CE TEST REPORT

according to

European Standard EN 55022:1998/A1:2000 Class A
EN 61000-3-2: 2000, EN 61000-3-3:1995/A1:2001 and
EN 55024:1998/A1:2001 (IEC 61000-4-2:1995,
IEC 61000-4-3:1995, IEC 61000-4-4:1995,
IEC 61000-4-5:1995, IEC 61000-4-6:1996, IEC 61000-4-8:1993,
IEC 61000-4-11:1994)

Equipment : STPC Half Size CPU Card

Model No. : HSB-440I Series

Applicant : **AAEON TECHNOLOGY INC.**
5F, No. 135, Lane235, Pao Chiao, Rd.,
Taipei Hsintien, Taiwan, R.O.C

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- This test report is only applicable to European Community.

SPORTON International Inc.

6F, No. 106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

Table of Contents

History of this test report

Original Report Issue Date: Apr. 11, 2003

■ No additional attachment.

□ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

Certificate No. : C340312

CERTIFICATE OF COMPLIANCE

according to

**European Standard EN 55022:1998/A1:2000 Class A
EN 61000-3-2: 2000, EN 61000-3-3:1995/A1:2001 and
EN 55024:1998/A1:2001 (IEC 61000-4-2:1995,
IEC 61000-4-3:1995, IEC 61000-4-4:1995, IEC 61000-4-5:1995,
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I **HEREBY** CERTIFY THAT:

The measurements shown in this test report were made in accordance with the procedures given in **EUROPEAN COUNCIL DIRECTIVE 89/336/EEC.** The equipment was ***passed*** the test performed according to **European Standard EN 55022:1998/A1:2000 Class A, EN61000-3-2:2000, EN 61000-3-3:1995/A1:2001 and EN 55024:1998/A1:2001 (IEC 61000-4-2:1995, IEC 61000-4-3:1995, IEC 61000-4-4:1995, IEC 61000-4-5:1995, IEC 61000-4-6:1996, IEC 61000-4-8:1993, IEC 61000-4-11:1994).** The test was carried out on Apr. 09, 2003 at **SPORTON International Inc.** LAB.

K. J. Lin
Manager

SPORTON International Inc.

6F, No. 106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

1. General Description of Equipment under Test

1.1. Applicant

AAEON TECHNOLOGY INC.
5F, No. 135, Lane235, Pao Chiao, Rd.,
Taipei Hsintien, Taiwan, R.O.C

1.2. Manufacturer

Same as 1.1

1.3. Basic Description of Equipment under Test

Equipment	: STPC Half Size CPU Card
Model No.	: HSB-440I Series
Trade Name	: AAEON
UTP Cable	: Non-Shielded, 20m
Power Supply Type	: Switching
AC Power Input	: Non-Shielded, 1.8m, 3pin

1.4. Feature of Equipment under Test

Form Factor	Half-Size CPU SBC
Processor	STPC Atlas SoC 133MHz
I/O Chipset	STPC Atlas + Winbond 83977F
System Memory	Onboard 64MB memory
VGA / LCD Controller	STPC Atlas, Share up to 4MB, Support VGA/SVGA 18bit TFT LCD / VGA/SVGA/XGA/SXGA CRT-out
Ethernet	One LAN, Use External RJ-45 Connector Realtek 8139DL 10/100Mbps LAN chips x 1
BIOS	Award Plug & Play ISA BIOS – 2Mb ROM
IDE Interface	PIO-Mode4 x 1 channel (Support two ATAPI devices)
Floppy Drive Interface	One Standard FDD port, support up to two floppy devices
Four Serial Port	Four COM ports:(Three internal pin headers, One external on bracket) COM 1 / 3 / 4: RS-232 COM 2: RS-232/ RS-422/ RS-485
Parallel Port	Supports SPP/ EPP/ ECP mode (From Winbond 83977F)
K/B and Mouse	One Mini-DIM PS/2 K/B and Mouse connector One internal keyboard pin header One internal mouse pin header (From Winbond 83977F)
Disk On Chip / Compact Flash	Supports DOC2000 Socket Supports CF type II Slot (Use IDE Secondary Interface)
PC/104 Module	Support PC/104 interface
Expansion Interface	Supports **ISA** Interface
IR Interface	Supports One IrDA header (only in Windows OS environment)
Watchdog Timer	15 ~ 240sec, 16 level and can be set with software (From W83977F)
RTC	Internal RTC (From Winbond 83977F)
Operation Temp.	0°C ~ 60°C

2. Test Configuration of Equipment under Test

2.1. Test Manner

a. During testing, the interface cables and equipment positions were varied according to European Standard EN 55022.

b. The complete test system included remote COMPAQ NOTEBOOK, VIEWSONIC Monitor, BTC PS/2 Keyboard, LOGITECH PS/2 MOUSE, HP PRINTER, ACEEX MODEM, AAEON Sever and EUT for EMI test.

c. The following test modes were performed for EMI tset:
Mode 1. LAN:100M, CPU : 133MHz
Mode 2. LAN:10M, CPU : 133MHz

d. The complete test system included remote Workstation, VIEWSONIC Monitor, DELL PS/2 Keyboard, Canon Printer, ACEEX Modem, DELL PS/2 Mouse, AAEON Sever and EUT for EMS test. The remote Workstation included DELL PC, VIEWSONIC Monitor, LOGITECH PS/2 Mouse and LOGITECH PS/2 Keyboard.

e. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 1000MHz.

2.2. Description of Test System

< EMI >

Support Unit 1. -- Monitor (VIEWSONIC) -- for local workstation

FCC ID	: N/A
Model No.	: VCDTS21553-3P
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0050
Data Cable	: Shielded, 1.7m
Remark	: This support device was tested to compy with FCC standards and authorized under a declaration of conformity.

Support Unit 2. – PS/2 Keyboard (BTC) -- for local workstation

FCC ID	: N/A
Model No.	: 9110
Serial No.	: SP0054
Data Cable	: Shielded, 360 degree via metal backshells, 1.7m
Remark	: This support device was tested to compy with FCC standards and authorized under a declaration of conformity.

Support Unit 3. -- PS/2 Mouse (LOGITECH) -- for local workstation

FCC ID	: DZL211029
Model No.	: M-S34
Serial No.	: SP0041
Data Cable	: Shielded, 1.7m

Support Unit 4. -- Printer (HP) – for local workstation

FCC ID	: B94C2642X
Model No.	: DJ 400
Power Supply Type	: Linear
Power Cord	: Non-Shielded
Serial No.	: SP0048
Data Cable	: Braided-Shielded, 360 degree via metal backshells, 1.35m

Support Unit 5. -- Modem (ACEEX) – for local workstation

FCC ID	: IFAXDM1414
Model No.	: DM1414
Power Supply Type	: Linear
Power Cord	: Non-Shielded
Serial No.	: SP0015
Data Cable	: Shielded, 360 degree via metal backshells, 1.15m

Support Unit 6. – Notebook (COMPAQ) -- for remote workstation

FCC ID	: N/A
Model No.	: Presario 1500
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0037
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 7. -- Sever (AAEON) -- for local workstation

FCC ID	: N/A
Model No.	: 4U
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0038
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

< EMS >

Support Unit 1. -- Monitor (VIEWSONIC) -- for local and remote workstation

FCC ID	: N/A
Model No.	: VCDTS21553-3J
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0056
Data Cable	: Shielded, 1.7m
Remark	: This support device was tested to compy with FCC standards and authorized under a declaration of conformity.

Support Unit 2. -- PS/2 Keyboard (DELL) -- for local workstation

FCC ID	: GYUM92SK
Model No.	: AT101(DE8M)
Serial No.	: SP0054
Data Cable	: Shielded, 360 degree via metal backshells, 1.9m

Support Unit 3. -- Printer (Canon) -- for local workstation

FCC ID	: N/A
Model No.	: Bjc-2100sp
Power Supply Type	: Linear
Power Cord	: Non-Shielded
Serial No.	: SP0047
Data Cable	: Shielded, 1.35m

Support Unit 4. -- Modem (ACEEX) -- for local workstation

FCC ID	: IFAXDM1414
Model No.	: DM1414
Power Supply Type	: Linear
Power Cord	: Non-Shielded
Serial No.	: SP0015
Data Cable	: Shielded, 1.15m

Support Unit 5. – PS/2 Mouse (DELL) -- for local workstation

FCC ID	: N/A
Model No.	: M-S34
Serial No.	: SP0001
Data Cable	: Shielded, 1.6m
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity

Support Unit 6. -- Personal Computer (DELL) -- for remote workstation

FCC ID	: N/A
Model No.	: DHS
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0037
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity

Support Unit 7. -- PS/2 Mouse (LOGITECH) -- for remote workstation

FCC ID	: N/A
Model No.	: M-CAA43
Serial No.	: SP0041
Data Cable	: Shielded, 1.8m
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 8. -- PS/2 Keyboard (LOGITECH) -- for remote workstation

FCC ID	: N/A
Model No.	: Y-SP29
Serial No.	: SP0054
Data Cable	: Shielded, 360 degree via metal backshells, 1.6m
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 7. -- Sever (AAEON) -- for local workstation

FCC ID	: N/A
Model No.	: 4U
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0038
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

3. Test Software

<EMI>

An executive programs, EMCTEST.EXE under WIN 98, which generate a complete line of continuously repeating " H " pattern was used as the test software.

The program was executed as follows:

a. Turn on the power of all equipment.
b. The PC reads the test program from the hard disk drive and runs it.
c. The PC sends " H" messages to the monitor, and the monitor displays " H " patterns on the screen.
d. The PC sends " H " messages to the printer, then the printer prints them on the paper.
e. The PC sends " H " messages to the modem.
f. The PC sends " H " messages to the internal Hard Disk, and the Hard Disk reads and writes the message.
g. Repeat the steps from c to f.

At the same time, "Ping.exe " was executed to link with the remote workstation to receive and transmit data by TP cable.

<EMS>

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e. The PC sends " H " messages to the modem.
f. The PC sends " H " messages to the internal Hard Disk, and the Hard Disk reads and writes the message.
f. Repeat the steps from c to f.

At the same time, the following programs were executed:

- Executed "Media player" to play audio and video.
- Executed "Ping.exe " was executed to link with the remote workstation to receive and transmit data byTP cable.

4. General Information of Test

4.1. Test Facility

<EMI>

Test Site Location : No. 52, Hwa Ya 1St Road, Hwa Ya Technology Park,
Kwei-Shan Hsiang, TaoYuan Hsien, Taiwan, R.O.C.
TEL : 886-3-3273456
FAX : 886-3-3180055

Test Site No. : CO01-HY, 10CH01-HY

<EMS>

Test Site Location : No. 52, Hwa Ya 1St Road, Hwa Ya Technology Park,
Kwei-Shan Hsiang, TaoYuan Hsien, Taiwan, R.O.C.
TEL : 886-3-3273456
FAX : 886-3-3180055

4.2. Test Voltage

230V/50Hz

4.3. Standard for Methods of Measurement

EMI Test (conduction and radiation) : European Standard EN 55022 Class A
Harmonics Test : European Standard EN 61000-3-2.
Voltage Fluctuations Test : European Standard EN 61000-3-3.
EMS Test : European Standard EN 55024.
(ESD: IEC 61000-4-2, RS: IEC 61000-4-3, EFT: IEC 61000-4-4, SURGE: IEC 61000-4-5,
CS: IEC 61000-4-6, Power Frequency Magnetic Field: IEC 61000-4-8, DIPS: IEC 61000-4-11)

4.4. Test in Compliance with

EMI Test (conduction and radiation) : European Standard EN 55022 Class A
Harmonics Test : European Standard EN 61000-3-2.
Voltage Fluctuations Test : European Standard EN 61000-3-3.
EMS Test : European Standard EN 55024.
(ESD: IEC 61000-4-2, RS: IEC 61000-4-3, EFT: IEC 61000-4-4, SURGE: IEC 61000-4-5,
CS: IEC 61000-4-6, Power Frequency Magnetic Field: IEC 61000-4-8, DIPS: IEC 61000-4-11)

4.5. Frequency Range Investigated

a. Conducted emission test: from 150 kHz to 30 MHz
b. Radiated emission test: from 30 MHz to 1,000 MHz
c. Radio frequency electromagnetic field immunity test: 80-1000 MHz.

4.6. Test Distance

a. The test distance of radiated emission test from antenna to EUT is 10 M.
b. The test distance of radio frequency electromagnetic field immunity test from antenna to EUT is 3 M.

5. Test of Conducted Powerline

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 kHz and return leads of the EUT according to the methods defined in European Standard EN 55022 Clause 9. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 5.3. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position producing maximum conducted emissions.

5.1. Description of Major Test Instruments

- Test Receiver (R&S ESCS 30)
  Attenuation 10 dB
  Start Frequency 0.15 MHz
  Stop Frequency 30 MHz
  IF Bandwidth 9 KHz

5.2. Test Procedures

a. The EUT was placed on a desk 0.8 meters height from the metal ground plane and 0.4 meter from the conducting wall of the shielding room and it was kept at least 0.8 meters from any other grounded conducting surface.

b. Connect EUT to the power mains through a line impedance stabilization network (LISN).

c. All the support units are connect to the other LISN.

d. The LISN provides 50 ohm coupling impedance for the measuring instrument.

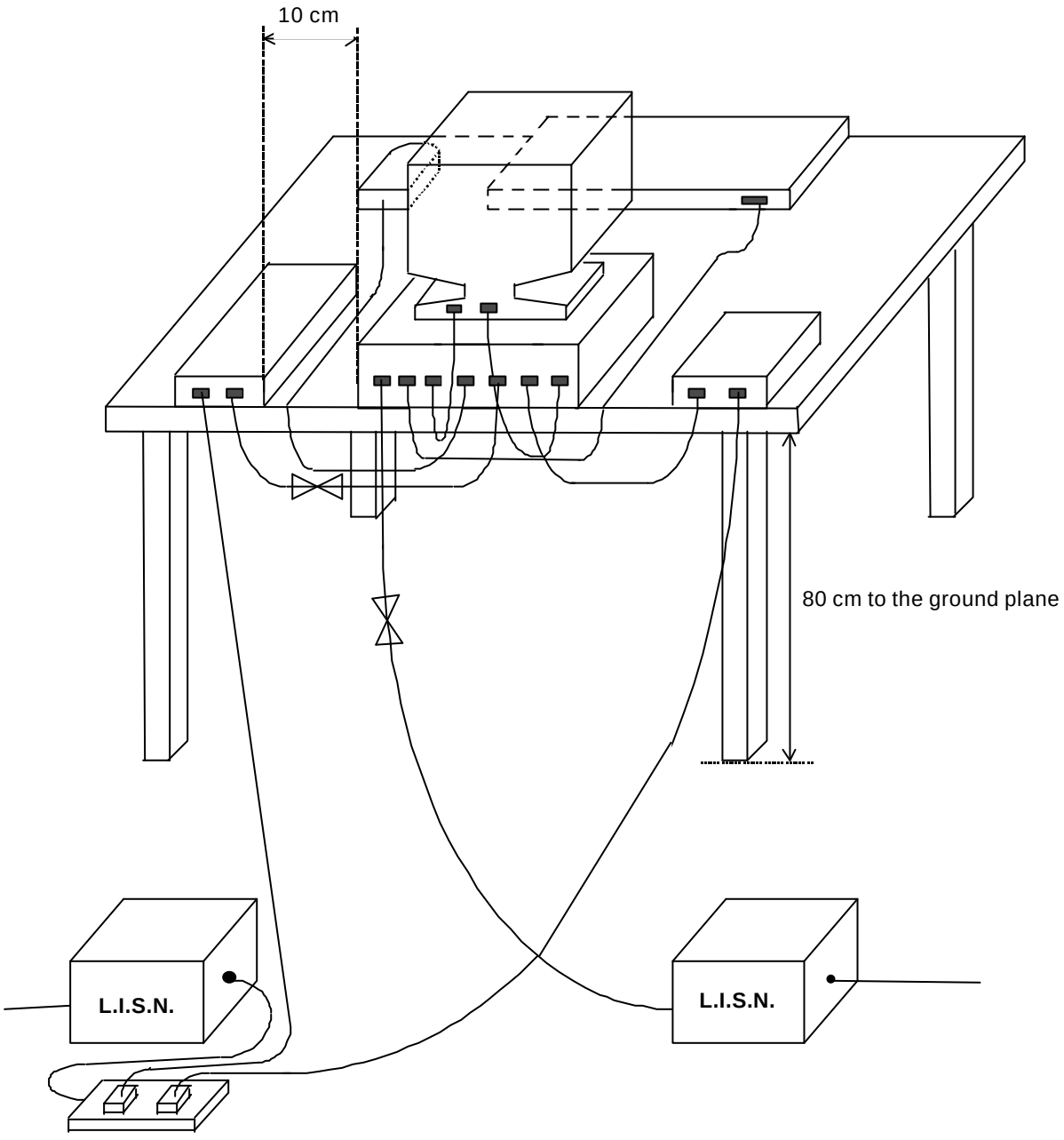
e. The CISPR states that a 50 ohm , 50 microhenry LISN should be used.

f. Both sides of AC line were checked for maximum conducted interference.

