FCC PART 15.407
ISEDC RSS-247, ISSUE 3, AUGUST 2023

TEST REPORT

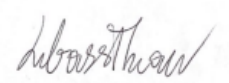
For

Roku, Inc.

1173 Coleman Ave
San Jose, CA 95110, USA

FCC ID: TC2-R1055
IC: 5959A-R1053

Report Type:	**Product Type:**
Original Report	Streaming Player

Prepared By:	Libass Thiaw RF Test Engineer	
Report Number:	R24111816-407	
Report Date:	2025-03-03	
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ACCREDITED
CERTIFICATE #3297.02

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R24111816-407	Original Report	2025-03-03

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test report is prepared on behalf of *Roku, Inc*., and their product model: 3830X, FCC ID: TC2-R1055, IC: 5959A-R1053 the "EUT" as referred to in this report. The EUT has 2.4 GHz/ 5 GHz Wi-Fi and 2.4 GHz BLE/BTC capabilities.

Model Number	3830X
FCC ID	TC2-R1055
IC	5959A-R1053
Radio Type	5 Wi-Fi
Operating Frequency	5150~5850 MHz
Mode	802.11a/n20/n40/ac20/ac40/ac80

1.2 Mechanical Description of EUT

The UUT measures approximately 95mm (L) x 24mm (W) x 14mm (H) and weighs approximately < 0.05 kg.

The data gathered was from a production sample provided by Roku, Inc. with BACL assigned S/N: R24111816-1,2,3

1.3 Objective

This report is prepared on behalf of *Roku, Inc.* in accordance with FCC CFR47 §15.407 and ISEDC RSS-247 Issue 3, August 2023.

The objective is to determine compliance with FCC Part 15.407 and ISEDC RSS-247 for Antenna Requirement, RF Exposure, AC Line Conducted Emissions, Radiated & Conducted Spurious Emissions, Emission Bandwidth, Output Power, Power Spectral Density, and Band Edges.

In order to determine compliance, the manufacturer or a contracted laboratory makes measurements and takes the necessary steps to ensure that the equipment complies with the appropriate technical standards.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the immunity should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing and/or I/O cable changes, etc.).

1.4 Related Submittal(s)/Grant(s)

FCC Part 15, Subpart C, Equipment Class: DSS with FCC ID: TC2-R1055, IC: 5959A-R1053
FCC Part 15, Subpart C, Equipment Class: DTS with FCC ID: TC2-R1055, IC: 5959A-R1053

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.10-2020, 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	±1.48 dB
Unwanted Emissions, conducted	±1.57dB
All emissions, radiated	±4.0 dB
AC power line Conducted Emission	±2.0 dB
Temperature	±2ºC
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.

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-428.

1.8 Test Facility Accreditations

Bay Area Compliance Laboratories Corp. (BACL) is:

A- ***An independent, 3rd-Party, Commercial Test Laboratory accredited to ISO/IEC 17025:2017 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 17025:2017 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 17025:2017 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 C63.10-2020 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.

2.2 EUT Exercise Software

The exercising software used during testing was "Tera Term", the software is compliant with the standard requirements being tested against.

NOTE: Device does not operate in the 5600-5650 MHz frequency band (TWDR) for ISED.

U-NII-1

Modulation	Frequency (MHz)	Power Setting
802.11a	5180	Default
	5200	Default
	5240	Default
802.11n20/ ac20	5180	18
	5200	Default
	5240	Default
802.11n40/ac40	5190	18
	5230	Default
802.11ac80	5210	17

Data rates used:
802.11a: 6 Mbps
802.11n/ ac: MCS0

U-NII-2A

Modulation	Frequency (MHz)	Power Setting
802.11a	5260	Default
	5300	Default
	5320	Default
802.11n20/ac20	5260	Default
	5300	Default
	5320	Default
802.11n40/ ac40	5270	Default
	5310	19
802.11ac80	5290	16

Data rates used:
802.11a: 6 Mbps
802.11n/ ac: MCS0

U-NII-2C

Modulation	Frequency (MHz)	Power Setting
802.11a	5500	Default
	5600	Default
	5720	Default
802.11n20/ ac20	5500	Default
	5600	Default
	5720	Default
802.11n40/ ac40	5510	19
	5590	Default
	5710	Default
802.11ac80	5530	18
	5610	Default
	5690	Default

Data rates used:
802.11a: 6 Mbps
802.11n/ ac: MCS0

U-NII-3

Modulation	Frequency (MHz)	Power Setting
802.11a	5745	Default
	5785	Default
	5825	Default
802.11n20/ ac20	5745	Default
	5785	Default
	5825	Default
802.11n40/ ac40	5755	Default
	5795	Default
802.11ac80	5775	Default

Data rates used:
802.11a: 6 Mbps
802.11n/ ac: MCS0

2.3 Duty Cycle Correction Factor

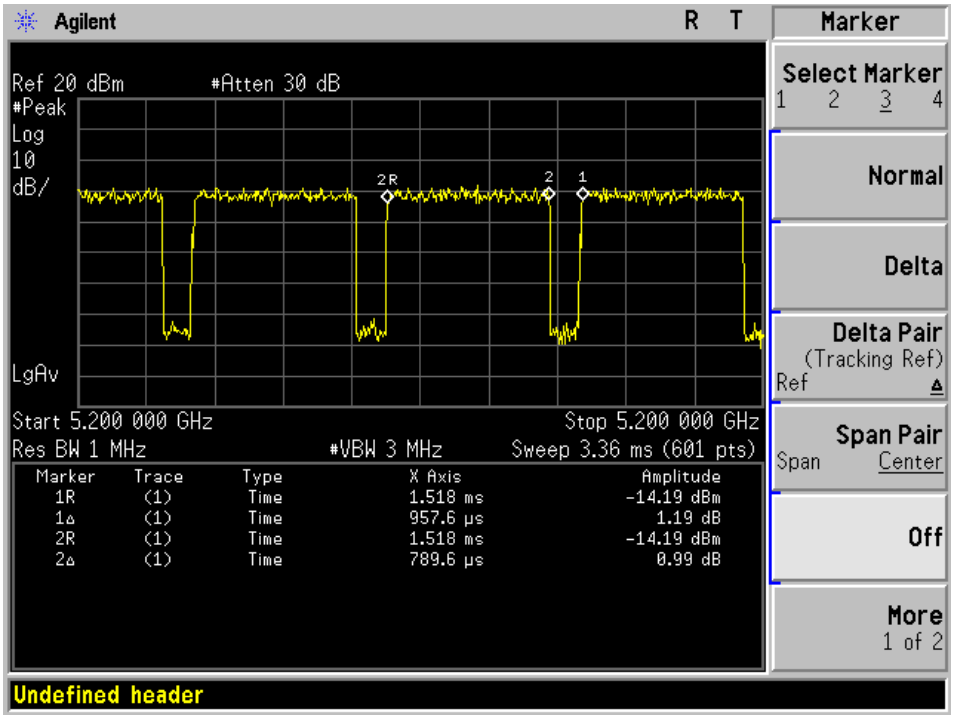
According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 section B:

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.

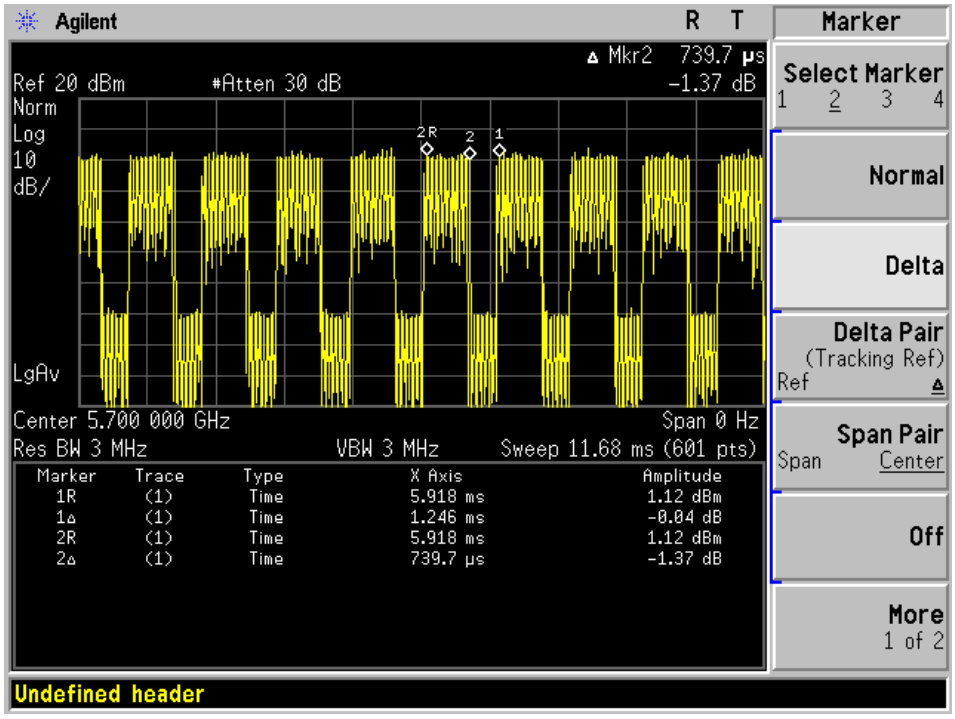
Modulation	Frequency	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
802.11a	5200	0.7896	0.9576	82.456140	0.8377700
802.11n/ac20	5700	0.7397	1.246	59.365971	2.2646242
802.11n/ac40	5190	0.3542	0.598	59.230769	2.2745263
802.11ac80	5210	0.1699	0.3953	42.980015	3.6673344

Duty Cycle = On Time (ms)/ Period (ms)
*Duty Cycle Correction Factor (dB) = 10*log(1/Duty Cycle)*

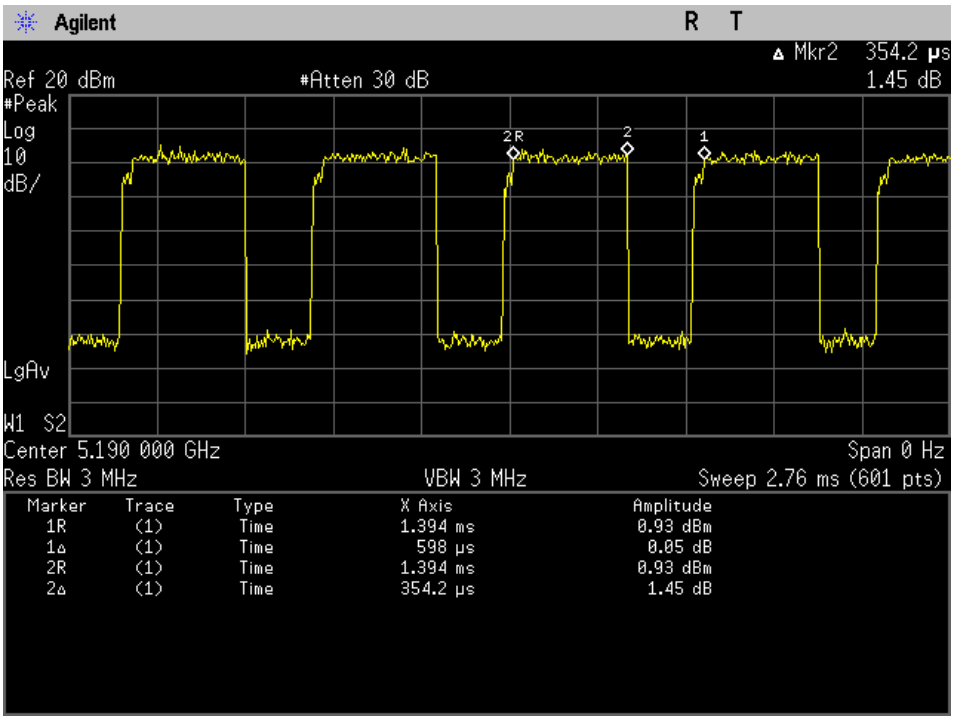
amode Duty Cycle



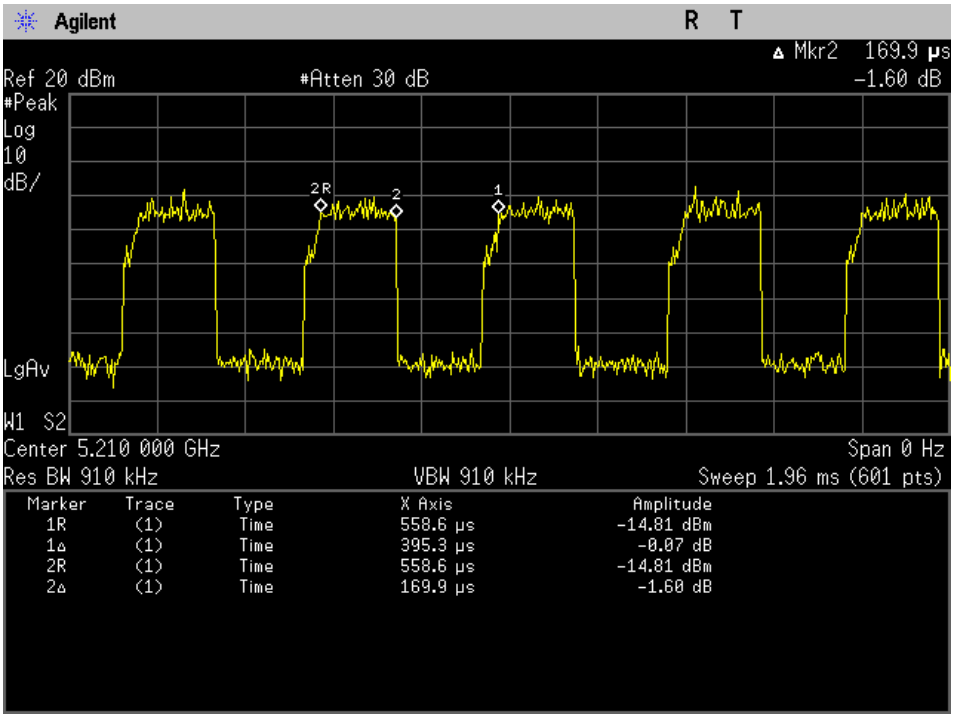
n/ac20mode Duty Cycle



n/ac40mode Duty Cycle



ac80mode Duty Cycle



2.4 Local Support Equipment

Manufacturer	Description	Model	Serial Number
Dell	Laptop	Latitude E7440	-

2.5 Remote Support Equipment

N/A

2.6 Power Supply and Line Filters

N/A

2.7 Interface Ports and Cabling

Cable Description	Length (m)	From	To
USB Cable	< 1 m	Laptop	EUT
RF Cable	< 1 m	EUT	PSA

3 Summary of Test Results

FCC & ISEDC Rules	Description of Test	Results
FCC §15.203 ISEDC RSS-Gen §6.8	Antenna Requirements	Compliant
FCC §2.1091, §15.407(f) ISEDC RSS-102	RF Exposure	Compliant
FCC §15.207 ISEDC RSS-Gen §8.8	AC Line Conducted Emisions	Compliant
FCC §2.1053, §15.35(b), §15.205, §15.209, 15.407(b) ISEDC RSS-247 §6.2 ISEDC RSS-Gen §8.9, §8.10	Radiated Spurious Emissions	Compliant
FCC §15.407(e) ISEDC RSS-247 §6.2 RSS-Gen §6.7	Emission Bandwidth	Compliant
FCC §407(a) ISEDC RSS-247 §6.2	Output Power	Compliant
FCC §15.407(a) ISEDC RSS-247 §6.2	Power Spectral Density	Compliant
FCC §2.1051, §15.407(b) ISEDC RSS-247 §6.2	Spurious Emissions at Antenna Terminals	Compliant
	Band Edges	Compliant
FCC §15.407(h) ISEDC RSS-247 §6.3	Dynamic Frequency Selection	Compliant
FCC §15.407(g)	Frequency Stability	Compliant[1]

Note 1: Customer confirmed an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

BACL is responsible for all the information provided in this report, except when information is provided by the customer as identified in this report. Information provided by the customer, e.g., antenna gain, can affect the validity of results.

4 FCC §15.203 & ISEDC RSS-Gen §6.8 – Antenna Requirements

4.1 Applicable Standards

According to FCC §15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

According to ISEDC RSS-Gen §6.8: Transmitter Antenna

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

For license-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:

This radio transmitter has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

4.2 Antenna Description

External/Internal/ Integral	Antenna Usage	Antenna Type	Band	Maximum Antenna Gain (dBi)
Integral	5 GHz Wi-Fi	Chip	U-NII-1	1.6
Integral	5 GHz Wi-Fi		U-NII-2A	1.6
Integral	5 GHz Wi-Fi		U-NII-2C	1.6
Integral	5 GHz Wi-Fi		U-NII-3	1

Note: The above antenna gain are provided by the customer

5 FCC §2.1091, FCC §15.407(f) & ISEDC RSS-102 – RF Exposure

5.1 Applicable Standards

According to FCC §1.1307(b)(1), 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.

According to KDB 447 498 Section (7.2), "simultaneous transmission of MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on calculated or measured field strengths or power density, is ≤ 1.0. The MPE ratio of each antenna is determined at the minimum *test separation distance* required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	* (100)	30
1.34-30	824/f	2.19/f	* ($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

Where: f = frequency in MHz
* = Plane-wave equivalent power density

Before equipment certification is granted, the procedure of IC RSS-102 must be followed concerning the exposure of humans to RF field.

According to ISED RSS-102 Issue 6:

6.6 Field reference level exposure exemption limits

Field reference level (FRL) exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm (i.e. mobile devices), except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 1 W (adjusted for tune-up tolerance)
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than $4.49/f^{0.5} W$ (adjusted for tune-up tolerance), where f is in MHz
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance)
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834} W$ (adjusted for tune-up tolerance), where f is in MHz
- at or above 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 5 W (adjusted for tune-up tolerance)

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the EIRP was derived.

5.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

5.3 RF exposure evaluation for FCC

Worst Case: 802.11n/ac40, 5270 MHz

Maximum output power at antenna input terminal (dBm):	20.24
Maximum output power at antenna input terminal (mW):	105.682
Prediction distance (cm):	20
Prediction frequency (MHz):	5270
Maximum Directional Antenna Gain, typical (dBi):	1.6
Maximum Antenna Gain (numeric):	1.445
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.030
FCC MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

The device is compliant with the requirement FCC MPE limit for uncontrolled exposure. The maximum power density at the distance of 20cm is 0.030 mW/cm^2. Limit is 1.0 mW/cm^2.

Worst case colocation: BLE ratio + 5Wifi ratio. 0.002/1 +0.030/1 = 0.032 < 1
Worst case colocation: BLE ratio + 2.4Wifi ratio. 0.002/1 +0.017/1 = 0.019< 1

Worst case colocation: BT Classic ratio + 5Wifi ratio. 0.0027/1 +0.030/1 = 0.0327< 1
Worst case colocation: BT Classic ratio + 2.4Wifi ratio 0.0027/1 +0.017/1 = 0.0197< 1

5.4 RF exposure evaluation exemption for IC

Maximum EIRP power = 20.24dBm + 1.6 dBi = 21.84 dBm which is less than $1.31\times10^{-2}\times f^{0.6834}$ = 4.53 W = 36.56 dBm

Therefore the RF exposure Evaluation is not required.

6 FCC §15 207 & ISEDC RSS-Gen §8.8 - AC Line Conducted Emissions

6.1 Applicable Standards

As per FCC §15.207 and ISEDC RSS-Gen §8.8 Conducted limits:

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56 Note1	56 to 46 Note2
0.5-5	56	46
5-30	60	50

Note1: Decreases with the logarithm of the frequency.
Note2: A linear average detector is required

6.2 Test Setup

The measurement was performed at shield room, using the setup per ANSI C63.10-2013 measurement procedure. The specification used were FCC §15.207 and ISED RSS-Gen §8.8 limits.

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

The AC/DC power adapter of the EUT was connected with LISN-1 which provided 120 V / 60 Hz AC power.

6.3 Test Procedure

During the conducted emissions test, the power cord of the EUT host system was connected to the mains outlet of the LISN-1 and the power cords of support equipment were connected to LISN-2.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data were recorded in the peak, quasi-peak, and average detection mode. Quasi-Peak readings are distinguished with a "QP." Average readings are distinguished with an "Ave".

6.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Correction Factor (CF) to indicated Amplitude (Ai) reading. The basic equation is as follows:

$$CA = Ai + CF$$

For example, a corrected amplitude of 46.2 dBuV = Indicated Reading (32.5 dBuV) + Correction Factor (13.7 dB)

The Correction Factor is calculated by adding Cable loss (CL) and attenuation of the impulse limiter and the high pass filter. The basic equation is as follows:

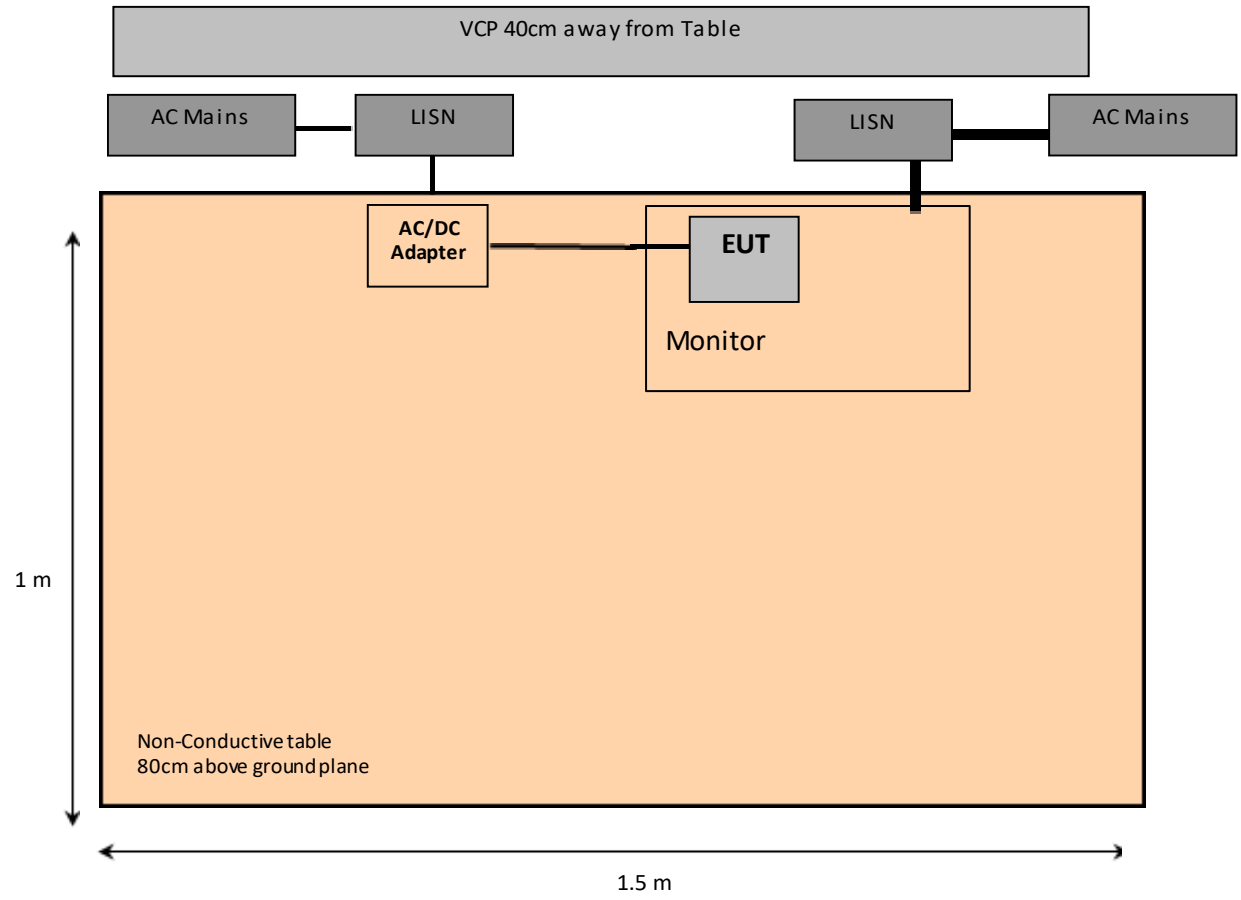
$$CF= CL + Attenuator$$

For example, a corrected amplitude of 13.7 dB = Cable Loss (3.7 dB) + Attenuation (10 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:

$$Margin = Corrected\ Amplitude – Limit$$

6.5 Test Setup Block Diagram



6.6 Test Equipment List and Details

BACL No.	Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
124	Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100044	2024-06-19	1 year
681	Rohde & Schwarz	Impulse Limiter	ESH3-Z2	101962	2024-09-17	6 months
732	FCC	LISN	FCC-LISN-50-25-2-10-CISPR16	160129	2024-09-13	1 year
732	FCC	LISN	FCC-LISN-50-25-2-10-CISPR16	160129	2024-03-05	1 year
1425	Pasternack	Ground Plane RG58 Coaxial Cable	PE3441-500CM	NA	2025-01-07	6 months

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".*

6.7 Test Environmental Conditions

Temperature:	21 to 24 ºC
Relative Humidity:	59 to 61.3 %
ATM Pressure:	101.9 kPa

The testing was performed by Shankar Pangeni on 2025-02-13 in the 5 meter chamber 3.

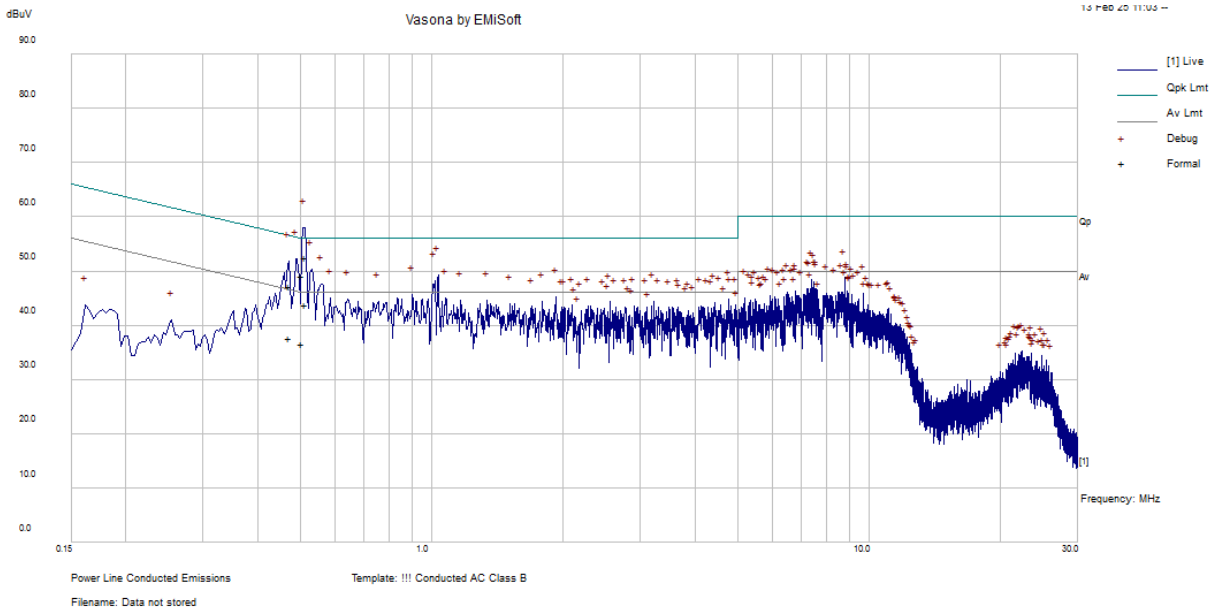
6.8 Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC 15C and ISEDC RSS-Gen standard's conducted emissions limits, with the margin reading of:

Worst Case – AC Line (via AC/DC Adapter): 120V, 60Hz			
Margin (dB)	**Frequency (MHz)**	**Conductor Mode (Live/Neutral)**	**Range (MHz)**
-0.08	0.512613	Live	0.15 to 30

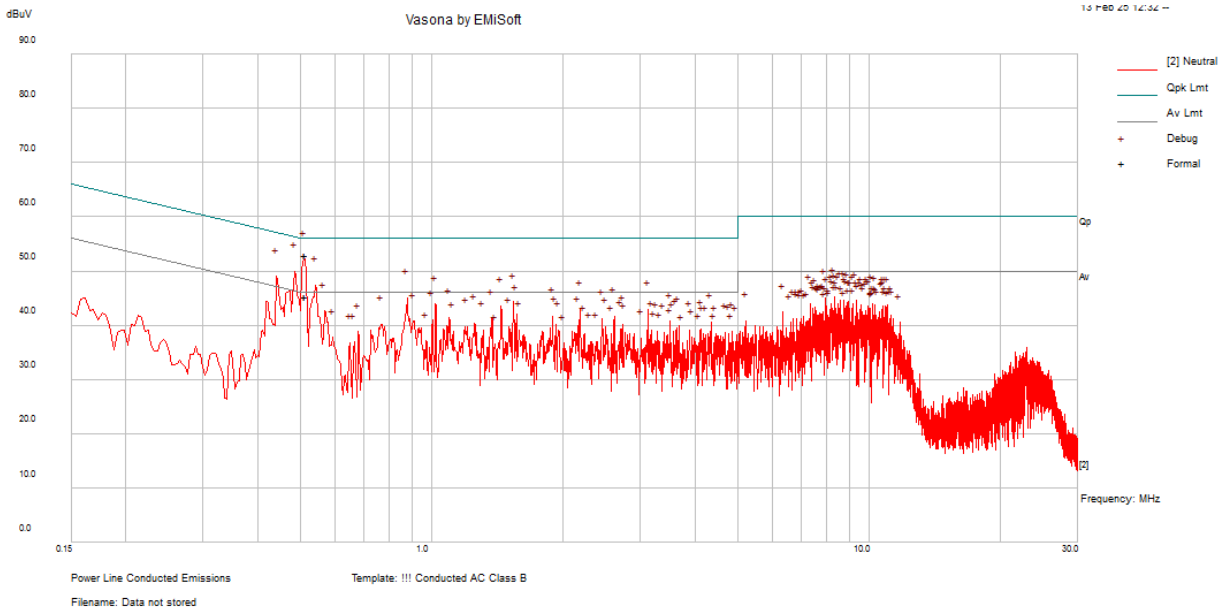
6.9 Conducted Emissions Test Plots and Data

AC Line (via AC/DC Adapter): 120V, 60Hz – Live Conductor



Frequency (MHz)	Ai. Reading (dBuV)	Correction Factor (dB)	Corrected Amplitude (dBµV)	Limit (dBµV)	Margin (dB)	Detector
0.512892	45.17	10.53	55.7	56	-0.30	QP
0.506973	45.11	10.53	55.64	56	-0.36	QP
0.488909	40.14	10.55	50.69	56.19	-5.5	QP
0.512613	45.15	10.53	55.68	56	-0.32	QP
1.030244	33.15	10.26	43.41	56	-12.59	QP
1.00984	34.26	10.28	44.54	56	-11.46	QP
0.512892	35.37	10.53	47.4	46	-0.10	Ave
0.506973	34.47	10.53	45	46	-1	Ave
0.488909	32.36	10.55	42.91	46.19	-3.27	Ave
0.512613	35.39	10.53	45.92	46	**-0.08**	Ave
1.030244	18.99	10.26	29.25	46	-16.75	Ave
1.00984	19.97	10.28	30.25	46	-15.75	Ave

AC Line (via AC/DC Adapter): 120V, 60Hz – Neutral Conductor



Frequency (MHz)	Ai. Reading (dBuV)	Correction Factor (dB)	Corrected Amplitude (dBµV)	Limit (dBµV)	Margin (dB)	Detector
0.504671	38.62	10.53	49.16	56	-6.84	QP
0.471145	36.6	10.58	47.17	56.49	-9.32	QP
0.512937	42.08	10.53	52.6	56	-3.4	QP
0.918689	35.58	10.31	45.89	46	-0.11	Peak[1]
0.87018	35.14	10.31	45.46	46	-0.54	Peak[1]
0.765698	33.99	10.35	44.33	46	-1.67	Peak[1]
0.504671	26.15	10.53	36.69	46	-9.31	Ave
0.471145	27.09	10.58	37.66	46.49	-8.83	Ave
0.512937	33.34	10.53	43.87	46	-2.13	Ave
0.918689	35.58	10.31	45.89	56	-10.11	Peak[1]
0.87018	35.14	10.31	45.46	56	-10.54	Peak[1]
0.765698	33.99	10.35	44.33	56	-11.67	Peak[1]

Note[1]: Peak emissions were measured and compared to the QP and AVE limits thus showing, worst-case compliance

7 FCC §15.35(b), §15.205, §15.209, §15.407(b) & ISEDC RSS-247 §6.2, RSS-Gen §8.9, §8.10 –Radiated Spurious Emissions

7.1 Applicable Standard

As per FCC §15.35(b): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz.

