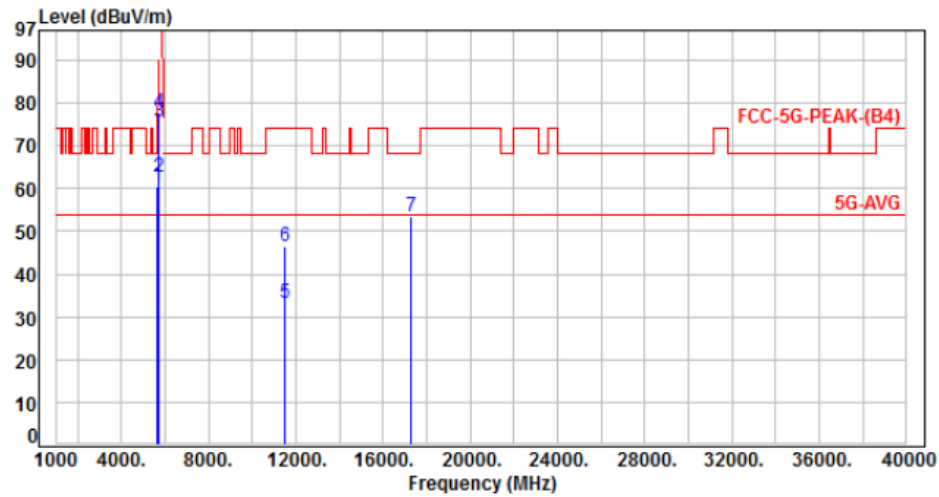




Power	: From PoE	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 3, CH151, Band 4	Temperature	: 22 °C
Test Date	: Nov. 12, 2018	Humidity	: 63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-6.97	67.50	60.53	68.20	-7.67	Peak	100	24	P
2	5700.00	-6.95	69.60	62.65	105.20	-42.55	Peak	100	24	P
3	5720.00	-6.95	82.60	75.65	110.80	-35.15	Peak	100	24	P
4	5725.00	-6.95	84.69	77.74	122.20	-44.46	Peak	100	24	P
5	11510.00	1.22	31.89	33.11	54.00	-20.89	Average	105	184	P
6	11510.00	1.22	45.19	46.41	74.00	-27.59	Peak	105	184	P
7	17265.00	11.84	41.66	53.50	68.20	-14.70	Peak	105	268	P

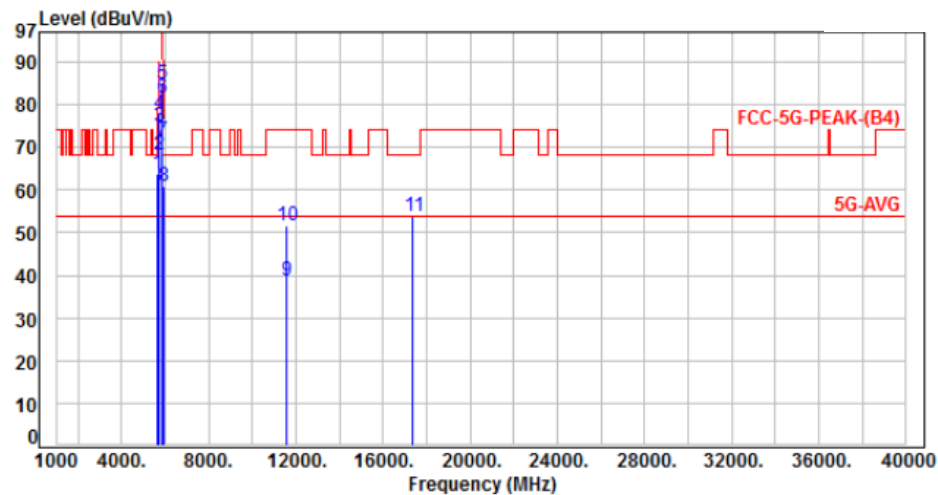
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: From PoE	Pol/Phase	: VERTICAL
Test Mode	: Mode 3, CH159, Band 4	Temperature	: 22 °C
Test Date	: Nov. 12, 2018	Humidity	: 63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-6.97	70.80	63.83	68.20	-4.37	Peak	170	246	P
2	5700.00	-6.95	75.30	68.35	105.20	-36.85	Peak	170	246	P
3	5720.00	-6.95	81.90	74.95	110.80	-35.85	Peak	170	246	P
4	5725.00	-6.95	84.61	77.66	122.20	-44.54	Peak	170	246	P
5	5850.00	-6.90	91.60	84.70	122.20	-37.50	Peak	170	246	P
6	5855.00	-6.90	88.50	81.60	110.80	-29.20	Peak	170	246	P
7	5875.00	-6.89	78.60	71.71	105.20	-33.49	Peak	170	246	P
8	5925.00	-6.88	67.90	61.02	68.20	-7.18	Peak	170	246	P
9	11590.00	1.29	37.56	38.85	54.00	-15.15	Average	120	299	P
10	11590.00	1.29	50.21	51.50	74.00	-22.50	Peak	120	299	P
11	17385.00	12.60	41.33	53.93	68.20	-14.27	Peak	100	123	P

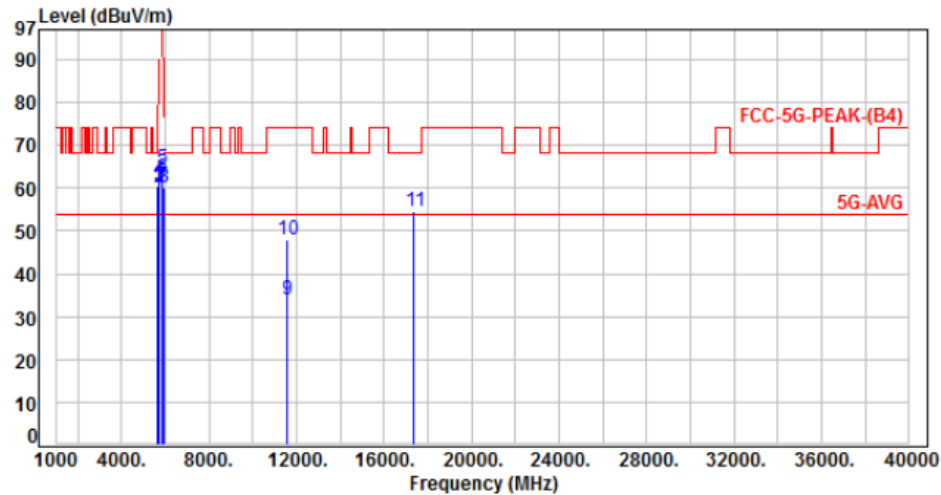
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: From PoE	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 3, CH159, Band 4	Temperature	: 22 °C
Test Date	: Nov. 12, 2018	Humidity	: 63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-6.97	67.50	60.53	68.20	-7.67	Peak	190	200	P
2	5700.00	-6.95	67.20	60.25	105.20	-44.95	Peak	190	200	P
3	5720.00	-6.95	67.56	60.61	110.80	-50.19	Peak	190	200	P
4	5725.00	-6.95	68.81	61.86	122.20	-60.34	Peak	190	200	P
5	5850.00	-6.90	71.60	64.70	122.20	-57.50	Peak	190	200	P
6	5855.00	-6.90	69.30	62.40	110.80	-48.40	Peak	190	200	P
7	5875.00	-6.89	67.21	60.32	105.20	-44.88	Peak	190	200	P
8	5925.00	-6.88	66.90	60.02	68.20	-8.18	Peak	190	200	P
9	11590.00	1.29	32.51	33.80	54.00	-20.20	Average	100	292	P
10	11590.00	1.29	46.61	47.90	74.00	-26.10	Peak	100	292	P
11	17385.00	12.60	42.11	54.71	68.20	-13.49	Peak	100	324	P

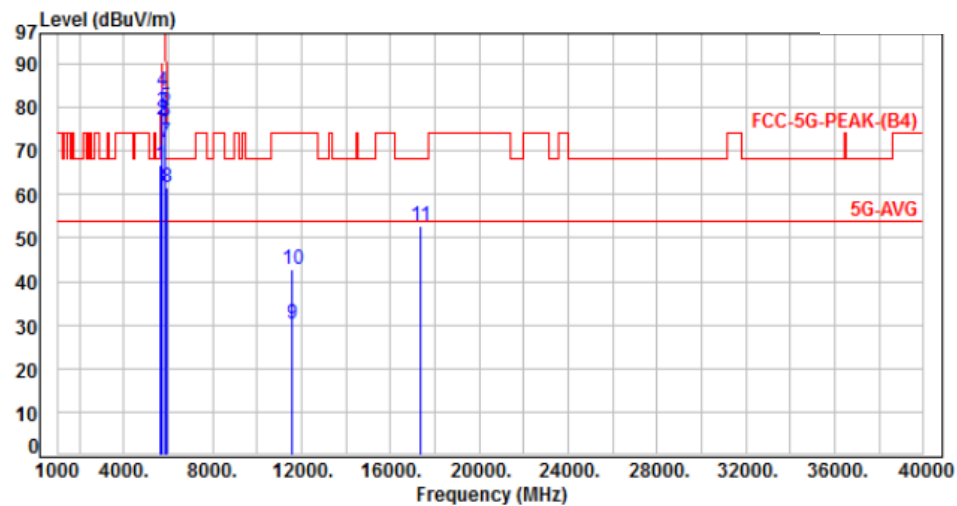
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: From PoE	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, CH155, Band 4	Temperature	: 22 °C
Test Date	: Nov. 12, 2018	Humidity	: 63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-6.97	73.80	66.83	68.20	-1.37	Peak	156	36	P
2	5700.00	-6.95	83.90	76.95	105.20	-28.25	Peak	156	36	P
3	5720.00	-6.95	85.70	78.75	110.80	-32.05	Peak	156	36	P
4	5725.00	-6.95	90.81	83.86	122.20	-38.34	Peak	156	36	P
5	5850.00	-6.90	86.95	80.05	122.20	-42.15	Peak	156	36	P
6	5855.00	-6.90	83.60	76.70	110.80	-34.10	Peak	156	36	P
7	5875.00	-6.89	78.70	71.81	105.20	-33.39	Peak	156	36	P
8	5925.00	-6.88	68.60	61.72	68.20	-6.48	Peak	156	36	P
9	11550.00	1.26	28.95	30.21	54.00	-23.79	Average	100	342	P
10	11550.00	1.26	41.65	42.91	74.00	-31.09	Peak	100	342	P
11	17325.00	12.22	40.55	52.77	68.20	-15.43	Peak	100	56	P

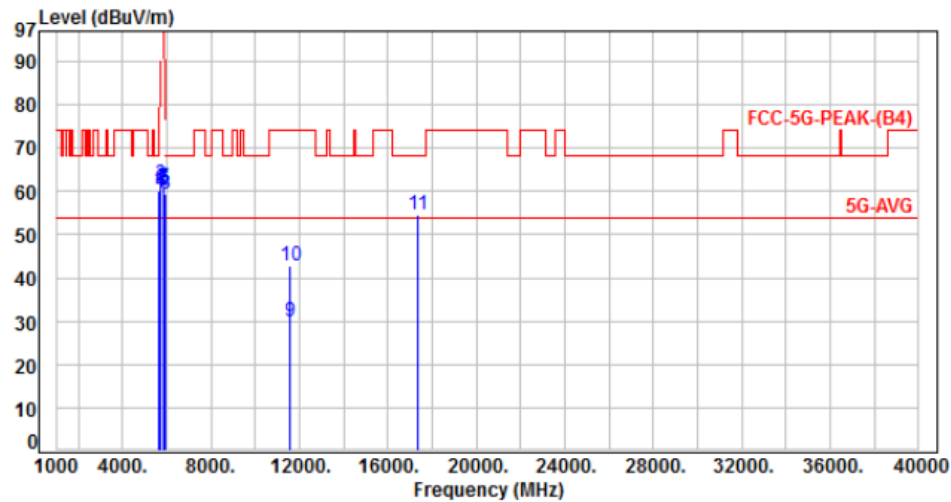
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: From PoE	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, CH155, Band 4	Temperature	: 22 °C
Test Date	: Nov. 12, 2018	Humidity	: 63 %



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	5650.00	-6.97	67.20	60.23	68.20	-7.97	Peak	190	240	P
2	5700.00	-6.95	67.60	60.65	105.20	-44.55	Peak	190	240	P
3	5720.00	-6.95	68.36	61.41	110.80	-49.39	Peak	190	240	P
4	5725.00	-6.95	67.61	60.66	122.20	-61.54	Peak	190	240	P
5	5850.00	-6.90	67.12	60.22	122.20	-61.98	Peak	190	240	P
6	5855.00	-6.90	67.50	60.60	110.80	-50.20	Peak	190	240	P
7	5875.00	-6.89	67.85	60.96	105.20	-44.24	Peak	190	240	P
8	5925.00	-6.88	66.32	59.44	68.20	-8.76	Peak	190	240	P
9	11550.00	1.26	28.65	29.91	54.00	-24.09	Average	100	316	P
10	11550.00	1.26	41.70	42.96	74.00	-31.04	Peak	100	316	P
11	17325.00	12.22	42.23	54.45	68.20	-13.75	Peak	100	299	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

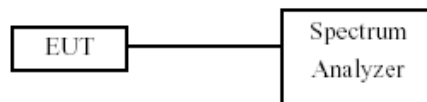
7.1. Test Limit

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 : 23°C Humidity : 64%
Test Date : Dec. 19, 2018 :

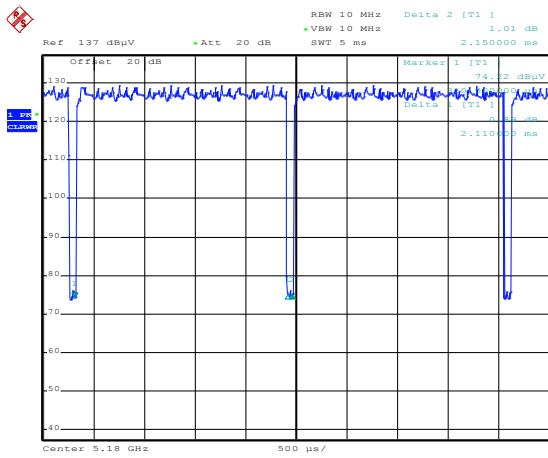
Modulation Type	On Time (msec)	Period Time (msec)	Duty Cycle (%)
802.11a	2.11	2.15	98.14%
802.11ac VHT20	5.10	5.12	99.61%
802.11ac VHT40	2.48	2.53	98.02%
802.11ac VHT80	1.17	1.22	95.90%

7.5. Measurement Methods

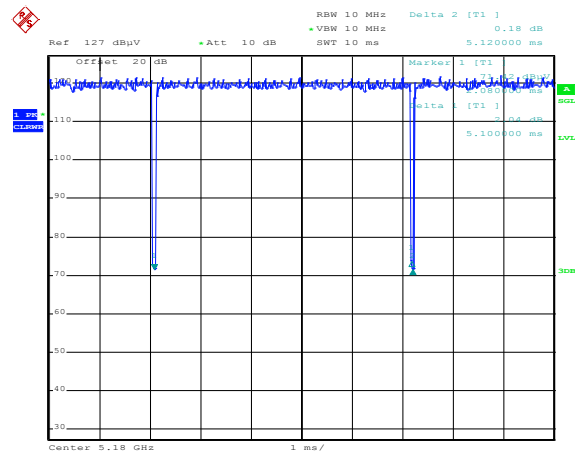
26 dB and 6dB Emission BW	KDB 789033 D02 v02r01, Section C
99% Occupied BW	KDB 789033 D02 v02r01, Section D
Conducted Output Power	KDB 789033 D02 v02r01, Section E.2.d and E.3.b (Method PM-G)
Power Spectral Density	KDB 789033 D02 v02r01, Section F
Unwanted emissions in restricted bands	KDB 789033 D02 v02r01, Sections G and H
Unwanted emissions in non-restricted bands	KDB 789033 D02 v02r01, Sections G and H



