UltraTech
Group of Labs

FCC TCB & ISED CB

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AT-1945

SL2-IN-E-1119R

CA2049

3000 Bristol Circle,
Oakville, Ontario,
Canada L6H 6G4
Tel.: (905) 829-1570
Fax.: (905) 829-8050
Website: www.ultratech-labs.com
Email: vic@ultratech-labs.comm

January 11, 2018

Elprotronic Inc
35 Austin Rumble Court
King City, Ontario
Canada, L7B 0B2

Attn.:	**Mr. Gregory Czajkowski**
Subject:	**Verification Testing under CISPR 11:2009 + A1:2010 / EN 55011:2009 +A1:2010, Class A, Group 1 - Industrial, Scientific and Medical Equipment.**
Product Name:	**XStreamPro-Iso**
Model:	**X2S**

Dear Mr. Czajkowski,

The product sample, as provided by you, has been tested and found to comply with **CISPR 11:2009 + A1:2010 / EN 55011:2009 +A1:2010, Class A - Industrial, Scientific and Medical Equipment.**

Please note that ISM equipment shall be labeled by the manufacturer indicating Class A and Group of the equipment; for example: **Class A, Group 1 ISM Equipment**.

Enclosed you will find a copy of the engineering report. If you have any queries, please do not hesitate to contact us.

Yours truly,

Tri Minh Luu, BASc.
V.P., Engineering

Encl

VERIFICATION CERTIFICATE

NOT TRANSFERABLE

This Verification Certificate is hereby issued to the named GRANTEE and is VALID ONLY for the equipment identified hereon for use under the rules and regulations listed below:

GRANTEE:	**Elprotronic Inc**
Address:	35 Austin Rumble Court King City, Ontario Canada, L7B 0B2
Contact Person:	Mr. Gregory Czajkowski Phone #: 905-539-0424 Fax #: 905-539-0474 Email Address: gregory@elprotronic.com
Equipment Type:	Class A, Group 1 - Industrial, Scientific and Medical Equipment
Product Name:	**XStreamPro-Iso**
Model:	**X2S**
The above product was tested by UltraTech Engineering Labs Inc. and found to comply with:	European CISPR 11:2009 + A1:2010 / EN 55011:2009 +A1:2010, Class A, Group 1
Date of Authorization:	Janunary 11, 2018

- **Note(s):** *See attached report, UltraTech's File No.: 18ELP015_CISPR11A, dated* January 11, 2018 *for details and conditions of Verification Compliance.*

Approved by: Tri M. Luu, BASc.
V.P. – Engineering

UltraTech

3000 Bristol Circle, Oakville, Ontario, Canada, L6H 6G4
Tel.: (905) 829-1570 Fax.: (905) 829-8050
Website: www.ultratech-labs.com, Email: vic@ultratech-labs.com, Email: tri@ultratech-labs.com

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ENGINEERING TEST REPORT

XStreamPro-Iso
Model: X2S

Applicant: **Elprotronic Inc**
35 Austin Rumble Court
King City, Ontario
Canada, L7B 0B2

Tested in Accordance With

INTERNATIONAL ELECTROTECHNICAL COMMISSION
(International Special Committee on Radio Interference)

CISPR 11:2009 + A1:2010 / EN 55011:2009 +A1:2010
CLASS A, GROUP 1
Industrial, Scientific and Medical (ISM) Equipment

UltraTech's File No.: 18ELP015_CISPR11A

This Test report is Issued under the Authority of Tri M. Luu Vice President of Engineering UltraTech Group of Labs Date: January 11, 2018	
Report Prepared by: Phuong Ho Date: January 11, 2018	Tested by: Mr. Hien Luu & Mrs. Phuong Ngo, EMC/EMI Technicians Test Date: December 22 , 2017

- *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.*

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:	CISPR 11:2009 + A1:2010 / EN 55011:2009 +A1:2010
Title	Limits and methods of measurements of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment
Purpose of Test:	To gain Verification Compliance with CISPR 11:2009 + A1:2010 / EN 55011:2009 +A1:2010 - Class A, Group 1, ISM Equipment.
Test Procedures	Both conducted and Electromagnetic Radiation Disturbance measurements were conducted in accordance with the European Standards CISPR 11:2009 + A1:2010 / EN 55011:2009 +A1:2010 - Limits and Methods of Measurements of Radio Disturbance Characteristics of Industrial, Scientific and Medical (ISM) Equipment.
Environmental Classification:	Light-industry, Commercial & Industry

