EN55022 / CISPR 22 / AS/NZS CISPR 22 Class B

EMI TEST REPORT

of

Product Name

Personal Computer

Model

EZ945;EX945;EY945

Applied by:

AOpen Inc.
N0. 83 , Ko Waug Road, Gau Yuan Tsun, Lung Tan Hsiang,
Tao-Yuan Hsien 325,
Taiwan, R. O. C.

Test Performed by:

International Standards Laboratory

Hsichih LAB	(V) Lung-Tan LAB
NEMKO:ELA 113a NVLAP:200234-0	NEMKO:ELA 113b NVLAP:200234-0
No. 65, Ku Dai Keng St.	No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd.
Hsichih, Taipei Hsien 22117	Lung-Tan Hsiang, Tao Yuan County 325
Taiwan, R.O.C.	Taiwan, R.O.C
Tel:(02)2646-2550	Tel:(03)407-1718
Fax:(02)2646-4641	Fax:(03)407-1738

Report Number: ISL-05LE134C **Issue Date: 2005/05/23**

HC LAB:NVLAP:200234-0;VCCI: R-341,C-354;NEMKO:ELA 113a,113c;BSMI:SL2-IN-E-0037;SL2-R1-E-0037;CNLA:1178
LT LAB:NVLAP:200234-0;VCCI: R-1435,C-1440;NEMKO:ELA 113b,113d;BSMI:SL2-IN-E-0013; CNLA:0997
ISL-T10-R2-9

Contents of Report

1. General

1.1 Certification of Accuracy of Test Data

Standards:	EN55022:1998/A1:2000 AS/NZS CISPR 22: 2002 Class B
Equipment Tested:	Personal Computer
Model:	EZ945;EX945;EY945
Applied by	AOpen Inc.
Sample received Date:	2005/05/12
Final test Date:	refer to the date of test data
Test Result	**PASS**
Test Engineer:	Jason Liao

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory.

The test results contained in this report accurately represent the radiated and power line conducted electromagnetic emissions generated by sample equipment under test at the time of the test.

The sample equipment tested as described in this report is in compliance with the limits of above standards.

Approve & Signature

Eddy Hsiung

Eddy Hsiung/Director

Test results given in this report apply only to the specific sample(s) tested under stated test conditions. This report shall not be reproduced other than in full without the explicit written consent of ISL. This report totally contains 45 pages, including 1 cover page , 1 contents page, and 43 pages for the test description.

1.2 Applicant Information

Applicant: AOpen Inc.
N0. 83 , Ko Waug Road, Gau Yuan Tsun, Lung Tan Hsiang,
Tao-Yuan Hsien 325,
Taiwan, R. O. C.

1.3 Operation Environment

Test Site: Chamber 02; Conduction 02

Test Distance 10M

Temperature refer to each site test data
Humidity: refer to each site test data

input power: Conduction input power: AC 230 V / 50 Hz
Radiation input power: AC 110 V / 60 Hz

2. Power Main Port Conducted Emissions

2.1 Configuration and Procedure

2.1.1 EUT Configuration

The EUT was set up on the non-conductive table that is 1.0 by 1.5 meter, 80cm above ground. The wall was 40cm to the rear of the EUT.

Power to the EUT was provided through the LISN. The impedance vs. frequency characteristic of the LISN is complied with the limit of standards used.

Both lines (neutral and hot) were connected to the LISN in series at testing. A coaxial-type connector which provides one 50 ohms impedance termination was connected to the test instrument. The excess length of the power cord was folded back and forth at the center of the lead to form a bundle 30cm to 40cm in length.

Any changes made to the configuration or modifications made to EUT during testing, are noted in the following test record.

If EUT has an extra auxiliary AC outlet which can provide power to an external monitor, all measurements will be made with the monitor power from EUT-mounted AC outlet and then from floor-mounted AC outlet.

2.1.2 Test Procedure

The system was set up as described above, with the EMI diagnostic software running. The main power line conducted EMI tests were run on both hot and neutral conductors of the power cord and the results were recorded. The effect of varying the position of the interface cables has been investigated to find the configuration that produces maximum emission.

At the frequencies where the peak values of the emissions were higher than 6dß below the applicable limits, the emissions were also measured with the quasi-peak detectors. At the frequencies where the quasi-peak values of the emissions were higher than 6dß below the applicable average limits, the emissions were also measured with the average detectors.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

2.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	150KHz--30MHz
Detector Function:	Quasi-Peak / Average Mode
Resolution Bandwidth:	9KHz

2.2 Test Data: Test Configuration 1

Table 2.2.1 Power Line Conducted Emissions (Hot)

Operator: Jason Liao
Temperature (C): 25
11:06:03 AM, Monday, May 16, 2005 Humidity (%): 49

Frequency MHz	LISN Loss (dB)	Cable Loss (dB)	QP Corrct. Amp.(dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVE Corrct. Amp.(dBuV)	AVE Limit (dBuV)	AVE Margin (dB)
0.19371	0.10	0.04	37.65	64.75	-27.10	26.94	54.75	-27.81
0.42241	0.10	0.08	30.51	58.22	-27.71	29.57	48.22	-18.65
0.5224	0.12	0.07	24.71	56.00	-31.29	11.57	46.00	-34.43
0.55028	0.13	0.07	27.73	56.00	-28.27	24.02	46.00	-21.98
0.58458	0.13	0.07	27.75	56.00	-28.25	24.14	46.00	-21.86
21.6354	0.83	0.34	26.72	60.00	-33.28	20.97	50.00	-29.03
22.5698	0.85	0.33	34.43	60.00	-25.57	32.86	50.00	-17.14
29.0694	1.06	0.36	34.18	60.00	-25.82	30.88	50.00	-19.12
29.4194	1.08	0.37	23.83	60.00	-36.17	16.69	50.00	-33.31
29.802	1.09	0.37	25.28	60.00	-34.72	17.02	50.00	-32.98

* Note:
Margin = Corrected Amplitude - Limit
Corrected Amplitude = Receiver Reading + LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit

Table 2.2.2 Power Line Conducted Emissions (Neutral)

Operator: Jason Liao
Temperature (C): 25
11:15:02 AM, Monday, May 16, 2005 Humidity (%): 49

Frequency MHz	LISN Loss (dB)	Cable Loss (dB)	QP Corrct. Amp.(dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVE Corrct. Amp.(dBuV)	AVE Limit (dBuV)	AVE Margin (dB)
0.16206	0.10	0.03	46.72	65.66	-18.94	41.46	55.66	-14.19
0.19423	0.10	0.04	45.04	64.74	-19.69	33.93	54.74	-20.80
0.42271	0.10	0.08	36.96	58.21	-21.25	36.26	48.21	-11.95
0.51993	0.12	0.07	33.41	56.00	-22.59	30.12	46.00	-15.88
0.55228	0.13	0.07	36.15	56.00	-19.85	35.47	46.00	-10.53
17.0903	0.18	0.32	43.62	60.00	-16.38	38.17	50.00	-11.83
19.9516	0.30	0.34	39.09	60.00	-20.91	34.28	50.00	-15.72
21.6329	0.37	0.34	31.92	60.00	-28.08	26.85	50.00	-23.15
22.784	0.41	0.33	46.84	60.00	-13.16	40.96	50.00	-9.04
28.4809	0.57	0.36	38.29	60.00	-21.71	32.63	50.00	-17.37

* Note:
Margin = Corrected Amplitude - Limit
Corrected Amplitude = Receiver Reading + LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit

2.3 Test Data: Test Configuration 2

Table 2.3.1 Power Line Conducted Emissions (Hot)

Operator: Jason Liao
Temperature (C): 25
11:32:58 AM, Monday, May 16, 2005 Humidity (%): 49

Frequency	LISN Loss	Cable Loss	QP Corrct.	QP Limit	QP Margin	AVE Corrct.	AVE Limit	AVE Margin
MHz	(dB)	(dB)	Amp.(dBuV)	(dBuV)	(dB)	Amp.(dBuV)	(dBuV)	(dB)
0.19385	0.10	0.04	40.46	64.75	-24.28	32.60	54.75	-22.14
0.42186	0.10	0.08	37.13	58.23	-21.11	35.76	48.23	-12.48
0.48623	0.11	0.07	31.69	56.39	-24.71	25.51	46.39	-20.88
0.5199	0.12	0.07	32.01	56.00	-23.99	29.89	46.00	-16.11
0.55106	0.13	0.07	35.66	56.00	-20.34	34.97	46.00	-11.03
3.14684	0.20	0.12	25.98	56.00	-30.02	21.50	46.00	-24.50
17.0901	0.57	0.32	44.93	60.00	-15.07	39.46	50.00	-10.54
19.9517	0.80	0.34	40.22	60.00	-19.78	34.56	50.00	-15.44
22.7843	0.86	0.33	47.49	60.00	-12.51	41.69	50.00	-8.31
28.4809	1.04	0.36	38.86	60.00	-21.14	33.45	50.00	-16.55

* Note:
Margin = Corrected Amplitude - Limit
Corrected Amplitude = Receiver Reading + LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit

Table 2.3.2 Power Line Conducted Emissions (Neutral)

Operator: Jason Liao
Temperature (C): 25
11:24:19 AM, Monday, May 16, 2005 Humidity (%): 49

Frequency MHz	LISN Loss (dB)	Cable Loss (dB)	QP Corrct. Amp.(dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVE Corrct. Amp.(dBuV)	AVE Limit (dBuV)	AVE Margin (dB)
0.16095	0.10	0.03	46.05	65.69	-19.64	41.72	55.69	-13.97
0.19451	0.10	0.04	43.59	64.73	-21.13	34.00	54.73	-20.73
0.42148	0.10	0.08	38.34	58.24	-19.91	36.71	48.24	-11.53
0.51855	0.12	0.07	33.26	56.00	-22.74	30.19	46.00	-15.81
0.5515	0.13	0.07	36.14	56.00	-19.86	35.42	46.00	-10.58
14.2554	0.11	0.29	34.80	60.00	-25.20	29.35	50.00	-20.65
17.087	0.18	0.32	43.59	60.00	-16.41	38.43	50.00	-11.57
19.9213	0.30	0.34	34.38	60.00	-25.62	29.11	50.00	-20.89
22.7844	0.41	0.33	42.79	60.00	-17.21	37.20	50.00	-12.80
28.4799	0.57	0.36	36.19	60.00	-23.81	30.66	50.00	-19.34

* Note:
Margin = Corrected Amplitude - Limit
Corrected Amplitude = Receiver Reading + LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit

3. Telecommunication Port Conducted Emissions

3.1 Configuration and Procedure

3.1.1 EUT Configuration

The EUT was set up on the non-conductive table that is 1.0 by 1.5 meter, 80cm above ground. The wall was 40cm to the rear of the EUT. The excess length of the power cord was folded back and forth at the center of the lead to form a bundle 30cm to 40cm in length. The distance between EUT and CDN is 80cm. CDN is connected to the reference ground plane.

