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Prepared for:

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By

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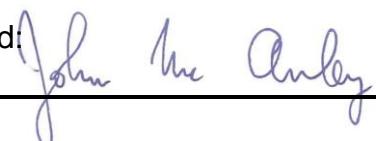
Date

9th February 2011

FCC EQUIPMENT AUTHORISATION
Test Report

EUT Description
Vital Signs Sensor

Authorised:

A handwritten signature in blue ink that reads 'John Mc Anby'.

List of Exhibits

Title Page

List of Exhibits

Exhibit A – Technical Report

Summary

Section	Aspect	Result	Comment
15.107	Conducted Emissions	PASS	Margin >10 dB
15.109	Radiated Emissions	PASS	Margin >10 dB

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE
WRITTEN APPROVAL OF COMPLIANCE ENGINEERING IRELAND LTD

Infrared

Exhibit A – Technical Report

**Intelesens
Vital Signs Sensor Cradle**

Applicant Name and Address

The system covered under this authorisation report was designed, manufactured and assembled by Intelesens Ltd. The company's full name and mailing address is given below:

Intelesens Limited
4 Heron Road
Belfast BT3 9LE
Northern Ireland UK

Model Name

The model number for the EUT covered under this application report is:

Aingeal Cradle

Description of Equipment

The EUT was a cradle for charging the Vital Signs Monitor.

Equipment Details

Brand Name:	Aingeal
Manufacturer:	Intelesens
Description:	Charging Cradle Vital Signs Sensor

Modifications

No modifications were required in order to pass the emissions test specifications:

Operating Conditions during Test:

Normal charging

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1.0 EUT Description

The EUT was a charging cradle.

1.1 EUT Operation

The EUT was tested in normal charging mode.

1.2 Date of Test

The tests were carried out on one sample of the EUT on the 1st and 2nd November 2010.

2.0 Electromagnetic Emissions Testing

The guidelines of CISPR 16-4 were used for all uncertainty calculations, estimates and expressions thereof for EMC testing. A copy of Compliance Engineering Ireland Ltd.'s policy for EMC Measurement Uncertainty is available on request.

RF Requirements: Spurious emissions in accordance with FCC CFR 15.107 and 15.109. Tests were carried out to the requirements of CISPR 16-4 and ANSI C63.4-2009.

2.1.1 Measurement Uncertainty

The measurement uncertainty (with a 95% confidence level) for the conducted emissions test was ± 3.5 dB.

The measurement uncertainty (with a 95% confidence level) for the radiated emissions test was ± 5.3 dB (from 30 to 100 MHz), ± 4.7 dB (from 100 to 300 MHz), ± 3.9 dB (from 300 to 1000 MHz) and ± 3.8 dB (from 1 GHz to 40 GHz).

3.0 Radiated Emissions Measurements

Final radiated emissions measurements were made at the Compliance Engineering Ireland Ltd Open Area Test Site located in Ashbourne, Co. Meath, Ireland to determine the radio noise radiated from the EUT. A "Description of Measurement Facilities" has been submitted to the FCC and approved pursuant to Section 2.948 of CFR 47 of the FCC rules.

3.1 Test Procedure

The EUT was centred on a motorised turntable, which allows 360 degree rotation. From frequencies between 30 MHz and 1000 MHz, a measurement antenna was positioned at a distance of 3 meters as measured from the closest point of the EUT. The radiated emissions were maximised by configuring the EUT, by rotating the EUT, and by raising and lowering the antenna from 1 to 4 meters.

A measuring receiver with peak detection was used to find the maximums of the radiated emissions during the variability testing below 1 GHz. All final measurements were taken using the quasi peak detector with a measurement bandwidth of 120 kHz. A drawing showing the test setup is given as Appendix B, Figure 2.

3.2 Test Criteria

The FCC Part 15.109 radiated limits are given below for a measurement distance of 3 meters.

Frequency (MHz)	Field Strength $\mu\text{V/m}$	Field Strength (dB $\mu\text{V/m}$)
30-88	90	40.0
88-216	150	43.52
216-960	210	46.0
above 960	500	54.0

4.0 Emissions

Test Specification: FCC PART 15, SECTION 47 CFR 15.107/15.109

4.1 Conducted Test Criteria

The FCC Part 15 Class B conducted limits are given below.

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46*
0.5-5	56	46
5-30	60	50

4.2 Conducted Emissions Measurements

4.2.1 Test Procedure

The measurements were taken using a Line Impedance Stabilisation Network (LISN). A Rohde and Schwarz ESHS30 Receiver with a bandwidth of 9 kHz was used to measure the conducted emissions. The measurements were carried out using the receiver analysis feature, which uses three detectors; peak, quasi peak and average. Using this mode the voltage emission spectrum was scanned in peak detection mode and the emissions which exceeded a sub range margin relevant to the respective limits were further measured using the quasi peak and average detectors. The live and neutral conductors were examined individually to determine the maximum. The receiver bandwidth was set to 10 kHz. Appendix A shows the plots from the test. For microwave emissions a resolution bandwidth of 1 MHz was used and a pre-scan performed in a 3m range semi anechoic chamber.

The excess interface cables were bundled in a non-inductive arrangement at the approximate centre of the cable with the bundle 30 to 40 centimetres in length. The conducted emissions were maximised by varying the operating states and configuration of the EUT.

