



FCC PART 15, SUBPART C

TEST REPORT

For

Sword Health S.A.

Av. de Sidónio Pais 153 Edifício A, Piso 5
4100-467 Porto
Portugal, VAT #: 510675565

FCC ID: 2AQ4A-MB1

Report Type: Original Report	Product Type: Smart Band
Prepared By: Rachana Khanduri RF Project Engineer	
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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	



Note: This test report was prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This test report shall not be used by the customer to claim product certification, approval, or endorsement by A2LA or any agency of the United States Government or any foreign government.

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

TABLE OF CONTENTS

1	GENERAL DESCRIPTION	5
1.1	PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	5
1.2	MECHANICAL DESCRIPTION OF EUT	5
1.3	OBJECTIVE	5
1.4	RELATED SUBMITTAL(S)/GRANT(S).....	5
1.5	TEST METHODOLOGY	6
1.6	MEASUREMENT UNCERTAINTY	6
1.7	TEST FACILITY REGISTRATIONS.....	6
1.8	TEST FACILITY ACCREDITATIONS	7
2	SYSTEM TEST CONFIGURATION	11
2.1	JUSTIFICATION	11
2.2	EUT EXERCISE SOFTWARE	11
2.3	DUTY CYCLE CORRECTION FACTOR	12
2.4	LOCAL SUPPORT EQUIPMENT.....	14
2.5	REMOTE SUPPORT EQUIPMENT	14
2.6	POWER SUPPLY AND LINE FILTERS	14
2.7	INTERFACE PORTS AND CABLING.....	14
3	SUMMARY OF TEST RESULTS.....	15
4	FCC §15.203 – ANTENNA REQUIREMENTS	16
4.1	APPLICABLE STANDARDS	16
4.2	ANTENNA DESCRIPTION.....	16
5	FCC §2.1093, FCC §15.247(I) – RF EXPOSURE	17
5.1	APPLICABLE STANDARDS	17
5.2	MPE RESULTS FOR FCC	19
6	FCC §15.207 - AC LINE CONDUCTED EMISSIONS	20
6.1	APPLICABLE STANDARDS	20
6.2	TEST SETUP.....	20
6.3	TEST PROCEDURE	20
6.4	CORRECTED AMPLITUDE AND MARGIN CALCULATION	21
6.5	TEST SETUP BLOCK DIAGRAM	22
6.6	TEST EQUIPMENT LIST AND DETAILS.....	22
6.7	TEST ENVIRONMENTAL CONDITIONS	23
6.8	SUMMARY OF TEST RESULTS	23
6.9	CONDUCTED EMISSIONS TEST PLOTS AND DATA.....	24
7	FCC §15.35(B), §15.205, §15.209, §15.247(D) – SPURIOUS RADIATED EMISSIONS.....	26
7.1	APPLICABLE STANDARDS	26
7.2	TEST SETUP.....	27
7.3	TEST PROCEDURE	27
7.4	CORRECTED AMPLITUDE AND MARGIN CALCULATION	28
7.5	TEST SETUP BLOCK DIAGRAM	29
7.6	TEST EQUIPMENT LIST AND DETAILS.....	30
7.7	TEST ENVIRONMENTAL CONDITIONS	31
7.8	SUMMARY OF TEST RESULTS	32
7.9	RADIATED EMISSIONS TEST RESULTS.....	33
8	FCC §15.247(A) (2) – EMISSION BANDWIDTH	45
8.1	APPLICABLE STANDARDS	45
8.2	MEASUREMENT PROCEDURE.....	45
8.3	TEST SETUP BLOCK DIAGRAM	46
8.4	TEST EQUIPMENT LIST AND DETAILS.....	46
8.5	TEST ENVIRONMENTAL CONDITIONS	46

8.6	TEST RESULTS	47
9	FCC §15.247(B)(3) – MAXIMUM OUTPUT POWER.....	48
9.1	APPLICABLE STANDARDS	48
9.2	MEASUREMENT PROCEDURE.....	48
9.3	TEST SETUP BLOCK DIAGRAM.....	49
9.4	TEST EQUIPMENT LIST AND DETAILS.....	49
9.5	TEST ENVIRONMENTAL CONDITIONS	49
9.6	TEST RESULTS	50
10	FCC §15.247(E)–POWER SPECTRAL DENSITY	51
10.1	APPLICABLE STANDARDS	51
10.2	MEASUREMENT PROCEDURE.....	51
10.3	TEST SETUP BLOCK DIAGRAM.....	52
10.4	TEST EQUIPMENT LIST AND DETAILS.....	52
10.5	TEST ENVIRONMENTAL CONDITIONS	52
10.6	TEST RESULTS	53
11	FCC §15.247(D) – SPURIOUS EMISSIONS AT ANTENNA TERMINAL AND 100 KHZ BAND EDGES ...	54
11.1	APPLICABLE STANDARDS	54
11.2	MEASUREMENT PROCEDURE.....	54
11.3	TEST SETUP BLOCK DIAGRAM.....	54
11.4	TEST EQUIPMENT LIST AND DETAILS.....	54
11.5	TEST ENVIRONMENTAL CONDITIONS	55
11.6	TEST RESULTS	55
12	APPENDIX A (NORMATIVE) – EUT TEST SETUP PHOTOGRAPHS.....	56
13	APPENDIX B (NORMATIVE) – EUT EXTERNAL PHOTOGRAPHS.....	57
14	APPENDIX C (NORMATIVE) – EUT INTERNAL PHOTOGRAPHS	58
15	APPENDIX D (NORMATIVE) – A2LA ELECTRICAL TESTING CERTIFICATE.....	59

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R2511194-247	Original Report	2025-12-29

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test report is prepared on behalf of *Sword Health S.A.*, and their product: Smart Band, model: MB1, FCC ID: 2AQ4A-MB1 or the “EUT” as referred to in this report. The EUT has 2.4 GHz BLE capabilities.

Model Name	MB1
FCC ID	2AQ4A-MB1
Radio Type	BLE
Operating Frequency	2402~2480 MHz
Modulation	GFSK
Data rates	1Mbps, 2Mbps

1.2 Mechanical Description of EUT

The EUT measures approximately 4.25 cm (Length) x 2.75 cm (Width) x 10.5 cm (Height) and weight approximately 0.012 kg.

The data gathered is from a production sample provided by Sword Health S.A. with BACL assigned S/N: R2511194-1 and R2511194-2.

1.3 Objective

This report is prepared on behalf of *Sword Health S.A.* in accordance with Part 2, Subpart J, and Part 15, Subpart C of the Federal Communication Commission’s rules.

The objective is to determine compliance with FCC Part 15.247 for Antenna Requirement, RF Exposure, Radiated & Conducted Spurious Emissions, Emission Bandwidth, Maximum Output Power, Peak Power Spectral Density, and 100 kHz 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)

N/A

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI/USEMCSC C63.10-2020/Cor 1-2023, 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.

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	±1.57 dB
All emissions, radiated	±4.0 dB
AC power line Conducted Emission	±2.0 dB
Temperature	±2°C
Humidity	±5%
DC and low frequency voltages	±1.0%
Time	±2%
Duty Cycle	±3%

1.7 Test Facility Registrations

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

BACL's test facilities that are used to perform Radiated and Conducted Emissions tests are currently registered with Innovation, Science, and Economic Development Canada (ISED) a 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-0428.

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/Wireless, RF Exposure, Safety, and Wireline Telecommunications test methods applicable to a wide range of product categories. These product categories include, but are not limited to: Central Office Telecommunications Equipment [including NEBS – Network Equipment Building Systems], Information Technology Equipment (ITE); Telecommunications Terminal Equipment (TTE); Medical Electrical Equipment; Industrial, Scientific and Medical Test Equipment; Professional Audio and Video Equipment; Industrial Equipment, Scientific Instruments and Laboratory Apparatus; Cable Distribution Systems, Railway Equipment, Marine Equipment, and Energy Efficient Lighting. Additionally, BACL offers comprehensive test capabilities for both Unlicensed and Licensed Wireless and RF Devices, per the requirements of the FCC (USA), ISED Canada (Canada), the EU/EEA/EFTA Nations (per the ETSI Standards applicable under the Radio Equipment Directive), Singapore, MIC (Japan), South Korea, Vietnam, and Taiwan ROC.

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 (Innovation, Science and Economic Development 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 Equipment Technical Standards (BETS) in the Category I Equipment Standards List.
7. RSS-HAC Radio Scope 6 Hearing Aid Compatibility and Volume Control

- For Singapore (Info-Comm Media Development Authority (IMDA)):

- 1 All Line Terminal Equipment: All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2011, Annex 2 IMDA Phase I
2. All Radio-Communication Equipment: All Technical Specifications for Radio-Communication Equipment – Table 2 of IDA MRA Recognition Scheme: 2011, Annex 2 IMDA Phase II

- For the Hong Kong Special Administrative Region & (Office of the Communications Authority-OFCA) – APEC Tel MRA- Phase I and Phase II:

- 1 Radio Equipment, per KHCA 10XX-series Specifications; HKCA 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1010, 1015, 1016, 1019, 1020, 1022, 1026, 1033, 1034, 1035, 1036, 1037, 1039, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1052, 1053, 1054, 1056, 1057, 1061, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1080, 1081
- 2 GMDSS Marine Radio Equipment, per HKCA 12XX-series Specifications; HKCA 1218, 1223, 1224, 1225, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1277, 1281, 1282, 1283

- 3 Fixed Network Equipment, per HKCA 20XX-series Specifications; HKCA 2001, 2011, 2014, 2015, 2017, 2026, 2027, 2028, 2029, 2030, 2031
- 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 Appliances:
 - for Clothes Washers (ver. 8.1)
 - for Residential Dishwashers (ver. 6.0)
 - for Residential Refrigerators and/or Freezers (ver. 5.0)
- 2 Commercial Food Service Equipment:
 - for Commercial Dishwashers (ver. 3.0)
 - for Commercial Ice Machines (ver. 3.0)
- 3 Data Center Equipment:
 - for Large Network Equipment (ver. 1.1)
- 4 Electronics and Office Equipment:
 - for Audio/Video Equipment (ver. 3.0)
 - for Computers (ver. 8.0)
 - for Data Center Storage (ver. 2.1)
 - for Displays (ver. 8.0)
 - for Enterprise Servers (ver. 4.0)
 - for Imaging Equipment (ver. 3.1)
 - for Set-top Boxes & Cable Boxes (ver. 5.1)
 - for Small Network Equipment (ver. 1.0)
 - for Telephony (ver. 3.0)
 - for Televisions (ver. 9.0), Title 10 Chapter II CFR Part 430 Subpart B –Appendix BB, Title 10 Chapter II CFR Part 430 Subpart B –Appendix DD
- 3 Lighting and Fans
 - for Decorative Light Strings (ver. 1.5)
 - for Downlights (ver. 1.0)
 - for Lamps (Light Bulbs)(ver. 2.1)
 - for Luminaires (including sub-components) (ver. 2.2)
 - for Residential Ceiling Fans (ver. 4.0)
 - for Residential Ventilating Fans (ver. 4.1)
- 4 Other
 - for Residential Ceiling Fans (ver. 4.0)

- for Electric Vehicle Supply Equipment (ver. 1.2)(Electric Vehicle Supply Equipment Final Test Method for DC-output EVSE Rev March 2021)
- for Water Coolers (ver. 3.0)
- for Smart Home Energy Management Systems (ver. 1.1)

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:

1. For the USA (Federal Communications Commission), as a Telecommunications Certification Body (TCB):
 - a. All Unlicensed radio frequency devices within FCC Scopes A1, A2, A3, and A4;
 - b. All Licensed radio frequency devices within FCC Scopes B1, B2, B3, and B4;
 - c. All Telephone Terminal Equipment within FCC Scope C.
2. Canada (ISED Canada) Foreign Certification Body – FCB – APEC Tel MRA -Phase I & Phase II:
 - a. Phase I Designation Letter
 - b. Phase II ISED Canada recognition as a Product Certification Body for unlicensed wireless devices, licensed radios, radars, etc.:
3. For Singapore (InfoComm Media Development Authority (IMDA)) APEC Tel MRA -Phase I & Phase II:
 - a. All Line Terminal Equipment: All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2011, Annex 2 IMDA Phase I
 - b. All Radio-Communication Equipment: All Technical Specifications for Radio-Communication Equipment – Table 2 of IDA MRA Recognition Scheme: 2011, Annex 2 IMDA Phase II
4. For the Hong Kong Special Administrative Region & (Office of the Communications Authority – OFCA) – APEC Tel MRA -Phase I & Phase II:
 - a. NIST Phase I Scope Recognition Letter from OFCA for BACL –US0057
 - b. OFCA Phase II Designation Letter
5. For Japan (Ministry of Communications):
 - a. NIST Japan Recognition
 - b. MIC Telecommunication Business Law (Terminal Equipment):
 1. All Scope A1 – Terminal Equipment for the Purpose of Calls;
 2. All Scope A2 – Other Terminal Equipment
 - c. Radio Law (Radio Equipment):
 1. All Scope B1 – Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 1 of the Radio Law
 2. All Scope B2 – Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 2 of the Radio Law
 3. All Scope B3 – Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 3 of the Radio Law
 - d. Japan VCCI – Voluntary Control Council for Interference US-Japan Telecom Treaty (VCCI Side Letter)
 1. VCCI Certificate
 - d. Japan Registered Certification Body
 1. RCB Recognition Letter
6. European Union:
 1. Radio Equipment Directive [RED] 2014/53/EU US-EU EMC & Telecom MRA CAB (NB)
 2. EMC Directive [EMCD] 2014/30/EU US-EU EMC & Telecom MRA CAB (NB):

7. Australia ACMA (Australian Communication and Media Authority) – APEC Tel MRA -Phase I:
 1. Phase I Designation Letter
8. Chinese Taipei (Republic of China – Taiwan):
 1. NCC (National Communications Commission) APEC Tel MRA -Phase I
9. Republic of Korea (Ministry of Communications – Radio Research Laboratory) APEC Tel MRA -Phase I:
 1. NIST Phase I Scope Update Notification Letter from Korea for BACL
10. Vietnam APEC Tel MRA -Phase I (page 13)
 1. Vietnam (MIC) NIST Phase I Scope
11. Indonesia SDPPI (page 6)
 1. Phase I Listing
12. Israel Phase I
 1. NIST Phase I Scope Update Recognition Letter from Israel for BACL –US0057
13. UK Radio and EMC NIST Designation Letters
UK website: <https://www.gov.uk/uk-market-conformity-assessment-bodies/bay-area-compliance-laboratories-corp-bacl>
 1. Electromagnetic Compatibility Regulations (SI 2016/1091)
https://assets.publishing.service.gov.uk/media/5fe1e344e90e07452fce4e5a/AB_1313_BACL_UK EMC_Regs_NIST_Designation_Extended.pdf
 2. Radio Equipment Regulations 2017 (SI 2017/1206)
https://assets.publishing.service.gov.uk/media/5fe1e351e90e074525bf7be6/AB_1313_BACL_UK_Radio_Regs_NIST_Designation_Extended.pdf
14. IFT Mexico Phase I
 1. NIST Phase I New Recognition Letter from Mexico for BACL – US0057
15. Taiwan (BSMI) Phase 1 Designation Letter and designation form.
 1. NIST Phase I Scope Update Designation Letter to BSMI for BACL – US0057
 2. NIST Phase I Scope Update Designation Form to BSMI for BACL – US0057

2 System Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI/USEMCSC C63.10-2020/Cor 1-2023 and FCC KDB 558074 D01 DTS Meas Guidance v05r02.

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 “nRF Connect”, the software is compliant with the standard requirements being tested against.

Radio	Frequency (MHz)	Data Rate	Power Setting
2.4 GHz BLE	2402	1 Mbps	8
	2440		8
	2480		8
	2402	2 Mbps	8
	2440		8
	2480		8

2.3 Duty Cycle Correction Factor

According to KDB 558074 D01 DTS Meas Guidance v05r02 section 6.0:

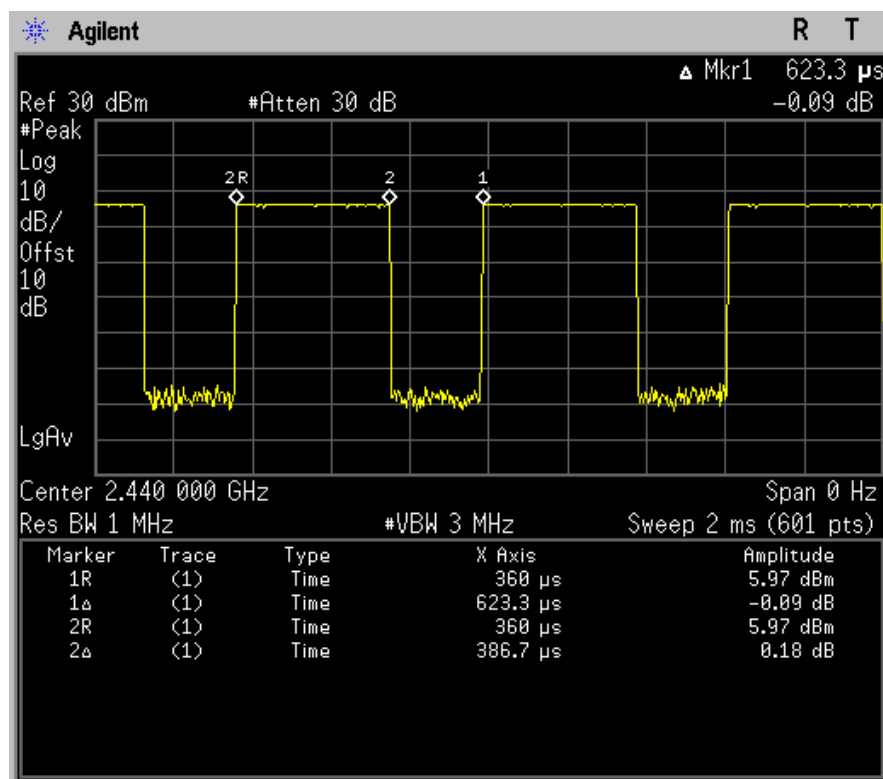
Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%). When continuous operation cannot be realized, then the use of sweep triggering/signal gating techniques can be utilized to ensure that measurements are made only during transmissions at the maximum power control level. Such sweep triggering/signal gating techniques will require knowledge of the minimum transmission duration (T) over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. Sweep triggering/signal gating techniques can then be used if the measurement/sweep time of the analyzer can be set such that it does not exceed T at any time that data is being acquired (i.e., no transmitter off-time is to be considered).

Radio	Radio Mode	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
2.4 GHZ BLE	1Mbps	0.387	0.623	62.119	2.068
	2Mbps	0.197	0.623	31.621	5.000

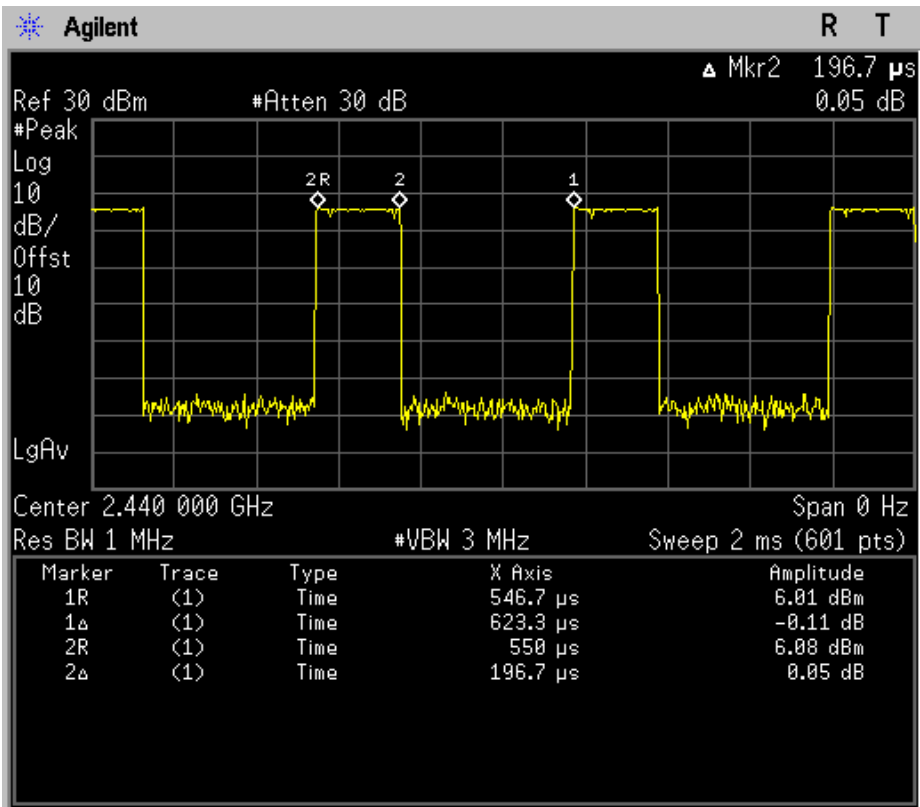
Note: Duty Cycle = On Time (ms) / Period (ms)

Duty Cycle Correction Factor = $10 \cdot \log(1/\text{duty cycle})$

1Mbps Duty Cycle



2Mbps Duty Cycle



2.4 Local Support Equipment

Manufacturer	Description	Model	Serial Number
Dell	Laptop	Latitude 5401	HCJH3Z2

2.5 Remote Support Equipment

Manufacturer	Description	Model	Serial Number
Sword Health S.A.	Programming board (Connected to the EUT for BLE Tx operation)	Custom	N/A

2.6 Power Supply and Line Filters

Manufacturer	Description	Model	Serial Number
Travel Charger	AC Adapter	SC/5WM500100-US	-

2.7 Interface Ports and Cabling

Cable Descriptions	Length (m)	From	To
Type-C to magnetic 2-pogo pin charging cable	<1	AC Adapter	EUT
Type-C USB cable	<1	Programming board	Laptop
RF Cable	<1	EUT	PSA

3 Summary of Test Results

FCC Rules	Description of Test	Results
FCC §15.203	Antenna Requirements	Compliant
FCC §2.1093, §15.247(i)	RF Exposure	Compliant
FCC §15.207	AC Line Conducted Emissions	Compliant
FCC §2.1053, §15.35(b), §15.205, §15.209, §15.247(d)	Radiated Spurious Emissions	Compliant
FCC §15.247(a)(2)	6 dB & 99% Emission Bandwidth	Compliant
FCC §15.247(b)(3)	Maximum Output Power	Compliant
FCC §15.247(e)	Power Spectral Density	Compliant
FCC §2.1051, §15.247 (d)	Spurious Emissions at Antenna Port	Compliant
	100 kHz Bandwidth of Frequency Band Edges	Compliant

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 – 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.

And according to FCC §15.247 (b) (4), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.2 Antenna Description

External/Internal/ Integral	Antenna Usage	Antenna Type	Frequency Range (MHz)	Maximum Antenna Gain (dBi)
Integral	2.4 GHz BLE	Chip	2402-2480	1

5 FCC §2.1093, FCC §15.247(i) – RF Exposure

5.1 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.

According to FCC KDB 447498 D01 General RF Exposure Guidance v06 Section 4.3.1, Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander (see 5) of section 4.1). To qualify for SAR test exclusion, the test separation distances applied must be fully explained and justified by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, typically in the SAR measurement or SAR analysis report, according to the required published RF exposure KDB procedures. When no other RF exposure testing or reporting is required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for the SAR test exclusion. When required, the device specific conditions described in the other published RF exposure KDB procedures must be satisfied before applying these SAR test exclusion provisions; for example, handheld PTT two-way radios, handsets, laptops & tablets etc.

- 1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\left[\frac{(\text{max. power of channel, including tune-up tolerance, mW})}{(\text{min. test separation distance, mm})} \right] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

- f (GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

- 2) At 100 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following, and as illustrated in Appendix B:

- a) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) · ($f(\text{MHz})/150$)] mW, at 100 MHz to 1500 MHz
- b) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) · 10] mW at > 1500 MHz and ≤ 6 GHz

- 3) At frequencies below 100 MHz, the following may be considered for SAR test exclusion, and as illustrated in Appendix C:

- The power threshold at the corresponding test separation distance at 100 MHz in step 2) is multiplied by $[1 + \log(100/f(\text{MHz}))]$ for test separation distances > 50 mm and < 200 mm
- The power threshold determined by the equation in a) for 50 mm and 100 MHz is multiplied by $\frac{1}{2}$ for test separation distances ≤ 50 mm
- SAR measurement procedures are not established below 100 MHz. When SAR test exclusion cannot be applied, a KDB inquiry is required to determine SAR evaluation requirements for any test results to be acceptable.

