



FCC PART 22, 24
INDUSTRY CANADA RSS-129, RSS-133
MEASUREMENT AND TEST REPORT

For

Motion Computing, Inc.

8601 Ranch Road 2222; Building 2
Austin, Texas 78730, USA

FCC ID: Q3QHWNVWEX725
IC ID: 4587A-NVWEX725
Trade Name: LE 1700, Model: T006

Report Type: <input checked="" type="checkbox"/> Class II Permissive Change, Supplemental Report		Product Type: Tablet Personal Computer	
Test Engineer(s):	Dan Corona 		
Report Number:	R0709186		
Report Date:	2007-10-09		
Reviewed By:	Daniel Deng, RF Engineering Lead 		
Prepared By: (24)	Bay Area Compliance Laboratories Corp. 1274 Anvilwood Ave. Sunnyvale, CA 94089, USA Tel: (408) 732-9162 Fax: (408) 732-9164		

Note: This test report is for the customer shown above and their specific product only. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government

TABLE OF CONTENTS

1	GENERAL INFORMATION	4
1.1	PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
1.2	MECHANICAL DESCRIPTION OF EUT	4
1.3	ANTENNA DESCRIPTION	4
1.4	EUT PHOTO	5
1.5	OBJECTIVE	5
1.6	RELATED SUBMITTAL(S)/GRANT(S)	5
1.7	TEST METHODOLOGY	6
1.8	MEASUREMENT UNCERTAINTY	6
1.9	TEST FACILITY	6
2	SYSTEM TEST CONFIGURATION	7
2.1	JUSTIFICATION	7
2.2	EUT EXERCISE SOFTWARE	7
2.3	SPECIAL ACCESSORIES	7
2.4	EQUIPMENT MODIFICATIONS	7
2.5	LOCAL SUPPORT EQUIPMENT	8
2.6	EUT INTERNAL CONFIGURATION DETAILS	8
2.7	POWER SUPPLY DETAILS	8
2.8	EXTERNAL I/O CABLING LIST AND DETAILS	8
2.9	TEST SETUP BLOCK DIAGRAMS	9
3	SUMMARY OF TEST RESULTS	10
4	FCC §2.1046 & IC RSS-129 §9.1, RSS-133 §6.4 - RF Output Power	11
4.1	APPLICABLE STANDARD	11
4.2	SUMMARY OF TEST RESULTS	11
4.3	TEST RESULTS	11
5	FCC §2.1053, §22.917, §24.238 & IC RSS-129 §8.1, RSS-133 §6.5 – Transmitter Field Strength of Spurious Radiation	12
5.1	APPLICABLE STANDARD	12
5.2	TEST PROCEDURE	13
5.3	ENVIRONMENTAL CONDITIONS	13
5.4	TEST EQUIPMENT LIST AND DETAILS	13
5.5	SUMMARY OF TEST DATA	13
5.6	TEST DATA	14
6	FCC §15.109 & IC RSS-129 §10, RSS-133 §6.7- Receiver Radiated Emissions	18
6.1	APPLICABLE STANDARD	18
6.2	TEST SETUP	19
6.3	TEST EQUIPMENT LIST AND DETAILS	19
6.4	TEST PROCEDURE	19
6.5	ENVIRONMENTAL CONDITIONS	20
6.6	CORRECTED AMPLITUDE & MARGIN CALCULATION	20
6.7	SUMMARY OF TEST RESULTS – 30 MHz TO 1 GHz	20
	RADIATED EMISSIONS TEST PLOT AND DATA – EV-DO REV. 0	21
6.8	21
7	EXHIBIT A – FCC & IC EQUIPMENT LABELING REQUIREMENTS	22
7.1	FCC § 2.925 IDENTIFICATION OF EQUIPMENT	22
7.2	FCC ID LABELING REQUIREMENTS AS PER FCC § 15.19	22
7.3	SPECIFICATIONS: AS PER RSS GEN 5.2 EQUIPMENT LABELING:	23
7.4	SUGGESTED FCC ID & IC LABEL	23
7.5	LABEL LOCATION	23
8	EXHIBIT B - TEST SETUP PHOTOGRAPHS	24

8.1	CONDUCTED EMISSIONS – FRONT VIEW	24
8.2	CONDUCTED EMISSIONS – SIDE VIEW	24
8.3	RADIATED EMISSIONS (30 MHz~1GHz) – FRONT VIEW	25
8.4	RADIATED EMISSIONS (30 MHz~1GHz) – REAR VIEW	25
9	EXHIBIT C - EUT PHOTOGRAPHS	26
9.1	EUT EXTERNAL VIEW 1	26
9.2	EUT EXTERNAL VIEW 2	26
9.3	EUT EXTERNAL VIEW 3	27
9.4	EUT EXTERNAL VIEW 4	27
9.5	EUT EXTERNAL VIEW 5	28
9.6	NOVATEL WIRELESS CDMA MODULE INSTALLED IN EUT	28
9.7	EUT INTERNAL VIEW 1	29
9.8	EUT INTERNAL VIEW 2	29
9.9	EUT INTERNAL VIEW 3	29
9.10	BATTERY PACK BOTTOM VIEW	29
9.11	EUT WITH KB004 KEYBOARD	29
9.12	EUT POWER SUPPLY TOP VIEW	30

1 GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

The *Motion Computing, Inc.* product, FCC ID: *Q3QHWNVWEX725*, IC: *4587A-NVWEX725*, Trade Name: *LE1700*, model: *T006* or the “EUT” as referred to this report is a mobile computing and wireless communications device which supports CDMA data protocol operating on the 800 MHz and 1900 MHz bands.

1.2 Mechanical Description of EUT

The EUT is a tablet personal computer of metal and plastic construction that measures approximately **298 mm** (L) x **245 mm** (W) x **22 mm** (H) and weighs approximately **1.47 kg**.

**The data gathered are from a typical production sample provided by the manufacturer, serial number: 00214569-LE1700.*

1.3 Antenna Description and Photograph



	Model/Type	
Antenna	Model number:	Pecos 2
	Manufacturer:	Motion Computing
	Frequency Range:	824 ~ 894 MHz (Cellular Band), 1850 ~ 1990 MHz (PCS Band)
	Minimum Peak Gain	1.0 dBi
	Antenna Type / Pattern:	External Swivel / Omni-directional
	Dimension:	72 mm (L) x 10.5 mm (W)

1.4 EUT Photo



Please refer to Exhibit C for addition EUT photographs.

1.5 Objective

This Class II Permissive Change Supplemental report is prepared on behalf of *Motion Computing, Inc.* in accordance with Part 2, Subpart J, Part 22, Subpart H, Part 24, Subpart E of the Federal Communication Commissions rules and Industry Canada RSS-129, Issue 2, September 1999, and RSS-133, Issue 3, June 2005.

