CE EMC TEST REPORT

according to

European Standard EN 61000-6-4:2001, EN 61000-3-2:2000, EN 61000-3-3:1995/A1:2001 and EN 61000-6-2:2001 (IEC 61000-4-2:1995/A1:1998, IEC 61000-4-3:1995/A1:1998, 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 : PANEL PC

Model No. : P108X-845 Series

Applicant : **AXIOMTEK Co., Ltd.**
9F, No. 2, Lane 235, Pao Chiao Road, Hsin Tien, Taipei Hsien, Taiwan, R.O.C.

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SPORTON International Inc.

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

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History of this test report

Original Report Issue Date: Oct. 12, 2004

▒ No additional attachment.

☐ additional attachment were issued as following record :

Attachment No.	Issue Date	Description

Certificate No. : EC4O0407

CERTIFICATE OF COMPLIANCE

according to

**European Standard EN 61000-6-4:2001,
EN 61000-3-2:2000, EN 61000-3-3:1995/A1:2001 and
EN 61000-6-2:2001 (IEC 61000-4-2:1995/A1:1998,
IEC 61000-4-3:1995/A1:1998, 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 : PANEL PC

Model No. : P108X-845 Series

Applicant : **AXIOMTEK Co., Ltd.**
9F, No. 2, Lane 235, Pao Chiao Road, Hsin Tien,
Taipei Hsien, Taiwan, R.O.C.

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 61000-6-4:2001, EN 61000-3-2:2000, EN 61000-3-3:1995/A1:2001 and EN 61000-6-2:2001 (IEC 61000-4-2:1995/A1:1998, IEC 61000-4-3:1995/A1:1998, 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 Oct. 11, 2004 at **SPORTON International Inc.** LAB.

Oct. 14, 2004

Alex Chen
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

AXIOMTEK Co., Ltd.
9F, No. 2, Lane 235, Pao Chiao Road, Hsin Tien,
Taipei Hsien, Taiwan, R.O.C.

1.2. Manufacturer

Same as 1.1

1.3. Basic Description of Equipment under Test

Equipment	: PANEL PC
Model No.	: P108X-845 Series
Trade Name	: AXIOMTEK
TP Cable	: Non-Shielded, 10 m
Ext. IDE Cable	: Shielded, 0.4 m
Ext. FDD Cable	: Shielded, 0.5 m
DIO Cable	: Shielded, 0.5 m
PS/2 Y Cable	: Shielded, 0.3 m
Audio Cable	: Shielded, 1 m
Data Cable Type	: Please see section 2.2 of this test report for details
Power Supply Type	: Switching
AC Power Cord	: Non-Shielded, 1.75 m, 3 pin

1.4. Feature of Equipment under Test

- CPU: Nation Semiconductor Geode GXl-233/300MHz
- HDD: FUJITSU / MHT2020AT / 20GB
- LCD Panel:
  - -AU / B0848N01
  - -TOSHIBA / LTM08C351
- Please refer to user manual for others

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 61000-6-4.

b. The complete test system included remote workstation, SONY Monitor, HP PS/2 Mouse, HP PS/2 Keyboard, LOGITECH USB Mouse, HP Printer, ACEEX Modem, GALAXY Headset, KOKA Walk Man, BEHAVIOR External CD-ROM, TEAC External FDD and EUT for EMI test. The remote workstation included ASUS PC, VIEWSONIC Monitor, HP PS/2 Mouse and HP PS/2 Keyboard.

c. The following test modes were pretested for conduction and radiation test:
Mode 1: P1080-845(Panel: AU), LCD+CRT: 800 x 600 38k/60Hz, LAN: 100Mbps
Mode 2: P1080-845(Panel: AU), CRT Only: 1280 x 1024 80k/75Hz, LAN: 100Mbps
Mode 3: P1087-845(Panel: TOSHIBA), LCD+CRT: 800 x 600 38k/60Hz, LAN: 100Mbps
Mode 4: P1087-845(Panel: TOSHIBA), CRT Only: 1280 x 1024 80k/75Hz, LAN: 100Mbps
cause “Mode 4” generated the worst test result, it was reported as final data.

