TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: DM05-US

FCC ID: UOJ-DG01T

IC Certification Number: 6769A-DG01T

To: FCC Part 15.247: 2010 Subpart C, RSS-210 Issue 8 December 2010
& RSS-Gen Issue 3 December 2010

Test Report Serial No:
RFI-RPT-RP79705JD01A

This Test Report Is Issued Under The Authority Of Chris Guy, Head of Global Approvals::	
Checked By:	Ian Watch
Signature:	
Date of Issue:	24 March 2011

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Registered in England and Wales. Company number:2117901

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1. Customer Information

Company Name:	Comfort Audio AB
Address:	Slottsmallan Halmstad 302 31 Sweden

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.247
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart C (Intentional Radiators) - Section 15.247
Specification Reference:	47CFR15.107 and 47CFR15.109
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart B (Unintentional Radiators) - Sections 15.107 and 15.109
Specification Reference:	47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart C (Intentional Radiators) – Section 15.209
Specification Reference:	RSS-Gen Issue 3 December 2010
Specification Title:	General Requirements and Information for the Certification of Radio Apparatus
Specification Reference:	RSS-210 Issue 8 December 2010
Specification Title:	Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment.
Site Registration:	FCC: 209735; Industry Canada: 3245B-2
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	6 March 2011 to 14 March 2011

2.2. Summary of Test Results

FCC Reference (47CFR)	IC Reference	Measurement	Result
Part 15.107(a)	RSS-Gen 7.2.4	Idle Mode AC Conducted Emissions	✓
Part 15.109	RSS-Gen 4.10/6.1	Idle Mode Radiated Spurious Emissions	✓
Part 15.247(a)(2)	RSS-Gen 4.6.2 RSS-210 A8.2(a)	Transmitter 6 dB Bandwidth	✓
Part 2.1049	RSS-Gen 4.6.1/4.6.3	Transmitter 20 dB Bandwidth	✓
Part 15.247(e)	RSS-210 A8.2(b)	Transmitter Power Spectral Density	✓
Part 15.247(b)(3)	RSS-Gen 4.8 RSS-210 A8.4(4)	Transmitter Maximum Peak Output Power	✓
Part 15.247(d)/ 15.209(a)	RSS-Gen 4.9 RSS-210 A8.5	Transmitter Radiated Emissions	✓
Part 15.247(d)	RSS-Gen 4.9 RSS-210 A8.5	Transmitter Band Edge Radiated Emissions	✓

Key to Results

✓ = Complied ✗ = Did not comply

2.3. Methods and Procedures

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.
Reference:	ANSI C63.10 (2009)
Title:	American National Standard for Testing Unlicensed Wireless Devices

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:	Comfort Audio
Model Name or Number:	Microphone DM05-US
Serial Number:	SN0003996
Hardware Version Number:	DM054C
Software Version Number:	1.3
FCC ID:	UOJ-DG01T
IC Certification Number:	6769A-DG01T

Description:	Microphone
Brand Name:	Comfort Audio
Model Name or Number:	Microphone DM10-US
Serial Number:	SN0003996

3.2. Description of EUT

The equipment under test was a small wireless microphone for digital transfer of sound to earpieces.

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:	Digital Transmission System		
Type of Unit:	Transmitter		
Modulation:	FSK		
Power Supply Requirement:	Nominal	3.7V	
Maximum Conducted Peak Output Power:	-3.4 dBm		
Transmit Frequency Range:	902 MHz to 928 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	1	904.65
	Middle	19	915.45
	Top	38	926.85

3.5. Support Equipment

No support equipment was used to exercise the EUT during testing:

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

- Continuous transmit mode (default and only supported operating mode) on bottom, middle and top channels as required.
- Idle mode (initiated by placing in a charging state)

4.2. Configuration and Peripherals

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

- Not charging (EUT in continuous transmit mode when not charging)
- Charging (EUT does not transmit when charging and so is in idle mode).
- Channel was selected by setting the transmit channel of the supporting DM10-US microphone and “pairing” the devices. This would cause the channel of the DM-05 to change to match that of the support equipment. The support equipment could then be powered off so as not to interfere.

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 Measurement Uncertainty for details.

5.2. Test Results

5.2.1. Idle AC Conducted Spurious Emissions

Test Summary:

Test Engineer:	Crawford Lindsay	**Test Date:**	11 March 2011
Test Sample Serial No:	SN0003996		

FCC Part:	15.107(a)
Test Method Used:	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

Environmental Conditions:

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

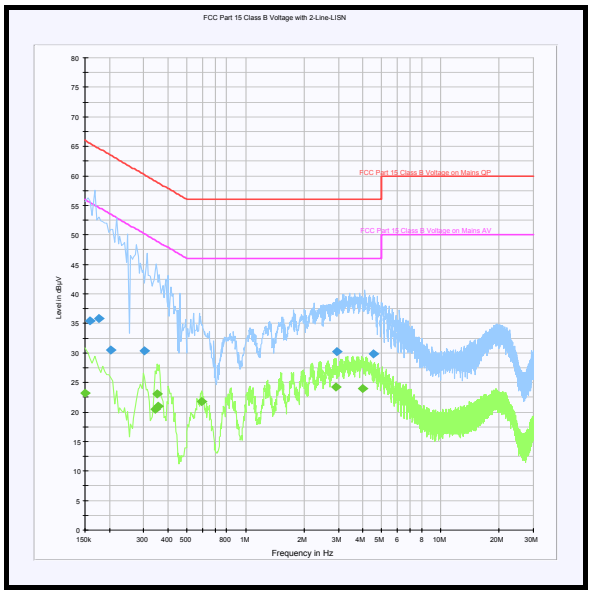
Results: Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.159	Neutral	35.4	65.5	30.1	Complied
0.177	Live	35.9	64.6	28.7	Complied
0.204	Neutral	30.4	63.4	33.0	Complied
0.303	Neutral	30.3	60.2	29.9	Complied
2.940	Neutral	30.2	56.0	25.8	Complied
4.533	Neutral	29.9	56.0	26.1	Complied