The CISPR standard defines the acceptable levels of Conducted Disturbance at Mains Ports and Radiated Disturbance emanated from electronic products. Countries are known to require CISPR compliance are ***Australia, Austria, Belgium, Ireland, France, Italy, Spain, Germany, Netherlands, Portugal, Denmark, Luxembourg, Switzerland, Finland, Norway, Sweden, Iceland, Greenland, New Zealand, Japan, United Kingdom, The United States, Canada and etc…***

1.2. REVISION HISTORY

Document	Issue Date	Description
18ELP015_CISPR11A	January 11, 2018	Original Document

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

None

1.4. NORMATIVE REFERENCES

Publication	Year	Title
CISPR 16-1-1 +A1 +A2	2006 2006 2007	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-1: Measuring Apparatus
CISPR 16-1-2 +A1: 2004 +A2: 2006	2003	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-2: Conducted disturbances
CISPR 11 EN 55011 +A1	2009 2009 2010	Limits and methods of measurements of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment
ANSI C63.4	2009	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

EXHIBIT 2. PERFORMANCE ASSESSMENT

2.1. CLIENT INFORMATION

APPLICANT:	
Name:	Elprotronic Inc
Address:	35 Austin Rumble Crt. King City, ON, L7B0B2, Canada
Contact Person:	Dr. Gregory Czajkowski
Email Address:	gregory@elprotronic.com
Telephone No.:	905-539-0424
Fax No.:	905-539-0474

MANUFACTURER:	
Name:	Elprotronic Inc
Address:	35 Austin Rumble Crt. King City, ON, L7B0B2, Canada
Contact Person:	Dr. Gregory Czajkowski
Email Address:	gregory@elprotronic.com
Telephone No.:	905-539-0424
Fax No.:	905-539-0474

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:	ELPROTRONIC INC.
Product Name: *(Product Marketing Name -PMN)*	XStreamPro-Iso
Model Name or Number: *(Hardware Version Identification Number-HVIN)*	X2S
Serial Number:	20171111
Oscillator Frequencies:	12.0 MHz, 25.0 MHz
CPU Frequencies:	168 MHz, 50MHz
Power input ratings:	DC derived from host – USB (5V) or from PoE (48V)
Equipment Environment / Type:	Industrial, Scientific and Medical Equipment

2.3. LIST OF COMPONENTS / PART OF THE EUT

None

2.4. LIST OF EUT'S PORT

Port #	EUT's Port Description	Number of Identical Ports	Port Type (eg. RJ-45, USB etc.)	Connected Cabling Length / Type	Cable Type
1	Ethernet Port	1	RJ-45	Greater than 3m	Non-shielded
2	Ribbon cable	1	14-pins header	-	Non-shielded
3	USB Port	1	USB 2.0 Port B	-	Shielded

2.5. ANCILLARY EQUIPMENT

Ancillary Equipment # 1	
Equipment Make and Name:	PC - ACER
Model Name or Number:	ACER ASPIRE 4830T-6605
Serial Number:	SNID: 22706117116
Cable Type:	DC power
Connected to EUT's Port #: *(See above table)*	USB, Ethernet - USB connected to EUT port 3

Ancillary Equipment # 2	
Equipment Make and Name:	Ethernet Router
Model Name or Number:	DLINK DIR-605L
Serial Number:	R3ET4GA004574
Cable Type:	RJ45- CAT-6
Connected to EUT's Port #: *(See above table)*	

Ancillary Equipment # 3	
Equipment Make and Name:	ETH 8 Port Switch
Model Name or Number:	TP-Link TL-SF1008P
Serial Number:	2155338002586
Cable Type:	RJ45- CAT-6
Connected to EUT's Port #: *(See above table)*	Connected to EUT – port 1

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:	23°C
Humidity:	23%
Pressure:	100.5 kPa
Power input source:	48 VDC (Poe), 5 VDC (USB)