d. The following test modes were performed for Disturbances at Telecommunication Ports test:
Mode 1: P1080-845(Panel: AU), LAN: 100Mbps
Mode 2: P1080-845(Panel: AU), LAN: 10Mbps
Mode 3: P1087-845(Panel: TOSHIBA), LAN: 100Mbps
Mode 4: P1087-845(Panel: TOSHIBA), LAN: 10Mbps

e. The complete test system included remote DELL Notebook, VIEWSONIC Monitor, LOGITECH PS/2 Keyboard, LOGITECH PS/2 Mouse, LOGITECH USB Mouse, CANON Printer, ACEEX Modem, KOKA Headset, KOKA Walk Man, TEAC External FDD, SONY External CD-ROM and EUT for EMS test.

f. 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 (SONY) – for local workstation

FCC ID	: AK8GDM17SE2T
Model No.	: GDM-17SE2T
Power Cord	: Shielded
Serial No.	: SP0006
Data Cable	: Shielded, 1.15m

Support Unit 2. -- HP Mouse (LOGITECH) – for local and remote workstation

FCC ID	: JNZ211443
Model No.	: M-S69
Serial No.	: SP0041
Data Cable	: Non-Shielded, 1.85m

Support Unit 3. – PS/2 Keyboard (HP) – for local and remote workstation

FCC ID	: N/A
Model No.	: KB-0133
Serial No.	: SP0054
Data Cable	: Shielded, 1.9m
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 4. – USB Mouse (LOGITECH) – for local workstation

FCC ID	: N/A
Model No.	: M-BE58
Serial No.	: SP0238
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 5. -- Printer (HP) – for local workstation

FCC ID	: B94C2642X
Model No.	: C2642A
Power Supply Type	: Linear
Power Cord	: Non-Shielded
Serial No.	: SP0048
Data Cable	: Shielded, 1.2m

Support Unit 6. -- 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 7. – Headset (HALAXY) – for local workstation

FCC ID	: N/A
Model No.	: HP-318
Serial No.	: SP0087
Data Cable	: Non-Shielded, 1.8m

Support Unit 8. – Walk Man (KOKA) – for local workstation

FCC ID	: N/A
Model No.	: KW-246
Serial No.	: SP0054
Data Cable	: Non-Shielded, 1.7m

Support Unit 9. – External CD-ROM (BEHAVIOR) – for local workstation

FCC ID	: N/A
Model No.	: BCDF 52213
Serial No.	: SP0203
Data Cable	: Shielded, 0.4m

Support Unit 10. – External FDD (TEAC) – for local workstation

FCC ID	: N/A
Model No.	: FD-235HF
Serial No.	: SP0204
Data Cable	: Shielded, 0.5m

Support Unit 11. – Personal Computer (ASUS) – for remote workstation

FCC ID	: N/A
Model No.	: TUSL-2
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 12. -- Monitor (VIEWSONIC) – for remote workstation

FCC ID	: N/A
Model No.	: E55
Power Cord	: Shielded
Serial No.	: SP0006
Data Cable	: Shielded, 1.5m
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 workstation

FCC ID	: N/A
Model No.	: VCDTS21553-3J
Power Cord	: Shielded
Serial No.	: SP0006
Data Cable	: Shielded, 1.7m
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

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

FCC ID	: N/A
Model No.	: Y-SP29
Serial No.	: SP0054
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 3. – PS/2 Mouse (LOGITECH) – for local workstation

FCC ID	: N/A
Model No.	: M-S34
Serial No.	: SP0001
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 4. – USB Mouse (LOGITECH) – for local workstation

FCC ID	: N/A
Model No.	: M-BE58
Serial No.	: SP0055
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 5. -- Printer (CANON) – for local workstation

FCC ID	: N/A
Model No.	: BJ-2100
Power Supply Type	: Linear
Power Cord	: Non-Shielded
Serial No.	: SP0048
Data Cable	: Shielded, 1.35m
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 6. -- 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 7. – Headset (KOKA) – for local workstation

FCC ID	: N/A
Model No.	: HD-305
Serial No.	: SP0095
Data Cable	: Non-Shielded, 1.2m

Support Unit 8. – Walk Man (KOKA) – for local workstation

FCC ID	: N/A
Model No.	: KW-247
Serial No.	: SP0054
Data Cable	: Non-Shielded, 1.7m

Support Unit 9. – External CD-ROM (SONY) – for local workstation

FCC ID	: N/A
Model No.	: CDV5211
Serial No.	: SP0203
Data Cable	: Shielded, 0.4m

Support Unit 10. – External FDD (TEAC) – for local workstation

FCC ID	: N/A
Model No.	: FD-235HF
Serial No.	: SP0204
Data Cable	: Shielded, 0.5m

Support Unit 11. -- Notebook (DELL) – for remote workstation

FCC ID	: N/A
Model No.	: PP01L
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0040
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

3. Test Software

< EMI >

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

The programs were 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 b to f.

