



11AC80MIMO\_Ant2\_5610



11AC80MIMO\_Ant1\_5775



11AC80MIMO\_Ant2\_5775



## 8.4 UNDESIRABLE RADIATED SPURIOUS EMISSION

### 8.4.1 Applicable Standard

According to FCC Part 15.407 (b)  
According to 789033 D02 Section II(G)

### 8.4.2 Conformance Limit

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

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

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

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

Restricted Frequency(MHz)	Field Strength ( $\mu\text{V}/\text{m}$ )	Field Strength ( $\text{dB}\mu\text{V}/\text{m}$ )	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	2400/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

The provisions of §15.205 apply to intentional radiators operating under this section, 15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

- Remark:
1. Emission level in  $\text{dBuV/m} = 20 \log(\mu\text{V/m})$
  2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
  3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of  $\xi$  15.205, and the emissions located in restricted bands also comply with 15.209 limit.

#### 8.4.3 Test Configuration

Test according to clause 6.2 radio frequency test setup 2.

#### 8.4.4 Test Procedure

##### ■ Unwanted Emissions Measurements below 1000 MHz

Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

The EUT was placed on a turn table which is 0.8m above ground plane.

And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

Repeat above procedures until all frequency measured was complete.

We use software control the EUT, Let EUT hopping on and transmit with highest power, All the modes have been tested and the worst result was reported.

Use the following spectrum analyzer settings:

Set RBW=120kHz for  $f < 1 \text{ GHz}$  (30MHz to 1GHz), 200Hz for  $f < 150\text{KHz}$  (9KHz to 150KHz), 9KHz for  $< 30\text{MHz}$  (150KHz to 30KHz).

Set the VBW > RBW.

Detector = Peak.

Trace mode = max hold.

Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Repeat above procedures until all frequency measured was complete.

##### ■ Unwanted Maximum peak Emissions Measurements above 1000 MHz

Maximum emission levels are measured by setting the analyzer as follows:

RBW = 1 MHz.

VBW  $\geq$  3 MHz.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately  $1/x$ , where  $x$  is the duty cycle. For example, at 50 percent duty cycle, the measurement time will increase by a factor of two relative to measurement time for continuous transmission.

##### ■ Unwanted Average Emissions Measurements above 1000 MHz

Method VB (Averaging using reduced video bandwidth): Alternative method.

RBW = 1 MHz.

Video bandwidth. • If the EUT is configured to transmit with duty cycle  $\geq$  98 percent, set  $\text{VBW} \leq \text{RBW}/100$  (i.e., 10 kHz) but not less than 10 Hz.

• If the EUT duty cycle is  $<$  98 percent, set  $\text{VBW} \geq 1/T$ , where  $T$  is defined in section II.B.1.a).

Video bandwidth mode or display mode • The instrument shall be set to ensure that video filtering is applied in the power domain. Typically, this requires setting the detector mode to RMS and setting the Average-VBW Type to Power (RMS).

• As an alternative, the analyzer may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some analyzers require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of  $1/x$ , where  $x$  is the duty cycle. For example, use at least 200 traces if the duty cycle is 25 percent. (If a specific emission is demonstrated to be continuous—i.e., 100 percent duty cycle—rather than turning on and off with the transmit cycle, at least 50 traces shall be averaged).

■ **Band edge measurements.**

Unwanted band-edge emissions may be measured using either of the special band-edge measurement techniques (the marker-delta or integration methods) described below. Note that the marker-delta method is primarily a radiated measurement technique that requires the 99% occupied bandwidth edge to be within 2 MHz of the authorized band edge, whereas the integration method can be used in either a radiated or conducted measurement without any special requirement with regards to the displacement of the unwanted emission(s) relative to the authorized bandwidth.

**Marker-Delta Method.**

The marker-delta method, as described in ANSI C63.10, can be used to perform measurements of the radiated unwanted emissions level of emissions provided that the 99% occupied bandwidth of the fundamental is within 2 MHz of the authorized band-edge.

#### 8.4.5 Test Results

The voltage 120V & 240V and the modes 802.11a/n/ac has been tested and the worst result recorded as below:

- For Undesirable radiated Spurious Emission in U-NII – 1  
All the modes 802.11a/n/ac has been tested and the worst result 802.11a recorded as below:
- Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)  
Highest gain of each antenna and highest output power is ANT2 and MIMO as below:

ANT2:

Test mode: 802.11n(20) Frequency(MHz): 5180

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11499.6	V	61.13	-34.1	-27	7.1
14708.3	V	64.48	-30.75	-27	3.75
17485.7	V	67.18	-28.05	-27	1.05
10702.7	H	61.23	-34	-27	7
14551.1	H	63.24	-31.99	-27	4.99
17498.5	H	66.33	-28.9	-27	1.9

Test mode: 802.11n(20) Frequency(MHz): 5200

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
10071.6	V	60.14	-35.09	-27	8.09
14740.2	V	63.45	-31.78	-27	4.78
17500.6	V	68.03	-27.2	-27	0.2
11306.2	H	60.31	-34.92	-27	7.92
14546.8	H	63.53	-31.7	-27	4.7
17492.1	H	66.25	-28.98	-27	1.98

Test mode: 802.11n(20) Frequency(MHz): 5240

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11506	V	60.93	-34.3	-27	7.3
14551.1	V	63.65	-31.58	-27	4.58
17022.5	V	66.82	-28.41	-27	1.41
11531.5	H	59.93	-35.3	-27	8.3
14546.8	H	62.99	-32.24	-27	5.24
17485.7	H	66.22	-27.01	-27	2.01

MIMO:

Test mode: 802.11n(20) Frequency(MHz): 5180

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11498.21	V	61	-34.23	-27	7.23
17486.98	V	67.15	-28.08	-27	1.08
14706.05	V	49.85	-45.38	-27	18.38
10714.39	H	61.15	-34.08	-27	7.08
17510.19	H	66.17	-29.06	-27	2.06
14547.79	H	49.73	-45.50	-27	18.50

Test mode: 802.11n(20) Frequency(MHz): 5200

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
10070.21	V	60.01	-35.22	-27	8.22
17501.88	V	68	-27.23	-27	0.23
14737.95	V	49.91	-45.32	-27	18.32
11317.89	H	60.23	-35.00	-27	8.00
17503.79	H	66.09	-29.14	-27	2.14
14543.59	H	50.02	-45.21	-27	18.21

Test mode: 802.11n(20) Frequency(MHz): 5240

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11504.61	V	60.8	-34.43	-27	7.43
17023.78	V	66.79	-28.44	-27	1.44
14548.75	V	49.82	-45.41	-27	18.41
11543.19	H	59.85	-35.38	-27	8.38
17497.39	H	66.06	-29.17	-27	2.17
14543.49	H	49.82	-45.41	-27	18.41

- Note:** (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss.  
 (3) EIRP[dBm] = E[dBuV/m] + 20 log(d[meters]) - 104.77  
 d is the measurement distance in 3 meters

**ANT2:**

Test mode:		802.11n(20)		Frequency(MHz): 5180	
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11499.6	V	61.13	74.00	12.87	peak
14708.3	V	64.48	74.00	9.52	peak
17485.7	V	67.18	74.00	6.82	peak
11499.6	V	45.84	54.00	8.16	AVG
14708.3	V	50.11	54.00	3.89	AVG
17485.7	V	50.63	54.00	3.37	AVG
10702.7	H	61.23	74.00	12.77	peak
14551.1	H	63.24	74.00	10.76	peak
17498.5	H	66.33	74.00	7.67	peak
10702.7	H	47.07	54.00	6.93	AVG
14551.1	H	49.91	54.00	4.09	AVG
17498.5	H	48.27	54.00	5.73	AVG

Test mode:		802.11n(20)		Frequency(MHz): 5200	
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10071.6	V	60.14	74.00	13.86	peak
14740.2	V	63.45	74.00	10.55	peak
17500.6	V	68.03	74.00	5.97	peak
10071.6	V	45.53	54.00	8.47	AVG
14740.2	V	50.17	54.00	3.83	AVG
17500.6	V	47.97	54.00	6.03	AVG
11306.2	H	60.31	74.00	13.69	peak
14546.8	H	63.53	74.00	10.47	peak
17492.1	H	66.25	74.00	5.75	peak
11306.2	H	47.95	54.00	6.05	AVG
14546.9	H	50.20	54.00	3.80	AVG
17492.1	H	49.72	54.00	4.28	AVG

Test mode:		802.11n(20)		Frequency(MHz): 5240	
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11506	V	60.93	74.00	13.07	peak
14551.1	V	63.65	74.00	10.35	peak
17022.5	V	66.82	74.00	7.18	peak
11505.9	V	46.34	54.00	7.66	AVG
14551.0	V	50.08	54.00	3.92	AVG
17022.4	V	48.57	54.00	5.43	AVG
11531.5	H	59.93	74.00	14.07	peak
14546.8	H	62.99	74.00	11.01	peak
17485.7	H	66.22	74.00	7.78	peak
11531.5	H	46.77	54.00	7.23	AVG
14546.8	H	50.00	54.00	4.00	AVG
17485.7	H	50.10	54.00	3.90	AVG



MIMO:

Test mode: 802.11n(20)		Frequency(MHz): 5180			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11498.210	V	61	74.00	13	peak
14706.910	V	64.32	74.00	9.68	peak
17486.980	V	67.15	74.00	6.85	peak
11500.880	V	45.82	54.00	8.18	AVG
14706.050	V	49.85	54.00	4.15	AVG
17483.450	V	50.44	54.00	3.56	AVG
10714.390	H	61.15	74.00	12.85	peak
14562.790	H	63.03	74.00	10.97	peak
17510.190	H	66.17	74.00	7.83	peak
10714.390	H	46.93	54.00	7.07	AVG
14547.790	H	49.73	54.00	4.27	AVG
17495.190	H	48.14	54.00	5.86	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5200			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10070.210	V	60.01	74.00	13.99	peak
14738.810	V	63.29	74.00	10.71	peak
17501.880	V	68	74.00	6	peak
10072.880	V	45.51	54.00	8.49	AVG
14737.950	V	49.91	54.00	4.09	AVG
17498.350	V	47.78	54.00	6.22	AVG
11317.890	H	60.23	74.00	13.77	peak
14558.490	H	63.32	74.00	10.68	peak
17503.790	H	66.09	74.00	7.91	peak
11317.890	H	47.81	54.00	6.19	AVG
14543.590	H	50.02	54.00	3.98	AVG
17488.790	H	49.59	54.00	4.41	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5240			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11504.610	V	60.8	74.00	13.2	peak
14549.710	V	63.49	74.00	10.51	peak
17023.780	V	66.79	74.00	7.21	peak
11507.180	V	46.32	54.00	7.68	AVG
14548.750	V	49.82	54.00	4.18	AVG
17020.150	V	48.38	54.00	5.62	AVG
11543.190	H	59.85	74.00	14.15	peak
14558.490	H	62.78	74.00	11.22	peak
17497.390	H	66.06	74.00	7.94	peak
11543.190	H	46.63	54.00	7.37	AVG
14543.490	H	49.82	54.00	4.18	AVG
17482.390	H	49.97	54.00	4.03	AVG

- Note:**
- (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).
  - (2) Emission Level= Reading Level+Correct Factor +Cable Loss.
  - (3) Correct Factor= Ant\_F + Cab\_L - Preamp
  - (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

●  Undesirable radiated Undesirable radiated Spurious Emission in Band Edge

Test mode: 802.11n(20) Frequency(MHz): 5180

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5120.91	H	54.59	-40.64	-27	Pass
5112.86	V	56.96	-38.27	-27	Pass

Test mode: 802.11n(20) Frequency(MHz): 5240

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5368.74	H	53.75	-41.48	-27	Pass
5350.20	V	58.18	-37.05	-27	Pass

- Note:** (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Correct Factor +Cable Loss.  
 (3) Correct Factor= Ant\_F + Cab\_L - Preamp  
 (4) EIRP[dBm] = E[dBuV/m] + 20 log(d[meters]) - 104.77  
 d is the measurement distance in 3 meters

