

EMC TEST REPORT

APPLICANT

PoziTech Inc.

MODEL NAME

RBN_V2R1

FCC ID

XPYNORAB1

REPORT NUMBER

HA241111-POZ-001-E02

TEST REPORT

Date of Issue
November 22, 2024

Test Site
HCT America, Inc.

Applicant	PoziTech Inc.
Applicant Address	3675 Webber St Sarasota, FL, 34232
Model Name	RBN_V2R1
Date of Test	November 20, 2024 – November 20, 2024
Test Standard(s)	FCC CFR 47 Part 15 Subpart B ANSI C63.4-2014
Class Type	Class A
Test Result	Refer to the present document.

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2014. (See Test Report if any modifications were made for compliance) The results of testing in this report apply only to the product which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

HCT America, Inc. certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

Tested By



Stark Choi

Test Engineer

Reviewed By



James Choi

Senior Engineer

REVISION HISTORY

The revision history for this document is shown in table.

Test Report No.	Issue Date	Description
HA241111-POZ-001-E01	11/22/2024	Original Issue

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1. Test Information of EUT

1.1. General Information of EUT

Model Name	RBN_V2R1
Product Name	RS-485 Bluetooth Module
Product Type	Bluetooth Module
Manufacturer	PoziTech Inc.
FCC ID	XPYNORAB1

1.2. Product Specification

Item	Specification	
Dimensions	90 mm x 58 mm x 29 mm (L x W x H)	
Weight	77 g	
Radio Technology	BLE	2 400 MHz – 2 483.5 MHz
Operating Temperature	-20 °C to +50 °C	
I/O Ports	Module I/O Port x 1	
Input Voltage	8 VDC to 30 VDC	

2. Configuration and Connections with the EUT

2.1. EUT and Ancillary Equipment

Equipment Type	Model	Serial Number	Manufacturer
EUT	RBN_V2R1	0A860002	PoziTech Inc.
ConnectBox	CBX_V1R3 with CWM_V1R1	0A6502FF	PoziTech Inc.
DC-DC Converter	CONVMOD_DCDC_100V	102C0001	PoziTech Inc.

2.2. Test Ports

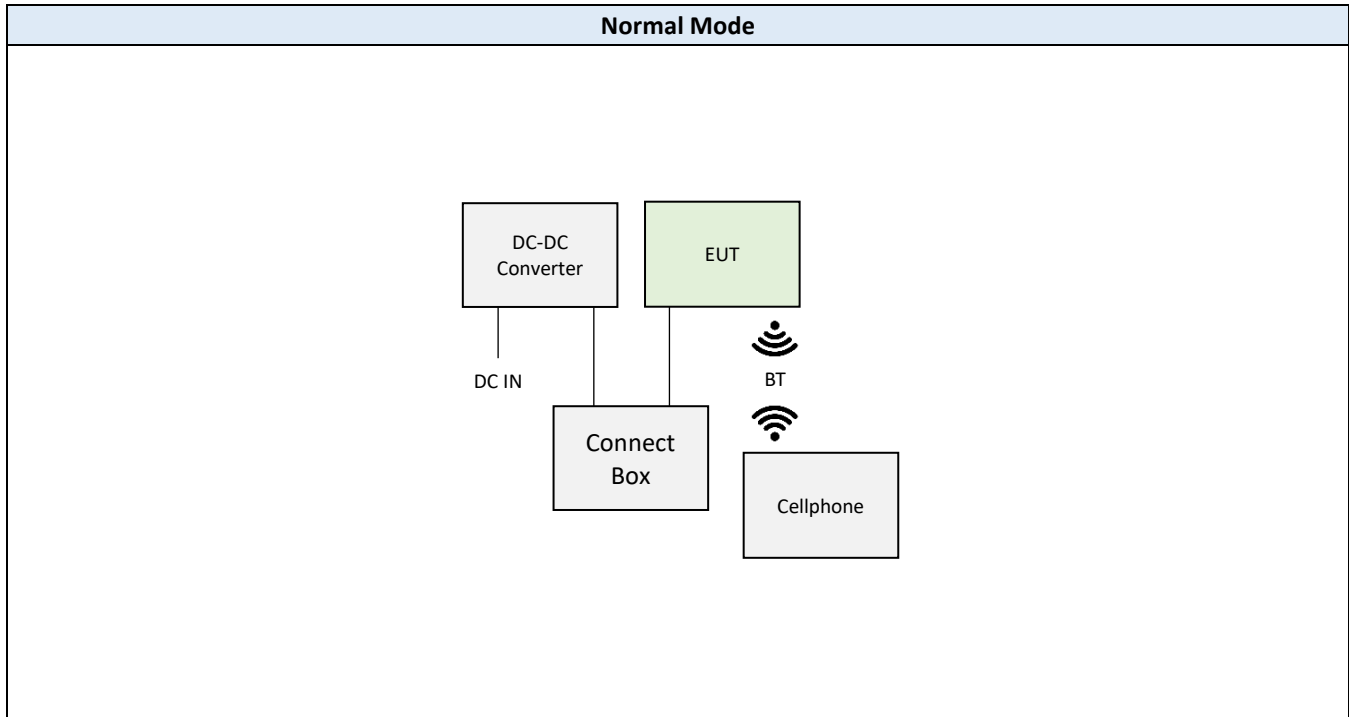
Start Connection		End Connection		Cable		Quantity
Equipment	I/O Port	Equipment	I/O Port	Length (m)	Shielding Condition	
EUT	Module Input	ConnectBox	RS485 Port	3 ≥	Unshielded	1
ConnectBox	Power Input	DC-DC Converter	VOUT	1.9	Unshielded	1
DC-DC Converter	Output	DC Power Supply	VIN	1.9	Unshielded	1

