TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: Nokia HS-128W

Partial Testing To: FCC Part 15.247: 2006 (Subpart C),
RSS-210 Issue 7 June 2007 and RSS-Gen Issue 2 June 2007

Test Report Serial No:
RFI/RPT2/RP73810JD05A

Supersedes Test Report Serial No:
RFI/RPT1/RP73810JD05A

This Test Report Is Issued Under The Authority Of Steve Flooks, Service Leader: **pp** 	
Checked By: Nigel Davison 	**Report Copy No: PDF01**
Issue Date: 12 September 2008	**Test Dates: 27 August 2008 to 29 August 2008**

This report is issued in Adobe Acrobat portable document format (PDF). It is only a valid copy of the report if it is being viewed in PDF format with the following security options not allowed: Changing the document, Selecting text and graphics, Adding or changing notes and form fields. This report may be copied in full. The results in this report apply only to the sample(s) tested.

RFI Global Services Ltd
Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire RG23 8BG
Telephone: +44 (0)1256 312000 Facsimile: +44 (0)1256 312001
Email: info@rfi-global.com Website: www.rfi-global.com

Registered in England and Wales. Company number:2117901

This page has been left intentionally blank.

Table of Contents

1. Customer Information

Company Name:	GN Netcom A/S
Address:	Lautrupbjerg 7 2750 Ballerup Denmark
Contact Name:	Mr T Ringtved

2. Equipment Under Test (EUT)

The following information (with the exception of the date of receipt) has been supplied by the customer:

2.1. Identification of Equipment Under Test (EUT)

Description:	Bluetooth Headset
Brand Name:	Nokia
Model Name or Number:	HS-128W
Serial Number:	000131
FCC ID Number:	PYAHS-128W
IC Number:	661V-HS128W
Date of Receipt:	27 August 2008

2.2. Description of EUT

The equipment under test was a Bluetooth Headset.

2.3. Modifications Incorporated in the EUT

During the course of testing the EUT was not modified.

2.4. Support Equipment

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

2.5. Additional Information Related to Testing

Power Supply Requirement:	Internal battery supply of 3.7 V		
Equipment Category:	*Bluetooth*		
Type of Unit:	*Bluetooth* Headset		
Transmit Frequency Range:	2402 MHz to 2480 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	1	2402
	Middle	40	2441
	Top	79	2480
Receive Frequency Range:	2402 MHz to 2480 MHz		
Receive Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	1	2402
	Middle	40	2442
	Top	79	2484

3. Test Specification, Methods and Procedures

3.1. Test Specification

Reference:	FCC Part 15.247: 2006 Subpart C
Title:	Code of Federal Regulations, Part 15.247 (47CFR15) (Intentional Radiators operating within the band 2400 MHz to 2483.5 MHz)

Reference:	RSS-210 Issue 7 June 2007
Title:	Low-power Licence-exempt Radio communication Devices (All Frequency Bands): Category I Equipment.

Reference:	RSS-Gen Issue 2 June 2007
Title:	General Requirements and Information for the Certification of Radio communication Equipment.

3.2. Methods and Procedures

The methods and procedures used were as detailed in:

ANSI C63.2 (1996)
Title: American National Standard for Instrumentation - Electromagnetic Noise and Field Strength Instrumentation, 10 Hz to 40 GHz.

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.

ANSI C63.5 (1988)
Title: American National Standard for the Calibration of antennas used for Radiated Emission measurements in Electromagnetic Interference (EMI) control.

ANSI C63.7 (1988)
Title: American National Standard Guide for Construction of Open Area Test Sites for performing Radiated Emission Measurements.

CISPR 16-1: (1999)
Title: Specification For Radio Disturbance and Immunity Measuring Apparatus and Methods. Part 1: Radio Disturbance and Immunity Measuring Apparatus.

DA00-705 (2000)
Title: Filing and Frequency Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

3.3. Definition of Measurement Equipment

The measurement equipment used complied with the requirements of the standards referenced in the methods & procedures section above. Appendix 1 contains a list of the test equipment used.

4. Deviations from the Test Specification

There were no deviations from the test specification.

5. Operation and Configuration of the EUT during Testing

5.1. Operating Modes

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

- Transmitting and receiving in EDR mode as this mode produced the maximum EIRP/Emissions profile for this unit.

5.2. Configuration and Peripherals

The EUT was tested in the following configuration:

- Paired with a *Bluetooth* test set.

