



FCC PART 15.225
ISED C RSS-210, ISSUE 11, JUNE 2024

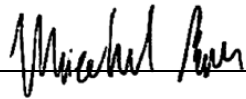
TEST REPORT

For

Tesla, Inc.

3500 Deer Creek Road
Palo Alto, CA 94304, USA

FCC ID: 2AEIM-2167704
IC: 20098-2167704

Report Type: Original Report	Product Type: Automotive Part
Prepared By: Michael Papa RF Test Engineer	
Report Number: R2510091-225	
Report Date: 2025-12-12	
Reviewed By: Steven Lianto EMC & RF Lead	
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).....	6
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	EQUIPMENT MODIFICATION	11
2.4	LOCAL SUPPORT EQUIPMENT.....	12
2.5	REMOTE SUPPORT EQUIPMENT	12
2.6	POWER SUPPLY AND LINE FILTERS	12
2.7	INTERFACE PORTS AND CABLING.....	12
3	SUMMARY OF TEST RESULTS.....	13
4	FCC §15.203 & ISEDC RSS-GEN §6.8 – ANTENNA REQUIREMENTS.....	14
4.1	APPLICABLE STANDARDS	14
4.2	ANTENNA DESCRIPTION.....	15
5	FCC §2.1091, §1.1307 & ISEDC RSS-102 – RF EXPOSURE.....	16
5.1	APPLICABLE STANDARDS	16
5.2	MPE PREDICTION	17
5.3	MPE RESULT FOR FCC.....	17
5.4	RF EXPOSURE EVALUATION FOR IC	17
6	FCC §15.225 (A) (B) (C) (D), FCC §15.205, FCC §15.209, ISEDC RSS-210 ANNEX B.6, RSS-GEN §8.9, §8.10 – RADIATED FIELD STRENGTH	18
6.1	APPLICABLE STANDARDS	18
6.2	TEST SETUP.....	20
6.3	TEST PROCEDURE	21
6.4	CORRECTED AMPLITUDE AND MARGIN CALCULATION	21
6.5	TEST SETUP BLOCK DIAGRAM	22
6.6	TEST EQUIPMENT LIST AND DETAILS.....	23
6.7	TEST ENVIRONMENTAL CONDITIONS	23
6.8	SUMMARY OF TEST RESULTS	24
6.9	RADIATED EMISSIONS TEST RESULTS.....	25
7	FCC §15.225 (E), ISEDC RSS-210 ANNEX B.6 – FREQUENCY TOLERANCE.....	30
7.1	APPLICABLE STANDARDS	30
7.2	MEASUREMENT PROCEDURE.....	30
7.3	TEST SETUP BLOCK DIAGRAM.....	30
7.4	TEST EQUIPMENT LIST AND DETAILS.....	31
7.5	TEST ENVIRONMENTAL CONDITIONS	31
7.6	TEST RESULTS	32
8	FCC §15.215 (C), ISED RSS-GEN §6.7 – OCCUPIED BANDWIDTH	38
8.1	APPLICABLE STANDARDS	38
8.2	MEASUREMENT PROCEDURE.....	39
8.3	TEST SETUP BLOCK DIAGRAM	39
8.4	TEST EQUIPMENT LIST AND DETAILS.....	40
8.5	TEST ENVIRONMENTAL CONDITIONS	40

8.6 TEST RESULTS 41

9 APPENDIX A (NORMATIVE) – EUT TEST SETUP PHOTOGRAPHS..... 42

10 APPENDIX B (NORMATIVE) – EUT EXTERNAL PHOTOGRAPHS..... 43

11 APPENDIX C (NORMATIVE) – EUT INTERNAL PHOTOGRAPHS 44

12 APPENDIX D (NORMATIVE) – A2LA ELECTRICAL TESTING CERTIFICATE..... 45

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R2510091-225	Original Report	2025-12-12

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test report is prepared on behalf of *Tesla, Inc.*, and their product model: 2167704, FCC ID: 2AEIM-2167704, IC: 20098-2167704, the “EUT” as referred to in this report. The EUT is an Automotive Part (Endpoint Device) equipped with an Ultra-Wideband (UWB) radio operating at 7987.2 MHz, a Bluetooth Low Energy (BLE) radio operating in the 2402–2480 MHz band, and a Near Field Communication (NFC) radio operating at 13.56 MHz.

1.2 Mechanical Description of EUT

The EUT measures approximately 75.0 cm (L) x 42.0 cm (W) x 5.5 cm (H) and weights approximately 1.25 kg.

The data gathered is from production samples provided by Tesla, Inc with S/N: 3125001 2.

1.3 Objective

This report was prepared on behalf of Tesla, Inc. in accordance with Part 2, Subpart J, and Part 15, Subpart B & C of the Federal Communication Commission’s rules and ISEDC RSS-210 Issue 11, June 2024.

The objective was to determine compliance with FCC Part 15.225 and ISEDC RSS-210 for Antenna Requirement, RF Exposure, AC Line Conducted Emissions, Radiated Field Strength, Frequency Tolerance, and Occupied Bandwidth.

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

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

1.4 Related Submittal(s)/Grant(s)

FCC Part 15, Subpart C, Equipment Class: DTS with FCC ID: 2AEIM-2167704, IC: 20098-2167704

FCC Part 15, Subpart F, Equipment Class: UWB with FCC ID: 2AEIM-2167704, IC: 20098-2167704

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.10-2020 + Cor.1-2023 + Errata to C63.10a-2024, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

1.6 Measurement Uncertainty

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

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

1.7 Test Facility Registrations

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

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

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):
 - All Unlicensed radio frequency devices within FCC Scopes A1, A2, A3, and A4;
 - All Licensed radio frequency devices within FCC Scopes B1, B2, B3, and B4;
 - All Telephone Terminal Equipment within FCC Scope C.
2. Canada (ISED Canada) Foreign Certification Body – FCB – APEC Tel MRA -Phase I & Phase II:
 - Phase I Designation Letter
 - 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:
 - All Line Terminal Equipment: All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2011, Annex 2 IMDA Phase I
 - 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:
 - NIST Phase I Scope Recognition Letter from OFCA for BACL –US0057
 - OFCA Phase II Designation Letter
5. For Japan (Ministry of Communications):
 - NIST Japan Recognition
 - MIC Telecommunication Business Law (Terminal Equipment):
 1. All Scope A1 – Terminal Equipment for the Purpose of Calls;
 2. All Scope A2 – Other Terminal Equipment
 - 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
 - Japan VCCI – Voluntary Control Council for Interference US-Japan Telecom Treaty (VCCI Side Letter)
 1. VCCI Certificate
 - Japan Registered Certification Body
 1. RCB Recognition Letter

6. European Union:
 - Radio Equipment Directive [RED] 2014/53/EU US-EU EMC & Telecom MRA CAB (NB)
 - 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:
 - Phase I Designation Letter
8. Chinese Taipei (Republic of China – Taiwan):
 - NCC (National Communications Commission) APEC Tel MRA -Phase I
9. Republic of Korea (Ministry of Communications – Radio Research Laboratory) APEC Tel MRA -Phase I:
 - NIST Phase I Scope Update Notification Letter from Korea for BACL
10. Vietnam APEC Tel MRA -Phase I (page 13)
 - Vietnam (MIC) NIST Phase I Scope
11. Indonesia SDPPI (page 6)
 - Phase I Listing
12. Israel Phase I
 - 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
 - NIST Phase I New Recognition Letter from Mexico for BACL – US0057
15. Taiwan (BSMI) Phase 1 Designation Letter and designation form.
 - NIST Phase I Scope Update Designation Letter to BSMI for BACL – US0057
 - 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 C63.10-2020 + Cor.1-2023 + Errata to C63.10a-2024.

The EUT was tested in a testing mode to represent worst-case results during the final qualification test.

2.2 EUT Exercise Software

The test software used was *python* script “*ethernet_tool.py*” provided by *Tesla, Inc.* The software is compliant with the standard requirements being tested against.

The power setting used during testing was: 0x00

The trim level used during testing was: 0x08

2.3 Equipment Modification

No modifications were made to the EUT during testing.

