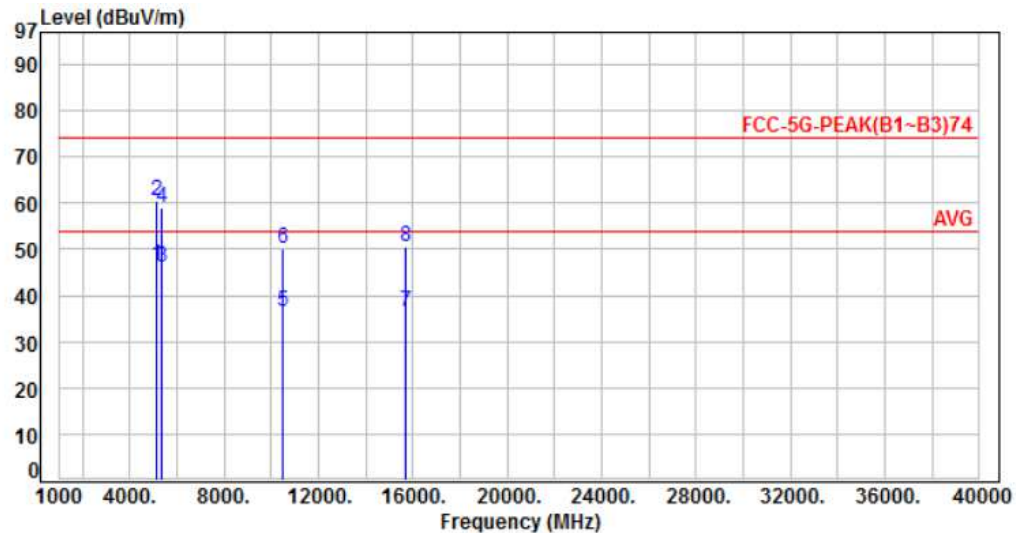




Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 5, CH46	Temperature	: 24°C
Test Date	: Feb. 11, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5150.00	-6.54	53.05	46.51	54.00	-7.49	Average	121	147	P
2	5150.00	-6.54	66.89	60.35	74.00	-13.65	Peak	121	147	P
3	5350.00	-6.06	52.09	46.03	54.00	-7.97	Average	121	147	P
4	5350.00	-6.06	64.98	58.92	74.00	-15.08	Peak	121	147	P
5	10460.00	0.72	35.69	36.41	54.00	-17.59	Average	121	302	P
6	10460.00	0.72	49.47	50.19	74.00	-23.81	Peak	121	302	P
7	15690.00	5.36	31.24	36.60	54.00	-17.40	Average	100	289	P
8	15690.00	5.36	45.13	50.49	74.00	-23.51	Peak	100	289	P

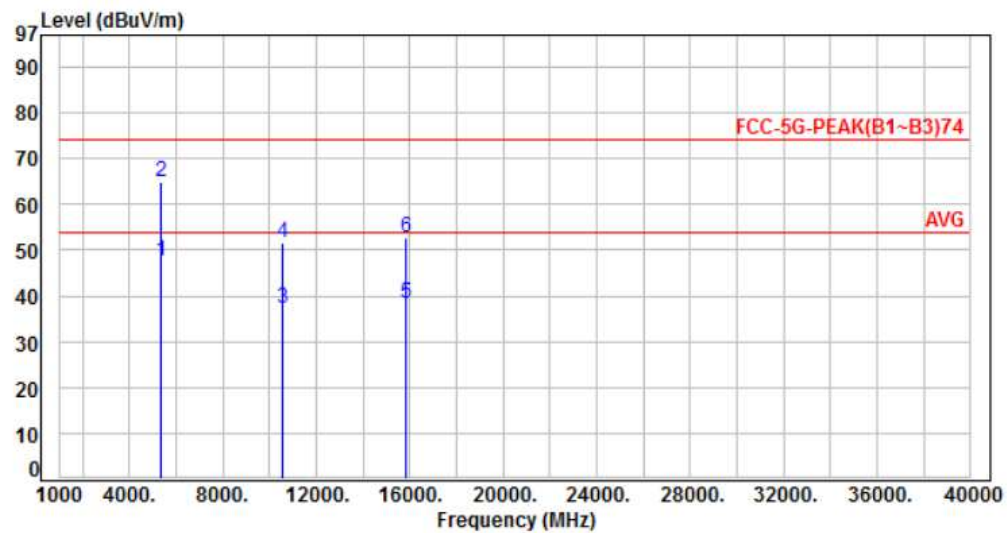
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 5, CH54	Temperature	: 24°C
Test Date	: Feb. 11, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5350.00	-6.06	53.74	47.68	54.00	-6.32	Average	100	157	P
2	5350.00	-6.06	70.93	64.87	74.00	-9.13	Peak	100	157	P
3	10540.00	0.79	36.62	37.41	54.00	-16.59	Average	137	249	P
4	10540.00	0.79	50.67	51.46	74.00	-22.54	Peak	137	249	P
5	15810.00	5.38	33.15	38.53	54.00	-15.47	Average	100	298	P
6	15810.00	5.38	47.36	52.74	74.00	-21.26	Peak	100	298	P

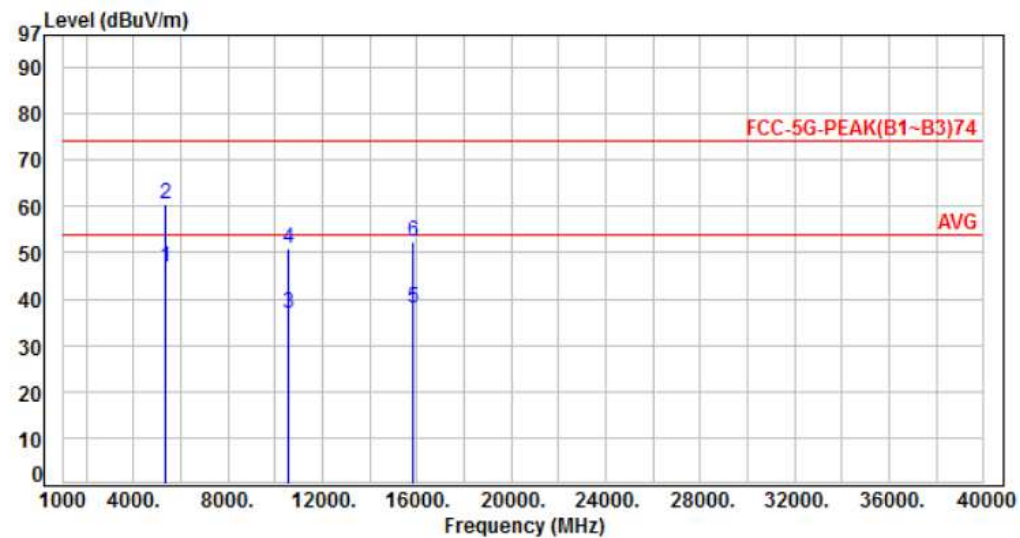
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 5, CH54	Temperature	: 24°C
Test Date	: Feb. 11, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5350.00	-6.06	52.78	46.72	54.00	-7.28	Average	149	102	P
2	5350.00	-6.06	66.37	60.31	74.00	-13.69	Peak	149	102	P
3	10540.00	0.79	36.13	36.92	54.00	-17.08	Average	100	337	P
4	10540.00	0.79	50.17	50.96	74.00	-23.04	Peak	100	337	P
5	15810.00	5.38	32.77	38.15	54.00	-15.85	Average	113	312	P
6	15810.00	5.38	46.88	52.26	74.00	-21.74	Peak	113	312	P

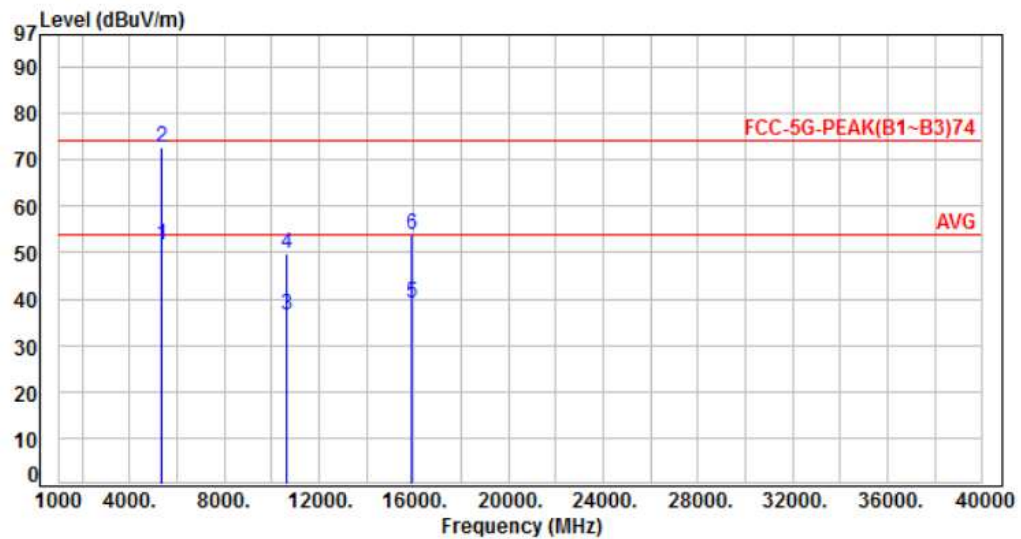
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 5, CH62	Temperature	: 24°C
Test Date	: Feb. 11, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5350.00	-6.06	57.61	51.55	54.00	-2.45	Average	208	167	P
2	5350.00	-6.06	78.89	72.83	74.00	-1.17	Peak	208	167	P
3	10620.00	0.90	35.78	36.68	54.00	-17.32	Average	121	302	P
4	10620.00	0.90	49.03	49.93	74.00	-24.07	Peak	121	302	P
5	15930.00	5.37	33.76	39.13	54.00	-14.87	Average	104	289	P
6	15930.00	5.37	48.65	54.02	74.00	-19.98	Peak	104	289	P

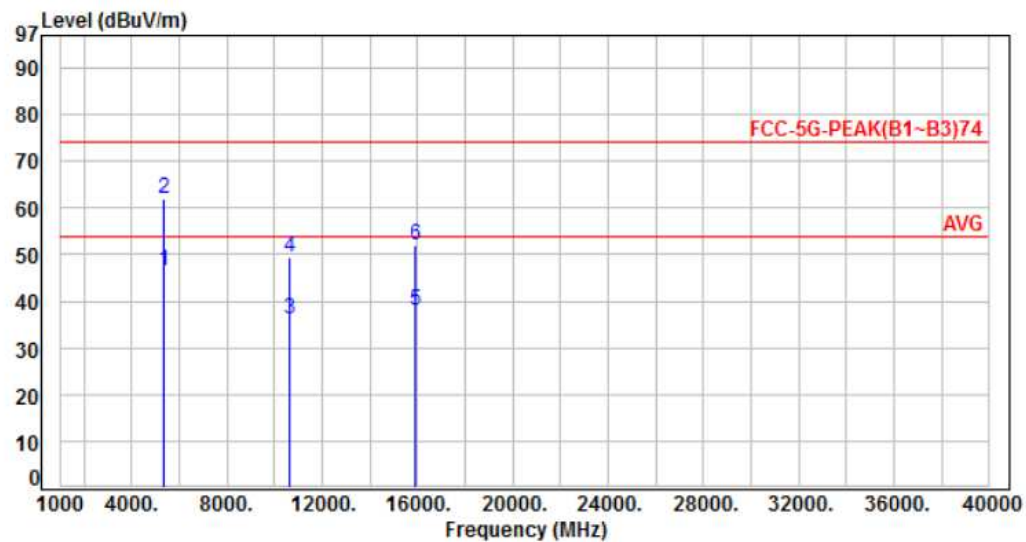
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 5, CH62	Temperature	: 24°C
Test Date	: Feb. 11, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5350.00	-6.06	52.66	46.60	54.00	-7.40	Average	121	156	P
2	5350.00	-6.06	68.15	62.09	74.00	-11.91	Peak	121	156	P
3	10620.00	0.90	35.13	36.03	54.00	-17.97	Average	124	337	P
4	10620.00	0.90	48.59	49.49	74.00	-24.51	Peak	124	337	P
5	15930.00	5.37	32.73	38.10	54.00	-15.90	Average	100	324	P
6	15930.00	5.37	46.47	51.84	74.00	-22.16	Peak	100	324	P

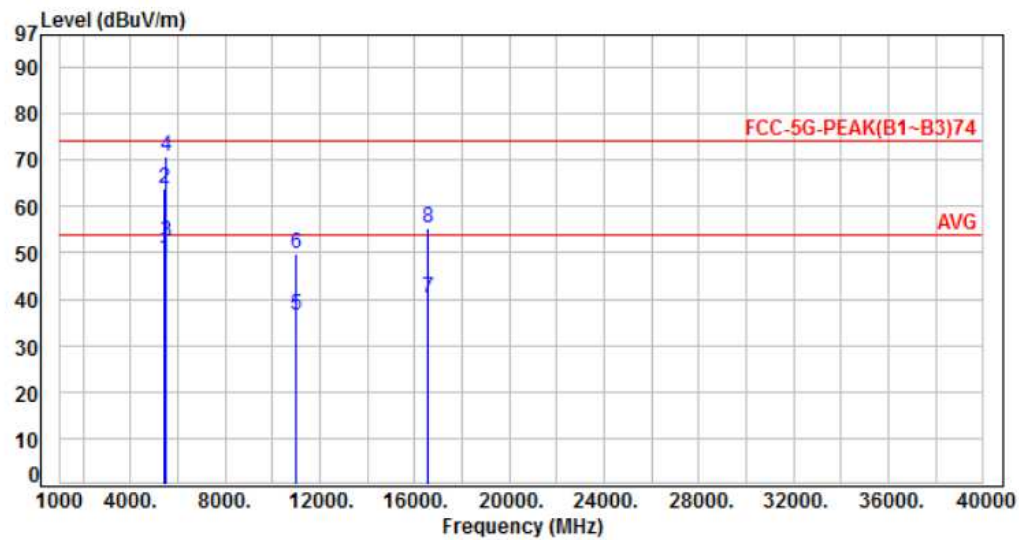
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 5, CH102	Temperature	: 24°C
Test Date	: Feb. 11, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5460.00	-5.80	54.44	48.64	54.00	-5.36	Average	289	158	P
2	5460.00	-5.80	69.43	63.63	74.00	-10.37	Peak	289	158	P
3	5470.00	-5.78	58.25	52.47	54.00	-1.53	Average	232	156	P
4	5470.00	-5.78	76.76	70.98	74.00	-3.02	Peak	232	156	P
5	11020.00	1.43	35.13	36.56	54.00	-17.44	Average	284	173	P
6	11020.00	1.43	48.38	49.81	74.00	-24.19	Peak	284	173	P
7	16530.00	6.80	33.40	40.20	54.00	-13.80	Average	279	201	P
8	16530.00	6.80	48.60	55.40	74.00	-18.60	Peak	279	201	P

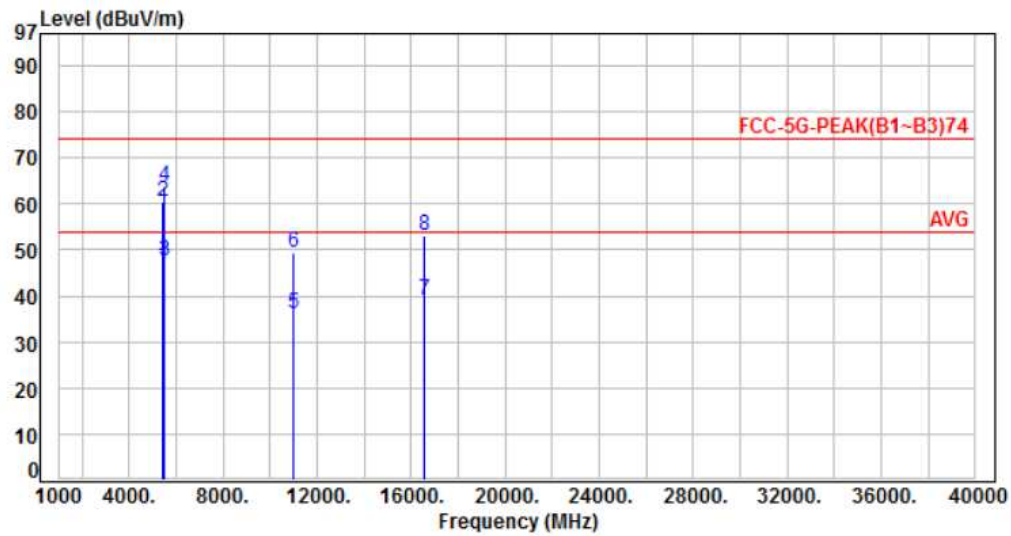
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 5, CH102	Temperature	: 24°C
Test Date	: Feb. 11, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5460.00	-5.80	52.38	46.58	54.00	-7.42	Average	113	221	P
2	5460.00	-5.80	66.35	60.55	74.00	-13.45	Peak	113	221	P
3	5470.00	-5.78	53.25	47.47	54.00	-6.53	Average	111	215	P
4	5470.00	-5.78	69.42	63.64	74.00	-10.36	Peak	111	215	P
5	11020.00	1.43	34.88	36.31	54.00	-17.69	Average	134	237	P
6	11020.00	1.43	47.95	49.38	74.00	-24.62	Peak	134	237	P
7	16530.00	6.80	32.13	38.93	54.00	-15.07	Average	100	307	P
8	16530.00	6.80	46.24	53.04	74.00	-20.96	Peak	100	307	P

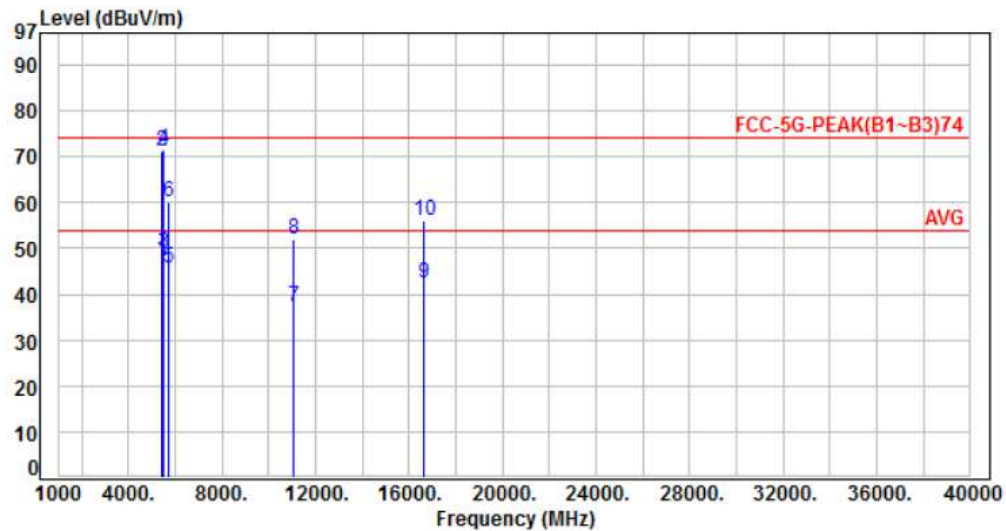
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 5, CH110	Temperature	: 24°C
Test Date	: Feb. 11, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5460.00	-5.80	53.27	47.47	54.00	-6.53	Average	226	174	P
2	5460.00	-5.80	76.81	71.01	74.00	-2.99	Peak	226	174	P
3	5470.00	-5.78	54.98	49.20	54.00	-4.80	Average	205	174	P
4	5470.00	-5.78	77.33	71.55	74.00	-2.45	Peak	205	174	P
5	5725.00	-5.80	51.67	45.87	54.00	-8.13	Average	205	174	P
6	5725.00	-5.80	65.89	60.09	74.00	-13.91	Peak	205	174	P
7	11100.00	1.54	35.61	37.15	54.00	-16.85	Average	287	198	P
8	11100.00	1.54	50.32	51.86	74.00	-22.14	Peak	287	198	P
9	16650.00	7.49	34.89	42.38	54.00	-11.62	Average	292	176	P
10	16650.00	7.49	48.74	56.23	74.00	-17.77	Peak	292	176	P

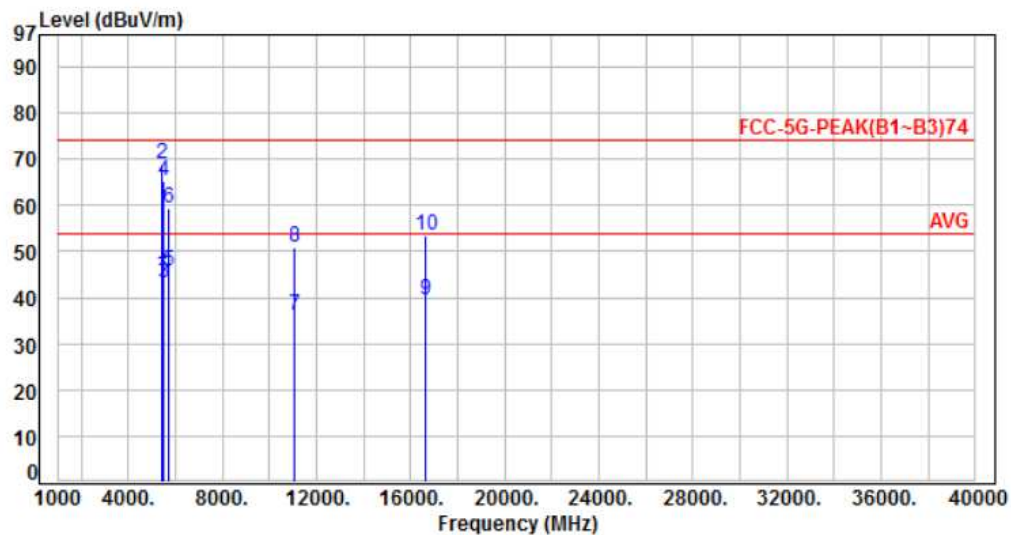
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 5, CH110	Temperature	: 24°C
Test Date	: Feb. 11, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5460.00	-5.80	50.93	45.13	54.00	-8.87	Average	157	166	P
2	5460.00	-5.80	74.91	69.11	74.00	-4.89	Peak	157	166	P
3	5470.00	-5.78	48.90	43.12	54.00	-10.88	Average	157	166	P
4	5470.00	-5.78	71.21	65.43	74.00	-8.57	Peak	157	166	P
5	5725.00	-5.80	51.64	45.84	54.00	-8.16	Average	157	166	P
6	5725.00	-5.80	65.27	59.47	74.00	-14.53	Peak	157	166	P
7	11100.00	1.54	34.73	36.27	54.00	-17.73	Average	112	298	P
8	11100.00	1.54	49.37	50.91	74.00	-23.09	Peak	112	298	P
9	16650.00	7.49	31.97	39.46	54.00	-14.54	Average	100	319	P
10	16650.00	7.49	45.83	53.32	74.00	-20.68	Peak	100	319	P

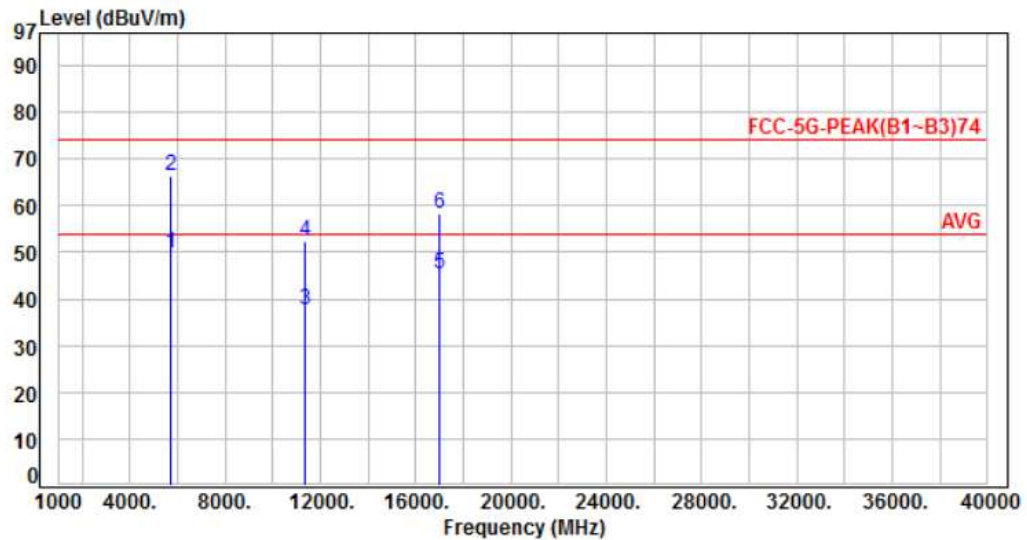
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 5, CH134	Temperature	: 24°C
Test Date	: Feb. 11, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5725.00	-5.80	55.60	49.80	54.00	-4.20	Average	241	178	P
2	5725.00	-5.80	72.02	66.22	74.00	-7.78	Peak	241	178	P
3	11340.00	1.86	35.89	37.75	54.00	-16.25	Average	124	267	P
4	11340.00	1.86	50.33	52.19	74.00	-21.81	Peak	124	267	P
5	17010.00	9.58	35.61	45.19	54.00	-8.81	Average	112	287	P
6	17010.00	9.58	48.69	58.27	74.00	-15.73	Peak	112	287	P

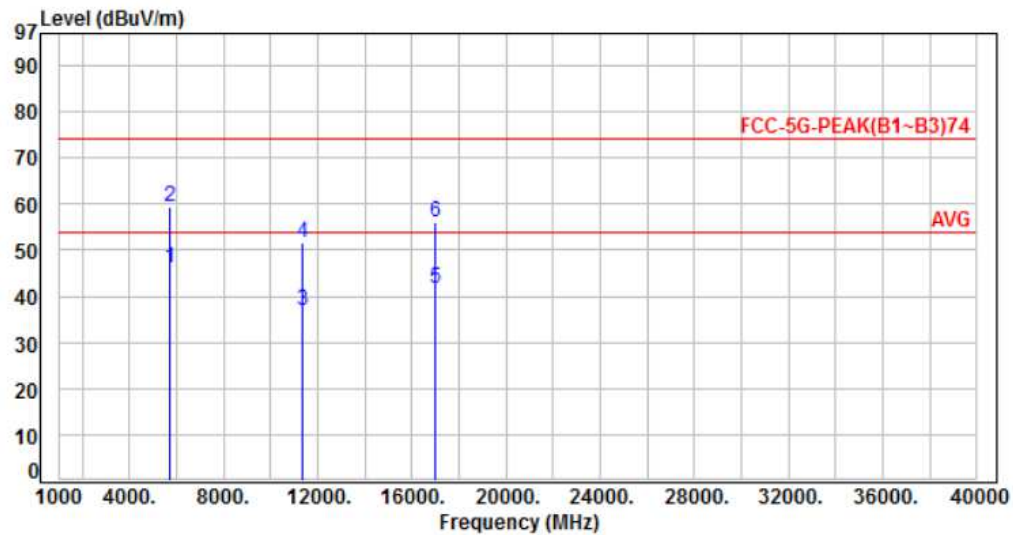
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 5, CH134	Temperature	: 24°C
Test Date	: Feb. 11, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5725.00	-5.80	51.88	46.08	54.00	-7.92	Average	148	131	P
2	5725.00	-5.80	65.29	59.49	74.00	-14.51	Peak	148	131	P
3	11340.00	1.86	34.97	36.83	54.00	-17.17	Average	113	314	P
4	11340.00	1.86	49.61	51.47	74.00	-22.53	Peak	113	314	P
5	17010.00	9.58	32.25	41.83	54.00	-12.17	Average	104	293	P
6	17010.00	9.58	46.36	55.94	74.00	-18.06	Peak	104	293	P