Any changes made to the configuration, or modifications made to the EUT, during testing are noted in the following test record.

3.1.2 Test Procedure

The system was set up as described above, with the EMI diagnostic software running. The content of the software consist of both periodic and pseudo-random messages.

The effect of varying the position of the interface cables has been investigated to find the configuration that produces maximum emission.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

3.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	150KHz--30MHz
Detector Function:	Quasi-Peak / Average Mode
Resolution Bandwidth:	9KHz

3.2 Test Data: LAN--10M

Table 3.2.1 Telecommunication Port Conducted Emission

Operator: Jason Liao
Temperature(C): 25
12:03:12 PM, Monday, May 16, 2005 Humidity(%): 49

Frequency	Telcom_Loss	Telcom_Cable	QP Reading	QP Limit	QP Margin	AVG Reading	AVG Limit	AVG Margin
Hz	dBuv	dBuv	dBuv	dBuv	dB	dBuv	dBuv	dB
0.63568	6.11	0.04	19.13	74.00	-48.72	11.27	64.00	-46.58
0.75071	6.10	0.05	34.41	74.00	-33.44	33.38	64.00	-24.47
0.88536	6.09	0.06	22.35	74.00	-45.50	12.10	64.00	-45.74
0.9239	6.09	0.06	25.29	74.00	-42.56	16.92	64.00	-40.92
0.9817	6.08	0.07	24.65	74.00	-43.20	14.65	64.00	-43.20
16.2573	6.01	0.29	34.42	74.00	-33.28	26.69	64.00	-31.01
21.629	5.98	0.28	16.49	74.00	-51.25	11.12	64.00	-46.62
23.107	5.97	0.30	14.88	74.00	-52.85	10.38	64.00	-47.35
26.4865	5.97	0.33	10.30	74.00	-57.40	4.29	64.00	-53.41
26.638	5.97	0.33	11.30	74.00	-56.40	4.32	64.00	-53.39

* Note 1:
Margin = Corrected Amplitude - Limit
Corrected Amplitude = Receiver Reading + LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
* Note 2:

Provisionally, a relaxation of 10 dB over the frequency range of 6 MHz to 30 MHz is allowed for high-speed services having significant spectral density in this band. However, this relaxation is restricted to the common mode disturbance converted by the cable from the wanted signal. The provisional relaxation of 10 dB will be reviewed no later than three years after the date of withdraw based on the results and interference cased seen in this period. Wherever possible it is recommended to comply with the limits without the provisional relaxation.

3.3 Test Data: LAN--100M

Table 3.3.1 Telecommunication Port Conducted Emission

Operator: Jason Liao
Temperature(C): 25
11:55:04 AM, Monday, May 16, 2005 Humidity(%): 49

Frequency	Telcom_Loss	Telcom_Cable	QP Reading	QP Limit	QP Margin	AVG Reading	AVG Limit	AVG Margin
Hz	dBuv	dBuv	dBuv	dBuv	dB	dBuv	dBuv	dB
0.75018	6.10	0.05	35.49	74.00	-32.36	32.28	64.00	-25.57
0.77653	6.10	0.05	28.45	74.00	-39.40	23.15	64.00	-34.69
0.92953	6.09	0.06	34.11	74.00	-33.74	29.80	64.00	-28.05
0.96488	6.08	0.07	26.86	74.00	-40.99	20.89	64.00	-36.96
0.99076	6.08	0.07	31.91	74.00	-35.94	27.17	64.00	-30.68
16.2272	6.01	0.29	58.59	74.00	-9.11	55.81	64.00	-1.89
20.2275	5.98	0.26	46.03	74.00	-21.73	43.08	64.00	-14.68
23.1277	5.97	0.30	60.48	74.00	-7.25	57.43	64.00	-0.30
26.4862	5.97	0.33	58.51	74.00	-9.19	55.60	64.00	-2.10
26.6084	5.97	0.33	58.82	74.00	-8.88	55.90	64.00	-1.80

* Note 1:
Margin = Corrected Amplitude - Limit
Corrected Amplitude = Receiver Reading + LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
* Note 2:

Provisionally, a relaxation of 10 dB over the frequency range of 6 MHz to 30 MHz is allowed for high-speed services having significant spectral density in this band. However, this relaxation is restricted to the common mode disturbance converted by the cable from the wanted signal. The provisional relaxation of 10 dB will be reviewed no later than three years after the date of withdraw based on the results and interference cased seen in this period. Wherever possible it is recommended to comply with the limits without the provisional relaxation.

3.4 Test Data: LAN--GIGA (Current)

Table 3.4.1 Telecommunication Port Conducted Emission

Operator: Jason Liao
Temperature(C): 25
12:29:11 PM, Monday, May 16, 2005 Humidity(%): 48

Frequency	TelCom Loss	TelCom Cable	Reading	QP_Limit	Margin	Reading	AVG_Limit	Margin
MHz	dBuv	dBuv	dBuv	dBuv	dBuv	dBuv	dBuv	dBuv
0.48971	0.03	0.07	9.24	30.29	-20.96	3.01	20.29	-17.18
20.3057	-0.20	0.34	6.88	30.00	-22.98	0.90	20.00	-18.96
22.5709	-0.18	0.33	12.58	30.00	-17.27	8.72	20.00	-11.13
24.9503	-0.17	0.33	7.13	30.00	-22.71	1.05	20.00	-18.79
29.2705	-0.11	0.36	6.99	30.00	-22.76	1.41	20.00	-18.33

* Note 1:
Margin = Corrected Amplitude - Limit
Corrected Amplitude = Receiver Reading + LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
* Note 2:

Provisionally, a relaxation of 10 dB over the frequency range of 6 MHz to 30 MHz is allowed for high-speed services having significant spectral density in this band. However, this relaxation is restricted to the common mode disturbance converted by the cable from the wanted signal. The provisional relaxation of 10 dB will be reviewed no later than three years after the date of withdraw based on the results and interference cased seen in this period. Wherever possible it is recommended to comply with the limits without the provisional relaxation.

3.5 Test Data: LAN--GIGA (Voltage)

Table 3.5.1 Telecommunication Port Conducted Emission

Operator: Jason Liao
Temperature (C): 25
12:22:55 PM, Monday, May 16, 2005 Humidity (%): 54

Frequency	Telcom_Loss	Telcom_Cable	QP Reading	QP Limit	QP Margin	AVG_Reading	AVG_Limit	AVG_Margin
MHz	dBuV	dB	dBuV	dBuV	dB	dBuV	dBuV	dB
0.34485	22.58	0.09	17.07	78.43	-38.69	9.14	68.43	-36.62
0.37033	22.56	0.09	18.20	77.70	-36.86	9.55	67.70	-35.51
0.4606	22.46	0.08	16.10	75.13	-36.49	10.01	65.13	-32.57
0.75113	22.40	0.07	25.24	74.00	-26.29	23.03	64.00	-18.49
0.93508	22.39	0.07	18.11	74.00	-33.43	10.17	64.00	-31.37
4.20765	22.26	0.14	23.47	74.00	-28.13	15.08	64.00	-26.51
5.66648	22.11	0.16	22.51	74.00	-29.22	13.78	64.00	-27.95
6.40051	22.03	0.17	23.32	74.00	-28.48	14.56	64.00	-27.24
6.59977	22.01	0.17	22.58	74.00	-29.24	14.24	64.00	-27.58
22.5702	20.87	0.33	31.65	74.00	-21.14	30.97	64.00	-11.83

* Note 1:
Margin = Corrected Amplitude - Limit
Corrected Amplitude = Receiver Reading + LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
* Note 2:

Provisionally, a relaxation of 10 dB over the frequency range of 6 MHz to 30 MHz is allowed for high-speed services having significant spectral density in this band. However, this relaxation is restricted to the common mode disturbance converted by the cable from the wanted signal. The provisional relaxation of 10 dB will be reviewed no later than three years after the date of withdraw based on the results and interference cased seen in this period. Wherever possible it is recommended to comply with the limits without the provisional relaxation.

4. Radiated Disturbance Emissions

4.1 Configuration and Procedure

4.1.1 EUT Configuration

The equipment under test was set up on a non-conductive table 80cm above ground, on open field or chamber. The excess length of the power cord was folded back and forth at the center of the lead to form a bundle 30cm to 40cm in length.