2.3. EUT Operating Mode(s)

Normal Mode

The EUT is powered of 12 VDC from ConnectBox and transmit an BLE Advertising messages periodically to simulate typical usage. The EUT is connected to a Cellphone via BLE and monitored with a third-party application.

2.4. Connection Diagram of the EUT and Ancillary Equipment



3. Test Facilities and Accreditations

3.1. Test Laboratory

Company Name	HCT America, Inc.
CEO	Sunwoo Kim
Address	1726 Ringwood Ave., San Jose, CA 95131 USA
Telephone	+1 510-933-8848
Fax	+1 510-933-8849

3.2. Test Facility

3 m Semi-Anechoic Chambers Address	1726 Ringwood Avenue, San Jose, CA 95131 USA
10 m Open Site Address	1177 Comstock Road, Hollister, CA 95023 USA

Measurement facilities are constructed in conformance with the requirements of ANSI C63.4-2014. The normalized site attenuations (30 MHz to 1 GHz) and site validation (1 GHz to 18 GHz) were performed in accordance with the standard in ANSI C63.4-2014.

Measurement Facilities	Test Facility	
Radiated Field Strength Measurement Facility 3 m Semi-Anechoic Chamber	Chamber #1	Chamber #2
Radiated Field Strength Measurement Facility 10 m Open Site	OATS	

3.3. Instrument Calibration

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturers recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

All antenna for measurement is calibrated in accordance with the requirements of ANSI C63.5-2017.

3.4. Accreditation Certificate



Accredited Laboratory

A2LA has accredited

HCT AMERICA, INC.

San Jose, 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 the A2LA – R256 – Specific Requirements – FDA ASCA 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 17th day of July 2023.



Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 4201.01
Valid to July 31, 2025
Revised July 15, 2024

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

4. References of Test

4.1. Test Standard

FCC CFR 47 Part 15 Subpart B

4.2. Test Method

FCC CFR 47 Part 15 Subpart B
ANSI C63.4-2014

4.3. Additional Deviations and Exclusions from Standards

No additions, deviations, or exclusions have been made from standards and/or accreditations.

5. Test Rationale

5.1. Test Limits Guideline

5.1.1. FCC CFR 47 Part 15 Subpart B

Conducted Emissions Limits AC Mains Power Port				
Frequency Range (MHz)	Class A		Class B	
	Average (dBμV)	Quasi-Peak (dBμV)	Average (dBμV)	Quasi-Peak (dBμV)
0.15 – 0.5	66	79	56 to 46 ¹	66 to 56 ¹
0.5 – 5	60	73	46	56
5 – 30	60	73	50	60

Note 1: The limit level in dBμV decreases linearly with the logarithm of the frequency.

Radiated Emissions Limits 30 MHz to 1 GHz					
Frequency Range (MHz)	Measurement Distance (m)	Class A		Class B	
		Quasi-Peak		Quasi-Peak	
		μV/m	dBμV/m	μV/m	dBμV/m
30 – 88	3	300	49.5	100	40
88 – 216		500	54	150	43.5
216 – 960		700	56.9	200	46
960 – 1 000		1 000	60	500	54
30 – 88	10	90	39	30	29.5
88 – 216		150	43.5	45	33
216 – 960		210	46.4	60	35.5
960 – 1 000		300	49.5	150	43.5

Radiated Emissions Limits 1 GHz to 40 GHz							
Frequency Range (MHz)	Measurement Distance (m)	Class A			Class B		
		Average		Peak	Average		Peak
		μV/m	dBμV/m	dBμV/m	μV/m	dBμV/m	dBμV/m
1 000 – 40 000	3	1 000	60	80	500	54	74

5.2. Frequency Range of Radiated Measurements

For an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a Radiated Emission limit is specified, up to the frequency shown in the following table. F_x is the highest fundamental frequency generated and/or used in the ITE or digital apparatus under test.

Highest Internal Frequency, F_x (MHz)	Upper Frequency of Measurement Range (MHz)
$F_x \leq 108$	1 000
$108 < F_x \leq 500$	2 000
$500 < F_x \leq 1\,000$	5 000
$F_x > 1\,000$	$5 \times F_x$ or 40 GHz, whichever is lower

5.3. Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014.

