



**TEST REPORT
FROM
RFI GLOBAL SERVICES LTD**

Test of: Easyprox Nano

To: FCC Part 15.249: 2008 Subpart C

Test Report Serial No:
RFI/RPT1/RP49344JD08A

This Test Report Is Issued Under The Authority Of Brian Watson, Operations Director:	
Checked By:	B. Watson
Signature:	
Date of Issue:	07 May 2009

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1. Customer Information








Company Name:	Paxton Access Ltd
Address:	Paxton House Home Farm Brighton Sussex BN1 9HU

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.249
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2008: Part 15 Subpart C (Radio Frequency Devices) - Section 15.249
Specification Reference:	47CFR15.109
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2008: Part 15 Subpart B (Radio Frequency Devices) - Sections 15.109
Site Registration:	FCC: 209735
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	17 April 2009

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Port Type	Result
Part 15.109	Idle Mode Radiated Spurious Emissions	Enclosure	
Part 15.249(a)	Transmitter Fundamental Field strength	Antenna	
Part 2.1049	Transmitter 20 dB Bandwidth	Antenna	
Part 15.249(a)(d)(e) & 15.209	Transmitter Radiated Emissions	Antenna	
Part 15.249(d) & 15.209	Transmitter Band Edge Radiated Emissions	Antenna	
Key to Results			
 = Complied  = Did not comply			

2.3. Methods and Procedures

Reference:	ANSI C63.4 (2003)
Title:	American National Standard Methods of Measurement of Electromagnetic 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:	Easyprox nano
Model Name or Number:	746-284
Serial Number:	967341
Hardware Version Number:	z-ep01 Rev. 12, ppc-esy Rev. H
Software Version Number:	None Stated
FCC ID Number:	USE746284

3.2. Description of EUT

The equipment under test is a door lock, with intelligent access control, using an integrated proximity reader and IEEE 802.15.4 2.4 GHz RF communications.

3.3. Modifications Incorporated in the EUT

It was not possible to test the EUT using the normal duty cycle as the Transmitter On' period is too small; therefore for the purposes of testing only, the EUT was configured by the customer to transmit continuously.

3.4. Additional Information Related to Testing

Power Supply Requirement:	6 VDC internal battery pack		
Channel Spacing:	5 MHz		
Modulation:	DSSS		
Transmit Frequency Range:	2405 to 2475 MHz		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	11	2405
	Middle	18	2440
	Top	25	2475
Receive Frequency Range:	2405 to 2475 MHz		
Receive Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	11	2405
	Middle	18	2440
	Top	25	2475

3.5. Support Equipment

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

Description:	Net2Air USB Bridge
Brand Name:	Net2Air
Model Name or Number:	477-268
Serial Number:	879806

Description:	Laptop PC
Model Name or Number:	Dell Inspiron 510m
Serial Number:	Not marked or stated

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

The EUT was tested in the following operating modes, unless otherwise stated:

- Transmit Mode: Continuously transmitting a modulated carrier at maximum power on the bottom, centre and top channels.
- Idle Mode

4.2. Configuration and Peripherals

The EUT was tested in the following configuration:

- Using an application on the laptop PC supplied by the customer, a Net2Air USB bridge was connected to the laptop PC via the USB port. The PC application controlled the EUT output power and the transmit frequency over a radio link via the Net2Air USB bridge. The Net2Air USB bridge was turned off once the EUT was transmitting on the required frequency.
- A proximity reader and token were used in conjunction with the PC application to put the EUT into and out of the test mode.

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

5.3. Idle Mode Radiated Spurious Emissions

Test Summary:

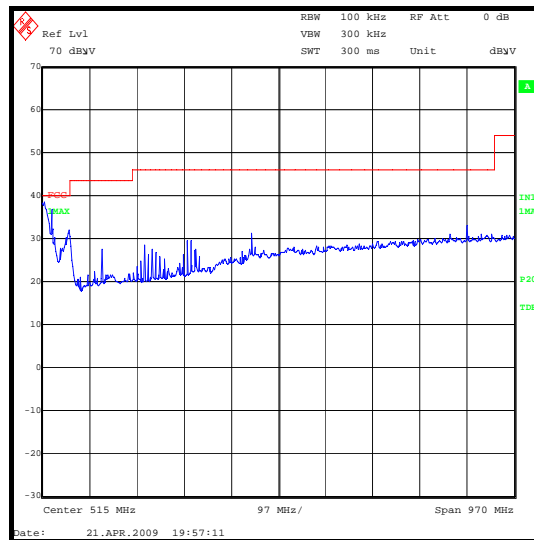
FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes
Frequency Range:	30 MHz to 1000 MHz

