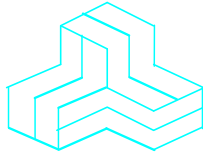


ENGINEERING TEST REPORT



IXM TOUCH 3 FP2
Model: IXM091
FCC ID: S38-T3ENXP

Applicant:

Invoxium Access Inc.
111 Gordon Baker Road, Suite 300
Toronto, Ontario
Canada M2H 3R1

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.: 26INVX180_FCC15C225

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

Date: July 14, 2026

Report Prepared by: Dan Huynh

Tested by: Angus Au

Issued Date: July 14, 2026

Test Date(s):
June 26, 2026

- The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.
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Lab Code: 0685



APEC TEL CA0001



1309



CA 0001/2049



AT-1945



SL2-IN-E-1119R



Korea KCC-RRR
CA0001

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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:	Equipment Certification for Class II Permissive Change
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 47 CFR 15	2026	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 of Procedures for Compliance Testing of Unlicensed Wireless Devices

EXHIBIT 2. PERFORMANCE ASSESSMENT

2.1. CLIENT INFORMATION

Applicant	
Name:	Invixium Access Inc.
Address:	111 Gordon Baker Road, Suite 300 Toronto, Ontario Canada M2H 3R1

Manufacturer	
Name:	Mara Technologies Inc.
Address:	5680 14th Avenue Markham, Ontario Canada L3S 3K8

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:	Invixium Access Inc.
Product Name:	IXM TOUCH 3 FP2
Model Name or Number:	IXM091
Serial Number:	Test sample
Type of Equipment:	Part 15 Low Power Communication Device Transmitter
Input Power Supply Type:	DC external power supply
Primary User Functions of EUT:	Access Control

2.3. EUT'S TECHNICAL SPECIFICATIONS

Transmitter	
Intended Operating Environment:	Commercial, light industry & heavy industry
Power Supply Requirement:	5V, 3.3V DC
Operating Frequency Range:	13.56 MHz
Field Strength:	53.56 dBµV/m at 10 m
20 dB Bandwidth:	3.045 kHz
Modulation Type:	ASK
Antenna Connector Type:	Integral, PCB Loop Antenna

2.4. LIST OF EUT'S PORTS

Port Number	EUT's Port Description	Number of Identical Ports	Connector Type	Cable Type (Shielded/Non-shielded)
1	Vin+, Vin-	1	Header	Non-Shielded, <3m
2	Wiegand Input (2 Lines)	1	Header	Non-Shielded >3m
3	Wiegand Output (2 Lines)	1	Header	Non-Shielded, > 3m
4	RS-485 (3 lines)	1	Header	Non-Shielded, > 3m
5	RS-232 (Tx, Rx)	1	Header	Non-Shielded, Service Port
6	USB 2.0 OTG	1	USB uAB	Service Port
7	Gigabit Ethernet	1	RJ-45	Non-Shielded, > 3m
8	Form C Relay, 3 lines	1	Header	Non-Shielded
9	General Purpose Output	2	Header	Non-Shielded
10	General Purpose Input	2	Header	Non-Shielded
11	General Purpose I/O for Door control	4	Header	Non-Shielded
12	GND for different interfaces	4	Header	Non-Shielded
13	EGND	1	Header	Non-Shielded
14	DS_OUT	1	Header	Non-Shielded
15	Access Control Panel LED	2	Header	Non-Shielded

2.5. ANCILLARY EQUIPMENT

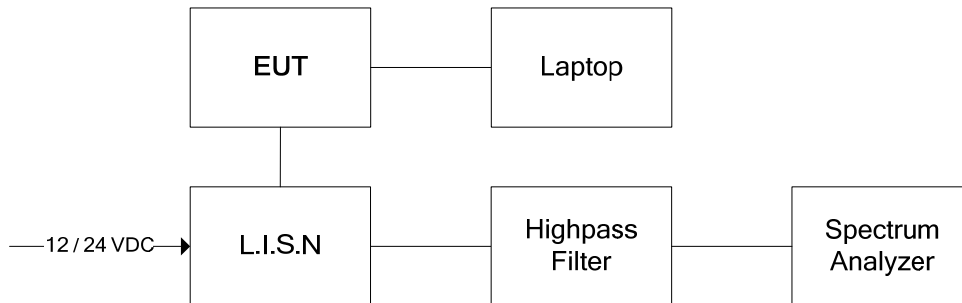
The EUT was tested while connected to the following representative configuration of ancillary equipment necessary to exercise the ports during tests:

