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Report On

FCC and Industry Canada Testing of the
IP Access
2G EDGE Picocell Base Station (1900MHz)

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FCC ID : QGGKU02ZZS
IC ID: 4644A-KU02ZZS

Document 75905356 Report 01 Issue 2

April 2009



Product Service

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DATED

30 April 2009

This report has been up-issued to Issue 2 to include the EUT's Industry Canada ID and references to the RSS-Gen specification.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47: Part 15 and RSS-Gen Issue 2. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

J Holcombe

G Lawler





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SECTION 1

REPORT SUMMARY

FCC and Industry Canada Testing of the
IP Access
2G EDGE Picocell Base Station(1900MHz)



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the IP Access 2G EDGE Picocell Base Station(1900MHz) to the requirements of FCC CFR 47 Part 15B and RSS-Gen Issue 2.

Objective	To perform FCC and Industry Canada testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	IP Access Ltd
Model Number(s)	165H (1900MHz)
Serial Number(s)	00075129
Software Version	168a357v142b30d0
Hardware Version	A
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15B: 2006 RSS-Gen Issue 2: 2007
Incoming Release Date	Declaration of Build Status 10 March 2009
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	20821 15 December 2008
Start of Test	09 February 2009
Finish of Test	05 March 2009
Name of Engineer(s)	J Holcombe G Lawler
Related Document(s)	ANSI 63.4 : 2001



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1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results in accordance with FCC CFR 47 Part 15B and RSS-Gen Issue 2, is shown below.

Configuration 1 - Powered Up							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Base Standard
	FCC	IC					
2.1	15.109	7.2.3	Radiated Emissions (Enclosure Port)	Idle	0	Pass	ANSI 63.4
2.2	15.107	7.2.2	Conducted Emissions (AC Power Port)	Idle	0	Pass	ANSI 63.4



1.3 DECLARATION OF BUILD STATUS

Manufacturer	IP Access Ltd
Country of origin	UK
UK Agent	N/A
Technical Description	2G EDGE Picocell Base Station
Model No	nanoBTS
Part No	165H (1900MHz)
Serial No	00075129
Drawing Number	165#006_PRT Individual Pack Assembly 165#012_PRT nanoBTS Assembly 165#017_PRT nanoBTS Sub-Assembly
Build Status	72
Software Issue	168a357v142b30d0
Hardware Issue	A
FCC ID	QGGKU02ZZS
Industry Canada ID	4644A-KU02ZZS
Signature	
Date	10 March 2009
D of B S Serial No	75905356

Note: This document has been prepared to enable manufacturers with no mechanism for producing their own Declaration of Build Status, to declare the build state of the equipment submitted for test.

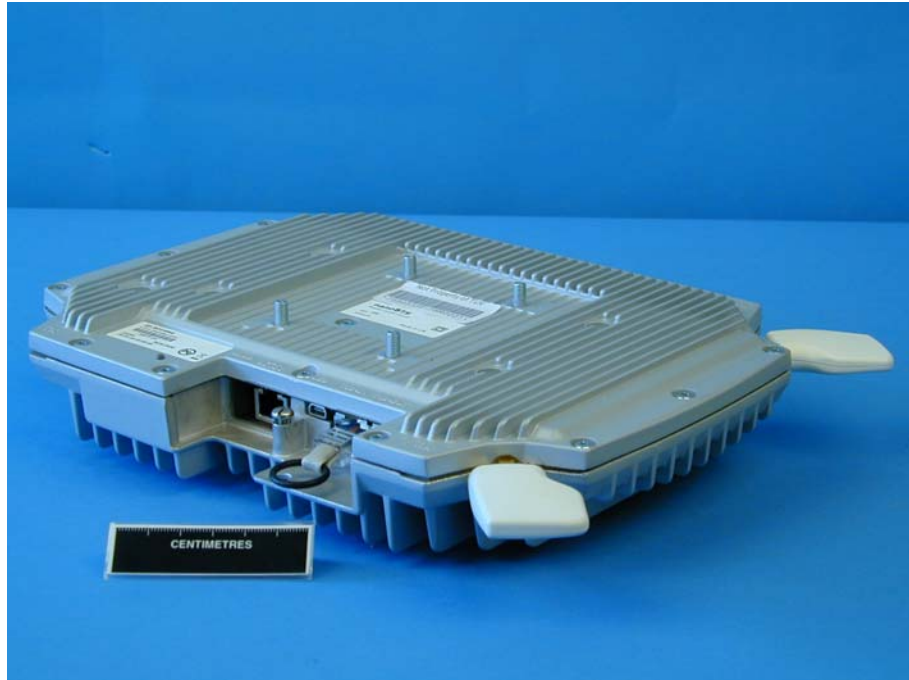
No responsibility will be accepted by TÜV Product Service as to the accuracy of the information declared in this document by the manufacturer.



