FCC PART 15.407
ISEDC RSS-247, ISSUE 2, FEBRUARY 2017
TEST REPORT

For

Cisco Systems Inc.

125 West Tasman Drive,
San Jose, CA 95134 USA

FCC ID: LDKAX5122118
IC: 2461N-AX5122118

Report Type: CIIPC Report	**Product Type:** Cisco Catalyst C9130AX Series Wi-Fi 6 Access Points
Prepared By	Deepak Mishra Test Technician
Report Number	R2104191-407
Report Date	2021-05-13
Reviewed By	Simon Ma RF Supervisor

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ACCREDITED
CERTIFICATE #3297.02

* This test report may contain data and test methods that are not covered by BACL's scope of accreditation as of the test report date shown above. These items are marked within the test report text with an asterisk "*"

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R2104191-407	CIIPC Report	2021-05-13

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report was prepared on behalf of *Cisco Systems Inc.,* and their product model: *C9130AXI-B (US), and C9130AXI-A (Canada), FCC ID: LDKAX5122118, IC: 2461N-AX5122118* as referred to as EUT in this report. The product is an 802.11ax Access Point.

1.2 Mechanical Description of EUT

Length (cm)	Width (cm)	Height (cm)	Weight (g)	S/N
23	23	4	1417.4761	KWC250408U

1.3 Objective

This report is prepared on behalf of *Cisco Systems Inc.* in accordance with FCC CFR47 §15.407, ISEDC RSS-247 Issue 2 on February 2017.

The objective is to determine continuous compliance with FCC Part 15.407, ISEDC RSS-247 rules for Radiated Spurious Emissions.

1.4 Related Submittal(s)/Grant(s)

Equipment Class: DTS, FCC ID: LDKAX5122118, IC: 2461N-AX5122118.

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.10-2013, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz, and FCC KDB 789033 D02 General UNII Test Procedure New Rules v02r01.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Parameter	Measurement uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.57 dB
Power Spectral Density, conducted	±1.48dB
Unwanted Emissions, conducted	±1.57dB
All emissions, radiated	±4.0 dB
AC power line Conducted Emission	±2.0 dB
Temperature	±2 ° C
Humidity	±5 %
DC and low frequency voltages	±1.0 %
Time	±2 %
Duty Cycle	±3 %

1.7 Test Facility Registrations

BACLs test facilities that are used to perform Radiated and Conducted Emissions tests are currently recognized by the Federal Communications Commission as Accredited with NIST Designation Number US1129.

BACL's test facilities that are used to perform Radiated and Conducted Emissions tests are currently registered with Industry Canada under Registration Numbers: 3062A-1, 3062A-2, and 3062A-3.

BACL is a Chinese Taipei Bureau of Standards Metrology and Inspection (BSMI) validated Conformity Assessment Body (CAB), under Appendix B, Phase I Procedures of the APEC Mutual Recognition Arrangement (MRA). BACL's BSMI Lab Code Number is: SL2-IN-E-1002R

BACL's test facilities that are used to perform AC Line Conducted Emissions, Telecommunications Line Conducted Emissions, Radiated Emissions from 30 MHz to 1 GHz, and Radiated Emissions from 1 GHz to 6 GHz are currently recognized as Accredited in accordance with the Voluntary Control Council for Interference [VCCI] Article 15 procedures under Registration Number A-0027.

1.8 Test Facility Accreditations

Bay Area Compliance Laboratories Corp. (BACL) is:

A- ***An independent, 3rd-Party, Commercial Test Laboratory accredited to ISO/IEC 17025:2005 by A2LA (Test Laboratory Accreditation Certificate Number 3297.02),*** in the fields of: Electromagnetic Compatibility and Telecommunications. Unless noted by an Asterisk (*) in the Compliance Matrix (See Section 3 of this Test Report), BACL's ISO/IEC 17025:2005 Scope of Accreditation includes all of the Test Method Standards and/or the Product Family Standards detailed in this Test Report..

BACL's ISO/IEC 17025:2005 Scope of Accreditation includes a comprehensive suite of EMC Emissions, EMC Immunity, Radio, RF Exposure, Safety and wireline Telecommunications test methods applicable to a wide range of product categories. These product categories include Central Office Telecommunications Equipment [including NEBS - Network Equipment Building Systems], Unlicensed and Licensed Wireless and RF devices, Information Technology Equipment (ITE); Telecommunications Terminal Equipment (TTE); Medical Electrical Equipment; Industrial, Scientific and Medical Test Equipment; Professional Audio and Video Equipment;

Industrial and Scientific Instruments and Laboratory Apparatus; Cable Distribution Systems, and Energy Efficient Lighting.

B- ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3297.03)*** to certify

- For the USA (Federal Communications Commission):
  - 1- All Unlicensed radio frequency devices within FCC Scopes A1, A2, A3, and A4;
  - 2- All Licensed radio frequency devices within FCC Scopes B1, B2, B3, and B4;
  - 3- All Telephone Terminal Equipment within FCC Scope C.
- For the Canada (Industry Canada):
  - 1 All Scope 1-Licence-Exempt Radio Frequency Devices;
  - 2 All Scope 2-Licensed Personal Mobile Radio Services;
  - 3 All Scope 3-Licensed General Mobile & Fixed Radio Services;
  - 4 All Scope 4-Licensed Maritime & Aviation Radio Services;
  - 5 All Scope 5-Licensed Fixed Microwave Radio Services
  - 6 All Broadcasting Technical Standards (BETS) in the Category I Equipment Standards List.
- For Singapore (Info-Communications Development Authority (IDA)):
  - 1 All Line Terminal Equipment: All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2011, Annex 2
  - 2. All Radio-Communication Equipment: All Technical Specifications for Radio-Communication Equipment – Table 2 of IDA MRA Recognition Scheme: 2011, Annex 2
- For the Hong Kong Special Administrative Region:
  - 1 All Radio Equipment, per KHCA 10XX-series Specifications;
  - 2 All GMDSS Marine Radio Equipment, per HKCA 12XX-series Specifications;
  - 3 All Fixed Network Equipment, per HKCA 20XX-series Specifications.
- For Japan:
  - 1 MIC Telecommunication Business Law (Terminal Equipment):
    - All Scope A1 - Terminal Equipment for the Purpose of Calls;
    - All Scope A2 - Other Terminal Equipment
  - 2 Radio Law (Radio Equipment):
    - All Scope B1 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 1 of the Radio Law
    - All Scope B2 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 2 of the Radio Law
    - All Scope B3 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 3 of the Radio Law

C- ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3297.01)*** to certify Products to USA's Environmental Protection Agency (EPA) ENERGY STAR Product Specifications for:

1 Electronics and Office Equipment:
- for Telephony (ver. 3.0)
- for Audio/Video (ver. 3.0)
- for Battery Charging Systems (ver. 1.1)
- for Set-top Boxes & Cable Boxes (ver. 4.1)
- for Televisions (ver. 6.1)
- for Computers (ver. 6.0)
- for Displays (ver. 6.0)
- for Imaging Equipment (ver. 2.0)
- for Computer Servers (ver. 2.0)

