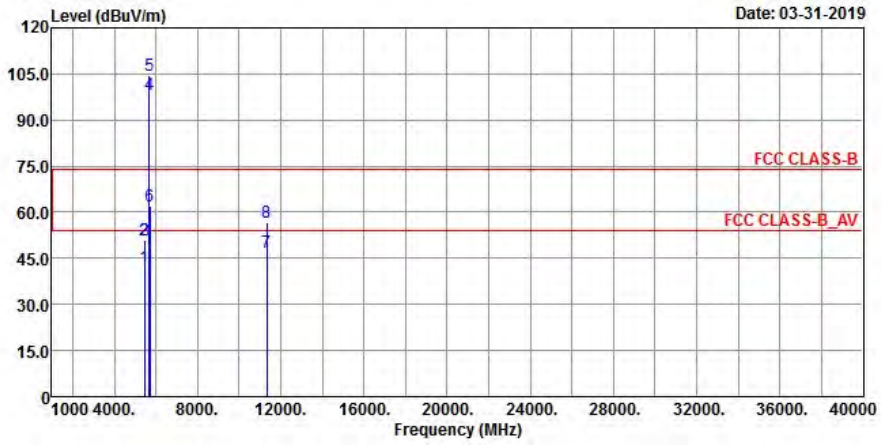
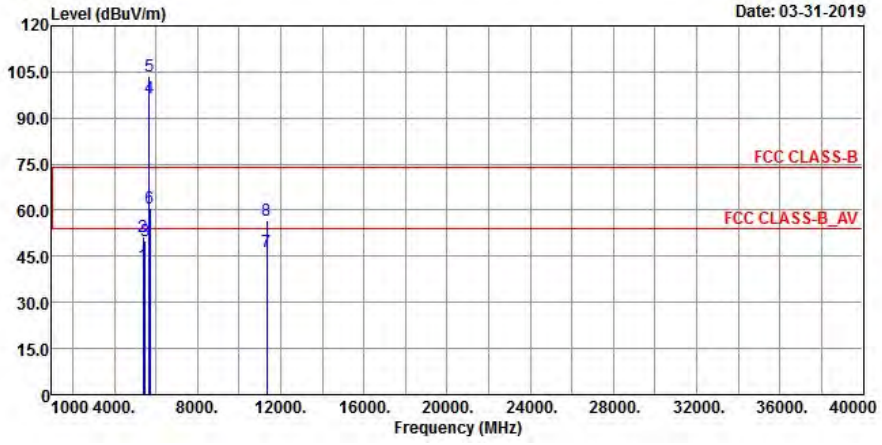
EUT Test Condition		Measurement Detail	
Channel	Channel 134	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Tim Chen

Horizontal



Vertical



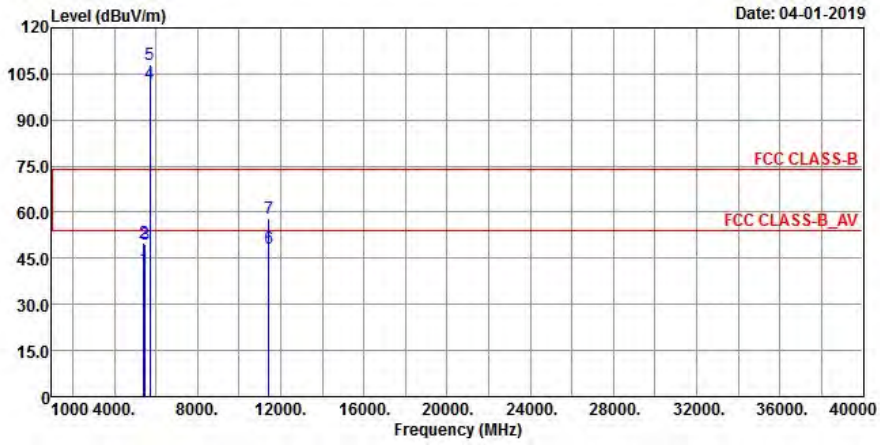
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5459.92	41.92	40.05	1.87	54	-12.08	172	2	Average
5459.92	50.88	49.01	1.87	74	-23.12	172	2	Peak
*5470	50.92	49.06	1.86	68.2	-17.28	172	2	Peak
5670	98.25	96.49	1.76			172	2	Average
5670	104.47	102.71	1.76			172	2	Peak
*5725	62.08	60.32	1.76	68.2	-6.12	172	2	Peak
11340	46.91	49.27	-2.36	54	-7.09	176	190	Average
11340	56.48	58.84	-2.36	74	-17.52	176	190	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5404.08	41.99	40.32	1.67	54	-12.01	196	103	Average
5404.08	51.26	49.59	1.67	74	-22.74	196	103	Peak
*5470	50.12	48.26	1.86	68.2	-18.08	196	103	Peak
5670	96.37	94.61	1.76			196	103	Average
5670	103.57	101.81	1.76			196	103	Peak
*5725	60.53	58.77	1.76	68.2	-7.67	196	103	Peak
11340	46.42	48.78	-2.36	54	-7.58	193	116	Average
11340	56.74	59.1	-2.36	74	-17.26	193	116	Peak

Remarks:

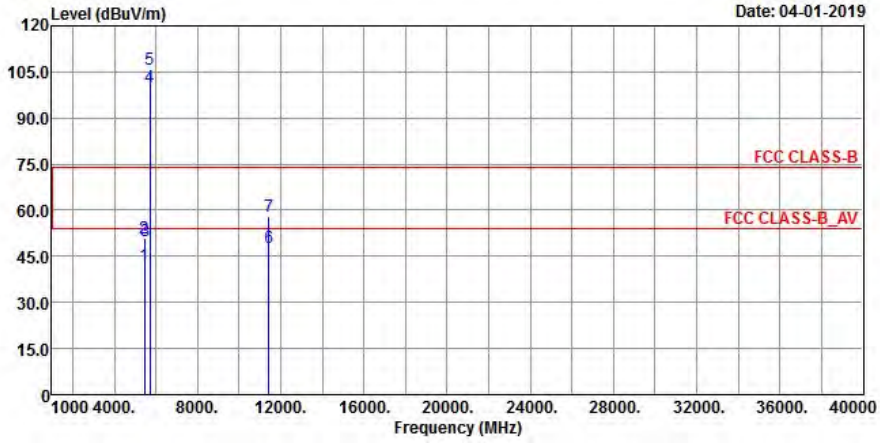
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5670 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 142	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Thomas Wei

Horizontal



Vertical



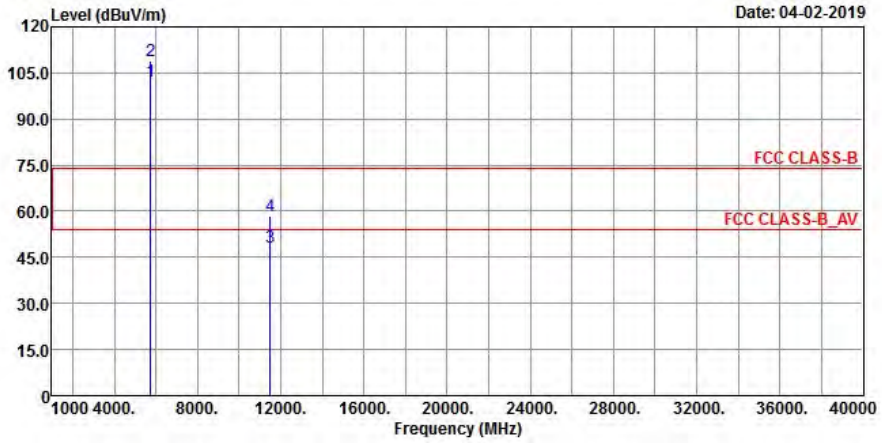
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5421.52	41.7	39.99	1.71	54	-12.3	174	13	Average
5421.52	50.11	48.4	1.71	74	-23.89	174	13	Peak
*5470	49.57	47.71	1.86	68.2	-18.63	174	13	Peak
5710	101.74	100.08	1.66			174	13	Average
5710	108.07	106.41	1.66			174	13	Peak
11420	48.27	50.51	-2.24	54	-5.73	123	272	Average
11420	58.07	60.31	-2.24	74	-15.93	123	272	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5456.4	42	40.13	1.87	54	-12	199	102	Average
5456.4	50.72	48.85	1.87	74	-23.28	199	102	Peak
*5470	50.19	48.33	1.86	68.2	-18.01	199	102	Peak
5710	100.05	98.39	1.66			199	102	Average
5710	105.73	104.07	1.66			199	102	Peak
11420	47.66	49.9	-2.24	54	-6.34	136	308	Average
11420	58.18	60.42	-2.24	74	-15.82	136	308	Peak

Remarks:

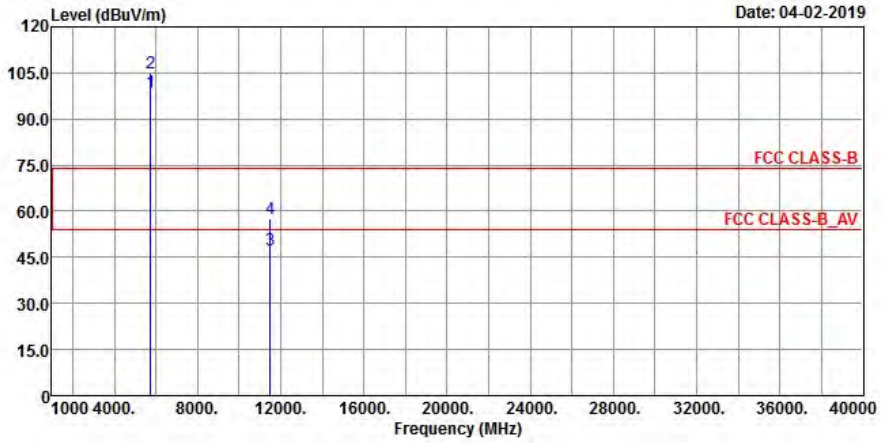
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5710 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 151	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Thomas Wei

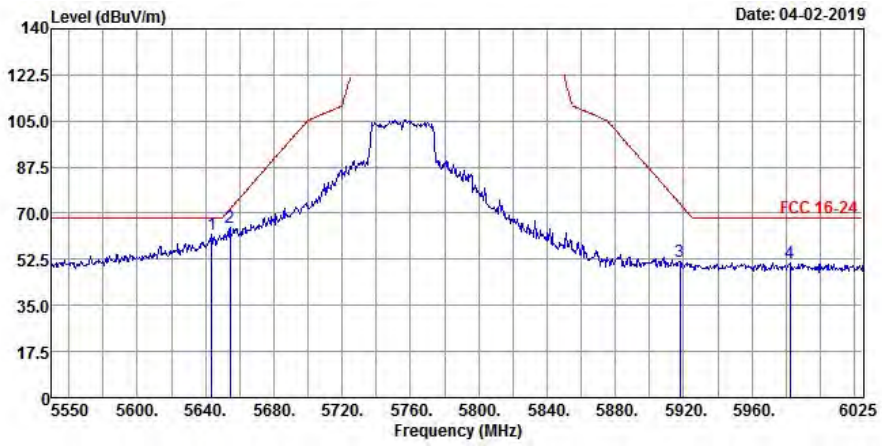
<Spurious Emission>
Horizontal



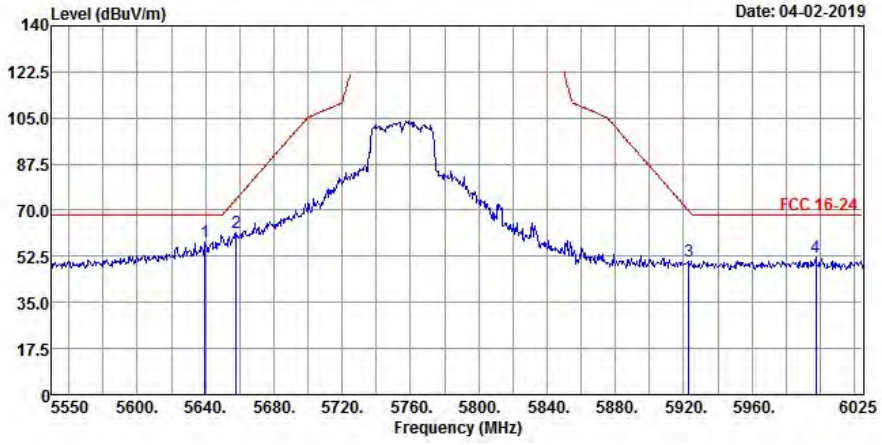
Vertical



<Out of Band Emission (OOBE)>
Horizontal



Vertical



<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5755	102.37	100.47	1.9			182	7	Average
5755	109.03	107.13	1.9			182	7	Peak
11510	48.28	50.49	-2.21	54	-5.72	123	275	Average
11510	58.67	60.88	-2.21	74	-15.33	123	275	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5755	98.61	96.71	1.9			200	103	Average
5755	104.77	102.87	1.9			200	103	Peak
11510	47.28	49.49	-2.21	54	-6.72	128	327	Average
11510	57.42	59.63	-2.21	74	-16.58	128	327	Peak

<Out of Band Emission (OOBE)>

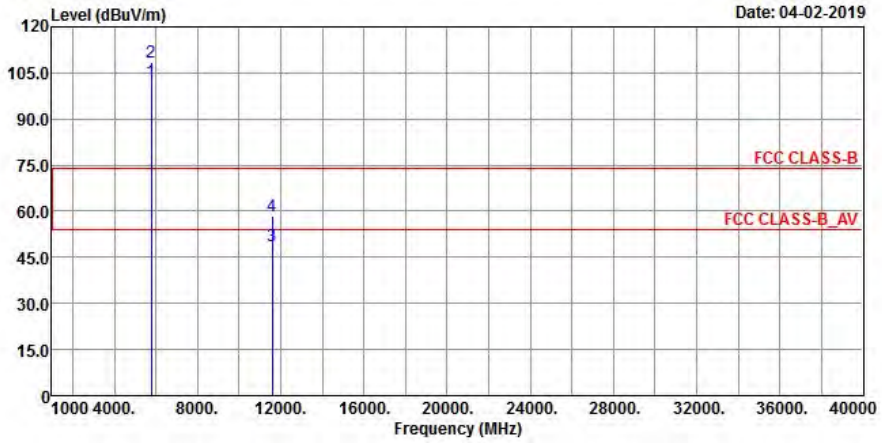
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5643.575	62.19	60.31	1.88	68.2	-6.01	182	7	Peak
5654.5	64.66	62.81	1.85	71.54	-6.88	182	7	Peak
5917.65	51.74	49.43	2.31	73.62	-21.88	182	7	Peak
5982.25	51.11	48.78	2.33	68.2	-17.09	182	7	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5639.775	57.94	56.06	1.88	68.2	-10.26	200	103	Peak
5657.825	61.42	59.57	1.85	74.01	-12.59	200	103	Peak
5922.875	50.58	48.28	2.3	69.77	-19.19	200	103	Peak
5997.45	51.94	49.58	2.36	68.2	-16.26	200	103	Peak

Remarks:

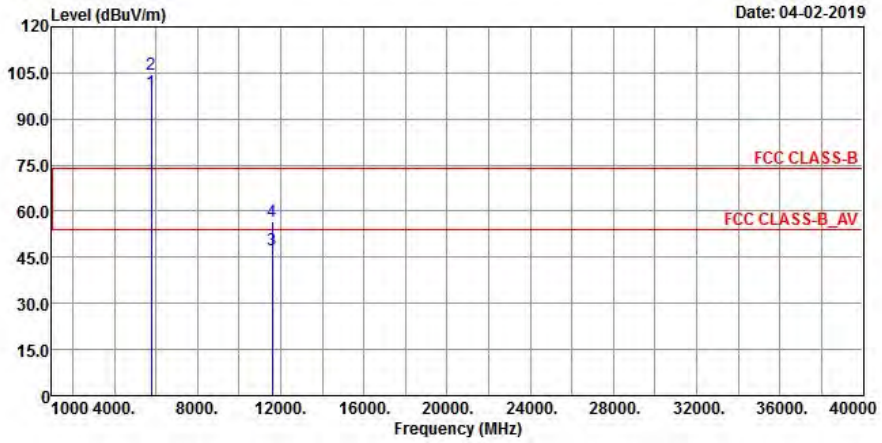
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5755 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 159	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Thomas Wei

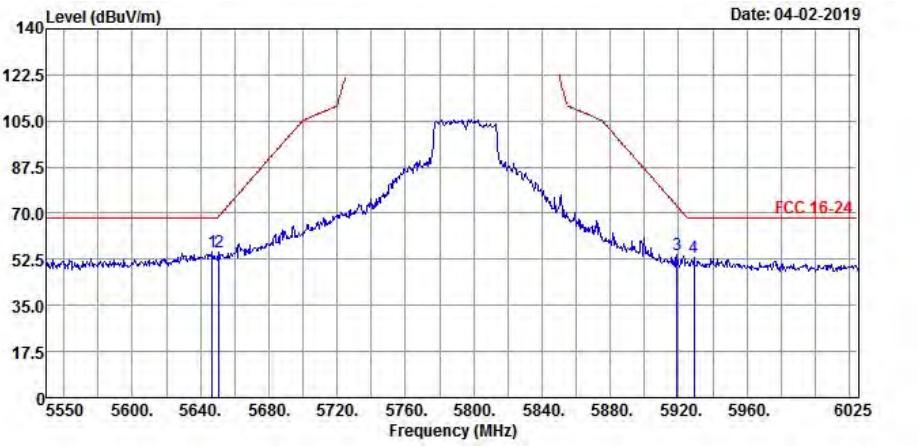
<Spurious Emission>
Horizontal



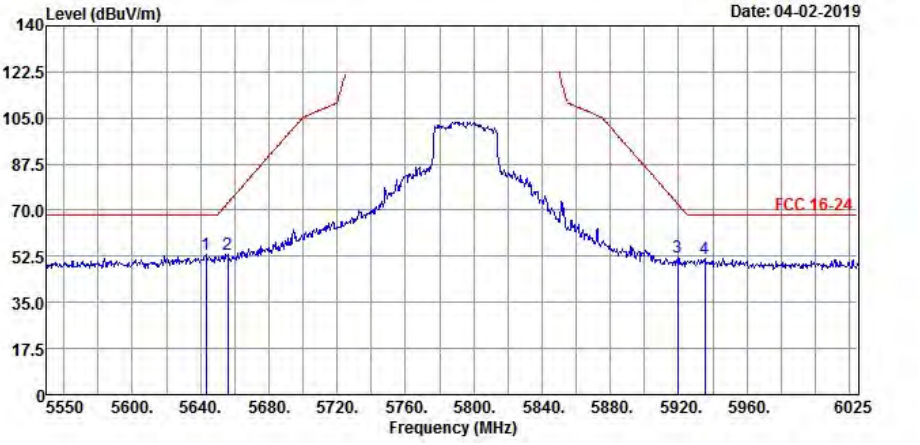
Vertical



<Out of Band Emission (OOBE)>
Horizontal



Vertical



<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5795	102.16	100.16	2			190	6	Average
5795	108.49	106.49	2			190	6	Peak
11590	48.52	50.71	-2.19	54	-5.48	129	322	Average
11590	58.61	60.8	-2.19	74	-15.39	129	322	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5795	98.54	96.54	2			193	105	Average
5795	104.63	102.63	2			193	105	Peak
11590	47.35	49.54	-2.19	54	-6.65	127	321	Average
11590	56.57	58.76	-2.19	74	-17.43	127	321	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5646.9	55.23	53.35	1.88	68.2	-12.97	190	6	Peak
5650.7	55.28	53.37	1.91	68.72	-13.44	190	6	Peak
5919.075	54.09	51.78	2.31	72.57	-18.48	190	6	Peak
5929.05	53.15	50.85	2.3	68.2	-15.05	190	6	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5643.1	52.98	51.1	1.88	68.2	-15.22	193	105	Peak
5655.925	53.28	51.43	1.85	72.6	-19.32	193	105	Peak
5919.55	52.05	49.74	2.31	72.22	-20.17	193	105	Peak
5935.225	51.56	49.26	2.3	68.2	-16.64	193	105	Peak

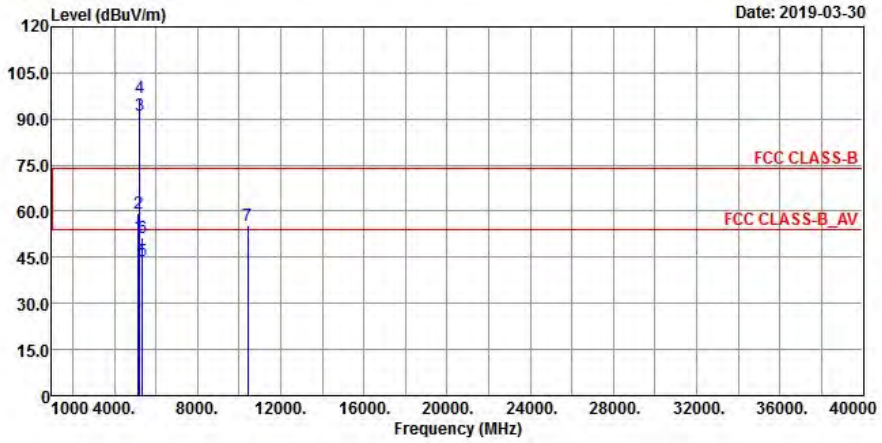
Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5795 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

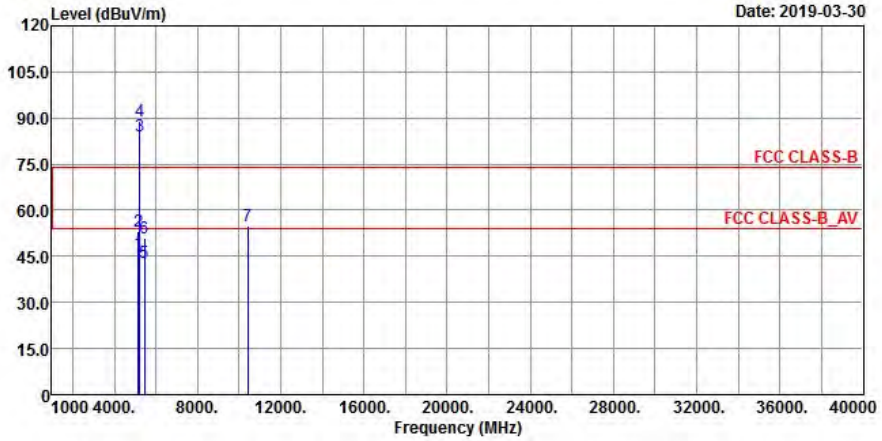
802.11ac (VHT80)

EUT Test Condition		Measurement Detail	
Channel	Channel 42	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Thomas Wei

Horizontal



Vertical



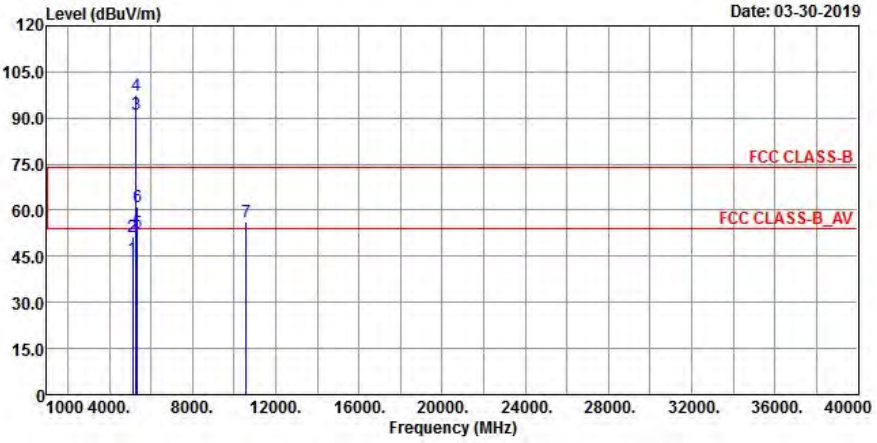
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5148.86	51.87	50.34	1.53	54	-2.13	204	339	Average
5148.86	59.16	57.63	1.53	74	-14.84	204	339	Peak
5210	91.41	89.97	1.44			204	339	Average
5210	97.08	95.64	1.44			204	339	Peak
5352.75	43.92	42.46	1.46	54	-10.08	204	339	Average
5352.75	51.31	49.85	1.46	74	-22.69	204	339	Peak
*10420	55.47	58.32	-2.85	68.2	-12.73	133	57	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5147.06	45.87	44.34	1.53	54	-8.13	133	314	Average
5147.06	53.23	51.7	1.53	74	-20.77	133	314	Peak
5210	84	82.56	1.44			133	314	Average
5210	89.01	87.57	1.44			133	314	Peak
5454.39	42.8	40.93	1.87	54	-11.2	133	314	Average
5454.39	51.01	49.14	1.87	74	-22.99	133	314	Peak
*10420	54.83	57.68	-2.85	68.2	-13.37	143	306	Peak

Remarks:

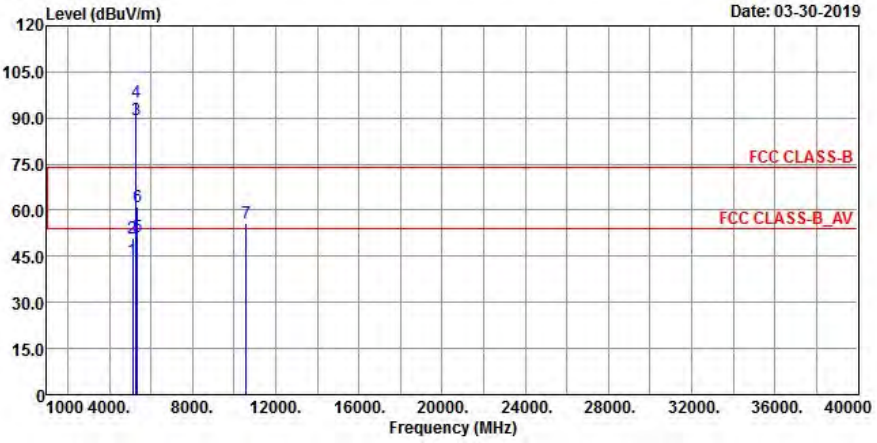
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5210 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 58	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Thomas Wei

Horizontal



Vertical



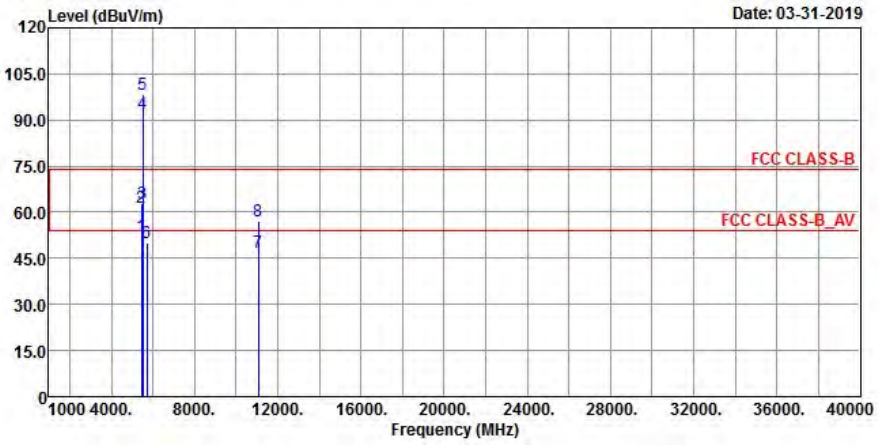
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5141.48	44.37	42.82	1.55	54	-9.63	182	339	Average
5141.48	51.36	49.81	1.55	74	-22.64	182	339	Peak
5290	91.1	89.79	1.31			182	339	Average
5290	97.31	96	1.31			182	339	Peak
5357.81	52.48	51.02	1.46	54	-1.52	182	339	Average
5357.81	61	59.54	1.46	74	-13	182	339	Peak
10580	56.35	59.23	-2.88	74	-17.65	165	203	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5141.48	43.77	42.22	1.55	54	-10.23	199	100	Average
5141.48	51.11	49.56	1.55	74	-22.89	199	100	Peak
5290	89.66	88.35	1.31			199	100	Average
5290	95.16	93.85	1.31			199	100	Peak
5352.2	51.48	50.02	1.46	54	-2.52	199	100	Average
5352.2	61.05	59.59	1.46	74	-12.95	199	100	Peak
10580	55.81	58.69	-2.88	74	-18.19	182	103	Peak

Remarks:

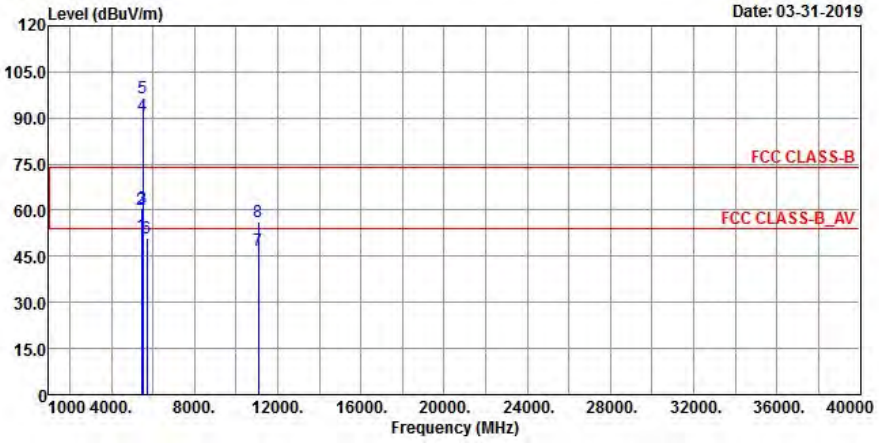
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5290 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 106	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Thomas Wei