Test exclusion is applied to the required test channels on a channel by channel basis.

When SAR evaluation is required by the hotspot mode or UMPC mini-tablet procedures, that is, where an antenna is ≤ 2.5 cm from a surface or edge, the test separation distance from the phantom to the antenna or device enclosure, as appropriate, should be applied to determine further SAR test exclusion according to the criteria in this document. Do not use the antenna to device surface or edge distance.

This is equivalent to the formula written as: $[(\text{max. power of channel, including tune-up tolerance, mW}) / (60 \sqrt{f(\text{GHz}) \text{ mW}})] \cdot [20 \text{ mm} / (\text{min. test separation distance, mm})] \leq 1.0$ for 1-g SAR; also see Appendix A for approximate exclusion threshold numerical values at selected frequencies and distances.

Appendix A

SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table. The equation and threshold in 4.3.1 must be applied to determine SAR test exclusion.

MHz	5	10	15	20	25	mm
150	39	77	116	155	194	<i>SAR Test Exclusion Threshold (mW)</i>
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	
MHz	30	35	40	45	50	mm
150	232	271	310	349	387	<i>SAR Test Exclusion Threshold (mW)</i>
300	164	192	219	246	274	
450	134	157	179	201	224	
835	98	115	131	148	164	
900	95	111	126	142	158	
1500	73	86	98	110	122	
1900	65	76	87	98	109	
2450	57	67	77	86	96	
3600	47	55	63	71	79	
5200	39	46	53	59	66	
5400	39	45	52	58	65	
5800	37	44	50	56	62	

Note: 10-g Extremity SAR Test Exclusion Power Thresholds are 2.5 times higher than the 1-g SAR Test Exclusion Thresholds indicated above. These thresholds do not apply, by extrapolation or other means, to occupational exposure limits.

5.2 MPE Results for FCC

<u>Maximum output power at antenna input terminal (dBm):</u>	<u>6.36</u>
<u>Maximum output power including tune-up tolerance (dBm):</u>	<u>7.36</u>
<u>Maximum output power including tune-up tolerance (mW):</u>	<u>5.44</u>
<u>Transmit frequency (GHz):</u>	<u>2.480</u>
<u>Minimum test separation distance (mm):</u>	<u>5</u>
<u>Calculated SAR test exclusion threshold:</u>	<u>1.71</u>
<u>SAR test exclusion threshold limit:</u>	<u>≤ 3</u>

The device is compliant with the SAR test exclusion threshold limit. The maximum SAR test exclusion threshold calculated is 1.71. Limit is ≤ 3 .

6 FCC §15 207 - AC Line Conducted Emissions

6.1 Applicable Standards

As per FCC §15.207 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 μ H/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 on the Ground Plane Test Site, using the setup per ANSI C63.10-2020/Cor.1-2023 measurement procedure. The specification used were FCC §15.207.

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 which provided 120 V / 60 Hz AC power.

6.3 Test Procedure

During the conducted emissions test, the adapter connected to the EUT was connected to the mains outlet of the LISN

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 and 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:

$$CA = A_i + CF$$

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:

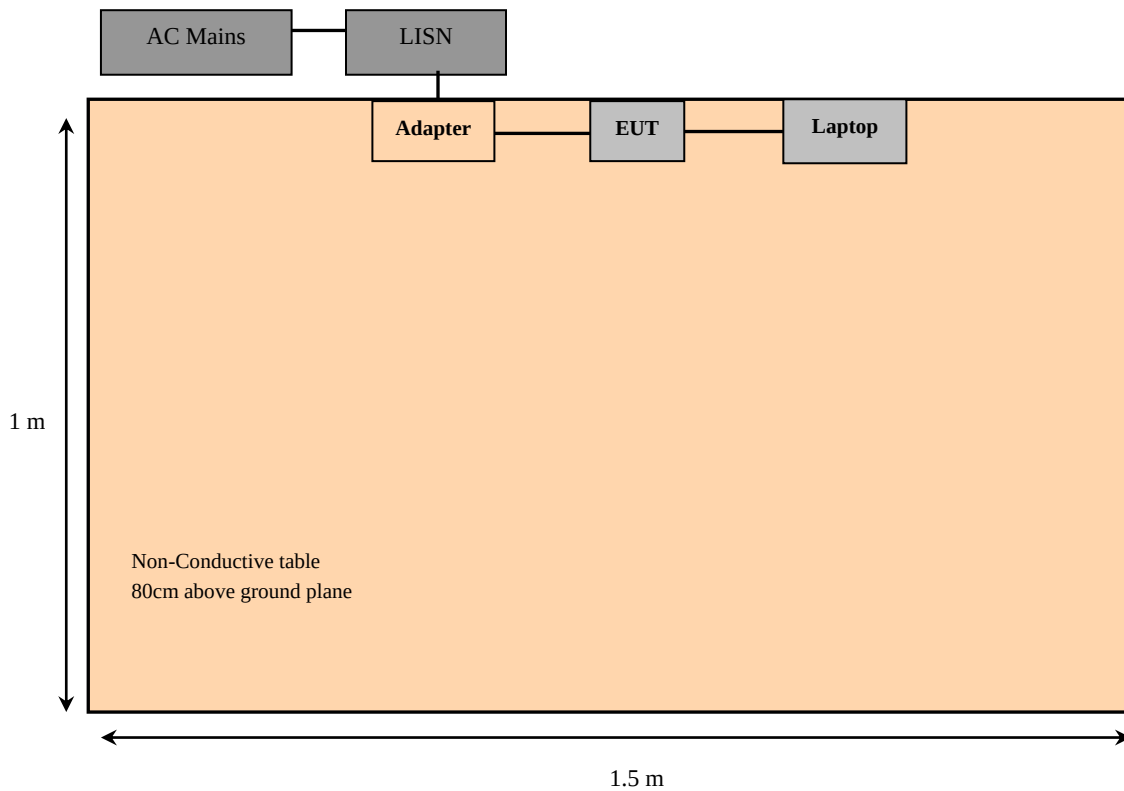
$$CF = CL + \text{Attenuator}$$

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:

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

6.5 Test Setup Block Diagram



6.6 Test Equipment List and Details

BACL Asset #	Manufacturers	Descriptions	Models	Serial Numbers	Calibration Date	Calibration Interval
1432	Keysight Technologies	MXE EMI Receiver, Multi-touch	N9038B	MY60180008	2025-01-03	1 year
681	Rohde & Schwarz	Impulse Limiter	ESH3-Z2	101962	2025-09-17	6 months
725	Solar Electronics Company	High Pass Filter	Type 7930-100	7930150203	2025-09-17	6 months
01425	Pasternack	Ground Plane RG58 Coaxial Cable	PE3441-500CM	NA	2025-07-08	6 months
733	FCC	LISN	FCC-LISN-50-25-2-10-CISPR16	160130	2025-02-28	1 year
01565	Ikonix	AC Power Source	EEC 8540	4280114	2025-05-09	1 year

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:	21.9 to 22.0 °C
Relative Humidity:	49.6 to 50.4 %
ATM Pressure:	101.9 kPa

The testing was performed by Rachana Khanduri on 2025-12-04 at the Ground Plane test site.

6.8 Summary of Test Results

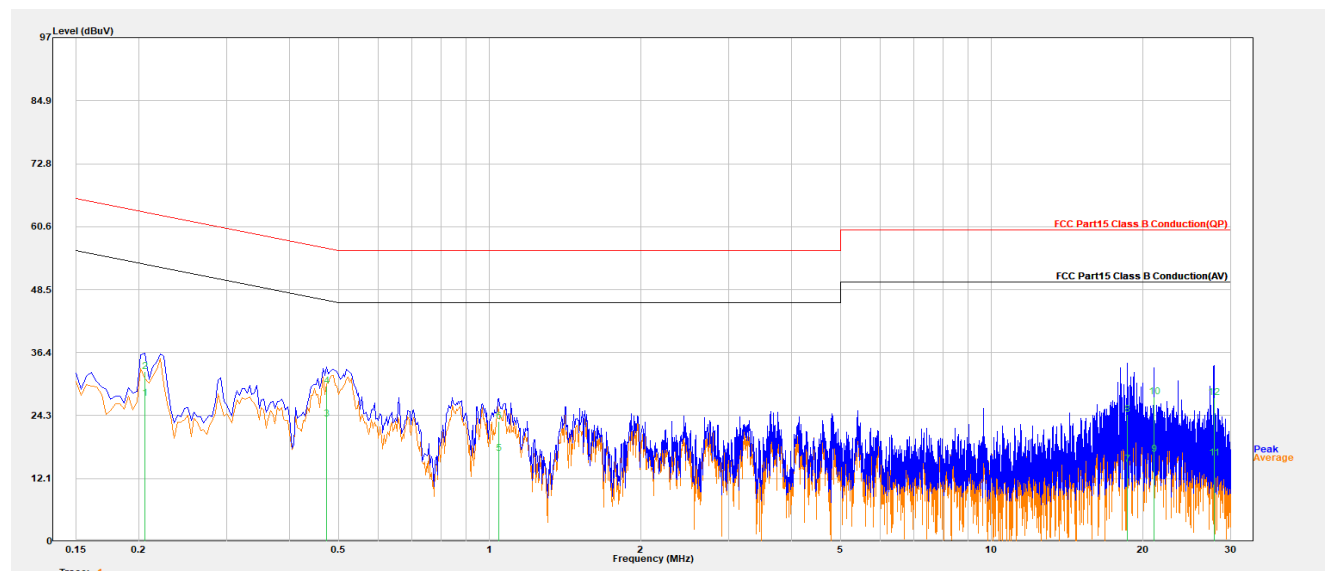
According to the recorded data in following table, the EUT complied with the FCC 15C standard's conducted emissions limits, with the margin reading of:

Worst Case – AC Line: 120V, 60Hz			
Margin (dB)	Frequency (MHz)	Conductor Mode (Hot/Neutral)	Range (MHz)
-18.52	0.523	Neutral	0.15 to 30

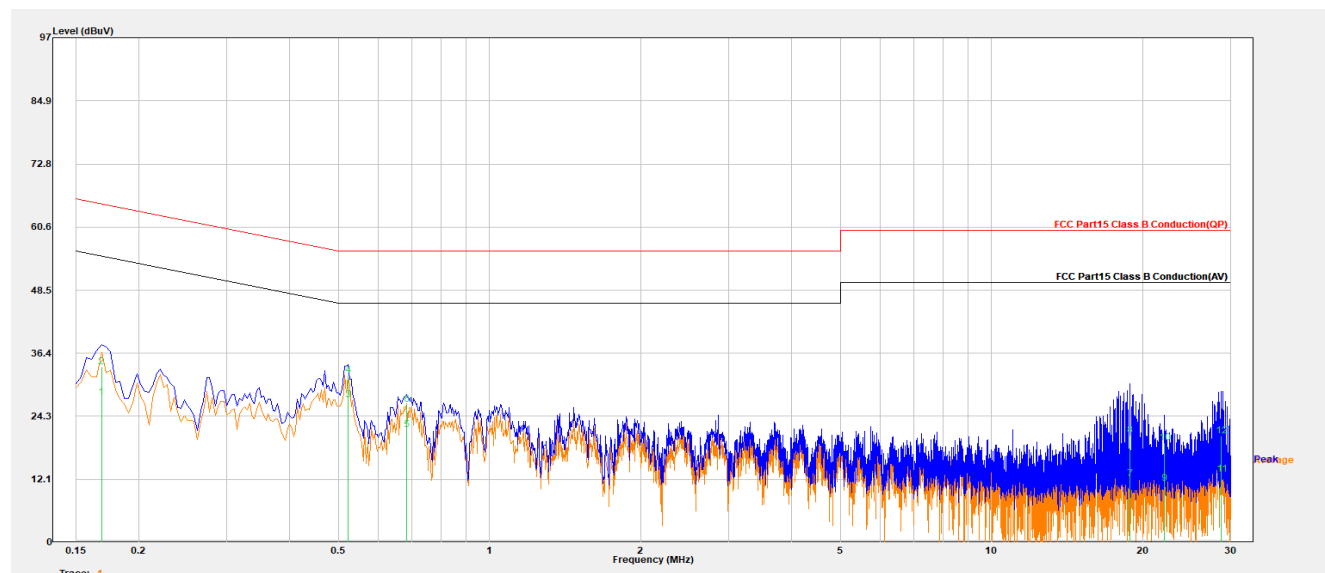
Please refer to the tables and plots in the next section for detailed test results.