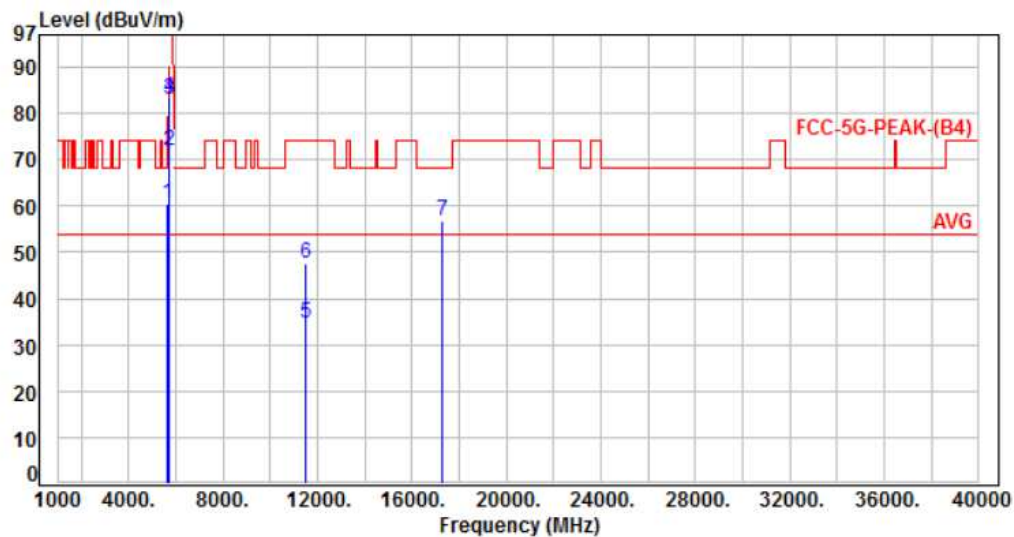
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 5, CH151	Temperature	: 24°C
Test Date	: Feb. 15, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-5.77	66.22	60.45	68.20	-7.75	Peak	161	243	P
2	5700.00	-5.79	77.81	72.02	105.20	-33.18	Peak	161	243	P
3	5720.00	-5.80	88.79	82.99	110.80	-27.81	Peak	161	243	P
4	5725.00	-5.80	89.00	83.20	122.20	-39.00	Peak	161	243	P
5	11510.00	2.07	32.76	34.83	54.00	-19.17	Average	149	198	P
6	11510.00	2.07	45.62	47.69	74.00	-26.31	Peak	149	198	P
7	17265.00	11.16	45.73	56.89	68.20	-11.31	Peak	131	216	P

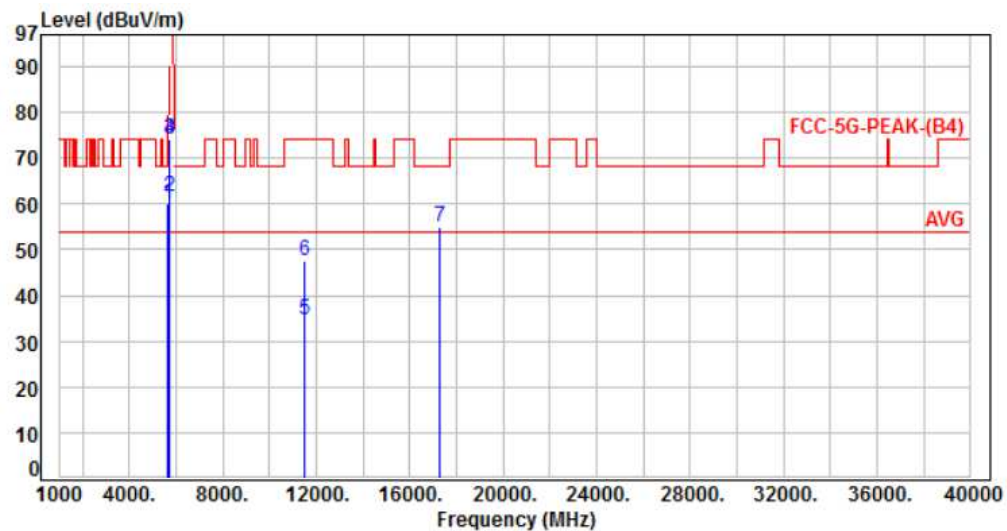
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 5, CH151	Temperature	: 24°C
Test Date	: Feb. 15, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-5.77	66.00	60.23	68.20	-7.97	Peak	169	132	P
2	5700.00	-5.79	67.40	61.61	105.20	-43.59	Peak	169	132	P
3	5720.00	-5.80	80.09	74.29	110.80	-36.51	Peak	169	132	P
4	5725.00	-5.80	80.04	74.24	122.20	-47.96	Peak	169	132	P
5	11510.00	2.07	32.51	34.58	54.00	-19.42	Average	156	214	P
6	11510.00	2.07	45.47	47.54	74.00	-26.46	Peak	156	214	P
7	17265.00	11.16	43.82	54.98	68.20	-13.22	Peak	100	192	P

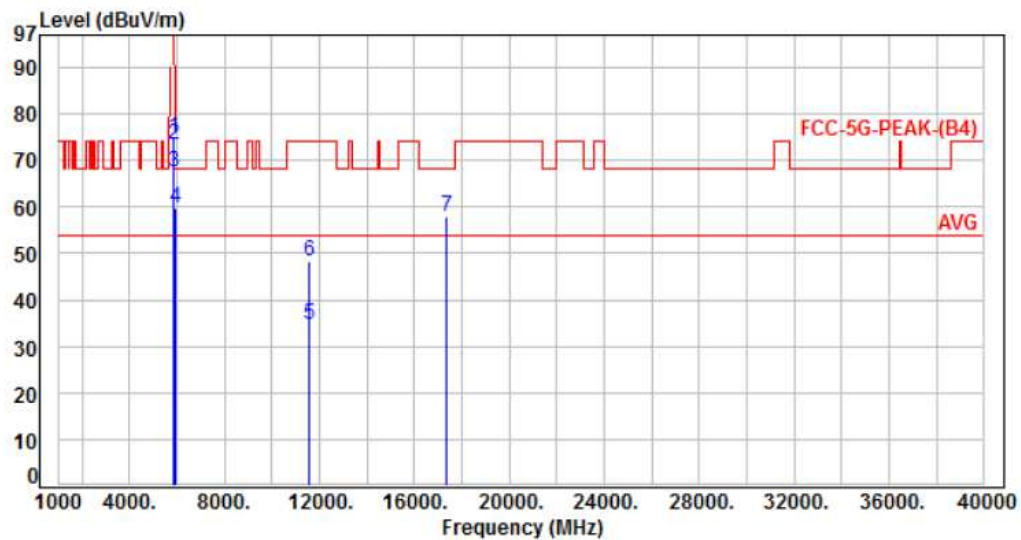
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 5, CH159	Temperature	: 24°C
Test Date	: Feb. 15, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5850.00	-5.84	80.79	74.95	122.20	-47.25	Peak	172	286	P
2	5855.00	-5.84	79.35	73.51	110.80	-37.29	Peak	172	286	P
3	5875.00	-5.85	73.33	67.48	105.20	-37.72	Peak	172	286	P
4	5925.00	-5.87	65.54	59.67	68.20	-8.53	Peak	172	286	P
5	11590.00	2.10	32.71	34.81	54.00	-19.19	Average	142	233	P
6	11590.00	2.10	46.12	48.22	74.00	-25.78	Peak	142	233	P
7	17385.00	11.89	45.99	57.88	68.20	-10.32	Peak	142	233	P

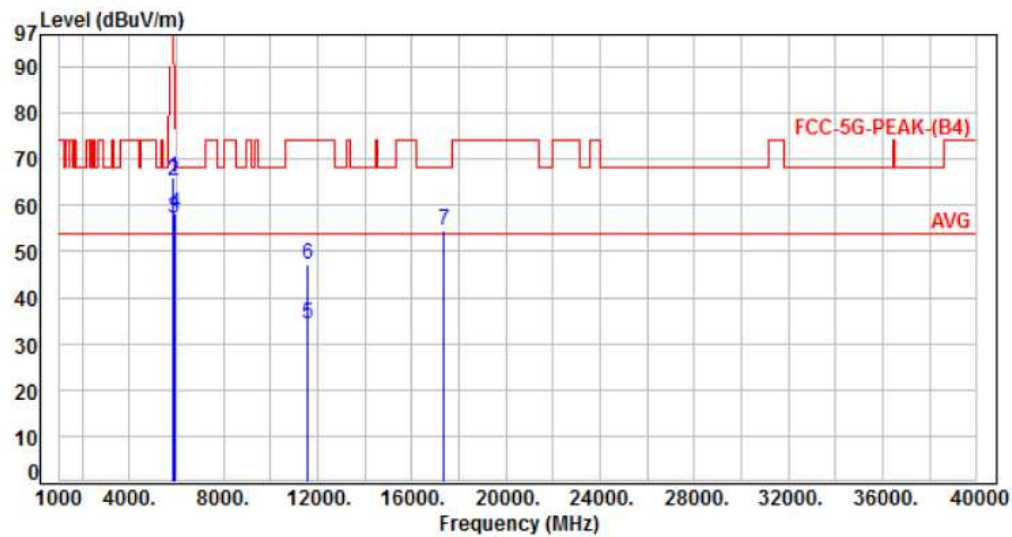
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 5, CH159	Temperature	: 24°C
Test Date	: Feb. 15, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5850.00	-5.84	71.96	66.12	122.20	-56.08	Peak	155	137	P
2	5855.00	-5.84	70.95	65.11	110.80	-45.69	Peak	155	137	P
3	5875.00	-5.85	63.13	57.28	105.20	-47.92	Peak	155	137	P
4	5925.00	-5.87	64.09	58.22	68.20	-9.98	Peak	155	137	P
5	11590.00	2.10	32.02	34.12	54.00	-19.88	Average	108	310	P
6	11590.00	2.10	45.23	47.33	74.00	-26.67	Peak	108	310	P
7	17385.00	11.89	42.63	54.52	68.20	-13.68	Peak	122	281	P

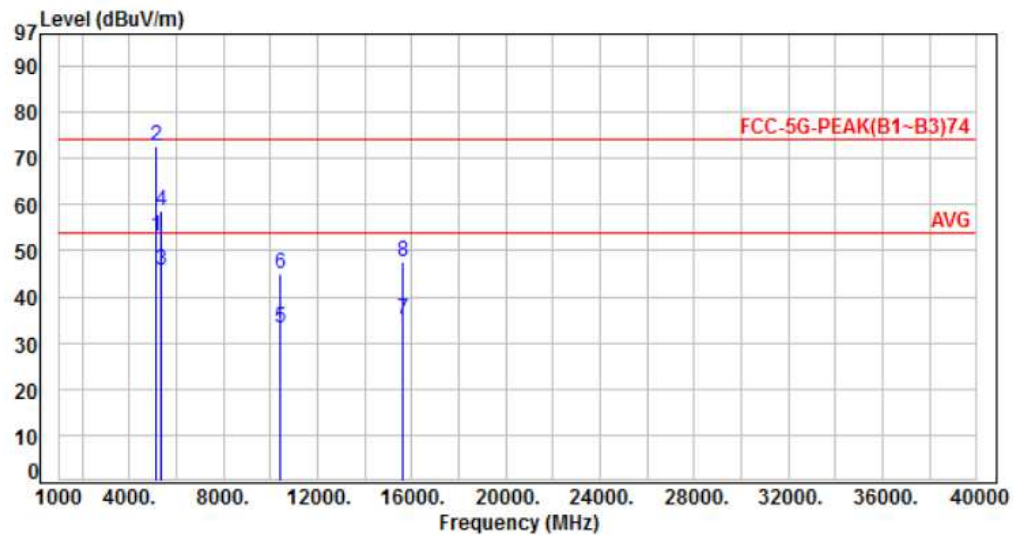
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 6, CH42	Temperature	: 24°C
Test Date	: Feb. 14, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5150.00	-6.54	59.50	52.96	54.00	-1.04	Average	197	167	P
2	5150.00	-6.54	79.34	72.80	74.00	-1.20	Peak	197	167	P
3	5350.00	-6.06	51.67	45.61	54.00	-8.39	Average	197	167	P
4	5350.00	-6.06	64.82	58.76	74.00	-15.24	Peak	197	167	P
5	10420.00	0.69	32.36	33.05	54.00	-20.95	Average	178	202	P
6	10420.00	0.69	44.22	44.91	74.00	-29.09	Peak	178	202	P
7	15630.00	5.37	29.51	34.88	54.00	-19.12	Average	137	198	P
8	15630.00	5.37	42.13	47.50	74.00	-26.50	Peak	137	198	P

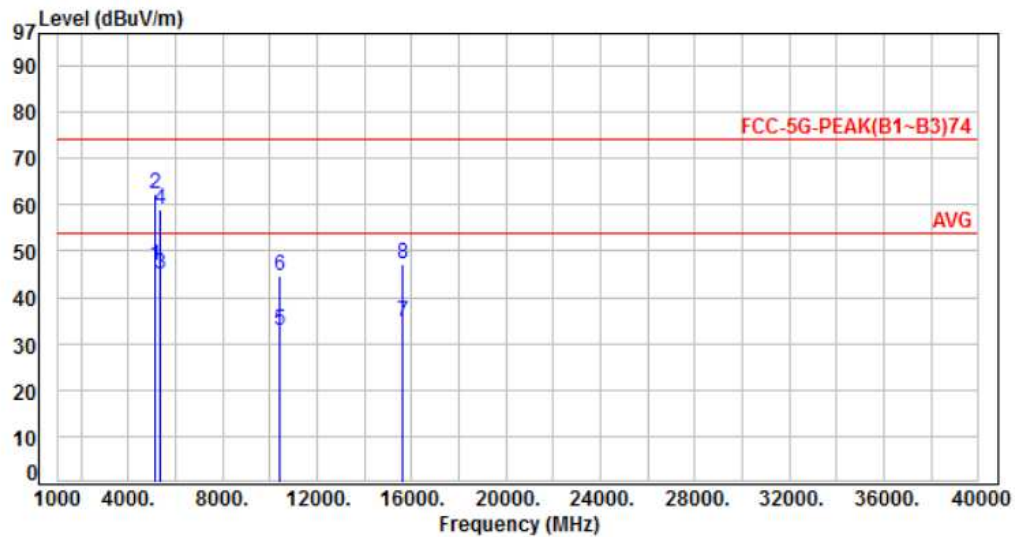
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 6, CH42	Temperature	: 24°C
Test Date	: Feb. 14, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5150.00	-6.54	53.50	46.96	54.00	-7.04	Average	195	203	P
2	5150.00	-6.54	68.90	62.36	74.00	-11.64	Peak	195	203	P
3	5350.00	-6.06	51.22	45.16	54.00	-8.84	Average	195	203	P
4	5350.00	-6.06	65.08	59.02	74.00	-14.98	Peak	195	203	P
5	10420.00	0.69	32.19	32.88	54.00	-21.12	Average	113	216	P
6	10420.00	0.69	44.07	44.76	74.00	-29.24	Peak	113	216	P
7	15630.00	5.37	29.25	34.62	54.00	-19.38	Average	100	183	P
8	15630.00	5.37	41.89	47.26	74.00	-26.74	Peak	100	183	P

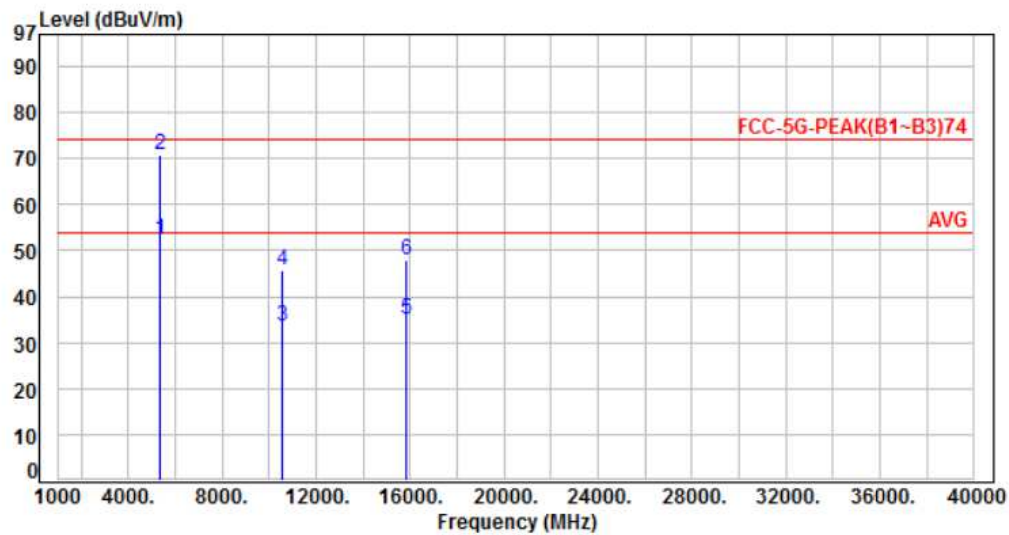
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 6, CH58	Temperature	: 24°C
Test Date	: Feb. 14, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5350.00	-6.06	58.37	52.31	54.00	-1.69	Average	241	171	P
2	5350.00	-6.06	76.75	70.69	74.00	-3.31	Peak	241	171	P
3	10580.00	0.85	32.78	33.63	54.00	-20.37	Average	172	213	P
4	10580.00	0.85	44.76	45.61	74.00	-28.39	Peak	172	213	P
5	15870.00	5.37	29.81	35.18	54.00	-18.82	Average	149	193	P
6	15870.00	5.37	42.65	48.02	74.00	-25.98	Peak	149	193	P

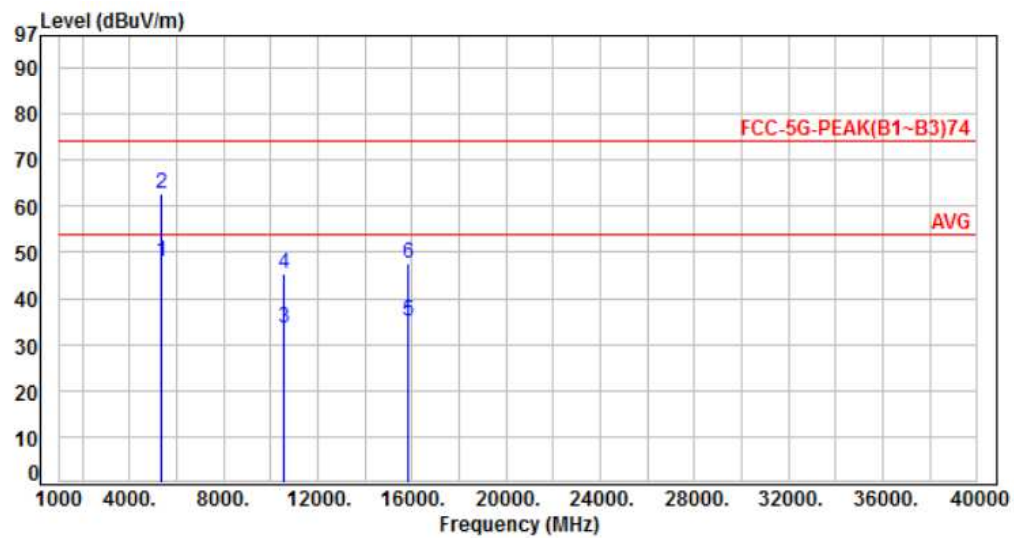
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 6, CH58	Temperature	: 24°C
Test Date	: Feb. 14, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5350.00	-6.06	53.89	47.83	54.00	-6.17	Average	161	137	P
2	5350.00	-6.06	68.73	62.67	74.00	-11.33	Peak	161	137	P
3	10580.00	0.85	32.57	33.42	54.00	-20.58	Average	131	244	P
4	10580.00	0.85	44.49	45.34	74.00	-28.66	Peak	131	244	P
5	15870.00	5.37	29.67	35.04	54.00	-18.96	Average	126	213	P
6	15870.00	5.37	42.33	47.70	74.00	-26.30	Peak	126	213	P

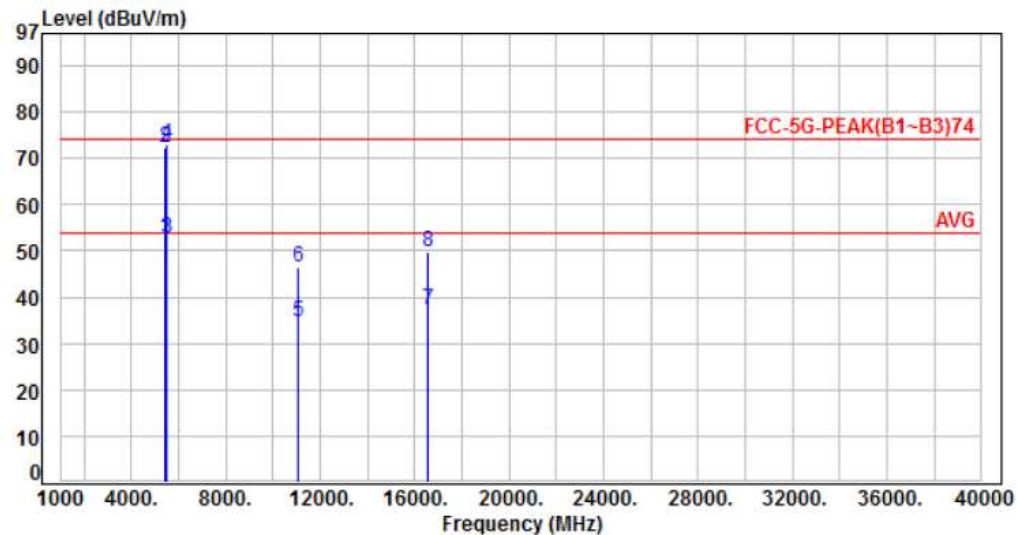
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 6, CH106	Temperature	: 24°C
Test Date	: Feb. 14, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5460.00	-5.80	58.40	52.60	54.00	-1.40	Average	215	176	P
2	5460.00	-5.80	77.93	72.13	74.00	-1.87	Peak	215	176	P
3	5470.00	-5.78	58.54	52.76	54.00	-1.24	Average	215	176	P
4	5470.00	-5.78	78.69	72.91	74.00	-1.09	Peak	215	176	P
5	11060.00	1.48	33.04	34.52	54.00	-19.48	Average	168	211	P
6	11060.00	1.48	45.13	46.61	74.00	-27.39	Peak	168	211	P
7	16590.00	7.13	30.14	37.27	54.00	-16.73	Average	149	198	P
8	16590.00	7.13	42.68	49.81	74.00	-24.19	Peak	149	198	P

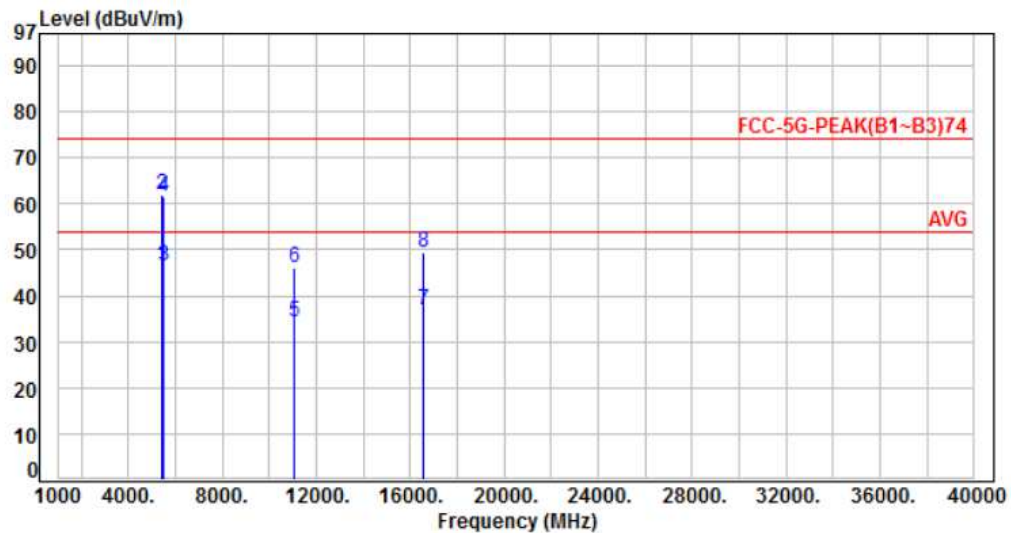
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 6, CH106	Temperature	: 24°C
Test Date	: Feb. 14, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5460.00	-5.80	52.39	46.59	54.00	-7.41	Average	179	123	P
2	5460.00	-5.80	67.80	62.00	74.00	-12.00	Peak	179	123	P
3	5470.00	-5.78	52.32	46.54	54.00	-7.46	Average	179	123	P
4	5470.00	-5.78	67.24	61.46	74.00	-12.54	Peak	179	123	P
5	11060.00	1.48	32.82	34.30	54.00	-19.70	Average	147	183	P
6	11060.00	1.48	44.80	46.28	74.00	-27.72	Peak	147	183	P
7	16590.00	7.13	29.88	37.01	54.00	-16.99	Average	161	202	P
8	16590.00	7.13	42.46	49.59	74.00	-24.41	Peak	161	202	P

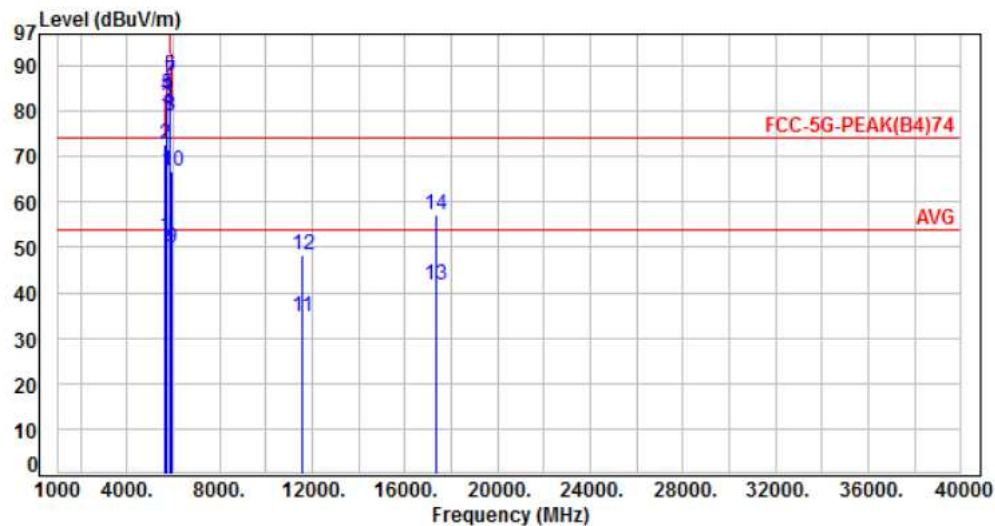
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 6, CH155	Temperature	: 24°C
Test Date	: Feb. 15, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV)	Limit (dBUV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-5.77	58.30	52.53	54.00	-1.47	Average	217	188	P
2	5650.00	-5.77	78.48	72.71	74.00	-1.29	Peak	217	188	P
3	5700.00	-5.79	86.50	80.71	105.20	-24.49	Peak	217	188	P
4	5720.00	-5.80	89.08	83.28	110.80	-27.52	Peak	217	188	P
5	5725.00	-5.80	89.68	83.88	122.20	-38.32	Peak	217	188	P
6	5850.00	-5.84	93.62	87.78	122.20	-34.42	Peak	221	201	P
7	5855.00	-5.84	92.56	86.72	110.80	-24.08	Peak	221	201	P
8	5875.00	-5.85	84.71	78.86	105.20	-26.34	Peak	221	201	P
9	5925.00	-5.87	55.62	49.75	54.00	-4.25	Average	221	201	P
10	5925.00	-5.87	72.76	66.89	74.00	-7.11	Peak	221	201	P
11	11550.00	2.09	32.40	34.49	54.00	-19.51	Average	137	268	P
12	11550.00	2.09	46.40	48.49	74.00	-25.51	Peak	137	268	P
13	17325.00	11.53	29.98	41.51	54.00	-12.49	Average	152	241	P
14	17325.00	11.53	45.60	57.13	74.00	-16.87	Peak	152	241	P

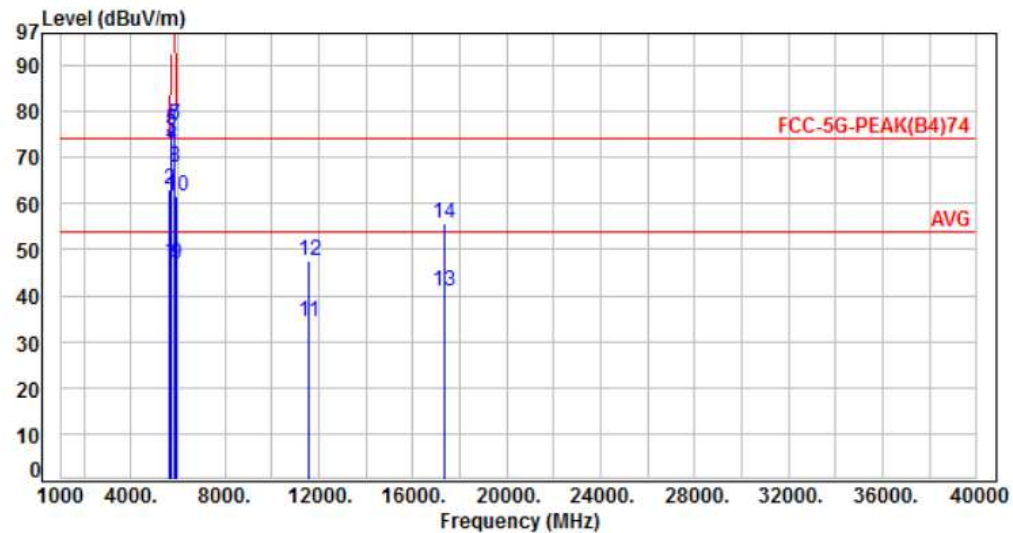
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 6, CH155	Temperature	: 24°C
Test Date	: Feb. 15, 2017	Humidity	: 63%



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-5.77	53.02	47.25	54.00	-6.75	Average	149	201	P
2	5650.00	-5.77	69.01	63.24	74.00	-10.76	Peak	149	201	P
3	5700.00	-5.79	79.87	74.08	105.20	-31.12	Peak	149	201	P
4	5720.00	-5.80	78.58	72.78	110.80	-38.02	Peak	149	201	P
5	5725.00	-5.80	81.81	76.01	122.20	-46.19	Peak	149	201	P
6	5850.00	-5.84	82.85	77.01	122.20	-45.19	Peak	133	198	P
7	5855.00	-5.84	83.03	77.19	110.80	-33.61	Peak	133	198	P
8	5875.00	-5.85	73.84	67.99	105.20	-37.21	Peak	133	198	P
9	5925.00	-5.87	52.58	46.71	54.00	-7.29	Average	133	198	P
10	5925.00	-5.87	67.60	61.73	74.00	-12.27	Peak	133	198	P
11	11550.00	2.09	32.18	34.27	54.00	-19.73	Average	137	148	P
12	11550.00	2.09	45.57	47.66	74.00	-26.34	Peak	137	148	P
13	17325.00	11.53	29.51	41.04	54.00	-12.96	Average	100	269	P
14	17325.00	11.53	44.10	55.63	74.00	-18.37	Peak	100	269	P

Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



6.7. Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.150
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz



7. On Time, Duty Cycle and Measurement methods

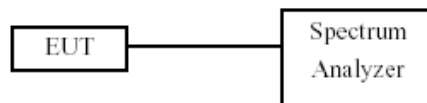
7.1. Test Limit

None; for reporting purposes only.

