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Report On

Radio Testing of the
Sharp CDMA SHX11 Tri-band CDMA (850MHz_BC0/BC3,
1900MHz_BC6) & Tri-band GSM (GSM900/DCS1800/PCS1900) Dual
mode Cellular Phone with Bluetooth, WLAN, FeliCa and GPS in
accordance with FCC CFR 47 Part 15B

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FCC ID: APYHRO00151

Document 75913577 Report 07 Issue 1

June 2011



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REPORT ON

Radio Testing of the
Sharp CDMA SHX11 Tri-band CDMA (850MHz_BC0/BC3,
1900MHz_BC6) & Tri-band GSM (GSM900/DCS1800/PCS1900)
Dual mode Cellular Phone with Bluetooth, WLAN, FeliCa and GPS
In accordance with FCC CFR 47 Part 15B

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PREPARED FOR

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PREPARED BY


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DATED

20 June 2011

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);


A R Hubbard


G Lawler



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SECTION 1

REPORT SUMMARY

Radio Testing of the
Sharp CDMA SHX11 Tri-band CDMA (850MHz_BC0/BC3, 1900MHz_BC6) & Tri-band GSM
(GSM900/DCS1800/PCS1900) Dual mode Cellular Phone with Bluetooth, WLAN, FeliCa and
GPS In accordance with FCC CFR 47 Part 15B



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1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Radio Testing of the Sharp CDMA SHX11 Tri-band CDMA (850MHz_BC0/BC3, 1900MHz_BC6) & Tri-band GSM (GSM900/DCS1800/PCS1900) Dual mode Cellular Phone with Bluetooth, WLAN, FeliCa and GPS to the requirements of FCC CFR 47 Part 15B.

Objective	To perform Radio 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
Model Number(s)	CDMA SHX11
Serial Number(s)	IMEI 004401113384065 IMEI 004401113359901
Number of Samples Tested	2
Test Specification/Issue/Date	FCC CFR 47 Part 15B (2010)
Incoming Release Date	Application Form 14 June 2011
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	8492 14 April 2011
Start of Test	24 May 2011
Finish of Test	8 June 2011
Name of Engineer(s)	T Hubbard G Lawler



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1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 15B is shown below.

Section	Spec Clause	Test Description	Result	Comments/Base Standard
AC Powered/USB Cable				
2.1	15.107	AC Line Conducted Emissions	Pass	
2.2	15.109	Radiated Emissions	Pass	



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1.3 APPLICATION FORM

APPLICANT'S DETAILS			
COMPANY NAME :	Sharp Telecommunications of Europe Ltd		
ADDRESS :	Azure House, Bagshot Road Bracknell, Berkshire RG12 7QY		
NAME FOR CONTACT PURPOSES :	Ken Newman		
TELEPHONE NO: 01344 301 883	FAX NO:	01344 300 293	
	E-MAIL:	ken.newman@sharp.eu	

EQUIPMENT INFORMATION			
<u>Equipment designator:</u>			
Model name/number	CDMA SHX11	Identification number	APYHRO00151
<u>Supply Voltage:</u>			
☐	AC mains	State AC voltage V	and AC frequency Hz
☐	DC (external)	State DC voltage V	and DC current A
☒	DC (internal)	State DC voltage 3.7 V	and Battery type Li-ion
<u>Frequency characteristics:</u>			
Frequency range	1850.2 MHz to 1909.8 MHz Channel spacing (if channelized)		
Designated test frequencies:	Bottom: 1850.2 MHz Middle: 1880 MHz Top: 1909.8 MHz		
<u>Power characteristics:</u>			
Maximum transmitter power	32 dBm	Minimum transmitter power (if variable)	 W
☒	Continuous transmission	State duty cycle	
☐	Intermittent transmission	If intermittent, can transmitter be set to continuous transmit test mode? Y/N	
<u>Antenna characteristics:</u>			
☒	Antenna connector	State impedance 50 ohm	
☐	Temporary antenna connector	State impedance ohm	
☐	Integral antenna	State gain dBi	
<u>Modulation characteristics:</u>			
☐	Amplitude	☐	Other
☐	Frequency	Details:	
☒	Phase		
Can the transmitter operate un-modulated?	N		
ITU Class of emission:			
<u>Extreme conditions:</u>			
Maximum temperature	+60 °C	Minimum temperature	-20 °C
Maximum supply voltage	4.0 V	Minimum supply voltage	3.7 V

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 : 14 June 2011



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1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp CDMA SHX11 Tri-band CDMA (850MHz_BC0/BC3, 1900MHz_BC6) & Tri-band GSM (GSM900/DCS1800/PCS1900) Dual mode Cellular Phone with Bluetooth, WLAN, FeliCa and GPS. A full technical description can be found in the manufacturer's documentation.

