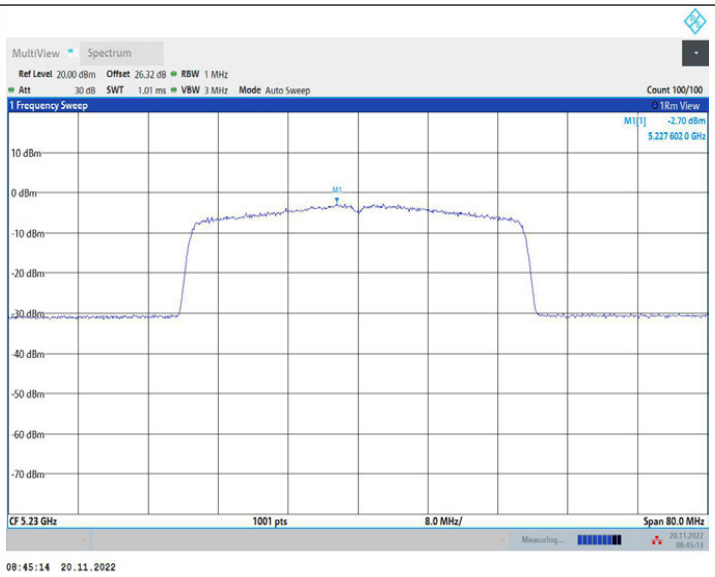

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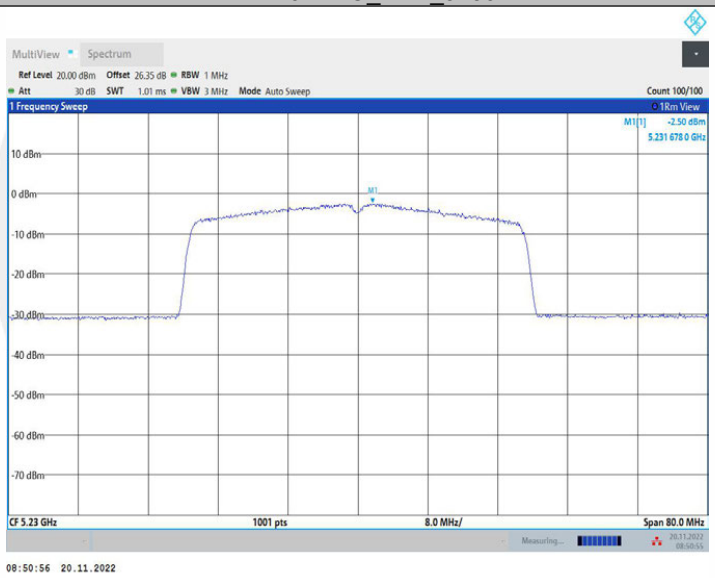

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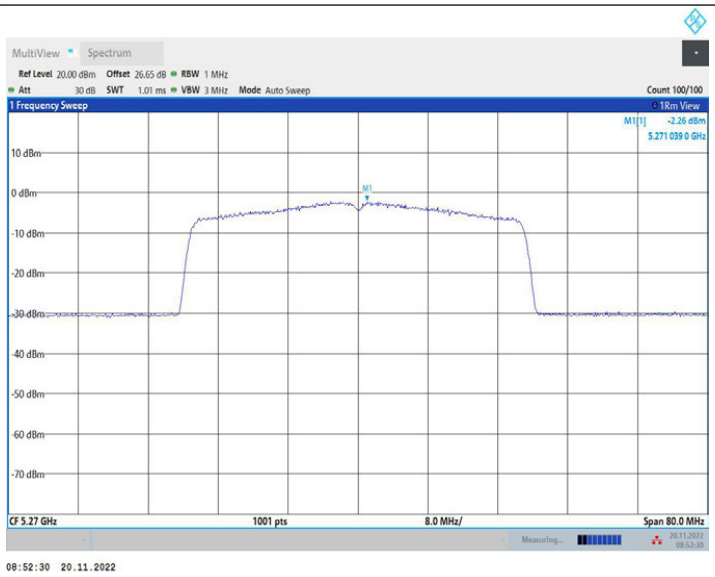

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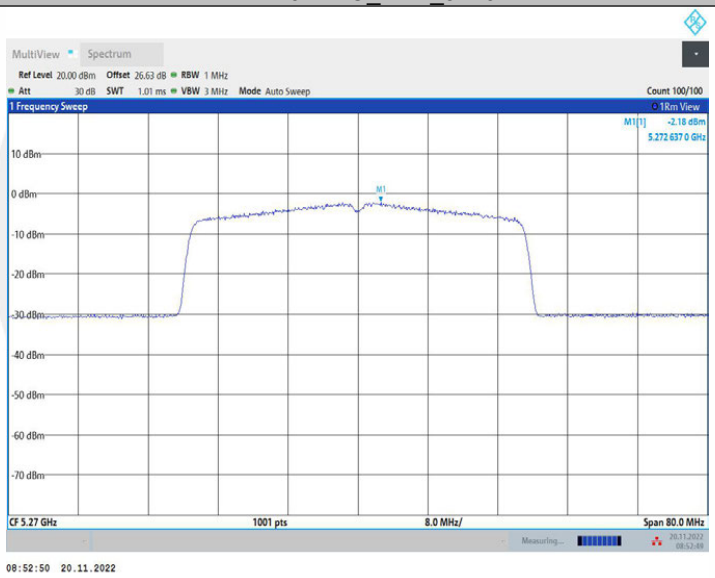

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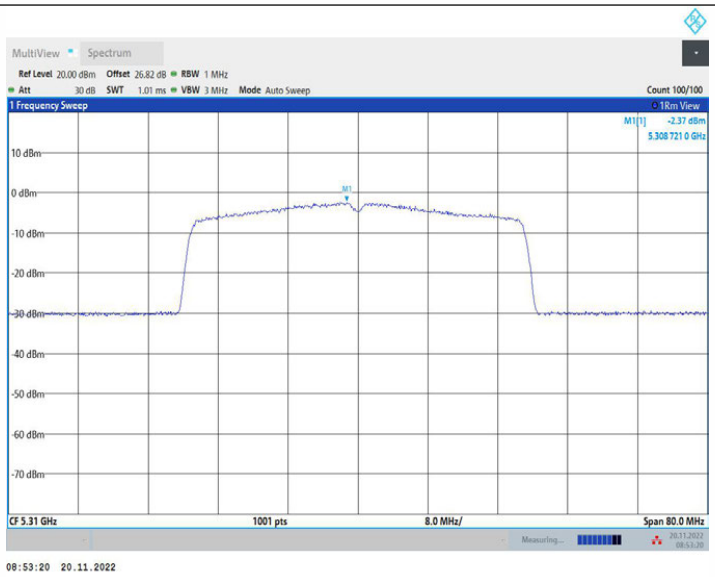

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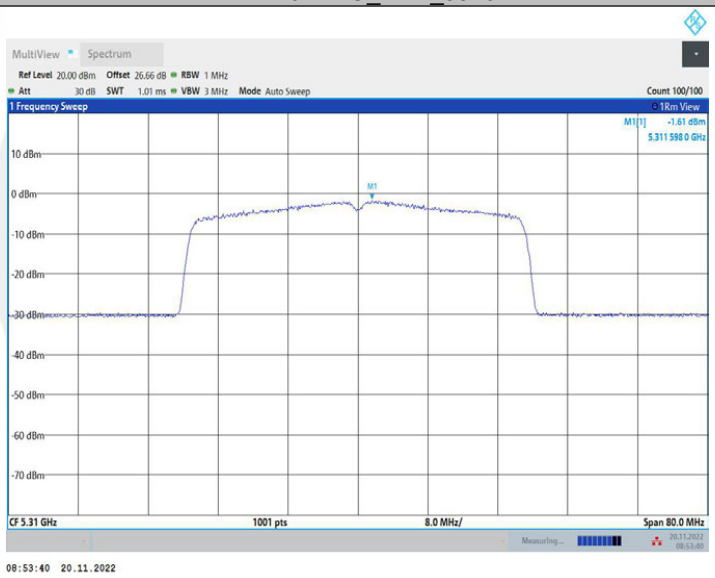

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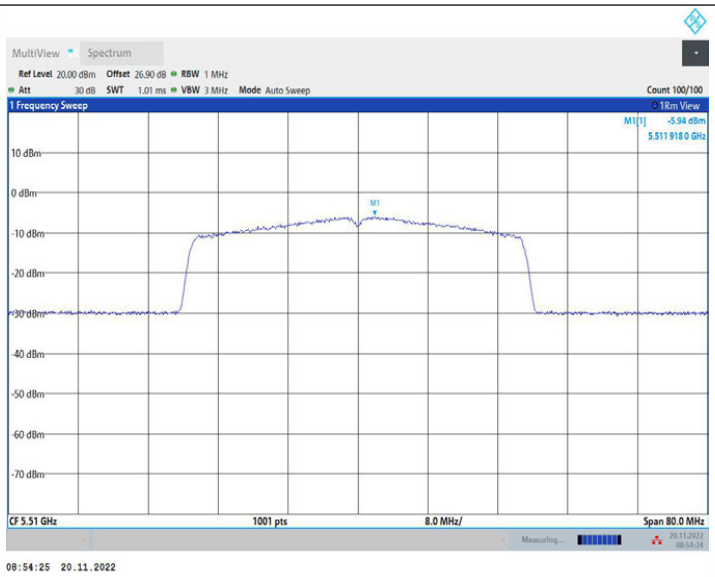

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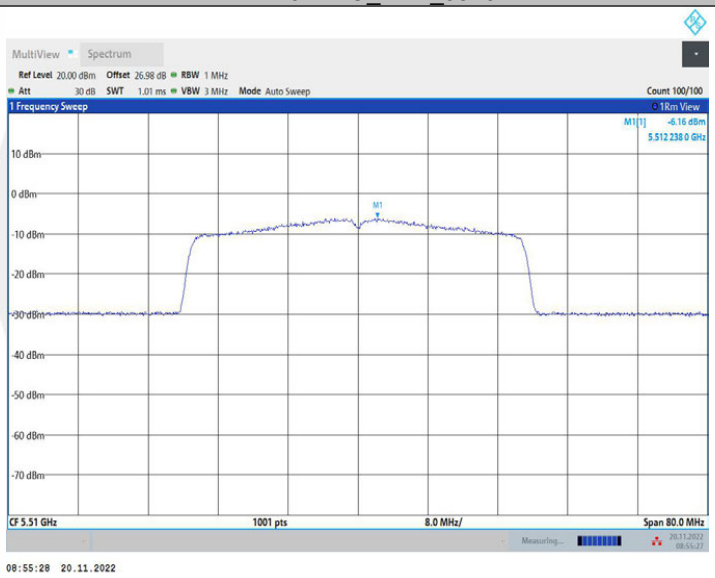

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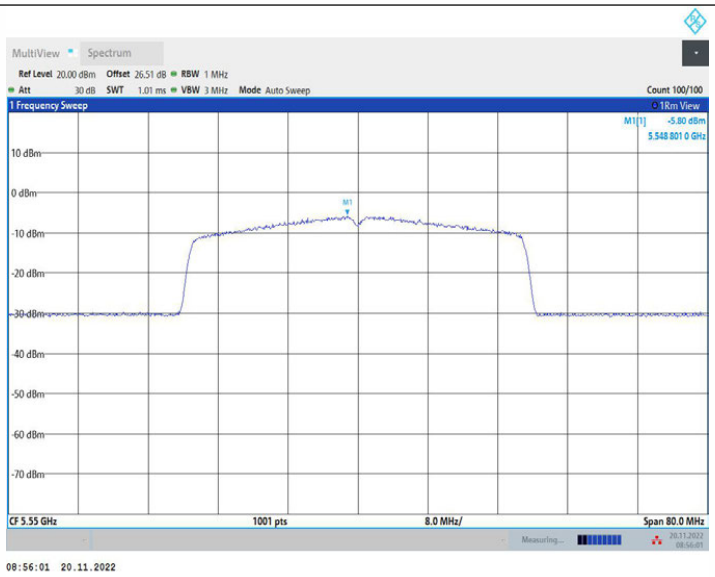

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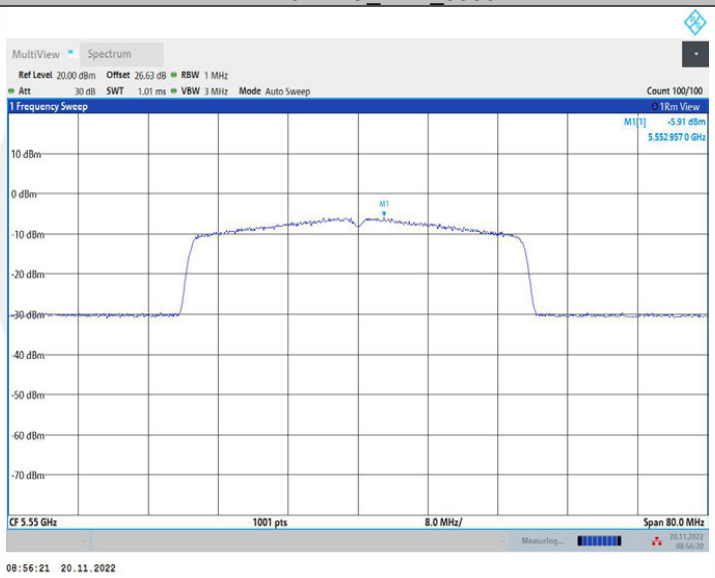

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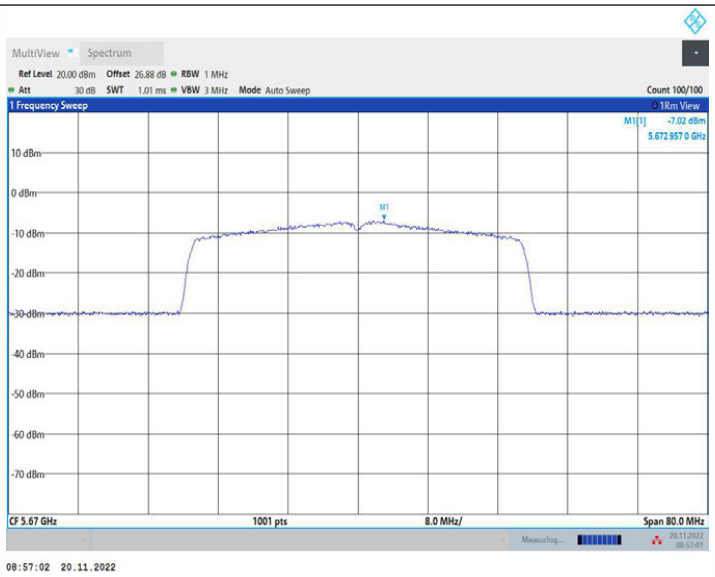

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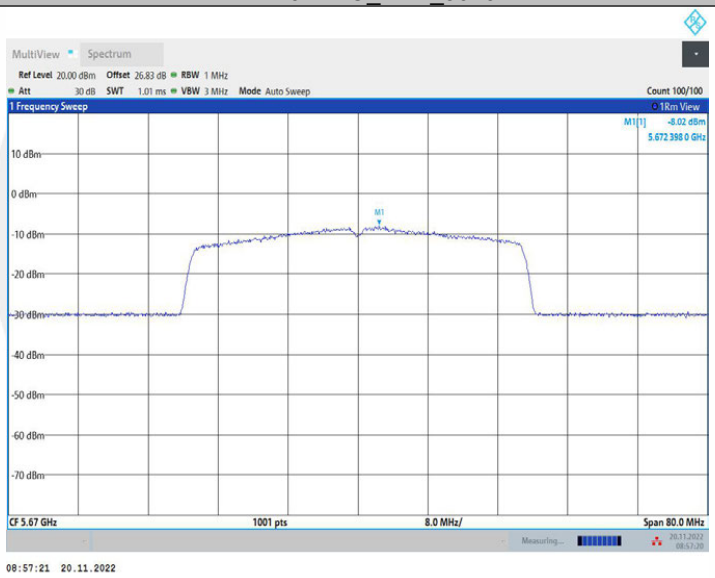