3.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TEST SIGNALS

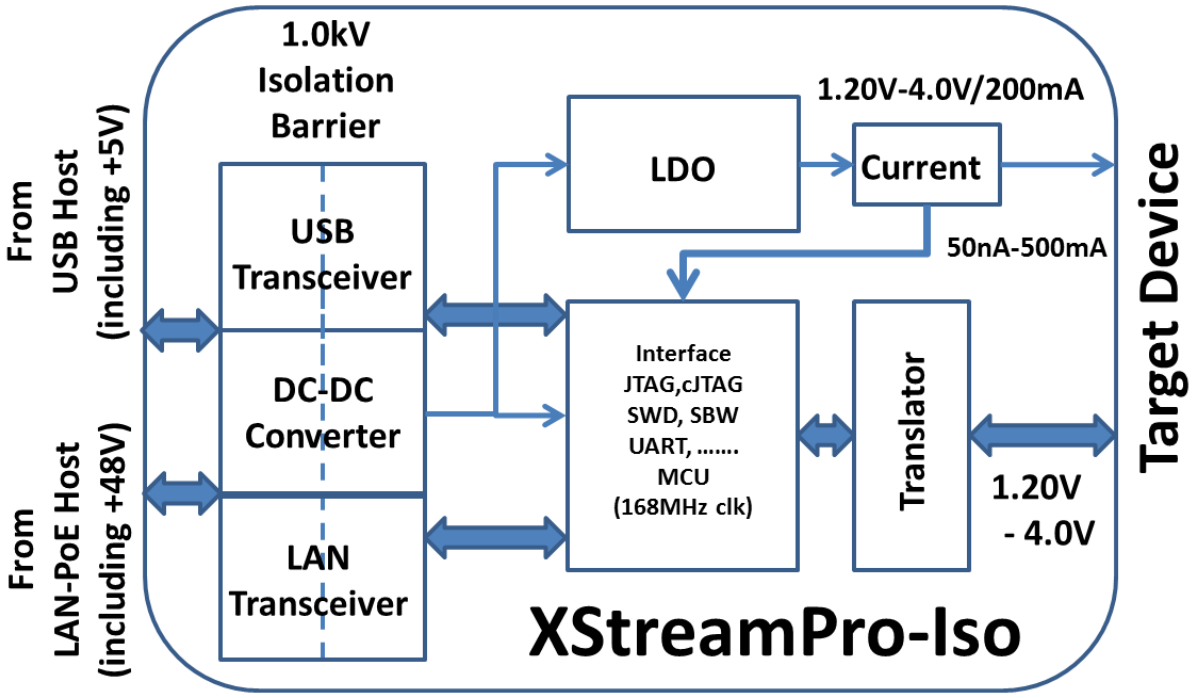
The EUT can be connected to PC via USB OR via Ethernet. The EUT is powered from the USB port if the USB communication is used, or from PoE port (Ethernet) if LAN communication is used. When two communication are connected (USB and LAN) then the active communication is selected in PC. There no communication via two ports at the same time. When EUT is connected to PC, also should be connected any target device that is supported by the EUT. Only EUT is tested. All other equipment listed above should be isolated, shielded for avoiding EUT test degradation.

3.3. TEST DEVIATION / CONFIGURATION: (IF APPLICABLE)

None

3.4. BLOCK DIAGRAM OF TEST SETUP

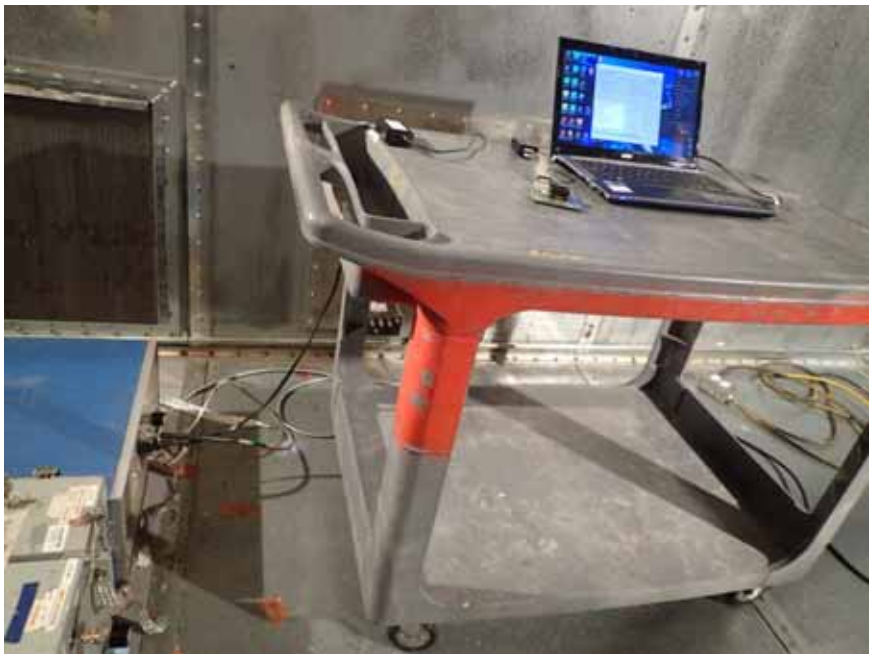
The following drawings show details of the test setup