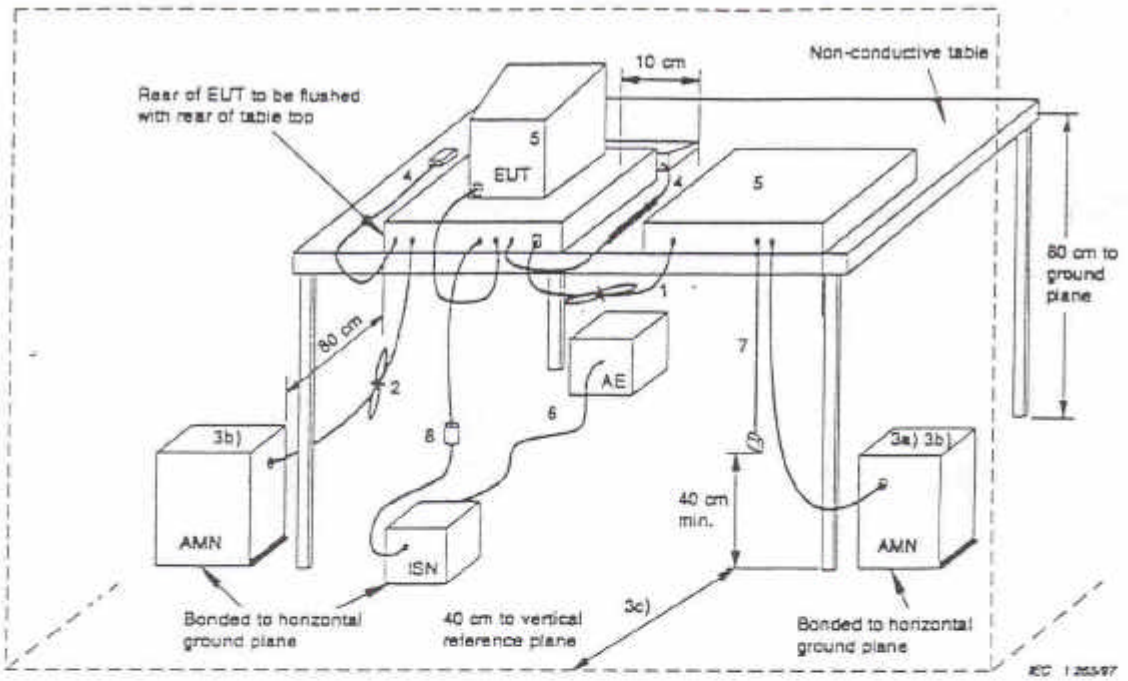
g. The frequency range from 150 kHz to 30 MHz was searched.

h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

5.3. Typical Test Setup Layout of Conducted Powerline



5.4. Typical Test Setup Layout of disturbances at telecommunication ports



AMN = Artificial mains network
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

1) If cables, which hang closer than 40 cm to the horizontal metal groundplane, cannot be shortened to appropriate length, the excess shall be folded back and forth forming a bundle 30 cm to 40 cm long.

2) Excess mains cord shall be bundled in the centre or shortened to appropriate length.

3) EUT is connected to one artificial mains network (AMN). All AMNs and ISNs may alternatively be connected to a vertical reference plane or metal wall (see figures 5 and 6).

a) All other units of a system are powered from a second AMN. A multiple outlet strip can be used for multiple mains cords.

b) AMN and ISN are 80 cm from the EUT and at least 80 cm from other units and other metal planes.

c) Mains cords and signal cables shall be positioned for their entire lengths, as far as possible, at 40 cm from the vertical reference plane.

4) Cables of hand operated devices, such as keyboards, mouses, etc. shall be placed as for normal usage.

5) Peripherals shall be placed at a distance of 10 cm from each other and from the controller, except for the monitor which, if this is an acceptable installation practice, shall be placed directly on the top of the controller.

6) I/O signal cable intended for external connection.

7) The end of the I/O signal cables which are not connected to an AE may be terminated, if required, using correct terminating impedance.

8) If used, the current probe shall be placed at 0,1 m from the ISN.

Figure 4 – Test configuration: tabletop equipment (conducted measurement)

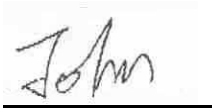
5.5. Test Result of AC Powerline Conducted Emission

5.5.1. Test Mode: Mode 1

- Frequency Range of Test: from 0.15 MHz to 30 MHz
- Temperature: 25.6°C
- Relative Humidity: 54%
- Test Date: Apr. 08, 2003
- All emissions not reported here are more than 10 dB below the prescribed limit.

■ The test was passed at the minimum margin that marked under gray area in the following table

Frequency	Line	Meter Reading		Limits		Margin	
	or	Q.P.	A.V.	Q.P.	A.V.	Q.P.	A.V.
(MHz)	Neutral	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)
0.164	L	48.17	48.56	79.00	66.00	-30.83	-17.44
0.230	L	43.13	43.43	79.00	66.00	-35.87	-22.57
0.823	L	27.97	27.08	73.00	60.00	-45.03	-32.92
1.740	L	30.68	18.91	73.00	60.00	-42.32	-41.09
3.140	L	23.03	15.40	73.00	60.00	-49.97	-44.60
5.770	L	15.87	11.91	73.00	60.00	-57.13	-48.09
0.150	N	46.86	47.21	79.00	66.00	-32.14	-18.79
0.166	N	45.46	45.73	79.00	66.00	-33.54	-20.27
0.231	N	41.70	42.23	79.00	66.00	-37.30	-23.77
1.750	N	24.41	17.41	73.00	60.00	-48.59	-42.59
4.850	N	29.72	28.37	73.00	60.00	-43.28	-31.63
22.570	N	38.26	35.98	73.00	60.00	-34.74	-24.02

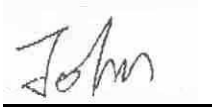
Test Engineer : 
John Huang

5.5.2. Test Mode: Mode 2

- Frequency Range of Test: from 0.15 MHz to 30 MHz
- Temperature: 25.6°C
- Relative Humidity: 54%
- Test Date: Apr. 08, 2003
- All emissions not reported here are more than 10 dB below the prescribed limit.

■ The test was passed at the minimum margin that marked under gray area in the following table

Frequency	Line	Meter Reading		Limits		Margin	
	or	Q.P.	A.V.	Q.P.	A.V.	Q.P.	A.V.
(MHz)	Neutral	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)
0.191	L	33.44	32.67	79.00	66.00	-45.56	-33.33
0.229	L	43.03	43.21	79.00	66.00	-35.97	-22.79
0.230	L	43.17	43.43	79.00	66.00	-35.83	-22.57
1.730	L	29.67	19.17	73.00	60.00	-43.33	-40.83
6.450	L	31.45	26.65	73.00	60.00	-41.55	-33.35
12.850	L	21.90	17.07	73.00	60.00	-51.10	-42.93
0.150	N	46.52	46.90	79.00	66.00	-32.48	-19.10
0.167	N	45.11	45.36	79.00	66.00	-33.89	-20.64
0.232	N	41.38	41.91	79.00	66.00	-37.62	-24.09
1.740	N	30.35	21.43	73.00	60.00	-42.65	-38.57
3.110	N	19.11	13.45	73.00	60.00	-53.89	-46.55
6.350	N	30.59	25.43	73.00	60.00	-42.41	-34.57

Test Engineer : 

John Huang

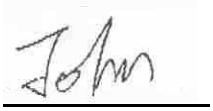
5.6. Test Result of disturbances at telecommunication ports

5.6.1. Test Mode: Mode 1

- Frequency Range of Test : from 150 kHz to 30 MHz
- Temperature: 25.6°C
- Relative Humidity: 54%
- Test Date: Apr. 08, 2003
- All emissions not reported here are more than 10 dB below the prescribed limit.

■ The test was passed at the minimum margin that marked under gray area in the following table

Frequency	Meter Reading		Limits		Margin	
	Q.P.	A.V.	Q.P.	A.V.	Q.P.	A.V.
(MHz)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)
14.153	60.95	58.71	87.00	74.00	-26.05	-15.29
17.695	68.64	66.82	87.00	74.00	-18.36	-7.18
18.490	62.27	63.33	87.00	74.00	-24.73	-10.67
19.708	68.53	66.70	87.00	74.00	-18.47	-7.30
24.352	66.83	64.81	87.00	74.00	-20.17	-9.19
28.685	66.99	65.00	87.00	74.00	-20.01	-9.00

Test Engineer : 

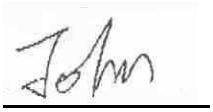
John Huang

5.6.2. Test Mode: Mode 2

- Frequency Range of Test : from 150 kHz to 30 MHz
- Temperature: 25.6°C
- Relative Humidity: 54%
- Test Date: Apr. 08, 2003
- All emissions not reported here are more than 10 dB below the prescribed limit.

■ The test was passed at the minimum margin that marked under gray area in the following table

Frequency	Meter Reading		Limits		Margin	
	Q.P.	A.V.	Q.P.	A.V.	Q.P.	A.V.
(MHz)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)
1.710	47.54	38.94	87.00	74.00	-39.46	-35.06
4.850	50.28	47.84	87.00	74.00	-36.72	-26.16
6.902	50.26	47.30	87.00	74.00	-36.74	-26.70
8.800	46.54	38.13	87.00	74.00	-40.46	-35.87
14.830	39.72	27.52	87.00	74.00	-47.28	-46.48
27.553	52.73	28.27	87.00	74.00	-34.27	-45.73

Test Engineer : 

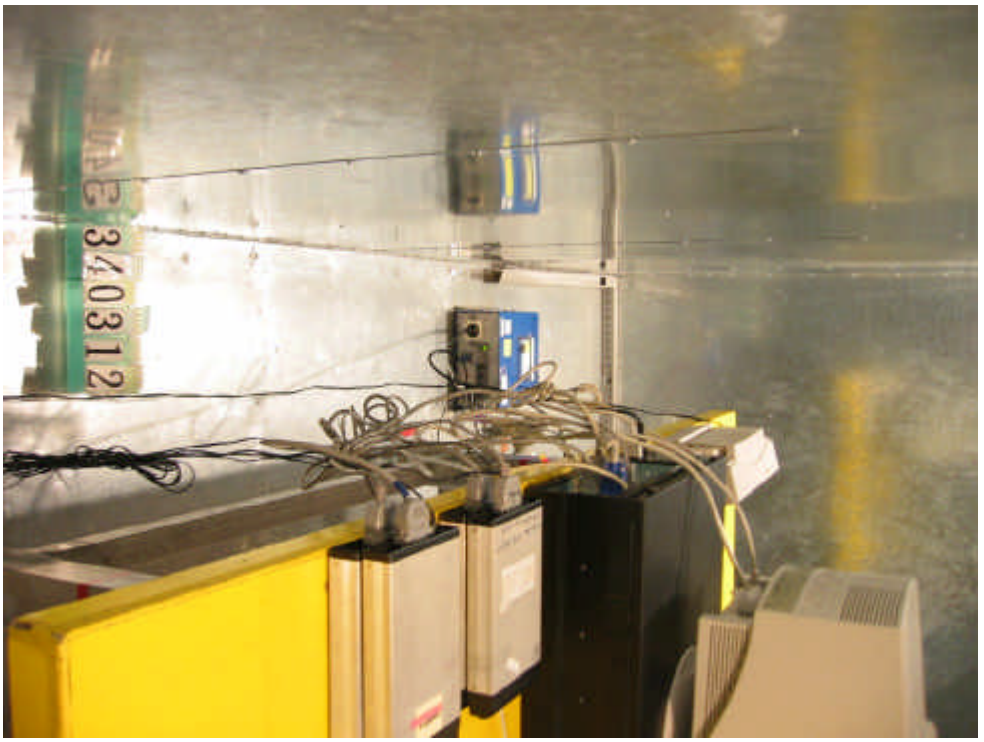
John Huang

5.7. Photographs of Conducted Powerline Test Configuration

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW

REAR VIEW

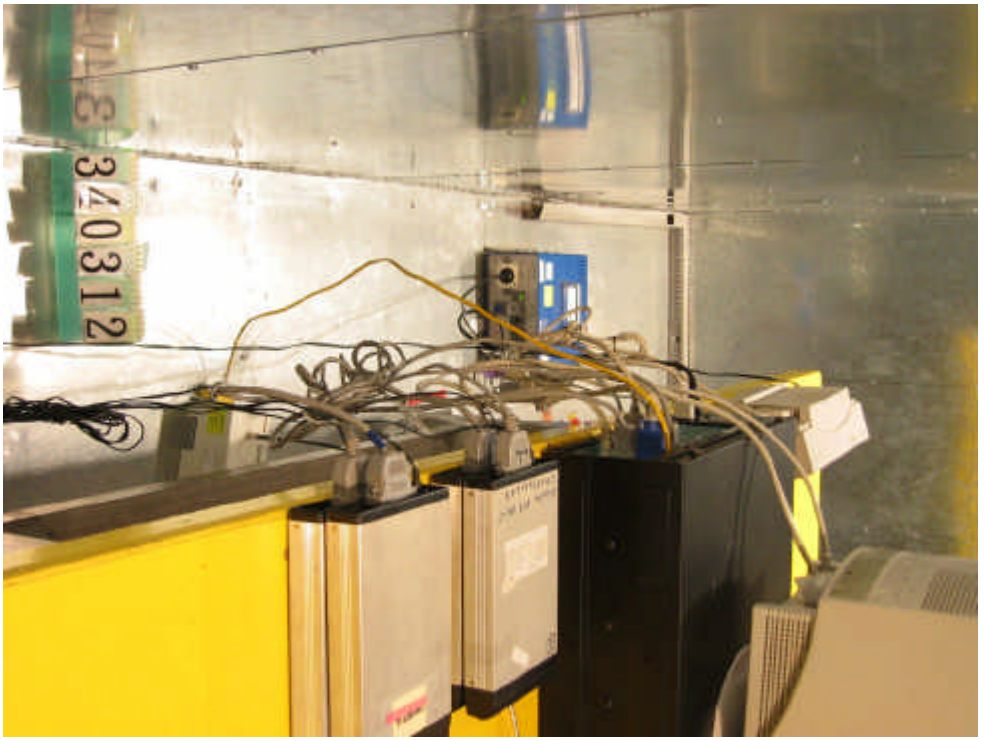


5.8. Photographs of Disturbances at Telecommunication Ports

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW

REAR VIEW



6. Test of Radiated Emission

Radiated emissions from 30 MHz to 1000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in European Standard EN 55022, Clause 10. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane, as shown in section 6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

6.1. Description of Major Test Instruments

• Amplifier	(ADVENTEST BB525C)
RF Gain	30 dB
Signal Input	9 KHz to 3 GHz
• Spectrum Analyzer	(R&S FSP7)
Attenuation	10 dB
Start Frequency	30 MHz
Stop Frequency	1000 MHz
Resolution Bandwidth	120 KHz for below 1GHz
	1 MHz for above 1GHz
Signal Input	9 KHz to 7 GHz
• Test Receiver	(R&S ESI 7)
Attenuation	10 dB
Start Frequency	30 MHz
Stop Frequency	1000 MHz
Resolution Bandwidth	120 KHz for below 1GHz
	1 MHz for above 1GHz
Signal Input	20 Hz to 7 GHz

6.2. Test Procedures

a. The EUT was placed on a rotatable table top 0.8 meter above ground.

b. The EUT was set 10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.

c. The table was rotated 360 degrees to determine the position of the highest radiation.

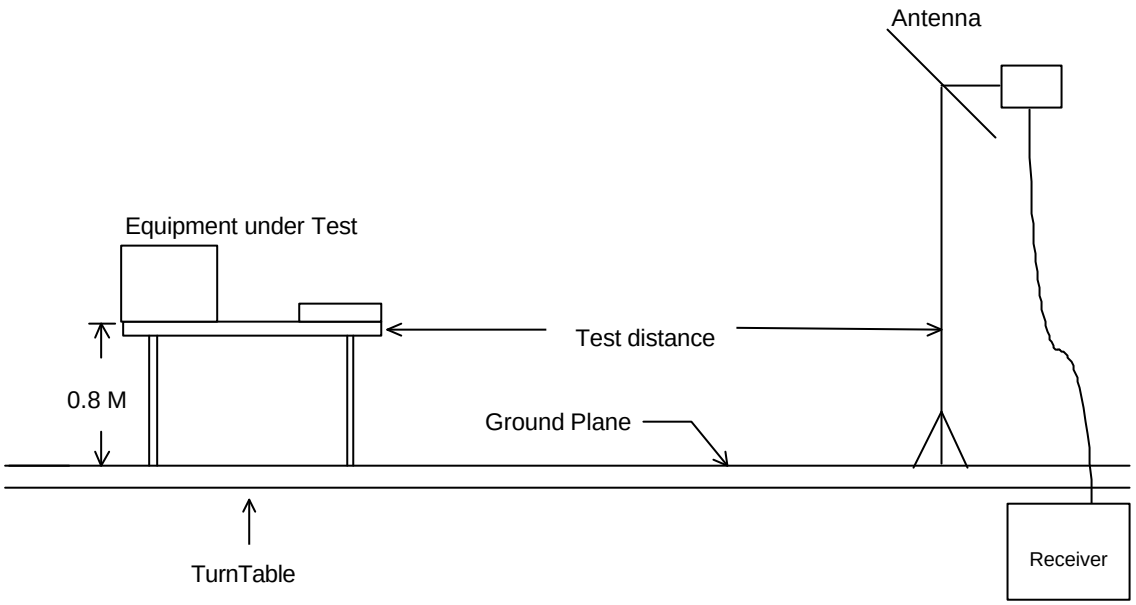
d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.

e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.

f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.

