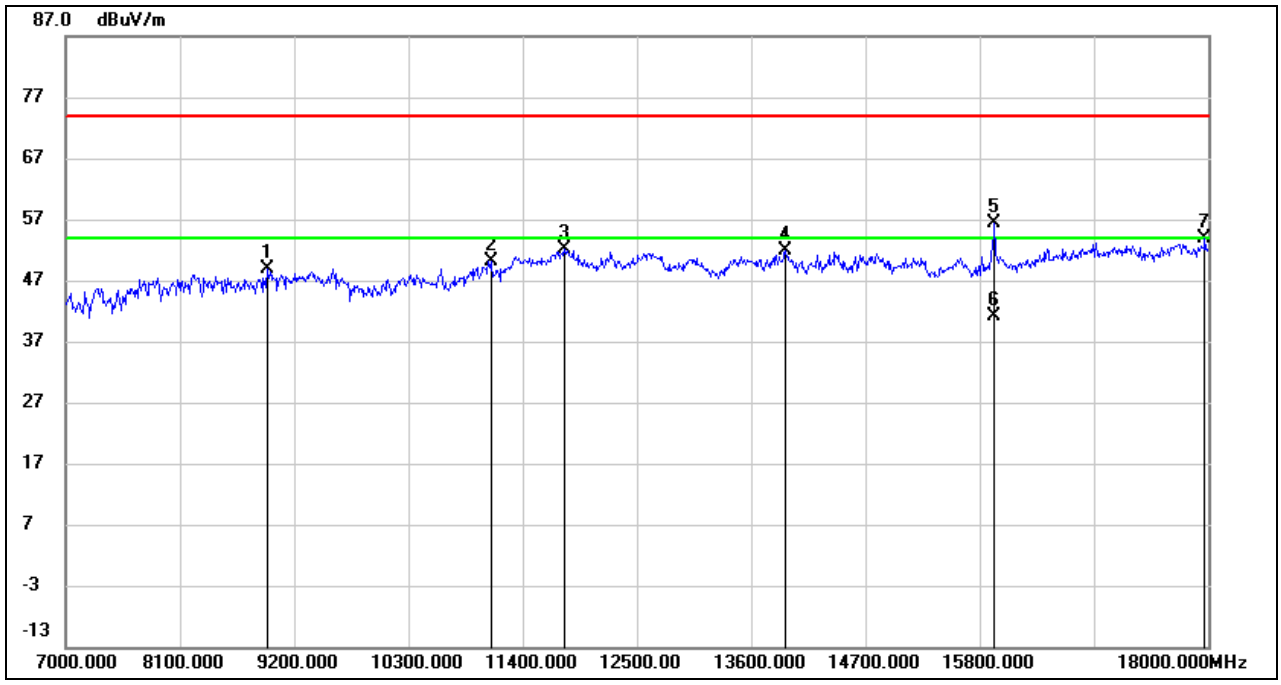
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8936.000	37.88	11.10	48.98	74.00	-25.02	peak
2	11092.000	35.51	14.64	50.15	74.00	-23.85	peak
3	11796.000	35.48	16.69	52.17	74.00	-21.83	peak
4	13930.000	33.93	17.97	51.90	74.00	-22.10	peak
5	15943.000	37.94	18.33	56.27	74.00	-17.73	peak
6	15943.000	22.83	18.33	41.16	54.00	-12.84	AVG
7	17967.000	29.79	24.00	53.79	74.00	-20.21	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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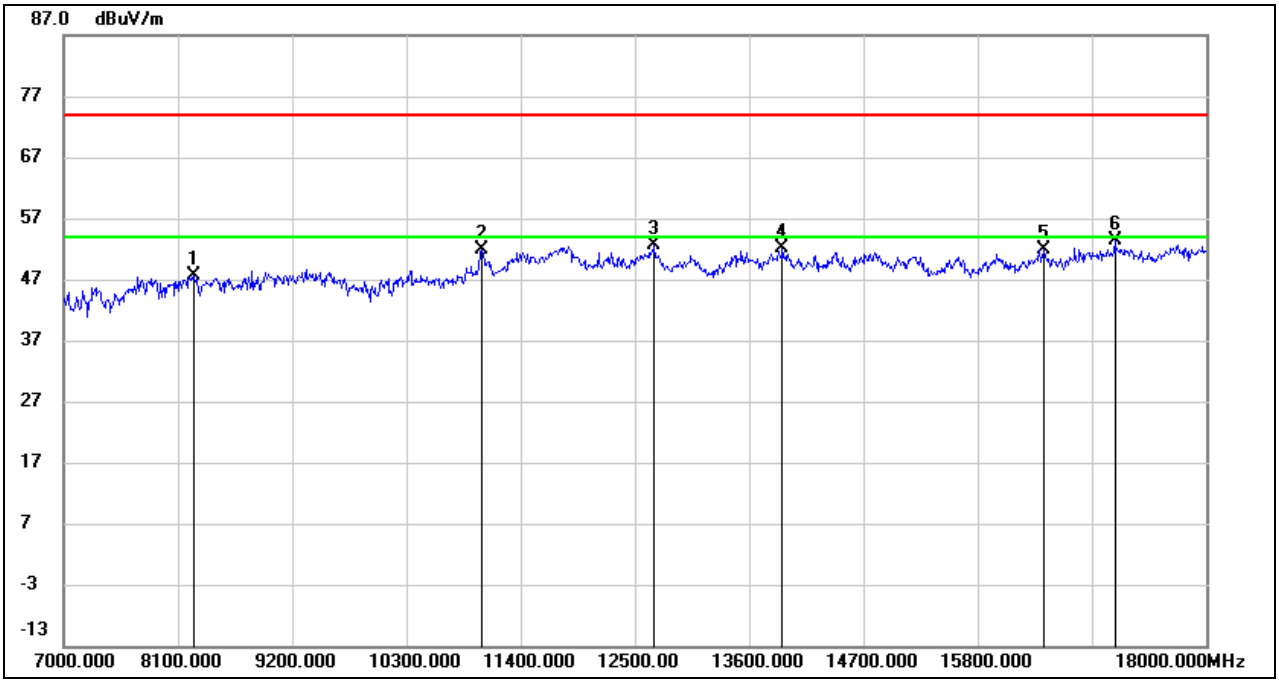
UNII-2C BAND

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8254.000	37.17	10.34	47.51	74.00	-26.49	peak
2	11026.000	37.42	14.48	51.90	74.00	-22.10	peak
3	12687.000	35.84	16.82	52.66	74.00	-21.34	peak
4	13919.000	34.18	17.97	52.15	74.00	-21.85	peak
5	16438.000	31.97	19.98	51.95	74.00	-22.05	peak
6	17120.000	31.30	22.03	53.33	74.00	-20.67	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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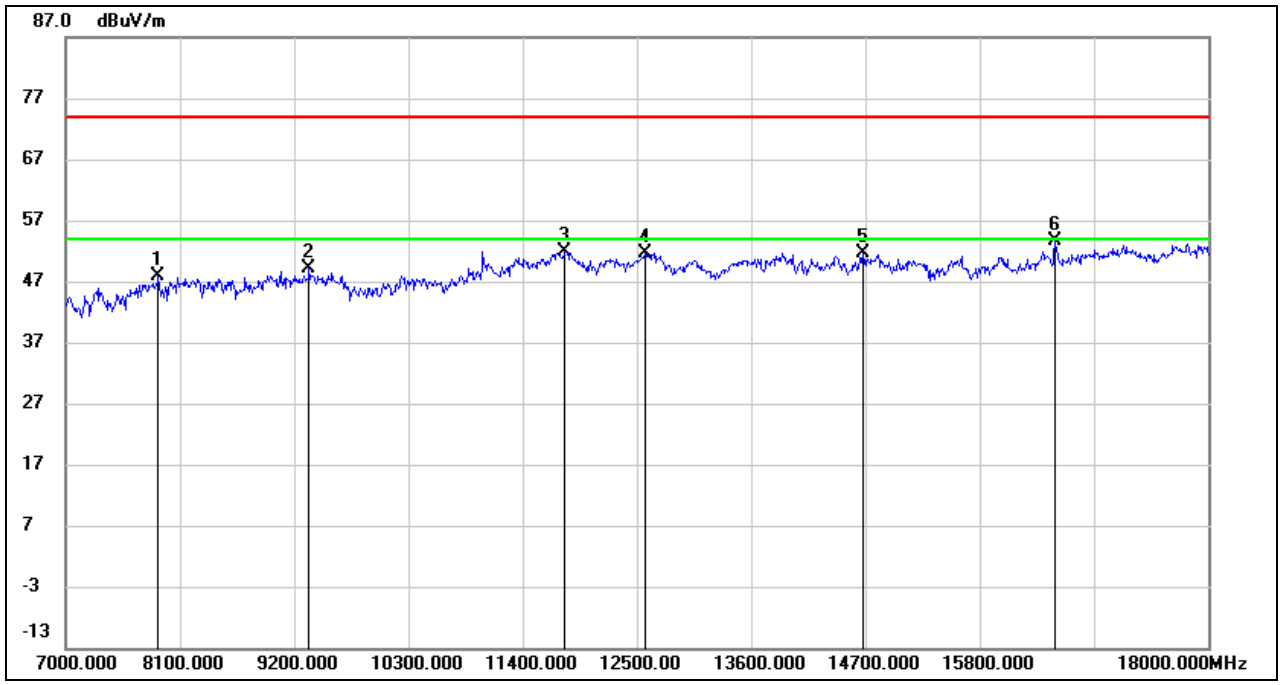
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7891.000	38.71	9.24	47.95	74.00	-26.05	peak
2	9343.000	38.00	11.19	49.19	74.00	-24.81	peak
3	11807.000	35.22	16.70	51.92	74.00	-22.08	peak
4	12577.000	34.85	16.80	51.65	74.00	-22.35	peak
5	14678.000	34.03	17.67	51.70	74.00	-22.30	peak
6	16526.000	33.24	20.42	53.66	74.00	-20.34	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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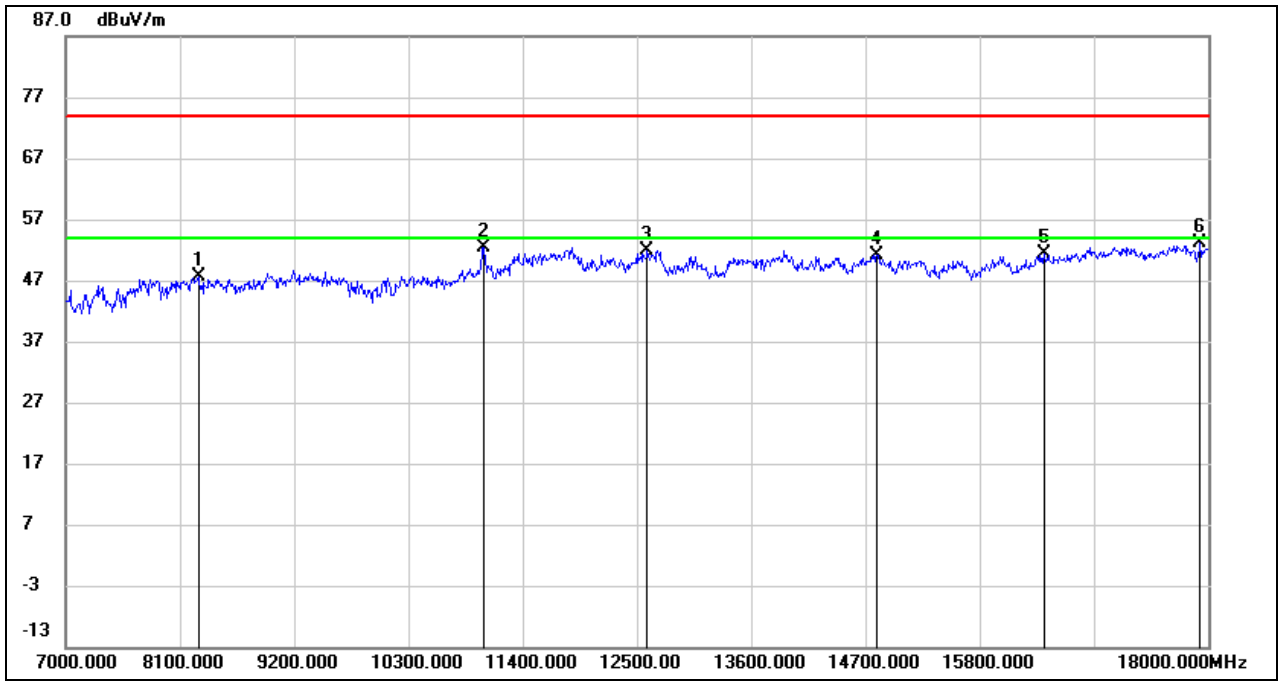
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8276.000	37.42	10.25	47.67	74.00	-26.33	peak
2	11026.000	37.85	14.48	52.33	74.00	-21.67	peak
3	12599.000	35.09	16.83	51.92	74.00	-22.08	peak
4	14810.000	33.35	17.82	51.17	74.00	-22.83	peak
5	16416.000	31.43	19.87	51.30	74.00	-22.70	peak
6	17923.000	29.11	23.99	53.10	74.00	-20.90	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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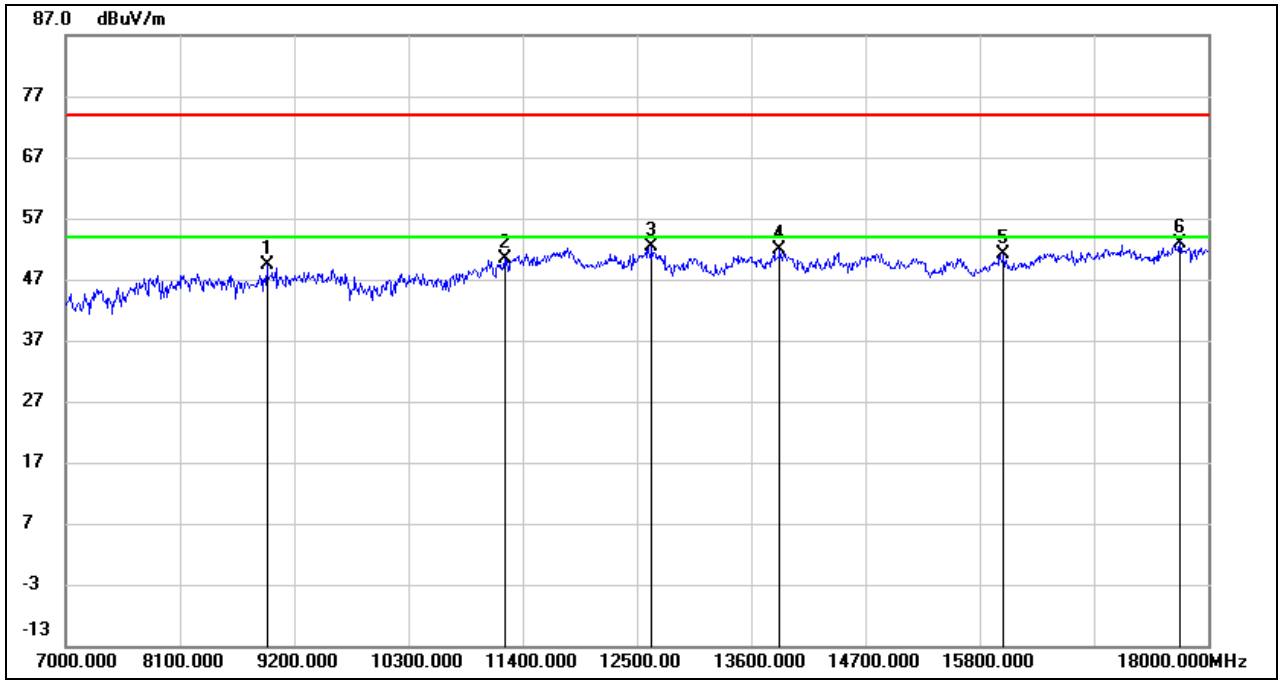
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8936.000	38.35	11.10	49.45	74.00	-24.55	peak
2	11224.000	35.33	14.98	50.31	74.00	-23.69	peak
3	12643.000	35.65	16.82	52.47	74.00	-21.53	peak
4	13875.000	33.88	18.04	51.92	74.00	-22.08	peak
5	16031.000	32.59	18.58	51.17	74.00	-22.83	peak
6	17725.000	29.58	23.42	53.00	74.00	-21.00	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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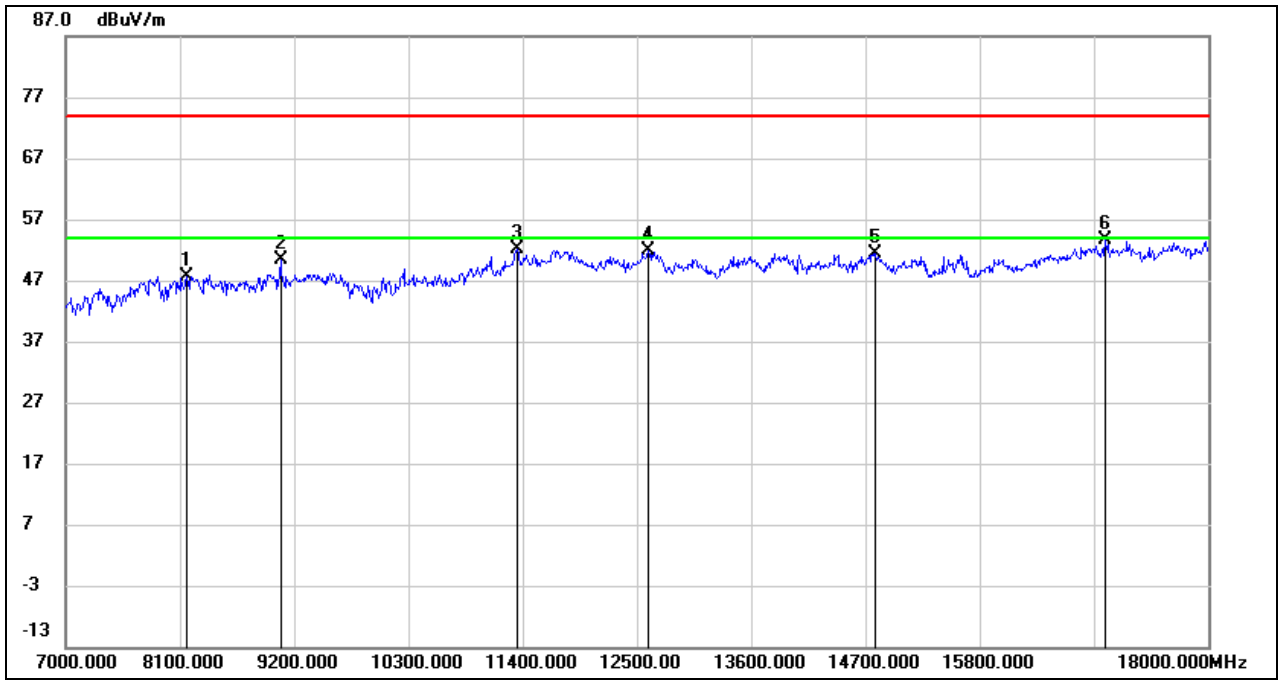
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8166.000	37.33	10.27	47.60	74.00	-26.40	peak
2	9068.000	39.05	11.32	50.37	74.00	-23.63	peak
3	11345.000	36.92	15.29	52.21	74.00	-21.79	peak
4	12610.000	35.03	16.82	51.85	74.00	-22.15	peak
5	14799.000	33.55	17.82	51.37	74.00	-22.63	peak
6	17010.000	32.21	21.43	53.64	74.00	-20.36	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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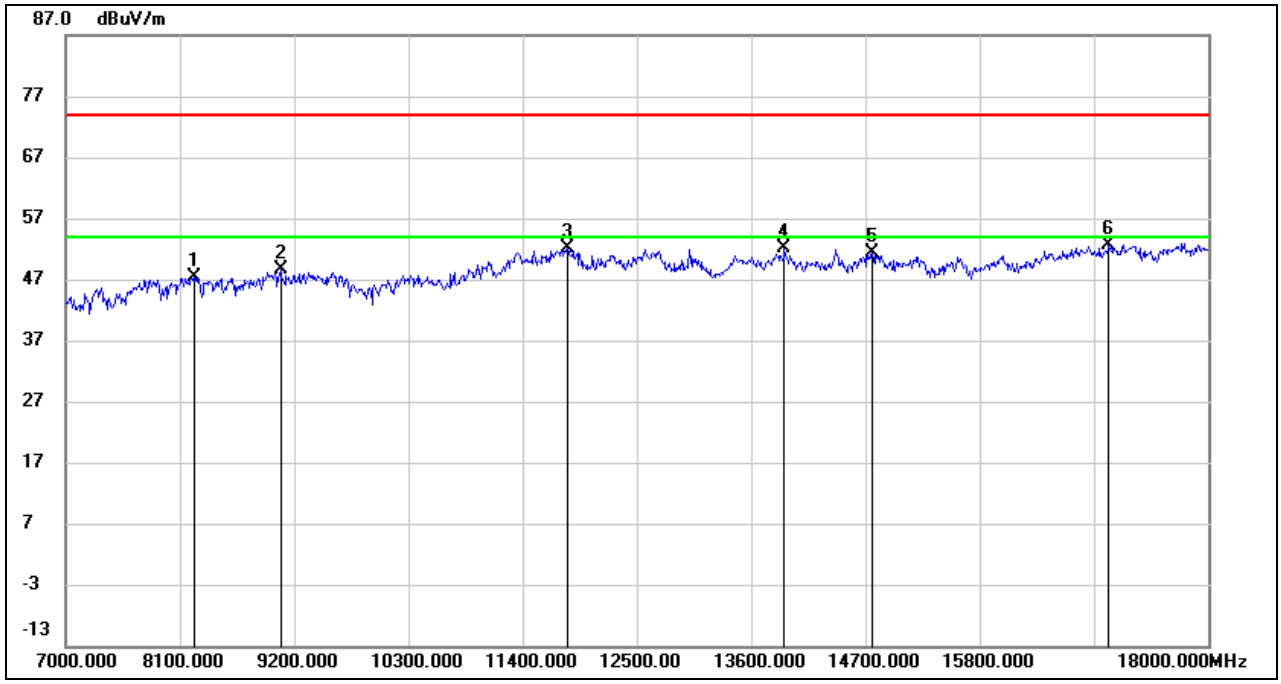
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8232.000	36.87	10.41	47.28	74.00	-26.72	peak
2	9068.000	37.20	11.32	48.52	74.00	-25.48	peak
3	11829.000	35.56	16.67	52.23	74.00	-21.77	peak
4	13919.000	34.05	17.97	52.02	74.00	-21.98	peak
5	14766.000	33.72	17.78	51.50	74.00	-22.50	peak
6	17043.000	31.05	21.60	52.65	74.00	-21.35	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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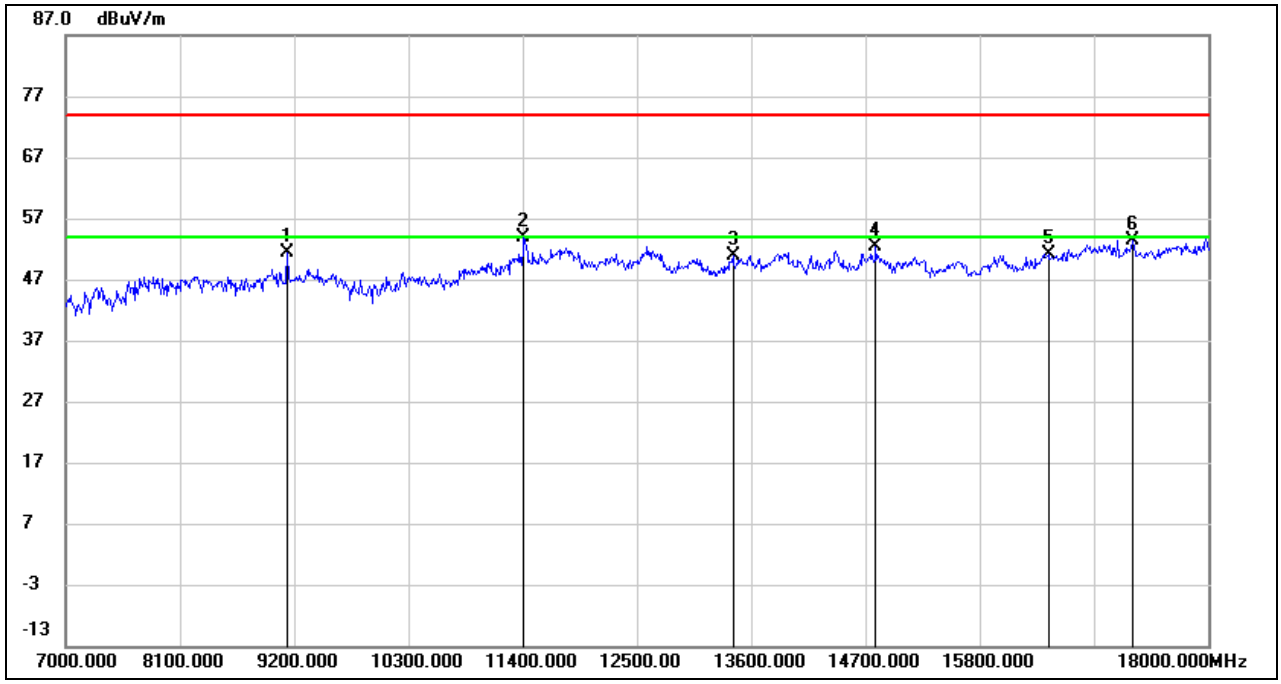
STRADDLE CHANNEL 142

