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Report On

FCC Testing of the
Sharp CDMA SHX12 Dual Band CDMA (BC0 and BC6) and Tri Band
GSM (900, 1800 and 1900 MHz) Dual Mode Cellular Phone with
Bluetooth, FeliCa, WLAN and GPS
In accordance with FCC CFR 47 Part 15C

COMMERCIAL-IN-CONFIDENCE

FCC ID: APYHRO00162

Document 75915934 Report 09 Issue 1

December 2011



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COMMERCIAL-IN-CONFIDENCE

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Document 75915934 Report 09 Issue 1

December 2011

PREPARED FOR

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PREPARED BY

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APPROVED BY

Mark Jenkins
Authorised Signatory

DATED

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

Test Engineer(s);

G Lawler

S Bennett





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SECTION 1

REPORT SUMMARY

FCC Testing of the
Sharp CDMA SHX12 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and
1900 MHz) Dual Mode Cellular Phone with Bluetooth, FeliCa, WLAN and GPS
In accordance with FCC CFR 47 Part 15C



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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 SHX12 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) Dual Mode Cellular Phone with Bluetooth, FeliCa, WLAN and GPS to the requirements of FCC CFR 47 Part 15C.

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 SHX12
Serial Number(s)	IMEI 004401113641159
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15C (2010)
Incoming Release Date	Application Form 09 November 2011
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	8873 11 November 2011
Start of Test	29 November 2011
Finish of Test	7 December 2011
Name of Engineer(s)	G Lawler S Bennett
Related Document(s)	ANSI C63.10: 2009



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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 15C is shown below.

Section	Spec Clause	Test Description	Result	Comments/Base Standard
FeliCa				
2.1	15.225 (a)(b)(c)(d)	Field Strength of any Emission	Pass	
2.2	15.225, 15.215 (c)	Occupied Bandwidth	Pass	
2.3	15.225 (e)	Frequency Stability Under Temperature Variations	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 SHX12	Identification number	APYHRO00162
<u>Supply Voltage:</u>			
<input type="checkbox"/> []	AC mains	State AC voltage V	and AC frequency Hz
<input type="checkbox"/> []	DC (external)	State DC voltage V	and DC current A
<input checked="" type="checkbox"/> [X]	DC (internal)	State DC voltage ...3.7 V	and Battery type...Li-Ion.
<u>Frequency characteristics:</u>			
Frequency range	13.56MHz to 13.56MHz	Channel spacing	(if channelized)
Designated test frequencies:			
Bottom: MHz	Middle: MHz	Top:MHz	
<u>Power characteristics:</u>			
Maximum transmitter powerW	Minimum transmitter power W
<input checked="" type="checkbox"/> [X]	Continuous transmission	(if variable)	
<input type="checkbox"/> []	Intermittent transmission	State duty cycle	
If intermittent, can transmitter be set to continuous transmit test mode? Y/N			
<u>Antenna characteristics:</u>			
<input type="checkbox"/> []	Antenna connector	State impedanceohm	
<input type="checkbox"/> []	Temporary antenna connector	State impedance ohm	
<input checked="" type="checkbox"/> [X]	Integral antenna	State gain 0 dBi	
<u>Modulation characteristics:</u>			
<input checked="" type="checkbox"/> [X]	Amplitude	<input type="checkbox"/> []	Other
<input type="checkbox"/> []	Frequency	Details:	
<input type="checkbox"/> []	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 : 9th November, 2011



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1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp CDMA SHX12 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and 1900 MHz) Dual Mode Cellular Phone with Bluetooth, FeliCa, WLAN 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 SHX12 Dual Band CDMA (BC0 and BC6) and Tri Band GSM (900, 1800 and
1900 MHz) Dual Mode Cellular Phone with Bluetooth, FeliCa, WLAN and GPS
In accordance with FCC CFR 47 Part 15C



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2.1 FIELD STRENGTH OF ANY EMISSION

2.1.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.225 (a)(b)(c)(d)

2.1.2 Equipment Under Test and Modification State

CDMA SHX12 S/N: IMEI 004401113641159 - Modification State 0

2.1.3 Date of Test

6 December 2011 & 7 December 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 EUT was placed on a remotely controlled turntable within a semi-anechoic chamber. Measurements of the carrier frequency from the EUT were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

