FCC Part 15.407

TEST REPORT

For

Cisco Systems, Inc.

125 West Tasman Drive, San Jose, CA 95134, USA

FCC ID: LDKPVDEO2618

Report Type: Original Report	**Product Type:** Cisco Catalyst 9120AX Series Wi-Fi 6 Access Points

Report Producer : Eva Kao

Report Number : RXZ220627003RF03

Report Date : 2022-7-8

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Revision History

Revision	No.	Report Number	Issue Date	Description	Author/ Revised by
0.0	RXZ220627003	RXZ220627003RF03	2022-7-8	Original Report	Eva Kao

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1 General Information

1.1 Product Description for Equipment under Test (EUT)

Manufacturer	Cisco Systems, Inc.
	125 West Tasman Drive, San Jose, CA 95134, USA
Brand(Trade) Name	CISCO
Product (Equipment)	Cisco Catalyst 9120AX Series Wi-Fi 6 Access Points
Main Model Name	C9120AXP-B
Frequency Range	5150 ~ 5250 MHz, 5250 ~ 5350 MHz, 5470 ~ 5725 MHz, 5725 ~ 5850 MHz
Modulation Technique	OFDM , OFDMA
Power Operation (Voltage Range)	55Vdc from PoE port
Received Date	2022/6/27
Date of Test	2022/6/30 ~ 2022/7/4

*All measurement and test data in this report was gathered from production sample serial number: RXZ220627003-01 (Assigned by BACL, New Taipei Laboratory).

1.2 Objective

This report is prepared on behalf of Cisco Systems, Inc. in accordance with Part 2, Subpart J, Part 15, Subparts A, C and E of the Federal Communication Commission's rules.

Wi-Fi and Chillwave leverage original test data (FCC ID: LDKROFSN2177) in accordance with FCC KDB 484596 D01. Wi-Fi and Chillwave will be verified by spot checking output power and radiated spurious emissions.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

1.4 Statement

Decision Rule: No, (The test results do not include MU judgment)

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
The determination of the test results does not require consideration of the uncertainty of the measurement, unless the assessment is required by customer agreement, regulation or standard document specification.
Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) is not responsible for the authenticity of the information provided by the applicant that affects the test results.

1.5 Measurement Uncertainty

Parameter		Uncertainty
RF output power, conducted		±0.93 (dB)
Emissions, radiated	30 MHz~1GHz	±5.22(dB)
	1 GHz~18 GHz	±6.12(dB)
	18 GHz~40 GHz	±4.99(dB)
Temperature		+/- 1.27 °C
Humidity		+/- 3 %

1.6 Environmental Conditions

Test Site	Test Date	Temperature (℃)	Relative Humidity (%)	ATM Pressure (hPa)	Test Engineer
Radiation Spurious Emissions	2022/6/30 ~ 2022/7/4	22	47	1010	Aaron Pan
Maximum Output Power	2022/7/4	23	51	1010	Jim Chen

1.7 Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) to collect test data is located on
☒70, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C.

Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 3732) and the FCC designation No.TW3732 under the Mutual Recognition Agreement (MRA) in FCC Test.

2 System Test Configuration

2.1 Equipment Modifications

No modification was made to the EUT.

2.2 Test Mode

Mode 1: WIFI 2.4GHz XOR + WIFI 5GHz Regular + WIFI 2.4GHz Aux + BLE

Mode 2: WIFI 2.4G XOR + WIFI 5GHz Regular + WIFI 5GHz Aux + BLE

Mode 3: WIFI 5G XOR + WIFI 5GHz Regular + WIFI 2.4GHz Aux + BLE

Mode 4: WIFI 5G XOR + WIFI 5GHz Regular + WIFI 5GHz Aux + BLE

Radiated spurious emissions for Transmitting simultaneously test: Mode 1-4.

2.3 Support Equipment List and Details

Description	Manufacturer	Model Number	S/N
POE Adapter	CISCO	SB-PWR-INJ2	C18426663000003170
NB	DELL	E6410	8N7PXN1

2.4 External Cable List and Details

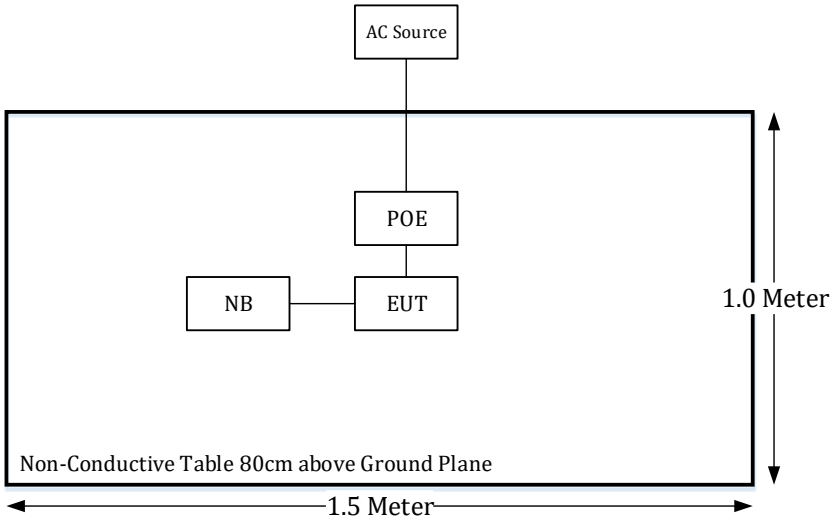
Cable Description	Length (m)	From	To
RJ-45 Cable	1	EUT	POE Adapter
RJ-45 to USB Serial Cable	2	EUT	NB