Horizontal



Vertical



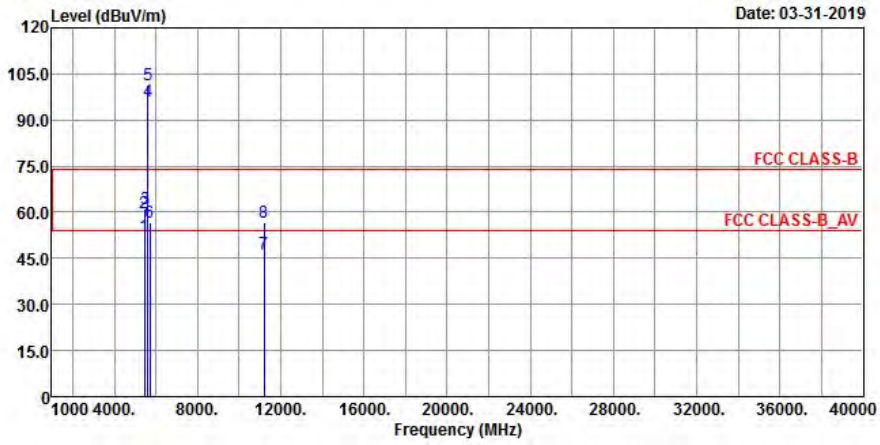
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5457.68	52.29	50.42	1.87	54	-1.71	185	340	Average
5457.68	61.55	59.68	1.87	74	-12.45	185	340	Peak
*5470	62.73	60.87	1.86	68.2	-5.47	185	340	Peak
5530	92.28	90.47	1.81			185	340	Average
5530	98.51	96.7	1.81			185	340	Peak
*5725	50	48.24	1.76	68.2	-18.2	185	340	Peak
11060	46.89	49.31	-2.42	54	-7.11	162	189	Average
11060	57.05	59.47	-2.42	74	-16.95	162	189	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5459.76	51.64	49.77	1.87	54	-2.36	191	100	Average
5459.76	60.08	58.21	1.87	74	-13.92	191	100	Peak
*5470	60.84	58.98	1.86	68.2	-7.36	191	100	Peak
5530	90.95	89.14	1.81			191	100	Average
5530	96.52	94.71	1.81			191	100	Peak
*5725	50.96	49.2	1.76	68.2	-17.24	191	100	Peak
11060	46.86	49.28	-2.42	54	-7.14	143	195	Average
11060	56.33	58.75	-2.42	74	-17.67	143	195	Peak

Remarks:

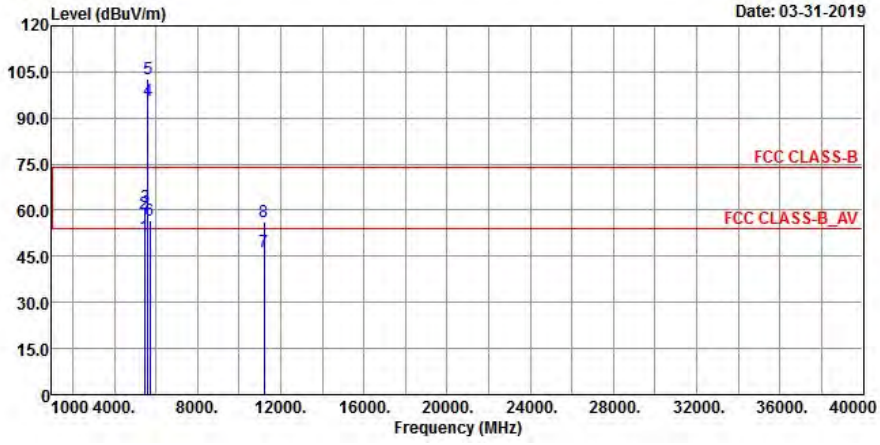
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5530 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 122	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Thomas Wei

Horizontal



Vertical



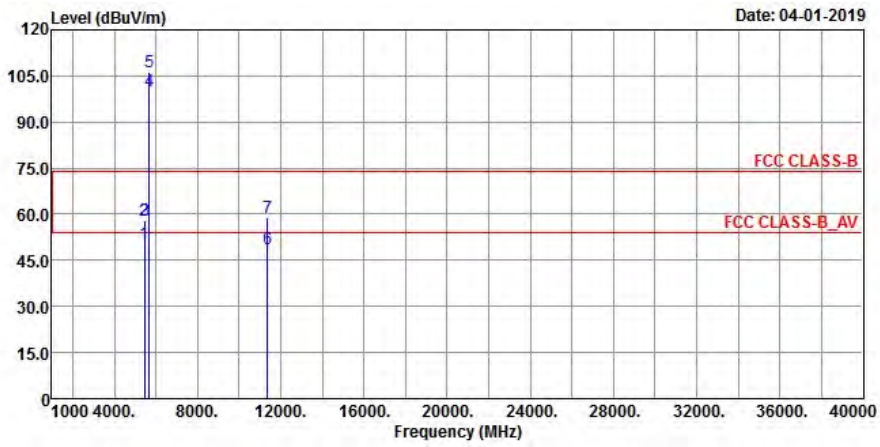
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5458.64	52.43	50.56	1.87	54	-1.57	184	343	Average
5458.64	59.65	57.78	1.87	74	-14.35	184	343	Peak
*5470	61.28	59.42	1.86	68.2	-6.92	184	343	Peak
5610	96.28	94.41	1.87			184	343	Average
5610	101.41	99.54	1.87			184	343	Peak
*5725	56.5	54.74	1.76	68.2	-11.7	184	343	Peak
11220	46.65	49.17	-2.52	54	-7.35	180	173	Average
11220	56.73	59.25	-2.52	74	-17.27	180	173	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5457.68	51.5	49.63	1.87	54	-2.5	190	102	Average
5457.68	58.99	57.12	1.87	74	-15.01	190	102	Peak
*5470	61.07	59.21	1.86	68.2	-7.13	190	102	Peak
5610	95.74	93.87	1.87			190	102	Average
5610	102.7	100.83	1.87			190	102	Peak
*5725	56.68	54.92	1.76	68.2	-11.52	190	102	Peak
11220	46.36	48.88	-2.52	54	-7.64	192	46	Average
11220	56.43	58.95	-2.52	74	-17.57	192	46	Peak

Remarks:

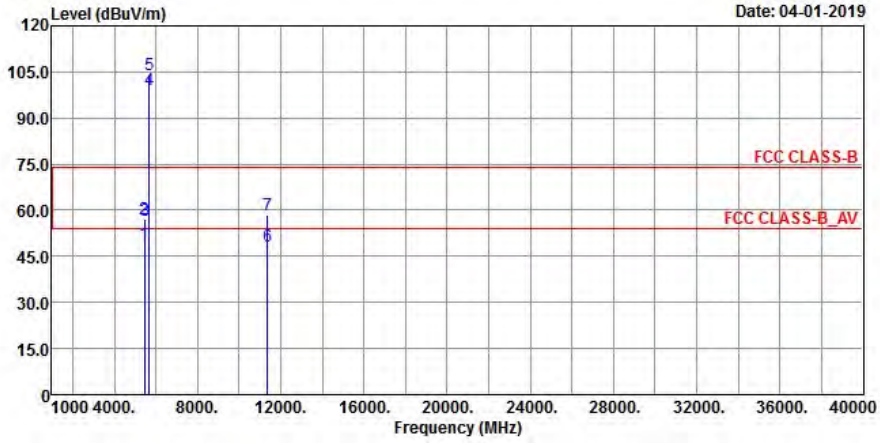
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5610 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 138	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Thomas Wei

Horizontal



Vertical



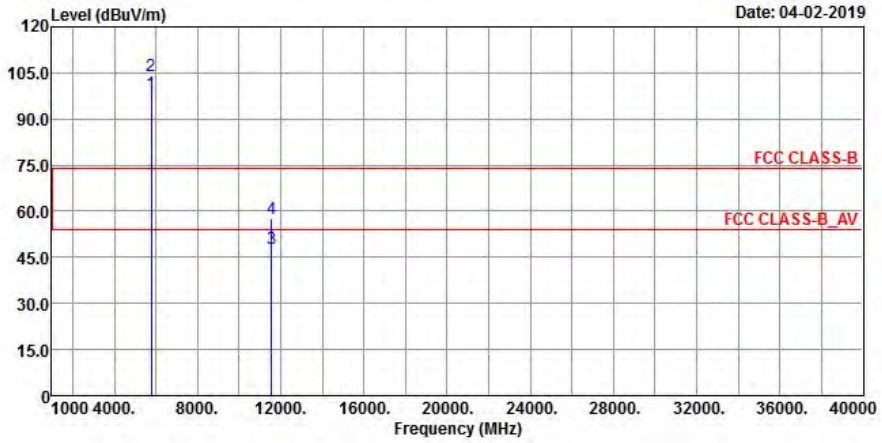
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5456.08	50.32	48.45	1.87	54	-3.68	179	342	Average
5456.08	57.82	55.95	1.87	74	-16.18	179	342	Peak
*5470	58.16	56.3	1.86	68.2	-10.04	179	342	Peak
5690	99.99	98.4	1.59			179	342	Average
5690	106.2	104.61	1.59			179	342	Peak
11380	48.76	51.02	-2.26	54	-5.24	124	261	Average
11380	58.98	61.24	-2.26	74	-15.02	124	261	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5459.92	49.08	47.21	1.87	54	-4.92	192	101	Average
5459.92	56.9	55.03	1.87	74	-17.1	192	101	Peak
*5470	56.78	54.92	1.86	68.2	-11.42	192	101	Peak
5690	99.11	60.12	38.99			192	101	Average
5690	104.19	65.2	38.99			192	101	Peak
11380	48.31	50.57	-2.26	54	-5.69	129	318	Average
11380	58.52	60.78	-2.26	74	-15.48	129	318	Peak

Remarks:

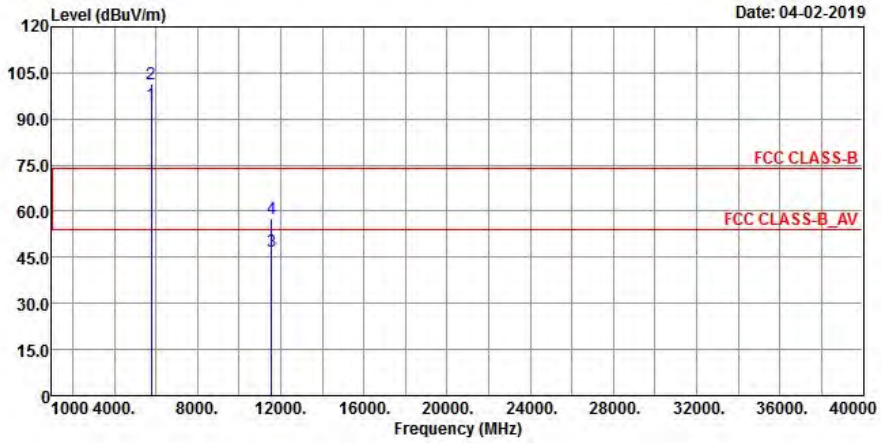
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5690 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 155	**Frequency Range**	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Thomas Wei

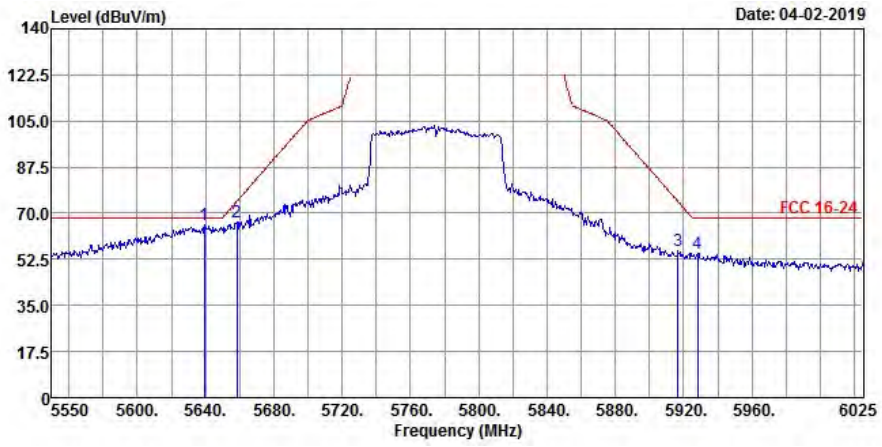
<Spurious Emission>
Horizontal



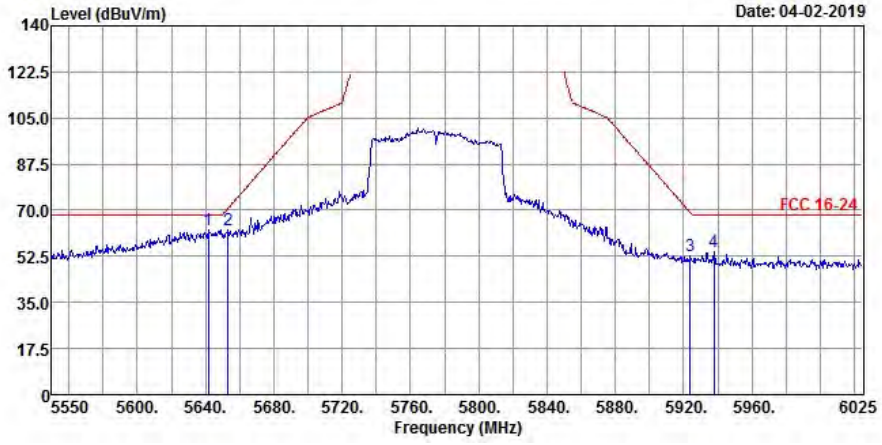
Vertical



<Out of Band Emission (OOBE)>
Horizontal



Vertical



<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5775	98.18	96.22	1.96			172	5	Average
5775	103.94	101.98	1.96			172	5	Peak
11550	47.85	50.05	-2.2	54	-6.15	124	267	Average
11550	57.5	59.7	-2.2	74	-16.5	124	267	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5775	94.98	93.02	1.96			203	99	Average
5775	101.49	99.53	1.96			203	99	Peak
11550	47.09	49.29	-2.2	54	-6.91	125	296	Average
11550	57.41	59.61	-2.2	74	-16.59	125	296	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5639.3	65.65	63.77	1.88	68.2	-2.55	172	5	Peak
5658.3	66.84	64.99	1.85	74.36	-7.52	172	5	Peak
5916.7	55.93	53.62	2.31	74.32	-18.39	172	5	Peak
5928.1	54.74	52.44	2.3	68.2	-13.46	172	5	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
5641.675	62.46	60.58	1.88	68.2	-5.74	203	99	Peak
5653.075	62.66	60.75	1.91	70.49	-7.83	203	99	Peak
5923.825	52.8	50.5	2.3	69.07	-16.27	203	99	Peak
5937.6	54.15	51.85	2.3	68.2	-14.05	203	99	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 5775 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

9 kHz ~ 30 MHz Data:

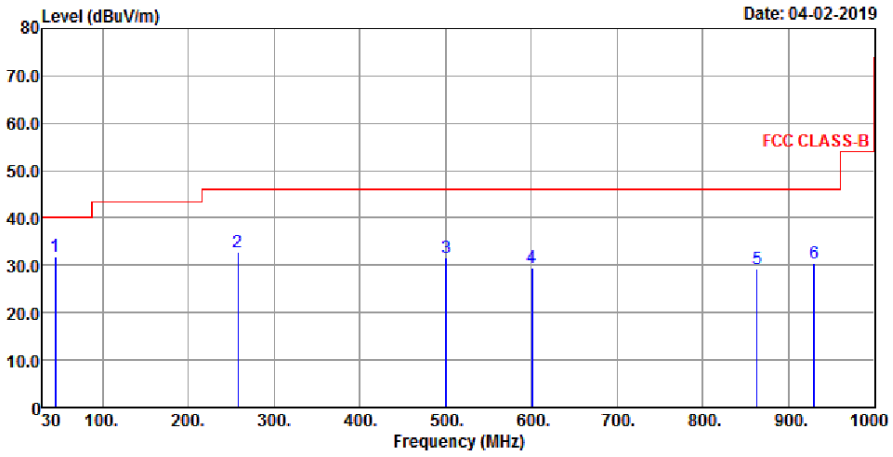
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Worst-Case Data:

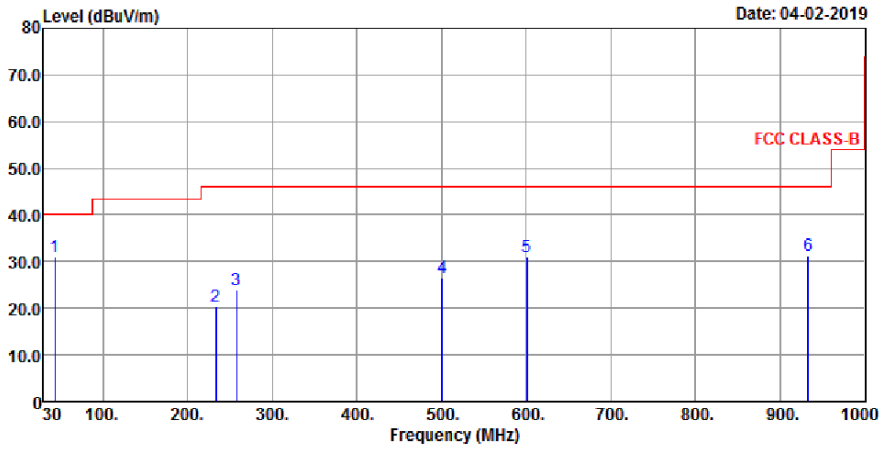
802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 40	**Frequency Range**	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	**Detector Function**	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	**Tested By**	Thomas Wei

Horizontal



Vertical



Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
44.55	31.96	48.97	-17.01	40	-8.04	137	155	Peak
257.95	32.7	50.13	-17.43	46	-13.3	168	176	Peak
500.45	31.53	42.04	-10.51	46	-14.47	198	203	Peak
600.36	29.66	37.95	-8.29	46	-16.34	235	247	Peak
863.23	29.18	33.39	-4.21	46	-16.82	269	288	Peak
930.16	30.27	33.12	-2.85	46	-15.73	298	332	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	**Emission Level (dBuV/m)**	**Read Level (dBuV)**	**Factor (dB/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (cm)**	**Table Angle (Degree)**	**Remark**
43.58	30.89	47.84	-16.95	40	-9.11	122	141	Peak
233.7	20.26	39.03	-18.77	46	-25.74	155	164	Peak
257.95	23.82	41.25	-17.43	46	-22.18	181	203	Peak
500.45	26.54	37.05	-10.51	46	-19.46	235	261	Peak
600.36	31	39.29	-8.29	46	-15	268	274	Peak
933.07	31.21	34.03	-2.82	46	-14.79	306	321	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. The emission levels of other frequencies were very low against the limit

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCS 30	100288	Jan. 03, 2019	Jan. 02, 2020
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2018	Sep. 04, 2019
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 21, 2019	Feb. 20, 2020
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 19, 2018	Aug. 18, 2019
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-12040.

4.2.3 Test Procedures

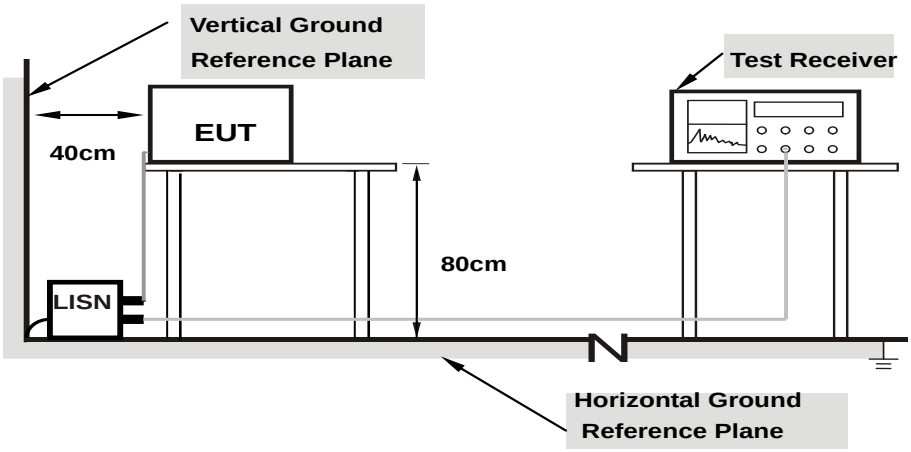
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit -20 dB) was not recorded.

Note: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

a. Placed the EUT on a testing table.
b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

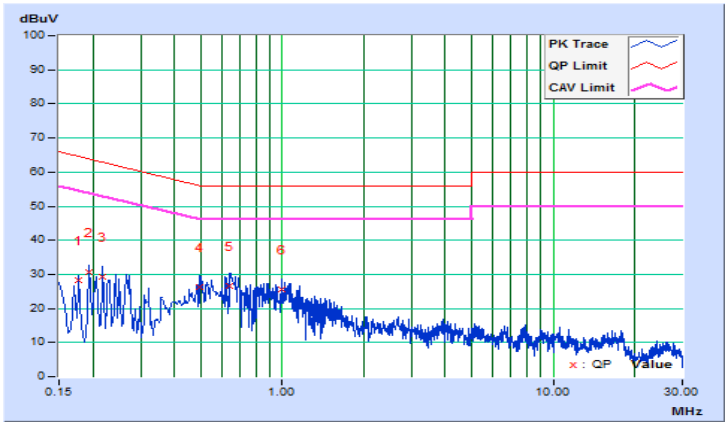
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Jisyong Wang	Test Date	2019/3/31

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17801	0.10	28.07	9.72	28.17	9.82	64.58	54.58	-36.41	-44.76
2	0.19400	0.10	30.56	14.15	30.66	14.25	63.86	53.86	-33.20	-39.61
3	0.21800	0.10	29.19	13.16	29.29	13.26	62.89	52.89	-33.60	-39.63
4	0.49800	0.11	26.17	12.52	26.28	12.63	56.03	46.03	-29.75	-33.40
5	0.64200	0.11	26.61	10.61	26.72	10.72	56.00	46.00	-29.28	-35.28
6	0.99400	0.11	25.41	12.30	25.52	12.41	56.00	46.00	-30.48	-33.59

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

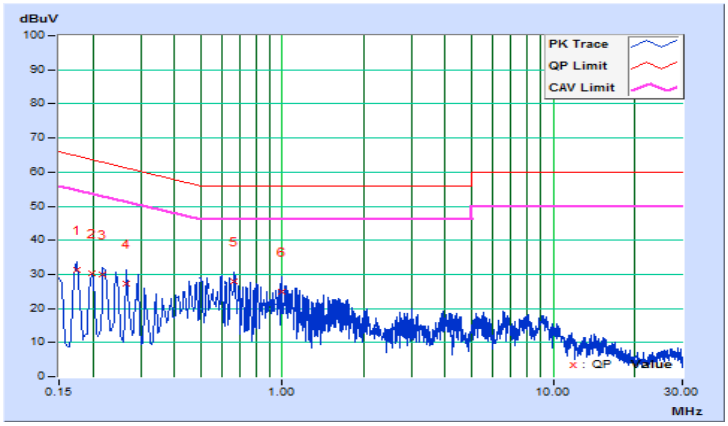


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Jisyong Wang	Test Date	2019/3/31

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17400	0.09	31.37	12.44	31.46	12.53	64.77	54.77	-33.31	-42.24
2	0.19832	0.09	30.36	12.27	30.45	12.36	63.68	53.68	-33.23	-41.32
3	0.21805	0.09	29.85	12.84	29.94	12.93	62.89	52.89	-32.95	-39.96
4	0.26600	0.09	27.24	9.31	27.33	9.40	61.24	51.24	-33.91	-41.84
5	**0.66633**	**0.10**	**27.95**	**10.17**	**28.05**	**10.27**	**56.00**	**46.00**	**-27.95**	**-35.73**
6	0.99400	0.09	24.81	10.71	24.90	10.80	56.00	46.00	-31.10	-35.20

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



4.3 Transmit Power Measurement

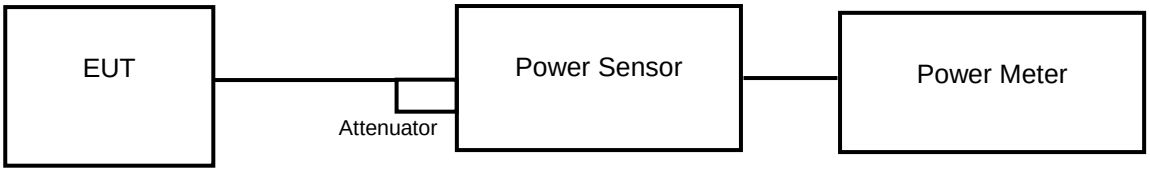
4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125 mW (21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
	√	Mobile and Portable client device	250 mW (24 dBm)
U-NII-2A	√		250 mW (24 dBm) or 11 dBm + 10 log B*
U-NII-2C	√		250 mW (24 dBm) or 11 dBm + 10 log B*
U-NII-3	√		1 Watt (30 dBm)

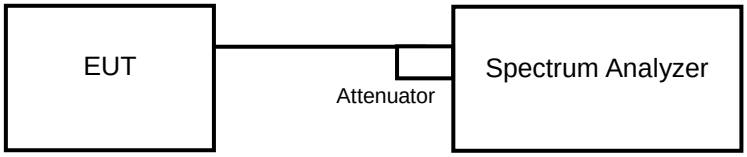
*B is the 26 dB emission bandwidth in megahertz

4.3.2 Test Setup

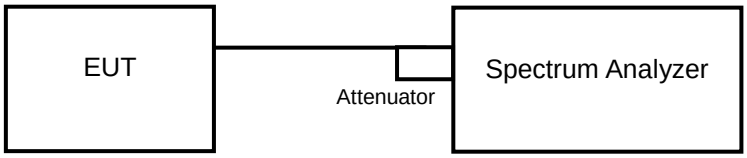
<Power Output Measurement>



or



<26 dB Bandwidth>



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

Average Power Measurement

<802.11a, 802.11n (HT20), 802.11n (HT40)>

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

<802.11ac (VHT80)>

a. Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99 % occupied bandwidth) of the signal.
b. Set sweep trigger to “free run”.
c. Set RBW = 1 MHz.
d. Set VBW ≥ 3 MHz
e. Number of points in sweep ≥ 2 Span / RBW.
f. Sweep time ≤ (number of points in sweep) * T
g. Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
h. Detector = RMS.
i. Trace mode = max hold.
j. Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

26 dB Bandwidth

a. Set RBW = approximately 1 % of the emission bandwidth.
b. Set the VBW > RBW.
c. Detector = Peak.
d. Trace mode = max hold.
e. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.
f. For channel aggregation (channel 138, 142, 144) measurement refer KDB 789033 D02 section III channel aggregation A.1.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Results

Power Output:

802.11a

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	34.277	15.35	24	Pass
40	5200	62.661	17.97	24	Pass
48	5240	61.802	17.91	24	Pass
52	5260	53.456	17.28	24	Pass
60	5300	55.463	17.44	24	Pass
64	5320	35.318	15.48	24	Pass
100	5500	32.961	15.18	24	Pass
116	5580	42.954	16.33	24	Pass
140	5700	21.827	13.39	24	Pass
144	5720	42.267	16.26	24	Pass
149	5745	43.853	16.42	30	Pass
157	5785	44.157	16.45	30	Pass
165	5825	43.954	16.43	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

1. 11 dBm + 10log (31.42) = 25.97 dBm > 24 dBm.
2. 11 dBm + 10log (31.30) = 25.96 dBm > 24 dBm.
3. 11 dBm + 10log (21.67) = 24.36 dBm > 24 dBm.
4. 11 dBm + 10log (21.57) = 24.34 dBm > 24 dBm.
5. 11 dBm + 10log (31.02) = 25.92 dBm > 24 dBm.
6. 11 dBm + 10log (21.64) = 24.35 dBm > 24 dBm.
7. 11 dBm + 10log (21.22) = 24.27 dBm > 24 dBm.

802.11n (HT20)

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	31.842	15.03	24	Pass
40	5200	61.66	17.90	24	Pass
48	5240	62.23	17.94	24	Pass
52	5260	54.2	17.34	24	Pass
60	5300	55.208	17.42	24	Pass
64	5320	29.717	14.73	24	Pass
100	5500	32.434	15.11	24	Pass
116	5580	43.451	16.38	24	Pass
140	5700	19.77	12.96	24	Pass
144	5720	42.855	16.32	24	Pass
149	5745	43.053	16.34	30	Pass
157	5785	44.157	16.45	30	Pass
165	5825	43.853	16.42	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

1. 11 dBm + 10log (34.04) = 26.32 dBm > 24 dBm.
2. 11 dBm + 10log (33.57) = 26.26 dBm > 24 dBm.
3. 11 dBm + 10log (21.95) = 24.41 dBm > 24 dBm.
4. 11 dBm + 10log (21.95) = 24.41 dBm > 24 dBm.
5. 11 dBm + 10log (34.28) = 26.35 dBm > 24 dBm.
6. 11 dBm + 10log (21.74) = 24.37 dBm > 24 dBm.
7. 11 dBm + 10log (21.57) = 24.34 dBm > 24 dBm.

802.11n (HT40)

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
38	5190	21.727	13.37	24	Pass
46	5230	51.761	17.14	24	Pass
54	5270	50.466	17.03	24	Pass
62	5310	17.14	12.34	24	Pass
102	5510	16.943	12.29	24	Pass
110	5550	42.855	16.32	24	Pass
134	5670	36.813	15.66	24	Pass
142	5710	42.658	16.30	24	Pass
151	5755	46.774	16.70	30	Pass
159	5795	46.345	16.66	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

1. 11 dBm + 10log (59.00) = 28.71 dBm > 24 dBm.
2. 11 dBm + 10log (40.03) = 27.02 dBm > 24 dBm.
3. 11 dBm + 10log (39.80) = 27.00 dBm > 24 dBm.
4. 11 dBm + 10log (57.64) = 28.61 dBm > 24 dBm.
5. 11 dBm + 10log (44.91) = 27.52 dBm > 24 dBm.
6. 11 dBm + 10log (56.24) = 28.50 dBm > 24 dBm.

802.11ac (VHT80)

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
42	5210	12.647	11.02	24	Pass
58	5290	12.388	10.93	24	Pass
106	5530	15.996	12.04	24	Pass
122	5610	38.637	15.87	24	Pass
138	5690	38.194	15.82	24	Pass
155	5775	41.02	16.13	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

1. 11 dBm + 10log (81.64) = 30.12 dBm > 24 dBm.
2. 11 dBm + 10log (81.55) = 30.11 dBm > 24 dBm.
3. 11 dBm + 10log (96.03) = 30.82 dBm > 24 dBm.
4. 11 dBm + 10log (110.77) = 31.44 dBm > 24 dBm.