Any changes made to the configuration, or modifications made to the EUT, during testing are noted in the following test record.

If EUT has an extra auxiliary AC outlet which can provide power to an external monitor, all measurements will be made with the monitor power from EUT-mounted AC outlet and then from floor-mounted AC outlet.

4.1.2 Test Procedure

The system was set up as described above, with the EMI diagnostic software running. The maximum emission was measured by varying the height of antenna and then by rotating the turntable. Both polarization of antenna, horizontal and vertical, were measured.

The highest emissions between 30 MHz to 1000 MHz were analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions. While doing so, the interconnecting cables and major parts of the system were moved around, the antenna height was varied between one and four meters, its polarization was varied between vertical and horizontal, and the turntable was slowly rotated, to maximize the emission.

4.1.3 Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	30MHz--1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth:	120KHz

4.2 Test Data: Test Configuration 1

Table 4.2.1 Radiated Emissions (Horizontal)

Operator: Jason Liao
Temperature (C): 25
06:56:27 PM, Friday, May 13, 2005 Humidity (%): 52

Frequency	RX_R	Ant_F	Cab_L	PreAmp	Emission	Limit	Margin	Ant.Pos	Table Pos
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg.
179.38	13.29	8.59	2.58	0.00	24.46	30.00	-5.54	192	149
194.9	13.88	8.70	2.66	0.00	25.24	30.00	-4.76	346	174
209.45	15.10	8.43	2.78	0.00	26.30	30.00	-3.70	260	145
224.97	11.48	8.65	2.89	0.00	23.01	30.00	-6.99	190	305
285.11	15.55	13.20	3.41	0.00	32.17	37.00	-4.83	222	321
314.21	14.55	13.80	3.76	0.00	32.11	37.00	-4.89	130	154
359.8	13.17	14.61	4.17	0.00	31.96	37.00	-5.04	144	106
540.22	9.43	18.55	5.46	0.00	33.43	37.00	-3.57	342	120
639.16	6.57	18.98	6.23	0.00	31.78	37.00	-5.22	198	131
934.04	3.30	20.88	8.32	0.00	32.50	37.00	-4.50	237	108

* Note:
Margin = Corrected Amplitude – Limit
Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
BILOG Antenna Distance: 10 meter, Frequency: under 1000MHz
Horn Antenna Distance: 3 meter, Frequency: 1000MHz—18GHz

Table 4.2.2 Radiated Emissions (Vertical)

Operator: Jason Liao
Temperature (C): 25
07:29:52 PM, Friday, May 13, 2005 Humidity (%): 52

Frequency	RX_R	Ant_F	Cab_L	PreAmp	Emission	Limit	Margin	Ant.Pos	Table Pos
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg.
62.01	19.27	5.40	1.37	0.00	26.04	30.00	-3.96	193	144
109.54	7.45	11.64	2.03	0.00	21.12	30.00	-8.88	115	182
209.45	15.33	8.43	2.78	0.00	26.53	30.00	-3.47	260	145
224.97	11.58	8.65	2.89	0.00	23.12	30.00	-6.88	190	305
540.22	5.94	18.55	5.46	0.00	29.94	37.00	-7.06	342	120
639.16	6.24	18.98	6.23	0.00	31.45	37.00	-5.55	198	131
659.53	4.16	19.00	6.37	0.00	29.52	37.00	-7.48	170	109
750.71	6.20	20.10	6.99	0.00	33.30	37.00	-3.70	393	214
791.45	3.22	20.10	7.28	0.00	30.60	37.00	-6.40	232	297
979.63	2.34	21.16	8.71	0.00	32.21	37.00	-4.79	206	52

* Note:
Margin = Corrected Amplitude – Limit
Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
BILOG Antenna Distance: 10 meter, Frequency: under 1000MHz
Horn Antenna Distance: 3 meter, Frequency: 1000MHz—18GHz

4.3 Test Data: Test Configuration 2

Table 4.3.1 Radiated Emissions (Horizontal)

Operator: Jason Liao
Temperature (C): 25
07:59:09 PM, Friday, May 13, 2005 Humidity (%): 52

Frequency	RX_R	Ant_F	Cab_L	PreAmp	Emission	Limit	Margin	Ant.Pos	Table Pos
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg.
119.24	13.20	11.70	2.06	0.00	26.96	30.00	-3.04	210	20
179.38	14.41	8.59	2.58	0.00	25.59	30.00	-4.41	192	149
194.9	14.91	8.70	2.66	0.00	26.26	30.00	-3.74	346	174
209.45	15.49	8.43	2.78	0.00	26.70	30.00	-3.30	260	145
224.97	12.98	8.65	2.89	0.00	24.52	30.00	-5.48	190	305
329.73	10.52	14.02	3.92	0.00	28.46	37.00	-8.54	135	124
491.72	5.25	17.30	5.20	0.00	27.75	37.00	-9.25	178	213
540.22	7.26	18.55	5.46	0.00	31.26	37.00	-5.74	342	120
639.16	6.36	18.98	6.23	0.00	31.57	37.00	-5.43	198	131
989.33	2.56	21.18	8.78	0.00	32.52	37.00	-4.48	206	35

* Note:
Margin = Corrected Amplitude – Limit
Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
BILOG Antenna Distance: 10 meter, Frequency: under 1000MHz
Horn Antenna Distance: 3 meter, Frequency: 1000MHz—18GHz

Table 4.3.2 Radiated Emissions (Vertical)

Operator: Jason Liao
Temperature (C): 25
07:59:09 PM, Friday, May 13, 2005 Humidity (%): 52

Frequency	RX_R	Ant_F	Cab_L	PreAmp	Emission	Limit	Margin	Ant.Pos	Table Pos
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg.
49.4	18.20	7.59	1.19	0.00	26.98	30.00	-3.02	368	137
149.31	9.74	9.46	2.33	0.00	21.54	30.00	-8.46	189	335
194.9	13.22	8.70	2.66	0.00	24.58	30.00	-5.42	346	174
209.45	13.20	8.43	2.78	0.00	24.41	30.00	-5.59	260	145
329.73	10.34	14.02	3.92	0.00	28.28	37.00	-8.72	135	124
540.22	5.98	18.55	5.46	0.00	29.98	37.00	-7.02	342	120
639.16	5.33	18.98	6.23	0.00	30.53	37.00	-6.47	198	131
747.8	6.49	20.05	6.98	0.00	33.52	37.00	-3.48	383	209
839.95	3.89	20.50	7.73	0.00	32.12	37.00	-4.88	200	153
959.26	2.59	21.12	8.54	0.00	32.25	37.00	-4.75	205	90

* Note:
Margin = Corrected Amplitude – Limit
Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
BILOG Antenna Distance: 10 meter, Frequency: under 1000MHz
Horn Antenna Distance: 3 meter, Frequency: 1000MHz—18GHz

5. Appendix

5.1 Appendix A: Measurement Procedure for Main Power Port Conducted Emissions

The measurements are performed in a 3.5m x 3.4m x 2.5m shielded room, which referred as Conduction 01 test site, or a 3m x 3m x 2.3m test site, which referred as Conduction 02 test site. The EUT was placed on non-conduction 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50ohm/50uH) vs. Frequency Characteristic in accordance with the standard. Power to the LISNs were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.

If the EUT is supplied with a flexible power cord, the power cord length in excess of the distance separating the EUT from the LISN shall be folded back and forth at the center of the lead so as to form a bundle not exceeding 40cm in length. If the EUT is provided with a permanently coiled power cord, bundling of the cord is not required. If the EUT is supplied without a power cord, the EUT shall be connected to the LISN by a power cord of the type specified by the manufacturer which shall not be longer than 1 meter. The excess power cord shall be bundled as described above. If a non-flexible power cord is provided with the EUT, it shall be cut to the length necessary to attach the EUT to the LISN and shall not be bundled.

The interconnecting cables were arranged and moved to get the maximum measurement. Both the line of power cord, hot and neutral, were measured.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

5.2 Appendix B: Measurement Procedure for Telecommunication Port Conducted Emissions

The measurements are performed in a 3.5m x 3.4m x 2.5m shielded room, which referred as Conduction 01 test site, or a 3m x 3m x 2.3m test site, which referred as Conduction 02 test site. The EUT was placed on non-conduction 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

The EUT, any support equipment, and any interconnecting cables were arranged and moved to get the maximum measurement.

Power to the EUT was provided through the LISN which has the Impedance (50 Ohm/50uH) vs. Frequency Characteristic in accordance with the standard. Power to the LISN was filtered to eliminate ambient signal interference and this filter was bonded to ground. Peripheral equipment to provide a functional system (support equipment) for EUT testing was powered through a ganged, metal power outlet box bonded to the ground. AC input power for the auxiliary power outlets was obtained from the same filtered source that provides input power to the LISN.

If the EUT is supplied with a flexible power cord, if the power cord length in excess of 1 m, the excess cable shall be bundled at approximate center of the power cord with the bundles 30 cm to 40 cm in length. If the EUT is provided with a permanently coiled power cord, bundling of the cord is not required. If the EUT is supplied without a power cord, the EUT shall be connected to the LISN by a power cord of the type specified by the manufacturer which shall be 1 meter in length. If a non-flexible power cord is provided with the EUT, it shall be cut to the length necessary to attach the EUT to the LISN and shall not be bundled.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information could be useful in reducing their amplitude.

