



KTL EMC Test Report : 3H7281GUS1

Applicant : Polycom Inc

Apparatus : SoundStation2 W

Authorised by

A handwritten signature in black ink, appearing to read 'McRenda'.

Issue Date : 1st March 2004

Authorised Copy Number : CD

Total number of pages : 43

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	7
Section 2:	Measurement Uncertainty	8
	2.1 Introduction	8
	2.2 Application of Measurement Uncertainty	8
	2.3 Measurement Uncertainty Values	9
Section 3:	Modifications	10
	3.1 Modifications Performed During Assessment	10
Appendix A:	Formal Test Results	11
	A1 Radiated Electric Field Emissions	12
	A2 AC Power Conducted Emissions	15
	A3 20 dB Bandwidth	18
	A4 Maximum Peak Power (EIRP)	19
	A5 Hopping frequencies	20
	A6 Channel Occupancy	21
	A6 Channel Occupancy	21
Appendix B:	Supporting Graphical Data	22
Appendix C:	Additional Test and Sample Details	29
Appendix D:	Additional Information	33
Appendix E:	Photographs and Figures	34

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.

Test performed by: KTL
Saxon Way
Priory Park West
Hull HU13 9PB
United Kingdom

Telephone: +44 (0) 1482 801801
Fax: +44 (0) 1482 801806
Email: ktl@ktl.com
Web site: www.ktl.com



Tests performed by: K J Anderson, Senior EMC Engineer

Report author: As above.

This report must not be reproduced except in full without prior written permission from KTL.

1.2 Tests Requested By

This testing in this report was requested by:

Polycom Inc
1565 Barber Lane
Milpitas
California
USA

1.3 Manufacturer

Celestica (Thailand) Ltd
49/18 Laem Chabang Industrial Estate
Moo, 5, Tungsukhla
Sriracha
Chonburi
Thailand
20230

1.4 Apparatus Assessed

The following apparatus was assessed between: 09/02/04 and 12/02/04:

SoundStation2 W

The Equipment was a conference phone that utilises a 2.4 GHz FHSS wireless link between the user interface (speaker, microphone, dialling mechanism etc.) and the line interface.

1.5 Test Result Summary

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
REFE	Title 47 of the CFR: 2002, Part 15 Subpart (c) 15.247	ANSI C63.4: 2001	PASS
AC Power conducted emissions	Title 47 of the CFR: 2002, Part 15 Subpart (c) 15.207	ANSI C63.4: 2001	PASS
20dB Bandwidth	Title 47 of the CFR: 2002, Part 15 Subpart (c) 15.247(a)(1)(i)	N/A	PASS
Maximum Peak Power	Title 47 of the CFR: 2002, Part 15 Subpart (c) 15.247(b)(2)	N/A	PASS
Hopping Frequencies	Title 47 of the CFR: 2002, Part 15 Subpart (c) 15.247(a)(1)	N/A	PASS
Channel Occupancy	Title 47 of the CFR: 2002, Part 15 Subpart (c) 15.247(a)(1)(i)	N/A	PASS

Abbreviations used in the above table:

Mod	: Modification	ANSI	: American National Standards Institution
CFR	: Code of Federal Regulations	PLCE	: Power Line Conducted Emissions
REFE	: Radiated Electric Field Emissions		

*See section 2.2 Note (c).

1.6 Notes Relating To The Assessment

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

- a) 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.
- b) The apparatus was set up and exercised using the configurations, modes of operation and arrangements defined in this report only.
- c) Where relevant, the apparatus was only assessed using the monitoring methods and susceptibility criteria defined in this report.
- d) 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

- e) All dates used in this report are in the format dd/mm/yy.
- f) This assessment has been performed in accordance with the requirements of ISO/IEC 17025.
- g) KTL Hull is a listed electromagnetic compatibility Conformance Assessment Body (CAB) for EC access to the US market. (Decision No 3/2000 of the Joint Committee established under the Agreement on Mutual Recognition between the European Community and the United States of America. This decision was effective from 16th January 2001).

KTL has submitted the information required by Section 2.948 of the FCC Rules for measuring specific types of intentionally radiating devices subject to the requirements in Part 15 of the FCC Rules. The FCC registration numbers for KTL's facilities are :

3m Alternative Test Site: 90743

3m and 10m Open Area Test Site 90744

1.7 Deviations from Test Standards

There were no deviations from the standards tested to.

Section 2:

Measurement Uncertainty

2.1 Introduction

The standard ISO/IEC 17025 used for laboratory accreditation requires laboratories to estimate measurement uncertainty using accepted methods of analysis.

Where required, the reported expanded uncertainty is based on a standard uncertainty providing a confidence level of approximately 95%.

Measurement uncertainty is calculated using the methods defined in the UKAS document Lab 34.

KTL measurement uncertainty is recorded in the KTL document UNC/RFG/001 Issue 16.

2.2 Application of Measurement Uncertainty

The following procedure is used when determining the result of a measurement:

- (i) If specification limits are not exceeded by the measured result, extended by the positive component of the expanded uncertainty interval at a confidence level of 95%, then a pass result is recorded.
- (ii) Where a specification limit is exceeded by the result even when the result is decreased by the negative component of the expanded uncertainty interval, a fail result is recorded.
- (iii) Where measured result is below a limit, but by a margin less than the positive measurement uncertainty component, it is not possible to record a pass based on a 95% confidence level. However, the result indicates that a pass result is more probable than a fail result.
- (iv) Where a measured result is above a limit, but by a margin less than the negative measurement uncertainty component, it is not possible to record a fail based on a 95% confidence level. However the result indicates that a fail is more probable than a pass.

2.3 Measurement Uncertainty Values

For the test data recorded in accordance with note (iii) of Section 2.2 the following measurement uncertainty was calculated:

Test type	Quantity	Quantity range	Expanded uncertainty
Radiated electric field emissions at the 3m alternative test site	Amplitude	30MHz to 100MHz	+4.3 / -4.1dB
		100MHz to 200MHz	+4.2 / -4.0dB
		200MHz to 700MHz	+4.2 / -3.5dB
		700MHz to 1000MHz	+4.3 / -3.7dB
		1 GHz to 26.5 GHz	+4.3 / -3.1 dB

Section 3:

Modifications

3.1 Modifications Performed During Assessment

No modifications were performed during the assessment:

Appendix A:**Formal Test Results**

Abbreviations used in the tables in this appendix:

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

A1 Radiated Electric Field Emissions

Preliminary radiated electric field emissions testing was performed using a peak detector in an absorber lined screened room.

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

10m 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: Conference Phone	
Regulation	Title 47 of the CFR :2002, Part 15 Subpart (c) Clause 15.247
Measurement standard	ANSI C63.4:2001
Frequency range	10 MHz to 25 GHz
EUT sample number	S01, S02, S05 and S06
Modification state	0
SE in test environment	S03 and S04
SE isolated from EUT	RFG400
EUT set up	Refer to Appendix C
Photographs (Appendix E)	Photograph 1

The worst case radiated emission measurements are listed below:

Ref No.	Freq (MHz)	Det.	Ang. Deg.	Height (cm)	Pol.	MD (m)	SD (m)	Result at SD (dB μ V/m)	Spec. Limit (dB μ V/m)	Margin (dB)	Result Summary
1	162.81	QP	330	200	V	3	3	33.3	54	-20.7	Pass
2	328.21	QP	302	180	H	3	3	38.8	54	-15.2	Pass
3	334.506	QP	295	185	H	3	3	41.8	54	-12.2	Pass
4	4964	Av	360	100	H	3	3	46.7	54	-7.3	Pass
5	7446	Av	360	100	H	3	3	53.2	54	-0.8	Pass*
6	18000	Av	360	100	H	3	3	86.2	103.1	-16.9	Pass

*See section 2.2 Note (iii).