All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Emission (0.15 MHz to 30 MHz)	2.55 dB ($k = 2$)
Radiated Emissions (30 MHz to 1 GHz)	4.73 dB ($k = 2$)
Radiated Emissions (1 GHz to 18 GHz)	5.21 dB ($k = 2$)
Radiated Emissions (18 GHz to 40 GHz)	5.18 dB ($k = 2$)

6. Test Summary

The results in this report apply only to sample tested:

Test Date	Phenomena	Limit Value / Performance Criteria	Test Result	Test Method
11/20/2024	Radiated Emission (30 MHz to 1 GHz)	See test data	Pass	ANSI C63.4-2014
11/20/2024	Radiated Emission (1 GHz to 13 GHz)	See test data	Pass	ANSI C63.4-2014

7. Test Equipment

Radiated Emissions (30 MHz to 1 GHz)					
Type	Manufacturer	Model	Serial #	Cal Cycle	Cal Due Date
EMI Test Receiver	Rohde & Schwarz	ESU40	100529	1 year	10/24/2025
LNA	Com-Power Corporation	PAM-103	18020254	1 year	05/03/2025
Hybrid Antenna	Sunol	JB1	A061416	2 years	05/04/2025
Antenna Mast	Innco	MA4640/0800-XP-ET	-	-	-
Turn Table	Sunol Sciences	-	-	-	-
Antenna Mast Controller	Innco	CO3000-1D	CO3000/1449/ 54230322/P	-	-
Turn Table Controller	Sunol Sciences	SC104V	090109-1	-	-
Software	TOYO	EP7RE	-	-	-

Radiated Emissions (1 GHz to 13 GHz)					
Type	Manufacturer	Model	Serial #	Cal Cycle	Cal Due Date
EMI Test Receiver	Rohde & Schwarz	ESU40	100529	1 year	12/01/2024
LNA	Com-Power Corporation	PAM-118A	18040059	1 year	04/17/2025
Horn Antenna	EMCO	3115	9611-5037	2 years	11/16/2024
Band Reject Filter (2.4 GHz)	Wainwright Instruments	WRCGV10-2363.5-2400-2483.5- 2520-60SS	16	1 year	08/28/2024
Antenna Mast	Innco	MA4640/0800-XP-ET	-	-	-
Turn Table	Sunol Sciences	-	-	-	-
Antenna Mast Controller	Innco	CO3000-1D	CO3000/1449/ 54230322/P	-	-
Turn Table Controller	Sunol Sciences	SC104V	090109-1	-	-
Software	TOYO	EP7RE	-	-	-

8. EMC Test Results

8.1. Radiated Emission (30 MHz – 1 GHz)

8.1.1. Test Environment

Test Site			
Chamber #1 ☒	Chamber #2 ☐	OATS ☐	Shield Stage #1 ☐
Date	Temperature	Relative Humidity	Pressure
11/20/2024	23.2 °C	30 % R.H.	101.3 kPa

8.1.2. Test Condition

Operating Mode(s)	Power Supply	Applicable Port
Normal Mode	80 VDC	Enclosure Port

8.1.3. Test Method and Levels

The test method shall be in accordance with ANSI C63.4-2014.