5.3 Appendix C: Test Procedure for Radiated Emissions

Preliminary Measurements in the Anechoic Chamber

The radiated emissions are initially measured in the anechoic chamber at a measurement distance of 3 meters. Desktop EUT are placed on a wooden stand 0.8 meter in height. The measurement antenna is 3 meters from the EUT. The test setup in anechoic chamber is the same as open site. The turntable rotated 360°C. The antenna height is varied from 1-2.5m. The primary objective of the radiated measurements in the anechoic chamber is to identify the frequency spectrum in the absence of the electromagnetic environment existing on the open test site. The frequencies can then be pre-selected on the open test site to obtain the corresponding amplitude. The initial scan is made with the spectrum analyzer in automatic sweep mode. The spectrum peaks are then measured manually to determine the exact frequencies.

Measurements on the Open Site or Chamber

The radiated emissions test will then be repeated on the open site or chamber to measure the amplitudes accurately and without the multiple reflections existing in the shielded room. The EUT and support equipment are set up on the turntable of one of 10 meter open field sites. Desktop EUT are set up on a wooden stand 0.8 meter above the ground.

For the initial measurements, the receiving antenna is varied from 1-4 meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. Both reading are recorded with the quasi-peak detector with 120KHz bandwidth. For frequency between 30 MHz and 1000MHz, the reading is recorded with peak detector or quasi-peak detector.

At the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. The interconnecting cables were arranged and moved to get the maximum measurement. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings.

5.4 Appendix D: Test Equipment

5.4.1 Test Equipment List

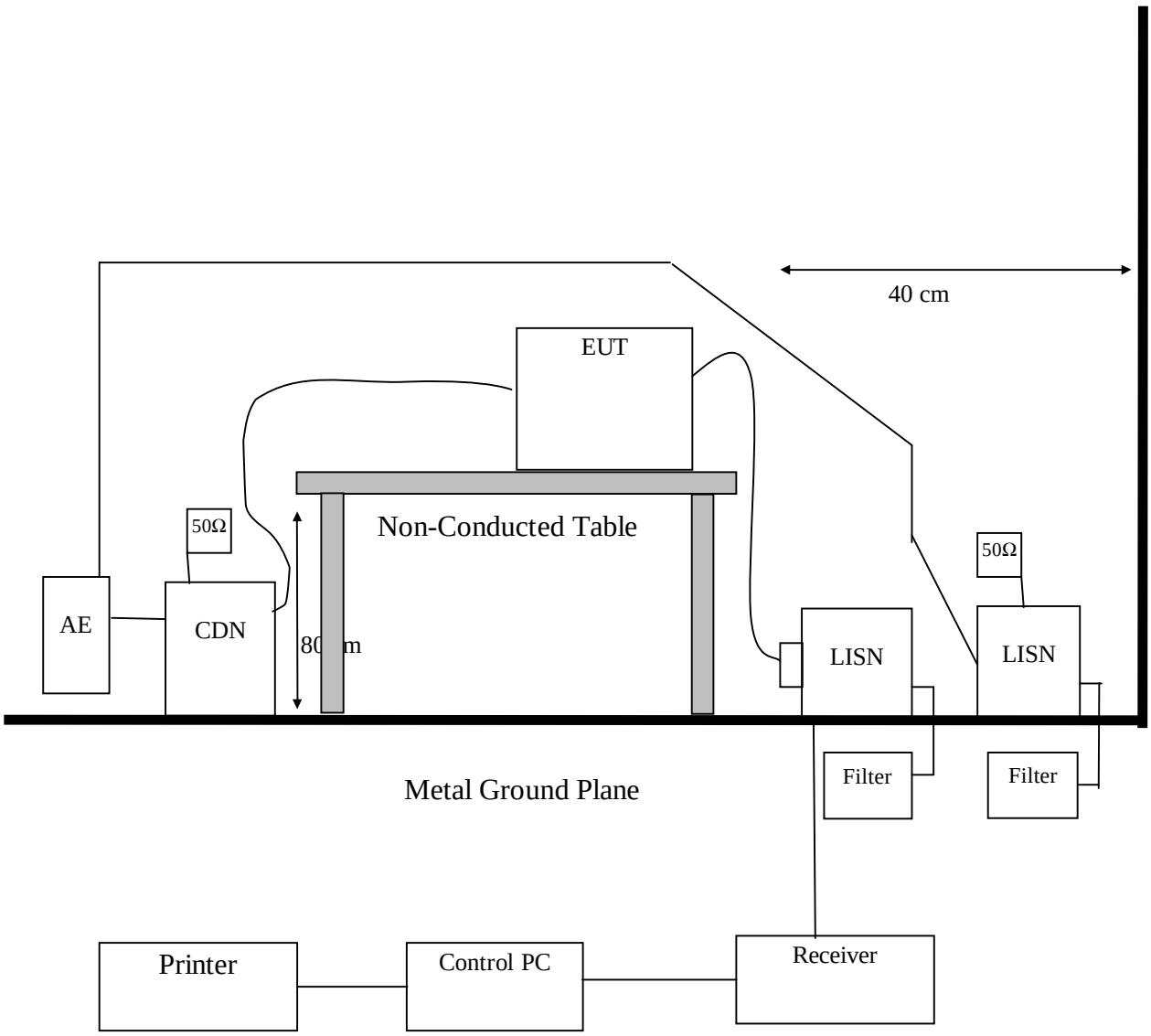
Location	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Conduction	CDN T2 03	FCC Inc.	FCC-801-T2	02066	01/07/2005	01/07/2006
Conduction	CDN T4 04	FCC Inc.	FCC-801-T4	02069	02/03/2005	02/03/2006
Conduction	Coaxial Cable 1F-C2	Harbourindustries	RG400	1F-C2	06/02/2004	06/02/2005
Conduction	Current Probe	Schaffner	SMZ 11	18030	12/28/2004	12/28/2005
Conduction	Digital Hygro-Thermometer Conduct	MicroLife	HT-2126G	ISL-Conduction02	12/04/2004	12/04/2005
Conduction	EMI Receiver 02	HP	85460A	3448A00183	10/01/2004	10/01/2005
Conduction	ISN T4	Schaffner	ISN T400	16593	12/27/2004	12/27/2005
Conduction	ISN T4 02	FCC	F-CMISN-CAT5	02003	12/27/2004	12/27/2005
Conduction	Capacitive Voltage Probe	FCC	F-CVP-1	68	05/19/2005	05/19/2006
Conduction	LISN 06	R&S	ESH3-Z5	828874/009	12/18/2004	12/18/2005
Conduction	LISN 04	EMCO	3810/2	9604-1429	12/24/2004	12/24/2005
Radiation	BILOG Antenna 08	Schaffner	CBL6112B	2756	06/02/2004	06/02/2005
Radiation	Coaxial Cable Chmb 02-10M	Belden	RG-8/U	Chmb 02-10M	11/16/2004	11/16/2005
Radiation	Digital Hygro-Thermometer Chmb 02	MicroLife	HT-2126G	Chmb 02	11/30/2004	11/30/2005
Radiation	EMI Receiver 03	HP	85460A	3448A00209	01/08/2005	01/08/2006
Radiation	Loop Antenna 01	R&S	HFH2-Z2	881056/46	07/29/2004	07/29/2005
Radiation	Spectrum Analyzer 13	Advantest	R3132	121200411	02/16/2005	02/16/2006
Rad. Above 1Ghz	Horn Antenna 02	Com-Power	AH-118	10088	02/17/2005	02/17/2006
Rad. Above 1Ghz	Horn Antenna 04	Com-Power	AH-826	081-001	01/13/2005	01/13/2006
Rad. Above 1Ghz	Horn Antenna 05	Com-Power	AH-640	100A	09/22/2004	09/22/2005
Rad. Above 1Ghz	Microwave Cable RF SK-01	HUBER+SUHNER AG.	Sucoflex 102	22139 /2	07/07/2004	07/07/2005
Rad. Above 1Ghz	Preamplifier 02	MITEQ	AFS44-00102650-40-10P-44	728229	01/12/2005	01/12/2006
Rad. Above 1Ghz	Preamplifier 10	MITEQ	JS-26004000-27-5A	818471	02/28/2005	02/28/2006
Rad. Above 1Ghz	Spectrum Analyzer 14	Advantest	R3182	140600028	09/09/2004	09/09/2005