7.2. Test Procedure

KDB 789033 Zero-Span Spectrum Analyzer Method.

7.3. Test Setup Layout



7.4. Test Result and Data

Temperature: 21°C

Humidity: 58%

Test Date: Feb. 24, 2017

Modulation Type	On Time (msec)	Period Time (msec)	Duty Cycle (%)	1/T Minimum VBW(Hz)	Duty Cycle correction Factor (dB)
802.11a	100.00	100.00	100.00%	10.00	0.00
802.11n HT20	100.00	100.00	100.00%	10.00	0.00
802.11n HT40	100.00	100.00	100.00%	10.00	0.00
802.11ac VHT20	100.00	100.00	100.00%	10.00	0.00
802.11ac VHT40	100.00	100.00	100.00%	10.00	0.00
802.11ac VHT80	100.00	100.00	100.00%	10.00	0.00

7.5. Measurement Methods

26 dB and 6dB Emission BW	KDB 789033 D02 v01, Section C
99% Occupied BW	KDB 789033 D02 v01, Section D
Conducted Output Power	KDB 789033 D02 v01, Section E.2.d and E.3.b (Method PM-G)
Power Spectral Density	KDB 789033 D02 v01, Section F
Unwanted emissions in restricted bands	KDB 789033 D02 v01, Sections G and H
Unwanted emissions in non-restricted bands	KDB 789033 D02 v01, Sections G and H



8. 6dB Bandwidth

8.1. Test Limit

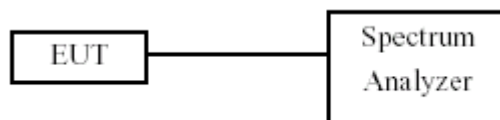
FCC §15.407

The minimum 6 dB bandwidth shall be at least 500 kHz.

8.2. Test Procedure

Reference to 789033 D02 General UNII Test Procedures New Rules v01: The transmitter output is connected to a spectrum analyzer with the RBW set to 100kHz, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

8.3. Test Setup Layout



8.4. Test Result and Data

Temperature: 21°C

Humidity: 58%

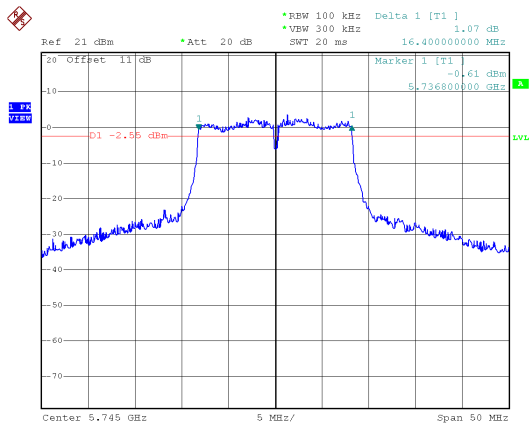
Test Date: Feb. 24, 2017

In the 5.8G Band

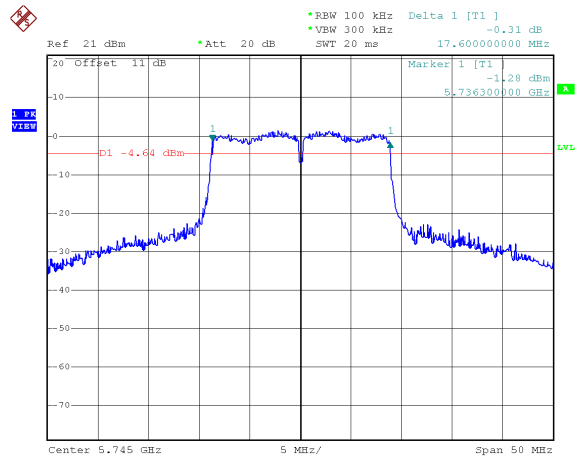
Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)
			ANT A	ANT B	
802.11a	149	5745	16.40	16.60	0.50
	157	5785	16.50	16.50	0.50
	165	5825	16.50	16.50	0.50
802.11ac VHT20	149	5745	17.60	17.70	0.50
	157	5785	17.60	17.60	0.50
	165	5825	17.70	17.60	0.50
802.11ac VHT40	155	5755	36.60	36.60	0.50
	159	5795	36.40	36.40	0.50
802.11ac VHT80	155	5775	76.48	76.48	0.50



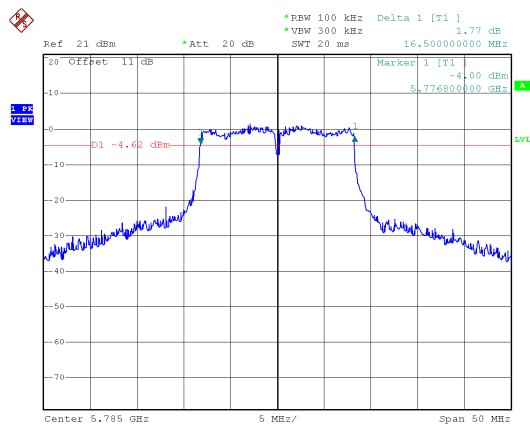
Antenna A
Modulation Standard: 802.11a (6Mbps)
CH149



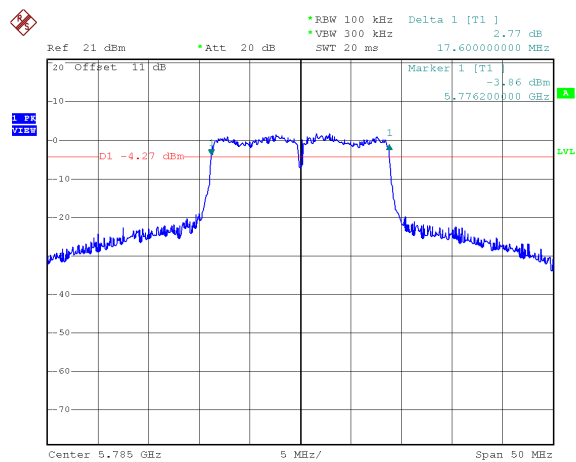
Modulation Standard: 802.11ac, VHT20 (6.5Mbps)
CH149



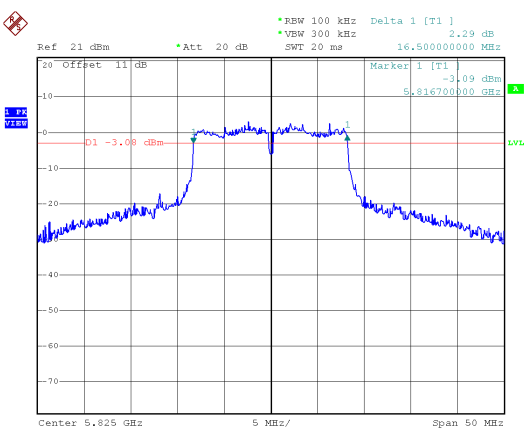
CH157



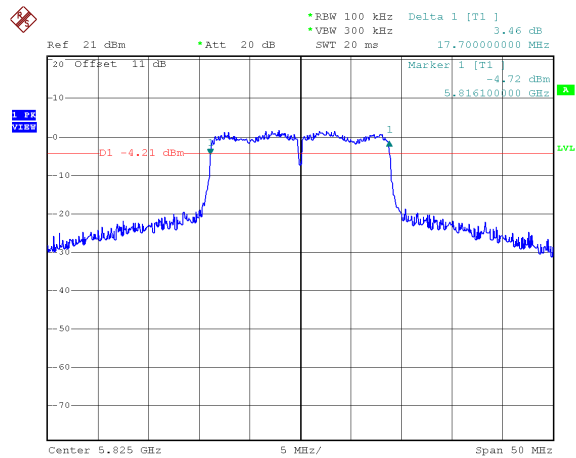
CH157



CH165

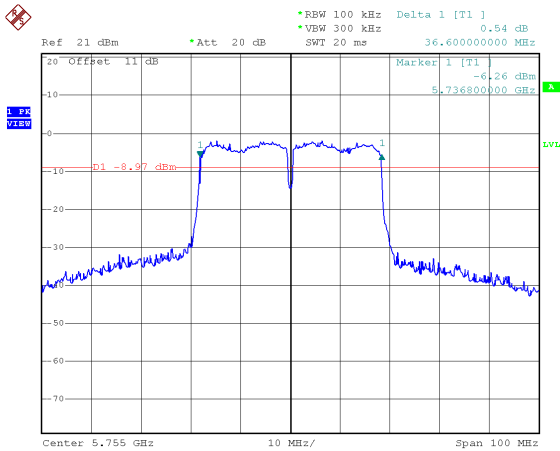
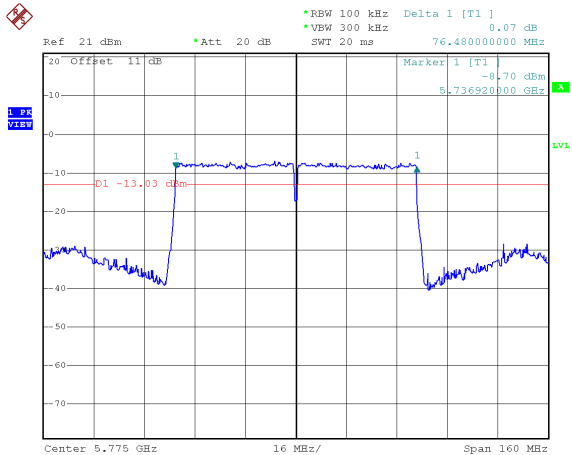


CH165

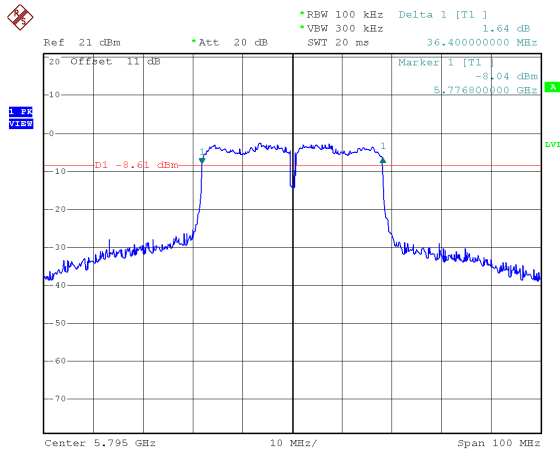




Antenna A

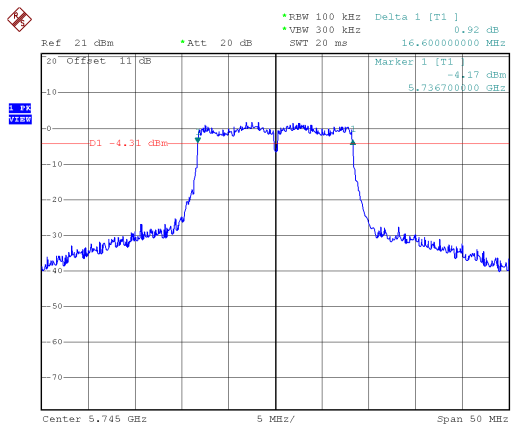
Modulation Standard: 802.11ac, VHT40 (13.5Mbps)
CH151Modulation Standard: 802.11ac, VHT80 (29.3Mbps)
CH155

CH159

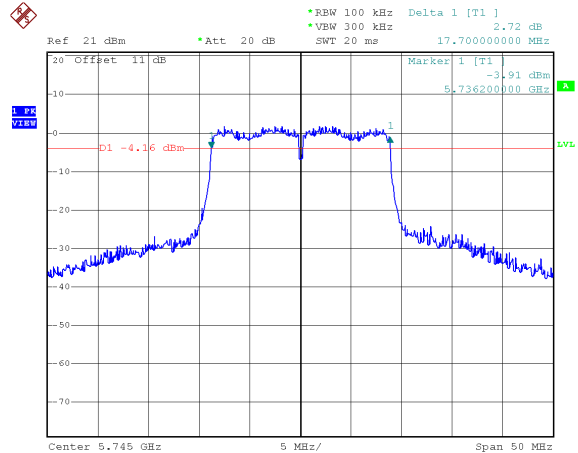




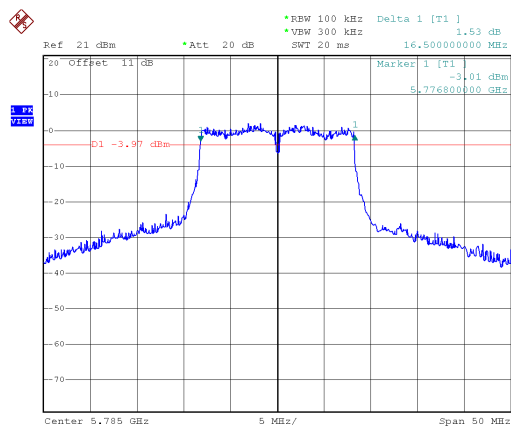
Antenna B
Modulation Standard: 802.11a (6Mbps)
CH149



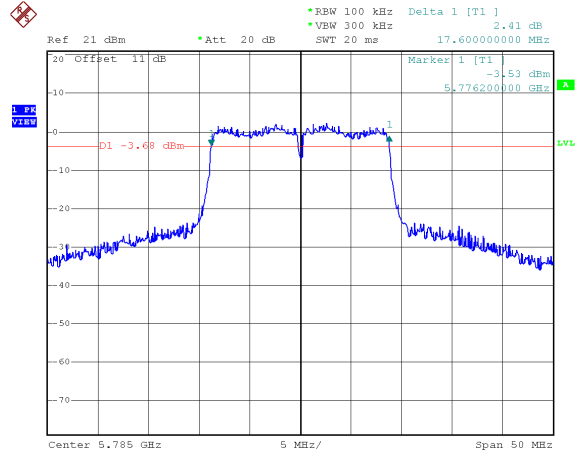
Modulation Standard: 802.11ac, VHT20 (6.5Mbps)
CH149



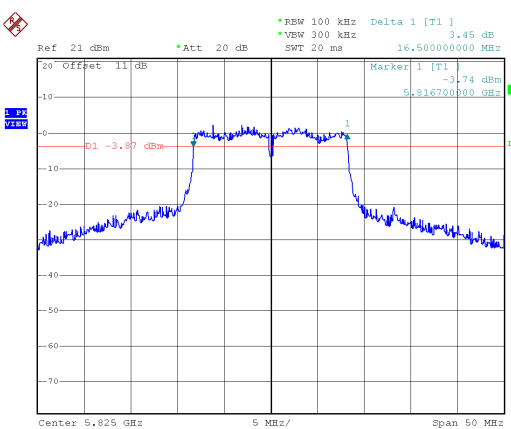
CH157



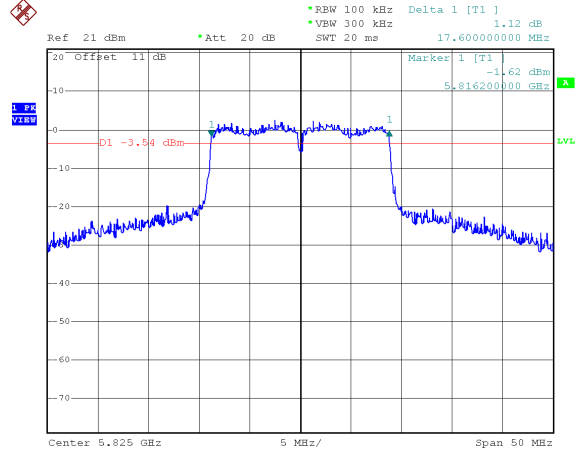
CH157



CH165

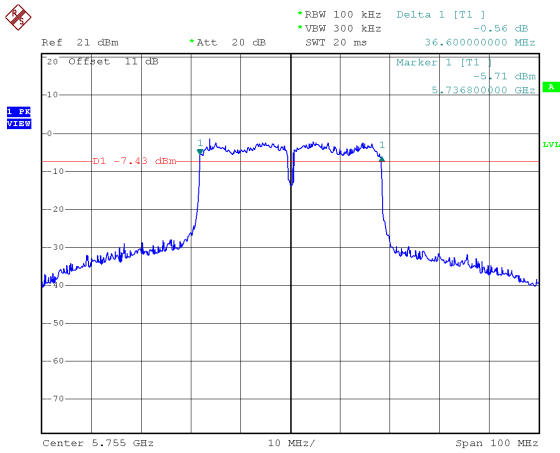
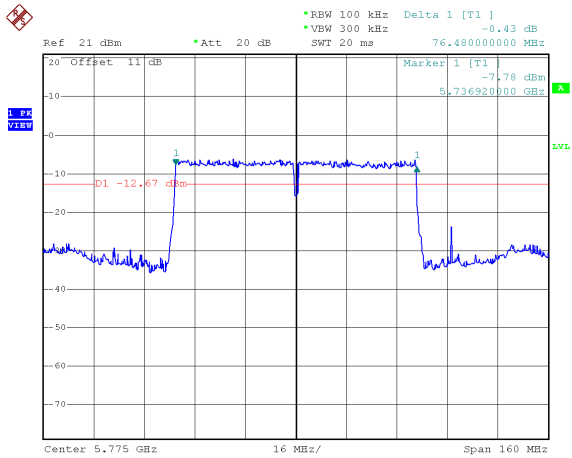


CH165

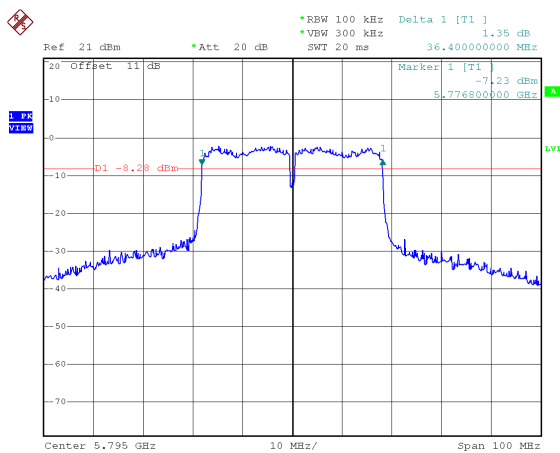




Antenna B

Modulation Standard: 802.11ac, VHT40 (13.5Mbps)
CH151Modulation Standard: 802.11ac, VHT80 (29.3Mbps)
CH155

CH159





9. 26dB Bandwidth

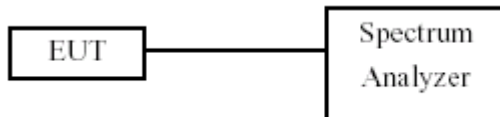
9.1. Test Limit

None; for reporting purposes only.

9.2. Test Procedure

Reference to 789033 D02 General UNII Test Procedures New Rules v01: The transmitter output is connected to a spectrum analyzer with the RBW = approximately 1% of the emission bandwidth, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

9.3. Test Setup Layout





9.4. Test Result and Data

Temperature: 21°C

Humidity: 58%

Test Date: Feb. 24, 2017

In the 5.2G Band

Modulation Type	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
			ANT A	ANT B
802.11a	36	5180	20.00	19.80
	44	5220	20.20	20.00
	48	5240	20.10	20.00
802.11ac VHT20	36	5180	20.50	20.40
	44	5220	23.30	21.30
	48	5240	21.00	20.40
802.11ac VHT40	38	5190	42.20	41.60
	46	5230	42.40	48.80
802.11ac VHT80	42	5210	82.56	82.56

In the 5.3G Band

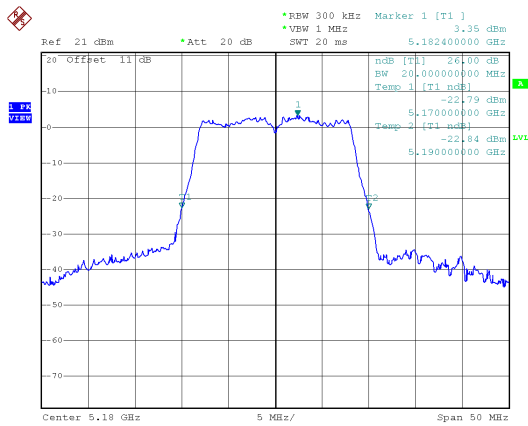
Modulation Type	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
			ANT A	ANT B
802.11a	52	5260	20.40	20.90
	60	5300	20.60	20.30
	64	5320	20.30	20.10
802.11ac VHT20	52	5260	23.30	22.70
	60	5300	31.90	24.20
	64	5320	25.60	20.40
802.11ac VHT40	54	5270	42.20	42.40
	62	5310	42.60	41.80
802.11ac VHT80	58	5290	82.24	82.24

In the 5.5G Band

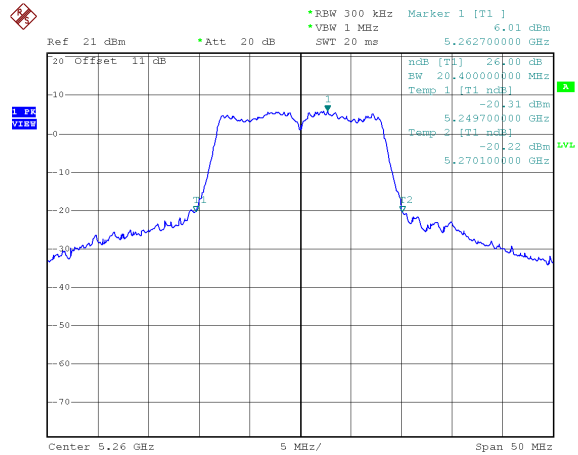
Modulation Type	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
			ANT A	ANT B
802.11a	100	5500	20.20	19.80
	116	5580	22.20	20.10
	140	5700	20.20	20.00
802.11ac VHT20	100	5500	20.80	20.40
	116	5580	21.20	25.60
	140	5700	20.60	20.50
802.11ac VHT40	102	5510	42.20	41.60
	110	5550	55.20	41.40
	134	5670	42.00	42.20
802.11ac VHT80	106	5530	82.56	82.56



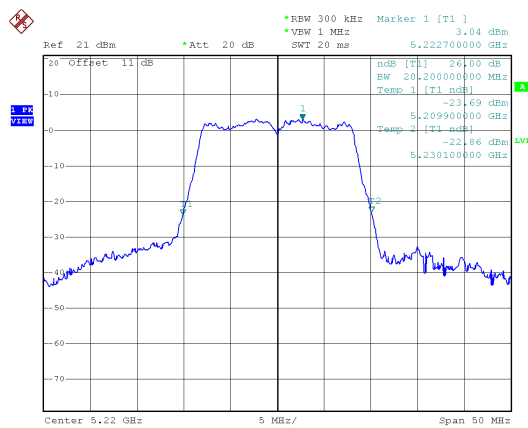
Antenna A
Modulation Standard: 802.11a (6Mbps)
CH36



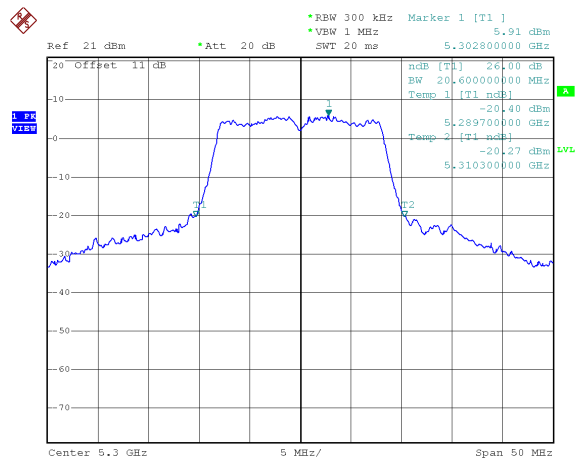
CH52



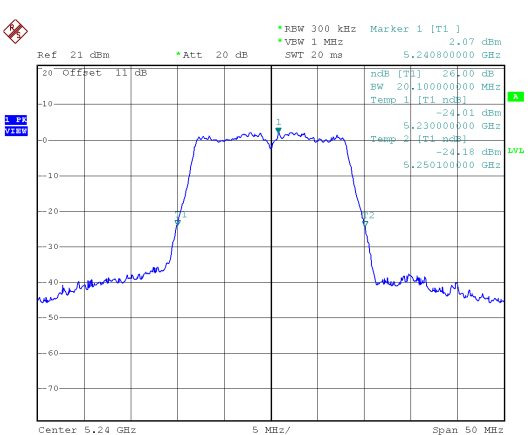
CH44



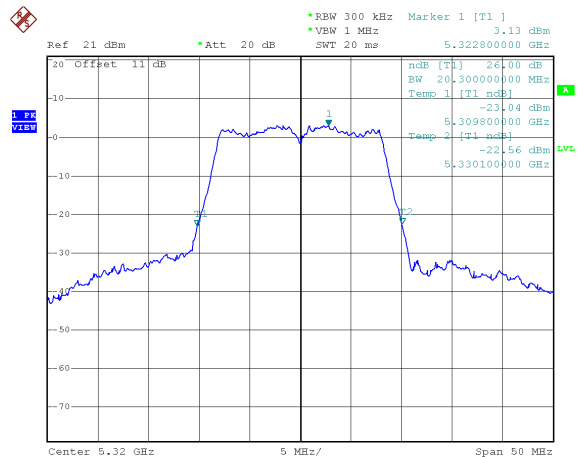
CH60



CH48

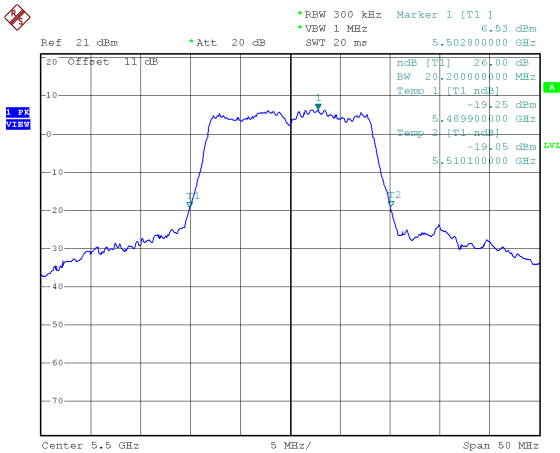


CH64

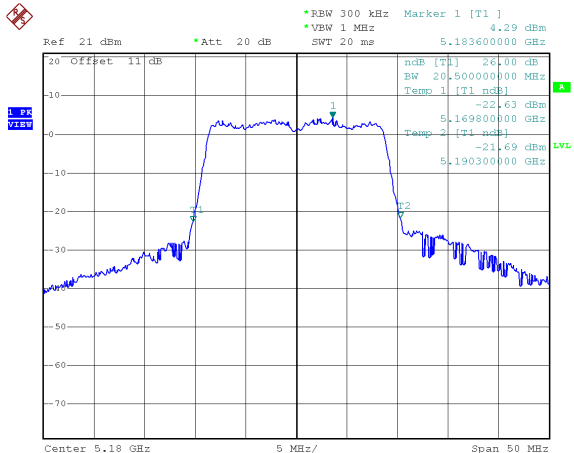




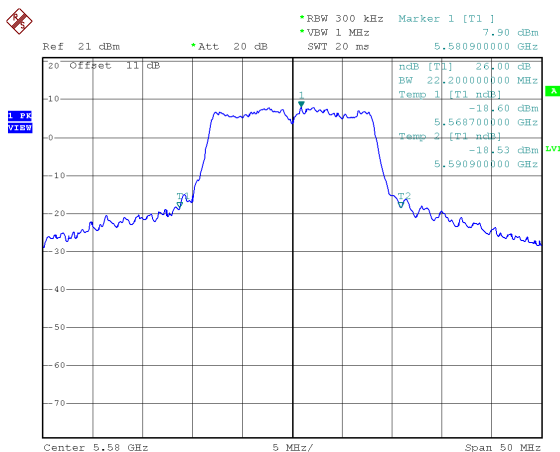
Antenna A
Modulation Standard: 802.11a (6Mbps)
CH100