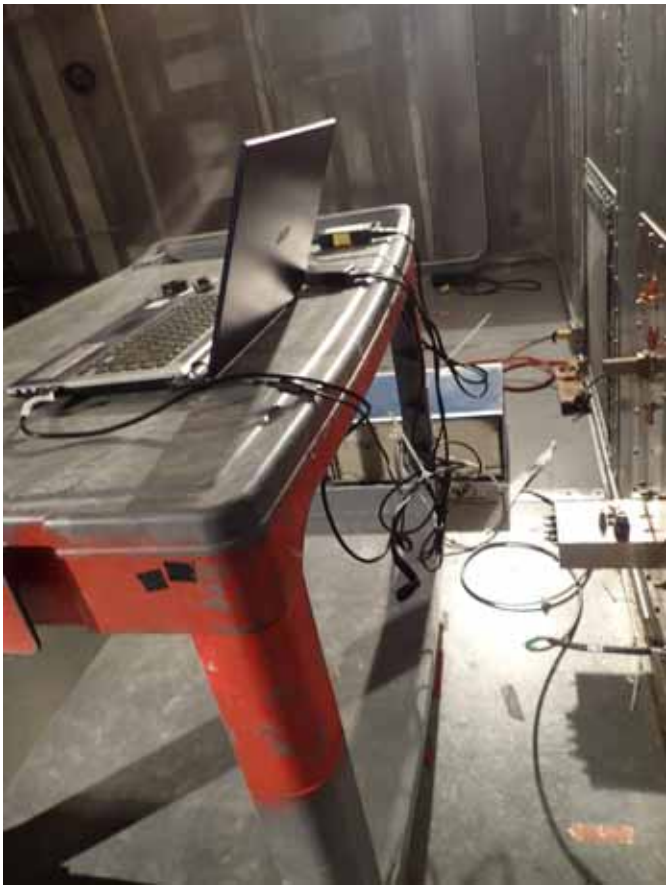


3.5. PHOTOGRAPHS OF TEST SETUP FOR CONDUCTED EMISSION MEASUREMENTS

Configuration 1: RJ45

Configuration 2: USB





3.6. PHOTOGRAPHS OF TEST SETUP FOR RADIATED EMISSION MEASUREMENTS

EXHIBIT 4. UMMARY 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.

- Powerline Conducted Emissions were performed in UltraTech's shielded room, 16'(L) by 12'(W) by 12'(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

CISPR 11: / EN 55011	TEST REQUIREMENTS	MARGIN BELOW (-) / ABOVE (+) THE LIMITS	COMPLIANCE (YES/NO)
6.2.1.3, Table 2, Class A (Group1)	Mains Terminal Disturbance Voltage in the frequency band 150 kHz to 30 MHz	- 26.7 dB @ 29.058 MHz	Yes
6.2.2.3, Table 4, Class A (Group 1)	Electromagnetic Radiation Disturbance in the frequency band 30 MHz to 1000 MHz	- 4.3 dB @ 54.87 MHz	Yes

4.3. MODIFICATIONS REQUIRED FOR COMPLIANCE

None

4.4. DEVIATION OF THE STANDARD TEST PROCEDURES

None

EXHIBIT 5. MEASUREMENT DATA

5.1. MAINS TERMINAL DISTURBANCE VOLTAGE IN FREQUENCY BAND 150 KHZ TO 30 MHz @ CISPR 11:2009 + A1:2010 / EN 55011:2009 +A1:2010 [6.2.1.3, TABLE 2]

5.1.1. Limits

The equipment shall meet the limits of the following table:

	CISPR 11/EN 55011 CLASS A LIMITS		
Test Frequency Range (MHz)	**Quasi-Peak (dBµV)**	**Average* (dBµV)**	**Measuring Bandwidth**
0.15 to 0.5	79	66	RBW = 9 kHz VBW ≥ 9 kHz for QP VBW = 10 Hz for Average
0.5 to 30	73	60	RBW = 9 kHz VBW ≥ 9 kHz for QP VBW = 10 Hz for Average

5.1.2. Method of Measurements

Refer to Test Procedures ULTR P001-2004, CISPR 11:2009 + A1:2010 / EN 55011:2009 +A1:2010, ANSI C63-4

Calculation of Conducted Emission Voltage (dBµV):

This is calculated by adding the L.I.S.N factor, Cable loss factor, and Attenuator factor to the measured reading. The basic equation with a sample calculation is as follows:

Voltage (dBµV) = RA + AF + CF + LF

Where

RA = Receiver/Analyzer Reading in dBµV
AF = Attenuation Factor in dB
CF = Cable loss Factor in dB
LF = L.I.S.N Factor in dB

