

- ☒ For Undesirable radiated Spurious Emission in UNII Band III

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)

Temperature :	28℃	Test By:	King Kong
Humidity :	65 %	Frequency(MHz):	5745
Test mode:	802.11a		

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
6187.53	V	53.71	-41.51	-27.00	-14.51
11055.25	V	55.54	-39.69	-27.00	-12.69
14434.38	V	61.11	-34.12	-27.00	-7.12
7309.06	H	53.71	-41.52	-27.00	-14.52
10752.13	H	61.31	-33.92	-27.00	-6.92
13373.49	H	62.01	-33.22	-27.00	-6.22

Temperature :	28℃	Test By:	King Kong
Humidity :	65 %	Frequency(MHz):	5785
Test mode:	802.11a		

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
6501.91	V	53.70	-41.53	-27.00	-14.53
11006.66	V	55.80	-39.42	-27.00	-12.42
14156.40	V	61.06	-34.17	-27.00	-7.17
7511.27	H	52.97	-42.26	-27.00	-15.26
10792.78	H	61.83	-33.39	-27.00	-6.39
13528.84	H	60.78	-34.45	-27.00	-7.45

Temperature :	28℃	Test By:	King Kong
Humidity :	65 %	Frequency(MHz):	5825
Test mode:	802.11a		

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
6799.69	V	55.66	-39.57	-27.00	-12.57
11502.86	V	55.88	-39.35	-27.00	-12.35
15016.30	V	61.62	-33.61	-27.00	-6.61
7390.83	H	51.32	-43.91	-27.00	-16.91
11036.63	H	61.41	-33.82	-27.00	-6.82
13920.00	H	60.62	-34.60	-27.00	-7.60

Note: (1) Emission Level= Reading Level+Probe Factor +Cable Loss.
 (2) EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77
 d is the measurement distance in 3 meters

- ☒ Undesirable radiated Spurious Emission in band edge

Temperature :	28℃	Test By:	King Kong
Humidity :	65 %	Frequency:	5745
Test mode:	802.11a		

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5725.00	H	64.37	-30.86	27.00	PASS
5724.87	V	62.74	-32.49	26.70	PASS

Temperature :	28℃	Test By:	King Kong
Humidity :	65 %	Frequency:	5825
Test mode:	802.11a		

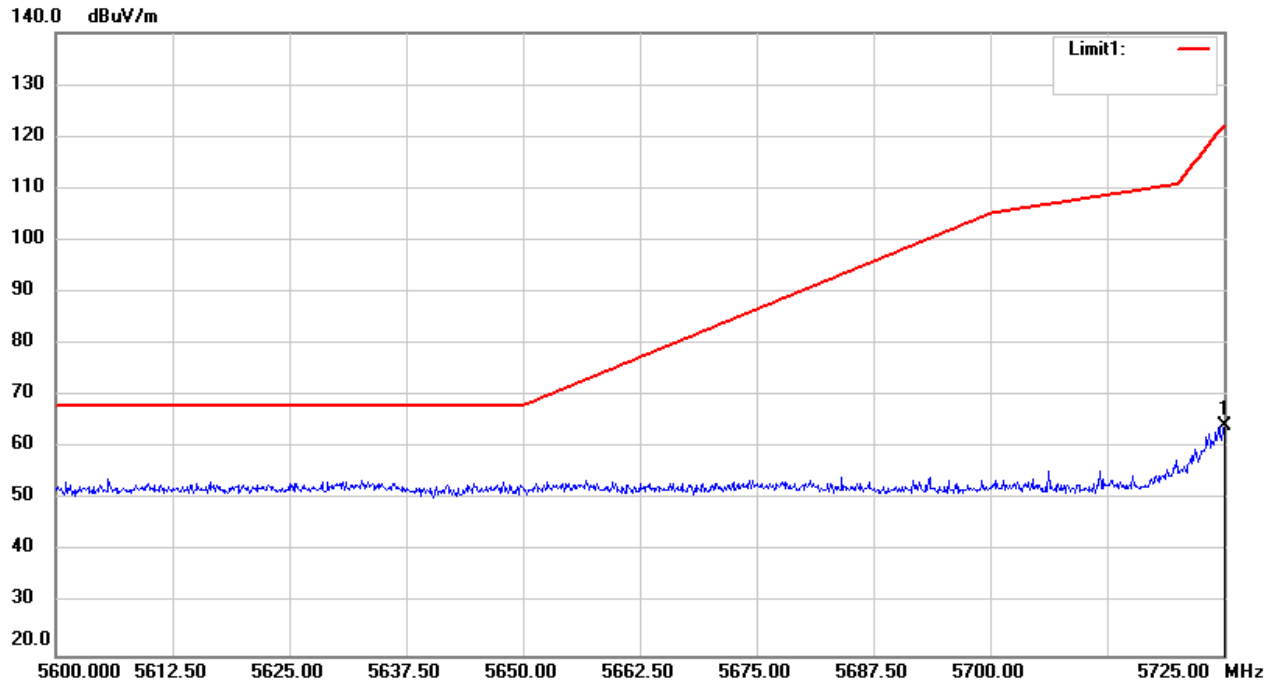
Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5850.00	H	62.77	-32.46	27.00	PASS
5850.00	V	63.14	-32.09	27.00	PASS

Note: (1) Emission Level= Reading Level+Probe Factor +Cable Loss.

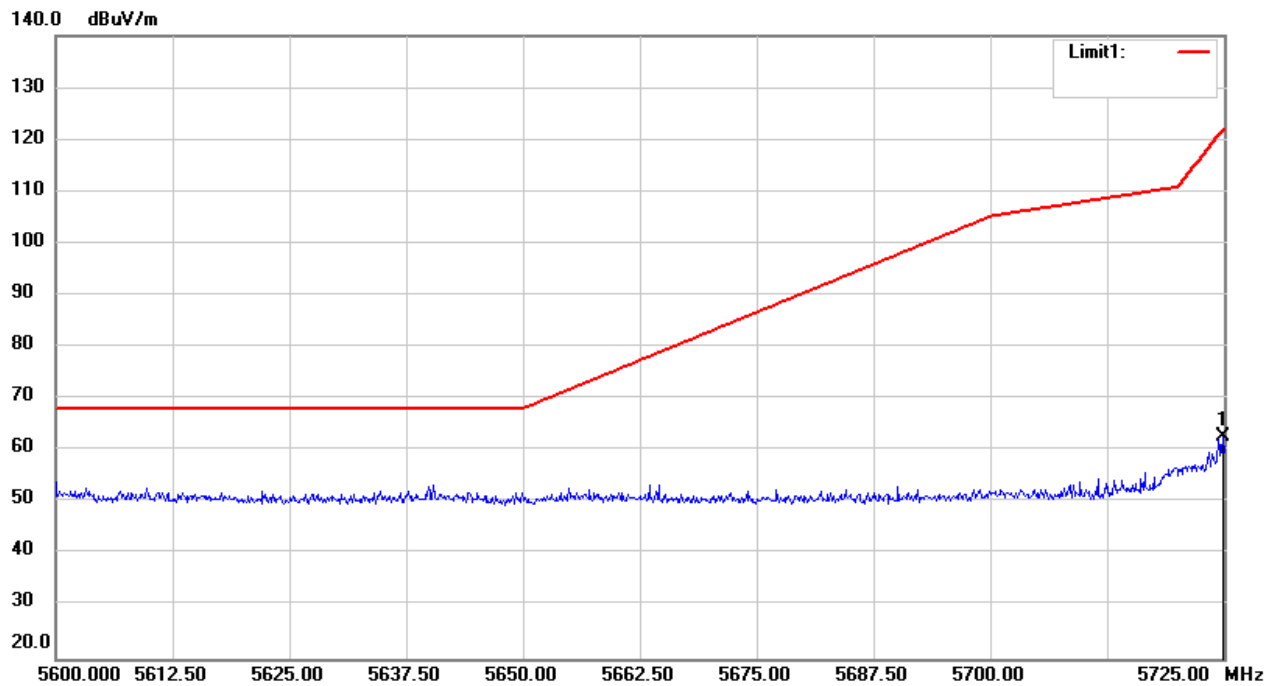
(2) EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77

