

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 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

Pass

Temperature :	25°C	ATM Pressure:	1011 mbar
Humidity :	45 %	Test Engineer:	CZF

All of the configurations or modes are tested, the data of the worst case is recorded as below.

☒ For Undesirable radiated Spurious Emission in U-NII – 1

☒ Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)

All of the configurations or modes are tested, the data of the worst case is recorded in the report.

Highest gain of each antenna and highest output power is ANT2 and MIMO as below:

Test mode: 802.11a Frequency(MHz): 5180

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
7096.35	V	53.83	-41.4	-27	14.4
9912.52	V	59.25	-35.98	-27	8.98
12574.6	V	61.43	-33.8	-27	6.8
6906.34	H	53.67	-41.56	-27	14.56
8678.45	H	55.84	-39.39	-27	12.39
12531.6	H	60.56	-34.67	-27	7.67

Test mode: 802.11a Frequency(MHz): 5200

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
8421.43	V	56.11	-39.12	-27	12.12
9925.52	V	59.30	-35.93	-27	8.93
12578.6	V	62.39	-32.84	-27	5.84
8712.45	H	56.02	-39.21	-27	12.21
9967.52	H	59.06	-36.17	-27	9.17
12563.6	H	60.45	-34.78	-27	7.78

Test mode: 802.11a Frequency(MHz): 5240

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
8421.43	V	55.77	-39.46	-27	12.46
9989.52	V	59.91	-35.32	-27	8.32
12582.6	V	61.27	-33.96	-27	6.96
8674.45	H	56.11	-39.12	-27	12.12
9911.52	H	59.86	-35.37	-27	8.37
12568.6	H	60.46	-34.77	-27	7.77

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

Test mode: 802.11a		Frequency(MHz): 5180			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7096.35	V	53.83	74.00	20.17	peak
9912.52	V	59.25	74.00	14.75	peak
12574.6	V	61.43	74.00	12.57	peak
7096.35	V	39.58	54.00	14.42	AVG
9912.52	V	41.92	54.00	12.08	AVG
12574.6	V	45.51	54.00	8.49	AVG
6906.34	H	53.67	74.00	20.33	peak
8678.45	H	55.84	74.00	18.16	peak
12531.6	H	60.56	74.00	13.44	peak
6906.34	H	39.12	54.00	14.88	AVG
8678.45	H	37.98	54.00	16.02	AVG
12531.6	H	44.71	54.00	9.29	AVG

Test mode: 802.11a		Frequency(MHz): 5200			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
8421.43	V	56.11	74.00	17.89	peak
9925.52	V	59.30	74.00	14.70	peak
12578.6	V	62.39	74.00	11.61	peak
8421.43	V	40.49	54.00	13.51	AVG
9925.52	V	41.53	54.00	12.47	AVG
12578.6	V	45.80	54.00	8.20	AVG
8712.45	H	56.02	74.00	17.98	peak
9967.52	H	59.06	74.00	14.94	peak
12563.6	H	60.45	74.00	13.55	peak
8712.45	H	42.72	54.00	11.28	AVG
9967.52	H	41.71	54.00	12.29	AVG
12563.6	H	46.16	54.00	7.84	AVG

Test mode: 802.11a		Frequency(MHz): 5240			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
8421.43	V	55.77	74.00	18.23	peak
9989.52	V	59.91	74.00	14.09	peak
12582.6	V	61.27	74.00	12.73	peak
8421.43	V	40.78	54.00	13.22	AVG
9989.52	V	41.86	54.00	12.14	AVG
12582.6	V	45.75	54.00	8.25	AVG
8674.45	H	56.11	74.00	17.89	peak
9911.52	H	59.86	74.00	14.14	peak
12568.6	H	60.46	74.00	13.54	peak
8674.45	H	42.31	54.00	11.69	AVG
9911.52	H	41.19	54.00	12.81	AVG
12568.6	H	45.64	54.00	8.36	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: 802.11ac(20) Frequency(MHz): 5180

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5149.43	H	53.28	-41.95	-27	Pass
5144.06	V	52.62	-42.61	-27	Pass

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

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5351.70	H	52.01	-43.22	-27	Pass
5351.54	V	52.24	-42.99	-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: 802.11ac(20) Frequency(MHz): 5180

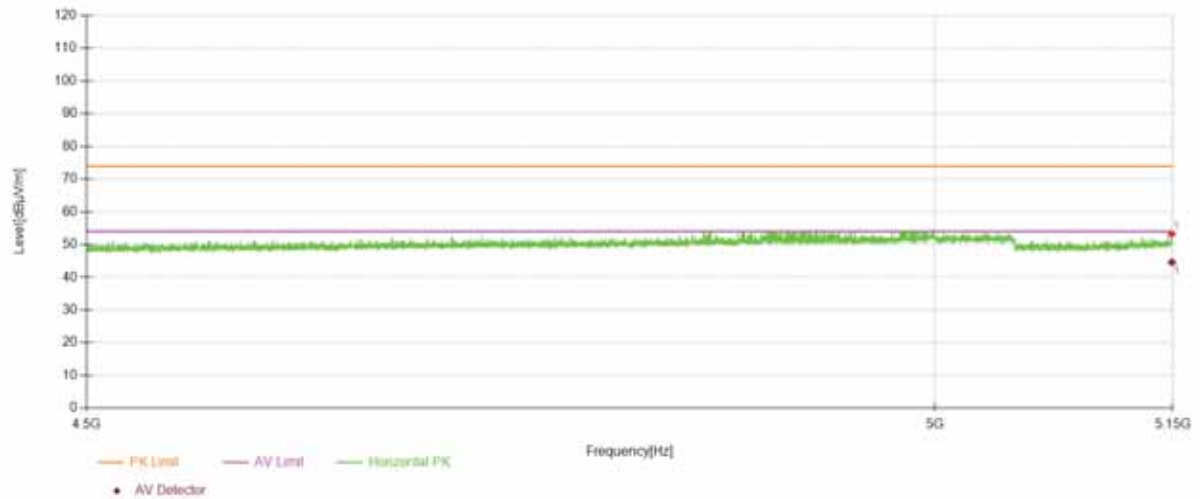
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5144.06	V	52.62	74.00	21.38	peak
5144.06	V	45.01	54.00	8.99	AVG
5149.43	H	53.28	74.00	20.72	peak
5149.43	H	44.62	54.00	9.38	AVG

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

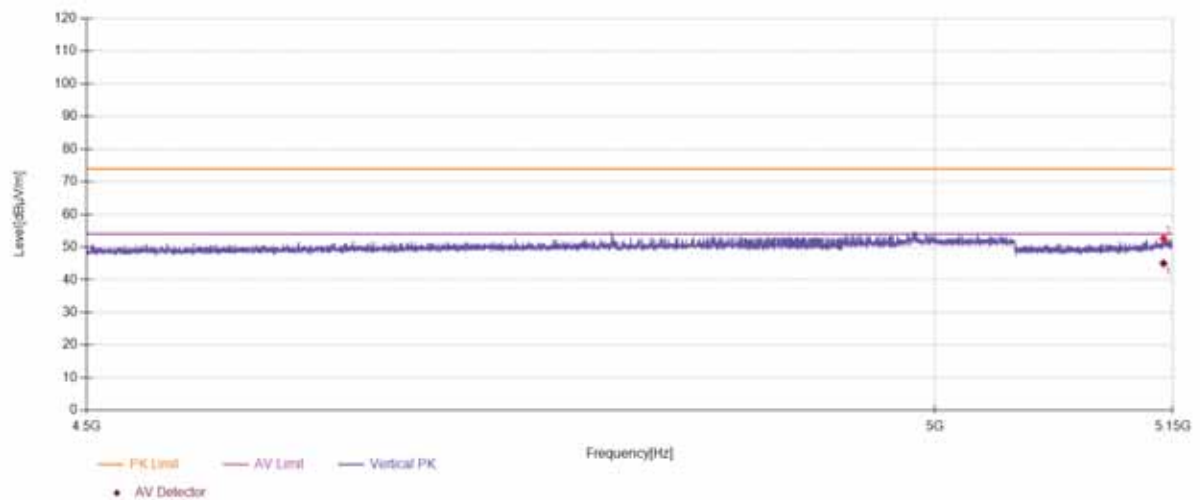
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5351.54	V	52.24	74.00	21.76	peak
5351.54	V	45.25	54.00	8.75	AVG
5351.70	H	52.01	74.00	21.99	peak
5351.70	H	45.47	54.00	8.53	AVG

- 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.