6.9 Conducted Emissions Test Plots and Data

AC Line: 120VA, 60Hz – Hot Conductor



Frequency (MHz)	Ai. Reading (dBuV)	Correction Factor (dB)	Corrected Amplitude (dBμV)	Limit (dBμV)	Margin (dB)	Detector
0.206	16.13	11.50	27.63	53.37	-25.74	Average
0.206	21.22	11.50	32.72	63.37	-30.65	QP
0.475	12.98	10.63	23.61	46.43	-22.82	Average
0.475	19.26	10.63	29.89	56.43	-26.54	QP
1.046	6.63	10.36	16.99	46.00	-29.01	Average
1.046	12.83	10.36	23.19	56.00	-32.81	QP
18.663	4.33	10.61	14.94	50.00	-35.06	Average
18.663	13.80	10.61	24.41	60.00	-35.59	QP
21.119	6.10	10.74	16.84	50.00	-33.16	Average
21.119	17.12	10.74	27.86	60.00	-32.14	QP
27.757	4.95	11.10	16.04	50.00	-33.96	Average
27.757	16.68	11.10	27.78	60.00	-32.22	QP

AC Line: 120VA, 60Hz – Neutral Conductor

Frequency (MHz)	Ai. Reading (dBuV)	Correction Factor (dB)	Corrected Amplitude (dBμV)	Limit (dBμV)	Margin (dB)	Detector
0.169	16.08	11.75	27.83	55.03	-27.20	Average
0.169	22.03	11.75	33.77	65.03	-31.25	QP
0.523	16.89	10.59	27.48	46.00	-18.52	Average
0.523	21.56	10.59	32.15	56.00	-23.85	QP
0.684	11.16	10.49	21.65	46.00	-24.35	Average
0.684	15.99	10.49	26.48	56.00	-29.52	QP
18.913	1.53	10.64	12.18	50.00	-37.82	Average
18.913	9.99	10.64	20.63	60.00	-39.37	QP
22.115	0.49	10.83	11.31	50.00	-38.69	Average
22.115	8.35	10.83	19.18	60.00	-40.82	QP
28.735	1.85	11.23	13.08	50.00	-36.92	Average
28.735	9.23	11.23	20.47	60.00	-39.53	QP

7 FCC §15.35(b), §15.205, §15.209, §15.247(d) – Spurious Radiated Emissions

7.1 Applicable Standards

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 1MHz.

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(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)).

7.2 Test Setup

The radiated emissions tests were performed in the 5-meter chamber, using the setup in accordance with ANSI/USEMCSC C63.10-2020/Cor 1-2023. The specification used was the FCC §15.247 limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundled 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 was set 3 meter away from the testing antenna, which was varied from 1-4 meters, and the EUT was placed on a turntable, which was 0.8 meters and 1.5 meters 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's polarity should be changed between horizontal and vertical.

The spectrum analyzer or receiver was set as:

9 kHz-150 kHz

RBW = 200Hz /VBW = 1kHz

150 kHz-30 MHz

RBW = 9kHz /VBW = 30kHz

30 MHz- 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 = 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:

$$CA = \text{S.A. Reading} + \text{Correction Factor}$$

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:

$$\text{Correction Factor} = AF + CL + \text{Atten} - Ga$$

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:

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

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:

$$CA = Ai + AF + CL + \text{Atten} - Ga$$

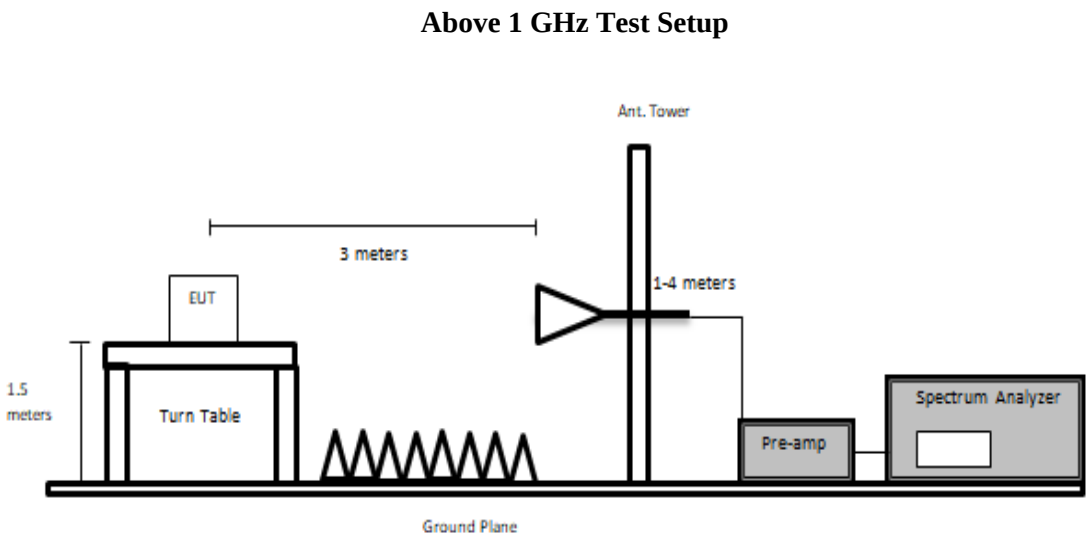
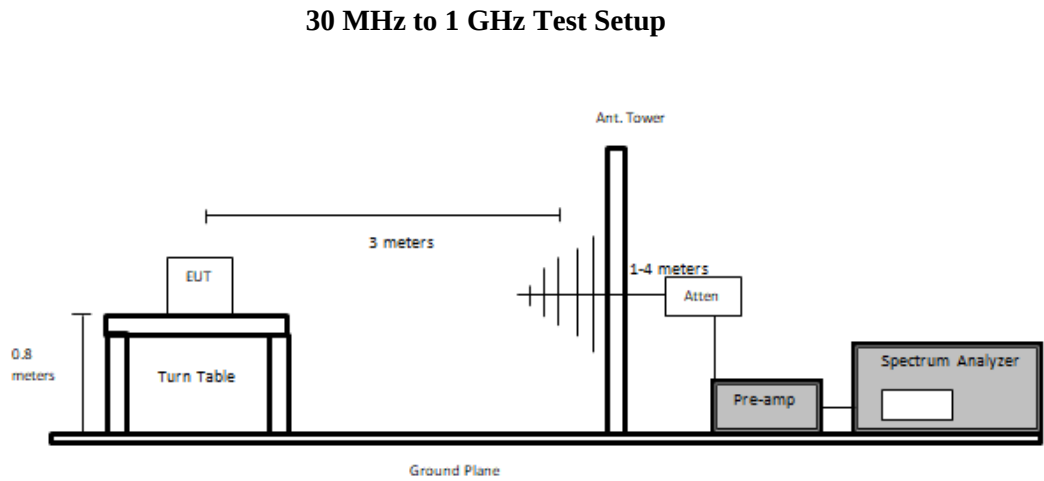
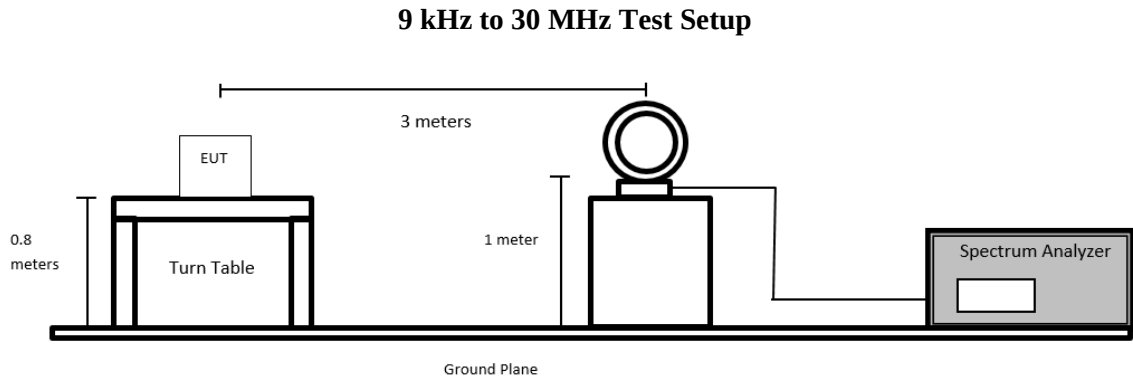
For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)

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:

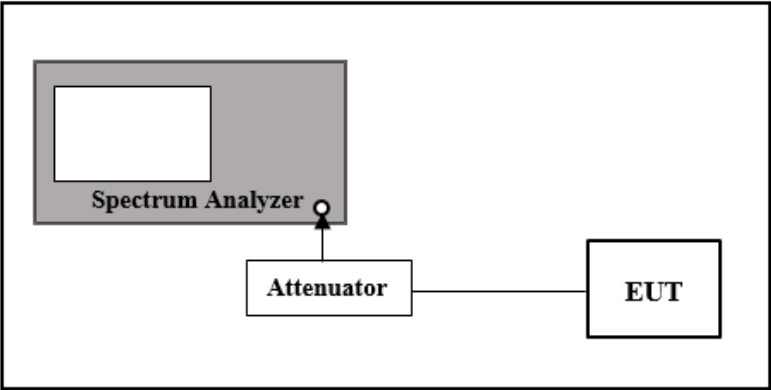
$$\text{Margin} = \text{Corrected Amplitude} - \text{Limit}$$

7.5 Test Setup Block Diagram

Radiated:



Conducted:



7.6 Test Equipment List and Details

Conducted:

BACL No	Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
624	Agilent	Spectrum Analyzer	E4446A	MY48250238	2025-06-09	1 year
1541	Pasternack	10dB Attenuator	PE7395-10	NA	2025-01-17	1 year

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”.

Radiated:

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
1432	Keysight Technologies	MXE EMI Receiver, Multi-touch	N9038B	MY60180008	2025-01-03	1 year
316	Sonoma Instruments	Preamplifier 10 kHz - 2.5 GHz	317	260406	2025-11-12	6 months
321	Sunol Sciences	Biconilog Antenna 30MHz-1GHz	JB3	A020106-2; 1504	2023-12-18	2 years
1245	Pasternack	6dB Attenuator	PE7390-6	01182018A	2023-12-18	2 years
1246	Hewlet Packard	RF Limiter 9KHz-1GHz	11867A	01734	2025-09-09	6 months
1210	Pasternack	N-type Coax Cable, 50ft RG213	PE3496-0600	2103161	2025-11-12	6 months
1248	Pasternack	RG214 COAX Cable 9 kHz - 1 GHz	PE3062	NA	2025-10-03	6 months
1192	ETS Lindgren	Horn Antenna 1-18GHz	3117	00218973	2024-10-23	2 years
1449	BACL	Preamplifier 100MHz-18GHz	BACL1313-A100M18G	4052472	2025-08-18	6 months
90	Wisewave	Horn Antenna 18-26.5GHz	ARH-4223-02	10555-01	2025-05-06	2 years
393	Com-Power	Loop Antenna, Active	AL-130	17043	2025-05-06	2 years
1451	BACL	Preamplifier 18-40GHz	BACL-1313-A1840	4052432	2025-08-18	6 months
1545	Megaphase	K-type coax cable	TM40-K1K3-12	20869601 001	2025-08-18	6 months
1546	Megaphase	SMA coax cable	TM26-S1S3-12	20869602 001	2025-08-18	6 months
1295	CarlisleIT	10m Coaxial Cable	UFB142A-1-3937-200200	64639890912-001	2025-10-16	6 months
672	Micro-Tronics	2.4 - 2.6GHz Notch Filter	BRM50701	160	2025-03-07	1 year

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 radiated testing was performed by Rachana Khanduri on 2025-12-02 and 2025-12-03 in 5m chamber 3.
The conducted band edge measurements performed by Rachana Khanduri on 2025-12-04 at RF test site.