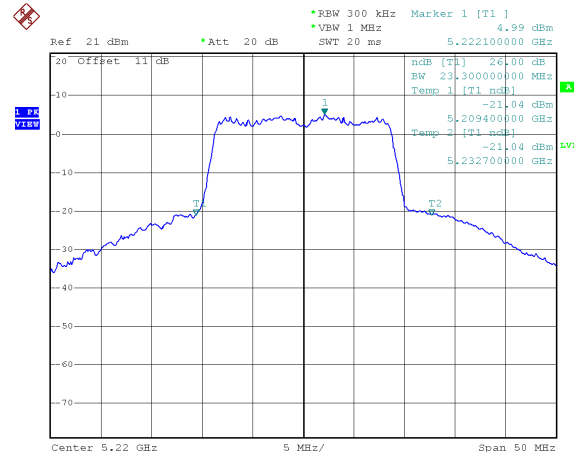
Modulation Standard: 802.11ac VHT20 (6.5Mbps)
CH36



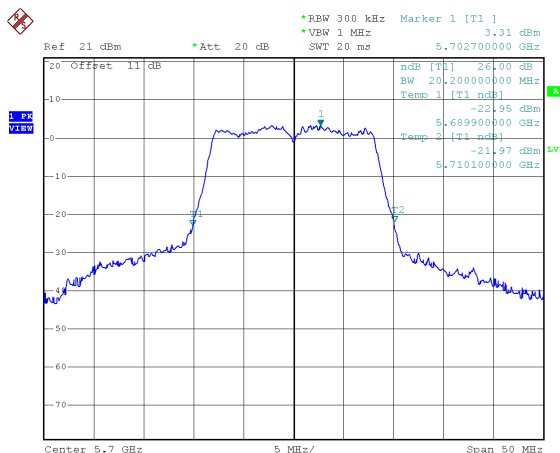
CH116



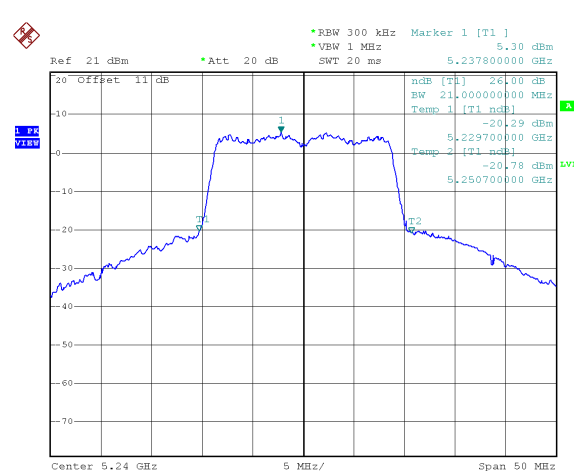
CH44



CH140

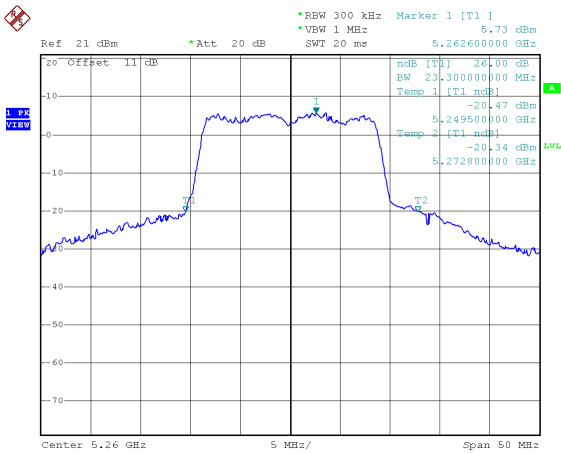


CH48

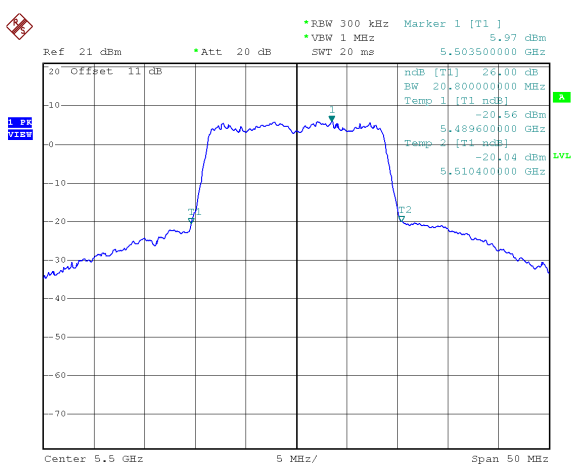




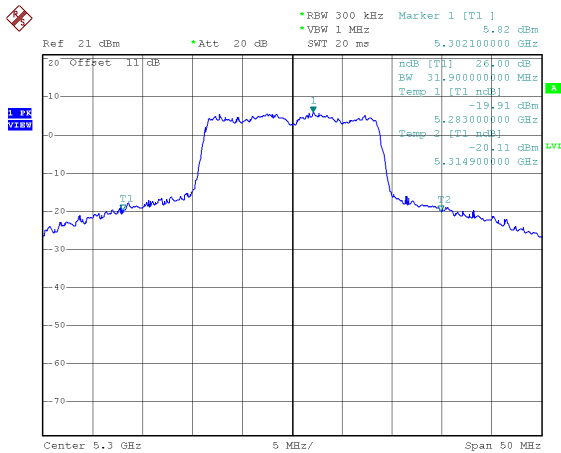
Antenna A
Modulation Standard: 802.11ac VHT20 (6.5Mbps)
CH52



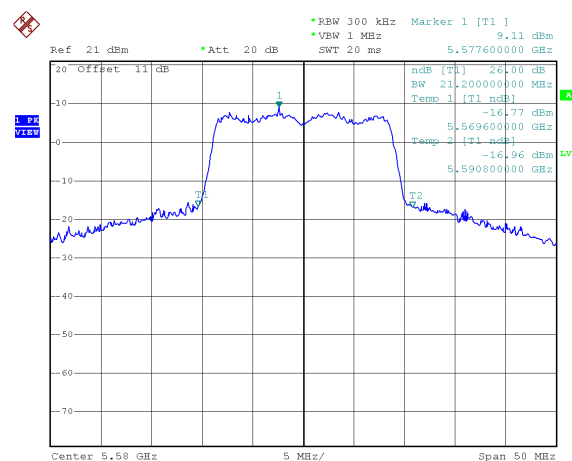
CH100



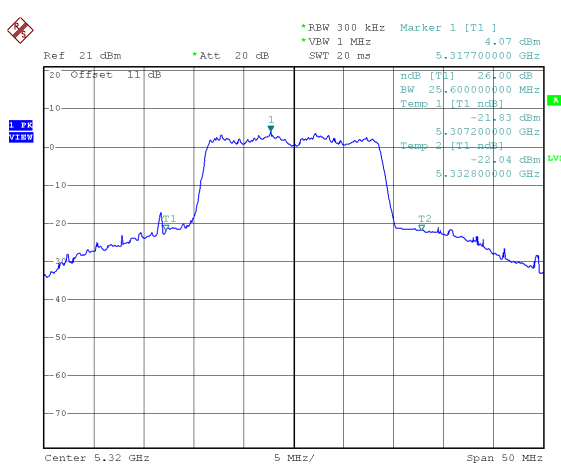
CH60



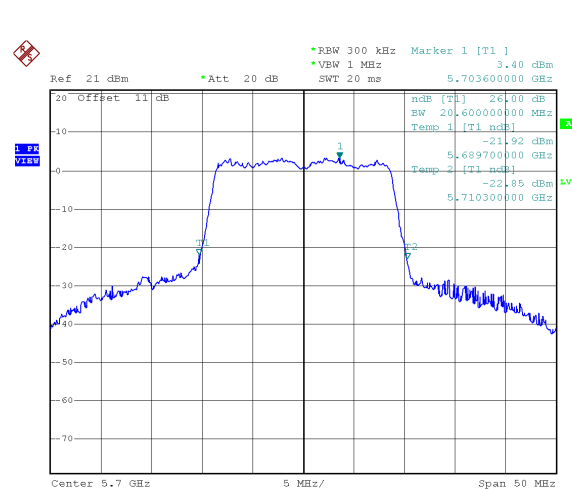
CH116



CH64

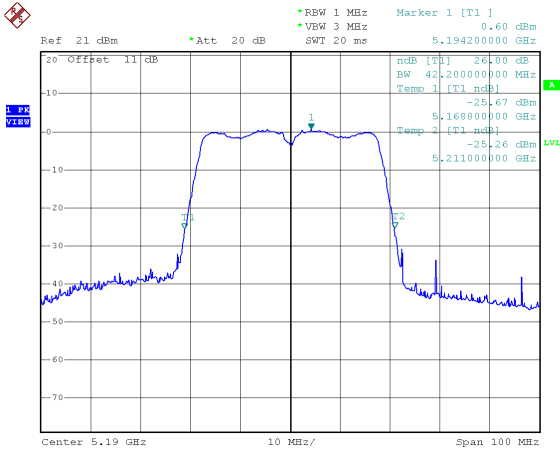


CH140

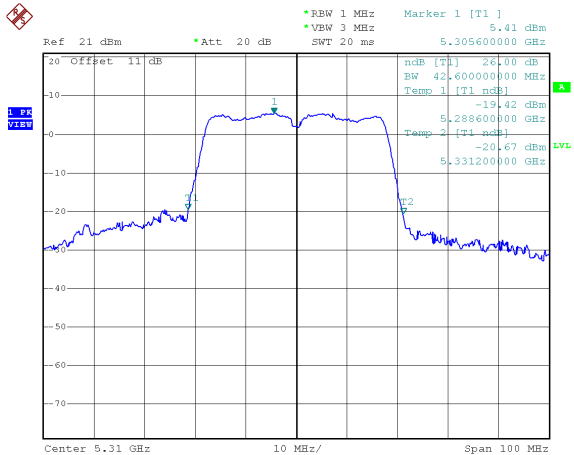




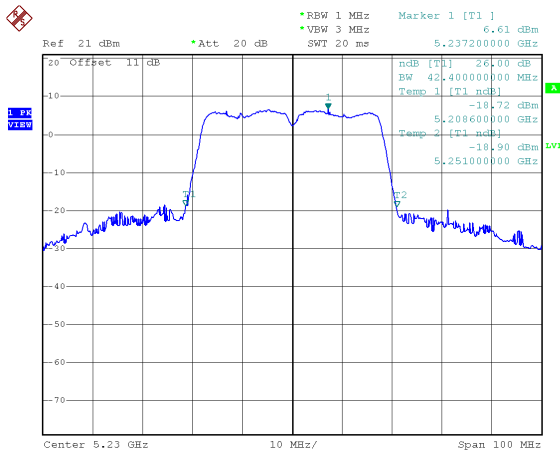
Antenna A
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH38



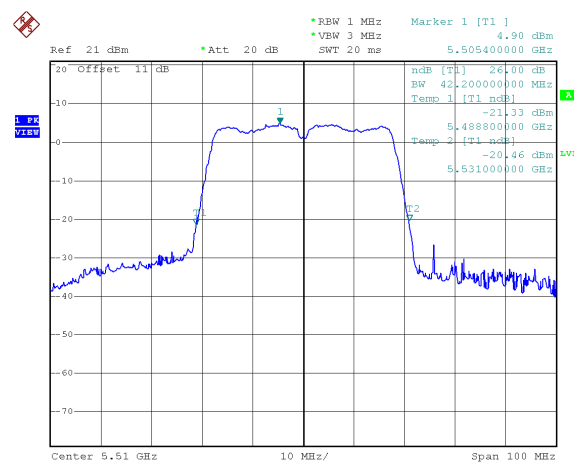
CH62



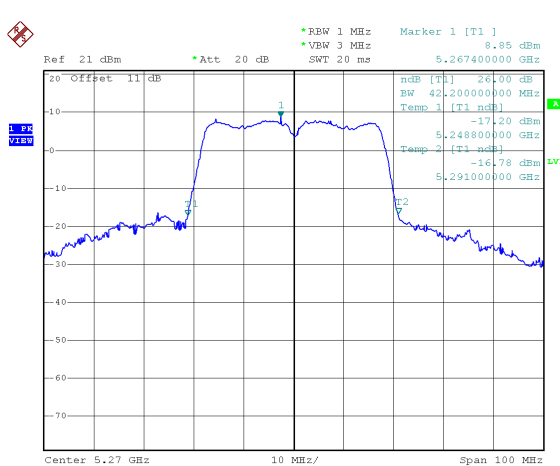
CH46



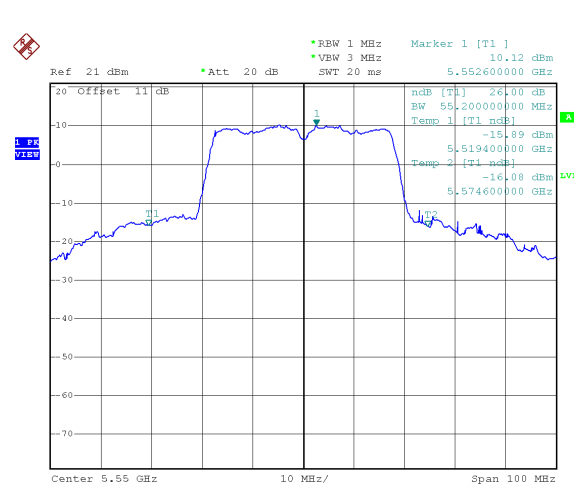
CH102



CH54



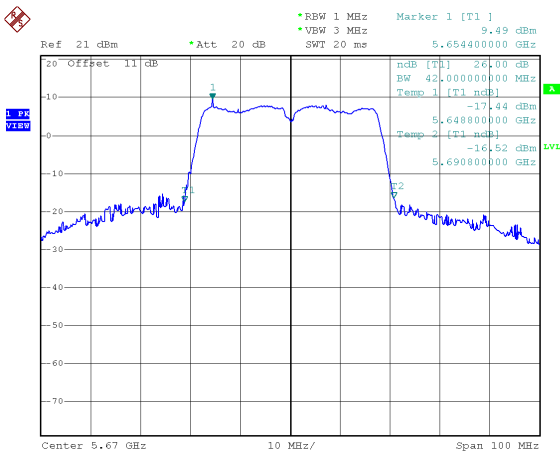
CH110



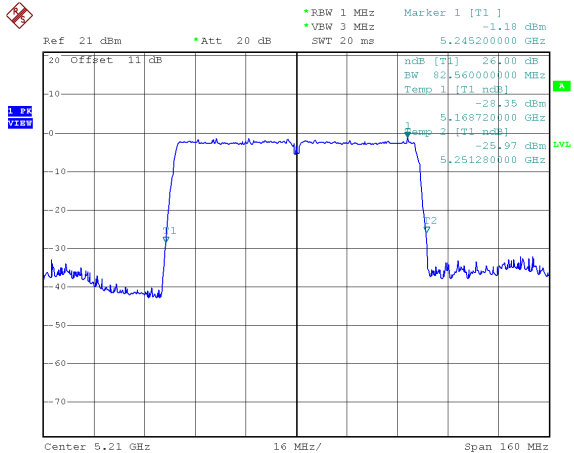


Antenna A

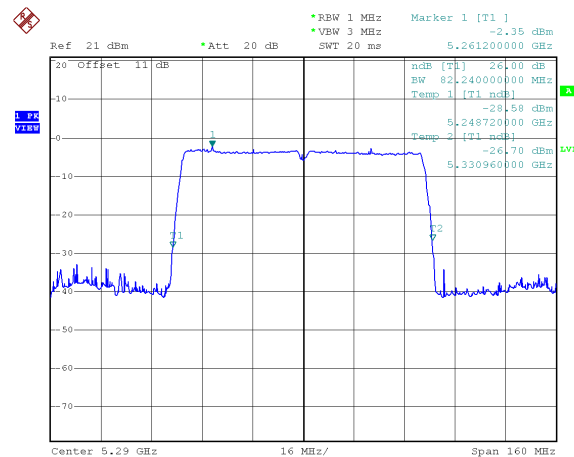
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH134



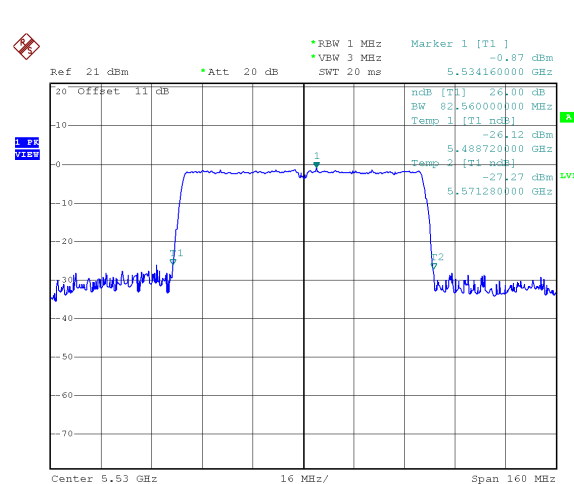
Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH42



CH58

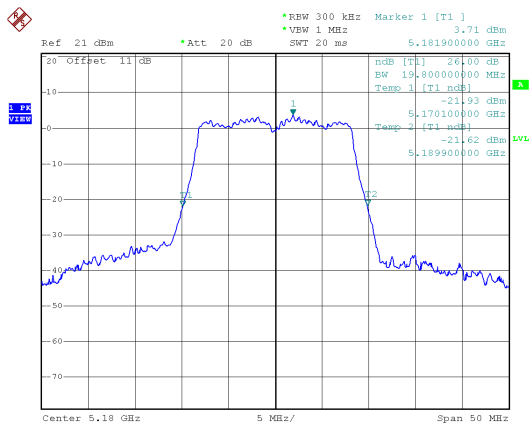


CH106

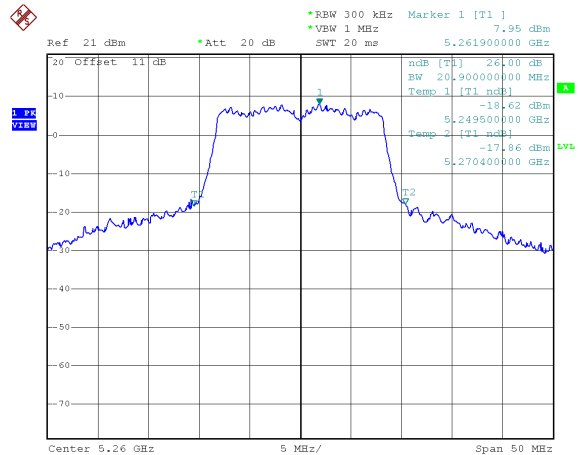




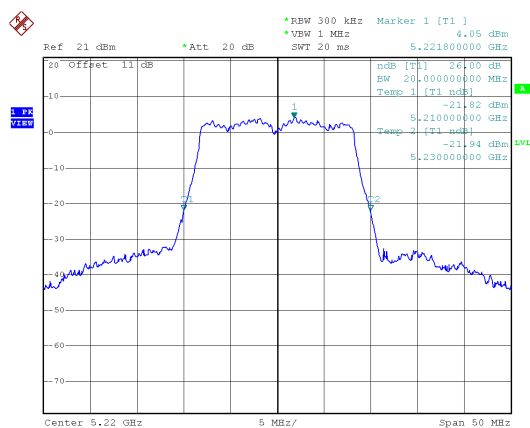
Antenna B
Modulation Standard: 802.11a (6Mbps)
CH36



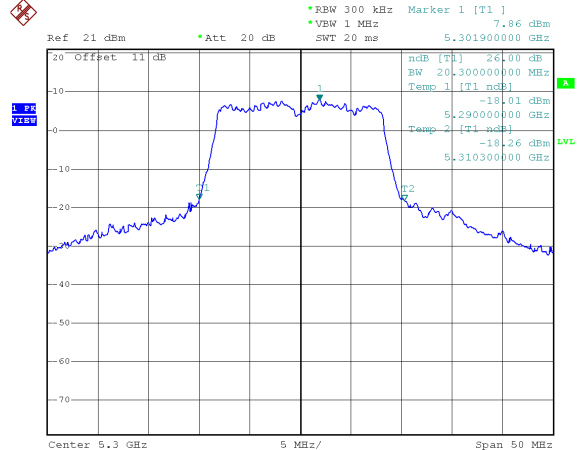
CH52



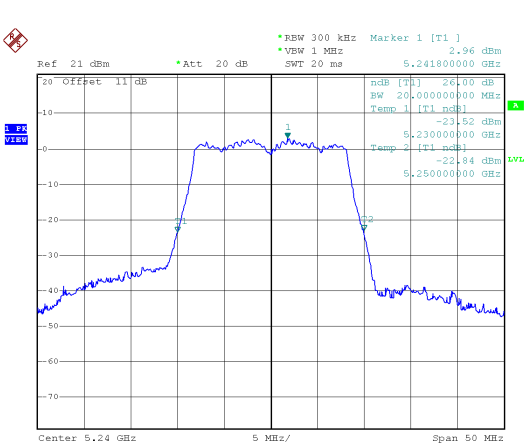
CH44



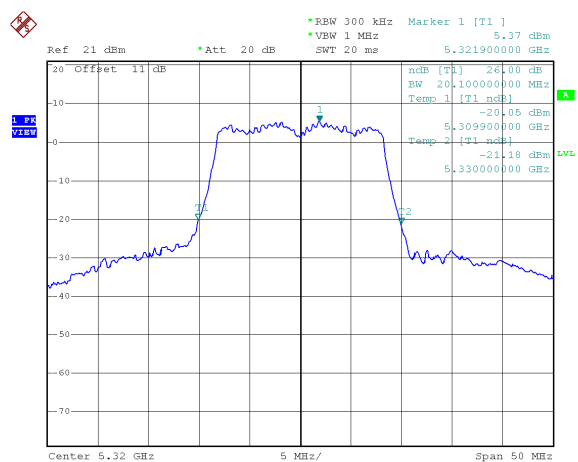
CH60



CH48

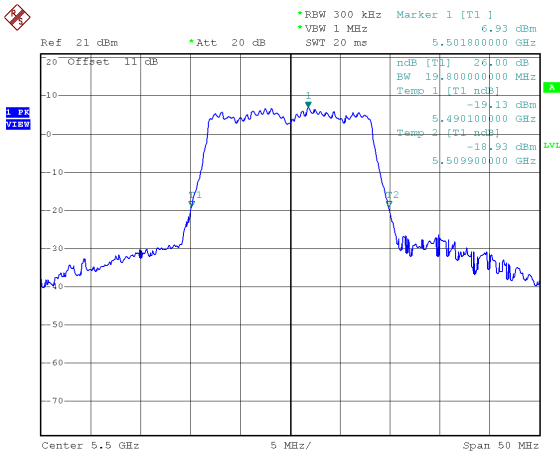


CH64

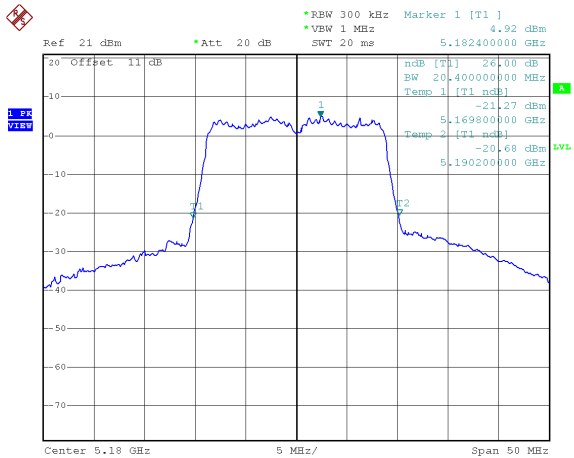




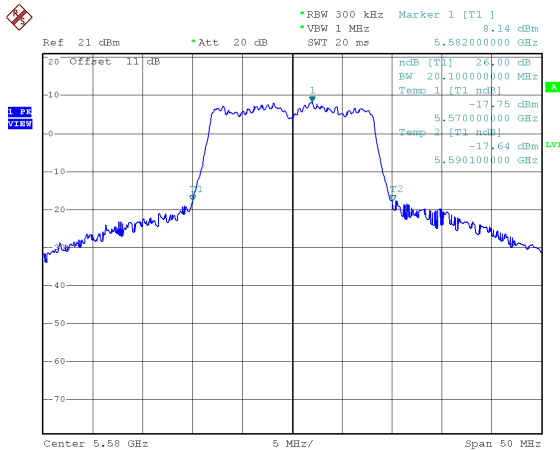
Antenna B
Modulation Standard: 802.11a (6Mbps)
CH100



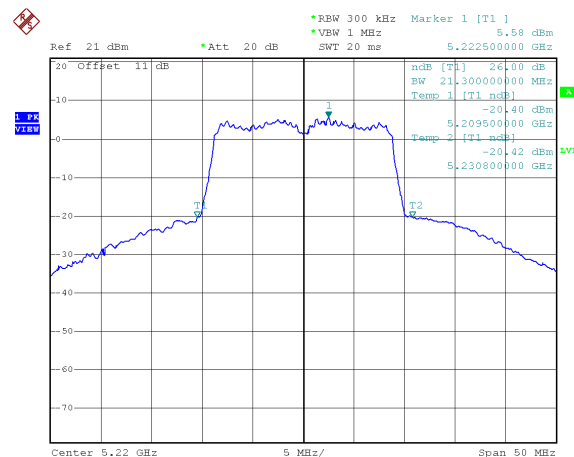
Modulation Standard: 802.11ac VHT20 (6.5Mbps)
CH36



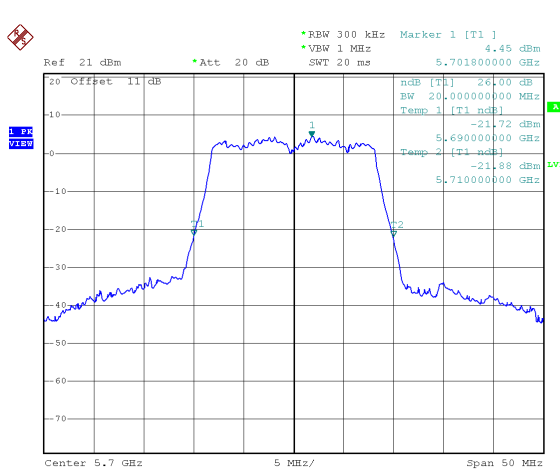
CH116



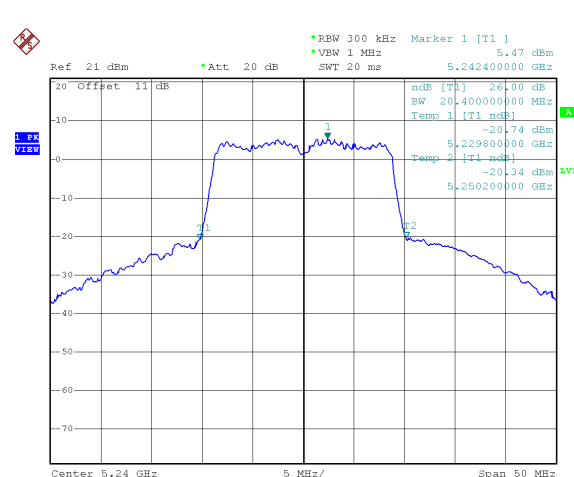
CH44



CH140

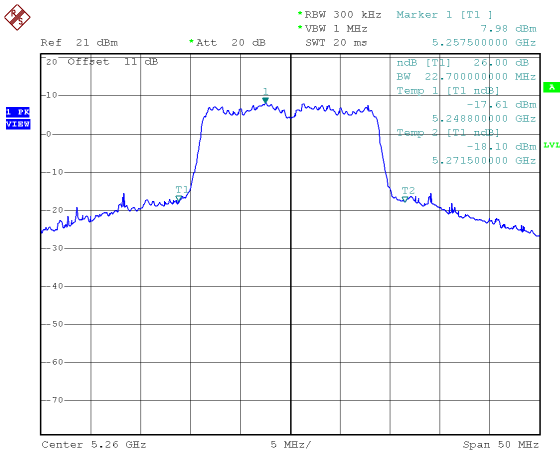


CH48

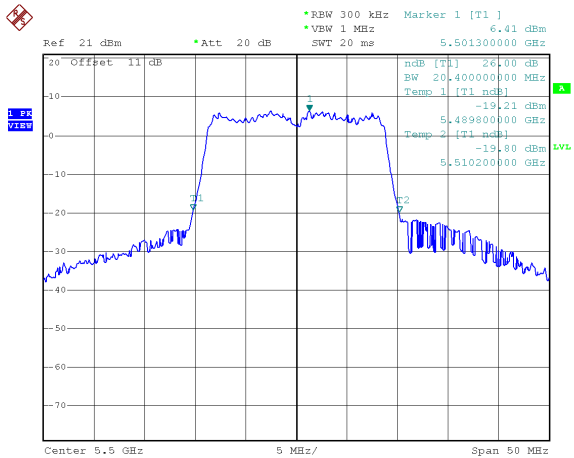




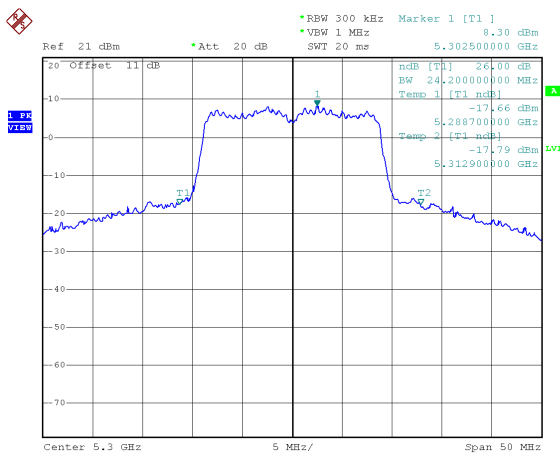
Antenna B
Modulation Standard: 802.11ac VHT20 (6.5Mbps)
CH52



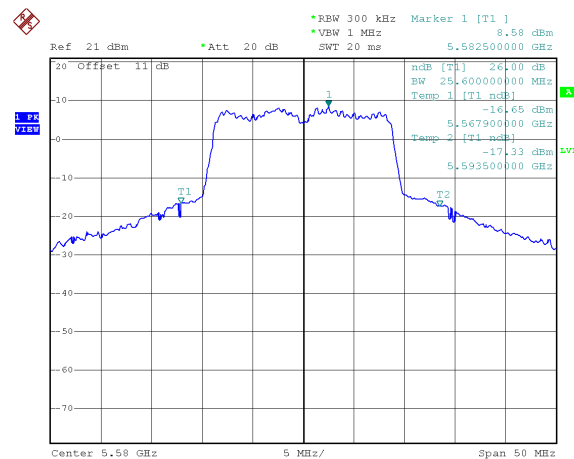
CH100



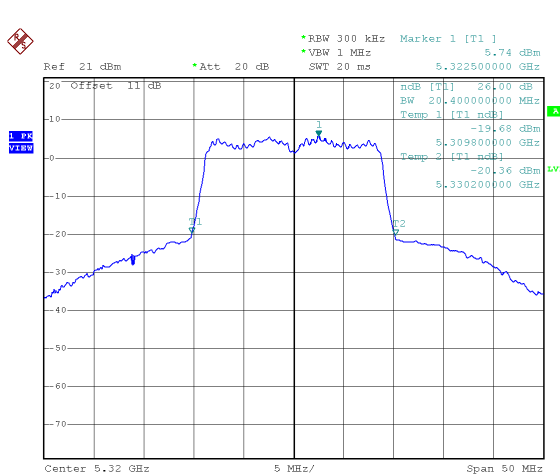
CH60



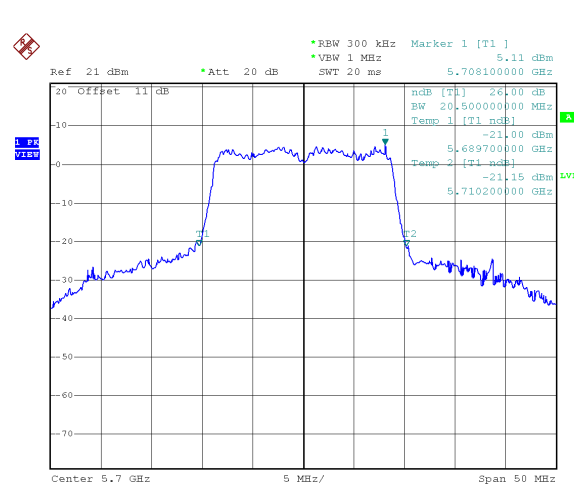
CH116



CH64



CH140





Antenna B
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH38







10. Average Power

10.1. Test Limit

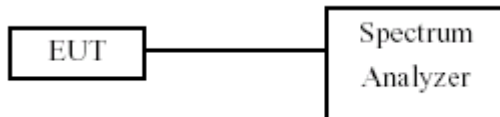
None; for reporting purposes only.

