TEST REPORT

FOR

FCC PART 15 Subpart B

of

Keyboard

Model

6300C

Applied by:

BEHAVIOR TECH COMPUTER CORP.
2F,51,Tung Hsing Rd.,
Taipei 110
Taiwan, R. O. C.

Test Performed by:
International Standards Laboratory

(NVLAP Lab. Code: 200234-0)

(V) Hsichih LAB	Lung-Tan LAB
Site Registration No.: (NVLAP Lab. Code: 200234-0)	**Site Registration No.:** (NVLAP Lab. Code: 200234-0)
No. 65, Ku Dai Keng St.	No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd.
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Contents of Report

1. General

1.1 Certification of Accuracy of Test Data

Standards:	ANSI C63.4-2001, CFR 47 Part 15 Subpart B or EN55022: 1998 Industry Canada Interference-Causing Equipment Standard ICES-003 Issue 4: 2004
Equipment Tested:	Keyboard
Model/Type/Machine Type:	6300C
Applied by	BEHAVIOR TECH COMPUTER CORP.
Sample received Date:	2004/06/11
Final test Date :	refer to the date of test data
Test Engineer:	David Wu 06/18/2004 David Y.Y. Wu

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 36 pages, including 1 cover page , 1 contents page, and 34 pages for the test description.
This report must not be use to claim product endorsement by NVLAP or any agency of the U.S. Government.

This test data shown below is traceable to NIST or national or international standard.
International Standards Laboratory certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).

1.2 Applicant Information

Applicant: BEHAVIOR TECH COMPUTER CORP.
2F,51,Tung Hsing Rd.,
Taipei 110
Taiwan, R. O. C.

1.3 Operation Environment

Test Site: OATS 01; Conduction 01

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

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

2. Powerline 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: *The EUT inserted into the USB port on Personal Computer.*

Table 2.2.1 Power Line Conducted Emissions (Hot)

Operator: David Y.Y. Wu

Temperature (C): 26

11:44:01 AM, Tuesday, June 15, 2004 Humidity (%): 55

Frequency	LISNLoss	CableLoss	QP Corrct.	QP Limit	QP Margin	AVE Corrct.	AVE Limit	AVE Margin
MHz	(dB)	(dB)	Amp.(dBuV)	(dBuV)	(dB)	Amp.(dBuV)	(dBuV)	(dB)
0.196278	0.10	0.27	50.77	64.68	-13.91	44.37	54.68	-10.31
0.245389	0.10	0.22	56.57	63.27	-6.71	46.59	53.27	-6.69
0.49	0.10	0.27	39.69	56.29	-16.60	31.69	46.29	-14.60
0.982056	0.10	0.42	37.35	56.00	-18.65	32.95	46.00	-13.05
3.933	0.20	0.90	41.28	56.00	-14.72	33.63	46.00	-12.37
4.029	0.20	0.91	41.05	56.00	-14.95	34.93	46.00	-11.07
4.126	0.20	0.91	38.84	56.00	-17.16	32.76	46.00	-13.24
4.225	0.21	0.90	38.09	56.00	-17.91	32.24	46.00	-13.76
4.417	0.21	0.89	41.56	56.00	-14.44	32.76	46.00	-13.24
7.863	0.33	0.70	41.72	60.00	-18.28	35.14	50.00	-14.86

* 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
Uncertainty of Measurement please sees the report of page 26

Graph 2.2.1 Power Line Conducted Emissions (Hot)

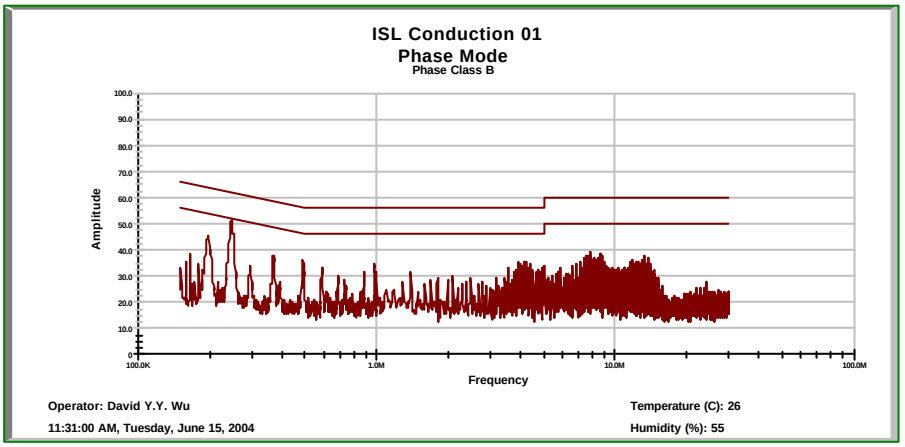


Table 2.2.2 Power Line Conducted Emissions (Neutral)