Environmental Conditions:

Temperature Range (°C):	24
Relative Humidity Range (%):	39

Results:

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
32.229	Vertical	32.2	40.0	7.8	Complied



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:**

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes
Frequency Range:	1 to 12.75 GHz

Environmental Conditions:

Temperature Range (°C):	24
Relative Humidity Range (%):	39

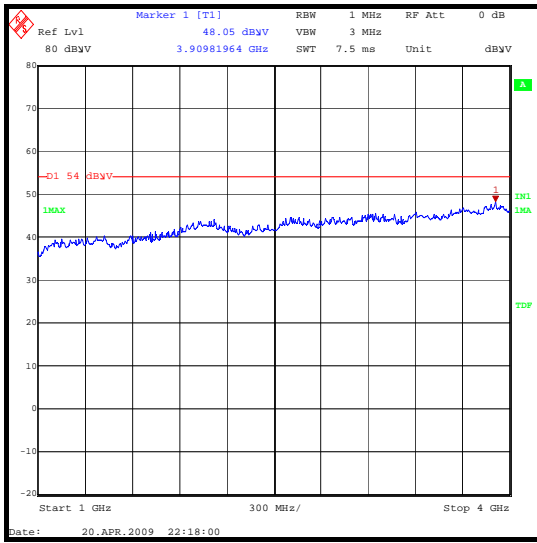
Results: Highest Peak Level

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Peak Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
12.597	Vertical	40.0	13.1	53.1	54.0	0.9	Complied

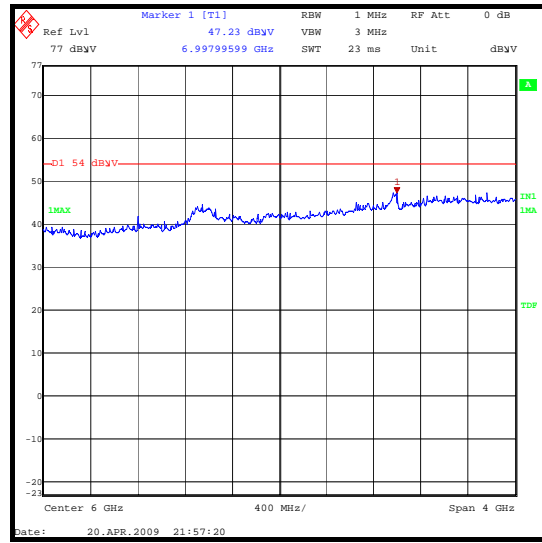
Note(s):

- 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.

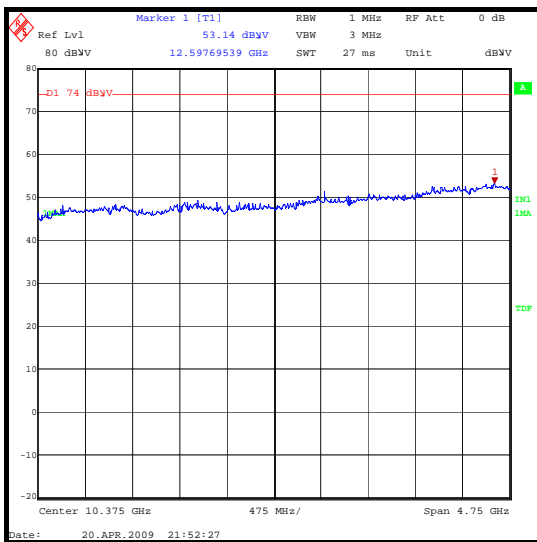
Idle Mode Radiated Spurious Emissions (continued)