d is the measurement distance in 3 meters

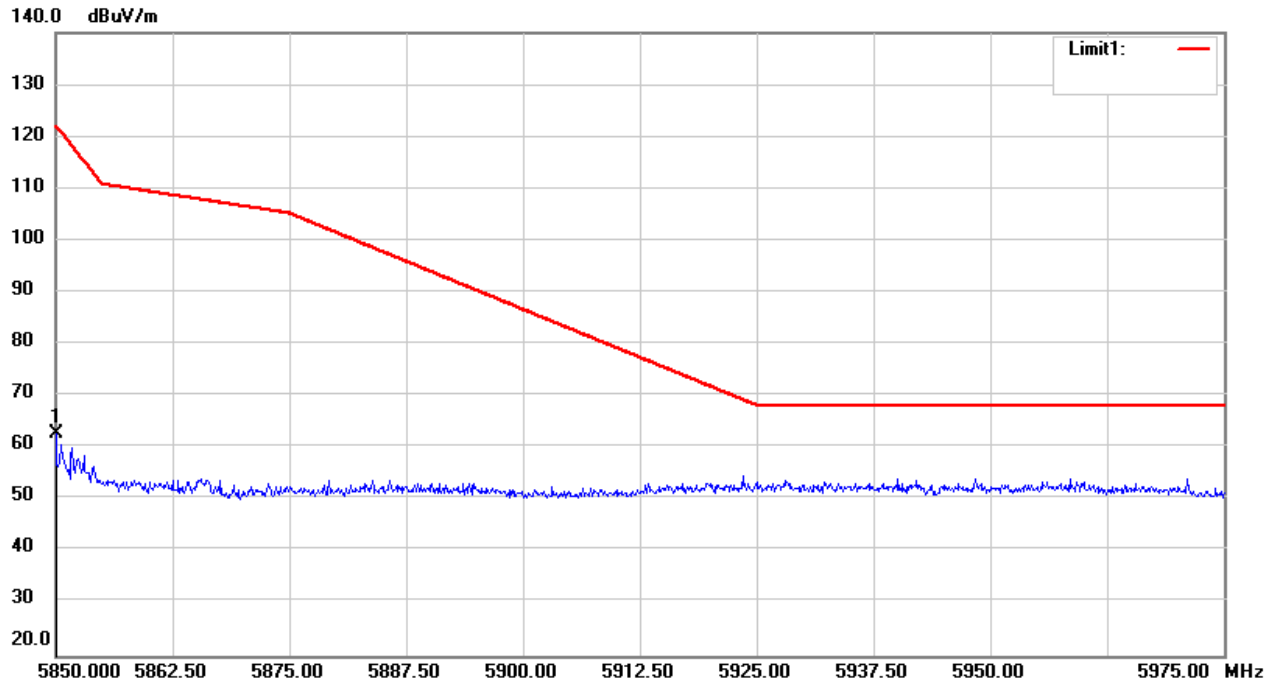
UNII Band III				
Test Model	Undesirable radiated	Undesirable radiated	Spurious Emission in Band Edge	
	<input checked="" type="checkbox"/> 802.11a	<input type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)	
	<input checked="" type="checkbox"/> 5745		Ant.Pol	H



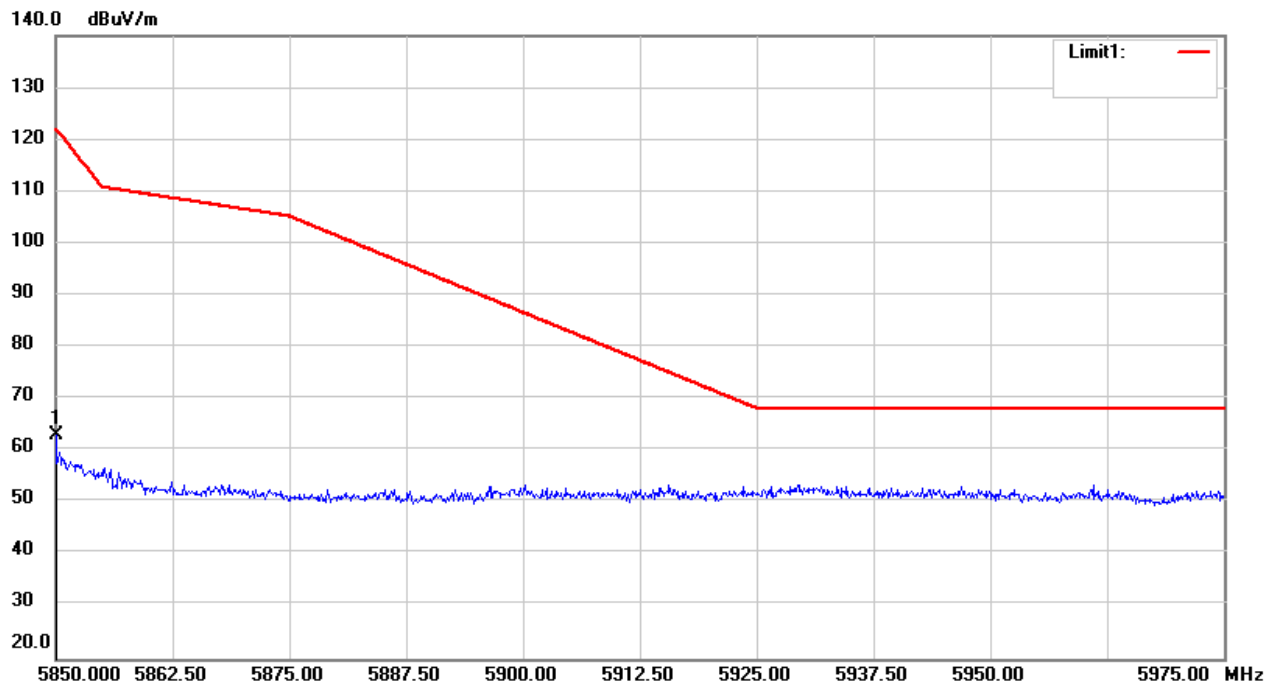
UNII Band III				
Test Model	Undesirable radiated	Undesirable radiated	Spurious Emission in Band Edge	
	<input checked="" type="checkbox"/> 802.11a	<input type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)	
	<input checked="" type="checkbox"/> 5745		Ant.Pol	V



UNII Band III				
Test Model	Undesirable radiated	Undesirable radiated	Spurious Emission in Band Edge	
	<input checked="" type="checkbox"/> 802.11a	<input type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)	
	<input checked="" type="checkbox"/> 5825		Ant.Pol	H

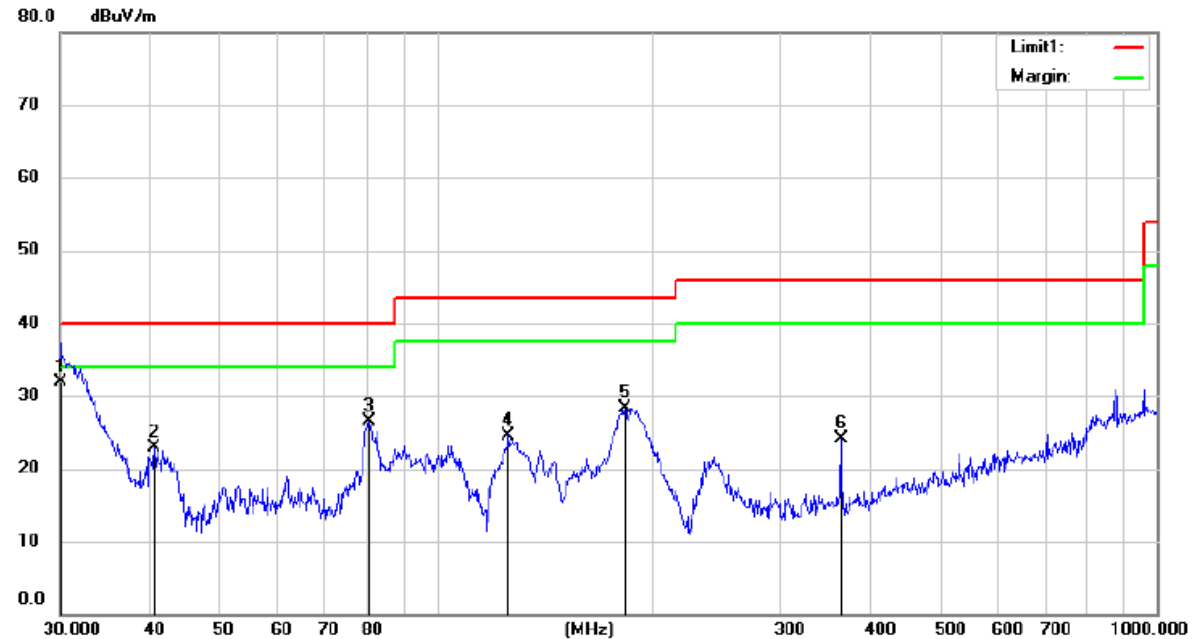


UNII Band III				
Test Model	Undesirable radiated	Undesirable radiated	Spurious Emission in Band Edge	
	<input checked="" type="checkbox"/> 802.11a	<input type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)	
	<input checked="" type="checkbox"/> 5825		Ant.Pol	V



- Undesirable radiated Spurious Emission below 1GHz (30MHz to 1GHz)
All modes have been tested, and the worst results have been recorded in the report.

