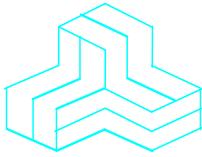


RF TEST REPORT



Model No.: Luxe 8700x
FCC ID: COL-LUXE8700X

Applicant:

NBS Payment Solutions Inc.
703 Evans Avenue, Suite 400
Toronto, Ontario
Canada M9C 5E9

In Accordance With

Federal Communications Commission (FCC)
Part 15, Subpart C
Unlicensed Low Power Transmitter Operating in the Band 13.110-14.010 MHz

UltraTech's File No.: 18MIS-122F15C225

This Test report is Issued under the Authority
of
Tri M. Luu
Vice President of Engineering
UltraTech Group of Labs

Date: September 10, 2024

Report Prepared by: Santhosh Fernandez

Tested by: Angus Au and Christian Luu

Issued Date: September 10, 2024

Test Dates: August 15- September 5, 2024

- The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.
- This report must not be used by the client to claim product endorsement by any agency of the US Government.
- This test report shall not be reproduced, except in full, without a written approval from UltraTech.

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91038



1309



46390-2049



AT-1945



SL2-IN-E-
1119R



Korea
KCC-RRA
CA2049

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EXHIBIT 1. INTRODUCTION

1.1. SCOPE

Reference:	FCC Part 15, Subpart C, Sec. 15.225 - Operation within the band 13.110 – 14.010 MHz.
Title:	Code of Federal Regulations (CFR), Title 47 Telecommunication, Part 15, Subpart C - Intentional Radiators
Purpose of Test:	To gain FCC Equipment Certification for FCC Part 15C.
Test Procedures:	ANSI C63.4 and ANSI C63.10
Environmental Classification:	Commercial, industrial or business environment

1.2. RELATED SUBMITTAL(S)/GRANT(S)

None.

1.3. NORMATIVE REFERENCES

Publication	Year	Title
FCC CFR Parts 0-19, 80-End	2024	Code of Federal Regulations (CFR), Title 47 – Telecommunication, Part 15 Radio Frequency Devices
ANSI C63.4	2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40 GHz
ANSI C63.10	2020	American National Standard for Testing Unlicensed Wireless Devices

EXHIBIT 2. PERFORMANCE ASSESSMENT

2.1. CLIENT INFORMATION

Applicant	
Name:	NBS Payment Solutions Inc.
Address:	703 Evans Avenue, Suite 400 Toronto, Ontario Canada M9C 5E9
Contact Person:	Drazen Ivanovic Phone #: 416 621 7410 x223 Fax #: 416 621 2450 Email Address: divanovic@equinoxpayments.com

Manufacturer	
Name:	NBS Payment Solutions Inc.
Address:	703 Evans Avenue, Suite 400 Toronto, Ontario Canada M9C 5E9
Contact Person:	Dragoslav Jovanovic Phone #: 416 621 7410 x 359 Fax #: 416 621 2450 Email Address: djovanovic@equinoxpayments.com

2.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

Brand Name:	NBS Payment Solutions Inc.
Product Name:	Luxe 8700x
Model Name or Number:	Luxe 8700x
Serial Number:	Test sample
Type of Equipment:	Low Power Communication Device Transmitter
Clocks:	External oscillators (crystals): 24MHz and 32.768KHz Internal clocks (PLL): 499MHz (CPU) and 396MHz (DDR3)
Input Power Supply Type:	9VDC (AC/DC adapter)
Primary User Functions of EUT:	Point of Sale Terminal

2.3. EUT'S TECHNICAL SPECIFICATIONS

Transmitter	
Equipment Type:	Mobile
Intended Operating Environment:	Residential, Commercial, light industry & heavy industry
Power Supply Requirement:	9VDC (AC/DC adapter)
Field Strength:	43.18 dB μ V/m at 10 m
Operating Frequency Range:	13.56 MHz
RF Output Impedance:	175 Ω
20 dB Bandwidth:	2.76 kHz
Modulation Type:	ASK
Oscillator Frequencies:	13.56 MHz
Antenna Connector Type:	Integral

Antenna Description	
Manufacturer:	NBS Payment Solutions Inc.
Type:	Loop
Model:	100975-001E
Frequency Range:	13.56MHz

2.4. LIST OF EUT'S PORTS

Port Number	EUT's Port Description	Number of Identical Ports	Connector Type	Cable Type (Specify minimum length and shielded/non-shielded)
1	Main Connector	1	ShenZhen ZengChuang Connector: UC24FTN6B001	2m, non-shielded
2	Earphone Jack	1	Oupiin: 8965-3505ADT	1m, non-shielded

2.5. ANCILLARY EQUIPMENT

The EUT was tested while connected to the following representative configuration of ancillary equipment necessary to exercise the ports during tests:

Ancillary Equipment # 1	
Equipment Make and Name:	AC to DC Adapter; Adapter Tech
ModelNo.:	ATS018T-P090 9Vdc
Connected to EUT's Port #: (See above table 2.4)	1. Main Connector

ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4

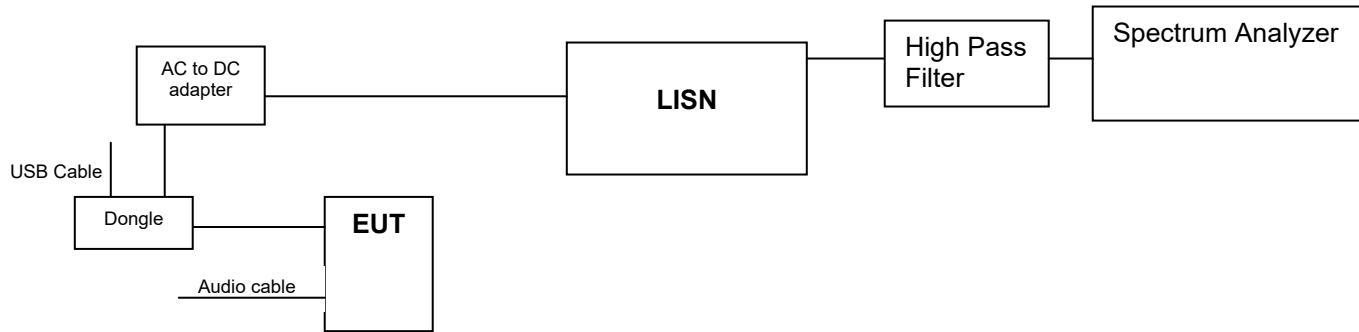
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: 24MIS161_F15C225

September 10, 2024

2.6. GENERAL TEST SETUP

2.6.1. Power Line Conducted Emission Test Setup



2.6.2. Radiated Emission Test Setup



EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

3.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

Temperature:	21°C
Humidity:	23%
Pressure:	102 kPa
Power input source:	9VDC (AC/DC adapter)

3.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TESTS

Operating Modes:	The EUT was configured for continuous transmission for the duration of testing.
Special Test Software:	N/A
Special Hardware Used:	N/A
Transmitter Test Antenna:	The EUT was tested with the antenna fitted in a manner typical of normal intended use as integral antenna equipment.

Transmitter Test Signals:	
Frequency Band(s):	13.56 MHz
Test Frequency(ies):	13.56 MHz
Transmitter Wanted Output Test Signals:	
▪ RF Power Output (measured maximum output power):	43.18 dB μ V/m at 10 m
▪	
▪ Normal Test Modulation:	ASK
▪ Modulating signal source:	Internal

EXHIBIT 4. SUMMARY OF TEST RESULTS

4.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- Power Line Conducted Emissions were performed in UltraTech's shielded room, 24'(L) by 16'(W) by 8'(H).

Radiated Emissions were performed at the Ultratech's 3-10 TDK Semi-Anechoic Chamber situated in the Town of Oakville, province of Ontario. This test site been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville 3-10 TDK Semi-Anechoic Chamber has been filed with ANAB File No.: AT-1945.

4.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

FCC Regulations	Test Requirements	Compliance (Yes/No)
15.203 & 15.204	The transmitter shall use a transmitting antenna that is an integral part of the device	Yes*
15.107 & 15.207	Class B - Power Line Conducted Emissions	Yes
15.215(c)	Emission Bandwidth	Yes
15.225(a) – (d)	Field Strength of Emissions Inside and Outside the Permitted Band 13.110 - 14.010 MHz	Yes
15.225(e)	Frequency Stability	Yes

* The EUT complies with the requirement; it employs integral antenna.

4.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None

EXHIBIT 5. TEST DATA

5.1. POWERLINE CONDUCTED EMISSION [47 CFR 15.207(a)]

5.1.1. Limit(s)

The equipment shall meet the limits of the following table:

Frequency of emission (MHz)	Conducted Limits (dB μ V)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

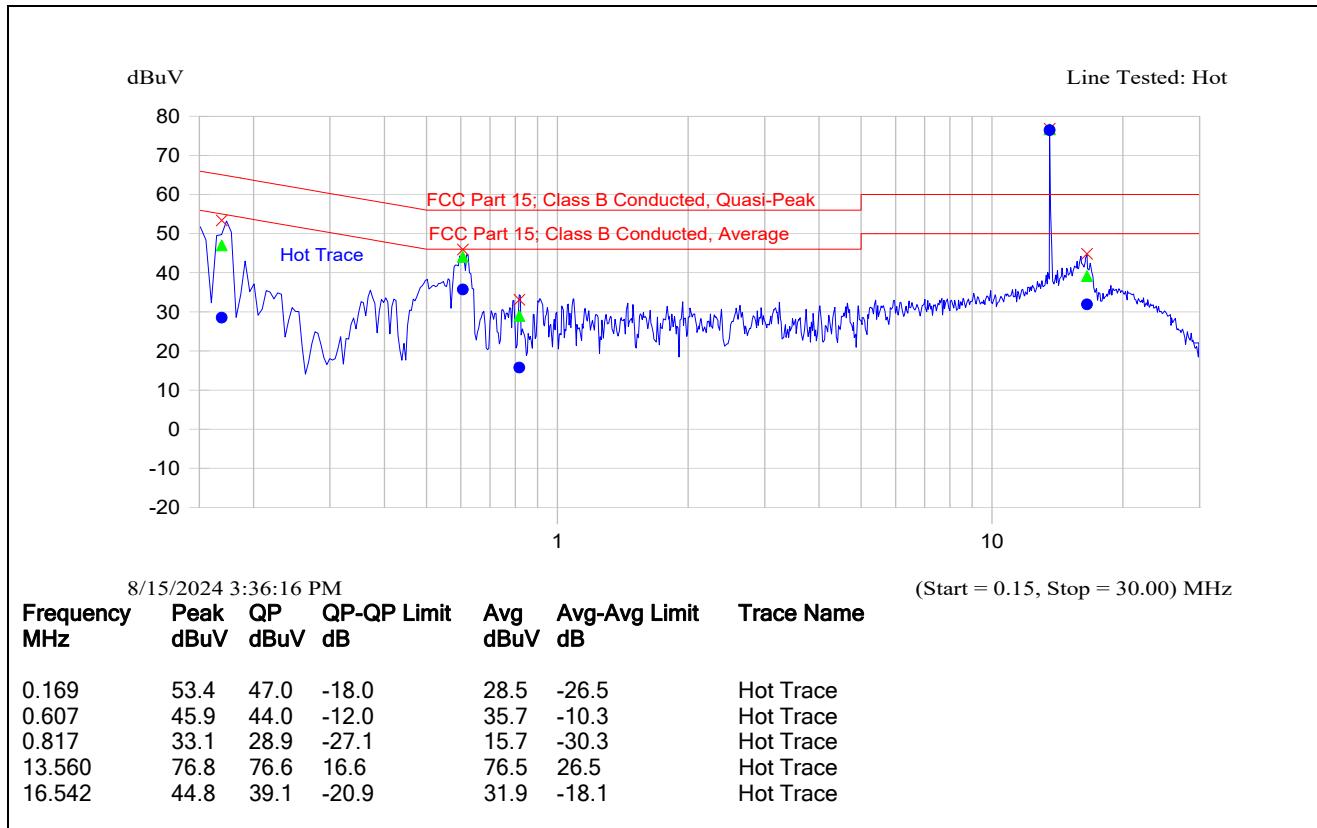
*Decreases linearly with the logarithm of the frequency

