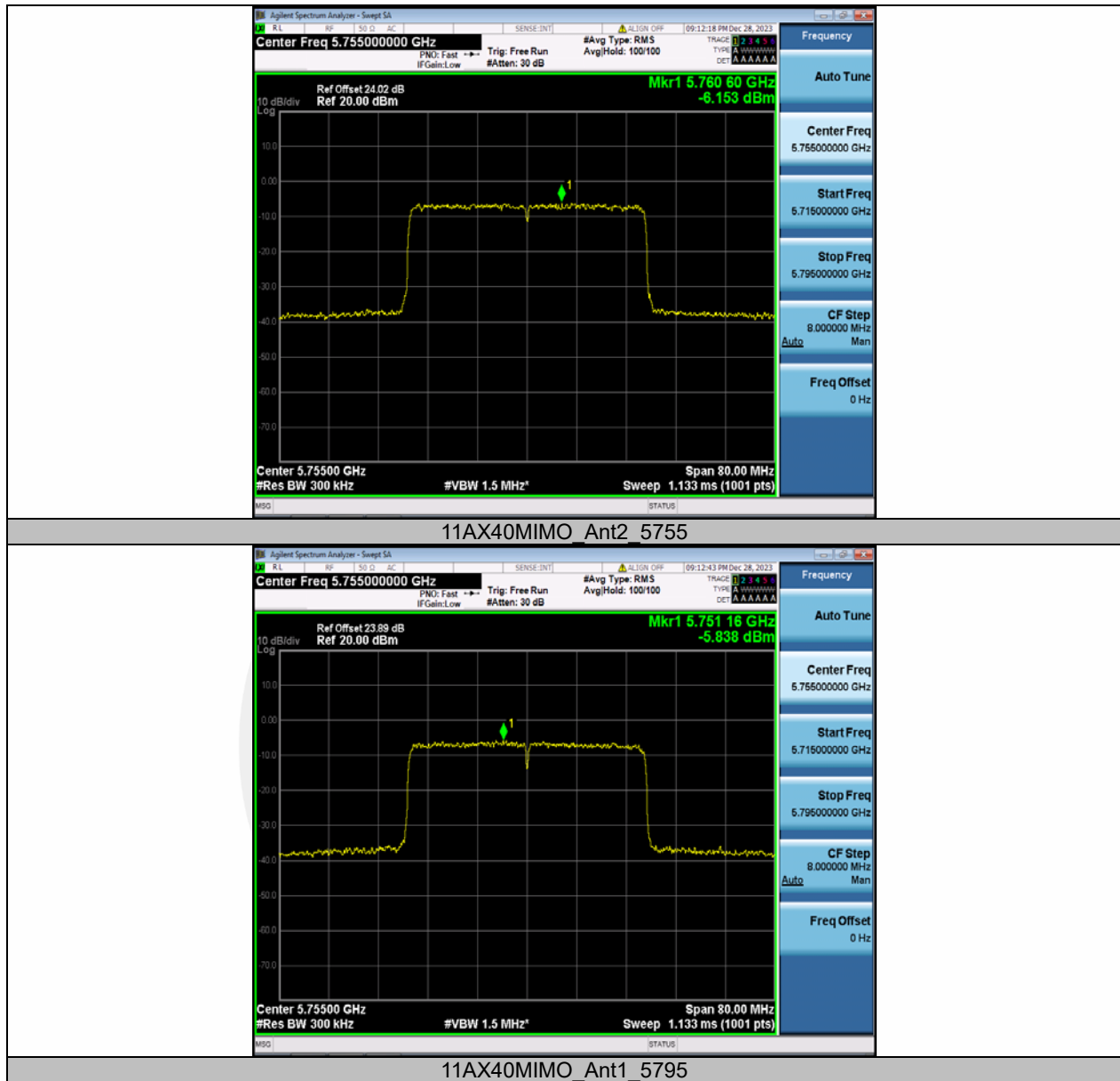
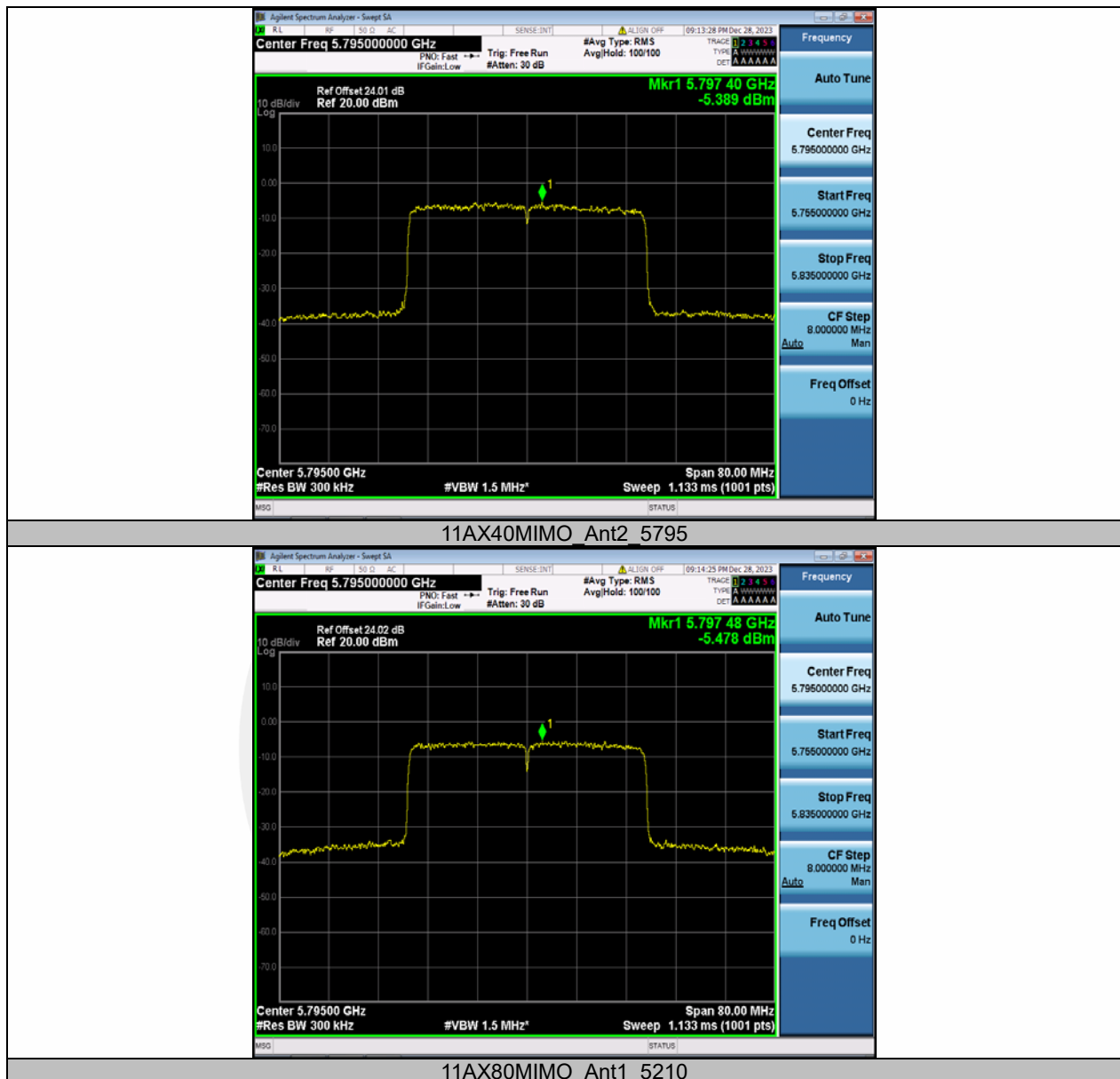
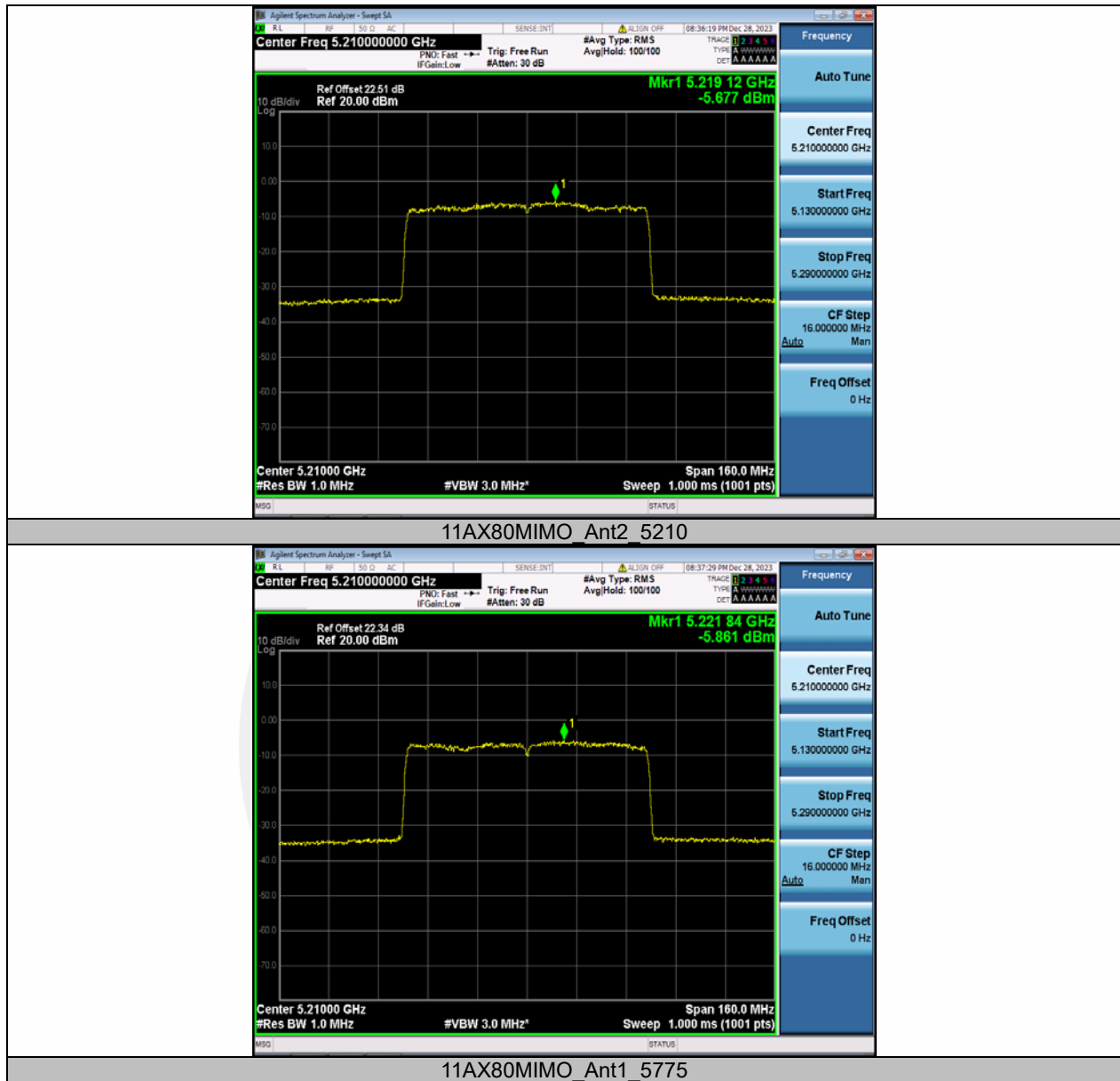