2.5 Block Diagram of Test Setup

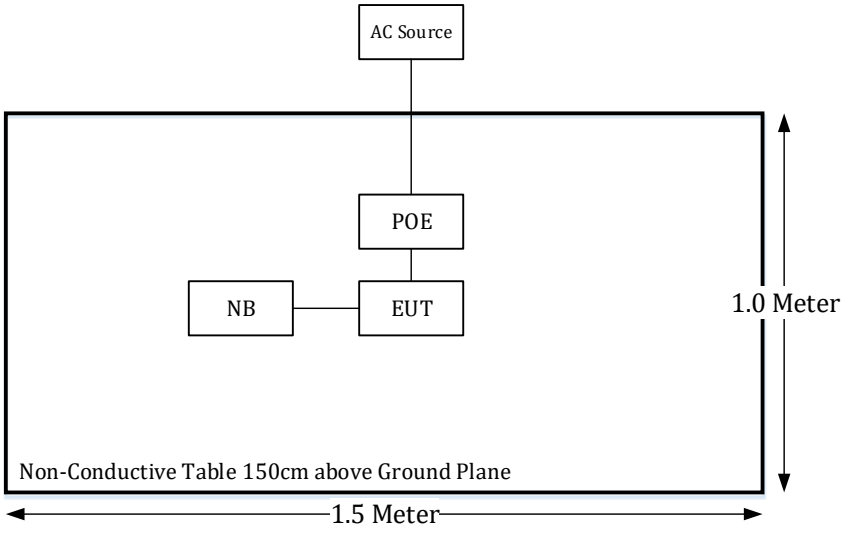
See test photographs attached in setup photos for the actual connections between EUT and support equipment.

Radiation:

Below 1GHz:



Above 1GHz:



3 Summary of Test Results

FCC Rules	Description of Test	Results
§15.407(f), §1.1307(b)(3)(i)	RF Exposure	Compliance
§15.205 & §15.209 & §15.407(b)	Unwanted Emission	Compliance
§15.407(a)(1)(3)	Conducted Transmitter Output Power	Compliance

*Note: The output power for each radio and each frequency band already verified.
The test report presented the worst modes and channels.

4 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Radiation 3M Room (966-A)					
Bilog Antenna with 6 dB Attenuator	SUNOL SCIENCES & MINI-CIRCUITS	JB6/UNAT-6+	A050115/15542_01	2022/02/14	2023/02/13
Horn Antenna	EMCO	3115	9809-55583	2021/8/26	2022/8/25
Horn Antenna	ETS-Lindgren	3116	62638	2021/8/11	2022/8/10
Preamplifier	Sonoma	310N	130602	2022/6/8	2023/6/7
Preamplifier	A.H. system Inc.	PAM-0118P	466	2021/11/4	2022/11/3
Microware Preamplifier	EM Electronics Corporation	EM18G40G	60656	2021/12/27	2022/12/26
Spectrum Analyzer	Rohde & Schwarz	FSV40	101435	2021/12/27	2022/12/26
EMI Test Receiver	Rohde & Schwarz	ESR7	101419	2021/11/9	2022/11/8
Micro flex Cable	UTIFLEX	UFB197C-1-2362-70U-70U	225757-001	2022/1/24	2023/1/23
Coaxial Cable	COMMATE	PEWC	8Dr	2021/12/24	2022/12/23
Coaxial Cable	UTIFLEX	UFB311A-Q-1440-300300	220490-006	2022/1/24	2023/1/23
Coaxial Cable	JUNFLON	J12J102248-00-B-5	AUG-07-15-044	2021/12/24	2022/12/23
Cable	EMC	EMC105-SM-SM-10000	201003	2022/1/24	2023/1/23
Coaxial Cable	ROSNOL	K1K50-UP0264-K1K50-450CM	160309-1	2022/1/24	2023/1/23
Coaxial Cable	ROSNOL	K1K50-UP0264-K1K50-50CM	15120-1	2022/1/18	2023/1/17
Software	Audix	e3	18621a bacl	N.C.R	N.C.R
Conducted Room					
Cable	UTIFLEX	UFA210A	9435	2021/10/5	2022/10/4
Power Sensor	KEYSIGHT	U2021XA	MY54080018	2021/1/28	2022/1/27
Attenuator	MINI-CIRCUITS	BW-S10W5+	1419	2021/1/28	2022/1/27

***Statement of Traceability:** BACL Corp. attests that all of the calibrations on the equipment items listed above were traceable to the SI System of Units via the R.O.C. Center for Measurement Standards of the Electronics Testing Center, Taiwan (ETC) or to another internationally recognized National Metrology Institute (NMI), and were compliant with the current Taiwan Accreditation Foundation (TAF) requirement

5 FCC §15.407(f), § 1.1307(b)(3)(i) – RF Exposure

5.1 Applicable Standard

According to subpart 15.247(i) and subpart §1.1307(b)(3)(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

For single RF sources (*i.e.*, any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);

(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold *Pth* (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). *Pth* is given by:

$$P_{th}\ (\text{mW}) = \begin{cases} ERP_{20\ cm}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\ cm} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\ cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

5.2 RF Exposure Evaluation Result

The EUT can be used in the following modes, selecting the worst mode for evaluation.

