FCC PART 15, SUBPART C, E
ISEDC RSS-247, ISSUE 3, AUGUST 2023

TEST REPORT

For

Zebra Technologies Corporation

3 Overlook Point
Lincolnshire, IL 60069, USA

FCC ID: I28-WYSBHVDXP
IC: 3798B-WYSBHVDXP

Report Type: Class II Permissive Change (FCC) Class IV Permissive Change (IC)	**Product Type:** WLAN/BTLE module
Prepared By:	Xavier Kelley RF Test Engineer
Report Number:	R2403221-01
Report Date:	2024-05-30
Reviewed By:	Christian McCaig RF Lead Engineer

Bay Area Compliance Laboratories Corp.
1274 Anvilwood Avenue,
Sunnyvale, CA 94089, USA
Tel: (408) 732-9162; Fax: (408) 732-9164

ACCREDITED
CERTIFICATE #3297.02

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R2403221-01	Class II Permissive Change (FCC) Class IV Permissive Change (IC)	2024-05-30

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test report was prepared on behalf of Zebra Technologies Corporation, and their product model: WYSBHVDXP, FCC ID: I28-WYSBHVDXP, IC: 3798B-WYSBHVDXP or the "EUT" as referred to in this report. The EUT is WLAN/BTLE module. The EUT was installed in host device with model number: ZD621 (Similar Model: ZD611).

1.2 Mechanical Description of the EUT

The EUT Host device (ZD621) dimension measured approximately 21.1 cm (L) x 17.7 cm (W) x 15.1 cm (H) and weights approximately 1.6 kg.

The data gathered was from a production sample provided by Zebra Technologies Corporation with S/N: DBJ235002565

1.3 Objective

This report was prepared on behalf of Zebra Technologies Corporation in accordance with Part 2, Subpart J, Part 15, Subpart C and Subpart E of the Federal Communication Commission's rules and ISEDC RSS-247 Issue 3, August 2023.

The objective was to determine compliance with FCC Part 15.247, 15.407 and ISEDC RSS-247 for RF Exposure, AC Line Conducted Emissions and Radiated Spurious Emissions.

This project is a Permissive Change submission for the purpose of enabling colocation with a RFID module (FCC ID: UZ7RE40 and IC: 109AN-RE40) installed in the two specific hosts wireless printer with models ZD621 and ZD611.

1.4 Related Submittal(s)/Grant(s)

N/A

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices and FCC KDB 558074 D01 DTS Meas Guidance v05r02: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247, and 789033 D02 General U-NII Test Procedures 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	±0.86 dB
Power Spectral Density, conducted	±0.86 dB
Unwanted Emissions, conducted	±2.76 dB
All emissions, radiated	±4.94 dB
AC power line Conducted Emission	±2.0 dB
Temperature	±2 ° C
Humidity	±5 %
DC and low frequency voltages	±1.0 %
Time	±2 %
Duty Cycle	±3 %

1.7 Test Facility Registrations

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

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

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

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

1.8 Test Facility Accreditations

Bay Area Compliance Laboratories Corp. (BACL) is:

A- ***An independent, 3rd-Party, Commercial Test Laboratory accredited to ISO/IEC 17025:2017 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 C63.10-2013, FCC KDB 558074 D01 DTS Meas Guidance v05r02 and 789033 D02 General U-NII Test Procedures New Rules v02r01

2.2 EUT Exercise Software

The test software used was "Toolbox – version 1.84.21488 CI" provided by Zebra Technologies Corporation, The software is compliant with the standard requirements being tested against.

Radio	Config	Frequency (MHz)
RE40	Default	902.75
I28-WYSBHVDXP	802.11ax 2.4GHz	2437
I28-WYSBHVDXP	802.11ax 5GHz	5580
I28-WYSBHVDXP	BLE	2402

2.3 Equipment Modifications

No modifications were made to the EUT during testing.

2.4 Local Support Equipment

Manufacturer	Description	Model	Serial Number
Dell	Laptop	Latitude E7440	GCP4P A03 DPC

2.5 Remote Support Equipment

None

2.6 Power Supply and Line Filters

None

2.7 Interface Ports and Cabling

Cable Description	Length (m)	From	To
USB-A to USB-B	< 1	EUT	Laptop

3 Summary of Test Results

Results reported relate only to the product tested.

FCC/ISEDC Rules	Description of Test	Results
FCC §2.1091, §15.247(i) ISEDC RSS-102	RF Exposure	Compliant
FCC §15.207 ISEDC RSS-Gen §8.8	AC Line Conducted Emissions	Compliant
FCC §15.209, §15.247(d), 15.407(b) ISEDC RSS-247 §5.5, §6.2 RSS-Gen §8.9, §8.10	Radiated Spurious Emissions	Compliant

Disclaimer: *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 §2.1091, §15.247(i) & ISEDC RSS-102 - RF Exposure

4.1 Applicable Standards

According to FCC §15.247(i) and §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.

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

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

According to ISED RSS-102 Issue 5:

2.5.2 Exemption Limits for Routine Evaluation — RF Exposure Evaluation

RF 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, except when the device operates as follows:

- below 20 MHzFootnote6 and the source-based, time-averaged maximum e.i.r.p. 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 e.i.r.p. 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 e.i.r.p. 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 e.i.r.p. of the device is equal to or less than 1.31×10^{-2} f0.6834 W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. 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 e.i.r.p. was derived.

4.2 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

4.3 RF Exposure Evaluation Exemption for FCC

NOTE: separation distance is declared to be 25cm based on minimum separation distance of RFID module.
Worst Case Co-location MPE Calculation: BT(I28- WYSBHVDXP) and RFID(UZ7RE40)

Radio	Max EIRP (dBm)	Evaluated Distance (cm)	Worst-Case Exposure Level	Limit	Worst-Case Ratios	Sum of Ratios	Limit
Worst Case							
BT	15.8	20	0.0076 mW/cm^2	1.0 mW/cm^2	0.76%	17.4%	100%
RFID*	27	20	0.0997 mW/cm^2	0.602 mW/cm^2	16.6%		

Note: Output Power is 12.0 dBm, antenna gain is 3.8dBi

Worst Case Co-location MPE Calculation: 2.4 Wi-Fi(I28- WYSBHVDXP) and RFID(UZ7RE40)

Radio	Max EIRP (dBm)	Evaluated Distance (cm)	Worst-Case Exposure Level	Limit	Worst-Case Ratios	Sum of Ratios	Limit
Worst Case							
Wi-Fi	20.5	20	0.022 mW/cm^2	1.0 mW/cm^2	2.2%	18.8%	100%
RFID*	27	20	0.0997 mW/cm^2	0.602 mW/cm^2	16.6%		

Note: Output Power is 17.0 dBm, antenna gain is 3.5dBi

Worst Case Co-location MPE Calculation: 5 Wi-Fi(I28- WYSBHVDXP) and RFID(UZ7RE40)

Radio	Max EIRP (dBm)	Evaluated Distance (cm)	Worst-Case Exposure Level	Limit	Worst-Case Ratios	Sum of Ratios	Limit
Worst Case							
Wi-Fi	18.7	20	0.015 mW/cm^2	1.0 mW/cm^2	1.5%	18.1%	100%
RFID*	27	20	0.0997 mW/cm^2	0.602 mW/cm^2	16.6%		

Note: Output Power is 15.0 dBm, antenna gain is 3.7dBi
Note: worst case of output power and eirp used for RFID for calculations*

4.4 RF Exposure Evaluation Exemption for IC

BT

Maximum EIRP power = 12 dBm + 3.8 dBi = 15.8 dBm which is lesser than $1.31\times10^{-2}f^{0.6834}$ = 2.67 W = 34.26 dBm.

2.4GHz WiFi

Maximum EIRP power = 17 dBm + 3.5 dBi = 20.5 dBm which is lesser than $1.31\times10^{-2}f^{0.6834}$ = 2.68 W = 34.28 dBm.

5GHz WiFi

Maximum EIRP power = 15 dBm + 3.7 dBi = 18.7 dBm which is lesser than $1.31\times10^{-2}f^{0.6834}$ = 4.52 W = 36.55 dBm.

RFID

Maximum EIRP power = 27.00 dBm -30 dBi = -3.00 dBm which is lesser than $1.31\times10^{-2}f^{0.6834}$ = 1.371 W = 31.37 dBm.

Therefore, the RF exposure Evaluation is exempt.

NOTE: for WIFI/BT, please refer to report number FA0D2423-05 issued by Sporton Lab on 8/28/2023.
NOTE: for RFID, please refer to report number FA051819 issued by Sporton Lab on 7/15/2020.
NOTE: Wifi Antenna models are B53023-30 and B53025-30. BT Antenna model is B53026-90.

5 FCC §15.207, ISEDC RSS-Gen §8.8 – AC Line Conducted Emissions

5.1 Applicable Standards

As per FCC §15.207(a): Except as shown in paragraphs (b) and (c) of this section, 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 frequency ranges.

Frequency of Emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50
* Decreases with the logarithm of the frequency		

As per ISEDC RSS-Gen §8.8 AC power-line conducted emissions limits:

Unless stated otherwise in the applicable RSS, for radio apparatus that are designed to be connected to the public utility AC power network, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the range 150 kHz to 30 MHz shall not exceed the limits in Table 4, as measured using a 50 μH / 50 Ω line impedance stabilization network. This requirement applies for the radio frequency voltage measured between each power line and the ground terminal of each AC power-line mains cable of the EUT.

For an EUT that connects to the AC power lines indirectly, through another device, the requirement for compliance with the limits in Table 4 shall apply at the terminals of the AC power-line mains cable of a representative support device, while it provides power to the EUT. The lower limit applies at the boundary between the frequency ranges. The device used to power the EUT shall be representative of typical applications.

Table 4 – AC power-line conducted emissions limits

Frequency (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56[Note 1]	56 to 46 [Note 1]
0.5 – 5	56	46
5 – 30	60	50
Note 1: The level decreases linearly with the logarithm of the frequency.		

5.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.10-2013. The specification used was the FCC 15 Subpart C and ISEDC RSS-Gen 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.

The EUT was connected (via LISN-1) to 120V, 60Hz AC power source.

5.3 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 was 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".

Below 1000 MHz, the Resolution Bandwidth was set to 120 kHz and the Video Bandwidth was set to 300 kHz for each sweep. The receiver automatically sets to these values.

