FCC Part 15.407

TEST REPORT

For

Cisco Systems, Inc.

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

FCC ID: LDKEDOVE2617

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

Report Producer : Coco Lin

Report Number : RXZ220627002RF03

Report Date : 2022-07-08

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Revision History

Revision	No.	Report Number	Issue Date	Description	Author/ Revised by
0.0	RXZ220627002	RXZ220627002RF03	2022-07-08	Original Report	Coco Lin

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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	C9120AXE-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: RXZ220627002-01 (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: LDKEDAC92157) 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)

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Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.
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	22.5~24.1	54~58	1010	Andy Cheng
Maximum Output Power	2022/7/4	24.1	56	1010	Boris Kao

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

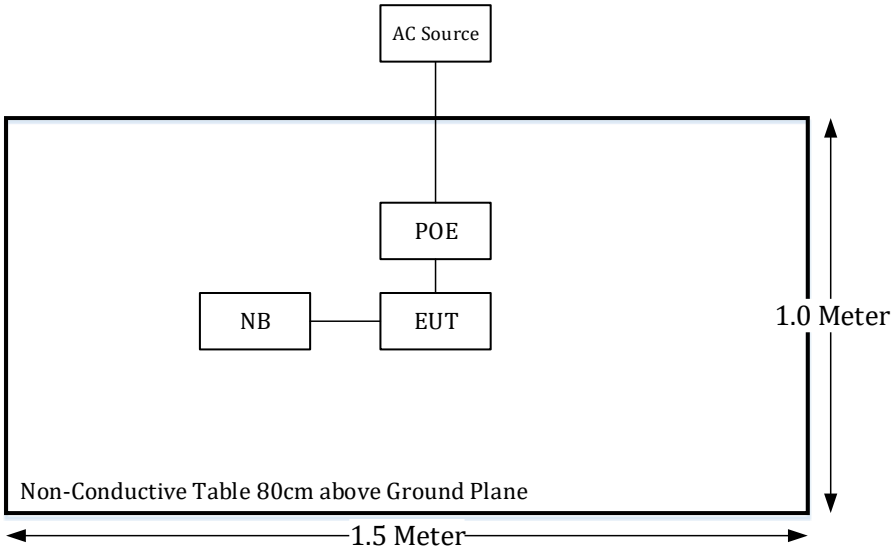
Cable Description	Length (m)	From	To
RJ-45 Cable	1	EUT	POE Adapter
RJ-45 to USB Serial Cable	2	EUT	NB

2.5 Block Diagram of Test Setup

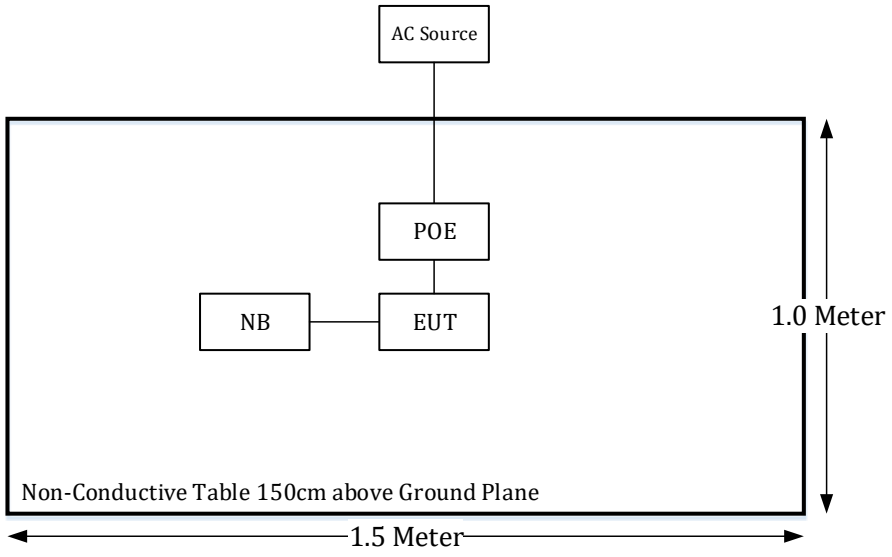
See test photographs attached in setup photos for the actual connections between EUT and support equipment.