5.4.2 Software for Controlling Spectrum/Receiver and Calculating Test Data

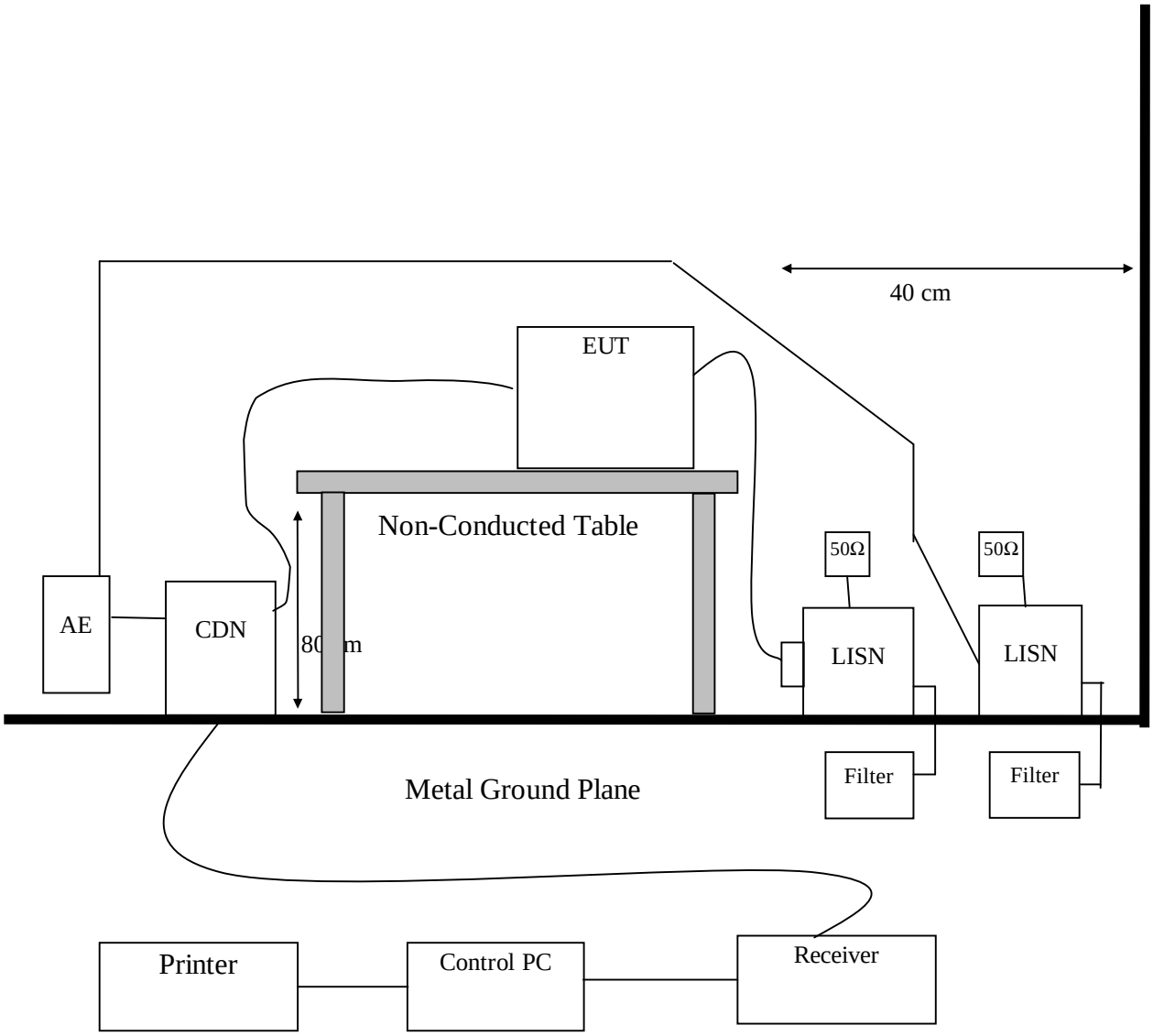
Radiation/Conduction	Filename	Version	Issued Date
Hsichih Conduction	Tile.exe	2.0.P	2/12/2002
Hsichih Radiation	Tile.exe	2.0.P	2/12/2002
Lung_Tan Conduction	Tile.exe	2.3.B	12/30/2003
Lung_Tan Radiation	Tile.exe	2.3.B	12/30/2003

5.5 Appendix E: Layout of EUT and Support Equipment

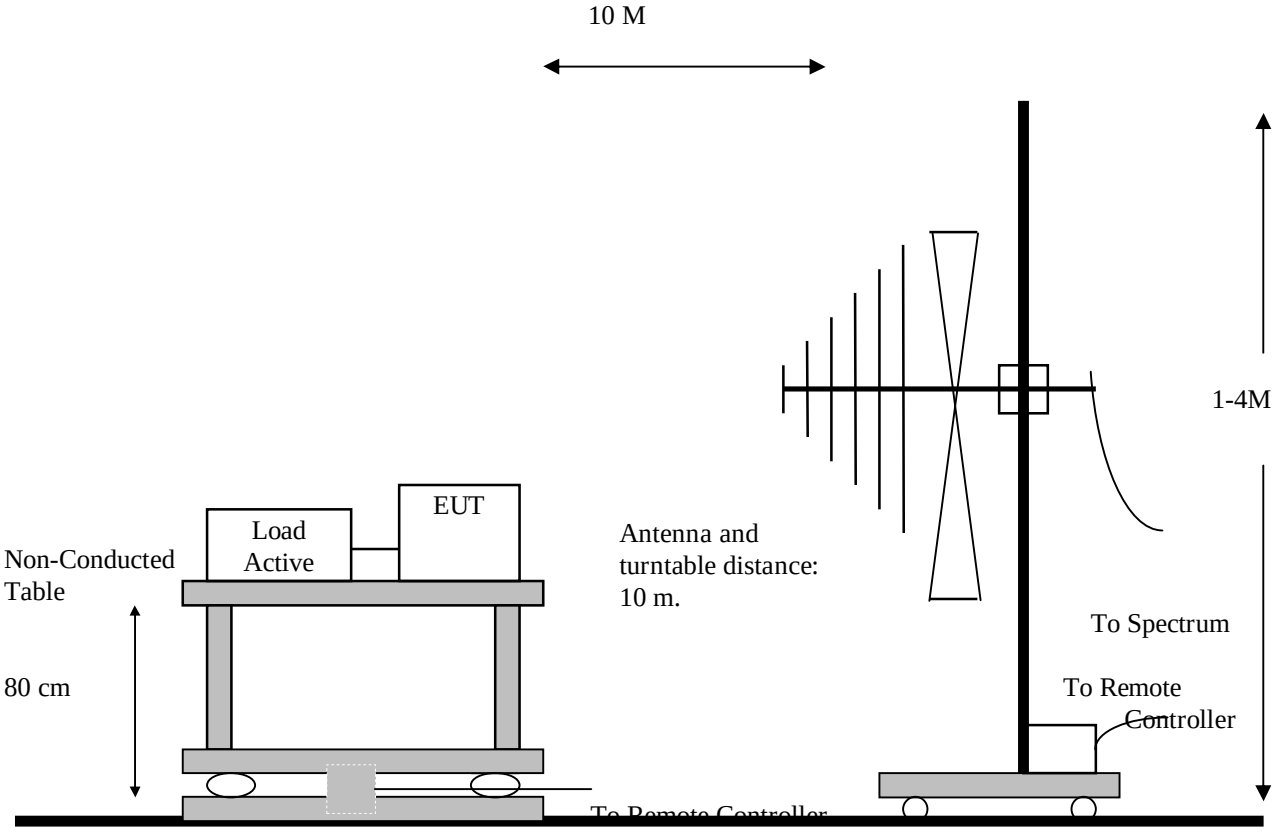
5.5.1 General Power Main Port Conducted Test Configuration



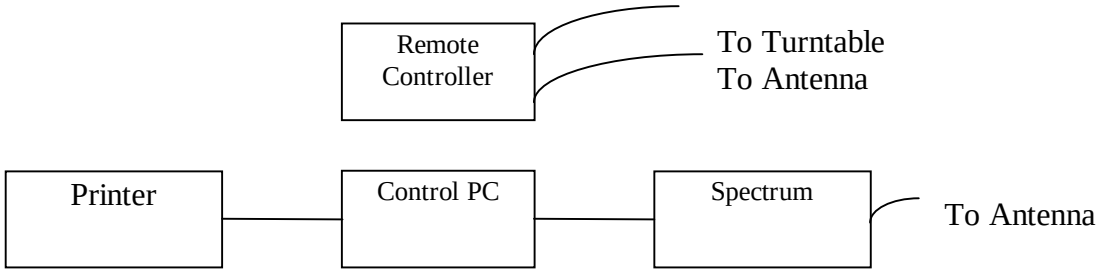
5.5.2 General Telecommunication Port Conducted Emission Test Configuration



5.5.3 General Radiation Test Configuration



Metal Full Soldered Ground Plane



5.6 Appendix F: Description of Support Equipment

5.6.1 Description of Support Equipment

Support Unit 1.

Description:	KOKA Headphone
Model Number:	ST-304
Serial Number:	N/A
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	N/A

Support Unit 2.

Description:	KOKA Headphone
Model Number:	ST-304
Serial Number:	N/A
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	N/A

Support Unit 3.

Description:	KOKA Headphone
Model Number:	ST-304
Serial Number:	N/A
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	N/A

Support Unit 4.

Description:	KOKA Headphone
Model Number:	ST-304
Serial Number:	N/A
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	N/A

Support Unit 5.

Description:	KOKA Microphone
Model Number:	DM-510
Serial Number:	N/A
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	N/A

Support Unit 6.

Description:	Digital Video Camera
Model:	DCR-PC100
Serial Number:	173009
Power Supply Type:	AC Power Adaptor (SONY, Model: AC-L10A)
Power Cord:	Nonshielded, Detachable
FCC ID:	(Comply with FCC DOC)

Support Unit 7.

Description:	USB 2.0 Card Reader/Writer
Model Number:	UID12W
Serial Number:	N/A
Power Supply Type:	From USB Port
USB 2.0 Port:	one 4-pin
SD/MMC Card Slot:	one
SecureDigital Card (Option):	SD (Model: SD-M16B1) 16MB
USB Cable:	Shielded, Detachable (With Cord)
FCC ID:	(Comply with FCC DOC)

Support Unit 8.

Description:	USB 2.0 Card Reader/Writer
Model Number:	UID12W
Serial Number:	N/A
Power Supply Type:	From USB Port
USB 2.0 Port:	one 4-pin
SD/MMC Card Slot:	one
SecureDigital Card (Option):	SD (Model: SD-M16B1) 16MB
USB Cable:	Shielded, Detachable (With Cord)
FCC ID:	(Comply with FCC DOC)

Support Unit 9.

Description:	USB 2.0 Card Reader/Writer
Model Number:	UID12W
Serial Number:	N/A
Power Supply Type:	From USB Port
USB 2.0 Port:	one 4-pin
SD/MMC Card Slot:	one
SecureDigital Card (Option):	SD (Model: SD-M16B1) 16MB
USB Cable:	Shielded, Detachable (With Cord)
FCC ID:	(Comply with FCC DOC)

Support Unit 10.

