Sargent Manufacturing Company

TEST REPORT

SCOPE OF WORK
Emissions Testing – Electronic access control system with RF Module, Model PC428D0089SA00CX

REPORT NUMBER
105838170BOX-001.125kHz.1

ISSUE DATE
December 16, 2024

[REVISED DATE]
June 23, 2025

DOCUMENT CONTROL NUMBER
Non-Specific Radio Report Shell Rev. October 2022

EMISSIONS TEST REPORT

(FULL COMPLIANCE)

Report Number: 105838170BOX-001.125kHz.1
Project Number: G105838170

Report Issue Date: December 16, 2024
Report Revision Date: June 23, 2025

Model(s) Tested: PC428D0089SA00CX
Model(s) Partially Tested: None
Model(s) Not Tested but declared equivalent by the client: None

Standards: CFR47 FCC Part 15 Subpart C, Section 15.209: 10/2024
CFR47 FCC Part 15 Subpart C, Section 15.205: 10/2024
CFR47 FCC Part 15 Subpart B, Section 15.109: 10/2024
RSS-210 Issue 11 June 25, 2024
ISED ICES-003 Issue 7 October 2020
RSS-Gen Issue 5 April 2018 +Amendment 1 March 2019

Host ID: FCC: U4A-MODBLE9163K
IC:6982A-MODBLE9163K

The product contains the following radio modules:
The Limited Module FCC ID containing all 4 radios:
OMNIKEY SE Reader Core Mini
FCC ID: JQ6-RCS5510
IC: 2236B- RCS5510

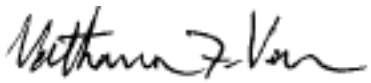
Tested by:
Intertek Testing Services NA, Inc.
70 Codman Hill Road
Boxborough, MA 01719
USA

Client:
Sargent Manufacturing Company
100 Sargent Drive
New Haven, CT 6511
USA

Report prepared by

Kouma Sinn / Senior Staff Engineer

Report reviewed by



Vathana Ven / Senior Staff Engineer

Table of Contents

1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

2 Test Summary

Section	Test full name	Result
3	Client Information	--
4	Description of Equipment Under Test and Variant Models	--
5	System Setup and Method	--
6	Fundamental Field Strength CFR47 FCC Part 15 Subpart C, Section 15.209: 10/2024 RSS-210 Issue 11 June 25, 2024	Pass
7	Occupied Bandwidth No limit, data for report purpose only	N/A
8	Transmitter spurious emissions CFR47 FCC Part 15 Subpart C, Section 15.209: 10/2024 CFR47 FCC Part 15 Subpart B 15.109: 10/2024 RSS-210 Issue 11 June 25, 2024 ISED ICES-003 Issue 7 October 2020	Pass
9	AC Mains Conducted Emissions FCC 47CFR Part 15.107: 10/2024 ISED ICES-003 Issue 7 October 2020	Pass
10	Revision History	--

Notes: The EUT is battery powered. The radio does not transmit simultaneously with other radio within the electronic access control system in normal operation.

3 Client Information

This EUT was tested at the request of:

Client: Sargent Manufacturing Company
100 Sargent Drive
New Haven, CT 6511
USA

Contact: Manuel Medeiros
Telephone: 1 862 221-6491
Email: manny.medeiros@assaabloy.com

4 Description of Equipment Under Test and Variant Models

Manufacturer: Sargent Manufacturing Company
100 Sargent Drive
New Haven, CT 6511
USA

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Electronic access control system with RF Module BLE (Metal Enclosure With Keypad)	Sargent Manufacturing Company	IN-BIKP	PC428D0089SA00CX
Electronic access control system with RF Module BLE (Plastic Enclosure With Keypad)	Sargent Manufacturing Company	IN-BIKP	PC428D0089SA00CX
Electronic access control system with RF Module BLE (Metal Enclosure Without Keypad)	Sargent Manufacturing Company	IN-BIKP	PC428D0089SA00CX
Electronic access control system with RF Module BLE (Plastic Enclosure Without Keypad)	Sargent Manufacturing Company	IN-BIKP	PC428D0089SA00CX

Receive Date:	10/24/2024
Received Condition:	Good
Type:	Production

Description of Equipment Under Test (provided by client)
Electronic access control system. It contains the radio modules as below. Host ID: FCC: U4A-MODBLE9163K IC:6982A-MODBLE9163K The product contains the following radio modules: The Limited Module FCC ID containing all 4 radios: OMNIKEY SE Reader Core Mini FCC ID: JQ6-RCS5510 IC: 2236B- RCS5510

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
9 V (6 x 1.5 V Batteries)	1.5 A	DC	N/A
POE Powered	N/A	DC	N/A

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	RFID – Programmed to transmit continuously with modulation at Low, Mid, and High channels

Software used by the EUT:

No.	Descriptions of EUT Exercising
1	None – Preprogrammed to transmit continuously with modulation

125 kHz RFID Radio/Receiver Characteristics	
Frequency Band(s)	125 kHz
Modulation Type(s)	ASK
Maximum Field Strength	65.06 dBuV/m
Test Channels	125 kHz
Occupied Bandwidth	0.416 kHz
Frequency Hopper: Number of Hopping Channels	N/A
Frequency Hopper: Channel Dwell Time	N/A
Frequency Hopper: Max interval between two instances of use of the same channel	N/A
MIMO Information (# of Transmit and Receive antenna ports)	N/A
Equipment Type	Limited Module
Antenna Type and Gain	Multi-loop Coil Antenna AWG #38 1dBi

Variant Models:

The following variant models were not tested as part of this evaluation, but have been identified by the manufacturer as being electrically identical models, depopulated models, or with reasonable similarity to the model(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

None

5 System Setup and Method

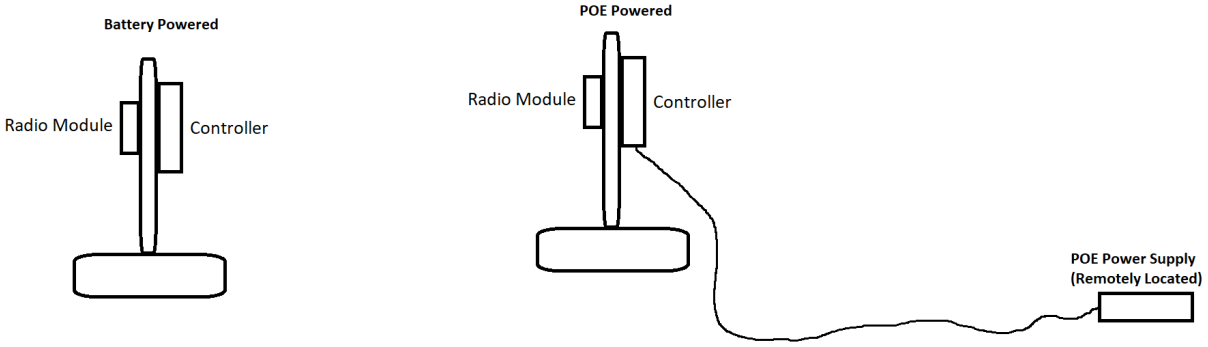
Cables					
ID	Description	Length	Shielding	Ferrites	Termination
--	POE	30 ft	N/A	N/A	Remotely Located POE Power Supply

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
Power Supply*	None	None	None
POE Power Supply	None	None	None

5.1 Method:

Configuration as required by ANSI C63.10-2013, RSS-Gen Issue 5 April 2018, and ANSI C63.4:2014.

5.2 EUT Block Diagram:



6 Fundamental Field Strength

6.1 Method

Tests are performed in accordance with ANSI C63.10 and RSS-Gen.

TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A Styrofoam table 80 cm high is used for table-top equipment.

6.2 Limits:

Limits – FCC Part §15.209 (a) The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	300

Notes: The limit for RSS-210 is the same as the FCC limits above.

6.3 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV007'	Weather Station Vantage Vue	Davis	6250	MS191212003	03/27/2024	03/27/2025
ROS014'	Receiver 1Hz-44GHz	Rhode & Schwarz	ESW 44	103232	06/10/2024	06/10/2025
145-420'	Receiver to floor cable	Utiflex	UFB311A-2-0591-70070	145-420	02/27/2024	02/27/2025
145-414'	Cable 145-414	Huber + Suhner	3m Track A cable	145-414	07/15/2024	07/15/2025
145-422'	10Amp Pre-amp to under floor	Utiflex	UFB311A-0-2756-70070	145-422	03/26/2024	03/26/2025
IW003'	8.4 meter cable	Insulated Wire	2800-NPS	003	01/17/2024	01/17/2025
ETS003'	9kHz-30MHz Active Loop Antenna	ETS Lindgren	6502	00143396	01/25/2024	01/25/2025
CBL053'	BNC cable 7.62 meters	MookEERF	RG58U	cbl053	11/20/2023	11/20/2024
145019'	Active Loop Antenna (9 KHz to 30 MHz)	EMCO	6502/1	9902-3267	03/05/2024	03/05/2025

Software Utilized:

Name	Manufacturer	Version
BAT-EMC	Nexio	2023.0.9.0

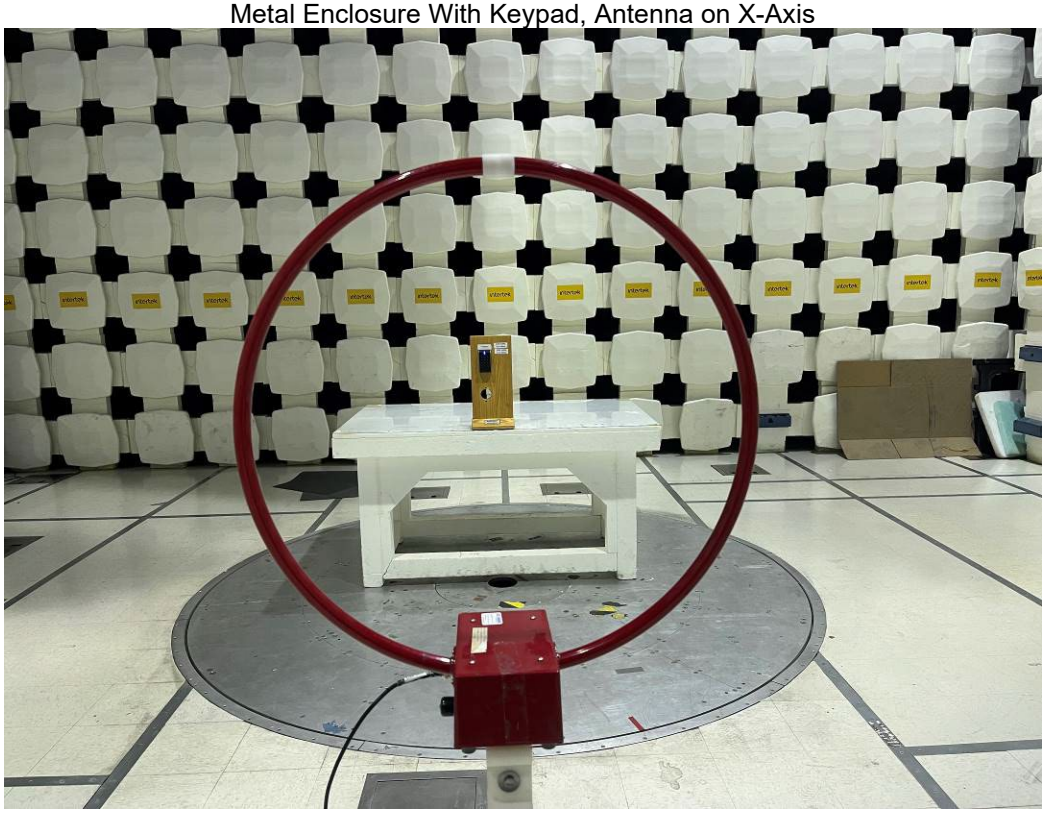
6.4 Results:

The sample tested was found to Comply.

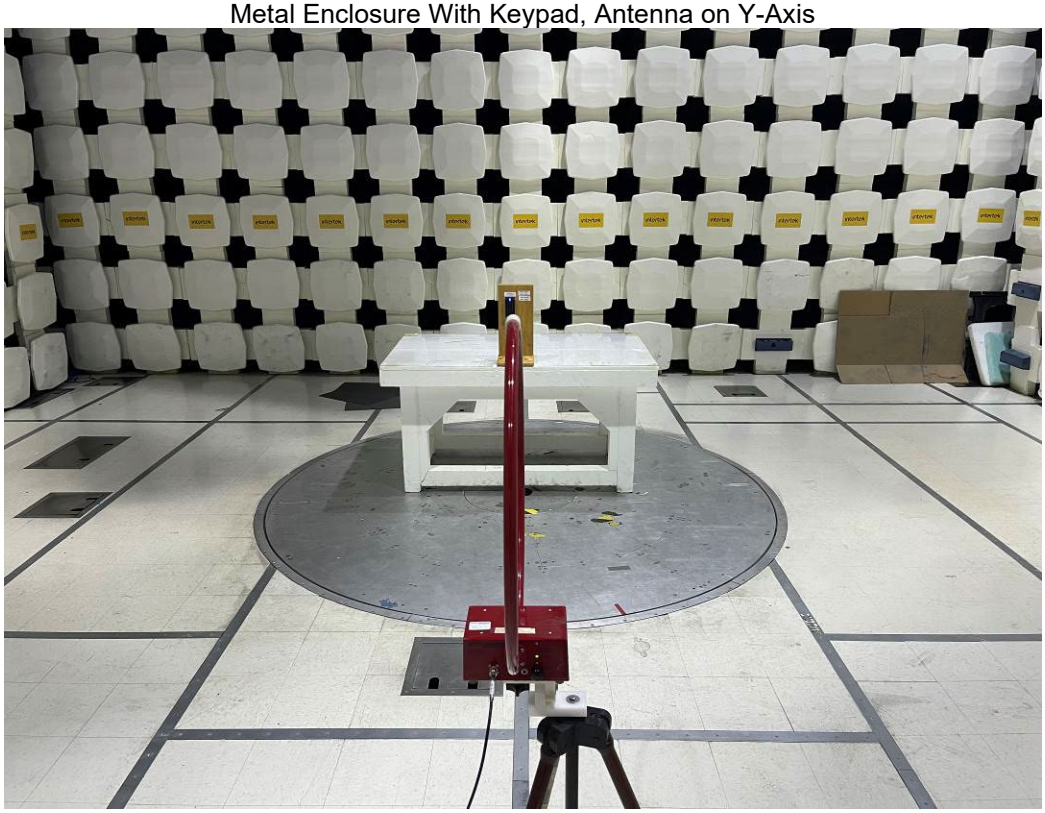
6.5 Setup Photographs:

===Battery Powered===

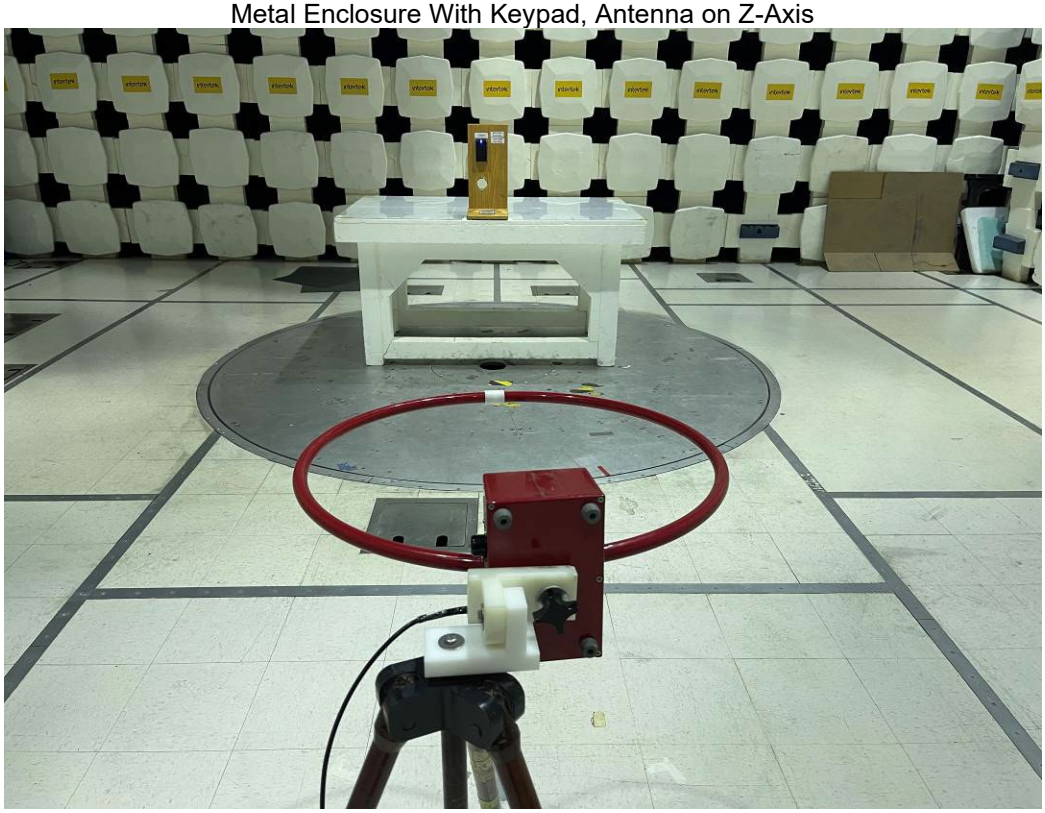
Metal Enclosure With Keypad, Antenna on X-Axis



