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Report On

FCC Testing of the Sharp SH011
CDMA2000(US850MHz) Cellular Phone with Bluetooth

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FCC ID: APYHRO00132

Document 75911236 Report 01 Issue 1

November 2010



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REPORT ON

FCC Testing of the Sharp SH011
CDMA2000(US850MHz) Cellular Phone with Bluetooth

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November 2010

PREPARED FOR

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Senior Administrator

APPROVED BY

C Gouid
Authorised Signatory

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DATED

16 November 2010

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 15B. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

G Lawler





CONTENTS

Section	Page No
1	REPORT SUMMARY 3
1.1	Introduction 4
1.2	Brief Summary of Results 5
1.3	Application Form 6
1.4	Product Information 8
1.5	Test Conditions 9
1.6	Deviations From the Standard 9
1.7	Modification Record 9
2	TEST DETAILS 10
2.1	Conducted Emissions (AC Power Port) 11
2.2	Radiated Emissions (Enclosure Port) 16
3	TEST EQUIPMENT USED 22
3.1	Test Equipment Used 23
3.2	Measurement Uncertainty 24
4	PHOTOGRAPHS 25
4.1	Test Set-up Photographs 26
5	ACCREDITATION, DISCLAIMERS AND COPYRIGHT 29
5.1	Accreditation, Disclaimers and Copyright 30



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SECTION 1

REPORT SUMMARY

FCC Testing of the Sharp SH011
CDMA2000(US850MHz) Cellular Phone with Bluetooth



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Sharp SH011 CDMA2000(US850MHz) Cellular Phone with Bluetooth to the requirements of FCC CFR 47 Part 15B.

Objective	To perform FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Sharp Corporation, Communication Systems Group
Manufacturing Description	CDMA2000(US850MHz) Cellular Phone with Bluetooth
Model Number(s)	SH011
Serial Number(s)	000527
Software Version	AA050
Hardware Version	PP1
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15B: 2009
Incoming Release Date	Application Form 12 November 2010
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	8147 19 October 2010
Start of Test	01 November 2010
Finish of Test	01 November 2010
Name of Engineer(s)	G Lawler
Related Document(s)	ANSI C63.4: 2003



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1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 15B is shown below.

Configuration 1: CDMA2000 with AC Adapter						
Section	Spec Clause	Test Description	Mode	Mod State	Result	Base Standard
2.1	15.107	Conducted Emissions (AC Power Port)	Receive Middle Channel	0	Pass	ANSI C63.4
			Bluetooth Switched On	0	Pass	
	15.109	Radiated Emissions (Enclosure Port)	Receive Middle Channel		N/A	ANSI C63.4
			Bluetooth Switched On		N/A	

Configuration 2: CDMA2000 with Battery						
Section	Spec Clause	Test Description	Mode	Mod State	Result	Base Standard
	15.107	Conducted Emissions (AC Power Port)	Receive Middle Channel		N/A	ANSI C63.4
			Bluetooth Switched On		N/A	
2.2	15.109	Radiated Emissions (Enclosure Port)	Receive Middle Channel	0	Pass	ANSI C63.4
			Bluetooth Switched On	0	Pass	

Configuration 3: USB & BT with AC Adapter						
Section	Spec Clause	Test Description	Mode	Mod State	Result	Base Standard
2.1	15.107	Conducted Emissions (AC Power Port)	Receive Middle Channel	0	Pass	ANSI C63.4
			Bluetooth Switched On	0	Pass	
	15.109	Radiated Emissions (Enclosure Port)	Receive Middle Channel		N/A	ANSI C63.4
			Bluetooth Switched On		N/A	

Configuration 4: USB & BT with Battery						
Section	Spec Clause	Test Description	Mode	Mod State	Result	Base Standard
	15.107	Conducted Emissions (AC Power Port)	Receive Middle Channel		N/A	ANSI C63.4
			Bluetooth Switched On		N/A	
2.2	15.109	Radiated Emissions (Enclosure Port)	Receive Middle Channel	0	Pass	ANSI C63.4
			Bluetooth Switched On	0	Pass	

N/A – Not Applicable



1.3 APPLICATION FORM

EQUIPMENT DESCRIPTION	
Model Name/Number	CDMA SH011
Part Number	N/A
Technical Description (Please provide a brief description of the intended use of the equipment)	CDMA2000 (US850MHz) Cellular Phone with Bluetooth

POWER SOURCE			
<input type="checkbox"/>	AC mains	State voltage	
	AC supply frequency	(Hz)	
	VAC		
	Max Current		
	Hz		
<input type="checkbox"/>	Single phase	<input type="checkbox"/>	Three phase
	And / Or		
<input type="checkbox"/>	External DC supply		
	Nominal voltage	V	Max Current A
	Extreme upper voltage	V	
	Extreme lower voltage	V	
	Battery		
<input type="checkbox"/>	Nickel Cadmium	<input type="checkbox"/>	Lead acid (Vehicle regulated)
<input type="checkbox"/>	Alkaline	<input type="checkbox"/>	Leclanche
<input checked="" type="checkbox"/>	Lithium	<input type="checkbox"/>	Other Details :
4.0	Volts nominal.		
	End point voltage as quoted by equipment manufacturer	3.7	V