8.4 UNDESIRABLE RADIATED SPURIOUS EMISSION

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 ($\mu\text{V/m}$)	Field Strength (dB $\mu\text{V/m}$)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log ($\mu\text{V/m}$)	300
0.490-1.705	2400/F(KHz)	20 log ($\mu\text{V/m}$)	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 dBuV/m=20 log (uV/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 ξ 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 $f < 1$ GHz(30MHz to 1GHz), 200Hz for $f < 150$ KHz(9KHz to 150KHz), 9KHz for $f < 30$ 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 $VBW \leq RBW/100$ (i.e., 10 kHz) but not less than 10 Hz.

• If the EUT duty cycle is < 98 percent, set $VBW \geq 1/T$, 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/ax 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/ax has been tested and the worst result 802.11n(HT20) 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(HT20) Frequency(MHz): 5180

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Margin(dB)
11400.7	V	60.22	-35.01	-27	8.01
14657.8	V	61.93	-33.3	-27	6.3
17498.2	V	66.01	-29.22	-27	2.22
11511.2	H	59.88	-35.35	-27	8.35
15593.2	H	61.75	-33.48	-27	6.48
17498.2	H	65.83	-29.4	-27	2.4

Test mode: 802.11n(HT20) Frequency(MHz): 5200

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Margin(dB)
11587.7	V	59.70	-35.53	-27	8.53
14232.6	V	61.34	-33.89	-27	6.89
17506.7	V	65.81	-29.42	-27	2.42
11502.7	H	59.23	-36	-27	9
14572.7	H	62.72	-32.51	-27	5.51
17523.7	H	66.76	-28.47	-27	1.47

Test mode: 802.11n(HT20) Frequency(MHz): 5240

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Margin(dB)
13373.6	V	60.13	-35.1	-27	8.1
15253.1	V	62.34	-32.89	-27	5.89
17489.7	V	66.07	-29.16	-27	2.16
11494.2	H	59.60	-35.63	-27	8.63
14564.2	H	61.81	-33.42	-27	6.42
17489.7	H	65.14	-30.09	-27	3.09

ANT2:

Test mode:		802.11n(HT20)	Frequency(MHz):	5180	
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Margin(dB)	Detector
11400.7	V	60.22	74.00	13.78	peak
14657.8	V	61.93	74.00	12.07	peak
17498.2	V	66.01	74.00	7.99	peak
11400.70	V	45.21	54.00	8.79	AVG
14657.82	V	44.84	54.00	9.16	AVG
17498.24	V	46.19	54.00	7.81	AVG
11511.2	H	59.88	74.00	14.12	peak
15593.2	H	61.75	74.00	12.25	peak
17498.2	H	65.83	74.00	8.17	peak
11511.25	H	46.37	54.00	7.63	AVG
15593.29	H	43.83	54.00	10.17	AVG
17498.24	H	45.06	54.00	8.94	AVG

Test mode:		802.11n(HT20)	Frequency(MHz):	5200	
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Margin(dB)	Detector
11587.7	V	59.70	74.00	14.30	peak
14232.6	V	61.34	74.00	12.66	peak
17506.7	V	65.81	74.00	8.19	peak
11587.79	V	46.32	54.00	7.68	AVG
14232.61	V	43.84	54.00	10.16	AVG
17506.75	V	44.87	54.00	9.13	AVG
11502.7	H	59.23	74.00	14.77	peak
14572.7	H	62.72	74.00	11.28	peak
17523.7	H	66.76	74.00	7.24	peak
11502.75	H	46.48	54.00	7.52	AVG
14572.78	H	44.92	54.00	9.08	AVG
17523.76	H	44.29	54.00	9.71	AVG

