

TRaC Wireless Test Report : TTR-004493WUS1

Applicant : Buddi Limited

Apparatus : Buddi V8

Specification(s) : CFR47 Part 15.249 July 2008

FCCID : ZDLB83

Purpose of Test : Certification

Authorised by



: Radio Product Manager

Issue Date : 24th March 2011

Authorised Copy Number : PDF

Contents

Section 1: Introduction	3
1.1 General	3
1.2 Tests Requested By	4
1.3 Manufacturer	4
1.4 Apparatus Assessed	4
1.5 Test Result Summary	5
1.6 Notes Relating To The Assessment	6
1.7 Deviations from Test Standards	6
Section 2: Measurement Uncertainty	7
2.1 Measurement Uncertainty Values	7
Section 3: Modifications	8
3.1 Modifications Performed During Assessment	8
Appendix A: Formal Emission Test Results	9
A1 Transmitter Peak Output Power	10
A2 Radiated Electric Field Spurious Emissions	11
A3 Unintentional Radiated Electric Field Emissions - 15.109	14
A4 Power Line Conducted Emissions	16
Appendix B: Supporting Graphical Data	19
Appendix C: Additional Test and Sample Details	27
C1 Test samples	28
C2 EUT Operating Mode During Testing.	29
C3 EUT Configuration Information.	30
C4 List of EUT Ports	31
C5 Details of Equipment Used	32
Appendix D: Additional Information	34
Appendix E: Photographs and Figures	35

Section 1:

Introduction

1.1 General

This report contains an assessment of an apparatus against Electromagnetic Compatibility Standards based upon tests carried out on samples submitted to the Laboratory.

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1.2 Tests Requested By

This testing in this report was requested by :

3rd Floor Kingfisher Exchange
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BUCKS
HP21 7AY
3rd Floor Kingfisher Exchange

1.3 Manufacturer

as above

1.4 Apparatus Assessed

The following apparatus was assessed between 15/03/11 and 18/03/11:

Buddi V8

The above equipment was a passive and discreet GPS device with an ISM transmitter operating at 915MHz.

1.5 Test Result Summary

Full details of test results are contained within Appendix A. The following table summarises the results of the assessment.

The statements relating to compliance with the standards below apply ONLY as qualified in the notes and deviations stated in sections 1.6 to 1.7 of this test report.

Full details of test results are contained within Appendix A. The following table summarises the results of the assessment.

Test Type	Regulation	Measurement standard	Result
Spurious Emissions Radiated <1000MHz	Title 47 of the CFR: Part 15 Subpart (c) 15.249	ANSI C63.10	Pass
Spurious Emissions Radiated >1000MHz	Title 47 of the CFR: Part 15 Subpart (c) 15.249	ANSI C63.10	Pass
AC Power conducted emissions	Title 47 of the CFR: Part 15 Subpart (c) 15.207	ANSI C63.10	Pass
Intentional Emission Frequency	Title 47 of the CFR: Part 15 Subpart (c) 15.249	ANSI C63.10	Pass
Intentional Emission Field Strength	Title 47 of the CFR: Part 15 Subpart (c) 15.249	ANSI C63.10	Pass
Intentional Emission Band Occupancy	Title 47 of the CFR: Part 15 Subpart (c) 15.249	ANSI C63.10	Pass
Unintentional Radiated Spurious Emissions	Title 47 of the CFR: Part 15 Subpart (b) 15.109	ANSI C63.10	Pass
Antenna Arrangements Integral:	Title 47 of the CFR: Part 15 Subpart (c) 15.203	-	Pass
Antenna Arrangements External Connector	Title 47 of the CFR: Part 15 Subpart (c) 15.204	-	Pass
Restricted Bands	Title 47 of the CFR: Part 15 Subpart (c) 15.205	-	Pass
Maximum Frequency of Search	Title 47 of the CFR: Part 15 Subpart (c) 15.33	-	Pass
Extrapolation Factor	Title 47 of the CFR: Part 15 Subpart (c) 15.31(f)	-	Pass

Abbreviations used in the above table:

CFR : Code of Federal Regulations
REFE : Radiated Electric Field Emissions

ANSI : American National Standards Institution
PLCE : Power Line Conducted Emissions

1.6 Notes Relating To The Assessment

With regard to this assessment, the following points should be noted:

The results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

The apparatus was set up and exercised using the configurations, modes of operation and arrangements defined in this report only.

Particular operating modes, apparatus monitoring methods and performance criteria required by the standards tested to have been performed except where identified in Section 1.7 of this test report (Deviations from Test Standards).

For emissions testing, throughout this test report, "Pass" indicates that the results for the sample as tested were below the specified limit (refer also to Section 2, Measurement Uncertainty).

Where relevant, the apparatus was only assessed using the monitoring methods and susceptibility criteria defined in this report.

All testing with the exception of testing at the Open Area Test Site was performed under the following environmental conditions:

Temperature	: 17 to 23 °C
Humidity	: 45 to 75 %
Barometric Pressure	: 86 to 106 kPa

All dates used in this report are in the format dd/mm/yy.

This assessment has been performed in accordance with the requirements of ISO/IEC 17025.

1.7 Deviations from Test Standards

There were no deviations from the standards tested to.

Section 2:**Measurement Uncertainty****2.1 Measurement Uncertainty Values**

For the test data recorded, the following measurement uncertainty was calculated:

Radio Testing – General Uncertainty Schedule

All statements of uncertainty are expanded standard uncertainty using a coverage factor of 1.96 to give a 95% confidence where no required test level exists.

[1] Adjacent Channel Power

Uncertainty in test result = **1.86dB**

[2] Carrier Power

Uncertainty in test result = **0.9 dB**

[3] Effective Radiated Power

Uncertainty in test result = **4.1 dB**

[4] Spurious Emissions

Uncertainty in test result = **4.1dB**

[5] Maximum frequency error

Uncertainty in test result = **3.6kHz**

[6] Frequency deviation

Uncertainty in test result = **3.6 kHz**

[7] Magnetic Field Emissions

Uncertainty in test result = **2.1 dB**

[8] Conducted Spurious

Uncertainty in test result = **0.9 dB**

[9] Channel Bandwidth

Uncertainty in test result = **3.6 kHz**

[10] Power Line Conduction

Uncertainty in test result = **3.5 dB**

[11] Spectrum Mask Measurements

Uncertainty in test result = **3.6 kHz (frequency)**

Uncertainty in test result = **0.9 dB (amplitude)**

[12] Transmission Time Measurement

Uncertainty in test result = **5.8% ± 10ns**

Section 3:

Modifications

3.1 Modifications Performed During Assessment

No modifications were performed during the assessment

Appendix A:**Formal Emission Test Results**

Abbreviations used in the tables in this appendix:

Spec	: Specification	ALSR	: Absorber Lined Screened Room
Mod	: Modification	OATS	: Open Area Test Site
		ATS	: Alternative Test Site
EUT	: Equipment Under Test		
SE	: Support Equipment	Ref	: Reference
L	: Live Power Line	Freq	: Frequency
N	: Neutral Power Line	MD	: Measurement Distance
E	: Earth Power Line	SD	: Spec Distance
Pk	: Peak Detector	Pol	: Polarisation
QP	: Quasi-Peak Detector	H	: Horizontal Polarisation
Av	: Average Detector	V	: Vertical Polarisation
CDN	: Coupling & decoupling network	Mbps	: Mega Bits Per Second

A1 Transmitter Peak Output Power

Carrier power was verified with the EUT transmitting at 915MHz.

Test Details:	
Regulation	Title 47 of the CFR: Part15 Subpart (c) 15.249(a)
Measurement standard	ANSI C63.10:2003
EUT sample number	S01 and S07
Modification state	0
SE in test environment	None
SE isolated from EUT	None
EUT set up	Refer to Appendix C
Temperature	20°C

FREQ. (MHz)	MEASUREMENT Rx. READING (dB μ V)	CABLE LOSS (dB)	ANT FACTOR (dB/m)	PRE AMP (dB)	FIELD STRENGTH (dB μ V/m)	FIELD STRENGTH (mV/m)
914.498	39.6	3.3	22.2	0.0	65.1	1.798871
Limit value @ fc			50mV/m at 3m			
Band occupancy @ -20 dBc			f lower		f higher	
			914.413MHz		914.535MHz	
			121.795kHz			

Notes:

- 1 Results quoted are extrapolated as indicated
- 2 Receiver detector @ fc = Quasi Peak 120kHz bandwidth
- 3 When battery powered the EUT was powered with new batteries

Test Method:

- 1 As per Radio – Noise Emissions, ANSI C63.10
- 2 Measuring distances 3m
- 3 EUT 0.8 metre above ground plane
- 4 Emissions maximised by rotation of EUT, on an automatic turntable.
Raising and lowering the receiver antenna between 1m & 4m.
Horizontal and vertical polarisations, of the receive antenna.
EUT orientation in three orthogonal planes.
Maximum results recorded

A2 Radiated Electric Field Spurious Emissions

Preliminary scans were performed using a peak detector with the RBW = 100kHz. The radiated electric field emission test applies to spurious emissions and harmonics that fall within the restricted bands listed in Section 15.205. The maximum permitted field strength is listed in Section 15.209. The EUT was set to transmit on 915MHz. Plots were taken covering all frequencies and are contained in appendix B.

The following test site was used for final measurements as specified by the standard tested to:

3m open area test site : 3m alternative test site :

The effect of the EUT set-up on the measurements is summarised in note (c) below.