The objective is to augment the FCC ID: Q3QHWNVWEX725, and IC ID: 4587A-NVWEX725 with an additional construction (EUT). Tests to provide evidence of compliance with the applicable FCC rules and IC Standards include:

- RF Output Power
- Modulation Characteristics
- Occupied Bandwidth
- Antenna Port Spurious Emissions
- Transmitter Field Strength of Spurious Radiation
- Frequency Stability
- Receiver Radiated Emission

1.6 Related Submittal(s)/Grant(s)

The Novatel Wireless E725 CDMA Module installed in the EUT has been granted modular approval by the Federal Communications Commission under the FCC ID: PKRNVWEX725, the relevant test report, as well as other documents for this device can be found by performing a search in the FCC office of engineering and technology (OET) website: <https://fjallfoss.fcc.gov/oetcf/eas/reports/GenericSearch.cfm> , please refer to the above mentioned report regarding the test data for the following tests: Modulation Characteristics, Occupied Bandwidth, Antenna Port Spurious Emission, and Frequency Stability.

1.7 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2003, 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.

1.8 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the values range from ± 2.0 for Conducted Emissions tests and ± 4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL.

Detailed instrumentation measurement uncertainties can be found in BACL report QAP-018.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.9 Test Facility

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test sites at BACL have been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission, Industry Canada, and Voluntary Control Council for Interference has the reports on file and is listed under FCC registration number: 90464, IC registration number: 3062A, and VCCI Registration Number: C-2463 and R-2698. The test site has been approved by the FCC, IC, and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm>

2 SYSTEM TEST CONFIGURATION

2.1 Justification

The EUT was configured for testing according to ANSI C63.4-2003.

The EUT was tested in the testing mode to represent *worst*-case results during the final qualification test.

2.2 EUT Exercise Software

The EUT is programmed with the following data rate settings that were used during testing:

Cell Band:

Channel	Low CH	Middle CH	High CH
Frequency (MHz)	824.70	836.52	848.31

PCS Band:

Channel	Low CH	Middle CH	High CH
Frequency (MHz)	1851.25	1880.00	1908.75

The Software to exercise the unit was provided by the customer.

Two types of software were used in both the 800 and the 1900 MHz bands:

1. CDMA 2000_1xEV-DO
2. EV-DO Rev. 0

2.3 Special Accessories

There were no special accessories were required, included, or intended for use with EUT during these tests.

2.4 Equipment Modifications

No modifications were made to the EUT.

2.5 Local Support Equipment

Manufacturer	Description	Model	Serial Number
Motion Computing	LE-Series Convertible Keyboard	KB004	TH-007020117-00288-59Q-0210
Motion Computing	DVD-ROM/CD-RW Drive	EDW085	CD-042020006-00381-69E-00A8
Dell	VGA Monitor	-	-
Lexar	USB Flash Drive x2	256 MB	-
Lexar	SD Flash Memory Card	256 MB	-
Logitech	Desktop Speakers	SP-12	-

2.6 EUT Internal Configuration Details

Manufacturer	Description	Model/ Rev.	Crystals (MHz)
Motion Computing	Tablet PC	T006	66.6
RAM	DDR-2 Base Memory	512 MB	667
Intel Dual-Core	Processor	Merom	1500
Hitachi	HDD	Travelstar 40 GB	-
USI	Bluetooth module	BM-GP-CS-08	16
Novatel Wireless	CDMA Module	E725	-

2.7 Power Supply Details

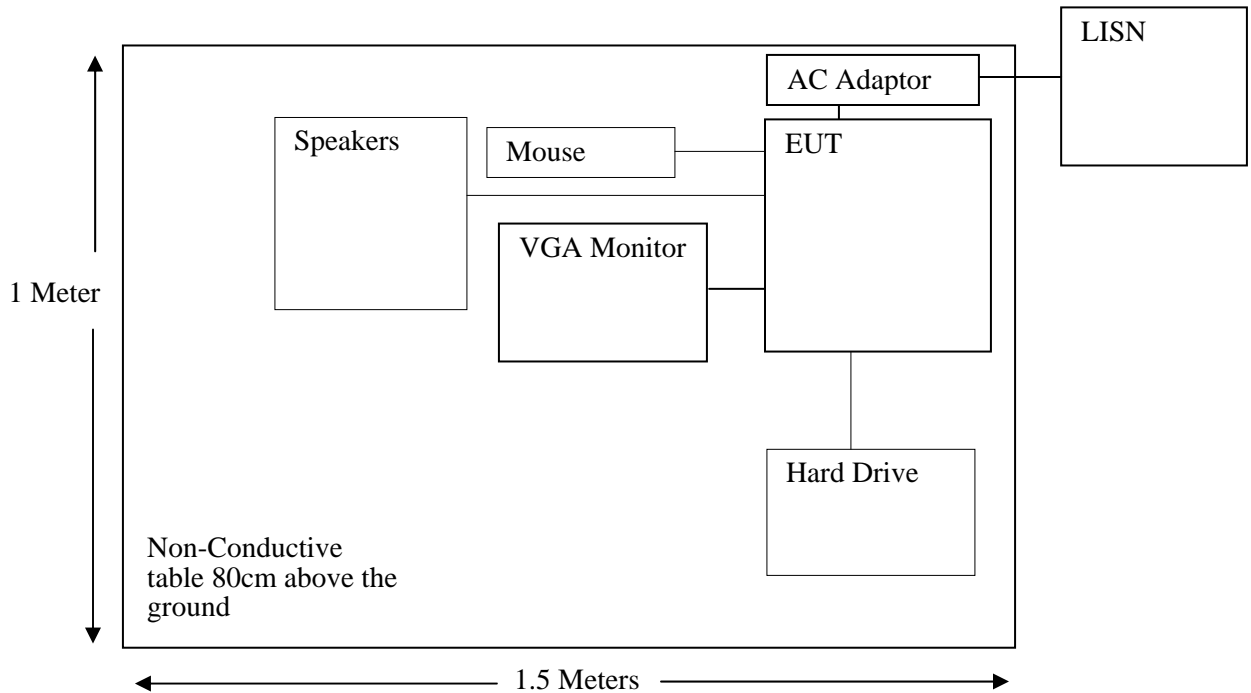
Manufacturer	Description	Model	Serial Number
Delta Electronics, Ltd.	Switching Power Supply	ADP-50HH	KOW0641001369