5.1.2. Method of Measurements

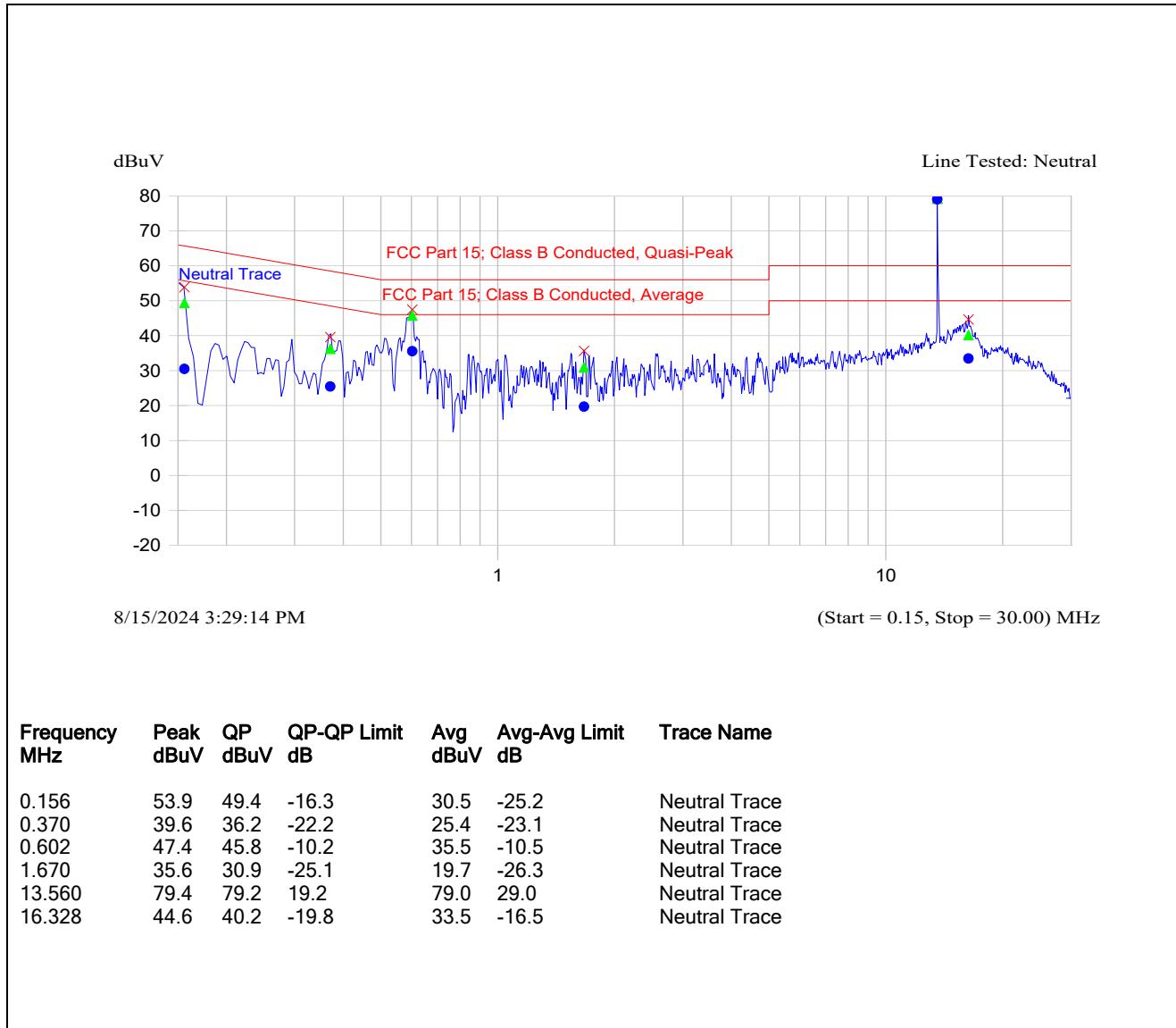
Refer to ANSI C63.4.