Operator: David Y.Y. Wu

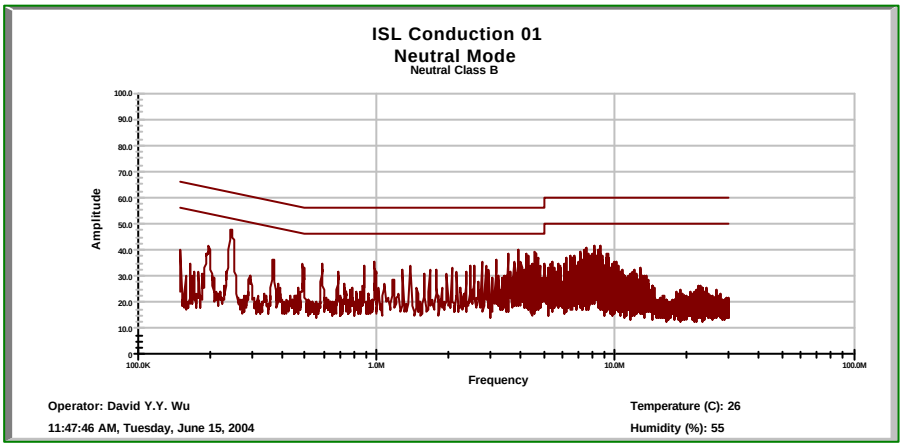
Temperature (C): 26

11:57:22 AM, Tuesday, June 15, 2004 Humidity (%): 55

Frequency	LISNLoss	CableLoss	QP Corrct.	QP Limit	QP Margin	AVE Corrct.	AVE Limit	AVE Margin
MHz	(dB)	(dB)	Amp.(dBuV)	(dBuV)	(dB)	Amp.(dBuV)	(dBuV)	(dB)
0.245389	0.10	0.22	53.87	63.27	-9.41	46.63	53.27	-6.65
3.538	0.18	0.85	40.68	56.00	-15.32	39.08	46.00	-6.92
3.93	0.20	0.90	44.29	56.00	-11.71	39.69	46.00	-6.31
4.224	0.21	0.90	39.57	56.00	-16.43	32.77	46.00	-13.23
4.321	0.21	0.90	42.26	56.00	-13.74	37.22	46.00	-8.78
4.616	0.22	0.88	38.61	56.00	-17.39	26.60	46.00	-19.40
4.716	0.22	0.88	40.19	56.00	-15.81	33.65	46.00	-12.35
7.573	0.32	0.72	42.33	60.00	-17.67	37.15	50.00	-12.85
8.203	0.34	0.69	39.86	60.00	-20.14	37.44	50.00	-12.56
8.591	0.35	0.66	40.89	60.00	-19.11	37.60	50.00	-12.40

* 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
Uncertainty of Measurement please sees the report of page 26

Graph 2.2.2 Power Line Conducted Emissions (Neutral)



2.3 Test Data: *The EUT used USB to PS/2 adaptor inserted into the PS/2 Keyboard port on Personal Computer.*

Table 2.3.1 Power Line Conducted Emissions (Hot)

Operator: David Y.Y. Wu — BTC 6300C PS/2
Temperature (C): 26
11:10:45 AM, Tuesday, June 15, 2004 — Humidity (%): 55

Frequency	LISNLoss	CableLoss	QP Corrct.	QP Limit	QP Margin	AVE Corrct.	AVE Limit	AVE Margin
MHz	(dB)	(dB)	Amp.(dBuV)	(dBuV)	(dB)	Amp.(dBuV)	(dBuV)	(dB)
0.198167	0.10	0.27	50.08	64.62	-14.55	44.51	54.62	-10.12
0.247278	0.10	0.21	56.48	63.22	-6.74	46.39	53.22	-6.83
0.371944	0.10	0.20	40.15	59.66	-19.51	36.11	49.66	-13.55
0.49	0.10	0.27	38.74	56.29	-17.55	32.91	46.29	-13.38
0.5882	0.10	0.30	37.62	56.00	-18.38	32.86	46.00	-13.14
0.9792	0.10	0.42	35.90	56.00	-20.10	31.78	46.00	-14.22
4.706	0.22	0.88	39.61	56.00	-16.39	31.31	46.00	-14.69
4.906	0.23	0.86	38.20	56.00	-17.80	32.76	46.00	-13.24
7.767	0.33	0.71	40.18	60.00	-19.82	33.18	50.00	-16.82
8.594	0.35	0.66	37.95	60.00	-22.05	31.29	50.00	-18.71

* 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
Uncertainty of Measurement please sees the report of page 26

Graph 2.3.1 Power Line Conducted Emissions (Hot)

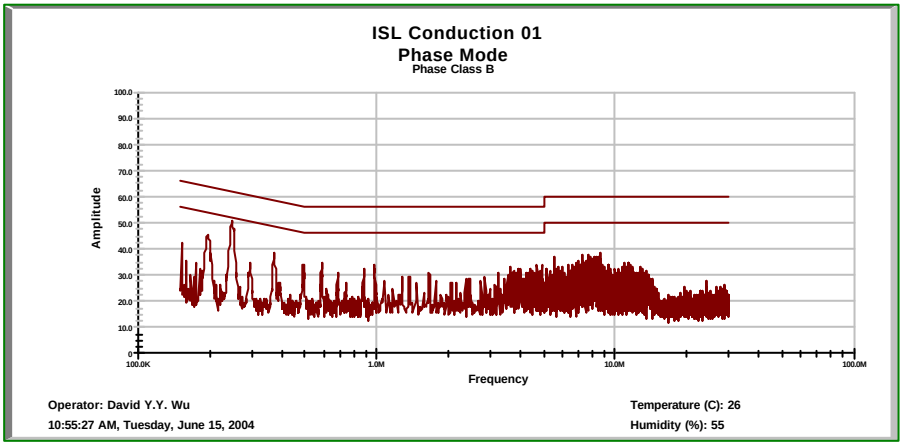


Table 2.3.2 Power Line Conducted Emissions (Neutral)

Operator: David Y.Y. Wu

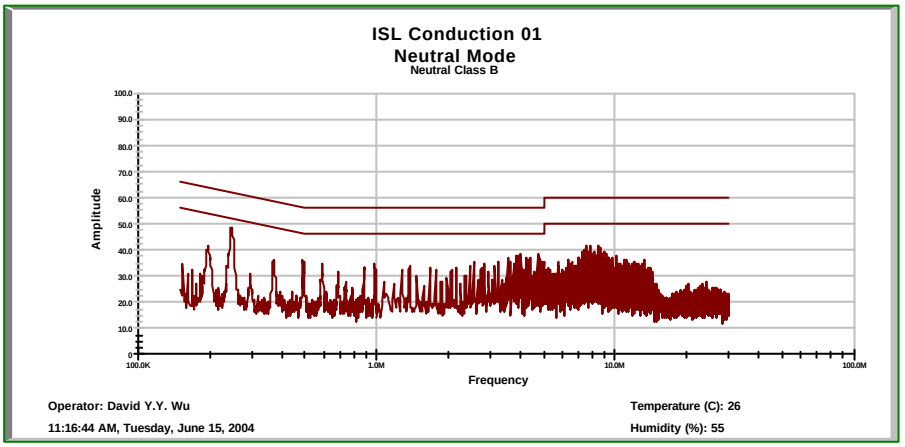
Temperature (C): 26

11:25:36 AM, Tuesday, June 15, 2004 Humidity (%): 55

Frequency	LISNLoss	CableLoss	QP Corrct.	QP Limit	QP Margin	AVE Corrct.	AVE Limit	AVE Margin
MHz	(dB)	(dB)	Amp.(dBuV)	(dBuV)	(dB)	Amp.(dBuV)	(dBuV)	(dB)
0.2463	0.10	0.22	54.02	63.25	-9.23	46.33	53.25	-6.92
3.535	0.18	0.85	39.81	56.00	-16.19	36.62	46.00	-9.38
3.833	0.19	0.89	38.11	56.00	-17.89	34.21	46.00	-11.79
4.027	0.20	0.91	42.40	56.00	-13.60	39.38	46.00	-6.62
4.71	0.22	0.88	41.91	56.00	-14.09	34.99	46.00	-11.01
4.806	0.23	0.87	41.80	56.00	-14.20	30.79	46.00	-15.21
5.533	0.25	0.83	40.44	60.00	-19.56	31.19	50.00	-18.81
7.571	0.32	0.72	41.65	60.00	-18.35	36.18	50.00	-13.82
7.814	0.33	0.71	41.37	60.00	-18.63	29.11	50.00	-20.89

