Statement of Conformity

Best Laboratory Co., Ltd.

No. 336, Ba Lian RD., Sec. 1, Hsi Chih City, Taipei Hsien, Taiwan, R.O.C.
Telephone: 886-2-2646-2899 Facsimile: 886-2-2646-2870

EMC Certificate

Applicant : **Advantech Co., Ltd.**
Address : **Fl.4, No. 108-3, Ming-Chuan Road, Shing-Tien City, Taipei, Taiwan, R.O.C.**
Equipment : **250 kS/s, 16-bit, 16-ch High-Resolution Multifunction Card**
Model : **PCI-1716/1716L**

Has fully complied with the requirements set out in the council directive on the approximation of the law of the members states relating to Electromagnetic Compatibility Directive (89/336/EEC). For the evaluation regarding EMC, the following standards were applied:

EMI: EN 50081-1:1992 -> EN 55022:1998, EN 61000-3-2:2000, EN 61000-3-3:1995

EMS: EN 61000-6-2:1999 -> EN 61000-4-2:1998, EN 61000-4-3:1998, EN 61000-4-4:1995, EN 61000-4-5:1995, EN 61000-4-6:1996, EN 61000-4-8:1993, EN 61000-4-11:1994,

The date of the measurement: June 04, 2001
The date of the certification sighed: June 08, 2001
The number of EMC Certificate: CER-A01-CE-297

Test Laboratory

June 08, 2001

Quality Department Manager: JEFF CHIU

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This verification is based on a single evaluation of one sample of above-mentioned products. It does not imply any assessment of the whole production and does not permit the use of the logo of the test laboratory.

EMC TEST REPORT

Applicant : Advantech Co., Ltd.
Equipment : 250 kS/s, 16-bit, 16-ch High-Resolution Multifunction Card
Model : PCI-1716/1716L

Test Report Certification

Best Laboratory Co., Ltd.

No. 336, Ba Lian Rd., Sec. 1, Hsi Chih City, Taipei Hsien, Taiwan, R.O.C.
Tel: 886-2-2646-2899 Fax: 886-2-2646-2870

Applicant	: Advantech Co., Ltd.
Address	: Fl.4, No. 108-3, Ming-Chuan Road, Shing-Tien City, Taipei, Taiwan, R.O.C.
Equipment	: 250 kS/s, 16-bit, 16-ch High-Resolution Multifunction Card
Model	: PCI-1716/1716L
Device's Class	: Class A Device
Measurement Standard	: EN 50081-1/1992, EN 61000-6-2/1999
Measurement Procedure	: EN 55022/1998, EN 61000-3-2/2000, EN 61000-3-3/1995 EN 61000-4-2/1998, EN 61000-4-3/1998, EN 61000-4-4/1995, EN 61000-4-5/1995, EN 61000-4-6/1996, EN 61000-4-8/1993 EN 61000-4-11/1994
Operating Voltage	: 230VAC, 50Hz
Test Result	: **Compliance** (Detail showed in the test report)
Sample Received	: May 28, 2001
Test Date	: June 04, 2001
Report Number	: RE-A01-CE-297
Test Firm	: No. 336, Ba Lian Rd., Sec. 1, Hsi Chih City, Taipei Hsien, Taiwan, R.O.C.

Remark:

(1) The test report is only relating to the sample tested

(2) The test report shall not be reproduced except in full, without the written approval of Best Laboratory Co., Ltd.

Prepared : Jacky Wu
JACKY WU

Approved : _____ (Title: Quality Department Manager)
JEFF CHIU

Date Issued : June 07. 2001

Contain

1. General Information

1.1 EUT Description

Applicant : Advantech Co., Ltd.

Address : Fl.4, No. 108-3, Ming-Chuan Road,
Shing-Tien City, Taipei, Taiwan, R.O.C.

Equipment : 250 kS/s, 16-bit, 16-ch High-Resolution Multifunction Card

Model No. : PCI-1716/1716L

Device's Class : Class A Device

Operation Voltage : 230VAC, 50Hz

Output Ports :

D-Sub 68 pin Connector : connect with the " Industrial Wiring Terminal Board ", Model No.: PCLD-8710, via one data cable, model No.: PCL-10168, which is 2 meters long, shielded, no ferrite bead.

Feature:

1. 16-BIT HIGH RESOLUTION
2. 250kS/s sampling rate
3. Auto Calibration Function
4. PCI-Bus mastering for data transfer
5. 16 analog input channels with 1K FIFO
6. 16 S.E. or 8 Diff. Al, or combination
7. Unipolar/Bipolar input range
8. 2 analog output channels (PCI-1716 only)
9. 16 digital input channels
10. 16 digital output channels
11. One 10MHz 16-bit resolution counter
12. Board ID
13. Windows 95/98/NT/2000 DLL drivers

1.2 Test System Detail

PC **: HP (Brio)**
Model No. : 71xx
Serial No. : TW84400040
FCC ID : DoC Approval
BSMI : 3872H009
Power Type : 100-127/200-240VAC, 50/60Hz, 6A/3A, Switching
Power Cord : 180cm long, non-shielded, no ferrite bead.

Monitor **: Viewsonic**
Model No. : VCDT321496-1D
Serial No. : HR94500066
FCC ID : DoC Approval
BSMI : 3882A702
Power Type : 100-240VAC, 50/60Hz, 1.5A, Switching
Power Cord : 180cm long, non-shielded, no ferrite bead.
Data Cable : 120cm long, shielded, with ferrite bead
Backshell : Metal
Connected Port : VGA Port

Keyboard **: HP (Pavilion)**
Model No. : SK-2506
Serial No. : C0006002889
FCC ID : DoC Approval
BSMI : 3882A375
Power Type : By PC
Data Cable : 180cm long, shielded, no ferrite bead
Backshell : Metal
Connected Port : PS/2 Keyboard Port

Mouse **: Logitech**
Model No : M-S48a
Serial No. : N/A
FCC ID : JNZ201213
BSMI : 4882A001
Power Type : By PC
Data Cable : 120cm long, non-shielded, no ferrite bead
Backshell : Metal
Connected Port : PS/2 Mouse Port

Modem	**: ACEEX**
Model No.	: XDM-9624
Serial No.	: 0017884
FCC ID	: IFAXDM-9624
Power Type	: 230VAC, 50Hz / 9VAC, 1A
Power Core	: 1.9meters long, non-shielded, no ferrite bead
Data Cable	: RS232, shielded, 1.2meters long, no ferrite bead RJ11C x 2, 7' long, non-shielded, no ferrite bead
Backshell	: Metal
Connected Port	: Serial #1 Port

Printer	**: Epson**
Model No.	: P950
Serial No.	: BW9Y113923
FCC ID	: DoC Approval
BSMI	: 3872P001
Power Type	: 230VAC, 50Hz, 0.4A
Power Core	: 165cm long, non-shielded, no ferrite bead
Data Cable	: 120cm long, shielded, no ferrite bead
Backshell	: Metal
Connected Port	: Parallel Port