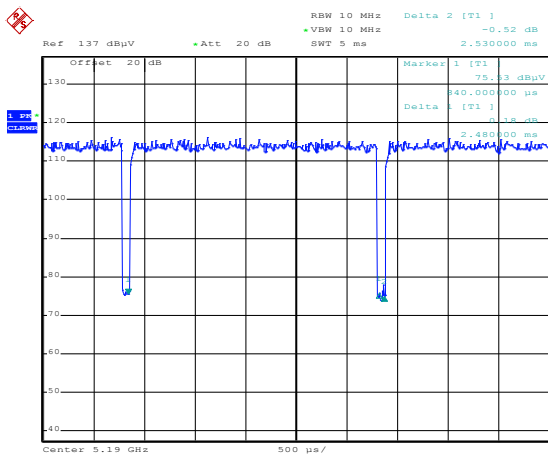
Modulation Standard: 802.11a (6Mbps)



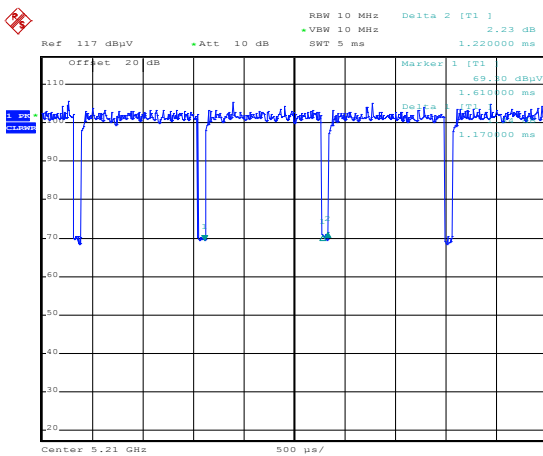
Modulation Standard: 802.11ac VHT20 (6.5Mbps)



Modulation Standard: 802.11ac VHT40 (13.5Mbps)



Modulation Standard: 802.11ac VHT80 (29.3Mbps)





8. 6dB Bandwidth & 99% Bandwidth

8.1. Test Limit

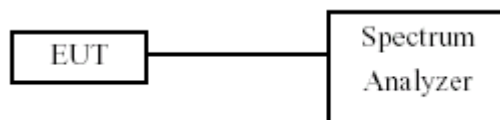
FCC §15.407

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 (6dB Bandwidth)

Temperature : 23°C

Humidity : 64%

Test Date : Dec. 19, 2018

:

In the 5.8G Band

Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)
			ANT A	ANT B	
802.11a	149	5745	16.10	16.30	0.50
	157	5785	16.40	16.40	0.50
	165	5825	16.30	16.30	0.50
802.11ac VHT20	149	5745	16.90	17.60	0.50
	157	5785	16.90	17.20	0.50
	165	5825	16.50	17.60	0.50
802.11ac VHT40	155	5755	35.10	35.10	0.50
	159	5795	35.10	35.10	0.50
802.11ac VHT80	155	5775	75.74	76.06	0.50

**8.5. Test Result and Data (99% Bandwidth)**

Temperature : 23°C

Humidity : 64%

Test Date : Dec. 19, 2018

:

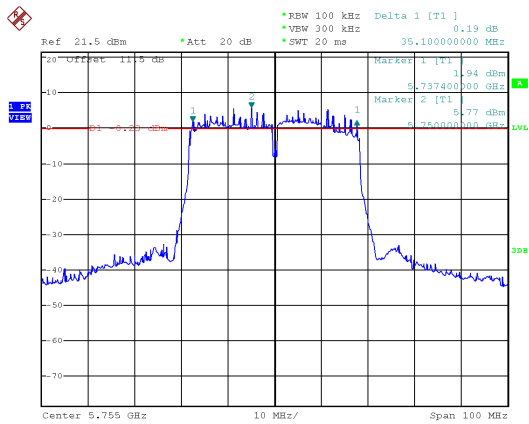
In the 5.8G Band

Modulation Type	Channel	Frequency (MHz)	99% Bandwidth (MHz)	
			ANT A	ANT B
802.11a	149	5745	16.60	16.50
	157	5785	16.60	16.50
	165	5825	16.50	16.60
802.11ac VHT20	149	5745	17.70	17.60
	157	5785	17.70	17.70
	165	5825	17.80	17.70
802.11ac VHT40	155	5755	36.40	36.40
	159	5795	36.00	36.40
802.11ac VHT80	155	5775	75.84	75.84

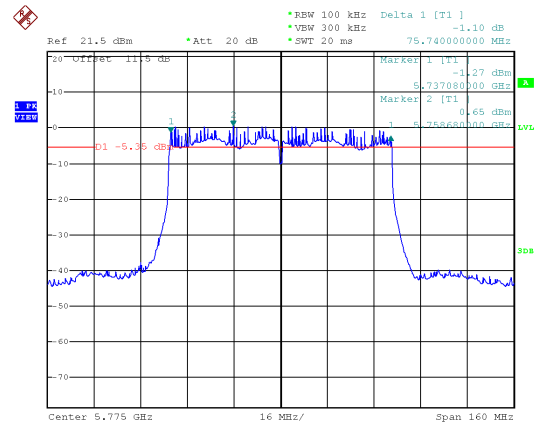




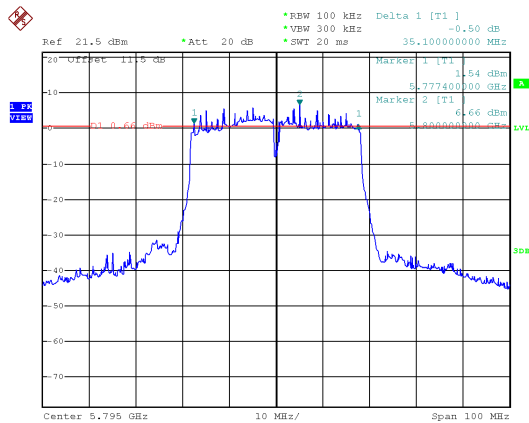
Modulation Standard: 802.11ac, VHT40 (13.5Mbps)
CH151



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

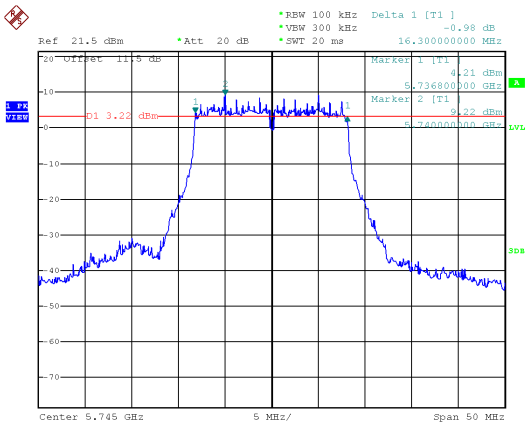


CH159

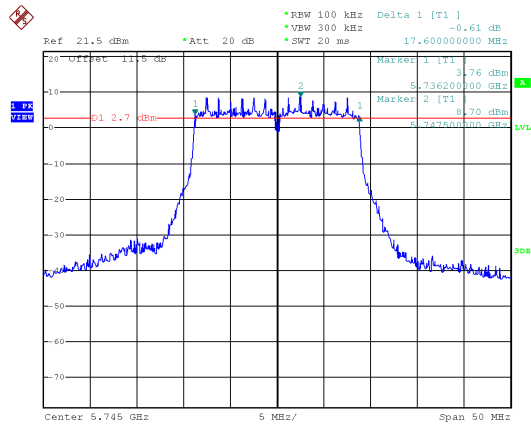




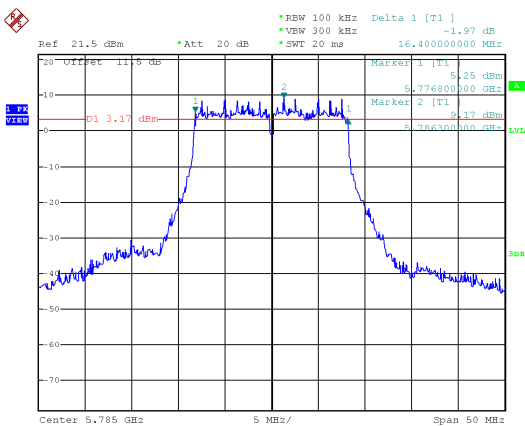
ANT B
Modulation Standard: 802.11a (6Mbps)
CH149



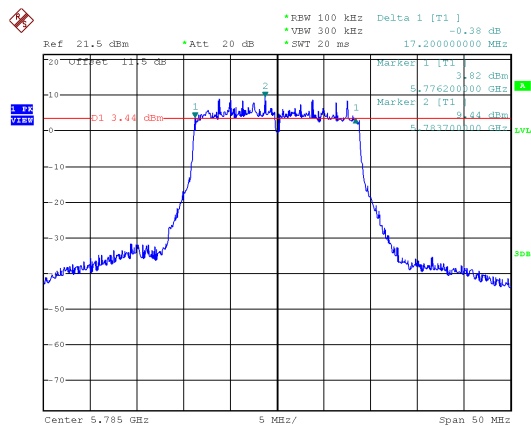
Modulation Standard: 802.11ac, VHT20 (6.5Mbps)
CH149



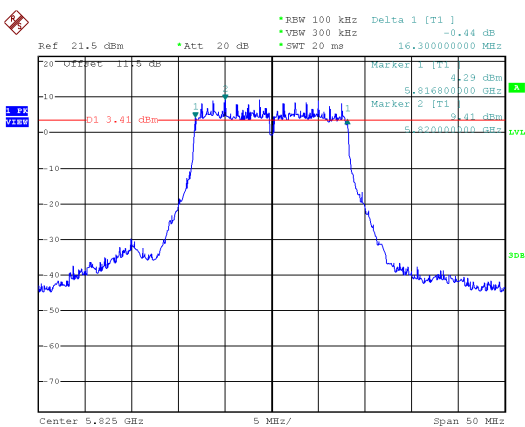
CH157



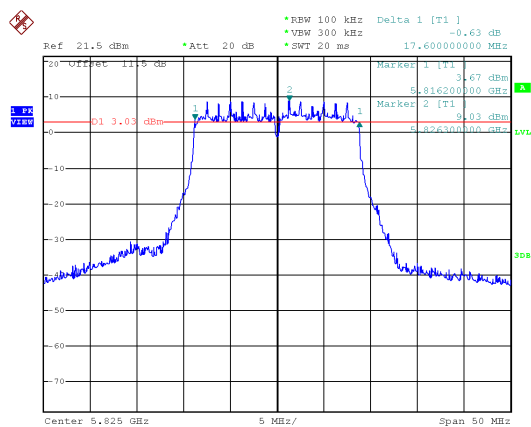
CH157

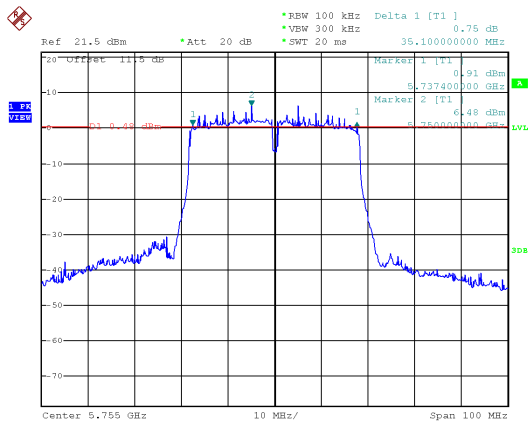
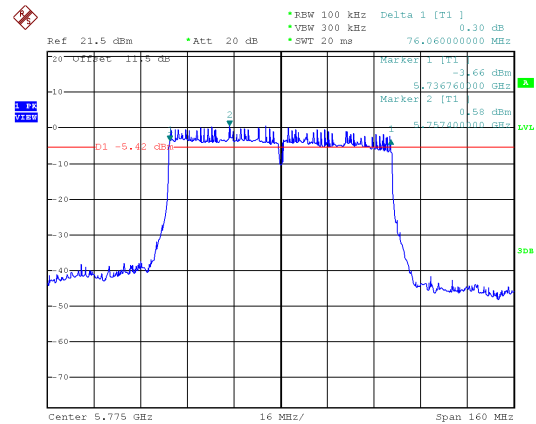


CH165

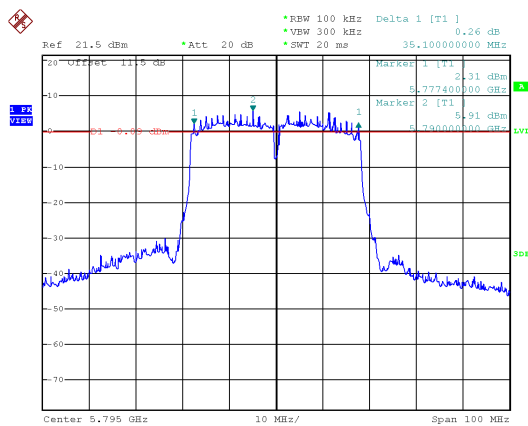


CH165



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

CH159



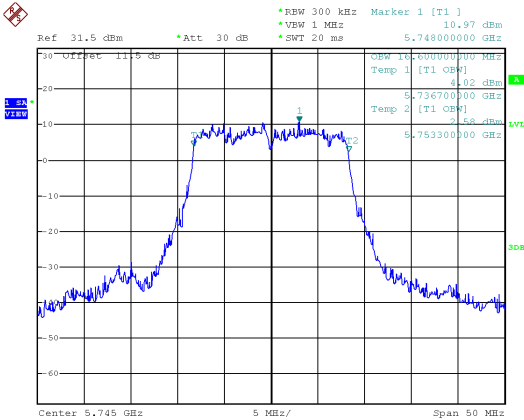


99% Bandwidth

ANT A

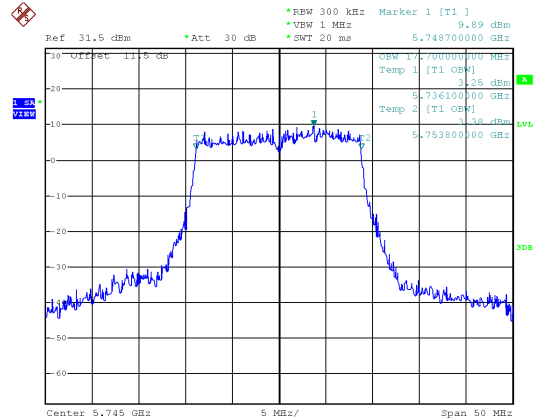
Modulation Standard: 802.11a (6Mbps)

CH149

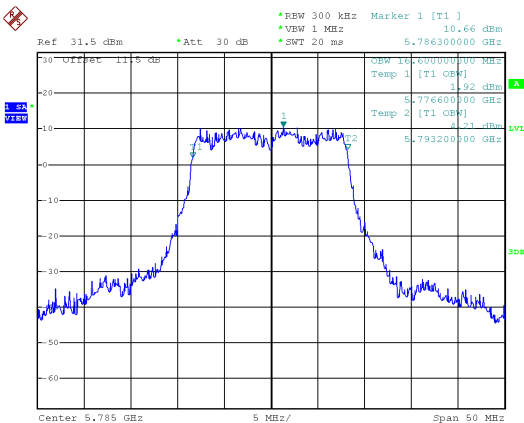


Modulation Standard: 802.11ac, VHT20 (6.5Mbps)