2.1.6 Environmental Conditions

Ambient Temperature	19.8 - 20.0°C
Relative Humidity	32.0%

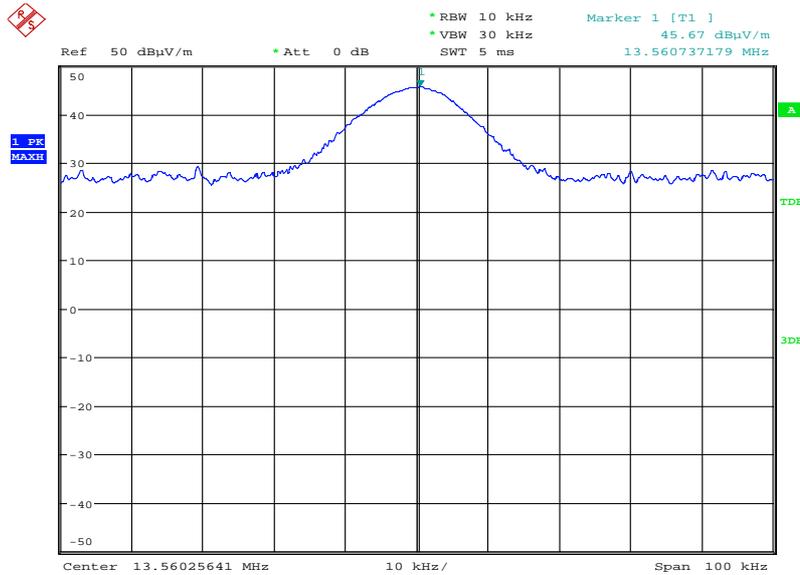


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2.1.7 Test Results

4.0 V DC Supply

Carrier

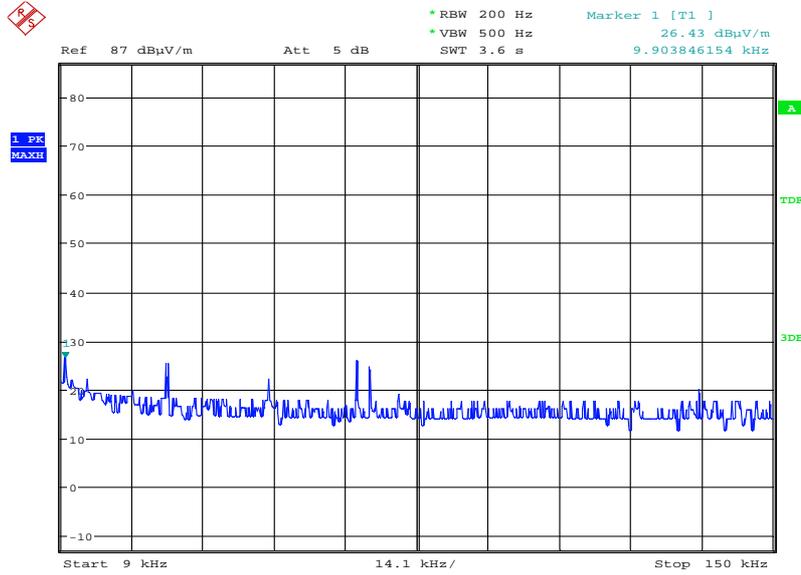


Date: 6.DEC.2011 23:13:24

Frequency (MHz)	QP Level (dBµV/m) at 3m	QP Level (µV/m) at 3m	QP Limit (dBµV/m) at 30m	QP Limit (µV/m) at 30m	Angle (deg)	Height (m)	Polarity
13.56	45.04	178.65	84.0	15848.9	181	1.5	Face On