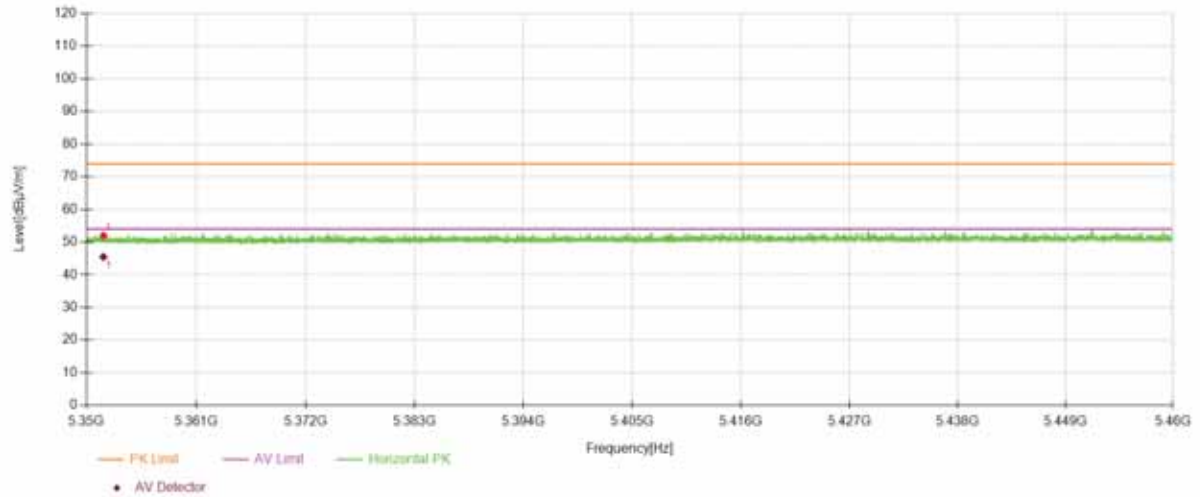
U-NII - 1				
Test Model	Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)			
	☐ 802.11a	☒ 802.11ac(HT20)	☐ 802.11n(HT40)	
	☒ 5180	☐ 5200	☐ 5240	Ant.Pol H



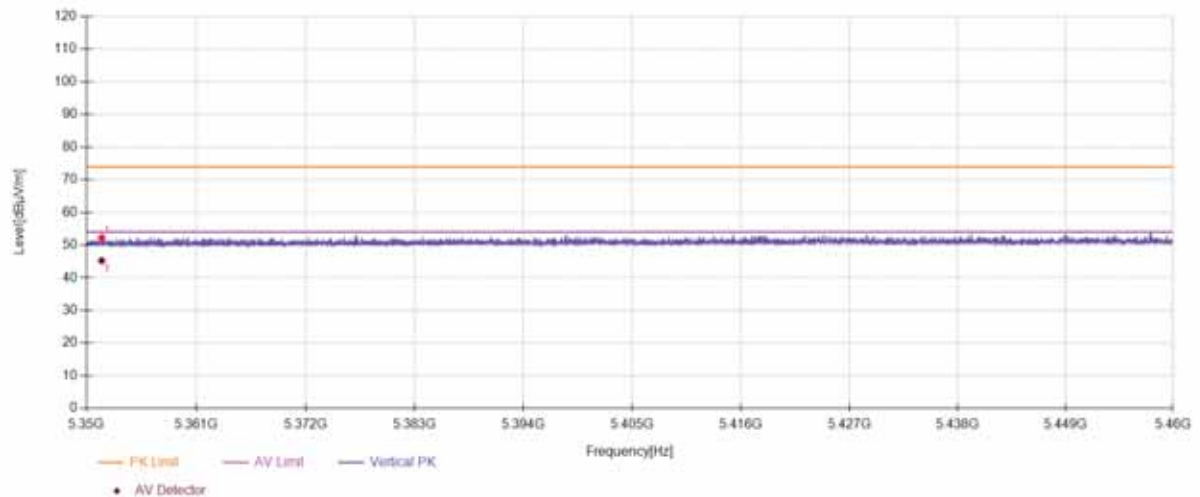
U-NII - 1				
Test Model	Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)			
	☐ 802.11a	☒ 802.11ac(HT20)	☐ 802.11n(HT40)	
	☒ 5180	☐ 5200	☐ 5240	Ant.Pol V



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



☒ For Undesirable radiated Spurious Emission in U-NII -2A

☒ Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)

All of the configurations or modes are tested, the data of the worst case is recorded in the report.

Highest gain of each antenna and highest output power is ANT2 and MIMO as below:

Test mode: 802.11a Frequency(MHz): 5260

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
7322.37	V	55.71	-39.52	-27	12.52
9910.52	V	59.47	-35.76	-27	8.76
12575.6	V	61.25	-33.98	-27	6.98
5719.27	H	50.22	-45.01	-27	18.01
8689.45	H	56.94	-38.29	-27	11.29
12528.6	H	61.59	-33.64	-27	6.64

Test mode: 802.11a Frequency(MHz): 5280

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
7479.38	V	54.06	-41.17	-27	14.17
9986.52	V	59.39	-35.84	-27	8.84
12589.6	V	61.05	-34.18	-27	7.18
8121.41	H	55.22	-40.01	-27	13.01
9980.52	H	59.48	-35.75	-27	8.75
12572.6	H	60.90	-34.33	-27	7.33

Test mode: 802.11a Frequency(MHz): 5320

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
6994.35	V	53.80	-41.43	-27	14.43
7988.41	V	57.04	-38.19	-27	11.19
12563.6	V	61.68	-33.55	-27	6.55
7002.35	H	54.33	-40.9	-27	13.9
9279.48	H	56.96	-38.27	-27	11.27
12538.6	H	60.71	-34.52	-27	7.52

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

Test mode: 802.11a		Frequency(MHz): 5260			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7322.37	V	55.71	74.00	18.29	peak
9910.52	V	59.47	74.00	14.53	peak
12575.6	V	61.25	74.00	12.75	peak
7322.37	V	39.53	54.00	14.47	AVG
9910.52	V	41.01	54.00	12.99	AVG
12575.6	V	46.25	54.00	7.75	AVG
5719.27	H	50.22	74.00	23.78	peak
8689.45	H	56.94	74.00	17.06	peak
12528.6	H	61.59	74.00	12.41	peak
5719.27	H	36.38	54.00	17.62	AVG
8689.45	H	38.31	54.00	15.69	AVG
12528.6	H	44.75	54.00	9.25	AVG

Test mode: 802.11a		Frequency(MHz): 5280			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7479.38	V	54.06	74.00	19.94	peak
9986.52	V	59.39	74.00	14.61	peak
12589.6	V	61.05	74.00	12.95	peak
7479.38	V	39.84	54.00	14.16	AVG
9986.52	V	41.80	54.00	12.20	AVG
12589.6	V	46.12	54.00	7.88	AVG
8121.41	H	55.22	74.00	18.78	peak
9980.52	H	59.48	74.00	14.52	peak
12572.6	H	60.90	74.00	13.10	peak
8121.41	H	40.69	54.00	13.31	AVG
9980.52	H	41.88	54.00	12.12	AVG
12572.6	H	45.44	54.00	8.56	AVG

Test mode: 802.11a		Frequency(MHz): 5320			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
6994.35	V	53.80	74.00	20.20	peak
7988.41	V	57.04	74.00	16.96	peak
12563.6	V	61.68	74.00	12.32	peak
6994.35	V	39.89	54.00	14.11	AVG
7988.41	V	35.75	54.00	18.25	AVG
12563.6	V	45.74	54.00	8.26	AVG
7002.35	H	54.33	74.00	19.67	peak
9279.48	H	56.96	74.00	17.04	peak
12538.6	H	60.71	74.00	13.29	peak
7002.35	H	40.29	54.00	13.71	AVG
9279.48	H	39.03	54.00	14.97	AVG
12538.6	H	45.02	54.00	8.98	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: 802.11ac(20) Frequency(MHz): 5260

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5148.05	H	52.73	-42.5	-27	Pass
5148.21	V	52.37	-42.86	-27	Pass

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

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5350.33	H	59.64	-35.59	-27	Pass
5351.07	V	57.85	-37.38	-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: 802.11ac(20) Frequency(MHz): 5260

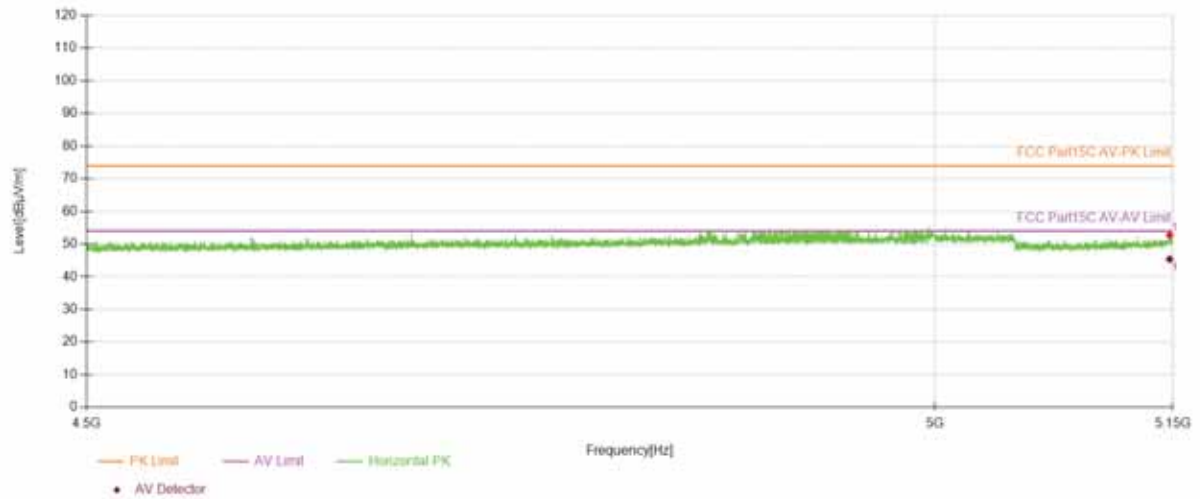
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5148.21	V	52.37	74.00	21.63	peak
5148.21	V	44.92	54.00	9.08	AVG
5148.05	H	52.73	74.00	21.27	peak
5148.05	H	45.39	54.00	8.61	AVG