HARMONICS AND SPURIOUS EMISSIONS (HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	9134.000	40.37	10.95	51.32	74.00	-22.68	peak
2	11411.000	38.37	15.44	53.81	74.00	-20.19	peak
3	13424.000	33.56	17.43	50.99	74.00	-23.01	peak
4	14799.000	34.53	17.82	52.35	74.00	-21.65	peak
5	16460.000	31.00	20.10	51.10	74.00	-22.90	peak
6	17274.000	31.19	22.24	53.43	74.00	-20.57	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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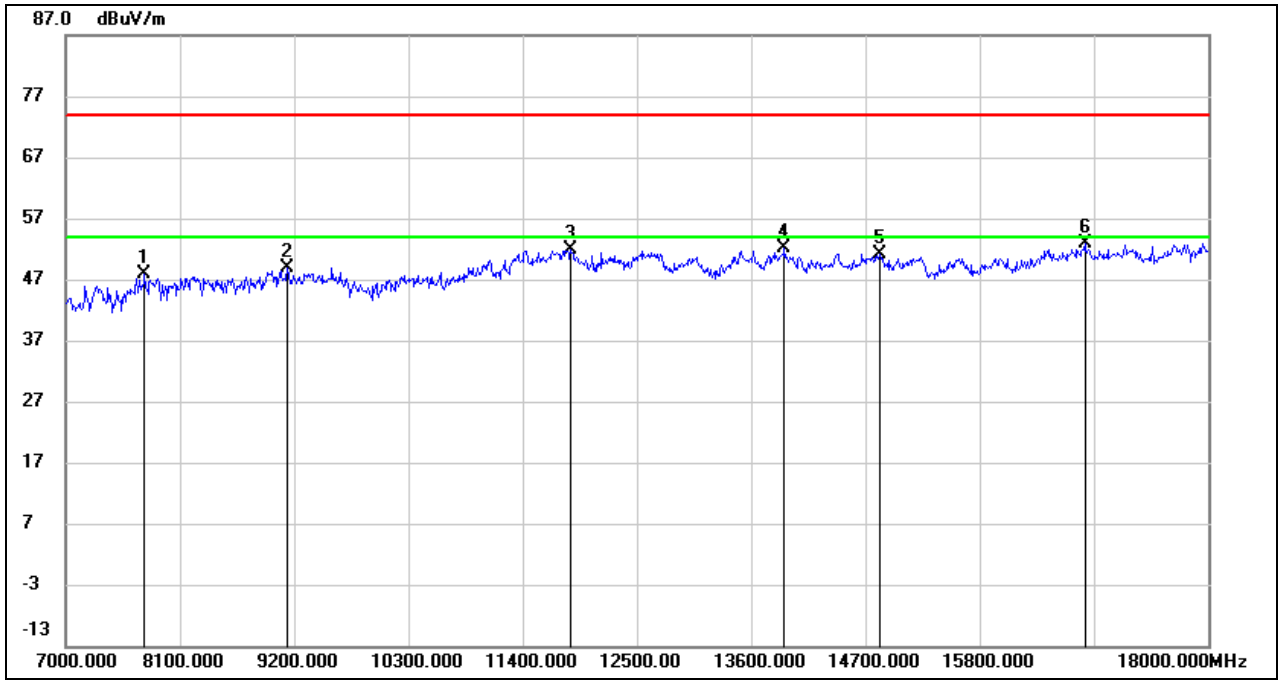
HARMONICS AND SPURIOUS EMISSIONS (VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7759.000	38.53	9.33	47.86	74.00	-26.14	peak
2	9134.000	37.97	10.95	48.92	74.00	-25.08	peak
3	11862.000	35.32	16.64	51.96	74.00	-22.04	peak
4	13919.000	34.16	17.97	52.13	74.00	-21.87	peak
5	14843.000	33.23	17.83	51.06	74.00	-22.94	peak
6	16812.000	31.85	21.02	52.87	74.00	-21.13	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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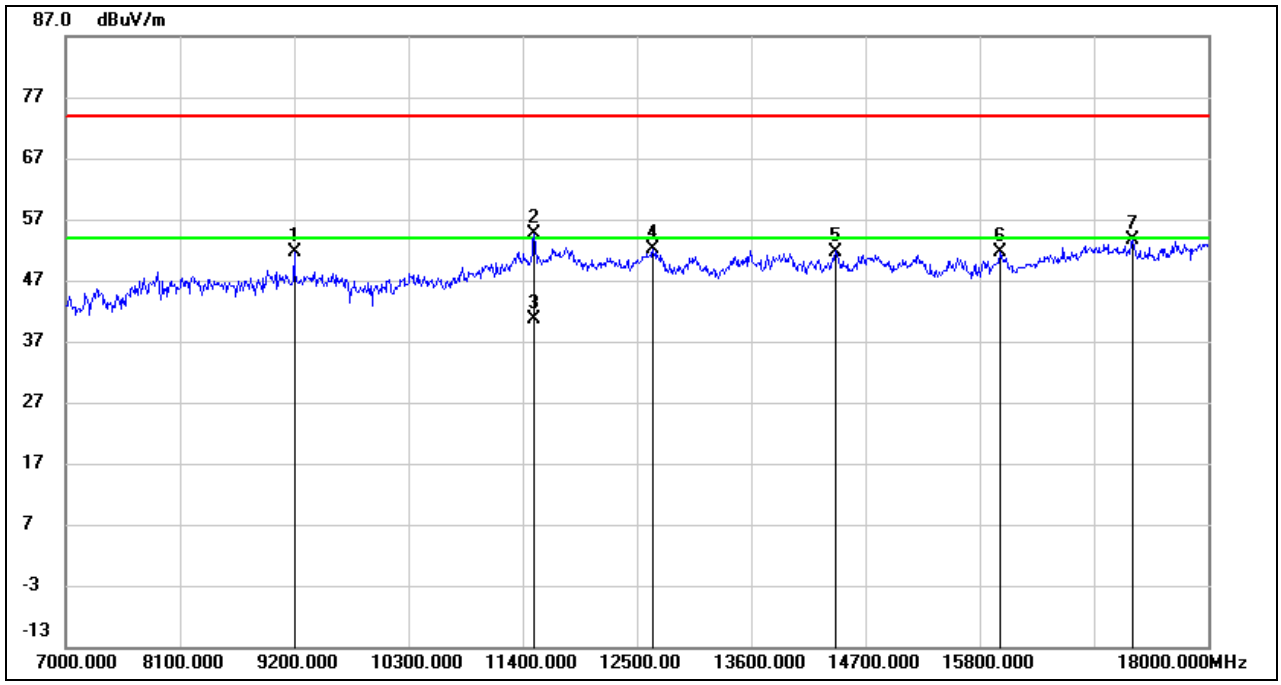
UNII-3 BAND

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	9200.000	41.01	10.57	51.58	74.00	-22.42	peak
2	11510.000	38.94	15.62	54.56	74.00	-19.44	peak
3	11510.000	24.98	15.62	40.60	54.00	-13.40	AVG
4	12654.000	35.32	16.81	52.13	74.00	-21.87	peak
5	14414.000	33.84	17.91	51.75	74.00	-22.25	peak
6	15998.000	33.07	18.52	51.59	74.00	-22.41	peak
7	17274.000	31.37	22.24	53.61	74.00	-20.39	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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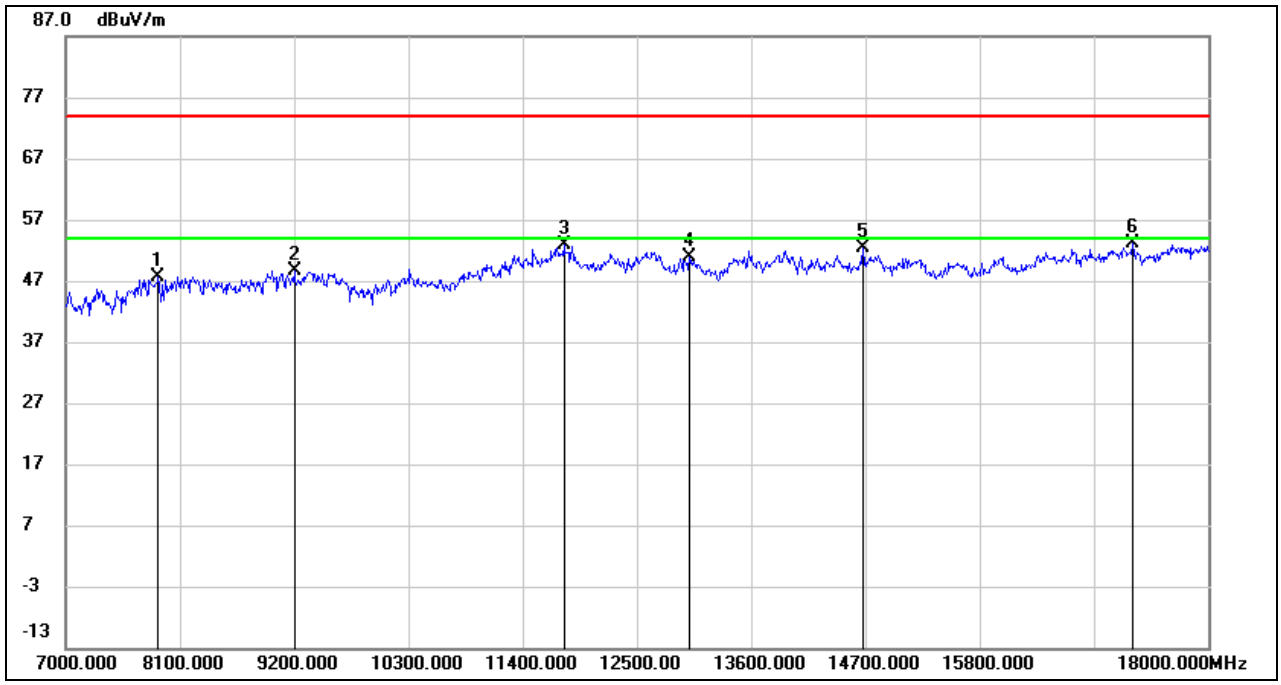
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7891.000	38.32	9.24	47.56	74.00	-26.44	peak
2	9200.000	38.02	10.57	48.59	74.00	-25.41	peak
3	11796.000	36.22	16.69	52.91	74.00	-21.09	peak
4	13006.000	34.05	16.88	50.93	74.00	-23.07	peak
5	14678.000	34.74	17.67	52.41	74.00	-21.59	peak
6	17274.000	30.90	22.24	53.14	74.00	-20.86	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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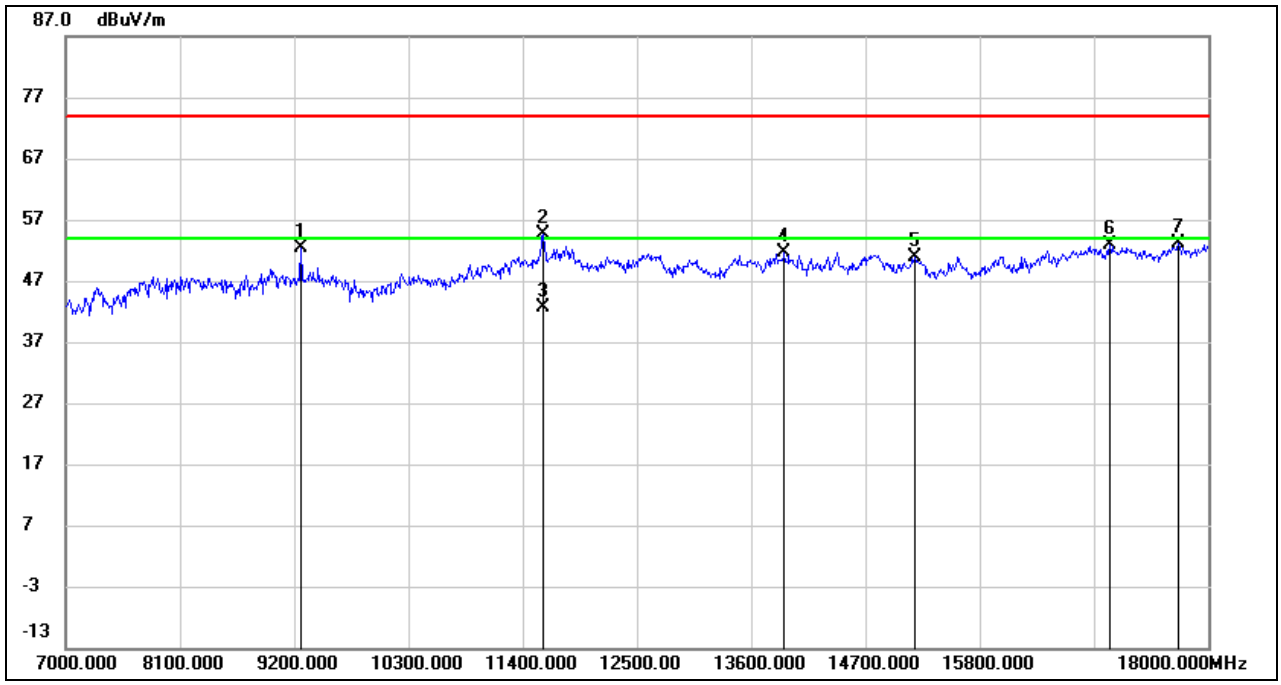
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	9266.000	41.42	10.85	52.27	74.00	-21.73	peak
2	11598.000	38.73	15.79	54.52	74.00	-19.48	peak
3	11598.000	26.81	15.79	42.60	54.00	-11.40	AVG
4	13919.000	33.64	17.97	51.61	74.00	-22.39	peak
5	15173.000	33.41	17.43	50.84	74.00	-23.16	peak
6	17054.000	31.12	21.66	52.78	74.00	-21.22	peak
7	17714.000	29.90	23.34	53.24	74.00	-20.76	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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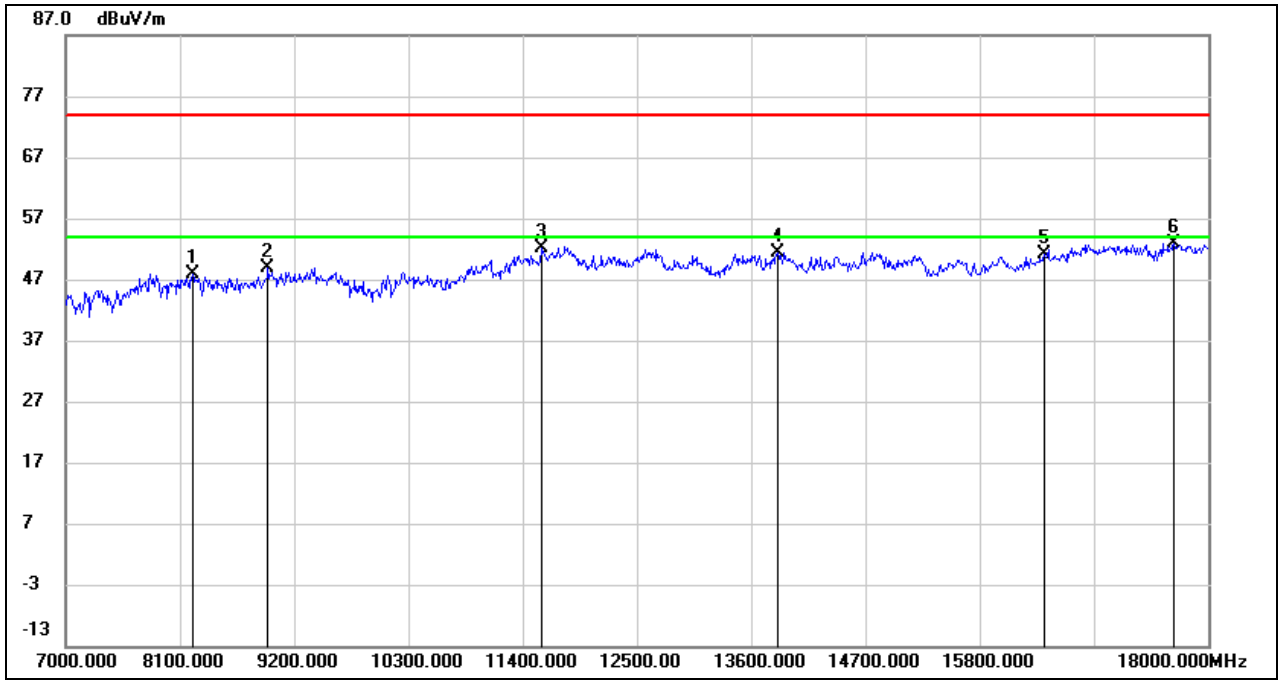
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8221.000	37.48	10.46	47.94	74.00	-26.06	peak
2	8947.000	37.61	11.21	48.82	74.00	-25.18	peak
3	11587.000	36.46	15.78	52.24	74.00	-21.76	peak
4	13853.000	33.39	18.05	51.44	74.00	-22.56	peak
5	16416.000	31.15	19.87	51.02	74.00	-22.98	peak
6	17670.000	29.83	23.04	52.87	74.00	-21.13	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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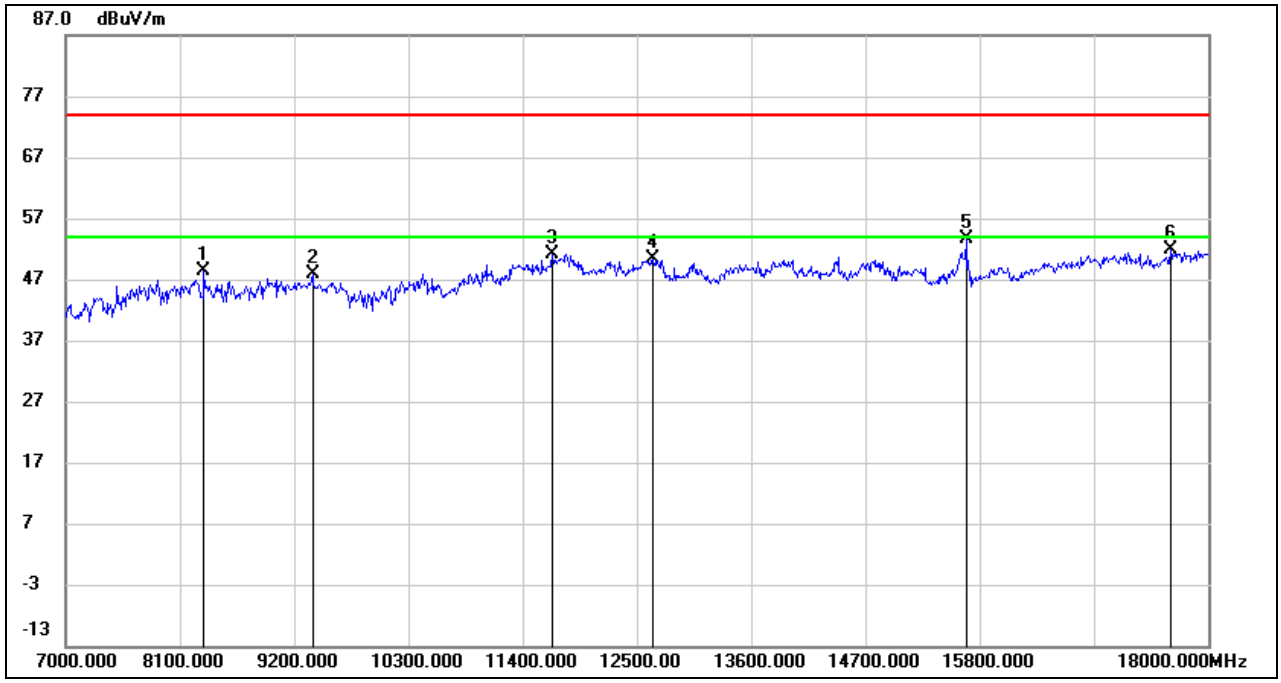
8.3.4. 802.11ac VHT80 MIMO MODE