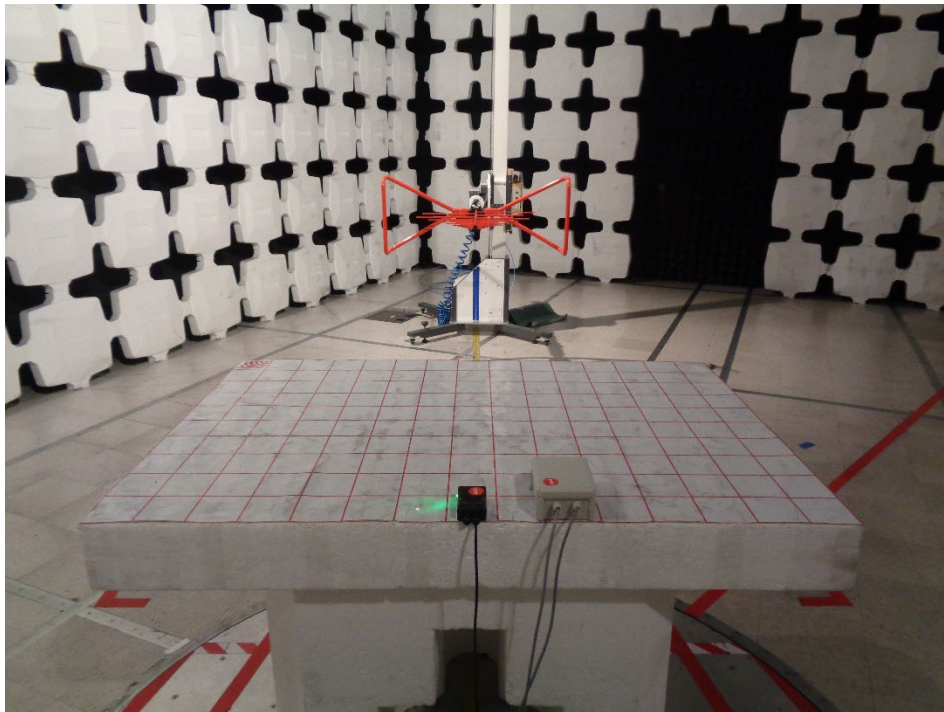
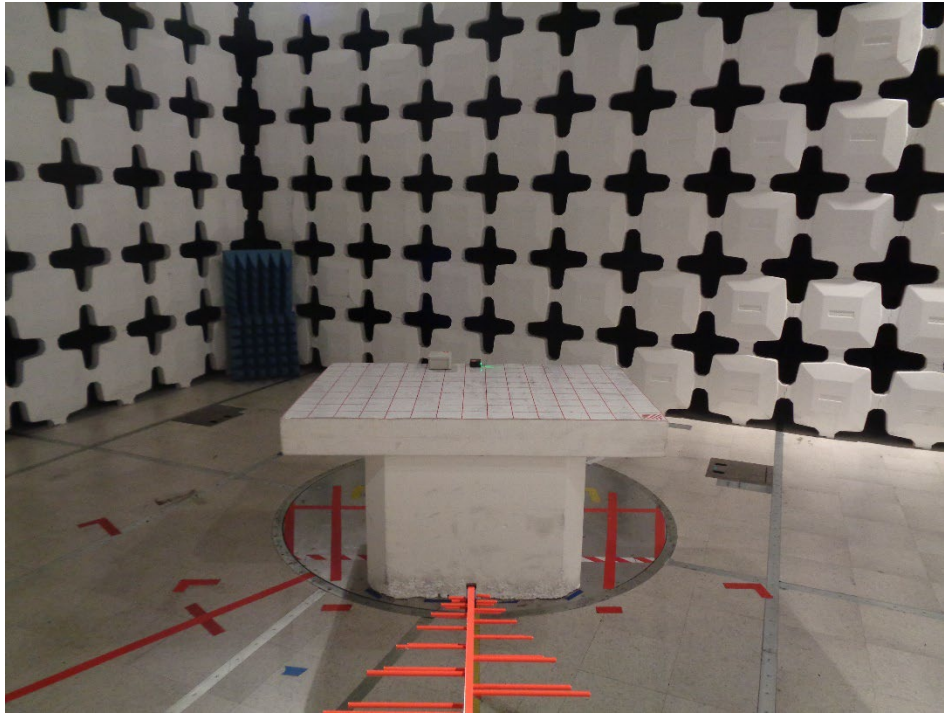
The equipment shall meet the Class A limits given in FCC CFR 47 Part 15 Subpart B.

Obtained the max. emission point by optimizing the antenna height, antenna polarization, and turntable azimuth.

Frequency Range	30 MHz to 1 000 MHz
Measurement Detector Type	Quasi-Peak
Measurement Bandwidth (IF BW)	120 kHz
Measurement Distance	3 m

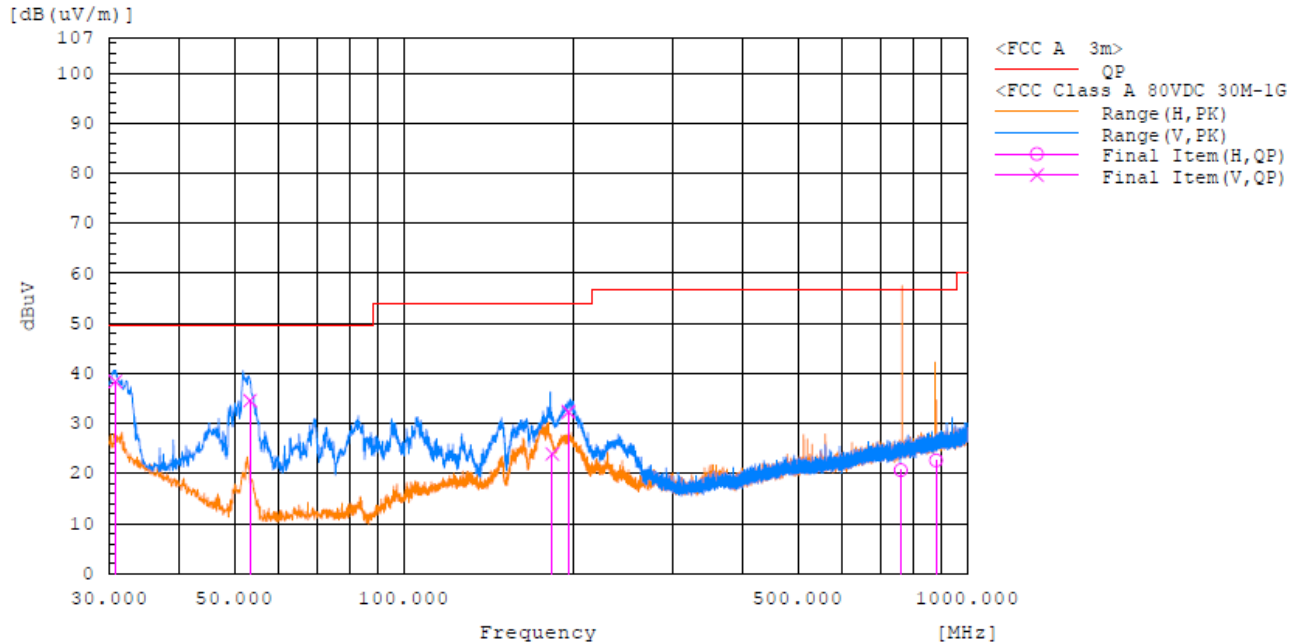
8.1.4. Test Setup Photos

Normal Mode
[30 MHz – 1 000 MHz]