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

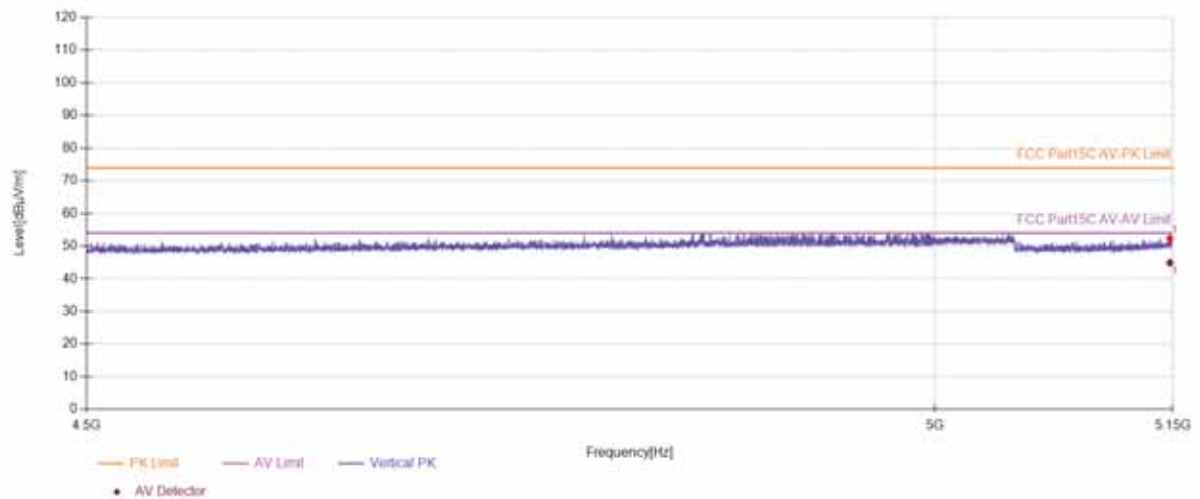
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5351.07	V	57.85	74.00	16.15	peak
5351.07	V	44.86	54.00	9.14	AVG
5350.33	H	59.64	74.00	14.36	peak
5350.33	H	44.92	54.00	9.08	AVG

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.

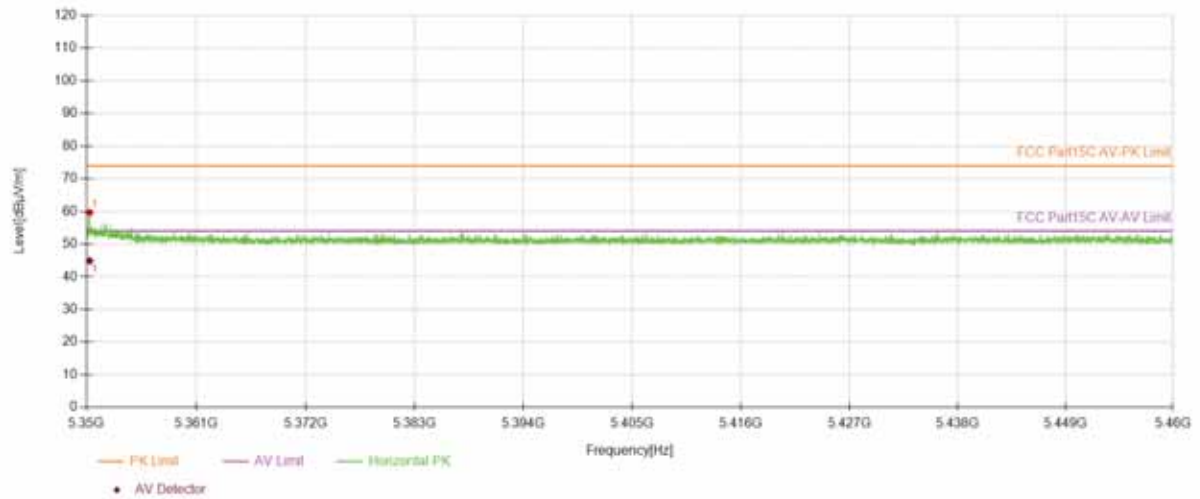
U-NII -2A				
Test Model	Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)			
	☐ 802.11a	☐ 802.11n(HT20)	☒ 802.11 ac (VHT20)	
	☒ 5260	☐ 5300	☐ 5320	Ant.Pol H



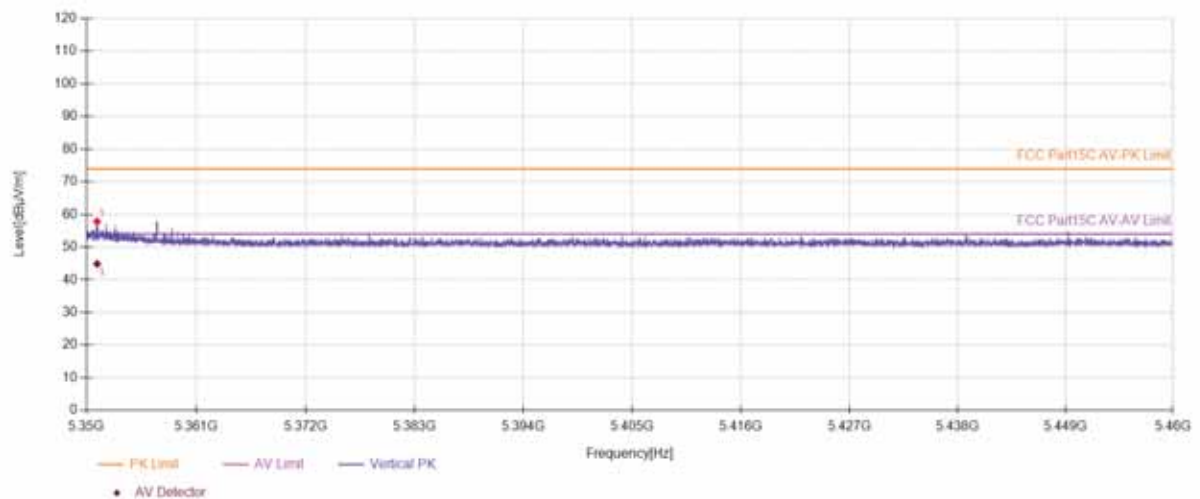
U-NII -2A				
Test Model	Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)			
	☐ 802.11a	☐ 802.11n(HT20)	☒ 802.11 ac(VHT20)	
	☒ 5260	☐ 5300	☐ 5320	Ant.Pol V



U-NII -2A				
Test Model	Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz)			
	☐ 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 (5350-5400MHz)			
	☐ 802.11a	☐ 802.11n(HT20)	☒ 802.11 ac (VHT20)	
	☐ 5260	☐ 5300	☒ 5320	Ant.Pol V



- ☒ For Undesirable radiated Spurious Emission in U-NII -2C
☒ Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)

All of the configurations or modes are tested, the data of the worst case is recorded in the report.
Highest gain of each antenna and highest output power is ANT2 and MIMO as below:

Test mode: 802.11a Frequency(MHz): 5500

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
7418.37	V	54.30	-40.93	-27	13.93
9994.52	V	59.60	-35.63	-27	8.63
12687.6	V	60.91	-34.32	-27	7.32
8012.41	H	56.46	-38.77	-27	11.77
9933.52	H	59.41	-35.82	-27	8.82
12729.6	H	60.40	-34.83	-27	7.83

Test mode: 802.11a Frequency(MHz): 5580

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
8455.43	V	55.60	-39.63	-27	12.63
9946.52	V	59.04	-36.19	-27	9.19
12566.6	V	59.97	-35.26	-27	8.26
7491.38	H	53.57	-41.66	-27	14.66
8699.45	H	56.87	-38.36	-27	11.36
12572.6	H	60.41	-34.82	-27	7.82

Test mode: 802.11a Frequency(MHz): 5700

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
8013.41	V	55.59	-39.64	-27	12.64
9932.52	V	59.35	-35.88	-27	8.88
12573.6	V	61.32	-33.91	-27	6.91
7775.39	H	54.57	-40.66	-27	13.66
9961.52	H	59.28	-35.95	-27	8.95
12597.6	H	60.74	-34.49	-27	7.49

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

Test mode: 802.11a		Frequency(MHz): 5500			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7418.37	V	54.30	74.00	19.70	peak
9994.52	V	59.60	74.00	14.40	peak
12687.6	V	60.91	74.00	13.09	peak
7418.37	V	39.41	54.00	14.59	AVG
9994.52	V	41.69	54.00	12.31	AVG
12687.6	V	44.80	54.00	9.20	AVG
8012.41	H	56.46	74.00	17.54	peak
9933.52	H	59.41	74.00	14.59	peak
12729.6	H	60.40	74.00	13.60	peak
8012.41	H	39.81	54.00	14.19	AVG
9933.52	H	41.31	54.00	12.69	AVG
12729.6	H	45.70	54.00	8.30	AVG

Test mode: 802.11a		Frequency(MHz): 5580			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
8455.43	V	55.60	74.00	18.40	peak
9946.52	V	59.04	74.00	14.96	peak
12566.6	V	59.97	74.00	14.03	peak
8455.43	V	40.26	54.00	13.74	AVG
9946.52	V	41.61	54.00	12.39	AVG
12566.6	V	46.09	54.00	7.91	AVG
7491.38	H	53.57	74.00	20.43	peak
8699.45	H	56.87	74.00	17.13	peak
12572.6	H	60.41	74.00	13.59	peak
7491.38	H	40.46	54.00	13.54	AVG
8699.45	H	38.83	54.00	15.17	AVG
12572.6	H	46.09	54.00	7.91	AVG

