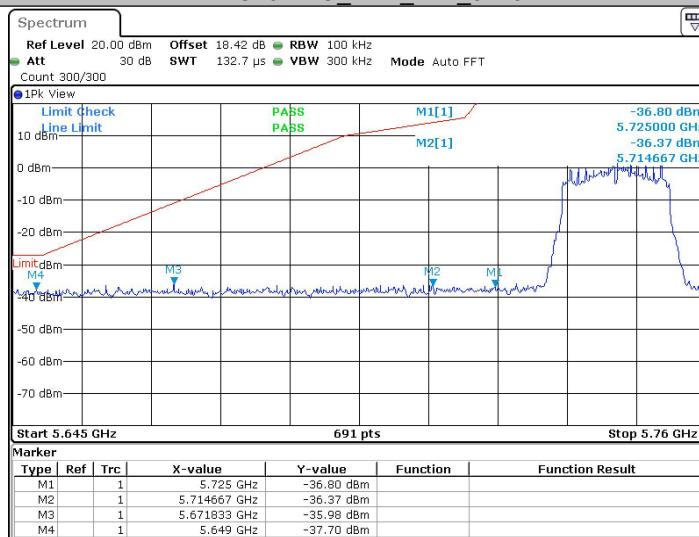
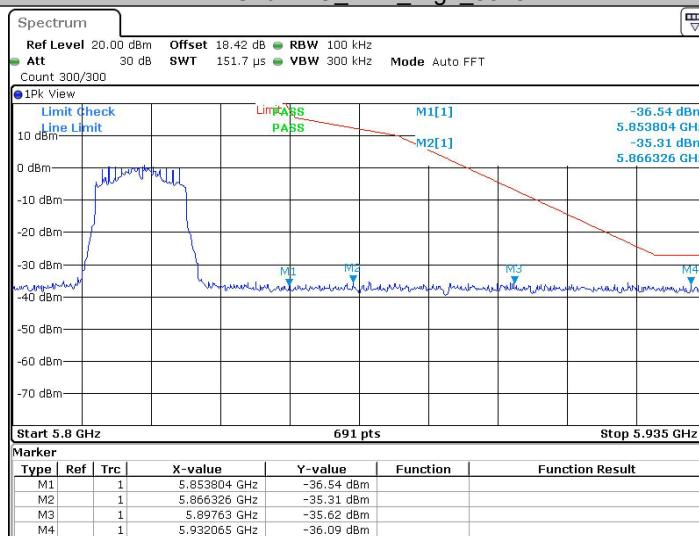
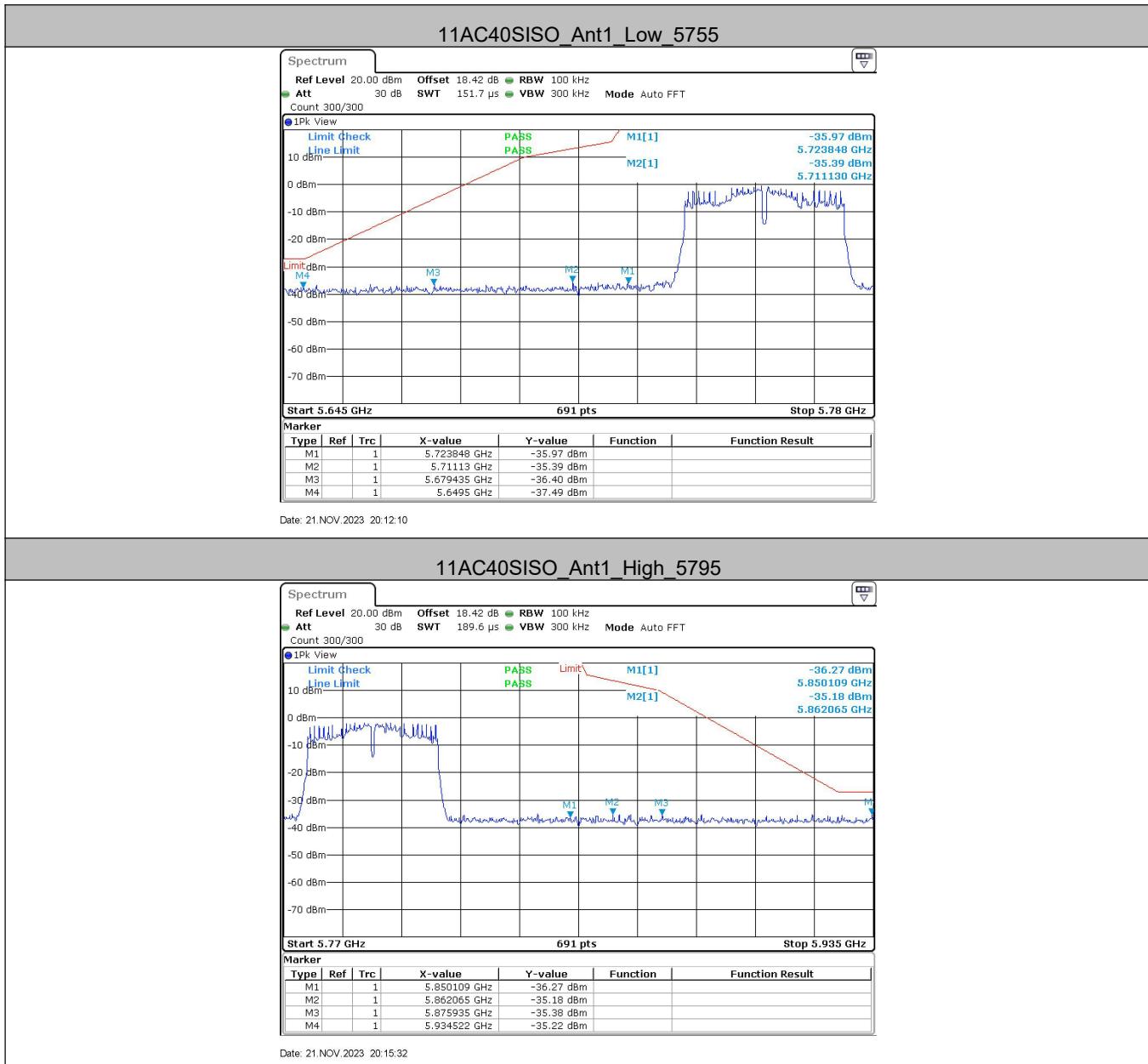