Test mode:		802.11n(HT20)		Frequency(MHz): 5240	
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Margin(dB)	Detector
13373.6	V	60.13	74.00	13.87	peak
15253.1	V	62.34	74.00	11.66	peak
17489.7	V	66.07	74.00	7.93	peak
13373.68	V	47.90	54.00	6.10	AVG
15253.12	V	43.16	54.00	10.84	AVG
17489.74	V	44.33	54.00	9.67	AVG
11494.2	H	59.60	74.00	14.40	peak
14564.2	H	61.81	74.00	12.19	peak
17489.7	H	65.14	74.00	8.86	peak
11494.24	H	46.59	54.00	7.41	AVG
14564.28	H	45.23	54.00	8.77	AVG
17489.74	H	44.77	54.00	9.23	AVG

● ☒ Undesirable radiated Undesirable radiated Spurious Emission in Band Edge

Test mode: 802.11n(HT20) Frequency(MHz): 5180

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5029.99	H	54.53	-40.7	-27	Pass
5011.22	V	54.68	-40.55	-27	Pass

Test mode: 802.11n(HT20) Frequency(MHz): 5240

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5359.24	V	54.12	-41.11	-27	Pass
5387.24	H	54.10	-41.13	-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(HT20) Frequency(MHz): 5180

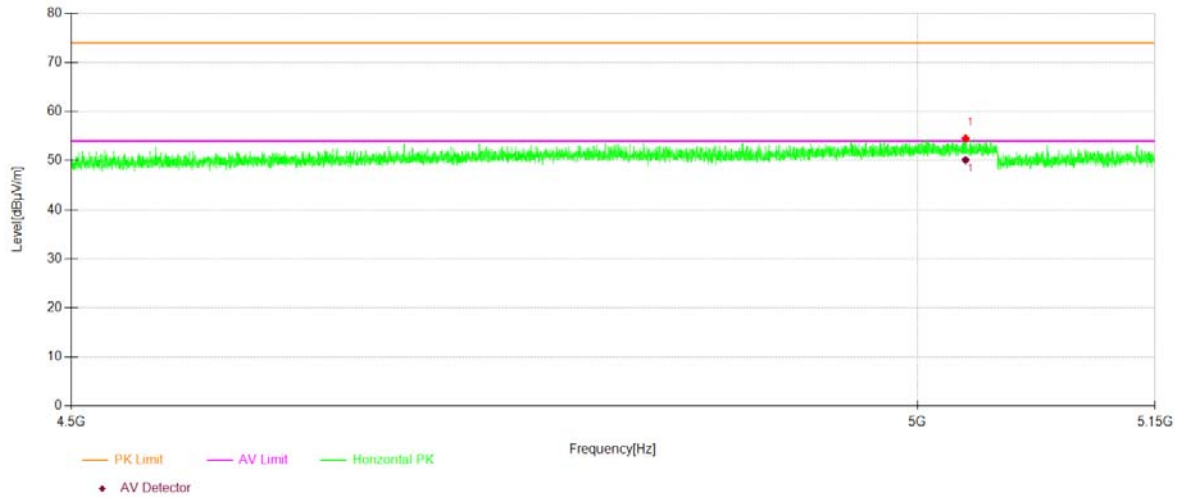
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Margin(dB)	Detector
5011.22	V	54.68	74.00	19.32	peak
5011.22	V	49.91	54.00	4.09	AVG
5029.99	H	54.53	74.00	19.47	peak
5029.99	H	50.11	54.00	3.89	AVG

Test mode: 802.11n(HT20) Frequency(MHz): 5240

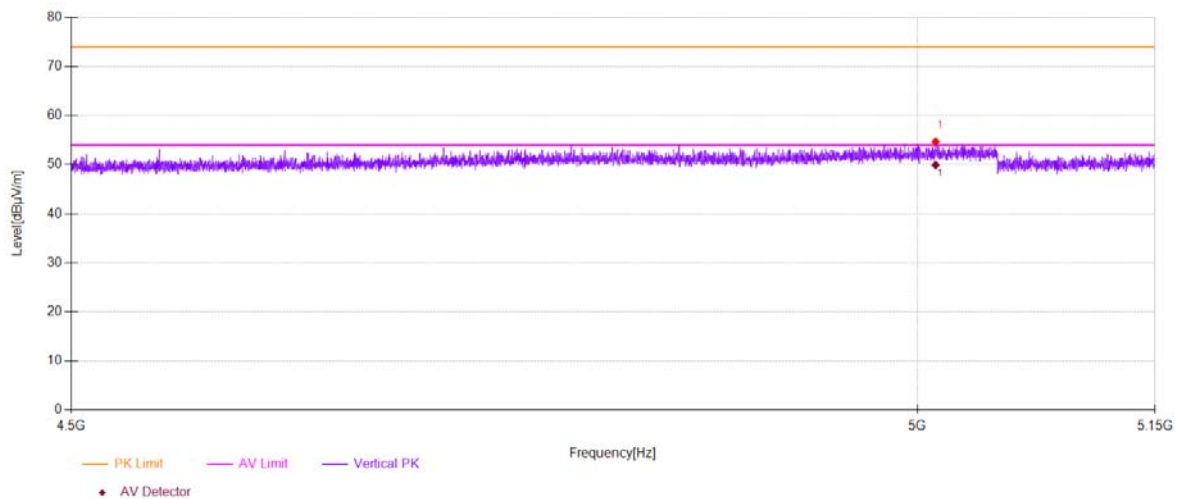
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Margin(dB)	Detector
5359.24	V	54.12	74.00	19.88	peak
5359.24	V	50.41	54.00	3.59	AVG
5387.24	H	54.10	74.00	19.90	peak
5387.24	H	49.43	54.00	4.57	AVG

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.

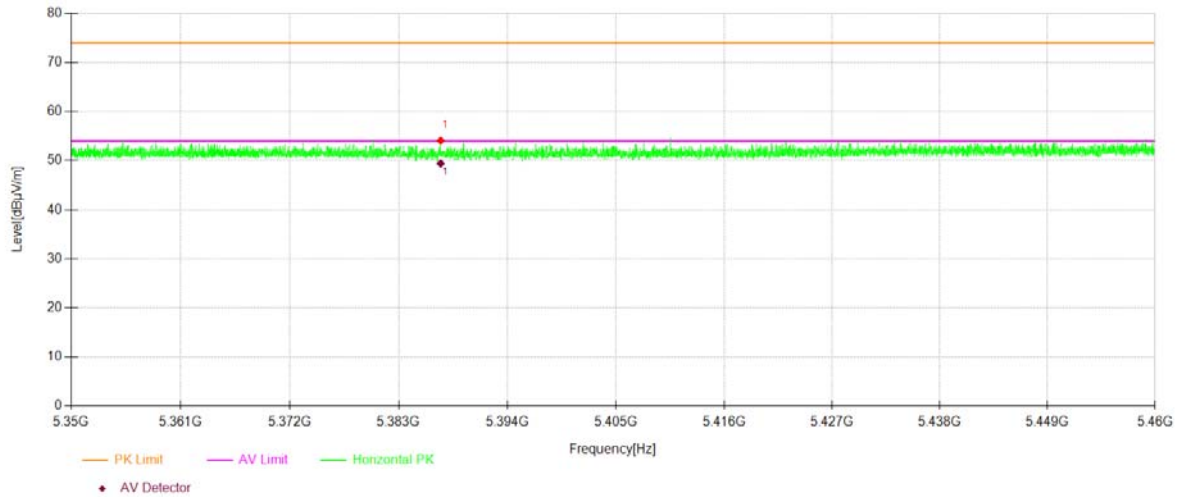
Test Model U-NII - 1
Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)
☐802.11a ☒802.11n(HT20) ☐802.11n(HT40)
☒5180 ☐5200 ☐5240 Ant.Pol H