2.4 Local Support Equipment

None

2.5 Remote Support Equipment

Manufacturer	Description	Model	Serial Number
HP	Laptop	Zbook Studio G3	CND823074L
Tesla, Inc.	Debug Board	-	-

2.6 Power Supply and Line Filters

Manufacturer	Description	Model	Serial Number
Volteq	DC Power Supply	HY5003D	160402343

2.7 Interface Ports and Cabling

Cable Description	Length (m)	From	To
Communication Cable	< 1	EUT	Debug Board
Power Cables	< 1	Debug Board	DC Power Supply
USB Cable	< 1	Debug Board	Laptop

3 Summary of Test Results

FCC & ISEDC Rules	Description of Test	Results
FCC §15.203 ISEDC RSS-Gen §6.8	Antenna Requirements	Compliant
FCC §2.1091, §1.1310(d)(3) ISEDC RSS-102	RF Exposure	Compliant
FCC §15.207 ISEDC RSS-Gen §8.8	AC Line Conducted Emissions	N/A ¹
FCC §15.225 (a) (b) (c) (d) FCC §15.205, FCC §15.209 ISED RSS-210 Annex B.6 ISEDC RSS-Gen §8.9, §8.10	Radiated Field Strength (9 kHz – 30 MHz, 30 MHz-1 GHz)	Compliant
FCC §15.225 (e) ISED RSS-210-Annex B.6	Frequency Tolerance	Compliant
FCC §15.215 (c) ISED RSS-Gen §6.7	Occupied Bandwidth	Compliant

Note¹: The EUT is battery powered.

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

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

4.1 Applicable Standards

According to FCC §15.203:

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

According to ISEDC RSS-Gen §6.8: Transmitter Antenna

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

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

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

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

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

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

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

4.2 Antenna Description

External/Internal/ Integral	Part Number	Antenna Type	Frequency Range (MHz)	Maximum Antenna Gain (dBi)
Integral	2167704	Coil	13.56	N/A

Note: Only radiated emissions are used to show compliance for fundamental and spurious emissions.

5 FCC §2.1091, §1.1307 & ISEDC RSS-102 – RF Exposure

5.1 Applicable Standards

According to FCC §2.1091, 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 MHz 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 $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum 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.

5.2 MPE Prediction

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

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

Where: S = power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

5.3 MPE Result for FCC

NFC Standalone

Maximum peak EIRP at antenna input terminal (dBm): -11.13

Maximum peak EIRP at antenna input terminal (mW): 0.077

Prediction distance (cm): 20

Prediction frequency (MHz): 13.56

Power density of prediction frequency at 20.0 cm (mW/cm²): 0.000015

FCC MPE limit for uncontrolled exposure at prediction frequency: 0.979

Maximum peak EIRP was calculated from Section 6.9 of this test report: 84.07 dBuV/m – 95.2 = -11.13 dBm

The device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power density at the distance of 20 cm is 0.000015 mW/cm². Limit is 0.979 mW/cm².

Worst Case Co-location MPE Calculation:

Radio	Max EIRP (dBm)	Evaluated Distance (cm)	Worst-Case Exposure Level (mW/cm ²)	Limit (mW/cm ²)	Worst-Case Ratios	Sum of Ratios	Limit
BLE	15.52	20	0.007	1.0	0.007	0.007045	1.0
UWB	-8.53	20	0.00003	1.0	0.00003		
NFC	-11.13	20	0.000015	0.979	0.000015		

Note 1: BLE Max. EIRP is referenced from BACL report R2510091-247

Note 2: UWB Max. EIRP is referenced from BACL report R2510091-519

5.4 RF Exposure Evaluation for IC

NFC Standalone

Maximum EIRP power = -11.13 dBm (0.000077 W) which is less than exemption threshold of 1 W.

Therefore, the RF Exposure is exempt for IC.

6 FCC §15.225 (a) (b) (c) (d), FCC §15.205, FCC §15.209, ISEDC RSS-210 Annex B.6, RSS-Gen §8.9, §8.10 – Radiated Field Strength

6.1 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 1 MHz.

As Per FCC §15.205(a) except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	960 – 1240	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	1300 – 1427	5.35 – 5.46
2.1735 – 2.1905	25.5 – 25.67	1435 – 1626.5	7.25 – 7.75
4.125 – 4.128	37.5 – 38.25	1645.5 – 1646.5	8.025 – 8.5
4.17725 – 4.17775	73 – 74.6	1660 – 1710	9.0 – 9.2
4.20725 – 4.20775	74.8 – 75.2	1718.8 – 1722.2	9.3 – 9.5
6.215 – 6.218	108 – 121.94	2200 – 2300	10.6 – 12.7
6.26775 – 6.26825	123 – 138	2310 – 2390	13.25 – 13.4
6.31175 – 6.31225	149.9 – 150.05	2483.5 – 2500	14.47 – 14.5
8.291 – 8.294	156.52475 – 156.52525	2690 – 2900	15.35 – 16.2
8.362 – 8.366	156.7 – 156.9	3260 – 3267	17.7 – 21.4
8.37625 – 8.38675	162.0125 – 167.17	3.332 – 3.339	22.01 – 23.12
8.41425 – 8.41475	167.72 – 173.2	3.3458 – 3.358	23.6 – 24.0
12.29 – 12.293	240 – 285	3.600 – 4.400	31.2 – 31.8
12.51975 – 12.52025	322 – 335.4		36.43 – 36.5
12.57675 – 12.57725	399.9 – 410		Above 38.6
13.36 – 13.41	608 – 614		

As per FCC §15.209(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 §15.225 Operation within the band 13.110-14.010 MHz:

- a. The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- b. Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- c. Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- d. The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

As per ISERC RSS-210 Annex B.6 Band 13.110-14.010 MHz:

- a. the field strength of any emission shall not exceed the following limits:
 - i. 15.848 mV/m (84 dBμV/m) at 30 m, within the band 13.553-13.567 MHz
 - ii. 334 μV/m (50.5 dBμV/m) at 30 m, within the bands 13.410-13.553 MHz and 13.567-13.710 MHz
 - iii. 106 μV/m (40.5 dBμV/m) at 30 m, within the bands 13.110-13.410 MHz and 13.710-14.010 MHz
 - iv. RSS-Gen general field strength limits for frequencies outside the band 13.110-14.010 MHz

As per ISERC RSS-Gen §8.9,

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

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

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

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

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

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

As per ISED RSS-Gen §8.10(c),

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

Table 7 – Restricted frequency bands^{Note 1}

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

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

6.2 Test Setup

The radiated emissions tests were performed in the 5-meter chamber, using the setup in accordance with ANSI C63.10-2020 + Cor.1-2023 + Errata to C63.10a-2024. The specifications used were the FCC §15.225 and RSS-210 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.

6.3 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 to 150 kHz:

$$\text{RBW} = 200 \text{ Hz} / \text{VBW} = 1 \text{ kHz} / \text{Sweep} = \text{Auto}$$

150 kHz to 30 MHz:

$$\text{RBW} = 9 \text{ kHz} / \text{VBW} = 30 \text{ kHz} / \text{Sweep} = \text{Auto}$$

30MHz to 135.6 MHz:

$$\text{RBW} = 100 \text{ kHz} / \text{VBW} = 300 \text{ kHz} / \text{Sweep} = \text{Auto}$$

6.4 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:

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

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:

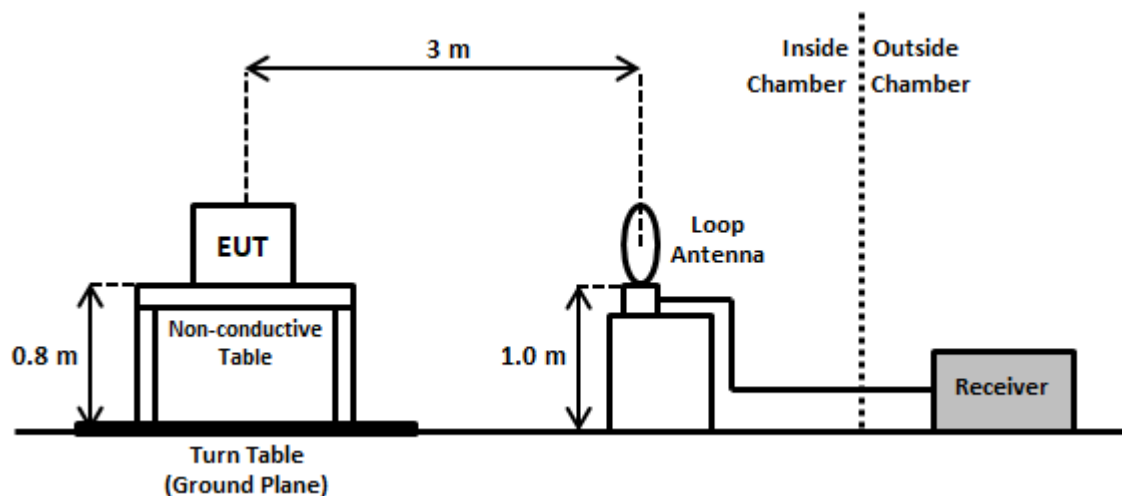
$$\text{Correction Factor} = \text{AF} + \text{CL} + \text{Atten} - \text{Ga}$$