The results of conducted emissions are shown in Appendix B, Figures 1 and 2.

Result: Pass

John McAnley

4.3 Radiated Emissions Measurements

4.3.1 Test Criteria

The FCC Part 15.109 radiated limits are given below for a measurement distance of 3 meters.

Frequency (MHz)	Field Strength $\mu\text{V/m}$	Field Strength (dB $\mu\text{V/m}$)
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
above 960	500	54.0

For the spurious and harmonics measurements, below 1GHz, the EUT was set up at a 3 meter distance from the receiving antenna, on an Open Area Test Site (OATS), with the EUT running in a continuous mode. The EUT was rotated 360 degrees azimuth and the search antenna height varied 1 to 4m in order to maximize the emissions. Significant peaks from the EUT had previously been recorded in a 3m range semi anechoic chamber. For measurements above 1GHz, the EUT is set up at a 3 meter distance from the antenna, in a semi-anechoic chamber, with the EUT running in a continuous mode. The EUT was rotated 360 degrees azimuth and the search antenna height varied 1 to 4m in order to maximize the emissions. Significant peaks from the EUT were then recorded to determine margin to the limits.

Appendix A shows the results of the pre scans in the anechoic chamber.

No emissions were evident in the frequency range 30 MHz to 15 GHz.

Result: Pass



5.0 List of Test Equipment

Instrument	Mftr.	Model	Calibration Due
Measuring Receiver	Rohde and Schwarz	ESVS30	07/04/11
Bilog Antenna	Chase	CBL6111	02/10/11
Measuring Receiver	Rohde and Schwarz	ESHS30	27/10/12
LISN	Rohde and Schwarz	ESH3-Z5	30/07/11
Spectrum Analyser	Agilent	E4408	16/10/11
Horn Antenna	EMCO	3115	25/05/11
Microwave Amplifier	Agilent	83017A	13/10/11

