



# TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: Net 2 Entry Panel 337-837

FCC ID: USE337837

Industry Canada Certification Number: 10217A-337837

To: FCC Parts 15.207, 15.209 and 15.215(c), Industry Canada  
RSS-Gen Sections 4.6.1, 4.8 and 4.9

**Test Report Serial No.:**  
RFI-RPT-RP83001JD07A V2.0

**Version 2.0 Supersedes All Previous Versions**

<b>This Test Report Is Issued Under The Authority Of John Newell, Group Quality Manager:</b>	
<b>Checked By:</b>	Sarah Williams
<b>Signature:</b>	
<b>Date of Issue:</b>	20 July 2012

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## **1. Customer Information**

<b>Company Name:</b>	Paxton Ltd
<b>Address:</b>	Paxton House Home Farm Brighton Sussex BN1 9HU United Kingdom

## 2. Summary of Testing

### 2.1. General Information

<b>Specification Reference:</b>	47CFR15.207, 47CFR15.209 and 47CFR15.215
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 15 Subpart C (Intentional Radiators) – Sections 15.207, 15.209 & 15.215
<b>Specification Reference:</b>	RSS-Gen Issue 3 December 2010
<b>Specification Title:</b>	General Requirements and Information for the Certification of Radio Apparatus
<b>Specification Reference:</b>	RSS-210 Issue 8 December 2010
<b>Specification Title:</b>	Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment.
<b>Site Registration:</b>	FCC: 209735, Industry Canada: 3245B-2
<b>Location of Testing:</b>	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
<b>Test Dates:</b>	11 April 2012 to 11 July 2012

### 2.2. Summary of Test Results

FCC Reference (47CFR)	IC Reference	Measurement	Result
Part 15.207	RSS-Gen 7.2.4	Transmitter AC Conducted Emissions	✓
Part 15.209	RSS-Gen 4.9/7.2.5	Transmitter Radiated Emissions	✓
Part 15.209	N/A	Transmitter Radiated Emissions (Fundamental)	✓
N/A	RSS-Gen 4.8/7.2.5	Transmitter Output Power	✓
Part 15.215(c)	N/A	Transmitter 20 dB Bandwidth	✓
N/A	RSS-Gen 4.6.1	Transmitter 99% Occupied Bandwidth	✓

**Key to Results**

✓ = Complied   ✘ = Did not comply

### 2.3. Methods and Procedures

<b>Reference:</b>	ANSI C63.4 (2009)
<b>Title:</b>	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
<b>Reference:</b>	ANSI C63.10 (2009)
<b>Title:</b>	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)**

<b>Brand Name:</b>	Net2 Entry
<b>Model Name or Number:</b>	337-837
<b>Serial Number:</b>	546777
<b>Hardware Version Number:</b>	z-dep1 rev 7, ppc-dep1 rev E
<b>Software Version Number:</b>	Not stated
<b>FCC ID:</b>	USE337837
<b>Industry Canada ID:</b>	10217A-337837

#### **3.2. Description of EUT**

The equipment under test was a Net2 Entry Panel.

#### **3.3. Modifications Incorporated in the EUT**

No modifications were applied to the EUT during testing.

#### **3.4. Additional Information Related to Testing**

<b>Tested Technology:</b>	RFID	
<b>Power Supply Requirement:</b>	Nominal	120 VAC
<b>Type of Unit:</b>	Transceiver	
<b>Modulation</b>	AM	
<b>Transmit Frequency</b>	125 kHz	

#### **3.5. Support Equipment**

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

<b>Description:</b>	Net2 door entry control unit / switch
<b>Brand Name:</b>	Paxton
<b>Model Name or Number:</b>	337-727
<b>Serial Number:</b>	Not Stated

## **4. Operation and Monitoring of the EUT during Testing**

### **4.1. Operating Modes**

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

- Transceiver mode.
- The EUT has only one mode of operation as it is constantly transmitting and receiving when in operation. It does not have a dedicated 'receive only' mode.

### **4.2. Configuration and Peripherals**

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

- Connected via a 3 metre multicore cable to a Net2 door entry control unit / switch contained inside a 2A PSU cabinet. Door entry control unit / switch was connected to a 120 VAC 50 Hz supply for all tests.

