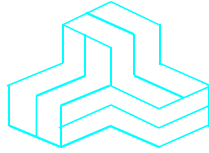


ENGINEERING TEST REPORT



IXM TOUCH 3 FP2 PWB
Model: IXM091PWB
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, Section 15.209

UltraTech's File No.: 26INVX177_FCC15C209

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

Date: March 27, 2026

Report Prepared by: Dan Huynh

Tested by: Angus Au

Issued Date: March 27, 2026

Test Date(s):
February 4 - March 5, 2026

- *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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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
Title:	Code of Federal Regulations (CFR), Title 47 Telecommunication, Part 15, Subpart C Intentional Radiators
Purpose of Test:	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 47 CFR 15	2025	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:	Invoxium 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:	Invoxium Access Inc.
Product Name:	IXM TOUCH 3 FP2 PWB
Model Name or Number:	IXM091PWB
Serial Number:	Test sample
Type of Equipment:	Part 15 Low Power Transmitter Below 1705 kHz
Input Power Supply Type:	DC external power supply / Power over Ethernet (PoE)
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:	121 kHz
Field Strength:	73.87 dB μ V/m peak at 3m distance
20 dB Bandwidth:	4.647 kHz
Modulation Type:	Load modulation
Antenna Connector Type:	Integral, Invixium Access Inc. 125 kHz wire 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
2	Wiegand Out	2	Header	Non-shielded
3	Wiegand In	2	Header	Non-shielded
4	RS-485	3	Header	Non-shielded
5	RS232	2	Header	Non-shielded
6	USB 2.0 OTG	1	uAB	Service Port
7	Gigabit Ethernet	1	RJ-45	Non-shielded
8	Form C Relay	3	Header	Non-shielded
9	Door Access Control	3	Header	Non-shielded
10	GPI	3	Header	Non-shielded
11	GPO	3	Header	Non-shielded
12	GND	3	Header	Non-shielded
13	EGND	1	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:

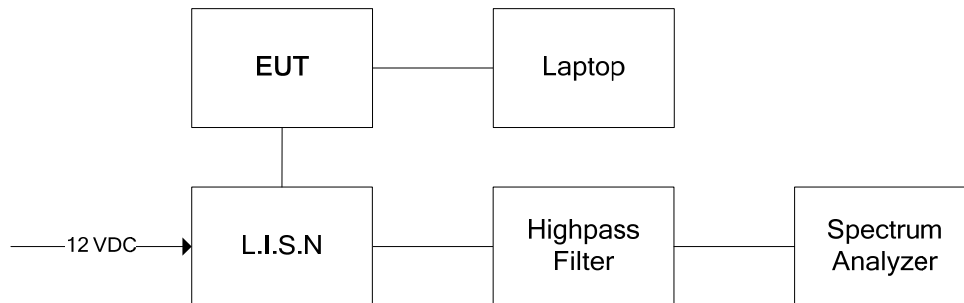
- 1) Cisco Power Injector, M/N: POE16U-1AF
- 2) EM Prox Card
- 3) HP Elitebook 2560P Laptop

NOTE: Invixium neither sells or recommends used of power injector.

