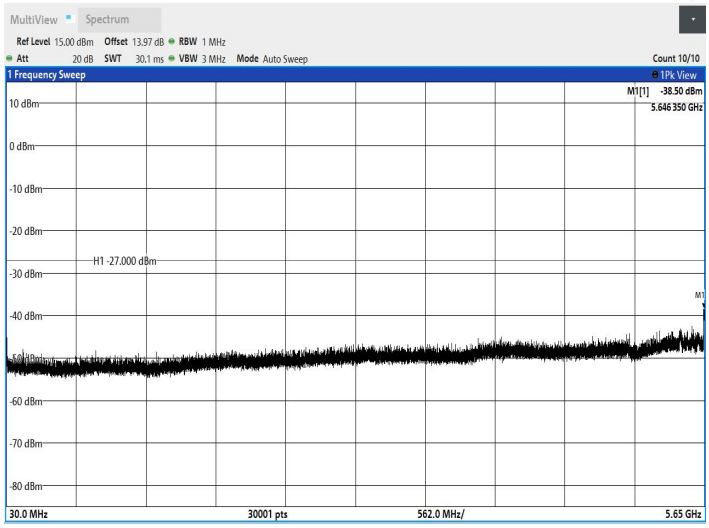
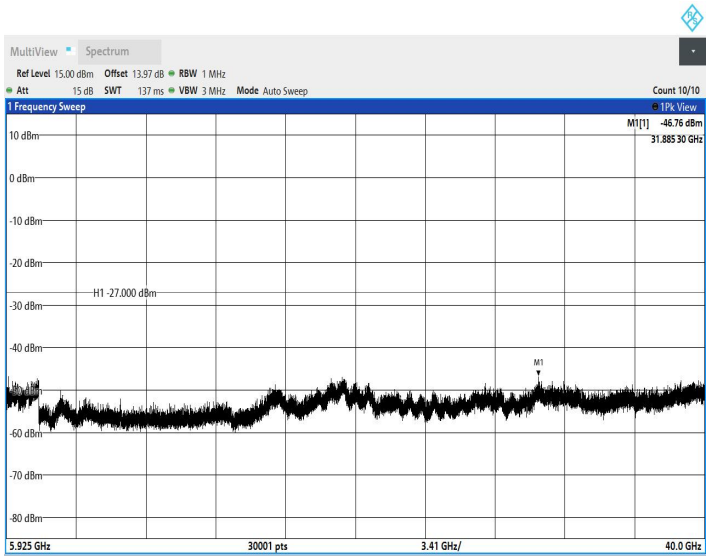
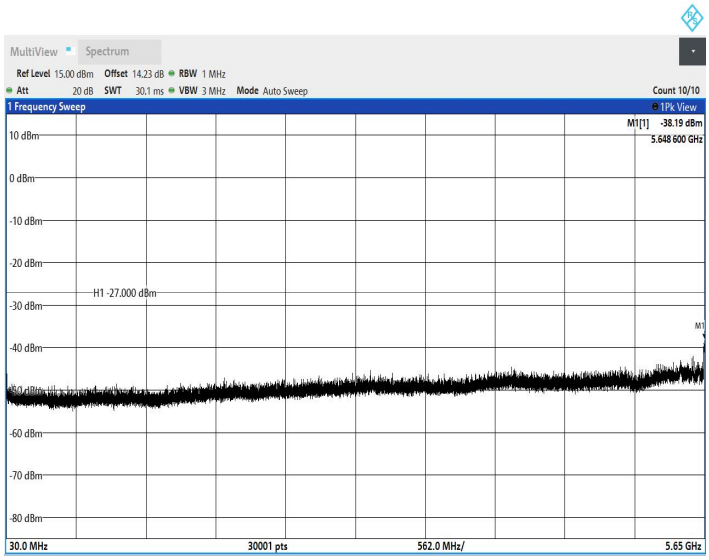


11AC20MIMO_Ant1_5745_30~5650



11AC20MIMO_Ant1_5745_5925~40000



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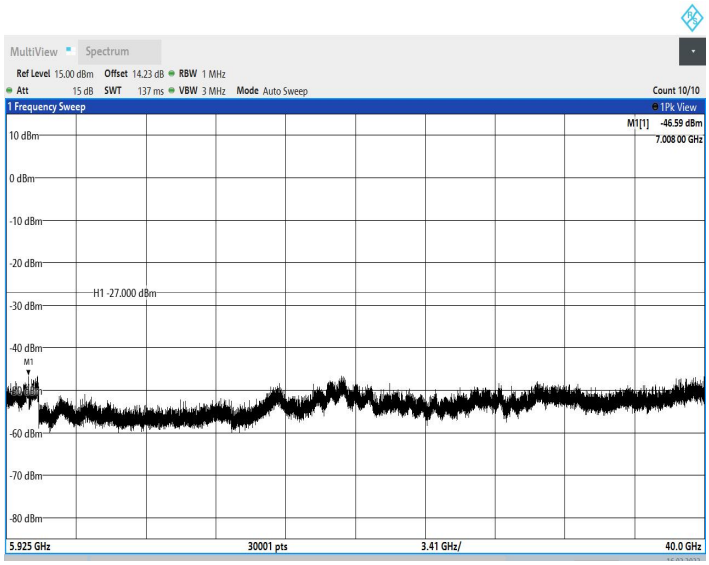

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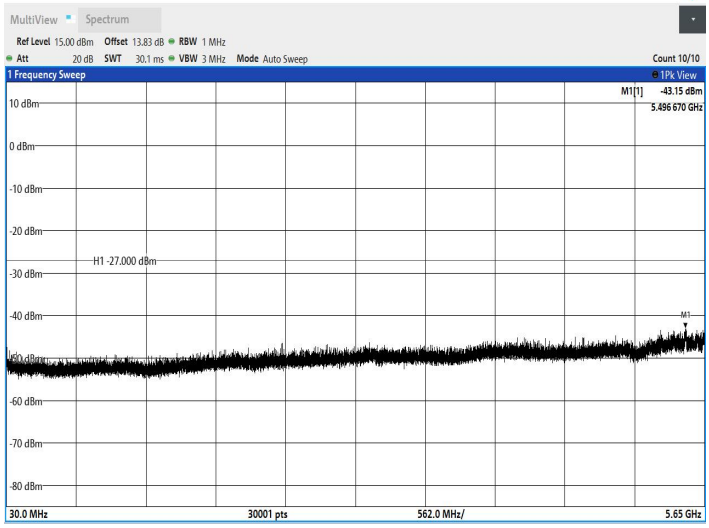

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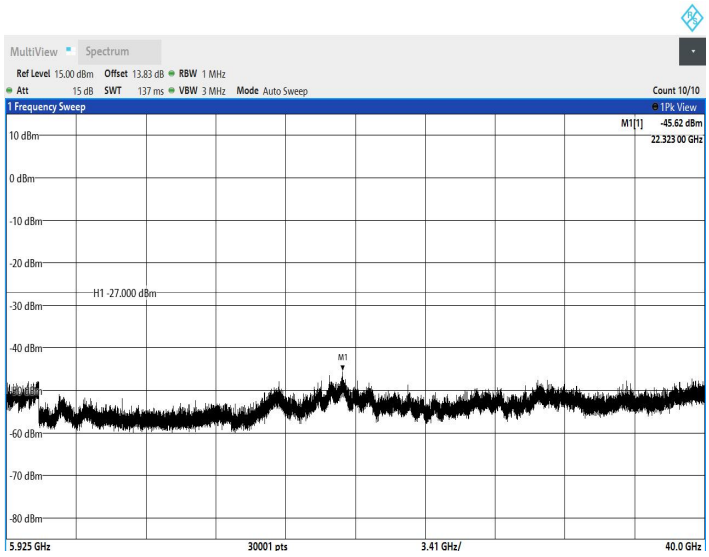

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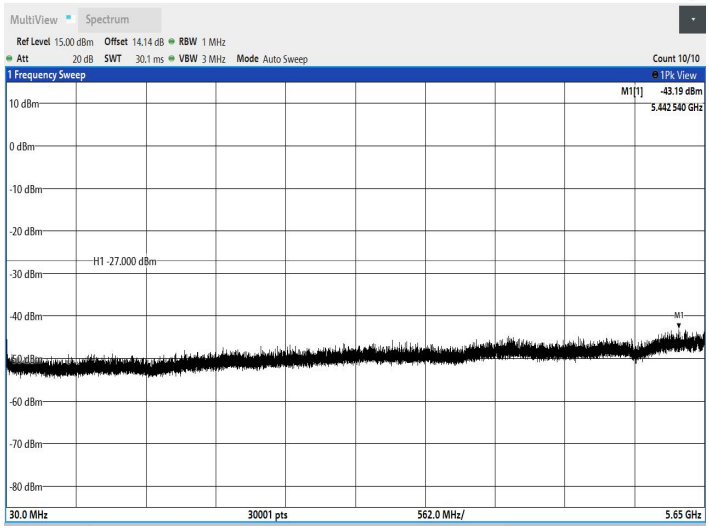