## **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. Transmitter AC Conducted Spurious Emissions**

#### **Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	16 April 2012
Test Sample Serial No.:	1546777		

FCC Reference:	Part 15.207
Industry Canada Reference:	RSS-Gen 7.2.4
Test Method Used:	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

#### **Environmental Conditions:**

Temperature (°C):	23
Relative Humidity (%):	28

#### **Results: Live / Quasi Peak**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
1.860	Live	31.6	56.0	24.4	Complied
27.555	Live	39.0	60.0	21.0	Complied
27.865	Live	39.1	60.0	20.9	Complied
28.171	Live	39.3	60.0	20.7	Complied
28.482	Live	39.5	60.0	20.5	Complied
28.792	Live	40.3	60.0	19.7	Complied
29.094	Live	41.1	60.0	18.9	Complied
29.404	Live	41.4	60.0	18.6	Complied
29.566	Live	37.5	60.0	22.5	Complied
29.715	Live	41.5	60.0	18.5	Complied

**Transmitter AC Conducted Spurious Emissions (continued)****Results: Live / Average**

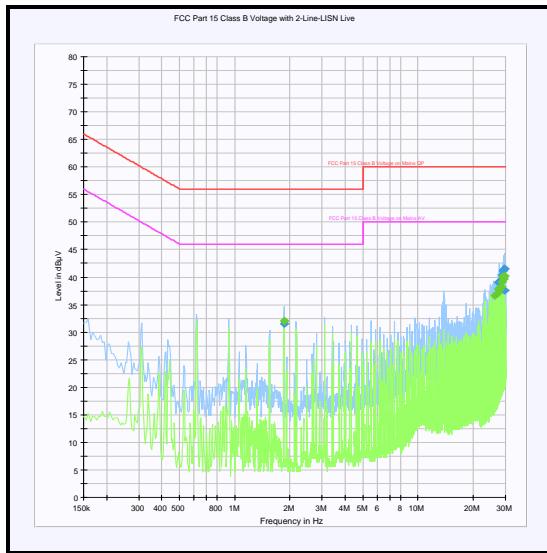
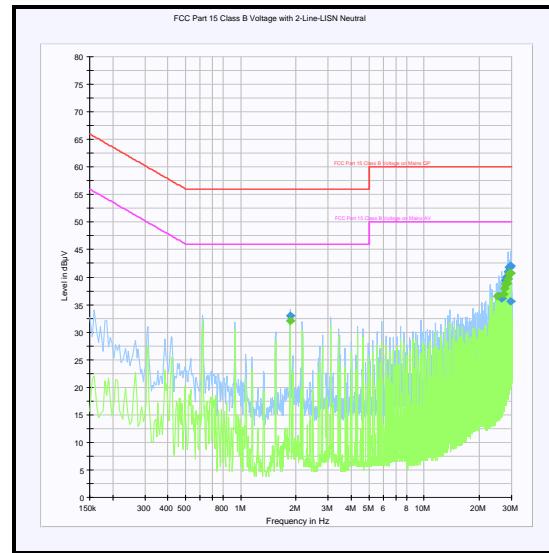
Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
1.855	Live	32.1	46.0	13.9	Complied
26.313	Live	36.7	50.0	13.3	Complied
27.244	Live	37.1	50.0	12.9	Complied
27.555	Live	37.8	50.0	12.2	Complied
27.865	Live	37.8	50.0	12.2	Complied
28.171	Live	38.1	50.0	11.9	Complied
28.482	Live	38.2	50.0	11.8	Complied
28.792	Live	39.1	50.0	10.9	Complied
29.098	Live	40.0	50.0	10.0	Complied
29.404	Live	39.7	50.0	10.3	Complied
29.719	Live	40.2	50.0	9.8	Complied

**Results: Neutral / Quasi Peak**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
1.855	Neutral	33.0	56.0	23.0	Complied
25.687	Neutral	36.5	60.0	23.5	Complied
26.497	Neutral	36.2	60.0	23.8	Complied
27.861	Neutral	39.4	60.0	20.6	Complied
28.167	Neutral	40.0	60.0	20.0	Complied
28.477	Neutral	40.0	60.0	20.0	Complied
28.783	Neutral	40.9	60.0	19.1	Complied
29.094	Neutral	41.8	60.0	18.2	Complied
29.404	Neutral	41.8	60.0	18.2	Complied
29.589	Neutral	35.7	60.0	24.3	Complied
29.715	Neutral	42.0	60.0	18.0	Complied