Mode 1: 2.4G XOR + 5G Regular + 2.4G Aux + BLE

Mode 2: 2.4G XOR + 5G Regular + 5G Aux + BLE

Mode 3: 5G XOR + 5G Regular + 2.4G Aux + BLE

Mode 4: 5G XOR + 5G Regular + 5G Aux + BLE

Worst case is Mode 1 :

Project info

Band	Freq (MHz)	Tune-up Power (dBm)	Ant Gain (dBi)	Distances (mm)	Duty (%)	Tune-up Power (mW)	ERP (dBm)	ERP (mW)
BLE	2480	5	13	300	100%	3.16	15.85	38.46
do0 2.4GHz XOR	2462	22	13	300	100%	158.49	32.85	1927.52
d01 5GHz Regualr	5850	23	13	300	100%	199.53	33.85	2426.61
do4 2.4G Aux	2462	16	13	300	100%	39.81	26.85	484.17

Option A

The available maximum time-averaged power is no more than 1 mW

Band	Freq (MHz)	Result Option A
BLE	2480	not exempt
do0 2.4GHz XOR	2462	not exempt
d01 5GHz Regualr	5850	not exempt
do4 2.4G Aux	2462	not exempt

Option B

The available maximum time-averaged power or effective radiated power (ERP), whichever is greater.

This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive).

Band	Freq (MHz)	Pth (mW)	X	ERP 20cm (mW)	Ratio	Result Option B
BLE	2480	3060.00	1.905	3060	0.01	exempt
do0 2.4GHz XOR	2462	3060.00	1.903	3060	0.63	exempt
d01 5GHz Regualr	5850	3060.00	2.091	3060	0.79	exempt
do4 2.4G Aux	2462	3060.00	1.903	3060	0.16	exempt

Simultaneous Analysis :

Band	Freq (MHz)	PSD Require	PSD (mW/cm^2)	PSD Limit (mW/cm^2)	Simultaneous TX	Ratio
BLE	2480	exempt	0.006	1.000	O	0.006
do0 2.4GHz XOR	2462	exempt	0.280	1.000	O	0.280
d01 5GHz Regualr	5850	exempt	0.352	1.000	O	0.352
do4 2.4G Aux	2462	exempt	0.070	1.000	O	0.070
Simultaneous Analysis (Limit 1)						0.708

Result: The EUT meets exemption requirement- RF exposure evaluation greater than **30cm** distance.

6 FCC §15.209, §15.205 , §15.407(b) – Spurious Emissions

6.1 Applicable Standard

As Per FCC §15.205(a) except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	608 – 614	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	960 – 1240	5.35 – 5. 46
2.1735 – 2.1905	16.80425 – 16.80475	1300 – 1427	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1435 – 1626.5	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1645.5 – 1646.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1660 – 1710	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1718.8 – 1722.2	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	2200 – 2300	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2310 – 2390	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2483.5 – 2500	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2690 – 2900	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	3260 – 3267	22.01 – 23.12
8.41425 – 8.41475	162.0125 –167.17	3.332 – 3.339	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3 3458 – 3 358	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3.600 – 4.400	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4		Above 38.6
13.36 – 13.41	399.9 – 410		

As per FCC §15.209(a): Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (micro volts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

Note 1: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

As per FCC Part 15.407 (b)

- 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 5.725-5.85 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

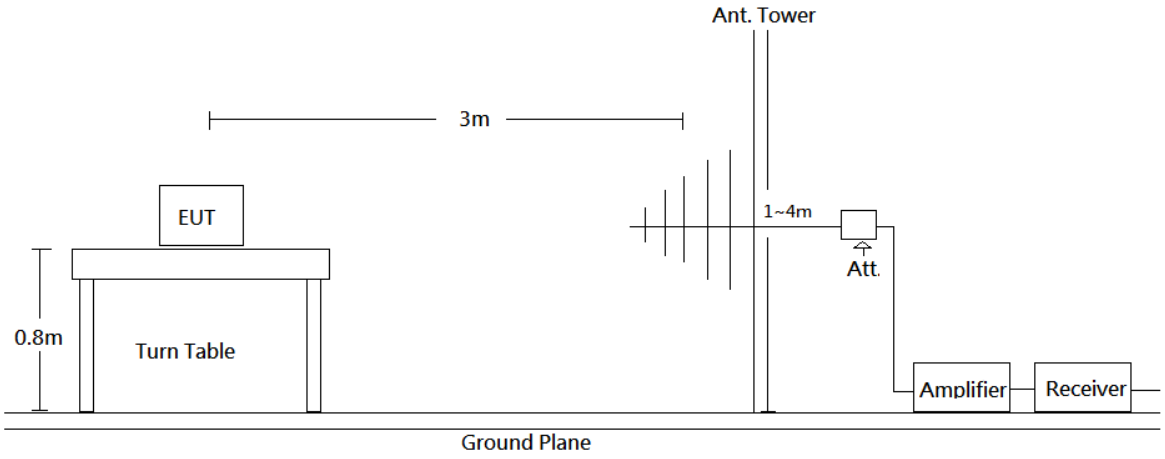
of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge..

˙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.

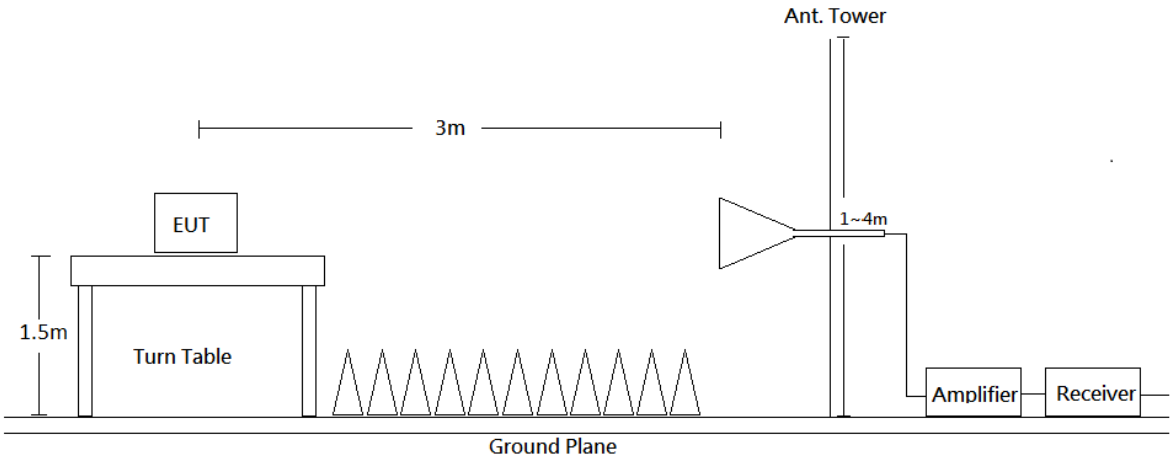
˙Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