Test mode: 802.11a		Frequency(MHz): 5700			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
8013.41	V	55.59	74.00	18.41	peak
9932.52	V	59.35	74.00	14.65	peak
12573.6	V	61.32	74.00	12.68	peak
8013.41	V	39.91	54.00	14.09	AVG
9932.52	V	41.57	54.00	12.43	AVG
12573.6	V	45.99	54.00	8.01	AVG
7775.39	H	54.57	74.00	19.43	peak
9961.52	H	59.28	74.00	14.72	peak
12597.6	H	60.74	74.00	13.26	peak
7775.39	H	39.72	54.00	14.28	AVG
9961.52	H	41.43	54.00	12.57	AVG
12597.6	H	45.85	54.00	8.15	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: 802.11ac(20) Frequency(MHz): 5500

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5469.91	H	58.74	-36.49	-27	Pass
5469.97	V	55.71	-39.52	-27	Pass

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

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5725.43	H	58.99	-36.24	-27	Pass
5725.18	V	58.80	-36.43	-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: 802.11ac(20) Frequency(MHz): 5500

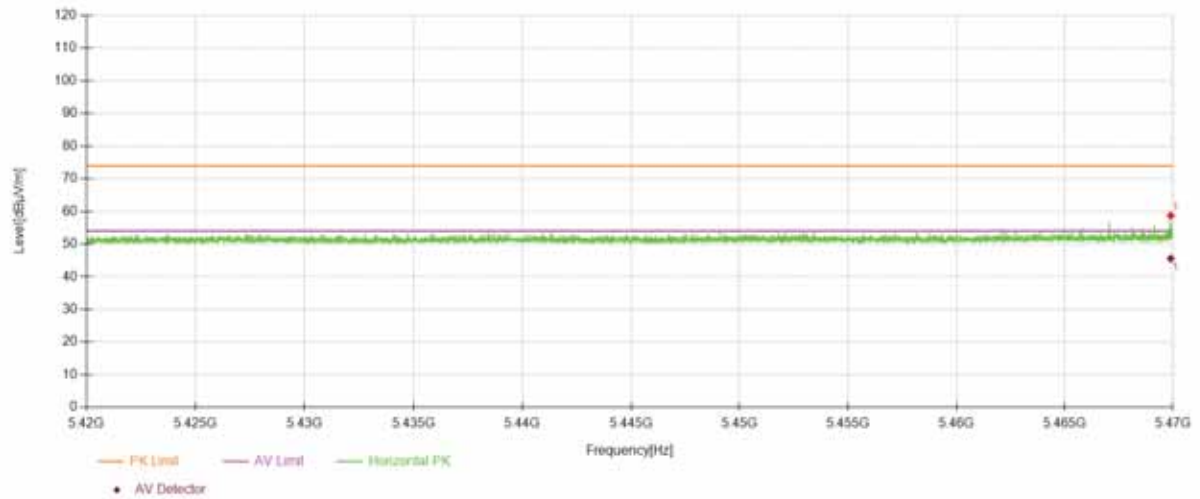
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5469.97	V	55.71	74.00	18.29	peak
5469.97	V	46.12	54.00	7.88	AVG
5469.91	H	58.74	74.00	15.26	peak
5469.91	H	45.57	54.00	8.43	AVG

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

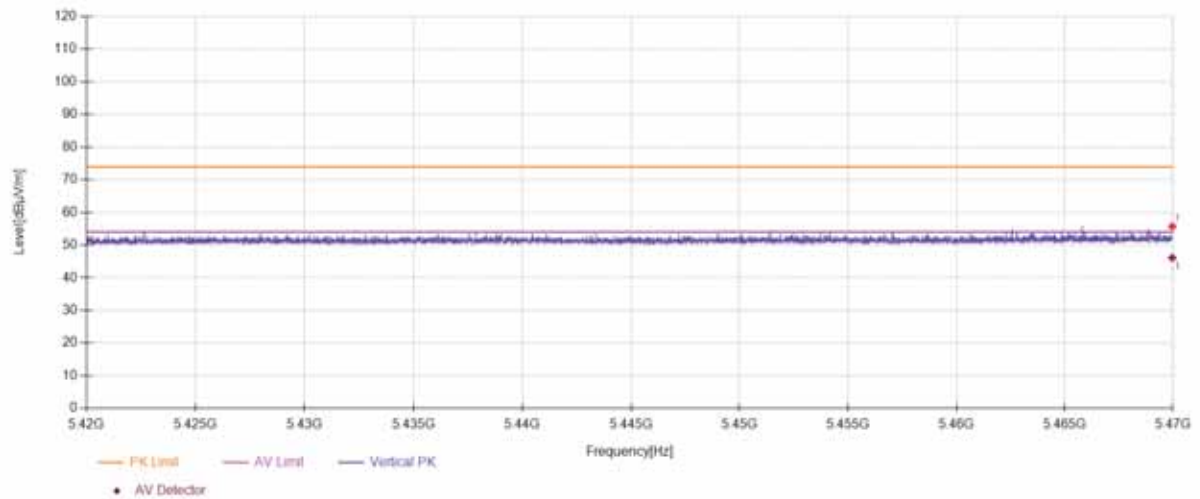
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5725.18	V	58.80	74.00	15.20	peak
5725.18	V	46.67	54.00	7.33	AVG
5725.43	H	58.99	74.00	15.01	peak
5725.43	H	46.43	54.00	7.57	AVG

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.

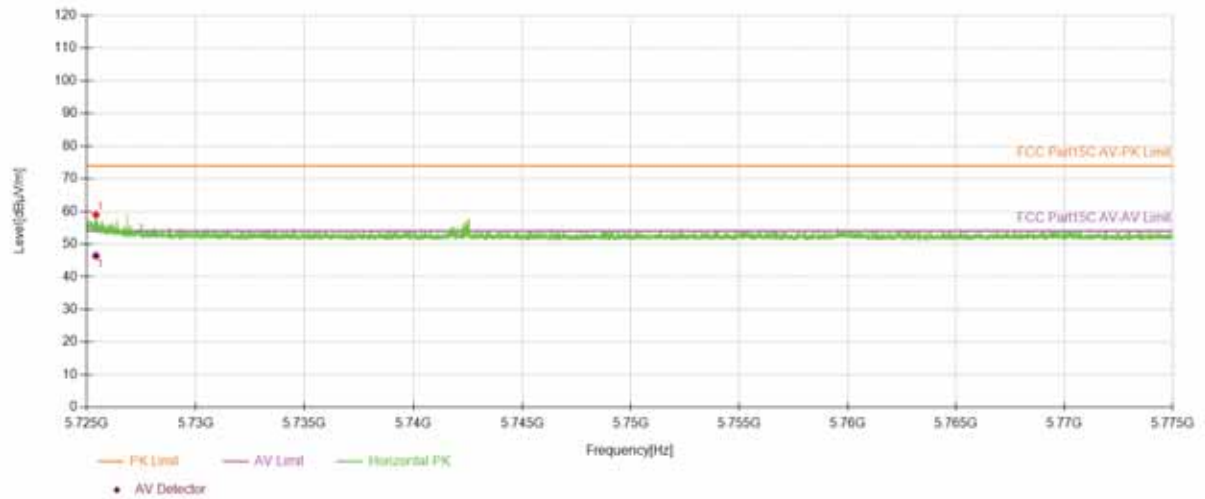
U-NII -2C			
Test Model	Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)		
	☐ 802.11a	☐ 802.11n(HT20)	☒ 802.11 ac(VHT20)
	☒ 5500	☐ 5580	☐ 5700
	Ant.Pol		H



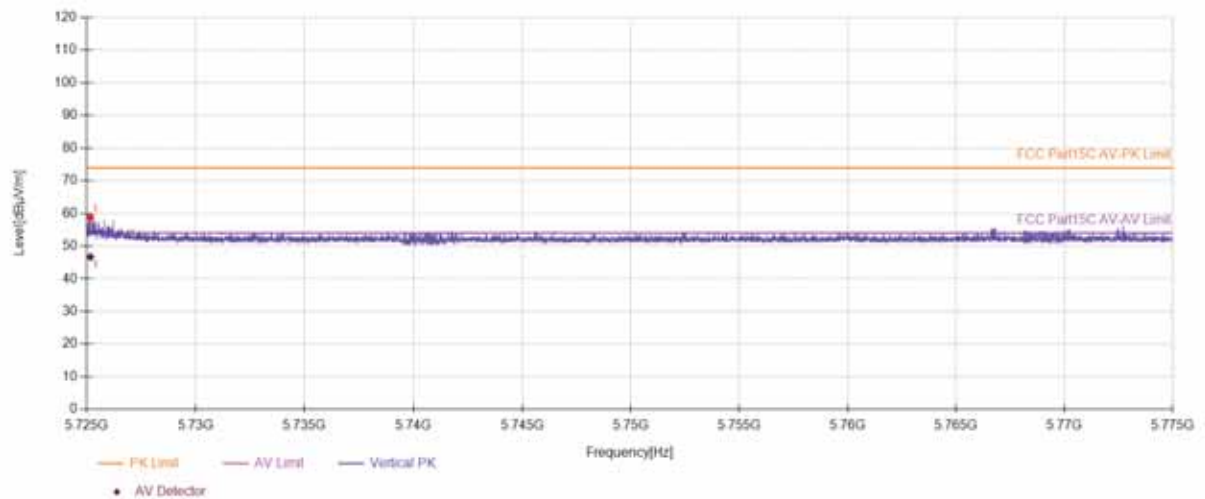
U-NII -2C			
Test Model	Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)		
	☐ 802.11a	☐ 802.11n(HT20)	☒ 802.11 ac(VHT20)
	☒ 5500	☐ 5580	☐ 5700
	Ant.Pol		V