10.2. Test Procedure

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

10.3. Test Setup Layout





10.4. Test Result and Data

Temperature: 21°C

Humidity: 58%

Test Date: Feb. 24, 2017

In the 5.2G Band

Modulation Type	Channel	Frequency (MHz)	Avg Power Output (dBm)		Total Power (dBm)	Total Power (mW)	Power Limit (dBm)
			ANT A	ANT B	A+B	A+B	
802.11a	36	5180	11.43	11.85	14.66	29.21	30.00
	44	5220	11.85	12.02	14.95	31.23	30.00
	48	5240	11.18	11.54	14.37	27.38	30.00
802.11an HT20	36	5180	12.51	12.82	15.68	36.97	30.00
	44	5220	13.75	14.03	16.90	49.01	30.00
	48	5240	13.99	14.42	17.22	52.73	30.00
802.11an HT40	38	5190	6.92	7.58	10.27	10.65	30.00
	46	5230	12.82	13.26	16.06	40.33	30.00
802.11ac VHT20	36	5180	12.56	12.89	15.74	37.48	30.00
	44	5220	13.8	14.07	16.95	49.52	30.00
	48	5240	14.02	14.5	17.28	53.42	30.00
802.11ac VHT40	38	5190	6.96	7.63	10.32	10.76	30.00
	46	5230	12.9	13.3	16.11	40.88	30.00
802.11ac VHT80	42	5210	8.36	8.61	11.50	14.12	30.00

In the 5.3G Band

Modulation Type	Channel	Frequency (MHz)	Avg Power Output (dBm)		Total Power (dBm)	Total Power (mW)	Power Limit (dBm)
			ANT A	ANT B	A+B	A+B	
802.11a	52	5260	15.31	15.43	18.38	68.88	24.00
	60	5300	15.16	15.17	18.18	65.69	24.00
	64	5320	11.2	11.95	14.60	28.85	24.00
802.11an HT20	52	5260	15.28	15.24	18.27	67.15	24.00
	60	5300	14.93	15.11	18.03	63.55	24.00
	64	5320	11.39	11.89	14.66	29.22	24.00
802.11an HT40	54	5270	13.97	14.12	17.06	50.77	24.00
	62	5310	11.62	11.89	14.77	29.97	24.00
802.11ac VHT20	52	5260	15.32	15.29	18.32	67.85	24.00
	60	5300	14.98	15.16	18.08	64.29	24.00
	64	5320	11.44	11.99	14.73	29.74	24.00
802.11ac VHT40	54	5270	14.05	14.22	17.15	51.83	24.00
	62	5310	11.7	11.96	14.84	30.49	24.00
802.11ac VHT80	58	5290	6.62	6.9	9.77	9.49	24.00



Temperature: 21°C

Humidity: 58%

Test Date: Feb. 24, 2017

In the 5.5G Band

Modulation Type	Channel	Frequency (MHz)	Avg Power Output (dBm)		Total Power (dBm)	Total Power (mW)	Power Limit (dBm)
			ANT A	ANT B	A+B	A+B	
802.11a	100	5500	12.17	11.94	15.07	32.11	24.00
	116	5580	14.9	14.45	17.69	58.76	24.00
	140	5700	10.08	10.26	13.18	20.80	24.00
802.11an HT20	100	5500	14.08	10.52	15.67	36.86	24.00
	116	5580	14.94	14.27	17.63	57.92	24.00
	140	5700	10.42	10.47	13.46	22.16	24.00
802.11an HT40	102	5510	7.49	8.67	11.13	12.97	24.00
	110	5550	14.12	13.78	16.96	49.70	24.00
	134	5670	12.63	12.58	15.62	36.44	24.00
802.11ac VHT20	100	5500	10.14	10.56	13.37	21.70	24.00
	116	5580	15.02	14.3	17.69	58.68	24.00
	140	5700	10.5	10.53	13.53	22.52	24.00
802.11ac VHT40	102	5510	7.53	8.73	11.18	13.13	24.00
	110	5550	14.2	13.85	17.04	50.57	24.00
	134	5670	12.7	12.65	15.69	37.03	24.00
802.11ac VHT80	106	5530	5.65	6.44	9.07	8.08	24.00

In the 5.8G Band

Modulation Type	Channel	Frequency (MHz)	Avg Power Output (dBm)		Total Power (dBm)	Total Power (mW)	Power Limit (dBm)
			ANT A	ANT B	A+B	A+B	
802.11a	149	5745	14.6	14.83	17.73	59.25	30.00
	157	5785	14.67	14.56	17.63	57.88	30.00
	165	5825	15.14	15	18.08	64.28	30.00
802.11an HT20	149	5745	14.61	14.72	17.68	58.56	30.00
	157	5785	14.55	14.63	17.60	57.55	30.00
	165	5825	15.12	15.07	18.11	64.65	30.00
802.11an HT40	151	5755	14.02	13.85	16.95	49.50	30.00
	159	5795	14.06	13.82	16.95	49.57	30.00
802.11ac VHT20	149	5745	14.72	14.78	17.76	59.71	30.00
	157	5785	14.68	14.7	17.70	58.89	30.00
	165	5825	15.2	15.14	18.18	65.77	30.00
802.11ac VHT40	151	5755	14.11	13.95	17.04	50.59	30.00
	159	5795	14.14	13.94	17.05	50.72	30.00
802.11ac VHT80	155	5775	13.52	13.5	16.52	44.88	30.00



11. Output Power and PPSD

11.1. Test Limit

Output Power:

Frequency Band		Limit
☒	5.15~5.25GHz	
Operating Mode		
☐	Outdoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30degrees as measured from the horizon must not exceed 125 mW (21 dBm).
☒	Indoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
☐	Fixed point-to-point access points	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.
☐	Mobile and portable client devices	The maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.



Frequency Band		Limit
☒	5.25-5.35 GHz	The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
☒	5.470-5.725 GHz	
☒	5.725~5.85 GHz	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

PSD:

Frequency Band		Limit
☒	5.15~5.25GHz	
	Operating Mode	
☐	Outdoor access point	17 dBm/MHz
☒	Indoor access point	17 dBm/MHz
☐	Fixed point-to-point access points	17 dBm/MHz
☐	Mobile and portable client devices	11 dBm/MHz
☒	5.725~5.85 GHz	11 dBm/MHz
☒	5.470-5.725 GHz	11 dBm/MHz
☒	5.725~5.85 GHz	30 dBm/500kHz



11.2. Test Procedure

As an alternative to FCC KDB-789033, the EUT maximum conducted output power was Measured with an average power meter employing a video bandwidth greater than 6dB BW of the emission under test. Maximum conducted output power was read directly from the meter across all data rates, and across three channels within each sub-band. Special care was used to make sure that the EUT was transmitting in continuous mode. This method exceeds the limitations of FCC KDB-789033, and provides more accurate measurements.

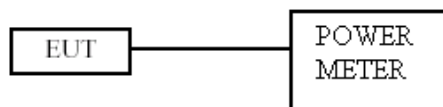
802.11an ($BW \leq 40\text{MHz}$) Maximum conducted output power using KDB 789033 section E)3)b) Method PM-G (Measurement using a gated RF average power meter)

Note: the power meter have a video bandwidth that is greater than or equal to the measurement bandwidth, (Anritsu/ MA2411B video bandwidth: 65MHz)

802.11ac ($BW=80\text{MHz}$) Maximum conducted output power using KDB 789033 section E)2)b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep).

When transmitted signals consist of two or more non-contiguous spectrum segments (e.g., 80+80 MHz mode) or when a single spectrum segment of a transmission crosses the boundary between two adjacent U-NII bands, KDB 644545 D01 section F) procedure is used for measurements.

11.3. Test Setup Layout





11.4. Test Result and Data

Temperature: 21°C

Humidity: 58%

Test Date: Feb. 24, 2017

In the 5.2G Band

Modulation Type	CH	Freq. (MHz)	Meas PPSD (dBm/MHz)		Sum chain (dBm)	Duty Cycle CF(dB)	Total Corr'd PPSD (dBm/MHz)	PPSD Limit (dBm/MHz)
			ANT A	ANT B				
802.11a	36	5180	-0.92	-1.73	1.70	0.00	1.70	11.00
	44	5220	-0.52	0.17	2.85	0.00	2.85	11.00
	48	5240	-1.28	-2.90	1.00	0.00	1.00	11.00
802.11ac VHT20	36	5180	0.06	-0.73	2.69	0.00	2.69	11.00
	44	5220	1.14	-0.07	3.59	0.00	3.59	11.00
	48	5240	1.17	0.16	3.70	0.00	3.70	11.00
802.11ac VHT40	38	5190	-8.36	-9.01	-5.66	0.00	-5.66	11.00
	46	5230	-2.05	-3.01	0.51	0.00	0.51	11.00
802.11ac VHT80	42	5210	-11.27	-11.56	-8.40	0.00	-8.40	11.00

In the 5.3G Band

Modulation Type	CH	Freq. (MHz)	Meas PPSD (dBm/MHz)		Sum chain (dBm)	Duty Cycle CF(dB)	Total Corr'd PPSD (dBm/MHz)	PPSD Limit (dBm/MHz)
			ANT A	ANT B				
802.11a	52	5260	2.48	3.35	5.95	0.00	5.95	11.00
	60	5300	2.56	2.54	5.56	0.00	5.56	11.00
	64	5320	-0.49	0.45	3.02	0.00	3.02	11.00
802.11ac VHT20	52	5260	2.11	1.99	5.06	0.00	5.06	11.00
	60	5300	2.59	2.68	5.65	0.00	5.65	11.00
	64	5320	-0.23	0.52	3.17	0.00	3.17	11.00
802.11ac VHT40	54	5270	-1.01	-0.76	2.13	0.00	2.13	11.00
	62	5310	-3.47	-2.56	0.02	0.00	0.02	11.00
802.11ac VHT80	58	5290	-11.23	-11.50	-8.35	0.00	-8.35	11.00



Temperature: 21°C

Humidity: 58%

Test Date: Feb. 24, 2017

In the 5.5G Band

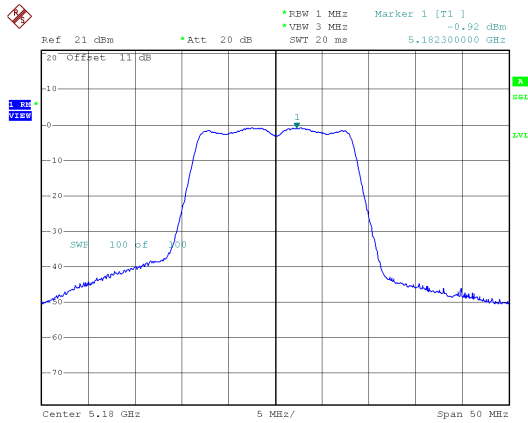
Modulation Type	CH	Freq. (MHz)	Meas PPST (dBm/MHz)		Sum chain (dBm)	Duty Cycle CF(dB)	Total Corr'd PPST (dBm/MHz)	PPST Limit (dBm/MHz)
			ANT A	ANT B				
802.11a	100	5500	1.28	1.29	4.30	0.00	4.30	11.00
	116	5580	3.50	3.07	6.30	0.00	6.30	11.00
	140	5700	-1.17	-0.66	2.10	0.00	2.10	11.00
802.11ac VHT20	100	5500	-0.55	-0.07	2.71	0.00	2.71	11.00
	116	5580	3.15	2.82	6.00	0.00	6.00	11.00
	140	5700	-1.27	0.29	2.59	0.00	2.59	11.00
802.11ac VHT40	102	5510	-5.78	-4.75	-2.22	0.00	-2.22	11.00
	118	5550	-0.09	0.20	3.07	0.00	3.07	11.00
	134	5670	-1.66	-2.30	1.04	0.00	1.04	11.00
802.11ac VHT80	106	5530	-11.79	-11.17	-8.46	0.00	-8.46	11.00

In the 5.8G Band

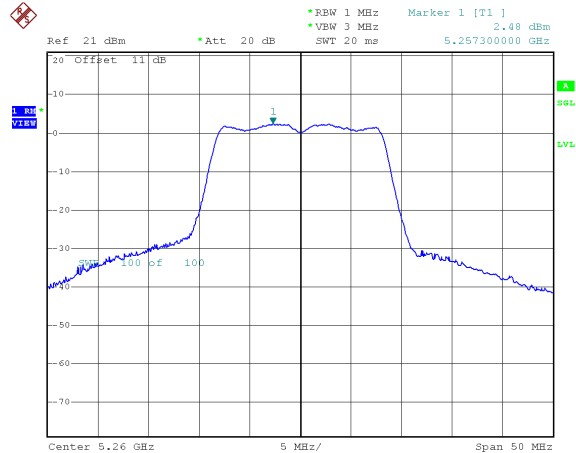
Modulation Type	CH	Freq. (MHz)	Meas PPST (dBm/MHz)		Sum chain (dBm)	Duty Cycle CF(dB)	10log (500KHz/RBW) CF (dB)	Total Corr'd PPST (dBm/MHz)	PPST Limit (dBm/MHz)
			ANT A	ANT B					
802.11a	149	5745	4.40	4.28	7.35	0.00	-3.01	4.34	30.00
	157	5785	4.38	4.04	7.22	0.00	-3.01	4.21	30.00
	165	5825	4.18	4.23	7.22	0.00	-3.01	4.21	30.00
802.11ac VHT20	149	5745	4.11	4.34	7.24	0.00	-3.01	4.23	30.00
	157	5785	4.70	4.16	7.45	0.00	-3.01	4.44	30.00
	165	5825	4.03	4.18	7.12	0.00	-3.01	4.11	30.00
802.11ac VHT40	155	5755	1.05	0.89	3.98	0.00	-3.01	0.97	30.00
	159	5795	0.01	0.09	3.06	0.00	-3.01	0.05	30.00
802.11ac VHT80	155	5775	-4.47	-4.08	-1.26	0.00	-3.01	-4.27	30.00



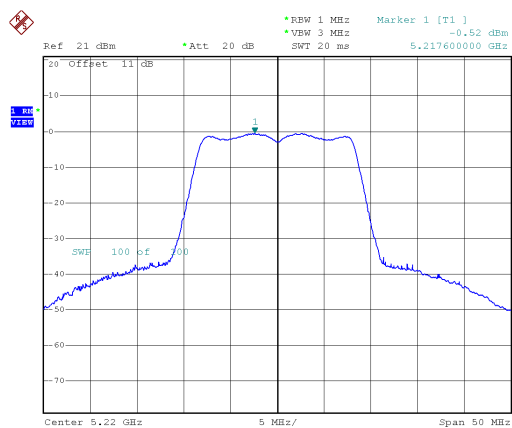
5.2G Band, 5.3G Band, 5.5G Band
Antenna A
Modulation Standard: 802.11a (6Mbps)
CH36



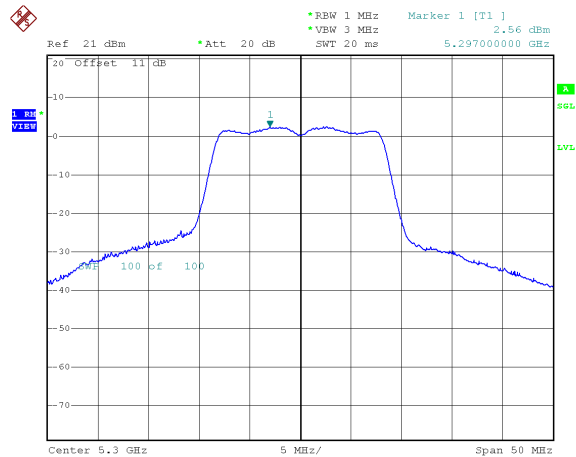
CH52



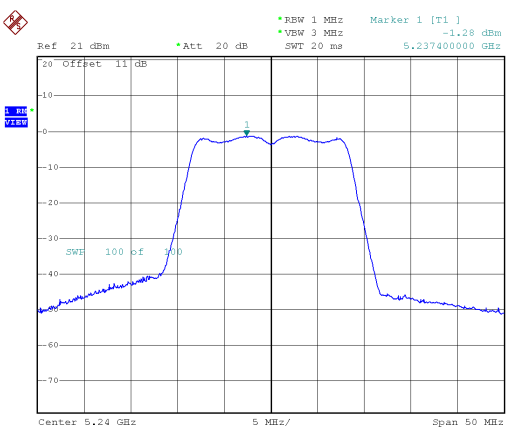
CH44



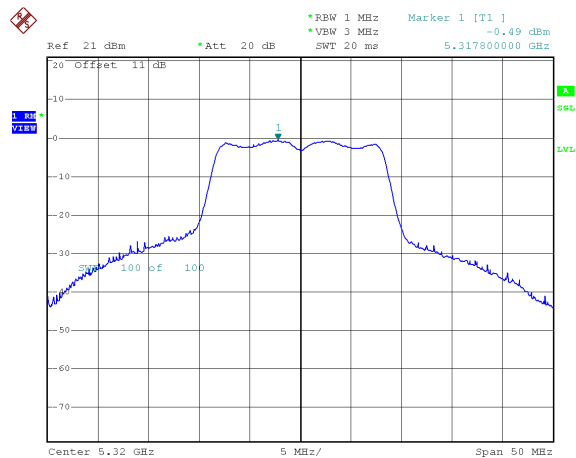
CH60



CH48

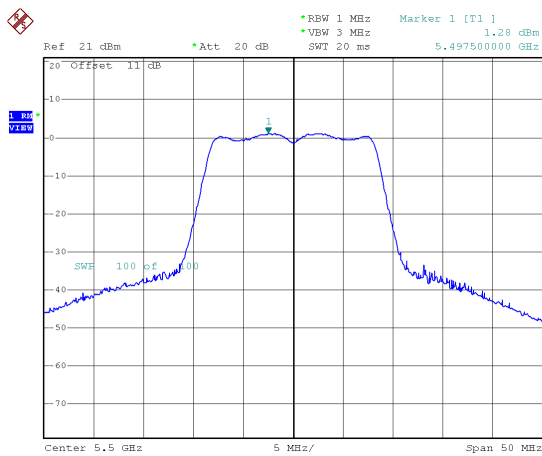


CH64

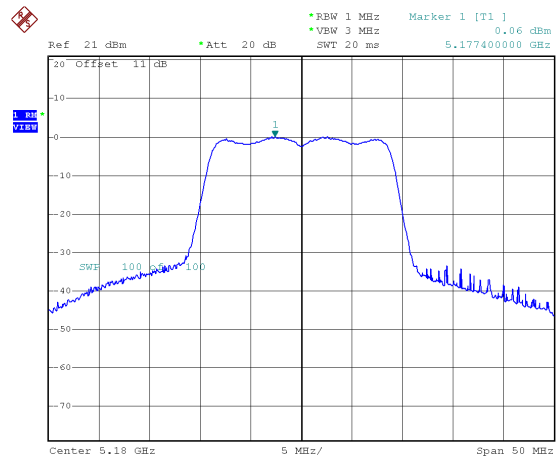




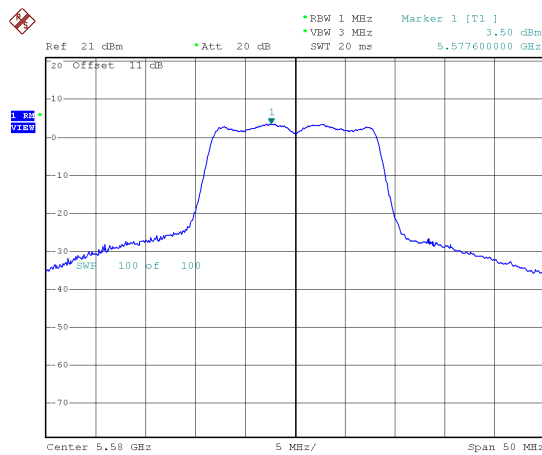
Antenna A
Modulation Standard: 802.11a (6Mbps)
CH100



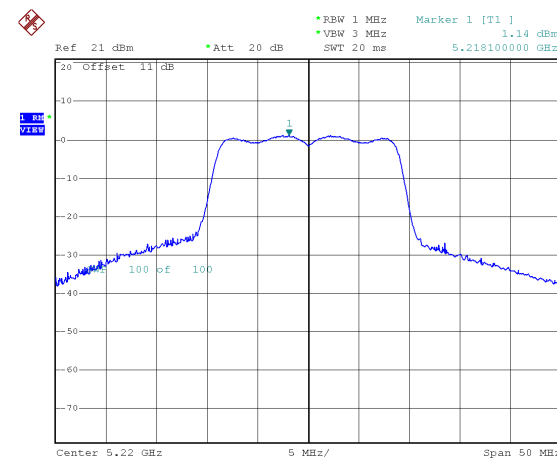
Modulation Standard: 802.11ac VHT20 (6.5Mbps)
CH36



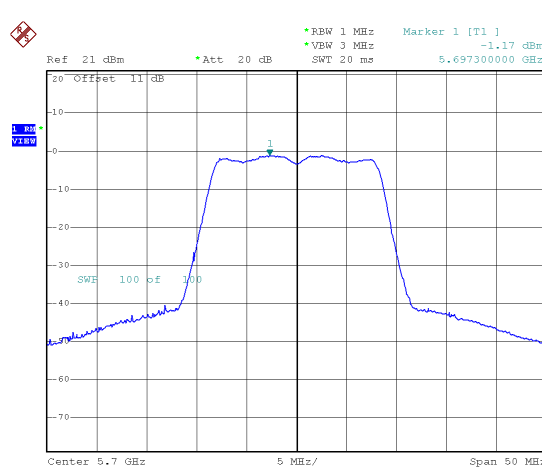
CH116



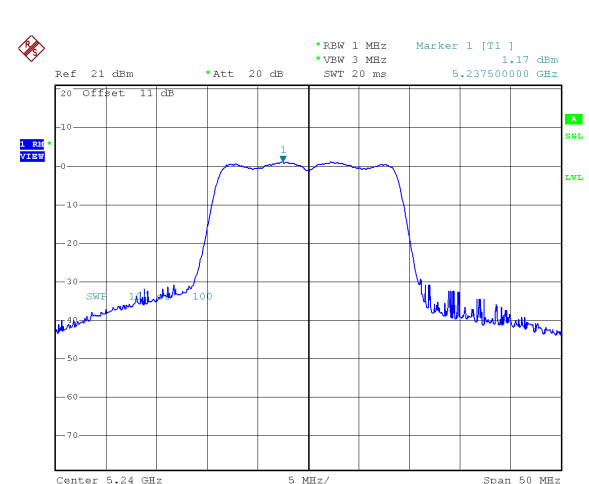
CH44



CH140

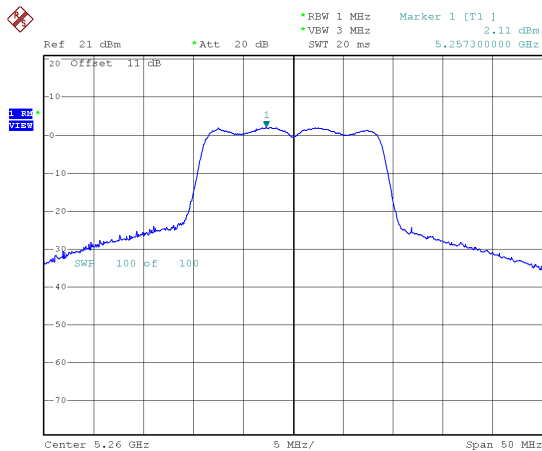


CH48

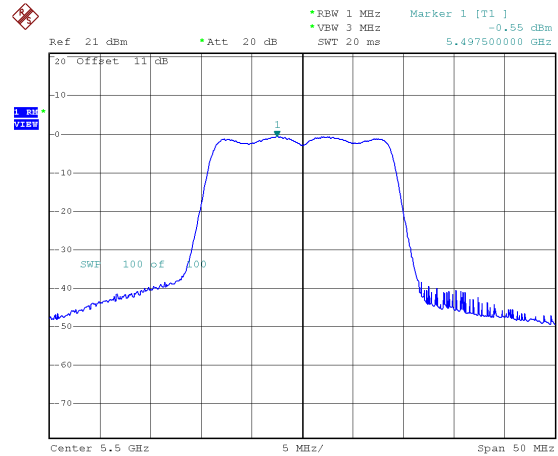




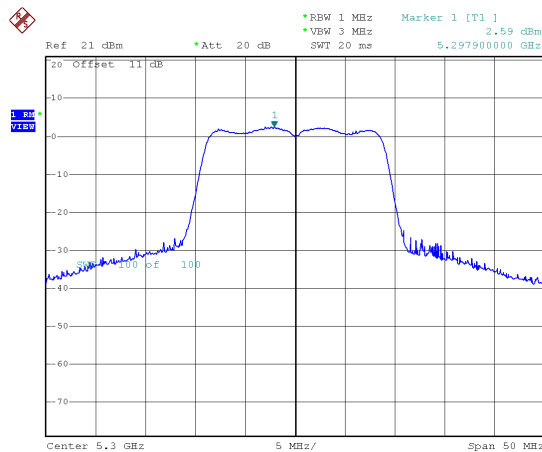
Antenna A
Modulation Standard: 802.11ac VHT20 (6.5Mbps)
CH52