6.2 EUT Setup

Below 1 GHz:



Above 1 GHz:



Radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part 15.209 and FCC 15.407 Limits.

6.3 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz. During the radiated emission test, the EMI test receiver was set with the following configurations measurement method 6.3 in ANSI C63.10.

Frequency Range	RBW	VBW	Duty cycle	Measurement method
30-1000 MHz	120 kHz	/	/	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1 MHz	10 Hz	>98%	Ave
	1 MHz	1/T	<98%	Ave

Note: T is minimum transmission duration

6.4 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

According to C63.10, emission shall be computed as: E [dBμV/m] = EIRP[dBm] + 95.2, for d = 3 meters.

All emissions under the average limit and under the noise floor have not recorded in the report

6.5 Corrected Factor & Margin Calculation

The Correct Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Result – Limit

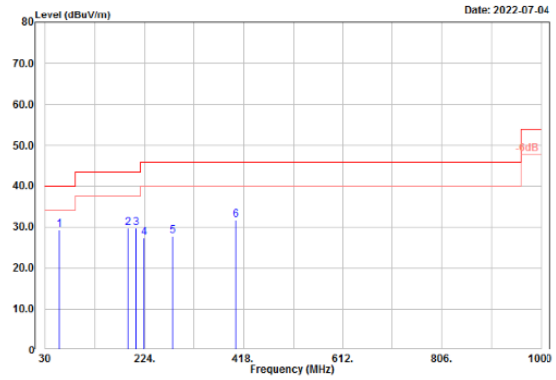
6.6 Test Results

Test Mode: Transmitting

Transmitting simultaneously test:

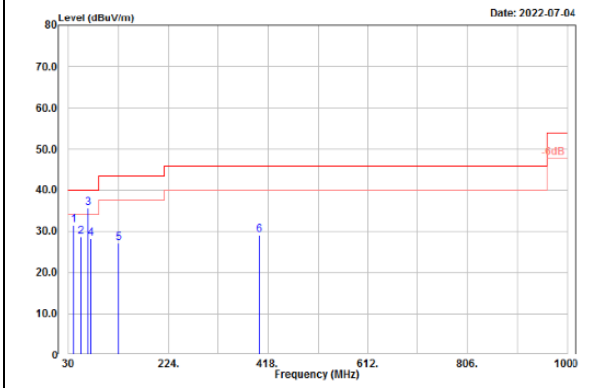
30MHz-1GHz:

Mode 1 / Horizontal



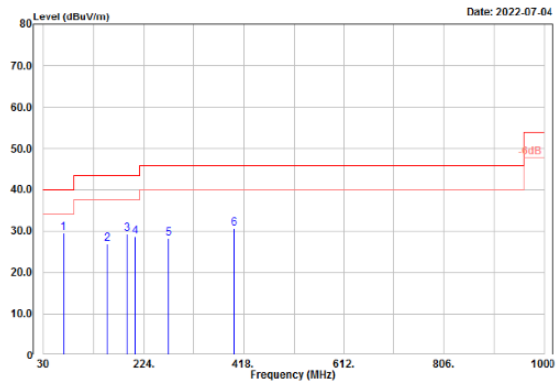
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
57.160	44.79	-15.58	29.21	40.00	-10.79	100	0	QP
191.020	40.08	-10.35	29.73	43.50	-13.77	100	45	QP
206.540	40.56	-10.95	29.61	43.50	-13.89	100	30	QP
223.030	37.98	-10.68	27.30	46.00	-18.70	100	32	QP
278.320	35.71	-7.89	27.82	46.00	-18.18	100	349	QP
402.480	36.38	-4.72	31.66	46.00	-14.34	100	72	QP

Mode 2 / Vertical



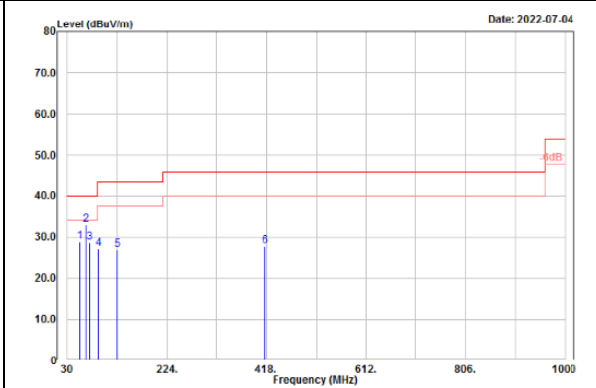
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
40.670	41.61	-10.12	31.49	40.00	-8.51	100	74	QP
53.280	44.14	-15.47	28.67	40.00	-11.33	100	205	QP
67.830	50.07	-14.54	35.53	40.00	-4.47	100	44	QP
72.680	42.86	-14.58	28.28	40.00	-11.72	100	129	QP
127.000	35.09	-8.07	27.02	43.50	-16.48	100	2	QP
401.510	33.91	-4.76	29.15	46.00	-15.85	100	28	QP