6.3. Typical Test Setup Layout of Radiated Emission

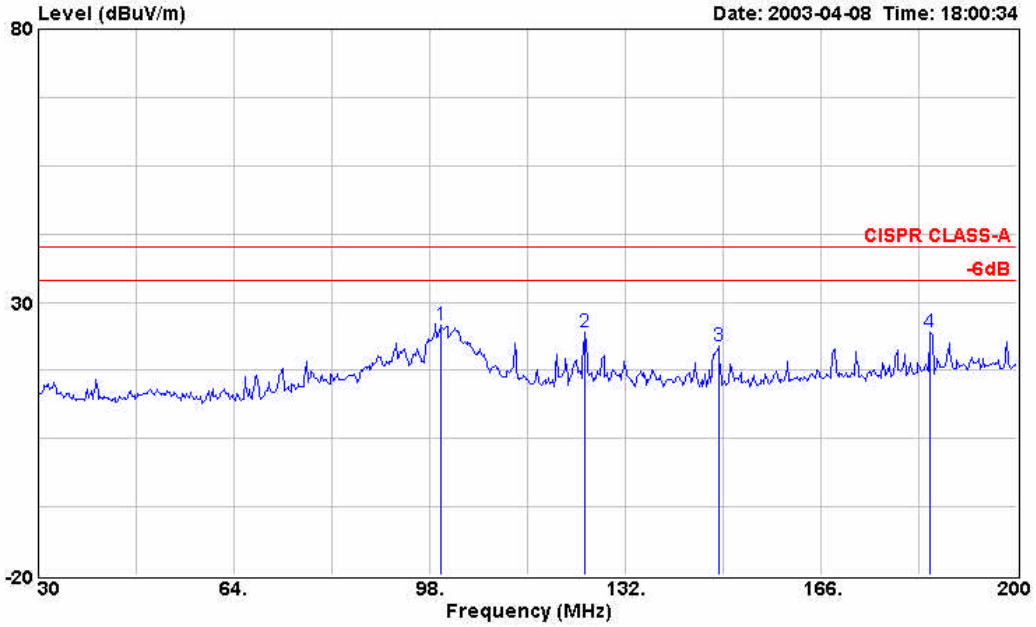


6.4. Test Result of Radiated Emission

6.4.1. Test mode : Mode 1

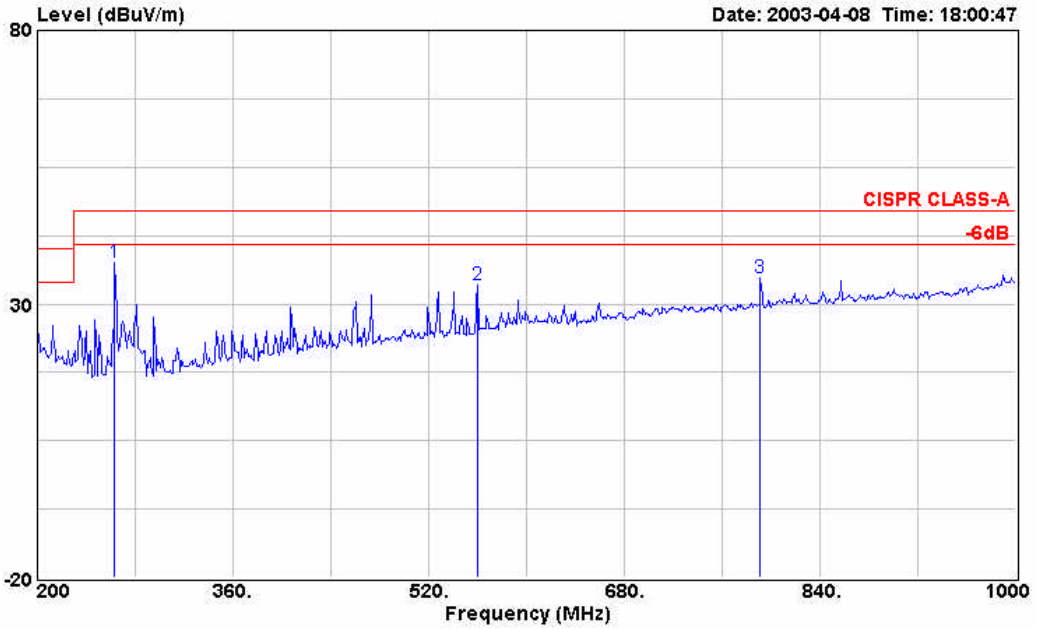
- Frequency Range of Test: from 30 MHz to 1,000 MHz
- Test Distance: 10 M
- Temperature: 26.2°C
- Relative Humidity: 51 %
- Test Date: Apr. 08, 2003
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

■ The test was passed at the minimum margin that marked by the frame in the following test record



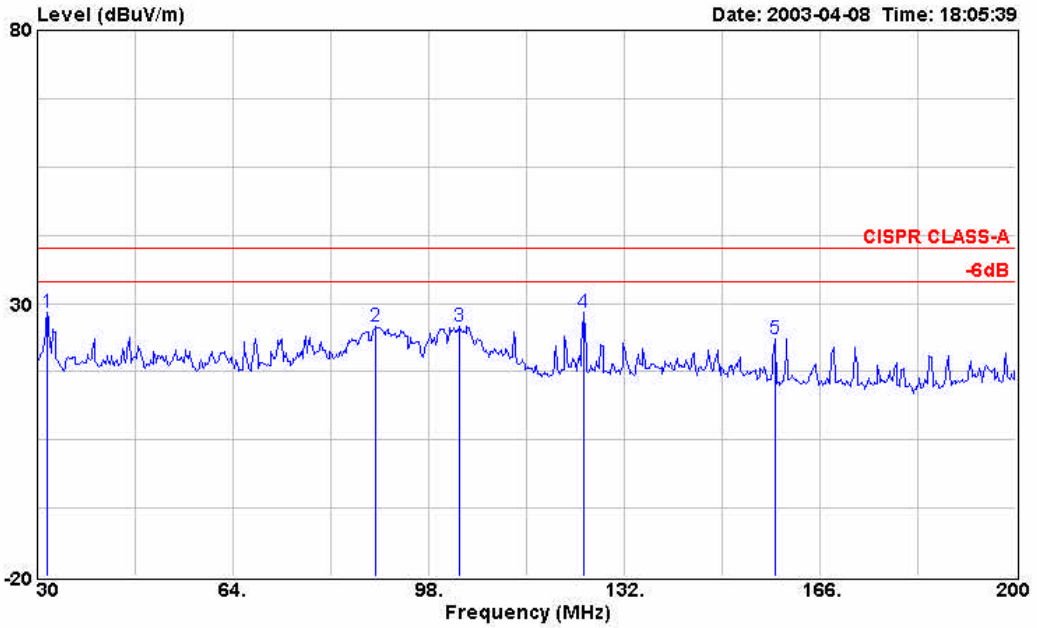
Site : 10CH01-HY
Condition : CISPR CLASS-A 10m BICONICAL-9124-286 VERTICAL
EUT : IPC CPU BOARD
Power : 230Vac/50Hz
Memo : HSB-4401
Memo : LAN 100Mbps
Memo :
Memo :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	99.870	25.77	-14.23	40.00	47.44	11.01	1.32	34.00	Peak	---	---
2	125.030	24.54	-15.46	40.00	46.78	10.45	1.31	34.00	Peak	---	---
3	148.150	21.86	-18.14	40.00	42.75	11.41	1.70	34.00	Peak	---	---
4	184.870	24.63	-15.37	40.00	42.57	14.45	1.61	34.00	Peak	---	---



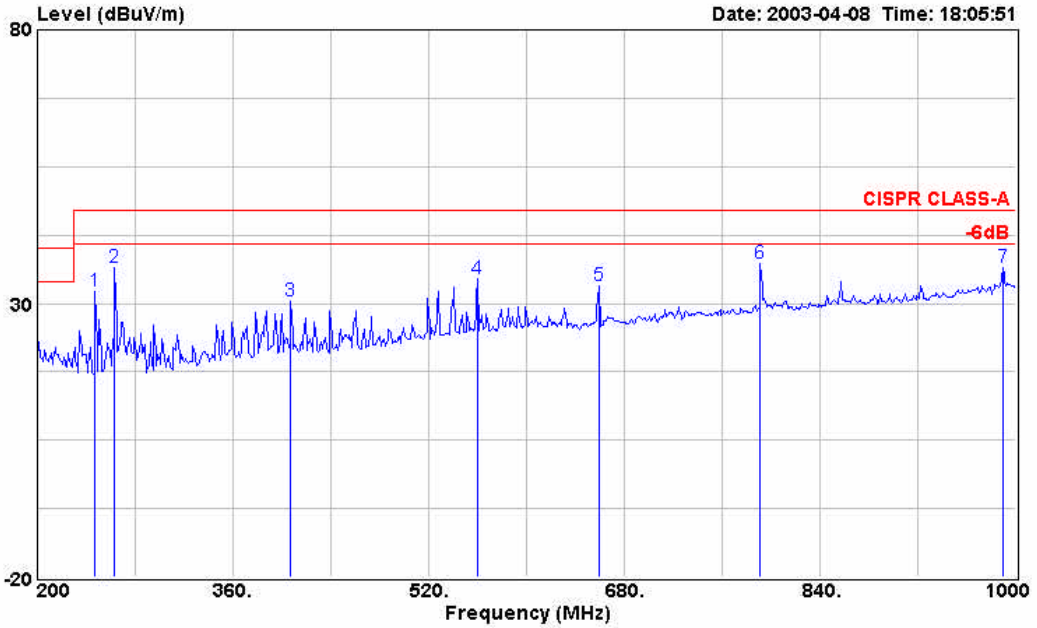
Site : 10CH01-HY
Condition : CISPR CLASS-A 10m LOG-9111-206 VERTICAL
EUT : IPC CPU BOARD
Power : 230Vac/50Hz
Memo : HSB-4401
Memo : LAN 100Mbps
Memo :
Memo :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	263.200	37.59	-9.41	47.00	55.69	12.50	3.37	33.97	Peak	100	209
2	560.000	33.53	-13.47	47.00	43.34	18.57	4.84	33.22	Peak	---	---
3	791.200	34.84	-12.16	47.00	40.38	21.19	5.78	32.51	Peak	---	---



Site : 10CH01-HY
Condition : CISPR CLASS-A 10m BICONICAL-9124-286 HORIZONTAL
EUT : IPC CPU BOARD
Power : 230Vac/50Hz
Memo : HSB-4401
Memo : LAN 100Mbps
Memo :
Memo :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	31.700	28.41	-11.59	40.00	49.18	12.73	0.64	34.14	Peak	---	---
2	88.820	25.72	-14.28	40.00	48.25	10.09	1.40	34.02	Peak	---	---
3	103.270	25.91	-14.09	40.00	47.69	10.90	1.32	34.00	Peak	---	---
4	124.860	28.38	-11.62	40.00	49.67	11.40	1.31	34.00	Peak	---	---
5	158.180	23.55	-16.45	40.00	43.71	12.40	1.44	34.00	Peak	---	---



Site : 10CH01-HY
Condition : CISPR CLASS-A 10m LOG-9111-206 HORIZONTAL
EUT : IPC CPU BOARD
Power : 230Vac/50Hz
Memo : HSB-4401
Memo : LAN 100Mbps
Memo :
Memo :

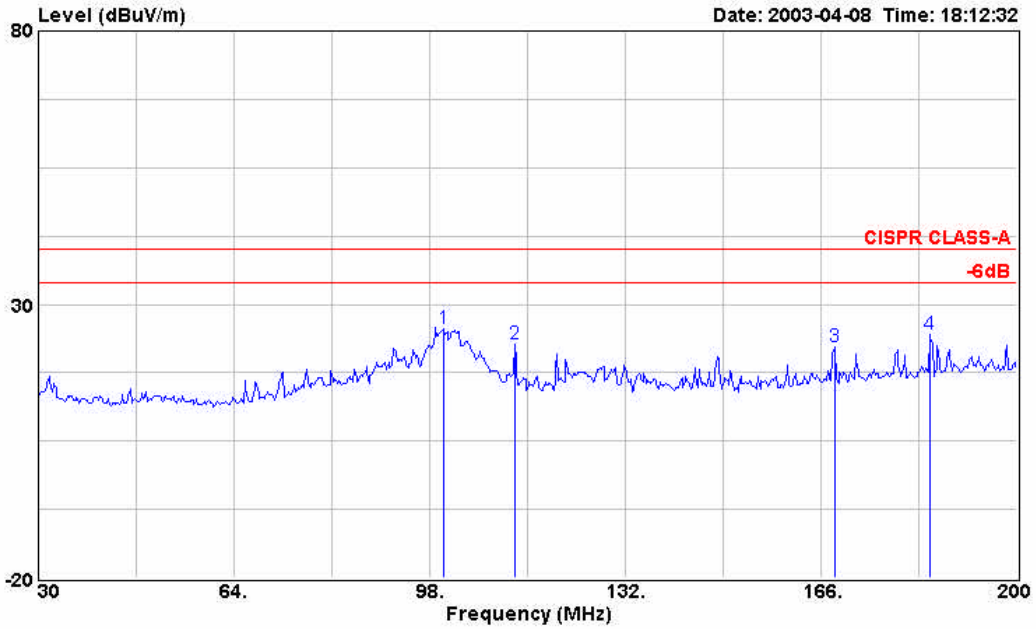
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	247.200	32.18	-14.82	47.00	50.21	12.75	3.22	34.00	Peak	---	---
2	263.200	36.64	-10.36	47.00	54.44	12.80	3.37	33.97	Peak	---	---
3	407.200	30.33	-16.67	47.00	43.89	15.68	4.34	33.58	Peak	---	---
4	560.000	34.49	-12.51	47.00	44.23	18.64	4.84	33.22	Peak	---	---
5	659.200	33.32	-13.68	47.00	41.80	19.16	5.22	32.86	Peak	---	---
6	791.200	37.38	-9.62	47.00	43.59	20.52	5.78	32.51	Peak	---	---
7	989.600	36.45	-10.55	47.00	39.05	22.40	6.55	31.55	Peak	---	---

Test Engineer : Joke Yang

6.4.2. Test mode : Mode 2

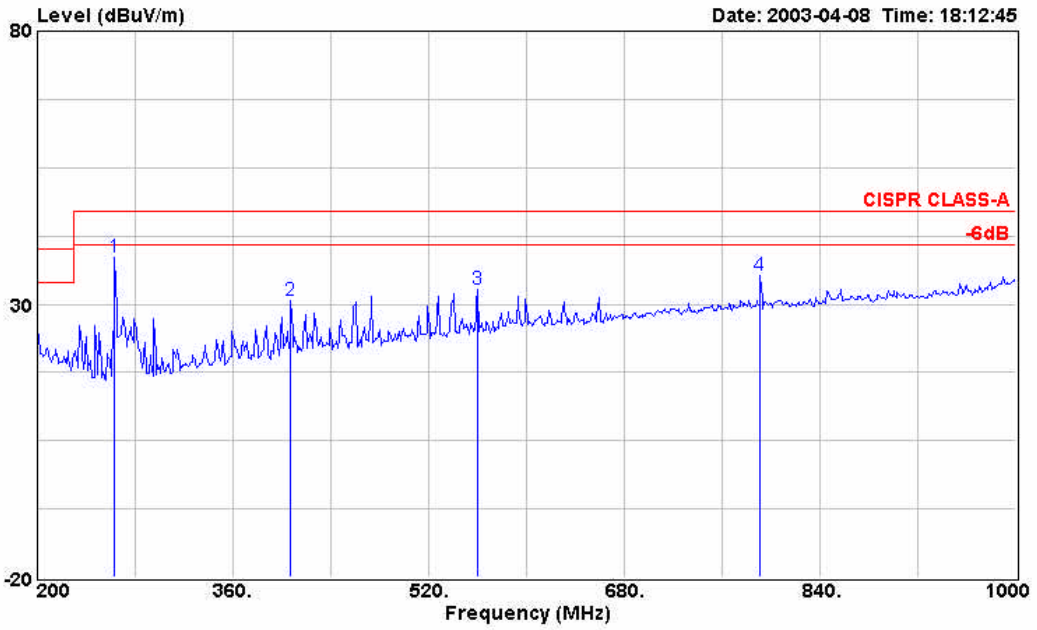
- Frequency Range of Test: from 30 MHz to 1,000 MHz
- Test Distance: 10 M
- Temperature: 26.2°C
- Relative Humidity: 51 %
- Test Date: Apr. 08, 2003
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