- 1) MIFARE Smart Card
- 2) HP Elitebook 2560P Laptop

2.6. GENERAL TEST SETUP

2.6.1. Conducted Emissions

EUT Powered by External DC Power Supply



2.6.2. Radiated Emissions

EUT Powered by External DC Power Supply

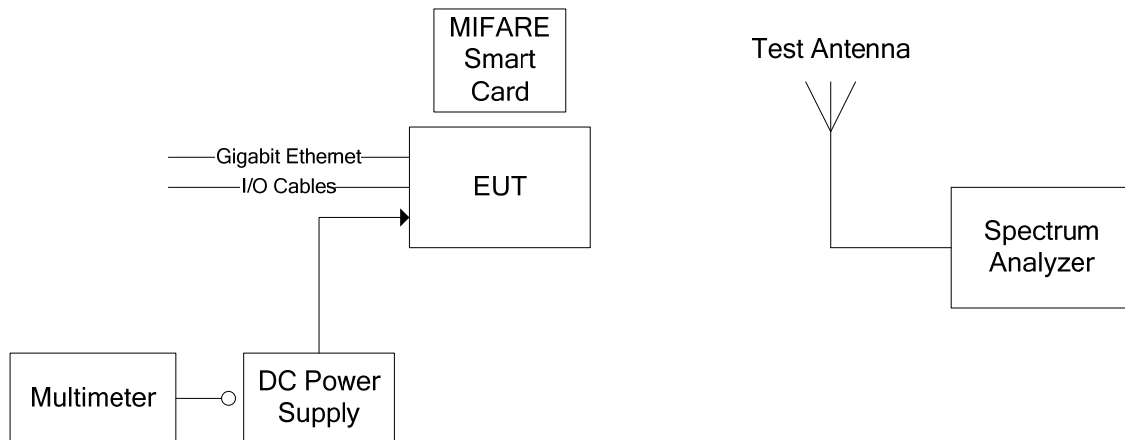


EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

3.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

Temperature:	21 to 23 °C
Humidity:	45 to 58%
Pressure:	102 kPa
Power input source:	12-24V DC

3.2. OPEPERATIONAL 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):	53.56 dBμV/m Peak at 10 m
▪ Normal Test Modulation:	ASK
▪ Modulating signal source:	Internal

EXHIBIT 4. SUMMARY OF TEST RESULTS

4.1. TEST LAB AND LOCATION

Company Name:	Ultratech Engineering labs Inc.	
Address:	3000 Bristol Circle, Oakville, Ontario, Canada, L6H 6G4 Tel.: (905) 829-1570 Fax.: (905) 829-8050 Website: www.ultratech-labs.com ,	
Test Site/Company Number:	FCC	ISED
	MRA: APEC TEL Designation no. CA0001 FRN: 0003781366	Company No.: 2049A CAB Identifier: CA0001

4.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

FCC Regulations	Test Requirements	Compliance (Yes/No)
15.203	Antenna Requirement	Yes ¹
15.207(a)	Class B - Power Line Conducted Emissions	Yes
15.215(c)	Emission Bandwidth	Yes ²
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	N/A

¹ The EUT complies with the requirement; it employs integral antenna.

² Refer to original filing test report.

4.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None.