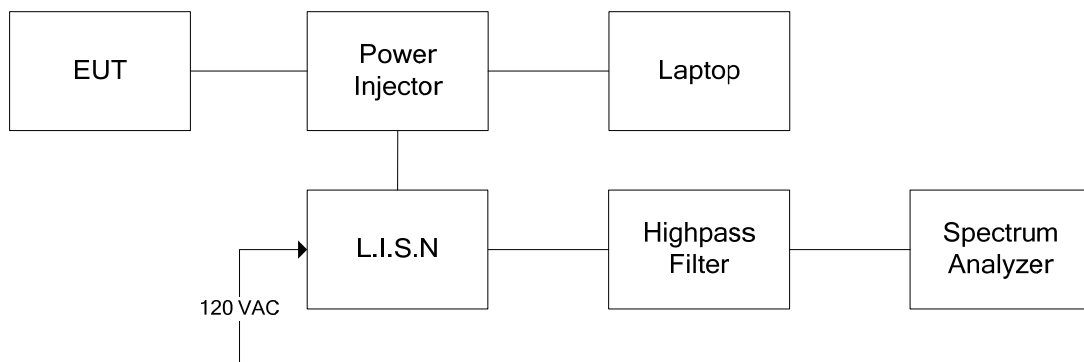
2.6. TEST SETUP BLOCK DIAGRAM

2.6.1. Conducted Emissions

EUT Powered by External DC Power Supply

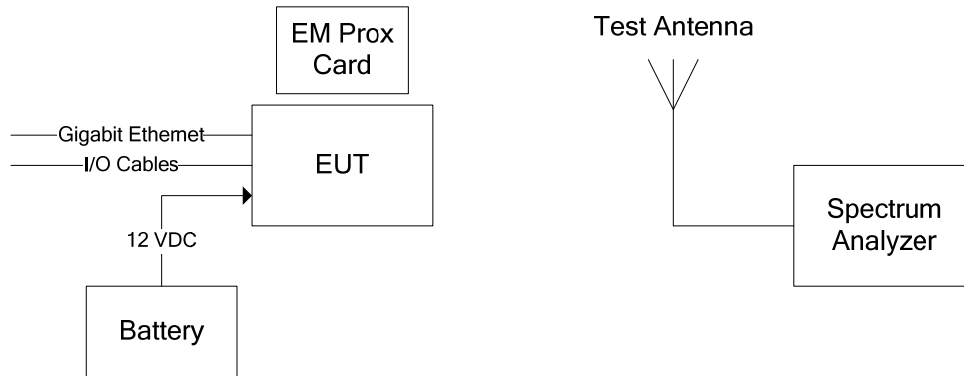


EUT Powered by PoE Adapter



2.6.2. Radiated Emissions

EUT Powered by External DC Power Supply



EUT Powered by PoE Adapter

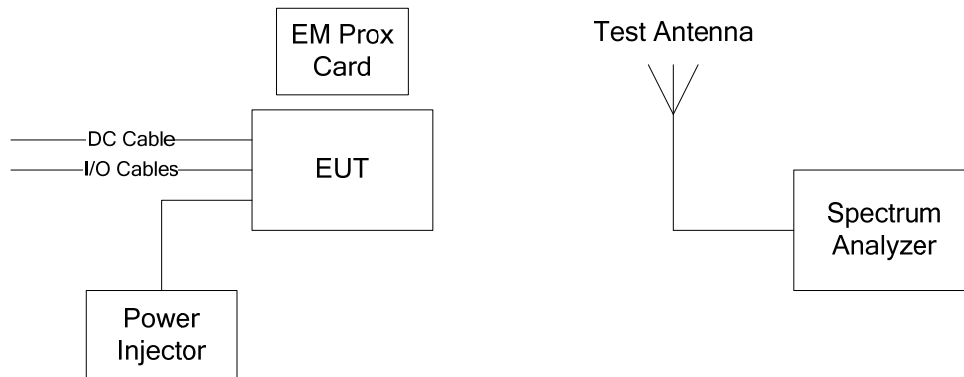


EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

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 / Power over Ethernet (PoE)

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):	121 kHz
Test Frequency(ies):	121 kHz
RF Power Output:	73.87 dBμV/m Peak at 3m distance
Normal Test Modulation:	Load modulation
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.

- AC 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 Section(s)	Test Requirements	Compliance (Yes/No)
15.203	Antenna Requirement	Yes*
15.207(a)	Power Line Conducted Emissions	Yes
15.209(a)	20 dB Bandwidth	Yes
15.209	Transmitter Radiated Emissions - Fundamental, Harmonic and Spurious Emissions	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. 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 (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

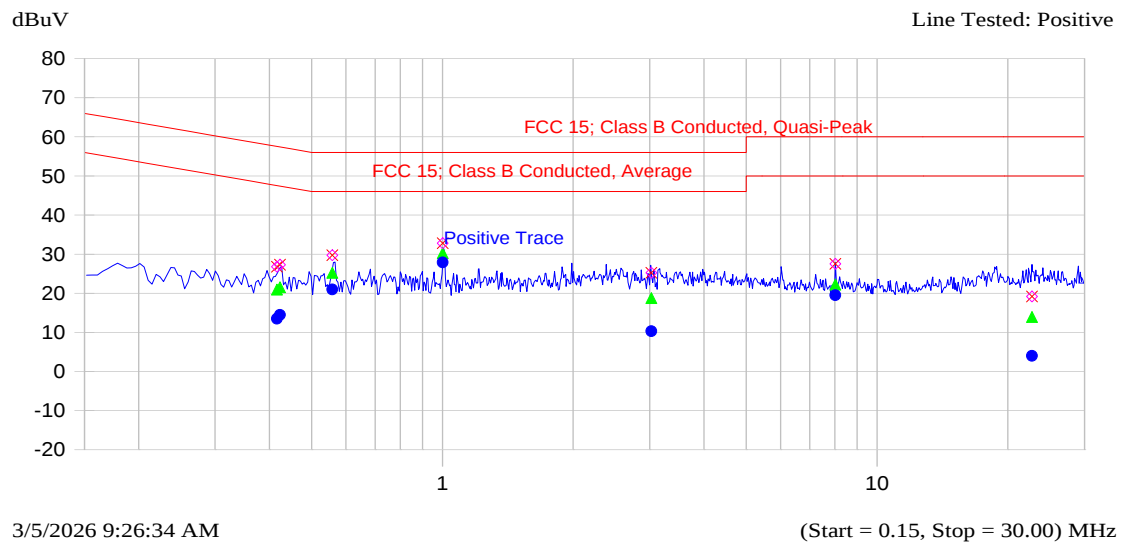
ANSI C63.4

5.1.3. Test Data

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

Plot 5.1.3.1. Power Line Conducted Emissions
Line Voltage: 12 VDC; Line Tested: Positive