At the same time, the following programs were executed:

- Executed "CD Player & Media Playe" to play audio.
- Executed "Ping.exe" to link with the remote workstation to receive and transmit data by TP cable.

< EMS >

Two executive programs, EMITEST.EXE & EMCTEST.EXE under WIN 2000, which generate a complete line of continuously repeating " H" pattern were used as the test software.

The programs were 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 b to f.

At the same time, the following programs were executed:

- Executed "Network Neighborhood" to link with the remote workstation to receive and transmit data by TP cable.
- Executed "Media Player" to play audio.

4. General Information of Test

4.1. Test Facility

<EMI>

Test Site Location : No. 3, Lane 238, Kang Lo Street, Nei Hwu District,
Taipei 11424, Taiwan, R.O.C.
TEL : 886-2-2631-4739
FAX : 886-2-2631-9740

Test Site No. : CO01-NH, OS01-NH

<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 : European Standard EN 61000-6-4
Harmonics Test : European Standard EN 61000-3-2
Voltage Fluctuations Test : European Standard EN 61000-3-3
EMS Test : European Standard EN 61000-6-2
(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 : European Standard EN 61000-6-4
Harmonics Test : European Standard EN 61000-3-2
Voltage Fluctuations Test : European Standard EN 61000-3-3
EMS Test : European Standard EN 61000-6-2
(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 61000-6-4. 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.

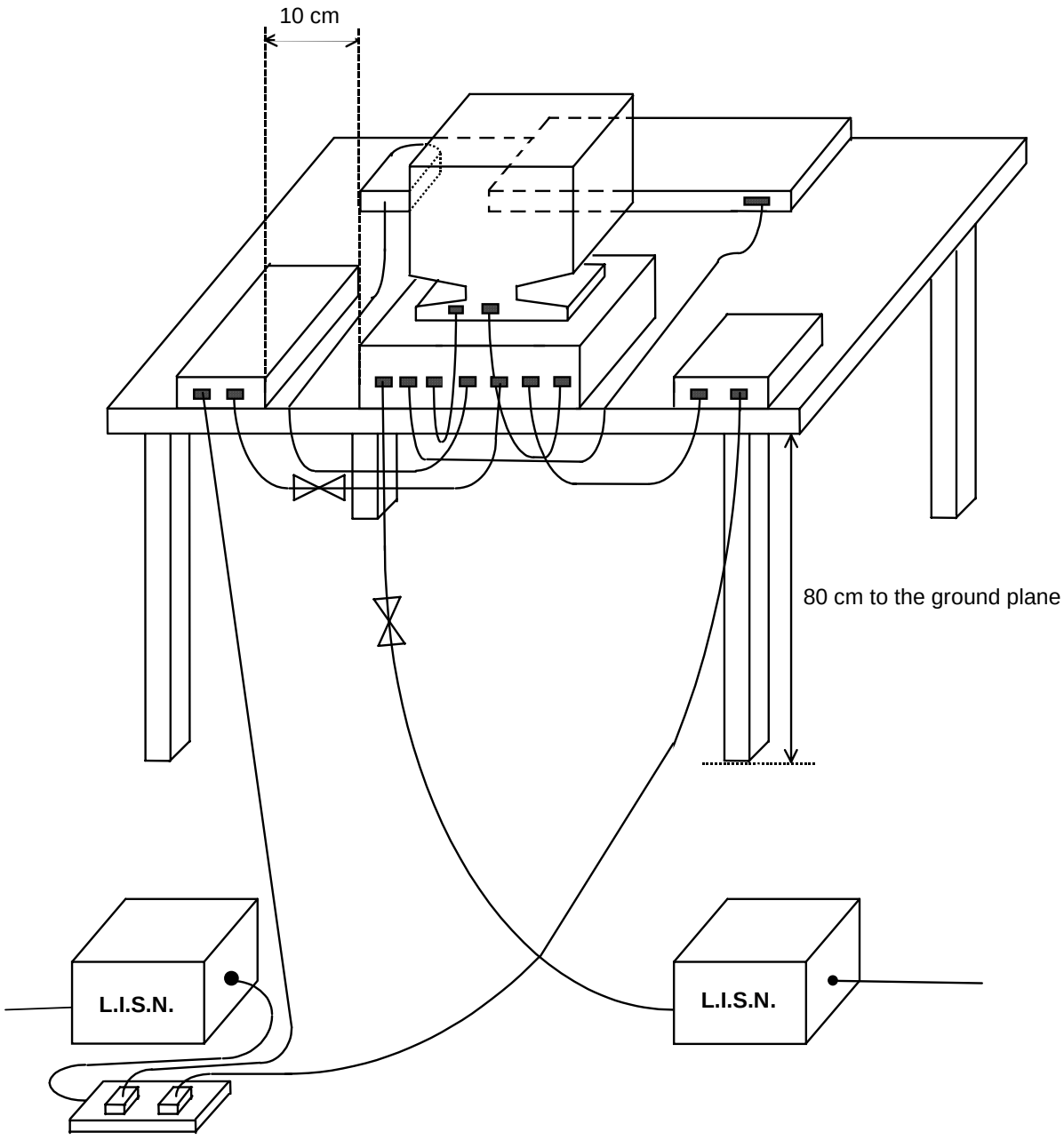
5.1. Description of Major Test Instruments

