



TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: 902-03-207

FCC ID: O2J-265AS

To: FCC Parts 15.207 & 27.53(m)(2)

Test Report Serial No.:
RFI-RPT-RP86522JD01A

This Test Report Is Issued Under The Authority Of Chris Guy, Head of Global Approvals:	 pp
Checked By:	Ian Watch
Signature:	
Date of Issue:	26 March 2012

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1. Customer Information






Company Name:	Airspan Communications Ltd.
Address:	Capital Point 33 Bath Road Slough Berkshire SL1 3UF United Kingdom

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.207
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 15 Subpart C (Intentional Radiators) - Sections 15.207
Specification Reference:	47CFR27
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 27 Subpart C (Miscellaneous Wireless Communication Services)
Site Registration:	209735
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Date:	19 March 2012

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.207	Transmitter AC Conducted Emissions	
Part 27.53(m)(2) / 2.1053	Transmitter Radiated Spurious Emissions	
Part 27.53(m)(2) / 2.1053	Transmitter Radiated Emissions at Band Edges	
Key to Results		
 = Complied  = Did not comply		

2.3. Methods and Procedures

Reference:	ANSI/TIA-603-C-2004
Title:	Land Mobile Communications Equipment, Measurements and performance Standards
Reference:	ANSI C63.4 (2009)
Title:	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above.

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

Brand Name:	Airspan
Model Name or Number:	Airsynergy 902-03-207
Serial Number:	MAC address: 00 01 aa ff fe 94
Hardware Version Number:	N/A
FCC ID Number:	O2J-265AS

3.2. Description of EUT

The equipment under test was a WiMax Base Station operating in the 2.6 GHz frequency band.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Tested Technology:	WiMAX	
Type of Equipment	Base Station	
Modulation Type:	64QAM3/4	
Antenna Gain:	18.0 dBi	
Channel Bandwidth:	10 MHz	
Transmit Frequency Range:	2578 MHz to 2609 MHz	
Transmit Channels Tested:	Channel ID	Channel Frequency (MHz)
	Bottom	2578
	Top	2608

3.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Description:	Laptop
Brand Name:	Dell
Model Name or Number:	Latitude
Serial Number:	AIRN005837

Description:	120 VAC 60 Hz to 48V DC PSU
Brand Name:	Meanwell
Model Name or Number:	CLG-100-48
Serial Number:	RA81186837

Description:	POE injector
Brand Name:	Airspan
Model Name or Number:	902-00-250
Serial Number:	5C20B8000007

Description:	Ethernet Hub
Brand Name:	Netgear
Model Name or Number:	10/100/1000M Switch GS605 v3
Serial Number:	1YG19430021A1

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

The EUT was tested in the following operating mode(s):

- Transmitting at maximum output power on the bottom and top channels.

4.2. Configuration and Peripherals

The EUT was tested in the following configuration(s):

- The EUT was controlled from a laptop PC using software supplied by the Customer. The laptop PC was disconnected after the EUT had been configured, prior to testing.
- 50 Ohm loads were fitted to both RF ports on the EUT during radiated spurious emission and AC conducted emission testing.
- The EUT was mounted on a metal pole 1.5 metres above floor level for radiated spurious emissions tests. An earth strap was used to bond the earthing point on the casing to the metal structure of the test chamber.
- Power to the EUT is provided by Ethernet cable from an Airspan PoE injector Model 902-00-250. Unused Ethernet ports on the PoE injector were terminated into an Ethernet hub. The PoE injector was powered from a Meanwell 120 VAC 60 Hz to 48 VDC PSU.
- AC conducted emissions tests were performed with the PSU connected to a 120 VAC 60 Hz single phase supply via a LISN.

5. Measurements, Examinations and Derived Results

5.1. General Comments

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to *Section 6* for Measurement Uncertainty details.

