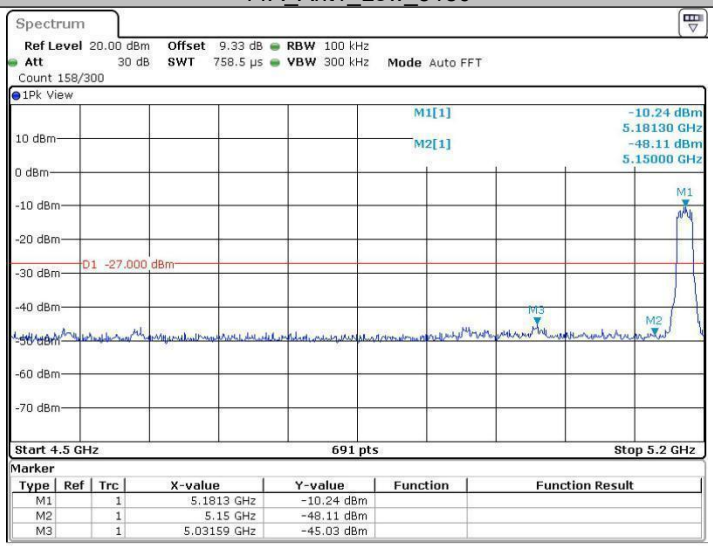
Test Result:

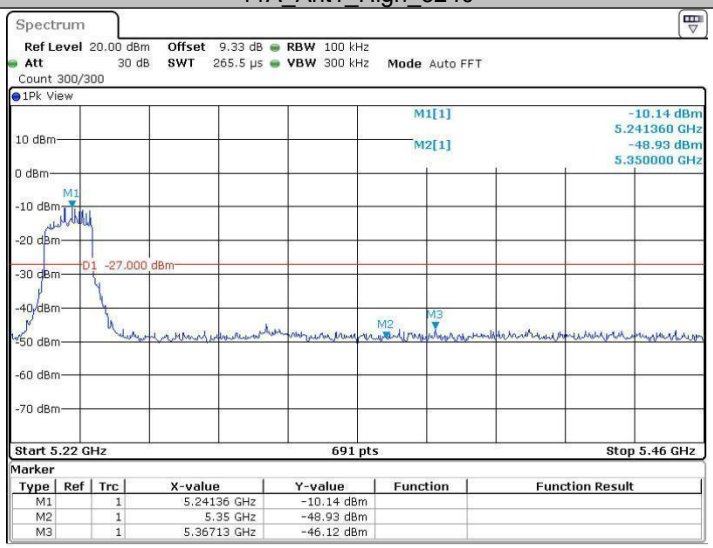
TestMode	ChName	Freq(MHz)	Result[dBm]	Limit[dBm]	Verdict
11A	Low	5180	-45.03	≤-27	PASS
	High	5240	-46.12	≤-27	PASS
11N20SISO	Low	5180	-44.98	≤-27	PASS
	High	5240	-46.02	≤-27	PASS
11N40SISO	Low	5190	-45.37	≤-27	PASS
	High	5230	-46.52	≤-27	PASS
11AC20SISO	Low	5180	-46.03	≤-27	PASS
	High	5240	-46.79	≤-27	PASS
11AC40SISO	Low	5190	-45.55	≤-27	PASS
	High	5230	-45.41	≤-27	PASS
11AC80SISO	Low	5210	-45.69	≤-27	PASS
	High	5210	-46.51	≤-27	PASS