● Test Receiver	(R&S ESH3)
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

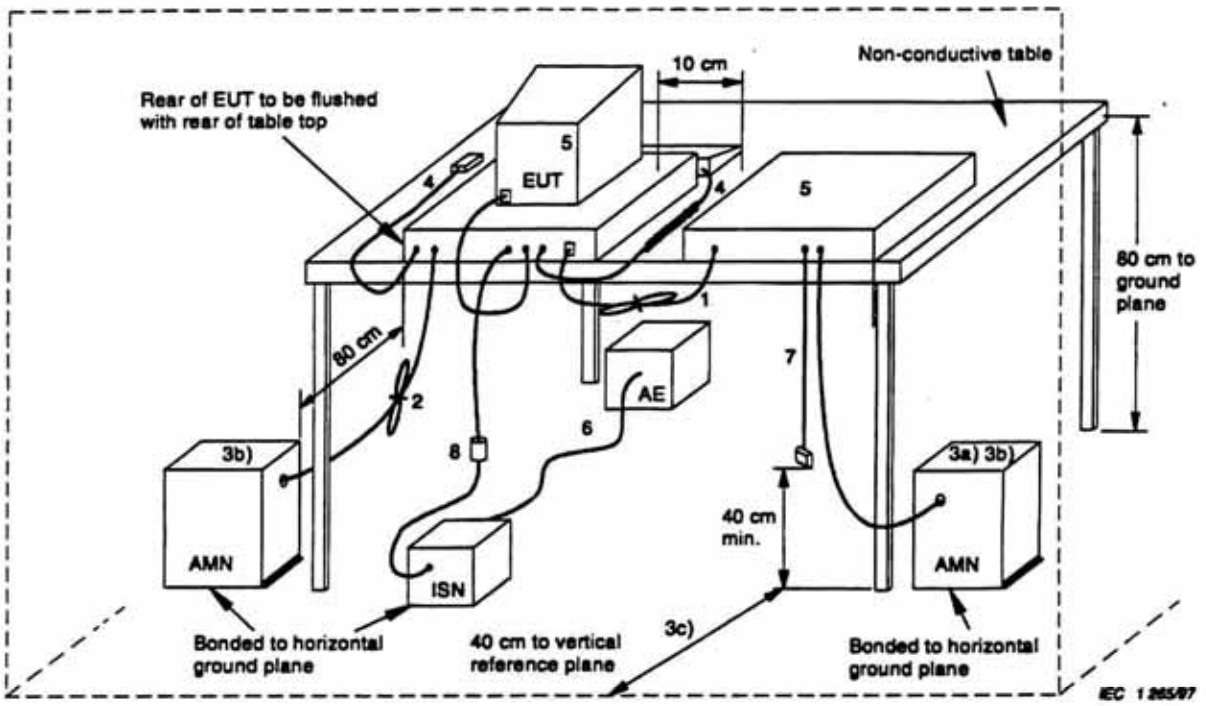
5.2. Test Procedures

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. Connect Telecommunication port to ISN (Impedance Stabilization Network).
d. All the support units are connect to the other LISN.
e. The LISN provides 50 ohm coupling impedance for the measuring instrument.
f. The CISPR states that a 50 ohm , 50 microhenry LISN should be used.
g. Both sides of AC line were checked for maximum conducted interference.
h. The frequency range from 150 kHz to 30 MHz was searched.
i. 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.