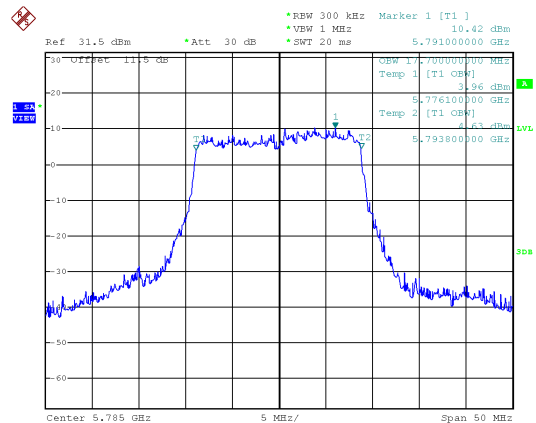
CH149



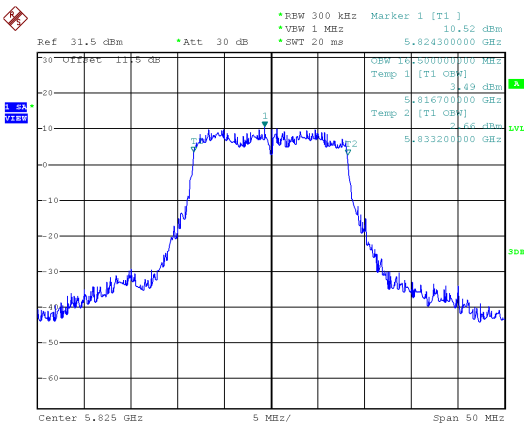
CH157



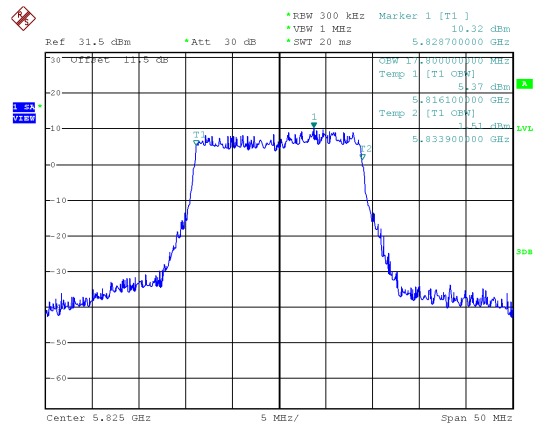
CH157



CH165

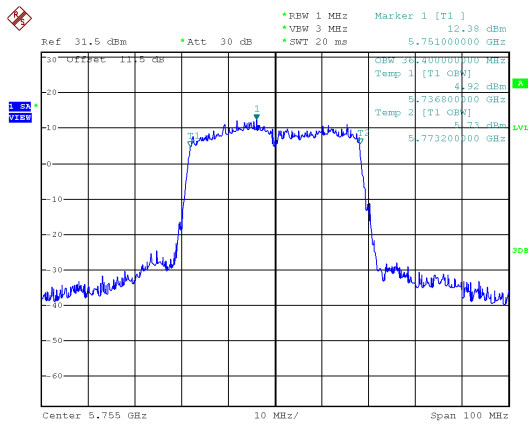


CH165

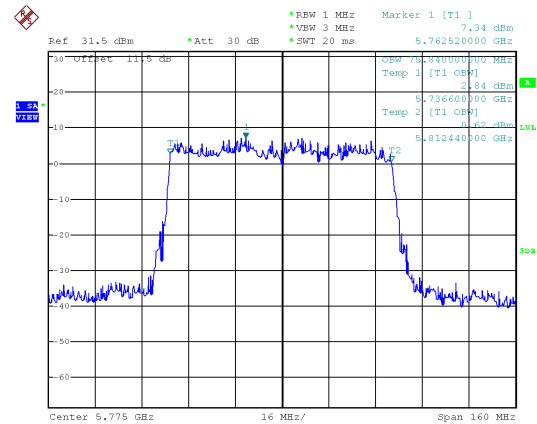




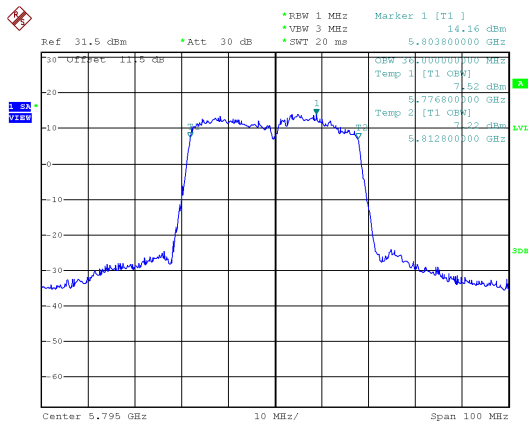
Modulation Standard: 802.11ac, VHT40 (13.5Mbps)
CH151



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



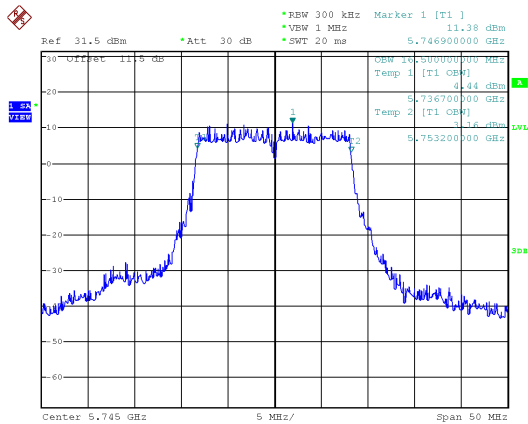
CH159



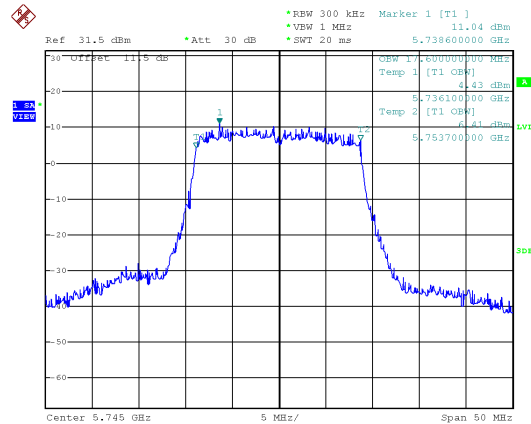


ANT B

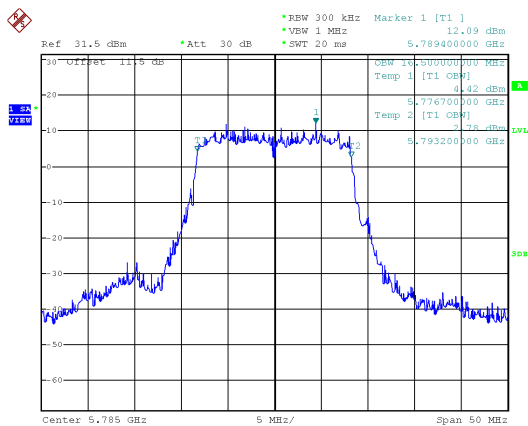
Modulation Standard: 802.11a (6Mbps)
CH149



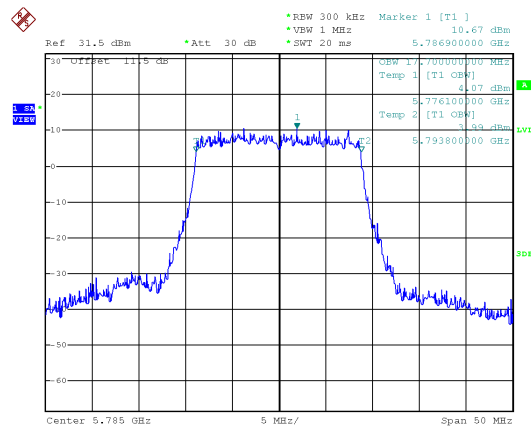
Modulation Standard: 802.11ac, VHT20 (6.5Mbps)
CH149



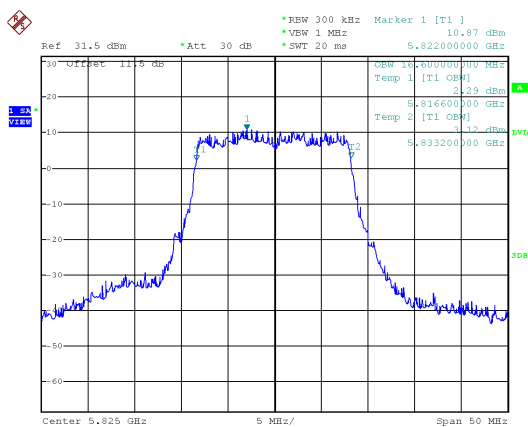
CH157



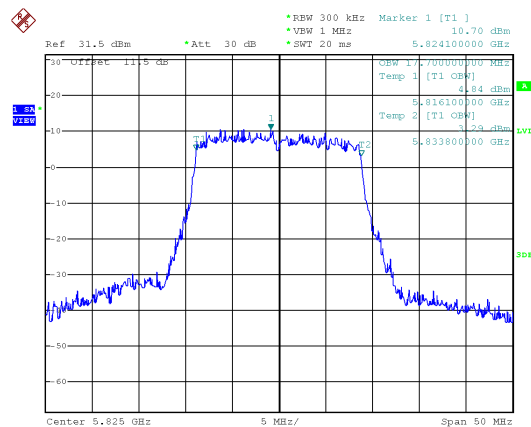
CH157



CH165

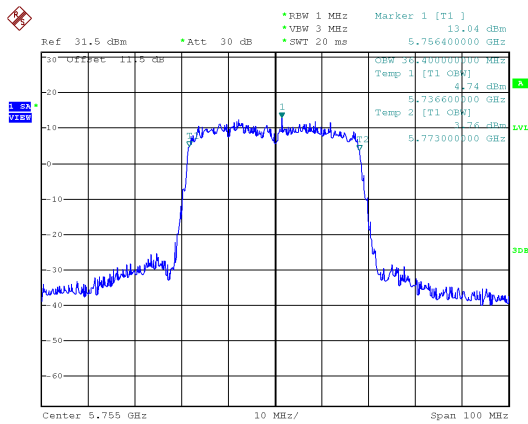


CH165

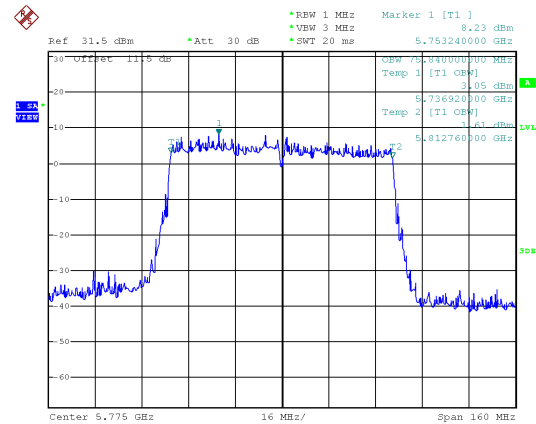




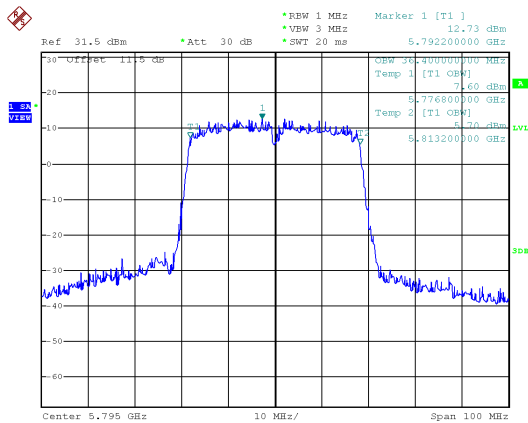
Modulation Standard: 802.11ac, VHT40 (13.5Mbps)
CH151



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



CH159





9. 26dB Bandwidth & 99% Bandwidth

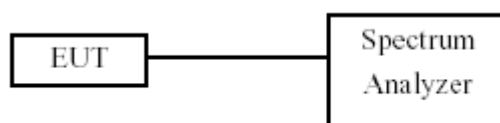
9.1. Test Limit

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 (26dB Bandwidth)

Temperature : 23°C

Humidity : 64%

Test Date : Dec. 19, 2018

:

In the 5.2G Band

Modulation Type	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
			ANT A	ANT B
802.11a	36	5180	19.40	19.20
	44	5220	19.30	19.30
	48	5240	19.30	19.30
802.11ac VHT20	36	5180	20.30	20.40
	44	5220	20.40	20.40
	48	5240	20.70	20.50
802.11ac VHT40	38	5190	40.60	41.00
	46	5230	40.80	41.00
802.11ac VHT80	42	5210	83.20	83.52

**9.5. Test Result and Data (99% Bandwidth)**

Temperature : 23°C

Humidity : 64%

Test Date : Dec. 19, 2018

:

In the 5.2G Band

Modulation Type	Channel	Frequency (MHz)	99% Bandwidth (MHz)	
			ANT A	ANT B
802.11a	36	5180	16.50	16.50
	44	5220	16.50	16.50
	48	5240	16.50	16.50
802.11ac VHT20	36	5180	17.70	17.70
	44	5220	17.70	17.70
	48	5240	17.70	17.70
802.11ac VHT40	38	5190	36.40	36.20
	46	5230	36.20	36.20
802.11ac VHT80	42	5210	75.84	75.84

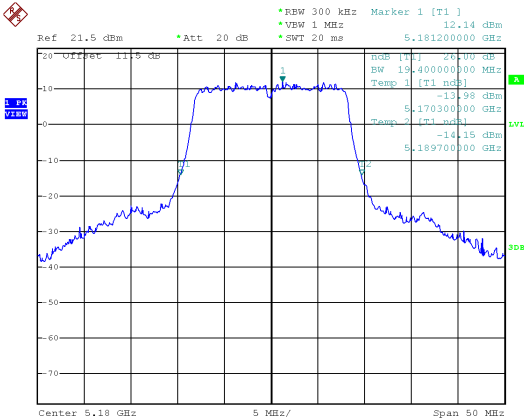


26dB Bandwidth

ANT A

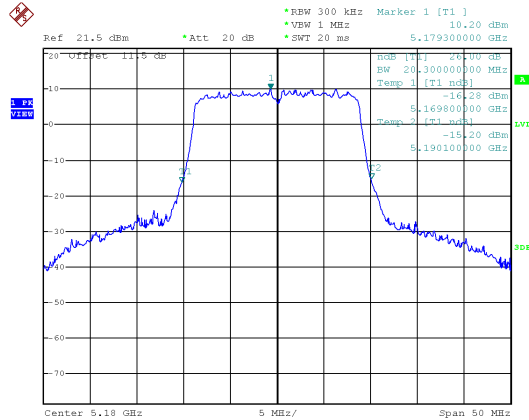
Modulation Standard: 802.11a (6Mbps)

CH36



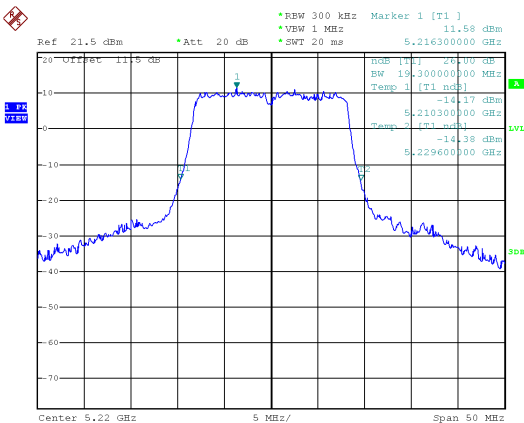
802.11ac VHT20 (6.5Mbps)