11A_Ant1_Low_5180



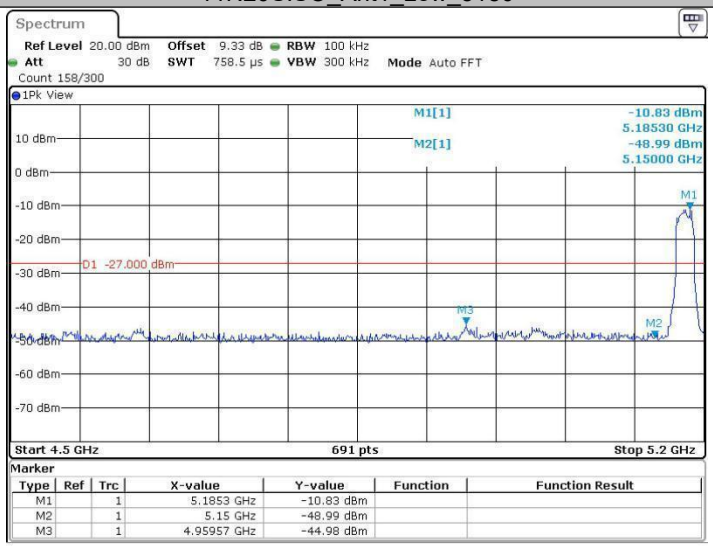
Date: 25.MAY.2023 15:31:42

11A_Ant1_High_5240



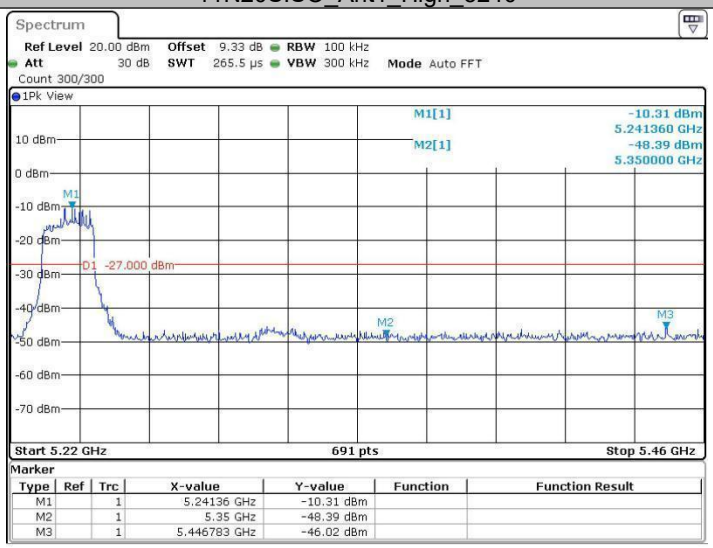
Date: 25.MAY.2023 15:37:39

11N20SISO_Ant1_Low_5180



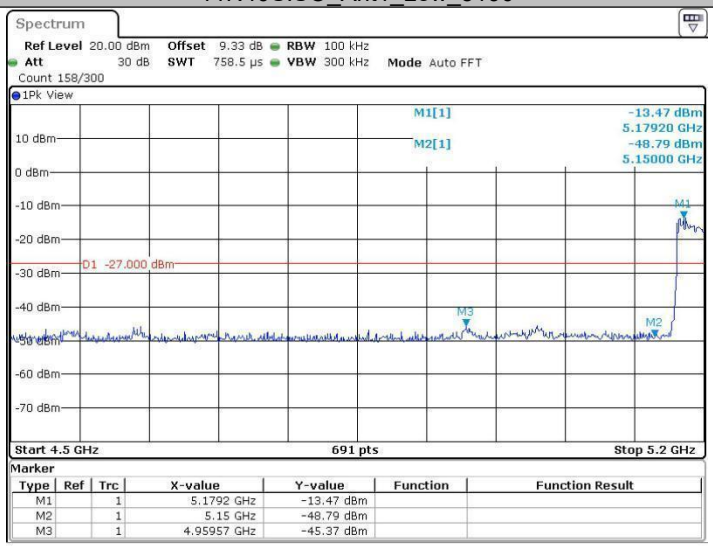
Date: 25.MAY.2023 15:41:30

11N20SISO_Ant1_High_5240



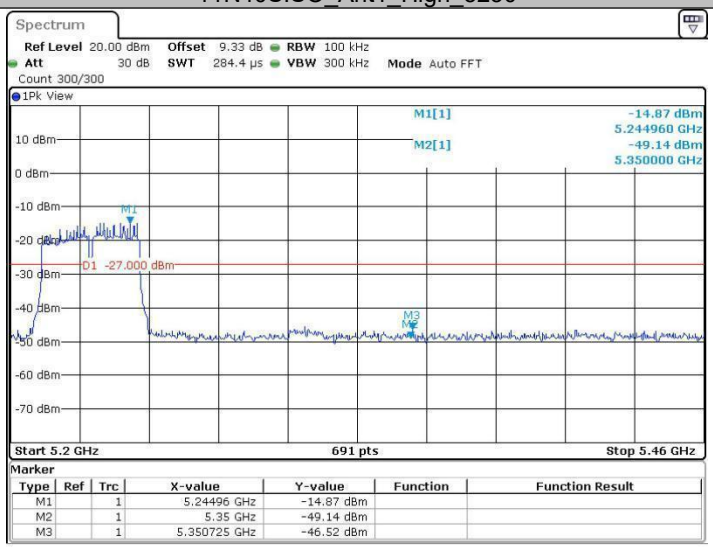
Date: 25.MAY.2023 15:45:22

11N40SISO_Ant1_Low_5190



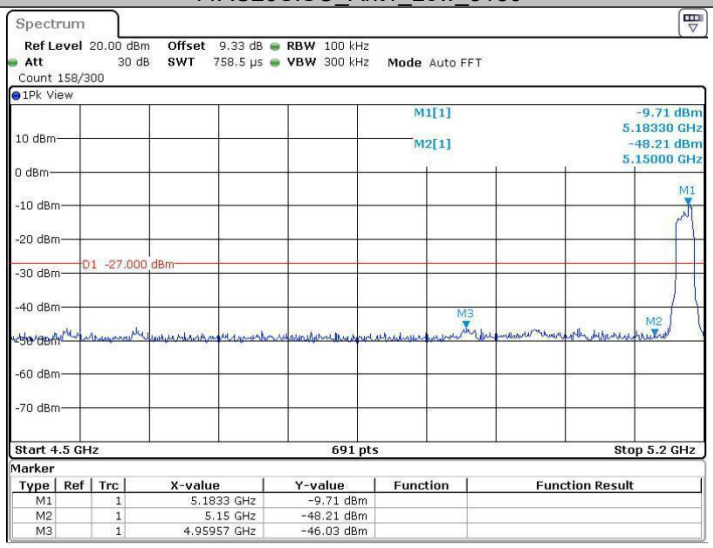
Date: 25.MAY.2023 15:48:18

11N40SISO_Ant1_High_5230



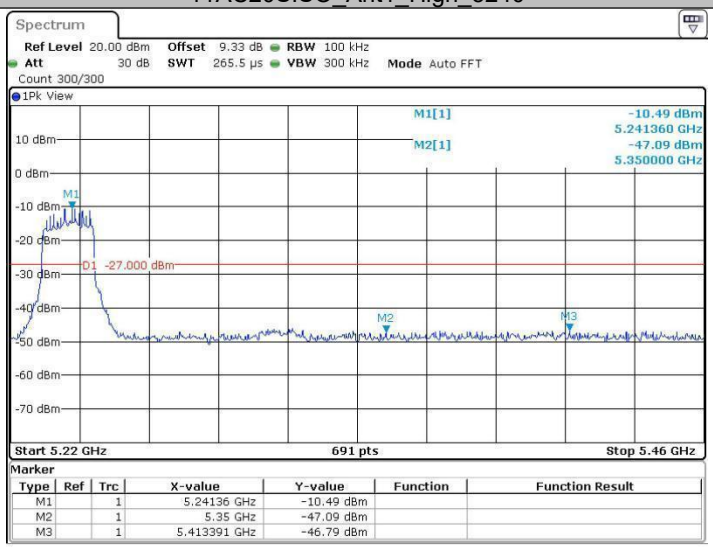
Date: 25.MAY.2023 15:53:49

11AC20SISO_Ant1_Low_5180



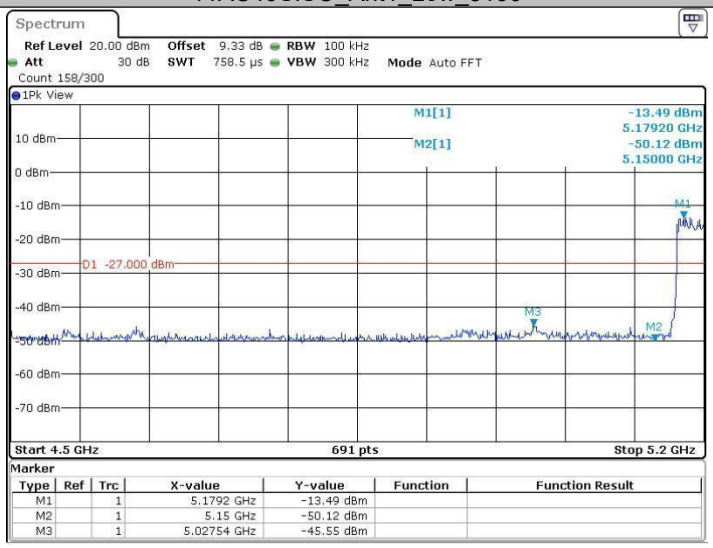
Date: 25.MAY.2023 15:59:39

11AC20SISO_Ant1_High_5240

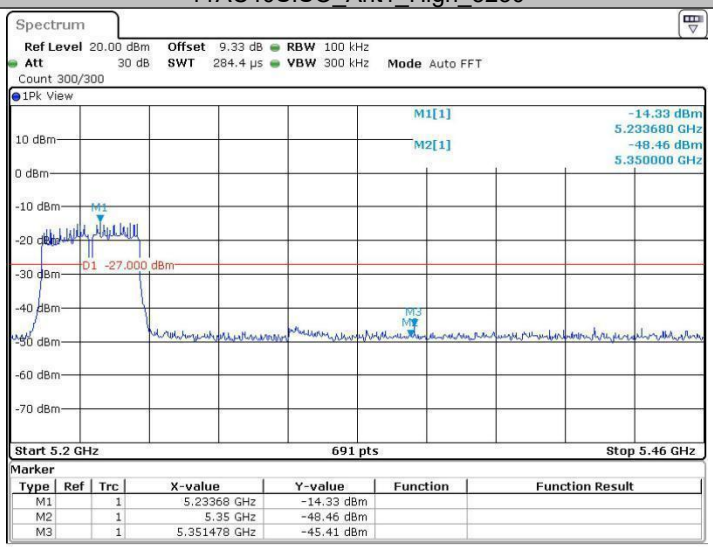


Date: 25.MAY.2023 16:25:57

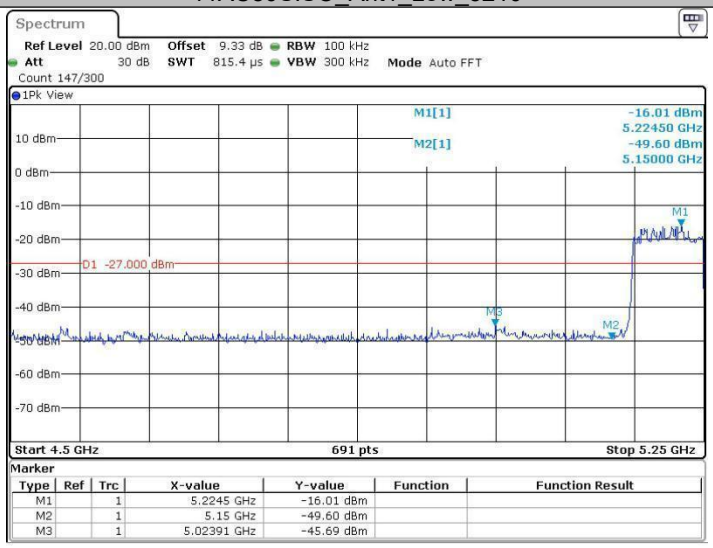