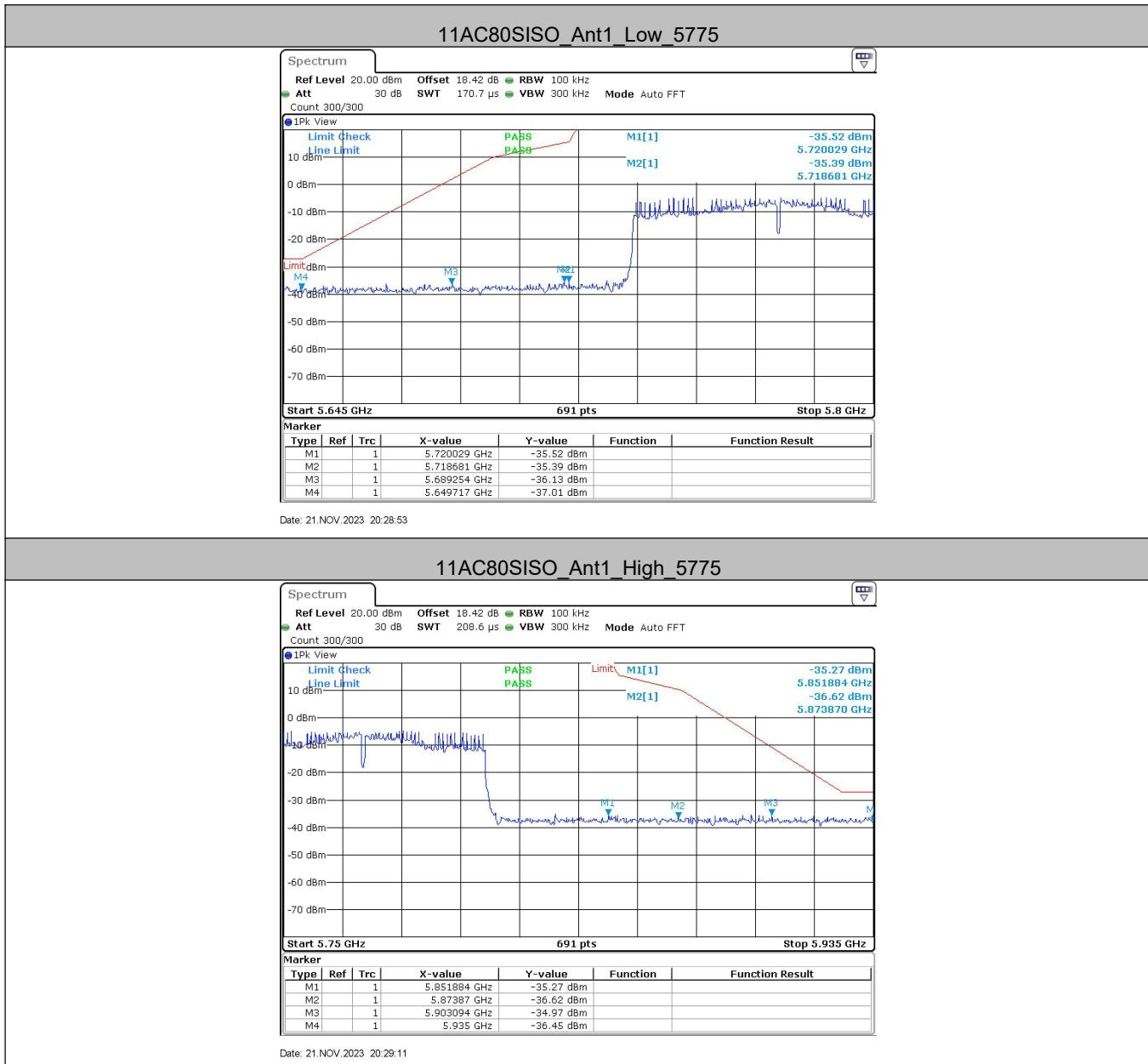
11AC20SISO_Ant1_Low_5745


Date: 21.NOV.2023 19:20:51

11AC20SISO_Ant1_High_5825


Date: 21.NOV.2023 19:24:50





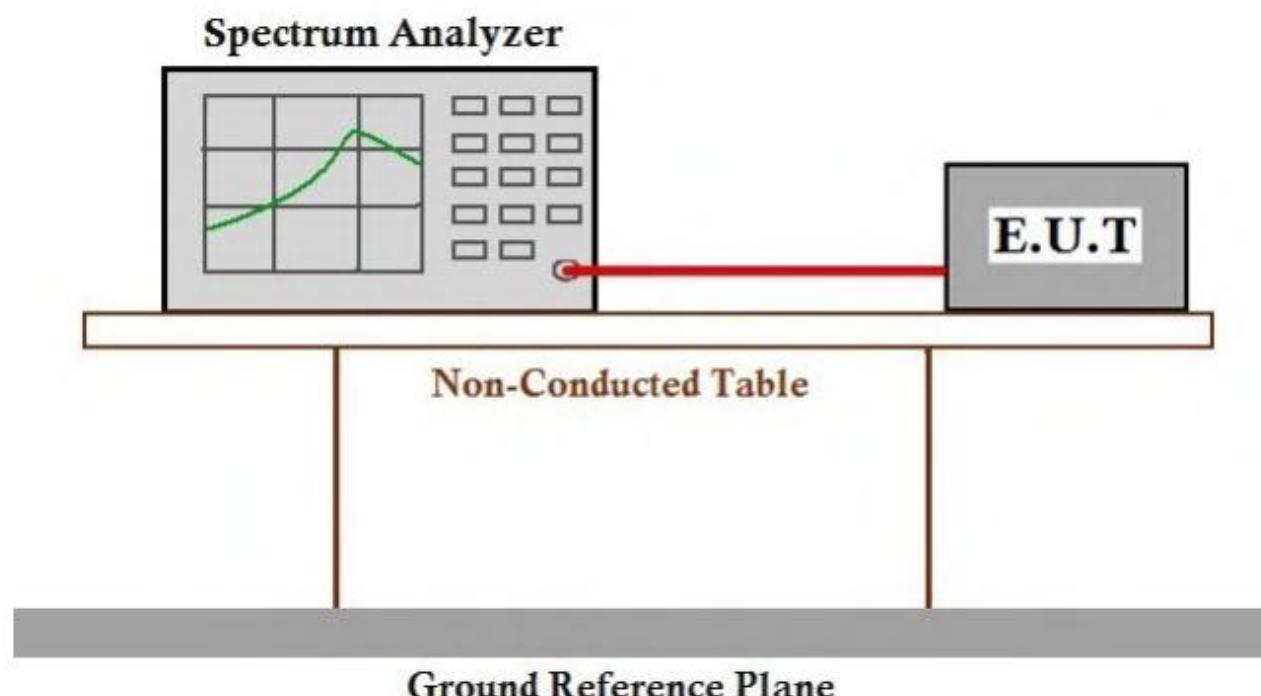
Appendix E): Frequency Stability

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

Frequency Stability Versus Temp.			
Operating Frequency: 5240 MHz			
Temp (°C)	Volta ge	Measured Frequency	Frequency Drift
		(MHz)	(ppm)
50	VN	5240.03	5.72519
40		5240.02	3.81679
30		5240.01	1.90840
20		5240.02	3.81679
10		5240.02	3.81679
0		5240.01	1.90840
-10		5240.02	3.81679
-20		5240.03	5.72519