Test Details	
Regulation	Title 47 of the CFR: Part 15 Subpart (c) Clause 15.249 (d) (e) and Clause 15.205
Measurement standard	ANSI C63.10:2003
Frequency range	30MHz to 10GHz
EUT sample number	S01 and S07
Modification state	0
SE in test environment	None
SE isolated from EUT	None
EUT set up	Refer to Appendix C
Temperature	20°C
Photographs (Appendix F)	Photograph 1 and 2

The worst case radiated emission measurements for spurious emissions and harmonics that fall within the restricted bands are listed below:

Ref No.	FREQ. (MHz)	Det.	MEAS Rx (dB μ V)	CABLE LOSS (dB)	ANT FACT. (dB/m)	PRE AMP (dB)	FIELD ST'GH (dB μ V/m)	EXTRAP FACT (dB)	FIELD ST'GH (μ V/m)	LIMIT (μ V/m)	Margin
1	1828.899	Pk	27.9	5.1	27.3	N/A	60.3	0.0	1035.1	5000.0	-3964.9
2	1828.899	AV	20.7	5.1	27.3	N/A	53.1	0.0	451.9	500.0	-48.1
3	3657.798	Pk	44.4	7.6	33.9	34.01	51.9	-9.5	131.8	5000.0	-4868.2
4	3657.798	AV	32.3	7.6	33.9	34.01	39.8	-9.5	32.7	500.0	-467.3
5	5486.697	Pk	48.6	9.4	36.7	33.99	60.7	-9.5	363.1	5000.0	-4636.9
6	5486.697	AV	41.5	9.4	36.7	33.99	53.6	-9.5	160.3	500.0	-339.7
7	7316.002	Pk	45.6	10.6	39.1	34.41	60.9	-9.5	371.5	5000.0	-4628.5
8	7316.002	AV	34.2	10.6	39.1	34.41	49.5	-9.5	100.0	500.0	-400.0

The effect of the EUT set-up on the measurements is summarised in note (c) below.

Notes:

- 1 Any testing performed below 30 MHz was performed using a magnetic loop antenna in accordance with ANSI C63.10: section 4.5, Table 1
- 2 In accordance with 15.35(b), above 1 GHz, emissions measured using a peak detector do not exceed a level 20 dB above the average limit.
- 3 Testing was performed with the EUT orientated in three orthogonal planes and the maximum emissions level recorded. In addition, the EUT antenna was varied within its range of motion in order to maximise emissions.
- 4 For Frequencies below 1 GHz, RBW= 100 kHz, testing was performed with CISPR16 compliant test receiver with QP detector. Above 1 GHz tests were performed using a spectrum analyser using the following settings:

Peak	RBW= 1MHz, VBW > RBW
Average	RBW= 1MHz, VBW > RBW

These settings as per ANSI C63.10 and DA 00-705.

The upper and lower frequency of the measurement range was decided according to CFR47 Part15:2008 Clause 15.33(a) and 15.33(a)(1).

Radiated emission limits (47 CFR 15: Clause 15.209) for emissions falling within the restricted bands defined in 15.205(a):

Frequency of emission (MHz)	Field strength uV/m	Measurement Distance m	Field strength dBuV/m
0.009-0.490	2400/F(kHz)	300	67.6/F (kHz)
0.490-1.705	24000/F(kHz)	30	87.6/F (kHz)
1.705-30	30	30	29.5
30-88	100	3	40.0
88-216	150	3	43.5
216-960	200	3	46.0
Above 960	500	3	54.0

Notes:

(a) Where results have been measured at one distance, and a signal level displayed at another, the results have been extrapolated using the following formula:

$$\text{Extrapolation (dB)} = 20 \log_{10} \left(\frac{\text{measurement distance}}{\text{specification distance}} \right)$$

The results displayed take into account applicable antenna factors and cable losses.

(b) The levels may have been rounded for display purposes.

(c) The following table summarises the effect of the EUT operating mode, internal configuration and arrangement of cables / samples on the measured emission levels:

	See (i)	See (ii)	See (iii)	See (iv)
Effect of EUT operating mode on emission levels	✓			
Effect of EUT internal configuration on emission levels		✓		
Effect of Position of EUT cables & samples on emission levels		✓		
(i) Parameter defined by standard and / or single possible, refer to Appendix D (ii) Parameter defined by client and / or single possible, refer to Appendix D (iii) Parameter had a negligible effect on emission levels, refer to Appendix D (iv) Worst case determined by initial measurement, refer to Appendix D				

A3 Unintentional Radiated Electric Field Emissions - 15.109

Preliminary scans were performed using a peak detector with the RBW = 100kHz. The maximum permitted field strength is listed in Section 15.109. The EUT was set to receive mode only.

The following test site was used for final measurements as specified by the standard tested to :

3m open area test site :

3m alternative test site :

Test Details:	
Regulation	Title 47 of the CFR: Part 15 Subpart (b) Clause 15.109
Measurement standard	ANSI C63.10:2003
Frequency range	30MHz to 25 GHz
EUT sample number	S01 and S07
Modification state	0
SE in test environment	None
SE isolated from EUT	None
EUT set up	Refer to Appendix C
Temperature	20°C
Photographs (Appendix F)	Photograph 1 and 2

The worst case radiated emission measurements for spurious emissions:

Ref No.	FREQ. (MHz)	Det.	MEAS Rx (dB μ V)	CABLE LOSS (dB)	ANT FACT. (dB/m)	PRE AMP (dB)	FIELD ST'GH (dB μ V/m)	EXTRAP FACT (dB)	FIELD ST'GH (μ V/m)	LIMIT (μ V/m)	Margin (dB)
No Emissions within 20dB of the limit											

Specification limits :

The upper frequency of the measurement range was decided according to 47 CFR 15:2008 Clause 15.33.

Radiated emission limits (47 CFR 15:2008 Clause 15.109):

Except for a Class A digital device, the field strength of radiated emissions from unintentional radiators at a distance of 3m shall not exceed the following values:

Frequency of emission (MHz)	Field strength μ V/m	Field strength dB μ V/m
30-88	100	40.0 (quasi-peak)
88-216	150	43.5 (quasi-peak)
216-960	200	46.0 (quasi-peak)
960-1000	500	54.0 (quasi-peak)
Above 1000	500	54.0 (average)
Above 1000	-	74.0 (peak)

Notes:

(a) Where results have been measured at one distance, and a signal level displayed at another, the results have been extrapolated using the following formula:

$$\text{Extrapolation (dB)} = 20 \log_{10} \left(\frac{\text{measurement distance}}{\text{specification distance}} \right)$$

The results displayed take into account applicable antenna factors and cable losses.

(b) The levels may have been rounded for display purposes.

(c) The following table summarises the effect of the EUT operating mode, internal configuration and arrangement of cables / samples on the measured emission levels :

	See 1)	See 2)	See 3)	See 4)
Effect of EUT operating mode on emission levels		✓		
Effect of EUT internal configuration on emission levels		✓		
Effect of Position of EUT cables & samples on emission levels		✓		
1) Parameter defined by standard and / or single possible. 2) Parameter defined by client and / or single possible. 3) Parameter had a negligible effect on emission levels. 4) Worst case determined by initial measurement.				

A4 Power Line Conducted Emissions

Previous power line conducted emission measurements were performed with a peak detector in a screened room. The effect of the EUT set-up on the measurements is summarised in note (b). Where applicable formal measurements of the emissions were performed with a peak, average and/or quasi peak detector. The EUT was set to transmit on 915MHz carrier frequency. The formal measurements are detailed below:

Test Details: Transmit Mode	
Regulation	Title 47 of the CFR: Part 15 Subpart (c) Clause 15.207
Measurement standard	ANSI C63.10
Frequency range	150kHz to 30MHz
EUT sample number	S01 and S07
Modification state	0
SE in test environment	None
SE isolated from EUT	None
EUT set up	Refer to Appendix C
Photographs (Appendix F)	Photograph 3

The worst-case power line conducted emission measurements are listed below:

Results measured using the peak detector compared to the average limit

Ref No.	Freq (MHz)	Conductor	Result (dBuV)	Spec Limit (dBuV)	Margin (dB)	Result Summary
1	0.150	L1	36.8	56.0	-19.2	Pass
2	0.173	L1	39.4	54.8	-15.4	Pass
3	0.185	L1	40.6	54.3	-13.7	Pass
4	0.277	L1	34.8	50.9	-16.1	Pass
5	0.462	L1	36.3	46.7	-10.4	Pass
6	1.134	L1	30.5	46.0	-15.5	Pass
7	2.355	L1	32.3	46.0	-13.7	Pass
8	2.494	L1	32.3	46.0	-13.7	Pass
9	0.150	N	34.1	56.0	-21.9	Pass
10	0.173	N	43.2	54.8	-11.6	Pass
11	0.185	N	44.6	54.3	-9.7	Pass
12	0.277	N	31.7	50.9	-19.2	Pass
13	0.520	N	28.3	46.0	-17.7	Pass
14	1.131	N	32.3	46.0	-13.7	Pass
15	2.355	N	33.2	46.0	-12.8	Pass
16	2.485	N	36.7	46.0	-9.3	Pass

Previous power line conducted emission measurements were performed with a peak detector in a screened room. The effect of the EUT set-up on the measurements is summarised in note (b). Where applicable formal measurements of the emissions were performed with a peak, average and/or quasi peak detector. The EUT was set to receive mode. The formal measurements are detailed below:

Test Details: Receive Mode	
Regulation	Title 47 of the CFR: Part 15 Subpart (c) Clause 15.107
Measurement standard	ANSI C63.10
Frequency range	150kHz to 30MHz
EUT sample number	S01 and S07
Modification state	0
SE in test environment	None
SE isolated from EUT	None
EUT set up	Refer to Appendix C
Photographs (Appendix F)	Photograph 3

The worst-case power line conducted emission measurements are listed below:

Results measured using the average detector compared to the average limit

Ref No.	Freq (MHz)	Conductor	Result (dBuV)	Spec Limit (dBuV)	Margin (dB)	Result Summary
1	0.173	L1	33.3	54.8	-21.5	Pass
2	0.278	L1	23.3	50.9	-27.6	Pass
3	0.378	L1	26.3	48.3	-22.0	Pass
4	0.501	L1	27.5	46.0	-18.5	Pass
5	1.429	L1	16.6	46.0	-29.4	Pass
6	1.950	L1	14.3	46.0	-31.7	Pass
7	2.600	L1	20.1	46.0	-25.9	Pass
8	0.150	N	11.0	56.0	-45.0	Pass
9	0.185	N	42.9	54.3	-11.4	Pass
10	0.286	N	30.7	50.6	-19.9	Pass
11	0.691	N	27.1	46.0	-18.9	Pass
12	1.360	N	21.7	46.0	-24.3	Pass
13	1.854	N	19.1	46.0	-26.9	Pass
14	2.600	N	20.9	46.0	-25.1	Pass

Results measured using the quasi-peak detector compared to the quasi-peak limit

Ref No.	Freq (MHz)	Conductor	Result (dBuV)	Spec Limit (dBuV)	Margin (dB)	Result Summary
1	0.173	L1	46.6	64.8	-18.2	Pass
2	0.278	L1	38.7	60.9	-22.2	Pass
3	0.378	L1	41.2	58.3	-17.1	Pass
4	0.501	L1	40.2	56.0	-15.8	Pass
5	1.429	L1	36.6	56.0	-19.4	Pass
6	1.950	L1	32.8	56.0	-23.2	Pass
7	2.600	L1	37.6	56.0	-18.4	Pass
8	0.150	N	30.0	66.0	-36.0	Pass
9	0.185	N	43.5	64.3	-20.8	Pass
10	0.286	N	39.6	60.6	-21.0	Pass
11	0.691	N	33.2	56.0	-22.8	Pass
12	1.360	N	33.7	56.0	-22.3	Pass
13	1.854	N	34.9	56.0	-21.1	Pass
14	2.600	N	40.3	56.0	-15.7	Pass

Specification limits :

Conducted emission limits (CFR47 Part 15 Clause 15.207):

Conducted disturbance at the mains ports.

