7.59	Peak	2414.272	100.00			107.59	-7.59	Peak
3216.000	34.58	54.00	-19.42	38.77	-4.19	Average	3216.000	40.07	54.00	-13.93	44.26	-4.19	Average
3216.000	43.98	74.00	-30.02	48.17	-4.19	Peak	3216.000	45.44	74.00	-28.56	49.63	-4.19	Peak
4824.000	36.30	54.00	-17.70	35.66	0.64	Average	4824.000	44.08	54.00	-9.92	43.44	0.64	Average
4824.000	50.18	74.00	-23.82	49.54	0.64	Peak	4824.000	58.74	74.00	-15.26	58.10	0.64	Peak
7236.000	46.68	54.00	-7.32	41.30	5.38	Average	7236.000	44.53	54.00	-9.47	39.15	5.38	Average
7236.000	61.02	74.00	-12.98	55.64	5.38	Peak	7236.000	59.02	74.00	-14.98	53.64	5.38	Peak

Middle CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2389.618	37.59	54.00	-16.41	45.22	-7.63	Average	2388.892	38.37	54.00	-15.63	46.00	-7.63	Average
2389.618	56.29	74.00	-17.71		-7.63	Peak	2388.892	57.36	74.00	-16.64	64.99	-7.63	Peak
2439.470	87.88			95.40	-7.52	Average	2439.228	89.24			96.76	-7.52	Average
2439.470	98.86			106.38	-7.52	Peak	2439.228	100.48			108.00	-7.52	Peak
2483.514	38.51	54.00	-15.49	45.85	-7.34	Average	2485.450	39.23	54.00	-14.77	46.57	-7.34	Average
2483.514	55.37	74.00	-18.63	62.71	-7.34	Peak	2485.450	55.05	74.00	-18.95	62.39	-7.34	Peak
3249.300	34.59	54.00	-19.41	38.64	-4.05	Average	3249.300	40.30	54.00	-13.70	44.35	-4.05	Average
3249.300	43.17	74.00	-30.83	47.22	-4.05	Peak	3249.300	45.43	74.00	-28.57	49.48	-4.05	Peak
4874.000	35.39	54.00	-18.61	34.60	0.79	Average	4874.000	43.69	54.00	-10.31	42.90	0.79	Average
4874.000	49.56	74.00	-24.44	48.77	0.79	Peak	4874.000	58.19	74.00	-15.81	57.40	0.79	Peak
7311.000	46.13	54.00	-7.87	40.49	5.64	Average	7311.000	45.14	54.00	-8.86	39.50	5.64	Average
7311.000	61.05	74.00	-12.95	55.41	5.64	Peak	7311.000	59.44	74.00	-14.56	53.80	5.64	Peak

High CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2464.100	85.93			93.34	-7.41	Average	2464.000	88.91			96.33	-7.42	Average
2464.100	97.50			104.91	-7.41	Peak	2464.000	100.23			107.65	-7.42	Peak
2483.600	45.24	54.00	-8.76	52.58	-7.34	Average	2483.500	47.62	54.00	-6.38	54.96	-7.34	Average
2483.600	69.45	74.00	-4.55	76.79	-7.34	Peak	2483.500	72.25	74.00	-1.75	79.59	-7.34	Peak
3282.700	35.19	54.00	-18.81	39.14	-3.95	Average	3282.700	39.93	54.00	-14.07	43.88	-3.95	Average
3282.700	42.41	74.00	-31.59	46.36	-3.95	Peak	3282.700	45.71	74.00	-28.29	49.66	-3.95	Peak
4924.000	34.33	54.00	-19.67	33.49	0.84	Average	4924.000	41.38	54.00	-12.62	40.54	0.84	Average
4924.000	49.34	74.00	-24.66	48.50	0.84	Peak	4924.000	55.59	74.00	-18.41	54.75	0.84	Peak
7386.000	45.64	54.00	-8.36	39.72	5.92	Average	7386.000	42.47	54.00	-11.53	36.55	5.92	Average
7386.000	59.72	74.00	-14.28	53.80	5.92	Peak	7386.000	58.12	74.00	-15.88	52.20	5.92	Peak

IEEE 802.11n HT20:

Low CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2389.632	49.22	54.00	-4.78	56.85	-7.63	Average	2389.856	50.82	54.00	-3.18	58.45	-7.63	Average
2389.632	68.32	74.00	-5.68	75.95	-7.63	Peak	2389.856	70.53	74.00	-3.47	78.16	-7.63	Peak
2410.464	86.05			93.65	-7.60	Average	2410.464	88.90			96.50	-7.60	Average
2410.464	97.19			104.79	-7.60	Peak	2410.464	100.06			107.66	-7.60	Peak
3216.000	34.34	54.00	-19.66	38.53	-4.19	Average	3216.000	34.58	54.00	-19.42	38.77	-4.19	Average
3216.000	43.12	74.00	-30.88	47.31	-4.19	Peak	3216.000	45.59	74.00	-28.41	49.78	-4.19	Peak
4824.000	35.87	54.00	-18.13	35.23	0.64	Average	4824.000	44.04	54.00	-9.96	43.40	0.64	Average
4824.000	50.73	74.00	-23.27	50.09	0.64	Peak	4824.000	58.48	74.00	-15.52	57.84	0.64	Peak
7236.000	46.08	54.00	-7.92	40.70	5.38	Average	7236.000	44.77	54.00	-9.23	39.39	5.38	Average
7236.000	61.25	74.00	-12.75	55.87	5.38	Peak	7236.000	59.66	74.00	-14.34	54.28	5.38	Peak

Middle CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2387.440	38.24	54.00	-15.76	45.88	-7.64	Average	2387.440	38.70	54.00	-15.30	46.34	-7.64	Average
2387.440	55.75	74.00	-18.25	63.39	-7.64	Peak	2387.440	56.82	74.00	-17.18	64.46	-7.64	Peak
2435.598	86.69			94.23	-7.54	Average	2435.598	89.35			96.89	-7.54	Average
2435.598	98.08			105.62	-7.54	Peak	2435.598	99.54			107.08	-7.54	Peak
2483.998	38.88	54.00	-15.12	46.22	-7.34	Average	2483.998	39.56	54.00	-14.44	46.90	-7.34	Average
2483.998	54.85	74.00	-19.15	62.19	-7.34	Peak	2483.998	56.46	74.00	-17.54	63.80	-7.34	Peak
3249.300	34.59	54.00	-19.41	38.64	-4.05	Average	3249.300	40.71	54.00	-13.29	44.76	-4.05	Average
3249.300	43.11	74.00	-30.89	47.16	-4.05	Peak	3249.300	45.60	74.00	-28.40	49.65	-4.05	Peak
4874.000	36.44	54.00	-17.56	35.65	0.79	Average	4874.000	44.51	54.00	-9.49	43.72	0.79	Average
4874.000	50.64	74.00	-23.36	49.85	0.79	Peak	4874.000	58.44	74.00	-15.56	57.65	0.79	Peak
7311.000	46.20	54.00	-7.80	40.56	5.64	Average	7311.000	44.44	54.00	-9.56	38.80	5.64	Average
7311.000	62.41	74.00	-11.59	56.77	5.64	Peak	7311.000	59.63	74.00	-14.37	53.99	5.64	Peak

High CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2464.100	86.33			93.74	-7.41	Average	2460.400	88.92			96.35	-7.43	Average
2464.100	97.15			104.56	-7.41	Peak	2460.400	100.19			107.62	-7.43	Peak
2483.700	48.01	54.00	-5.99	55.35	-7.34	Average	2483.500	50.18	54.00	-3.82	57.52	-7.34	Average
2483.700	70.11	74.00	-3.89	77.45	-7.34	Peak	2483.500	72.81	74.00	-1.19	80.15	-7.34	Peak
3282.700	34.62	54.00	-19.38	38.57	-3.95	Average	3282.700	40.62	54.00	-13.38	44.57	-3.95	Average
3282.700	42.96	74.00	-31.04	46.91	-3.95	Peak	3282.700	45.80	74.00	-28.20	49.75	-3.95	Peak
4924.000	34.49	54.00	-19.51	33.65	0.84	Average	4924.000	41.55	54.00	-12.45	40.71	0.84	Average
4924.000	49.44	74.00	-24.56	48.60	0.84	Peak	4924.000	54.69	74.00	-19.31	53.85	0.84	Peak
7386.000	45.43	54.00	-8.57	39.51	5.92	Average	7386.000	42.63	54.00	-11.37	36.71	5.92	Average
7386.000	58.80	74.00	-15.20	52.88	5.92	Peak	7386.000	57.45	74.00	-16.55	51.53	5.92	Peak

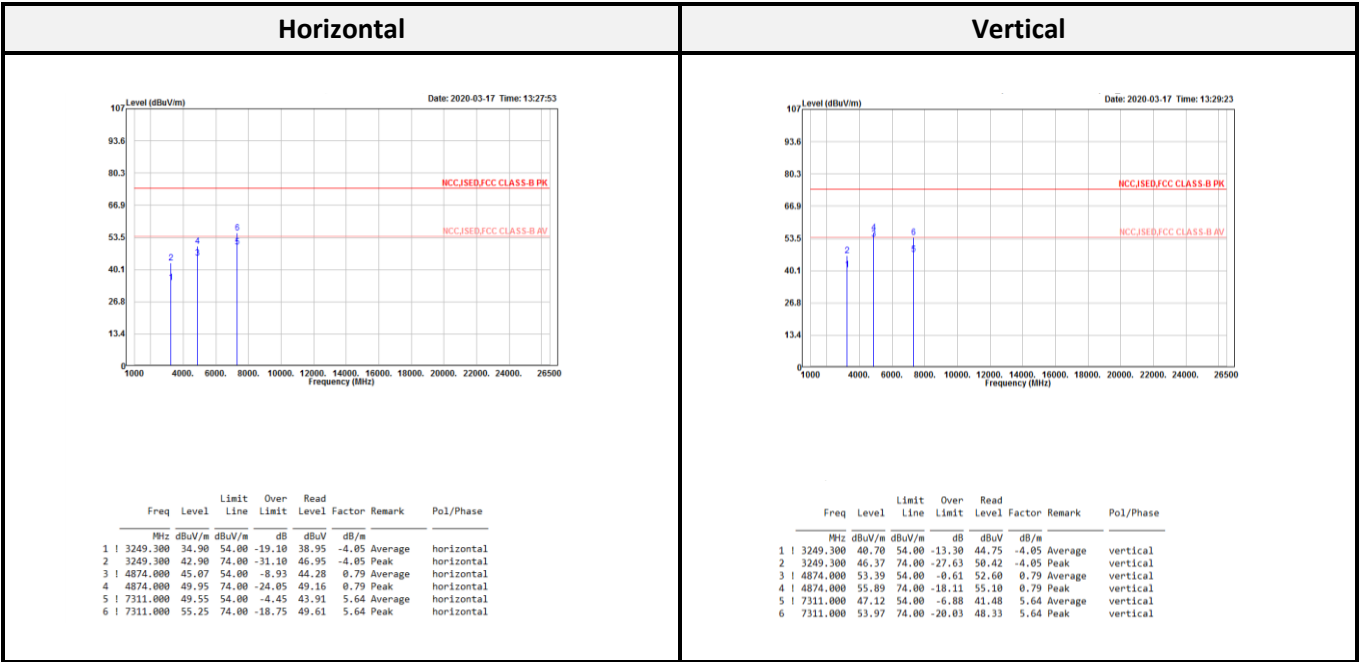
IEEE 802.11n HT40:

Low CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2389.200	48.61	54.00	-5.39	56.24	-7.63	Average	2389.200	48.08	54.00	-5.92	55.71	-7.63	Average
2389.200	66.31	74.00	-7.69	73.94	-7.63	Peak	2389.200	68.32	74.00	-5.68	75.95	-7.63	Peak
2438.700	81.05			88.57	-7.52	Average	2427.612	83.05			90.61	-7.56	Average
2438.700	91.78			99.30	-7.52	Peak	2427.612	94.46			102.02	-7.56	Peak
3229.300	34.46	54.00	-19.54	38.58	-4.12	Average	3229.300	40.53	54.00	-13.47	44.65	-4.12	Average
3229.300	43.73	74.00	-30.27	47.85	-4.12	Peak	3229.300	45.44	74.00	-28.56	49.56	-4.12	Peak
4844.000	43.54	54.00	-10.46	42.84	0.70	Average	4844.000	48.51	54.00	-5.49	47.81	0.70	Average
4844.000	47.57	74.00	-26.43	46.87	0.70	Peak	4844.000	53.68	74.00	-20.32	52.98	0.70	Peak
7266.000	50.25	54.00	-3.75	44.82	5.43	Average	7266.000	48.40	54.00	-5.60	42.97	5.43	Average
7266.000	54.01	74.00	-19.99	48.58	5.43	Peak	7266.000	52.88	74.00	-21.12	47.45	5.43	Peak

Middle CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2389.618	43.47	54.00	-10.53	51.10	-7.63	Average	2387.440	44.76	54.00	-9.24	52.40	-7.64	Average
2389.618	60.80	74.00	-13.20	68.43	-7.63	Peak	2387.440	62.61	74.00	-11.39	70.25	-7.64	Peak
2440.196	81.78			89.30	-7.52	Average	2440.680	83.25			90.77	-7.52	Average
2440.196	93.40			100.92	-7.52	Peak	2440.680	94.82			102.34	-7.52	Peak
2483.514	44.44	54.00	-9.56	51.78	-7.34	Average	2483.998	46.16	54.00	-7.84	53.50	-7.34	Average
2483.514	64.22	74.00	-9.78	71.56	-7.34	Peak	2483.998	66.12	74.00	-7.88	73.46	-7.34	Peak
3249.300	34.39	54.00	-19.61	38.44	-4.05	Average	3249.300	40.32	54.00	-13.68	44.37	-4.05	Average
3249.300	42.90	74.00	-31.10	46.95	-4.05	Peak	3249.300	45.37	74.00	-28.63	49.42	-4.05	Peak
4874.000	43.06	54.00	-10.94	42.27	0.79	Average	4874.000	48.06	54.00	-5.94	47.27	0.79	Average
4874.000	47.29	74.00	-26.71	46.50	0.79	Peak	4874.000	53.09	74.00	-20.91	52.30	0.79	Peak
7311.000	51.23	54.00	-2.77	45.59	5.64	Average	7311.000	49.24	54.00	-4.76	43.60	5.64	Average
7311.000	55.44	74.00	-18.56	49.80	5.64	Peak	7311.000	53.32	74.00	-20.68	47.68	5.64	Peak

High CH													
Horizontal							Vertical						
Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
2447.000	81.51			89.00	-7.49	Average	2457.560	83.54			90.98	-7.44	Average
2447.000	92.99			100.48	-7.49	Peak	2457.560	95.12			102.56	-7.44	Peak
2484.440	49.16	54.00	-4.84	56.50	-7.34	Average	2484.200	51.76	54.00	-2.24	59.10	-7.34	Average
2484.440	69.32	74.00	-4.68	76.66	-7.34	Peak	2484.200	72.44	74.00	-1.56	79.78	-7.34	Peak
3269.300	34.76	54.00	-19.24	38.75	-3.99	Average	3269.300	40.78	54.00	-13.22	44.77	-3.99	Average
3269.300	43.26	74.00	-30.74	47.25	-3.99	Peak	3269.300	45.54	74.00	-28.46	49.53	-3.99	Peak
4904.000	42.65	54.00	-11.35	41.80	0.85	Average	4904.000	48.15	54.00	-5.85	47.30	0.85	Average
4904.000	47.38	74.00	-26.62	46.53	0.85	Peak	4904.000	53.56	74.00	-20.44	52.71	0.85	Peak
7356.000	50.13	54.00	-3.87	44.31	5.82	Average	7356.000	49.39	54.00	-4.61	43.57	5.82	Average
7356.000	54.38	74.00	-19.62	48.56	5.82	Peak	7356.000	53.51	74.00	-20.49	47.69	5.82	Peak

Above 1G (1 GHz-26.5 GHz): The worst mode: 802.11b Middle CH.