UNII-1 BAND

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8331.000	39.65	8.85	48.50	74.00	-25.50	peak
2	9376.000	37.71	10.19	47.90	74.00	-26.10	peak
3	11686.000	36.05	14.99	51.04	74.00	-22.96	peak
4	12654.000	34.88	15.38	50.26	74.00	-23.74	peak
5	15668.000	36.89	16.75	53.64	74.00	-20.36	peak
6	17637.000	30.35	21.46	51.81	74.00	-22.19	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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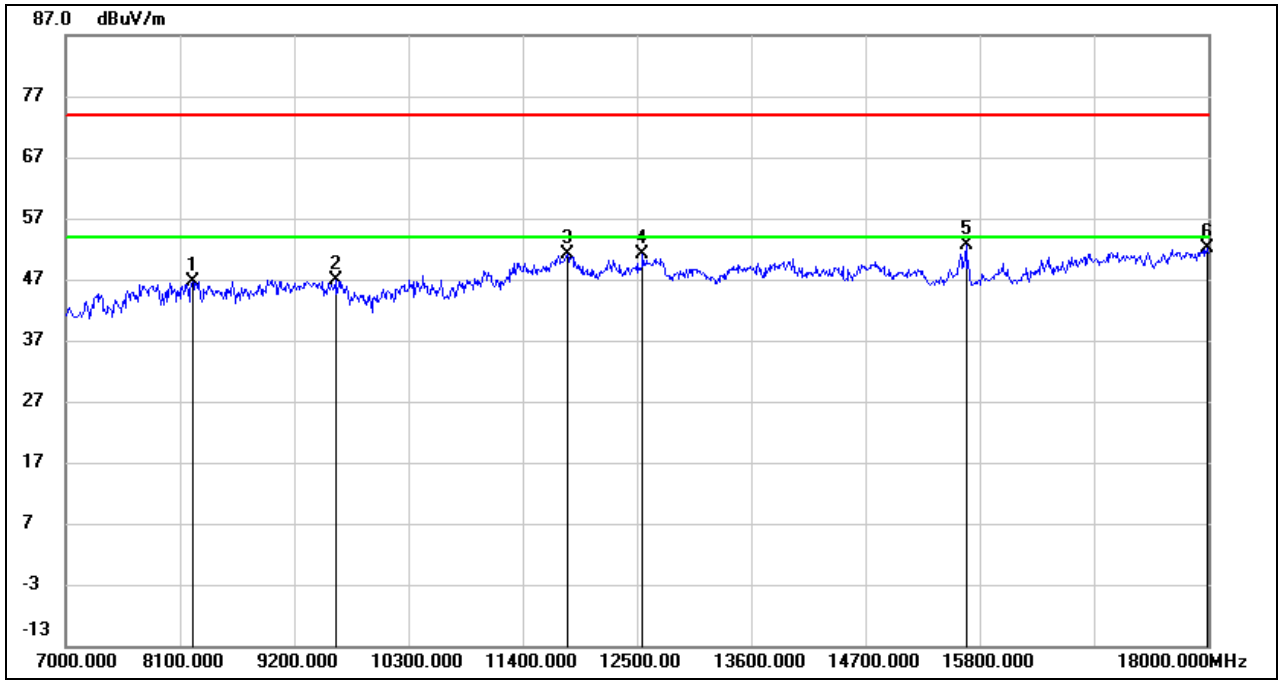
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8221.000	37.39	9.28	46.67	74.00	-27.33	peak
2	9596.000	36.40	10.47	46.87	74.00	-27.13	peak
3	11829.000	35.46	15.57	51.03	74.00	-22.97	peak
4	12555.000	35.69	15.32	51.01	74.00	-22.99	peak
5	15668.000	35.81	16.75	52.56	74.00	-21.44	peak
6	17989.000	29.34	22.67	52.01	74.00	-21.99	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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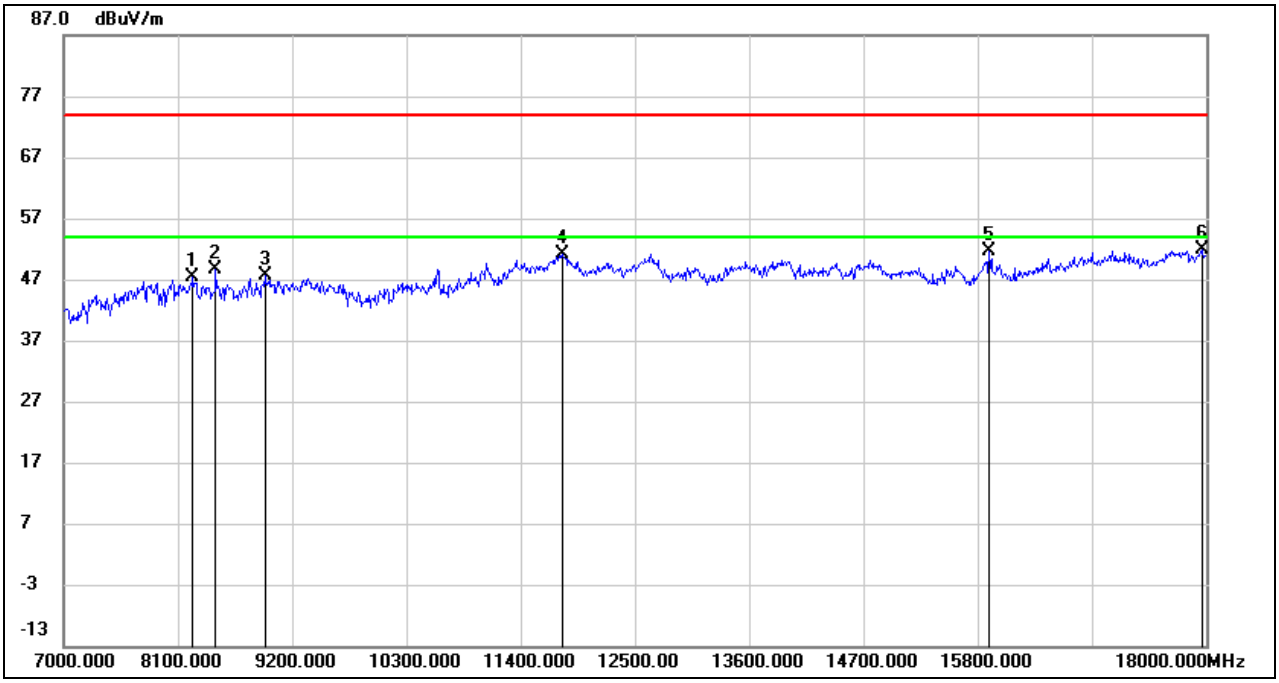
UNII-2A BAND

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8243.000	38.14	9.19	47.33	74.00	-26.67	peak
2	8463.000	39.98	8.55	48.53	74.00	-25.47	peak
3	8936.000	37.73	9.96	47.69	74.00	-26.31	peak
4	11796.000	35.55	15.59	51.14	74.00	-22.86	peak
5	15910.000	34.46	17.05	51.51	74.00	-22.49	peak
6	17956.000	29.25	22.68	51.93	74.00	-22.07	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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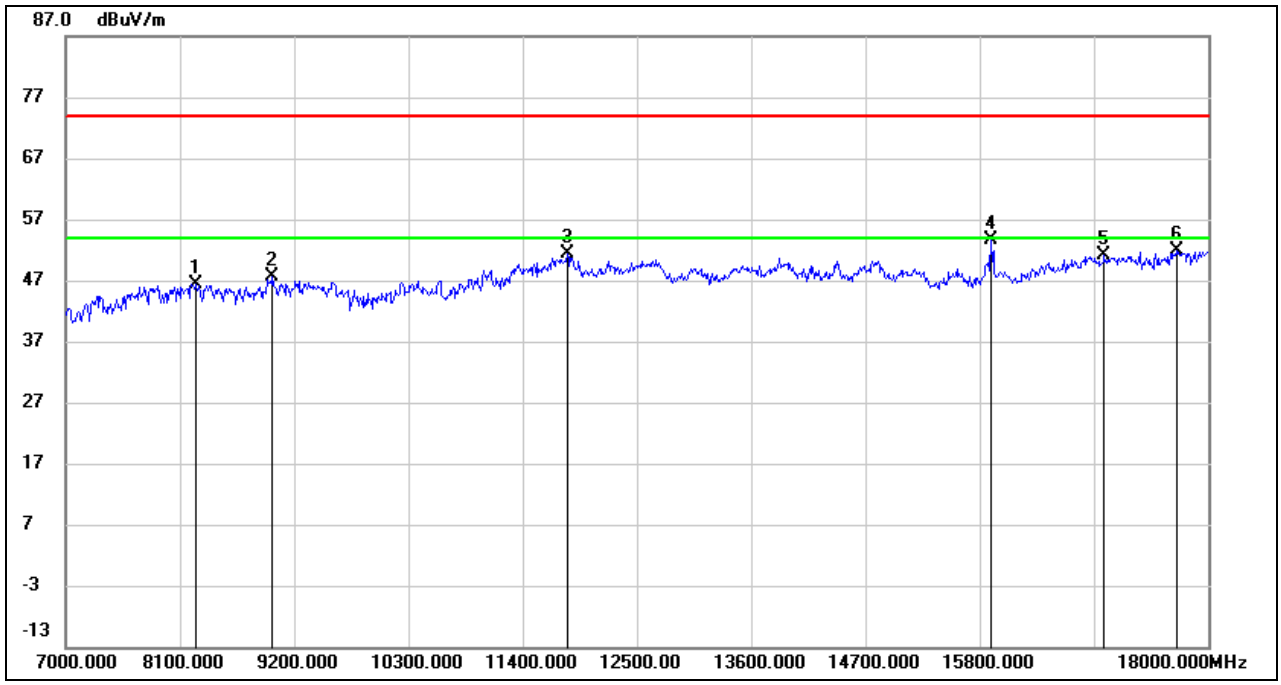
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8254.000	37.23	9.15	46.38	74.00	-27.62	peak
2	8991.000	37.00	10.53	47.53	74.00	-26.47	peak
3	11829.000	35.80	15.57	51.37	74.00	-22.63	peak
4	15910.000	36.50	17.05	53.55	74.00	-20.45	peak
5	16999.000	30.87	20.23	51.10	74.00	-22.90	peak
6	17692.000	29.90	21.87	51.77	74.00	-22.23	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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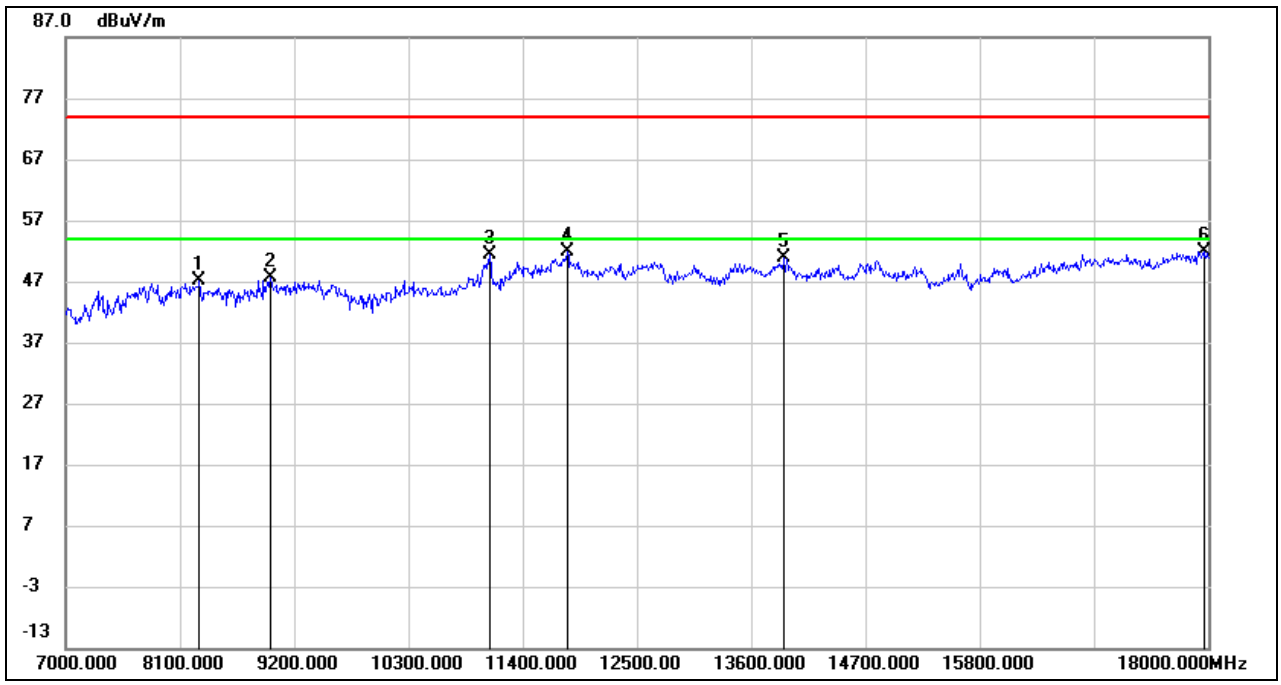
UNII-2C BAND