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: 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

Worst case is Mode 2 :

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	6	300	100%	3.16	8.85	7.67
do0 2.4GHz XOR	2462	24	12	300	100%	251.19	33.85	2426.61
d01 5GHz Regualr	5850	23	11	300	100%	199.53	31.85	1531.09
do4 5G Aux	5850	14	6	300	100%	25.12	17.85	60.95

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 5G Aux	5850	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	0.00	exempt
do0 2.4GHz XOR	2462	3060.00	1.903	3060	0.79	exempt
d01 5GHz Regualr	5850	3060.00	2.091	3060	0.50	exempt
do4 5G Aux	5850	3060.00	2.091	3060	0.02	exempt

Simultaneous Analysis :

Band	Freq (MHz)	PSD Require	PSD (mW/cm^2)	PSD Limit (mW/cm^2)	Simultaneous TX	Ratio
BLE	2480	exempt	0.001	1.000	O	0.001
do0 2.4GHz XOR	2462	exempt	0.352	1.000	O	0.352
d01 5GHz Regualr	5850	exempt	0.222	1.000	O	0.222
do4 5G Aux	5850	exempt	0.009	1.000	O	0.009
Simultaneous Analysis (Limit 1)						0.584

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

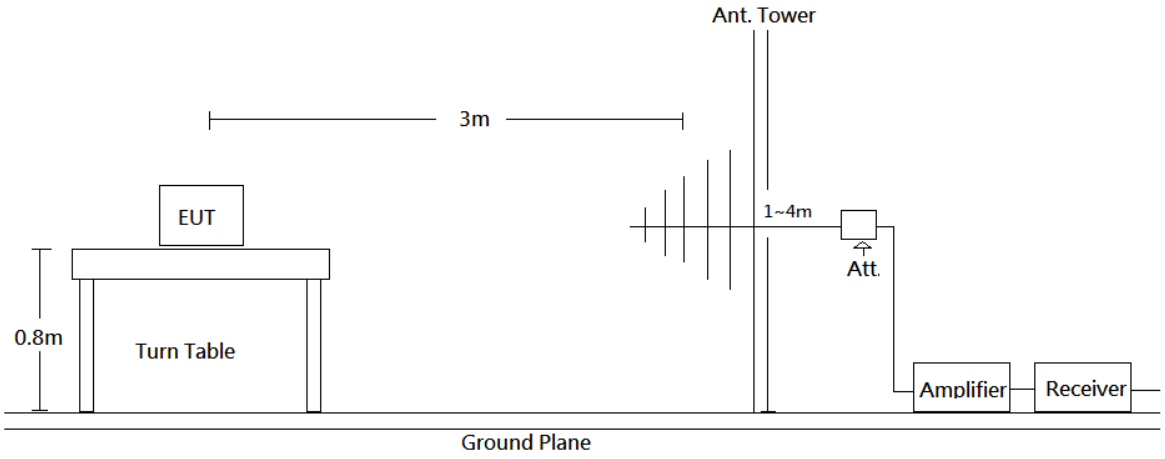
of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge..

˙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.

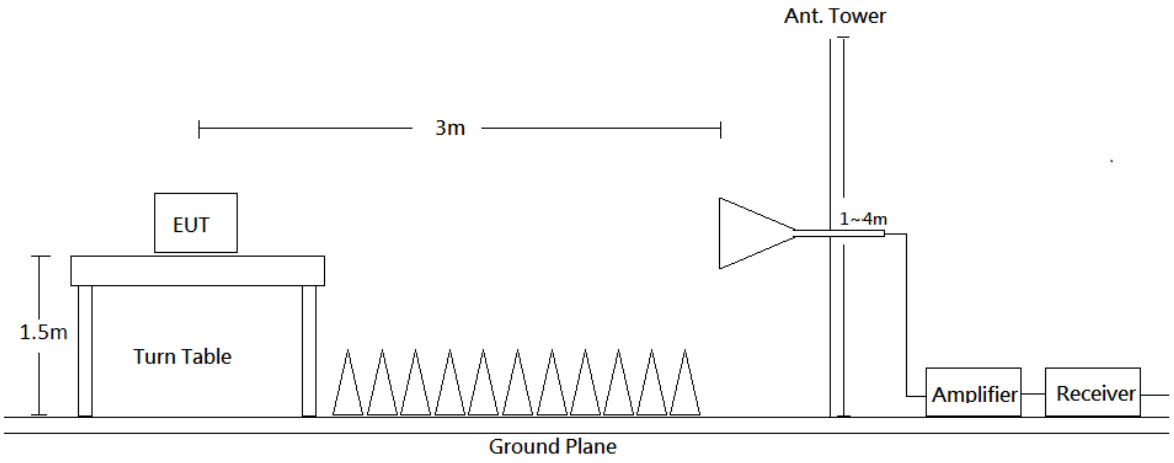
˙Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