Notes:

1. Testing below 30 MHz was performed using a magnetic loop antenna in accordance with ANSI C63.4:2001 section 8.2.1.
2. All other emissions in the restricted bands defined in 47CFR15.205(a) were greater than 10 dB below the 47CFR15.209 limit.
3. The emissions limit for emissions outside the restricted bands defined in 47CFR15.205(a) are based on a transmitted carrier level of 123.1 dB μ V/m

Test Details: Base Station	
Regulation	Title 47 of the CFR :2002, Part 15 Subpart (c) Clause 15.247
Measurement standard	ANSI C63.4:2001
Frequency range	10 MHz to 25 GHz
EUT sample number	S03 and S04
Modification state	0
SE in test environment	S01, S02, S05 and S06
SE isolated from EUT	RFG400
EUT set up	Refer to Appendix C
Photographs (Appendix E)	Photograph 1

The worst case radiated emission measurements are listed below:

Ref No.	Freq (MHz)	Det.	Ang. Deg.	Height (cm)	Pol.	MD (m)	SD (m)	Result at SD (dB μ V/m)	Spec. Limit (dB μ V/m)	Margin (dB)	Result Summary
1	162.81	QP	35	150	V	3	3	33.3	54.0	-20.7	Pass
2	328.21	QP	44	150	H	3	3	38.8	54.0	-15.2	Pass
3	334.506	QP	87	150	H	3	3	36.0	54.0	-18.0	Pass
4	4964	Av	360	100	H	3	3	46.7	54.0	-7.3	Pass
5	7446	Av	360	100	H	3	3	53.2	54.0	-0.8	Pass*
6	18000	Av	360	100	H	3	3	86.2	97.3	-11.1	Pass

*See section 2.2 Note (iii).

Notes:

1. Testing below 30 MHz was performed using a magnetic loop antenna in accordance with ANSI C63.4:2001 section 8.2.1.
2. All other emissions in the restricted bands defined in 47CFR15.205(a) were greater than 10 dB below the 47CFR15.209 limit.
3. The emissions limit for emissions outside the restricted bands defined in 47CFR15.205(a) are based on a transmitted carrier level of 117.3 dB μ V/m

The frequency measurement range was decided according to 47 CFR 15:2002 Clause 15.33.

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				

A2 AC Power Conducted Emissions

Preview 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) below.

Where applicable formal measurements of the emissions were performed with a peak, average and/or quasi peak detector. The formal measurements are detailed below:

Test Details : Conference Phone	
Regulation	Title 47 of the CFR Part 15(c) Section 15.207
Measurement standard	ANSI C63.4:2001
Frequency range	150kHz to 30MHz
Class	B
EUT sample number	S01, S02, S05 and S06
Modification state	0
SE in test environment	S03, S04
SE isolated from EUT	REF268
EUT set up	Refer to Appendix D
Photographs (Appendix F)	Photographs F

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

Ref No.	Freq (MHz)	Conductor	Detector Used	Result (dBuV)	Av Spec Limit (dBuV)	Result Summary
1	0.15	Neutral	Av	18.5	56.0	Pass
2	0.2	Neutral	Av	13.0	53.6	Pass
3	0.3	Neutral	Av	11.0	50.24	Pass
4	0.4	Neutral	Av	9.5	47.9	Pass
5	0.5	Neutral	Av	8.6	46.0	Pass
6	1.0	Neutral	Av	4.3	46.0	Pass
7	0.15	Live	Av	18.7	56.0	Pass
8	0.2	Live	Av	12.7	53.6	Pass
9	0.3	Live	Av	10.3	50.24	Pass
10	0.4	Live	Av	8.3	47.9	Pass
11	0.5	Live	Av	7.0	46.0	Pass
12	1.0	Live	Av	3.1	46.0	Pass

Ref No.	Freq (MHz)	Conductor	Detector Used	Result (dBuV)	Qp Spec Limit (dBuV)	Result Summary
1	0.15	Neutral	Qp	43.3	66.0	Pass
2	0.2	Neutral	QP	41.3	66.3	Pass
3	0.3	Neutral	Qp	38.2	60.2	Pass
4	0.4	Neutral	Qp	36.1	57.9	Pass
5	0.5	Neutral	Qp	34.2	56.0	Pass
6	1.0	Neutral	Qp	23.2	56.0	Pass
7	0.15	Live	Qp	43.0	66.0	Pass
8	0.2	Live	Qp	40.8	66.3	Pass
9	0.3	Live	Qp	37.1	60.2	Pass
10	0.4	Live	Qp	34.1	57.9	Pass
11	0.5	Live	Qp	30.9	56.0	Pass
12	1.0	Live	Qp	16.5	56.0	Pass

Preview 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) below.

Where applicable formal measurements of the emissions were performed with a peak, average and/or quasi peak detector. The formal measurements are detailed below:

Test Details : Base Station	
Standard	Title 47 of the CFR Part 15(c) Section 15.207
Reference document	ANSI C63.4:2001
Frequency range	150kHz to 30MHz
Class	B
EUT sample number	S03, S04
Modification state	0
SE in test environment	S01, S02, S05, S06
SE isolated from EUT	REF268
EUT set up	Refer to Appendix D
Photographs (Appendix F)	Photographs F

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

Ref No.	Freq (MHz)	Conductor	Detector Used	Result (dBuV)	Av Spec Limit (dBuV)	Result Summary
1	0.3	Neutral	Av	10.6	50.2	Pass
2	0.4	Neutral	Av	8.6	47.9	Pass
3	0.5	Neutral	Av	8.4	46.0	Pass
4	0.6	Neutral	Av	7.8	46.0	Pass
5	12.0	Neutral	Av	43.8	50.0	Pass
6	24.0	Neutral	Av	24.2	50.0	Pass
7	0.3	Live	Av	9.3	50.2	Pass
8	0.4	Live	Av	6.6	47.9	Pass
9	0.5	Live	Av	6.4	46.0	Pass
10	0.6	Live	Av	5.4	46.0	Pass
11	12.0	Live	Av	43.1	50.0	Pass
12	24.0	Live	Av	22.5	50.0	Pass

Ref No.	Freq (MHz)	Conductor	Detector Used	Result (dBuV)	Qp Spec Limit (dBuV)	Result Summary
1	0.3	Neutral	Qp	37.1	60.2	Pass
2	0.4	Neutral	Qp	34.6	50.9	Pass
3	0.5	Neutral	Qp	33.6	50.0	Pass
4	0.6	Neutral	Qp	33.0	56.0	Pass
5	12.0	Neutral	Qp	45.3	60.0	Pass
6	24.0	Neutral	Qp	27.0	60.0	Pass
7	0.3	Live	Qp	34.5	60.2	Pass
8	0.4	Live	Qp	31.1	50.9	Pass
9	0.5	Live	Qp	28.9	50.0	Pass
10	0.6	Live	Qp	27.3	56.0	Pass
11	12.0	Live	Qp	44.4	60.0	Pass
12	24.0	Live	Qp	26.6	60.0	Pass

Specification limits :

Limits for conducted disturbance at the mains ports of Class B information technology equipment.