Frequency Stability Versus Temp.			
Operating Frequency: 5210 MHz			
Temp.	Volta ge	Measured Frequency	Frequency Drift
		(MHz)	(ppm)
TN	VL	5210.00	0.00000
	VN	5210.03	5.75816
	VH	5210.02	3.83877

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 amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is FPC antenna with ipex connector. The best case gain of the 5G WiFi antenna is 1.73dBi@5GHz: Wi-Fi: U-NII-1, 3.43dBi@5GHz: Wi-Fi: U-NII-3

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 signaling 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

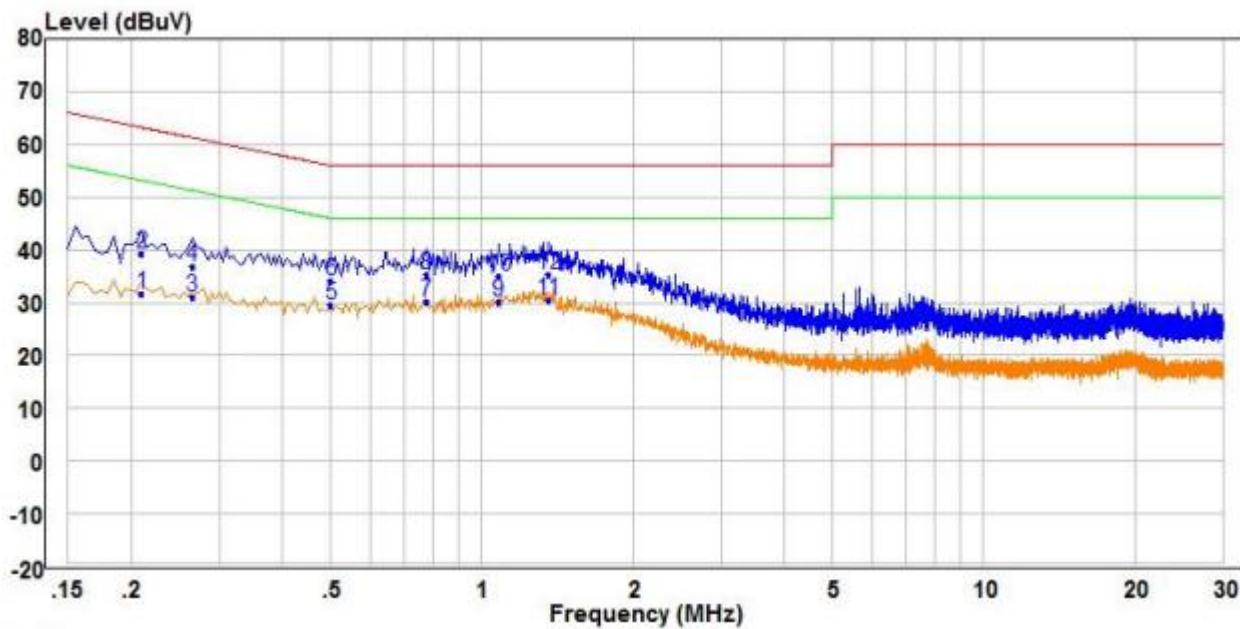
Test Procedure:	<p>Test frequency range :150KHz-30MHz</p> <p>1)The mains terminal disturbance voltage test was conducted in a shielded room.</p> <p>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear 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.</p> <p>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,</p> <p>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.</p> <p>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.</p>														
Limit:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBμV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>* The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.</p> <p>NOTE : The lower limit is applicable at the transition frequency</p>	Frequency range (MHz)	Limit (dB μ V)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dB μ V)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													