Appendix A

Test Results

Conducted Emissions LISN

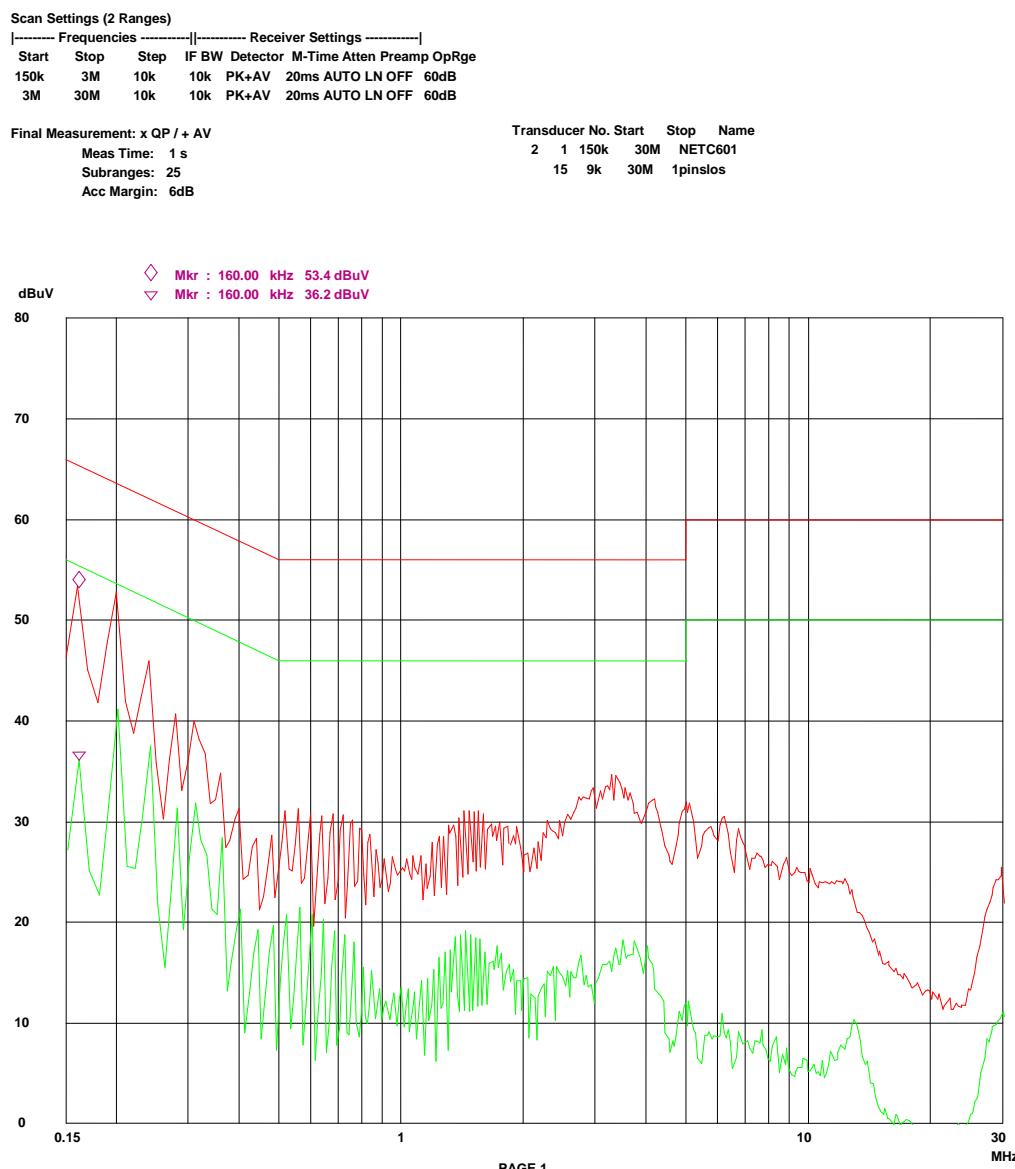


Figure 1: Conducted Emissions, Live

Conducted Emissions

LISN