For Adapter1



Site 3m Chamber #3

Polarization: **Horizontal**

Temperature: 27 C

Limit: FCC PART 15 CLASS B

Power: AC 120V/60Hz

Humidity: 49 %

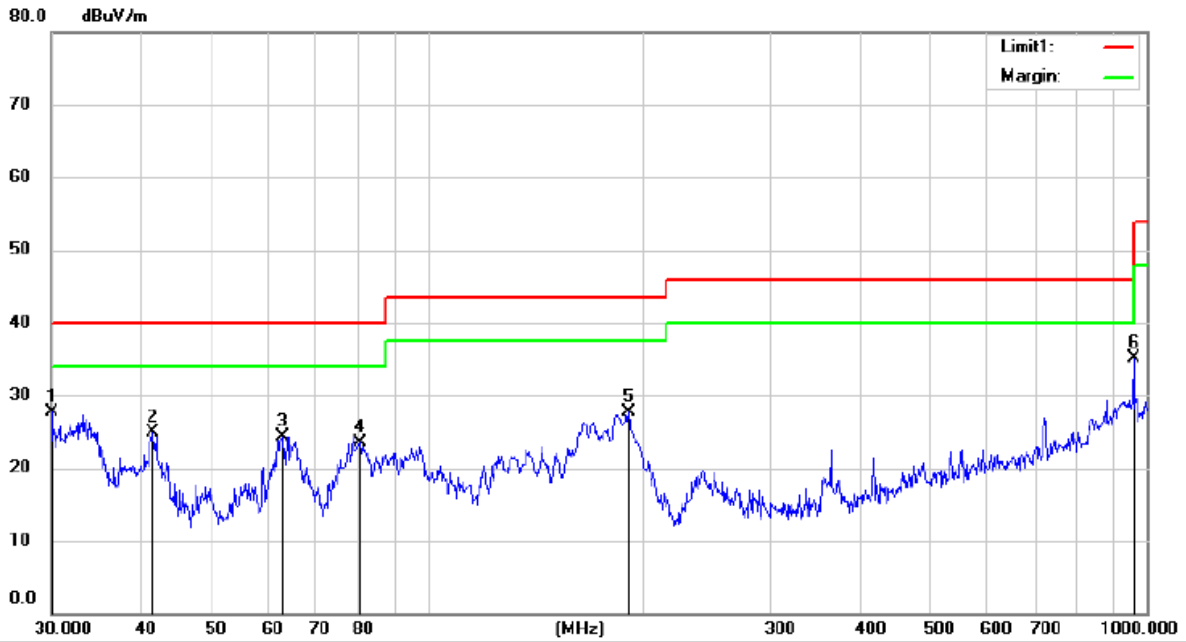
Mode: 802.11 a 5180 MHz

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1	*	30.0000	48.73	-16.73	32.00	40.00	-8.00	QP		
2		40.5591	37.56	-14.65	22.91	40.00	-17.09	QP		
3		80.6442	46.23	-19.64	26.59	40.00	-13.41	QP		
4		125.8864	43.02	-18.42	24.60	43.50	-18.90	QP		
5		182.5592	45.26	-16.94	28.32	43.50	-15.18	QP		
6		364.2595	35.30	-11.10	24.20	46.00	-21.80	QP		

*:Maximum data x:Over limit !:over margin

Operator: CSL

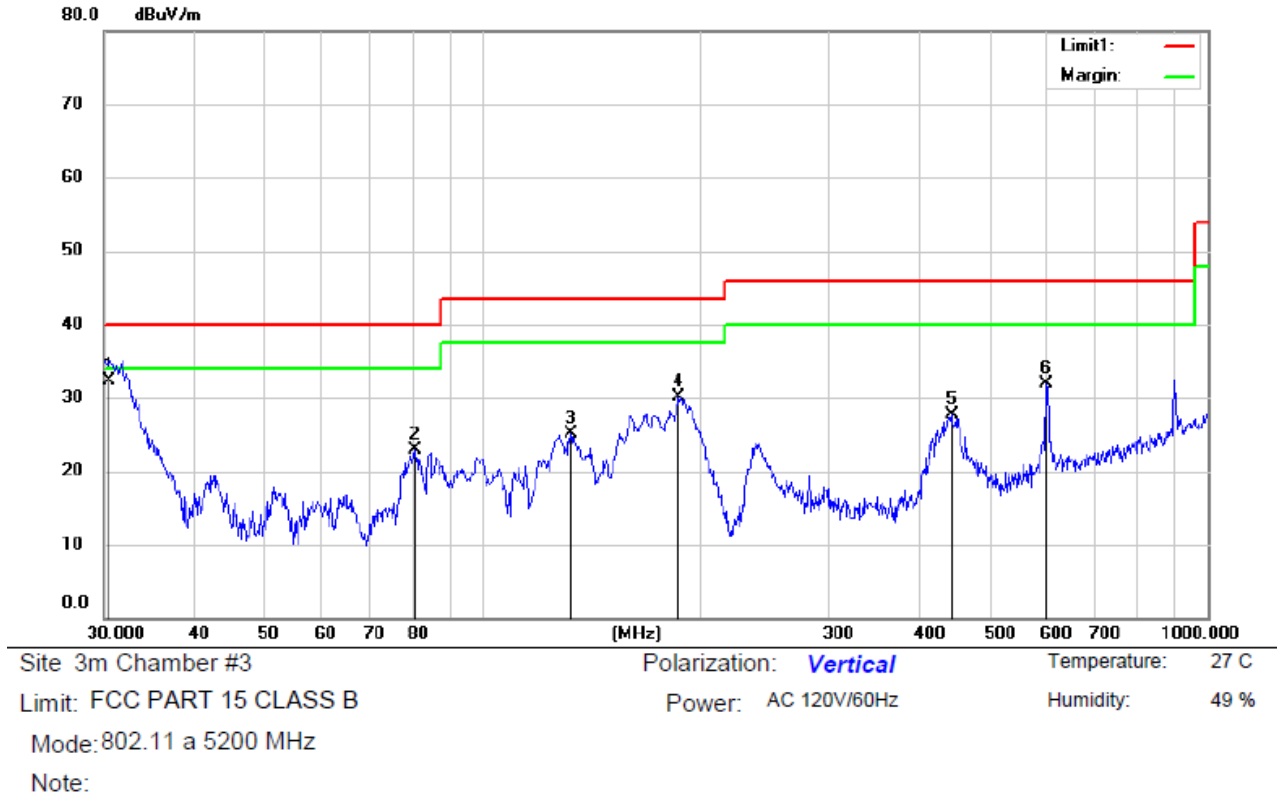


Site 3m Chamber #3 Polarization: **Vertical** Temperature: 27 C
 Limit: FCC PART 15 CLASS B Power: AC 120V/60Hz Humidity: 49 %
 Mode: 802.11 a 5180 MHz
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		30.0000	44.43	-16.73	27.70	40.00	-12.30	QP			
2		41.4215	39.20	-14.29	24.91	40.00	-15.09	QP			
3		62.8708	40.18	-15.78	24.40	40.00	-15.60	QP			
4		80.6442	43.11	-19.64	23.47	40.00	-16.53	QP			
5		190.4050	43.85	-16.24	27.61	43.50	-15.89	QP			
6	*	958.7943	34.96	0.10	35.06	46.00	-10.94	QP			