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8287.000	38.13	9.02	47.15	74.00	-26.85	peak
2	8969.000	37.24	10.31	47.55	74.00	-26.45	peak
3	11081.000	38.02	13.41	51.43	74.00	-22.57	peak
4	11829.000	36.32	15.57	51.89	74.00	-22.11	peak
5	13919.000	33.87	16.89	50.76	74.00	-23.24	peak
6	17956.000	29.30	22.68	51.98	74.00	-22.02	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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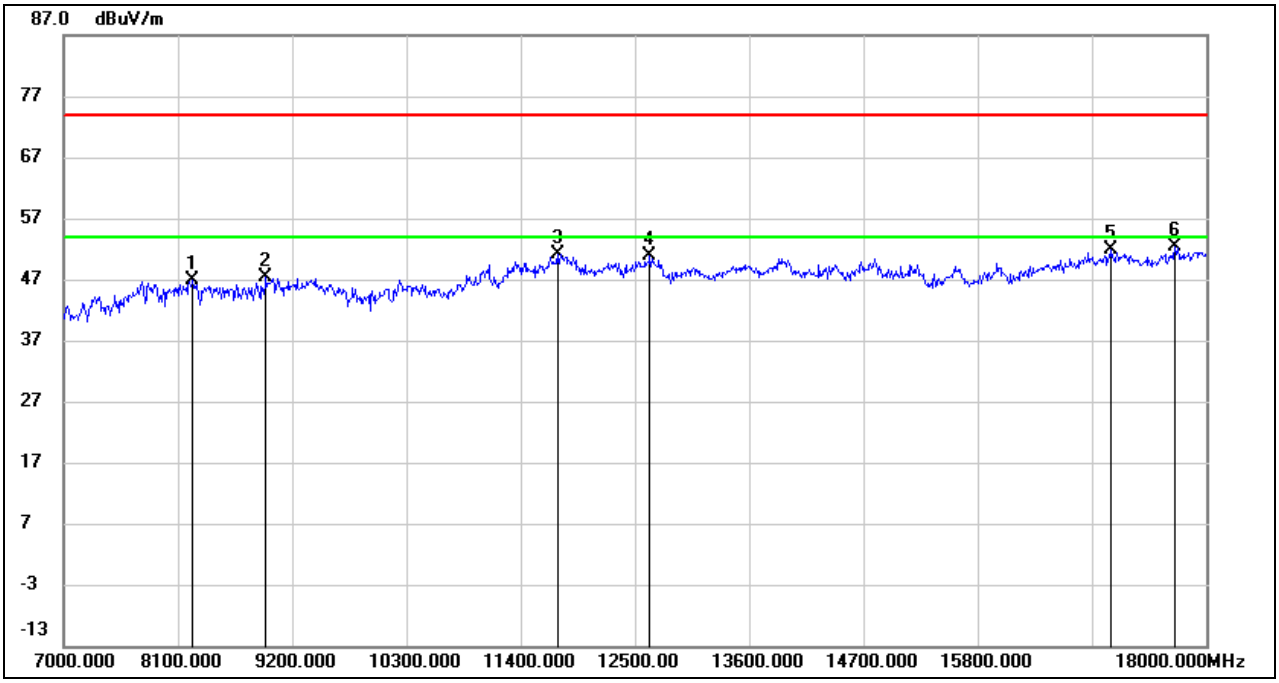
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8243.000	37.69	9.19	46.88	74.00	-27.12	peak
2	8947.000	37.41	10.07	47.48	74.00	-26.52	peak
3	11752.000	35.86	15.35	51.21	74.00	-22.79	peak
4	12643.000	35.53	15.36	50.89	74.00	-23.11	peak
5	17076.000	31.44	20.54	51.98	74.00	-22.02	peak
6	17692.000	30.51	21.87	52.38	74.00	-21.62	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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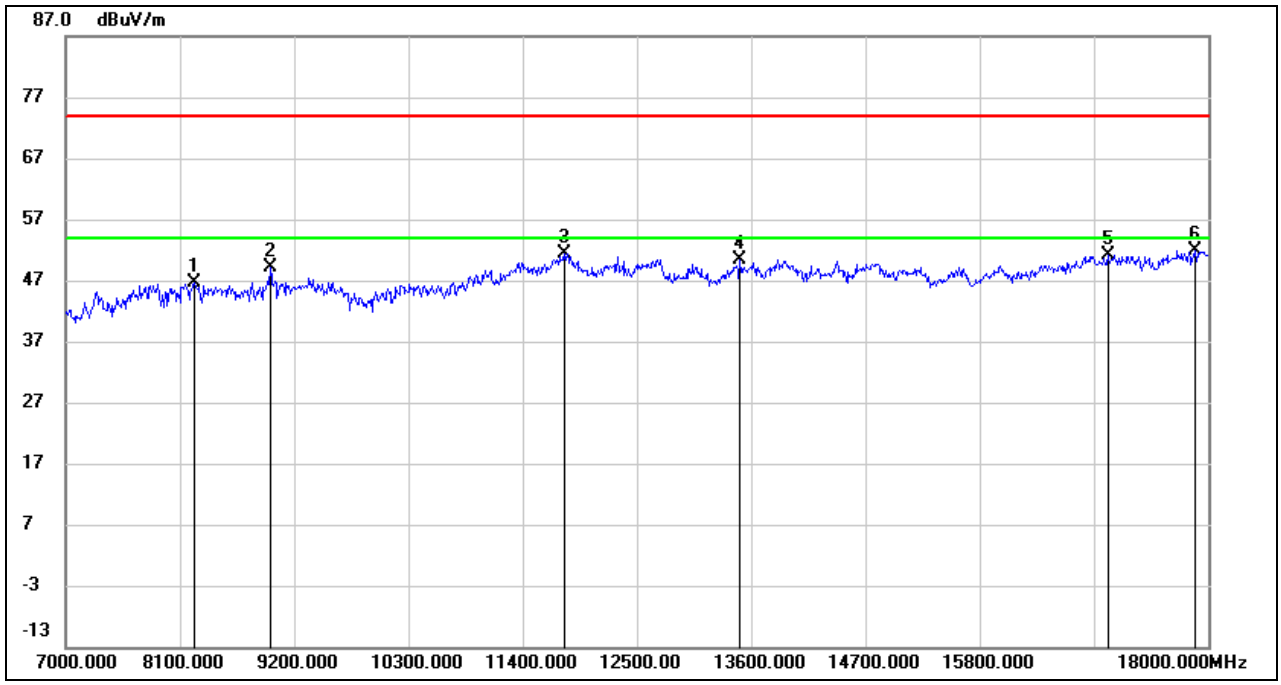
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8232.000	37.47	9.23	46.70	74.00	-27.30	peak
2	8969.000	38.80	10.31	49.11	74.00	-24.89	peak
3	11796.000	35.88	15.59	51.47	74.00	-22.53	peak
4	13490.000	34.04	16.41	50.45	74.00	-23.55	peak
5	17032.000	30.73	20.36	51.09	74.00	-22.91	peak
6	17879.000	29.23	22.70	51.93	74.00	-22.07	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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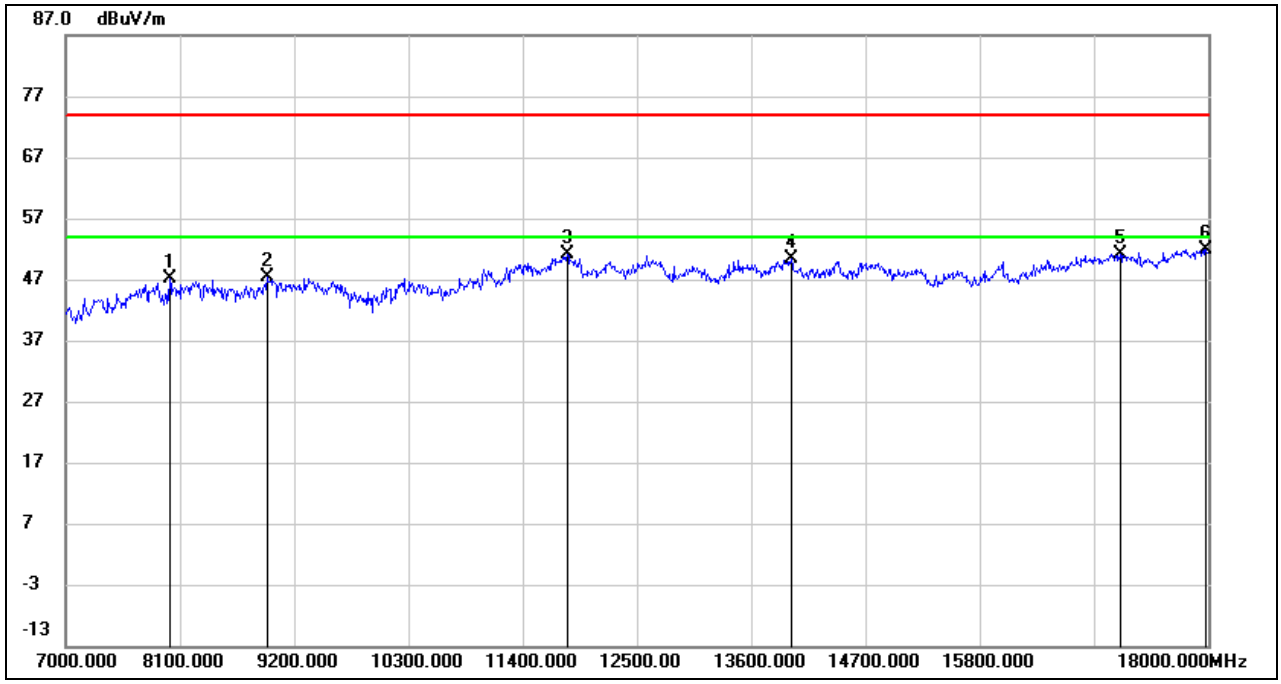
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8001.000	39.40	7.67	47.07	74.00	-26.93	peak
2	8936.000	37.31	9.96	47.27	74.00	-26.73	peak
3	11829.000	35.60	15.57	51.17	74.00	-22.83	peak
4	13985.000	33.41	16.86	50.27	74.00	-23.73	peak
5	17153.000	30.31	20.85	51.16	74.00	-22.84	peak
6	17978.000	29.25	22.68	51.93	74.00	-22.07	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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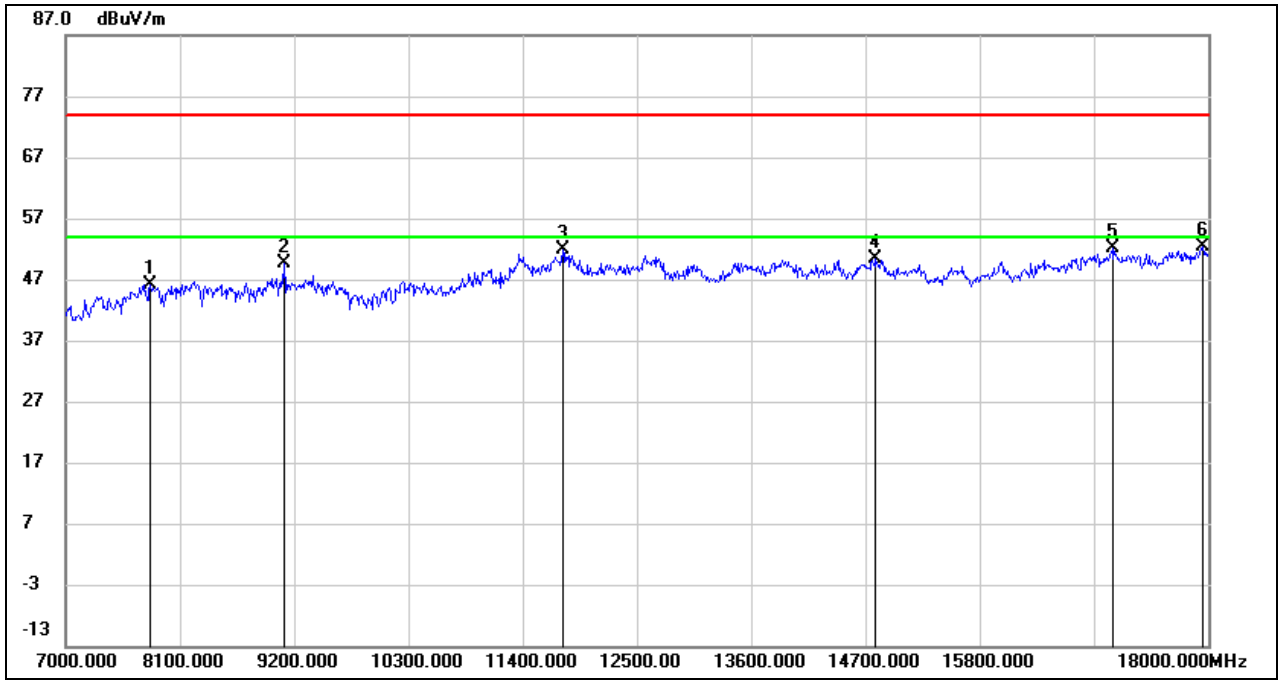
STRADDLE CHANNEL 138

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7814.000	37.90	8.21	46.11	74.00	-27.89	peak
2	9101.000	39.57	9.95	49.52	74.00	-24.48	peak
3	11785.000	36.34	15.52	51.86	74.00	-22.14	peak
4	14799.000	33.49	16.80	50.29	74.00	-23.71	peak
5	17076.000	31.49	20.54	52.03	74.00	-21.97	peak
6	17945.000	29.71	22.68	52.39	74.00	-21.61	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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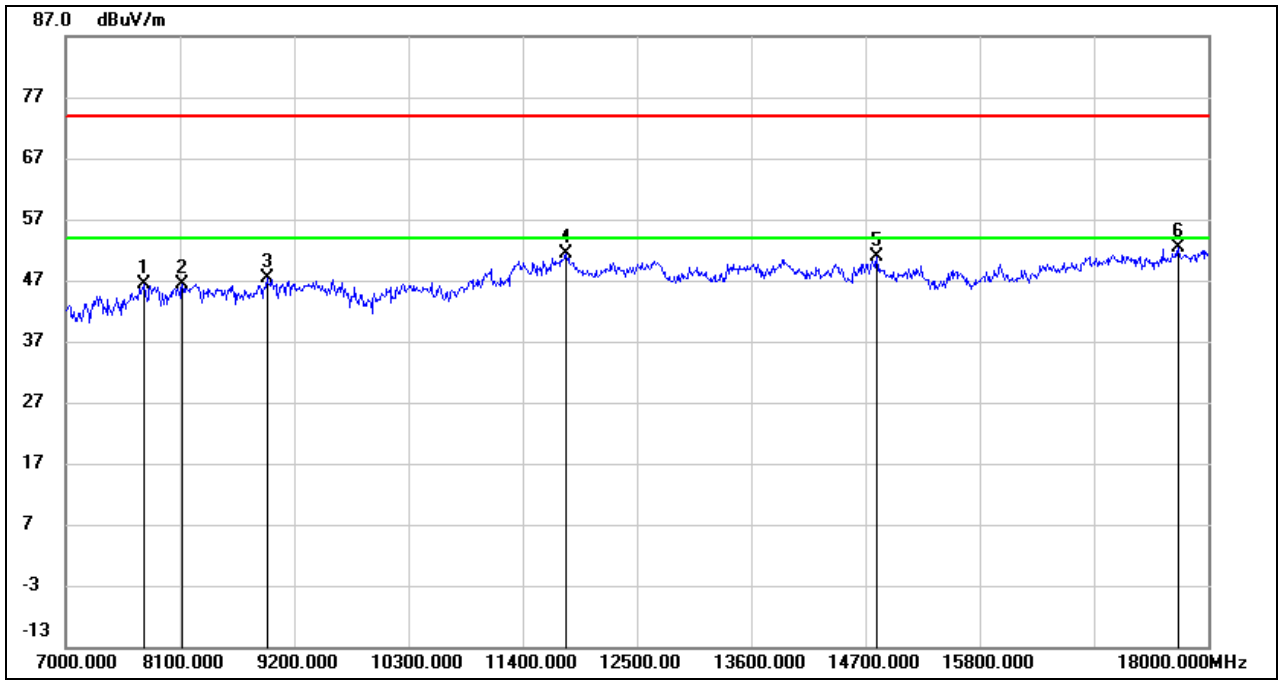
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7759.000	38.40	8.09	46.49	74.00	-27.51	peak
2	8122.000	37.68	8.70	46.38	74.00	-27.62	peak
3	8936.000	37.35	9.96	47.31	74.00	-26.69	peak
4	11818.000	35.68	15.58	51.26	74.00	-22.74	peak
5	14810.000	34.08	16.80	50.88	74.00	-23.12	peak
6	17714.000	30.32	22.04	52.36	74.00	-21.64	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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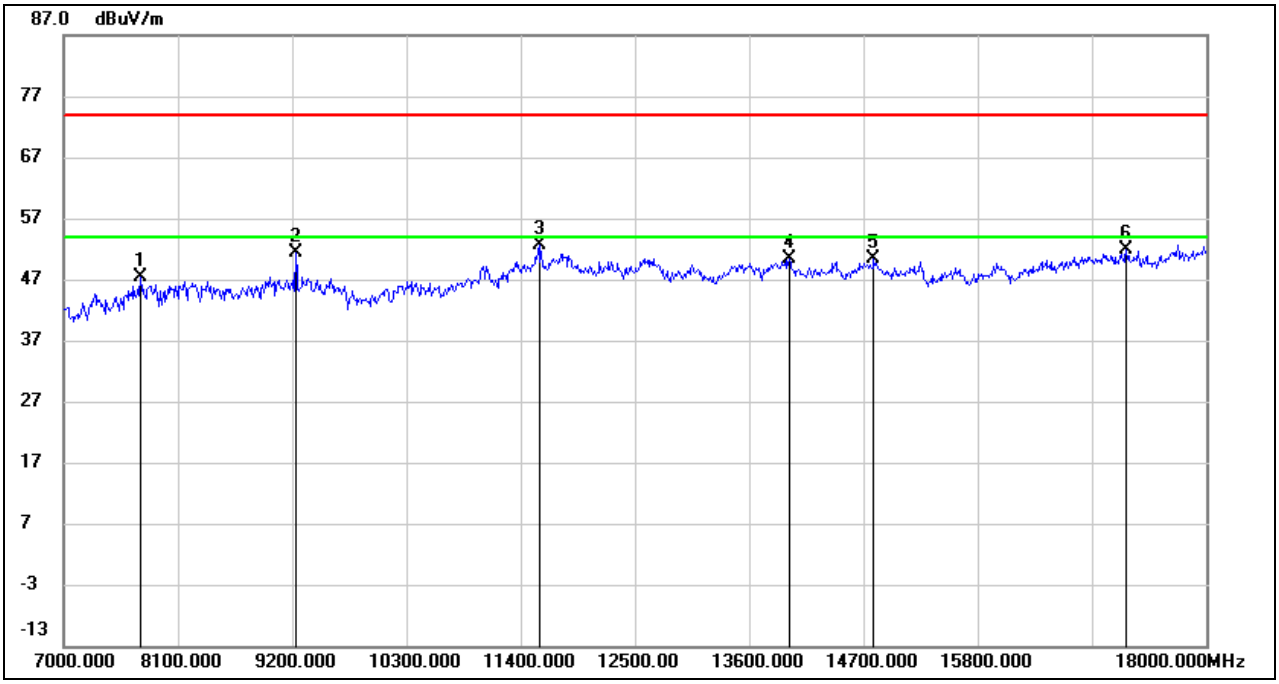
UNII-3 BAND

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7737.000	39.27	8.00	47.27	74.00	-26.73	peak
2	9233.000	41.99	9.46	51.45	74.00	-22.55	peak
3	11576.000	38.25	14.48	52.73	74.00	-21.27	peak
4	13985.000	33.55	16.86	50.41	74.00	-23.59	peak
5	14799.000	33.55	16.80	50.35	74.00	-23.65	peak
6	17230.000	30.83	20.99	51.82	74.00	-22.18	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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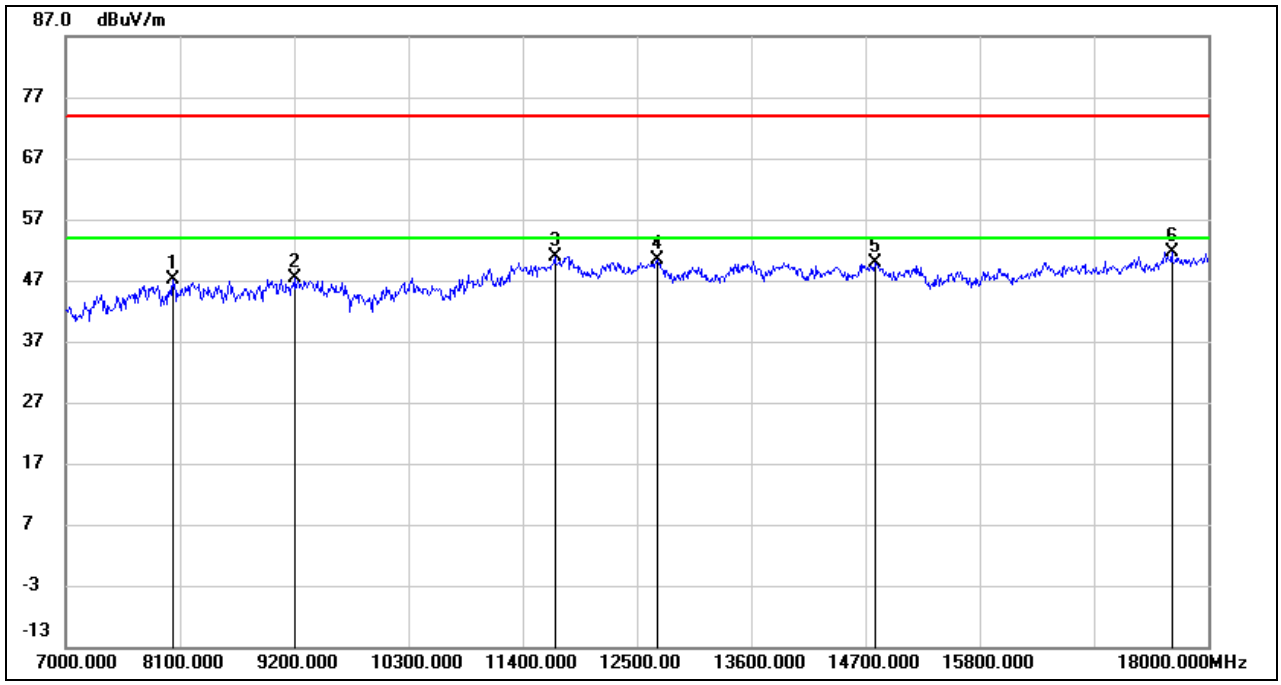
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8034.000	39.14	7.95	47.09	74.00	-26.91	peak
2	9200.000	38.04	9.29	47.33	74.00	-26.67	peak
3	11708.000	35.80	15.11	50.91	74.00	-23.09	peak
4	12698.000	34.88	15.47	50.35	74.00	-23.65	peak
5	14799.000	32.98	16.80	49.78	74.00	-24.22	peak
6	17648.000	30.15	21.54	51.69	74.00	-22.31	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. Since non-restricted band peak emissions are less than the average limit, they also comply with the -27dBm/MHz (68.2dBuV/m) limit.

