ELECTRONICS TEST CENTRE
MPB TECHNOLOGIES INC.
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Canada

Electromagnetic Compatibility (EMC) Test Report

LIBRA Plus
FCC ID; XCE-LP5860-001

EMISSIONS, CLASS B

FCC Part 15 Subpart B: 2007

Report No.: E35R3608 **Customer P.O. No.:** 8166

Test Personnel: Glen Albert

Client Acceptance

Prepared for:

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EION Wireless
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Issue Date: February 10, 2010
Revision: 2

Dan Zanette
Technical Director

Report Composition: 14 Pages

Industry Canada Industrie Canada

NVLAP LAB CODE 200282-0

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1 INTRODUCTION

1.1 Purpose

The purpose of this report is to present the findings and results of compliance testing performed on the LIBRA Plus in accordance with, FCC Part 15 Subpart B: 2007.

1.2 Scope

All test procedures, limits, and results defined in this document apply to the LIBRA Plus which shall be referred to herein as the Equipment Under Test (**EUT**).

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1.3 Revision Status

Revision	Date Issued	Reason for Issue / Re-Issue
1	February 10, 2010	First draft
2	February 11, 2010	Final

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1.4 Applicable Documents

The following document(s), or parts thereof, are applicable to this Report:

FCC Part 15:2007	-	CFR Title 47, Telecommunication: Chapter 1, Federal Communications Commission: Part 15, Radio Frequency Devices
ANSI 63.4: 2003	-	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

1.5 Definitions

The following abbreviations may be used in this document:

A	-	Ampere	mm	-	Millimeter(s)
AC	-	Alternating Current	MPBT	-	MPB Technologies Inc.
BB	-	Broadband	NA	-	Not Applicable
BW	-	Bandwidth	NB	-	Narrowband
CE	-	Conducted Emissions	PPS	-	Pulses per Second
cm	-	Centimeter(s)	RATF	-	Resistive Ambient Test Fixture
CS	-	Conducted Susceptibility	RE	-	Radiated Emissions
CW	-	Continuous Wave	RF	-	Radio Frequency
DC	-	Direct Current	rms.	-	Root mean square
EMC	-	Electromagnetic Compatibility	RS	-	Radiated Susceptibility
EMI	-	Electromagnetic Interference	S	-	Second(s)
EMITP	-	Electromagnetic Interference Test Plan	TSA	-	Test Support Apparatus
EMITR	-	Electromagnetic Interference Test Report	*F	-	MicroFarad
EUT	-	Equipment Under Test	*S	-	MicroSecond
FTP	-	Functional Test Procedure	V	-	Volt(s)
GHz	-	GigaHertz	V/m	-	Volt(s) per meter
IME	-	Interference Measurement Equipment	VAC	-	Volt(s) Alternating Current
kHz	-	KiloHertz	VDC	-	Volt(s) Direct Current
M	-	Meter(s)	Vpp	-	Volt(s) peak-to-peak
m...	-	Milli....	VHF	-	Very High Frequency
MHz	-	MegaHertz	Vrms	-	Volt(s) root mean square
MIL-STD	-	Military Standard	W	-	Watt(s)

1.6 General Test Conditions

The EUT was setup and exercised using the configurations, modes of operation and arrangements as defined in this report only. All inputs and outputs to and from other equipment associated with the EUT were adequately simulated.

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2 TEST RESULT SUMMARY

The following table summarizes the test results for the LIBRA Plus .

Test Type	Qualification			
Operational Configuration	Normal			
Mod. State	Normal			
Test Specification	Test description	Class/Level / Section	Observations /Criteria	Test Result
FCC Part 15.109	Radiated Emissions	N/A	None	Pass
FCC Part 15.107	Conducted Emissions	N/A	None	Pass

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2.1 RADIATED EMISSIONS, FCC Part 15.109

TEST DATA	
Standard Method	FCC Part 15.109
Class	B
Test Personnel	Glen Albert
Test Date	September 3, 2008.

Measurement	Remarks	Test Result
30 MHz – 1 GHz	FCC Part 15.109	Pass

Limit(s):

See Spectral Plot(s) with peak measurements below.