5.1.3. Test Data

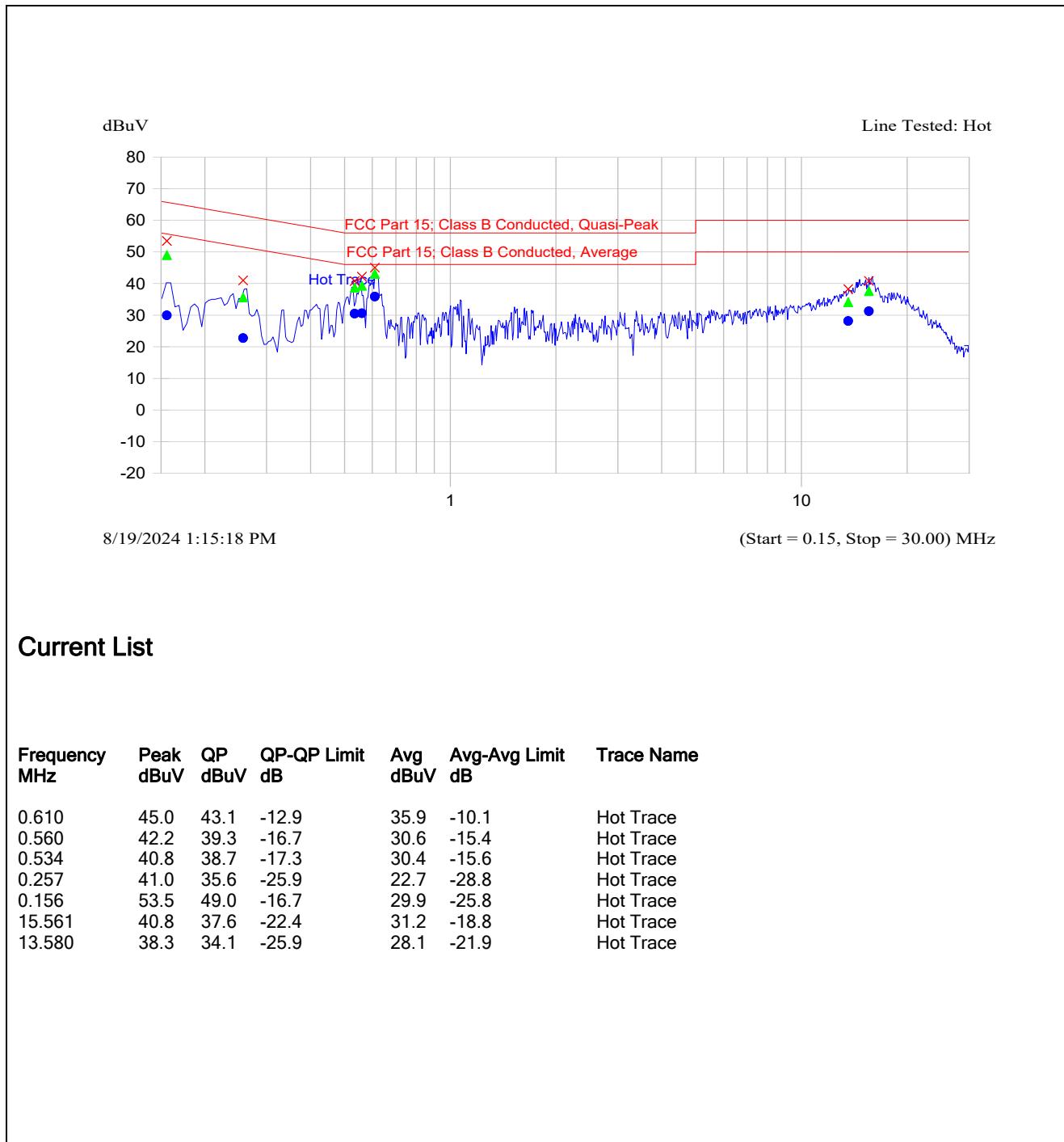
5.1.3.1. Power Line Conducted Emissions –RFID on without termination Line Voltage: 120 Vac; Line Tested: Hot



Plot 5.1.3.2. Power Line Conducted Emissions –RFID on without termination
Line Voltage: 120 Vac; Line Tested:-Neutral