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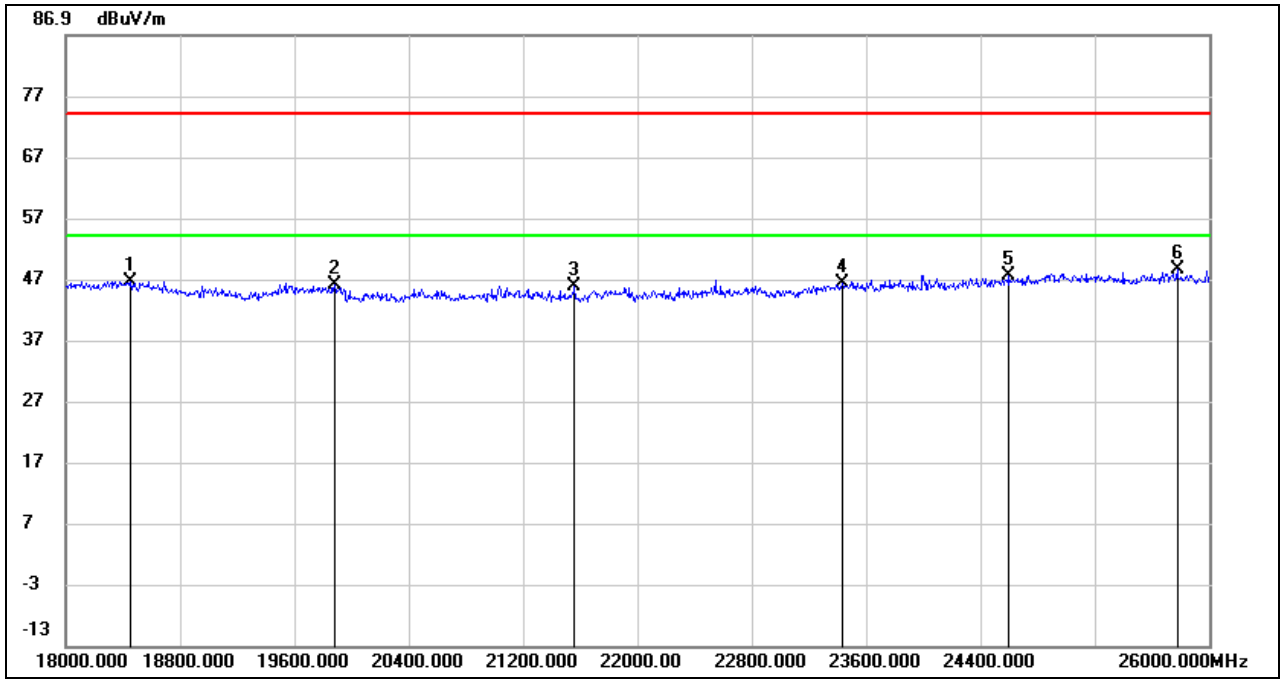
8.4. SPURIOUS EMISSIONS (18 GHz ~ 26 GHz)

8.4.1. 802.11ac VHT80 MODE

SPURIOUS EMISSIONS (UNII-1 BAND LOW CHANNEL, HORIZONTAL, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18456.000	50.93	-4.38	46.55	74.00	-27.45	peak
2	19880.000	50.35	-4.36	45.99	74.00	-28.01	peak
3	21560.000	51.56	-5.77	45.79	74.00	-28.21	peak
4	23432.000	51.16	-4.89	46.27	74.00	-27.73	peak
5	24600.000	49.74	-2.33	47.41	74.00	-26.59	peak
6	25776.000	49.92	-1.45	48.47	74.00	-25.53	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. The preamplifier only effect to the above 18GHz signal and no filter added to the measurement chain.

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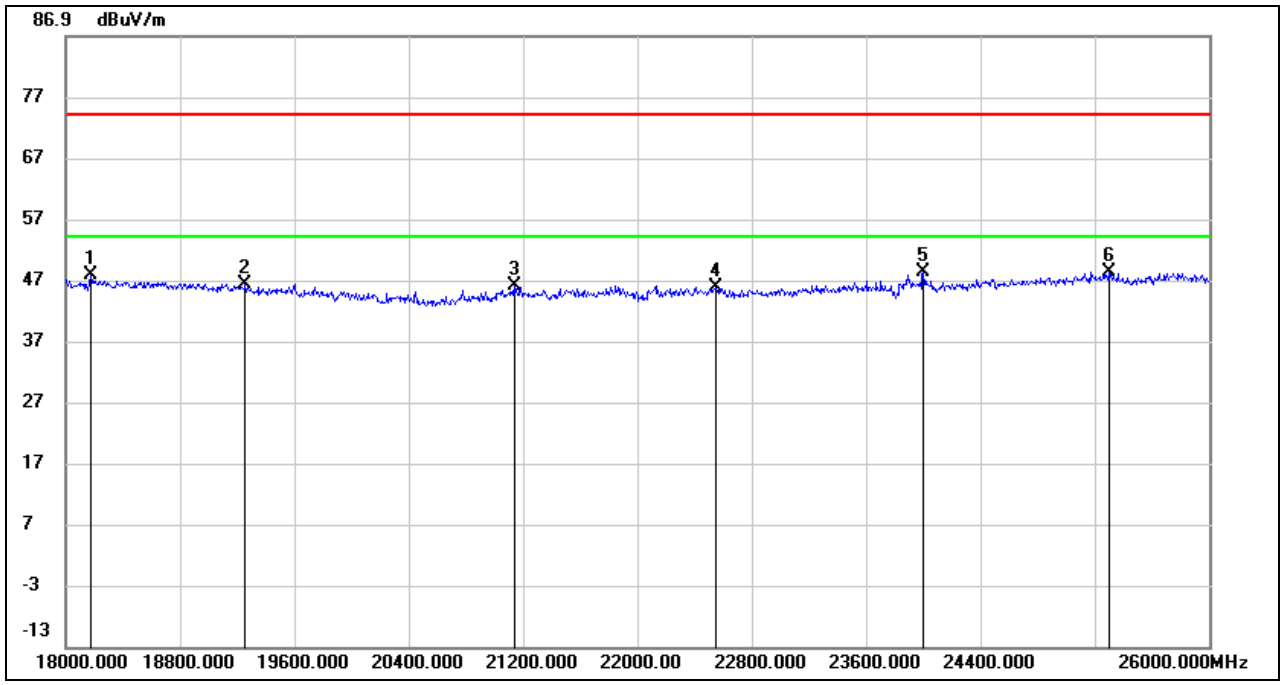
SPURIOUS EMISSIONS (UNII-1 BAND LOW CHANNEL, VERTICAL, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18176.000	51.89	-4.22	47.67	74.00	-26.33	peak
2	19256.000	51.31	-5.04	46.27	74.00	-27.73	peak
3	21136.000	51.36	-5.41	45.95	74.00	-28.05	peak
4	22552.000	51.67	-5.78	45.89	74.00	-28.11	peak
5	24000.000	52.36	-4.01	48.35	74.00	-25.65	peak
6	25296.000	49.70	-1.30	48.40	74.00	-25.60	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. The preamplifier only effect to the above 18GHz signal and no filter added to the measurement chain.

Note: All the modes and antennas had been tested, but only the worst data was recorded in the report.

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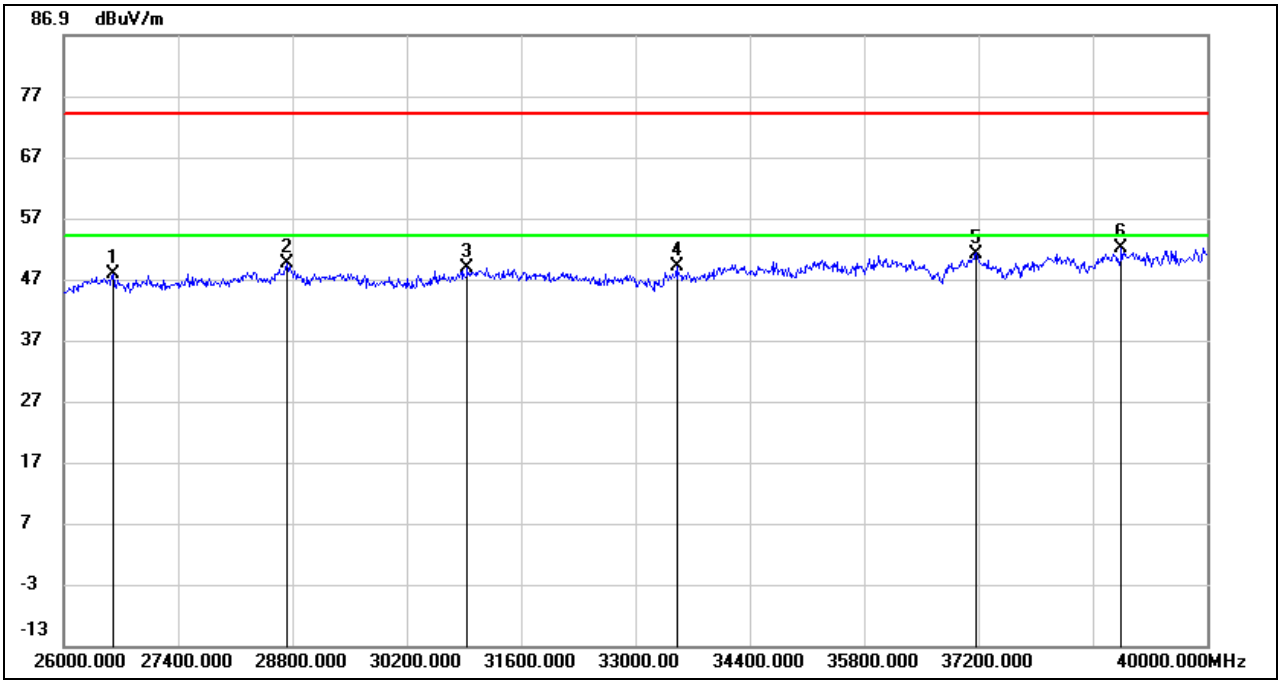
8.5. SPURIOUS EMISSIONS (26 GHz ~ 40 GHz)

8.5.1. 802.11ac VHT80 MODE

SPURIOUS EMISSIONS (UNII-1 BAND LOW CHANNEL, HORIZONTAL, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	26602.000	52.59	-4.80	47.79	74.00	-26.21	peak
2	28730.000	50.22	-0.69	49.53	74.00	-24.47	peak
3	30942.000	49.56	-0.81	48.75	74.00	-25.25	peak
4	33504.000	48.45	0.58	49.03	74.00	-24.97	peak
5	37172.000	47.99	3.16	51.15	74.00	-22.85	peak
6	38950.000	47.78	4.31	52.09	74.00	-21.91	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. The preamplifier only effect to the above 18GHz signal and no filter added to the measurement chain.

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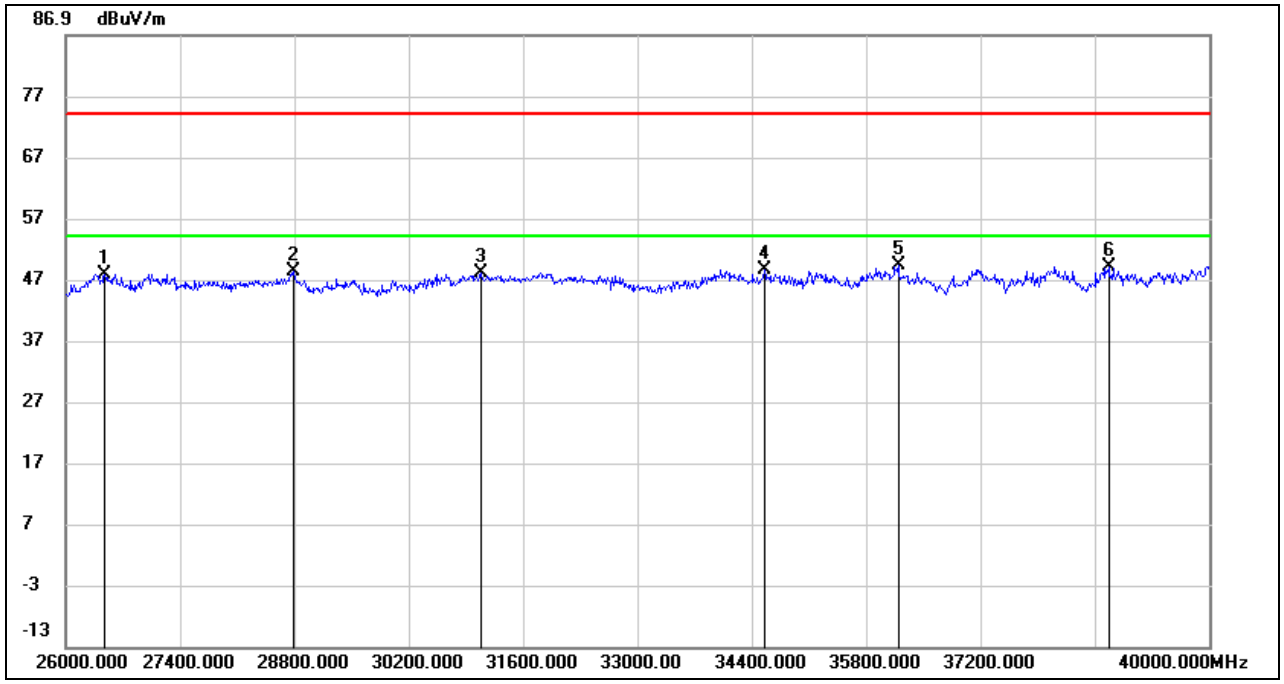
SPURIOUS EMISSIONS (UNII-1 BAND LOW CHANNEL, VERTICAL, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	26476.000	52.61	-4.78	47.83	74.00	-26.17	peak
2	28786.000	48.80	-0.64	48.16	74.00	-25.84	peak
3	31082.000	48.79	-0.74	48.05	74.00	-25.95	peak
4	34554.000	47.45	1.07	48.52	74.00	-25.48	peak
5	36192.000	45.86	3.43	49.29	74.00	-24.71	peak
6	38768.000	44.88	4.12	49.00	74.00	-25.00	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. The preamplifier only effect to the above 18GHz signal and no filter added to the measurement chain.

Note: All the modes and antennas had been tested, but only the worst data was recorded in the report.

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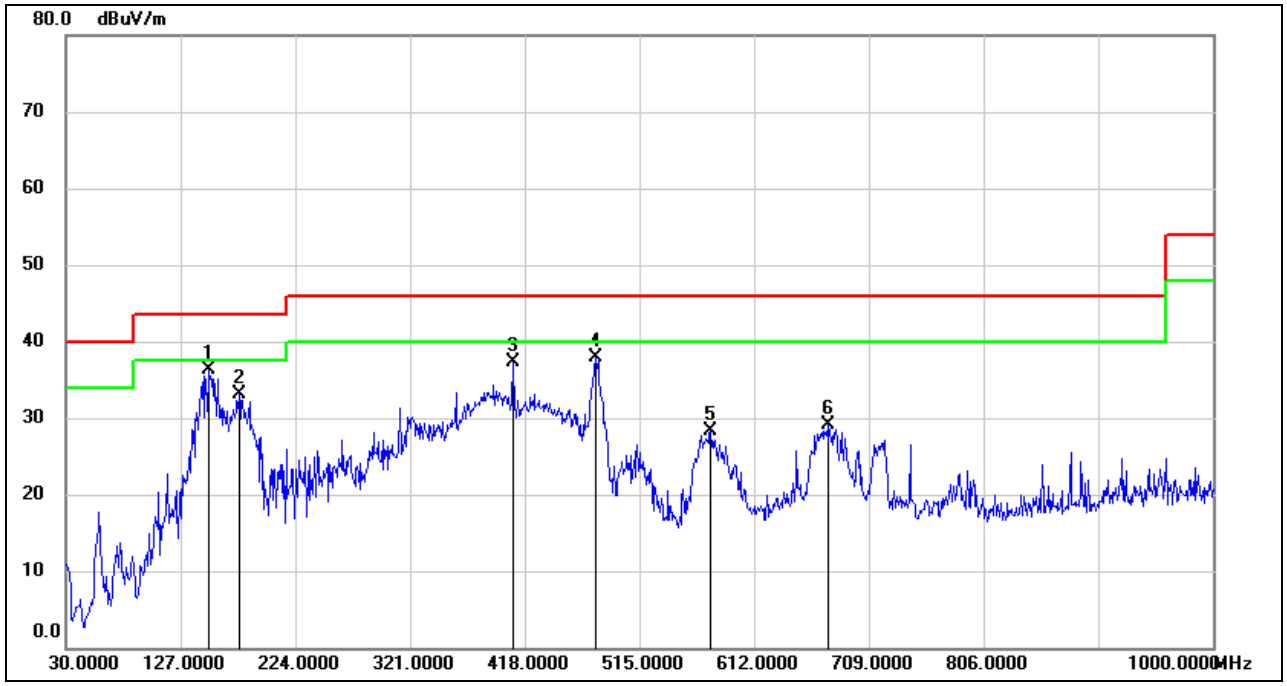
8.6. SPURIOUS EMISSIONS (30 MHz ~ 1 GHz)

8.6.1. 802.11ac VHT80 MODE

SPURIOUS EMISSIONS (UNII-1 BAND LOW CHANNEL, HORIZONTAL, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	151.2500	54.53	-18.21	36.32	43.50	-7.18	QP
2	176.4700	50.14	-17.02	33.12	43.50	-10.38	QP
3	408.3000	50.40	-13.17	37.23	46.00	-8.77	QP
4	478.1400	49.67	-11.83	37.84	46.00	-8.16	QP
5	575.1400	38.39	-10.03	28.36	46.00	-17.64	QP
6	674.0800	37.68	-8.62	29.06	46.00	-16.94	QP

Note: 1. Result Level = Read Level + Correct Factor.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

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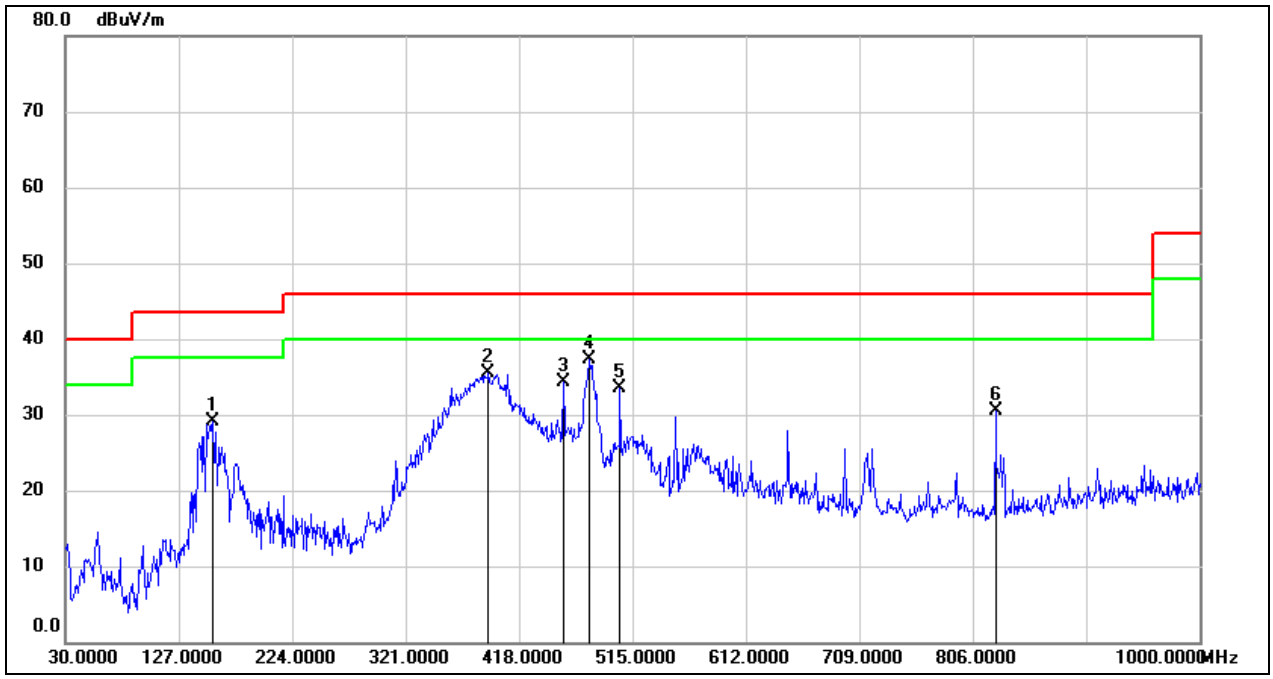
SPURIOUS EMISSIONS (UNII-1 BAND LOW CHANNEL, VERTICAL, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	156.1000	47.06	-17.96	29.10	43.50	-14.40	QP
2	391.8100	48.92	-13.47	35.45	46.00	-10.55	QP
3	455.8300	46.52	-12.27	34.25	46.00	-11.75	QP
4	478.1400	49.06	-11.83	37.23	46.00	-8.77	QP
5	504.3300	44.91	-11.37	33.54	46.00	-12.46	QP
6	825.4000	37.34	-6.78	30.56	46.00	-15.44	QP

Note: 1. Result Level = Read Level + Correct Factor.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto

Note: All the modes and antennas had been tested, but only the worst data was recorded in the report.