2 Commercial Food Service Equipment
- for Commercial Dishwashers (ver. 2.0)
- for Commercial Ice Machines (ver. 2.0)
- for Commercial Ovens (ver. 2.1)
- for Commercial Refrigerators and Freezers

3 Lighting Products
- For Decorative Light Strings (ver. 1.5)
- For Luminaires (including sub-components) and Lamps (ver. 1.2)
- For Compact Fluorescent Lamps (CFLs) (ver. 4.3)
- For Integral LED Lamps (ver. 1.4)

4 Heating, Ventilation, and AC Products
- for Residential Ceiling Fans (ver. 3.0)
- for Residential Ventilating Fans (ver. 3.2)

5 Other
- For Water Coolers (ver. 3.0)

D- ***A NIST Designated Phase-I and Phase-II Conformity Assessment Body (CAB) for the following economies and regulatory authorities under the terms of the stated MRAs/Treaties:***

- Australia: ACMA (Australian Communication and Media Authority) – APEC Tel MRA -Phase I;
- Canada: (Innovation, Science and Economic development Canada - ISEDC) Foreign Certification Body – FCB – APEC Tel MRA -Phase I & Phase II;
- Chinese Taipei (Republic of China – Taiwan):
  - BSMI (Bureau of Standards, Metrology and Inspection) APEC Tel MRA -Phase I;
  - NCC (National Communications Commission) APEC Tel MRA -Phase I;
- European Union:
  - EMC Directive 2014/30/EU US-EU EMC & Telecom MRA CAB (NB)
  - Radio Equipment (RE) Directive 2014/53/EU US-EU EMC & Telecom MRA CAB (NB)
  - Low Voltage Directive (LVD) 2014/35/EU
- Hong Kong Special Administrative Region: (Office of the Telecommunications Authority – OFTA) APEC Tel MRA -Phase I & Phase II
- Israel – US-Israel MRA Phase I
- Republic of Korea (Ministry of Communications - Radio Research Laboratory) APEC Tel MRA -Phase I
- Singapore: (Infocomm Media Development Authority - IMDA) APEC Tel MRA -Phase I & Phase II;
- Japan: VCCI - Voluntary Control Council for Interference US-Japan Telecom Treaty VCCI Side Letter-
- USA:
  - ENERGY STAR Recognized Test Laboratory – US EPA
  - Telecommunications Certification Body (TCB) – US FCC;
  - Nationally Recognized Test Laboratory (NRTL) – US OSHA
- Vietnam: APEC Tel MRA -Phase I;

2 System Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.10-2013 and FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

The EUT was tested in a testing mode to represent worst-case results during the final qualification test. Radio was configured to transmit the highest power setting that's supported, and all antennas were active at the same time.

2.2 EUT Exercise Software

The test firmware used was Tera Term and test commands, provided by *Cisco Systems Inc.,* the software is compliant with the standard requirements being tested against.

Modulation	Frequency (MHz)	Power Setting
5 GHz Wi-Fi, 5 GHz Regular 5 GHz XOR, 5 GHz Aux (nonHT20)	5200	17
	5300	17
	5580	17
	5785	17

Data Rates Tested:
802.11a mode: 6Mbps

2.3 Duty Cycle Correction Factor

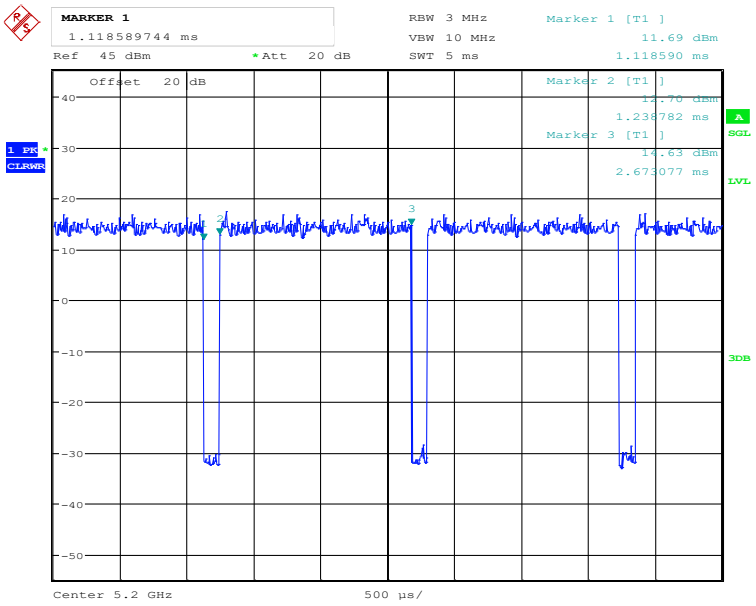
According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 section B:

All measurements are to be performed with the EUT transmitting at 100% duty cycle at its maximum power control level; however, if 100% duty cycle cannot be achieved, measurements of duty cycle, x, and maximum-power transmission duration, T, are required for each tested mode of operation.

Radio Mode	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
5 GHz Wi-Fi (nonHT20)	1.434295	1.554487	92.27	0.35
5 GHz Regular (nonHT20)	1.442308	1.564103	92.21	0.35
5 GHz XOR (nonHT20)	1.442308	1.576923	91.46	0.39
5 GHz Aux (nonHT20)	0.291667	0.307692	94.79	0.23

Note: Duty Cycle Correction Factor = 10*log(1/duty cycle)
Please refer to the following plots.

5 GHz Wi-Fi (nonHT20)



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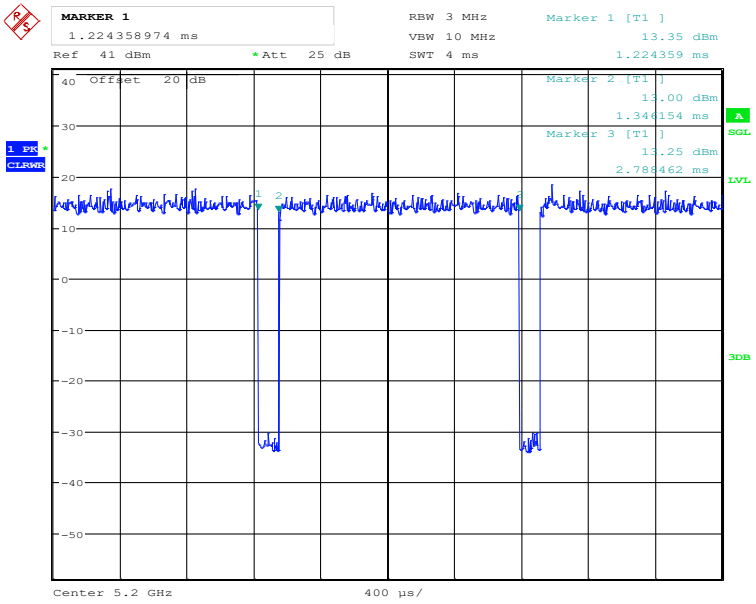
5 GHz Regular (nonHT20)