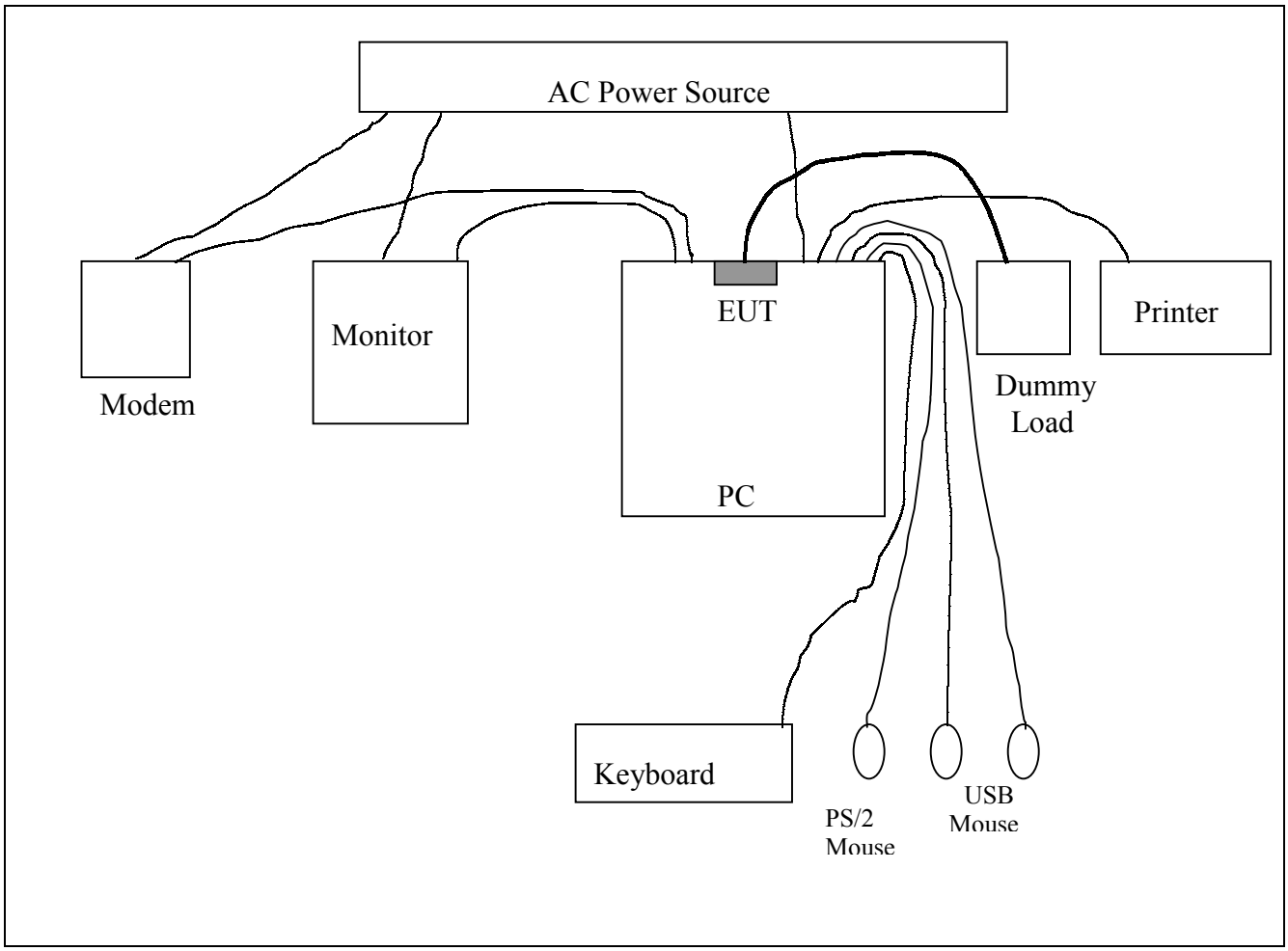
USB Mouse	**: Logitech**
Model No.	: M-BB48
Serial No.	: LZE92250126
FCC ID	: DoC Approval
BSMI	: 4872A221
Power Type	: By PC
Data Cable	: 120cm long, shielded, no ferrite bead
Backshell	: Metal
Connected Port	: USB Port

1.3 EUT Configuration

(1) Plug the EUT into the PCI bus of PC and screw it up.
(2) The D-Sub 68 pin connector of EUT is connected the "Industrial Wiring Terminal Board; PCLD-8710 " via the data cable (Model No. PCL- PCL-10168).

(***PS: Please refers to the Photograph***)

Drawing of Configuration



1.4 EUT Exercise Software

The testing software is provided by the applicant.

It is designed to exercise the EUT in a manner similar to a typical use. The software will be continuous sending out the data to the "Industrial Wiring Terminal Board; PCLD-8710" from EUT; The "Industrial Wiring Terminal Board; PCLD-8710" will be continuous to feed back the data to EUT. The software will enable all functions of EUT.

1.5 Test Performed

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver which bandwidth is set at 9KHz.

Radiated emissions were invested over the frequency range from 30MHz to 1000MHz using a receiver which bandwidth is set at 120KHz. Radiated measurement was performed at distance that from an antenna to EUT is 10meters.

The testing result of pretest was shown out that the " Testing " mode is worse than the " Standby " mode. So, the final measurement was made on the " Testing " mode.

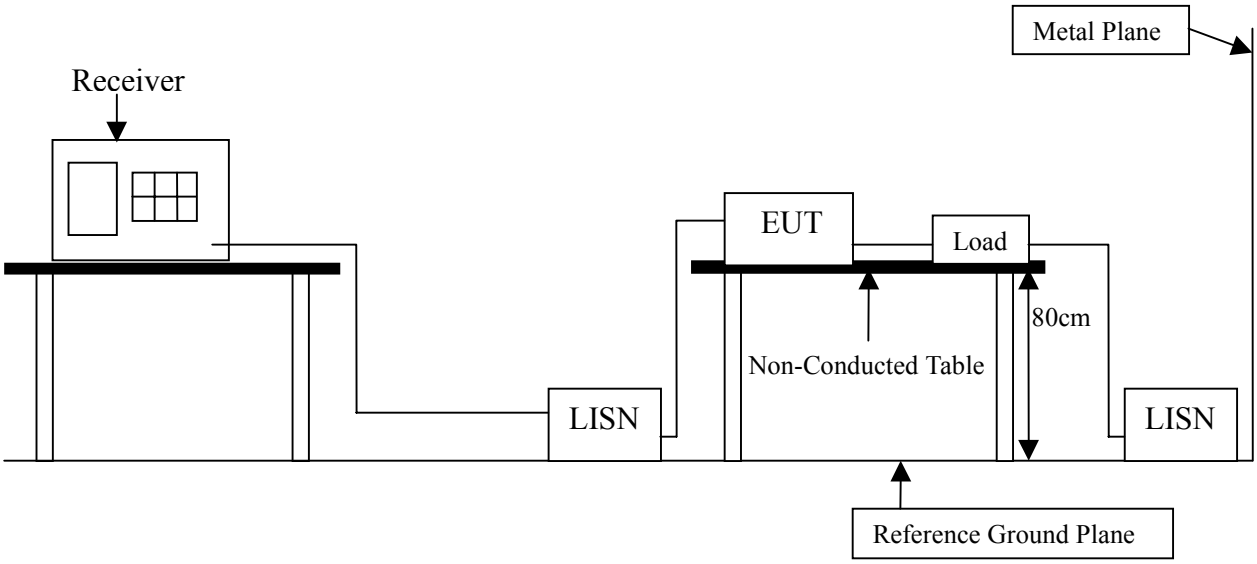
2 Conducted Emission Measurement

2.1 Test Equipment

No.	Instrument	Manufacture	Model	Serial No.	Last Calibrate
1.	LISN (EUT)	Rolf Heine	NNB-2/16Z	99084	Dec 14, 1999
2.	LISN (AXE)	Rolf Heine	NNB-2/16Z	99086	Dec 14, 1999
3.	EMI Receiver	Rohde & Schwarz	ESI 7	830154/001	Nov 22, 1999
4.	50Ω Terminator	Amphenol	46650-51	N/A	Mar 10, 2000
5.	RF Cable	Belden	M17/158	MIL-C-17	Jan 20, 2000

Remark: All equipment upon which need to calibrated are with calibration period of one year.

2.2 Test Set-Up



2.3 Limit

Frequency	Limit (dBμV)			
	Class A		Class B	
MHz	Quasi Peak	Average	Quasi Peak	Average
0.15 ~ 0.50	79	66	66 ~ 56	56 ~ 46
0.50 ~ 5.0	73	60	56	46
5.0 ~ 30.0	73	60	60	50

Remark: In the above table, the tighter limit applies at the band edges.

2.4 Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). It provides a 50 ohm / 50 μH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm / 50 μH coupling impedance with 50 ohm termination. (Please refers to the block diagram of the test setup and photograph.)

Both sides of AC line are checked for the maximum conducted emission interference. In order to find the maximum emissions, the relating positions of equipment and all of the interference cables must be changed according to EN 55022/1998 regulation: The measurement procedure on conducted emission interference.

The resolution bandwidth of the field strength meter (Rohde & Schwarz) is set at 9KHz.

2.5 Test Specification

According to the EN 55022/1998

2.6 Test Result

The emissions that come from the EUT were below the specified limits. The worst case of conducted emissions measurement are shown in the appendix A. The acceptance criterion was met and the EUT has pass the measurement.

2.7 Deviation from the Test Method

No Deviation.

