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Test Report

Certification

FCC ID	O9U-B-DS-PRO
Equipment Under Test	B-DS-PRO
Test Report Serial No	V082125_02
Dates of Test	November 17-25, 2025
Report Issue Date	February 20, 2026

Test Specifications:	Applicant:
FCC Part 15, Subpart C	Brivo Systems LLC 7700 Old Georgetown Rd. Suite 300 Bethesda, MD 20814 U.S.A.



Certification of Engineering Report

This report has been prepared by VPI Technology, Inc. to document compliance of the device described below with the requirements of Federal Communications Commission (FCC) Part 15, Subpart C. This report may be reproduced in full. Partial reproduction of this report may only be made with the written consent of the laboratory. The results in this report apply only to the sample tested.

Applicant	Brivo Systems LLC
Manufacturer	Brivo Systems LLC
Brand Name	Brivo
Model Number	B-DS-PRO
FCC ID	O9U-B-DS-PRO

On this 20th day of February 2026, I, individually and for VPI Technology, Inc., certify that the statements made in this engineering report are true, complete, and correct to the best of my knowledge, and are made in good faith.

Although NVLAP has accredited the VPI Technology, Inc. EMC testing facilities, this report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the US government.

VPI Technology, Inc.



Tested by: Benjamin N. Antczak



Reviewed by: Jason Stewart

Revision History		
Revision	Description	Date
01	Original Report Release	February 20, 2026
02	Correcting applicant address on pages 1 and 5, and test standard version in section 3.3	February 27, 2026

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1 Client Information

1.1 Applicant

Company Name	Brivo Systems LLC 7700 Old Georgetown Rd. Suite 300 Bethesda, MD 20814 U.S.A.
Contact Name	Brad Huber
Title	Vice President of Smart Devices

1.2 Manufacturer

Company Name	Brivo Systems LLC 7700 Old Georgetown Rd. Suite 300 Bethesda, MD 20814 U.S.A.
Contact Name	Brad Huber
Title	Vice President of Smart Devices

1.3 Party Responsible for Declaration of Conformity

Company Name	Brivo Systems LLC 7700 Old Georgetown Rd. Suite 300 Bethesda, MD 20814 U.S.A.
Contact Name	Steven Bryant
Title	Sr. Embedded Project Manager

2 Equipment Under Test (EUT)

2.1 Identification of EUT

Brand Name	Brivo
Model Number	B-DS-PRO
Model Name	N/A
Serial Number	253821000011
Dimensions (cm)	6.0 x 8.0 x 3.5

2.2 Customer Supplied Data (if applicable)

2.2.1 Disclaimer

This test report contains customer supplied data that may change the validity of the results presented. The customer maintains responsibility for the accuracy of these results.

2.3 Description of EUT

The B-DS-PRO is a door access system that operates with capacitive button key codes, NFC badges, optical recognition and IR scanning. It is powered by standard PoE and contains provisions for BLE communications. For testing, a TP Link TL-POE150S 48VDC PoE Injector was used with a Cat5e cable to power and communicate with the device. It contains an NFC reader that operates at 13.56MHz and interfaces with passive tag recognition. EUT was tested with and without tags present.

This report covers the transmitter circuitry of the devices subject to FCC Part 15, Subpart C, §15.225. Transmitter circuitry subject to FCC Part 15, Subpart C, §15.247 was found to be compliant and is covered in VPI Technology, Inc. report V082128. The circuitry of the device subject to FCC Subpart B was found to be compliant and is covered in VPI Technology, Inc. report V082125.

2.4 EUT and Support Equipment

The EUT and support equipment used during the test are listed below.

Brand Name Model Number Serial Number	Description	Name of Interface Ports / Interface Cables
BN: Brivo MN: B-DS-PRO (Note 1) SN: 253821000011	Door Access System	See Section 2.4
BN: TP Link MN: TL-POE150S SN: 2149905002129	48VDC PoE Injector	Data and Power / Cat5e Ethernet (Note 2)

Brand Name Model Number Serial Number	Description	Name of Interface Ports / Interface Cables
BN: Trendnet MN: TEG-S50TXE SN: CA06225006898	Network Switch	PoE Data Port / Cat5e Ethernet (No Direct Connection to EUT)
BN: Netgear MN: R7000 SN: 5KS5127BA2DA2	Internet-Connected Router	LAN Port to Switch / Cat5e Ethernet (No Direct Connection to EUT)
BN: Lenovo MN: ThinkPad SN: 20SQ-S27W00	Laptop PC	Switch Port to PC / Cat5e Ethernet (No Direct Connection to EUT)
BN: HID MN: N/A SN: N/A	HID NFC Access Card	Wireless (NFC)

Notes: (1) EUT

(2) Interface port connected to EUT (See Section 2.4)

The support equipment listed above was not modified in order to achieve compliance with this standard.

2.5 Interface Ports on EUT

Name of Ports	No. of Ports Fitted to EUT	Cable Description/Length
Data/Power	1 of 1	Cat5e Ethernet / 4 meters
Access Control	1 of 1	8 Unterminated Conductors / 0.2 meters

2.6 Modification Incorporated/Special Accessories on EUT

There were no modifications or special accessories required to comply with the specification.

2.7 Deviation from Test Standard

There were no deviations from the test specification.

3 Test Specification, Methods and Procedures

3.1 Test Specification

Title	FCC PART 15, Subpart C (47 CFR 15) 15.203, 15.207, and 15.225
Purpose of Test	The tests were performed to demonstrate initial compliance

3.2 Methods & Procedures

3.2.1 §15.203 Antenna Requirement

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. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

3.2.2 §15.207 Conducted Limits

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 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 frequency ranges.

Frequency range (MHz)	Limit (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50*	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

*Decreases with the logarithm of the frequency.

Table 1: Limits for conducted emissions at mains ports of Class B ITE.

3.2.3 §15.225 Operation Within the Band 13.110 – 14.010

- The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- 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.
- e) The frequency tolerance of the carrier signal shall be maintained within +/- 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.
- f) In the case of radio frequency powered tags designed to operate with a device authorized under this section, the tag may be approved with the device or be considered as a separate device subject to its own authorization. Powered tags approved with a device under a single application shall be labeled with the same identification number as the device.

3.3 Test Procedure

VPI Technology, Inc. is accredited by National Voluntary Laboratory Accreditation Program (NVLAP); NVLAP Lab Code: 100272-0, which is effective until September 30, 2026. VPI Technology, Inc. carries FCC Registration number 679030, and Accreditation Designation Number US5263. VPI Technology main office is located at 313 W 12800 S, Suite 311, Draper, UT 84020. The testing was performed according to the procedures in ANSI C63.10-2020/Cor 1:2021, KDB 558074, and 47 CFR Part 15.

4 Operation of EUT During Testing

4.1 Operating Environment

Power Supply	120 VAC
AC Mains Frequency	60 Hz

4.2 Operating Modes

The transmitter was tested in a single orientation consistent with wall-mount installation. Transmitter was in constant transmit mode at 13.56MHz. No changes were detected above 30MHz with the presence of tags. The BLE transmitter was active and advertising in the 2400-2483.5MHz band. The AC mains voltage to the AC adapter was varied as required by §15.31(e).

4.3 EUT Exercise Software

Engineering firmware was installed to force NFC into constant modulated transmit mode.

5 Summary of Test Results

5.1 FCC Part 15, Subpart C

5.1.1 Summary of Tests

Section	Environmental Phenomena	Frequency Range (MHz)	Result
15.203	Antenna Requirements	Structural requirement	Complied
15.207	Conducted Disturbance at Mains Ports	0.15 to 30	Complied
15.225(a)	Field Strength	13.11 – 14.01	Complied
15.225(b)	Field Strength	13.11 – 14.01	Complied
15.225(c)	Field Strength	13.11 – 14.01	Complied
15.225(d)	Field Strength	13.11 – 14.01	Complied
15.225(e)	Frequency Stability	13.11 – 14.01	Complied
---	Emission Bandwidth	13.56	Reported

5.2 Result

In the configuration tested, the EUT complied with the requirements of the specification.

6 Measurements, Examinations and Derived Results

6.1 General Comments

This section contains the test results only. Details of the test methods used and a list of the test equipment used during the measurements can be found in Section 7 of this report.

When calculations in this report require EUT antenna gains, those values have been provided by the manufacturer unless otherwise noted.

6.2 Test Results

6.2.1 §15.203 Antenna Requirements

The EUT uses a printed coil on a PCB.

Result

The EUT complied with the specification.

6.2.2 Conducted Emissions at Mains Ports Data (Hot Lead)

Transmitting With NFC Tag

Frequency (MHz)	Detector	Receiver Reading (dBμV)	Correction Factor (dB)	Measured Level (dBμV)	Class B Limit (dBμV)	Margin (dB)
0.15	Quasi-Peak	38.5	11.8	50.2	65.9	-15.7
0.15	Average	16.0	11.8	27.7	55.9	-28.2
4.1	Quasi-Peak	30.6	10.3	40.9	56.0	-15.1
4.1	Average	20.3	10.3	30.6	46.0	-15.4
4.5	Quasi-Peak	31.4	10.3	41.7	56.0	-14.3
4.5	Average	20.9	10.3	31.2	46.0	-14.8
4.7	Quasi-Peak	30.0	10.3	40.3	56.0	-15.7
4.7	Average	17.9	10.3	28.2	46.0	-17.8
4.8	Quasi-Peak	30.7	10.3	41.1	56.0	-14.9
4.8	Average	20.3	10.3	30.7	46.0	-15.3
6.5	Quasi-Peak	31.6	10.4	41.9	60.0	-18.1
6.5	Average	21.4	10.4	31.7	50.0	-18.3

Transmitting Without NFC Tag

Frequency (MHz)	Detector	Receiver Reading (dBμV)	Correction Factor (dB)	Measured Level (dBμV)	Class B Limit (dBμV)	Margin (dB)
0.18	Quasi-Peak	37.1	11.4	48.5	64.5	-16.0
0.18	Average	15.6	11.4	26.9	54.5	-27.6
4.2	Quasi-Peak	31.1	10.3	41.4	56.0	-14.6
4.2	Average	19.9	10.3	30.2	46.0	-15.8
4.5	Quasi-Peak	30.9	10.3	41.2	56.0	-14.8
4.5	Average	18.9	10.3	29.3	46.0	-16.8
4.6	Quasi-Peak	29.8	10.3	40.1	56.0	-15.9
4.6	Average	17.2	10.3	27.5	46.0	-18.5
4.8	Quasi-Peak	30.9	10.3	41.3	56.0	-14.7
4.8	Average	20.7	10.3	31.0	46.0	-15.0
8.0	Peak	36.3	10.4	46.7	50.0	-3.3

Result

The EUT complied with the specification limit.