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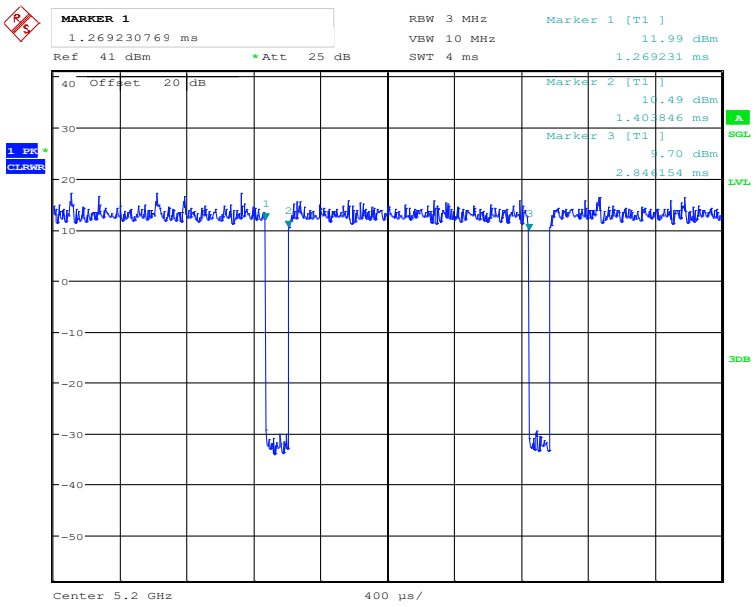
5 GHz XOR (nonHT20)



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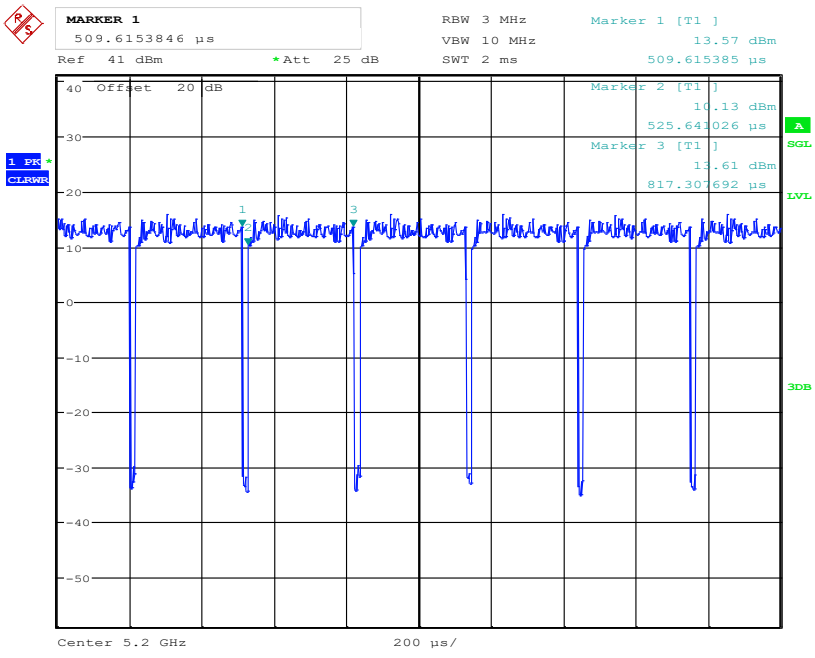
5 GHz Aux (nonHT20)



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2.4 Equipment Modifications

N/A

2.5 Local Support Equipment

Manufacturer	Description	Model	Serial Number
Dell	Laptop	Latitude E6410	3CKRAQ1

2.6 Remote Support Equipment

Manufacturer	Description	Model
Cisco	Power Supply	AIR-PWRIN-J6 V01

2.7 Interface Ports and Cabling

Cable Description	Length (m)	To	From
RS232 Male to Ethernet Cable	2 m	RS232 Female to USB Cable	EUT
RS232 Female to USB Cable	2 m	Laptop	RS232 Male to Ethernet Cable

3 Summary of Test Results

FCC, ISED Rules	Description of Test	Result
FCC §2.1053, §15.205, §15.209, 15.407(b) ISEDC RSS-247 §6.2	Spurious Radiated Emissions	Compliant

4 FCC §15.209, §15.407(b) & ISEDC RSS-247 §6.2 - Spurious Radiated Emissions

4.1 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	960 – 1240	4. 5 – 5. 15
0.495 – 0.505	16.69475 – 16.69525	1300 – 1427	5. 35 – 5. 46
2.1735 – 2.1905	25.5 – 25.67	1435 – 1626.5	7.25 – 7.75
4.125 – 4.128	37.5 – 38.25	1645.5 – 1646.5	8.025 – 8.5
4.17725 – 4.17775	73 – 74.6	1660 – 1710	9.0 – 9.2
4.20725 – 4.20775	74.8 – 75.2	1718.8 – 1722.2	9.3 – 9.5
6.215 – 6.218	108 – 121.94	2200 – 2300	10.6 – 12.7
6.26775 – 6.26825	123 – 138	2310 – 2390	13.25 – 13.4
6.31175 – 6.31225	149.9 – 150.05	2483.5 – 2500	14.47 – 14.5
8.291 – 8.294	156.52475 – 156.52525	2690 – 2900	15.35 – 16.2
8.362 – 8.366	156.7 – 156.9	3260 – 3267	17.7 – 21.4
8.37625 – 8.38675	162.0125 –167.17	3.332 – 3.339	22.01 – 23.12
8.41425 – 8.41475	167.72 – 173.2	3 3458 – 3 358	23.6 – 24.0
12.29 – 12.293	240 – 285	3.600 – 4.400	31.2 – 31.8
12.51975 – 12.52025	322 – 335.4		36.43 – 36.5
12.57675 – 12.57725	399.9 – 410		Above 38.6
13.36 – 13.41	608 – 614		

As per FCC §15.209: 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 Note 1	3
88 - 216	150 Note 1	3
216 - 960	200 Note 1	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 470-806 MHz. 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) and LP0002§4.7.4

(1) 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.

(2) For transmitters operating in the 5.25-5.35 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.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) 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.

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

(5) 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.

(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(7) The provisions of §15.205 apply to intentional radiators operating under this section.

(8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

As per ISEDC RSS-247 §6.2

For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, any unwanted emissions that fall into the band 5250- 5350 MHz must be 26 dBc, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth, above 5.25 GHz. Otherwise, the transmission is considered as intentional and the devices shall implement dynamic frequency selection (DFS) and transmitter power control (TPC) as per the requirements for the band 5250-5350 MHz

For devices with both operating frequencies and channel bandwidths contained within the band 5250-5350 MHz, the device shall comply with the following:

1. All emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. if the equipment is intended for outdoor use; or
2. All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and any emissions within the band 5150-5250 MHz shall meet the power spectral density limits of Section 6.2.1. The device shall be labelled “for indoor use only.”

For devices with operating frequencies in the band 5250-5350 MHz but having a channel bandwidth that overlaps the band 5150-5250 MHz, the devices’ unwanted emission shall not exceed -27 dBm/MHz e.i.r.p. outside the band 5150-5350 MHz and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device shall be labelled “for indoor use only.”

For transmitters operating in the band 5470-5725 MHz, emissions outside the band shall not exceed -27 dBm/MHz e.i.r.p.