FREQUENCY INFORMATION					
Frequency Range	824.7 to 848.31	MHz			
Channel Spacing (where applicable)	30kHz				
Test Frequencies*	Bottom	814.7	MHz	Channel Number (if applicable)	1013
	Middle	836.52	MHz	Channel Number (if applicable)	384
	Top	848.31	MHz	Channel Number (if applicable)	777
If alternate test modes are available resulting in different test frequencies please specify which mode is applicable:					
POWER CHARACTERISTICS					
Maximum TX power	25dBm	W			
Minimum TX power	-50dBm	W (if variable)			
Is transmitter intended for :					
Continuous duty				<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Intermittent duty				<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
If intermittent state DUTY CYCLE					
Transmitter ON		seconds			
Transmitter OFF		seconds			



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ANTENNA CHARACTERISTICS			
<input type="checkbox"/>	Antenna connector	State impedance	Ohm
<input type="checkbox"/>	Temporary antenna connector	State impedance	Ohm
<input checked="" type="checkbox"/>	Integral antenna	Gain	3.0 dBi

MODULATION CHARACTERISTICS			
<input type="checkbox"/>	Amplitude	<input type="checkbox"/>	Frequency
<input type="checkbox"/>	Phase	<input checked="" type="checkbox"/>	Other (please provide details): BPSK,HPSK,QPSK
Can the transmitter operate un-modulated?			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

CLASS OF EMISSION USED	
ITU designation or Class of Emission:	
1	1M28F9W
(if applicable) 2	
(if applicable) 3	
If more than three classes of emission, list separately:	

EXTREME CONDITIONS					
Extreme test voltages (Max)	4.0	V	Extreme test voltages (Min)	3.7	V
Nominal DC Voltage	4.0	V	DC Maximum Current	600m	A
Maximum temperature	60	°C	Minimum temperature	-20	°C

I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

Signature: *T. Taki* Name: Tetsuya Taki
 Position held: Manager Date: 12th, November 2010



1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp SH011 CDMA2000(US850MHz) Cellular Phone with Bluetooth. A full technical description can be found in the manufacturer's documentation.

1.4.2 Test Configuration

Configuration 1: CDMA2000 with AC Adapter

The EUT was configured in accordance with FCC CFR 47 Part 15B.

Configuration 2: CDMA2000 with Battery

The EUT was configured in accordance with FCC CFR 47 Part 15B.

Configuration 3: USB & BT with AC Adapter

The EUT was configured in accordance with FCC CFR 47 Part 15B.

Configuration 4: USB & BT with Battery

The EUT was configured in accordance with FCC CFR 47 Part 15B.

1.4.3 EUT Cable / Port Identification

Port	Max Cable Length specified	Usage	Type	Screened
DC Power	80cm	Power Lead	2 core	No
USB	80cm	USB	multicore	Yes

1.4.4 Modes of Operation

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

Mode 1 - Receive Middle Channel

Mode 2 - Bluetooth Switched On

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 or test laboratories as appropriate.

The EUT was powered from an internal battery and an AC Adapter, as detailed in each test result section.

FCC Accreditation
90987 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.



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SECTION 2

TEST DETAILS

FCC Testing of the Sharp SH011
CDMA2000(US850MHz) Cellular Phone with Bluetooth



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2.1 CONDUCTED EMISSIONS (AC POWER PORT)

2.1.1 Specification Reference

FCC CFR 47 Part 15B, Clause 15.107

2.1.2 Equipment Under Test

SH011, S/N: 000527

2.1.3 Date of Test and Modification State

01 November 2010 - Modification State 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 C63.4.

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

Configuration 1 - Mode 1

Configuration 3 - Mode 2

2.1.6 Environmental Conditions

01 November 2010

Ambient Temperature 26.6°C

Relative Humidity 26%

Atmospheric Pressure 1012mbar



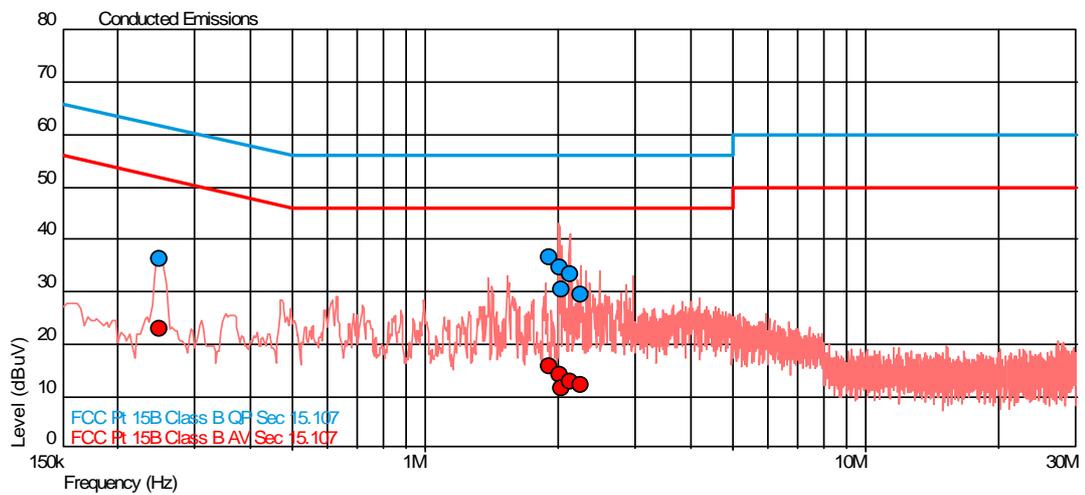
2.1.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15B for Conducted Emissions (AC Power Port).