■ The test was passed at the minimum margin that marked by the frame in the following test record



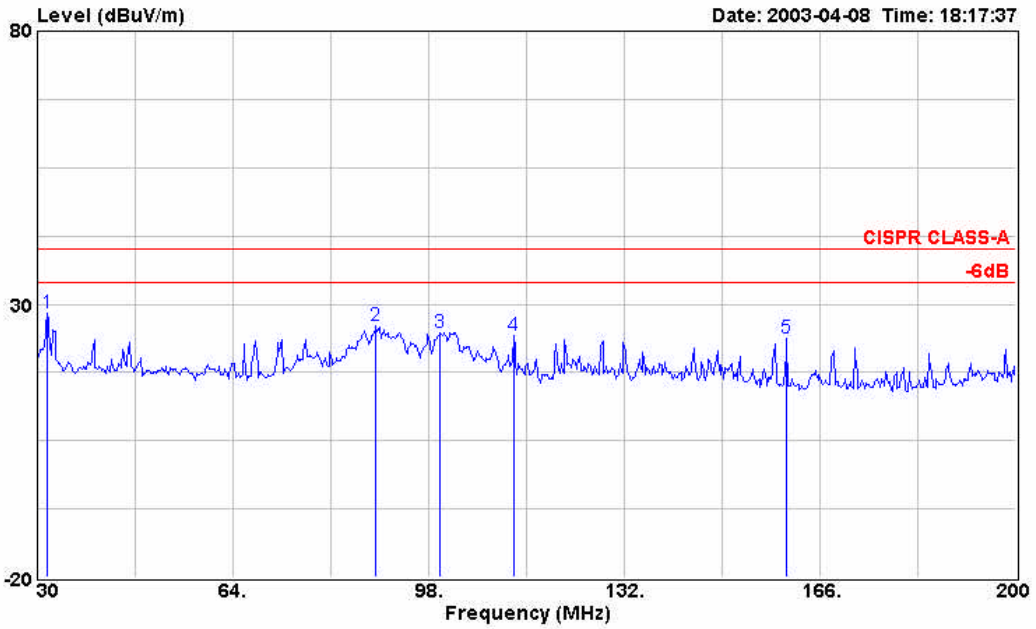
Site : 10CH01-HY
Condition : CISPR CLASS-A 10m BICONICAL-9124-286 VERTICAL
EUT : IPC CPU BOARD
Power : 230Vac/50Hz
Memo : HSB-4401
Memo : LAN 10Mbps
Memo :
Memo :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	100.380	25.41	-14.59	40.00	47.07	11.02	1.32	34.00	Peak	---	---
2	112.790	22.71	-17.29	40.00	44.82	10.61	1.28	34.00	Peak	---	---
3	168.380	22.28	-17.72	40.00	41.60	13.13	1.55	34.00	Peak	---	---
4	184.870	24.59	-15.41	40.00	42.53	14.45	1.61	34.00	Peak	---	---



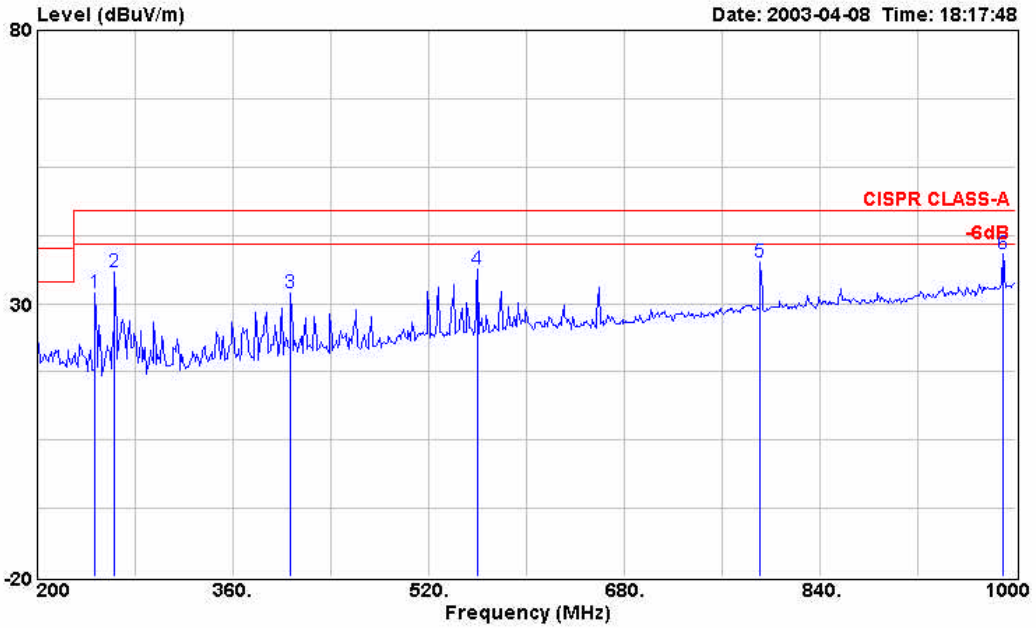
Site : 10CH01-HY
Condition : CISPR CLASS-A 10m LOG-9111-206 VERTICAL
EUT : IPC CPU BOARD
Power : 230Vac/50Hz
Memo : HSB-4401
Memo : LAN 10Mbps
Memo :
Memo :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	263.200	38.61	-8.39	47.00	56.71	12.50	3.37	33.97	Peak	---	---
2	407.200	30.71	-16.29	47.00	43.89	16.06	4.34	33.58	Peak	---	---
3	560.000	32.63	-14.37	47.00	42.44	18.57	4.84	33.22	Peak	---	---
4	791.200	35.21	-11.79	47.00	40.75	21.19	5.78	32.51	Peak	---	---



Site : 10CH01-HY
Condition : CISPR CLASS-A 10m BICONICAL-9124-286 HORIZONTAL
EUT : IPC CPU BOARD
Power : 230Vac/50Hz
Memo : HSB-4401
Memo : LAN 10Mbps
Memo :
Memo :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	31.700	28.29	-11.71	40.00	49.06	12.73	0.64	34.14	Peak	---	---
2	88.820	26.00	-14.00	40.00	48.53	10.09	1.40	34.02	Peak	---	---
3	99.870	24.72	-15.28	40.00	46.58	10.82	1.32	34.00	Peak	---	---
4	112.790	24.24	-15.76	40.00	45.86	11.10	1.28	34.00	Peak	---	---
5	160.220	23.68	-16.32	40.00	43.84	12.44	1.40	34.00	Peak	---	---



Site : 10CH01-HY
Condition : CISPR CLASS-A 10m LOG-9111-206 HORIZONTAL
EUT : IPC CPU BOARD
Power : 230Vac/50Hz
Memo : HSB-4401
Memo : LAN 10Mbps
Memo :
Memo :

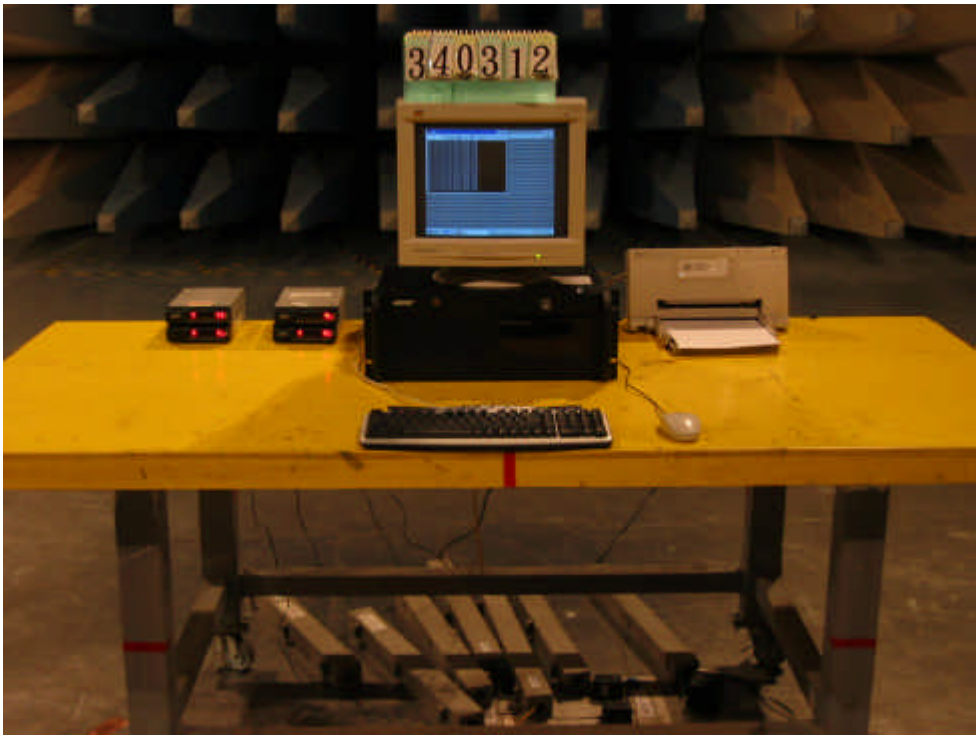
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	247.200	32.02	-14.98	47.00	50.05	12.75	3.22	34.00	Peak	---	---
2	263.200	35.74	-11.26	47.00	53.54	12.80	3.37	33.97	Peak	---	---
3	407.200	32.03	-14.97	47.00	45.59	15.68	4.34	33.58	Peak	---	---
4	560.000	36.23	-10.77	47.00	45.97	18.64	4.84	33.22	Peak	---	---
5	791.200	37.59	-9.41	47.00	43.80	20.52	5.78	32.51	Peak	---	---
6	989.600	39.07	-7.93	47.00	41.67	22.40	6.55	31.55	Peak	104	155

Test Engineer : Joke Yang

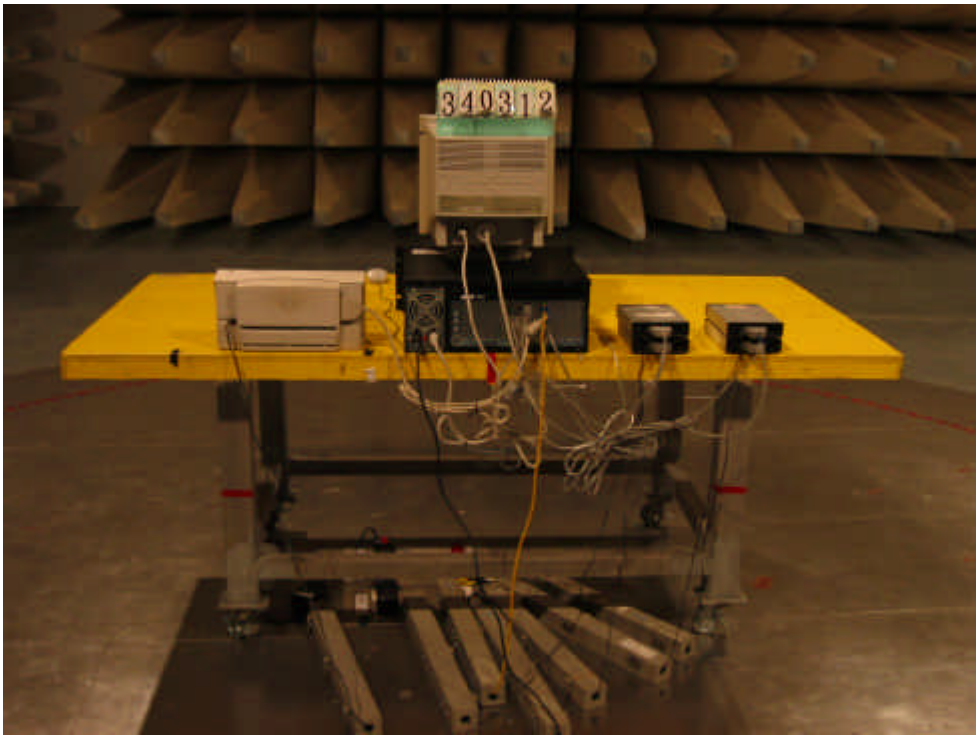
6.5. Photographs of Radiated Emission Test Configuration

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW



REAR VIEW



7. HARMONICS TEST

7.1. Standard

- Standard : EN 61000-3-2:2000

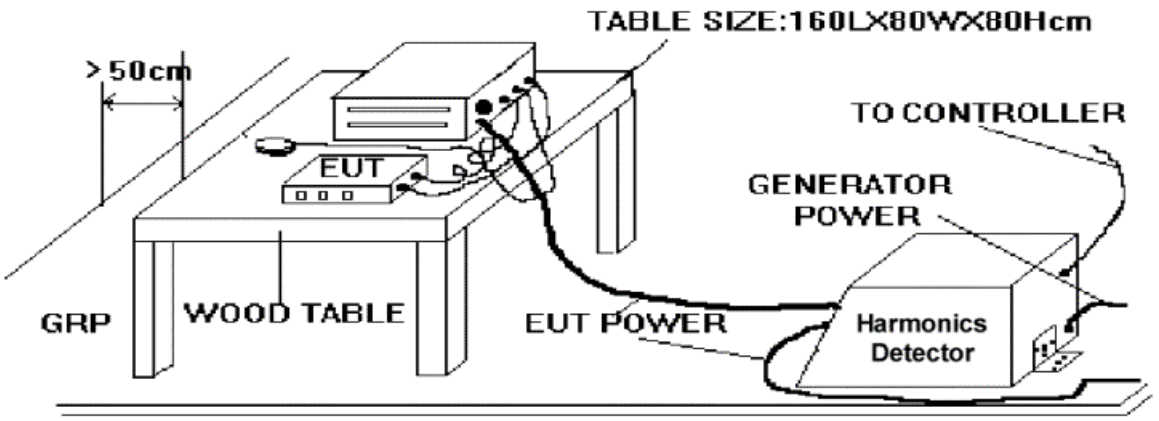
7.2. Test Procedure

The measured values of the harmonics components of the input current, including line current and neutral current, shall be compared with the limits given in Clause 7 of EN 61000-3-2.

7.3. Test Equipment Settings

- Line Voltage : 230 V
- Line Frequency : 50 Hz
- Device Class : A
- Current Measurement Range : High
- Measurement Delay : 10.0 seconds
- Test Duration : 2.00 minutes
- Class determination Pre-test Duration : 10.00 seconds

7.4. Test Setup



7.5. Current Harmonics Test

7.5.1. Test Data Of Current Harmonics

- FINAL TEST RESULT : ***PASS***
- Temperature : 24 ℃
- Relative Humidity : 53% RH
- Test Date : Apr. 09, 2002

Urms = 228.5V Freq = 50.000 Range: 5 A
Irms = 0.767A Ipk = 3.044A cf = 3.971
P = 83.93W Pap = 175.2VA pf = 0.479
THDi = 87.9 % THDu = 0.10 % Class A

Test - Time : 2min (100 %)

Test completed, Result: PASSED

Order	Iavg [A]	Iavg% [%]	Imax [A]	Imax% [%]	Limit [A]
1	0.3723	48.567	0.3751	48.925	
2	0.0000	0.0000	0.0009	0.1194	1.0800
3	0.3558	46.417	0.3586	46.775	2.3000
4	0.0000	0.0000	0.0018	0.2389	0.4300
5	0.3308	43.153	0.3333	43.471	1.1400
6	0.0000	0.0000	0.0027	0.3583	0.3000
7	0.2951	38.495	0.2972	38.774	0.7700
8	0.0000	0.0000	0.0031	0.3981	0.2300
9	0.2518	32.842	0.2533	33.041	0.4000
10	0.0000	0.0000	0.0034	0.4379	0.1840
11	0.2045	26.672	0.2057	26.831	0.3300
12	0.0000	0.0000	0.0034	0.4379	0.1533
13	0.1569	20.462	0.1575	20.541	0.2100
14	0.0000	0.0000	0.0031	0.3981	0.1314
15	0.1123	14.650	0.1129	14.729	0.1500
16	0.0000	0.0000	0.0027	0.3583	0.1150
17	0.0735	9.5939	0.0742	9.6736	0.1324
18	0.0000	0.0000	0.0021	0.2787	0.1022
19	0.0418	5.4538	0.0427	5.5732	0.1184
20	0.0000	0.0000	0.0015	0.1990	0.0920
21	0.0186	2.4283	0.0192	2.5080	0.1071
22	0.0000	0.0000	0.0009	0.1194	0.0836
23	0.0049	0.6369	0.0052	0.6768	0.0978
24	0.0000	0.0000	0.0006	0.0796	0.0767
25	0.0082	1.0748	0.0085	1.1146	0.0900
26	0.0000	0.0000	0.0003	0.0398	0.0708
27	0.0113	1.4729	0.0116	1.5127	0.0833
28	0.0000	0.0000	0.0000	0.0000	0.0657
29	0.0110	1.4331	0.0113	1.4729	0.0776
30	0.0000	0.0000	0.0000	0.0000	0.0613
31	0.0089	1.1545	0.0089	1.1545	0.0726
32	0.0000	0.0000	0.0000	0.0000	0.0575
33	0.0058	0.7564	0.0058	0.7564	0.0682
34	0.0000	0.0000	0.0000	0.0000	0.0541
35	0.0000	0.0000	0.0037	0.4777	0.0643
36	0.0000	0.0000	0.0000	0.0000	0.0511
37	0.0000	0.0000	0.0034	0.4379	0.0608
38	0.0000	0.0000	0.0000	0.0000	0.0484
39	0.0000	0.0000	0.0037	0.4777	0.0577
40	0.0000	0.0000	0.0000	0.0000	0.0460