Mode 2 / Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
68.800	44.19	-14.66	29.53	40.00	-10.47	100	197	QP
152.220	36.55	-9.58	26.97	43.50	-16.53	100	85	QP
191.020	39.66	-10.35	29.31	43.50	-14.19	100	33	QP
206.540	39.58	-10.95	28.63	43.50	-14.87	100	15	QP
270.560	36.35	-8.11	28.24	46.00	-17.76	100	343	QP
399.570	35.48	-4.86	30.62	46.00	-15.38	100	301	QP

Mode 2 / Vertical



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
54.250	44.35	-15.62	28.73	40.00	-11.27	100	0	QP
65.890	47.94	-15.04	32.90	40.00	-7.10	100	339	QP
72.680	43.26	-14.58	28.68	40.00	-11.32	100	104	QP
90.140	41.80	-14.68	27.12	43.50	-16.38	100	113	QP
127.000	34.99	-8.07	26.92	43.50	-16.58	100	23	QP
415.090	31.85	-4.15	27.70	46.00	-18.30	100	36	QP

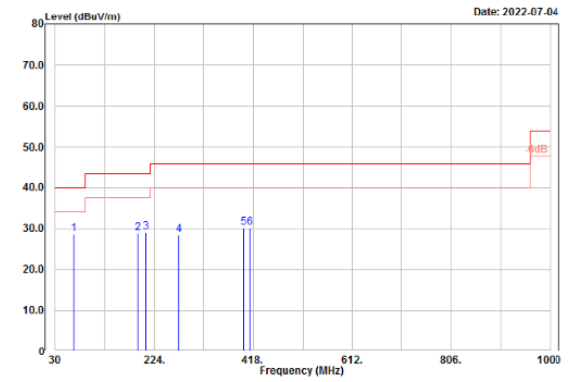
Level (Result) = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

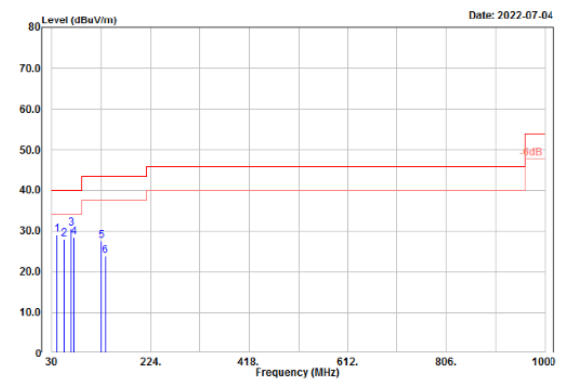
Spurious emissions more than 20 dB below the limit were not reported.

Mode 3 / Horizontal



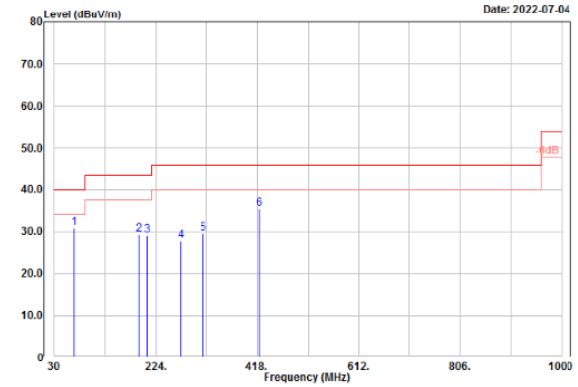
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
65.890	43.68	-15.04	28.64	40.00	-11.36	100	134	QP
191.020	39.24	-10.35	28.89	43.50	-14.61	100	35	QP
206.540	39.93	-10.95	28.98	43.50	-14.52	100	40	QP
270.560	36.41	-8.11	28.30	46.00	-17.70	100	351	QP
399.570	34.94	-4.86	30.08	46.00	-15.92	100	83	QP
411.210	34.46	-4.29	30.17	46.00	-15.83	100	74	QP

Mode 3 / Vertical



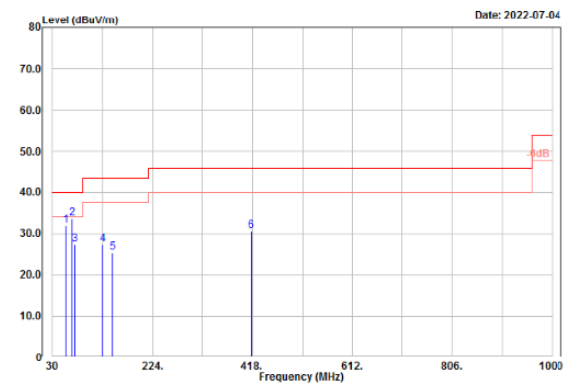
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
39.700	38.39	-9.35	29.04	40.00	-10.96	100	129	QP
53.280	43.54	-15.47	28.07	40.00	-11.93	100	56	QP
67.830	45.18	-14.54	30.64	40.00	-9.36	100	151	QP
73.650	42.99	-14.69	28.30	40.00	-11.70	100	245	QP
127.000	35.65	-8.07	27.58	43.50	-15.92	100	360	QP
134.760	32.43	-8.49	23.94	43.50	-19.56	100	357	QP

Mode 4 / Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remar
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
67.830	45.28	-14.54	30.74	40.00	-9.26	100	2	QP
191.020	39.61	-10.35	29.26	43.50	-14.24	100	27	QP
206.540	40.09	-10.95	29.14	43.50	-14.36	100	42	QP
270.560	35.88	-8.11	27.77	46.00	-18.23	100	350	QP
314.210	36.59	-7.05	29.54	46.00	-16.46	100	261	QP
421.880	39.34	-4.03	35.31	46.00	-10.69	100	322	QP