5.1.3. Test Instruments

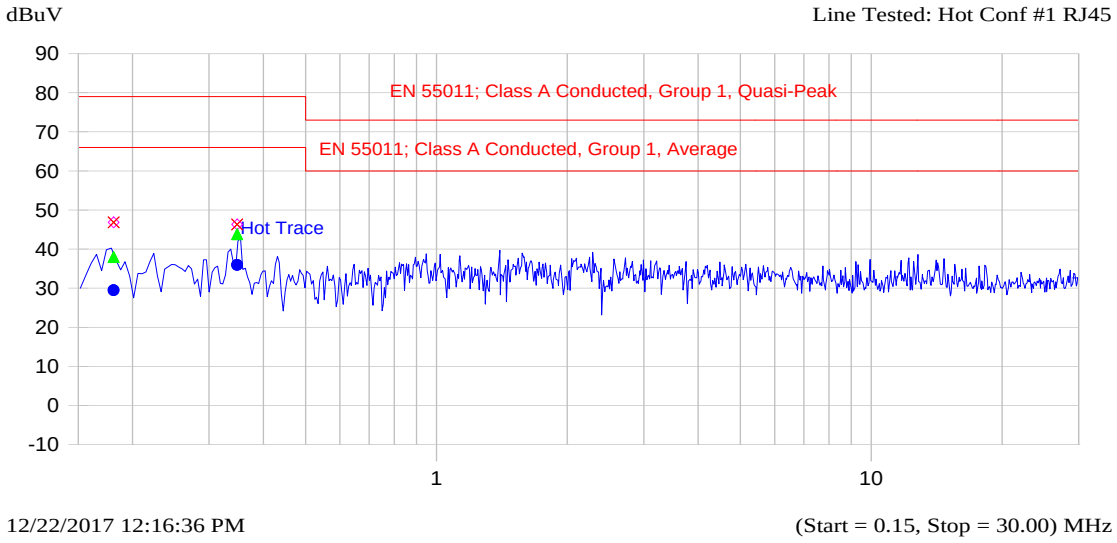
Refer to Exhibit 6 for Test Instruments and Measurement Uncertainty.

5.1.4. Test Results

The emissions were scanned from 150 KHz to 30 MHz at mains Terminal via a LISN, and all emissions less than 20 dB below the limits were recorded.

Description: Line Test : RJ45
Setup Name: EN 55011 Class A Group 1
Customer Name: Elprotronic Inc.
Project Number: ELP-014Q
Operator Name: Phuong Luu
EUT Name: XStreamPro-Iso
Date Created: 12/22/2017 11:50:54 AM
Date Modified: 12/22/2017 12:13:47 PM

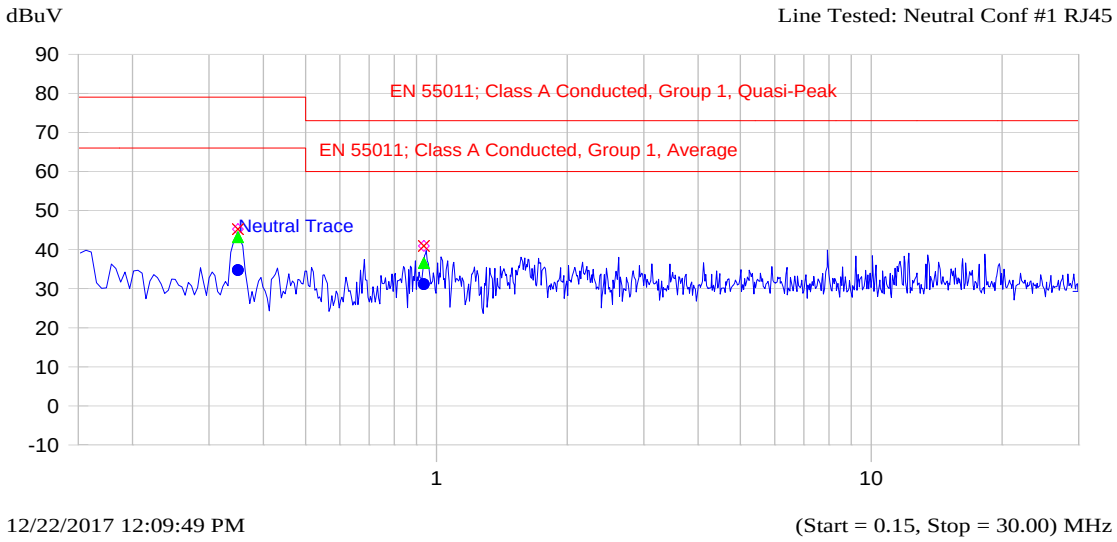
Plot # 1



Frequency MHz	Peak dBuV	QP dBuV	QP-QP Limit dB	Avg dBuV	Avg-Avg Limit dB	Trace Name	Comment
0.348	46.3	43.8	-35.2	35.9	-30.1	Hot Trace	
0.181	46.8	38.0	-41.0	29.5	-36.5	Hot Trace	