Results: Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.150	Neutral	23.2	56.0	32.8	Complied
0.344	Live	20.5	49.1	28.6	Complied
0.353	Neutral	23.0	48.9	25.9	Complied
0.357	Live	21.0	48.8	27.8	Complied
0.596	Neutral	21.7	46.0	24.3	Complied
2.891	Neutral	24.2	46.0	21.8	Complied
3.975	Neutral	23.9	46.0	22.1	Complied

Idle Mode AC Conducted Spurious Emissions (continued)



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.

5.2.2. Idle Mode Radiated Spurious Emissions

Test Summary:

Test Engineer:	Crawford Lindsay	**Test Date:**	11 March 2011
Test Sample Serial No:	SN0003996		

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
Frequency Range:	30 MHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	27

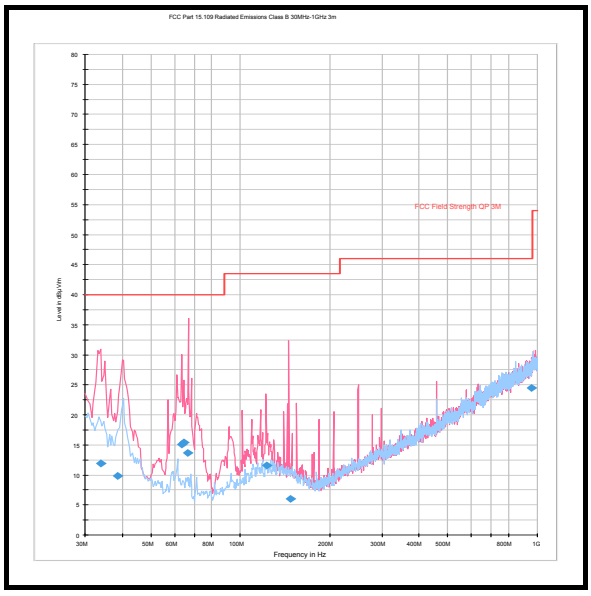
Results: Quasi-Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
33.995	Vertical	11.9	40.0	28.1	Complied
38.636	Vertical	9.9	40.0	30.1	Complied
63.721	Vertical	15.1	40.0	24.9	Complied
64.475	Vertical	15.4	40.0	24.6	Complied
66.465	Vertical	13.7	40.0	26.3	Complied
122.613	Vertical	11.5	43.5	32.0	Complied
147.041	Vertical	6.1	43.5	37.5	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
3. 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.

Receiver/Idle Mode Radiated Spurious Emissions (continued)



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Idle Mode Radiated Spurious Emissions (continued)

Test Summary:

Test Engineer:	Patrick Jones	**Test Date:**	14 January 2011
Test Sample Serial No:	DM0930803		

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
Frequency Range:	1 GHz to 5 GHz

Environmental Conditions:

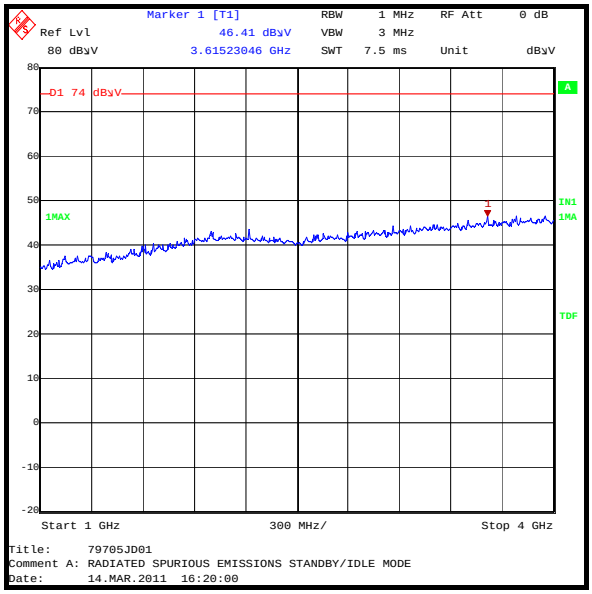
Temperature (°C):	24
Relative Humidity (%):	21

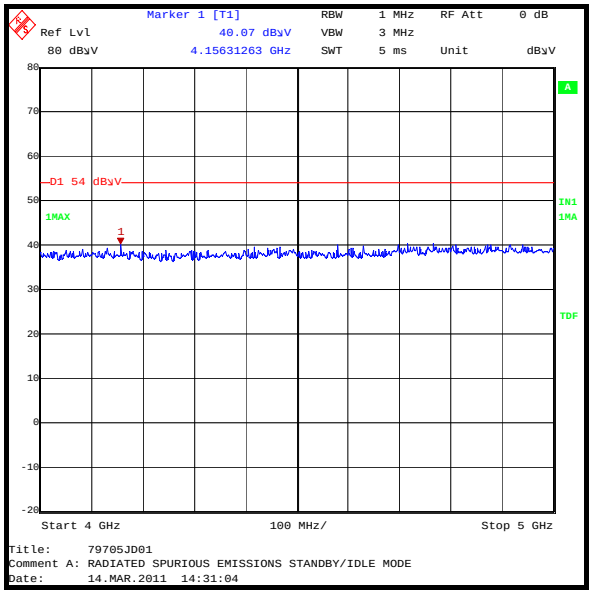
Results:

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
3615.230	V	46.4	54.0	7.6	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. 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.
3. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit.