5.5. Test Result of AC Powerline Conducted Emission

- Temperature: 23 °C
- Relative Humidity: 42 %
- Test Date: Oct. 06, 2004
- Corrected Reading (dBuV) = Insertion Loss + Cable Loss + Read Level = Level
- 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

LINE

Frequency (MHz)	Level (dBμV)	Over Limit (dB)	Limit Line (dBuV)	Read Level (dBμV)	Insertion Loss (dB)	Cable Loss (dB)	Detect Mode (QP or AV)
0.398	52.26	-26.74	79.00	52.10	0.10	0.06	QP
0.398	51.56	-14.44	66.00	51.40	0.10	0.06	AV
0.455	55.27	-23.73	79.00	55.10	0.10	0.07	QP
0.455	54.27	-11.73	66.00	54.10	0.10	0.07	AV
0.512	50.47	-22.53	73.00	50.30	0.10	0.07	QP
0.512	49.97	-10.03	60.00	49.80	0.10	0.07	AV
0.569	60.08	-12.92	73.00	59.90	0.10	0.08	QP
0.569	59.38	-0.62	60.00	59.20	0.10	0.08	AV
0.626	53.98	-19.02	73.00	53.80	0.10	0.08	QP
0.626	53.28	-6.72	60.00	53.10	0.10	0.08	AV
0.683	52.88	-20.12	73.00	52.70	0.10	0.08	QP
0.683	52.28	-7.72	60.00	52.10	0.10	0.08	AV

NEUTRAL

Frequency (MHz)	Level (dBμV)	Over Limit (dB)	Limit Line (dBuV)	Read Level (dBμV)	Insertion Loss (dB)	Cable Loss (dB)	Detect Mode (QP or AV)
0.341	49.25	-29.75	79.00	49.10	0.10	0.05	QP
0.341	47.95	-18.05	66.00	47.80	0.10	0.05	AV
0.398	53.36	-25.64	79.00	53.20	0.10	0.06	QP
0.398	52.56	-13.44	66.00	52.40	0.10	0.06	AV
0.455	56.07	-22.93	79.00	55.90	0.10	0.07	QP
0.455	55.37	-10.63	66.00	55.20	0.10	0.07	AV
0.569	60.08	-12.92	73.00	59.90	0.10	0.08	QP
0.569	59.38	-0.62	60.00	59.20	0.10	0.08	AV
0.626	53.38	-19.62	73.00	53.20	0.10	0.08	QP
0.626	52.28	-7.72	60.00	52.10	0.10	0.08	AV
0.683	53.68	-19.32	73.00	53.50	0.10	0.08	QP
0.683	52.58	-7.42	60.00	52.40	0.10	0.08	AV

Test Engineer: Cash

Cash Chu

5.6. Test Result of disturbances at telecommunication ports

5.6.1. Test Mode: Mode 1

- Temperature: 23 °C
- Relative Humidity: 42 %
- Test Date: Oct. 06, 2004
- Corrected Reading (dBuV) = Insertion Factor + Cable Loss + Read Level = Level
- 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 (MHz)	Level (dBvA)	Over Limit (dB)	Limit Line (dBvA)	Read Level (dBvA)	Insertion Factor (dB)	Cable Loss (dB)	Detect Mode (QP or AV)
6.891	45.92	-41.08	87.00	36.10	9.56	0.26	QP
6.891	44.62	-29.38	74.00	34.80	9.56	0.26	AV
11.871	53.79	-33.21	87.00	43.90	9.55	0.34	QP
11.871	51.39	-22.61	74.00	41.50	9.55	0.34	AV
12.456	61.10	-25.90	87.00	51.20	9.55	0.35	QP
12.456	56.30	-17.70	74.00	46.40	9.55	0.35	AV
13.205	58.81	-28.19	87.00	48.90	9.54	0.37	QP
13.205	55.11	-18.89	74.00	45.20	9.54	0.37	AV
24.156	65.69	-21.31	87.00	55.70	9.51	0.48	QP
24.156	63.39	-10.61	74.00	53.40	9.51	0.48	AV
27.156	66.10	-20.90	87.00	56.10	9.50	0.50	QP
27.156	65.40	-8.60	74.00	55.40	9.50	0.50	AV