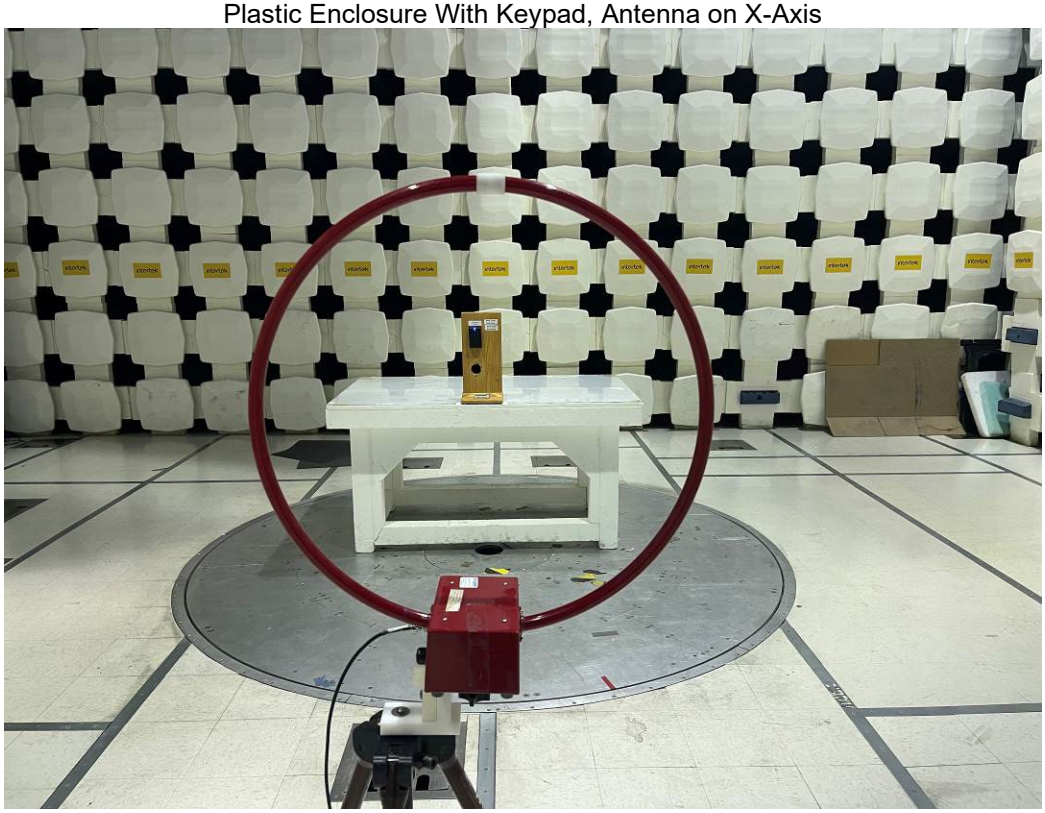
Metal Enclosure With Keypad, Antenna on Y-Axis



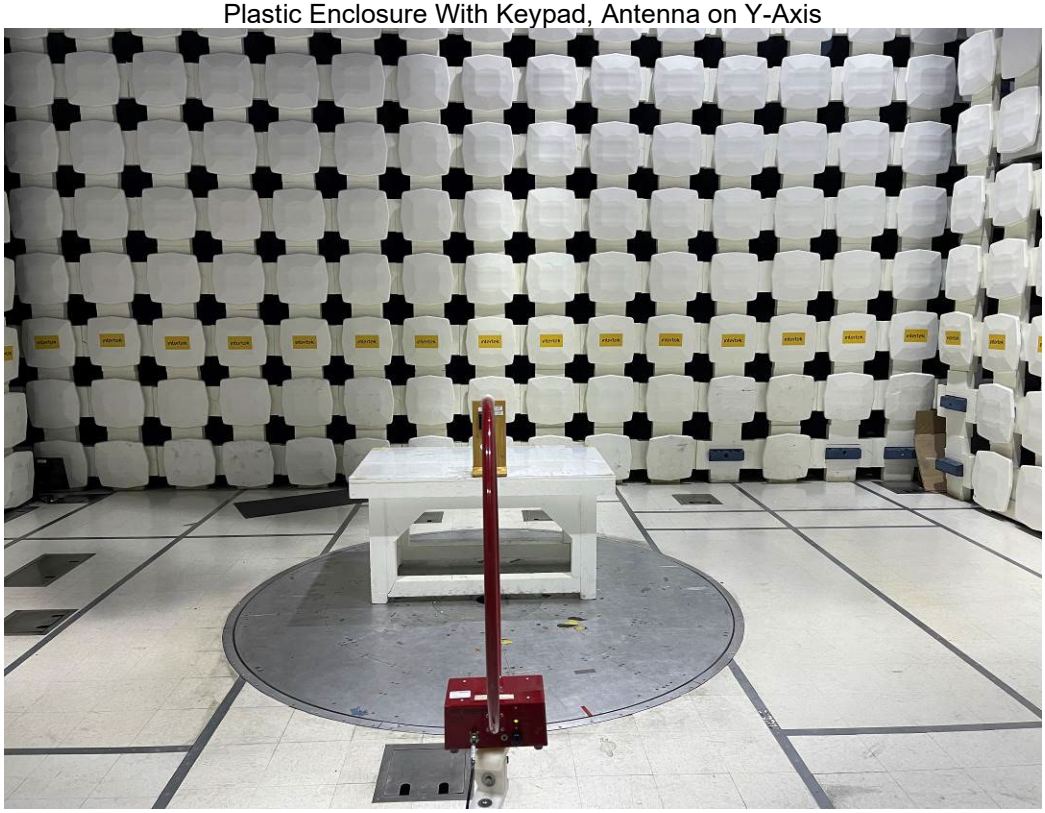
Metal Enclosure With Keypad, Antenna on Z-Axis



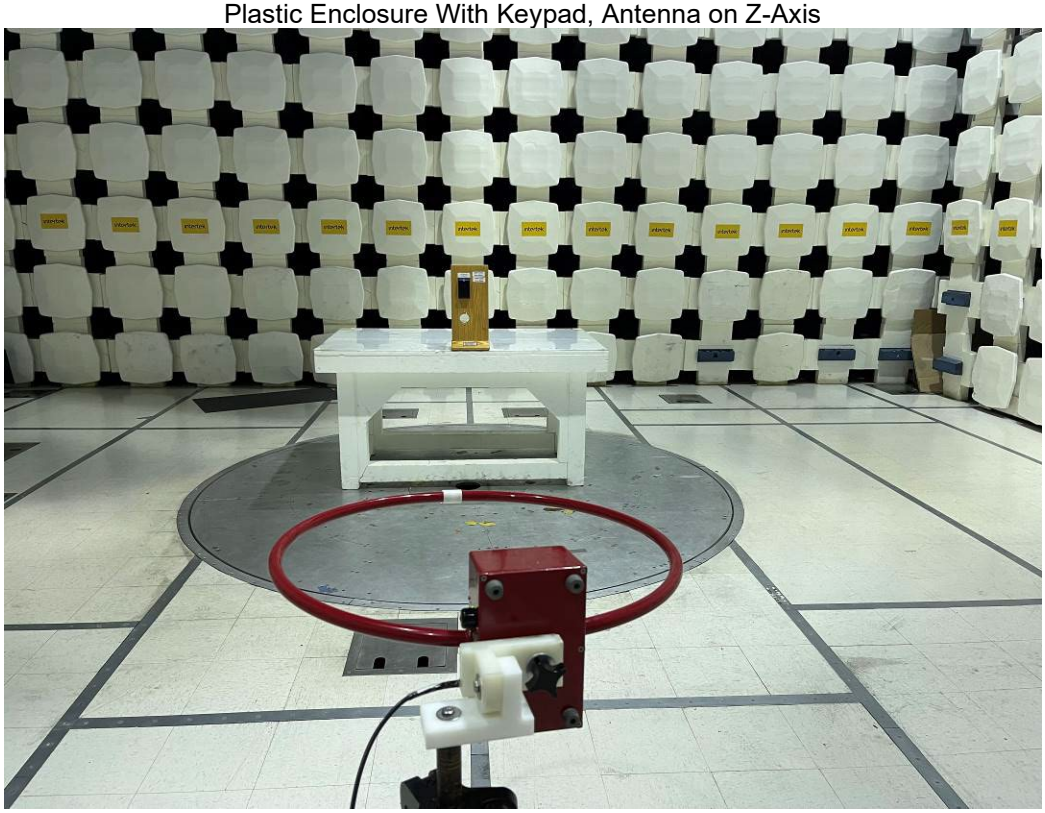
Plastic Enclosure With Keypad, Antenna on X-Axis