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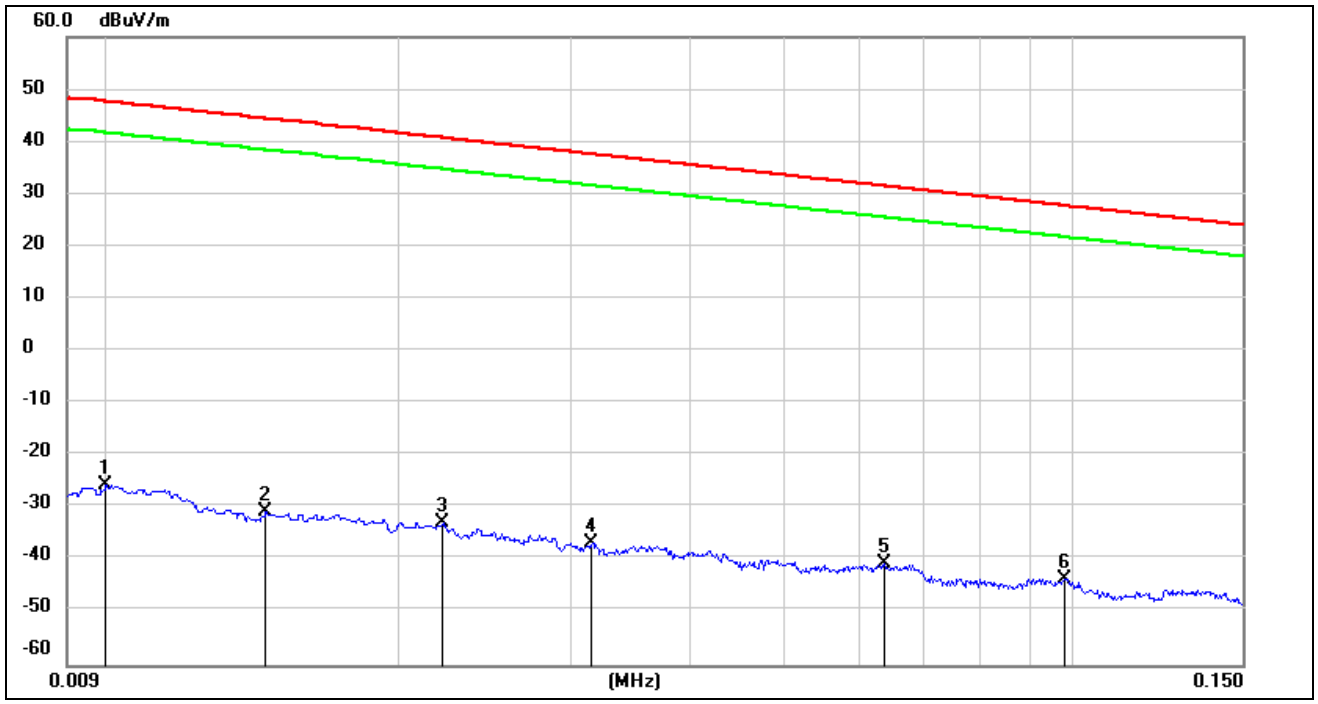
8.7. SPURIOUS EMISSIONS BELOW 30 MHz

8.7.1. 802.11ac VHT80 MODE

SPURIOUS EMISSIONS (UNII-1 BAND LOW CHANNEL, LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)

9 kHz ~ 150 kHz



No.	Frequency	Reading	Correct	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.0100	75.72	-101.40	-25.68	47.6	-77.18	-3.90	-73.28	peak
2	0.0145	70.55	-101.38	-30.83	44.37	-82.33	-7.13	-75.20	peak
3	0.0221	68.63	-101.35	-32.72	40.71	-84.22	-10.79	-73.43	peak
4	0.0316	64.74	-101.40	-36.66	37.61	-88.16	-13.89	-74.27	peak
5	0.0636	60.81	-101.54	-40.73	31.53	-92.23	-19.97	-72.26	peak
6	0.0981	58.27	-101.78	-43.51	27.77	-95.01	-23.73	-71.28	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.
4. dBuA/m = dBuV/m – 20log10(120π) = dBuV/m -51.5.

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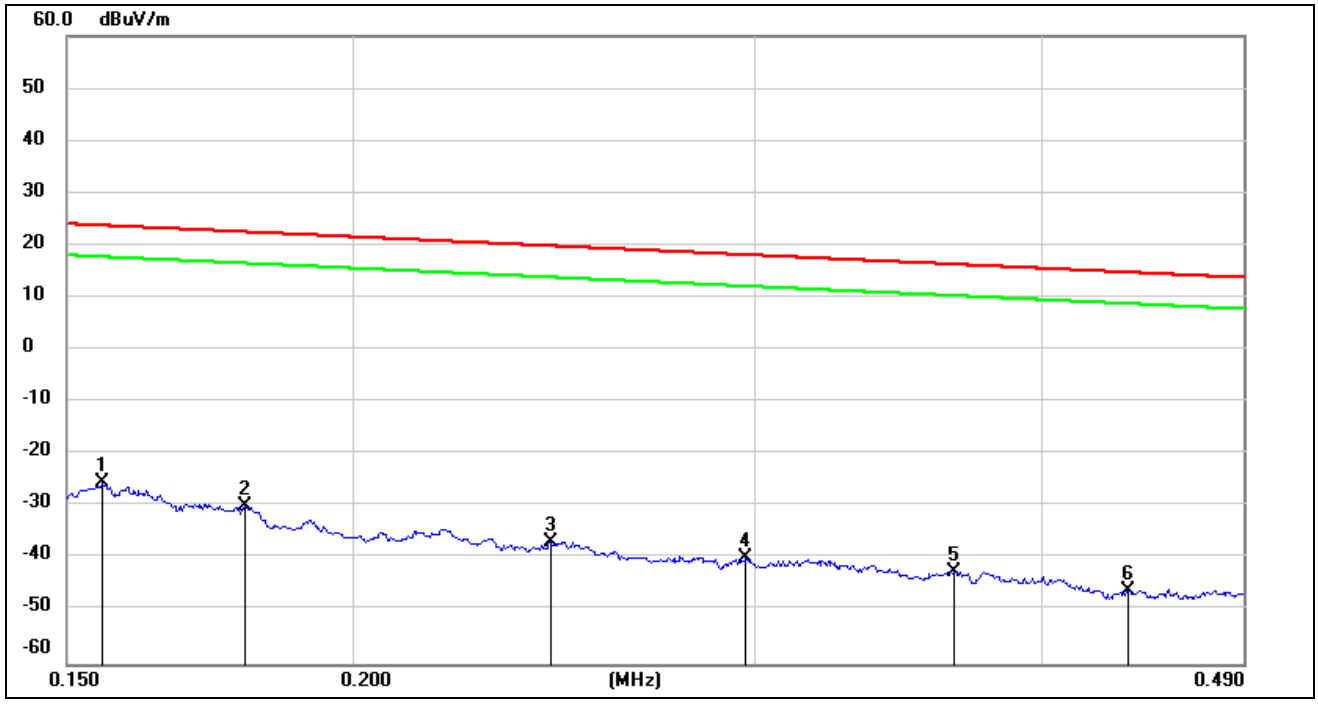
150 kHz ~ 490 kHz



No.	Frequency	Reading	Correct	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.1554	76.27	-101.65	-25.38	23.77	-76.88	-27.73	-49.15	peak
2	0.1794	71.77	-101.68	-29.91	22.53	-81.41	-28.97	-52.44	peak
3	0.2442	65.03	-101.79	-36.76	19.85	-88.26	-31.65	-56.61	peak
4	0.2972	62.16	-101.85	-39.69	18.14	-91.19	-33.36	-57.83	peak
5	0.3662	59.58	-101.93	-42.35	16.33	-93.85	-35.17	-58.68	peak
6	0.4364	55.86	-101.99	-46.13	14.8	-97.63	-36.70	-60.93	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.
4. dBuA/m = dBuV/m – 20log10(120π) = dBuV/m -51.5.

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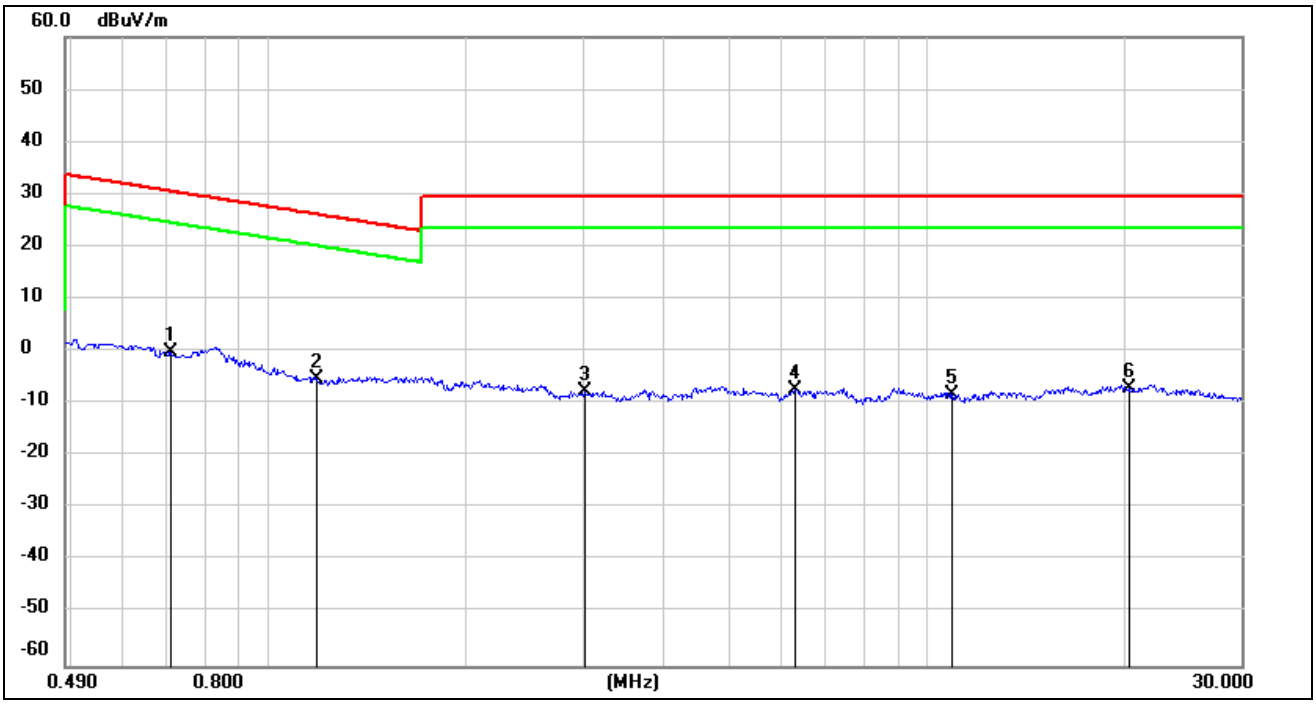
490 kHz ~ 30 MHz



No.	Frequency	Reading	Correct	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.7096	61.86	-62.12	-0.26	30.58	-51.76	-20.92	-30.84	peak
2	1.1814	56.85	-62.19	-5.34	26.16	-56.84	-25.34	-31.50	peak
3	3.0278	53.93	-61.57	-7.64	29.54	-59.14	-21.96	-37.18	peak
4	6.3033	53.95	-61.31	-7.36	29.54	-58.86	-21.96	-36.90	peak
5	10.9365	52.50	-60.84	-8.34	29.54	-59.84	-21.96	-37.88	peak
6	20.3501	53.84	-60.80	-6.96	29.54	-58.46	-21.96	-36.50	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.
4. dBuA/m = dBuV/m – 20log10(120π) = dBuV/m -51.5.

Note: All the modes and antennas had been tested, but only the worst data was recorded in the report.

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9. AC POWER LINE CONDUCTED EMISSIONS

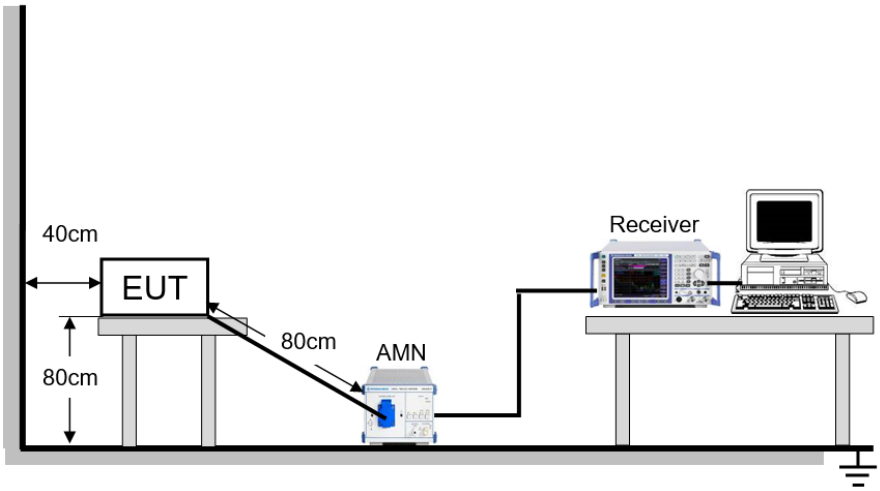
LIMITS

Please refer to CFR 47 FCC §15.207 (a) and ISED RSS-Gen Clause 8.8

FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

TEST SETUP AND PROCEDURE

Refer to ANSI C63.10-2013 clause 6.2.



The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

TEST ENVIRONMENT

Temperature	26.3 °C	Relative Humidity	64.4 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 V

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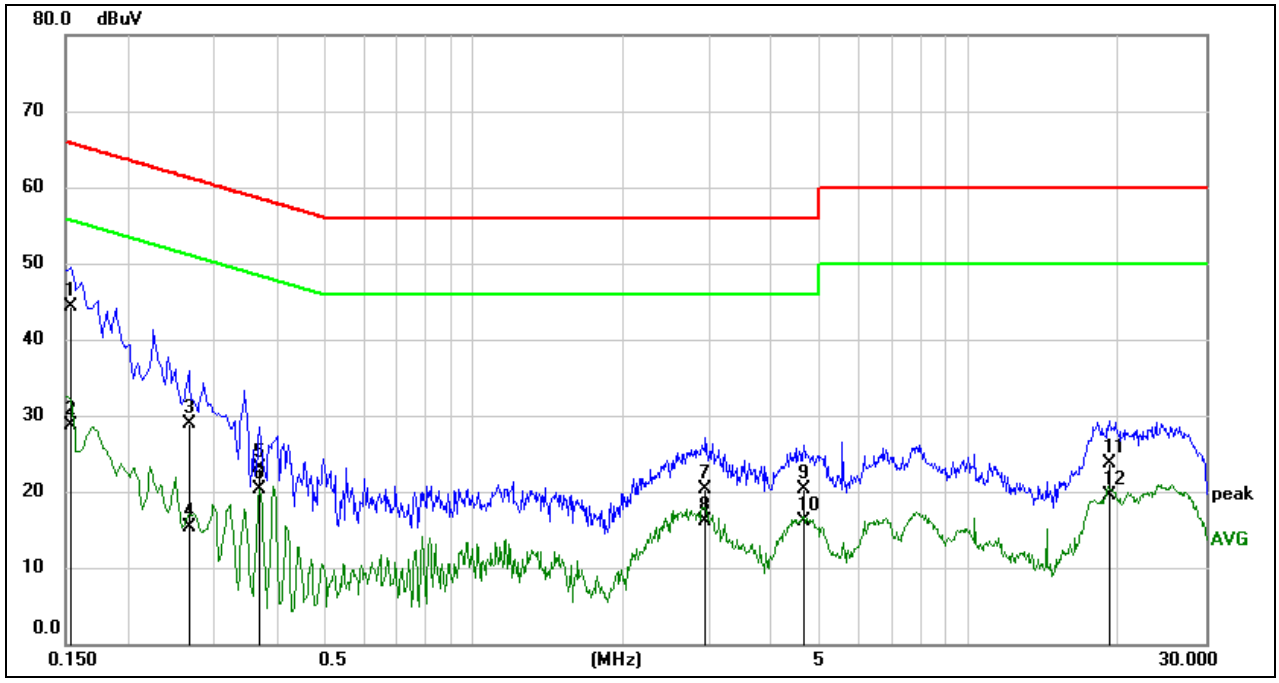
RESULTS

9.1.1. 802.11ac VHT80 MODE

LINE N RESULTS (UNII-1 BAND LOW CHANNEL, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1539	34.71	9.59	44.30	65.79	-21.49	QP
2	0.1539	19.04	9.59	28.63	55.79	-27.16	AVG
3	0.2668	19.24	9.59	28.83	61.22	-32.39	QP
4	0.2668	5.70	9.59	15.29	51.22	-35.93	AVG
5	0.3701	13.54	9.59	23.13	58.50	-35.37	QP
6	0.3701	10.62	9.59	20.21	48.50	-28.29	AVG
7	2.9190	10.62	9.62	20.24	56.00	-35.76	QP
8	2.9190	6.45	9.62	16.07	46.00	-29.93	AVG
9	4.6427	10.77	9.61	20.38	56.00	-35.62	QP
10	4.6427	6.42	9.61	16.03	46.00	-29.97	AVG
11	19.2227	13.95	9.73	23.68	60.00	-36.32	QP
12	19.2227	9.70	9.73	19.43	50.00	-30.57	AVG

Note: 1. Result = Reading + Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).
4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

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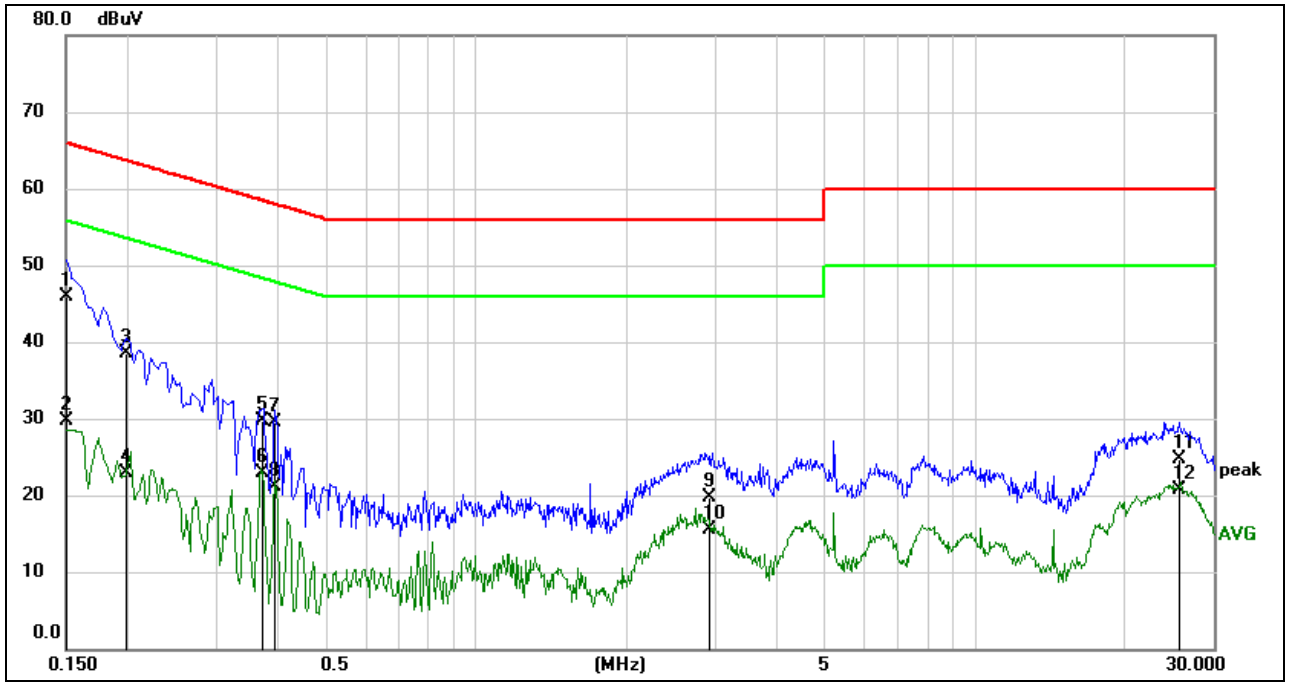
LINE L RESULTS (UNII-1 BAND LOW CHANNEL, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1510	36.30	9.59	45.89	65.94	-20.05	QP
2	0.1510	20.14	9.59	29.73	55.94	-26.21	AVG
3	0.1982	28.90	9.59	38.49	63.69	-25.20	QP
4	0.1982	13.41	9.59	23.00	53.69	-30.69	AVG
5	0.3707	20.02	9.59	29.61	58.49	-28.88	QP
6	0.3707	13.24	9.59	22.83	48.49	-25.66	AVG
7	0.3923	19.97	9.59	29.56	58.01	-28.45	QP
8	0.3923	11.57	9.59	21.16	48.01	-26.85	AVG
9	2.9451	10.07	9.62	19.69	56.00	-36.31	QP
10	2.9451	5.79	9.62	15.41	46.00	-30.59	AVG
11	25.5897	14.98	9.75	24.73	60.00	-35.27	QP
12	25.5897	10.95	9.75	20.70	50.00	-29.30	AVG

Note: 1. Result = Reading + Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).
4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

Note: All the modes had been tested, but only the worst data was recorded in the report.

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10. FREQUENCY STABILITY

LIMITS

The frequency of the carrier signal shall be maintained within band of operation.

TEST PROCEDURE

1. The EUT was placed inside an environmental chamber as the temperature in the chamber was varied between 0 °C ~ 70 °C (declared by customer).