1 GHz to 4 GHz



4 GHz to 8 GHz



8 GHz to 12.75 GHz

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

5.4. Transmitter Fundamental Fieldstrength**Test Summary:**

FCC Part:	15.249(a)
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	39

Results: Bottom Channel - Peak Level

Antenna Polarity	Level (dB μ V/m)	Transducer Factor (dB)	Actual Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
Horizontal	99.2	-0.2	99.0	114.0	15.0	Complied

Results: Bottom Channel - Average Level

Antenna Polarity	Level (dB μ V/m)	Transducer Factor (dB)	Actual Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
Horizontal	92.3	-0.2	92.1	94.0	1.9	Complied

Results: Middle Channel - Peak Level

Antenna Polarity	Level (dB μ V/m)	Transducer Factor (dB)	Actual Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
Horizontal	98.4	-0.2	98.2	114.0	15.8	Complied

Results: Middle Channel - Average Level

Antenna Polarity	Level (dB μ V/m)	Transducer Factor (dB)	Actual Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
Horizontal	91.6	-0.2	91.4	94.0	2.6	Complied

Results: Top Channel - Peak Level

Antenna Polarity	Level (dB μ V/m)	Transducer Factor (dB)	Actual Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
Horizontal	97.0	-0.2	96.8	114.0	17.2	Complied

Results: Top Channel - Average Level

Antenna Polarity	Level (dB μ V/m)	Transducer Factor (dB)	Actual Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
Horizontal	89.8	-0.2	89.6	94.0	4.4	Complied

5.5. Transmitter 20 dB Bandwidth

Test Summary:

FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.4 Section 13.1.7 and relevant annexes (see note below)

Environmental Conditions:

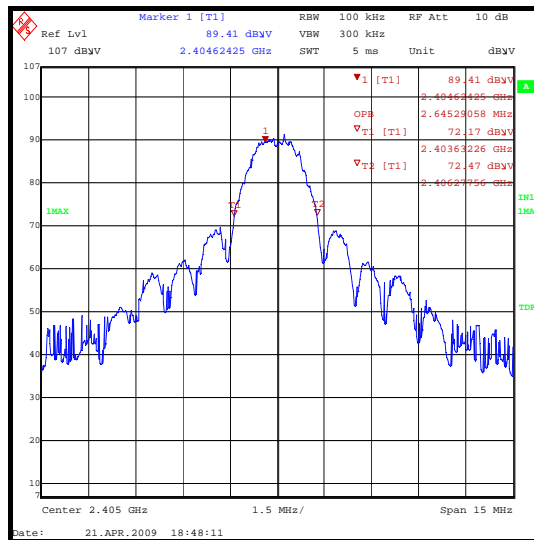
Temperature (°C):	22
Relative Humidity (%):	34

Results:

Channel	20 dB Bandwidth (kHz)
Bottom	2645.290

Note(s):

- In lieu of the test method detailed in ANSI C63.4 Section 13.1.7 the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser



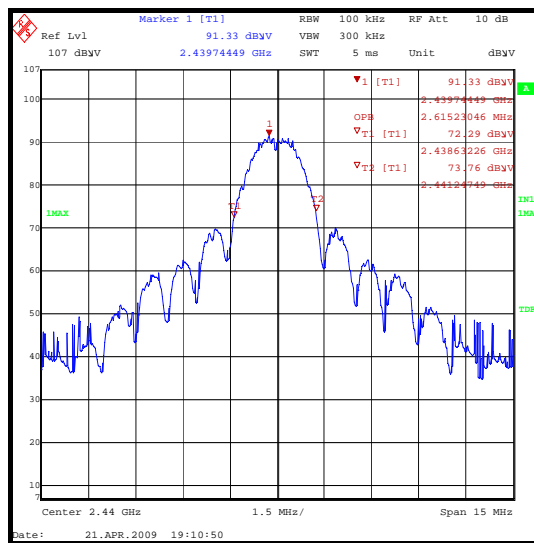
Transmitter 20 dB Bandwidth (continued)

Results:

Channel	20 dB Bandwidth (kHz)
Middle	2615.230

Note(s):

1. In lieu of the test method detailed in ANSI C63.4 Section 13.1.7 the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser



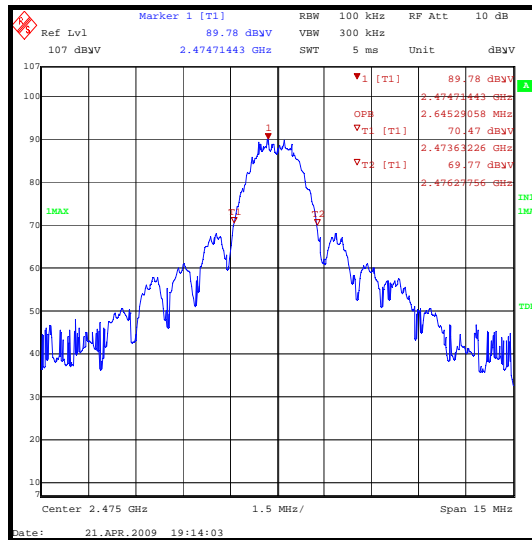
Transmitter 20 dB Bandwidth (continued)

Results:

Channel	20 dB Bandwidth (kHz)
Top	2645.291

Note(s):

1. In lieu of the test method detailed in ANSI C63.4 Section 13.1.7 the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser



5.6. Transmitter Radiated Emissions

Test Summary:

FCC Part:	15.249(a)(d)(e) & 15.209
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes
Frequency Range	30 to 1000 MHz

Environmental Conditions:

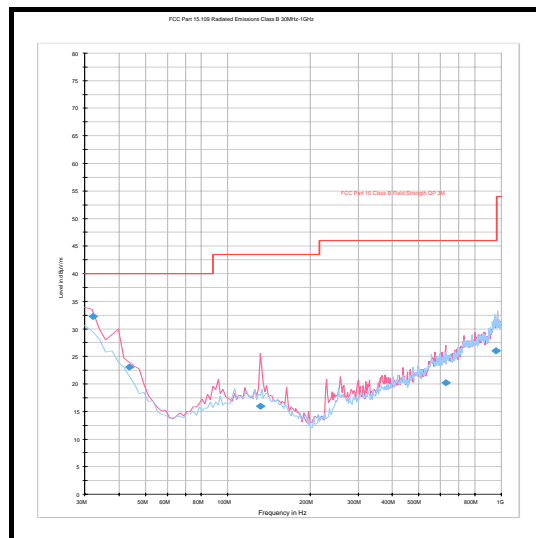
Temperature (°C):	22
Relative Humidity (%):	34

Results: Top Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
32.229	Vertical	32.2	40.0	7.8	Complied

Note(s):

- 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.



5.7. Transmitter Radiated Emissions**Test Summary:**

FCC Part:	15.249(a)(d)(e) & 15.209
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes
Frequency Range	1 to 26 GHz

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	34

Results: Highest Peak Level - Bottom Channel

Frequency (MHz)	Antenna Polarity	Detector Level (dB μ V)	Transducer Factor (dB)	Actual Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4810.938	Horiz	64.3	-0.2	64.1	74.0	9.9	Complied
7216.379	Vert	60.9	-0.2	60.7	74.0	13.3	Complied

Results: Highest Average Level - Bottom Channel

Frequency (MHz)	Antenna Polarity	Detector Level (dB μ V)	Transducer Factor (dB)	Actual Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4810.938	Horiz	53.2	-0.2	53.0	54.0	1.0	Complied
7216.379	Vert	50.1	-0.2	49.9	54.0	4.1	Complied

Results: Highest Peak Level - Middle Channel

Frequency (MHz)	Antenna Polarity	Detector Level (dB μ V)	Transducer Factor (dB)	Actual Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4878.949	Horiz	63.6	-0.2	63.4	74.0	9.6	Complied
7318.494	Vert	59.8	-0.2	59.6	74.0	14.4	Complied

Results: Highest Average Level - Middle Channel

Frequency (MHz)	Antenna Polarity	Detector Level (dB μ V)	Transducer Factor (dB)	Actual Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4878.949	Horiz	52.3	-0.2	52.1	54.0	1.9	Complied
7318.494	Vert	48.7	-0.2	48.5	54.0	5.5	Complied