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.

The EUT was powered from a 4.0 V DC supply.

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1.6 DEVIATIONS FROM THE STANDARD

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

1.7 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.



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SECTION 2

TEST DETAILS

Radio Testing of the
Sharp CDMA SHX11 Tri-band CDMA (850MHz_BC0/BC3, 1900MHz_BC6) & Tri-band GSM
(GSM900/DCS1800/PCS1900) Dual mode Cellular Phone with Bluetooth, WLAN, FeliCa and
GPS In accordance with FCC CFR 47 Part 15B



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2.1 AC LINE CONDUCTED EMISSIONS

2.1.1 Specification Reference

FCC CFR 47 Part 15B, Clause 15.107

2.1.2 Equipment Under Test and Modification State

CDMA SHX11 S/N: 004401113384065 - Modification State 0

2.1.3 Date of Test

8 June 2011

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 Procedure

The test was applied in accordance with the test method requirements of ANSI C63.4.

The EUT is set up on a test table 800mm above a horizontal ground plane. A vertical ground plane is also required and is placed 400mm from the EUT.

The EUT is powered through a Line Impedance Stabilisation Network (LISN) which is bonded to the ground plane. The EUT is located so that the distance between the EUT and the LISN is no less than 800mm. The cable between the mains input of the EUT and the LISN is 1m.

A preliminary profile of the Conducted Emissions is obtained over the frequency range 150kHz to 30MHz. Any points of interest are noted for formal measurements.

During formal measurements, the measuring receiver is tuned to the emission of interest where Quasi – Peak and Average measurements are performed in a 9kHz Video and Resolution Bandwidth.