Frequency range MHz	Limits dB μ V	
	Quasi-peak	Average
0.15 to 0.5	66 to 56 ²	56 to 46 ²
0.5 to 5	56	46
5 to 30	60	50

Notes:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

Notes:

- (a) The levels may have been rounded for display purposes.
- (b) The following table summarises the effect of the EUT operating mode and internal configuration on the measured emission levels :

	See (i)	See (ii)	See (iii)	See (iv)
Effect of EUT operating mode on emission levels		✓		
Effect of EUT internal configuration on emission levels		✓		
(i) Parameter defined by standard and / or single possible, refer to Appendix C				
(ii) Parameter defined by client and / or single possible, refer to Appendix C				
(iii) Parameter had a negligible effect on emission levels, refer to Appendix C				
(iv) Worst case determined by initial measurement, refer to Appendix C				

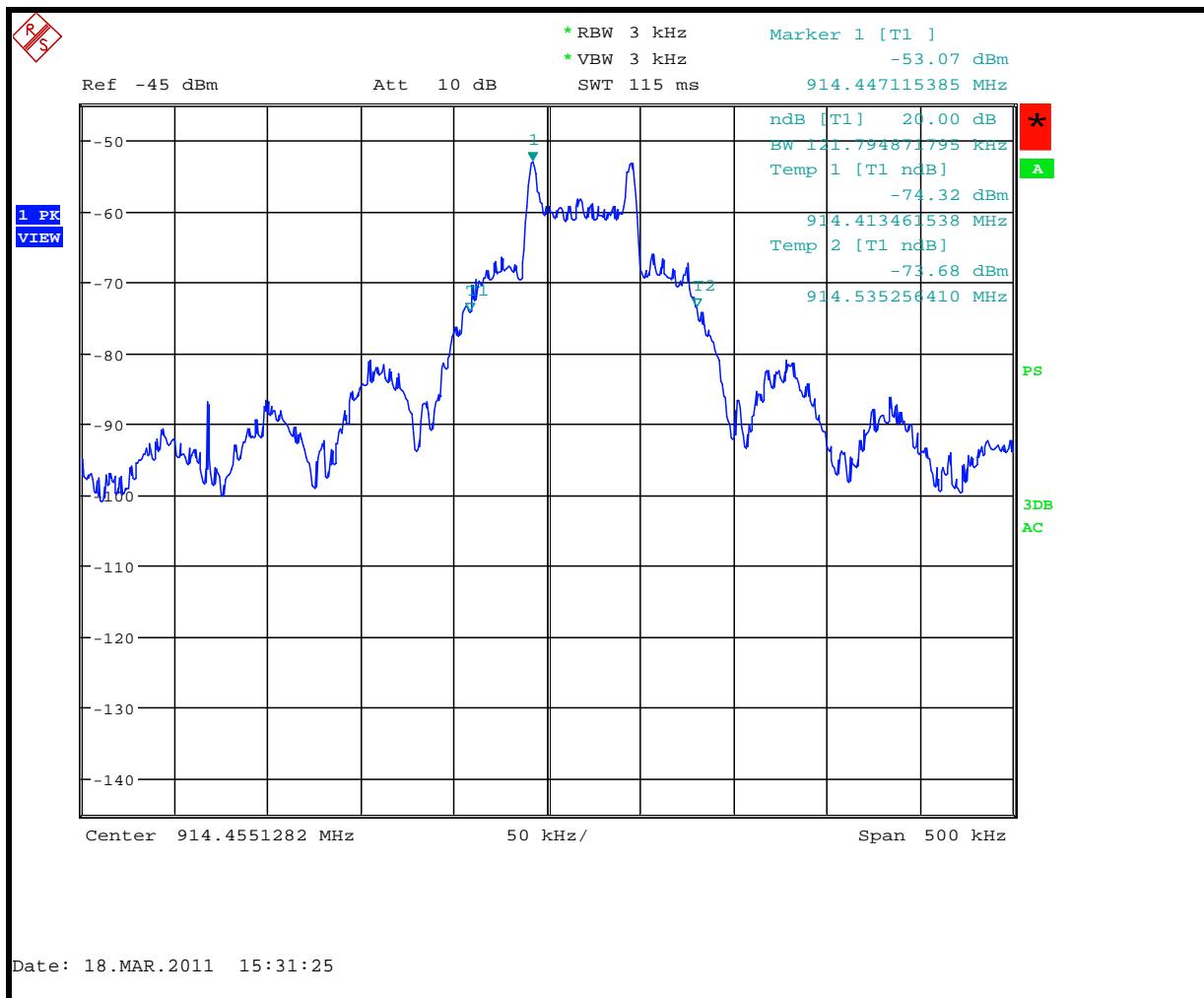
Appendix B:

Supporting Graphical Data

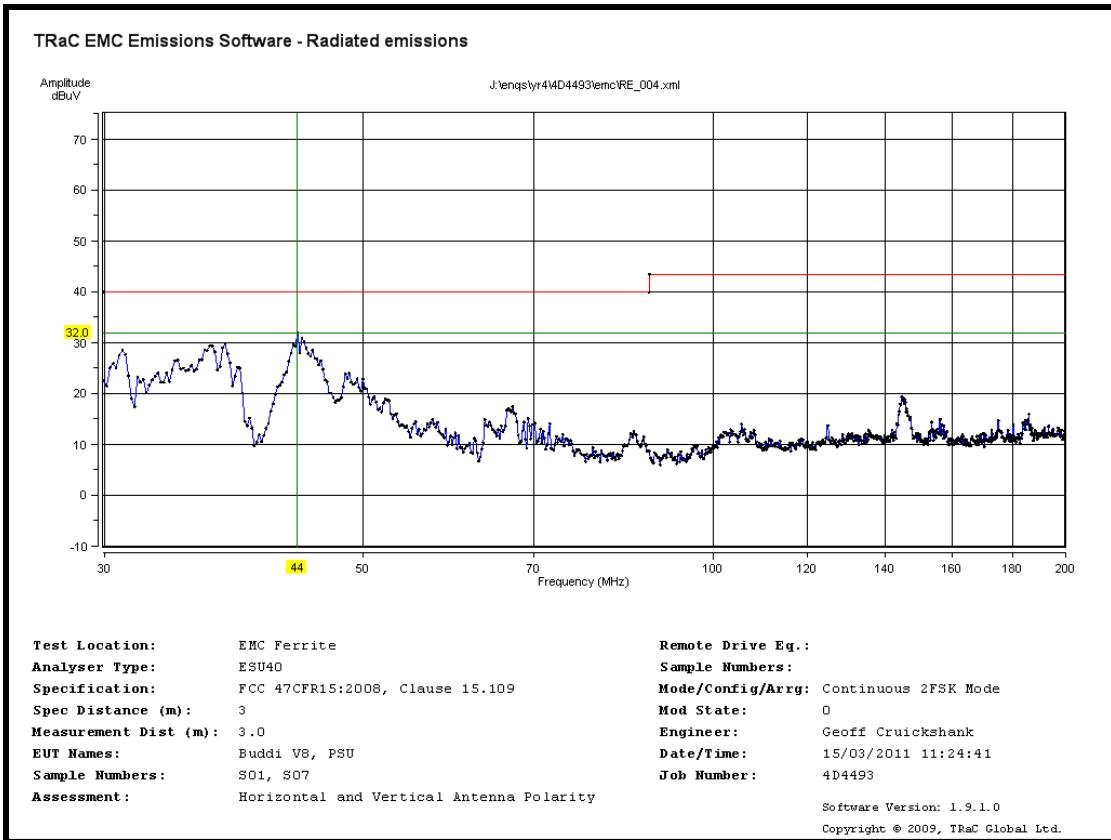
This appendix contains graphical data obtained during testing.