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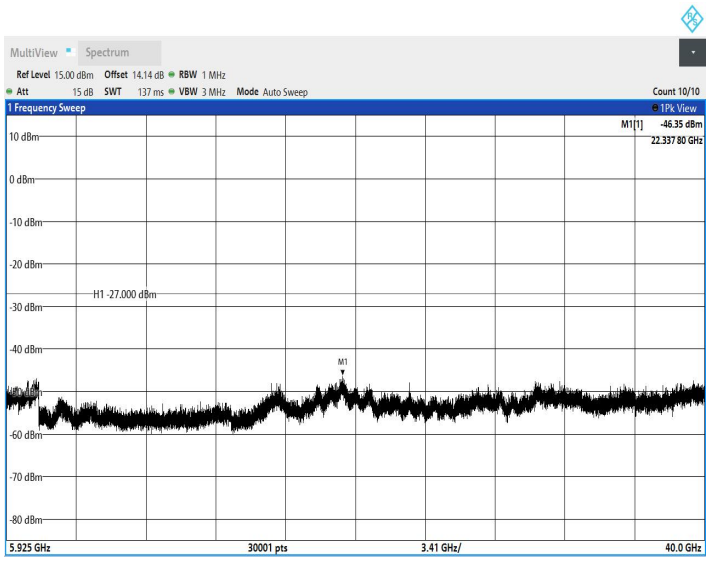
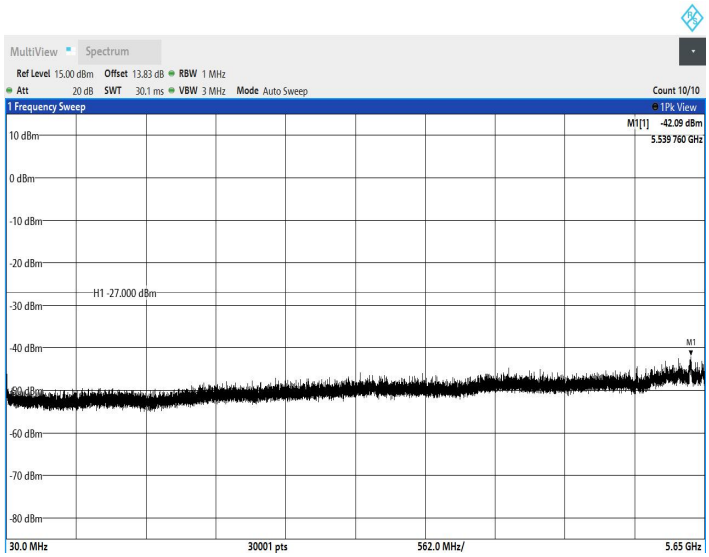
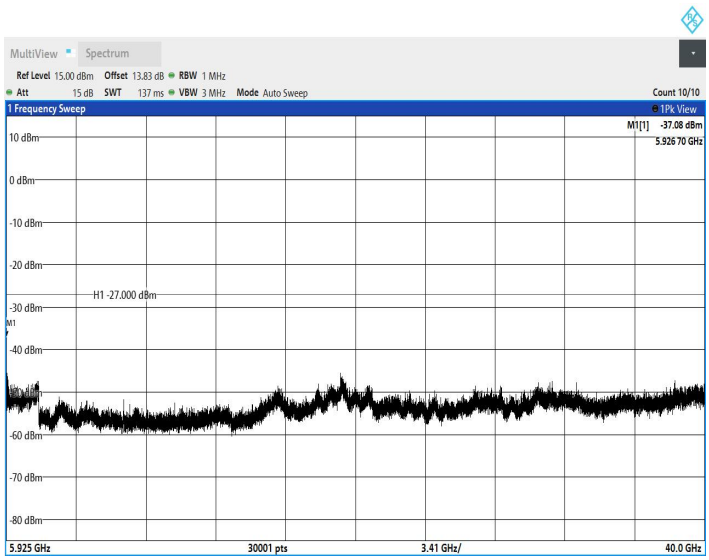


11AC20MIMO_Ant2_5785_5925~40000



11AC20MIMO_Ant1_5825_30~5650



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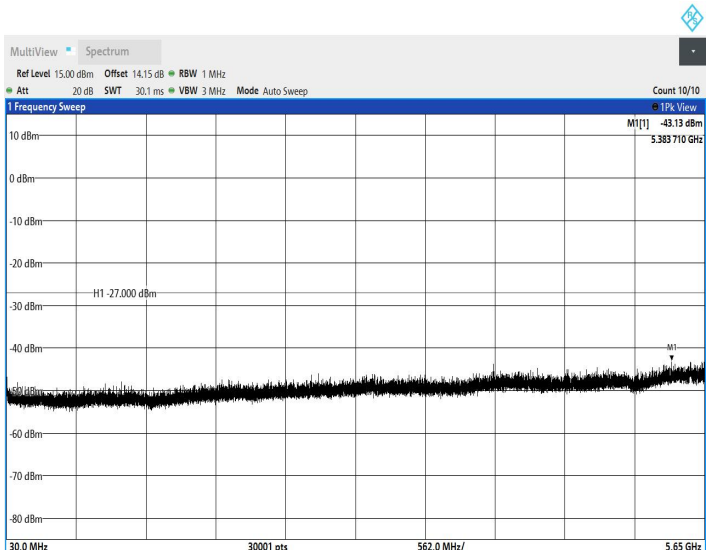

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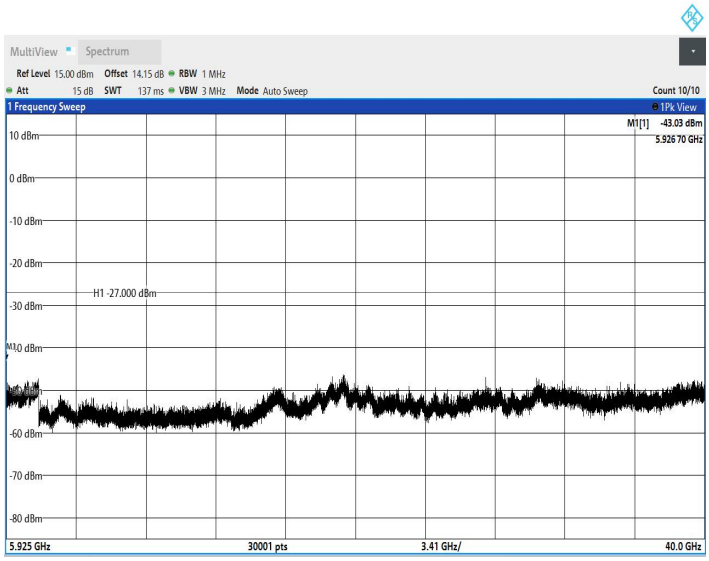
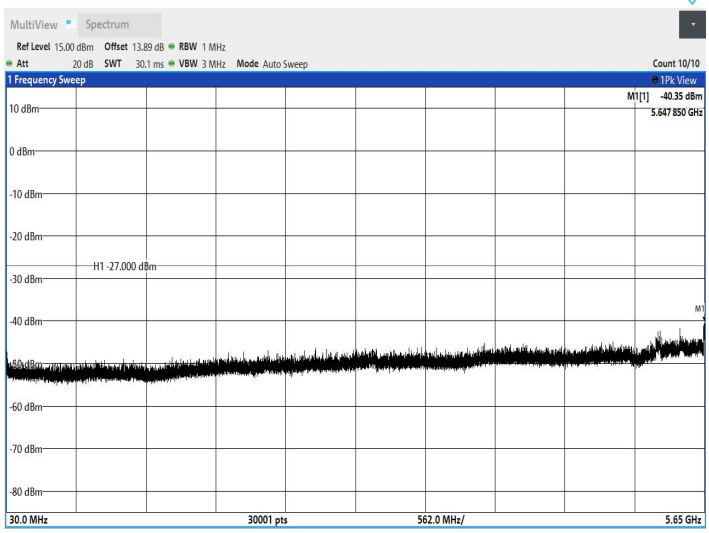


11AC20MIMO_Ant2_5825_5925~40000



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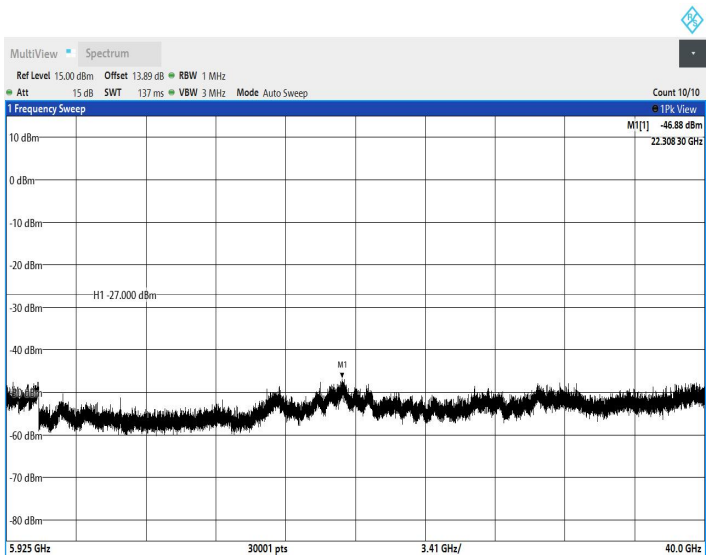

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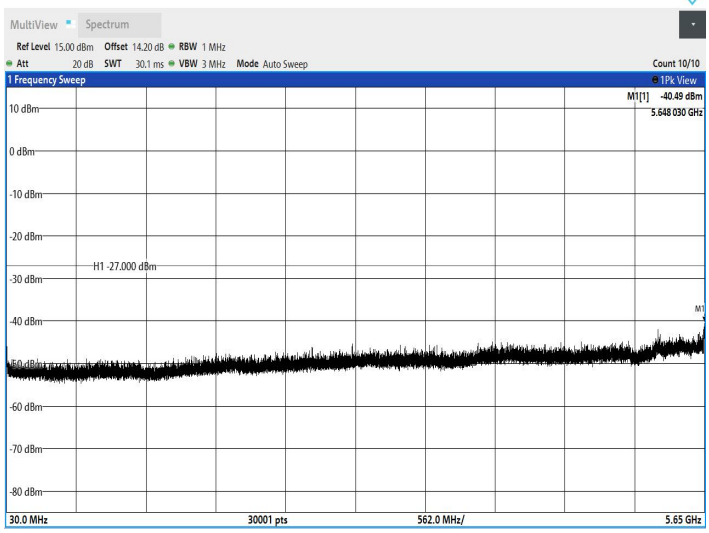

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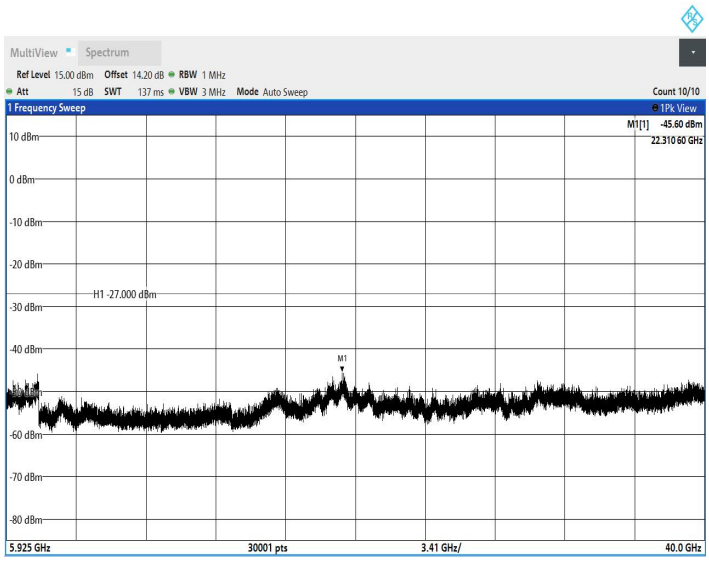