5.4 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), LISN calibration factor, and attenuation of the impulse limiter and the high pass filter. The basic equation is as follows:

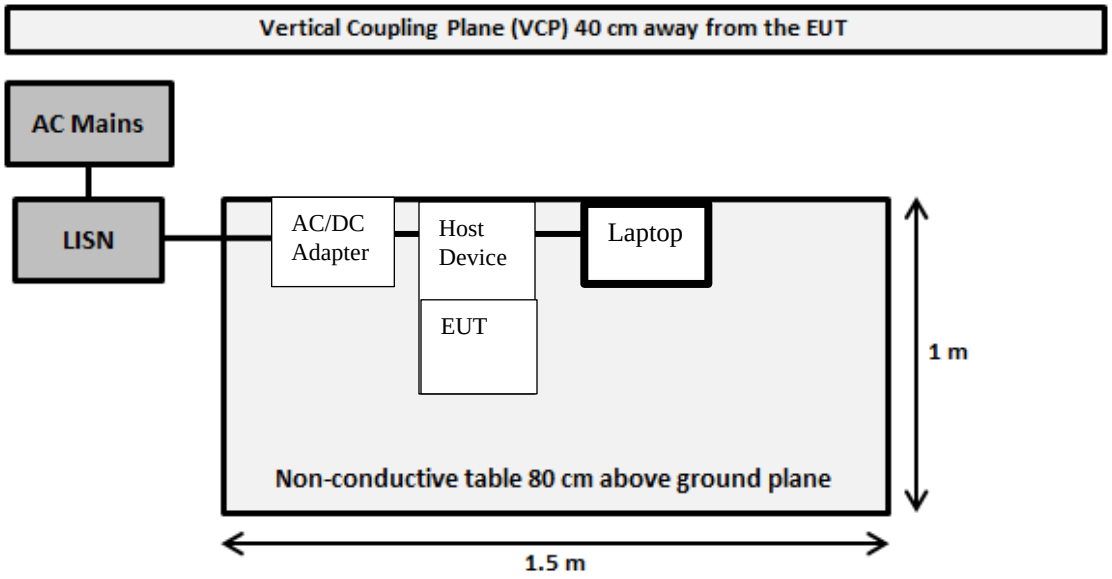
$$CF = CL + \text{LISN calibration factor} + \text{Attenuation}$$

For example, a corrected amplitude of 46.2 dBuV = Indicated Reading (32.5 dBuV) + Cable Loss (3.5 dB) + LISN calibration factor (0.2 dB) + Attenuator (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:

$$\text{Margin} = \text{Corrected Amplitude} - \text{Limit}$$

5.5 Test Setup Block Diagram



5.6 Test Equipment List and Details

BACL No.	Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
310	Rohde & Schwarz	Receiver, EMI Test	ESCI 1166.5950.03	100338	2023-05-11	1 year
680	Rohde & Schwarz	Impulse Limiter	ESH3-Z2	101964	2024-03-22	1 year
724	Solar Electronics Company	High Pass Filter	Type 7930-100	7930150202	2024-03-22	1 year
732	FCC	LISN	FCC-LISN-50-25-2-10-CISPR16	160129	2023-09-12	1 year
1425	Fairview Microwave	Micro-Coax Cable	FMC0101223-240	210241	2024-01-12	1 year
348	California Instruments	AC Power Source	5001ix-208	57079	Calibration not Required	Calibration not Required

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".*

5.7 Test Environmental Conditions

Temperature:	23.1 to 24.1 °C
Relative Humidity:	54.0-56.1 %
ATM Pressure:	101.9 kPa

The testing was performed by Libass Thiaw on 2024-04-08 in Ground Plane.

5.8 Summary of Test Results

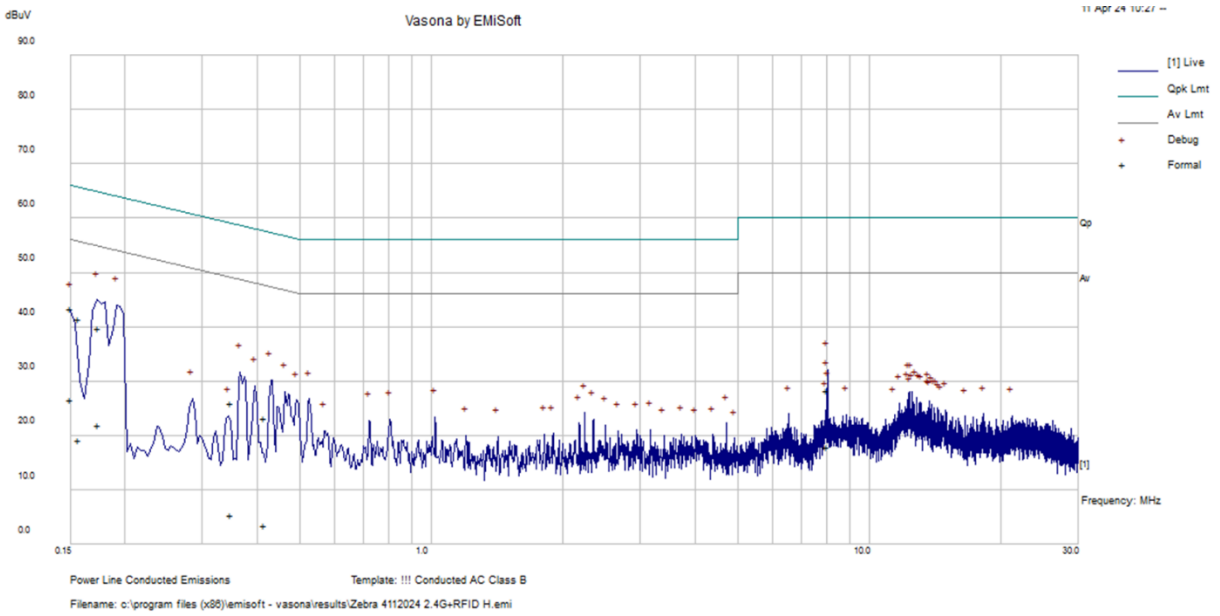
According to the data hereinafter, the EUT complied with the FCC Part 15C, FCC PART 15E and ISEDC RSS-247 standards' radiated emissions limits, and had the worst margin of:

Worst Case – AC Line : 120V, 60Hz			
Margin (dB)	**Frequency (MHz)**	**Conductor Mode (Hot/Neutral)**	**Frequency Range**
-22.03	0.150173	Neutral	150 kHz to 30 MHz

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

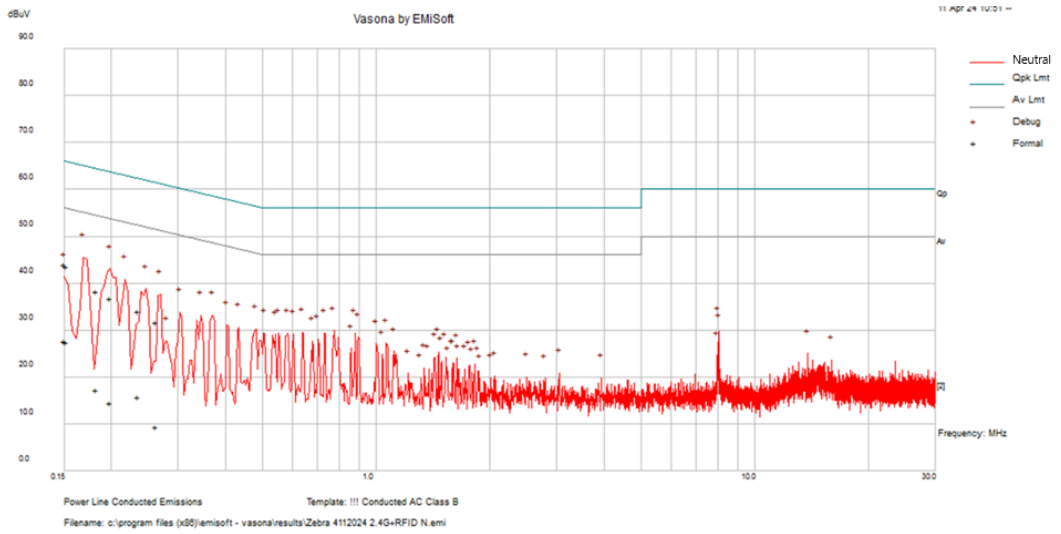
5.9 AC Line Conducted Emissions Test Results

AC Line: RFID+2.4GHz: 120V, 60Hz – Hot Conductor



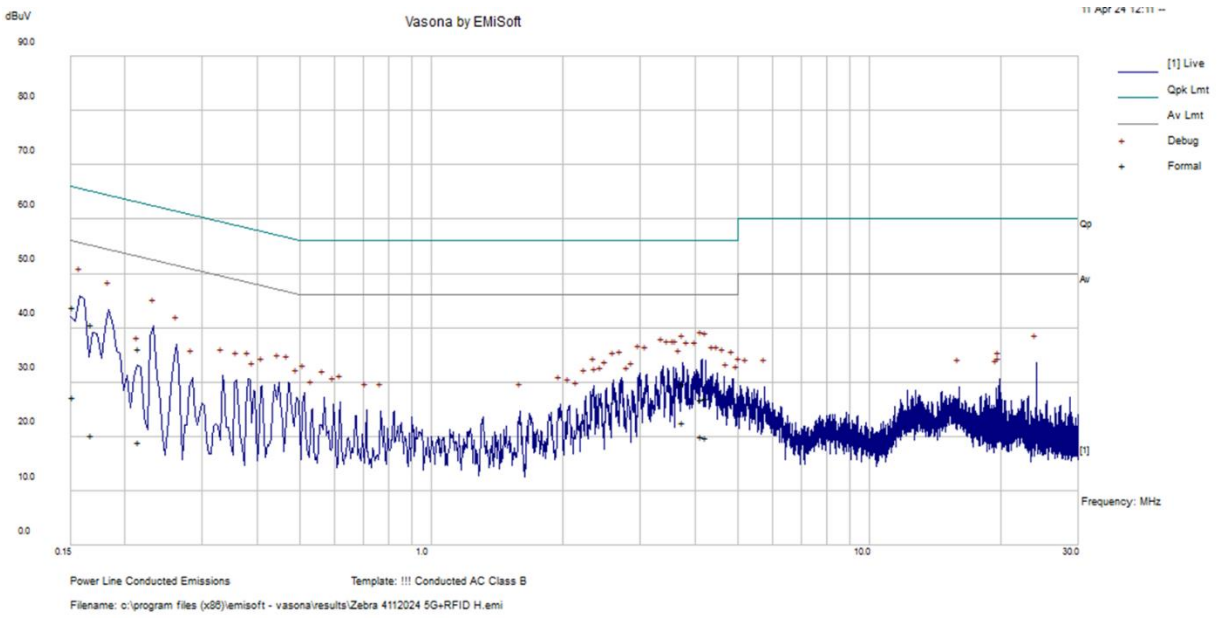
Frequency (MHz)	Ai. Reading (dBuV)	Correction Factor (dB)	Corrected Amplitude (dBµV)	Limit (dBµV)	Margin (dB)	Detector
0.156873	29.56	11.9	41.46	65.63	-24.17	QP
0.173641	27.88	11.82	39.7	64.78	-25.08	QP
0.150397	31.5	11.93	43.43	65.98	-22.55	QP
0.349849	15.28	10.62	25.9	58.97	-33.07	QP
0.414797	12.83	10.4	23.23	57.55	-34.32	QP
8.016326	18.13	10.11	28.24	60	-31.76	QP
0.156873	7.25	11.9	19.15	55.63	-36.48	Ave
0.173641	10.16	11.82	21.98	54.78	-32.8	Ave
0.150397	14.69	11.93	26.62	55.98	-29.36	Ave
0.349849	-5.25	10.62	5.37	48.97	-43.6	Ave
0.414797	-6.97	10.4	3.43	47.55	-44.12	Ave
8.016326	7.82	10.11	17.93	50	-32.07	Ave