26 dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)
36	5180	21.66
40	5200	32.04
48	5240	31.87
52	5260	31.42
60	5300	31.30
64	5320	21.67
100	5500	21.57
116	5580	31.02
140	5700	21.64
144	5720 (U-NII-2C)	21.22
144	5720 (U-NII-3)	10.86

802.11n (HT20)

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)
36	5180	21.97
40	5200	33.11
48	5240	32.77
52	5260	34.04
60	5300	33.57
64	5320	21.95
100	5500	21.95
116	5580	34.28
140	5700	21.74
144	5720 (U-NII-2C)	21.57
144	5720 (U-NII-3)	13.00

802.11n (HT40)

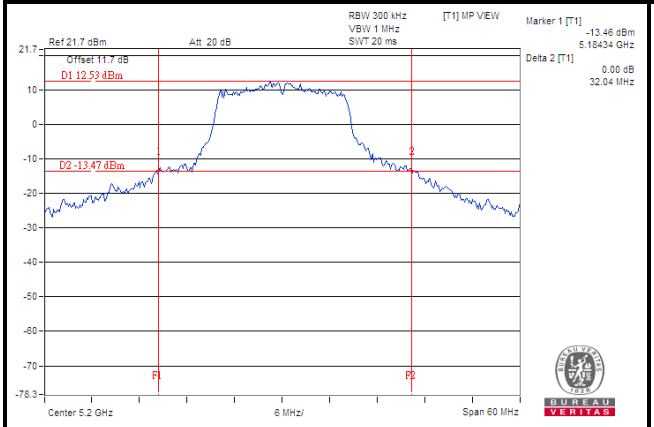
Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)
38	5190	39.69
46	5230	64.83
54	5270	59.00
62	5310	40.03
102	5510	39.80
110	5550	57.64
134	5670	44.91
142	5710 (U-NII-2C)	56.24
142	5710 (U-NII-3)	26.07

802.11ac (VHT80)

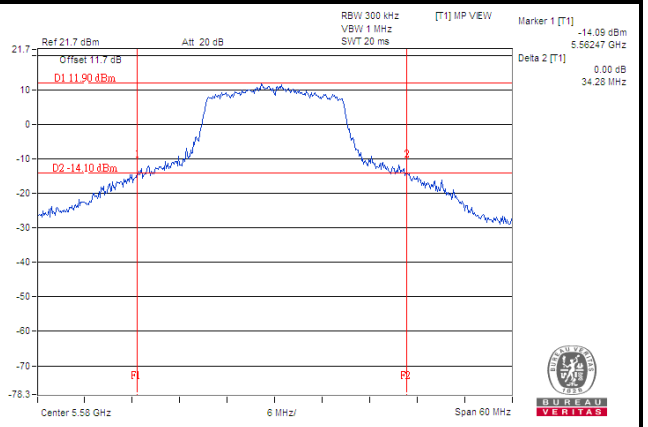
Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)
42	5210	81.47
58	5290	81.64
106	5530	81.55
122	5610	96.03
138	5690 (U-NII-2C)	110.77
138	5690 (U-NII-3)	27.64

Spectrum Plot of Worst Value

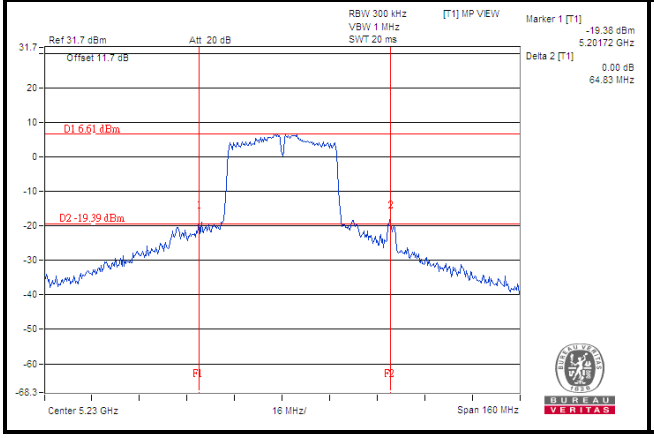
802.11a



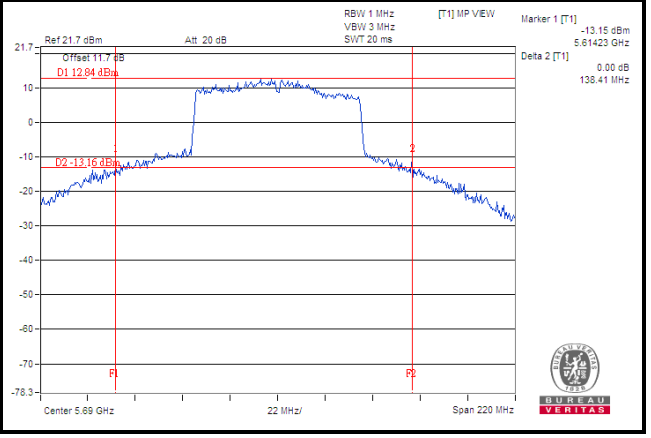
802.11n (HT20)



802.11n (HT40)

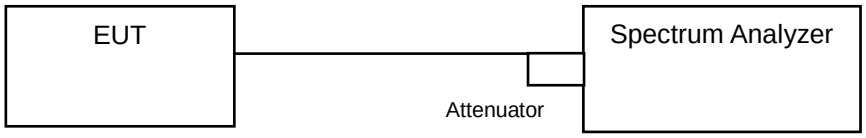


802.11ac (VHT80)



4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1 % to 5 % of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to SAMPLE. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

4.4.4 Test Results

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	17.04
40	5200	18.48
48	5240	18.48
52	5260	18.12
60	5300	18.12
64	5320	17.04
100	5500	17.16
116	5580	18.84
140	5700	16.92
144	5720 (U-NII-2C)	14.24
144	5720 (U-NII-3)	3.88
149	5745	19.14
157	5785	18.78
165	5825	18.84

802.11n (HT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	18.12
40	5200	18.84
48	5240	18.84
52	5260	18.84
60	5300	18.84
64	5320	18.12
100	5500	18.12
116	5580	19.32
140	5700	18.00
144	5720 (U-NII-2C)	14.48
144	5720 (U-NII-3)	4.24
149	5745	19.32
157	5785	19.08
165	5825	19.02

802.11n (HT40)

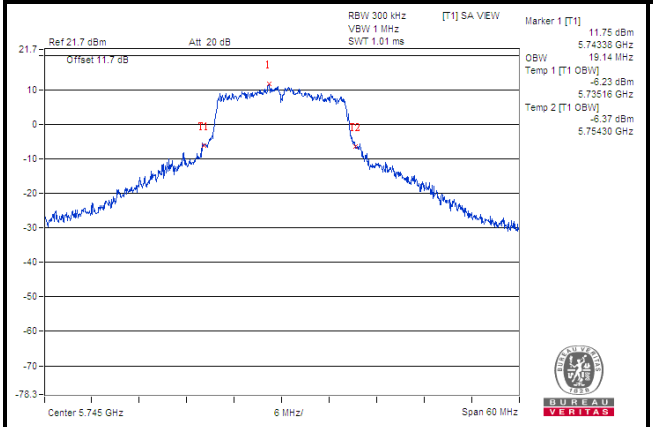
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
38	5190	36.60
46	5230	36.60
54	5270	36.72
62	5310	36.48
102	5510	36.48
110	5550	37.08
134	5670	36.72
142	5710 (U-NII-2C)	33.96
142	5710 (U-NII-3)	3.84
151	5755	38.04
159	5795	37.98

802.11ac (VHT80)

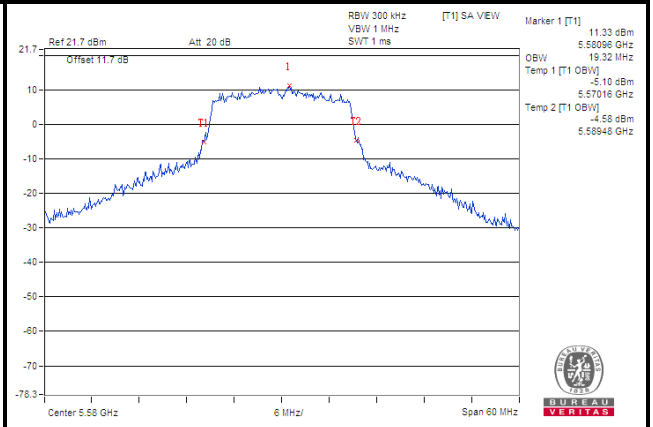
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
42	5210	75.60
58	5290	75.60
106	5530	75.60
122	5610	75.84
138	5690 (U-NII-2C)	73.64
138	5690 (U-NII-3)	2.92
155	5775	75.96

Spectrum Plot of Worst Value

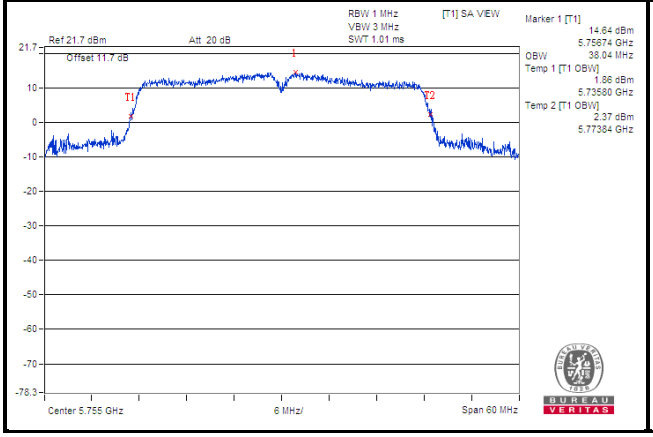
802.11a



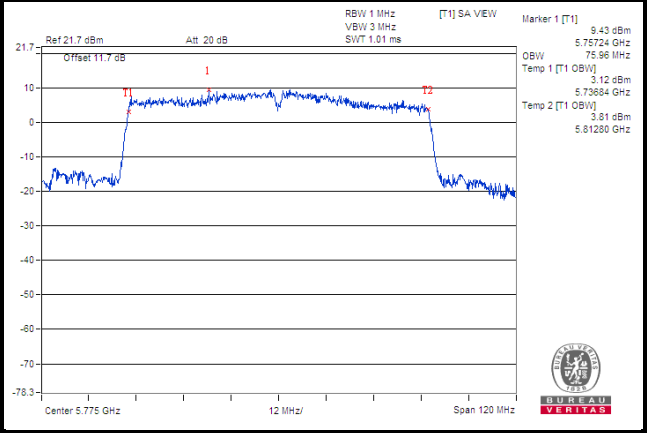
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

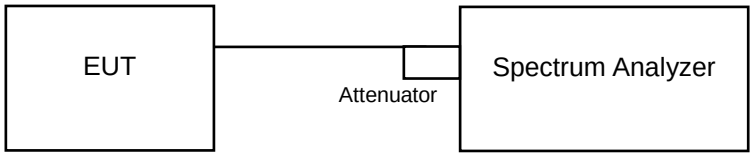


4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	17 dBm/MHz
		Fixed point-to-point Access Point	
		Indoor Access Point	
	√	Mobile and Portable client device	11 dBm/MHz
U-NII-2A	√		11 dBm/MHz
U-NII-2C	√		11 dBm/MHz
U-NII-3	√		30 dBm/500 kHz

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.5.4 Test Procedures

For U-NII-1, U-NII-2A, U-NII-2C band:

Using method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 RBW, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value and add 10 log (1/duty cycle)

※For U-NII-3:

1. Set span to encomass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 1 RBW, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz / 300 kHz).
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value and add 10 log (1/duty cycle)

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.5.7 Test Results

802.11a

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/MHz)	Duty Factor (dB)	PSD with Duty Factor (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
36	5180	5.18	0.31	5.49	11	Pass
40	5200	7.91	0.31	8.22	11	Pass
48	5240	7.88	0.31	8.19	11	Pass
52	5260	7.42	0.31	7.73	11	Pass
60	5300	7.33	0.31	7.64	11	Pass
64	5320	4.77	0.31	5.08	11	Pass
100	5500	5.02	0.31	5.33	11	Pass
116	5580	6.31	0.31	6.62	11	Pass
140	5700	3.24	0.31	3.55	11	Pass
144	5720 (U-NII-2C)	6.13	0.31	6.44	11	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/MHz)	Duty Factor (dB)	PSD with Duty Factor (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
36	5180	4.48	0.35	4.83	11	Pass
40	5200	7.20	0.35	7.55	11	Pass
48	5240	7.10	0.35	7.45	11	Pass
52	5260	6.78	0.35	7.13	11	Pass
60	5300	6.64	0.35	6.99	11	Pass
64	5320	3.90	0.35	4.25	11	Pass
100	5500	4.39	0.35	4.74	11	Pass
116	5580	5.34	0.35	5.69	11	Pass
140	5700	2.39	0.35	2.74	11	Pass
144	5720 (U-NII-2C)	5.62	0.35	5.97	11	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/MHz)	Duty Factor (dB)	PSD with Duty Factor (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
38	5190	-0.39	0.68	0.29	11	Pass
46	5230	3.33	0.68	4.01	11	Pass
54	5270	3.19	0.68	3.87	11	Pass
62	5310	-2.01	0.68	-1.33	11	Pass
102	5510	-1.61	0.68	-0.93	11	Pass
110	5550	1.58	0.68	2.26	11	Pass
134	5670	1.92	0.68	2.60	11	Pass
142	5710 (U-NII-2C)	1.71	0.68	2.39	11	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

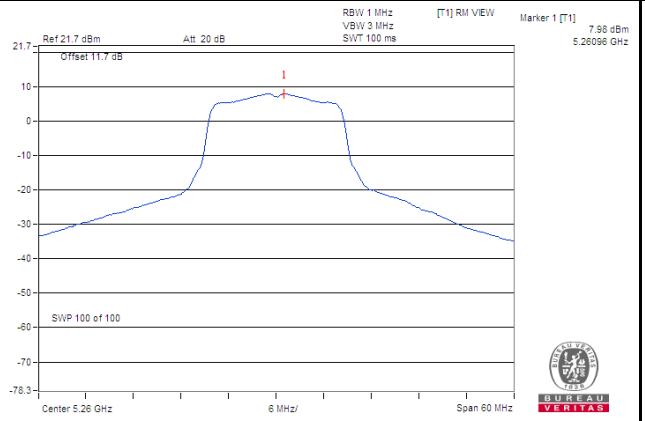
802.11ac (VHT80)

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/MHz)	Duty Factor (dB)	PSD with Duty Factor (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
42	5210	-8.79	1.24	-7.55	11	Pass
58	5290	-9.26	1.24	-8.02	11	Pass
106	5530	-7.91	1.24	-6.67	11	Pass
122	5610	-3.81	1.24	-2.57	11	Pass
138	5690 (U-NII-2C)	-4.10	1.24	-2.86	11	Pass

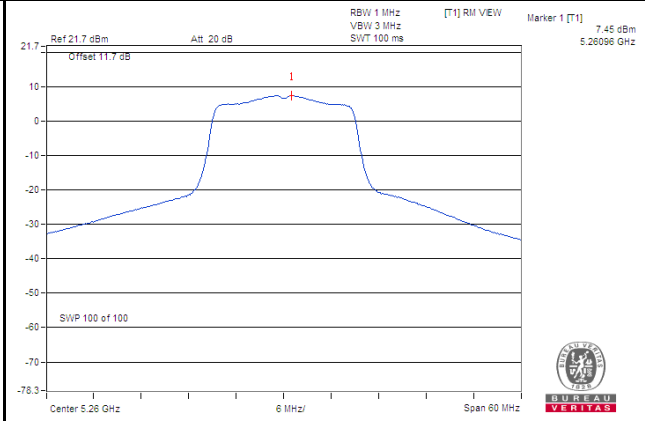
Note: Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

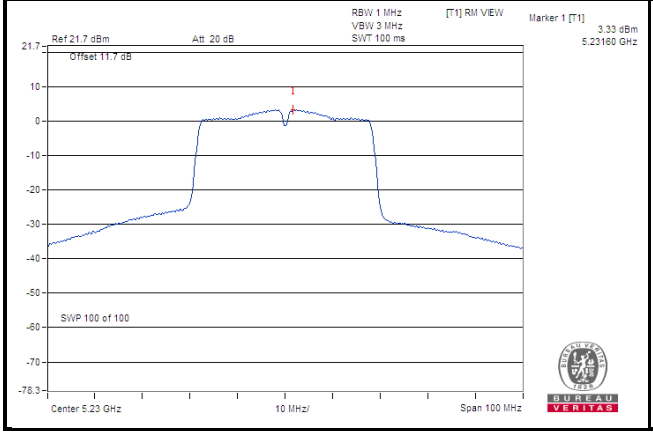
802.11a



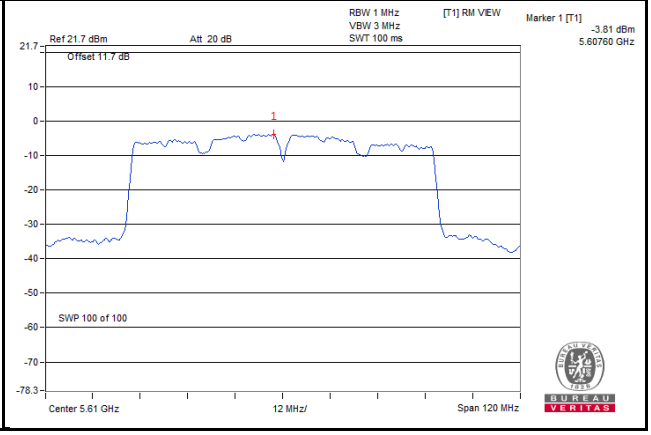
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



For U-NII-3 Band

802.11a

Channel	Frequency (MHz)	PSD w/o Duty Factor		Duty Factor (dB)	PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
		(dBm/300 kHz)	(dBm/500 kHz)				
144	5720 (U-NII-3)	-1.53	0.69	0.31	1.00	30	Pass
149	5745	1.34	3.56	0.31	3.87	30	Pass
157	5785	1.41	3.63	0.31	3.94	30	Pass
165	5825	1.56	3.78	0.31	4.09	30	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

Channel	Frequency (MHz)	PSD w/o Duty Factor		Duty Factor (dB)	PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
		(dBm/300 kHz)	(dBm/500 kHz)				
144	5720 (U-NII-3)	-2.01	0.21	0.35	0.56	30	Pass
149	5745	0.80	3.02	0.35	3.37	30	Pass
157	5785	0.74	2.96	0.35	3.31	30	Pass
165	5825	0.85	3.07	0.35	3.42	30	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

Channel	Frequency (MHz)	PSD w/o Duty Factor		Duty Factor (dB)	PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
		(dBm/300 kHz)	(dBm/500 kHz)				
142	5710 (U-NII-3)	-5.66	-3.44	0.68	-2.76	30	Pass
151	5755	-3.03	-0.81	0.68	-0.13	30	Pass
159	5795	-3.11	-0.89	0.68	-0.21	30	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

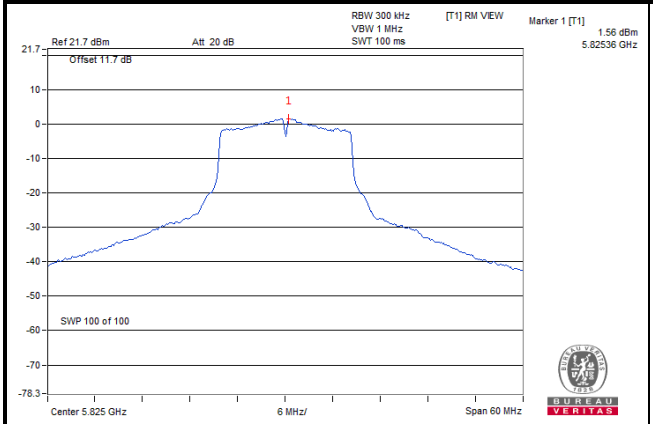
802.11ac (VHT80)

Channel	Frequency (MHz)	PSD w/o Duty Factor		Duty Factor (dB)	PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
		(dBm/300 kHz)	(dBm/500 kHz)				
138	5690 (U-NII-3)	-11.11	-8.89	1.24	-7.65	30	Pass
155	5775	-7.98	-5.76	1.24	-4.52	30	Pass

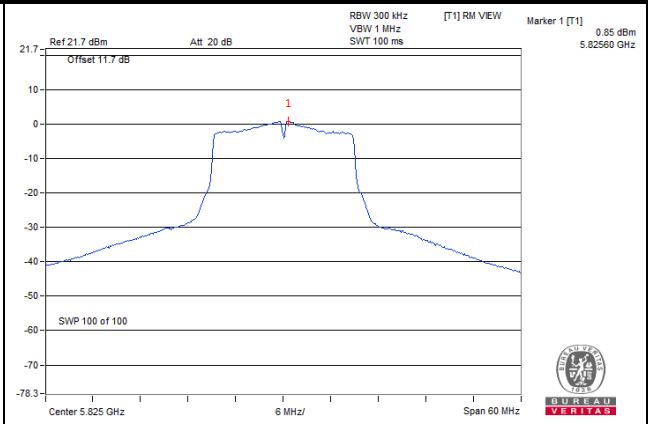
Note: Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

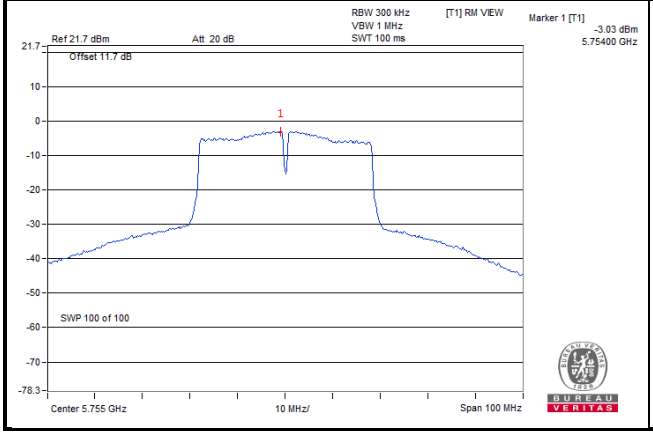
802.11a



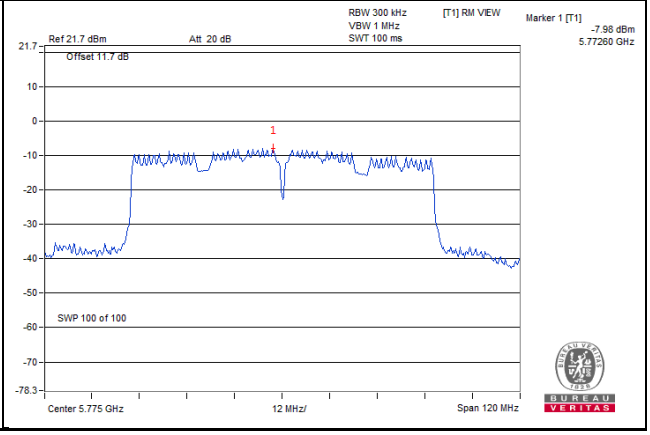
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

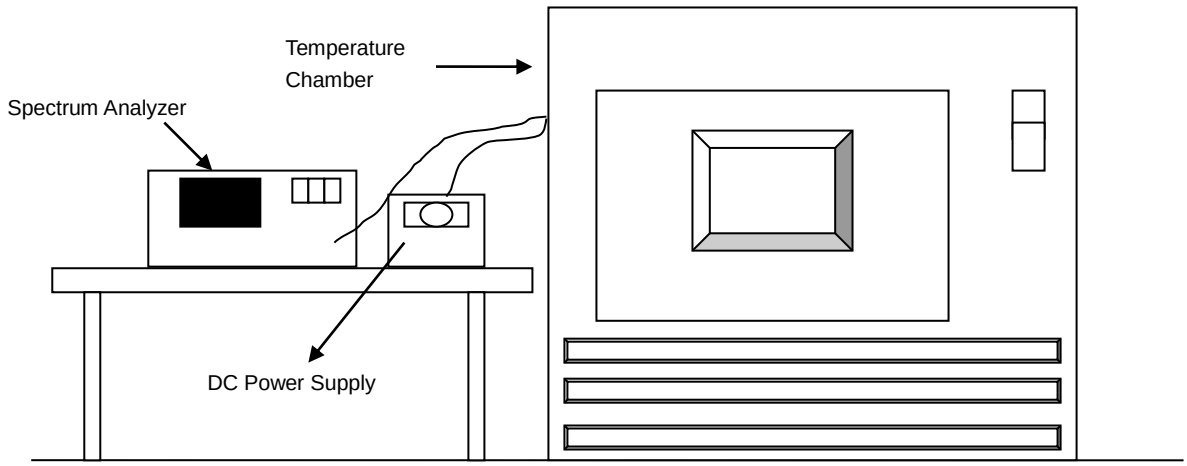


4.6 Frequency Stability

4.6.1 Limit of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.6.4 Test Procedure

a. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
b. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10 dB lower than the measured peak value.
c. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Set the EUT transmit at un-modulation mode to test frequency stability.

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
50	120	5179.9806	PASS	5179.9794	PASS	5179.9772	PASS	5179.9783	PASS
40	120	5180.0148	PASS	5180.0176	PASS	5180.0149	PASS	5180.0157	PASS
30	120	5179.9986	PASS	5179.9966	PASS	5180.0016	PASS	5180.0006	PASS
20	120	5180.0124	PASS	5180.0108	PASS	5180.0146	PASS	5180.0143	PASS
10	120	5179.9774	PASS	5179.9769	PASS	5179.981	PASS	5179.9804	PASS
0	120	5179.9816	PASS	5179.9808	PASS	5179.9805	PASS	5179.9836	PASS
-10	120	5180.01	PASS	5180.0108	PASS	5180.0096	PASS	5180.0103	PASS
-20	120	5179.9769	PASS	5179.9737	PASS	5179.9752	PASS	5179.9766	PASS
-30	120	5179.9899	PASS	5179.9894	PASS	5179.9931	PASS	5179.9893	PASS

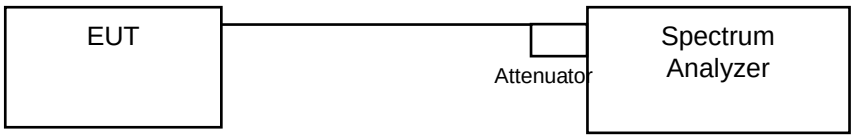
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
Temp. (℃)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
20	138	5180.0115	PASS	5180.0112	PASS	5180.0152	PASS	5180.0144	PASS
	120	5180.0124	PASS	5180.0108	PASS	5180.0146	PASS	5180.0143	PASS
	102	5180.0117	PASS	5180.0108	PASS	5180.0153	PASS	5180.0142	PASS

4.7 6 dB Bandwidth Measurement

4.7.1 Limits of 6 dB Bandwidth Measurement

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

a. Set resolution bandwidth (RBW) = 100 kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
144	5720 (U-NII-3)	16.33	0.5	Pass
149	5745	16.32	0.5	Pass
157	5785	16.31	0.5	Pass
165	5825	16.31	0.5	Pass

802.11n (HT20)

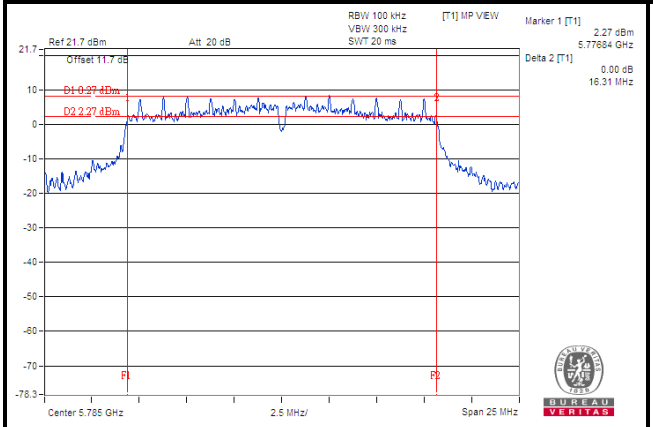
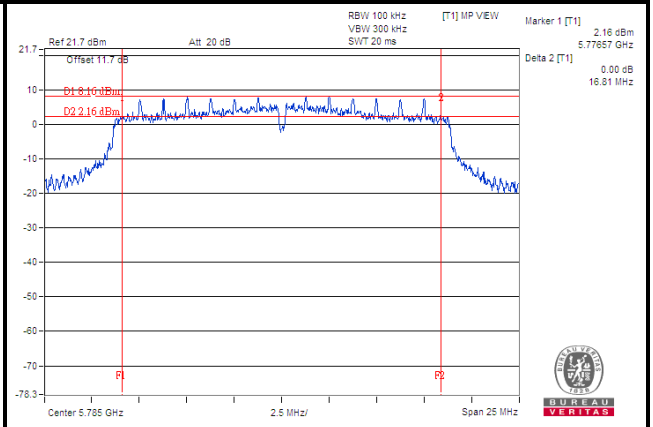
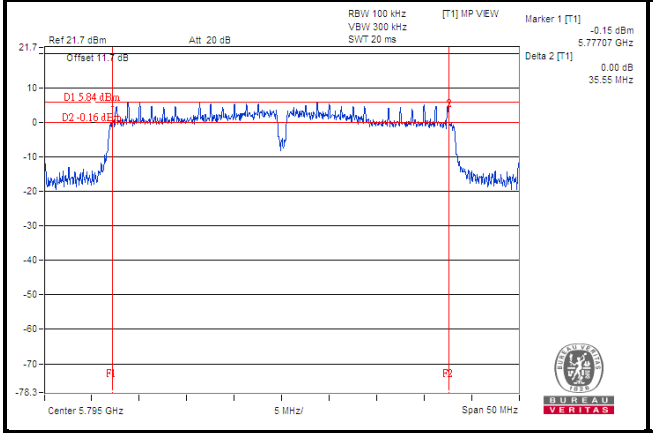
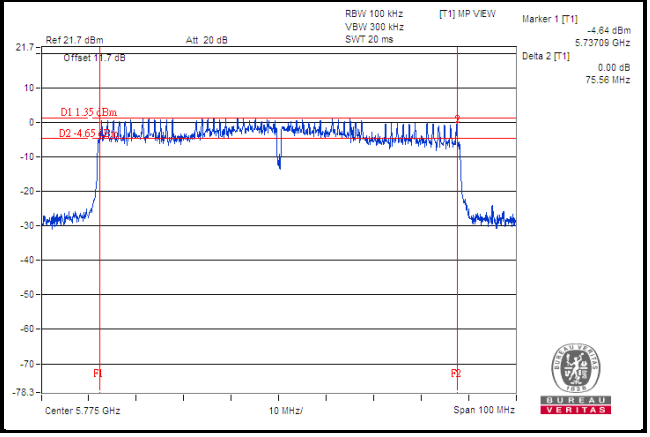
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
144	5720 (U-NII-3)	17.08	0.5	Pass
149	5745	17.07	0.5	Pass
157	5785	16.81	0.5	Pass
165	5825	17.16	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
142	5710 (U-NII-3)	36.10	0.5	Pass
151	5755	35.81	0.5	Pass
159	5795	35.55	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
138	5690 (U-NII-3)	75.91	0.5	Pass
155	5775	75.56	0.5	Pass