EXHIBIT 5. TEST DATA

5.1. POWER LINE CONDUCTED EMISSIONS [§15.207(a)]

5.1.1. Limit(s)

The equipment shall meet the limits of the following table:

Frequency of emission (MHz)	Conducted Limits (dBµV)	
	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

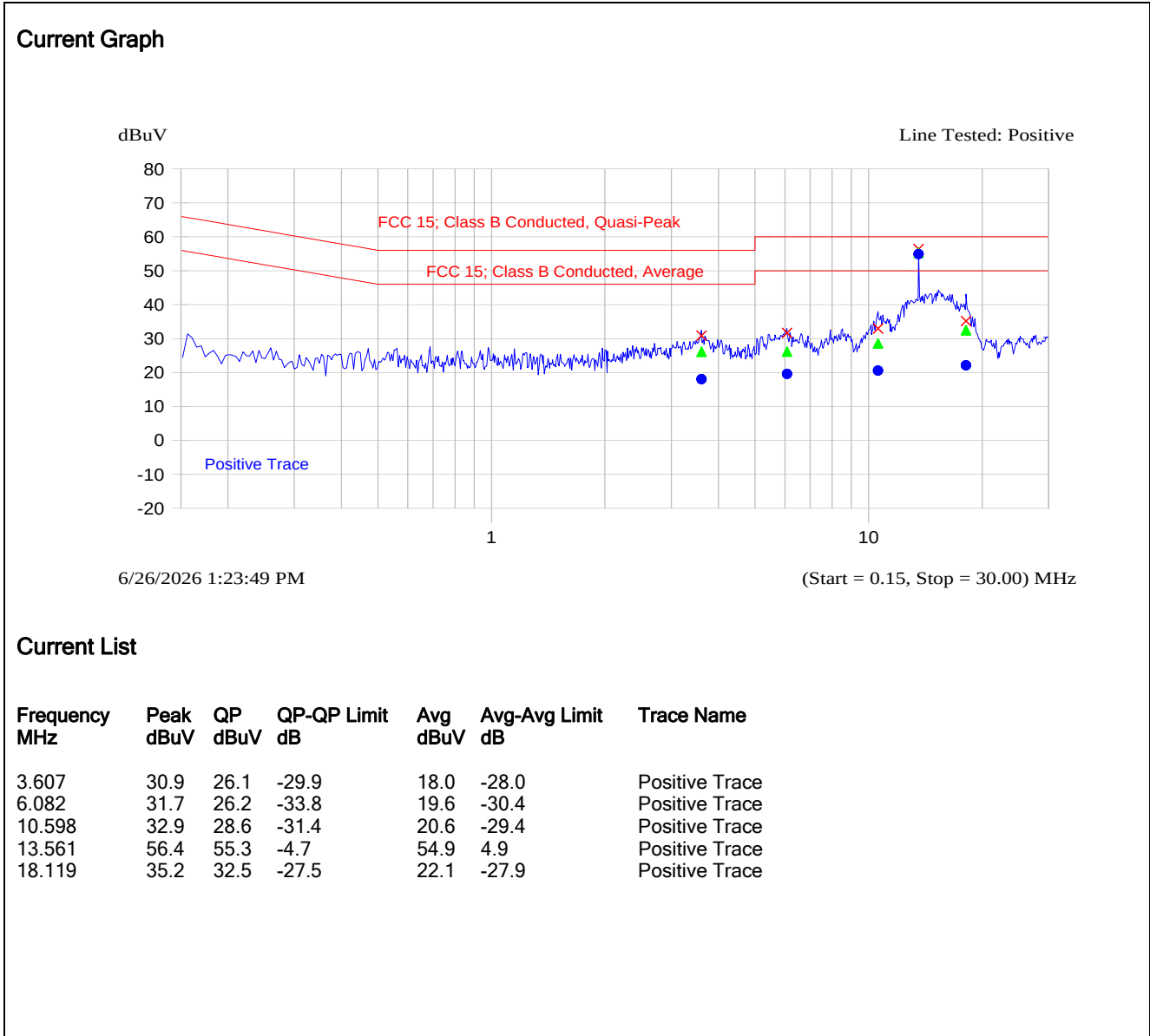
5.1.2. Method of Measurements

ANSI C63.4

5.1.3. Test Data

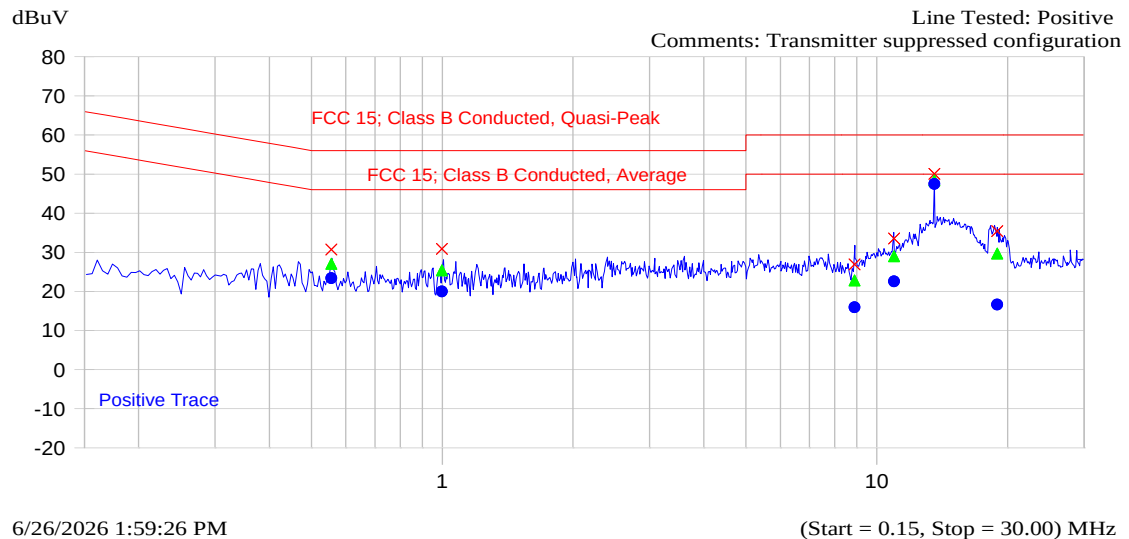
Note: The radiated emissions from intentional radiator below 30MHz (13.56 MHz Tx) were shielded by wrapping the EUT in aluminum foil for the purpose of eliminating any radiated coupling onto the device's AC power cable or LISN during testing. The results presented below represents the worst-case test configurations.

Plot 5.1.3.1. Power Line Conducted Emissions (without suppression method)
Line Voltage: 24 VDC; Line Tested: Positive



Plot 5.1.3.2. Power Line Conducted Emissions (with suppression method)
Line Voltage: 24 VDC; Line Tested: Positive