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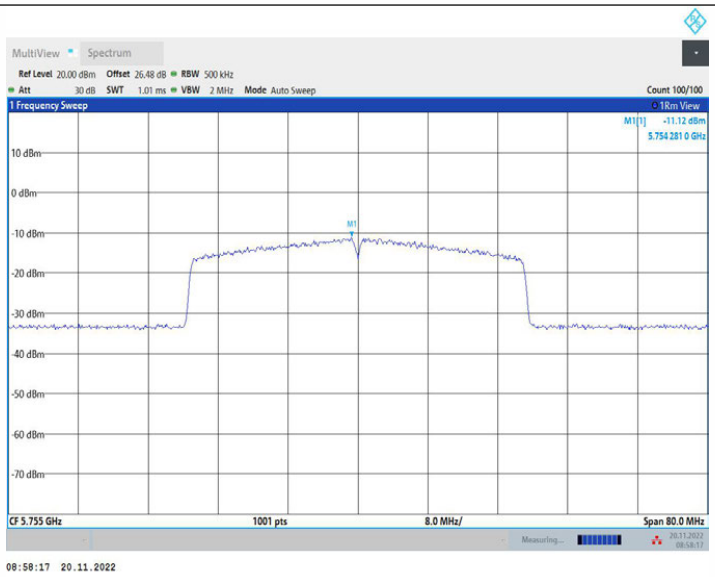

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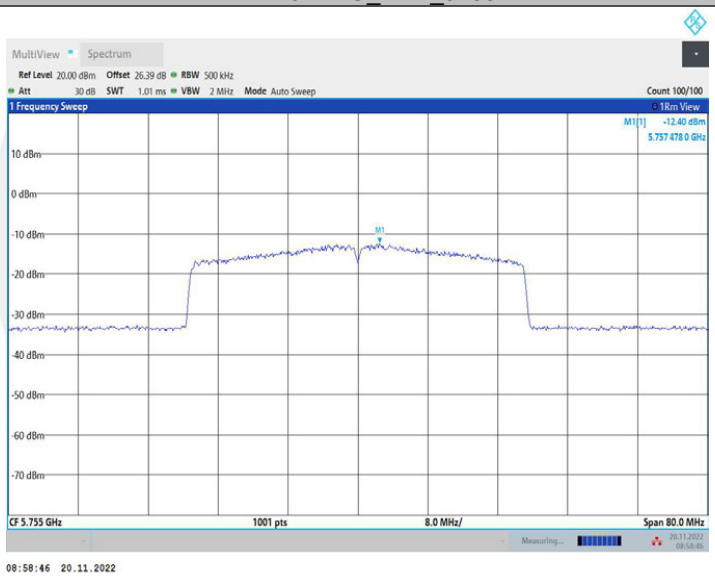

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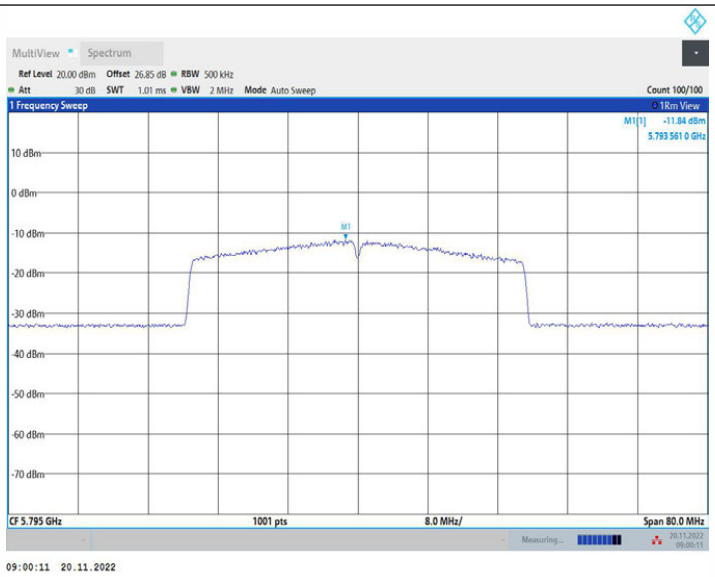

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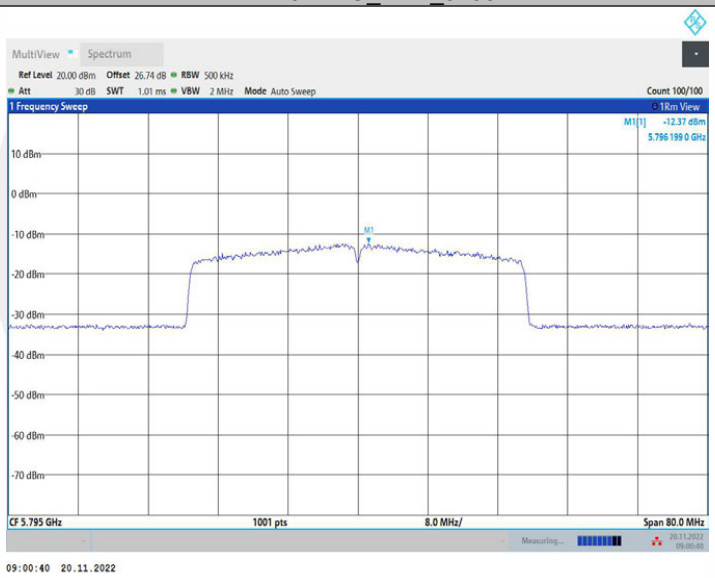

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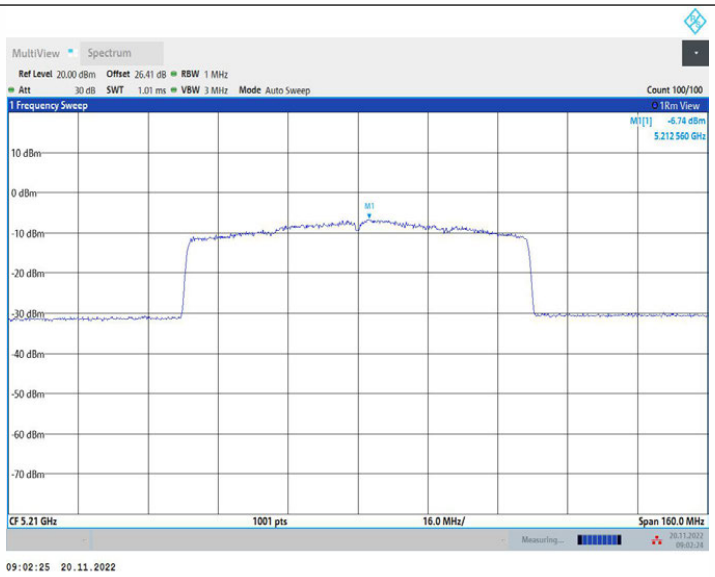

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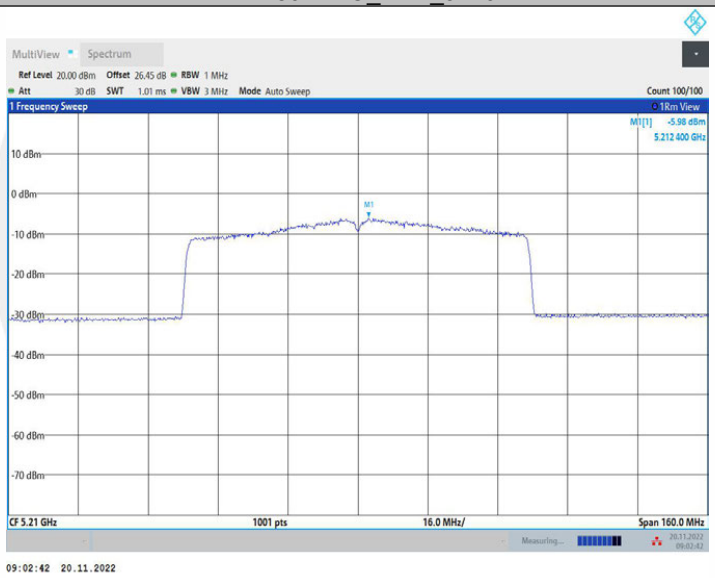

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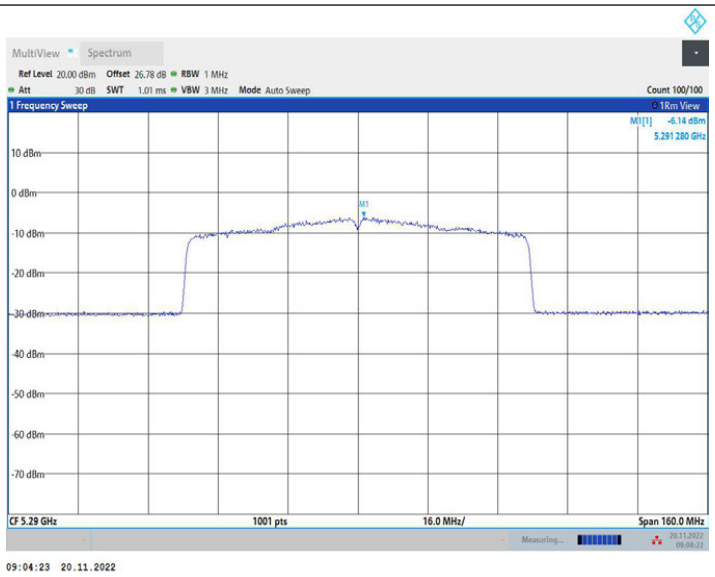

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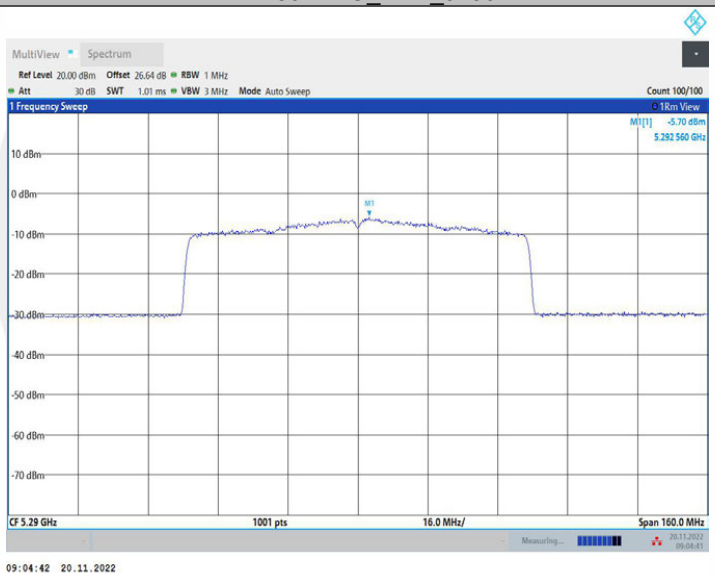

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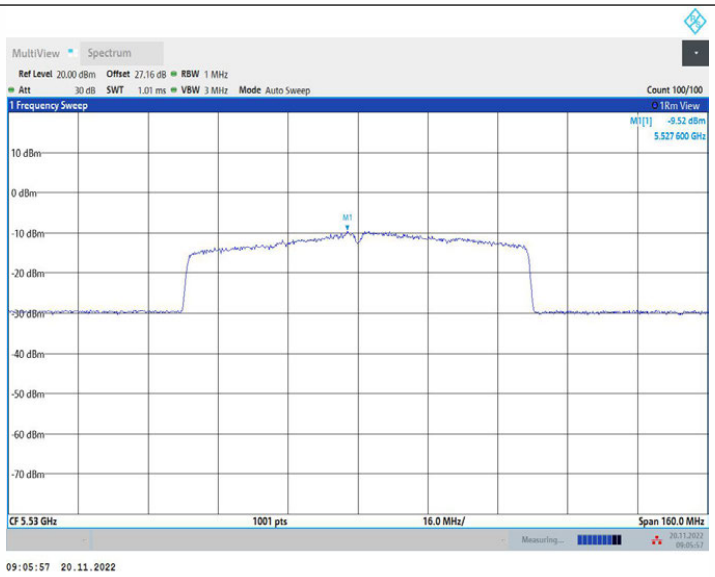

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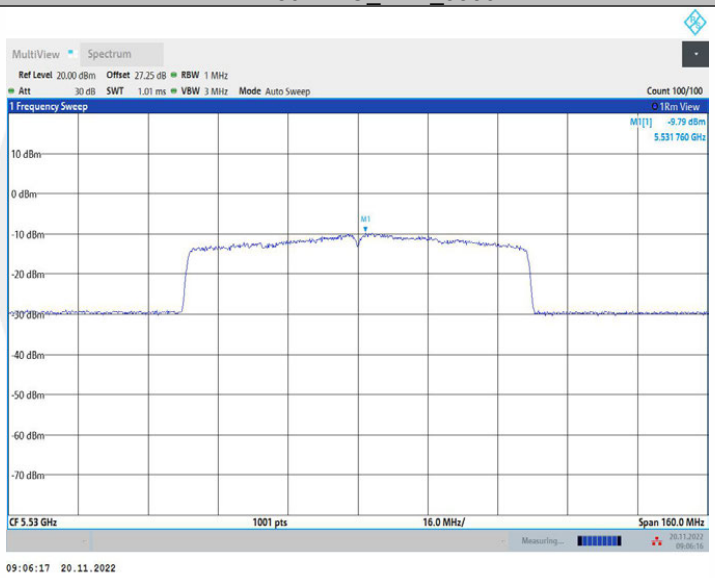

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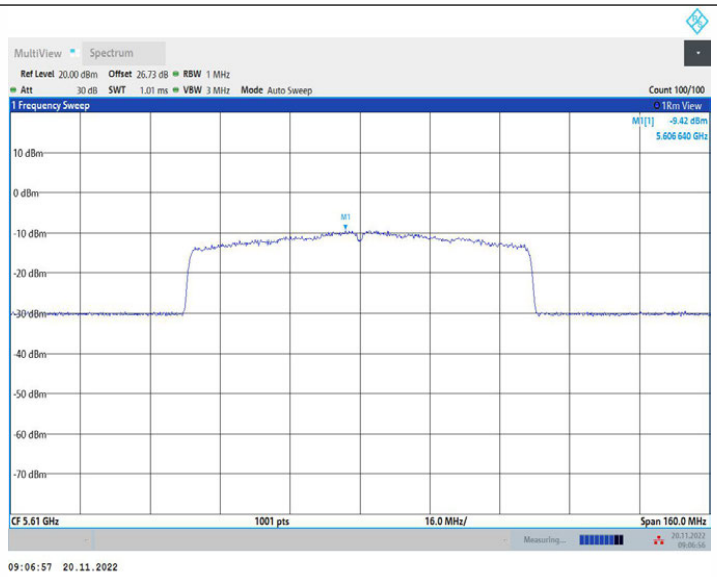