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**	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 470-806 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 §15.407 (b),

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 solely in the 5.725–5.850 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.
8) 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.
9) 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.
10) The provisions of §15.205 apply to intentional radiators operating under this section.

According to ISEDC RSS-247 §6.2.1.2, for transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

According to ISEDC RSS-247 §6.2.2.2, devices shall comply with the following:

a. All emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.; or
b. All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device, except devices installed in vehicles, shall be labelled or include in the user manual the following text "for indoor use only."

According to ISEDC RSS-247 §6.2.3.2, Emissions outside the band 5470-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, devices with bandwidth overlapping the band edge of 5725 MHz can meet the emission limit of -27 dBm/MHz e.i.r.p.at 5850 MHz instead of 5725 MHz.

According to ISEDC RSS-247 §6.2.4.3, Devices operating in the band 5725-5850 MHz shall comply with the following e.i.r.p. spectral density limits:

a. 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 Bm/MHz at 5 MHz above or below the band edges;
b. 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
c. 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
d. -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

As per ISEDC RSS-Gen §8.9,

Except where otherwise indicated in the applicable RSS, radiated emissions shall comply with the field strength limits shown in table 5 and table 6. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission.

Table 5 – General field strength limits at frequencies above 30 MHz

Frequency (MHz)	Field Strength (µV/m at 3 m)
30 – 88	100
88 – 216	150
216 – 960	200
Above 960	500

Table 6 – General field strength limits at frequencies below 30 MHz

Frequency	Field Strength (micro volts/meter)	Measurement Distance (meters)
9 – 490 kHz[Note 1]	6.37/F (F in kHz)	300
490 – 1705 kHz	63.7/F (F in kHz)	30
1.705 – 30 MHz	0.08	30

Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

As per ISEDC RSS-Gen §8.10(c),

Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6.

Table 7 – Restricted frequency bands[Note 1]

MHz	MHz	GHz
0.090 – 0.110	149.9 – 150.05	9.0 – 9.2
0.495 – 0.505	156.52475 – 156.52525	9.3 – 9.5
2.1735 – 2.1905	156.7 – 156.9	10.6 – 12.7
3.020 – 3.026	162.0125 –167.17	13.25 – 13.4
4.125 – 4.128	167.72 – 173.2	14.47 – 14.5
4.17725 – 4.17775	240 – 285	15.35 – 16.2
4.20725 – 4.20775	322 – 335.4	17.7 – 21.4
5.677 – 5.683	399.9 – 410	22.01 – 23.12
6.215 – 6.218	608 – 614	23.6 – 24.0
6.26775 – 6.26825	960 – 1427	31.2 – 31.8
6.31175 – 6.31225	1435 – 1626.5	36.43 – 36.5
8.291 – 8.294	1645.5 – 1646.5	Above 38.6
8.362 – 8.366	1660 – 1710	
8.37625 – 8.38675	1718.8 – 1722.2	
8.41425 – 8.41475	2200 – 2300	
12.29 – 12.293	2310 – 2390	
12.51975 – 12.52025	2483.5 – 2500	
12.57675 – 12.57725	2655 – 2900	
13.36 – 13.41	3260 – 3267	
16.42 – 16.423	3332 – 3339	
16.69475 – 16.69525	3345.8 – 3358	
16.80425 – 16.80475	3500 – 4400	
25.5 – 25.67	4500 – 5150	
37.5 – 38.25	5350 – 5460	
73 – 74.6	7250 – 7750	
74.8 – 75.2	8025 – 8500	
108 – 138		

Note 1: Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

7.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.10-2020. The specification used was the FCC §15.407 and ISEDC RSS-247 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.

7.3 Test Procedure

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 = 100ms
(2) Average: RBW = 1MHz / VBW = 3MHz / Sweep = Auto / Trace averaging for 100 traces

7.4 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

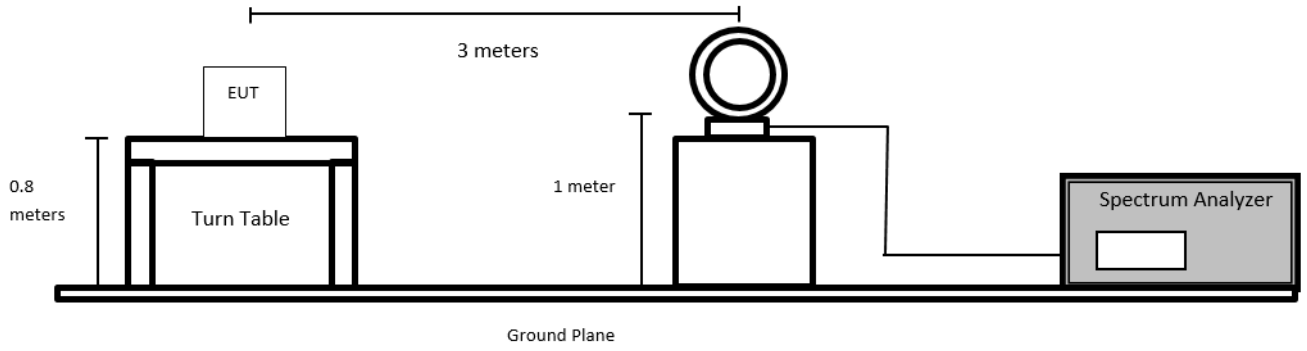
For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)

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:

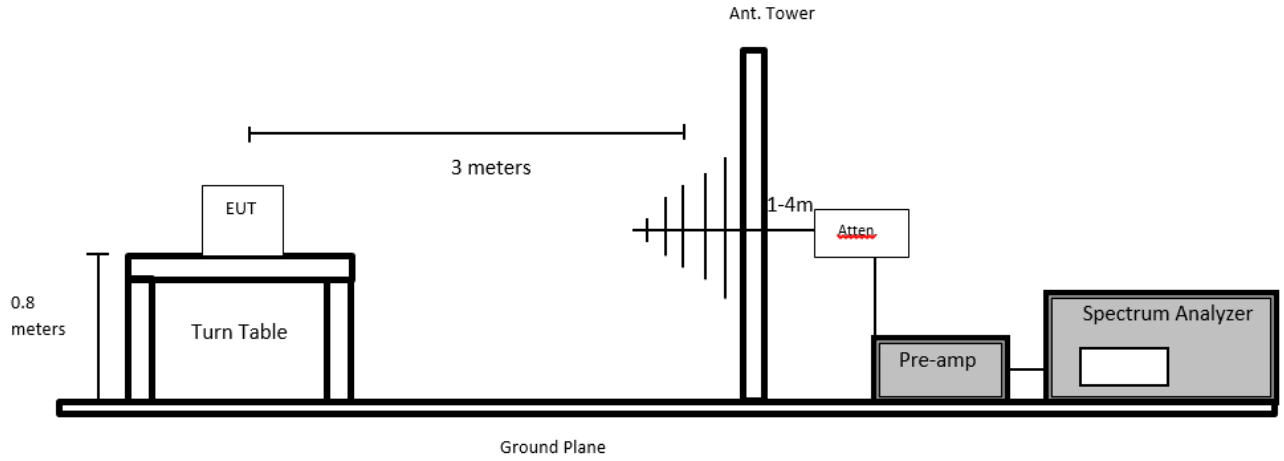
Margin = Corrected Amplitude – Limit

7.5 Test Setup Block Diagram

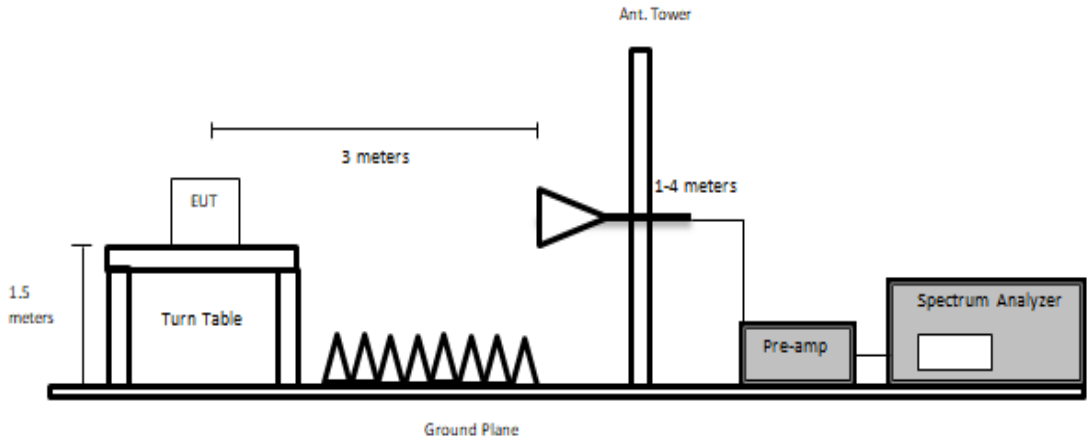
9 kHz to 30 MHz



30 MHz to 1 GHz



Above 1 GHz



7.6 Test Equipment List and Details

BACL No.	Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
327	Sunol Sciences	System Controller	SC110V	122303-1	N/R	N/R
1075	Sunol Sciences	Boresight Tower	TLT3	050119-7	N/R	N/R
1388	Sunol Sciences	Flush Mount Turntable	FM	112005-2	N/R	N/R
624	Agilent	Spectrum Analyzer	E4446A	MY48250238	2024-06-14	1 year
1427	Keysight Technologies	PXE EMI Receiver	N9048B	MY59500006	2024-12-23	1 year[1]
1432	Keysight Technologies	MXE EMI Receiver, Multi-touch	N9038B	MY60180008	2025-01-03	1 year[1]
316	Sonoma Instruments	Preamplifier 10 kHz - 2.5 GHz	317	260406	2024-08-30	6 months
321	Sunol Sciences	Biconilog Antenna	JB3	A020106-2; 1504	2023-12-18	2 years
1245	-	6dB Attenuator	PE7390-6	01182018A	2023-12-18	2 years
1246	Hewlet Packard	RF Limiter	11867A	1734	2024-04-09	1 year
1248	Pasternack	RG214 COAX Cable	PE3062	-	2024-10-01	6 months
1249	Time microwave	LMR-400 Cable Dc-3 GHz	AE13684	2k80612-5 6fts	2024-04-09	1 year
1456	Pasternack	11m LMR-400 RF Cable	PE3C0033-1100CM	NA	2025-01-27	6 months[2]
1533	Pasternack	Coaxial Cable	NA	NA	2024-12-31	6 months[2]
1192	ETS Lindgren	Horn Antenna	3117	218973	2024-10-23	2 years
1397	Mini Circuit	CBL ASSY 2.92MM PLUG TO PLUG 12"	FL086-12KM+	QN2318110-2318	2024-08-16	6 months
1449	BACL	Preamplifier	BACL1313-A100M18G	4052472	2024-08-19	6 months
90	Wisewave	Horn Antenna	ARH-4223-02	10555-01	2023-05-02	2 years
1394	Mini Circuit	CBL ASSY 2.92MM PLUG TO PLUG 12"	FL086-12KM+	QN2318110-2318	2024-08-16	6 months
1451	BACL	Preamplifier	BACL-1313-A1840	4052432	2024-08-16	6 months
92	Wisewave	Horn Antenna	ARH-2823-02	10555-01	2024-06-26	2 years
393	Com-Power	Loop Antenna, Active	AL-130	17043	2023-05-26	2 years
387	Micro-Tronics	Notch Filter	BRC50703	6	2024-03-06	1 year
389	Micro-Tronics	5.6 GHz Notch Filter	BRC 50704	3	2024-05-04	1 year
1175	Micro-Tronics	Notch Filter	BRC50705	6	2024-12-12	1 year

Note[1]: *The equipment with BACL number 1427 was used for the measuremnts in the 1 GHz to 18 GHz frequency range that were performed on 2025-01-02 (5180MHz, 5280MHz, 5240MHz, and 5300MHz). The equipment with BACL number 1432 was alternatively used for all other radiated testing.*

Note[2]: *The equipment with BACL number 1456 was used for 5GHz WiFi+BT colocation testing in the 9 kHz to 30 MH frequencyz range on 2025-01-31 and 5180MHz in the 26.5GHz to 40 GHz range on 2025-02-14. The equipment with BACL number 1533 was alternatively used for all other radiated 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".*

7.7 Test Environmental Conditions

Temperature:	20 – 22.5°C
Relative Humidity:	55%
ATM Pressure:	101.85 kPa

The testing was performed by Arturo Reyes and Michael Papa on 2025-01-02 and from 2025-01-13 to 2025-01-17 and on 2025-01-31 and 2025-02-14 in 5m chamber 3.

7.8 Summary of Test Results

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

Worst Case – Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Configuration**
-0.02	1871.25	Horizontal	802.11n/ac20: 5825 MHz

Please refer to the tables and plots in the next section for detailed test results.

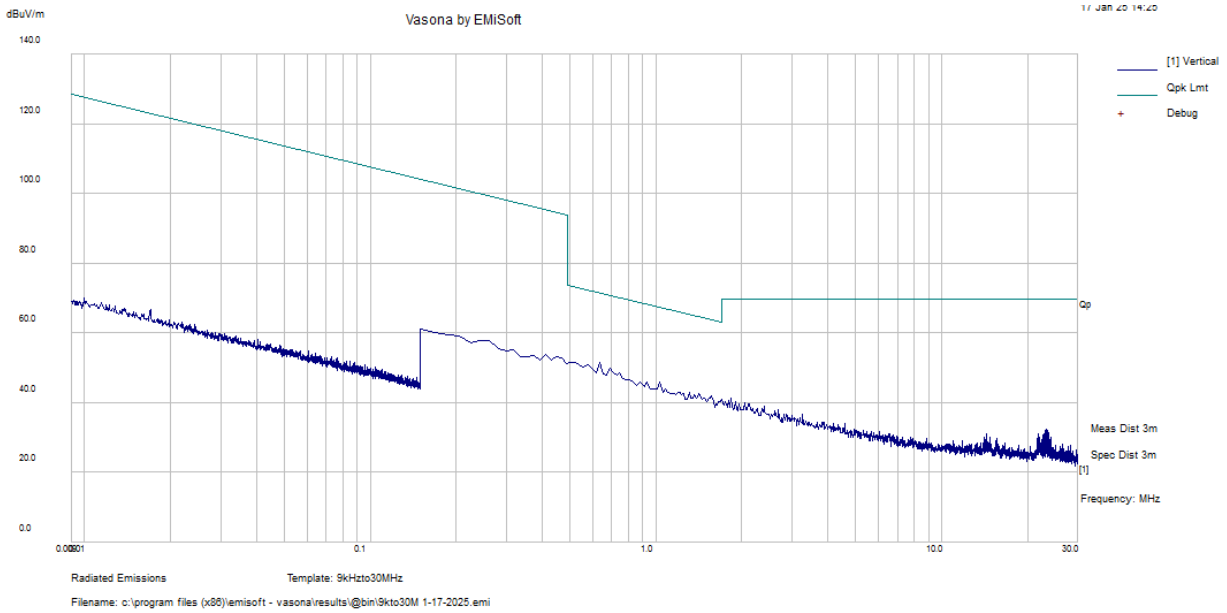
7.9 Radiated Emissions Test Result Data

Note: *Below test data are the radiated measurements. For conducted band edge measurements at the antenna port please refer to* ANNEX *D.*
Note: *Pre-scan was performed in order to determine worst-case orientation of device with respect to measurement antenna in the X/Y/Z axis. Plots/data shown represent measurements made in worst-case orientation.*
Note: *worst-case performed on worst configs per modulation family.*

1) 9kHz to 30MHz, Measured at 3 meters

Note: 802.11n/ac at 5300 MHz is the worst case configuration and is used to show compliance for 9 kHz to 30MHz.

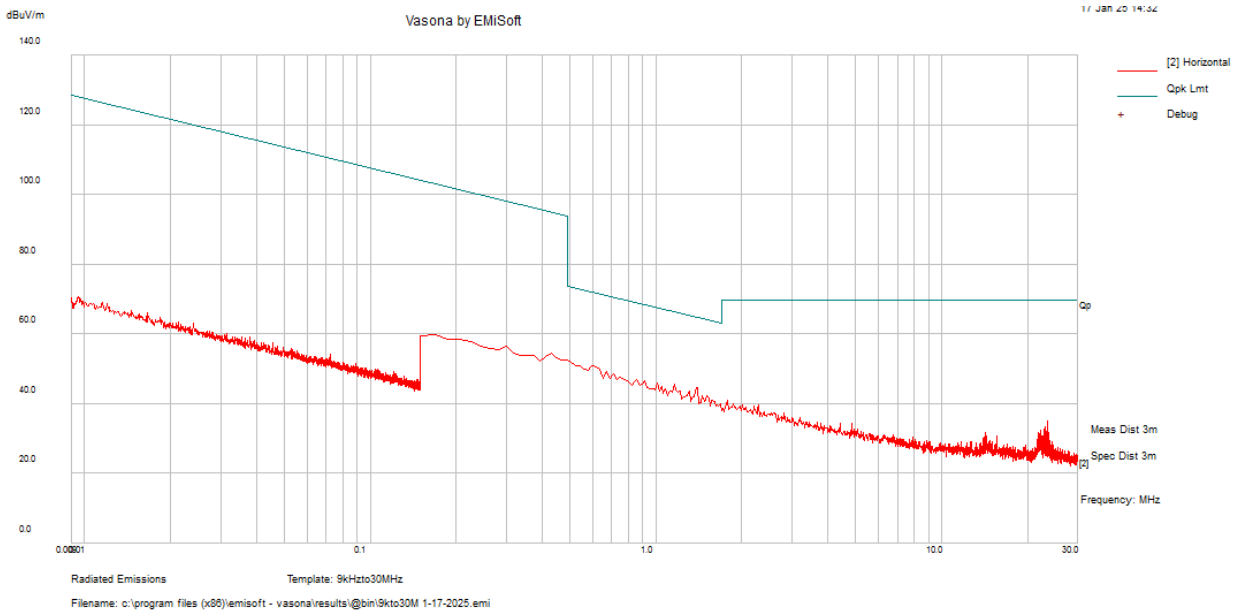
802.11n/ac20: 5300 MHz, Parallel



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
23.711	18.71	9.09	27.8	69.54	-41.74	Peak

Note: Peak emissions are compared to QP limits to show worst-case compliance.

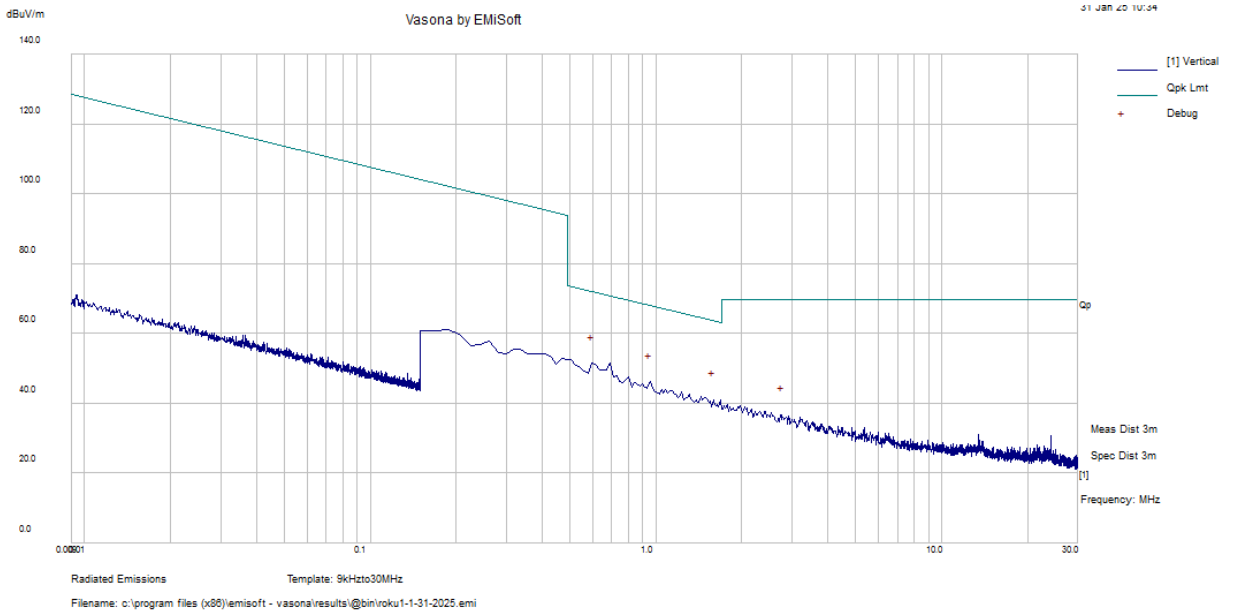
802.11 n/ac20: 5300 MHz, Perpendicular



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
23.52	21.25	9.05	30.3	69.54	-39.24	Peak

Note: Peak emissions are compared to QP limits to show worst-case compliance.

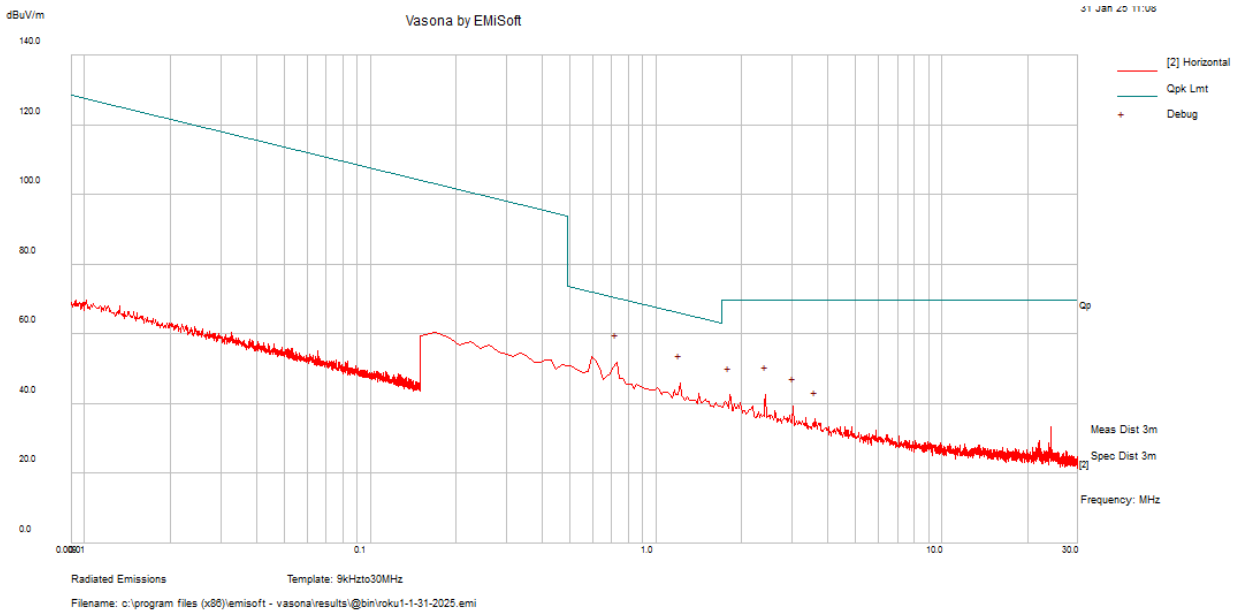
5 GHz WI-FI + BT, Parallel



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
0.59775	41.21	10.17	51.38	72.08	-20.7	Peak
0.952219	36.04	10.06	46.1	68.03	-21.93	Peak
1.586531	30.8	10.24	41.04	63.6	-22.55	Peak
2.761875	26.21	10.39	36.6	69.54	-32.94	Peak

Note: Peak emissions are compared to QP limits to show worst-case compliance.

5 GHz WI-FI + BT, Perpendicular

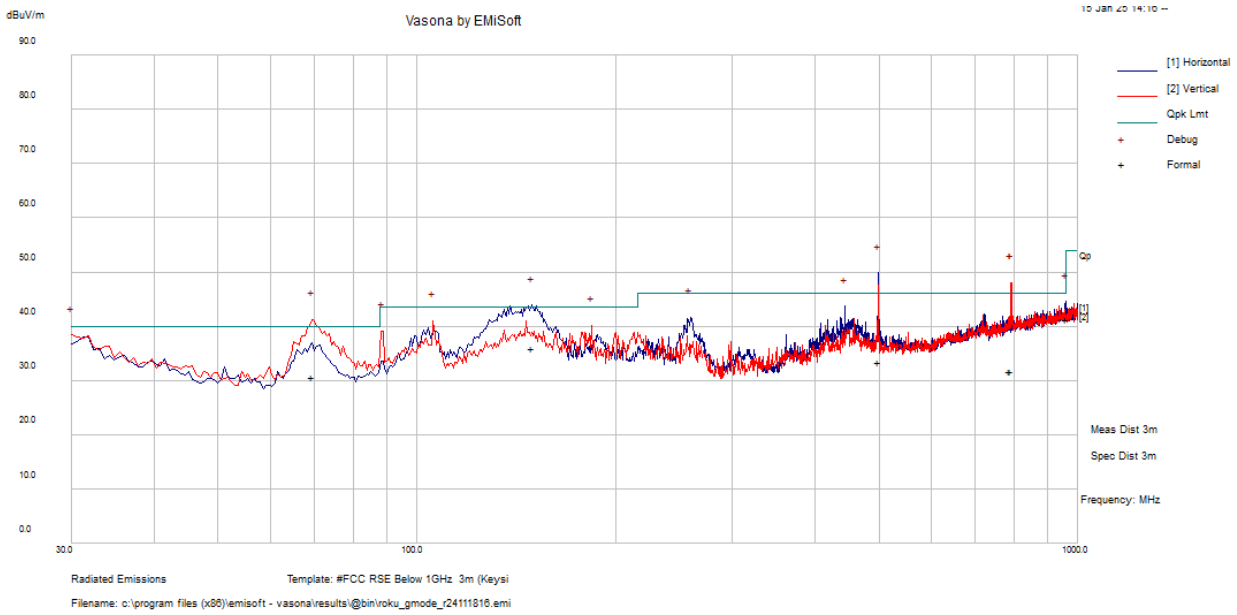


Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
0.728344	41.69	10.13	51.82	70.36	-18.54	Peak
1.213406	35.83	10.14	45.97	65.92	-19.96	Peak
2.426063	32.2	10.37	42.57	69.54	-26.97	Peak
1.810406	32.19	10.3	42.49	69.54	-27.05	Peak
3.023063	28.99	10.41	39.4	69.54	-30.14	Peak
3.620063	25.18	10.38	35.56	69.54	-33.99	Peak

Note: Peak emissions are compared to QP limits to show worst-case compliance.