1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a IP Access 2G EDGE Picocell Base Station(1900MHz) as shown in the photograph below. A full technical description can be found in the Manufacturers documentation.



Equipment Under Test



1.4.2 Test Configuration

Configuration 1: Powered Up

The EUT was powered up and linked up to a drive laptop.

1.4.3 EUT Cable / Port Identification

Port	Max Cable Length specified	Usage	Type	Screened
DC Power	1.5m or <3m	Power /Signal Lead	Multicore	No
AC Power	1.0m	Power	3 Core	No

1.4.4 Modes of Operation

Modes of operation of each EUT during testing were as follows:

Mode 1 – Idle

EUT powered up but no transmissions were operated.

Information on the specific test modes utilised are detailed in the test procedure for each individual test.



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1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure, test laboratories or an open test area as appropriate.

The EUT was powered from a 110V, 60Hz supply via a AC to DC Power Supply Unit. The EUT is rated at 48V DC.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation
IC2932B-1 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.7 MODIFICATION RECORD

No modifications were made to the EUT during testing.



SECTION 2

TEST DETAILS

FCC and Industry Canada Testing of the
IP Access
2G EDGE Picocell Base Station(1900MHz)



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2.1 RADIATED EMISSIONS (ENCLOSURE PORT)

2.1.1 Specification Reference

FCC CFR 47 Part 15B, Clause 15.109
RSS-Gen Issue 2, Clause 7.2.3

2.1.2 Equipment Under Test

2G EDGE Picocell Base Station(1900MHz), S/N: 00075129

2.1.3 Date of Test and Modification State

09 February to 05 March 2009 - Modification State 1 and 0

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI 63.4.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1

2.1.6 Environmental Conditions

	09 February 2009	05 March 2009
Ambient Temperature	24°C	19°C
Relative Humidity	25%	59%
Atmospheric Pressure	979mbar	993mbar

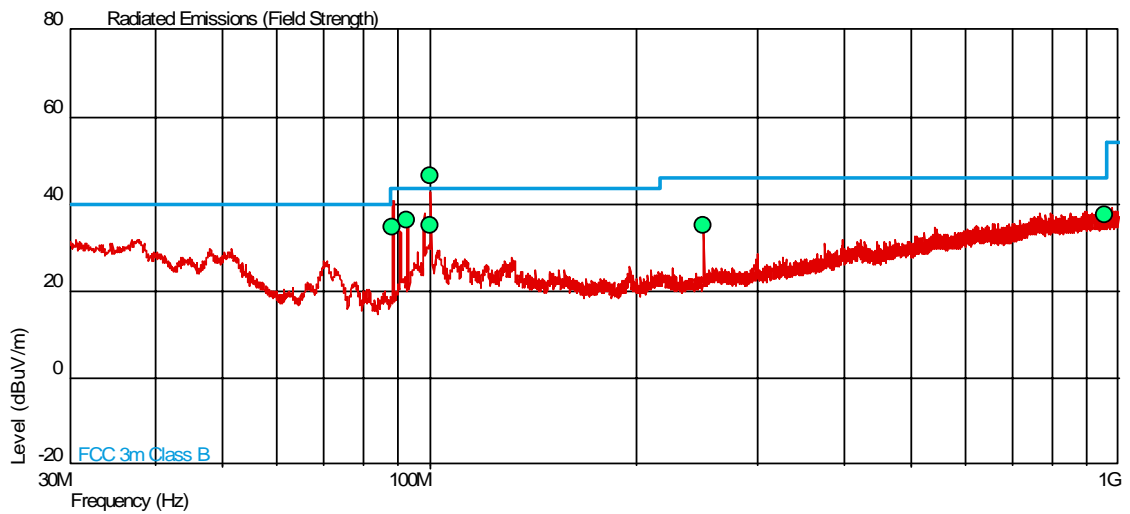


2.1.7 Test Results

For the period of test the EUT met the Class A requirements of FCC CFR 47 Part 15B and RSS-Gen Issue 2 for Radiated Emissions (Enclosure Port).

The test results are shown below.

Configuration 1 - Mode 1



Note: The Limit Lines shown on the emissions plot is Class B but the client has declared the product to the a Class A limit. The emissions results have been compared to the Class A limits.