Mode 4 / Vertical



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
56.190	47.42	-15.58	31.84	40.00	-8.16	100	360	QP
67.830	48.20	-14.54	33.66	40.00	-6.34	100	262	QP
73.650	41.95	-14.69	27.26	40.00	-12.74	100	205	QP
127.000	35.31	-8.07	27.24	43.50	-16.26	100	19	QP
145.430	34.86	-9.48	25.38	43.50	-18.12	100	272	QP
416.060	34.59	-4.13	30.46	46.00	-15.54	100	12	QP

Level (Result) = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

Above 1GHz

Mode 1:

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4804.000	38.15	-2.47	35.68	54.00	-18.32	169	167	Average
4804.000	43.38	-2.47	40.91	74.00	-33.09	169	167	Peak
4874.000	35.33	-2.25	33.08	54.00	-20.92	199	71	Average
4874.000	44.39	-2.25	42.14	74.00	-31.86	199	71	Peak
7206.000	35.63	3.03	38.66	54.00	-15.34	203	263	Average
7206.000	44.40	3.03	47.43	74.00	-26.57	203	263	Peak
7311.000	34.77	3.34	38.11	54.00	-15.89	143	315	Average
7311.000	41.76	3.34	45.10	74.00	-28.90	143	315	Peak
11490.000	35.58	8.62	44.20	54.00	-9.80	154	192	Average
11490.000	40.80	8.62	49.42	74.00	-24.58	154	192	Peak
17235.000	31.51	13.26	44.77	54.00	-9.23	171	185	Average
17235.000	41.42	13.26	54.68	74.00	-19.32	171	185	Peak
19216.000	41.54	-0.57	40.97	54.00	-13.03	150	257	Average
19216.000	51.58	-0.57	51.01	74.00	-22.99	150	257	Peak
19496.000	41.60	0.25	41.85	54.00	-12.15	150	323	Average
19496.000	51.66	0.25	51.91	74.00	-22.09	150	323	Peak
22980.000	38.98	2.57	41.55	54.00	-12.45	150	357	Average
22980.000	49.03	2.57	51.60	74.00	-22.40	150	357	Peak

Level (Result) = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4804.000	37.21	-2.47	34.74	54.00	-19.26	161	102	Average
4804.000	43.27	-2.47	40.80	74.00	-33.20	161	102	Peak
4874.000	34.10	-2.25	31.85	54.00	-22.15	177	84	Average
4874.000	44.17	-2.25	41.92	74.00	-32.08	177	84	Peak
7206.000	35.44	3.03	38.47	54.00	-15.53	185	318	Average
7206.000	40.83	3.03	43.86	74.00	-30.14	185	318	Peak
7311.000	34.54	3.34	37.88	54.00	-16.12	152	273	Average
7311.000	41.40	3.34	44.74	74.00	-29.26	152	273	Peak
11490.000	34.91	8.62	43.53	54.00	-10.47	204	0	Average
11490.000	40.68	8.62	49.30	74.00	-24.70	204	0	Peak
17235.000	31.42	13.26	44.68	54.00	-9.32	169	201	Average
17235.000	41.21	13.26	54.47	74.00	-19.53	150	201	Peak
19216.000	40.30	-0.57	39.73	54.00	-14.27	150	243	Average
19216.000	50.18	-0.57	49.61	74.00	-24.39	150	243	Peak
19496.000	41.37	0.25	41.62	54.00	-12.38	150	104	Average
19496.000	51.39	0.25	51.64	74.00	-22.36	150	104	Peak
22980.000	38.32	2.57	40.89	54.00	-13.11	150	80	Average
22980.000	48.82	2.57	51.39	74.00	-22.61	150	80	Peak

Level (Result) = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

Mode 2:

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4804.000	37.18	-2.47	34.71	54.00	-19.29	149	18	Average
4804.000	44.19	-2.47	41.72	74.00	-32.28	149	18	Peak
4874.000	34.79	-2.25	32.54	54.00	-21.46	169	292	Average
4874.000	43.44	-2.25	41.19	74.00	-32.81	169	292	Peak
7206.000	32.42	3.03	35.45	54.00	-18.55	201	173	Average
7206.000	41.54	3.03	44.57	74.00	-29.43	201	173	Peak
7311.000	31.50	3.34	34.84	54.00	-19.16	170	142	Average
7311.000	41.36	3.34	44.70	74.00	-29.30	170	142	Peak
10440.000	32.92	7.97	40.89	54.00	-13.11	152	228	Average
10440.000	43.26	7.97	51.23	74.00	-22.77	152	228	Peak
11490.000	33.01	8.62	41.63	54.00	-12.37	203	292	Average
11490.000	41.11	8.62	49.73	74.00	-24.27	203	292	Peak
15660.000	39.66	11.11	50.77	54.00	-3.23	150	228	Average
15660.000	43.38	11.11	54.49	74.00	-19.51	150	228	Peak
17235.000	31.57	13.26	44.83	54.00	-9.17	149	228	Average
17235.000	41.23	13.26	54.49	74.00	-19.51	149	228	Peak
19216.000	42.32	-0.57	41.75	54.00	-12.25	150	321	Average
19216.000	52.13	-0.57	51.56	74.00	-22.44	150	321	Peak
19496.000	41.61	0.25	41.86	54.00	-12.14	150	264	Average
19496.000	51.63	0.25	51.88	74.00	-22.12	150	264	Peak
20880.000	40.19	1.85	42.04	54.00	-11.96	150	32	Average
20880.000	50.54	1.85	52.39	74.00	-21.61	150	32	Peak
22980.000	39.76	2.57	42.33	54.00	-11.67	150	32	Average
22980.000	49.82	2.57	52.39	74.00	-21.61	150	32	Peak