CH36

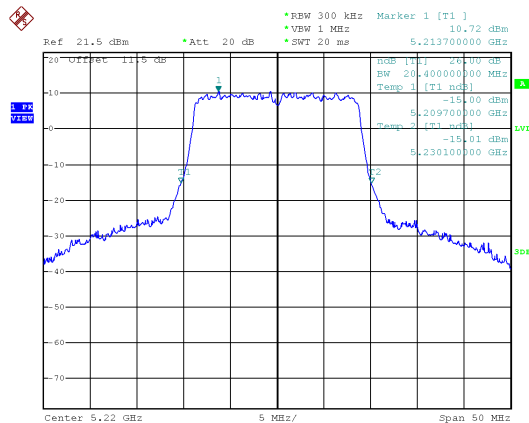


1

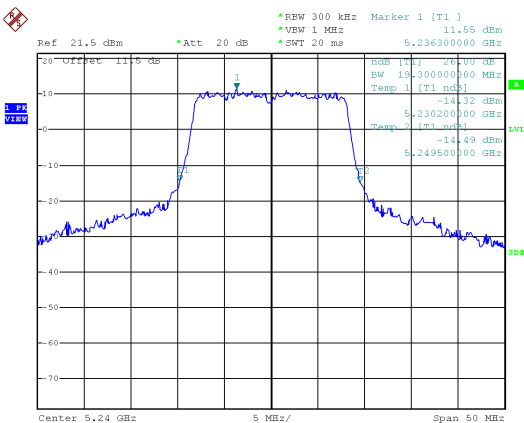
CH44



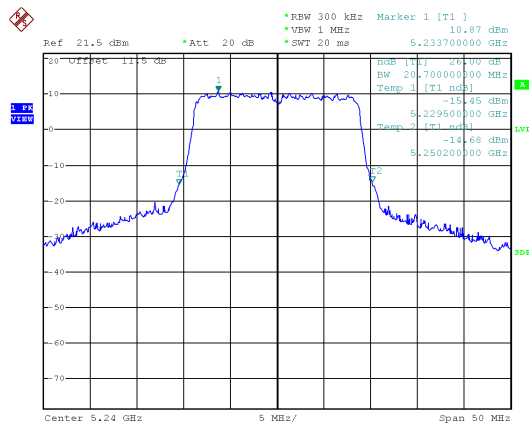
CH44

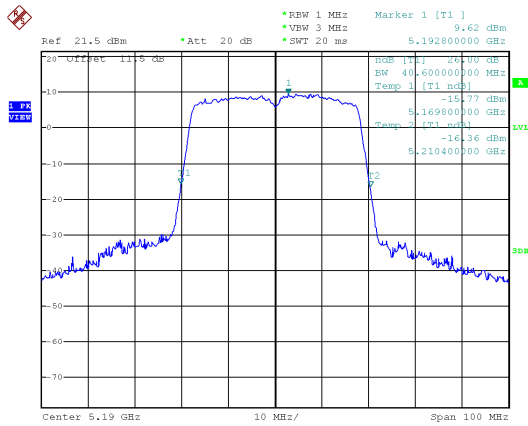
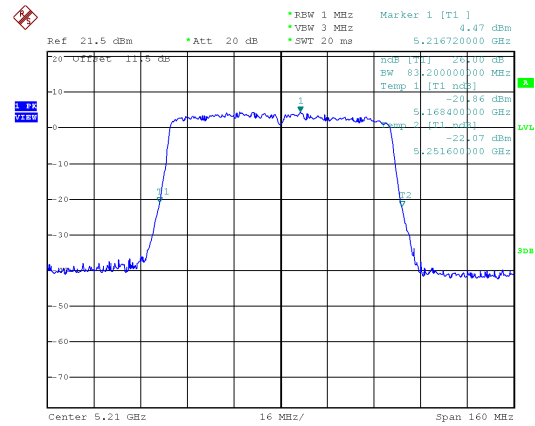


CH48

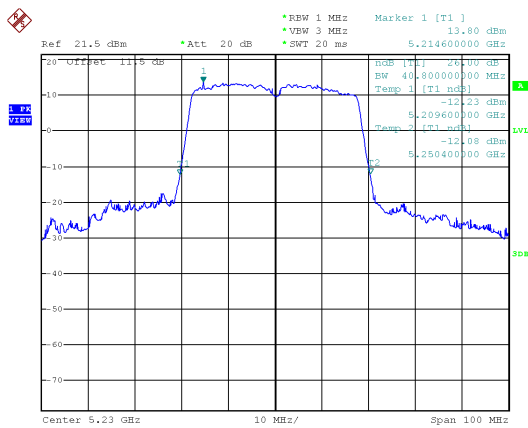


CH48



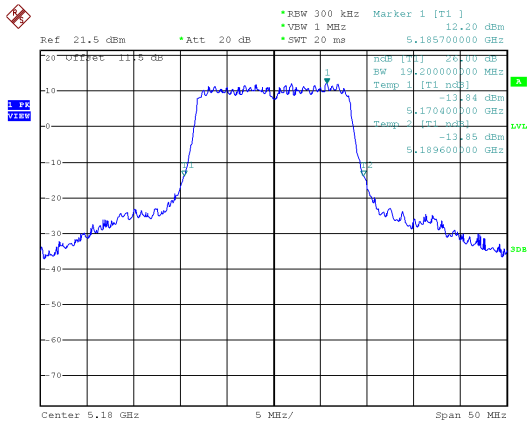
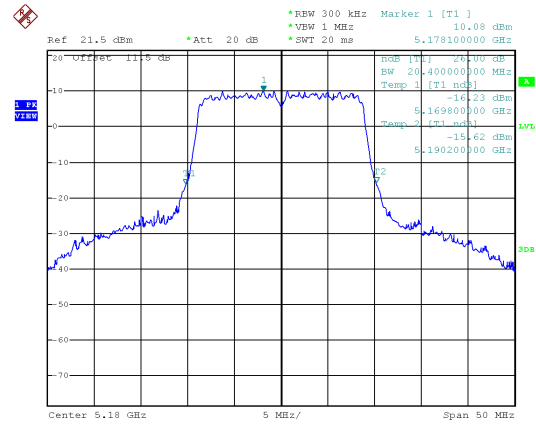
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH38Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH42

CH46

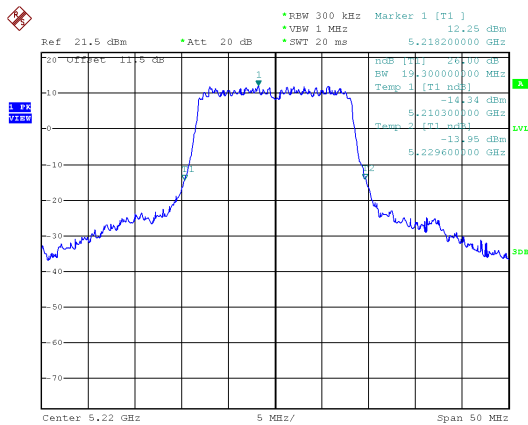




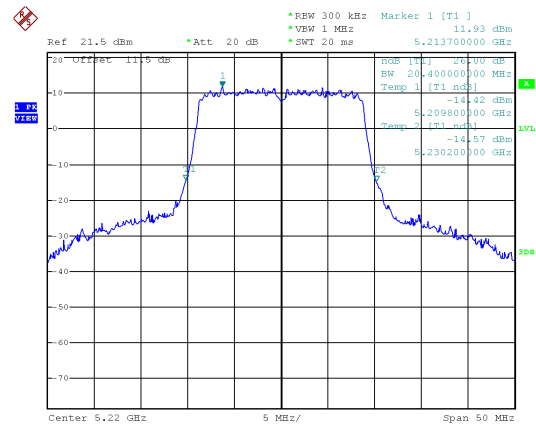
ANT B

Modulation Standard: 802.11a (6Mbps)
CH36802.11ac VHT20 (6.5Mbps)
CH36

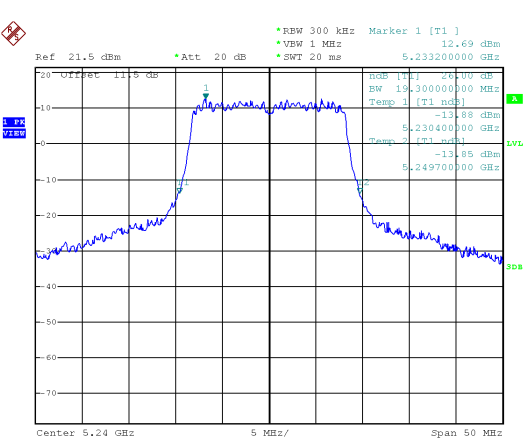
CH44



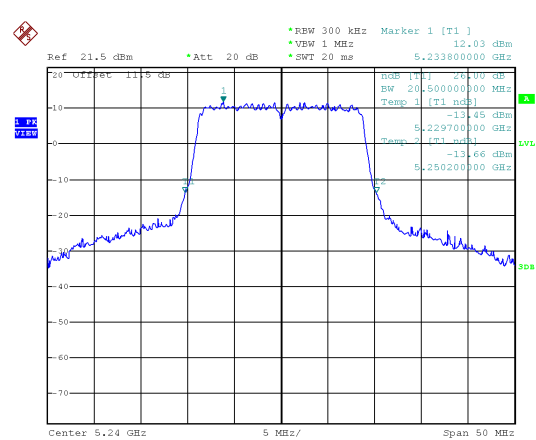
CH44



CH48

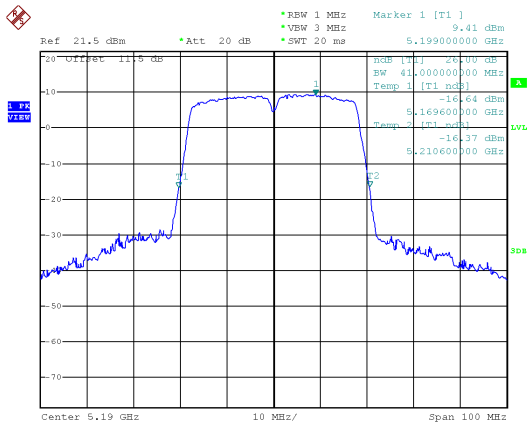


CH48

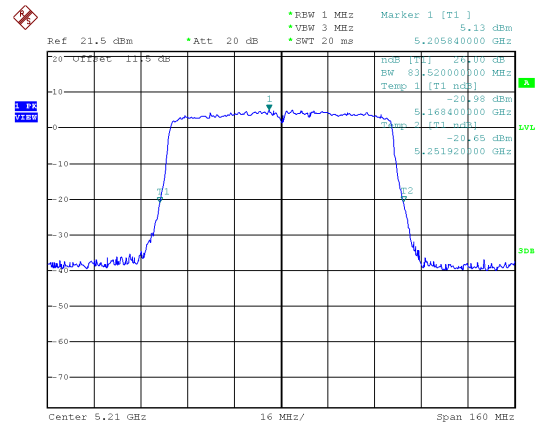




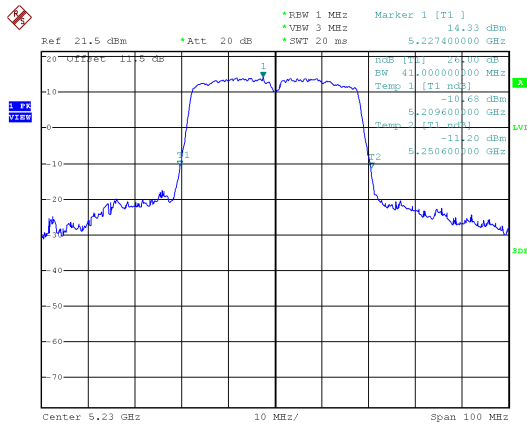
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH38



Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH42



CH46



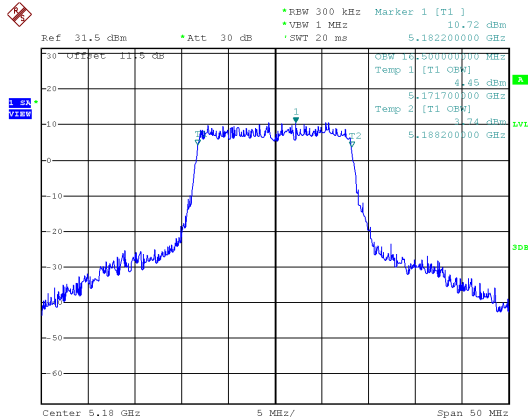


99% Bandwidth

ANT A

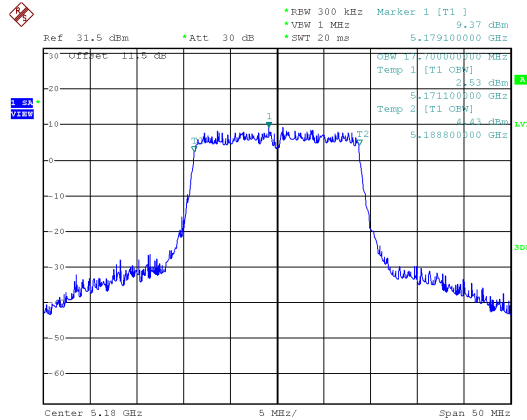
Modulation Standard: 802.11a (6Mbps)

CH36

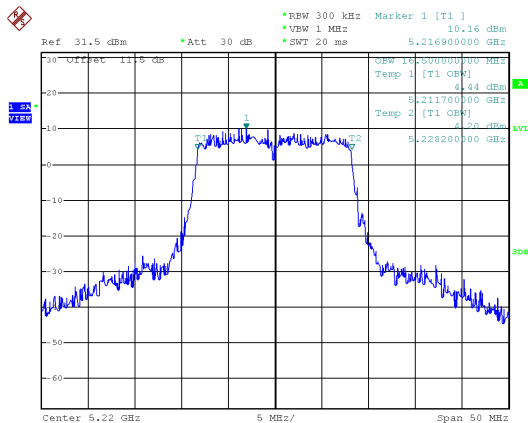


802.11ac VHT20 (6.5Mbps)