The test results are shown below.

Configuration 1 - Mode 1

Live Line

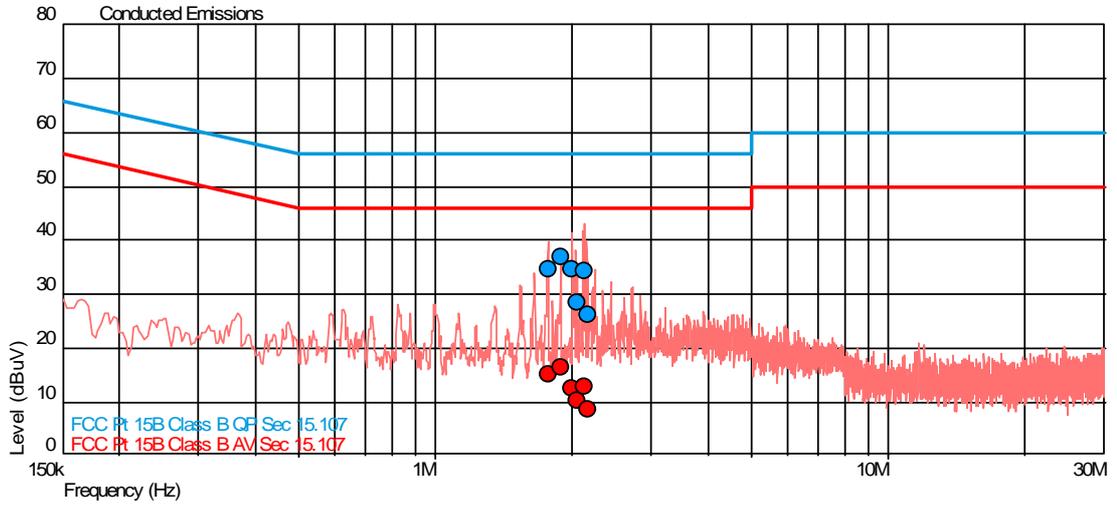


Final Result

Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.248	36.1	61.8	-25.7	23.0	51.8	-28.8
1.904	36.5	56.0	-19.5	15.9	46.0	-30.1
2.010	34.6	56.0	-21.4	14.3	46.0	-31.7
2.038	30.3	56.0	-25.7	11.6	46.0	-34.4
2.132	33.5	56.0	-22.5	13.0	46.0	-33.0
2.253	29.4	56.0	-26.6	12.3	46.0	-33.7



Neutral Line



Final Result

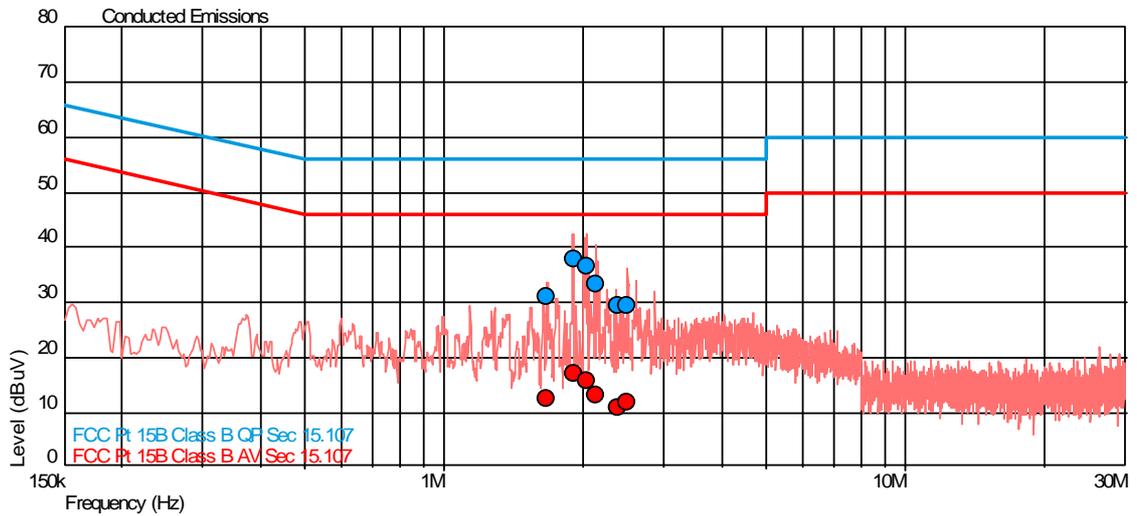
Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
1.773	34.7	56.0	-21.3	15.0	46.0	-31.0
1.899	37.0	56.0	-19.0	16.4	46.0	-29.6
2.007	34.7	56.0	-21.3	12.5	46.0	-33.5
2.046	28.4	56.0	-27.6	10.1	46.0	-35.9
2.128	34.3	56.0	-21.7	12.9	46.0	-33.1
2.161	26.1	56.0	-29.9	8.8	46.0	-37.2