Current Graph

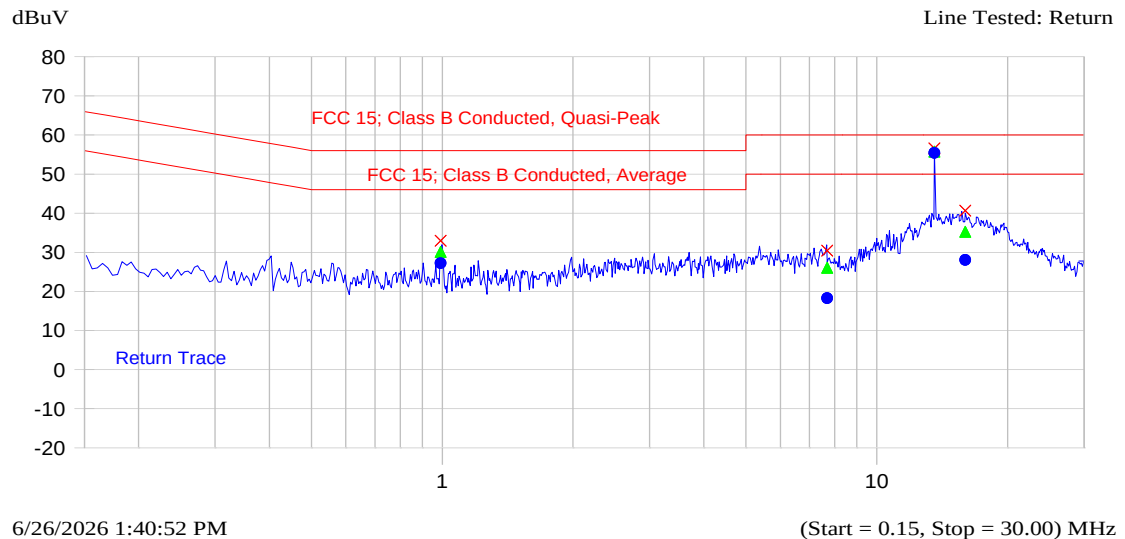


Current List

Frequency MHz	Peak dBuV	QP dBuV	QP-QP Limit dB	Avg dBuV	Avg-Avg Limit dB	Trace Name	Comment
0.555	30.7	27.0	-29.0	23.4	-22.6	Positive Trace	
0.998	30.9	25.4	-30.6	20.0	-26.0	Positive Trace	
8.884	26.9	22.8	-37.2	15.9	-34.1	Positive Trace	
10.951	33.5	29.0	-31.0	22.6	-27.4	Positive Trace	
13.562	50.0	48.4	-11.6	47.5	-2.5	Positive Trace	
18.926	35.4	29.7	-30.3	16.6	-33.4	Positive Trace	

Plot 5.1.3.3. Power Line Conducted Emissions (without suppression method)
Line Voltage: 24 VDC; Line Tested: Return

Current Graph

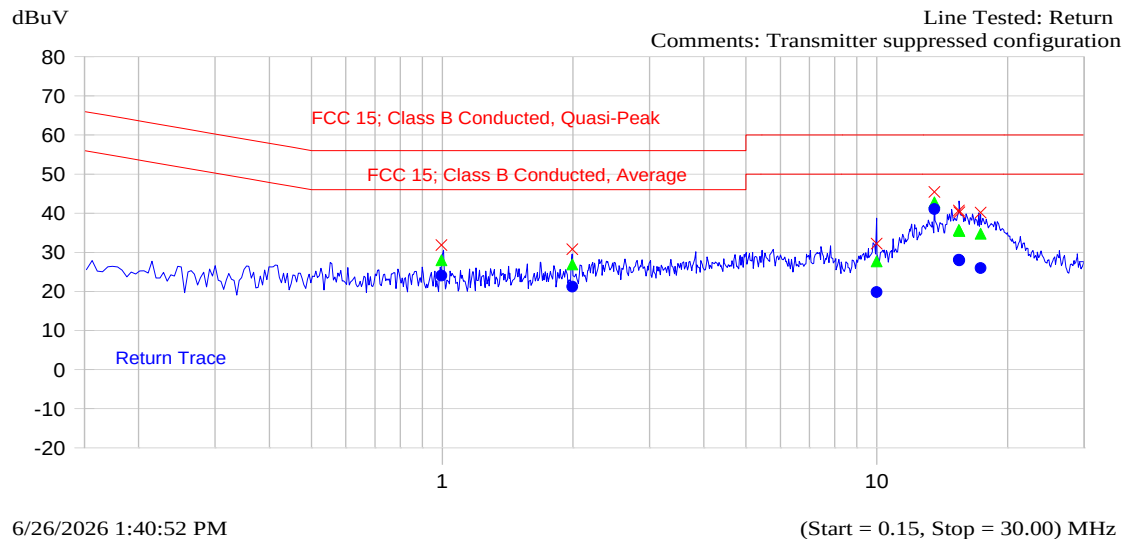


Current List

Frequency MHz	Peak dBuV	QP dBuV	QP-QP Limit dB	Avg dBuV	Avg-Avg Limit dB	Trace Name	Comment
0.991	32.9	30.1	-25.9	27.2	-18.8	Return Trace	
7.682	30.4	26.0	-34.0	18.3	-31.7	Return Trace	
13.560	56.6	55.7	-4.3	55.4	5.4	Return Trace	
15.968	40.7	35.2	-24.8	28.0	-22.0	Return Trace	