Current Graph

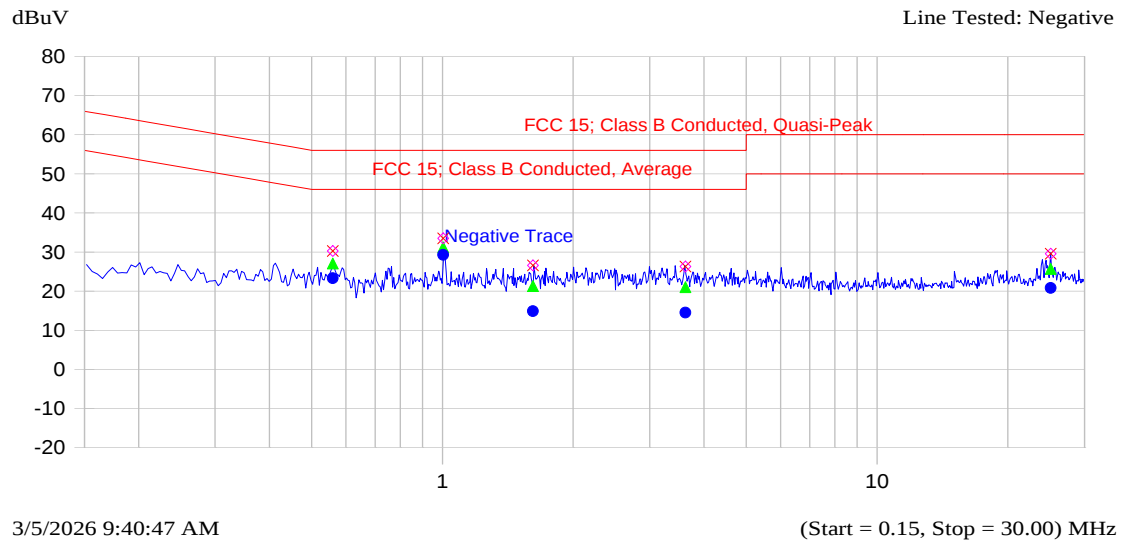


Current List

Frequency MHz	Peak dBuV	QP dBuV	QP-QP Limit dB	Avg dBuV	Avg-Avg Limit dB	Trace Name
0.416	26.8	21.0	-36.6	13.5	-34.0	Positive Trace
0.423	27.3	21.5	-35.9	14.5	-32.9	Positive Trace
0.558	29.7	25.2	-30.8	21.0	-25.0	Positive Trace
1.001	32.8	30.3	-25.7	27.9	-18.1	Positive Trace
3.024	25.2	18.8	-37.2	10.3	-35.7	Positive Trace
8.019	27.5	22.2	-37.8	19.5	-30.5	Positive Trace
22.723	19.2	13.9	-46.1	4.0	-46.0	Positive Trace

Plot 5.1.3.2. Power Line Conducted Emissions
Line Voltage: 12 VDC; Line Tested: Negative

Current Graph

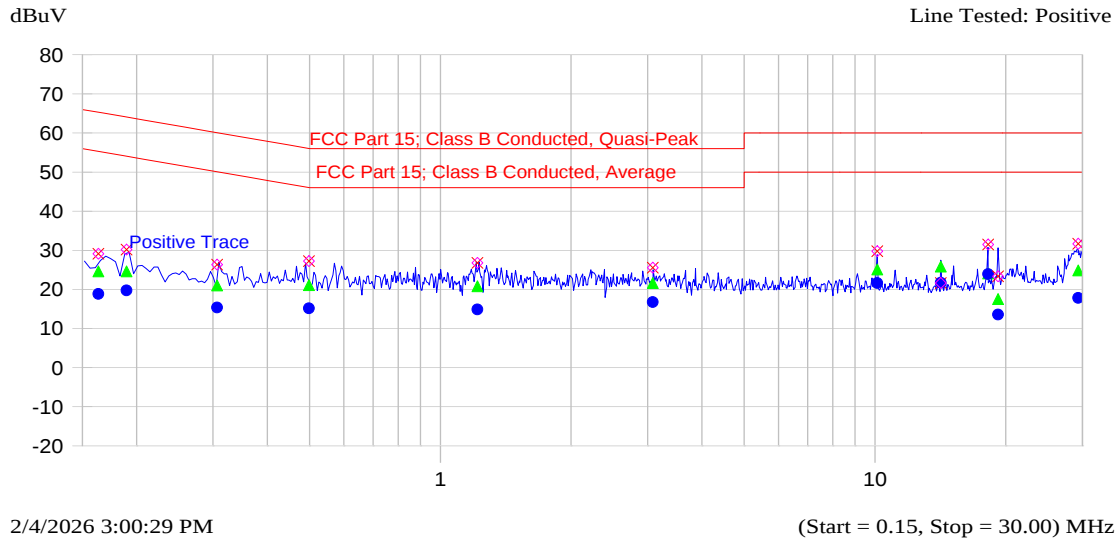


Current List

Frequency MHz	Peak dBuV	QP dBuV	QP-QP Limit dB	Avg dBuV	Avg-Avg Limit dB	Trace Name
0.559	30.2	27.1	-28.9	23.3	-22.7	Negative Trace
1.004	33.5	31.2	-24.8	29.3	-16.7	Negative Trace
1.617	26.6	21.3	-34.7	14.9	-31.1	Negative Trace
3.624	26.3	21.0	-35.0	14.5	-31.5	Negative Trace
25.091	29.6	25.7	-34.3	20.8	-29.2	Negative Trace