* 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
Uncertainty of Measurement please sees the report of page 26

Graph 2.3.2 Power Line Conducted Emissions (Neutral)



3. Open Field Radiated Emissions

3.1 Configuration and Procedure

3.1.1 EUT Configuration

The equipment under test was set up on a non-conductive table 80cm above ground, on a 10 meter open field or 10 meter 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.

3.1.2 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. The highest emissions of frequency higher than 1000 MHz was analyzed in peak mode and/or average mode to determine the precise amplitude of the emission.

3.1.3 Spectrum Analyzer Configuration (for the frequencies tested)

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

Frequency Range:	Above 1000Mhz
Detector Function:	Peak/Average Mode
Resolution Bandwidth:	1MHz

3.2 Test Data:.*The EUT inserted into the USB port on Personal Computer.*

Table 3.2.1 Open Field Radiated Emissions (Horizontal)

Operator: David Y.Y. Wu
Temperature (C): 30
03:19:02 PM, Monday, June 14, 2004 Humidity (%): 65

Frequency	Rx Amp.	Ant Fact	Cb Loss	PreAmp.	Corrct. Emi.	Limit	Margin*	Ant.Pos.	TablePos.
MHz	(dBuV)	(dB/m)	(dB)	Gain (dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)
66.3715	13.00	5.40	1.40	0.00	19.80	30.00	-10.20	400	204
72.1615	13.40	5.72	1.48	0.00	20.60	30.00	-9.40	400	281
78.164	10.10	6.62	1.55	0.00	18.27	30.00	-11.73	400	126
84.511	7.80	7.71	1.60	0.00	17.11	30.00	-12.89	400	286
90	12.20	8.70	1.62	0.00	22.52	30.00	-7.48	400	90
120.009	9.00	11.60	1.87	0.00	22.47	30.00	-7.53	400	109
180.335	7.70	8.40	2.38	0.00	18.48	30.00	-11.52	400	241
192.25	9.10	8.57	2.51	0.00	20.17	30.00	-9.83	400	240
216.41	8.70	8.37	2.69	0.00	19.77	30.00	-10.23	400	344
228.418	9.00	8.81	2.79	0.00	20.60	30.00	-9.40	400	123

* 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
Uncertainty of Measurement please sees the report of page 28

Graph 3.2.1 Open Field Radiated Emissions (Horizontal)

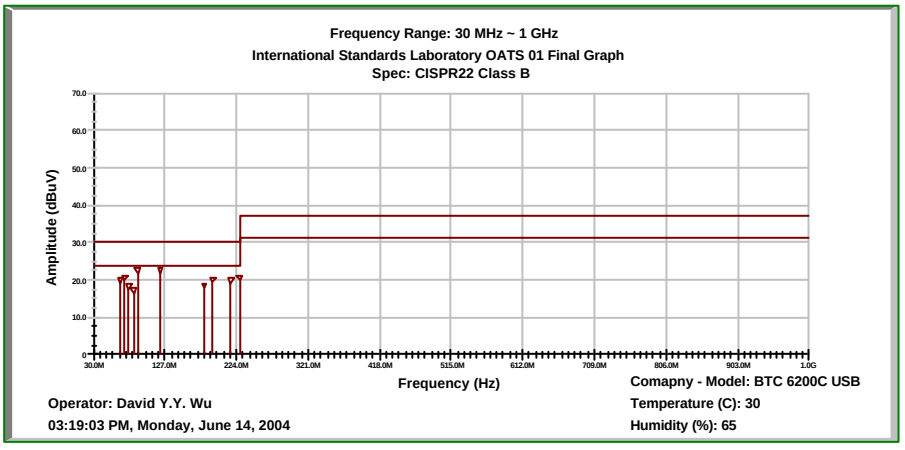


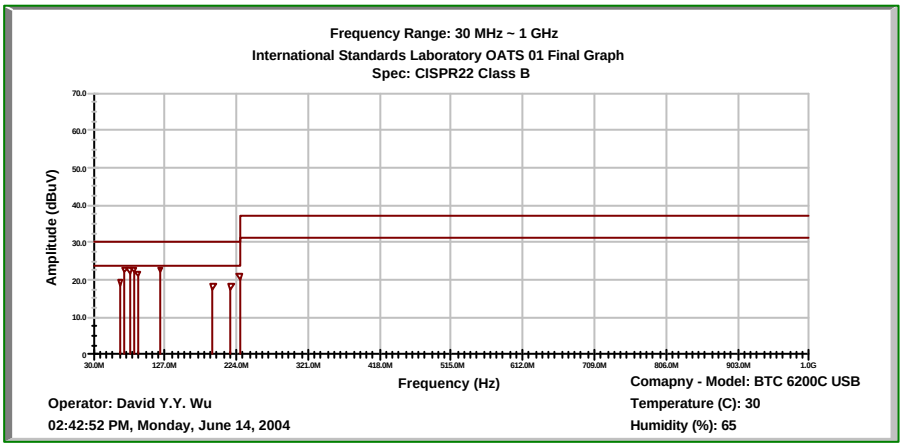
Table 3.2.2 Open Field Radiated Emissions (Vertical)

Operator: David Y.Y. Wu
Temperature (C): 30
02:42:51 PM, Monday, June 14, 2004 Humidity (%): 65