Test Engineer : Kero
Kero Kao

8. VOLTAGE FLUCTUATIONS TEST

8.1. STANDARD

- Product Standard : EN 61000-3-3:1995/A1:2001

8.2. TEST PROCEDURE

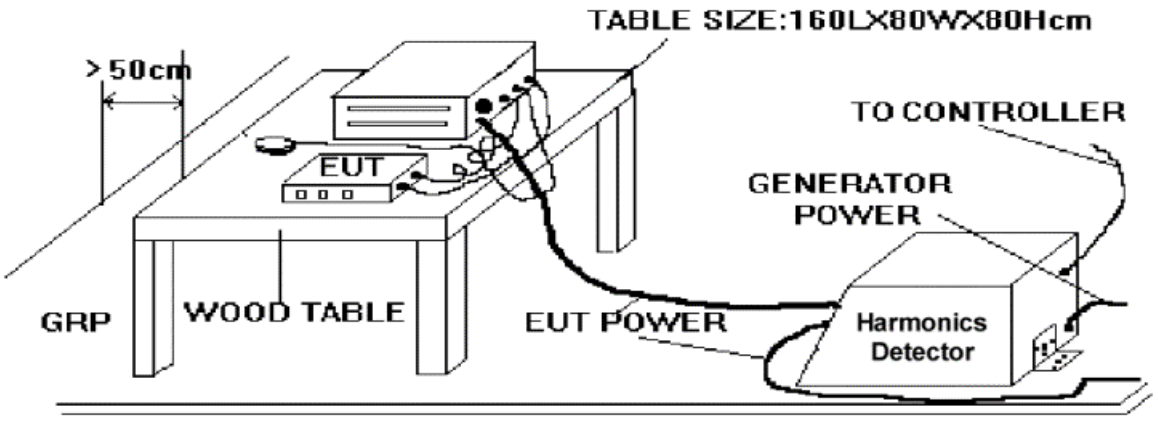
The equipment shall be tested under the conditions of **Clause 5.**

The total impedance of the test circuit, excluding the appliance under test, but including the internal impedance of the supply source, shall be equal to the reference impedance. The stability and tolerance of the reference impedance shall be adequate to ensure that the overall accuracy of ±8% is achieved during the whole assessment procedure.

8.3. TEST EQUIPMENT SETTINGS :

- Line Voltage: 230 V
- Line Frequency: 50 Hz
- Measurement Delay: 10.0 seconds
- Pst Integration Time: 10 minutes
- Pst Integration Periods: 1
- Test Duration: 00:10:00 minutes

8.4. TEST SETUP



8.5. TEST RESULT OF VOLTAGE FLUCTUATION AND FLICKER TEST

8.5.1. TEST DATA OF VOLTAGE FLUCTUATION AND FLICKER

- FINAL TEST RESULT : **PASS**
- Temperature : 24 ℃
- Relative Humidity : 53 % RH
- Test Date : Apr. 09, 2003

Urms	= 228.3V	Freq	= 49.984	Range	: 5A
Irms	= 0.764A	Ipk	= 3.040A	Cf	= 3.978
P	= 83.69W	Pap	= 174.5VA	pf	= 0.480

Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : Soft LIN 0.24 Ohm +j 0.15 Ohm N: 0.16 Ohm +j 0.10 Ohm

Limits :	Plt	: 0.65	Pst	:	1.00
	dmax	: 4.00 %	dc	:	3.00 %
	dtLim	: 3.00 %	dt>Lim	:	200ms

Test completed, Result: PASSED

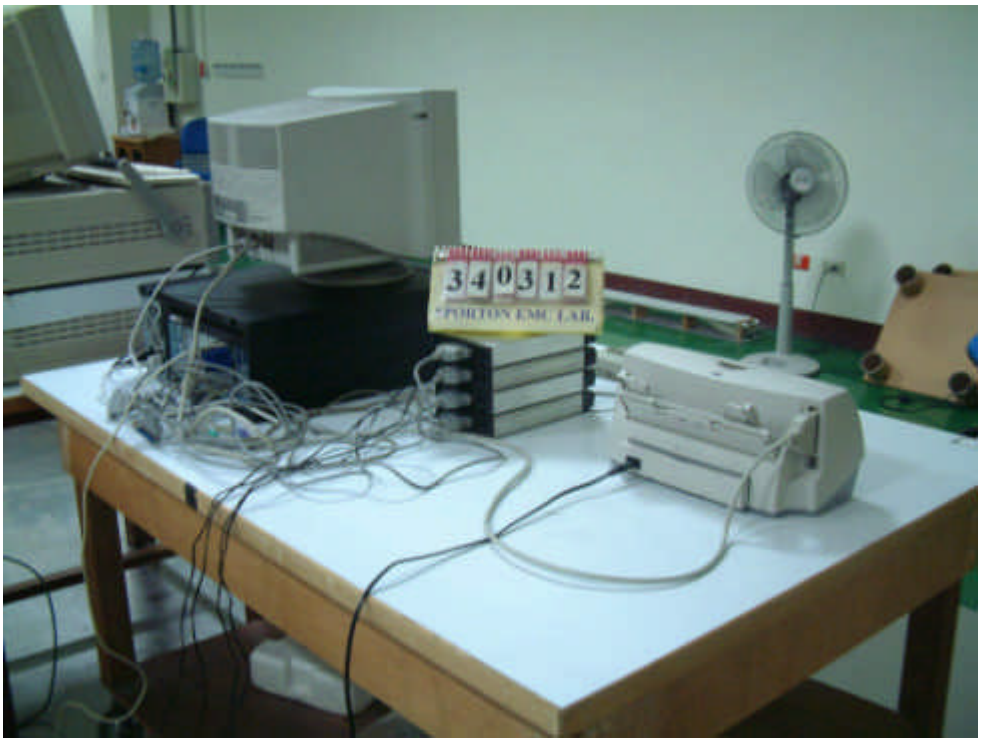
Test Engineer : Kero

Kero Kao

8.6. PHOTOGRAPHS OF HARMONICS TEST, VOLTAGE FLUCTUATION AND FLICKER TEST

FRONT VIEW

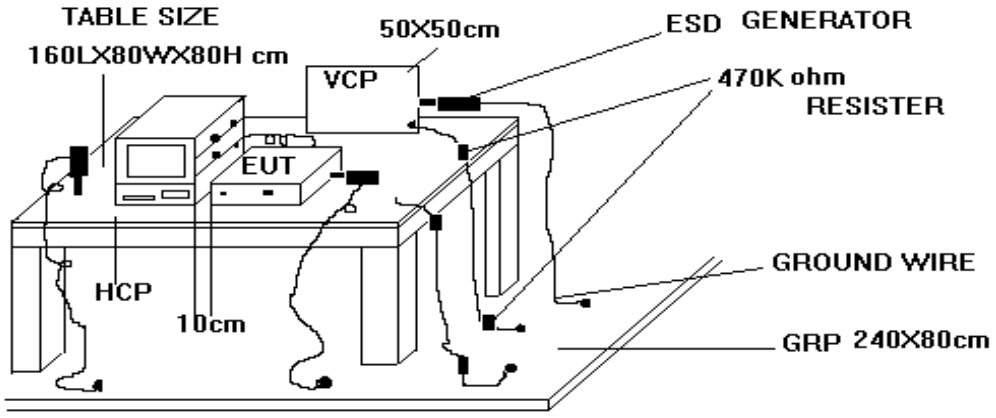
REAR VIEW



9. Electrostatic Discharge Immunity Test (ESD)

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : A
- Required performance criteria: B
- Basic Standard : IEC 61000-4-2:1995
- Product Standard : EN 55024:1998/A1:2001
- Level : 3 for air discharge,
  : 2 for contact discharge
- Tested voltage : ±2 / ±4 / ±8 KV for air discharge,
  : ±2 / ±4 KV for contact discharge
- Temperature : 24 °C
- Relative Humidity : 56 %
- Test Date : Apr. 09, 2003
- Observation : Normal.

9.1. Test setup



The test setup consists of the test generator, EUT and auxiliary instrumentation necessary to perform DIRECT and INDIRECT application of discharges to the EUT as applicable, in the follow manner :

a. CONTACT DISCHARGE to the conductive surfaces and to coupling plane;
b. AIR DISCHARGE at insulating surfaces.

The preferred test method is that of type tests performed in laboratories and the only accepted method of demonstrating conformance with this standard. The EUT was arranged as closely as possible to arrangement in final installed conditions.

9.2. Test Setup for Tests Performed in Laboratory

A ground reference plane was provided on the floor of the test site. It was a metallic sheet (copper or aluminum) of 0.25 mm, minimum thickness; other metallic may be used but they shall have at least 0.65 mm thickness. In the SPORTON EMC LAB., we provided 1 mm thickness aluminum ground reference plane or 1 mm thickness stainless steel ground reference plane. The minimum size of the ground reference plane is 1 m x 1 m, the exact size depending on the dimensions of the EUT. It was connected to the protective grounding system.

The EUT was arranged and connected according to its functional requirements. A distance of 1m minimum was provided between the EUT and the wall of the lab. and any other metallic structure. In cases where this length exceeds the length necessary to apply the discharges to the selected points, the excess length shall, where possible, be placed non-inductively off the ground reference plane and shall not come closer than 0.2m to other conductive parts in the test setup.

Where the EUT is installed on a metal table, the table was connected to the reference plane via a cable with a 470k ohm resister located at each end, to prevent a build-up of charge. The test setup was consist a wooden table, 0.8m high, standing on the ground reference plane. A HCP, 1.6 m x 0.8 m, was placed on the table. The EUT and cables was isolated from the HCP by an insulating support 0.5 mm thick. The VCP size, 0.5 m x 0.5 m.

9.3. ESD Test Procedure

a. In the case of air discharge testing the climatic conditions shall be within the following ranges:
   - ambient temperature: 15℃ to 35℃;
   - relative humidity : 30% to 60%;
   - atmospheric pressure : 68 KPa (680 mbar) to 106 KPa (1060 mbar).

b. Test programs and software shall be chosen so as to exercise all normal modes of operation of the EUT. The use of special exercising software is encouraged, but permitted only where it can be shown that the EUT is being comprehensively exercised.

c. The test voltage shall be increased from the minimum to the selected test severity level, in order to determine any threshold of failure. The final severity level should not exceed the product specification value in order to avoid damage to the equipment.

d. The test shall be performed with both air discharge and contact discharge. On preselected points at least 10 single discharges (in the most sensitive polarity) shall be applied on air discharge. On preselected points at least 25 single discharges (in the most sensitive polarity) shall be applied on contact discharge.

e. For the time interval between successive single discharges an initial value of one second is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.

f. In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

g. In the case of painted surface covering a conducting substrate, the following procedure shall be adopted :
   - If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate.
   - Coating declared as insulating by the manufacturer shall only be submitted to the air discharge.
   - The contact discharge test shall not be applied to such surfaces.

h. In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT . After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then retriggered for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.

9.4. Test Severity Levels

9.4.1. Contact Discharge

Level	Test Voltage (KV) of Contact discharge
1	±2
2	±4
3	±6
4	±8
X	Specified

Remark: "X" is an open level.

9.4.2. Air Discharge

Level	Test Voltage (KV) of Air Discharge
1	±2
2	±4
3	±8
4	±15
X	Specified

Remark: "X" is an open level.

9.5. Test Points

9.5.1. Test Result of Air Discharge

Test Point	Voltage	Tested No.
Printer port	±2 / ±4 / ±8 KV	BY 10
Com1 Com2	±2 / ±4 / ±8 KV	BY 10
LED	±2 / ±4 / ±8 KV	BY 10
AC SOCKET	±2 / ±4 / ±8 KV	BY 10

9.5.2. Test Result of Contact Discharge

Polarity	Voltage	Tested No.
Horizontal (At Front)	±2 / ±4 KV	BY 25
Horizontal (At Left)	±2 / ±4 KV	BY 25
Horizontal (At Right)	±2 / ±4 KV	BY 25
Horizontal (At Rear)	±2 / ±4 KV	BY 25
CASE	±2 / ±4 KV	BY 25
SCREW	±2 / ±4 KV	BY 25
Bracket	±2 / ±4 KV	BY 25
FAN	±2 / ±4 KV	BY 25
VGA port	±2 / ±4 KV	BY 25
Com1 Com2	±2 / ±4 KV	BY 25
RJ45 PORT	±2 / ±4 KV	BY 25
PS/2 PORT	±2 / ±4 KV	BY 25

Test Engineer : Kero

Kero Kao

9.6. Photographs of Electrostatic Discharge Immunity Test

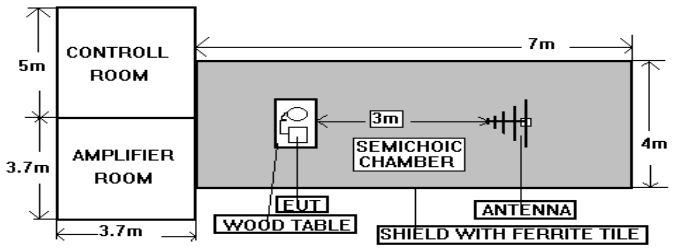
FRONT VIEW

REAR VIEW

10. Radio Frequency Electromagnetic Field Immunity Test (RS)

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : A
- Required performance criteria: A
- Basic Standard : IEC 61000-4-3:1995
- Product Standard : EN 55024:1998/A1:2001
- Level : 2
- Frequency Range : 80-1000 MHz
- Field Strength : 3 V/m (Modulated 80% AM)
- Temperature : 25 °C
- Relative Humidity : 54 %
- Test Date : Apr. 09, 2003
- Observation : Normal

10.1. Test setup



NOTE : The SPORTON 7m x 4m x 4m semichoic chamber is compliance with the sixteen points uniform field requirement as stated in IEC 1000-4-3 Section 6.2.

The procedure defined in this part requires the generation of electromagnetic fields within which the test sample is placed and its operation observed. To generate fields that are useful for simulation of actual (field) conditions may require significant antenna drive power and the resultant high field strength levels. To comply with local regulations and to prevent biological hazards to the testing personnel, it is recommended that these tests be carried out in a shielded enclosure or semichoic chamber.

10.2. Test Procedure

a. The equipment to be tested is placed in the center of the enclosure on a wooden table. The equipment is then connected to power and signal leads according to pertinent installation instructions.
b. The antenna which is enabling the complete frequency range of 80-1000 MHz is placed 3m away from the equipment. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the applicable antennae.
c. The test is normally performed with the antenna facing the most sensitive side of the EUT. The polarization of the field generated by the biconical antenna necessitates testing each position twice, once with the antenna positioned vertically and again with the antenna positioned horizontally. The circular polarization of the field from the log-spiral antenna makes a change of position of the antenna unnecessary.
d. At each of the above conditions, the frequency range is swept 80-1000 MHz, pausing to adjust the R.F. signal level or to switch oscillators and antenna. The rate of sweep is in the order of 1.5*10-3 decades/s. The sensitive frequencies or frequencies of dominant interest may be discretely analyzed.

10.3. Test Severity Levels

Frequency Band: 80-1000 MHz

Level	Test field strength (V/m)
1	1
2	3
3	10
X	Specified

Remark: "X" is an open class.