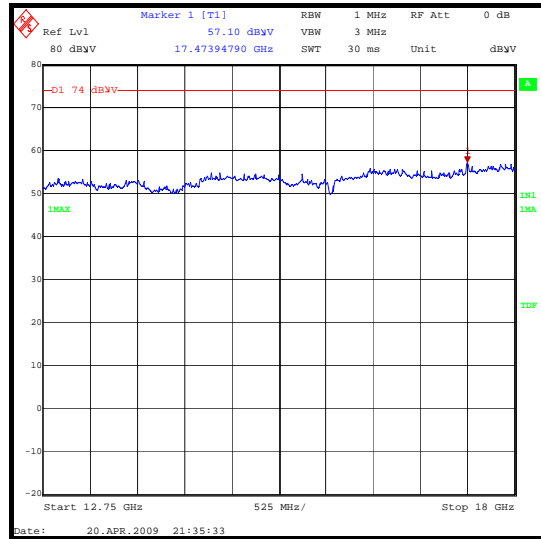
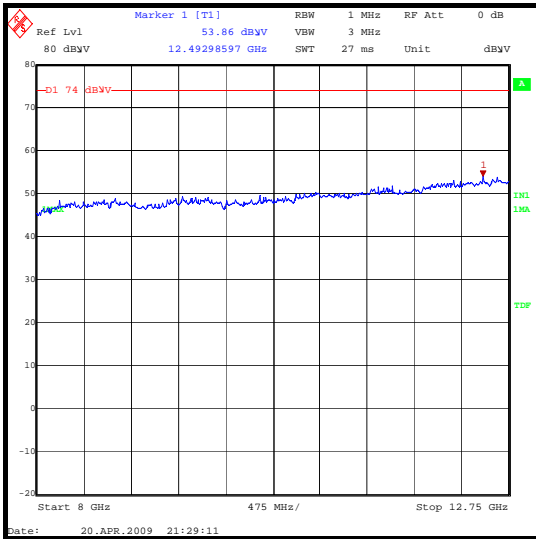
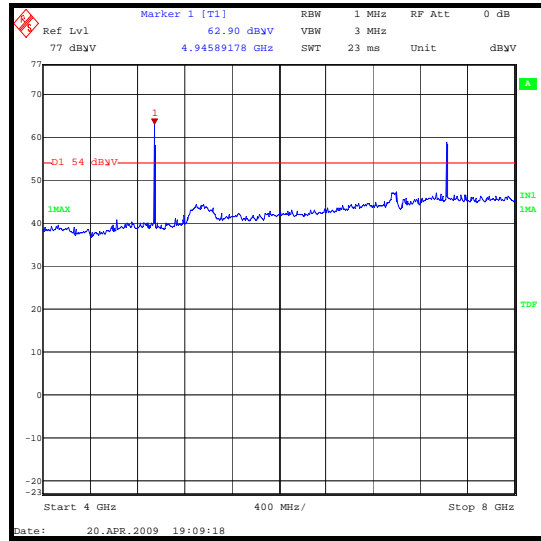
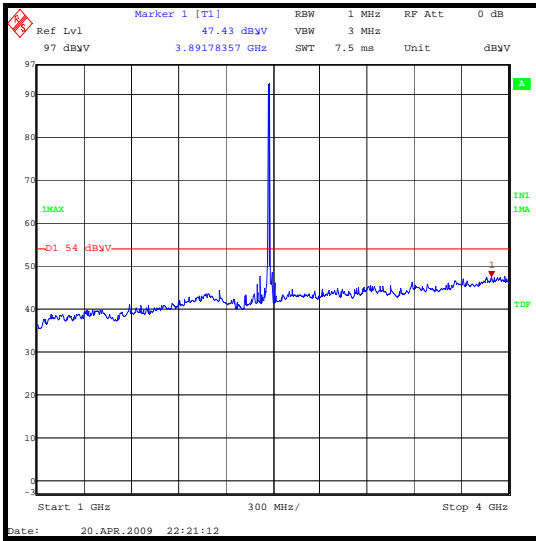
Results: Highest Peak Level - Top Channel

Frequency (MHz)	Antenna Polarity	Detector Level (dB μ V)	Transducer Factor (dB)	Actual Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4950.866	Horiz	63.2	-0.2	63.0	74.0	11.0	Complied
7423.423	Vert	58.6	-0.2	58.4	74.0	15.6	Complied