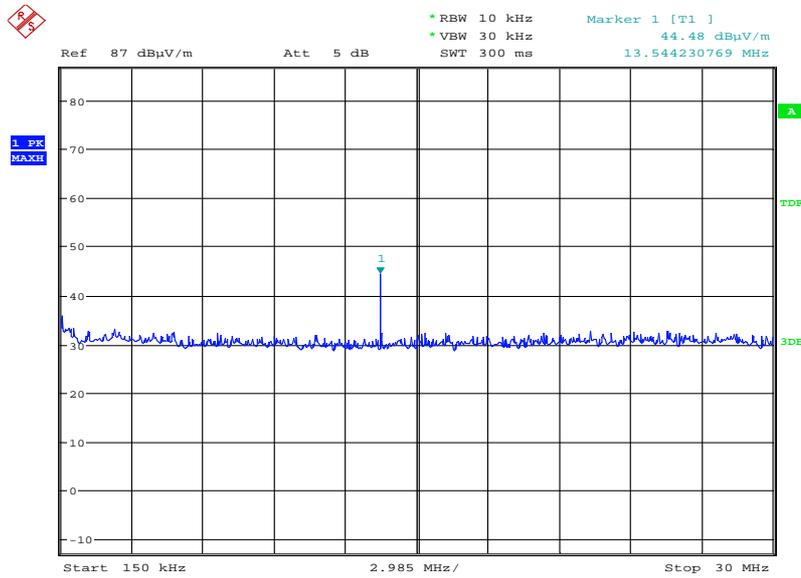


9 kHz to 150 kHz



Date: 6.DEC.2011 23:05:14

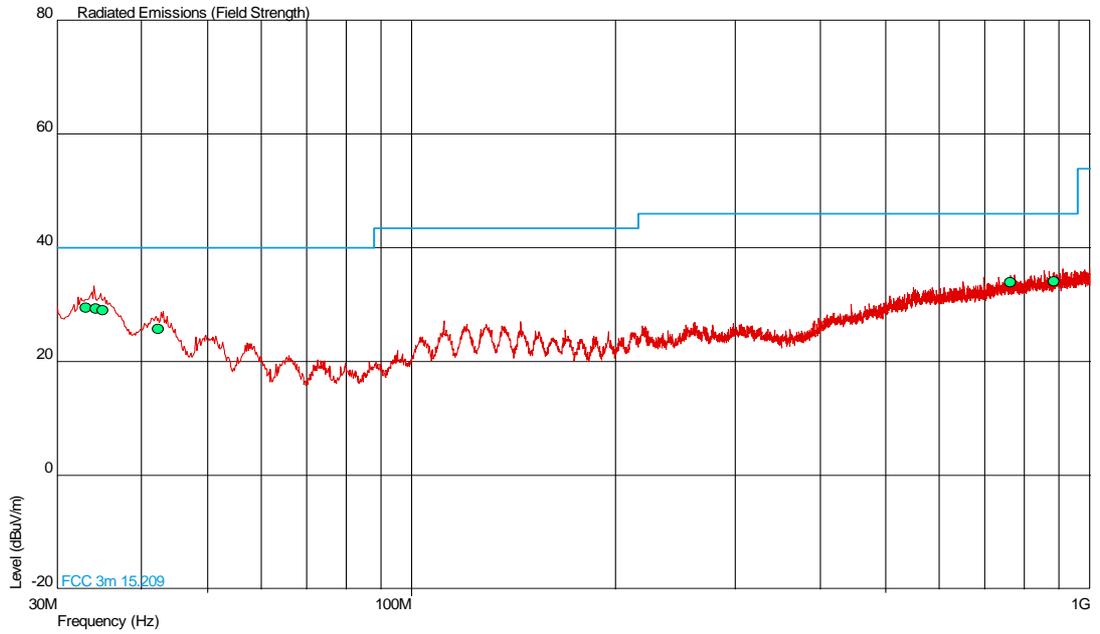
150 kHz to 30 MHz



Date: 6.DEC.2011 23:07:51



30 MHz to 1 GHz



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
33.150	29.5	29.9	40.0	100	-10.5	70.1	0	1.00	Horizontal
34.200	29.3	29.2	40.0	100	-10.7	70.8	180	1.00	Horizontal
35.100	29.0	28.2	40.0	100	-11.0	71.8	180	1.00	Horizontal
42.332	25.7	19.3	40.0	100	-14.3	80.7	180	1.00	Horizontal
763.650	33.9	49.5	46.0	200	-12.1	150.5	0	1.00	Horizontal
885.150	34.0	50.1	46.0	200	-12.0	149.9	180	1.00	Horizontal



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2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.225, 15.215 (c)

2.2.2 Equipment Under Test and Modification State

CDMA SHX12 S/N: IMEI 004401113641159 - Modification State 0

2.2.3 Date of Test

29 November 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 FCC CFR 47 Part 15C and ANSI C63.10.

The EUT was set to transmit at maximum power on 212 and 424 kbps data rates via a test jig to a Spectrum Analyser. The Analyser settings were adjusted to display the EUT signal on screen. Using the measurement function of the Spectrum Analyser, the 99% Occupied Bandwidth was measured.