Test mode: 802.11n(20) Frequency(MHz): 5180

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5112.86	V	56.96	74.00	17.04	peak
5112.86	V	44.18	54.00	9.82	AVG
5120.91	H	54.59	74.00	19.41	peak
5120.86	H	38.41	54.00	15.59	AVG

Test mode: 802.11n(20) Frequency(MHz): 5240

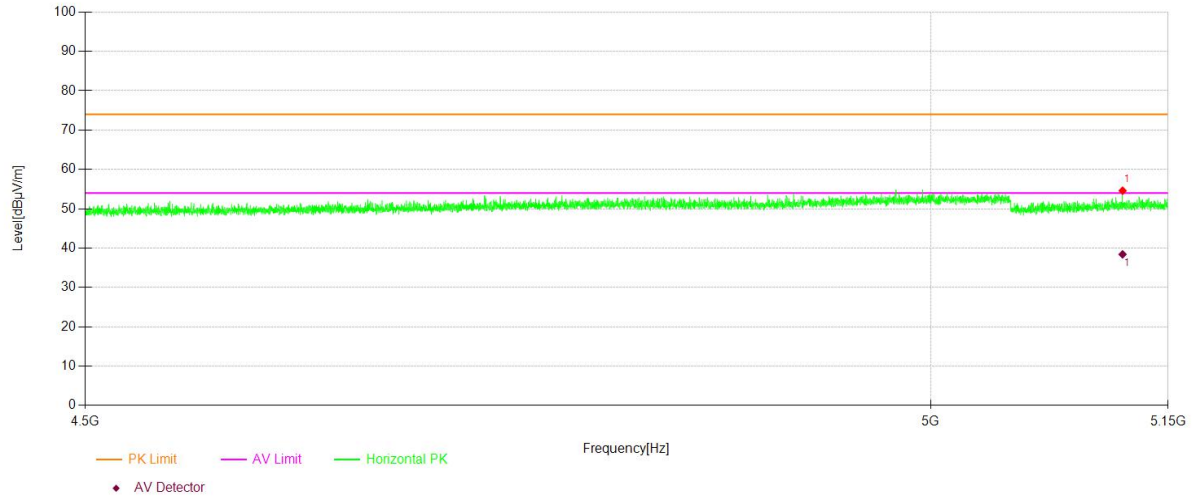
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5350.20	V	58.18	74.00	15.82	peak
5350.23	V	44.38	54.00	9.62	AVG
5368.74	H	53.75	74.00	20.25	peak
5368.70	H	41.07	54.00	12.93	AVG

- Note:** (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Correct Factor +Cable Loss.  
 (3) Correct Factor= Ant\_F + Cab\_L - Preamp  
 (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

**U-NII - 1**

**Test Model**    Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)

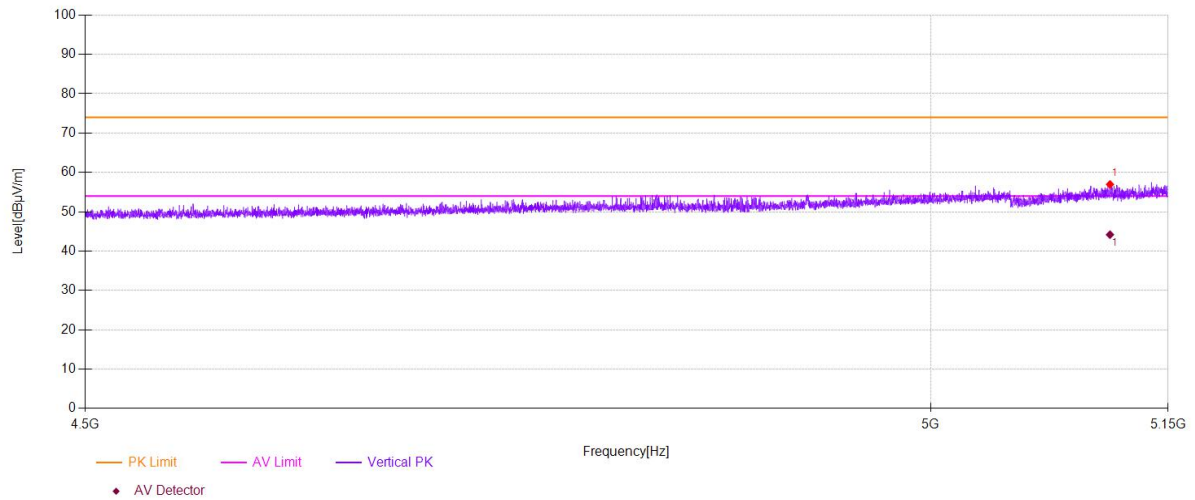
<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)
<input checked="" type="checkbox"/> 5180	<input type="checkbox"/> 5200	<input type="checkbox"/> 5240
		<b>Ant.Pol</b> H



**U-NII - 1**

**Test Model**    Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)

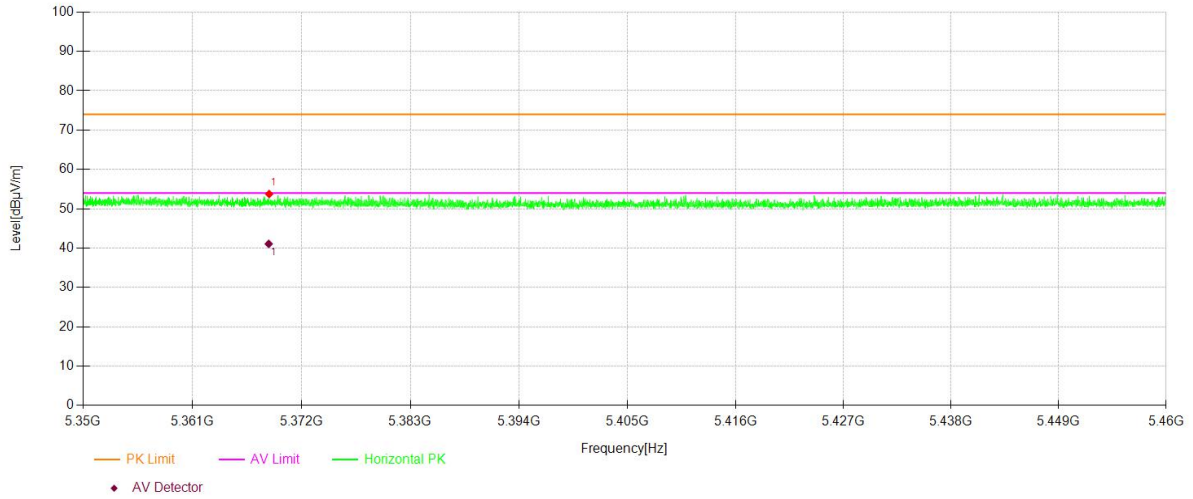
<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)
<input checked="" type="checkbox"/> 5180	<input type="checkbox"/> 5200	<input type="checkbox"/> 5240
		<b>Ant.Pol</b> V



**U-NII - 1**

**Test Model**    Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz )

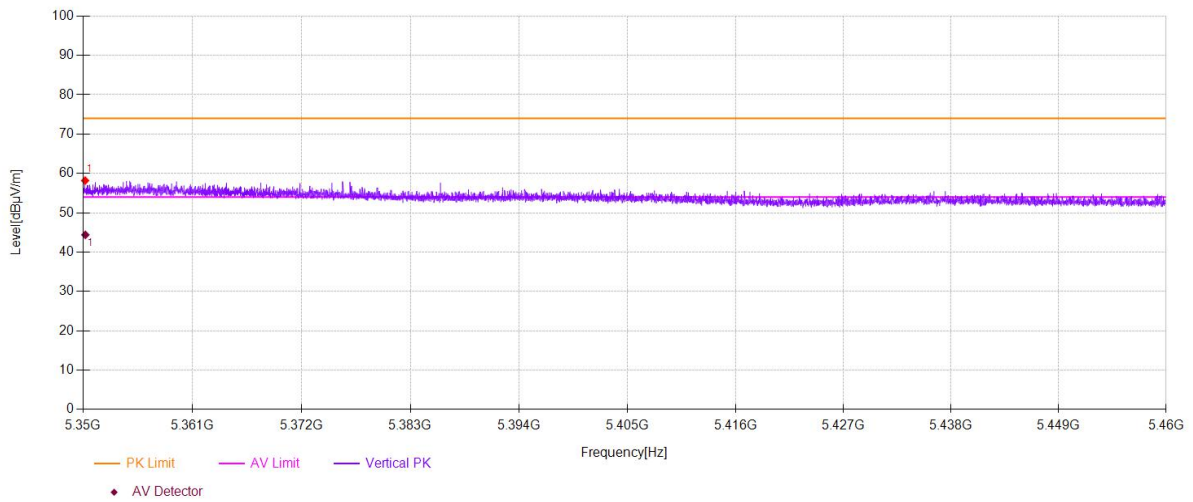
<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)
<input type="checkbox"/> 5180	<input type="checkbox"/> 5200	<input checked="" type="checkbox"/> 5240
		<b>Ant. Pol</b> H



**U-NII - 1**

**Test Model**    Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz )

<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)
<input type="checkbox"/> 5180	<input type="checkbox"/> 5200	<input checked="" type="checkbox"/> 5240
		<b>Ant. Pol</b> V



- For Undesirable radiated Spurious Emission in U-NII -2A  
All the modes 802.11a/n/ac has been tested and the worst result 802.11a recorded as below:
- Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)  
Highest gain of each antenna and highest output power is ANT2 and MIMO as below:

ANT2:

Test mode: 802.11n(20) Frequency(MHz): 5260

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
10743.1	V	59.81	-35.42	-27	8.42
13762.7	V	61.29	-33.94	-27	6.94
17498.5	V	68.01	-27.22	-27	0.22
12415.5	H	59.69	-35.54	-27	8.54
15122.7	H	63.17	-32.06	-27	5.06
17496.3	H	66.01	-29.22	-27	2.22

Test mode: 802.11n(20) Frequency(MHz): 5280

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
10711.2	V	60.31	-34.92	-27	7.92
15169.5	V	62.99	-32.24	-27	5.24
17492.1	V	66.43	-28.8	-27	1.8
12668.3	H	59.94	-35.29	-27	8.29
14899.6	H	63.67	-31.56	-27	4.56
17513.3	H	66.14	-29.09	-27	2.09

Test mode: 802.11n(20) Frequency(MHz): 5320

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
10645.3	V	60.08	-35.15	-27	8.15
15248.1	V	63.08	-32.15	-27	5.15
17507	V	65.91	-29.32	-27	2.32
11529.3	H	60.23	-35	-27	8
14672.2	H	62.94	-32.29	-27	5.29
17498.5	H	65.51	-29.72	-27	2.72

MIMO:

Test mode: 802.11n(20) Frequency(MHz): 5260

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
10741.71	V	59.68	-35.55	-27	8.55
17499.78	V	67.98	-27.25	-27	0.25
13760.45	V	47.71	-47.52	-27	20.52
12427.19	H	59.61	-35.62	-27	8.62
17507.99	H	65.85	-29.38	-27	2.38
15119.39	H	47.64	-47.59	-27	20.59

Test mode: 802.11n(20) Frequency(MHz): 5280

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
10709.81	V	60.18	-35.05	-27	8.05
17493.38	V	66.4	-28.83	-27	1.83
15167.15	V	48.79	-46.44	-27	19.44
12679.99	H	59.86	-35.37	-27	8.37
17524.99	H	65.98	-29.25	-27	2.25
14896.19	H	50.04	-45.19	-27	18.19

Test mode: 802.11n(20) Frequency(MHz): 5320

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
10643.91	V	59.95	-35.28	-27	8.28
17508.28	V	65.88	-29.35	-27	2.35
15245.85	V	47.37	-47.86	-27	20.86
11540.99	H	60.15	-35.08	-27	8.08
17510.19	H	65.35	-29.88	-27	2.88
14668.89	H	49.32	-45.91	-27	18.91

- Note:** (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss.  
 (3) EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77  
 d is the measurement distance in 3 meters

ANT2:

Test mode:		802.11n(20)		Frequency(MHz): 5260	
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10743.1	V	59.81	74.00	14.19	peak
13762.7	V	61.29	74.00	12.71	peak
17498.5	V	68.01	74.00	5.99	peak
10743.1	V	46.67	54.00	7.33	AVG
13762.7	V	47.97	54.00	6.03	AVG
17498.5	V	50.27	54.00	3.73	AVG
12415.5	H	59.69	74.00	14.31	peak
15122.7	H	63.17	74.00	10.83	peak
17496.3	H	66.01	74.00	7.99	peak
12415.4	H	43.72	54.00	10.28	AVG
15122.7	H	47.82	54.00	6.18	AVG
17496.3	H	49.82	54.00	4.18	AVG

Test mode:		802.11n(20)		Frequency(MHz): 5280	
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10711.2	V	60.31	74.00	13.69	peak
15169.5	V	62.99	74.00	11.01	peak
17492.1	V	66.43	74.00	7.57	peak
10711.2	V	46.81	54.00	7.19	AVG
15169.4	V	49.05	54.00	4.95	AVG
17492.1	V	49.52	54.00	4.48	AVG
12668.3	H	59.94	74.00	14.06	peak
14899.6	H	63.67	74.00	10.33	peak
17513.3	H	66.14	74.00	7.86	peak
12668.3	H	44.79	54.00	9.21	AVG
14899.5	H	50.22	54.00	3.78	AVG
17513.3	H	49.50	54.00	4.50	AVG

Test mode:		802.11n(20)		Frequency(MHz): 5320	
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10645.3	V	60.08	74.00	13.92	peak
15248.1	V	63.08	74.00	10.92	peak
17507	V	65.91	74.00	8.09	peak
10645.3	V	45.99	54.00	8.01	AVG
15248.1	V	47.63	54.00	6.37	AVG
17507	V	50.43	54.00	3.57	AVG
11529.3	H	60.23	74.00	13.77	peak
14672.2	H	62.94	74.00	11.06	peak
17498.5	H	65.51	74.00	8.49	peak
11529.3	H	46.56	54.00	7.44	AVG
14672.2	H	49.50	54.00	4.50	AVG
17498.5	H	49.89	54.00	4.11	AVG

MIMO:

Test mode: 802.11n(20)		Frequency(MHz): 5260			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10741.710	V	59.68	74.00	14.32	peak
13761.310	V	61.13	74.00	12.87	peak
17499.780	V	67.98	74.00	6.02	peak
10744.380	V	46.65	54.00	7.35	AVG
13760.450	V	47.71	54.00	6.29	AVG
17496.250	V	50.08	54.00	3.92	AVG
12427.190	H	59.61	74.00	14.39	peak
15134.390	H	62.96	74.00	11.04	peak
17507.990	H	65.85	74.00	8.15	peak
12427.090	H	43.58	54.00	10.42	AVG
15119.390	H	47.64	54.00	6.36	AVG
17492.990	H	49.69	54.00	4.31	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5280			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10709.810	V	60.18	74.00	13.82	peak
15168.110	V	62.83	74.00	11.17	peak
17493.380	V	66.4	74.00	7.6	peak
10712.480	V	46.79	54.00	7.21	AVG
15167.150	V	48.79	54.00	5.21	AVG
17489.850	V	49.33	54.00	4.67	AVG
12679.990	H	59.86	74.00	14.14	peak
14911.290	H	63.46	74.00	10.54	peak
17524.990	H	65.98	74.00	8.02	peak
12679.990	H	44.65	54.00	9.35	AVG
14896.190	H	50.04	54.00	3.96	AVG
17509.990	H	49.37	54.00	4.63	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5320			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10643.910	V	59.95	74.00	14.05	peak
15246.710	V	62.92	74.00	11.08	peak
17508.280	V	65.88	74.00	8.12	peak
10646.580	V	45.97	54.00	8.03	AVG
15245.850	V	47.37	54.00	6.63	AVG
17504.750	V	50.24	54.00	3.76	AVG
11540.990	H	60.15	74.00	13.85	peak
14683.890	H	62.73	74.00	11.27	peak
17510.190	H	65.35	74.00	8.65	peak
11540.990	H	46.42	54.00	7.58	AVG
14668.890	H	49.32	54.00	4.68	AVG
17495.190	H	49.76	54.00	4.24	AVG

- Note:**
- (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).
  - (2) Emission Level= Reading Level+Correct Factor +Cable Loss.
  - (3) Correct Factor= Ant\_F + Cab\_L - Preamp
  - (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



●  Undesirable radiated Undesirable radiated Spurious Emission in Band Edge

Test mode: 802.11n(20) Frequency(MHz): 5260

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5006.83	H	55.08	-40.15	-27	Pass
5148.94	V	60.80	-34.43	-27	Pass

Test mode: 802.11n(20) Frequency(MHz): 5320

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5354.07	H	59.23	-36	-27	Pass
5350.24	V	65.42	-29.81	-27	Pass

- Note:** (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Correct Factor +Cable Loss.  
 (3) Correct Factor= Ant\_F + Cab\_L - Preamp  
 (4) EIRP[dBm] = E[dBuV/m] + 20 log(d[meters]) - 104.77  
 d is the measurement distance in 3 meters

Test mode: 802.11n(20) Frequency(MHz): 5260

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5148.94	V	60.80	74.00	13.20	peak
5148.95	V	47.68	54.00	6.32	AVG
5006.83	H	55.08	74.00	18.92	peak
5006.85	H	39.33	54.00	14.67	AVG

Test mode: 802.11n(20) Frequency(MHz): 5320

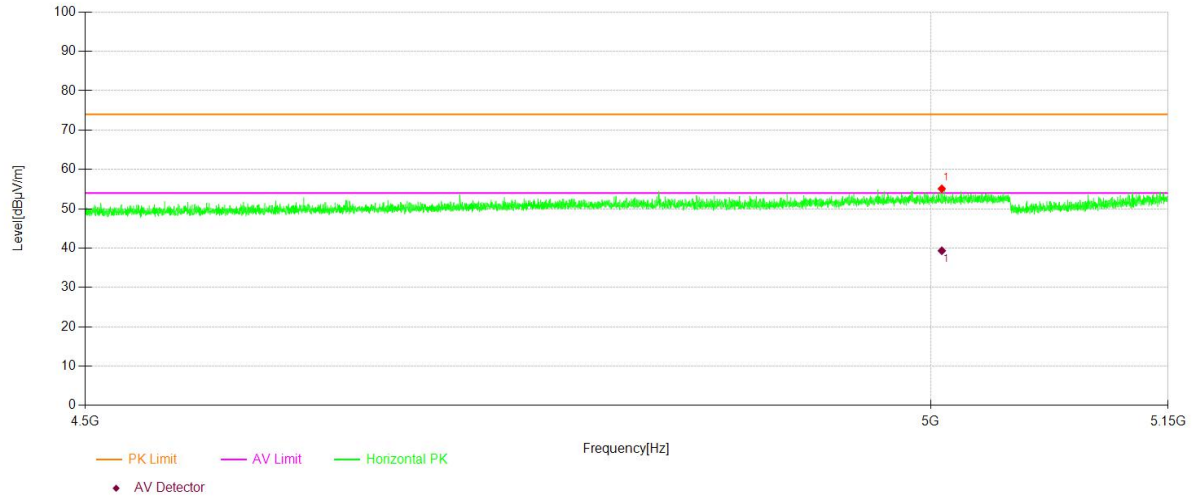
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5350.24	V	65.42	74.00	8.58	peak
5350.26	V	50.96	54.00	3.04	AVG
5354.07	H	59.23	74.00	14.77	peak
5354.07	H	46.93	54.00	7.07	AVG

- Note:** (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Correct Factor +Cable Loss.  
 (3) Correct Factor= Ant\_F + Cab\_L - Preamp  
 (4)The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

**U-NII -2A**

**Test Model**    Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)

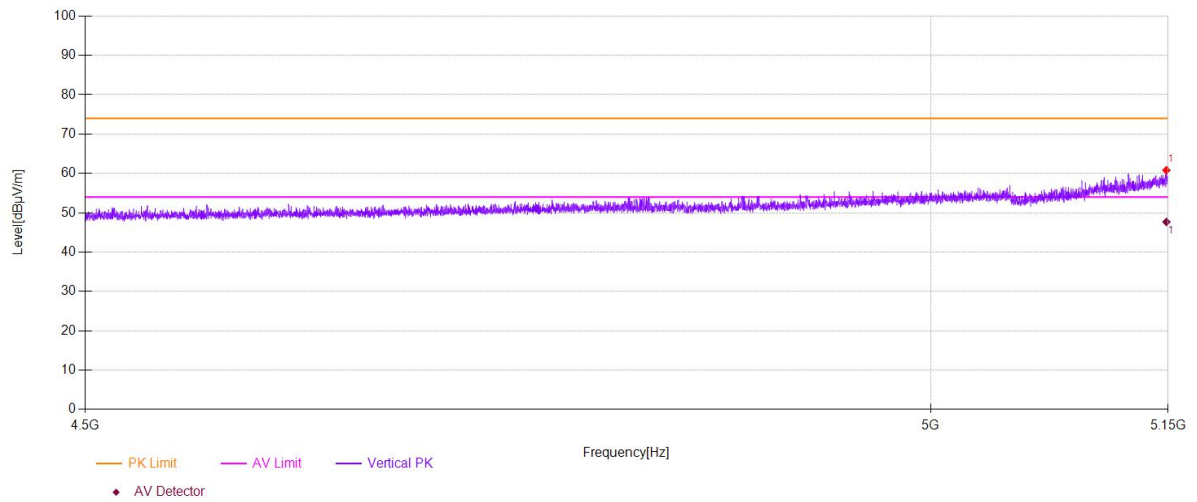
802.11a                       802.11n(HT20)                       802.11 ac (VHT20)  
 5260                       5300                       5320                      Ant.Pol                      H



**U-NII -2A**

**Test Model**    Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)

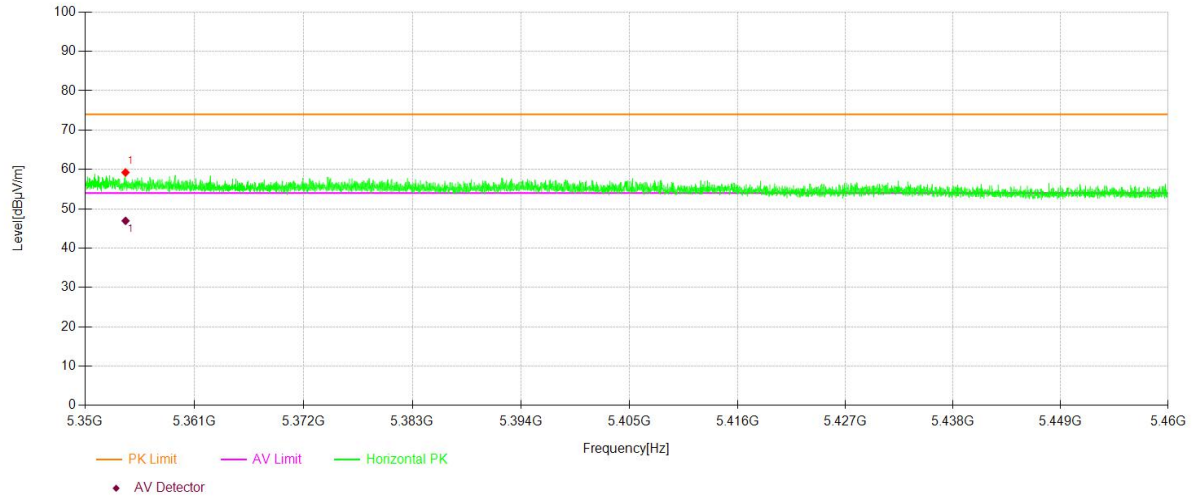
802.11a                       802.11n(HT20)                       802.11 ac (VHT20)  
 5260                       5300                       5320                      Ant.Pol                      V