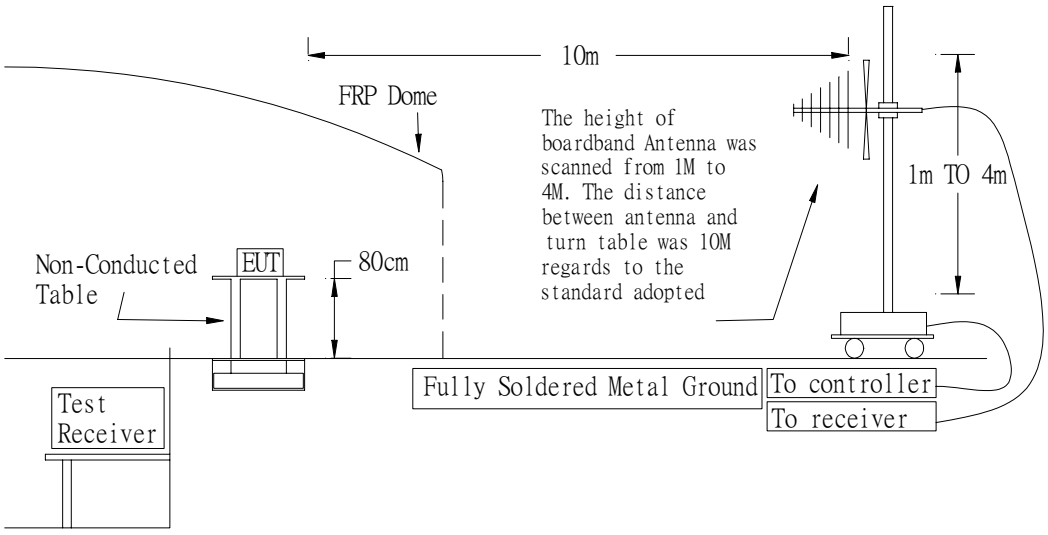
3. Radiated Emission Measurement

3.1 Test Equipment List

No.	Instrument	Manufacture	Model	Serial No.	Last Calibrate
1.	Antenna	Mess-Elektronik	VULB 9160	9160-3078	Jan 19, 2000
2.	EMI Receiver	Rohde & Schwarz	ESI 7	830154/001	Nov 22, 1999
3.	RF Cable	Adventest	AD-N-CA-01	2000-0220	Apr 01, 2000
4.	OATS	Bestlab	N/A	OATS#1	Mar 30, 2000

Remark: All equipment upon which need to calibrated are with calibration period of one year.

3.2 Test Setup



3.3 Limit

Frequency	Class A		Class B	
MHz	Distance (Meter)	Limit (dBμV)	Distance (Meter)	Limit (dBμV)
30 ~ 230	10	40	10	30
230 ~ 1000	10	47	10	37

Remark: In the above table, the tighter limit applies at the band edges

3.4 Test Procedure

The EUT and its simulators are placed on turn table, non-ducted and wooden, which is 0.8 meter above ground. The turn table rotates 360 degree to determine the position of the maximum emission level. The EUT was positioned such that distance from antenna to the EUT is 10 meters.
The antenna is moved up and down between 1 meter to 4 meter to receive the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interference cables must be manipulated according to EN 55022/1998 regulation: the test procedure of the radiated emission measurement.

The bandwidth set on the field strength is 120KHz when the frequency range is below 1GHz

3.5 Test Specification

According to EN 55022/1998

3.6 Test Result

The emissions that come from the EUT was below the specified limits. The worst case of conducted emissions measurement are shown in the appendix A. The acceptance criterion was met and the EUT has pass the measurement.

3.7 Deviation from the Test Method

No Deviation.

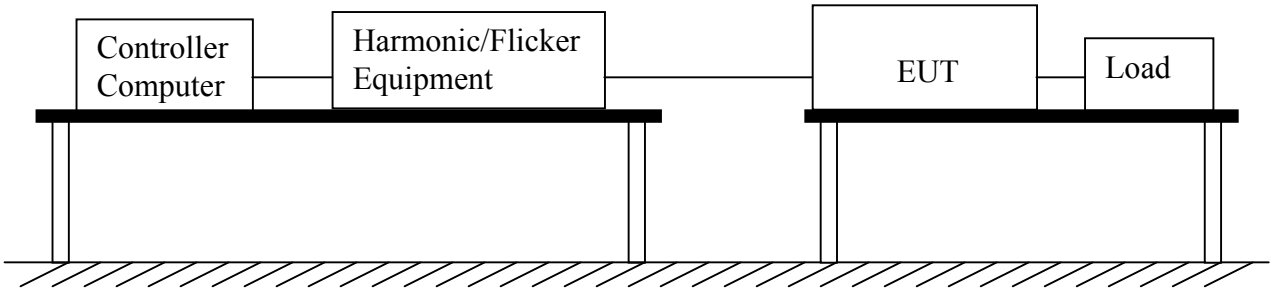
4. Power Harmonic and Voltage Fluctuation Measurement

4.1 Power Harmonic and Voltage Fluctuation Test Equipment List

No.	Instrument	Manufacture	Model	Serial No.	Last Calibrate
1.	H/F Test System	EMC Partner	Harmonic-1000	325807	Jun. 10, 2000

Remark: All equipment upon which need to calibrated are with calibration period of 1 year.

4.2 Test Setup



4.3 Limit of Harmonic Current

Limit of Harmonic Currents

Harmonic Order	Maximum Permissible Harmonic Current (Ampere)	Harmonic Order	Maximum Permissible Harmonic Current (Ampere)
Odd Harmonic		Even Harmonic	
3	2.30	2	1.08
5	1.14	4	0.43
7	0.77	6	0.30
9	0.40	8≤ n ≥ 40	0.23 x 8/n
11	0.33		
13	0.21		
15≤ n ≥ 39	0.15 x 15/n		

4.4 Test Procedure

The EUT is supplied in series with power analyzer from a power source has the same normal voltage and frequency as the rated supply voltage and the equipment under test. The rated voltage at the supply voltage of EUT of 0.94 times and 1.06 times shall be performed.

4.5 Test Specification

According to EN 61000-3-2/2000, EN 61000-3-3/1995

4.6 Test Result

The measurement of the power harmonics, which test at the extremes of EUT‘s supply range, was investigated and the test result was shown on the Appendix A. The acceptance criterion was met and the EUT has pass the measurement.

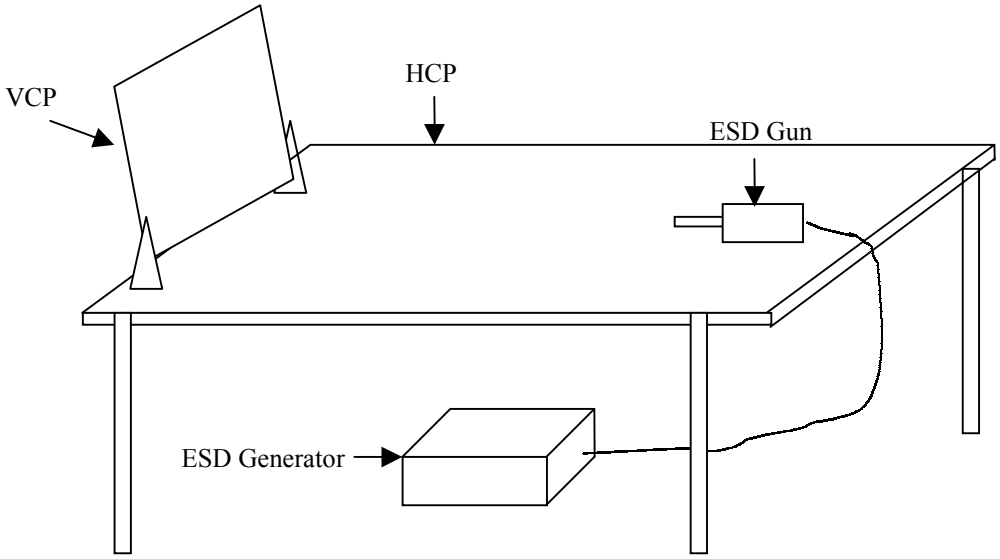
5. Electrostatic Discharge (ESD)

5.1 Test Equipment List

No.	Instrument	Manufacture	Model	Serial No.	Last Calibrate
1.	ESD Emulator	Noiseken	ESS-100L	0199C02380	Feb 02, 2000

Remark: All equipment upon which need to calibrated are with calibration period of one year.

5.2 Test Setup



5.3 Test Level

Item	Environment	Unit	Test Specification	Performance Criteria
Enclosure	Room	KV(Charge Voltage)		B
	Electrostatic Discharge		8 (Air Discharge) 4 (Contact Discharge)	

5.4 Test Procedure

Direct applicant of discharge to the EUT:

Contact discharge was applied only to the conducted surfaces of the EUT.

Air discharge was applied only to the non-conductive surfaces of the EUT.

When the measurement was taken, The ESD discharger was performed in single discharge. For the single discharge time between successive single discharges will keep on one second. It was at least ten single discharges with positive and negative at the same selected pointed. The selected pointed, which was performed with electrostatic discharge, was marked on the red label on the EUT.

Indirect applicant of discharge to the EUT:

Vertical Coupling Plane (VCP)

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to , and positioned at a distance 0.1m from, the EUT, with the discharge electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge. It was at least ten single discharges with positive and negative at the same selected point.

Horizontal Coupling Plane (HCP)

The coupling plane is placed under the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the discharge electrode touching the coupling.

The four faces of the EUT will be performed with electrostatic discharge. It was at least ten single discharges with positive and negative at the same selected pointed.

5.5 Test Specification

According to EN 61000-4-2/1998

5.6 Test Result

The measurement of the electrostatic discharge was investigated and the test result was shown on the Appendix A. The acceptance criterion was met and the EUT has passed the measurement.