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:

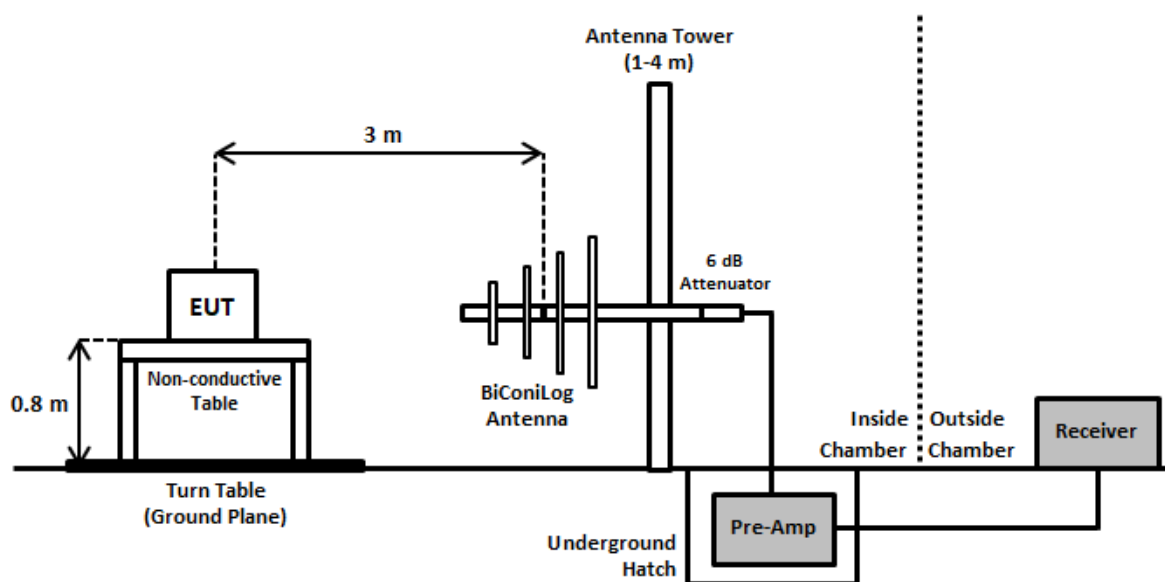
$$\text{Margin} = \text{Corrected Amplitude} - \text{Limit}$$

6.5 Test Setup Block Diagram

9 kHz to 30 MHz



30 MHz to 135.6 MHz



6.6 Test Equipment List and Details

BACL No	Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
327	Sunol Sciences	System Controller	SC110V	122303-1	N/R	N/R
1075	Sunol Sciences	Boresight Tower	TLT3	050119-7	N/R	N/R
1388	Sunol Sciences	Flush Mount Turntable	FM	112005-2	N/R	N/R
1432	Keysight Technologies	MXE EMI Reciever	N9038B	MY60180008	2025-01-03	1 year
316	Sonoma Instruments	Preamplifier 10 kHz - 2.5 GHz	317	260406	2025-08-18	6 months
321	Sunol Sciences	Biconilog Antenna	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	11867A	01734	2025-09-09	6 months
1248	Pasternack	RG214 COAX Cable	PE3062	-	2025-10-03	6 months
1249	Time microwave	LMR-400 Cable Dc-3 GHz	AE13684	2k80612-5 6fts	2025-09-09	6 months
1359	Pasternack	N 600in RF Cable	PE3496LF-600	-	2025-07-02	6 months
393	Com-Power	Loop Antenna, Active	AL-130	17043	2025-05-06	2 years

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:	25 °C
Relative Humidity:	48 %
ATM Pressure:	101.4 kPa

The testing was performed by Michael Papa on 2025-10-14 in 5m chamber 3.

6.8 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Part 15C and ISED RSS-210 standards' radiated emissions limits, and had the worst margin of:

Worst Case – Mode: Transmitting			
Margin (dB)	Frequency (MHz)	Polarization	Configuration
-6.71	13.50788.	Perpendicular	9 kHz to 30 MHz
-18.43	132.9079	Horizontal	30 MHz to 135.6 MHz

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

6.9 Radiated Emissions Test Results

9 kHz to 30 MHz, Measured at 3 meters (Perpendicular Polarization)

Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comments (Peak/QP/Average)
13.56	66.21	10.66	76.87	124	-47.13	Peak
13.553	65.88	10.66	76.54	90.47	-13.93	Peak
13.567	65.74	10.66	76.4	90.47	-14.07	Peak
13.41	34.76	10.66	45.42	80.51	-35.09	Peak
13.734	35.75	10.64	46.39	80.51	-34.12	Peak

9 kHz to 30 MHz, Measured at 3 meters (Parallel Polarization)

Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comments (Peak/QP/Average)
13.56	73.41	10.66	84.07	124	-39.93	Peak
13.553	65.13	10.66	75.79	90.47	-14.68	Peak
13.567	64.99	10.66	75.65	90.47	-14.82	Peak
13.41	44.45	10.66	55.11	80.51	-25.4	Peak
13.71	44.33	10.64	54.97	80.51	-25.54	Peak

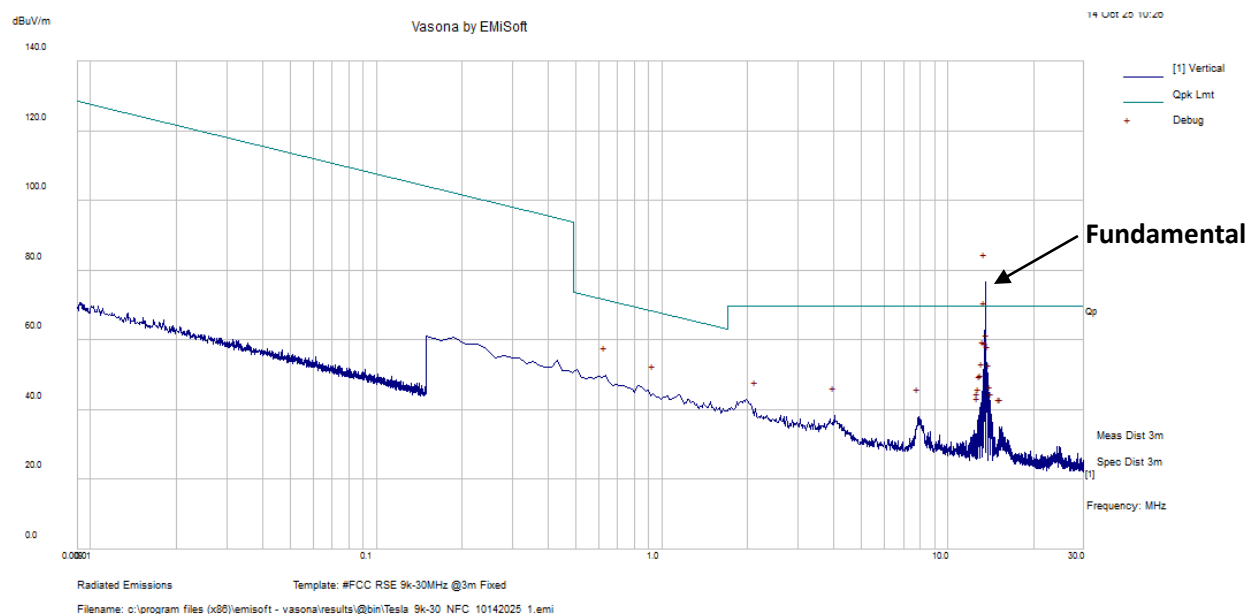
9 kHz to 30 MHz, Measured at 3 meters (Ground Parallel Polarization)

Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comments (Peak/QP/Average)
13.56	64.82	10.66	75.48	124	-48.52	Peak
13.553	64.68	10.66	75.34	90.47	-15.13	Peak
13.567	64.26	10.66	74.92	90.47	-15.55	Peak
13.402	29.7	10.66	40.36	80.51	-40.15	Peak
13.734	37.16	10.64	47.8	80.51	-32.71	Peak

Note: The distance extrapolation factor (40 dB/decade) is used for below 30 MHz

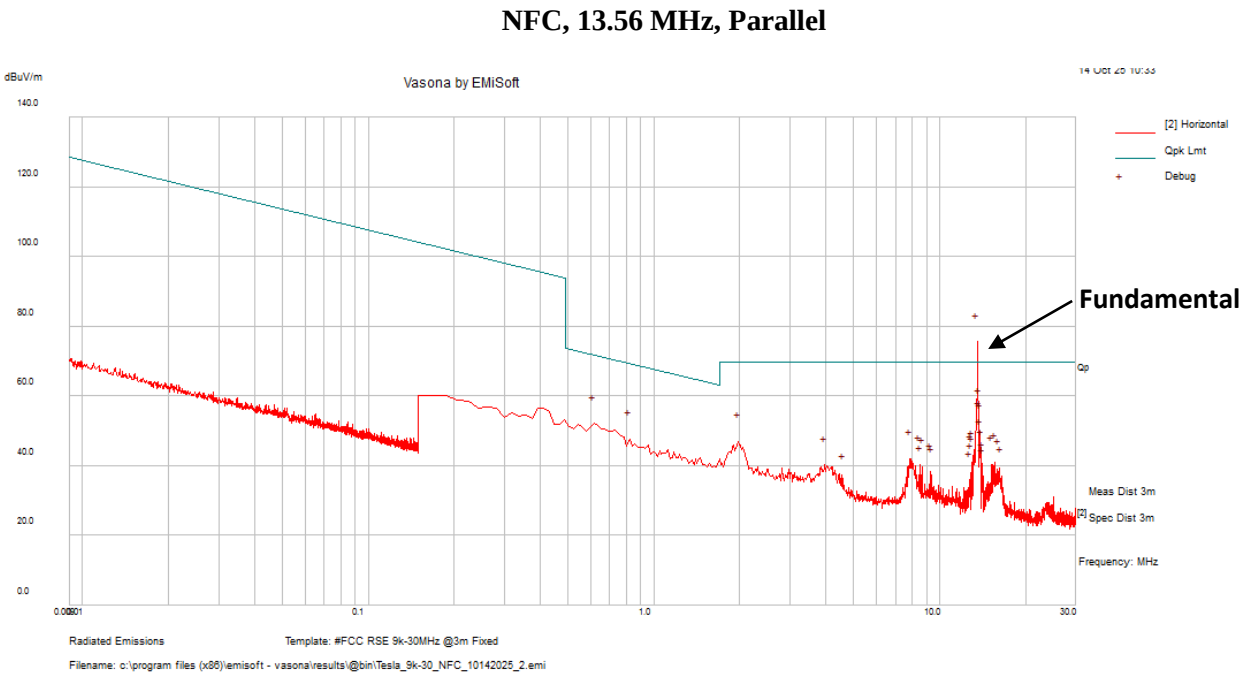
1) 9 kHz – 30 MHz Worst Case, Measured at 3 meters

NFC, 13.56 MHz, Perpendicular



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
13.50788	52.17	10.66	62.83	69.54	-6.71	Peak
13.75041	42.86	10.65	53.51	69.54	-16.03	Peak
13.35863	40.85	10.67	51.52	69.54	-18.02	Peak
13.65713	40.77	10.65	51.42	69.54	-18.12	Peak
13.84369	39.79	10.64	50.43	69.54	-19.11	Peak
0.635063	39.76	10.13	49.89	71.55	-21.66	Peak

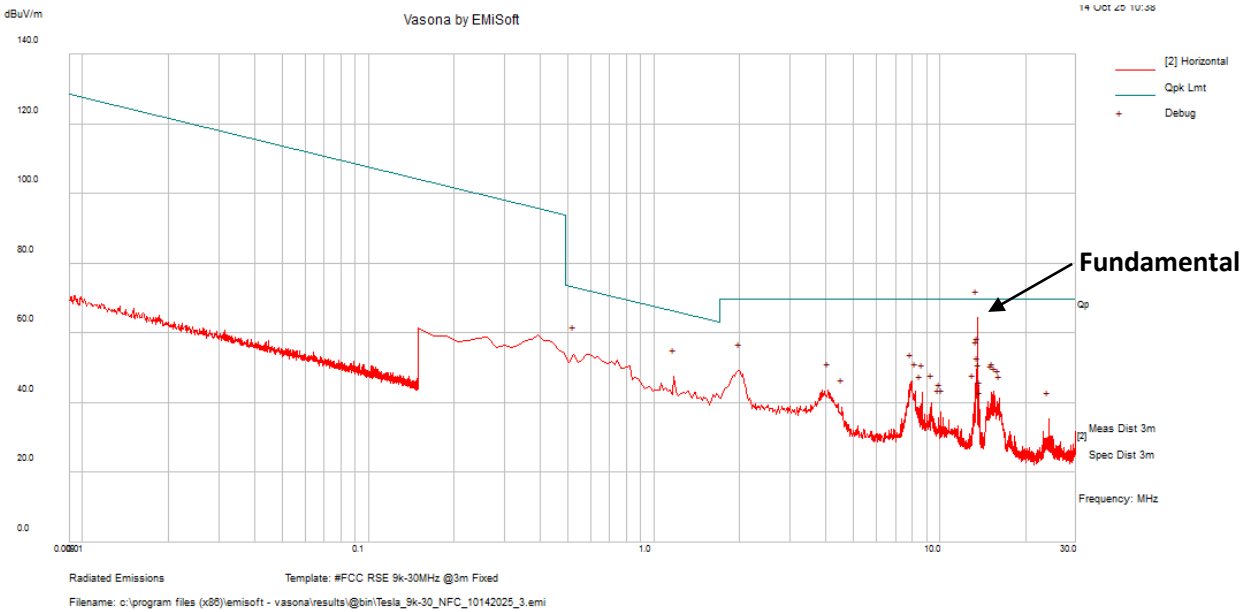
Note: Peak measurement is used to compare to the QP limit to show compliance.



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
13.71309	43.38	10.65	54.03	69.54	-15.51	Peak
13.75041	39.73	10.64	50.37	69.54	-19.17	Peak
0.616406	41.94	10.15	52.09	71.81	-19.72	Peak
13.82503	39.05	10.64	49.69	69.54	-19.85	Peak
0.821625	37.42	10.08	47.5	69.31	-21.81	Peak
1.978313	36.49	10.35	46.84	69.54	-22.7	Peak

Note: Peak measurement is used to compare to the QP limit to show compliance.