Plastic Enclosure With Keypad, Antenna on Y-Axis

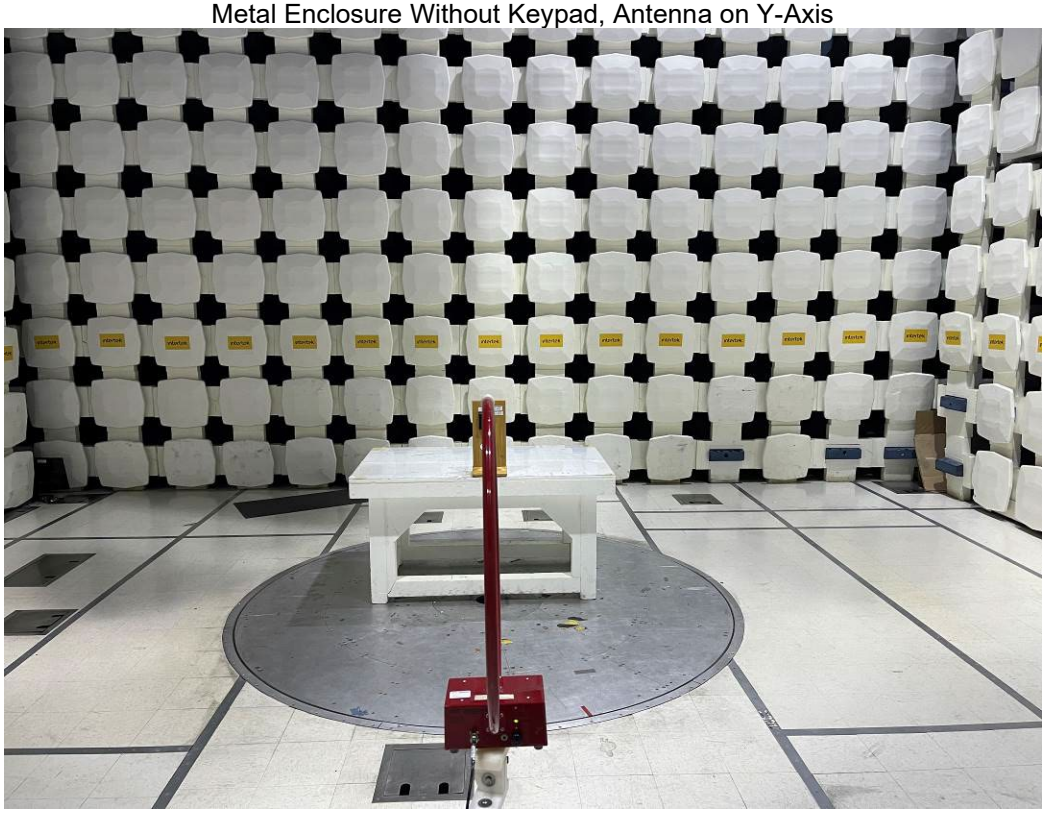


Plastic Enclosure With Keypad, Antenna on Z-Axis

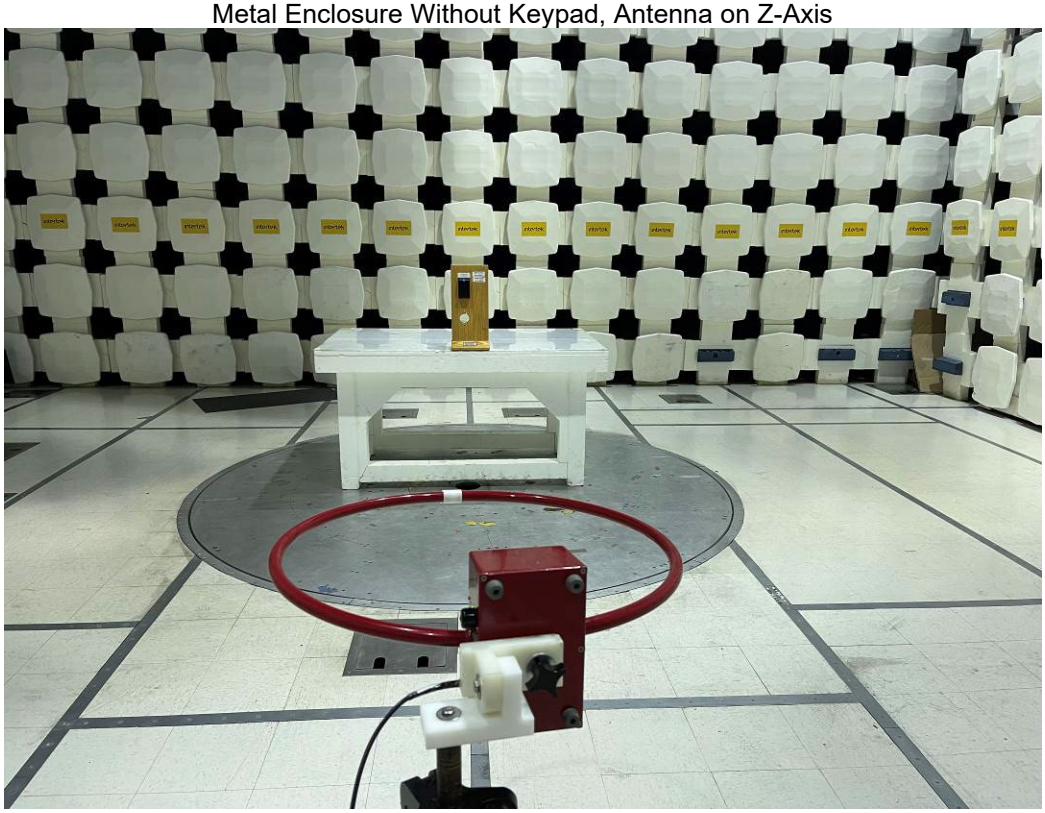


Metal Enclosure Without Keypad, Antenna on X-Axis

Metal Enclosure Without Keypad, Antenna on Y-Axis

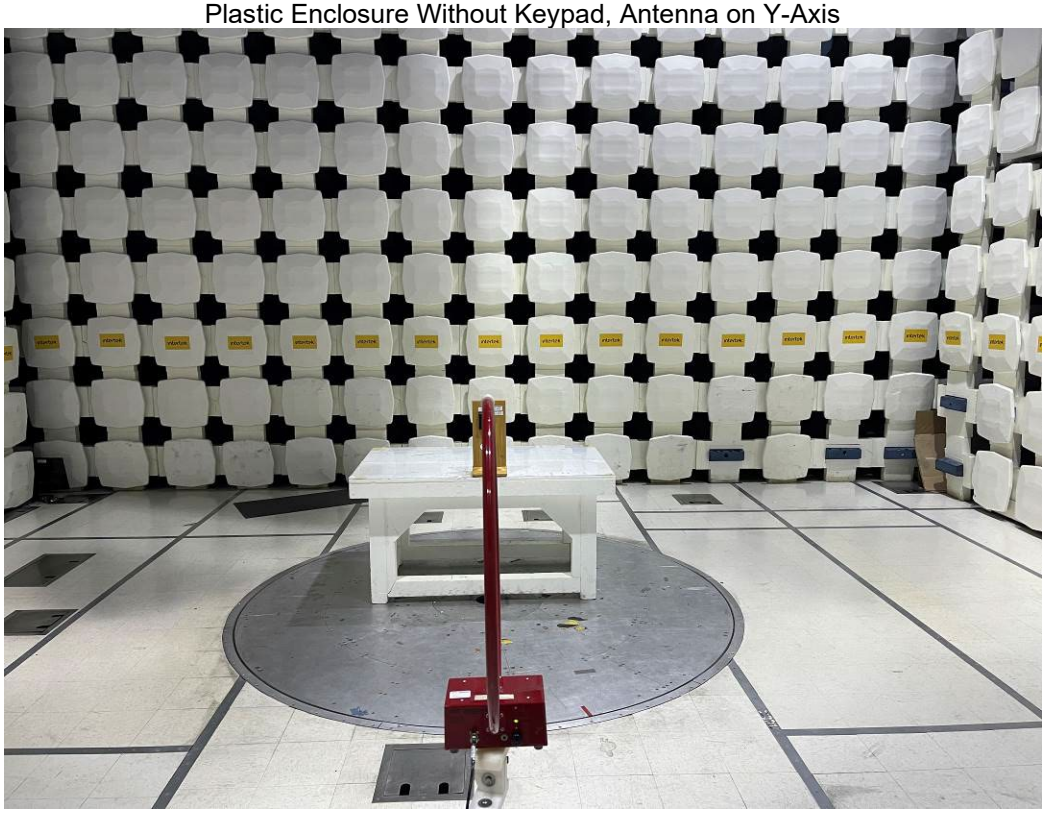


Metal Enclosure Without Keypad, Antenna on Z-Axis

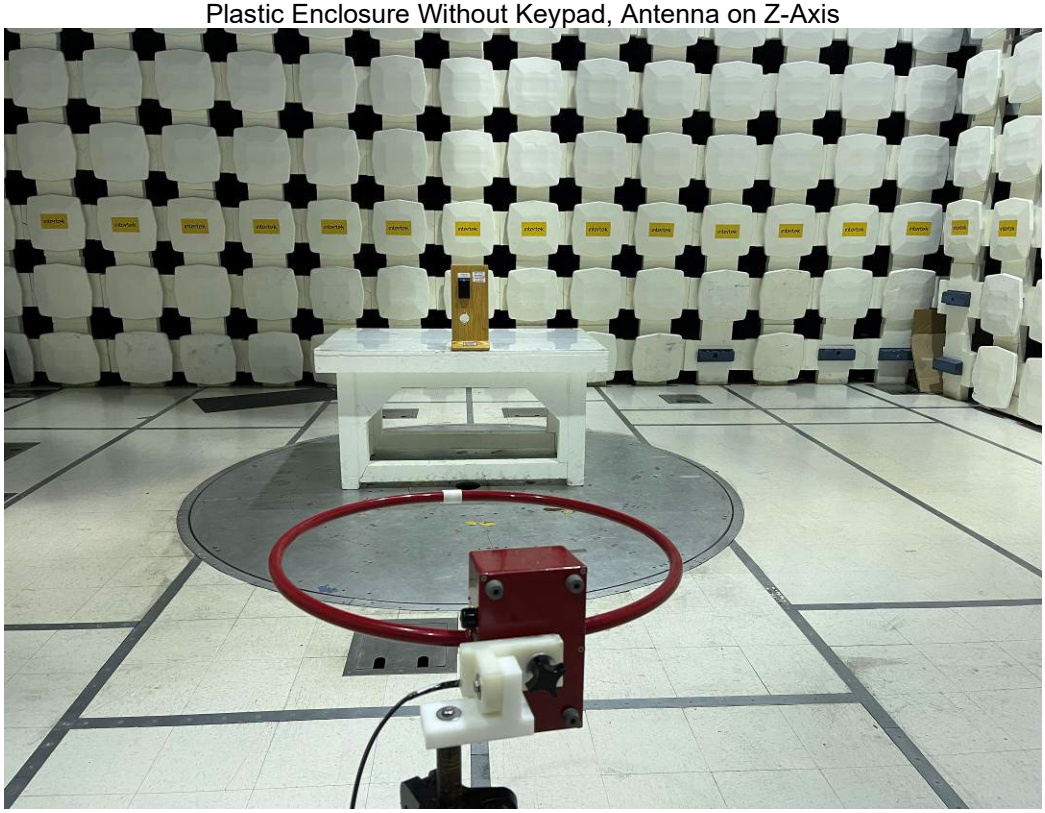


Plastic Enclosure Without Keypad, Antenna on X-Axis

Plastic Enclosure Without Keypad, Antenna on Y-Axis



Plastic Enclosure Without Keypad, Antenna on Z-Axis

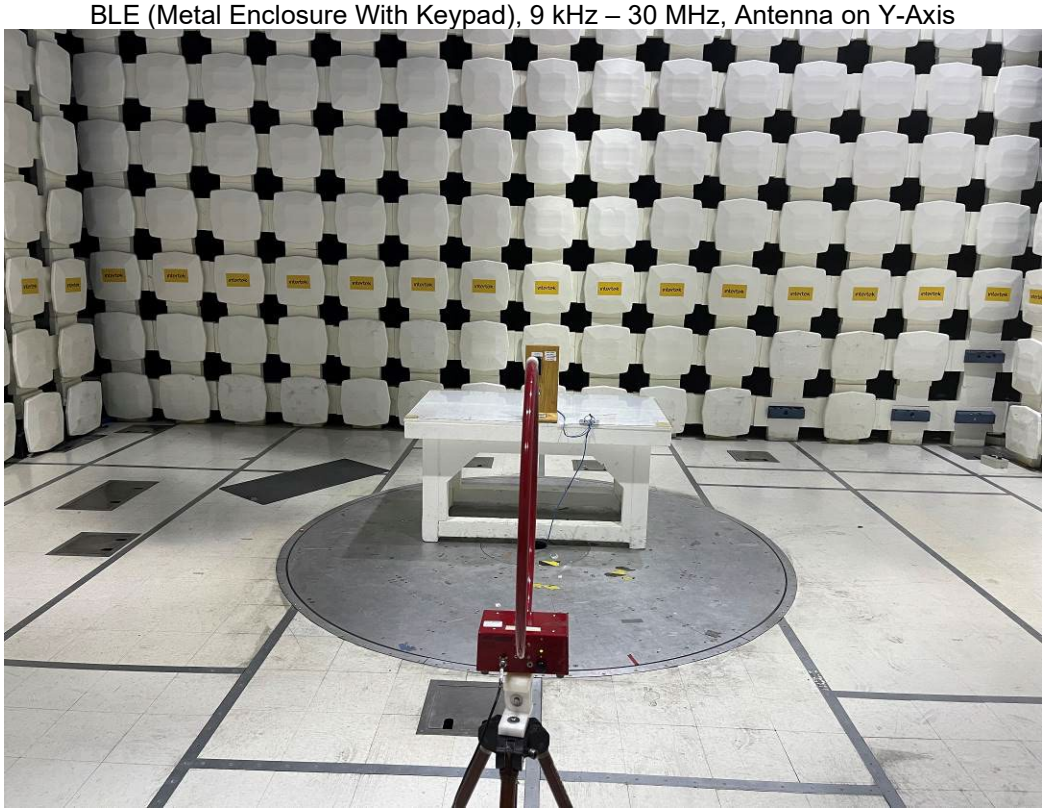


===POE Powered===

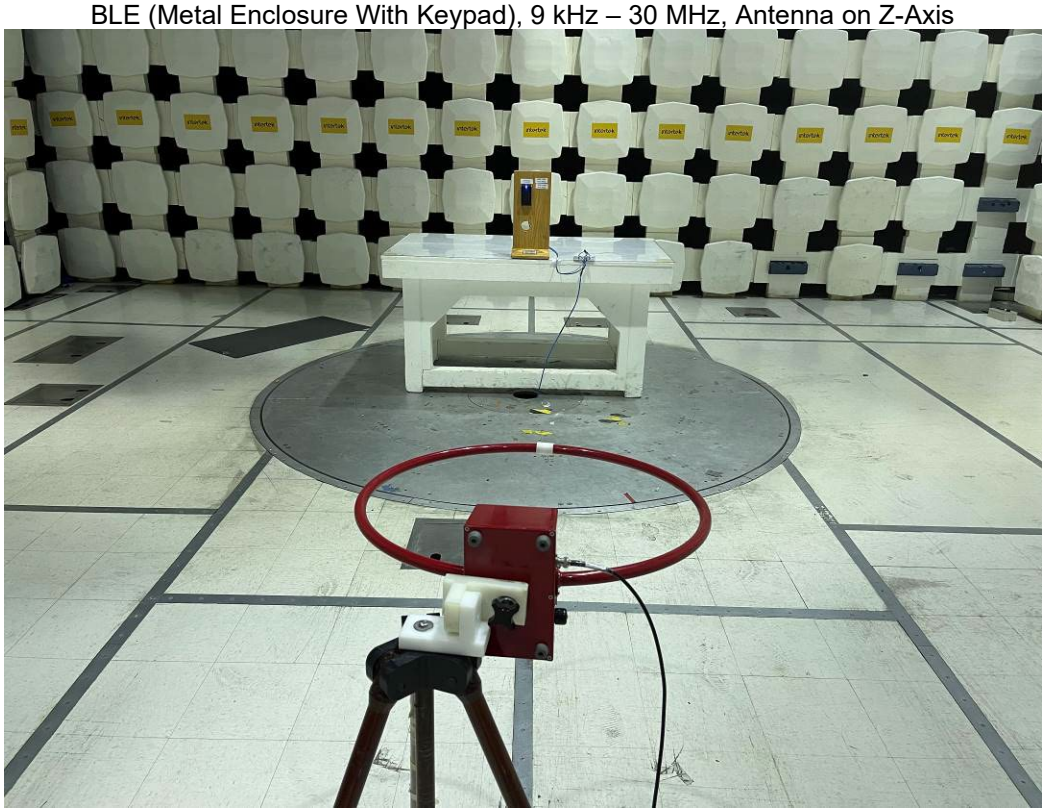
BLE (Metal Enclosure With Keypad), 9 kHz – 30 MHz, Antenna on X-Axis

Photo was not taken

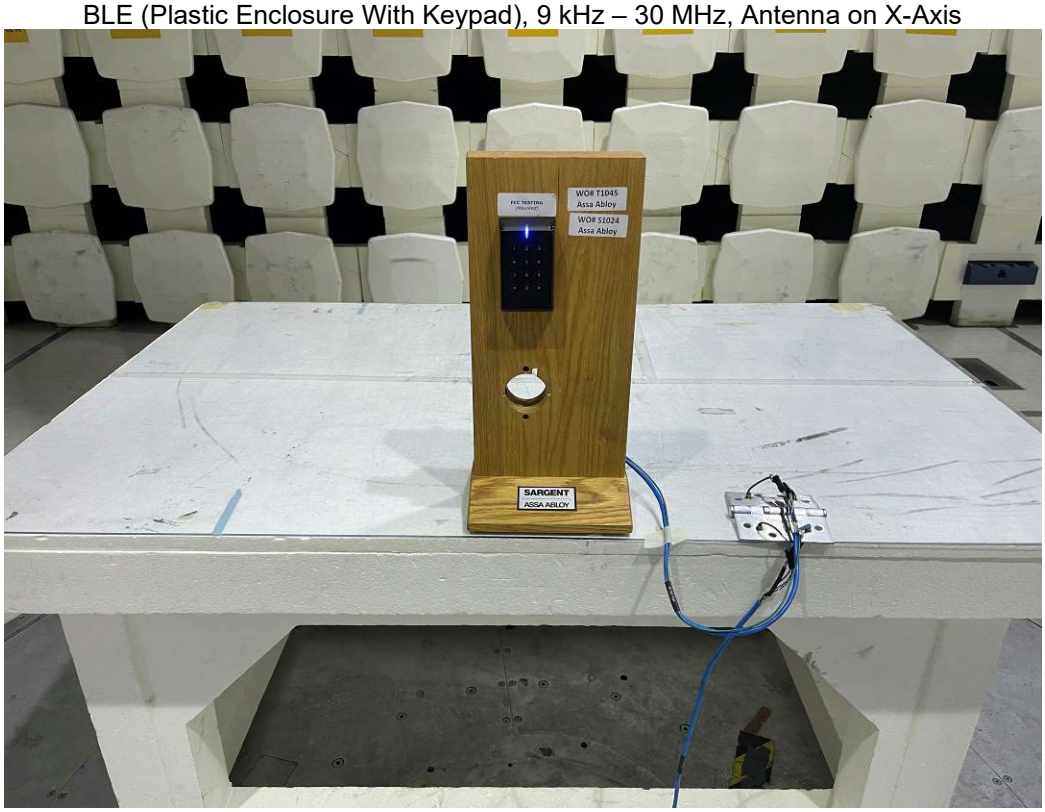
BLE (Metal Enclosure With Keypad), 9 kHz – 30 MHz, Antenna on Y-Axis

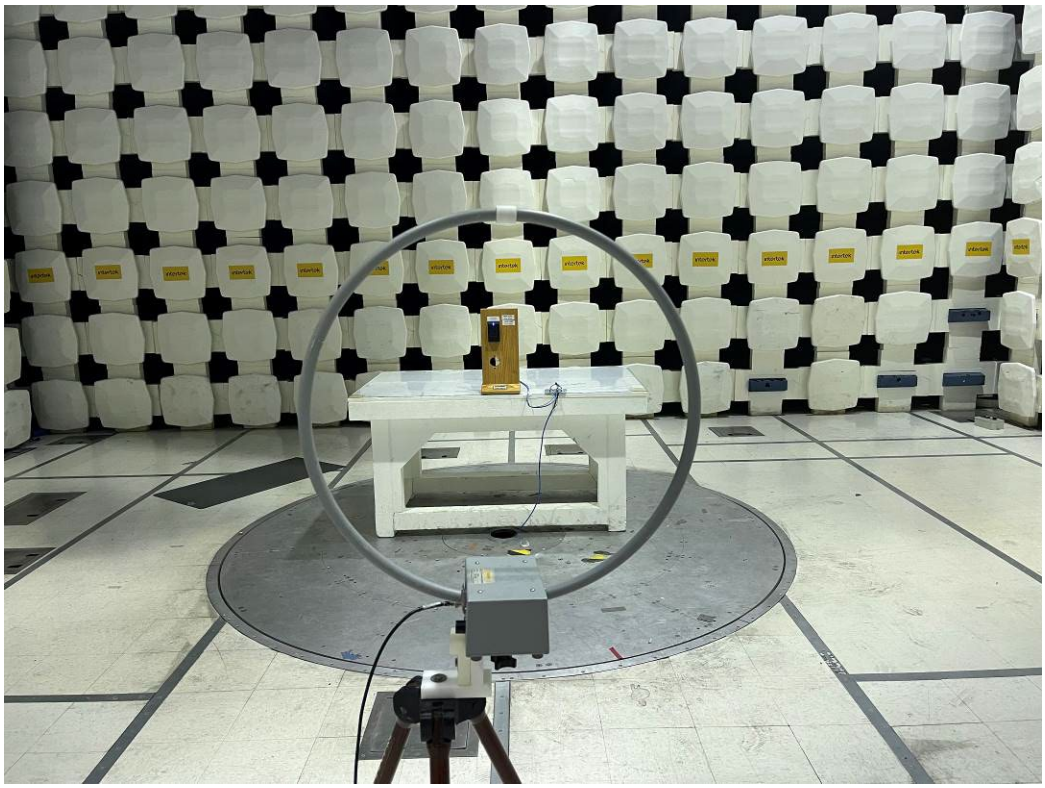


BLE (Metal Enclosure With Keypad), 9 kHz – 30 MHz, Antenna on Z-Axis

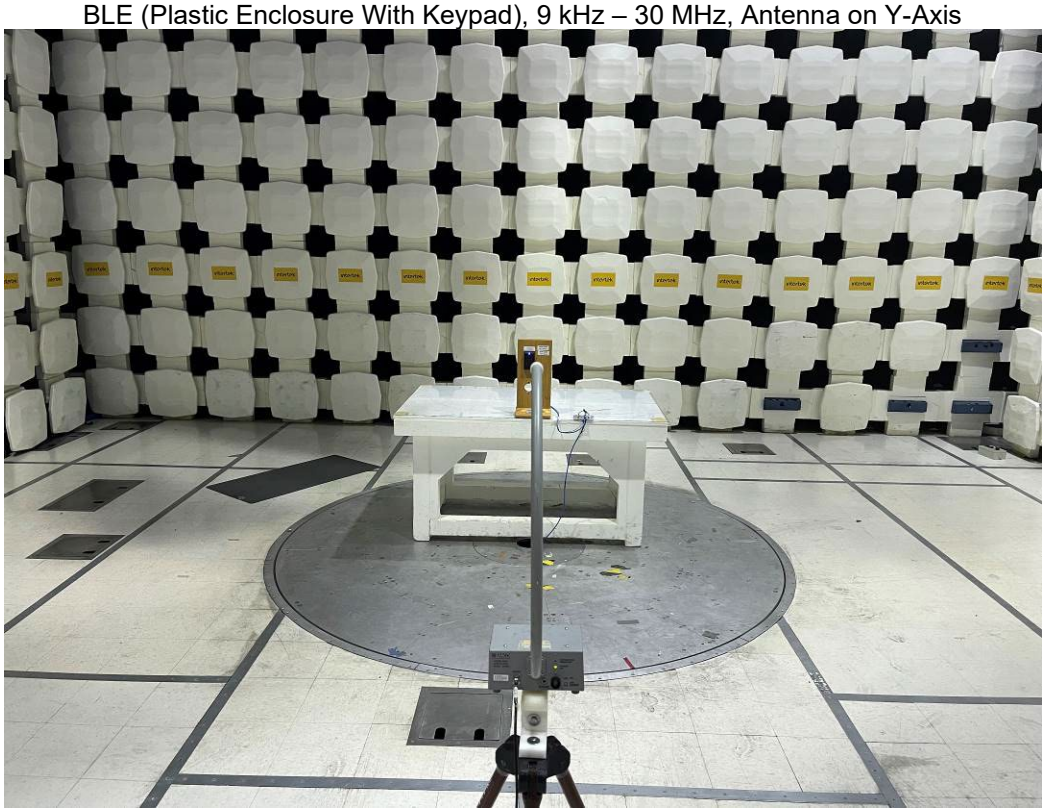


BLE (Plastic Enclosure With Keypad), 9 kHz – 30 MHz, Antenna on X-Axis

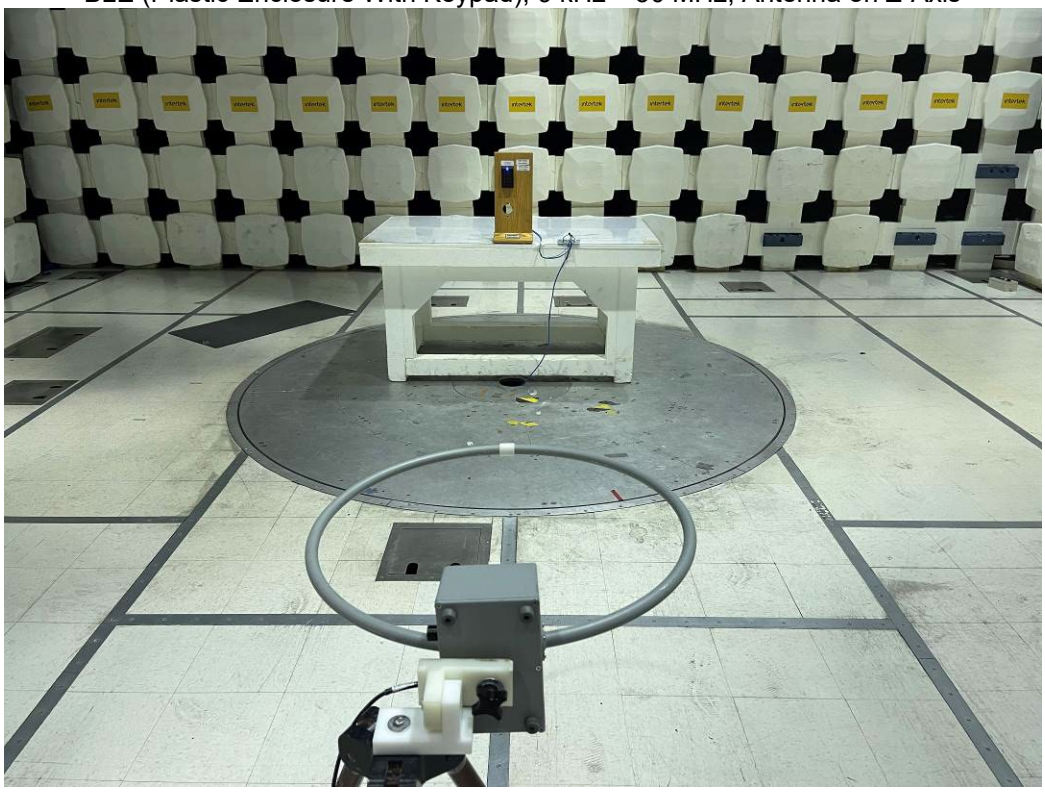




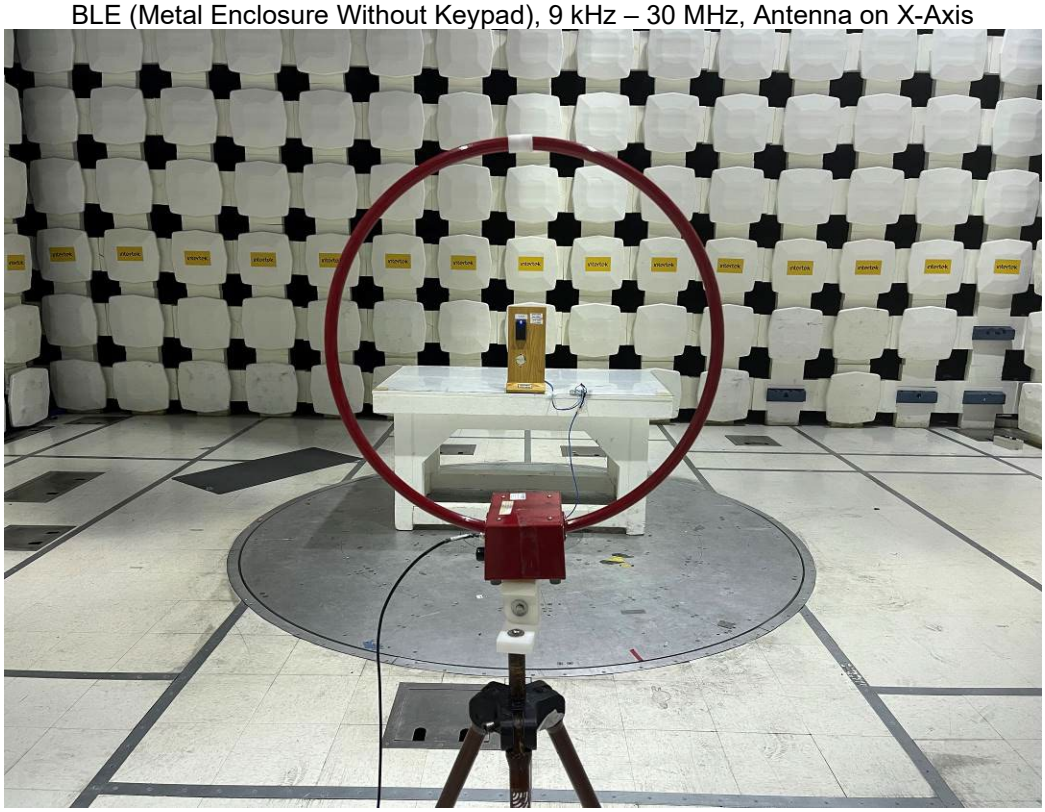
BLE (Plastic Enclosure With Keypad), 9 kHz – 30 MHz, Antenna on Y-Axis