5.2. Test Results**5.2.1. Transmitter AC Conducted Spurious Emissions****Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	19 March 2012
Test Sample Serial No:	MAC address: 00 01 aa ff fe 94		

FCC Part:	15.207
Test Method Used:	ANSI C63.10 Section 6.2 referencing ANSI C63.4

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	29

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.150000	Live	50.3	66.0	15.7	Complied
26.092500	Live	46.7	60.0	13.3	Complied
26.403000	Live	47.9	60.0	12.1	Complied
27.006000	Live	47.4	60.0	12.6	Complied
27.312000	Live	44.7	60.0	15.3	Complied
27.915000	Live	47.0	60.0	13.0	Complied
28.518000	Live	47.8	60.0	12.2	Complied
28.819500	Live	44.6	60.0	15.4	Complied

Results: Live / Average

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
26.097000	Live	45.4	50.0	4.6	Complied
26.403000	Live	44.3	50.0	5.7	Complied
26.704500	Live	42.5	50.0	7.5	Complied
27.006000	Live	42.7	50.0	7.3	Complied
27.307500	Live	44.7	50.0	5.3	Complied
27.609000	Live	44.7	50.0	5.3	Complied
27.910500	Live	45.4	50.0	4.6	Complied
28.212000	Live	46.0	50.0	4.0	Complied
28.518000	Live	43.0	50.0	7.0	Complied
28.819500	Live	41.0	50.0	9.0	Complied

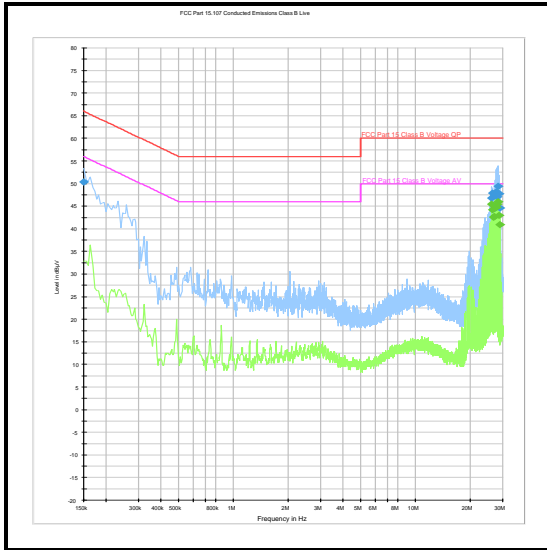
Transmitter AC Conducted Spurious Emissions (continued)**Results: Neutral / Quasi Peak**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
25.782000	Neutral	44.5	60.0	15.5	Complied
26.088000	Neutral	47.0	60.0	13.0	Complied
26.389500	Neutral	46.5	60.0	13.5	Complied
26.997000	Neutral	47.2	60.0	12.8	Complied
27.303000	Neutral	49.0	60.0	11.0	Complied
27.604500	Neutral	51.0	60.0	9.0	Complied
27.906000	Neutral	52.1	60.0	7.9	Complied
28.207500	Neutral	51.8	60.0	8.2	Complied
28.518000	Neutral	49.4	60.0	10.6	Complied
28.815000	Neutral	45.8	60.0	14.2	Complied

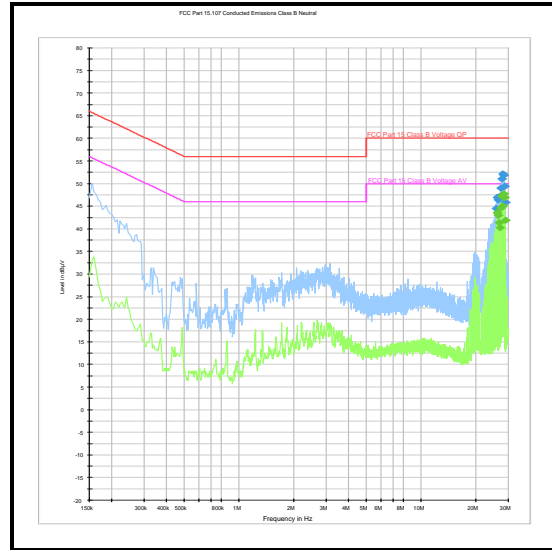
Results: Neutral / Average

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
26.088000	Neutral	43.6	50.0	6.4	Complied
26.394000	Neutral	43.0	50.0	7.0	Complied
26.695500	Neutral	41.4	50.0	8.6	Complied
27.001500	Neutral	40.3	50.0	9.7	Complied
27.303000	Neutral	44.6	50.0	5.4	Complied
27.604500	Neutral	47.2	50.0	2.8	Complied
27.910500	Neutral	45.0	50.0	5.0	Complied
28.212000	Neutral	47.7	50.0	2.3	Complied
28.518000	Neutral	47.0	50.0	3.0	Complied
28.819500	Neutral	41.8	50.0	8.2	Complied

Transmitter AC Conducted Spurious Emissions (continued)



Live



Neutral

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

5.2.2. Transmitter Radiated Spurious Emissions**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	19 March 2012
Test Sample Serial No:	MAC address: 00 01 aa ff fe 94		