6.2.1 Conducted Emissions at Mains Ports Data (Neutral Lead)

Transmitting With NFC Tag

Frequency (MHz)	Detector	Receiver Reading (dBμV)	Correction Factor (dB)	Measured Level (dBμV)	Class B Limit (dBμV)	Margin (dB)
0.15	Quasi-Peak	39.0	11.9	50.8	66.0	-15.1
0.15	Average	24.3	11.9	36.1	56.0	-19.8
2.1	Quasi-Peak	29.6	10.2	39.8	56.0	-16.2
2.1	Average	16.9	10.2	27.1	46.0	-18.9
4.0	Quasi-Peak	28.7	10.3	39.0	56.0	-17.0
4.0	Average	15.2	10.3	25.5	46.0	-20.5
4.2	Quasi-Peak	30.1	10.3	40.5	56.0	-15.6
4.2	Average	18.6	10.3	28.9	46.0	-17.1
4.5	Quasi-Peak	29.3	10.3	39.6	56.0	-16.4
4.5	Average	17.4	10.3	27.7	46.0	-18.3
4.9	Quasi-Peak	28.7	10.3	39.0	56.0	-17.0
4.9	Average	16.5	10.3	26.9	46.0	-19.2

Transmitting Without NFC Tag

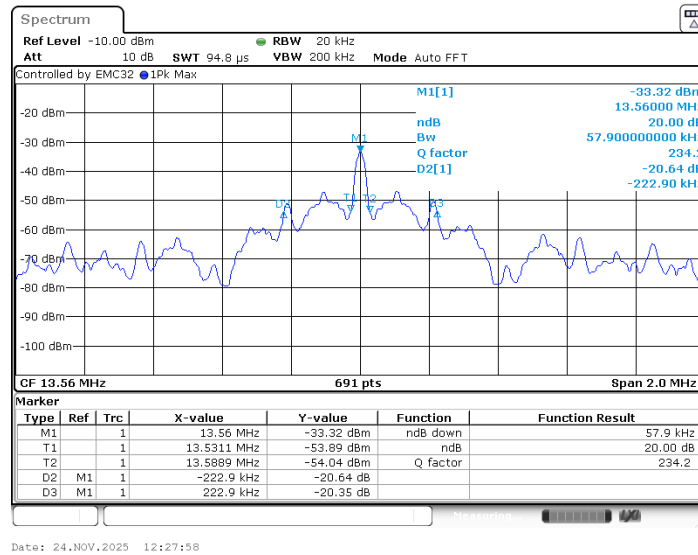
Frequency (MHz)	Detector	Receiver Reading (dBμV)	Correction Factor (dB)	Measured Level (dBμV)	Class B Limit (dBμV)	Margin (dB)
0.15	Quasi-Peak	39.2	11.8	51.0	65.9	-14.9
0.15	Average	33.5	11.8	45.4	55.9	-10.6
0.17	Quasi-Peak	38.3	11.5	49.8	65.0	-15.2
0.17	Average	15.8	11.5	27.4	55.0	-27.7
0.19	Quasi-Peak	34.9	11.3	46.2	64.0	-17.8
0.19	Average	19.9	11.3	31.2	54.0	-22.7
3.8	Quasi-Peak	29.3	10.3	39.6	56.0	-16.4
3.8	Average	17.7	10.3	28.0	46.0	-18.0
4.2	Peak	30.4	10.3	40.7	56.0	-15.3
4.2	Peak	19.1	10.3	29.4	46.0	-16.6
4.9	Quasi-Peak	28.7	10.3	39.1	56.0	-16.9
4.9	Average	17.0	10.3	27.3	46.0	-18.7

Result

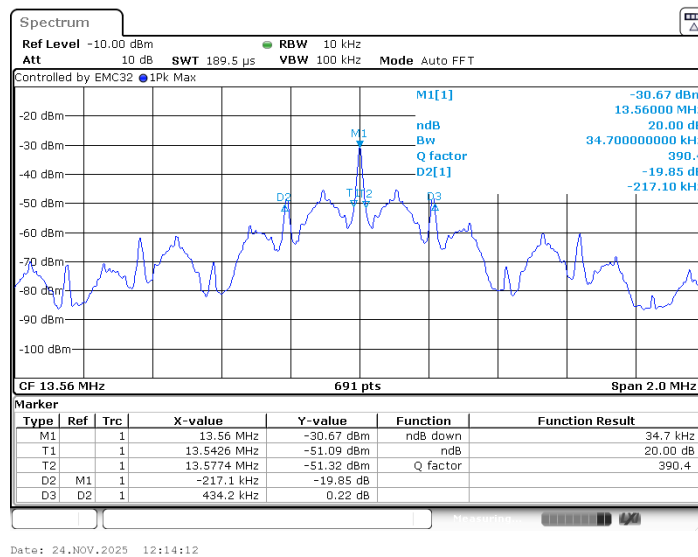
The EUT complied with the specification limit.

6.2.2 20dB Emissions Bandwidth

Mode	Frequency (MHz)	Emissions 20dB Bandwidth (kHz)
Transmitting with NFC Tag	13.56	445.8
Transmitting without NFC Tag	13.56	434.2



Graph 1: 20dB Bandwidth with Tags



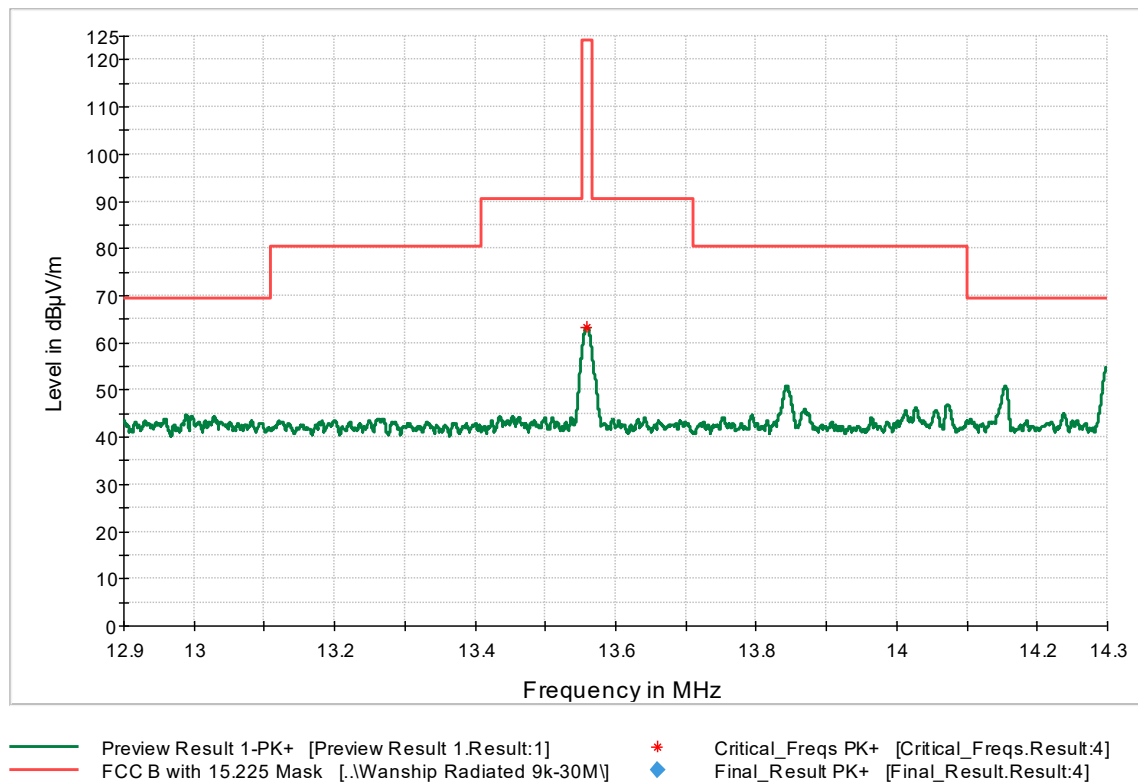
Graph 2: 20dB Bandwidth without Tags

6.2.3 §15.255(a)-(c) In-Band Radiated Disturbance Data (13.110 MHz – 14.010 MHz)

The maximum field strength shall not exceed 15,848.0 $\mu\text{V/m}$ at 30 meters. Test data was taken at 3 meters and extrapolated to the limit distance according to 47 CFR 15.31. Measurements were taken in both vertical and horizontal polarity. Vertical polarity on Antenna 1 with a tag was the worst case and is reported below.

Frequency (MHz)	Polarity	Highest Measured 3m Peak Power (dB $\mu\text{V/m}$)	30m Peak Power (dB $\mu\text{V/m}$)	Measured 30m Peak Power ($\mu\text{V/m}$)
13.56	Vertical	63.6	23.6	15.1
13.56	Horizontal	43.6	3.6	1.5

The plots below show compliance with the full band compared to the limits of 47 CFR §15.255(a)-(c).



Graph 3: Worst-Case Radiated Emission (Vertical Polarization Without Tag)

6.2.4 §15.225 (d) Radiated Disturbance Data (0.009 – 1000 MHz, excluding the range 13.110 – 14.010 MHz)

Worst-case emissions were detected with the EUT transmitting without an NFC Tag in place. Emissions below 30MHz were tested with a Loop antenna. Due to the low power of the device's transmission, it was evaluated at three meters to keep the signal above the noise-floor, and extrapolated to the limit distance according to ANSI C63.10.