U-NII -2C			
Test Model	Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz)		
	☐ 802.11a	☐ 802.11n(HT20)	☒ 802.11 ac(VHT20)
	☐ 5500	☐ 5580	☒ 5700
			Ant.Pol H



U-NII -2C			
Test Model	Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz)		
	☐ 802.11a	☐ 802.11n(HT20)	☒ 802.11 ac (VHT20)
	☐ 5500	☐ 5580	☒ 5700
			Ant.Pol V



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

☒ **Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)**

All of the configurations or modes are tested, the data of the worst case is recorded in the report.
Highest gain of each antenna and highest output power is ANT2 and MIMO as below:

Test mode: 802.11a Frequency(MHz): 5745

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
8032.41	V	55.77	-39.46	-27	12.46
9981.52	V	59.31	-35.92	-27	8.92
12544.6	V	59.79	-35.44	-27	8.44
7000.35	H	54.78	-40.45	-27	13.45
9917.52	H	59.53	-35.7	-27	8.7
12580.6	H	60.62	-34.61	-27	7.61

Test mode: 802.11a Frequency(MHz): 5785

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
7493.38	V	54.86	-40.37	-27	13.37
9361.49	V	56.71	-38.52	-27	11.52
12546.6	V	60.52	-34.71	-27	7.71
7331.37	H	53.11	-42.12	-27	15.12
8664.45	H	55.90	-39.33	-27	12.33
12614.6	H	60.28	-34.95	-27	7.95

Test mode: 802.11a Frequency(MHz): 5825

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
7099.35	V	52.98	-42.25	-27	15.25
9930.52	V	58.96	-36.27	-27	9.27
12587.6	V	60.10	-35.13	-27	8.13
8032.41	H	56.32	-38.91	-27	11.91
9960.52	H	59.50	-35.73	-27	8.73
12585.6	H	60.73	-34.5	-27	7.5

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

Test mode: 802.11a		Frequency(MHz): 5745			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
8032.41	V	55.77	74.00	18.23	peak
9981.52	V	59.31	74.00	14.69	peak
12544.6	V	59.79	74.00	14.21	peak
8032.41	V	40.14	54.00	13.86	AVG
9981.52	V	41.54	54.00	12.46	AVG
12544.6	V	45.70	54.00	8.30	AVG
7000.35	H	54.78	74.00	19.22	peak
9917.52	H	59.53	74.00	14.47	peak
12580.6	H	60.62	74.00	13.38	peak
7000.35	H	40.14	54.00	13.86	AVG
9917.52	H	41.24	54.00	12.76	AVG
12580.6	H	46.23	54.00	7.77	AVG

Test mode: 802.11a		Frequency(MHz): 5785			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7493.38	V	54.86	74.00	19.14	peak
9361.49	V	56.71	74.00	17.29	peak
12546.6	V	60.52	74.00	13.48	peak
7493.38	V	39.93	54.00	14.07	AVG
9361.49	V	39.19	54.00	14.81	AVG
12546.6	V	45.62	54.00	8.38	AVG
7331.37	H	53.11	74.00	20.89	peak
8664.45	H	55.90	74.00	18.10	peak
12614.6	H	60.28	74.00	13.72	peak
7331.37	H	39.43	54.00	14.57	AVG
8664.45	H	38.25	54.00	15.75	AVG
12614.6	H	45.79	54.00	8.21	AVG

Test mode: 802.11a		Frequency(MHz): 5825			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7099.35	V	52.98	74.00	21.02	peak
9930.52	V	58.96	74.00	15.04	peak
12587.6	V	60.10	74.00	13.90	peak
7099.35	V	39.56	54.00	14.44	AVG
9930.52	V	41.98	54.00	12.02	AVG
12587.6	V	46.24	54.00	7.76	AVG
8032.41	H	56.32	74.00	17.68	peak
9960.52	H	59.50	74.00	14.50	peak
12585.6	H	60.73	74.00	13.27	peak
8032.41	H	40.34	54.00	13.66	AVG
9960.52	H	41.53	54.00	12.47	AVG
12585.6	H	45.65	54.00	8.35	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.

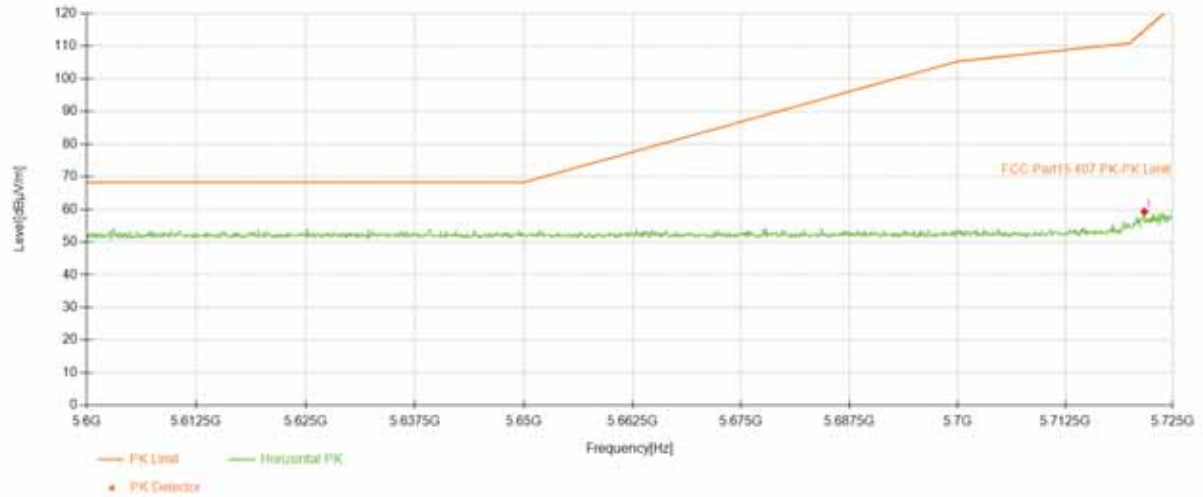
☒ Undesirable radiated Spurious Emission in band edge

Test mode:		Frequency:			
802.11ac(20)		5745			
Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5721.68	H	59.33	-35.9	-27	PASS
5724.49	V	58.46	-36.77	-27	PASS

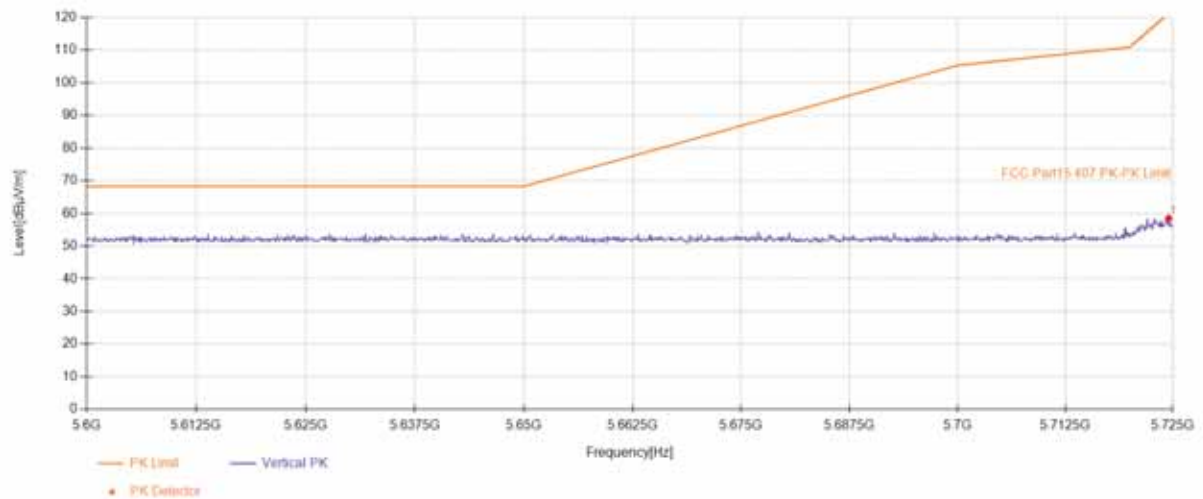
Test mode:		Frequency:			
802.11ac(20)		5825			
Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5850.87	H	58.95	-36.28	-27	PASS
5850.31	V	57.27	-37.96	-27	PASS