Comments:

The EUT was powered 115VAC/60 Hz.

The EUT passes in all cases.

The worst case emission was found in the Vertical Polarization at 66.6945 MHz. The measured quasi peak amplitude was 38.02 dBuV/m, -1.98 dB below the FCC Part 15:Subpart B Limit.

Quasi peak results in table after Spectral Plot(s) except where labeled avg for average if applicable.

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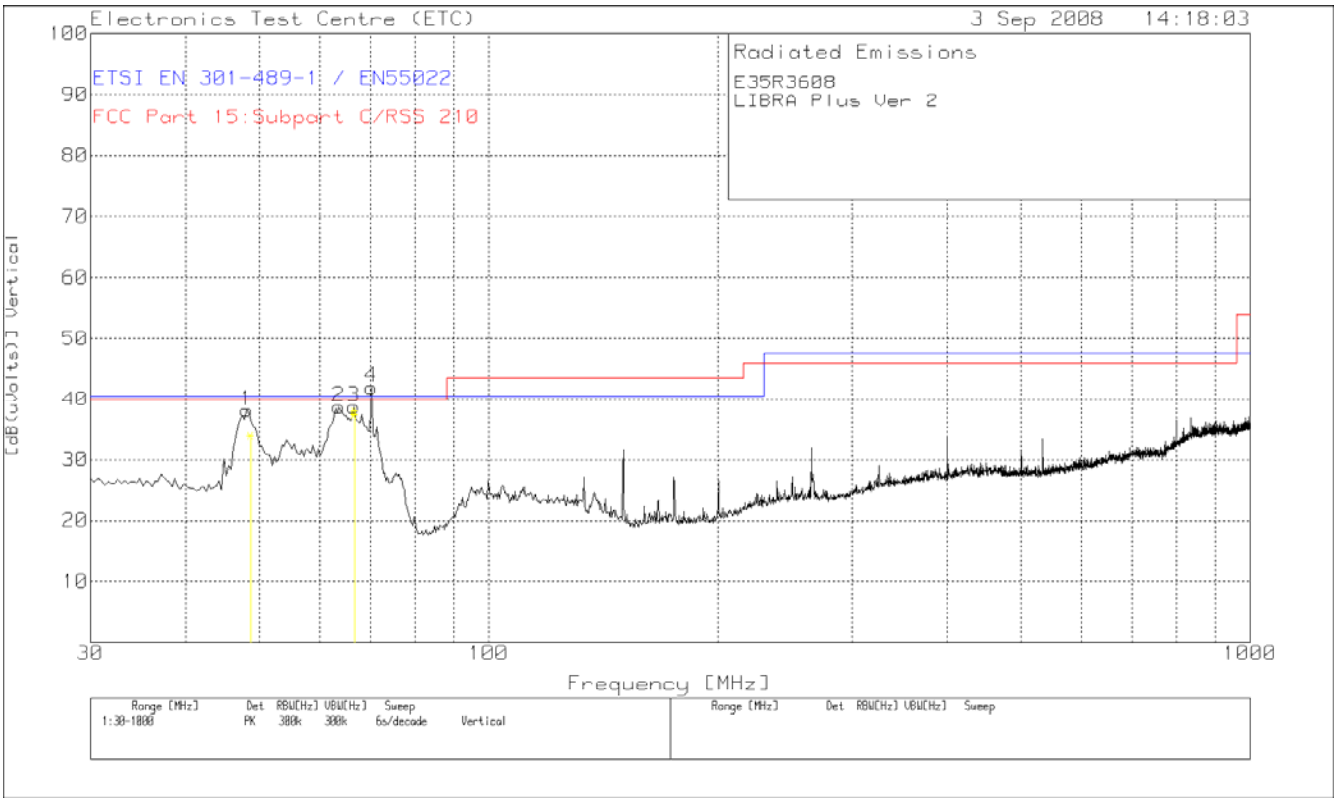
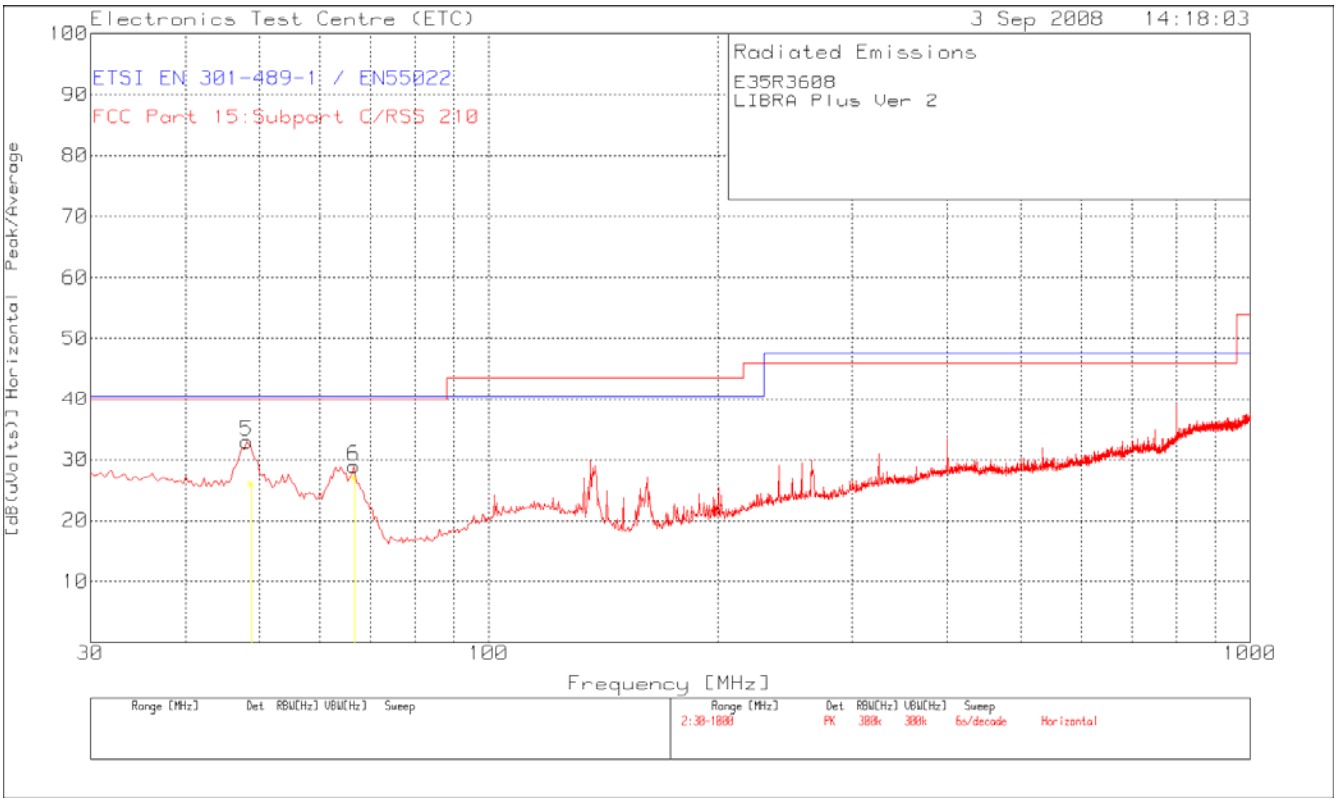
2.1.1 Spectral Plot(s)