Notes:

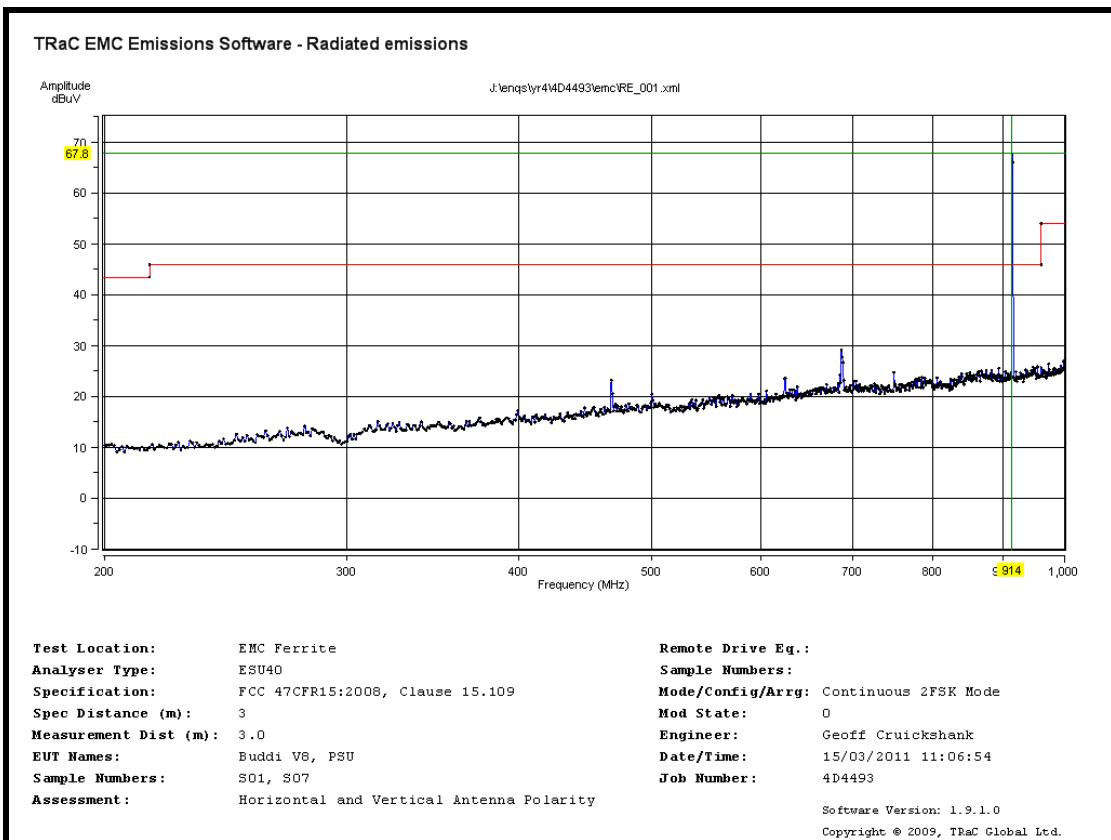
- (a) The radiated electric field emissions and conducted emissions graphical data in this appendix is preview data. For details of formal results, refer to Appendix A and Appendix B.
- (b) The time and date on the plots do not necessarily equate to the time of the test.
- (c) Where relevant, on power line conducted emission plots, the limit displayed is the average limit, which is stricter than the quasi peak limit.
- (d) Appendix C details the numbering system used to identify the sample and its modification state.
- (e) The plots presented in this appendix may not be a complete record of the measurements performed, but are a representative sample, relative to the final assessment.



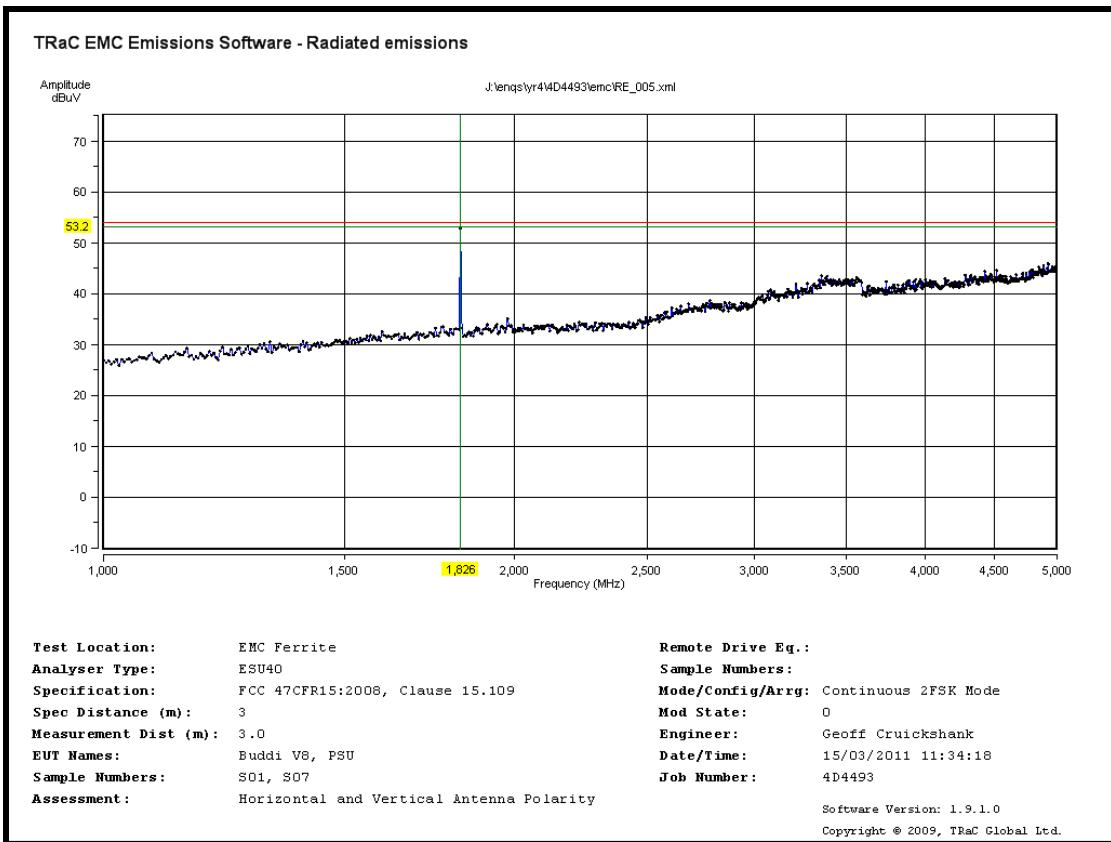
20dB Bandwidth



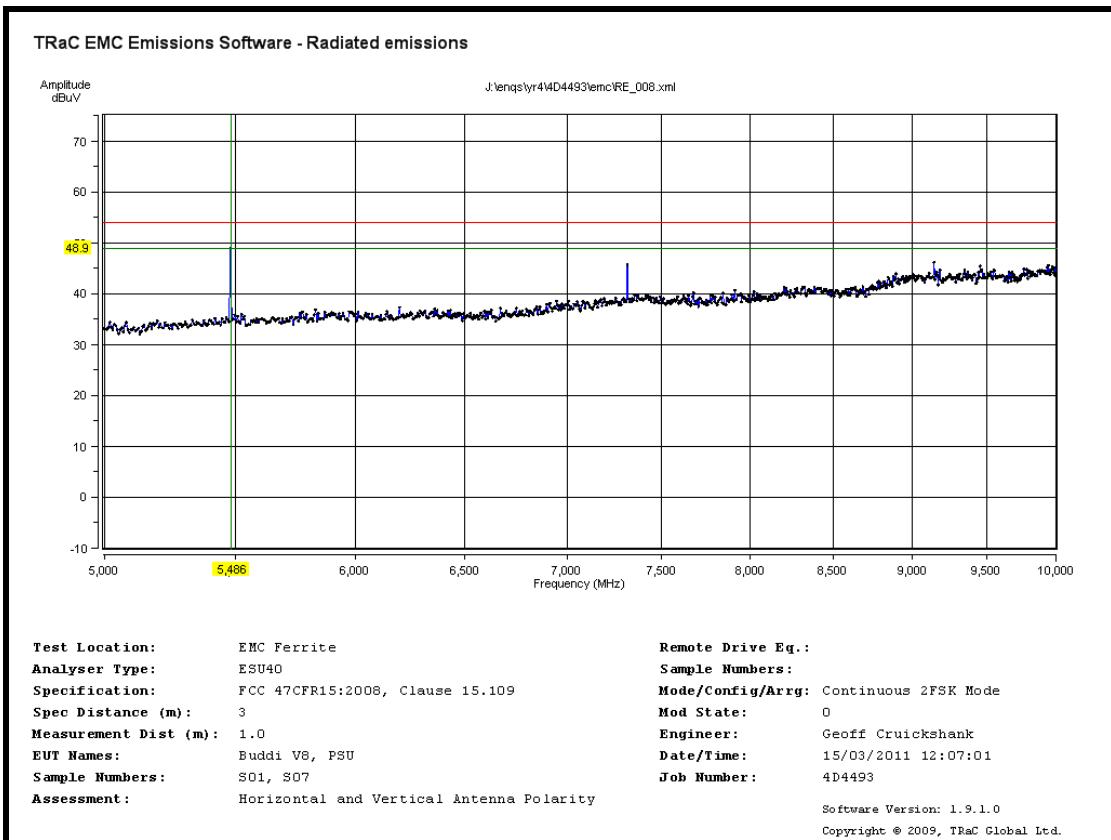
Radiated Spurious emissions – Transmit mode 30 MHz to 200 MHz