11AC40SISO_Ant1_Low_5190



11AC40SISO_Ant1_High_5230



11AC80SISO_Ant1_Low_5210

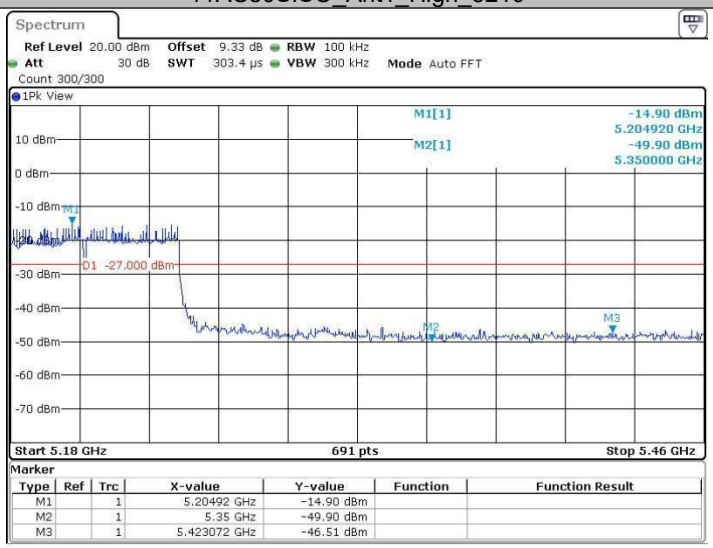


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.2245 GHz	-16.01 dBm		
M2		1	5.15 GHz	-49.60 dBm		
M3		1	5.02391 GHz	-45.69 dBm		

Date: 25.MAY.2023 16:35:36

11AC80SISO_Ant1_High_5210



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.20492 GHz	-14.90 dBm		
M2		1	5.35 GHz	-49.90 dBm		
M3		1	5.423072 GHz	-46.51 dBm		

Date: 25.MAY.2023 16:35:50

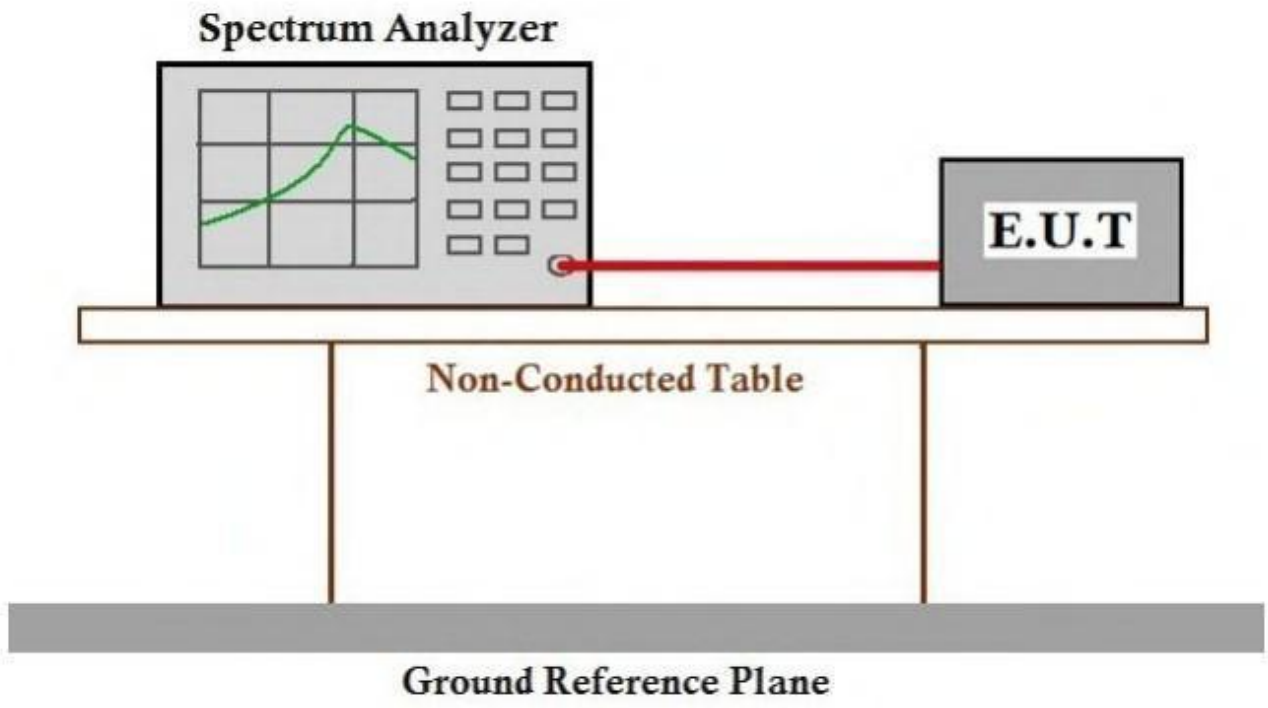
Appendix E): Frequency Stability

Test Requirement 47 CFR Part 15, Subpart C 15.407 (g)

Test Method: ANSI C63.10 (2013) Section 6.8

Limit:The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 35 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