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

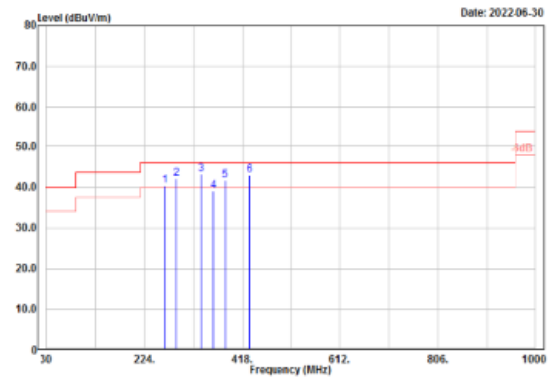
6.6 Test Results

Test Mode: Transmitting

Transmitting simultaneously test:

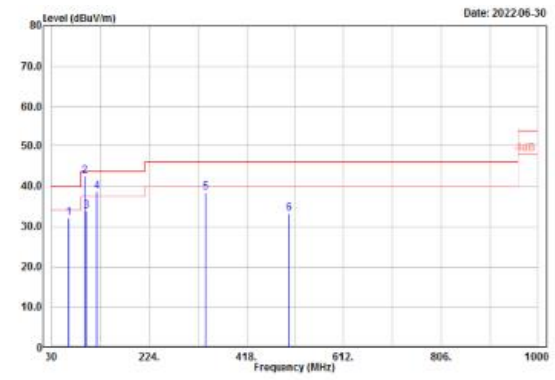
30MHz-1GHz:

Mode 1 / Horizontal



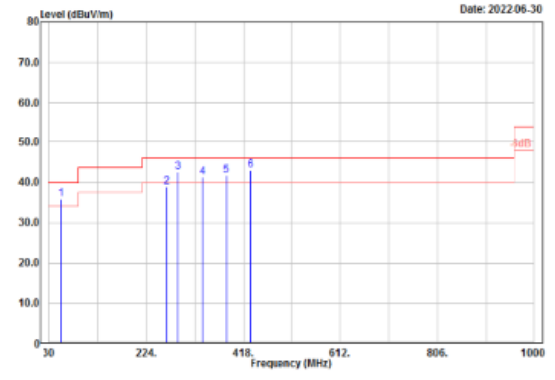
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
263.770	49.04	-8.72	40.32	46.00	-5.68	100	163	QP
287.050	49.89	-7.79	42.10	46.00	-3.90	100	227	QP
335.550	49.77	-6.69	43.08	46.00	-2.92	100	248	QP
359.800	44.95	-5.90	39.05	46.00	-6.95	100	187	QP
383.080	47.24	-5.57	41.67	46.00	-4.33	100	212	QP
431.580	46.92	-3.93	42.99	46.00	-3.01	100	215	QP

Mode 1 / Vertical



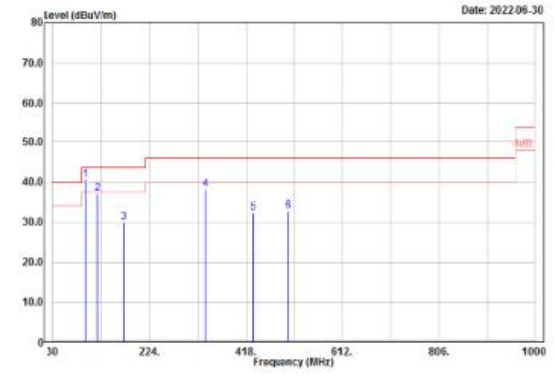
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
64.920	47.14	-14.95	32.19	40.00	-7.81	100	160	QP
95.960	55.70	-13.26	42.44	43.50	-1.06	100	209	QP
98.870	46.38	-12.48	33.90	43.50	-9.60	100	261	QP
119.240	47.14	-8.52	38.62	43.50	-4.88	100	154	QP
335.550	44.97	-6.69	38.28	46.00	-7.72	100	297	QP
503.360	35.53	-2.40	33.13	46.00	-12.87	100	74	QP