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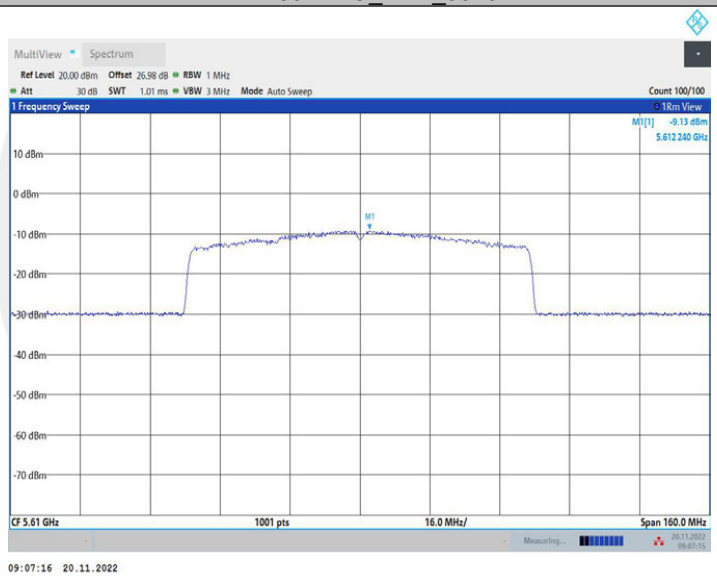

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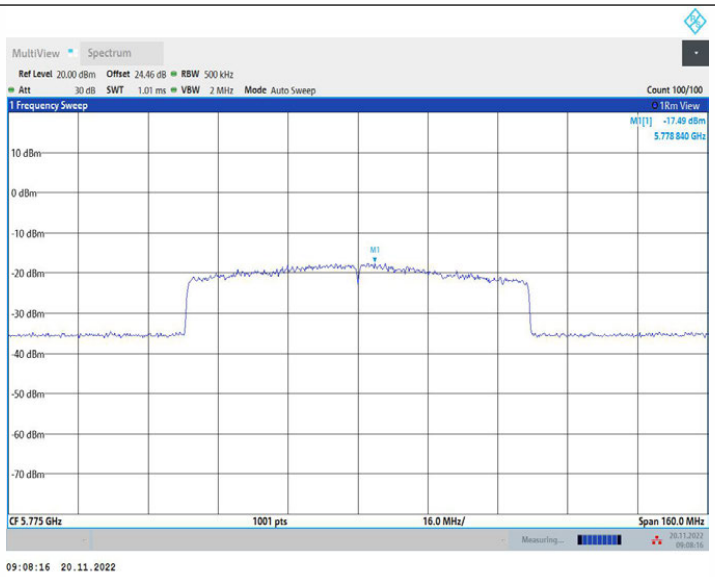

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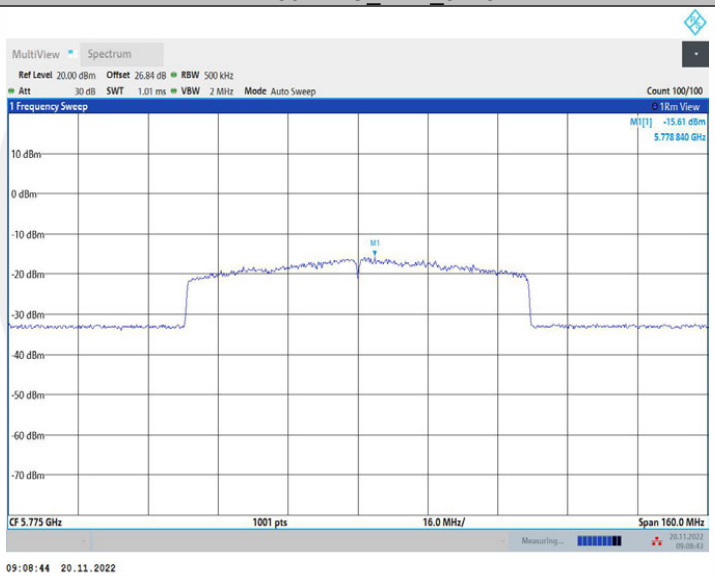


11AX80MIMO_Ant2_5775

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 (μV/m)	Field Strength (dBμV/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 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<150KHz(9KHz to 150KHz), 9KHz for <30MHz (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 ≥ 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 ≥ 98 percent, set VBW ≤ RBW/100 (i.e., 10 kHz) but not less than 10 Hz.
• If the EUT duty cycle is < 98 percent, set VBW ≥ 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 ANT1 and MIMO as below:

ANT1:

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)
6400	V	51.40	-43.83	-27	16.83
15540	V	59.49	-35.74	-27	8.74
17498	V	65.18	-30.05	-27	3.05
11528.26	H	60.16	-35.07	-27	8.07
15540	H	59.46	-35.77	-27	8.77
17481.24	H	64.92	-30.31	-27	3.31

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)
11387	V	59.75	-35.48	-27	8.48
15603	V	63.80	-31.43	-27	4.43
17513.37	V	64.94	-30.29	-27	3.29
11350.87	H	60.16	-35.07	-27	8.07
14542.62	H	63.20	-32.03	-27	5.03
17502.75	H	64.37	-30.86	-27	3.86

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)
10486	V	60.29	-34.94	-27	7.94
14621.25	V	62.85	-32.38	-27	5.38
15730.5	V	65.32	-29.91	-27	2.91
10479.62	H	59.76	-35.47	-27	8.47
15719.87	H	64.37	-30.86	-27	3.86
17500.62	H	64.77	-30.46	-27	3.46

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)
6398.61	V	51.27	-43.96	-27	16.96
17499.28	V	65.15	-30.08	-27	3.08
15537.75	V	47.24	-47.99	-27	20.99
11539.95	H	60.08	-35.15	-27	8.15
17492.93	H	64.76	-30.47	-27	3.47
15536.69	H	49.49	-45.74	-27	18.74

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)
10484.61	V	59.62	-35.61	-27	8.61
15731.78	V	64.91	-30.32	-27	3.32
14619	V	40.32	-54.91	-27	27.91
10491.31	H	60.08	-35.15	-27	8.15
17512.31	H	64.21	-31.02	-27	4.02
15716.56	H	42.98	-52.25	-27	25.25

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)
10484.61	V	60.16	-35.07	-27	8.07
15731.78	V	65.29	-29.94	-27	2.94
14619	V	42.42	-52.81	-27	25.81
10491.31	H	59.68	-35.55	-27	8.55
17512.31	H	64.61	-30.62	-27	3.62
15716.56	H	44.21	-51.02	-27	24.02

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

ANT1:

Test mode: 802.11n(20) Frequency: 5180

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
6400	V	51.40	74.00	22.60	peak
15540	V	59.49	74.00	14.51	peak
17498	V	65.18	74.00	8.82	peak
6400.200	V	37.96	54.00	16.04	AVG
15540	V	47.50	54.00	6.50	AVG
17498.24	V	47.12	54.00	6.88	AVG
11528.26	H	60.16	74.00	13.84	peak
15540	H	59.46	74.00	14.54	peak
17481.24	H	64.92	74.00	9.08	peak
11528.26	H	42.61	54.00	11.39	AVG
15540	H	49.67	54.00	4.33	AVG
17481.24	H	50.58	54.00	3.42	AVG

Test mode: 802.11n(20) Frequency: 5200

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11387	V	59.75	74.00	14.25	peak
15603	V	63.80	74.00	10.20	peak
17513.37	V	64.94	74.00	9.06	peak
11387	V	39.16	54.00	14.84	AVG
15603	V	40.58	54.00	13.42	AVG
17513.37	V	47.60	54.00	6.40	AVG
11350.87	H	60.16	74.00	13.84	peak
14542.62	H	63.20	74.00	10.80	peak
17502.75	H	64.37	74.00	9.63	peak
11350.87	H	40.41	54.00	13.59	AVG
14542.62	H	43.16	54.00	10.84	AVG
17502.75	H	48.07	54.00	5.93	AVG

Test mode: 802.11n(20) Frequency: 5240

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10486	V	60.29	74.00	13.71	peak
14621.25	V	62.85	74.00	11.15	peak
15730.5	V	65.32	74.00	8.68	peak
10486	V	37.07	54.00	16.93	AVG
14621.25	V	42.68	54.00	11.32	AVG
15730.5	V	48.49	54.00	5.51	AVG
10479.62	H	59.76	74.00	14.24	peak
15719.87	H	64.37	74.00	9.63	peak
17500.62	H	64.77	74.00	9.23	peak
10479.62	H	39.03	54.00	14.97	AVG
15719.87	H	44.39	54.00	9.61	AVG
17500.62	H	47.07	54.00	6.93	AVG

MIMO:

Test mode: 802.11n(20) Frequency: 5180

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
6398.610	V	51.27	74.00	22.73	peak
15538.610	V	59.33	74.00	14.67	peak
17499.280	V	65.15	74.00	8.85	peak
6401.480	V	37.94	54.00	16.06	AVG
15537.750	V	47.24	54.00	6.76	AVG
17495.990	V	46.93	54.00	7.07	AVG
11539.950	H	60.08	74.00	13.92	peak
15551.690	H	59.25	74.00	14.75	peak
17492.930	H	64.76	74.00	9.24	peak
11539.950	H	42.47	54.00	11.53	AVG
15536.690	H	49.49	54.00	4.51	AVG
17477.930	H	50.45	54.00	3.55	AVG

Test mode: 802.11n(20) Frequency: 5200

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
11385.610	V	59.62	74.00	14.38	peak
15601.610	V	63.64	74.00	10.36	peak
17514.650	V	64.91	74.00	9.09	peak
11388.280	V	39.14	54.00	14.86	AVG
15600.750	V	40.32	54.00	13.68	AVG
17511.120	V	47.41	54.00	6.59	AVG
11362.560	H	60.08	74.00	13.92	peak
14554.310	H	62.99	74.00	11.01	peak
17514.440	H	64.21	74.00	9.79	peak
11362.560	H	40.27	54.00	13.73	AVG
14539.310	H	42.98	54.00	11.02	AVG
17499.440	H	47.94	54.00	6.06	AVG

Test mode: 802.11n(20) Frequency: 5240

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10484.610	V	60.16	74.00	13.84	peak
14619.860	V	62.69	74.00	11.31	peak
15731.780	V	65.29	74.00	8.71	peak
10487.280	V	37.05	54.00	16.95	AVG
14619.000	V	42.42	54.00	11.58	AVG
15728.250	V	48.3	54.00	5.7	AVG
10491.310	H	59.68	74.00	14.32	peak
15731.560	H	64.16	74.00	9.84	peak
17512.310	H	64.61	74.00	9.39	peak
10491.310	H	38.89	54.00	15.11	AVG
15716.560	H	44.21	54.00	9.79	AVG
17497.310	H	46.94	54.00	7.06	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
5350.660	H	62.38	-32.85	-27	Pass
5350.66	V	62.38	-32.85	-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
5421.250	H	62.91	-32.32	-27	Pass
5469.600	V	63.60	-31.63	-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): 5180

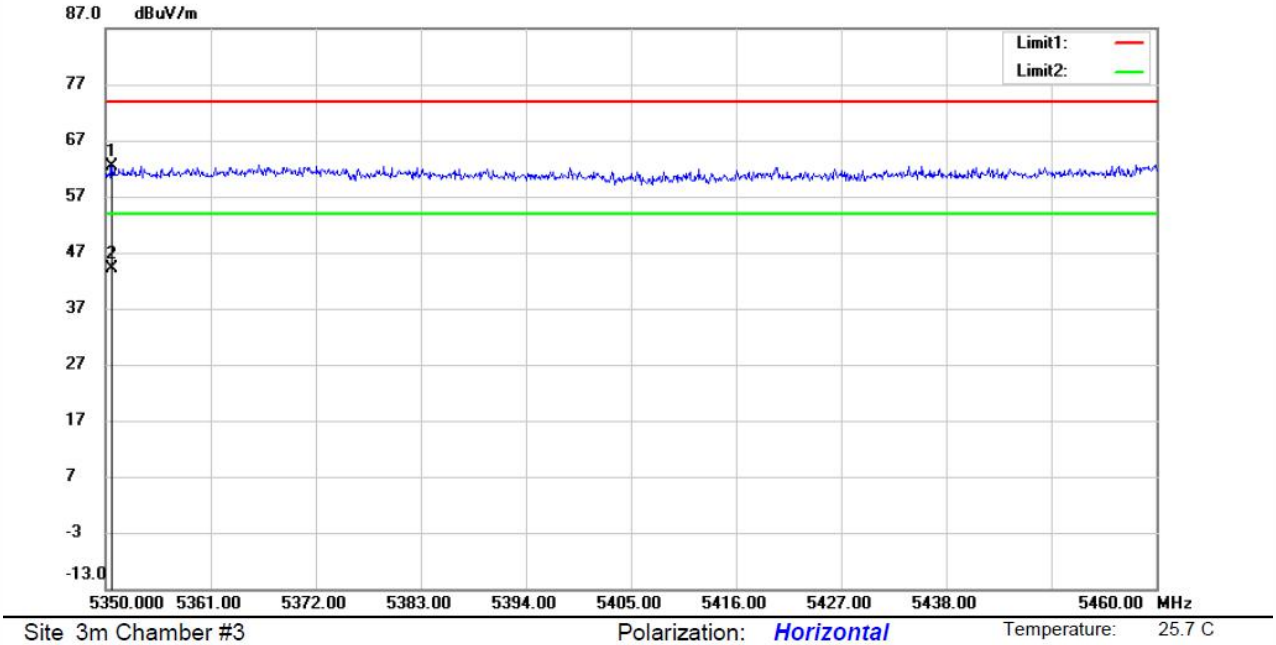
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5350.660	V	62.38	74.00	11.62	peak
5350.66	V	44.25	54.00	9.75	AVG
5350.660	H	62.38	74.00	11.62	peak
5350.66	H	44.24	54.00	9.76	AVG

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

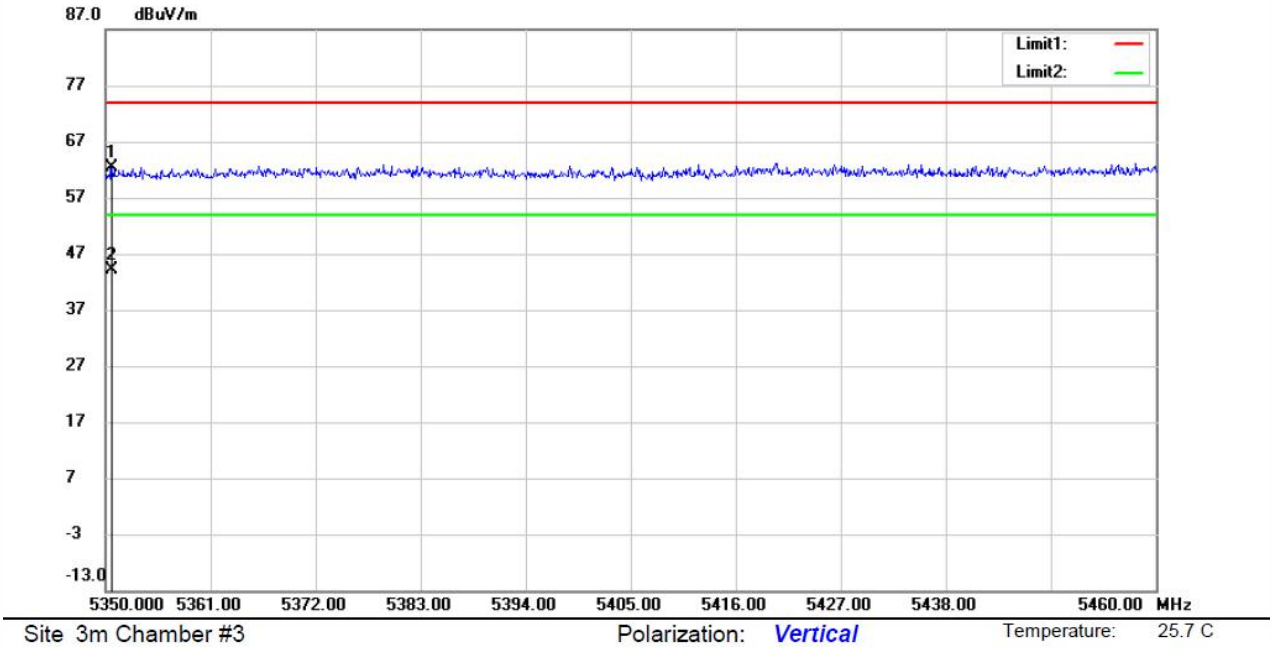
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5469.600	V	63.60	74.00	10.40	peak
5469.6	V	45.77	54.00	8.23	AVG
5421.250	H	62.91	74.00	11.09	peak
5421.25	H	45.03	54.00	8.97	AVG

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.