Frequency	Rx Amp.	Ant Fact	Cb Loss	PreAmp.	Corrct. Emi.	Limit	Margin*	Ant.Pos.	TablePos.
MHz	(dBuV)	(dB/m)	(dB)	Gain (dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)
66.085	12.50	5.40	1.40	0.00	19.30	30.00	-10.70	100	325
72.165	15.60	5.72	1.48	0.00	22.80	30.00	-7.20	100	21
78.618	14.30	6.69	1.55	0.00	22.54	30.00	-7.46	100	320
84.17	13.70	7.65	1.60	0.00	22.95	30.00	-7.05	100	264
90	11.40	8.70	1.62	0.00	21.72	30.00	-8.28	100	294
120.032	9.40	11.60	1.87	0.00	22.87	30.00	-7.13	100	294
192.278	7.10	8.57	2.51	0.00	18.18	30.00	-11.82	100	291
216.383	7.10	8.37	2.69	0.00	18.17	30.00	-11.83	100	289
228.417	9.40	8.81	2.79	0.00	21.00	30.00	-9.00	100	278

* 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
Uncertainty of Measurement please sees the report of page 28

Graph 3.2.2 Open Field Radiated Emissions (Vertical)



3.3 Test Data: *The EUT used USB to PS/2 adaptor inserted into the PS/2 Keyboard port on Personal Computer.*

Table 3.3.1 Open Field Radiated Emissions (Horizontal)

Operator: David Y.Y. Wu
Temperature (C): 30
04:28:34 PM, Monday, June 14, 2004 Humidity (%): 65

Frequency	Rx Amp.	Ant Fact	Cb Loss	PreAmp.	Corrct. Emi.	Limit	Margin*	Ant.Pos.	TablePos.
MHz	(dBuV)	(dB/m)	(dB)	Gain (dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)
66.073	12.65	5.40	1.39	0.00	19.44	30.00	-10.56	400	239
72.1775	10.68	5.73	1.48	0.00	17.88	30.00	-12.12	400	98
78.1568	9.30	6.62	1.55	0.00	17.47	30.00	-12.53	400	221
84.2	11.82	7.66	1.60	0.00	21.07	30.00	-8.93	400	283
120	6.80	11.60	1.87	0.00	20.27	30.00	-9.73	400	133
128.885	6.15	11.42	1.99	0.00	19.56	30.00	-10.44	400	171
186.399	9.20	8.46	2.47	0.00	20.13	30.00	-9.87	400	180
192.25	6.50	8.57	2.51	0.00	17.57	30.00	-12.43	400	271
216.475	5.80	8.37	2.70	0.00	16.87	30.00	-13.13	400	123

* 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
Uncertainty of Measurement please sees the report of page 28

Graph 3.3.1 Open Field Radiated Emissions (Horizontal)

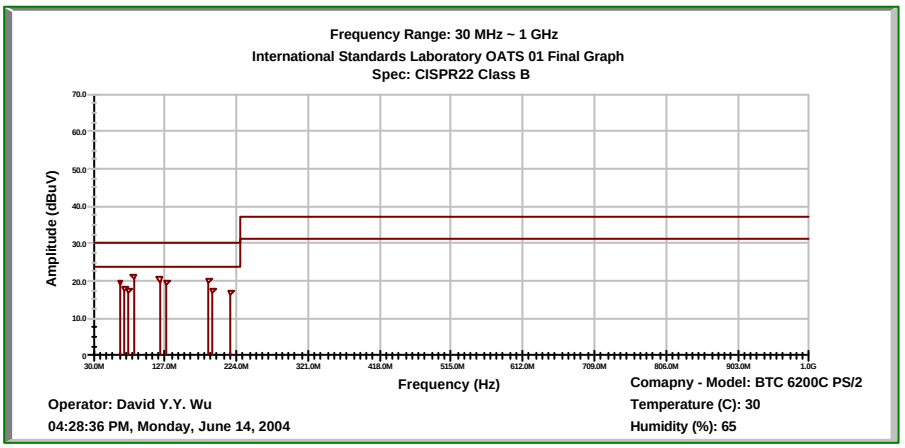


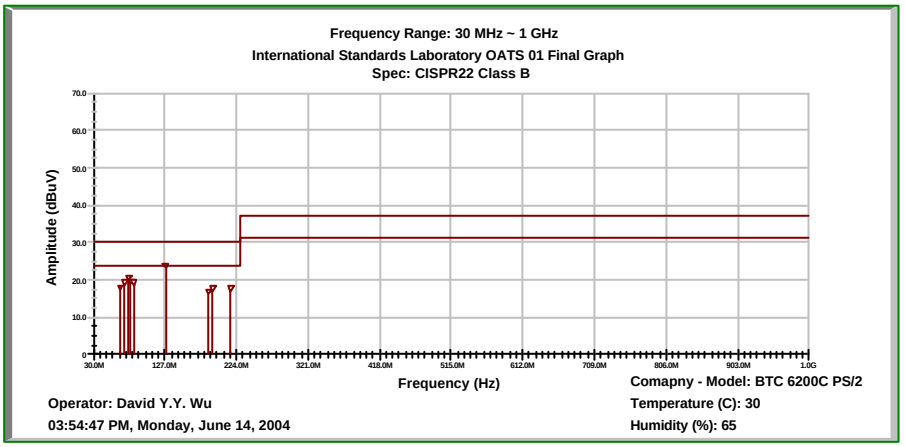
Table 3.3.2 Open Field Radiated Emissions (Vertical)

Operator: David Y.Y. Wu
Temperature (C): 30
03:54:46 PM, Monday, June 14, 2004 Humidity (%): 65

Frequency	Rx Amp.	Ant Fact	Cb Loss	PreAmp.	Corrct. Emi.	Limit	Margin*	Ant.Pos.	TablePos.
MHz	(dBuV)	(dB/m)	(dB)	Gain (dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)
66.082	11.30	5.40	1.40	0.00	18.10	30.00	-11.90	100	329
72.174	12.10	5.73	1.48	0.00	19.30	30.00	-10.70	100	316
78.147	12.50	6.62	1.55	0.00	20.67	30.00	-9.33	100	341
80.0135	11.00	6.90	1.56	0.00	19.46	30.00	-10.54	100	189
84.1445	10.00	7.65	1.60	0.00	19.24	30.00	-10.76	100	234
128.17	10.30	11.44	1.98	0.00	23.71	30.00	-6.29	100	301
186.158	6.10	8.46	2.47	0.00	17.03	30.00	-12.97	100	89
192.25	6.70	8.57	2.51	0.00	17.77	30.00	-12.23	100	294
216.365	6.70	8.37	2.69	0.00	17.77	30.00	-12.23	100	157

* 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
Uncertainty of Measurement please sees the report of page 28

Graph 3.3.2 Open Field Radiated Emissions (Vertical)



4. Appendix

4.1 Appendix A: Warning Labels

Label Requirements

A Class B digital device subject to FCC shall carry a label which includes the following statement:

*** * * W A R N I N G * * ***

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The sample label shown shall be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time of purchase.