6. Summary of Test Results

Range of Measurements	FCC Part 15 Reference	IC RSS Reference	Port Type	Result
Idle Mode Radiated Spurious Emissions	15.109	RSS-Gen 6.0	Antenna	Complied
Transmitter Maximum Peak Output Power	15.247(b)(1)	RSS-210 A8.4(2)	Antenna	Complied
Transmitter Radiated Emissions	15.247(d) & 15.209(a)	RSS-210 A8.5	Antenna	Complied
Transmitter Band Edge Radiated Emissions	15.247(d) & 15.209(a)	RSS-210 A8.5	Antenna	Complied

6.1. Location of Tests

All the measurements described in this report were performed at the premises of RFI Global Services Ltd, Ewhurst Park, Ramsdell, Basingstoke, Hampshire, RG26 5RQ and Unit 3 Horizon, Kingsland Business Park, Basingstoke, Hampshire, RG24 8LJ.

6.2. Site Registration Numbers

FCC: 90895

IC: 3485

7. Measurements, Examinations and Derived Results

7.1. General Comments

This section contains test results only.

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 8 for details of measurement uncertainties.

7.2. Test Results

7.2.1. Idle Mode Radiated Spurious Emissions

Ambient Temperature: 24ºC Relative Humidity: 47%

Tests were performed using the test methods detailed in ANSI C63.4 Section 8.

Results:

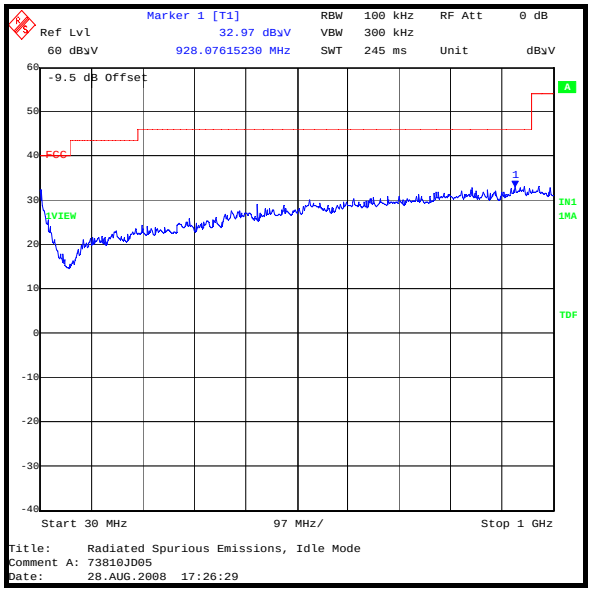
Electric Field Strength Measurements (Frequency Range: 30 MHz to 1000 MHz)

Frequency (MHz)	Antenna Polarity	Quasi-Peak Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
928.076	Vertical	33.0	46.0	13.0	Complied

Note(s):

1. 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)



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

7.2.2. Idle Mode Radiated Spurious Emissions (Continued)

Electric Field Strength Measurements (Frequency Range: 1 GHz to 12.75 GHz)

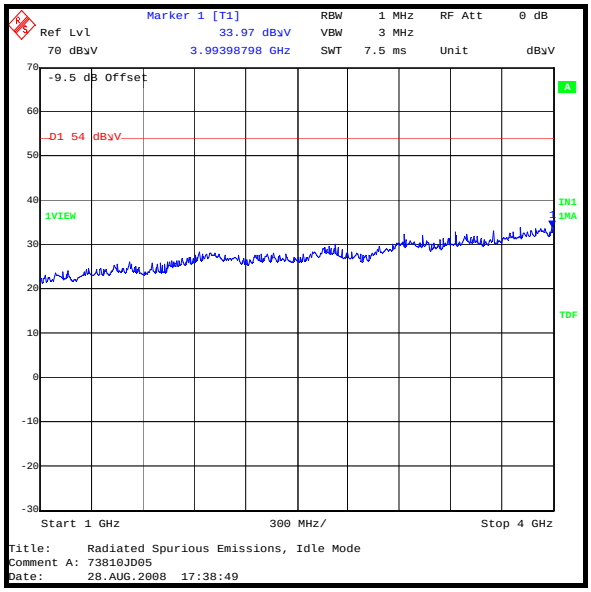
Highest Average Level:

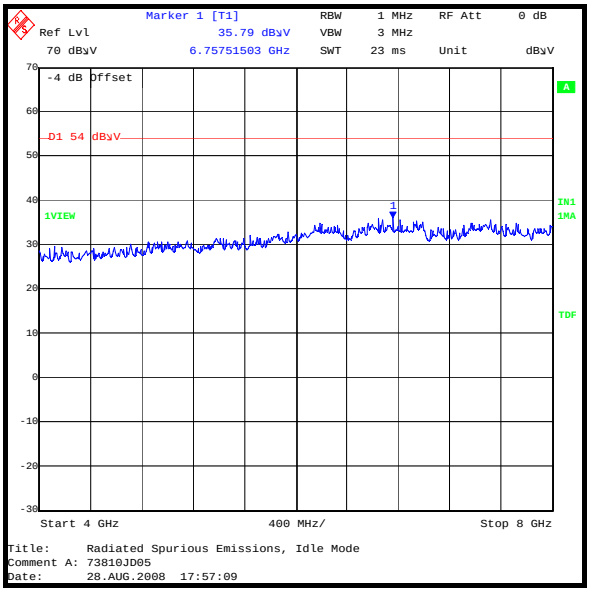
Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
12.064629	Vertical	34.0	1.9	35.9	54.0	13.1	Complied

