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Report On

FCC Testing of the Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) Multi Mode Cellular Phone with Bluetooth, WLAN, WiMAX, NFC (FeliCa) and GPS
In accordance with FCC CFR 47 Part 15B

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September 2012



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REPORT ON

FCC Testing of the
Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band
GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V)
Multi Mode Cellular Phone with Bluetooth, WLAN, WiMAX, NFC
(FeliCa) and GPS
In accordance with FCC CFR 47 Part 15B

Document 75918726 Report 10 Issue 1

September 2012

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DATED

06 September 2012

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

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SECTION 1

REPORT SUMMARY

FCC Testing of the
Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900
MHz) and Dual Band UMTS (FDD I and V) Multi Mode Cellular Phone with Bluetooth, WLAN,
WiMAX, NFC (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 FCC Testing of the Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) Multi Mode Cellular Phone with Bluetooth, WLAN, WiMAX, NFC (FeliCa) and GPS 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
Model Number(s)	CDMA SHL21
Serial Number(s)	IMEI 004401114094697
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15B (2011)
Incoming Release Date	Declaration of Build Status 06 August 2012
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	9290 03 August 2012
Start of Test	8 August 2012
Finish of Test	8 August 2012
Name of Engineer(s)	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				
2.1	15.107	AC Line Conducted Emissions	Pass	
2.2	15.109	Radiated Emissions	Pass	



1.3 DECLARATION OF BUILD STATUS

MAIN EUT				
MANUFACTURING DESCRIPTION	CDMA SHL21			
MANUFACTURER	Sharp Corporation			
TYPE	Cellular Phone			
PART NUMBER	N/A			
SERIAL NUMBER	See individual handset			
HARDWARE VERSION	PP1_5			
SOFTWARE VERSION	V4.0.3 (IceCream Sandwich)			
TRANSMITTER OPERATING RANGE <i>*LTE: activates in Japan only</i> <i>*LAN: doesn't operates USII band</i>	GSM900 : 880.2MHz to 914.8MHz GSM1800 : 1710.2MHz to 1784.8MHz UMTS2100 : 1922.6MHz to 1977.4MHz LTE (B11) : 1430.4MHz to 1445.4MHz LTE (B18) : 817.5MHz to 827.5MHz BT & WLAN : 2400 MHz to 2483.5 MHz WLAN (5G) : 5180 MHz to 5670MHz (Doesn't operates USII band (5725 - 5825MHz)) NFC/FeliCa : 13.553MHz to 13.567 MHz			
RECEIVER OPERATING RANGE <i>*LTE: activates in Japan only</i> <i>*LAN: doesn't operates USII band</i>	GSM900 : 925.2MHz to 959.8MHz GSM1800 : 1805.2MHz to 1879.8MHz UMTS2100 : 2112.6MHz to 2167.4MHz LTE (B11) : 1478.4MHz to 1493.4MHz LTE (B18) : 862.5MHz to 872.5MHz BT & WLAN : 2400 MHz to 2483.5 MHz WLAN(5G) : 5180MHz to 5670MHz (Doesn't operates USII band (5725 - 5825MHz)) GPS : 1574MHz to 1576 MHz FeliCa : 13.553MHz to 13.567 MHz			
OUTPUT POWER (W or dBm)	GSM900 : 35 dBm max GSM1800 : 32 dBm max UMTS2100 : 24.5 dBm max LTE (B11) : 25 dBm max LTE (B18) : 25 dBm max BT : 6 dBm max WLAN (11a/g) : 15 dBm max WLAN (11b) : 17 dBm max WLAN (11n) : 14 dBm max			
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	Dual-band CDMA (800MHz_BC0, 1900MHz_BC6) & Tri-band GSM (GSM900, DCS1800, PCS1900) & Dual band UMTS(850(FDDV), 2100(FDDI)) & Dual-band LTE(15GHz(B11), 800MHz(B18) Quad-mode Cellular Phone with GPS, Bluetooth, WLAN and NFC/FeliCa.			
BATTERY/POWER SUPPLY				
MANUFACTURING DESCRIPTION	SHL21UAA	Can't remove from the unit		
MANUFACTURER	Sanyo			
TYPE	Lithium-Ion			
PART NUMBER	N/A			
VOLTAGE	3.7V			
SERIAL NUMBER	N/A			
ANCILLARIES (if applicable)				
MANUFACTURING DESCRIPTION	USB data cable	Charger	Stereo Headset	Desktop Holder
MANUFACTURER	Hoshiden	SHENZHEN TENWEI ELEC	Sony	Sharp(Option)
TYPE	SHI01HUA	SHN10	MDR-E921LP/BC	SHL21PUA
PART NUMBER	N/A	N/A	N/A	N/A
SERIAL NUMBER	N/A	N/A	N/A	N/A



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Signature

M. Kishino

Masahiko Kishino

Date

6th August 2012

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.