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Configuration 3 - Mode 2

Live Line

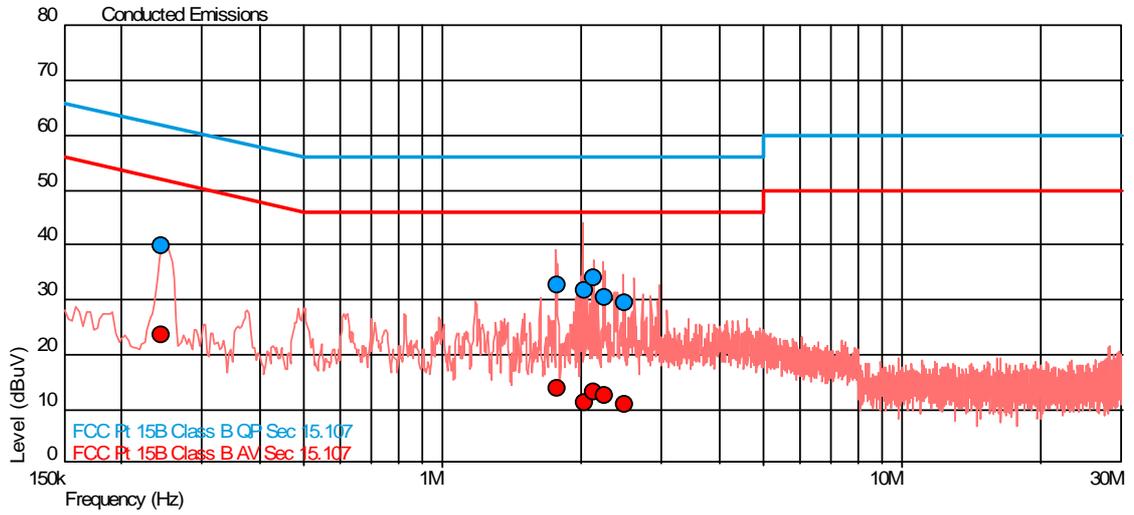


Final Result

Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
1.660	31.0	56.0	-25.0	12.4	46.0	-33.6
1.906	37.9	56.0	-18.1	17.0	46.0	-29.0
2.027	36.5	56.0	-19.5	15.8	46.0	-30.2
2.136	33.4	56.0	-22.6	13.2	46.0	-32.8
2.377	29.6	56.0	-26.4	10.8	46.0	-35.2
2.498	29.3	56.0	-26.7	12.0	46.0	-34.0



Neutral Line



Final Result

Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.246	39.8	61.9	-22.1	23.7	51.9	-28.3
1.770	32.6	56.0	-23.4	13.9	46.0	-32.1
2.030	31.6	56.0	-24.4	11.3	46.0	-34.7
2.137	33.9	56.0	-22.1	13.1	46.0	-32.9
2.250	30.4	56.0	-25.6	12.5	46.0	-33.5
2.486	29.4	56.0	-26.6	10.9	46.0	-35.1



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2.2 RADIATED EMISSIONS (ENCLOSURE PORT)