For the band 5725-5850 MHz, emissions at frequencies from the band edges to 10 MHz above or below the band edges shall not exceed -17 dBm/MHz e.i.r.p. For emissions at frequencies more than 10 MHz above or below the band edges, the emissions power shall not exceed -27 dBm/MHz.

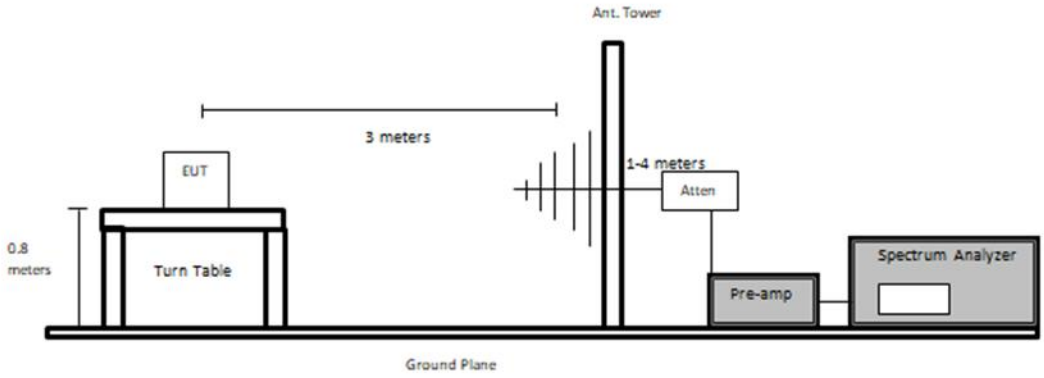
4.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.10-2013. The specification used was the FCC 15.407 limits.

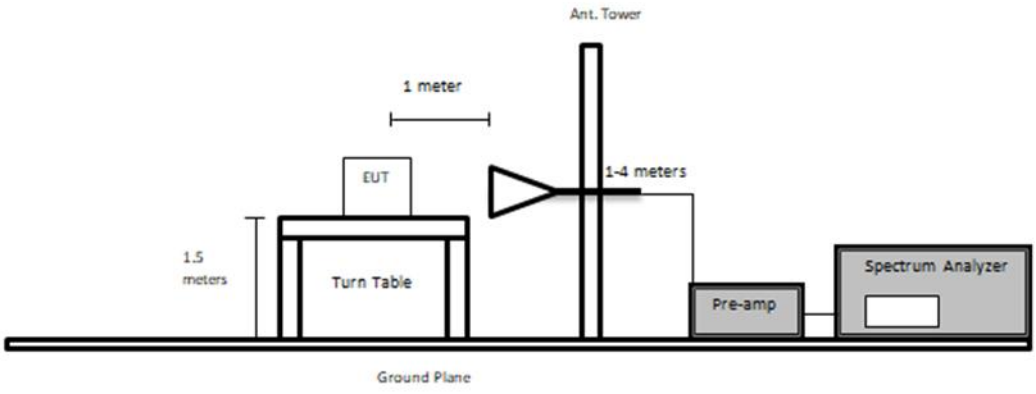
The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

Below 1GHz:



Above 1GHz:



4.3 Test Procedure

For the radiated emissions test, the EUT host, and all support equipment power cords were connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.
The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 meter, and the EUT is placed on a turntable, which is 0.8 meter or 1.5 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

The spectrum analyzer or receiver is set as:

Below 1000 MHz:

RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000 MHz:

(1) Peak: RBW = 1MHz / VBW = 3MHz / Sweep = 100 ms
(2) Average: RBW = 1MHz / VBW = 1 / T or 10 Hz / Sweep = Auto

4.4 Corrected Amplitude and Margin Calculation

For emissions below 1 GHz,

The Corrected Amplitude (CA) is calculated by adding the Correction Factor to the S.A. Reading. The basic equation is as follows:

CA = S.A. Reading + Correction Factor

For example, a corrected amplitude of 40.3 dBuV/m = S.A. Reading (32.5 dBuV) + Correction Factor (7.8 dB/m)

The Correction Factor is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) together. This calculation is done in the measurement software, and reported in the test result section. The basic equation is as follows:

Correction Factor = AF + CL + Atten – Ga

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

Margin = Corrected Amplitude – Limit

For emission above 1 GHz,

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to indicated Amplitude (Ai) reading. The basic equation is as follows:

$$CA = Ai + AF + CL + Atten – Ga$$

For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)

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

$$Margin = Corrected\ Amplitude – Limit$$

4.5 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde and Schwarz	Receiver, EMI Test	ESCI 1166.5950.03	100338	2020-03-17	17 months
Agilent	Analyzer, Spectrum	E4446A	MY48250238	2021-02-12	1 year
Sunol Sciences	System Controller	SC99V	011003-1	N/R	N/A
Sunol Sciences	Antenna, Biconi-Log	JB3	A020106-2	2019-11-20	2 years
ETS Lindgren	Horn Antenna	3117	00218973	2019-02-13	2.5 years
Wisewave	Antenna, Horn	ARH-4223-02	10555-02	2020-02-05	2 years
Wisewave	Antenna, Horn	ARH-2823-02	10555-02	2020-02-27	2 years
Agilent	Amplifier, Pre	8447D	2443A04374	2020-08-17	1 year
HP	Pre-Amplifier	8449B	3008A01978	2021-05-05	1 year
AH Systems	Preamplifier	PAM 1840 VH	170	2020-11-09	1 year
BACL	5m3 Sensitivity Box	1	2	2020-10-27	1 year
IW Incorporated	157 Series 2.92 SM (x2) Armored 33 ft. Cable	KPS-1571AN-3960-KPS	DC 1917	2021-03-03	1 year
IW Incorporated	157 Series Cable Armored with 2.92mm Male Plugs on Both Sides	KPS-1571AN-2400	DC 1922	2020-06-06	1 year
Keysight Technologies	RF Limiter	11867A	MY42242932	2021-03-03	1 year
MDP Digital	Times Microwave LMR 400 UltraFex Coaxial Cable 35'	LMR400UF	BACL1904161	2020-05-20	1 year
Vasona	Test software	V6.0 build 11	10400213	N/R	N/R

Note[1]: cable and attenuator included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with the latest version of A2LA policy P102 "A2LA Policy on Metrological Traceability".*

4.6 Test Environmental Conditions

Temperature:	22-25 ºC
Relative Humidity:	29-30 %
ATM Pressure:	102.1 kPa

The testing was performed by Deepak Mishra from 2021-04-29 to 2021-05-13 in 5m chamber 3.4

4.7 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Part 15.407 and RSS-247 standards' radiated emissions limits, and had the worst margin of:

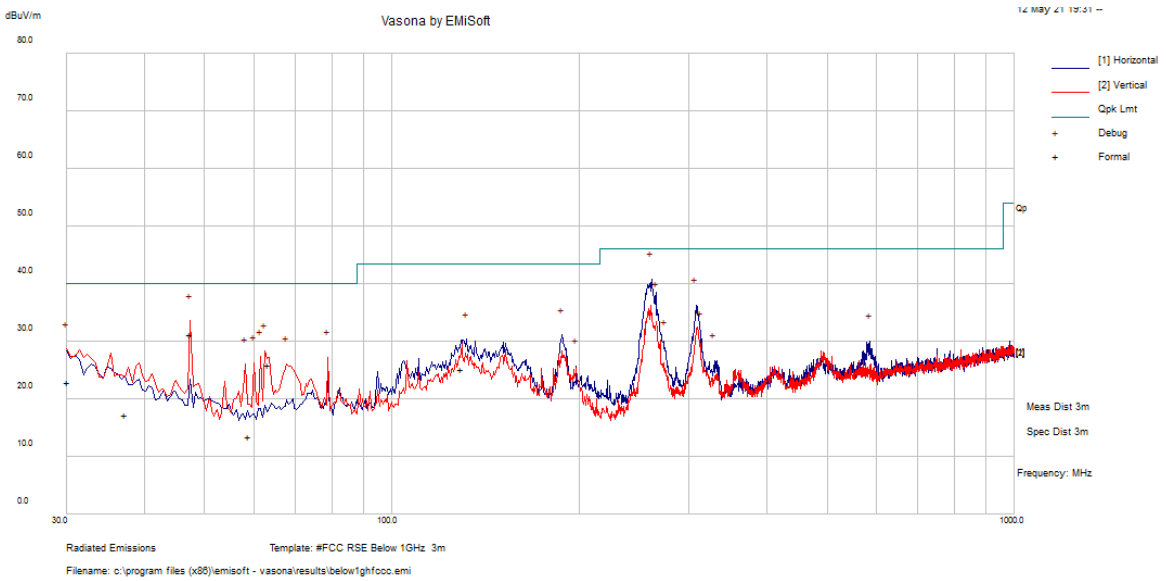
Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Mode, Channel**
-3.68	39957.986	Vertical	nonHT20, 5200 MHz

Please refer to the following table and plots for specific test result details

4.8 Radiated Emissions Test Result

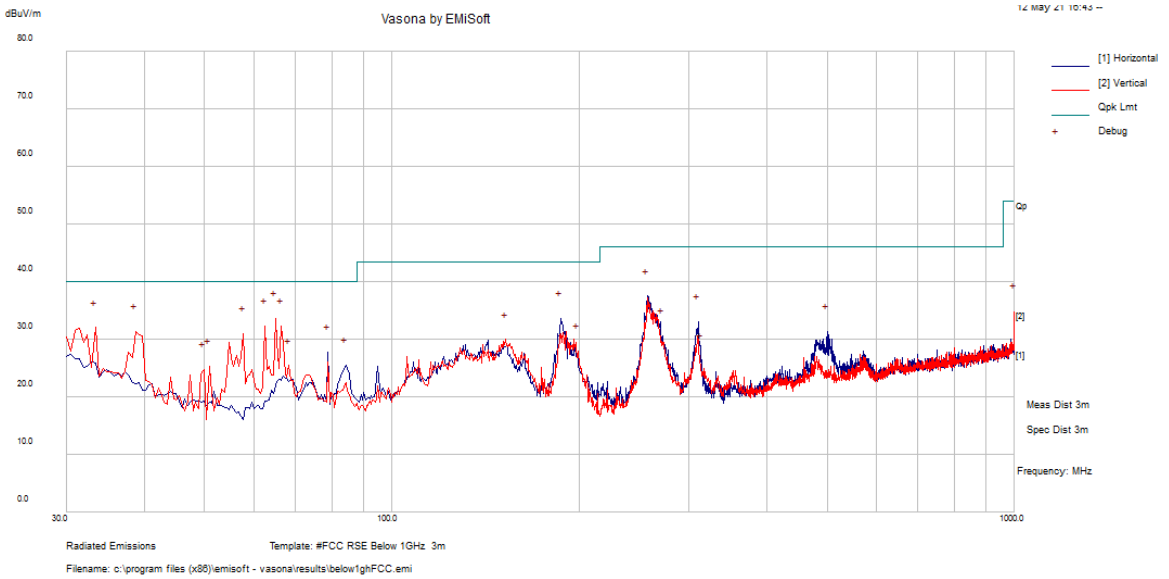
1) 30 MHz – 1 GHz Worst Case, Measured at 3 meters

EUT configuration: 5 GHz Wi-Fi Regular (802.11a, 5200 MHz, 4Txs) + 5 GHz Wi-Fi XOR (802.11a, 5200 MHz, 4Txs) + 5 GHz AUX (802.11a, 5200MHz, 1Tx)



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comment
261.538	44.29	-5.45	38.84	136	H	307	46	-7.16	QP
47.47875	41.71	-9.83	31.87	210	V	303	40	-8.13	QP
308.314	37.51	-4.32	33.19	102	H	329	46	-12.81	QP
266.3885	39	-4.96	34.04	153	H	306	46	-11.96	QP
30.161902	20.72	2.34	23.06	231	H	26	40	-16.94	QP
62.85425	27.4	-10.86	16.55	118	V	156	40	-23.45	QP

EUT configuration: 5 GHz Wi-Fi (802.11a, 5200 MHz, 8Txs) + 5 GHz AUX (802.11a, 5200MHz, 1Tx)



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comment
62.528	26.97	-10.89	16.08	219	V	245	40	-23.92	QP
66.3695	32.99	-10.48	22.5	220	V	303	40	-17.5	QP
33.15975	20.9	0.03	20.92	181	V	327	40	-19.08	QP
256.7925	29.28	-6.19	23.09	138	V	27	46	-22.91	QP
38.98125	24.6	-4.48	20.13	135	V	339	40	-19.87	QP
65.02	32.64	-10.63	22.01	238	V	333	40	-17.99	QP