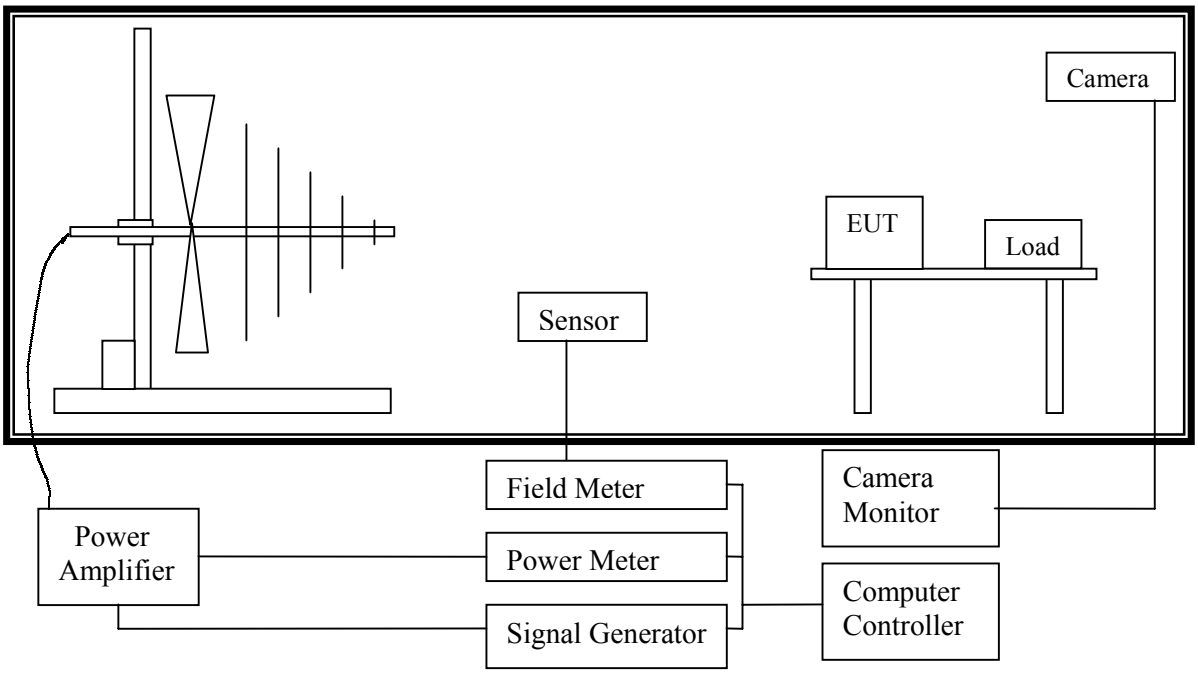
6. Radiated Susceptibility (RS)

6.1 Test Equipment List

No.	Instrument	Manufacture	Model	Serial No.	Last Calibrate
1.	Signal Generator	Rohde & Schwarz	SMY 02	845069/018	May 02, 1999
2.	Amplifier	Amplifier Research	100W1000M1A	20638	May 01, 1999
3.	Field Monitor	Amplifier Research	FM 2000	20391	Mar 03, 1999

Remark: All equipment upon which need to calibrated are with calibration period of one and half year.

6.2 Test Setup



6.2 Test Level

Item	Environment	Unit	Test Specification	Performance Criteria
Enclosure Room				
	Radio –Frequency	MHz	80 ~ 1000	A
	Electromagnetic Field	V/m (unmodulated, rms)	10	
	Amplitude Modulated	%AM (1KHz)	80	

6.3 Test Procedure

The EUT and load, which are placed on a wooden table that the height is 0.8 meter above ground, are placed with one coincident with the calibration plane such that the distance from antenna to the EUT is 3 meters.

Both horizontal and vertical polarization of the antenna position and four sides of the EUT are set on measurement.

In order to judge the EUT performance, a CCD camera is used to monitor the situation of EUT. All the scanning conditions are as follows:

Condition of Test	Remarks
EN 61000-4-3/1998	
1. Field Strength	10V/M; Level 3
2. Radiated Signal	AM 80% modulated with 1KHz
3. Scanning Frequencies	80MHz ~ 1000MHz
4. Dwell Time	3 seconds
5. Frequency step size Δf	1%
6. The rate of swept of frequency	1.5 x 10

***** The above measurement was performed in HomeTek Technology Inc. *****

6.4 Specification

According to EN 61000-4-3/1998

6.5 Test Result

The measurement of the radiated susceptibility was investigated and the test result was shown on the appendix A. The acceptance criterion was met and the EUT has passed the measurement.

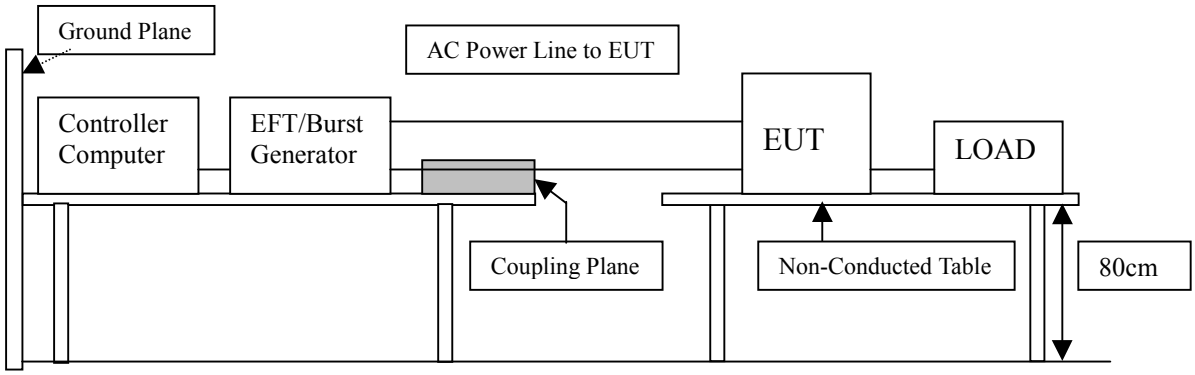
7 Electrical Fast Transient/Burst (EFT/B)

7.1 Test Equipment List

No.	Instrument	Manufacture	Model	Serial No.	Last Calibrate
1.	EMC Test System	EMC Partner	Transient-1000	TR1000-341	Aug 25, 1999
2.	Absorbing Clamp	EMC Partner	Transient-1000	CNEFT1000-176	Aug 25, 1999

Remark: All equipment upon which need to calibrated are with calibration period of one year.

7.2 Test Setup



7.3 Test Level

Item	Environment	Unit	Test Specification	Performance Criteria
Ports for signal Lines and Control Lines				B
	Fast Transients Common Mode	KV (Peak)	1	
		Tr/Ts (ns)	5/50	
		Rep. Frequency (KHz)	5	
DC Input and DC Output Power Ports				B
	Fast Transients Common Mode	KV (Peak)	2	
		Tr/Ts (ns)	5/50	
		Rep. Frequency (KHz)	5	
Input and Output AC Power Ports				B
	Fast Transients Common Mode	KV (Peak)	2	
		Tr/Ts (ns)	5/50	
		Rep. Frequency (KHz)	5	
Functional Earth Ports				B
	Fast Transients Common Mode	KV (Peak)	1	
		Tr/Ts (ns)	5/50	
		Rep. Frequency (KHz)	5	

7.4 Test Procedure

The EUT and load are placed on a wooden table that is 0.8meter height above a metal ground plane dimension is 1m x 1m and thickness is at least 0.2mm. It also projected beyond the EUT by at lease 0.1meter on all sides.

For Input and Output AC power or DC Input and DC Output Power Ports:

The EUT is connected with the power mains through a coupling device that directly couples the EFT interference signal.

Each of the line and nature conductors is impressed with burst noise for 1 minute.
For Functional Earth Port:

The EUT is connected to the power mains through a coupling device that directly couples the EFT interference signal.

The protective earth line (PE) is impressed with burst noise for 1 minute.

The length of power cord between the coupling device and the EUT shall be 1 meter.
For signal Lines and Control Lines Test:

The EFT interference signal is through a coupling clamp device couples to the signal and control lines of the EUT with burst noise for 1 minute.

7.5 Test Specification

According to EN 61000-4-4/1995

7.6 Test Result

The measurement of the Electrical Fast Transient/Burst was investigated and test result was shown on the appendix A. The acceptance criterion was met and the EUT has passed the measurement.