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

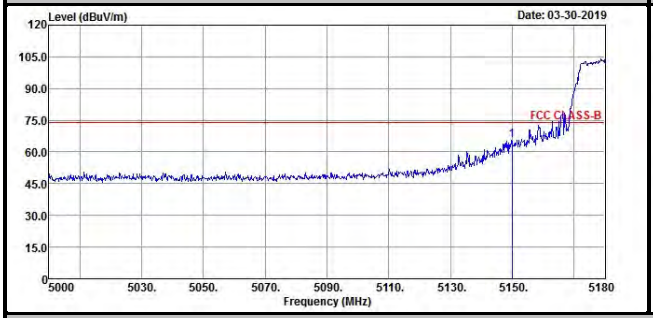
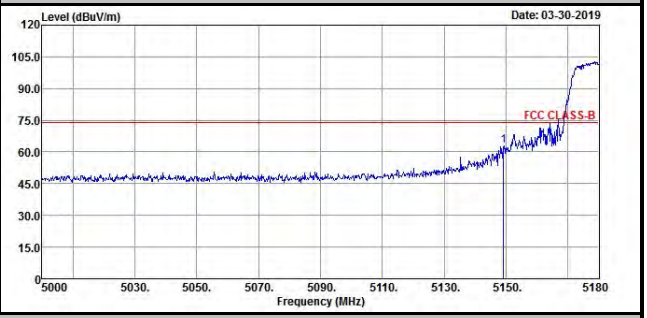
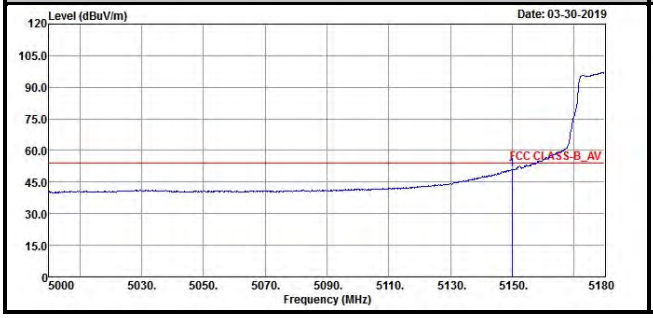
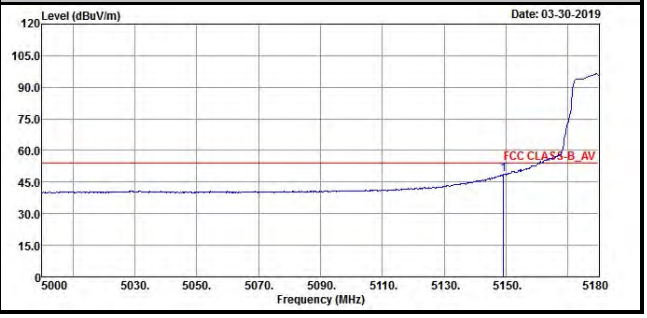
Note:
For Ch144 (UNII-3 Band): The 6 dB bandwidth above 5725 MHz = Marker 1 + Delta 2 – 5725 MHz
For Ch142 (UNII-3 Band): The 6 dB bandwidth above 5725 MHz = Marker 1 + Delta 2 – 5725 MHz
For Ch138 (UNII-3 Band): The 6 dB bandwidth above 5725 MHz = Marker 1 + Delta 2 – 5725 MHz

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Annex A- Band-edge measurement (For U-NII-1, U-NII-2A, U-NII-2C band)

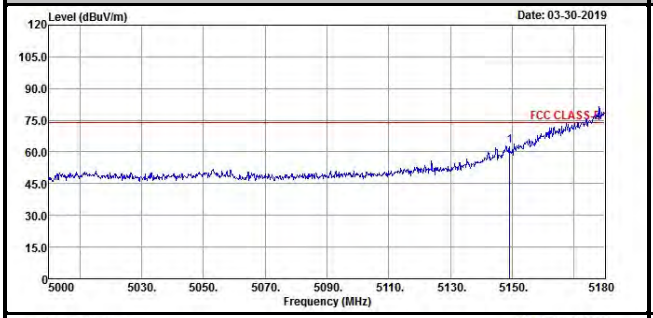
802.11a

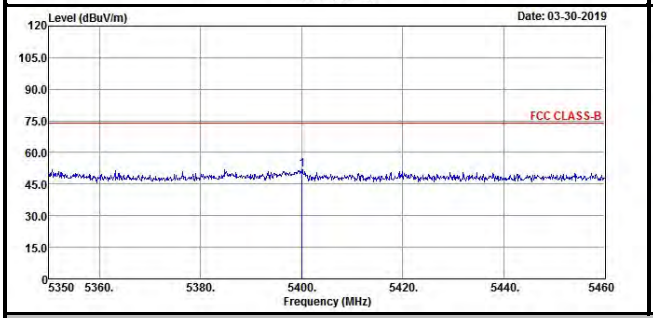
Ch 36	
Peak	
Horizontal	Vertical
	
Average	
Horizontal	Vertical
	

Ch 40

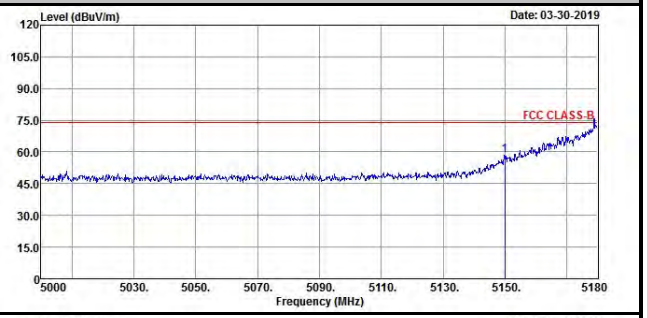
Peak

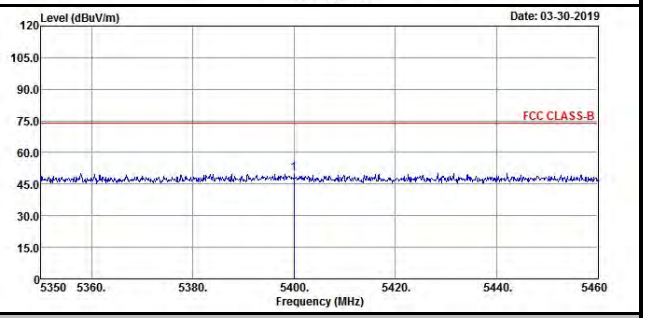
Horizontal





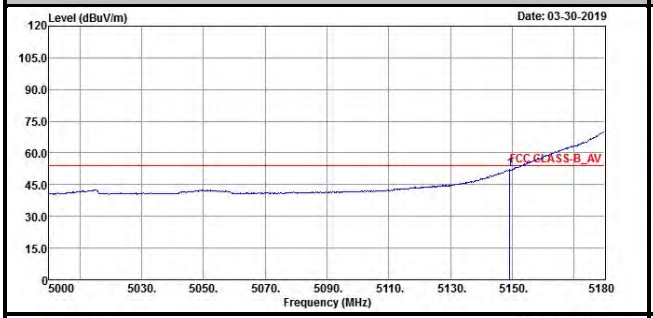
Vertical

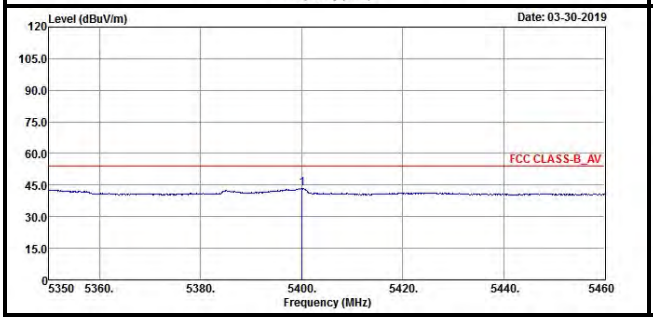




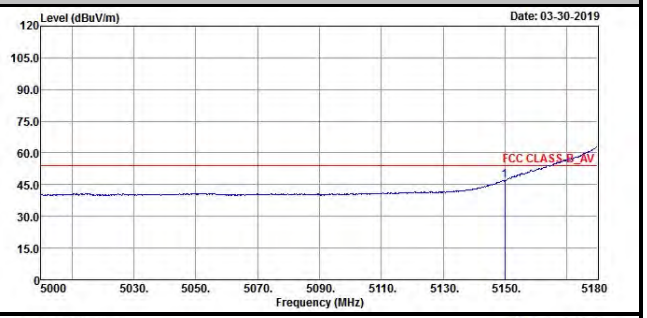
Average

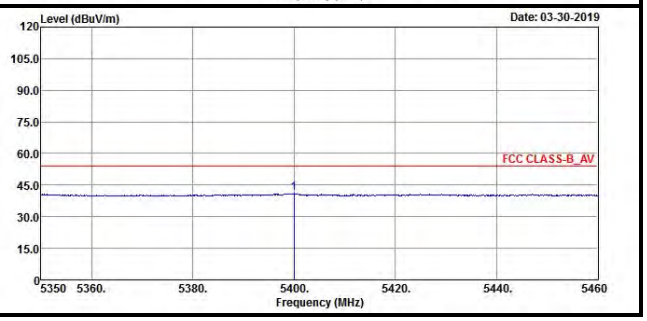
Horizontal

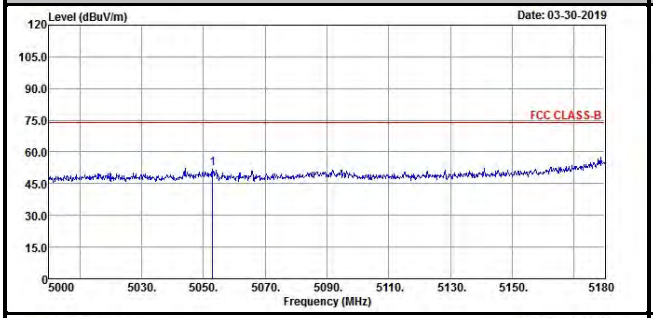
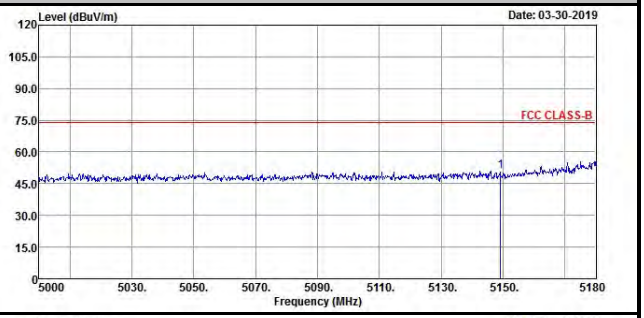
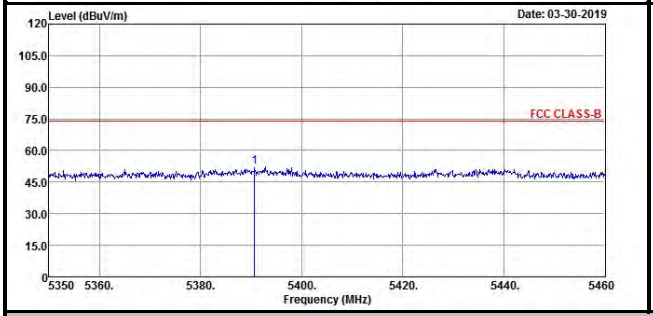
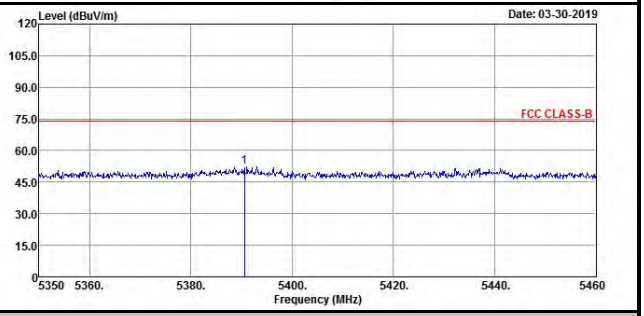
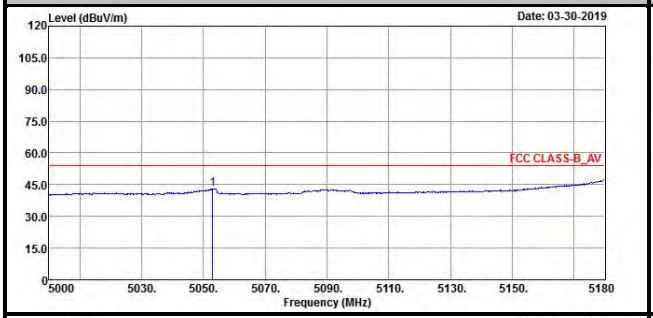
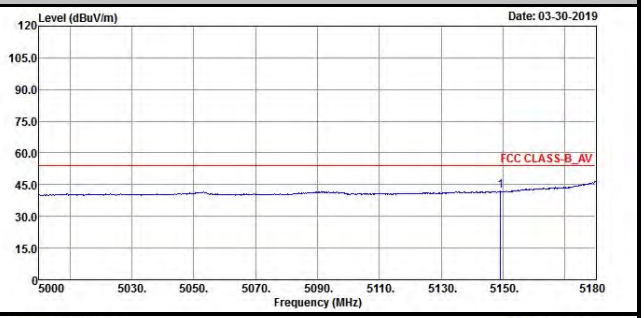
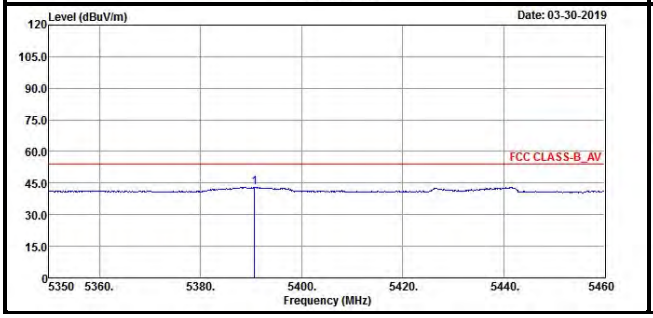
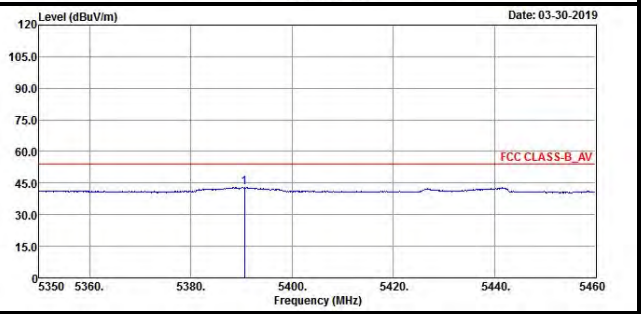


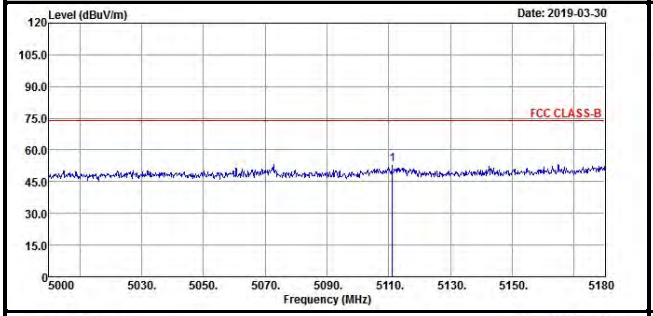
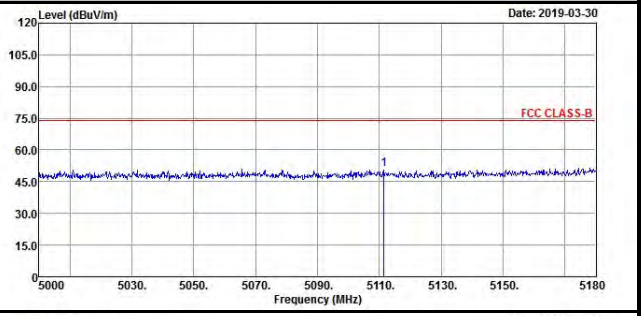
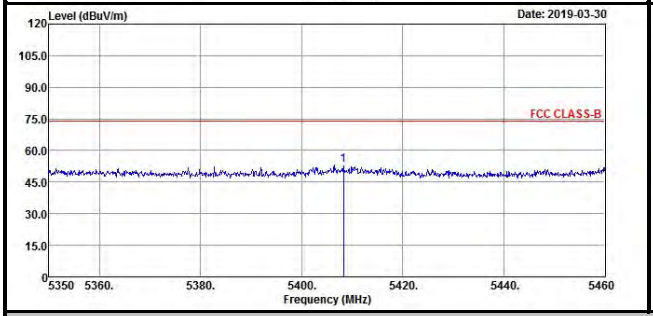
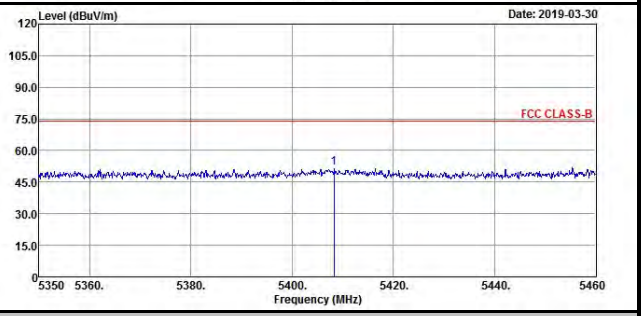
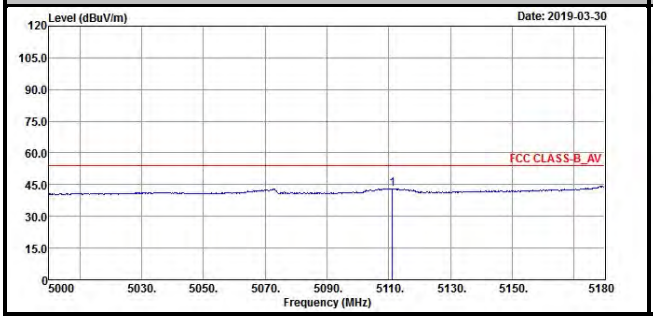
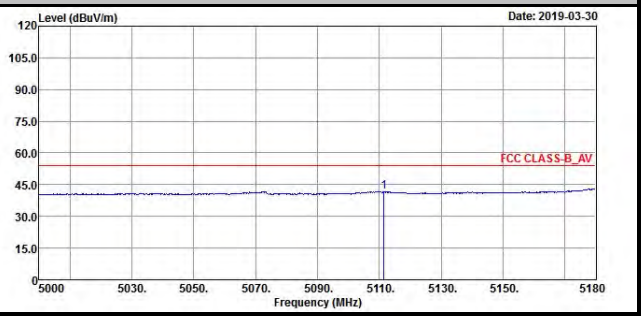
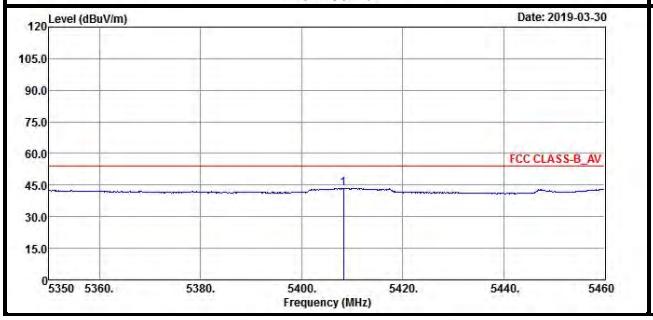
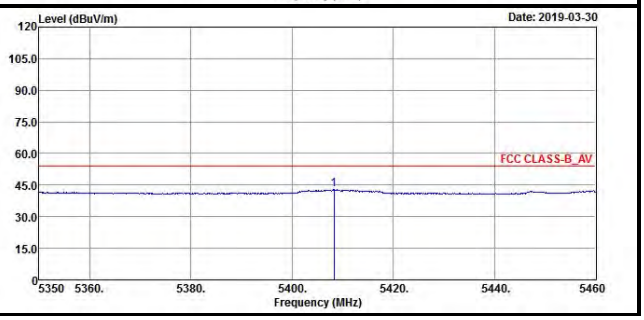


Vertical





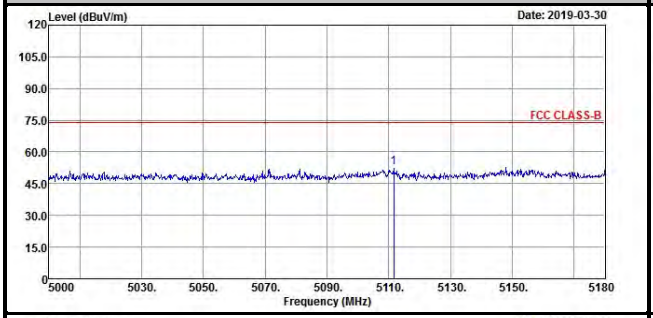
Ch 48	
Peak	
Horizontal	Vertical
	
	
Average	
Horizontal	Vertical
	
	

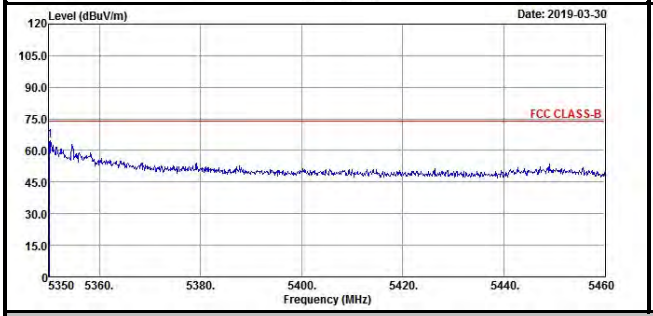
Ch 52	
Peak	
Horizontal	Vertical
	
	
Average	
Horizontal	Vertical
	
	

Ch 60

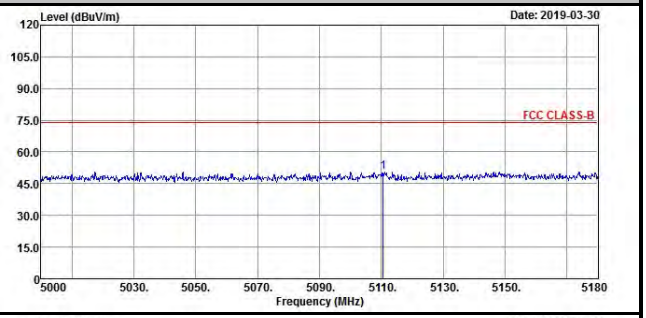
Peak

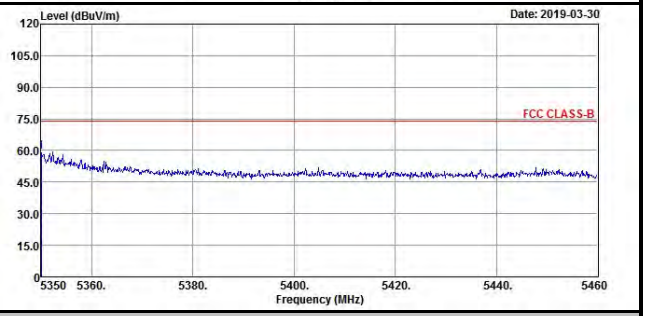
Horizontal





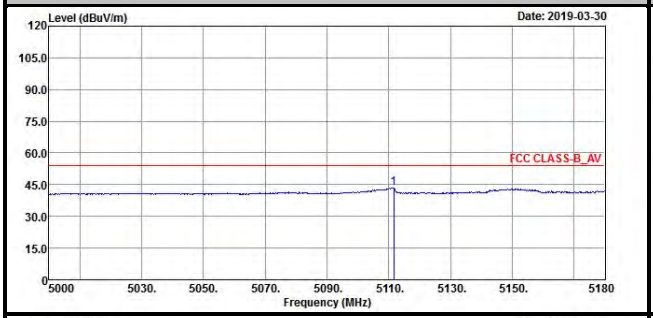
Vertical

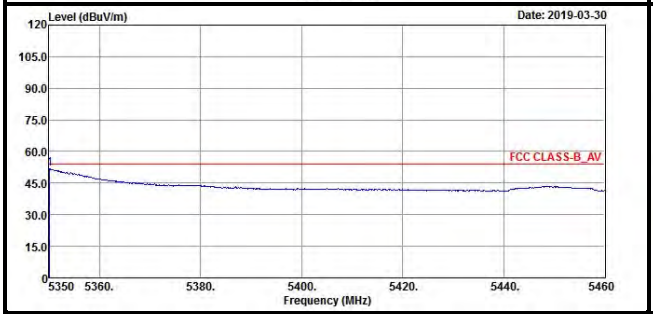




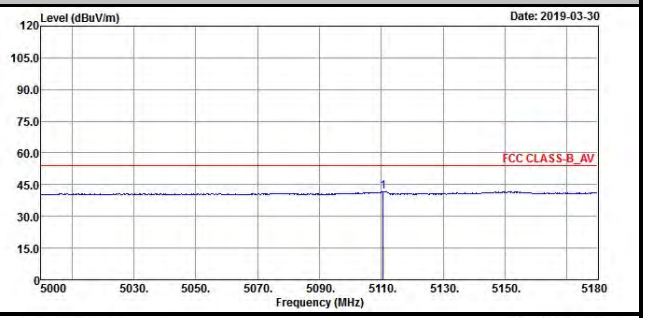
Average

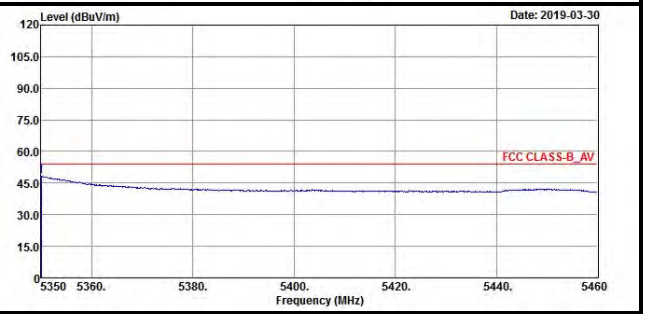
Horizontal

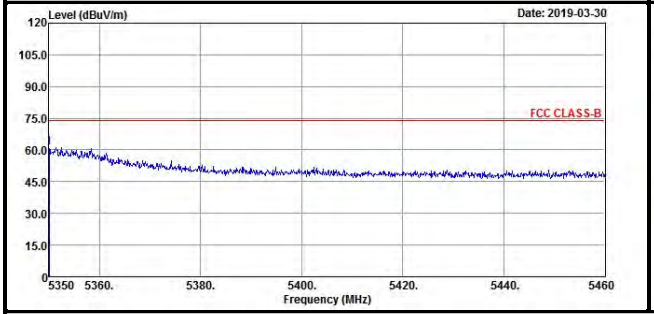
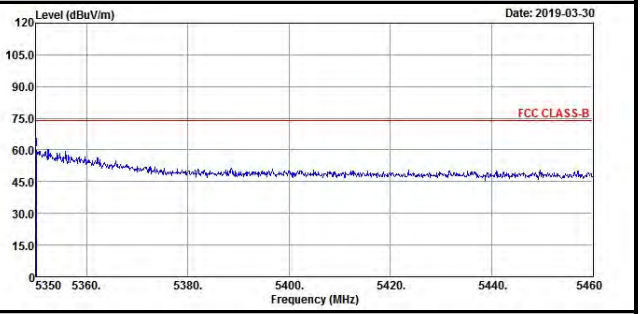
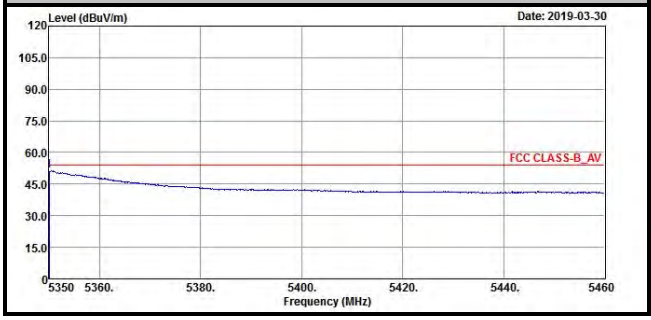
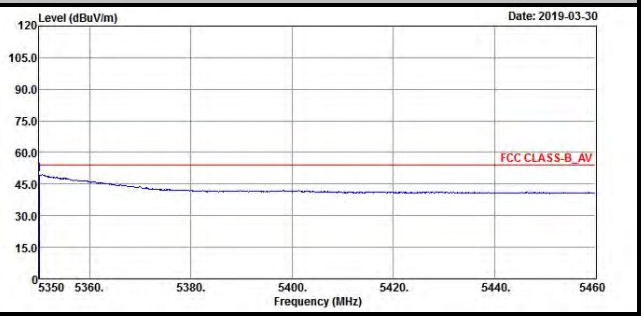