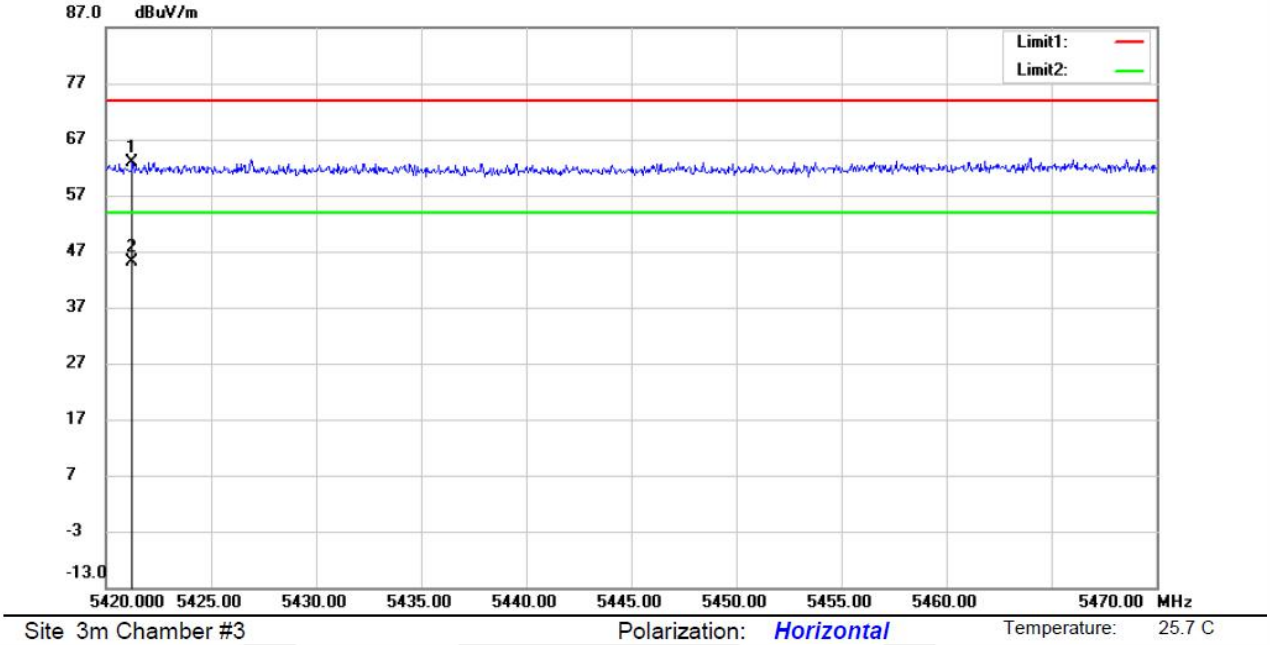
Test Model	U-NII - 1 Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz) ☐ 802.11a ☒ 802.11n(HT20) ☐ 802.11n(HT40) ☒ 5180 ☐ 5200 ☐ 5240 Ant.Pol H



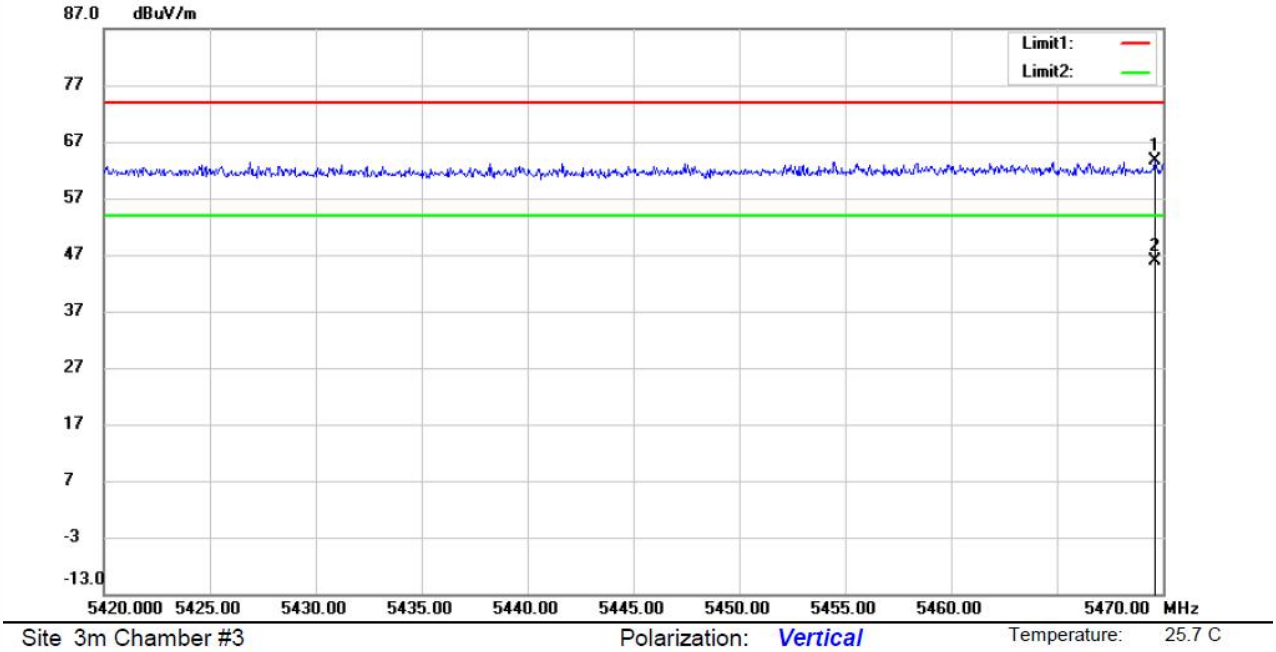
Test Model	U-NII - 1 Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz) ☐ 802.11a ☒ 802.11n(HT20) ☐ 802.11n(HT40) ☒ 5180 ☐ 5200 ☐ 5240 Ant.Pol V



Test Model	U-NII - 1 Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz) ☐ 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 (5350-5400MHz) ☐ 802.11a ☒ 802.11n(HT20) ☐ 802.11n(HT40) ☐ 5180 ☐ 5200 ☒ 5240 Ant.Pol 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 ANT1 and MIMO as below:

ANT1:

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)
7242.121	V	52.25	-42.98	-27	15.98
15780	V	57.88	-37.35	-27	10.35
17940.47	V	65.81	-29.42	-27	2.42
7004.002	H	52.02	-43.21	-27	16.21
15780	H	58.36	-36.87	-27	9.87
17974.48	H	65.61	-29.62	-27	2.62

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)
10562.5	V	62.53	-32.7	-27	5.7
15849.5	V	64.04	-31.19	-27	4.19
17494.25	V	65.06	-30.17	-27	3.17
10564.62	H	60.41	-34.82	-27	7.82
15834.62	H	60.55	-34.68	-27	7.68
17511.25	H	65.09	-30.14	-27	3.14

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)
10645.37	V	63.85	-31.38	-27	4.38
15960	V	62.47	-32.76	-27	5.76
17498.5	V	64.36	-30.87	-27	3.87
10643.25	H	61.65	-33.58	-27	6.58
15968.5	H	61.91	-33.32	-27	6.32
17513.37	H	64.52	-30.71	-27	3.71

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)
7240.731	V	52.12	-43.11	-27	16.11
17941.75	V	65.78	-29.45	-27	2.45
15777.75	V	47.74	-47.49	-27	20.49
7015.692	H	51.94	-43.29	-27	16.29
17986.17	H	65.45	-29.78	-27	2.78
15776.69	H	47.68	-47.55	-27	20.55

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)
10561.11	V	62.4	-32.83	-27	5.83
17495.53	V	65.03	-30.20	-27	3.20
15847.25	V	46.42	-48.81	-27	21.81
10576.31	H	60.33	-34.90	-27	7.90
17522.94	H	64.93	-30.30	-27	3.30
15831.31	H	48.55	-46.68	-27	19.68

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)
10643.98	V	63.72	-31.51	-27	4.51
17499.78	V	64.33	-30.90	-27	3.90
15957.75	V	47.79	-47.44	-27	20.44
10654.94	H	61.57	-33.66	-27	6.66
17525.06	H	64.36	-30.87	-27	3.87
15965.19	H	47.81	-47.42	-27	20.42

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

ANT1:

Test mode: 802.11n(20)		Frequency(MHz): 5260			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7242.121	V	52.25	74.00	21.75	peak
15780.00	V	57.88	74.00	16.12	peak
17940.47	V	65.81	74.00	8.19	peak
7242.121	V	39.23	54.00	14.77	AVG
15780.00	V	48.00	54.00	6.00	AVG
17940.47	V	47.59	54.00	6.41	AVG
7004.002	H	52.02	74.00	21.98	peak
15780.00	H	58.36	74.00	15.64	peak
17974.48	H	65.61	74.00	8.39	peak
7004.002	H	39.56	54.00	14.44	AVG
15780.00	H	47.86	54.00	6.14	AVG
17974.48	H	47.89	54.00	6.11	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5280			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10562.5	V	62.53	74.00	11.47	peak
15849.5	V	64.04	74.00	9.96	peak
17494.25	V	65.06	74.00	8.94	peak
10562.5	V	44.44	54.00	9.56	AVG
15849.5	V	46.68	54.00	7.32	AVG
17494.25	V	48.27	54.00	5.73	AVG
10564.62	H	60.41	74.00	13.59	peak
15834.62	H	60.55	74.00	13.45	peak
17511.25	H	65.09	74.00	8.91	peak
10564.62	H	40.38	54.00	13.62	AVG
15834.62	H	48.73	54.00	5.27	AVG
17511.25	H	48.76	54.00	5.24	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5320			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10645.37	V	63.85	74.00	10.15	peak
15960	V	62.47	74.00	11.53	peak
17498.5	V	64.36	74.00	9.64	peak
10645.37	V	43.48	54.00	10.52	AVG
15960	V	48.05	54.00	5.95	AVG
17498.5	V	47.80	54.00	6.20	AVG
10643.25	H	61.65	74.00	12.35	peak
15968.5	H	61.91	74.00	12.09	peak
17513.37	H	64.52	74.00	9.48	peak
10643.25	H	39.41	54.00	14.59	AVG
15968.5	H	47.99	54.00	6.01	AVG
17513.37	H	49.70	54.00	4.30	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
7240.731	V	52.12	74.00	21.88	peak
15778.610	V	57.72	74.00	16.28	peak
17941.750	V	65.78	74.00	8.22	peak
7243.401	V	39.21	54.00	14.79	AVG
15777.750	V	47.74	54.00	6.26	AVG
17938.220	V	47.4	54.00	6.6	AVG
7015.692	H	51.94	74.00	22.06	peak
15791.690	H	58.15	74.00	15.85	peak
17986.170	H	65.45	74.00	8.55	peak
7015.692	H	39.42	54.00	14.58	AVG
15776.690	H	47.68	54.00	6.32	AVG
17971.170	H	47.76	54.00	6.24	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5280			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10561.110	V	62.4	74.00	11.6	peak
15848.110	V	63.88	74.00	10.12	peak
17495.530	V	65.03	74.00	8.97	peak
10563.780	V	44.42	54.00	9.58	AVG
15847.250	V	46.42	54.00	7.58	AVG
17492.000	V	48.08	54.00	5.92	AVG
10576.310	H	60.33	74.00	13.67	peak
15846.310	H	60.34	74.00	13.66	peak
17522.940	H	64.93	74.00	9.07	peak
10576.310	H	40.24	54.00	13.76	AVG
15831.310	H	48.55	54.00	5.45	AVG
17507.940	H	48.63	54.00	5.37	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5320			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
10643.980	V	63.72	74.00	10.28	peak
15958.610	V	62.31	74.00	11.69	peak
17499.780	V	64.33	74.00	9.67	peak
10646.650	V	43.46	54.00	10.54	AVG
15957.750	V	47.79	54.00	6.21	AVG
17496.250	V	47.61	54.00	6.39	AVG
10654.940	H	61.57	74.00	12.43	peak
15980.190	H	61.7	74.00	12.3	peak
17525.060	H	64.36	74.00	9.64	peak
10654.940	H	39.27	54.00	14.73	AVG
15965.190	H	47.81	54.00	6.19	AVG
17510.060	H	49.57	54.00	4.43	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
5131.8	V	49.93	-45.3	-27	Pass
5145.450	H	50.08	-45.15	-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
5350	V	60.31	-34.92	-27	Pass
5353.300	H	61.04	-34.19	-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): 5260

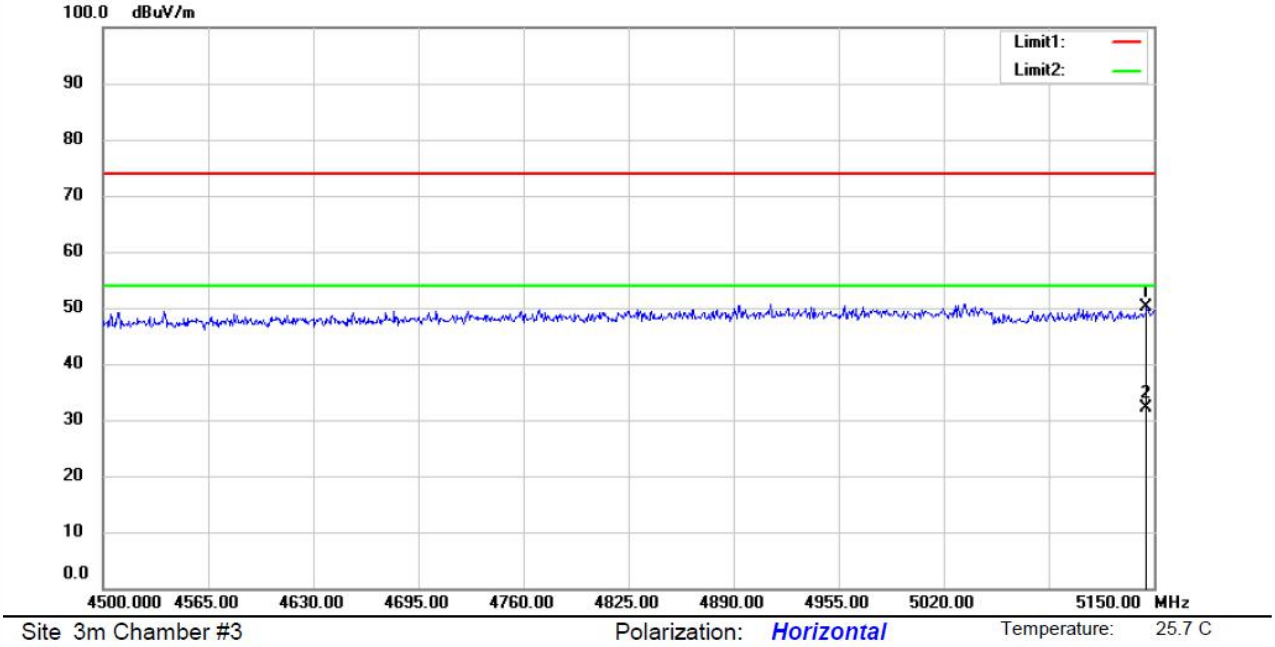
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5131.800	V	49.93	74.00	24.07	peak
5131.8	V	31.25	54.00	22.75	AVG
5145.450	H	50.08	74.00	23.92	peak
5145.45	H	32.18	54.00	21.82	AVG