2.2.1 Specification Reference

FCC CFR 47 Part 15B, Clause 15.109

2.2.2 Equipment Under Test

SH011, S/N: 000527

2.2.3 Date of Test and Modification State

01 November 2010 - 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 C63.4.

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

Configuration 2 - Mode 1

Configuration 4 - Mode 2

2.2.6 Environmental Conditions

01 November 2010

Ambient Temperature 26.6°C

Relative Humidity 26%

Atmospheric Pressure 1012mbar



Product Service

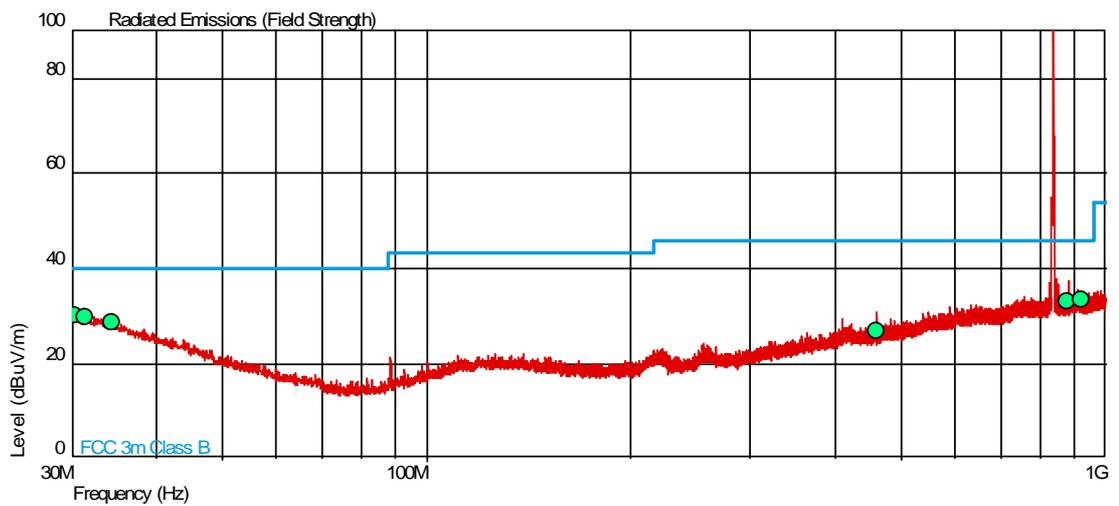
2.2.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15B for Radiated Emissions (Enclosure Port).

The test results are shown below.

Configuration 2 - Mode 1

30MHz to 1 GHz



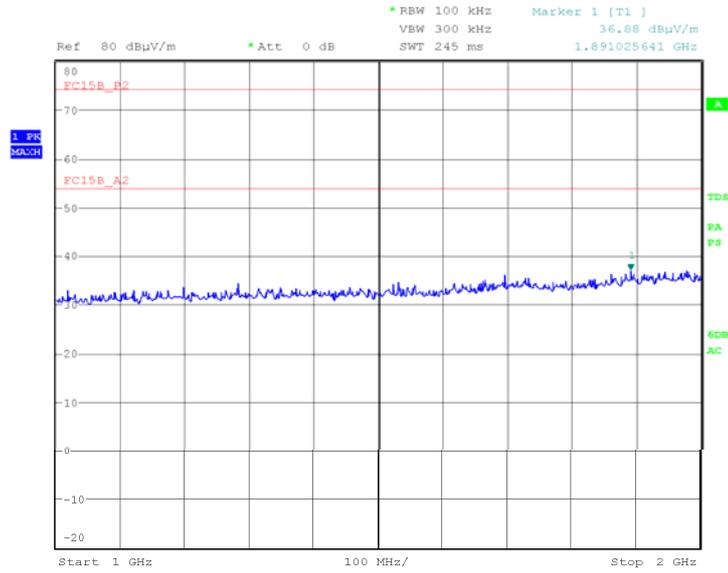
Final Result

Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
30.261	30.2	32.4	40.0	100	-9.8	67.6	360	1.00	Horizontal
31.433	29.7	30.5	40.0	100	-10.3	69.5	195	1.94	Horizontal
34.352	28.6	26.9	40.0	100	-11.4	73.1	254	1.00	Horizontal
460.535	26.9	22.1	46.0	200	-19.1	177.9	255	4.00	Vertical
879.916	33.2	45.7	46.0	200	-12.8	154.3	0	1.00	Horizontal
920.574	33.5	47.3	46.0	200	-12.5	152.7	291	1.00	Vertical