Level = Reading Level + Correct Factor

Over Limit = Level – Limit

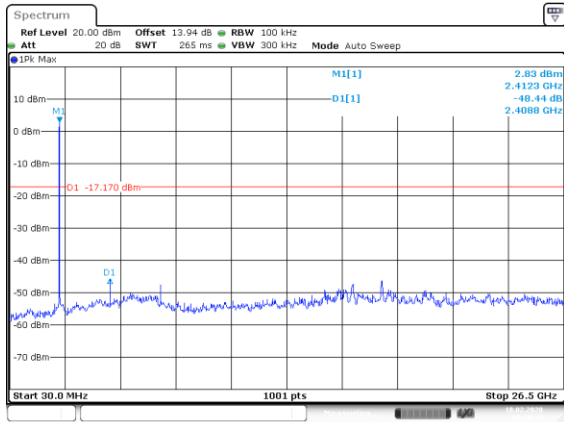
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported

Conducted Spurious Emissions:

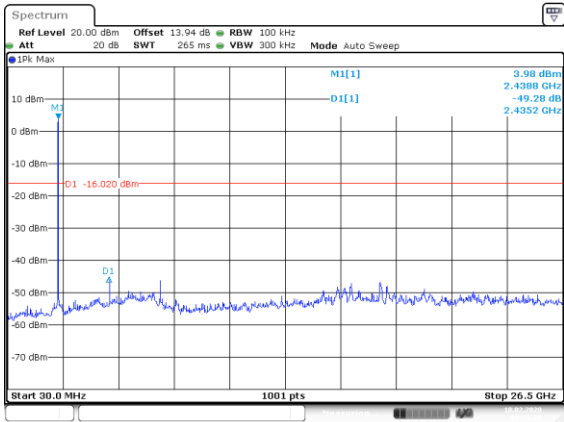
Configuration	Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Result
IEEE 802.11b	Low	2412	48.44	≥ 20	Compliance
	Mid	2437	49.28	≥ 20	Compliance
	High	2462	50.6	≥ 20	Compliance
IEEE 802.11g	Low	2412	45.10	≥ 20	Compliance
	Mid	2437	45.97	≥ 20	Compliance
	High	2462	45.45	≥ 20	Compliance
IEEE 802.11n HT20	Low	2412	43.35	≥ 20	Compliance
	Mid	2437	45.11	≥ 20	Compliance
	High	2462	44.73	≥ 20	Compliance
IEEE 802.11n HT40	Low	2422	38.11	≥ 20	Compliance
	Mid	2437	43.34	≥ 20	Compliance
	High	2452	39.71	≥ 20	Compliance

IEEE 802.11b Low CH



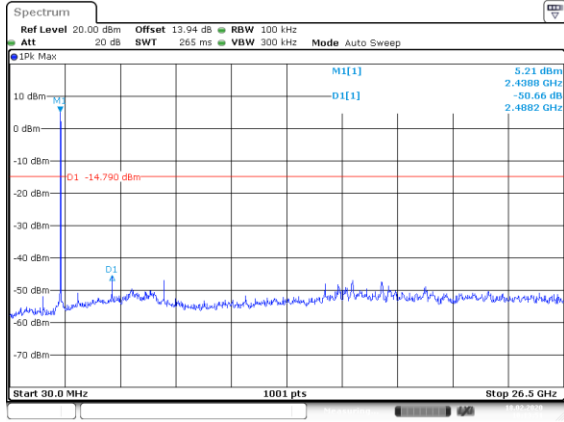
Date: 18.FEB.2020 09:38:48

IEEE 802.11b Middle CH



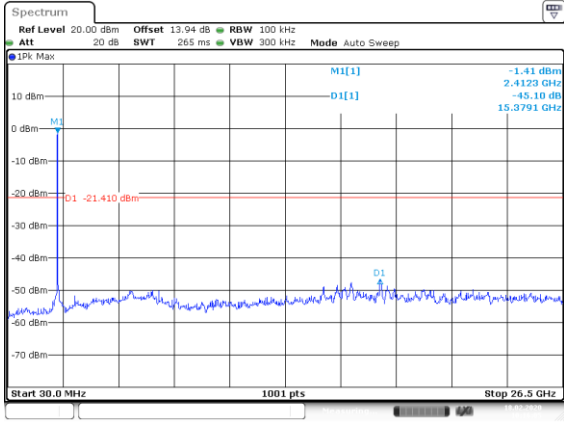
Date: 18.FEB.2020 09:56:29

IEEE 802.11b High CH



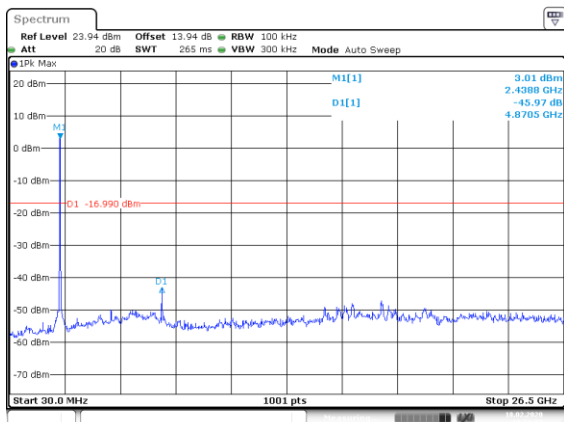
Date: 18.FEB.2020 10:13:52

IEEE 802.11g Low CH



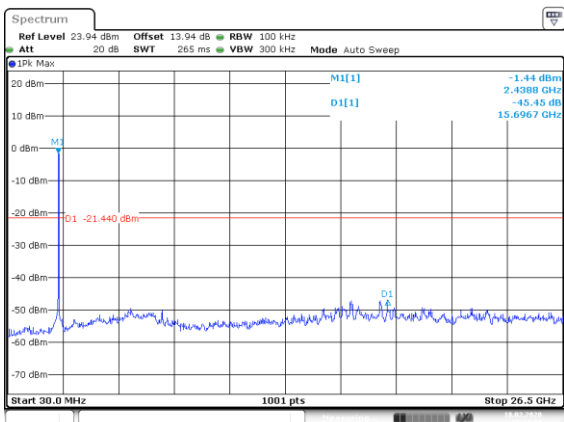
Date: 18.FEB.2020 10:16:06

IEEE 802.11g Middle CH



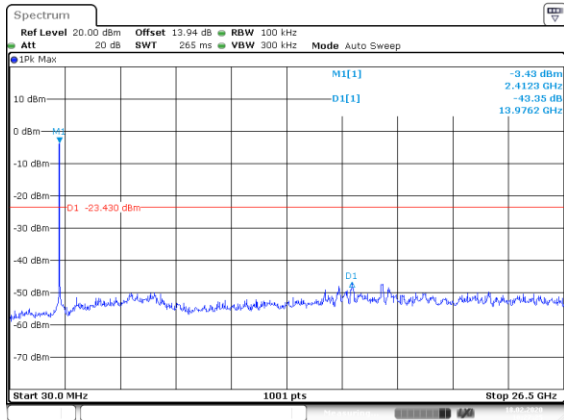
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IEEE 802.11g High CH



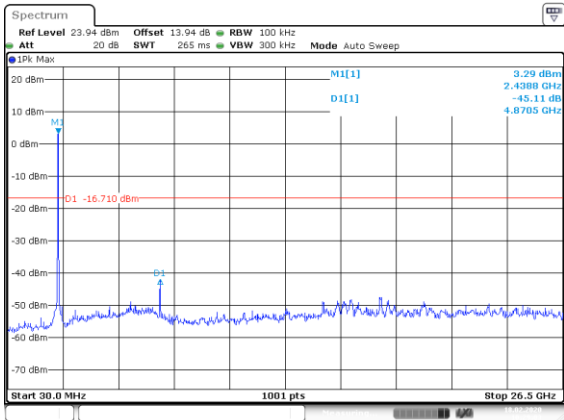
Date: 18.FEB.2020 10:24:02

IEEE 802.11n HT20 Low CH



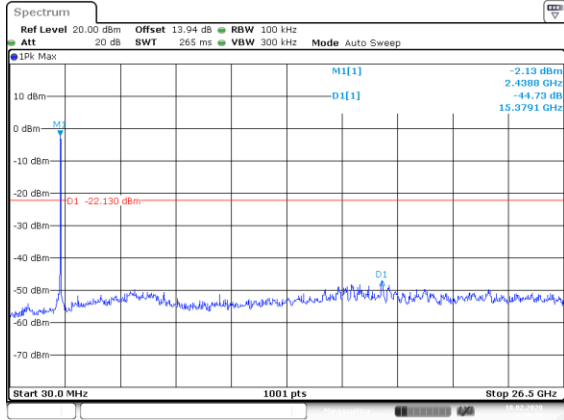
Date: 18.FEB.2020 10:27:25

IEEE 802.11n HT20 Middle CH



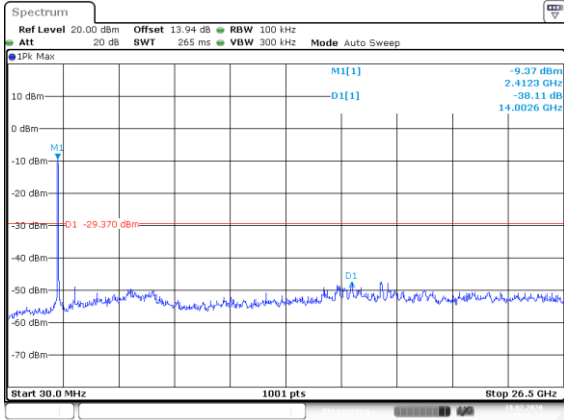
Date: 18.FEB.2020 10:29:04

IEEE 802.11n HT20 High CH



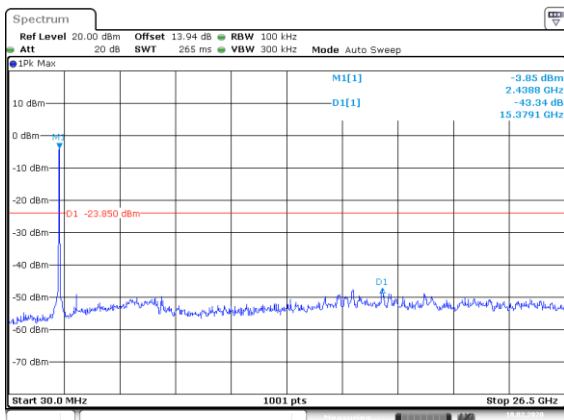
Date: 18.FEB.2020 10:30:59

IEEE 802.11n HT40 Low CH



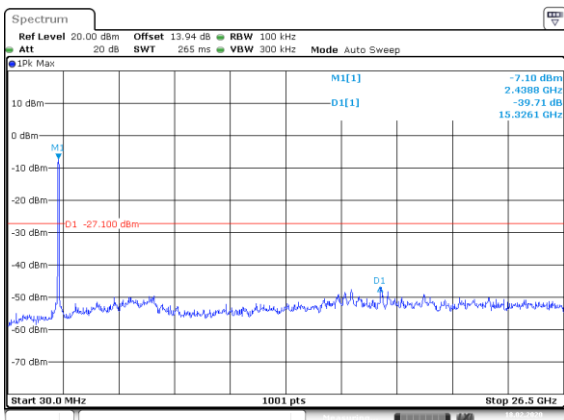
Date: 18.FEB.2020 10:30:14

IEEE 802.11n HT40 Middle CH



Date: 18.FEB.2020 10:36:05

IEEE 802.11n HT40 High CH



Date: 18.FEB.2020 10:37:59

9 FCC §15.247(a)(2) and RSS-247 Sec 5.2 – 6 dB Emission Bandwidth

9.1 Applicable Standard

According to FCC §15.247(a) (2),

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

According to RSS-247 §5.2

The minimum 6 dB bandwidth shall be 500 kHz.

According to RSS-Gen §6.7,

The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

In some cases, the “x dB bandwidth” is required, which is defined as the frequency range between two points, one at the lowest frequency below and one at the highest frequency above the carrier frequency, at which the maximum power level of the transmitted emission is attenuated x dB below the maximum in-band power level of the modulated signal, where the two points are on the outskirts of the in-band emission.

The following conditions shall be observed for measuring the occupied bandwidth and x dB bandwidth:

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.
- The detector of the spectrum analyzer shall be set to “Sample”. However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or “Max Hold”) may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

9.2 Test Procedure

6 dB Emission Bandwidth

According to ANSI C63.10-2013, the steps for the first option are as follows:

- (1) Set RBW = 100 kHz. (2) Set the VBW $\geq [3 \times \text{RBW}]$. (3) Detector = peak. (4) Trace mode = max hold.
- (5) Sweep = auto couple. (6) Allow the trace to stabilize. (7) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

99% Emission Bandwidth

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.

The following procedure shall be used for measuring 99% power bandwidth:

- a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.
- c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than $[10 \log (\text{OBW}/\text{RBW})]$ below the reference level. Specific guidance is given in 4.1.5.2.
- d) Step a) through step c) might require iteration to adjust within the specified range.
- e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.
- g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.

h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

9.3 Test Equipment List and Details

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
Conducted Room(TH-02)					
Signal Analyzer 40GHZ	Rohde & Schwarz	FSV40-N	102248	2019/09/11	2020/09/10
RF Cable	MTJ	MT40S	MT40S-001	Each Use	/

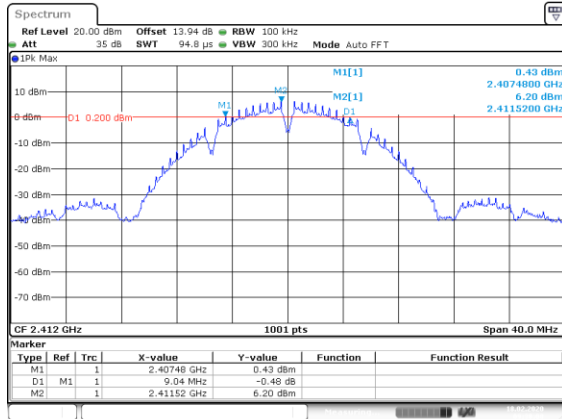
***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

9.4 Test Results

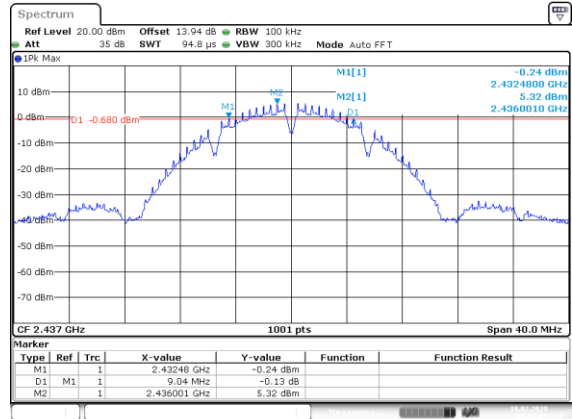
Configuration	Channel	Frequency (MHz)	99% OBW (MHz)	6 dB BW (MHz)	6dB Limit (MHz)	Result
IEEE 802.11b	Low	2412	13.95	9.04	> 0.5	Compliance
	Mid	2437	13.91	9.04	> 0.5	Compliance
	High	2462	13.95	9.04	> 0.5	Compliance
IEEE 802.11g	Low	2412	16.66	16.56	> 0.5	Compliance
	Mid	2437	17.06	16.56	> 0.5	Compliance
	High	2462	16.66	16.56	> 0.5	Compliance
IEEE 802.11n HT20	Low	2412	17.82	17.84	> 0.5	Compliance
	Mid	2437	18.14	17.76	> 0.5	Compliance
	High	2462	17.70	17.80	> 0.5	Compliance
IEEE 802.11n HT40	Low	2422	36.44	36.48	> 0.5	Compliance
	Mid	2437	36.52	36.40	> 0.5	Compliance
	High	2452	36.44	36.56	> 0.5	Compliance

6 dB Bandwidth:

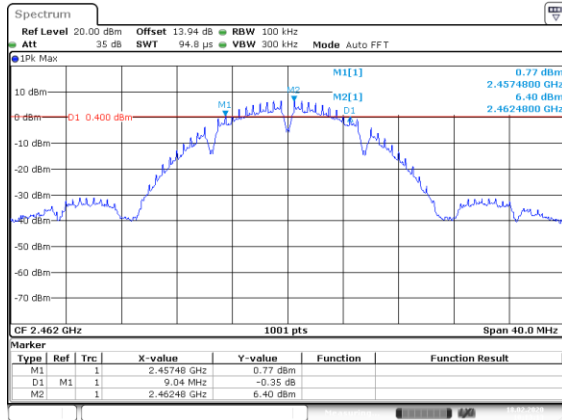
IEEE 802.11b Low CH



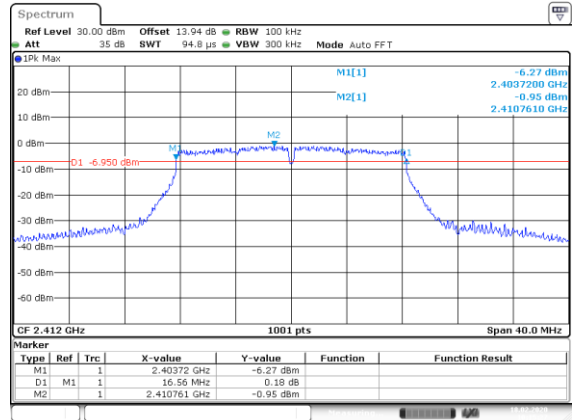
IEEE 802.11b Middle CH



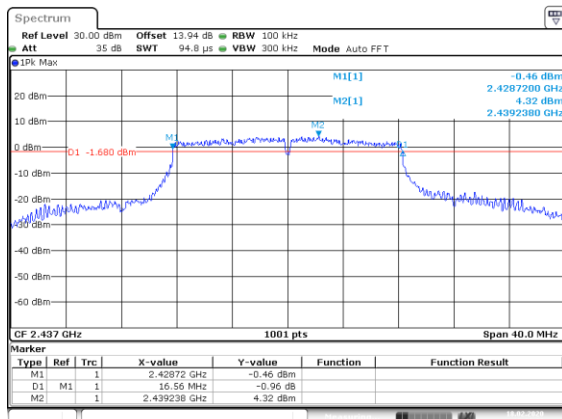
IEEE 802.11b High CH



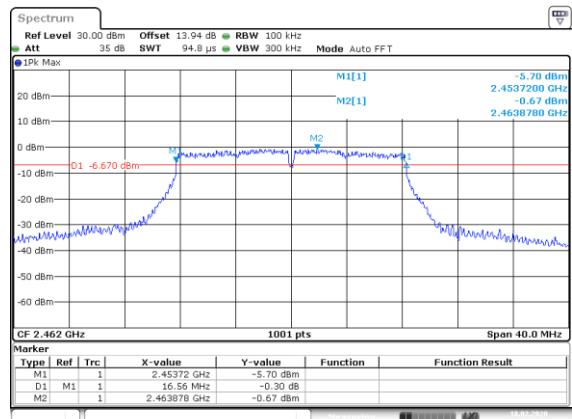
IEEE 802.11g Low CH



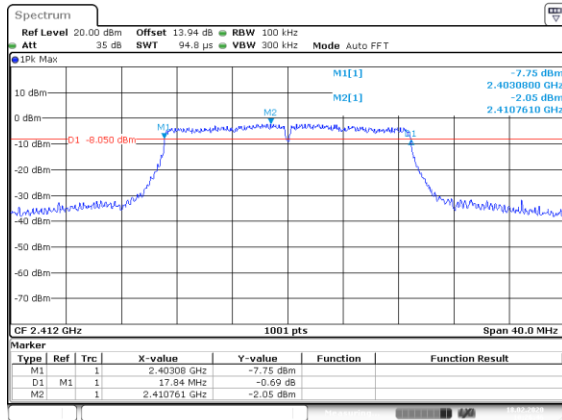
IEEE 802.11g Middle CH



IEEE 802.11g High CH

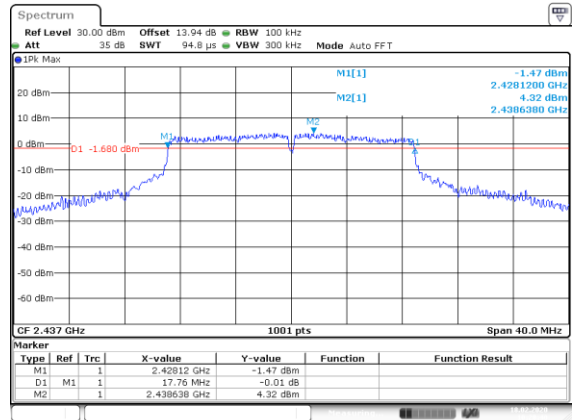


IEEE 802.11n HT20 Low CH



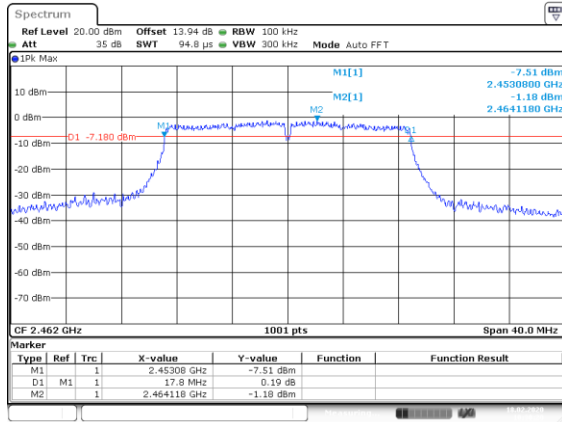
Date: 18.FEB.2020 10:26:46

IEEE 802.11n HT20 Middle CH



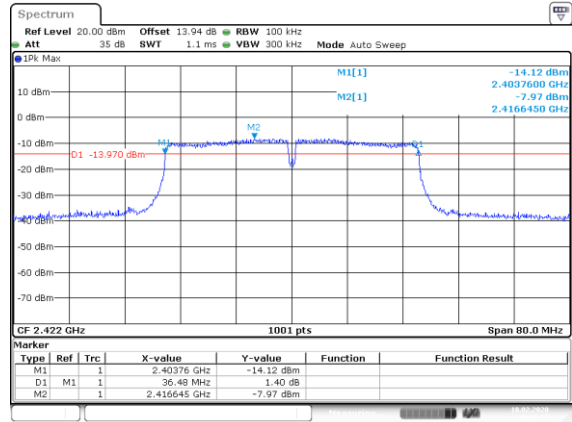
Date: 18.FEB.2020 10:28:40

IEEE 802.11n HT20 High CH



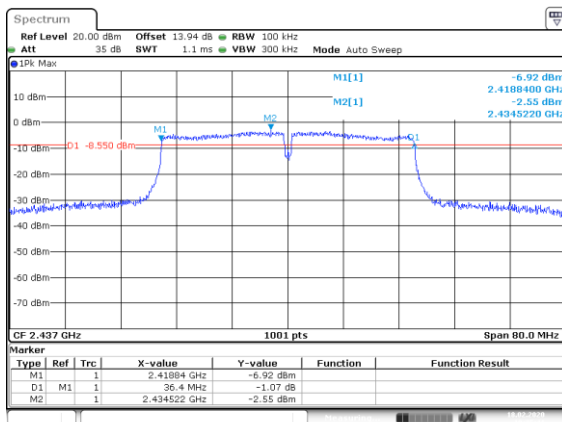
Date: 18.FEB.2020 10:30:21

IEEE 802.11n HT40 Low CH



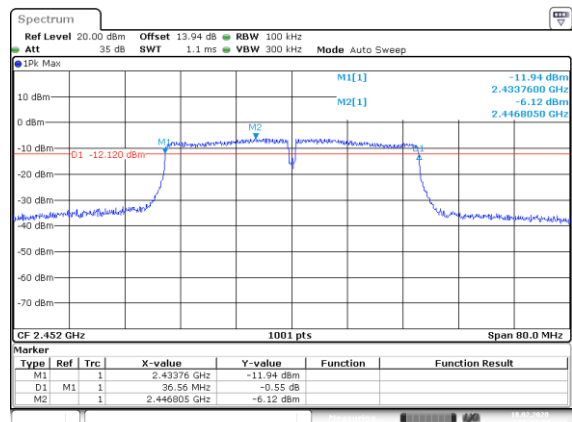
Date: 18.FEB.2020 10:32:36

IEEE 802.11n HT40 Middle CH



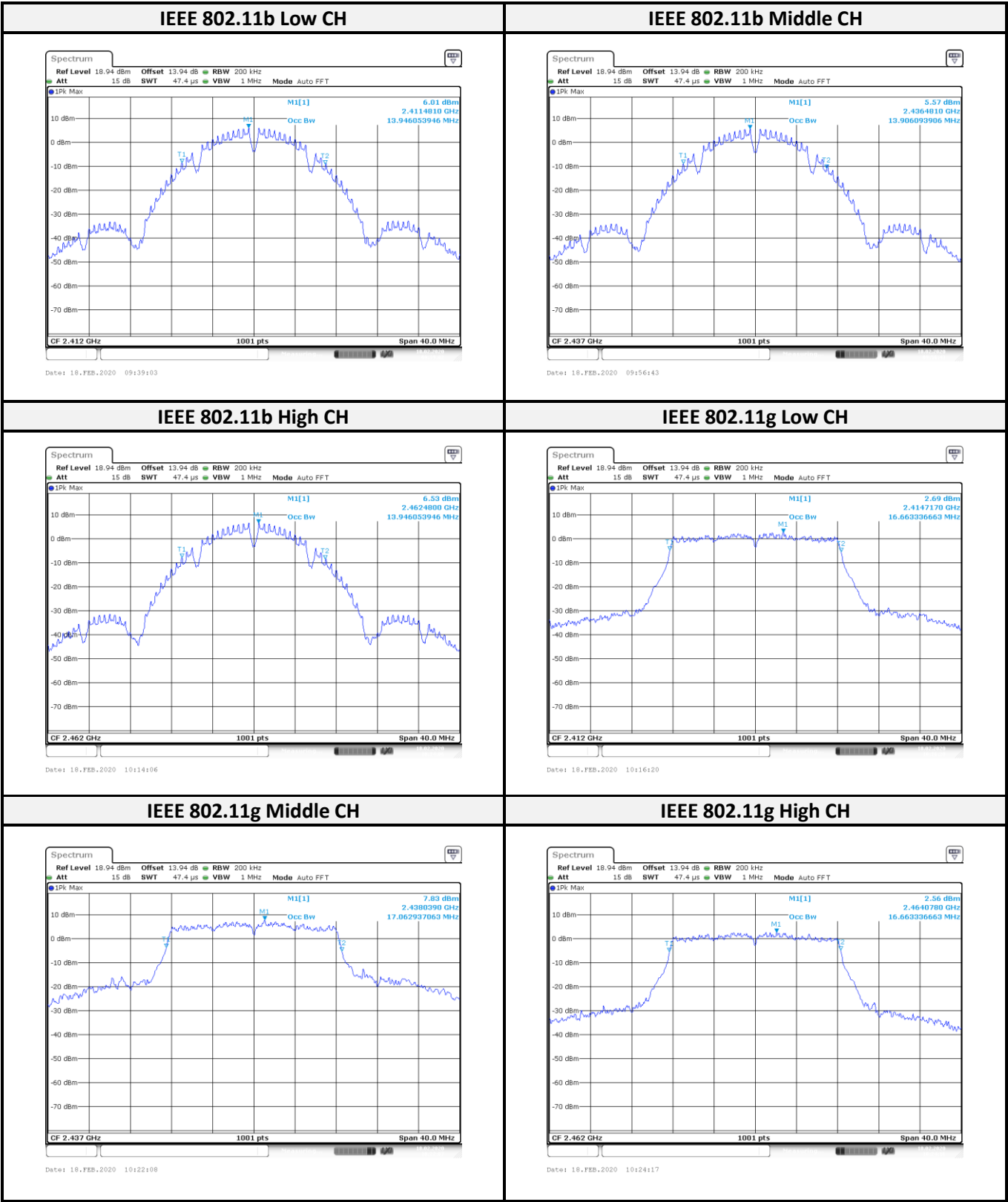
Date: 18.FEB.2020 10:35:41

IEEE 802.11n HT40 High CH

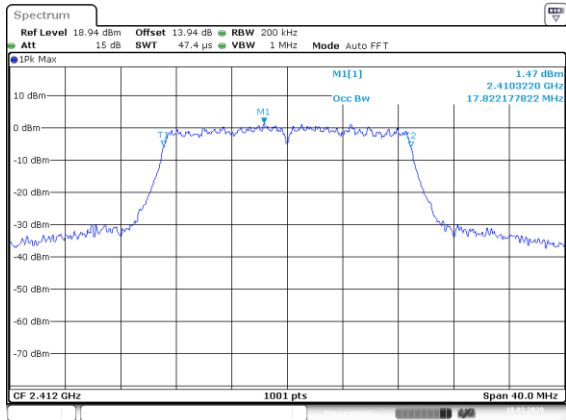


Date: 18.FEB.2020 10:37:21

Occupied Bandwidth:

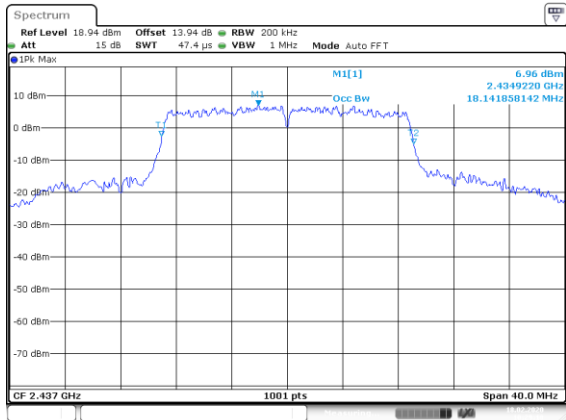


IEEE 802.11n HT20 Low CH



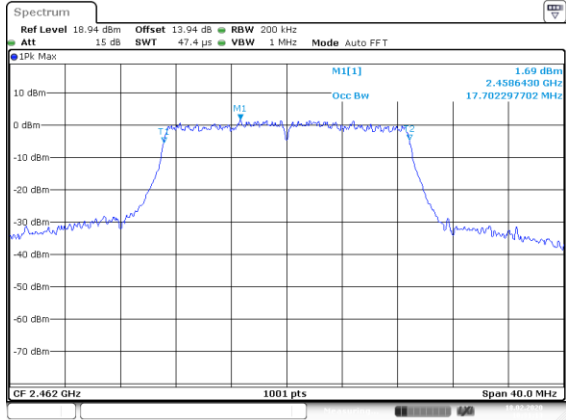
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IEEE 802.11n HT20 Middle CH



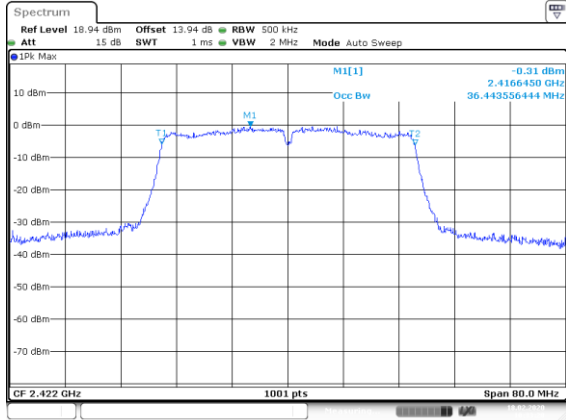
Date: 18.FEB.2020 10:29:18

IEEE 802.11n HT20 High CH



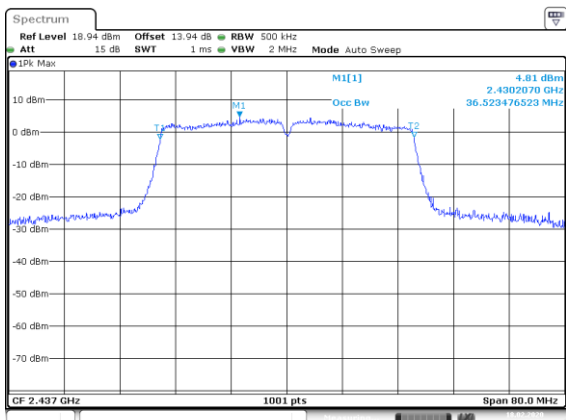
Date: 18.FEB.2020 10:31:14

IEEE 802.11n HT40 Low CH



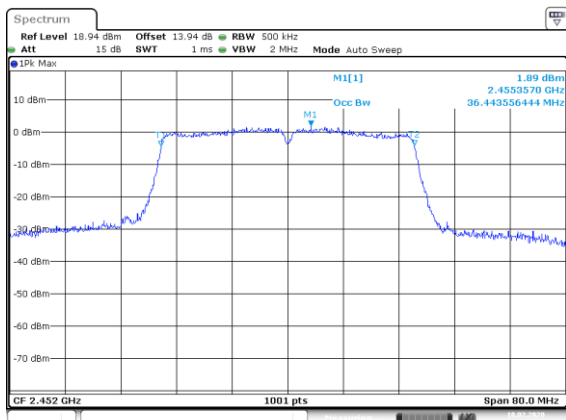
Date: 18.FEB.2020 10:33:29

IEEE 802.11n HT40 Middle CH



Date: 18.FEB.2020 10:36:20

IEEE 802.11n HT40 High CH



Date: 18.FEB.2020 10:38:14

10 FCC §15.247(b) (3) and RSS-247 Sec 5.4(d) – Maximum Output Power

10.1 Applicable Standard

According to FCC §15.247(b) (3),

Systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

According to RSS-247 §5.4(d).

For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).

10.2 Test Procedure

- (1) Place the EUT on a bench and set it in transmitting mode.
- (2) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to measuring equipment.
- (3). Add a correction factor to the display.