FCC ID: E5XKB6300C

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

4.2 Appendix B: Warning Statement

Statement Requirements

The operators manual for a Class B digital device shall contain the following statements or their equivalent:

*** * * W A R N I N G * * ***

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Notice: The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equivalent.

*** * * * * * * * ***

If the EUT was tested with special shielded cables the operators manual for such product shall also contain the following statements or their equivalent:

Shielded interface cables and/or AC power cord, if any, must be used in order to comply with the emission limits.

4.3 Appendix C: Measurement Procedure for Powerline 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.

4.4 Appendix D: 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 10m EMC Chamber

The radiated emissions test will then be repeated on the open site or 10m EMC 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 3 or 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. For frequency above 1 GHz, the reading is recorded with peak detector or average detector with 1 MHz bandwidth.

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.

4.5 Appendix E: Test Equipment

4.5.1 Test Equipment List

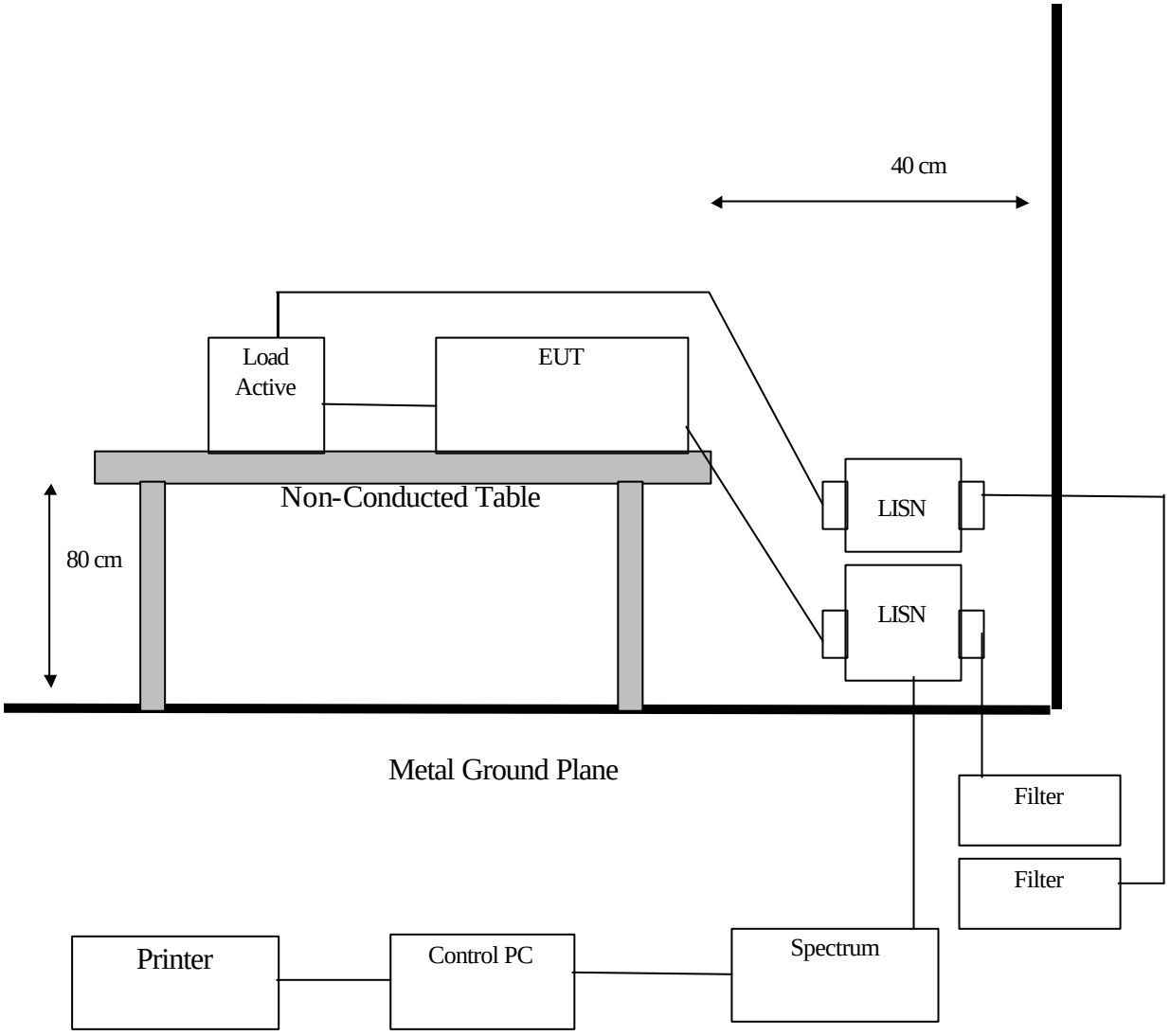
Location	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Conduction	Coaxial Cable 1F-C1	Harbourindustries	RG400	1F-C1	06/02/2004	06/02/2005
Conduction	Digital Thermo-Hygro Meter Conduc	MicroLife		ISL-C-002	12/04/2002	12/04/2004
Conduction	EMI Receiver 01	R&S	ESMI; rev. 02.80	8491821013	10/09/2003	10/09/2004
Conduction	LISN 02	EMCO	3825/2	1407	06/28/2003	06/28/2004
Conduction	LISN 03	R&S	ESH3-Z5 831.5518.52	828874/010	06/28/2003	06/28/2004
Radiation	BILOG Antenna 01	CHASE	CBL6112	2487	11/21/2003	11/21/2004
Radiation	Coaxial Cable 3F-10M	Belden	RG-8/U	3F-10M	06/02/2004	06/02/2005
Radiation	Coaxial Cable 3F-3M	Harbourindustries	9913	3F-3M	06/02/2004	06/02/2005
Radiation	Preselector 02	HP	85685A	2837A00816	07/05/2003	07/05/2004
Radiation	Quasi-Peak Adapter 02	HP	85650A	2811A01188	07/05/2003	07/05/2004
Radiation	Spectrum Analyzer 02	HP	8568B	2415A00491, 2648A14610	07/05/2003	07/05/2004
Radiation	Thermo-Hygro Meter OATS 01	CRECER	HD30	ISL-C-001	12/04/2002	12/04/2004
Rad. above 1Ghz	Coaxial Cable CHMB	Harbourindustries	RG 213U	CHMB	06/02/2004	06/02/2005
Rad. above 1Ghz	Horn Antenna 01	EMCO	3115	9504-4462	10/22/2003	10/22/2004
Rad. above 1Ghz	Horn Antenna 03	COM-Power	AH-826	100A	02/10/2004	02/10/2005
Rad. above 1Ghz	Microwave Cable RF07-3	HUBER+SUHNER AG.	Sucoflex 103	42728/3	07/10/2003	07/10/2004
Rad. above 1Ghz	Preamplifier 01	R&S	ESMI-Z7	1045.502	07/10/2003	07/10/2004