2. The temperature was incremented by 10 °C intervals and the unit allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.

3. The primary supply voltage is varied from 85 % to 115 % of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

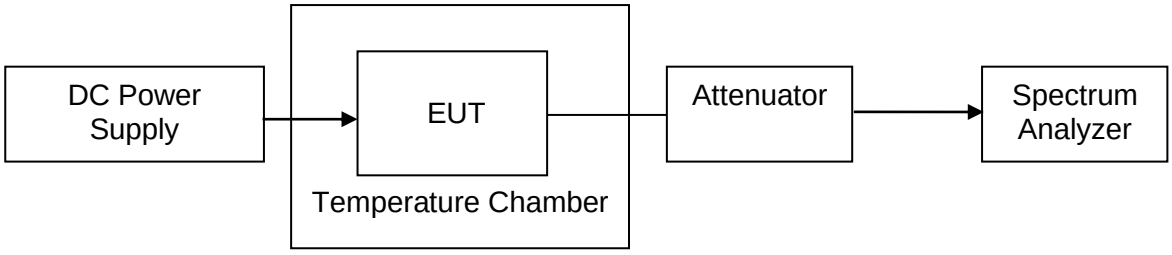
Connect the EUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	10 kHz
VBW	≥3 × RBW
Span	Encompass the entire emissions bandwidth (EBW) of the signal
Trace	Max hold
Sweep time	Auto

4. While maintaining a constant temperature inside the environmental chamber, turn the EUT on and record the operating frequency at startup, and at 2 minutes, 5minutes, and 10 minutes after the EUT is energized.

5. Allow the trace to stabilize, find the peak value of the power envelope and record the frequency, then calculated the frequency drift.

TEST SETUP



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TEST ENVIRONMENT

	Normal Test Conditions	Extreme Test Conditions
Relative Humidity	20 % ~ 75 %	/
Atmospheric Pressure	100 kPa ~ 102 kPa	/
Temperature	TN (Normal Temperature): 26.4 °C	TL (Low Temperature): 0 °C
		TH (High Temperature): 70 °C
Supply Voltage	VN (Normal Voltage): DC 3.3 V	VL (Low Voltage): DC 2.805 V
		VH (High Voltage): DC 3.795 V

RESULTS

Please refer to Appendix D.

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11. DYNAMIC FREQUENCY SELECTION

APPLICABILITY OF DFS REQUIREMENTS

A U-NII network will employ a DFS function to detect signals from radar systems and to avoid co-channel operation with these systems. This applies to the 5250-5350 MHz and/or 5470-5725 MHz bands.
Within the context of the operation of the DFS function, a U-NII device will operate in either Master Mode or Client Mode. U-NII devices operating in Client Mode can only operate in a network controlled by a U-NII device operating in Master Mode.

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	☐ Master	☒ Client Without Radar Detection	☐ Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	☐ Master Device or Client with Radar Detection	☒ Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	☐ Master Device 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 tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check 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.		

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LIMITS

(1) DFS Detection Thresholds

Table 3: DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 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 D01.	

(2) DFS Response Requirements

Table 4: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.
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 facilitating 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. Note 3: 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.	

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PARAMETERS OF RADAR TEST WAVEFORMS

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Table 5 Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A	$\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{\text{PRI}_{\mu\text{sec}}}\right)\right\}$	60%	30
		Test B			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.
Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a
Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B. Test aggregate is average of the percentage of successful detections of short pulse radar types 1-4.

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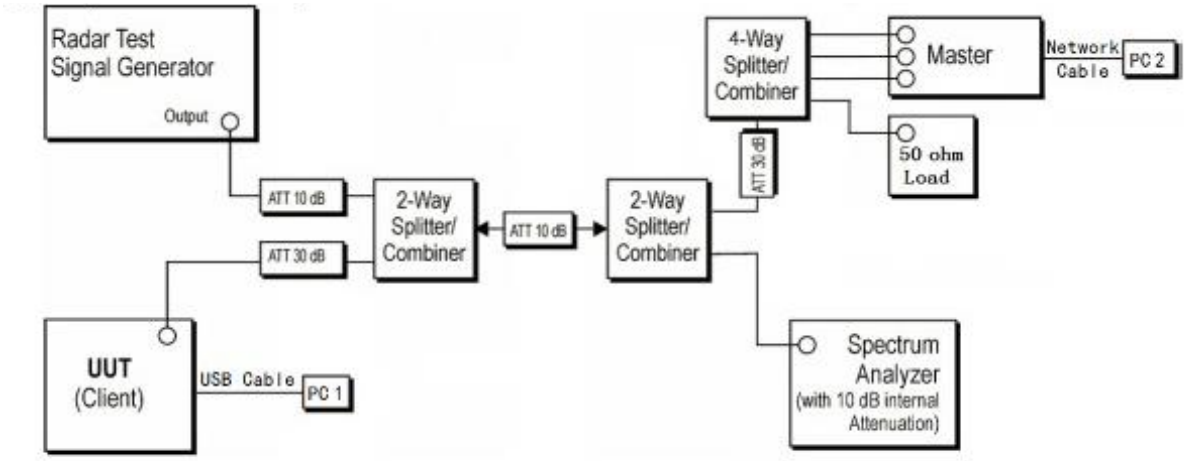
TEST SETUP

Setup for Client with injection at the Master



TEST ENVIRONMENT

Temperature	24.1 °C	Relative Humidity	60.5 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3.3 V

RESULTS

Please refer to Appendix F.

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12. ANTENNA REQUIREMENTS

APPLICABLE REQUIREMENTS

Please refer to FCC §15.203
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Please refer to FCC §15.247(b)(4)
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RESULTS

Complies

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12.1. Appendix A1: Emission Bandwidth

12.1.1. Test Result

Test Mode	Antenna	Channel	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	19.880	5170.040	5189.920	---	PASS
	Ant2	5180	19.680	5170.080	5189.760	---	PASS
	Ant1	5200	20.000	5190.000	5210.000	---	PASS
	Ant2	5200	19.520	5190.240	5209.760	---	PASS
	Ant1	5240	19.840	5230.200	5250.040	---	PASS
	Ant2	5240	20.000	5229.960	5249.960	---	PASS
	Ant1	5260	19.280	5250.360	5269.640	---	PASS
	Ant2	5260	19.840	5250.040	5269.880	---	PASS
	Ant1	5280	19.920	5269.960	5289.880	---	PASS
	Ant2	5280	19.000	5270.440	5289.440	---	PASS
	Ant1	5320	19.200	5310.520	5329.720	---	PASS
	Ant2	5320	19.600	5310.200	5329.800	---	PASS
	Ant1	5500	20.040	5490.000	5510.040	---	PASS
	Ant2	5500	19.280	5490.320	5509.600	---	PASS
	Ant1	5580	19.680	5570.240	5589.920	---	PASS
	Ant2	5580	19.160	5570.440	5589.600	---	PASS
	Ant1	5700	19.520	5690.080	5709.600	---	PASS
	Ant2	5700	20.040	5690.120	5710.160	---	PASS
	Ant1	5720	20.080	5709.880	5729.960	---	PASS
	Ant2	5720	19.960	5709.960	5729.920	---	PASS
	Ant1	5720_UNII-2C	15.12	5709.880	5725	---	PASS
	Ant2	5720_UNII-2C	15.04	5709.960	5725	---	PASS
	Ant1	5720_UNII-3	4.96	5725	5729.960	---	PASS
	Ant2	5720_UNII-3	4.92	5725	5729.920	---	PASS
	Ant1	5745	20.280	5735.040	5755.320	---	PASS
	Ant2	5745	19.400	5735.320	5754.720	---	PASS
	Ant1	5785	20.040	5774.920	5794.960	---	PASS
	Ant2	5785	19.960	5774.880	5794.840	---	PASS
	Ant1	5825	20.120	5814.800	5834.920	---	PASS
	Ant2	5825	19.560	5815.200	5834.760	---	PASS
11N20MIMO	Ant1	5180	19.640	5170.320	5189.960	---	PASS
	Ant2	5180	19.840	5170.120	5189.960	---	PASS
	Ant1	5200	19.960	5189.960	5209.920	---	PASS
	Ant2	5200	19.960	5190.120	5210.080	---	PASS
	Ant1	5240	19.800	5230.040	5249.840	---	PASS
	Ant2	5240	19.800	5229.960	5249.760	---	PASS
	Ant1	5260	20.080	5249.880	5269.960	---	PASS
	Ant2	5260	20.040	5249.960	5270.000	---	PASS
	Ant1	5280	20.040	5270.000	5290.040	---	PASS
	Ant2	5280	19.920	5270.080	5290.000	---	PASS
	Ant1	5320	19.840	5309.960	5329.800	---	PASS
	Ant2	5320	20.080	5310.040	5330.120	---	PASS
	Ant1	5500	19.840	5490.120	5509.960	---	PASS
	Ant2	5500	19.680	5490.080	5509.760	---	PASS
	Ant1	5580	20.000	5569.920	5589.920	---	PASS
	Ant2	5580	19.840	5570.080	5589.920	---	PASS
	Ant1	5700	20.280	5689.680	5709.960	---	PASS
	Ant2	5700	19.840	5689.960	5709.800	---	PASS
	Ant1	5720	19.800	5709.960	5729.760	---	PASS
	Ant2	5720	19.720	5710.080	5729.800	---	PASS

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	Ant1	5720_UNII-2C	15.04	5709.960	5725	---	PASS
	Ant2	5720_UNII-2C	14.92	5710.080	5725	---	PASS
	Ant1	5720_UNII-3	4.76	5725	5729.760	---	PASS
	Ant2	5720_UNII-3	4.8	5725	5729.800	---	PASS
	Ant1	5745	20.400	5734.800	5755.200	---	PASS
	Ant2	5745	19.920	5734.880	5754.800	---	PASS
	Ant1	5785	20.160	5774.960	5795.120	---	PASS
	Ant2	5785	19.960	5774.920	5794.880	---	PASS
	Ant1	5825	20.160	5814.720	5834.880	---	PASS
	Ant2	5825	20.160	5814.640	5834.800	---	PASS
11N40MIMO	Ant1	5190	40.000	5169.840	5209.840	---	PASS
	Ant2	5190	40.400	5169.440	5209.840	---	PASS
	Ant1	5230	40.960	5209.280	5250.240	---	PASS
	Ant2	5230	39.120	5210.560	5249.680	---	PASS
	Ant1	5270	39.600	5250.160	5289.760	---	PASS
	Ant2	5270	39.360	5250.160	5289.520	---	PASS
	Ant1	5310	39.520	5290.240	5329.760	---	PASS
	Ant2	5310	39.680	5290.000	5329.680	---	PASS
	Ant1	5510	40.560	5489.760	5530.320	---	PASS
	Ant2	5510	39.600	5490.400	5530.000	---	PASS
	Ant1	5550	40.320	5529.920	5570.240	---	PASS
	Ant2	5550	40.000	5529.760	5569.760	---	PASS
	Ant1	5670	39.920	5650.400	5690.320	---	PASS
	Ant2	5670	39.520	5650.160	5689.680	---	PASS
	Ant1	5710	40.000	5689.920	5729.920	---	PASS
	Ant2	5710	39.280	5690.080	5729.360	---	PASS
	Ant1	5710_UNII-2C	35.08	5689.920	5725	---	PASS
	Ant2	5710_UNII-2C	34.92	5690.080	5725	---	PASS
	Ant1	5710_UNII-3	4.92	5725	5729.920	---	PASS
	Ant2	5710_UNII-3	4.36	5725	5729.360	---	PASS
	Ant1	5755	40.400	5734.600	5775.000	---	PASS
	Ant2	5755	39.360	5735.080	5774.440	---	PASS
	Ant1	5795	40.160	5774.920	5815.080	---	PASS
	Ant2	5795	39.600	5775.560	5815.160	---	PASS
11AC80MIMO	Ant1	5210	80.640	5169.200	5249.840	---	PASS
	Ant2	5210	79.200	5170.480	5249.680	---	PASS
	Ant1	5290	79.840	5249.840	5329.680	---	PASS
	Ant2	5290	80.320	5249.680	5330.000	---	PASS
	Ant1	5530	79.840	5490.000	5569.840	---	PASS
	Ant2	5530	79.520	5490.160	5569.680	---	PASS
	Ant1	5610	80.000	5569.840	5649.840	---	PASS
	Ant2	5610	79.200	5570.480	5649.680	---	PASS
	Ant1	5690	79.520	5650.320	5729.840	---	PASS
	Ant2	5690	79.680	5650.000	5729.680	---	PASS
	Ant1	5690_UNII-2C	74.68	5650.320	5725	---	PASS
	Ant2	5690_UNII-2C	75	5650.000	5725	---	PASS
	Ant1	5690_UNII-3	4.84	5725	5729.840	---	PASS
	Ant2	5690_UNII-3	4.68	5725	5729.680	---	PASS
	Ant1	5775	80.000	5734.680	5814.680	---	PASS

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	Ant2	5775	80.000	5735.160	5815.160	---	PASS

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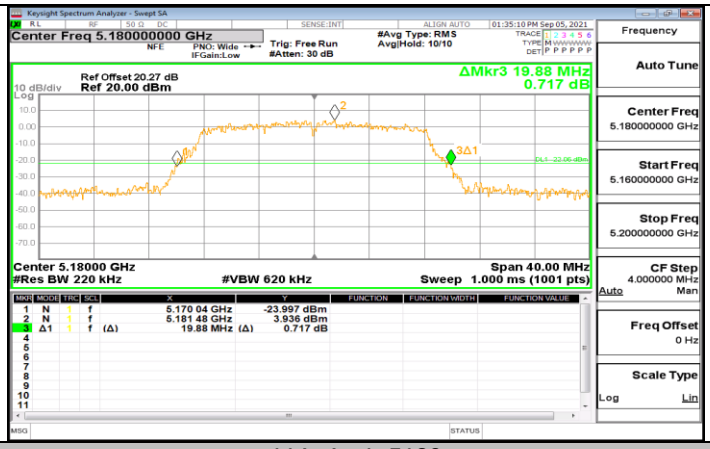
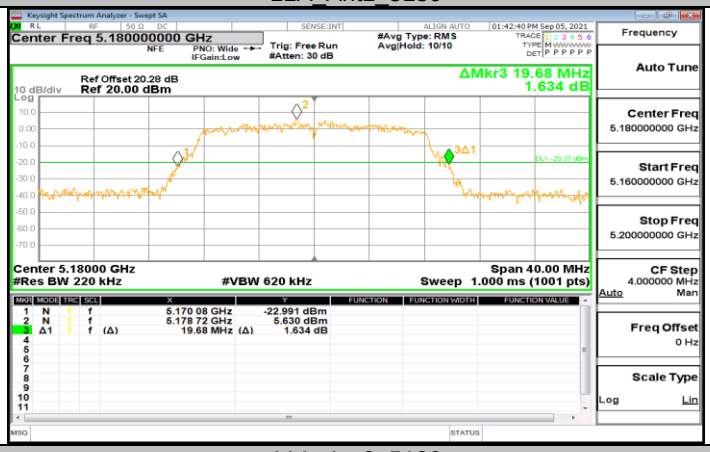
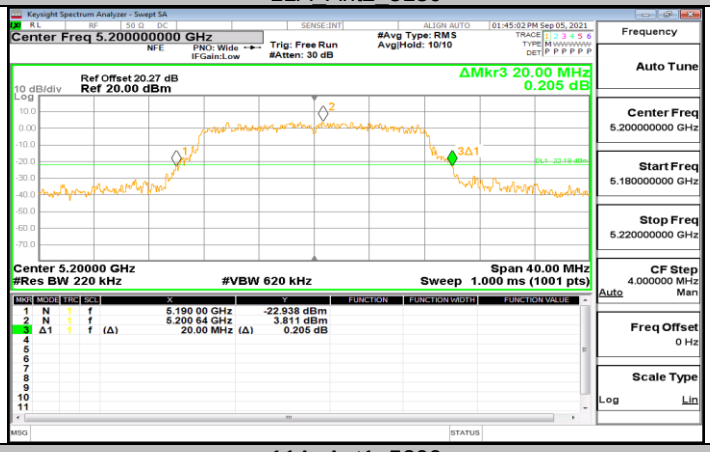
12.1.2. Test Graphs



11A_Ant1_5180



11A_Ant2_5180



11A_Ant1_5200

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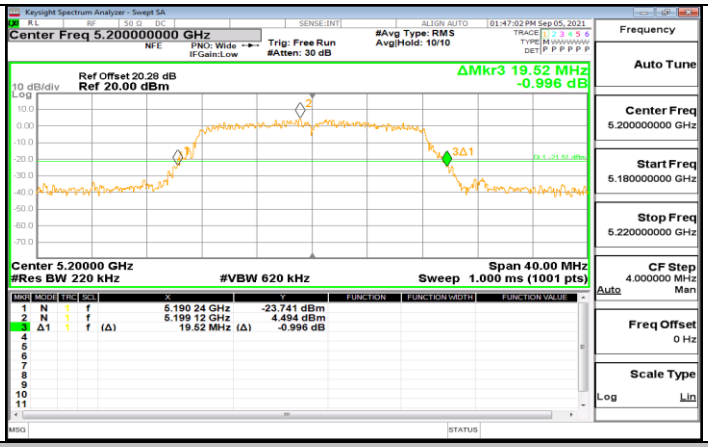
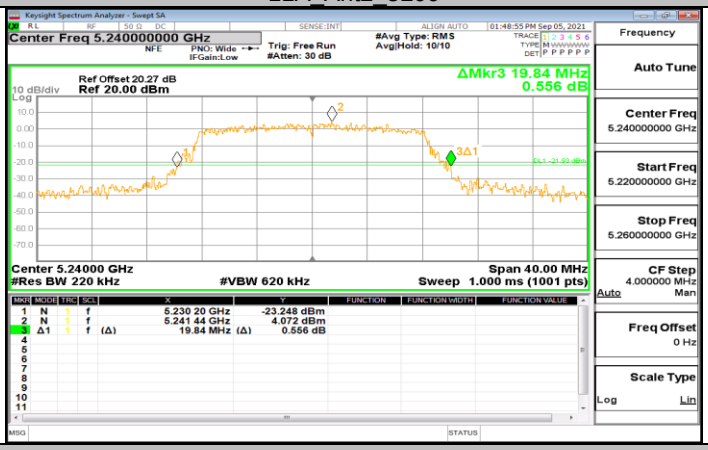


11A_Ant2_5200



11A_Ant1_5240

11A_Ant2_5240

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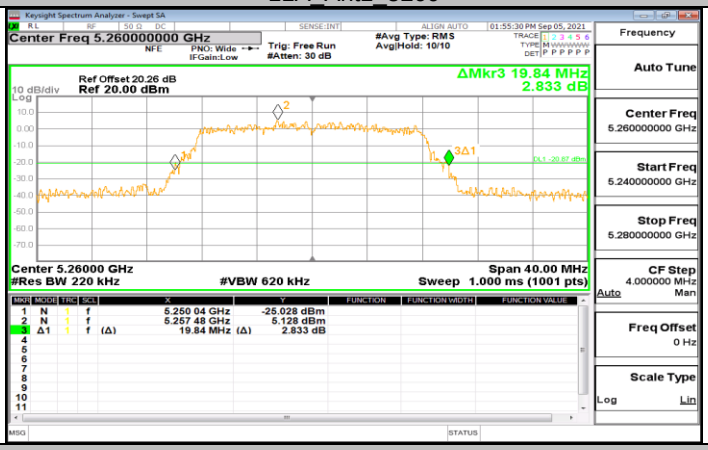
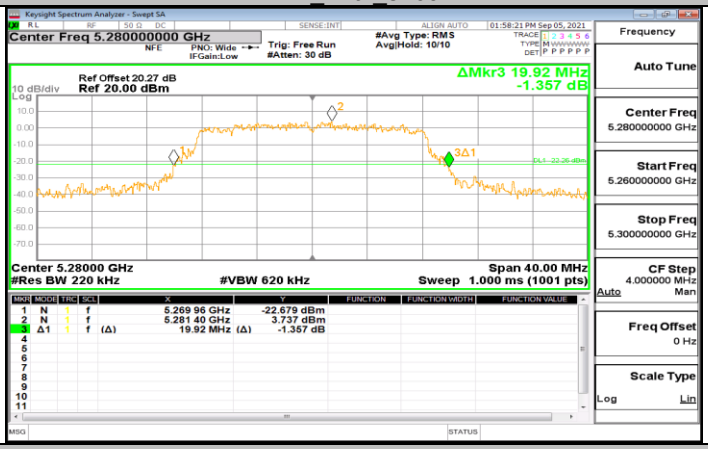
11A_Ant1_5260