Test Setup Diagram



Measurement Data

Voltage								
TestMode	Antenna	Freq(MHz)	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
11A	Ant1	5180	NV	NT	27000.00	5.212355	20	PASS
			LV	NT	27000.00	5.212355	20	PASS
			HV	NT	27000.00	5.212355	20	PASS
		5200	NV	NT	28000.00	5.384615	20	PASS
			LV	NT	27000.00	5.192308	20	PASS
			HV	NT	28000.00	5.384615	20	PASS
		5240	NV	NT	28000.00	5.343511	20	PASS
			LV	NT	27000.00	5.152672	20	PASS
			HV	NT	27000.00	5.152672	20	PASS
11N20SISO	Ant1	5180	NV	NT	27000.00	5.212355	20	PASS
			LV	NT	28000.00	5.405405	20	PASS
			HV	NT	27000.00	5.212355	20	PASS
		5200	NV	NT	28000.00	5.384615	20	PASS
			LV	NT	27000.00	5.192308	20	PASS
			HV	NT	27000.00	5.192308	20	PASS
		5240	NV	NT	28000.00	5.343511	20	PASS
			LV	NT	28000.00	5.343511	20	PASS
			HV	NT	28000.00	5.343511	20	PASS
11N40SISO	Ant1	5190	NV	NT	28000.00	5.394990	20	PASS
			LV	NT	27000.00	5.202312	20	PASS
			HV	NT	27000.00	5.202312	20	PASS
		5230	NV	NT	29000.00	5.544933	20	PASS
			LV	NT	28000.00	5.353728	20	PASS
			HV	NT	28000.00	5.353728	20	PASS
11AC20SISO	Ant1	5180	NV	NT	28000.00	5.405405	20	PASS
			LV	NT	27000.00	5.212355	20	PASS
			HV	NT	27000.00	5.212355	20	PASS
		5200	NV	NT	27000.00	5.192308	20	PASS
			LV	NT	27000.00	5.192308	20	PASS
			HV	NT	28000.00	5.384615	20	PASS
		5240	NV	NT	28000.00	5.343511	20	PASS
			LV	NT	28000.00	5.343511	20	PASS
			HV	NT	28000.00	5.343511	20	PASS

11AC40SISO	Ant1	5190	NV	NT	28000.00	5.394990	20	PASS
			LV	NT	28000.00	5.394990	20	PASS
			HV	NT	27000.00	5.202312	20	PASS
		5230	NV	NT	28000.00	5.353728	20	PASS
			LV	NT	28000.00	5.353728	20	PASS
			HV	NT	28000.00	5.353728	20	PASS
11AC80SISO	Ant1	5210	NV	NT	28000.00	5.374280	20	PASS
			LV	NT	28000.00	5.374280	20	PASS
			HV	NT	28000.00	5.374280	20	PASS

Temperature								
TestMode	Antenna	Freq(MHz)	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
11A	Ant1	5180	NV	-30	27000.00	5.212355	20	PASS
			NV	-20	27000.00	5.212355	20	PASS
			NV	-10	27000.00	5.212355	20	PASS
			NV	0	28000.00	5.405405	20	PASS
			NV	10	27000.00	5.212355	20	PASS
			NV	20	27000.00	5.212355	20	PASS
			NV	30	28000.00	5.405405	20	PASS
			NV	40	27000.00	5.212355	20	PASS
			NV	50	27000.00	5.212355	20	PASS
		5200	NV	-30	28000.00	5.384615	20	PASS
			NV	-20	27000.00	5.192308	20	PASS
			NV	-10	28000.00	5.384615	20	PASS
			NV	0	28000.00	5.384615	20	PASS
			NV	10	28000.00	5.384615	20	PASS
			NV	20	28000.00	5.384615	20	PASS
			NV	30	27000.00	5.192308	20	PASS
			NV	40	28000.00	5.384615	20	PASS
			NV	50	28000.00	5.384615	20	PASS
		5240	NV	-30	28000.00	5.343511	20	PASS
			NV	-20	27000.00	5.152672	20	PASS
			NV	-10	28000.00	5.343511	20	PASS
			NV	0	28000.00	5.343511	20	PASS
			NV	10	28000.00	5.343511	20	PASS
			NV	20	27000.00	5.152672	20	PASS

			NV	30	28000.00	5.343511	20	PASS
			NV	40	28000.00	5.343511	20	PASS
			NV	50	28000.00	5.343511	20	PASS
11N20SISO	Ant1	5180	NV	-30	28000.00	5.405405	20	PASS
			NV	-20	28000.00	5.405405	20	PASS
			NV	-10	27000.00	5.212355	20	PASS
			NV	0	27000.00	5.212355	20	PASS
			NV	10	27000.00	5.212355	20	PASS
			NV	20	27000.00	5.212355	20	PASS
			NV	30	27000.00	5.212355	20	PASS
			NV	40	28000.00	5.405405	20	PASS
			NV	50	27000.00	5.212355	20	PASS
		5200	NV	-30	28000.00	5.384615	20	PASS
			NV	-20	27000.00	5.192308	20	PASS
			NV	-10	28000.00	5.384615	20	PASS
			NV	0	28000.00	5.384615	20	PASS
			NV	10	28000.00	5.384615	20	PASS
			NV	20	28000.00	5.384615	20	PASS
			NV	30	28000.00	5.384615	20	PASS
			NV	40	28000.00	5.384615	20	PASS
			NV	50	28000.00	5.384615	20	PASS
		5240	NV	-30	28000.00	5.343511	20	PASS
			NV	-20	28000.00	5.343511	20	PASS
			NV	-10	28000.00	5.343511	20	PASS
			NV	0	28000.00	5.343511	20	PASS
			NV	10	28000.00	5.343511	20	PASS
			NV	20	28000.00	5.343511	20	PASS
			NV	30	28000.00	5.343511	20	PASS
			NV	40	28000.00	5.343511	20	PASS
			NV	50	28000.00	5.343511	20	PASS
11N40SISO	Ant1	5190	NV	-30	27000.00	5.202312	20	PASS
			NV	-20	27000.00	5.202312	20	PASS
			NV	-10	27000.00	5.202312	20	PASS
			NV	0	28000.00	5.394990	20	PASS
			NV	10	28000.00	5.394990	20	PASS
			NV	20	28000.00	5.394990	20	PASS
			NV	30	27000.00	5.202312	20	PASS

			NV	40	27000.00	5.202312	20	PASS
			NV	50	27000.00	5.202312	20	PASS
		5230	NV	-30	28000.00	5.353728	20	PASS
			NV	-20	28000.00	5.353728	20	PASS
			NV	-10	27000.00	5.162524	20	PASS
			NV	0	28000.00	5.353728	20	PASS
			NV	10	28000.00	5.353728	20	PASS
			NV	20	28000.00	5.353728	20	PASS
			NV	30	27000.00	5.162524	20	PASS
			NV	40	28000.00	5.353728	20	PASS
			NV	50	28000.00	5.353728	20	PASS
11AC20SISO	Ant1	5180	NV	-30	27000.00	5.212355	20	PASS
			NV	-20	28000.00	5.405405	20	PASS
			NV	-10	27000.00	5.212355	20	PASS
			NV	0	27000.00	5.212355	20	PASS
			NV	10	28000.00	5.405405	20	PASS
			NV	20	27000.00	5.212355	20	PASS
			NV	30	27000.00	5.212355	20	PASS
			NV	40	27000.00	5.212355	20	PASS
			NV	50	28000.00	5.405405	20	PASS
		5200	NV	-30	28000.00	5.384615	20	PASS
			NV	-20	27000.00	5.192308	20	PASS
			NV	-10	27000.00	5.192308	20	PASS
			NV	0	27000.00	5.192308	20	PASS
			NV	10	27000.00	5.192308	20	PASS
			NV	20	27000.00	5.192308	20	PASS
			NV	30	28000.00	5.384615	20	PASS
			NV	40	28000.00	5.384615	20	PASS
			NV	50	28000.00	5.384615	20	PASS
		5240	NV	-30	28000.00	5.343511	20	PASS
			NV	-20	28000.00	5.343511	20	PASS
			NV	-10	27000.00	5.152672	20	PASS
			NV	0	28000.00	5.343511	20	PASS
			NV	10	28000.00	5.343511	20	PASS
			NV	20	28000.00	5.343511	20	PASS
			NV	30	28000.00	5.343511	20	PASS
			NV	40	28000.00	5.343511	20	PASS