NFC, 13.56 MHz, Ground-Parallel

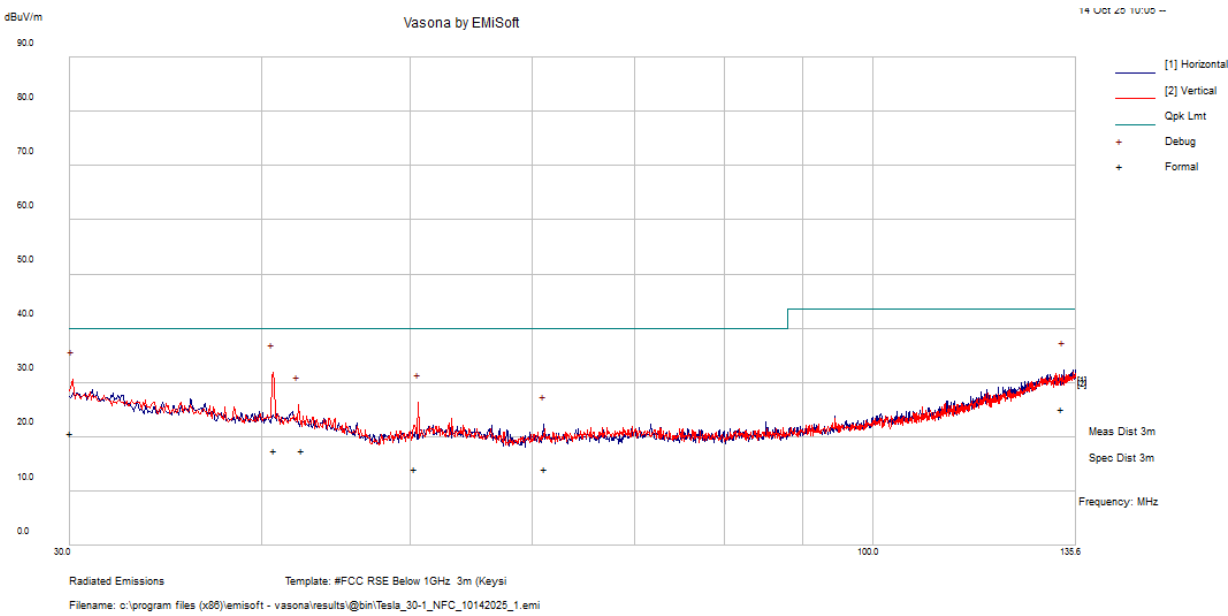


Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
13.61981	40.11	10.65	50.76	69.54	-18.78	Peak
1.176094	37.28	10.12	47.4	66.2	-18.8	Peak
0.523125	43.79	10.17	53.96	73.23	-19.28	Peak
13.45191	38.95	10.66	49.61	69.54	-19.93	Peak
1.996969	38.76	10.36	49.12	69.54	-20.42	Peak
7.985625	35.54	10.56	46.1	69.54	-23.44	Peak

Note: Peak measurement is used to compare to the QP limit to show compliance.

2) 30 MHz – 135.6 GHz, Measured at 3 meters

NFC, 13.56 MHz



Frequency (MHz)	S.A. Reading (dBuV)	Correction Factor (dB/m)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Detector
132.9079	41.29	-16.21	25.08	H	281	248	43.5	-18.43	QP
30.05169	31.08	-10.36	20.72	V	217	192	40	-19.28	QP
40.79013	35.34	-17.8	17.54	V	238	167	40	-22.46	QP
42.511	36.41	-18.97	17.44	V	300	16	40	-22.56	QP
61.15819	37.19	-23.1	14.09	H	224	48	40	-25.92	QP
50.342	37.19	-23.13	14.06	V	103	117	40	-25.94	QP

7 FCC §15.225 (e), ISEDC RSS-210 Annex B.6 – Frequency Tolerance

7.1 Applicable Standards

As per FCC §15.225 Operation within the band 13.110-14.010 MHz:

- a. The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

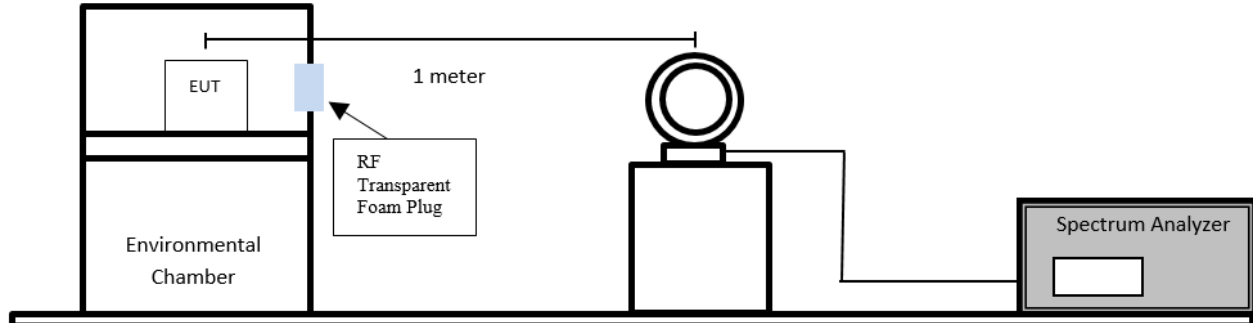
As per ISEDC RSS-210 Annex B.6 Band 13.110-14.010 MHz:

- b. the carrier frequency stability shall not exceed ± 100 ppm

7.2 Measurement Procedure

Testing was performed based on measurement procedures stated in ANSI C63.10-2020 + Cor.1-2023 + Errata to C63.10a-2024.

7.3 Test Setup Block Diagram



7.4 Test Equipment List and Details

BACL No	Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
912	Rhode & Schwarz	Signal Analyzer	FSV40	1321.3008k39-101203-UW	2025-08-04	1 year
1060	BACL	Temp and Humi Chamber	BTH-150-40	30078	2024-12-03	1 year
393	Com-Power	Loop Antenna, Active	AL-130	17043	2025-05-06	2 years
1551	-	SMA coax cable 1.5m	SMA-J/SWA-500/SMA-J/1.5m	-	2025-09-10	6 months

Statement of Traceability: **BACL Corp.** attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with the latest version of A2LA policy P102 “A2LA Policy on Metrological Traceability”.

7.5 Test Environmental Conditions

Temperature:	25 °C
Relative Humidity:	41 %
ATM Pressure:	101.6 kPa

The testing was performed by Michael Papa on 2025-10-22 in the RF test site.

7.6 Test Results

Normal Voltage (16 V)

Temperature (°C)	Operating Frequency (MHz)	Measured Frequency (MHz)	Frequency Tolerance (%)	FCC Limit (%)	Frequency Tolerance (ppm)	IC Limit (ppm)	Result
-20	13.56	13.56019220	-0.000596	±0.01	-5.96	±100	Pass
-10	13.56	13.56015780	0.001417	±0.01	14.17	±100	Pass
0	13.56	13.56011720	0.001164	±0.01	11.64	±100	Pass
10	13.56	13.56003590	0.000864	±0.01	8.64	±100	Pass
20	13.56	13.55998590	0.000265	±0.01	2.65	±100	Pass
30	13.56	13.55984220	-0.000104	±0.01	-1.04	±100	Pass
40	13.56	13.55977500	-0.001164	±0.01	-11.64	±100	Pass
50	13.56	13.55972660	-0.001659	±0.01	-16.59	±100	Pass

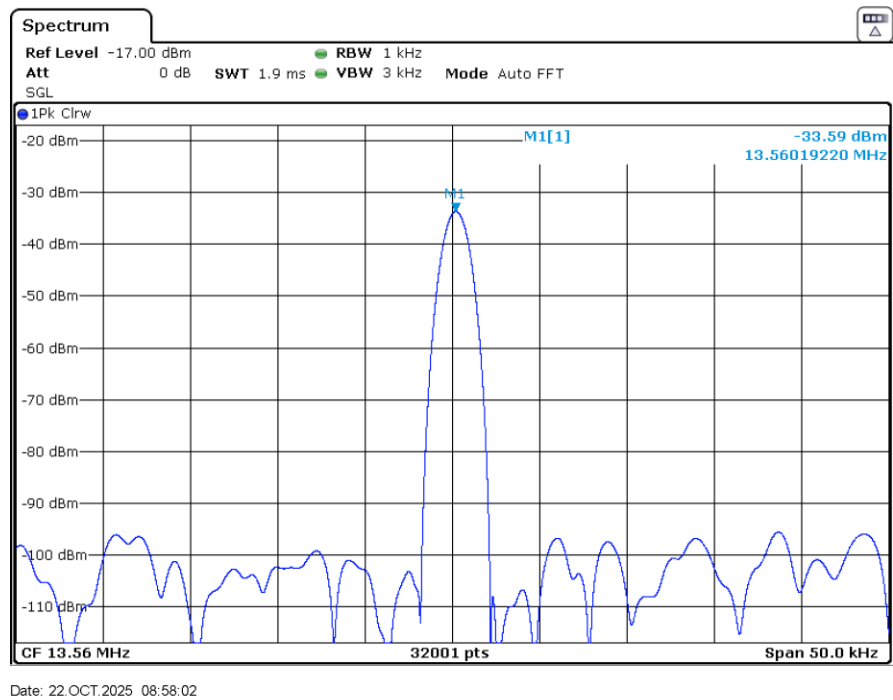
Normal Temperature (20 °C)