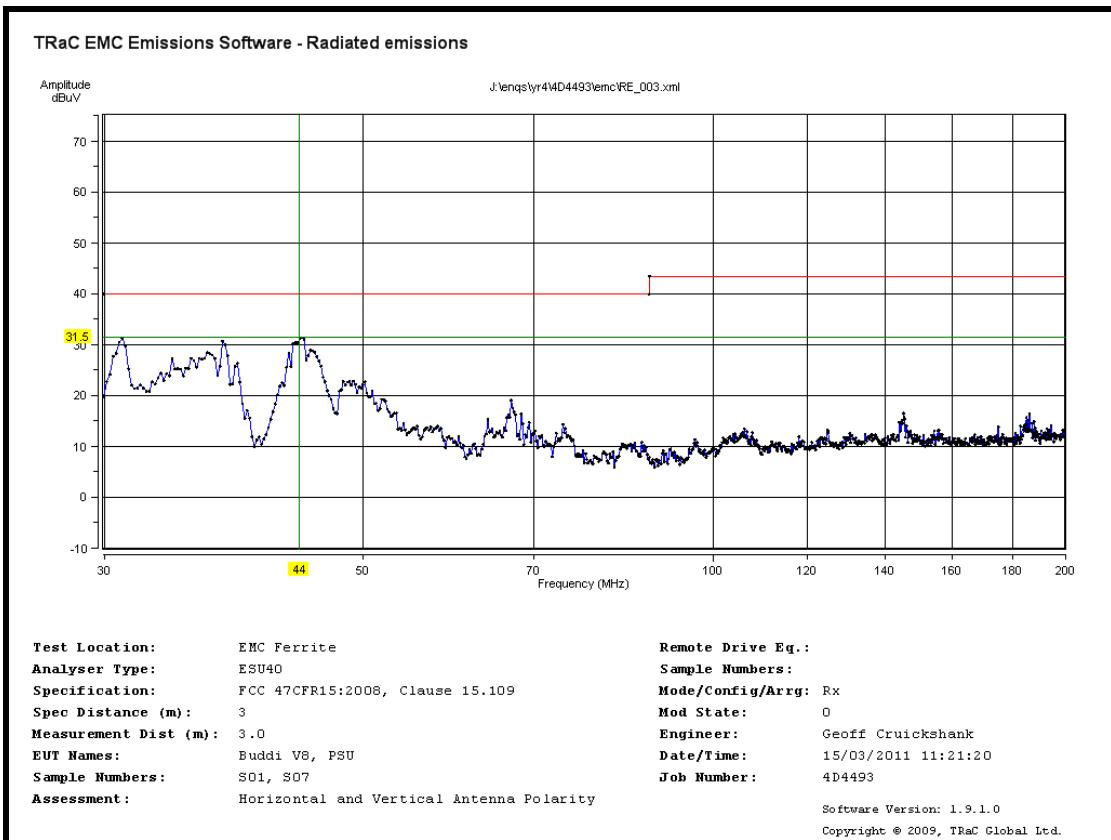
Radiated Spurious emissions – Transmit mode 200 MHz to 1 GHz



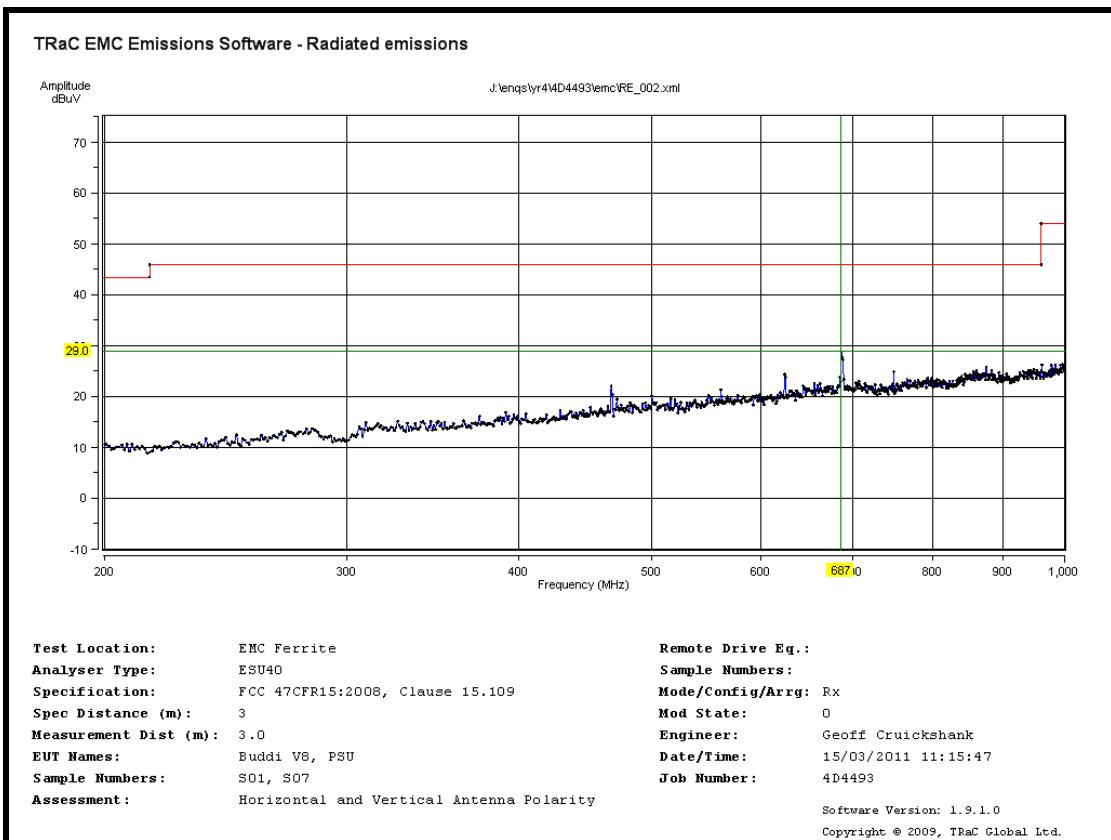
Radiated Spurious emissions – Transmit mode 1 GHz to 5 GHz



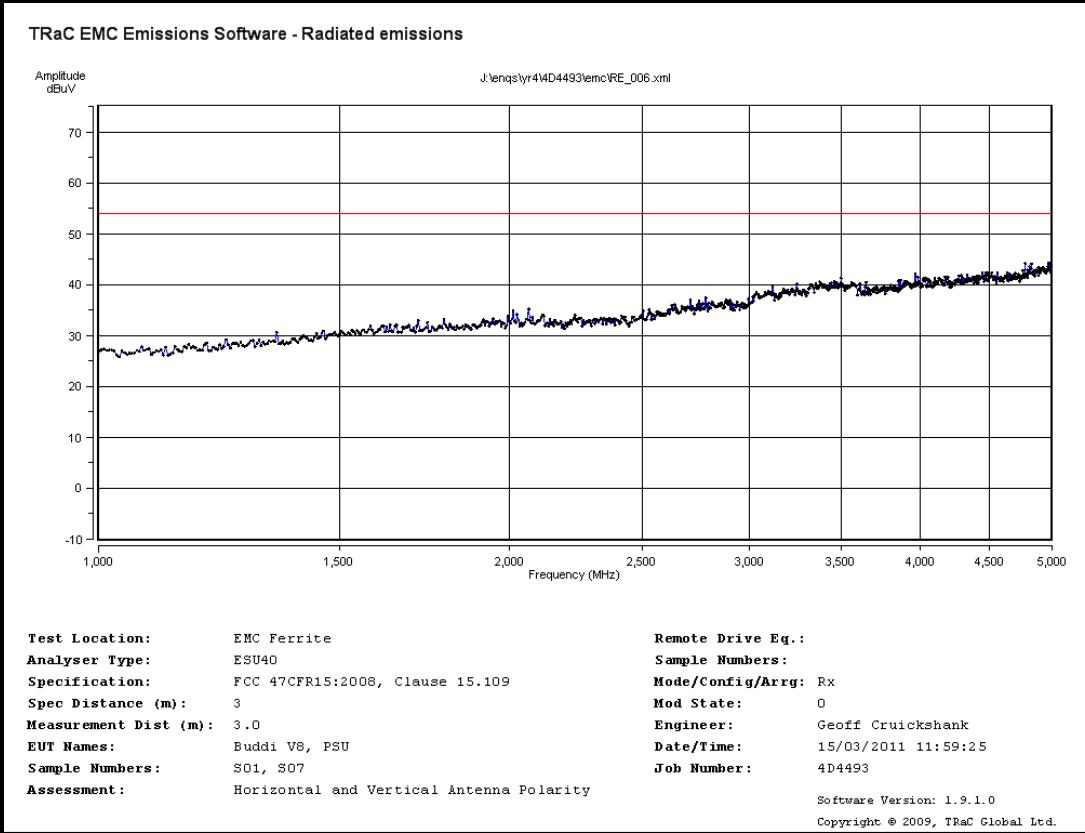
Radiated Spurious emissions – Transmit mode 5 GHz to 10 GHz



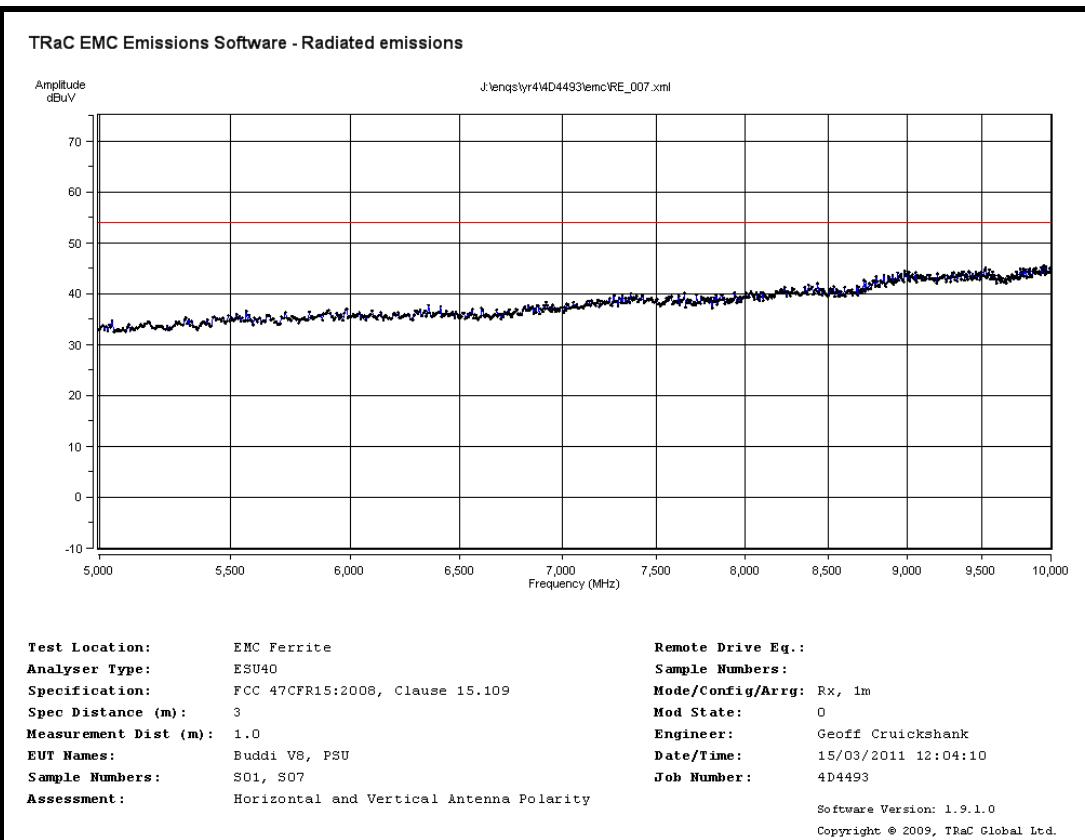
Radiated Spurious emissions – Receive mode 30 MHz to 200 MHz