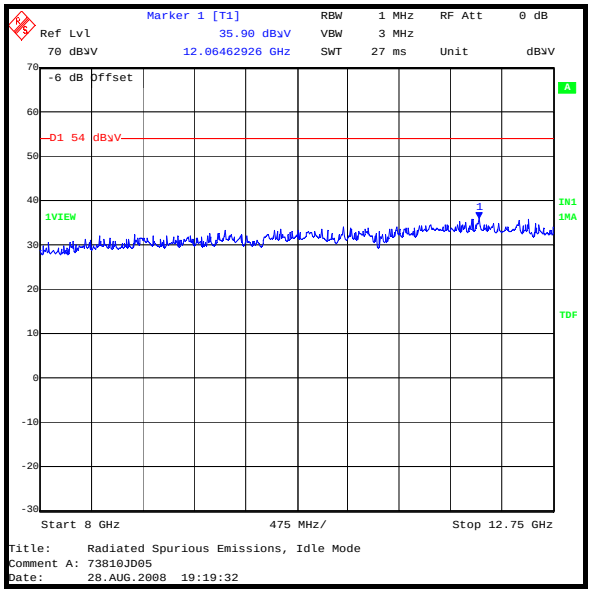
Note(s):

1. 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)







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

7.2.3. Transmitter Maximum Peak Output Power: (EIRP)

Ambient Temperature: 24ºC Relative Humidity: 47%

Tests were performed using the test methods detailed in Public Notice DA 00-705 (March 30, 2000), ANSI TIA-603-C-2004 and FCC CFR Part 2.

Results:

Battery Powered Devices – EDR Mode

Channel	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	-1.0	30.0	31.0	Complied
Middle	-2.5	30.0	29.5	Complied
Top	-5.4	30.0	35.4	Complied

Note(s):

1. These tests were performed radiated; therefore the EUT antenna gain is encompassed in the final result and not measurable.

7.2.4. Transmitter Radiated Emissions

Ambient Temperature: 24ºC Relative Humidity: 47%

Tests were performed using the test methods detailed in ANSI C63.4 Section 8 and Public Notice DA 00-705 (March 30, 2000).

Results:

Electric Field Strength Measurements: 30 MHz to 1000 MHz
(Emissions Occurring in the Restricted Bands)

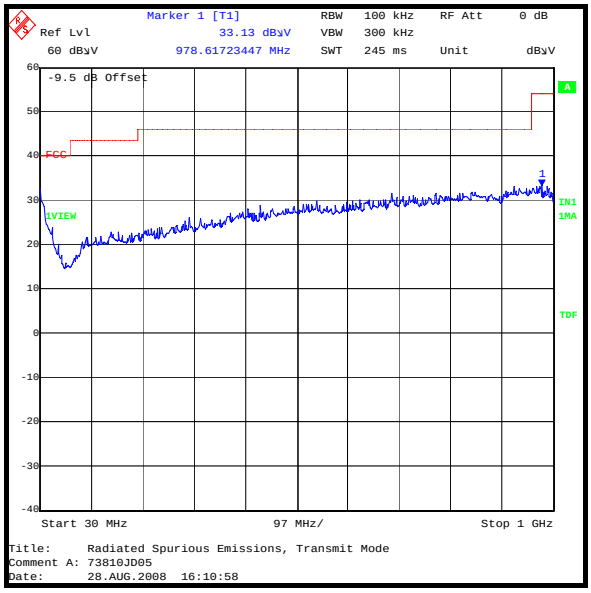
Top Channel

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
978.617	Vertical	33.1	54.0	20.9	Complied

Note(s):

1. 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.

Transmitter Radiated Emissions (Continued)



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

Transmitter Radiated Emissions (Continued)

Results:

Electric Field Strength Measurements (Frequency Range: 1 GHz to 26.5 GHz)
(Emissions Occurring in the Restricted Bands)

Highest Peak Level: Bottom Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.803820	Vertical	52.5	-3.3	49.2	74.0	24.8	Complied

Highest Average Level: Bottom Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.803820	Vertical	40.6	-3.3	37.3	54.0	16.7	Complied

Highest Peak Level: Middle Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.881693	Vertical	51.7	-3.3	48.4	74.0	25.6	Complied

Highest Average Level: Middle Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.881693	Vertical	40.0	-3.3	36.7	54.0	17.3	Complied

Transmitter Radiated Emissions (Continued)

Highest Peak Level: Top Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.959654	Vertical	50.5	-3.3	47.2	74.0	26.8	Complied

Highest Average Level: Top Channel

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.959654	Vertical	38.7	-3.3	35.4	54.0	18.6	Complied