1GHz to 2GHz

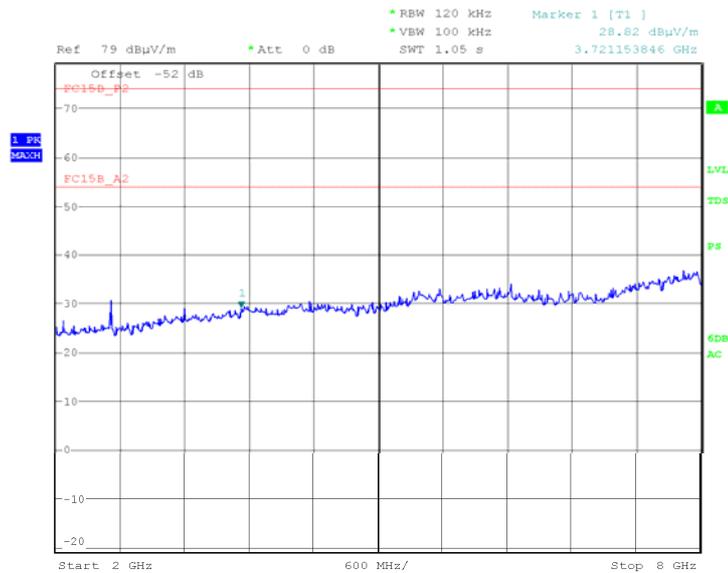
Combined Plot



Date: 1.NOV.2010 19:00:19

2GHz to 8 GHz

Combined Plot

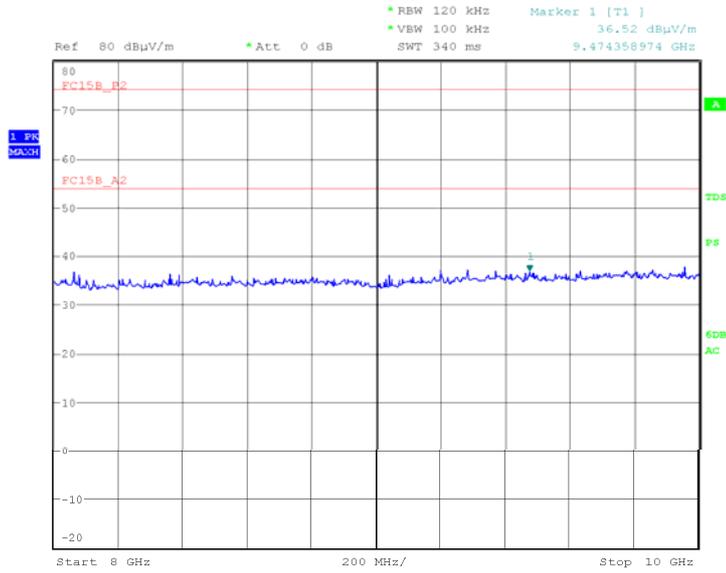


Date: 1.NOV.2010 19:17:42



8GHz to 10GHz

Combined Plot



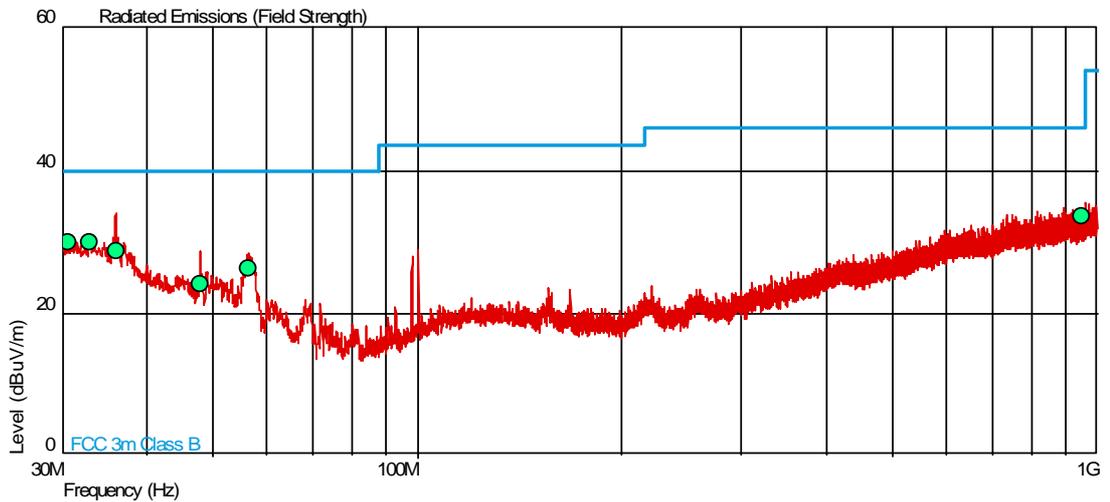
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Configuration 4 - Mode 2

30MHz to 1GHz



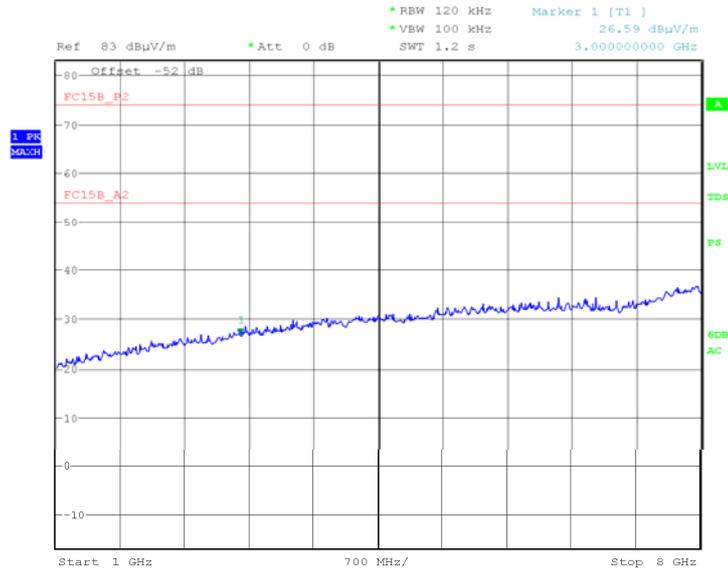
Final Result

Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
30.652	29.9	31.3	40.0	100	-10.1	68.7	273	1.00	Vertical
33.029	29.8	30.9	40.0	100	-10.2	69.1	172	1.00	Vertical
36.006	28.7	27.2	40.0	100	-11.3	32.8	360	1.00	Vertical
48.016	24.0	15.8	40.0	100	-16.0	84.2	104	1.00	Vertical
56.549	26.2	20.4	40.0	100	-13.8	79.6	360	1.00	Vertical
950.965	33.6	47.9	46.0	200	-12.4	152.1	63	1.00	Horizontal