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Quasi-Peak Readings

LIMIT: FCC Part 15: Subpart B

Test Frequency [MHz]	QP Level [dBuV/m]	Limit [dBuV/m]	QP Margin dB Limit	Polarization
48.7522	33.83	40	-6.17	Vertical
66.6945	38.02	40	-1.98	Vertical
66.6992	37.4	40	-2.6	Vertical
66.7032	37.26	40	-2.74	Vertical
48.7683	25.89	40	-14.11	Vertical
66.7059	26.98	40	-13.02	Vertical

2.1.2 Measurement Uncertainty

The following measurement uncertainty with 95% confidence level was calculated using the methods defined in CISPR16-4-2.

Frequency: $\pm$ 1x10^{-3} MHz
Amplitude: $\pm$ 4.01 dB

2.1.3 Test Equipment

Asset #	Device	Characteristics	Manufacturer	Model	Serial #	Cal Date	Cal Due date
4297	Spectrum Analyzer	100Hz-22GHz	Hewlett Packard	8566B	2747A05484	24-Jul-08	24-Jul-09
5076	Computer, Software EMC	N/A	Underwriters Laboratories	V3.02	MC106399N K07147	Monitored	Monitored
3970	Signal Generator, RF	10MHz-20GHz	Hewlett Packard	83620A	3145A01010	9-Dec-07	31-Dec-08
2318	Antenna, DRG Horn	1-18GHz	Eaton Corp.	96001	3070	3-Jan-07	3-Jan-09
4552 (High Freq)	Preamplifier	1 - 20GHz	Miteq	AFS44-01-00220045-8P44	327221	06-Aug-08	22-Aug-09
4552 (Low Freq)	Preamplifier	10KHz - 1GHz	Electrometrics	BPA-1000	900710B	06-Aug-08	22-Aug-09
5078	Antenna, Biconical Log Periodic	20MHz-2GHz	Amplifier Research	LPB-2520/A	1173	26-Jul-07	26-Jul-09

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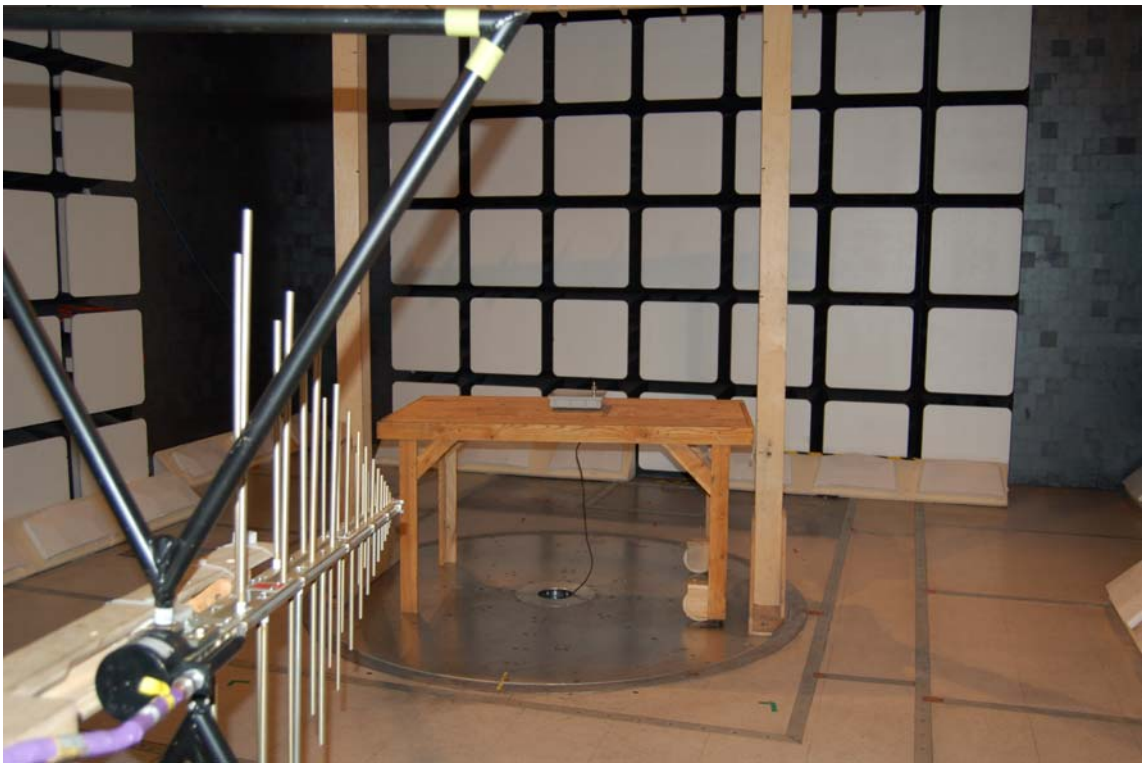
2.1.4 Photograph(s)



FCC Part 15.109, Radiated Emissions, 30 MHz – 1GHz

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2.2 CONDUCTED EMISSIONS, FCC Part 15.107

TEST SUMMARY	
Standard(s) / Method(s)	FCC Part 15.107
Class	B
Result	Pass
Test Personnel	Glen Albert
Test Date	September 3, 2008.