*:Maximum data x:Over limit !:over margin

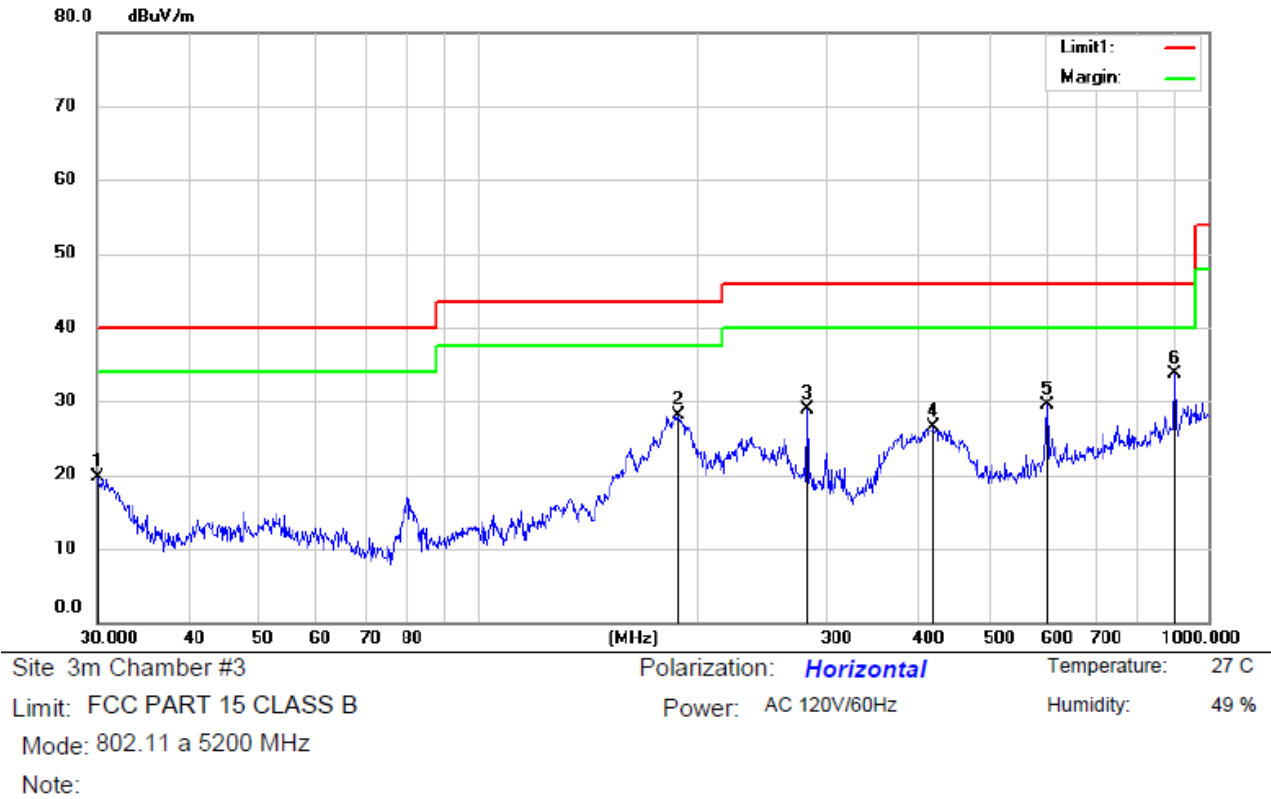
Operator: CSL



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	30.4237	49.14	-16.74	32.40	40.00	-7.60	QP		
2		80.6441	42.45	-19.64	22.81	40.00	-17.19	QP		
3		132.2205	44.25	-19.09	25.16	43.50	-18.34	QP		
4		186.4408	46.55	-16.53	30.02	43.50	-13.48	QP		
5		443.2942	36.93	-9.28	27.65	46.00	-18.35	QP		
6		599.3212	37.64	-5.64	32.00	46.00	-14.00	QP		

*:Maximum data x:Over limit l:over margin

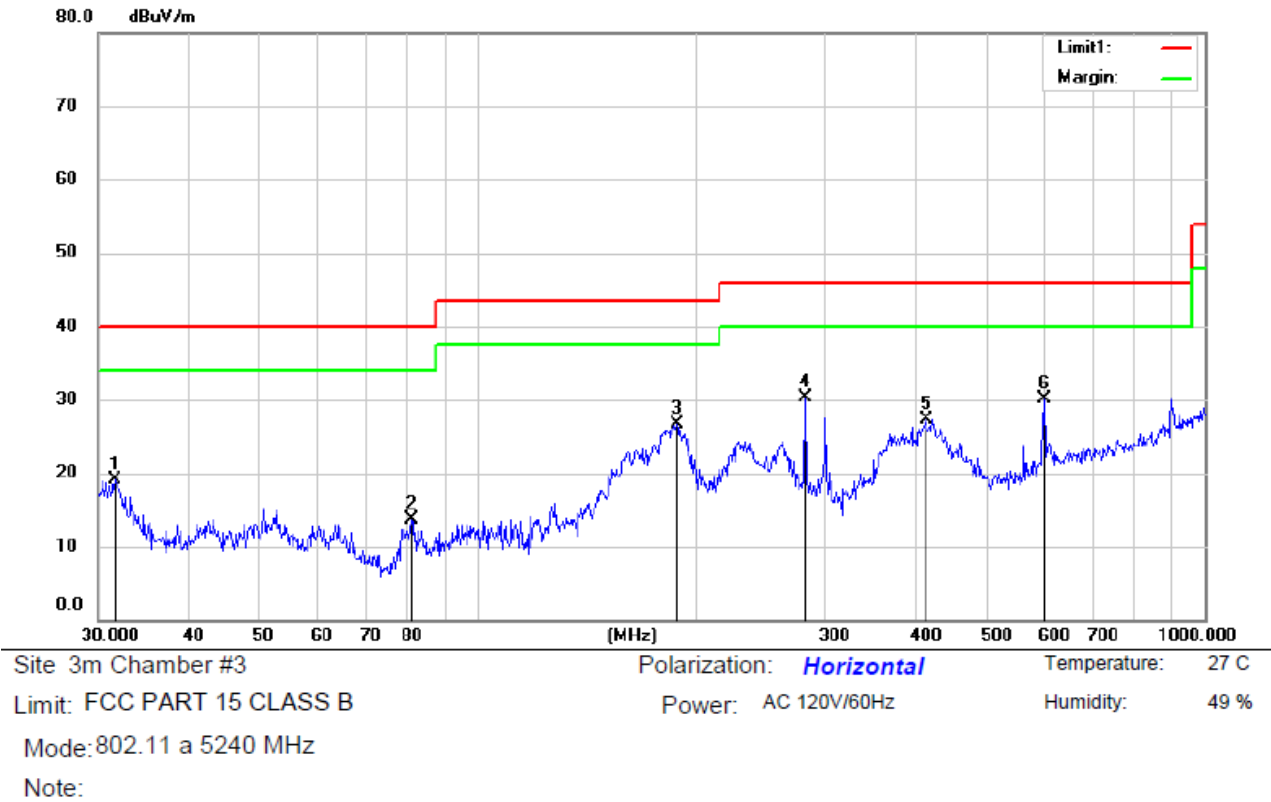
Operator: CSL



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		30.0000	36.44	-16.73	19.71	40.00	-20.29	QP		
2		187.7530	44.59	-16.44	28.15	43.50	-15.35	QP		
3		281.9945	41.97	-13.04	28.93	46.00	-17.07	QP		
4		420.5803	35.88	-9.40	26.48	46.00	-19.52	QP		
5		601.4265	34.99	-5.58	29.41	46.00	-16.59	QP		
6	*	900.1474	34.76	-1.01	33.75	46.00	-12.25	QP		

*:Maximum data x:Over limit !:over margin

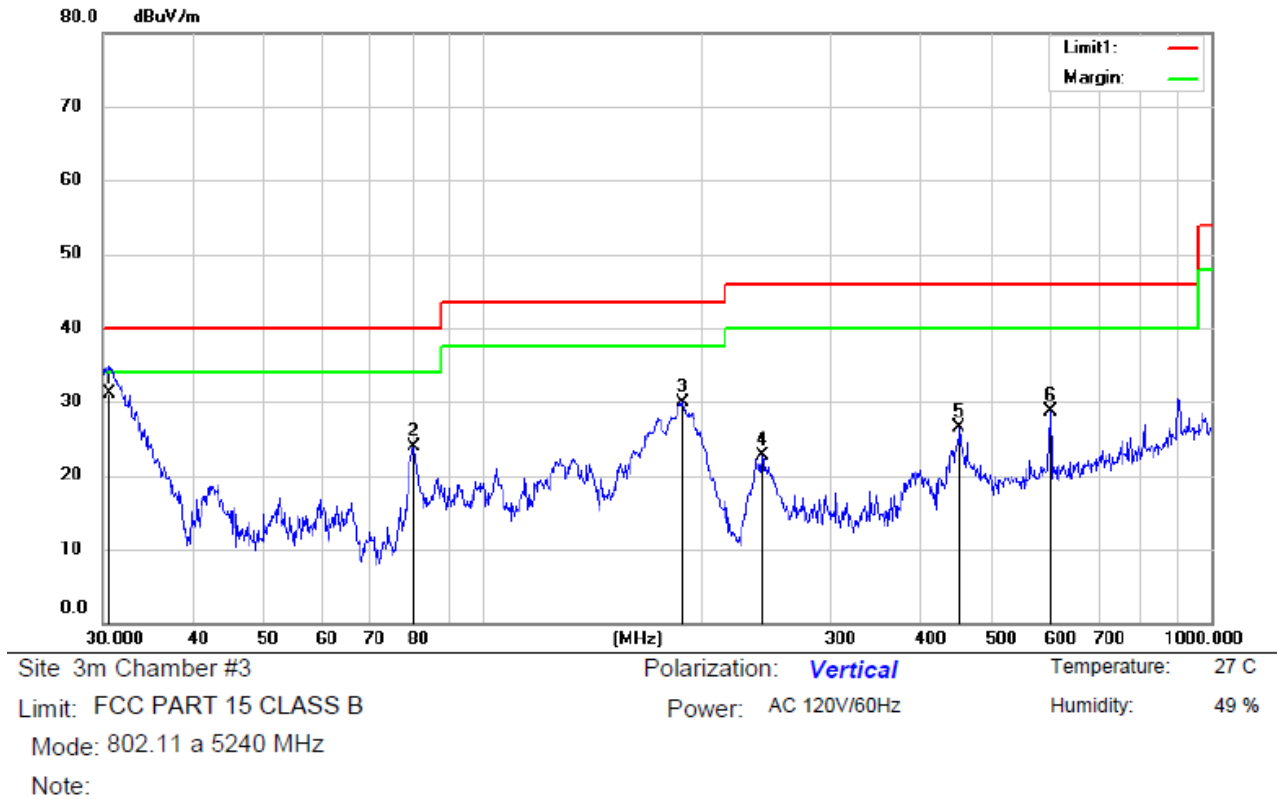
Operator: CSL



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		31.6201	35.94	-16.79	19.15	40.00	-20.85	QP		
2		80.9274	30.03	-16.35	13.68	40.00	-26.32	QP		
3		187.7530	43.15	-16.44	26.71	43.50	-16.79	QP		
4	*	281.9945	43.39	-13.04	30.35	46.00	-15.65	QP		
5		413.2706	36.94	-9.69	27.25	46.00	-18.75	QP		
6		601.4265	35.74	-5.58	30.16	46.00	-15.84	QP		