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1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) and Dual Band UMTS (FDD I and V) Multi Mode Cellular Phone with Bluetooth, WLAN, WiMAX, NFC (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.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard 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

FCC Testing of the
Sharp CDMA SHL21 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900
MHz) and Dual Band UMTS (FDD I and V) Multi Mode Cellular Phone with Bluetooth, WLAN,
WiMAX, NFC (FeliCa) and GPS
In accordance with FCC CFR 47 Part 15B



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 SHL21 S/N: IMEI004401114094697 - Modification State 0

2.1.3 Date of Test

8 August 2012

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 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. Where a EUT is floor standing it will be stood on but insulated from the ground plane by up to 12mm.

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. Where possible the cable between the mains input of the EUT and the LISN is 1m. Where this is not possible the cable is non inductively bundled with the bundle not exceeding 400mm in length.

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.

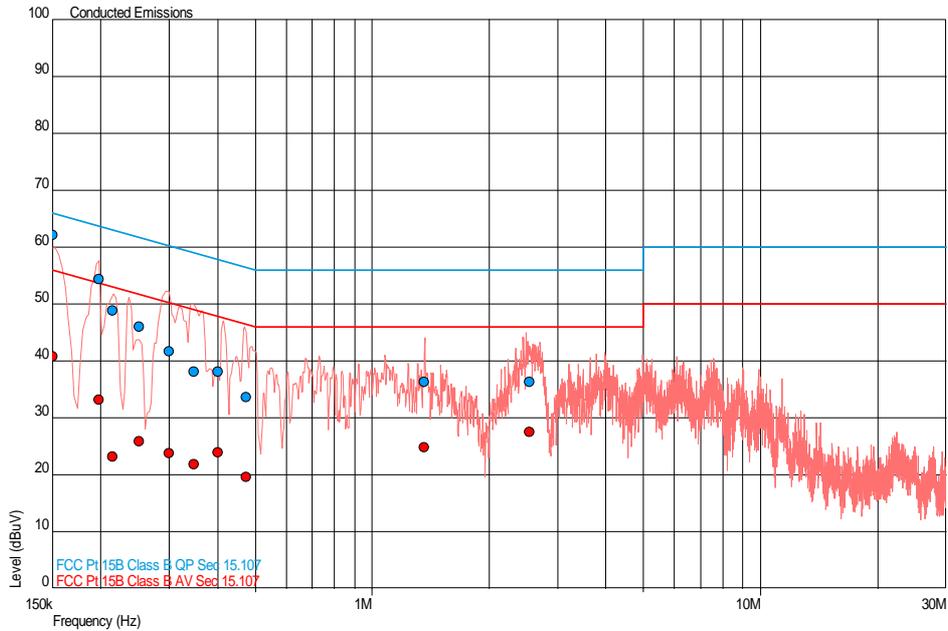
2.1.6 Environmental Conditions

Ambient Temperature	20.0°C
Relative Humidity	71.0%



2.1.7 Test Results

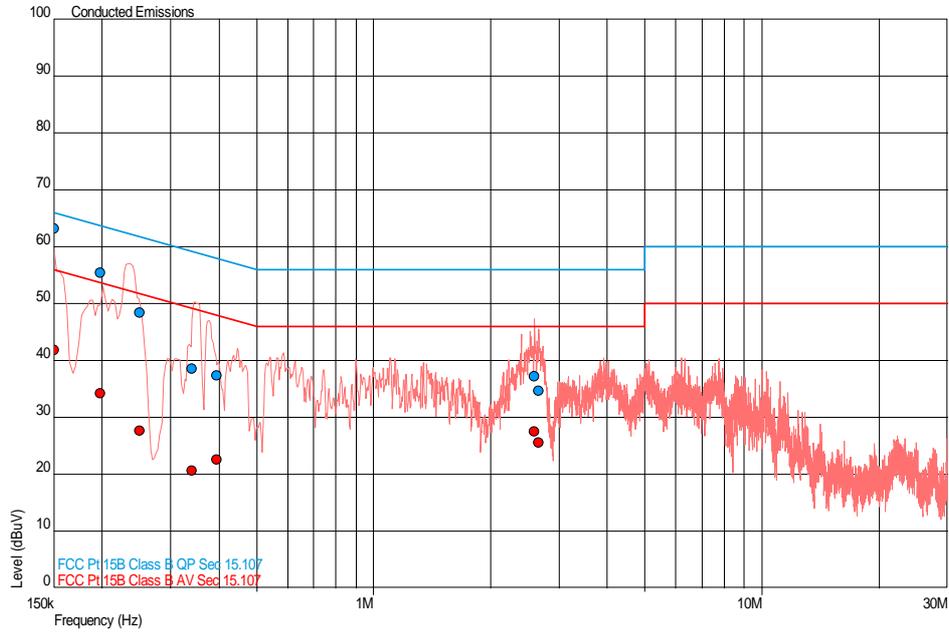
Live Line



Frequency (MHz)	QP Level (dBµV)	QP Limit (dBµV)	QP Margin (dBµV)	AV Level (dBµV)	AV Limit (dBµV)	AV Margin (dBµV)