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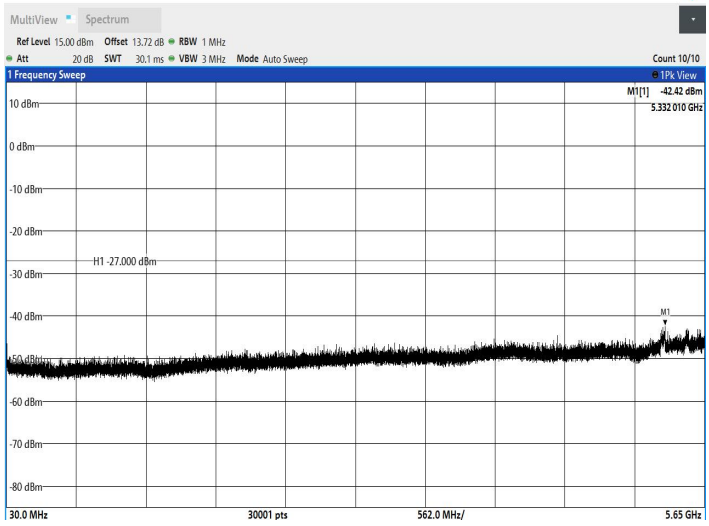

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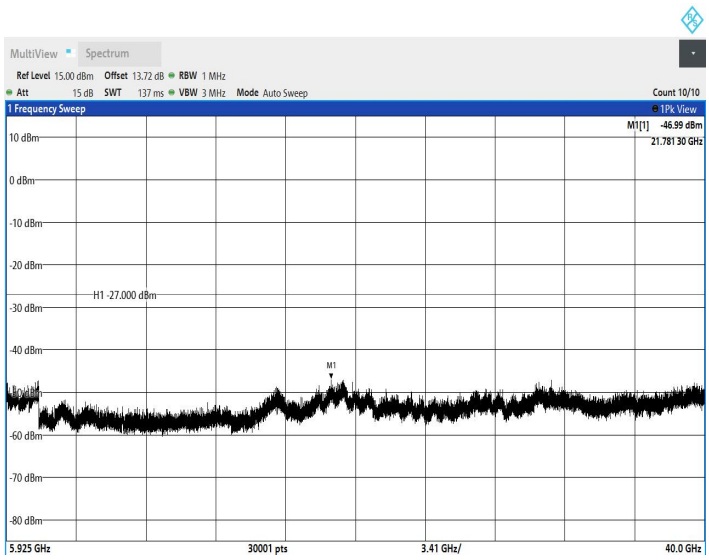

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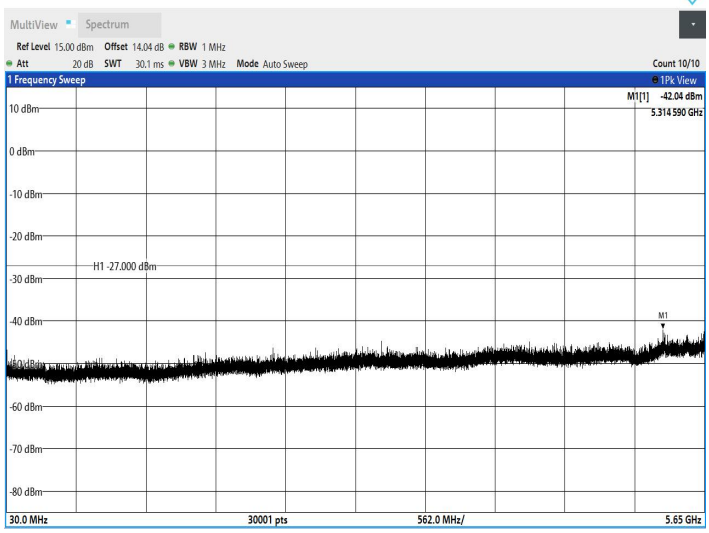

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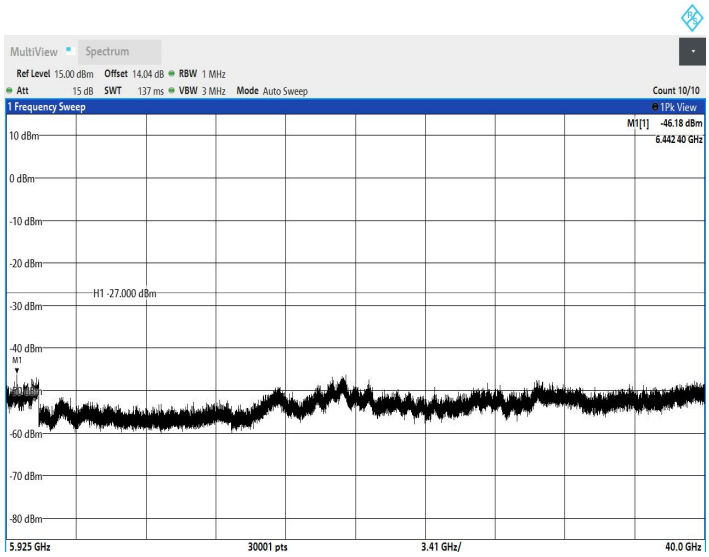

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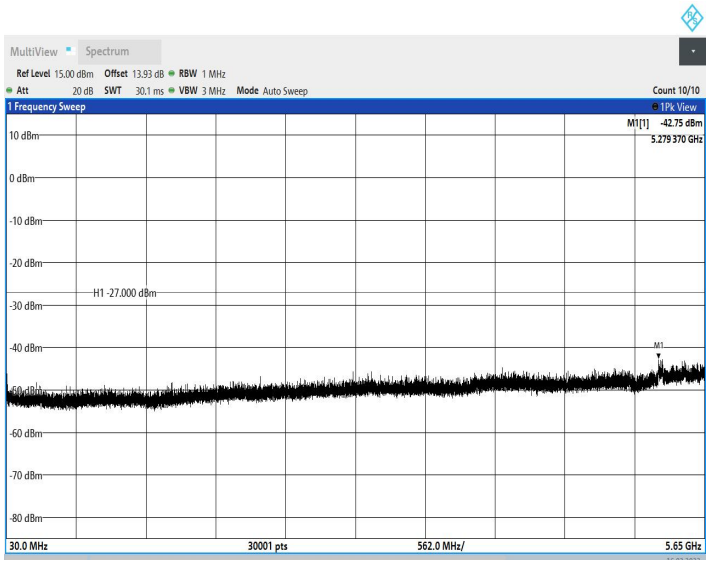

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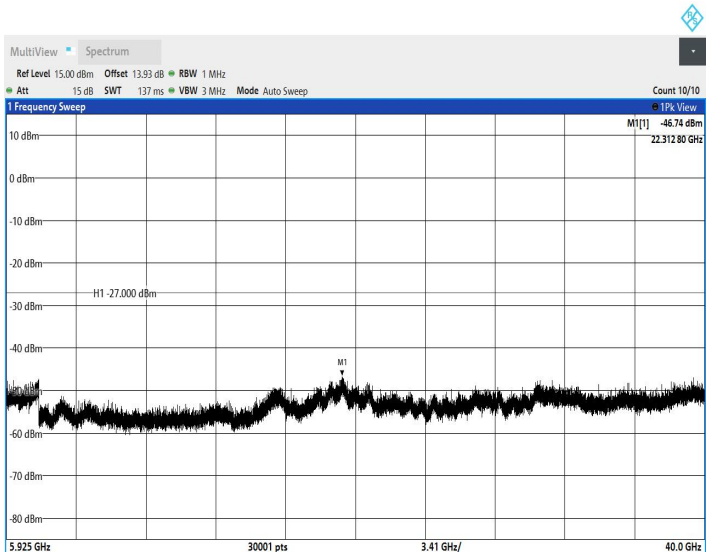

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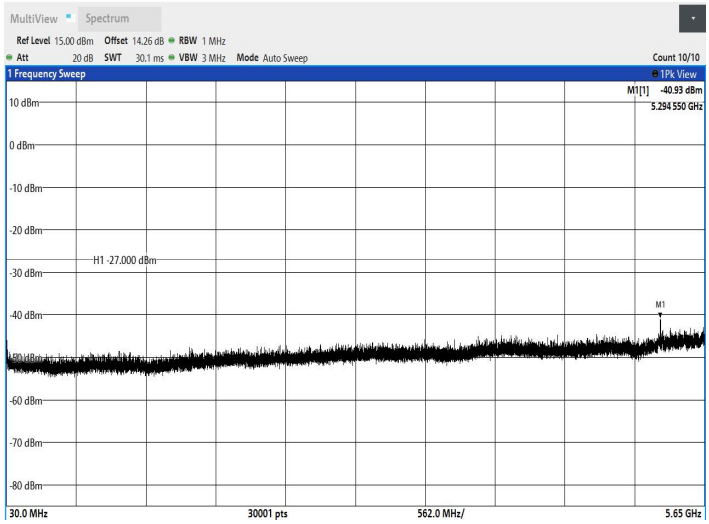
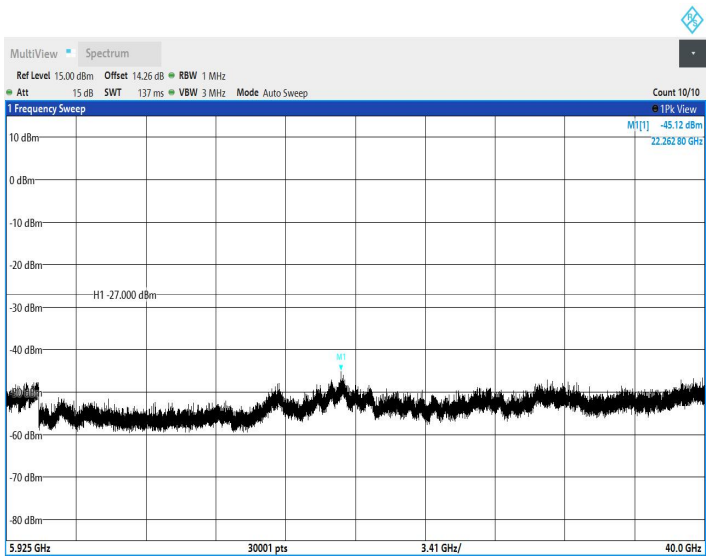


11AC80MIMO_Ant2_5775_30~5650



11AC80MIMO_Ant2_5775_5925~40000

Transmitter Spurious Emission - Radiated

The measurement is made according to ANSI C63.10.

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
0.009-0.490	2400/F(kHz)	129-94
0.490-1.705	24000/F(kHz)	74-63
1.705-30	30	70
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Measurement Uncertainty:

Measurement Uncertainty	30MHz-1000MHz: 4.09 dB(MAX) (k=2). 1000MHz-6000MHz : 4.84 dB (k=2). 6000MHz-18000MHz : 4.52 dB (k=2). 18GHz-26.5GHz: 6.19 dB (k=2). 26.5GHz-40GHz: 6.03 dB (k=2).

Test procedures

The measurement was applied in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, if applied, the pre-amplifier would be equipped just at the output terminal of the antenna.

Tabletop devices shall be placed on a nonconducting platform with nominal top surface dimensions 1 m by 1.5 m. For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m.