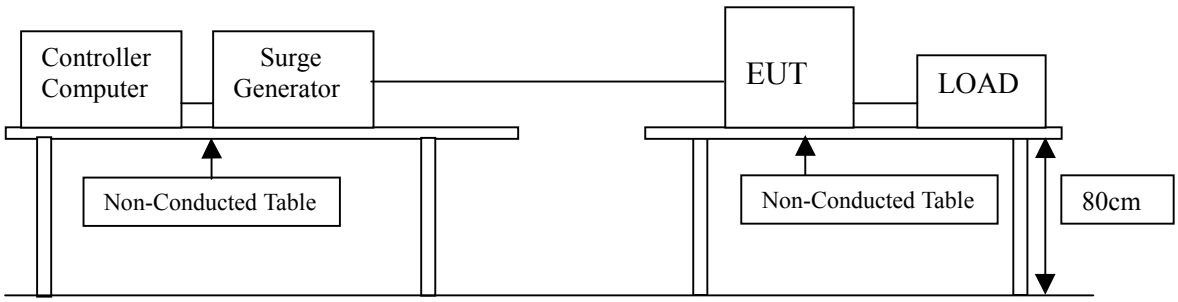
8. Surge

8.1 Test Equipment List

No	Instrument	Manufacture	Model	Serial No.	Last Calibrate
1.	EMC Test System	EMC Partner	Transient-1000	TR1000-341	Aug 25, 1999

Remark: All equipment upon which need to calibrated are with calibration period of one year.

8.2 Test Setup



8.3 Test Level

Item	Environment	Unit	Test Specification	Performance Criteria
Dc Input and DC Output Power Ports				
	Surge	Tr/Ts (μs)	1.2/50(8/20)	B
	Line to Ground	KV	±0.5	
	Line to Line	KV	±0.5	
AC Input and Ac Output Power Ports				
	Surge	Tr/Ts (μs)	1.2/50(8/20)	B
	Line to Ground	KV	±4	
	Line to Line	KV	±2	

8.4 Test Procedure

The EUT and its load are placed on a table which is 0.8 meter height above a metal ground plane dimension is 1 meter x 1 meter and the thickness is 0.5 mm. It's also projected beyond the EUT at least 0.1 meter on all sides. The length of power cord between the coupling device and the EUT shall be 2meter or less.

For Input and Output AC Power or DC Input and Dc Output Power Ports:

The EUT is connected to the power mains through a coupling device that directly couples the Surge interference signal.

The Surge noise shall be applied synchronized to the voltage phase at 0°, 90°, 180°, 270° and the peak value of the AC voltage wave. (Positive and Negative)

Each of line-earth and line-line is impressed with a sequence of five surge voltages with interval of 1 minute.

8.5 Test Specification

According to EN 61000-4-5/1995

8.6 Test Result

The Measurement of the Surge was investigated and the test result was shown on the appendix A. The acceptance criterion was met and the EUT has passed the test.

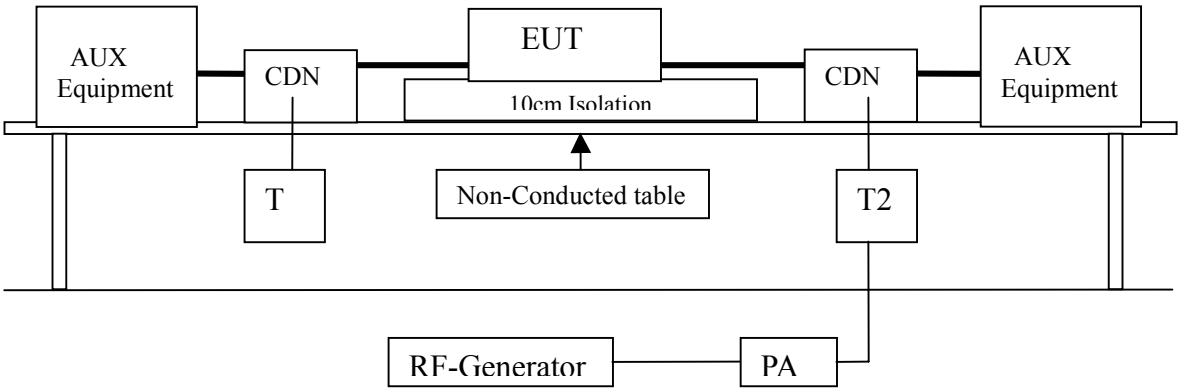
9. Conducted Susceptibility

9.1 Test Equipment List

No.	Instrument	Manufacture	Model	Serial No.	Last Calibrate
1.	Signal Generator	Rohde & Schwarz	SMY 02	845069/018	May 02, 1999
2.	Power Amplifier	Amplifier Research	100W1000M1A	20638	May 01, 1999
4.	Directional Coupler	Amplifier Research	DC2600	20508	Aug 23, 1999
5.	CDN	FCC	FCC-801-M3-25A	9993	Aug 23, 1999

Remark: All equipment upon which need to calibrated are with calibration period of one year.

9.2 Test Setup



9.3 Test Level

Item	Environment	Unit	Test Specification	Performance Criteria
Ports for Signal Lines and Data Buses, not involved in process control, etc.				
	Radio-Frequency	MHz	0.15 ~ 80	A
	Common Mode	V (rms, Unmodulated)	10	
	Amplitude Modulated	%AM (1KHz)	80	
		Source Impedance	150	
Ac Input and AC Output and DC Input and DC output Ports and Functional Earth Ports				
	Radio-Frequency	MHz	0.15 ~ 80	A
	Common Mode	V (rms, Unmodulated)	10	
	Amplitude Modulated	%AM (1KHz)	80	
		Source Impedance	150	

9.4 Test Procedure

The EUT are placed on a table which is 0.8meter height and a ground reference plane on the table, the EUT are placed upon table and use a 10cm insulation between the EUT and ground reference plane.

For AC Input and AC Output Power or DC Input and DC Output Power Ports:
The EUT is connected to the power mains through a coupling and decoupling networks for power supply lines. It also directly couples the disturbance signal into EUT.
Use CDN-M2 for two wires or CDN-3 for three wires.

For Signal Lines Lines and Control Lines Test:
The disturbance signal is through a coupling and decoupling networks (CDN) or EM-clamp device couples to the signal and control lines of the EUT.

All scanning frequencies conditions are as following:

Condition of Test	Remarks:
1. Field Strength	10V, Level 3
2. Radiated Signal	AM 80% modulated with 1KHz
3. Scanning frequencies	0.15MHz ~ 80MHz
4. Dwell Time	3 seconds
5. Frequency step size Δf	1%
6. The rate of Swept of Frequency	1.5×10^{-3} decades/s

***** The above measurement was performed in HomeTek Technology Inc. *****

9.5 Test Specification

According to EN 61000-4-6/1996

9.6 Test Result

The Measurement of the Conducted Susceptibility was investigated and the test result was shown on the appendix A. The acceptance criterion was met and the EUT has passed the test.

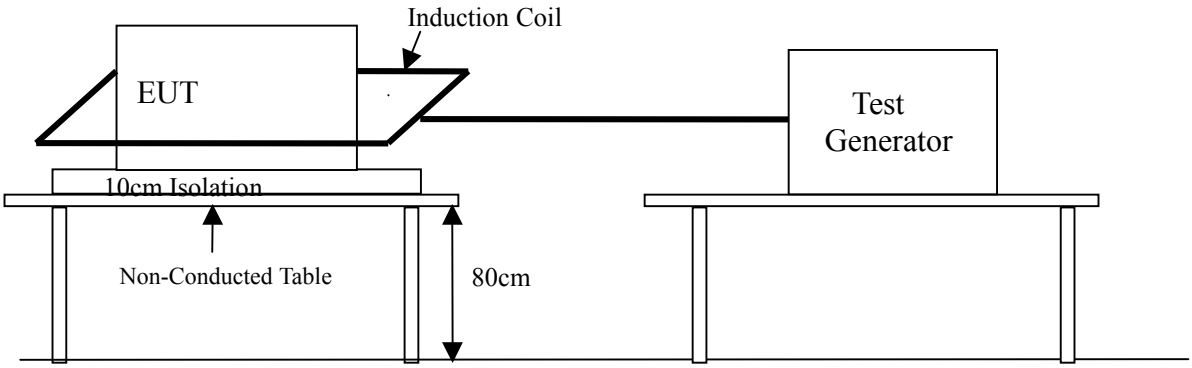
10 Power Frequency Magnetic Field

10.1 Test Equipment List

No.	Instrument	Manufacture	Model	Serial No.	Last Calibrate
1.	EMC Test System	EMC Partner	Transient-1000	TR1000-341	Aug 25, 1999
2.	Magnetic Coil	EMC Partner	MF-1000	MF1000-1-51	Aug 25, 1999

Remark: All equipment upon which need to calibrated are with calibration period of one year.

10.2 Test Setup



10.3 Test Level

Item	Environment	Unit	Test Specification	Performance Criteria
Enclosure Room				
	Power-Frequency	50	Hz	A
	Magnetic Field	30	A/M	

10.4 Test Procedure

The EUT and its load are placed on a table that is 0.8 meter above the metal ground plane dimension is at least 1 meter x 1 meter. The test magnetic field shall be placed at least than 3 meters distance from the induction coil.

The test magnetic field shall be applied by the immersion method to the EUT. The induction coil shall be rotated by 90° in order to expose the EUT to the test field with different orientation (X, Y, Z orientation).