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

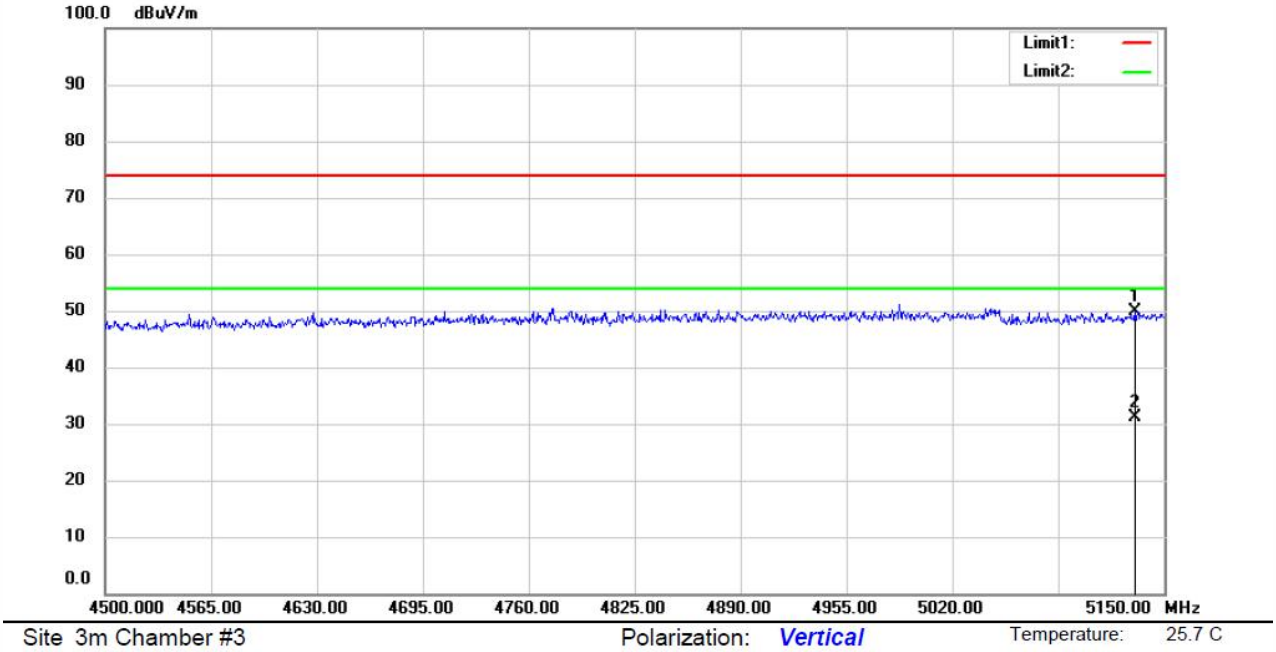
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5350.000	V	60.31	74.00	13.69	peak
5350	V	43.52	54.00	10.48	AVG
5353.300	H	61.04	74.00	12.96	peak
5353.3	H	44.80	54.00	9.20	AVG

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.

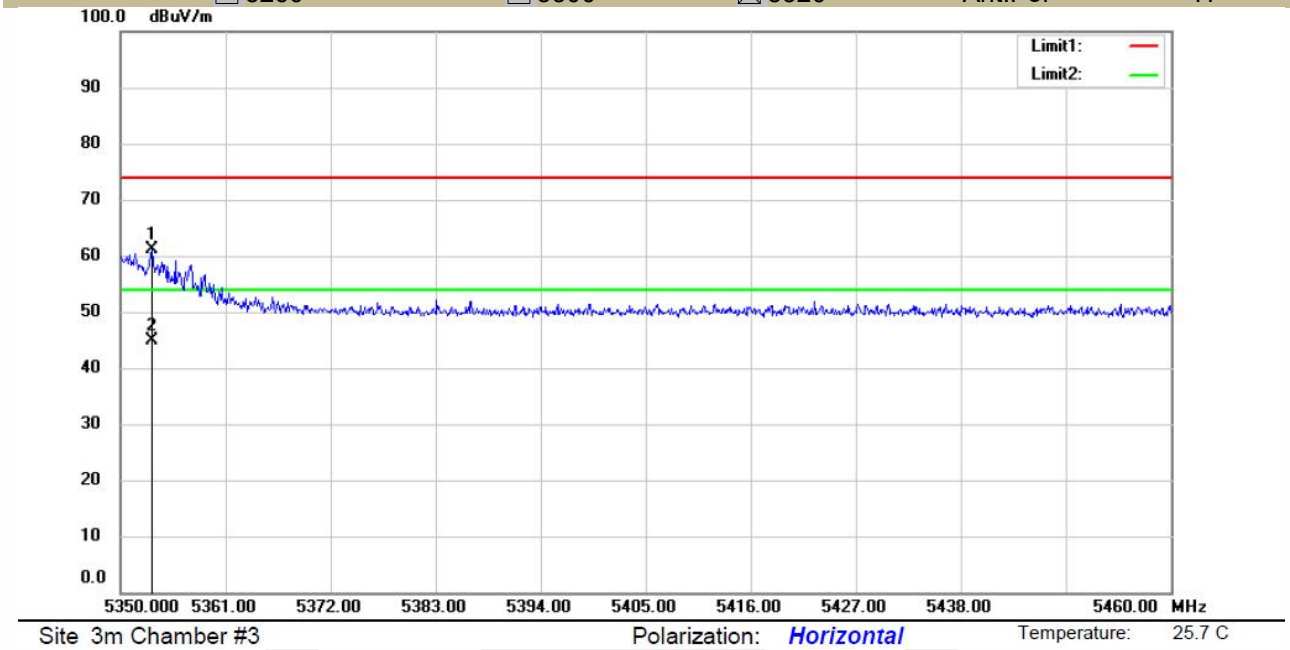
Test Model	U-NII -2A Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz) ☐ 802.11a ☒ 802.11n(HT20) ☐ 802.11 ac (VHT20) ☒ 5260 ☐ 5300 ☐ 5320 Ant.Pol H



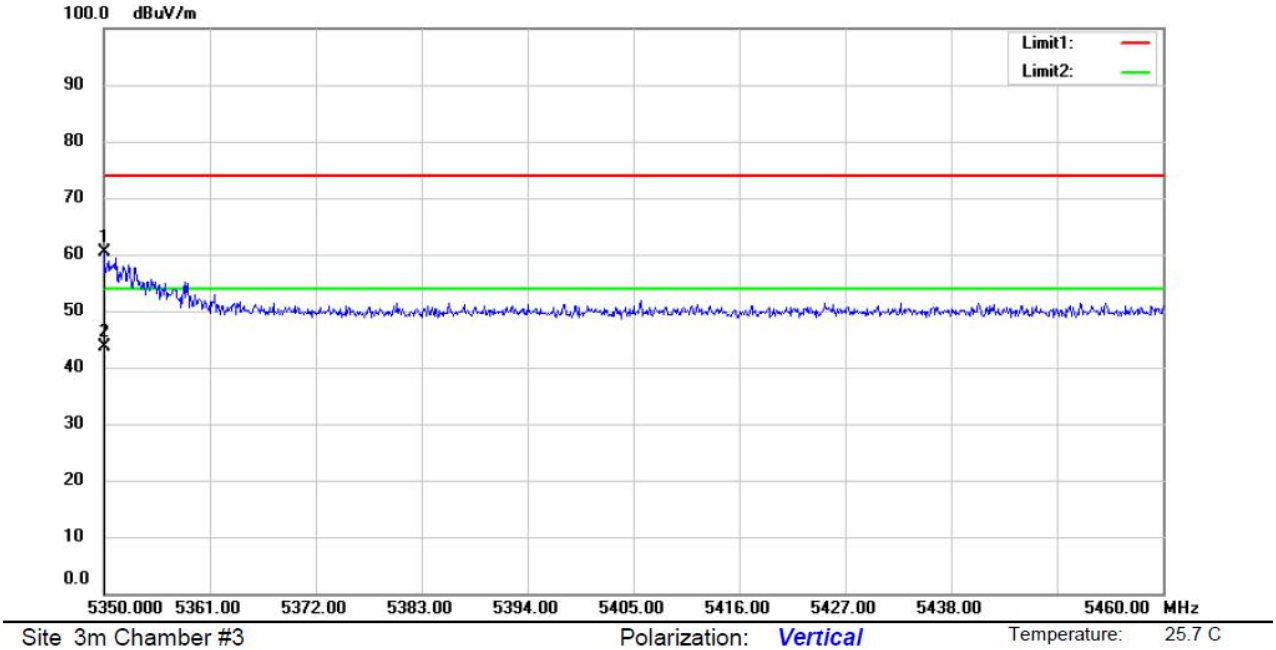
Test Model	U-NII -2A Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz) ☐ 802.11a ☒ 802.11n(HT20) ☐ 802.11 ac (VHT20) ☒ 5260 ☐ 5300 ☐ 5320 Ant.Pol V



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



Test Model	U-NII -2A 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
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 ANT1 and MIMO as below:

ANT1:

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)
5906.953	V	50.11	-45.12	-27	18.12
11000.00	V	58.93	-36.3	-27	9.3
17957.47	V	64.00	-31.23	-27	4.23
7514.257	H	53.58	-41.65	-27	14.65
11001.00	H	60.76	-34.47	-27	7.47
17880.94	H	64.09	-31.14	-27	4.14

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)
7046.523	V	53.31	-41.92	-27	14.92
11171.08	V	61.07	-34.16	-27	7.16
17523.76	V	65.09	-30.14	-27	3.14
7420.710	H	53.14	-42.09	-27	15.09
11154.07	H	63.00	-32.23	-27	5.23
17506.75	H	65.38	-29.85	-27	2.85

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)
7233.616	V	53.70	-41.53	-27	14.53
11400.00	V	58.98	-36.25	-27	9.25
17515.25	V	64.98	-30.25	-27	3.25
7981.991	H	54.84	-40.39	-27	13.39
11400.00	H	60.20	-35.03	-27	8.03
17498.24	H	65.28	-29.95	-27	2.95

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)
5905.563	V	49.98	-45.25	-27	18.25
17958.75	V	63.97	-31.26	-27	4.26
10998.74	V	48.73	-46.50	-27	19.50
7525.947	H	53.5	-41.73	-27	14.73
17892.63	H	63.93	-31.30	-27	4.30
10999.77	H	50.02	-45.21	-27	18.21

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)
7045.133	V	53.18	-42.05	-27	15.05
17525.04	V	65.06	-30.17	-27	3.17
11156.78	V	49.55	-45.68	-27	18.68
7432.4	H	53.06	-42.17	-27	15.17
17518.44	H	65.22	-30.01	-27	3.01
11156.33	H	46.81	-48.42	-27	21.42

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)
7232.226	V	53.57	-41.66	-27	14.66
17516.53	V	64.95	-30.28	-27	3.28
11397.07	V	48.19	-47.04	-27	20.04
7993.681	H	54.76	-40.47	-27	13.47
17509.93	H	65.12	-30.11	-27	3.11
11396.58	H	49.26	-45.97	-27	18.97

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

ANT1:

Test mode: 802.11n(20)		Frequency(MHz): 5500			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5906.953	V	50.11	74.00	23.89	peak
11000.00	V	58.93	74.00	15.07	peak
17957.47	V	64.00	74.00	10.00	peak
5906.959	V	37.12	54.00	16.88	AVG
11000.99	V	48.99	54.00	5.01	AVG
17957.47	V	48.69	54.00	5.31	AVG
7514.257	H	53.58	74.00	20.42	peak
11001.00	H	60.76	74.00	13.24	peak
17880.94	H	64.09	74.00	9.91	peak
7514.257	H	40.32	54.00	13.68	AVG
11003.08	H	50.20	54.00	3.80	AVG
17880.94	H	48.30	54.00	5.70	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5580			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7046.523	V	53.31	74.00	20.69	peak
11171.08	V	61.07	74.00	12.93	peak
17523.76	V	65.09	74.00	8.91	peak
7046.523	V	40.17	54.00	13.83	AVG
11159.03	V	49.81	54.00	4.19	AVG
17523.76	V	50.39	54.00	3.61	AVG
7420.710	H	53.14	74.00	20.86	peak
11154.08	H	63.00	74.00	11.00	peak
17506.75	H	65.38	74.00	8.62	peak
7420.710	H	40.37	54.00	13.63	AVG
11159.64	H	46.99	54.00	7.01	AVG
17506.75	H	50.93	54.00	3.07	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5700			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7233.616	V	53.70	74.00	20.30	peak
11400.00	V	58.98	74.00	15.02	peak
17515.25	V	64.98	74.00	9.02	peak
7233.616	V	40.20	54.00	13.80	AVG
11399.32	V	48.45	54.00	5.55	AVG
17515.25	V	50.09	54.00	3.91	AVG
7981.991	H	54.84	74.00	19.16	peak
11400.00	H	60.20	74.00	13.80	peak
17498.24	H	65.28	74.00	8.72	peak
7981.991	H	41.18	54.00	12.82	AVG
11399.89	H	49.44	54.00	4.56	AVG
17498.24	H	50.48	54.00	3.52	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
5905.563	V	49.98	74.00	24.02	peak
10998.610	V	58.77	74.00	15.23	peak
17958.750	V	63.97	74.00	10.03	peak
5908.239	V	37.1	54.00	16.9	AVG
10998.740	V	48.73	54.00	5.27	AVG
17955.220	V	48.5	54.00	5.5	AVG
7525.947	H	53.5	74.00	20.5	peak
11012.690	H	60.55	74.00	13.45	peak
17892.630	H	63.93	74.00	10.07	peak
7525.947	H	40.18	54.00	13.82	AVG
10999.770	H	50.02	54.00	3.98	AVG
17877.630	H	48.17	54.00	5.83	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5580			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7045.133	V	53.18	74.00	20.82	peak
11169.690	V	60.91	74.00	13.09	peak
17525.040	V	65.06	74.00	8.94	peak
7047.803	V	40.15	54.00	13.85	AVG
11156.780	V	49.55	54.00	4.45	AVG
17521.510	V	50.2	54.00	3.8	AVG
7432.400	H	53.06	74.00	20.94	peak
11165.770	H	62.79	74.00	11.21	peak
17518.440	H	65.22	74.00	8.78	peak
7432.400	H	40.23	54.00	13.77	AVG
11156.330	H	46.81	54.00	7.19	AVG
17503.440	H	50.8	54.00	3.2	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5700			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7232.226	V	53.57	74.00	20.43	peak
11398.610	V	58.82	74.00	15.18	peak
17516.530	V	64.95	74.00	9.05	peak
7234.896	V	40.18	54.00	13.82	AVG
11397.070	V	48.19	54.00	5.81	AVG
17513.000	V	49.9	54.00	4.1	AVG
7993.681	H	54.76	74.00	19.24	peak
11411.690	H	59.99	74.00	14.01	peak
17509.930	H	65.12	74.00	8.88	peak
7993.681	H	41.04	54.00	12.96	AVG
11396.580	H	49.26	54.00	4.74	AVG
17494.930	H	50.35	54.00	3.65	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
5469.45	V	63.83	-31.4	-27	Pass
5469.600	H	65.79	-29.44	-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
5726.55	V	53.31	-41.92	-27	Pass
5725.550	H	52.78	-42.45	-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