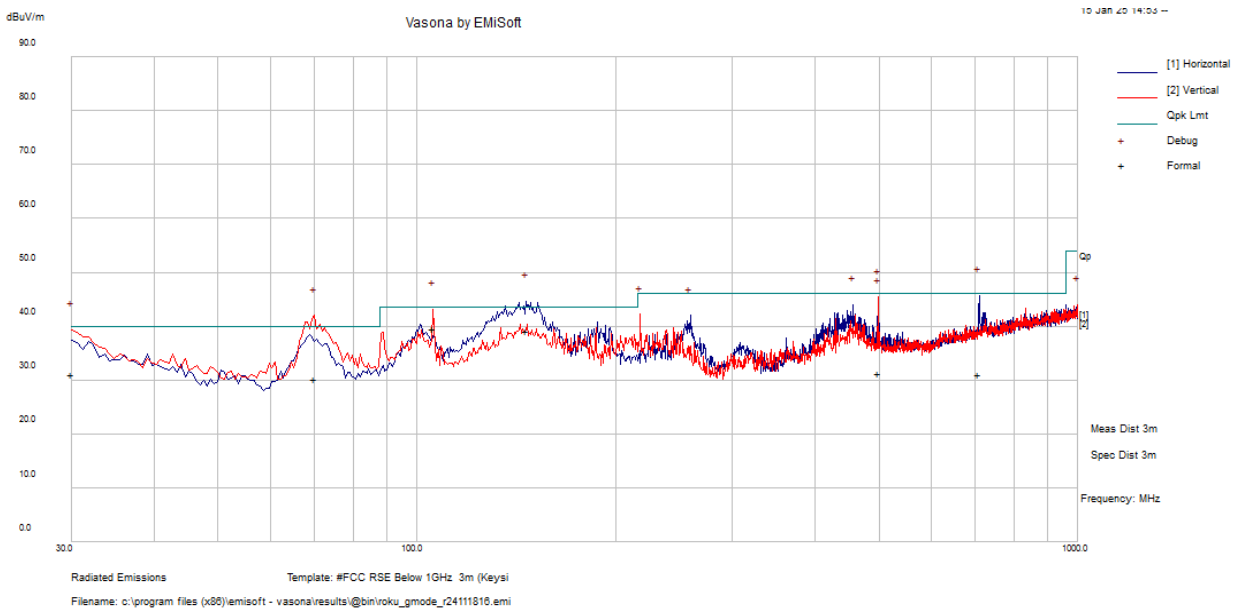
2) 30 MHz – 1 GHz, Measured at 3 meters

U-NII-1, 802.11 n/ac20: 5180 MHz



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)	Detector
499.1969	34.57	-1.14	33.43	100	H	197	46	-12.57	QP
790.7678	28.43	3.2	31.63	198	V	199	46	-14.37	QP
793.2956	28.36	3.27	31.63	149	V	29	46	-14.37	QP
69.58625	43.65	-12.99	30.66	249	V	251	40	-9.34	QP
149.5019	43.82	-7.94	35.88	247	H	342	43.5	-7.62	QP
959.995	36	5.26	41.26	152	H	159	46	-4.74	QP

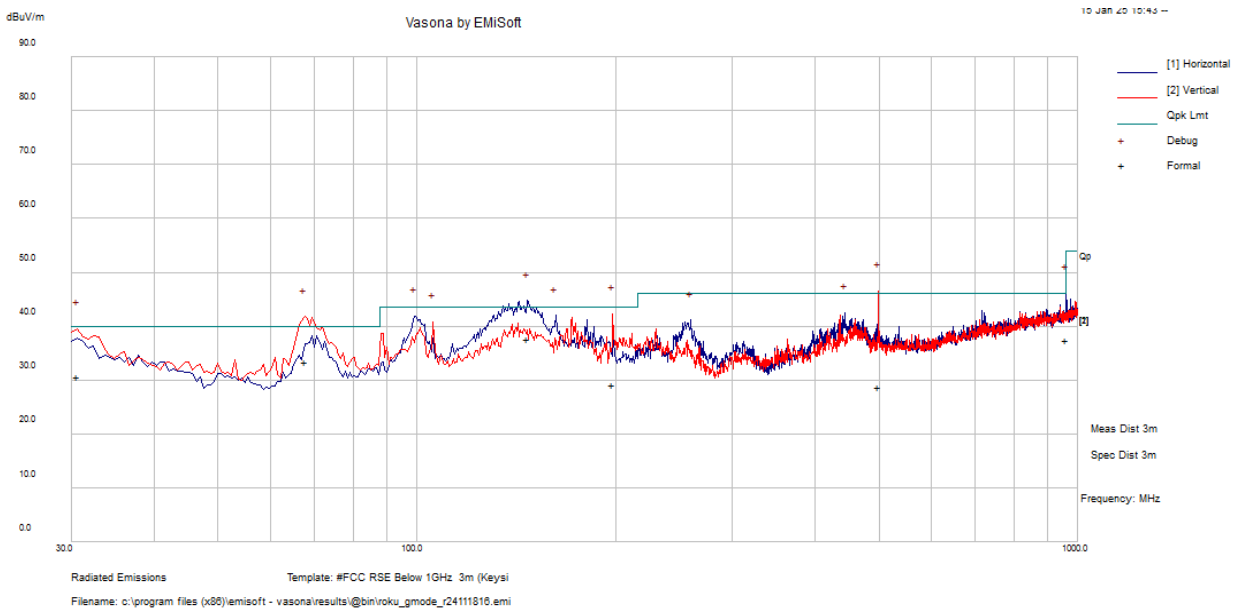
U-NII-1, 802.11 n/ac20: 5200 MHz



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)	Detector
70.12656	43.13	-12.98	30.15	224	V	92	40	-9.86	QP
146.6334	47.1	-7.87	39.23	202	H	107	43.5	-4.27	QP
709.57	28.59	2.42	31.01	285	H	190	46	-14.99	QP
105.7334	48.19	-8.59	39.60	201	V	7	43.5	-3.90	QP
30	31.71	-0.71	31.00	268	V	230	40	-9.00	QP
498.8056	32.49	-1.14	31.35	121	V	138	46	-14.65	QP

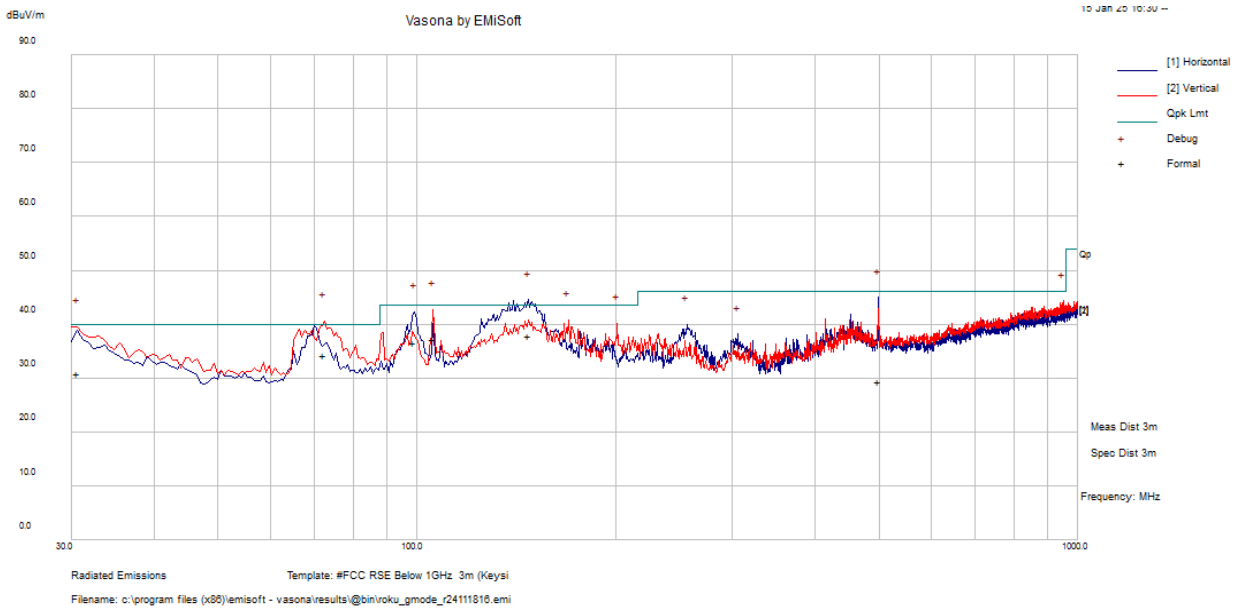
Note: Peak measurement was compared to the quasi-peak limit to show compliance.

U-NII-1, 802.11 n/ac20: 5240 MHz



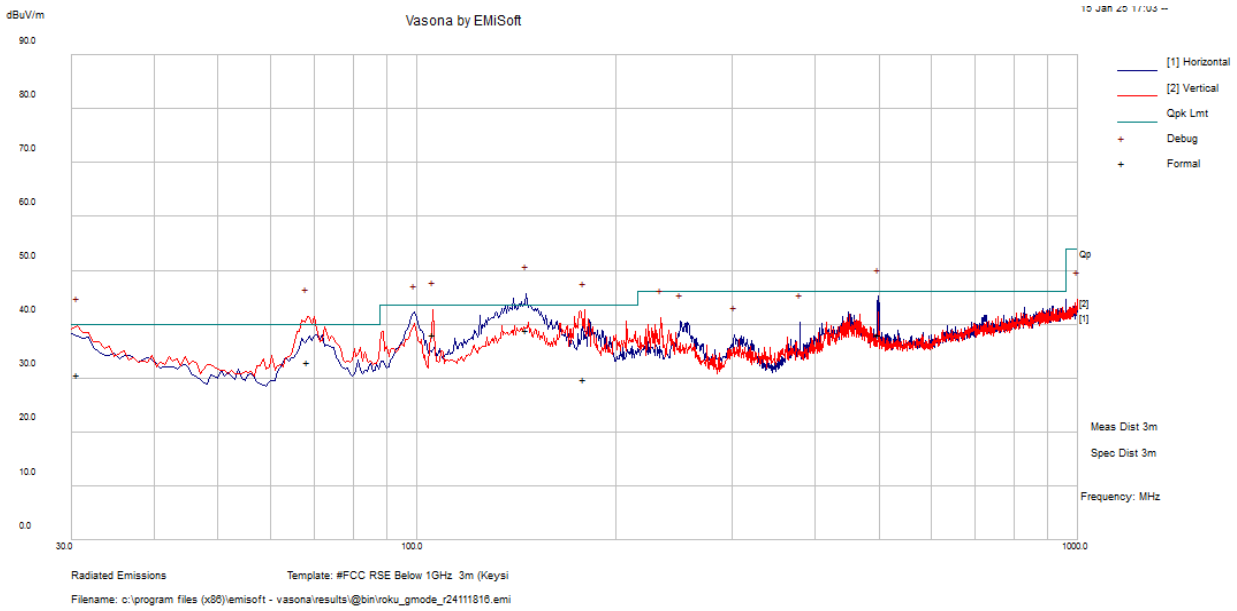
Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector
67.73906	46.5	-13.06	33.44	261	V	117	40	-6.56	QP
146.9125	45.45	-7.87	37.58	297	H	123	43.5	-5.92	QP
499.0938	29.94	-1.14	28.8	175	V	79	46	-17.2	QP
959.9972	32.15	5.26	37.41	239	H	136	46	-8.59	QP
30.625	31.92	-1.2	30.72	289	V	174	40	-9.28	QP
198.0141	36.9	-7.79	29.11	170	V	239	43.5	-14.4	QP

U-NII-2A, 802.11 n/ac20: 5260 MHz



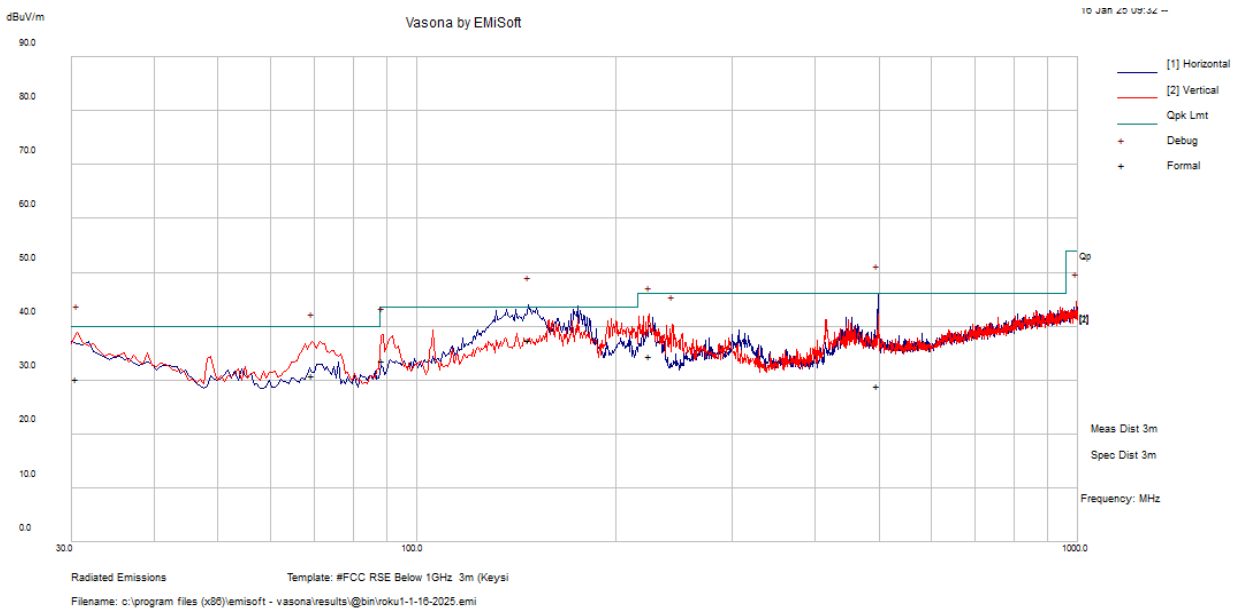
Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector
147.5956	45.68	-7.89	37.79	184	H	112	43.5	-5.71	QP
72.34219	47.31	-13	34.31	298	V	221	40	-5.69	QP
30.66406	32.05	-1.23	30.82	239	V	80	40	-9.18	QP
105.7516	45.74	-8.59	37.15	201	V	337	43.5	-6.35	QP
498.8622	30.47	-1.14	29.33	209	H	80	46	-16.67	QP
98.96219	46.85	-10.25	36.6	165	H	134	43.5	-6.9	QP

U-NII-2A, 802.11 n/ac20: 5300 MHz



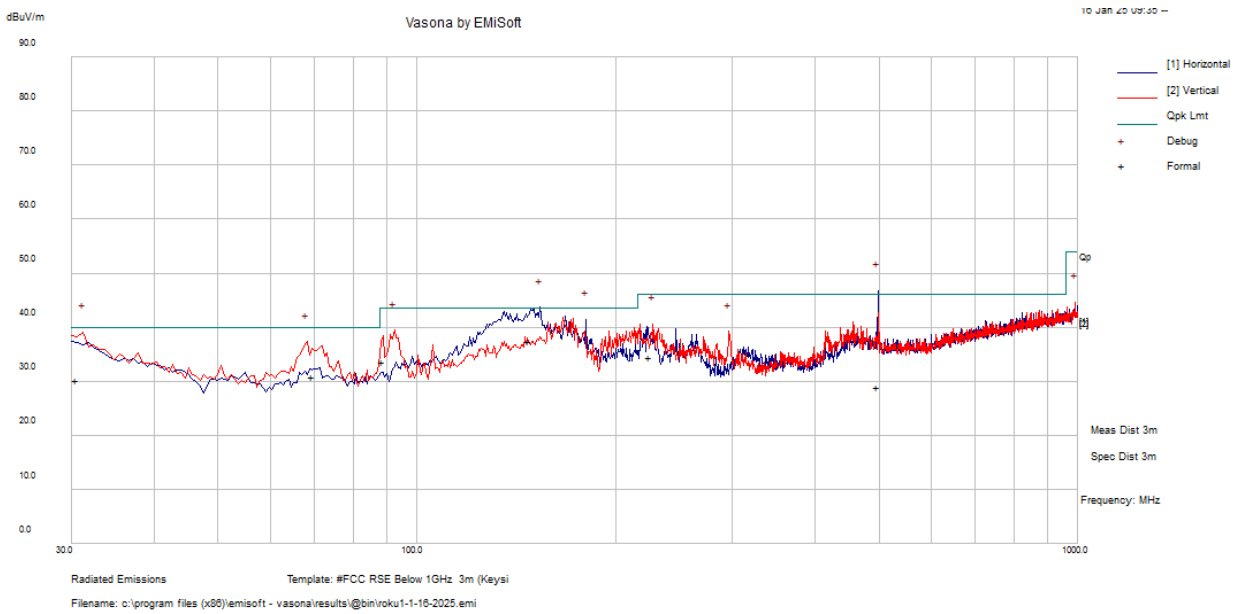
Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector
146.2444	46.76	-7.85	38.91	235	H	303	43.5	-4.59	QP
68.31594	45.92	-13.03	32.89	280	V	149	40	-7.11	QP
30.62	31.8	-1.2	30.6	240	V	269	40	-9.41	QP
105.7453	46.73	-8.6	38.13	207	V	21	43.5	-5.37	QP
499.2628	39.28	-1.14	38.14	101	H	174	46	-7.86	QP
179.2413	39.06	-9.19	29.87	201	V	146	43.5	-13.63	QP

U-NII-2A, 802.11 n/ac20: 5320 MHz



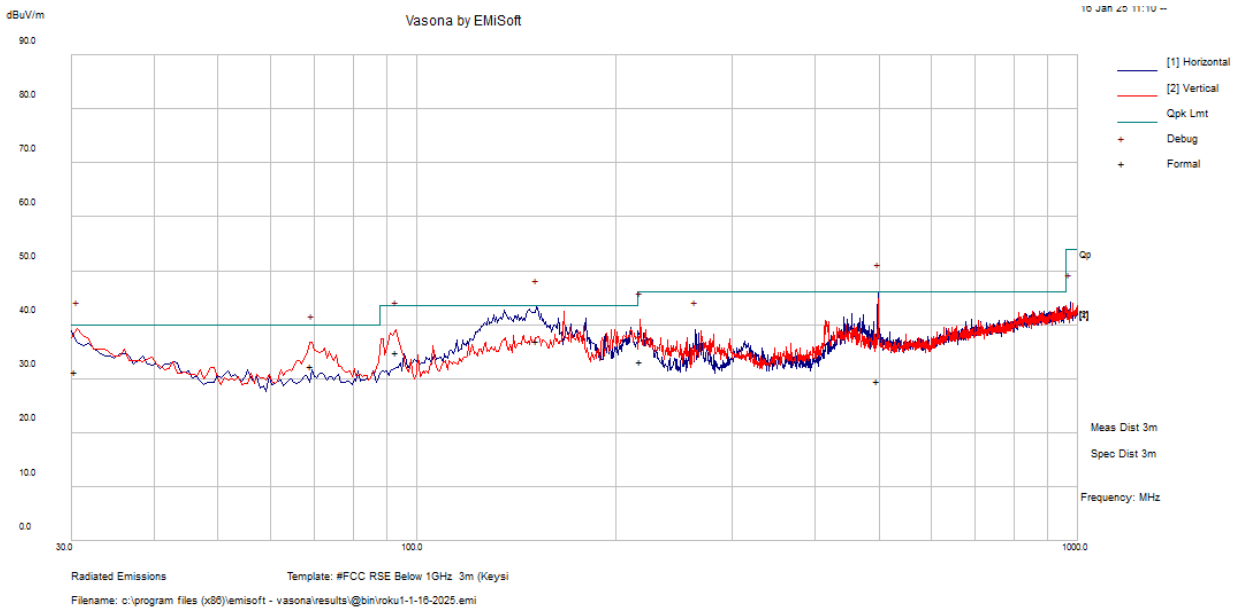
Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector
147.7641	45.29	-7.88	37.41	193	H	305	43.5	-6.09	QP
497.9828	30.03	-1.15	28.88	150	H	95	46	-17.12	QP
30.53906	31.25	-1.14	30.11	224	V	233	40	-9.89	QP
69.46531	43.79	-12.99	30.8	237	V	149	40	-9.2	QP
224.8538	43.8	-9.42	34.38	125	V	109	46	-11.62	QP
88.56875	46.94	-13.27	33.67	227	V	259	43.5	-9.83	QP

U-NII-2C, 802.11 n/ac20: 5500 MHz



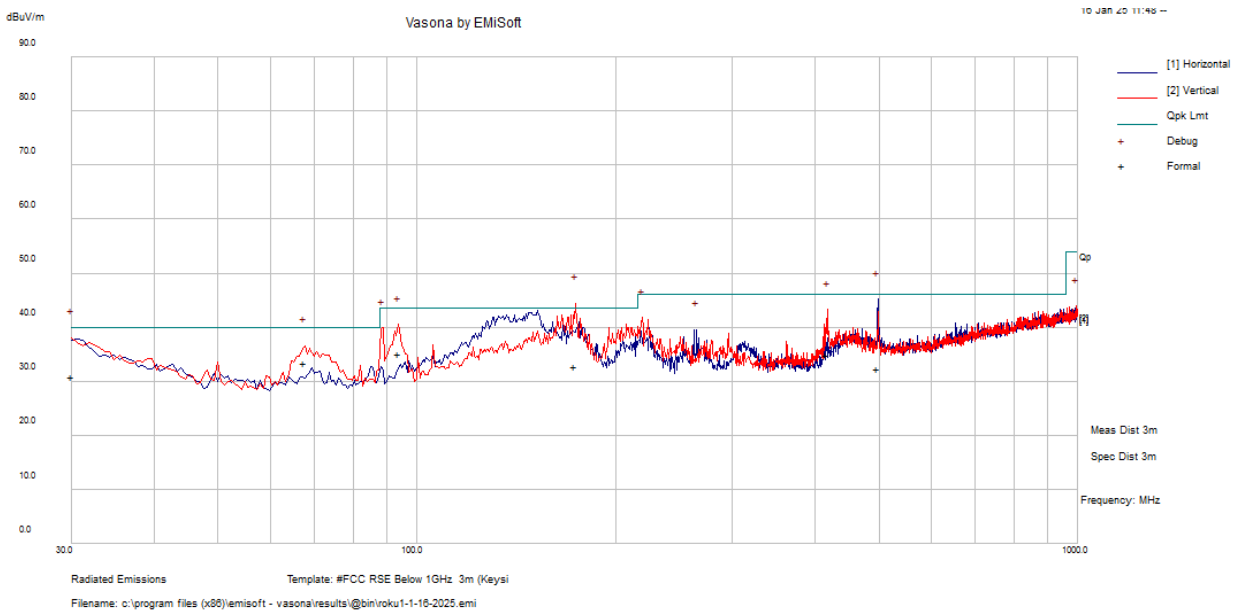
Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector
68.27875	42.5	-13.03	29.47	120	V	191	40	-10.53	QP
92.19969	46.07	-12.23	33.84	149	V	28	43.5	-9.66	QP
498.2003	30.67	-1.14	29.53	206	H	131	46	-16.47	QP
153.5241	44.92	-8.09	36.83	186	H	47	43.5	-6.67	QP
31.14688	31.89	-1.61	30.28	131	V	242	40	-9.72	QP
180.5856	42.14	-9.21	32.93	152	H	173	43.5	-10.57	QP

U-NII-2C, 802.11 n/ac20: 5600 MHz



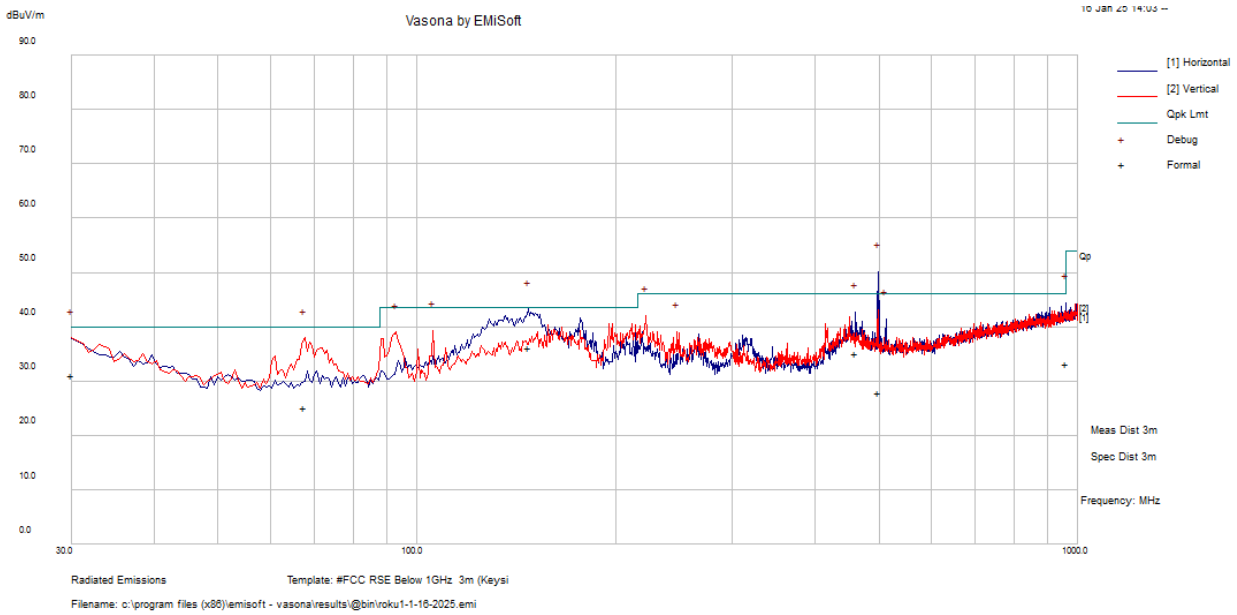
Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector
498.4253	30.76	-1.14	29.62	266	H	115	46	-16.38	QP
151.9719	45.08	-8.04	37.04	174	H	208	43.5	-6.46	QP
30.42813	32.29	-1.05	31.24	159	V	27	40	-8.76	QP
69.21438	45.22	-12.99	32.23	131	V	232	40	-7.77	QP
92.99	46.76	-11.98	34.78	135	V	47	43.5	-8.72	QP
217.9516	42.86	-9.64	33.22	103	V	158	46	-12.78	QP

U-NII-2C, 802.11 n/ac20: 5720 MHz



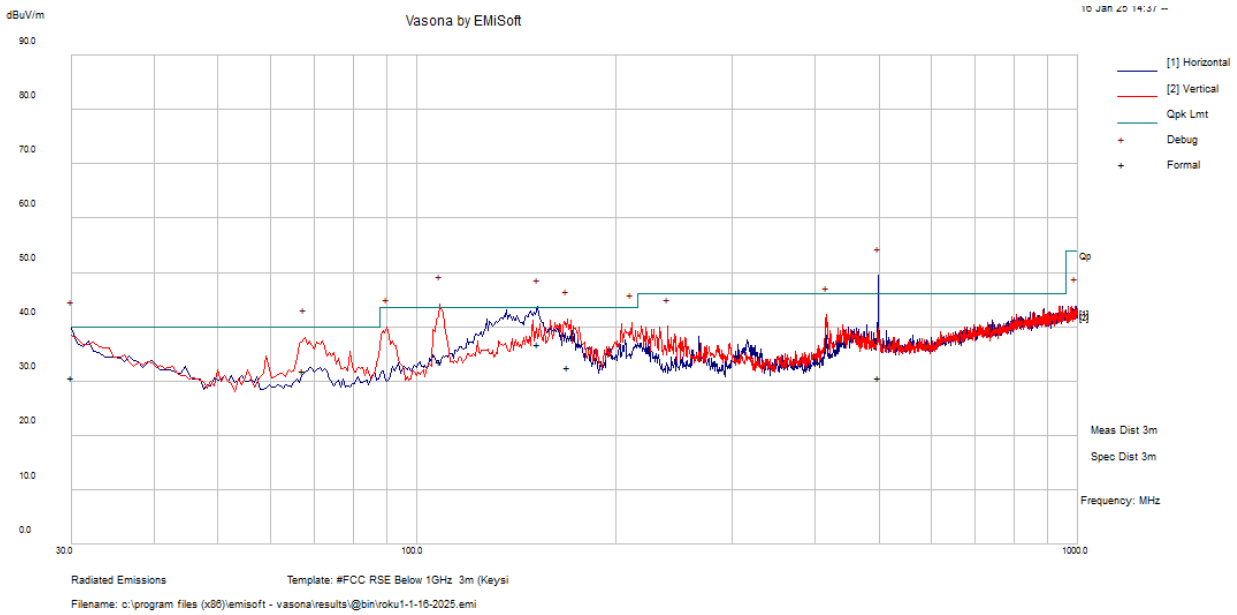
Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector
173.6488	41.68	-8.93	32.75	226	V	27	43.5	-10.75	QP
497.9125	33.39	-1.14	32.25	142	H	204	46	-13.75	QP
30.01609	31.53	-0.73	30.8	270	V	7	40	-9.2	QP
417.7703	38.16	-3.17	34.99	110	V	201	46	-11.01	QP
93.77969	46.8	-11.74	35.06	143	V	29	43.5	-8.44	QP
67.54031	46.54	-13.07	33.47	101	V	194	40	-6.53	QP