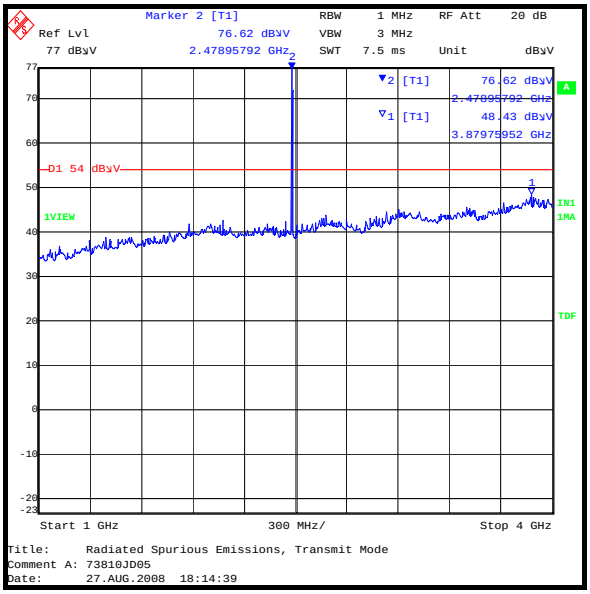
Highest Peak Level: Hopping Mode

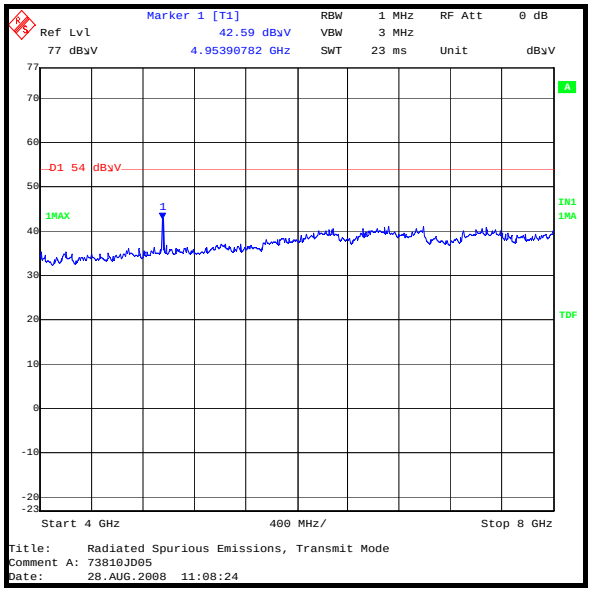
Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.817635	Vertical	52.4	-3.3	49.1	74.0	24.9	Complied

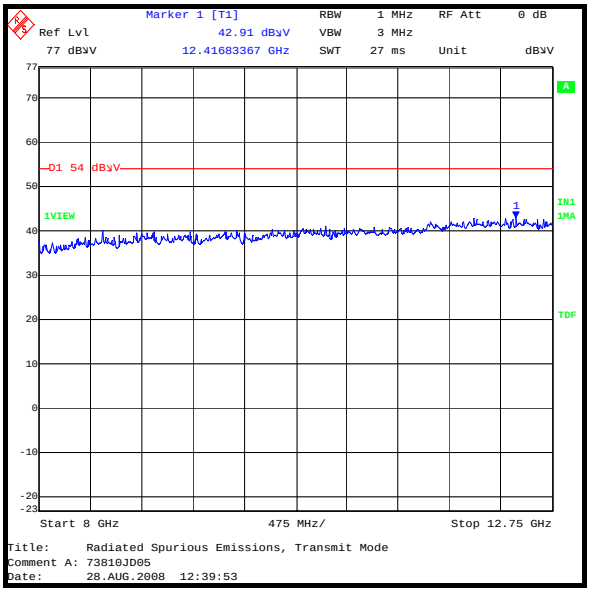
Highest Average Level: Hopping Mode

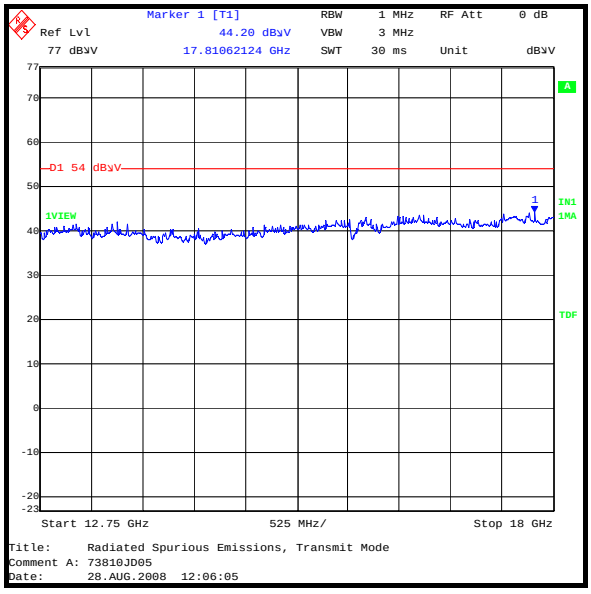
Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
4.803607	Vertical	40.7	-3.3	37.4	54.0	16.6	Complied