The turntable rotated 360 degrees to determine the position of the maximum emission level.

The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1meter to 4 meters to find out the maximum emission level.

The EUT was tested according to KDB 789033 D02: Section G.

The radiated emission was measured using the Spectrum Analyzer with the resolutions

bandwidth set as:

RBW = 300 Hz, VBW = 1 kHz (9 kHz~150 kHz);

RBW = 10 kHz, VBW = 30 kHz (150 kHz~30MHz);

RBW = 100 kHz, VBW = 300 kHz (30MHz~1GHz for PK)

RBW = 1MHz, VBW = 3MHz (>1GHz for PK);

Remark:

1. Factor= Antenna Factor + Cable Loss (-Amplifier, is employed)

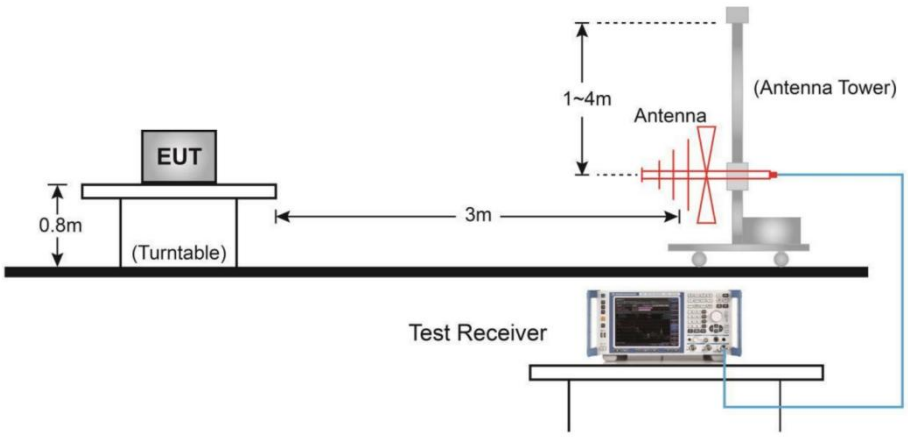
2. Measured level= Original Receiver Reading + Factor

3. Margin = Limit – Measured level

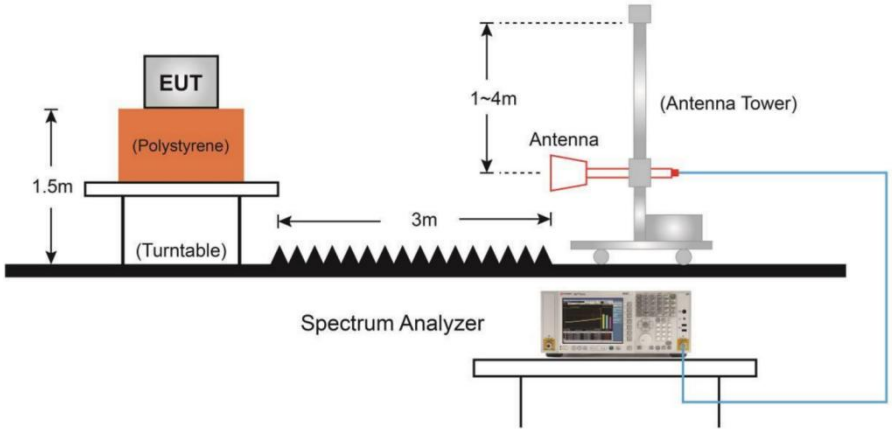
4. If the PK measured level is lower than AV limit, the AV test can be elided.Modulation type and data rate tested (Only worst case result is given below):

Mode	Data rate	Channel
802.11a	6Mbps	149,157,165
802.11n-HT20	MCS0	149,157,165
802.11n-HT40	MCS0	151,159
802.11ac-HT20	MCS0	149,157,165
802.11ac-HT40	MCS0	151,159
802.11ac-HT80	MCS0	155

Below 1GHz Test Setup



Above 1GHz Test Setup

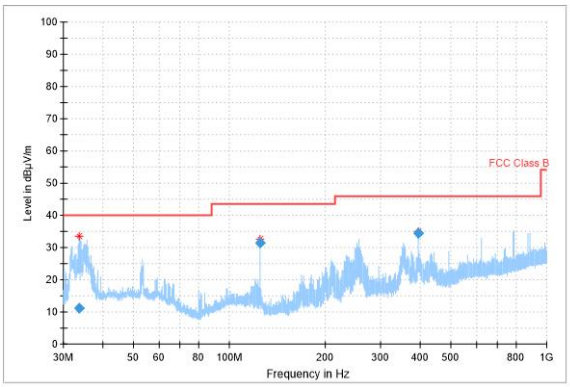
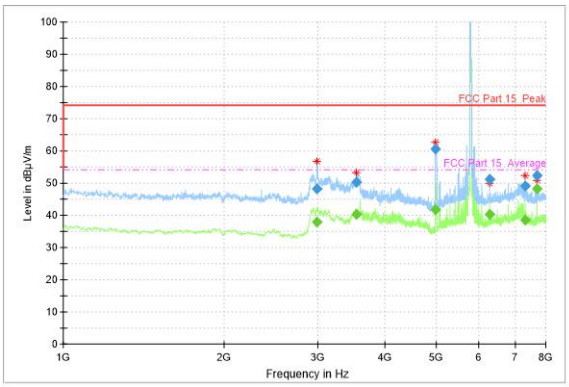
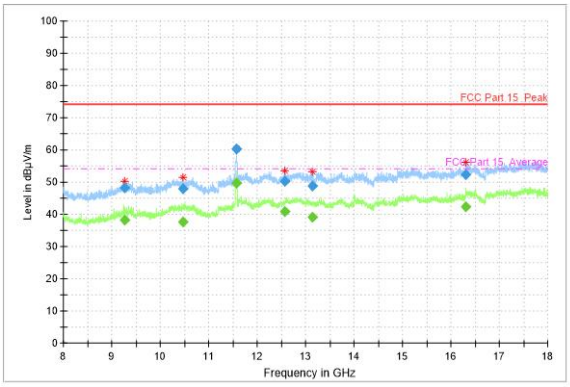
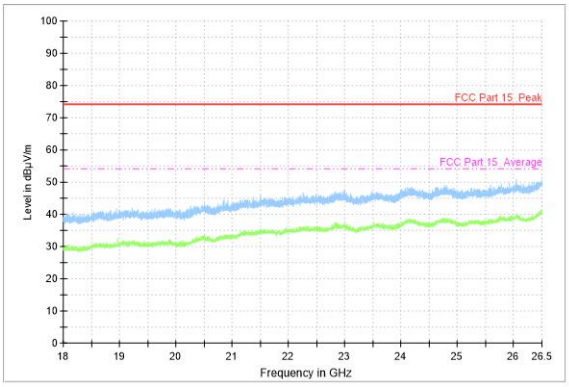
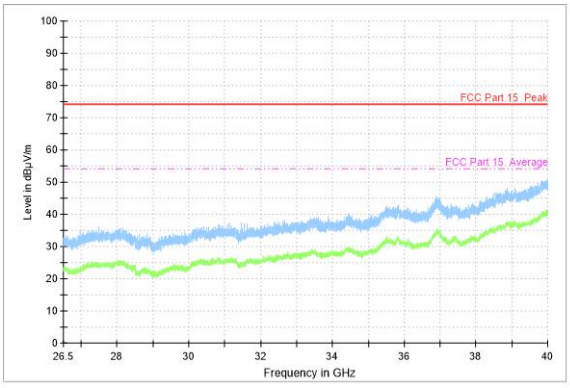
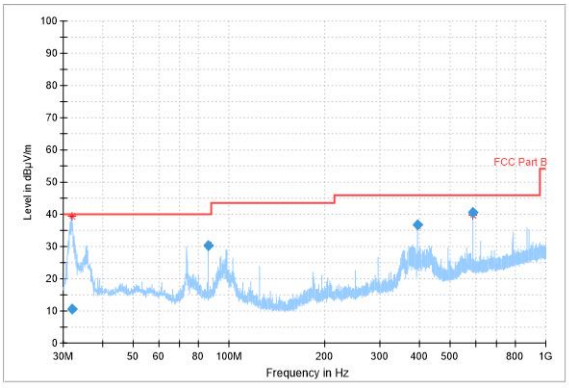

EUT
(Polystyrene)
1.5m
(Turntable)
3m
1~4m
Antenna
(Antenna Tower)
Spectrum Analyzer

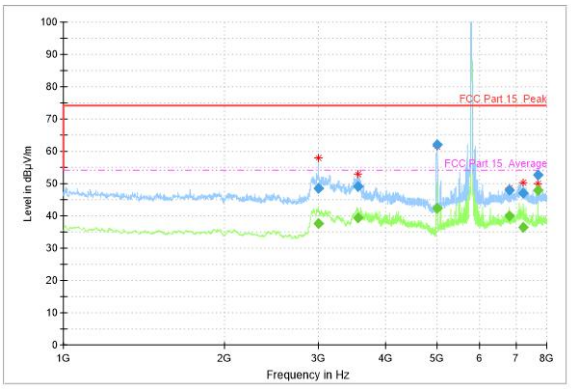
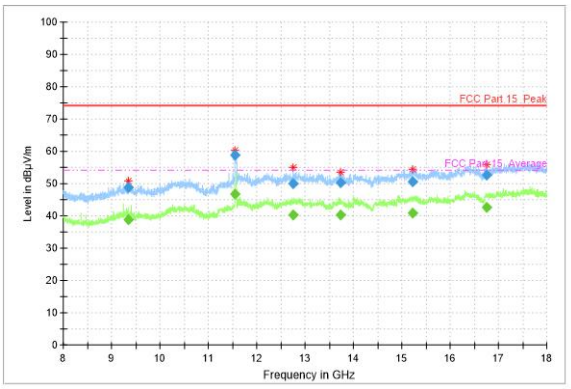
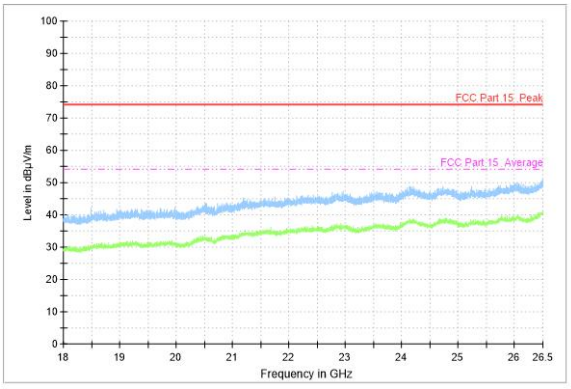
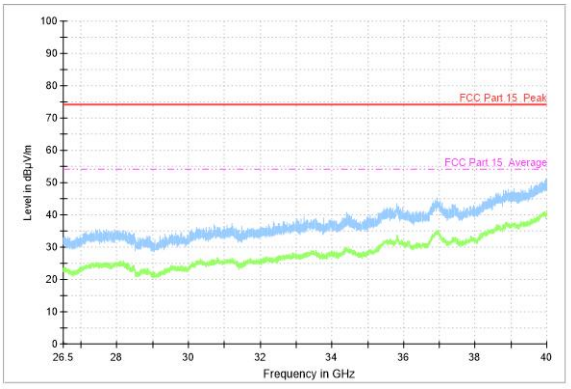
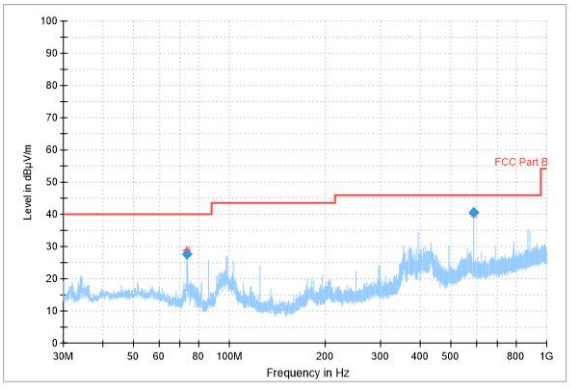
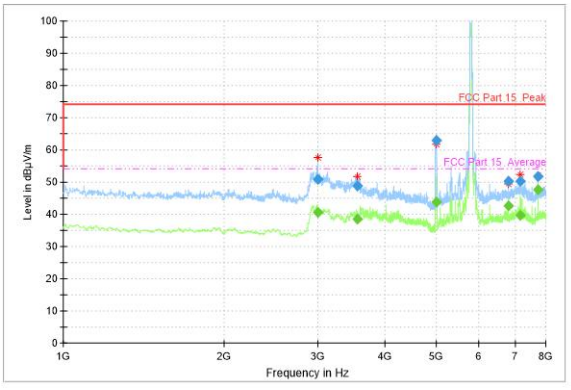
6.6.2.2 Measurement Results