2.8 External I/O Cabling List and Details

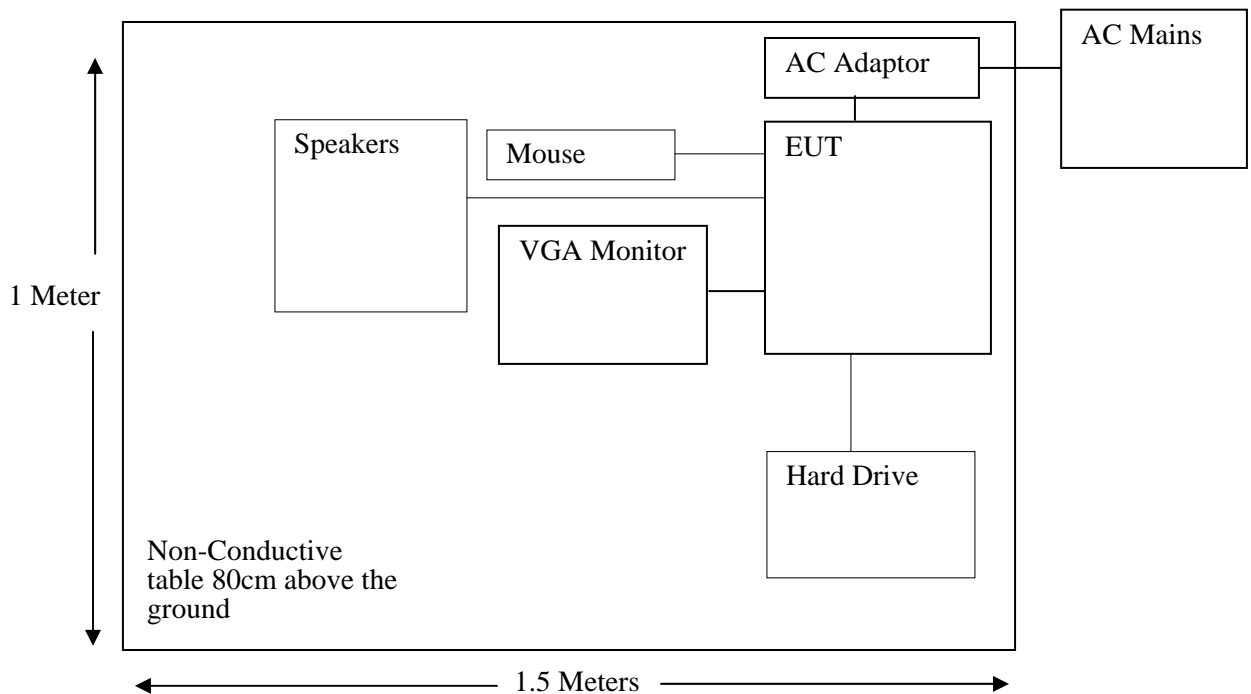
Cable Description	Length (M)	Shielded (S) / Unshielded (U)	From	To
VGA	3	S	Dell Monitor	EUT
Speaker	>1	U	Desktop Speakers	EUT
DC Power	3	S	Power Adaptor	EUT
Optical Disk Drive	>1	U	ODD	EUT

2.9 Test Setup Block Diagrams

Conducted Emission



Radiated Emission



3 SUMMARY OF TEST RESULTS

Results reported relate only to the product tested.

FCC & IC Rules/Standards	Description of Test	Result
FCC §2.1046, IC RSS-129 §9.1 & RSS-133 §6.4	RF Output Power	Compliant
FCC §2.1047 IC RSS-129 §5.1.1 & RSS-133 §6.2	Modulation Characteristics	Compliant*
FCC §2.1049 IC RSS-129 §8.1 & RSS-133 §6.5	Occupied Bandwidth	Compliant*
FCC §2.1051, §22.917, §24.238 IC RSS-129 §8.1 & RSS-133 §6.5	Antenna Port Spurious Emissions	Compliant*
FCC §2.1053, §22.917, §24.238 IC RSS-129 §8.1 & RSS-133 §6.5	Transmitter Field Strength of Spurious Radiation	Compliant
FCC §2.1055 IC RSS-129 §9.2.1 & RSS-133 §6.3	Frequency Stability	Compliant*
§15.109 IC RSS-129 §10 & RSS-133 §6.7	Receiver Radiated Emission	Compliant

*Please refer to the test report for FCC ID: PKRNVWEX725 for information regarding these tests.

4 FCC §2.1046 & IC RSS-129 §9.1, RSS-133 §6.4 - RF Output Power

4.1 Applicable Standard

According to FCC §2.1046, the output power of mobile transmitters and auxiliary test transmitters must not exceed 7 watts (38.45 dBm).

According to RSS-129 §9.1, maximum permissible output power for a class II (portable) mobile station is 2.5 watts (33.98 dBm).

According to RSS-133 §6.4 (with reference to SRSP-510), the maximum permissible output power for a mobile station is 2 watts (33.01 dBm).

4.2 Summary of Test Results

According to the test data below, the RF output power for both the Cellular and PCS bands on which the EUT operates are under the output power limits described in the respective FCC and IC rules and standards.

4.3 Environmental Conditions

Temperature:	20° C
Relative Humidity:	55%
ATM Pressure:	101.5 kPa

Testing was performed by Dan Corona on 2007-10-03.

4.4 Test Results

Band	Channel	S02	S02	S055	S055	TDSO S032	1x EvDO Rev.0	1x EvDO Rev.0	1x EvDO Rev.0	1x EvDO Rev.0
		RC1/1	RC3/3	RC1/1	RC3/3	RC3/3	(FTAP)	(RTAP)	(FETAP)	(RETAP)
Cellular	1013	23.45	23.49	23.43	23.49	23.55	23.56	23.54	23.58	23.57
	384	23.82	23.80	23.86	23.90	23.96	23.90	23.93	23.97	23.94
	777	24.05	24.03	24.07	24.05	24.04	24.08	24.06	24.07	24.05
PCS	25	24.02	24.07	24.08	24.09	24.03	24.06	24.09	24.05	24.07
	600	23.72	23.61	23.55	23.76	23.84	23.85	23.83	23.86	23.88
	1175	23.80	23.84	23.82	23.75	23.89	23.93	23.90	23.96	23.95

5 FCC §2.1053, §22.917, §24.238 & IC RSS-129 §8.1, RSS-133 §6.5 – Transmitter Field Strength of Spurious Radiation

5.1 Applicable Standard

5.1.1 As per FCC § 2.1053, § 22.917, § 24.238:

According to FCC § 2.1053, § 22.917, § 24.238: “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.”

5.1.2 As per RSS-129 §8.1:

- (1) The spurious emissions shall not exceed the limits in Table 8.1, where dBc is dB relative to the transmitter mean output power.

Table 8.1

Mobile Station Spurious Emission Limits When Transmitting

Col. 1	Col. 2 : Centre frequency offset by greater than 900 kHz for 30 kHz bandwidth or greater than 1.385 MHz for 1 MHz bandwidth. #	Col. 3: Centre frequency offset by greater than 1.98 MHz for 30 kHz bandwidth or greater than 2.465 MHz for 1 MHz bandwidth. #
Spurious emissions not to exceed (a), or both (b) and (c), whichever is less stringent.	(a) -42 dBc/30 kHz (b) -60 dBm/30 kHz (c) -55 dBm/ MHz	(a) -54 dBc/30 kHz (b) -60 dBm/30 kHz (c) -55 dBm/ MHz

See 5.2(e).

Note: In Table 8.1, the dBm values are to be measured at the antenna connector.