The plot of the following pages shows the resultant display from the Spectrum Analyser.

2.2.6 Environmental Conditions

Ambient Temperature	23.7°C
Relative Humidity	32.9%

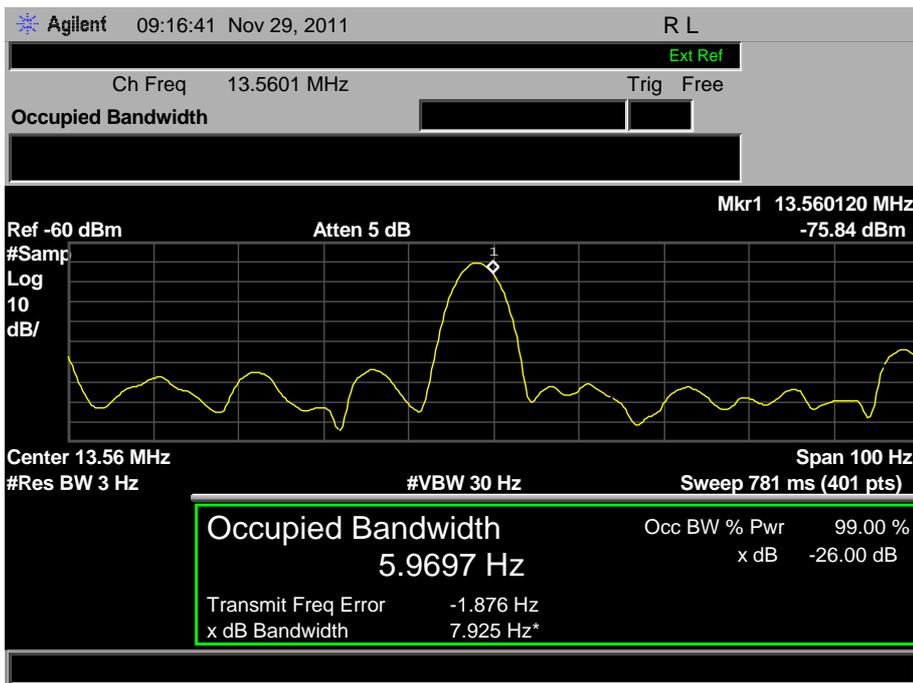


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2.2.7 Test Results

4.0 V DC Supply

Frequency (MHz)	20 dB Bandwidth (Hz)
13.56 (212 kbps)	5.9697
13.56 (424 kbps)	5.9865





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2.3 FREQUENCY STABILITY UNDER TEMPERATURE VARIATIONS

2.3.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.225 (e)

2.3.2 Equipment Under Test and Modification State

CDMA SHX12 S/N: IMEI 004401113641159 - Modification State 0

2.3.3 Date of Test

30 November 2011

2.3.4 Test Equipment Used

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

2.3.5 Test Procedure

The EUT was set to transmit on maximum power with normal modulation. An frequency counter, was used to measure the frequency error. The temperature was adjusted between -20°C and +50°C in 10° steps as per 15.225 (e).

2.3.6 Environmental Conditions

Ambient Temperature	22.0°C
Relative Humidity	35.3%



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2.3.7 Test Results

4.0 V DC Supply

RFID

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (%)
-20	13.56	0.0013
-10	13.56	0.0017
0	13.56	0.0018
+10	13.56	0.0017
+20	13.56	0.0009
+30	13.56	0.0009
+40	13.56	0.0003
+50	13.56	-0.0003

Limit Clause

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency.