5.2.3. Transmitter 6 dB Bandwidth

Test Summary:

Test Engineer:	Crawford Lindsay	**Test Date:**	07 March 2011
Test Sample Serial No:	SN0003996		

FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.1 referencing KDB 558074 "Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005"

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	24

Results:

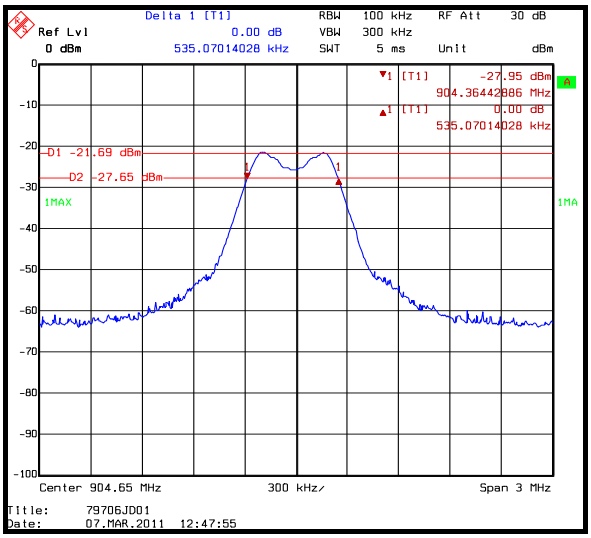
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	0.535	≥0.5	0.035	Complied
Middle	0.529	≥0.5	0.029	Complied
Top	0.529	≥0.5	0.029	Complied

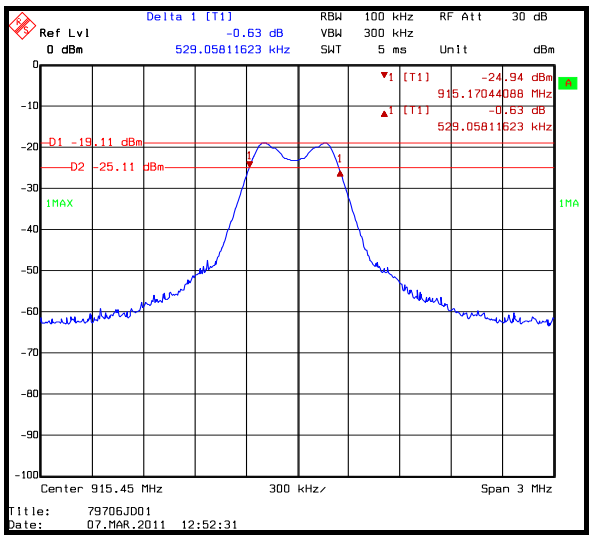
Note(s):

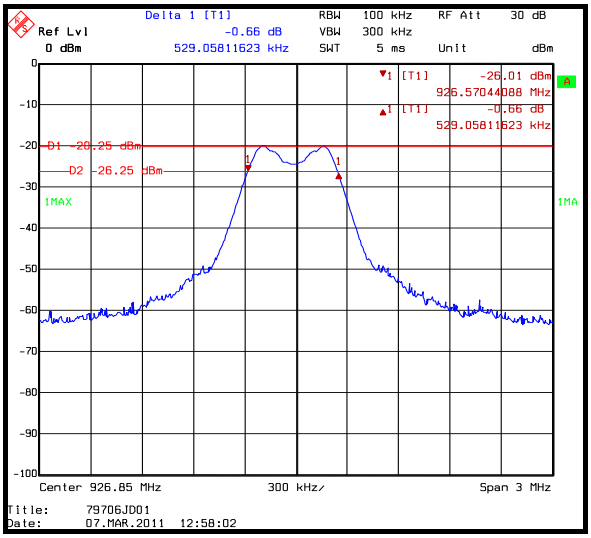
1. These measurements were performed radiated as the EUT has an integral antenna and does not have an external antenna port.
2. The measurements were taken with a RBW of 100 kHz as allowable under KDB 558074 "Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005".

Transmitter 6 dB Bandwidth (continued)

Results:







5.2.4. Transmitter 20 dB Bandwidth

Test Summary:

Test Engineer:	Crawford Lindsay	**Test Date:**	07 March 2011
Test Sample Serial No:	SN0003996		

FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.1 referencing KDB 558074 “Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005”.