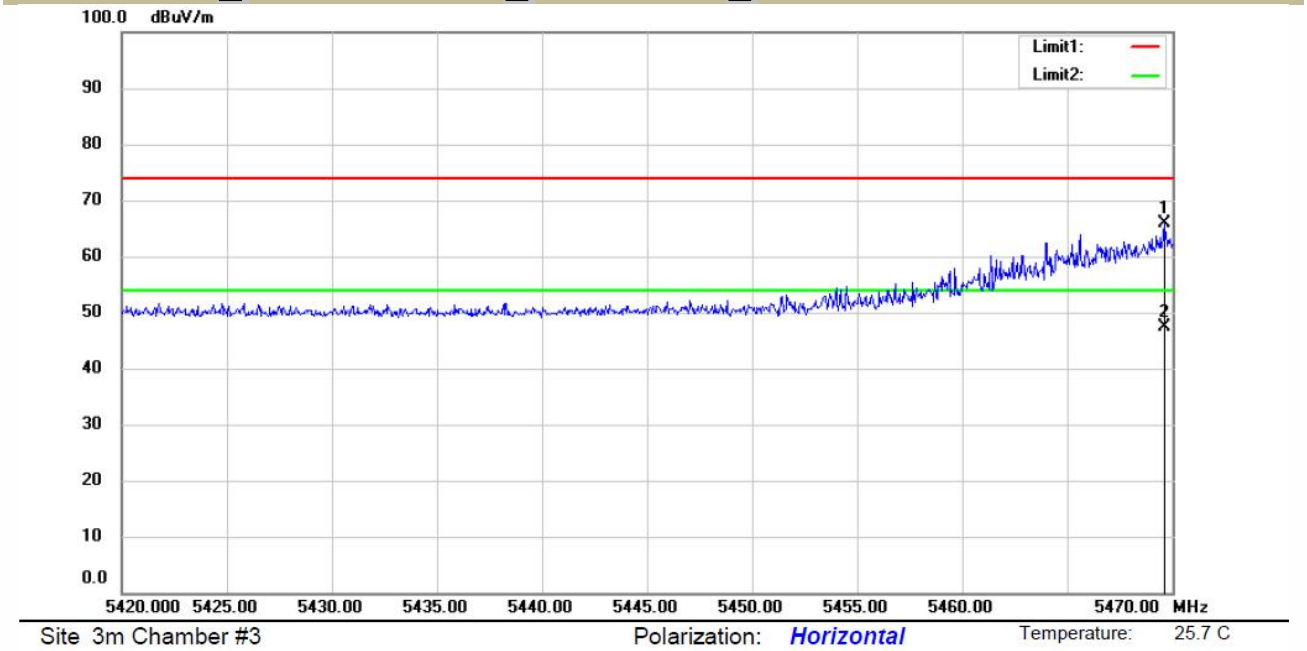
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5469.450	V	63.83	74.00	10.17	peak
5469.45	V	46.82	54.00	7.18	AVG
5469.600	H	65.79	74.00	8.21	peak
5469.6	H	47.33	54.00	6.67	AVG

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

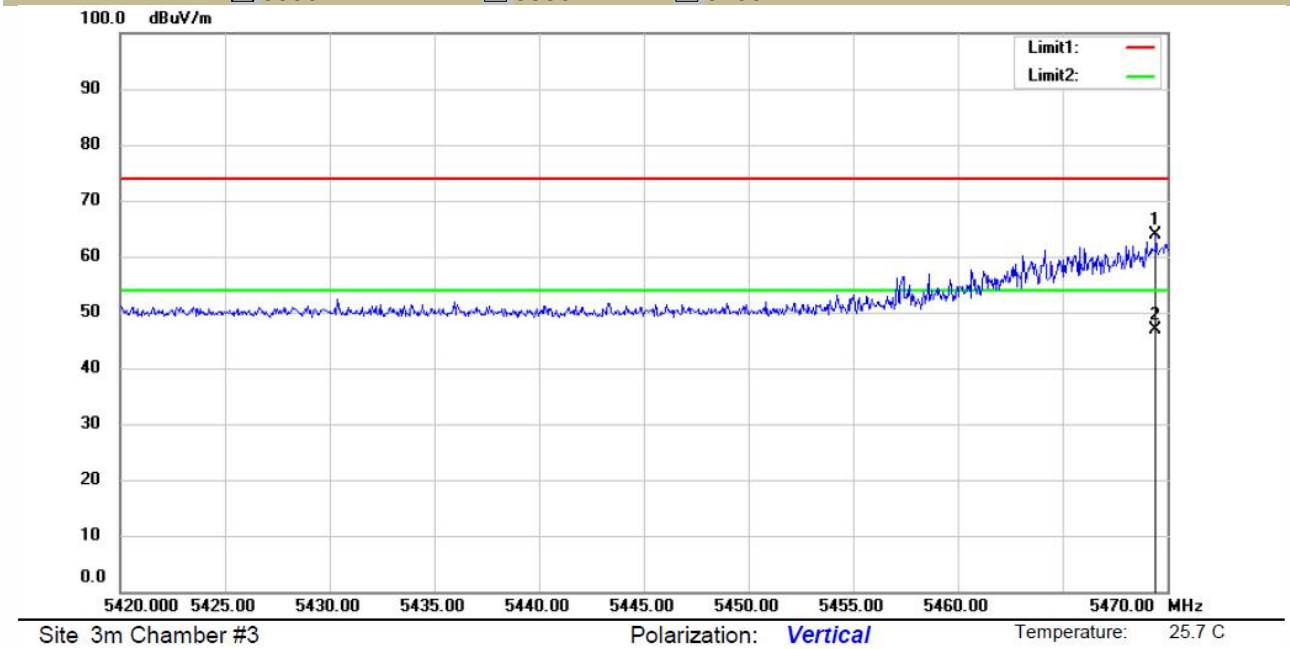
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
5726.550	V	53.31	74.00	20.69	peak
5726.55	V	35.29	54.00	18.71	AVG
5725.550	H	52.78	74.00	21.22	peak
5725.55	H	34.69	54.00	19.31	AVG

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.

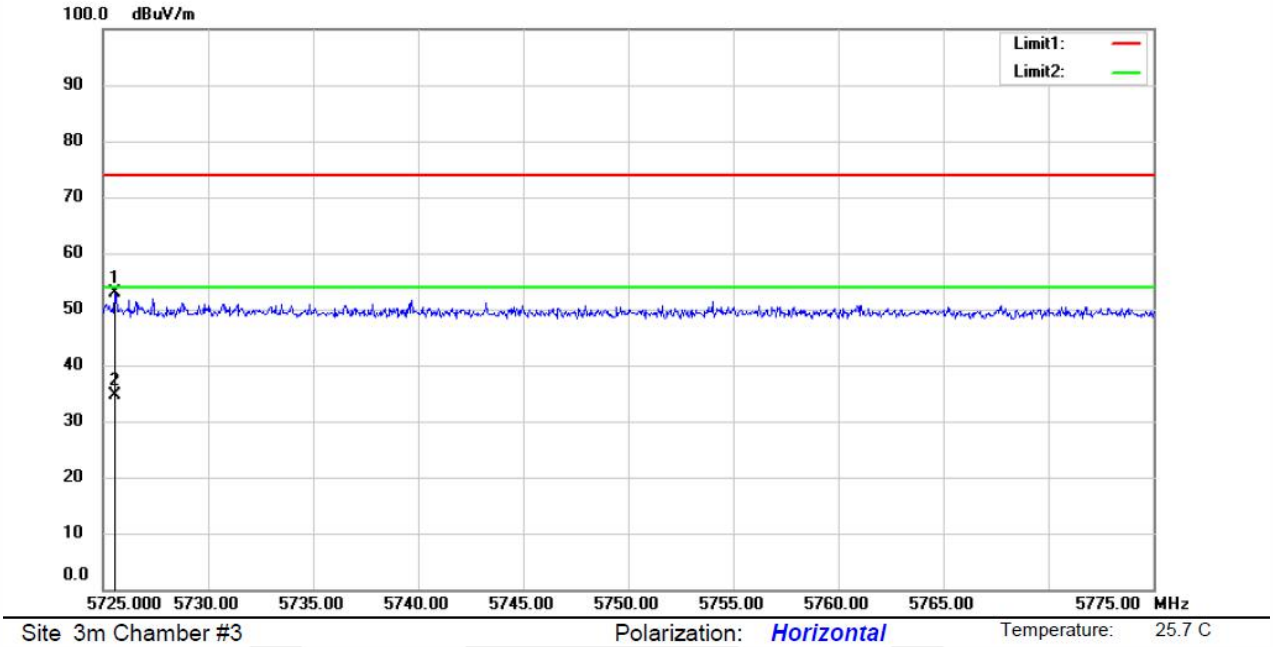
Test Model	U-NII -2C Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz) ☐ 802.11a ☒ 802.11n(HT20) ☐ 802.11 ac (VHT20) ☒ 5500 ☐ 5580 ☐ 5700 Ant.Pol H



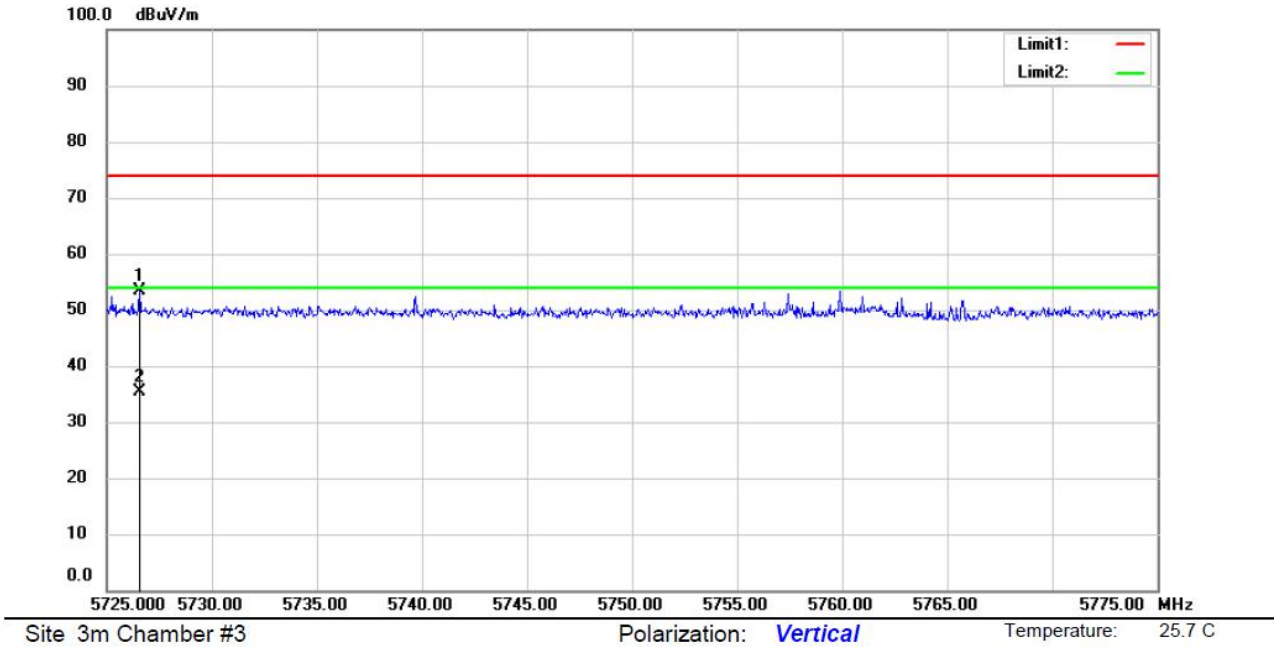
Test Model	U-NII -2C Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz) ☐ 802.11a ☒ 802.11n(HT20) ☐ 802.11 ac (VHT20) ☒ 5500 ☐ 5580 ☐ 5700 Ant.Pol V



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



Test Model	U-NII -2C 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
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 ANT1 and MIMO as below:

ANT1:

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)
6451.225	V	51.62	-43.61	-27	16.61
11490.00	V	60.23	-35	-27	8
17948.97	V	64.37	-30.86	-27	3.86
6485.242	H	51.40	-43.83	-27	16.83
11590.00	H	58.64	-36.59	-27	9.59
17489.74	H	65.45	-29.78	-27	2.78

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)
7395.197	V	52.99	-42.24	-27	15.24
11502.75	V	60.91	-34.32	-27	7.32
17498.24	V	65.27	-29.96	-27	2.96
6663.831	H	51.85	-43.38	-27	16.38
11570.78	H	62.66	-32.57	-27	5.57
17489.74	H	65.38	-29.85	-27	2.85

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)
6493.746	V	52.43	-42.8	-27	15.8
11650.00	V	59.71	-35.52	-27	8.52
17498.24	V	66.26	-28.97	-27	1.97
7029.514	H	52.53	-42.7	-27	15.7
11650.00	H	60.88	-34.35	-27	7.35
17489.74	H	65.17	-30.06	-27	3.06

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)
6449.835	V	51.49	-43.74	-27	16.74
17950.25	V	64.34	-30.89	-27	3.89
11499.69	V	48.05	-47.18	-27	20.18
6496.932	H	51.32	-43.91	-27	16.91
17501.43	H	65.29	-29.94	-27	2.94
11531.69	H	47.74	-47.49	-27	20.49

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)
7393.807	V	52.86	-42.37	-27	15.37
17499.52	V	65.24	-29.99	-27	2.99
11557.38	V	48.12	-47.11	-27	20.11
6675.521	H	51.77	-43.46	-27	16.46
17501.43	H	65.22	-30.01	-27	3.01
11568.28	H	51.38	-43.85	-27	16.85

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)
6492.356	V	52.3	-42.93	-27	15.93
17499.52	V	66.23	-29.00	-27	2.00
11649.15	V	49.53	-45.70	-27	18.70
7041.204	H	52.45	-42.78	-27	15.78
17501.43	H	65.01	-30.22	-27	3.22
11645.88	H	51.71	-43.52	-27	16.52

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

ANT1:

Test mode: 802.11n(20)		Frequency(MHz): 5745			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
6451.225	V	51.62	74.00	22.38	peak
11490.00	V	60.23	74.00	13.77	peak
17948.97	V	64.37	74.00	9.63	peak
6451.225	V	39.23	54.00	14.77	AVG
11501.94	V	48.31	54.00	5.69	AVG
17948.97	V	47.92	54.00	6.08	AVG
6485.242	H	51.40	74.00	22.60	peak
11590.00	H	58.64	74.00	15.36	peak
17489.74	H	65.45	74.00	8.55	peak
6485.242	H	38.99	54.00	15.01	AVG
11535.00	H	47.92	54.00	6.08	AVG
17489.74	H	49.74	54.00	4.26	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5785			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7395.197	V	52.99	74.00	21.01	peak
11502.75	V	60.91	74.00	13.09	peak
17498.24	V	65.27	74.00	8.73	peak
7395.197	V	40.05	54.00	13.95	AVG
11559.63	V	48.38	54.00	5.62	AVG
17498.24	V	50.48	54.00	3.52	AVG
6663.831	H	51.85	74.00	22.15	peak
11570.78	H	62.66	74.00	11.34	peak
17489.74	H	65.38	74.00	8.62	peak
6663.831	H	37.90	54.00	16.10	AVG
11571.59	H	51.56	54.00	2.44	AVG
17489.74	H	48.64	54.00	5.36	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5825			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
6493.746	V	52.43	74.00	21.57	peak
11650.00	V	59.71	74.00	14.29	peak
17498.24	V	66.26	74.00	7.74	peak
6493.746	V	38.31	54.00	15.69	AVG
11651.40	V	49.79	54.00	4.21	AVG
17498.24	V	46.81	54.00	7.19	AVG
7029.514	H	52.53	74.00	21.47	peak
11650.00	H	60.88	74.00	13.12	peak
17489.74	H	65.17	74.00	8.83	peak
7029.514	H	39.23	54.00	14.77	AVG
11649.19	H	51.89	54.00	2.11	AVG
17489.74	H	46.73	54.00	7.27	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
6449.835	V	51.49	74.00	22.51	peak
11488.610	V	60.07	74.00	13.93	peak
17950.250	V	64.34	74.00	9.66	peak
6452.505	V	39.21	54.00	14.79	AVG
11499.690	V	48.05	54.00	5.95	AVG
17946.720	V	47.73	54.00	6.27	AVG
6496.932	H	51.32	74.00	22.68	peak
11601.690	H	58.43	74.00	15.57	peak
17501.430	H	65.29	74.00	8.71	peak
6496.932	H	38.85	54.00	15.15	AVG
11531.690	H	47.74	54.00	6.26	AVG
17486.430	H	49.61	54.00	4.39	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5785			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7393.807	V	52.86	74.00	21.14	peak
11501.360	V	60.75	74.00	13.25	peak
17499.520	V	65.24	74.00	8.76	peak
7396.477	V	40.03	54.00	13.97	AVG
11557.380	V	48.12	54.00	5.88	AVG
17495.990	V	50.29	54.00	3.71	AVG
6675.521	H	51.77	74.00	22.23	peak
11582.470	H	62.45	74.00	11.55	peak
17501.430	H	65.22	74.00	8.78	peak
6675.521	H	37.76	54.00	16.24	AVG
11568.280	H	51.38	54.00	2.62	AVG
17486.430	H	48.51	54.00	5.49	AVG

Test mode: 802.11n(20)		Frequency(MHz): 5825			
Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
6492.356	V	52.3	74.00	21.7	peak
11648.610	V	59.55	74.00	14.45	peak
17499.520	V	66.23	74.00	7.77	peak
6495.026	V	38.29	54.00	15.71	AVG
11649.150	V	49.53	54.00	4.47	AVG
17495.990	V	46.62	54.00	7.38	AVG
7041.204	H	52.45	74.00	21.55	peak
11661.690	H	60.67	74.00	13.33	peak
17501.430	H	65.01	74.00	8.99	peak
7041.204	H	39.09	54.00	14.91	AVG
11645.880	H	51.71	54.00	2.29	AVG
17486.430	H	46.6	54.00	7.4	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.