Frequency range MHz	Limits dB μ V	
	Quasi-peak	Average
0.15 to 0.5	66 to 56	56 to 46
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.		

The specification limit in the above tables is the average detector limit. When the average limit was met using the peak detector, the EUT was deemed to meet both the average detector and quasi-peak detector limits, and measurement with the average detector and quasi-peak detector was not required.

Notes :

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

A3 20 dB Bandwidth

Title 47 of the CFR: 2002, Part 15 Subpart (c) 15.247(a)(1)(i) requires the measurement of the bandwidth of the transmission between the -20 dB points on the transmitted spectrum. The results of this test determine the limits for other tests. The formal measurements are detailed below:

Test Details: Conference Phone	
Regulation	Title 47 of the CFR :2002, Part 15 Subpart (c) 15.247(a)(1)(i)
EUT sample number	S07
Modification state	0
SE in test environment	S09, S20, 2H6417S08 and 2H6417S09
SE isolated from EUT	None
EUT set up	Refer to Appendix C

Measured 20 dB Bandwidth	Limit
863 kHz	864 KHz

Test Details: Base Station	
Regulation	Title 47 of the CFR :2002, Part 15 Subpart (c) 15.247(a)(1)(i)
EUT sample number	S08
Modification state	0
SE in test environment	S09, S20, 2H6417S08 and 2H6417S09
SE isolated from EUT	None
EUT set up	Refer to Appendix C

Measured 20 dB Bandwidth	Limit
863 kHz	864 KHz

A4 Maximum Peak Power (EIRP)

Peak carrier EIRP was carried out at an ANSI 63.4 test site with the EUT transmitting at a carrier frequency of 2.43688 GHz.

Test Details: Conference Phone	
Regulation	Title 47 of the CFR2002, Part15 Subpart (c) 15.247(b)(2)
EUT sample number	S01, S02, S05 and S06
Modification state	0
SE in test environment	S03 and S04
SE isolated from EUT	RFG 400
EUT set up	Refer to Appendix C

Measured Peak Carrier EIRP (W) at 2.482 GHz	Limit (W)
0.602	1

Test Details: Base Station	
Regulation	Title 47 of the CFR2002, Part15 Subpart (c) 15.247(b)(2)
EUT sample number	S03 and S04
Modification state	0
SE in test environment	S01, S02, S05 and S06
SE isolated from EUT	RFG400
EUT set up	Refer to Appendix C

Measured Peak Carrier EIRP (W) at 2.482 GHz	Limit (W)
0.158	1.0

A5 Hopping frequencies

Hopping frequencies were verified using a spectrum analyser in zero span mode, centred on each declared frequency in turn, while the EUT was operating in its normal frequency hopping mode.

Test Details: Conference Phone	
Regulation	Title 47 of the CFR :2002, Part 15 Subpart (c) 15.247(a)(1)(i)
EUT sample number	S07
Modification state	0
SE in test environment	S09,S20, 2H6417S08 and 2H6417S09
SE isolated from EUT	None
EUT set up	Refer to Appendix C

No. of Hopping Channels	Requirement
95	For 1W EIRP Limit, greater than 75

Test Details: Base Station	
Regulation	Title 47 of the CFR :2002, Part 15 Subpart (c) 15.247(a)(1)(i)
EUT sample number	S08
Modification state	0
SE in test environment	S09,S20, 2H6417S08 and 2H6417S09
SE isolated from EUT	None
EUT set up	Refer to Appendix C

No. of Hopping Channels	Requirement
95	For 1W EIRP Limit, greater than 75

A6 Channel Occupancy

Channel occupancy time was verified using a spectrum analyser in zero span mode, centred on the middle hopping channel frequency, while the EUT was operating in its normal frequency hopping mode. The other channels were then verified to ensure that the channel occupancy was identical for all channels.

Test Details: Conference Phone	
Regulation	Title 47 of the CFR2002, Part15 Subpart (c) 15.247(a)(1)(i)
EUT sample number	S07
Modification state	0
SE in test environment	S09,S20, 2H6417S08 and 2H6417S09
SE isolated from EUT	None
EUT set up	Refer to Appendix C

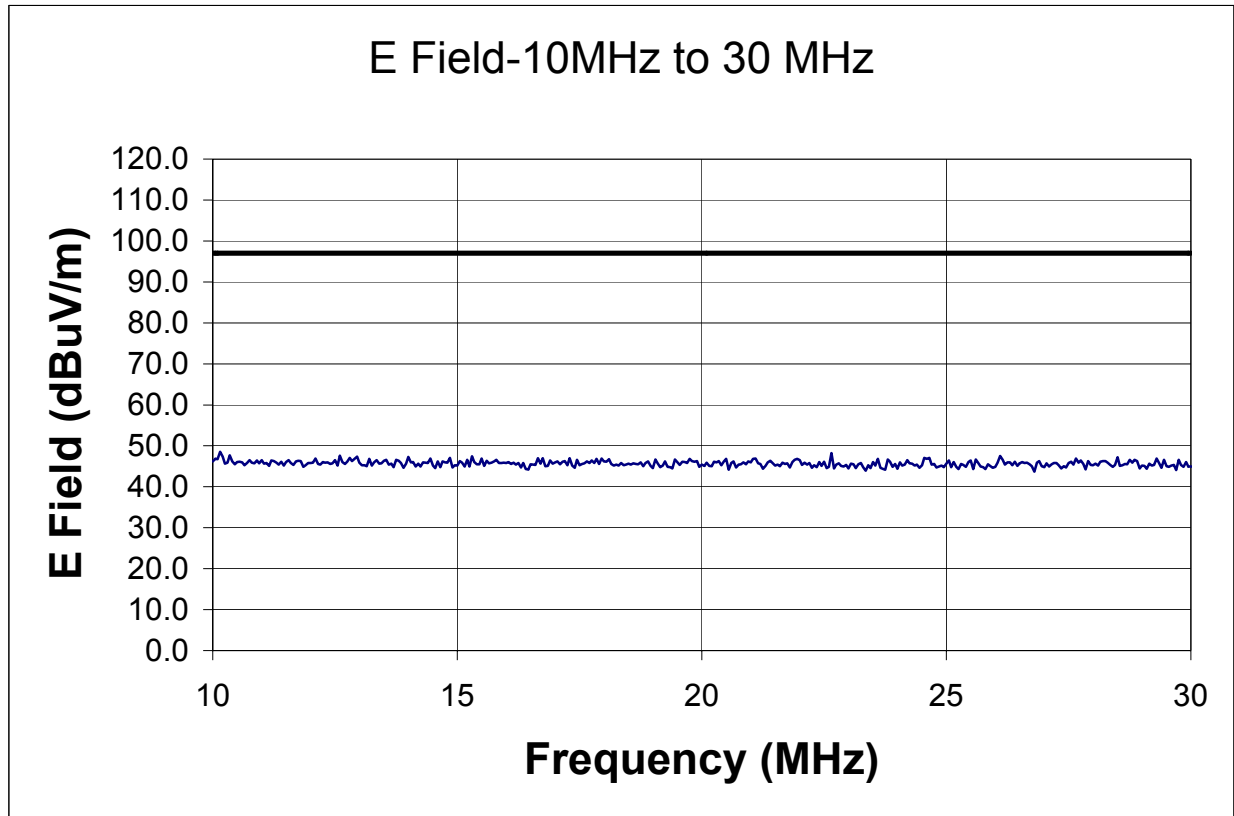
Measured Channel Occupancy Time	Limit
0.8625 ms	400 ms