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	24

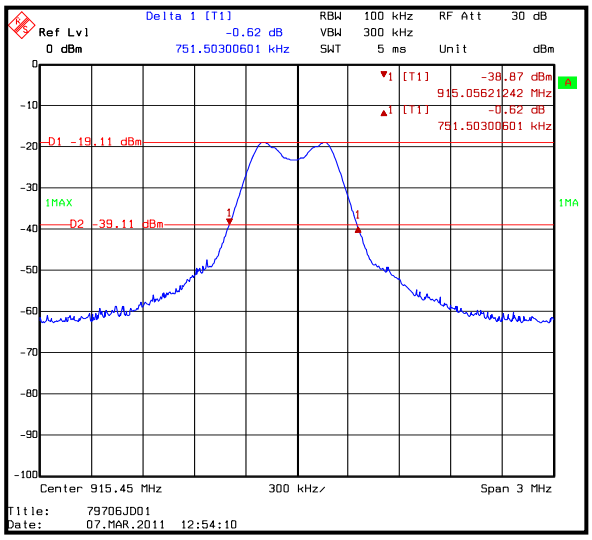
Results:

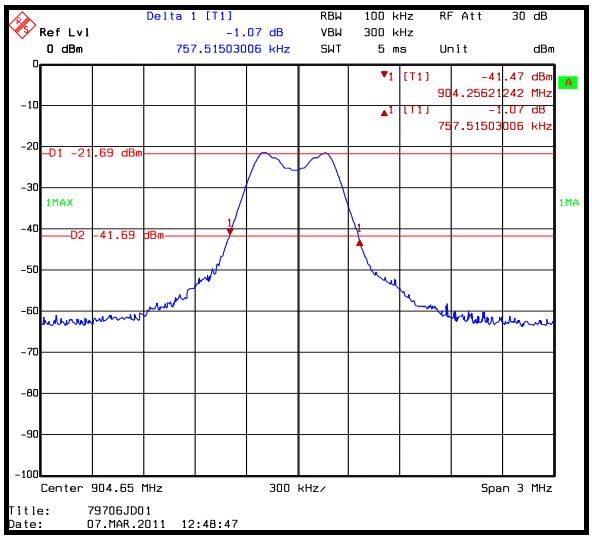
Channel	20 dB Bandwidth (kHz)
Bottom	757.515
Middle	751.503
Top	757.515

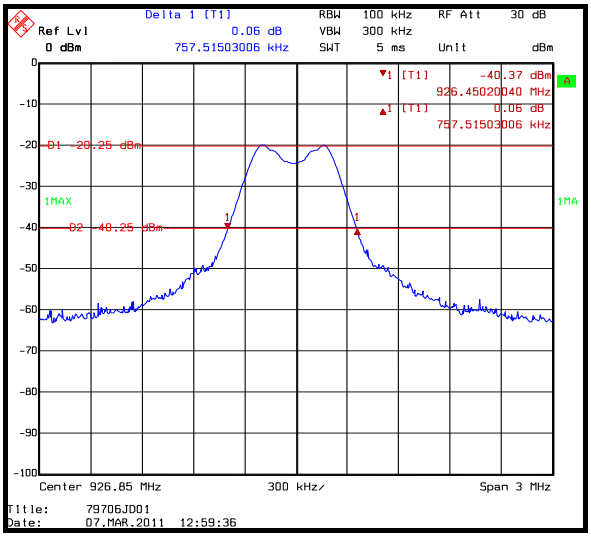
Note(s):

1. These measurements were performed radiated as the EUT has an integral antenna and does not have an external antenna port.
2. The measurements were taken with a RBW of 100 kHz as allowable under KDB 558074 “Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005”.

Transmitter 20 dB Bandwidth (continued)







5.2.5. Transmitter Power Spectral Density

Test Summary:

Test Engineer:	Andrew Edwards	**Test Date:**	14 March 2011
Test Sample Serial No:	SN0003996		

FCC Part:	15.247(e)
Test Method Used:	As detailed in ANSI C63.10 Section 6.11.2

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	26

Results:

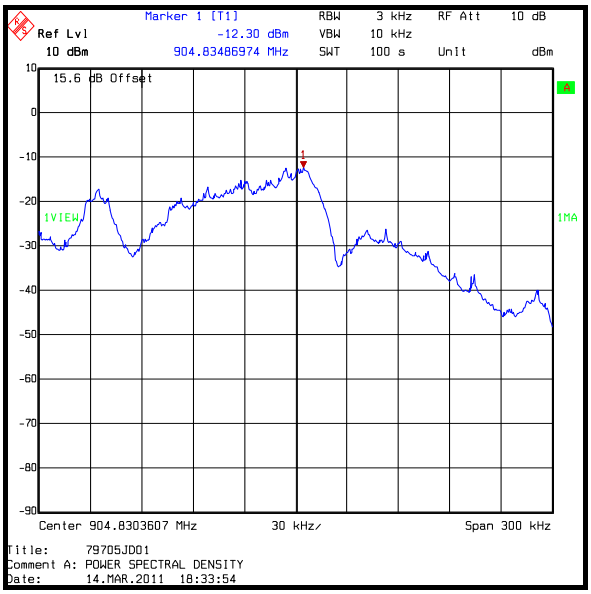
Channel	Output Power (dBm/3 kHz)	Limit (dBm/3 kHz)	Margin (dB)	Result
Bottom	-12.3	8.0	20.3	Complied
Middle	-13.0	8.0	21.0	Complied
Top	-12.2	8.0	20.2	Complied