Transmitter Radiated Emissions (Continued)



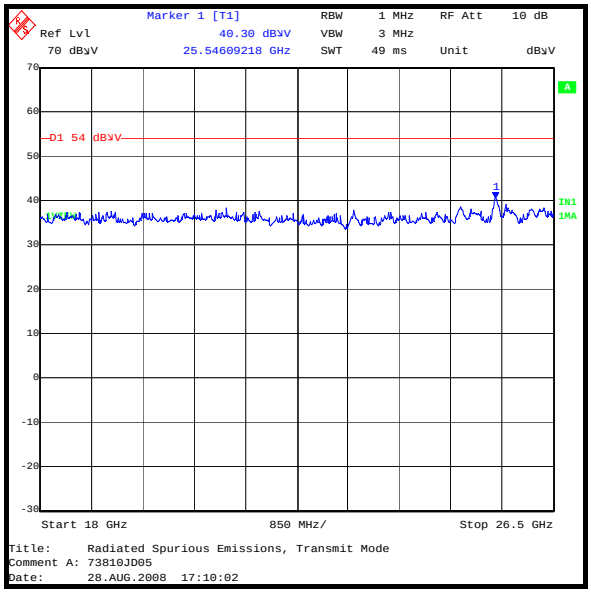






Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Transmitter Radiated Emissions (Continued)



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

7.2.5. Transmitter Band Edge Radiated Emissions

Ambient Temperature: 24ºC Relative Humidity: 47%

Tests were performed using the test methods detailed in ANSI C63.4 Section 8 and Public Notice DA 00-705 (March 30, 2000).

Results:

Electric Field Strength Measurements

Peak Power Level Hopping Mode:

Frequency (MHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4000	Vertical	46.4	-6.5	39.9	73.7*	33.8	Complied
2.4835	Vertical	54.5	-6.5	48.0	74.0	26.0	Complied

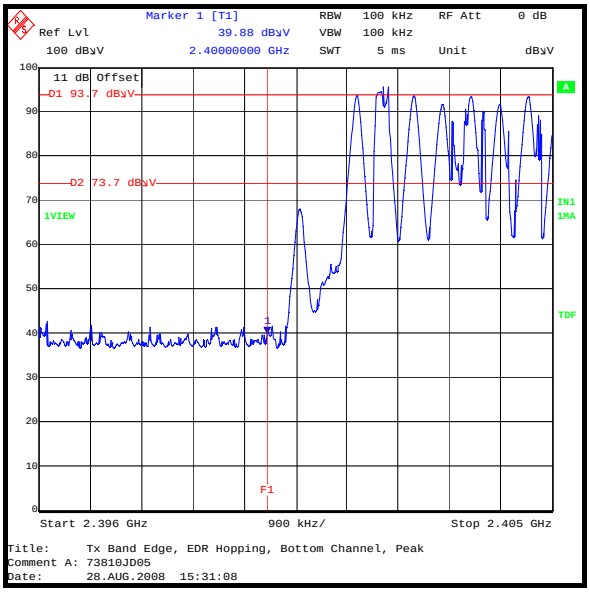
Average Power Level Hopping Mode:

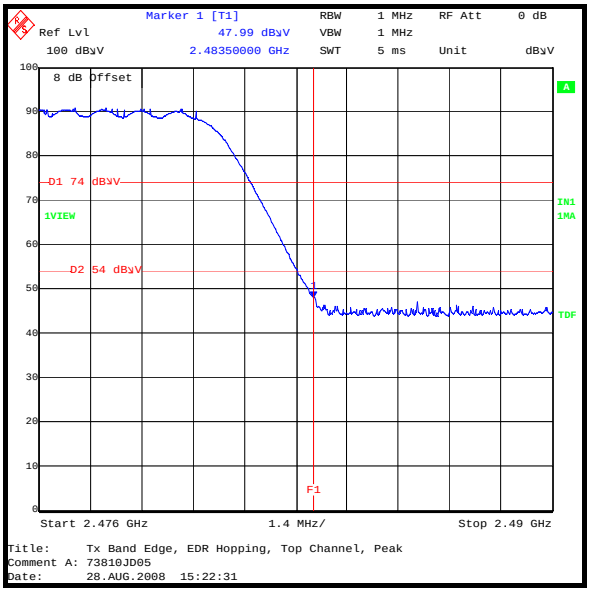
Frequency (MHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2.4835	Vertical	40.4	-6.5	33.9	54.0	20.1	Complied