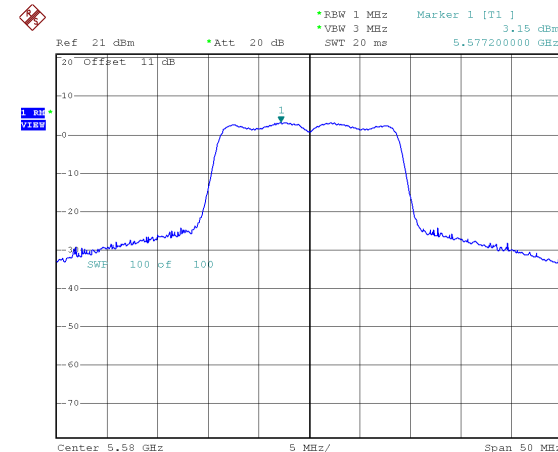
CH100



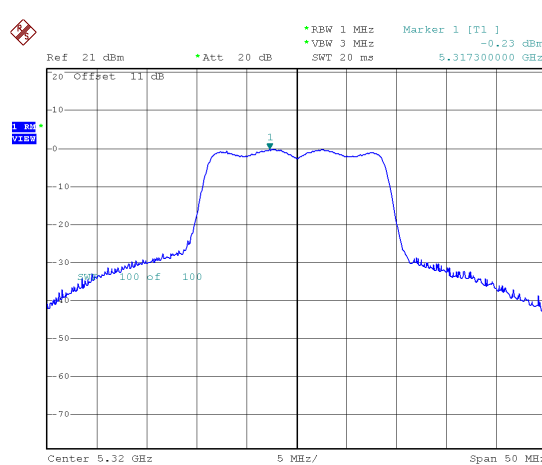
CH60



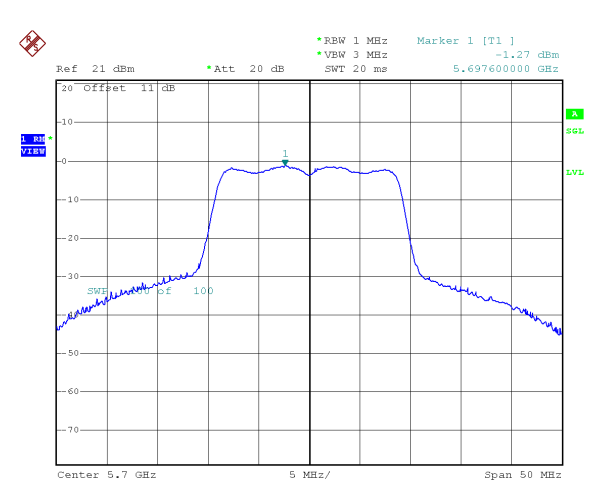
CH116



CH64

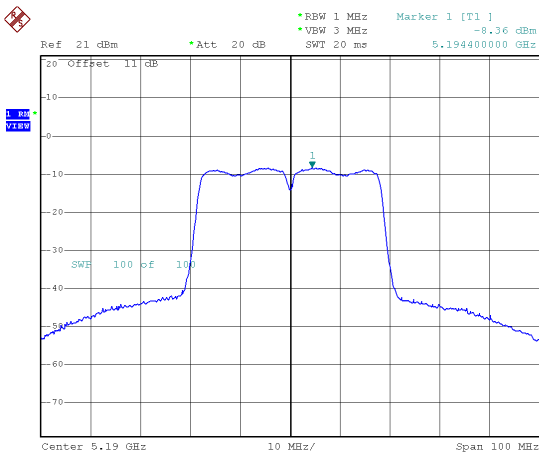


CH140

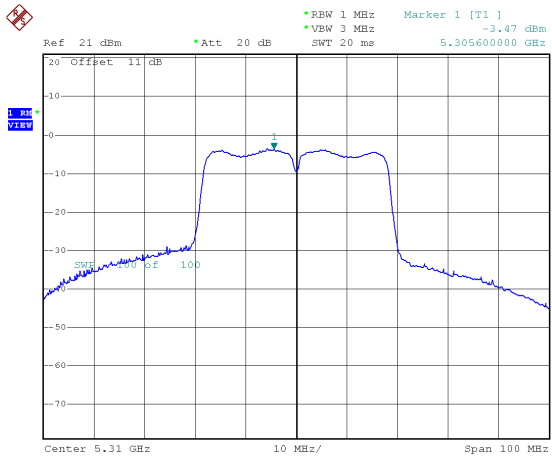




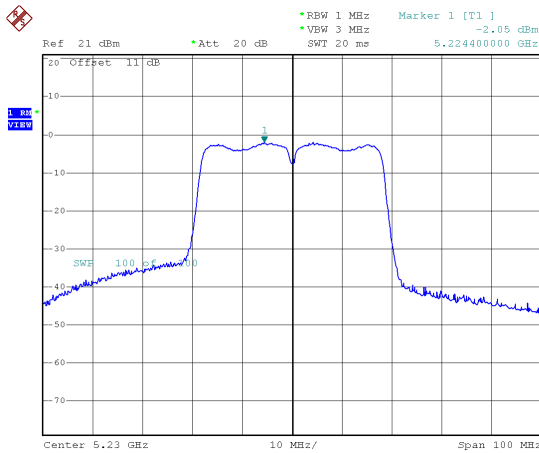
Antenna A
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH38



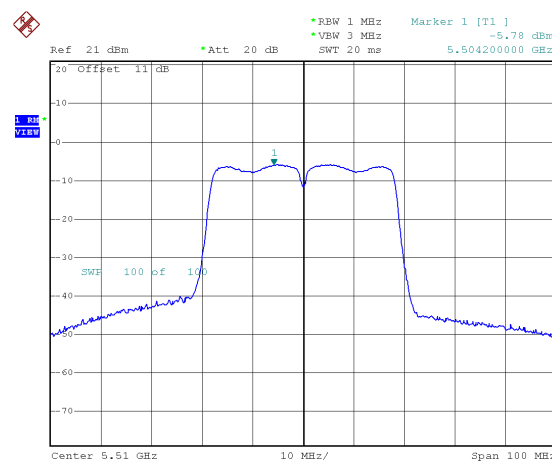
CH62



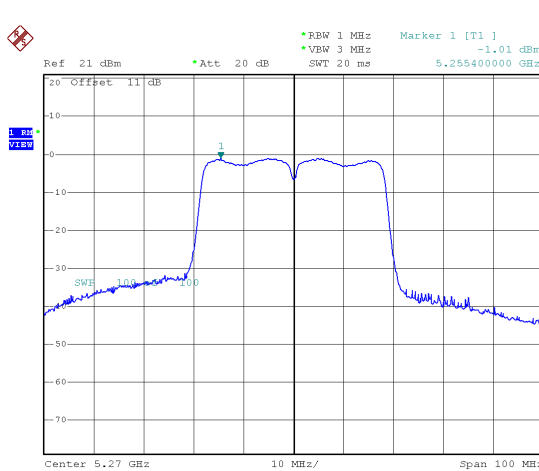
CH46



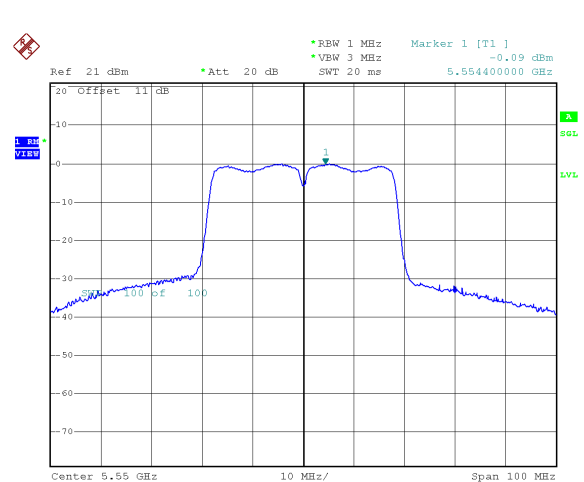
CH102



CH54

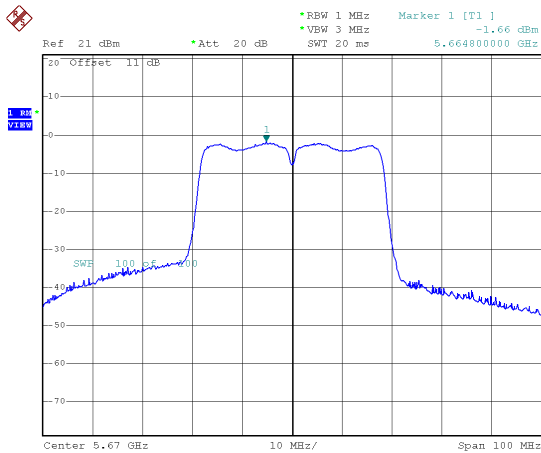
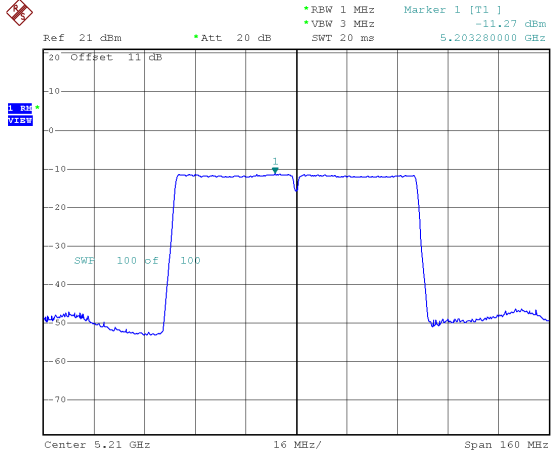


CH110

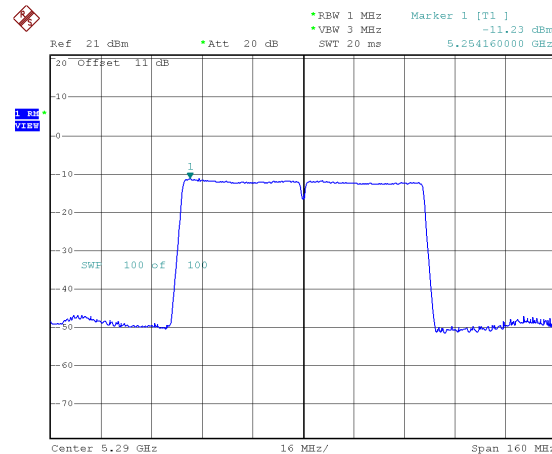




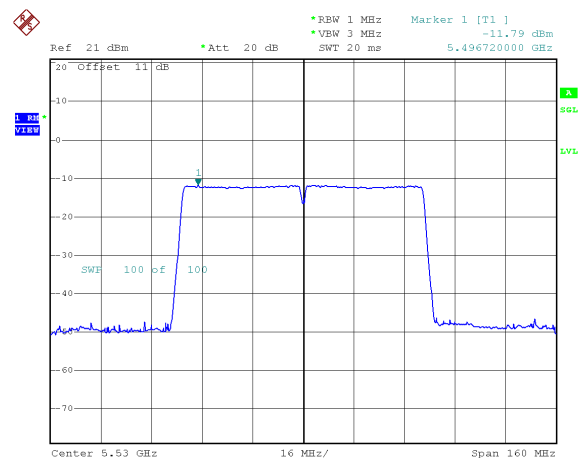
Antenna A

Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH134Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH42

CH58

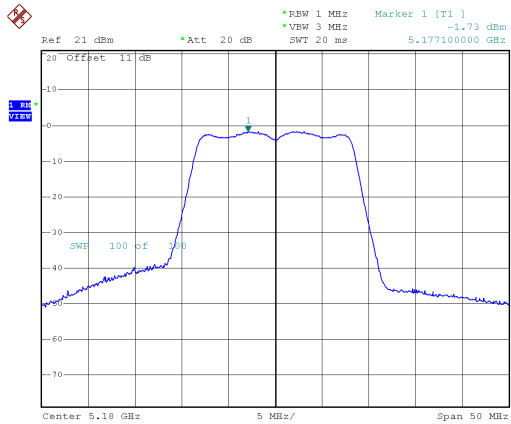


CH106

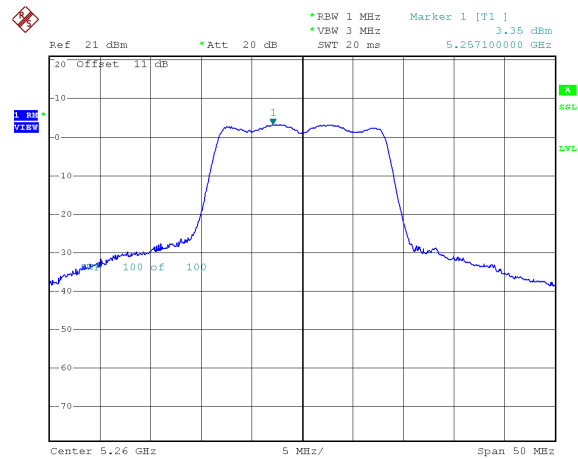




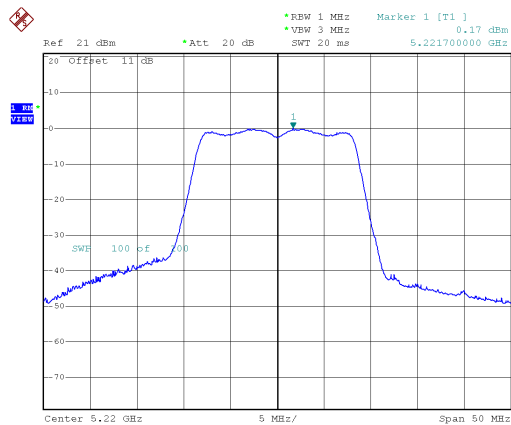
Antenna B
Modulation Standard: 802.11a (6Mbps)
CH36



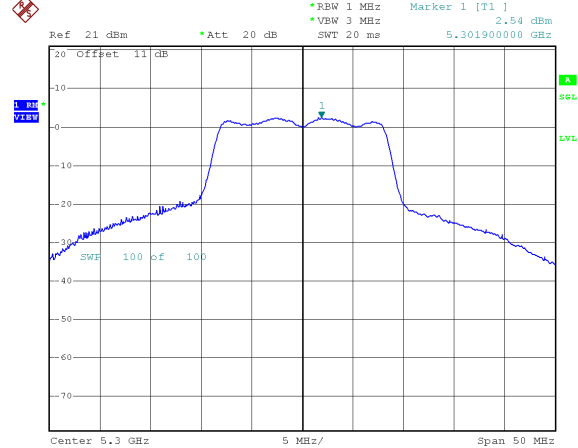
CH52



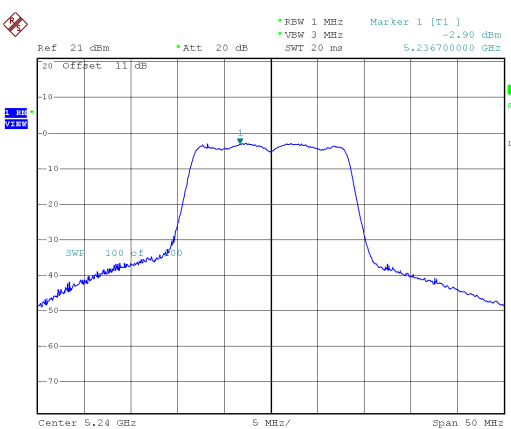
CH44



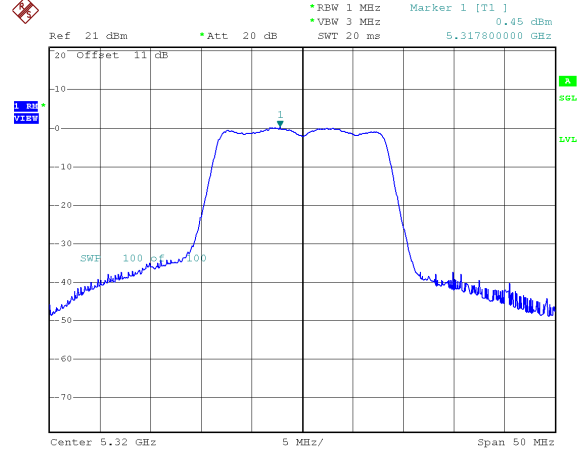
CH60



CH48

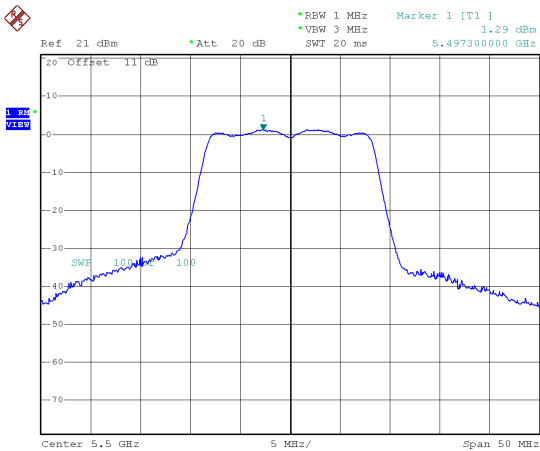


CH64

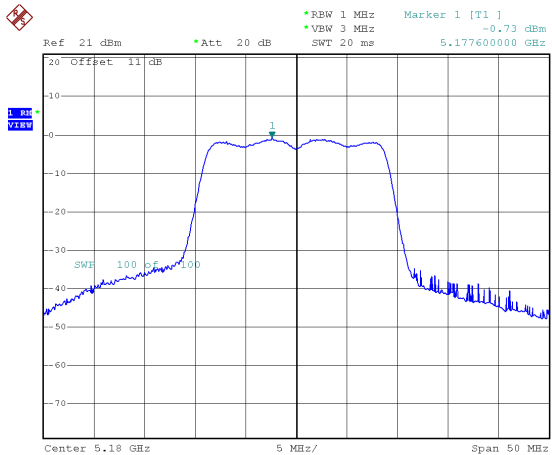




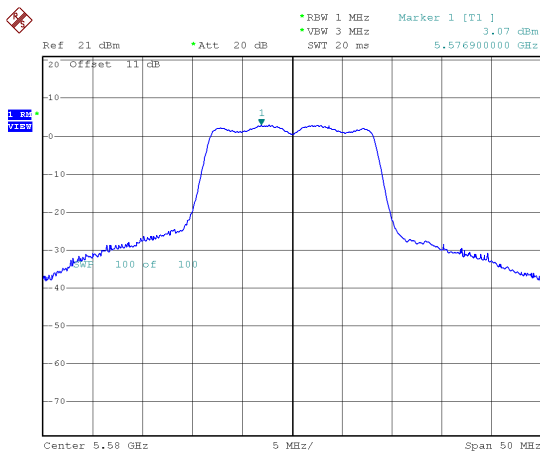
Antenna B
Modulation Standard: 802.11a (6Mbps)
CH100



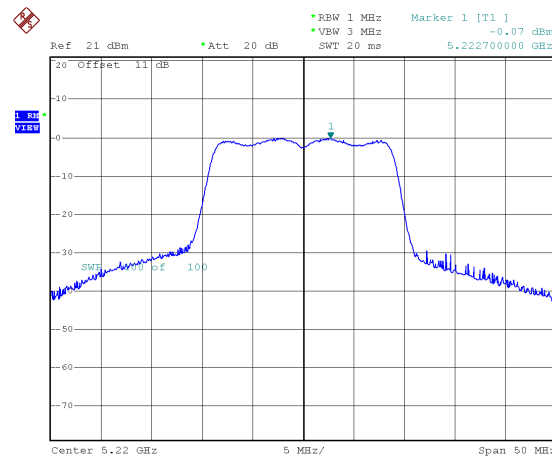
Modulation Standard: 802.11ac VHT20 (6.5Mbps)
CH36



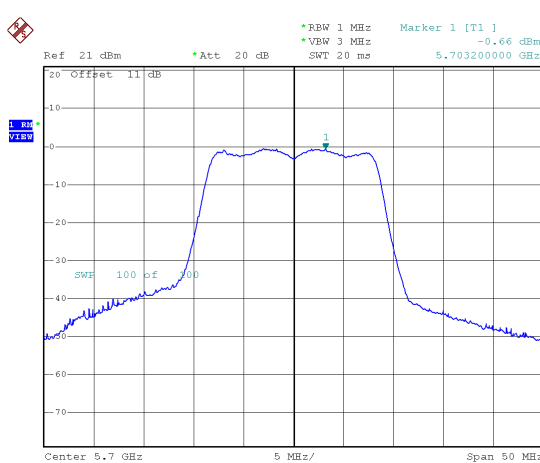
CH116



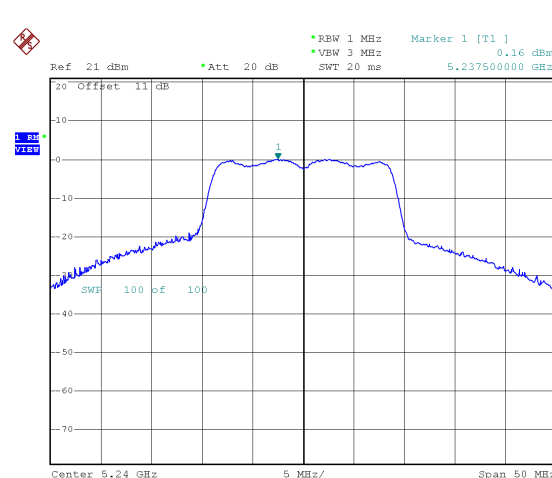
CH44



CH140

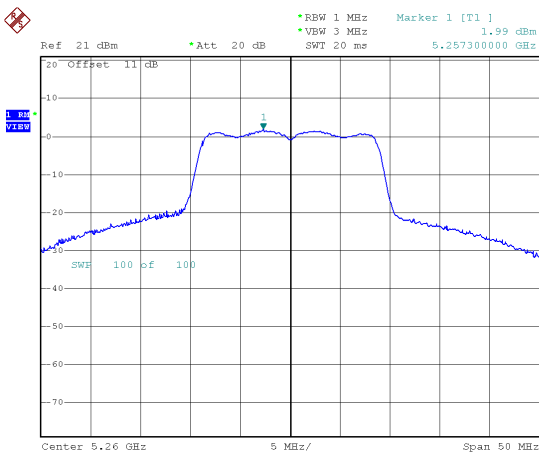


CH48

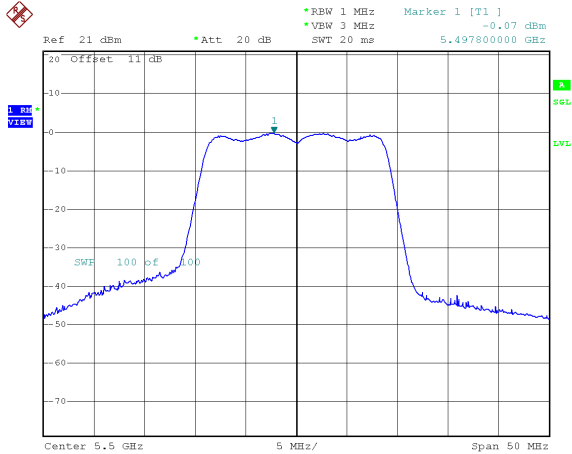




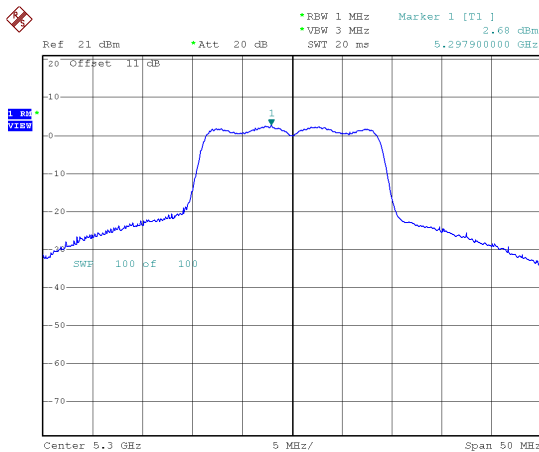
Antenna B
Modulation Standard: 802.11ac VHT20 (6.5Mbps)
CH52



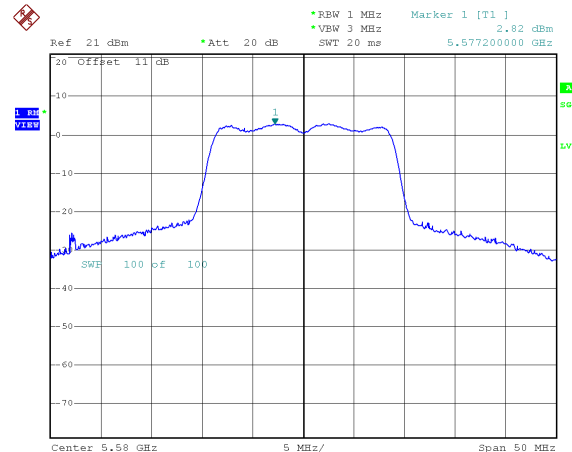
CH100



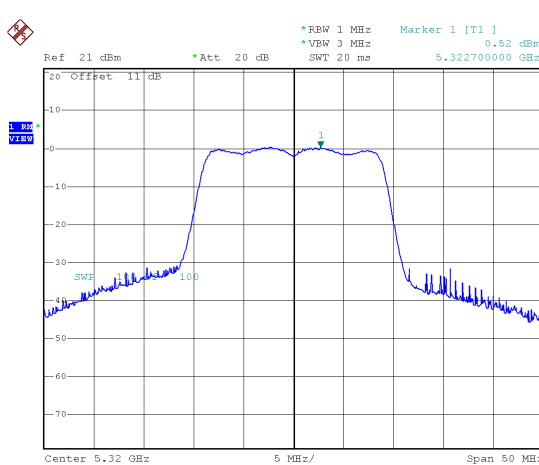
CH60



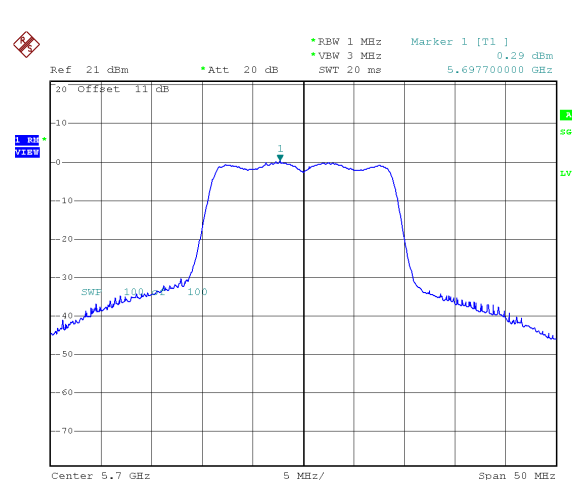
CH116



CH64

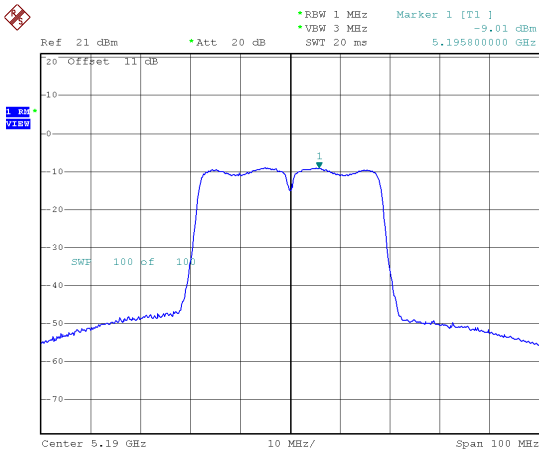


CH140

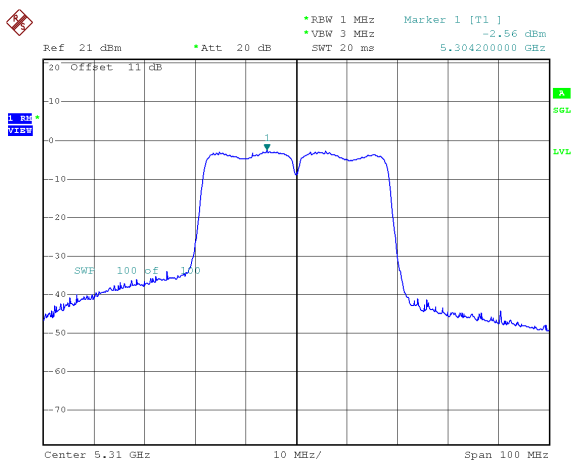




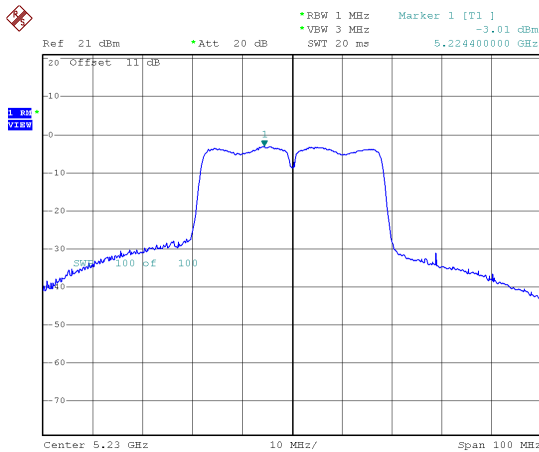
Antenna B
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH38