Mode 2 / Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
53.280	51.23	-15.47	35.76	40.00	-4.24	100	188	QP
263.770	47.61	-8.72	38.89	46.00	-7.11	100	50	QP
287.050	50.18	-7.79	42.39	46.00	-3.61	100	222	QP
335.550	47.82	-6.69	41.13	46.00	-4.87	100	249	QP
383.080	47.24	-5.57	41.67	46.00	-4.33	100	197	QP
431.580	46.79	-3.93	42.86	46.00	-3.14	100	216	QP

Mode 2 / Vertical



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
95.960	53.88	-13.26	40.62	43.50	-2.88	100	212	QP
119.240	45.66	-8.52	37.14	43.50	-6.36	100	46	QP
172.590	40.35	-10.36	29.99	43.50	-13.51	100	153	QP
335.550	44.85	-6.69	38.16	46.00	-7.84	100	302	QP
431.580	36.20	-3.93	32.27	46.00	-13.73	100	224	QP
503.360	35.13	-2.40	32.73	46.00	-13.27	100	55	QP

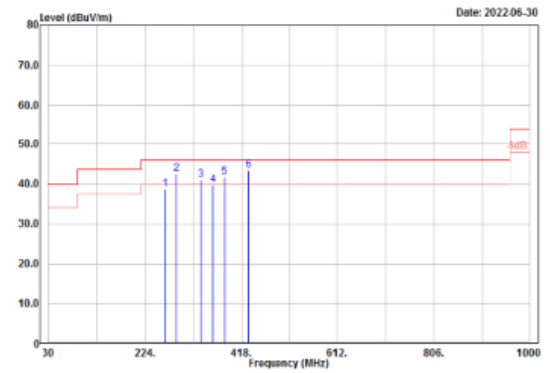
Level (Result) = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

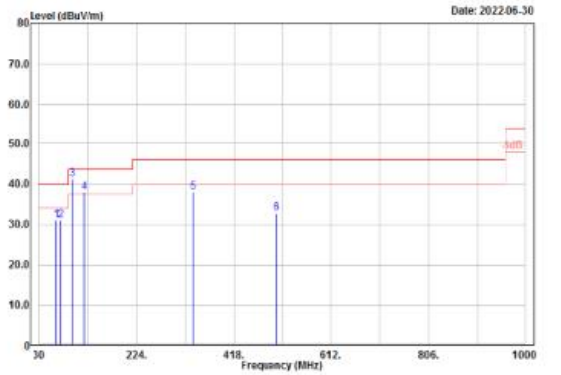
Spurious emissions more than 20 dB below the limit were not reported.

Mode 3 / Horizontal



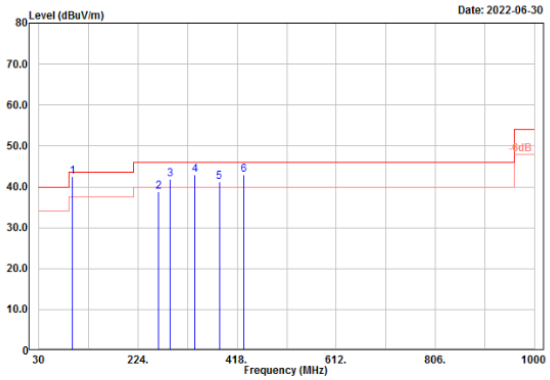
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
263.770	47.36	-8.72	38.64	46.00	-7.36	100	167	QP
287.050	50.35	-7.79	42.56	46.00	-3.44	100	225	QP
335.550	47.71	-6.69	41.02	46.00	-4.98	100	256	QP
359.800	45.49	-5.90	39.59	46.00	-6.41	100	200	QP
383.080	47.19	-5.57	41.62	46.00	-4.38	100	216	QP
431.580	47.28	-3.93	43.35	46.00	-2.65	100	212	QP