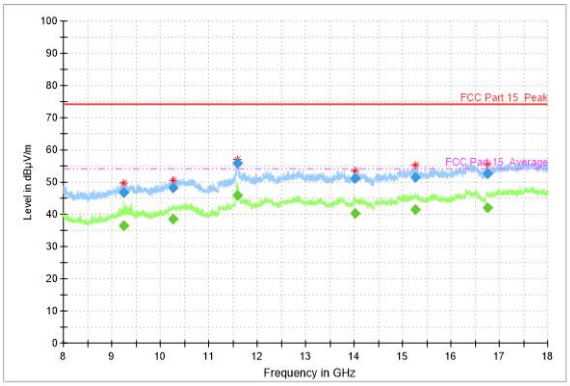
Mode	Channel	Frequency Range	Conclusion
802.11a	157(5785MHz)	30 MHz ~1 GHz	P
		1 GHz ~ 8 GHz	P
		8 GHz ~ 18 GHz	P
		18 GHz ~ 26.5 GHz	P
		26.5 GHz~ 40 GHz	P
802.11n-HT20	157(5785MHz)	30 MHz ~1 GHz	P
		1 GHz ~ 8 GHz	P
		8 GHz ~ 18 GHz	P
		18 GHz ~ 26.5 GHz	P
		26.5 GHz~ 40 GHz	P
802.11n-HT40	159(5795MHz)	30 MHz ~1 GHz	P
		1 GHz ~ 8 GHz	P
		8 GHz ~ 18 GHz	P
		18 GHz ~ 26.5 GHz	P
		26.5 GHz~ 40 GHz	P
802.11ac-VHT20	165(5825MHz)	30 MHz ~1 GHz	P
		1 GHz ~ 8 GHz	P
		8 GHz ~ 18 GHz	P
		18 GHz ~ 26.5 GHz	P
		26.5 GHz~ 40 GHz	P
802.11ac-VHT40	151(5755MHz)	30 MHz ~1 GHz	P
		1 GHz ~ 8 GHz	P
		8 GHz ~ 18 GHz	P
		18 GHz ~ 26.5 GHz	P
		26.5 GHz~ 40 GHz	P
802.11ac-VHT80	155(5775MHz)	30 MHz ~1 GHz	P
		1 GHz ~ 8 GHz	P
		8 GHz ~ 18 GHz	P

		18 GHz ~ 26.5 GHz	P
		26.5 GHz~ 40 GHz	P

The test data below 30MHz is more than 20dB lower than the limit value, so it is not provided in the report.

Radiated Spurious Emission (802.11a, ch157, 30MHz-1GHz)	Radiated Spurious Emission (802.11a, ch157, 1GHz-8GHz)
	
Radiated Spurious Emission (802.11a, ch157, 8GHz-18GHz)	Radiated Spurious Emission (802.11a, ch157, 18GHz-26.5GHz)
	
Radiated Spurious Emission (802.11a, ch157, 26.5GHz-40GHz)	Radiated Spurious Emission (802.11n-HT20, ch157, 30MHz-1GHz)
	

Radiated Spurious Emission (802.11n-HT20, ch157, 1GHz-8GHz)	Radiated Spurious Emission (802.11n-HT20, ch157, 8GHz-18GHz)
	
Radiated Spurious Emission (802.11n-HT20, ch157, 18GHz-26.5GHz)	Radiated Spurious Emission (802.11n-HT20, ch157, 26.5GHz-40GHz)
	
Radiated Spurious Emission (802.11n-HT40, ch159, 30MHz-1GHz)	Radiated Spurious Emission (802.11n-HT40, ch159, 1GHz-8GHz)
	
Radiated Spurious Emission (802.11n-HT40, ch159, 8GHz-18GHz)	Radiated Spurious Emission (802.11n-HT40, ch159, 18GHz-26.5GHz)



Radiated Spurious Emission
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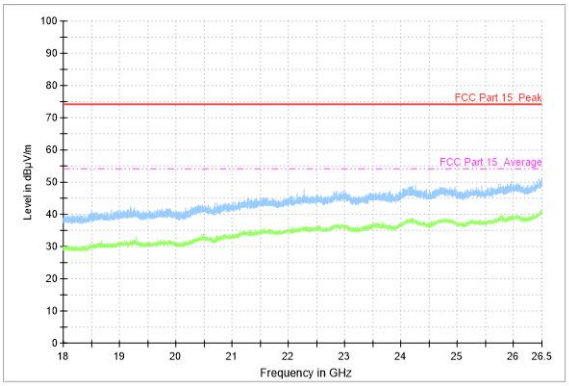

Radiated Spurious Emission
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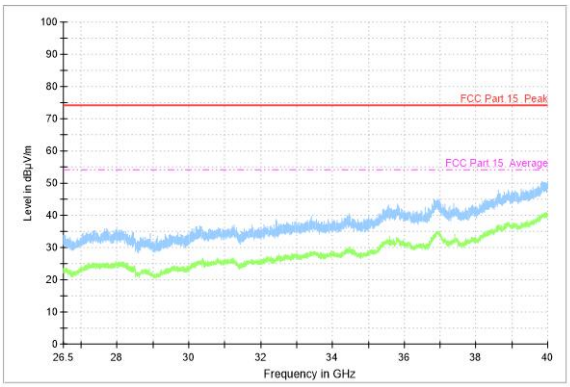

Radiated Spurious Emission
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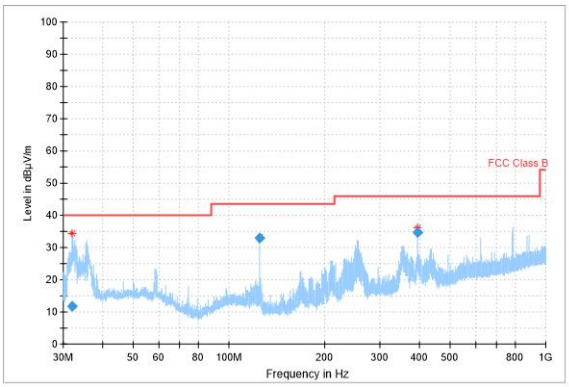

Radiated Spurious Emission
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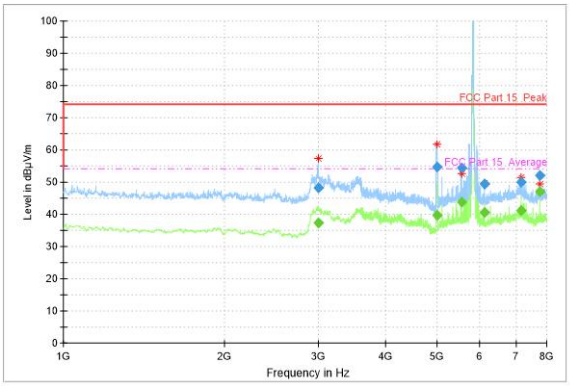

Radiated Spurious Emission
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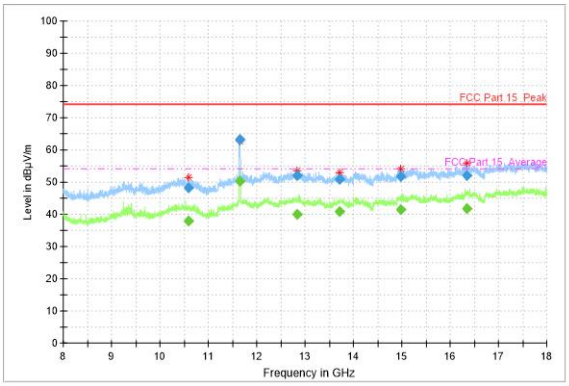

Radiated Spurious Emission
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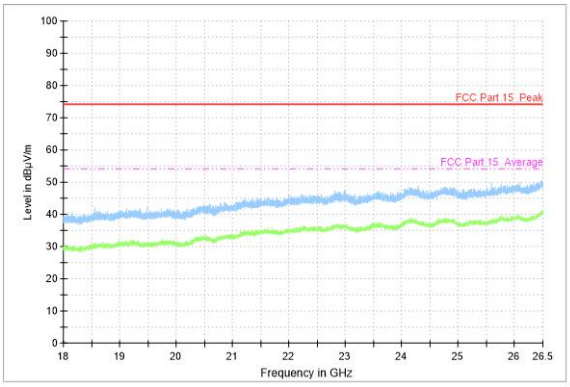