Voltage (V)	Operating Frequency (MHz)	Measured Frequency (MHz)	Frequency Tolerance (%)	FCC Limit (%)	Frequency Tolerance (ppm)	IC Limit (ppm)	Result
13.6 (85%)	13.56	13.55980630	-0.001428	±0.01	-14.28	±100	Pass
18.4 (115%)	13.56	13.55981090	-0.001395	±0.01	-13.95	±100	Pass

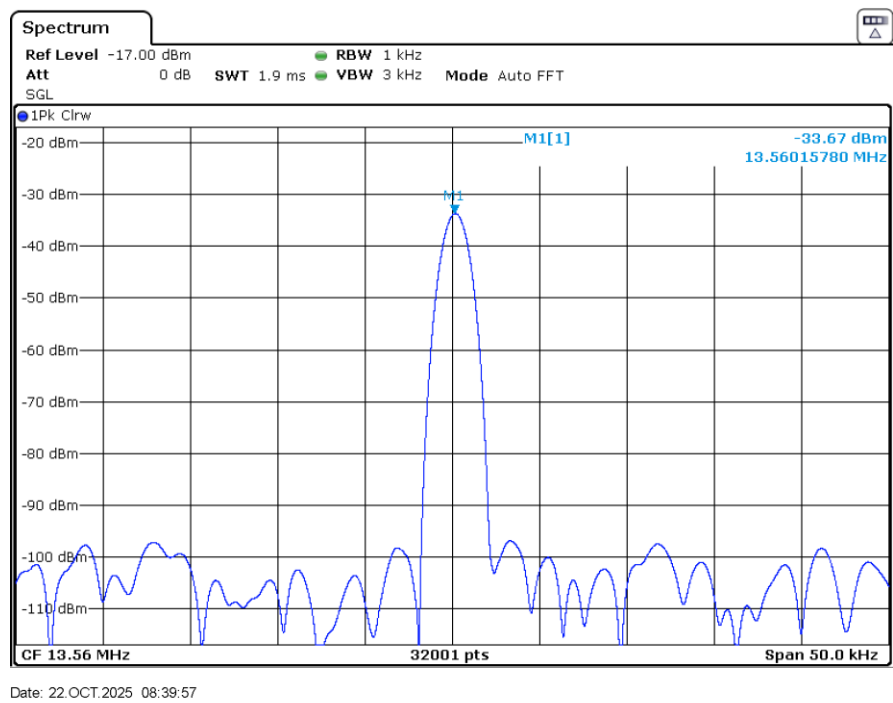
Please refer to the following plots for detailed test data.

Normal Voltage (16 V)