Mode 3 / Vertical



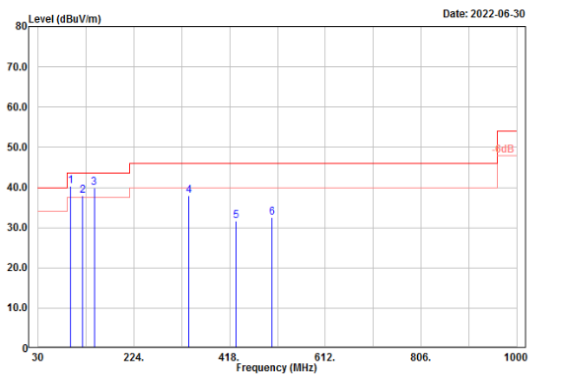
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
63.950	46.07	-14.98	31.09	40.00	-8.91	100	169	QP
73.650	45.59	-14.69	30.90	40.00	-9.10	100	309	QP
95.960	54.36	-13.26	41.10	43.50	-2.40	100	219	QP
119.240	46.53	-8.52	38.01	43.50	-5.49	100	121	QP
335.550	44.63	-6.69	37.94	46.00	-8.06	100	300	QP
503.360	35.19	-2.40	32.79	46.00	-13.21	100	84	QP

Mode 4 / Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
95.960	55.65	-13.26	42.39	43.50	-1.11	100	248	QP
263.770	47.61	-8.72	38.89	46.00	-7.11	100	38	QP
287.050	49.72	-7.79	41.93	46.00	-4.07	100	227	QP
335.550	49.60	-6.69	42.91	46.00	-3.09	100	257	QP
383.080	46.82	-5.57	41.25	46.00	-4.75	100	208	QP
431.580	46.86	-3.93	42.93	46.00	-3.07	100	214	QP

Mode 4 / Vertical



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
95.960	53.59	-13.26	40.33	43.50	-3.17	100	214	QP
119.240	46.43	-8.52	37.91	43.50	-5.59	100	36	QP
143.490	49.20	-9.30	39.90	43.50	-3.60	100	296	QP
335.550	44.64	-6.69	37.95	46.00	-8.05	100	302	QP
431.580	35.55	-3.93	31.62	46.00	-14.38	100	234	QP
503.360	34.93	-2.40	32.53	46.00	-13.47	100	69	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	33.22	-2.47	30.75	54.00	-23.25	156	27	Average
4804.000	43.11	-2.47	40.64	74.00	-33.36	156	27	Peak
4874.000	33.14	-2.25	30.89	54.00	-23.11	172	0	Average
4874.000	43.20	-2.25	40.95	74.00	-33.05	172	0	Peak
7206.000	30.94	3.03	33.97	54.00	-20.03	139	51	Average
7206.000	40.18	3.03	43.21	74.00	-30.79	139	51	Peak
7311.000	30.87	3.34	34.21	54.00	-19.79	203	45	Average
7311.000	40.94	3.34	44.28	74.00	-29.72	203	45	Peak
10440.000	30.25	7.97	38.22	54.00	-15.78	195	313	Average
10440.000	40.78	7.97	48.75	74.00	-25.25	195	313	Peak
15660.000	33.09	11.11	44.20	54.00	-9.80	144	267	Average
15660.000	42.40	11.11	53.51	74.00	-20.49	144	267	Peak

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
19216.000	41.52	-0.57	40.95	54.00	-13.05	150	342	Average
19216.000	51.40	-0.57	50.83	74.00	-23.17	150	342	Peak
19496.000	42.72	0.25	42.97	54.00	-11.03	150	91	Average
19496.000	51.56	0.25	51.81	74.00	-22.19	150	91	Peak
20880.000	39.01	1.85	40.86	54.00	-13.14	150	339	Average
20880.000	49.11	1.85	50.96	74.00	-23.04	150	339	Peak
20920.000	29.05	1.81	30.86	54.00	-23.14	150	339	Average
20920.000	39.28	1.81	41.09	74.00	-32.91	150	339	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	33.41	-2.47	30.94	54.00	-23.06	152	129	Average
4804.000	43.21	-2.47	40.74	74.00	-33.26	152	129	Peak
4874.000	33.82	-2.25	31.57	54.00	-22.43	171	60	Average
4874.000	43.91	-2.25	41.66	74.00	-32.34	171	60	Peak
7206.000	31.64	3.03	34.67	54.00	-19.33	198	175	Average
7206.000	41.73	3.03	44.76	74.00	-29.24	198	175	Peak
7311.000	32.25	3.34	35.59	54.00	-18.41	177	314	Average
7311.000	42.18	3.34	45.52	74.00	-28.48	177	314	Peak
10440.000	30.93	7.97	38.90	54.00	-15.10	202	172	Average
10440.000	41.09	7.97	49.06	74.00	-24.94	202	172	Peak
15660.000	33.90	11.11	45.01	54.00	-8.99	144	73	Average
15660.000	43.83	11.11	54.94	74.00	-19.06	144	73	Peak