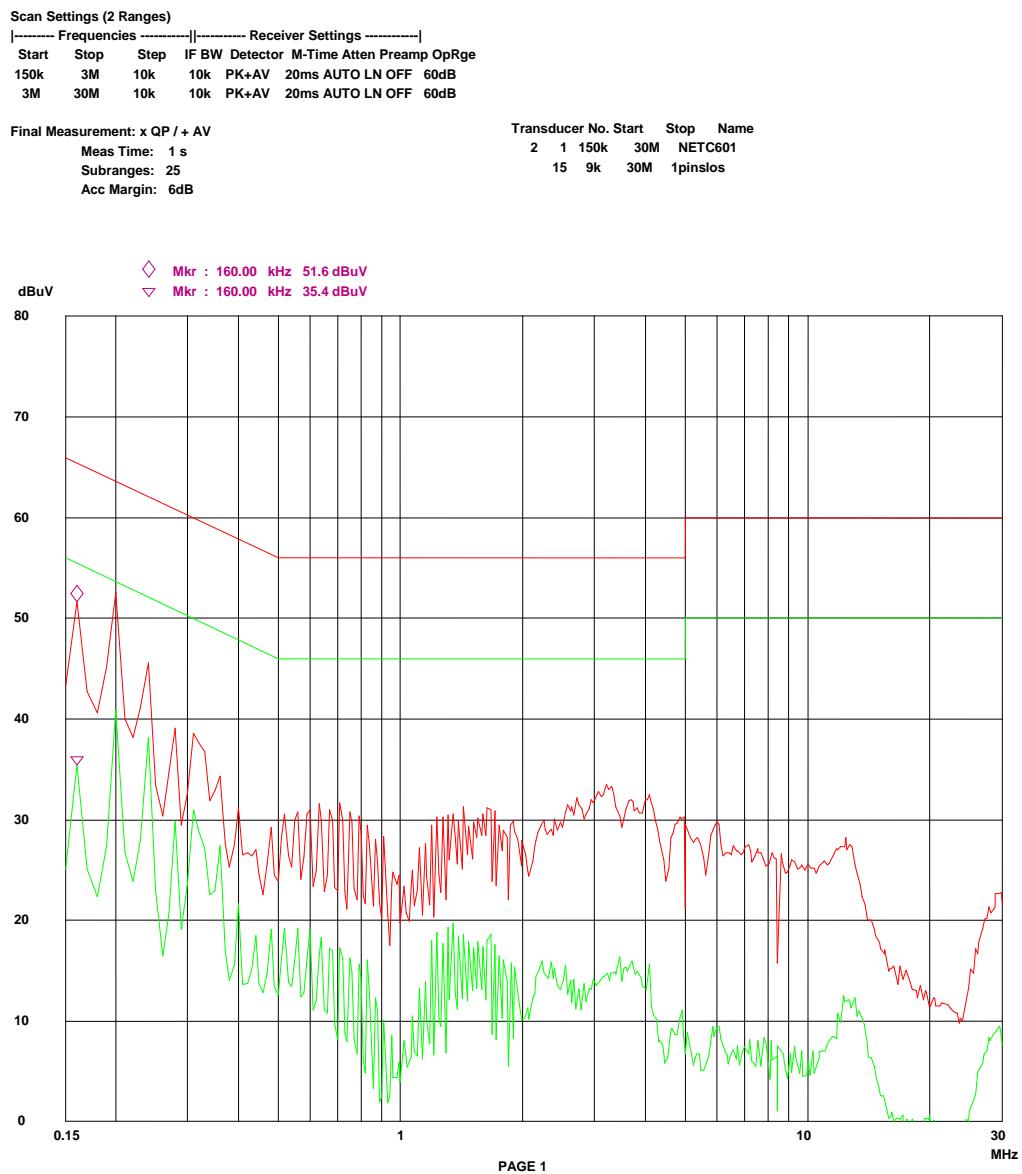


Figure 2: Conducted Emissions, Neutral

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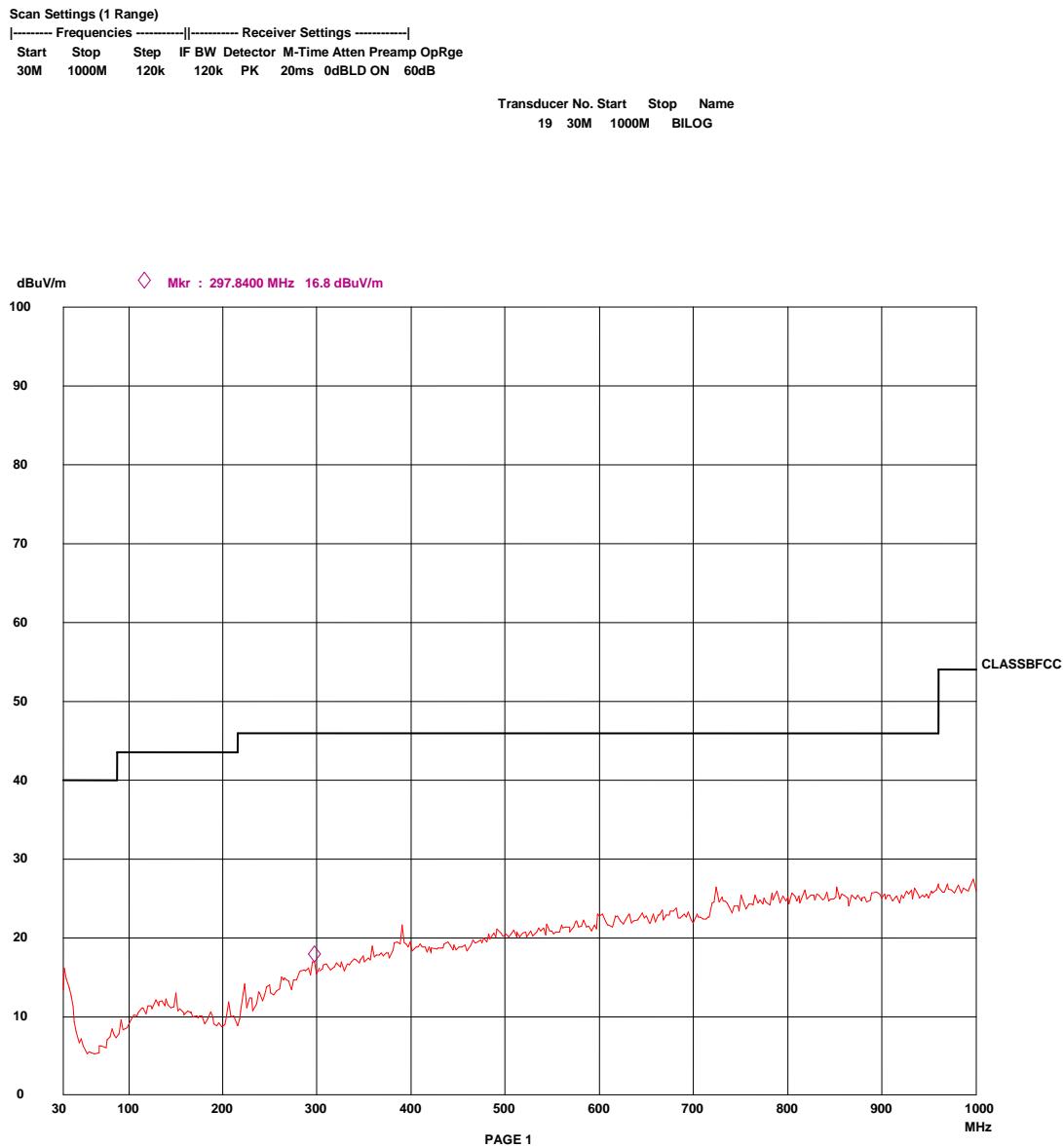