**U-NII -2A**

**Test Model**    Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz )

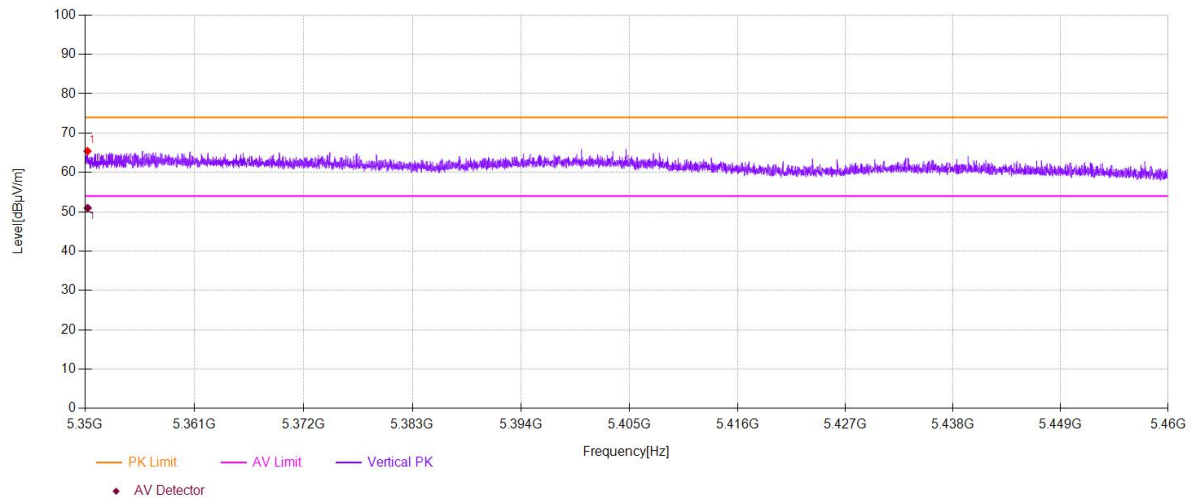
<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11 ac (VHT20)
<input type="checkbox"/> 5260	<input type="checkbox"/> 5300	<input checked="" type="checkbox"/> 5320
		Ant.Pol    H



**U-NII -2A**

**Test Model**    Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz )

<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11 ac (VHT20)
<input type="checkbox"/> 5260	<input type="checkbox"/> 5300	<input checked="" type="checkbox"/> 5320
		Ant.Pol    V



- For Undesirable radiated Spurious Emission in U-NII -2C  
 All the modes 802.11a/n/ac has been tested and the worst result 802.11a recorded as below:
- Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)  
 Highest gain of each antenna and highest output power is ANT2 and MIMO as below:

ANT2:

Test mode: 802.11n(20) Frequency(MHz): 5500

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11333.8	V	59.94	-35.29	-27	8.29
14540.5	V	63.02	-32.21	-27	5.21
17479.3	V	65.85	-29.38	-27	2.38
11501.7	H	59.73	-35.5	-27	8.5
14627.6	H	63.04	-32.19	-27	5.19
17496.3	H	67.90	-27.33	-27	0.33

Test mode: 802.11n(20) Frequency(MHz): 5580

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
10656	V	59.71	-35.52	-27	8.52
14517.1	V	63.05	-32.18	-27	5.18
17519.7	V	67.65	-27.58	-27	0.58
11382.7	H	60.30	-34.93	-27	7.93
14529.8	H	63.18	-32.05	-27	5.05
17498.5	H	67.96	-27.27	-27	0.27

Test mode: 802.11n(20) Frequency(MHz): 5700

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11391.2	V	61.03	-34.2	-27	7.2
14532	V	63.50	-31.73	-27	4.73
17492.1	V	68.13	-27.1	-27	0.1
11370	H	59.98	-35.25	-27	8.25
14540.5	H	63.32	-31.91	-27	4.91
17511.2	H	67.68	-27.55	-27	0.55

MIMO:

Test mode: 802.11n(20) Frequency(MHz): 5500

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11332.41	V	59.81	-35.42	-27	8.42
17480.58	V	65.82	-29.41	-27	2.41
14538.25	V	49.63	-45.60	-27	18.60
11513.39	H	59.65	-35.58	-27	8.58
17507.99	H	67.74	-27.49	-27	0.49
14624.19	H	48.66	-46.57	-27	19.57

Test mode: 802.11n(20) Frequency(MHz): 5580

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
10654.61	V	59.58	-35.65	-27	8.65
17520.98	V	67.62	-27.61	-27	0.61
14514.85	V	49.76	-45.47	-27	18.47
11394.39	H	60.22	-35.01	-27	8.01
17510.19	H	67.8	-27.43	-27	0.43
14526.49	H	49.56	-45.67	-27	18.67

Test mode: 802.11n(20) Frequency(MHz): 5700

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11389.81	V	60.9	-34.33	-27	7.33
17493.38	V	68.1	-27.13	-27	0.13
14529.75	V	49.35	-45.88	-27	18.88
11381.69	H	59.9	-35.33	-27	8.33
17522.89	H	67.52	-27.71	-27	0.71
14537.19	H	48.96	-46.27	-27	19.27

- Note:** (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss.  
 (3) EIRP[dBm] = E[dBuV/m] + 20 log(d[meters]) - 104.77  
 d is the measurement distance in 3 meters

**ANT2:**

Test mode:		802.11n(20)		Frequency(MHz): 5500	
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11333.8	V	59.94	74.00	14.06	peak
14540.5	V	63.02	74.00	10.98	peak
17479.3	V	65.85	74.00	8.15	peak
11333.8	V	46.77	54.00	7.23	AVG
14540.5	V	49.89	54.00	4.11	AVG
17479.3	V	49.39	54.00	4.61	AVG
11501.7	H	59.73	74.00	14.27	peak
14627.6	H	63.04	74.00	10.96	peak
17496.3	H	67.90	74.00	6.10	peak
11501.7	H	46.06	54.00	7.94	AVG
14627.5	H	48.84	54.00	5.16	AVG
17496.3	H	50.37	54.00	3.63	AVG

Test mode:		802.11n(20)		Frequency(MHz): 5580	
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10656	V	59.71	74.00	14.29	peak
14517.1	V	63.05	74.00	10.95	peak
17519.7	V	67.65	74.00	6.35	peak
10656.0	V	47.11	54.00	6.89	AVG
14517.1	V	50.02	54.00	3.98	AVG
17519.7	V	49.85	54.00	4.15	AVG
11382.7	H	60.30	74.00	13.70	peak
14529.8	H	63.18	74.00	10.82	peak
17498.5	H	67.96	74.00	6.04	peak
11382.7	H	45.52	54.00	8.48	AVG
14529.8	H	49.74	54.00	4.26	AVG
17498.5	H	50.47	54.00	3.53	AVG

Test mode:		802.11n(20)		Frequency(MHz): 5700	
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11391.2	V	61.03	74.00	12.97	peak
14532	V	63.50	74.00	10.50	peak
17492.1	V	68.13	74.00	5.87	peak
11391.2	V	46.51	54.00	7.49	AVG
14532.0	V	49.61	54.00	4.39	AVG
17492.1	V	50.16	54.00	3.84	AVG
11370	H	59.98	74.00	14.02	peak
14540.5	H	63.32	74.00	10.68	peak
17511.2	H	67.68	74.00	6.32	peak
11370	H	46.81	54.00	7.19	AVG
14540.5	H	49.14	54.00	4.86	AVG
17511.2	H	49.87	54.00	4.13	AVG

MIMO:

Test mode: 802.11n(20)		Frequency(MHz): 5500			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11332.410	V	59.81	74.00	14.19	peak
14539.110	V	62.86	74.00	11.14	peak
17480.580	V	65.82	74.00	8.18	peak
11335.080	V	46.75	54.00	7.25	AVG
14538.250	V	49.63	54.00	4.37	AVG
17477.050	V	49.2	54.00	4.8	AVG
11513.390	H	59.65	74.00	14.35	peak
14639.290	H	62.83	74.00	11.17	peak
17507.990	H	67.74	74.00	6.26	peak
11513.390	H	45.92	54.00	8.08	AVG
14624.190	H	48.66	54.00	5.34	AVG
17492.990	H	50.24	54.00	3.76	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5580			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10654.610	V	59.58	74.00	14.42	peak
14515.710	V	62.89	74.00	11.11	peak
17520.980	V	67.62	74.00	6.38	peak
10657.280	V	47.09	54.00	6.91	AVG
14514.850	V	49.76	54.00	4.24	AVG
17517.450	V	49.66	54.00	4.34	AVG
11394.390	H	60.22	74.00	13.78	peak
14541.490	H	62.97	74.00	11.03	peak
17510.190	H	67.8	74.00	6.2	peak
11394.390	H	45.38	54.00	8.62	AVG
14526.490	H	49.56	54.00	4.44	AVG
17495.190	H	50.34	54.00	3.66	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5700			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11389.810	V	60.9	74.00	13.1	peak
14530.610	V	63.34	74.00	10.66	peak
17493.380	V	68.1	74.00	5.9	peak
11392.480	V	46.49	54.00	7.51	AVG
14529.750	V	49.35	54.00	4.65	AVG
17489.850	V	49.97	54.00	4.03	AVG
11381.690	H	59.9	74.00	14.1	peak
14552.190	H	63.11	74.00	10.89	peak
17522.890	H	67.52	74.00	6.48	peak
11381.690	H	46.67	54.00	7.33	AVG
14537.190	H	48.96	54.00	5.04	AVG
17507.890	H	49.74	54.00	4.26	AVG

- Note:**
- (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).
  - (2) Emission Level= Reading Level+Correct Factor +Cable Loss.
  - (3) Correct Factor= Ant\_F + Cab\_L - Preamp
  - (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

●  Undesirable radiated Undesirable radiated Spurious Emission in Band Edge

Test mode: 802.11n(20) Frequency(MHz): 5500

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5428.17	H	58.36	-36.87	-27	Pass
5434.37	V	66.22	-29.01	-27	Pass

Test mode: 802.11n(20) Frequency(MHz): 5700

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5726.22	H	56.76	-38.47	-27	Pass
5726.17	V	63.28	-31.95	-27	Pass

**Note:** (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Correct Factor +Cable Loss.  
 (3) Correct Factor= Ant\_F + Cab\_L - Preamp  
 (4) EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77  
 d is the measurement distance in 3 meters

Test mode: 802.11n(20) Frequency(MHz): 5500

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5434.37	V	66.22	74.00	7.78	peak
5434.37	V	50.36	54.00	3.64	AVG
5428.17	H	58.36	74.00	15.64	peak
5428.15	H	45.25	54.00	8.75	AVG

Test mode: 802.11n(20) Frequency(MHz): 5700

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5726.17	V	63.28	74.00	10.72	peak
5726.14	V	47.92	54.00	6.08	AVG
5726.22	H	56.76	74.00	17.24	peak
5726.19	H	43.59	54.00	10.41	AVG

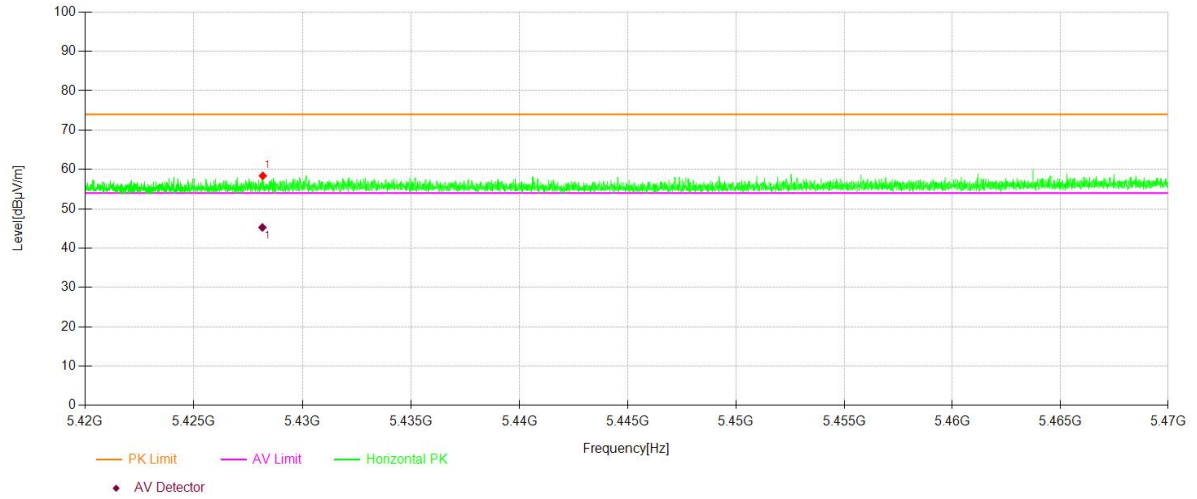
**Note:** (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Correct Factor +Cable Loss.  
 (3) Correct Factor= Ant\_F + Cab\_L - Preamp  
 (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