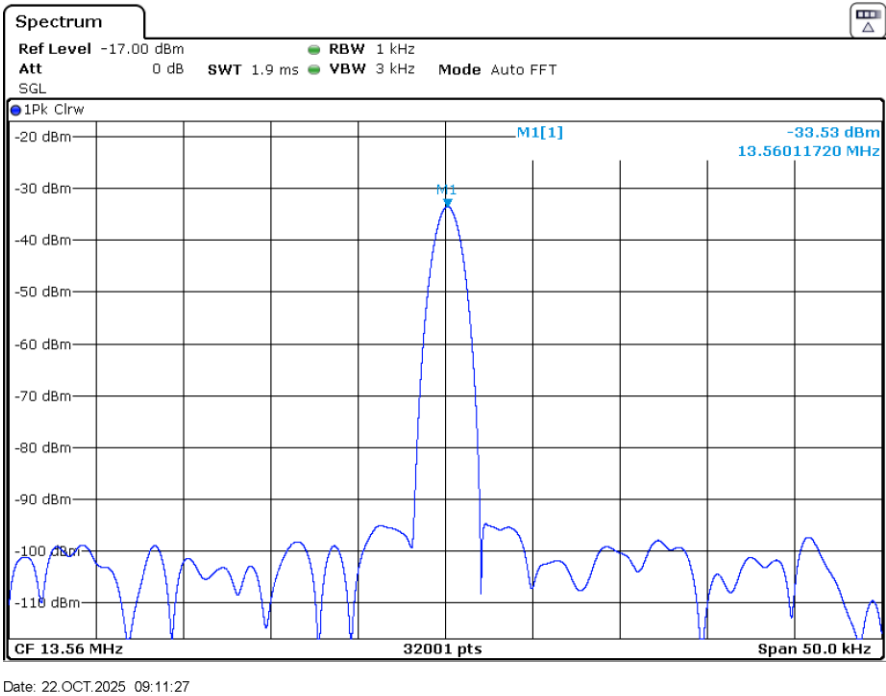
13.56 MHz at -20 °C



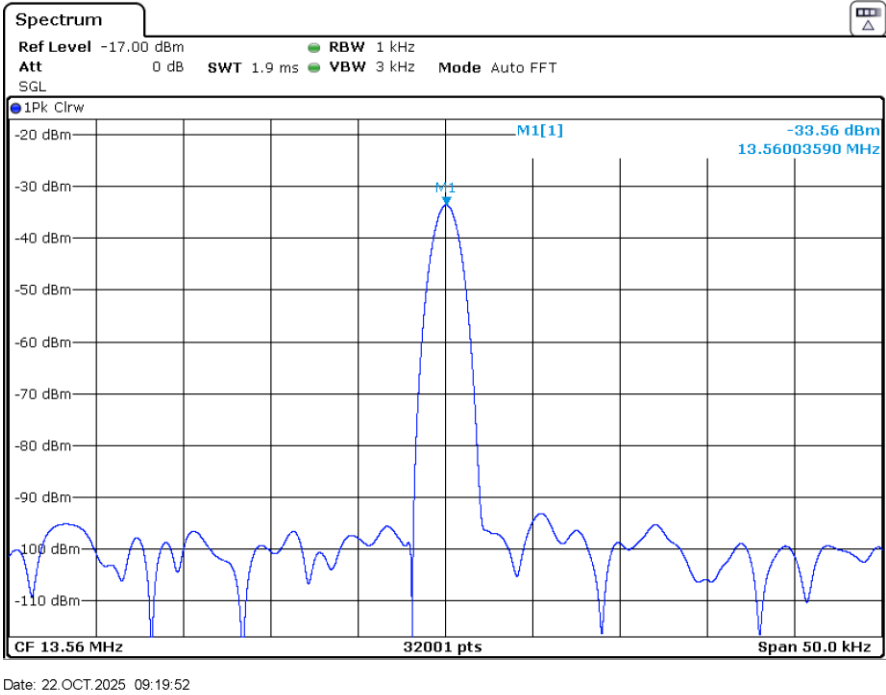
13.56 MHz at -10 °C



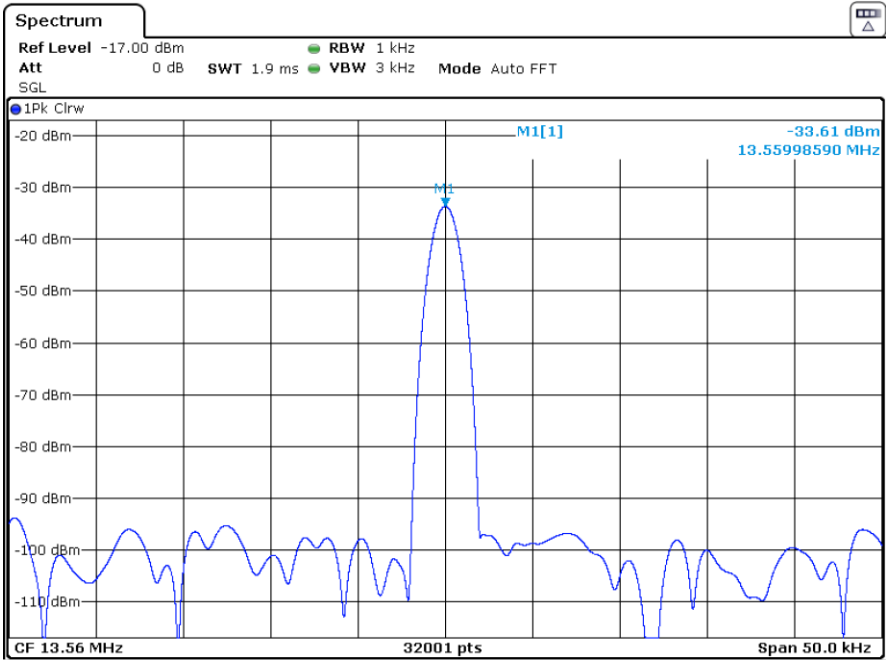
13.56 MHz at 0 °C



13.56 MHz at 10 °C

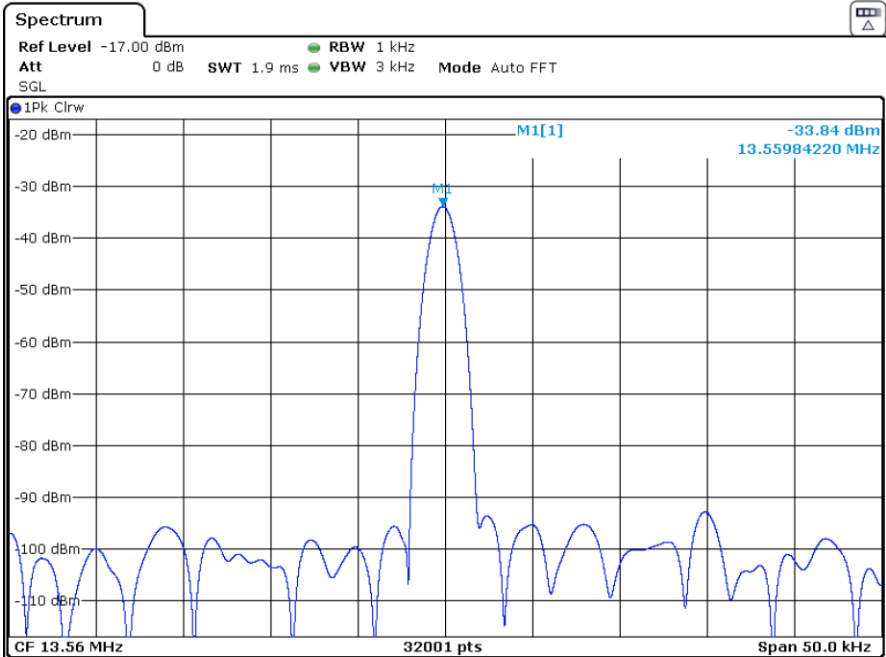


13.56 MHz at 20 °C



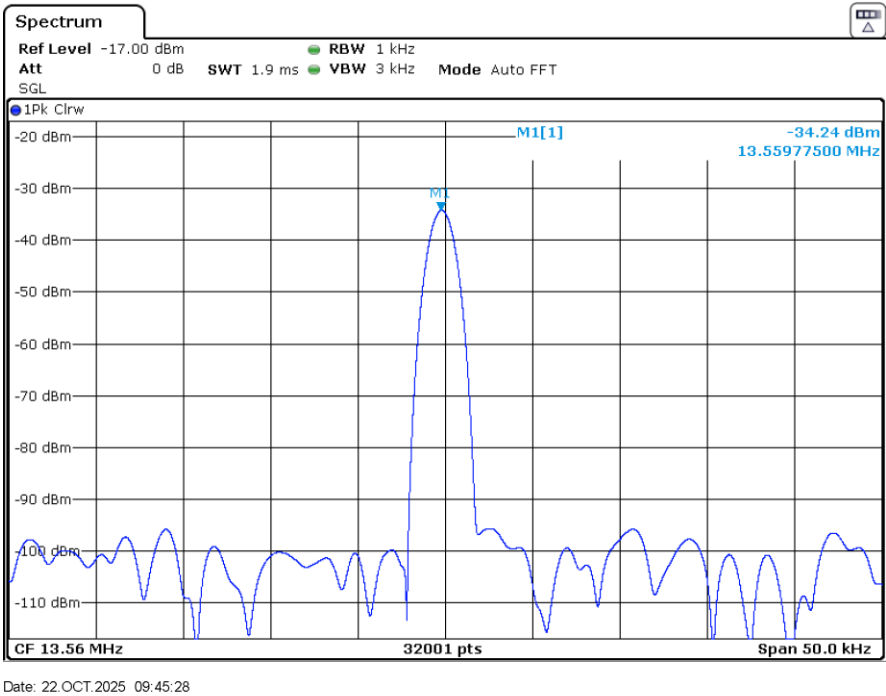
Date: 22.OCT.2025 09:22:07

13.56 MHz at 30 °C

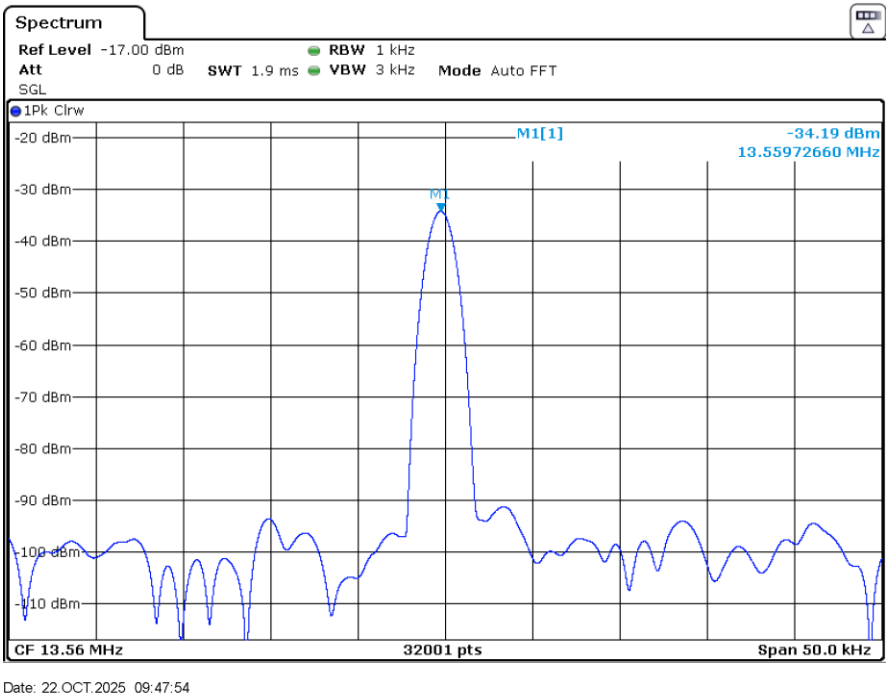


Date: 22.OCT.2025 09:41:33

13.56 MHz at 40 °C

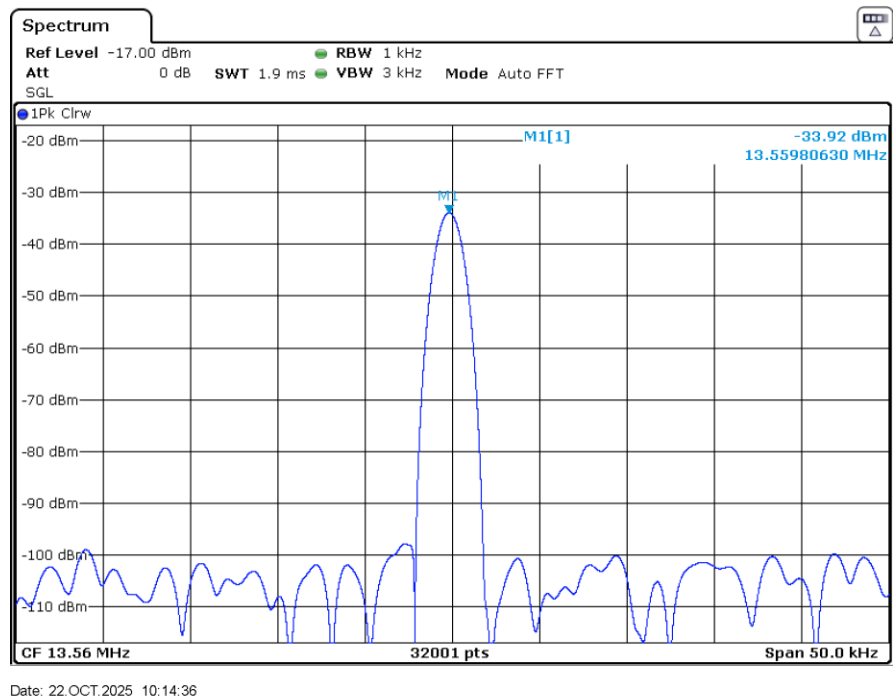


13.56 MHz at 50 °C

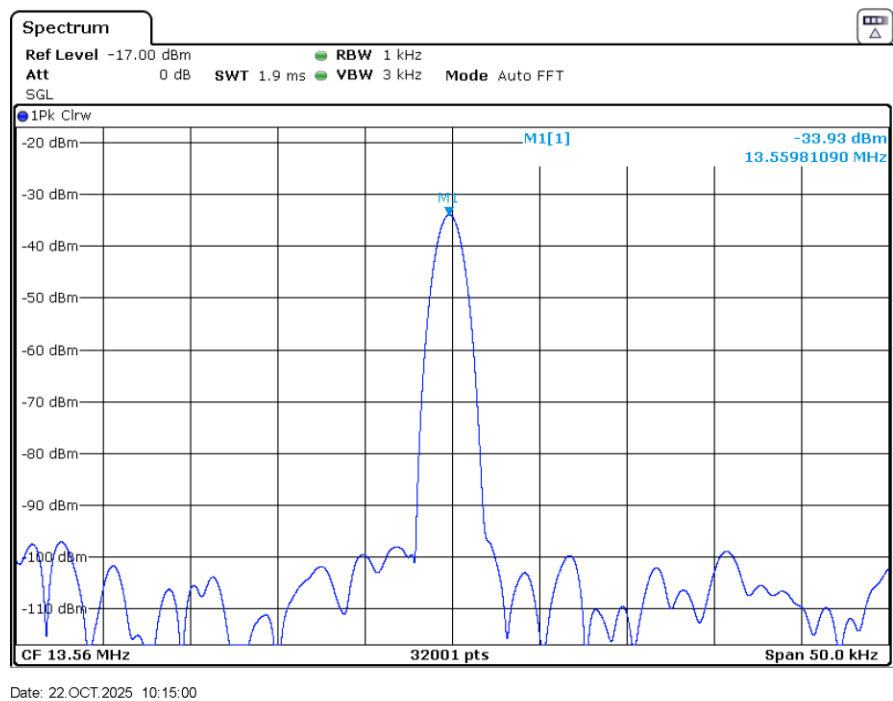


Normal Temperature (20 °C)

13.56 MHz at 13.6 V



13.56 MHz at 18.4 V



8 FCC §15.215 (c), ISSED RSS-Gen §6.7 – Occupied Bandwidth

8.1 Applicable Standards

As per FCC §15.215 Additional provisions to the general radiated emission limitations:

- c. Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

As per ISERC RSS-GEN §6.7 Occupied bandwidth (or 99% emission bandwidth) and x dB bandwidth:

The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

In some cases, the “x dB bandwidth” is required, which is defined as the frequency range between two points, one at the lowest frequency below and one at the highest frequency above the carrier frequency, at which the maximum power level of the transmitted emission is attenuated x dB below the maximum in-band power level of the modulated signal, where the two points are on the outskirts of the in-band emission.

The following conditions shall be observed for measuring the occupied bandwidth and x dB bandwidth:

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.
- The detector of the spectrum analyzer shall be set to “Sample”. However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or “Max Hold”) may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