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	Polarity
88.491	34.6	53.5	-18.9	274	1.00	Vertical
92.891	36.1	53.5	-17.4	283	1.00	Vertical
100.291***	46.4	53.5	-7.1	219	1.00	Vertical
100.296	35.0	53.5	-18.5	25	1.68	Horizontal
250.000	35.0	56.0	-21.0	133	1.16	Horizontal
953.907	37.5	56.0	-18.5	360	1.00	Vertical

***The emission detected above was proven to be Classic FM coupling into the chamber, via the ethernet cable connecting the EUT to the support equipment. All measures were taken to minimise emissions cross coupling into the chamber with use of a ferrite absorbing clamp



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2.2 CONDUCTED EMISSIONS (AC POWER PORT)

2.2.1 Specification Reference

FCC CFR 47 Part 15B, Clause 15.107
RSS-Gen Issue 2, Clause 7.2.2

2.2.2 Equipment Under Test

2G EDGE Picocell Base Station(1900MHz), S/N: 00075129

2.2.3 Date of Test and Modification State

09 February 2009 - Modification State 0

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI 63.4.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1

2.2.6 Environmental Conditions

09 February 2009

Ambient Temperature 24°C

Relative Humidity 25%

Atmospheric Pressure 979mbar



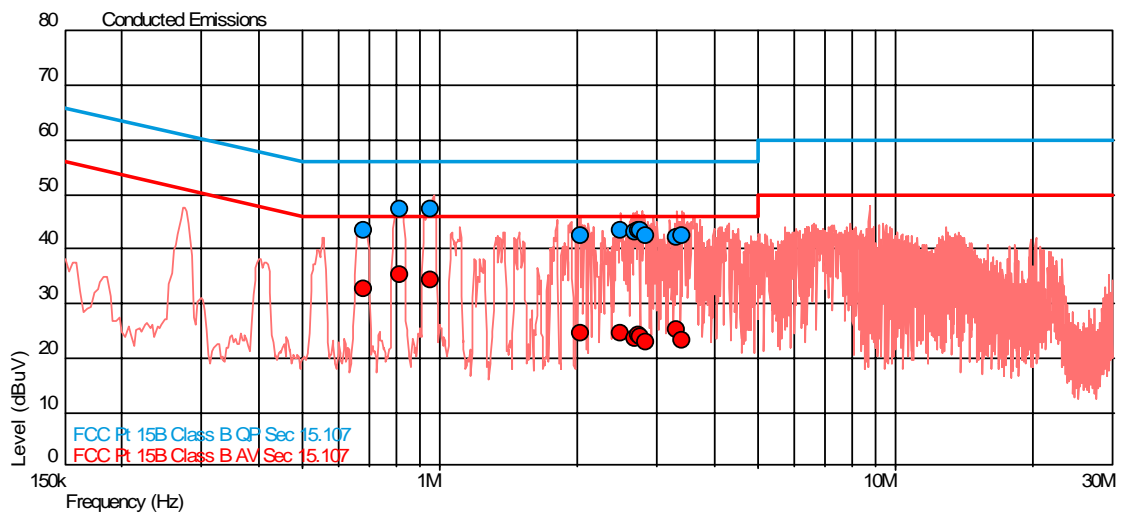
2.2.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15B and RSS-Gen Issue 2 for Conducted Emissions (AC Power Port).

The test results are shown below.