Description: Line Test : RJ45
Setup Name: EN 55011 Class A Group 1
Customer Name: Elprotronic Inc.
Project Number: ELP-014Q
Operator Name: Phuong Luu
EUT Name: XStreamPro-Iso
Date Created: 12/22/2017 11:50:54 AM
Date Modified: 12/22/2017 12:04:47 PM

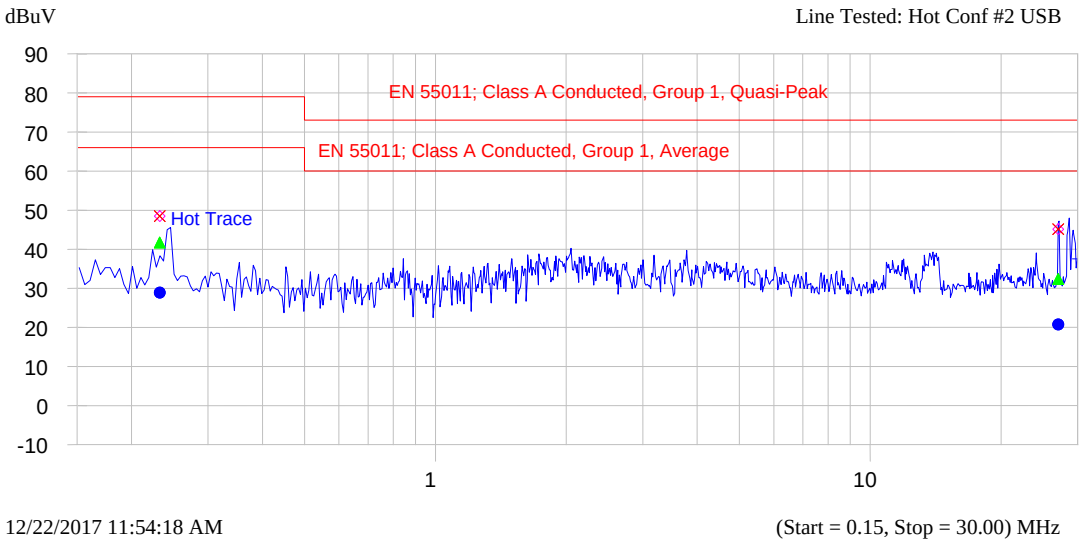
Plot # 2



Frequency MHz	Peak dBuV	QP dBuV	QP-QP Limit dB	Avg dBuV	Avg-Avg Limit dB	Trace Name	Comment
0.350	45.2	43.2	-35.8	34.8	-31.2	Neutral Trace	
0.935	40.9	36.6	-36.4	31.1	-28.9	Neutral Trace	

Description: Line Test : USB
Setup Name: EN 55011 Class A Group 1
Customer Name: Elprotronic Inc.
Project Number: ELP-014Q
Operator Name: Phuong Luu
EUT Name: XStreamPro-Iso
Date Created: 12/22/2017 11:50:54 AM
Date Modified: 12/22/2017 11:50:54 AM