Plot 5.1.3.3. Power Line Conducted Emissions
Line Voltage: 24 VDC; Line Tested: Positive

Current Graph

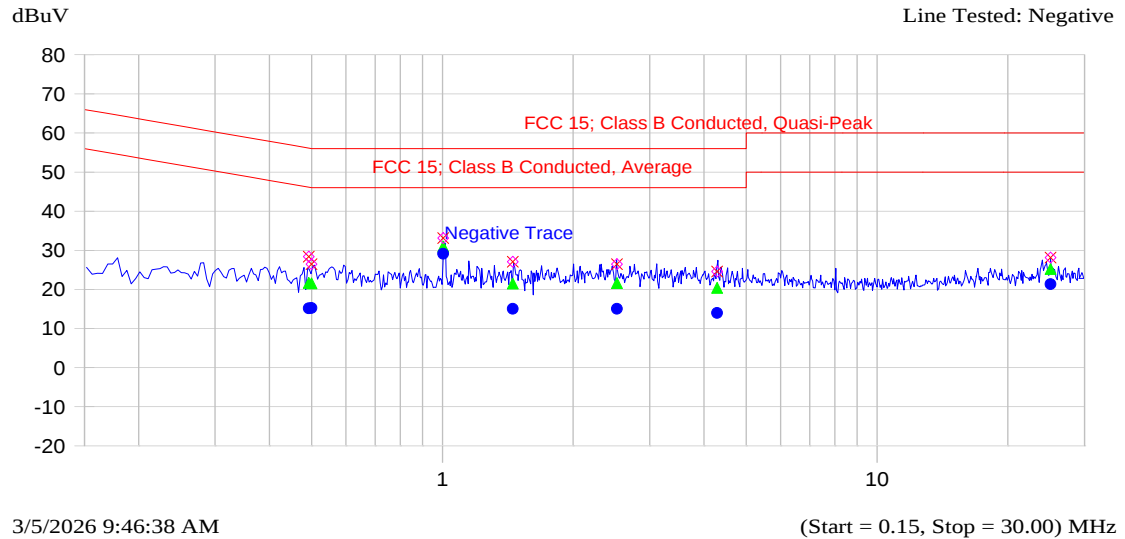


Current List

Frequency MHz	Peak dBuV	QP dBuV	QP-QP Limit dB	Avg dBuV	Avg-Avg Limit dB	Trace Name
0.163	29.1	24.6	-40.7	18.9	-36.4	Positive Trace
0.190	30.2	24.6	-39.4	19.7	-34.3	Positive Trace
0.306	26.3	21.0	-39.1	15.4	-34.7	Positive Trace
0.499	27.2	21.1	-34.9	15.1	-30.9	Positive Trace
1.217	26.8	20.8	-35.2	14.9	-31.1	Positive Trace
3.082	25.5	21.6	-34.4	16.7	-29.3	Positive Trace
10.124	29.8	25.1	-34.9	21.6	-28.4	Positive Trace
14.160	21.6	25.9	-34.1	21.7	-28.3	Positive Trace
18.202	31.5	24.1	-35.9	23.9	-26.1	Positive Trace
19.203	23.3	17.5	-42.5	13.6	-36.4	Positive Trace
29.339	31.7	24.9	-35.1	17.8	-32.2	Positive Trace

Plot 5.1.3.4. Power Line Conducted Emissions
Line Voltage: 24 VDC; Line Tested: Negative