4.5.2 Software for Controlling Spectrum/Receiver and Calculating Test Data

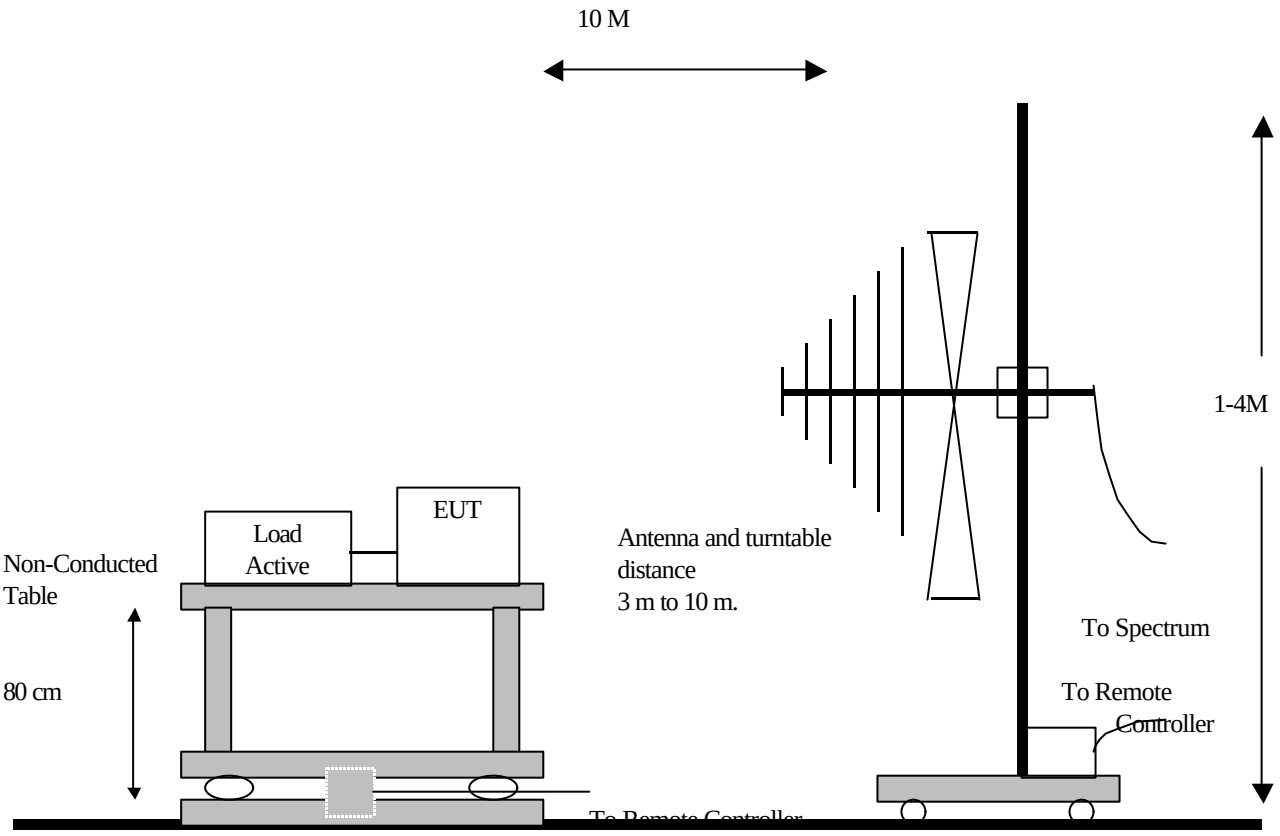
Radiation/Conduction	Filename	Version	Issued Date
Conduction	Tile.exe	2.0.P	2/12/2002
Radiation	Tile.exe	2.0.P	2/12/2002

4.6 Appendix F: Layout of EUT and Support Equipment

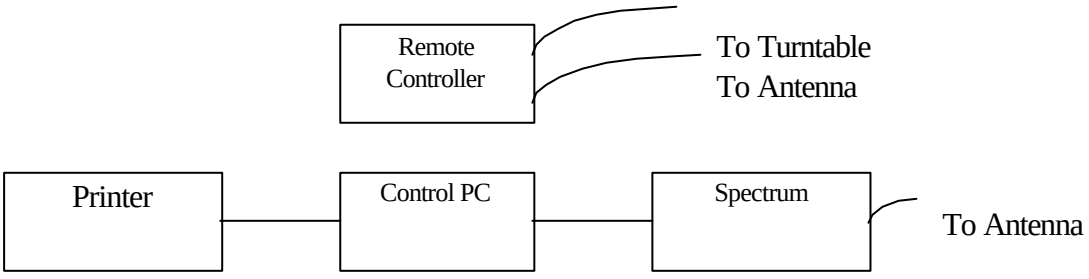
4.6.1 General Conducted Test Configuration



4.6.2 General Radiation Test Configuration



Metal Full Soldered Ground Plane



4.7 Appendix G: Description of Support Equipment

4.7.1 Description of Support Equipment

Support Unit 1.

Description:	Acer USB Speaker
Model Number:	A-1
Serial Number:	N/A
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	(Comply with FCC DOC)

Support Unit 2.