AC Line: RFID+2.4GHz: 120V, 60Hz – Neutral Conductor



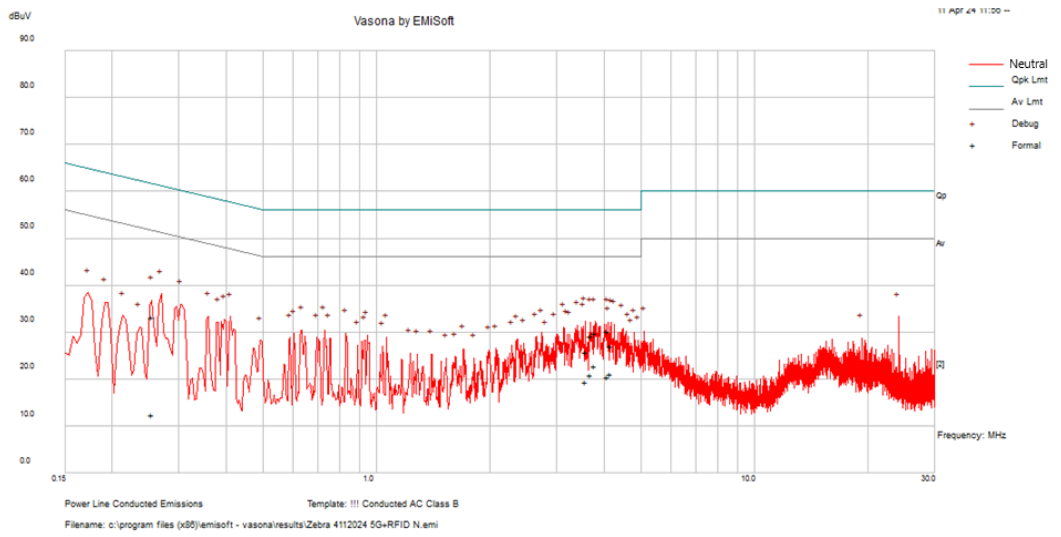
Frequency (MHz)	Ai. Reading (dBuV)	Correction Factor (dB)	Corrected Amplitude (dBµV)	Limit (dBµV)	Margin (dB)	Detector
0.151882	31.75	11.93	43.68	65.9	-22.22	QP
0.182904	26.44	11.8	38.24	64.35	-26.11	QP
0.199167	25.07	11.74	36.81	63.65	-26.84	QP
0.235193	22.67	11.43	34.1	62.26	-28.16	QP
0.263036	20.61	11.17	31.78	61.33	-29.55	QP
0.150173	32.03	11.93	43.96	65.99	-22.03	QP
0.151882	15.42	11.93	27.35	55.9	-28.55	Ave
0.182904	5.41	11.8	17.21	54.35	-37.14	Ave
0.199167	2.64	11.74	14.38	53.65	-39.27	Ave
0.235193	4.43	11.43	15.86	52.26	-36.4	Ave
0.263036	-1.9	11.17	9.27	51.33	-42.06	Ave
0.150173	15.75	11.93	27.68	55.99	-28.31	Ave

AC Line: 5GHz+RFID: 120V, 60Hz – Hot Conductor



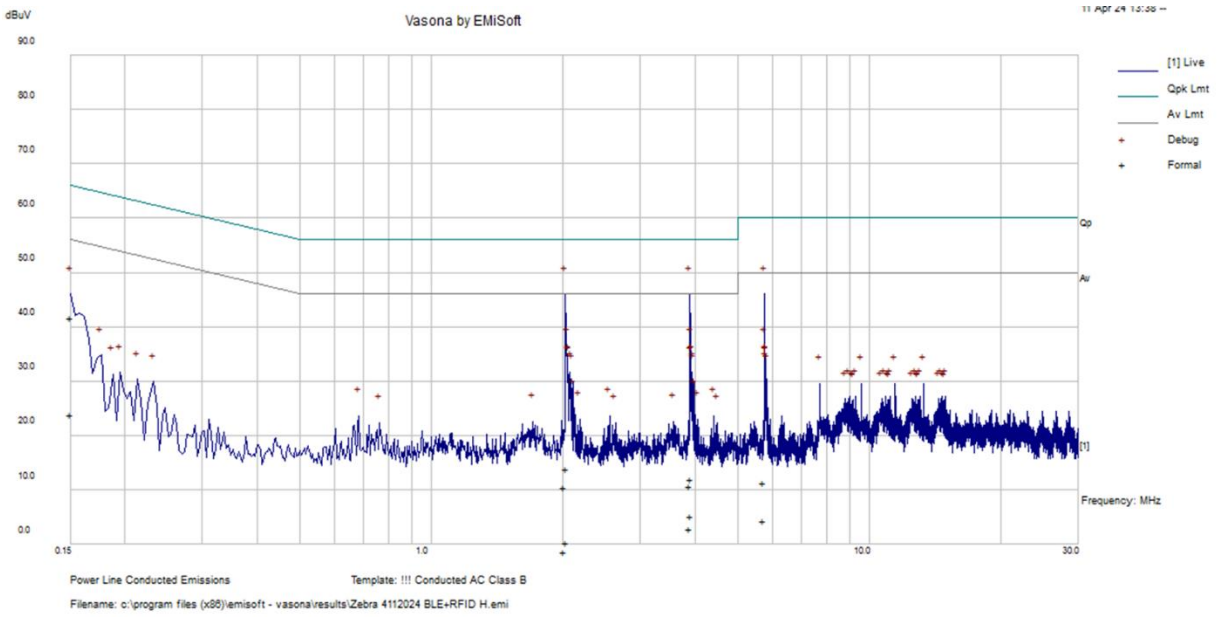
Frequency (MHz)	Ai. Reading (dBuV)	Correction Factor (dB)	Corrected Amplitude (dBµV)	Limit (dBµV)	Margin (dB)	Detector
0.151865	31.91	11.93	43.84	65.9	-22.06	QP
0.168014	28.87	11.85	40.72	65.06	-24.34	QP
4.143744	16.68	10.1	26.78	56	-29.22	QP
4.224197	16.9	10.11	27.01	56	-28.99	QP
0.215551	24.5	11.64	36.14	62.99	-26.85	QP
3.746511	19.6	10.11	29.71	56	-26.29	QP
0.151865	15.32	11.93	27.25	55.9	-28.65	Ave
0.168014	8.45	11.85	20.3	55.06	-34.76	Ave
4.143744	9.96	10.1	20.06	46	-25.94	Ave
4.224197	9.63	10.11	19.74	46	-26.26	Ave
0.215551	7.3	11.64	18.94	52.99	-34.05	Ave
3.746511	12.35	10.11	22.46	46	-23.54	Ave

AC Line: RFID+5GHz: 120V, 60Hz – Neutral Conductor



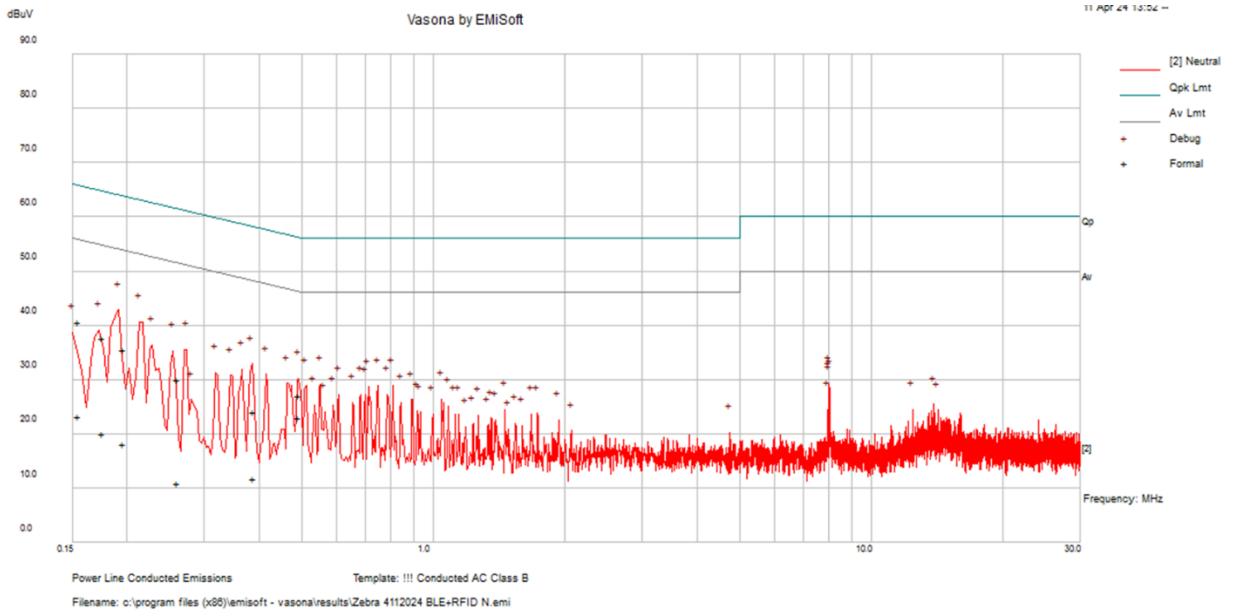
Frequency (MHz)	Ai. Reading (dBuV)	Correction Factor (dB)	Corrected Amplitude (dBµV)	Limit (dBµV)	Margin (dB)	Detector
0.255314	21.84	11.24	33.08	61.58	-28.5	QP
3.571013	15.54	10.1	25.64	56	-30.36	QP
3.77778	19.71	10.11	29.82	56	-26.18	QP
4.078806	20.05	10.1	30.15	56	-25.85	QP
3.679897	18.94	10.11	29.05	56	-26.95	QP
4.169748	16.97	10.1	27.07	56	-28.93	QP
0.255314	1.09	11.24	12.33	51.58	-39.25	Ave
3.571013	9.35	10.1	19.45	46	-26.55	Ave
3.77778	12.72	10.11	22.83	46	-23.17	Ave
4.078806	10.35	10.1	20.45	46	-25.55	Ave
3.679897	10.66	10.11	20.77	46	-25.23	Ave
4.169748	10.9	10.1	21	46	-25	Ave

AC Line: RFID+BLE: 120V, 60Hz – Hot Conductor



Frequency (MHz)	Ai. Reading (dBuV)	Correction Factor (dB)	Corrected Amplitude (dBµV)	Limit (dBµV)	Margin (dB)	Detector
0.150032	11.95	11.93	23.88	56	-32.12	QP
0.150032	29.77	11.93	41.7	66	-24.3	QP
2.007134	-11.64	10.13	-1.51	46	-47.51	QP
2.007134	0.37	10.13	10.5	56	-45.5	QP
2.0413	3.71	10.13	13.84	56	-42.16	QP
2.0413	-9.98	10.13	0.15	46	-45.85	QP
3.887145	-7.37	10.11	2.74	46	-43.26	Ave
3.887145	0.51	10.11	10.62	56	-45.38	Ave
3.914184	-4.95	10.11	5.16	46	-40.84	Ave
3.914184	1.86	10.11	11.97	56	-44.03	Ave
5.752955	-5.92	10.1	4.18	50	-45.82	Ave
5.752955	1.29	10.1	11.39	60	-48.61	Ave

AC Line: RFID+BLE: 120V, 60Hz – Neutral Conductor



Frequency (MHz)	Ai. Reading (dBuV)	Correction Factor (dB)	Corrected Amplitude (dBµV)	Limit (dBµV)	Margin (dB)	Detector
0.176215	25.72	11.82	37.54	64.66	-27.12	QP
0.195724	23.81	11.75	35.56	63.79	-28.23	QP
0.389279	13.53	10.48	24.01	58.08	-34.07	QP
0.260702	18.8	11.19	29.99	61.41	-31.42	QP
0.154857	28.67	11.91	40.58	65.74	-25.16	QP
0.494234	16.95	10.12	27.07	56.1	-29.03	QP
0.176215	8.19	11.82	20.01	54.66	-34.65	Ave
0.195724	6.31	11.75	18.06	53.79	-35.73	Ave
0.389279	1.16	10.48	11.64	48.08	-36.44	Ave
0.260702	-0.24	11.19	10.95	51.41	-40.46	Ave
0.154857	11.35	11.91	23.26	55.74	-32.48	Ave
0.494234	12.88	10.12	23	46.1	-23.1	Ave

6 FCC §15.209, §15.247(d), §15.407(b) & ISEDC RSS-247 §5.5, §6.2 , RSS-Gen §8.9, §8.10 - Spurious Radiated Emissions

6.1 Applicable Standards

As per FCC §15.35(d): 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) and RSS-Gen 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(a): Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

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

** 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 §15.247(d),

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c).