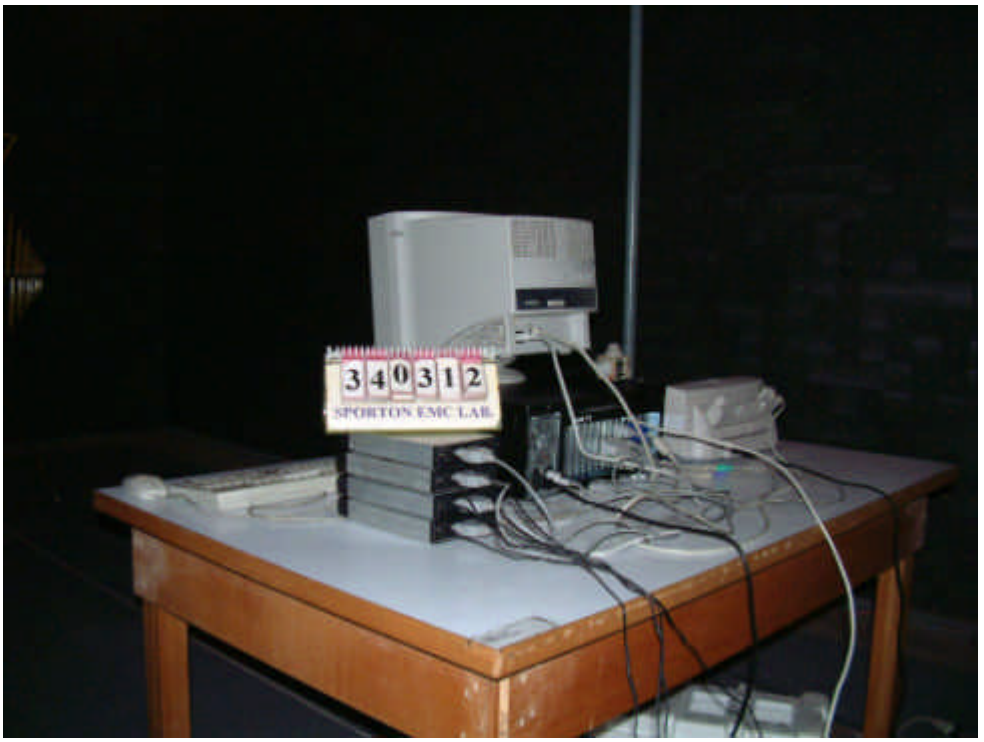
Test Engineer : Kero

Kero Kao

10.4. Photographs of Radio Frequency Electromagnetic Field Immunity Test

FRONT VIEW

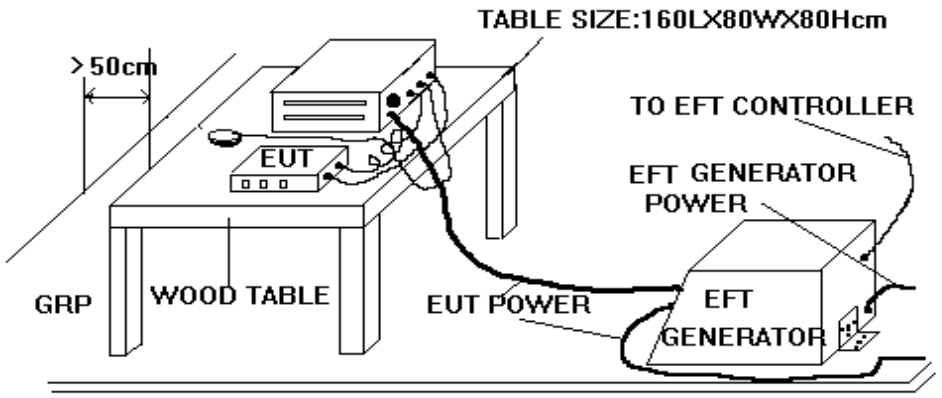
REAR VIEW



11. Electrical Fast Transient/Burst Immunity Test (EFT/BURST)

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : B
- Required performance criteria: B
- Basic Standard : IEC 61000-4-4:1995
- Product Standard : EN 55024:1998/A1:2001
- Level : on Power Supply -- 2
- : on I/O signal, data and control line -- 2
- Test Voltage : on Power Supply -- ±0.5 / ±1.0 KV
- : on I/O signal, data and control line -- ±0.25 / ±0.5 KV
- Temperature : 24°C
- Relative Humidity : 52%
- Test Date : Apr. 09, 2003
- Observation : During the test, the transmission of LAN signals stopped. After the test, the equipment continued to operate as intended without operator intervention.

11.1. Test setup



The EUT was placed on a ground reference plane and was insulated from it by an insulating support about 0.1m thick. If the EUT is table-top equipment, it was located approximately 0.8m above the GRP.. The GRP. Was a metallic sheet (copper or aluminum) of 0.25 mm ,minimum thickness; other metallic may be used but they shall have at least 0.65 mm thickness. It shall project beyond the EUT by at least 0.1m on all sides and connected to the protective earth. In the SPORTON EMC LAB. We provided 1 mm thickness aluminum ground reference plane or 1 mm thickness stainless steel ground reference plane. The minimum size of the ground reference plane is 1 m x 1 m, the exact size depending on the dimensions of the EUT. It was connected to the protective grounding system. The EUT was arranged and connected according to its functional requirements. The minimum distance between the EUT and other conductive structures, except the GRP. Beneath the EUT, was more than 0.5 m. Using the coupling clamp, the minimum distance between the coupling plates and all other conductive structures, except the GRP. Beneath the EUT, was more than 0.5 m. The length of the signal and power lines between the coupling device and the EUT was

1m or less.

11.2. Test on Power Line

a. The EFT/B-generator was located on the GRP.. The length from the EFT/B-generator to the EUT as not exceed 1 m.
b. The EFT/B-generator provides the ability to apply the test voltage in a non-symmetrical condition to the power supply input terminals of the EUT.

11.3. Test on Communication Lines

a. The coupling clamp is composed of a clamp unit for housing the cable (length more than 3 m), and was placed on the GRP..
b. The coupling clamp provides the ability of coupling the fast transient/bursts to the cable under test.

11.4. Test Procedure

a. In order to minimize the effect of environmental parameters on test results, the climatic conditions when test is carrying out shall comply with the following requirements:
   - ambient temperature: 15℃ to 35℃;
   - relative humidity : 45% to 75%;
   - atmospheric pressure : 68 Kpa (680 mbar) to 106 Kpa (1060 mbar).
b. In order to minimize the effect of environmental parameters on test results, the electromagnetic environment of the laboratory shall not influence the test results.
c. The variety and diversity of equipment and systems to be tested make it difficult to establish general criteria for the evaluation of the effects of fast transients/bursts on equipment and systems.
d. The test results may be classified on the basic of the operating conditions and the functional specification of the equipment under test, according to the following performance criteria :
   - Normal performance within the specification limits.
   - Temporary degradation or loss of function or performance which is self-recoverable.
   - Temporary degradation or loss of function or performance which requires operator intervention or system reset.
   - Degradation or loss of function which is not recoverable due to damage of equipment (components).

11.5. Test Severity Levels

The following test severity levels are recommended for the fast transient/burst test :

Open circuit output test voltage ± 10%		
Level	On Power Supply	On I/O signal, data and control line
1	0.5 KV	0.25 KV
2	1.0 KV	0.50 KV
3	2.0 KV	1.00 KV
4	4.0 KV	2.00 KV
X	Specified	Specified

Remark : " X " is an open level. The level is subject to negotiation between the user and the manufacturer or is specified by the manufacturer.

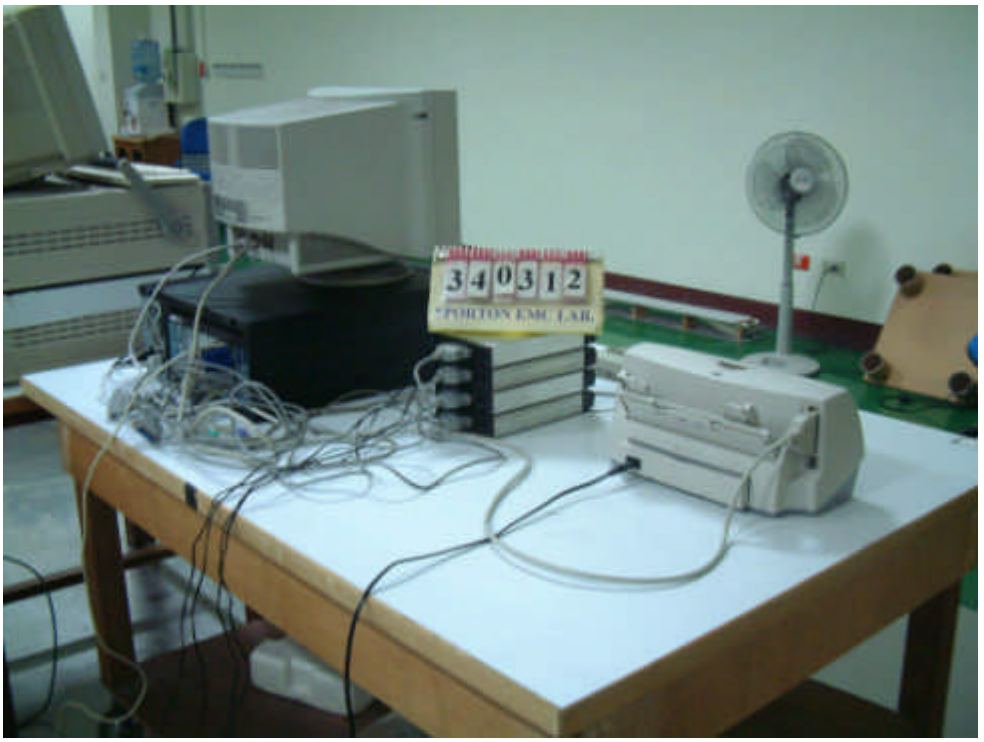
Test Engineer : Kero

Kero Kao

11.6. Photographs of Electrical Fast Transient/BURST Immunity Test

FRONT VIEW

REAR VIEW



Clamp

12. SURGE IMMUNITY TEST

- FINAL TEST RESULT : **PASS**
- Pass performance Criteria : B
- Required performance criteria: B
- Basic Standard : IEC 61000-4-5 (1995)
- Product Standard : EN 55024:1998/A1:2001
- Surge wave form (Tr/Th) : 1, 2/50（8/20）μs
- Level : on RJ45 port – N/A
- : on Input AC Power Port – 3
- Test Voltage : on RJ45 port – N/A
- : on Input AC Power Port -- ±1.0/±2.0 KV
- Temperature : 24 °C
- Relative Humidity : 53 %
- Test Date : Apr. 09, 2003
- Observation : During the test, the transmission of LAN signals stopped. After the test, the equipment continued to operate as intended without operator intervention.
- Remark : The test on RJ45 ports is not required due to normal functioning cannot be achieved because of the impact of the CDN on the EUT.

12.1. TEST RECORD

Voltage (KV)	Test Location	Polarity	Phase Angle				Test Result
			0°	90°	180°	270°	
1 KV	L - N	+	B	B	B	B	***PASS***
		−	B	B	B	B	***PASS***
2 KV	L - PE	+	B	B	B	B	***PASS***
		−	B	B	B	B	***PASS***
	N-PE	+	B	B	B	B	***PASS***
		−	B	B	B	B	***PASS***

※ *Remark : PE = DC output GND*

12.2. TEST LEVEL

Level	Open-circuit test voltage, ± 10%, KV
1	0.5
2	1.0
3	2.0
4	4.0
x	Specified
NOTE - x is an open class. This level can be specified in the product specification.	

12.3. TEST PROCEDURE

a. Climatic conditions

The climatic conditions shall comply with the following requirements :

-- ambient temperature : 15 ℃ to 35 ℃
-- relative humidity : 10 % to 75 %
-- atmospheric pressure : 86 kPa to 106 kPa (860 mbar to 1060 mbar)

b. Electromagnetic conditions

The electromagnetic environment of the laboratory shall not influence the test results.

c. The test shall be performed according the test plan that shall specify the test set-up with

-- generator and other equipment utilized;
-- test level (voltage/current);
-- generator source impedance;
-- internal or external generator trigger;
-- number of tests : at least five positive and five negative at the selected points;
-- repetition rate : maximum 1/min.
-- inputs and outputs to be tested;
-- representative operating conditions of the EUT;
-- sequence of application of the surge to the circuit;

-- phase angle in the case of a.c. power supply;
-- actual installation conditions, for example :
AC : neutral earthed,
DC : (+) or (-) earthed to simulated the actual earthing conditions.

d. If not otherwise specified the surges have to be applied synchronized to the voltage phase at the zero-crossing and the peak value of the a.c. voltage wave (positive and negative).

e. The surges have to be applied line to line and line(s) and earth. When testing line to earth, the test voltage has to be applied successively between each of the lines and earth, if there is no other specification.

f. The test procedure shall also consider the non-linear current-voltage characteristics of the equipment under test. Therefore the test voltage has to be increased by steps up to the test level specified in the product standard or test plan.

g. All lower levels including the selected test level shall be satisfied. For testing the secondary protection, the output voltage of the generator shall be increased up to the worstcase voltage breakdown level (let-through level) of the primary protection.

h. If the actual operating signal sources are not available, the may be simulated. Under no circumstances may the test level exceed the product specification. The test shall be carried out according the a test plan.

i. To find all critical points of the duty cycle of the equipment, a sufficient number of positive and negative test pulses shall be applied. For acceptance test a previously unstressed equipment shall be used to the protection devices shall be replaced.

12.4. OPERATING CONDITION

Full system

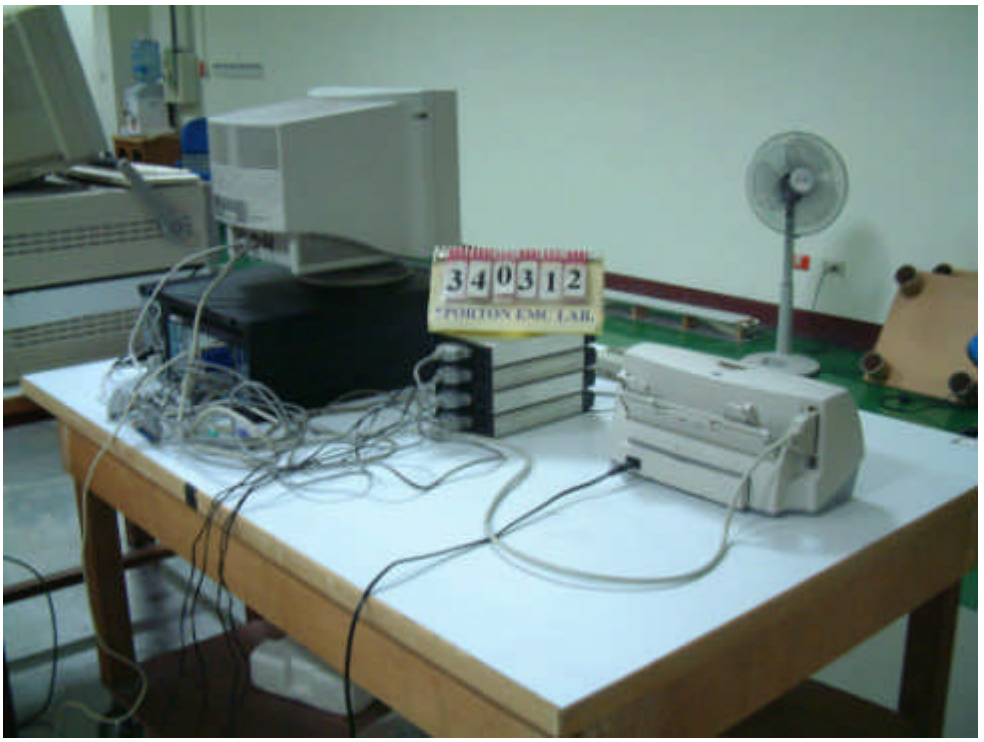
Test Engineer : Kero

Kero Kao

12.5. Photographs of SURGE IMMUNITY TEST

FRONT VIEW

REAR VIEW



13.CONDUCTED DISTURBANCES INDUCED BY RADIO-FREQUENCY FIELD IMMUNITY TEST (CS)

- FINAL TEST RESULT : **PASS**
- Pass performance Criteria : A
- Required performance criteria: A
- Basic Standard : IEC 61000-4-6 (1996)
- Product Standard : EN 55024:1998/A1:2001
- Level : 2
- Test Voltage : 3 V rms (Modulated, 1KHz, 80%, AM)
- Frequency Range : 0.15 MHz to 80 MHz
- Dwell time : 2.9 seconds
- Frequency step size : 1 %
- Coupling mode : CDN-M3 for AC power ports, CDN-RJ45 for Signal Ports and ISDN Ports.
- Temperature : 23° C
- Relative Humidity : 57 %
- Test Date : Apr. 09, 2003
- Observation : Normal

13.1. TEST LEVEL

Level	Voltage Level (EMF),
1	1 V
2	3 V
3	10 V
x	Specified
NOTE - x is an open class. This level can be specified in the product specification.	

13.2. OPERATING CONDITION

Full system

13.3. TEST PROCEDURE

a. The EUT shall be operated within its intended climatic conditions. The temperature and relative humidity should be recorded.

b. This test method test can be performed without using a sell shielded enclosure. This is because the disturbance levels applied and the geometry of the setups are not likely to radiated a high amount of energy, especially at the lower frequencies. If under certain circumstances the radiated energy is too high, a shielded enclosure has to be used.

c. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn while the other non-excited RF-input ports of the coupling devices are terminated by a 50 ohm load resistor.

d. The frequency range is swept from 150 KHz to 230 MHz, using the signal levels established during the setting process, and with the disturbance signal 80% amplitude modulated with a 1KHz sinewave, pausing to adjust the RF-signal level or to switch coupling devices as necessary. The rate of sweep shall no exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall no exceed 1% of the start and thereafter 1% of the preceding frequency value.

e. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies e.g. clock frequency(ies) and harmonics or frequencies of dominant interest shall be analyzed separately.

f. An alternative test procedure may be adopted, wherein the frequency range is swept incrementally, with a step size not exceeding 4% of the start ad thereafter 4% of the preceding frequency value. The test level should be at least twice the value of the specified test level.

g. In cases of dispute, the test procedure using a step size not exceeding 1% of the start and thereafter 1% of preceding frequency value shall take precedence.

h. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.

i. The use of special exercising programs is recommended.

j. Testing shall be performed according to a Test Plan, which shall be included in the test report.

k. It may be necessary to carry out some investigatory testing in order to establish some aspects of the test plan.