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

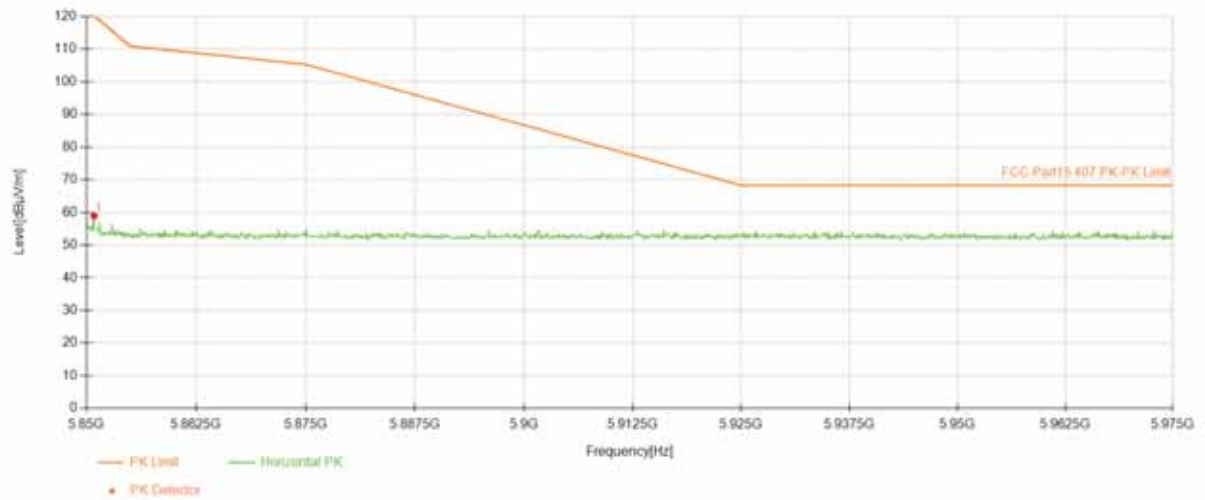
Test Model U-NII -3
Undesirable radiated ☐802.11a Undesirable radiated ☐802.11n(HT20) Spurious Emission in Band Edge ☒802.11 ac (VHT20)
☒5745 Ant.Pol H



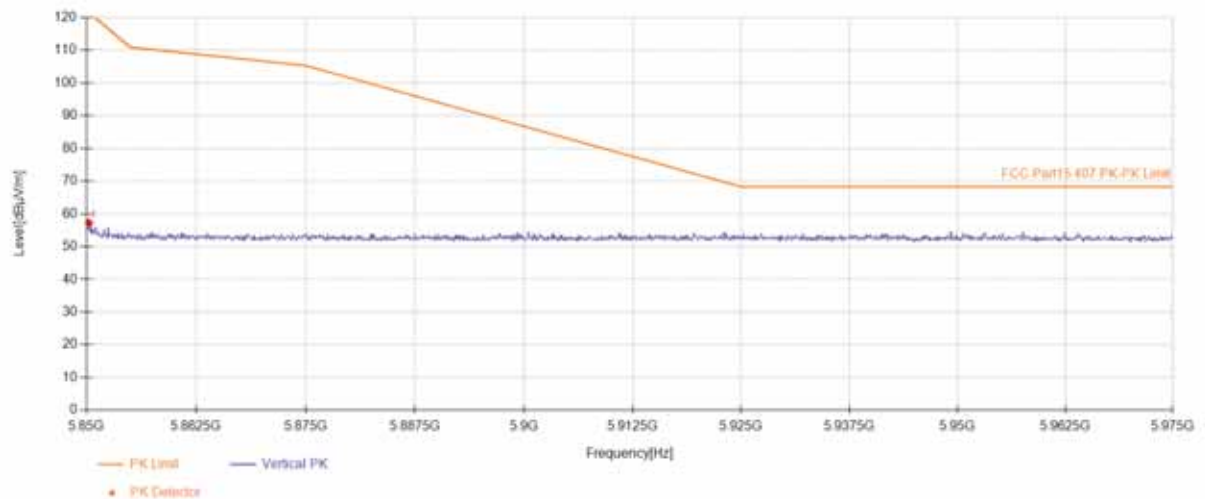
Test Model U-NII -3
Undesirable radiated ☐802.11a Undesirable radiated ☐802.11n(HT20) Spurious Emission in Band Edge ☒802.11 ac (VHT20)
☒5745 Ant.Pol V



U-NII -3				
Test Model	Undesirable radiated	Undesirable radiated	Spurious Emission in Band Edge	
	☐ 802.11a	☐ 802.11n(HT20)	☒ 802.11 ac (VHT20)	
		☒ 5825	Ant.Pol	H



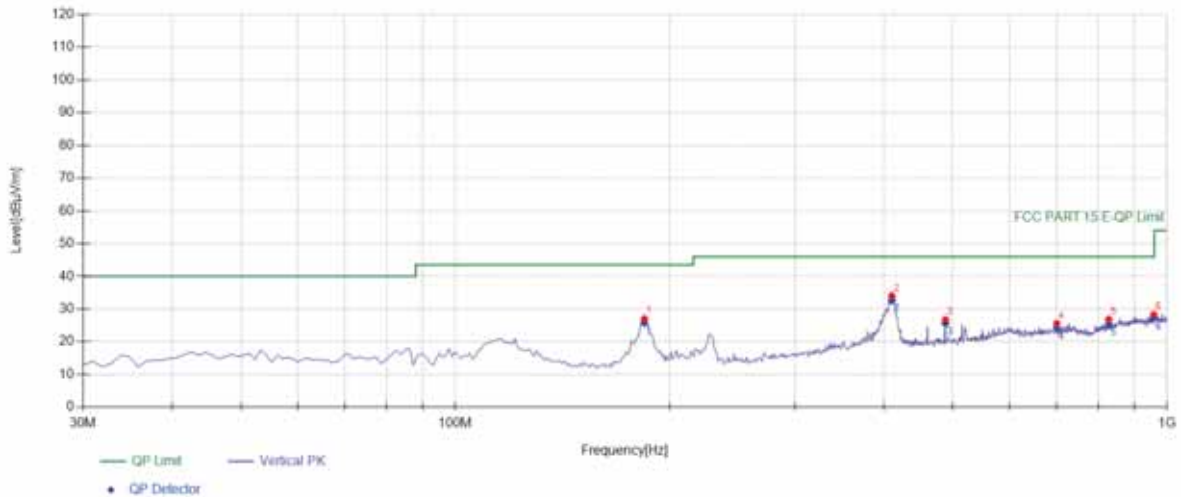
U-NII -3				
Test Model	Undesirable radiated	Undesirable radiated	Spurious Emission in Band Edge	
	☐ 802.11a	☐ 802.11n(HT20)	☒ 802.11 ac (VHT20)	
		☒ 5825	Ant.Pol	V



Undesirable radiated Spurious Emission below 1GHz (30MHz to 1GHz)

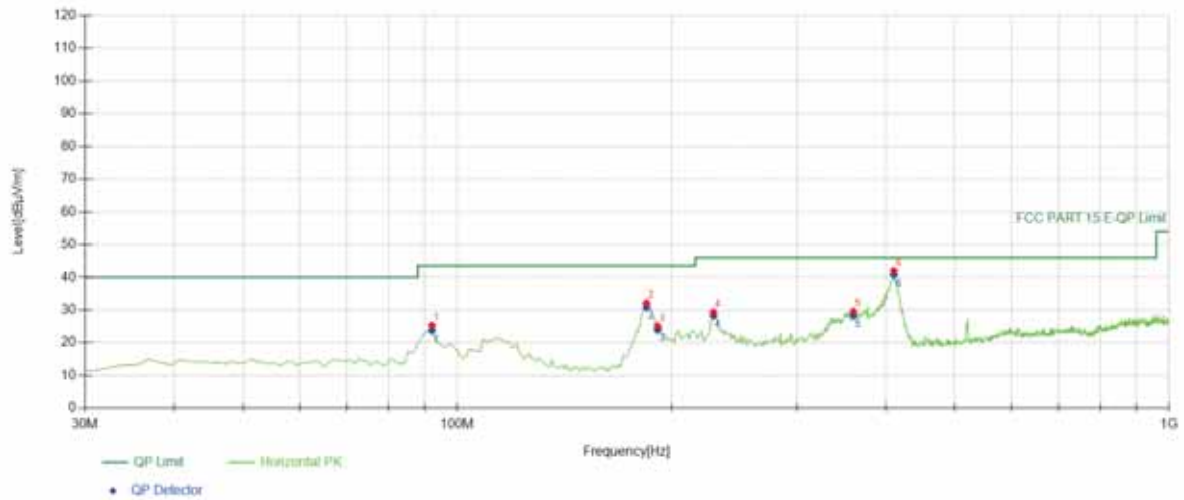
All of the configurations or modes are tested, the data of the worst case is recorded as below.