0.150	62.1	66.0	-3.9	40.8	56.0	-15.2
0.197	54.4	63.7	-9.4	33.1	53.7	-20.6
0.214	48.8	63.0	-14.2	23.2	53.0	-29.8
0.251	46.0	61.7	-15.7	25.9	51.7	-25.9
0.301	41.7	60.2	-18.5	23.8	50.2	-26.4
0.348	38.2	59.0	-20.9	21.8	49.0	-27.2
0.400	38.1	57.9	-19.8	24.0	47.9	-23.8
0.474	33.7	56.4	-22.8	19.7	46.4	-26.8
1.364	36.3	56.0	-19.7	24.8	46.0	-21.2
2.536	36.4	56.0	-19.6	27.5	46.0	-18.5



Neutral Line



Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.150	63.1	66.0	-2.8	41.8	56.0	-14.2
0.198	55.5	63.7	-8.2	34.2	53.7	-19.5
0.250	48.5	61.8	-13.3	27.7	51.8	-24.1
0.341	38.6	59.2	-20.6	20.7	49.2	-28.5
0.394	37.4	58.0	-20.6	22.6	48.0	-25.4
2.596	37.3	56.0	-18.7	27.5	46.0	-18.5
2.654	34.7	56.0	-21.3	25.7	46.0	-20.3



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 SHL21 S/N: IMEI004401114094697 - Modification State 0

2.2.3 Date of Test

8 August 2012

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

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. For frequencies above 18GHz, the EUT height is increased by 200mm to a height of 1000mm. This is to ensure the beam width of the measuring antenna gives sufficient vertical coverage of the EUT.

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. Above 18GHz this distance may be reduced to 1m.

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. Then 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. If measurements are made at a 1m measuring distance, then 10dB is added to the specification limit.