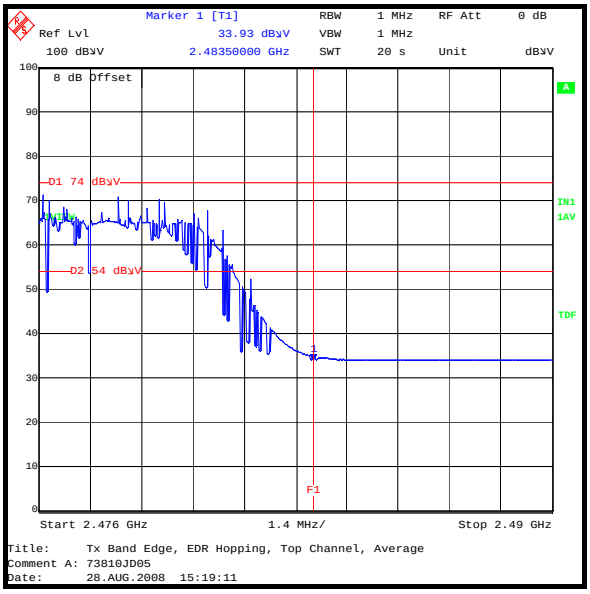
Note(s):

1. * -20 dBc limit

Transmitter Band Edge Radiated Emissions (Continued)







Transmitter Band Edge Radiated Emissions (Continued)

Ambient Temperature: 24ºC Relative Humidity: 49%

Results – EDR Mode:

Peak Power Level Static Mode:

Frequency (MHz)	Antenna Polarity	Detector Level (dBµV)	Transducer Factor (dB)	Actual Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2.4000	Vertical	46.8	-6.5	40.3	73.7*	33.4	Complied
2.4835	Vertical	56.1	-6.5	49.6	74.0	24.4	Complied

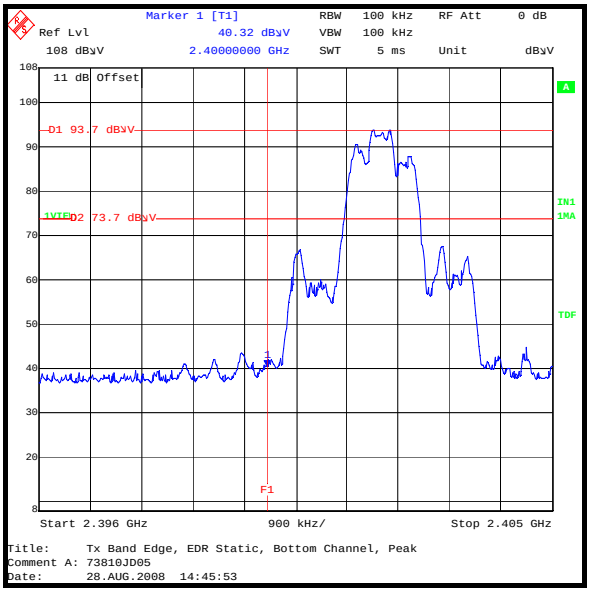
Average Power Level Static Mode:

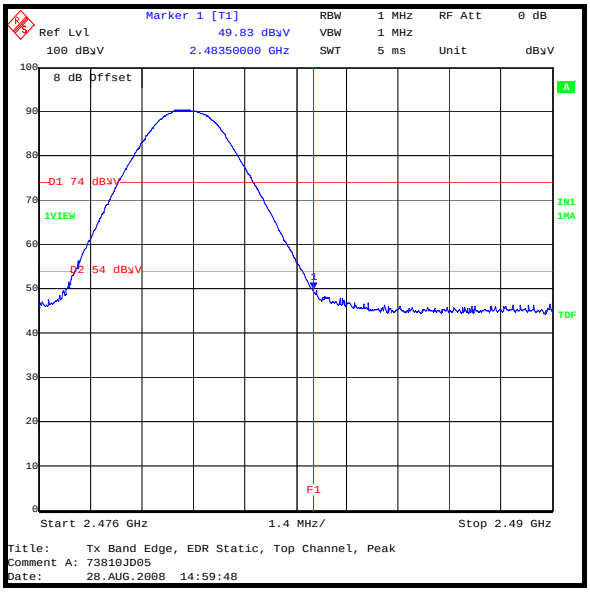
Frequency (MHz)	Antenna Polarity	Detector Level (dBµV)	Transducer Factor (dB)	Actual Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2.4835	Vertical	44.4	-6.5	37.9	54.0	16.1	Complied