Test mode: 802.11a 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	184.384	45.40	-18.37	27.03	PK	43.50	16.47	Vertical
2	410.620	45.68	-11.65	34.03	PK	46.00	11.97	Vertical
3	488.298	36.86	-10.11	26.75	PK	46.00	19.25	Vertical
4	699.97	31.87	-6.19	25.68	PK	46.00	20.32	Vertical
5	828.138	31.86	-4.99	26.87	PK	46.00	19.13	Vertical
6	958.248	30.92	-2.54	28.38	PK	46.00	17.62	Vertical

Final Data List					
NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]
1	184.3844	-18.37	25.82	43.50	17.68
2	410.6206	-11.65	32.74	46.00	13.26
3	488.2983	-10.11	25.64	46.00	20.36
4	699.97	-6.19	24.25	46.00	21.75
5	828.1381	-4.99	25.44	46.00	20.56
6	958.2482	-2.54	27.37	46.00	18.63



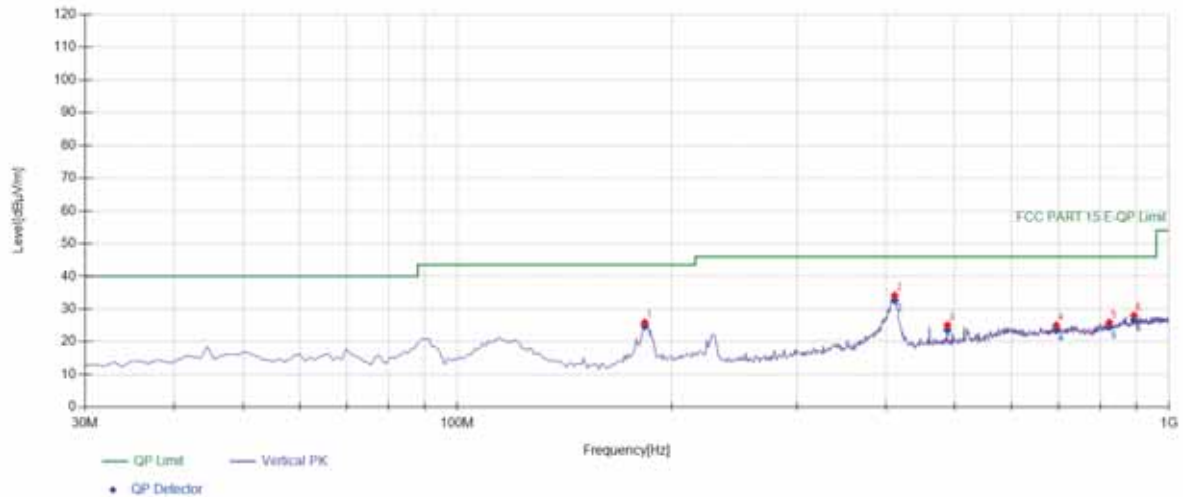
Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	92.1421	43.77	-18.49	25.28	PK	43.50	18.22	Horizontal
2	184.384	50.45	-18.37	32.08	PK	43.50	11.42	Horizontal
3	191.181	43.12	-18.03	25.09	PK	43.50	18.41	Horizontal
4	229.049	45.53	-16.16	29.37	PK	46.00	16.63	Horizontal
5	360.130	41.86	-12.34	29.52	PK	46.00	16.48	Horizontal
6	410.620	53.64	-11.65	41.99	PK	46.00	4.01	Horizontal

Final Data List

NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]
1	92.1421	-18.49	23.82	43.50	19.68
2	184.3844	-18.37	30.80	43.50	12.70
3	191.1812	-18.03	23.99	43.50	19.51
4	229.049	-16.16	28.27	46.00	17.73
5	360.1301	-12.34	28.34	46.00	17.66
6	410.6206	-11.65	40.81	46.00	5.19

Test mode: 802.11a Frequency(MHz): 5200

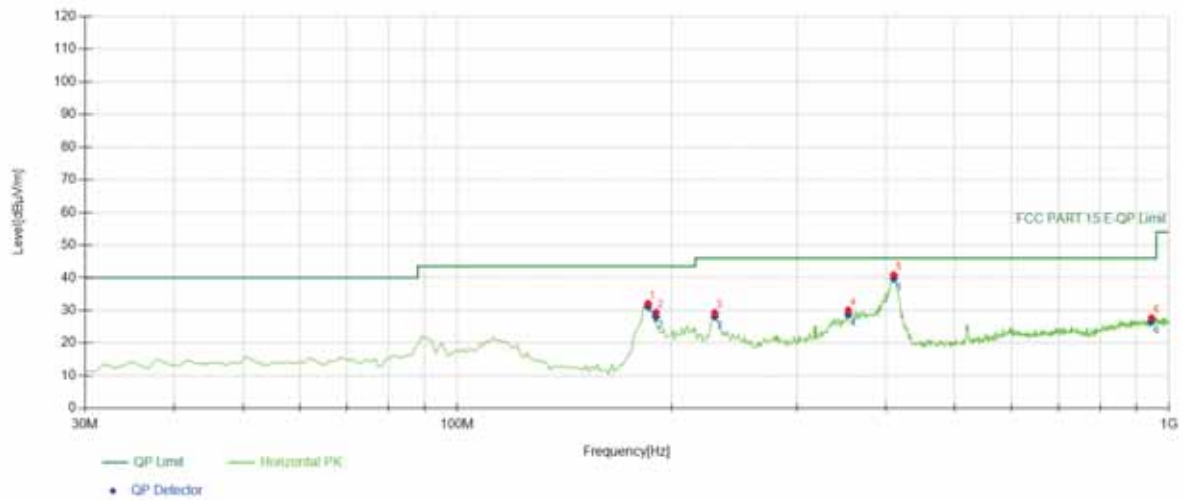


Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	183.413	44.26	-18.42	25.84	PK	43.50	17.66	Vertical
2	411.591	45.78	-11.67	34.11	PK	46.00	11.89	Vertical
3	488.298	35.22	-10.11	25.11	PK	46.00	20.89	Vertical
4	694.144	31.38	-6.41	24.97	PK	46.00	21.03	Vertical
5	824.254	30.98	-5.10	25.88	PK	46.00	20.12	Vertical
6	893.193	31.43	-3.41	28.02	PK	46.00	17.98	Vertical

Final Data List

NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]
1	183.4134	-18.42	24.79	43.50	18.71
2	411.5916	-11.67	32.74	46.00	13.26
3	488.2983	-10.11	23.66	46.00	22.34
4	694.1441	-6.41	23.69	46.00	22.31
5	824.2543	-5.10	24.60	46.00	21.40
6	893.1932	-3.41	26.66	46.00	19.34



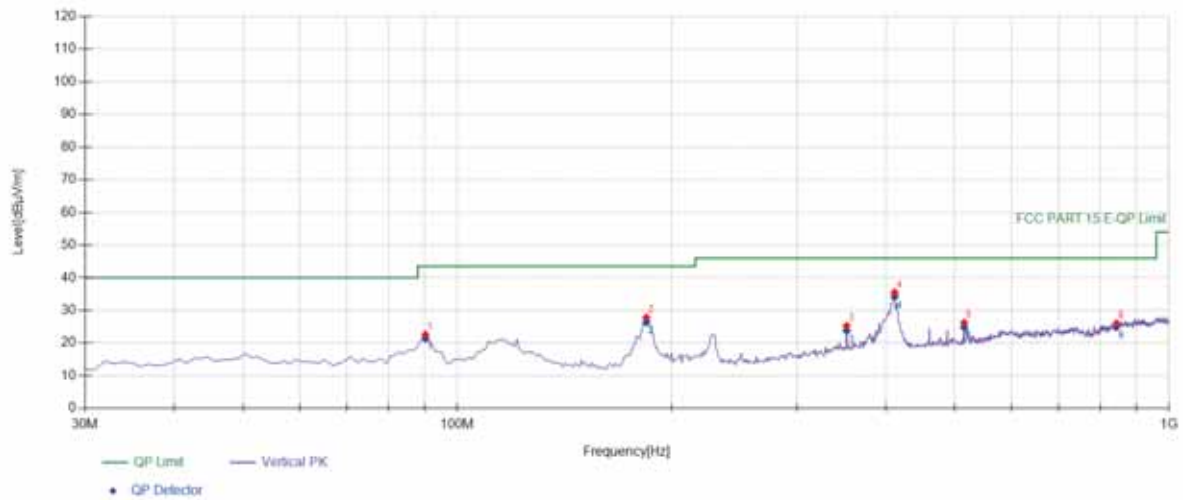
Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	185.355	50.49	-18.33	32.16	PK	43.50	11.34	Horizontal
2	190.210	47.50	-18.08	29.42	PK	43.50	14.08	Horizontal
3	230.02	45.45	-16.13	29.32	PK	46.00	16.68	Horizontal
4	354.304	42.43	-12.36	30.07	PK	46.00	15.93	Horizontal
5	410.620	52.54	-11.65	40.89	PK	46.00	5.11	Horizontal
6	944.654	31.00	-3.28	27.72	PK	46.00	18.28	Horizontal

Final Data List

NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]
1	185.3554	-18.33	31.09	43.50	12.41
2	190.2102	-18.08	28.03	43.50	15.47
3	230.02	-16.13	28.11	46.00	17.89
4	354.3043	-12.36	28.78	46.00	17.22
5	410.6206	-11.65	39.77	46.00	6.23
6	944.6547	-3.28	26.60	46.00	19.40

Test mode: 802.11a Frequency(MHz): 5240

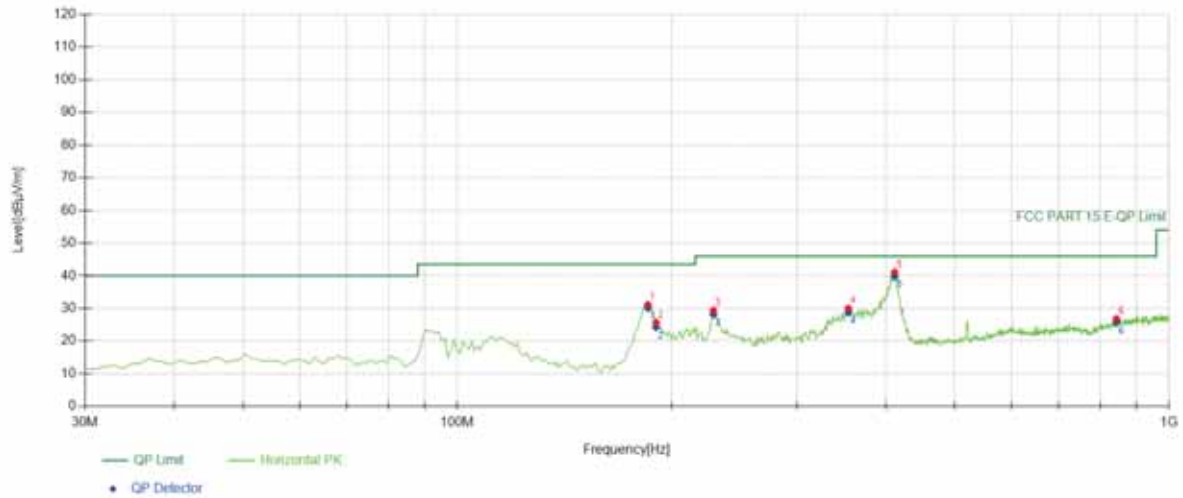


Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	90.2002	41.41	-18.80	22.61	PK	43.50	20.89	Vertical
2	184.384	46.22	-18.37	27.85	PK	43.50	15.65	Vertical
3	352.362	37.63	-12.36	25.27	PK	46.00	20.73	Vertical
4	411.591	47.20	-11.67	35.53	PK	46.00	10.47	Vertical
5	515.485	36.06	-9.83	26.23	PK	46.00	19.77	Vertical
6	843.673	30.54	-4.49	26.05	PK	46.00	19.95	Vertical