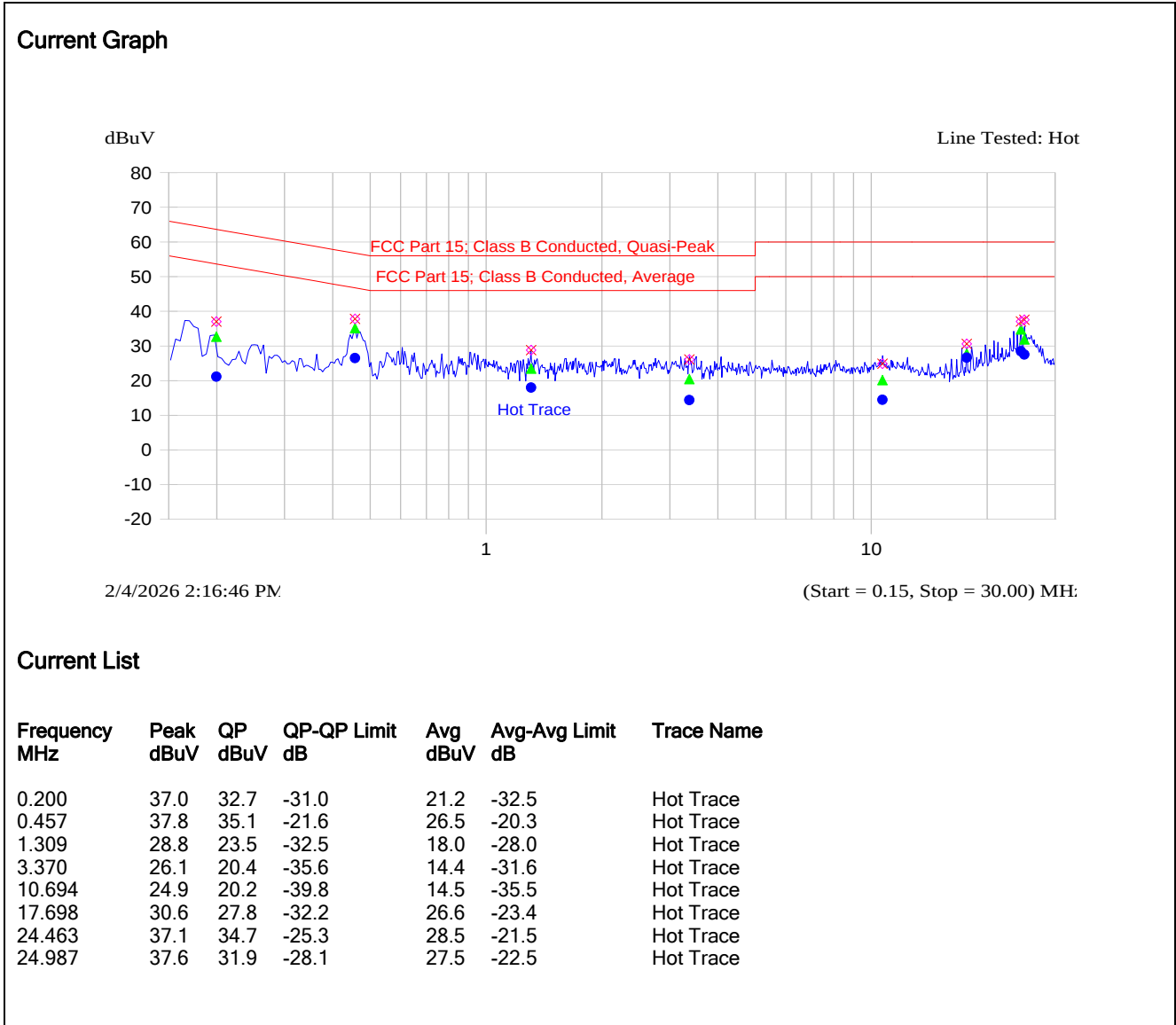
Current Graph



Current List

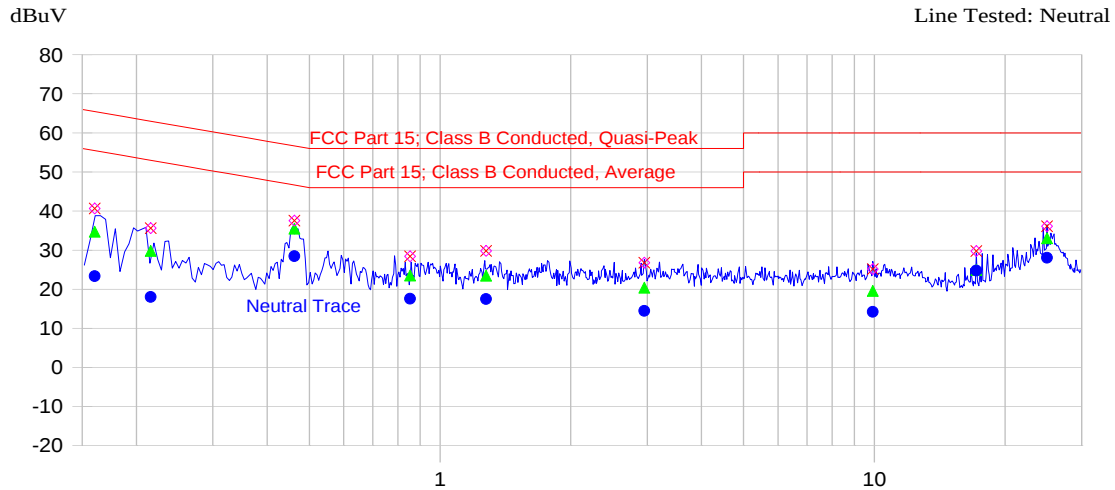
Frequency MHz	Peak dBuV	QP dBuV	QP-QP Limit dB	Avg dBuV	Avg-Avg Limit dB	Trace Name
0.500	26.5	21.5	-34.5	15.3	-30.7	Negative Trace
0.493	28.4	21.7	-34.5	15.2	-30.9	Negative Trace
1.004	33.1	30.9	-25.1	29.1	-16.9	Negative Trace
1.452	27.1	21.5	-34.5	15.0	-31.0	Negative Trace
2.520	26.5	21.6	-34.4	15.0	-31.0	Negative Trace
4.287	24.6	20.4	-35.6	14.0	-32.0	Negative Trace
25.058	28.1	25.2	-34.8	21.3	-28.7	Negative Trace