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 when the requirements applicable to a given device state otherwise, emission from license-exempt transmitters shall company with the field strength limits shown in the table below. Additional, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission.

General Field Strength Limits for License-Exemption Transmitters at Frequencies above 30 MHz

Frequency (MHz)	Field Strength (µv/m at 3 meters)
30-88	100
88-216	150
216-960	200
Above 960*	500

* Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for license-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.

Note: Transmitting devices are not permitted in restricted frequency bands unless stated otherwise in the specific RSS.

As per ISEDC RSS-247 §5.5, in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with

the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

6.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.10-2013. The specification used was the FCC 15 Subpart C 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.

6.3 Test Procedure

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

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

The EUT was set 3 meter away from the testing antenna, which was varied from 1-4 meter, and the EUT was placed on a turntable, which was 0.8 meter and 1.5 meter above the ground plane for below and above 1000 MHz measurements, 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 = 1MHz / Sweep = Auto
(2) Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

6.4 Corrected Amplitude & 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

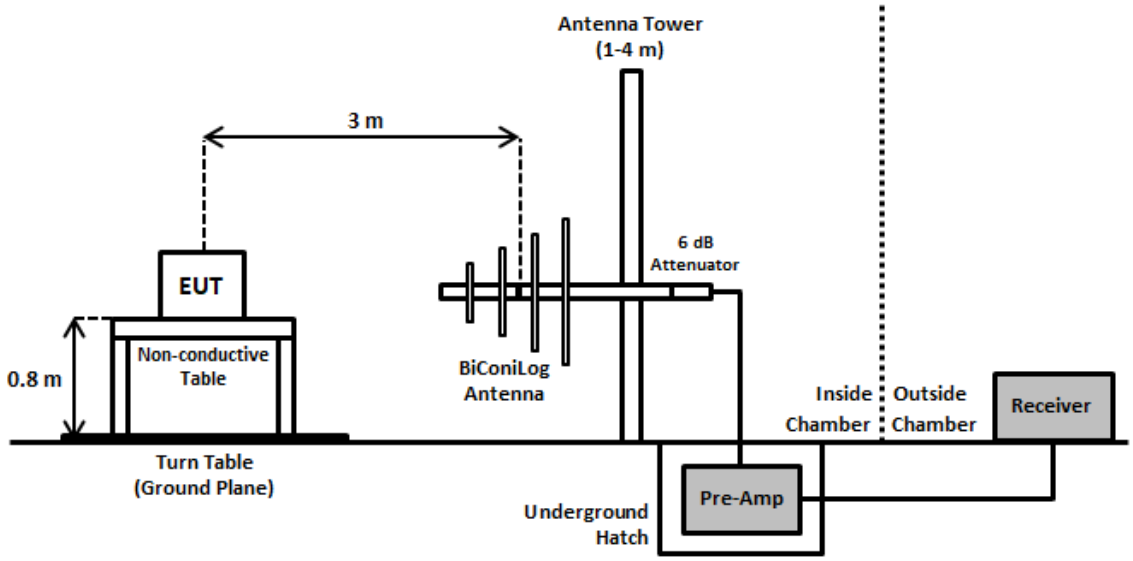
For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)

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:

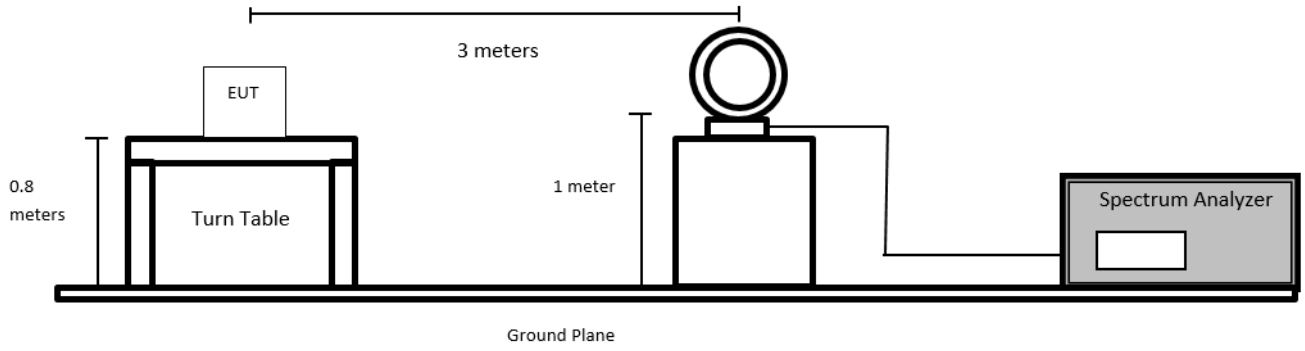
Margin = Corrected Amplitude – Limit

6.5 Test Setup Block Diagram

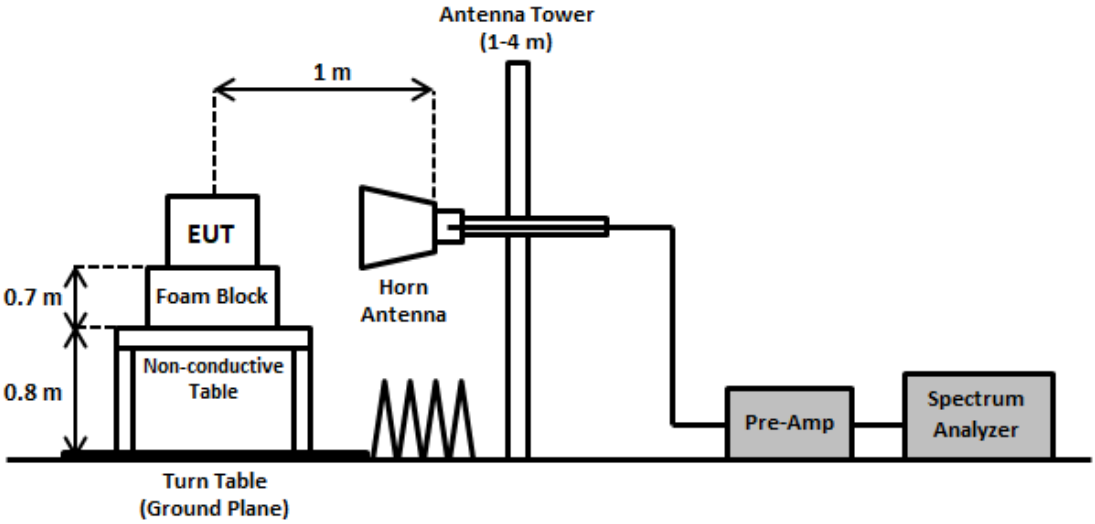
30 MHz to 1000 MHz



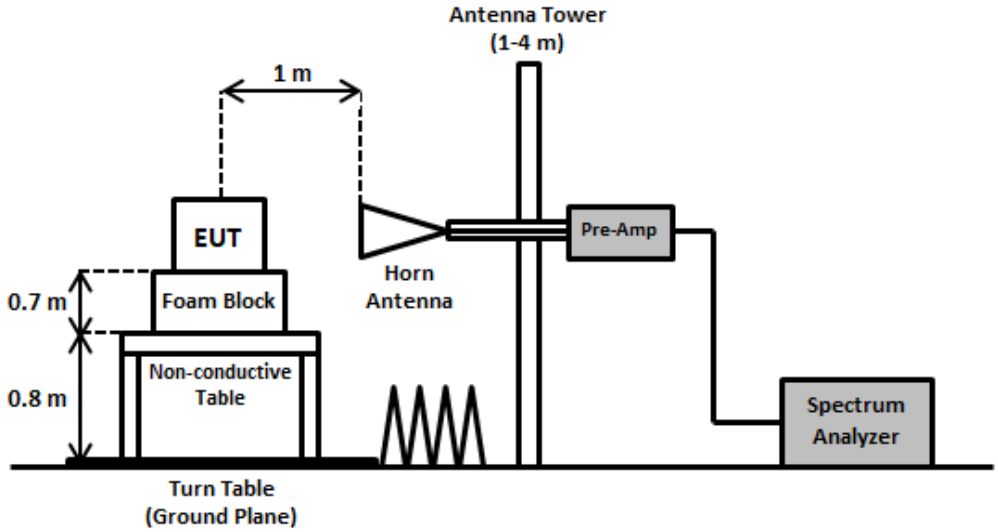
< 30MHz



1 GHz to 18 GHz



> 18 GHz



6.6 Test Equipment List and Details

BACL No.	Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
310	Rohde & Schwarz	EMI Test Receiver 9 KHZ to 3 GHZ	ESCI 1166.5950.03	100338	2023-05-11	1 year
393	Com-Power	Antenna, Loop Active	AL-130	17043	2023-05-26	2 years
624	Agilent	Spectrum Analyzer	E4446A	MY48250238	2023-05-12	1 year
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
316	Sonoma Instruments	Preamplifier	317	260406	2024-02-27	6 months
321	Sunol Sciences	Biconilog Antenna	JB3	A020106-2; 1504	2023-12-18	2 years
1186	Pasternack	Coaxial Cable, RG214	PE3062-1050CM	N/A	2023-10-03	1 year
1245	-	6dB Attenuator	PE7390-6	01182018A	2023-12-18	2 years
1246	Hewlet Packard	RF Limiter	11867A	01734	2023-04-13	1 year
1248	Pasternack	RG214 COAX Cable	PE3062	N/A	2023-10-04	1 year
1249	Time Microwave	LMR-400 Cable Dc-3 GHz	AE13684	2k80612-5 6fts	2023-10-09	1 year
658	HP/ Agilant	Pre Amplifier	8449B OPT HO2	3008A01103	2023-12-01	6 months
1192	ETS Lindgren	Horn Antenna	3117	00218973	2022-09-29	2 years
1247	Uti flex	Micro - Coax	N/A	N/A	2023-12-01	6 months
1353	RFMW	2.92mm 10ft RF Cable DC to 40 GHz	P1CA-29M29M-F150-120	N/A	2024-01-24	6 months
672	Micro-Tronics	2.4-2.6 GHz Notch Filter	BRM50701	160	2024-03-06	1 year
91	Wisewave	Horn Antenna	ARH-4223-02	10555-02	2024-03-14	2 years
230	Wisewave	Horn Antenna	ARH-2823-02	10555-02	2024-03-14	2 years
827	AH Systems	Preamplifier	PAM 1840 VH	170	2023-11-08	6 months
1329	Pasternack	2.92mm short coaxial cable	PE360-12	N/A	2023-11-28	6 months

Note: cable and notch filters 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".*

6.7 Test Environmental Conditions

Temperature:	23.1 to 24.1 °C
Relative Humidity:	54.0-56.1 %
ATM Pressure:	101.9 kPa

The testing was performed by Xavier Kelley on 2024-04-03 to 2024-04-09 in 5m3 chamber.