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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- Field Strength of any Emission					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Communications Tester	Rohde & Schwarz	CMU 200	442	12	13-Oct-2012
Antenna (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	2-Aug-2012
Pre-Amplifier	Phase One	PS04-0086	1533	12	20-Sep-2012
Screened Room (5)	Rainford	Rainford	1545	36	3-Feb-2014
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
EMI Test Receiver	Rohde & Schwarz	ESIB26	2028	12	4-Oct-2012
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
Test Receiver	Rohde & Schwarz	ESIB40	2941	12	12-May-2012
Comb Generator	Schaffner	RSG1000	3034	-	TU
Antenna (DRG Horn)	ETS-LINDGREN	3115	3125	12	27-Apr-2012
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	22-Aug-2012
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	20-Dec-2011
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
Power magnetic field Coil (Horizontal 2.1m*2.2m)	TUV	N/A	3522	-	TU
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Feb-2012
3 GHz High Pass Filter	K&L Microwave	11SH10-3000/X18000-O/O	3552	12	14-Apr-2012
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3696	12	28-Jan-2012
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3703	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	26-Aug-2012
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
Low Noise Amplifier	Wright Technologies	APS04-0085	3969	12	8-Jul-2012



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.2 - Occupied Bandwidth					
RF Coupler	TUV	TUV	415	-	TU
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	23-Jun-2012
Attenuator (10dB)	Weinschel	47-10-34	481	12	24-Mar-2012
Attenuator (20dB/ 2W)	Pasternack	PE7004-20	489	12	21-Sep-2012
Power Divider	Weinschel	1506A	604	12	17-Mar-2012
Broadband Resistive Power Divider	Weinschel	1506A	605	12	6-Sep-2012
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	28-Jun-2012
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	13-Mar-2012
Power Supply Unit	Farnell	TSV-70	2043	-	O/P Mon
Multimeter	Iso-tech	IDM101	2421	12	26-Oct-2012
Multimeter	Iso-tech	IDM101	2424	12	5-Sep-2012
Power Supply Unit	Weir	460	2754	-	TU
GSM Test Set	Rohde & Schwarz	CMU 200	2809	12	26-May-2012
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	10-Jun-2012
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
Power Divider	Weinschel	1506A	3345	12	4-May-2012
ESA-E Series Spectrum Analyser	Agilent	E4402B	3348	12	6-Jun-2012
Power Supply	Farnell	ET30/2	3423	-	TU
Power Meter	Rohde & Schwarz	NRP	3491	12	19-Apr-2012
Wideband Power Sensor, 50MHz - 18GHz	Rohde & Schwarz	NRP-Z81	3492	12	19-Apr-2012
Vector Signal Generator	Rohde & Schwarz	SMU 200A	3493	12	20-Sep-2012
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	23-Feb-2012
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	8-Feb-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3700	12	11-Jan-2012
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	11-Jan-2012
DC - 12.4 GHz 10 dB Attenuator 1 W	Suhner	6810.17.A	3964	12	24-Jun-2012
P-Series Power Meter	Agilent	N1911A	3981	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3983	12	12-Sep-2012
Section 2.3 Frequency Stability under Temperature Variations					
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Temperature Chamber	Montford	2F3	467	-	O/P Mon
GPS Frequency Standard	Rapco	GPS-804/3	1312	6	13-Mar-2012
Attenuator (10dB, 10W)	Trilithic	HFP-50N	1377	12	19-Oct-2012
Power Supply Unit	Farnell	TSV-70	2043	-	O/P Mon
Multimeter	Iso-tech	IDM101	2421	12	26-Oct-2012
Thermocouple Thermometer	Fluke	51	3172	12	23-Jul-2012
Hygrometer	Rotronic	I-1000	3220	12	3-May-2012
ESA-E Series Spectrum Analyser	Agilent	E4402B	3348	12	6-Jun-2012
Power Supply	Farnell	ET30/2	3423	-	TU

TU – Traceability Unscheduled

O/P MON – Output Monitored with Calibrated Equipment



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3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	MU
Frequency Stability Under Temperature Variations	± 3.54 Hz
Field Strength of any Emission	30MHz to 1GHz: ± 5.1 dB
Occupied Bandwidth	± 16.74 kHz



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SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

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.

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