10.5 Test Specification

According to EN 61000-4-8/1993

10.6 Test Result

The Measurement of the Power Frequency Magnetic Field was investigated and the test result was shown on the appendix A. The acceptance criterion was met and the EUT has passed the test.

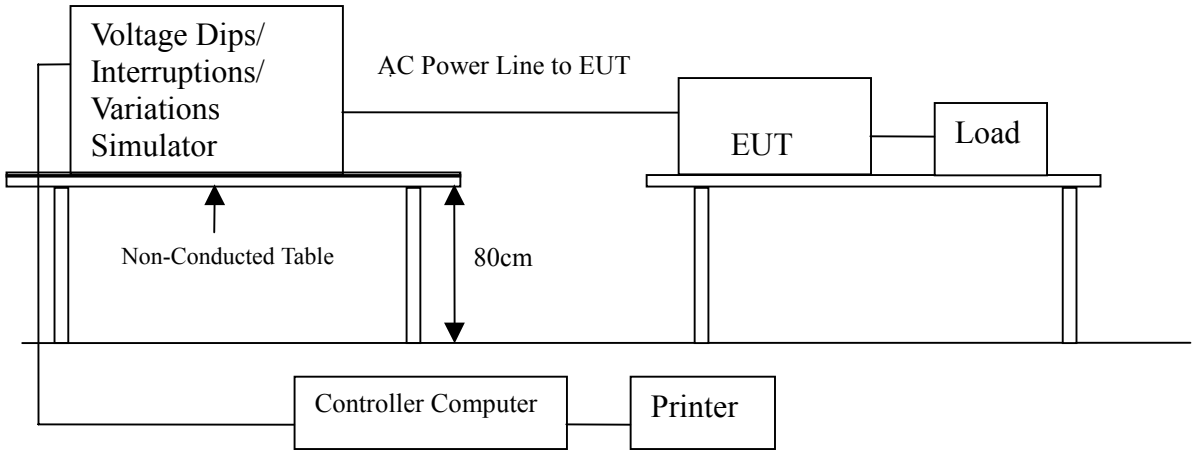
11. Voltage Dips and Interruption Measurement

11.1 Test Equipment List

No.	Instrument	Manufacture	Model	Serial No.	Last Calibrate
1.	EMC Test System	EMC Partner	Transient-1000	TR1000-341	Aug 25, 1999

Remark: All equipment upon which need to calibrated are with calibration period of one year.

11.2 Test setup



11.3 Test Level

Item	Environment	Unit	Test Specification	Performance Criteria
Ac Input and AC Output Power Ports				
	Voltage Dips	30	% Reduction	B
		10	ms	
		60	% reduction	C
		100	ms	
		>95%	Reduction	C
	Voltage Interruption	5000	ms	

11.4 Test Procedure

The EUT and its load are placed on a wooden table which is 0.8 meter above a metal ground plane which dimension is 1 meter x 1 meter, the thickness is 0.65mm. It projected beyond the EUT by at least 0.1 meter on all sides. The power cord shall be used the shortest power cord as specified by the manufacturer.

For Voltage Dips / Interruption Test:

The EUT is connected to the power mains through a coupling device that directly couples to the Voltage Dips and Interruption Generator.

The EUT shall be tested for 30% voltage dips of supplied voltage and duration time is 10ms, for 60% voltage dips of supplied voltage and duration time is 100ms with a sequence of three voltage dips with intervals of 10 seconds, and for 95% voltage interruption of supplied voltage and the duration time is 5000ms with a sequence of three voltage interruptions with intervals of 10 seconds.

Voltage phase shifting are shall occur at 0°, 45°, 90°, 135, 180°, 225°, 270°, 315° of the voltage.

11.5 Test Specification

According to EN 61000-4-11/1994

11.6 Test Result

The Measurement of the Voltage Dips and Interruption was investigated and the test result was shown on the appendix A. The acceptance criterion was met and the EUT has passed the test.

12 Modification List for EMC Complying Test

The modification is solely made by the applicant.

14 Appendix

Appendix A: Summary of Test Result

Appendix B: The test photograph of EUT

Appendix C: The Detail Photograph of EUT

Appendix A: Summary of Test Result

The test result in the emission and immunity were performed according to the requirement of measurement standard and procedures. Best Laboratory is assumed full responsibility for the accuracy and completeness of these measurements. The Test data of the emissions and immunity are listed as the appendix data.

All these tests are were carried out with the EUT in normal operation, which was defined as:

******* EMC Test Result: The EUT has been passed the all measurements. *******

The uncertainty is calculated in accordance with NAMAS NIS 81, the total uncertainty for this test is as follows:

⇒ Emission Test

- Uncertainty in the Conducted Emission Test: <±2.0dB
- Uncertainty in the Field Strength measurement: <±4.0dB

Conducted Emission Test

Date Measurement Performed: May 29, 2001
EUT : 250 kS/s, 16-bit, 16-ch High-Resolution Multifunction Card
Temperature : 26°C
Humidity :75%RH

Line 1:

Frequency	Corrected Amplitude (dBμV)			Limit (dBμV)		Margin
(KHz)	Peak	QP	Avg.	QP	Avg.	dB
199.3000	47.79	*.**	*.**	79.00	60.00	-18.21
218.8500	44.35	*.**	*.**	79.00	60.00	-21.65
2105.0000	37.93	*.**	*.**	73.00	60.00	-22.07
5470.0000	38.95	*.**	*.**	73.00	60.00	-21.05
12536.0000	39.33	*.**	*.**	73.00	60.00	-20.67
***						

Line 2:

Frequency	Corrected Amplitude (dBμV)			Limit (dBμV)		Margin
(KHz)	Peak	QP	Avg.	QP	Avg.	dB
200.1500	49.42	*.**	*.**	79.00	66.00	-16.58
217.1500	43.45	*.**	*.**	79.00	66.00	-22.55
298.7500	35.06	*.**	*.**	79.00	66.00	-30.94
1290.0000	31.77	*.**	*.**	73.00	60.00	-28.23
2075.0000	37.34	*.**	*.**	73.00	60.00	-22.66
5375.0000	38.12	*.**	*.**	73.00	60.00	-21.88
12760.0000	41.09	*.**	*.**	73.00	60.00	-18.91
***						

*** Remark: The above corrected amplitudes are all under the average limit. ***

Field Strength Test

Date Measurement Performed: May 30, 2001
EUT : 250 kS/s, 16-bit, 16-ch High-Resolution Multifunction Card
Polarity : Vertical
Temperature : 25°C
Humidity : 52%RH

Frequency (MHz)	Reading Amplitude (dBμV/m)	Table Degree (°)	Antenna Height (Meter)	Correction Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
32.170	15.99	220	1.00	11.25	27.25	40.00	-12.75
48.506	19.89	191	4.00	11.99	31.88	40.00	-8.12
75.016	20.48	219	3.00	9.87	30.35	40.00	-9.65
171.094	15.17	256	1.00	12.62	27.79	40.00	-12.21
220.020	24.78	314	4.00	10.60	35.38	40.00	-4.62
415.693	15.96	328	4.00	16.74	32.70	47.00	-14.30
***							

Remark:
1. The " Correction Factor " contains antenna factor, cable loss.
2. The formula of " Corrected Amplitude " is as follow"
   Reading Amplitude + Correction Factor = Corrected Amplitude.

Field Strength Measurement

Date Measurement Performed: May 30, 2001
EUT : 250 kS/s, 16bit, 16-ch High-Resolution Multifunction Card
Polarity : Horizontal
Temperature : 25°C
Humidity : 51%RH

Frequency (MHz)	Reading Amplitude (dBμV/m)	Table Degree (°)	Antenna Height (Meter)	Correction Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
31.360	17.90	79	4.00	11.29	29.19	40.00	-10.81
62.676	10.23	358	3.00	10.59	20.82	40.00	-19.18
63.486	14.65	221	3.00	10.48	25.13	40.00	-14.87
581.385	9.01	22	4.00	20.19	29.20	47.00	-17.80
747.997	1.44	336	1.00	22.98	24.42	47.00	-22.58
***							

Remark:
1. The “ Correction Factor “ contains antenna factor, cable loss.
2. The formula of “ Corrected Amplitude “ is as follow”
   Reading Amplitude + Correction Factor = Corrected Amplitude.