6.8 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Part 15C, 15E and ISEDC RSS-247 standards' radiated emissions limits, and had the worst margin of:

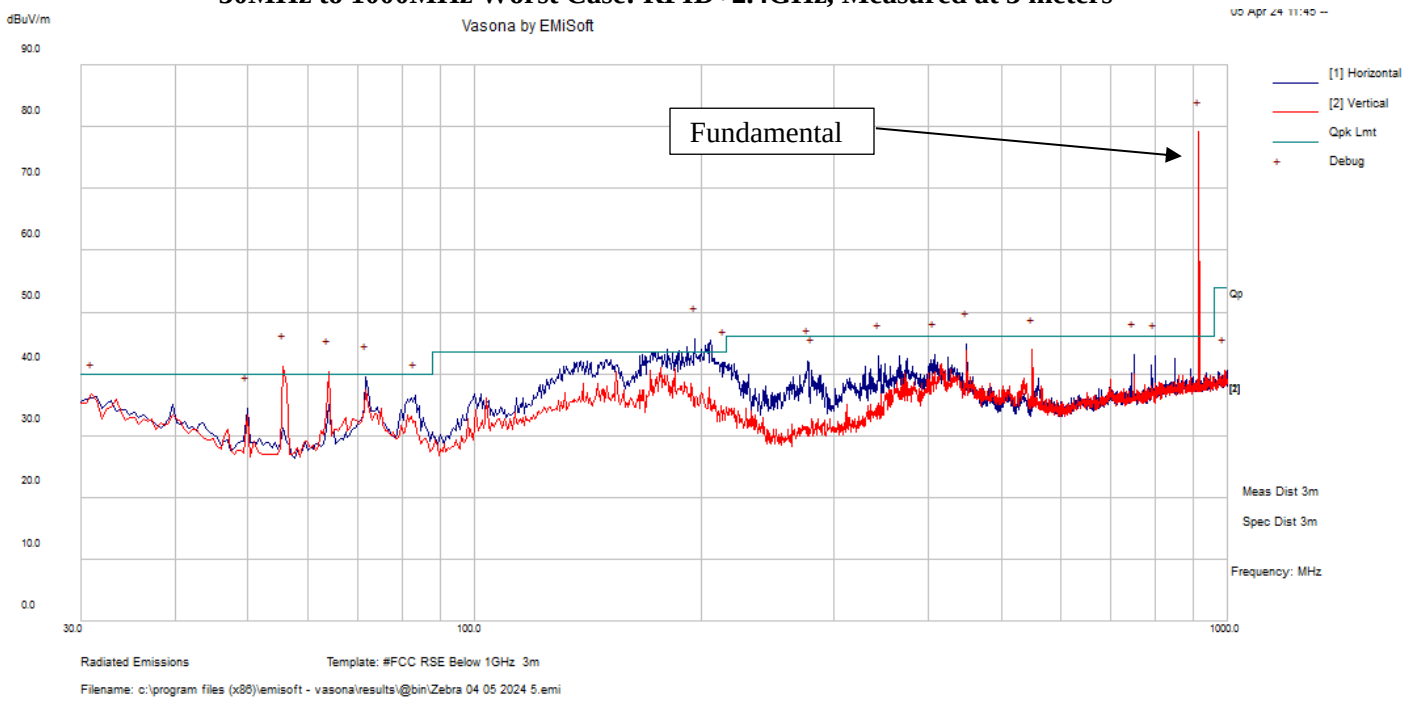
Mode: Transmitting			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Mode, Channel**
-0.78	749.98	Horizontal	RFID+BLE

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

6.9 Radiated Emissions Test Results

Note: The EUT is not transmitting at below 30 MHz, thus 9 kHz to 30 MHz was not evaluated for Radiated Spurious Emissions.

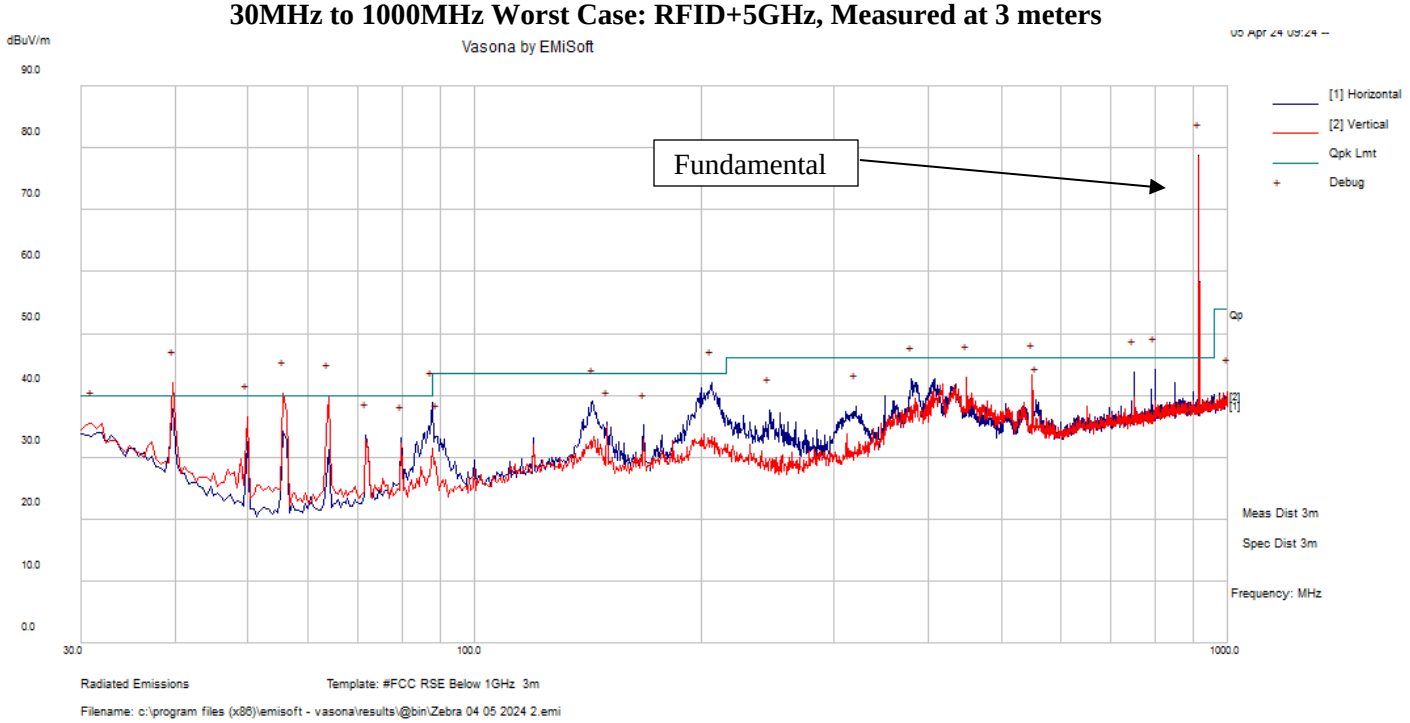
30MHz to 1000MHz Worst Case: RFID+2.4GHz, Measured at 3 meters



Formally Assessed Peaks

Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comments (Peak/QP/ Average)
195.621	48.94	-8.19	40.75	H	109	108	43.5	-2.75	QP
55.95025	47.09	-14.12	32.97	V	206	86	40	-7.03	QP
63.98475	50.36	-13.45	36.91	V	108	118	40	-3.09	QP
71.9395	47.46	-13.15	34.31	H	295	262	40	-5.69	QP
449.9813	45.3	-2.53	42.77	H	187	344	46	-3.23	QP
214.3553	49	-9.9	39.1	H	142	33	43.5	-4.4	QP

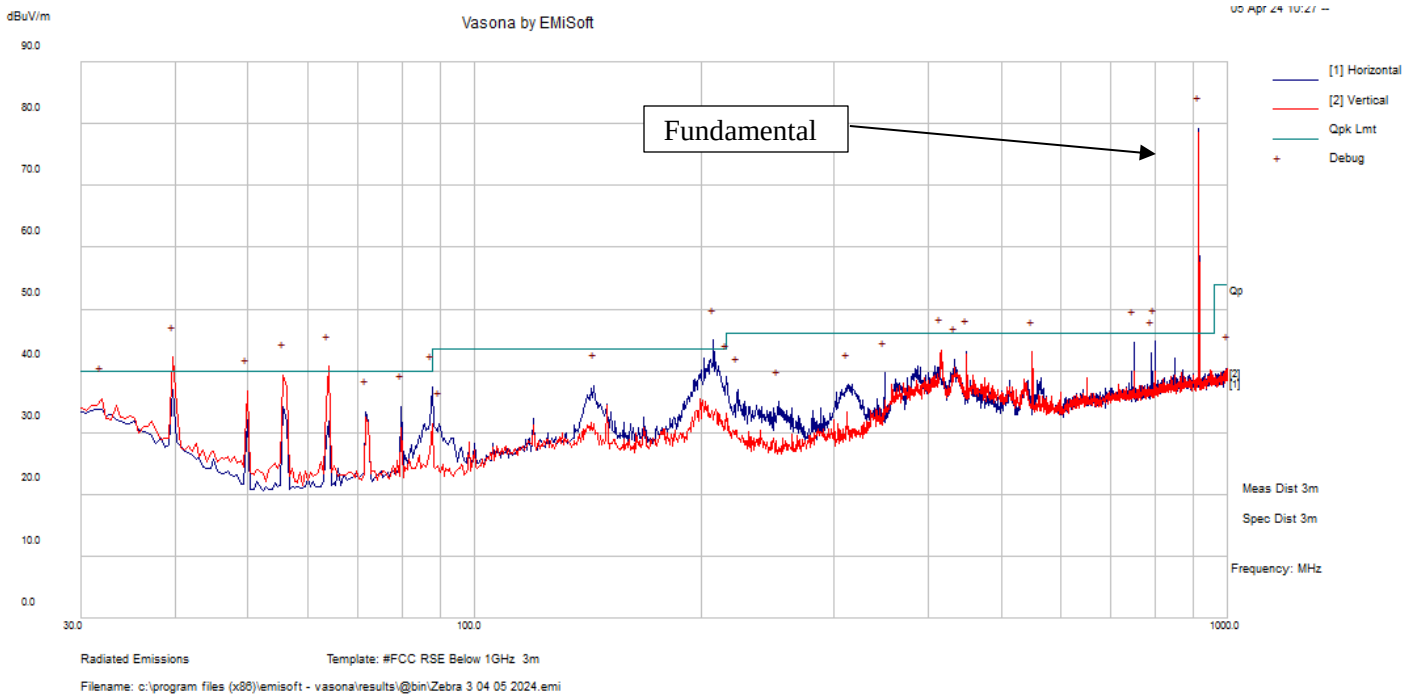
30MHz to 1000MHz Worst Case: RFID+5GHz, Measured at 3 meters