Radiated Emissions Data (Vertical Polarity)

Frequency (MHz)	Detector	Receiver Reading (dBµV)	Correction Factor (dB/m)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
27.1	Peak (Notes 1 & 3)	35.0	9.7	44.7	69.5	-24.8
40.7	Peak (Note 1)	24.9	1.5	26.3	40.0	-13.7
54.3	Peak (Note 1)	30.9	-2.0	28.9	40.0	-11.1
67.9	Peak (Note 1)	25.4	-0.9	24.5	40.0	-15.5
81.2	Peak (Note 1)	32.0	-1.1	30.9	40.0	-9.1
95.2	Peak (Note 1)	28.1	-0.6	27.4	43.5	-16.1
108.8	Peak (Note 1)	24.9	0.4	25.3	43.5	-18.2
121.3	Peak (Note 1)	18.7	-0.2	18.5	43.5	-25.0
135.8	Peak (Note 1)	20.6	0.9	21.5	43.5	-22.0

Note 1: The reference detector used for the measurements was peak or quasi-peak and the data was compared to the quasi-peak limit.

Note 2: For radiated emissions above 1000 MHz, the reference detector used for the measurements was average and peak and the data was compared to the respective limits.

Note 3: Emissions below 30MHz were tested with a Loop antenna. Due to the low power of the device's transmission power, it was evaluated at three meters to keep the signal above the noise-floor, and then extrapolated to the limit distance.

Result

The EUT complied with the specification limit by a margin of 9.1 dB.

Radiated Emissions Data (Horizontal Polarity)

Frequency (MHz)	Detector	Receiver Reading (dBµV)	Correction Factor (dB/m)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
27.1	Peak (Notes 1 & 3)	30.6	9.7	40.2	69.5	-29.3
40.5	Peak (Note 1)	17.4	1.5	18.9	40.0	-21.1
54.4	Peak (Note 1)	18.4	-2.0	16.4	40.0	-23.6
68.0	Peak (Note 1)	18.7	-0.9	17.9	40.0	-22.1
81.2	Peak (Note 1)	17.7	-1.1	16.6	40.0	-23.5
94.9	Peak (Note 1)	19.5	-0.7	18.8	43.5	-24.7
108.4	Peak (Note 1)	17.5	0.5	18.0	43.5	-25.5

Frequency (MHz)	Detector	Receiver Reading (dBμV)	Correction Factor (dB/m)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
123.4	Peak (Note 1)	17.2	-0.1	17.2	43.5	-26.3
135.2	Peak (Note 1)	17.9	0.9	18.8	43.5	-24.7

Note 1: The reference detector used for the measurements was peak or quasi-peak and the data was compared to the quasi-peak limit.

Note 2: For radiated emissions above 1000 MHz, the reference detector used for the measurements was average and peak and the data was compared to the respective limits.

Note 3: Emissions below 30MHz were tested with a Loop antenna. Due to the low power of the device's transmission power, it was evaluated at three meters to keep the signal above the noise-floor, and then extrapolated to the limit distance.

Result

The EUT complied with the specification limit by a margin of 21.1 dB.

6.2.5 §15.225(e) Frequency Stability

The EUT was tested for frequency stability as specified in §15.225(e). The 13.56 MHz module has its own voltage regulation. The transmitter transmits at 13,559,918 Hz. The transmitter is allowed a deviation of 0.01% or 1355.9 Hz. Varying the voltage +15% showed a frequency deviation of 5 Hz, and varying the voltage -15% showed a frequency deviation of 26 Hz.

(°C)	Frequency (Hz) over Time (Minutes)				Deviation (Hz)			
	Startup	2 min	5 min	10 min	Min Freq	Deviation	Max Freq	Deviation
50	13559922	13559817	13559823	13559823	13559817	-101	13559922	4
40	13559868	13559852	13559840	13559819	13559819	-99	13559868	-50
30	13559895	13559872	13559862	13559857	13559857	-61	13559895	-23
20	13559918	13559899	13559887	13559872	13559872	-46	13559918	0
10	13559949	13559945	13559951	13559913	13559913	-5	13559951	33
0	13559958	13559940	13559925	13559941	13559925	7	13559958	40
-10	13559933	13559934	13559939	13559951	13559933	15	13559951	33
-20	13559977	13559970	13560031	13559972	13559970	52	13560031	113

Result

The EUT complied with the specification as the fundamental frequency was maintained with $\pm 0.01\%$ of the operating frequency through the tests.

6.3 Sample Measurement Calculations

6.3.1 Filed Strength Calculations

The field strength is calculated by adding the *Correction Factor* (*Antenna Factor* + *Cable Factor*), to the measured level from the receiver. The receiver amplitude reading is compensated for any amplifier gain. When an average measurement requires an average measurement correction value, it is also accounted for. The basic equation with a sample calculation is shown below:

$$\text{Receiver Amplitude Reading} = \text{Receiver Reading} - \text{Amplifier Gain}$$

$$\text{Correction Factor} = \text{Antenna Factor} + \text{Cable Factor}$$

$$\text{Field Strength} = \text{Receiver Amplitude Reading} + \text{Correction Factor} [+ \text{Average Correction Value}]$$

Example

Assuming a *Receiver Reading* of 42.5 dBμV is obtained from the receiver, the *Amplifier Gain* is 26.5 dB, the *Antenna Factor* is 4.5 dB, and the *Cable Factor* is 4.0 dB. The *Field Strength* is calculated by subtracting the *Amplifier Gain* and adding the *Correction Factor*, giving a *Field Strength* of 24.5 dBμV/m.

$$\text{Receiver Amplitude Reading} = 42.5 - 26.5 = 16.0 \text{ dB}\mu\text{V/m}$$

$$\text{Correction Factor} = 4.5 + 4.0 = 8.5 \text{ dB}$$

$$\text{Field Strength} = 16.0 + 8.5 = 24.5 \text{ dB}\mu\text{V/m}$$

6.3.2 Conducted Measurement Value Calculations

A conducted emission value is calculated by adding the *Correction Factor* (*LISN Transducer Factor* + *Cable Factor*) to the measured value from the receiver. The LISN contains an internal 10dB (nominal) attenuation accounted for in the LISN Transducer Factor. Amplifiers are not utilized for this measurement. The basic equation with a sample calculation is shown below:

$$\text{Correction Factor} = \text{LISN Transducer Factor} + \text{Cable Factor}$$

$$\text{Conducted Emission Value} = \text{Receiver Amplitude Reading} + \text{Correction Factor}$$

Example

Assuming a *Receiver Reading* of 20.8 dBμV is obtained from the receiver, *LISN Transducer Factor* is 10.1 dB, and the *Cable Factor* is 0.3 dB. The *Conducted Emissions Value* is calculated by adding the *Correction Factor*, giving a *Conducted Emissions Value* of 31.2 dBμV.

$$\text{Receiver Amplitude Reading} = 20.8 \text{ dB}\mu\text{V}$$

$$\text{Correction Factor} = 10.1 + 0.3 = 10.4 \text{ dB}$$

$$\text{Conducted Emissions Value} = 20.8 + 10.4 = 31.2 \text{ dB}\mu\text{V}$$

7 Test Procedures and Test Equipment

7.1 Conducted Emissions at Mains Ports

The conducted emissions at mains and telecommunications ports from the EUT were measured using a spectrum analyzer with a quasi-peak adapter for peak, quasi-peak and average readings. The quasi-peak adapter uses a bandwidth of 9 kHz, with the spectrum analyzer's resolution bandwidth set at 100 kHz, for readings in the 150 kHz to 30 MHz frequency ranges.

The conducted emissions at mains ports measurements are performed in a screen room using a (50 Ω /50 μ H) Line Impedance Stabilization Network (LISN).

Where mains flexible power cords are longer than 1 m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4 m in length.

Where the EUT is a collection of devices with each device having its own power cord, the point of connection for the LISN is determined from the following rules:

- Each power cord, which is terminated in a mains supply plug, shall be tested separately.
- Power cords, which are not specified by the manufacturer to be connected via a host unit, shall be tested separately.
- Power cords which are specified by the manufacturer to be connected via a host unit or other power supplying equipment shall be connected to that host unit and the power cords of that host unit connected to the LISN and tested.
- Where a special connection is specified, the necessary hardware to effect the connection is supplied by the manufacturer for the testing purpose.
- When testing equipment with multiple mains cords, those cords not under test are connected to an artificial mains network (AMN) different than the AMN used for the mains cord under test.

For testing, desktop EUT are placed on a non-conducting table at least 0.8 meters from the metallic floor and placed 40 cm from the vertical coupling plane (copper plating in the wall behind EUT table). Floor standing equipment is placed directly on the earth grounded floor.

Type of Equipment	Manufacturer	Model Number	Asset Number	Date of Last Calibration	Due Date of Calibration
Spectrum Analyzer/Receiver	Rohde & Schwarz	ESU40	V033119	12/02/2024	12/02/2025
Spectrum Analyzer/Signal Analyzer	Rohde & Schwarz	FSV40	V044352	03/05/2024	03/05/2026
LISN	Teseq	NNB 51	V045406	12/19/2024	12/19/2025
Conductance Cable Wanship Upper Site	VPI Labs	Cable J	V034832	12/19/2024	12/19/2025
EMC32 Measurement Software	Rohde & Schwarz	10.60.20	N/A	N/A	N/A

Table 2: List of equipment used for conducted emissions testing at mains ports.