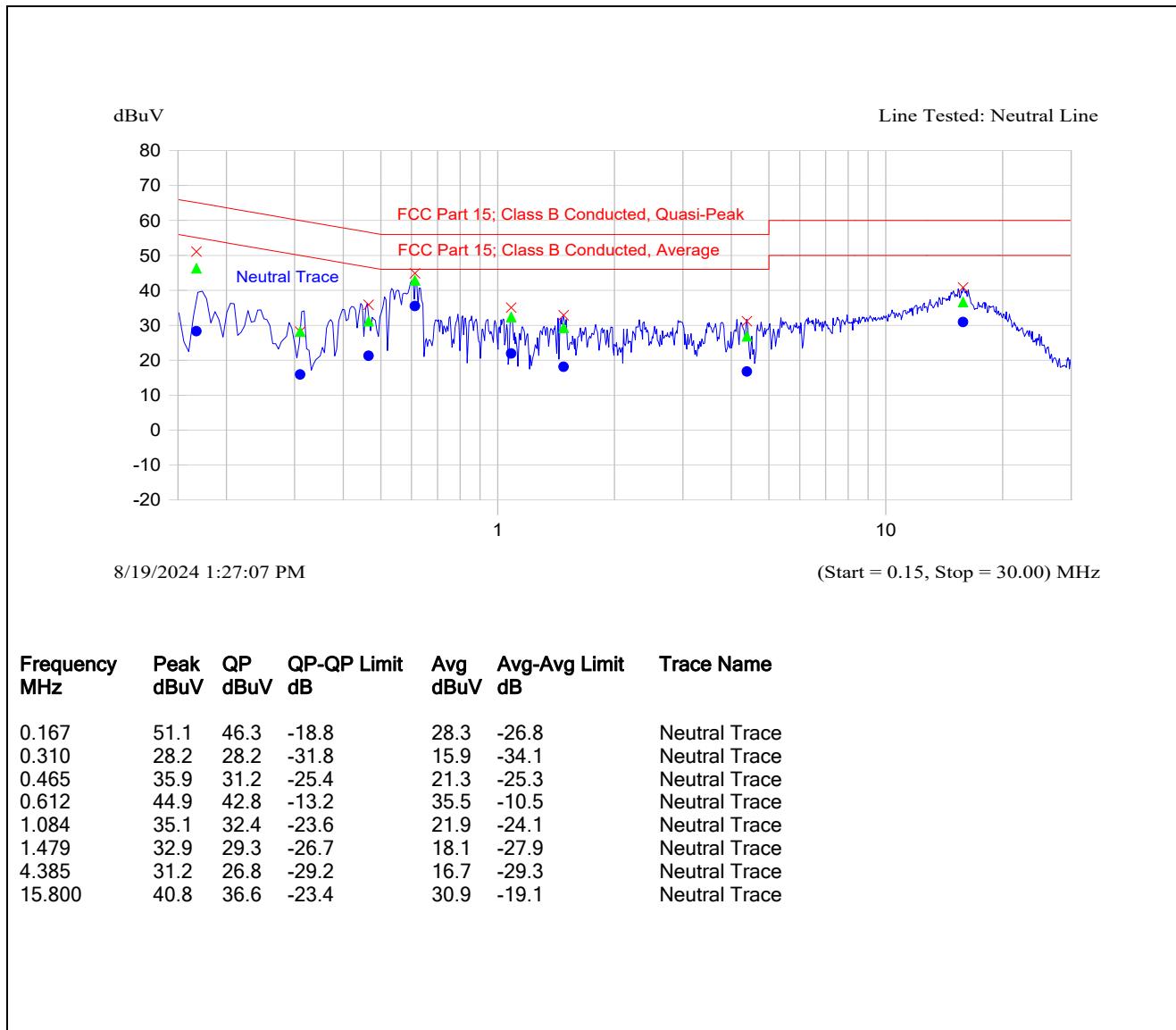
Plot 5.1.3.3. Power Line Conducted Emissions –RFID with Antenna termination
Line Voltage: 120 Vac; Line Tested: Hot



Current List

Frequency MHz	Peak dBuV	QP dBuV	QP-QP Limit dB	Avg dBuV	Avg-Avg Limit dB	Trace Name
0.610	45.0	43.1	-12.9	35.9	-10.1	Hot Trace
0.560	42.2	39.3	-16.7	30.6	-15.4	Hot Trace
0.534	40.8	38.7	-17.3	30.4	-15.6	Hot Trace
0.257	41.0	35.6	-25.9	22.7	-28.8	Hot Trace
0.156	53.5	49.0	-16.7	29.9	-25.8	Hot Trace
15.561	40.8	37.6	-22.4	31.2	-18.8	Hot Trace
13.580	38.3	34.1	-25.9	28.1	-21.9	Hot Trace

Plot 5.1.3.4. Power Line Conducted Emissions –RFID with Antenna termination
Line Voltage: 120 Vac; Line Tested:Neutral



5.2. EMISSION BANDWIDTH

5.2.1. Limit(s)

The 20 dB bandwidth of the emission shall be contained within the band 13.110–14.010 MHz.