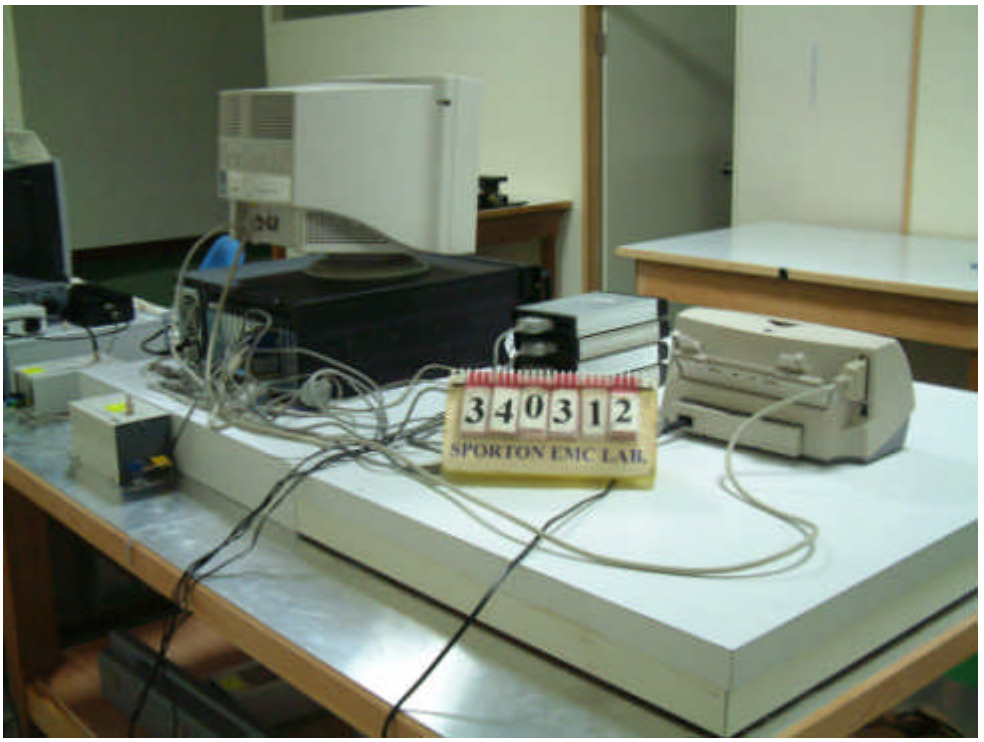
Test Engineer : Kero

Kero Kao

13.4. Photographs of CS tests

FRONT VIEW

REAR VIEW



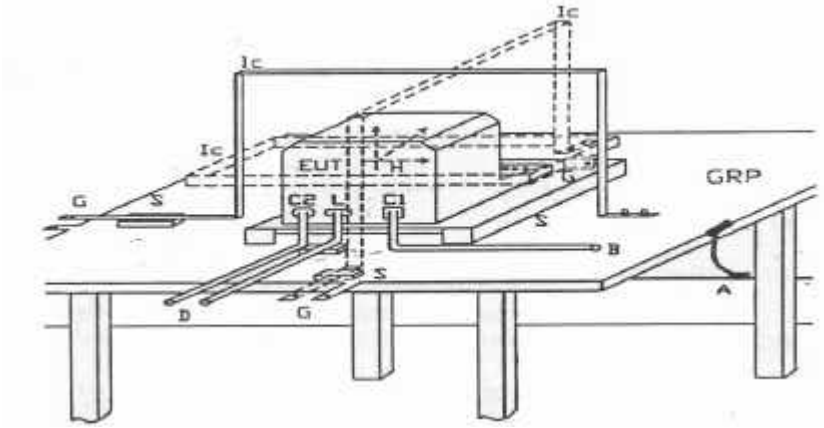
14. Power Frequency Magnetic Field immunity tests

- FINAL TEST RESULT : **PASS**
- Pass performance Criteria : A
- Required performance criteria: A
- Basic Standard : IEC 61000-4-8 (1993)
- Product Standard : EN 55024:1998/A1:2001
- Temperature : 23 °C
- Relative Humidity : 52 %
- Test Date : Apr. 09, 2003
- Observation : Normal

14.1. TEST RECORD

Power Frequency Magnetic Field	Testing duration	Coil Orientation	Results
50Hz, 1A/m	1.0 Min	X-axis	Pass
50Hz, 1A/m	1.0 Min	Y-axis	Pass
50Hz, 1A/m	1.0 Min	Z-axis	Pass

14.2. TEST SETUP



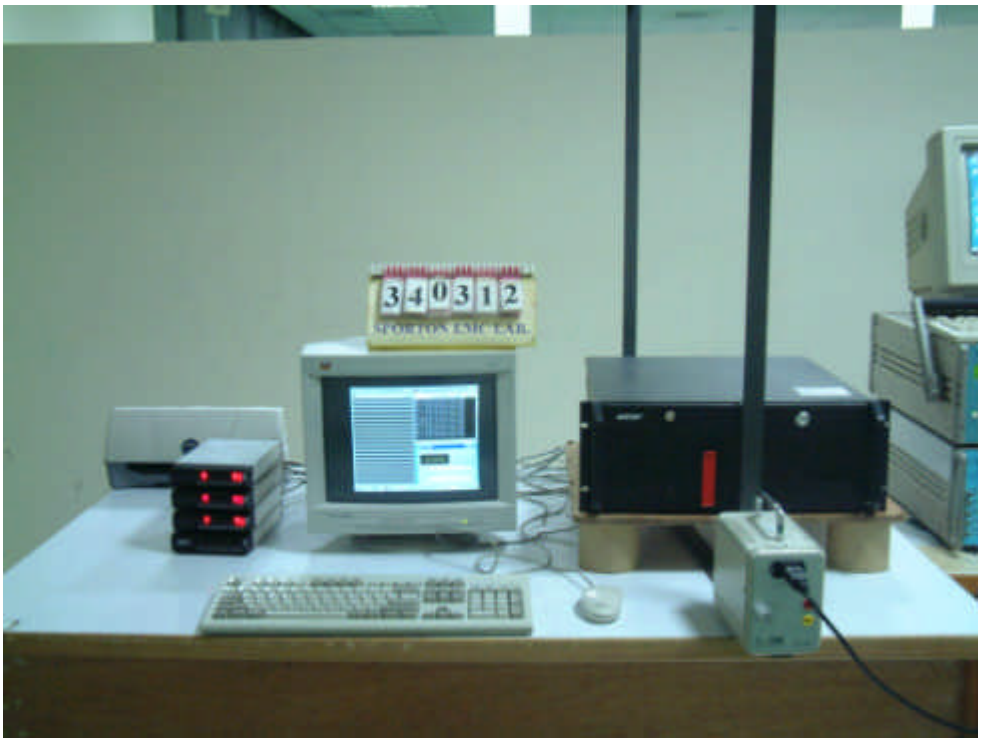
GRP:	Ground plane	C1:	Power supply circuit
A:	Safety earth	C2:	Signal circuit
S:	Insulating support	L:	Communication line
EUT:	Equipment under test	B:	To power supply source
Lc:	Induction coil	D:	To signal source, simulator
E:	Earth terminal	G:	To the test generator

Test Engineer : Kero

Kero Kao

14.3. Photographs of Power Frequency Magnetic Field immunity tests

FRONT VIEW



REAR VIEW

15. VOLTAGE DIPS AND VOLTAGE INTERRUPTIONS IMMUNITY TESTS

- FINAL TEST RESULT : **PASS**
- Pass performance Criteria : C for voltage interruption, A for voltage dips
- Required performance criteria: C for voltage interruption, B/C for voltage dips
- Basic Standard : IEC 61000-4-11 (1994)
- Product Standard : EN 55024:1998/A1:2001
- Temperature : 24 °C
- Relative Humidity : 53 %
- Test Date : Apr. 09, 2003

15.1. TEST RECORD OF VOLTAGE INTERRUPTION

Voltage	Phase Angle		% Reduction	periods (s)	Observation
(V)	0 °	180 °			
230	C	C	>95%	250	After the interruption, the power of EUT was off. The power of the EUT must be reset by the operator.

15.2. TEST RECORD OF VOLTAGE DIPS

Voltage	Phase Angle		% Reduction	periods (s)	Observation
(V)	0 °	180 °			
230	A	A	30	25	Normal
230	A	A	>95 %	0.5	Normal

15.3. TESTING REQUIREMENT AND PROCEDURE

The test was based on IEC 61000-4-11 (1994)

15.4. TEST CONDITIONS

1. Source voltage and frequency : 230V / 50Hz, Single phase.
2. Test of interval : 10 sec.
3. Level and duration : Sequency of 3 dips/interrupts.
4. Voltage rise (and fall) time : 1 ~ 5 μs.
5. Test severity :

Voltage dip and Interrupt reduction (%)	Test Duration (ms)
30	500
60	100
100	10
100	80
100	5000

15.5. OPERATING CONDITION

Full system

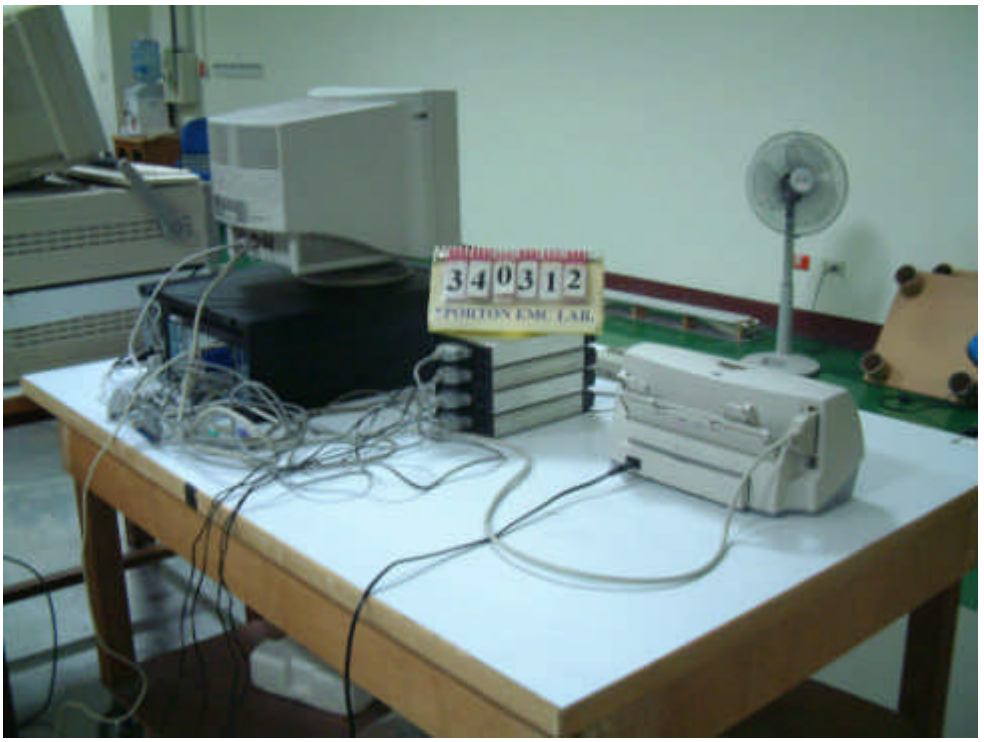
Test Engineer : Kero

Kero Kao

15.6. Photographs of VOLTAGE DIPS AND VOLTAGE INTERRUPTIONS IMMUNITY TESTS

FRONT VIEW

REAR VIEW



16. List of Measuring Equipment Used

<EMI>

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100132	9 KHz – 2.75 GHz	Jun. 03, 2002	Conduction (CO01-HY)
LISN	MessTec	NNB-2/16Z	2001-008	9 KHz – 30 MHz	Apr. 30, 2002	Conduction (CO01-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	2001-009	9 KHz – 30 MHz	Apr. 30, 2002	Conduction (CO01-HY)
EMI Filter	LINDGREN	LRE-2060	1004	< 450 Hz	N/A	Conduction (CO01-HY)
EMI Filter	LINDGREN	N6006	201052	0 ~ 60 Hz	N/A	Conduction (CO01-HY)
Spectrum Analyzer	R&S	FSP7	838858/013	9KHz – 7GHz	Jan. 29, 2003	Radiation (10CH01-HY)
Receiver	R&S	ESI7	838496/009	20Hz – 7GHz	Jan. 27, 2003	Radiation (10CH01-HY)
Biconical Antenna	SCHWARZBECK	VHBB 9124	286	30MHz –200MHz	Aug.09, 2002	Radiation
Log Antenna	SCHWARZBECK	VUSLP 9111	206	200MHz -1GHz	Aug.09, 2002	Radiation (10CH01-HY)
Amplifier	ADVENTEST	BB525C	CH100001	9KHz – 3GHz	Nov. 18, 2002	Radiation (10CH01-HY)
Amplifier	ADVENTEST	BB525C	CH100002	9KHz – 3GHz	Nov. 18, 2002	Radiation (10CH01-HY)
Turn Table	HD	DT 60 RPS	1513/004/00	0 ~ 360 degree	N/A	Radiation (10CH01-HY)
Antenna Mast	HD	MA240	240/556/00	1 m - 4 m	N/A	Radiation (10CH01-HY)
Antenna Mast	HD	MA240	240/557/00	1 m - 4 m	N/A	Radiation (10CH01-HY)
Half-wave dipole antenna	R&S	HZ12 HZ13	83924403 83924503	30MHz - 1GHz	Sep. 23, 2002	Radiation (10CH01-HY)

※ Calibration Interval of instruments listed above is one year.

<EMS>

Instrument	Manufacturer	Model No.	Characteristics	Calibration Date	Remark
ESD Simulator	KEYTEK	MZ-15/EC	0 KV - 15 KV	Apr. 25, 2002	ESD
Mini Zap	KEYTEK	TPC-2	0 KV - 15 KV	Apr. 25, 2002	ESD
Amplifier	AR	100W 1000M3	80 MHz - 1 GHz	N/A	RS
Isotropic Field Probe	AR	CP3000A	10 KHz - 1 GHz	Jun. 17, 2002	RS
IEEE-488 Interface	AR	CP3000	N/A	N/A	RS
System Interface	EMC Automation	200	HP-IB INTERFACE	N/A	RS
Power Meter	EMC Automation	438A	100 KHz -4.2 GHz	N/A	RS
Video Camera controller	EMC Automation	VCC-01	N/A	N/A	RS
Signal Generator	HP	8648A	100 KHz - 1 GHz	Sep. 08, 2002	RS
Antenna	CHASE	CBL6121A	26 MHz - 1 GHz	Jun. 10, 2002	RS
Amplifier	AR	75W 75A220	25MHz - 300MHz	Jun. 12, 2002	RS
EFT Generator	EMC PARTNER AG Switzerland	TRANSIENT 2000	Up to 4 KV	Feb. 02, 2003	EFT
Harmonic/Flicker Test System	EMC PARTNER	Harmonics -1000	4000VA 16A PEAK	Mar. 28, 2003	Harmonics, Flicker
Combination Wave Generator	EMC PARTNER AG Switzerland	TRANSIENT 2000	Up to 4 KV	Feb. 02, 2003	SURGE
Conducted Immunity Test System	FRANKONIA	CIT-10/W	100KHz ~ 266MHz	Jan. 06, 2003	CS
Magnetic field Antenna	EMC PARTNER AG Switzerland	TRANSIENT 2000	0.5 up to 150A / m	Feb. 02, 2003	Magnetic
EMC Immunity Tester	EMC PARTNER AG Switzerland	TRANSIENT 2000	0 ~ 260 rms, 16A	Feb. 02, 2003	DIP

17. Notice for Class A Product

This Notice is for class A product only. If the Equipment under Test is a class B product, this notice should be disregarded.

Class A ITE is a category of all other ITE which satisfies the class A ITE limits but not the class B ITE limits. Such equipment should not be restricted in its sale but the following warning shall be included in the instructions for use:

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

18. Declaration of Conformity and the CE Mark

There are three possible procedures pertaining to the declaration of conformity :

18.1. Conformity Testing and Declaration of Conformity by the Manufacturer or His Authorized Representative Established within the Community or by an Importer.

- Article 10 (1) of the EMC Directive,
- § 3 (1) no. 2a of the EMC Act.

18.2. Declaration of Conformity Issued by the Manufacturer or His Authorized Representative Established within the Community or by an Importer Following Testing of the Product and Issued of an EC certificate of conformity by a competent body.