Power Harmonic / Fluctuation Test

Power Harmonic:

Operating Environment:

Temperature : 26℃
Humidity : 68%RH
Atmosphere : 1010mBar

Test Condition:

EUT Position : Table Top

Result:

Summary of the test result: Pass

Fluctuation Test:

Test Frequency	: 50Hz	Test Voltage	: 230VAC
Test Time	: 10 min.	Tshort	: 5.0 min

EUT	Data	Limit	Result	Test Enable
Pst	0.001	1.00	Pass	True
Plt	0.001	0.65	Pass	True
dc %	0.00	3.00	Pass	True
dmax %	0.00	4.00	Pass	True
d(t) sec	0.00	0.20	Pass	True
Power Source Data				
Source Pst max	0.022	0.400	Pass	True
% THD	0.02	3.00	Pass	True

Electrostatic Discharge Test

Item	Amount of Discharge	Voltage	Required Criteria	Complied to Criteria	Results
Air Discharge	10	+8KV	B	B	Pass
	10	-8KV	B	B	Pass
Contact Discharge	10	+4KV	B	B	Pass
	10	-4KV	B	B	Pass
Indirect Discharge	10	+4KV	B	B	Pass
(HCP)	10	-4KV	B	B	Pass
Indirect Discharge	10	+4KV	B	B	Pass
(VCP Front)	10	-4KV	B	B	Pass
Indirect Discharge	10	+4KV	B	B	Pass
(VCP left)	10	-4KV	B	B	Pass
Indirect Discharge	10	+4KV	B	B	Pass
(VCP Rear)	10	-4KV	B	B	Pass
Indirect Discharge	10	+4KV	B	B	Pass
(VCP Right)	10	-4KV	B	B	Pass

Remark:

( ) Criteria A: Operation as intended during and after the measurement
(X) Criteria B: Operation as Intended after the test
( ) Criteria C: Malfunction during and after, need manual reset
( ) Criteria D: The sample is damaged

Radiated Susceptibility

Frequency (MHz)	Position (Angle)	Polarity (H or V)	Field Strength (V/m)	Required Criteria	Complied Criteria	Result
80 ~ 1000	0	H	10	A	A	Pass
80 ~ 1000	0	V	10	A	A	Pass
80 ~ 1000	90	H	10	A	A	Pass
80 ~ 1000	90	V	10	A	A	Pass
80 ~ 1000	180	H	10	A	A	Pass
80 ~ 1000	180	V	10	A	A	Pass
80 ~ 1000	270	H	10	A	A	Pass
80 ~ 1000	270	V	10	A	A	Pass

Remark:

(X) Criteria A: Operation as intended during and after the measurement
( ) Criteria B: Operation as Intended after the test
( ) Criteria C: Malfunction during and after, need manual reset
( ) Criteria D: The sample is damaged

Electrical Fast Transient / Burst

Inject Line	Polarity	Voltage (KV)	Inject Time (Second)	Inject Method	Required Criteria	Complied Criteria	Result
L	±	2KV	60	Direct	B	B	Pass
N	±	2KV	60	Direct	B	B	Pass
PE	±	2KV	60	Direct	B	B	Pass
L+N	±	2KV	60	Direct	B	B	Pass
L+PE	±	2KV	60	Direct	B	B	Pass
N+PE	±	2KV	60	Direct	B	B	Pass
L+N+PE	±	2KV	60	Direct	B	B	Pass
Clamp	±	1KV	60	Couple	B	B	Pass

Remark:

( ) Criteria A: Operation as intended during and after the measurement
(X) Criteria B: Operation as Intended after the test
( ) Criteria C: Malfunction during and after, need manual reset
( ) Criteria D: The sample is damaged

Surge Test

Inject Line	Polarity	Angle	Voltage (KV)	Inject Time (Second)	Inject Method	Required Criteria	Complied Criteria	Result
L+N	±	0	2KV	60	Direct	B	B	Pass
L+N	±	90	2KV	60	Direct	B	B	Pass
L+N	±	180	2KV	60	Direct	B	B	Pass
L+N	±	270	2KV	60	Direct	B	B	Pass
L+PE	±	0	4KV	60	Direct	B	B	Pass
L+PE	±	90	4KV	60	Direct	B	B	Pass
L+PE	±	180	4KV	60	Direct	B	B	Pass
L+PE	±	270	4KV	60	Direct	B	B	Pass
N+PE	±	0	4KV	60	Direct	B	B	Pass
N+PE	±	90	4KV	60	Direct	B	B	Pass
N+PE	±	180	4KV	60	Direct	B	B	Pass
N+PE	±	270	4KV	60	Direct	B	B	Pass

Remark:

( ) Criteria A: Operation as intended during and after the measurement
(X) Criteria B: Operation as Intended after the test
( ) Criteria C: Malfunction during and after, need manual reset
( ) Criteria D: The sample is damaged

Conducted Susceptibility

Inject Line	Field Strength V	Inject Method	Required Criteria	Complied Criteria	Result
AC Line	10V	CDN	A	A	Pass

Remark:

(X) Criteria A: Operation as intended during and after the measurement
( ) Criteria B: Operation as Intended after the test
( ) Criteria C: Malfunction during and after, need manual reset
( ) Criteria D: The sample is damaged

Power Frequency Magnetic Field Test

Polarization	Frequency (Hz)	Magnetic Strength (A/M)	Required Criteria	Complied Criteria	Result
X Orientation	50	30	A	A	Pass
Y Orientation	50	30	A	A	Pass
Z Orientation	50	30	A	A	Pass

Remark:

(X) Criteria A: Operation as intended during and after the measurement
( ) Criteria B: Operation as Intended after the test
( ) Criteria C: Malfunction during and after, need manual reset
( ) Criteria D: The sample is damaged

Voltage Dips and Interruption Test

Voltage Dips and Interruption Reduction (%)	Angle (Degree)	Test Duration (ms)	Required Criteria	Complied Criteria	Result
30	45	10	B	B	Pass
30	90	10	B	B	Pass
30	135	10	B	B	Pass
30	180	10	B	B	Pass
30	225	10	B	B	Pass
30	270	10	B	B	Pass
30	315	10	B	B	Pass
60	45	100	C	C	Pass
60	90	100	C	C	Pass
60	135	100	C	C	Pass
60	180	100	C	C	Pass
60	225	100	C	C	Pass
60	270	100	C	C	Pass
60	315	100	C	C	Pass
>95	45	5000	C	C	Pass
>95	90	5000	C	C	Pass
>95	135	5000	C	C	Pass
>95	180	5000	C	C	Pass
>95	225	5000	C	C	Pass
>95	270	5000	C	C	Pass
>95	315	5000	C	C	Pass

Remark:

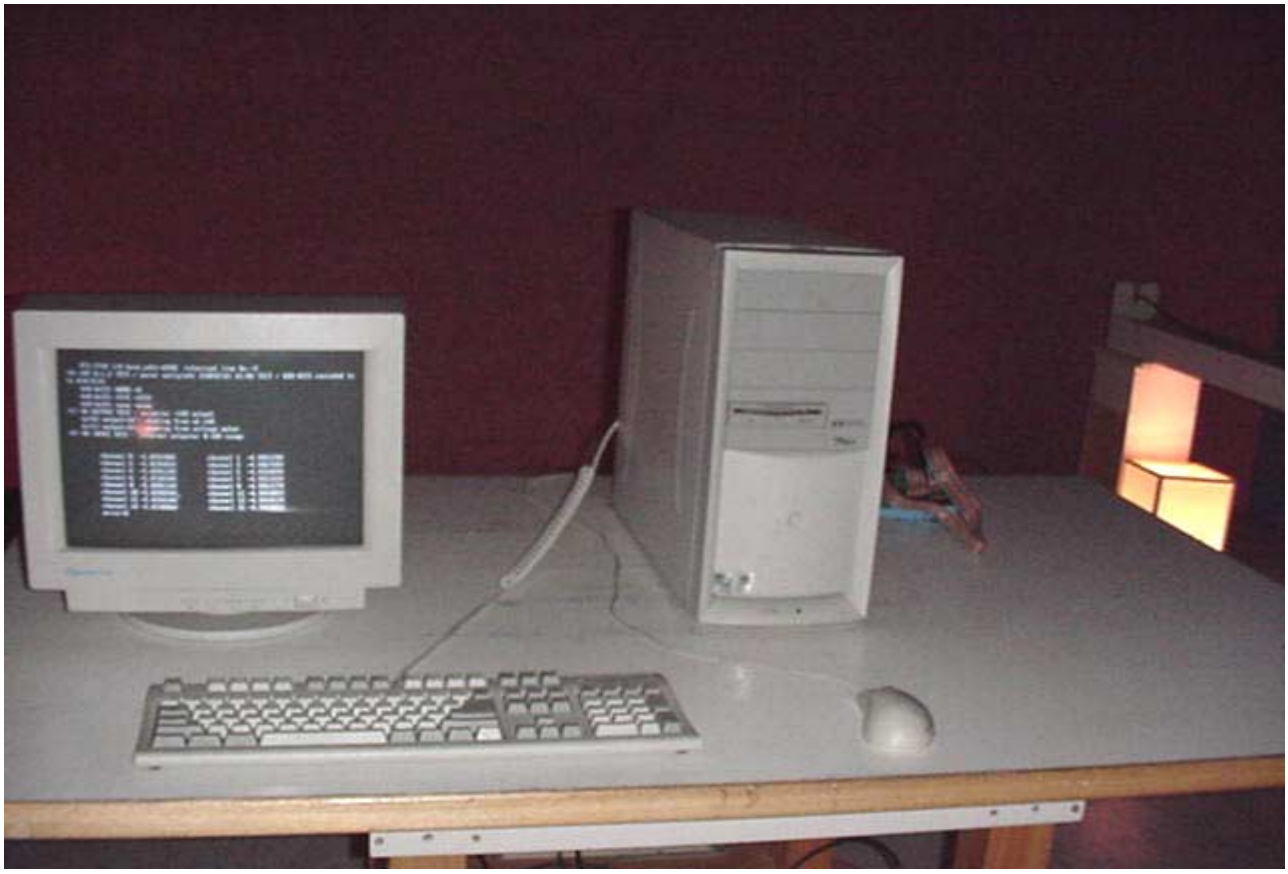
( ) Criteria A: Operation as intended during and after the measurement
(X) Criteria B: Operation as Intended after the test (Test Mode: 30%)
(X) Criteria C: Malfunction during and after, need manual reset(Test Mode: 60%, >95%)
( ) Criteria D: The sample is damaged