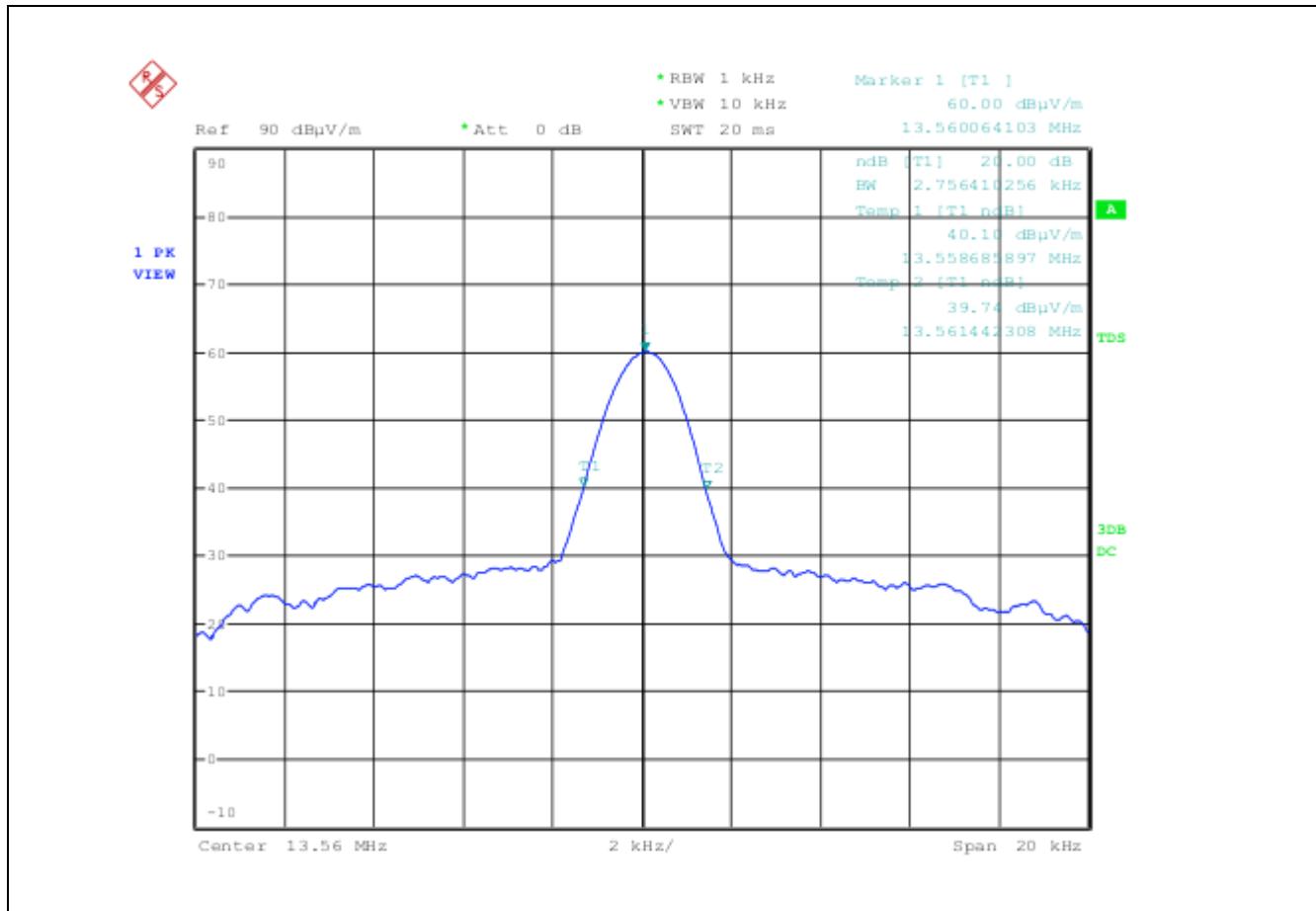
5.2.2. Method of Measurements

The measurements were performed in accordance with Ultratech Test Procedures, File # ULTR P001-2004 and ANSI C63.4.