7.8 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Part 15.209, 15.247 standards radiated emissions limits, and had the worst margin of:

Worst Case – Mode: Transmitting			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Configuration
-5.81	26298.12	Horizontal	GFSK(1M), 2402 MHz

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

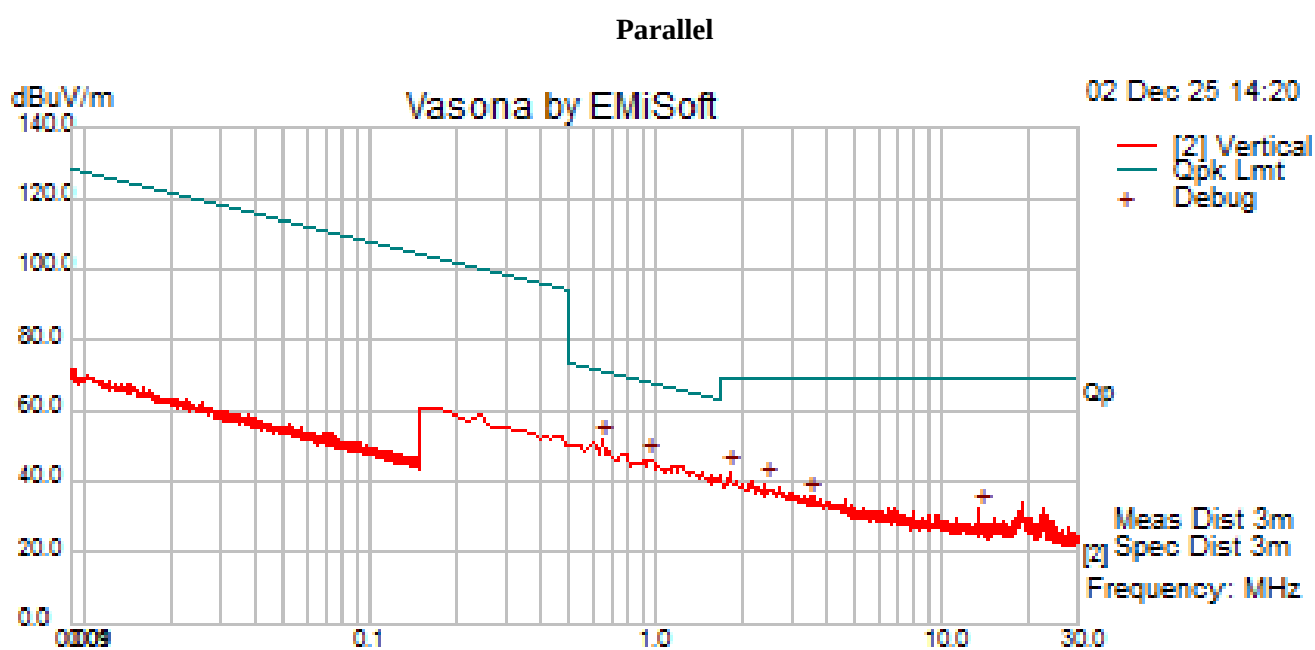
7.9 Radiated Emissions Test Results

Note:

1. Below test data are the radiated measurements. For conducted band edge measurements at the antenna port please refer to ANNEX E.
2. 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.
3. Highest Power & Power Spectral Density is measured at 1Mbps data rate and used as worst case to perform radiated spurious emissions test.

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

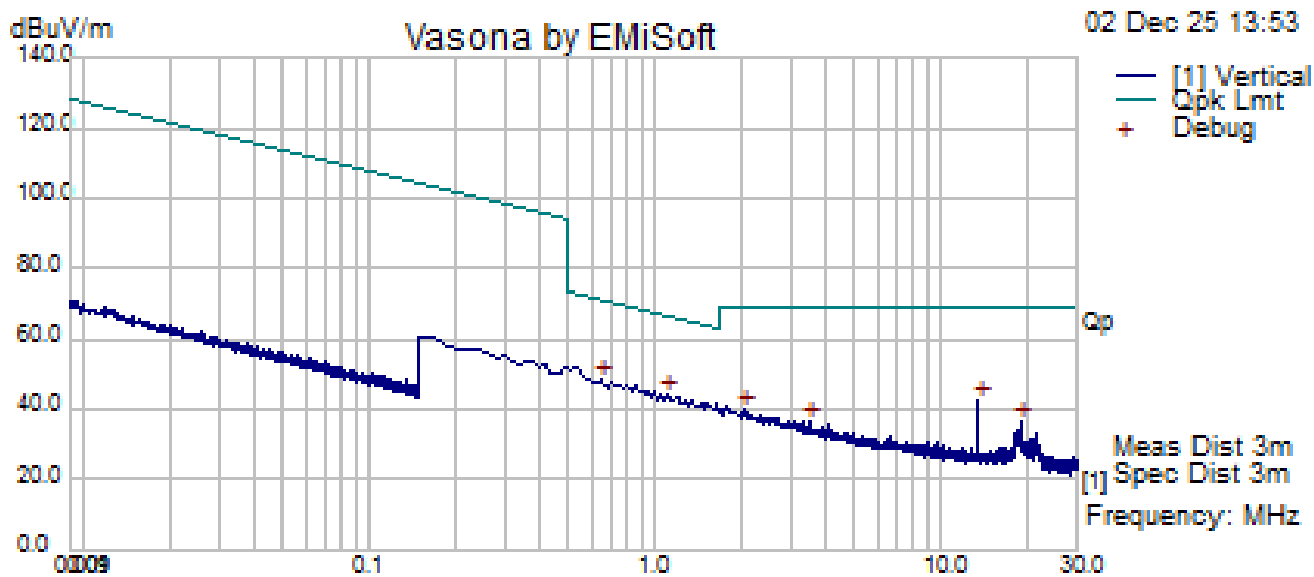
Note: Highest OP/PSD is measured at 2440MHz at 1Mbps and used as worst case configuration to show compliance for 9 kHz to 30MHz.



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBμV/m)	Antenna Position	Limit (dBμV/m)	Margin (dB)	Detector
0.65	41.42	10.14	51.56	Parallel	71.30	-19.74	Peak
0.93	36.18	10.05	46.23	Parallel	68.20	-21.97	Peak
1.81	32.49	10.32	42.81	Parallel	69.54	-26.73	Peak
2.41	28.95	10.41	39.36	Parallel	69.54	-30.18	Peak
3.47	25.01	10.44	35.45	Parallel	69.54	-34.09	Peak
13.56	21.16	10.66	31.82	Parallel	69.54	-37.72	Peak

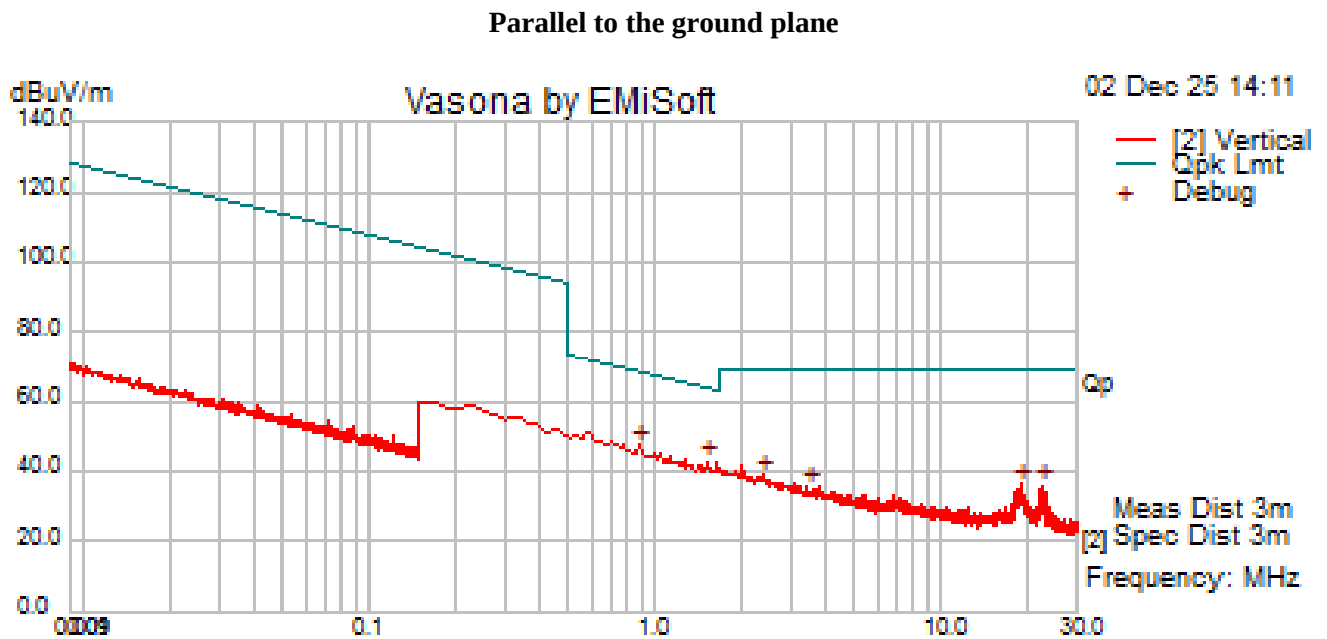
Note: Peak emissions are compared to QP limits to show worst-case compliance.

Perpendicular



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBμV/m)	Antenna Position	Limit (dBμV/m)	Margin (dB)	Detector
0.65	38.44	10.14	48.58	Perpendicular	71.30	-22.72	Peak
1.10	33.92	10.09	44.01	Perpendicular	66.77	-22.76	Peak
13.56	31.90	10.66	42.56	Perpendicular	69.54	-26.98	Peak
2.05	29.45	10.37	39.82	Perpendicular	69.54	-29.72	Peak
3.45	25.90	10.44	36.34	Perpendicular	69.54	-33.20	Peak
18.92	26.12	10.10	36.22	Perpendicular	69.54	-33.32	Peak

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

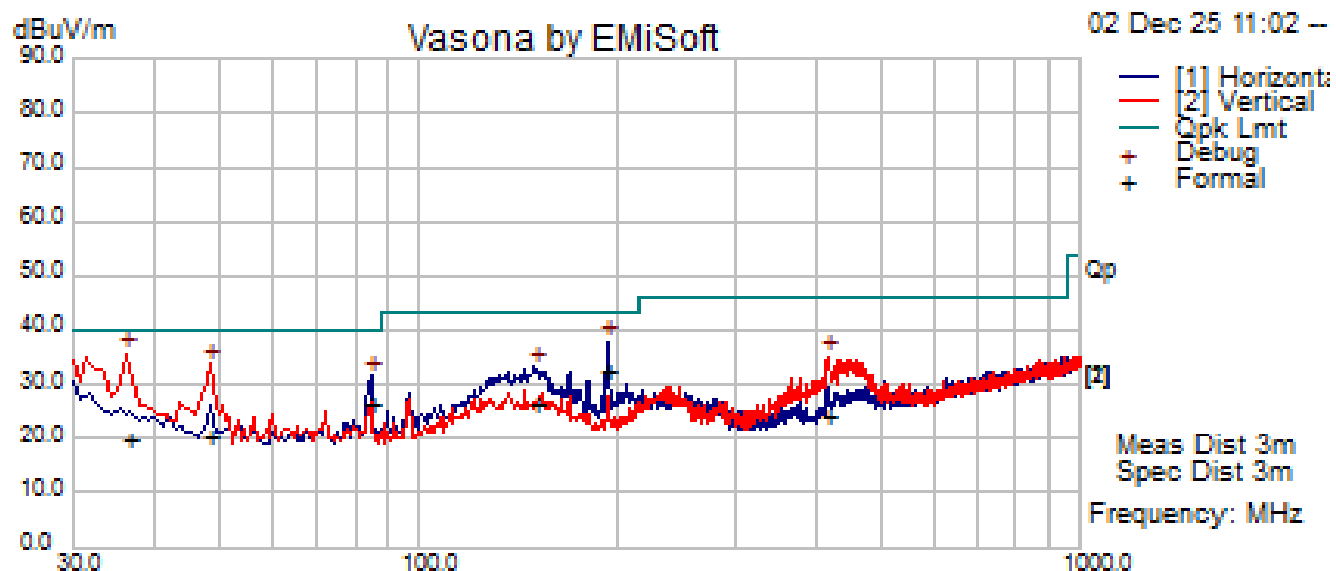


Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBμV/m)	Antenna Position	Limit (dBμV/m)	Margin (dB)	Detector
1.51	32.50	10.24	42.74	Ground-Parallel	64.01	-21.27	Peak
0.88	37.27	10.07	47.34	Ground-Parallel	68.74	-21.40	Peak
2.39	28.70	10.41	39.11	Ground-Parallel	69.54	-30.43	Peak
18.92	26.03	10.10	36.13	Ground-Parallel	69.54	-33.41	Peak
22.69	27.32	8.76	36.08	Ground-Parallel	69.54	-33.46	Peak
3.41	25.02	10.44	35.46	Ground-Parallel	69.54	-34.08	Peak