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
19216.000	42.18	-0.57	41.61	54.00	-12.39	150	290	Average
19216.000	53.00	-0.57	52.43	74.00	-21.57	150	290	Peak
19496.000	42.01	0.25	42.26	54.00	-11.74	150	30	Average
19496.000	52.16	0.25	52.41	74.00	-21.59	150	30	Peak
20880.000	39.38	1.85	41.23	54.00	-12.77	150	107	Average
20880.000	47.94	1.85	49.79	74.00	-24.21	150	107	Peak
20920.000	29.42	1.81	31.23	54.00	-22.77	150	107	Average
20920.000	40.47	1.81	42.28	74.00	-31.72	150	107	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	33.01	-2.47	30.54	54.00	-23.46	148	148	Average
4804.000	42.56	-2.47	40.09	74.00	-33.91	148	148	Peak
4874.000	32.63	-2.25	30.38	54.00	-23.62	161	163	Average
4874.000	42.87	-2.25	40.62	74.00	-33.38	161	163	Peak
7206.000	31.29	3.03	34.32	54.00	-19.68	200	158	Average
7206.000	41.23	3.03	44.26	74.00	-29.74	200	158	Peak
7311.000	31.02	3.34	34.36	54.00	-19.64	181	31	Average
7311.000	41.16	3.34	44.50	74.00	-29.50	181	31	Peak
10440.000	30.48	7.97	38.45	54.00	-15.55	149	139	Average
10440.000	40.37	7.97	48.34	74.00	-25.66	149	139	Peak
11650.000	29.45	8.77	38.22	54.00	-15.78	174	325	Average
11650.000	39.42	8.77	48.19	74.00	-25.81	174	325	Peak
15660.000	32.40	11.11	43.51	54.00	-10.49	195	325	Average
15660.000	41.61	11.11	52.72	74.00	-21.28	195	325	Peak
17475.000	30.46	13.25	43.71	54.00	-10.29	150	325	Average
17475.000	35.30	13.25	48.55	74.00	-25.45	150	325	Peak
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
19216.000	41.78	-0.57	41.21	54.00	-12.79	150	0	Average
19216.000	51.90	-0.57	51.33	74.00	-22.67	150	0	Peak
19496.000	41.07	0.25	41.32	54.00	-12.68	150	74	Average
19496.000	51.10	0.25	51.35	74.00	-22.65	150	74	Peak
20880.000	37.83	1.85	39.68	54.00	-14.32	150	7	Average
20880.000	48.03	1.85	49.88	74.00	-24.12	150	7	Peak
23300.000	37.69	2.89	40.58	54.00	-13.42	150	7	Average
23300.000	47.14	2.89	50.03	74.00	-23.97	150	7	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	33.05	-2.47	30.58	54.00	-23.42	204	17	Average
4804.000	43.02	-2.47	40.55	74.00	-33.45	204	17	Peak
4874.000	33.14	-2.25	30.89	54.00	-23.11	172	37	Average
4874.000	43.52	-2.25	41.27	74.00	-32.73	172	37	Peak
7206.000	31.67	3.03	34.70	54.00	-19.30	139	346	Average
7206.000	41.67	3.03	44.70	74.00	-29.30	139	346	Peak
7311.000	31.43	3.34	34.77	54.00	-19.23	168	312	Average
7311.000	41.51	3.34	44.85	74.00	-29.15	168	312	Peak
10440.000	30.60	7.97	38.57	54.00	-15.43	200	225	Average
10440.000	40.68	7.97	48.65	74.00	-25.35	200	225	Peak
11650.000	29.57	8.77	38.34	54.00	-15.66	191	225	Average
11650.000	39.88	8.77	48.65	74.00	-25.35	191	225	Peak
15660.000	32.68	11.11	43.79	54.00	-10.21	188	281	Average
15660.000	43.25	11.11	54.36	74.00	-19.64	188	281	Peak
17475.000	30.77	13.25	44.02	54.00	-9.98	150	225	Average
17475.000	35.40	13.25	48.65	74.00	-25.35	150	225	Peak