5.1.3 As per RSS-133 §6.5:

6.5.1 Out-of-Block Emissions (Mobile and Base Stations)

- a. Mobile stations must comply with subsection i. below. Base stations must comply with either subsection i. or subsection ii. It is only required to use the plots from Sections 4.4 a. and b. to demonstrate that the out-of-block emissions for blocks A and C3 are met. (Consult SRSP-510 for information on the frequency blocks.)
 - i. In the first 1.0 MHz bands immediately outside and adjacent to the licensee’s frequency block, the power of emissions **per any 1% of the emission bandwidth** shall be attenuated below the transmitter output power P (in watts) by at least $43 + 10 \log_{10}(P)$, dB.
 - b. After the first 1.0 MHz (for equipment that complies with a.i. of this subsection) or 1.5 MHz (for equipment that complies with a.ii. of this subsection), the power of emissions shall be attenuated below the transmitter output power by at least $43 + 10 \log_{10}(P)$, dB, **per any MHz of bandwidth**. (**Note:** If the test result using 1% of the emission bandwidth is used, then power integration over 1.0 MHz is required; alternatively, the spectrum analyser resolution and video bandwidths can be increased to 1.0 MHz for this measurement).

5.2 Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TXpwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log₁₀ (power out in Watts)

5.3 Environmental Conditions

Temperature:	20° C
Relative Humidity:	55%
ATM Pressure:	101.5 kPa

Testing was performed by Dan Coronia on 2007-10-03.

5.4 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date
Agilent	Analyzer, Spectrum	E4446A	US44300386	2007-04-26
HP	Amplifier, Pre	8447D	2944A10198	2007-01-08
HP	Amplifier, Pre, Microwave	8449B	3147A00400	2006-08-21
A. H. Systems	Antenna, Horn, DRG	SAS-200/571	261	2006-04-20
HP	Generator, Signal	83650B	3614A00276	2007-5-08
A.R.A.	Antenna, Horn	DRG-118/A	1132	2006-08-17

* **Statement of Traceability:** BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

5.5 Summary of Test Data

According to the test data below, the EUT meets the compliance requirements set out in the rules and standards listed in section 5.1 of this report.

5.6 Test Data

5.6.1 CDMA 2000_1xEV-DO

Run # 1: 30MHz -10GHz Cellular CDMA 800 MHz Band Middle Channel, 824.700 MHz, Low: 1013

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)		Height (m)	Polar H/V	Freq. (MHz)	Level (dBm)	Antenna Gain Correction (dBi)	Cable Loss dB			
1649.40	55.25	65	1.2	v	1649.40	-41.80	9.27	1.20	-33.7	-13	-20.7
1649.40	48.42	76	1.1	h	1649.40	-42.70	9.27	1.20	-34.6	-13	-21.6
2474.10	40.75	114	1.1	v	2474.10	-44.80	9.50	1.50	-36.8	-13	-23.8
2474.10	40.67	165	1.9	h	2474.10	-44.70	9.50	1.50	-36.7	-13	-23.7
3298.80	37.60	190	1.9	v	3298.80	-56.30	9.50	2.00	-48.8	-13	-35.8
3298.80	35.21	241	1.7	h	3298.80	-63.30	9.50	2.00	-55.8	-13	-42.8

Run # 2: 30MHz -10GHz Cellular CDMA 800 MHz Band Middle Channel, 836.520 MHz, Middle: 384

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)		Height (m)	Polar H/V	Freq. (MHz)	Level (dBm)	Antenna Gain Correction (dBi)	Cable Loss dB			
1673.04	53.33	21.5	1.4	v	1673.04	-48.00	9.27	1.40	-40.1	-13	-27.1
1673.04	56.67	242	1.9	h	1673.04	-53.00	9.27	1.40	-45.1	-13	-32.1
2509.56	50.17	257	2.1	v	2509.56	-51.00	9.25	1.50	-43.3	-13	-30.3
2509.56	48.17	251	2.3	h	2509.56	-56.00	9.25	1.50	-48.3	-13	-35.3
3346.08	39.51	260	2.4	v	3346.08	-60.00	9.99	1.90	-51.9	-13	-38.9
3346.08	38.65	240	1.9	h	3346.08	-61.00	9.99	1.90	-52.9	-13	-39.9

Run # 3: 30MHz -10GHz Cellular CDMA 800 MHz Band Middle Channel, 848.300 MHz, High: 777

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)		Height (m)	Polar H/V	Freq. (MHz)	Level (dBm)	Antenna Gain Correction (dBi)	Cable Loss dB			
1697.40	53.00	179	1.0	v	1697.40	-47.90	9.27	1.39	-40.0	-13	-27.0
1697.40	55.25	241	1.0	h	1697.40	-52.30	9.27	1.39	-44.4	-13	-31.4
2545.70	50.20	123	1.2	v	2545.70	-50.75	9.25	1.54	-43.0	-13	-30.0
2545.70	49.62	194	1.2	h	2545.70	-55.25	9.25	1.54	-47.5	-13	-34.5
3394.00	39.85	215	1.2	v	3394.00	-59.45	9.99	1.81	-51.3	-13	-38.3
3394.00	39.61	139	1.8	h	3394.00	-58.56	9.99	1.81	-50.4	-13	-37.4

5.6.2 EV-DO Rev. 0**Run # 1: 30MHz -10GHz Cellular CDMA 800 MHz Band Middle Channel, 824.700 MHz, Low: 1013**

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)		Height (m)	Polar H/V	Freq. (MHz)	Level (dBm)	Antenna Gain Correction (dBi)	Cable Loss dB			
1649.40	55.12	70	1.1	v	1649.40	-41.15	9.27	1.20	-33.1	-13	-20.1
1649.40	48.35	80	1.2	h	1649.40	-42.30	9.27	1.20	-34.2	-13	-21.2
2474.10	40.52	100	1.2	v	2474.10	-43.98	9.50	1.50	-36.0	-13	-23.0
2474.10	40.56	155	1.8	h	2474.10	-43.85	9.50	1.50	-35.9	-13	-22.9
3298.80	38.90	185	1.7	v	3298.80	-55.64	9.50	2.00	-48.1	-13	-35.1
3298.80	39.42	235	1.6	h	3298.80	-58.78	9.50	2.00	-51.3	-13	-38.3

Run # 2: 30MHz -10GHz Cellular CDMA 800 MHz Band Middle Channel, 836. 520 MHz, Middle: 384

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)		Height (m)	Polar H/V	Freq. (MHz)	Level (dBm)	Antenna Gain Correction (dBi)	Cable Loss dB			
1673.04	54.12	190	1.1	v	1673.04	-48.15	9.27	1.40	-40.3	-13	-27.3
1673.04	56.89	250	1.2	h	1673.04	-53.45	9.27	1.40	-45.6	-13	-32.6
2509.56	50.17	130	1.1	v	2509.56	-51.24	9.25	1.50	-43.5	-13	-30.5
2509.56	49.25	185	1.0	h	2509.56	-55.89	9.25	1.50	-48.1	-13	-35.1
3346.08	40.25	200	1.3	v	3346.08	-61.28	9.99	1.90	-53.2	-13	-40.2
3346.08	39.89	140	1.7	h	3346.08	-60.00	9.99	1.90	-51.9	-13	-38.9

Run # 3: 30MHz -10GHz Cellular CDMA 800 MHz Band Middle Channel, 848.300 MHz, High: 777