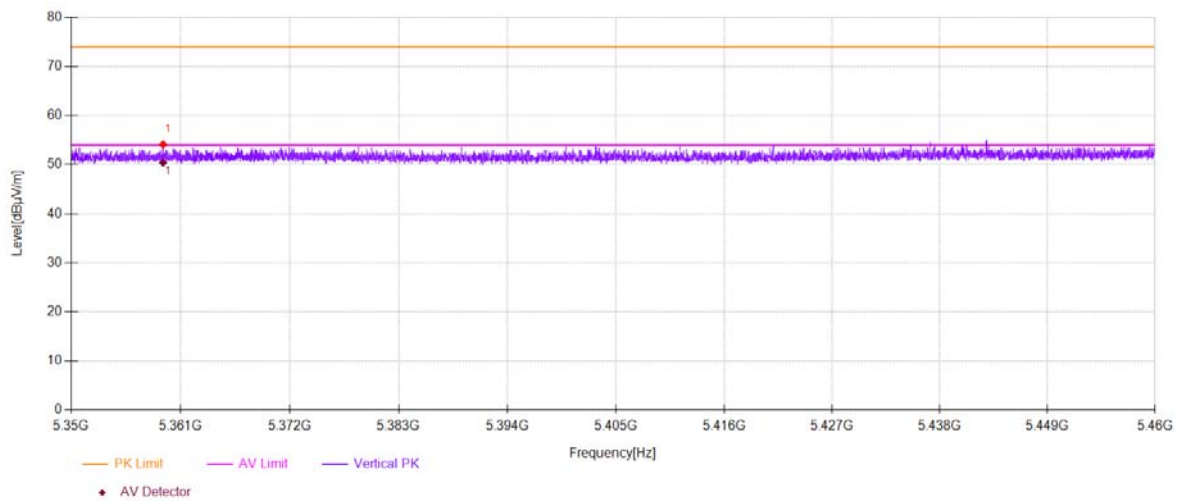
Test Model U-NII - 1
Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)
☐802.11a ☒802.11n(HT20) ☐802.11n(HT40)
☒5180 ☐5200 ☐5240 Ant.Pol V



U-NII - 1				
Test Model	Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz)			
	☐ 802.11a	☒ 802.11n(HT20)	☐ 802.11n(HT40)	
	☐ 5180	☐ 5200	☒ 5240	Ant.Pol H



U-NII - 1				
Test Model	Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz)			
	☐ 802.11a	☒ 802.11n(HT20)	☐ 802.11n(HT40)	
	☐ 5180	☐ 5200	☒ 5240	Ant.Pol V



■ ☒ For Undesirable radiated Spurious Emission in U-NII -3

All the modes 802.11a/n/ac/ax has been tested and the worst result 802.11n(HT20) 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(HT20)		Frequency(MHz):		5745	
Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Margin(dB)		
11570.7	V	60.25	-34.98	-27	7.98		
15440.2	V	62.99	-32.24	-27	5.24		
17498.2	V	66.80	-28.43	-27	1.43		
11375.1	H	59.86	-35.37	-27	8.37		
14615.3	H	62.34	-32.89	-27	5.89		
17515.2	H	65.74	-29.49	-27	2.49		

Test mode:		802.11n(HT20)		Frequency(MHz):		5785	
Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Margin(dB)		
10728.8	V	60.06	-35.17	-27	8.17		
14598.2	V	62.03	-33.2	-27	6.2		
17498.2	V	66.83	-28.4	-27	1.4		
11536.7	H	59.96	-35.27	-27	8.27		
15151.0	H	61.82	-33.41	-27	6.41		
17523.7	H	66.43	-28.8	-27	1.8		

Test mode:		802.11n(HT20)		Frequency(MHz):		5825	
Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Margin(dB)		
11579.2	V	59.83	-35.4	-27	8.4		
15448.7	V	61.98	-33.25	-27	6.25		
17498.2	V	66.68	-28.55	-27	1.55		
11519.7	H	59.75	-35.48	-27	8.48		
15465.7	H	62.82	-32.41	-27	5.41		
17506.7	H	66.18	-29.05	-27	2.05		

ANT2:

Test mode: 802.11n(HT20)		Frequency(MHz): 5745			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Margin(dB)	Detector
11570.7	V	60.25	74.00	13.75	peak
15440.2	V	62.99	74.00	11.01	peak
17498.2	V	66.80	74.00	7.20	peak
11570.78	V	46.12	54.00	7.88	AVG
15440.22	V	42.58	54.00	11.42	AVG
17498.24	V	45.10	54.00	8.90	AVG
11375.1	H	59.86	74.00	14.14	peak
14615.3	H	62.34	74.00	11.66	peak
17515.2	H	65.74	74.00	8.26	peak
11375.18	H	45.96	54.00	8.04	AVG
14615.30	H	45.48	54.00	8.52	AVG
17515.25	H	44.17	54.00	9.83	AVG

Test mode: 802.11n(HT20)		Frequency(MHz): 5785			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Margin(dB)	Detector
10728.8	V	60.06	74.00	13.94	peak
14598.2	V	62.03	74.00	11.97	peak
17498.2	V	66.83	74.00	7.17	peak
10728.86	V	47.04	54.00	6.96	AVG
14598.29	V	45.67	54.00	8.33	AVG
17498.24	V	45.10	54.00	8.90	AVG
11536.7	H	59.96	74.00	14.04	peak
15151.0	H	61.82	74.00	12.18	peak
17523.7	H	66.43	74.00	7.57	peak
11536.76	H	46.57	54.00	7.43	AVG
15151.07	H	43.56	54.00	10.44	AVG
17523.76	H	44.38	54.00	9.62	AVG

Test mode: 802.11n(HT20)		Frequency(MHz): 5825			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Margin(dB)	Detector
11579.2	V	59.83	74.00	14.17	peak
15448.7	V	61.98	74.00	12.02	peak
17498.2	V	66.68	74.00	7.32	peak
11579.28	V	46.35	54.00	7.65	AVG
15448.72	V	43.14	54.00	10.86	AVG
17498.24	V	46.10	54.00	7.90	AVG
11519.7	H	59.75	74.00	14.25	peak
15465.7	H	62.82	74.00	11.18	peak
17506.7	H	66.18	74.00	7.82	peak
11519.75	H	46.55	54.00	7.45	AVG
15465.73	H	43.42	54.00	10.58	AVG
17506.75	H	44.91	54.00	9.09	AVG