U-NII-3, 802.11 n/ac20: 5745 MHz



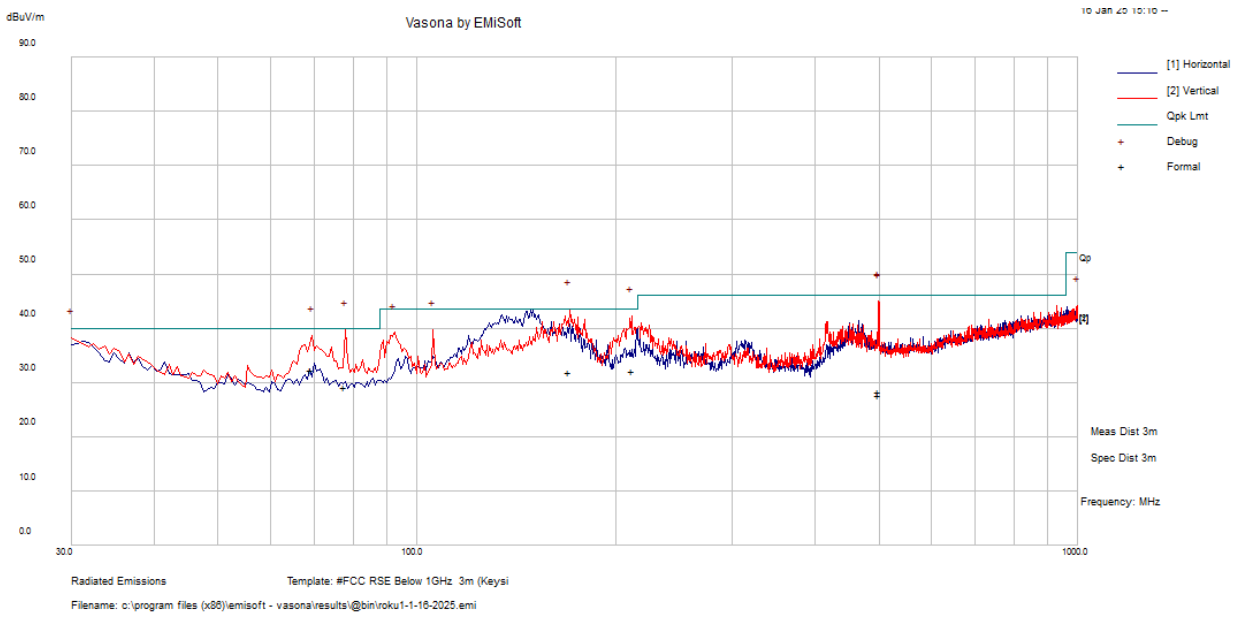
Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector
499.6825	29.04	-1.13	27.91	282	H	181	46	-18.1	QP
147.595	44.13	-7.88	36.25	253	H	209	43.5	-7.26	QP
959.8253	27.95	5.25	33.2	302	H	135	46	-12.8	QP
30.00045	31.84	-0.71	31.13	294	V	51	40	-8.87	QP
67.58906	38.23	-13.07	25.16	240	V	216	40	-14.84	QP
460.965	36.93	-1.73	35.2	105	H	199	46	-10.8	QP

U-NII-3, 802.11 n/ac20: 5785 MHz



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)	Detector
499.1206	31.7	-1.14	30.56	238	H	141	46	-15.44	QP
108.2088	41.69	-8.16	33.53	197	V	183	43.5	-9.97	QP
152.3184	44.78	-8.05	36.73	200	H	207	43.5	-6.77	QP
30.00299	31.44	-0.71	30.73	223	H	145	40	-9.27	QP
67.38594	44.93	-13.08	31.85	152	V	232	40	-8.15	QP
168.8659	41.25	-8.63	32.62	150	V	123	43.5	-10.88	QP

U-NII-3, 802.11 n/ac20: 5825 MHz



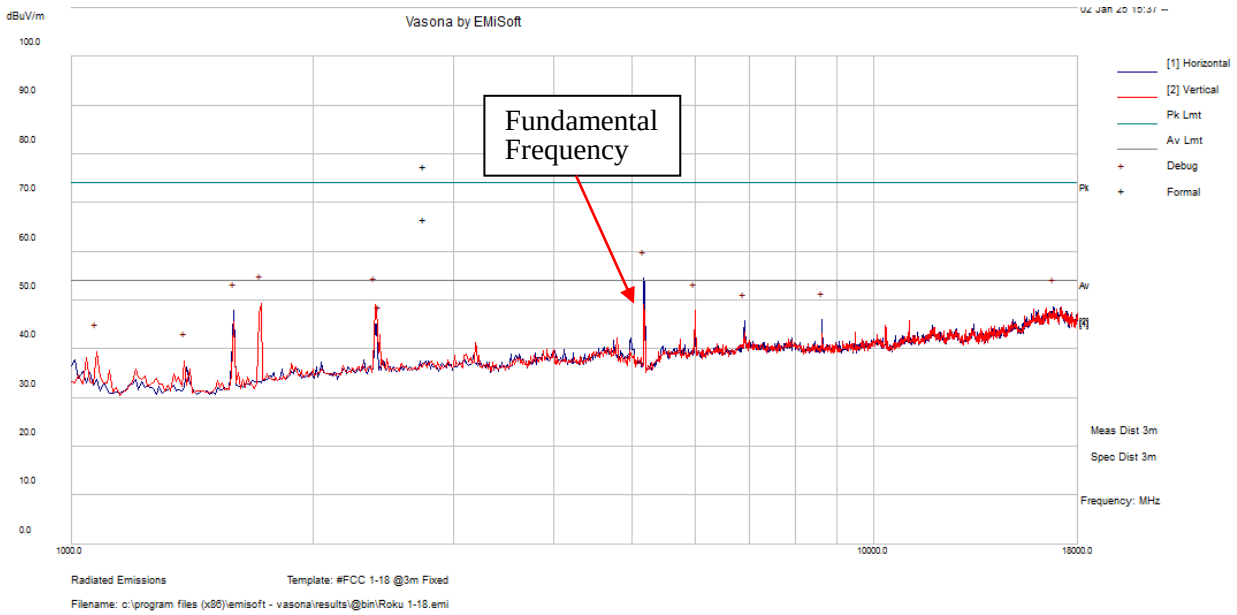
Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector
170.1531	40.69	-8.70	31.99	159	V	152	43.5	-11.51	QP
77.84531	42.87	-13.72	29.15	125	V	202	40	-10.85	QP
498.7469	29.44	-1.13	28.31	291	V	342	46	-17.7	QP
500.3809	28.87	-1.12	27.75	112	V	196	46	-18.25	QP
211.4603	41.98	-9.82	32.16	125	V	102	43.5	-11.34	QP
69.20813	45.27	-12.99	32.28	273	V	209	40	-7.73	QP

FCC/IC Limits for 1 GHz to 40 GHz			
Applicability	**(dBm)**	**(uV/m at 3meters)**	**(dBuV/m at 3meters)**
Restricted Band Average Limit	-	500	54
Restricted Band Peak Limit[1]	-	-	74
FCC §15.407(b)/ ISEDC RSS-247 §6.2 Defined Unwanted Emissions Limit[3]	-27	-	68.2

Note 1: Restricted Band Peak Limit is defined to be 20dB higher than Average Limit.
Note 2: Where Restricted Band Peak Limit is replaced with the stricter 78 dBµV/m limit at 1 meter, compliance is being shown for unwanted emissions per FCC §15.407(b)/ISEDC RSS-247 §6.2.

3) 1 GHz – 18 GHz, Measured at 3 meters

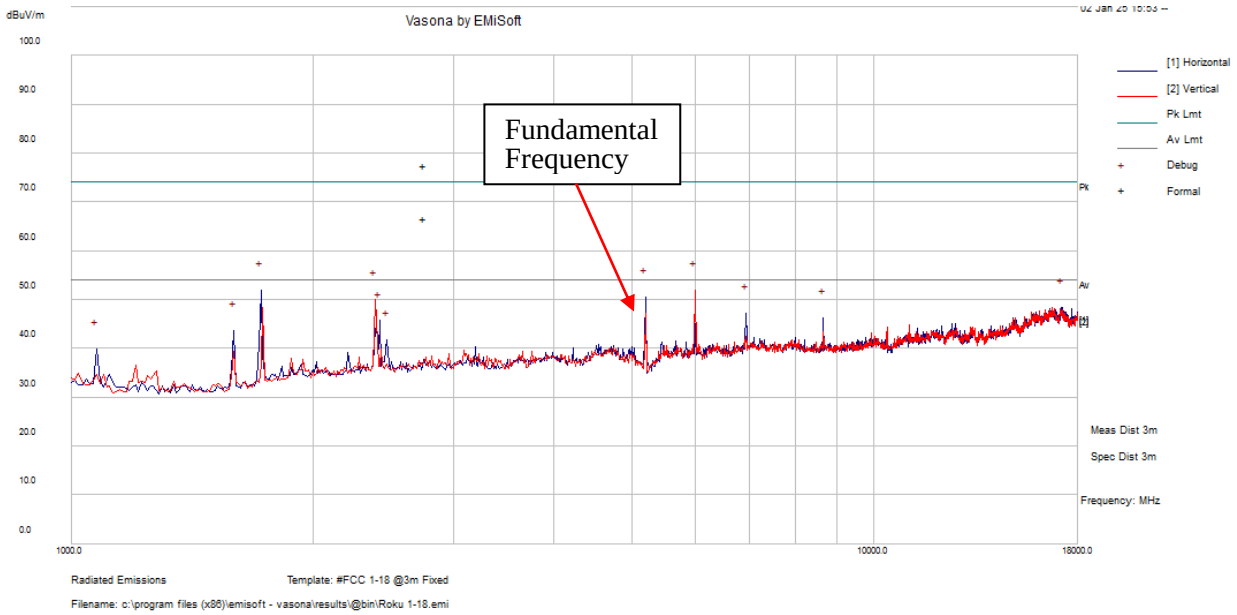
U-NII-1, 802.11 n/ac20: 5180 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
1722.5	57.24	-7.86	49.38	V	54	-4.62	Peak
2391.875	53.6	-4.57	49.03	V	54	-4.97	Peak
16788.75	32.98	15.59	48.57	H	54	-5.44	Peak
5993.75	47.51	0.3	47.81	V	54	-6.2	Peak
1595	57.13	-9.33	47.8	H	54	-6.2	Peak
8628.75	42.1	3.86	45.96	H	54	-8.04	Peak

Note: Peak measurement was compared to the average limit to show compliance.

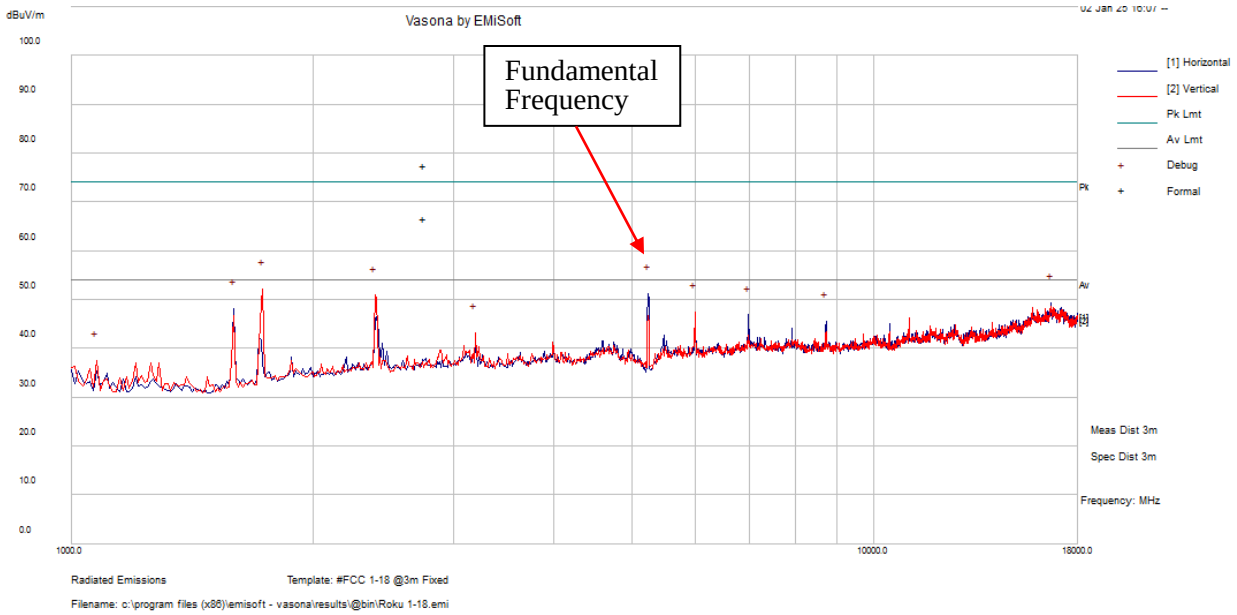
U-NII-1, 802.11 n/ac20: 5200 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
1722.5	59.8	-7.86	51.94	H	54	-2.06	Peak
5993.75	51.63	0.29	51.92	V	54	-2.08	Peak
2391.875	54.58	-4.58	50	V	54	-4.00	Peak
17160.63	33.42	15.05	48.47	H	54	-5.53	Peak
6939.375	44.98	2.2	47.18	H	54	-6.82	Peak
8660.625	42.47	3.87	46.34	H	54	-7.66	Peak

Note: Peak measurement was compared to the average limit to show compliance.

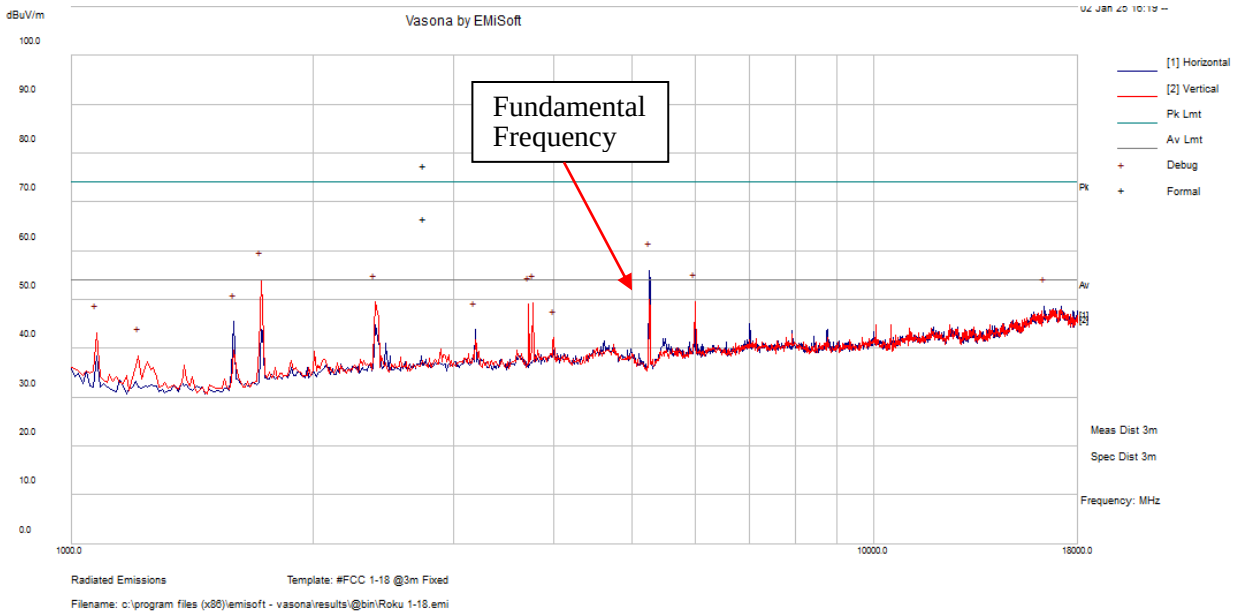
U-NII-1, 802.11 n/ac20: 5240 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
1733.125	59.86	-7.72	52.14	V	54	-1.86	Peak
2391.875	55.47	-4.57	50.9	V	54	-3.11	Peak
16661.25	33.76	15.64	49.4	H	54	-4.6	Peak
1595	57.43	-9.33	48.1	H	54	-5.91	Peak
5993.75	47.22	0.29	47.51	V	54	-6.49	Peak
6992.5	44.36	2.5	46.86	H	54	-7.14	Peak

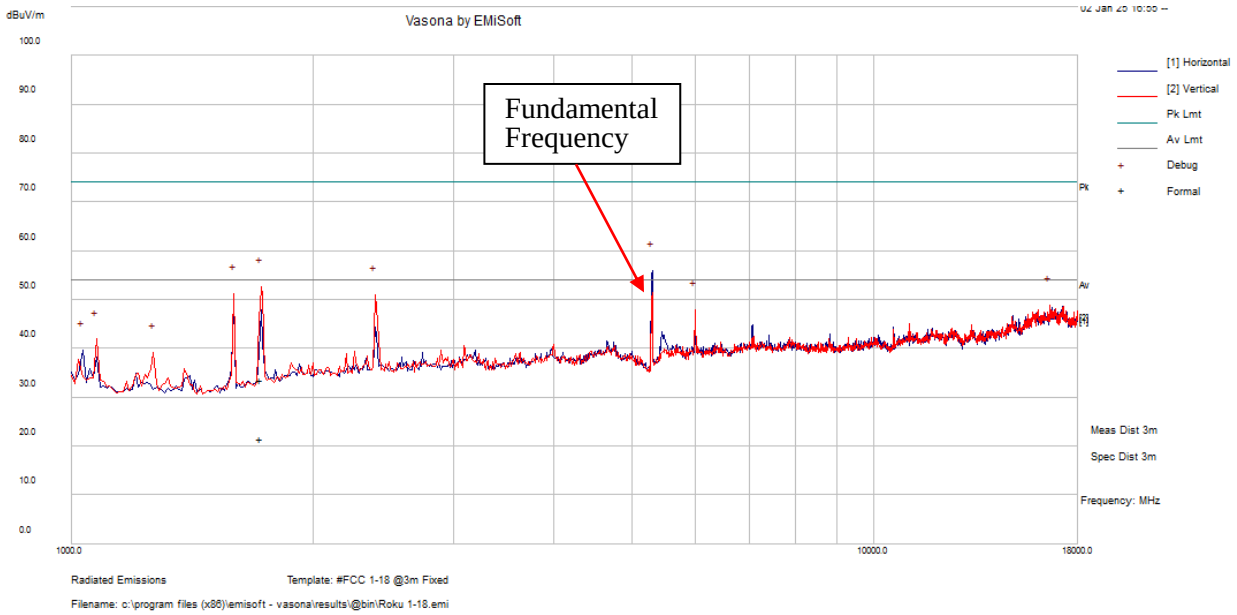
Note: Peak measurement was compared to the average limit to show compliance.

U-NII-2A, 802.11 n/ac20: 5260 MHz



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)	Detector
1721.205	41.4	-7.89	33.51	141	V	142	74	-40.49	Peak
1721.205	29.39	-7.89	21.5	141	V	142	54	-32.5	Avg

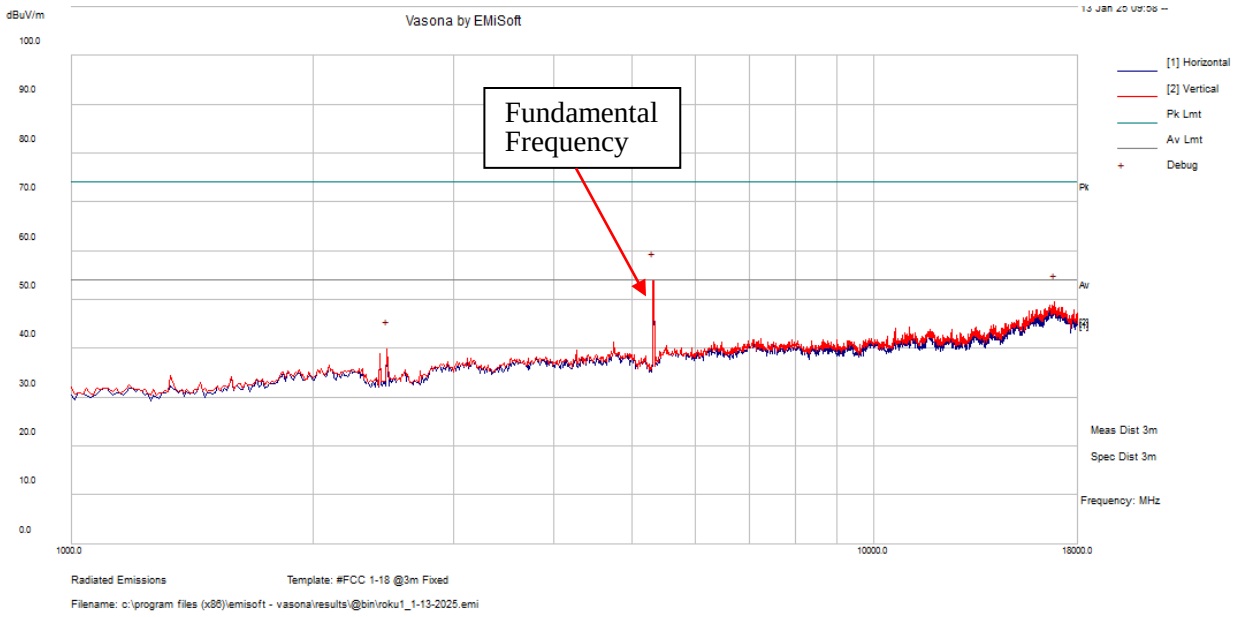
U-NII-2A, 802.11 n/ac20: 5300 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
1722.5	60.54	-7.87	52.67	V	54	-1.33	Peak
1595	60.55	-9.33	51.22	V	54	-2.78	Peak
2391.875	55.57	-4.57	51	V	54	-3.01	Peak
16597.5	33.14	15.74	48.88	V	54	-5.12	Peak
5993.75	47.65	0.29	47.94	V	54	-6.06	Peak
1074.375	52.67	-10.72	41.95	V	54	-12.06	Peak

Note: Peak measurement was compared to the average limit to show compliance.

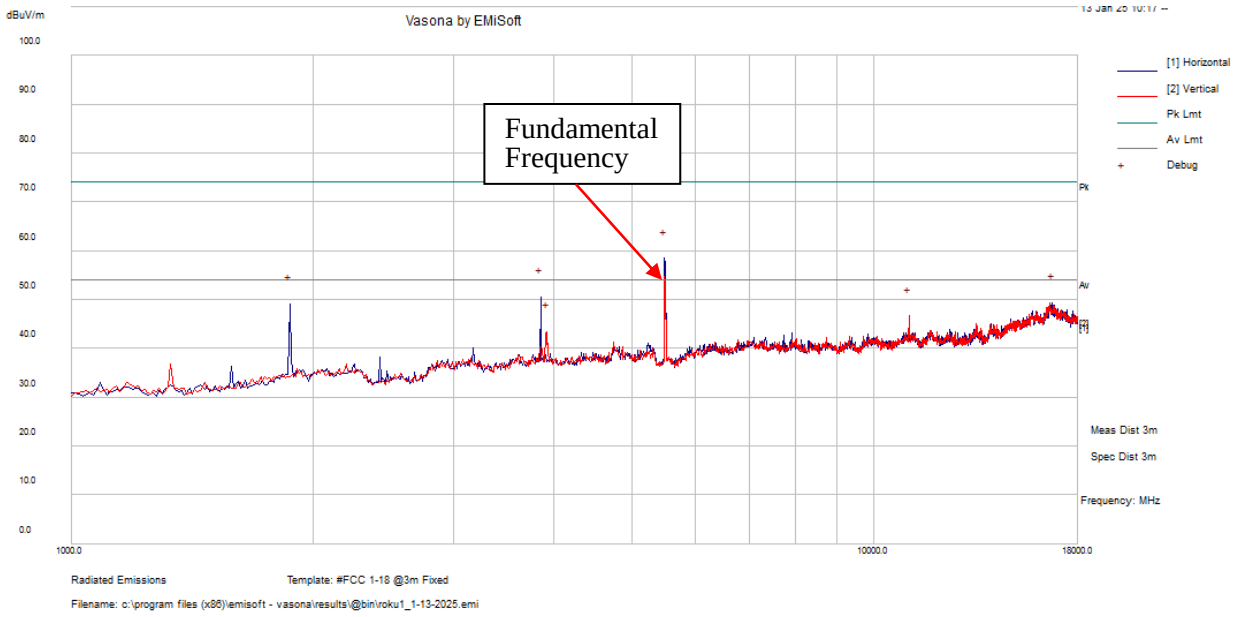
U-NII-2A, 802.11 n/ac20: 5320 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
16852.5	33.87	15.56	49.43	V	54	-4.57	Peak
2476.875	44.15	-4.29	39.86	V	54	-14.14	Peak

Note: Peak measurement was compared to the average limit to show compliance.

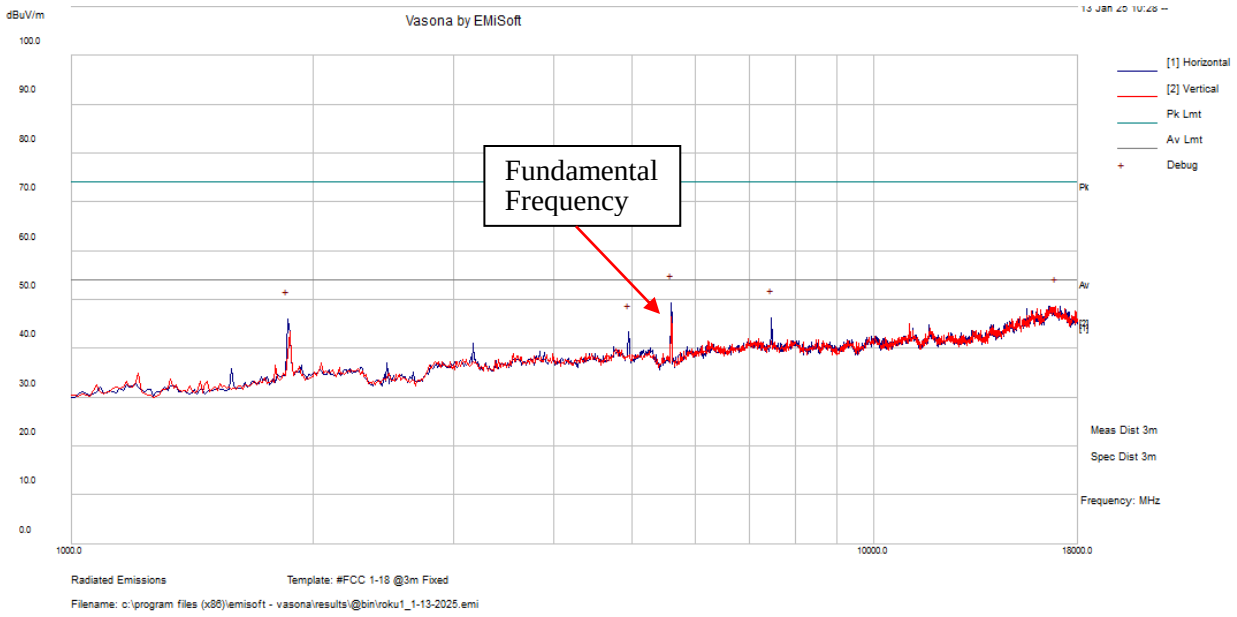
U-NII-2C, 802.11 n/ac20: 5500 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
3847.5	52.4	-1.84	50.56	H	54	-3.44	Peak
16735.63	33.81	15.56	49.37	H	54	-4.63	Peak
1871.25	55.22	-6.18	49.04	H	54	-4.96	Peak
11083.13	38.77	7.85	46.62	V	54	-7.38	Peak
3921.875	45.38	-1.89	43.49	V	54	-10.51	Peak

Note: Peak measurement was compared to the average limit to show compliance.