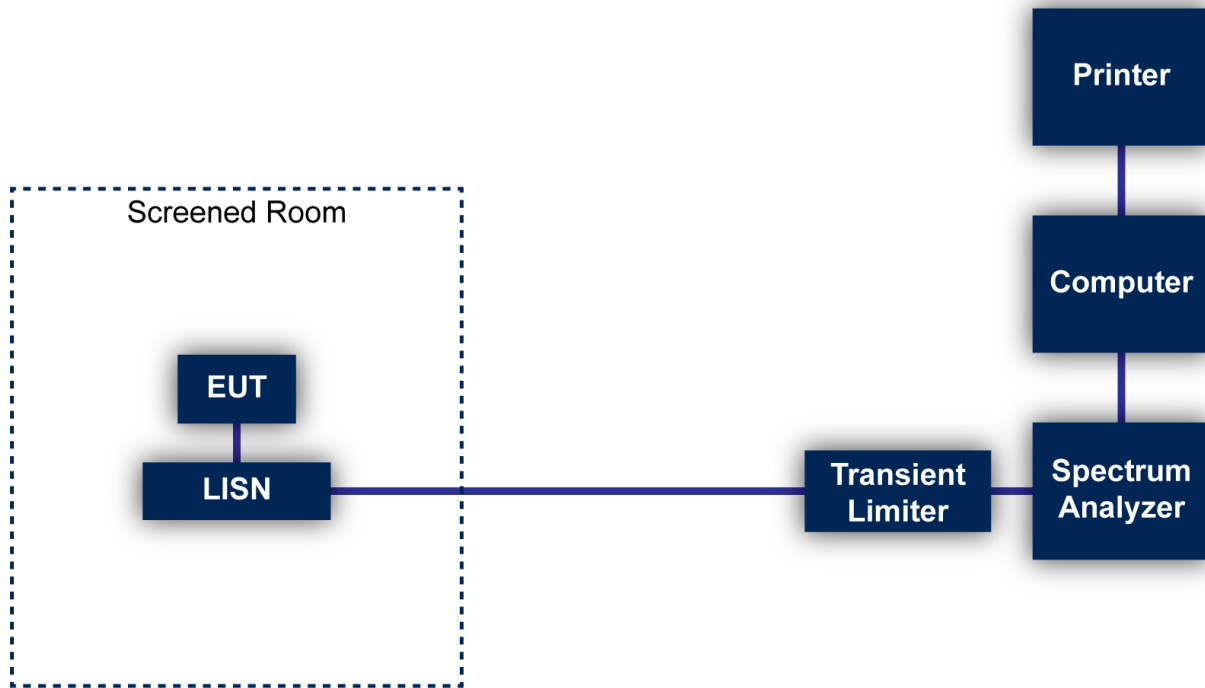


Figure 1: Conducted Emissions Test

7.2 Radiated Emissions

The radiated emissions from the EUT were measured using a spectrum analyzer with a quasi-peak adapter for peak and quasi-peak readings.

A preamplifier with a fixed gain was used to increase the sensitivity of the measuring instrumentation. The quasi-peak adapter uses a bandwidth of 120 kHz, with the spectrum analyzer's resolution bandwidth set at 1 MHz, for readings in the 30 to 1000 MHz frequency ranges. For frequencies below 30 MHz, a 9 kHz resolution Bandwidth was used.

A loop antenna was used to measure frequencies below 30 MHz. A biconilog antenna was used to measure the frequency range of 30 to 1000 MHz, at a distance of 3 meters from the EUT. The readings obtained by these antennas are correlated to the levels obtained with a tuned dipole antenna by adding antenna factors. A double-ridged guide antenna was used to measure the emissions at frequencies above 1000 MHz at a distance of 3 and/or 1 meter from the EUT.

The configuration of the EUT was varied to find the maximum radiated emission. The EUT was connected to the peripherals listed in Section 2.3 via the interconnecting cables listed in Section 2.4. A technician manually manipulated these interconnecting cables to obtain worst-case radiated emissions. The EUT was rotated 360 degrees, and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission. Where there were multiple interface ports all of the same type, cables are either placed on all of the ports or cables added to these ports until the emissions do not increase by more than 2 dB.

Desktop EUT are measured on a non-conducting table 0.8 meters above the ground plane. For frequencies above 1000 MHz, the EUT is placed on a table 1.5 meters above the ground plane. The table is placed on a turntable, which is level with the ground plane. For equipment normally placed on floors, the equipment shall be placed directly on the turntable.

For radiated emissions testing that is performed at distances closer than the specified distance; an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

Type of Equipment	Manufacturer	Model Number	Asset Number	Date of Last Calibration	Due Date of Calibration
Spectrum Analyzer/Receiver	Rohde & Schwarz	ESU40	V033119	12/02/2024	12/02/2025
Spectrum Analyzer/Signal Analyzer	Rohde & Schwarz	FSV40	V044352	03/05/2024	03/05/2026
Loop Antenna	EMCO	6502	V034216	04/27/2023	12/31/2025
Biconilog Antenna	EMCO	3142E	V035736	07/08/2025	07/08/2027
Power Amplifier	HP	8447E	V034189	12/19/2024	12/19/2025
Double Ridged Guide Antenna	EMCO	3115	V034194	06/25/2025	06/25/2027
Standard Gain Horn	ETS-Lindgren	3160-09	V034223	ICO	ICO
High Frequency Amplifier	Miteq	AFS4-001018000-35-10P-4	V033997	12/19/2024	12/19/2025
900 MHz High Pass Filter	Micro-Tronics	HPM50108-03	V034185	12/19/2024	12/19/2025
2.4 GHz High Pass Filter	Micro-Tronics	HPM50111-03	V034183	12/19/2024	12/19/2025
2.4 GHz Notch Filter	Micro-Tronics	BRM50702-03	V034213	12/19/2024	12/19/2025
6' High Frequency Cable	Microcoax	UFB197C-0-0720-000000	V033638	12/19/2024	12/19/2025
20' High Frequency Cable	Microcoax	UFB197C-1-3120-000000	V033979	12/19/2024	12/19/2025
3 Meter Radiated Emissions Cable Wanship Upper Site	Microcoax	UFB205A-0-4700-000000	V033639	12/19/2024	12/19/2025
EMC32 Test Software	Rohde & Schwarz	10.60.20	N/A	N/A	N/A

Table 3: List of equipment used for radiated emissions testing.

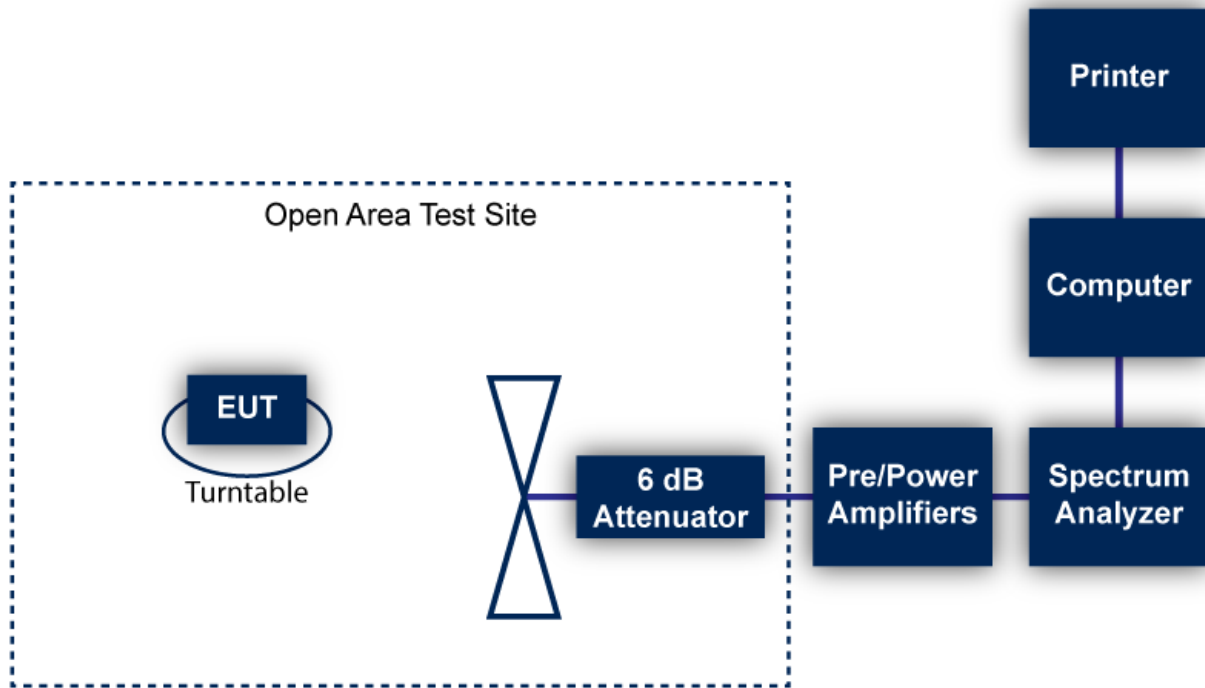


Figure 2: Radiated Emissions Test

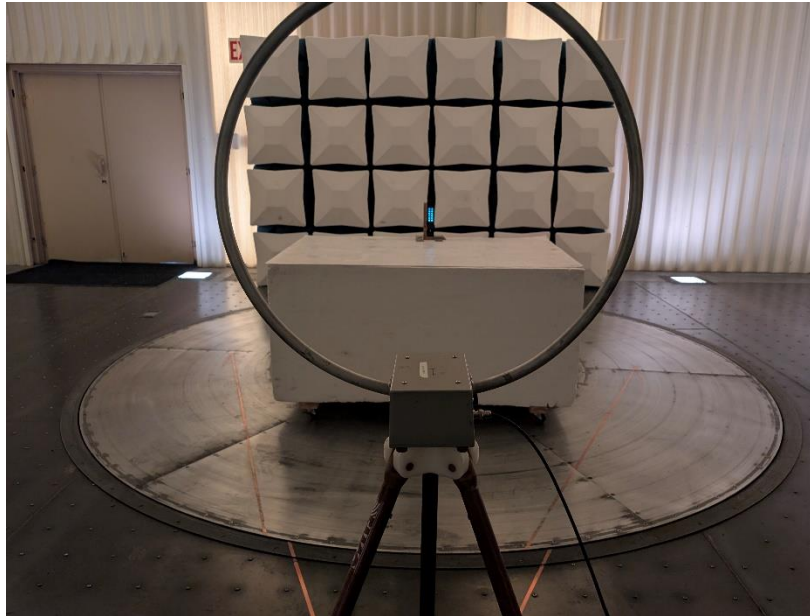
7.3 Equipment Calibration

All applicable equipment is calibrated using either an independent calibration laboratory or VPI Technology, Inc. personnel at intervals defined in ANSI C63.4:2014 following outlined calibration procedures. All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to tractability is on file and is available for examination upon request.