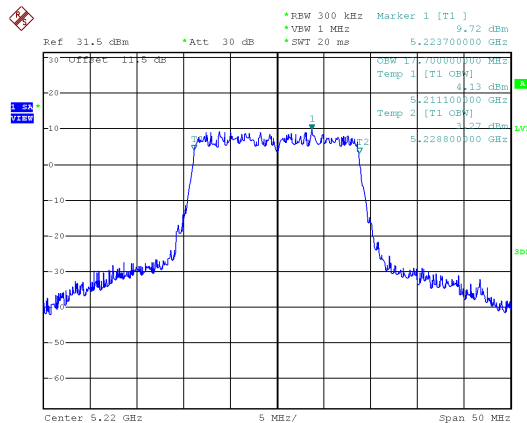
CH36



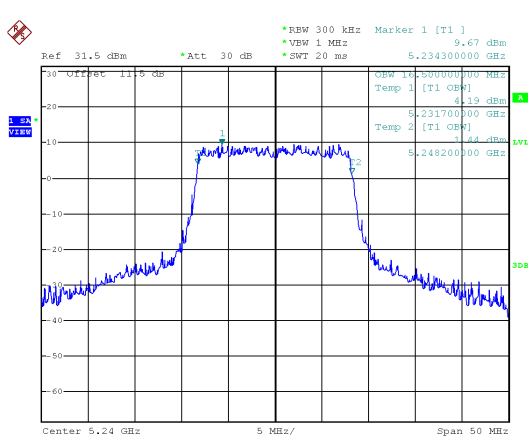
CH44



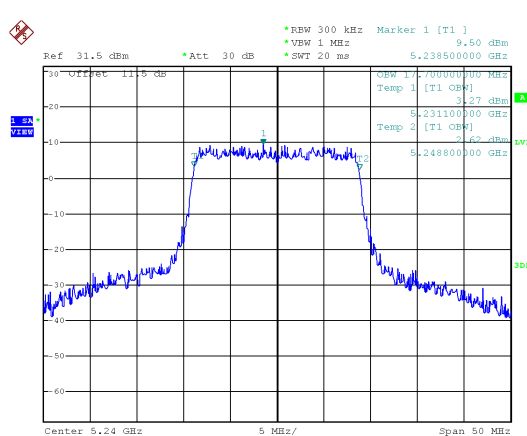
CH44



CH48

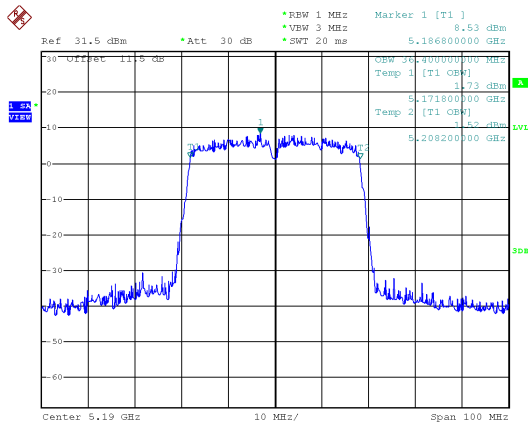


CH48

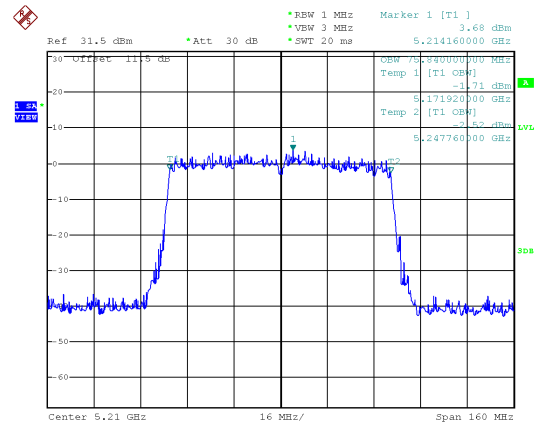




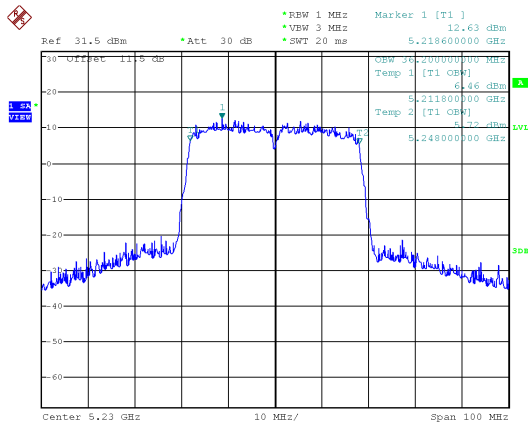
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH38



Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH42



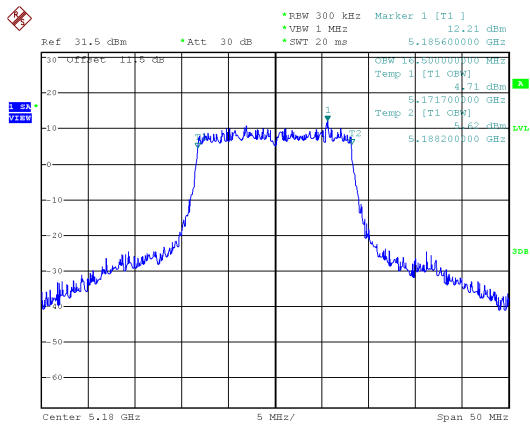
CH46



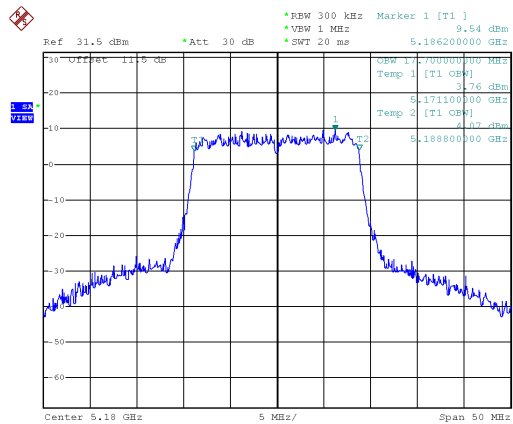


ANT B

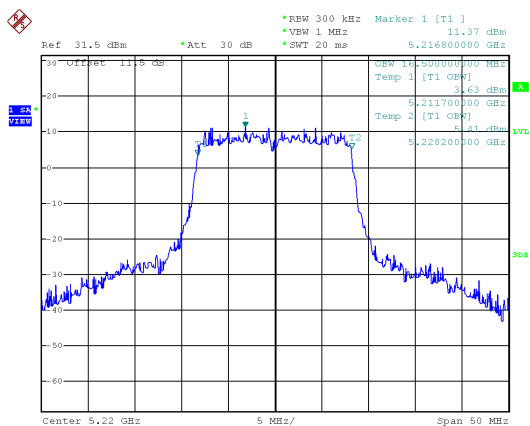
Modulation Standard: 802.11a (6Mbps)
CH36



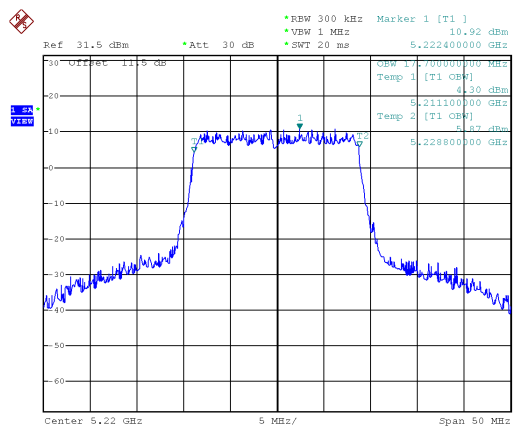
802.11ac VHT20 (6.5Mbps)
CH36



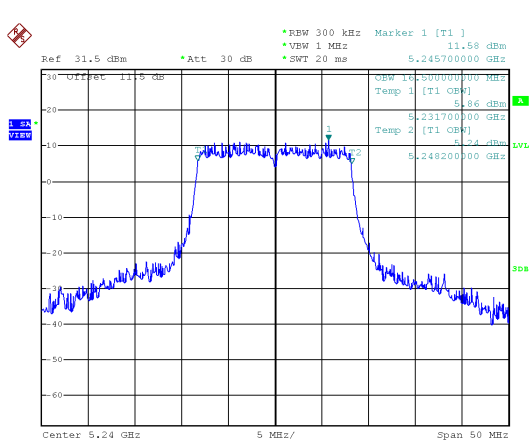
CH44



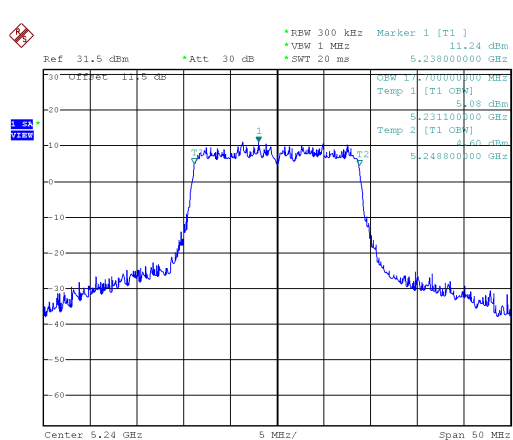
CH44



CH48

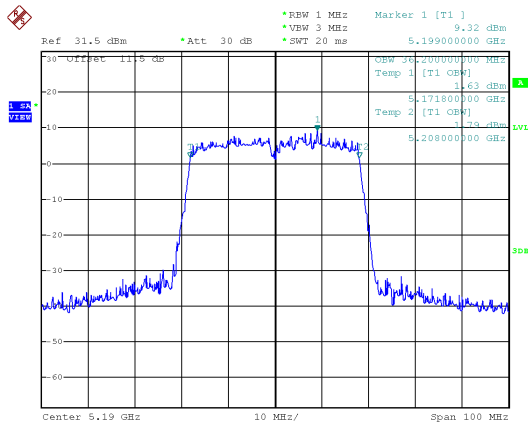


CH48

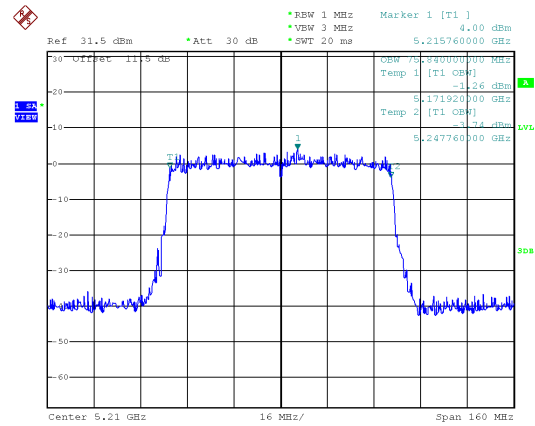




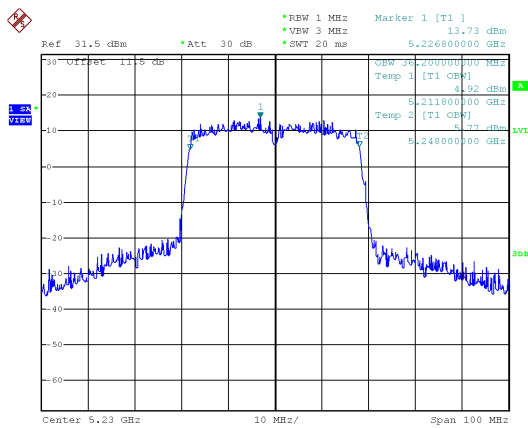
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH38



Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH42



CH46





10. Average Power

10.1. 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 30 degrees 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.
☐	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.



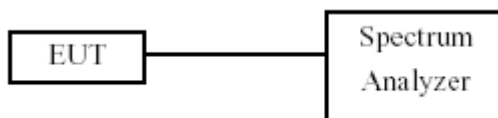
Frequency Band		Limit
☐	5.25-5.35 GHz	The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, 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.

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
Test Date: Feb. 08, 2018

Humidity: 64%
Test Mode: Non-Beamforming

In the 5.2G Band

Modulation	Data Rate	Channel	Frequency (MHz)	Measured value of each antenna port (dBm)		Total power (dBm)	FCC Limit (dBm)
				ANT A	ANT B		
802.11a	6 Mbps	36	5180	19.99	19.99	23.00	29.09
	6 Mbps	44	5220	19.37	19.98	22.70	29.09
	6 Mbps	48	5240	19.48	19.97	22.74	29.09
802.11an HT20	MCS 0	36	5180	18.49	18.50	21.51	29.09
	MCS 0	44	5220	19.23	19.98	22.63	29.09
	MCS 0	48	5240	19.41	19.95	22.70	29.09
802.11an HT40	MCS 0	38	5190	15.33	15.32	18.34	29.09
	MCS 0	46	5230	19.32	19.96	22.66	29.09
802.11ac VHT20	MCS0-NSS1	36	5180	18.53	18.54	21.55	29.09
	MCS0-NSS1	44	5220	19.26	19.99	22.65	29.09
	MCS0-NSS1	48	5240	19.44	19.96	22.72	29.09
802.11ac VHT40	MCS0-NSS1	38	5190	15.36	15.34	18.36	29.09
	MCS0-NSS1	46	5230	19.33	19.97	22.67	29.09
802.11ac VHT80	MCS0-NSS1	42	5210	13.46	13.79	16.64	29.09

In the 5.8G Band

Modulation	Data Rate	Channel	Frequency (MHz)	Measured value of each antenna port (dBm)		Total power (dBm)	FCC Limit (dBm)
				ANT A	ANT B		
802.11a	6 Mbps	149	5745	19.22	19.96	22.62	28.92
	6 Mbps	157	5785	19.31	19.99	22.67	28.92
	6 Mbps	165	5825	18.88	19.87	22.41	28.92
802.11an HT20	MCS 0	149	5745	18.91	19.56	22.26	28.92
	MCS 0	157	5785	19.02	19.67	22.37	28.92
	MCS 0	165	5825	18.41	19.58	22.04	28.92
802.11an HT40	MCS 0	151	5755	18.62	19.51	22.10	28.92
	MCS 0	159	5795	18.89	19.73	22.34	28.92
802.11ac VHT20	MCS0-NSS1	149	5745	18.96	19.63	22.32	28.92
	MCS0-NSS1	157	5785	19.11	19.78	22.47	28.92
	MCS0-NSS1	165	5825	18.43	19.62	22.08	28.92
802.11ac VHT40	MCS0-NSS1	151	5755	18.67	19.55	22.14	28.92
	MCS0-NSS1	159	5795	18.92	19.78	22.38	28.92
802.11ac VHT80	MCS0-NSS1	155	5775	17.12	17.49	20.32	28.92



Temperature: 21°C
Test Date: Feb. 08, 2018

Humidity: 64%
Test Mode: Beamforming

In the 5.2G Band

Modulation	Data Rate	Channel	Frequency (MHz)	Measured value of each antenna port (dBm)		Total power (dBm)	FCC Limit (dBm)
				ANT A	ANT B		
802.11a	6 Mbps	36	5180	16.98	16.98	19.99	26.08
	6 Mbps	44	5220	16.36	16.97	19.69	26.08
	6 Mbps	48	5240	16.47	16.96	19.73	26.08
802.11an HT20	MCS 0	36	5180	15.48	15.49	18.50	26.08
	MCS 0	44	5220	16.22	16.97	19.62	26.08
	MCS 0	48	5240	16.40	16.94	19.69	26.08
802.11an HT40	MCS 0	38	5190	12.32	12.31	15.33	29.09
	MCS 0	46	5230	16.31	16.95	19.65	29.09
802.11ac VHT20	MCS0-NSS1	36	5180	15.52	15.53	18.54	26.08
	MCS0-NSS1	44	5220	16.25	16.98	19.64	26.08
	MCS0-NSS1	48	5240	16.43	16.95	19.71	26.08
802.11ac VHT40	MCS0-NSS1	38	5190	12.35	12.33	15.35	26.08
	MCS0-NSS1	46	5230	16.32	16.96	19.66	26.08
802.11ac VHT80	MCS0-NSS1	42	5210	10.45	10.78	13.63	26.08

In the 5.8G Band

Modulation	Data Rate	Channel	Frequency (MHz)	Measured value of each antenna port (dBm)		Total power (dBm)	FCC Limit (dBm)
				ANT A	ANT B		
802.11a	6 Mbps	149	5745	16.21	16.95	19.61	25.91
	6 Mbps	157	5785	16.30	16.98	19.66	25.91
	6 Mbps	165	5825	15.87	16.86	19.40	25.91
802.11an HT20	MCS 0	149	5745	15.90	16.55	19.25	25.91
	MCS 0	157	5785	16.01	16.66	19.36	25.91
	MCS 0	165	5825	15.40	16.57	19.03	25.91
802.11an HT40	MCS 0	151	5755	15.61	16.50	19.09	28.92
	MCS 0	159	5795	15.88	16.72	19.33	28.92
802.11ac VHT20	MCS0-NSS1	149	5745	15.95	16.62	19.31	25.91
	MCS0-NSS1	157	5785	16.10	16.77	19.46	25.91
	MCS0-NSS1	165	5825	15.42	16.61	19.07	25.91
802.11ac VHT40	MCS0-NSS1	151	5755	15.66	16.54	19.13	25.91
	MCS0-NSS1	159	5795	15.91	16.77	19.37	25.91
802.11ac VHT80	MCS0-NSS1	155	5775	14.11	14.48	17.31	25.91