*:Maximum data x:Over limit !:over margin

Operator: CSL

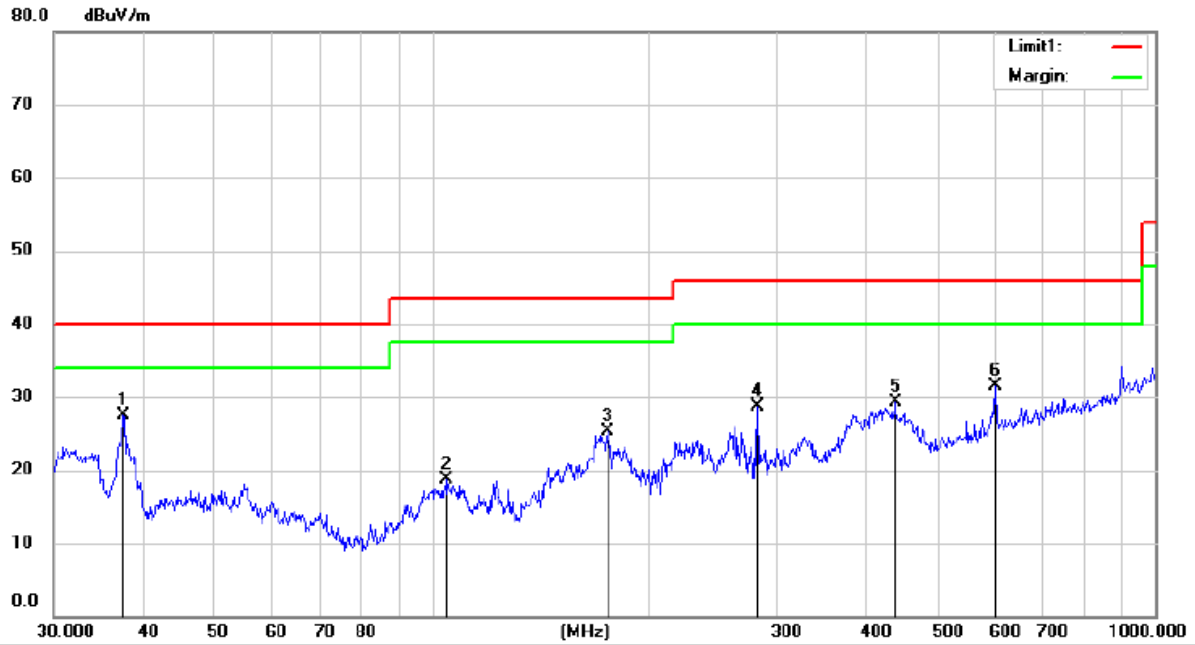


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1	*	30.6380	47.95	-16.75	31.20	40.00	-8.80	QP		
2		80.0806	43.53	-19.70	23.83	40.00	-16.17	QP		
3		187.7530	46.38	-16.44	29.94	43.50	-13.56	QP		
4		241.6763	36.68	-14.06	22.62	46.00	-23.38	QP		
5		451.1350	35.72	-9.22	26.50	46.00	-19.50	QP		
6		601.4265	34.31	-5.58	28.73	46.00	-17.27	QP		

*:Maximum data x:Over limit !:over margin

Operator: CSL

For Adapter2



Site 3m Chamber #1

Polarization: **Horizontal**

Temperature: 27 C

Limit: (RE)FCC PART 15 CLASS B

Power: AC 120V/60Hz

Humidity: 43 %

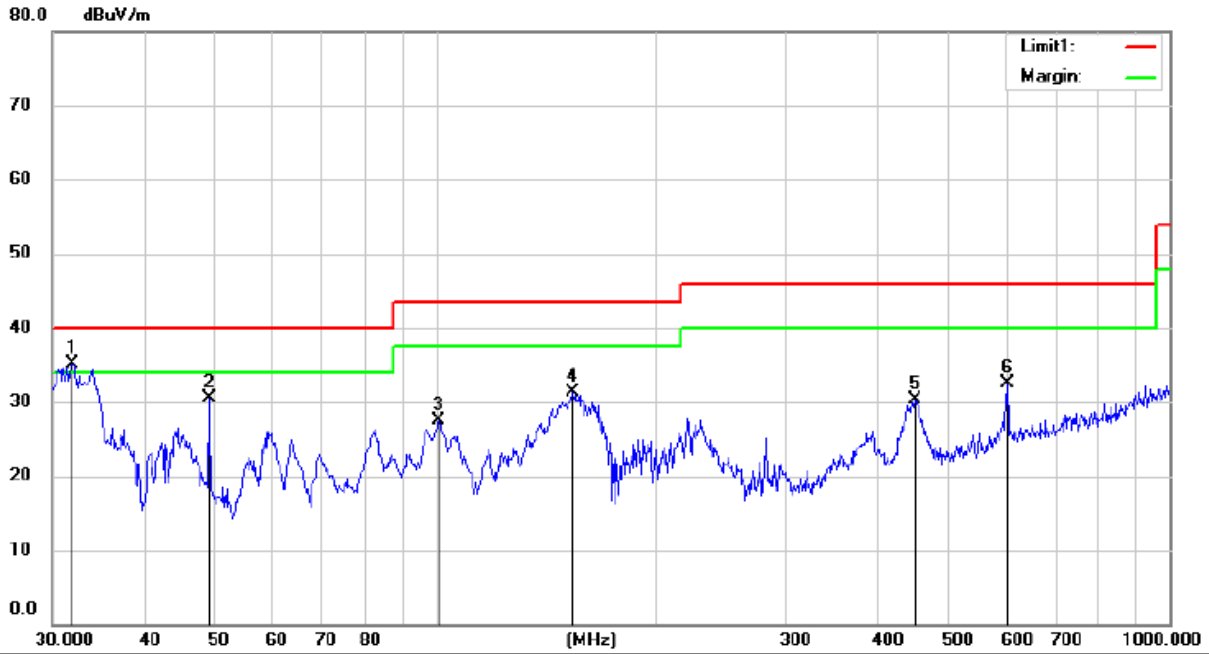
Mode:802.11a 5180MHz

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	37.4165	40.42	-12.90	27.52	40.00	-12.48	QP		
2		104.9033	30.96	-12.27	18.69	43.50	-24.81	QP		
3		175.0368	39.34	-13.97	25.37	43.50	-18.13	QP		
4		281.9946	37.54	-8.83	28.71	46.00	-17.29	QP		
5		437.1200	34.61	-5.36	29.25	46.00	-16.75	QP		
6		601.4265	33.73	-2.14	31.59	46.00	-14.41	QP		

*:Maximum data x:Over limit !:over margin

Operator: XZC



Site 3m Chamber #1

Polarization: **Vertical**

Temperature: 27 C

Limit: (RE)FCC PART 15 CLASS B

Power: AC 120V/60Hz

Humidity: 43 %

Mode: 802.11a 5180MHz

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	31.9546	49.34	-14.17	35.17	40.00	-4.83	QP		
2		49.0145	41.69	-11.22	30.47	40.00	-9.53	QP		
3		100.9340	40.00	-12.58	27.42	43.50	-16.08	QP		
4		153.7385	46.43	-15.14	31.29	43.50	-12.21	QP		
5		451.1350	35.76	-5.37	30.39	46.00	-15.61	QP		
6		601.4265	34.58	-2.14	32.44	46.00	-13.56	QP		