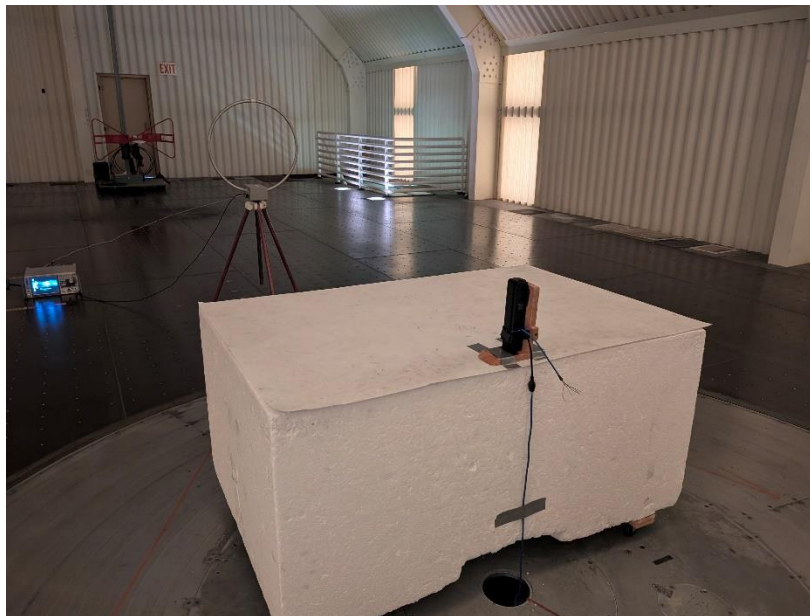
7.4 Measurement Uncertainty

Test	Uncertainty ($\pm$ dB)	Confidence (%)
Conducted Emissions	2.8	95
Radiated Emission (9 kHz to 30 MHz)	3.3	95
Radiated Emissions (30 MHz to 1 GHz)	3.4	95
Radiated Emissions (1 GHz to 18 GHz)	5.0	95
Radiated Emissions (18 GHz to 40 GHz)	4.1	95

8 Photographs



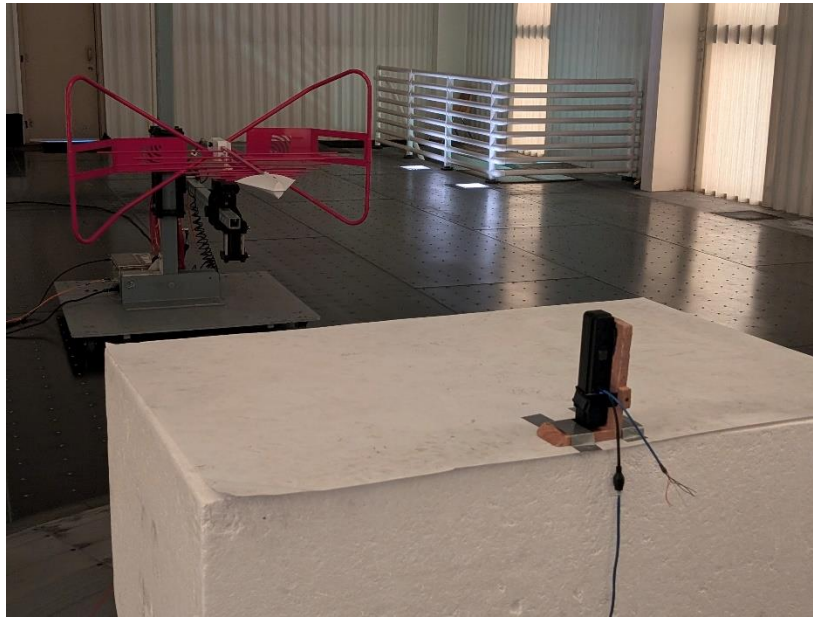
Photograph 1: Front View Radiated Emissions Worst Case Configuration – Frequencies Below 30 MHz



Photograph 2: Back View Radiated Emissions Worst Case Configuration – Frequencies Below 30 MHz



Photograph 3: Front View Radiated Emissions Worst Case Configuration – Frequencies 30 - 1000 MHz



Photograph 4: Back View Radiated Emissions Worst Case Configuration – Frequencies 30 - 1000 MHz



Photograph 5: Front View Conducted Emissions Worst Case Configuration



Photograph 6: Back View Conducted Emissions Worst Case Configuration



Photograph 7: Front View of the EUT



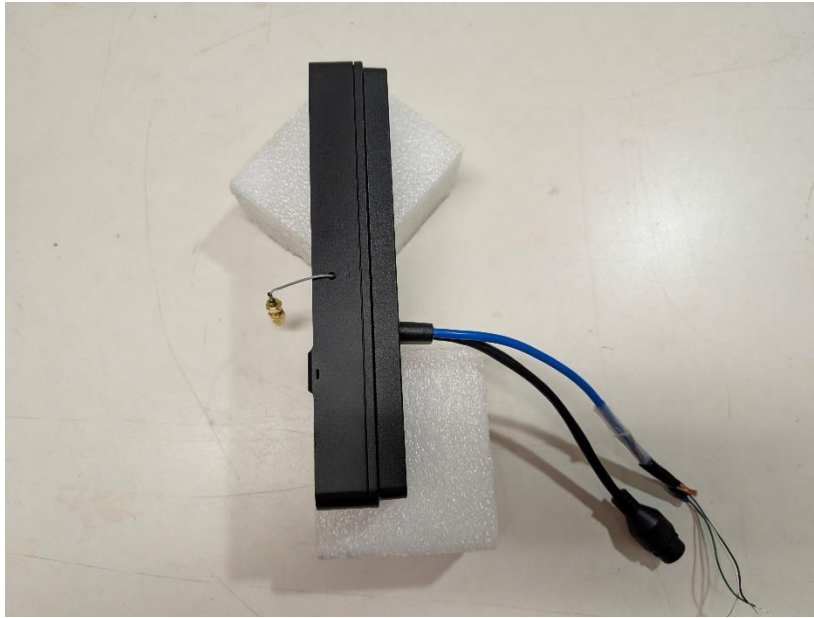
Photograph 8: Back View of the EUT



Photograph 9: Top View of the EUT



Photograph 10: Bottom View of the EUT



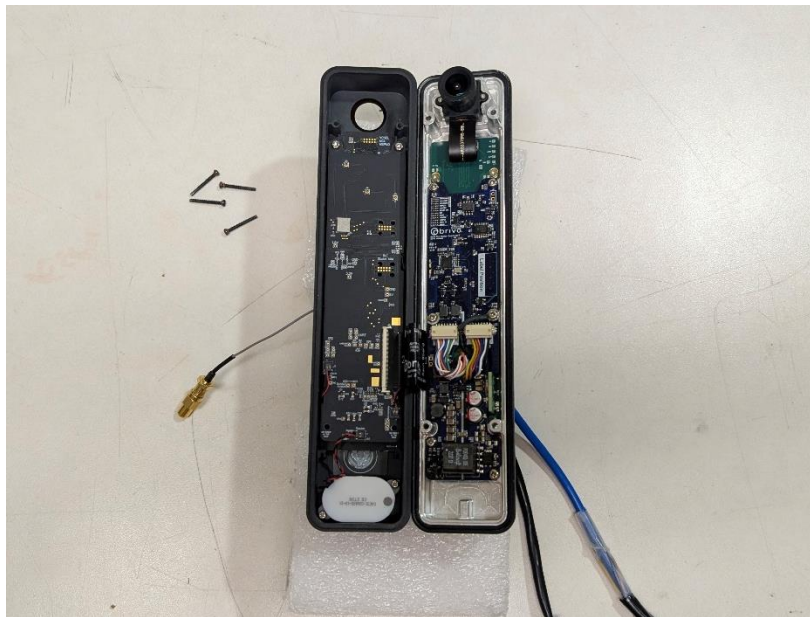
Photograph 11: Side 1 View of the EUT



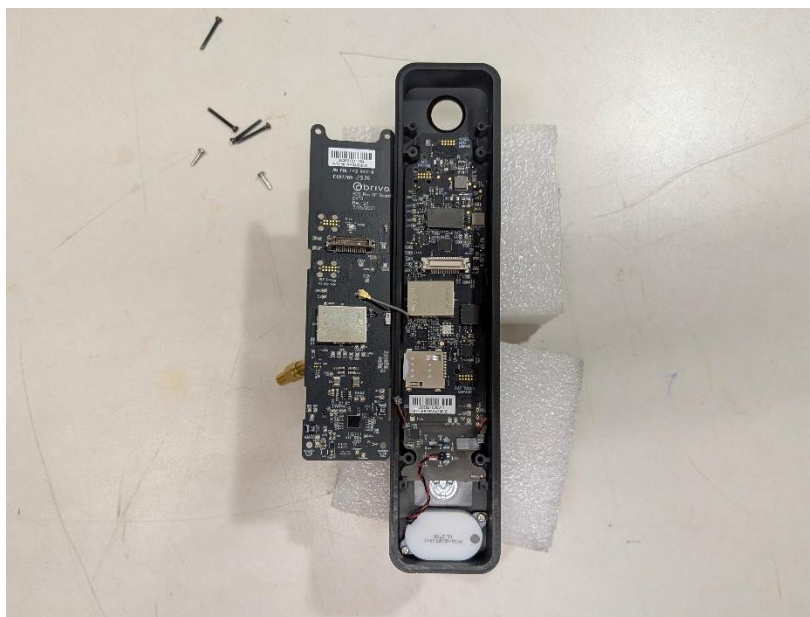
Photograph 12: Side 2 View of the EUT



Photograph 13: NFC Tag Placement on EUT During Test



Photograph 14: Rear Cover Removed Showing Placement of PCBs in Enclosure (“RF Board” on Top of “Keypad Board” on Left, “Power Board” on Top of “Main Board” on Right)



Photograph 15: Enclosure Front with RF Board Removed Showing “Keypad Board”



Photograph 16: Enclosure Front with “Keypad Board”