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
19216.000	42.52	-0.57	41.95	54.00	-12.05	150	278	Average
19216.000	52.74	-0.57	52.17	74.00	-21.83	150	278	Peak
19496.000	41.10	0.25	41.35	54.00	-12.65	150	294	Average
19496.000	51.15	0.25	51.40	74.00	-22.60	150	294	Peak
20880.000	38.74	1.85	40.59	54.00	-13.41	150	218	Average
20880.000	48.88	1.85	50.73	74.00	-23.27	150	218	Peak
23300.000	37.84	2.89	40.73	54.00	-13.27	150	218	Average
23300.000	47.59	2.89	50.48	74.00	-23.52	150	218	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	31.78	-2.47	29.31	54.00	-24.69	161	2	Average
4804.000	42.03	-2.47	39.56	74.00	-34.44	161	2	Peak
4874.000	33.65	-2.25	31.40	54.00	-22.60	199	358	Average
4874.000	42.68	-2.25	40.43	74.00	-33.57	199	358	Peak
7206.000	31.02	3.03	34.05	54.00	-19.95	155	155	Average
7206.000	41.26	3.03	44.29	74.00	-29.71	155	155	Peak
7311.000	30.20	3.34	33.54	54.00	-20.46	171	309	Average
7311.000	40.39	3.34	43.73	74.00	-30.27	171	309	Peak
10440.000	30.01	7.97	37.98	54.00	-16.02	150	33	Average
10440.000	40.10	7.97	48.07	74.00	-25.93	150	33	Peak
10460.000	30.17	8.06	38.23	54.00	-15.77	205	353	Average
10460.000	40.03	8.06	48.09	74.00	-25.91	205	353	Peak
15660.000	33.64	11.11	44.75	54.00	-9.25	164	180	Average
15660.000	43.70	11.11	54.81	74.00	-19.19	164	180	Peak
15690.000	32.57	11.30	43.87	54.00	-10.13	200	183	Average
15690.000	42.57	11.30	53.87	74.00	-20.13	200	183	Peak
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
19216.000	42.26	-0.57	41.69	54.00	-12.31	150	159	Average
19216.000	51.44	-0.57	50.87	74.00	-23.13	150	159	Peak
19496.000	42.55	0.25	42.80	54.00	-11.20	150	217	Average
19496.000	50.34	0.25	50.59	74.00	-23.41	150	217	Peak
20880.000	38.81	1.85	40.66	54.00	-13.34	150	156	Average
20880.000	48.01	1.85	49.86	74.00	-24.14	150	156	Peak
20920.000	39.24	1.81	41.05	54.00	-12.95	150	308	Average
20920.000	48.75	1.81	50.56	74.00	-23.44	150	308	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	32.09	-2.47	29.62	54.00	-24.38	142	240	Average
4804.000	42.68	-2.47	40.21	74.00	-33.79	142	240	Peak
4874.000	33.97	-2.25	31.72	54.00	-22.28	200	24	Average
4874.000	43.63	-2.25	41.38	74.00	-32.62	200	24	Peak
7206.000	31.74	3.03	34.77	54.00	-19.23	189	185	Average
7206.000	41.64	3.03	44.67	74.00	-29.33	189	185	Peak
7311.000	30.28	3.34	33.62	54.00	-20.38	154	30	Average
7311.000	40.78	3.34	44.12	74.00	-29.88	154	30	Peak
10440.000	30.21	7.97	38.18	54.00	-15.82	203	175	Average
10440.000	40.25	7.97	48.22	74.00	-25.78	203	175	Peak
10460.000	30.87	8.06	38.93	54.00	-15.07	193	1	Average
10460.000	40.61	8.06	48.67	74.00	-25.33	193	1	Peak
15660.000	33.81	11.11	44.92	54.00	-9.08	150	48	Average
15660.000	43.90	11.11	55.01	74.00	-18.99	150	48	Peak
15690.000	33.59	11.30	44.89	54.00	-9.11	143	1	Average
15690.000	43.28	11.30	54.58	74.00	-19.42	143	1	Peak

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
19216.000	42.48	-0.57	41.91	54.00	-12.09	150	169	Average
19216.000	52.12	-0.57	51.55	74.00	-22.45	150	169	Peak
19496.000	43.01	0.25	43.26	54.00	-10.74	150	346	Average
19496.000	51.29	0.25	51.54	74.00	-22.46	150	346	Peak
20880.000	39.28	1.85	41.13	54.00	-12.87	150	15	Average
20880.000	49.06	1.85	50.91	74.00	-23.09	150	15	Peak
20920.000	39.59	1.81	41.40	54.00	-12.60	150	169	Average
20920.000	49.33	1.81	51.14	74.00	-22.86	150	169	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