**U-NII -2C**

**Test Model**    Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)

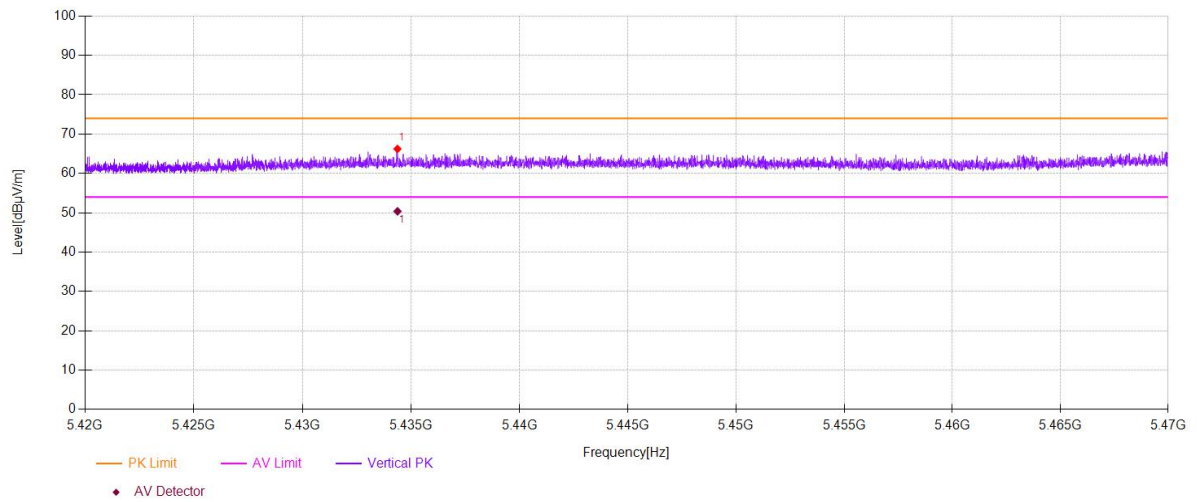
<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11 ac (VHT20)
<input checked="" type="checkbox"/> 5500	<input type="checkbox"/> 5580	<input type="checkbox"/> 5700
Ant.Pol		H



**U-NII -2C**

**Test Model**    Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)

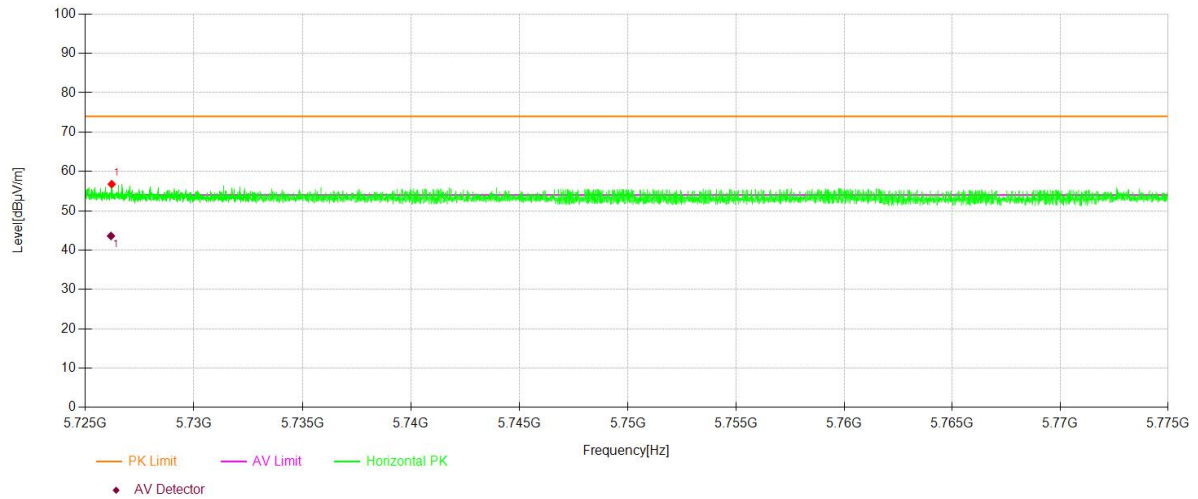
<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11 ac (VHT20)
<input checked="" type="checkbox"/> 5500	<input type="checkbox"/> 5580	<input type="checkbox"/> 5700
Ant.Pol		V



**U-NII -2C**

**Test Model**    Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz )

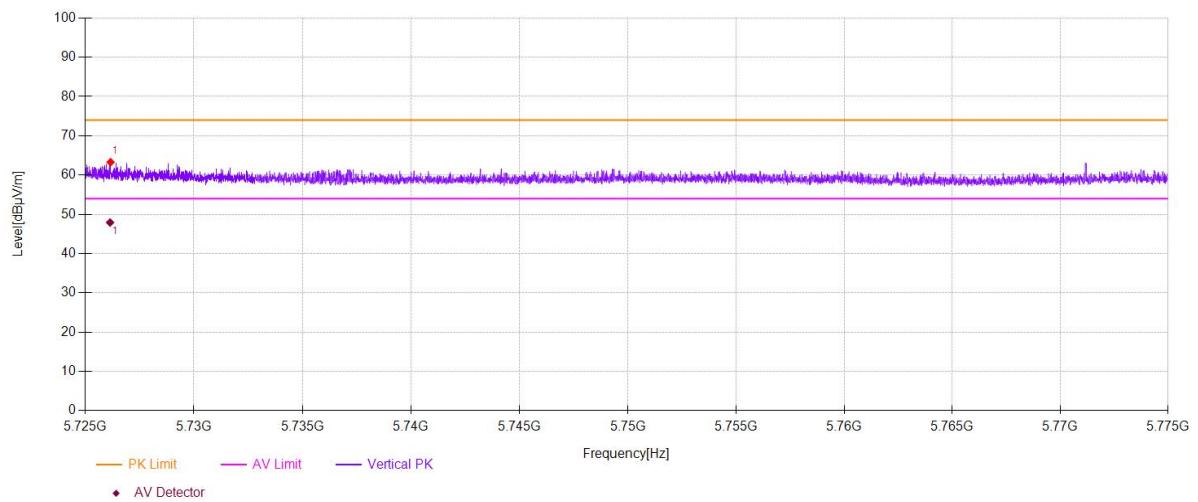
<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11 ac (VHT20)
<input type="checkbox"/> 5500	<input type="checkbox"/> 5580	<input checked="" type="checkbox"/> 5700
		Ant.Pol    H



**U-NII -2C**

**Test Model**    Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz )

<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11 ac (VHT20)
<input type="checkbox"/> 5500	<input type="checkbox"/> 5580	<input checked="" type="checkbox"/> 5700
		Ant.Pol    V



- For Undesirable radiated Spurious Emission in U-NII -3  
 All the modes 802.11a/n/ac has been tested and the worst result 802.11a recorded as below:
  - Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)  
 Highest gain of each antenna and highest output power is ANT2 and MIMO as below:

ANT2:

Test mode: 802.11n(20) Frequency(MHz): 5745

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11493.2	V	63.14	-32.09	-27	5.09
15131.2	V	62.76	-32.47	-27	5.47
17487.8	V	67.21	-28.02	-27	1.02
11493.2	H	61.04	-34.19	-27	7.19
14806.1	H	63.03	-32.2	-27	5.2
17509.1	H	67.48	-27.75	-27	0.75

Test mode: 802.11n(20) Frequency(MHz): 5785

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11567.6	V	63.44	-31.79	-27	4.79
14623.3	V	63.03	-32.2	-27	5.2
17492.1	V	67.06	-28.17	-27	1.17
11569.7	H	60.21	-35.02	-27	8.02
14540.5	H	63.17	-32.06	-27	5.06
17498.5	H	67.72	-27.51	-27	0.51

Test mode: 802.11n(20) Frequency(MHz): 5825

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11646.2	V	61.16	-34.07	-27	7.07
14585.1	V	62.95	-32.28	-27	5.28
17509.1	V	67.47	-27.76	-27	0.76
11644.1	H	59.83	-35.4	-27	8.4
14578.7	H	62.93	-32.3	-27	5.3
17490	H	68.05	-27.18	-27	0.18

MIMO:

Test mode: 802.11n(20) Frequency(MHz): 5745

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11491.81	V	63.01	-32.22	-27	5.22
17489.08	V	67.18	-28.05	-27	1.05
15128.95	V	48.41	-46.82	-27	19.82
11504.89	H	60.96	-34.27	-27	7.27
17520.79	H	67.32	-27.91	-27	0.91
14802.79	H	47.56	-47.67	-27	20.67

Test mode: 802.11n(20) Frequency(MHz): 5785

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11566.21	V	63.31	-31.92	-27	4.92
17493.38	V	67.03	-28.20	-27	1.20
14621.05	V	50.2	-45.03	-27	18.03
11581.39	H	60.13	-35.10	-27	8.10
17510.19	H	67.56	-27.67	-27	0.67
14537.19	H	50.39	-44.84	-27	17.84

Test mode: 802.11n(20) Frequency(MHz): 5825

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
11644.81	V	61.03	-34.20	-27	7.20
17510.38	V	67.44	-27.79	-27	0.79
14582.85	V	49.47	-45.76	-27	18.76
11655.79	H	59.75	-35.48	-27	8.48
17501.69	H	67.89	-27.34	-27	0.34
14575.39	H	50.22	-45.01	-27	18.01

- Note:** (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss.  
 (3) EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77  
 d is the measurement distance in 3 meters

ANT2:

Test mode:		802.11n(20)		Frequency(MHz): 5745	
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11493.2	V	63.14	74.00	10.86	peak
15131.2	V	62.76	74.00	11.24	peak
17487.8	V	67.21	74.00	6.79	peak
11493.2	V	49.00	54.00	5.00	AVG
15131.2	V	48.67	54.00	5.33	AVG
17487.8	V	49.43	54.00	4.57	AVG
11493.2	H	61.04	74.00	12.96	peak
14806.1	H	63.03	74.00	10.97	peak
17509.1	H	67.48	74.00	6.52	peak
11493.2	H	47.23	54.00	6.77	AVG
14806.1	H	47.74	54.00	6.26	AVG
17509.1	H	50.37	54.00	3.63	AVG

Test mode:		802.11n(20)		Frequency(MHz): 5785	
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11567.6	V	63.44	74.00	10.56	peak
14623.3	V	63.03	74.00	10.97	peak
17492.1	V	67.06	74.00	6.94	peak
11567.5	V	50.08	54.00	3.92	AVG
14623.3	V	50.46	54.00	3.54	AVG
17492.1	V	49.97	54.00	4.03	AVG
11569.7	H	60.21	74.00	13.79	peak
14540.5	H	63.17	74.00	10.83	peak
17498.5	H	67.72	74.00	6.28	peak
11569.7	H	49.87	54.00	4.13	AVG
14540.5	H	50.57	54.00	3.43	AVG
17498.5	H	49.84	54.00	4.16	AVG

Test mode:		802.11n(20)		Frequency(MHz): 5825	
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11646.2	V	61.16	74.00	12.84	peak
14585.1	V	62.95	74.00	11.05	peak
17509.1	V	67.47	74.00	6.53	peak
11646.2	V	50.70	54.00	3.30	AVG
14585.1	V	49.73	54.00	4.27	AVG
17509.1	V	50.24	54.00	3.76	AVG
11644.1	H	59.83	74.00	14.17	peak
14578.7	H	62.93	74.00	11.07	peak
17490	H	68.05	74.00	5.95	peak
11644.1	H	48.35	54.00	5.65	AVG
14578.7	H	50.40	54.00	3.60	AVG
17490	H	49.44	54.00	4.56	AVG

MIMO:

Test mode: 802.11n(20)		Frequency(MHz): 5745			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11491.810	V	63.01	74.00	10.99	peak
15129.810	V	62.6	74.00	11.4	peak
17489.080	V	67.18	74.00	6.82	peak
11494.480	V	48.98	54.00	5.02	AVG
15128.950	V	48.41	54.00	5.59	AVG
17485.550	V	49.24	54.00	4.76	AVG
11504.890	H	60.96	74.00	13.04	peak
14817.790	H	62.82	74.00	11.18	peak
17520.790	H	67.32	74.00	6.68	peak
11504.890	H	47.09	54.00	6.91	AVG
14802.790	H	47.56	54.00	6.44	AVG
17505.790	H	50.24	54.00	3.76	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5785			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11566.210	V	63.31	74.00	10.69	peak
14621.910	V	62.87	74.00	11.13	peak
17493.380	V	67.03	74.00	6.97	peak
11568.780	V	50.06	54.00	3.94	AVG
14621.050	V	50.2	54.00	3.8	AVG
17489.850	V	49.78	54.00	4.22	AVG
11581.390	H	60.13	74.00	13.87	peak
14552.190	H	62.96	74.00	11.04	peak
17510.190	H	67.56	74.00	6.44	peak
11581.390	H	49.73	54.00	4.27	AVG
14537.190	H	50.39	54.00	3.61	AVG
17495.190	H	49.71	54.00	4.29	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5825			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11644.810	V	61.03	74.00	12.97	peak
14583.710	V	62.79	74.00	11.21	peak
17510.380	V	67.44	74.00	6.56	peak
11647.480	V	50.68	54.00	3.32	AVG
14582.850	V	49.47	54.00	4.53	AVG
17506.850	V	50.05	54.00	3.95	AVG
11655.790	H	59.75	74.00	14.25	peak
14590.390	H	62.72	74.00	11.28	peak
17501.690	H	67.89	74.00	6.11	peak
11655.790	H	48.21	54.00	5.79	AVG
14575.390	H	50.22	54.00	3.78	AVG
17486.690	H	49.31	54.00	4.69	AVG

- Note:**
- (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).
  - (2) Emission Level= Reading Level+Correct Factor +Cable Loss.
  - (3) Correct Factor= Ant\_F + Cab\_L - Preamp
  - (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

●  Undesirable radiated Spurious Emission in band edge

Test mode: 802.11n(20) Frequency: 5745

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5724.74	H	62.74	-32.49	-27	PASS
5724.43	V	71.04	-24.19	-27	PASS

Test mode: 802.11n(20) Frequency: 5825

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5851.81	H	61.67	-33.56	-27	PASS
5850.93	V	67.74	-27.49	-27	PASS

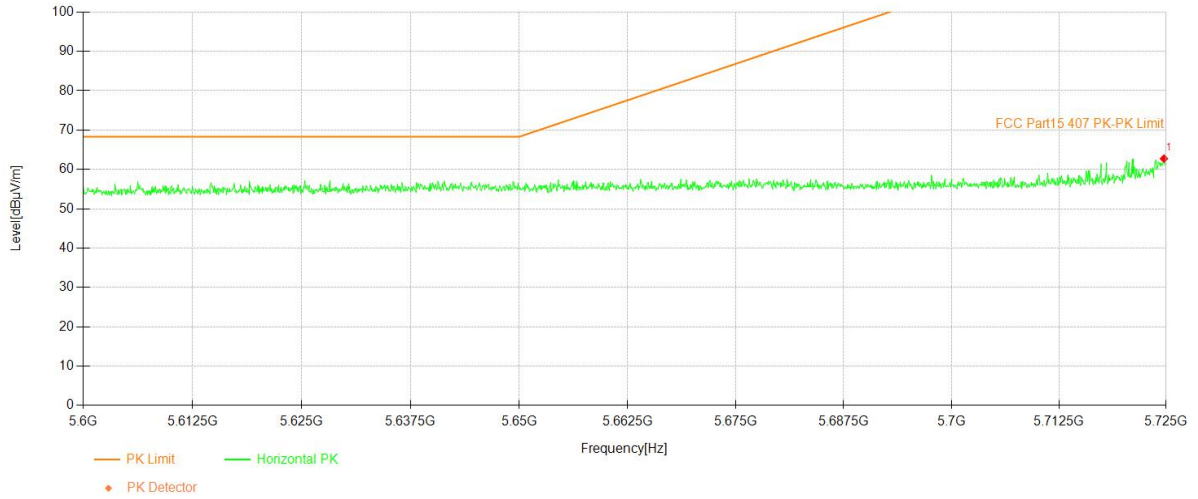
- Note:** (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Correct Factor +Cable Loss.  
 (3) Correct Factor= Ant\_F + Cab\_L - Preamp  
 (4) EIRP[dBm] = E[dBuV/m] + 20 log(d[meters]) - 104.77  
 d is the measurement distance in 3 meters

**U-NII -3**

Test Model    Undesirable radiated    Undesirable radiated    Spurious Emission in Band Edge

802.11a    802.11n(HT20)    802.11n(HT40)

5745    Ant.Pol    H

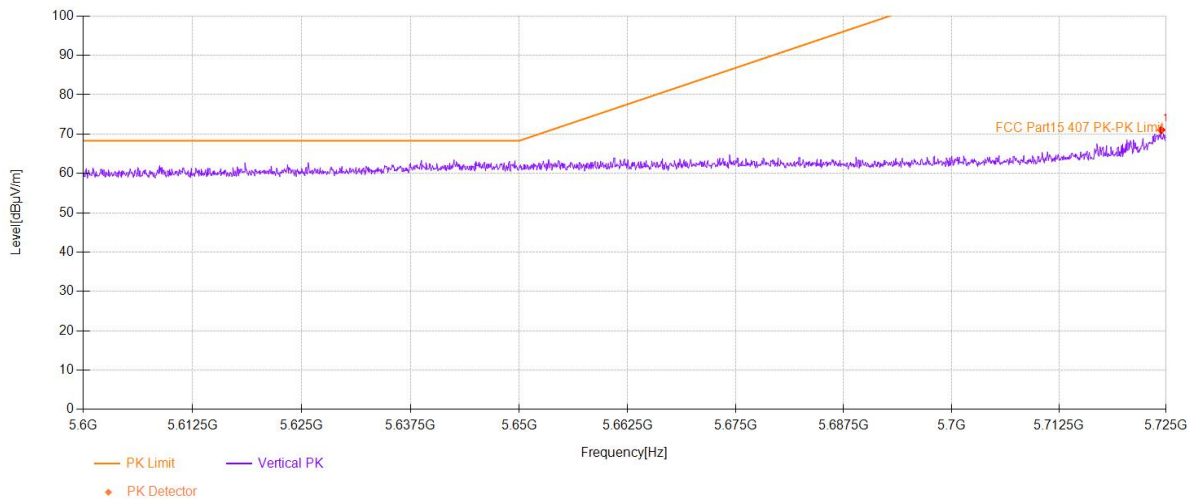


**U-NII -3**

Test Model    Undesirable radiated    Undesirable radiated    Spurious Emission in Band Edge

802.11a    802.11n(HT20)    802.11n(HT40)

5745    Ant.Pol    V



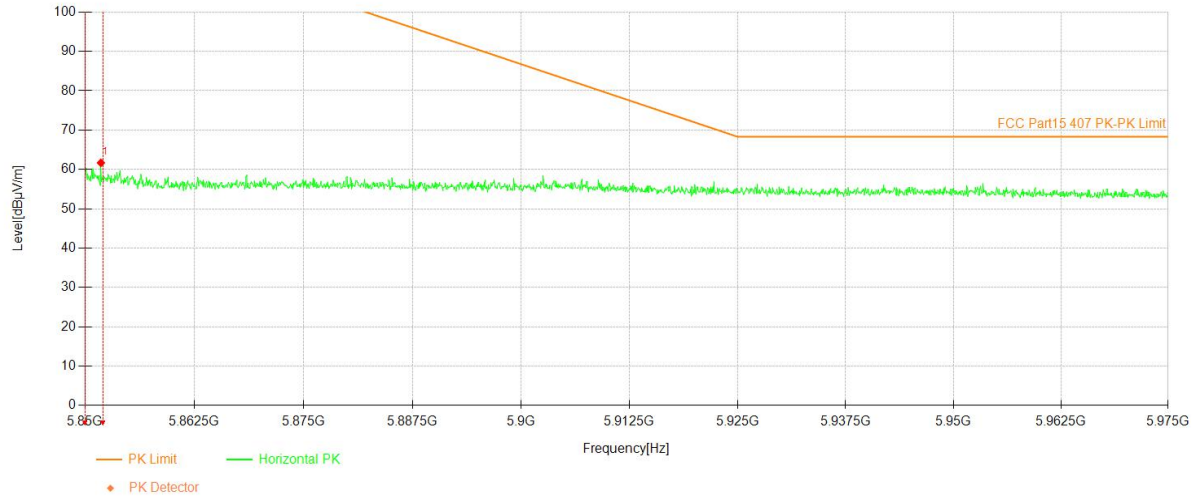


**U-NII -3**

Test Model    Undesirable radiated Spurious Emission in Band Edge

802.11a     802.11n(HT20)     802.11n(HT40)

5825    Ant.Pol    H

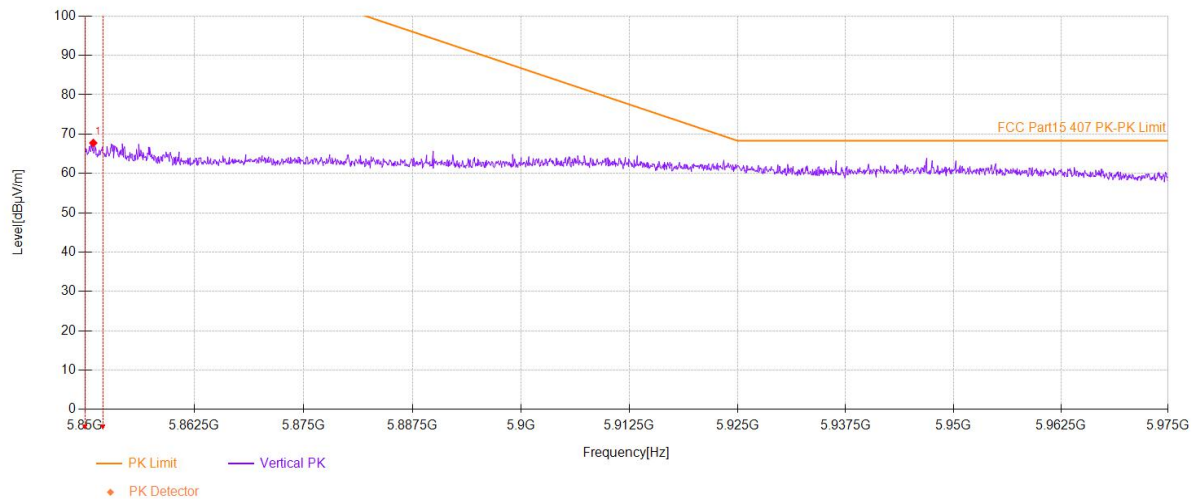


**U-NII -3**

Test Model    Undesirable radiated Spurious Emission in Band Edge

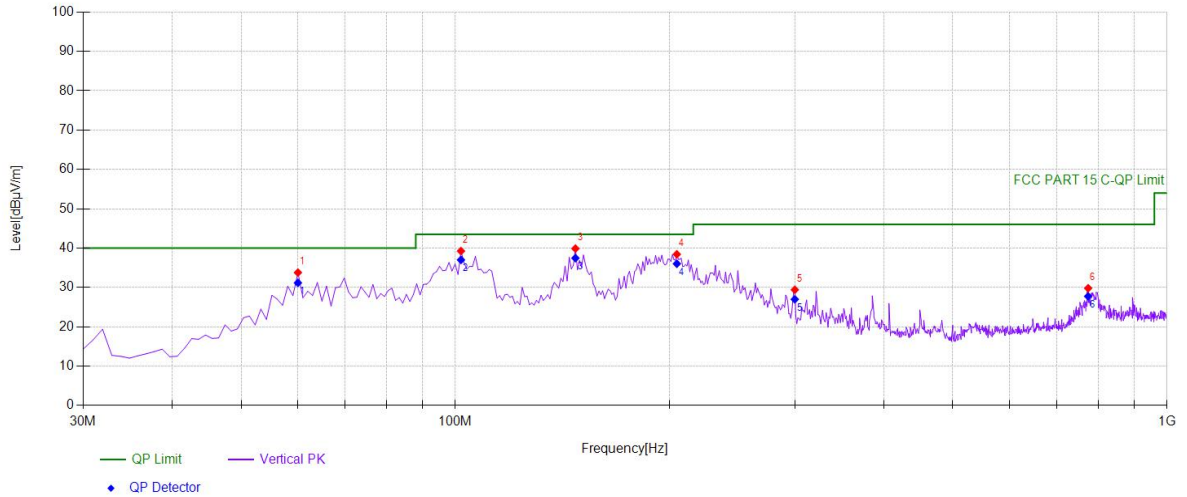
802.11a     802.11n(HT20)     802.11n(HT40)