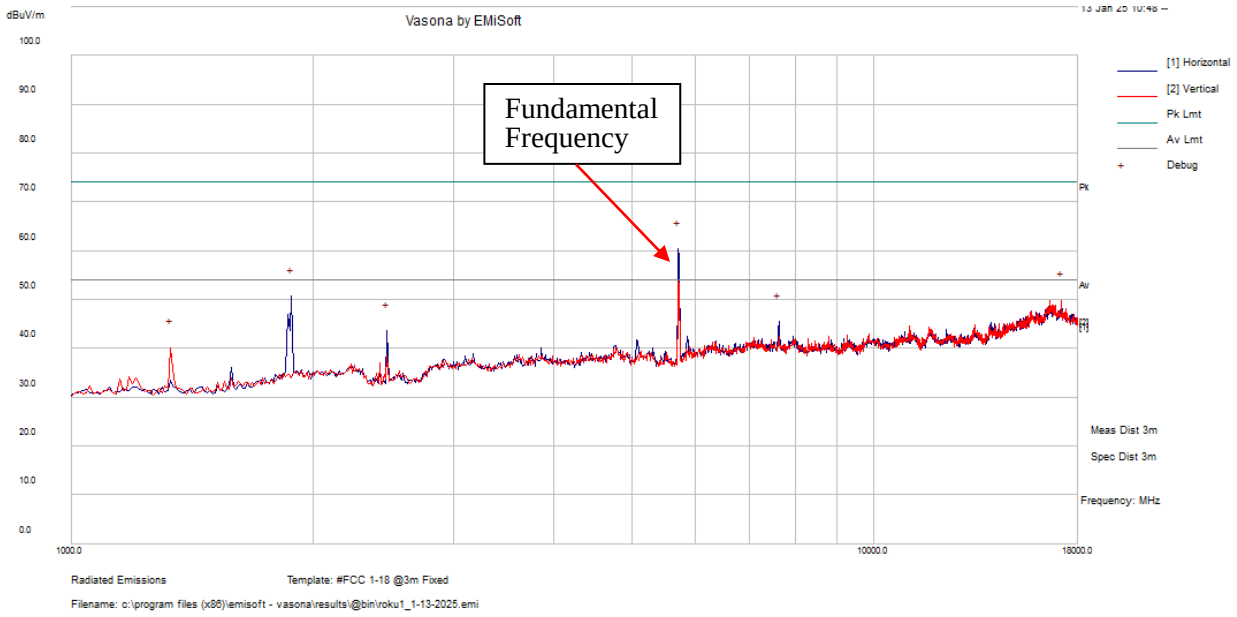
U-NII-2C, 802.11 n/ac20: 5600 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
16895	33.2	15.46	48.66	H	54	-5.34	Peak
7470.625	43.73	2.53	46.26	H	54	-7.74	Peak
1860.625	52.34	-6.28	46.06	H	54	-7.94	Peak
4952.5	44.42	-1.09	43.33	H	54	-10.67	Peak

Note: Peak measurement was compared to the average limit to show compliance.

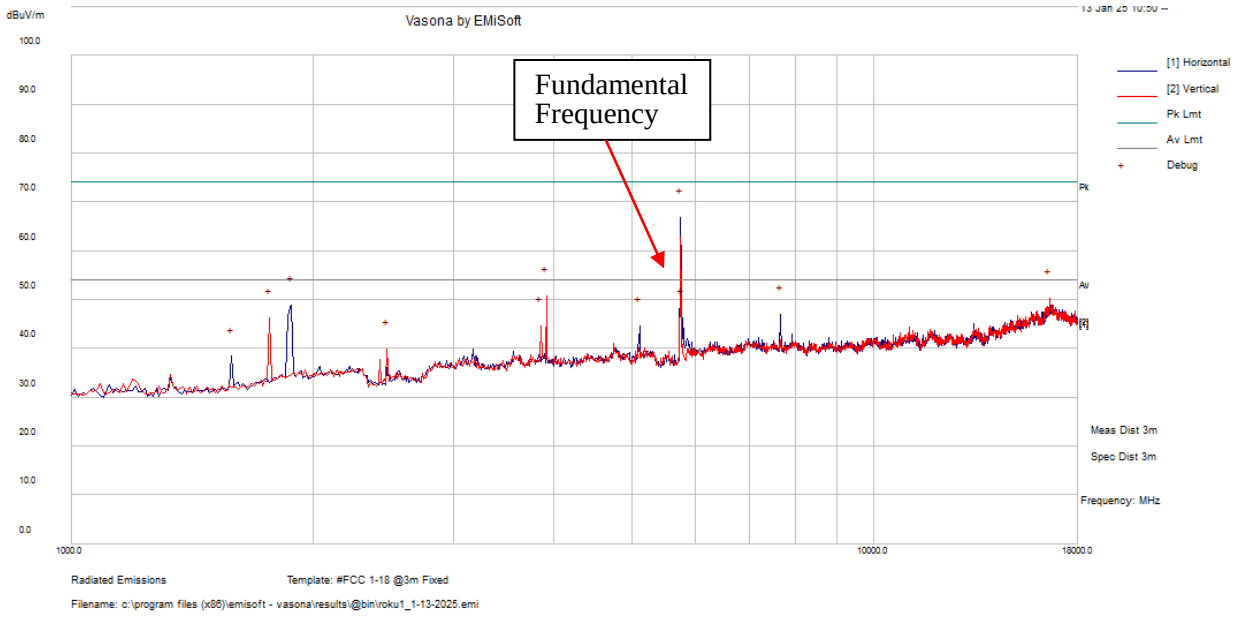
U-NII-2C, 802.11 n/ac20: 5720 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
1881.875	56.73	-6.07	50.66	H	54	-3.34	Peak
17171.25	34.77	15.06	49.83	V	54	-4.17	Peak
7630	42.76	2.68	45.44	H	54	-8.56	Peak
2476.875	47.85	-4.29	43.56	H	54	-10.44	Peak
1329.375	49.69	-9.5	40.19	V	54	-13.81	Peak

Note: Peak measurement was compared to the average limit to show compliance.

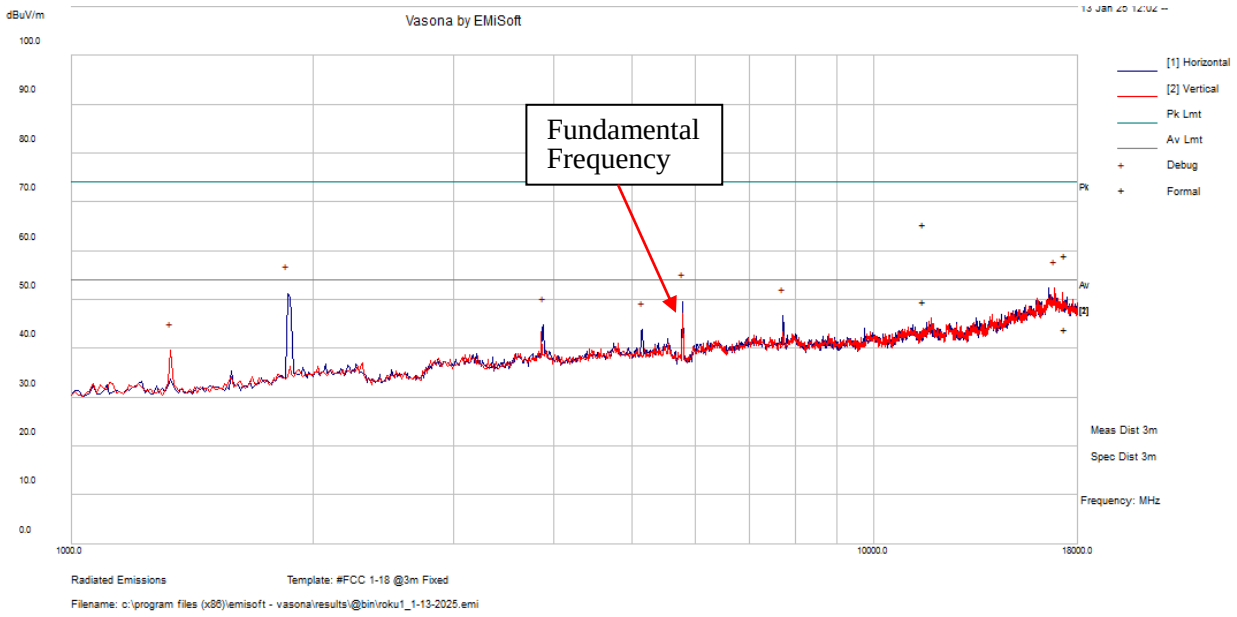
U-NII-3, 802.11 n/ac20: 5745 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
3911.25	52.65	-1.86	50.79	V	54	-3.21	Peak
16586.88	34.62	15.65	50.27	V	54	-3.73	Peak
1881.875	54.95	-6.07	48.88	H	54	-5.12	Peak
7661.875	44.2	2.82	47.02	H	54	-6.98	Peak
1765	53.62	-7.32	46.3	V	54	-7.7	Peak
5781.25	46.26	-0.05	46.21	H	54	-7.79	Peak

Note: Peak measurement was compared to the average limit to show compliance.

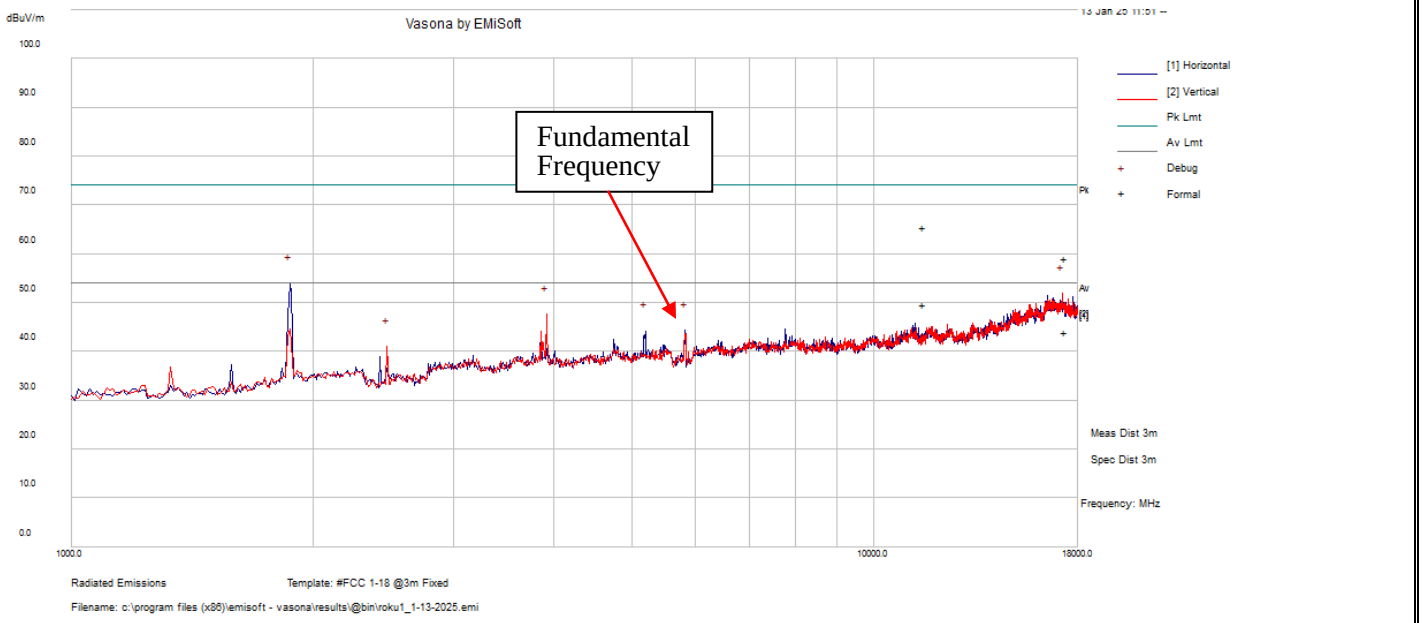
U-NII-3, 802.11 n/ac20: 5785 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
16841.88	36.75	15.57	52.32	V	54	-1.68	Peak
1860.625	57.52	-6.28	51.24	H	54	-2.76	Peak
7715	43.6	3.07	46.67	H	54	-7.33	Peak
3879.375	46.59	-1.82	44.77	H	54	-9.24	Peak
5154.375	44.14	-0.37	43.77	H	54	-10.23	Peak
1329.375	49.04	-9.49	39.55	V	54	-14.46	Peak

Note: Peak measurement was compared to the average limit to show compliance.

U-NII-3, 802.11 n/ac20: 5825 MHz

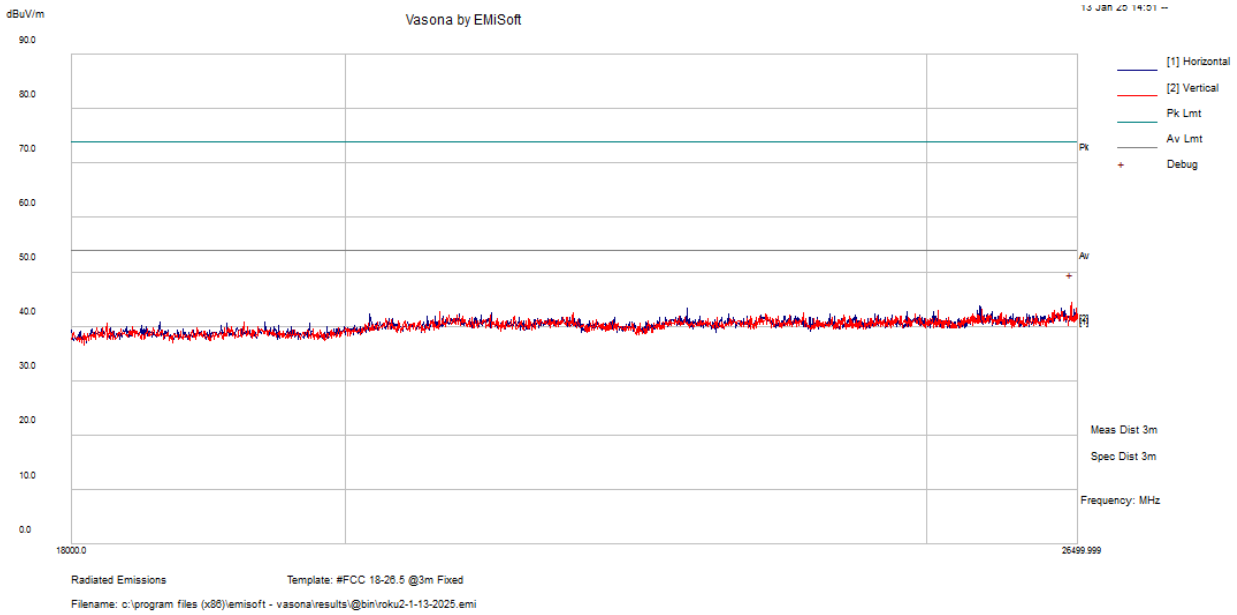


Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
1871.25	**60.16**	**-6.18**	**53.98**	**H**	**54**	**-0.02**	**Peak**
17192.5	36.73	15.09	51.82	V	54	-2.18	Peak
3911.25	49.4	-1.85	47.55	V	54	-6.45	Peak
5196.875	44.44	-0.32	44.12	H	54	-9.88	Peak
2476.875	45.27	-4.29	40.98	V	54	-13.02	Peak

Note: Peak measurement was compared to the average limit to show compliance.

4) 18 GHz – 26.5 GHz, Measured at 3 meters

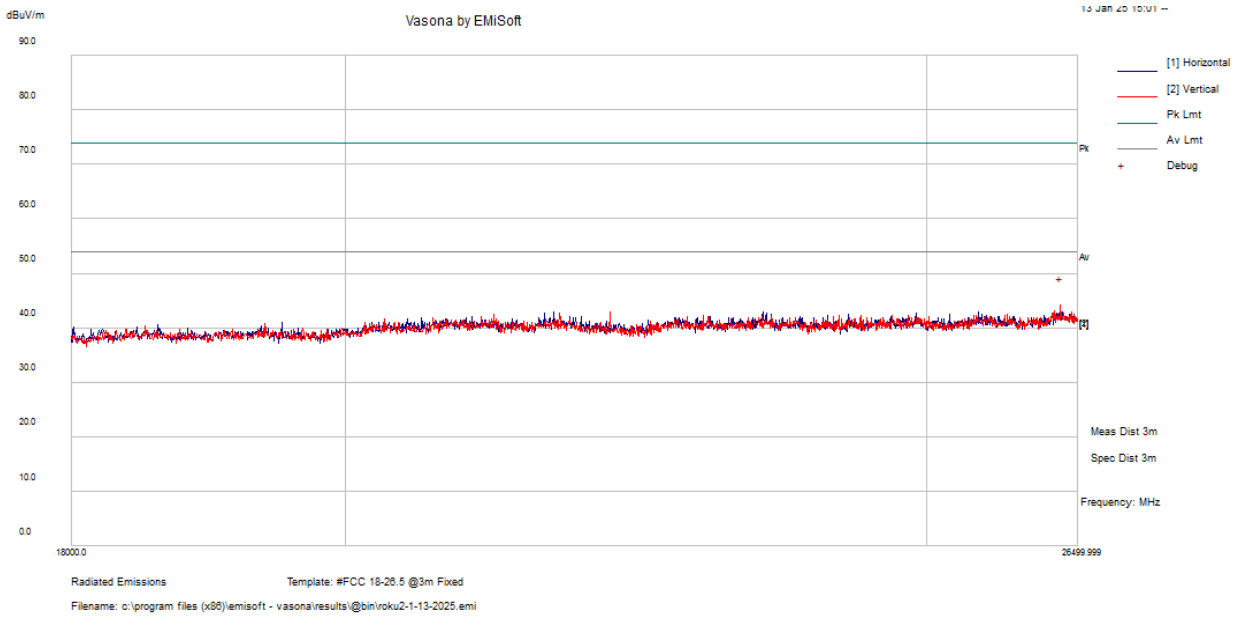
U-NII-1, 802.11 n/ac20: 5180 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
26430.94	41.15	3.22	44.37	V	54	-9.63	Peak

Note: Peak measurement was compared to the average limit to show compliance.

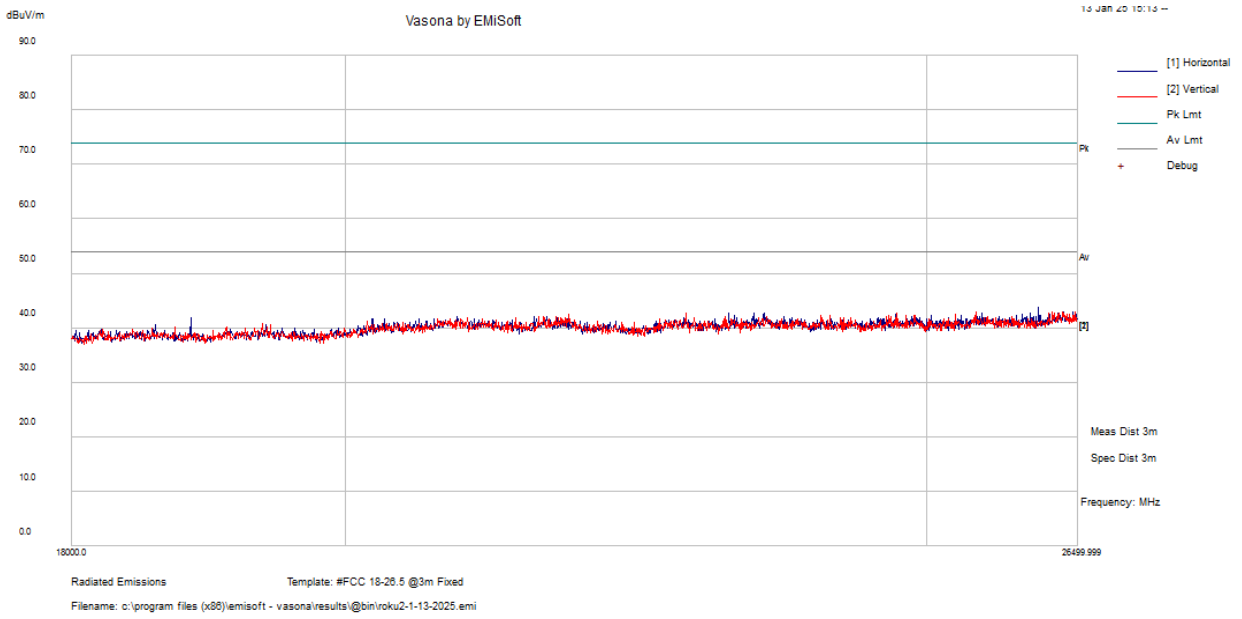
U-NII-1, 802.11 n/ac20: 5200 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
26324.69	41.00	3.12	44.12	V	54	-9.88	Peak

Note: Peak measurement was compared to the average limit to show compliance.

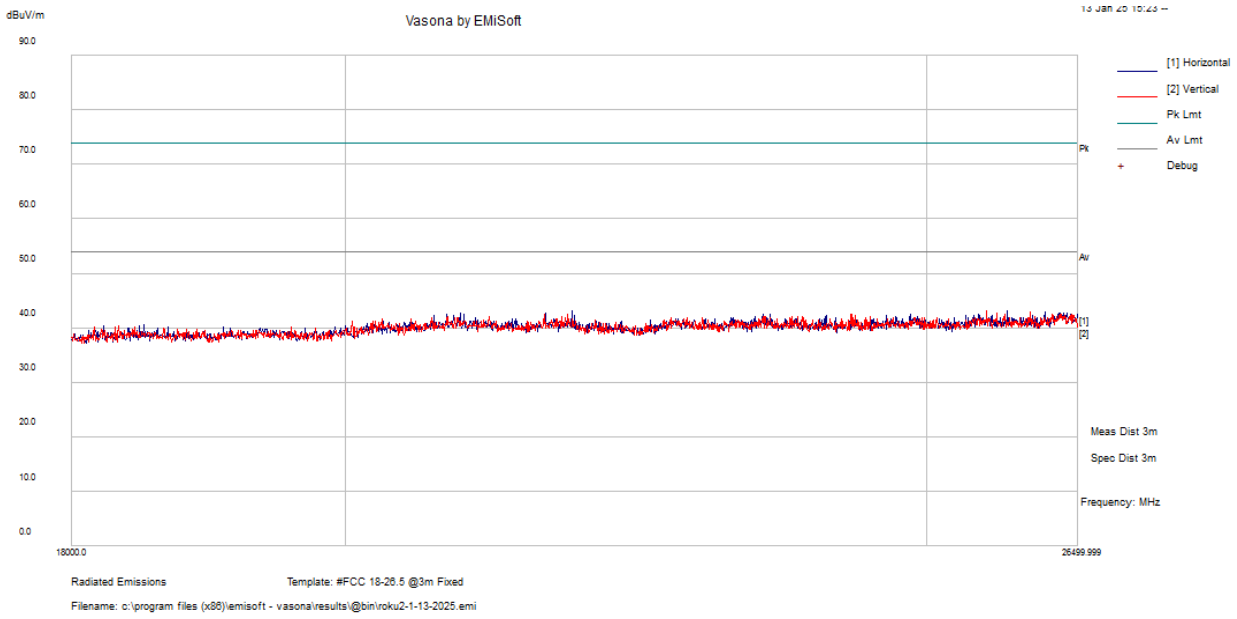
U-NII-1, 802.11 n/ac20: 5240 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
23743.32	40.31	0.79	41.10	H	54	-12.96	Peak

Note: Peak measurement was compared to the average limit to show compliance.

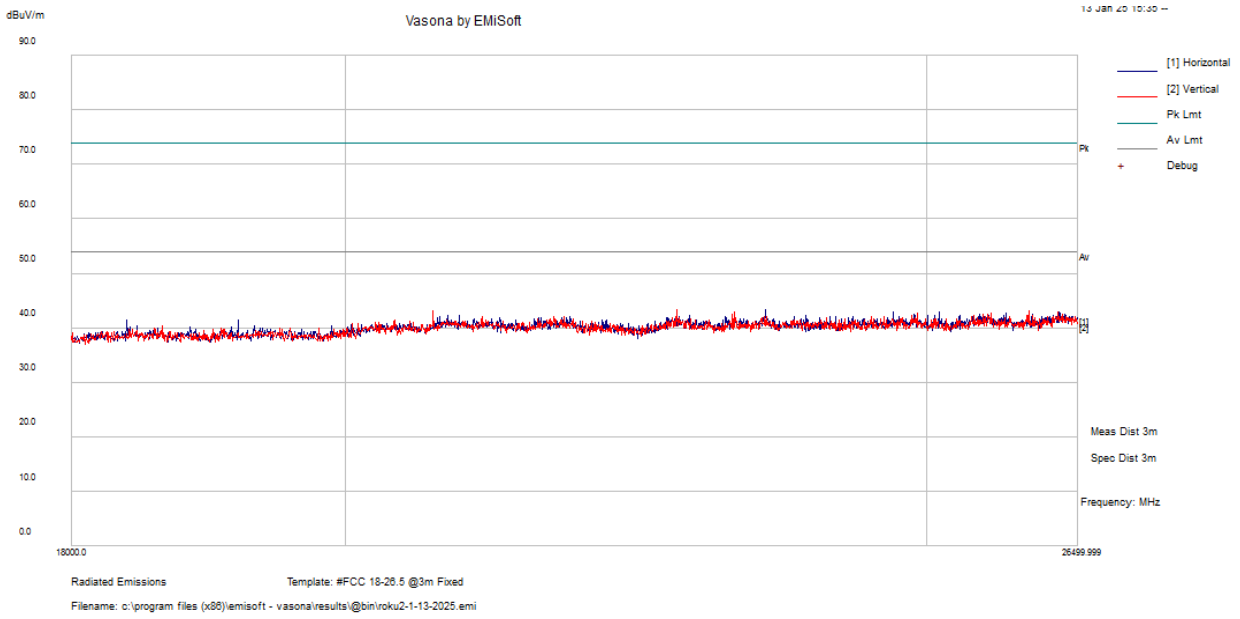
U-NII-2A, 802.11 n/ac20: 5260 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
20778.44	42.74	-1.22	41.52	V	54	-11.26	Peak

Note: Peak measurement was compared to the average limit to show compliance.

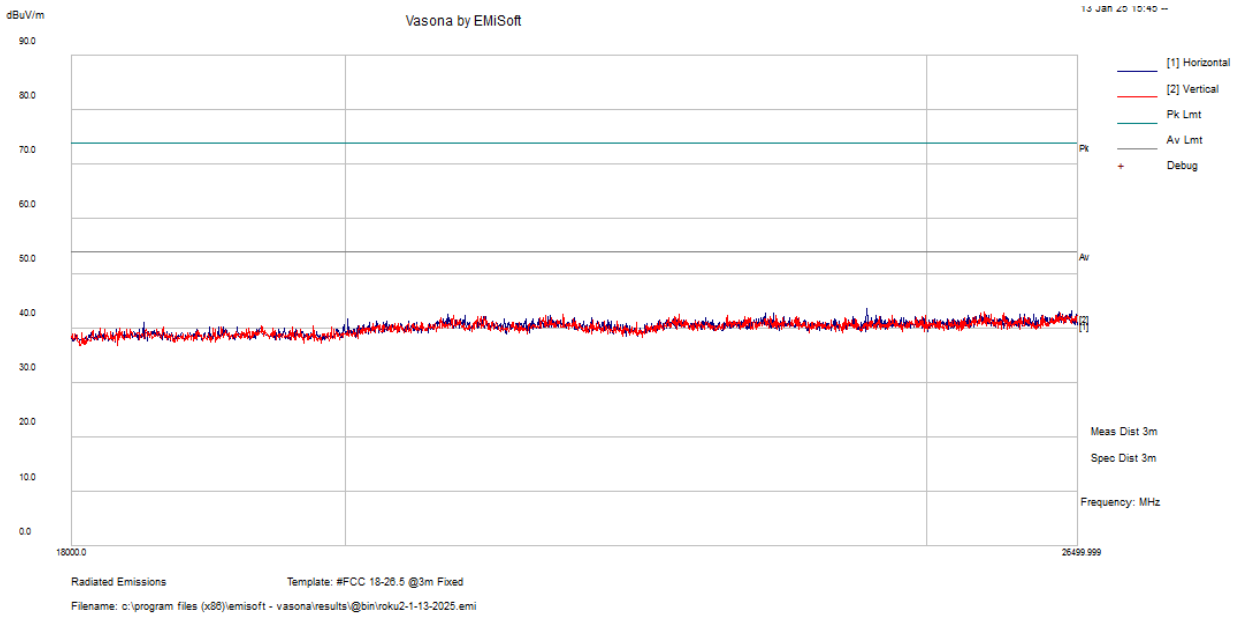
U-NII-2A, 802.11 n/ac20: 5300 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
20820.94	42.61	1.22	41.39	V	54	-12.61	Peak

Note: Peak measurement was compared to the average limit to show compliance.