10.3 Test Equipment List and Details

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
Conducted Room(TH-02)					
USB Wideband Power Sensor	Agilent	U2021XA	MY56120026	2019/09/06	2020/09/05
RF Cable	MTJ	MT40S	MT40S-001	Each Use	/

***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

10.4 Test Results

<Dipole antenna (TAOGLAS GW.71.5153)>

Mode	CH	Freq. (MHz)	Peak Output Power		Ant Gain (dBi)	EIRP Peak Output Power		Limit (dBm)	EIRP Limit (dBm)
			(dBm)	(W)		(dBm)	(W)		
IEEE 802.11b	Low	2412	16.32	0.0429	3.80	20.12	0.1028	30	36
	Middle	2437	16.11	0.0408	3.80	19.91	0.0979	30	36
	High	2462	17.21	0.0526	3.80	21.01	0.1262	30	36
IEEE 802.11g	Low	2412	21.96	0.1570	3.80	25.76	0.3767	30	36
	Middle	2437	24.56	0.2858	3.80	28.36	0.6855	30	36
	High	2462	22.24	0.1675	3.80	26.04	0.4018	30	36
IEEE 802.11n HT20	Low	2412	21.21	0.1321	3.80	25.01	0.3170	30	36
	Middle	2437	24.74	0.2979	3.80	28.54	0.7145	30	36
	High	2462	22.29	0.1694	3.80	26.09	0.4064	30	36
IEEE 802.11n HT40	Low	2422	16.55	0.0452	3.80	20.35	0.1084	30	36
	Middle	2437	21.26	0.1337	3.80	25.06	0.3206	30	36
	High	2452	18.86	0.0769	3.80	22.66	0.1845	30	36

Note1: Conducted Power Limit: 1W = 30 dBm, 4W = 36 dBm

Mode	CH	Freq. (MHz)	Average Output Power		Ant Gain (dBi)	EIRP Average Output Power		Limit (dBm)	EIRP Limit (dBm)
			(dBm)	(W)		(dBm)	(W)		
IEEE 802.11b	Low	2412	14.38	0.0274	3.80	18.18	0.0658	30	36
	Middle	2437	14.06	0.0255	3.80	17.86	0.0611	30	36
	High	2462	15.31	0.0340	3.80	19.11	0.0815	30	36
IEEE 802.11g	Low	2412	12.83	0.0192	3.80	16.63	0.0460	30	36
	Middle	2437	17.75	0.0596	3.80	21.55	0.1429	30	36
	High	2462	13.25	0.0211	3.80	17.05	0.0507	30	36
IEEE 802.11n HT20	Low	2412	11.76	0.0150	3.80	15.56	0.0360	30	36
	Middle	2437	18.03	0.0635	3.80	21.83	0.1524	30	36
	High	2462	12.51	0.0178	3.80	16.31	0.0428	30	36
IEEE 802.11n HT40	Low	2422	8.29	0.0067	3.80	12.09	0.0162	30	36
	Middle	2437	12.91	0.0195	3.80	16.71	0.0469	30	36
	High	2452	10.31	0.0107	3.80	14.11	0.0258	30	36

Note1: Conducted Power Limit: 1W = 30 dBm, 4W = 36 dBm

Note2: Duty Cycle is 100% and Duty Factor is 0 dB

< Dipole antenna (Inside WLAN PRO-IS-299)>

Mode	CH	Freq. (MHz)	Peak Output Power		Ant Gain (dBi)	EIRP Peak Output Power		Limit (dBm)	EIRP Limit (dBm)
			(dBm)	(W)		(dBm)	(W)		
IEEE 802.11b	Low	2412	16.93	0.0493	2.50	19.43	0.0877	30	36
	Middle	2437	16.77	0.0475	2.50	19.27	0.0845	30	36
	High	2462	18.76	0.0752	2.50	21.26	0.1337	30	36
IEEE 802.11g	Low	2412	24.65	0.2917	2.50	27.15	0.5188	30	36
	Middle	2437	24.11	0.2576	2.50	26.61	0.4581	30	36
	High	2462	24.09	0.2564	2.50	26.59	0.4560	30	36
IEEE 802.11n HT20	Low	2412	24.42	0.2767	2.50	26.92	0.4920	30	36
	Middle	2437	24.74	0.2979	2.50	27.24	0.5297	30	36
	High	2462	24.77	0.2999	2.50	27.27	0.5333	30	36
IEEE 802.11n HT40	Low	2422	22.53	0.1791	2.50	25.03	0.3184	30	36
	Middle	2437	22.24	0.1675	2.50	24.74	0.2979	30	36
	High	2452	22.94	0.1968	2.50	25.44	0.3499	30	36

Note1: Conducted Power Limit: 1W = 30 dBm, 4W = 36 dBm

Mode	CH	Freq. (MHz)	Average Output Power		Ant Gain (dBi)	EIRP Average Output Power		Limit (dBm)	EIRP Limit (dBm)
			(dBm)	(W)		(dBm)	(W)		
IEEE 802.11b	Low	2412	15.02	0.0318	2.50	17.52	0.0565	30	36
	Middle	2437	14.82	0.0303	2.50	17.32	0.0540	30	36
	High	2462	16.84	0.0483	2.50	19.34	0.0859	30	36
IEEE 802.11g	Low	2412	17.84	0.0608	2.50	20.34	0.1081	30	36
	Middle	2437	17.51	0.0564	2.50	20.01	0.1002	30	36
	High	2462	13.54	0.0226	2.50	16.04	0.0402	30	36
IEEE 802.11n HT20	Low	2412	17.81	0.0604	2.50	20.31	0.1074	30	36
	Middle	2437	18.03	0.0635	2.50	20.53	0.1130	30	36
	High	2462	17.93	0.0621	2.50	20.43	0.1104	30	36
IEEE 802.11n HT40	Low	2422	14.62	0.0290	2.50	17.12	0.0515	30	36
	Middle	2437	14.33	0.0271	2.50	16.83	0.0482	30	36
	High	2452	13.91	0.0246	2.50	16.41	0.0438	30	36

Note1: Conducted Power Limit: 1W = 30 dBm, 4W = 36 dBm

Note2: Duty Cycle is 100% and Duty Factor is 0 dB

< PCB Antenna (Redpine Signals RSIA7)>

Mode	CH	Freq. (MHz)	Peak Output Power		Ant Gain (dBi)	EIRP Peak Output Power		Limit (dBm)	EIRP Limit (dBm)
			(dBm)	(W)		(dBm)	(W)		
IEEE 802.11b	Low	2412	16.32	0.0429	0.71	17.03	0.0505	30	36
	Middle	2437	16.11	0.0408	0.71	16.82	0.0481	30	36
	High	2462	15.29	0.0338	0.71	16.00	0.0398	30	36
IEEE 802.11g	Low	2412	21.96	0.1570	0.71	22.67	0.1849	30	36
	Middle	2437	24.35	0.2723	0.71	25.06	0.3206	30	36
	High	2462	18.97	0.0789	0.71	19.68	0.0929	30	36
IEEE 802.11n HT20	Low	2412	21.18	0.1312	0.71	21.89	0.1545	30	36
	Middle	2437	24.74	0.2979	0.71	25.45	0.3508	30	36
	High	2462	18.31	0.0678	0.71	19.02	0.0798	30	36
IEEE 802.11n HT40	Low	2422	16.48	0.0445	0.71	17.19	0.0524	30	36
	Middle	2437	18.42	0.0695	0.71	19.13	0.0818	30	36
	High	2452	14.76	0.0299	0.71	15.47	0.0352	30	36

Note1: Conducted Power Limit: 1W = 30 dBm, 4W = 36 dBm

Mode	CH	Freq. (MHz)	Average Output Power		Ant Gain (dBi)	EIRP Average Output Power		Limit (dBm)	EIRP Limit (dBm)
			(dBm)	(W)		(dBm)	(W)		
IEEE 802.11b	Low	2412	14.38	0.0274	0.71	16.88	0.0488	30	36
	Middle	2437	14.06	0.0255	0.71	16.56	0.0453	30	36
	High	2462	12.98	0.0199	0.71	15.48	0.0353	30	36
IEEE 802.11g	Low	2412	12.83	0.0192	0.71	15.33	0.0341	30	36
	Middle	2437	17.87	0.0612	0.71	20.37	0.1089	30	36
	High	2462	9.84	0.0096	0.71	12.34	0.0171	30	36
IEEE 802.11n HT20	Low	2412	11.59	0.0144	0.71	14.09	0.0256	30	36
	Middle	2437	18.03	0.0635	0.71	20.53	0.1130	30	36
	High	2462	9.01	0.0080	0.71	11.51	0.0142	30	36
IEEE 802.11n HT40	Low	2422	8.17	0.0066	0.71	10.67	0.0117	30	36
	Middle	2437	10.63	0.0116	0.71	13.13	0.0206	30	36
	High	2452	7.01	0.0050	0.71	9.51	0.0089	30	36

Note1: Conducted Power Limit: 1W = 30 dBm, 4W = 36 dBm

Note2: Duty Cycle is 100% and Duty Factor is 0 dB

< PIFA Antenna (SMARTEQ 4211613980)>

Mode	CH	Freq. (MHz)	Peak Output Power		Ant Gain (dBi)	EIRP Peak Output Power		Limit (dBm)	EIRP Limit (dBm)
			(dBm)	(W)		(dBm)	(W)		
IEEE 802.11b	Low	2412	16.32	0.0429	0.00	16.32	0.0429	30	36
	Middle	2437	16.77	0.0475	0.00	16.77	0.0475	30	36
	High	2462	17.21	0.0526	0.00	17.21	0.0526	30	36
IEEE 802.11g	Low	2412	24.65	0.2917	0.00	24.65	0.2917	30	36
	Middle	2437	24.56	0.2858	0.00	24.56	0.2858	30	36
	High	2462	23.72	0.2355	0.00	23.72	0.2355	30	36
IEEE 802.11n HT20	Low	2412	21.21	0.1321	0.00	21.21	0.1321	30	36
	Middle	2437	24.74	0.2979	0.00	24.74	0.2979	30	36
	High	2462	23.95	0.2483	0.00	23.95	0.2483	30	36
IEEE 802.11n HT40	Low	2422	22.53	0.1791	0.00	22.53	0.1791	30	36
	Middle	2437	22.24	0.1675	0.00	22.24	0.1675	30	36
	High	2452	22.94	0.1968	0.00	22.94	0.1968	30	36

Note1: Conducted Power Limit: 1W = 30 dBm, 4W = 36 dBm

Mode	CH	Freq. (MHz)	Average Output Power		Ant Gain (dBi)	EIRP Average Output Power		Limit (dBm)	EIRP Limit (dBm)
			(dBm)	(W)		(dBm)	(W)		
IEEE 802.11b	Low	2412	14.38	0.0274	0.00	14.38	0.0274	30	36
	Middle	2437	14.82	0.0303	0.00	14.82	0.0303	30	36
	High	2462	15.31	0.0340	0.00	15.31	0.0340	30	36
IEEE 802.11g	Low	2412	17.84	0.0608	0.00	17.84	0.0608	30	36
	Middle	2437	17.75	0.0596	0.00	17.75	0.0596	30	36
	High	2462	16.05	0.0403	0.00	16.05	0.0403	30	36
IEEE 802.11n HT20	Low	2412	11.76	0.0150	0.00	11.76	0.0150	30	36
	Middle	2437	18.03	0.0635	0.00	18.03	0.0635	30	36
	High	2462	16.56	0.0453	0.00	16.56	0.0453	30	36
IEEE 802.11n HT40	Low	2422	14.62	0.0290	0.00	14.62	0.0290	30	36
	Middle	2437	14.33	0.0271	0.00	14.33	0.0271	30	36
	High	2452	13.91	0.0246	0.00	13.91	0.0246	30	36

Note1: Conducted Power Limit: 1W = 30 dBm, 4W = 36 dBm

Note2: Duty Cycle is 100% and Duty Factor is 0 dB

11 FCC §15.247(d) and RSS-247 Sec 5.5 – 100 kHz Bandwidth of Frequency Band Edge

11.1 Applicable Standard

According to FCC §15.247(d),

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Attenuation below the general limits specified in §15.209(a) is not required. 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)).

According to RSS-247 §5.5. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

11.2 Test Procedure

- (1) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- (2) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- (3) Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- (4) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.

11.3 Test Equipment List and Details

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
Conducted Room(TH-02)					
Signal Analyzer 40GHZ	Rohde & Schwarz	FSV40-N	102248	2019/09/11	2020/09/10
RF Cable	MTJ	MT40S	MT40S-001	Each Use	/

***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

11.4 Test Results**< Dipole antenna (TAOGLAS GW.71.5153)>**

Configuration	Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Result
IEEE 802.11b	Low	2412	38.45	≥ 20	Compliance
	High	2462	44.90	≥ 20	Compliance
IEEE 802.11g	Low	2412	30.35	≥ 20	Compliance
	High	2462	37.71	≥ 20	Compliance
IEEE 802.11n HT20	Low	2412	31.14	≥ 20	Compliance
	High	2462	35.70	≥ 20	Compliance
IEEE 802.11n HT40	Low	2422	26.68	≥ 20	Compliance
	High	2452	30.47	≥ 20	Compliance

< Dipole antenna (Inside WLAN PRO-IS-299)>

Configuration	Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Result
IEEE 802.11b	Low	2412	37.06	≥ 20	Compliance
	High	2462	45.44	≥ 20	Compliance
IEEE 802.11g	Low	2412	24.50	≥ 20	Compliance
	High	2462	35.15	≥ 20	Compliance
IEEE 802.11n HT20	Low	2412	23.59	≥ 20	Compliance
	High	2462	32.08	≥ 20	Compliance
IEEE 802.11n HT40	Low	2422	25.28	≥ 20	Compliance
	High	2452	26.98	≥ 20	Compliance

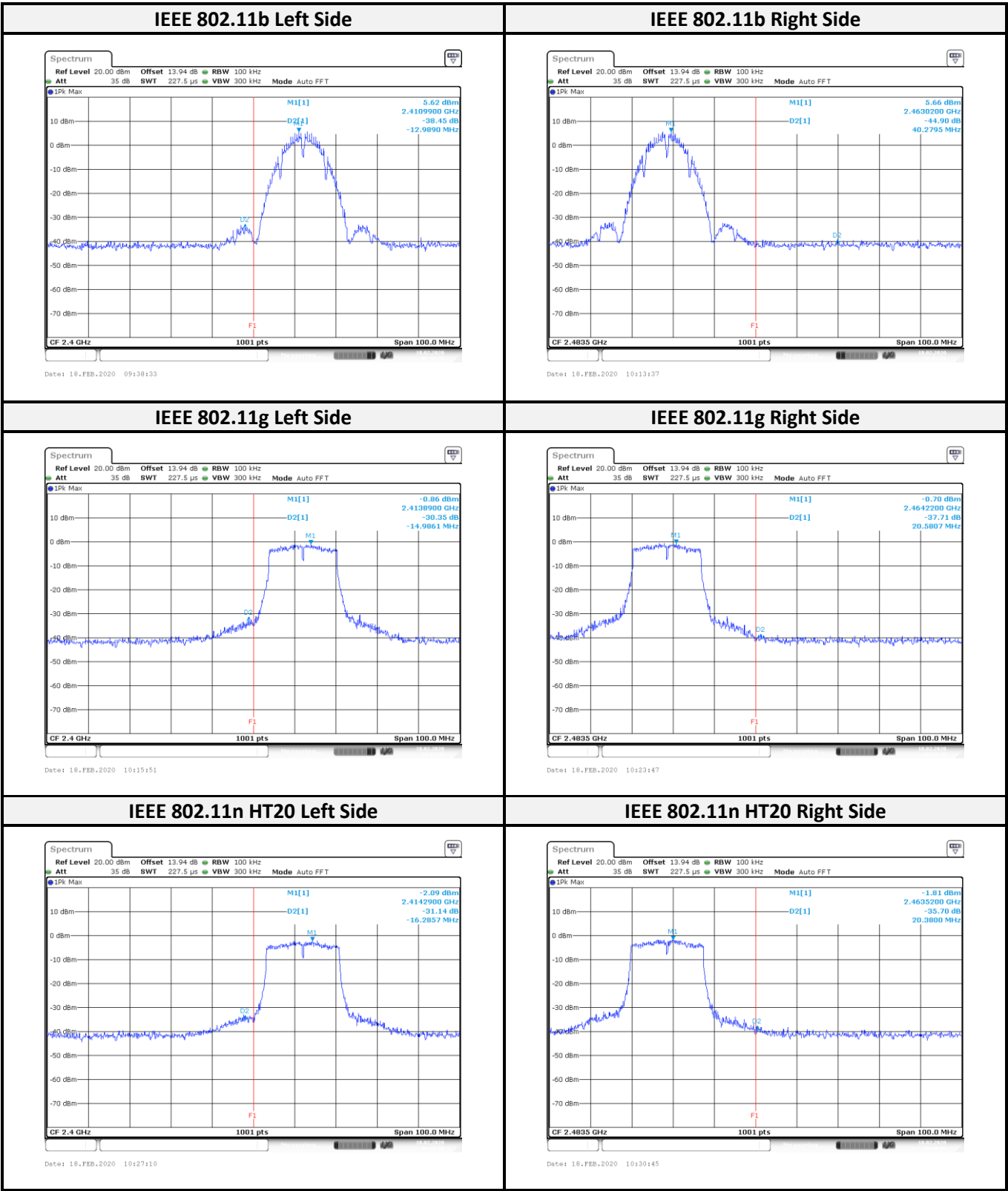
< PCB Antenna (Redpine Signals RSIA7)>

Configuration	Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Result
IEEE 802.11b	Low	2412	38.45	≥ 20	Compliance
	High	2462	43.41	≥ 20	Compliance
IEEE 802.11g	Low	2412	30.35	≥ 20	Compliance
	High	2462	34.52	≥ 20	Compliance
IEEE 802.11n HT20	Low	2412	31.14	≥ 20	Compliance
	High	2462	33.58	≥ 20	Compliance
IEEE 802.11n HT40	Low	2422	26.68	≥ 20	Compliance
	High	2452	28.92	≥ 20	Compliance