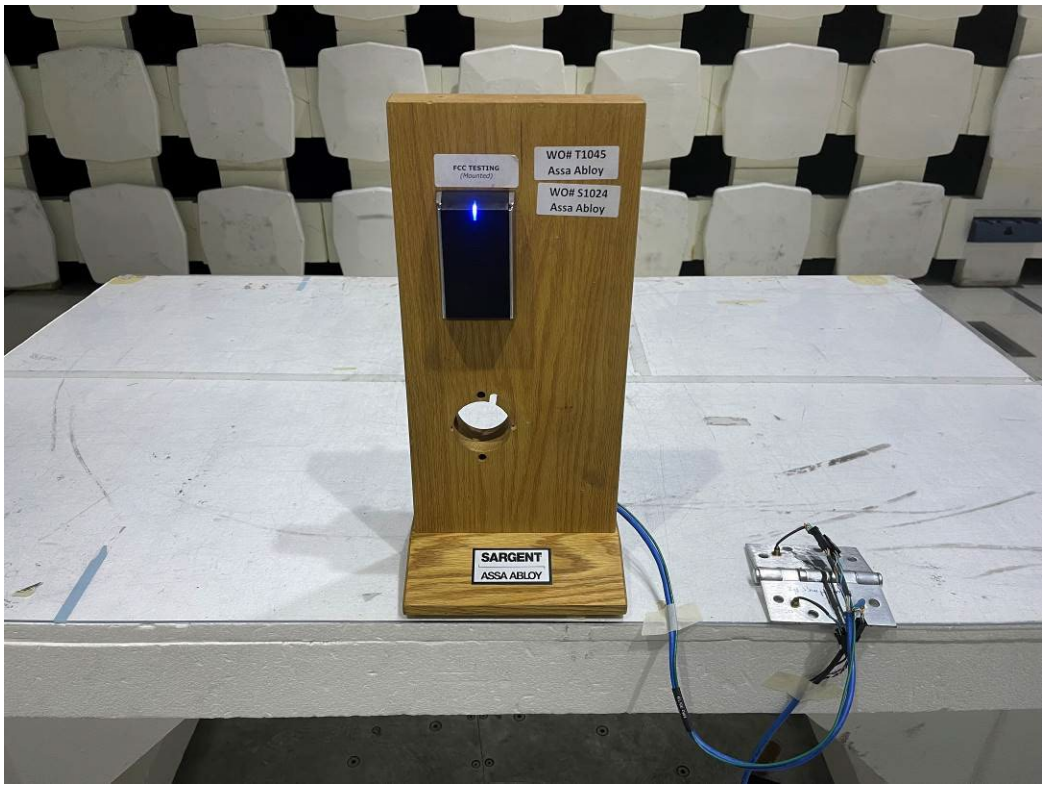


BLE (Plastic Enclosure With Keypad), 9 kHz – 30 MHz, Antenna on Z-Axis

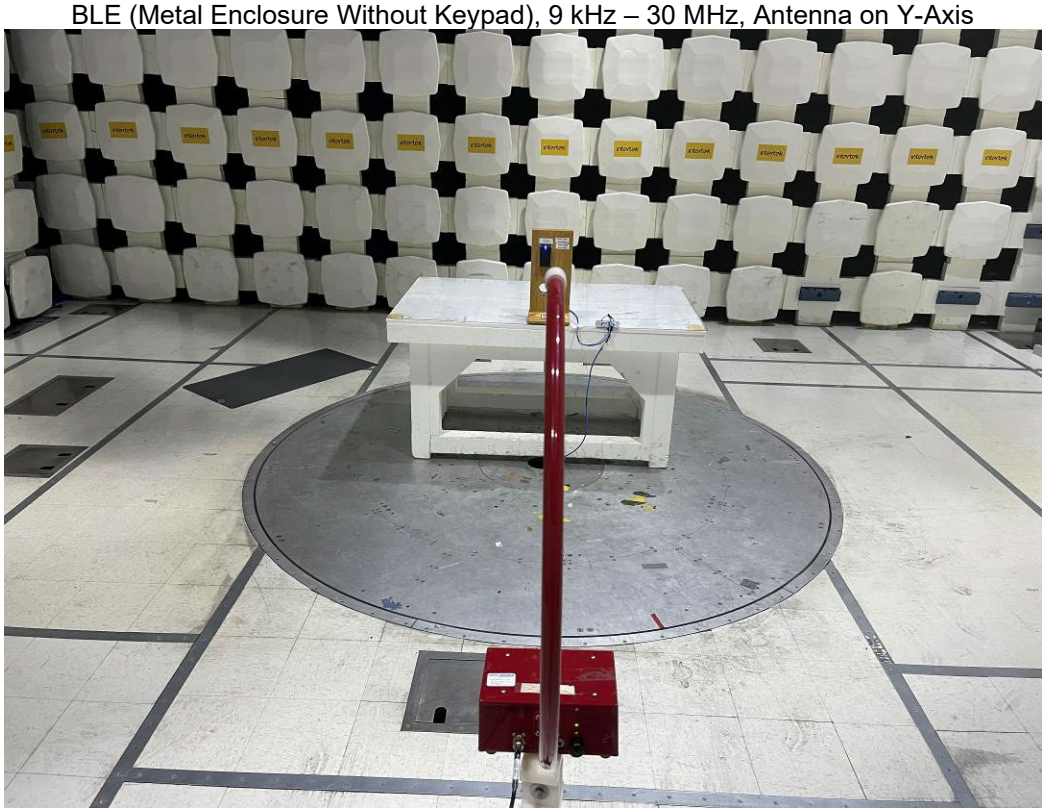


BLE (Metal Enclosure Without Keypad), 9 kHz – 30 MHz, Antenna on X-Axis

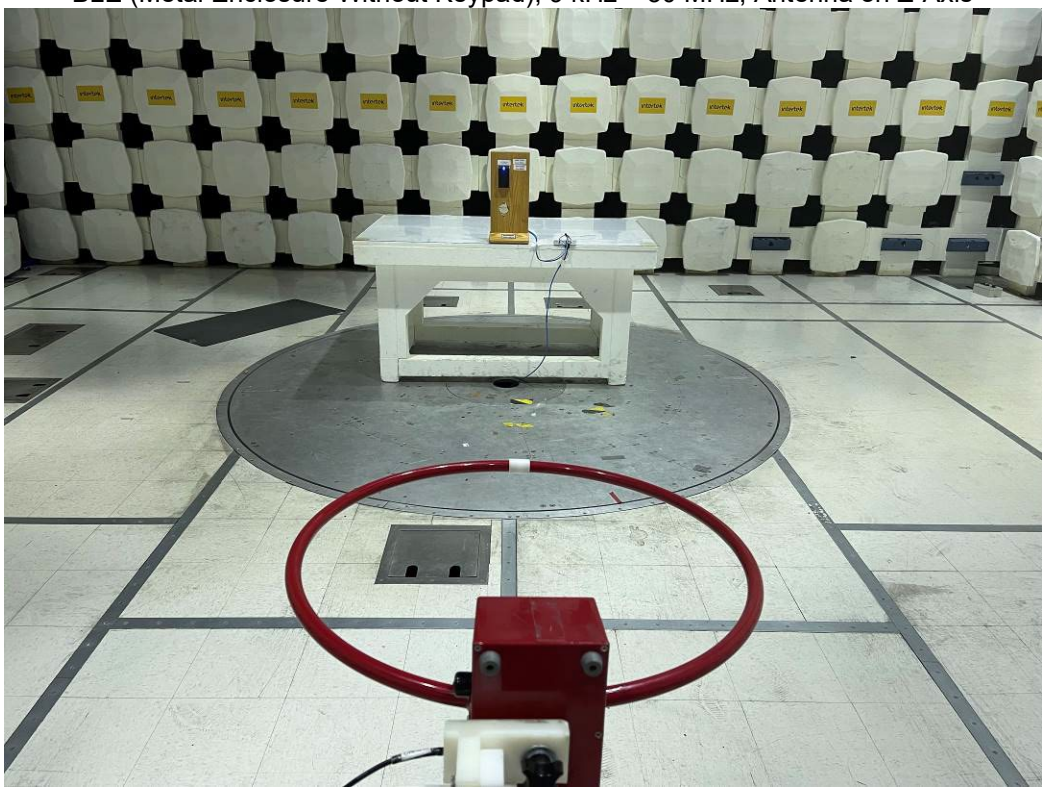




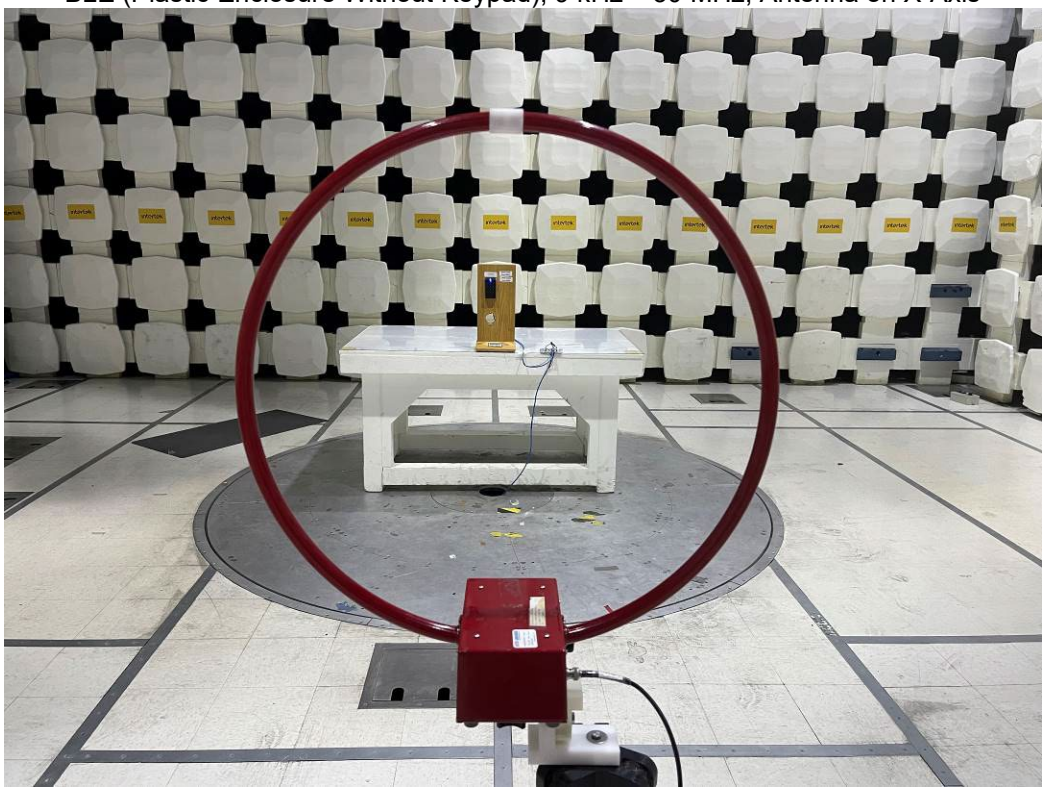
BLE (Metal Enclosure Without Keypad), 9 kHz – 30 MHz, Antenna on Y-Axis



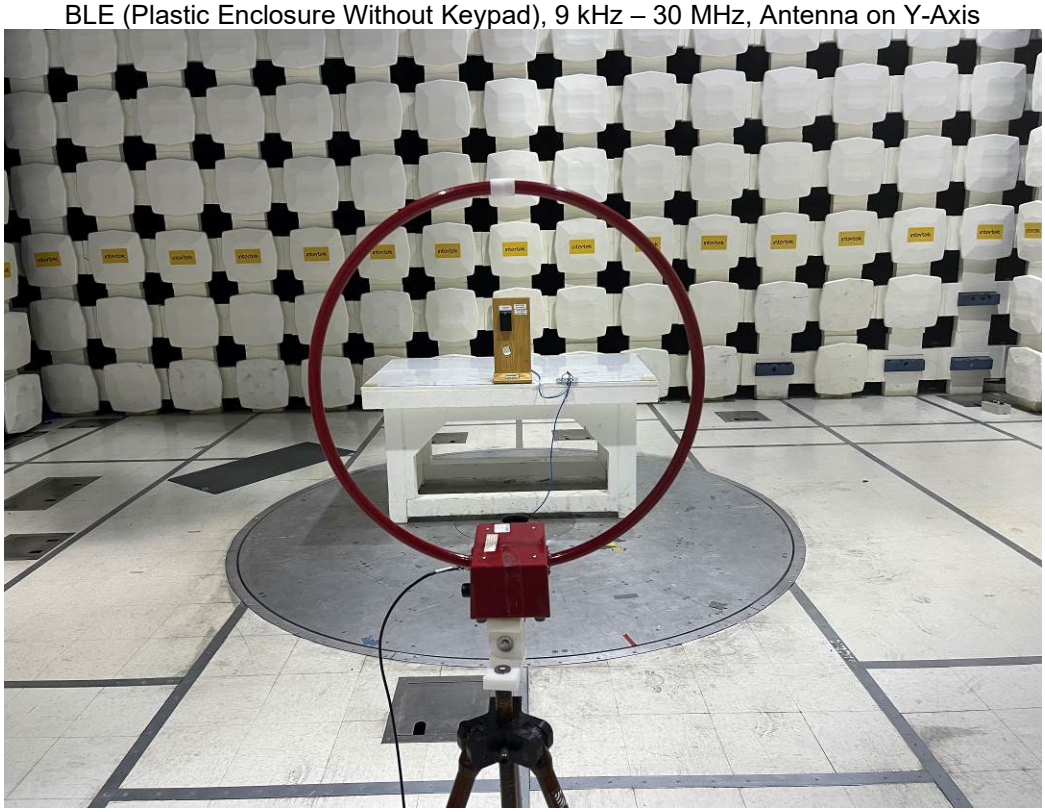
BLE (Metal Enclosure Without Keypad), 9 kHz – 30 MHz, Antenna on Z-Axis



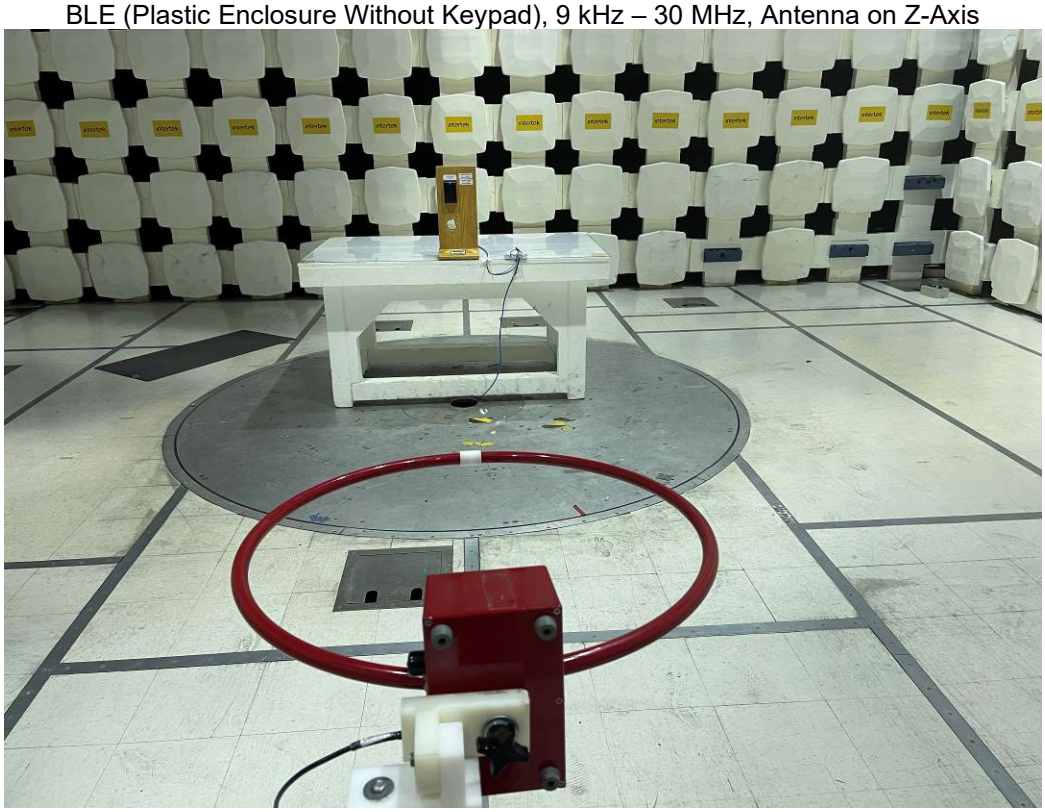
BLE (Plastic Enclosure Without Keypad), 9 kHz – 30 MHz, Antenna on X-Axis



BLE (Plastic Enclosure Without Keypad), 9 kHz – 30 MHz, Antenna on Y-Axis



BLE (Plastic Enclosure Without Keypad), 9 kHz – 30 MHz, Antenna on Z-Axis



6.6 Test Data:

125 kHz RFID Field Strength (Battery Powered)

EUT Configurations	Frequency (kHz)	Field Strength at 3 meters (dBuV/m)	Field Strength Limit at 3 meters (dBuV/m)	Results
Plastic Enclosure With Keypad	125	63.87	105.67	Compliance
Metal Enclosure With Keypad	125	64.29	105.67	Compliance
Plastic Enclosure Without Keypad	125	64.51	105.67	Compliance
Metal Enclosure Without Keypad	125	64.57	105.67	Compliance

Notes: The field strength was measured using Quasi-peak detector.