Radiated Spurious Emission
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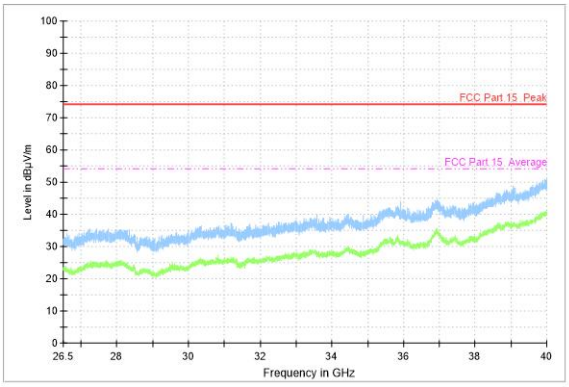
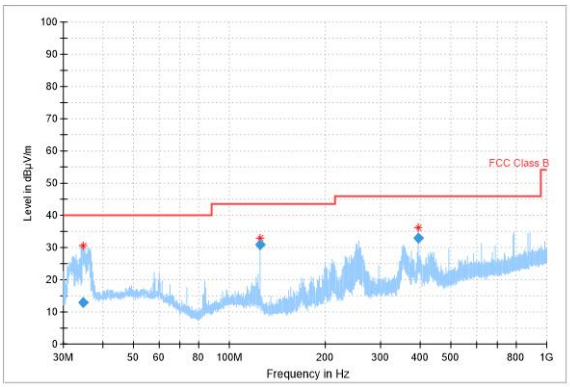
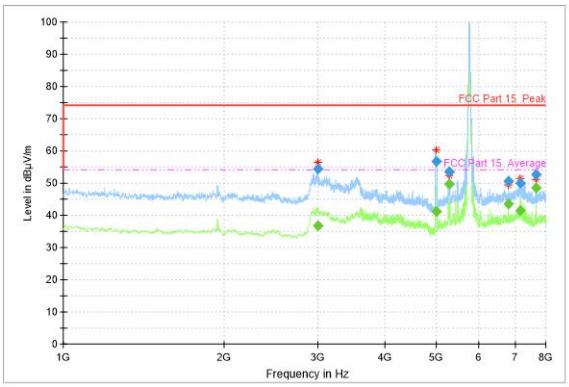


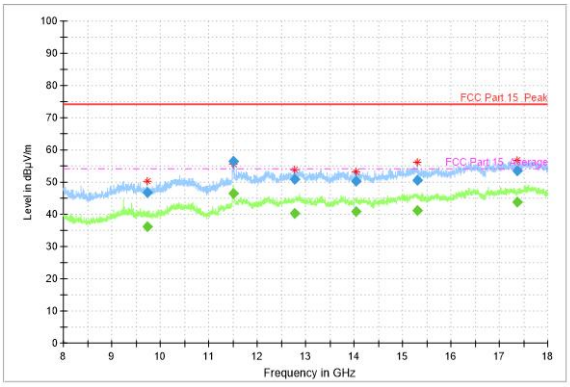
Radiated Spurious Emission
(802.11ac-VHT40, ch151, 1GHz-8GHz)



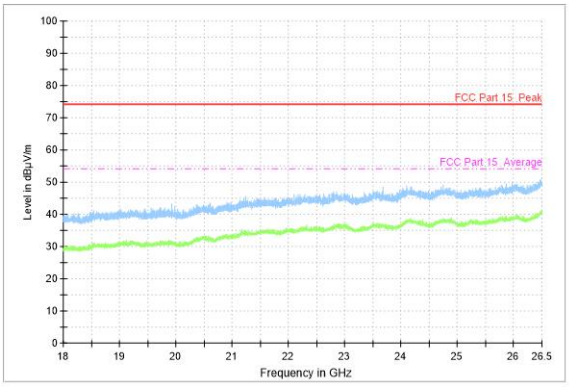
Radiated Spurious Emission
(802.11ac-VHT40, ch151, 8GHz-18GHz)



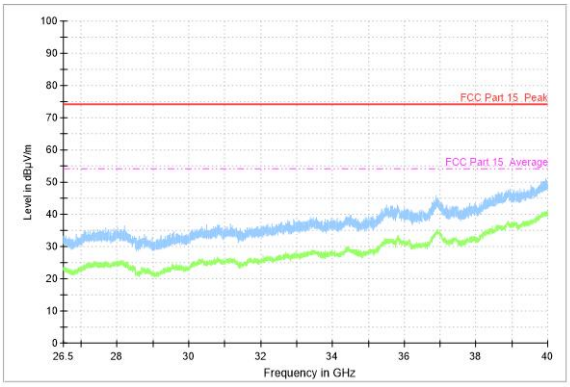
Radiated Spurious Emission
(802.11ac-VHT40, ch151, 18GHz-26.5GHz)



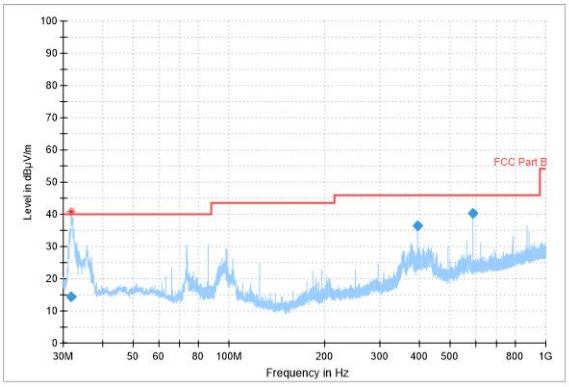
Radiated Spurious Emission
(802.11ac-VHT40, ch151, 26.5GHz-40GHz)



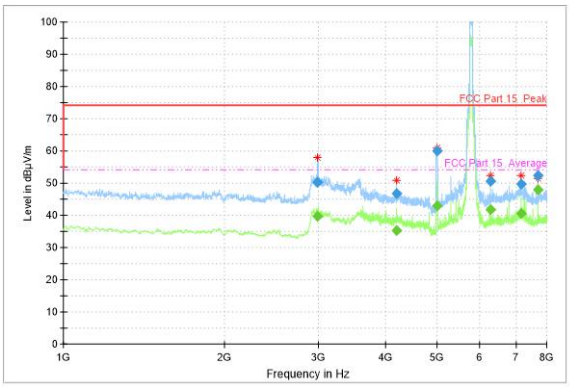
Radiated Spurious Emission
(802.11ac-VHT80, ch155, 30MHz-1GHz)



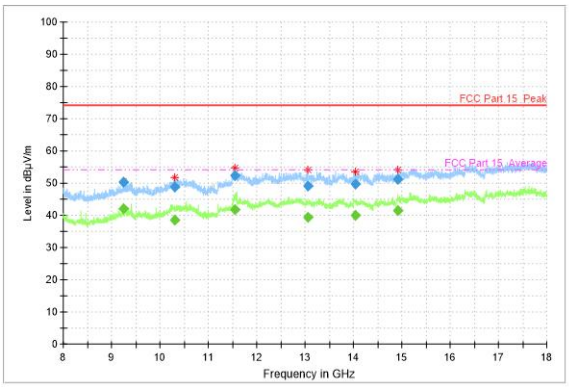
Radiated Spurious Emission
(802.11ac-VHT80, ch155, 1GHz-8GHz)



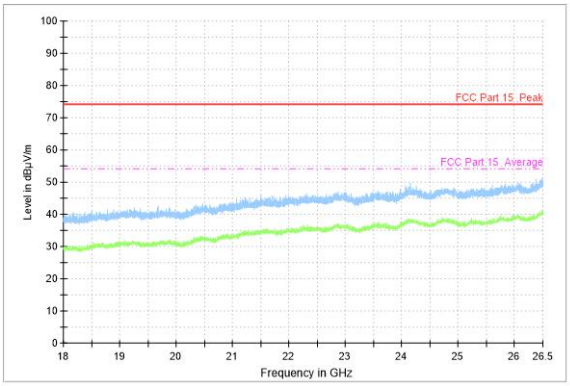
Radiated Spurious Emission
(802.11ac-VHT80, ch155, 8GHz-18GHz)

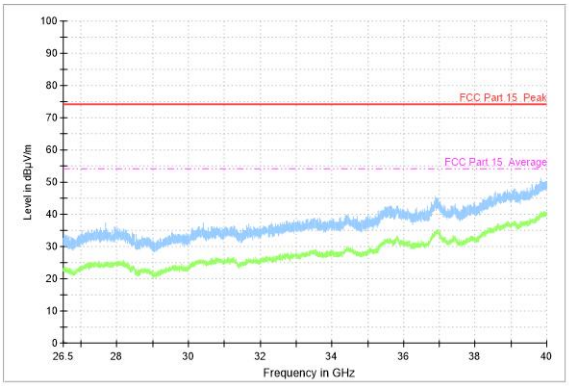


Radiated Spurious Emission
(802.11ac-VHT80, ch155, 18GHz-26.5GHz)



Radiated Spurious Emission
(802.11ac-VHT80, ch155, 26.5GHz-40GHz)





Note:

1. Only data in worst mode is provided
2. The out-of- limit signal in the picture is the main frequency signal.

802.11a mode

Channel 157(30MHz ~ 1GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
33.8	11.17	-14.1	25.27	V
125.0	31.58	-15.9	47.48	H
393.2	34.51	-8.3	42.81	V

Channel 157 (1GHz-8GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
2987.2	48.36	1.9	46.46	V
3539.2	50.39	1.2	49.19	H
4977.2	60.45	3.2	57.25	V
6279.6	51.24	2.9	48.34	H
7315.0	49.09	4	45.09	H
7713.4	52.46	3.8	48.66	V

Channel 157 (1GHz-8GHz) (Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
4977.2	41.81	3.2	38.61	V

Channel 157 (8GHz-18GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
9274.8	48.13	5.2	42.93	H
10472.6	47.84	7.5	40.34	V
11575.0	60.35	9.7	50.65	H
12575.4	50.29	10.5	39.79	H
13151.4	48.95	10.4	38.55	V
16313.6	52.22	16.1	36.12	H

Channel 157 (8GHz-18GHz) (Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
11575.0	49.63	9.7	39.93	H

802.11n mode

Channel 157(30MHz ~ 1GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
32.0	10.73	-14.3	25.03	H
86.0	30.24	-16.5	46.74	H
393.2	36.82	-8.2	45.02	V
589.8	40.48	-3.7	44.18	V

Channel 157 (1GHz-8GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
2993.4	48.46	1.8	46.66	V

3551.0	49.24	1.2	48.04	H
4988.2	61.98	3.7	58.28	V
6812.6	47.98	3.4	44.58	V
7225.4	47.04	3.9	43.14	V
7713.4	52.55	3.8	48.75	V

Channel 157 (1GHz-8GHz) (Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
4988.2	42.38	3.7	38.68	V

Channel 157 (8GHz-18GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
9341.8	48.95	5.7	43.25	H
11558.6	58.73	9.7	49.03	H
12757.0	50.12	10.9	39.22	V
13740.0	50.39	11.7	38.69	H
15216.0	50.52	14.1	36.42	H
16751.0	52.55	16.7	35.85	V