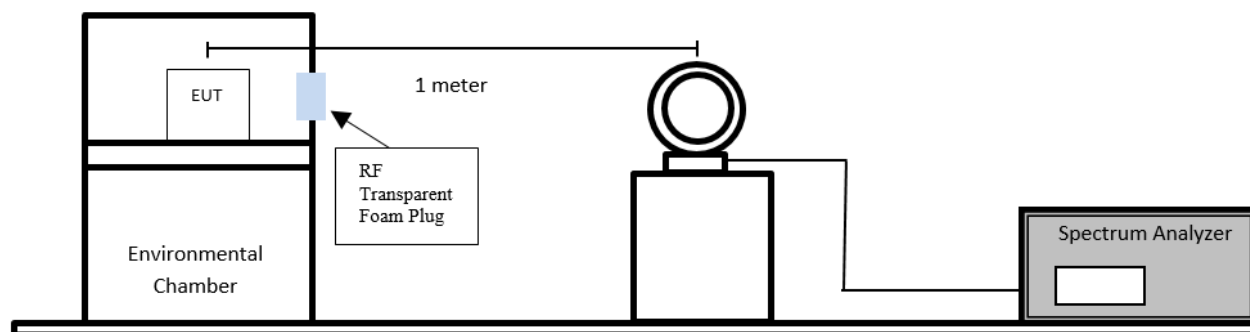
Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level 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, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

8.2 Measurement Procedure

Testing was performed based on measurement procedures stated in ANSI C63.10-2020 + Cor.1-2023 + Errata to C63.10a-2024.

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
912	Rhode & Schwarz	Signal Analyzer	FSV40	1321.3008k39-101203-UW	2025-08-04	1 year
1060	BACL	Temp and Humi Chamber	BTH-150-40	30078	2024-12-03	1 year
393	Com-Power	Loop Antenna, Active	AL-130	17043	2025-05-06	2 years
1551	-	SMA coax cable 1.5m	SMA-J/SWA-500/SMA-J/1.5m	-	2025-09-10	6 months

Statement of Traceability: *BACL Corp.* attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with the latest version of A2LA policy P102 “A2LA Policy on Metrological Traceability”.

8.5 Test Environmental Conditions

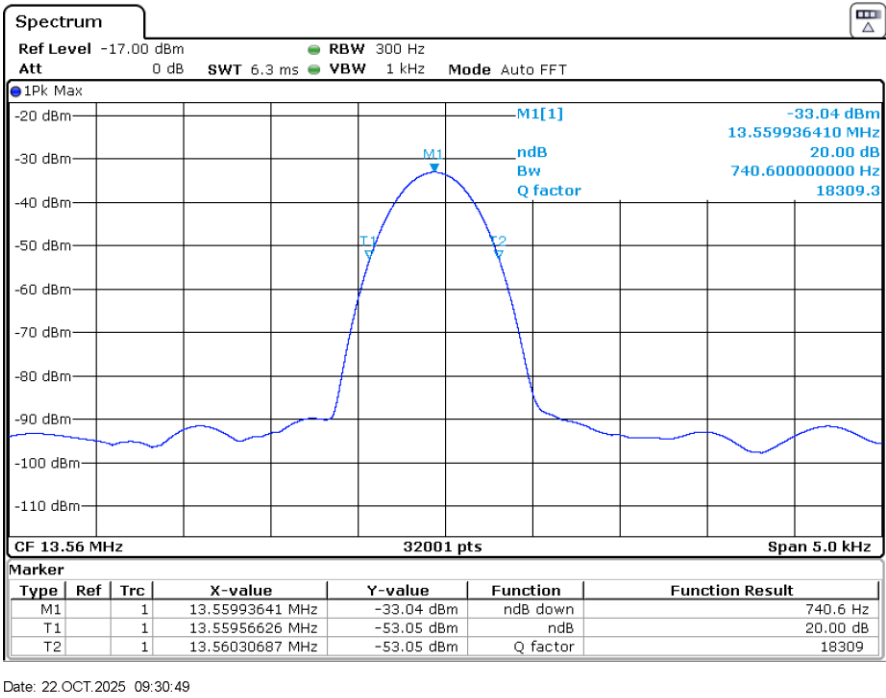
Temperature:	25 °C
Relative Humidity:	41 %
ATM Pressure:	101.6 kPa

The testing was performed by Michael Papa on 2025-10-22 in the RF test site.

8.6 Test Results

20dB Bandwidth: 740.6 Hz

Please refer to the following plot for detailed test data.



9 Appendix A (Normative) – EUT Test Setup Photographs

Please refer to the attachment.

10 Appendix B (Normative) – EUT External Photographs

Please refer to the attachment.

11 Appendix C (Normative) – EUT Internal Photographs

Please refer to the attachment.

12 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.

A blue ink signature of Mr. Trace McInturf.

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

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

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

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

--- END OF REPORT ---