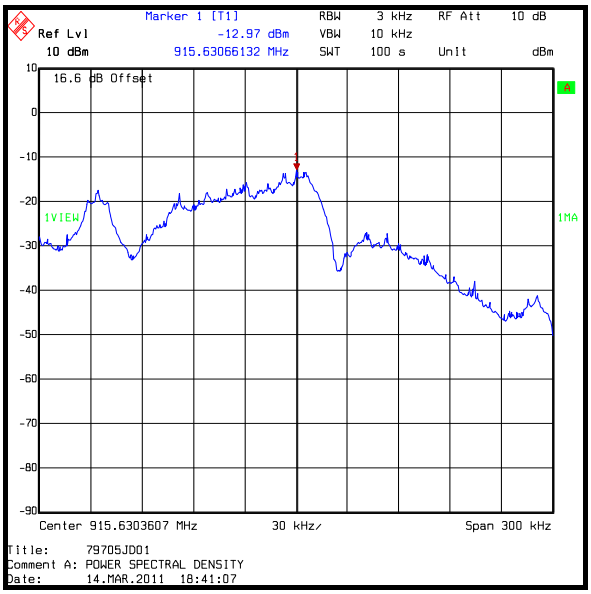
Note(s):

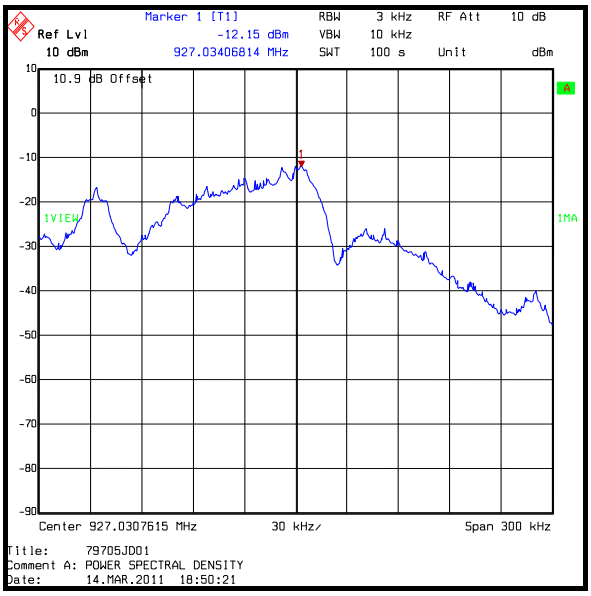
1. These tests were performed radiated as the EUT has an integral antenna and does not have an external antenna port.

Transmitter Power Spectral Density (continued)

Results:







5.2.6. Transmitter Maximum Peak Output Power

Test Summary:

Test Engineer:	Crawford Lindsay	**Test Date:**	07 March 2011
Test Sample Serial No:	SN0003996		

FCC Part:	15.247(b)(3)
Test Method Used:	As detailed in ANSI C63.10 Section 6.10.1 and Sections 6.3 and 6.6 referencing ANSI C63.4 (see note below)

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	24

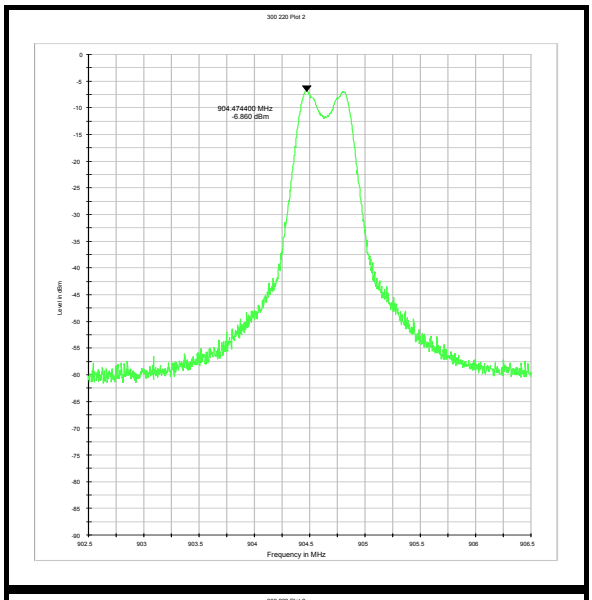
Results:

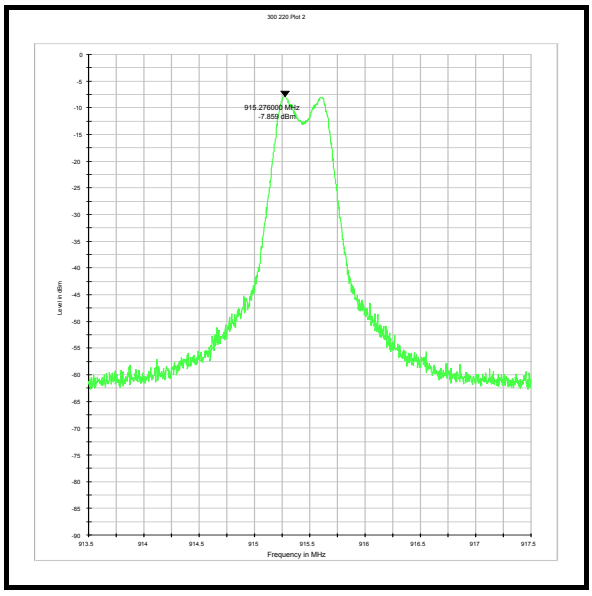
Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBd)	ERP (dBm)	ERP to EIRP Conversion Factor	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	-3.4	-3.5	-6.9	2.15	-4.75	36.0	40.75	Complied
Middle	-4.4	-3.5	-7.9	2.15	-5.75	36.0	41.75	Complied
Top	-3.6	-3.5	-7.1	2.15	-4.95	36.0	40.95	Complied