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)		Height (m)	Polar H/V	Freq. (MHz)	Level (dBm)	Antenna Gain Correction (dBi)	Cable Loss dB			
1697.40	53.56	185	2.0	v	1697.40	-47.82	9.27	1.39	-39.9	-13	-26.9
1697.40	55.12	250	1.3	h	1697.40	-52.10	9.27	1.39	-44.2	-13	-31.2
2545.70	49.85	130	1.4	v	2545.70	-50.26	9.25	1.54	-42.6	-13	-29.6
2545.70	50.31	185	1.2	h	2545.70	-55.35	9.25	1.54	-47.6	-13	-34.6
3394.00	39.58	200	1.2	v	3394.00	-58.96	9.99	1.81	-50.8	-13	-37.8
3394.00	39.95	150	1.6	h	3394.00	-57.72	9.99	1.81	-49.5	-13	-36.5

5.6.3 CDMA 2000_1xEV-DO**Run # 1: 30MHz -20GHz PCS CDMA 1900 MHz Band Middle Channel, 1851.250 MHz, Low: 25**

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)		Height (m)	Polar H/V	Freq. (MHz)	Level (dBm)	Antenna Gain Correction (dBi)	Cable Loss dB			
3702.50	57.50	105	1.1	v	3702.50	-40.80	11.44	2.00	-31.4	-13	-18.4
3702.50	56.00	250	1.3	h	3702.50	-41.90	11.44	2.00	-32.5	-13	-19.5
5553.75	39.56	230	1.0	v	5553.75	-42.80	10.93	2.40	-34.3	-13	-21.3
5553.75	38.17	247	2.0	h	5553.75	-50.70	10.93	2.40	-42.2	-13	-29.2
7405.00	39.00	66	1.4	v	7405.00	-56.30	10.67	2.80	-48.4	-13	-35.4
7405.00	35.83	39	1.3	h	7405.00	-63.30	10.67	2.80	-55.4	-13	-42.4

Run # 2: 30MHz -20GHz PCS CDMA 1900 MHz Band Middle Channel, 1880.000 MHz, Middle: 600

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)		Height (m)	Polar H/V	Freq. (MHz)	Level (dBm)	Antenna Gain Correction (dBi)	Cable Loss dB			
3760.00	54.33	15	2.0	v	3760.00	-48.00	11.44	2.00	-38.6	-13	-25.6
3760.00	57.90	290	1.9	h	3760.00	-53.00	11.44	2.00	-43.6	-13	-30.6
5640.00	42.43	32	1.1	v	5640.00	-51.00	11.22	2.60	-42.4	-13	-29.4
5640.00	45.89	120	1.5	h	5640.00	-56.00	11.22	2.60	-47.4	-13	-34.4
7520.00	38.52	50	1.8	v	7520.00	-60.00	11.14	3.00	-51.9	-13	-38.9
7520.00	39.12	139	1.8	h	7520.00	-61.00	11.14	3.00	-52.9	-13	-39.9

Run # 3: 30MHz -20GHz PCS CDMA 1900 MHz Band Middle Channel, 1908.750 MHz, High: 1175

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)		Height (m)	Polar H/V	Freq. (MHz)	Level (dBm)	Antenna Gain Correction (dBi)	Cable Loss dB			
3817.50	50.46	110	1.0	v	3817.50	-61.90	10.67	2.00	-53.2	-13	-40.2
3817.50	49.35	260	1.0	h	3817.50	-62.20	10.67	2.00	-53.5	-13	-40.5
5726.25	39.85	220	1.2	v	5726.25	-60.20	11.45	2.50	-51.3	-13	-38.3
5726.25	39.20	260	2.2	h	5726.25	-63.30	11.45	2.50	-54.4	-13	-41.4
7635.00	38.27	60	1.2	v	7635.00	-60.20	11.44	3.00	-51.8	-13	-38.8
7635.00	36.12	48	1.3	h	7635.00	-66.30	11.44	3.00	-57.9	-13	-44.9

5.6.4 EV-DO Rev. 0**Run # 1: 30MHz -20GHz PCS CDMA 1900 MHz Band Middle Channel, 1851.250 MHz, Low: 25**

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)		Height (m)	Polar H/V	Freq. (MHz)	Level (dBm)	Antenna Gain Correction (dBi)	Cable Loss dB			
3702.50	56.80	110	1.0	v	3702.50	-40.95	11.44	2.00	-31.5	-13	-18.5
3702.50	55.62	220	1.2	h	3702.50	-40.20	11.44	2.00	-30.8	-13	-17.8
5553.75	40.50	200	1.1	v	5553.75	-41.56	10.93	2.40	-33.0	-13	-20.0
5553.75	39.25	237	1.9	h	5553.75	-55.30	10.93	2.40	-46.8	-13	-33.8
7405.00	39.23	76	1.5	v	7405.00	-55.40	10.67	2.80	-47.5	-13	-34.5
7405.00	38.65	45	1.2	h	7405.00	-60.23	10.67	2.80	-52.4	-13	-39.4

Run # 2: 30MHz -20GHz PCS CDMA 1900 MHz Band Middle Channel, 1880.000 MHz, Middle: 600

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)		Height (m)	Polar H/V	Freq. (MHz)	Level (dBm)	Antenna Gain Correction (dBi)	Cable Loss dB			
3760.00	53.20	20	2.1	v	3760.00	-48.00	11.44	2.00	-38.6	-13	-25.6
3760.00	56.85	250	1.8	h	3760.00	-53.00	11.44	2.00	-43.6	-13	-30.6
5640.00	41.35	40	1.1	v	5640.00	-51.00	11.22	2.60	-42.4	-13	-29.4
5640.00	44.89	100	1.4	h	5640.00	-56.00	11.22	2.60	-47.4	-13	-34.4
7520.00	39.60	60	1.9	v	7520.00	-60.00	11.14	3.00	-51.9	-13	-38.9
7520.00	39.12	125	1.9	h	7520.00	-61.00	11.14	3.00	-52.9	-13	-39.9

Run # 3: 30MHz -20GHz PCS CDMA 1900 MHz Band Middle Channel, 1908.750 MHz, High: 1175

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)		Height (m)	Polar H/V	Freq. (MHz)	Level (dBm)	Antenna Gain Correction (dBi)	Cable Loss dB			
3817.50	51.45	100	1.2	v	3817.50	-60.12	10.67	2.00	-51.5	-13	-38.5
3817.50	50.20	245	1.3	h	3817.50	-61.25	10.67	2.00	-52.6	-13	-39.6
5726.25	39.25	200	1.2	v	5726.25	-60.15	11.45	2.50	-51.2	-13	-38.2
5726.25	39.50	250	2.0	h	5726.25	-60.00	11.45	2.50	-51.1	-13	-38.1
7635.00	39.80	70	1.5	v	7635.00	-60.30	11.44	3.00	-51.9	-13	-38.9
7635.00	39.60	50	1.4	h	7635.00	-61.20	11.44	3.00	-52.8	-13	-39.8

6 FCC §15.109 & IC RSS-129 §10, RSS-133 §6.7- Receiver Radiated Emissions

6.1 Applicable Standard

6.1.5 As per FCC §15.109: Radiated Emission Limits

(a) Except for Class B digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Field Strength (dB μ V/m)
30-88	100
88-216	150
216-960	200
Above 960	500

(g) As an alternative to the radiated emission limits shown in paragraphs (a) and (b) of this section, digital devices may be shown to comply with the standards contained in Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, "Information Technology Equipment—Radio Disturbance Characteristics—Limits and Methods of Measurement."