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

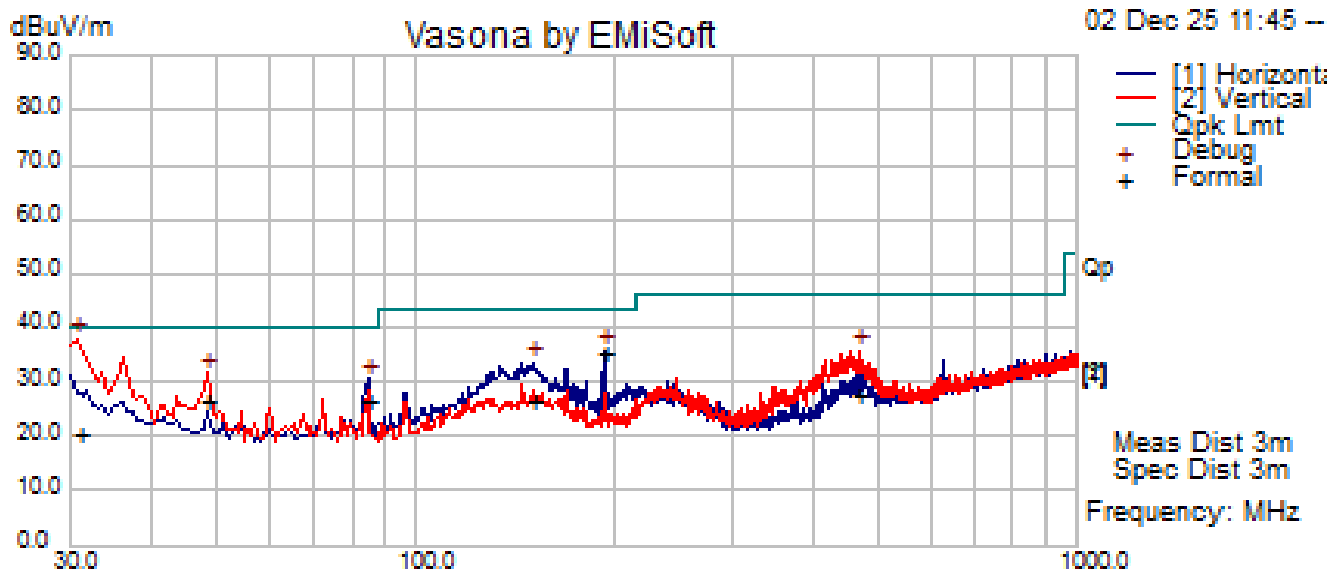
2) 30 MHz – 1 GHz, Measured at 3 meters

BLE GFSK (1Mbps), 2402 MHz



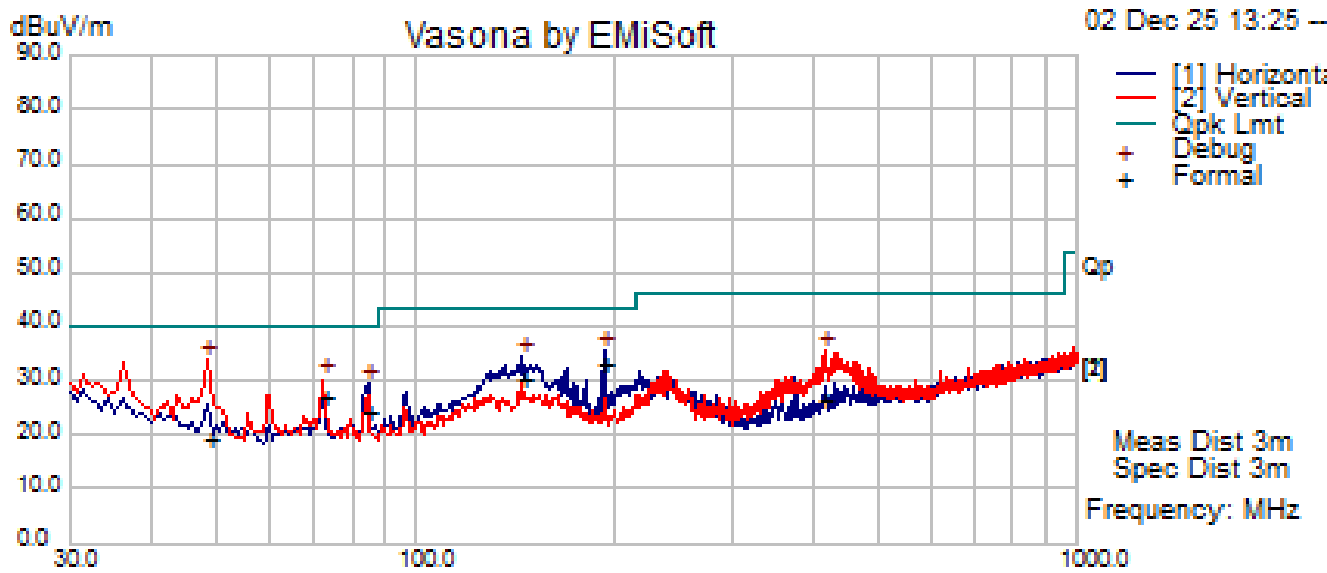
Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBuV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBuV/m)	Margin (dB)	Detector
36.21	34.74	-14.62	20.12	V	215	93	40	-19.88	QP
192.89	50.68	-17.95	32.73	H	123	98	43.5	-10.77	QP
48.05	42.95	-22.30	20.65	V	185	196	40	-19.35	QP
84.49	50.10	-23.45	26.65	H	206	7	40	-13.35	QP
149.34	43.72	-17.41	26.31	H	296	233	43.5	-17.19	QP
414.40	36.66	-12.63	24.03	V	121	106	46	-21.97	QP

BLE GFSK (1Mbps), 2440 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBuV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBuV/m)	Margin (dB)	Detector
192.91	53.20	-17.95	35.25	H	127	71	43.5	-8.25	QP
48.05	49.03	-22.30	26.73	V	234	46	40	-13.27	QP
84.32	50.21	-23.47	26.74	H	200	41	40	-13.26	QP
150.13	43.72	-17.44	26.28	H	299	39	43.5	-17.22	QP
469.37	37.95	-10.49	27.46	V	167	127	46	-18.54	QP
30.78	31.64	-11.00	20.64	V	169	27	40	-19.36	QP

BLE GFSK (1Mbps), 2480 MHz



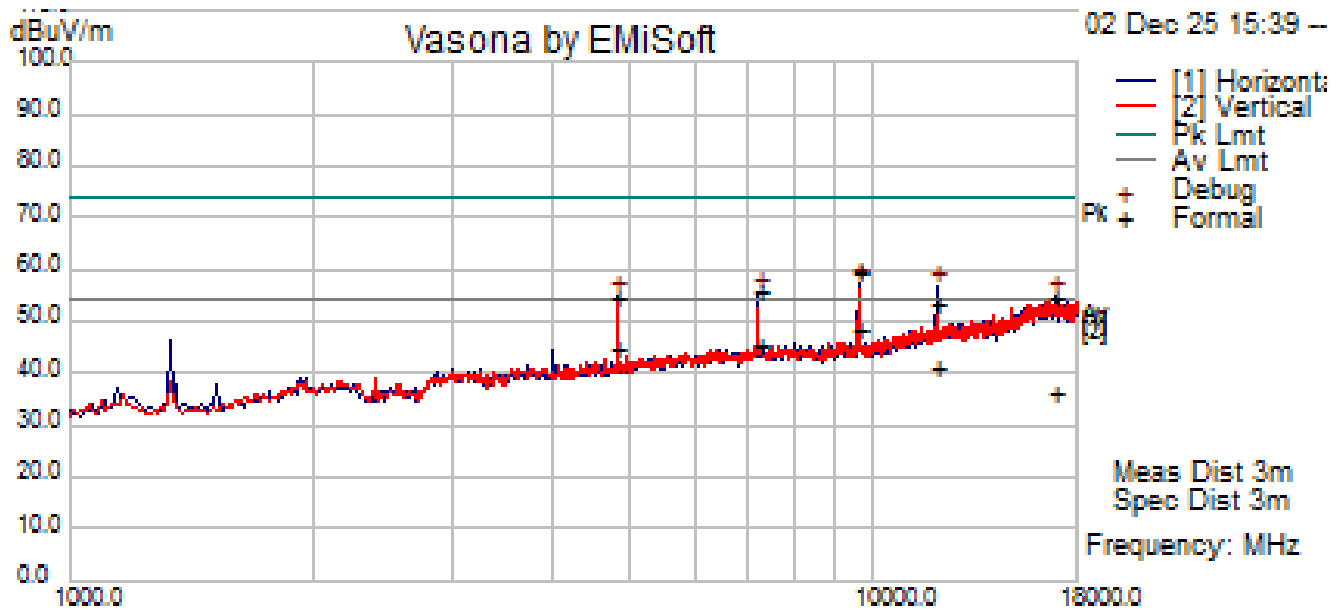
Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBuV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBuV/m)	Margin (dB)	Detector
48.43	41.81	-22.48	19.33	V	157	147	40	-20.67	QP
192.97	51.00	-17.94	33.06	H	151	66	43.5	-10.44	QP
144.57	47.53	-17.27	30.26	H	249	95	43.5	-13.24	QP
72.44	49.52	-22.64	26.88	V	101	22	40	-13.12	QP
414.45	39.28	-12.63	26.65	V	126	135	46	-19.35	QP
84.50	47.72	-23.45	24.27	H	122	47	40	-15.73	QP

FCC Limits for 1 GHz to 26.5 GHz			
Applicability	(dBm)	(uV/m at 3meters)	(dBuV/m at 3meters)
Restricted Band Average Limit	-	500	54
Restricted Band Peak Limit ¹	-	-	74

Note¹: Restricted Band Peak Limit is defined to be 20dB higher than Average Limit.