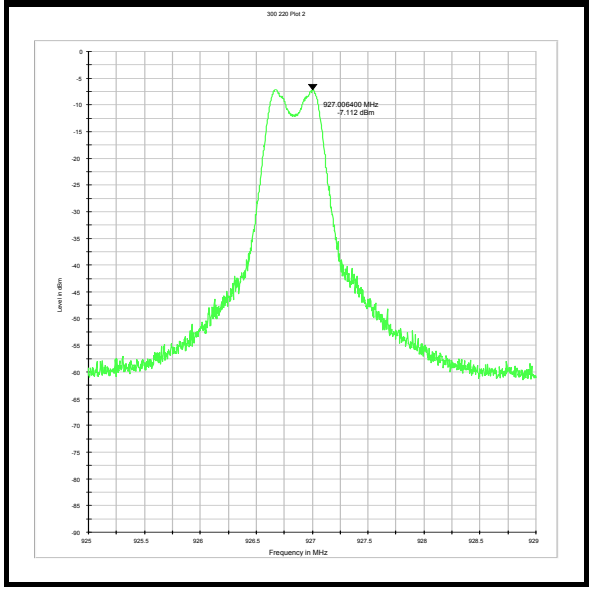
Note(s):

1. These tests were performed radiated; therefore the EUT antenna gain is encompassed in the final result and not measurable.
2. As the EUT has an integral antenna, in order to obtain the conducted peak power (into the antenna) the declared antenna gain was subtracted from the measured ERP.
3. Tests were performed using a combination of the conducted test method described in ANSI C63.10 Section 6.10.1 and the test methods for radiated emissions measurements described in Sections 6.3 and 6.6. The reason for this being that the measurements were performed radiated as the EUT has an integral antenna and does have not an external antenna port.

Transmitter Maximum Peak Output Power (continued)







5.2.7. Transmitter Radiated Emissions

Test Summary:

Test Engineer:	Crawford Lindsay	**Test Date:**	06 March 2011
Test Sample Serial No:	SN0003996		

FCC Part:	15.247(d) & 15.209(a)
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
Frequency Range	30 MHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	24

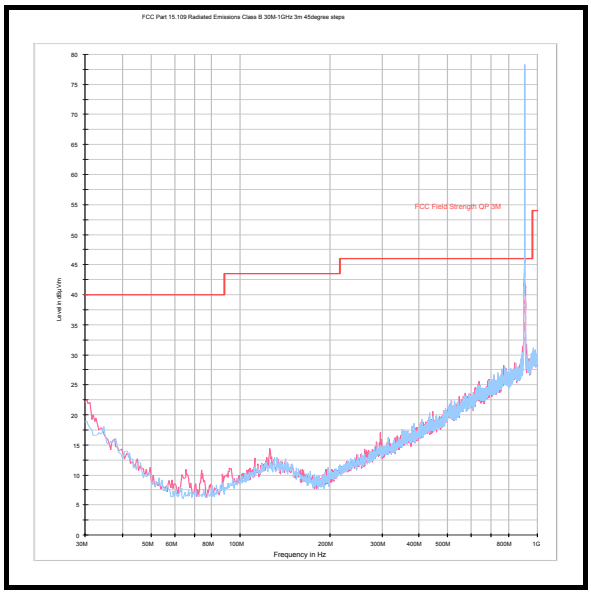
Results: Quasi-Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
Note 1					

Note(s):

1. All emissions were greater than 20 dB below the appropriate limit and hence no final measurements were taken.
2. The emission at 928.076 MHz shown on the 30 MHz to 1 GHz plot is the EUT fundamental.
3. The preliminary scans showed similar emission levels below 1 GHz, for each channel of operation. Therefore final radiated emissions measurements were performed with the EUT set to the top channel only.
4. 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.

Transmitter Radiated Emissions (continued)



5.2.8. Transmitter Radiated Emissions

Test Summary:

Test Engineer:	Patrick Jones	**Test Date:**	14 March 2011
Test Sample Serial No:	DM0930803		

FCC Part:	15.247(d) & 15.209(a)
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
Frequency Range	1 GHz to 9.30 GHz

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	22

Results: Peak Bottom Channel

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
1809.66	Vertical	51.4	70.5*	19.1	Complied

Results: Peak Middle Channel

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
1830.54	Vertical	56.7	69.5*	12.8	Complied

Results: Peak Top Channel

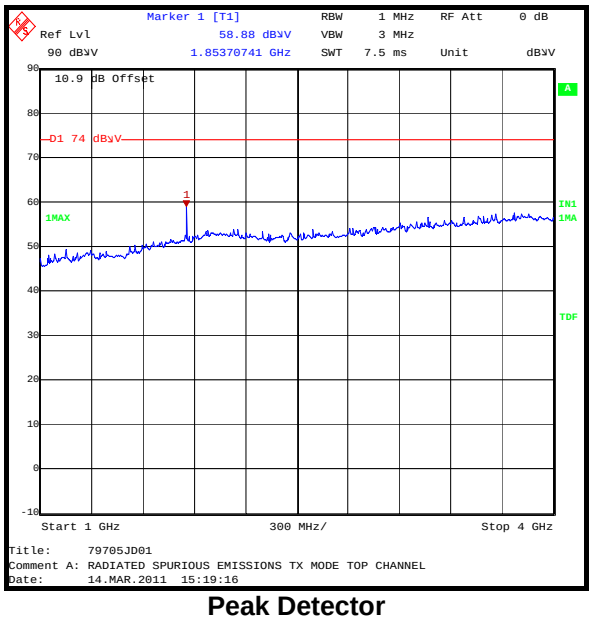
Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
1854.04	Vertical	56.7	70.3*	13.6	Complied