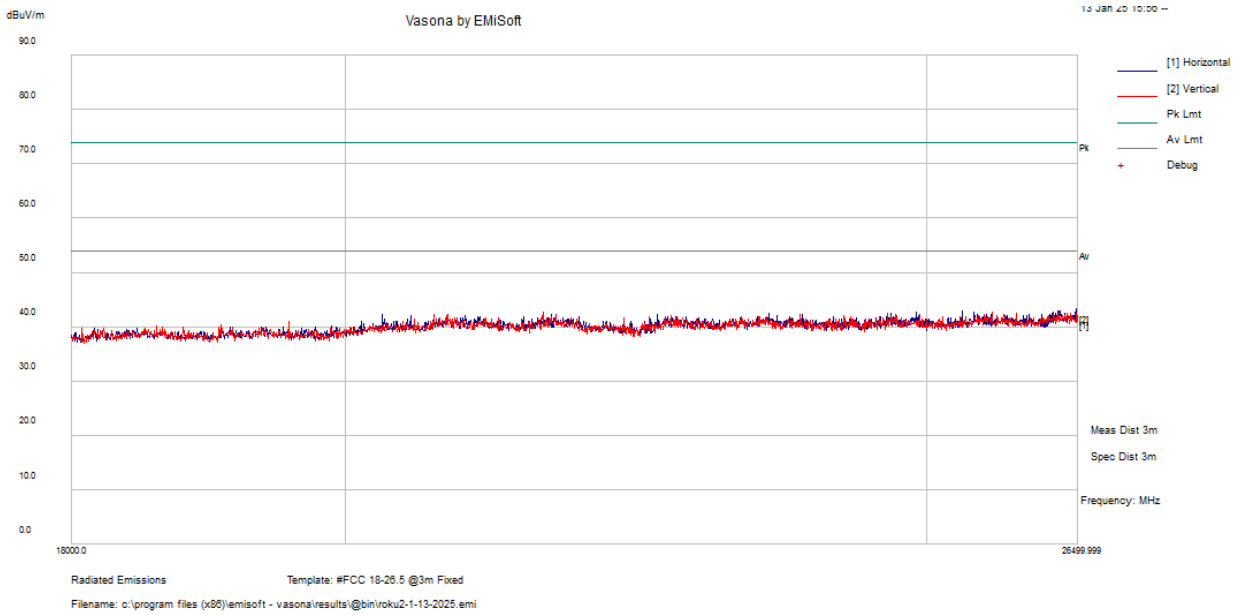
U-NII-2A, 802.11 n/ac20: 5320 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
20985.62	42.796	-1.46	41.336	H	54	-12.664	Peak

Note: Peak measurement was compared to the average limit to show compliance.

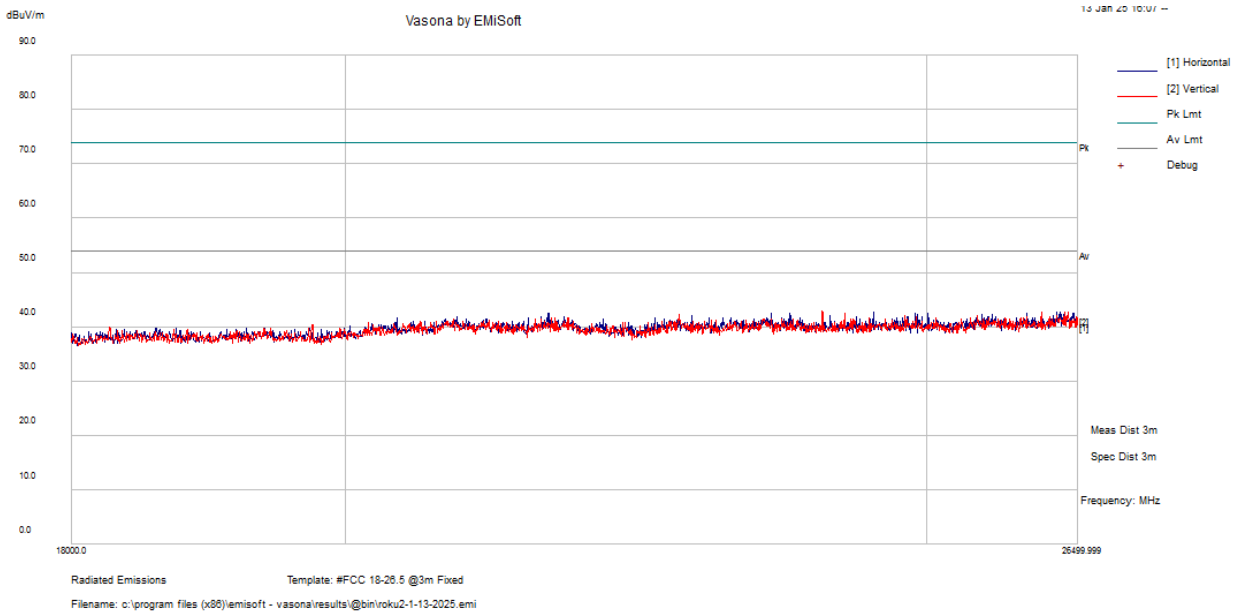
U-NII-2C, 802.11 n/ac20: 5500 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
21075.94	42.97	-1.46	41.51	H	54	-12.49	Peak

Note: Peak measurement was compared to the average limit to show compliance.

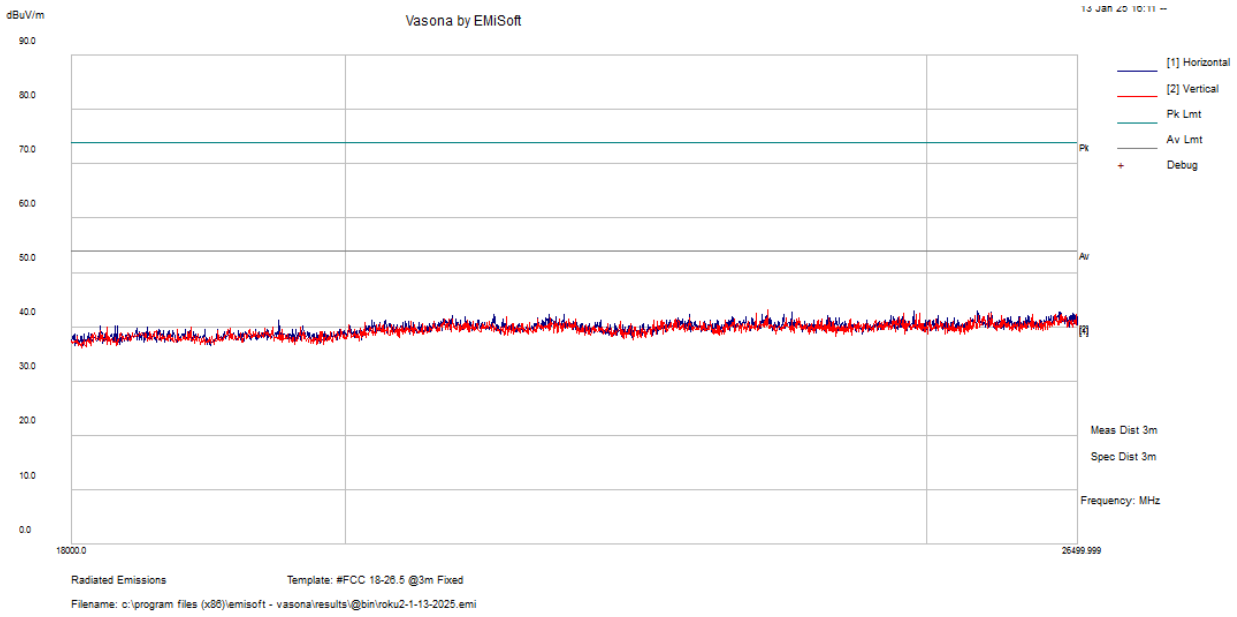
U-NII-2C, 802.11 n/ac20: 5600 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
21670.94	41.99	-0.19	41.80	V	54	-12.20	Peak

Note: Peak measurement was compared to the average limit to show compliance.

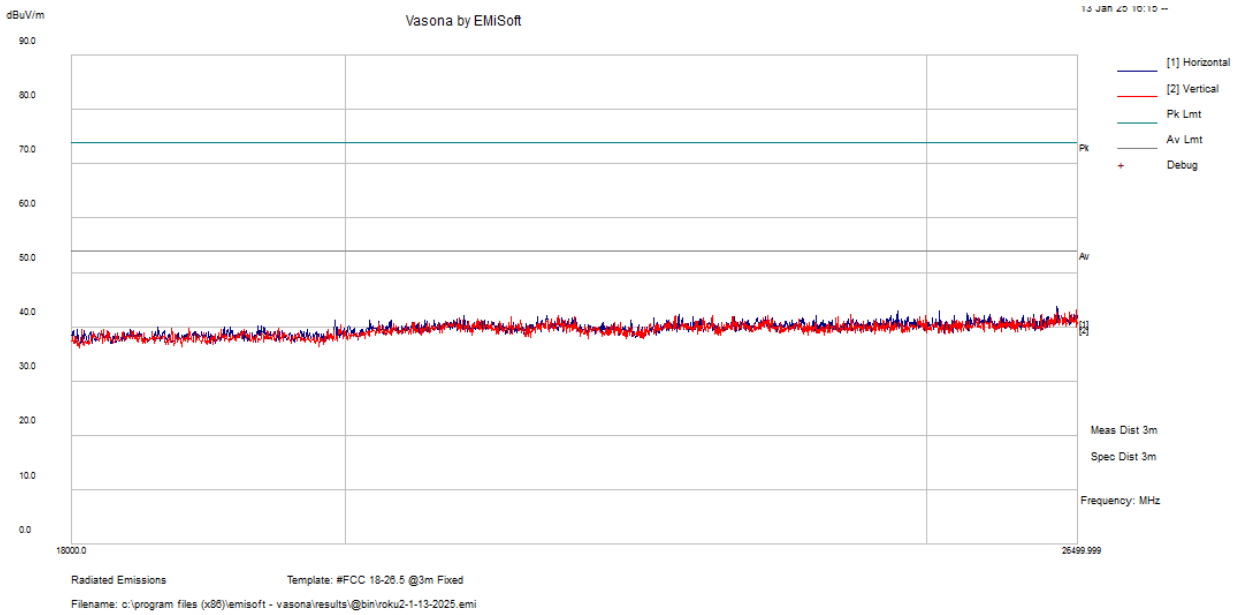
U-NII-2C, 802.11 n/ac20: 5720 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
24295.31	40.32	1.49	41.81	V	54	-12.19	Peak

Note: Peak measurement was compared to the average limit to show compliance.

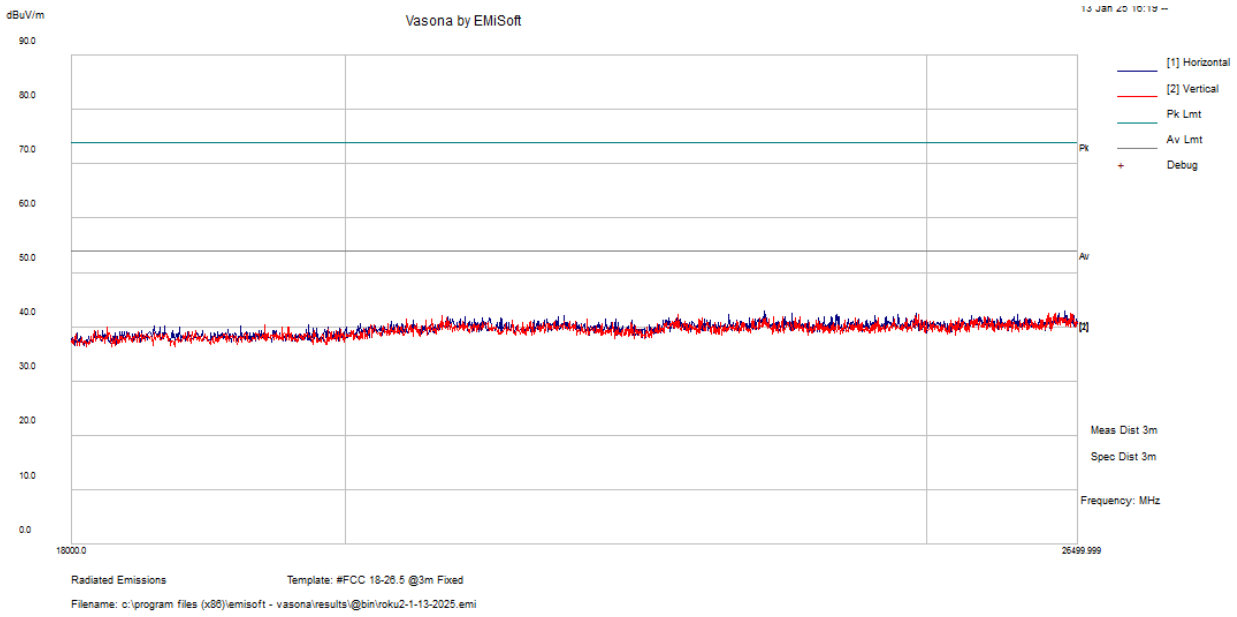
U-NII-3, 802.11 n/ac20: 5745 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
24656.56	41.12	1.63	42.75	V	54	-11.25	Peak

Note: Peak measurement was compared to the average limit to show compliance.

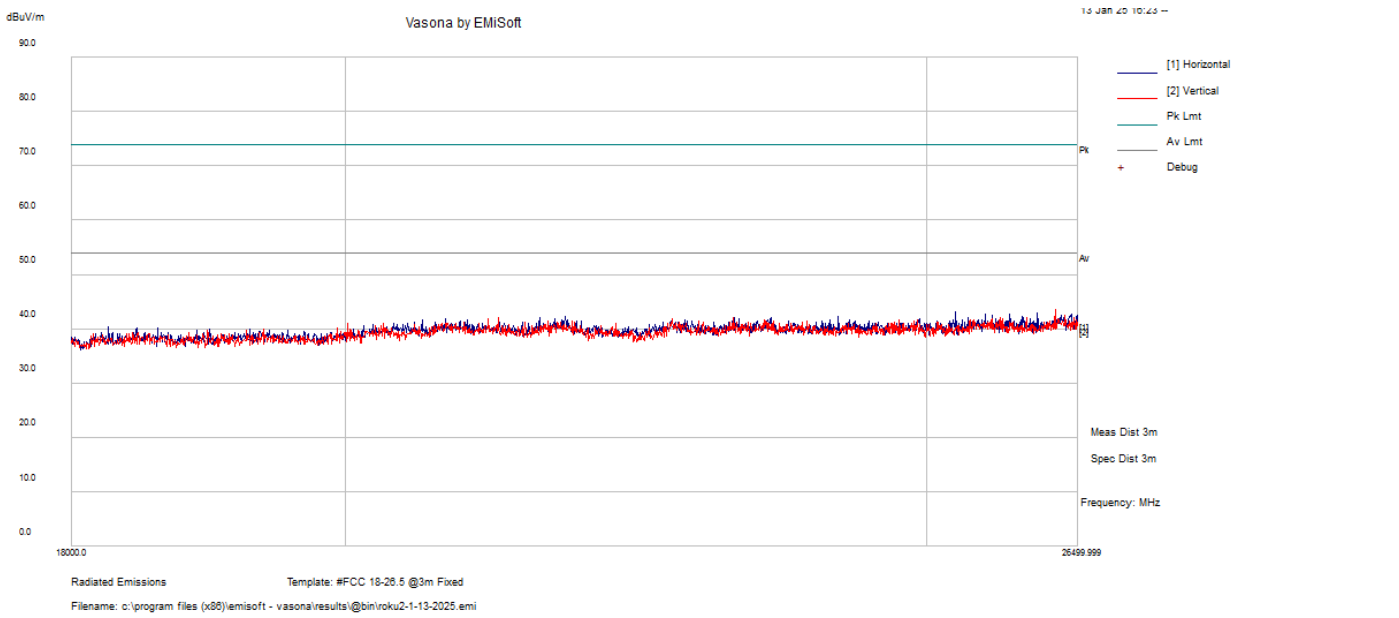
U-NII-3, 802.11 n/ac20: 5785 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
24906.25	39.95	1.78	41.73	H	54	-12.27	Peak

Note: Peak measurement was compared to the average limit to show compliance.

U-NII-3, 802.11 n/ac20: 5825 MHz

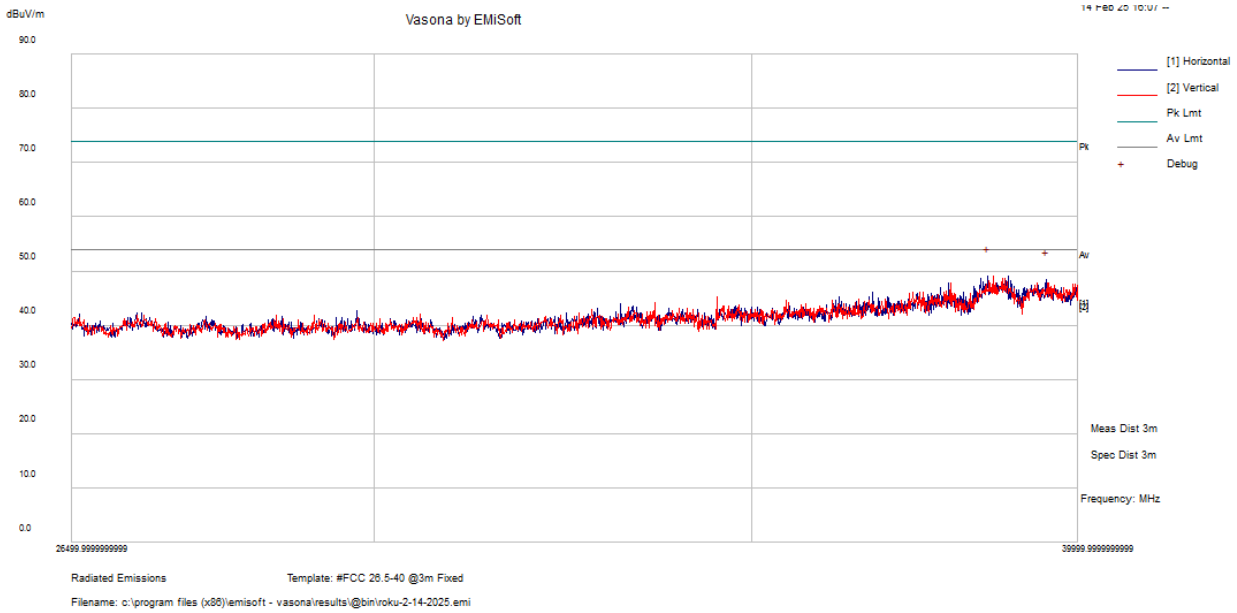


Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
25177.19	40.172	1.53	41.702	H	54	-12.298	Peak

Note: Peak measurement was compared to the average limit to show compliance.

5) 26.5 GHz – 40 GHz, Measured at 3 meter

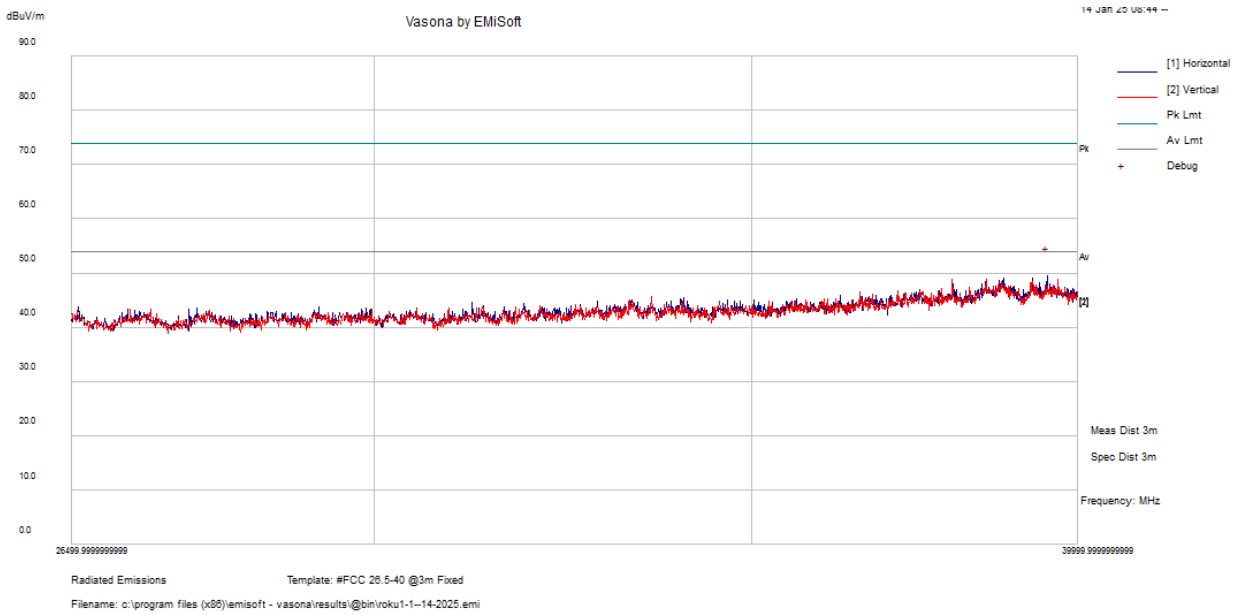
U-NII-1, 802.11 n/ac20: 5180 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
38557.19	37.49	11.64	49.13	H	54	-4.87	Peak
39485.31	36.43	12.04	48.47	H	54	-5.53	Peak

Note: Peak measurement was compared to the average limit to show compliance.

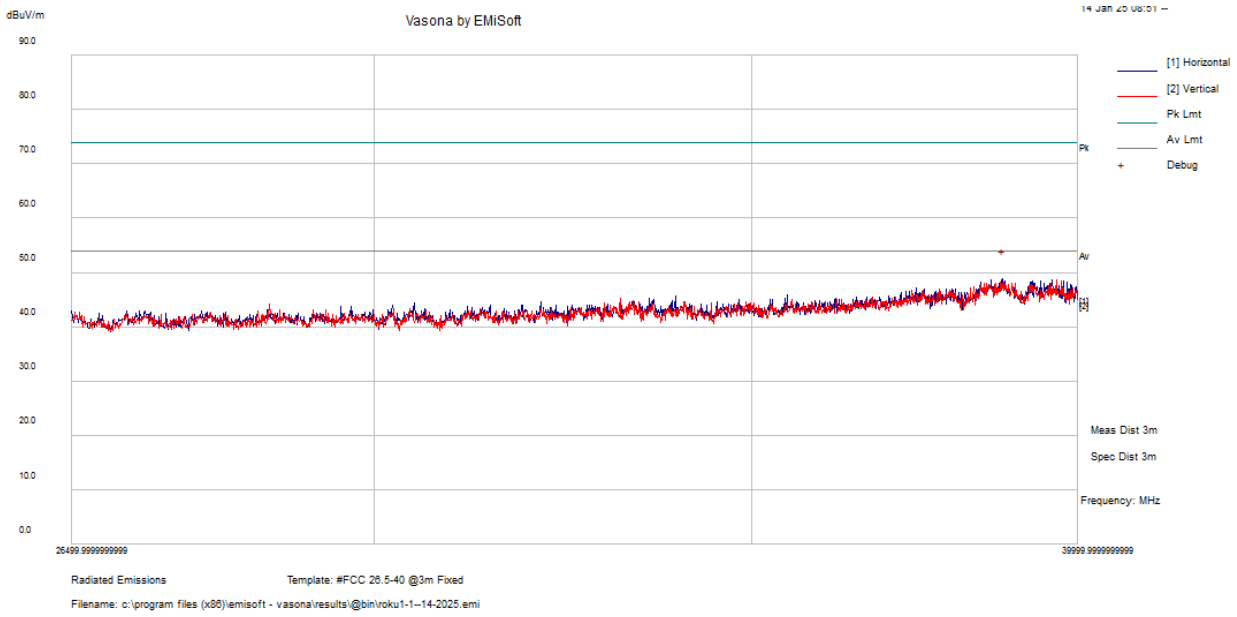
U-NII-1, 802.11 n/ac20: 5200 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
39502.19	39.22	10.32	49.54	H	54	-4.46	Peak

Note: Peak measurement was compared to the average limit to show compliance.

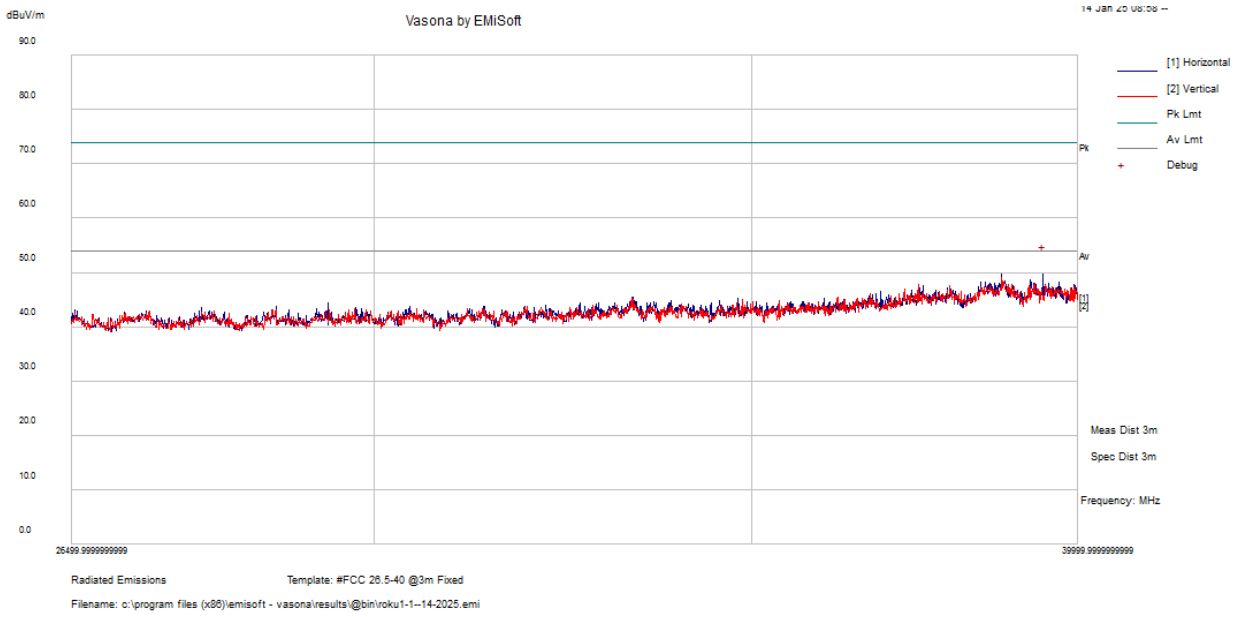
U-NII-1, 802.11 n/ac20: 5240 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
38785	38.62	10.22	48.84	H	54	-5.16	Peak

Note: Peak measurement was compared to the average limit to show compliance.

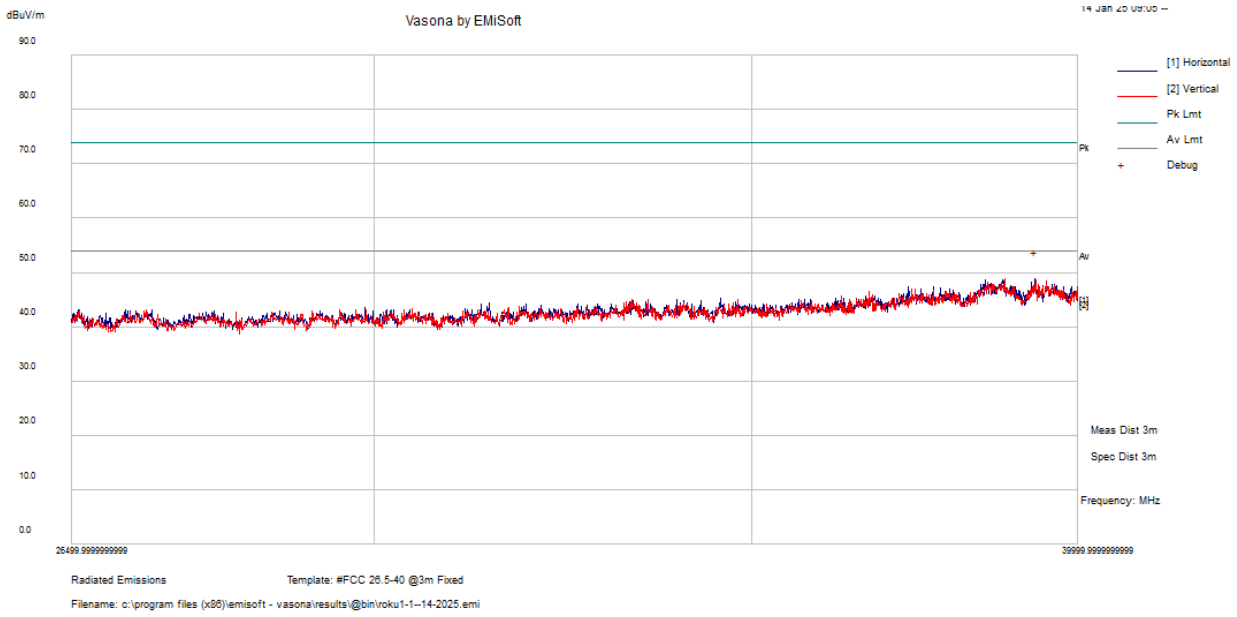
U-NII-2A, 802.11 n/ac20: 5260 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
39434.69	39.68	10.08	49.76	H	54	-4.24	Peak

Note: Peak measurement was compared to the average limit to show compliance.