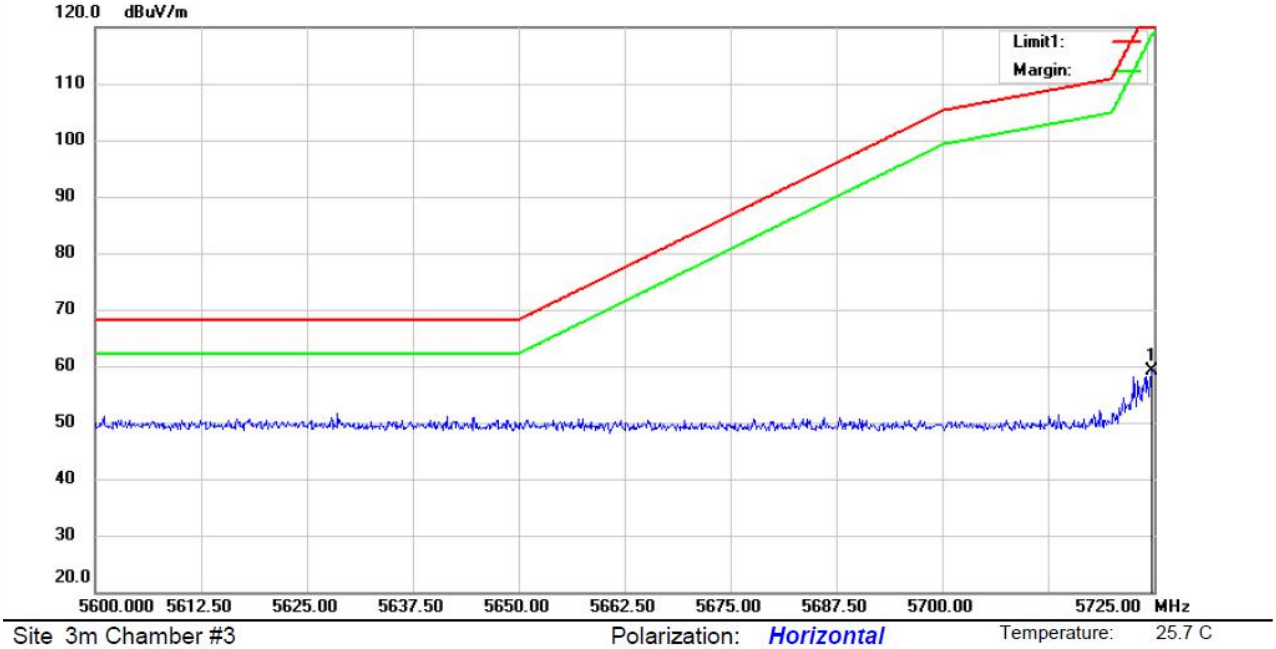
- ☒ Undesirable radiated Spurious Emission in band edge

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
5724.750	H	59.10	-36.13	-27	PASS
5725.000	V	59.35	-35.88	-27	PASS

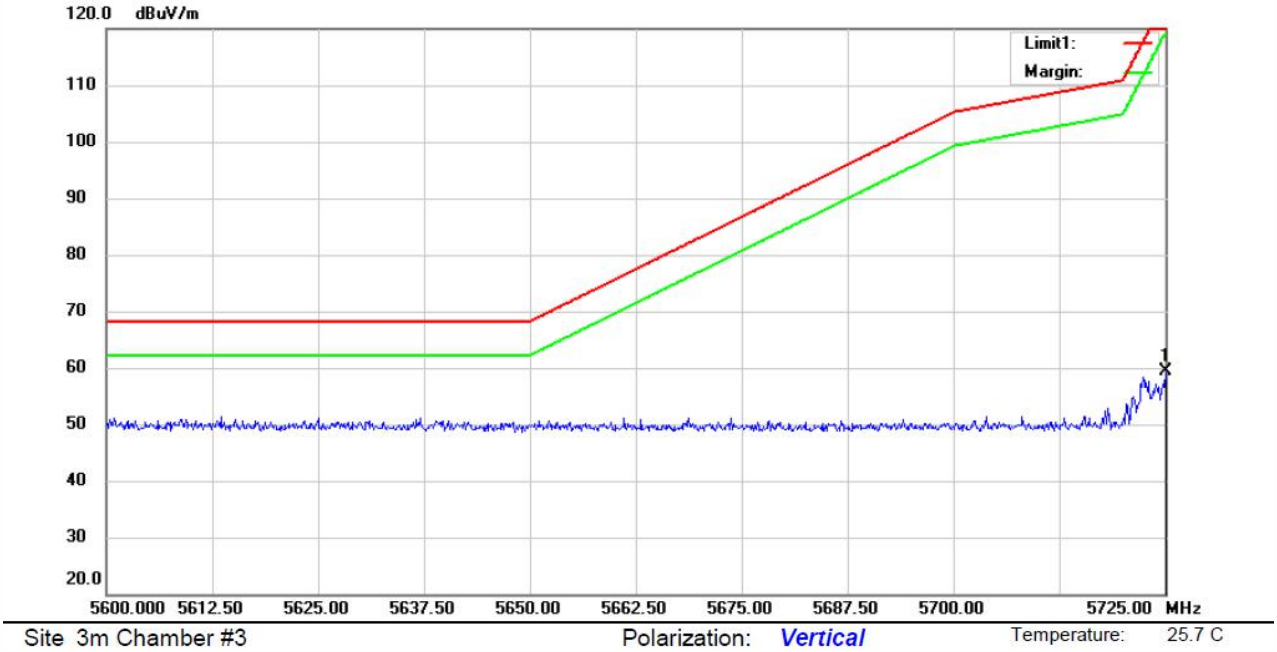
Test mode:	802.11n(20)	Frequency:	5825		
Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5850.000	H	54.06	-41.17	-27	PASS
5852.250	V	53.58	-41.65	-27	PASS

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

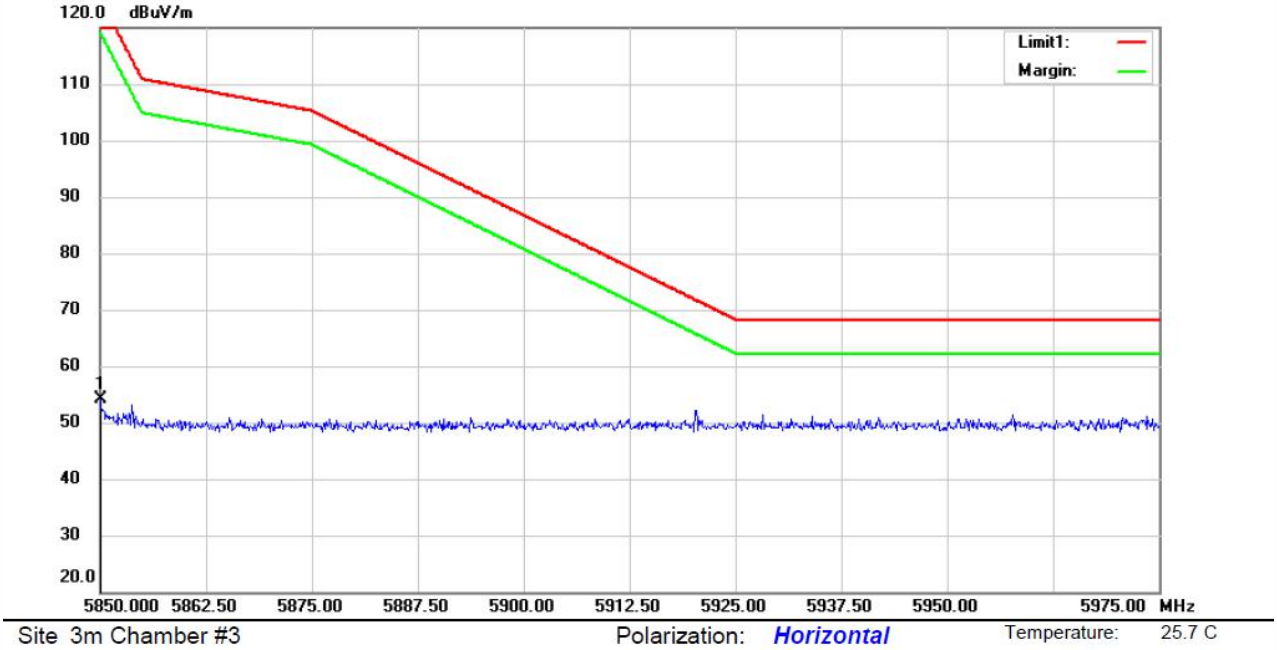
Test Model	U-NII -3 Undesirable radiated Undesirable radiated Spurious Emission in Band Edge ☐ 802.11a ☒ 802.11n(HT20) ☐ 802.11n(HT40) ☒ 5745 Ant.Pol H



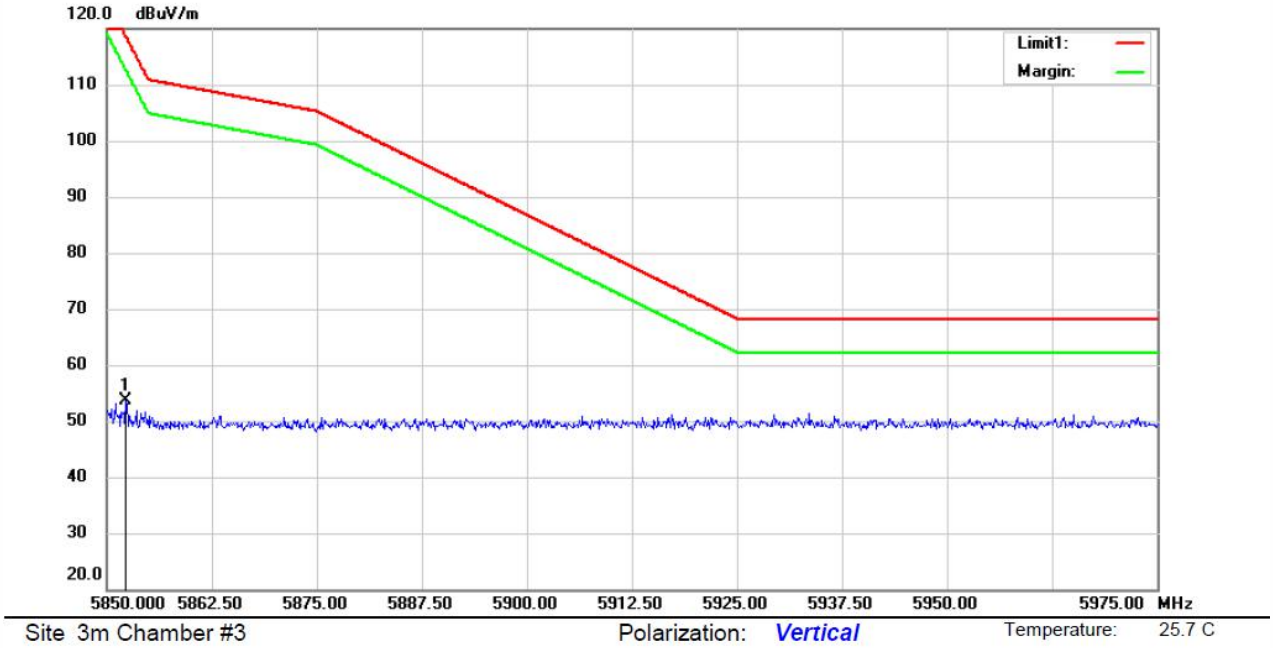
Test Model	U-NII -3 Undesirable radiated Undesirable radiated Spurious Emission in Band Edge ☐ 802.11a ☒ 802.11n(HT20) ☐ 802.11n(HT40) ☒ 5745 Ant.Pol V



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

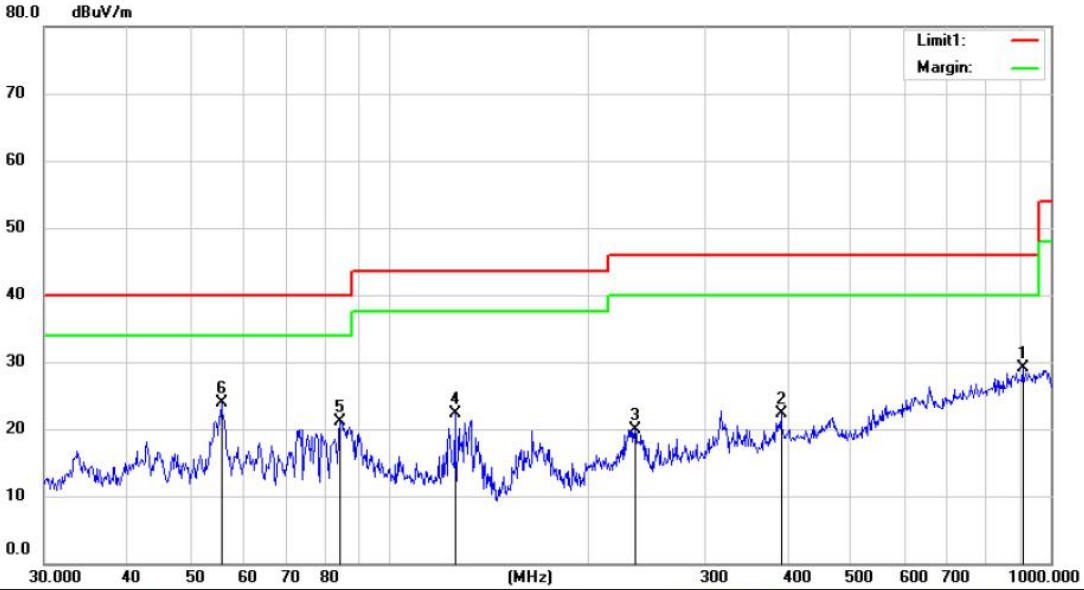


Test Model	U-NII -3 Undesirable radiated Undesirable radiated Spurious Emission in Band Edge ☐ 802.11a ☒ 802.11n(HT20) ☐ 802.11n(HT40) ☒ 5825 Ant.Pol V