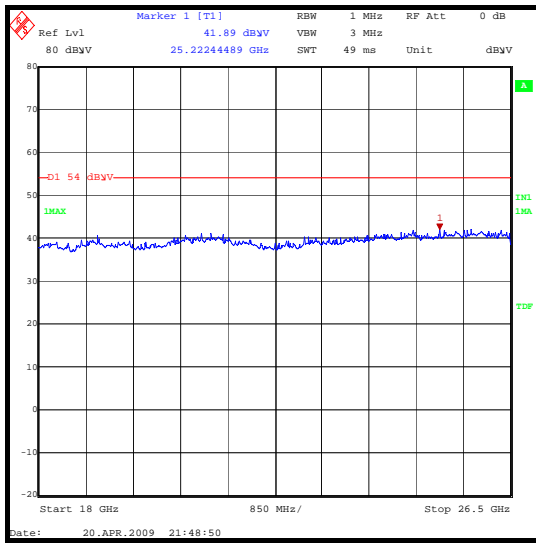
Results: Highest Average Level - Top Channel

Frequency (MHz)	Antenna Polarity	Detector Level (dB μ V)	Transducer Factor (dB)	Actual Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4950.866	Horiz	52.4	-0.2	52.2	54.0	1.8	Complied
7423.423	Vert	48.0	-0.2	47.8	54.0	6.2	Complied

Transmitter Radiated Emissions (continued)



Transmitter Radiated Emissions (continued)



5.8. Transmitter Band Edge Radiated Emissions

Test Summary:

FCC Part:	15.249(d) & 15.209
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	36

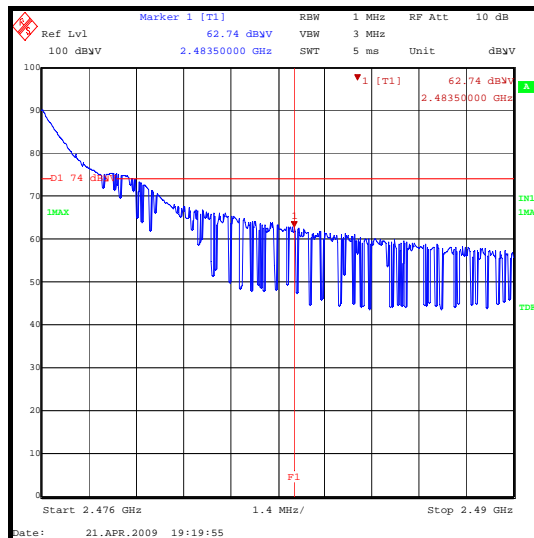
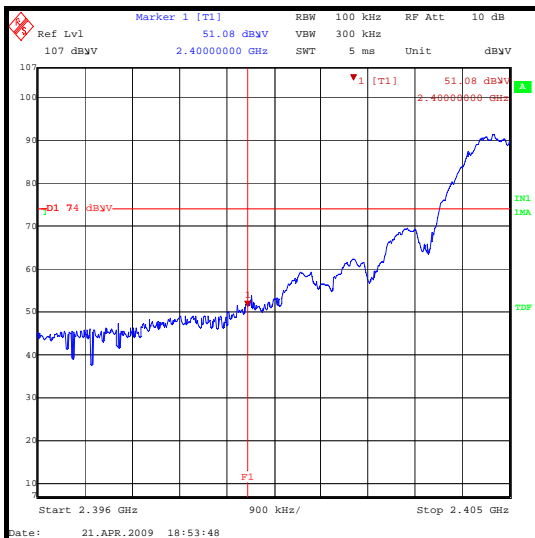
Results: Peak Power Level

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factors (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4000	Vert	51.3	-0.2	51.1	74.0*	22.9	Complied
2.4835	Vert	62.9	-0.2	62.9	74.0	11.1	Complied

* -20 dBc limit

Results: Average Power Level

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factors (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4835	Vert	31.7	-0.2	31.5	54.0	22.5	Complied



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
Fundamental Fieldstrength	Not Applicable	95%	±2.94 dB
Transmitter 20 dB Bandwidth	Not Applicable	95%	±0.92 ppm
Radiated Spurious Emissions	30 MHz to 40 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 Last Calibrated	Cal. Interval (Months)
A1818	Antenna	EMCO	3115	00075692	25 Oct 2008	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	13 Aug 2008	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	09 Mar 2009	12

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