Vertical



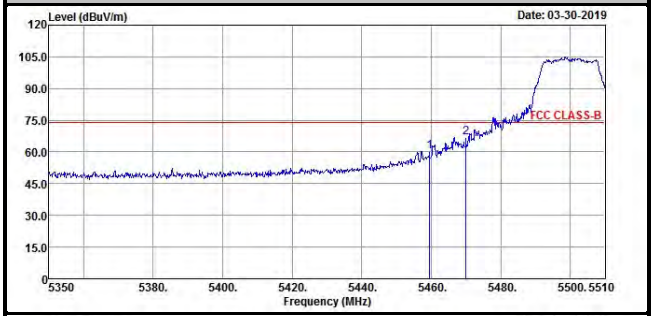


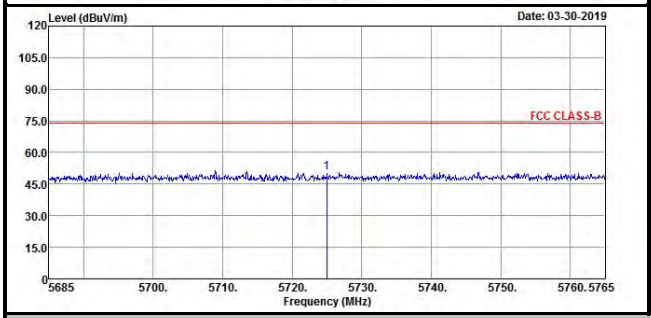
Ch 64	
Peak	
Horizontal	Vertical
	
Average	
Horizontal	Vertical
	

Ch 100

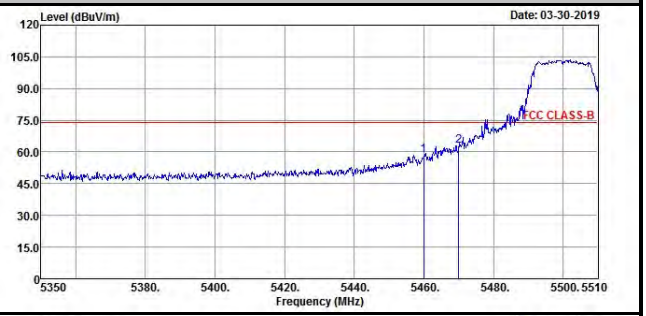
Peak

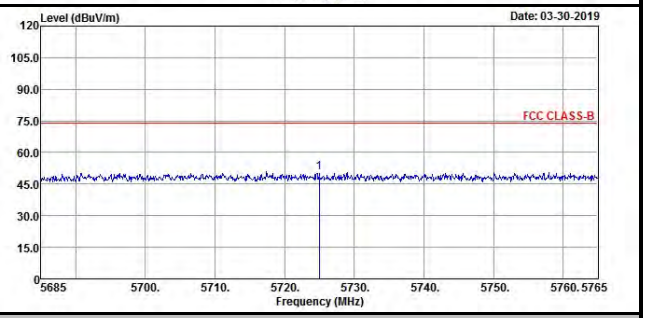
Horizontal





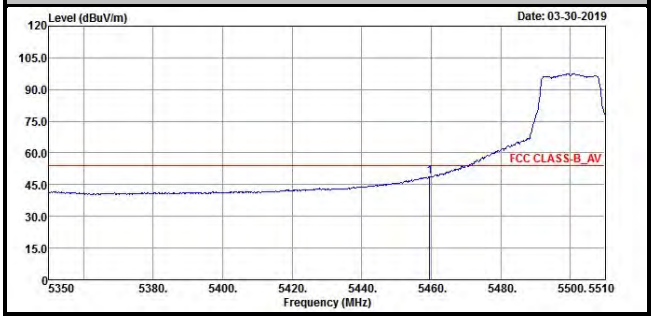
Vertical



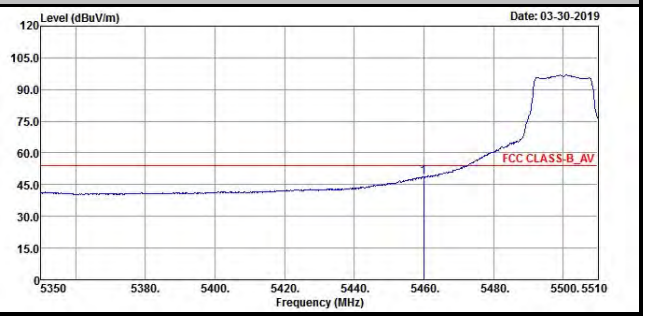


Average

Horizontal



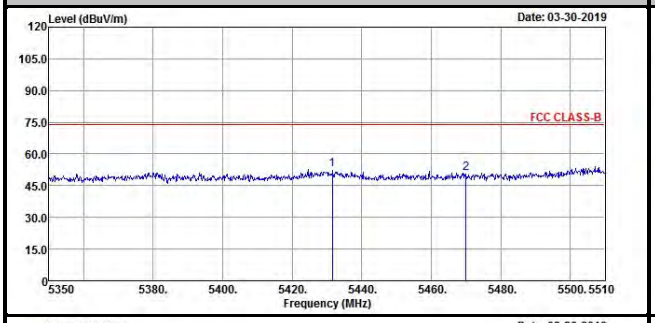
Vertical

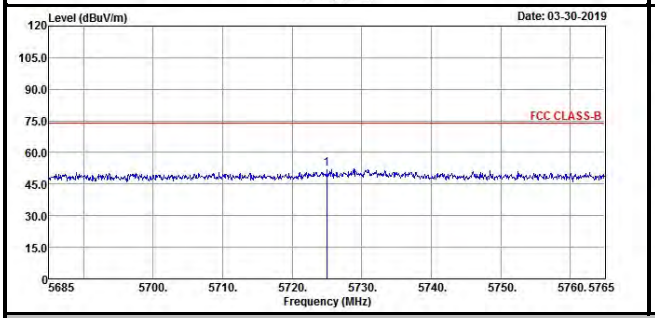


Ch 116

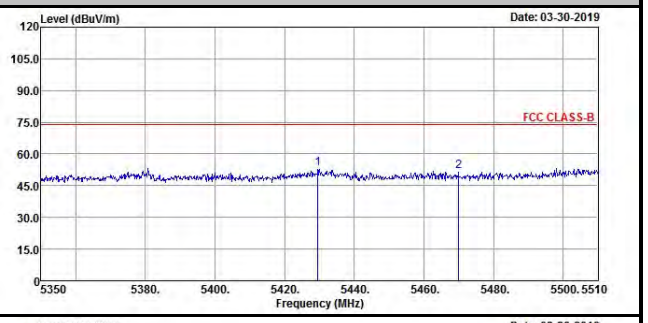
Peak

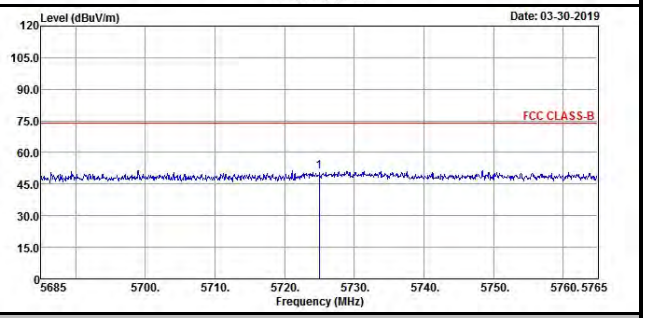
Horizontal





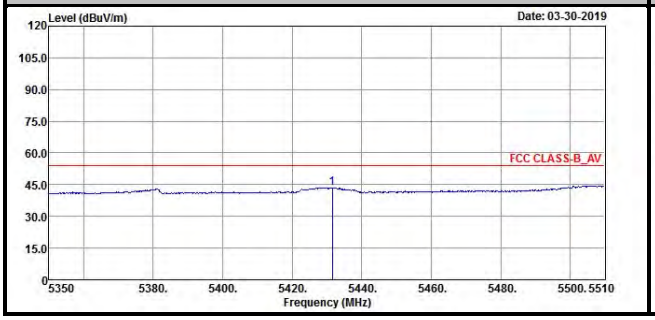
Vertical



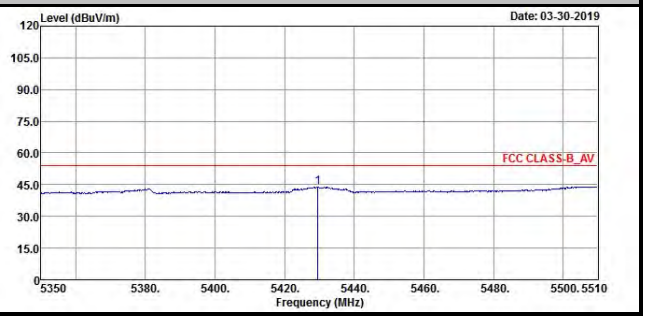


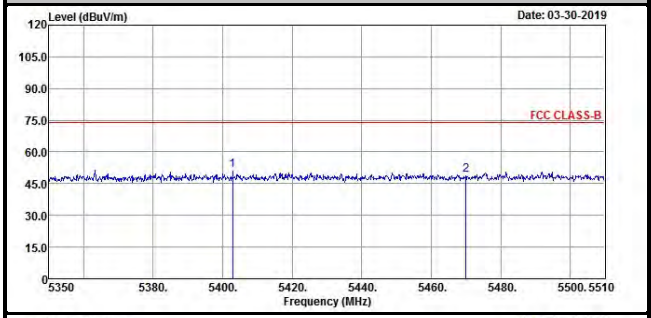
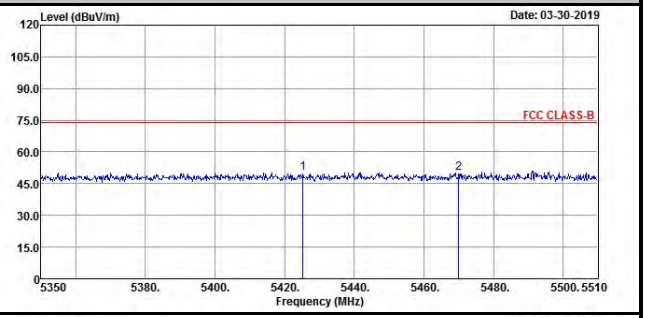
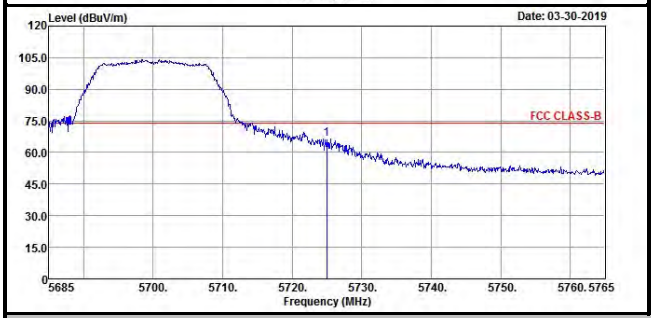
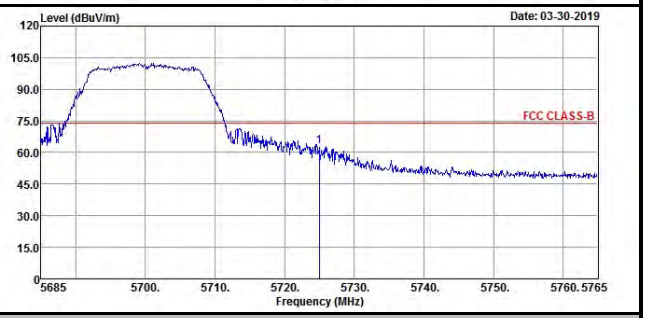
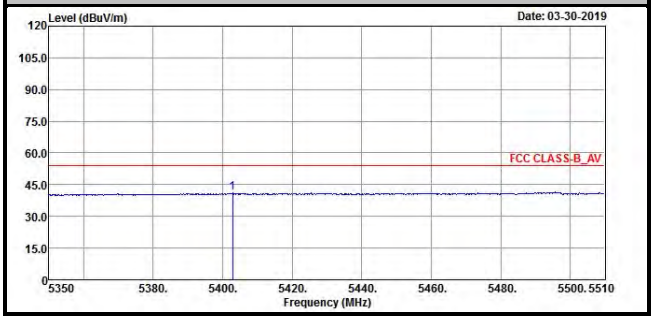
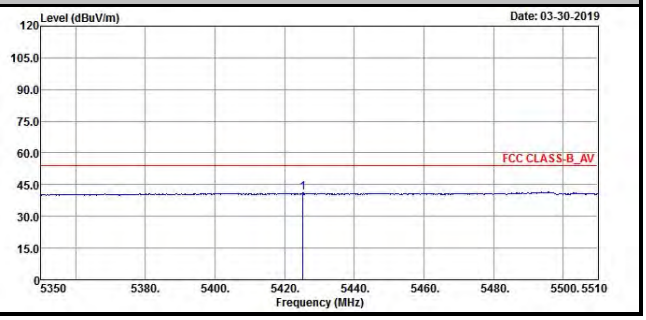
Average

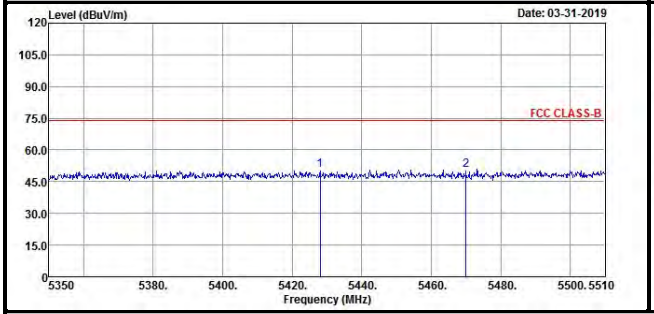
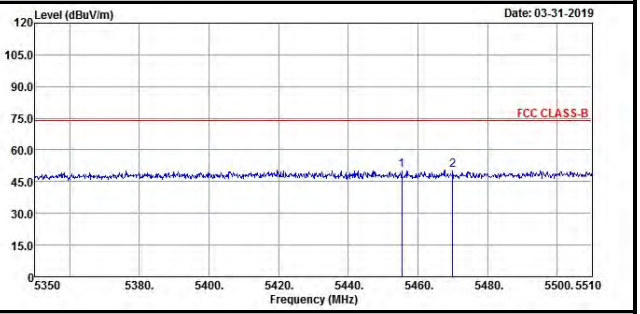
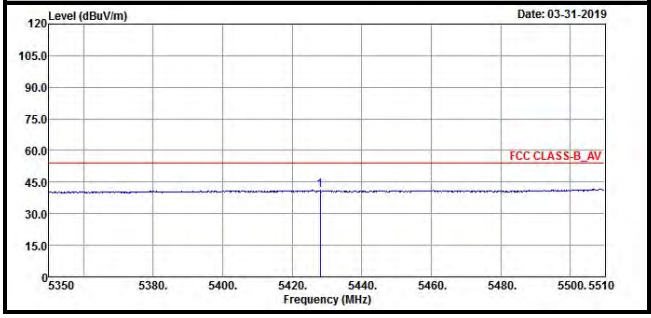
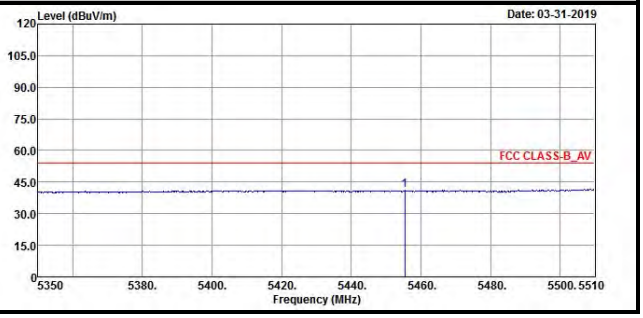
Horizontal



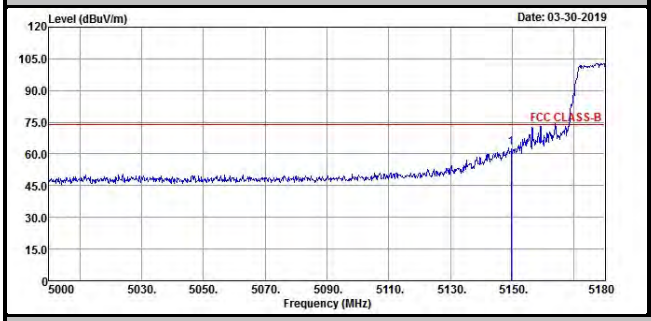
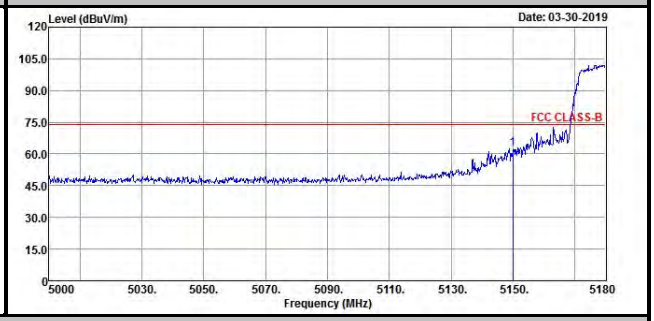
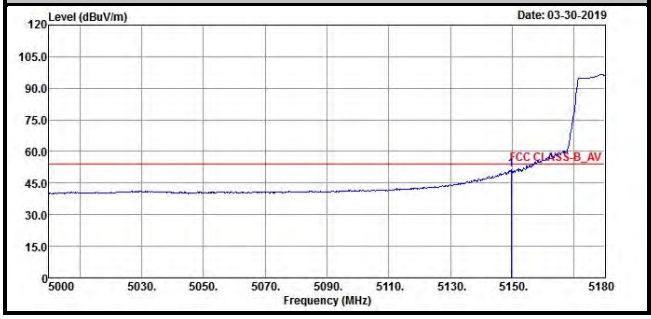
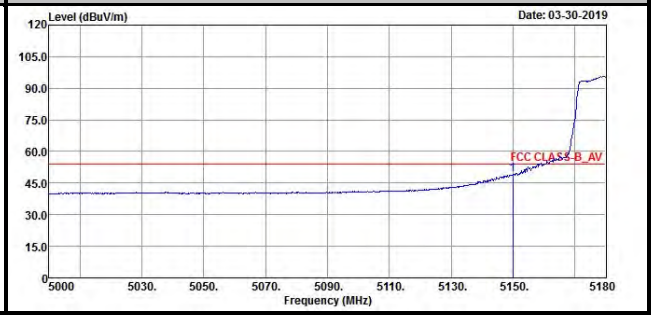
Vertical



Ch 140	
Peak	
Horizontal	Vertical
	
	
Average	
Horizontal	Vertical
	

Ch 144	
Peak	
Horizontal	Vertical
	
Average	
Horizontal	Vertical
	

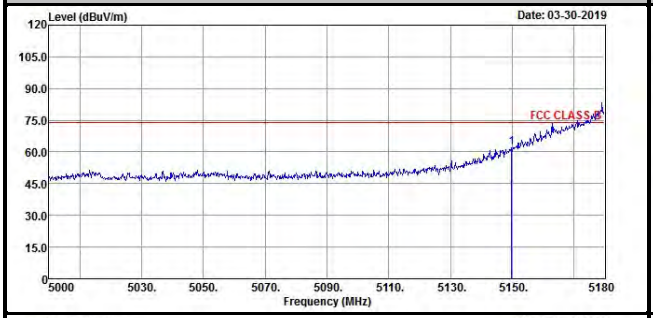
802.11n (HT20)