Photograph 17: Enclosure Front with Keypad Board Removed



RF
Shielding

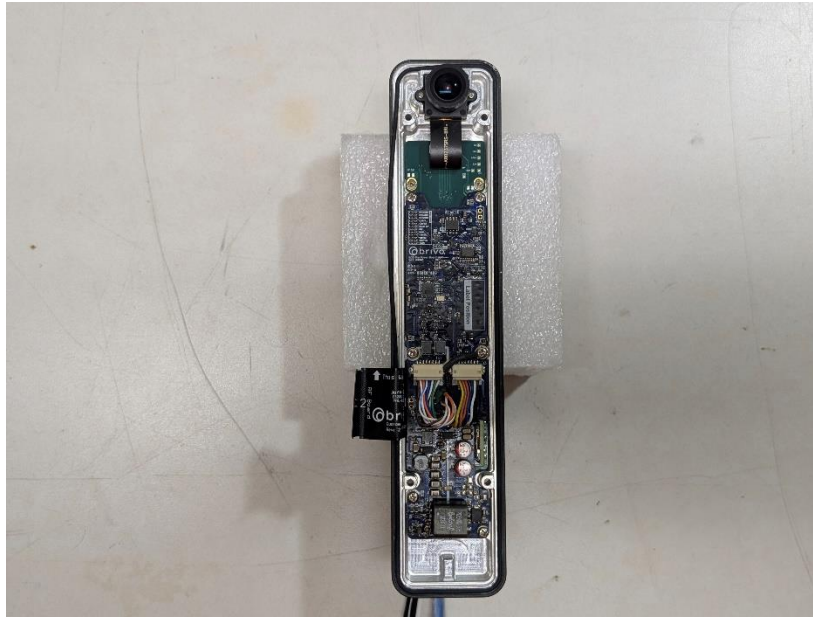
Photograph 18: Close-up of Keypad with RF Shielding



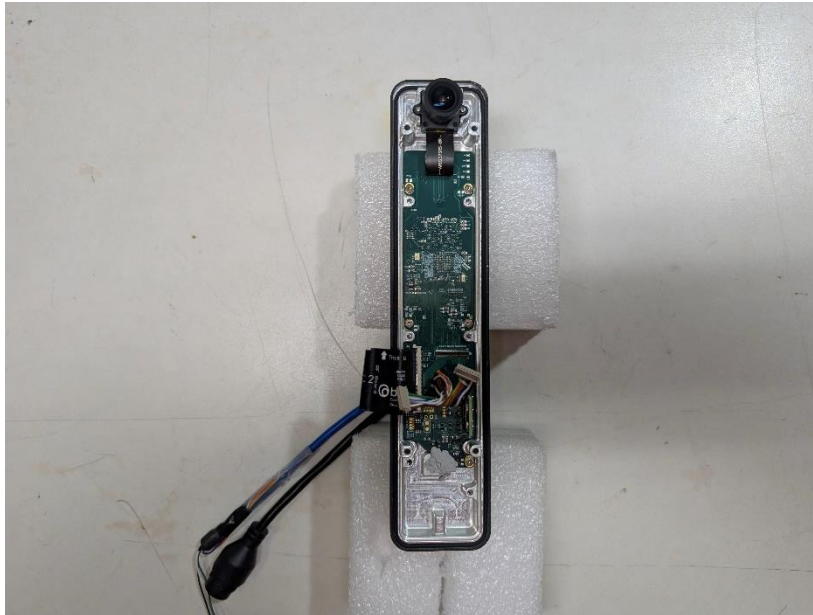
Photograph 19: Enclosure with RF Shielding Removed from Keypad



Photograph 20: Closeup View of Enclosure with RF Shielding Removed from Keypad, Showing NFC Antenna



Photograph 21: Enclosure Back Showing “Power Board” on Top of “Main Board”



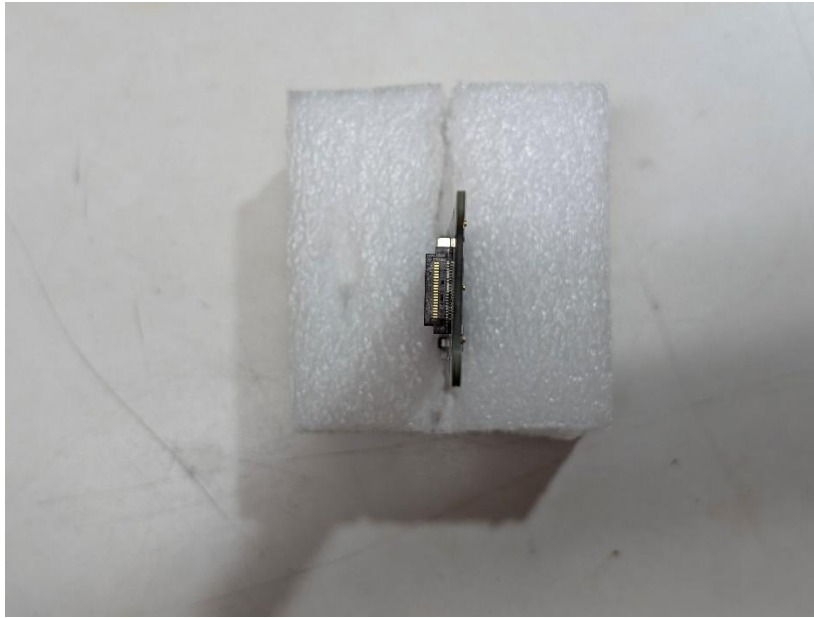
Photograph 22: Enclosure Back Showing Placement of “Main Board” with “Power Board” Removed



Photograph 23: Front of PCB "RF Board"



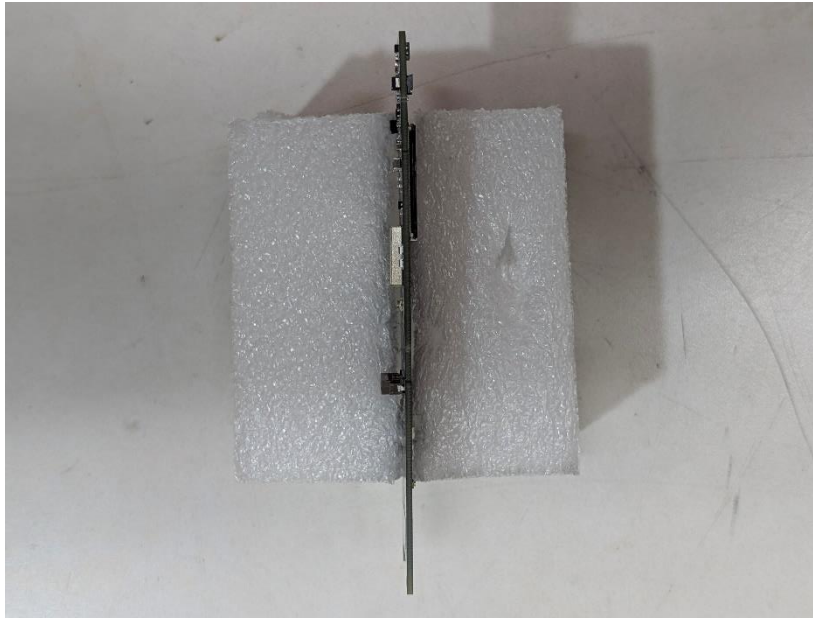
Photograph 24: Back of PCB "RF Board"



Photograph 25: Top Edge of PCB "RF Board"



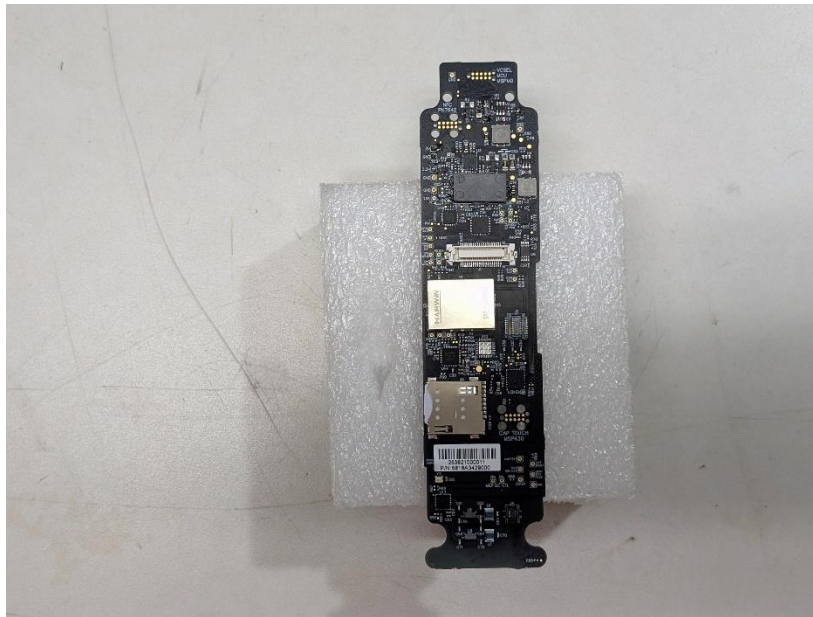
Photograph 26: Bottom Edge of PCB "RF Board"



Photograph 27: Side 1 Edge of PCB "RF Board"



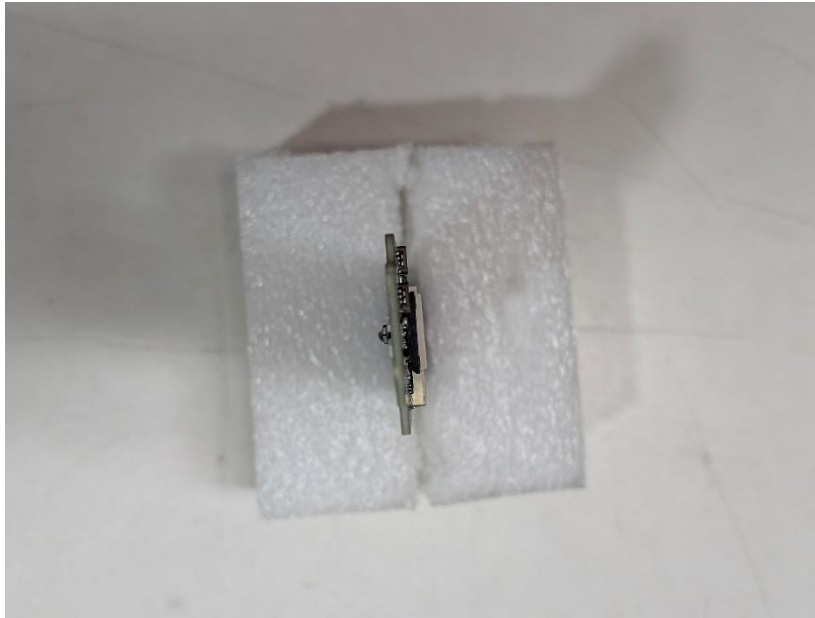
Photograph 28: Side 2 Edge of PCB "RF Board"