Power Lead Under Test		Test Result
Line 1	Neutral Contact from AC Power Connector	Pass
Line 2	Hot Contact AC Power Connector	Pass

Limit(s):

See Spectral Plot(s) with peak readings below.

Comments:

The EUT passes in all cases.

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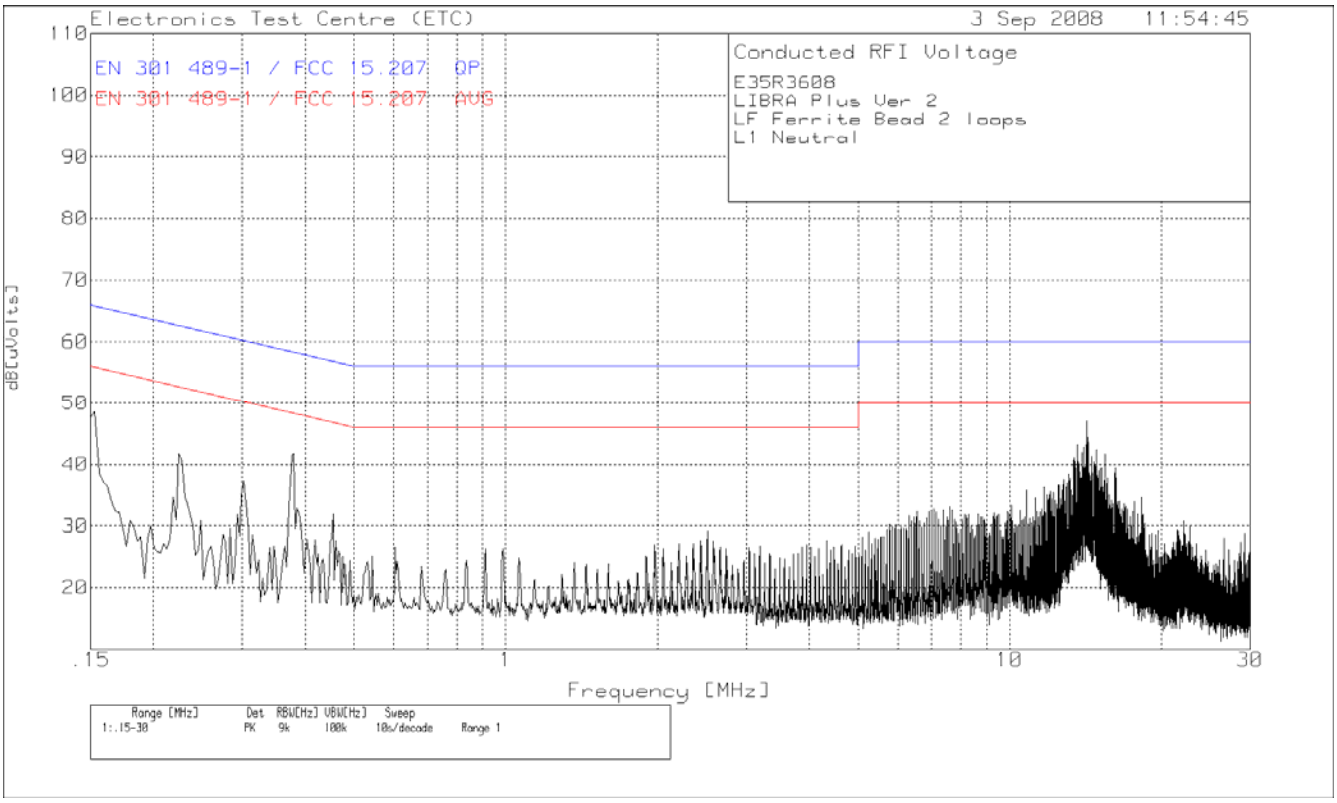
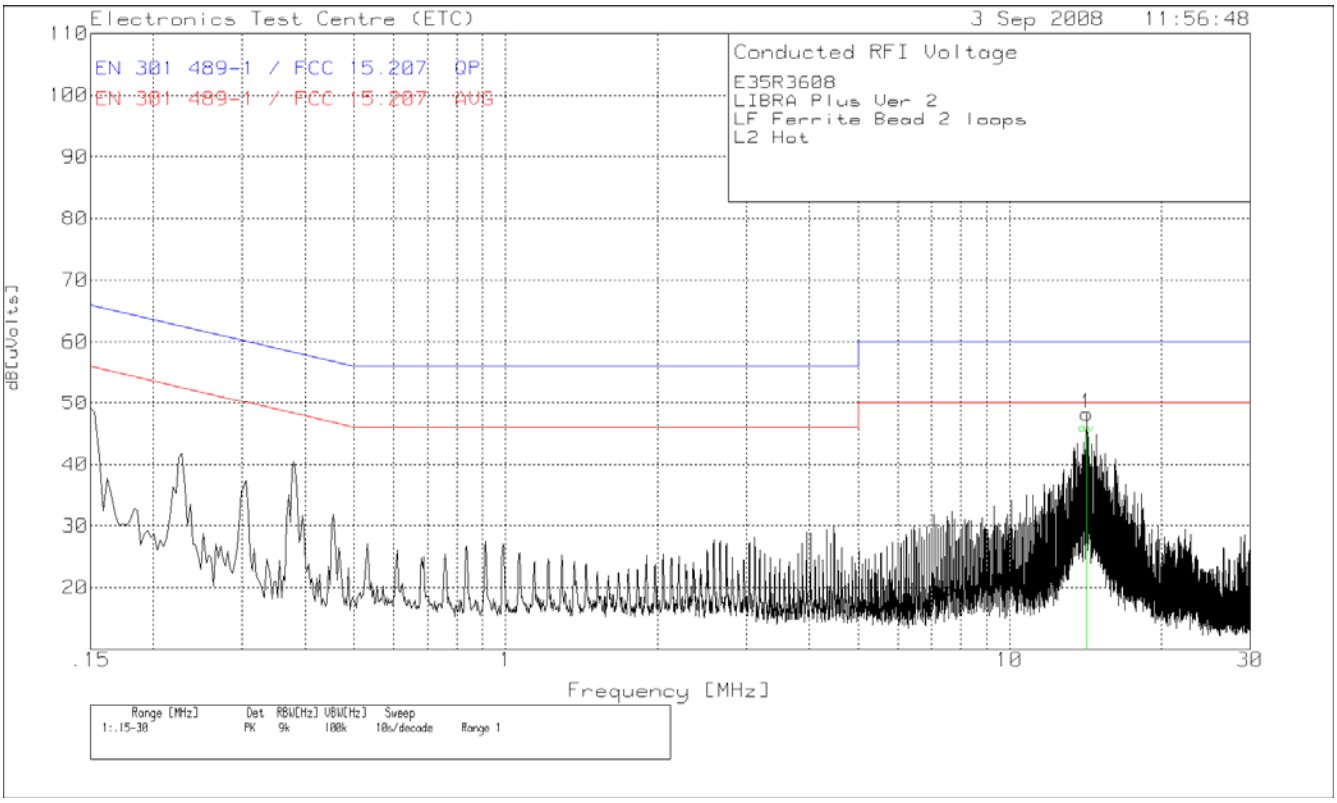
2.2.1 Spectral Plot(s)





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Average Peak Reading(s)

LIMIT: FCC Part 15: Subpart B

Test Frequency [MHz]	Average Level [dBuV/m]	Average Limit [dBuV/m]	Average Margin dB to Limit [dBuV/m]
14.21751	44.75	50	-5.25

2.2.2 Measurement Uncertainty

The following measurement uncertainty with 95% confidence level was calculated using the methods defined in CISPR16-4-2.