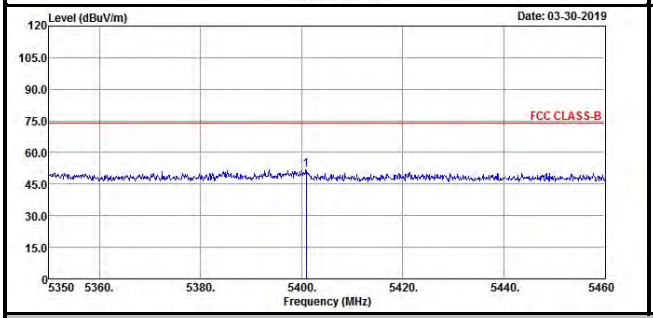
Ch 36	
Peak	
Horizontal	**Vertical**
	
Average	
Horizontal	**Vertical**
	

Ch 40

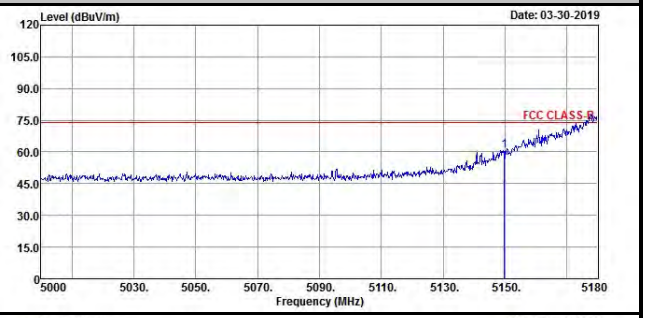
Peak

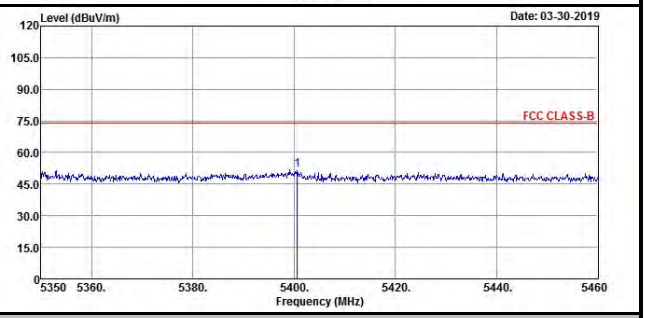
Horizontal





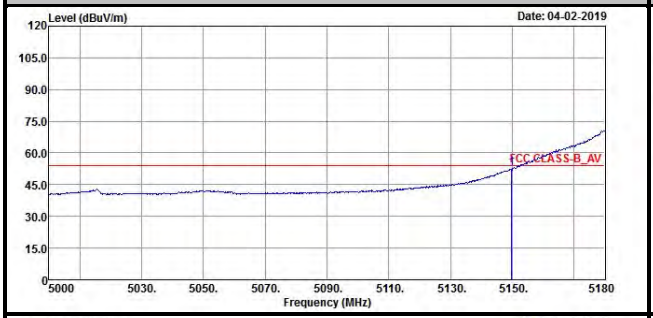
Vertical

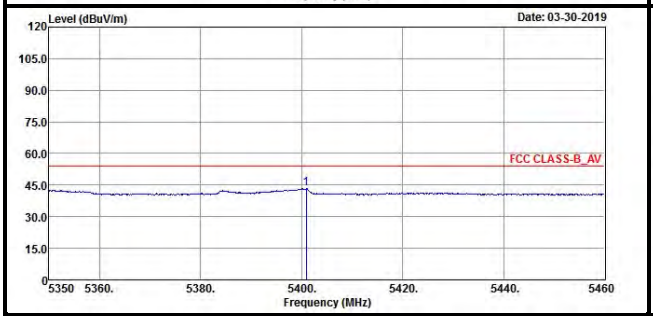




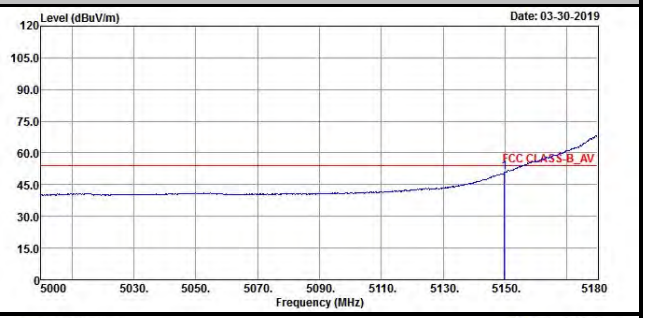
Average

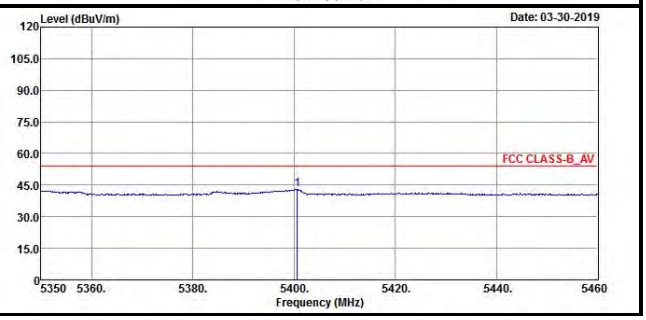
Horizontal





Vertical

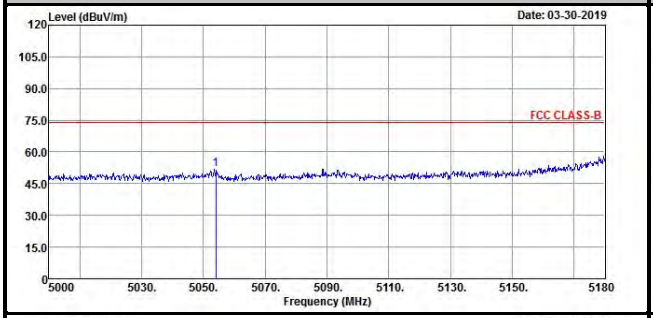


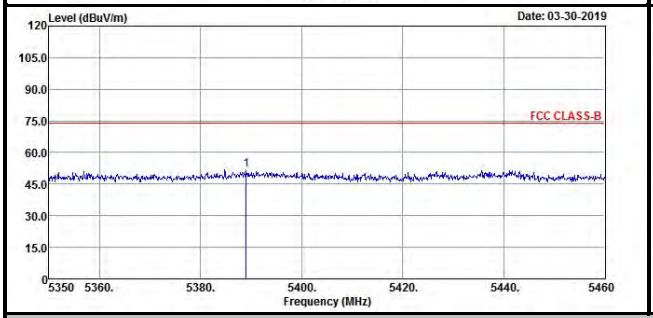


Ch 48

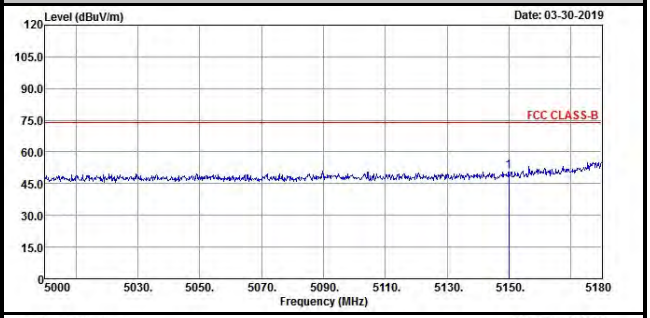
Peak

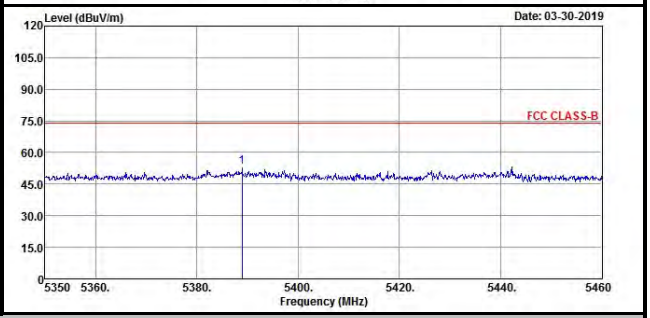
Horizontal





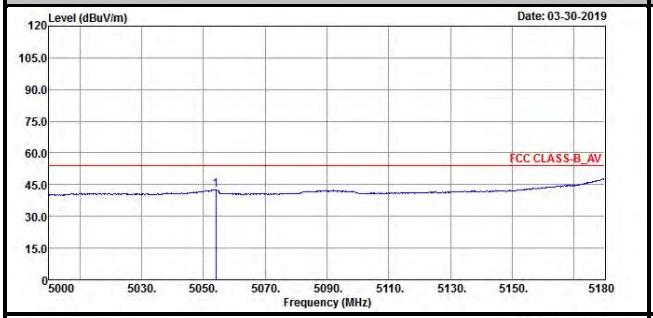
Vertical

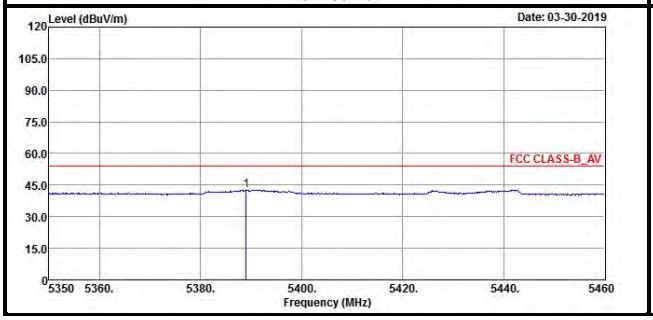




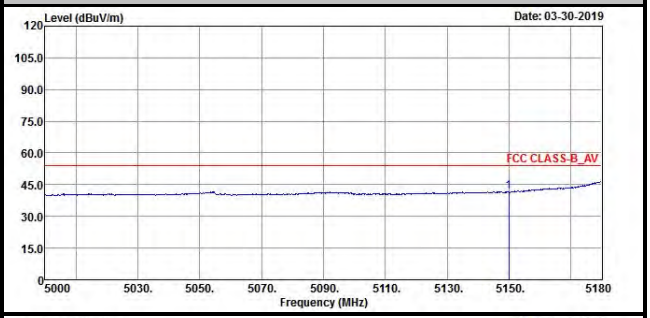
Average

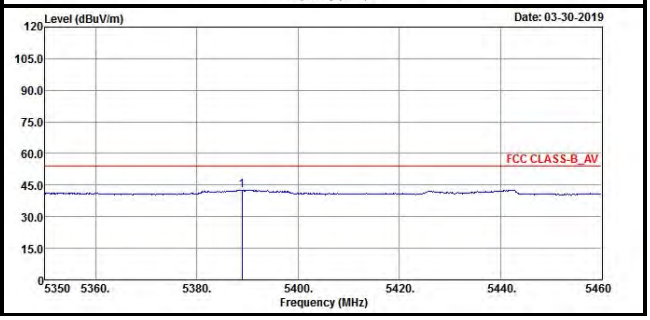
Horizontal

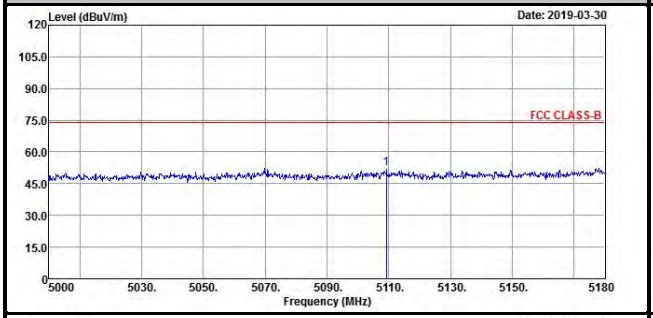
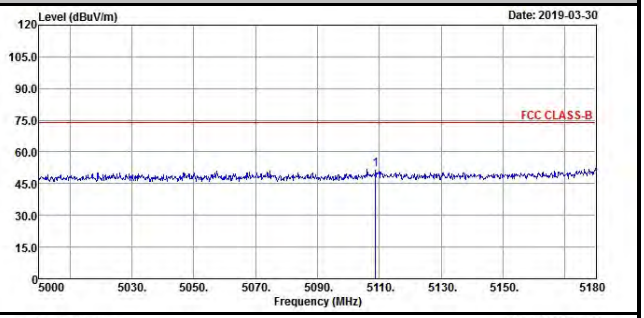
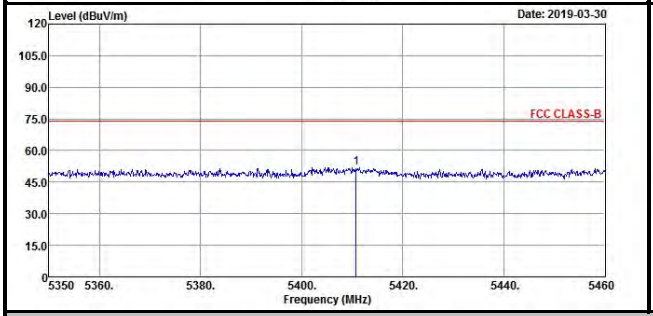
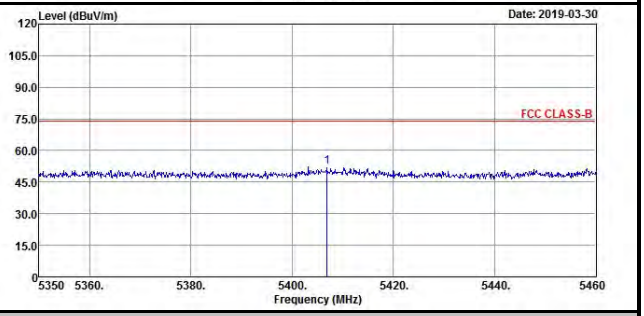
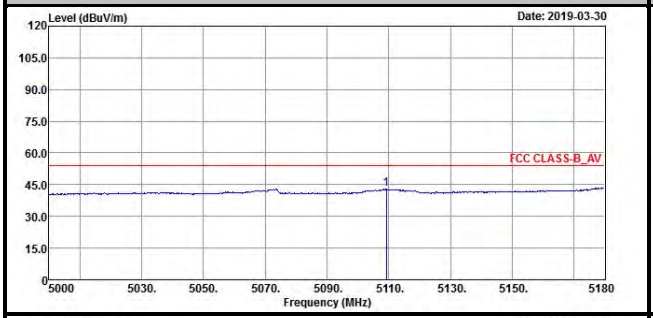
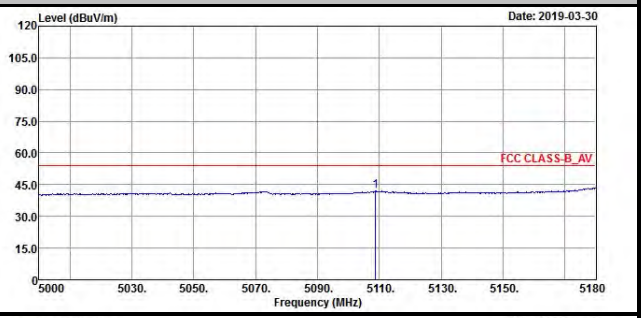
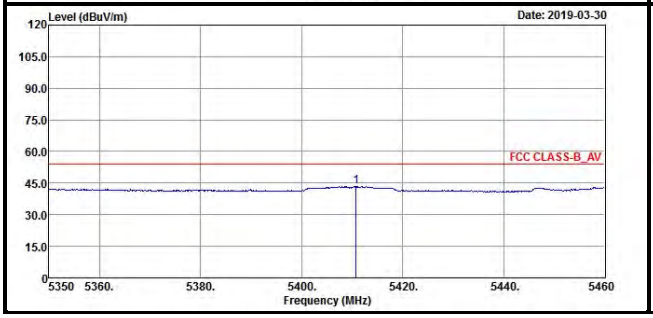
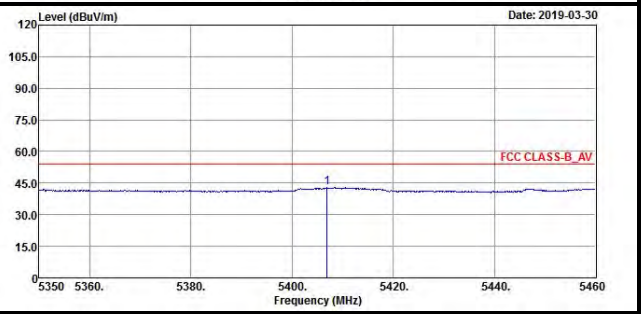




Vertical



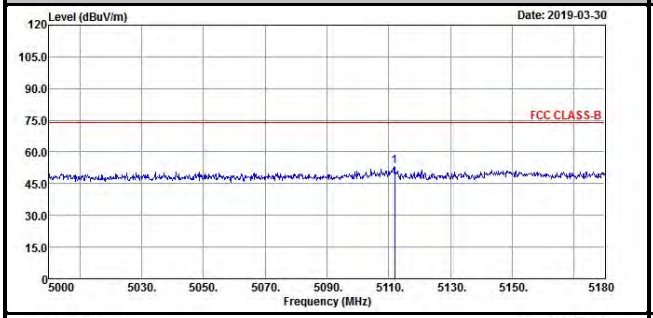


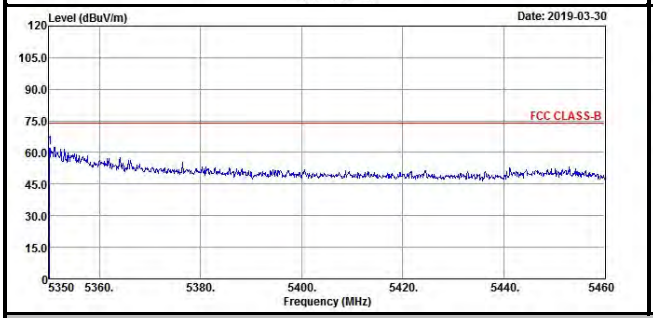
Ch 52	
Peak	
Horizontal	Vertical
	
	
Average	
Horizontal	Vertical
	
	

Ch 60

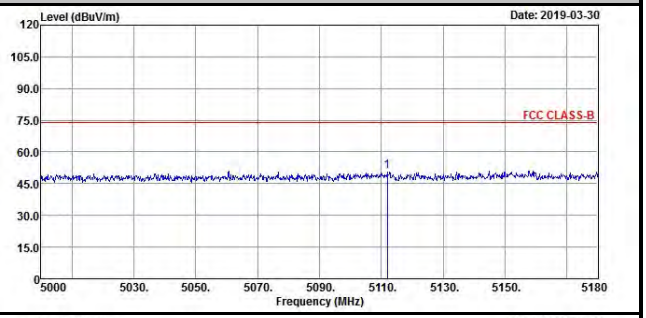
Peak

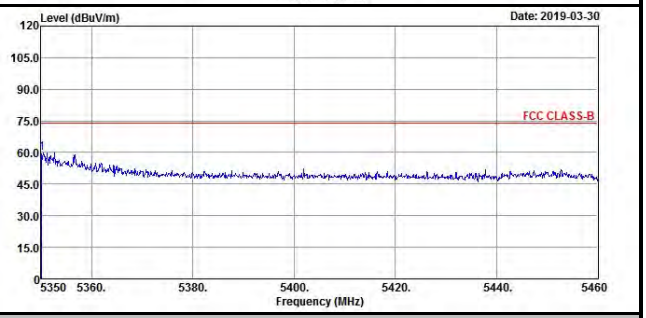
Horizontal





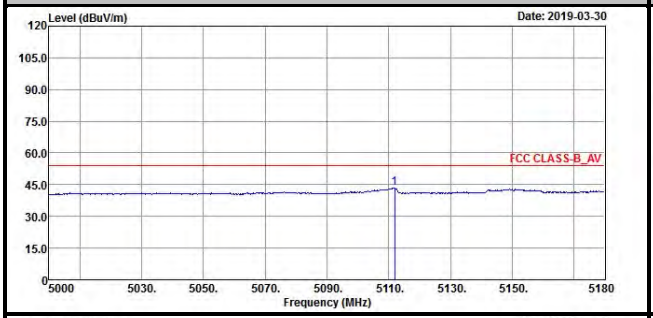
Vertical

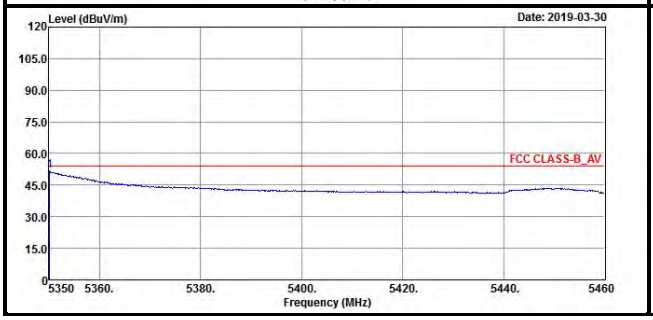




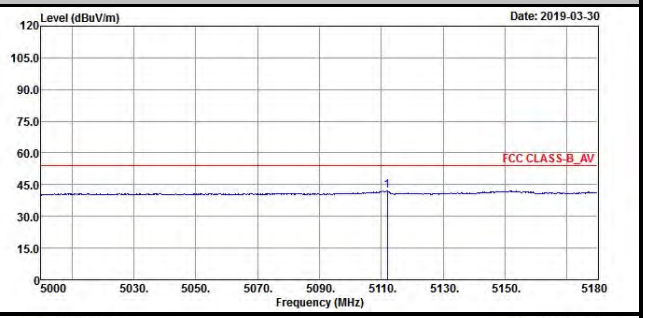
Average

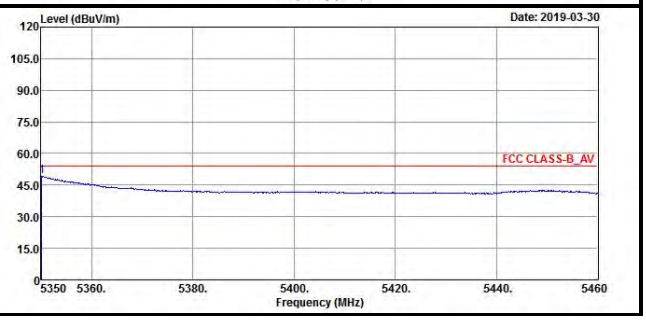
Horizontal

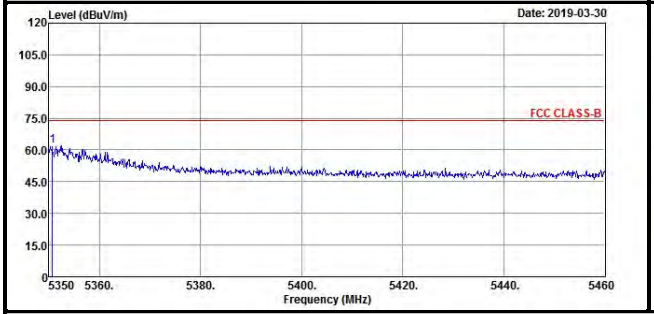
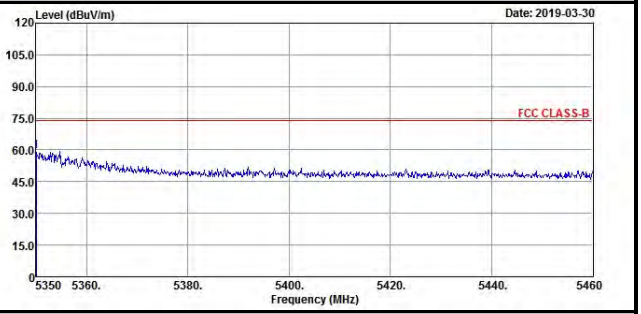
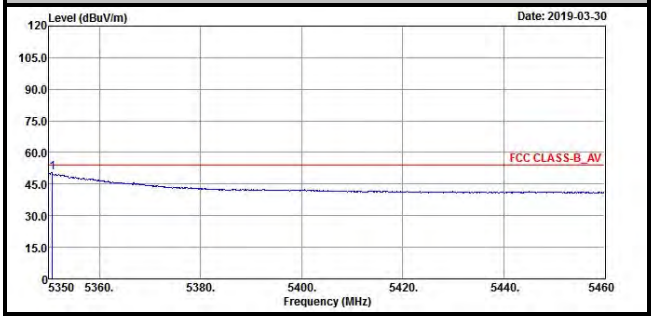
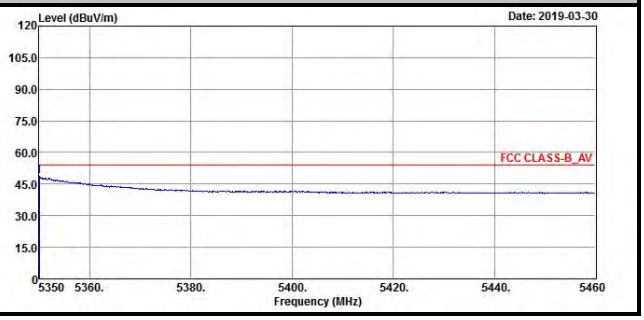




Vertical



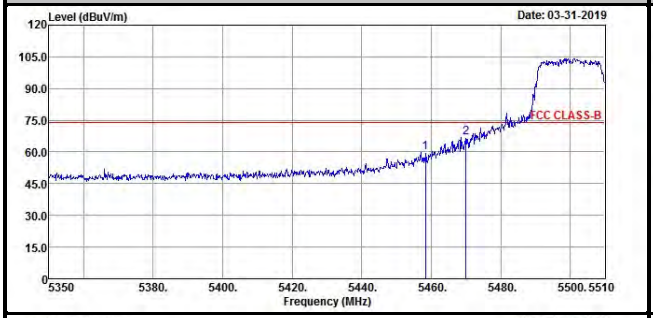


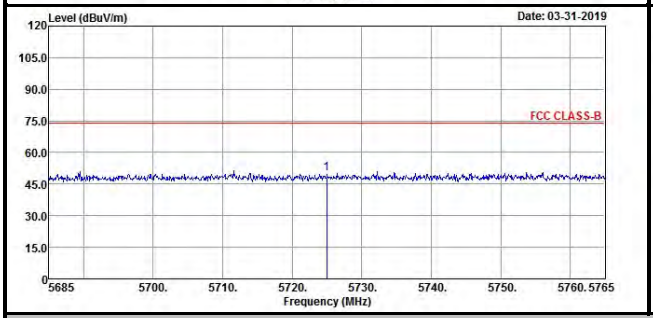
Ch 64	
Peak	
Horizontal	Vertical
	
Average	
Horizontal	Vertical
	

Ch 100

Peak

Horizontal





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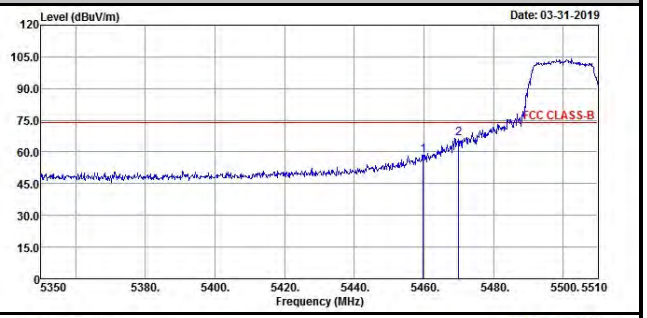

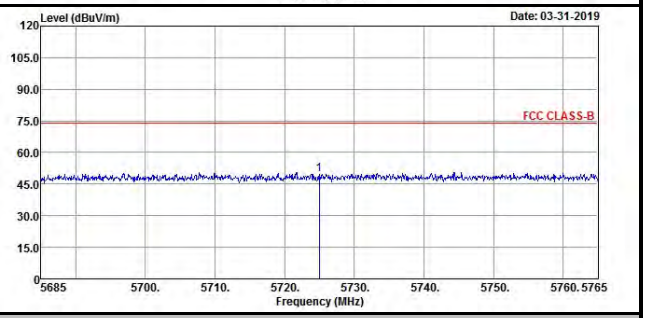

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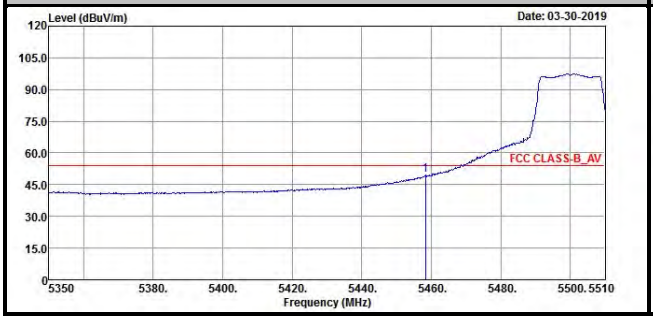

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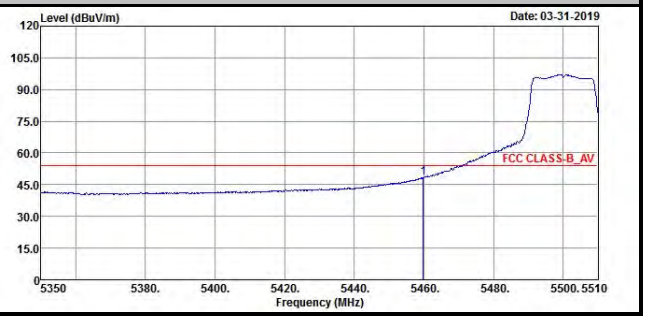
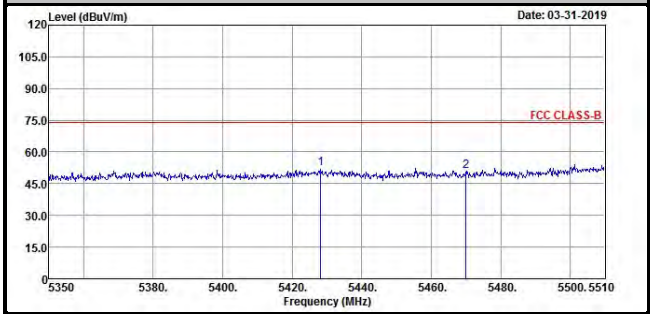
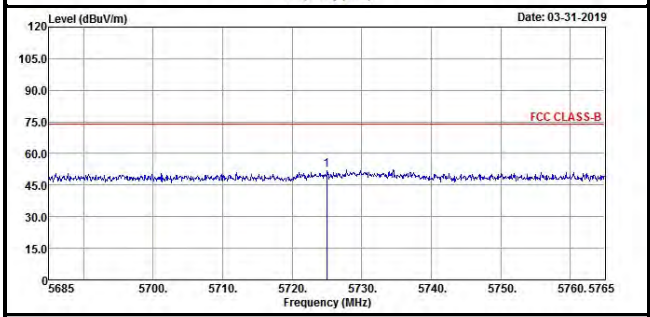


Ch 116

Peak

Horizontal





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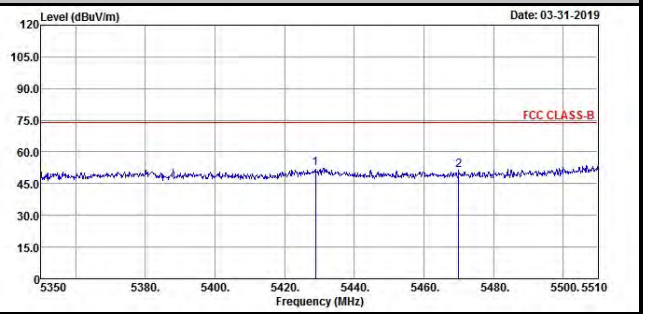

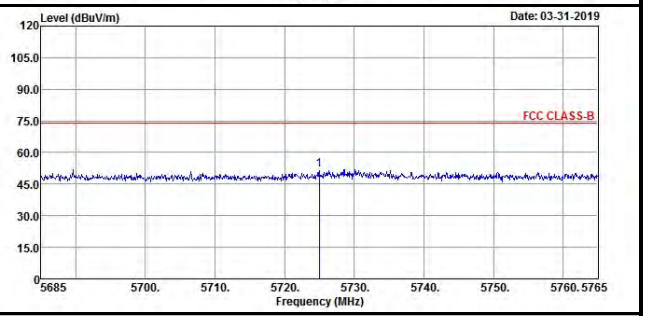

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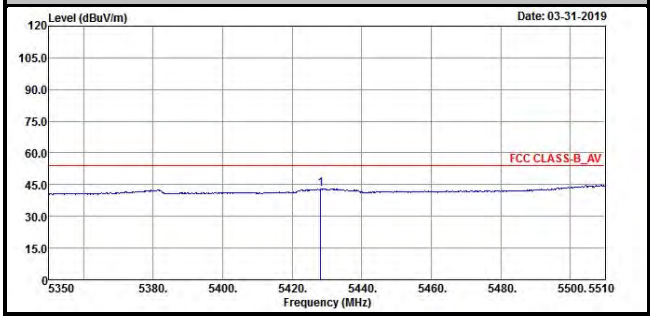

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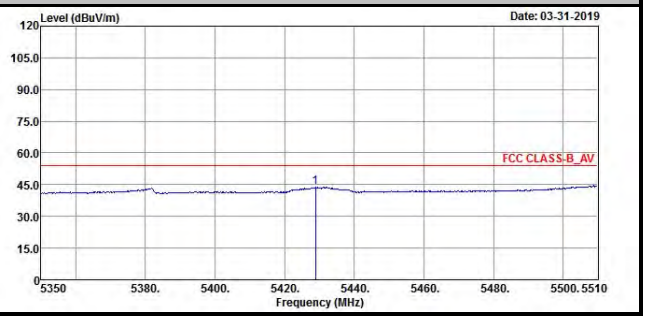
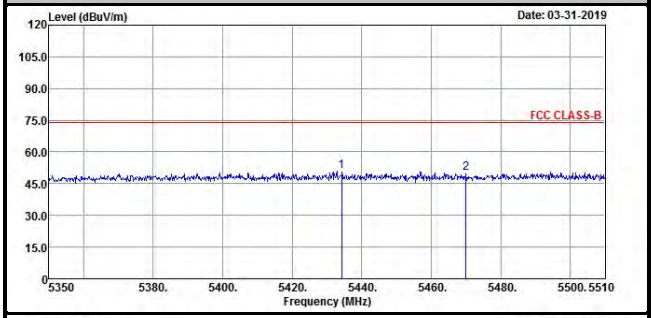
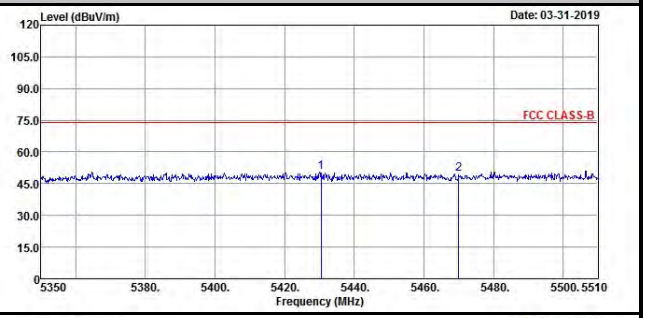
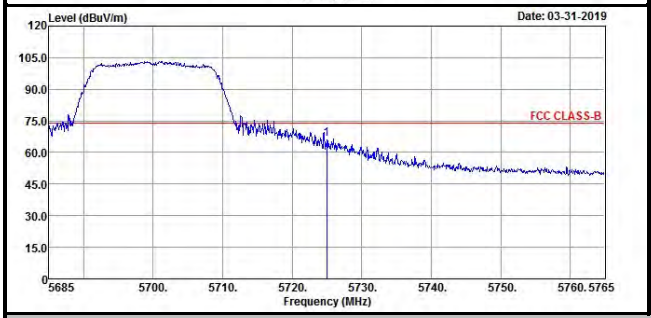
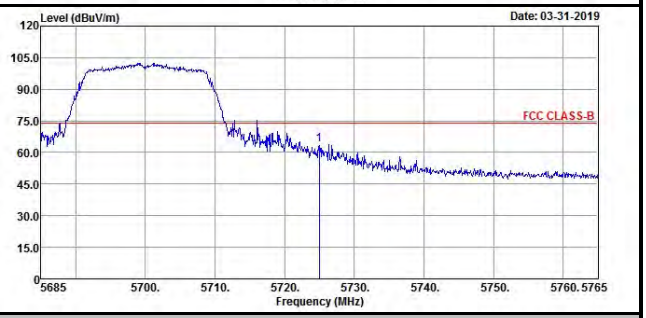


Ch 140	
Peak	
Horizontal	Vertical
	
	
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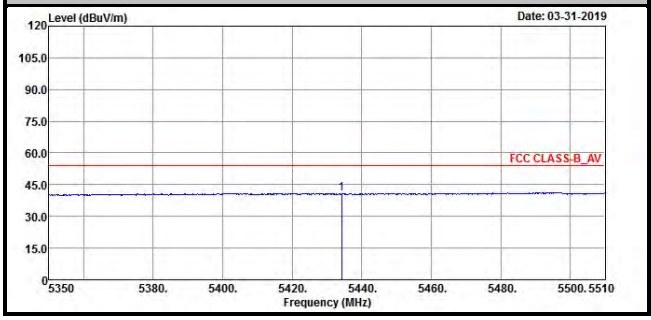
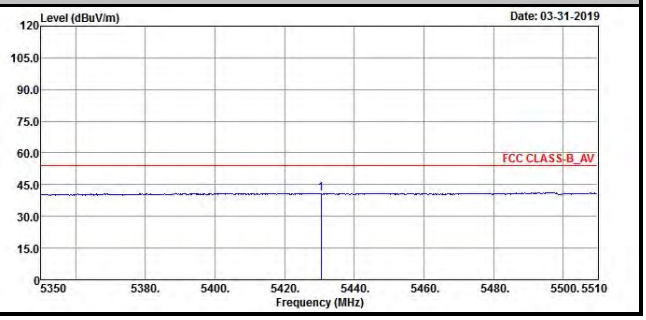
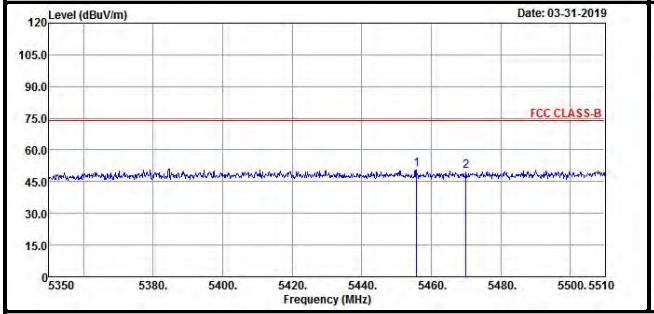
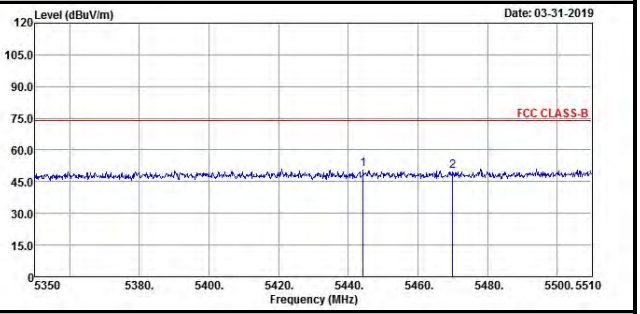
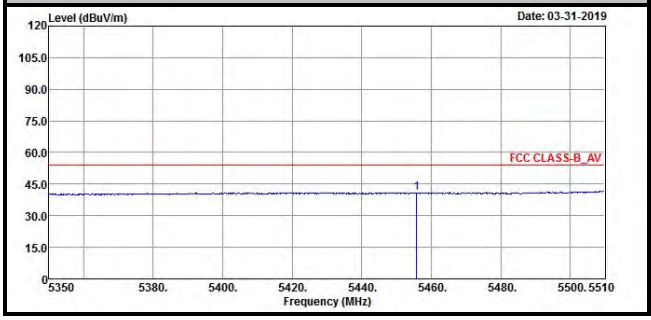
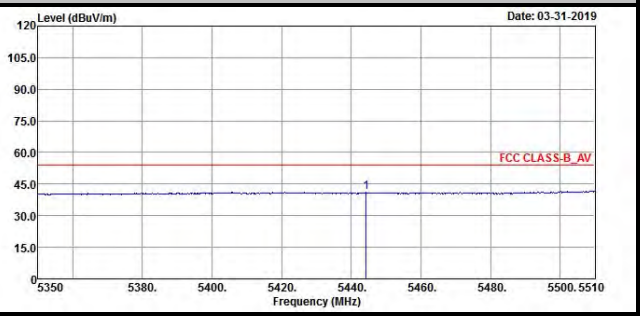
Horizontal	Vertical
	

Ch 144	
Peak	
Horizontal	Vertical
	
Average	
Horizontal	Vertical
	

802.11n (HT40)