Transmitter Radiated Emissions (continued)

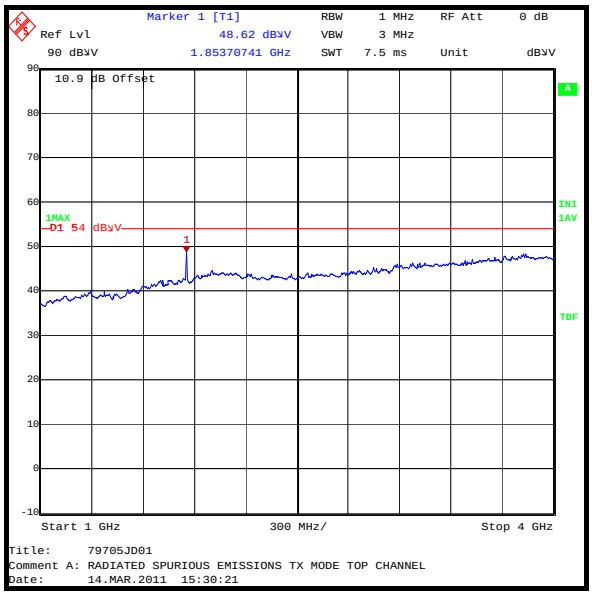
Note(s):

1. *-20 dBc limit.
2. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss
3. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
4. 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.
5. All pre-scans were performed with a peak detector against average limits apart from measurements made in the range of 1 to 4GHz where pre-scans were performed with peak and average detectors and the applicable limit applied. This was due to the noise floor being close to the average limit when using a peak detector.

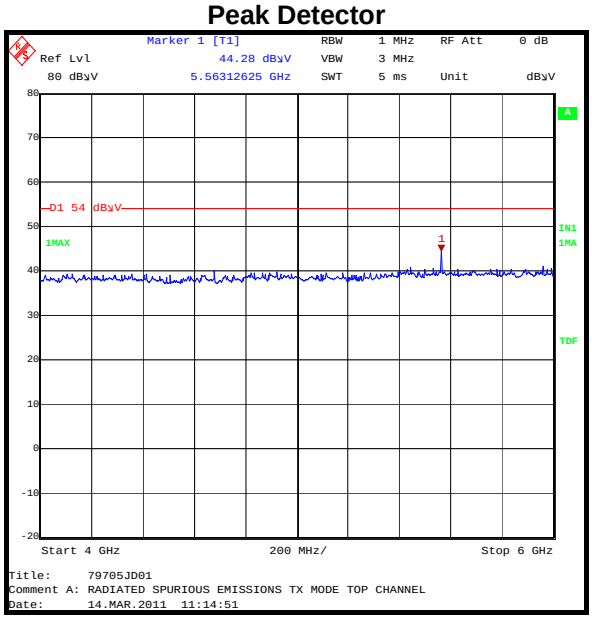
Transmitter Radiated Emissions (continued)

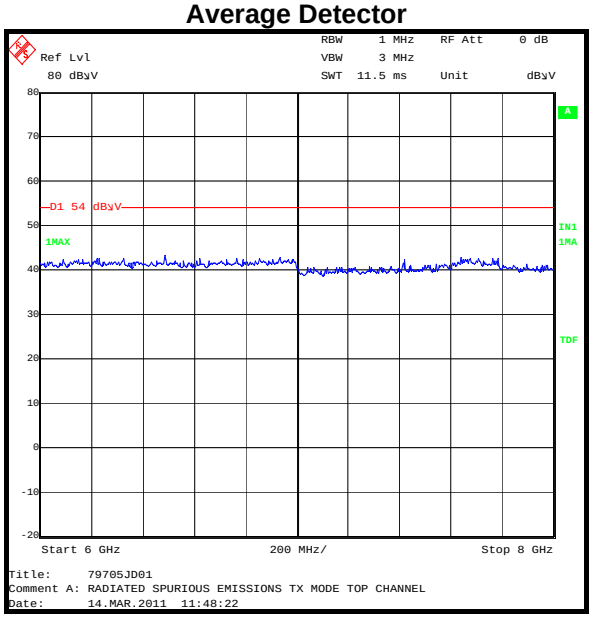


Peak Detector

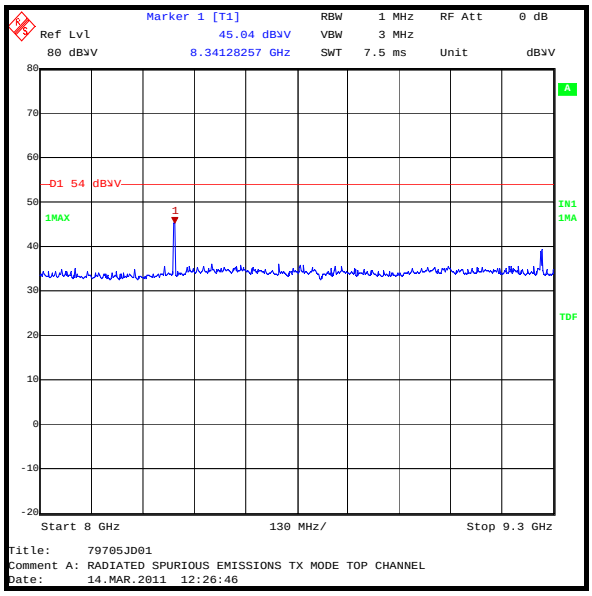


Average Detector





Transmitter Radiated Emissions (continued)