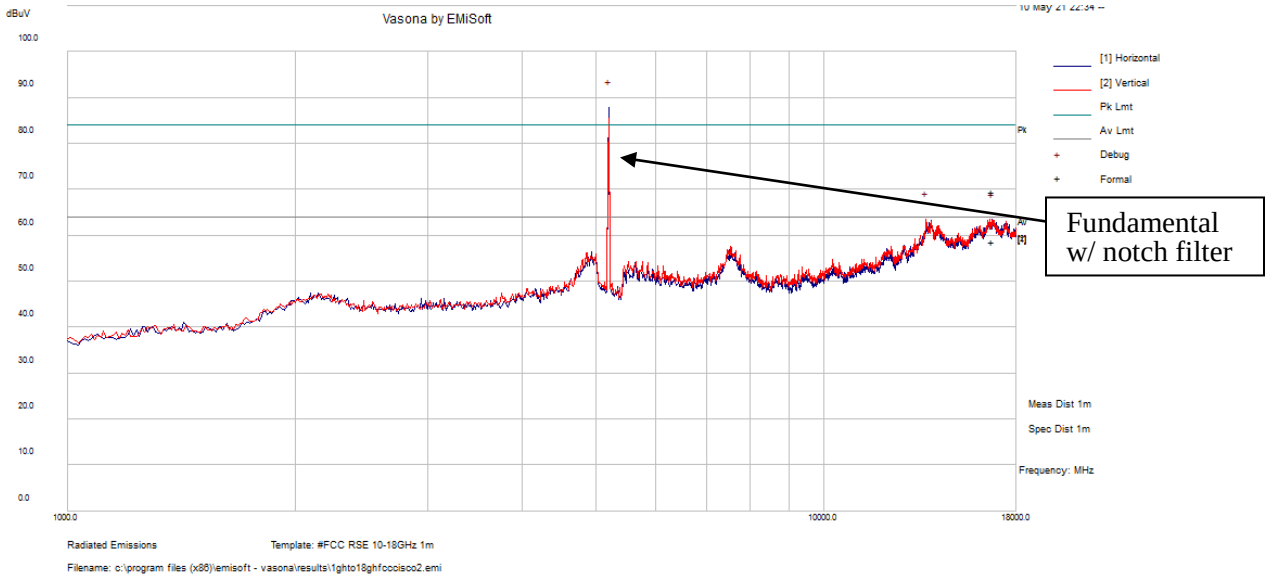
2) 1-18 GHz, measured at 1 meters

EUT configuration: 5 GHz Wi-Fi Regular (nonHT20, 4Txs) + 5 GHz Wi-Fi XOR (nonHT20, 4Txs) + 5 GHz AUX (802.11a, 1Tx)

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Channel 40: 5200 MHz Non HT20 mode power setting: 17											
10400	30.71	0	150	V	38.00	13.35	29.71	52.35	84	-31.65	PK
10400	20.81	0	150	V	38.00	13.35	29.71	42.45	64	-21.55	AV
10392	35.92	0	150	H	38.00	13.35	29.71	57.56	84	-26.44	PK
10392	19.63	0	150	H	38.00	13.35	29.71	41.27	64	-22.73	AV
15622	30.85	0	150	V	40.50	11.06	26.65	55.76	84	-28.24	PK
15622	19.64	0	150	V	40.50	11.06	26.65	44.55	64	-19.45	AV
15597	29.32	0	150	H	40.50	11.06	26.65	54.23	84	-29.77	PK
15597	20.06	0	150	H	40.50	11.06	26.65	44.97	64	-19.03	AV
Channel 60: 5300 MHz Non HT20 mode power setting: 17											
10599	33.07	0	150	V	38.20	13.35	30.25	54.37	84	-29.63	PK
10599	20.31	0	150	V	38.20	13.35	30.25	41.61	64	-22.39	AV
10592	33.21	0	150	H	38.20	13.35	30.25	54.51	84	-29.49	PK
10592	20.95	0	150	H	38.20	13.35	30.25	42.25	64	-21.75	AV
15885	31.14	0	150	V	41.00	11.06	25.51	57.69	84	-26.31	PK
15885	20.21	0	150	V	41.00	11.06	25.51	46.76	64	-17.24	AV
15898	29.55	0	150	H	41.00	11.06	25.51	56.10	84	-27.90	PK
15898	20.67	0	150	H	41.00	11.06	25.51	47.22	64	-16.78	AV
Channel 116: 5580 MHz Non HT20 mode power setting: 17											
11152	33.02	0	150	V	38.50	13.64	28.16	57.00	84	-27.00	PK
11152	18.26	0	150	V	38.50	13.64	28.16	42.24	64	-21.76	AV
11152	34.27	0	150	H	38.50	13.64	28.16	58.25	84	-25.75	PK
11152	19.61	0	150	H	38.50	13.64	28.16	43.59	64	-20.41	AV
11169	32.48	0	150	V	42.30	11.40	25.47	60.71	84	-23.29	PK
11169	18.81	0	150	V	42.30	11.40	25.47	47.04	64	-16.96	AV
11165	34.16	0	150	H	42.30	11.40	25.47	62.39	84	-21.61	PK
11165	19.11	0	150	H	42.30	11.40	25.47	47.34	64	-16.66	AV

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Channel 157: 5785 MHz Non HT20 mode power setting: 17											
11347	34.12	0	150	V	38.60	13.88	28.23	58.37	84	-25.63	PK
11347	21.18	0	150	V	38.60	13.88	28.23	45.43	64	-18.57	AV
12070	33.51	0	150	H	39.30	14.32	28.23	58.90	84	-25.10	PK
12070	21.03	0	150	H	39.30	14.32	28.23	46.42	64	-17.58	AV
17355	31.76	0	150	V	41.80	12.94	25.96	60.54	84	-23.46	PK
17355	21.63	0	150	V	41.80	12.94	25.96	50.41	64	-13.59	AV
17355	32.97	0	150	H	41.80	12.94	25.96	61.75	84	-22.25	PK
17355	21.81	0	150	H	41.80	12.94	25.96	50.59	64	-13.41	AV

Measurement plots for channel 40: 5200 MHz

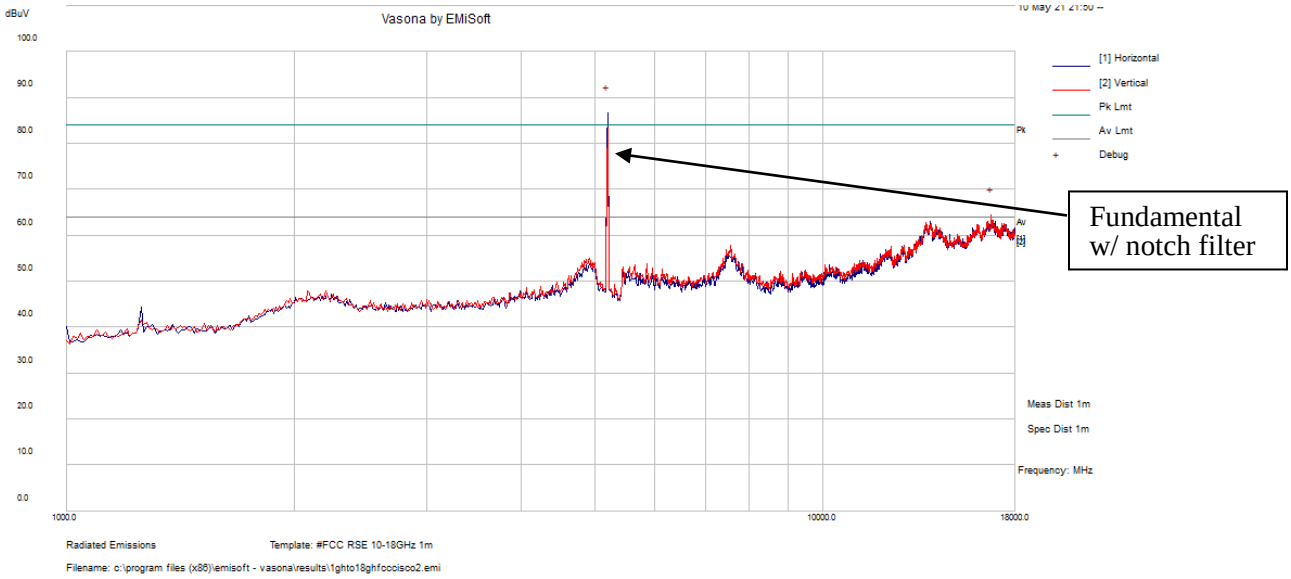


EUT configuration: 5 GHz Wi-Fi (nonHT20, 8Txs) + 5 GHz AUX (nonHT20, 1Tx)