Limit = 2400/F(kHz) µV/m @ 300 meters (FCC Part 15.209)
= 2400/125 µV/m
= 19.20 µV/m
= 20*Log(19.202) dBµV/m
= 25.666 dBµV/m @ 300 meters
= 25.666 dBµV/m + 40*log(3/300) @ 3 meters
= 105.666 dBµV/m @ 3 meters base on average detector per FCC Part 15.209(d) for frequency range of 110-490 kHz

125 kHz RFID Field Strength (POE Powered)

EUT Configurations	Frequency (kHz)	Field Strength at 3 meters (dBuV/m)	Field Strength Limit at 3 meters (dBuV/m)	Results
Plastic Enclosure With Keypad	125	64.61	105.67	Compliance
Metal Enclosure With Keypad	125	64.43	105.67	Compliance
Plastic Enclosure Without Keypad	125	63.57	105.67	Compliance
Metal Enclosure Without Keypad	125	65.06	105.67	Compliance

Notes: The field strength was measured using Quasi-peak detector.

Limit = 2400/F(kHz) µV/m @ 300 meters (FCC Part 15.209)
= 2400/125 µV/m
= 19.20 µV/m
= 20*Log(19.202) dBµV/m
= 25.666 dBµV/m @ 300 meters
= 25.666 dBµV/m + 40*log(3/300) @ 3 meters
= 105.666 dBµV/m @ 3 meters base on average detector per FCC Part 15.209(d) for frequency range of 110-490 kHz

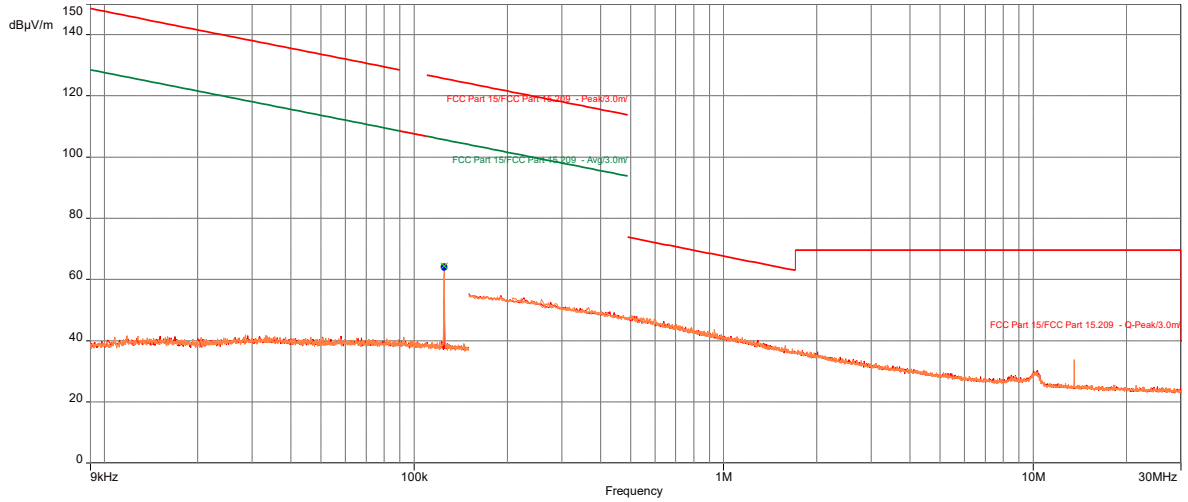
===Battery Powered===

125 kHz RFID (Plastic Enclosure, With Keypad), Field Strength at 3m, (X, Y, Z Polarities)

Test Information:

Date and Time	9/20/2024 12:47:48 PM
Client and Project Number	Sargent Assa Abloy
Engineer	Kouma Sinn
Temperature	24 deg C
Humidity	52 %
Atmospheric Pressure	1006 mbar
Comments	Scan 20_125kHz RFID With Modulation (Plastic Enclosure - With Keypad), RE 9kHz-30MHz Loop antenna, Electric Field, 3M Location (FCC 15.209)

Graph:



Results:

QuasiPeak (PASS) (1)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	RBW	Meas.Time(s)	Correction (dB)
0.1249925	63.87	105.67	-41.80	7.30	X-axis	200	0.10	11.04

Limit = 2400/F(kHz) µV/m @ 300 meters (FCC Part 15.209)
= 2400/124.9925 µV/m
= 19.201 µV/m
= 20*Log(19.201) dBµV/m
= 25.67 dBµV/m
= 25.67 dBµV/m + 40*log(3/300) @ 3 meters
= 105.67 dBµV/m @ 3 meters base on average detector per FCC Part 15.209(d) for frequency range of 110-490 kHz

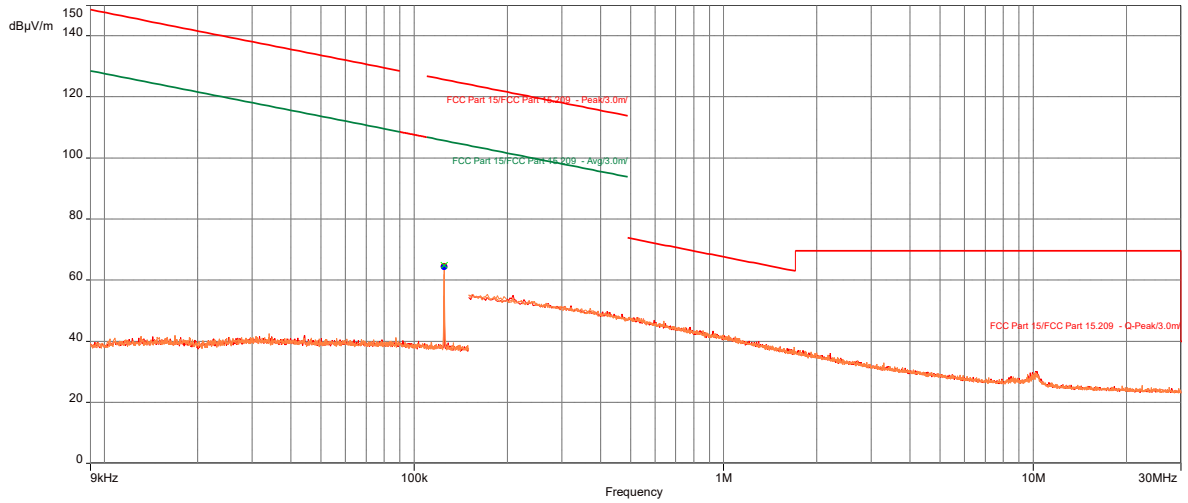
Please note that the QuasiPeak reading meets the average limit.

125 kHz RFID (Metal Enclosure, With Keypad), Field Strength at 3m, (X, Y, Z Polarities)

Test Information:

Date and Time	9/20/2024 11:13:42 AM
Client and Project Number	Sargent Assa Abloy
Engineer	Kouma Sinn
Temperature	24 deg C
Humidity	52 %
Atmospheric Pressure	1006 mbar
Comments	Scan 17_125kHz RFID With Modulation (Metal Enclosure - With Keypad), RE 9kHz-30MHz Loop antenna, Electric Field, 3M Location (FCC 15.209)

Graph:



Results:

QuasiPeak (PASS) (1)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (d)	Azimuth (°)	Pol.	RBW	Meas.Time(s)	Correction (dB)
0.124985	64.29	105.67	-41.38	0.00	X-axis	200	0.10	11.04

Limit = 2400/F(kHz) µV/m @ 300 meters (FCC Part 15.209)
= 2400/124.985 µV/m
= 19.202 µV/m
= 20*Log(19.202) dBµV/m
= 25.735 dBµV/m
= 25.67 dBµV/m + 40*log(3/300) @ 3 meters
= 105.67 dBµV/m @ 3 meters base on average detector per FCC Part 15.209(d) for frequency range of 110-490 kHz

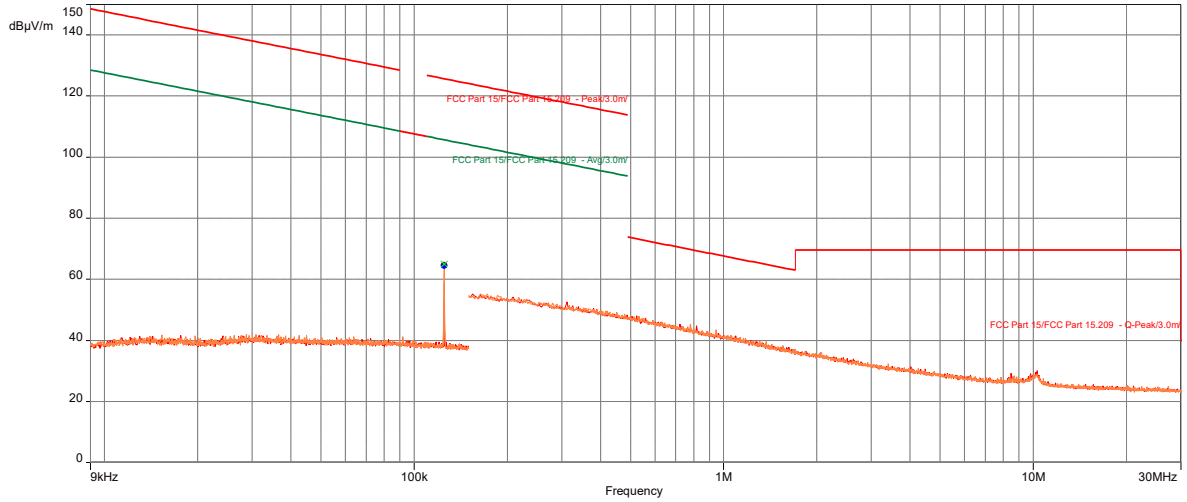
Please note that the QuasiPeak reading meets the average limit.

125 kHz RFID (Plastic Enclosure, Without Keypad), Field Strength at 3m, (X, Y, Z Polarities)

Test Information:

Date and Time	9/20/2024 9:16:51 AM
Client and Project Number	Sargent Assa Abloy
Engineer	Kouma Sinn
Temperature	24 deg C
Humidity	52 %
Atmospheric Pressure	1006 mbar
Comments	Scan 14_ 125 kHz RFID With Modulation (Plastic Enclosure - Without Keypad), RE 9kHz-30MHz Loop antenna, Electric Field, 3M Location (FCC 15.209)

Graph:



Results:

QuasiPeak (PASS) (1)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	RBW	Meas.Time(s)	Correction (dB)
0.1250075	64.51	105.74	-41.23	360.00	X-axis	200	0.10	11.04

Limit = 2400/F(kHz) µV/m @ 300 meters (FCC Part 15.209)
= 2400/125 µV/m
= 19.20 µV/m
= 20*Log(19.20) dBµV/m
= 25.67 dBµV/m
= 25.67 dBµV/m + 40*log(3/300) @ 3 meters
= 105.67 dBµV/m @ 3 meters base on average detector per FCC Part 15.209(d) for frequency range of 110-490 kHz

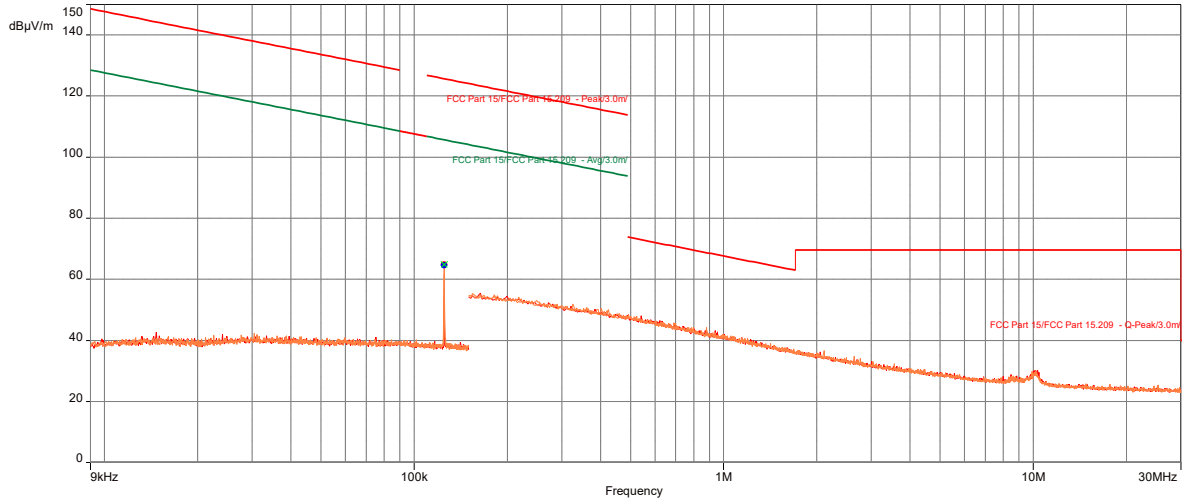
Please note that the QuasiPeak reading meets the average limit.

125 kHz RFID (Metal Enclosure, Without Keypad), Field Strength at 3m, (X, Y, Z Polarities)

Test Information:

Date and Time	9/20/2024 10:40:45 AM
Client and Project Number	Sargent Assa Abloy
Engineer	Kouma Sinn
Temperature	24 deg C
Humidity	52 %
Atmospheric Pressure	1006 mbar
Comments	Scan 16_ 125kHz RFID With Modulation (Metal Enclosure - Without Keypad), RE 9kHz-30MHz Loop antenna, Electric Field, 3M Location (FCC 15.209)

Graph:



Results:

QuasiPeak (PASS) (1)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	RBW	Meas.Time(s)	Correction (dB)
0.1249975	64.57	105.67	-41.10	0.00	X-axis	200	0.10	11.04

Limit = 2400/F(kHz) µV/m @ 300 meters (FCC Part 15.209)
= 2400/124.998 µV/m
= 19.200 µV/m
= 20*Log(19.200) dBµV/m
= 25.666 dBµV/m
= 25.666 dBµV/m + 40*log(3/300) @ 3 meters
= 105.666 dBµV/m @ 3 meters base on average detector per FCC Part 15.209(d) for frequency range of 110-490 kHz

Please note that the QuasiPeak reading meets the average limit.

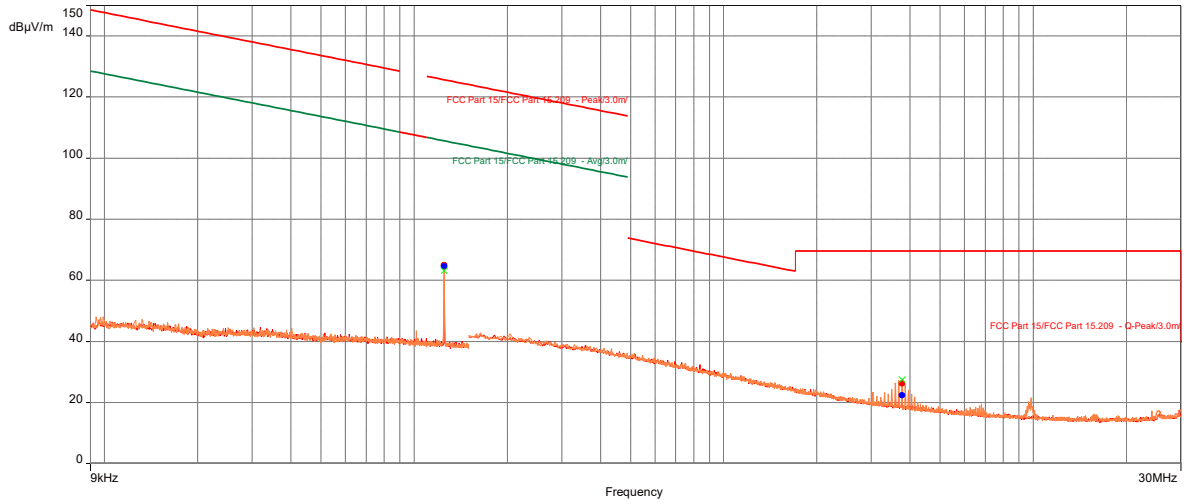
===POE Powered===

125 kHz RFID (Plastic Enclosure, With Keypad), Field Strength at 3m, (X, Y, Z Polarities)

Test Information:

Date and Time	11/18/2024 2:16:14 PM
Client and Project Number	Sargent Assa Abloy
Engineer	Kouma Sinn
Temperature	22 deg C
Humidity	22 %
Atmospheric Pressure	1000 mbars
Comments	Scan 55_RFID 125 kHz (Plastic With Keypad), POE Powered, RE 9 kHz-30 MHz, 3m

Graph:



Results:

QuasiPeak (PASS) (2)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	RBW	Meas.Time (s)	Correction (dB)
0.1250026	64.61	105.67	-40.86	7.20	Vertical	200	0.10	13.85

Limit = 2400/F(kHz) µV/m @ 300 meters (FCC Part 15.209)
= 2400/125 µV/m
= 19.20µV/m
= 20*Log(19.20) dBµV/m
= 25.67 dBµV/m
= 25.67 dBµV/m + 40*log(3/300) @ 3 meters
= 105.67 dBµV/m @ 3 meters base on average detector per FCC Part 15.209(d) for frequency range of 110-490 kHz

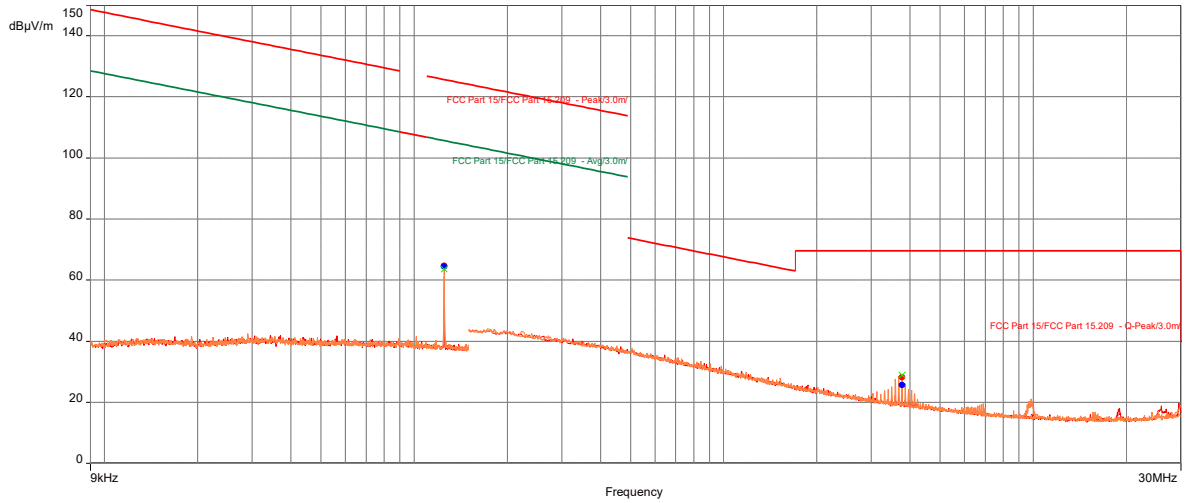
Please note that the QuasiPeak reading meets the average limit.