Level (Result) = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4804.000	36.30	-2.47	33.83	54.00	-20.17	149	0	Average
4804.000	43.17	-2.47	40.70	74.00	-33.30	149	0	Peak
4874.000	34.58	-2.25	32.33	54.00	-21.67	201	153	Average
4874.000	43.38	-2.25	41.13	74.00	-32.87	201	153	Peak
7206.000	32.30	3.03	35.33	54.00	-18.67	171	107	Average
7206.000	41.22	3.03	44.25	74.00	-29.75	171	107	Peak
7311.000	30.92	3.34	34.26	54.00	-19.74	188	7	Average
7311.000	40.70	3.34	44.04	74.00	-29.96	188	7	Peak
10440.000	32.86	7.97	40.83	54.00	-13.17	144	0	Average
10440.000	42.13	7.97	50.10	74.00	-23.90	144	0	Peak
11490.000	32.88	8.62	41.50	54.00	-12.50	167	72	Average
11490.000	40.90	8.62	49.52	74.00	-24.48	167	72	Peak
15660.000	29.72	11.11	40.83	54.00	-13.17	147	0	Average
15660.000	38.51	11.11	49.62	74.00	-24.38	147	0	Peak
17235.000	30.87	13.26	44.13	54.00	-9.87	155	360	Average
17235.000	41.02	13.26	54.28	74.00	-19.72	155	360	Peak
19216.000	42.12	-0.57	41.55	54.00	-12.45	150	18	Average
19216.000	52.09	-0.57	51.52	74.00	-22.48	150	18	Peak
19496.000	41.29	0.25	41.54	54.00	-12.46	150	95	Average
19496.000	51.18	0.25	51.43	74.00	-22.57	150	95	Peak
20880.000	40.04	1.85	41.89	54.00	-12.11	150	18	Average
20880.000	50.25	1.85	52.10	74.00	-21.90	150	18	Peak
22980.000	39.44	2.57	42.01	54.00	-11.99	150	161	Average
22980.000	49.40	2.57	51.97	74.00	-22.03	150	161	Peak

Level (Result) = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

Mode 3:

Horizontal

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4804.000	38.15	-2.47	35.68	54.00	-18.32	169	167	Average
4804.000	43.38	-2.47	40.91	74.00	-33.09	169	167	Peak
4874.000	35.33	-2.25	33.08	54.00	-20.92	199	71	Average
4874.000	44.39	-2.25	42.14	74.00	-31.86	199	71	Peak
7206.000	35.62	3.03	38.65	54.00	-15.35	203	263	Average
7206.000	41.37	3.03	44.40	74.00	-29.60	203	263	Peak
7311.000	34.78	3.34	38.12	54.00	-15.88	143	315	Average
7311.000	41.77	3.34	45.11	74.00	-28.89	143	315	Peak
10460.000	36.14	8.06	44.20	54.00	-9.80	154	192	Average
10460.000	41.36	8.06	49.42	74.00	-24.58	154	192	Peak
11490.000	32.15	8.62	40.77	54.00	-13.23	178	185	Average
11490.000	40.39	8.62	49.01	74.00	-24.99	178	185	Peak
15690.000	33.47	11.30	44.77	54.00	-9.23	171	185	Average
15690.000	43.38	11.30	54.68	74.00	-19.32	171	185	Peak
17235.000	31.51	13.26	44.77	54.00	-9.23	200	185	Average
17235.000	41.00	13.26	54.26	74.00	-19.74	200	185	Peak
19216.000	42.67	-0.57	42.10	54.00	-11.90	150	76	Average
19216.000	52.25	-0.57	51.68	74.00	-22.32	150	76	Peak
19496.000	41.67	0.25	41.92	54.00	-12.08	150	350	Average
19496.000	51.46	0.25	51.71	74.00	-22.29	150	350	Peak
20920.000	39.40	1.81	41.21	54.00	-12.79	150	360	Average
20920.000	49.55	1.81	51.36	74.00	-22.64	150	360	Peak
22980.000	39.60	2.57	42.17	54.00	-11.83	150	360	Average
22980.000	49.63	2.57	52.20	74.00	-21.80	150	360	Peak

Level (Result) = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4804.000	33.17	-2.47	30.70	54.00	-23.30	169	137	Average
4804.000	43.99	-2.47	41.52	74.00	-32.48	169	137	Peak
4874.000	33.26	-2.25	31.01	54.00	-22.99	151	201	Average
4874.000	43.23	-2.25	40.98	74.00	-33.02	151	201	Peak
7206.000	31.59	3.03	34.62	54.00	-19.38	144	161	Average
7206.000	41.21	3.03	44.24	74.00	-29.76	144	161	Peak
7311.000	31.80	3.34	35.14	54.00	-18.86	209	327	Average
7311.000	41.04	3.34	44.38	74.00	-29.62	209	327	Peak
10460.000	30.68	8.06	38.74	54.00	-15.26	175	271	Average
10460.000	40.77	8.06	48.83	74.00	-25.17	175	271	Peak
11490.000	30.80	8.62	39.42	54.00	-14.58	160	271	Average
11490.000	40.59	8.62	49.21	74.00	-24.79	160	271	Peak
15690.000	33.20	11.30	44.50	54.00	-9.50	183	283	Average
15690.000	43.18	11.30	54.48	74.00	-19.52	183	283	Peak
17235.000	30.95	13.26	44.21	54.00	-9.79	167	149	Average
17235.000	41.11	13.26	54.37	74.00	-19.63	167	149	Peak
19216.000	42.42	-0.57	41.85	54.00	-12.15	150	189	Average
19216.000	51.88	-0.57	51.31	74.00	-22.69	150	189	Peak
19496.000	41.38	0.25	41.63	54.00	-12.37	150	11	Average
19496.000	51.40	0.25	51.65	74.00	-22.35	150	11	Peak
20920.000	38.32	1.81	40.13	54.00	-13.87	150	317	Average
20920.000	49.23	1.81	51.04	74.00	-22.96	150	317	Peak
22980.000	39.42	2.57	41.99	54.00	-12.01	150	253	Average
22980.000	48.63	2.57	51.20	74.00	-22.80	150	253	Peak