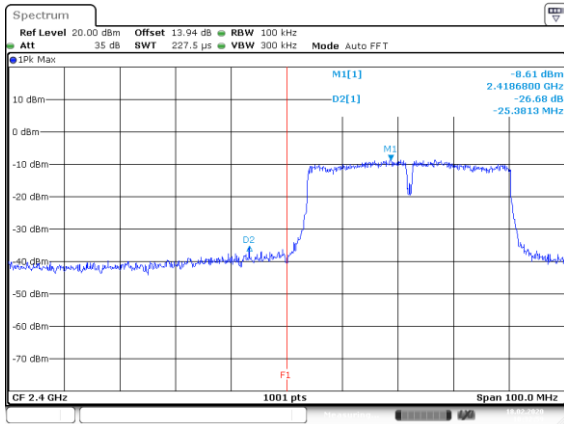
< PIFA Antenna (SMARTEQ 4211613980)>

Configuration	Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Result
IEEE 802.11b	Low	2412	39.78	≥ 20	Compliance
	High	2462	43.23	≥ 20	Compliance
IEEE 802.11g	Low	2412	25.09	≥ 20	Compliance
	High	2462	38.02	≥ 20	Compliance
IEEE 802.11n HT20	Low	2412	30.83	≥ 20	Compliance
	High	2462	32.91	≥ 20	Compliance
IEEE 802.11n HT40	Low	2422	26.50	≥ 20	Compliance
	High	2452	28.83	≥ 20	Compliance

< Dipole antenna (TAOGLAS GW.71.5153)>

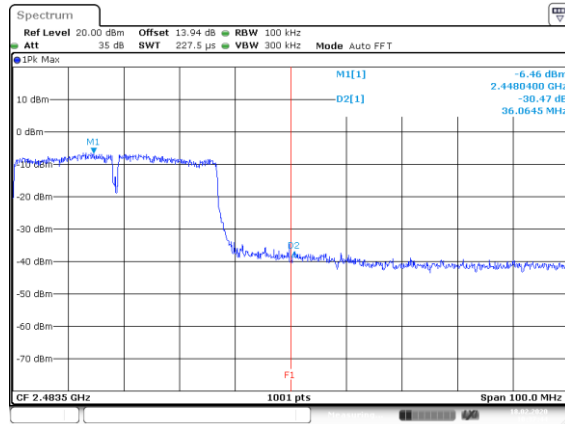


IEEE 802.11n HT40 Left Side



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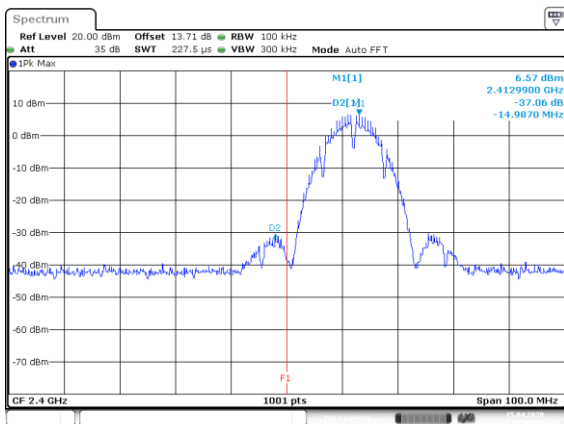
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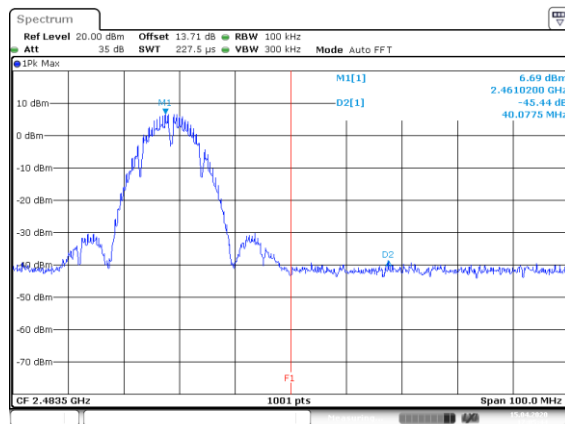
< Dipole antenna (Inside WLAN PRO-IS-299)>

IEEE 802.11b Left Side



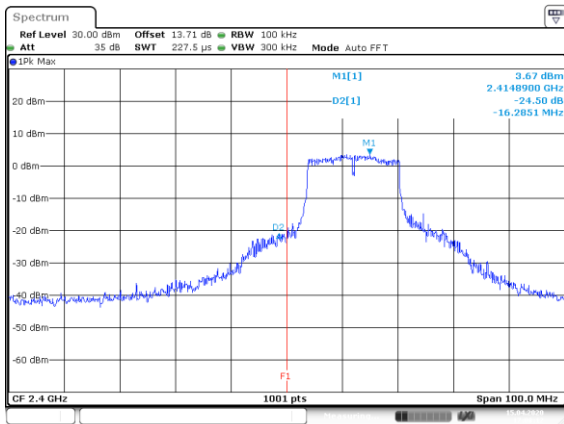
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IEEE 802.11b Right Side



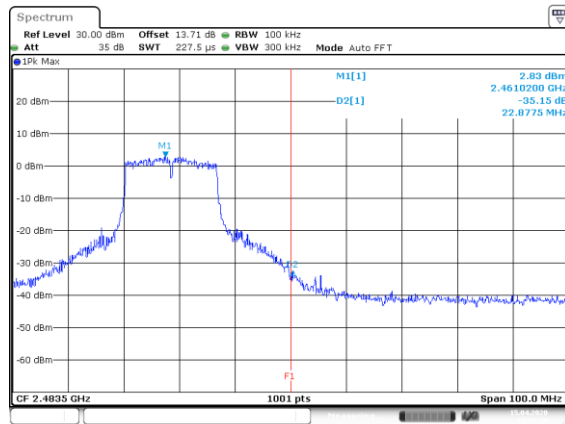
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IEEE 802.11g Left Side



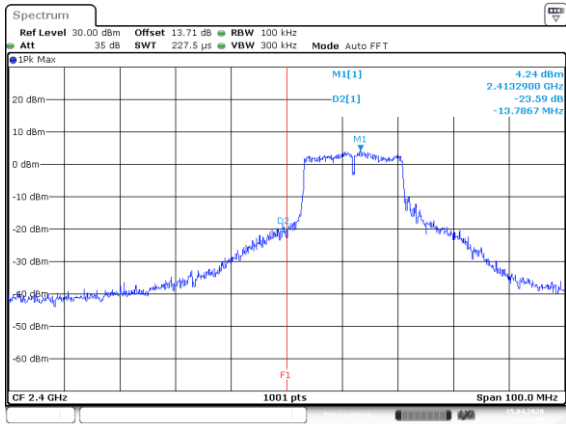
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IEEE 802.11g Right Side

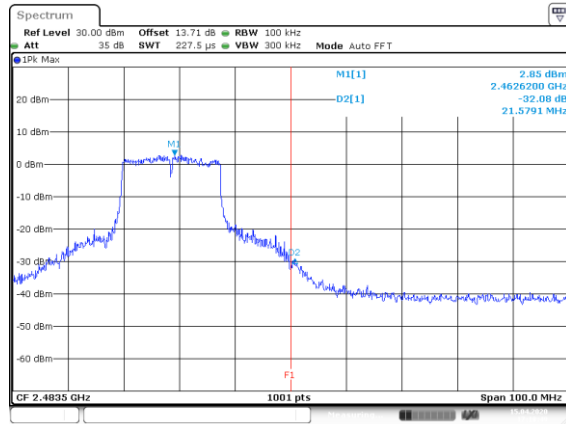


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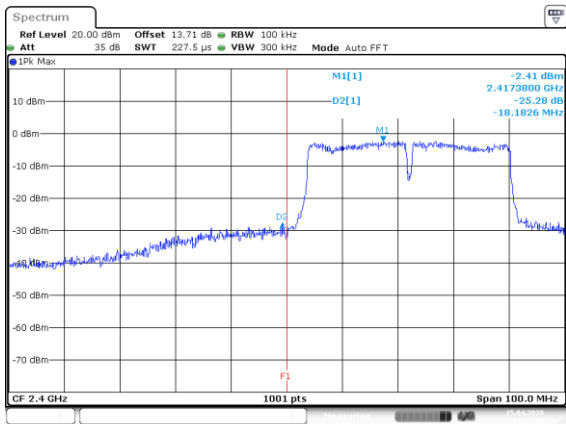
IEEE 802.11n HT20 Left Side



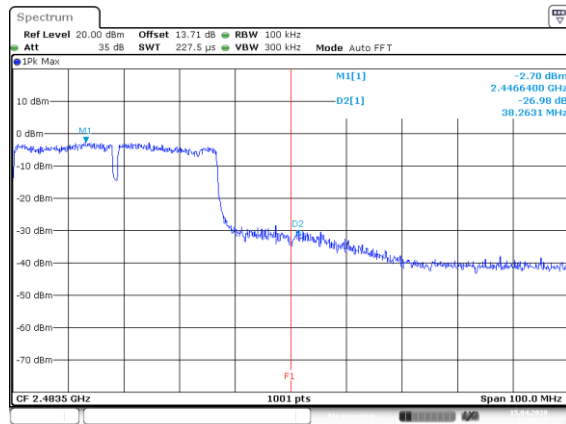
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IEEE 802.11n HT40 Left Side

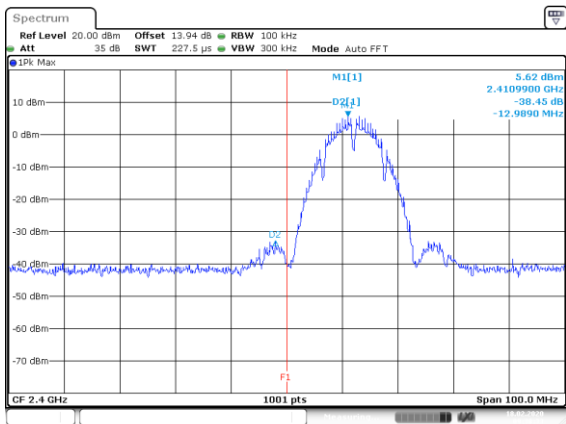


IEEE 802.11n HT40 Right Side

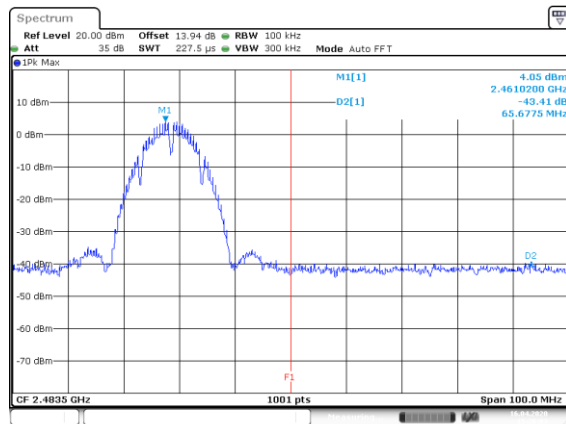


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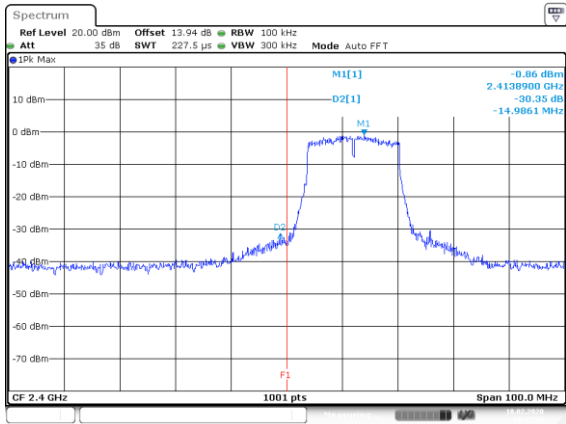
IEEE 802.11b Left Side



IEEE 802.11b Right Side

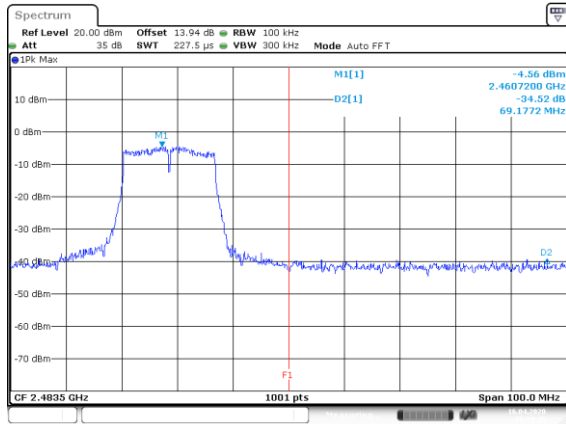


IEEE 802.11g Left Side



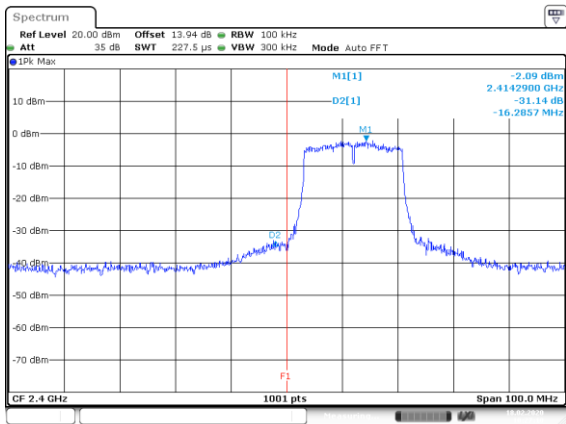
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IEEE 802.11g Right Side



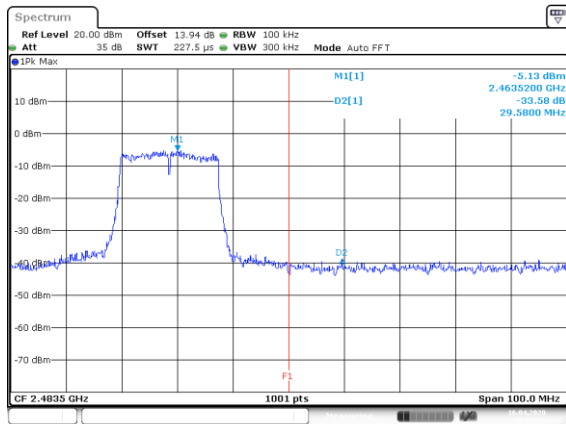
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IEEE 802.11n HT20 Left Side



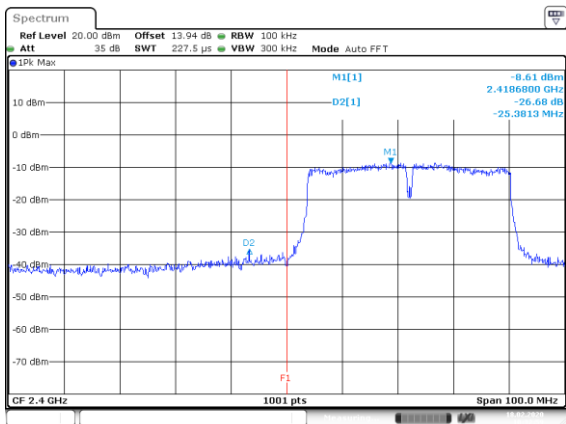
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IEEE 802.11n HT20 Right Side



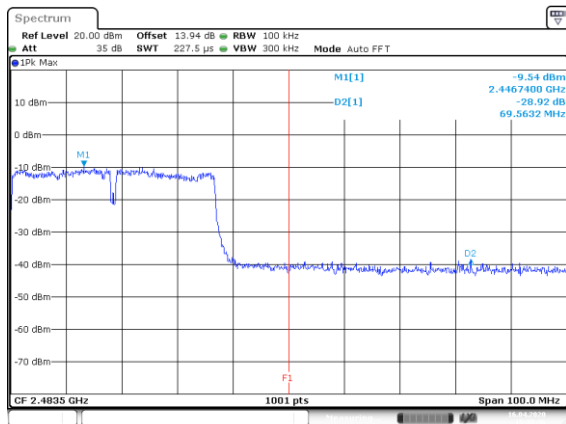
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IEEE 802.11n HT40 Left Side