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

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
1.855	Neutral	32.0	46.0	14.0	Complied
25.071	Neutral	36.6	50.0	13.4	Complied
27.240	Neutral	36.9	50.0	13.1	Complied
27.550	Neutral	38.0	50.0	12.0	Complied
27.856	Neutral	38.7	50.0	11.3	Complied
28.167	Neutral	38.7	50.0	11.3	Complied
28.473	Neutral	38.9	50.0	11.1	Complied
28.783	Neutral	39.7	50.0	10.3	Complied
29.094	Neutral	40.6	50.0	9.4	Complied
29.404	Neutral	40.8	50.0	9.2	Complied
29.715	Neutral	40.8	50.0	9.2	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:**

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Dates:</b>	11 April 2012 & 16 April 2012
<b>Test Sample Serial No.:</b>	1546777		

<b>FCC Reference:</b>	Part 15.209
<b>Industry Canada Reference:</b>	RSS-Gen 4.9
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
<b>Frequency Range:</b>	9 kHz to 1000 MHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	26
<b>Relative Humidity (%):</b>	28

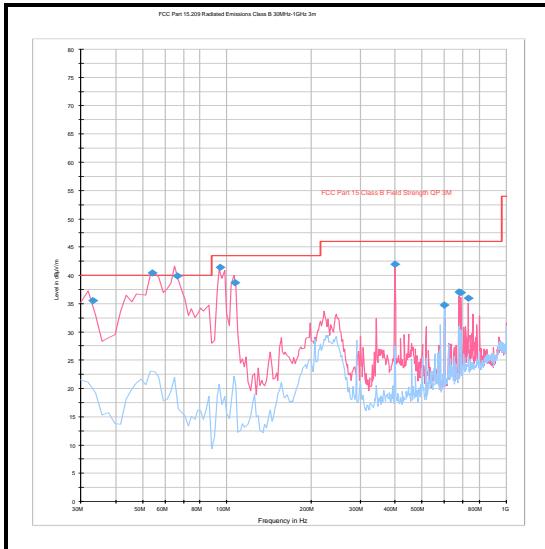
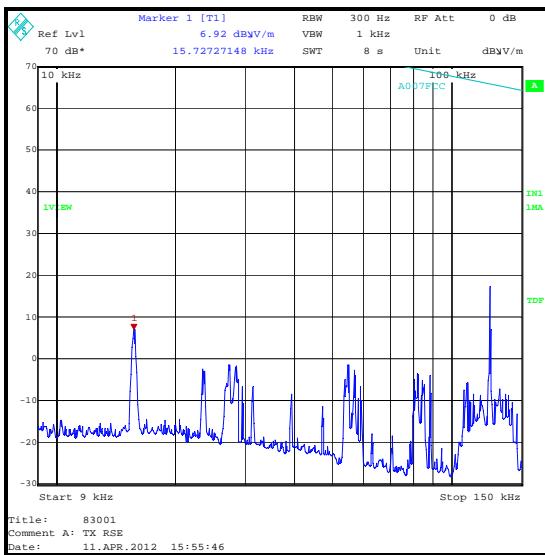
**Results: Quasi Peak**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
33.186	Vertical	35.5	40.0	4.5	Complied
54.178	Vertical	39.9	40.0	0.1	Complied
66.264	Vertical	39.8	40.0	0.2	Complied
94.374	Vertical	41.4	43.5	2.1	Complied
106.691	Vertical	38.7	43.5	4.8	Complied
399.949	Vertical	41.9	46.0	4.1	Complied
599.997	Horizontal	34.7	46.0	11.3	Complied
675.019	Vertical	37.0	46.0	9.0	Complied
687.308	Vertical	37.0	46.0	9.0	Complied
729.025	Vertical	35.9	46.0	10.1	Complied

**Transmitter Radiated Spurious Emissions (continued)****Note(s):**

1. Limits below 30 MHz are specified at a test distance of 30 metres, whilst below 0.49 MHz they are specified at a test distance of 300 metres. However, as specified by FCC Section 15.31 (f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by using the square of an inverse linear distance extrapolation factor (40dB/decade).
2. A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres where required. A distance extrapolation factor of 40 dB was used.
3. Final measurement values include corrections for antenna factor and cable losses.
4. The emission shown at approximately 125 kHz is the fundamental emission frequency which was greater than 20 dB below the specified limit.
5. The emissions from 15 kHz to 54 kHz were investigated and found to be radiating from the test site turntable.
6. All other emissions shown on the pre-scan plots were investigated and found to be >20 dB below the applicable limit or below the measurement system noise floor.
7. Measurements in the range 30 MHz to 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)