2.1.6 Environmental Conditions

Ambient Temperature	20.4°C
Relative Humidity	39.0%
Atmospheric Pressure	1002mbar



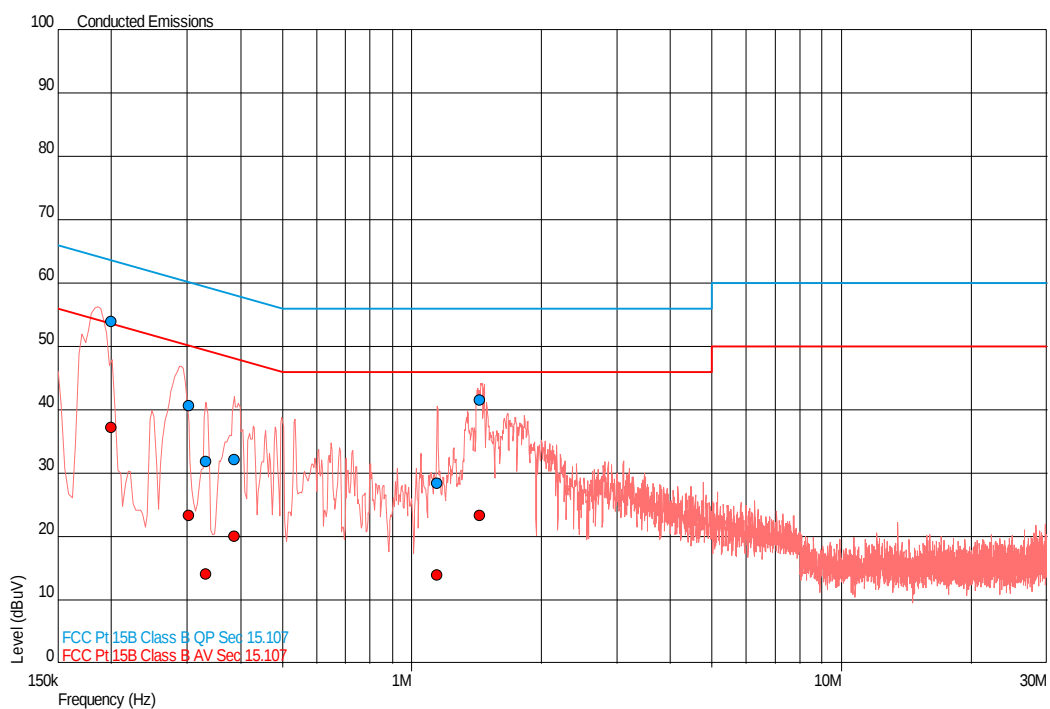
2.1.7 Test Results

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

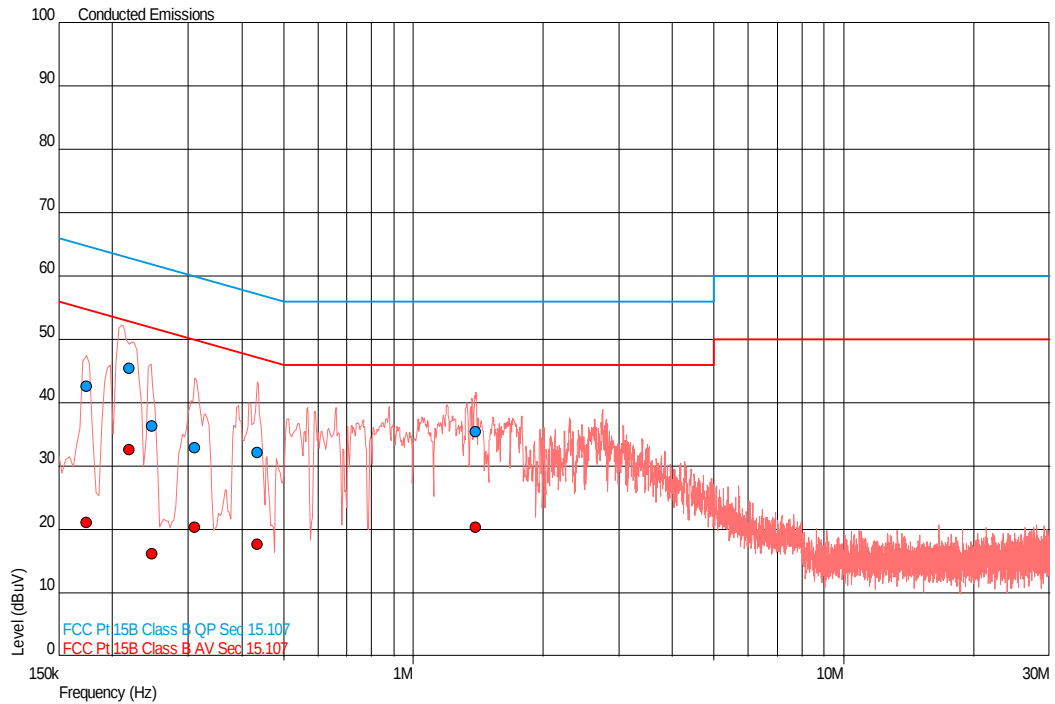


Final Result

Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.200	54.0	63.6	-9.7	37.2	53.6	-16.4
0.303	40.7	60.1	-19.5	23.3	50.1	-26.8
0.333	31.8	59.4	-27.6	14.0	49.4	-35.3
0.387	32.2	58.1	-26.0	20.1	48.1	-28.1
1.144	28.5	56.0	-27.5	13.9	46.0	-32.1
1.441	41.6	56.0	-14.4	23.3	46.0	-22.7



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Neutral LineFinal Result

Frequency (MHz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.174	42.6	64.8	-22.2	21.1	54.8	-33.7
0.219	45.4	62.9	-17.4	32.5	52.9	-20.3
0.247	36.4	61.8	-25.4	16.2	51.8	-35.6
0.311	33.0	59.9	-27.0	20.4	49.9	-29.5
0.434	32.2	57.2	-25.0	17.7	47.2	-29.4
1.394	35.5	56.0	-20.5	20.4	46.0	-25.6



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2.2 RADIATED EMISSIONS

2.2.1 Specification Reference

FCC CFR 47 Part 15B, Clause 15.109

2.2.2 Equipment Under Test and Modification State

CDMA SHX11 S/N: IMEI 04401113359901 - Modification State 0

2.2.3 Date of Test

24 May 2011

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 Procedure

The test was applied in accordance with the test method requirements of ANSI C63.4.