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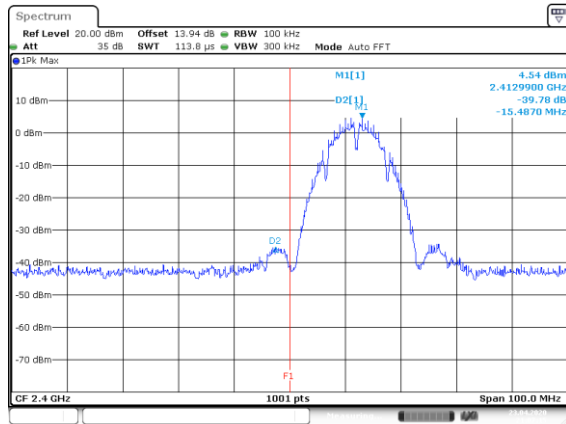
IEEE 802.11n HT40 Right Side



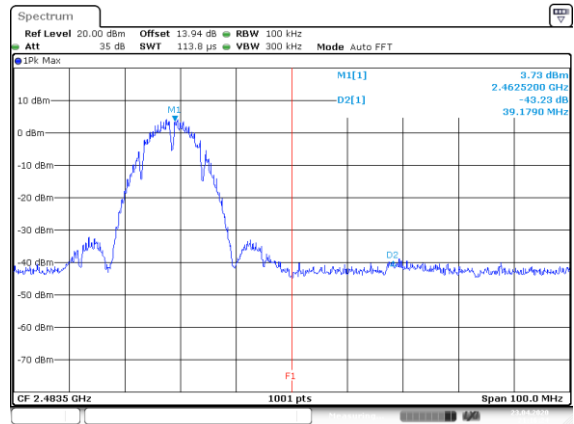
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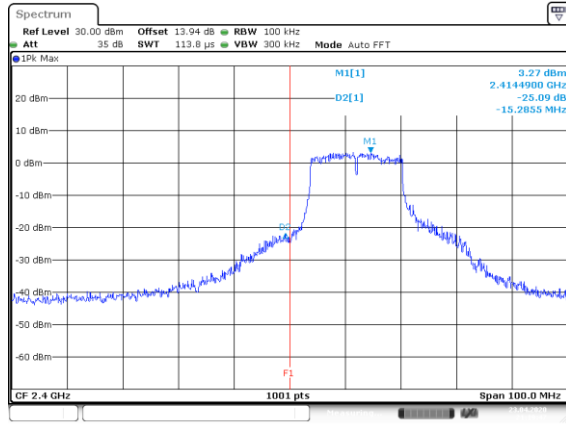
IEEE 802.11b Left Side



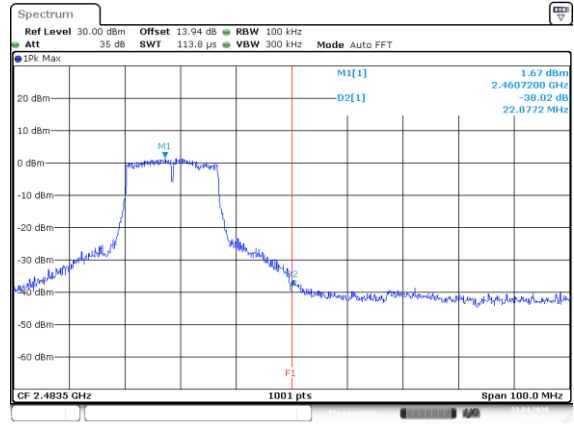
IEEE 802.11b Right Side



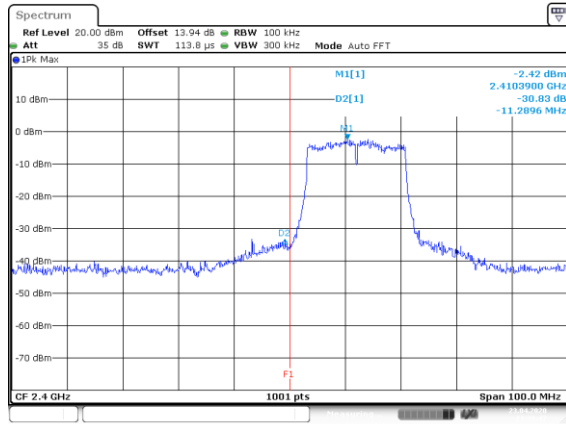
IEEE 802.11g Left Side



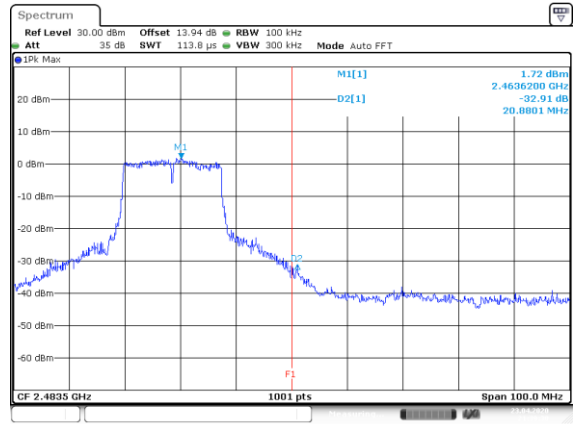
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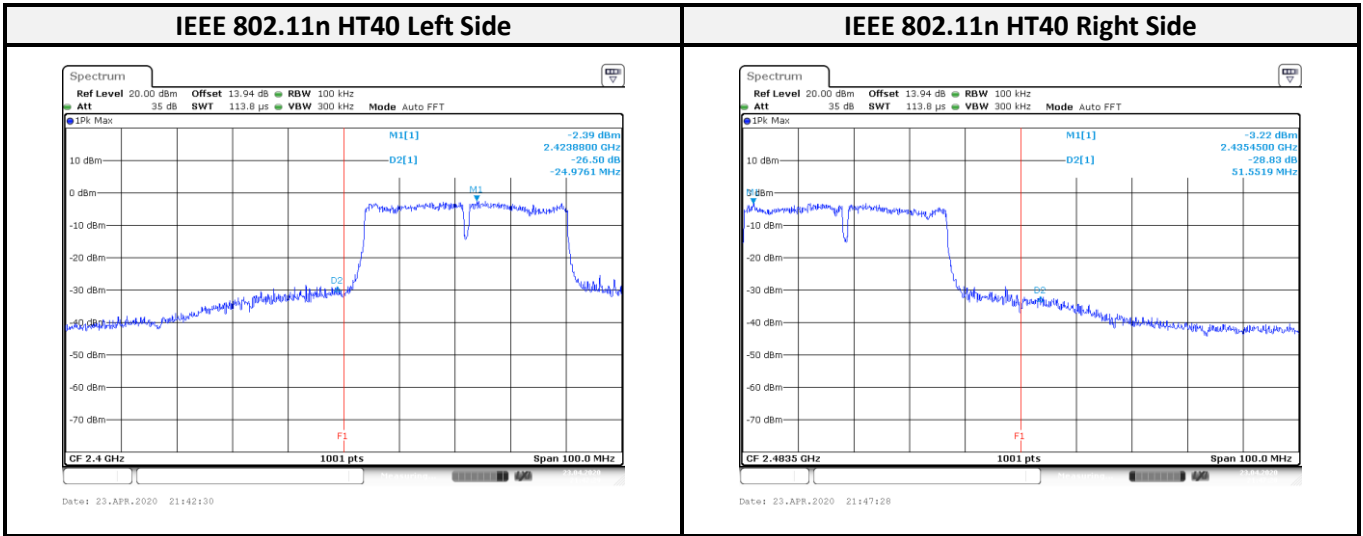


IEEE 802.11n HT20 Left Side



IEEE 802.11n HT20 Right Side





12 FCC §15.247(e) and RSS-247 Sec 5.2(b)– Power Spectral Density

12.1 Applicable Standard

According to FCC §15.247(e),

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

According to RSS-247 §5.2(b).

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of section 5.4(d), (i.e. the power spectral density shall be determined using the same method as is used to determine the conducted output power).

12.2 Test Procedure

According to ANSI C63.10-2013,

- (1) Set analyzer center frequency to DTS channel center frequency.
- (2) Set the span to 1.5 times the DTS bandwidth. (3) Set the RBW to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- (4) Set the VBW $\geq [3 \times \text{RBW}]$. (5) Detector = peak. (6) Sweep time = auto couple.
- (7) Trace mode = max hold. (8) Allow trace to fully stabilize.
- (9) Use the peak marker function to determine the maximum amplitude level within the RBW.
- (10) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

12.3 Test Equipment List and Details

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
Conducted Room(TH-02)					
Signal Analyzer 40GHZ	Rohde & Schwarz	FSV40-N	102248	2019/09/11	2020/09/10
RF Cable	MTJ	MT40S	MT40S-001	Each Use	/

***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

12.4 Test Results

< Dipole antenna (TAOGLAS GW.71.5153)>

Configuration	Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Result
IEEE 802.11b	Low	2412	-7.43	8	Compliance
	Mid	2437	-8.20	8	Compliance
	High	2462	-6.98	8	Compliance
IEEE 802.11g	Low	2412	-11.16	8	Compliance
	Mid	2437	-5.82	8	Compliance
	High	2462	-10.70	8	Compliance
IEEE 802.11n HT20	Low	2412	-10.95	8	Compliance
	Mid	2437	-5.69	8	Compliance
	High	2462	-10.44	8	Compliance
IEEE 802.11n HT40	Low	2422	-17.69	8	Compliance
	Mid	2437	-13.29	8	Compliance
	High	2452	-16.25	8	Compliance

< Dipole antenna (Inside WLAN PRO-IS-299)>

Configuration	Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Result
IEEE 802.11b	Low	2412	-6.86	8	Compliance
	Mid	2437	-7.19	8	Compliance
	High	2462	-6.70	8	Compliance
IEEE 802.11g	Low	2412	-7.03	8	Compliance
	Mid	2437	-7.62	8	Compliance
	High	2462	-8.01	8	Compliance
IEEE 802.11n HT20	Low	2412	-5.52	8	Compliance
	Mid	2437	-6.53	8	Compliance
	High	2462	-7.24	8	Compliance
IEEE 802.11n HT40	Low	2422	-12.47	8	Compliance
	Mid	2437	-13.03	8	Compliance
	High	2452	-12.96	8	Compliance

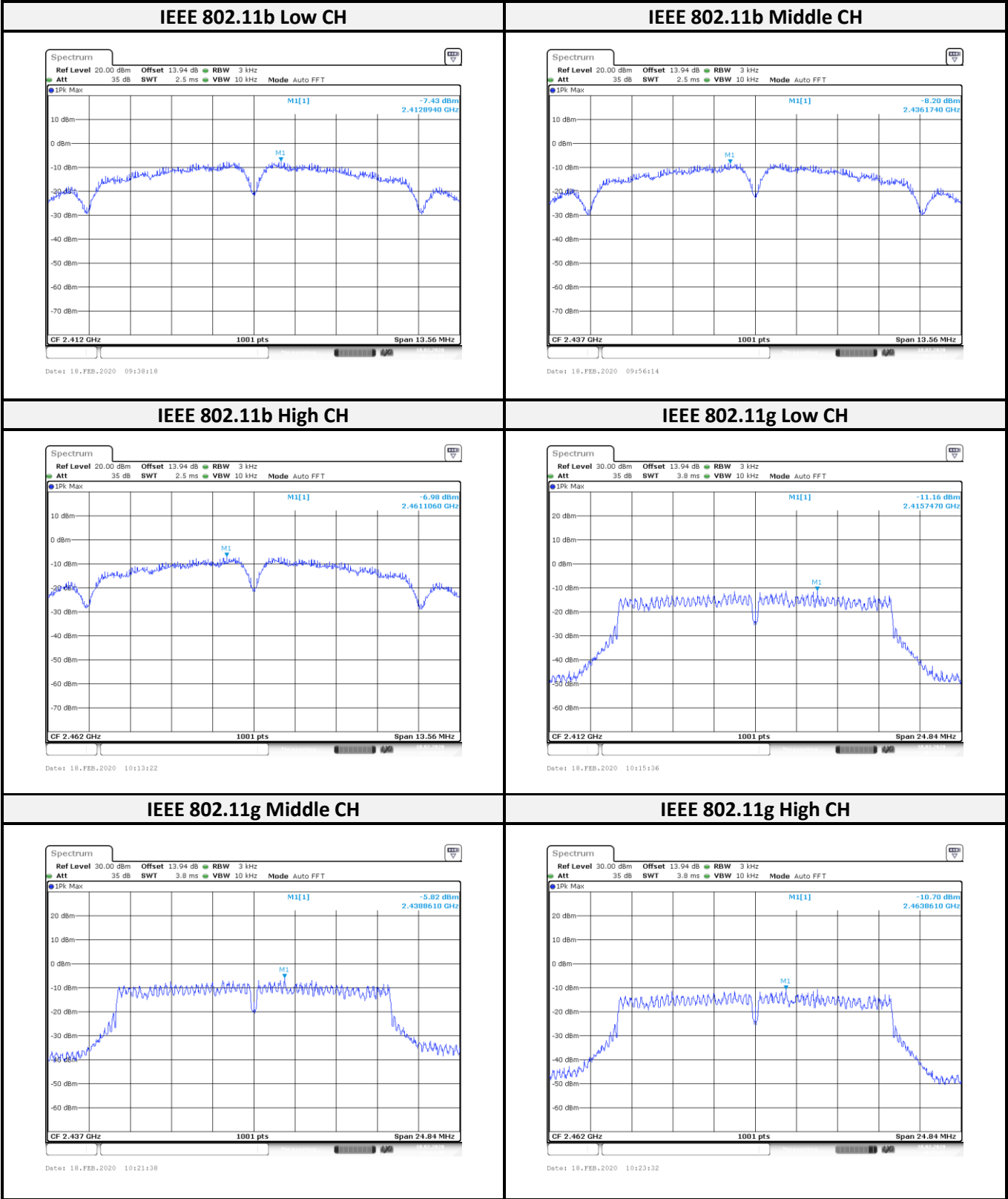
< PCB Antenna (Redpine Signals RSIA7)>

Configuration	Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Result
IEEE 802.11b	Low	2412	-7.43	8	Compliance
	Mid	2437	-8.20	8	Compliance
	High	2462	-9.28	8	Compliance
IEEE 802.11g	Low	2412	-11.16	8	Compliance
	Mid	2437	-5.82	8	Compliance
	High	2462	-14.98	8	Compliance
IEEE 802.11n HT20	Low	2412	-10.95	8	Compliance
	Mid	2437	-5.69	8	Compliance
	High	2462	-14.75	8	Compliance
IEEE 802.11n HT40	Low	2422	-17.69	8	Compliance
	Mid	2437	-16.84	8	Compliance
	High	2452	-20.82	8	Compliance

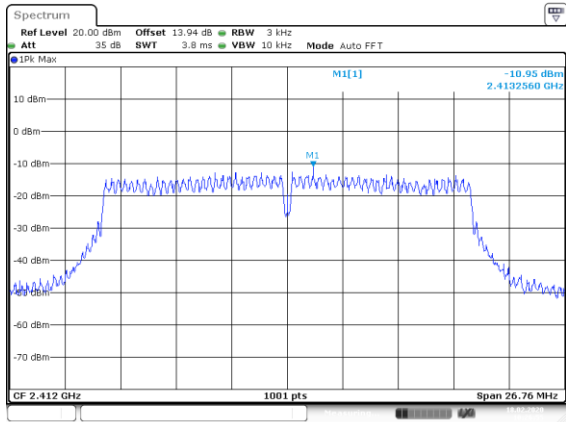
< PIFA Antenna (SMARTEQ 4211613980)>

Configuration	Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Result
IEEE 802.11b	Low	2412	-8.58	8	Compliance
	Mid	2437	-7.41	8	Compliance
	High	2462	-7.92	8	Compliance
IEEE 802.11g	Low	2412	-7.12	8	Compliance
	Mid	2437	-7.86	8	Compliance
	High	2462	-9.19	8	Compliance
IEEE 802.11n HT20	Low	2412	-11.83	8	Compliance
	Mid	2437	-6.38	8	Compliance
	High	2462	-8.57	8	Compliance
IEEE 802.11n HT40	Low	2422	-13.42	8	Compliance
	Mid	2437	-13.36	8	Compliance
	High	2452	-13.76	8	Compliance