			NV	50	28000.00	5.343511	20	PASS
11AC40SISO	Ant1	5190	NV	-30	28000.00	5.394990	20	PASS
			NV	-20	28000.00	5.394990	20	PASS
			NV	-10	28000.00	5.394990	20	PASS
			NV	0	28000.00	5.394990	20	PASS
			NV	10	27000.00	5.202312	20	PASS
			NV	20	27000.00	5.202312	20	PASS
			NV	30	28000.00	5.394990	20	PASS
			NV	40	27000.00	5.202312	20	PASS
			NV	50	28000.00	5.394990	20	PASS
		5230	NV	-30	28000.00	5.353728	20	PASS
			NV	-20	28000.00	5.353728	20	PASS
			NV	-10	28000.00	5.353728	20	PASS
			NV	0	28000.00	5.353728	20	PASS
			NV	10	28000.00	5.353728	20	PASS
			NV	20	28000.00	5.353728	20	PASS
			NV	30	28000.00	5.353728	20	PASS
			NV	40	28000.00	5.353728	20	PASS
			NV	50	28000.00	5.353728	20	PASS
11AC80SISO	Ant1	5210	NV	-30	27000.00	5.182342	20	PASS
			NV	-20	28000.00	5.374280	20	PASS
			NV	-10	28000.00	5.374280	20	PASS
			NV	0	28000.00	5.374280	20	PASS
			NV	10	28000.00	5.374280	20	PASS
			NV	20	28000.00	5.374280	20	PASS
			NV	30	27000.00	5.182342	20	PASS
			NV	40	28000.00	5.374280	20	PASS
			NV	50	28000.00	5.374280	20	PASS

Note: All the modulation and channels had been tested, but only the worst data recorded in the report.

Appendix F): Antenna Requirement

15.203 requirement:

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, 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.

15.407(a)(1) (2) requirement:

The conducted output power limit specified in paragraph (a) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (a) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power and the peak power spectral density shall be reduced by the by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:	 

The antenna is FPC antenna.

The connection/connection type between the antenna to the EUT's antenna port is: unique coupling.

This is either permanently attachment or a unique coupling that satisfies the requirement.

Appendix G): Operation in the absence of information to the transmit

15.407(c) requirement: The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signal ling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.
Operation in the absence of information to the transmit
While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ASK message transmitting from remote device and verify whether it shall resend or discontinue transmission. (manufacturer declare)

Appendix H): AC Power Line Conducted Emission

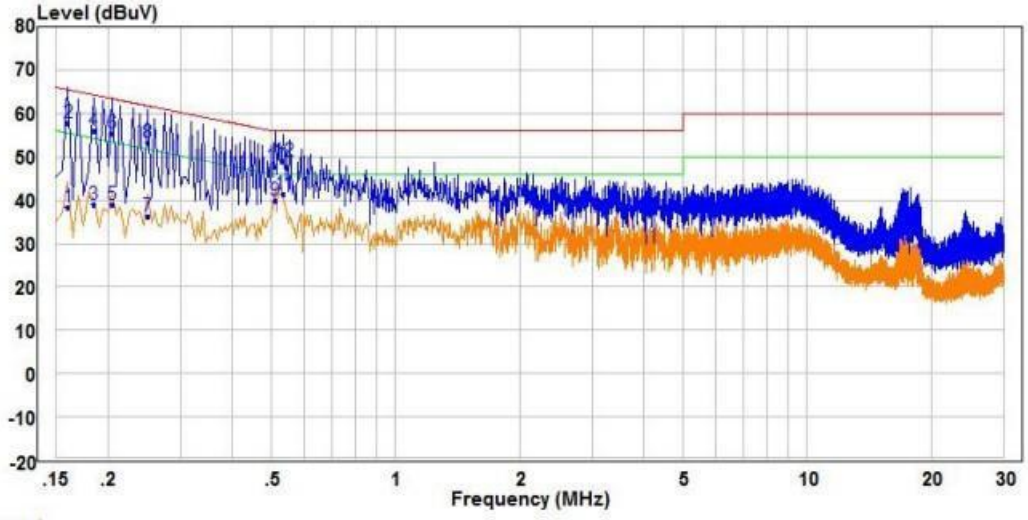
<table>
<tr><td>Test Procedure:</td><td>Test frequency range :150KHz-30MHz
1)The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3)The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBμV)</th></tr>
<tr><th>Quasi-peak</th><th>Average</th></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
* The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.
NOTE : The lower limit is applicable at the transition frequency</td></tr>
</table>

Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

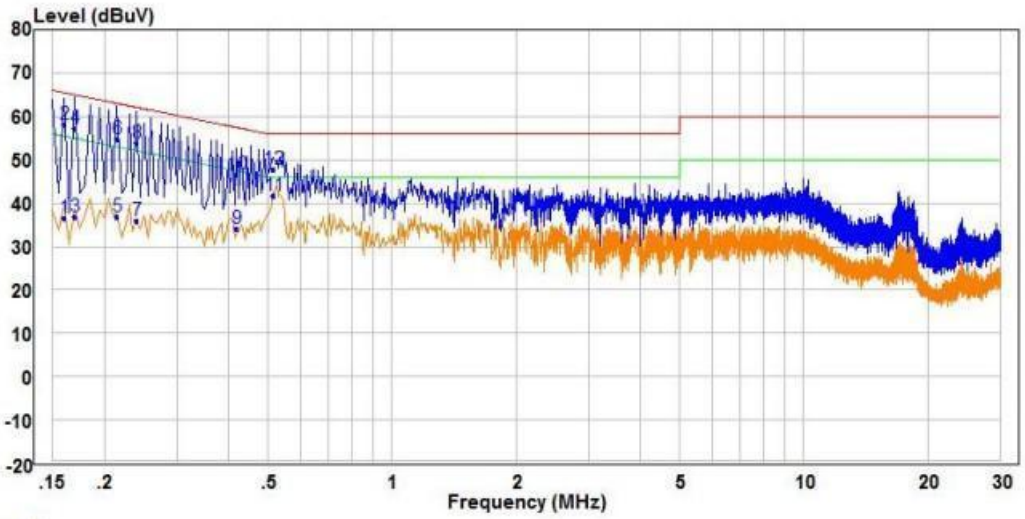
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live line:



		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.160	28.55	9.68	38.23	55.46	-17.23	Average	Line
2		0.160	48.12	9.68	57.80	65.46	-7.66	QP	Line
3		0.185	29.19	9.64	38.83	54.26	-15.43	Average	Line
4		0.185	46.34	9.64	55.98	64.26	-8.28	QP	Line
5		0.205	29.23	9.61	38.84	53.41	-14.57	Average	Line
6		0.205	45.88	9.61	55.49	63.41	-7.92	QP	Line
7		0.250	26.75	9.55	36.30	51.76	-15.46	Average	Line
8		0.250	43.81	9.55	53.36	61.76	-8.40	QP	Line
9		0.510	30.30	9.71	40.01	46.00	-5.99	Average	Line
10		0.510	38.10	9.71	47.81	56.00	-8.19	QP	Line
11	PP	0.535	31.52	9.74	41.26	46.00	-4.74	Average	Line
12	QP	0.535	39.19	9.74	48.93	56.00	-7.07	QP	Line

Neutral line:



		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.160	26.86	9.68	36.54	55.46	-18.92	Average	Neutral
2	QP	0.160	48.37	9.68	58.05	65.46	-7.41	QP	Neutral
3		0.170	27.31	9.66	36.97	54.96	-17.99	Average	Neutral
4		0.170	47.61	9.66	57.27	64.96	-7.69	QP	Neutral
5		0.215	27.19	9.59	36.78	53.01	-16.23	Average	Neutral
6		0.215	45.32	9.59	54.91	63.01	-8.10	QP	Neutral
7		0.240	26.37	9.55	35.92	52.10	-16.18	Average	Neutral
8		0.240	44.33	9.55	53.88	62.10	-8.22	QP	Neutral
9		0.420	24.36	9.62	33.98	47.45	-13.47	Average	Neutral
10		0.420	36.85	9.62	46.47	57.45	-10.98	QP	Neutral
11	PP	0.515	31.94	9.72	41.66	46.00	-4.34	Average	Neutral
12		0.515	37.93	9.72	47.65	56.00	-8.35	QP	Neutral

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. The 6Mbps of rate of 802.11A_5240 is the worst case, only the worst data recorded in the report.

Appendix I): Restricted bands around fundamental frequency (Radiated Emission)

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Test Procedure:

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
h. Test the EUT in the lowest channel , the Highest channel
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.
j. Repeat above procedures until all frequencies measured was complete.

Limit:

Frequency	Limit (dBμV/m @3cm)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	54.0	Average Value
	74.0	Peak Value

Test plot as follows:

Worse case mode:		802.11a(6Mbps)		Test channel:		36	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150.00	61.38	-3.63	57.75	74	-16.25	peak	H
5150.00	44.20	-3.63	40.57	54	-13.43	AVG	H
5150.00	45.38	-3.63	41.75	74	-32.25	peak	V
5150.00	43.99	-3.63	40.36	54	-13.64	AVG	V

Worse case mode:		802.11a(6Mbps)		Test channel:		48	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5350.00	55.23	-3.59	51.64	74	-22.36	peak	H
5350.00	42.14	-3.59	38.55	54	-15.45	AVG	H
5350.00	52.70	-3.59	49.11	74	-24.89	peak	V
5350.00	38.60	-3.59	35.01	54	-18.99	AVG	V

Worse case mode:		802.11n(HT20)(6.5Mbps)		Test channel:		36	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150.00	62.07	-3.63	58.44	74	-15.56	peak	H
5150.00	44.55	-3.63	40.92	54	-13.08	AVG	H
5150.00	44.31	-3.63	40.68	74	-33.32	peak	V
5150.00	45.53	-3.63	41.90	54	-12.10	AVG	V

Worse case mode:		802.11n(HT20)(6.5Mbps)		Test channel:		48	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5350.00	56.92	-3.59	53.33	74	-20.67	peak	H
5350.00	43.16	-3.59	39.57	54	-14.43	AVG	H
5350.00	53.45	-3.59	49.86	74	-24.14	peak	V
5350.00	38.33	-3.59	34.74	54	-19.26	AVG	V

Worse case mode:		802.11n(HT40)(13.5Mbps)		Test channel:		38	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150	62.02	-3.63	58.39	74	-15.61	peak	H
5150	46.27	-3.63	42.64	54	-11.36	AVG	H
5150	44.42	-3.63	40.79	74	-33.21	peak	V
5150	44.77	-3.63	41.14	54	-12.86	AVG	V

Worse case mode:		802.11n(HT40)(13.5Mbps)		Test channel:		46	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5350.00	55.52	-3.59	51.93	74	-22.07	peak	H
5350.00	41.39	-3.59	37.80	54	-16.20	AVG	H
5350.00	51.78	-3.59	48.19	74	-25.81	peak	V
5350.00	38.27	-3.59	34.68	54	-19.32	AVG	V

Worse case mode:		802.11ac(HT20)(6.5Mbps)		Test channel:		36	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150.00	60.39	-3.63	56.76	74	-17.24	peak	H
5150.00	44.63	-3.63	41.00	54	-13.00	AVG	H
5150.00	44.76	-3.63	41.13	74	-32.87	peak	V
5150.00	44.27	-3.63	40.64	54	-13.36	AVG	V

Worse case mode:		802.11ac(HT20)(6.5Mbps)		Test channel:		48	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5350.00	57.07	-3.59	53.48	74	-20.52	peak	H
5350.00	41.43	-3.59	37.84	54	-16.16	AVG	H
5350.00	52.20	-3.59	48.61	74	-25.39	peak	V
5350.00	37.58	-3.59	33.99	54	-20.01	AVG	V

Worse case mode:		802.11ac(VHT40)(13.5Mbps)		Test channel:		38	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150.00	60.90	-3.63	57.27	74	-16.73	peak	H
5150.00	45.59	-3.63	41.96	54	-12.04	AVG	H
5150.00	44.39	-3.63	40.76	74	-33.24	peak	V
5150.00	45.88	-3.63	42.25	54	-11.75	AVG	V

Worse case mode:		802.11ac(VHT40)(13.5Mbps)		Test channel:		46	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5350.00	55.52	-3.59	51.93	74	-22.07	peak	H
5350.00	42.91	-3.59	39.32	54	-14.68	AVG	H
5350.00	51.88	-3.59	48.29	74	-25.71	peak	V
5350.00	36.36	-3.59	32.77	54	-21.23	AVG	V

Worse case mode:		802.11ac(VHT80)(29.3Mbps)		Test channel:		42	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150.00	60.46	-3.63	56.83	74	-17.17	peak	H
5150.00	43.89	-3.63	40.26	54	-13.74	AVG	H
5150.00	44.82	-3.63	41.19	74	-32.81	peak	V
5150.00	46.34	-3.63	42.71	54	-11.29	AVG	V
5350.00	54.83	-3.59	51.24	74	-21.15	peak	H
5350.00	41.59	-3.59	38.00	54	-14.77	AVG	H
5350.00	52.59	-3.59	49.00	74	-20.04	peak	V
5350.00	37.64	-3.59	34.05	54	-13.43	AVG	V

Note:
1) Through Pre-scan transmitting mode with all kind of modulation and data rate, Only the worst case is recorded in the report.
2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level =Receiver Reading - Correct Factor
Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

Appendix J): Radiated Spurious Emissions

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Test Procedure:

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre)
h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.
j. Repeat above procedures until all frequencies measured was complete.