*:Maximum data x:Over limit !:over margin

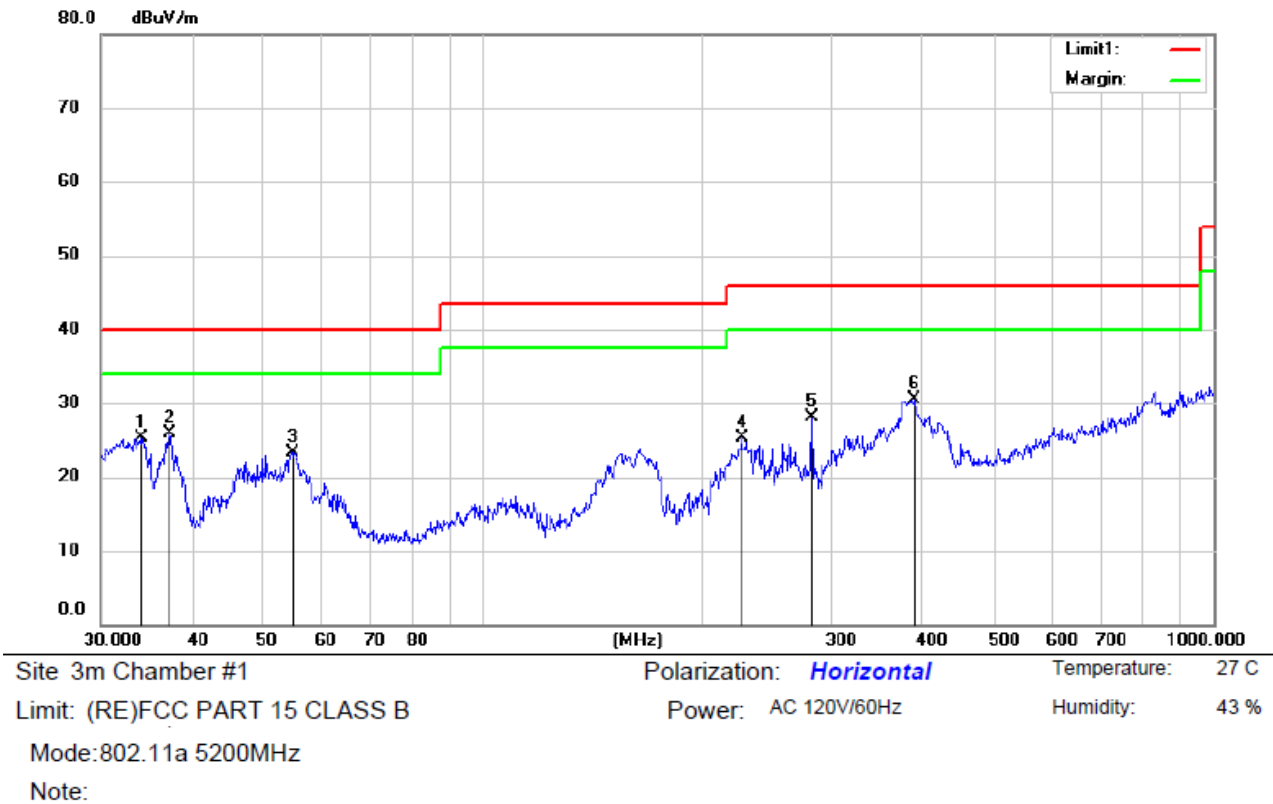
Operator: XZC



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1	*	31.7313	46.26	-14.16	32.10	40.00	-7.90	QP		
2		49.0145	41.69	-11.22	30.47	40.00	-9.53	QP		
3		96.7750	43.49	-13.15	30.34	43.50	-13.16	QP		
4		154.2786	49.36	-15.11	34.25	43.50	-9.25	QP		
5		444.8514	37.99	-5.36	32.63	46.00	-13.37	QP		
6		601.4265	36.58	-2.14	34.44	46.00	-11.56	QP		

*:Maximum data x:Over limit !:over margin

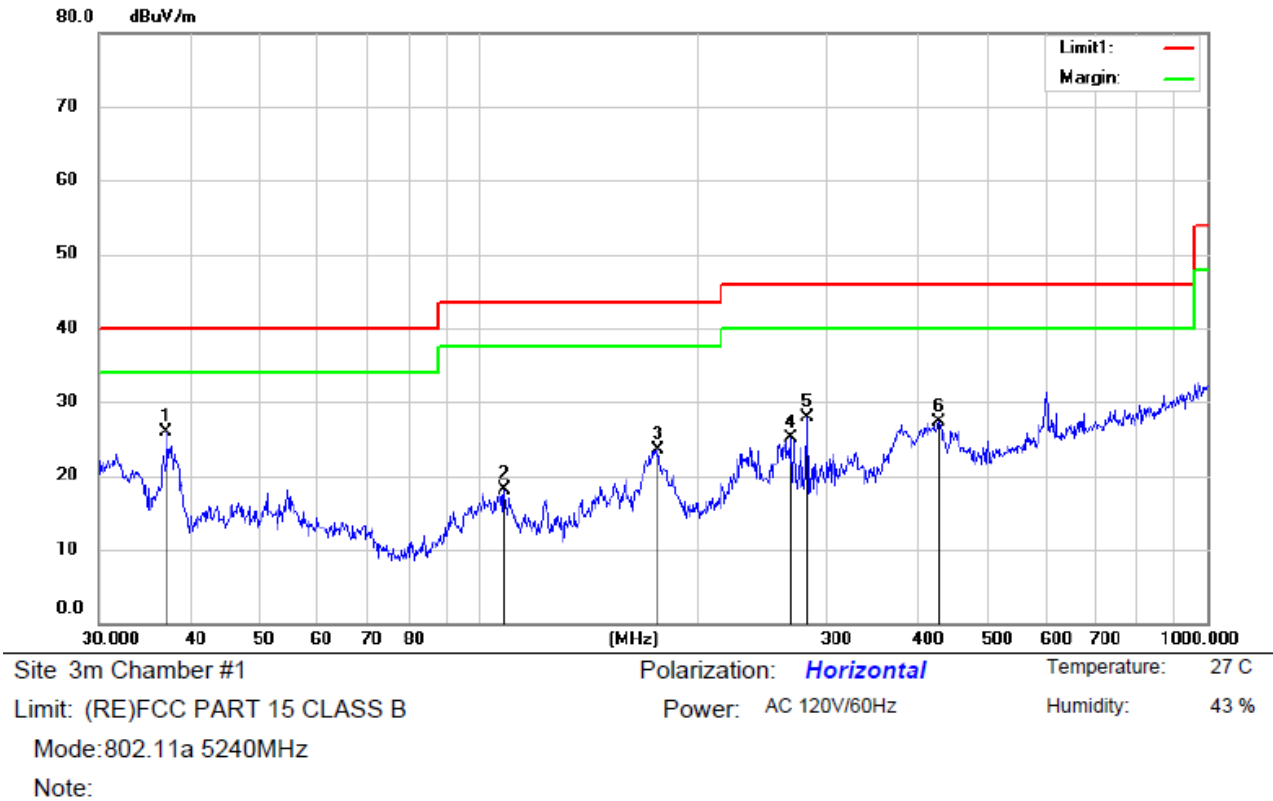
Operator: XZC



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		34.1561	38.31	-13.09	25.22	40.00	-14.78	QP		
2	*	37.2855	38.82	-12.96	25.86	40.00	-14.14	QP		
3		55.0274	35.01	-11.64	23.37	40.00	-16.63	QP		
4		226.0994	36.09	-10.79	25.30	46.00	-20.70	QP		
5		281.9946	36.98	-8.83	28.15	46.00	-17.85	QP		
6		389.3550	36.90	-6.36	30.54	46.00	-15.46	QP		