5825    Ant.Pol    V

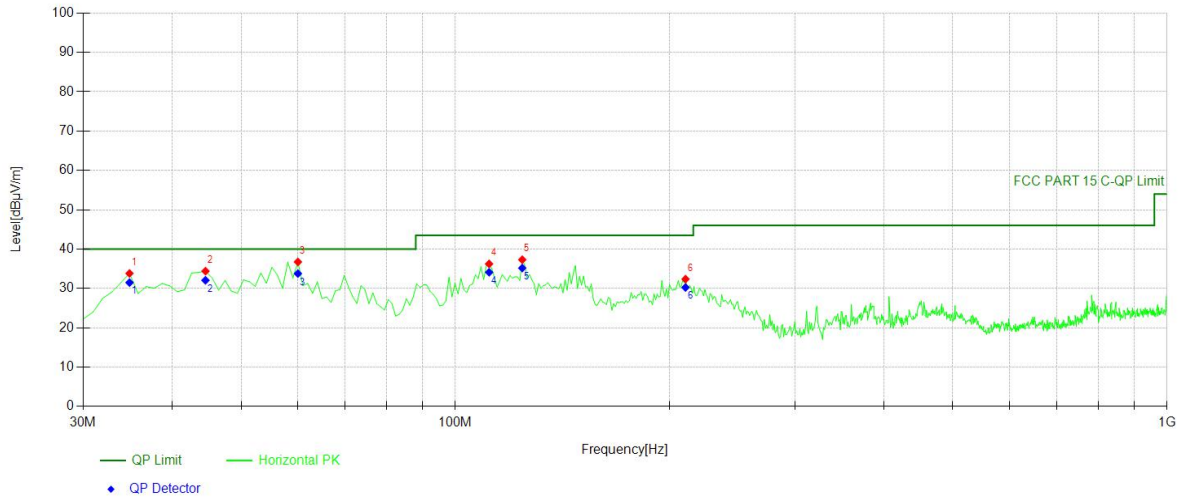


- Undesirable radiated Spurious Emission below 1GHz (30MHz to 1GHz)  
All modes have been tested, and the worst result recorded was report as below:

Test mode: 802.11n(20) Frequency(MHz): 5180



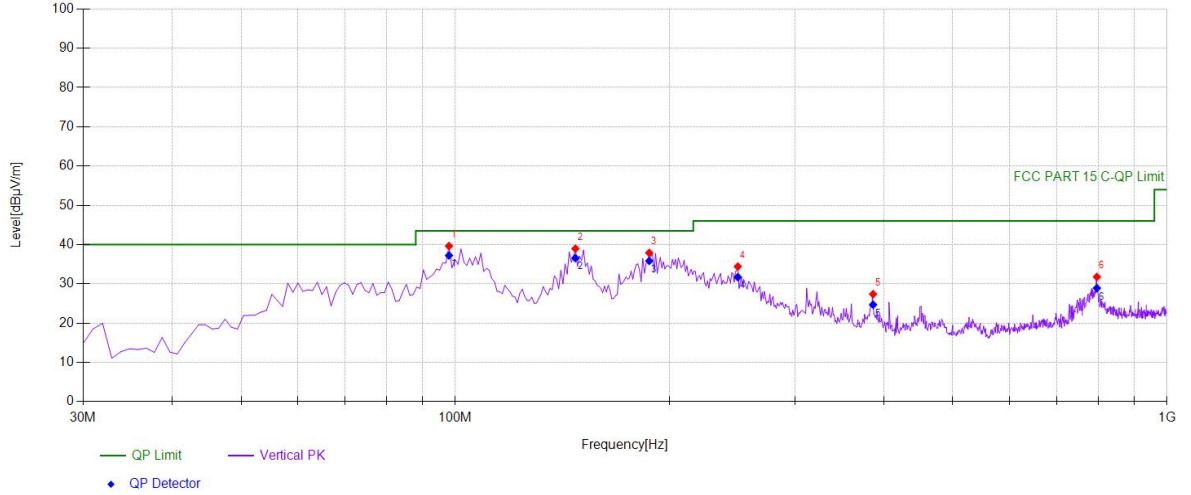
Suspected Data List										
NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Detector	Limit [dBµV/m]	Margin [dB]	Polarity	Angle[°]	Height [cm]
1	60.1001	52.34	-18.56	33.78	PK	40.00	1.22	Vertical	260	100
2	101.851	56.15	-16.90	39.25	PK	43.50	4.25	Vertical	192	100
3	147.487	59.71	-19.83	39.88	PK	43.50	3.62	Vertical	86	100
4	204.774	55.57	-17.13	38.44	PK	43.50	0.06	Vertical	219	100
5	299.929	43.55	-14.14	29.41	PK	46.00	11.59	Vertical	256	100
6	774.734	34.64	-4.83	29.81	PK	46.00	11.19	Vertical	293	100



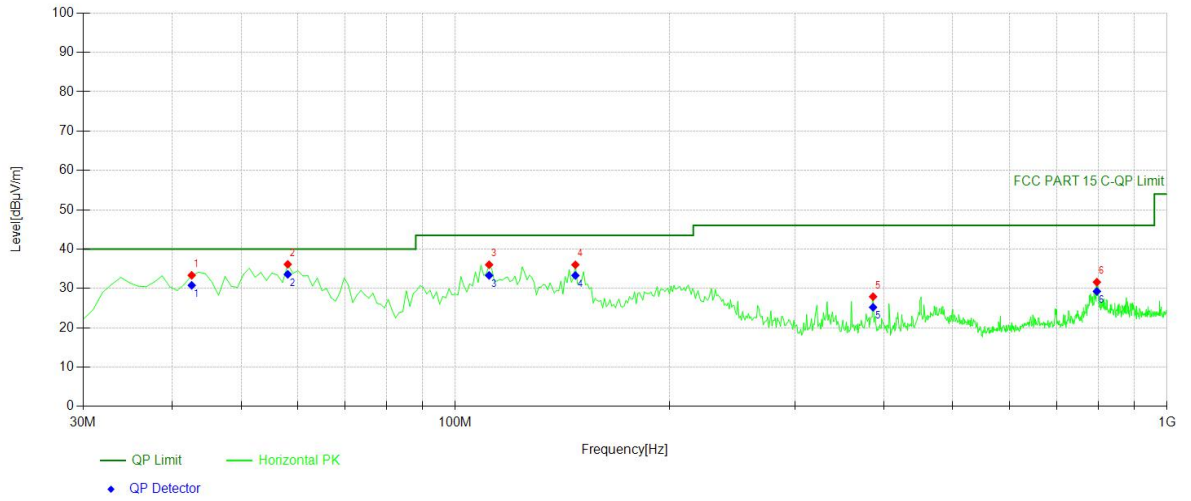
### Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity	Angle[°]	Height [cm]
1	34.8549	52.05	-18.23	33.82	PK	40.00	6.18	Horizon	293	100
2	44.5646	51.99	-17.59	34.40	PK	40.00	5.60	Horizon	159	100
3	60.1001	55.31	-18.56	36.75	PK	40.00	3.25	Horizon	140	100
4	111.561	53.65	-17.41	36.24	PK	43.50	3.26	Horizon	224	100
5	124.184	55.68	-18.37	37.31	PK	43.50	6.19	Horizon	140	100
6	210.600	49.51	-17.13	32.38	PK	43.50	7.12	Horizon	279	100

Test mode: 802.11n(20) Frequency(MHz): 5200



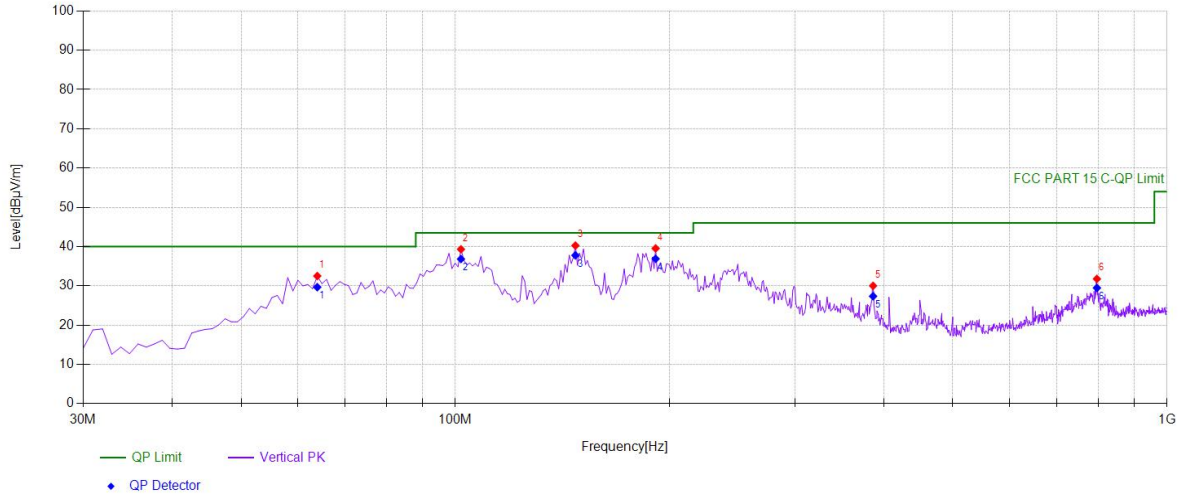
Suspected Data List										
NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Detector	Limit [dBµV/m]	Margin [dB]	Polarity	Angle[°]	Height[cm]
1	97.968	56.92	-17.28	39.64	PK	43.50	3.86	Vertical	205	100
2	147.487	58.80	-19.83	38.97	PK	43.50	4.53	Vertical	182	100
3	187.297	55.81	-17.92	37.89	PK	43.50	5.61	Vertical	228	100
4	249.439	49.58	-15.17	34.41	PK	46.00	11.59	Vertical	58	100
5	386.346	39.21	-11.83	27.38	PK	46.00	18.62	Vertical	329	100
6	797.067	36.22	-4.45	31.77	PK	46.00	14.23	Vertical	159	100