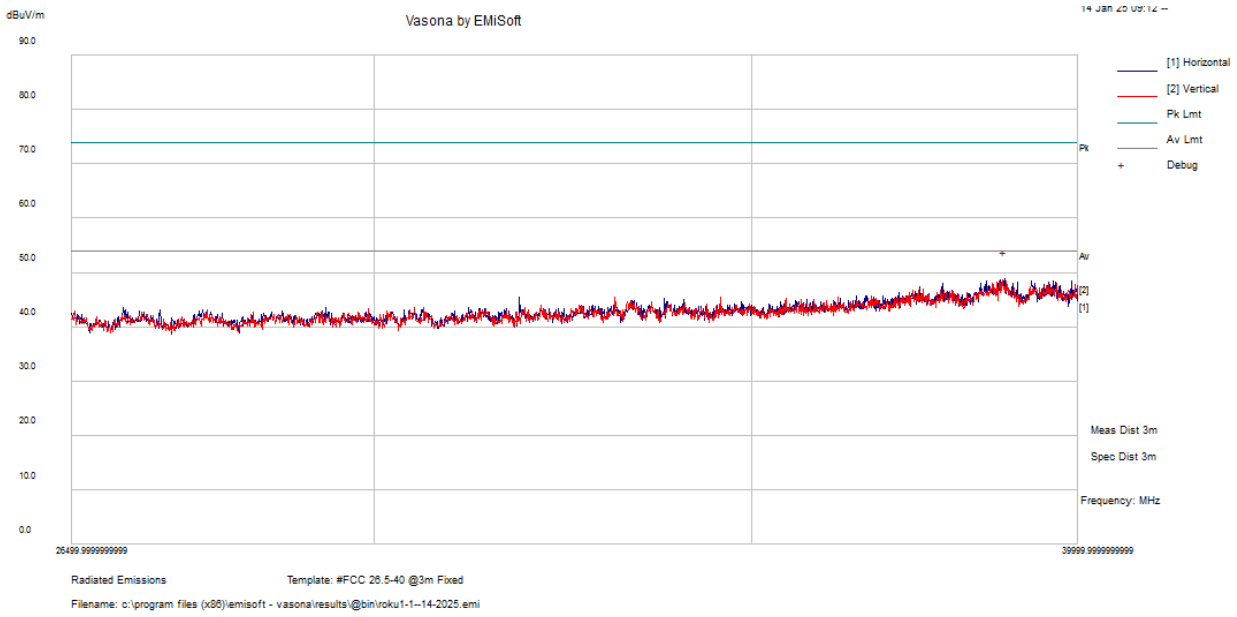
U-NII-2A, 802.11 n/ac20: 5300 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
39299.69	37.91	10.90	48.81	H	54	-5.19	Peak

Note: Peak measurement was compared to the average limit to show compliance.

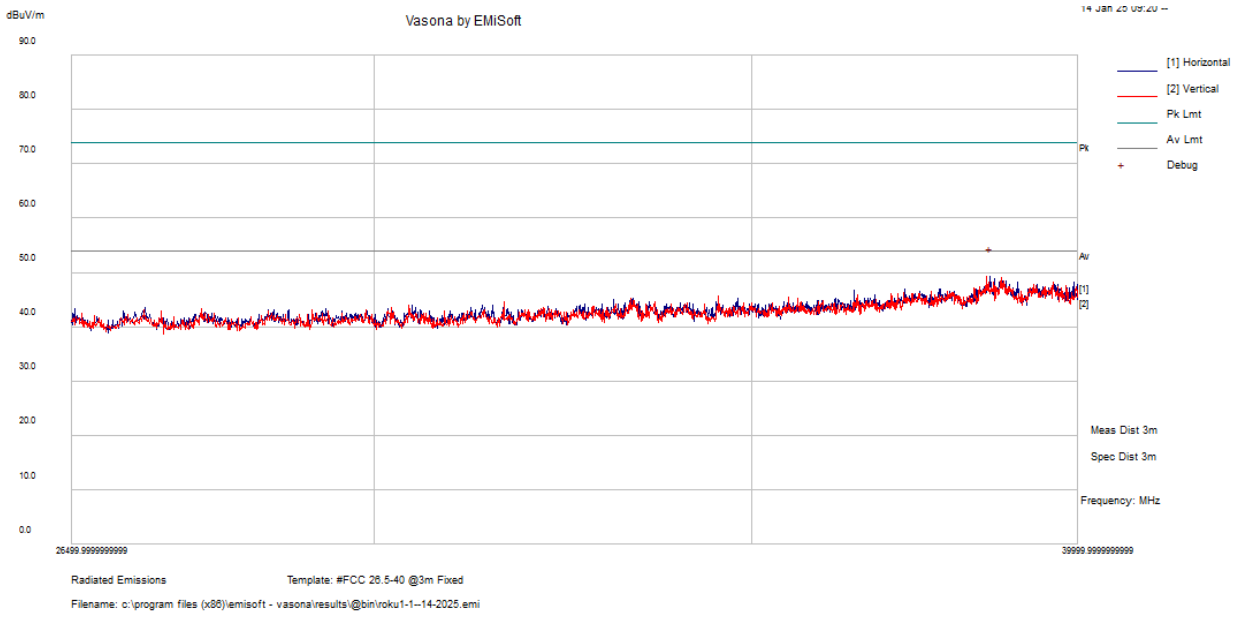
U-NII-2A, 802.11 n/ac20: 5320 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
38818.75	38.57	10.23	48.80	H	54	-5.20	Peak

Note: Peak measurement was compared to the average limit to show compliance.

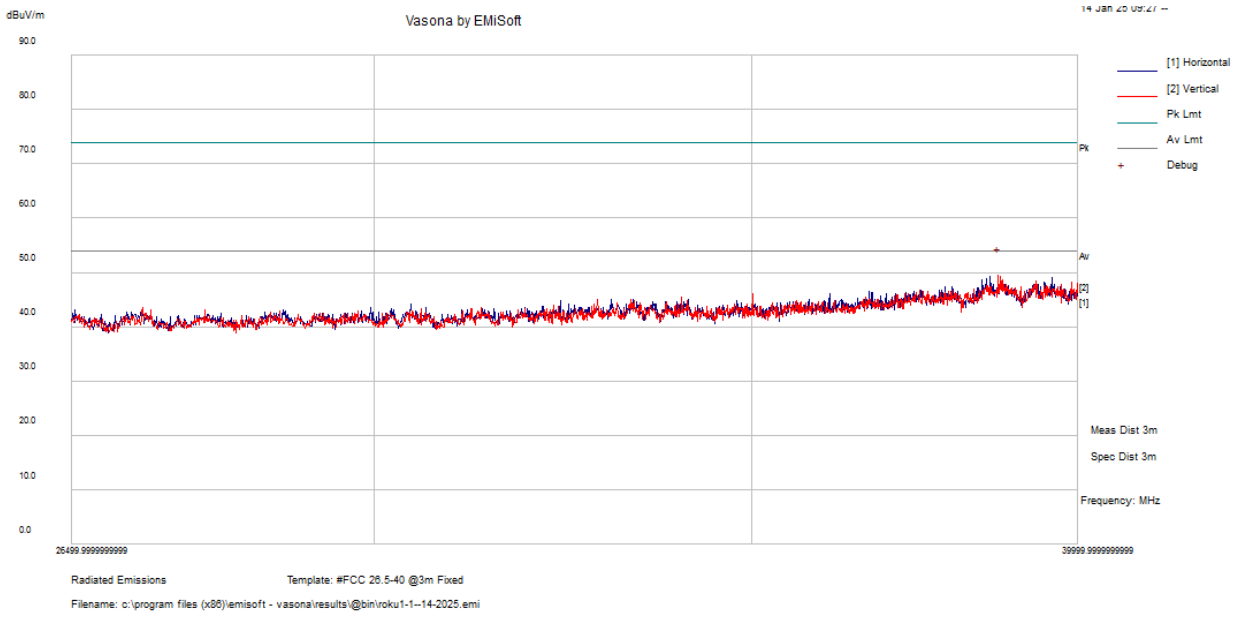
U-NII-2C, 802.11 n/ac20: 5500 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
38590.94	39.27	10.07	49.34	H	54	-4.67	Peak

Note: Peak measurement was compared to the average limit to show compliance.

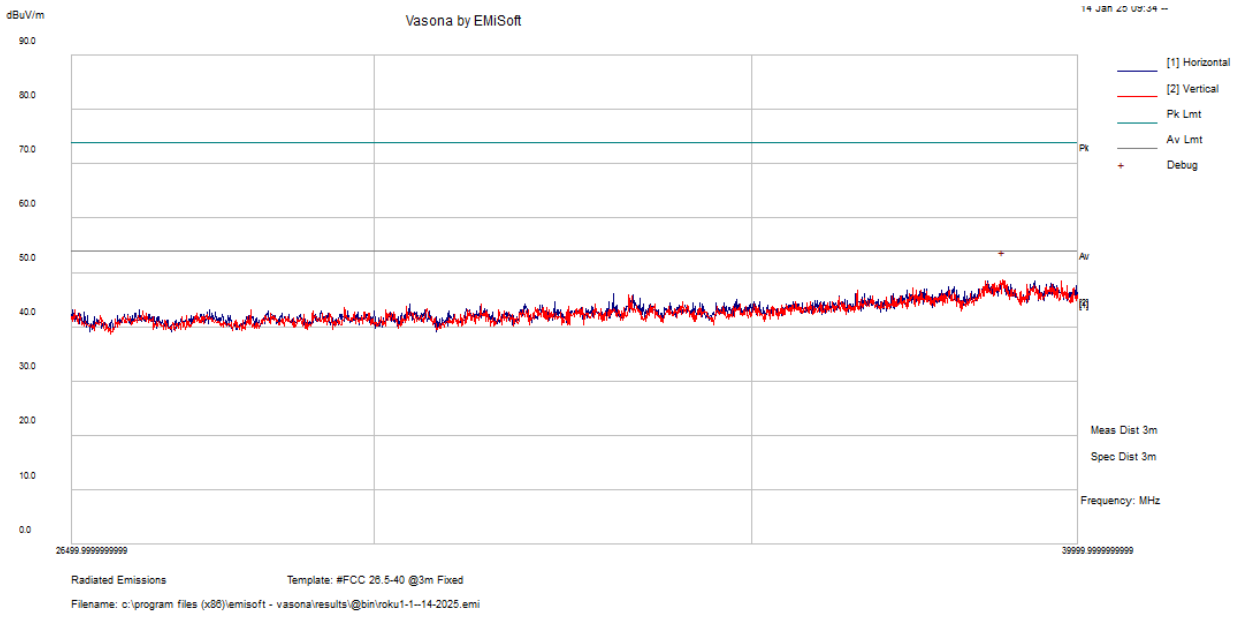
U-NII-2C, 802.11 n/ac20: 5600 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
38717.5	39.71	9.68	49.39	V	54	-4.61	Peak

Note: Peak measurement was compared to the average limit to show compliance.

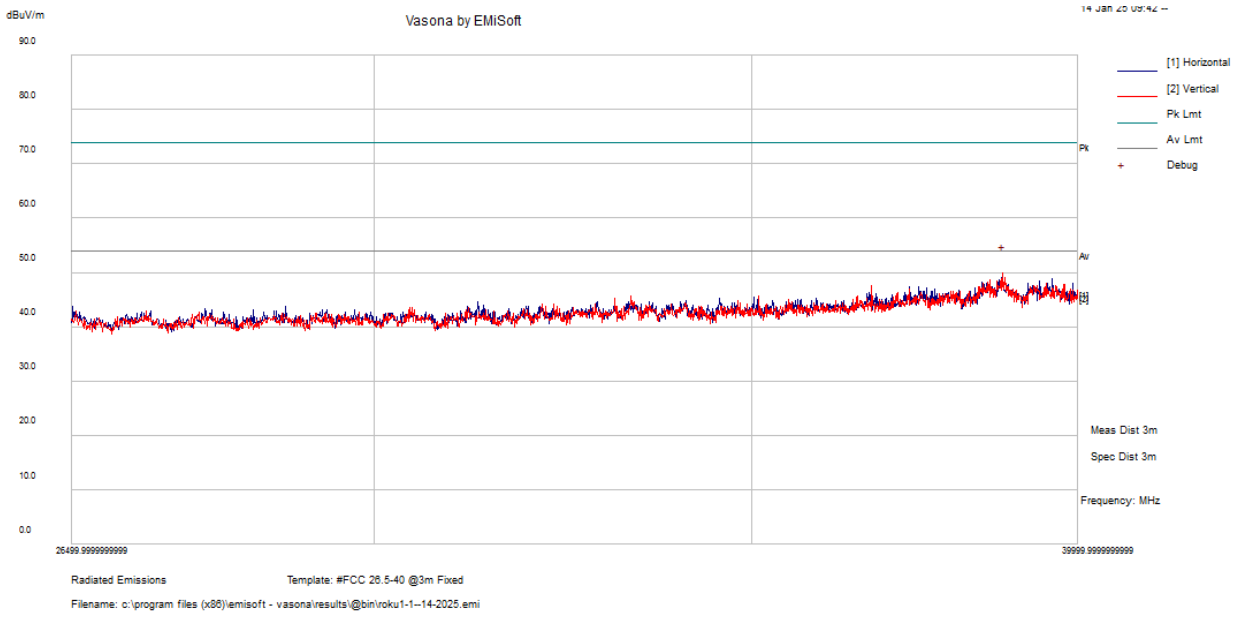
U-NII-2C, 802.11 n/ac20: 5720 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
38793.44	38.34	10.29	48.63	V	54	-5.37	Peak

Note: Peak measurement was compared to the average limit to show compliance.

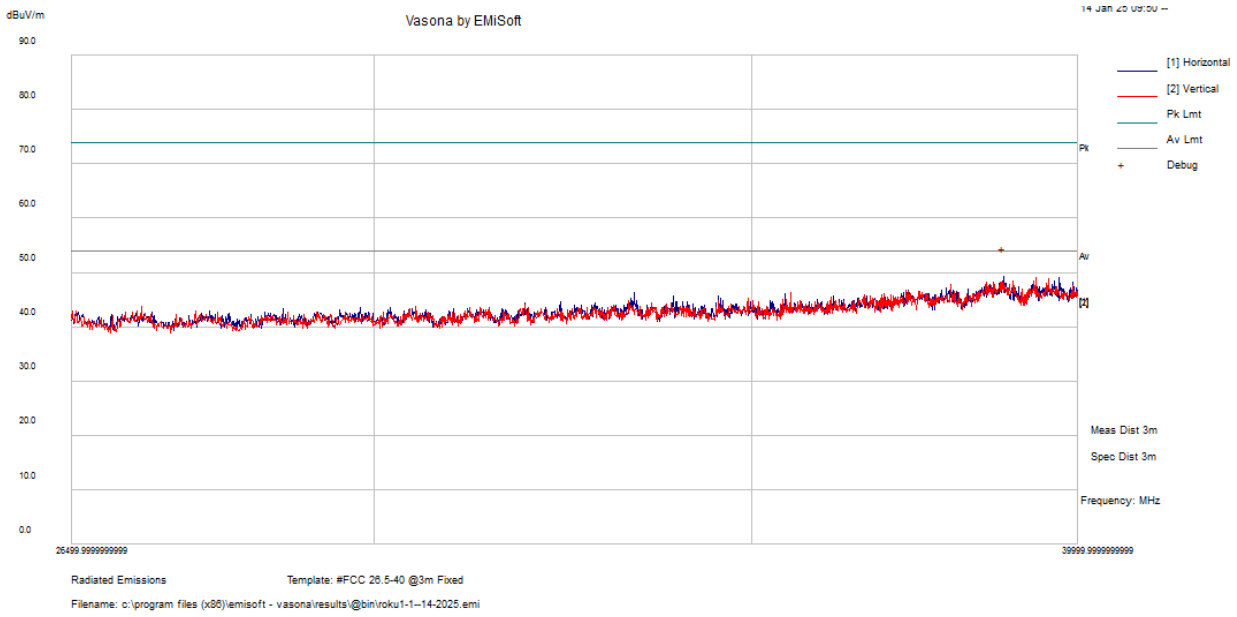
U-NII-3, 802.11 n/ac20: 5745 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
38785	39.64	10.22	49.86	V	54	-4.14	Peak

Note: Peak measurement was compared to the average limit to show compliance.

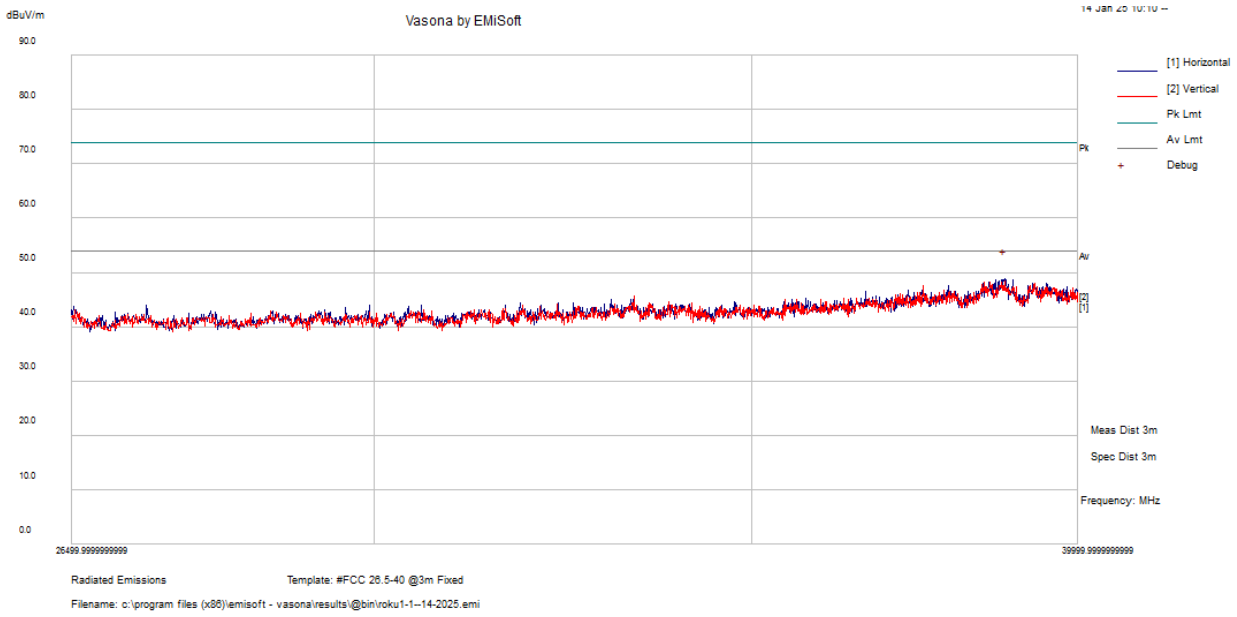
U-NII-3, 802.11 n/ac20: 5785 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
38801.88	38.95	10.33	49.28	H	54	-4.73	Peak

Note: Peak measurement was compared to the average limit to show compliance.

U-NII-3, 802.11 n/ac20: 5825 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Limit (dBµV/m)	Margin (dB)	Detector
38818.75	38.72	10.23	48.95	H	54	-5.06	Peak

Note: Peak measurement was compared to the average limit to show compliance.

8 FCC §15.407(e) & ISEDC RSS-247 §6.2 – 6 dB, 26 dB, & 99% Occupied Bandwidth

8.1 Applicable Standards

As per FCC §15.407(e) and ISEDC RSS-247 6.2.4(1): for equipment operating in the band 5725 – 5850 MHz, the minimum 6 dB bandwidth of U-NII devices shall be 500 kHz.

8.2 Measurement Procedure

As per the ANSI 63.10 Clause 12.4.1: Emission Bandwidth

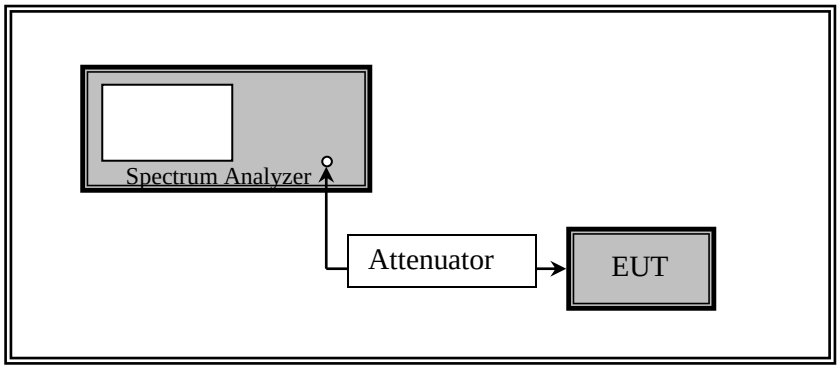
a. Set RBW = approximately 1% of the emission bandwidth
b. Set the VBW > RBW.
c. Detector = peak.
d. Trace mode = max hold.
e. Measure the maximum width of the emission that is 6 or 26 dB down from the peak of the emission. Compare this with the RBW setting of the instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

As per the ANSI 63.10 Clause 6.9.3: Occupied Bandwidth – Power Bandwidth (99%)

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The following procedure shall be used for measuring 99% power bandwidth:

f. The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
g. The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.
h. Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.
i. Step a) through step c) might require iteration to adjust within the specified range.
j. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
k. Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.
l. If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.
m. The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

8.3 Test Setup Block Diagram



8.4 Test Equipment List and Details

BACL No.	Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
624	Agilent	Spectrum Analyzer	E4446A	MY48250238	2024-06-14	1 year
-	-	10dB Attenuator	-	-	-	-

Note[1]: cables, attenuators and notch filters included in the test set-up were 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".*

8.5 Test Environmental Conditions

Temperature:	21ºC
Relative Humidity:	53%
ATM Pressure:	101.5 kPa

The testing was performed by Libass Thiaw from 2025-01-10 at RF test site.

8.6 Test Results

Please refer to the plots in Annex A for detailed test results.

U-NII-1

Channel	Frequency (MHz)	99% OBW (MHz)	26 dB OBW (MHz)
802.11a			
36	5180	17.276	22.861
40	5200	17.708	24.296
48	5240	17.135	23.224
802.11n/ac20			
36	5180	18.095	22.731
40	5200	18.376	24.891
48	5240	18.439	25.230
802.11n/ac40			
38	5190	36.676	45.572
46	5230	36.453	45.188
802.11ac80			
42	5210	75.518	94.940

U-NII-2A

Channel	Frequency (MHz)	99% OBW (MHz)	26 dB OBW (MHz)
802.11a			
52	5260	17.111	23.671
60	5300	17.399	23.397
64	5320	17.223	23.065
802.11n/ac20			
52	5260	18.411	23.967
60	5300	18.295	23.794
64	5320	18.064	23.220
802.11n/ac40			
54	5270	36.469	46.531
62	5310	36.866	47.575
802.11ac80			
58	5290	75.951	96.270

U-NII-2C

Channel	Frequency (MHz)	99% OBW (MHz)	26 dB OBW (MHz)
802.11a			
100	5500	17.611	23.539
120	5600	17.291	23.715
144	5720	17.073	23.706
802.11n/ac20			
100	5500	18.2.34	24.339
120	5600	19.013	23.768
144	5720	18.618	24.277
802.11n/ac40			
102	5510	36.487	47.197
118	5590	36.510	47.092
142	5710	38.926	47.842
802.11ac80			
106	5530	75.881	89.909
122	5610	75.702	89.560
138	5690	76.081	89.735

U-NII-3

Channel	Frequency (MHz)	99% OBW (MHz)	6 dB OBW (MHz)	6 dB OBW Limit (kHz)	Result
802.11a					
149	5745	17.081	15.202	≥ 500	Pass
157	5785	16.915	15.555	≥ 500	Pass
165	5825	16.997	15.210	≥ 500	Pass
802.11n/ac20					
149	5745	17.849	15.264	≥ 500	Pass
157	5785	17.822	15.127	≥ 500	Pass
165	5825	17.909	16.123	≥ 500	Pass
802.11n/ac40					
151	5755	36.311	35.211	≥ 500	Pass
159	5795	36.173	33.862	≥ 500	Pass
802.11ac80					
155	5775	75.137	75.304	≥ 500	Pass

9 FCC §407(a) & ISEDC RSS-247 §6.2 – Output Power

9.1 Applicable Standards

According to FCC §15.407(a):

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.

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.

According to ISEDC RSS-247 §6.2.1 for frequency band 5150-5250 MHz:

The maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10}B$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

According to ISEDC RSS-247 §6.2.2 for frequency band 5250-5350 MHz:

The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10}B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10}B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

According to ISEDC RSS-247 §6.2.3 for frequency band 5470-5600 MHz and 5650-5725 MHz:

The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10}B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

According to ISEDC RSS-247 §6.2.4 for frequency band 5725-5850 MHz:

The maximum conducted output power shall not exceed 1 W. The 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 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 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.

9.2 Measurement Procedure

The measurements are based on ANSI C63.10-2020, Section 12.4.3.2

12.4.3.2 Method PM-G

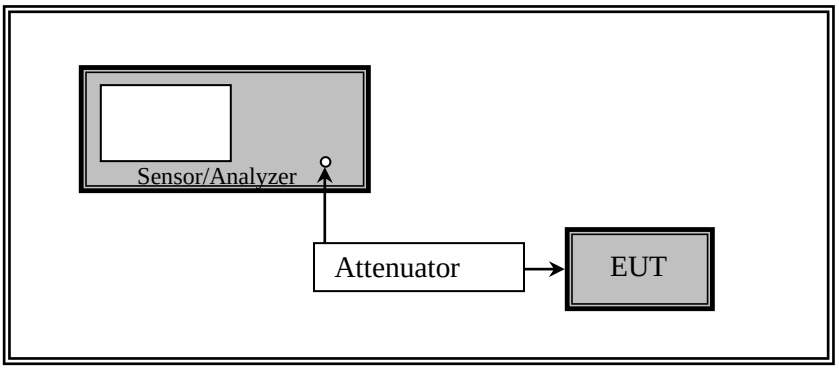
Method PM-G is measurement using a gated RF average power meter. Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Straddle Power

Straddle Power is the measurement of power level of the communication channel that overlaps with the edges of two adjancent channels to ensure compliance with the regulations that limit the amount of power that can leak into neighbouring channels.
ANSI C63-10 2020 Section 12.3.2.2 Method SA-1 Method SA-1 was considered as measurement procedure.
12.3.2.2 Method SA-1 Method SA-1 uses trace averaging with the EUT transmitting at full power throughout each sweep. The procedure for this method is as follows:

a) Set span to encompass the entire 26 dB EBW or 99% OBW of the signal.
b) Set RBW = 1 MHz.
c) Set VBW ≥ 3 MHz.
d) Number of points in sweep ≥ [2 × span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)
e) Sweep time = auto.
f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
g) If transmit duty cycle < 98%, use a video trigger with the trigger level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no OFF intervals) or at duty cycle ≥ 98%, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run."
h) Trace average at least 100 traces in power averaging (rms) mode.
i) Compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument's band power measurement function, with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW or 99% OBW of the spectrum

9.3 Test Setup Block Diagram



9.4 Test Equipment List and Details

BACL No.	Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
624	Agilent	Spectrum Analyzer	E4446A	MY48250238	2024-06-14	1 year
697	ETS-Lindgren	USB RF Power Sensor	7002-006	00160097	2024-06-03	1 Year
-	-	10dB Attenuator	-	-	-	-

Note[1]: cables, attenuators and notch filters included in the test set-up were 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".*

9.5 Test Environmental Conditions

Temperature:	21ºC
Relative Humidity:	53%
ATM Pressure:	101.5 kPa

The testing was performed by Shankar Pangeni and Libass Thiaw from 2024-12-16 to 2025-02-10 at RF test site

9.6 Test Results

U-NII-1.IC

Channel	Frequency (MHz)	Conducted Power (dBm)	EIRP (dBm)	IC Limit (dBm)
802.11a				
36	5180	16.93	18.53	22.37443
40	5200	17.21	18.81	22.4817
48	5240	16.09	17.69	22.33884
802.11n/ac20				
36	5180	15.72	17.32	22.57559
40	5200	18.15	19.75	22.64251
48	5240	18.11	19.71	22.65737
802.11n/ac40				
38	5190	16.53	18.13	23
46	5230	19.46	21.06	23
802.11ac80				
42	5210	13.85	15.45	23

Note: EIRP = Conducted Power [dBm] + Antenna Gains [dBi]
Note: DCCF has already been added to measurements
Note: The maximum e.i.r.p shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever is less. Here B is the 99% emission bandwidth in megahertz

U-NII-1.FCC

Channel	Frequency (MHz)	Conducted Output Power (dBm)	FCC Limit (dBm)
802.11a			
36	5180	16.93	24
40	5200	17.21	24
48	5240	16.09	24
802.11n/ac20			
36	5180	15.72	24
40	5200	18.15	24
48	5240	18.11	24
802.11n/ac40			
38	5190	16.53	24
46	5230	19.46	24
802.11ac80			
42	5210	13.85	24

Note: DCCF has already been added to measurements
Note: The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. Here B is the 26dB bandwidth in megahertz.