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Channel 40: 5200 MHz Non HT20 mode power setting: 17											
10402	35.59	217	203	V	38.10	13.35	29.71	57.33	84	-26.67	PK
10402	25.81	217	203	V	38.10	13.35	29.71	47.55	64	-16.45	AV
10402	33.20	0	150	H	38.10	13.35	29.71	54.94	84	-29.06	PK
10402	21.30	0	150	H	38.10	13.35	29.71	43.04	64	-20.96	AV
15813	30.79	0	150	V	40.50	13.38	25.75	58.92	84	-25.08	PK
15813	19.45	0	150	V	40.50	13.38	25.75	47.58	64	-16.42	AV
15581	30.78	0	150	H	40.50	13.38	26.65	58.01	84	-25.99	PK
15581	19.14	0	150	H	40.50	13.38	26.65	46.37	64	-17.63	AV
Channel 60: 5300 MHz Non HT20 mode power setting: 17											
10593	41.39	275	287	V	38.20	13.35	30.25	62.69	84	-21.31	PK
10593	29.21	275	287	V	38.20	13.35	30.25	50.51	64	-13.49	AV
10603	35.45	171	281	H	38.20	13.35	30.25	56.75	84	-27.25	PK
10603	23.57	171	281	H	38.20	13.35	30.25	44.87	64	-19.13	AV
15940	31.62	0	150	V	41.00	11.06	26.36	57.32	84	-26.68	PK
15940	19.63	0	150	V	41.00	11.06	26.36	45.33	64	-18.67	AV
15920	31.80	0	150	H	41.00	11.06	26.36	57.50	84	-26.50	PK
15920	19.91	0	150	H	41.00	11.06	26.36	45.61	64	-18.39	AV
Channel 116: 5580 MHz Non HT20 mode power setting: 17											
11167	23.49	360	150	V	38.50	13.88	28.16	47.71	84	-36.29	PK
11167	9.80	360	150	V	38.50	13.88	28.16	34.02	64	-29.98	AV
11141	22.95	0	150	H	38.50	13.88	28.16	47.17	84	-36.83	PK
11141	10.71	0	150	H	38.50	13.88	28.16	34.93	64	-29.07	AV
16764	31.84	0	150	V	42.30	11.40	25.47	60.07	84	-23.93	PK
16764	19.35	0	150	V	42.30	11.40	25.47	47.58	64	-16.42	AV
16717	31.98	0	150	H	42.30	11.40	25.47	60.21	84	-23.79	PK
16717	20.38	0	150	H	42.30	11.40	25.47	48.61	64	-15.39	AV

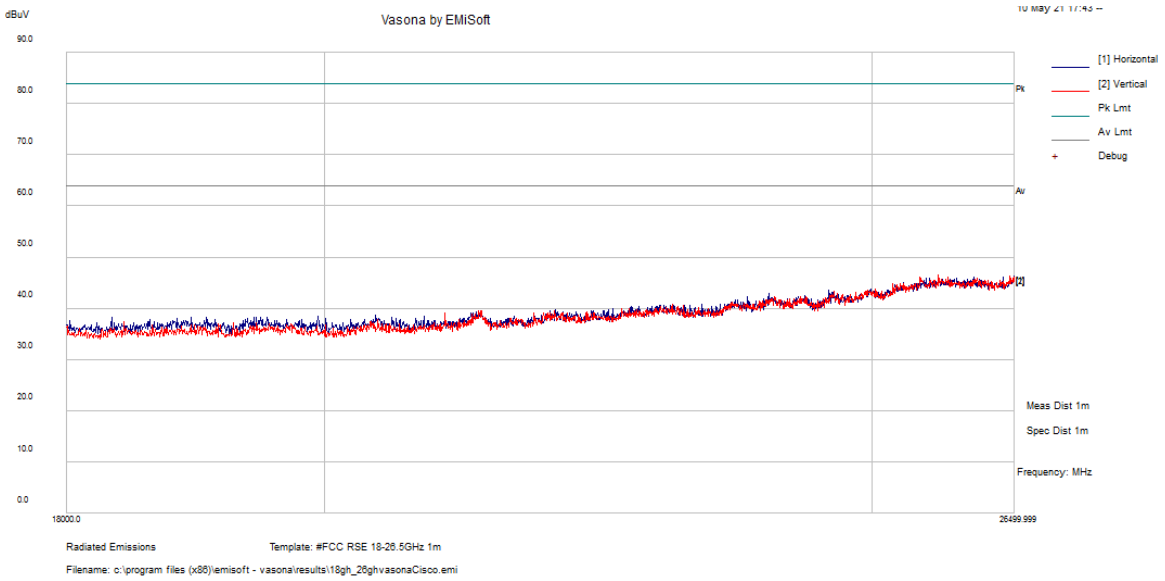
Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/ISEDC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Channel 157: 5785 MHz Non HT20 mode power setting: 17											
11303	31.24	0	150	V	38.90	13.88	28.22	55.80	84	-28.20	PK
11303	19.13	0	150	V	38.90	13.88	28.22	43.69	64	-20.31	AV
10697	31.48	0	150	H	38.90	13.88	30.33	53.93	84	-30.07	PK
10697	18.79	0	150	H	38.90	13.88	30.33	41.24	64	-22.76	AV
17352	30.39	0	150	V	41.80	12.94	25.96	59.17	84	-24.83	PK
17352	19.37	0	150	V	41.80	12.94	25.96	48.15	64	-15.85	AV
17072	31.52	0	150	H	41.80	12.94	27.11	59.15	84	-24.85	PK
17072	19.23	0	150	H	41.80	12.94	27.11	46.86	64	-17.14	AV

Measurement plots for channel 40: 5200 MHz

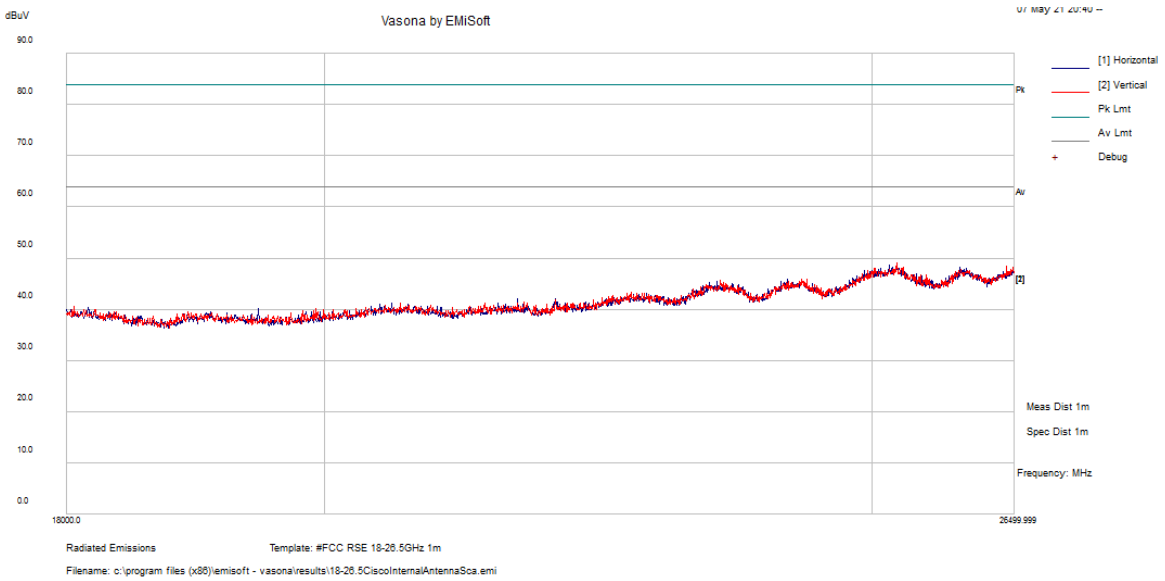


3) 18 - 26.5 GHz Scan, measured at 1 meter

EUT configuration: 5 GHz Wi-Fi Regular (nonHT20, 5200 MHz, 4Txs) + 5 GHz Wi-Fi XOR (nonHT20, 5200 MHz, 4Txs) + 5 GHz AUX (802.11a, 5200 MHz, 1Tx)