● ☒ Undesirable radiated Spurious Emission in band edge

Test mode: 802.11n(HT20) Frequency: 5745

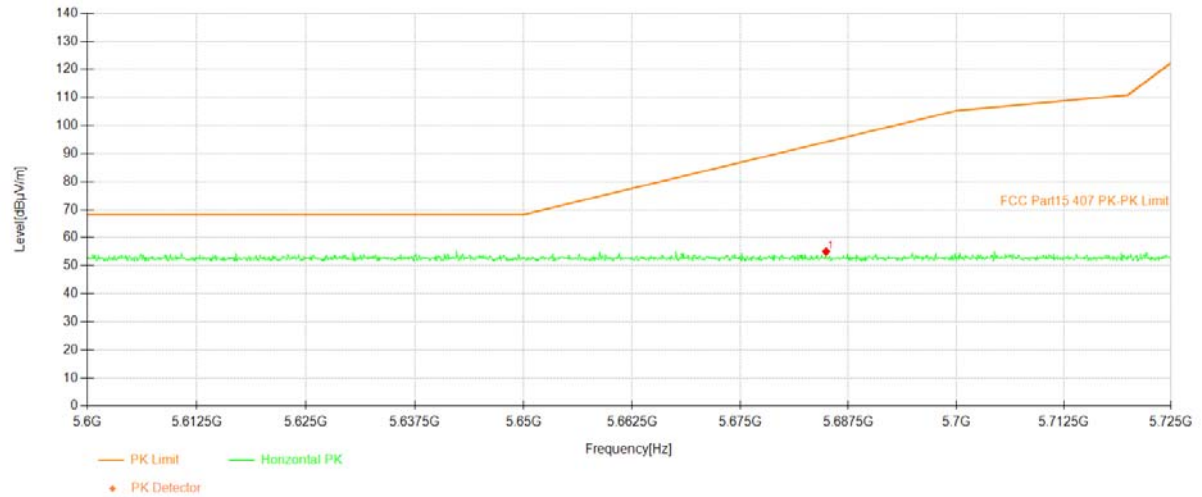
Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5684.91	H	55.05	-40.18	-27	PASS
5687.29	V	54.68	-40.55	-27	PASS

Test mode: 802.11n(HT20) Frequency: 5825

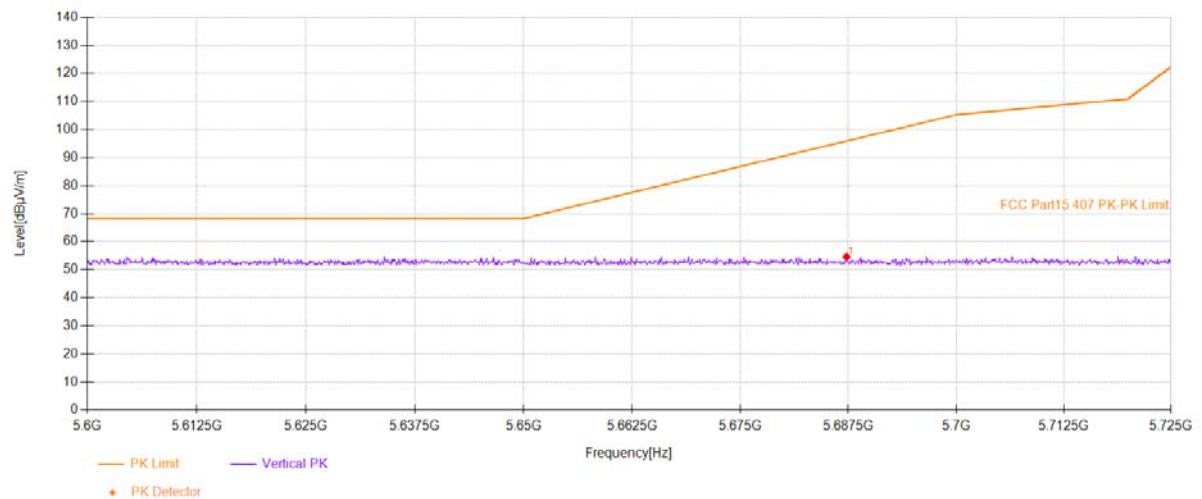
Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5883.20	H	55.10	-40.13	-27	PASS
5883.32	V	55.05	-40.18	-27	PASS

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

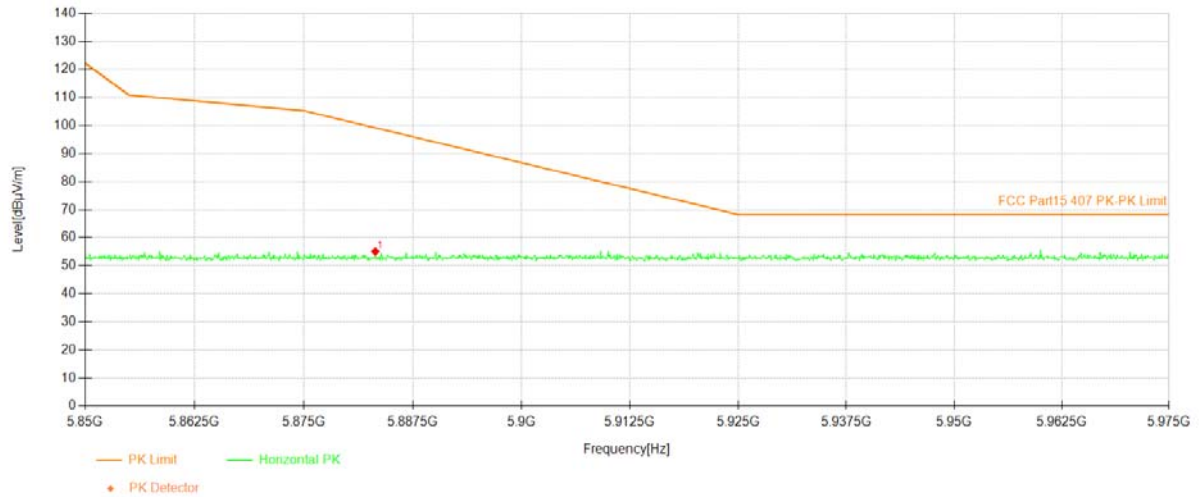
Test Model U-NII -3
Undesirable radiated ☐802.11a Undesirable radiated ☒5745 Spurious Emission in Band Edge ☐802.11n(HT40)
Ant.Pol H



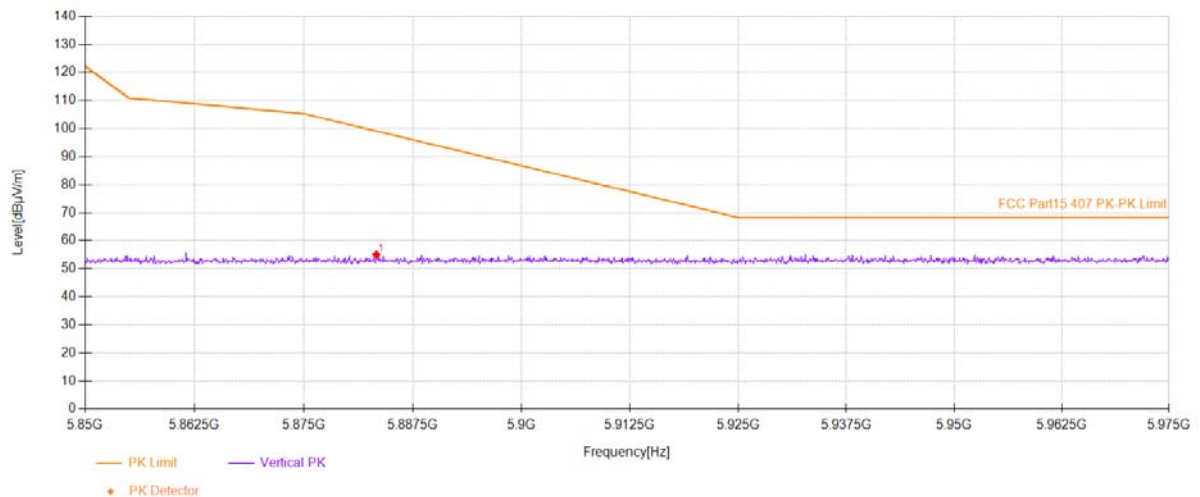
Test Model U-NII -3
Undesirable radiated ☐802.11a Undesirable radiated ☒5745 Spurious Emission in Band Edge ☐802.11n(HT40)
Ant.Pol V