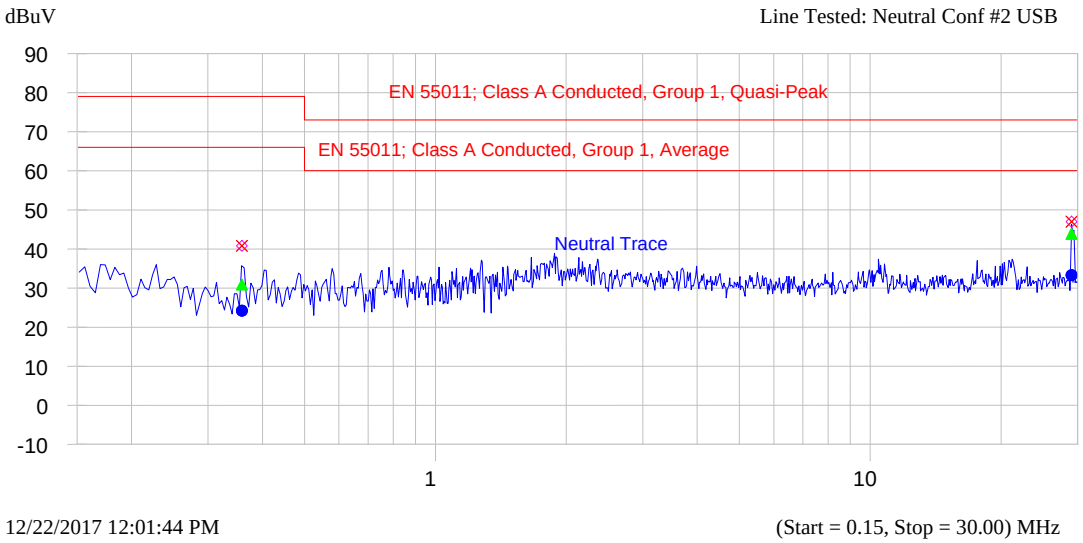
Plot # 3



Frequency MHz	Peak dBuV	QP dBuV	QP-QP Limit dB	Avg dBuV	Avg-Avg Limit dB	Trace Name	Comment
0.232	48.4	41.7	-37.3	28.9	-37.1	Hot Trace	
27.058	45.1	32.4	-40.6	20.8	-39.2	Hot Trace	

Description: Line Test : USB
Setup Name: EN 55011 Class A Group 1
Customer Name: Elprotronic Inc.
Project Number: ELP-014Q
Operator Name: Phuong Luu
EUT Name: XStreamPro-Iso
Date Created: 12/22/2017 11:50:54 AM
Date Modified: 12/22/2017 11:58:38 AM

Plot # 4



Frequency MHz	Peak dBuV	QP dBuV	QP-QP Limit dB	Avg dBuV	Avg-Avg Limit dB	Trace Name	Comment
0.359	40.8	30.9	-48.1	24.2	-41.8	Neutral Trace	
29.058	47.0	43.9	-29.1	33.3	-26.7	Neutral Trace	

5.2. ELECTROMAGNETIC RADIATION DISTURBANCE FROM 30 TO 1000 MHz @ CISPR 11:2009 + A1:2010 / EN 55011:2009 +A1:2010 [6.2.2.3, TABLE 4]

5.2.1. Limits

Test Frequency Range (MHz)	Class A, Group 1 Limits @10 M (dBµV/m)	EMI Detector Used	Measuring Bandwidth (kHz)
30 – 230	40	Quasi-Peak	RBW = 120 kHz, VBW ≥ 120 kHz
230 – 1000	47	Quasi-Peak	RBW = 120 kHz, VBW ≥ 120 kHz

5.2.2. Method of Measurements

Refer to Test Procedures ULTR P001-2004, CISPR 11:2009 + A1:2010 / EN 55011:2009 +A1:2010, ANSI C63-4
The EUT shall be scanned from 30 MHz to 1000 MHz.

Calculation of Field Strength:

The field strength is calculated by adding the calibrated 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
RA = Receiver/Analyzer Reading
AF = Antenna Factor
CF = Cable Attenuation Factor
AG = Amplifier Gain

5.2.3. Test Instruments

Refer to Exhibit 6 for Test Instruments and Measurement Uncertainty.

5.2.4. Test Data

The emissions were scanned from 30 MHz to 1 GHz at 10 Meters distance and all emissions less than 20 dB below the limits were recorded.

FREQUENCY (MHz)	RF LEVEL (dBuV/m)	DETECTOR USED (PEAK/QP)	ANTENNA PLANE (H/V)	LIMIT (dBuV/m)	MARGIN (dB)	PASS/ FAIL
54.87	35.66	PEAK	V	40.0	**-4.3**	PASS
54.87	19.90	PEAK	H	40.0	-20.1	PASS
73.52	34.02	PEAK	V	40.0	-6.0	PASS
73.52	22.18	PEAK	H	40.0	-17.8	PASS
101.50	32.18	PEAK	V	40.0	-7.8	PASS
101.50	22.30	PEAK	H	40.0	-17.7	PASS
250.00	36.42	PEAK	V	47.0	-10.6	PASS
250.00	37.45	PEAK	H	47.0	-9.6	PASS
625.36	31.94	PEAK	V	47.0	-15.1	PASS
625.36	32.76	PEAK	H	47.0	-14.2	PASS

EXHIBIT 6. TEST INSTRUMENTS & MEASUREMENT UNCERTAINTY (K=2, 95% CONFIDENCE LEVEL)

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.

6.1. LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY (9 KHZ - 30 MHZ)

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range	Calibration Due Date
Spectrum Analyzer	Hewlett Packard	HP 8593EM	3710A00223	9 kHz–22 GHz	Oct. 19, 2018
Attenuator	Pasternack	PE7010-20	07	DC to 2 GHz	Mar. 13, 2018
LISN Used	EMCO	3825/2R	1165	10 kHz-30MHz	Nov. 3, 2018
Test Software: HP designed E7415A EMI Test Measurement Software version A.01.40 is used for automated measurement.					