*:Maximum data x:Over limit !:over margin

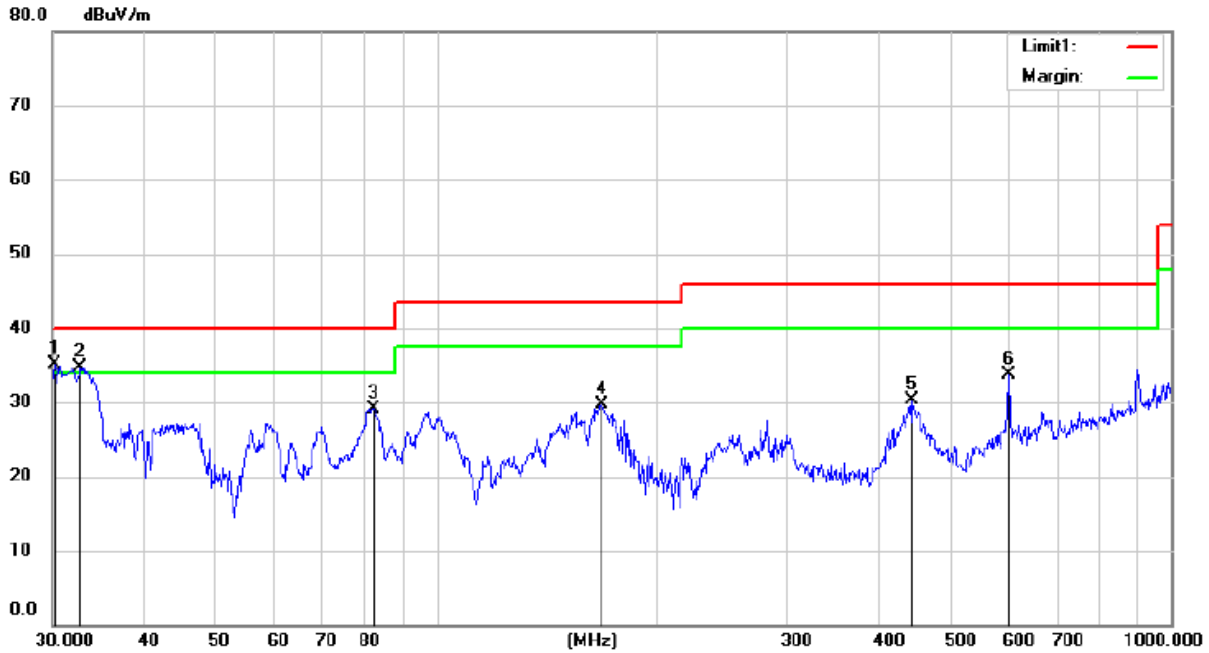
Operator: XZC



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1	*	37.1550	38.90	-13.02	25.88	40.00	-14.12	QP		
2		108.2667	30.47	-12.46	18.01	43.50	-25.49	QP		
3		176.2686	37.41	-13.87	23.54	43.50	-19.96	QP		
4		267.5455	34.35	-9.32	25.03	46.00	-20.97	QP		
5		281.9946	36.69	-8.83	27.86	46.00	-18.14	QP		
6		428.0193	32.71	-5.44	27.27	46.00	-18.73	QP		

*:Maximum data x:Over limit !:over margin

Operator: XZC



Site 3m Chamber #1

Polarization: **Vertical**

Temperature: 27 C

Limit: (RE)FCC PART 15 CLASS B

Power: AC 120V/60Hz

Humidity: 43 %

Mode:802.11a 5240MHz

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1	*	30.2111	49.18	-14.13	35.05	40.00	-4.95	QP		
2	!	32.7486	48.42	-13.75	34.67	40.00	-5.33	QP		
3		82.0706	45.81	-16.67	29.14	40.00	-10.86	QP		
4		167.8243	43.98	-14.35	29.63	43.50	-13.87	QP		
5		444.8514	35.61	-5.36	30.25	46.00	-15.75	QP		
6		601.4265	35.94	-2.14	33.80	46.00	-12.20	QP		

*:Maximum data x:Over limit !:over margin

Operator: XZC

8.6 POWER LINE CONDUCTED EMISSIONS

8.6.1 Applicable Standard

According to FCC Part 15.207(a)

8.6.2 Conformance Limit

Frequency(MHz)	Conducted Emission Limit	
	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

8.6.3 Test Configuration

Test according to clause 6.3 conducted emission test setup

8.6.4 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.

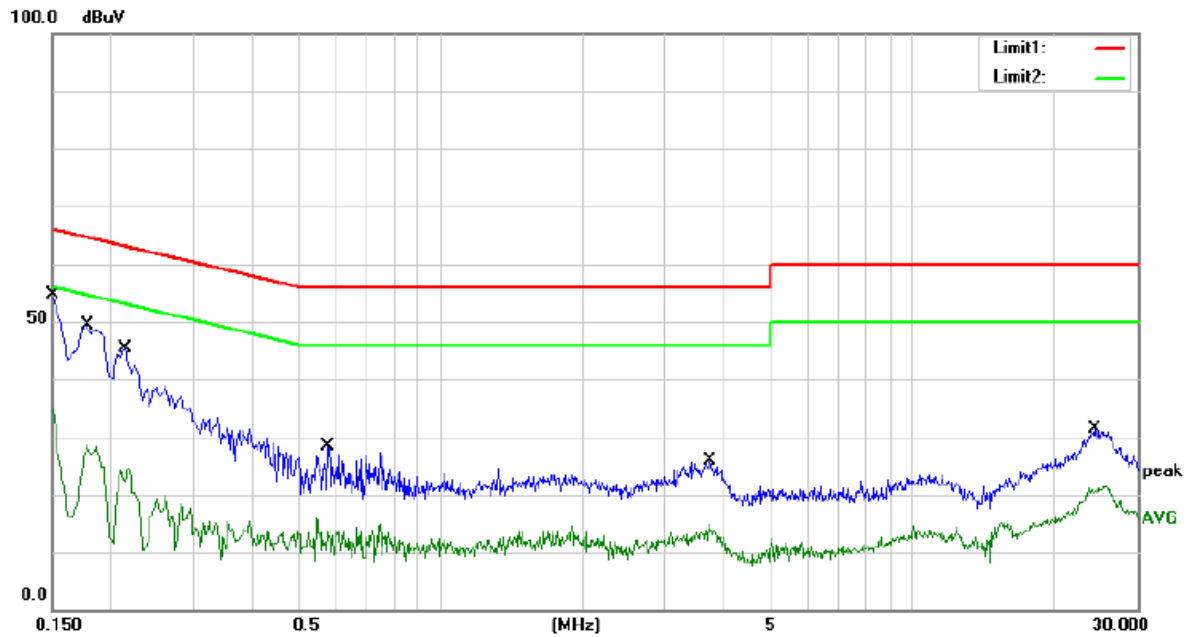
Repeat above procedures until all frequency measured were complete.

8.6.5 Test Results

Pass

All mode and the voltage 120V and 240V have been tested, and show the worst result. (802.11a low channel, 120V~ 60Hz) as bellow.

For Adapter1



Site Conduction #1

Phase: **N**

Temperature: 24.9

Limit: (CE)FCC PART 15 class B_QP

Power: AC 120V/60Hz

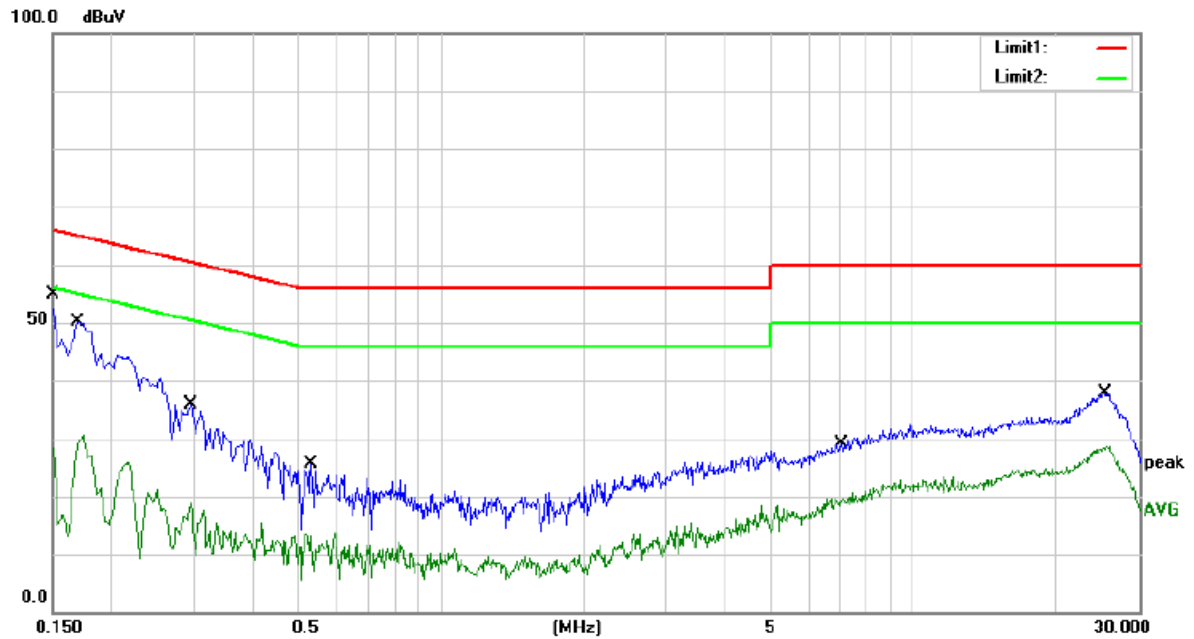
Humidity: 54 %

Mode: 802.11a 5180MHz

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1500	45.04	9.56	54.60	66.00	-11.40	QP	
2		0.1500	27.16	9.56	36.72	56.00	-19.28	AVG	
3		0.1780	39.88	9.56	49.44	64.58	-15.14	QP	
4		0.1780	19.14	9.56	28.70	54.58	-25.88	AVG	
5		0.2140	35.87	9.56	45.43	63.05	-17.62	QP	
6		0.2140	15.06	9.56	24.62	53.05	-28.43	AVG	
7		0.5780	18.80	9.58	28.38	56.00	-27.62	QP	
8		0.5780	6.17	9.58	15.75	46.00	-30.25	AVG	
9		3.7220	16.18	9.64	25.82	56.00	-30.18	QP	
10		3.7220	5.13	9.64	14.77	46.00	-31.23	AVG	
11		24.3460	21.39	10.02	31.41	60.00	-28.59	QP	
12		24.3460	10.98	10.02	21.00	50.00	-29.00	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: WQG