FCC Part:	27.53(m)(2) & 2.1053
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12. referencing FCC Part 2.1053
Frequency Range:	30 MHz to 26.5 GHz

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	21

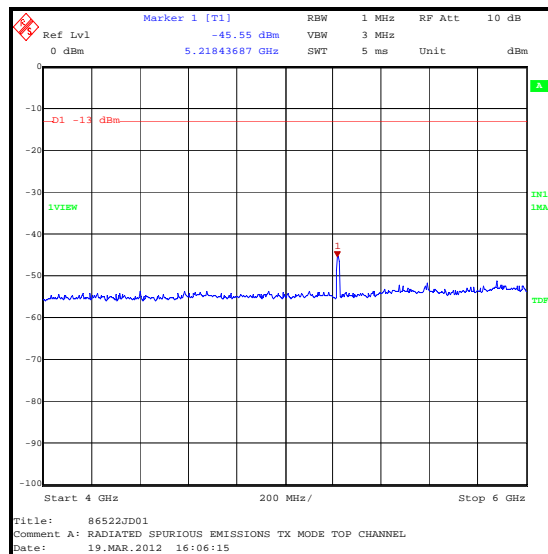
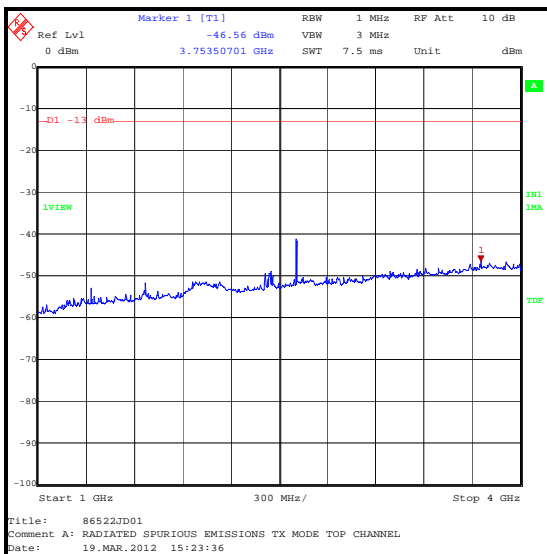
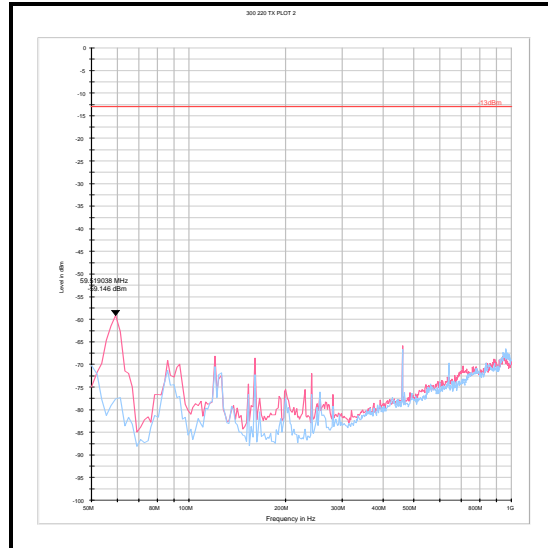
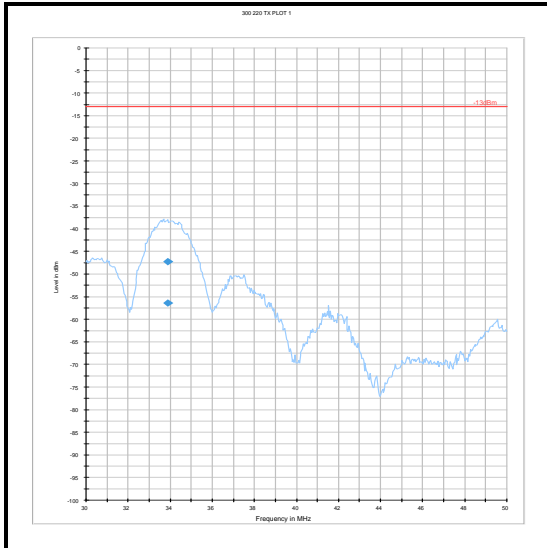
Results: Top Channel

Frequency (MHz)	Antenna Polarisation	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
25564.329	Vertical	-43.8	-13.0	30.8	Complied