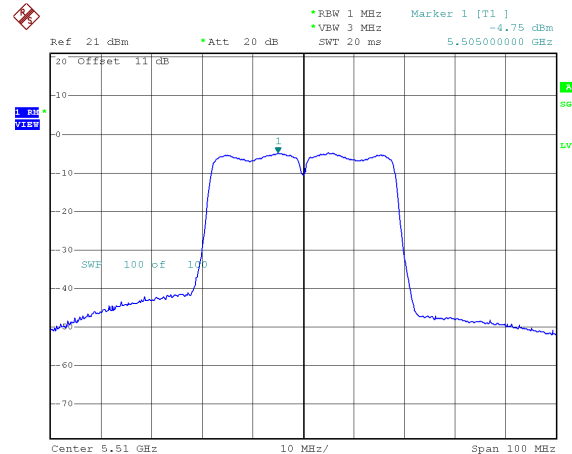
CH62



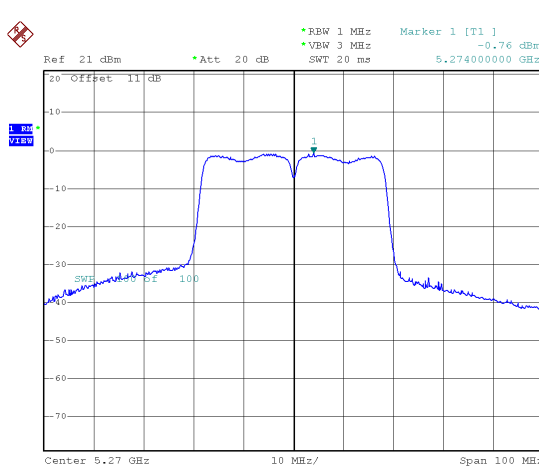
CH46



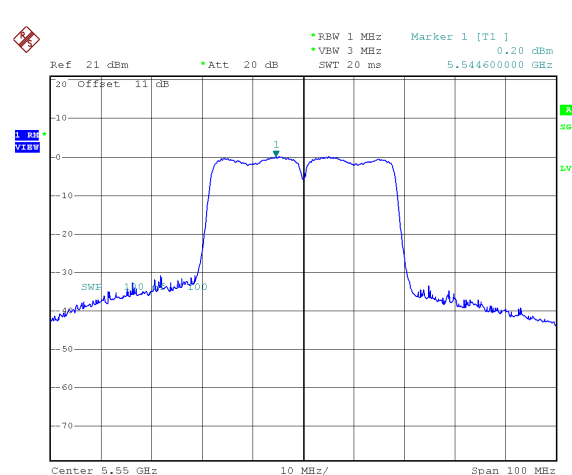
CH102



CH54

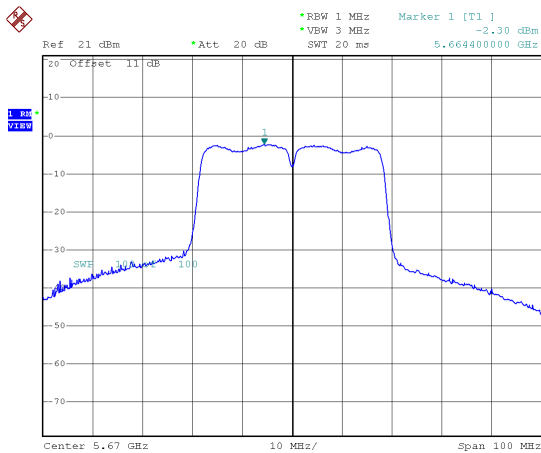
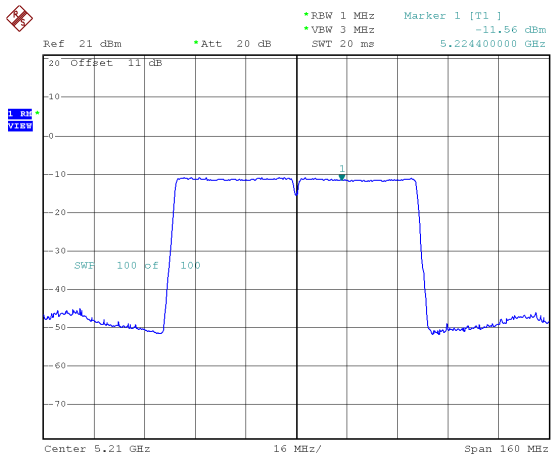


CH110

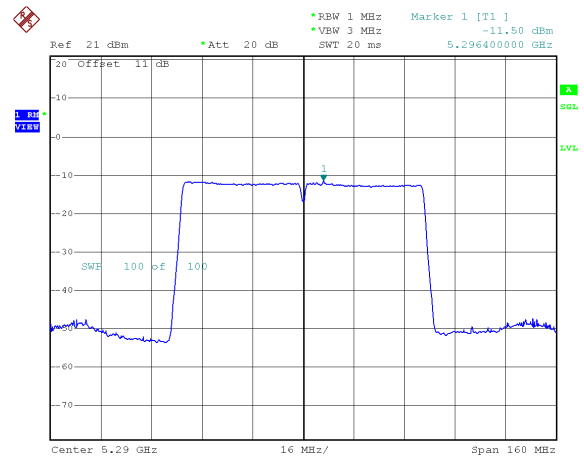




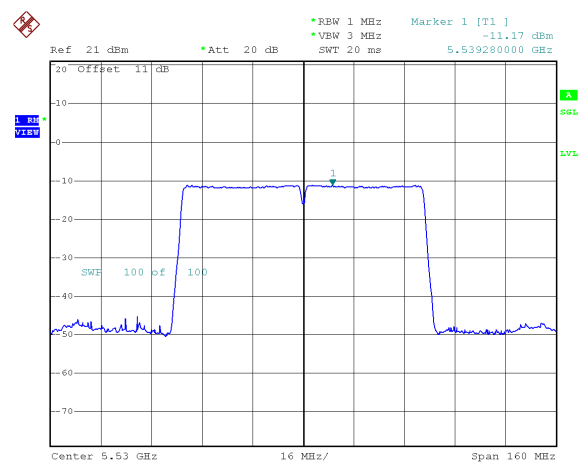
Antenna B

Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH134Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH42

CH58



CH106

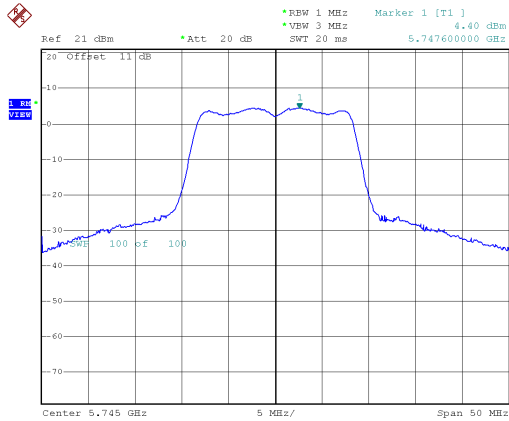




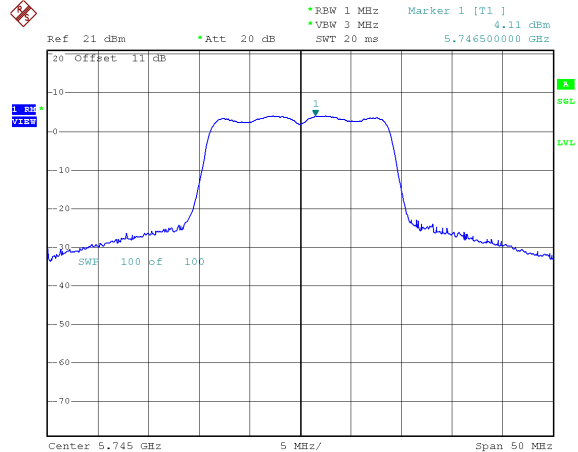
5.8G Band

Antenna A

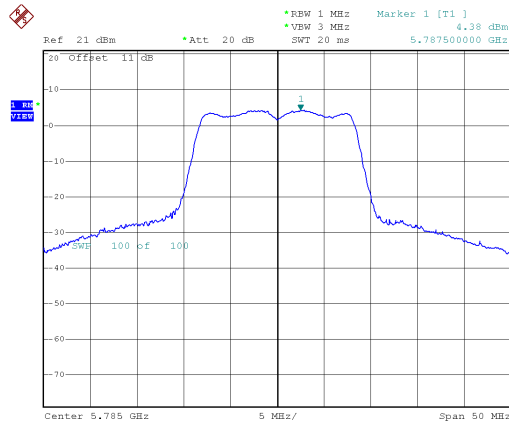
Modulation Standard: 802.11a (6Mbps)
CH149



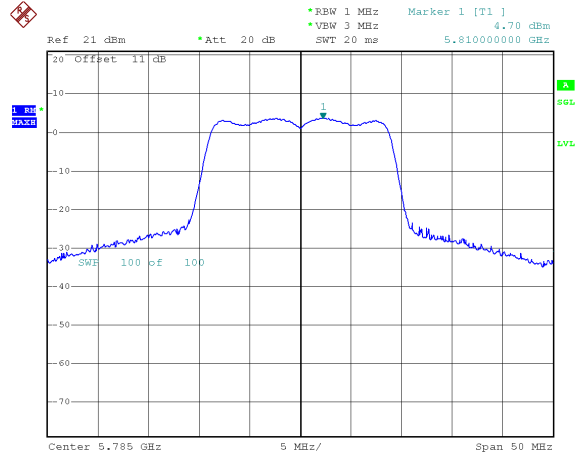
Modulation Standard: 802.11ac, VHT20 (6.5Mbps)
CH149



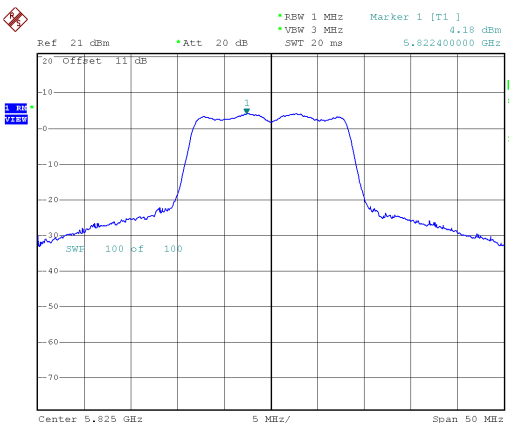
CH157



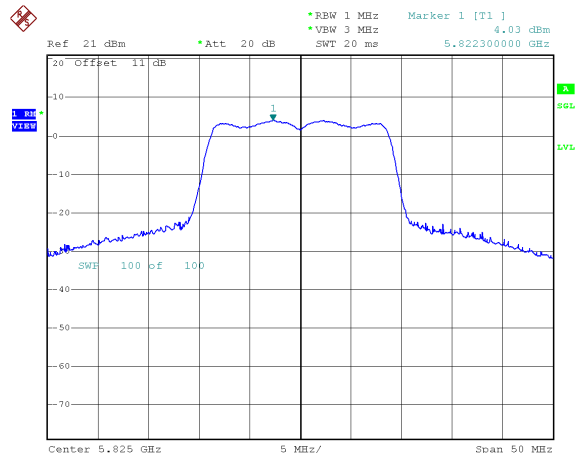
CH157



CH165

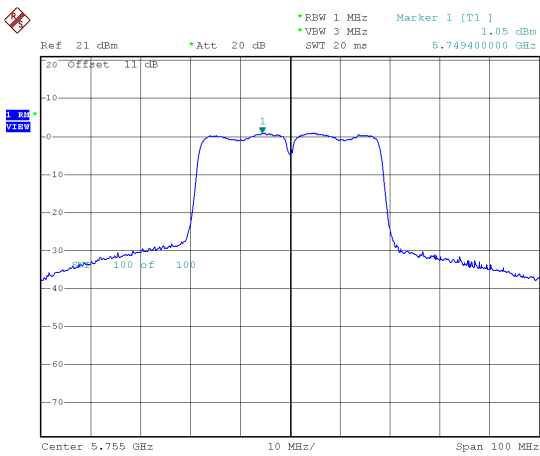
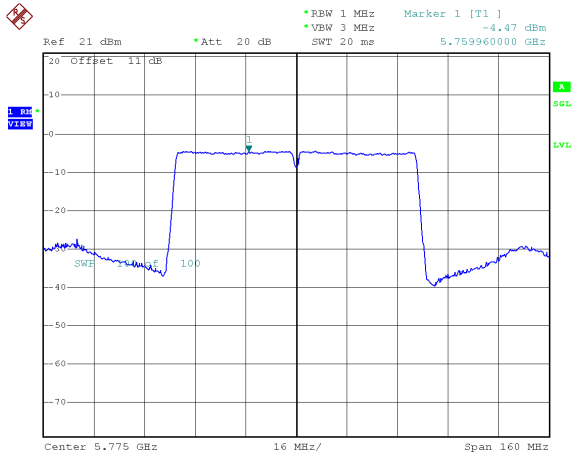


CH165

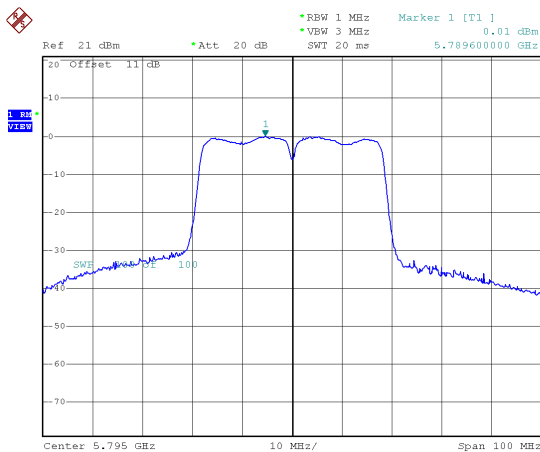




Antenna A

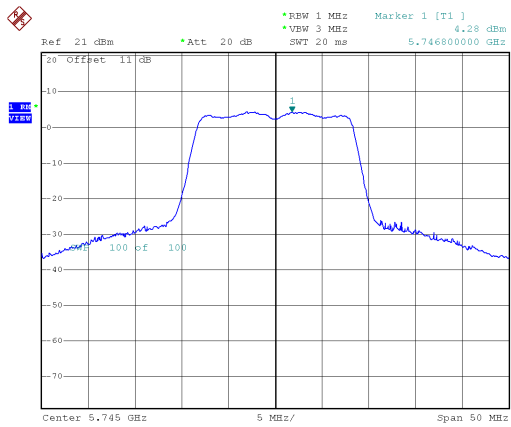
Modulation Standard: 802.11ac, VHT40 (13.5Mbps)
CH151Modulation Standard: 802.11ac, VHT80 (29.3Mbps)
CH155

CH159

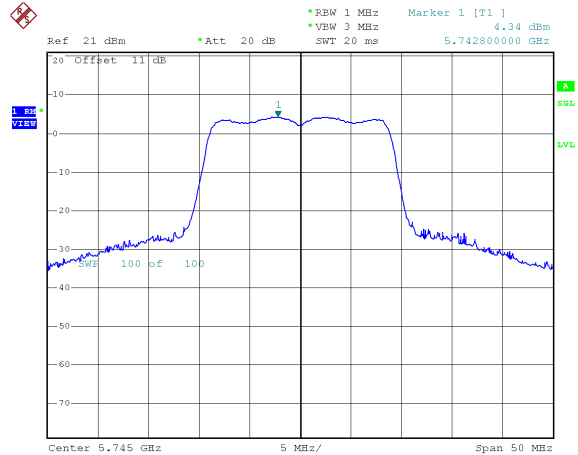




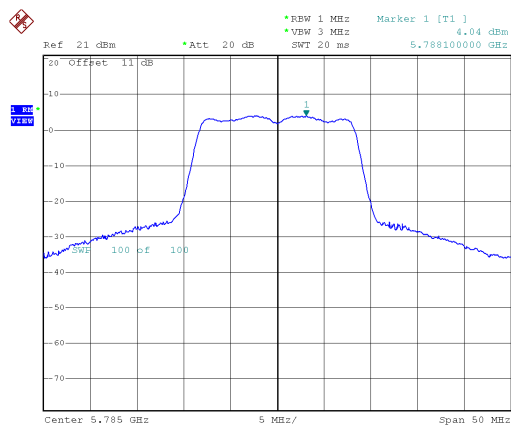
Antenna B
Modulation Standard: 802.11a (6Mbps)
CH149



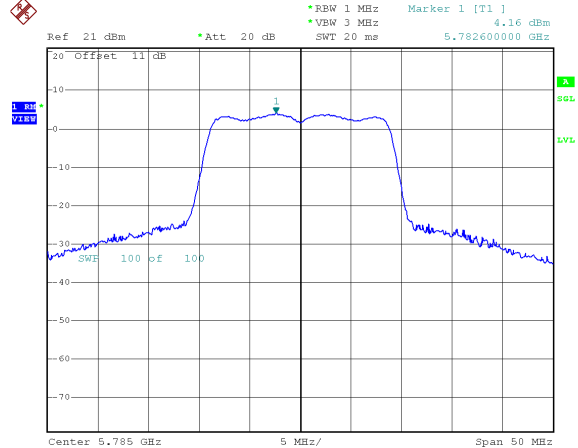
Modulation Standard: 802.11ac, VHT20 (6.5Mbps)
CH149



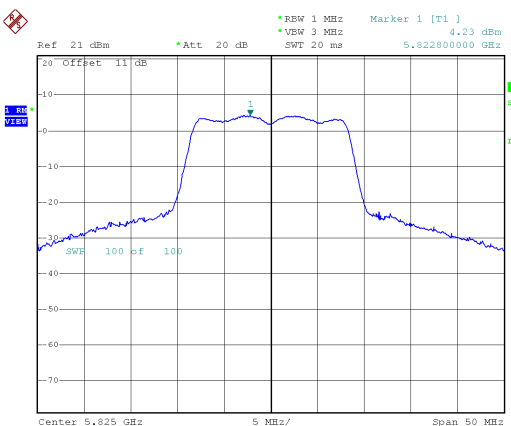
CH157



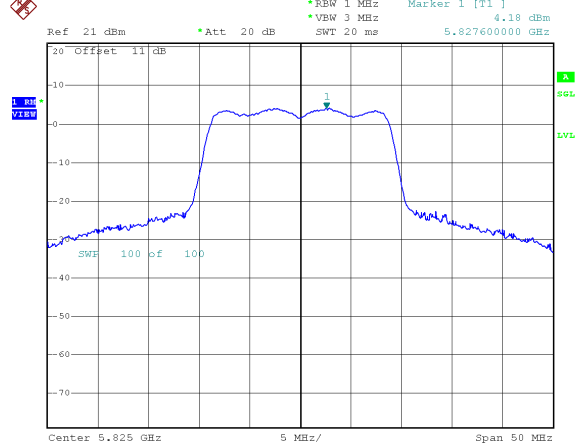
CH157



CH165

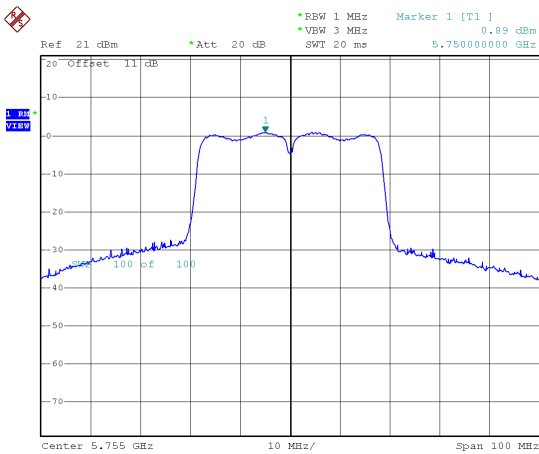
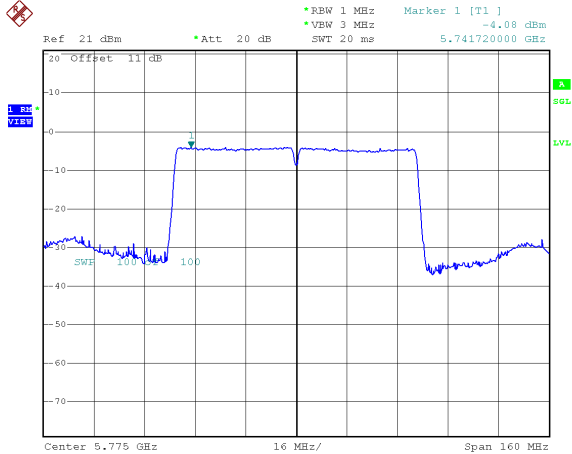


CH165

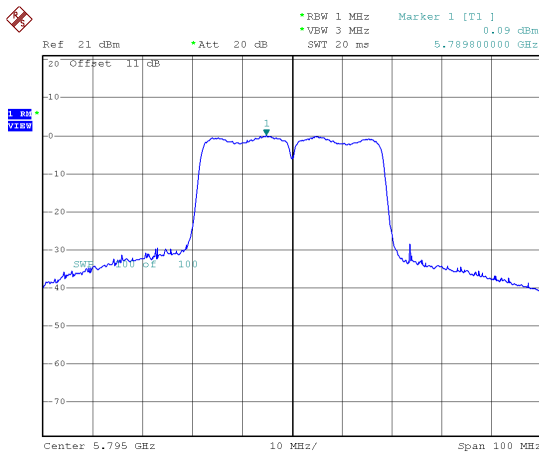




Antenna B

Modulation Standard: 802.11ac, VHT40 (13.5Mbps)
CH151Modulation Standard: 802.11ac, VHT80 (29.3Mbps)
CH155

CH159



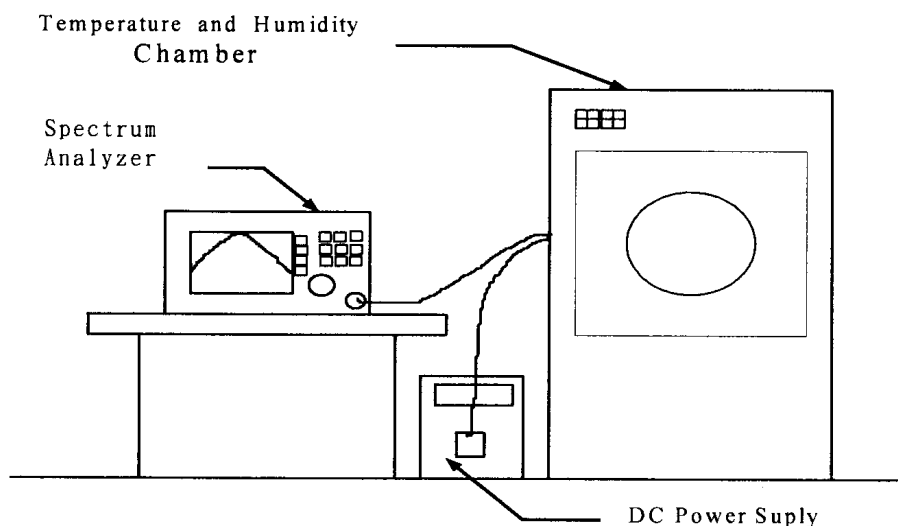


12. Frequency Stability

12.1. Test Procedure

1. The EUT was placed inside the Temperature and Humidity chamber.
2. The transmitter output was connected to spectrum analyzer.
3. Turn the EUT on and couple its output to a spectrum analyzer.
4. Turn the EUT off and set the chamber to the highest temperature specified.
5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
6. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
7. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

12.2. Test Setup Layout



**12.3. Test Result and Data**

Temperature: 21°C

Humidity: 58%

Test Date: Feb. 24, 2017

Operating frequency: 5180 MHz							
Temp	Power supply	2 minute		5 minute		10 minute	
(°C)	(V)	(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
55	102	5239.2208	-0.014870	5239.9964	-0.000068	5239.3594	-0.122260
	120	5239.7888	-0.004030	5239.1039	-0.017102	5239.9132	-0.016557
	138	5239.6274	-0.007112	5239.5806	-0.008003	5239.9511	-0.009335
40	102	5239.0298	-0.018515	5239.0071	-0.018948	5239.3854	-0.117297
	120	5239.6028	-0.007580	5239.8548	-0.002771	5239.6561	-0.065639
	138	5239.5786	-0.008043	5239.2741	-0.013854	5239.8616	-0.026405
30	102	5239.1987	-0.015292	5239.3637	-0.012143	5239.3133	-0.131050
	120	5239.8523	-0.002818	5239.1697	-0.015846	5239.1598	-0.160349
	138	5239.8557	-0.002755	5239.3492	-0.012419	5239.0000	-0.190831
20	102	5239.6138	-0.007370	5239.0093	-0.018906	5239.7330	-0.050959
	120	5239.8400	-0.003053	5239.5472	-0.008642	5239.8517	-0.028309
	138	5239.3523	-0.012362	5239.4146	-0.011172	5239.1463	-0.162929
10	102	5239.9207	-0.001514	5239.1229	-0.016739	5239.3434	-0.125311
	120	5239.0894	-0.017379	5239.1744	-0.015756	5239.5398	-0.087824
	138	5239.1100	-0.016985	5239.3629	-0.012158	5239.4726	-0.100646
0	102	5239.6443	-0.006789	5239.8118	-0.003592	5239.8222	-0.033925
	120	5239.4257	-0.010960	5239.0612	-0.017915	5239.1149	-0.168914
	138	5239.5209	-0.009143	5239.9060	-0.001793	5239.9204	-0.015187
-10	102	5239.6569	-0.006547	5239.2042	-0.015188	5239.5148	-0.092587
	120	5239.4497	-0.010502	5239.1234	-0.016729	5239.5342	-0.088891
	138	5239.2877	-0.013593	5239.6349	-0.006968	5239.8814	-0.022628
-20	102	5239.0517	-0.018098	5239.8849	-0.002196	5239.7830	-0.041414
	120	5239.5829	-0.007960	5239.5388	-0.008801	5239.0090	-0.189124
	138	5239.3714	-0.011996	5239.3185	-0.013007	5239.0566	-0.180029
-30	102	5239.0447	-0.018231	5239.9730	-0.000515	5239.4884	-0.097642
	120	5239.4734	-0.010050	5239.0348	-0.018420	5239.9134	-0.016518
	138	5239.3744	-0.011939	5239.5251	-0.009062	5239.1445	-0.163262

Limit:

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.



13. Automatically Discontinue Transmission

13.1.Limit of Automatically Discontinue Transmission

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

13.2.Test Result of Automatically Discontinue Transmission

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.



14. Dynamic Frequency Selection

14.1. List of Measurement and Examinations

EUT Applicability of DFS requirements and Frequency Range

Operation Mode		Operating Frequency Range	
		5250-5350MHz	5470-5725MHz (5600MHz-5650MHz will be disable)
Master	--	--	--
Client without radar detection	√	√	√
Client with radar detection	--	--	--

DEVICES WITH RADAR DETECTION

MAXIMUM TRANSMIT POWER	VALUE (SEE Note 1 and 2)
≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911	

Table1: Applicability of DFS requirements prior to use of a channel

REQUIREMENT RADAR	OPERATIONAL MODE		
	MASTER	CLIENT WITHOUT RADAR DETECTION	CLIENT WITH RADAR DETECTION
Non-Occupancy Period	V	V _{Note}	V
DFS Detection Threshold	V	Not required	V
Channel Availability Check Time	V	Not required	Not required
U-NII Detection Bandwidth	V	Not required	V
Note: Regarding KDB 905462 D03 Client Without DFS New Rules section (b)(5/6), If the client moves with the master, the device is considered compliant if nothing appears in the client non-occupancy period test. For devices that shut down (rather than moving channels), no beacons should appear. An analyzer plot that contains a single 30-minute sweep on the original channel.			

**Table2: Applicability of DFS requirements during normal operation**

REQUIREMENT RADAR	OPERATIONAL MODE		
	MASTER	CLIENT WITHOUT RADAR DETECTION	CLIENT WITH RADAR DETECTION
DFS Detection Threshold	V	Not required	V
Channel Closing Transmission Time	V	V	V
Channel Move Time	V	V	V
U-NII Detection Bandwidth	V	Not required	V

Additional requirements for devices with multiple bandwidth modes	Master or Client with radar detection	Client without radar detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other	Any single BW mode	Not required

Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.