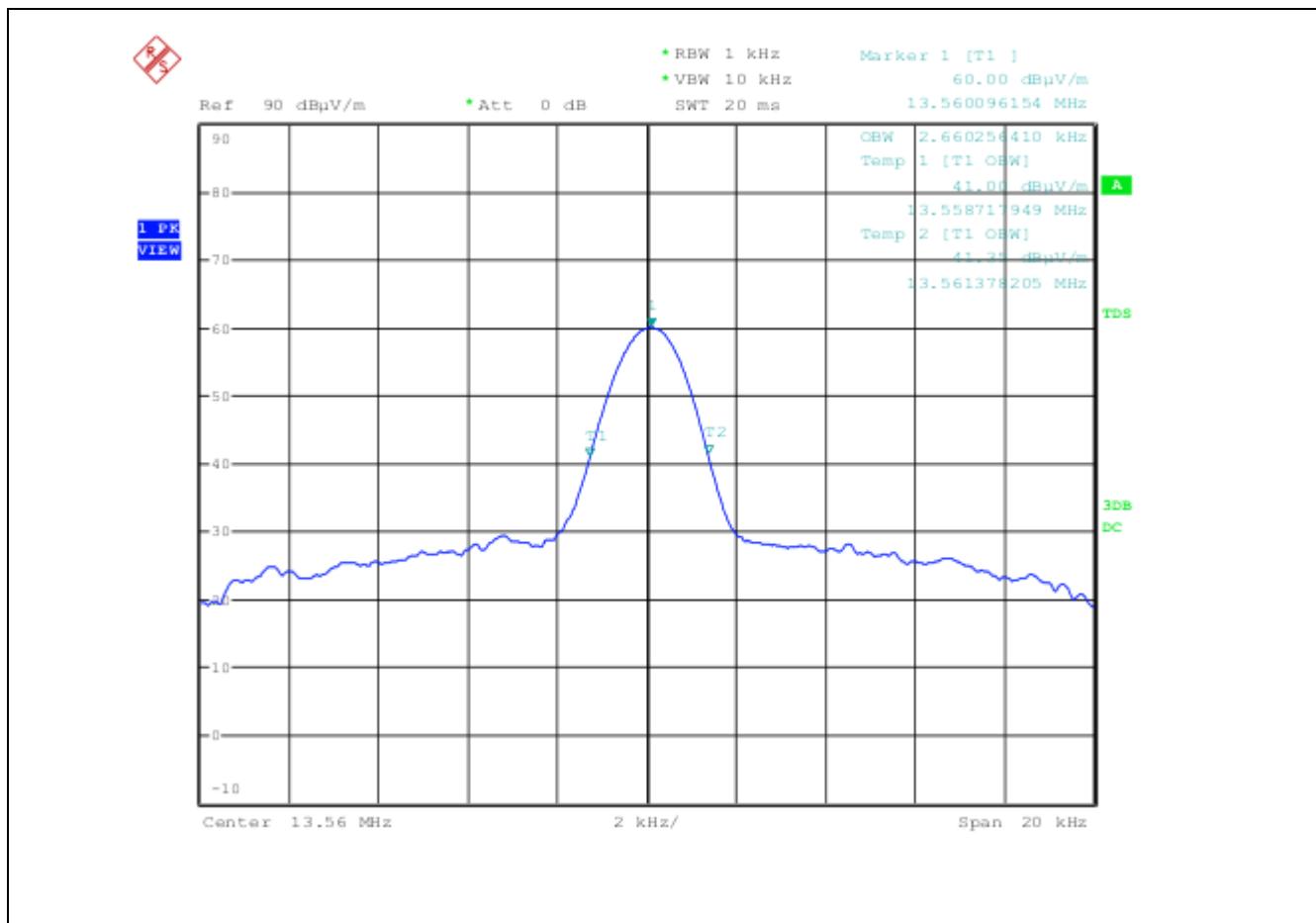
5.2.3. Test Data

Test Frequency (MHz)	Occupied Bandwidth (kHz)	
	20 dB BW	99 % BW
13.56	2.76	2.67

Plot 5.2.3.1. 20 dB Bandwidth, Fc: 13.56 MHz



Plot 5.2.3.2. 99% Occupied Bandwidth, Fc: 13.56 MHz



5.3. FIELD STRENGTH OF EMISSIONS WITHIN & OUTSIDE THE PERMITTED BAND 13.110-14.010 MHz [47 CFR 15.225 (a) to (d)]

5.3.1. Limits

- (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.

47 CFR 15.209(a) – Radiated Emission Limits; general requirements

Frequency (MHz)	Field Strength Limits (microvolts/m)	Distance (Meters)
0.009 - 0.490	2,400 / F (KHz)	300
0.490 - 1.705	24,000 / 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

5.3.2. Method of Measurements

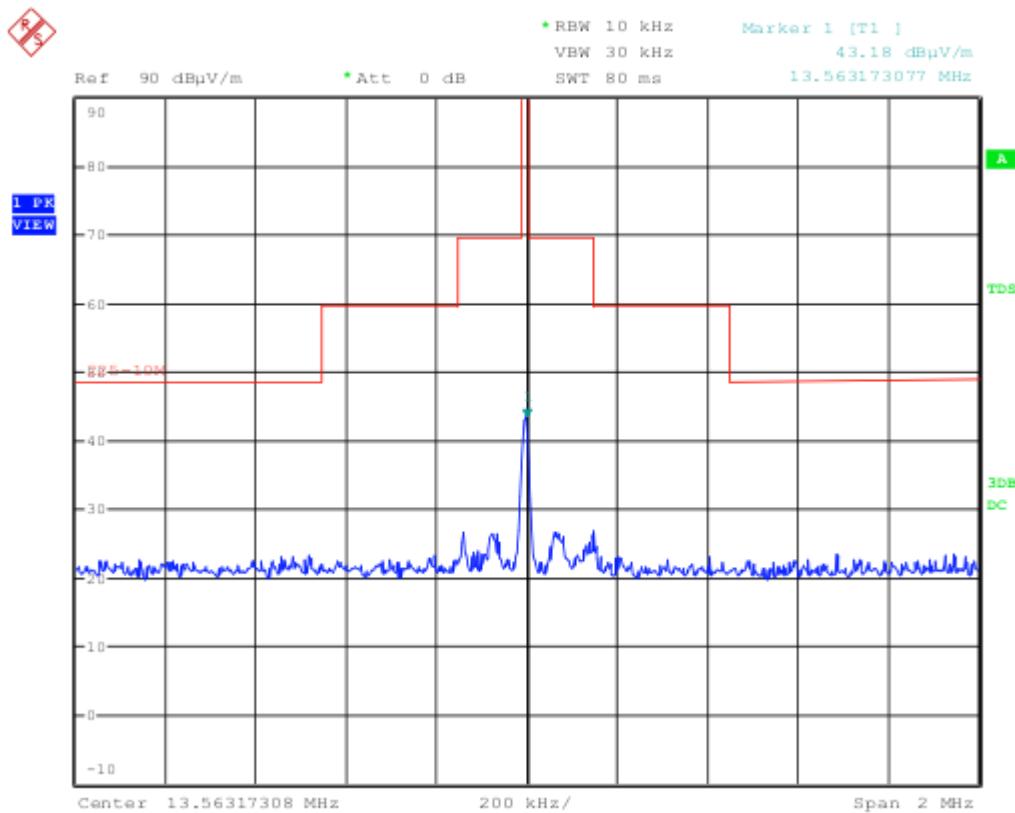
Refer to Ultratech Test Procedures, File # ULTR P001-2004 and ANSI C63.4 for measurement methods

5.3.3. Test Data

Remarks:

- Radiated spurious emissions measurements were performed from 10 kHz – 10th harmonic of the fundamental and all spurious emissions that are in excess of 20 dB below the specified limit shall be recorded.
- For frequencies below 30 MHz, the results measured at 10 m distance shall be extrapolated to the specified distance using an extrapolation factor of 40 dB/decade for determining compliance.
- Three orientations were pre-scanned and the worst case readings are shown below

5.3.3.1. Plot Of Band Within And Just Outside Permitted Band @10m



5.3.3.2. Field Strength of Emissions Within the Permitted Band at 10 m

Frequency (MHz)	Measured Field Strength @ 10 m (dBμV/m)	Detector Used (Peak/QP)	Antenna Plane	Field Strength Extrapolated 30m Value (dBμV/m)	§ 15.225 Field Strength Limits (dBμV/m)	Margin (dB)
13.56	42.18	PEAK	0 degree	23.10	84.0	-60.90
13.56	43.18	PEAK	90 degree	24.10	84.0	-59.90
13.56	39.27	PEAK	Flat	20.19	84.0	-63.81

5.3.3.3. Field Strength of Emissions Outside the Permitted Band Below 30 MHz at 10 m

Frequency (MHz)	Measured Field Strength @ 10 m (dBμV/m)	Detector Used (Peak/QP)	Antenna Plane	Field Strength Extrapolated Value (dBμV/m)	§ 15.209 Field Strength Limits (dBμV/m)	Margin (dB)
All spurious emissions are more than 20 dB below the specified limit.						