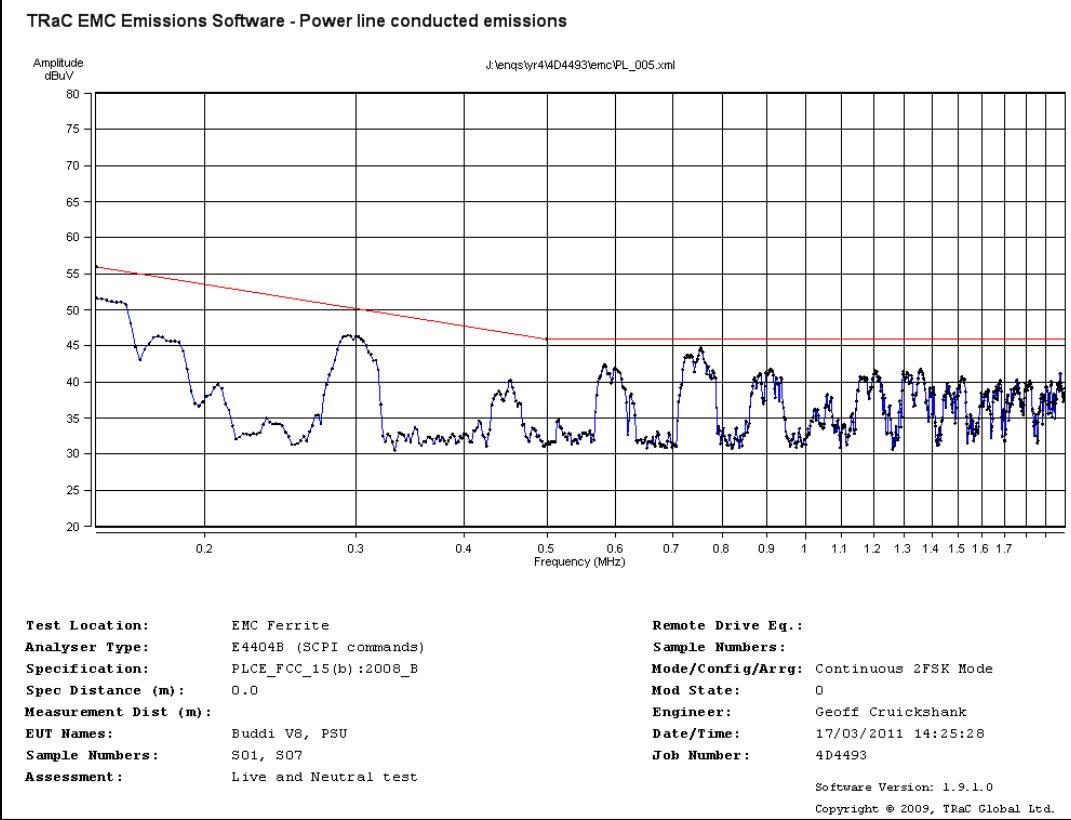
Radiated Spurious emissions – Receive mode 200 MHz to 1 GHz



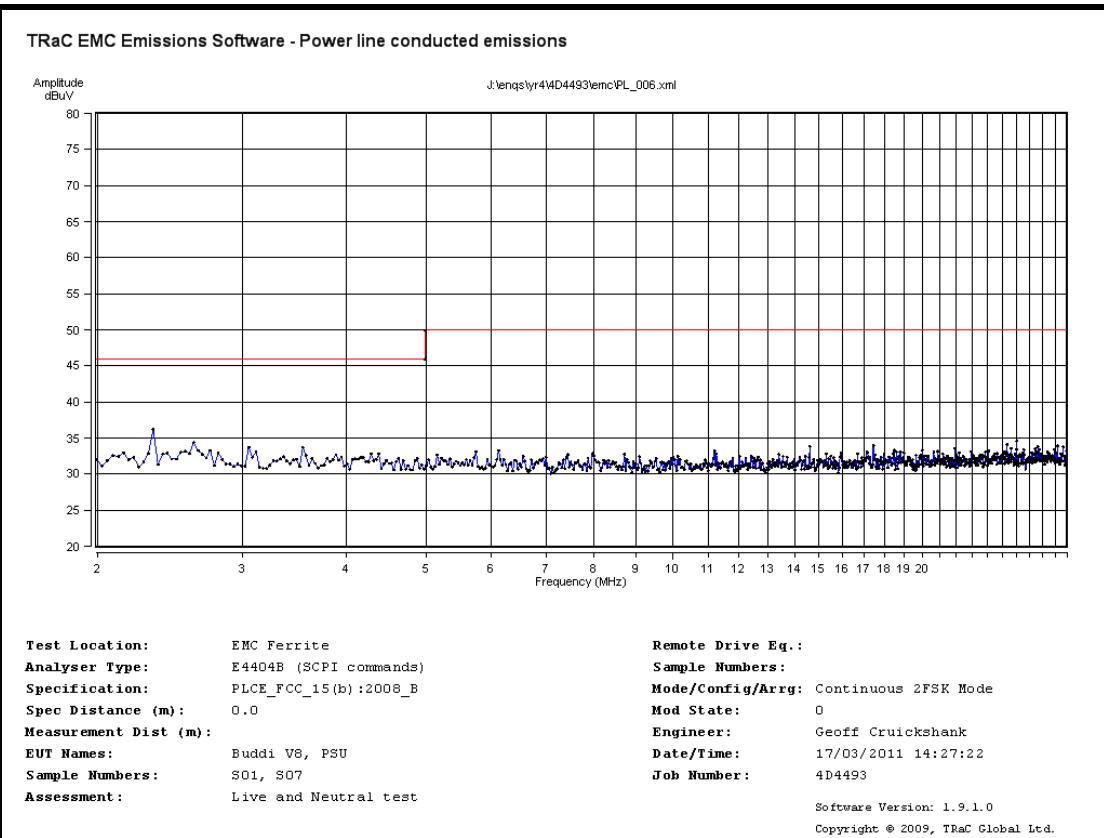
Radiated Spurious emissions – Receive mode 1 GHz to 5 GHz



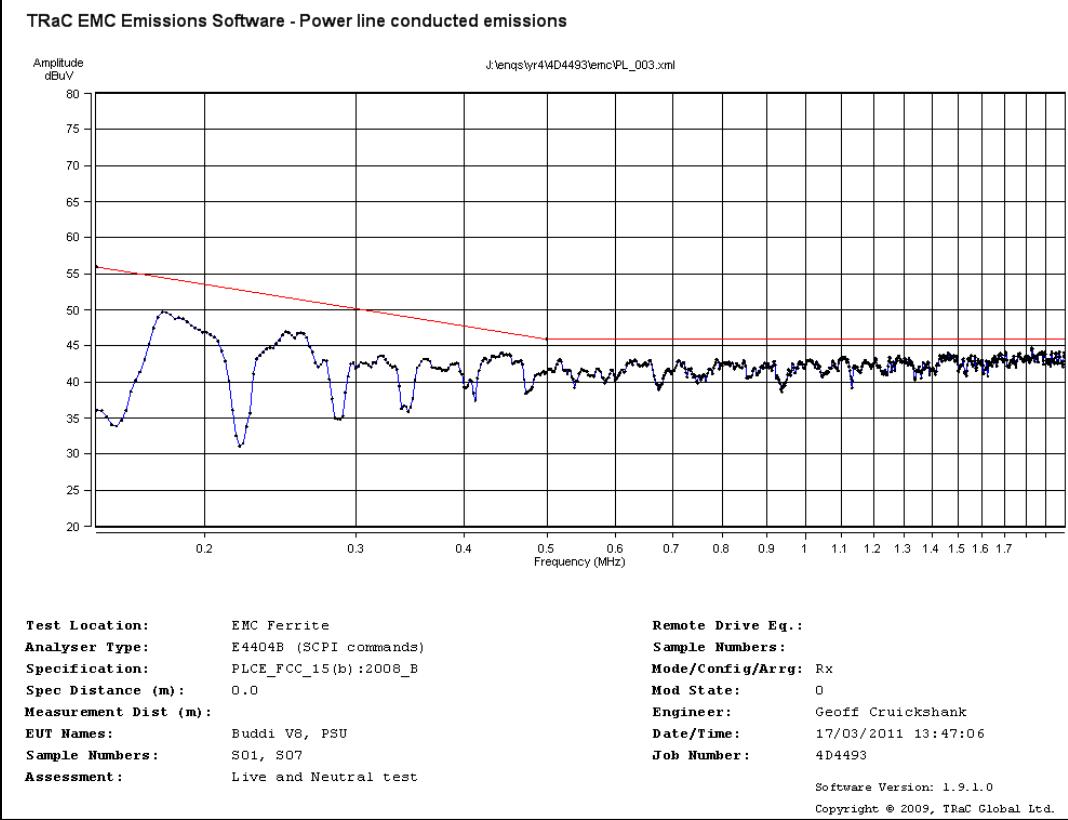
Radiated Spurious emissions – Receive mode 5 GHz to 10 GHz