Configuration 1 - Mode 1

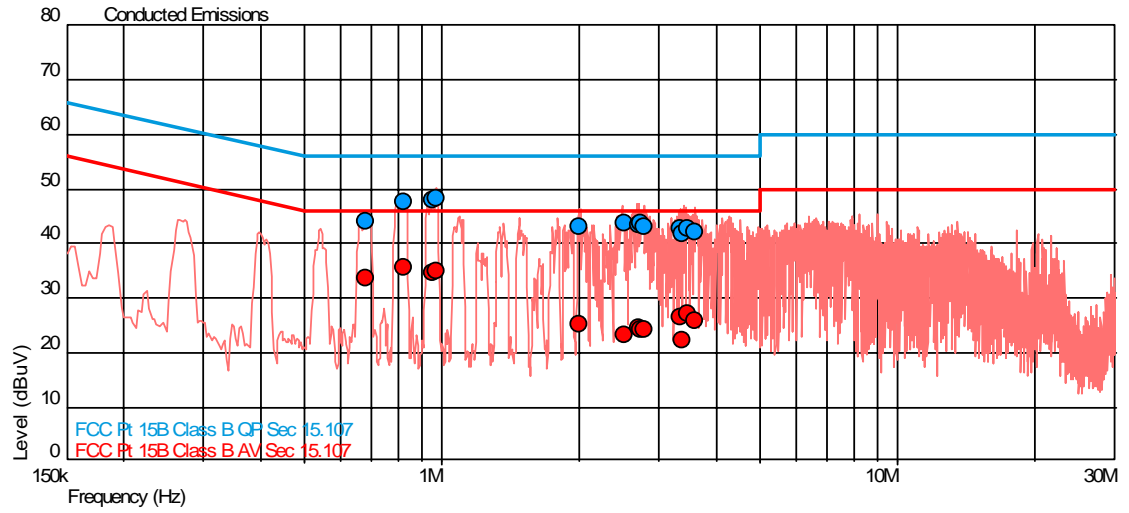
Neutral Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.679	43.3	56.0	-12.7	32.7	46.0	-13.3
0.816	47.4	56.0	-8.6	35.3	46.0	-10.7
0.952	47.5	56.0	-8.5	34.2	46.0	-11.8
2.035	42.3	56.0	-13.7	24.5	46.0	-21.5
2.495	43.4	56.0	-12.6	24.5	46.0	-21.5
2.683	43.2	56.0	-12.8	23.7	46.0	-22.3
2.731	43.5	56.0	-12.5	24.2	46.0	-21.8
2.753	43.3	56.0	-12.7	23.9	46.0	-22.1
2.819	42.3	56.0	-13.7	22.9	46.0	-23.1
3.311	42.1	56.0	-13.9	25.1	46.0	-20.9
3.393	42.5	56.0	-13.5	23.1	46.0	-22.9



Live Line



Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.680	44.1	56.0	-11.9	33.6	46.0	-12.4
0.825	47.5	56.0	-8.5	35.5	46.0	-10.5
0.955	47.9	56.0	-8.1	34.7	46.0	-11.3
0.968	48.3	56.0	-7.7	34.8	46.0	-11.2
2.001	43.2	56.0	-12.8	25.2	46.0	-20.8
2.504	43.8	56.0	-12.2	23.2	46.0	-22.8
2.694	43.5	56.0	-12.5	24.4	46.0	-21.6
2.727	43.7	56.0	-12.3	24.3	46.0	-21.7
2.775	43.0	56.0	-13.0	24.2	46.0	-21.8
3.323	42.6	56.0	-13.4	26.3	46.0	-19.7
3.367	41.9	56.0	-14.1	22.3	46.0	-23.7
3.445	42.9	56.0	-13.1	27.3	46.0	-18.7
3.582	42.1	56.0	-13.9	26.0	46.0	-20.0



SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 EMC - Conducted Emissions					
LISN (1 Phase)	Chase	MN 2050	336	12	18-Mar-2009
Transient Limiter	Hewlett Packard	11947A	1032	12	18-Jun-2009
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	20-Aug-2009
Section 2.2 EMC - Radiated Emissions					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	6-Sep-2009
Pre-Amplifier	Phase One	PS04-0086	1533	12	15-Sep-2009
Pre-Amplifier	Phase One	PS04-0087	1534	12	30-Jul-2009
Screened Room (5)	Rainford	Rainford	1545	36	11-Feb-2011
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Turntable/Mast Controller	EMCO	2090	1607	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	28-Nov-2009
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	25-Jul-2009
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	20-Aug-2009

TU – Traceability Unscheduled

OP MON – Output Monitored with Calibrated Equipment



3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.1dB*
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Conducted Emissions, LISN	150kHz to 30MHz Amplitude	3.2dB*
Conducted Emissions, ISN	150kHz to 30MHz Amplitude	2.1dB
Substitution Antenna, Radiated Field	30MHz to 18GHz Amplitude	2.6dB
Discontinuous Interference	150kHz to 30MHz Amplitude	3.0dB*
Interference Power	30MHz to 300MHz Amplitude	3.0dB*
Radiated E-Field Susceptibility	26MHz to 2.5GHz Test Amplitude	1.4dB†
Conducted Susceptibility	100kHz to 250MHz Amplitude	1.8dB†
DC Input Ripple Immunity	Current Voltage	0.45% 0.91%
Power Frequency Magnetic Field	50Hz/60Hz Amplitude	0.45%
Magnetic Emissions	9kHz to 30MHz Amplitude	3.4dB*
Magnetic Field/Flux iaw EN 50366	10Hz to 400kHz	2.64%
Harmonics and Flicker	The test was applied using proprietary equipment that meets the requirements of EN 61000-3-2 and EN 61000-3-3	—
Mains Voltage Variations and Interrupts	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-11	—
Fast Transient Burst	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-4	—
Electrostatic Discharge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-2	—
Surge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-5	—
Vehicle Transients	The test was applied using proprietary equipment that meets the requirements of ISO 7637-1 and 2	—
Compass Safe Distance	Azimuth Accuracy	0.10°

Worst case error for both Time and Frequency measurement 12 parts in 10⁶.