8.1.5. Test Data

Operating Mode: Normal Mode
Power Supply: 80 VDC
Frequency Range: 30 MHz – 1 000 MHz
Test Limit: FCC Part 15 Subpart B Class B



Frequency MHz	Polarization	Reading dB(uV)	Corr. dB(1/m)	Level dB(uV/m)	Limit dB(uV/m)	Margin dB	Height cm	Angle deg
		QP		QP	QP	QP		
30.726	V	47.6	-9.2	38.4	49.5	11.1	100.6	11.8
53.269	V	56.7	-22.1	34.6	49.5	14.9	101.2	26.5
183.161	V	41.8	-17.9	23.9	54	30.1	100.0	29.8
195.798	V	49.4	-17.0	32.4	54	21.6	100.8	350.5
761.750	H	26.1	-5.4	20.7	56.9	36.2	203.2	103.8
880.020	H	26.2	-3.5	22.7	56.9	34.2	171.9	137.3

Calculation Formula:

1. Polarization: H = Horizontal, V = Vertical
2. Corr. (Correction Factor) = Antenna Factor + Cable Loss + LNA
3. QuasiPeak Level = Reading (Receiver Reading) + Corr.
4. Margin = Limit - QuasiPeak Level

8.2. Radiated Emission (1 GHz – 13 GHz)

8.2.1. Test Environment

Test Site			
Chamber #1 ☒	Chamber #2 ☐	OATS ☐	Shield Stage #1 ☐
Date	Temperature	Relative Humidity	Pressure
11/20/2024	23.2 °C	30 % R.H.	101.3 kPa

8.2.2. Test Condition

Operating Mode(s)	Power Supply	Applicable Port
Normal Mode	80 VDC	Enclosure Port

8.2.3. Test Method and Levels

The test method shall be in accordance with ANSI C63.4-2014.

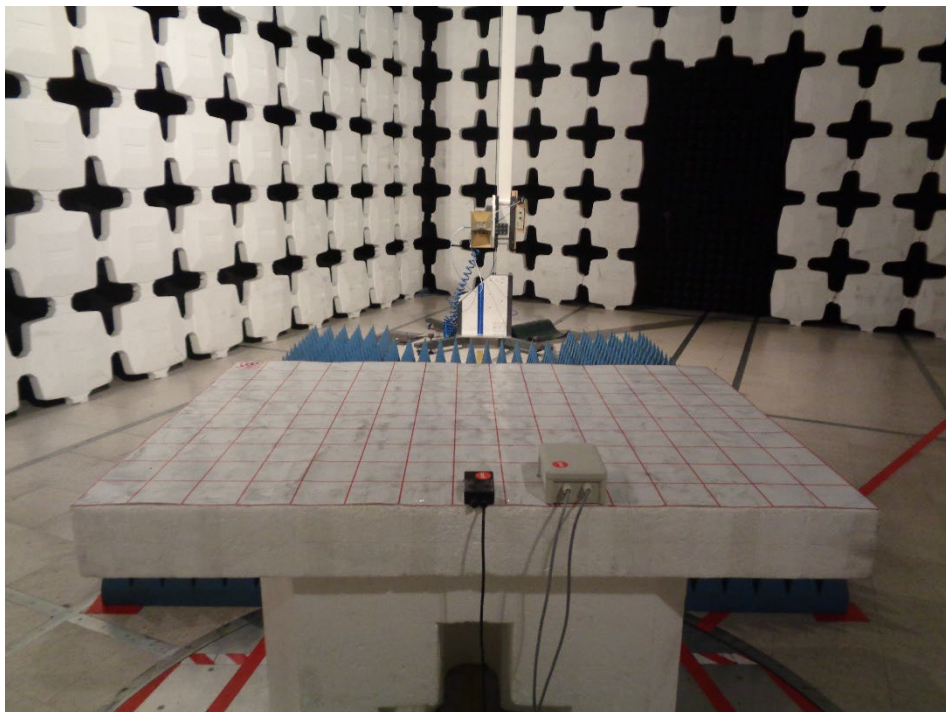
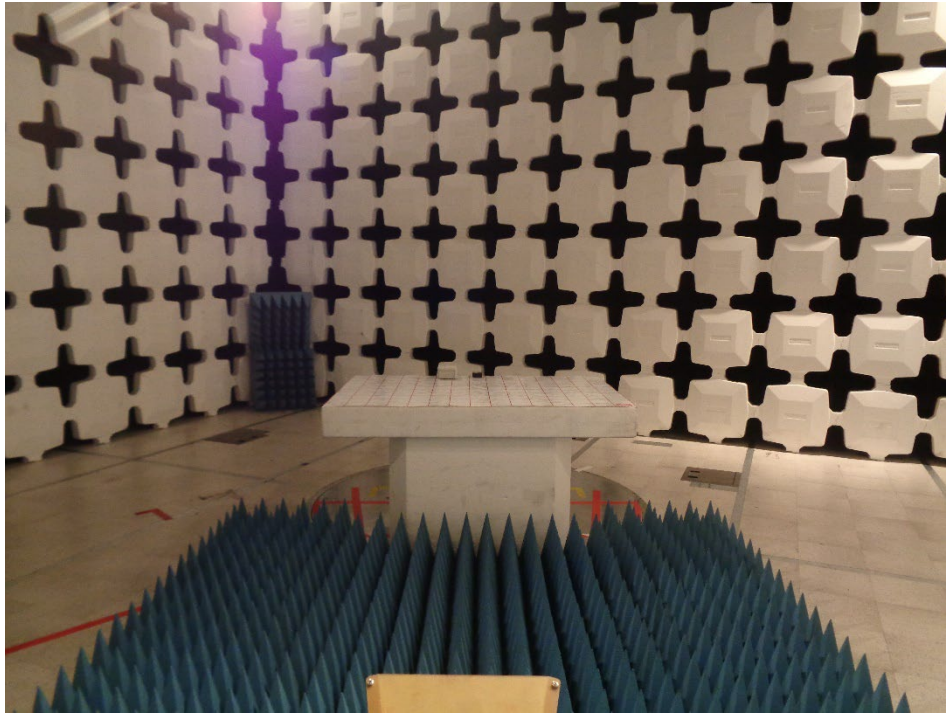
The equipment shall meet the Class A limits given in FCC CFR 47 Part 15 Subpart B.