Formally Assessed Peaks

Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comments (Peak/QP/ Average)
39.9465	46.11	-7.79	38.32	V	100	128	40	-1.68	QP
55.95425	49.06	-14.13	34.93	V	193	33	40	-5.07	QP
63.98825	50.64	-13.45	37.19	V	105	353	40	-2.81	QP
87.9605	49.18	-13.56	35.62	H	166	86	40	-4.38	QP
205.8485	45.46	-9.58	35.88	H	163	89	43.5	-7.62	QP
799.984	41.27	2.94	44.21	H	113	141	46	-1.79	QP

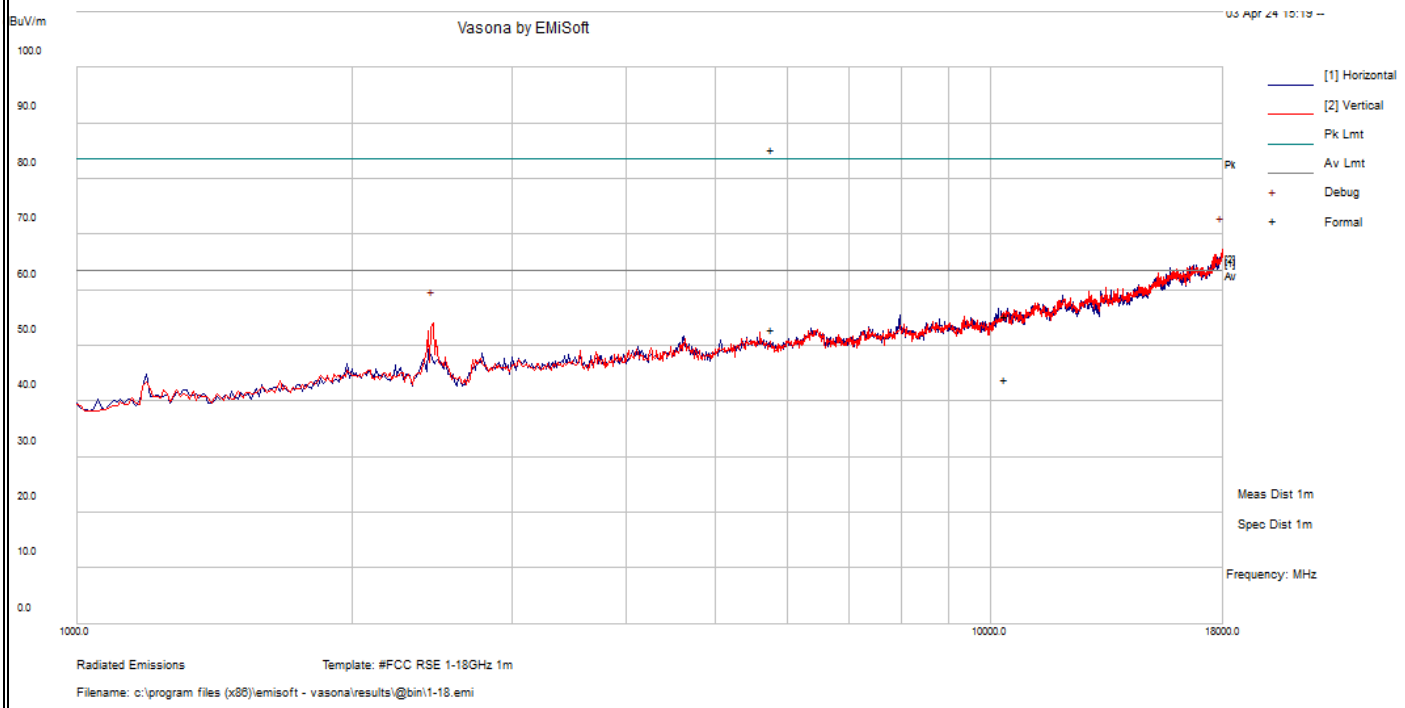
30MHz to 1000MHz Worst Case: RFID+BLE, Measured at 3 meters



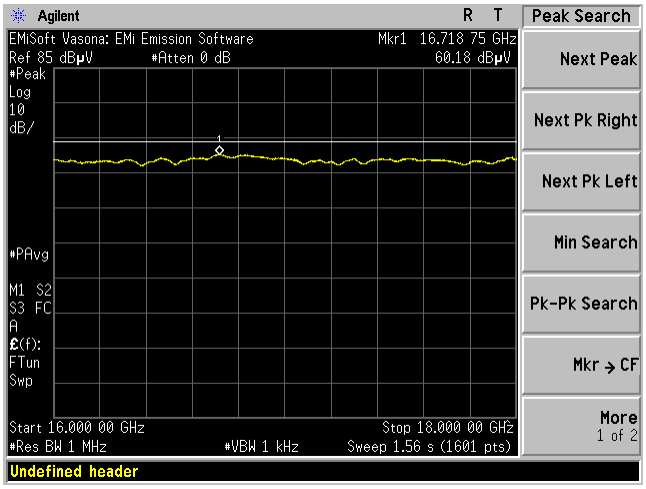
Formally Assessed Peaks

Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comments (Peak/QP/ Average)
39.95	46.44	-7.79	38.65	V	105	353	40	-1.35	QP
207.711	43.41	-9.78	33.63	H	140	6	43.5	-9.87	QP
64.0065	50.63	-13.45	37.18	V	101	113	40	-2.82	QP
55.9535	50.6	-14.12	36.48	V	117	353	40	-3.52	QP
799.9843	41.58	2.94	44.52	H	113	130	46	-1.48	QP
749.98	42.95	2.27	45.22	H	113	133	46	-0.78	QP

1GHz to 18GHz Worst Case: RFID+2.4GHz, Measured at 1 meter



Note: above plot shows all peak emissions below 16GHz pass under average limits

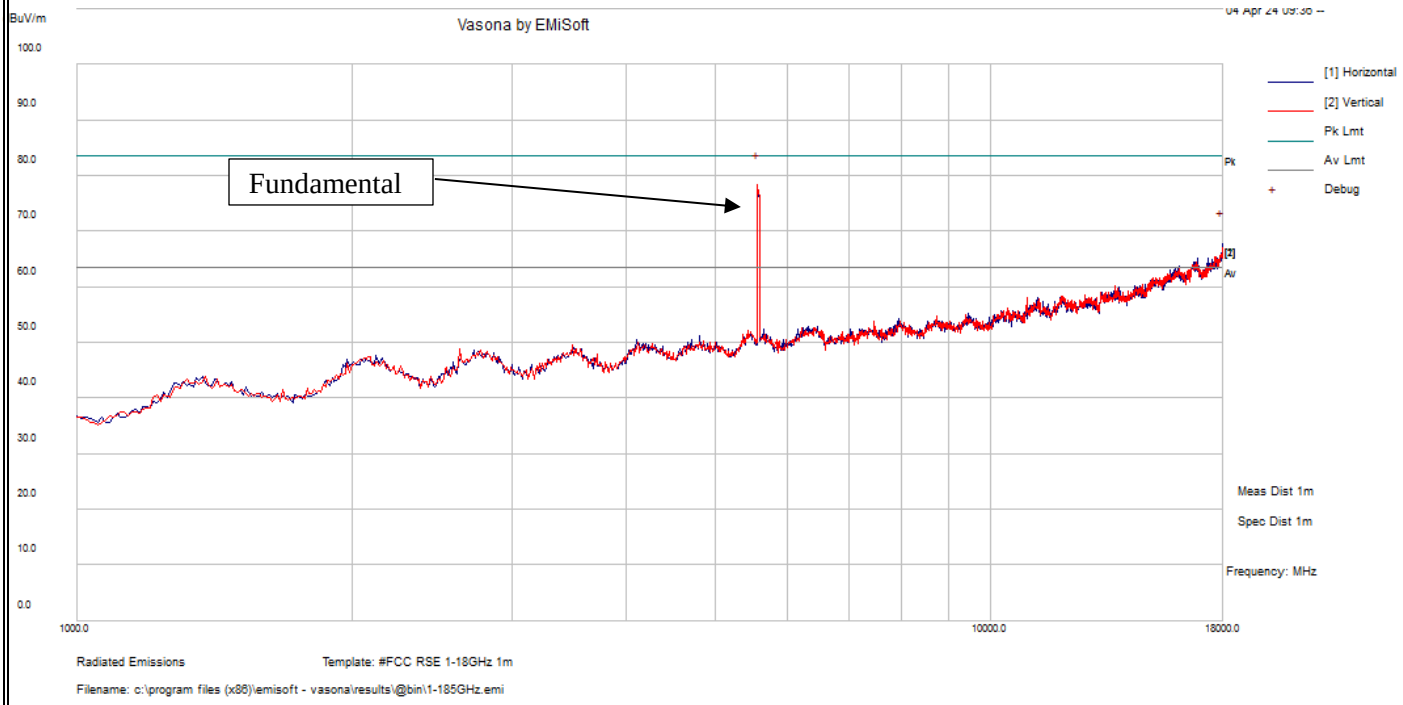


Note: above plot shows reduced VBW to make average measurements comparing to average limits and thus show compliance in range of 16-18GHz

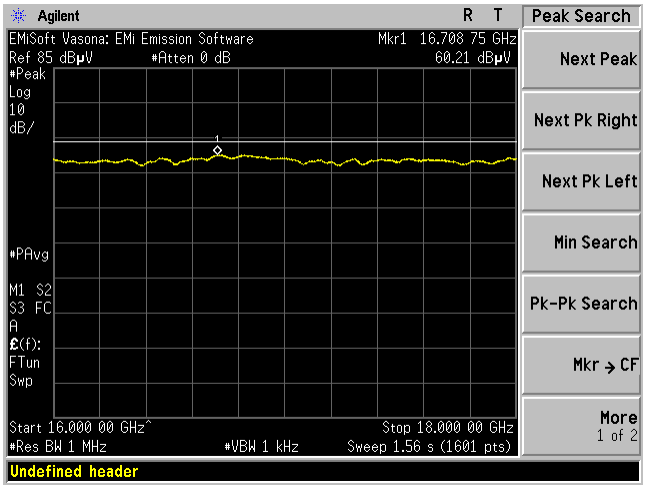
Debug Frequencies

Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comments (Peak/QP/ Average)
16718.75	48.5	11.68	60.18	V	100	0	63.54	-3.36	Avg