**10.5. Test Result and Data(E.I.R.P Power above 30°)**

Temperature: 21°C

Humidity: 64%

Test Date: Feb. 08, 2018

Test Mode: Non-Beamforming

Mode	Channel (MHz)	Frequency (MHz)	Measured value of each antenna port (dBm)		Gain above 30° (dB)	E.I.R.P Power above 30° (dBm)	Total E.I.R.P above 30° (dBm)	E.I.R.P Limit (dBm)
6 Mbps	36	5180	Chain 0	19.99	-2.08	17.91	20.92	21
			Chain 1	19.99	-2.08	17.91		
6 Mbps	44	5220	Chain 0	19.37	-2.08	17.29	20.62	21
			Chain 1	19.98	-2.08	17.90		
6 Mbps	48	5240	Chain 0	19.48	-2.08	17.40	20.66	21
			Chain 1	19.97	-2.08	17.89		
802.11n HT20	36	5180	Chain 0	18.49	-2.08	16.41	19.43	21
			Chain 1	18.5	-2.08	16.42		
802.11n HT20	44	5220	Chain 0	19.23	-2.08	17.15	20.55	21
			Chain 1	19.98	-2.08	17.90		
802.11n HT20	48	5240	Chain 0	19.41	-2.08	17.33	20.62	21
			Chain 1	19.95	-2.08	17.87		
802.11n HT40	38	5190	Chain 0	15.33	-2.08	13.25	16.26	21
			Chain 1	15.32	-2.08	13.24		
802.11n HT40	46	5230	Chain 0	19.32	-2.08	17.24	20.58	21
			Chain 1	19.96	-2.08	17.88		
802.11ac VHT20	36	5180	Chain 0	18.53	-2.08	16.45	19.47	21
			Chain 1	18.54	-2.08	16.46		
802.11ac VHT20	44	5220	Chain 0	19.26	-2.08	17.18	20.57	21
			Chain 1	19.99	-2.08	17.91		
802.11ac VHT20	48	5240	Chain 0	19.44	-2.08	17.36	20.64	21
			Chain 1	19.96	-2.08	17.88		
802.11ac VHT40	38	5190	Chain 0	15.36	-2.08	13.28	16.28	21
			Chain 1	15.34	-2.08	13.26		
802.11ac VHT40	46	5230	Chain 0	19.33	-2.08	17.25	20.59	21
			Chain 1	19.97	-2.08	17.89		
802.11ac VHT80	42	5210	Chain 0	13.46	-2.08	11.38	14.56	21
			Chain 1	13.79	-2.08	11.71		



Temperature: 21°C
Test Date: Feb. 08, 2018

Humidity: 64%
Test Mode: Beamforming

Mode	Channel (MHz)	Frequency (MHz)	Measured value of each antenna port (dBm)		Gain above 30° (dB)	E.I.R.P Power above 30° (dBm)	Total E.I.R.P above 30° (dBm)	E.I.R.P Limit (dBm)
6 Mbps	36	5180	Chain 0	16.98	0.93	17.91	20.92	21
			Chain 1	16.98	0.93	17.91		
6 Mbps	44	5220	Chain 0	16.36	0.93	17.29	20.62	21
			Chain 1	16.97	0.93	17.90		
6 Mbps	48	5240	Chain 0	16.47	0.93	17.40	20.66	21
			Chain 1	16.96	0.93	17.89		
802.11n HT20	36	5180	Chain 0	15.48	0.93	16.41	19.43	21
			Chain 1	15.49	0.93	16.42		
802.11n HT20	44	5220	Chain 0	16.22	0.93	17.15	20.55	21
			Chain 1	16.97	0.93	17.90		
802.11n HT20	48	5240	Chain 0	16.4	0.93	17.33	20.62	21
			Chain 1	16.94	0.93	17.87		
802.11n HT40	38	5190	Chain 0	12.32	0.93	13.25	16.26	21
			Chain 1	12.31	0.93	13.24		
802.11n HT40	46	5230	Chain 0	16.31	0.93	17.24	20.58	21
			Chain 1	16.95	0.93	17.88		
802.11ac VHT20	36	5180	Chain 0	15.52	0.93	16.45	19.47	21
			Chain 1	15.53	0.93	16.46		
802.11ac VHT20	44	5220	Chain 0	16.25	0.93	17.18	20.57	21
			Chain 1	16.98	0.93	17.91		
802.11ac VHT20	48	5240	Chain 0	16.43	0.93	17.36	20.64	21
			Chain 1	16.95	0.93	17.88		
802.11ac VHT40	38	5190	Chain 0	12.35	0.93	13.28	16.28	21
			Chain 1	12.33	0.93	13.26		
802.11ac VHT40	46	5230	Chain 0	16.32	0.93	17.25	20.59	21
			Chain 1	16.96	0.93	17.89		
802.11ac VHT40	42	5210	Chain 0	10.45	0.93	11.38	14.56	21
			Chain 1	10.78	0.93	11.71		



11. PSD

11.1. Test Limit

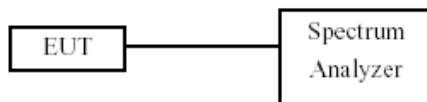
PSD:

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
☐	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

Reference to KDB789033 D02 General UNII Test Procedures New Rules v02r01

11.3. Test Setup Layout





11.4. Test Result and Data

Temperature : 23°C Humidity : 64%
Test Date : Dec. 19, 2018 :

In the 5.2G Band

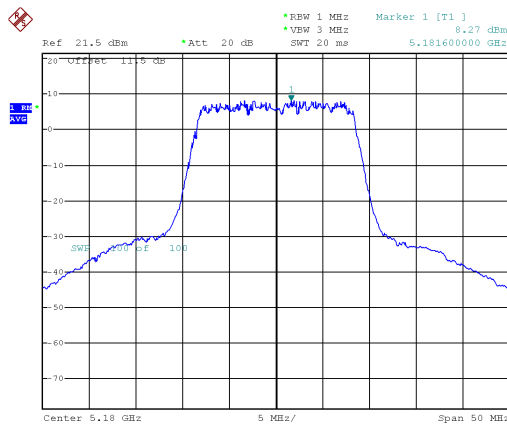
Mode	Channel (MHz)	Frequency (MHz)	Meas PSD (dBm/MHz)		Sum chain (dBm)	Duty Cycle CF(dB)	Total Corr'd PSD (dBm/MHz)	PSD Limit (dBm/MHz)
			ANT A	ANT B				
802.11a	36	5180	8.27	8.16	11.23	0.00	11.23	13.08
	44	5220	7.57	8.15	10.88	0.00	10.88	13.08
	48	5240	7.75	8.28	11.03	0.00	11.03	13.08
802.11ac VHT20	36	5180	6.82	6.61	9.73	0.00	9.73	13.08
	44	5220	7.09	8.10	10.63	0.00	10.63	13.08
	48	5240	7.35	8.21	10.81	0.00	10.81	13.08
802.11ac VHT40	38	5190	0.58	0.49	3.55	0.00	3.55	13.08
	46	5230	4.79	5.27	8.05	0.00	8.05	13.08
802.11ac VHT80	42	5210	-4.23	-4.15	-1.18	0.18	-1.00	13.08

In the 5.8G Band

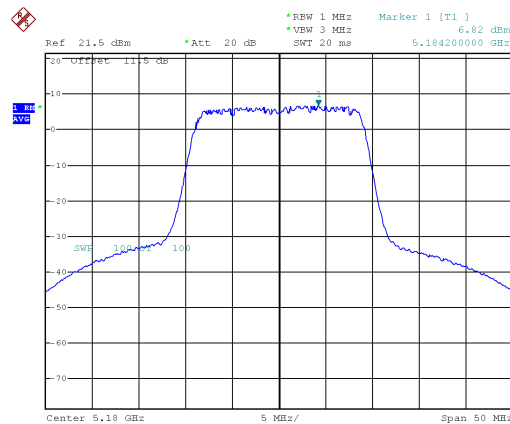
Mode	Channel (MHz)	Frequency (MHz)	Meas PSD (dBm/MHz)		Sum chain (dBm)	Duty Cycle CF(dB)	10log(500K Hz/RBW) CF (dB)	Total Corr'd PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)
			ANT A	ANT B					
802.11a	149	5745	8.45	8.91	11.70	0.00	-3.01	8.69	25.91
	157	5785	8.74	9.09	11.93	0.00	-3.01	8.92	25.91
	165	5825	8.45	8.70	11.59	0.00	-3.01	8.58	25.91
802.11ac VHT20	149	5745	8.13	8.08	11.12	0.00	-3.01	8.11	25.91
	157	5785	8.59	8.25	11.43	0.00	-3.01	8.42	25.91
	165	5825	7.64	8.48	11.09	0.00	-3.01	8.08	25.91
802.11ac VHT40	151	5755	5.05	5.57	8.33	0.00	-3.01	5.32	25.91
	159	5795	5.58	5.40	8.50	0.00	-3.01	5.49	25.91
802.11ac VHT80	155	5775	-0.34	0.48	3.10	0.18	-3.01	0.27	25.91



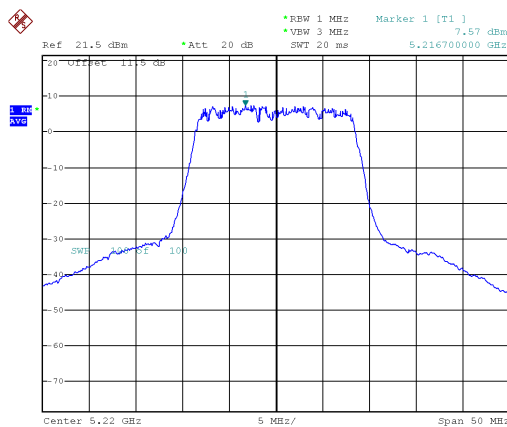
5.2G Band 1, ANT A
Modulation Standard: 802.11a (6Mbps)
CH36



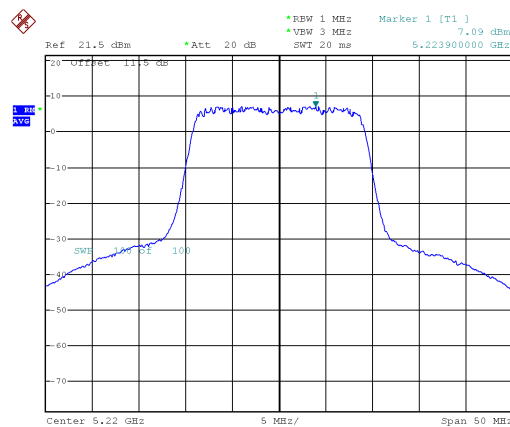
Modulation Standard: 802.11ac VHT20 (6.5Mbps)
CH36



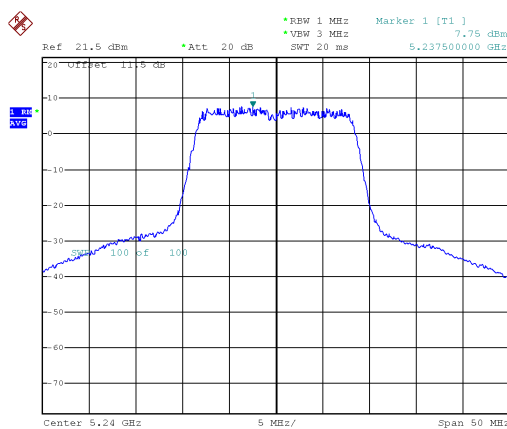
CH44



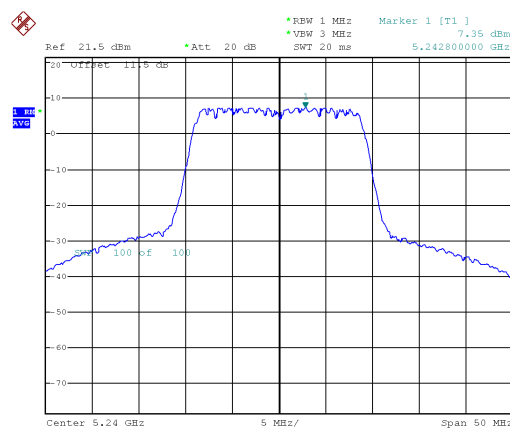
CH44



CH48

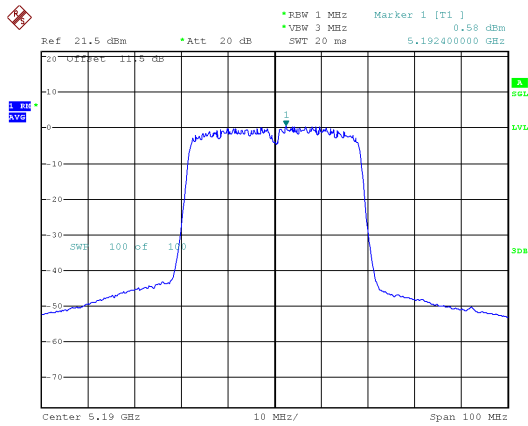


CH48

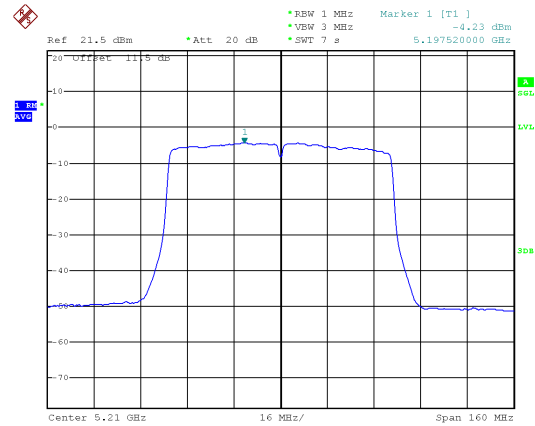




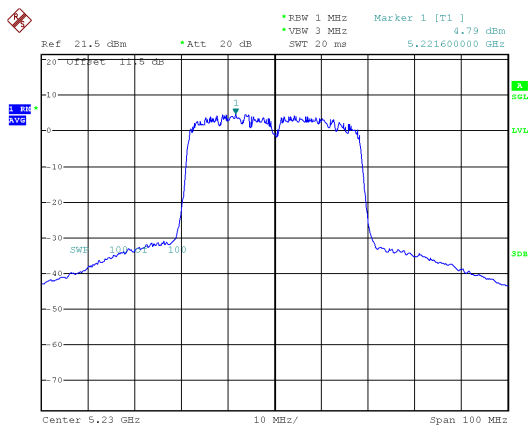
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH38



Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH42

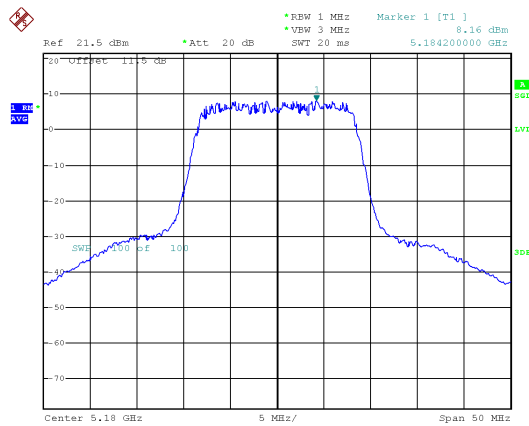


CH46

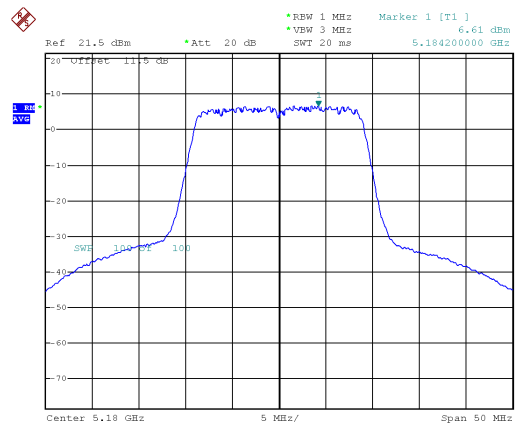




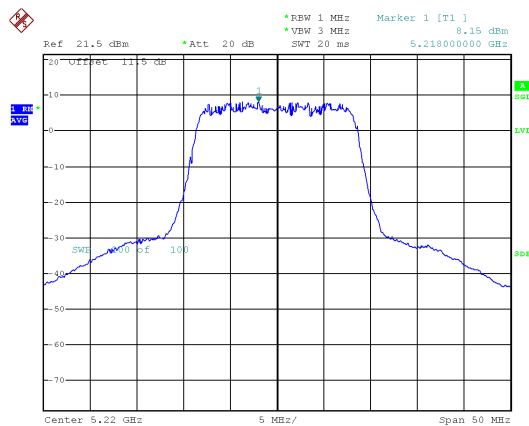
5.2G Band 1, ANT B
Modulation Standard: 802.11a (6Mbps)
CH36



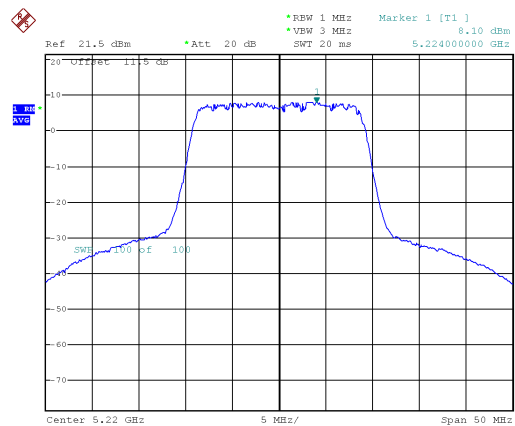
Modulation Standard: 802.11ac VHT20 (6.5Mbps)
CH36



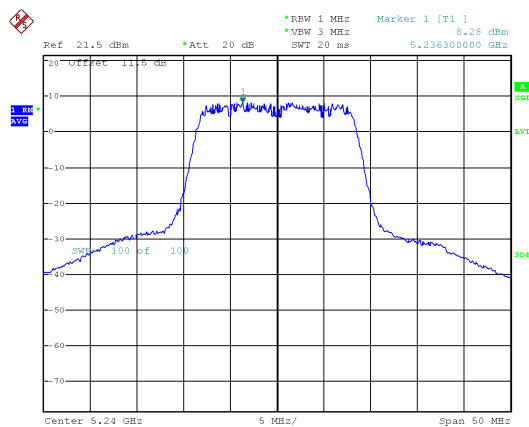
CH44



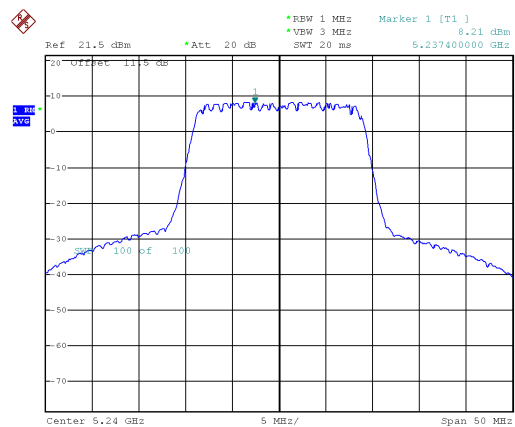
CH44



CH48

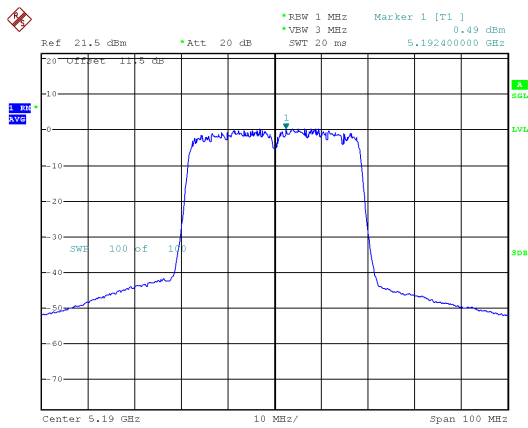


CH48

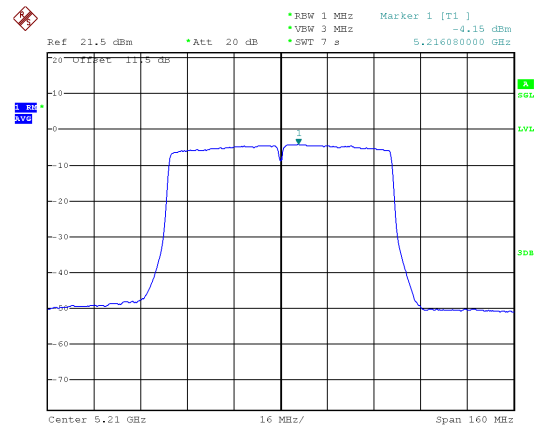




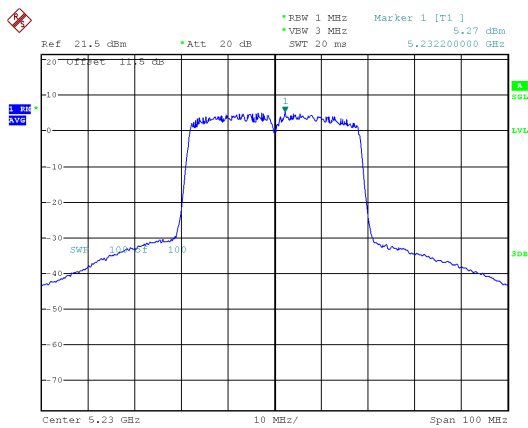
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH38



Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH42

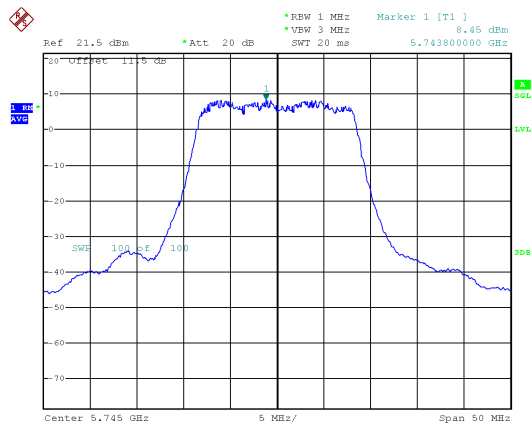


CH46

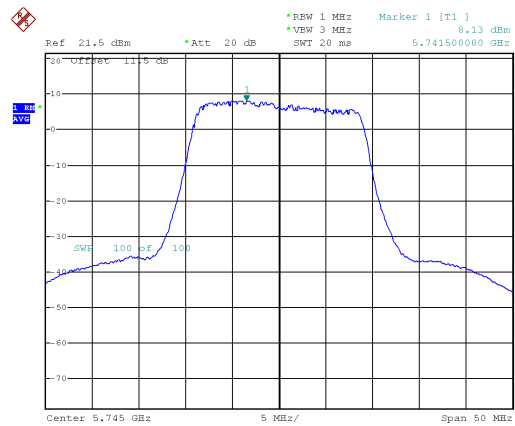




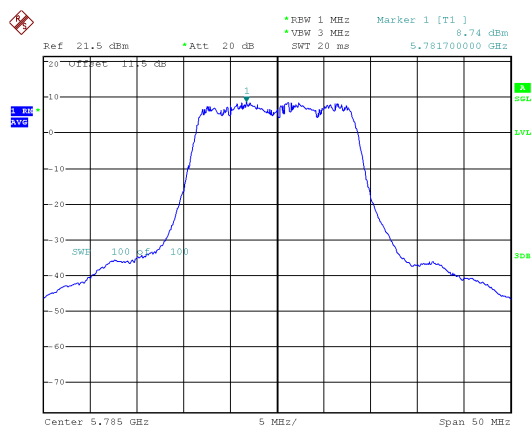
5.8G Band 4, ANT A
Modulation Standard: 802.11a (6Mbps)
CH149



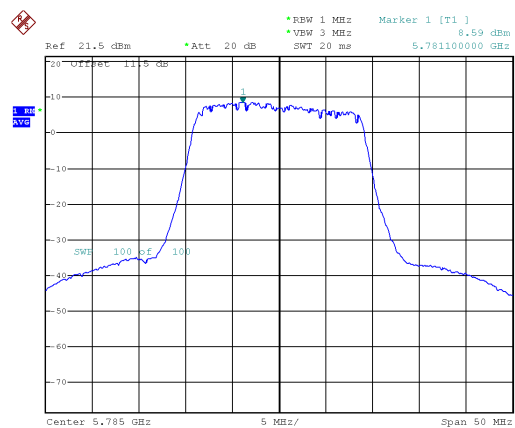
Modulation Standard: 802.11ac VHT20 (6.5Mbps)
CH149



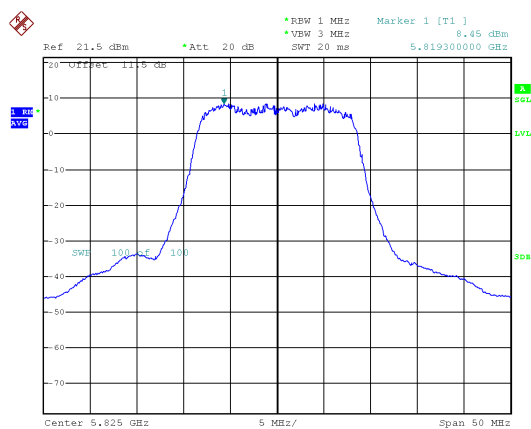
CH157



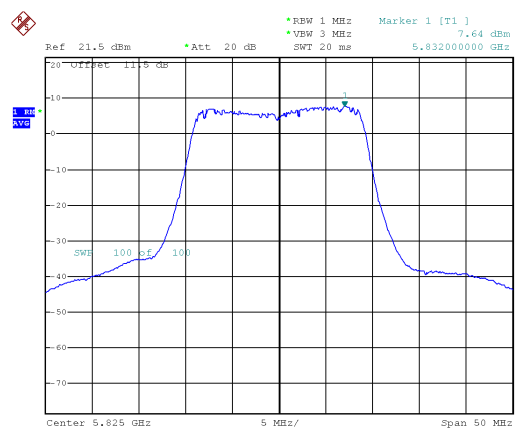
CH157



CH165

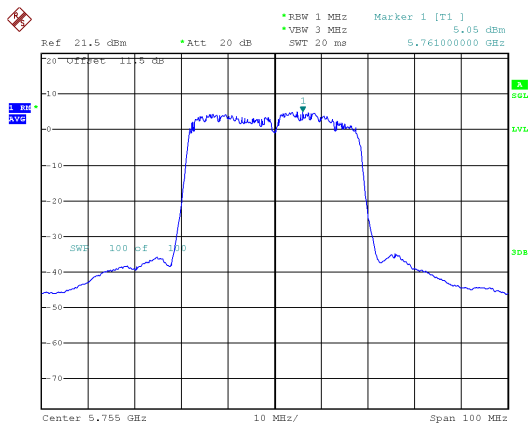


CH165

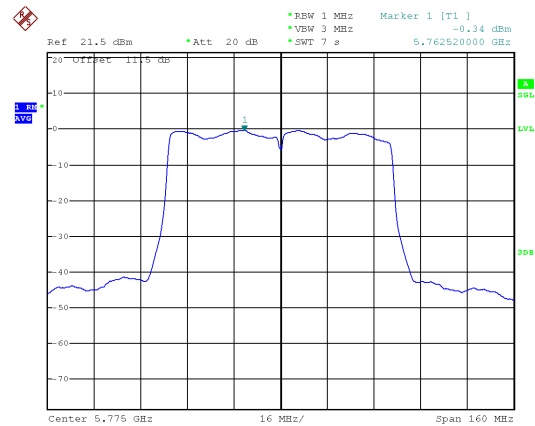




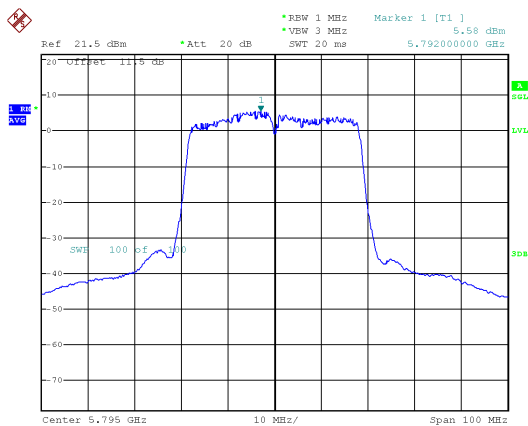
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH151



Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH155

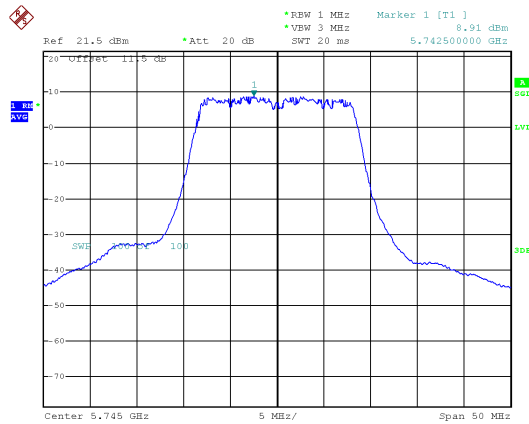


CH159

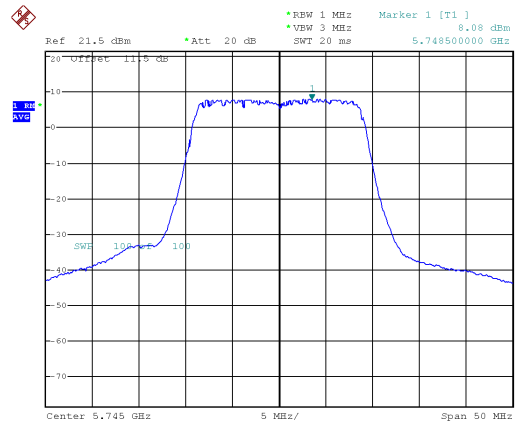




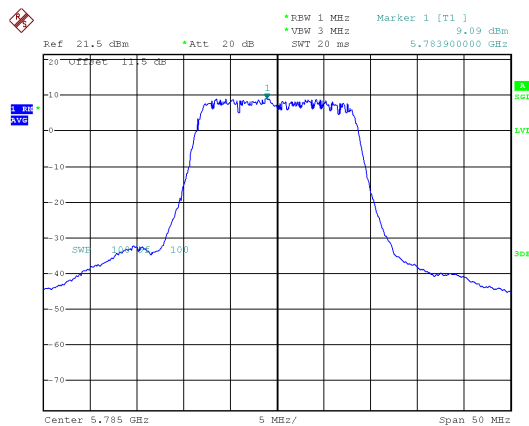
5.8G Band 4, ANT B
Modulation Standard: 802.11a (6Mbps)
CH149