Plot 5.1.3.5. Power Line Conducted Emissions
PoE, Line Voltage120 VAC, Line Tested: Hot



Plot 5.1.3.6. Power Line Conducted Emissions
PoE, Line Voltage 120 VAC, Line Tested: Neutral

Current Graph



(Start = 0.15, Stop = 30.00) MHz

Current List

Frequency MHz	Peak dBuV	QP dBuV	QP-QP Limit dB	Avg dBuV	Avg-Avg Limit dB	Trace Name
0.160	40.7	34.7	-30.7	23.4	-32.1	Neutral Trace
0.216	35.6	29.8	-33.2	18.0	-35.0	Neutral Trace
0.462	37.6	35.5	-21.2	28.5	-18.2	Neutral Trace
0.853	28.4	23.5	-32.5	17.6	-28.4	Neutral Trace
1.278	29.8	23.5	-32.5	17.5	-28.5	Neutral Trace
2.954	26.8	20.4	-35.6	14.5	-31.5	Neutral Trace
9.910	25.1	19.6	-40.4	14.2	-35.8	Neutral Trace
17.171	29.8	24.9	-35.1	24.8	-25.2	Neutral Trace
24.977	36.1	33.0	-27.0	28.0	-22.0	Neutral Trace

5.2. TRANSMITTER RADIATED EMISSIONS [47 CFR §§ 15.209 & 15.205]

5.2.1. Limit(s)

§ 15.209 Radiated emission limits; general requirements.

(a) Except as provided elsewhere in this subpart, 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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.

(b) In the emission table above, the tighter limit applies at the band edges.

(c) The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. For intentional radiators which operate under the provisions of other sections within this part and which are required to reduce their unwanted emissions to the limits specified in this table, the limits in this table are based on the frequency of the unwanted emission and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.

(d) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

(e) The provisions in §§15.31, 15.33, and 15.35 for measuring emissions at distances other than the distances specified in the above table, determining the frequency range over which radiated emissions are to be measured, and limiting peak emissions apply to all devices operated under this part.

(f) In accordance with §15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation of a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in §15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in §15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit. Emissions which must be measured above the tenth harmonic of the highest fundamental frequency designed to be emitted by the

intentional radiator and which fall within the restricted bands shall comply with the general radiated emission limits in §15.109 that are applicable to the incorporated digital device.

(g) Perimeter protection systems may operate in the 54-72 MHz and 76-88 MHz bands under the provisions of this section. The use of such perimeter protection systems is limited to industrial, business and commercial applications.

5.2.2. Method of Measurements

ANSI C63.10 for measurement methods.

5.2.3. Test Data

Remarks:

- The measuring receiver shall be tuned over the frequency range 10 kHz to 1 GHz.
- All spurious emissions that are in excess of 20 dB below the specified limit shall be recorded.
- EUT was initially tested at 3m and the value measured at 3m shall be extrapolated as applicable to compare with limit and measurement distance specified in section 15.209(a).

5.2.3.1. Fundamental Emissions

Remarks:

- Field strength limit of the fundamental 121 kHz at 300m distance is $20\log(2400/121) = 25.9$ dBμV/m
- For frequency band 0.009- 0.490 MHz, the measured E-Field at 3m (column 2) will be extrapolated to 300m E-Field Level (column 3) using the extrapolation factor of $40\log(3/300) = -80$ dB

EUT Powered by External DC Power Supply					
Frequency (kHz)	Peak E-Field at 3m (dBμV/m)	Extrapolated E-Field Level at 300m (dBμV/m)	Antenna Plane (H/V)	§ 15.209 (a) Limits @ 300m (dBμV/m)	Margin (dB)
121	73.87	-6.13	V	25.9	-32.0
121	70.94	-9.06	H	25.9	-35.0

EUT Powered by PoE Adapter					
Frequency (kHz)	Peak E-Field at 3m (dBμV/m)	Extrapolated E-Field Level at 300m (dBμV/m)	Antenna Plane (H/V)	§ 15.209 (a) Limits @ 300m (dBμV/m)	Margin (dB)
121	73.81	-6.19	V	25.9	-32.1
121	70.97	-9.03	H	25.9	-34.9

5.2.3.2. Harmonic/Spurious Emissions

Remarks:

- For frequency band 0.009- 0.490 MHz, the measured E-Field at 3m (column 2) will be extrapolated to 300m E-Field Level (column 3) using the extrapolation factor of $40 \cdot \log(3/300) = -80$ dB
- For frequency bands 0.490-1.705 MHz and 1.705-30.0 MHz, the measured E-Field at 3m (column 2) will be extrapolated to 30m E-Field Level (column 3) using the extrapolation factor of $40 \cdot \log(3/30) = -40$ dB

Frequency (MHz)	Peak E-Field @ 3m (dB μ V/m)	Extrapolated E-Field Level (dB μ V/m)	Antenna Plane (H/V)	§ 15.209 (a) Limits (dB μ V/m)	Margin (dB)
0.010 - 0.490	*	*	H / V	*	*
0.490 - 1.705	*	*	H / V	*	*
1.705 - 30.0	*	*	H / V	*	*

* No emissions or harmonics were detected within 20 dB of the limit.

5.3. 20 dB BANDWIDTH [47 CFR 15.209 (a)]

5.3.1. Limit(s)

Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., [§§ 15.231](#) and [15.241](#).

5.3.2. Method of Measurements

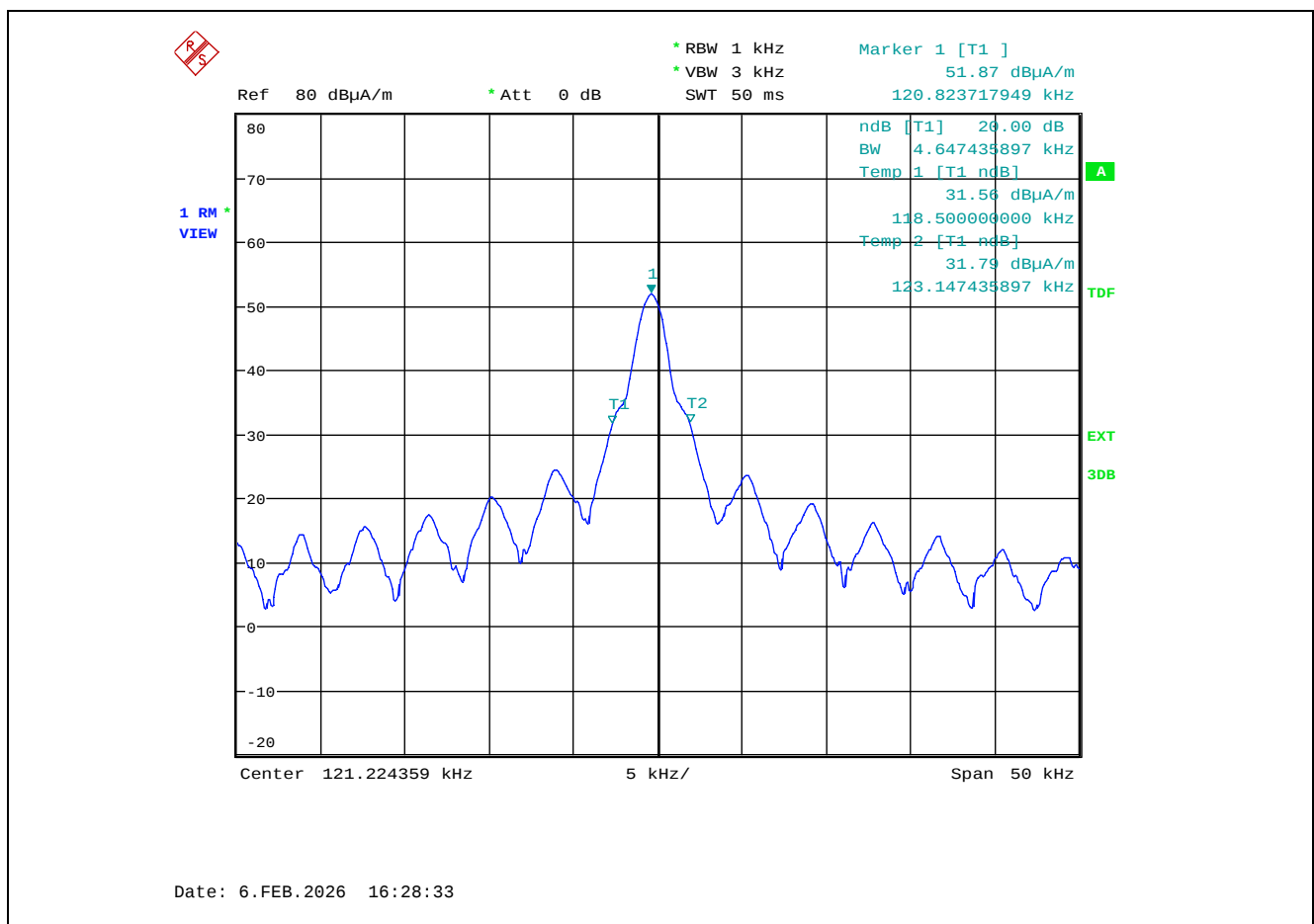
ANSI C63.10

5.3.3. Test Data

Channel Frequency	20 dB Bandwidth	99 %Occupied Bandwidth
121 kHz	4.647 kHz	5.369 kHz

See the following plot for details.