11A_Ant2_5260



11A_Ant1_5280

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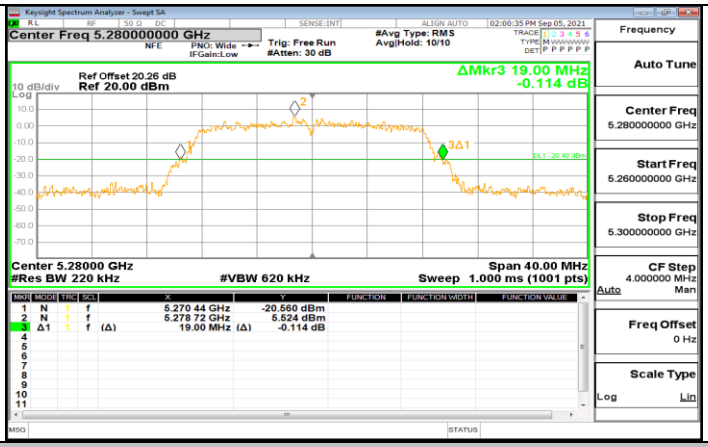
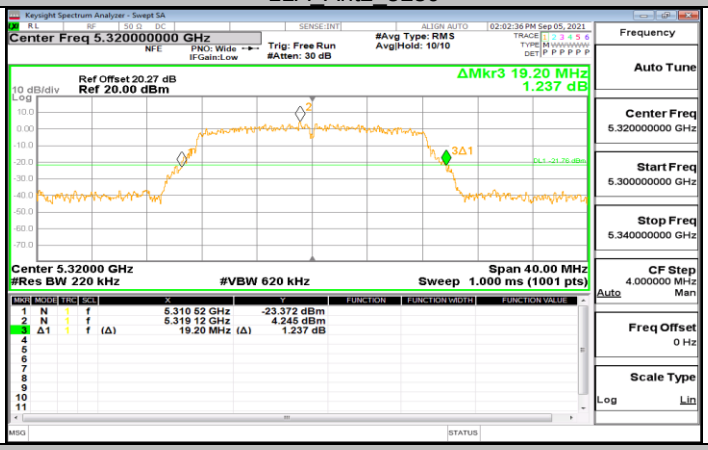
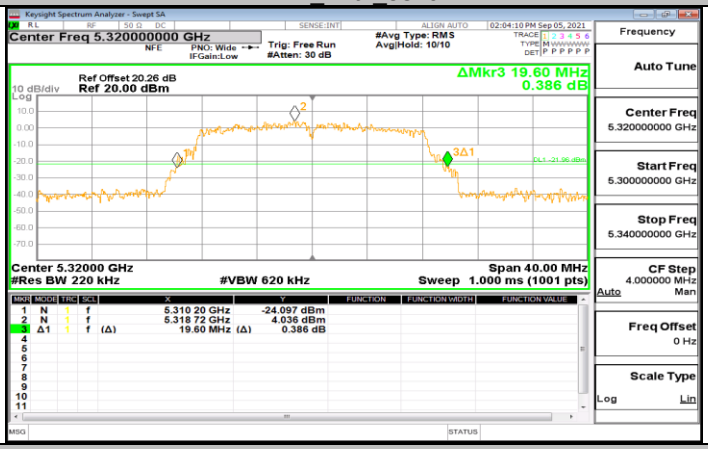


11A_Ant2_5280



11A_Ant1_5320



11A_Ant2_5320

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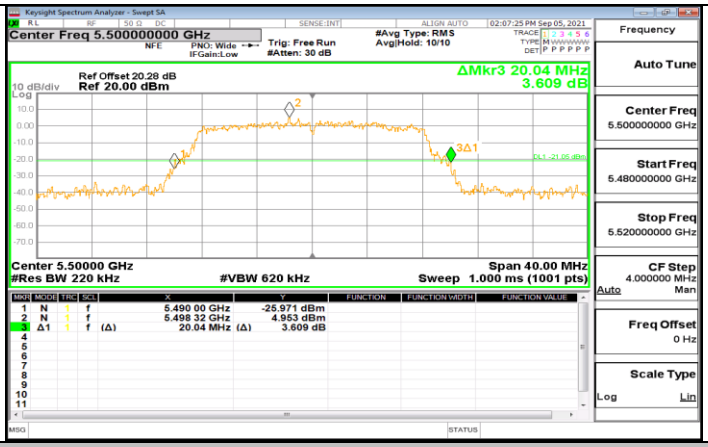
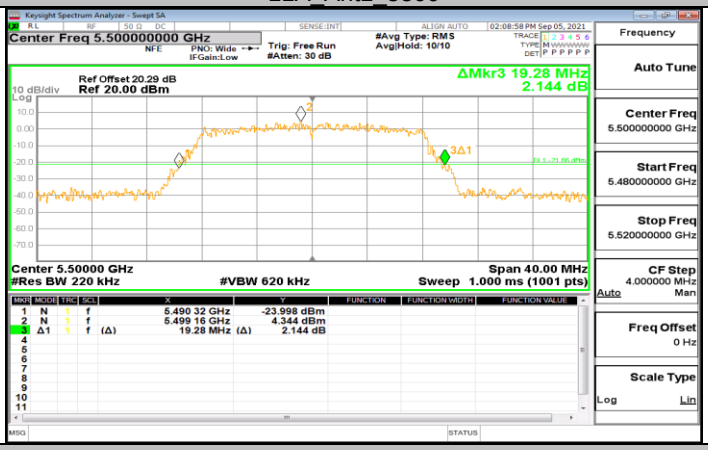


11A_Ant1_5500



11A_Ant2_5500

11A_Ant1_5580

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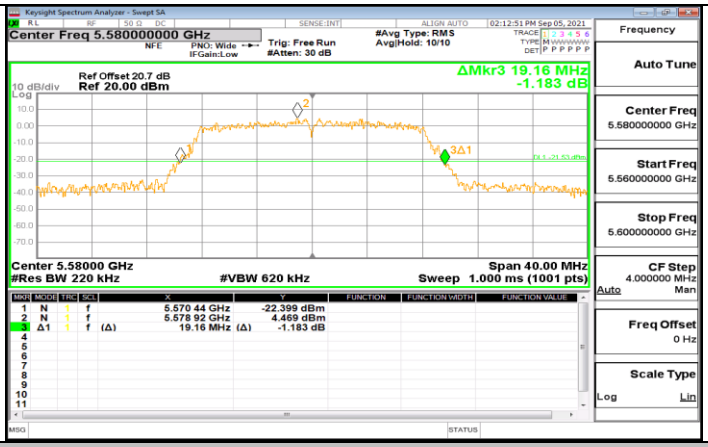
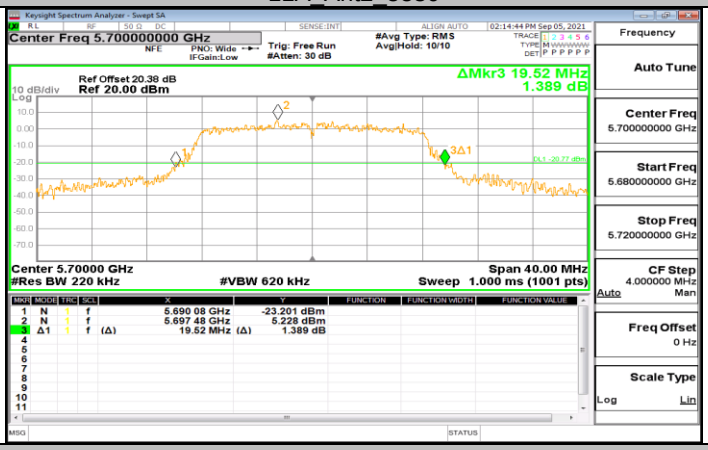
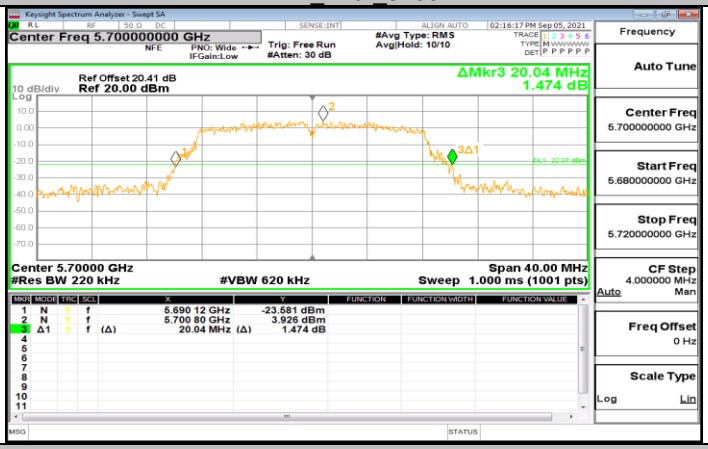


11A_Ant2_5580



11A_Ant1_5700



11A_Ant2_5700

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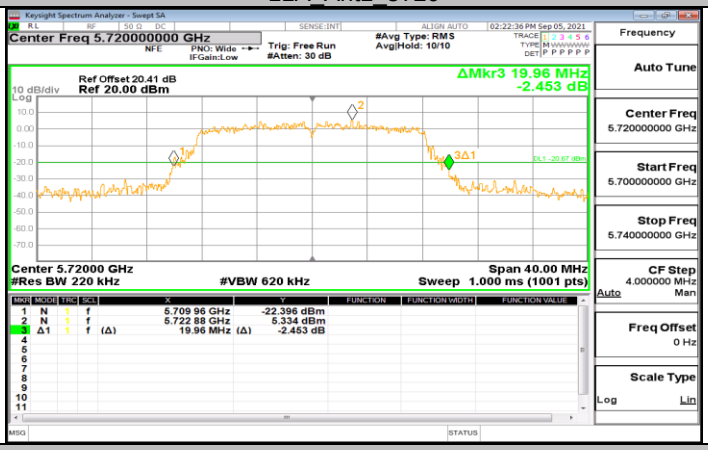
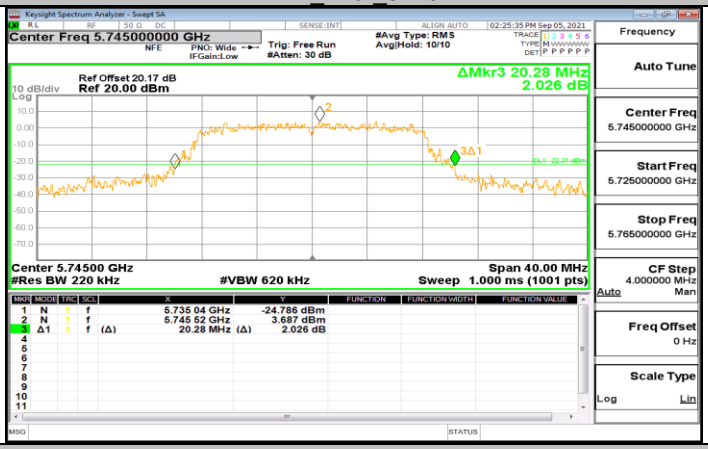
11A_Ant1_5720



11A_Ant2_5720



11A_Ant1_5745

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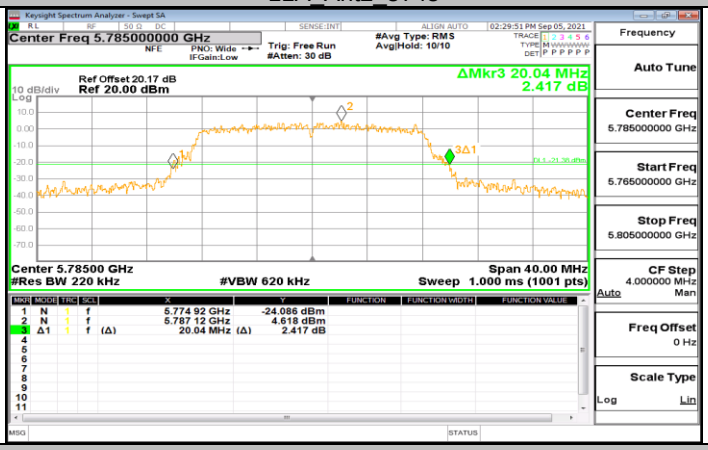
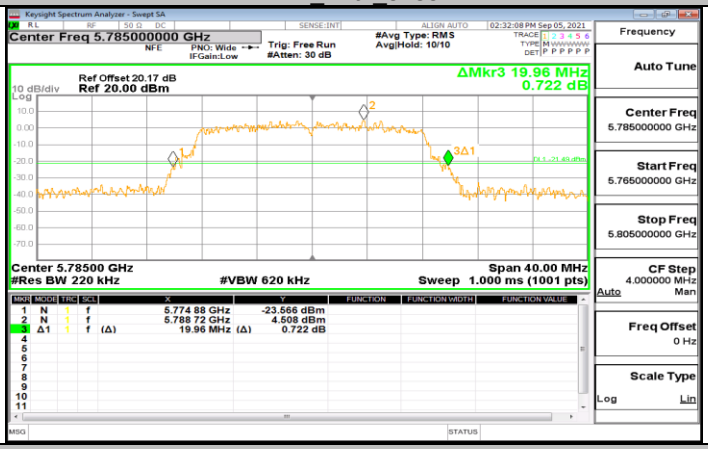
11A_Ant2_5745



11A_Ant1_5785



11A_Ant2_5785

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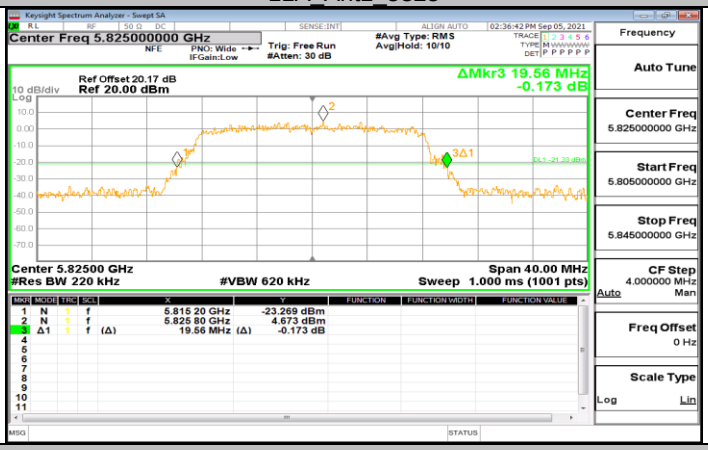
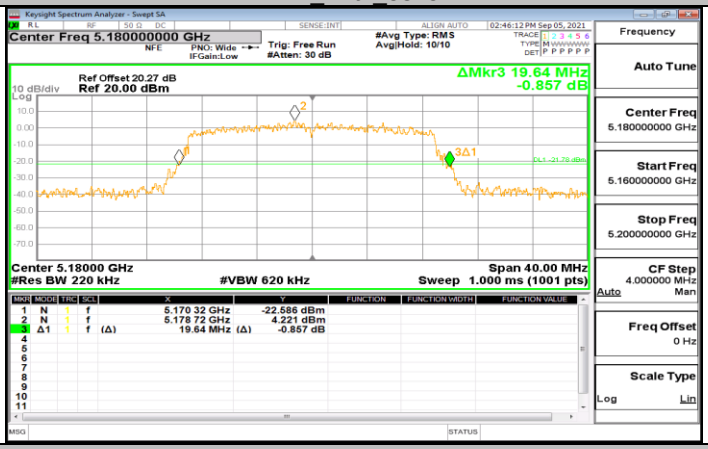
11A_Ant1_5825



11A_Ant2_5825



11N20MIMO_Ant1_5180

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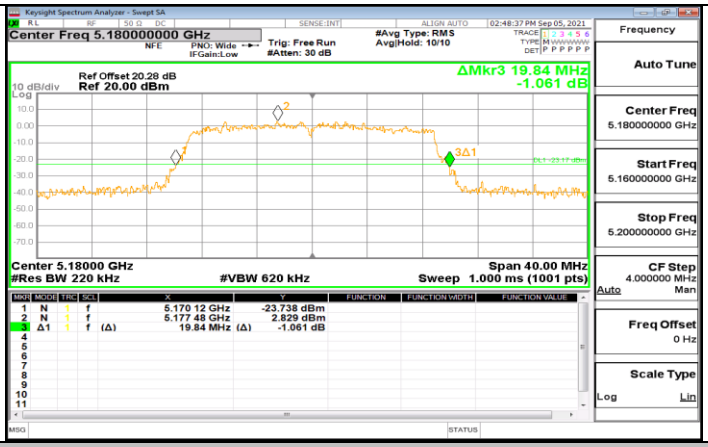
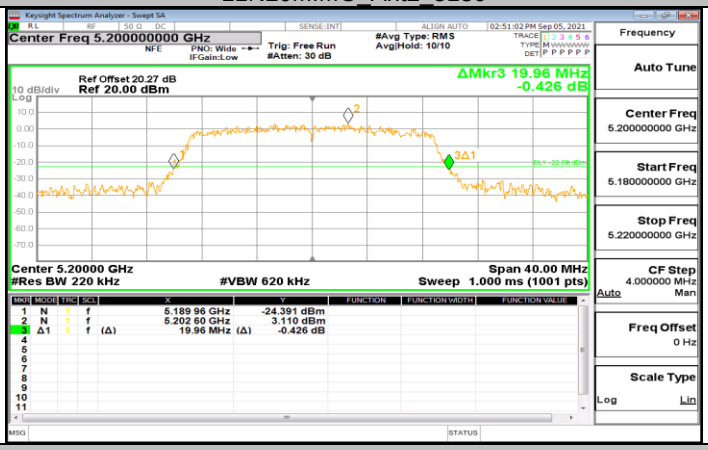
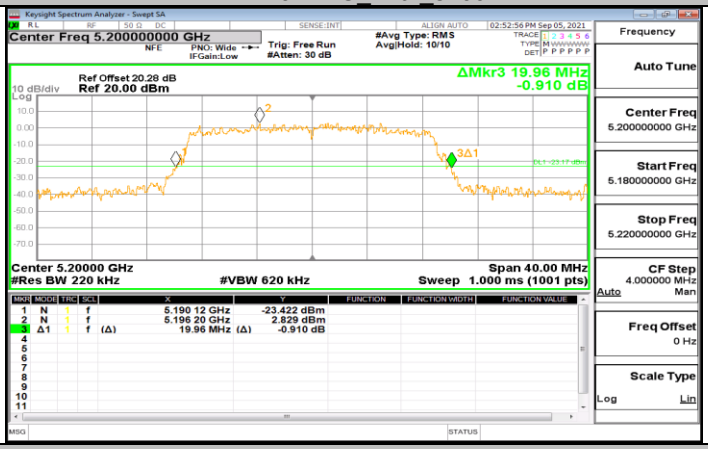


11N20MIMO_Ant2_5180



11N20MIMO_Ant1_5200



11N20MIMO_Ant2_5200

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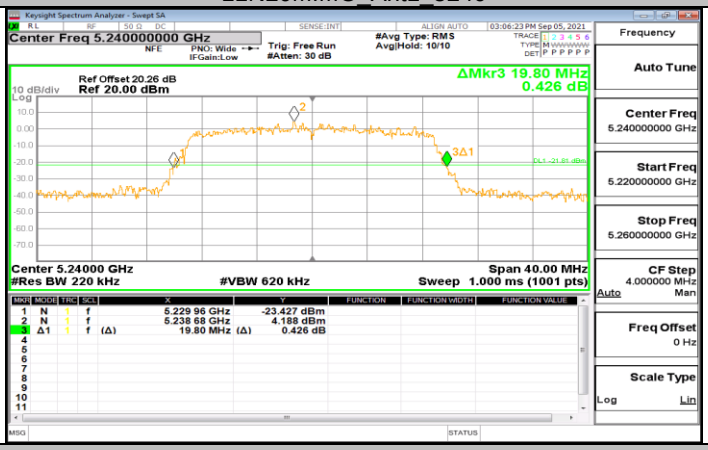
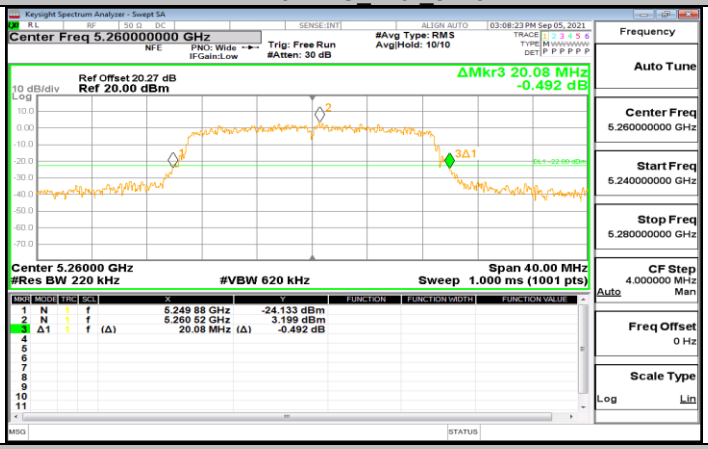
11N20MIMO_Ant1_5240



11N20MIMO_Ant2_5240



11N20MIMO_Ant1_5260

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