U-NII-2A

Channel	Frequency (MHz)	Conducted Output Power (dBm)	Limit (dBm)
802.11a			
52	5260	17.66	24
60	5300	18.30	24
64	5320	15.53	24
802.11n/ac20			
52	5260	19.35	24
60	5300	18.90	24
64	5320	19.30	24
802.11n/ac40			
54	5270	20.24	24
62	5310	17.61	24
802.11ac80			
56	5290	13.75	24

Note: DCCF has already been added to measurements
Note: The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. Here B is the 26dB bandwidth in megahertz.

U-NII-2C

Channel	Frequency (MHz)	Conducted Output Power (dBm)	Limit (dBm)
802.11a			
100	5500	13.98	24
120	5600	15.22	24
140	5700	12.05	24
802.11n/ac20			
100	5500	17.12	24
120	5600	17.60	24
140	5700	13.42	24
802.11n/ac40			
102	5510	15.84	24
118	5590	16.00	24
134	5670	13.94	24
802.11ac80			
106	5530	13.02	24
122	5610	13.10	24

Note: DCCF has already been added to measurements
Note: Tthe maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. Here B is the 26dB bandwidth in megahertz.

U-NII- 3

Channel	Frequency (MHz)	Conducted Output Power (dBm)	Limit (dBm)
802.11a			
149	5745	14.60	30
157	5785	15.74	30
165	5825	14.84	30
802.11n/ac20			
149	5745	16.14	30
157	5785	16.56	30
165	5825	16.00	30
802.11n/ac40			
151	5755	16.65	30
159	5795	16.51	30
802.11ac80			
155	5775	14.12	30

Note: DCCF has already been added to measurements

Straddle Channel Output Power

Channel	Frequency (MHz)	Straddle OP U-NII-2C (dBm)	Straddle OP U-NII-2C Limit (dBm)	Straddle OP U-NII-3 (dBm)	Straddle OP U-NII-3 Limit (dBm)
802.11a					
144	5720	12.66	11	4.79	30
802.11n/ac20					
144	5720	12.26	11	1.73	30
802.11n/ac40					
142	5710	10.28	11	-0.91	30
802.11ac80					
138	5690	8.15	11	-6.08	30

Note: DCCF has already been added to measurements

Please refer to the plots in Annex B for detailed Straddle Power test results.
Beside Straddle Power test all other power measurements were performed with Power Sensor.

10 FCC §15.407(a) & ISEDC RSS-247 §6.2 – Power Spectral Density

10.1 Applicable Standards

According to FCC §15.407(a):

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.

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.

According to ISEDC RSS-247 §6.2.1 for frequency band 5150-5250 MHz:

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

According to ISEDC RSS-247 §6.2.2 for frequency band 5250-5350 MHz:

The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

According to ISEDC RSS-247 §6.2.3 for frequency band 5470-5600 MHz and 5650-5725 MHz:

The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

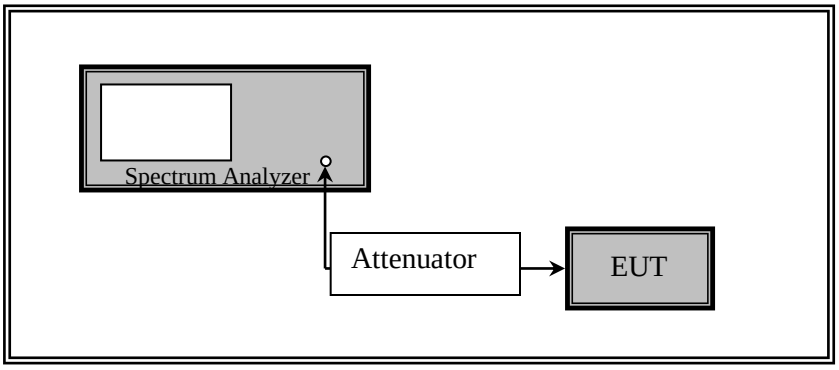
According to ISEDC RSS-247 §6.2.4 for frequency band 5725-5850 MHz:

The maximum conducted output power shall not exceed 1 W. The 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 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 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.

10.2 Measurement Procedure

1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) Set RBW = 1 MHz.
3) Set VBW ≥ 3 MHz.
4) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
5) Sweep time = auto.
6) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
7) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".
8) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

10.3 Test Setup Block Diagram



10.4 Test Equipment List and Details

BACL No.	Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
624	Agilent	Spectrum Analyzer	E4446A	MY48250238	2024-06-14	1 year
-	-	10dB Attenuator	-	-	-	-

Note[1]: cables, attenuators and notch filters included in the test set-up were 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".*

10.5 Test Environmental Conditions

Temperature:	21ºC
Relative Humidity:	53%
ATM Pressure:	101.5 kPa

The testing was performed by Shankar Pangeni and Libass Thiaw from 2024-12-16 to 2025-02-10 at RF test site

10.6 Test Results

Please refer to the plots in Annex C for detailed test results.

U-NII-1.IC

Channel	Frequency (MHz)	Corrected PSD (dBm/MHz)	E.I.R.P Corrected PSD (dBm/MHz)	IC Limit (dBm/MHz)
802.11a				
36	5180	7.236	8.837	10
40	5200	6.080	7.680	10
48	5240	6.955	8.555	10
802.11n/ac20				
36	5180	5.510	7.110	10
40	5200	8.042	9.642	10
48	5240	7.399	8.999	10
802.11n/ac40				
38	5190	0.940	2.540	10
46	5230	3.656	5.256	10
802.11ac80				
42	5210	-2.550	-0.950	10

Note: EIRP PSD [dBm/MHz] = PSD [dBm/MHz] + Antenna Gain [dBi].
Note: DCCF was added to measurements

U-NII-1.FCC

Channel	Frequency (MHz)	PSD (dBm/MHz)	E.I.R.P Corrected PSD (dBm/MHz)	FCC Limit (dBm/MHz)
802.11a				
36	5180	7.236	8.837	11
40	5200	6.080	7.680	11
48	5240	6.955	8.555	11
802.11n/ac20				
36	5180	5.510	7.110	11
40	5200	8.042	9.642	11
48	5240	7.399	8.999	11
802.11n/ac40				
38	5190	0.940	7.110	11
46	5230	3.656	9.642	11
802.11ac80				
42	5210	-2.550	-0.950	11

Note: EIRP PSD [dBm/MHz] = PSD [dBm/MHz] + Antenna Gain [dBi].
Note: DCCF was added to measurements

U-NII-2A

Channel	Frequency (MHz)	PSD (dBm/MHz)	Corrected PSD (dBm/MHz)	Limit (dBm/MHz)
802.11a				
52	5260	6.448	7.286	11
60	5300	6.852	7.690	11
64	5320	6.806	7.644	11
802.11n/ac20				
52	5260	6.167	8.432	11
60	5300	6.289	8.554	11
64	5320	6.194	8.459	11
802.11n/ac40				
54	5270	1.847	4.122	11
62	5310	-0.367	1.908	11
802.11ac80				
56	5290	-6.273	-2.606	11

Note: Corrected PSD [dBm/MHz] = PSD [dBm/MHz] + DCCF

U-NII-2C

Channel	Frequency (MHz)	PSD (dBm/MHz)	Corrected PSD (dBm/MHz)	Limit (dBm/MHz)
802.11a				
100	5500	4.81	5.648	11
120	5600	5.215	6.053	11
140	5700	1.182	2.020	11
802.11n/ac20				
100	5500	3.901	6.166	11
120	5600	4.778	7.043	11
140	5700	0.595	2.860	11
802.11n/ac40				
102	5510	-0.750	1.705	11
118	5590	0.382	2.657	11
802.11ac80				
106	5530	-6.779	-3.112	11
122	5610	-8.105	-4.438	11

Note: Corrected PSD [dBm/MHz] = PSD [dBm/MHz] + DCCF

U-NII-3

Channel	Frequency (MHz)	PSD (dBm/510kHz)	Corrected PSD (dBm/510kHz)	Limit (dBm/500kHz)
802.11a				
149	5745	1.617	2.455	30
157	5785	1.565	2.403	30
165	5825	1.766	2.604	30
802.11n/ac20				
149	5745	1.491	3.756	30
157	5785	1.758	4.023	30
165	5825	0.559	2.824	30
802.11n/ac40				
151	5755	-2.622	-0.347	30
159	5795	-2.526	-0.251	30
802.11ac80				
155	5775	-8.353	-4.686	30

Note: For U-NII-3, measurement passed with more stringent RBW of 510kHz in order to show worst-case compliance.
Note: Corrected PSD [dBm/MHz] = PSD [dBm/MHz] + DCCF

Straddle PSD

Channel	Frequency (MHz)	Straddle PSD U-NII-2C (dBm/MHz)	Straddle PSD U-NII-2C Limit (dBm/MHz)	Straddle PSD U-NII-3 (dBm/MHz)	Straddle PSD U-NII-3 Limit (dBm/500kHz)
802.11a					
144	5720	2.575	11	2.110	30
802.11n/ac20					
144	5720	3.410	11	2.291	30
802.11n/ac40					
142	5710	-1.063	11	-3.940	30
802.11ac80					
138	5690	-5.226	11	-8.748	30

Note: For U-NII-3, measurement passed with more stringent RBW of 1MHz in order to show worst-case compliance.
Note: Corrected PSD [dBm/MHz] = PSD [dBm/MHz] + DCCF

11 FCC §15.407(b) & ISEDC RSS-247 §6.2 – Spurious Emissions at Antenna Terminals and Band Edges

11.1 Applicable Standards

According to FCC §15.407(b), undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

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 solely in the 5.725–5.850 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.
8) 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.
9) 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.
10) The provisions of §15.205 apply to intentional radiators operating under this section.

According to ISEDC RSS-247 §6.2.1.2, for transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

According to ISEDC RSS-247 §6.2.2.2, devices shall comply with the following:

c. All emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.; or
d. All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device, except devices installed in vehicles, shall be labelled or include in the user manual the following text "for indoor use only."

According to ISEDC RSS-247 §6.2.3.2, Emissions outside the band 5470-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, devices with bandwidth overlapping the band edge of 5725 MHz can meet the emission limit of -27 dBm/MHz e.i.r.p.at 5850 MHz instead of 5725 MHz.

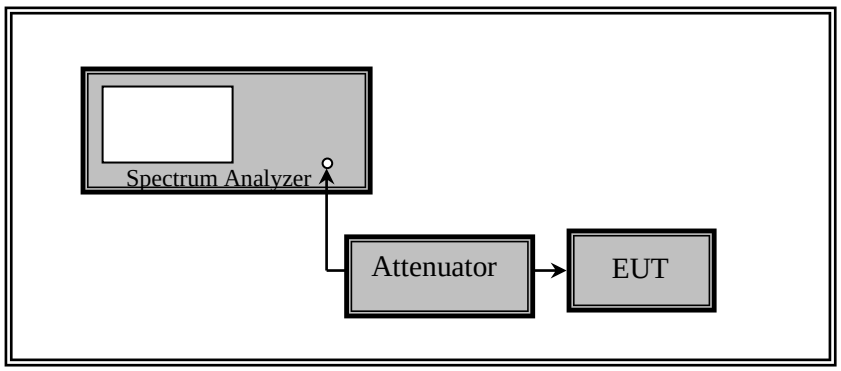
According to ISEDC RSS-247 §6.2.4.3, Devices operating in the band 5725-5850 MHz shall comply with the following e.i.r.p. spectral density limits:

e. 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 Bm/MHz at 5 MHz above or below the band edges;
f. 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
g. 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
h. -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

11.2 Measurement Procedure

1) Span = wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation
2) Set RBW = 1 MHz
3) Set VBW = 3 MHz
4) Sweep = coupled
5) Detector function = peak
6) Trace = max hold

11.3 Test Setup Block Diagram



11.4 Test Equipment List and Details

BACL No.	Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
624	Agilent	Spectrum Analyzer	E4446A	MY48250238	2024-06-14	1 year
-	-	10dB Attenuator	-	-	-	-

Note[1]: cables, attenuators and notch filters included in the test set-up were 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".*

11.5 Test Environmental Conditions

Temperature:	21ºC
Relative Humidity:	53%
ATM Pressure:	101.5 kPa

The testing was performed by Shankar Pangeni and Libass Thiaw from 2024-12-16 to 2025-02-10 at RF test site

11.6 Test Results

Test Result: Pass

Please refer to the plots from Annex F for detailed -27dBm test results.

U-NII-1 to U-NII-2A Leakage

These measurements are to verify the following: ISED RSS-247 Section 6.2.1.2, any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB.

Channel	Frequency (MHz)	Conducted Output Power at Fundamental (dBm)	Leakage Output Power (dBm)	Attenuation (dB)	Limit (dB)
802.11a					
48	5240	16.6727138	-17.53	34.202714	> 26
802.11n/ac20					
48	5240	18.0146242	-17.69	35.704624	> 26
802.11n/ac40					
46	5230	16.9745263	-18.56	35.5345263	> 26
802.11ac80					
42	5210	12.9412976	-26.98	39.9212976	> 26

Please refer to the plots in Annex E for detailed test results.

12 FCC §15.407(h) & ISEDC RSS-247 §6.3 – Dynamic Frequency Selection

12.1 Applicable Standards

FCC CFR47 §15.407 (h), RSS-247 Issue 3 and KDB: 905462 D02 UNII DFS Compliance Procedures New Rules v02.

Table 1: Applicability of DFS requirements prior to use of a channel

Requirement	Operational Mode		
	Master	Client (Without radar detection)	Client (With radar detection)
Non-Occupancy Period	Yes	Not Required	Yes
DFS Detection Threshold	Yes	Not Required	Yes
Channel Availability Check Time	Yes	Not Required	Not Required
U-NII Detection Bandwidth	Yes	Not Required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
DFS Detection Threshold	Yes	Not Required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not Required

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

Table 3: Interference Threshold for Master and Client with Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2 and 3)
EIRP≥ 200 milliwatt	-64 dBm
EIRP< 200 milliwatt and power spectral density < 10dBm/MHz	-62 dBm
EIRP< 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. **Note 2:** Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. **Note3**: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

Table 4: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds ***See Note 1***.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. ***See Notes 1 and 2***.
U-NII Detection Bandwidth	Minimum 100% of the UNII 99% transmission power bandwidth. ***See Note 3***.

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

Table 5: Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (Microseconds)	PRI (Microseconds)	Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a Test B: 15 unique PRI values randomly selected within the range of 518-3066 µsec, with a minimum increment of 1 µsec, excluding PRI values selected in Test A	$\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{\text{PRI}_{\mu\text{sec}}}\right)\right\}$	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.

Table 6: Long Pulse Radar Test Signal

Radar Type	Bursts	Chirp Width (MHz)	PRI (usec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Table 7: Frequency Hopping Radar Test Signal

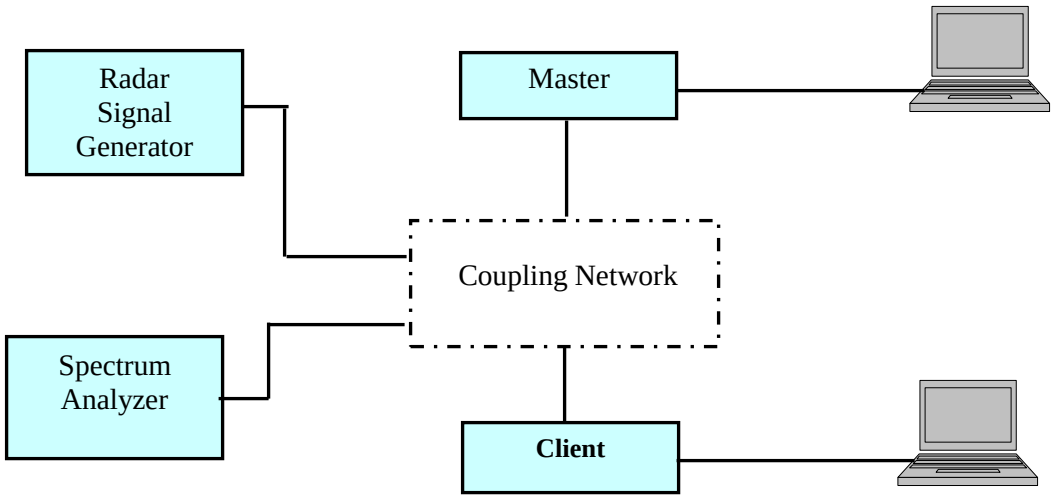
Radar Type	Pulse Width (usec)	PRI (usec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

Note: According to KDB: 905462 D02 UNII DFS Compliance Procedures New Rules v02, **Table 5: Short Pulse Radar Test Waveforms**, **Short Pulse Radar Type 0** was used for the detection bandwidth test, channel move time, and channel closing time tests.

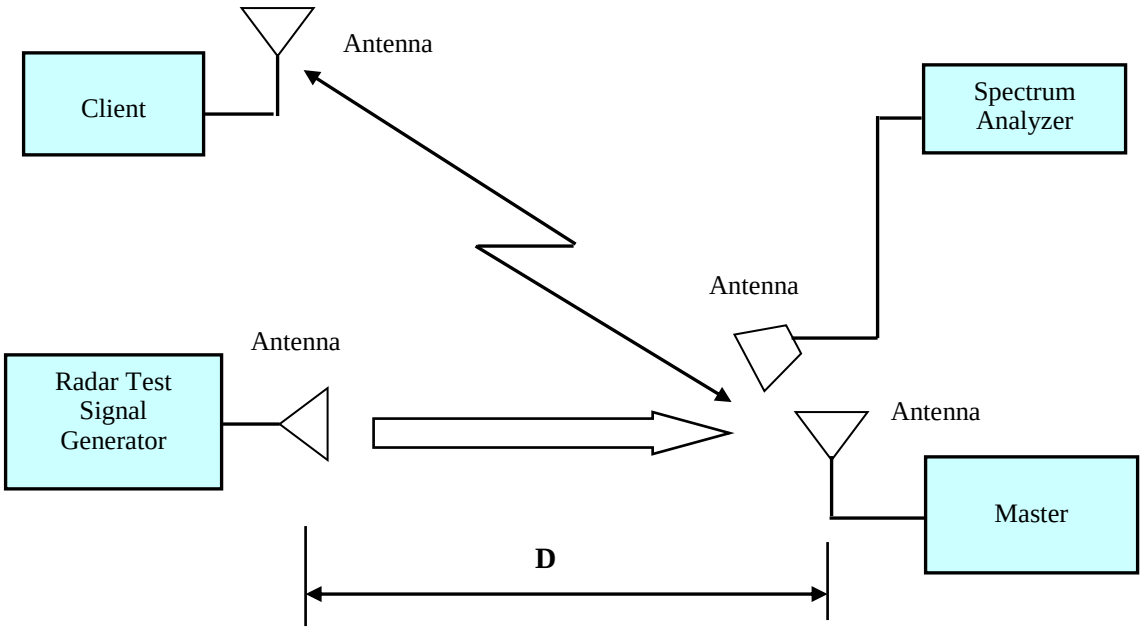
12.2 DFS Measurement System

BACL DFS measurement system consists of two subsystems: (1) The radar signal generating subsystem and (2) the traffic monitoring subsystem.

12.3 System Block Diagram



12.4 Radiated Method



12.5 Test Procedure

The EUT was connected to a certified master device (FCC ID: TC2-R1055 S9GH350, IC: 5912A-H350). A spectrum analyzer was used as a monitor that verifies the EUT's status, which includes the Channel Closing Transmission Time and the Channel Move Time.

BACL use type 0 radar signal to test the channel move time and channel closing transmission time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = N * Dwell Time

N is the number of spectrum analyzer bins showing a device transmission
Dwell Time is the dwell time per bin (i.e. Dwell Time = S/B, S is the sweep time and B is the number of bin, i.e. 8192)

12.6 Test Equipment List and Details

BACL No.	Manufacturer	Equipment Description	Model	S/N	Calibration Date	Calibration Interval
0424	Agilent	Analyzer, Spectrum	E4440A	US44300386	2024-06-03	1 year
0688	Keysight Technologies	MXG Vector Signal Generator	N5182B	MY51350070	2024-10-30	1 year
0188	Sunol Sciences	Horn Antenna	DRH-118	A052704	2023-06-11	2 years
0187	A.R.A	Horn Antenna	DRG-118/A	1132	2024-05-23	2 years
1120	Megaphase	20ft SMA-SMA RF cable	GC29-S1S1-240	1GVT4 18182702	2024-12-31	6 months
-	-	RF Cable	-	-	N/A	N/A

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".*

12.7 Test Environmental Conditions

Temperature:	22-24ºC
Relative Humidity:	47-49%
ATM Pressure:	101.9 kPa

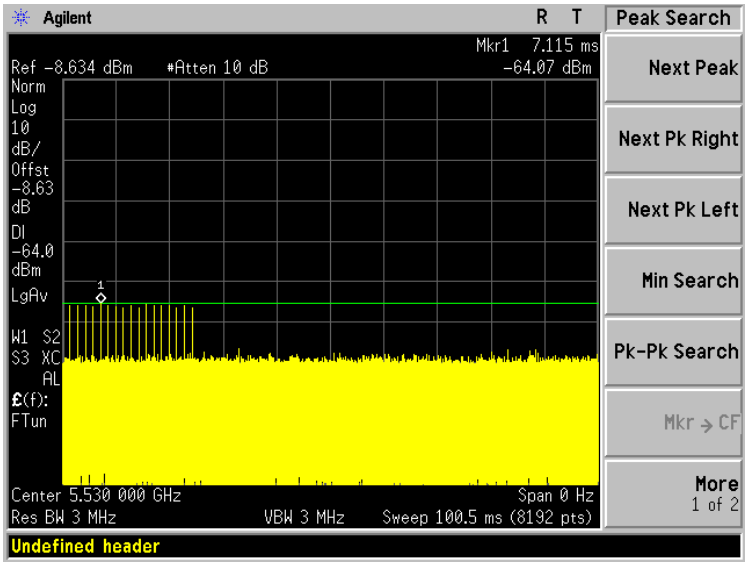
The testing was performed by Shankar Pangeni on 2025-01-21 to 2025-01-22 at DFS site.

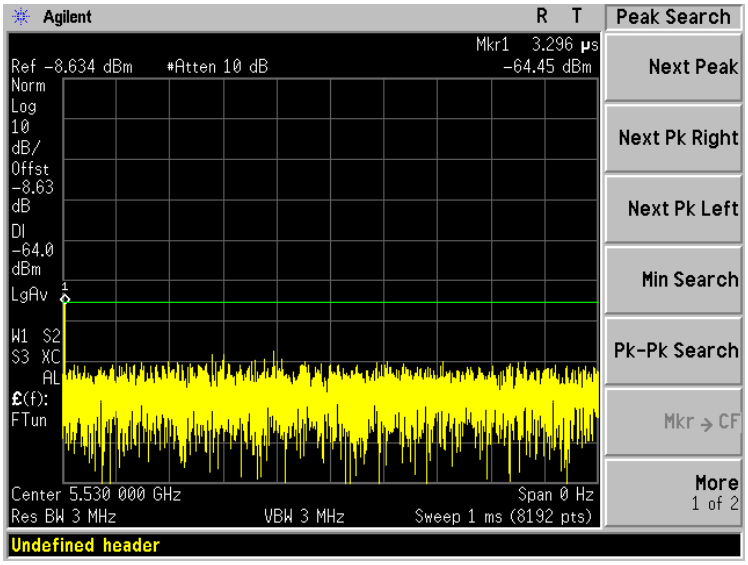
12.8 Test Results

Plots of Radar Waveforms

Radar Type 0

5530 MHz



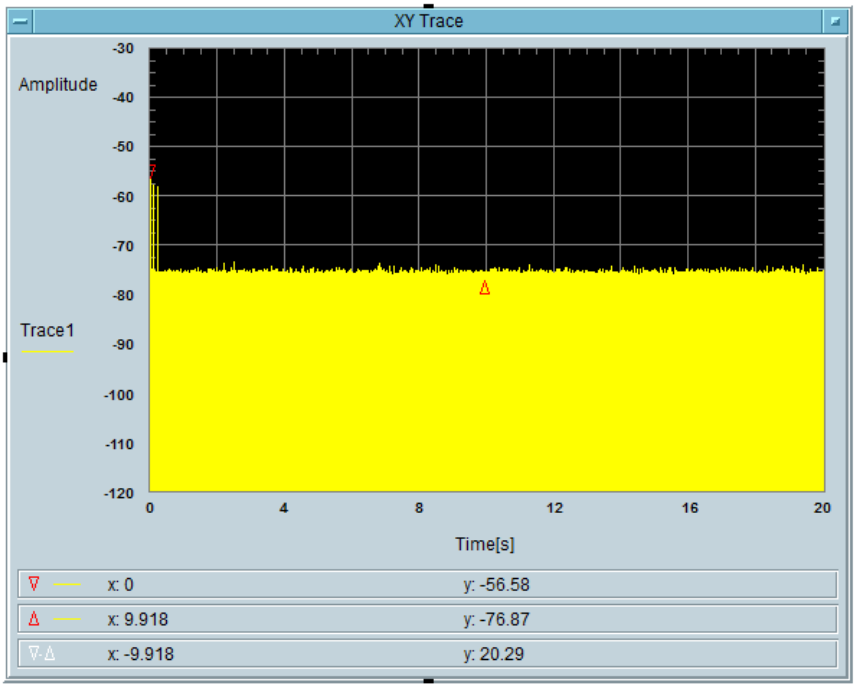


Note: Second plot represents the initial pulse by decreasing the Sweep time.

Channel Shutdown and Closing Time

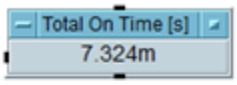
Frequency (MHz)	Bandwidth (MHz)	Radar Type	Results
5530	80	Type 0	Compliant

Type 0 radar channel move time less than 10s result:



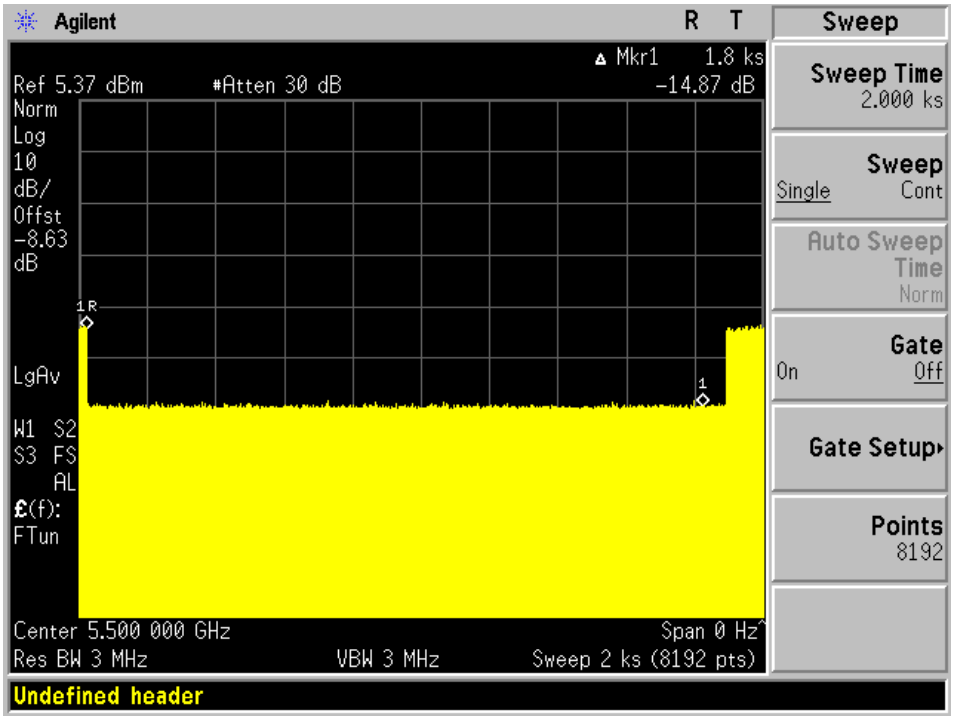
Type 0 radar channel closing transmission time result:

Channel closing transmitting time (ms)	Limit (ms)	Result
7.324+2.441=9.765	200	Pass



Non-occupancy Time

5500 MHz for 20 MHz channel bandwidth



Note: the communication between EUT and router was set to 5530 MHz and 80 MHz channel bandwidth. However, 5500 MHz is the primary channel that contains the control signal. Therefore, it was monitored for the non-occupancy period.

13 Appendix A (Normative) – EUT Test Setup Photographs

Please refer to the attachment.

14 Appendix B (Normative) – EUT External Photographs

Please refer to the attachment.

15 Appendix C (Normative) – EUT Internal Photographs

Please refer to the attachment.

16 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 13th day of September 2024.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3297.02
Valid to September 30, 2026

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 ---