Plot 5.3.3.1. 20 dB Bandwidth, Fc: 121 kHz



Plot 5.3.3.2. 99% Occupied Bandwidth, Fc: 121 kHz

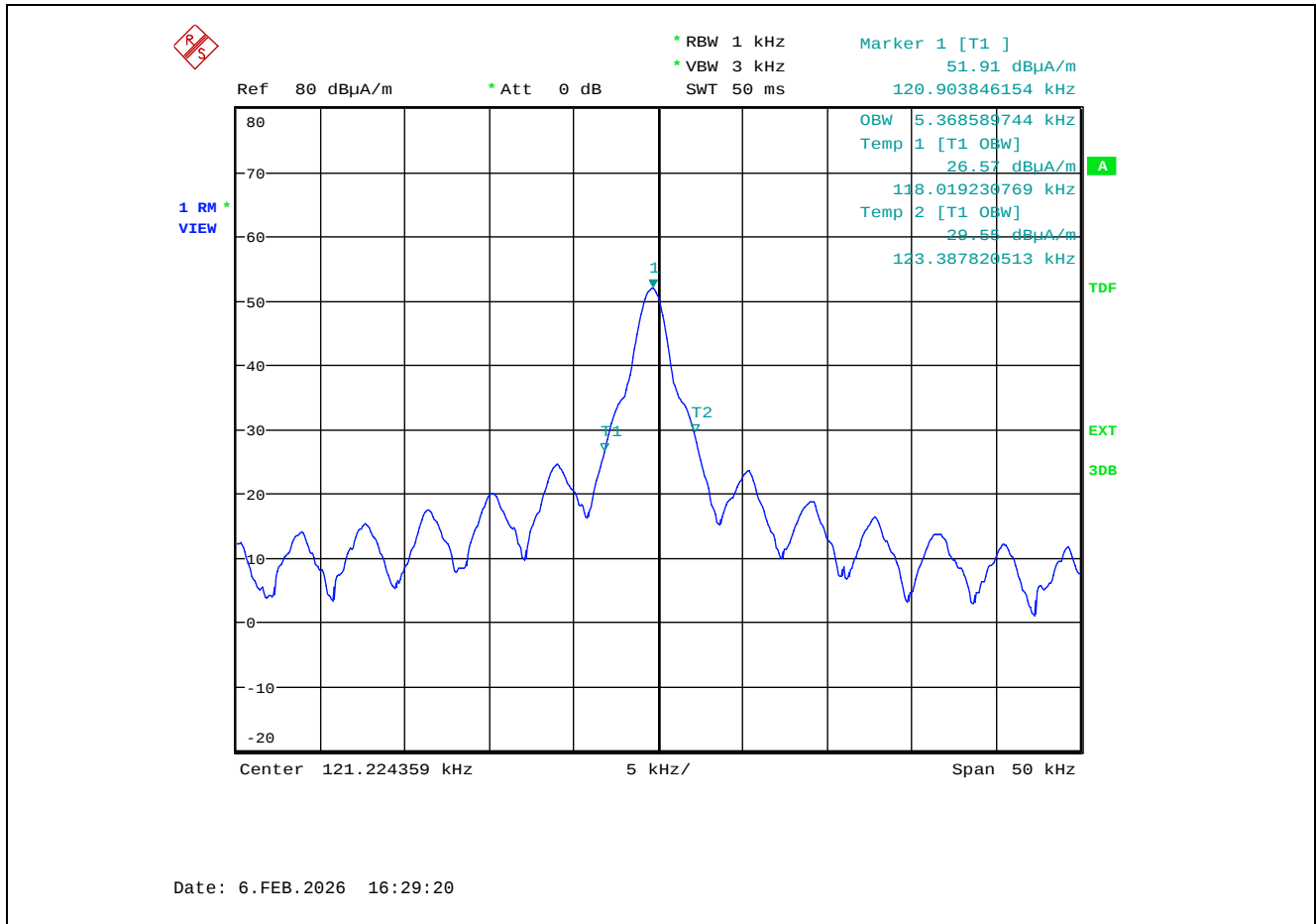


EXHIBIT 6. TEST EQUIPMENT LIST

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	20Hz–26.5 GHz	26 Sep 2027
Loop Antenna	EMCO	6502	9104-2611	0.01 – 30 MHz	13 Jun 2026
Biconilog Antenna	EMCO	3142B	1575	26 MHz - 2000 MHz	12 Nov 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 #: 26INVX177_FCC15C209

March 27, 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)
Frequency Stability/Bandwidth	± 2 Hz

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>

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March 27, 2026

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