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

### 5.2.3. Transmitter Radiated Emissions (Fundamental)

#### Test Summary:

Test Engineer:	Andrew Edwards	Test Date:	11 April 2012
Test Sample Serial No:	1546777		

FCC Part:	15.209
Test Method Used:	ANSI C63.10 Section 6.4

#### Environmental Conditions:

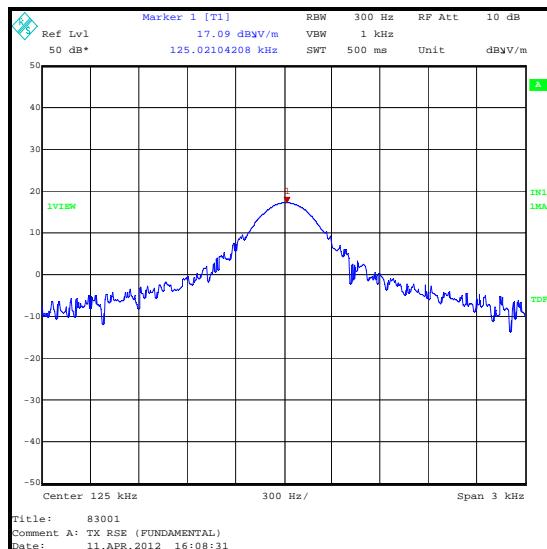
Temperature (°C):	26
Relative Humidity (%):	28

#### Results: Quasi Peak

Frequency (kHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit at 300 m (dB $\mu$ V/m)	Margin (dB)	Result
125	90° to EUT	-23.7	25.7	49.4	Complied

#### Note(s):

1. The limit is specified at a test distance of 300 metres. However, as specified by FCC Section 15.31 (f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by using the square of an inverse linear distance extrapolation factor (40dB/decade).
2. A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres. The transducer factor has a 40 dB extrapolation at a distance of 30 metres (1 decade). Measurements below 490 kHz should be performed at a distance of 300 metres (2 decades) therefore another 40 dB was subtracted from the measured value. The quasi peak level was measured as  $16.3 \text{ dB}\mu\text{V/m} - 40 = -23.7 \text{ dB}\mu\text{V/m}$ .



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

**5.2.4. Transmitter Output Power****Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	11 July 2012
Test Sample Serial No.:	1546777		

Industry Canada Reference:	RSS-Gen 4.8
Test Method Used:	RSS-Gen clause 7.2.5 table 6

**Environmental Conditions:**

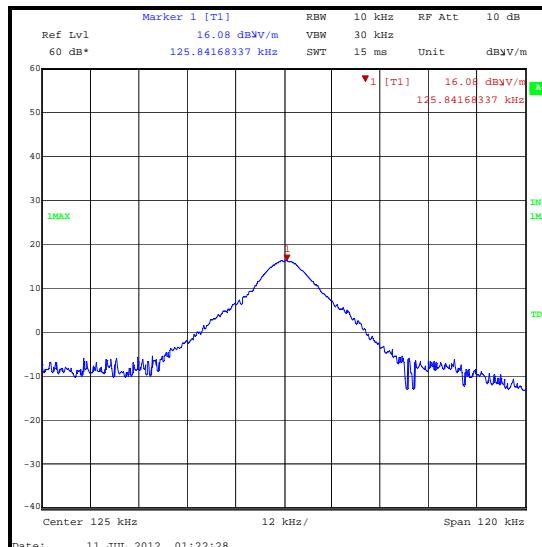
Temperature (°C):	25
Relative Humidity (%):	42

**Results: Average**

Frequency (kHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit at 300 m (dB $\mu$ V/m)	Margin (dB)	Result
125	90° to EUT	-24.3	25.7	50.0	Complied

**Note(s):**

1. The limit is specified at a test distance of 300 metres. However, as specified by RSS Gen Section 7.2.7(b), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by using the square of an inverse linear distance extrapolation factor (40dB/decade).
2. A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres. The transducer factor has a 40 dB extrapolation at a distance of 30 metres (1 decade). Measurements below 490 kHz should be performed at a distance of 300 metres (2 decades) therefore another 40 dB was subtracted from the measured value. The average level was measured as  $15.7 \text{ dB}\mu\text{V/m} - 40 = -24.3 \text{ dB}\mu\text{V/m}$ .
3. In RSS-Gen section 4.8 & 7.2.5, it states that this test should be measured with an average detector using a bandwidth > 99% Emission bandwidth, however this was not possible with the test receiver and it was set to its maximum bandwidth of 10 kHz when measuring at 125 kHz.