Figure 3: Radiated Emissions Vertical

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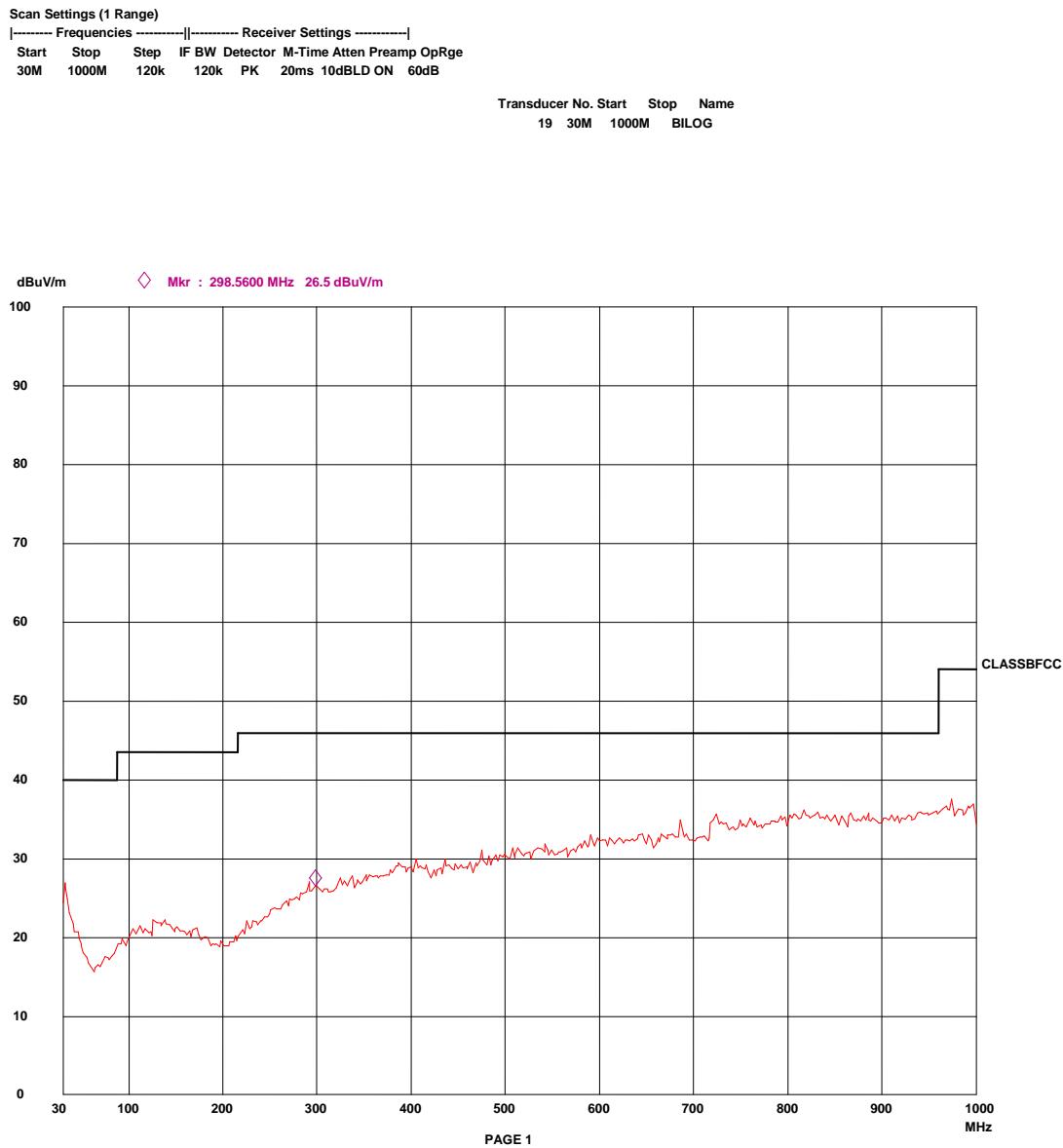