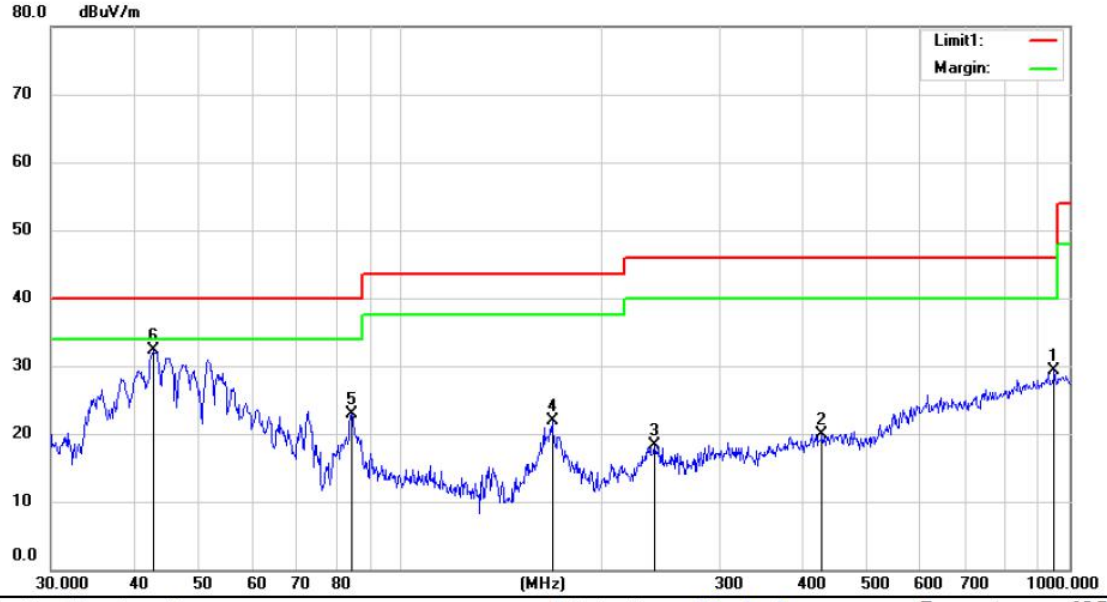
- Undesirable radiated Spurious Emission below 1GHz (30MHz to 1GHz)
  All modes have been tested, and the worst result recorded was report as below:

Test mode:	802.11a	Frequency(MHz):	5180



Site 3m Chamber #3 Polarization: ***Horizontal*** Temperature: 25.7 C

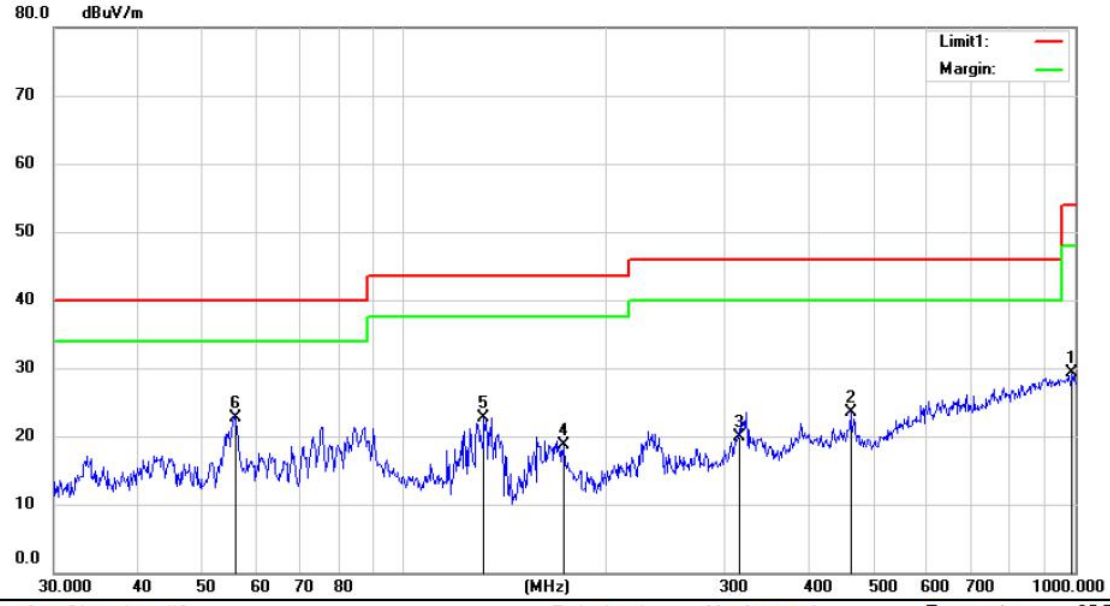
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		907.1184	33.46	-4.31	29.15	46.00	-16.85	QP			
2		391.4082	35.68	-13.43	22.25	46.00	-23.75	QP			
3		235.7337	36.94	-17.02	19.92	46.00	-26.08	QP			
4		125.6658	41.94	-19.68	22.26	43.50	-21.24	QP			
5		84.4054	41.53	-20.38	21.15	40.00	-18.85	QP			
6	*	55.7851	42.68	-18.82	23.86	40.00	-16.14	QP			



Site 3m Chamber #3 Polarization: *Vertical* Temperature: 25.7 C

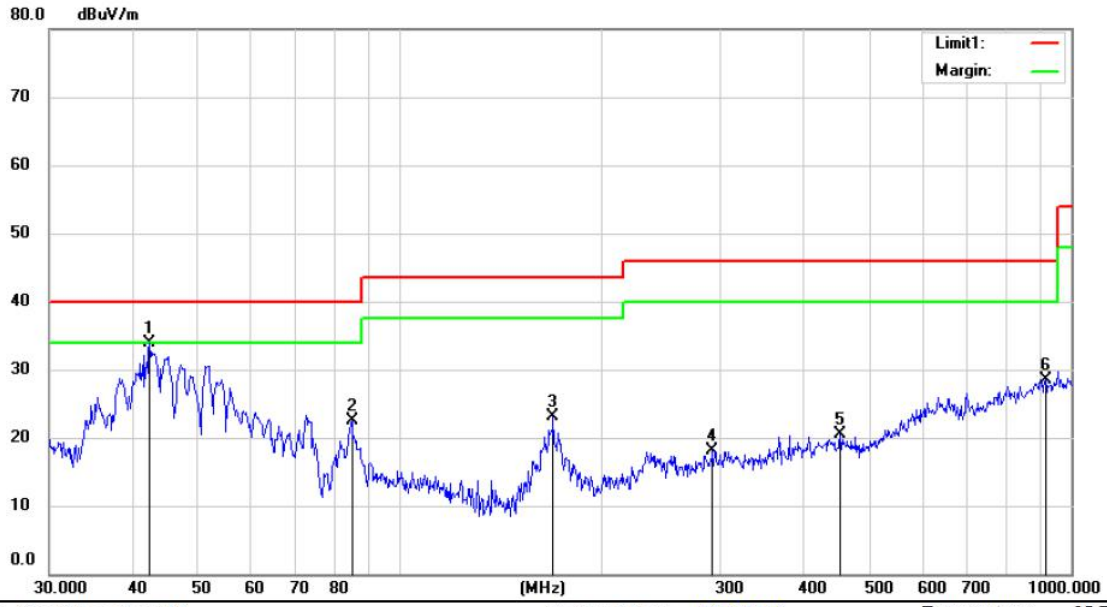
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		949.7596	32.96	-3.73	29.23	46.00	-16.77	QP			
2		427.7192	32.24	-12.35	19.89	46.00	-26.11	QP			
3		239.3151	35.21	-16.90	18.31	46.00	-27.69	QP			
4		168.4138	42.16	-20.25	21.91	43.50	-21.59	QP			
5		84.5536	43.14	-20.30	22.84	40.00	-17.16	QP			
6	*	42.8847	51.07	-18.85	32.22	40.00	-7.78	QP			

Test mode:	802.11a	Frequency(MHz):	5200



Site 3m Chamber #3 Polarization: *Horizontal* Temperature: 25.7 C

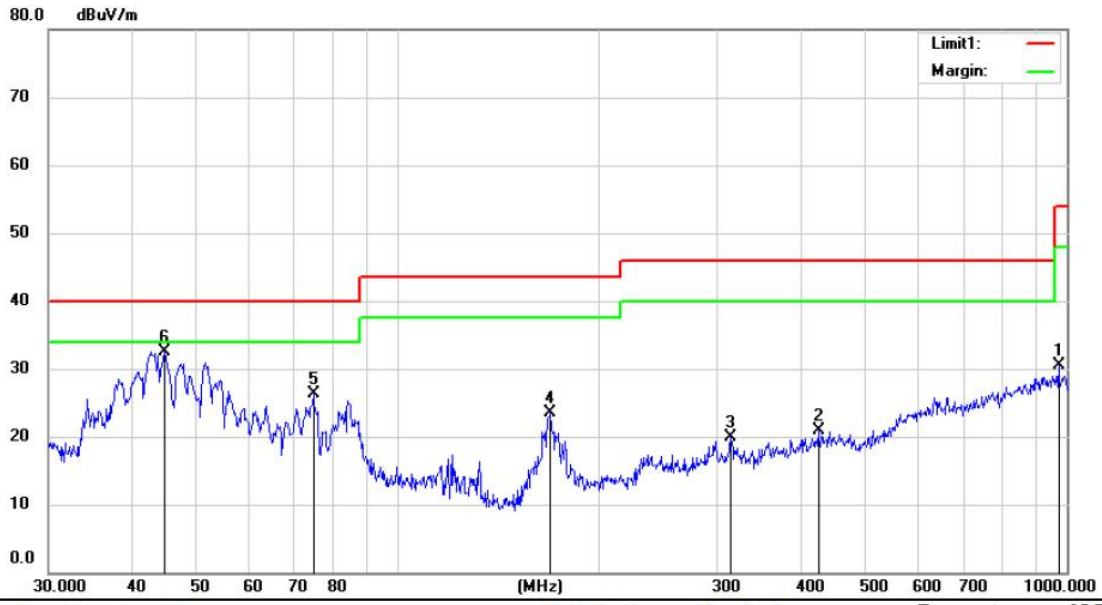
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		990.5770	32.81	-3.46	29.35	54.00	-24.65	QP			
2		463.3193	35.69	-12.15	23.54	46.00	-22.46	QP			
3		315.0386	34.92	-15.11	19.81	46.00	-26.19	QP			
4		173.1444	38.65	-19.88	18.77	43.50	-24.73	QP			
5		131.6192	43.78	-21.09	22.69	43.50	-20.81	QP			
6	*	56.0007	41.58	-18.83	22.75	40.00	-17.25	QP			



Site 3m Chamber #3 Polarization: *Vertical* Temperature: 25.7 C

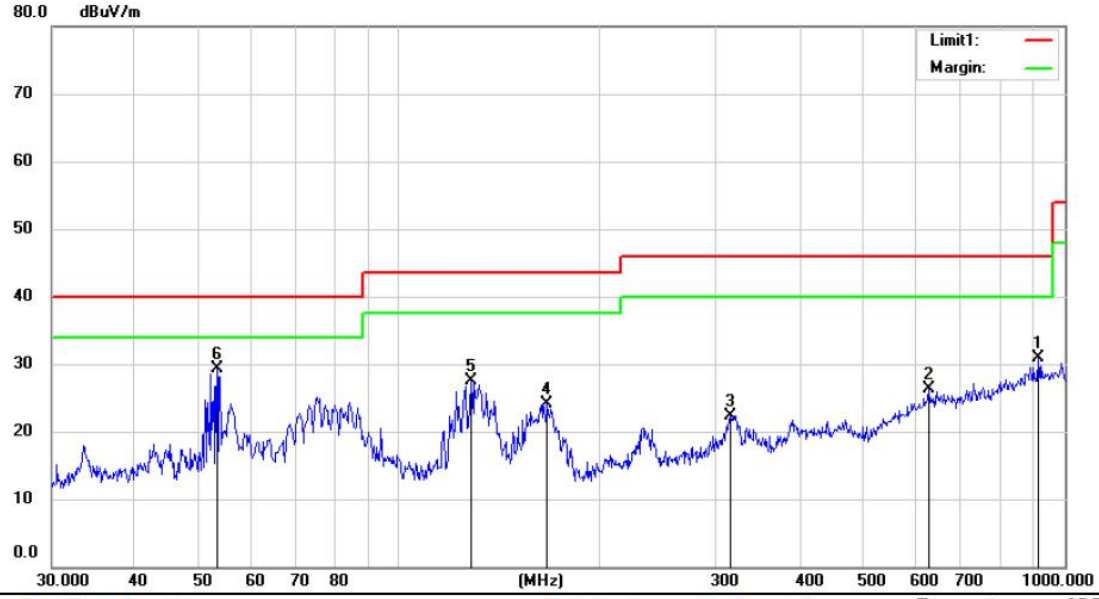
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	42.3022	52.71	-18.82	33.89	40.00	-6.11	QP			
2		84.8208	42.59	-20.17	22.42	40.00	-17.58	QP			
3		169.4801	43.27	-20.14	23.13	43.50	-20.37	QP			
4		292.5708	33.62	-15.59	18.03	46.00	-27.97	QP			
5		453.9915	32.82	-12.39	20.43	46.00	-25.57	QP			
6		916.7113	32.71	-4.21	28.50	46.00	-17.50	QP			

Test mode:	802.11a	Frequency(MHz):	5240



Site 3m Chamber #3 Polarization: *Vertical* Temperature: 25.7 C

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		974.7270	34.05	-3.62	30.43	54.00	-23.57	QP			
2		425.7740	33.12	-12.31	20.81	46.00	-25.19	QP			
3		314.8177	34.96	-15.11	19.85	46.00	-26.15	QP			
4		169.3020	43.64	-20.16	23.48	43.50	-20.02	QP			
5		74.7880	48.79	-22.49	26.30	40.00	-13.70	QP			
6	*	44.8691	51.38	-18.94	32.44	40.00	-7.56	QP			



Site 3m Chamber #3 Polarization: ***Horizontal*** Temperature: 25.7 C

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		913.5025	35.12	-4.24	30.88	46.00	-15.12	QP			
2		627.2738	35.24	-8.95	26.29	46.00	-19.71	QP			
3		314.7073	37.50	-15.11	22.39	46.00	-23.61	QP			
4		167.1782	44.44	-20.37	24.07	43.50	-19.43	QP			
5		128.2478	47.98	-20.49	27.49	43.50	-16.01	QP			
6	*	53.1686	47.87	-18.57	29.30	40.00	-10.70	QP			

8.5 POWER LINE CONDUCTED EMISSIONS

8.5.1 Applicable Standard

According to FCC Part 15.207(a)

8.5.2 Conformance Limit

Conducted Emission Limit		
Frequency(MHz)	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

Not applicable, since EUT is DC power.

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 PCB antenna, the antenna gain as below:
5150-5250MHz: ANT1: 3.92dBi , ANT2: 3.92dBi
5250-5350MHz: ANT1: 3.92dBi , ANT2: 3.92dBi
5470-5725MHz: ANT1: 3.92dBi , ANT2: 3.92dBi
5725-5850MHz: ANT1: 3.92dBi , ANT2: 3.92dBi

- ☒ 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 ---