Obtained the max. emission point by optimizing the antenna height, antenna polarization, and turntable azimuth.

Frequency Range	1 000 MHz to 13 000 MHz
Measurement Detector Type	Peak / Average
Measurement Bandwidth (IF BW)	1 MHz
Measurement Distance	3 m

8.2.4. Test Setup Photos

Normal Mode
[1 000 MHz – 13 000 MHz]

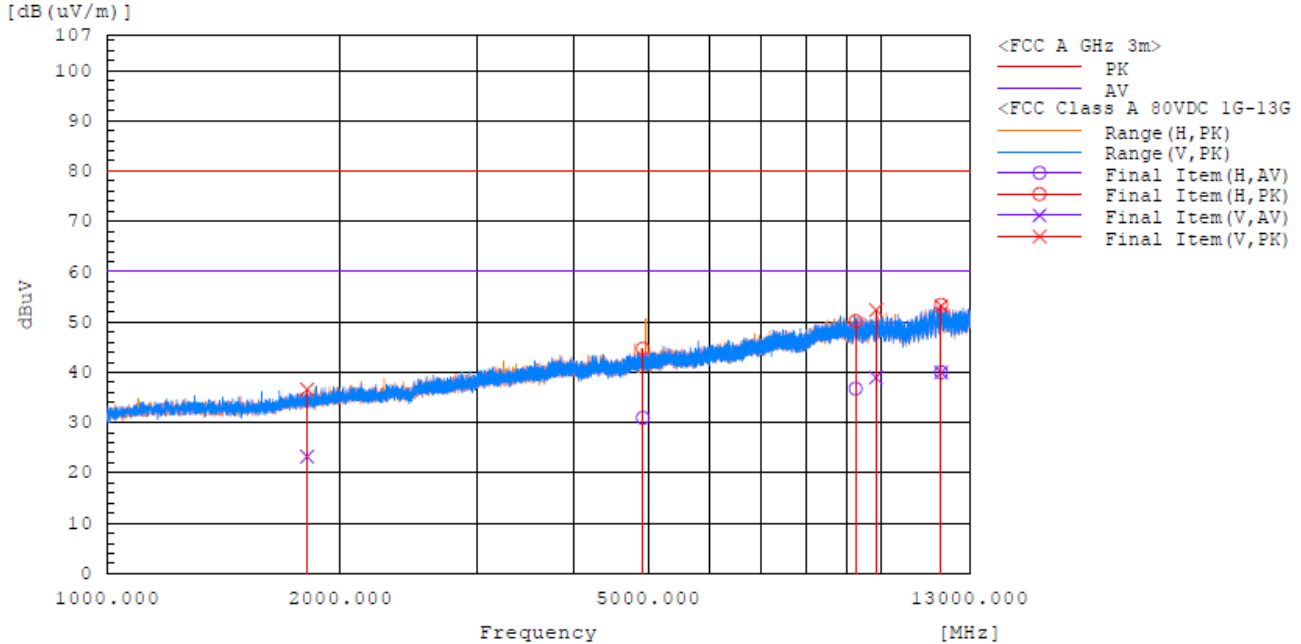


8.2.5. Test Data

Operating Mode: Normal Mode

Power Supply: 80 VDC

Frequency Range: 1 000 MHz – 13 000 MHz



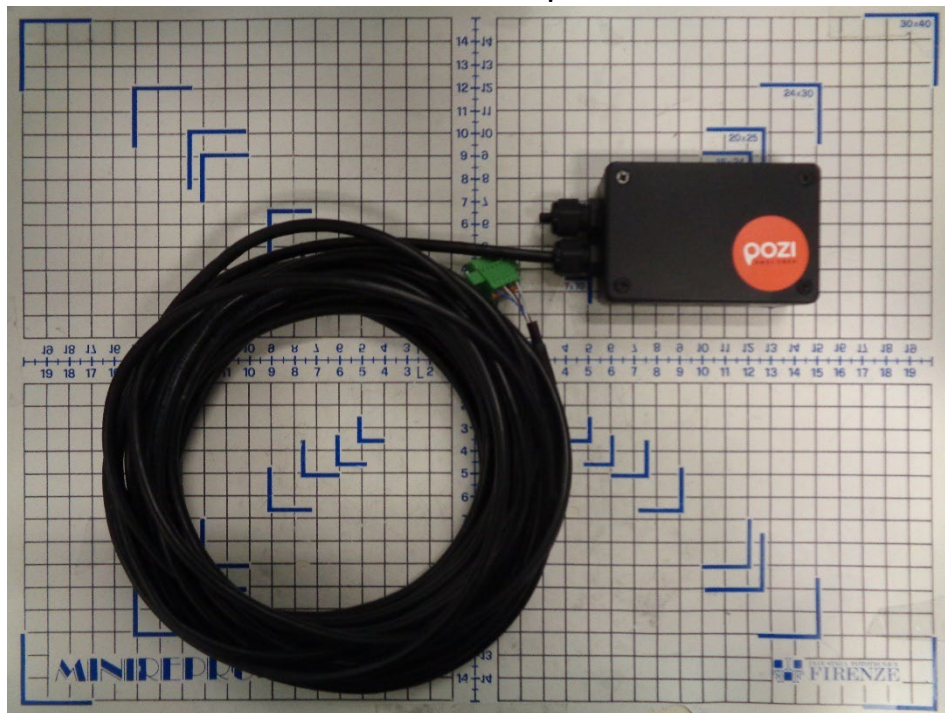
Frequency MHz	Polarization	Reading dB(uV)		Corr. dB(1/m)	Level dB(uV/m)		Limit dB(uV/m)		Margin dB		Height cm	Angle deg
		AV	PK		AV	PK	AV	PK	AV	PK		