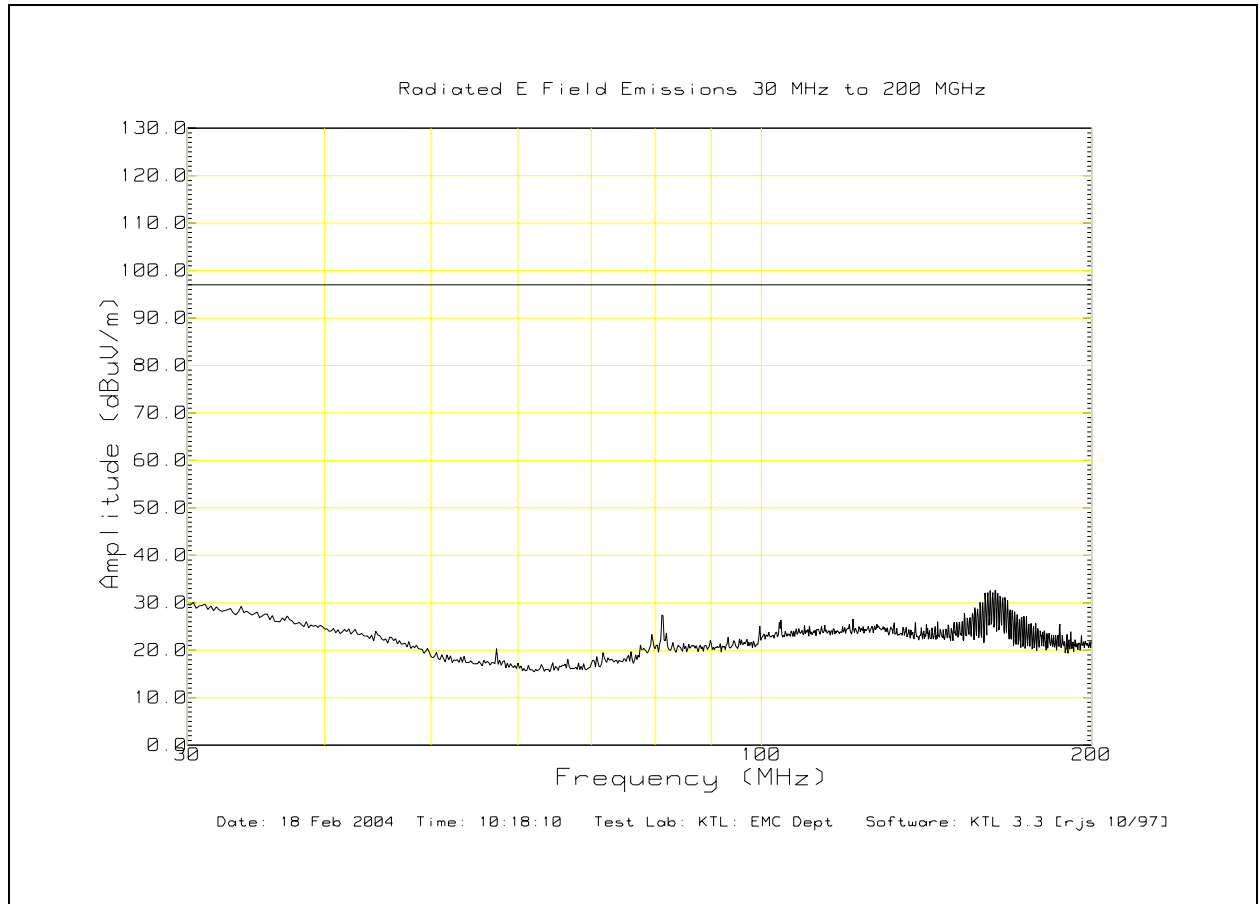
Test Details: Base Station	
Regulation	Title 47 of the CFR2002, Part15 Subpart (c) 15.247(a)(1)(i)
EUT sample number	S08
Modification state	0
SE in test environment	S09,S20, 2H6417S08 and 2H6417S09
SE isolated from EUT	None
EUT set up	Refer to Appendix C

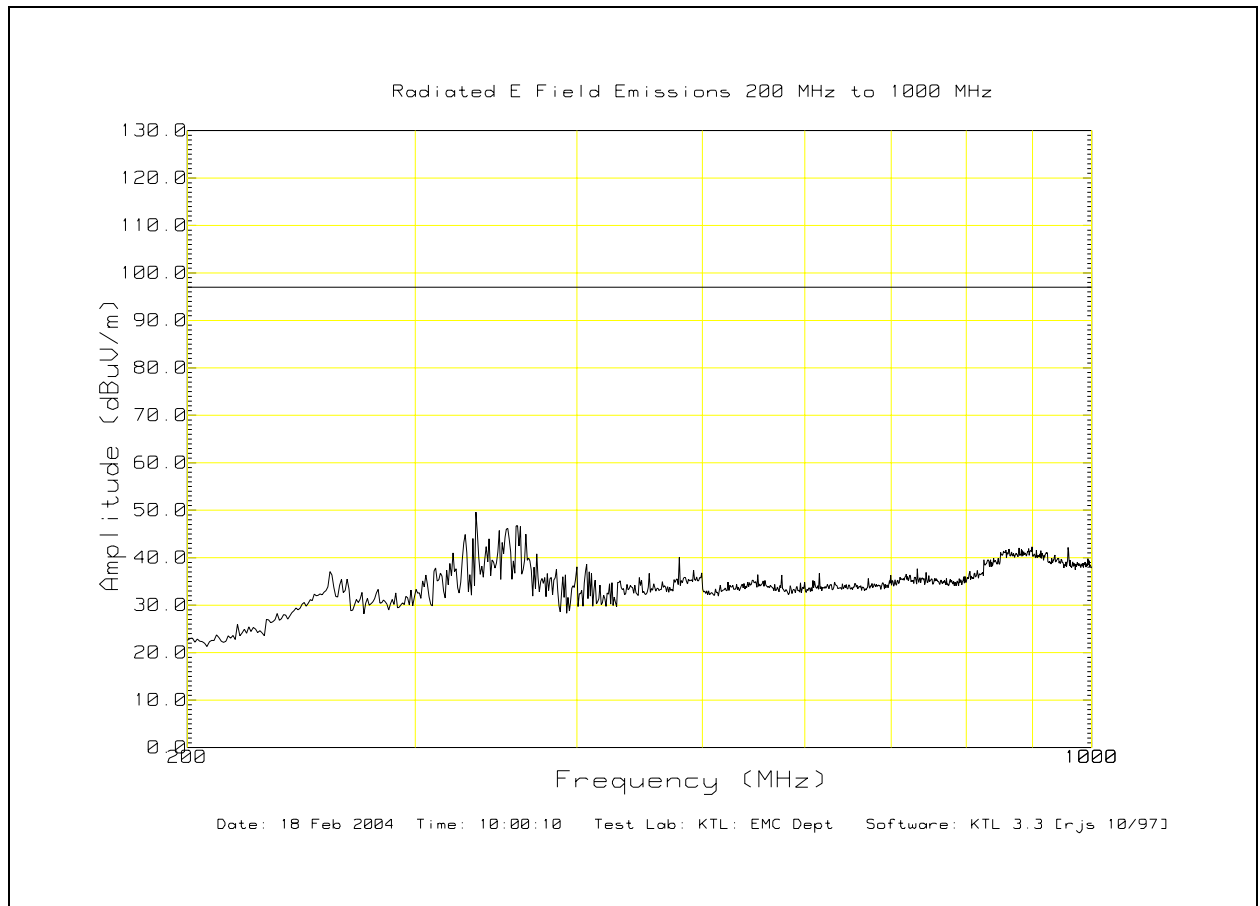
Measured Channel Occupancy Time	Limit
0.875 ms	400 ms