Test Model U-NII -3
Undesirable radiated Undesirable radiated Spurious Emission in Band Edge
☐802.11a ☒802.11n(HT20) ☐802.11n(HT40)
☒5825 Ant.Pol H

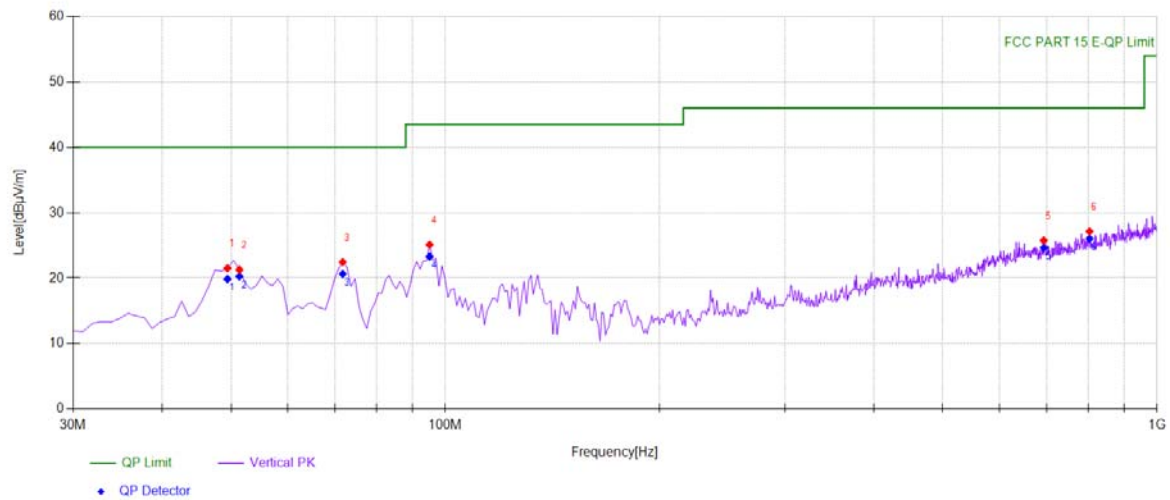


Test Model U-NII -3
Undesirable radiated Undesirable radiated Spurious Emission in Band Edge
☐802.11a ☒802.11n(HT20) ☐802.11n(HT40)
☒5825 Ant.Pol V

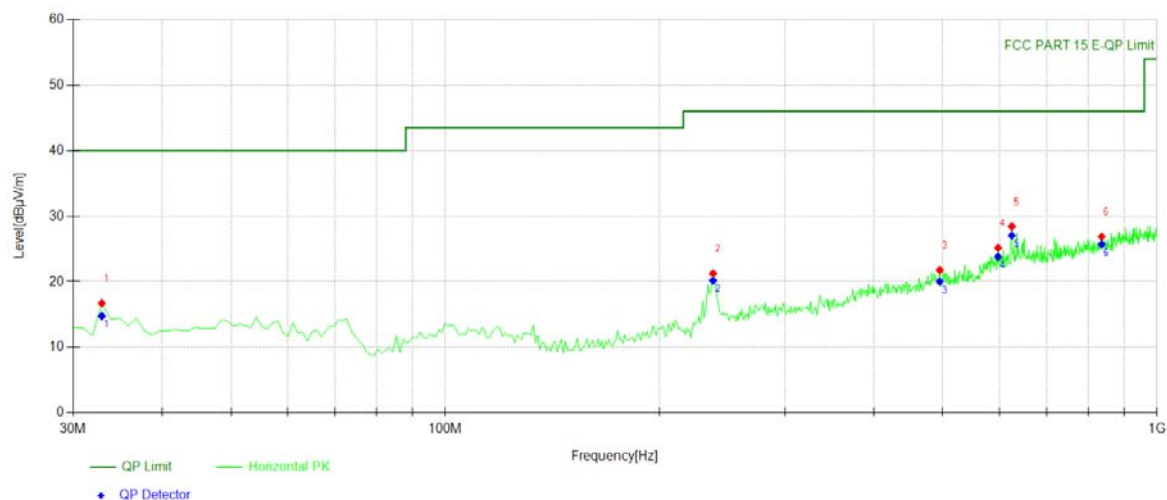


- Undesirable radiated Spurious Emission below 1GHz (30MHz to 1GHz)
All modes have been tested, and the worst result recorded was report as below:

Test mode: 802.11n(HT20) Frequency(MHz): 5180



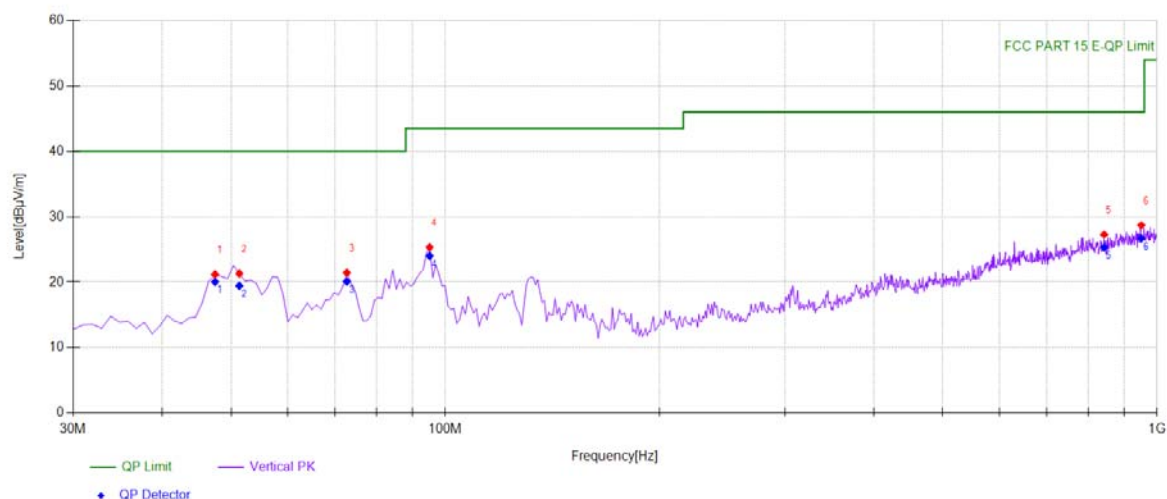
Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	49.4194	38.76	-17.25	21.51	PK	40.00	18.49	Vertical
2	51.3614	38.69	-17.39	21.30	PK	40.00	18.70	Vertical
3	71.7518	42.69	-20.23	22.46	PK	40.00	17.54	Vertical
4	95.0551	43.10	-17.97	25.13	PK	43.50	18.37	Vertical
5	693.173	31.76	-6.00	25.76	PK	46.00	20.24	Vertical
6	803.863	31.54	-4.39	27.15	PK	46.00	18.85	Vertical