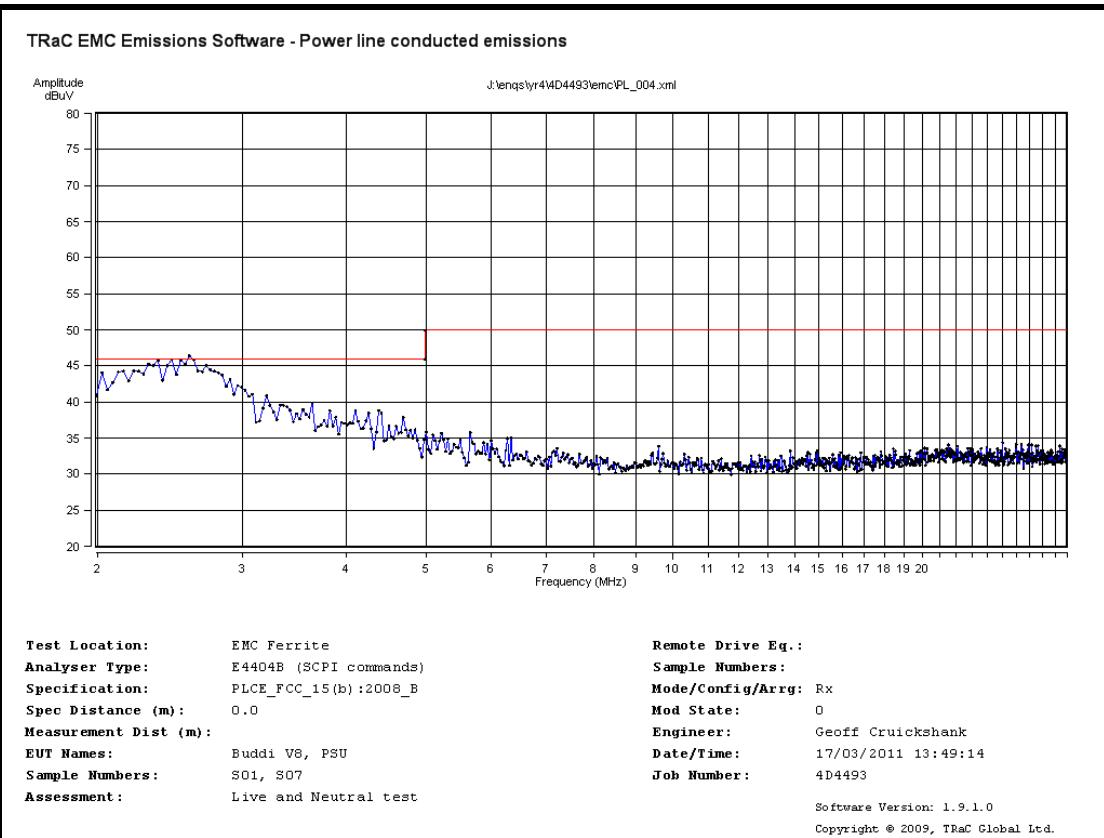
Power line conducted emissions Transmit Mode 0.15 MHz to 2 MHz



Power line conducted emissions Transmit Mode 2 MHz to 30 MHz



Power line conducted emissions Receive Mode 0.15 MHz to 2 MHz



Power line conducted emissions Receive Mode 2 MHz to 30 MHz

Appendix C:**Additional Test and Sample Details**

This appendix contains details of:

1. The samples submitted for testing.
2. Details of EUT operating mode(s)
3. Details of EUT configuration(s) (see below).
4. EUT arrangement (see below).

Throughout testing, the following numbering system is used to identify the sample and its modification state:

Sample No: Sxx Mod w

where:

xx	= sample number	eg. S01
w	= modification number	eg. Mod 2

The following terminology is used throughout the test report:

Support Equipment (SE) is any additional equipment required to exercise the EUT in the applicable operating mode. Where relevant SE is divided into two categories:

SE in test environment: The SE is positioned in the test environment and is not isolated from the EUT (e.g. on the table top during REFE testing).

SE isolated from the EUT: The SE is isolated via filtering from the EUT. (e.g. equipment placed externally to the ALSR during REFE testing).

EUT configuration refers to the internal set-up of the EUT. It may include for example:

- Positioning of cards in a chassis.
- Setting of any internal switches.
- Circuit board jumper settings.
- Alternative internal power supplies.

Where no change in EUT configuration is **possible**, the configuration is described as “single possible configuration”.

EUT arrangement refers to the termination of EUT ports / connection of support equipment, and where relevant, the relative positioning of samples (EUT and SE) in the test environment.

For further details of the test procedures and general test set ups used during testing please refer to the related document "EMC Test Methods - An Overview", which can be supplied by TRaC Telecoms & Radio upon request.

C1 Test samples

The following samples of the apparatus were submitted by the client for testing :

Sample No.	Description	Identification
S01	Buddi V8	S/N: UBIN 29920090
S05	Buddi V8	S/N: UBIN 29920038
S07	Emerson PSU	None

C2 EUT Operating Mode During Testing.

During testing, the EUT was exercised as described in the following tables :

Test	Description of Operating Mode
All Transmitter tests detailed in this report	EUT active transmitting, operating at 915MHz using 2FSK as the modulation method.

Test	Description of Operating Mode:
All Receiver tests detailed in this report	EUT active but non-transmitting.

C3 EUT Configuration Information.

The EUT was submitted for testing in one single possible configuration.

C4 List of EUT Ports

The tables below describe the termination of EUT ports:

Sample : S01
 Tests : All radiated emissions and power line emissions

Port	Description of Cable Attached	Cable length	Equipment Connected
dc Power Port	2 core unscreened	1m	S07

Sample : S05
 Tests : 20dB bandwidth

Port	Description of Cable Attached	Cable length	Equipment Connected
dc Power Port	2 core unscreened	1m	S07
Antenna port	Sucoflex cable	1m	REF847

Sample : S07
 Tests : All radiated emissions and power line emissions

Port	Description of Cable Attached	Cable length	Equipment Connected
dc Power Port	2 core unscreened	1m	S01
ac Power Port	None	N/A	ac mains

Sample : S07
 Tests : 20dB bandwidth

Port	Description of Cable Attached	Cable length	Equipment Connected
dc Power Port	2 core unscreened	1m	S05
ac Power Port	None	N/A	ac mains

C5 Details of Equipment Used

For Radiated Measurements:

For Radiated TX and Standby/RX spurious emissions 30MHz to 1GHz

RFG No	Type	Description	Manufacturer	Date Calibrated.
REF886	Lab 16	Large Anechoic Chamber	TRaC	10/06/10
095	96002	Bicon Antena (30-200MHz)	Eaton	12/05/10
191	3146	Log Periodic Antenna (200-1000MHz)	EMCO	12/05/10
673	310	Pre-Amp (9kHz-1GHz)	Sonoma	14/09/10
REF847	ESU	Spectrum Analyser	R&S	14/06/10
454		HF RF coaxial cable	Teledyne Reynolds	04/05/10
REF881		HF RF coaxial cable	Teledyne Reynolds	10/06/10
REF882		HF RF coaxial cable	Teledyne Reynolds	10/06/10
REF884		HF RF coaxial cable	Teledyne Reynolds	10/06/10

Radiated TX and Standby/RX spurious emissions 1GHz to 10GHz

RFG No	Type	Description	Manufacturer	Date Calibrated
REF886	Lab 16	Large Anechoic Chamber	TRaC	10/06/10
REF880	HL050	Log Periodic Antenna (1-26.5GHz)	R&S	14/05/10
307	HP8449B	Microwave Pre-Amp (1-26.5GHz)	HP	01/03/10
REF847	ESU	Spectrum Analyser	R&S	14/06/10
454		HF RF coaxial cable	Teledyne Reynolds	04/05/10
REF881		HF RF coaxial cable	Teledyne Reynolds	10/06/10
REF882		HF RF coaxial cable	Teledyne Reynolds	10/06/10
REF884		HF RF coaxial cable	Teledyne Reynolds	10/06/10

For Conducted Measurements

RFG No	Type	Description	Manufacturer	Date Calibrated
REF847	ESU	Spectrum Analyser	R&S	14/06/10
454		HF RF coaxial cable	Teledyne Reynolds	04/05/10

For Power Line Conducted Measurements

RFG No	Type	Description	Manufacturer	Date Calibrated
404	E4407B	Spectrum Analyser	Agilent	10/05/10
125	ESHS10	Test receiver	R&S	23/11/10
232	ESH2-Z5	LISN	R&S	22/05/10
674	0357.8810.54	Pulse Limiter	R&S	08/07/10
295	BNC	Cable	TRaC	17/09/10
299	BNC	Cable	TRaC	17/09/10

Appendix D:

Additional Information

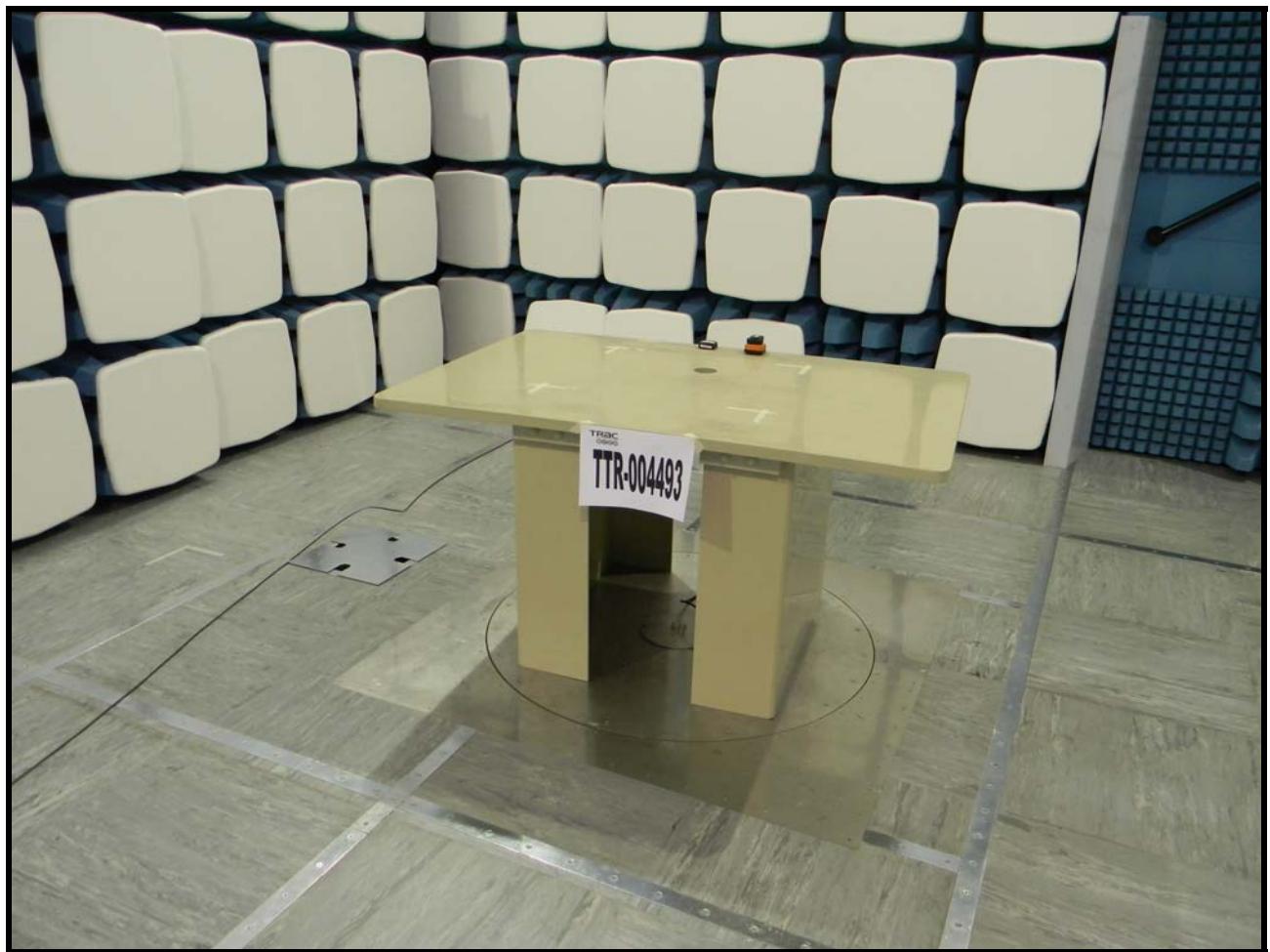
No additional information is included within this test report.

Appendix E:

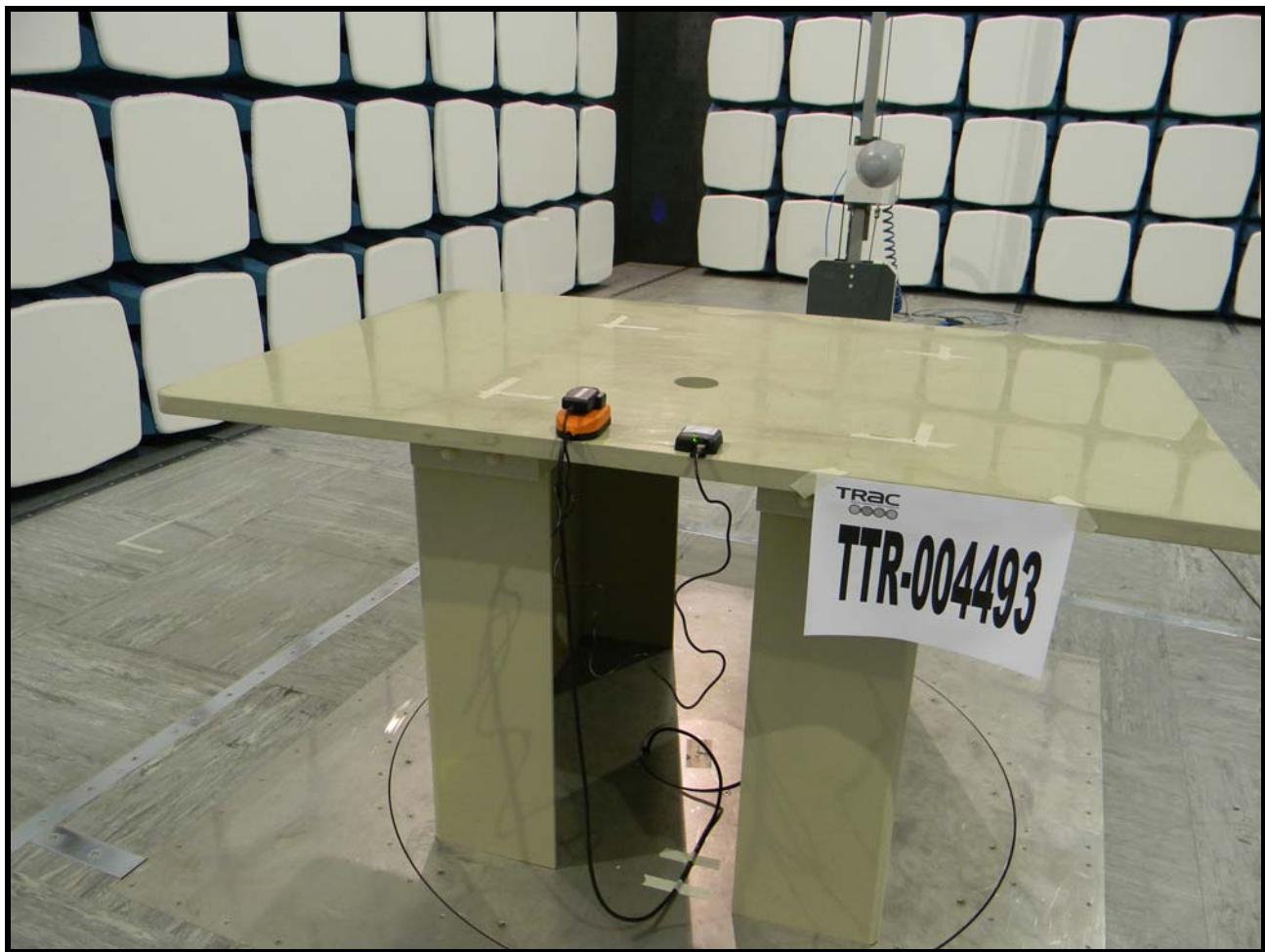
Photographs and Figures

The following photographs were taken of the test samples:

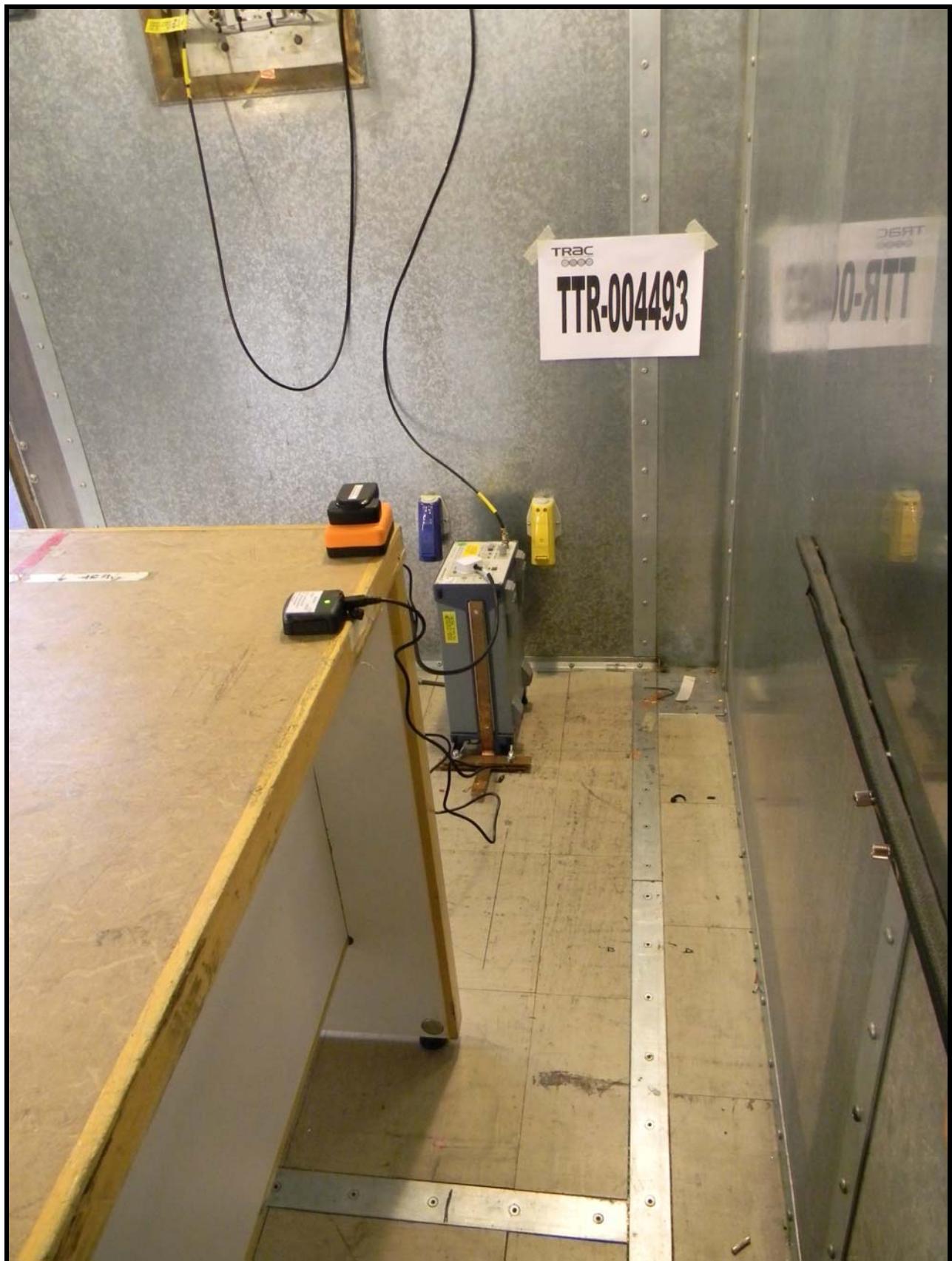
1. Radiated emissions overview: Front view
2. Radiated emissions overview: Back view
3. Power line conducted emissions overview



Photograph 1



Photograph 2



Photograph 3