125 kHz RFID (Metal Enclosure, With Keypad), Field Strength at 3m, (X, Y, Z Polarities)

Test Information:

Date and Time	11/18/2024 12:26:55 PM
Client and Project Number	Sargent Assa Abloy
Engineer	Kouma Sinn
Temperature	22 deg C
Humidity	22 %
Atmospheric Pressure	1000 mbars
Comments	Scan 52_RFID 125 kHz, (Metal- With Keypad), POE Powered, RE 9 kHz-30 MHz, 3m

Graph:



Results:

QuasiPeak (PASS) (2)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	RBW	Meas.Time (s)	Correction (dB)
0.1250025	64.43	105.67	-41.24	360.00	Vertical	200	0.10	11.04

Limit = 2400/F(kHz) µV/m @ 300 meters (FCC Part 15.209)
= 2400/125 µV/m
= 19.20 µV/m
= 20*Log(19.20) dBµV/m
= 25.67 dBµV/m
= 25.67 dBµV/m + 40*log(3/300) @ 3 meters
= 105.67 dBµV/m @ 3 meters base on average detector per FCC Part 15.209(d) for frequency range of 110-490 kHz

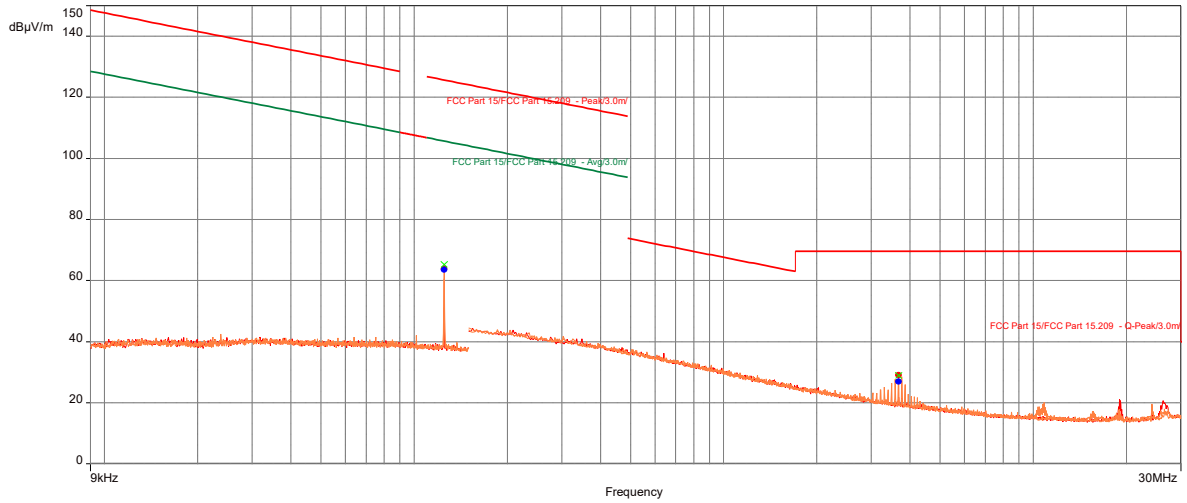
Please note that the QuasiPeak reading meets the average limit.

125 kHz RFID (Plastic Enclosure, Without Keypad), Field Strength at 3m, (X, Y, Z Polarities)

Test Information:

Date and Time	11/18/2024 10:31:47 AM
Client and Project Number	Sargent Assa Abloy
Engineer	Kouma Sinn
Temperature	22 deg C
Humidity	22 %
Atmospheric Pressure	1000 mbars
Comments	Scan 49_RFID 125 kHz (Plastic- No Keypad), POE Powered, RE 9 kHz-30 MHz, 3m

Graph:



Results:

QuasiPeak (PASS) (2)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	RBW	Meas.Time (s)	Correction (dB)
0.1250025	63.57	105.67	-42.10	7.20	Vertical	200	0.10	11.04

Limit = 2400/F(kHz) µV/m @ 300 meters (FCC Part 15.209)
= 2400/125 µV/m
= 19.20 µV/m
= 20*Log(19.20) dBµV/m
= 25.67 dBµV/m
= 25.67 dBµV/m + 40*log(3/300) @ 3 meters
= 105.67 dBµV/m @ 3 meters base on average detector per FCC Part 15.209(d) for frequency range of 110-490 kHz

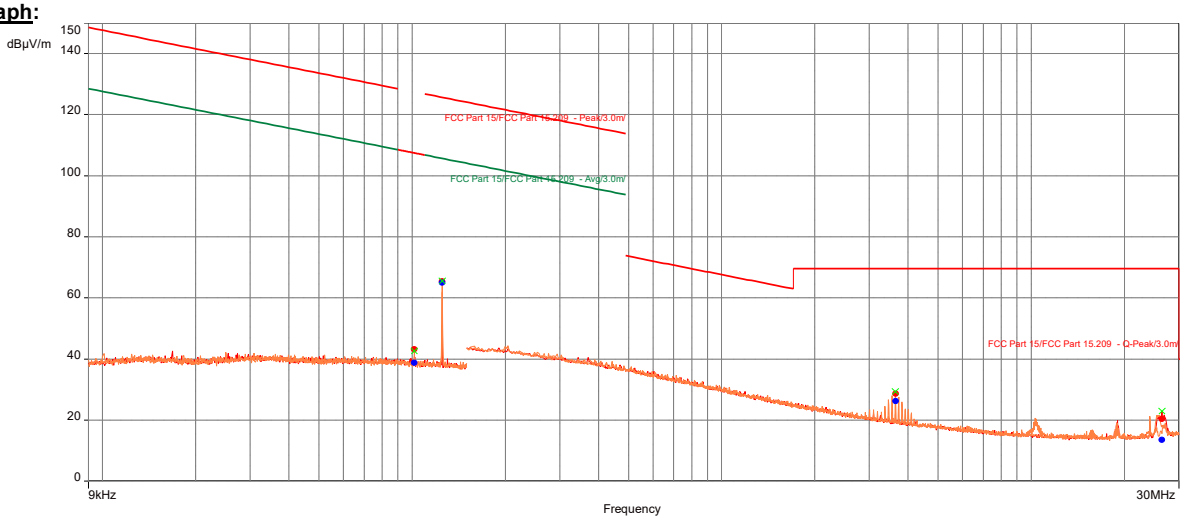
Please note that the QuasiPeak reading meets the average limit.

125 kHz RFID (Metal Enclosure, Without Keypad), Field Strength at 3m, (X, Y, Z Polarities)

Test Information:

Date and Time	11/18/2024 8:33:44 AM
Client and Project Number	Sargent Assa Abloy
Engineer	Kouma Sinn
Temperature	22 deg C
Humidity	22 %
Atmospheric Pressure	1000 mbars
Comments	Scan 46_RFID 125 kHz (Metal- No Keypad), POE Powered, RE 150 kHz-30 MHz, 3m

Graph:



Results:

QuasiPeak (PASS) (4)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	RBW	Meas.Time (s)	Correction (dB)
0.1250174	65.06	105.67	-40.61	0.00	X-axis	200	0.10	11.04

Limit = 2400/F(kHz) µV/m @ 300 meters (FCC Part 15.209)
= 2400/125 µV/m
= 19.20 µV/m
= 20*Log(19.20) dBµV/m
= 25.67 dBµV/m
= 25.67 dBµV/m + 40*log(3/300) @ 3 meters
= 105.67 dBµV/m @ 3 meters base on average detector per FCC Part 15.209(d) for frequency range of 110-490 kHz

Please note that the QuasiPeak reading meets the average limit.

Product Standard: FCC Part 15 15.209 and RSS-210				Limit applied: See Report Section 6.2			
Test Date	Test Personnel/ Initials	Supervising Engineer/ Initials	Input Voltage	Mode	Atmospheric Data		
					Temp C°	Relative Humidity %	Atmospheric Pressure mbar
09/20/2024	Kouma Sinn KPS	N/A	Battery Powered	Continuous Transmitting	24	52	1006
11/18/2024	Kouma Sinn KPS	N/A	Battery Powered	Continuous Transmitting	22	22	1000

Deviations, Additions, or Exclusions: None

7 Occupied Bandwidth

7.1 Method

Tests are performed in accordance with ANSI C63.10.

TEST SITE: EMC Lab

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

7.2 Limit

No limit, data for report purpose only.

7.3 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV007'	Weather Station Vantage Vue	Davis	6250	MS191212003	03/27/2024	03/27/2025
ROS014'	Receiver 1Hz-44GHz	Rhode & Schwarz	ESW 44	103232	06/10/2024	06/10/2025
145-420'	Receiver to floor cable	Utiflex	UFB311A-2-0591-70070	145-420	02/27/2024	02/27/2025
145-414'	Cable 145-414	Huber + Suhner	3m Track A cable	145-414	07/15/2024	07/15/2025
145-422'	10Amp Pre-amp to under floor	Utiflex	UFB311A-0-2756-70070	145-422	03/26/2024	03/26/2025
IW003'	8.4 meter cable	Insulated Wire	2800-NPS	003	01/17/2024	01/17/2025
ETS003'	9kHz-30MHz Active Loop Antenna	ETS Lindgren	6502	00143396	01/25/2024	01/25/2025
CBL053'	BNC cable 7.62 meters	MookEERF	RG58U	cbl053	11/20/2023	11/20/2024

Software Utilized:

Name	Manufacturer	Version
BAT-EMC	Nexio	2023.0.9.0

7.4 Results:

The sample tested was found to Comply.

7.5 Setup Photographs:

See Section 6.5

7.6 Test Data:

125 kHz RFID Occupied Bandwidth (Battery Powered)

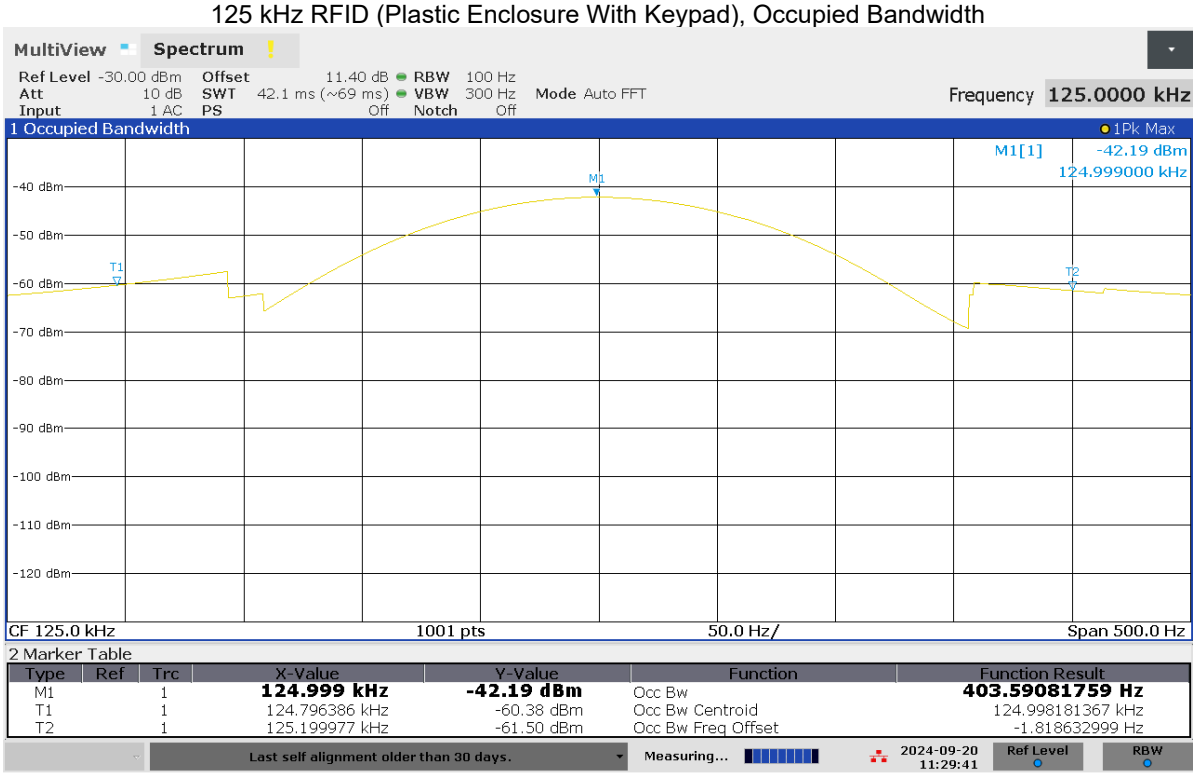
EUT Configurations	Frequency (kHz)	Occupied Bandwidth (kHz)	Occupied Bandwidth Limit (kHz)	Results
Plastic Enclosure With Keypad	125	0.403591	N/A	Compliance
Metal Enclosure With Keypad	125	0.411425	N/A	Compliance
Plastic Enclosure Without Keypad	125	0.416116	N/A	Compliance
Metal Enclosure Without Keypad	125	0.394875	N/A	Compliance

125 kHz RFID Occupied Bandwidth (POE Powered)

EUT Configurations	Frequency (kHz)	Occupied Bandwidth (kHz)	Occupied Bandwidth Limit (kHz)	Results
Plastic Enclosure With Keypad	125	0.152468	N/A	Compliance
Metal Enclosure With Keypad	125	0.152813	N/A	Compliance
Plastic Enclosure Without Keypad	125	0.134.966	N/A	Compliance
Metal Enclosure Without Keypad	125	0.146837	N/A	Compliance