* In accordance with CISPR 16-4

† In accordance with UKAS Lab 34



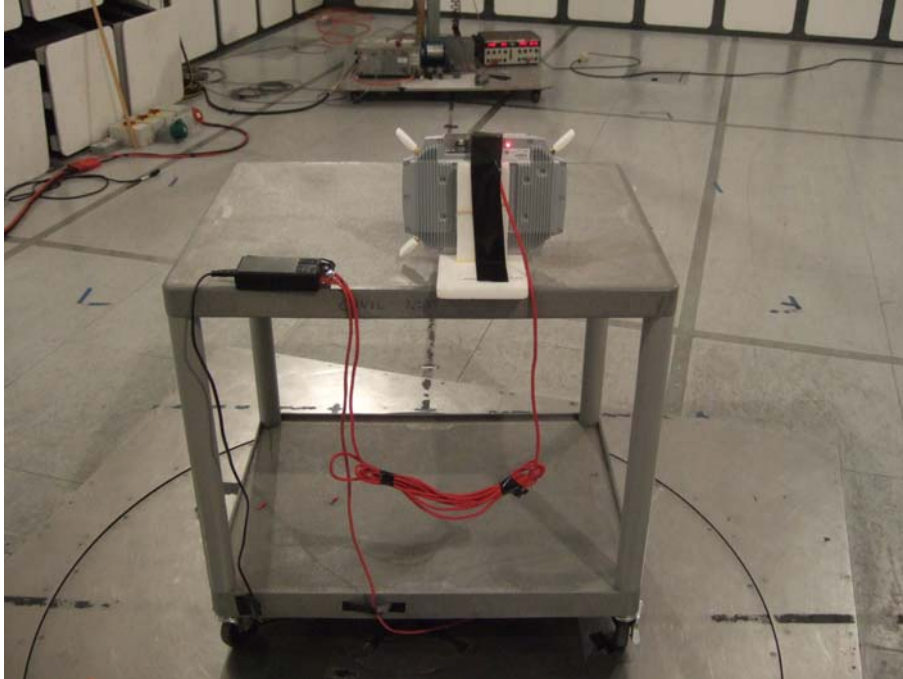
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SECTION 4

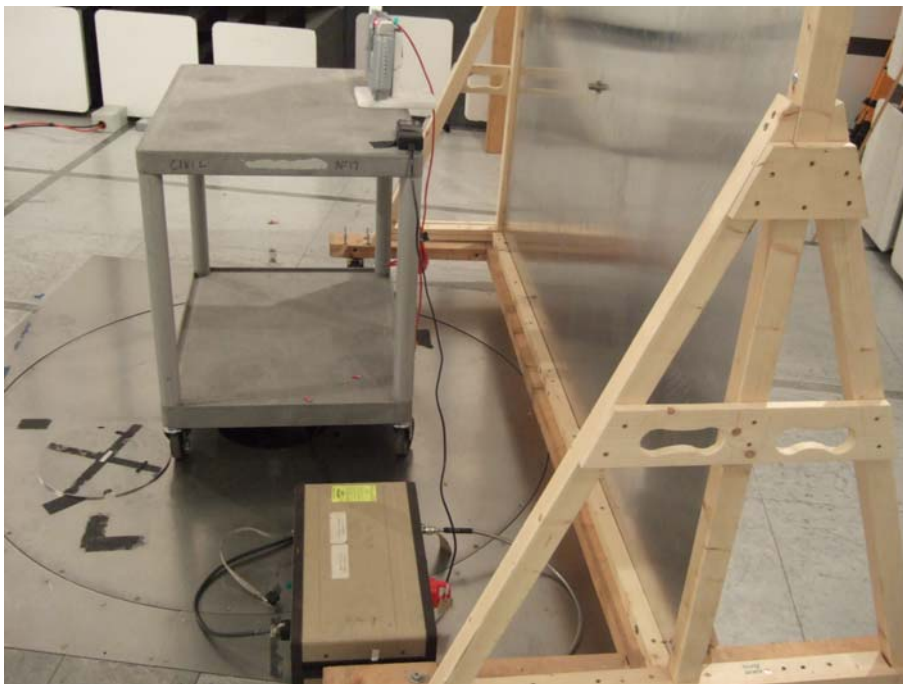
PHOTOGRAPHS



4.1 TEST SET UP PHOTOGRAPHS



Radiated Emissions (Enclosure Port)



Conducted Emissions (AC Power Port)



SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

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