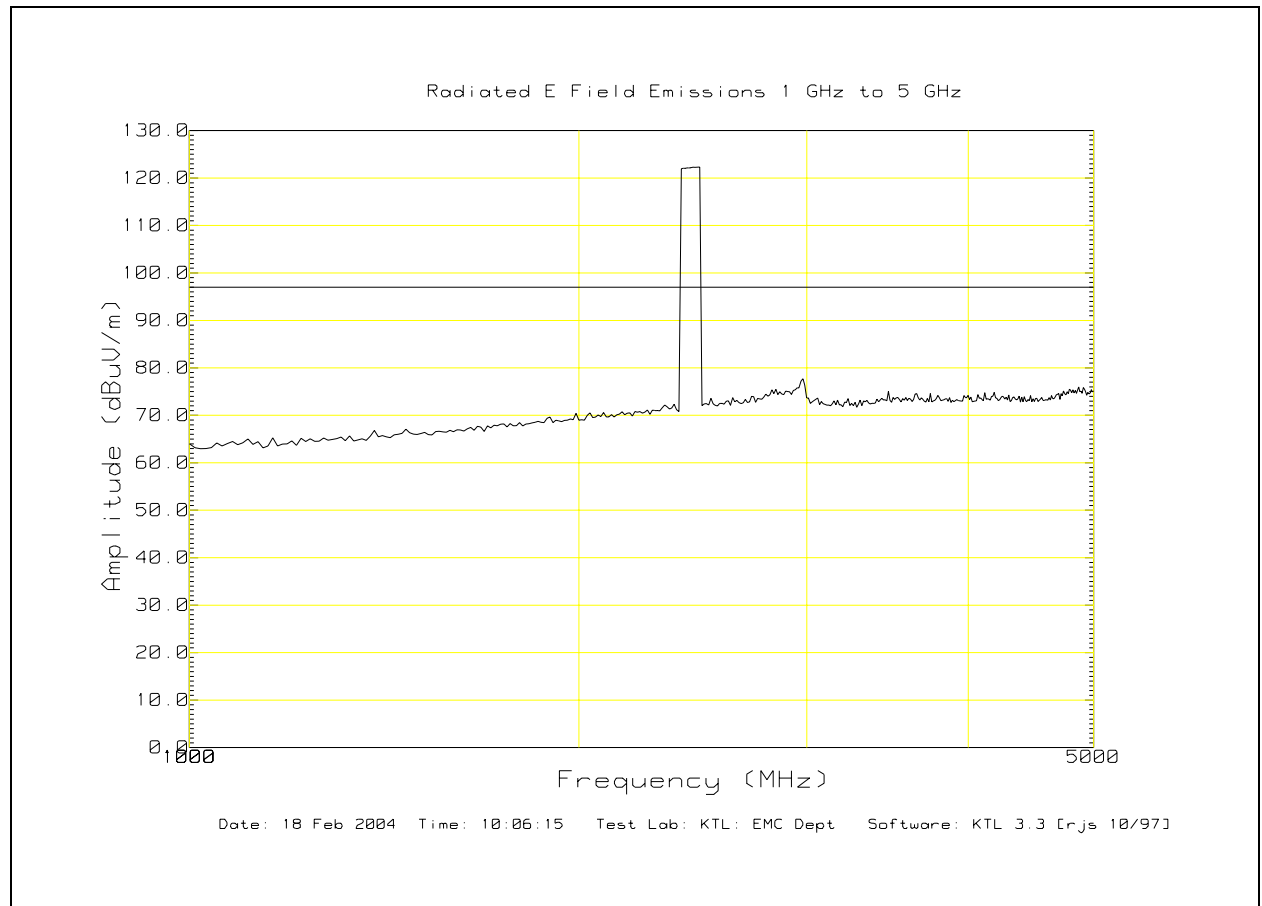
Appendix B:**Supporting Graphical Data**