1GHz to 18GHz Worst Case: RFID+5GHz, Measured at 1 meter



Note: above plot shows all peak emissions below 16GHz pass under average limits

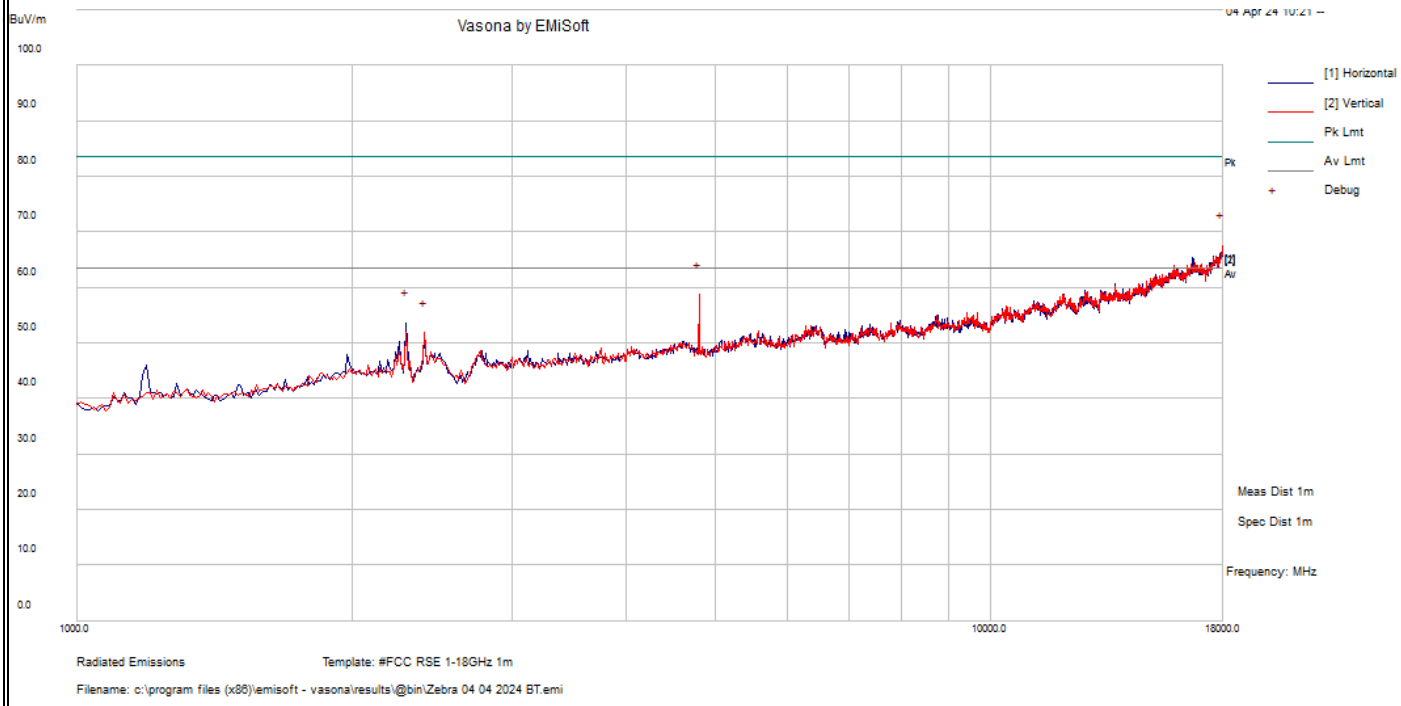


Note: above plot shows reduced VBW to make average measurements comparing to average limits and thus show compliance in range of 16-18GHz

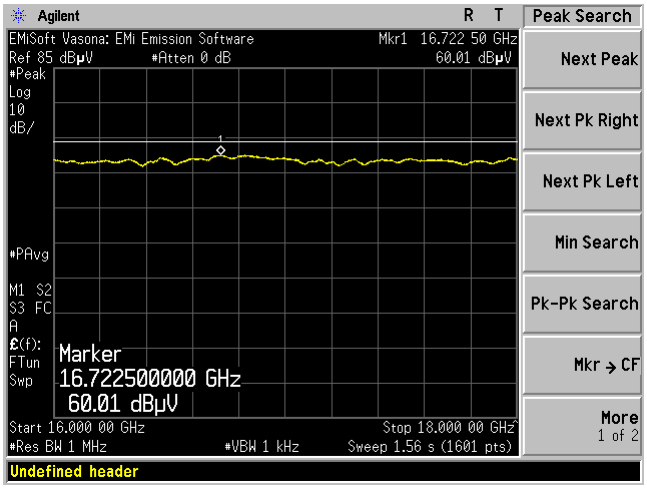
Debug Frequencies

Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comments (Peak/QP/ Average)
16708.75	48.53	11.68	60.21	V	100	0	63.54	-3.33	Avg

1GHz to 18GHz Worst Case: RFID+BLE, Measured at 1 meter



Note: above plot shows all peak emissions below 16GHz pass under average limits

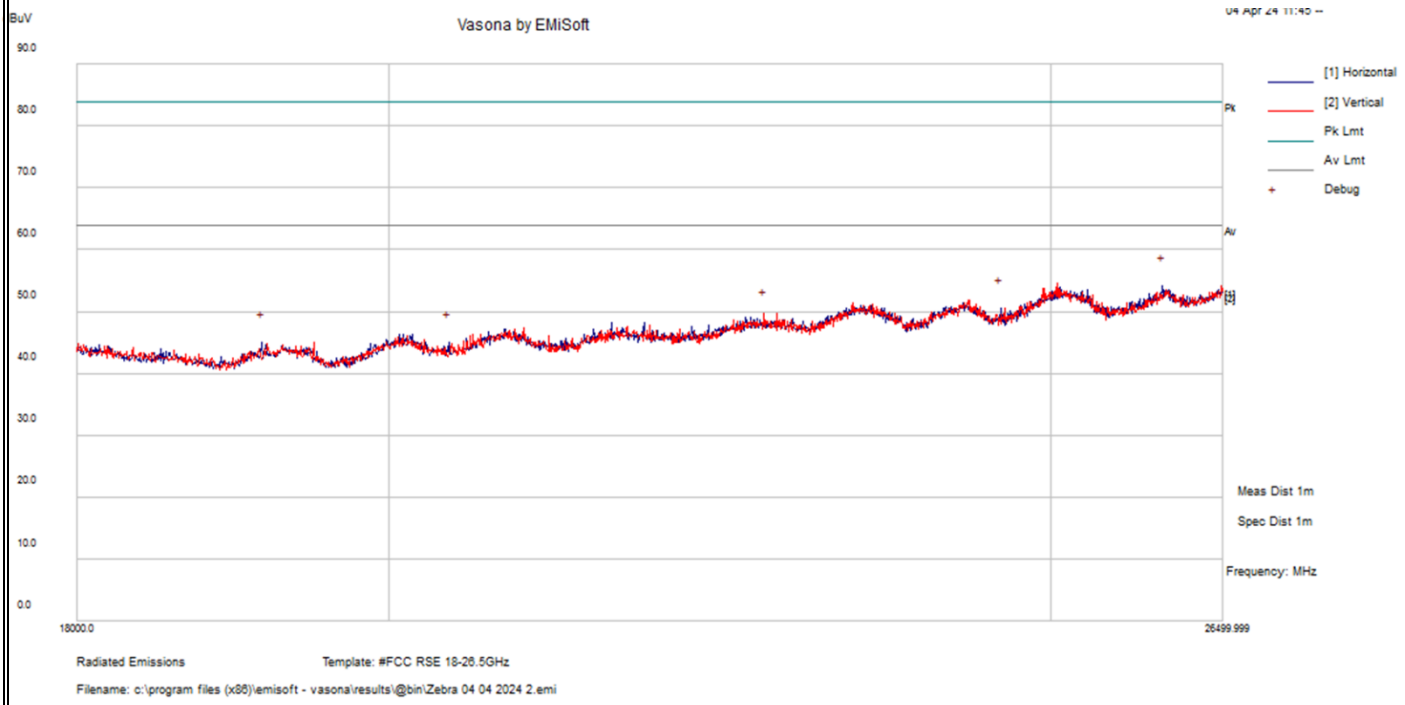


Note: above plot shows reduced VBW to make average measurements comparing to average limits and thus show compliance in range of 16-18GHz

Debug Frequencies

Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comments (Peak/QP/ Average)
16722.5	48.33	11.68	60.01	V	100	0	63.54	-3.53	Avg

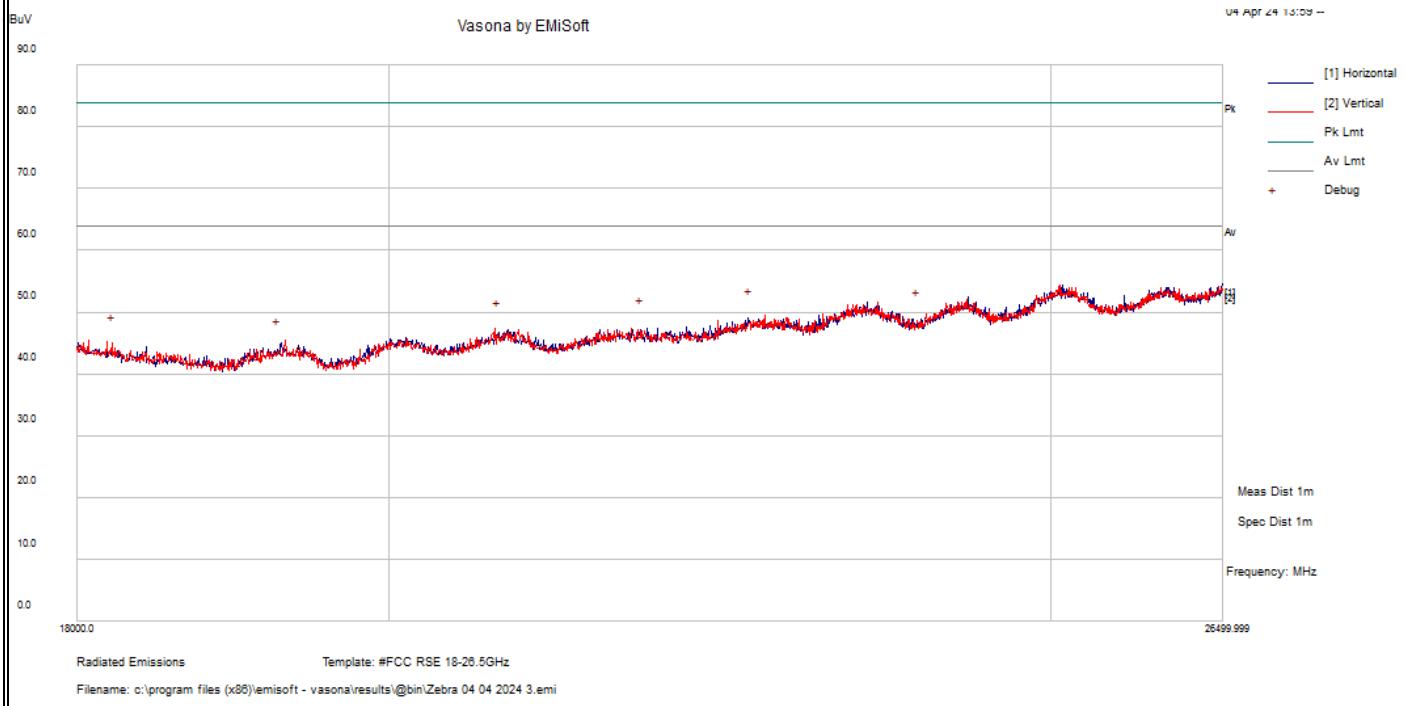
18GHz to 26.5GHz Worst Case: RFID+2.4GHz, Measured at 1 meter



Peak Emissions Under Average Limits

Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comments (Peak/QP/ Average)
19158.85	34.92	-4.27	44.62	V	100	7	63.54	-18.92	Peak
20407.77	35.3	1.55	44.57	V	100	7	63.54	-18.97	Peak
22700.26	35.08	-9.94	48.26	V	100	7	63.54	-15.28	Peak
24583.3	34.68	-11.34	50.2	V	100	7	63.54	-13.34	Peak
25965.43	36.33	3.29	53.78	V	200	7	63.54	-9.76	Peak