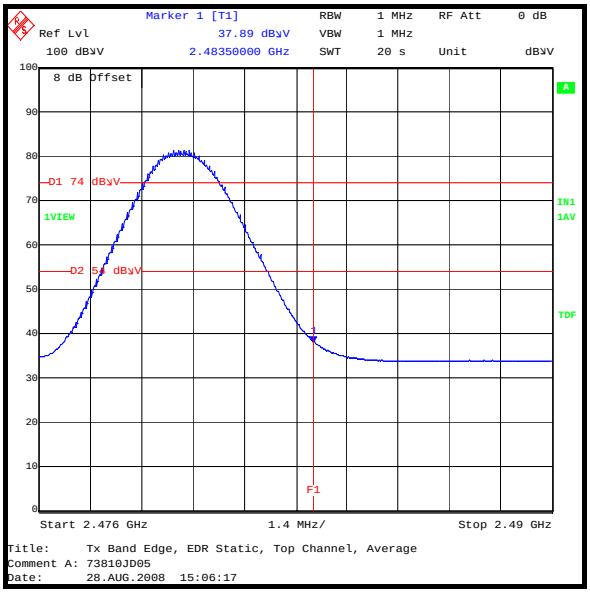
Note(s):

1. * -20 dBc limit

Transmitter Band Edge Radiated Emissions (Continued)







8. 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
Transmitter Maximum Peak Output Power	Not Applicable	95%	±2.94 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	±4.64 dB
Radiated Spurious Emissions	1 GHz 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.
A1793	Pre Amplifier	A.H.Systems Inc.	PAM-0118	183
A1818	Antenna	EMCO	3115	00075692
A436	Antenna	Flann	20240-20	330
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K
M1447	CBT	Rohde and Schwarz	1153.9000.35	100329

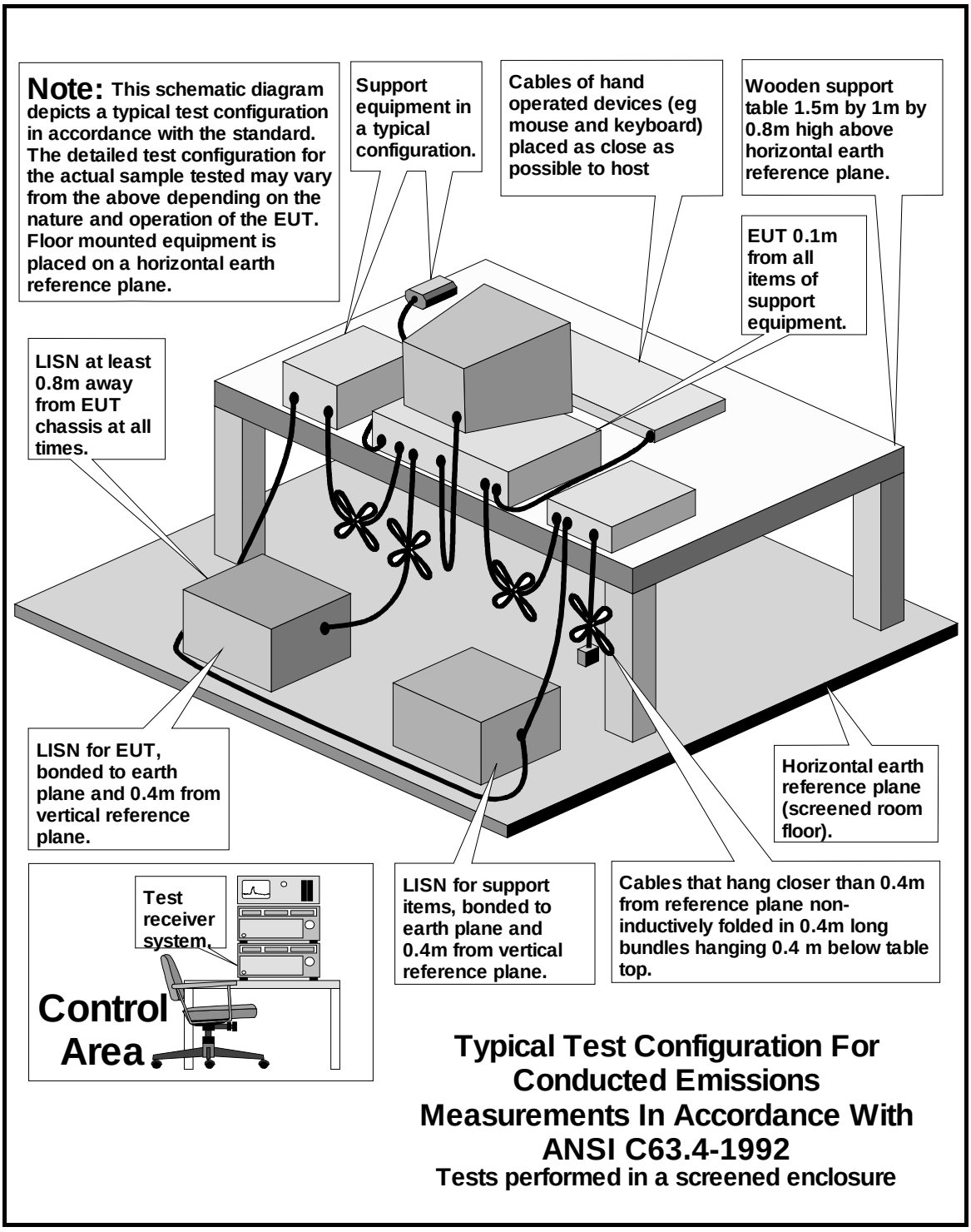
NB In accordance with UKAS requirements, all the measurement equipment is on a calibration schedule.