Limit:

Frequency	Field strength (microvolt/meter)	Limit (dBμV/cm)	Remark	Measurement distance (cm)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3

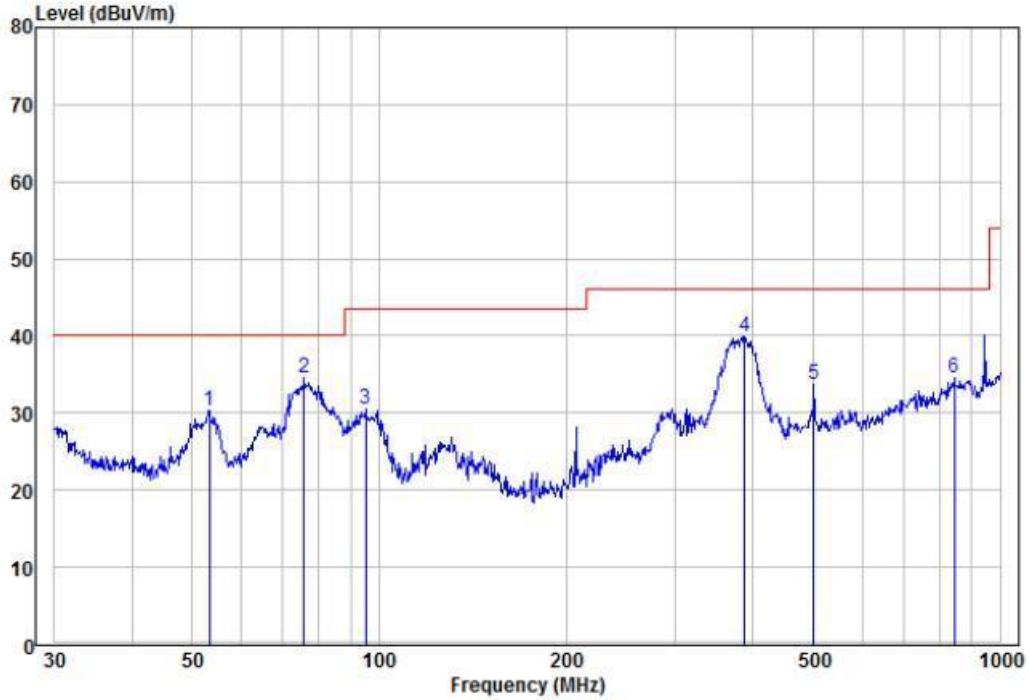
Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

Test result: PASS

Test Data:

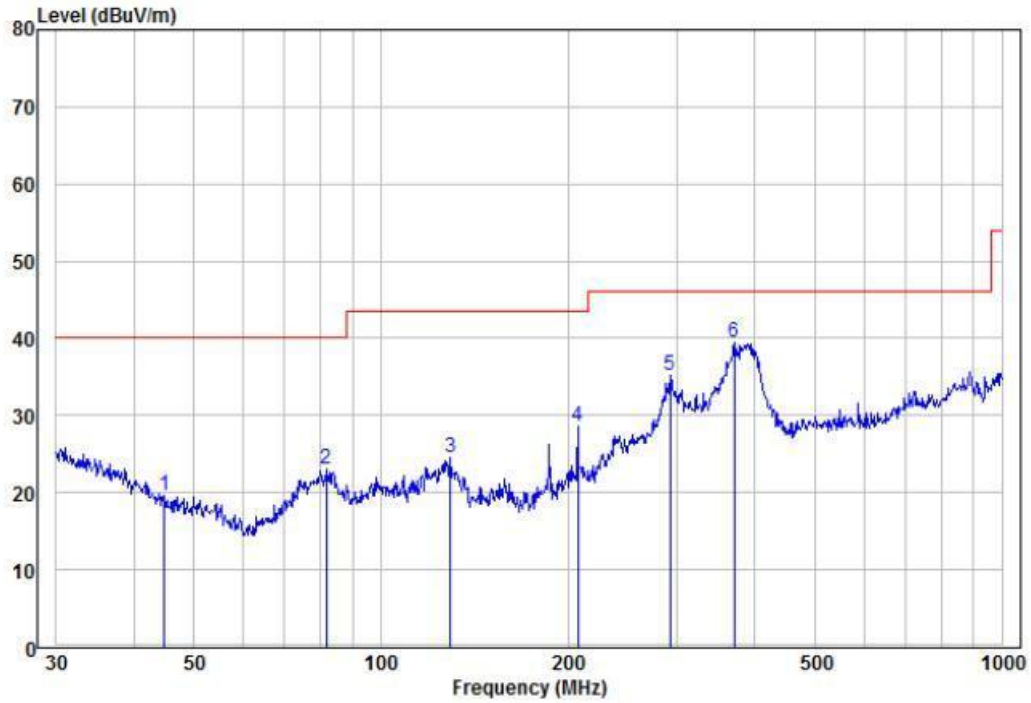
Radiated Emission below 1GHz

30MHz~1GHz		
Test mode:	Transmitting (802.11a 36CH)	Vertical



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	53.32	22.93	7.40	30.33	40.00	-9.67	Peak	VERTICAL
2 pp	75.71	25.46	9.08	34.54	40.00	-5.46	Peak	VERTICAL
3	95.09	20.09	10.34	30.43	43.50	-13.07	Peak	VERTICAL
4	387.99	25.11	14.86	39.97	46.00	-6.03	Peak	VERTICAL
5	501.18	15.45	18.29	33.74	46.00	-12.26	Peak	VERTICAL
6	845.09	10.50	24.08	34.58	46.00	-11.42	Peak	VERTICAL

Test mode:	Transmitting (802.11a 36CH)	Horizontal



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	44.74	8.99	10.57	19.56	40.00	-20.44	Peak	HORIZONTAL
2	81.78	13.20	9.83	23.03	40.00	-16.97	Peak	HORIZONTAL
3	129.47	14.29	10.34	24.63	43.50	-18.87	Peak	HORIZONTAL
4	207.85	19.91	8.74	28.65	43.50	-14.85	Peak	HORIZONTAL
5	292.06	21.76	13.46	35.22	46.00	-10.78	Peak	HORIZONTAL
6 pp	370.70	24.11	15.31	39.42	46.00	-6.58	Peak	HORIZONTAL

Transmitter Emission above 1GHz

Test mode:	802.11a(6Mbps)			Test channel:		36 CH	
Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Over (dB)	Detector Type	Ant. Pol. H/V
10360	53.04	2.26	55.30	74	-18.70	peak	H
10360	36.92	2.26	39.18	54	-14.82	AVG	H
15540	51.94	3.75	55.69	74	-18.31	peak	H
15540	38.69	3.75	42.44	54	-11.56	AVG	H
10360	55.80	2.26	58.06	74	-15.94	peak	V
10360	38.22	2.26	40.48	54	-13.52	AVG	V
15540	51.87	3.75	55.62	74	-18.38	peak	V
15540	36.10	3.75	39.85	54	-14.15	AVG	V