Channel 157 (8GHz-18GHz) (Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
11558.6	46.8	9.7	37.1	H

802.11n-HT40 mode

Channel 159(30MHz-1GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
73.7	27.7	-16.6	44.3	V
589.8	40.54	-3.7	44.24	V

Channel 159 (1GHz-8GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
3000.2	50.81	1.6	49.21	V
3549.2	48.74	1.2	47.54	V
4999.8	62.85	4.1	58.75	V
6812.4	50.17	3.4	46.77	H
7152.4	50.25	4.1	46.15	V
7726.8	51.65	3.8	47.85	V

Channel 159 (1GHz-8GHz) (Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
4999.8	43.86	4.1	39.76	V

Channel 159 (8GHz-18GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
9251.2	46.7	5.1	41.6	V
10271.0	48.13	7.5	40.63	H
11596.8	55.97	9.8	46.17	H
14010.6	51.1	12.4	38.7	H
15273.8	51.6	14.4	37.2	H
16748.0	52.68	16.7	35.98	H

Channel 159 (8GHz-18GHz) (Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
11596.8	45.91	9.8	36.11	H

802.11ac-VHT20 mode

Channel 165(30MHz-1GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
32.1	11.8	-14.4	26.2	V
125.0	32.87	-15.9	48.77	H
393.2	34.61	-8.3	42.91	V

Channel 165(1GHz-8 GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
2999.2	48.2	1.7	46.5	V
4986.2	54.8	3.6	51.2	V
5540.6	54.3	2.2	52.1	H
6114.2	49.36	2.6	46.76	H
7152.0	50.12	4.1	46.02	V
7766.6	51.96	4.1	47.86	V

Channel 165(1GHz-8 GHz) (Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
4986.2	39.68	3.6	36.08	V
5540.6	43.74	2.2	41.54	H

Channel 165(8GHz-18 GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
10589.6	48.25	7.6	40.65	H
11648.0	63.35	9.9	53.45	H
12838.2	52.08	11.1	40.98	V
13723.2	51.01	11.7	39.31	H
14974.8	51.73	13.8	37.93	H
16339.4	51.93	16.2	35.73	V

Channel 165(1GHz-8 GHz) (Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
11648.0	50.19	9.9	40.29	H

Channel 165(8GHz-18 GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
9418.6	50.57	5.9	44.67	H
10606.2	49.01	7.6	41.41	H
11644.2	61.7	9.9	51.8	H
12844.4	49.53	11.1	38.43	V
14153.4	50.24	12.4	37.84	H
16308.2	52.09	16.1	35.99	H

Channel 165(1GHz-8 GHz) (Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
11644.2	50.76	9.9	40.86	H

802.11ac-VHT40 mode

Channel 151(30MHz-1GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
34.7	12.99	-13.9	26.89	V
125.0	30.86	-15.9	46.76	H
393.2	33.02	-8.3	41.32	V

Channel 151(1GHz-8 GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
2997.4	54.5	1.7	52.8	V
4996.6	56.62	4	52.62	V
5275.0	53.52	2.2	51.32	V
6812.6	50.6	3.4	47.2	V
7152.6	50.06	4.1	45.96	V
7673.4	52.64	3.6	49.04	V

Channel 151(1GHz-8 GHz) (Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
2997.4	36.88	1.7	35.18	V
4996.6	41.25	4	37.25	V

Channel 151(8GHz-18 GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
9739.2	46.72	5.5	41.22	H
11510.6	56.56	9.4	47.16	H

12772.8	50.97	10.9	40.07	H
14044.8	50.26	12.4	37.86	H
15300.8	50.7	14.4	36.3	H
17377.0	53.4	17.8	35.6	H

Channel 151(8GHz-18 GHz) (Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
11510.6	46.61	9.4	37.21	H

802.11ac-VHT80 mode

Channel 155(30MHz-1GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
31.8	14.51	-14.4	28.91	H
393.2	36.6	-8.2	44.8	V
589.8	40.37	-3.7	44.07	V

Channel 155(1GHz-8 GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
2988.8	50.33	1.9	48.43	V
4189.6	46.73	0.9	45.83	V
4982.8	59.92	3.5	56.42	V
6279.0	50.64	2.9	47.74	V
7152.6	49.73	4.1	45.63	V
7700.0	52.41	3.7	48.71	V

Channel 155(1GHz-8 GHz) (Average)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
4982.8	43.02	3.5	39.52	V

Channel 155(8GHz-18 GHz)

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
9245.4	50.33	5.1	45.23	H
10315.4	48.73	7.7	41.03	H
11542.2	52.28	9.6	42.68	H
13065.0	49.24	10.7	38.54	H
14043.2	49.66	12.4	37.26	V
14921.8	51.3	13.8	37.5	V

6.8 Band Edges Compliance

Specifications:	FCC 47 Part 15.407(b)
DUT Serial Number:	S1
Test conditions:	Ambient Temperature:20℃ Relative Humidity:40% Air pressure: 90kPa
Test Results:	Pass

Measurement Limit

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(5) In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	[2]
13.36-13.41			

Measurement Uncertainty:

Measurement Uncertainty	4.84 dB (k=2)

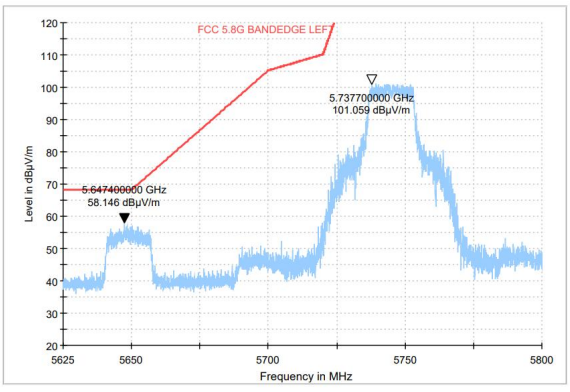
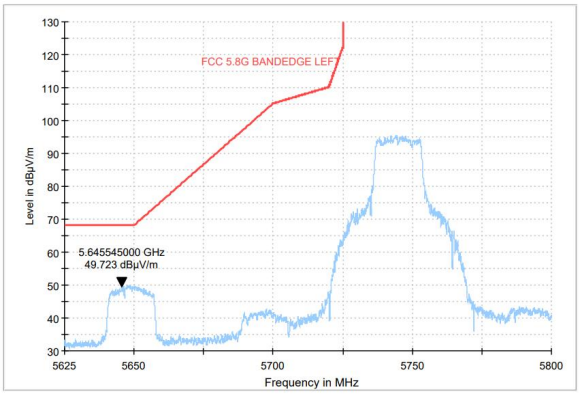
Set the spectrum analyzer in the following

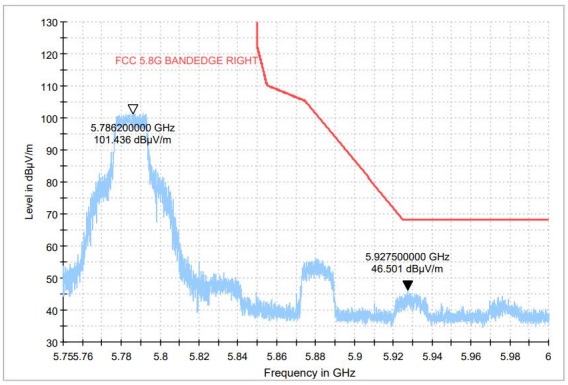
1. Sweep mode: SweepAnalyzer6db.
2. PEAK: RBW=1MHz / VBW=3MHz / Sweep=2.5ms， Sweep point;5001
3. AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=2.5ms， Sweep point;5001

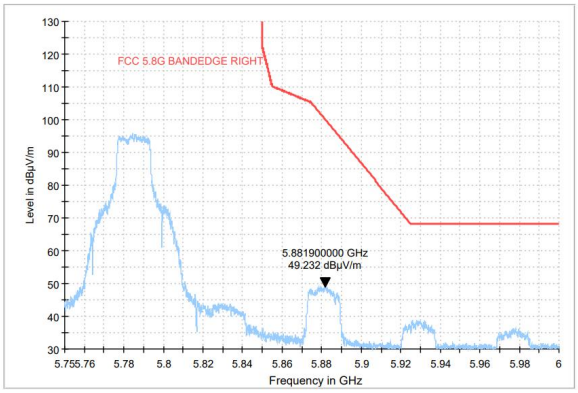
Measurement Result

Mode	Channel	Conclusion
802.11a	149	P
	165	P
802.11n HT20	149	P
	165	P
802.11n HT40	151	P
	159	P
802.11ac VHT20	149	P
	165	P
802.11ac VHT40	151	P
	159	P
802.11ac VHT80	155	P

Test graphs as below:

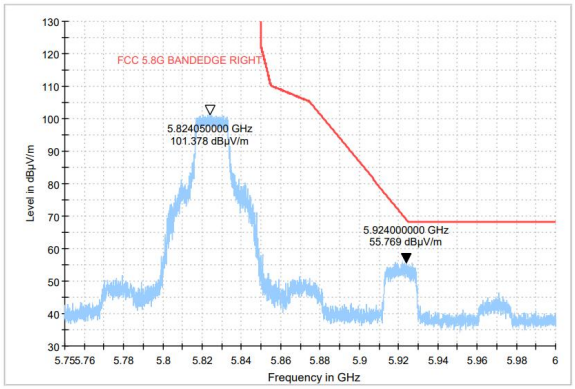
Band Edges (802.11a, CH149)	
Peak	Average
	
Band Edges (802.11a, CH157)	
Peak	Average

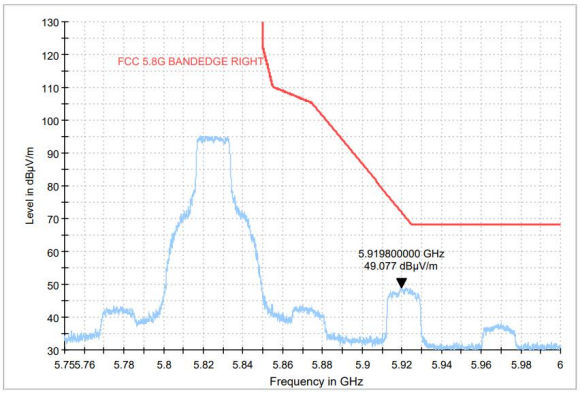




Band Edges (802.11a, CH165)