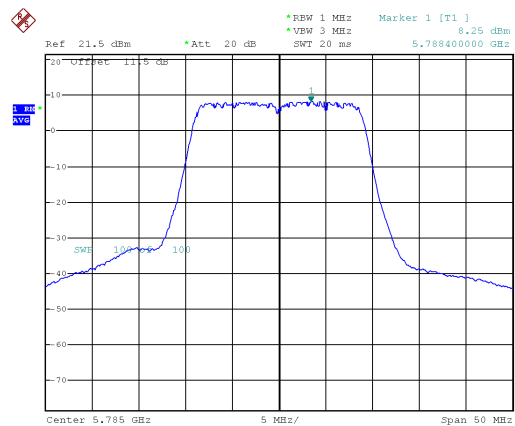
Modulation Standard: 802.11ac VHT20 (6.5Mbps)
CH149



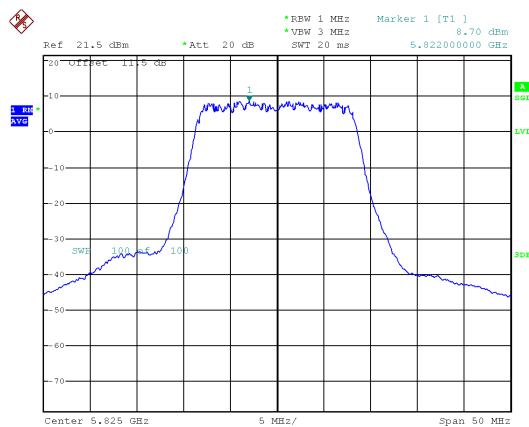
CH157



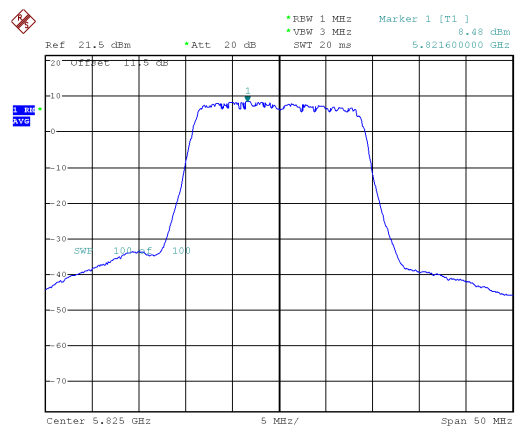
CH157



CH165

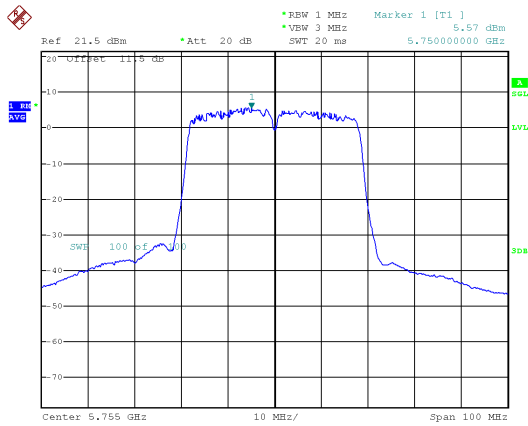


CH165

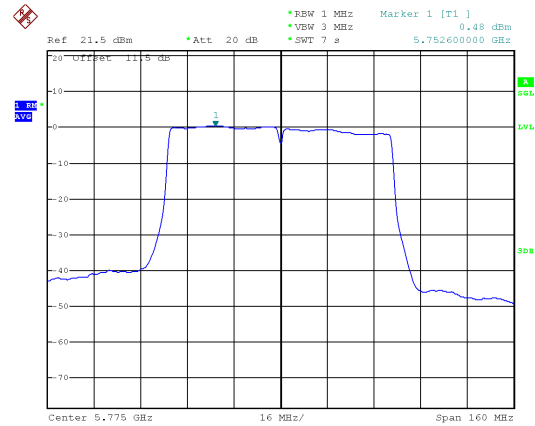




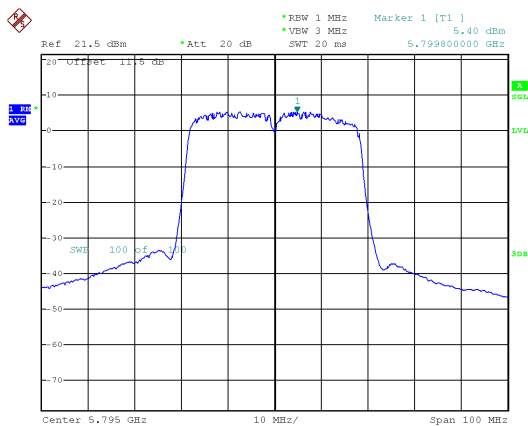
Modulation Standard: 802.11ac VHT40 (13.5Mbps)
CH151



Modulation Standard: 802.11ac VHT80 (29.3Mbps)
CH155



CH159



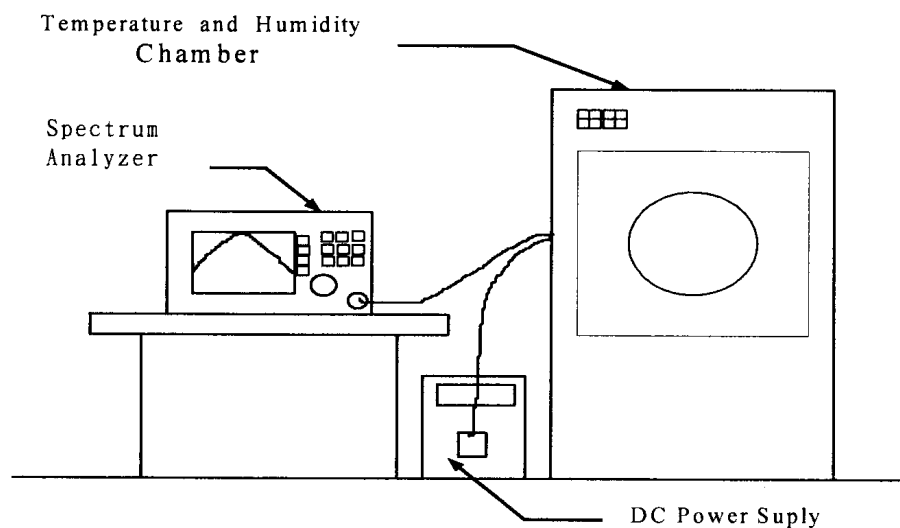


12. Frequency Stability

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 : 23°C

Humidity : 64%

Test Date : Dec. 19, 2018

:

Operating frequency: 5180 MHz							
Temp(°C)	Power supply(V)	2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
65	102	5180.003738	0.000072	5180.003925	0.000076	5180.004041	0.000078
	120	5180.007802	0.000151	5180.007924	0.000153	5180.007777	0.000150
	138	5180.004872	0.000094	5180.005116	0.000099	5180.005106	0.000099
60	102	5180.005449	0.000105	5180.005268	0.000102	5180.004972	0.000096
	120	5180.004527	0.000087	5180.003918	0.000076	5180.004275	0.000083
	138	5180.007741	0.000149	5180.007385	0.000143	5180.007945	0.000153
50	102	5180.008518	0.000164	5180.008936	0.000173	5180.008409	0.000162
	120	5180.005971	0.000115	5180.006574	0.000127	5180.005836	0.000113
	138	5180.010043	0.000194	5180.009348	0.000180	5180.009452	0.000182
40	102	5180.007069	0.000136	5180.007415	0.000143	5180.007550	0.000146
	120	5180.004777	0.000092	5180.004919	0.000095	5180.005133	0.000099
	138	5180.008849	0.000171	5180.008348	0.000161	5180.008505	0.000164
30	102	5180.004986	0.000096	5180.005060	0.000098	5180.005362	0.000104
	120	5180.006796	0.000131	5180.006723	0.000130	5180.006466	0.000125
	138	5180.005252	0.000101	5180.005317	0.000103	5180.005437	0.000105
20	102	5180.007294	0.000141	5180.007486	0.000145	5180.007318	0.000141
	120	5180.007176	0.000139	5180.007117	0.000137	5180.007389	0.000143
	138	5180.005965	0.000115	5180.005749	0.000111	5180.005490	0.000106
10	102	5180.008763	0.000169	5180.008206	0.000158	5180.008576	0.000166
	120	5180.007097	0.000137	5180.007716	0.000149	5180.007795	0.000150
	138	5180.007859	0.000152	5180.007669	0.000148	5180.008294	0.000160
0	102	5180.009157	0.000177	5180.009572	0.000185	5180.009416	0.000182
	120	5180.007466	0.000144	5180.007554	0.000146	5180.007529	0.000145
	138	5180.008099	0.000156	5180.008046	0.000155	5180.008140	0.000157
-10	102	5180.008134	0.000157	5180.008112	0.000157	5180.008083	0.000156
	120	5180.007925	0.000153	5180.008276	0.000160	5180.008126	0.000157
	138	5180.009050	0.000175	5180.009168	0.000177	5180.009129	0.000176
-20	102	5180.003642	0.000070	5180.008347	0.000161	5180.008107	0.000157
	120	5180.007756	0.000150	5180.007645	0.000148	5180.007525	0.000145
	138	5180.004997	0.000096	5180.008091	0.000156	5180.008288	0.000160
-30	102	5180.004957	0.000096	5180.008885	0.000172	5180.009050	0.000175
	120	5180.004178	0.000081	5180.007811	0.000151	5180.007762	0.000150
	138	5180.007627	0.000147	5180.008263	0.000160	5180.007921	0.000153
-40	102	5180.008333	0.000161	5180.008830	0.000170	5180.008633	0.000167
	120	5180.006208	0.000120	5180.008556	0.000165	5180.008639	0.000167
	138	5180.009702	0.000187	5180.008953	0.000173	5180.008713	0.000168

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.



Temperature : 23°C
Test Date : Dec. 19, 2018

Humidity : 64%
:

Operating frequency: 5785 MHz							
Temp(°C)	Power supply(V)	2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
65	102	5785.0040	2.028289	5785.0039	2.028287	5785.0038	2.028285
	120	5785.0078	2.028356	5785.0076	2.028353	5785.0078	2.028357
	138	5785.0047	2.028301	5785.0051	2.028308	5785.0053	2.028313
60	102	5785.0060	2.028325	5785.0056	2.028317	5785.0057	2.028319
	120	5785.0051	2.028308	5785.0046	2.028300	5785.0047	2.028302
	138	5785.0076	2.028352	5785.0080	2.028360	5785.0076	2.028353
50	102	5785.0089	2.028375	5785.0087	2.028372	5785.0088	2.028374
	120	5785.0058	2.028320	5785.0062	2.028328	5785.0058	2.028321
	138	5785.0103	2.028400	5785.0102	2.028398	5785.0099	2.028393
40	102	5785.0075	2.028350	5785.0073	2.028348	5785.0072	2.028346
	120	5785.0048	2.028304	5785.0048	2.028303	5785.0048	2.028304
	138	5785.0094	2.028384	5785.0093	2.028383	5785.0094	2.028384
30	102	5785.0052	2.028311	5785.0053	2.028312	5785.0050	2.028306
	120	5785.0067	2.028336	5785.0069	2.028340	5785.0072	2.028346
	138	5785.0051	2.028308	5785.0051	2.028308	5785.0054	2.028315
20	102	5785.0074	2.028349	5785.0073	2.028348	5785.0074	2.028350
	120	5785.0074	2.028350	5785.0070	2.028342	5785.0075	2.028352
	138	5785.0060	2.028325	5785.0059	2.028323	5785.0060	2.028324
10	102	5785.0086	2.028370	5785.0088	2.028374	5785.0093	2.028383
	120	5785.0073	2.028348	5785.0077	2.028355	5785.0071	2.028344
	138	5785.0078	2.028356	5785.0079	2.028358	5785.0079	2.028357
0	102	5785.0096	2.028388	5785.0092	2.028381	5785.0092	2.028381
	120	5785.0077	2.028354	5785.0074	2.028348	5785.0073	2.028347
	138	5785.0082	2.028364	5785.0080	2.028360	5785.0082	2.028363
-10	102	5785.0084	2.028366	5785.0085	2.028368	5785.0084	2.028367
	120	5785.0082	2.028363	5785.0080	2.028359	5785.0079	2.028357
	138	5785.0092	2.028381	5785.0095	2.028387	5785.0093	2.028383
-20	102	5785.0038	2.028286	5785.0039	2.028287	5785.0034	2.028279
	120	5785.0081	2.028361	5785.0082	2.028364	5785.0079	2.028358
	138	5785.0053	2.028312	5785.0051	2.028309	5785.0053	2.028312
-30	102	5785.0056	2.028317	5785.0051	2.028308	5785.0055	2.028316
	120	5785.0042	2.028292	5785.0045	2.028298	5785.0046	2.028299
	138	5785.0079	2.028358	5785.0079	2.028358	5785.0080	2.028360
-40	102	5785.0084	2.028366	5785.0088	2.028374	5785.0085	2.028368
	120	5785.0064	2.028331	5785.0066	2.028334	5785.0067	2.028337
	138	5785.0100	2.028396	5785.0098	2.028391	5785.0098	2.028391

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. Radio Frequency Exposure

14.1.Applicable Standards

The measurements shown in this test report were made in accordance with the procedures given in FCC Part 2 (Section 2.1091)
KDB 447498

14.2.EUT Specification

Frequency band (Operating)	☒ WLAN: 2412MHz ~ 2462MHz ☒ WLAN: 5150MHz ~ 5250MHz ☐ WLAN: 5250MHz ~ 5350MHz ☐ WLAN: 5470MHz ~ 5725MHz ☒ WLAN: 5725MHz ~ 5850MHz ☐ Bluetooth: 2402MHz ~ 2480MHz
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation)
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm ²) ☒ General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☒ Tx/Rx diversity
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

Remark:

1. The maximum output power is 23dBm at 5180MHz (with 6.91 antenna gain.)
2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
3. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 0.195 mW/cm² even if the calculation indicates that the power density would be larger.

14.3.Test Results

No non-compliance noted.



14.4.Calculation

$$\text{Given } E = \frac{\sqrt{30 \times P \times G}}{d} \quad \& \quad S = \frac{E^2}{3770}$$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

$P \text{ (mW)} = P \text{ (W)} / 1000$ and

$d \text{ (cm)} = d \text{ (m)} / 100$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

**14.5.Maximum Permissible Exposure****Maximum Permissible Exposure (Non-Beamforming)**

Channel Frequency (MHz)	Max. Conducted output power (dBm)	Antenna Gain(dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
5180-5240	23.00	6.91	20	0.195	1
5745-5825	22.67	7.08	20	0.188	1

Maximum Permissible Exposure (Beamforming)

Channel Frequency (MHz)	Max. Conducted output power (dBm)	Antenna Gain(dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
5180-5240	19.99	9.92	20	0.195	1
5745-5825	19.66	10.09	20	0.188	1

**Maximum Permissible Exposure (Co-location)****(Non-Beamforming)**

Modulation Mode	Channel Frequency (MHz)	Max. Conducted output power (dBm)	Antenna Gain(dBi)	Distance (cm)	Power Density (mW/cm ²)
802.11b	2412-2462	22.54	5.2	20	0.118
802.11a	5180-5240	23	6.91	20	0.195
802.11a	5745-5825	22.67	7.08	20	0.188
Co-location Total					0.501
Maximum Permissible Exposure Limit					1

(Beamforming)

Modulation Mode	Channel Frequency (MHz)	Max. Conducted output power (dBm)	Antenna Gain(dBi)	Distance (cm)	Power Density (mW/cm ²)
802.11g	2412-2462	19.47	8.21	20	0.117
802.11a	5180-5240	19.99	9.92	20	0.195
802.11a	5500-5700	19.66	10.09	20	0.188
Co-location Total					0.500
Maximum Permissible Exposure Limit					1