- Article 10 (2) of the EMC Directive,
- § 3 (1) no. 2b of the EMC Act.

18.3. Declaration of Conformity Issued by the Manufacturer or His Authorized Representative Established within the Community or by an Importer Following Testing and Certification of the Product by a Notified Body.

- Article 10 (5) of the EMC Directive,
- § 3 (1) no. 2b of the EMC Act (radio transmitting installations).

18.4. Specimen For The CE Marking Of Electrical / Electronical Equipment

The components of the CE marking shall have substantially the same vertical dimension, which may not be less than 5 mm.

Appendix B. Normalized Site Attenuation

Calibrated by

Austrian Research Centers

SEIBERSDORF

AUSTRIAN RESEARCH CENTERS
SEIBERSDORF

ACCREDITED TESTING LABORATORY (NR. 32)
for Electromagnetic Compatibility

TEST REPORT NO. EH-H16/01

On: **Normalised Site Attenuation, Chamber Factor Field Uniformity and Transmission Loss Measurements**

Ordered by: **SIDT Europe**

Address: **Route d'Hesdin-Ramecourt**
62130 Saint Pol Sur Ternoise
France

Subject: **Semi Anechoic Chamber 1, 2, 3 and 4, at SPORTON International Inc. Taiwan**

Internal Order No.: **EH-1.92.00004-H171**

L/C N°: ORCAB1-00016.OC

Technical responsibility:

Test performed by: Gerhard Koll

Date: **25.06.2001**

Number of Pages: **48**

Comments:
The test results refers exclusively to the test subject.
The production or transmission of extracts of the present report is subject to authorisation by the testing laboratory

APPENDIX A. Photographs of EUT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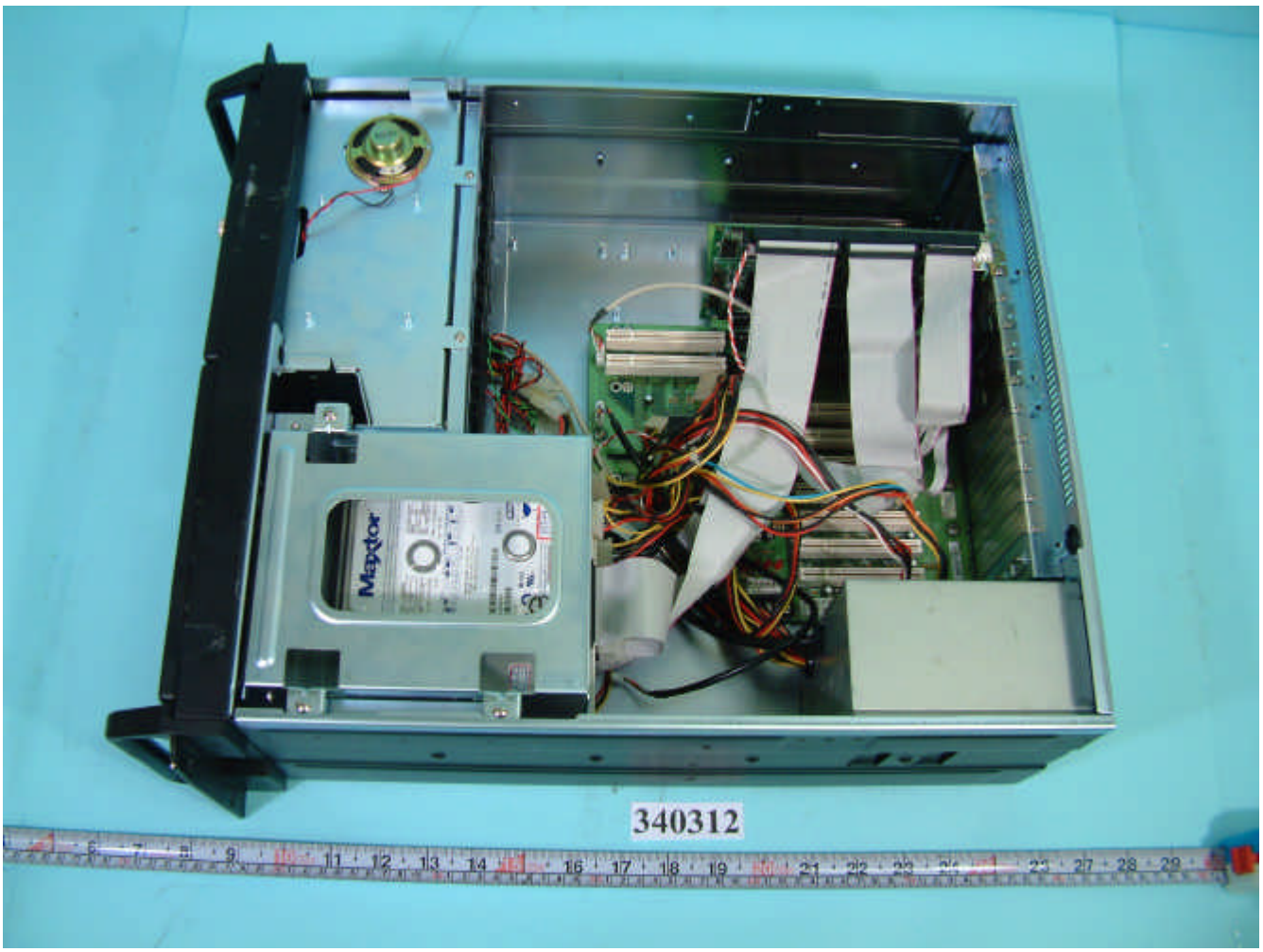
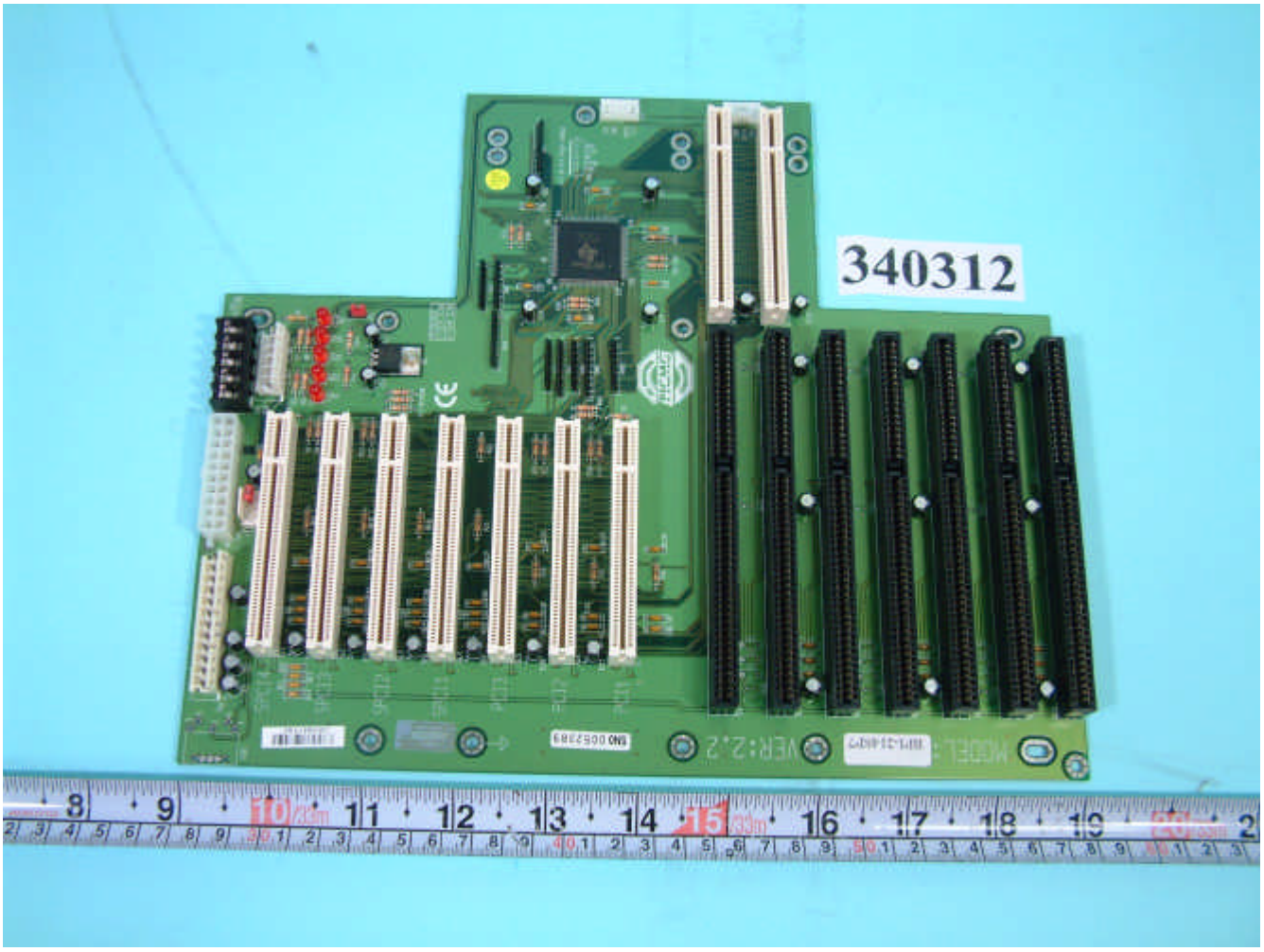

Maxtor
340312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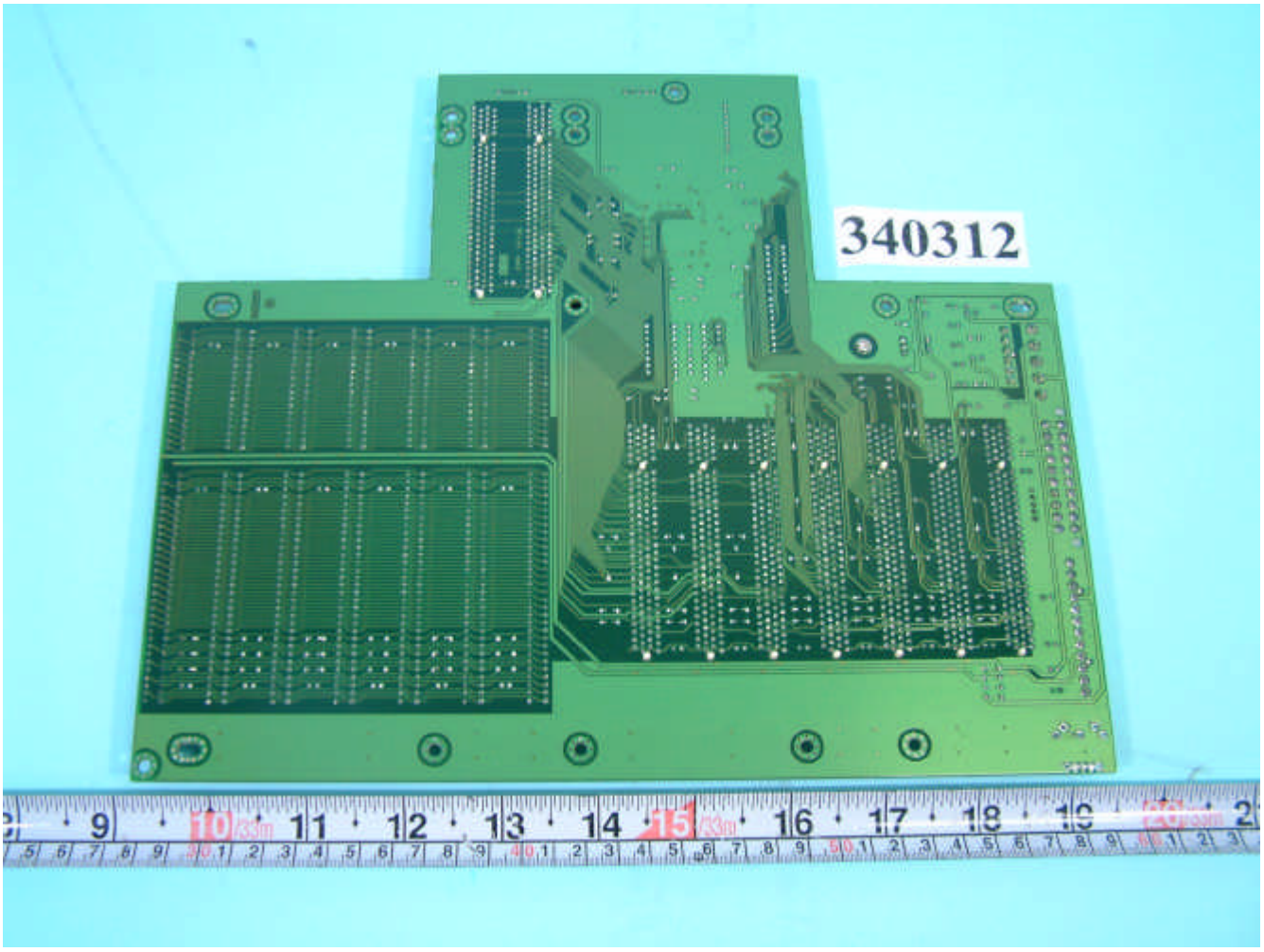
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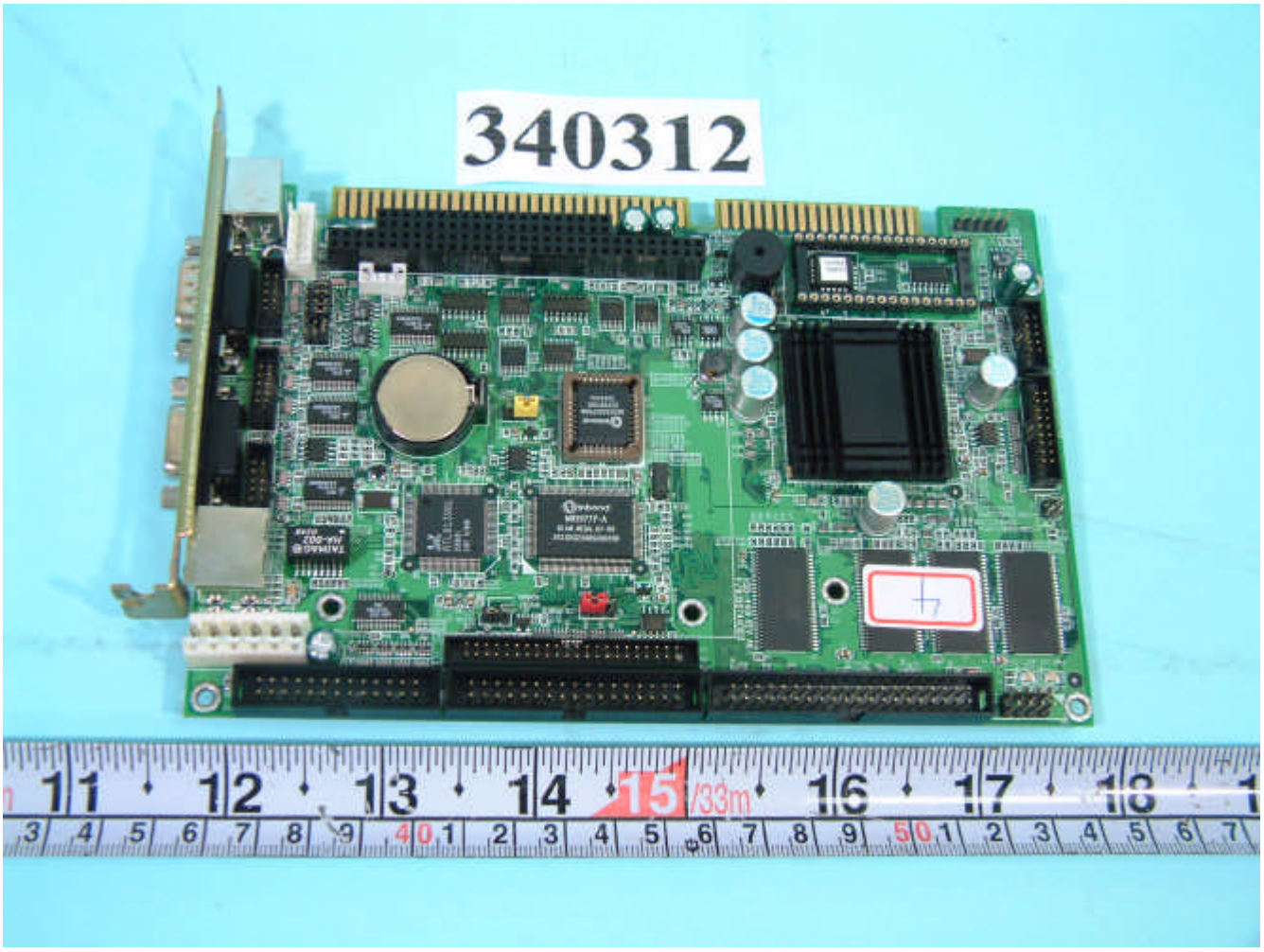
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