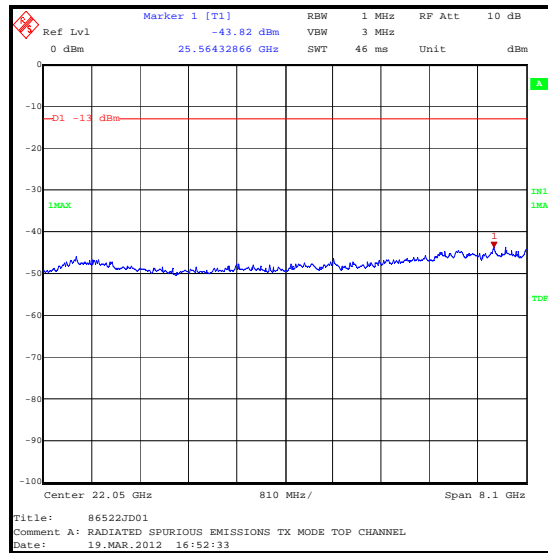
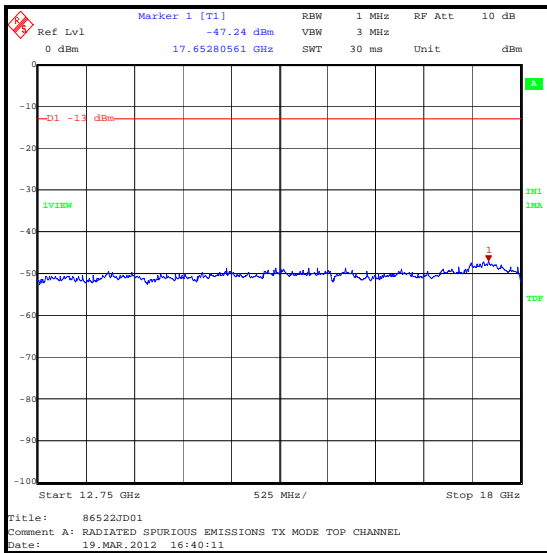
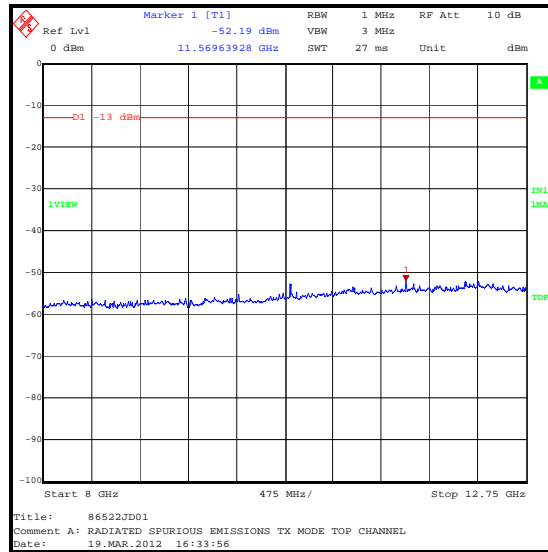
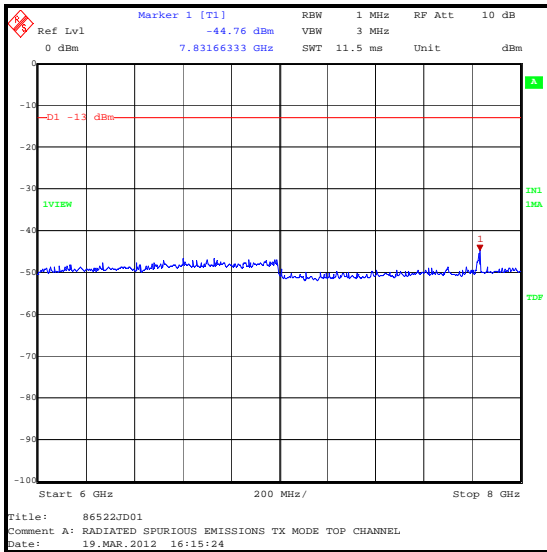
Note(s):

1. The EUT was configured to transmit with 64QAM3/4 modulation applied as this was previously found to have the highest output power compared with other modes.
2. Both ports were terminated into 50 Ohm loads during the test.
3. Pre-scans were performed with the EUT transmitting on the top channel.
4. The emission seen on the 1 GHz to 4 GHz plot at approximately 2.6 GHz is the EUT carrier.
5. All emissions were at least 20 dB below the specification limit or below the measurement system noise floor. The highest noise floor level across the measured frequency range was recorded in the table above.
6. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
7. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Radiated Spurious Emissions (continued)