Final Data List

NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]
1	90.2002	-18.80	21.40	43.50	22.10
2	184.3844	-18.37	26.46	43.50	17.04
3	352.3624	-12.36	23.78	46.00	22.22
4	411.5916	-11.67	34.22	46.00	11.78
5	515.4855	-9.83	24.82	46.00	21.18
6	843.6737	-4.49	24.96	46.00	21.04



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	185.355	49.48	-18.33	31.15	PK	43.50	12.35	Horizontal
2	190.210	43.76	-18.08	25.68	PK	43.50	17.82	Horizontal
3	229.049	45.59	-16.16	29.43	PK	46.00	16.57	Horizontal
4	354.304	42.41	-12.36	30.05	PK	46.00	15.95	Horizontal
5	411.591	52.77	-11.67	41.10	PK	46.00	4.90	Horizontal
6	843.673	31.36	-4.49	26.87	PK	46.00	19.13	Horizontal

Final Data List

NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]
1	185.3554	-18.33	30.10	43.50	13.40
2	190.2102	-18.08	24.31	43.50	19.19
3	229.049	-16.16	28.24	46.00	17.76
4	354.3043	-12.36	28.86	46.00	17.14
5	411.5916	-11.67	39.83	46.00	6.17
6	843.6737	-4.49	25.78	46.00	20.22

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

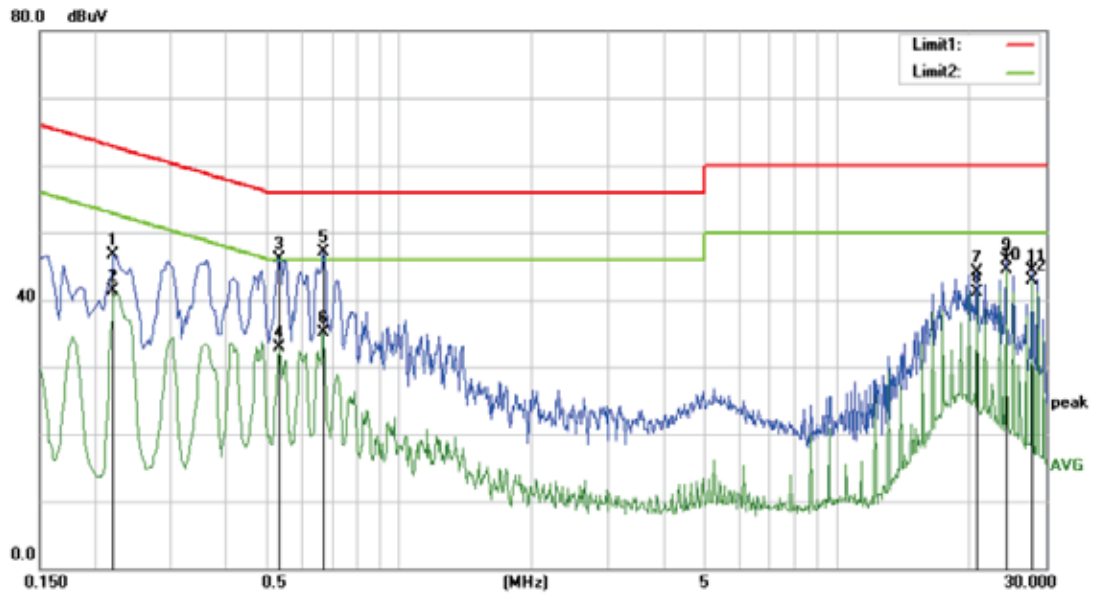
The EUT was placed on a table which is 0.8m above ground plane.

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.

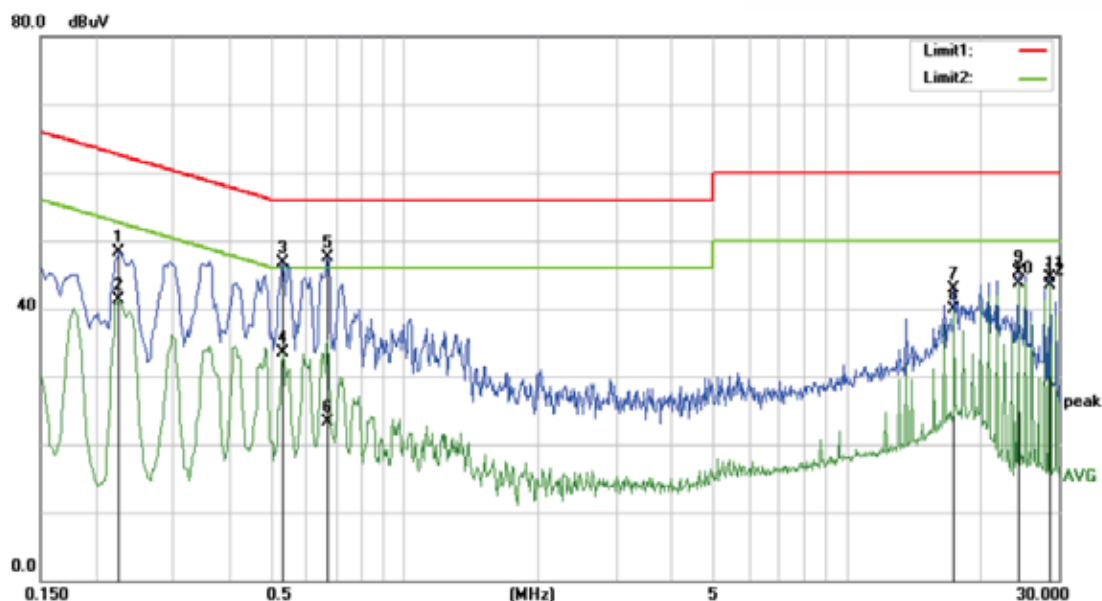


Site Conduction #1
Limit: (CE)FCC PART 15 class B QP
Mode: 5G wifi mode
Note: 2#

Phase: **L1**
Power: AC 120V/60Hz

Temperature: 24.9
Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2220	36.66	10.03	46.69	62.74	-16.05	QP	
2		0.2220	31.21	10.03	41.24	52.74	-11.50	AVG	
3		0.5300	36.14	9.96	46.10	56.00	-9.90	QP	
4		0.5300	22.88	9.96	32.84	46.00	-13.16	AVG	
5		0.6700	37.10	10.00	47.10	56.00	-8.90	QP	
6		0.6700	25.13	10.00	35.13	46.00	-10.87	AVG	
7		20.9140	33.61	10.47	44.08	60.00	-15.92	QP	
8		20.9140	30.60	10.47	41.07	50.00	-8.93	AVG	
9		24.3940	35.29	10.54	45.83	60.00	-14.17	QP	
10	*	24.3940	33.98	10.54	44.52	50.00	-5.48	AVG	
11		27.8820	33.72	10.61	44.33	60.00	-15.67	QP	
12		27.8820	32.38	10.61	42.99	50.00	-7.01	AVG	



Site Conduction #1

Phase: N

Temperature: 24.9

Limit: (CE)FCC PART 15 class B QP

Power: AC 120V/60Hz

Humidity: 55 %

Mode: 5G wifi mode

Note: 2#

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2260	38.33	10.02	48.35	62.60	-14.25	QP	
2		0.2260	31.22	10.02	41.24	52.60	-11.36	AVG	
3		0.5300	36.70	9.96	46.66	56.00	-9.34	QP	
4		0.5300	23.45	9.96	33.41	46.00	-12.59	AVG	
5		0.6700	37.49	10.00	47.49	56.00	-8.51	QP	
6		0.6700	13.23	10.00	23.23	46.00	-22.77	AVG	
7		17.4260	32.45	10.38	42.83	60.00	-17.17	QP	
8		17.4260	29.61	10.38	39.99	50.00	-10.01	AVG	
9		24.3940	34.71	10.54	45.25	60.00	-14.75	QP	
10	*	24.3940	33.19	10.54	43.73	50.00	-6.27	AVG	
11		28.7500	33.86	10.63	44.49	60.00	-15.51	QP	
12		28.7500	32.82	10.63	43.45	50.00	-6.55	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

Temperature : 25°C ATM Pressure: 1011 mbar
Humidity : 45 % Test Engineer: XXH

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

Ant1:1.4 dBi Ant2:1.4 dBi

- ☒ 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 ---

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6. Objections shall be raised within 20 days from the date receiving the report.