### Suspected Data List

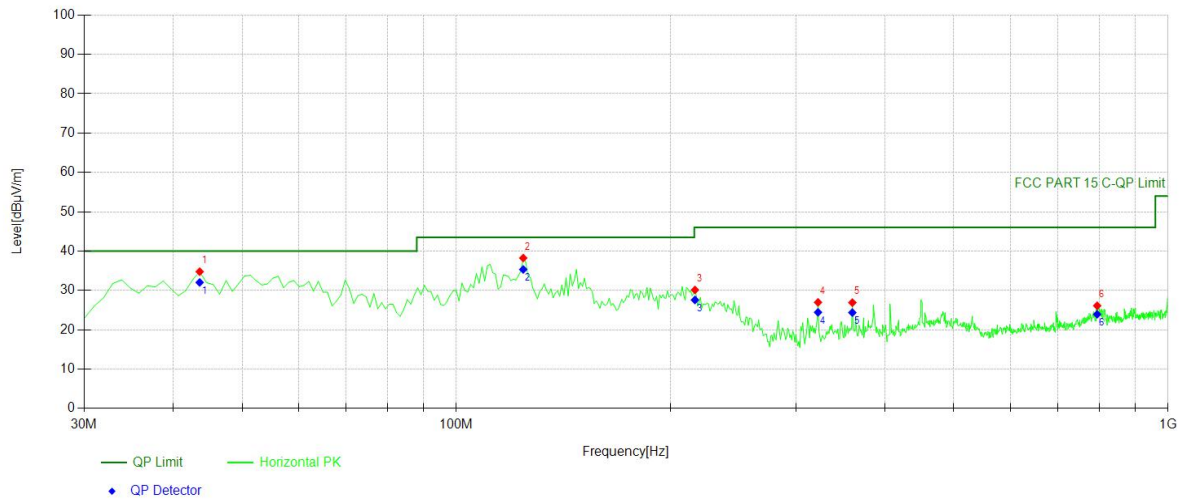
NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Detector	Limit [dBµV/m]	Margin [dB]	Polarity	Angle[°]	Height[cm]
1	42.6226	51.07	-17.73	33.34	PK	40.00	6.66	Horizon	288	100
2	58.1582	54.44	-18.30	36.14	PK	40.00	3.86	Horizon	127	100
3	111.561	53.43	-17.41	36.02	PK	43.50	7.48	Horizon	256	100
4	147.487	55.84	-19.83	36.01	PK	43.50	7.49	Horizon	76	100
5	386.346	39.75	-11.83	27.92	PK	46.00	18.08	Horizon	260	100
6	797.067	36.06	-4.45	31.61	PK	46.00	14.39	Horizon	168	100

Test mode: 802.11n(20) Frequency(MHz): 5240



### Suspected Data List

NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Detector	Limit [dBµV/m]	Margin [dB]	Polarity	Angle[°]	Height[cm]
1	63.984	51.62	-19.11	32.51	PK	40.00	7.49	Vertical	239	100
2	101.851	56.21	-16.90	39.31	PK	43.50	4.19	Vertical	192	100
3	147.487	60.08	-19.83	40.25	PK	43.50	3.25	Vertical	201	100
4	191.181	57.22	-17.68	39.54	PK	43.50	3.96	Vertical	206	100
5	386.346	41.84	-11.83	30.01	PK	46.00	15.99	Vertical	326	100
6	797.067	36.22	-4.45	31.77	PK	46.00	14.23	Vertical	258	100



Suspected Data List										
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity	Angle[°]	Height [cm]
1	43.5936	52.44	-17.66	34.78	PK	40.00	5.22	Horizon	329	100
2	124.184	56.61	-18.37	38.24	PK	43.50	5.26	Horizon	159	100
3	216.426	47.24	-17.11	30.13	PK	46.00	15.87	Horizon	288	100
4	322.262	41.02	-14.04	26.98	PK	46.00	19.02	Horizon	233	100
5	360.130	40.34	-13.43	26.91	PK	46.00	19.09	Horizon	251	100
6	795.125	30.59	-4.47	26.12	PK	46.00	19.88	Horizon	34	100

## 8.5 POWER LINE CONDUCTED EMISSIONS

### 8.5.1 Applicable Standard

According to FCC Part 15.207(a)

### 8.5.2 Conformance Limit

Frequency(MHz)	Conducted Emission Limit	
	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	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 0.50MHz.

### 8.5.3 Test Configuration

Test according to clause 6.3 conducted emission test setup

### 8.5.4 Test Procedure

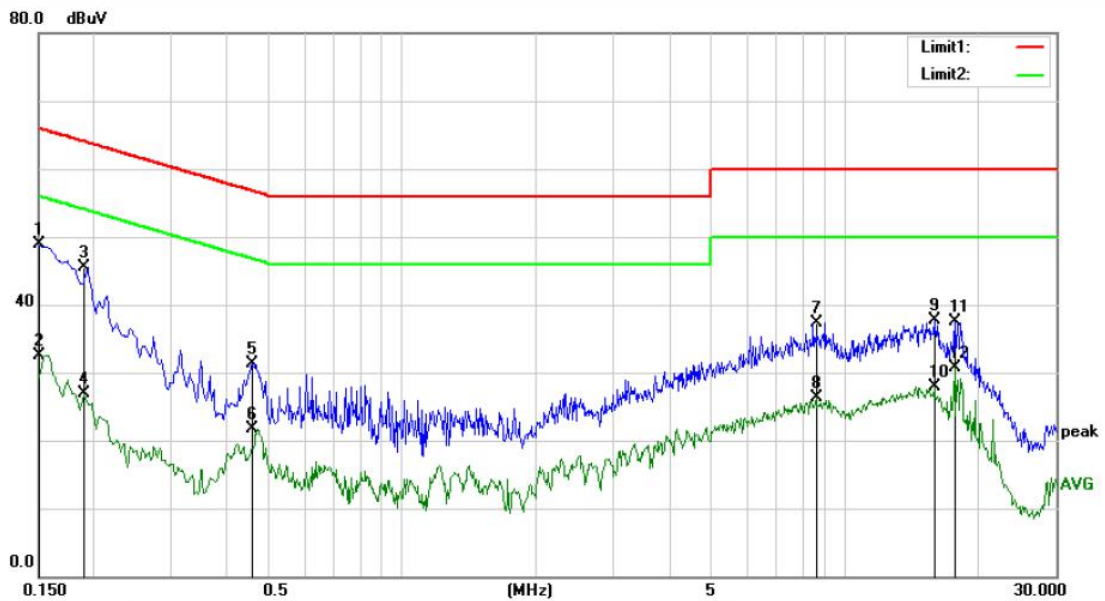
The EUT was placed on a table which is 0.8m above ground plane.  
 Maximum procedure was performed on the highest emissions to ensure EUT compliance.  
 Repeat above procedures until all frequency measured were complete.

### 8.5.5 Test Results

**Pass**

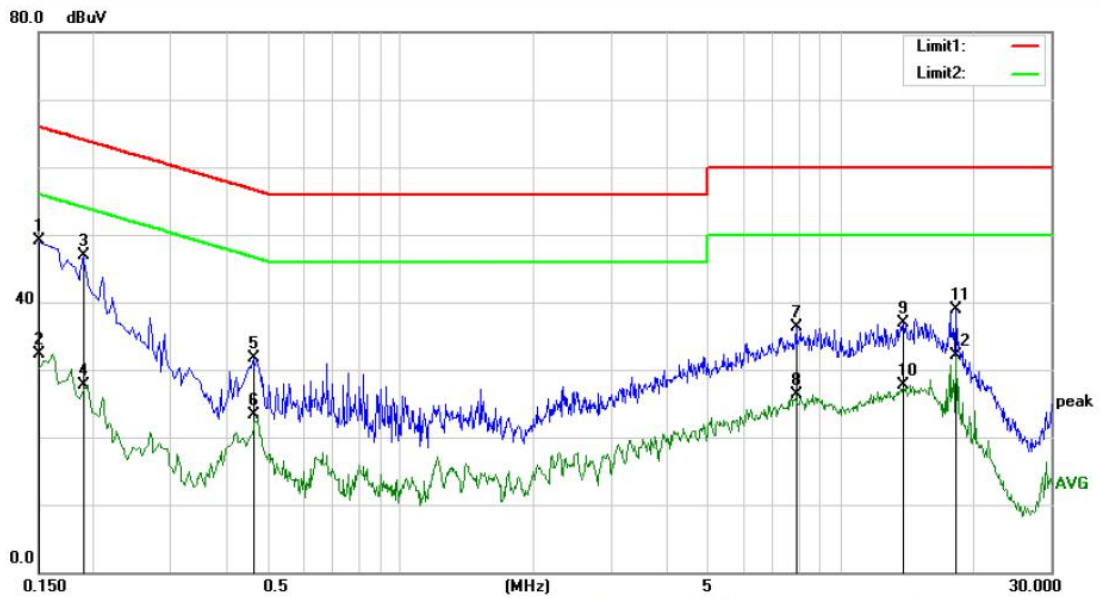
The 120V &240V voltage have been tested, and the worst result recorded was report as below:





Site Conduction #2 Phase: **N** Temperature: 25.1

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1500	38.57	10.25	48.82	66.00	-17.18	QP	
2		0.1500	22.26	10.25	32.51	56.00	-23.49	AVG	
3		0.1900	35.16	10.34	45.50	64.04	-18.54	QP	
4		0.1900	16.60	10.34	26.94	54.04	-27.10	AVG	
5		0.4580	21.05	10.23	31.28	56.73	-25.45	QP	
6		0.4580	11.49	10.23	21.72	46.73	-25.01	AVG	
7		8.5980	26.81	10.40	37.21	60.00	-22.79	QP	
8		8.5980	15.92	10.40	26.32	50.00	-23.68	AVG	
9		15.9020	27.10	10.51	37.61	60.00	-22.39	QP	
10		15.9020	17.43	10.51	27.94	50.00	-22.06	AVG	
11		17.6980	26.95	10.57	37.52	60.00	-22.48	QP	
12		17.6980	20.09	10.57	30.66	50.00	-19.34	AVG	



Site Conduction #2 Phase: **L1** Temperature: 25.1

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1500	38.83	10.25	49.08	66.00	-16.92	QP	
2		0.1500	22.09	10.25	32.34	56.00	-23.66	AVG	
3		0.1900	36.65	10.34	46.99	64.04	-17.05	QP	
4		0.1900	17.42	10.34	27.76	54.04	-26.28	AVG	
5		0.4620	21.50	10.23	31.73	56.66	-24.93	QP	
6		0.4620	13.06	10.23	23.29	46.66	-23.37	AVG	
7		7.9260	25.92	10.39	36.31	60.00	-23.69	QP	
8		7.9260	15.90	10.39	26.29	50.00	-23.71	AVG	
9		13.8980	26.50	10.48	36.98	60.00	-23.02	QP	
10		13.8980	17.13	10.48	27.61	50.00	-22.39	AVG	
11		18.2460	28.32	10.59	38.91	60.00	-21.09	QP	
12		18.2460	21.54	10.59	32.13	50.00	-17.87	AVG	

## 8.6 ANTENNA APPLICATION

### 8.6.1 Antenna Requirement

Standard	Requirement
FCC CRF Part 15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.407 (a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 8.6.2 Result

#### PASS

The EUT is integrated antenna, the antenna gain as below:

5150-5250MHz: Ant 1: 5.9dBi, Ant 2: 5.5dBi  
 5250-5350MHz: Ant 1: 5.9dBi, Ant 2: 5.5dBi  
 5470-5725MHz: Ant 1: 5.9dBi, Ant 2: 5.5dBi  
 5725-5850MHz: Ant 1: 5.9dBi, Ant 2: 5.5dBi

- Antennas use a permanently attached antenna which is not replaceable.
- Not using a standard antenna jack or electrical connector for antenna replacement
- The antenna has to be professionally installed (please provide method of installation)

Which in accordance to section 15.203, please refer to the internal photos.

Detail of factor for radiated emission:

Frequency(MHz)	Ant_F(dB)	Cab_L(dB)	Preamp(dB)	Correct Factor(dB)
0.009	20.6	0.03	\	20.63
0.15	20.7	0.1	\	20.8
1	20.9	0.15	\	21.05
10	20.1	0.28	\	20.38
30	18.8	0.45	\	19.25
30	11.7	0.62	27.9	-15.58
100	12.5	1.02	27.8	-14.28
300	12.9	1.91	27.5	-12.69
600	19.2	2.92	27	-4.88
800	21.1	3.54	26.6	-1.96
1000	22.3	4.17	26.2	0.27
1000	25.6	1.76	41.4	-14.04
3000	28.9	3.27	43.2	-11.03
5000	31.1	4.2	44.6	-9.3
8000	36.2	5.95	44.7	-2.55
10000	38.4	6.3	43.9	0.8
12000	38.5	7.14	42.3	3.34
15000	40.2	8.15	41.4	6.95
18000	45.4	9.02	41.3	13.12
18000	37.9	1.81	47.9	-8.19
21000	37.9	1.95	48.7	-8.85
25000	39.3	2.01	42.8	-1.49
28000	39.6	2.16	46.0	-4.24
31000	41.2	2.24	44.5	-1.06
34000	41.5	2.29	46.6	-2.81
37000	43.8	2.30	46.4	-0.3
40000	43.2	2.50	42.2	3.5

--- End of Report ---