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

**5.2.5. Transmitter 20 dB Bandwidth****Test Summary:**

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	16 April 2012
<b>Test Sample Serial No.:</b>	1546777		

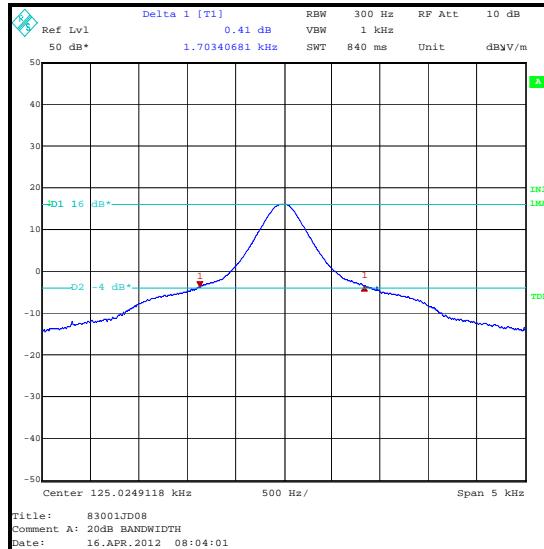
<b>FCC Reference:</b>	Part 15.215(c)
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Section 6.9.1

**Environmental Conditions:**

<b>Temperature (°C):</b>	23
<b>Relative Humidity (%):</b>	25

**Results:**

<b>20 dB Bandwidth (kHz)</b>	
	1.703

**Note(s):**

1. As can be seen from the above plot, the 20 dB bandwidth of the emission remains within the non-restricted band of operation between 0.110 MHz and 0.495 MHz.

**5.2.6. Transmitter 99% Occupied Bandwidth****Test Summary:**

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	11 July 2012
<b>Test Sample Serial No.:</b>	1546777		

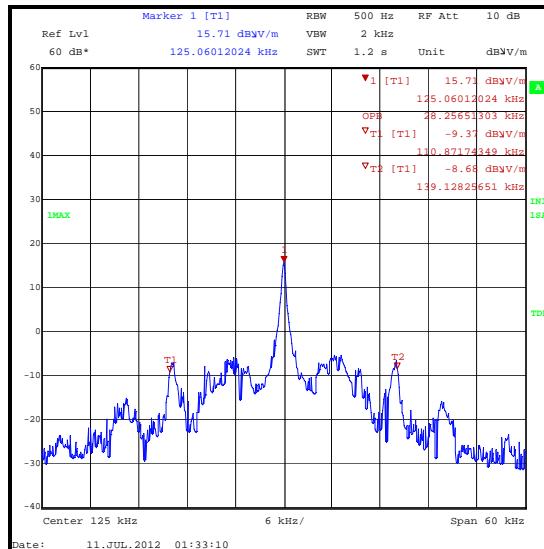
<b>Industry Canada Reference:</b>	RSS-Gen 4.6.1
<b>Test Method Used:</b>	Test receiver 99% occupied bandwidth function

**Environmental Conditions:**

<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	42

**Results:**

<b>99% Emission Bandwidth (kHz)</b>	
	28.257



## **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
20 dB Bandwidth	125 kHz	95%	±0.92 ppm
99% Occupied Bandwidth	125 kHz	95%	±0.92 ppm
Radiated Spurious Emissions	9 kHz to 30 MHz	95%	±3.53 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	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)
A067	LISN	Rohde & Schwarz	ESH3-Z5	890603/002	08 Jun 2013	12
A1830	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100668	25 Feb 2013	12
A1834	Attenuator	Hewlett Packard	8491B	10444	29 Jan 2013	12
A558	Antenna	RFI	N/A	N/A	16 Apr 2013	12
G0543	Amplifier	Sonoma	310N	230801	13 Apr 2013	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	31 Aug 2012	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	03 Feb 2013	12
M1379	Test Receiver	Rohde & Schwarz	ESIB7	100330	20 Oct 2012	12
M1568	Antenna	Rohde & Schwarz	HFH2-Z2	879284/2	27 Jan 2013	12

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