< Dipole antenna (TAOGLAS GW.71.5153)>

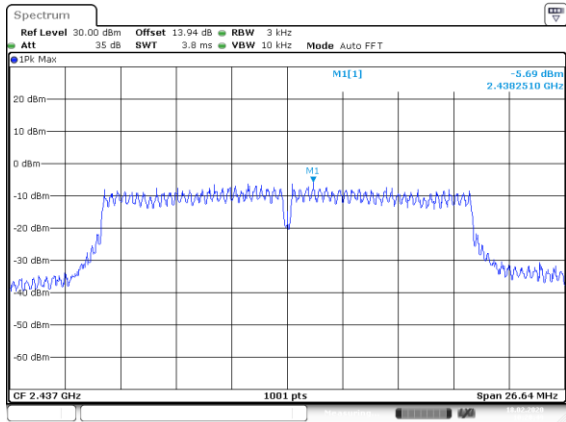


IEEE 802.11n HT20 Low CH



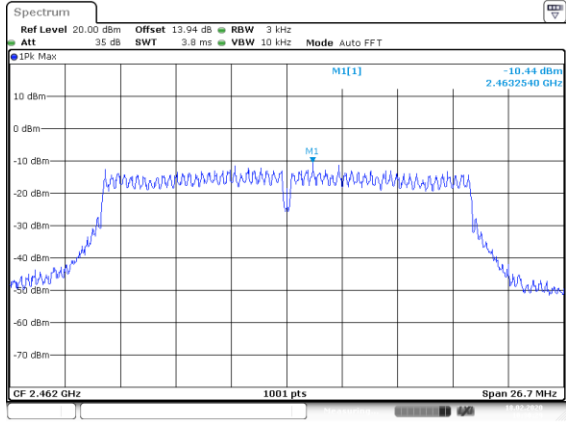
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IEEE 802.11n HT20 Middle CH



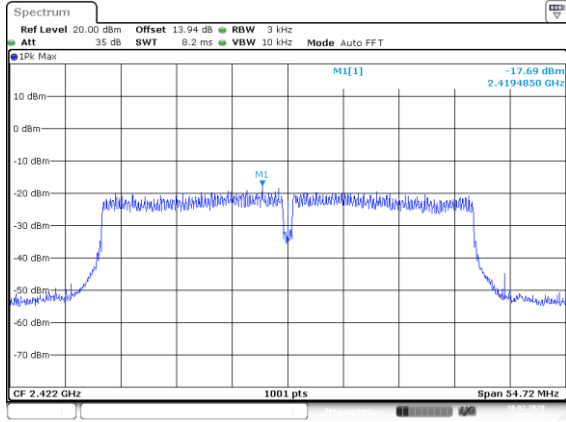
Date: 18.FEB.2020 10:28:49

IEEE 802.11n HT20 High CH



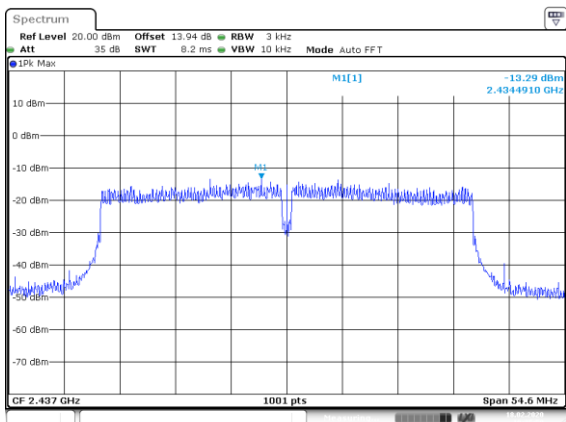
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IEEE 802.11n HT40 Low CH



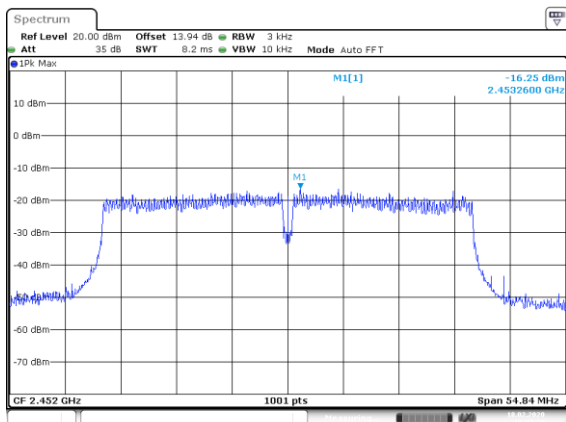
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IEEE 802.11n HT40 Middle CH



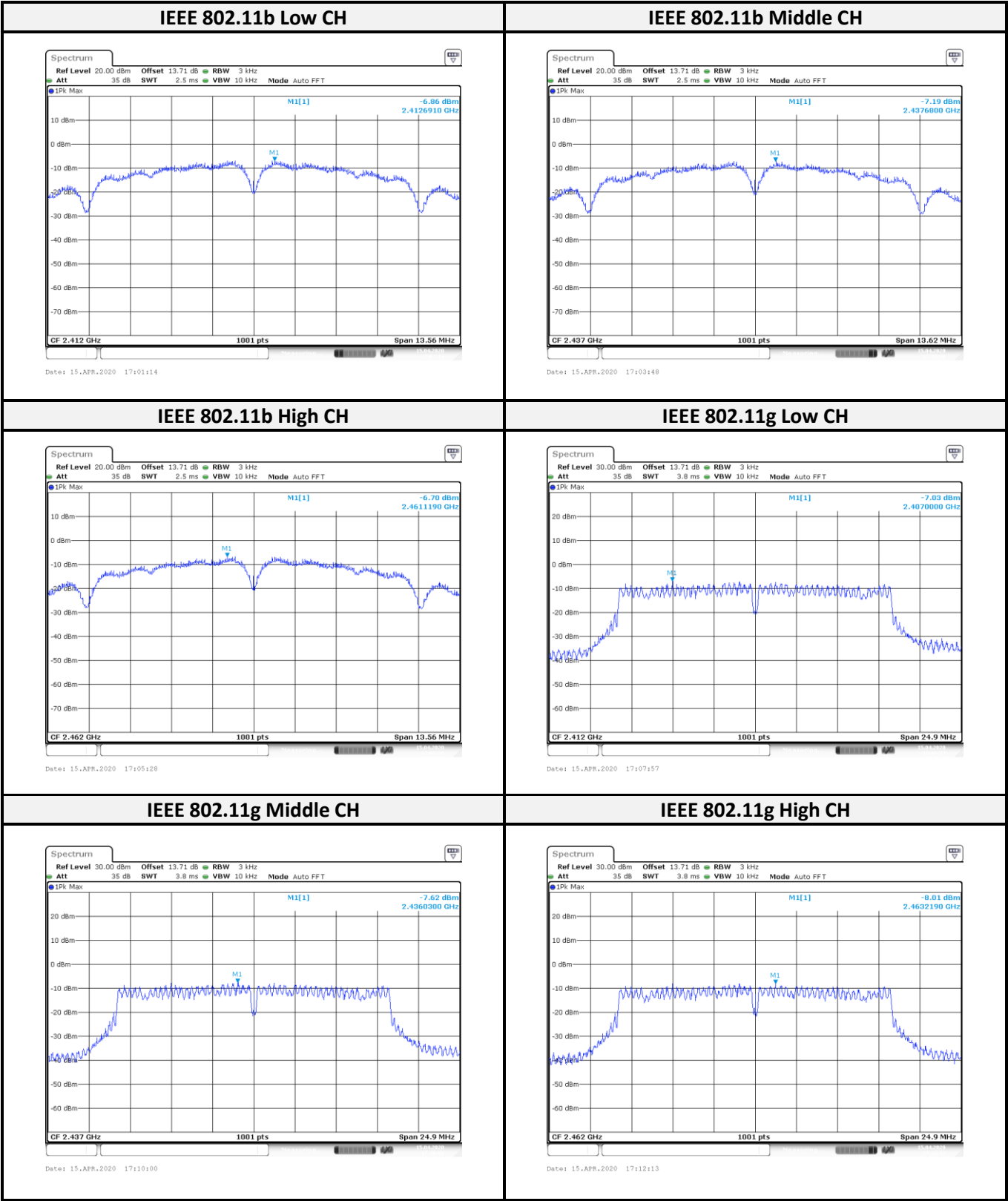
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IEEE 802.11n HT40 High CH

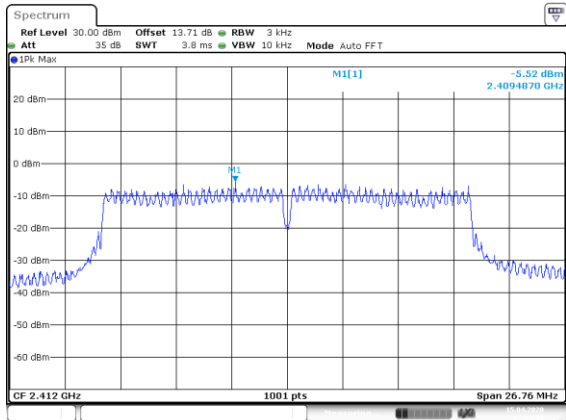


Date: 18.FEB.2020 10:37:29

< Dipole antenna (Inside WLAN PRO-IS-299)>

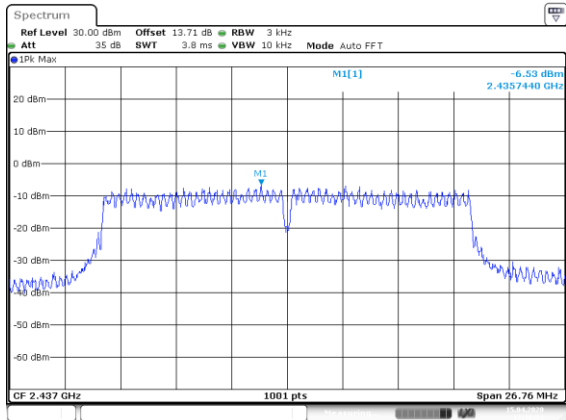


IEEE 802.11n HT20 Low CH



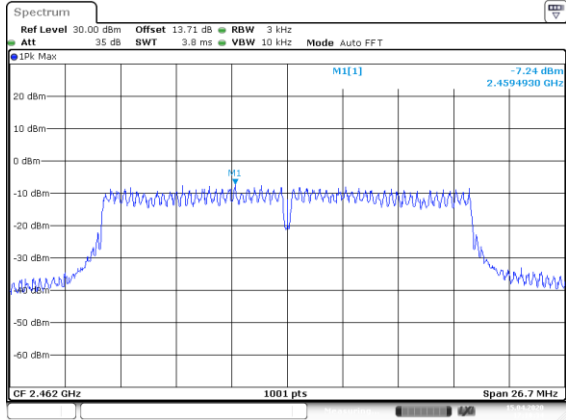
Date: 15.APR.2020 17:14:49

IEEE 802.11n HT20 Middle CH



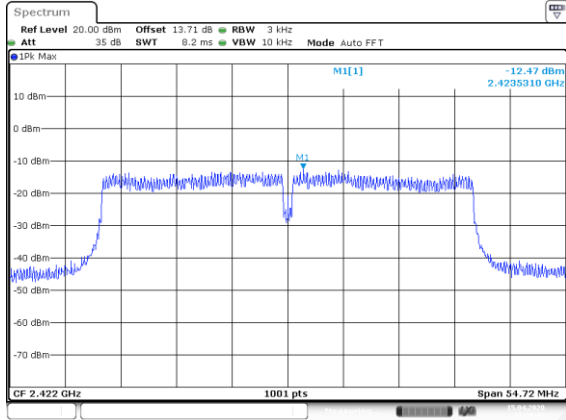
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IEEE 802.11n HT20 High CH



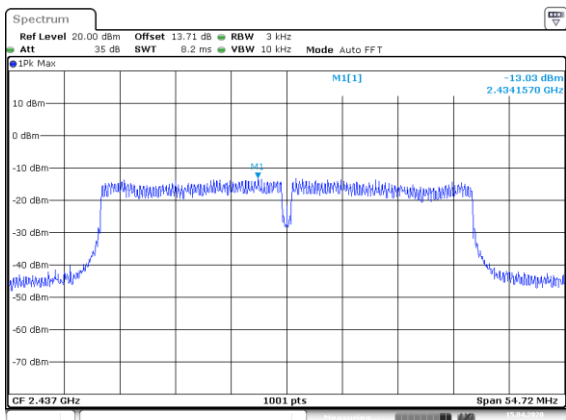
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IEEE 802.11n HT40 Low CH



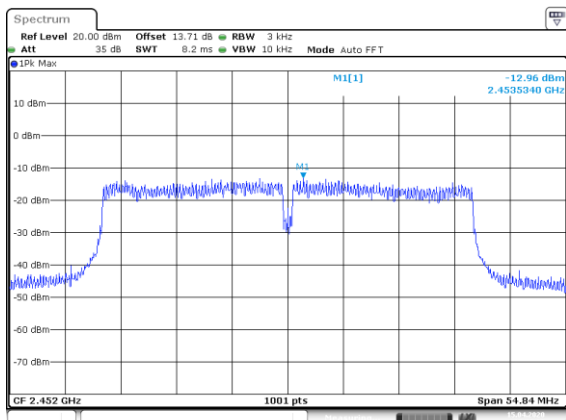
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IEEE 802.11n HT40 Middle CH



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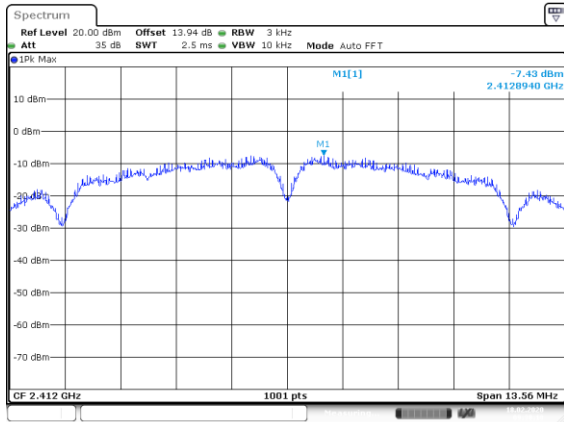
IEEE 802.11n HT40 High CH



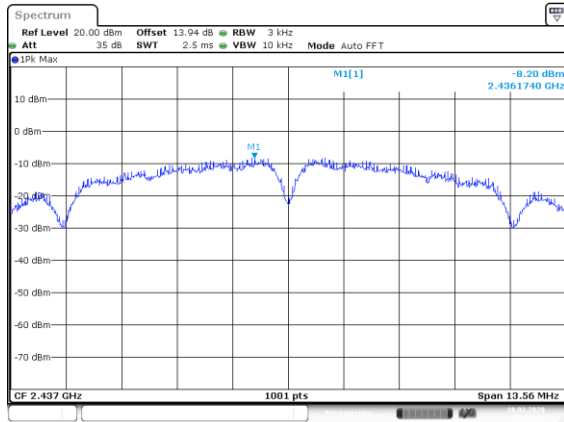
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< PCB Antenna (Redpine Signals RSIA7)>