A preliminary profile of the Spurious Radiated Emissions is obtained up to the 5th harmonic of the EUT's highest internally generated fundamental frequency. For frequencies from 30MHz to 18GHz the EUT is placed on a test table 800mm above the ground plane.

During characterisation the turntable azimuth is adjusted from 0 to 360 degrees with the measuring antenna in one polarity. It is then repeated for the other polarity. Any frequencies of interest are noted for formal measuring later. The distance from the measuring antenna to the boundary of the EUT is 3m.

During formal measurement the spectrum analyser is tuned to the frequency of the emission. The turntable azimuth is adjusted from 0 to 360 degrees to determine the point at which the maximum emission level occurs. The height of the measuring antenna is adjusted from a height of 1m to 4m to determine the height at which the maximum emission level occurs. Once the point of maximum emission has been determined the emission is measured. Emissions in the 30MHz to 1GHz range are measured using a CISPR Quasi – Peak detector function in a 120kHz bandwidth. Emissions in the range 1GHz to 40GHz require Peak and Average measurements. The Peak measurements are made using a peak detector with 1MHz Resolution and Video bandwidths. The average measurements employ a peak detector with a Resolution bandwidth of 1MHz and a Video bandwidth of 10Hz.

2.2.6 Environmental Conditions

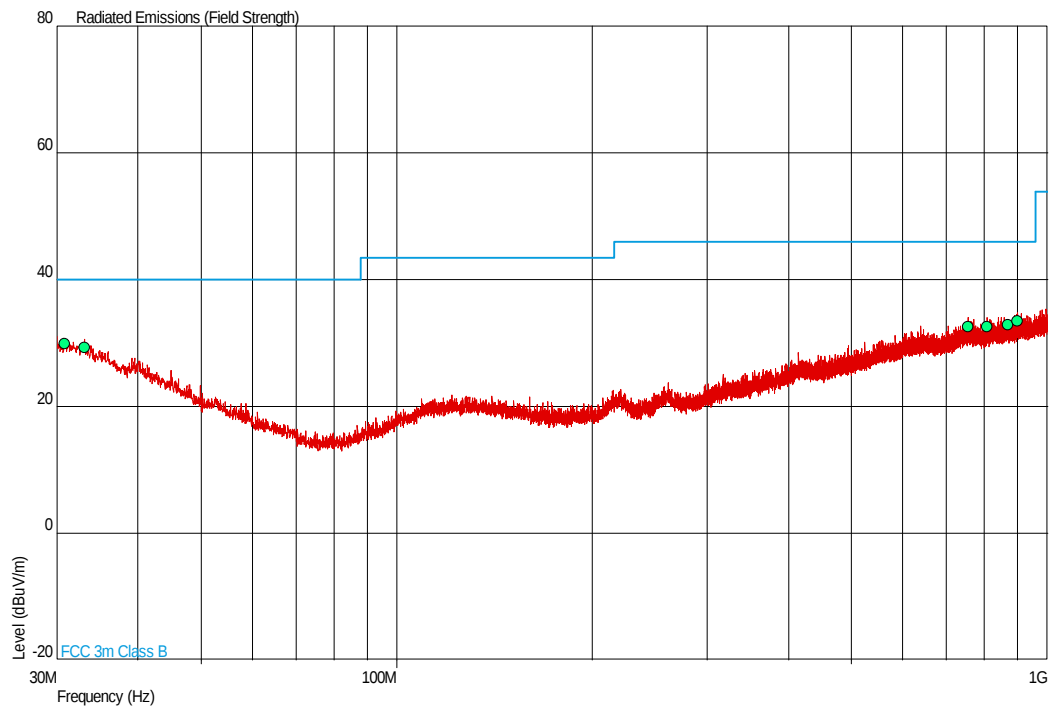
Ambient Temperature	19.3°C
Relative Humidity	40.0%
Atmospheric Pressure	1025mbar