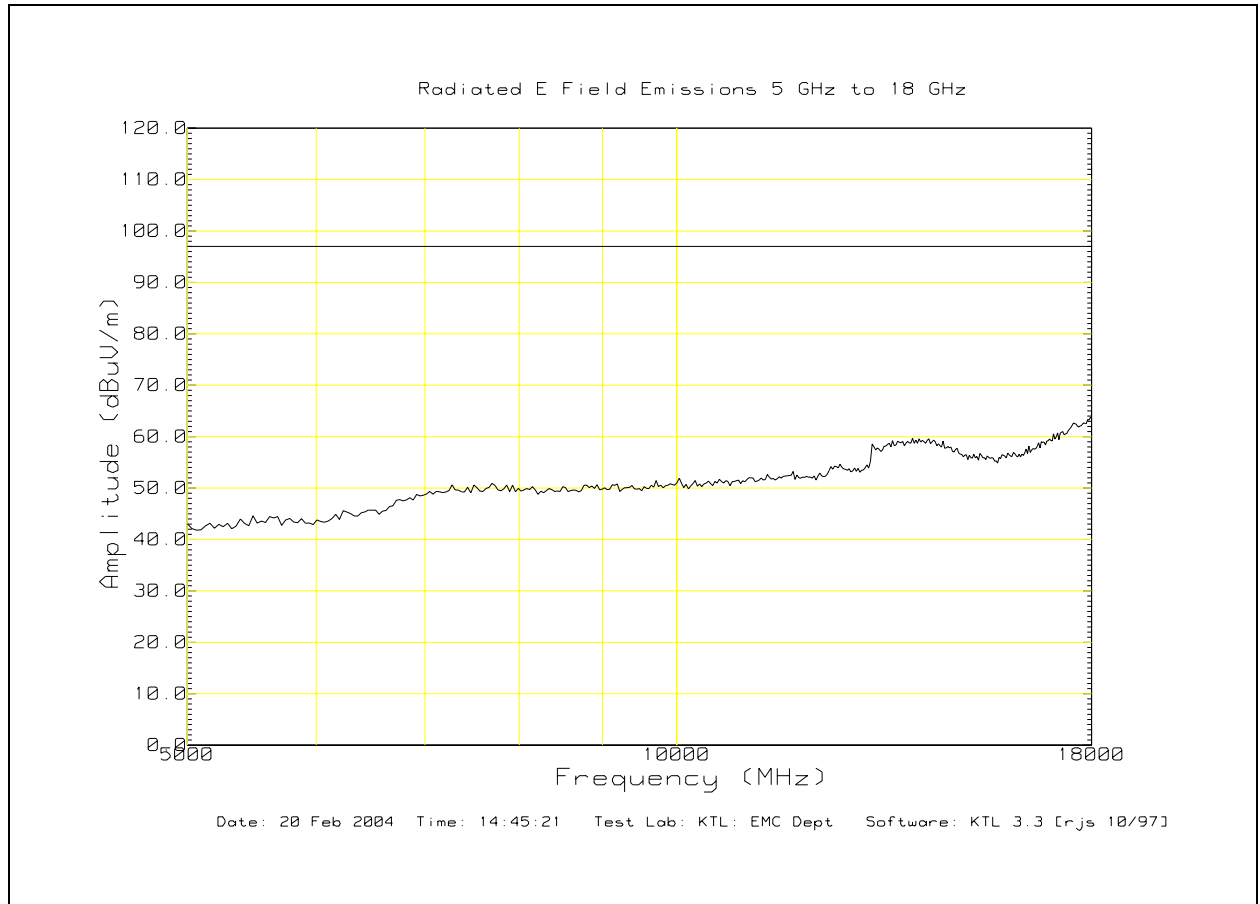
This appendix contains preview E Field data. The data was obtained using a peak detector. Formal measurements were made using a Quasi-Peak or Average detector as appropriate.

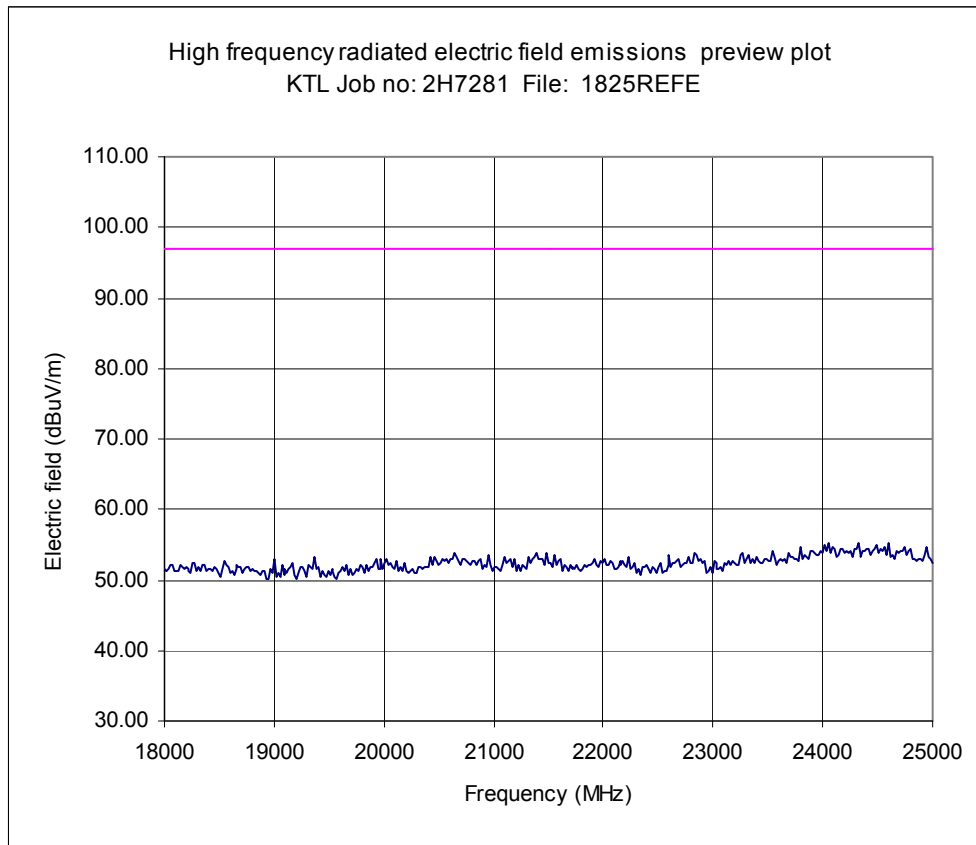












Appendix C:**Additional Test and Sample Details**

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 it's modification state:

Sample No: Sxx Mod w

where:

xx	= sample number	e.g. S01
w	= modification number	e.g. 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 KTL upon request.

C1) Test Samples

The following samples of the apparatus were submitted for testing:

Sample No.	Description	Identification
S01	SoundStation2 W (Conference Phone)	Serial No. 6203520000E
S02	PSU for S01	Part No. JOD-48-1199-3
S03	Base Station	None
S04	PSU for S03	Part No. AD41-1200400DU
S05	External Microphone	None
S06	External Microphone	None
S07	Conference phone	G2035200001D
S08	Base Station	Assy No. 2202-06642-001 Rev. X4
S12	PSU for S08	Part No. AD41-1200400DU
S13	PSU for S07	Part No. JOD-48-1199-3

The following samples of apparatus were submitted (or supplied by KTL) as host, support or drive equipment (auxiliary equipment):

Sample No.	Description	Identification
S09	Palimino RS232 Interface	None
S20	PSU for S09	Model No. JOD-488-020
2H6417S08	Toshiba Tectra 8100 Laptop PC	Serial No. 11122480G ST810-4
2H6417S09	Toshiba PA3083U-1ACA PSU for 2H6417S08	Serial No. 0112A0000462G
RFG400	KTL SPL Rack (TDU & PSU only)	None

C2) EUT Operating Mode During Testing.

During testing, the EUTs were exercised as described in the following tables :

Test	Description of Operating Mode
20 dB bandwidth	EUT transmitting on maximum power on Channel 1 (2401.8 MHz) using FSK Modulation
All other tests	EUT transmitting on maximum power using FHSS over 95 channels with 864 kHz channel spacing using FSK Modulation

C3) EUT Configuration Information.

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

C4) Termination of EUT Ports.