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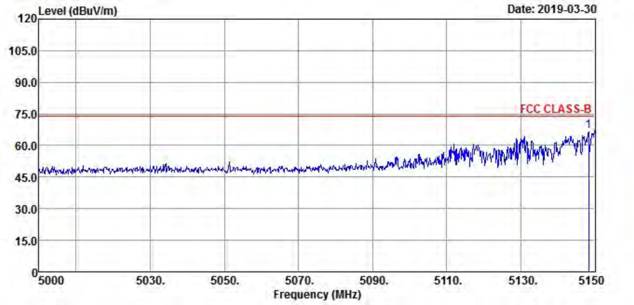
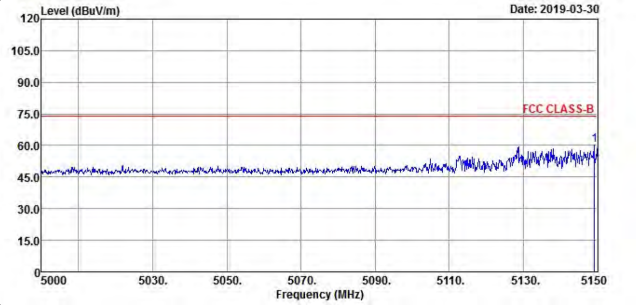
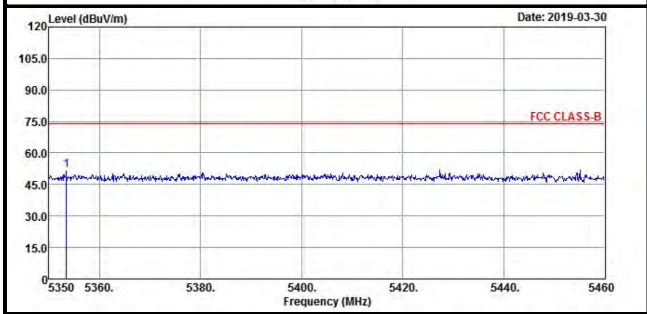
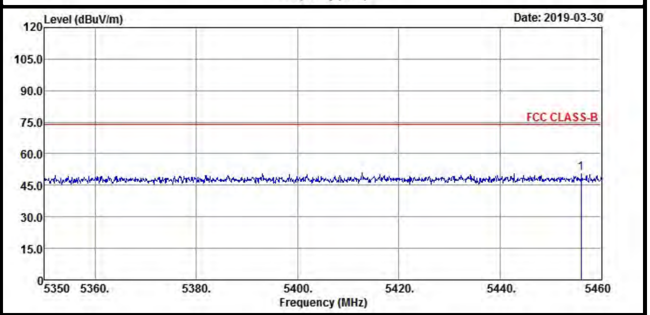
<tr><td>  </td><td>  </td></tr>
<tr><td>  </td><td>  </td></tr>
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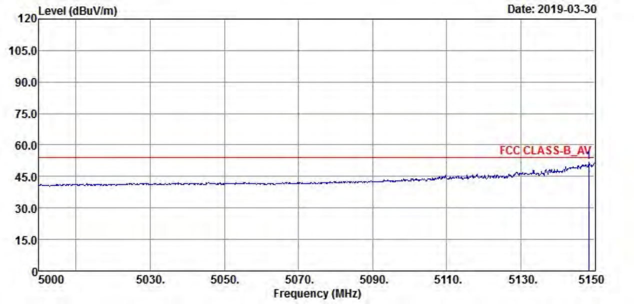
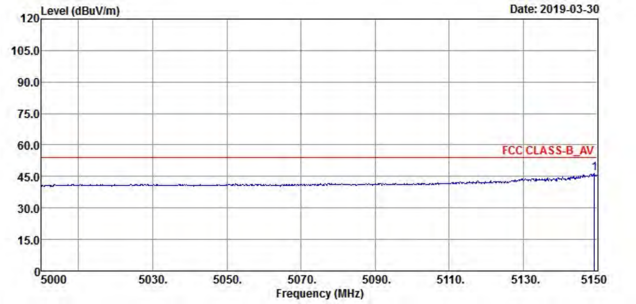
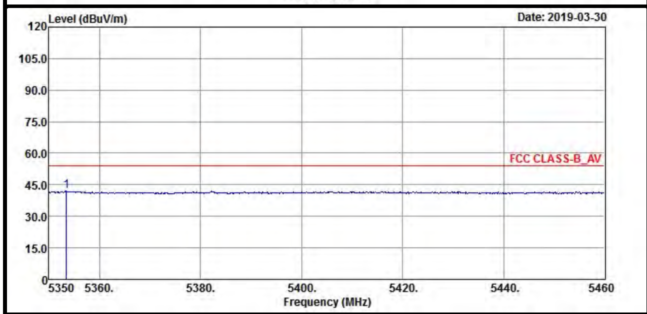
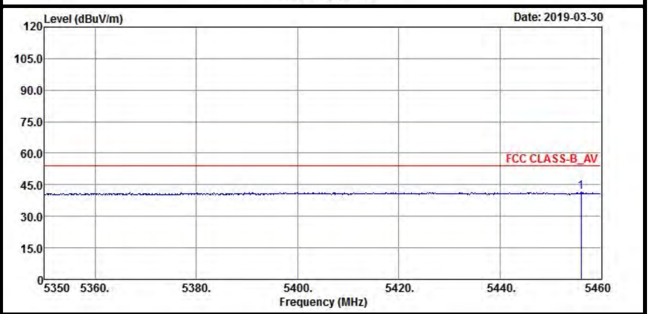
<tr><td>  </td><td>  </td></tr>
<tr><td>  </td><td>  </td></tr>
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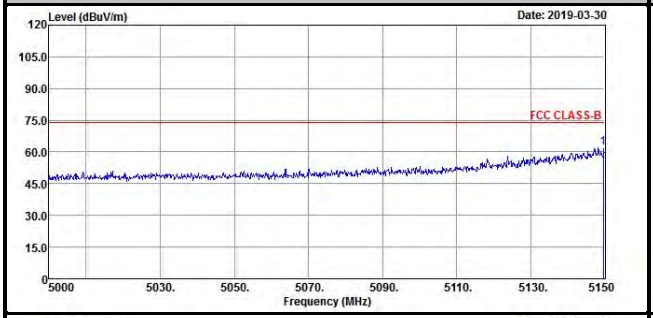
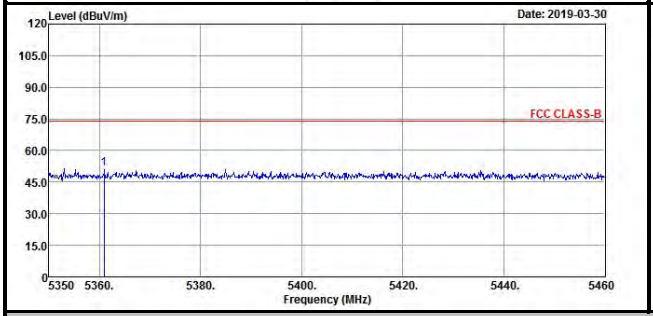
Ch 46

Peak

Horizontal





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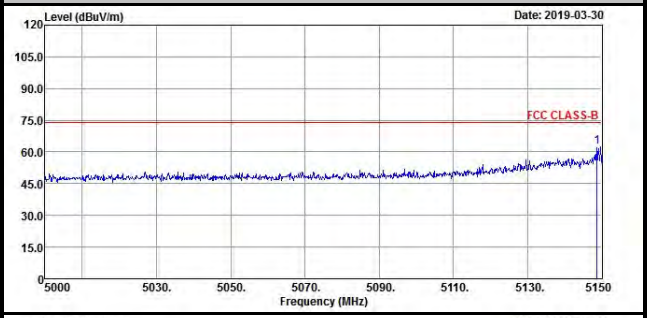
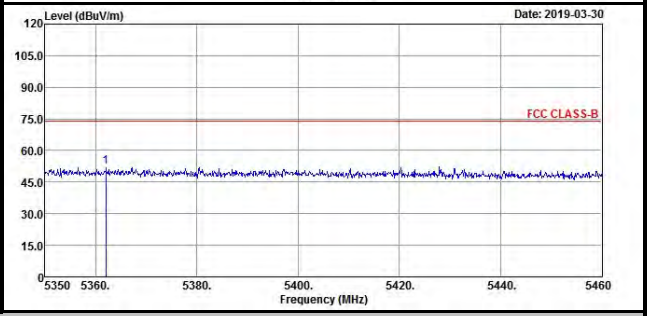
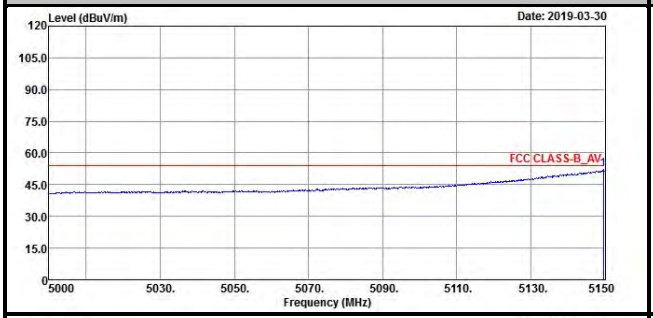
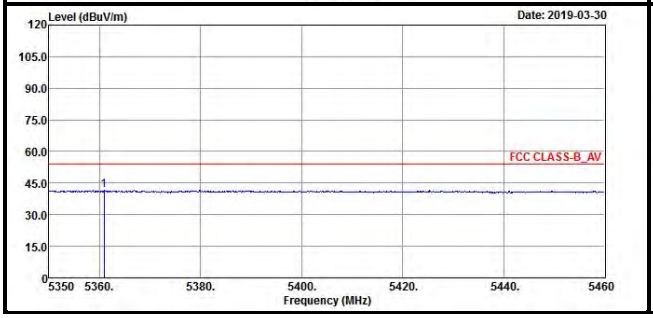




Average

Horizontal





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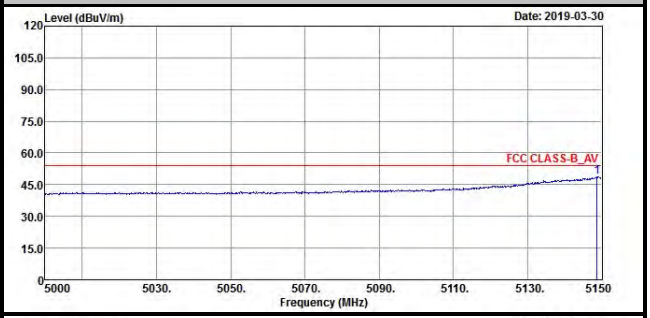
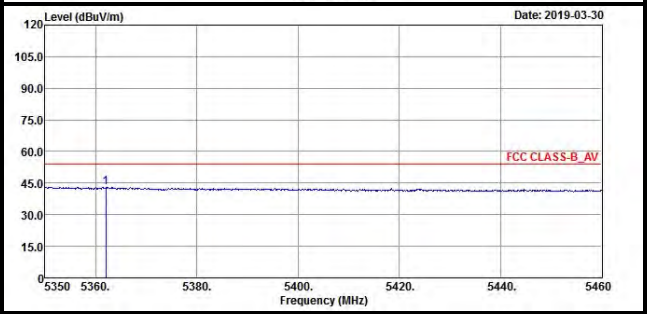
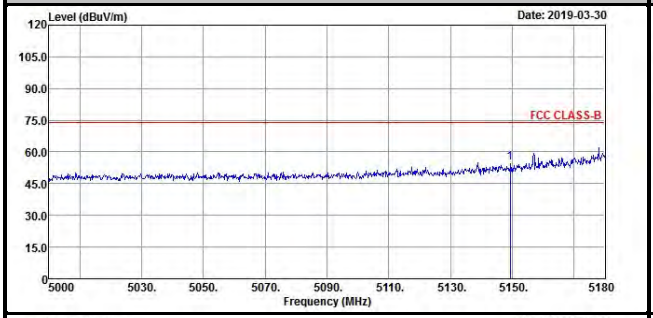


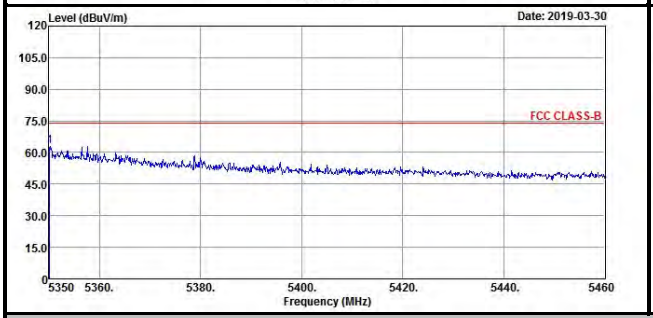


Ch 54

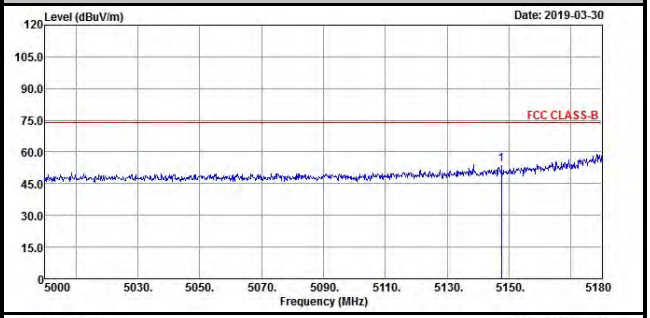
Peak

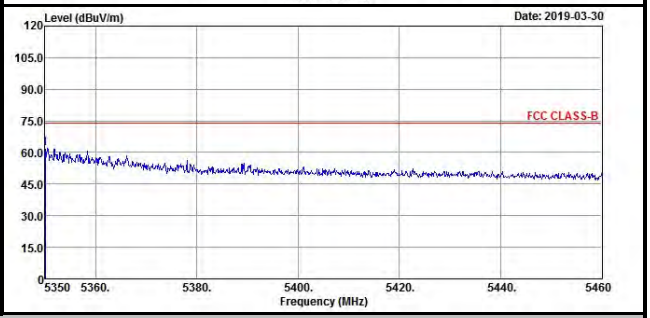
Horizontal





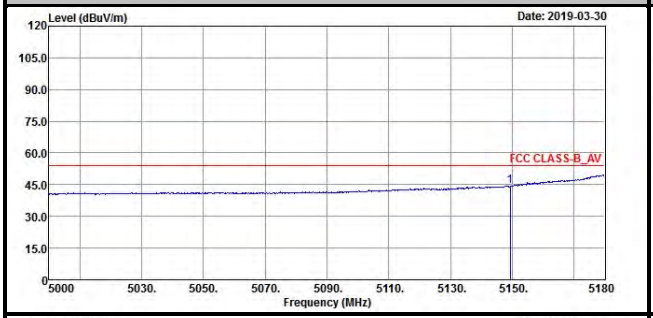
Vertical

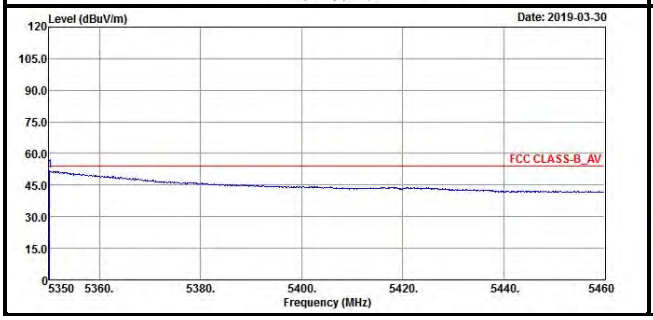




Average

Horizontal





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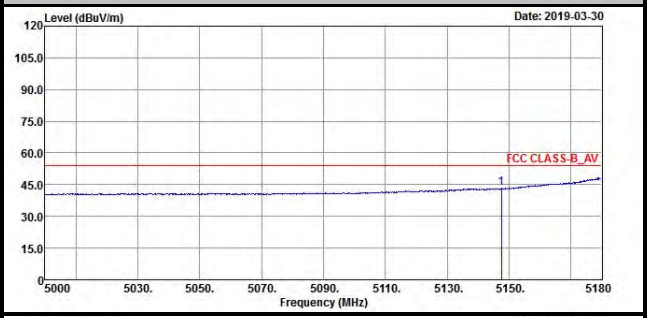
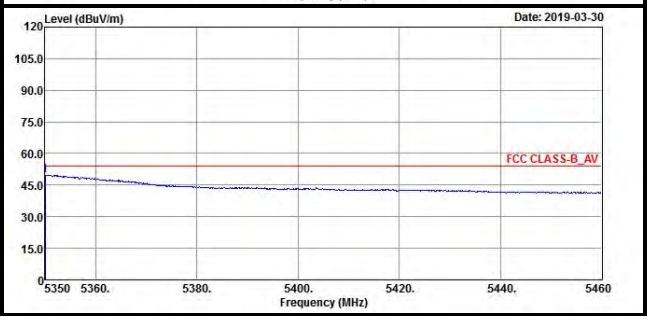
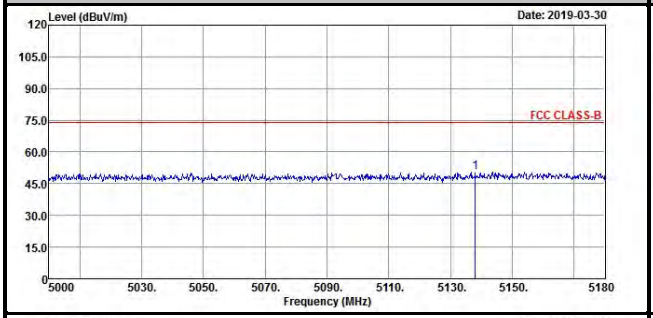
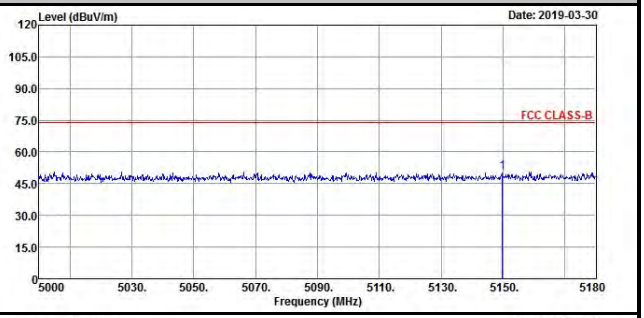
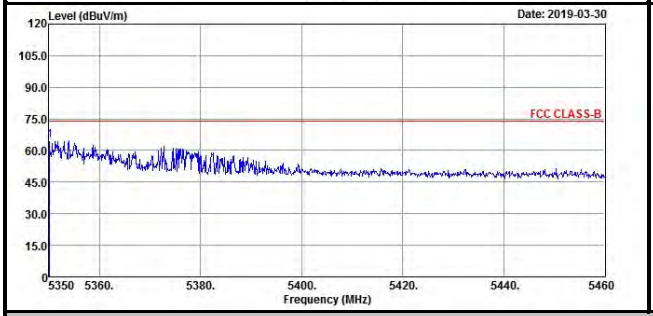
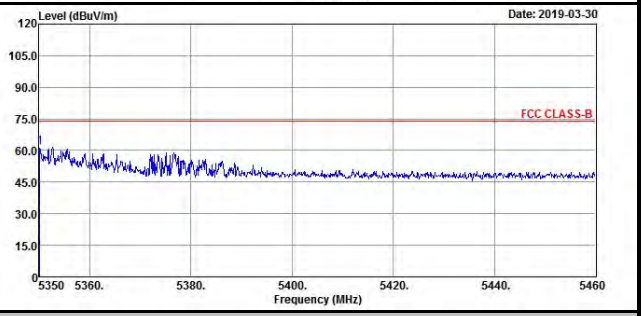




Ch 62	
Peak	
Horizontal	Vertical
	
	
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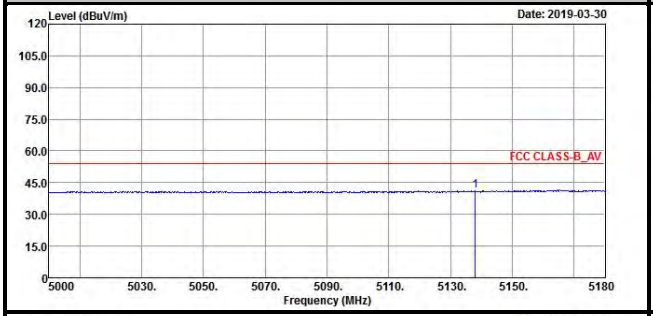
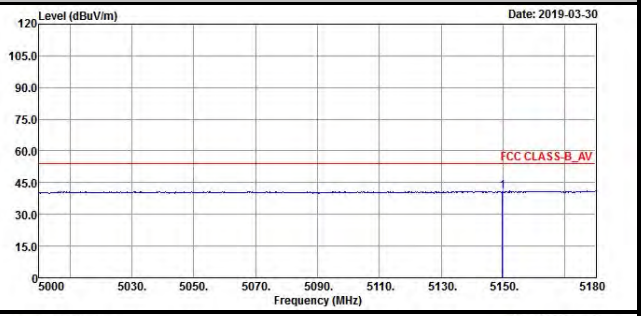
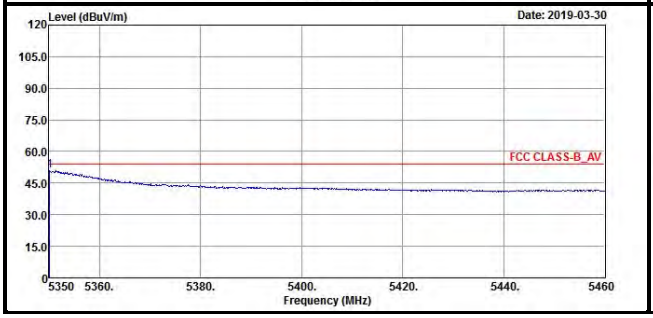
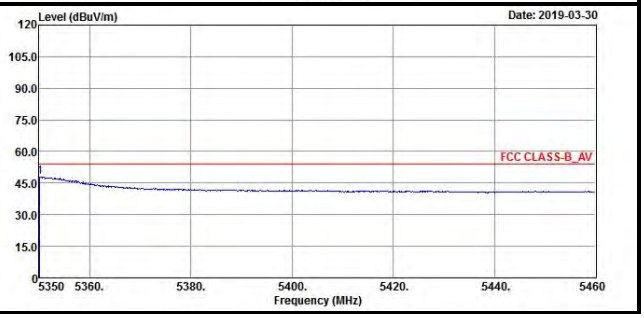
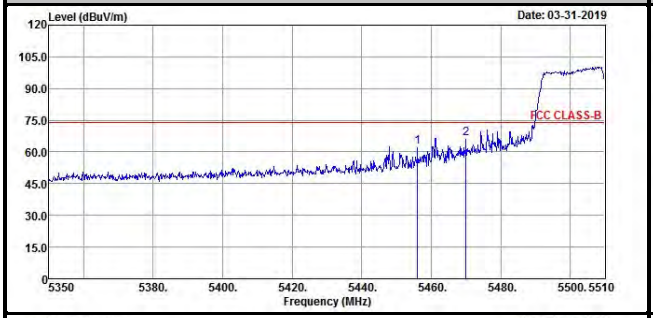
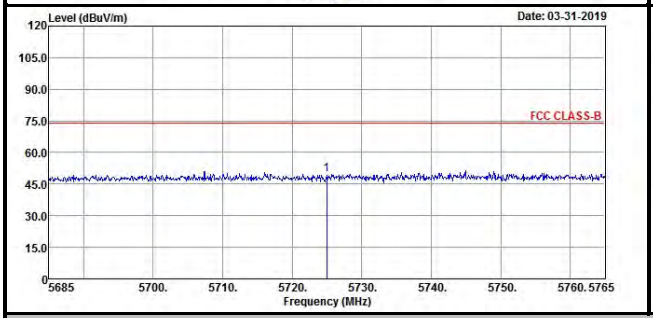
Horizontal	Vertical
	
	

Ch 102

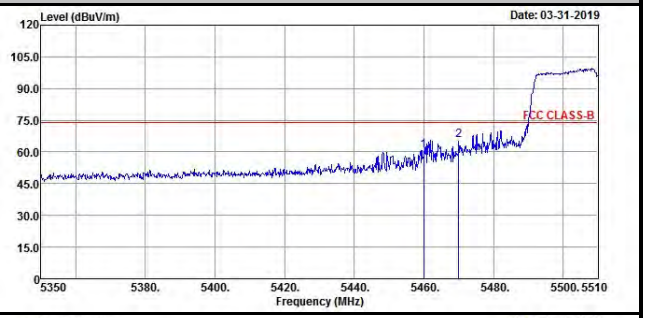
Peak

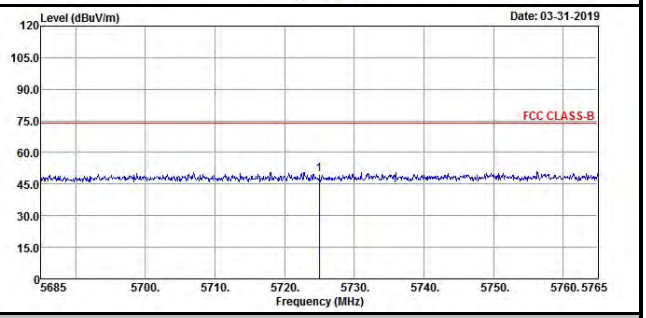
Horizontal





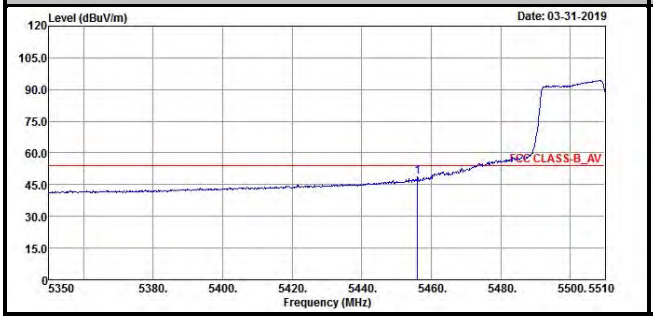
Vertical





Average

Horizontal



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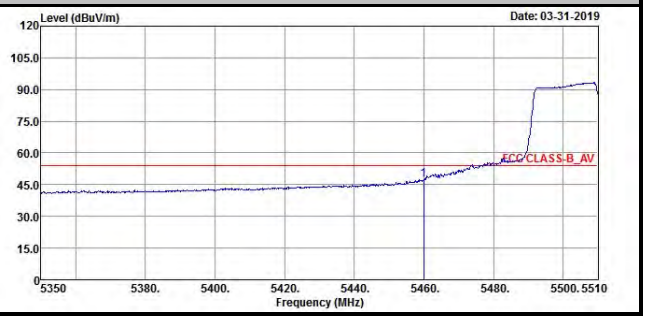
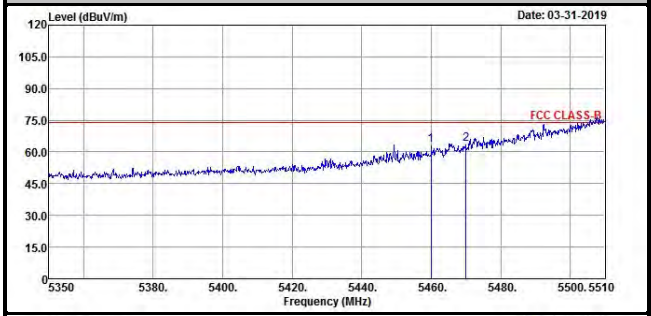
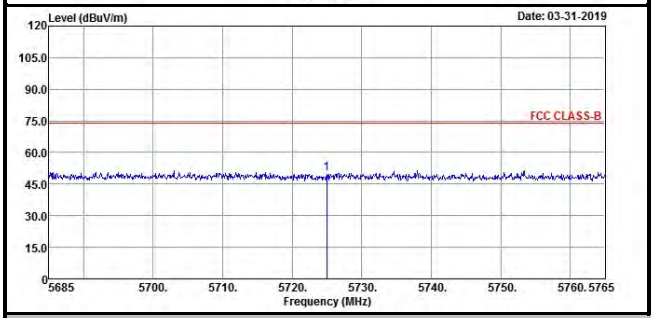