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

5.2.9. Transmitter Band Edge Radiated Emissions

Test Summary:

Test Engineer:	Andrew Edwards	**Test Date:**	14 March 2011
Test Sample Serial No:	SN0003996		

FCC Part:	15.247(d)
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.2

Environmental Conditions:

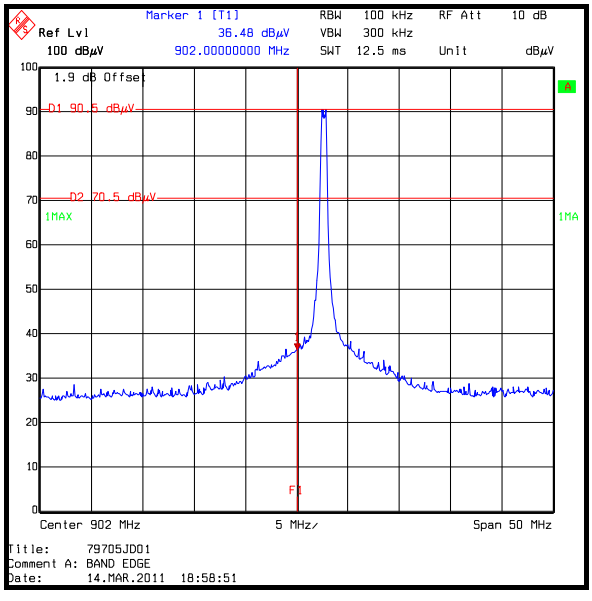
Temperature (°C):	25
Relative Humidity (%):	26

Results:

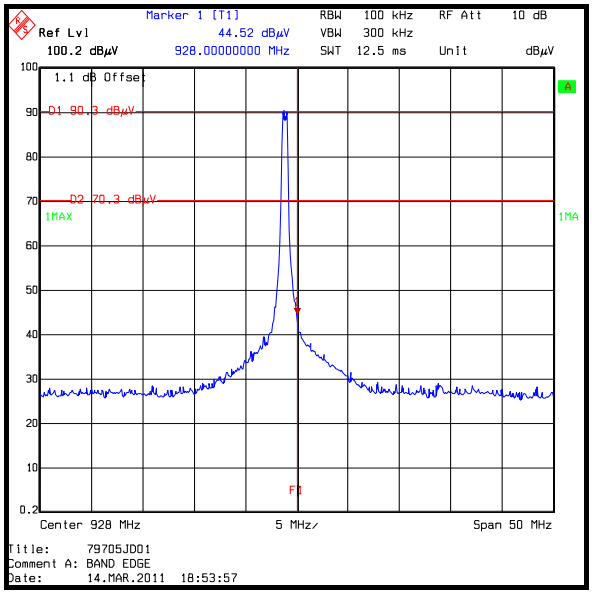
Frequency (MHz)	Peak Level (dBµV/m)	-20 dBc Limit (dBµV/m)	Margin (dB)	Result
902	36.5	70.5	34.0	Complied
928	44.5	70.3	25.8	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.



Lower Band Edge / Bottom Channel



Upper Band Edge / 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 Maximum Peak Output Power	902 MHz to 928 MHz	95%	±2.94 dB
Spectral Power Density	902 MHz to 928 MHz	95%	±2.94 dB
6 dB Bandwidth	902 MHz to 928 MHz	95%	±0.92 ppm
20 dB Bandwidth	902 MHz to 928 MHz	95%	±0.92 ppm
Radiated Spurious Emissions	30 MHz to 10 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
A1069	LISN	Rohde & Schwarz	ESH3-Z5	837469/012	13 Apr 2011	12
A1396	Attenuator	Huber + Suhner	757987	6810.17.B	06 Jul 2011	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	06 Jun 2011	12
A1818	Antenna	EMCO	3115	00075692	05 Sep 2011	12
A1974	High Pass Filter	AtlanTecRF	AFH-01000	090000283	29 Dec 2011	12
A1996	Attenuator	Huber + Suhner	6810.17.B	301749	09 Feb 2012	12
A253	Antenna	Flann Microwave	12240-20	128	05 Sep 2011	12
A254	Antenna	Flann Microwave	14240-20	139	05 Sep 2011	12
A255	Antenna	Flann Microwave	16240-20	519	05 Sep 2011	12
G0543	Amplifier	Sonoma Instrument	310N	230801	30 Jun 2011	12
K0001	5m Semi-Anechoic Chamber	Rainford EMC	N/A	N/A	25 Apr 2011	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	05 Sep 2011	12
L1001	Test Receiver	Rohde & Schwarz	ESU26	100239	16 Mar 2011	12
M1124	Test Receiver	Rohde & Schwarz	ESI26	100046K	22 Apr 2011	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	28 Jun 2011	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	15 Sep 2011	12

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