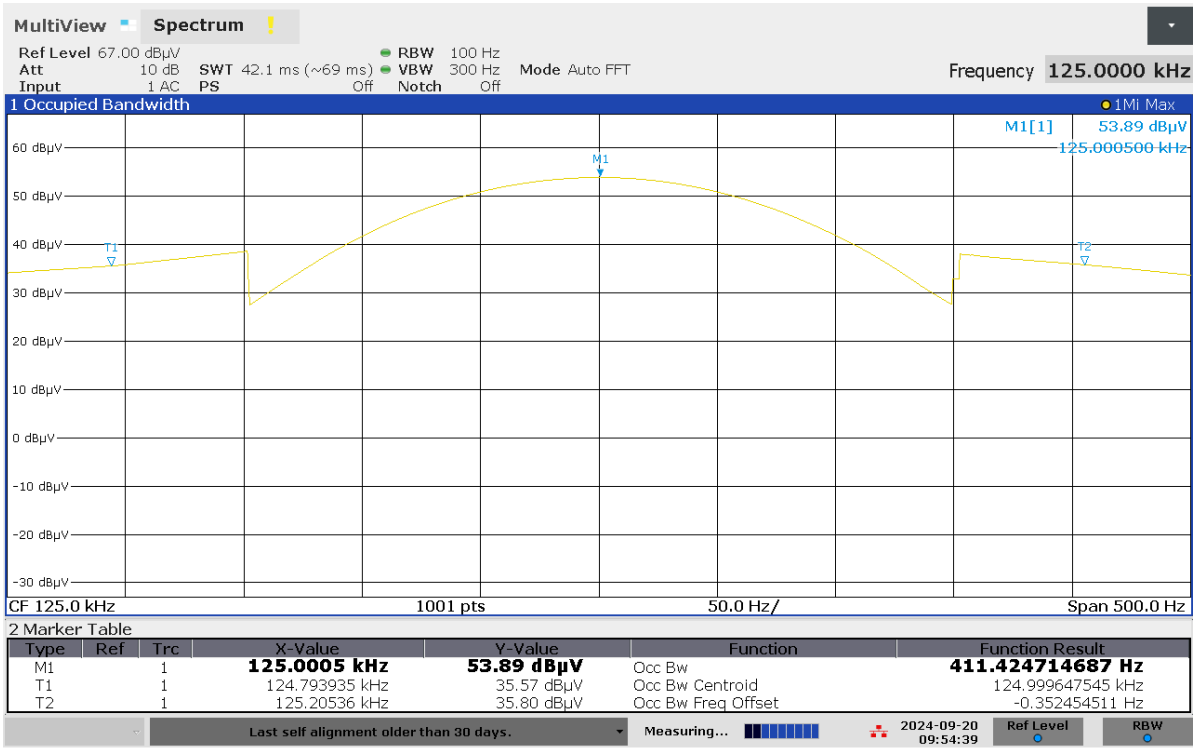
===Battery Powered====

125 kHz RFID (Plastic Enclosure With Keypad), Occupied Bandwidth



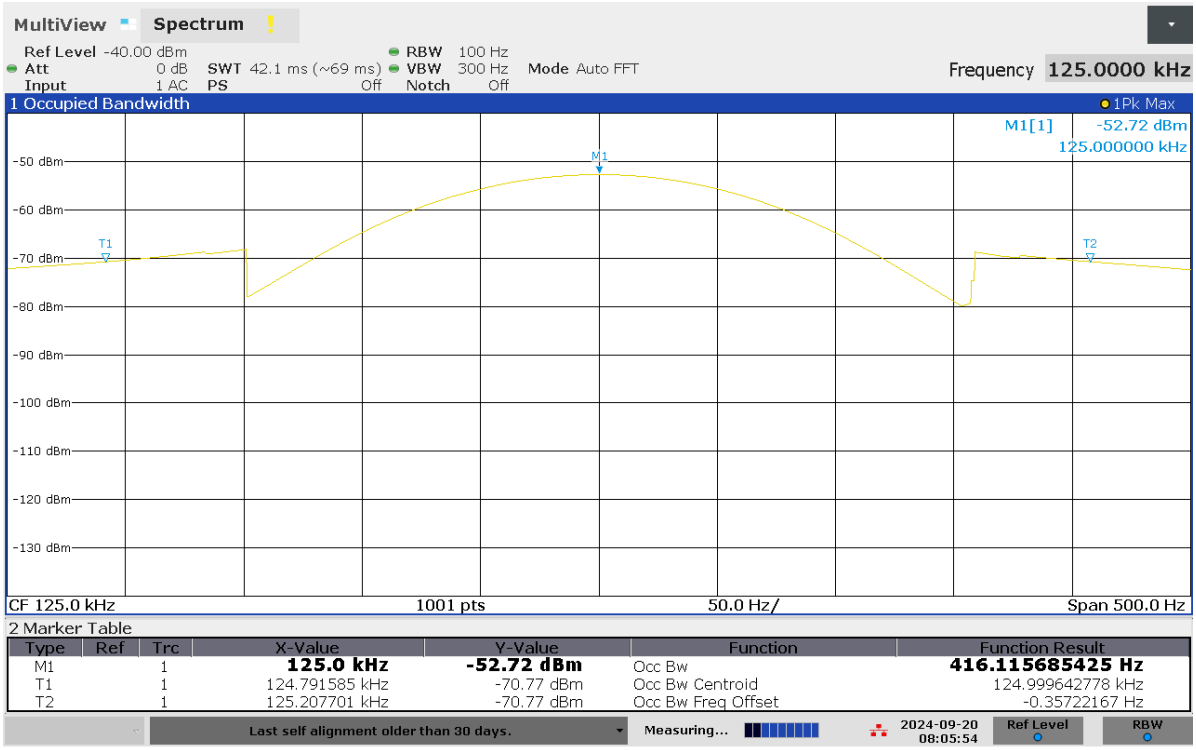
11:29:41 AM 09/20/2024

125 kHz RFID (Metal Enclosure With Keypad), Occupied Bandwidth

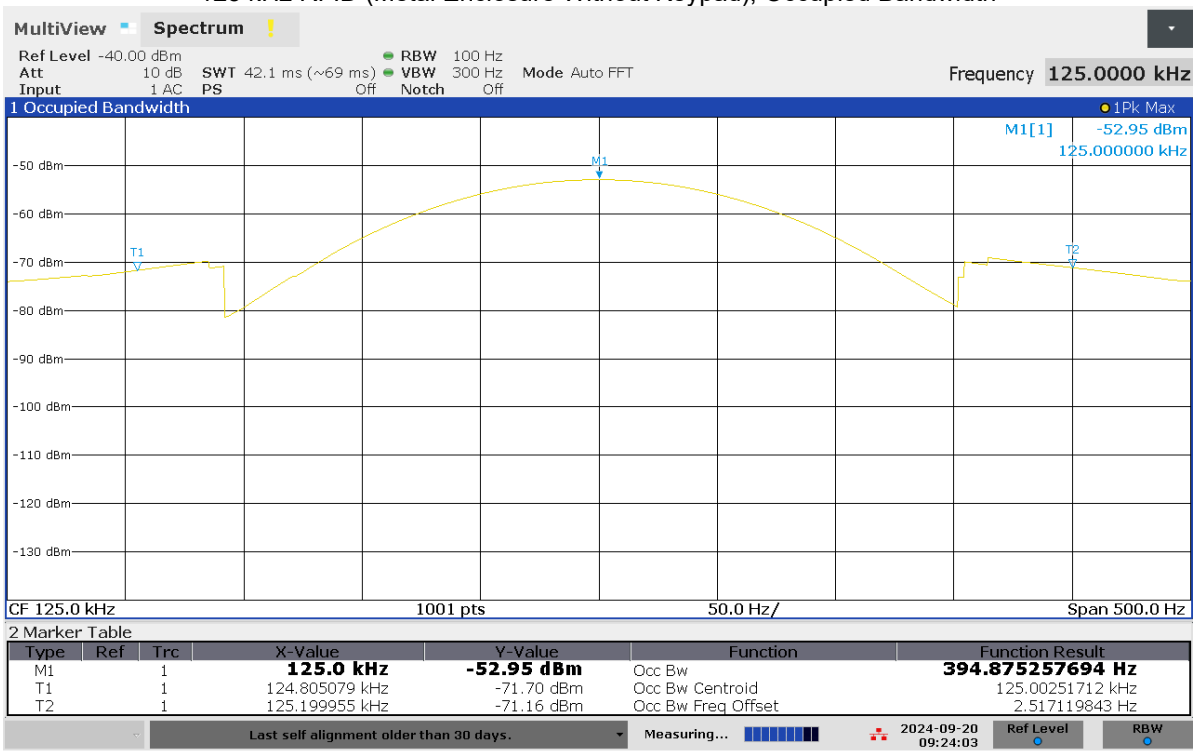


09:54:39 AM 09/20/2024

125 kHz RFID (Plastic Enclosure Without Keypad), Occupied Bandwidth

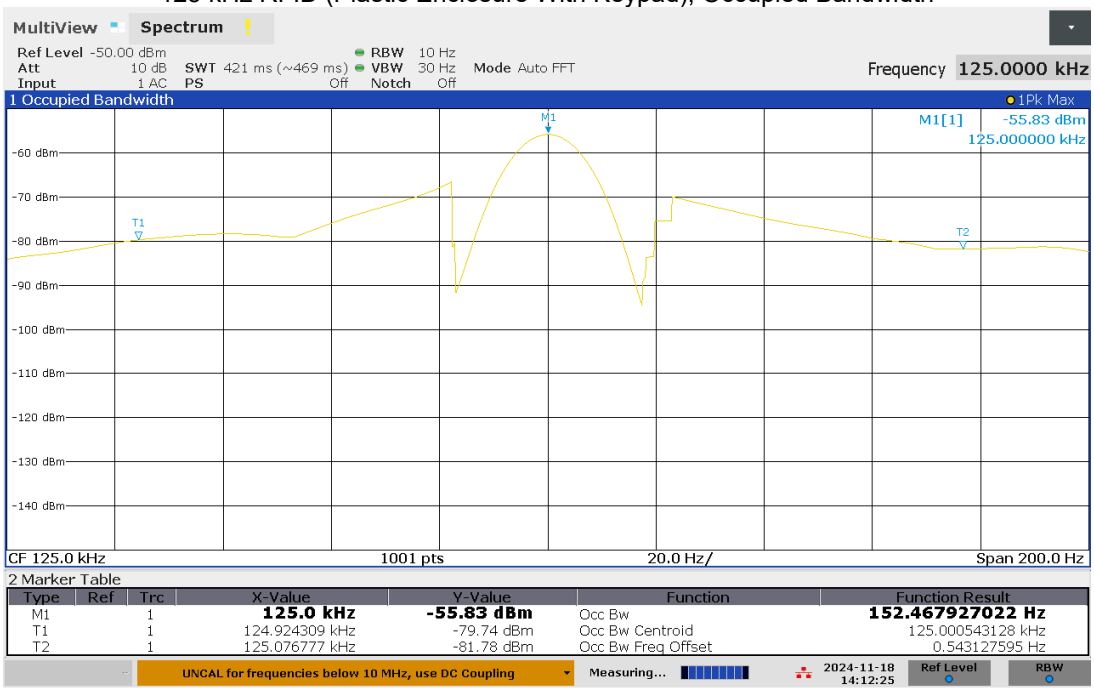


125 kHz RFID (Metal Enclosure Without Keypad), Occupied Bandwidth



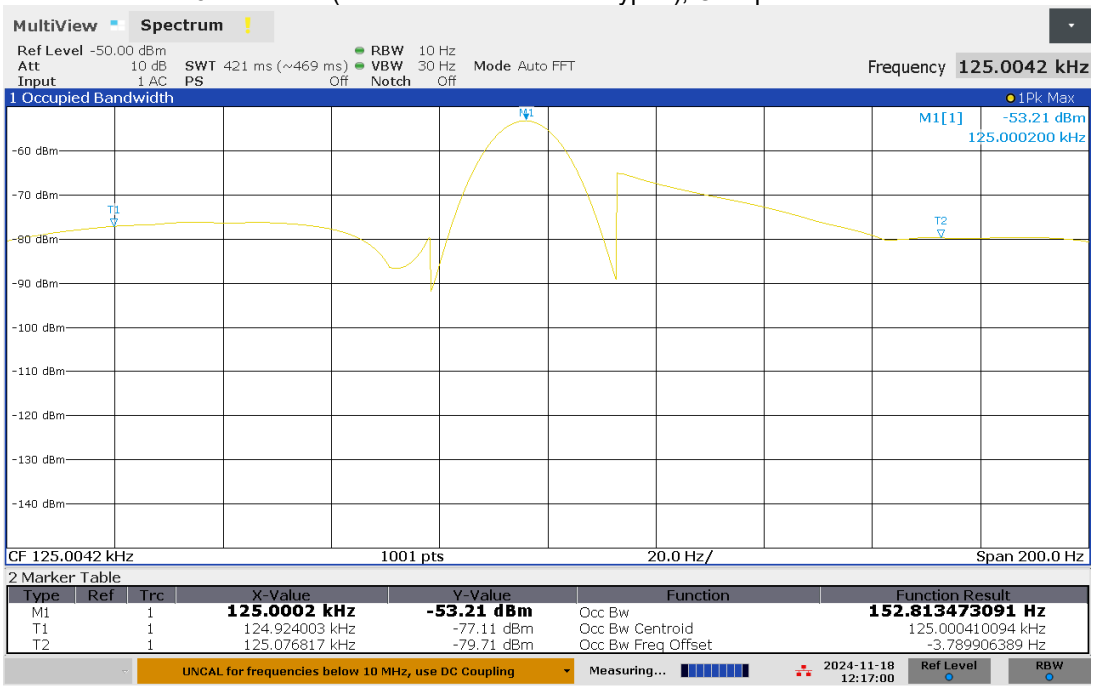
===POE Powered====

125 kHz RFID (Plastic Enclosure With Keypad), Occupied Bandwidth



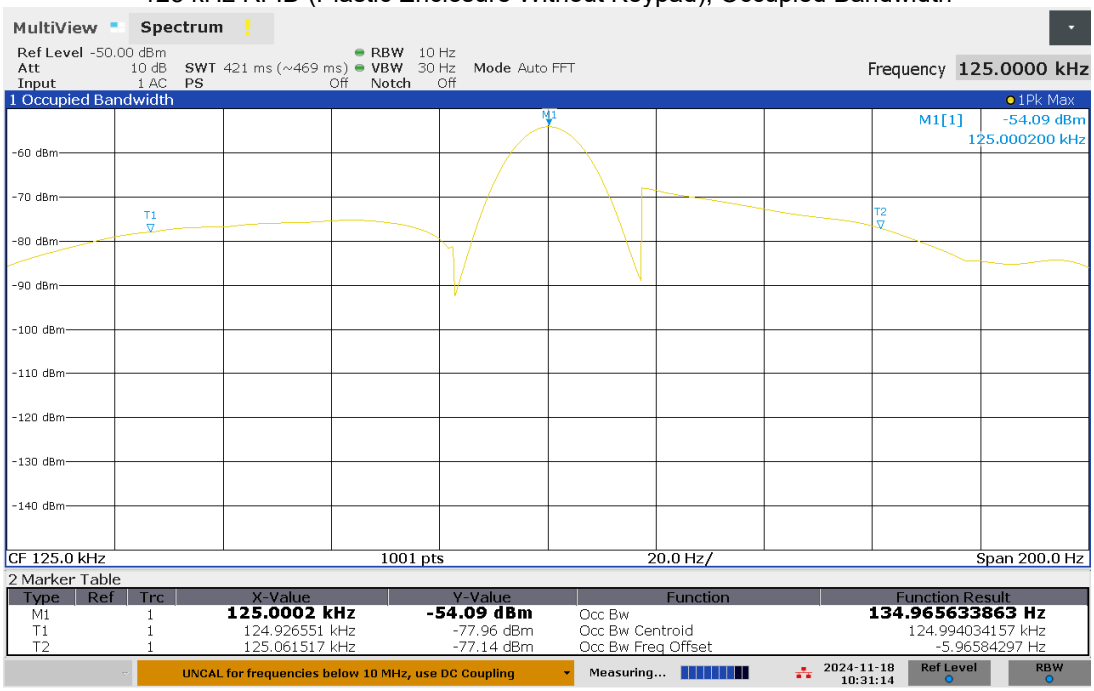
02:12:26 PM 11/18/2024

125 kHz RFID (Metal Enclosure With Keypad), Occupied Bandwidth



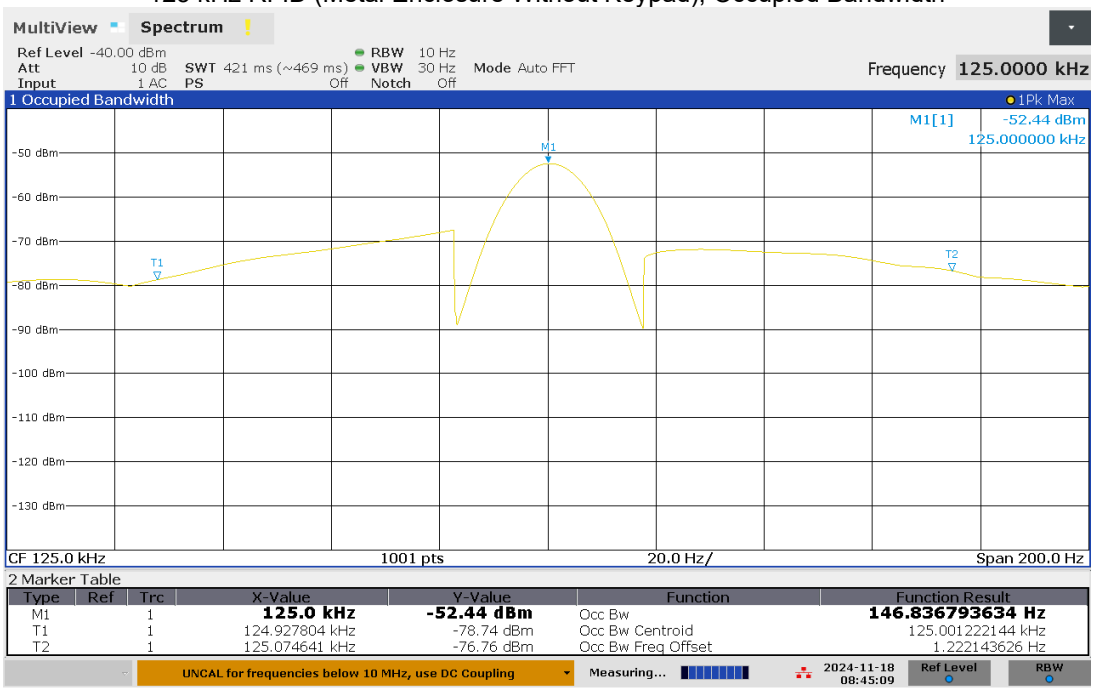
12:17:01 PM 11/18/2024

125 kHz RFID (Plastic Enclosure Without Keypad), Occupied Bandwidth



10:31:15 AM 11/18/2024

125 kHz RFID (Metal Enclosure Without Keypad), Occupied Bandwidth



08:45:09 AM 11/18/2024

Product Standard: FCC Part 15 15.209 and RSS-210				Limit applied: See Report Section 7.2			
Test Date	Test Personnel/ Initials	Supervising Engineer/ Initials	Input Voltage	Mode	Atmospheric Data		
					Temp C°	Relative Humidity %	Atmospheric Pressure mbar
09/20/2024	Kouma Sinn KPS	N/A	Battery Powered	Continuous Transmitting	24	52	1006
11/18/2024	Kouma Sinn KPS	N/A	Battery Powered	Continuous Transmitting	22	22	1000

Deviations, Additions, or Exclusions: None

8 Transmitter spurious emissions

8.1 Method

Tests are performed in accordance with ANSI C63.10, ANSI C 63.4, and RSS-Gen.

TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
Radiated Emissions, 10m	30-1000 MHz	4.6dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This

value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

UF = $10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
UF = $10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

Alternately, when BAT-EMC Emission Software is used, the “Level” includes all losses and gains and is compared directly in the “Margin” column to the “Limit”. The “Correction” includes Antenna Factor, Preamp, and Cable Loss. These are already accounted for in the “Level” column.

8.2 Limits

Limits – FCC Part §15.209 (a) The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/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

Notes: The limit for RSS-210 is the same as the FCC limits above.