Ch 110

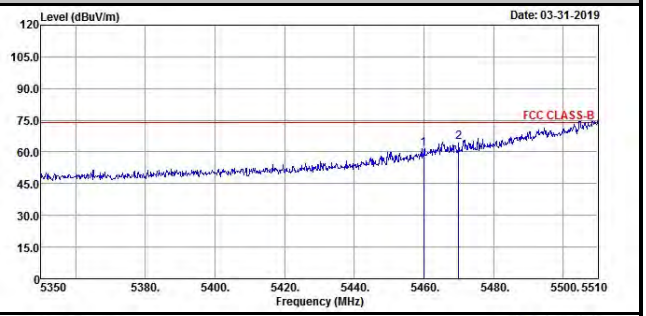
Peak

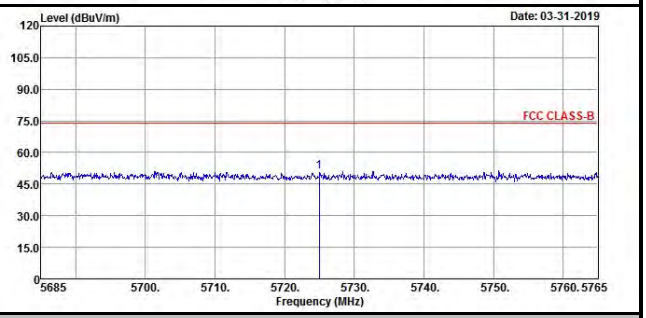
Horizontal





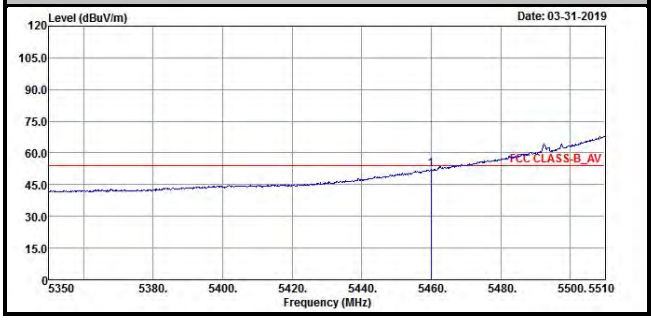
Vertical



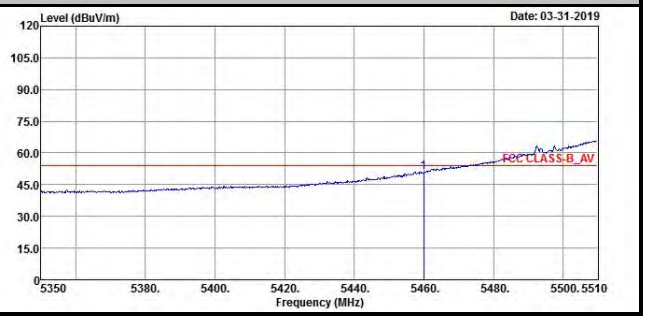


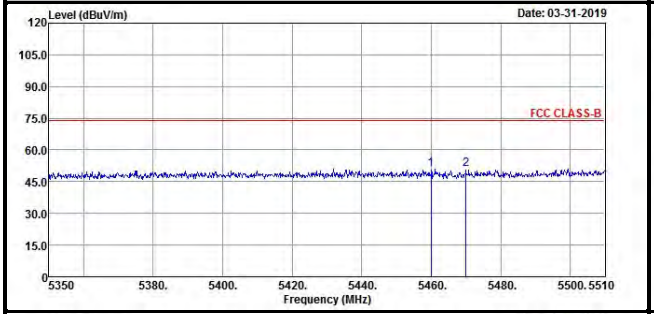
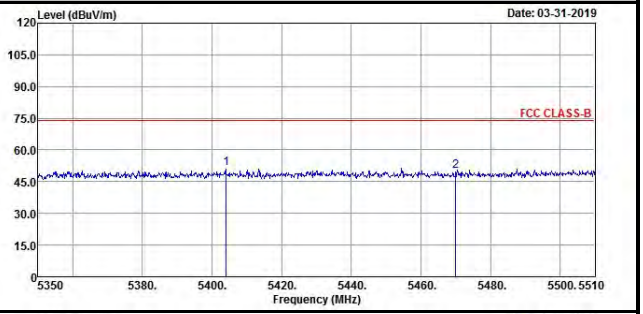
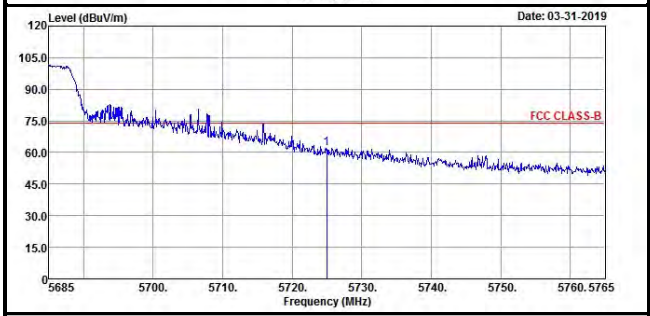
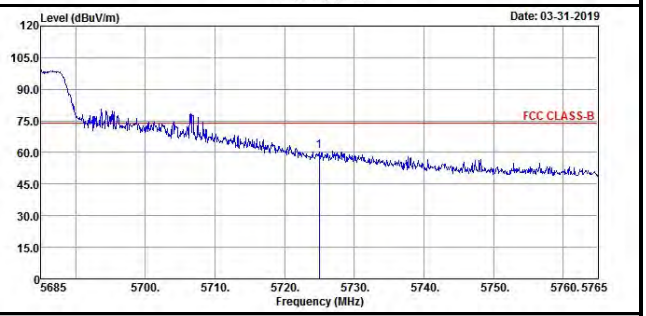
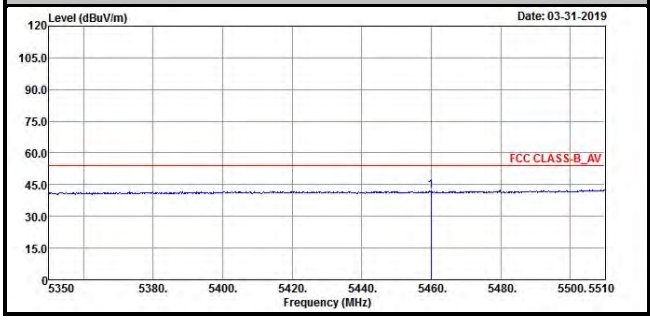
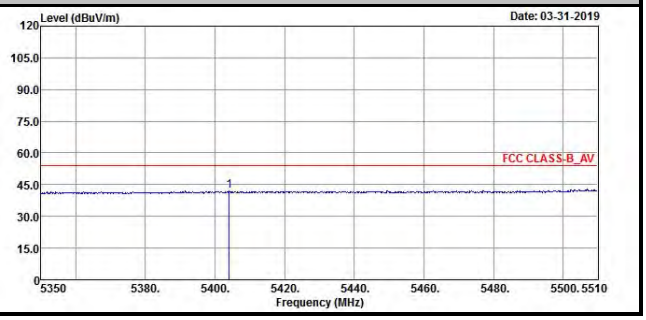
Average

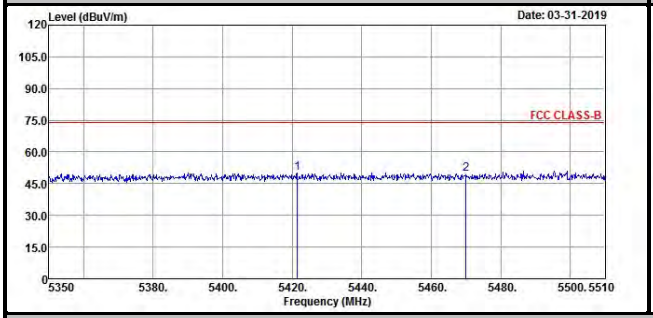
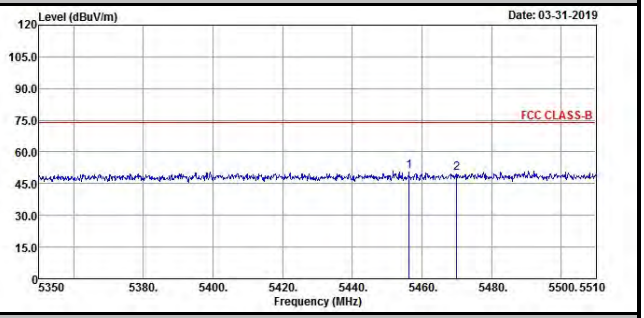
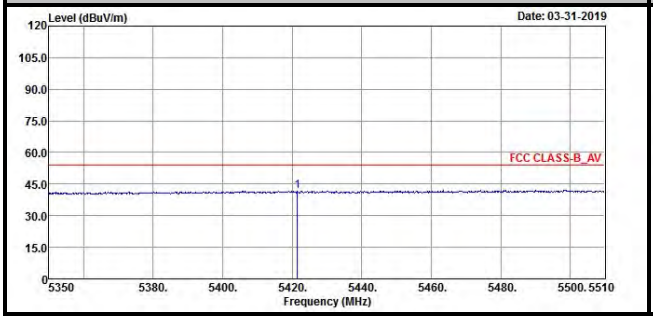
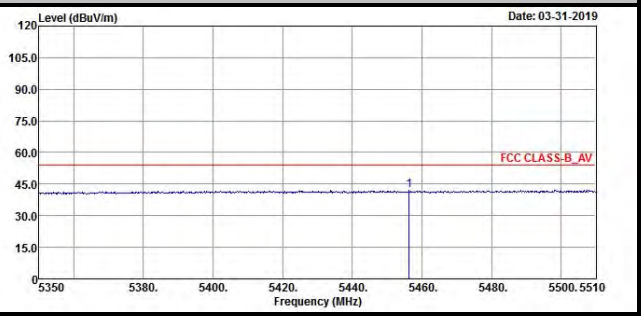
Horizontal



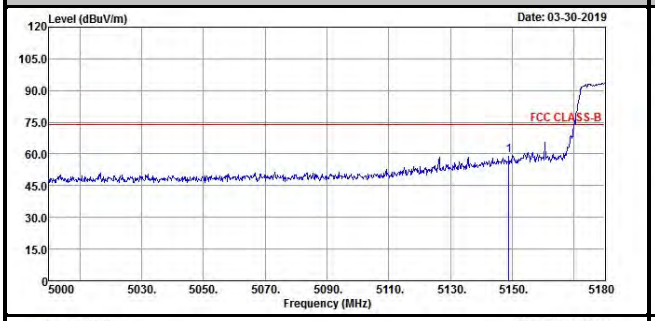
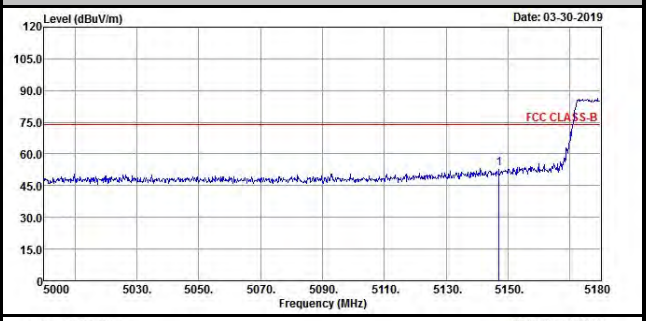
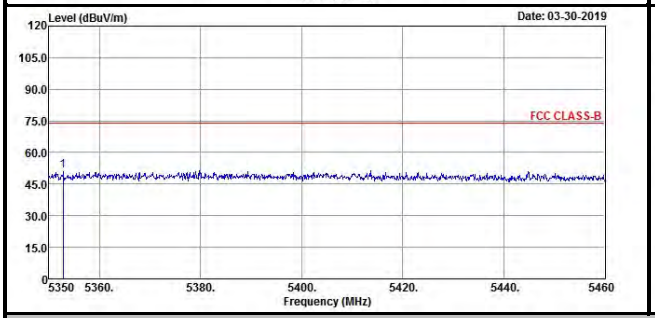
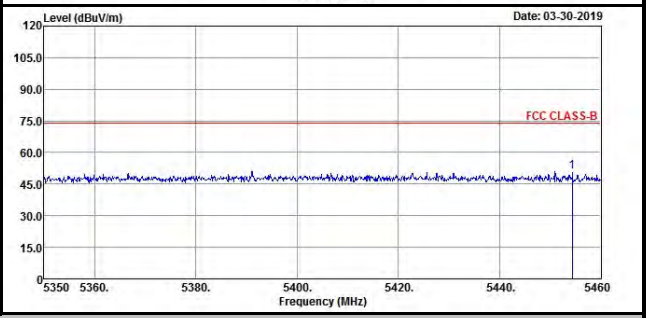
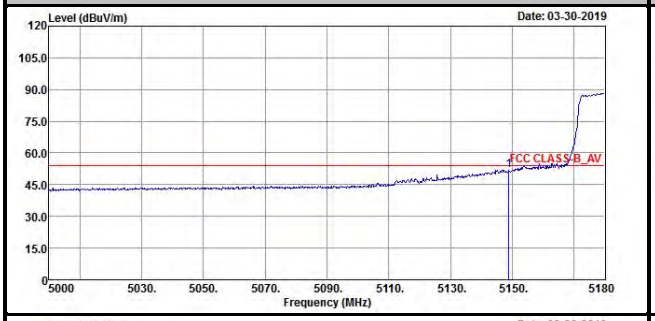
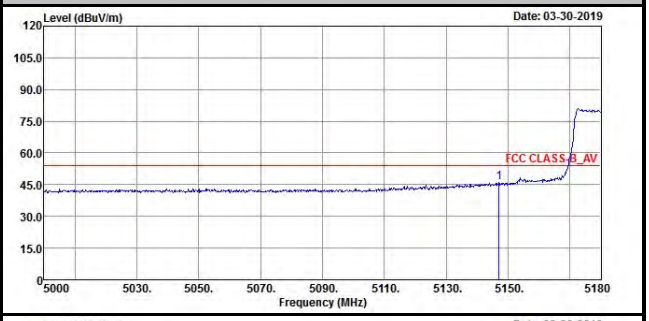
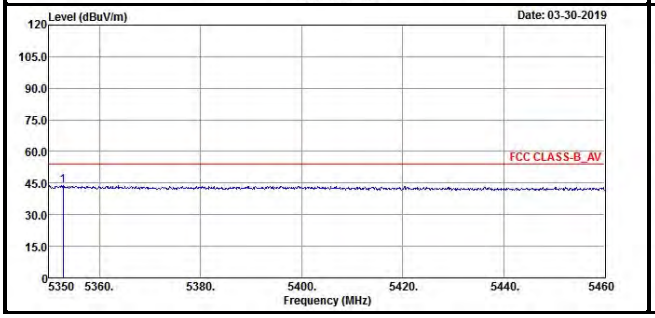
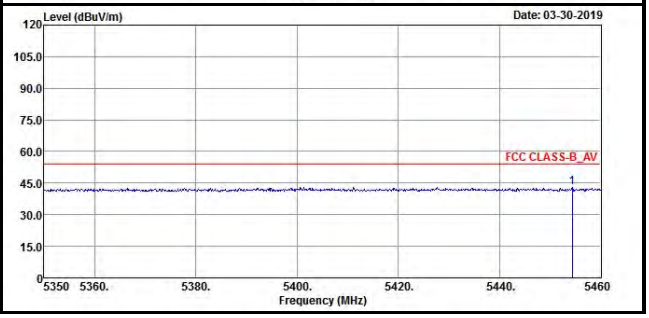
Vertical



Ch 134	
Peak	
Horizontal	Vertical
	
	
Average	
Horizontal	Vertical
	

Ch 142	
Peak	
Horizontal	Vertical
	
Average	
Horizontal	Vertical
	

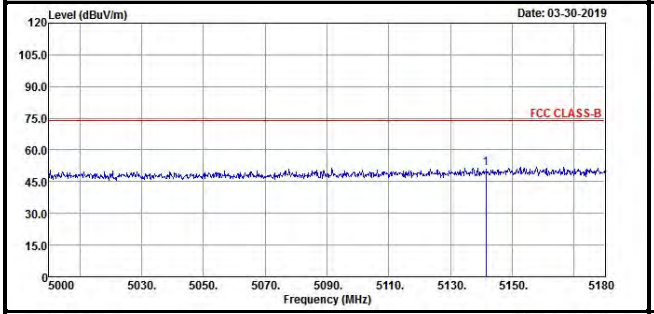
802.11ac (VHT80)

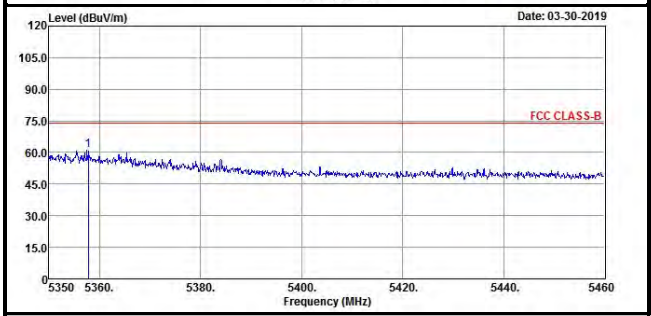
Ch 42	
Peak	
Horizontal	**Vertical**
	
	
Average	
Horizontal	**Vertical**
	
	

Ch 58

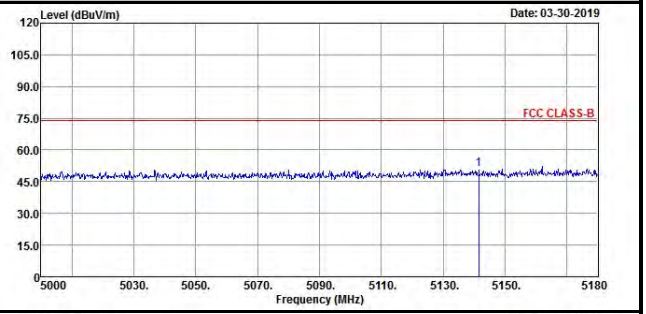
Peak

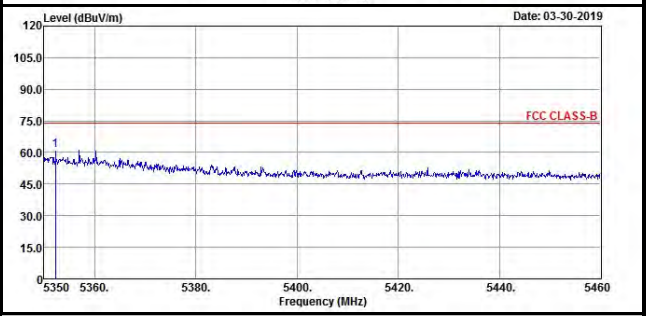
Horizontal





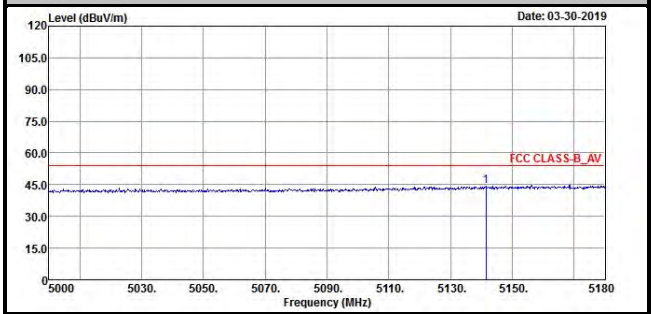
Vertical

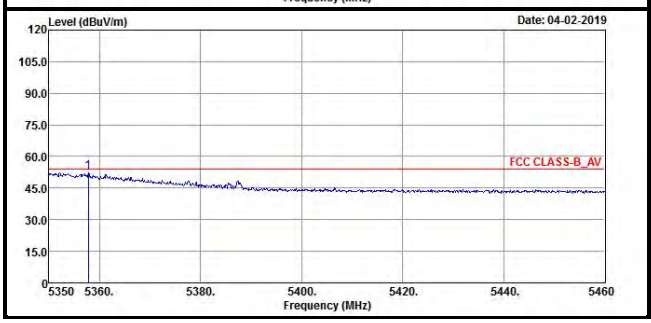




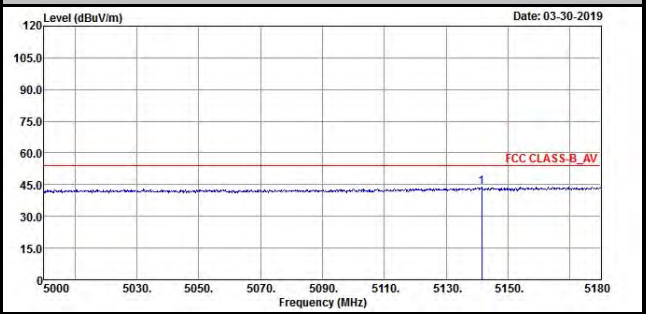
Average

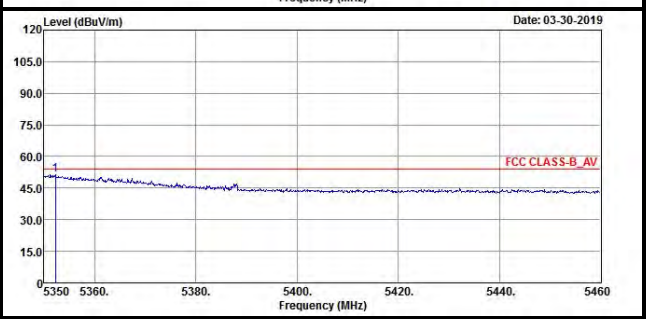
Horizontal

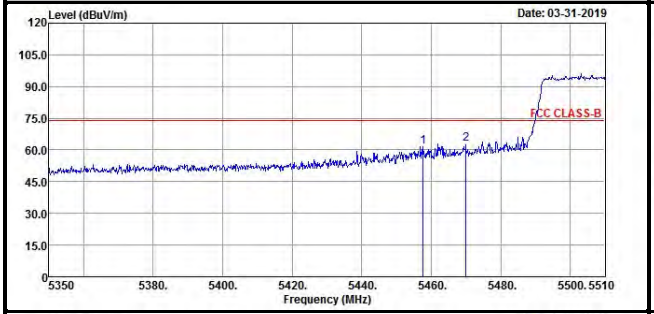
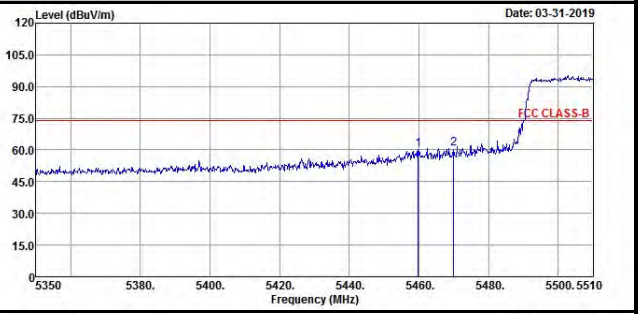
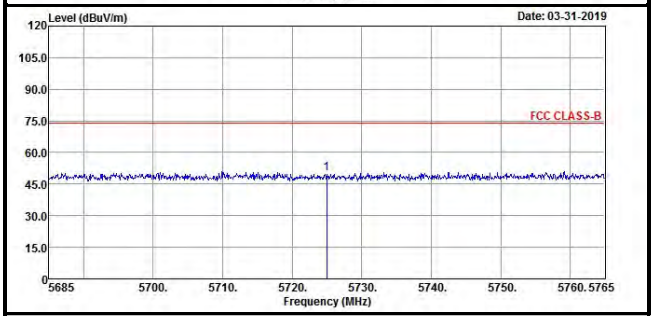
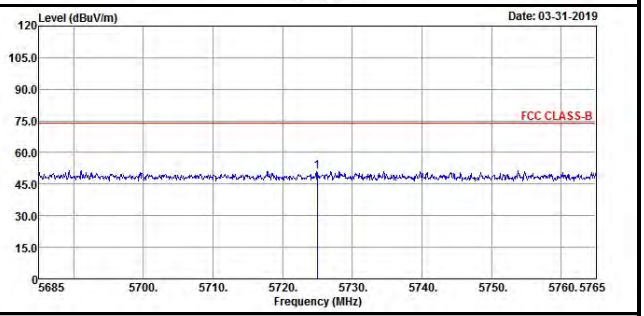
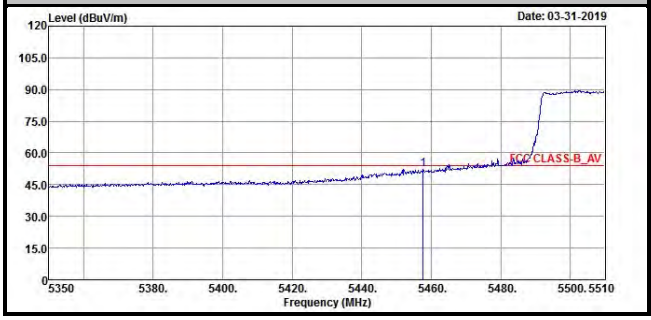
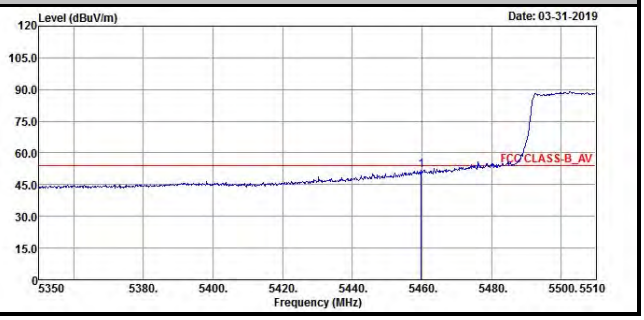


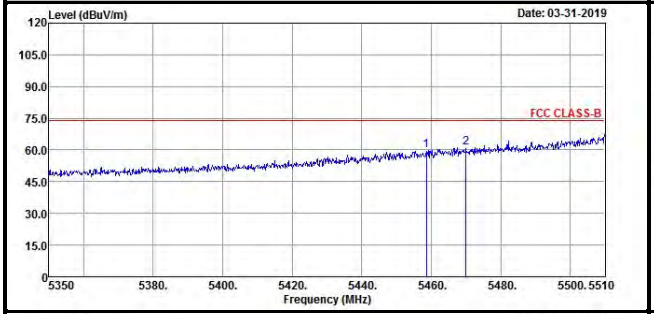
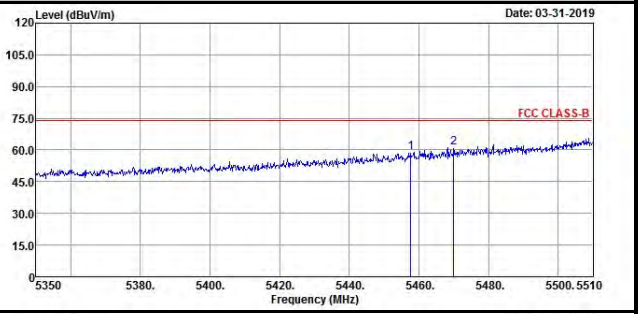
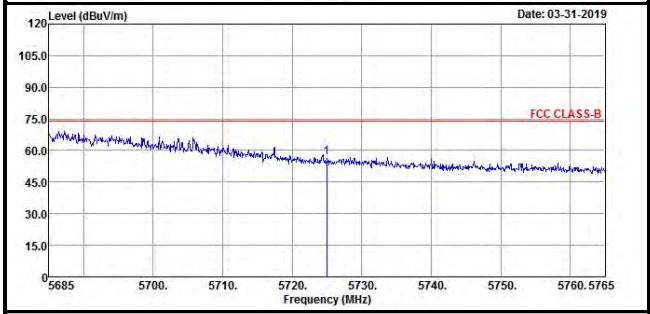
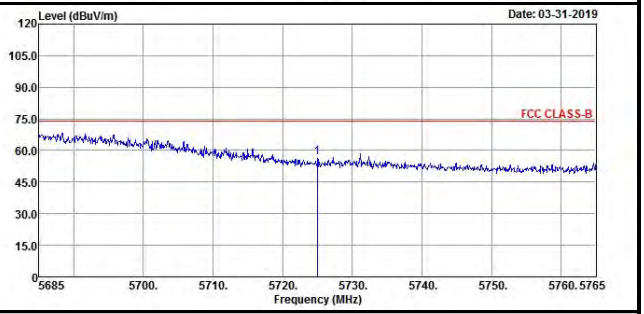
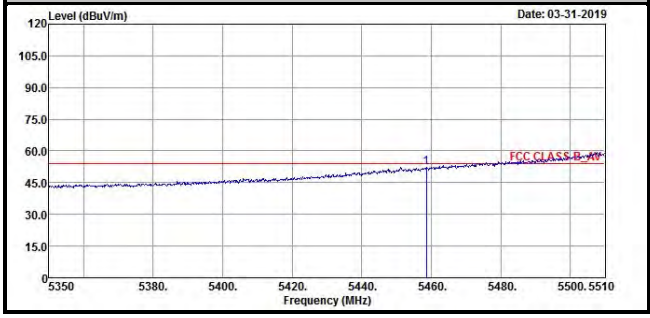
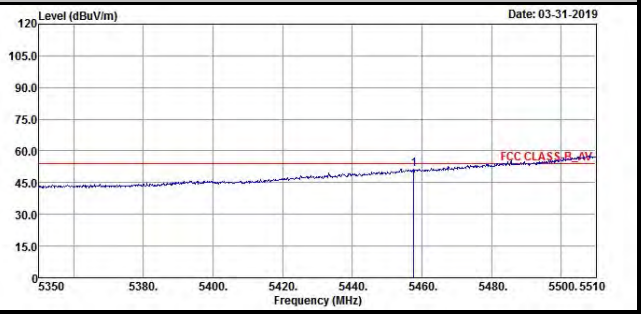


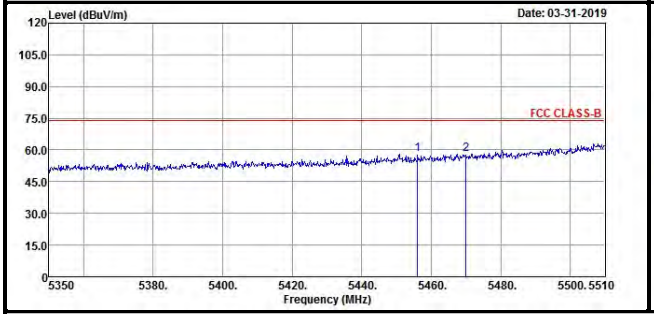
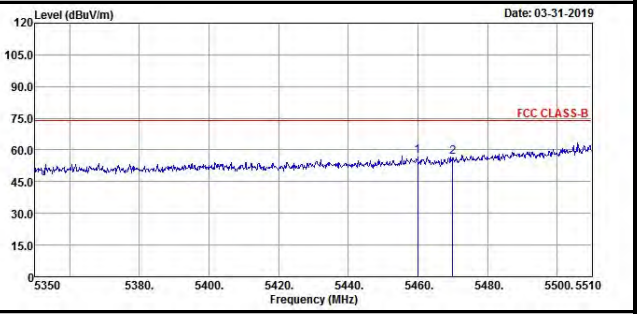
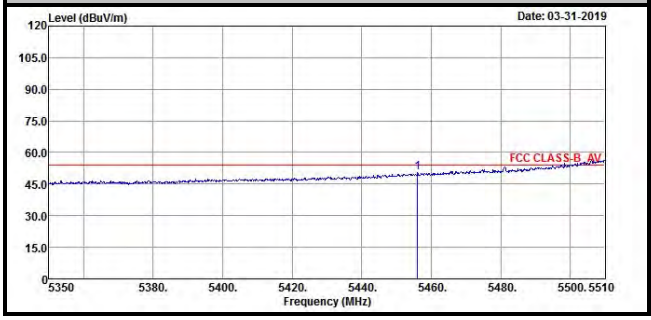
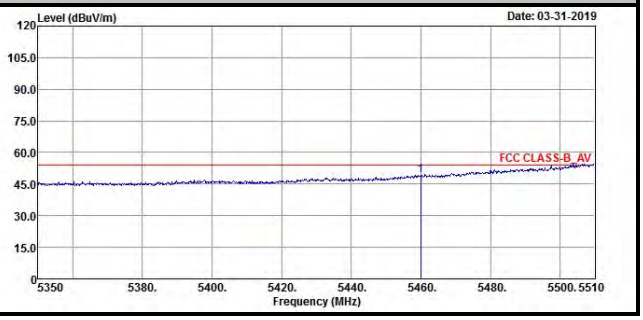
Vertical





Ch 106	
Peak	
Horizontal	Vertical
	
	
Average	
Horizontal	Vertical
	

Ch 122	
Peak	
Horizontal	Vertical
	
	
Average	
Horizontal	Vertical
	

Ch 138	
Peak	
Horizontal	Vertical
	
Average	
Horizontal	Vertical
	

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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