14.2. Test Setup

Setup for Master with injection at the Master

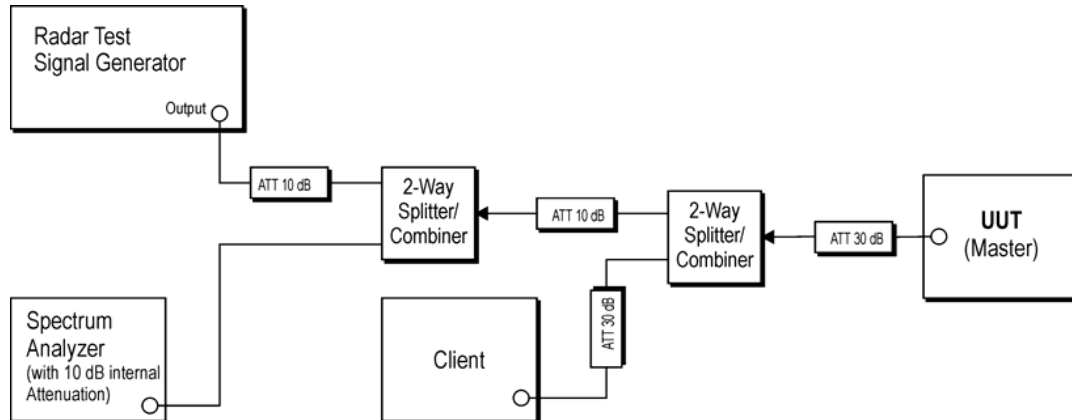


Figure 1: Example Conducted Setup where UUT is a Master and Radar Test Waveforms are injected into the Master

Setup for Client with injection at the Master

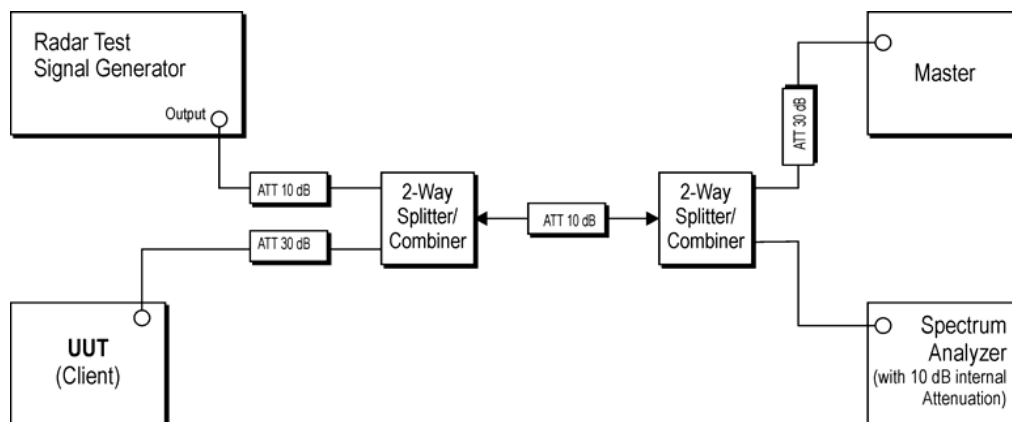


Figure 2: Example Conducted Setup where UUT is a Client and Radar Test Waveforms are injected into the Master



Setup for Client with injection at the Client

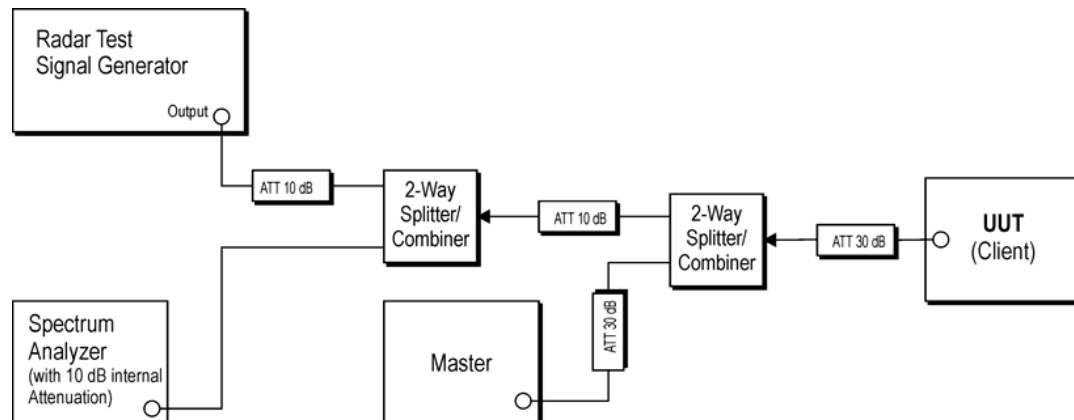


Figure 3: Example Conducted Setup where UUT is a Client and Radar Test Waveforms are injected into the Client



14.3. Non-Occupancy Period

The Channel Shutdown is defined as the process initiated by the RLAN device immediately after a radar signal has been detected on an Operating Channel.

The master device shall instruct all associated slave devices to stop transmitting on this channel, which they shall do within the Channel Move Time.

Slave devices with a Radar Interference Detection function, shall stop their own transmissions within the Channel Move Time.

The aggregate duration of all transmissions of the RLAN device on this channel during the Channel Move Time shall be limited to the Channel Closing Transmission Time. The aggregate duration of all transmissions shall not include quiet periods in between transmissions.

14.3.1. Test Limit

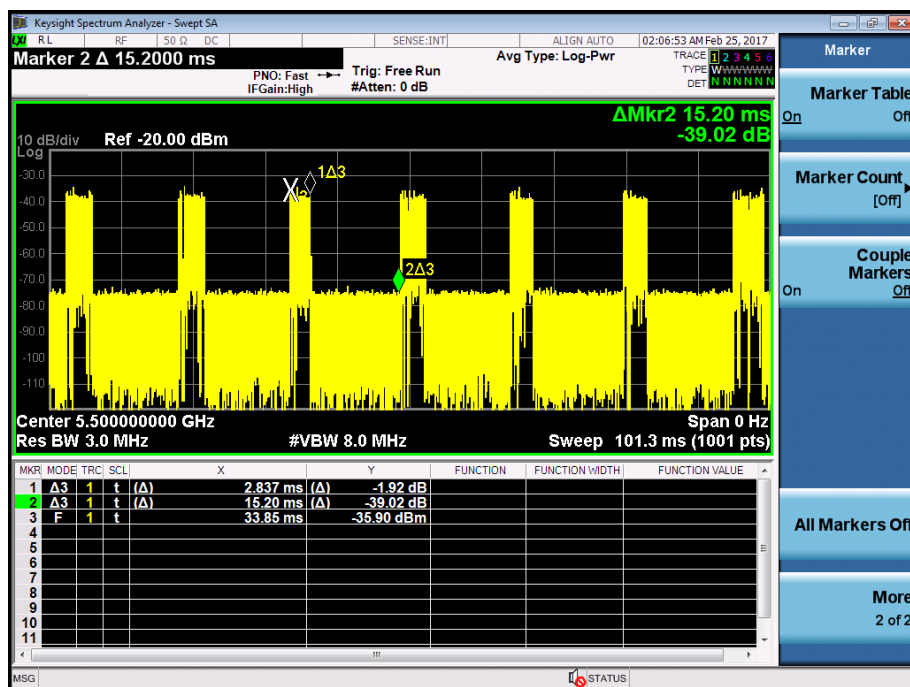
Radar Test Signal	Master (min)	Client (min)
0	> 30	> 30

14.3.2. Channel Loading

Timing plots are required with calculations demonstrating a minimum channel loading of approximately 17% or greater. For example, channel loading can be estimated by setting the spectrum analyzer for zero span and approximate the Time On/ (Time On + Off Time). This can be done with any appropriate channel BW and modulation type

Modulation Standard: 802.11ac VHT20

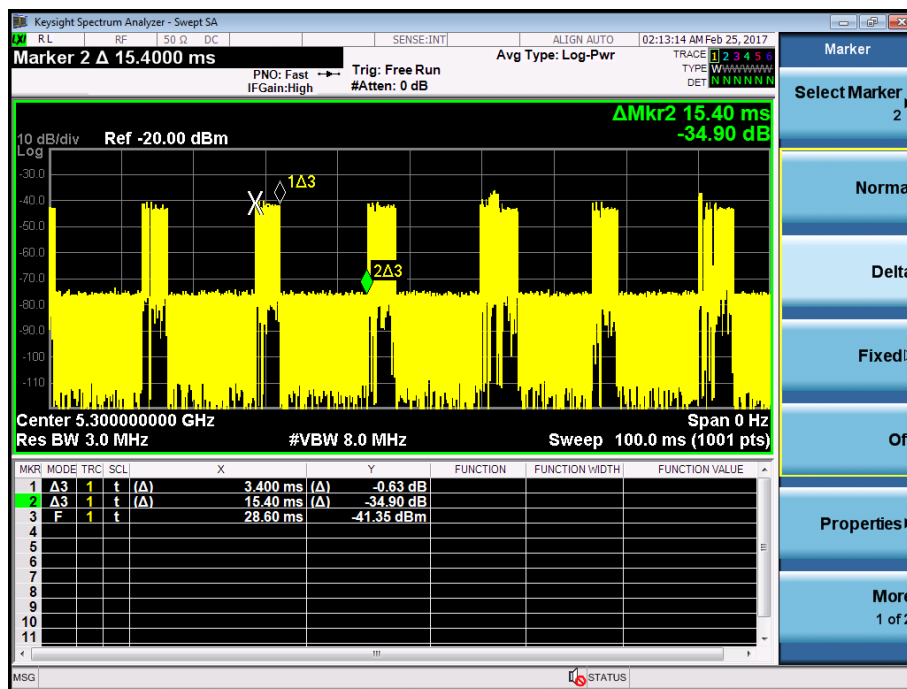
Time On/ (Time On + Off Time) = 2.837ms/15.2ms=18.66%





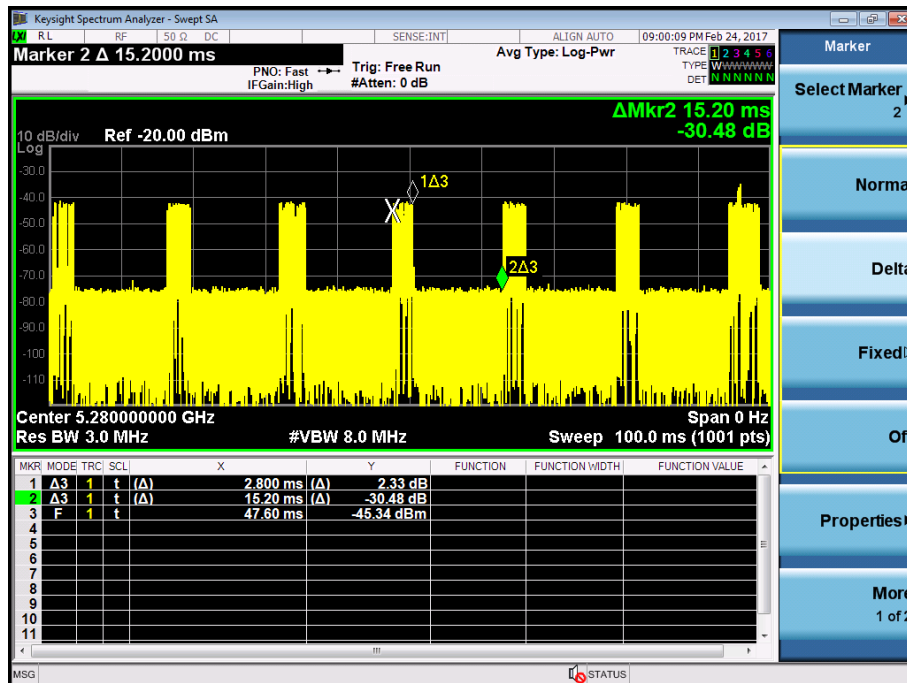
Modulation Standard: 802.11ac VHT40

Time On/ (Time On + Off Time) = 3.4ms/15.4ms=22.07%



Modulation Standard: 802.11ac VHT80

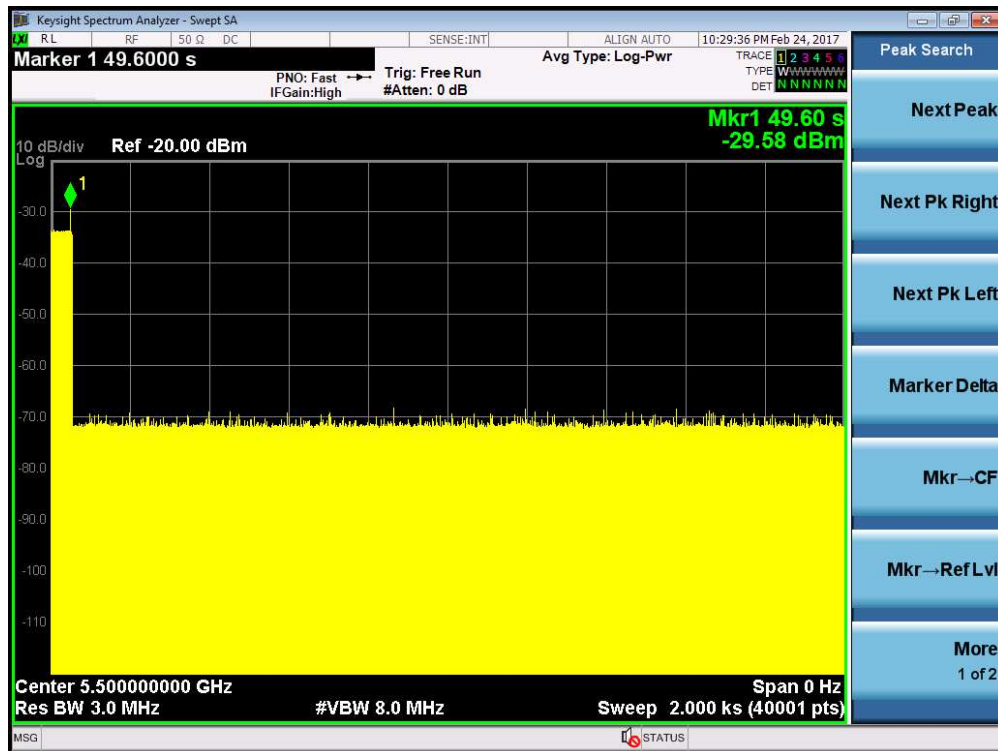
Time On/ (Time On + Off Time) = 2.8ms/15.2ms=18.42%



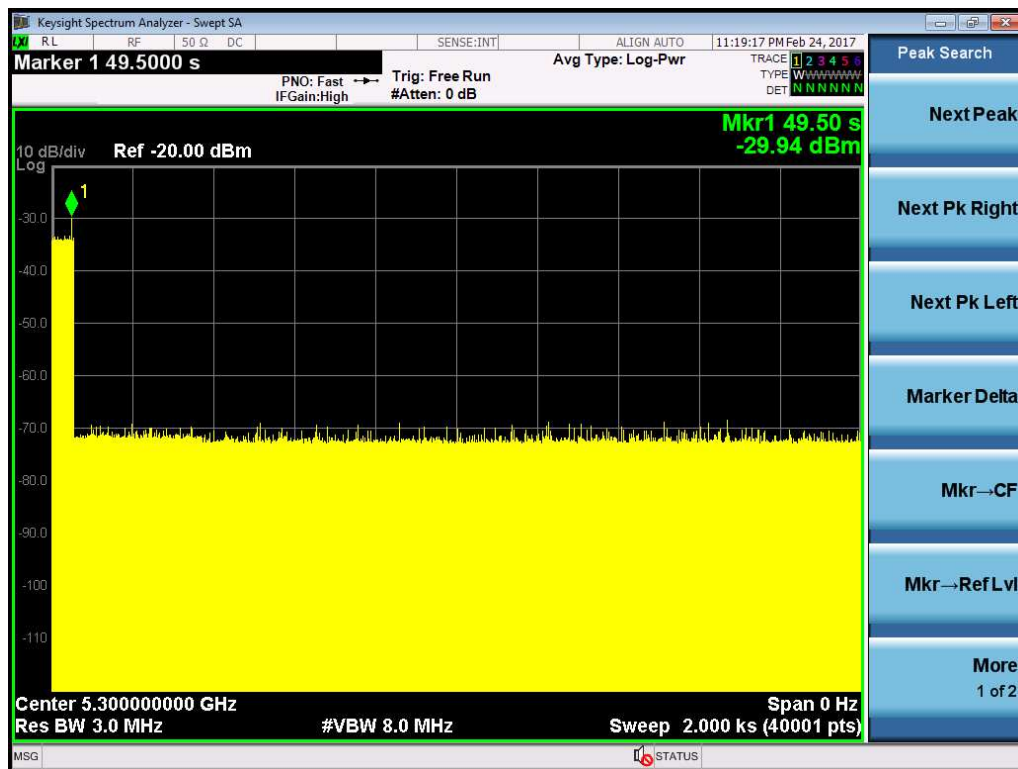


14.3.3. Test Result of Non-Occupancy Period

Modulation Standard: 802.11ac VHT20

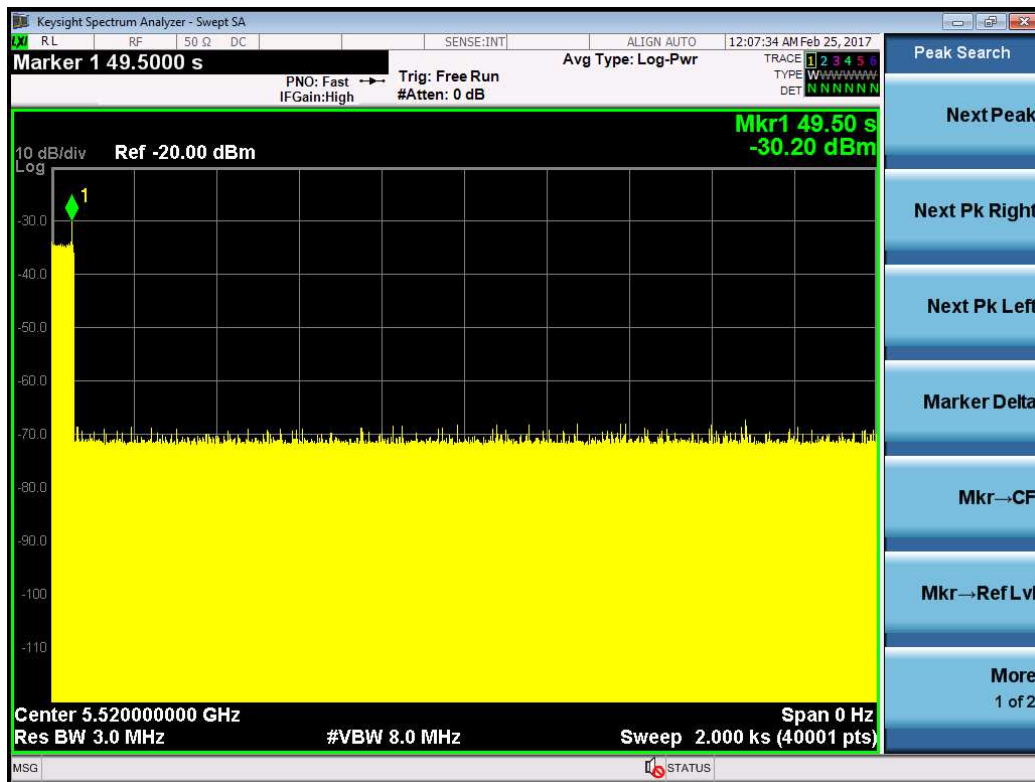


Modulation Standard: 802.11ac VHT40





Modulation Standard: 802.11ac VHT80





14.4. DFS Detection Threshold

DFS Detection Threshold is the level used by the DFS mechanism to detect radar interference.

14.4.1. Test Limit

Limits Clause 4.7.2.1.2

DFS Detection Thresholds for Master Devices and Client Devices with Radar

Detection

MAXIMUM TRANSMIT POWER	VALUE (SEE Note 1 and 2)
≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm

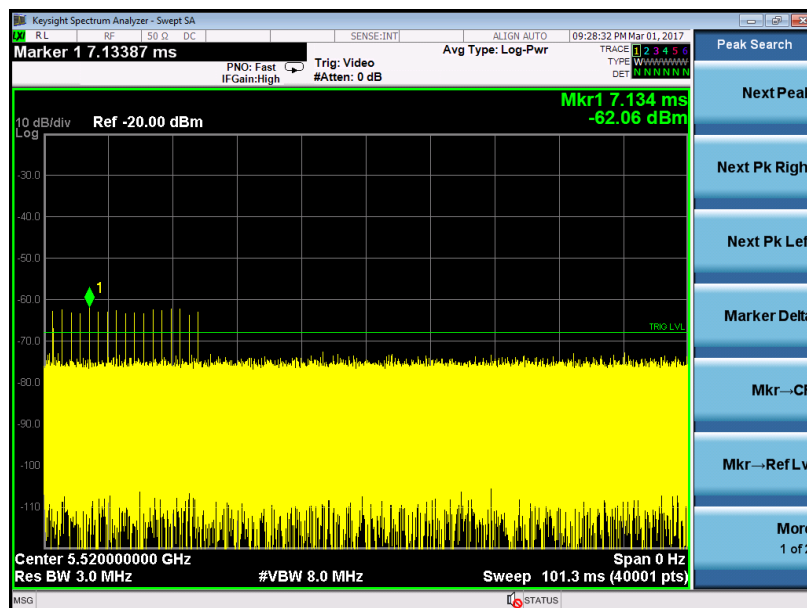
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.

Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911

14.4.2. Test Result of DFS Detection Threshold

EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz, Radar 0 VALUE -62dBm





14.5.Channel Availability Check

The Channel Availability Check is defined as the mechanism by which an RLAN device checks a channel for the presence of radar signals.

There shall be no transmissions by the device within the channel being checked during this process.

If no radars have been detected, the channel becomes an Available Channel valid for a period of time.

The RLAN shall only start transmissions on Available Channels.

At power-up, the RLAN is assumed to have no Available Channels.

14.5.1. Test Limit

Limits Clause 4.7.2.1.2

Table D.2: DFS requirement values

Parameter	Value
Channel Availability Check	> 60s

14.5.2. Test Result of Channel Availability Check

Not required



14.6.U-NII Detection Bandwidth

14.6.1. Test Limit

Limits Clause 4.7.2.1.2 Table D.2: DFS requirement values

Parameter	Value
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission
Note : During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

14.6.2. Test Result of U-NII Detection Bandwidth

Not required



14.7. Uniform Spreading

The UUT will select channel by random mode and remember this channel when detect radar signal, so that will select unused channel by random mode.

14.7.1. Test Result of Uniform Spreading

Not required



14.8. In-Service Monitoring

The In-Service Monitoring is defined as the process by which an RLAN monitors the Operating Channel for the presence of radar signals.

14.8.1. Test Limit

Parameter	Value
Channel Move Time	< 10 s (See Note 1)
Channel Closing Transmission Time	< 200 ms+ an aggregate of 60 milliseconds over remaining 10 second period. (See Notes 1 and Notes 2.)
Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.	

Limits Clause 4.7.2.2.2

The In-Service Monitoring shall be used to continuously monitor an Operating Channel.

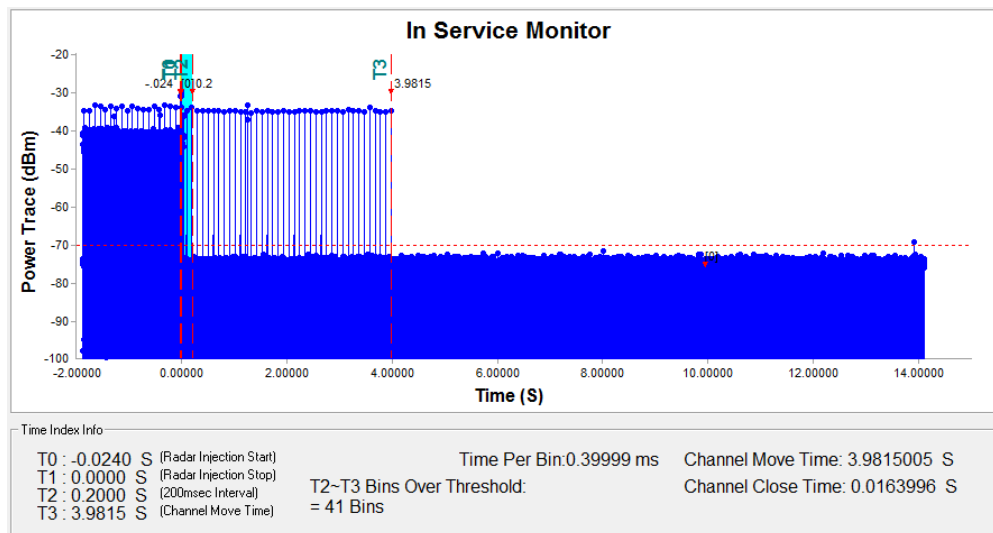
The In-Service-Monitoring shall start immediately after the RLAN has started transmissions on an Operating Channel.



14.8.2. Test Result of In-Service Monitoring

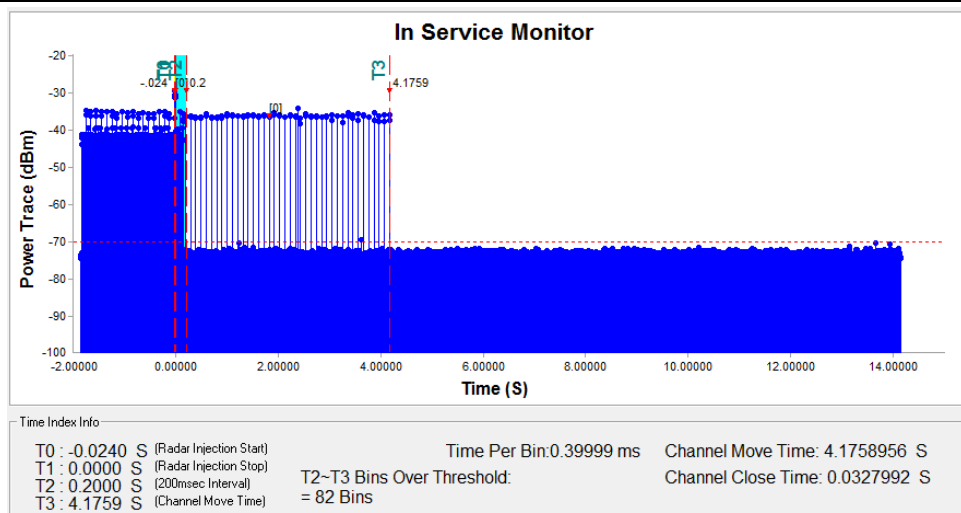
Bandwidth 80MHz
Channel 58

	Value	Limit
Channel Move Time	3.9815005s	<10 s
Channel Closing Transmission Time	16.996ms	< 200 ms



Channel 106

	Value	Limit
Channel Move Time	4.1758956	<10 s
Channel Closing Transmission Time	32.7992ms	< 200 ms



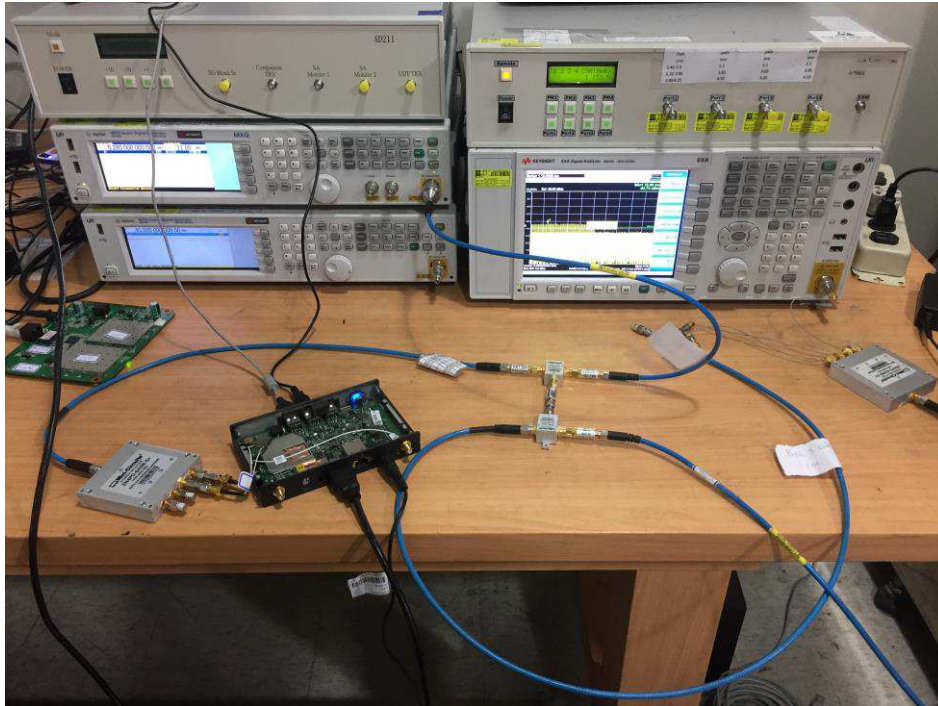


14.9. Statistical Performance Check

Not required

14.10. EUT Setup Photos

Radar Calibration Setup Photo



Test Setup Photo