Note: The CISPR 22 §6 Standard, Class B limits are applied to the test data hereinafter.

6.1.6 As per IC RSS-129 §10: Limits

Table 10.1

Spurious Frequency (MHz)	Field Strength (microvolts/m) at 3 metres
30-88	100
88-216	150
216-960	200
960-1610	500
Above 1610	1000

6.1.7 As per IC RSS-133 §6.7: Limits**Table 2 - Spurious Emission Limits for Receivers**

Spurious Frequency (MHz)	Field Strength (microvolts/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960	500

6.2 Test Setup

The radiated emissions tests were performed in the 10-meter test chamber, using the setup in accordance with CISPR 22 Ed. 5.2 b: 2006 measurement procedures. The specifications used were in accordance with CISPR 22 §6 Standard, Class B limits for frequencies between 30 MHz and 1 GHz.

The spacing between the peripherals was 10 cm.

The external I/O cables were draped along the test table and bundled as required.

The EUT was connected to a 120 V, 60 Hz AC line power source.

6.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date
Sonoma Instruments	Pre amplifier	317	260407	2007-04-26
Sunol Sciences Corp	Broadband Antenna	JB3 Antenna	A020106-2	2007-04-05
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.595 0K03	100044	2007-02-19

***Statement of Traceability:** BACL Corp. attests that all calibrations have been performed according to NVLAP requirements, traceable to the NIST.

6.4 Test Procedure

Maximization procedure was performed on the six (6) highest emissions readings to ensure the EUT is compliant with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings were performed only when an emission was found to be marginal (within -4 dB of specification limits).

6.5 Environmental Conditions

Temperature:	20° C
Relative Humidity:	55%
ATM Pressure:	101.5 kPa

Testing was performed by Dan Corona on 2007-10-03.

6.6 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor, and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corrected Amplitude} - \text{Class B Limit}$$

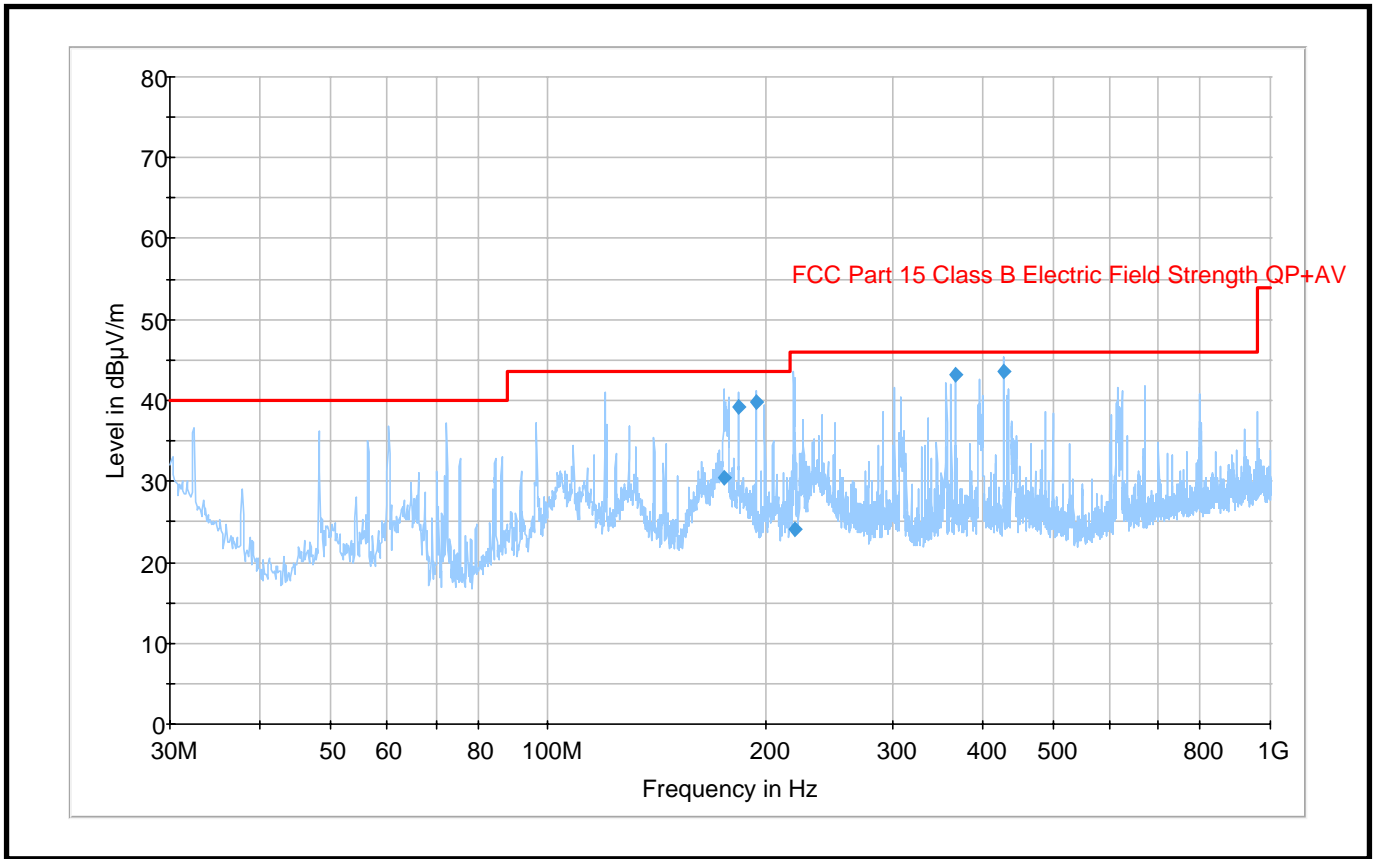
6.7 Summary of Test Results – 30 MHz to 1 GHz

According to the recorded data, the EUT complied with CISPR 22 §6 Standard, Class B limits, and had the worst margin reading of:

Mode: Data Transmit			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Range (MHz)
-2.3	427.215000	Vertical	30 MHz to 1000 MHz

6.8 Radiated Emissions Test Plot and Data – EV-DO Rev. 0

30 MHz – 1 GHz



Frequency (MHz)	Quasi-Peak (dBµV/m)	Antenna Height (cm)	Polarity (H/V)	Turntable Position (degrees)	Limit (dBµV/m)	Margin (dB)
427.215000	43.7	100.7	V	10.0	46.0	-2.3
366.165000	43.1	100.7	V	343.0	46.0	-2.9
194.415000	39.8	100.7	H	327.0	43.5	-3.7
183.623750	39.2	100.7	H	42.0	43.5	-4.3
175.317500	30.5	100.7	H	105.0	43.5	-13.0
219.210000	24.0	100.7	H	44.0	46.0	-22.0

7 EXHIBIT A – FCC & IC EQUIPMENT LABELING REQUIREMENTS

7.1 FCC § 2.925 Identification of equipment

(a) Each equipment covered in an application for equipment authorization shall bear a nameplate or label listing the following:

(1) FCC Identifier consisting of the two elements in the exact order specified in §2.926. The FCC Identifier shall be preceded by the term *FCC ID* in capital letters on a single line, and shall be of a type size large enough to be legible without the aid of magnification.