Description:	USB 2.0 Card Reader/Writer
Model Number:	UID12W
Serial Number:	N/A
Power Supply Type:	From USB Port
USB 2.0 Port:	one 4-pin
SD/MMC Card Slot:	one
SecureDigital Card (Option):	SD (Model: SD-M16B1) 16MB
USB Cable:	Shielded, Detachable (With Cord)
FCC ID:	(Comply with FCC DOC)

Support Unit 11.

Description:	KOKA Headphone
Model Number:	ST-304
Serial Number:	N/A
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	N/A

Support Unit 12.

Description:	KOKA Microphone
Model Number:	DM-510
Serial Number:	N/A
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	N/A

Support Unit 13.

Description:	Coson radio cassette player
Model Number:	C-2087
Serial Number:	N/A
Power Supply Type:	N/A
Power Cord:	N/A

Support Unit 14.

Description:	HP Printer (for parallel interface port)
Model Number:	C2642A
Serial Number:	TH84T1N3J3
Power Supply Type:	AC Adaptor (HP Model: C2175A)
Power Cord:	Non-shielded, Detachable
Data Cable:	Shielded, Detachable, With Metal Hood
FCC ID:	B94C2642X

Support Unit 15.

Description:	DELL Mouse
Model Number:	M-SAW34
Serial Number:	LZE24108086
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	DZL211029

Support Unit 16.

Description:	Aceex Modem (for serial interface port)
Model Number:	DM1414
Serial Number:	0301000557
Power Supply Type:	Linear, Power Adapter (AC to AC Xfmr, Wall Mounted Type)
Power Cord:	Nonshielded, Without Grounding Pin
FCC ID:	IFAXDM1414

Support Unit 17.

Description:	SONY Video Monitor
Model Number:	KV-XA25N90
Serial Number:	1450610
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	N/A

Support Unit 18.

Description:	Philips Monitor
Model:	109P40
Serial Number:	BZ000421172019
Power Cord:	Non-shielded, Detachable
FCC ID:	A3KM092

Support Unit 19.

Description:	DELL Keyboard
Model Number:	SK-8110
Serial Number:	MY-05N456-38843-2BK-3315
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	N/A (comply with FCC DOC)

Support Unit 20.

Description:	DELL Notebook Personal Computer
Model:	Latitude D400
Serial Number:	N/A
CPU:	Pentium M- 1.5GHz(FSB 400 MHz)
A/C Adapter Type:	LITEON 65W (Model PA-1650-05D) 3 Pins
Hard Disk Driver:	Toshiba (Model: MK4019GAX) 40 GB
MDC Modem:	Conexant (Model: RD01-D480)
VGA Connector:	One 15 Pins
Serial Connector:	One 9 Pins
RJ11 Connector:	One 2 Pins
RJ45 Connector:	One 8 Pins
USB Connector:	Two 4 Pins
1394 Connector:	One 4 Pins
Smart Card Slot:	One
PCMCIA Slot:	One
Earphone Port:	One
Microphone Port:	One
Power In Port:	One
Battery:	Sanyo 6-cell (Model: 6T087)
RAM:	Nanya DDR 256MB x 1
LCD Panel and Inverter:	Toshiba 12.1”XGA (Model: LTM12C505D) RICOH KEIKI Inverter (Model: K3E19T5 0090)
Power Cord:	Non-shielded, Detachable

Support Unit 21.

Description:	DTS/Dolby Digital Surround Sound Decoder
Model Number:	AD-300
Serial Number:	AD30000021115-0400
A/C Adapter:	Model: AD48-1201000DU
Power Cord:	Non-shielded, Detachable

Support Unit 22.

Description:	Speaker
Model:	A-1
Serial Number:	N/A

Support Unit 23.

Description:	External Hard Disk Case
Manufacturer :	TeraSys
Model Number:	F12-UF
Serial Number	NA
Power Supply Type:	YHI(Model:YS-1015U12)
1394 Port:	one 6-Pins
USB:	one 4-Pins
Power In:	one
Power Cable:	Non-shielded, Detachable, (Can Dismantle)

Support Unit 24.

Description:	External Hard Disk Case
Manufacturer :	TeraSys
Model Number:	F12-UF
Serial Number	NA
Power Supply Type:	YHI(Model:YS-1015U12)
1394 Port:	one 6-Pins
USB:	one 4-Pins
Power In:	one
Power Cable:	Non-shielded, Detachable, (Can Dismantle)

5.6.2 Software for Controlling Support Unit

Test programs exercising various part of EUT were used. The programs were executed as follows:

A. Read and write to the disk drives.
B. Capture the image from digital video camera then transfer to display.(CCD).
C. R/W memory card form EUT USB Port through Card Reader/Writer
D. Send audio signal to the headphone.
E. Receive audio signal from the microphone.
F. Receive audio signal from walkman.
G. Send H pattern to the parallel port device (Printer).
H. Send H pattern to the serial port device (Modem).
I. Send H pattern to the video port device (TV).
J. Send H pattern to the video port device (Monitor).
K. Send signal to the DTS/Dolby Digital Surround Sound Decoder
L. Send audio signal to the Speaker
M. R/W Hard Disk form EUT USB Port through External Hard Disk Case
N. From DVD/CD-ROM Open Windows Media player.exe, Audio signals and to send them to the speaker
O. Through LAN Port(Gigabit)From EUT Send Singal to NoteBook
P. Repeat the above steps.

	Filename	Issued Date
TV	EMITEST.exe	05/01/1990
Modem 1	EMC.exe	11/22/1996
Printer1	EMC.exe	11/22/1996
Digital Video Camera	Divpcam.exe	12/10/1998
Monitor	EMITEST.exe	05/01/1990
External Hard Disk Case	EMC.exe	11/22/1996
DVD/CD-ROM	Windows Media player.exe	1/1/2001
LAN	Ping.exe	8/3/2001

5.6.3 I/O Cable Condition of EUT and Support Units

Description	Path	Cable Length	Cable Type	Connector Type
AC Power Cord	110V (~240V) to EUT SPS	1.8M	Nonshielded, Detachable	Plastic Head
Server Data Cable	Server to PC LAN Port	33 feet	Non-shielded, Detachable	RJ-45, with Plastic Head
Keyboard Data Cable	Keyboard to PC Keyboard port	1.8M	Shielded, Undetachable	Metal Head
Monitor Data Cable	Monitor to PC VGA Port	1.6M	Shielded, Detachable	Metal Head
TV Data Cable	TV to PC S Terminal	1.6M	Shielded, Detachable	Metal Head
Modem Data Cable	Modem to PC COM 1 port	1.5M	Shielded, Detachable	Metal Head
Mouse Data Cable	Mouse to PC Mouse port	1.8M	Shielded, Un-detachable	Metal Head
Printer Data Cable	Printer to PC Parallel port	1.5M	Shielded, Detachable	Metal Head
Audio-in Data Cable	Walkman to PC Line In Port	2M	Non-shielded, Detachable	Plastic Head
Microphone Data Cable*2	Microphone to PC Microphone Port	1.5M	Nonshielded, Undetachable	Plastic Head
Headphone Data Cable*5	Headphone to PC Line Out Port	1.2M	Nonshielded, Undetachable	Plastic Head
USB Data Cable*4	PC USB Port to Card Reader/Writer	1.0 M	Shielded, detachable (with cord)	Metal Head
Digital Video Camera 1394 Data Cable	Digital Video Camera to 1394 port of PC	1.0M	Shielded, Detachable	Metal Head
1394 Data Cable*2	EUT 1394 Port (6 Pin) to External Hard Disk Case 1394 Port(6 Pin)	2M	Non-shielded, Detachable	Metal Head
SPDIF Data Cable	EUT SPDIF Out Port to DTS/Dolby SPDIF In Port	1.5M	Shielded, Detachable	Plastic Head

SPDIF Data Cable	EUT SPDIF Input Port to SN41G2(Support PC) Output SPDIF	1.5M	Shielded, Detachable	Plastic Head
Speaker Cable	Speaker to DTS/Dolby Line Out Port	1.5M	Non-shielded, Detachable	Metal Head
RCA Data Cable	EUT RCA Out Port to DTS/Dolby RCA In Port	1.5M	Shielded, Detachable	Plastic Head
D4 Data Cable	EUT D4 Out Port to TV R G B Port	3.3M	Shielded, Detachable	Metal Head

5.7 Appendix G: Description of Equipment Under Test

EUT

Description:	Personal Computer
Condition:	Pre-Production
Model:	EZ945;EX945;EY945
Serial Number:	N/A
Motherboard:	AOpen (Model: UX945G)
CPU:	FSB 533 MHz Pentium 4-3.73 GHz
Power Supply Type:	AOPEN (Model:FSP275-60CU(PF))
Hard Disk Driver:	Western Digital (Model:WD1200JD-00FYB0)
Flopply Disk Driver:	Panasonic (Model:JU-257A607P)
DVD/CD-ROM Drive:	AOpen (Model: COM4824/AAH)
Power in Port:	one
VGA Port:	one(15 pin)
Parallel Port:	one(25-pin)
Serial Port:	one(9-pin)
Keyboard Connector:	one(6-pin)
Mouse Connector:	one(6-pin)
USB Connector:	four(4-pin)
LAN Port:	one(8-pin)
1394 Connector:	three (one 4-pin , two 6-pin)
Microphone Port:	two
Line In Port:	one
Line out Poer:	three
Headphone Port:	two
S-Video Port:	one(8-pin)
D4 Port:	one(14-pin)
RCA AUDIO Port:	one
Optical fiber out Port:	one
Memory:	DDRII533 *1 (128MB)
Power Cord:	Non-shielded, Detachable

All types of LAN and VGA Resolution, listed above have been tested. We present the worst case test data in the report. The test configuration is listed below:

Test Mode	CPU	VGA Resolution	LAN
1	FSB 1066 MHz Pentium 4-3.73 GHz	VGA+S	1Gbps
2	FSB 533 MHz Pentium 4-3.73 GHz	D4	100M

Difference From:

Model name	COLOR
EZ945	White
EX945	Black
EY945	Silver

EMI Noise Source:
Crystal: 25MHz (X1), 14.318MHz (X2), 24.5MHz (X3), 27MHz (X4),32.768KHz
Clock Generator: U28
EMI Solution:
None

5.8 Appendix H: Uncertainty of Measurement

The measurement uncertainties mentioned below refer to CISPR 16-4: 2002 Uncertainty in EMC measurements.