Test mode:	802.11a(6Mbps)			Test channel:		48 CH	
Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Over (dB)	Detector Type	Ant. Pol. H/V
10480	52.62	2.31	54.93	74	-19.07	peak	H
10480	36.96	2.31	39.27	54	-14.73	AVG	H
15720	49.93	3.79	53.72	74	-20.28	peak	H
15720	35.71	3.79	39.50	54	-14.50	AVG	H
10480	53.49	2.31	55.80	74	-18.20	peak	V
10480	36.97	2.31	39.28	54	-14.72	AVG	V
15720	49.23	3.79	53.02	74	-20.98	peak	V
15720	36.04	3.79	39.83	54	-14.17	AVG	V

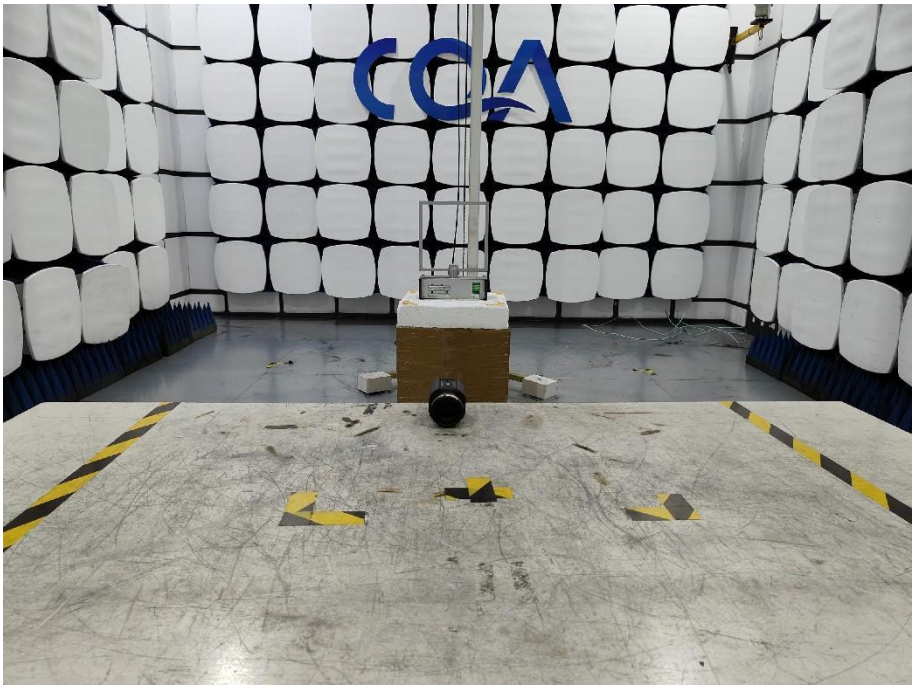
Remark:

1) The 802.11a 6Mbps of rate is the worst case, only the worst data recorded in the report.
2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
   Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
3) Scan from 9kHz to 40GHz,The disturbance above 18GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

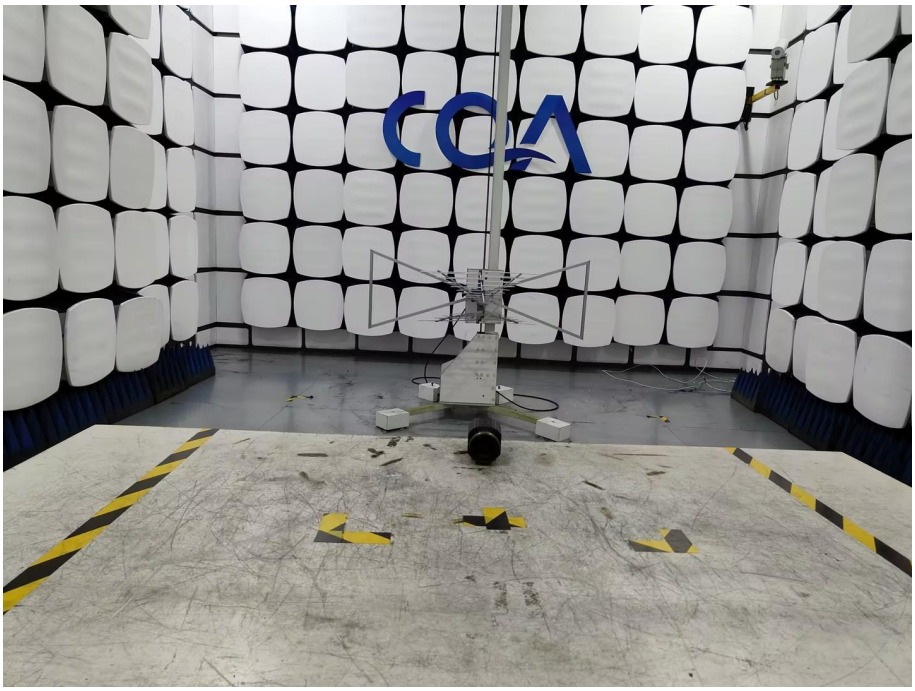
8 Photographs - EUT Test Setup

8.1 Radiated Spurious Emission

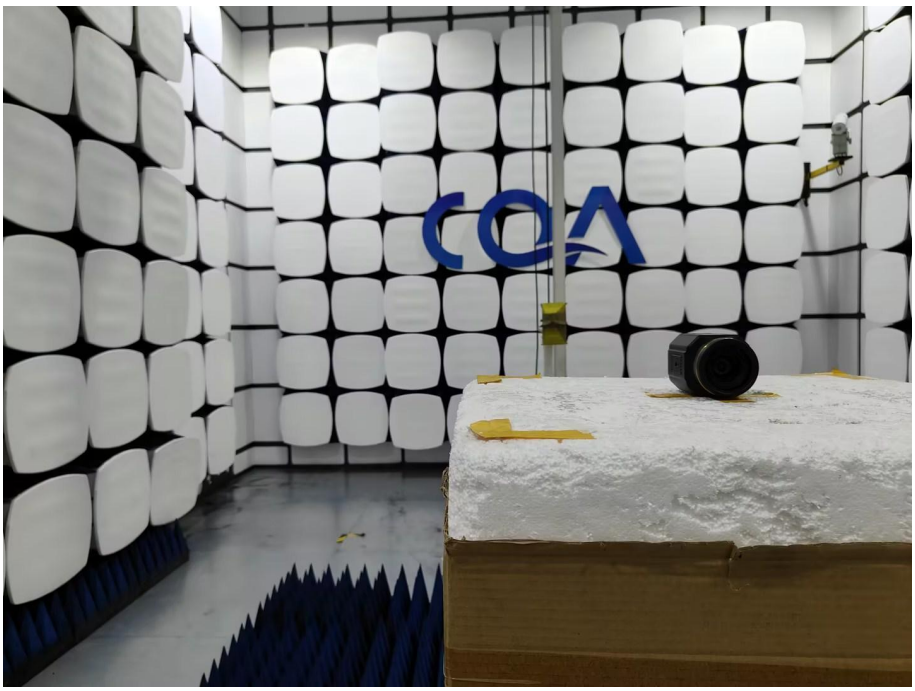
9kHz~30MHz:



30MHz~1GHz:



Above 1GHz:



8.2 Conducted Emissions Test Setup

9 Photographs - EUT Constructional Details

Refer to PHOTOGRAPHS OF EUT for CQASZ20230500829E-01.

*** END OF REPORT ***