Test Date: Dec. 22, 2017

	Line Conducted Emission Measurement Uncertainty (9 kHz – 30 MHz):	Measured	Limit
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{i=1}^{m} u_i^2(y)}$	**± 1.44**	**± 1.8**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 2.89**	**± 3.6**

6.2. RADIATED EMISSION MEASUREMENT UNCERTAINTY

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Due Date
EMI Receiver	Rohde & Schawrz	ESU40	100037	20 Hz to 40 GHz	May 09, 2018
Biconilog Antenna	EMCO	3142	9601-1005	26 – 2000 MHz	May 12, 2018
Pre-Amplifier	Com-Power	Pam-0118A	551052	500MHz – 18 GHz	July 17, 2018
Horn Antenna	EMCO	3115	9701-5061	1 – 18 GHz	April 24, 2018
Semi-Anechoic Chamber	TDK	IC: 2049A-3	--	--	March 27, 2020

Tested Date: Dec. 22, 2017

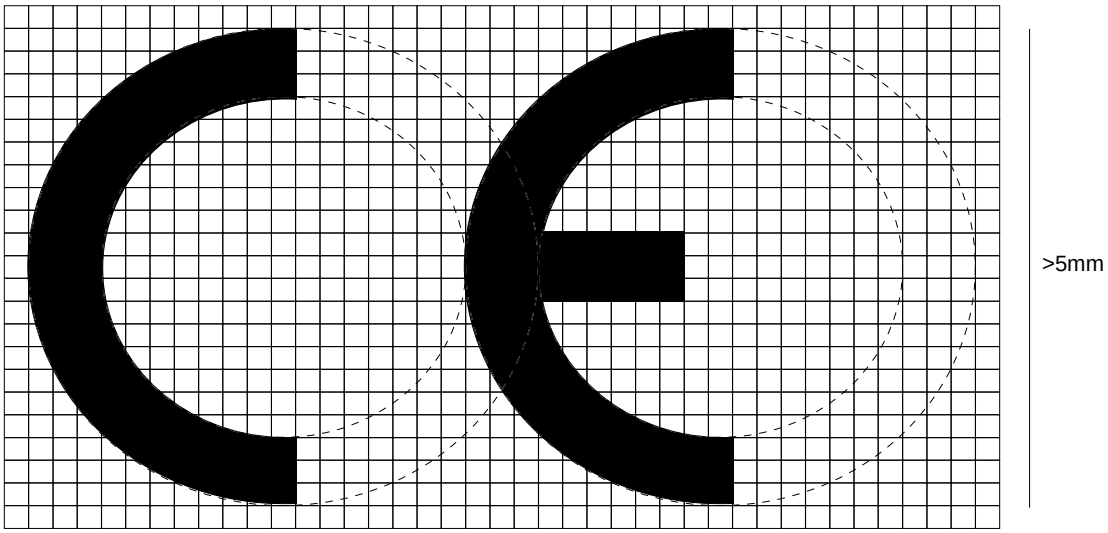
	Radiated Emission Measurement Uncertainty @ 10m, Horizontal (30-1000 MHz):	Measured (dB)	Limit (dB)
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	**± 2.32**	**± 2.6**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 4.65**	**± 5.2**

	Radiated Emission Measurement Uncertainty @ 10m, Vertical (30-1000 MHz):	Measured (dB)	Limit (dB)
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	**± 2.32**	**± 2.6**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 4.64**	**± 5.2**

	Radiated Emission Measurement Uncertainty @ 3 m, Horizontal & Vertical (1 – 18 GHz):	Measured (dB)	Limit (dB)
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	**± 1.87**	Under consideration
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 3.75**	Under consideration

EXHIBIT 7. LABELLING REQUIREMENTS

The CE Mark with respect to the EMC Directive 2014/30/EU



The CE mark shall consist of the initials "CE" taking the following form

- If the CE marking is reduced or enlarged, the proportions given in the above graduated drawing must be respected.
- Where apparatus is the subject of other Directives covering other aspects and which also provide for the CE conformity marking, the latter shall indicate that the appliances are also presumed to conform to those other Directives.
- However, where one or more of these Directives allow the manufacturer, during a transitional period, to choose which arrangements to apply, the CE mark shall indicate conformity only to the Directives applied by the manufacturer. In this case, particulars of the Directive applied, as published in the Official Journal of the European Communities, must be given in the documents, notices or instructions required by the Directives and accompanying such apparatus.

The various components of the CE marking must have substantially the same vertical dimension, which may not be less than 5mm.