Frequency: $\pm$ 1x10^{-3} MHz
Amplitude: $\pm$ 3.25 dB

2.2.3 Test Equipment

Asset #	Device	Characteristics	Manufacturer	Model	Serial #	Cal Date	Cal Due date
5315	LISN	50µH 150kHz-100MHz	Fischer Custom Comm	FCC-LISN-50-32-2-01	1056	18-Jan-08	18-Jan-09
4297	Spectrum Analyzer	100Hz-22GHz	Hewlett Packard	8566B	2747A05484	24-Jul-08	24-Jul-09
5076	Computer, Software EMC	N/A	Underwriters Laboratories	V3.02	MC106399NK07147	Monitored	Monitored
4552 (Low Freq)	Preamplifier	10KHz - 1GHz	Electrometrics	BPA-1000	900710B	06-Aug-08	22-Aug-09
2436	Quasi Peak Adapter	9kHz-1GHz	Hewlett Packard	85650A	2811A01123	24-Jul-08	24-Jul-09
4297	Spectrum Analyzer	100Hz-22GHz	Hewlett Packard	8566B	2747A05484	24-Jul-08	24-Jul-09

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2.2.4 Photograph(s)

Power Line Conducted Emissions

3 TEST FACILITY

3.1 Location

The EUT was tested for Electromagnetic Compatibility at the Electronics Test Centre, located in Kanata, Ontario, Canada.

3.2 Power

AC power was supplied via a CORCOM RFI feed through, 60 Ampere wall mounted/ filter. Bonding to hydro ground is via one-inch grounding braid straps.

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APPENDIX A: Client Sample Description

MPBT Personnel	Date	Work Order
GLEN ALBERT	22 AUGUST 2008	3608

Contact	DOUG REID	Address	
		320 MARCH ROAD, SUITE 500	
Company	EION WIRELESS	OTTAWA, ON K2K 2E3	
Client Code	E35		
		Phone: 1-613-271-4400 Ext 247	Fax: 1-613-271-7040

Product Application	Product Category	Product Type
Military ☐ Commercial x	Telecom x Info Tech. ☐ Space ☐ Avionics ☐ Other ☐	Production Unit x Pre-production Unit ☐ Prototype ☐

PRODUCT NAME	LibraPlus 5845
PART NUMBER	**9140-280(0-4),** Variant (9140-230(0-4))
MODEL NUMBER	**LibraPlus 5845-28** Variant LibraPlus 5845-26, (lower power) Configuration types: RD, ER, AP, CPE, LCPE:
SERIAL NUMBER	N/A
POWER REQUIREMENTS: AC/DC, CURRENT	120 VAC, 0.15 Amps POE 48 VDC 350 ma
OPERATIONAL FREQUENCY	5.150 to 5.320 GHz, 5.470 to 5.725 GHz, 5.745 to 5.825 GHz
TYPICAL INSTALLATION INSTRUCTIONS OR CONFIGURATION	Tower mounted enclosure with integrated antenna adjustable brackets for aiming antenna – option for external antenna – Metal enclosure is grounded to tower ground system via an enclosure mounted ground lug – Lighting protection RF coax cable installed. Internal Surge and lighting protect provide external Ethernet surge/lightning protection option.
GROUND EUT?	Yes x No ☐
# INTERCONNECTING LEADS	Coaxial cable and Ethernet POE Outdoor shielded Category 5 cable.
INTERNAL CLOCK FREQUENCY	366 MHz and 20 MHz
PERIPHERAL EQUIPMENT	POE power Injector power supply , RF lightning arrestors, Ethernet Cable Surge protector
CABLES	Coaxial cable and Ethernet POE Cat 5, Power supply AC ,mains cord and plug
FUNCTIONAL OR SELF-TEST DURATION	30 seconds during stat-up
BRIEF FUNCTIONAL DESCRIPTION	5.8 GHz Proprietary Spread Spectrum radio 802.11a based Mac. Power output adjustable up to 28 dBm maximum. 10,20, 40 MHz channels, 54 Mb/s and 108 Mb/s capacity maximums. Utilizes Type approved mini-PCI radio modules and antenna systems.

Prepared By:	Title:	Date:
Douglas J Reid P'eng	Systems Architect EION Inc.	February ,2009

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