Suspected Data List

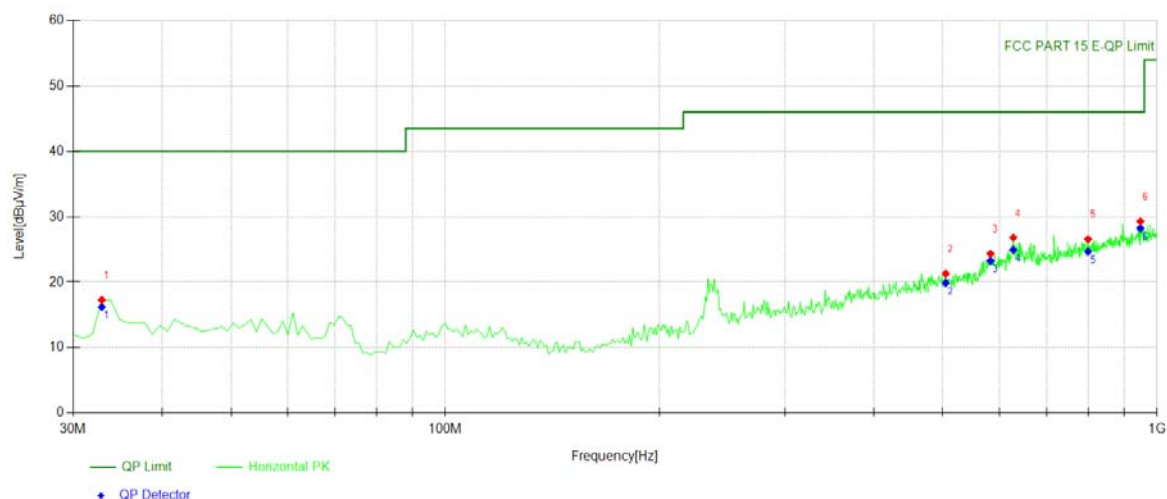
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	32.9129	35.07	-18.35	16.72	PK	40.00	23.28	Horizontal
2	237.787	36.67	-15.40	21.27	PK	46.00	24.73	Horizontal
3	495.095	31.54	-9.78	21.76	PK	46.00	24.24	Horizontal
4	598.018	32.32	-7.14	25.18	PK	46.00	20.82	Horizontal
5	625.205	35.35	-6.92	28.43	PK	46.00	17.57	Horizontal
6	835.905	30.85	-3.96	26.89	PK	46.00	19.11	Horizontal

Test mode: 802.11n(HT20) Frequency(MHz): 5200



Suspected Data List

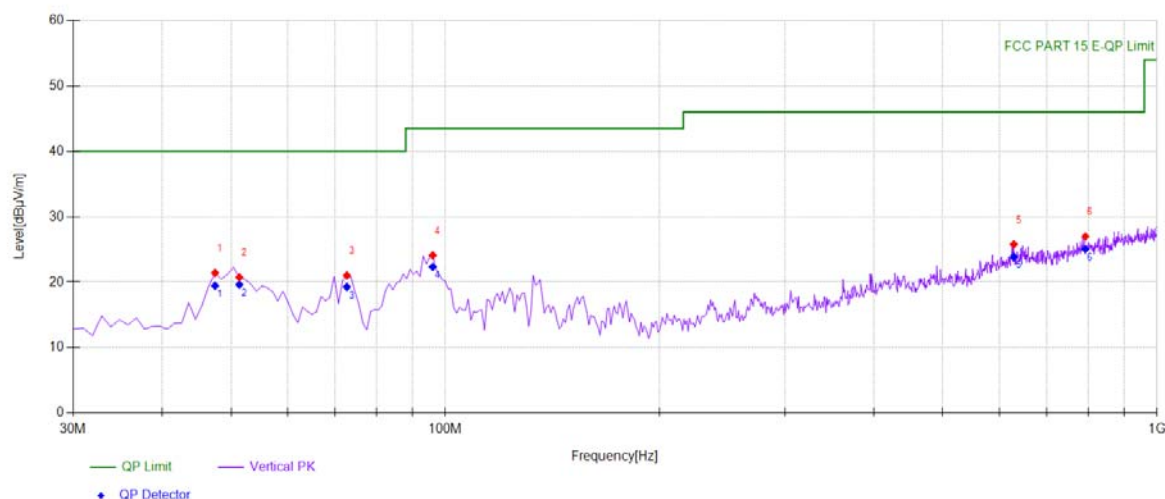
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	47.4775	38.59	-17.39	21.20	PK	40.00	18.80	Vertical
2	51.3614	38.72	-17.39	21.33	PK	40.00	18.67	Vertical
3	72.7227	41.81	-20.38	21.43	PK	40.00	18.57	Vertical
4	95.0551	43.31	-17.97	25.34	PK	43.50	18.16	Vertical
5	842.702	31.13	-3.84	27.29	PK	46.00	18.71	Vertical
6	950.480	31.02	-2.33	28.69	PK	46.00	17.31	Vertical



Suspected Data List

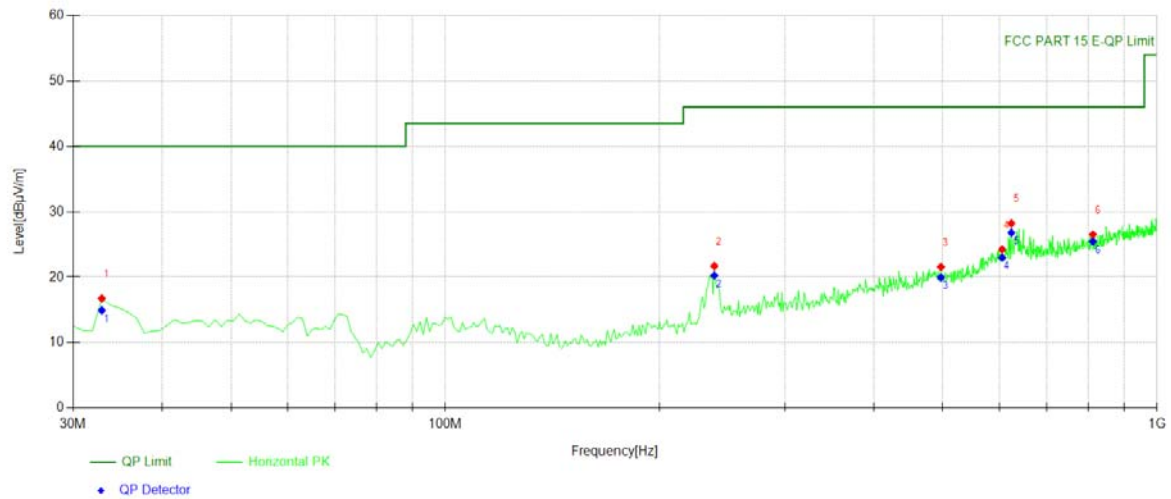
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	32.9129	35.62	-18.35	17.27	PK	40.00	22.73	Horizontal
2	504.804	31.07	-9.77	21.30	PK	46.00	24.70	Horizontal
3	583.453	31.48	-7.14	24.34	PK	46.00	21.66	Horizontal
4	628.118	33.62	-6.81	26.81	PK	46.00	19.19	Horizontal
5	799.98	30.98	-4.42	26.56	PK	46.00	19.44	Horizontal
6	947.567	31.64	-2.36	29.28	PK	46.00	16.72	Horizontal

Test mode: 802.11n(HT20) Frequency(MHz): 5240



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	47.4775	38.80	-17.39	21.41	PK	40.00	18.59	Vertical
2	51.3614	38.13	-17.39	20.74	PK	40.00	19.26	Vertical
3	72.7227	41.40	-20.38	21.02	PK	40.00	18.98	Vertical
4	96.026	41.82	-17.73	24.09	PK	43.50	19.41	Vertical
5	629.089	32.55	-6.77	25.78	PK	46.00	20.22	Vertical
6	793.183	31.48	-4.49	26.99	PK	46.00	19.01	Vertical



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	32.9129	35.09	-18.35	16.74	PK	40.00	23.26	Horizontal
2	238.758	37.01	-15.31	21.70	PK	46.00	24.30	Horizontal
3	497.037	31.33	-9.77	21.56	PK	46.00	24.44	Horizontal
4	605.785	31.34	-7.11	24.23	PK	46.00	21.77	Horizontal
5	624.234	35.16	-6.95	28.21	PK	46.00	17.79	Horizontal
6	812.602	30.86	-4.33	26.53	PK	46.00	19.47	Horizontal

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.