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2.2.7 Test Results

30 MHz to 1 GHz



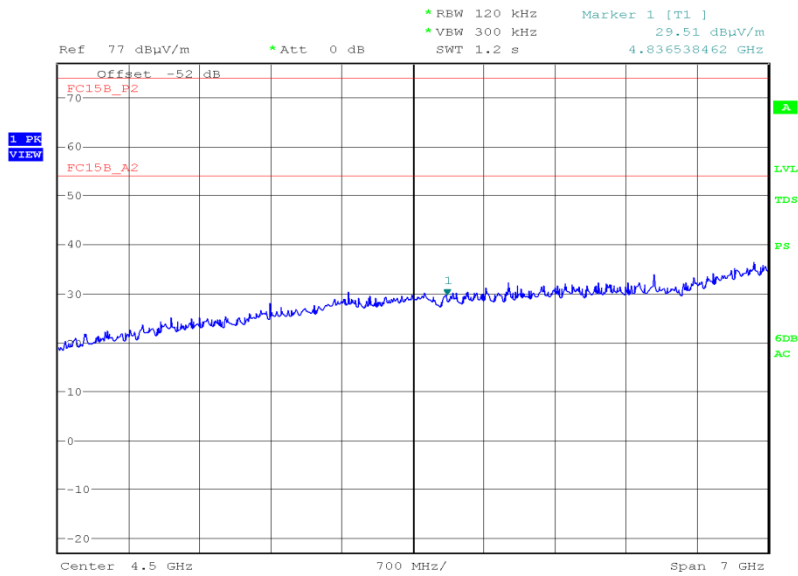
Final Result

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
30.825	30.0	40.0	-10.0	135	1.00	Horizontal	30.825	30.0	40.0
33.104	29.3	40.0	-10.7	90	1.00	Vertical	33.104	29.3	40.0
754.251	32.5	46.0	-13.5	225	1.00	Horizontal	754.251	32.5	46.0
808.686	32.5	46.0	-13.5	225	1.00	Horizontal	808.686	32.5	46.0
871.328	32.9	46.0	-13.1	225	1.00	Horizontal	871.328	32.9	46.0
900.381	33.6	46.0	-12.4	315	1.00	Horizontal	900.381	33.6	46.0



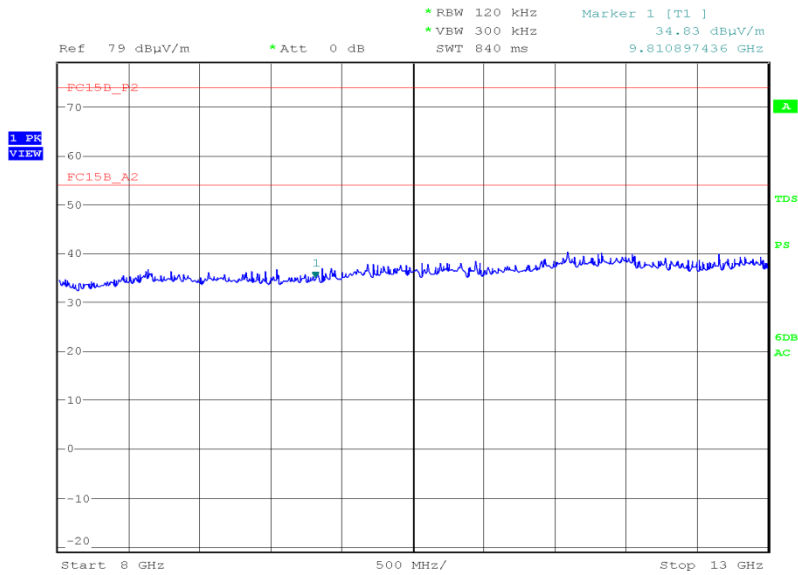
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1 GHz to 8 GHz



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8 GHz to 13 GHz



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SECTION 3

TEST EQUIPMENT USED



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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	23-Mar-2012
Transient Limiter	Hewlett Packard	11947A	1032	12	22-Jun-2011
EMI Test Receiver	Rohde & Schwarz	ESIB26	2028	12	17-Sep-2011
Section 2.2 - Radiated Emissions (Enclosure Port)					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	12-Nov-2011
Antenna (Bilog)	Schaffner	CBL6143	287	24	19-Jan-2012
Antenna (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	2-Aug-2012
Pre-Amplifier	Phase One	PS04-0086	1533	12	15-Sep-2011
Pre-Amplifier	Phase One	PS04-0087	1534	12	22-Sep-2011
Screened Room (5)	Rainford	Rainford	1545	24	3-Feb-2014
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Turntable/Mast Controller	EMCO	2090	1607	-	TU
Amplifier (1 - 8GHz)	Phase One	PS06-0060	3175	12	2-Jul-2011
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	9-Sep-2011
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	10-Aug-2011
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU

TU – Traceability Unscheduled



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3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	MU
Radiated Emissions	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB
AC Line Conducted Emissions	± 3.2 dB



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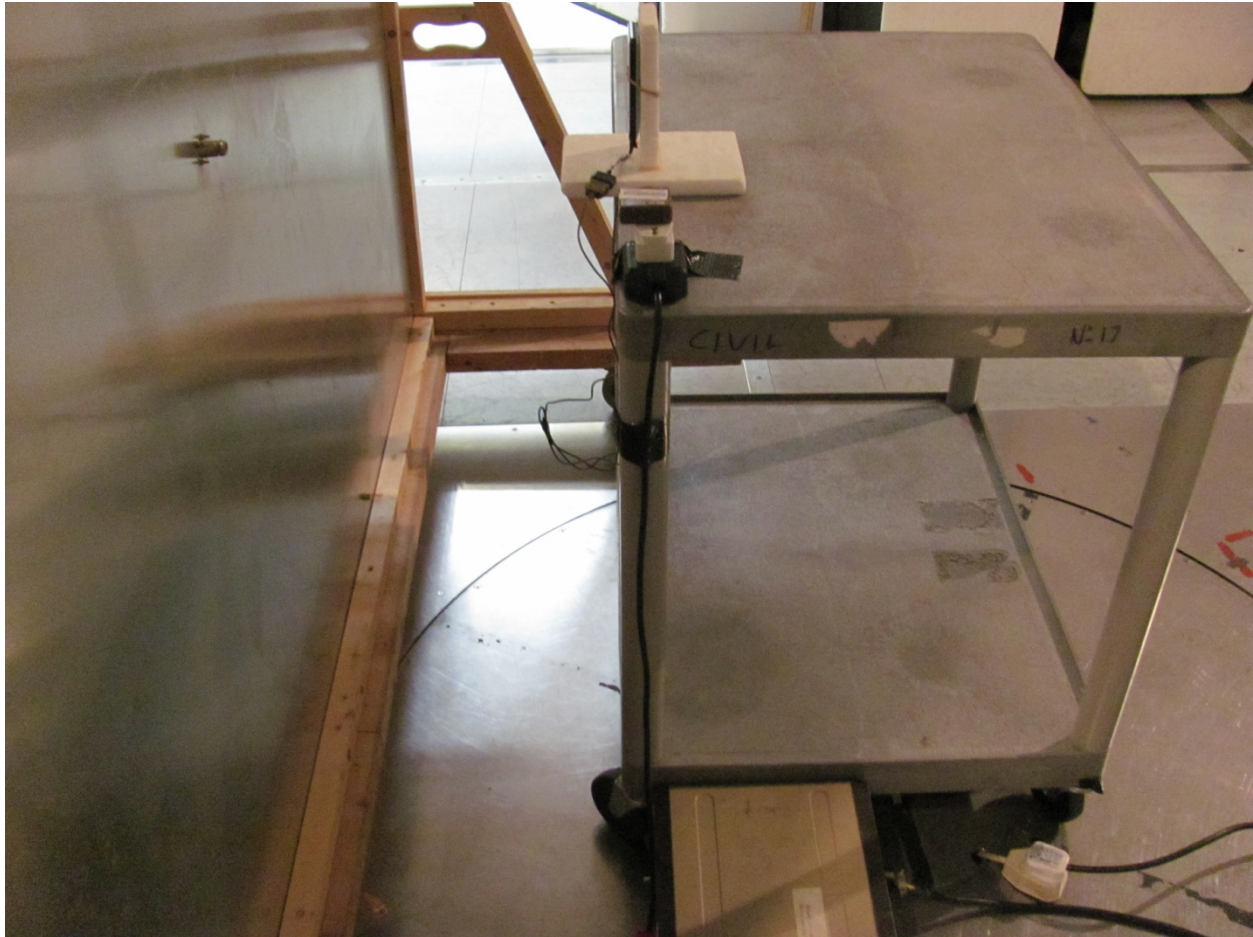
SECTION 4