Plot 5.1.3.4. Power Line Conducted Emissions (with suppression method)
Line Voltage: 24 VDC; Line Tested: Return

Current Graph



Current List

Frequency MHz	Peak dBuV	QP dBuV	QP-QP Limit dB	Avg dBuV	Avg-Avg Limit dB	Trace Name	Comment
15.451	40.7	35.7	-24.3	28.1	-21.9	Return Trace	
0.996	31.8	28.0	-28.0	24.0	-22.0	Return Trace	
1.992	30.8	26.9	-29.1	21.2	-24.8	Return Trace	
9.985	32.2	27.7	-32.3	19.8	-30.2	Return Trace	
13.560	45.4	42.8	-17.2	41.1	-8.9	Return Trace	
15.477	40.2	35.5	-24.5	27.9	-22.1	Return Trace	
17.332	40.2	34.7	-25.3	26.0	-24.0	Return Trace	

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

5.2.1. 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

5.2.2. Method of Measurements

ANSI C63.10 and ANSI C63.4 for measurement methods.

5.2.3. Test Data

Remarks:

- Radiated spurious emissions measurements were performed at a measuring distance of 10 m or 3 m, from 10 kHz – 1 GHz 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 as applicable to compare with limit and measurement distance specified in section 15.209(a), using an extrapolation factor of 40 dB/decade for determining compliance.

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

EUT Powered by External DC Power Supply						
Frequency (MHz)	Measured Field Strength @ 10 m (dBµV/m)	Detector Used (Peak/QP)	Antenna Plane (H/V)	Field Strength Extrapolated Value (dBµV/m)	§ 15.225 Field Strength Limits (dBµV/m)	Margin (dB)
13.56	53.56	Peak	V	34.48	84.0	-49.5
13.56	46.48	Peak	H	27.40	84.0	-56.6

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

EUT Powered by External DC Power Supply						
Frequency (MHz)	Measured Field Strength @ 10 m (dBµV/m)	Detector Used (Peak/QP)	Antenna Plane (H/V)	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.						

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

EUT Powered by External DC Power Supply					
Frequency (MHz)	Measured Field Strength @ 3 m (dBµV/m)	Detector Used (Peak/QP)	Antenna Plane (H/V)	§ 15.209 Field Strength Limits (dBµV/m)	Margin (dB)
40.68	35.23	QP	V	40.0	-4.8
40.68	27.47	QP	H	40.0	-12.5
67.80	24.27	QP	V	40.0	-15.7

EXHIBIT 6. TEST EQUIPMENT LIST

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range	Cal. Due Date
EMC Analyzer	HP	8593EM	3710A00223	9 kHz–22 GHz	02 Sep 2026
LISN	Schwarzbeck Mess Elektronik	NSLK 8127	8127276	9 kHz - 30 MHz	22 Dec 2026
High-pass Filter	Rohde & Schwarz	EZ-25	100064	150 kHz - 30 MHz	29 Oct 2026
Spectrum Analyzer	Rohde & Schwarz	FSU26	100398	20 Hz - 26.5 GHz	26 Sep 2027
Loop Antenna	EMCO	6502	9104-2611	0.01 - 30 MHz	31 Jul 2026
Biconilog Antenna	EMCO	3142B	1575	26 MHz - 2000 MHz	11 Dec 2026
Power Supply	BK Precision	1740	1550497	0-60Vdc, 4 A	See Note 1
Multimeter	Fluke	8842A	5021295	---	25 Jul 2027
Note 1: Internal Verification/Calibration check					

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 #: 26INVX180_FCC15C225
July 14, 2026

All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of CISPR 16-4-2 @ IEC:2003 and JCGM 100:2008 (GUM 1995) – Guide to the Expression of Uncertainty in Measurement.

Test Description	Expanded Uncertainty, K=2 for 95% Confidence Level
Power Line Conducted Emissions	± 2.62 dB
Radiated Emissions	± 2.68 dB (10 kHz - 30 MHz)
	± 4.30 dB (30 MHz – 1 GHz)

ULTRATECH GROUP OF LABS

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

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