Site Conduction #1

Phase: L1

Temperature: 24.9

Limit: (CE)FCC PART 15 class B_QP

Power: AC 120V/60Hz

Humidity: 54 %

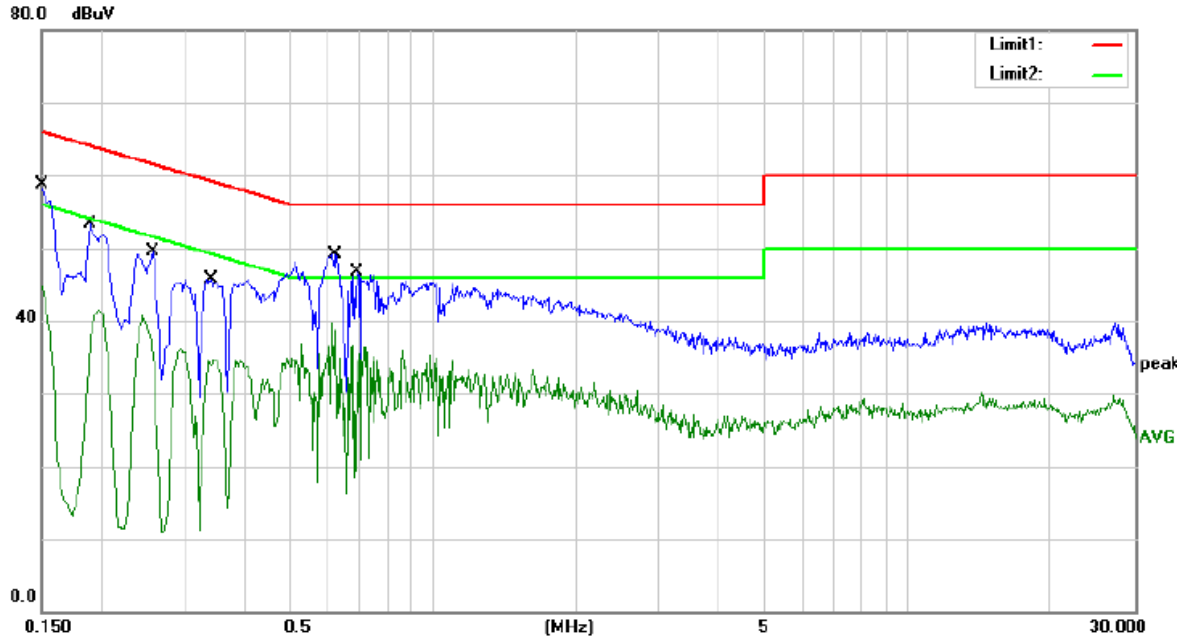
Mode: 802.11a 5180MHz

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1500	45.22	9.56	54.78	66.00	-11.22	QP	
2		0.1500	22.28	9.56	31.84	56.00	-24.16	AVG	
3		0.1700	40.68	9.56	50.24	64.96	-14.72	QP	
4		0.1700	20.97	9.56	30.53	54.96	-24.43	AVG	
5		0.2940	26.28	9.57	35.85	60.41	-24.56	QP	
6		0.2940	9.37	9.57	18.94	50.41	-31.47	AVG	
7		0.5300	16.14	9.57	25.71	56.00	-30.29	QP	
8		0.5300	4.14	9.57	13.71	46.00	-32.29	AVG	
9		7.0620	19.38	9.71	29.09	60.00	-30.91	QP	
10		7.0620	12.50	9.71	22.21	50.00	-27.79	AVG	
11		25.3580	27.93	10.04	37.97	60.00	-22.03	QP	
12		25.3580	18.57	10.04	28.61	50.00	-21.39	AVG	

*:Maximum data x:Over limit l:over margin Comment: Factor build in receiver. Operator: WQG

For Adapter2



Site Conduction #1

Phase: **L1**

Temperature: 24.9

Limit: (CE)FCC PART 15 class B_QP

Power: AC 120V/60Hz

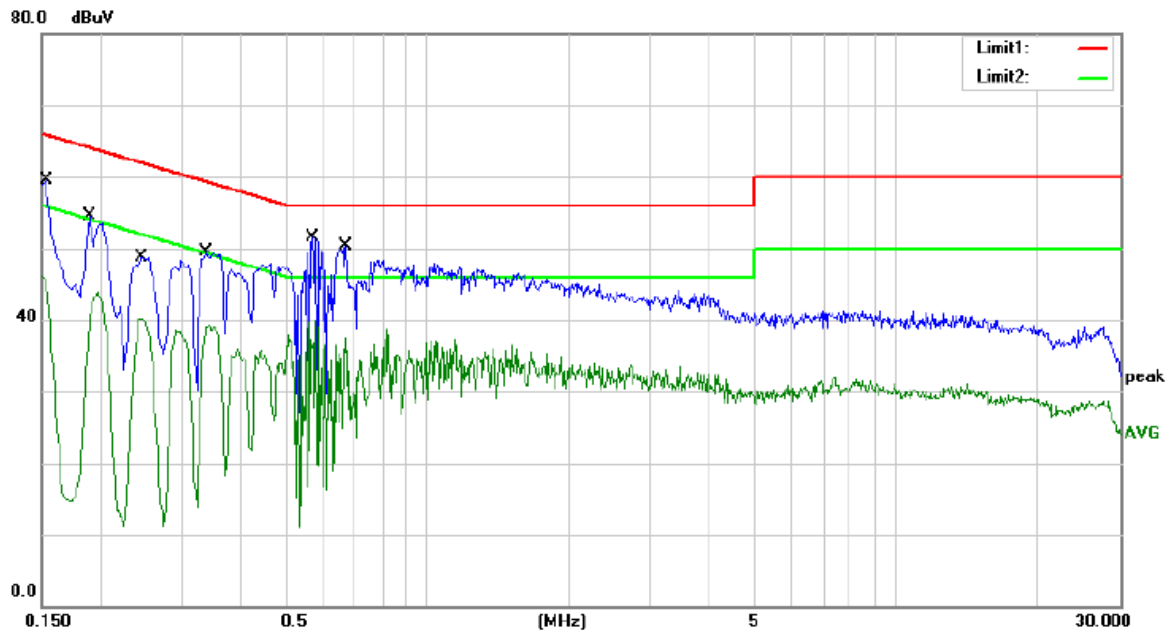
Humidity: 54 %

Mode: 802.11 a 5180MHz

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	49.20	9.56	58.76	66.00	-7.24	QP	
2		0.1500	35.99	9.56	45.55	56.00	-10.45	AVG	
3		0.1900	43.67	9.56	53.23	64.04	-10.81	QP	
4		0.1900	31.94	9.56	41.50	54.04	-12.54	AVG	
5		0.2580	39.91	9.56	49.47	61.50	-12.03	QP	
6		0.2580	31.05	9.56	40.61	51.50	-10.89	AVG	
7		0.3420	36.22	9.57	45.79	59.15	-13.36	QP	
8		0.3420	26.54	9.57	36.11	49.15	-13.04	AVG	
9		0.6220	39.55	9.58	49.13	56.00	-6.87	QP	
10	*	0.6220	30.05	9.58	39.63	46.00	-6.37	AVG	
11		0.6940	37.19	9.58	46.77	56.00	-9.23	QP	
12		0.6940	27.21	9.58	36.79	46.00	-9.21	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: WQG



Site Conduction #1

Phase: **N**

Temperature: 24.9

Limit: (CE)FCC PART 15 class B_QP

Power: AC 120V/60Hz

Humidity: 54 %

Mode: 802.11 a 5180MHz

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1540	49.88	9.56	59.44	65.78	-6.34	QP	
2		0.1540	36.77	9.56	46.33	55.78	-9.45	AVG	
3		0.1900	44.95	9.56	54.51	64.04	-9.53	QP	
4		0.1900	34.25	9.56	43.81	54.04	-10.23	AVG	
5		0.2460	39.12	9.56	48.68	61.89	-13.21	QP	
6		0.2460	30.62	9.56	40.18	51.89	-11.71	AVG	
7		0.3380	39.85	9.57	49.42	59.25	-9.83	QP	
8		0.3380	29.73	9.57	39.30	49.25	-9.95	AVG	
9		0.5700	40.63	9.57	50.20	56.00	-5.80	QP	
10		0.5700	24.17	9.57	33.74	46.00	-12.26	AVG	
11		0.6700	40.69	9.58	50.27	56.00	-5.73	QP	
12	*	0.6700	30.98	9.58	40.56	46.00	-5.44	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: WQG

8.7 ANTENNA APPLICATION

8.7.1 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.

8.7.2 Result

PASS.

The EUT has a FPC antenna for WIFI, the antenna max gain as follow:

3.38 dBi for UNII Band I/ II-A

3.86 dBi for UNII Band II-C

2.88 dBi for UNII Band III

Note:

- ☒ Antenna 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.