Photograph 29: Front of PCB “Keypad Board”



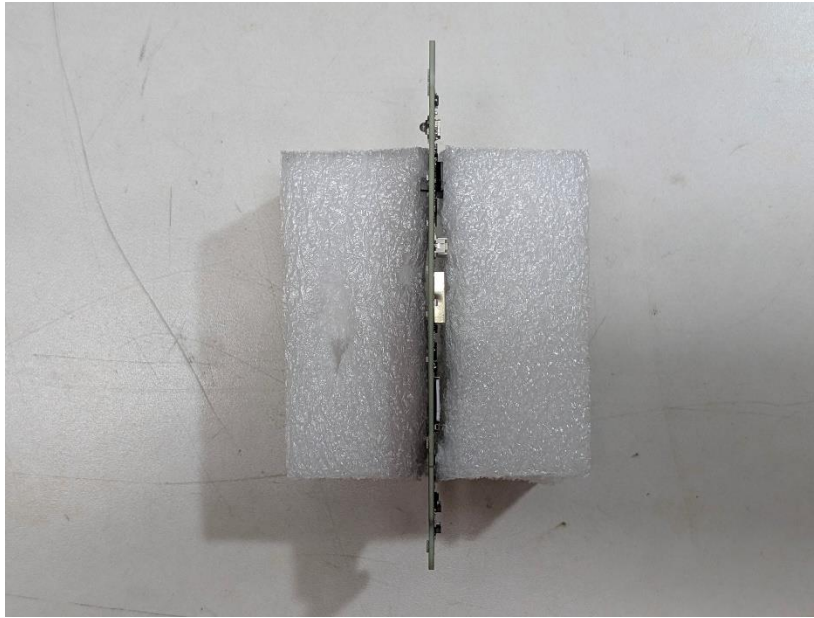
Photograph 30: Back of PCB “Keypad Board”



Photograph 31: Top Edge of PCB “Keypad Board”



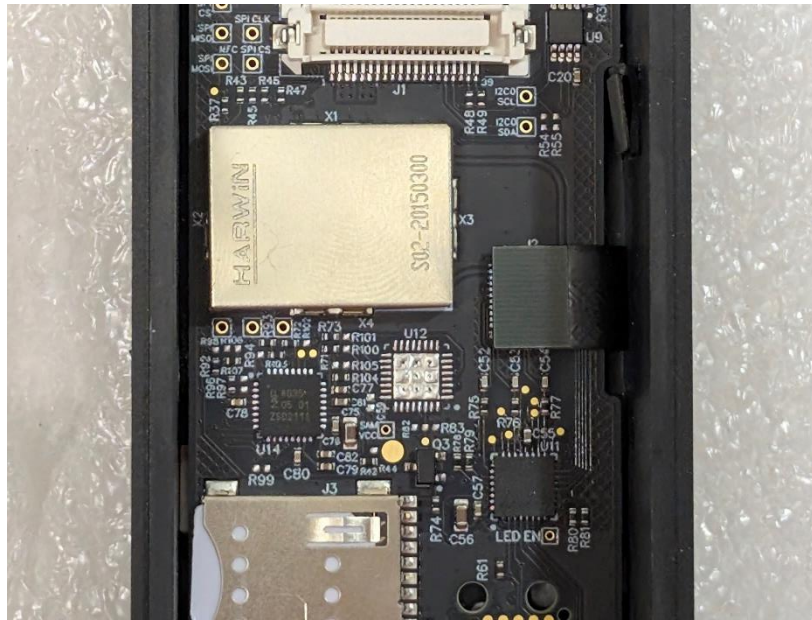
Photograph 32: Bottom Edge of PCB “Keypad Board”



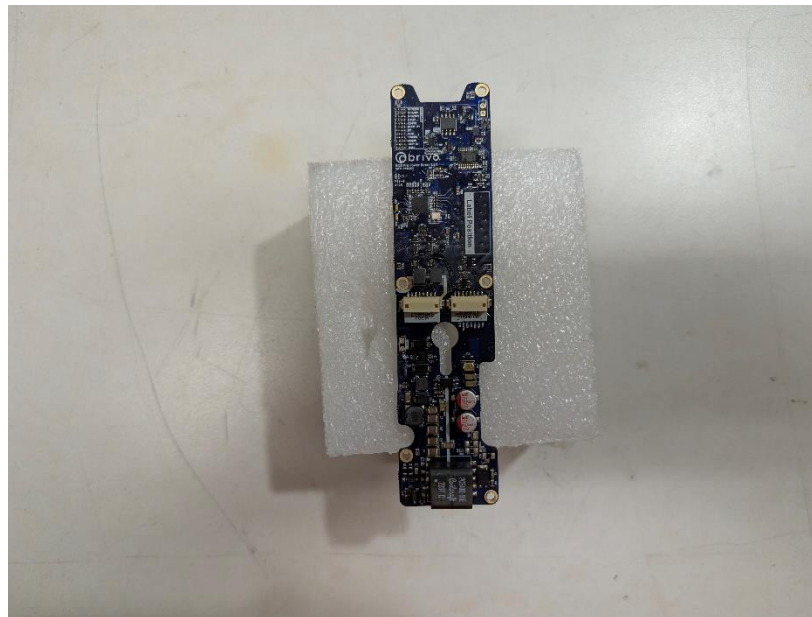
Photograph 33: Side 1 Edge of PCB "Keypad Board"



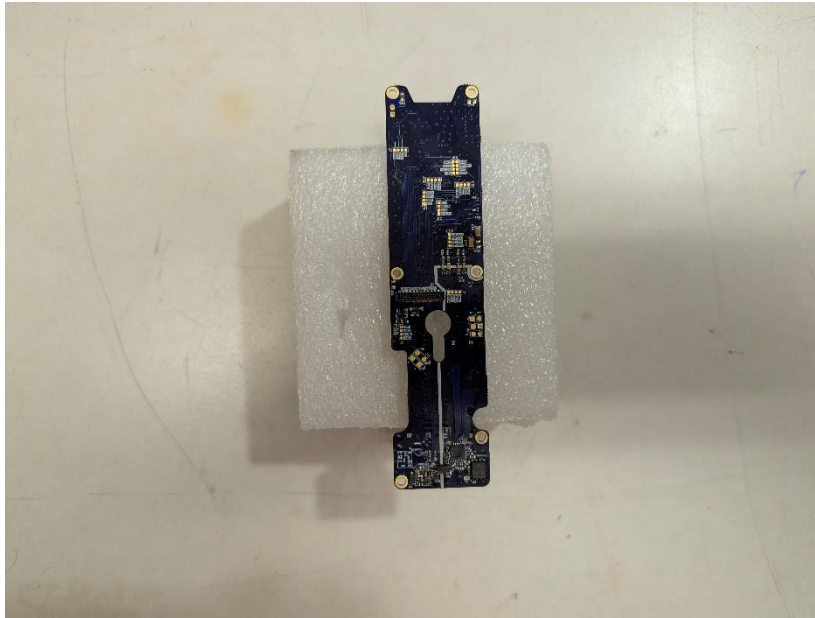
Photograph 34: Side 2 Edge of PCB "Keypad Board"



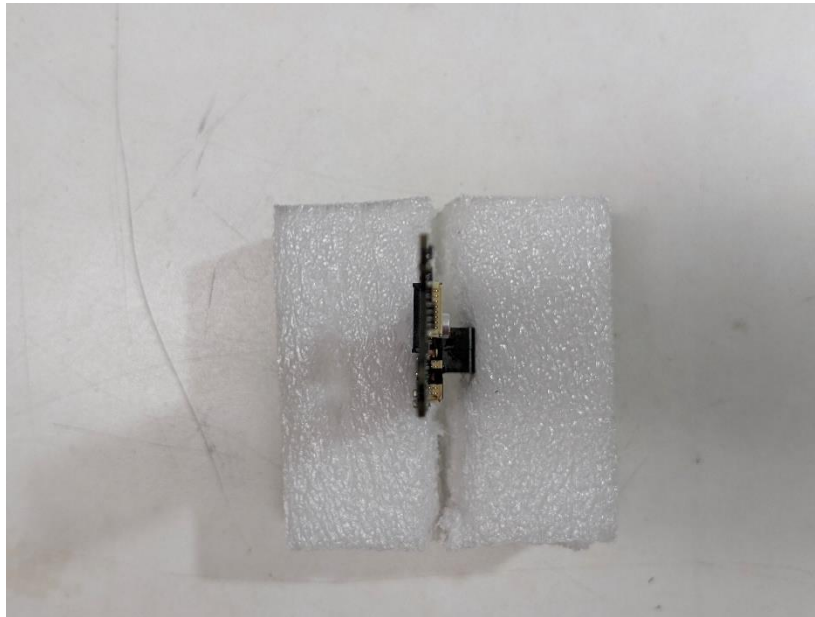
Photograph 35: Closeup View of NFC Circuitry