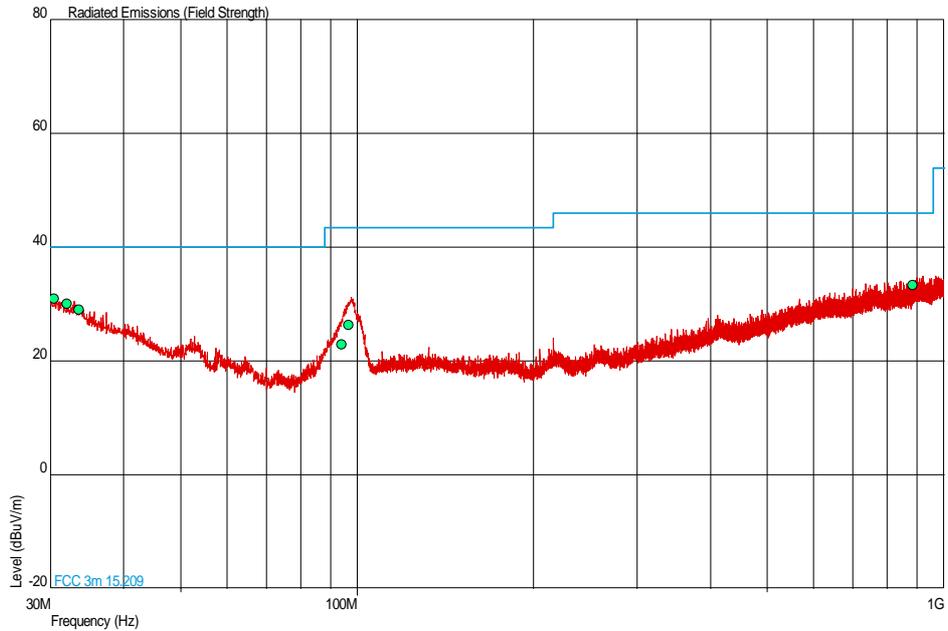
2.2.6 Environmental Conditions

Ambient Temperature	20.0°C
Relative Humidity	71.0%



2.2.7 Test Results

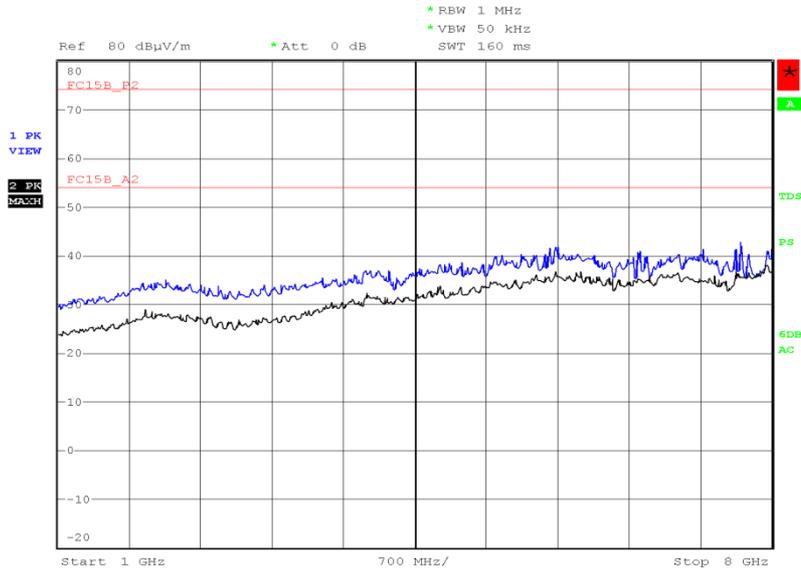
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity
30.503	30.9	35.1	40.0	100	-9.1	64.9	90	1.00	Vertical
32.054	30.1	32.0	40.0	100	-9.9	68.0	96	2.75	Vertical
33.559	29.1	28.5	40.0	100	-10.9	71.5	235	1.00	Horizontal
94.026	22.9	14.0	43.5	150	-20.6	136.0	353	1.00	Vertical
96.741	26.4	20.9	43.5	150	-17.1	129.1	181	1.00	Vertical
885.190	33.3	46.2	46.0	200	-12.7	153.8	0	1.00	Vertical

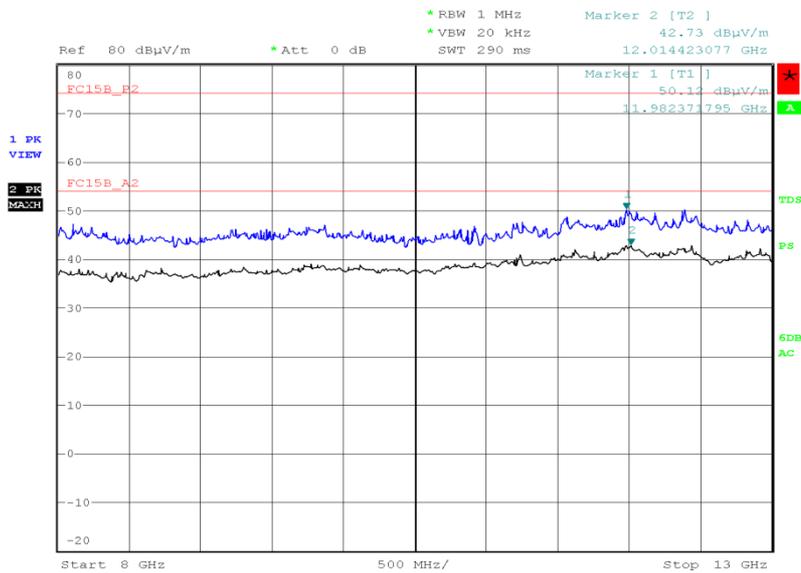


1GHz - 8GHz



Date: 8.AUG.2012 20:20:49

8GHz - 13GHz



Date: 8.AUG.2012 20:27:42



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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 Wireless Group – AC Line Conducted Emissions					
Transient Limiter	Hewlett Packard	11947A	15	12	1-Dec-2012
3 phase LISN	Rohde & Schwarz	ESH2-Z5	323	12	13-Jan-2013
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
Section 2.2 - Radiated Emissions					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Pre-Amplifier	Phase One	PS04-0086	1533	12	20-Sep-2012
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
High Pass Filter (3GHz)	RLC Electronics	F-100-3000-5-R	3349	12	29-May-2013
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
9m RF Cable (N Type)	Rhophase	NPS-2303-9000- NPS	3791	12	26-Aug-2012
Tilt Antenna Mast	matur GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	matur GmbH	NCD	3917	-	TU
Low Noise Amplifier	Wright Technologies	APS04-0085	3969	-	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

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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4.1 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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