Appendix 2. Test Configuration Drawings

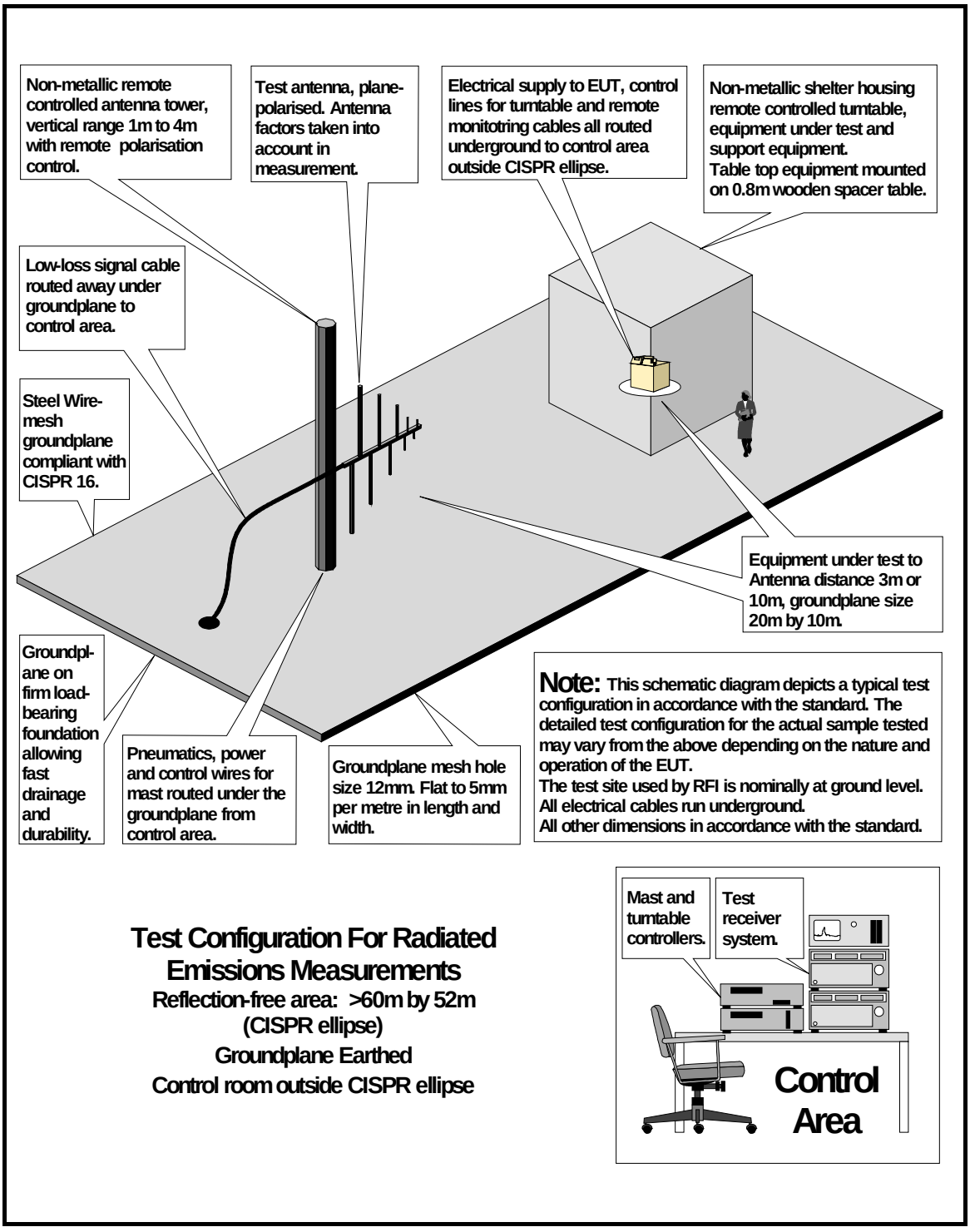
This appendix contains the following drawings:

Drawing Reference Number	Title
DRG\73810JD05\EMICON	Test configuration for measurement of conducted emissions.
DRG\73810JD05\EMIRAD	Test configuration for measurement of radiated emissions.

DRG\73810JD05\EMICON



DRG\73810JD05\EMIRAD



Test Configuration For Radiated Emissions Measurements
Reflection-free area: >60m by 52m (CISPR ellipse)
Groundplane Earthed
Control room outside CISPR ellipse