1GHz to 8GHz

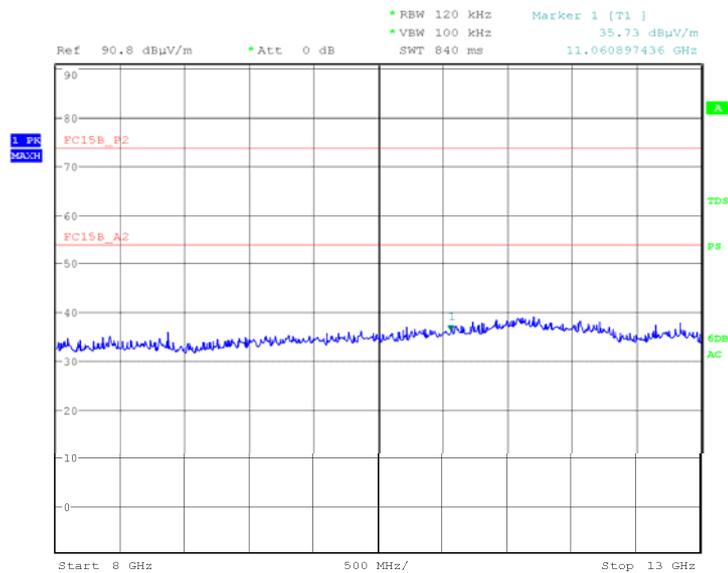
Combined Plot



Date: 1.NOV.2010 20:23:55

8GHz to 10GHz

Combined Plot



Date: 1.NOV.2010 23:58:24



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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 - Conducted Emissions (AC Power Port)					
LISN (1 Phase)	Chase	MN 2050	336	12	25-Mar-2011
Transient Limiter	Hewlett Packard	11947A	1032	12	22-Jun-2011
Screened Room (5)	Rainford	Rainford	1545	36	11-Feb-2011
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	9-Sep-2011
Section 2.2 - Radiated Emissions (Enclosure Port)					
Power Splitter	Weinschel	1506A	607	-	TU
Pre-Amplifier	Phase One	PS04-0086	1533	12	15-Sep-2011
Screened Room (5)	Rainford	Rainford	1545	36	11-Feb-2011
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Filter	Daden Anthony Ass	MH-1500-7SS	2778	12	30-Nov-2010
Antenna (Bilog)	Chase	CBL6143	2904	24	4-Dec-2011
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	12-Aug-2011
Amplifier (1 - 8GHz)	Phase One	PS06-0060	3175	12	2-Jul-2011
1m RF Cable sma(m)-sma(m)	Reynolds	262-0248-1000	3453	12	TU
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3703	12	26-Jan-2011
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	10-Aug-2011

TU – Traceability Unscheduled



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	10MHz to 6GHz Test Amplitude	2.0dB†
Conducted Susceptibility RF	50kHz to 1000MHz Amplitude	3.1dB•
	EM Clamp Method of Test	1.2dB•
	CDN Method of Test	1.1dB•
	BCI Clamp Method of Test	1.2dB•
Conducted Susceptibility LF	DC to 150kHz	1.0%†
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 16-4-2
- † In accordance with UKAS Lab 34
- In accordance with EN61000-4-6