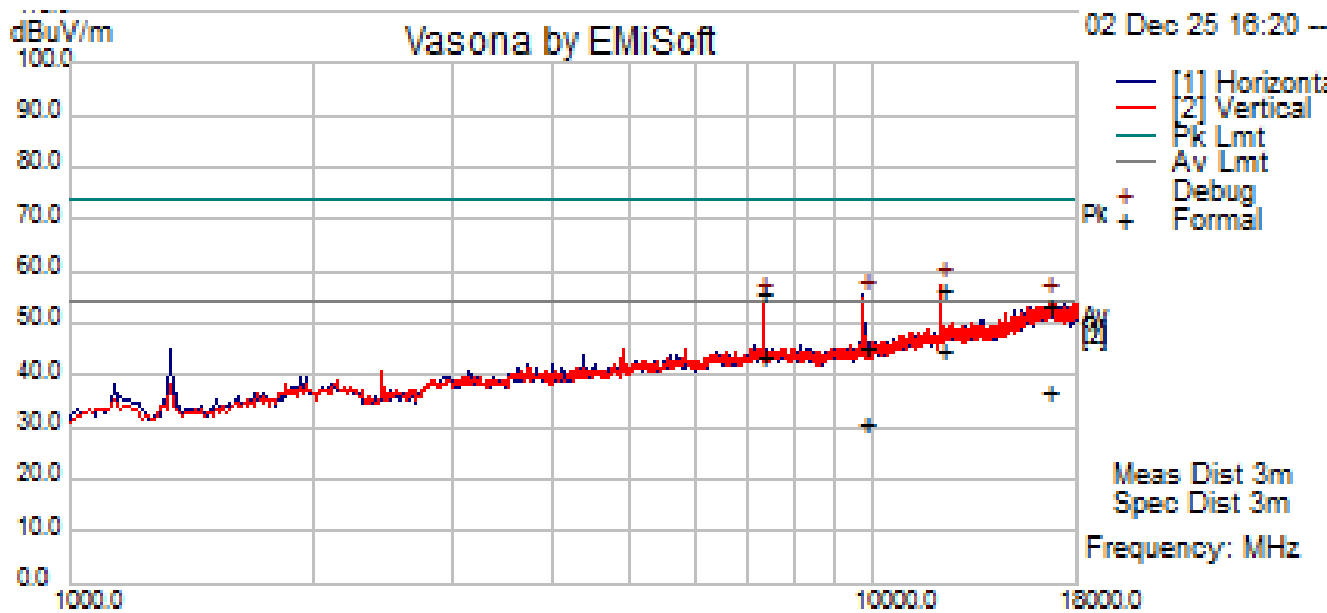
3) 1 GHz – 18 GHz, Measured at 3 meters

BLE GFSK (1Mbps), 2402 MHz



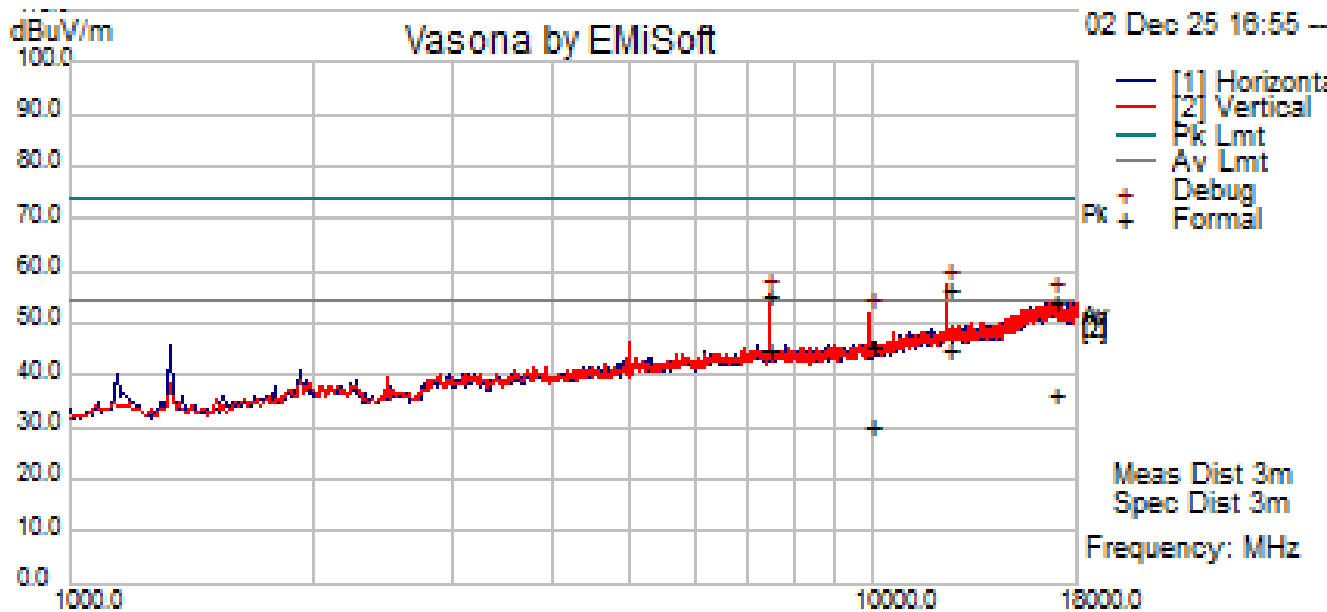
Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBuV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBuV/m)	Margin (dB)	Detector
9607.10	51.09	8.16	59.25	H	118	128	74	-14.75	Peak
12009.03	41.24	12.26	53.50	H	100	14	74	-20.50	Peak
7205.46	50.60	5.06	55.66	H	115	193	74	-18.34	Peak
16906.20	35.89	18.37	54.26	H	168	207	74	-19.74	Peak
4803.63	53.63	0.95	54.58	H	132	244	74	-19.42	Peak
9607.10	40.02	8.16	48.18	H	118	128	54	-5.82	Average
12009.03	28.78	12.26	41.04	H	100	14	54	-12.96	Average
7205.46	40.09	5.06	45.15	H	115	193	54	-8.85	Average
16906.20	17.99	18.37	36.36	H	168	207	54	-17.64	Average
4803.63	43.77	0.95	44.72	H	132	244	54	-9.28	Average

BLE GFSK(1Mbps), 2440 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBuV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBuV/m)	Margin (dB)	Detector
12199.00	44.37	12.32	56.69	H	111	177	74	-17.31	Peak
9767.38	36.82	8.33	45.15	H	140	236	74	-28.85	Peak
16577.44	35.24	18.11	53.35	V	297	172	74	-20.65	Peak
7320.86	50.56	5.19	55.75	V	218	288	74	-18.25	Peak
12199.00	32.27	12.32	44.59	H	111	177	54	-9.41	Average
9767.38	22.23	8.33	30.56	H	140	236	54	-23.44	Average
16577.44	18.73	18.11	36.84	V	297	172	54	-17.16	Average
7320.86	38.46	5.19	43.65	V	218	288	54	-10.35	Average

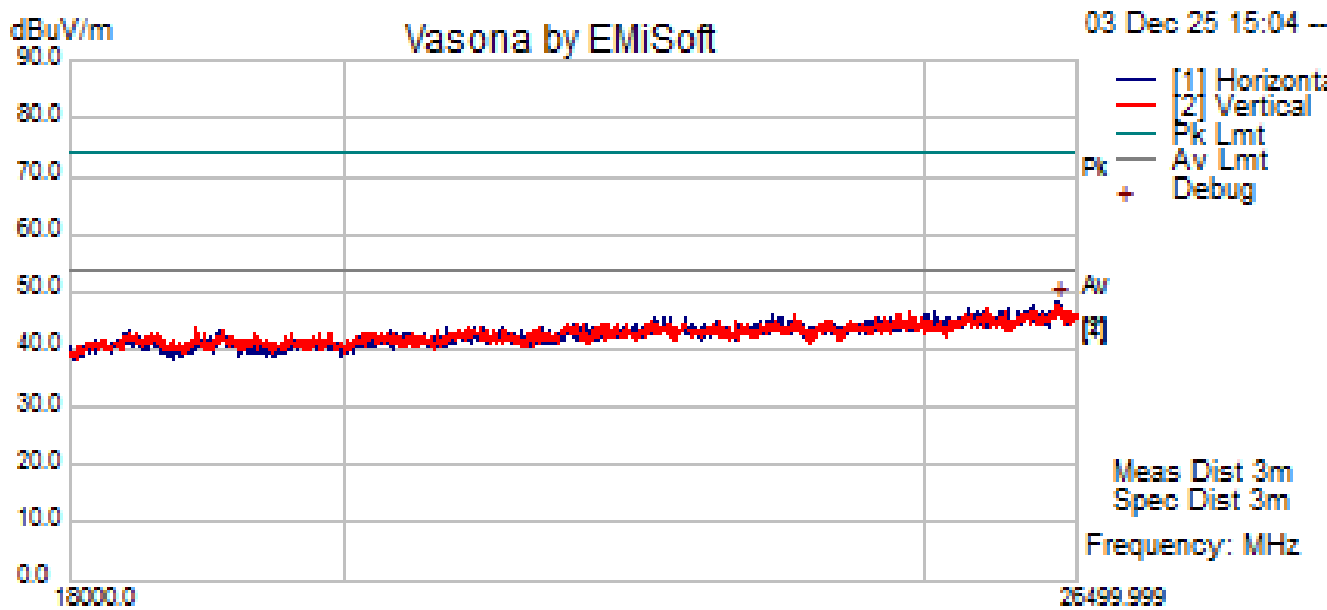
BLE GFSK(1Mbps), 2480 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBuV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBuV/m)	Margin (dB)	Detector
12399.03	43.73	12.61	56.34	V	110	96	74	-17.66	Peak
7439.53	49.43	5.45	54.88	V	191	271	74	-19.12	Peak
16839.95	35.34	18.54	53.88	H	211	261	74	-20.12	Peak
9926.60	36.96	8.60	45.56	V	294	180	74	-28.44	Peak
12399.03	32.20	12.61	44.81	V	110	96	54	-9.19	Average
7439.53	39.13	5.45	44.58	V	191	271	54	-9.42	Average
16839.95	17.71	18.54	36.25	H	211	261	54	-17.75	Average
9926.60	21.21	8.60	29.81	V	294	180	54	-24.19	Average

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

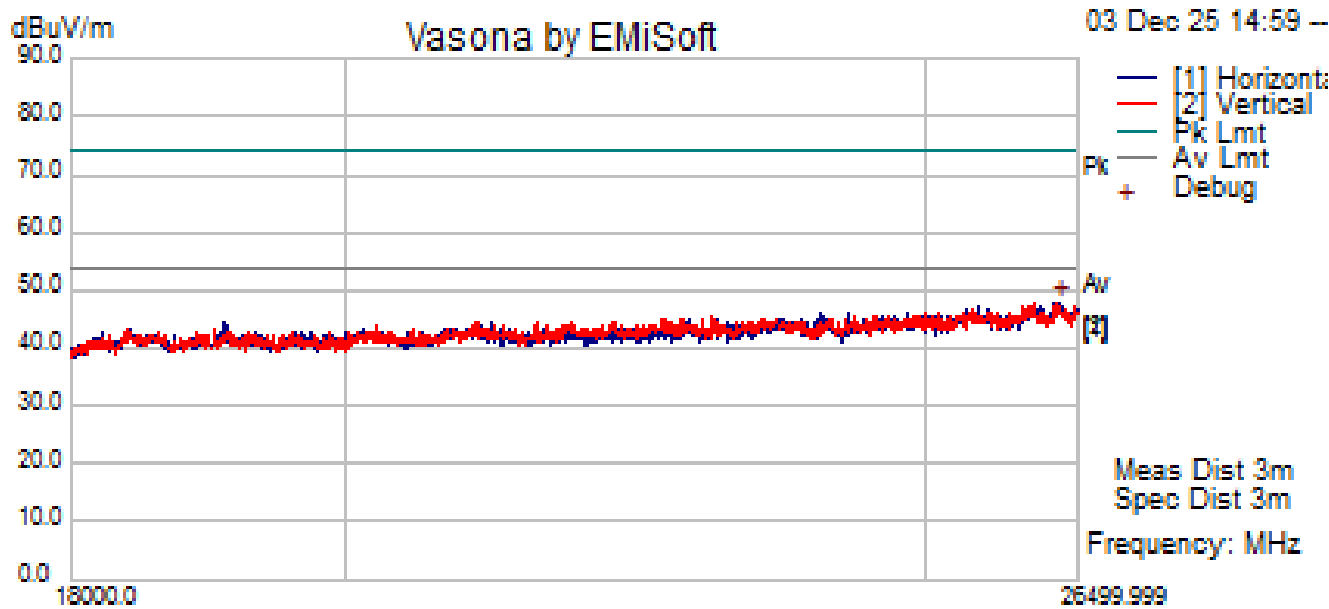
BLE GFSK (1Mbps), 2402 MHz



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)	Detector
26298.12	40.26	7.93	48.19	H	200	0	54	-5.81	Peak

Note: Peak measurement is used to compare to the average limit.