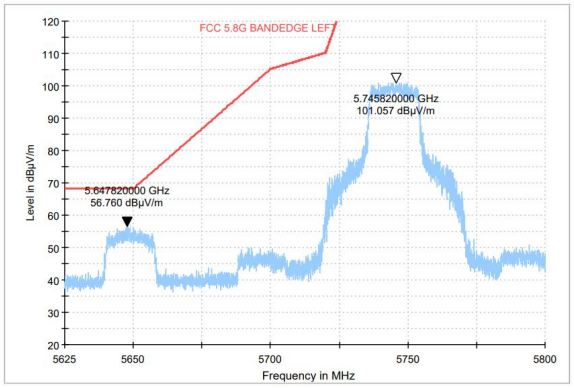
Peak	Average

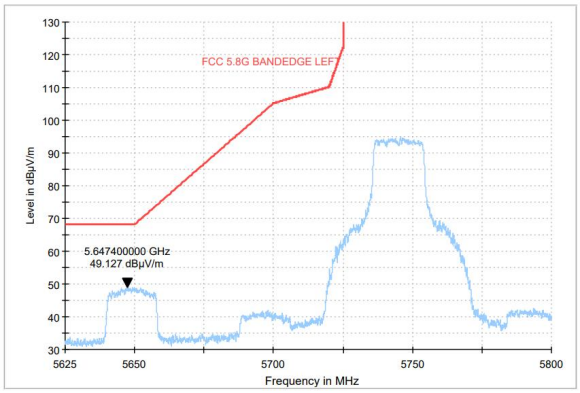




Band Edges (802.11n-HT20, CH149)

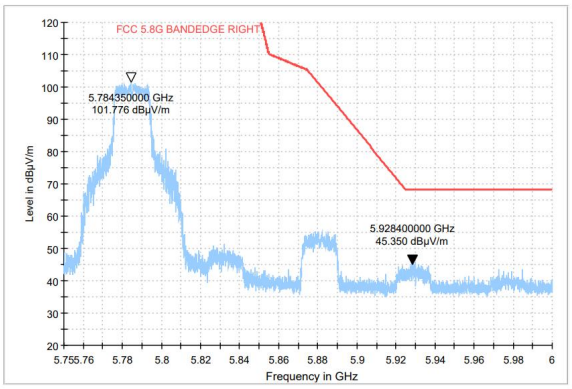
Peak	Average

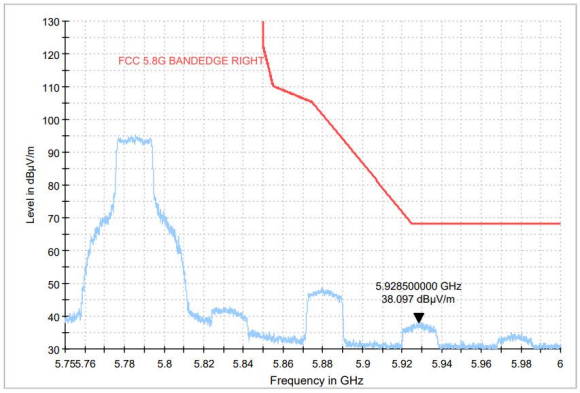




Band Edges (802.11n-HT20, CH157)

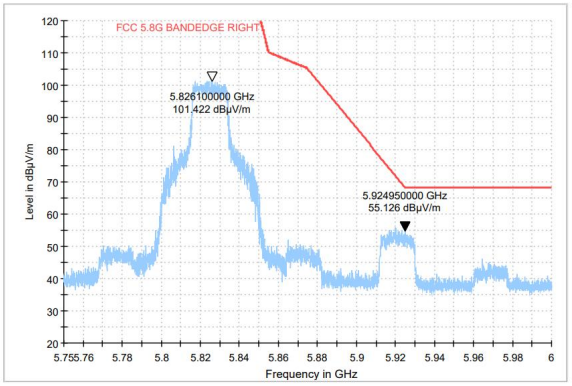
Peak	Average

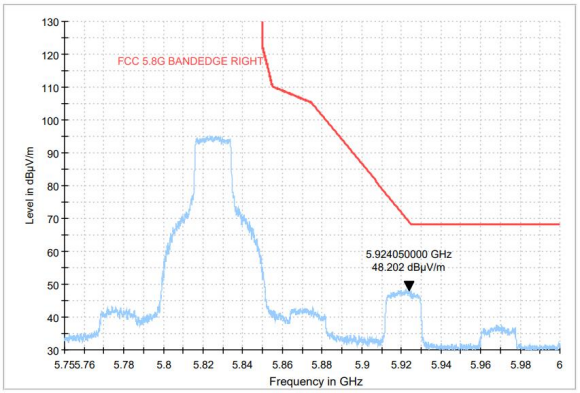




Band Edges (802.11n-HT20, CH165)

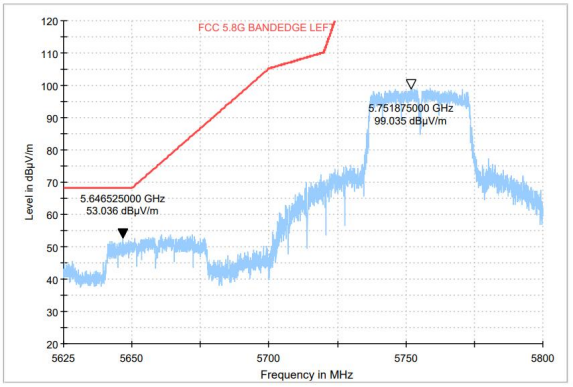
Peak	Average

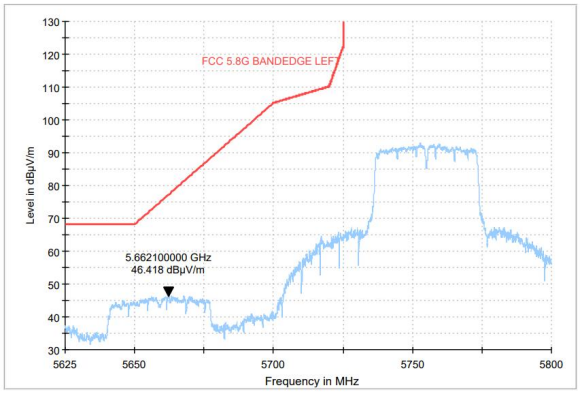




Band Edges (802.11n-HT40, CH151)

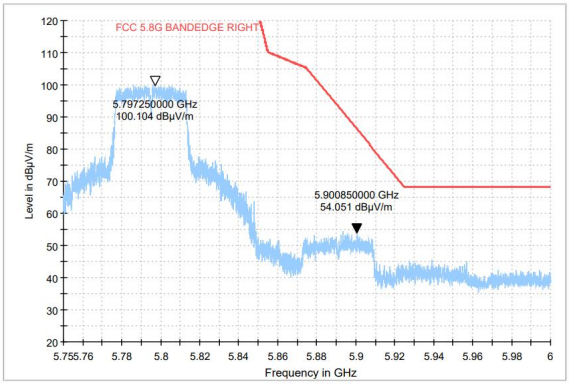
Peak	Average

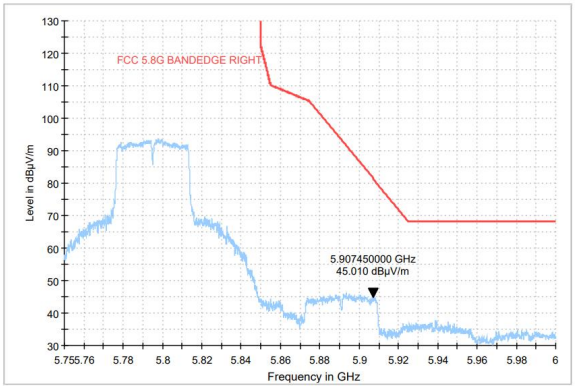




Band Edges (802.11n-HT40, CH159)

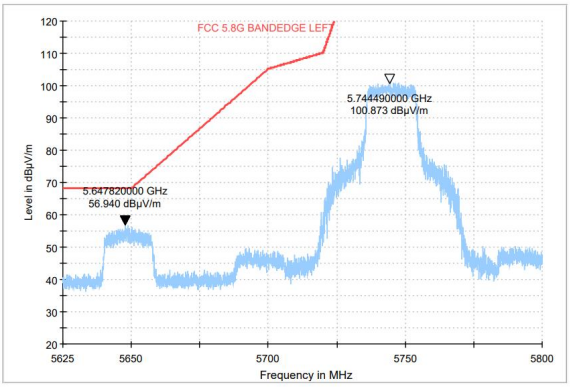
Peak	Average

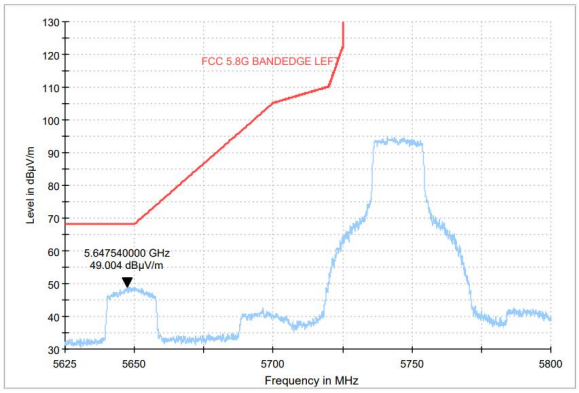




Band Edges (802.11ac-VHT20, CH149)

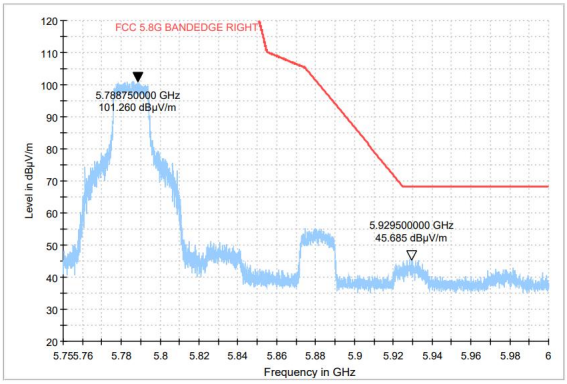
Peak	Average

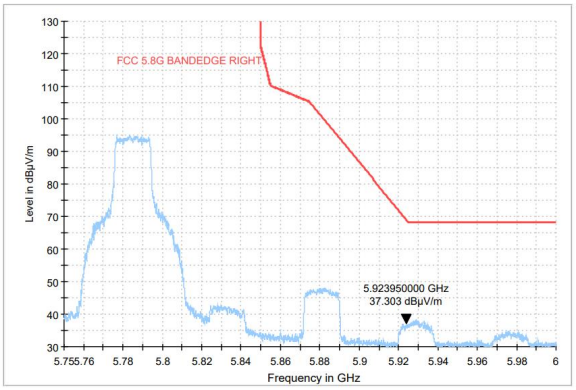




Band Edges (802.11ac-VHT20, CH157)

Peak	Average





Band Edges (802.11ac-VHT20, CH165)

Peak	Average