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4804.000	33.14	-2.47	30.67	54.00	-23.33	191	272	Average
4804.000	43.05	-2.47	40.58	74.00	-33.42	191	272	Peak
7206.000	30.62	3.03	33.65	54.00	-20.35	155	323	Average
7206.000	40.68	3.03	43.71	74.00	-30.29	155	323	Peak
10440.000	31.42	7.97	39.39	54.00	-14.61	144	113	Average
10440.000	40.60	7.97	48.57	74.00	-25.43	144	113	Peak
10460.000	31.37	8.06	39.43	54.00	-14.57	152	314	Average
10460.000	41.40	8.06	49.46	74.00	-24.54	152	314	Peak
11650.000	30.02	8.77	38.79	54.00	-15.21	166	353	Average
11650.000	39.87	8.77	48.64	74.00	-25.36	166	353	Peak
15660.000	32.40	11.11	43.51	54.00	-10.49	160	353	Average
15660.000	42.08	11.11	53.19	74.00	-20.81	160	353	Peak
15690.000	32.10	11.30	43.40	54.00	-10.60	185	296	Average
15690.000	42.69	11.30	53.99	74.00	-20.01	185	296	Peak
17475.000	30.46	13.25	43.71	54.00	-10.29	205	353	Average
17475.000	36.39	13.25	49.64	74.00	-24.36	205	353	Peak

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
19216.000	41.17	-0.57	40.60	54.00	-13.40	150	301	Average
19216.000	50.32	-0.57	49.75	74.00	-24.25	150	301	Peak
20880.000	38.80	1.85	40.65	54.00	-13.35	150	128	Average
20880.000	48.22	1.85	50.07	74.00	-23.93	150	128	Peak
20920.000	39.16	1.81	40.97	54.00	-13.03	150	340	Average
20920.000	48.37	1.81	50.18	74.00	-23.82	150	340	Peak
23300.000	37.68	2.89	40.57	54.00	-13.43	150	128	Average
23300.000	46.78	2.89	49.67	74.00	-24.33	150	128	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	33.43	-2.47	30.96	54.00	-23.04	175	299	Average
4804.000	43.22	-2.47	40.75	74.00	-33.25	175	299	Peak
7206.000	31.30	3.03	34.33	54.00	-19.67	211	79	Average
7206.000	41.45	3.03	44.48	74.00	-29.52	211	79	Peak
10440.000	31.92	7.97	39.89	54.00	-14.11	151	260	Average
10440.000	41.36	7.97	49.33	74.00	-24.67	151	260	Peak
10460.000	31.48	8.06	39.54	54.00	-14.46	170	39	Average
10460.000	41.74	8.06	49.80	74.00	-24.20	170	39	Peak
11650.000	31.06	8.77	39.83	54.00	-14.17	144	39	Average
11650.000	41.03	8.77	49.80	74.00	-24.20	144	39	Peak
15660.000	32.58	11.11	43.69	54.00	-10.31	197	60	Average
15660.000	42.44	11.11	53.55	74.00	-20.45	197	60	Peak
15690.000	33.65	11.30	44.95	54.00	-9.05	148	85	Average
15690.000	43.10	11.30	54.40	74.00	-19.60	148	85	Peak
17475.000	33.19	13.25	46.44	54.00	-7.56	188	39	Average
17475.000	36.55	13.25	49.80	74.00	-24.20	188	39	Peak
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
19216.000	42.15	-0.57	41.58	54.00	-12.42	150	354	Average
19216.000	52.02	-0.57	51.45	74.00	-22.55	150	354	Peak
20880.000	39.70	1.85	41.55	54.00	-12.45	150	112	Average
20880.000	48.61	1.85	50.46	74.00	-23.54	150	112	Peak
20920.000	39.32	1.81	41.13	54.00	-12.87	150	171	Average
20920.000	48.88	1.81	50.69	74.00	-23.31	150	171	Peak
23300.000	38.66	2.89	41.55	54.00	-12.45	150	112	Average
23300.000	46.97	2.89	49.86	74.00	-24.14	150	112	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	AX20 Mode, 2437MHz	23.69
XOR WIFI-5GHz	AX40 Mode, 5230MHz	21.17
Regular WIFI-5GHz	AX20 Mode, 5220 MHz	22.90
AUX WIFI-2.4GHz	G Mode, 2437MHz	13.26
AUX WIFI-5GHz	A Mode, 5825MHz	13.75

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