Test Site: Conduction 02

Item	Source of Uncertainty	Probability Distribution	Total Uncertainties (dB)		Standard Uncertainty (dB)	
1	Systematic Effects: (Assessment from 20 repeat observation; 1 reading on EUT)	Normal	k=1	0.058	k=1	0.058
2	Random Effects: (Assessment from 20 random observations; 1 reading on EUT)	Normal	k=2	0.144	k=1	0.072
3	Receiver: Sine wave voltage	Normal	k=2	0.500	k=2	0.250
4	Receiver: Pulse amplitude response	Rectangular	k=1.73	0.500	k=1	0.289
5	Receiver: Pulse repetition rate response	Rectangular	k=1.73	0.500	k=1	0.289
6	Receiver: Noise floor proximity	Normal	k=1.73	0.500	k=1	0.250
7	LISN Loss Calibration	Normal	k=2	1.200	k=1	0.600
8	Cable Loss Calibration	Normal	k=2	1.000	k=1	0.500
9	Combined Standard Uncertainty Uc(y)	Normal			k=1	0.954
10	**Total Uncertainty @95% minimum Confidence Level**	**Normal**			**k=2**	**1.908**

Measurement Uncertainty Calculations:

Uc (y) = square root ($u_1 (y)^2 + u_2 (y)^2 + ...+u_n (y)^2$)

U = 2 * Uc (y)

Test Site: Chamber 02-10M (30M~1GHz)

Item	Source of Uncertainty	Probability Distribution	Total Uncertainties (dB)		Standard Uncertainty (dB)	
			k	(dB)	k	(dB)
1	Systematic Effects: (Assessment from 20 repeat observation; 1 reading on EUT)	Normal	1	0.067	1	0.067
2	Random Effects: (Assessment from 20 random observations; 1 reading on EUT)	Normal	1	0.103	1	0.103
3	Antenna Factor Calibration	Normal	2	1.400	1	0.700
4	Receiver: Sine wave voltage	Normal	2	0.470	1	0.235
5	Receiver: Pulse amplitude response	Rectangular	1.73	1.600	1	0.925
6	Receiver: Pulse repetition rate response	Rectangular	1.73	0.400	1	0.231
7	Receiver: Noise floor proximity	Normal	2	0.500	1	0.250
8	Mismatch: antenna-receiver	U-shaped	1.5	1.000	1	0.667
9	Antenna: AF freq. Interpolation	Rectangular	1.73	0.300	1	0.173
10	Antenna: Directivity difference	Rectangular	1.73	1.000	1	0.578
11	Antenna: Balance	Rectangular	1.73	0.300	1	0.173
12	Site separation distance	Rectangular	1.73	0.300	1	0.173
13	Cable Loss Calibration	Normal	2	1.000	1	0.500
14	Combined Standard Uncertainty Uc(y)	Normal			1.000	1.628
15	**Total Uncertainty @95% minimum Confidence Level**	**Normal**			**2.000**	**3.256**

Measurement Uncertainty Calculations:

Uc (y) = square root ($u_1 (y)^2 + u_2 (y)^2 + ...+u_n (y)^2$)

U = 2 * Uc (y)

Test Site: Chamber 02-3M (1G~18Ghz)

Item	Source of Uncertainty	Probability Distribution	Total Uncertainties (dB)		Standard Uncertainty (dB)	
			k	(dB)	k	(dB)
1	Systematic Effects: (Assessment from 20 repeat observation; 1 reading on EUT)	Normal	1	0.039	1	0.039
2	Random Effects: (Assessment from 20 random observations; 1 reading on EUT)	Normal	1	0.072	1	0.072
3	Antenna Factor Calibration	Normal	2	1.700	1	0.850
4	Receiver: Sine wave voltage	Normal	2	0.470	1	0.235
5	Receiver: Pulse amplitude response	Rectangular	1.73	1.600	1	0.925
6	Receiver: Pulse repetition rate response	Rectangular	1.73	0.400	1	0.231
7	Receiver: Noise floor proximity	Normal	2	0.500	1	0.250
8	Mismatch: antenna-receiver	U-shaped	1.5	1.000	1	0.667
9	Antenna: AF freq. Interpolation	Rectangular	1.73	0.300	1	0.173
10	Antenna: Directivity difference	Rectangular	1.73	1.000	1	0.578
11	Antenna: Balance	Rectangular	1.73	0.300	1	0.173
12	Site separation distance	Rectangular	1.73	0.300	1	0.173
13	Cable Loss Calibration	Normal	2	1.000	1	0.500
14	Combined Standard Uncertainty Uc(y)	Normal			1.000	1.695
15	**Total Uncertainty @95% minimum Confidence Level**	**Normal**			**2.000**	**3.391**

Measurement Uncertainty Calculations:

Uc (y) = square root ($u_1 (y)^2 + u_2 (y)^2 + ...+u_n (y)^2$)

U = 2 * Uc (y)

Test Site: Chamber 02-3M (18G~26Ghz)

Item	Source of Uncertainty	Probability Distribution	Total Uncertainties (dB)		Standard Uncertainty (dB)	
			k	(dB)	k	(dB)
1	Systematic Effects: (Assessment from 20 repeat observation; 1 reading on EUT)	Normal	1	0.060	1	0.060
2	Random Effects: (Assessment from 20 random observations; 1 reading on EUT)	Normal	1	0.094	1	0.094
3	Antenna Factor Calibration	Normal	2	2.000	1	1.000
4	Receiver: Sine wave voltage	Normal	2	0.470	1	0.235
5	Receiver: Pulse amplitude response	Rectangular	1.73	1.600	1	0.925
6	Receiver: Pulse repetition rate response	Rectangular	1.73	0.400	1	0.231
7	Receiver: Noise floor proximity	Normal	2	0.500	1	0.250
8	Mismatch: antenna-receiver	U-shaped	1.5	1.000	1	0.667
9	Antenna: AF freq. Interpolation	Rectangular	1.73	0.300	1	0.173
10	Antenna: Directivity difference	Rectangular	1.73	1.000	1	0.578
11	Antenna: Balance	Rectangular	1.73	0.300	1	0.173
12	Site separation distance	Rectangular	1.73	0.300	1	0.173
13	Cable Loss Calibration	Normal	2	1.000	1	0.500
14	Combined Standard Uncertainty Uc(y)	Normal			1.000	1.777
15	**Total Uncertainty @95% mim. Confidence Level**	**Normal**			**2.000**	**3.554**

Measurement Uncertainty Calculations:

Uc (y) = square root ($u_1 (y)^2 + u_2 (y)^2 + ...+u_n (y)^2$)

U = 2 * Uc (y)

Test Site: Chamber 02-3M (26G~40Ghz)

Item	Source of Uncertainty	Probability Distribution	Total Uncertainties (dB)		Standard Uncertainty (dB)	
			k	(dB)	k	(dB)
1	Systematic Effects: (Assessment from 20 repeat observation; 1 reading on EUT)	Normal	1	0.044	1	0.044
2	Random Effects: (Assessment from 20 random observations; 1 reading on EUT)	Normal	1	0.089	1	0.089
3	Antenna Factor Calibration	Normal	2	2.000	1	1.000
4	Receiver: Sine wave voltage	Normal	2	0.470	1	0.235
5	Receiver: Pulse amplitude response	Rectangular	1.73	1.600	1	0.925
6	Receiver: Pulse repetition rate response	Rectangular	1.73	0.400	1	0.231
7	Receiver: Noise floor proximity	Normal	2	0.500	1	0.250
8	Mismatch: antenna-receiver	U-shaped	1.5	1.000	1	0.667
9	Antenna: AF freq. Interpolation	Rectangular	1.73	0.300	1	0.173
10	Antenna: Directivity difference	Rectangular	1.73	1.000	1	0.578
11	Antenna: Balance	Rectangular	1.73	0.300	1	0.173
12	Site separation distance	Rectangular	1.73	0.300	1	0.173
13	Cable Loss Calibration	Normal	2	1.000	1	0.500
14	Combined Standard Uncertainty Uc(y)	Normal			1.000	1.776
15	**Total Uncertainty @95% mim. Confidence Level**	**Normal**			**2.000**	**3.553**

Measurement Uncertainty Calculations:

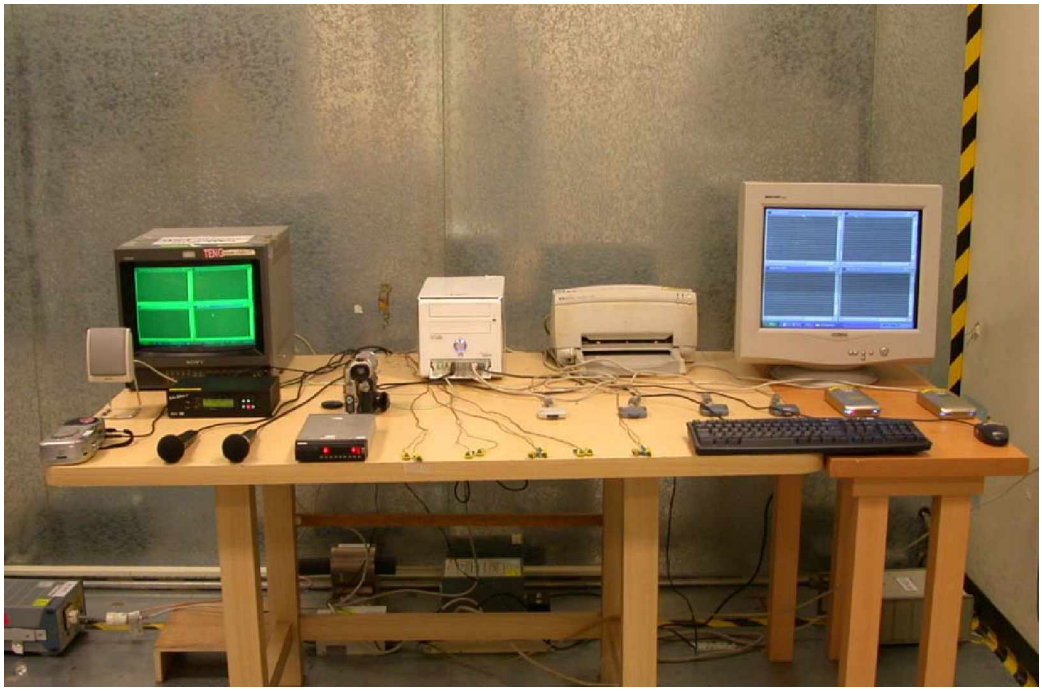
Uc (y) = square root ($u_1 (y)^2 + u_2 (y)^2 + ...+u_n (y)^2$)

U = 2 * Uc (y)

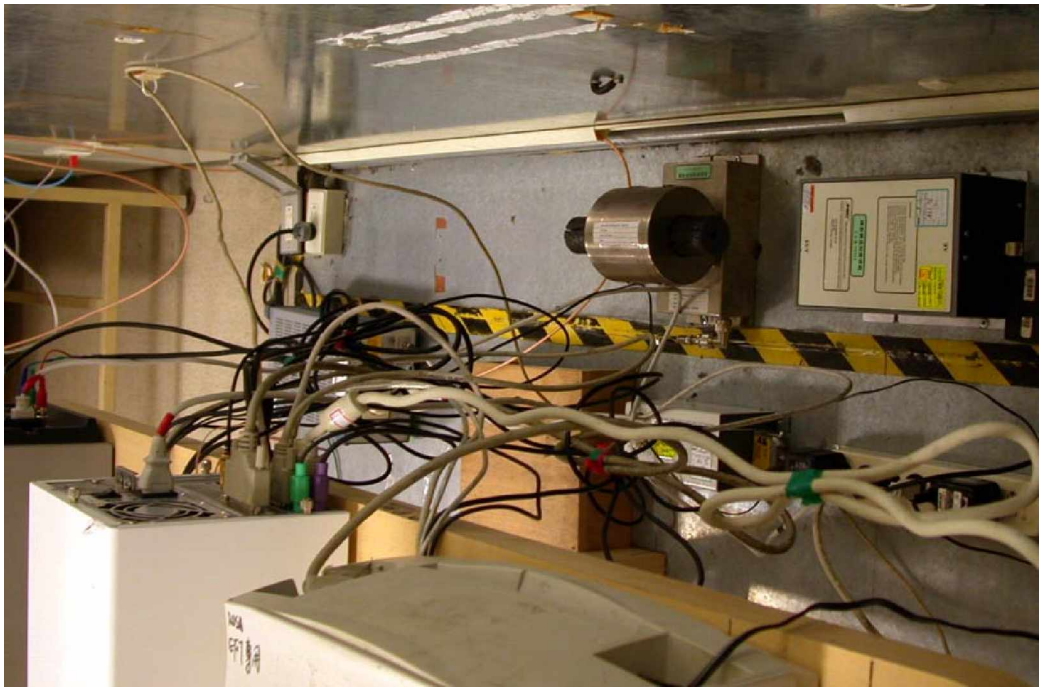
5.9 Appendix I: Photographs of EUT Configuration Test Set Up

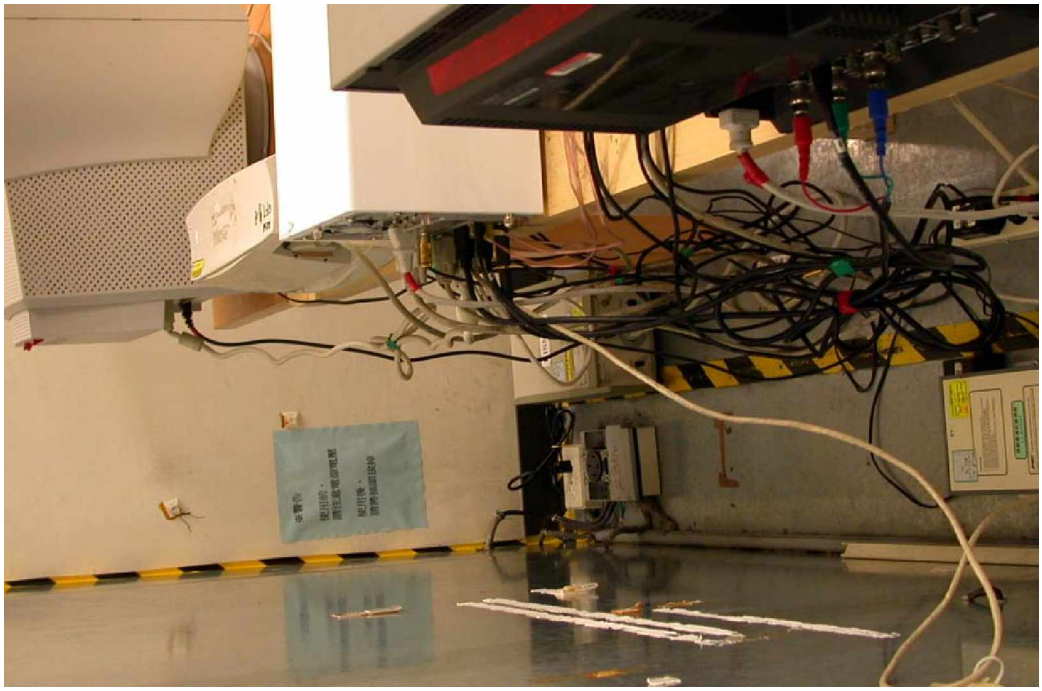
According to EN55022:1998/A1:2000; AS/NZS CISPR 22: 2002:

Front View of Highest Main Power Port Conducted Emission and Telecommunication Port Conducted Emission

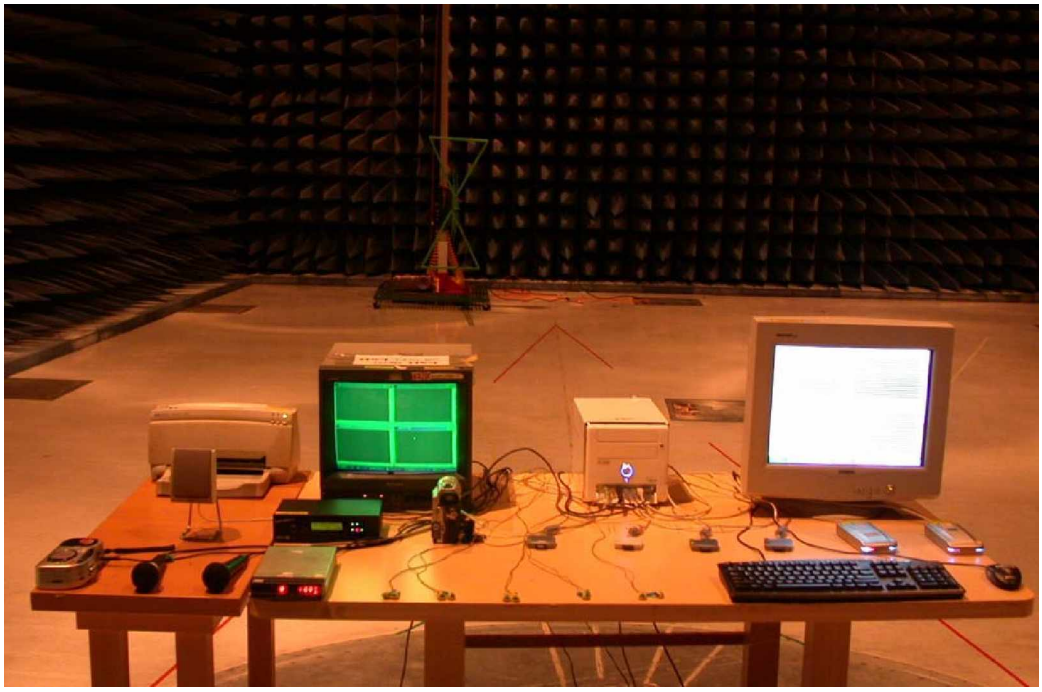


Back View of Highest Main Power Port Conducted Emission and Telecommunication Port Conducted Emission





Front View of Highest Radiated Emission Test.



Back View of Highest Radiated Emission Test.