Transmitter Radiated Spurious Emissions (continued)



5.2.3. Transmitter Radiated Spurious Emissions at Band Edges**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	19 March 2012
Test Sample Serial No:	MAC address: 00 01 aa ff fe 94		

FCC Part:	27.53(m)(2) & 2.1053
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12. referencing FCC Part 2.1053

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	21

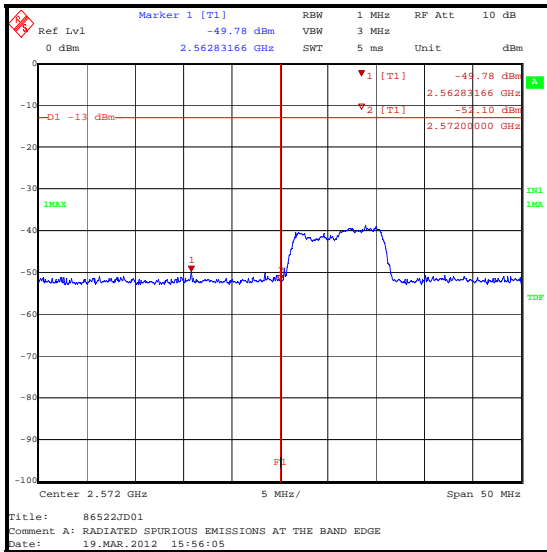
Results:

Frequency (MHz)	Antenna Polarisation	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
2562.832	Vertical	-49.8	-13.0	36.8	Complied
2572.000	Vertical	-52.1	-13.0	39.1	Complied
2614.000	Vertical	-51.7	-13.0	38.7	Complied
2624.671	Vertical	-50.2	-13.0	37.2	Complied

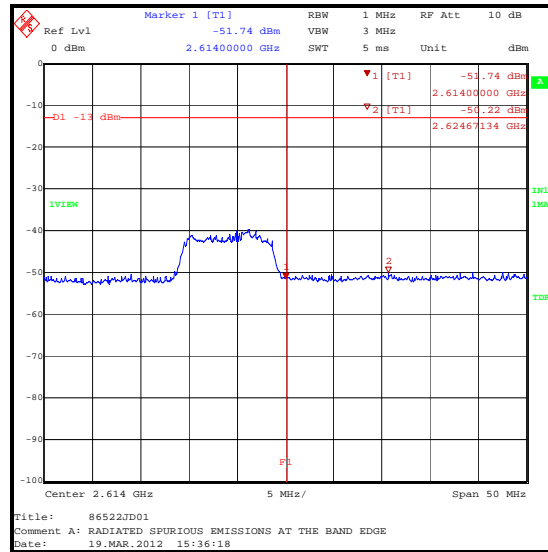
Note(s):

1. Measurements at the lower band edge were performed with the EUT transmitting on the bottom channel. Measurements at the upper band edge were performed with the EUT transmitting on the top channel.

Transmitter Radiated Emissions at Band Edges (continued)



Bottom Channel



Top Channel

6. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document "approximately" is interpreted as meaning "effectively" or "for most practical purposes".

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.25 dB
Radiated Spurious Emissions	30 MHz to 26.5 GHz	95%	±2.94 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (months)
A004	LISN	Rohde & Schwarz	ESH3-Z5	890604/027	14 Sep 2012	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	09 Oct 2012	12
A1818	Antenna	EMCO	3115	00075692	09 Oct 2012	12
A1829	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100671	31 Jan 2013	12
A1834	Attenuator	Hewlett Packard	8491B	10444	29 Jan 2013	12
A253	Antenna	Flann Microwave	12240-20	128	09 Oct 2012	12
A254	Antenna	Flann Microwave	14240-20	139	09 Oct 2012	12
A255	Antenna	Flann Microwave	16240-20	519	09 Oct 2012	12
A256	Antenna	Flann Microwave	18240-20	400	09 Oct 2012	12
A436	Antenna	Flann Microwave	20240-20	330	09 Oct 2012	12
A553	Antenna	Chase	CBL6111A	1593	15 Feb 2013	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	29 May 2012	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	09 Oct 2012	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESI26	100046K	29 Jun 2012	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	03 Feb 2013	12

NB In accordance with UKAS requirements all the measurement equipment is on a calibration schedule.