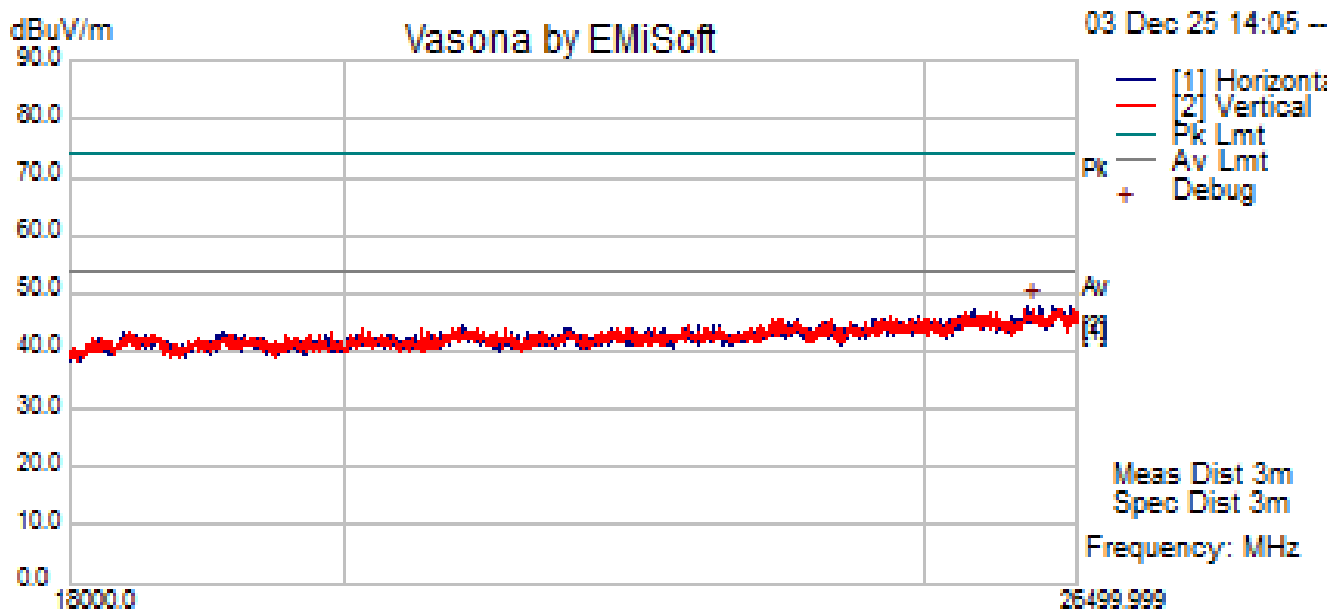
BLE GFSK (1Mbps), 2440 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBuV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBuV/m)	Margin (dB)	Detector
26308.75	40.13	7.84	47.97	H	200	0	54	-6.03	Peak

Note: Peak measurement is used to compare to the average limit.

BLE GFSK (1Mbps), 2480 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBuV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (degrees)	Limit (dBuV/m)	Margin (dB)	Detector
26005.94	39.94	7.92	47.86	H	200	0	54	-6.14	Peak

Note: Peak measurement is used to compare to the average limit.

8 FCC §15.247(a) (2) – Emission Bandwidth

8.1 Applicable Standards

According to FCC §15.247(a) (2): the minimum 6 dB bandwidth shall be 500 kHz.

8.2 Measurement Procedure

The measurements are based on FCC KDB 558074 D01 DTS Meas Guidance v05r02: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 8: DTS bandwidth.

As per ANSI C63.10 Clause 11.8: DTS bandwidth

One of the following procedures may be used to determine the modulated DTS bandwidth.

Option 1:

- a. Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz.
- b. Set the VBW $\geq [3 \times \text{RBW}]$.
- c. Detector = peak.
- d. Trace mode = max hold.
- e. Sweep = auto couple.
- f. Allow the trace to stabilize.
- g. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 00206 dB relative to the maximum level measured in the fundamental emission.

Option 2:

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1 (i.e., RBW = 100 kHz, VBW $\geq 3 \times \text{RBW}$, and peak detector with maximum hold) is implemented by the instrumentation function.

When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

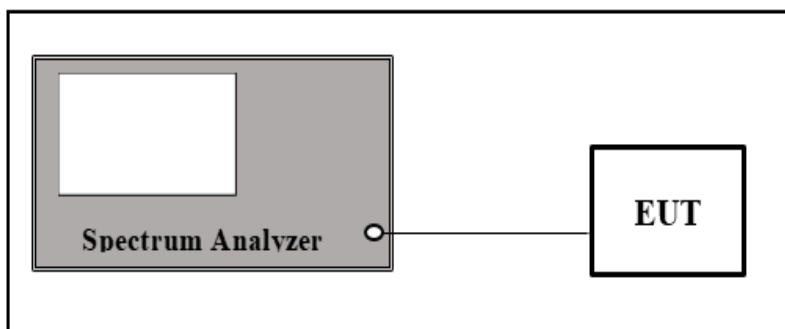
As per the ANSI 63.10 Clause 6.9.3: Occupied Bandwidth

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:

- a. 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.
- b. 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.
- c. 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 $[10 \log (\text{OBW}/\text{RBW})]$ below the reference level. Specific guidance is given in 4.1.5.2.
- d. Step a) through step c) might require iteration to adjust within the specified range.
- e. 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.

- f. Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.
- g. 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.
- h. 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	2025-06-09	1 year

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:	22°C
Relative Humidity:	53%
ATM Pressure:	101.5 kPa

The testing was performed by Rachana Khanduri on 2025-12-04 at RF test site.

8.6 Test Results

2.4 GHz BLE

Channel	Frequency (MHz)	6 dB OBW (MHz)		99% OBW (MHz)		6 dB OBW Limit (kHz)	Result
		1 Mbps	2 Mbps	1 Mbps	2 Mbps		
Low	2402	0.700	1.182	1.061	2.116	≥ 500	Pass
Middle	2440	0.715	1.167	1.056	2.107	≥ 500	Pass
High	2480	0.676	1.158	1.060	2.094	≥ 500	Pass

Please refer to Annex A for detailed test results.

9 FCC §15.247(b)(3) – Maximum Output Power

9.1 Applicable Standards

According to FCC §15.247(b)(3): For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

9.2 Measurement Procedure

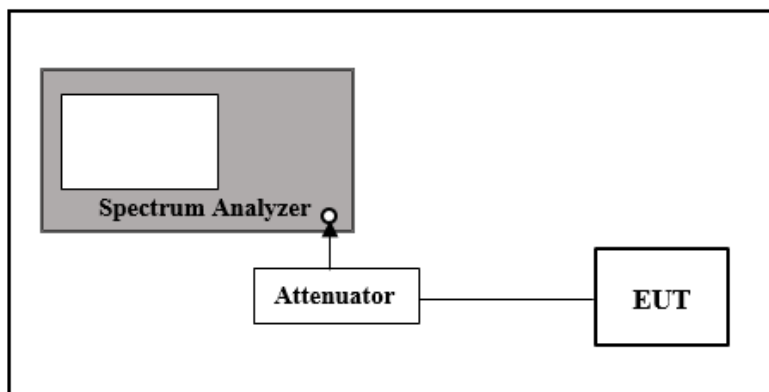
The measurements are based on ANSI C63.10, Section 11.9.1.1

11.9.1.1 Maximum peak conducted output power $RBW \geq DTS$ bandwidth

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:

- a) Set the $RBW \geq DTS$ bandwidth.
- b) Set $VBW \geq [3 \times RBW]$.
- c) Set $span \geq [3 \times RBW]$.
- d) Sweep time = No faster than coupled (auto) time.
- e) Detector = peak.
- f) Trace mode = max-hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

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	2025-06-09	1 year
1541	Pasternack	10dB Attenuator	PE7395-10	NA	2025-01-17	1 year

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:	22°C
Relative Humidity:	53%
ATM Pressure:	101.5 kPa

The testing was performed by Rachana Khanduri on 2025-12-04 at RF test site.

9.6 Test Results

2.4 GHz BLE

Channel	Frequency (MHz)	Conducted Output Power (dBm)		Output Power Limit (dBm)	Result
		1 Mbps	2 Mbps		
Low	2402	6.33	6.36	< 30	Pass
Middle	2440	6.22	6.22	< 30	Pass
High	2480	5.66	5.70	< 30	Pass

Please refer to Annex B for detailed test results.

10 FCC §15.247(e)–Power Spectral Density

10.1 Applicable Standards

According to ECFR §15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

10.2 Measurement Procedure

The measurements are based on FCC KDB 558074 D01 DTS Meas Guidance v05r02: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 8.4: Maximum power spectral density level in the fundamental emission.

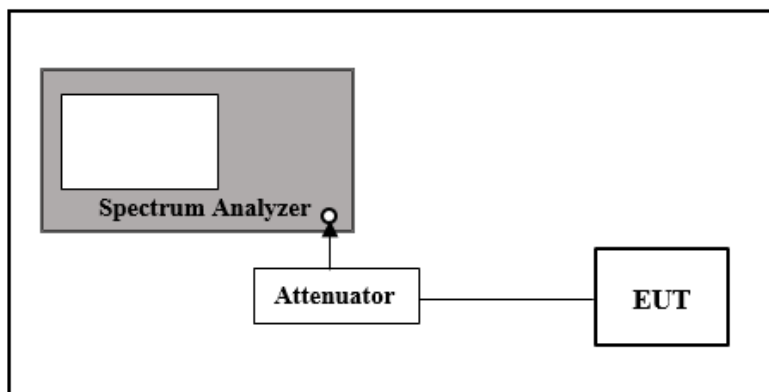
As per ANSI C63.10 Clause 11.10: Maximum power spectral density level in the fundamental emission

Some regulatory requirements specify a conducted PSD limit within the DTS bandwidth during any time interval of continuous transmission.⁸⁸ Such specifications require that the same method as used to determine the conducted output power shall be used to determine the power spectral density. If maximum peak conducted output power was measured, then the peak PSD procedure 11.10.2 (method PKPSD) shall be used. If maximum conducted output power was measured, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option):

Method PKPSD (peak PSD): The following procedure shall be used if maximum peak conducted output power was used to determine compliance, and it is optional if the maximum conducted (average) output power was used to determine compliance:

- a. Set analyzer center frequency to DTS channel center frequency.
- b. Set the span to 1.5 times the DTS bandwidth.
- c. Set the RBW to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d. Set the VBW $\geq [3 \times \text{RBW}]$.
- e. Detector = peak.
- f. Sweep time = auto couple.
- g. Trace mode = max hold.
- h. Allow trace to fully stabilize.
- i. Use the peak marker function to determine the maximum amplitude level within the RBW.
- j. If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

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	2025-06-09	1 year
1541	Pasternack	10dB Attenuator	PE7395-10	NA	2025-01-17	1 year

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:	22°C
Relative Humidity:	53%
ATM Pressure:	101.5 kPa

The testing was performed by Rachana Khanduri on 2025-12-04 at RF test site.

10.6 Test Results

2.4 GHz BLE

Channel	Frequency (MHz)	PSD (dBm/10kHz)		Limit (dBm/3kHz)
		1 Mbps	2 Mbps	
Low	2402	-3.94	-4.70	<8
Middle	2440	-3.85	-5.09	<8
High	2480	-4.57	-5.68	<8

Note: The EUT passed with stringent RBW of 10 kHz, thus complied with FCC RBW requirement of 3 kHz.

Please refer to Annex C for detailed test results.

11 FCC §15.247(d) – Spurious Emissions at Antenna Terminal and 100 kHz Band Edges

11.1 Applicable Standards

According to FCC §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum 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. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emissions limits specified in §15.209(a) see §15.205(c).

11.2 Measurement Procedure

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.

RBW = 100 kHz

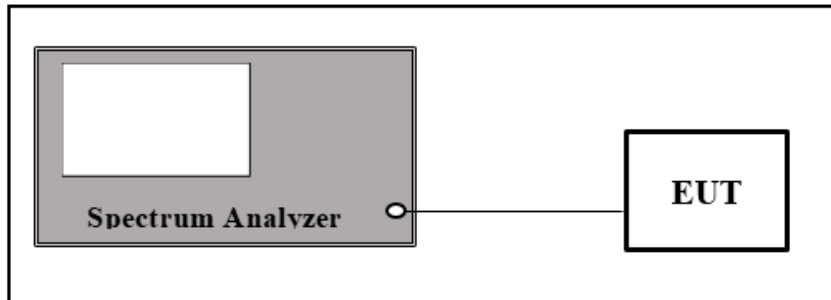
VBW = 300 kHz

Sweep = coupled

Detector function = peak

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	2025-06-09	1 year

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:	22°C
Relative Humidity:	53%
ATM Pressure:	101.5 kPa

The testing was performed by Rachana Khanduri on 2025-12-04 at RF test site.

11.6 Test Results

Please refer to Annex D

Test Results: Pass

12 Appendix A (Normative) – EUT Test Setup Photographs

Please refer to the attachment.

13 Appendix B (Normative) – EUT External Photographs

Please refer to the attachment.

14 Appendix C (Normative) – EUT Internal Photographs

Please refer to the attachment.

15 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>

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