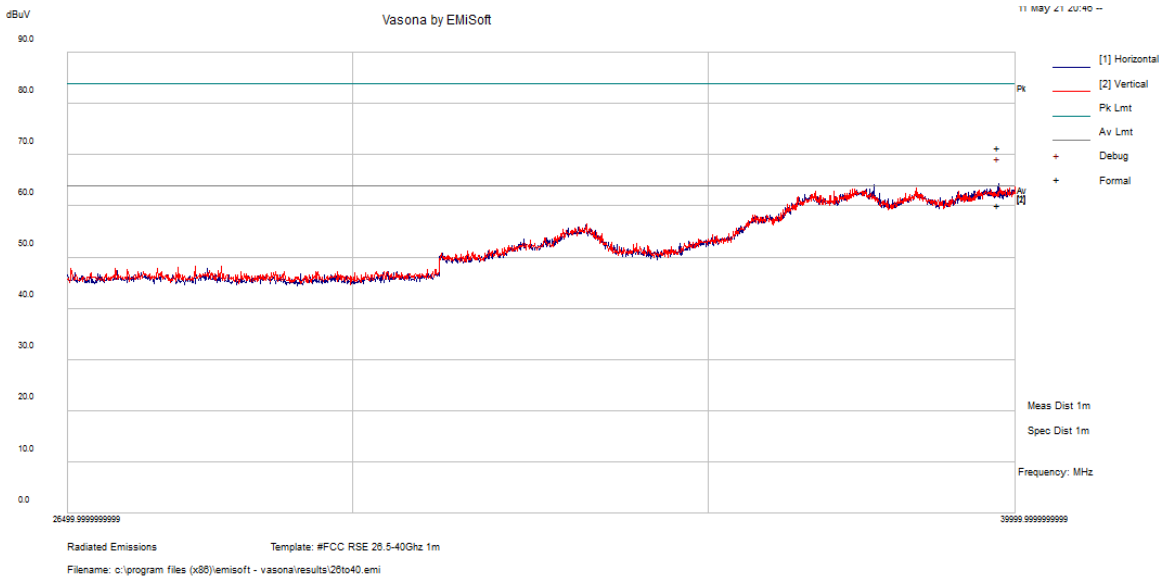


EUT configuration: 5 GHz Wi-Fi (nonHT20, 5200 MHz, 8Txs) + 5 GHz AUX (nonHT20, 5200 MHz, 1Tx)



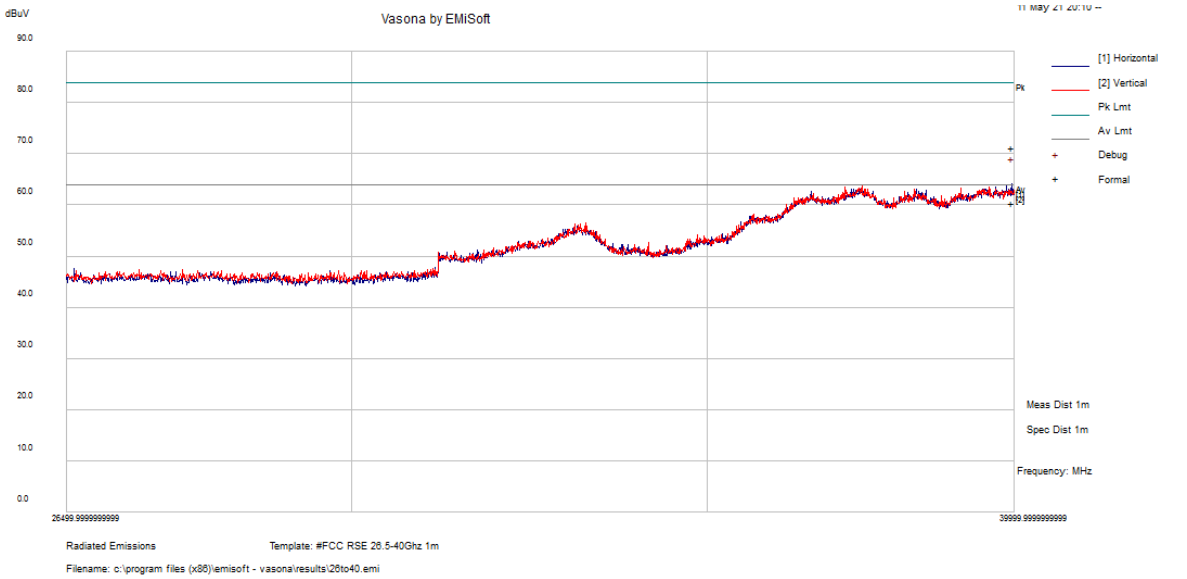
4) 26.5 - 40 GHz Scan, measured at 1 meter

EUT configuration: 5 GHz Wi-Fi Regular (nonHT20, 5200 MHz, 4Txs) + 5 GHz Wi-Fi XOR (nonHT20, 5200 MHz, 4Txs) + 5 GHz AUX (802.11a, 5200 MHz, 1Tx)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comment
39705.601	71.39	234	V	254	84	-12.61	Pass
39705.601	60.22	234	V	254	64	-3.78	Pass

EUT configuration: 5 GHz Wi-Fi (nonHT20, 5200 MHz, 8Txs) + 5 GHz AUX (nonHT20, 5200 MHz, 1Tx)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comment
39957.986	71.24	258	H	249	84	-12.76	Pass
39957.986	60.32	174	V	191	64	-3.68	Pass

5 Appendix A- EUT Test Setup Photographs

Please refer to the attachment

6 Appendix B- EUT Internal Photographs

Please refer to the attachment

7 Appendix D (Normative) - A2LA Electrical Testing Certificate

Accredited Laboratory

A2LA has accredited

BAY AREA COMPLIANCE LABORATORIES CORP.

Sunnyvale, CA

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets A2LA R222 - *Specific Requirements EPA ENERGY STAR Accreditation Program*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 10th day of March 2021.

Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3297.02
Valid to September 30, 2022

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

Please follow the web link below for a full ISO 17025 scope

https://www.a2la.org/scopepdf/3297-02.pdf

--- END OF REPORT ---