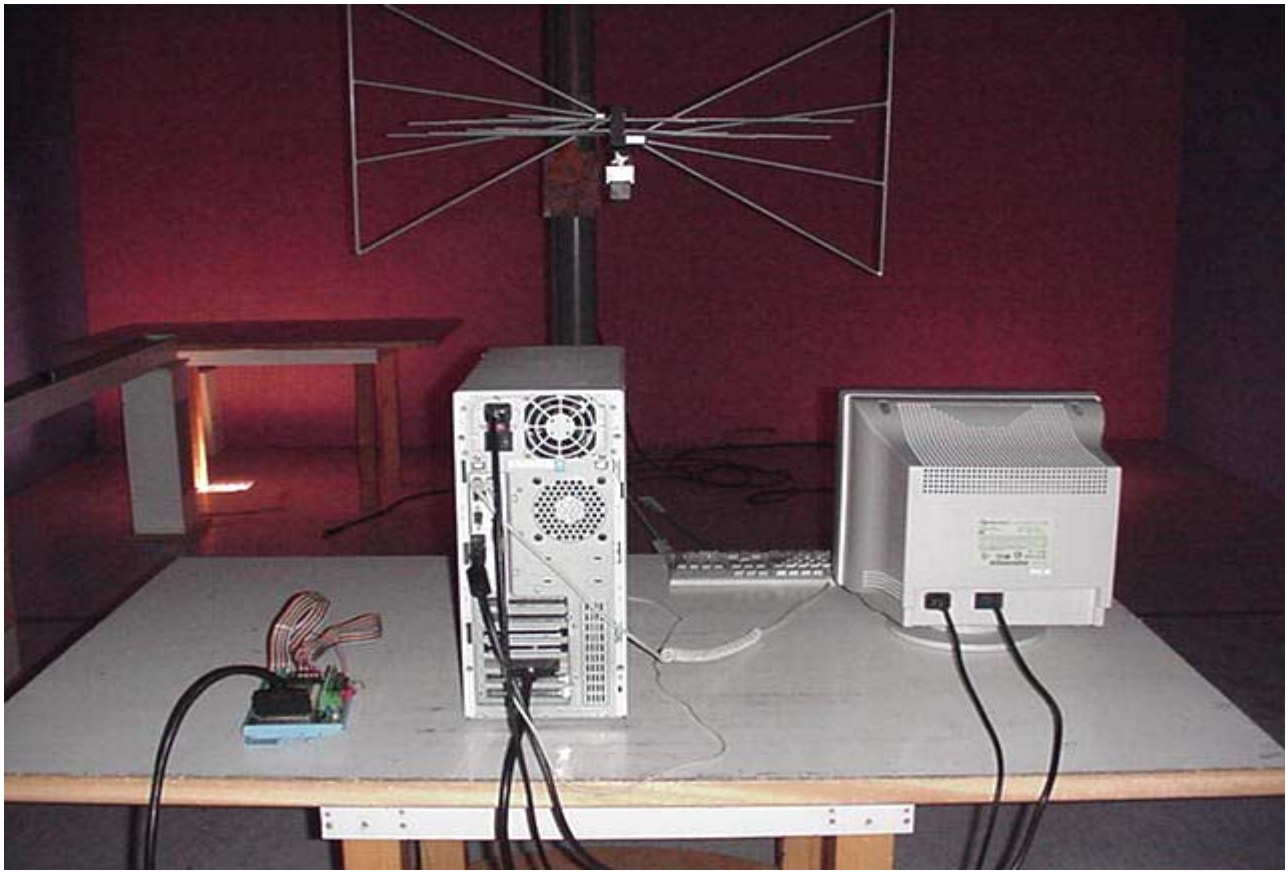
Appendix B: The Test Photograph of EUT

The Photograph of Conducted Emission Test

The Photograph of Radiated Emission Test

The Photograph of Radiation Susceptibility Test



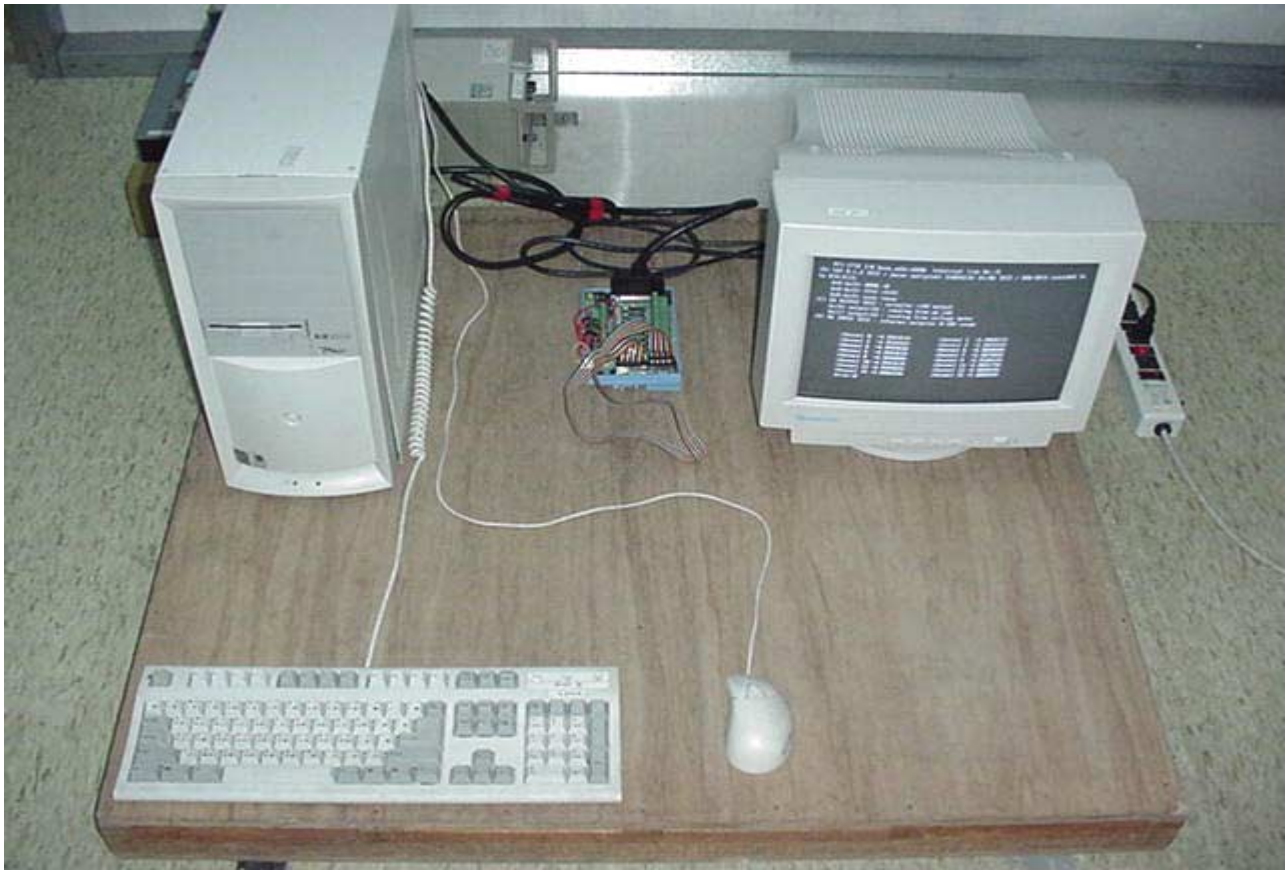


The Photograph of Electrical Fast Transient/Burst Test

The Photograph of Electrostatic Discharge Test

The Photograph of Surge Test

The Photograph of Conducted Susceptibility Test



The Photograph of Power Frequency Magnetic Field Test

The Photograph of Voltage Dips and Interruption Test

Appendix C: The Detail Photograph of EUT


PCI-1716
AGND
MINMAX
MW 3027
Lattice