8.3 Test Equipment Used:

Test equipment used from 9 kHz-30 MHz

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV007'	Weather Station Vantage Vue	Davis	6250	MS191212003	03/27/2024	03/27/2025
ROS014'	Receiver 1Hz-44GHz	Rhode & Schwarz	ESW 44	103232	06/10/2024	06/10/2025
145-420'	Receiver to floor cable	Utiflex	UFB311A-2-0591-70070	145-420	02/27/2024	02/27/2025
145-414'	Cable 145-414	Huber + Suhner	3m Track A cable	145-414	07/15/2024	07/15/2025
145-422'	10Amp Pre-amp to under floor	Utiflex	UFB311A-0-2756-70070	145-422	03/26/2024	03/26/2025
IW003'	8.4 meter cable	Insulated Wire	2800-NPS	003	01/17/2024	01/17/2025
ETS003'	9kHz-30MHz Active Loop Antenna	ETS Lindgren	6502	00143396	01/25/2024	01/25/2025
CBL053'	BNC cable 7.62 meters	MookEERF	RG58U	cbl053	11/20/2023	11/20/2024

Test equipment used from 30-1000 MHz

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV007'	Weather Station Vantage Vue	Davis	6250	MS191212003	03/27/2024	03/27/2025
ROS014'	Receiver 1Hz-44GHz	Rhode & Schwarz	ESW 44	103232	06/10/2024	06/10/2025
145-420'	Receiver to floor cable	Utiflex	UFB311A-2-0591-70070	145-420	02/27/2024	02/27/2025
HS003'	10m under floor cable	Huber-Schuner	10m-1	HS003	02/27/2024	02/27/2025
IW006'	DC-18GHz cable 8.4m long	Insulated Wire	2800-NPS	IW006	05/23/2024	05/23/2025
HS001'	DC-18GHz cable 1.5m long	Huber & Suhner	SucoFlex 106A	HS001	01/30/2024	01/30/2025
145145'	Broadband Hybrid Antenna 30 MHz - 3 GHz	Sunol Sciences Corp.	JB3	A122313	07/11/2024	07/11/2025
PRE10'	30-1000MHz pre-amp	ITS	PRE10	PRE10	02/27/2024	02/27/2025

Software Utilized:

Name	Manufacturer	Version
BAT-EMC	Nexio	2023.0.9.0

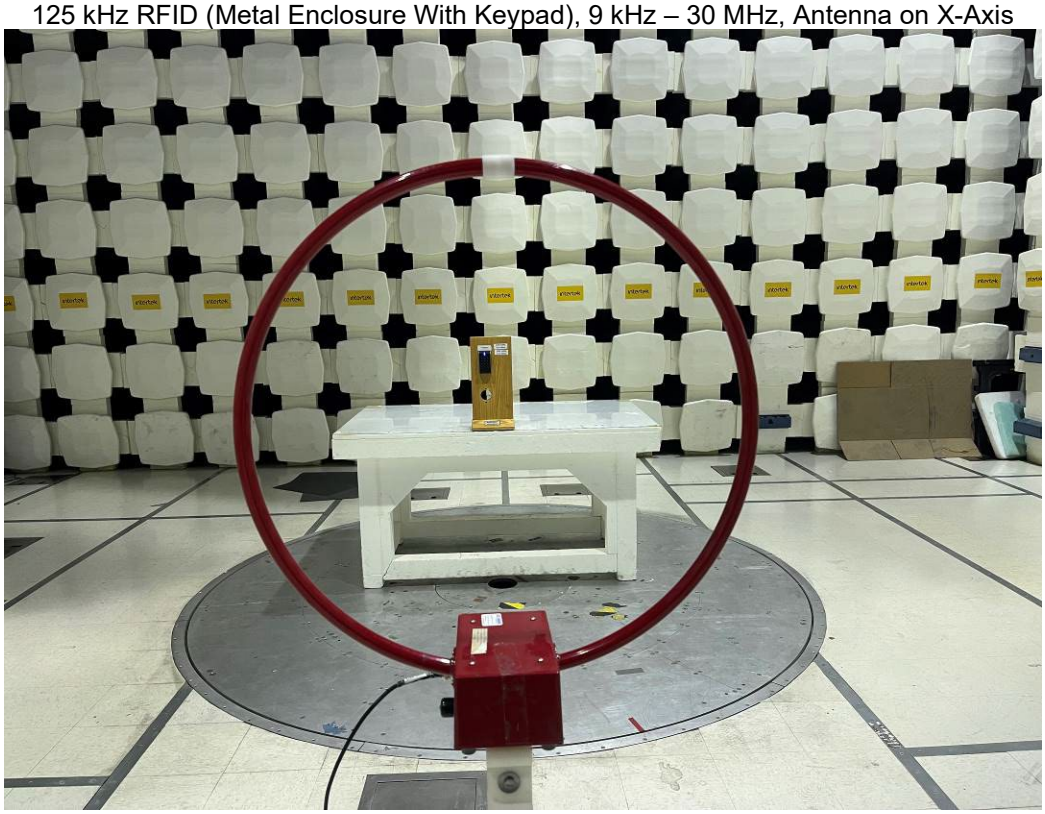
8.4 Results:

The sample tested was found to Comply.

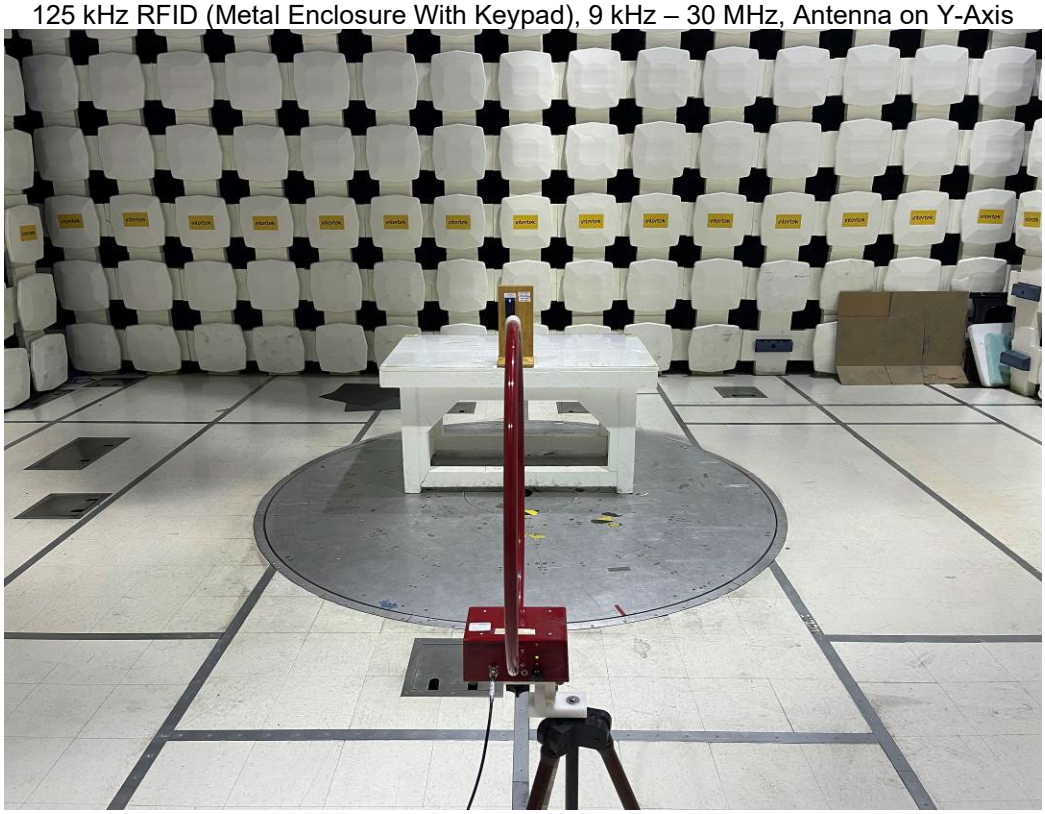
8.5 Setup Photographs:

===Battery Powered===

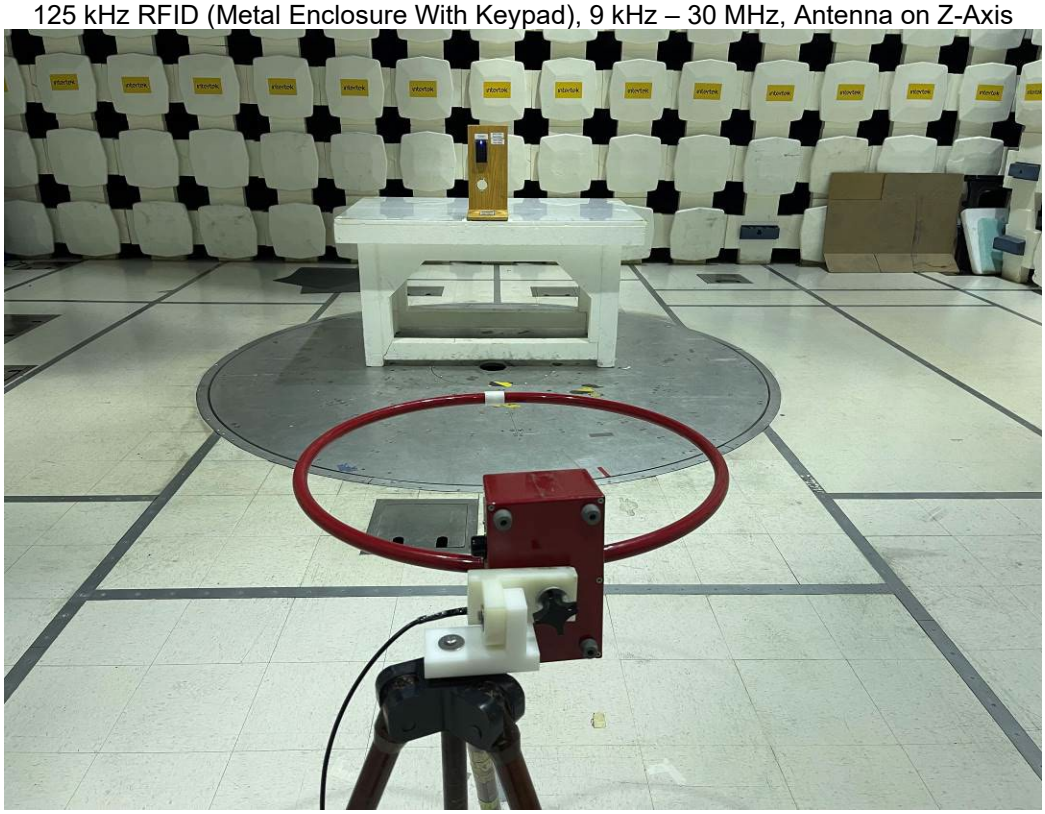
125 kHz RFID (Metal Enclosure With Keypad), 9 kHz – 30 MHz, Antenna on X-Axis



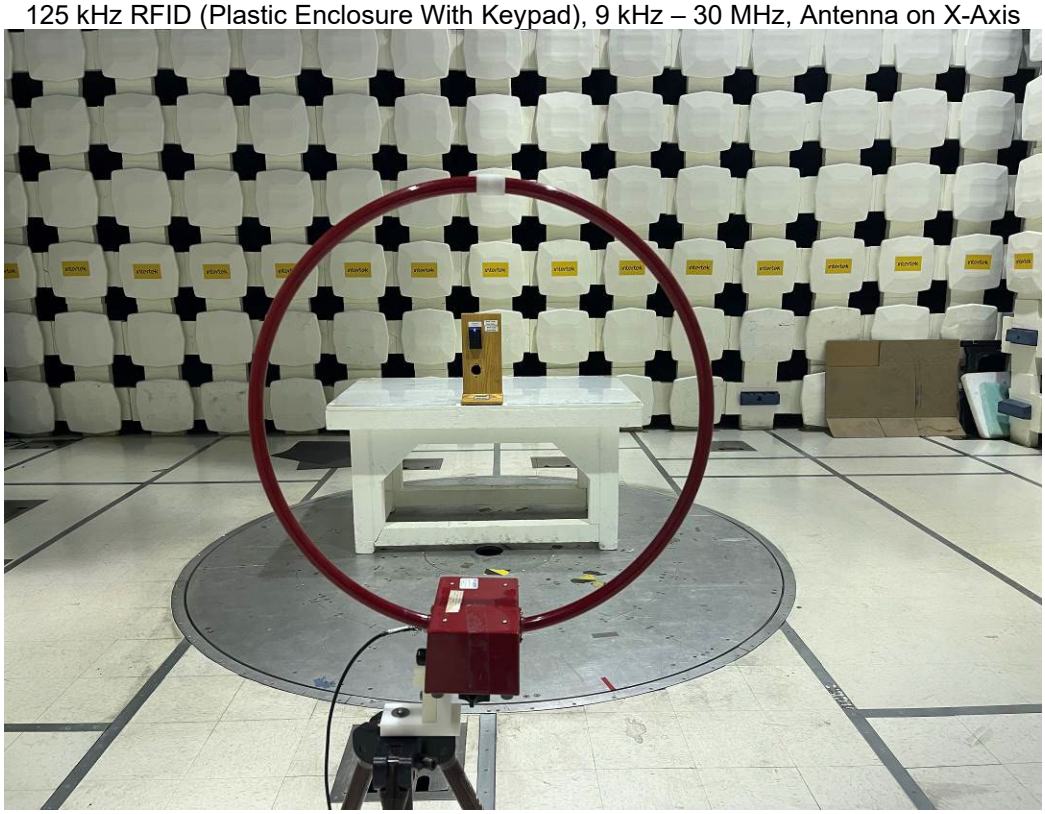
125 kHz RFID (Metal Enclosure With Keypad), 9 kHz – 30 MHz, Antenna on Y-Axis



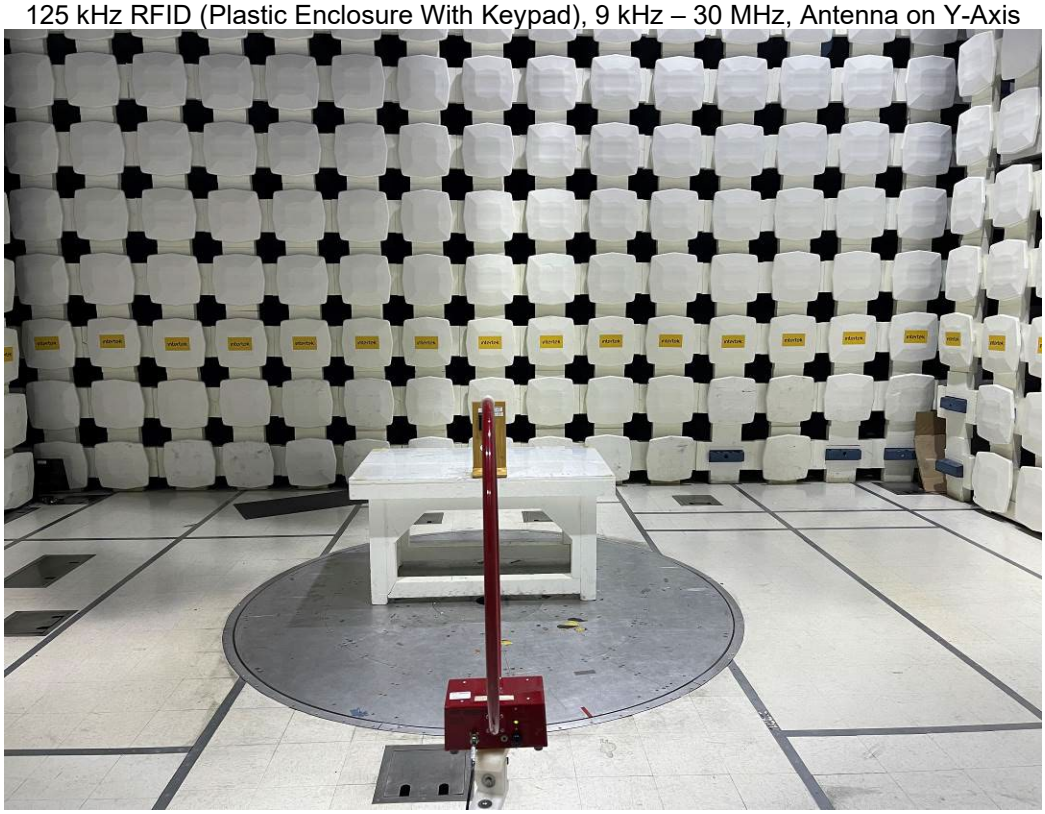
125 kHz RFID (Metal Enclosure With Keypad), 9 kHz – 30 MHz, Antenna on Z-Axis



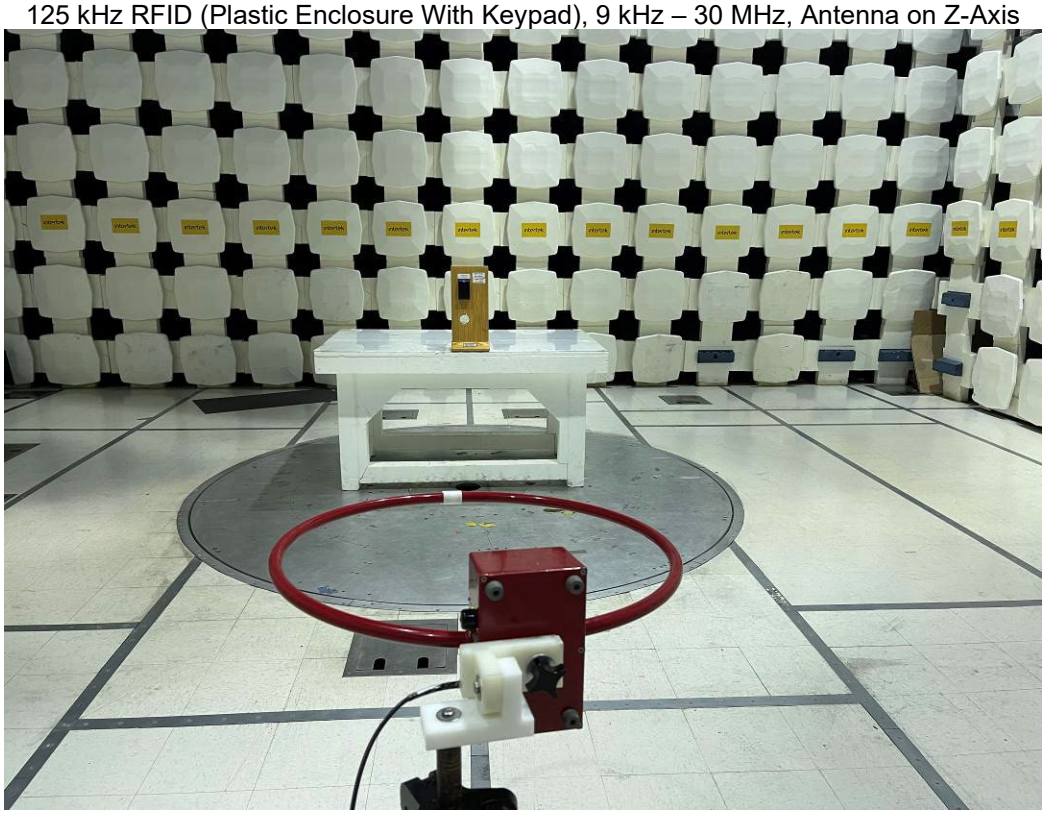
125 kHz RFID (Plastic Enclosure With Keypad), 9 kHz – 30 MHz, Antenna on X-Axis



125 kHz RFID (Plastic Enclosure With Keypad), 9 kHz – 30 MHz, Antenna on Y-Axis



125 kHz RFID (Plastic Enclosure With Keypad), 9 kHz – 30 MHz, Antenna on Z-Axis



125 kHz RFID (Metal Enclosure Without Keypad), 9 kHz – 30 MHz, Antenna on X-Axis