Description:	Microsoft Joy Stick
Model Number:	90873
Serial Number:	01151545
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	C3KMGP1
BSMI ID:	3862A202

Support Unit 3.

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 4.

Description:	SONY radio cassette player
Model Number:	WM-FX50
Serial Number:	N/A
Power Supply Type:	N/A
Power Cord:	N/A

Support Unit 5.

Description:	HP Printer (for parallel interface port)
Model Number:	C2642E
Serial Number:	N/A
Power Supply Type:	AC Adaptor (HP Model: C2175A)
Power Cord:	Non-shielded, Detachable
Data Cable:	Shielded, Detachable, With Metal Hood
FCC ID:	N/A

Support Unit 6.

Description:	Logitech Mouse
Model Number:	M-SAH
Serial Number:	LZB81251703
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	DZL211029

Support Unit 7.

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 8.

Description:	Acer Monitor
Model:	7377xe
Serial Number:	999027100501700055P644E1 P
Power Supply Type:	Switching
Power Cord:	Nonshielded, Detachable
FCC ID:	(Comply with FCC DOC)

Support Unit 9.

Description:	Acer Keyboard
Model Number:	6511-TW4C
Serial Number:	916600704C83D11076S00000
Power Supply Type:	N/A
Power Cord:	N/A
FCC ID:	JVPKBS-WIN

Support Unit 10.

Description:	Personal Computer
Model:	IBM 2170
Serial No.:	N/A
Power Supply Type:	Switching Delta (Model: DPS-145PB-80A)
Hard Disk Drive:	Maxtor (Model: 91303D6) 13.3GB
Floppy Driver:	Panasonic (Model: JU256A276P)
CD-ROM Drive:	AOpen (Model: CD-940E/TKU PRO)
ZIP Driver:	Iomega (Model: Z100ATAPI)
FDD/HDD Controller and VGA port/ Parallel/ Serial port:	Built on Motherboard
VGA port:	one 15-pin
Parallel Port:	one 25-pin
Serial Port:	one 9-pin
Keyboard Connector:	6-pin
Mouse Connector:	6-pin
USB Connector:	two 4-pin
Game Port:	one 15-pin
Speaker Port:	one
Microphone Port:	one
Line In Port:	one
Power Cord:	Nonshielded, Detachable
FCC ID:	N/A (comply witch FCC DOC)

4.7.2 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. Send audio signal to the speaker.
C. Receive audio signal from the microphone.
D. Receive audio signal from walkman.
E. Send H pattern to the parallel port device (Printer).
F. Send H pattern to the serial port device (Modem).
G. Send H pattern to the video port device (Monitor).
H. Press the "H" font key, Send H pattern to the WordPad file show on the monitor screen.
I. Repeat the above steps.

	Filename	Issued Date
Monitor	HH.bat	8/20/1991
Modem 1	Hm.bat	8/20/1991
Printer1	Wordpad.exe	11/11/1999
WordPad	WordPad.exe	8/21/2002

4.7.3 I/O Cable Condition of EUT and Support Units

Description	Path	Cable Length	Cable Type	Connector Type
AC Power Cord	110V (~240V) to AC Power Cord Inlet (3-pin)	1.8M	Nonshielded, Detachable	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, Un-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	1.5M	Non-shielded, Detachable	Plastic Head
Microphone Data Cable	Microphone to PC Line In Port	1.5M	Nonshielded, Undetachable	Plastic Head
Joy Stick Data Cable	Joystick to PC Game port	1.8M	Shielded, Un-detachable	Metal Head
USB Speaker Data Cable	USB Speaker to PC USB port	1.5M	Shielded, Un-detachable	Metal Head
USB Speaker Data Cable	USB Speaker to PC Line out port	1.5M	Non-shielded, Un-detachable	Plastic Head
USB Data Cable	EUT USB Port to Personal Computer USB port	1.65M	Shielded, Detachable	Metal Head

4.8 Appendix H: Description of Equipment Under Test

EUT

Description:	Keyboard
Condition:	Pre-Production
Model:	6300C
Serial Number:	N/A
Power:	From Personal Computer USB port
USB Connector:	one 4 pin
USB Signal Data Cable:	Shielded, Detachable
Internet Keys:	Back, Forward, WWW, Favorites, E-mail
Multimedia Keys:	Volume up, Volume down, Stop, Mute, Play/Pause, Previous, Next
Other Function Keys:	Sleep

The test configurations are listed below:

Configuration 1:

The EUT inserted into the USB port on Personal Computer.

Configuration 2:

The EUT used USB to PS/2 adaptor inserted into the PS/2 Keyboard port on Personal Computer.

The major alike between model numbers are for different Brand name presented of the listed detail below:

BRAND	MODEL
BTC	6300C
EMPREX	6300C

EMI Noise Source:

Crystal: 6MHz (Y1).

EMI Solution:

1. Added one ferrite core on the USB Signal Cable.
2. Added one aluminum foil on the keyboard iron contact with Multimedia iron. Type: RH6cmx4cm.

4.9 Appendix I: Uncertainty of Measurement

Test Site: Condcution 01

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	0.098	k=1	0.098
2	Random Effects: (Assessment from 20 random observations; 1 reading on EUT)	Normal	k=2	0.682	k=1	0.341
3	Receiver: Sine wave voltage	Normal	k=2		k=2	0.000
4	Receiver: Pulse amplitude response	Rectangular	k=1.73	1.000	k=1	0.577
5	Receiver: Pulse repetition rate response	Rectangular	k=1.73		k=1	0.000
6	Receiver: Noise floor proximity	Normal	k=1.73	0.000	k=1	0.000
7	LISN Factor 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	1.034
10	Total Uncertainty @95% mim. Confidence Level	Normal			k=2	2.068

Measurement Uncertainty Calculations:
Uc (y) = square root ($u_1 (y)^2 + u_2 (y)^2 + ...+u_n (y)^2$)
U = 2 * Uc (y)

Note: The measurement Uncertainties mentioned above also refer to NIS 81-1994 of NAMAS : The treatment of Uncertainty in EMC Measurement.