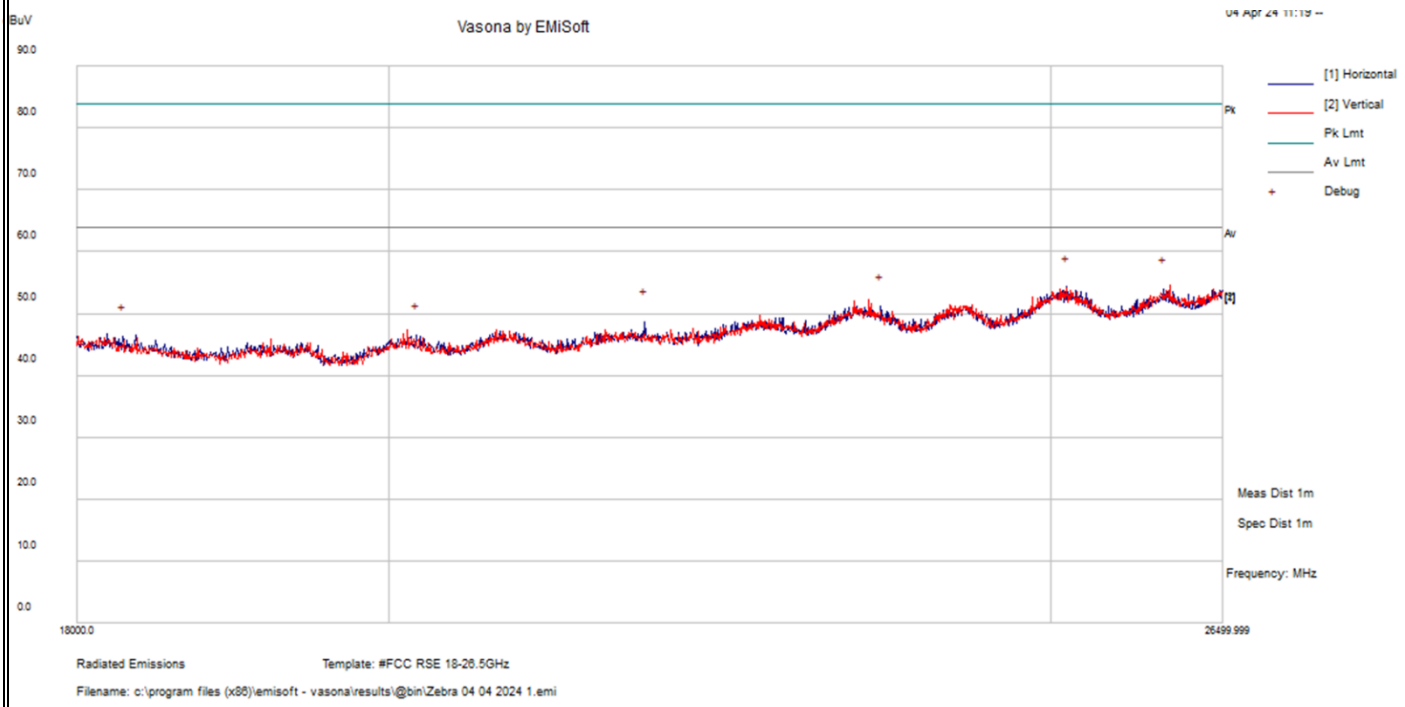
18GHz to 26.5GHz Worst Case: RFID+5GHz, Measured at 1 meter



Peak Emissions Under Average Limits

Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comments (Peak/QP/ Average)
18217.4	33.78	10.37	44.15	V	102	7	63.54	-19.39	Peak
19262.03	34.14	9.56	43.7	V	102	7	63.54	-19.84	Peak
20751.59	36.25	10.4	46.65	V	102	7	63.54	-16.89	Peak
21776.1	34.92	12.03	46.95	V	102	7	63.54	-16.59	Peak
23907.88	33.36	14.84	48.2	V	102	7	63.54	-15.34	Peak
22584.49	35.51	13.01	48.52	V	102	7	64.54	-16.02	Peak

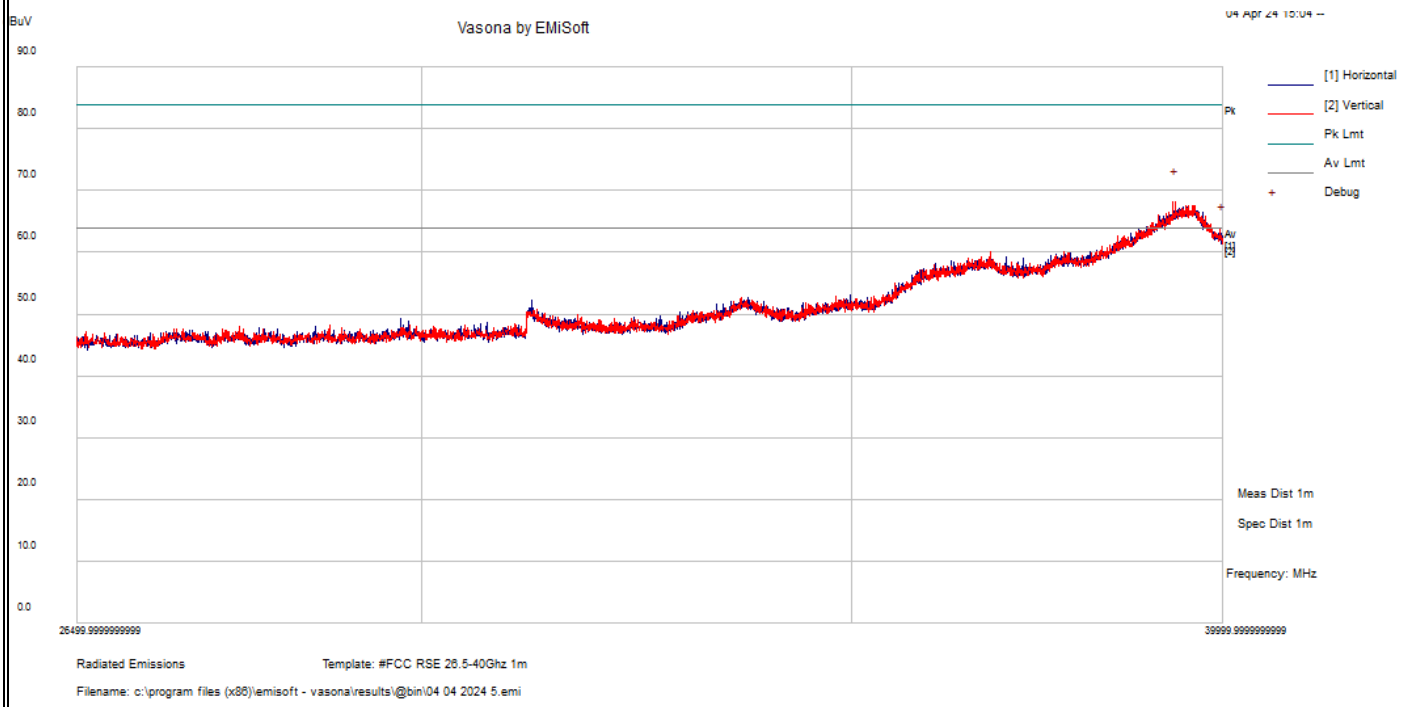
18GHz to 26.5GHz Worst Case: RFID+BLE, Measured at 1 meter



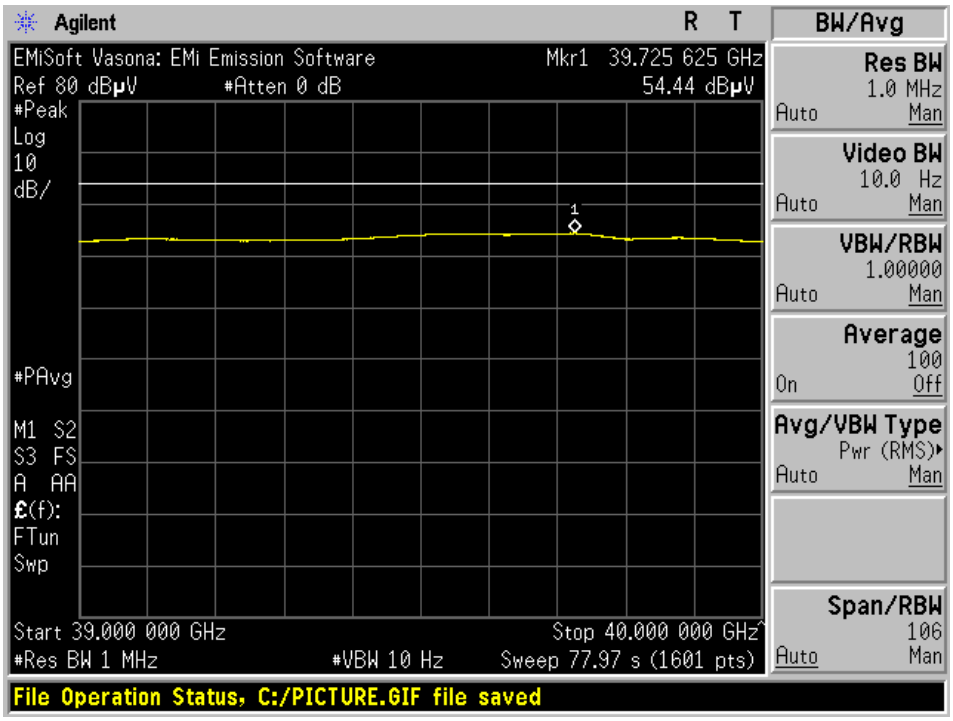
Peak Emissions Under Average Limits

Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comments (Peak/QP/ Average)
25135.34	37.65	10.37	54.04	V	101	7	63.54	-9.5	Peak
25974.17	36.45	9.56	53.91	V	101	7	63.54	-9.63	Peak
23610.32	36.7	10.4	51.08	V	101	7	63.54	-12.46	Peak
21803.9	36.54	12.03	48.64	V	101	7	63.54	-14.9	Peak
20184.19	36.87	14.84	46.29	V	101	7	63.54	-17.25	Peak
18281.69	35.85	13.01	46.24	V	101	7	64.54	-18.3	Peak

26.5GHz to 40GHz Worst Case: RFID+5GHz, Measured at 1 meter



Note: above plot shows all peak emissions below 39GHz pass under average limits



Note: above plot shows reduced VBW to make average measurements comparing to average limits and thus show compliance in range of 39-40GHz

Debug Frequencies

Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comments (Peak/QP/ Average)
39.73	36.1	18.34	54.44	H	200	0	63.54	-9.1	Avg

7 Annex A (Normative) – Test Setup Photographs

Please refer to the attachment.

8 Annex B (Normative) – EUT External Photographs

Please refer to the attachment.

9 Annex C (Normative) – EUT Internal Photographs

Please refer to the attachment.

10 Annex D (Normative) – A2LA Electrical Testing Certificate

Accredited Laboratory

A2LA has accredited

BAY AREA COMPLIACE 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 21st day of December 2022.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3297.02
Valid to September 30, 2024

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 ---