Figure 4: Radiated Emissions Horizontal

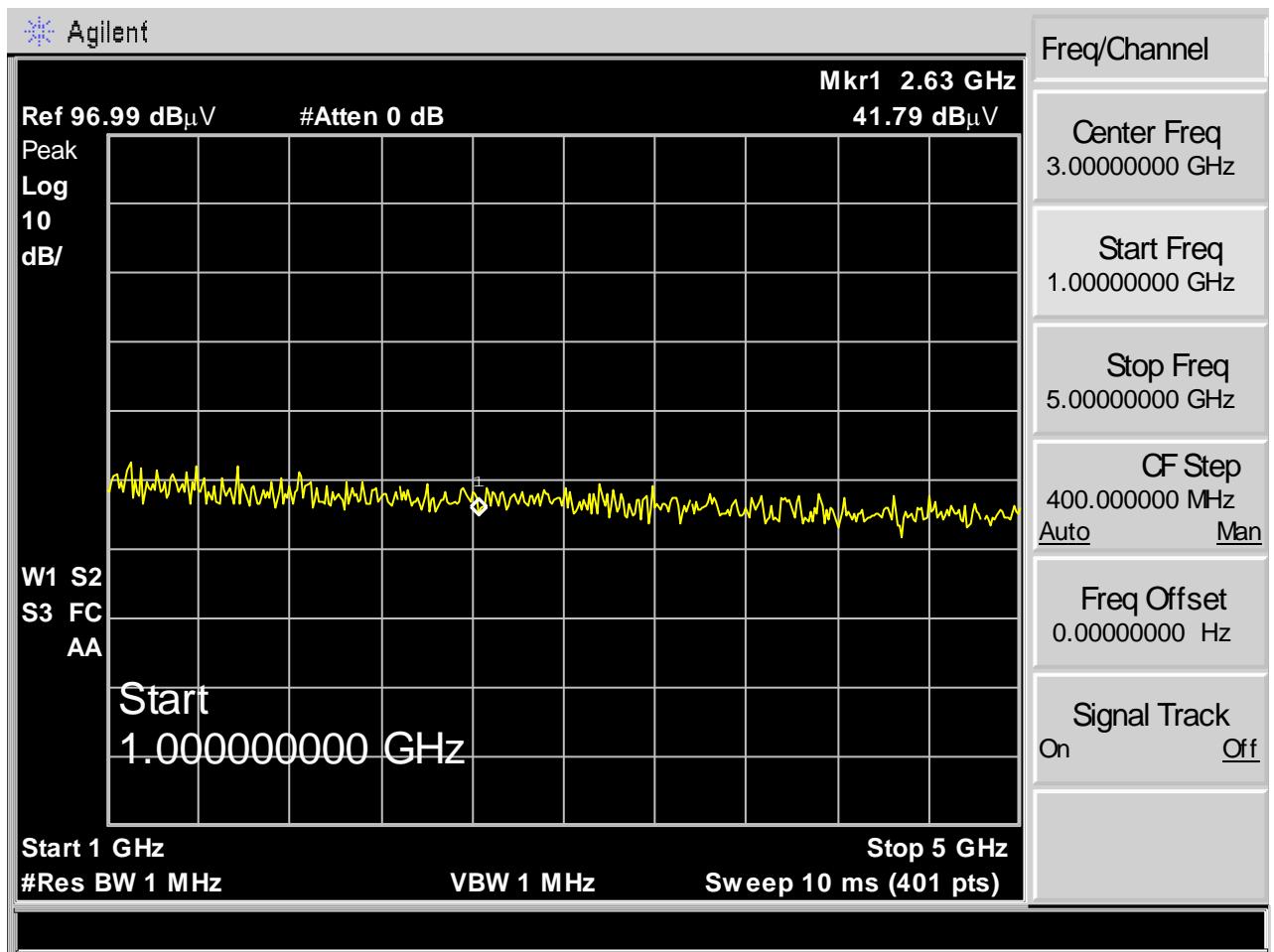


Figure 5: Radiated Emissions 1 GHz to 5 GHz, 3m Anechoic Chamber

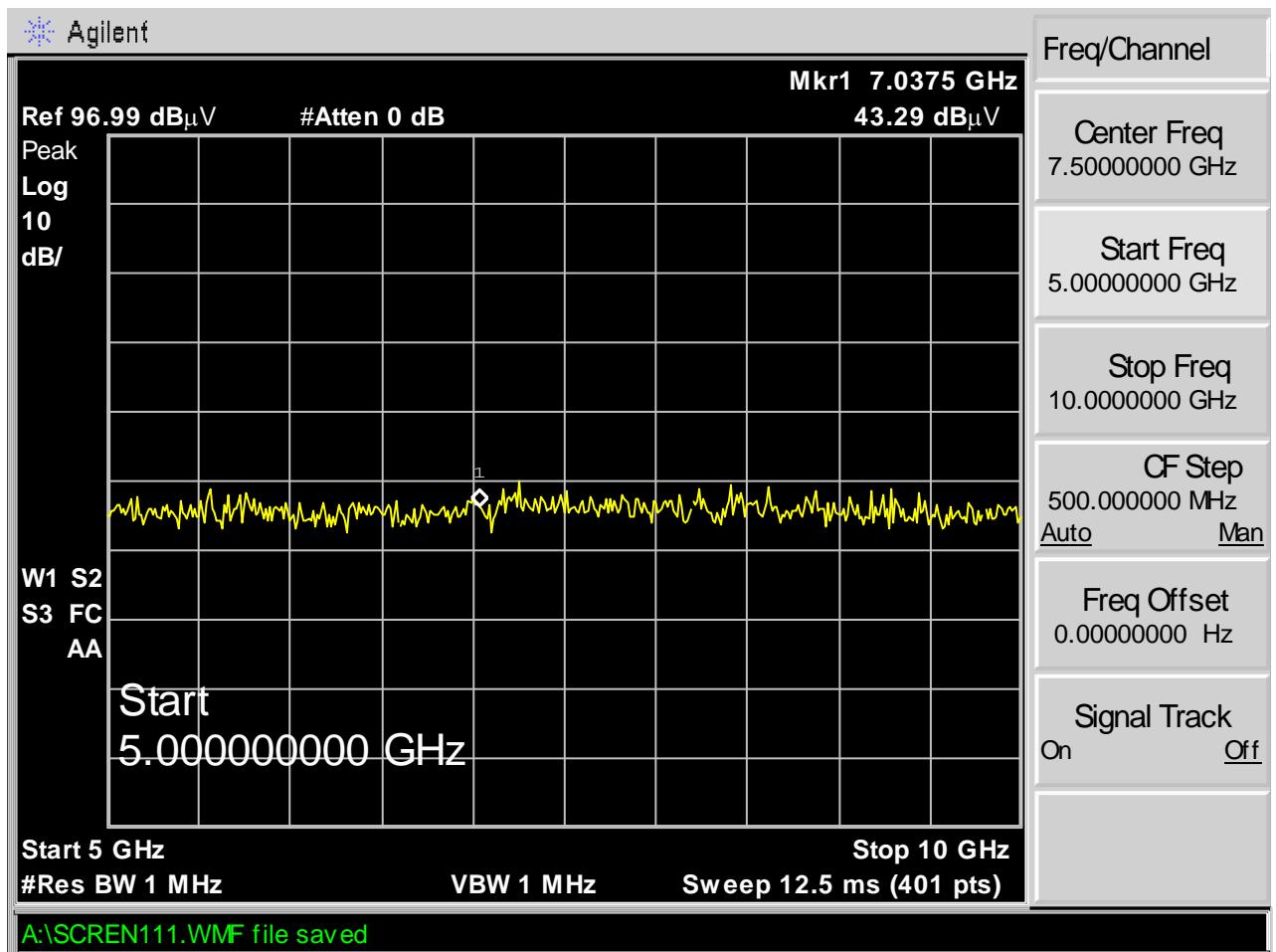


Figure 6: Radiated Emissions 5 GHz to 10 GHz, 3m Anechoic Chamber

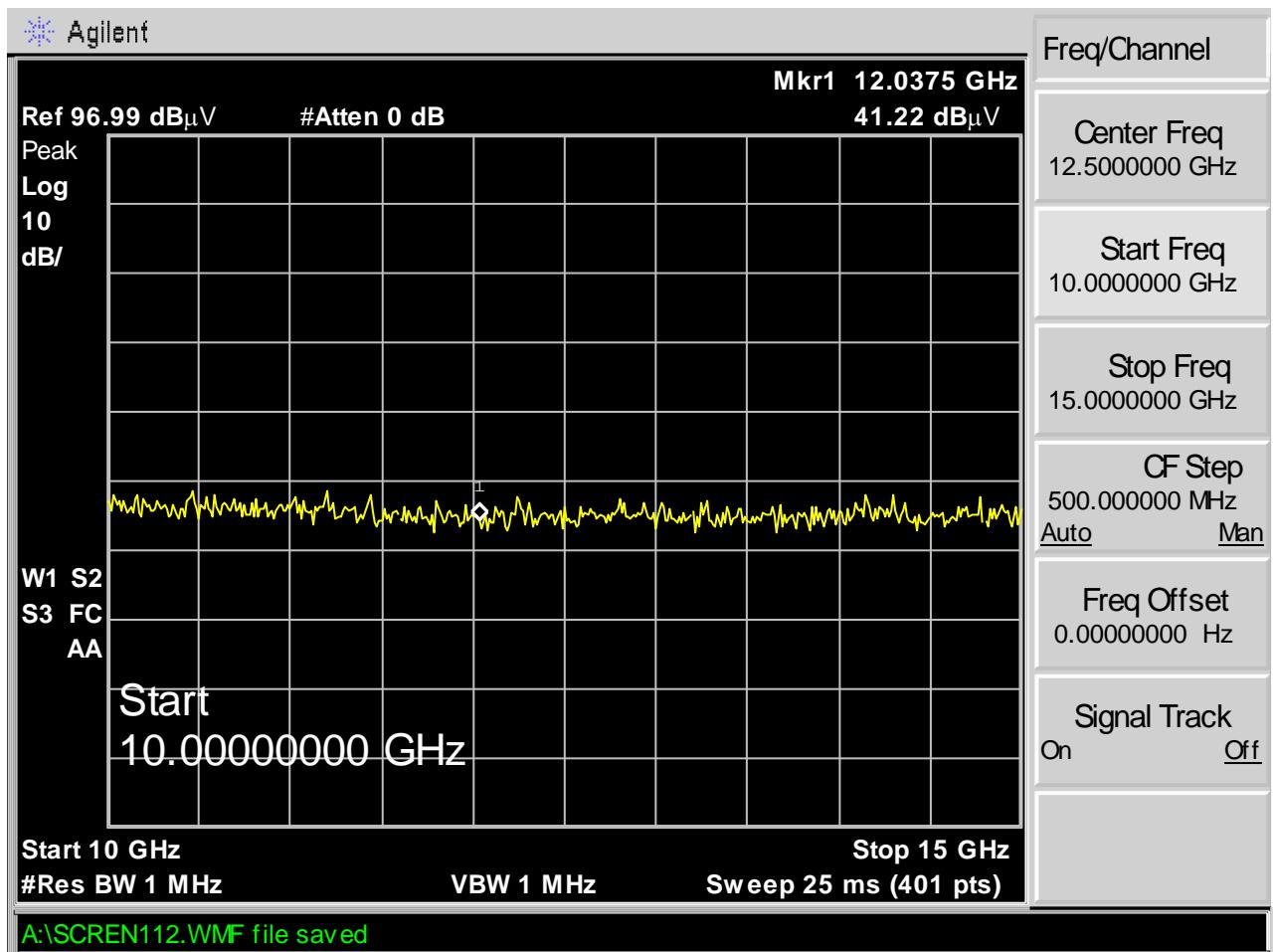


Figure 7: Radiated Emissions 10 GHz to 15 GHz, 3m Anechoic Chamber

Appendix B Test Setups

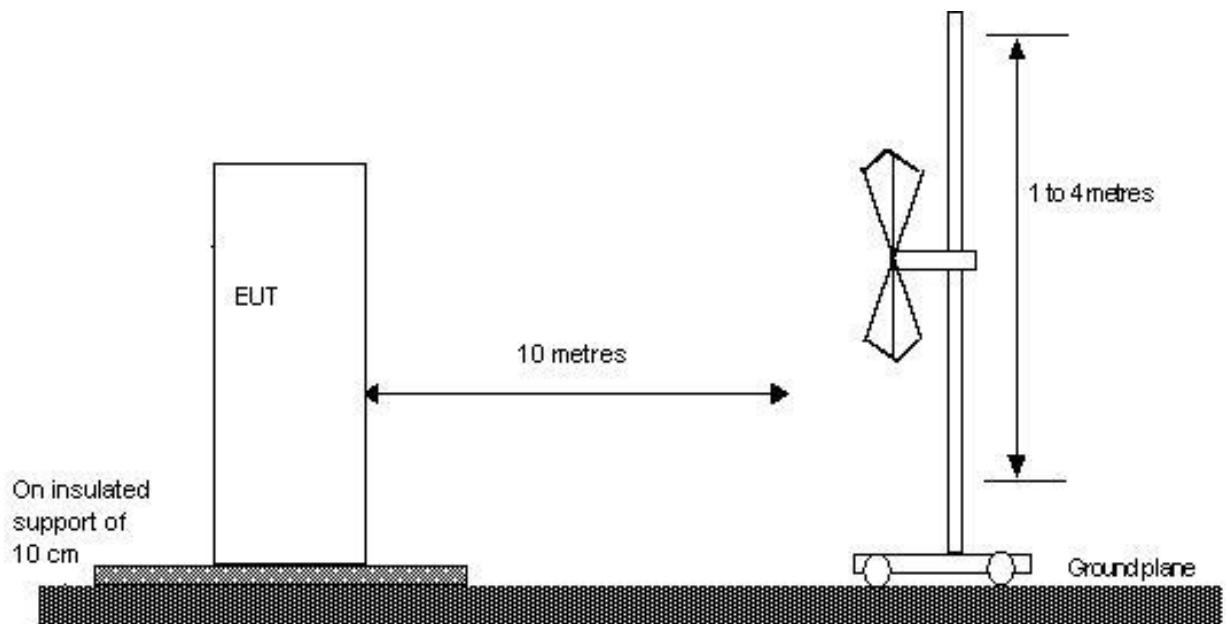
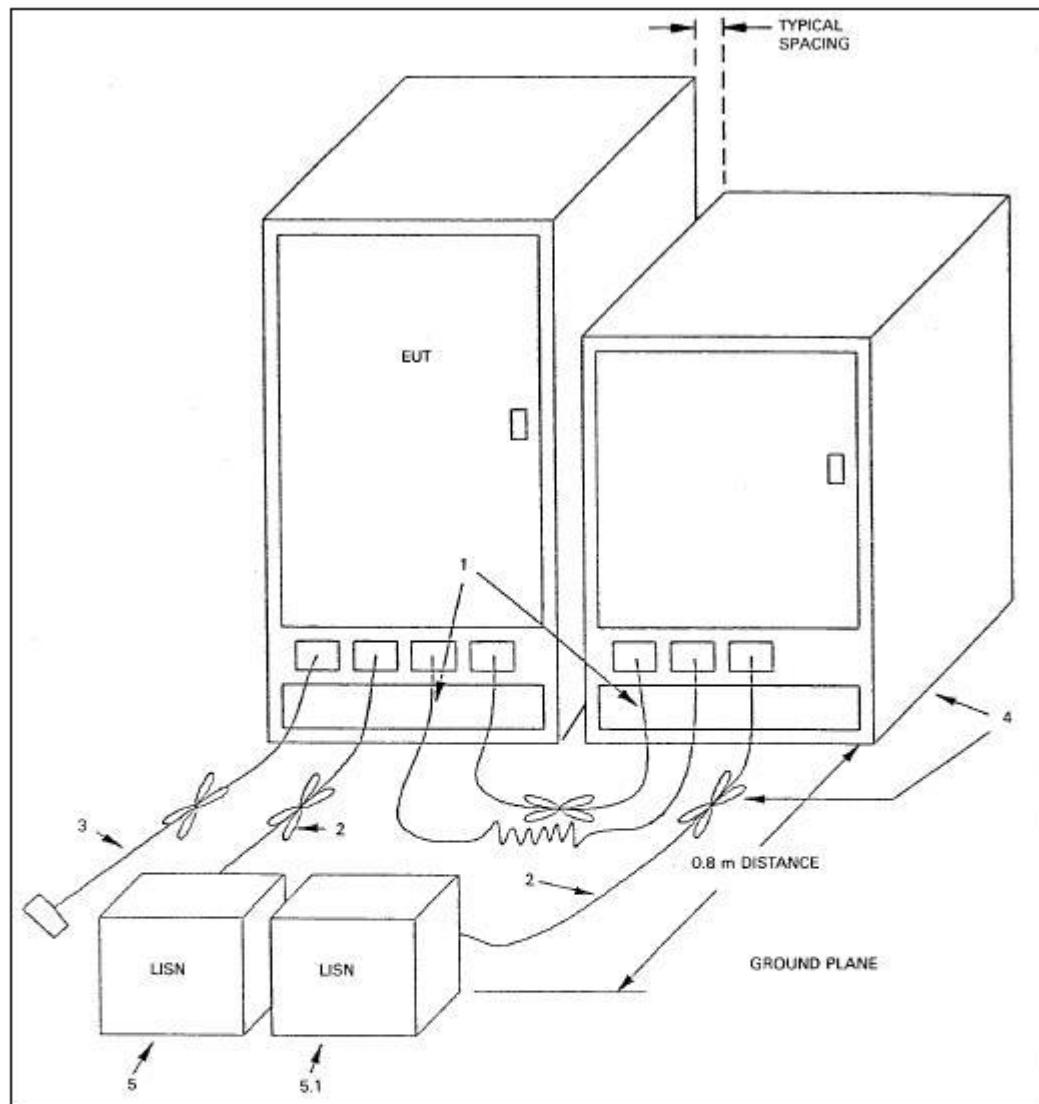


FIGURE 1: Radiated Emissions Test Setup – Test Distance 3m



LEGEND:

- 1) Excess I/O cables shall be bundled in the center. If bundling is not possible, the cables shall be arranged in serpentine fashion. Bundling shall not exceed 40 cm in length (see 6.1.4 and 11.2.4).
- 2) Excess power cords shall be bundled in the center or shortened to appropriate length (see 7.2.1).
- 3) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. If bundling is not possible, the cable shall be arranged in serpentine fashion (see 6.1.4).
- 4) EUT and all cables shall be insulated, if required, from the groundplane by up to 12 mm of insulating material (see 6.1.4 and 6.2.2).
- 5) EUT connected to one LISN. LISN can be placed on top of, or immediately beneath, the groundplane.
 - 5.1) All other equipment powered from a second LISN or additional LISN(s) (see 5.2.3 and 7.2.1).
 - 5.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.

FIGURE 2: Conducted Emissions Test Setup