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=2	0.104	k=1	0.052
2	Random Effects: (Assessment from 20 random observations; 1 reading on EUT)	Normal	k=2	0.330	k=1	0.165
3	Receiver Calibration	Rectangular	k=1.73	1.000	k=1	0.577
4	LISN Factor Calibration	Normal	k=2	1.200	k=1	0.600
5	Cable Loss Calibration	Normal	k=2	1.000	k=1	0.500
6	Combined Standard Uncertainty Uc(y)	Normal			k=1	0.850
7	**Total Uncertainty @95% mim. Confidence Level**	**Normal**	**k=2**	**1.701**		

Measurement Uncertainty Calculations:

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

Note: The measurement Uncertainties mentioned above also refer to NIS 81-1994 of NAMAS : The treatment of Uncertainty in EMC Measurement.

OATS 01

Source of Uncertainty	Probability Distribution	Total Uncertainties (dB)		Standard Uncertainty (dB)	
Systematic Effects: (Assessment from 20 repeat observation; 1 reading on EUT)	Normal	k=2	0.286	k=1	0.143
Random Effects: (Assessment from 20 random observations; 1 reading on EUT)	Normal	k=2	1.642	k=1	0.821
Receiver Calibration	Rectangular	k=1.73	1.000	k=1	0.577
Antenna Factor Calibration	Normal	k=2	1.400	k=1	0.700
Cable Loss Calibration	Normal	k=2	1.000	k=1	0.500
Combined Standard Uncertainty Uc(y)	Normal			k=1	1.232
Total Uncertainty @95% mim. Confidence Level	Normal			k=2	2.464

Measurement Uncertainty Calculations:
Uc (y) = square root ($u_1 (y)^2 + u_2 (y)^2 + ...+u_n (y)^2$)
U = 2 * Uc (y)

Note: The measurement Uncertainties mentioned above also refer to NIS 81-1994 of NAMAS : The treatment of Uncertainty in EMC Measurement.

Test Site: Chamber 01-3M

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	0.036	k=1	0.036
2	Random Effects: (Assessment from 20 random observations; 1 reading on EUT)	Normal	k=1	0.040	k=1	0.040
3	Antenna Factor Calibration	Normal	k=2	1.400	k=1	0.700
4	Receiver: Sine wave voltage	Normal	k=2	0.500	k=1	0.250
5	Receiver: Pulse amplitude response	Rectangular	k=1.73	1.000	k=1	0.577
6	Receiver: Pulse repetition rate response	Rectangular	k=1.73	1.000	k=1	0.577
7	Receiver: Noise floor proximity	Normal	k=2	0.500	k=1	0.250
8	Mismatch: antenna-receiver	U-shaped	k=1	0.670	k=1	0.670
9	Antenna: AF freq. Interpolation	Rectangular	k=1.73	1.000	k=1	0.577
10	Antenna: AF height deviation	Rectangular	k=1.73	1.000	k=1	0.577
11	Antenna: Directivity diffrence	Rectangular	k=1.73	1.000	k=1	0.577
12	Antenna: Balance	Rectangular	k=1	1.000	k=1	1.000
13	Site imperfections	Triangular	k=1.73	1.000	k=1	0.577
14	Site separation distance	Rectangular	k=1.73	1.000	k=1	0.577
15	Table height	Normal	k=2	1.000	k=1	0.500
16	Cable Loss Calibration	Normal	k=2	1.000	k=1	0.500
17	Combined Standard Uncertainty Uc(y)	Normal			k=1	2.214
18	Total Uncertainty @95% mim. Confidence Level	Normal			k=2	4.427

Measurement Uncertainty Calculations:

$Uc(y) = \text{square root}(u_1(y)^2 + u_2(y)^2 + ...+u_n(y)^2)$

$U = 2 * Uc(y)$

Note: The measurement Uncertainties mentioned above also refer to NIS 81-1994 of NAMAS : The treatment of Uncertainty in EMC Measurement.

Test Site: Chamber 02-10M

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=2	0.134	k=1	0.067
2	Random Effects: (Assessment from 20 random observations; 1 reading on EUT)	Normal	k=2	0.206	k=1	0.103
3	Receiver Calibration	Rectangular	k=1.73	1.000	k=1	0.577
4	Antenna Factor Calibration	Normal	k=2	1.400	k=1	0.700
5	Cable Loss Calibration	Normal	k=2	1.000	k=1	0.500
6	Combined Standard Uncertainty Uc(y)	Normal			k=1	0.916
7	**Total Uncertainty @95% mim. Confidence Level**	**Normal**	**k=2**	**1.831**		

Measurement Uncertainty Calculations:

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

Note: The measurement Uncertainties mentioned above also refer to NIS 81-1994 of NAMAS : The treatment of Uncertainty in EMC Measurement.

Test Site: Chamber 02-3M

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=2	0.067	k=1	0.034
2	Random Effects: (Assessment from 20 random observations; 1 reading on EUT)	Normal	k=2	0.103	k=1	0.052
3	Receiver Calibration	Rectangular	k=1.73	1.000	k=1	0.577
4	Antenna Factor Calibration	Normal	k=2	1.700	k=1	0.850
5	Cable Loss Calibration	Normal	k=2	1.000	k=1	0.500
6	Combined Standard Uncertainty Uc(y)	Normal			k=1	1.029
7	**Total Uncertainty @95% mim. Confidence Level**	**Normal**	**k=2**	**2.059**		

Measurement Uncertainty Calculations:

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

Note: The measurement Uncertainties mentioned above also refer to NIS 81-1994 of NAMAS : The treatment of Uncertainty in EMC Measurement.

4.10 Appendix J: Photographs of EUT Configuration Test Set Up

The measurement results along with the appropriate limits for comparison shall be presented in tabular form. If an alternate test method is used, the test report must identify that method and justification for its use shall be provided. Instrumentation, instrument attenuator and bandwidth settings, detector function, EUT arrangements, a sample calculation with all conversion factors and all other pertinent details shall be included along with the measurement results. When automatic scan techniques are used, an explanation of how each emission from the EUT was maximized shall be included in the test report along with the scan rate used to obtain each level.

The justification for selecting a particular EUT configuration and particular length of interface cable to produce maximized emissions must be documented in the test report. Photographs clearly showing the test set-up and interface cable arrangement for the highest radiated and line conducted emission measured shall be included.

The Front View of Highest Conducted Set-up For EUT

The Front View of Highest Radiated Set-up For EUT

The Back View of Highest Radiated Set-up For EUT

4.11 Appendix K: Photographs of EUT

Please find this appendix in the File of **ISL-04HE064P**