PHOTOGRAPHS



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1.1 TEST SET-UP PHOTOGRAPHS



Conducted Emissions – 1



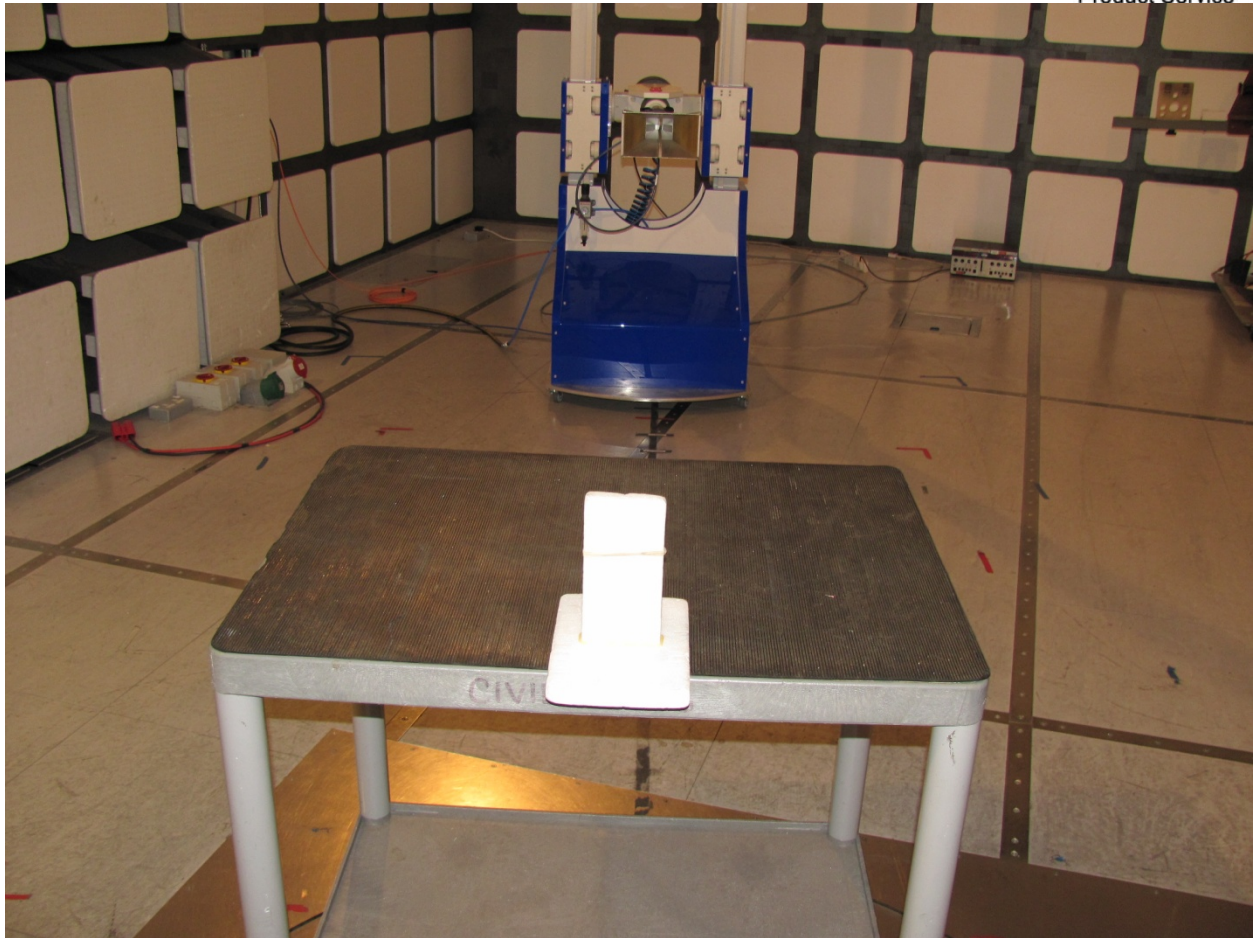
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Conducted Emissions – 2



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Radiated Emissions –



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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.

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
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