Measurement Data

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

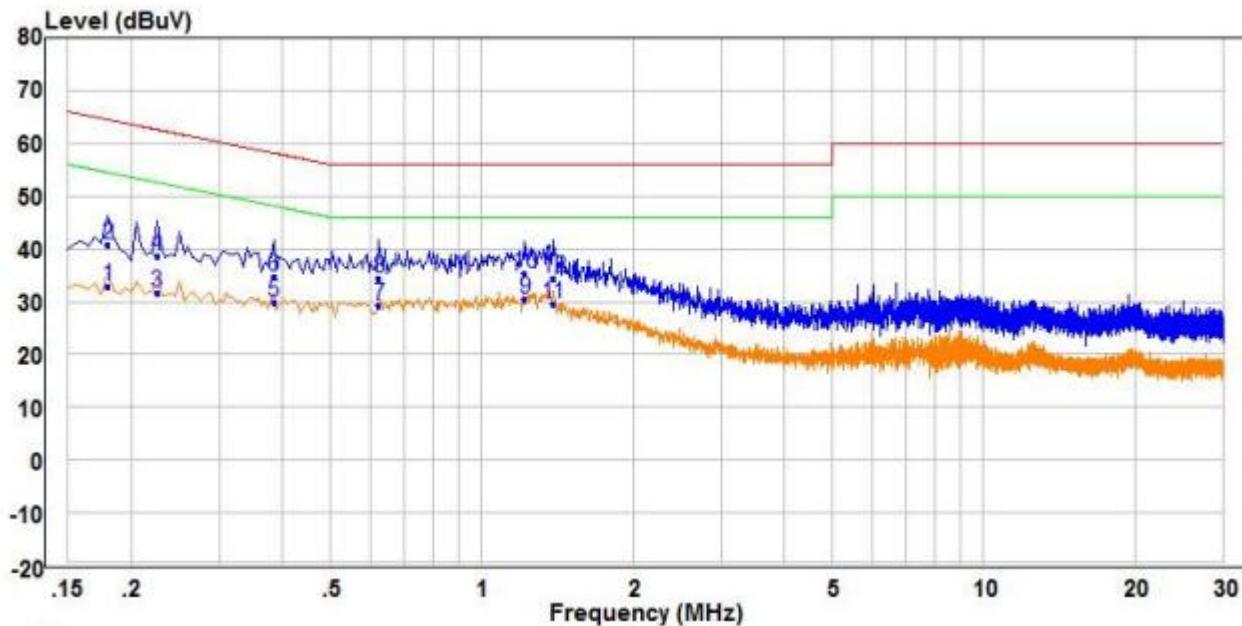
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live line:



Freq	Read			Limit		Over Line	Over Limit	Remark	Pol/Phase
	MHz	Level	Factor	Level	Line				
1	0.210	21.22	10.60	31.82	53.21	-21.39	Average		Line
2	0.210	28.60	10.60	39.20	63.21	-24.01	QP		Line
3	0.265	20.59	10.53	31.12	51.27	-20.15	Average		Line
4	0.265	26.44	10.53	36.97	61.27	-24.30	QP		Line
5	0.500	18.81	10.70	29.51	46.00	-16.49	Average		Line
6	0.500	23.49	10.70	34.19	56.00	-21.81	QP		Line
7	0.775	19.43	10.85	30.28	46.00	-15.72	Average		Line
8 QP	0.775	24.59	10.85	35.44	56.00	-20.56	QP		Line
9	1.080	19.33	10.91	30.24	46.00	-15.76	Average		Line
10	1.080	24.26	10.91	35.17	56.00	-20.83	QP		Line
11 PP	1.355	18.93	11.55	30.48	46.00	-15.52	Average		Line
12	1.355	23.71	11.55	35.26	56.00	-20.74	QP		Line

Neutral line:



Freq	Read		Limit	Over	Over	Remark	Pol/Phase
	Level	Factor					
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.180	22.17	10.64	32.81	54.49	-21.68	Average
2	0.180	30.26	10.64	40.90	64.49	-23.59	QP
3	0.225	21.04	10.57	31.61	52.63	-21.02	Average
4	0.225	28.03	10.57	38.60	62.63	-24.03	QP
5	0.385	19.23	10.59	29.82	48.17	-18.35	Average
6	0.385	24.21	10.59	34.80	58.17	-23.37	QP
7	0.625	18.35	10.83	29.18	46.00	-16.82	Average
8	0.625	23.64	10.83	34.47	56.00	-21.53	QP
9 PP	1.220	19.83	10.71	30.54	46.00	-15.46	Average
10 QP	1.220	24.53	10.71	35.24	56.00	-20.76	QP
11	1.385	18.84	10.72	29.56	46.00	-16.44	Average
12	1.385	23.58	10.72	34.30	56.00	-21.70	QP

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:	<p>Below 1GHz test procedure as below:</p> <ol style="list-style-type: none"> The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 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. 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. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 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 <p>Above 1GHz test procedure as below:</p> <ol style="list-style-type: none"> 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). Test the EUT in the lowest channel , the Highest channel 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. Repeat above procedures until all frequencies measured was complete. 					
Limit:	Frequency	Limit (dB μ V/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			