1 811.446	V	33.3	46.6	-10.0	23.3	36.6	60	80	36.7	43.4	101.5	292.8
4 917.034	H	33.0	46.8	-2.1	30.9	44.7	60	80	29.1	35.3	122.0	256.3
9 254.938	H	31.3	44.7	5.5	36.8	50.2	60	80	23.2	29.8	151.7	257.8
9 837.094	V	33.1	46.5	5.9	39.0	52.4	60	80	21.0	27.6	231.0	308.5
11 941.950	H	31.7	45.1	8.3	40.0	53.4	60	80	20.0	26.6	265.7	298.5
11 943.380	V	31.7	44.9	8.3	40.0	53.2	60	80	20.0	26.8	231.5	189.3

Calculation Formula:

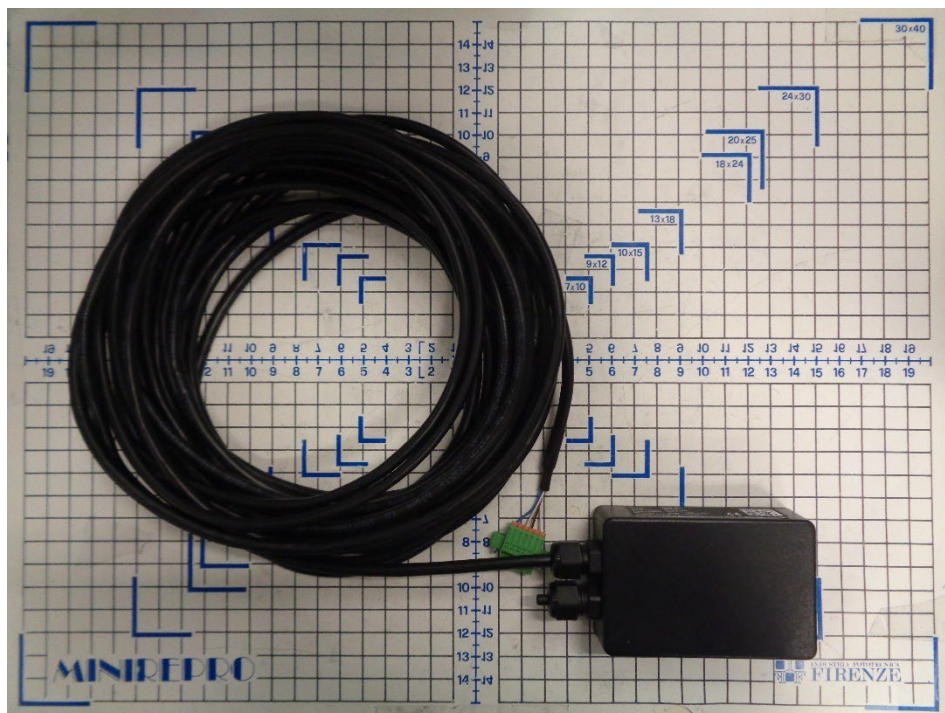
1. Polarization: H = Horizontal, V = Vertical
2. Corr. (Correction Factor) = Antenna Factor + Cable Loss + LNA
3. CAverage or Peak Level = Reading (Receiver Reading) + Corr.
4. Margin = Limit – CAverage or Peak Level