Example: FCC ID XXX123. XXX—Grantee Code 123—Equipment Product Code

7.2 FCC ID Labeling Requirements as per FCC § 15.19

(a) In addition to the requirements in part 2 of this chapter, a device subject to certification, or verification shall be labeled as follows:

(3) All other devices shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

(4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified above is required to be affixed only to the main control unit. If the EUT is integrated within another device then a label affixed to the host shall also state, "Contains FCC ID:XXXXXX"

(5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

IC: XXXXXX-YYYYYYYY Where:

- "XXXXXX-YYYYYYYY" is the certification number
- "XXXXXX" is the Certificate Holder Number (CHN), made of at most 6 alphanumeric characters (A-Z, 0-9), assigned by Industry Canada; and
- "YYYYYYYY" is the Unique Product Number (UPN), made of at most 8 alphanumeric characters (A-Z, 0-9) assigned by the applicant.
- Note 1: The term "IC" before the equipment certification number only signifies that the Industry Canada technical specifications were met.
- Note 2: Note 1 shall be conspicuously placed in the equipment user manual.
- Note 3: Permitted alphanumeric characters used in the CHN and UPN are limited to capital letters (A-Z) and digits (0-9). Other characters, such as "#", "/" or "-", shall not be used.

7.3 Specifications: As per RSS GEN 5.2 Equipment Labeling:

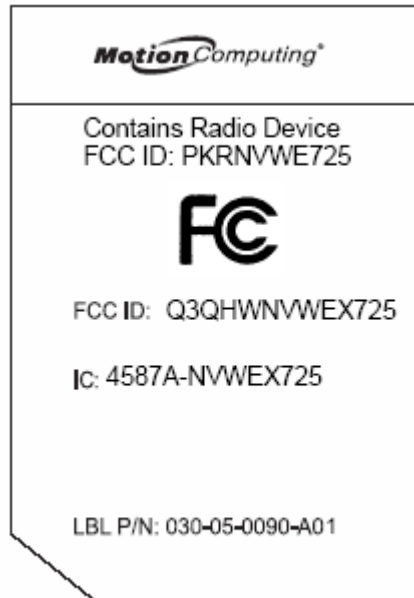
Equipment subject to certification under the applicable RSS, shall be permanently labeled on each item, or as an inseparable combination. The label must contain the following information for full compliance:

- (a) the certification number, prefixed by the term "IC:";
- (b) the manufacturer's name, trade name or brand name; and
- (c) a model name or number.

Equipment for which a certificate has been issued is not considered certified if it is not properly labeled.

The information on the Canadian label can be combined with the manufacturer's other labeling requirements. If the device size is too small to put a label, the label can be included in the user's manual, upon agreement with Industry Canada.