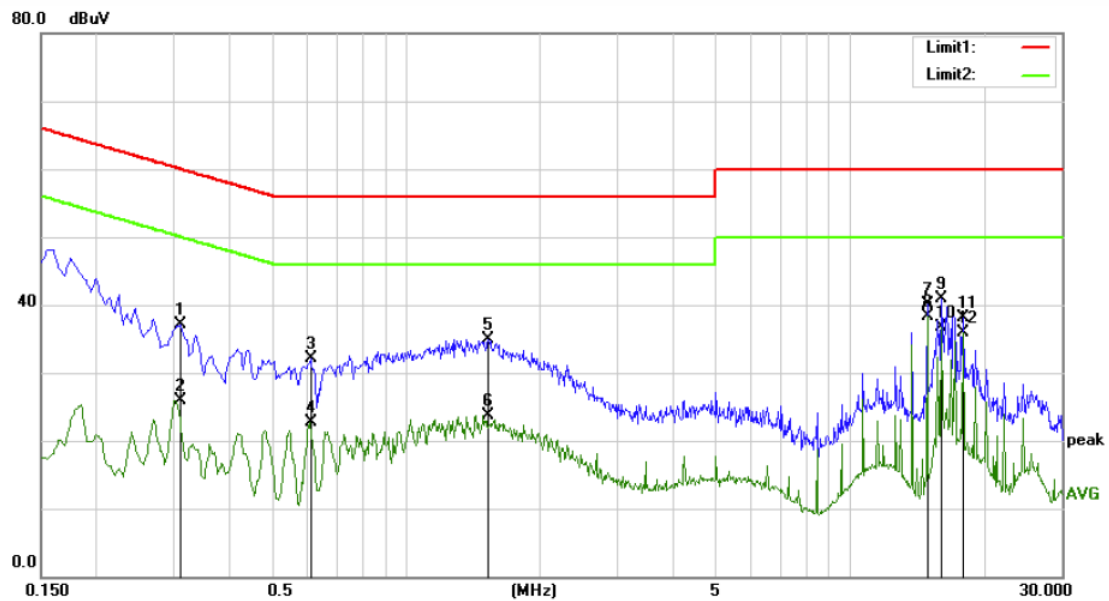
Maximum procedure was performed on the highest emissions to ensure EUT compliance.

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 #1

Phase: **L1**

Temperature: 21.9

Limit: (CE)FCC PART 15 CLASS B_QP

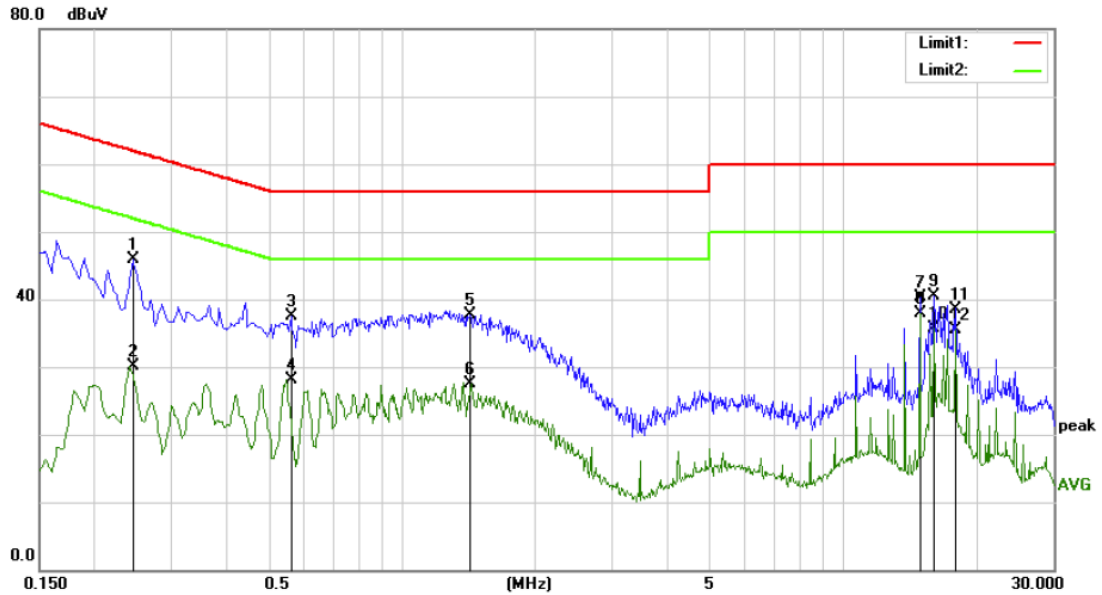
Power: AC 120V/60Hz

Humidity: 58 %

Mode: WIFI mode

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.3100	27.02	10.00	37.02	59.97	-22.95	QP	
2		0.3100	15.85	10.00	25.85	49.97	-24.12	AVG	
3		0.6100	22.18	9.87	32.05	56.00	-23.95	QP	
4		0.6100	12.89	9.87	22.76	46.00	-23.24	AVG	
5		1.5350	24.97	9.86	34.83	56.00	-21.17	QP	
6		1.5350	13.86	9.86	23.72	46.00	-22.28	AVG	
7		14.9550	30.19	9.91	40.10	60.00	-19.90	QP	
8	*	14.9550	28.43	9.91	38.34	50.00	-11.66	AVG	
9		16.1050	31.00	9.99	40.99	60.00	-19.01	QP	
10		16.1050	26.65	9.99	36.64	50.00	-13.36	AVG	
11		18.0300	28.03	10.14	38.17	60.00	-21.83	QP	
12		18.0300	25.81	10.14	35.95	50.00	-14.05	AVG	



Site Conduction #1

Phase: **N**

Temperature: 21.9

Limit: (CE)FCC PART 15 CLASS B_QP

Power: AC 120V/60Hz

Humidity: 58 %

Mode: WIFI mode

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2450	35.82	10.01	45.83	61.92	-16.09	QP	
2		0.2450	20.05	10.01	30.06	51.92	-21.86	AVG	
3		0.5600	27.66	9.86	37.52	56.00	-18.48	QP	
4		0.5600	18.30	9.86	28.16	46.00	-17.84	AVG	
5		1.4300	27.88	9.87	37.75	56.00	-18.25	QP	
6		1.4300	17.70	9.87	27.57	46.00	-18.43	AVG	
7		14.9550	30.37	9.91	40.28	60.00	-19.72	QP	
8	*	14.9550	28.04	9.91	37.95	50.00	-12.05	AVG	
9		16.1050	30.53	9.99	40.52	60.00	-19.48	QP	
10		16.1050	25.68	9.99	35.67	50.00	-14.33	AVG	
11		18.0300	28.46	10.14	38.60	60.00	-21.40	QP	
12		18.0300	25.37	10.14	35.51	50.00	-14.49	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 use FPC Antenna, the antenna gain as below:

ANT1: 3.3dBi, ANT2: 3.4dBi

- ☐ 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 ---