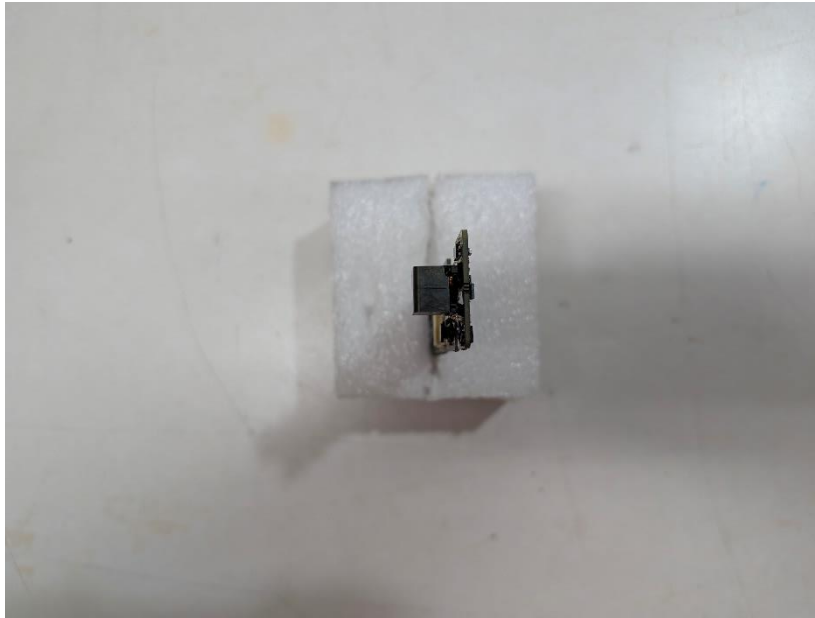
Photograph 36: Front of PCB "Power Board"



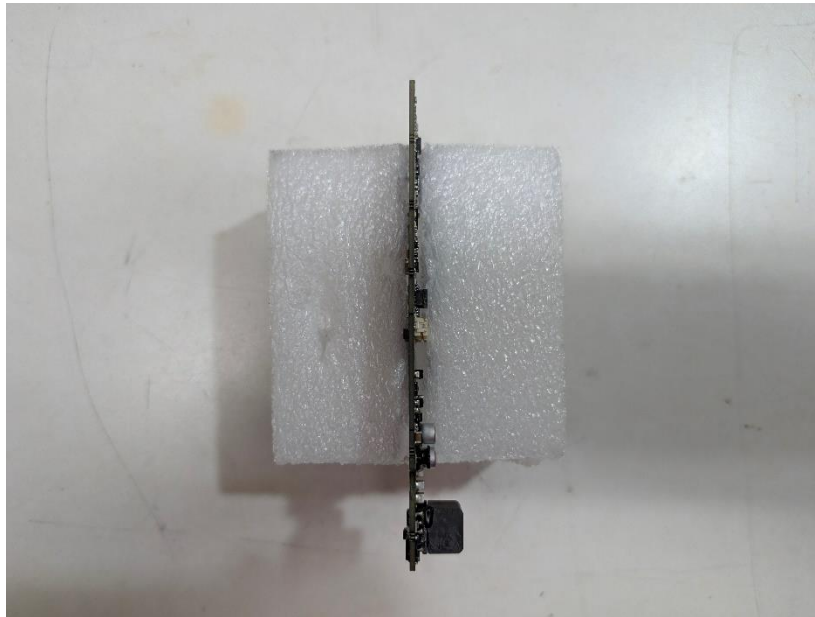
Photograph 37: Back of PCB "Power Board"



Photograph 38: Top Edge of PCB "Power Board"



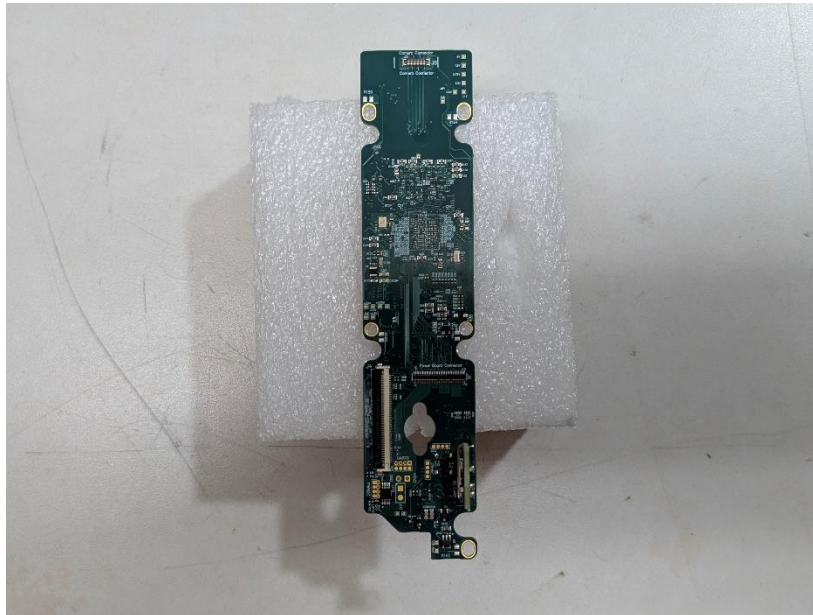
Photograph 39: Bottom Edge of PCB "Power Board"



Photograph 40: Side 1 Edge of PCB "Power Board"



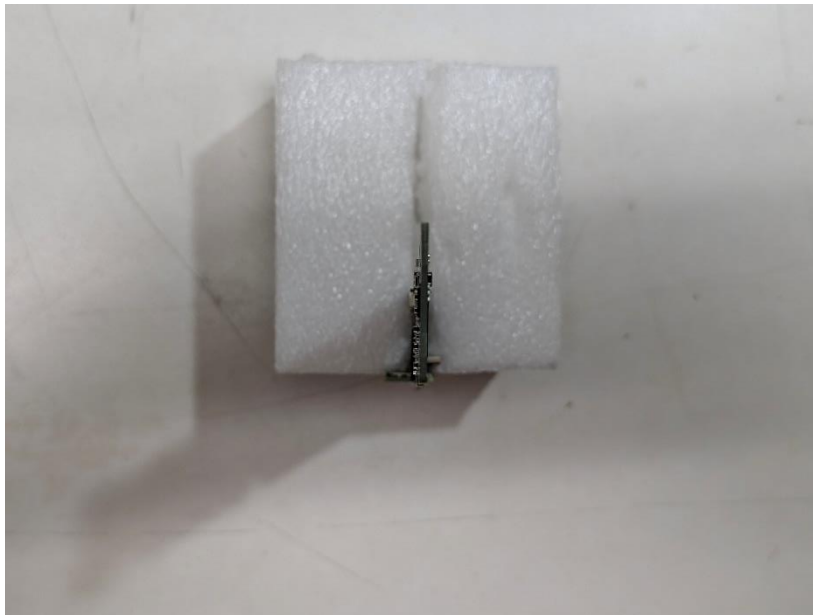
Photograph 41: Side 2 Edge of PCB “Power Board”



Photograph 42: Front of PCB “Main Board”



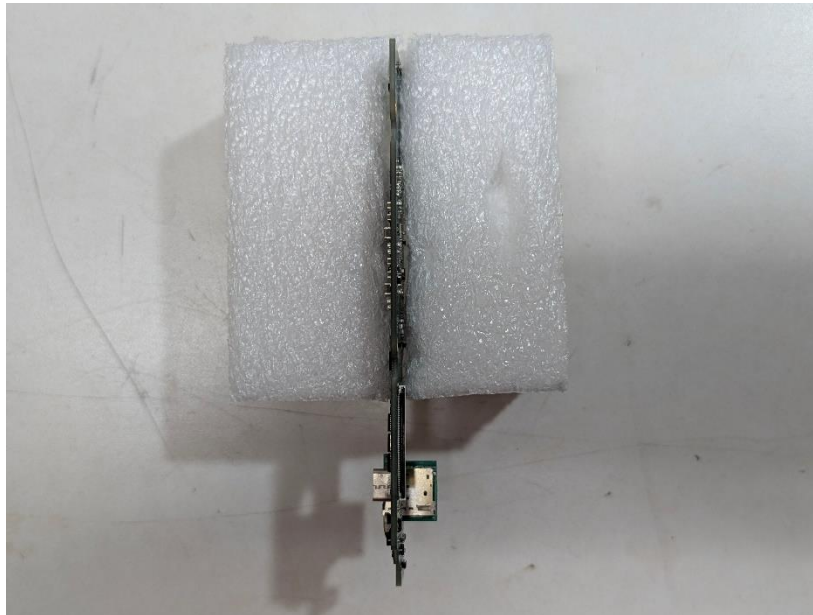
Photograph 43: Back of PCB "Main Board"



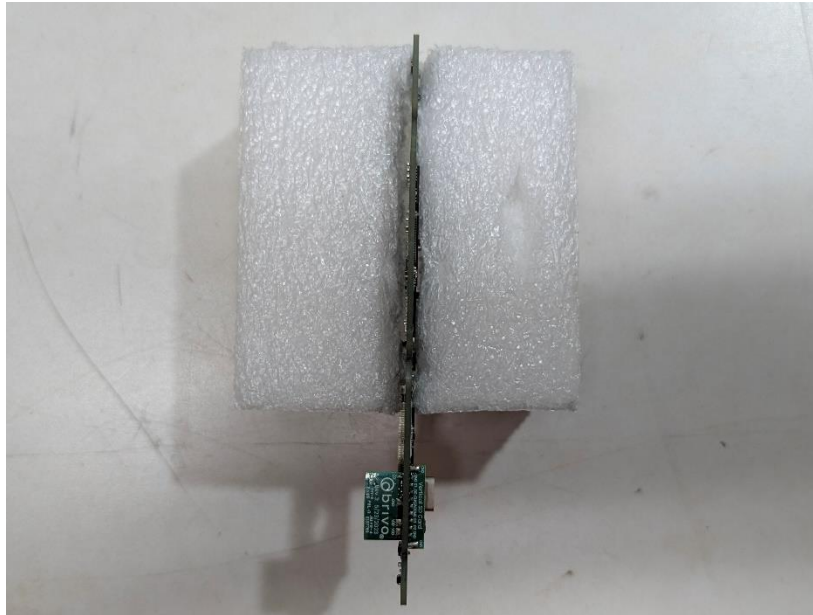
Photograph 44: Top Edge of PCB "Main Board"



Photograph 45: Bottom Edge of PCB “Main Board”



Photograph 46: Side 1 Edge of PCB “Main Board”



Photograph 47: Side 2 Edge of PCB “Main Board”

--- End of Report ---