The table below describes the termination of EUT ports:

Sample : S01,S03,S07 and S08

Tests : All

Port	Description of Cable Attached	Cable length	Equipment Connected
S01 dc Input	2 Core Unscreened	2m	S02
S02 Mic1	4 Core Unscreened	2m	S05
S02 Mic2	4 Core Unscreened	2m	S06
S03 dc Input	2 Core Unscreened	2m	S04
S03 PSTN	4 Core PSTN Cable	10m	RFG400
S07 dc Input	2 Core Unscreened	2m	S09
S08 dc Input	2 Core Unscreened	2m	S22

C5) Details of test equipment used

For Radiated Electric Field Emissions 10 MHz to 1GHz:

RFG No	Type	Description	Manufacturer	Date Calibrated.
274	ATS	Ferrite Lined Chamber	KTL	16/09/02
023	HFH-Z2	Screened magnetic loop antenna 9 kHz to 30 MHz	R & S	02/04/02
231	CBL6111	Blue BILOG Antenna 30 MHz to 1GHz	Chase	02/05/00
214	ESAI	Spec Analyser/Test Receiver (LF/HF)	R & S	20/06/03

For Radiated Electric Field Emissions 1GHz to 18GHz

RFG No	Type	Description	Manufacturer	Date Calibrated
274	ATS	Ferrite Lined Chamber	KTL	16/09/02
129	3115	Horn Antennas	EMCO	29/07/98
307	HP8449B	Microwave Pre-Amp (1-26.5GHz)	HP	01/02/02
311	-	Sucoflex uW Adapter Cable 1m	Suhner	10/11/02
312	-	Sucoflex uW Adapter Cable 1m	Suhner	10/11/02
137	N-104	Sucoflex uW Cable 2m	Suhner	01/11/02
138	N-104	Sucoflex uW Cable 2m	Suhner	01/11/02
158	N-106	Sucoflex uW Cable 6m	Suhner	10/11/02
404	E4407B	Spectrum Analyser	Agilent	21/11/02

For Radiated Electric Field Emissions 18GHz to 25GHz

RFG No	Type	Description	Manufacturer	Date Calibrated
274	ATS	Ferrite Lined Chamber	KTL	16/09/02
N/A	EM3160-09	Horn Antennas	Electrometrics	17/08/02
307	HP8449B	Microwave Pre-Amp (1- 26.5GHz)	HP	01/02/02
311		Sucoflex uW Adapter Cable 1m	Suhner	10/11/02
312		Sucoflex uW Adapter Cable 1m	Suhner	10/11/02
N/A	UFA-147A	uW Cable 2m	Rosenberger	16/07/03
404	E4407B	Spectrum Analyser	Agilent	21/11/02

All other tests

RFG No	Type	Description	Manufacturer	Date Calibrated
404	E4407B	Spectrum Analyser	Agilent	21/11/02
313		Sucoflex uW Adapter Cable 1m	Suhner	10/11/02

Appendix D:

Additional Information

No additional information is included.

Appendix E:

Photographs and Figures

The following photographs were taken of the test samples:

- 1 Test Setup - Radiated Electric Field Emissions
- 2 Base Station External View
- 3 External View
- 4 Base Station PCB Top View
- 5 Base Station PCB Bottom View
- 6 Conference Phone Keyboard/Display PCB Top View
- 7 Conference Phone Keyboard/Display PCB Bottom View
- 8 Conference Phone Main PCB Top View
- 9 Conference Phone Main PCB Bottom View