Level (Result) = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

Mode 4:

Horizontal

4804.000	32.88	-2.47	30.41	54.00	-23.59	149	65	Average
4804.000	42.93	-2.47	40.46	74.00	-33.54	149	65	Peak
7206.000	31.28	3.03	34.31	54.00	-19.69	181	219	Average
7206.000	41.20	3.03	44.23	74.00	-29.77	181	219	Peak
10440.000	32.49	7.97	40.46	54.00	-13.54	200	65	Average
10440.000	42.13	7.97	50.10	74.00	-23.90	200	65	Peak
10460.000	30.51	8.06	38.57	54.00	-15.43	199	359	Average
10460.000	40.55	8.06	48.61	74.00	-25.39	199	359	Peak
11490.000	29.80	8.62	38.42	54.00	-15.58	175	133	Average
11490.000	40.18	8.62	48.80	74.00	-25.20	175	133	Peak
15660.000	29.31	11.11	40.42	54.00	-13.58	150	65	Average
15660.000	32.35	11.11	43.46	74.00	-30.54	150	65	Peak
15690.000	31.67	11.30	42.97	54.00	-11.03	158	327	Average
15690.000	41.89	11.30	53.19	74.00	-20.81	158	327	Peak
17235.000	30.77	13.26	44.03	54.00	-9.97	166	296	Average
17235.000	41.04	13.26	54.30	74.00	-19.70	166	296	Peak
19216.000	43.11	-0.57	42.54	54.00	-11.46	150	194	Average
19216.000	53.30	-0.57	52.73	74.00	-21.27	150	194	Peak
20880.000	40.69	1.85	42.54	54.00	-11.46	150	194	Average
20880.000	50.22	1.85	52.07	74.00	-21.93	150	194	Peak
20920.000	39.29	1.81	41.10	54.00	-12.90	150	109	Average
20920.000	51.66	1.81	53.47	74.00	-20.53	150	109	Peak
22980.000	38.82	2.57	41.39	54.00	-12.61	150	84	Average
22980.000	49.56	2.57	52.13	74.00	-21.87	150	84	Peak

Level (Result) = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

Vertical

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4804.000	32.03	-2.47	29.56	54.00	-24.44	201	288	Average
4804.000	42.65	-2.47	40.18	74.00	-33.82	201	288	Peak
7206.000	31.21	3.03	34.24	54.00	-19.76	168	151	Average
7206.000	40.09	3.03	43.12	74.00	-30.88	168	151	Peak
10440.000	32.22	7.97	40.19	54.00	-13.81	177	346	Average
10440.000	41.38	7.97	49.35	74.00	-24.65	177	346	Peak
10460.000	30.44	8.06	38.50	54.00	-15.50	152	334	Average
10460.000	40.15	8.06	48.21	74.00	-25.79	152	334	Peak
11490.000	29.68	8.62	38.30	54.00	-15.70	144	205	Average
11490.000	39.80	8.62	48.42	74.00	-25.58	144	205	Peak
15660.000	29.07	11.11	40.18	54.00	-13.82	180	346	Average
15660.000	31.24	11.11	42.35	74.00	-31.65	180	346	Peak
15690.000	31.51	11.30	42.81	54.00	-11.19	191	24	Average
15690.000	41.27	11.30	52.57	74.00	-21.43	191	24	Peak
17235.000	30.79	13.26	44.05	54.00	-9.95	211	346	Average
17235.000	40.56	13.26	53.82	74.00	-20.18	211	346	Peak
19216.000	42.83	-0.57	42.26	54.00	-11.74	150	196	Average
19216.000	52.74	-0.57	52.17	74.00	-21.83	150	196	Peak
20880.000	39.51	1.85	41.36	54.00	-12.64	150	51	Average
20880.000	48.64	1.85	50.49	74.00	-23.51	150	51	Peak
20920.000	39.18	1.81	40.99	54.00	-13.01	150	1	Average
20920.000	50.31	1.81	52.12	74.00	-21.88	150	1	Peak
22980.000	38.76	2.57	41.33	54.00	-12.67	150	51	Average
22980.000	47.92	2.57	50.49	74.00	-23.51	150	51	Peak

Level (Result) = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

7 FCC §15.407(a) – Maximum Output Power

7.1 Applicable Standard

According to FCC §15.407(a):

For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

7.2 Test Procedure

The use Power Meter

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a Power sensor.

7.3 Test Results

Conducted output power for worst case :

Worst case mode		Output power dBm
XOR WIFI-2.4GHz	B Mode, 2437MHz	21.60
XOR WIFI-5GHz	AX40 Mode, 5230MHz	19.91
Regular WIFI-5GHz	AX20 Mode, 5745 MHz	22.82
CW WIFI-2.4GHz	G Mode, 2437MHz	15.99
CW WIFI-5GHz	A Mode, 5220MHz	14.80

******* END OF REPORT *******