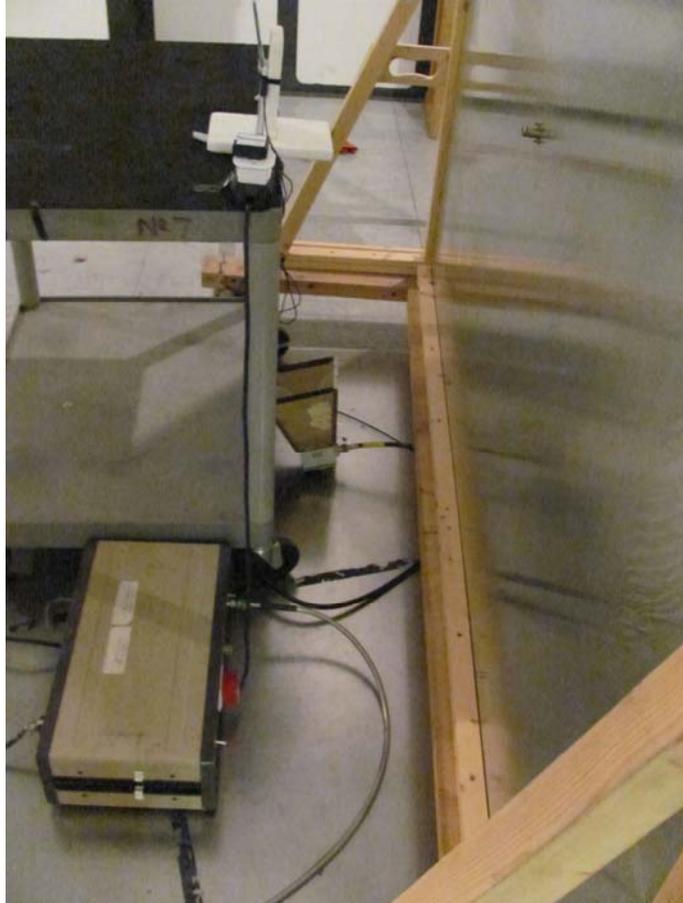
Product Service

SECTION 4

PHOTOGRAPHS



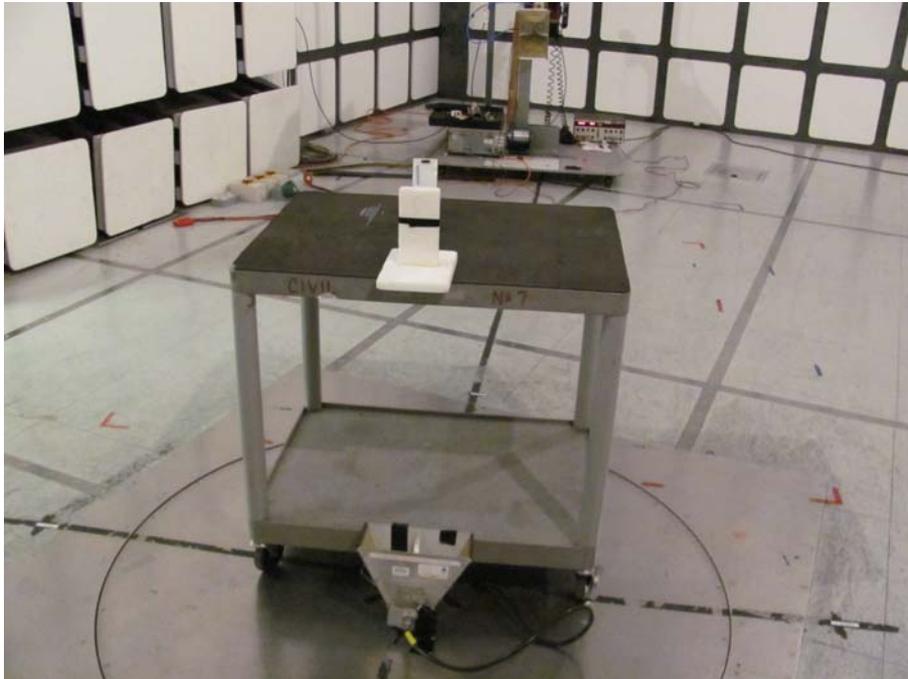
4.1 TEST SET-UP PHOTOGRAPHS



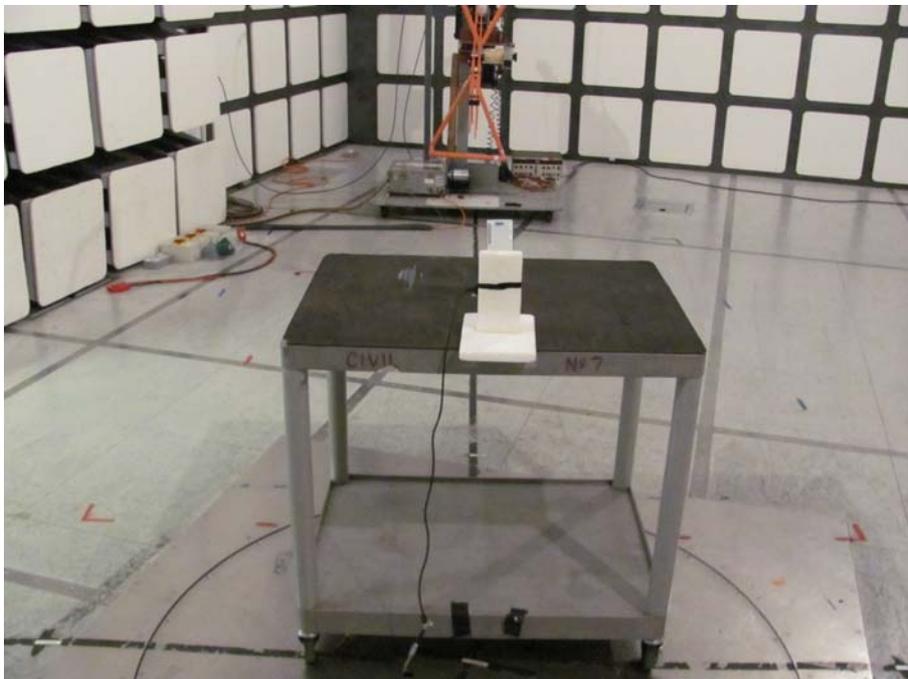
Conducted Emissions – CDMA2000



Conducted Emissions – USB and BT



Radiated Emissions – CDMA2000



Radiated Emissions – USB and BT



Product Service

SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA
(Not UKAS Accredited).

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