7.4 Suggested FCC ID & IC Label



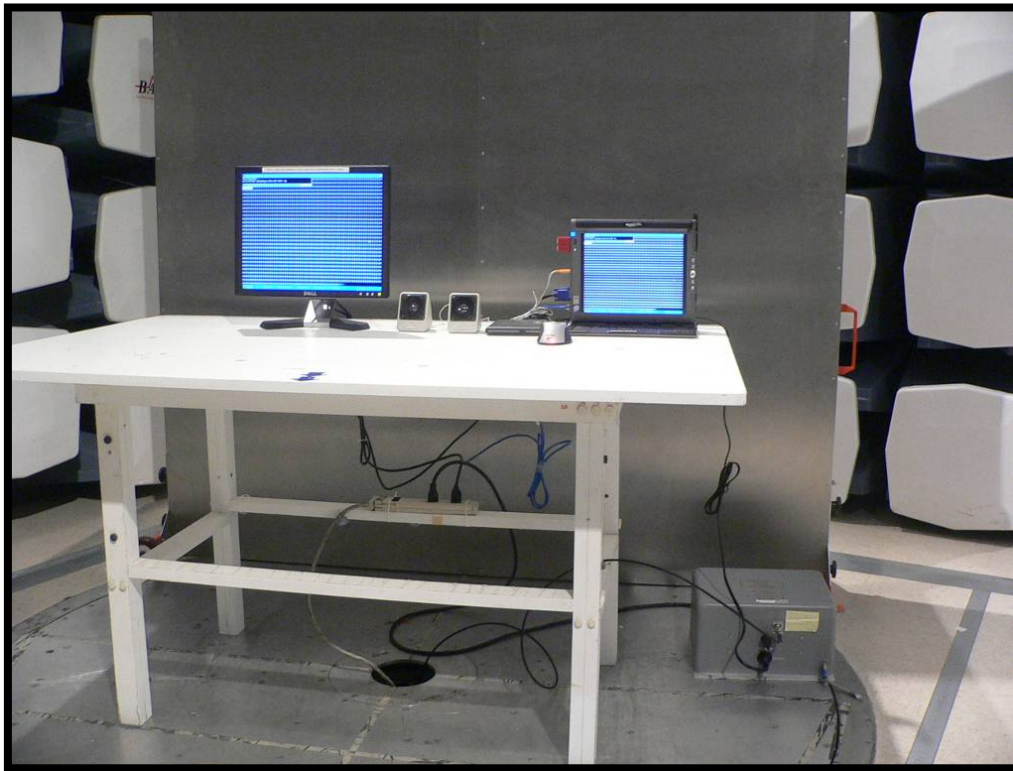
7.5 Label Location

SCALE:200%

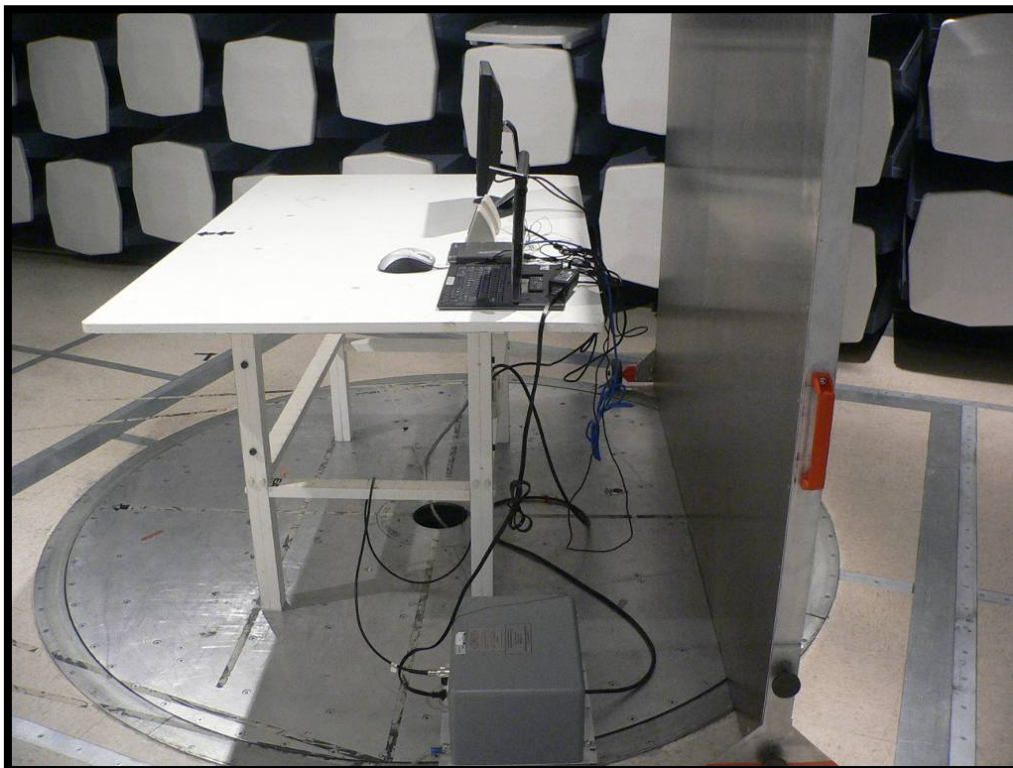


8 EXHIBIT B - TEST SETUP PHOTOGRAPHS

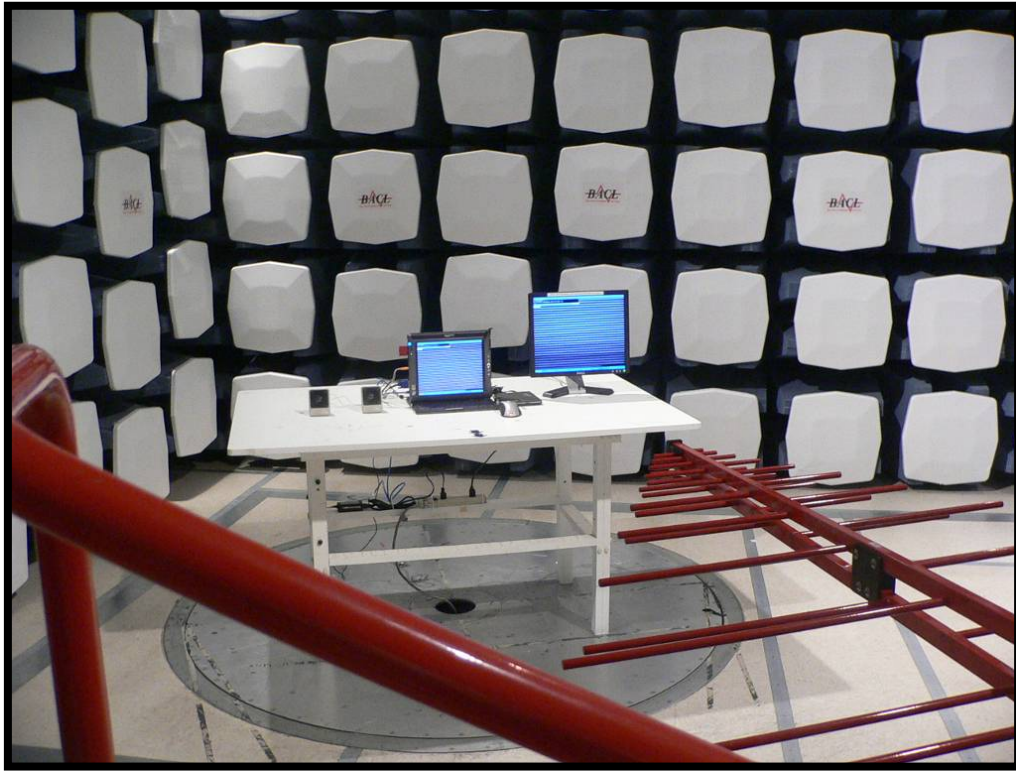
8.1 Conducted Emissions – Front View



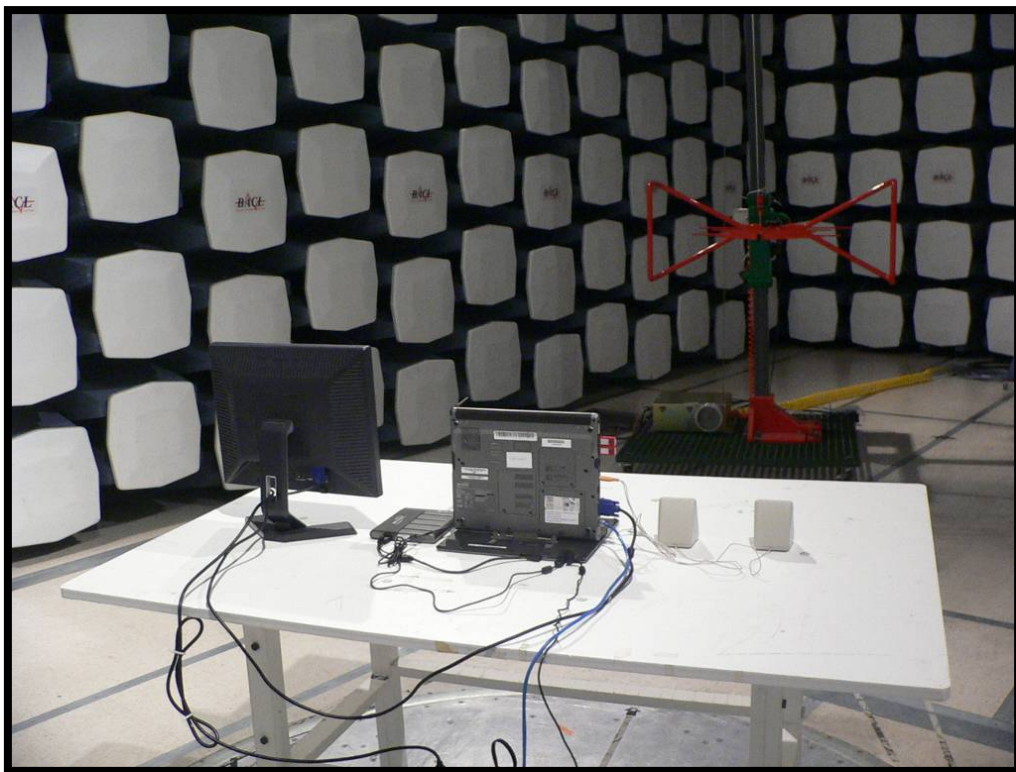
8.2 Conducted Emissions – Side View



8.3 Radiated Emissions (30 MHz~1GHz) – Front View



8.4 Radiated Emissions (30 MHz~1GHz) – Rear View



9 EXHIBIT C - EUT PHOTOGRAPHS

9.1 EUT External View 1



9.2 EUT External View 2



9.3 EUT External View 3



9.4 EUT External View 4



9.5 EUT External View 5



9.6 Novatel Wireless CDMA Module installed in EUT



9.7 Battery Pack Bottom View



9.8 EUT with KB004 Keyboard



9.9 EUT Power Supply Top View



***** END OF REPORT *****