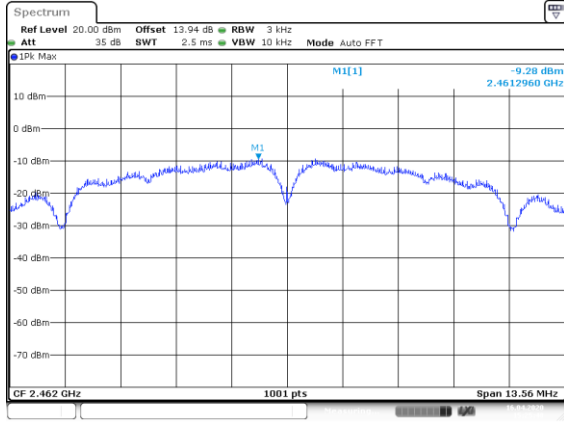
IEEE 802.11b Low CH



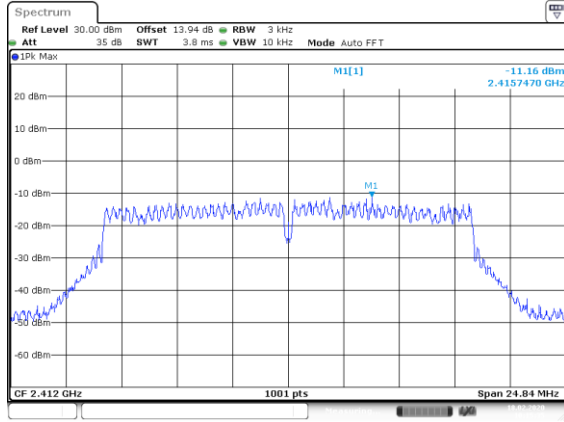
IEEE 802.11b Middle CH



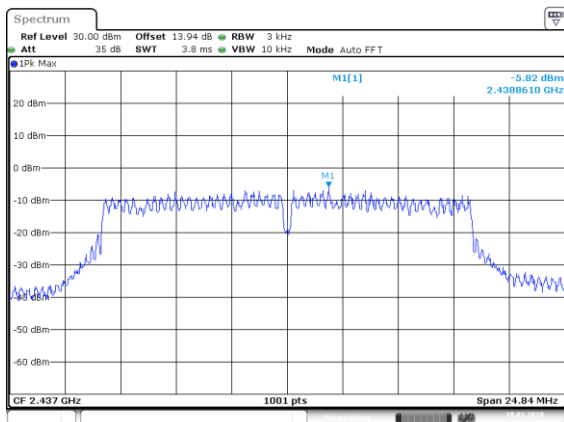
IEEE 802.11b High CH



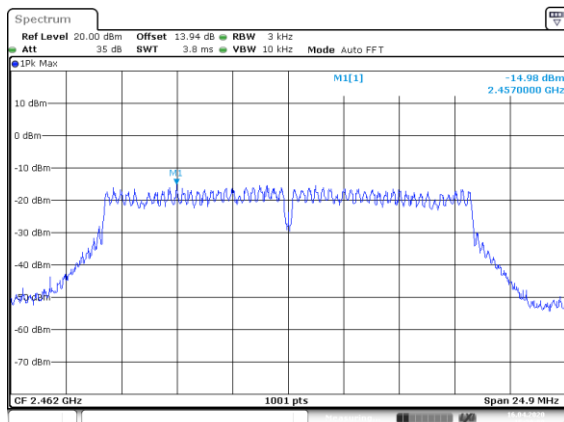
IEEE 802.11g Low CH



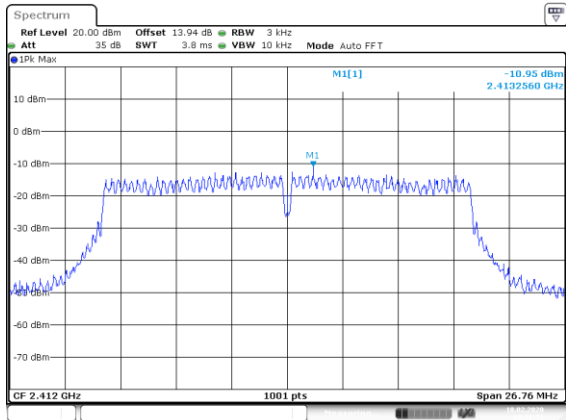
IEEE 802.11g Middle CH



IEEE 802.11g High CH

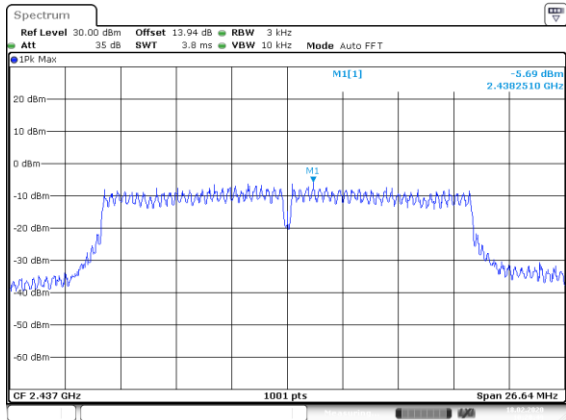


IEEE 802.11n HT20 Low CH



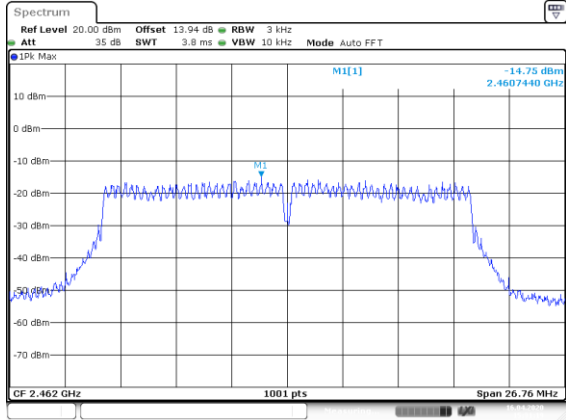
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IEEE 802.11n HT20 Middle CH



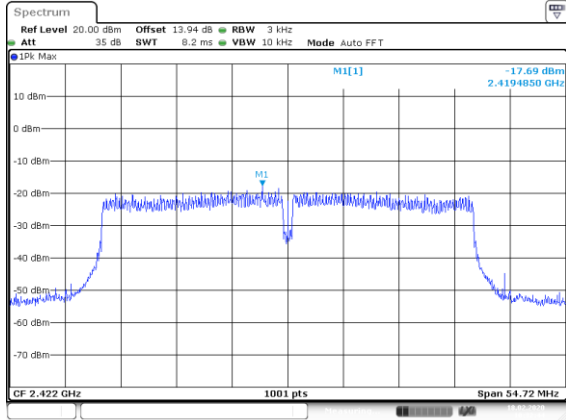
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IEEE 802.11n HT20 High CH



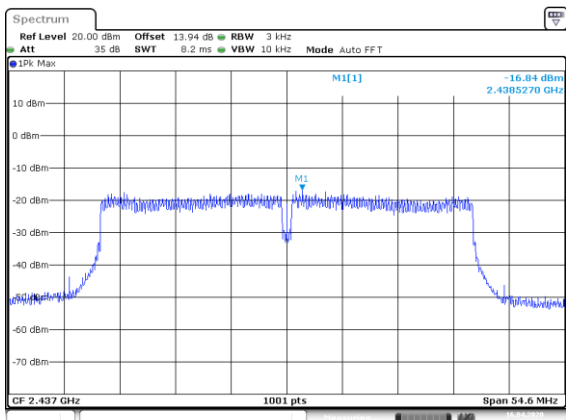
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IEEE 802.11n HT40 Low CH



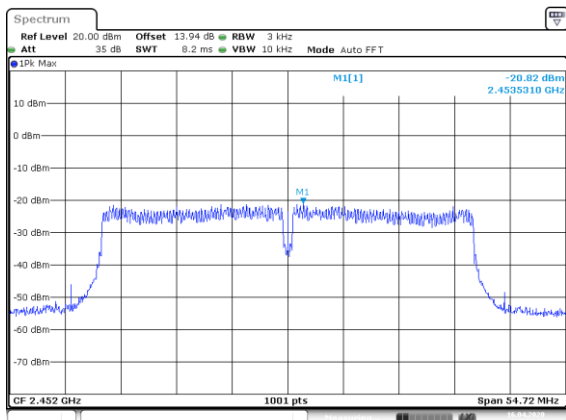
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IEEE 802.11n HT40 Middle CH



Date: 16.APR.2020 15:33:22

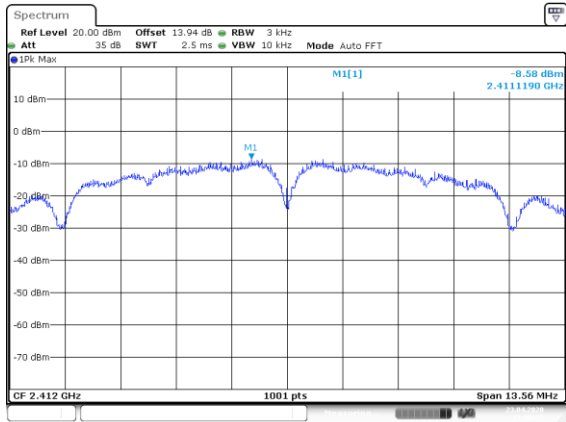
IEEE 802.11n HT40 High CH



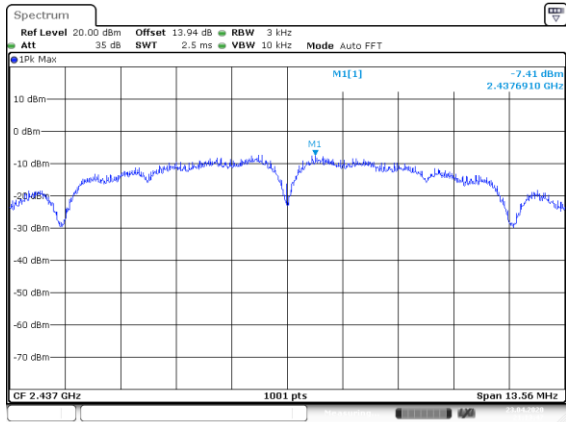
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< PIFA Antenna (SMARTEQ 4211613980)>

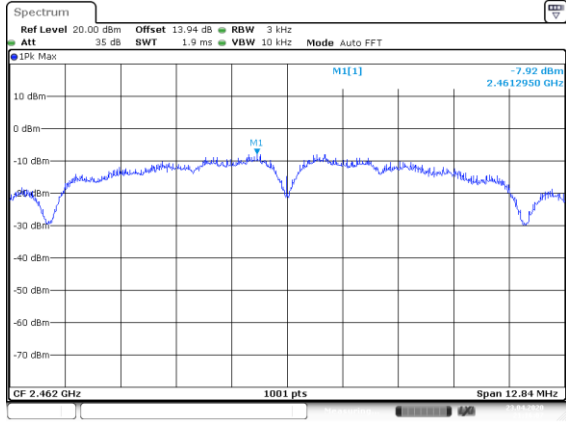
IEEE 802.11b Low CH



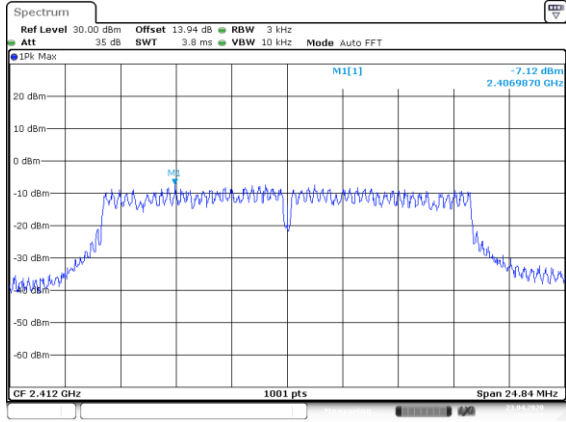
IEEE 802.11b Middle CH



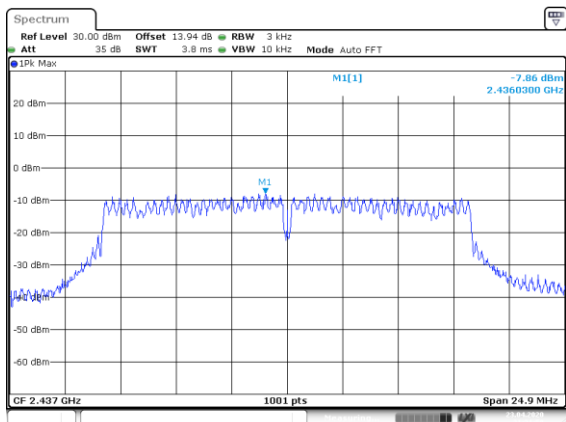
IEEE 802.11b High CH



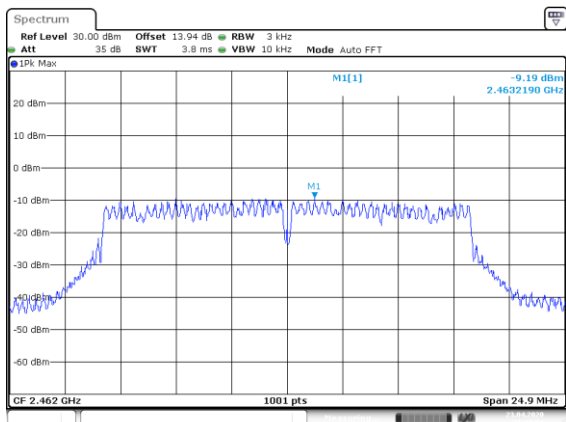
IEEE 802.11g Low CH



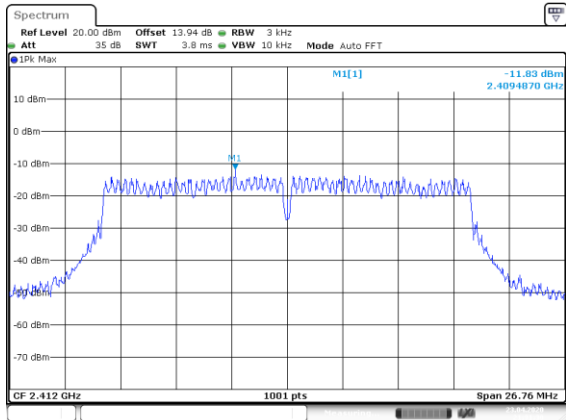
IEEE 802.11g Middle CH



IEEE 802.11g High CH

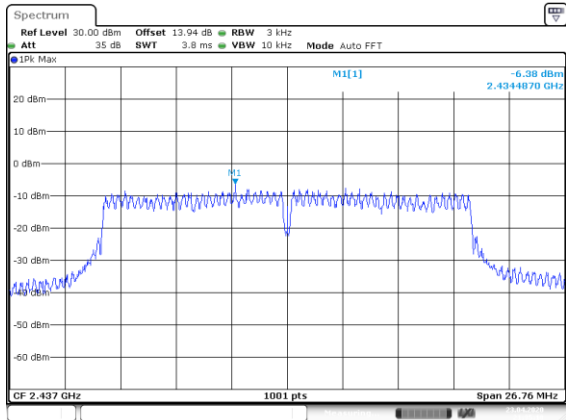


IEEE 802.11n HT20 Low CH



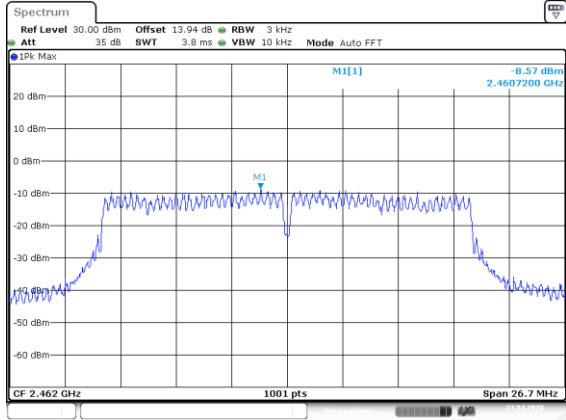
Date: 23.APR.2020 21:31:30

IEEE 802.11n HT20 Middle CH



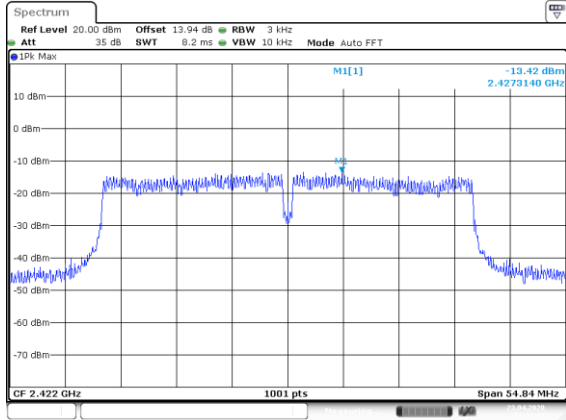
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IEEE 802.11n HT20 High CH



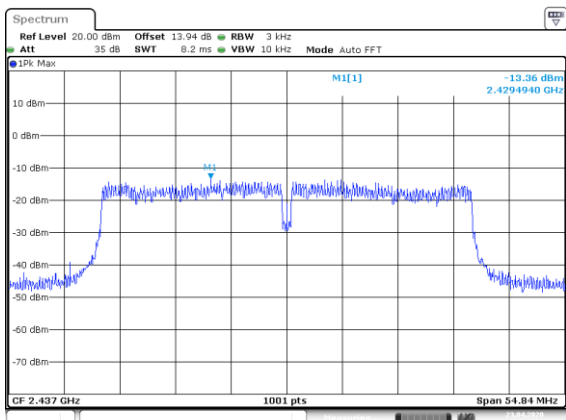
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IEEE 802.11n HT40 Low CH



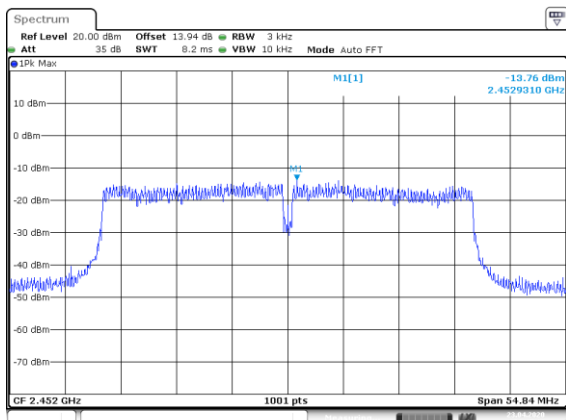
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IEEE 802.11n HT40 Middle CH



Date: 23.APR.2020 21:44:31

IEEE 802.11n HT40 High CH



Date: 23.APR.2020 21:47:11

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