Photograph 1



Photograph 2



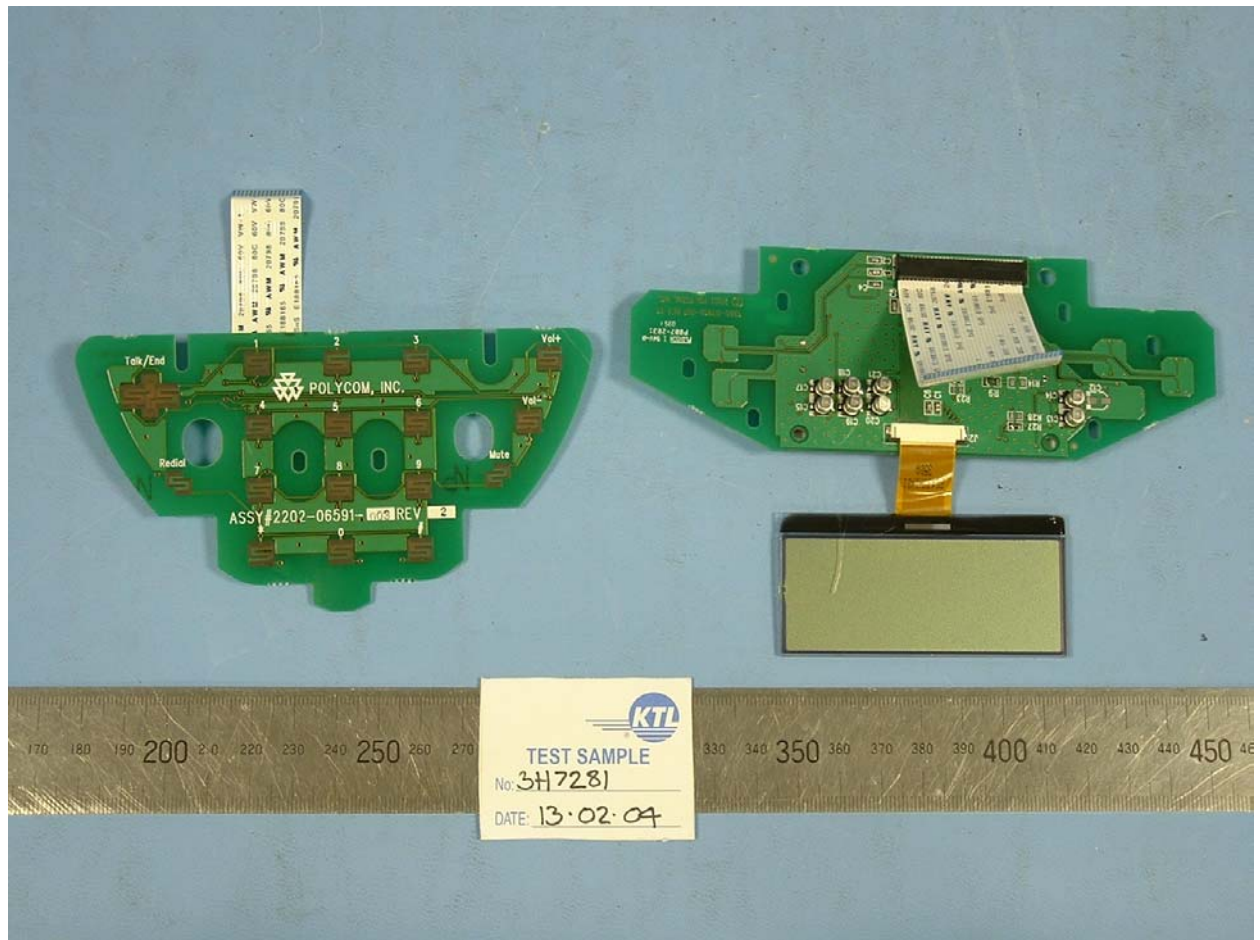
Photograph 3



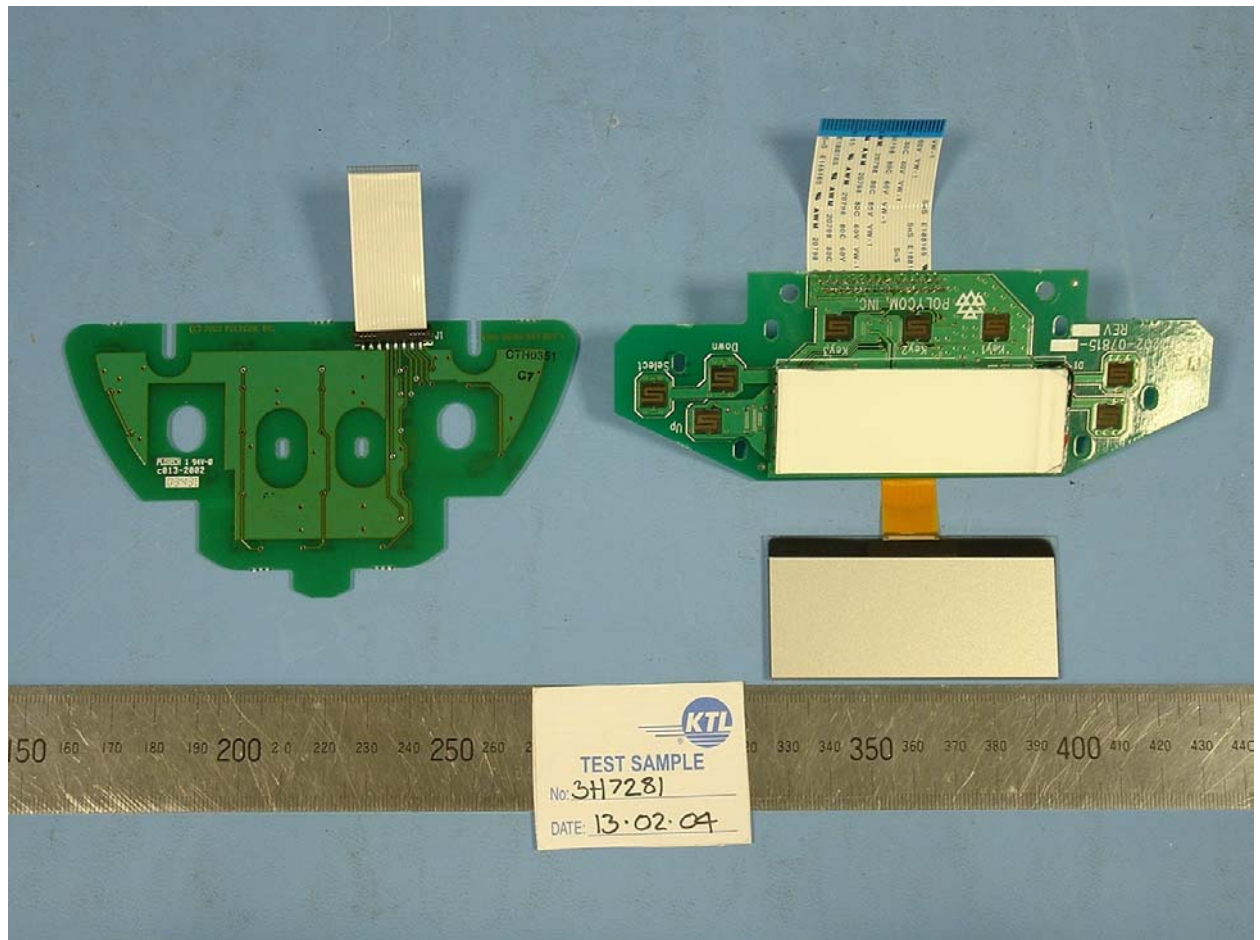
Photograph 4



Photograph 5



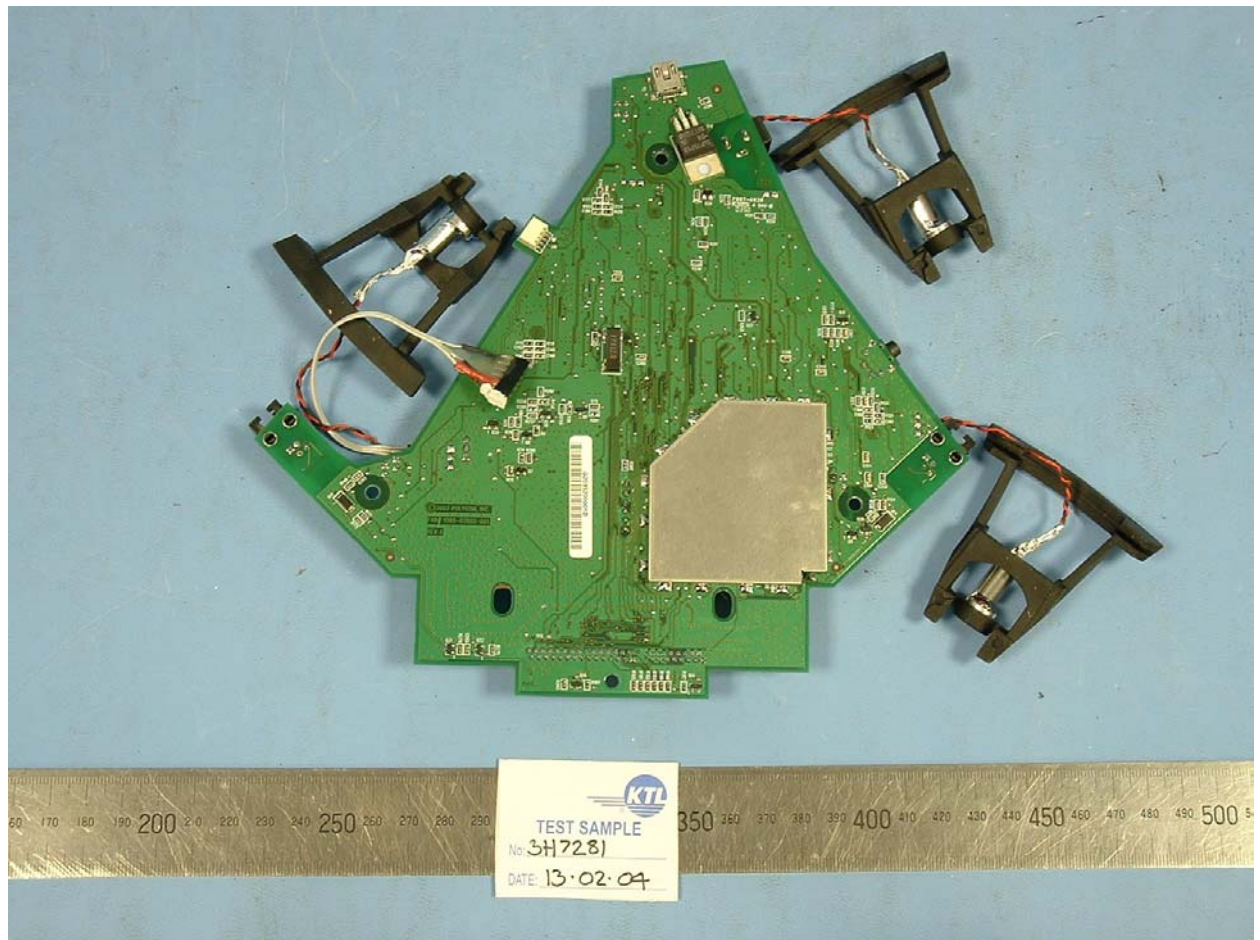
Photograph 6



Photograph 7



Photograph 8



Photograph 9