9. Photographs of EUT

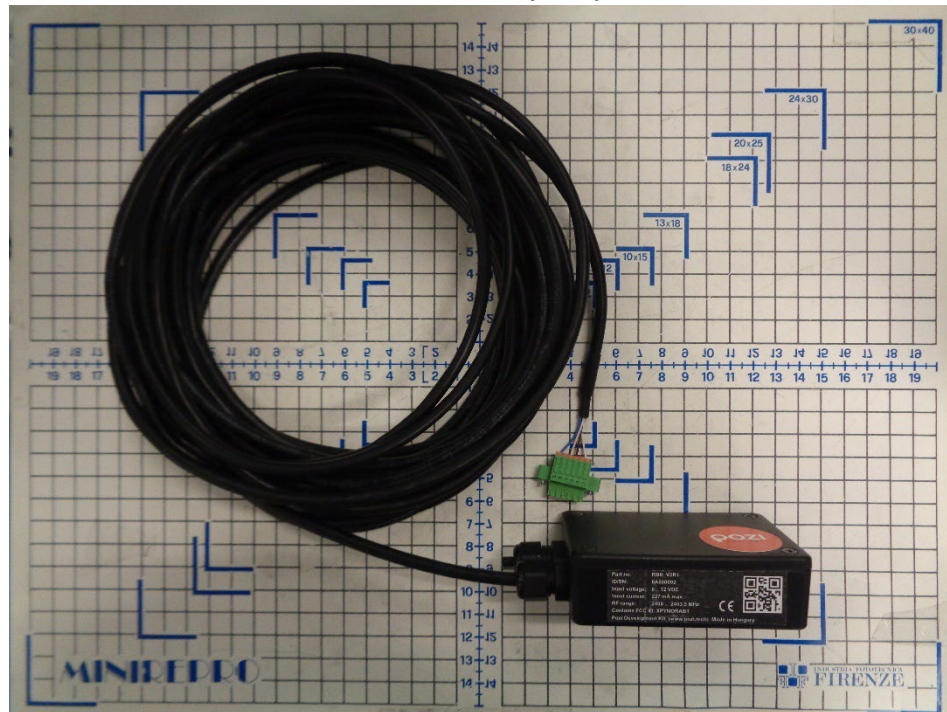
Exterior of Top



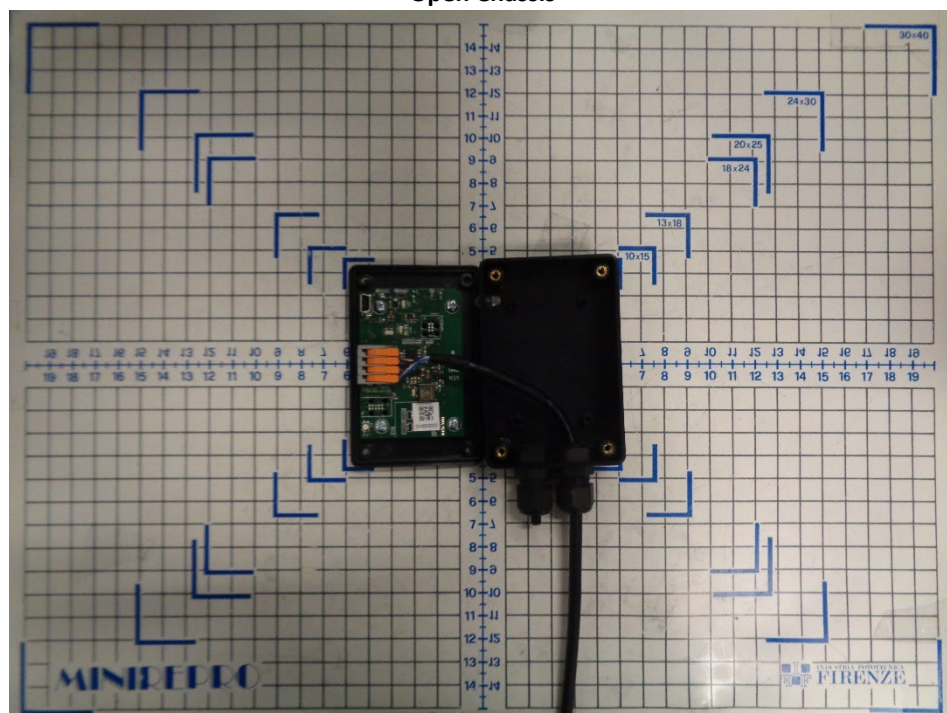
Exterior of Bottom



Exterior of Left(Label)



Open Chassis



END OF TEST REPORT