5.3.3.4. Field Strength of Emissions Outside the Permitted Band at or Above 30 MHz at 3 m

Frequency (MHz)	Measured Field Strength @ 3 m (dB μ V/m)	Detector Used (Peak/QP)	Antenna Plane (H/V)	§ 15.209 Field Strength Limits (dB μ V/m)	Margin (dB)
40.68	32.9	QP	V	40	-7.10
40.68	27.11	QP	H	40	-12.89
54.24	20.89	QP	V	40	-19.11
54.24	20.02	QP	H	40	-19.98

5.3.3.5. Field Strength of Emissions from Unintentional Radiators (30 MHz-5MHz)

Frequency (MHz)	Measured Field Strength @ 10m (dB μ V/m)	Detector Used (Peak/QP)	Antenna Plane (H/V)	Field Strength Limits (dB μ V/m)	Margin (dB)
30	20.66	PEAK	V	29.5	-8.84
30	20.16	PEAK	H	29.5	-9.34
81.29	19.16	PEAK	V	29.5	-10.34
107.72	21.33	PEAK	V	33	-11.67
107.72	23.5	QP	H	33	-9.5
188.55	24.19	PEAK	V	33	-8.81
188.55	18.63	PEAK	H	33	-14.37
208.76	19.95	PEAK	V	33	-13.05
249.18	24.13	PEAK	V	35.5	-11.37
249.18	24.28	PEAK	H	35.5	-11.22

Frequency (MHz)	Measured Field Strength @ 3m (dB μ V/m)	Detector Used (Peak/QP)	Antenna Plane (H/V)	Field Strength Limits (dB μ V/m)	Margin (dB)
2441	41.7	PEAK	H	54	-12.3

5.4. FREQUENCY STABILITY [47 CFR 15.225(e)]

5.4.1. Limit(s)

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.

5.4.2. Method of Measurements

ANSI C63.4-2014.

5.4.3. Test Data

Full power

Frequency Band:	13.56 MHz
Center Frequency:	13.56 MHz
Frequency Tolerance Limit:	<u>± 0.01% (+1356 Hz)</u>
Max. Frequency Tolerance Measured:	806 Hz
Input Voltage Rating:	120Vac of the AC to Dc adapter

Ambient Temperature (°C)	Frequency Drift (Hz)		
	Supply Voltage (Nominal) 9 VDC	Supply Voltage (85 % of Nominal) 102V AC	Supply Voltage (115% of Nominal) 138V AC
-30	799	N/A	N/A
-20	803	N/A	N/A
-10	22	N/A	N/A
0	10	N/A	N/A
10	801	N/A	N/A
20	0	0	0
30	806	N/A	N/A
40	1	N/A	N/A
50	799	N/A	N/A

EXHIBIT 6. TEST EQUIPMENT LIST

6.1. Emission Bandwidth, Field Strength of Emissions Inside and Outside the Permitted Band, Frequency Stability

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range	Calibration Due Date
EMI Receiver	Rohde & Schwarz	ESU40	100037	20Hz–40 GHz	21 Sep 2024
Loop Antenna	EMCO	6502	9104-2611	10kHz – 30MHz	13-Jun-2026
Biconilog Antenna	EMCO	3142C	00034792	26-2000MHz	16 Dec 2025
Pre-Amplifier	Com-Power	PAM-118A	550152	500 MHz to 18 GHz	06-Oct-24
Horn Antenna	EMCO	3115	5955	1GHz – 18 GHz	10-Aug-24
AC to DC adapter	Adapter Tech	ATS018T-P090	-	9Vdc	-

Test Dates: August 15 and September 5, 2024

6.2. Power Line Conducted Emissions

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range	Calibration Due Date
Spectrum Analyzer	Agilent	E7401A	US40240432	9 kHz–22 GHz	Nov 06, 2024
High Pass filter	Rohde & Schwarz	EZ-25	830164/007	Cut off 150kHz	Oct 12, 2024
LISN	NSLK 8127	NSLK 8127	8127276	9 kHz–30 MHz	Dec 11, 2024
AC to DC adapter	Adapter Tech	ATS018T-P090	-	9Vdc	-

Test Dates: August 15, 19, 2024

6.3. Frequency Stability

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range	Calibration Due Date
Spectrum Analyzer	Rohde & Schwarz	FSU26	200946	20Hz–26.5 GHz	26-Mar-2026
Loop Antenna	Schwarzbeck	HFRA 5164	00110	0.01MHz to 120MHz	25-Feb-2025
Environmental Chamber	Envirotronics	SSH32C	11994847-S-11059	-60°C to +177°C	29-Aug-2025
AC to DC adapter	Adapter Tech	ATS018T-P090	-	9Vdc	-

Test Dates: August 15, 2024

EXHIBIT 7. MEASUREMENT UNCERTAINTY

Test description	Uncertainty
Radiated Emissions	<30 MHz
	30-1000 MHz
	>1 GHz
Frequency Stability	+/-1.2 Hz
Power Line Conducted Emission	+ 2.62dB
Occupied bandwidth	+/-0.2Hz

All uncertainty values are expanded standard uncertainty to give a confidence level of 95%, based on coverage factor k=2