Test Engineer: Cash

Cash Chu

5.6.2. Test Mode: Mode 2

- Temperature: 23 °C
- Relative Humidity: 42 %
- Test Date: Oct. 06, 2004
- Corrected Reading (dBuV) = Insertion Factor + Cable Loss + Read Level = Level
- 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 (MHz)	Level (dBvA)	Over Limit (dB)	Limit Line (dBvA)	Read Level (dBvA)	Insertion Factor (dB)	Cable Loss (dB)	Detect Mode (QP or AV)
0.556	45.26	-41.74	87.00	35.60	9.59	0.07	QP
0.556	43.06	-30.94	74.00	33.40	9.59	0.07	AV
0.725	46.47	-40.53	87.00	36.80	9.58	0.09	QP
0.725	42.17	-31.83	74.00	32.50	9.58	0.09	AV
0.806	46.57	-40.43	87.00	36.90	9.58	0.09	QP
0.806	44.17	-29.83	74.00	34.50	9.58	0.09	AV
4.389	46.27	-40.73	87.00	36.50	9.56	0.21	QP
4.389	42.47	-31.53	74.00	32.70	9.56	0.21	AV
22.156	36.75	-50.25	87.00	26.80	9.51	0.45	QP
22.156	28.85	-45.15	74.00	18.90	9.51	0.45	AV
23.189	36.37	-50.63	87.00	26.40	9.51	0.47	QP
23.189	29.37	-44.63	74.00	19.40	9.51	0.47	AV

Test Engineer: Cash

Cash Chu

5.6.3. Test Mode: Mode 3

- Temperature: 23 °C
- Relative Humidity: 42 %
- Test Date: Oct. 06, 2004
- Corrected Reading (dBuV) = Insertion Factor + Cable Loss + Read Level = Level
- 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 (MHz)	Level (dBvA)	Over Limit (dB)	Limit Line (dBvA)	Read Level (dBvA)	Insertion Factor (dB)	Cable Loss (dB)	Detect Mode (QP or AV)
7.801	45.43	-41.57	87.00	35.60	9.56	0.27	QP
7.801	44.33	-29.67	74.00	34.50	9.56	0.27	AV
11.837	53.09	-33.91	87.00	43.20	9.55	0.34	QP
11.837	52.49	-21.51	74.00	42.60	9.55	0.34	AV
12.747	62.50	-24.50	87.00	52.60	9.55	0.36	QP
12.747	61.20	-12.80	74.00	51.30	9.55	0.36	AV
13.907	57.52	-29.48	87.00	47.60	9.54	0.38	QP
13.907	56.02	-17.98	74.00	46.10	9.54	0.38	AV
23.128	63.77	-23.23	87.00	53.80	9.51	0.47	QP
23.128	62.07	-11.93	74.00	52.10	9.51	0.47	AV
26.481	65.90	-21.10	87.00	55.90	9.50	0.50	QP
26.481	65.10	-8.90	74.00	55.10	9.50	0.50	AV

Test Engineer: Cash

Cash Chu

5.6.4. Test Mode: Mode 4

- Temperature: 23 °C
- Relative Humidity: 42 %
- Test Date: Oct. 06, 2004
- Corrected Reading (dBuV) = Insertion Factor + Cable Loss + Read Level = Level
- 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 (MHz)	Level (dBvA)	Over Limit (dB)	Limit Line (dBvA)	Read Level (dBvA)	Insertion Factor (dB)	Cable Loss (dB)	Detect Mode (QP or AV)
0.557	43.56	-43.44	87.00	33.90	9.59	0.07	QP
0.557	40.86	-33.14	74.00	31.20	9.59	0.07	AV
0.656	44.16	-42.84	87.00	34.50	9.58	0.08	QP
0.656	41.46	-32.54	74.00	31.80	9.58	0.08	AV
0.728	42.57	-44.43	87.00	32.90	9.58	0.09	QP
0.728	38.57	-35.43	74.00	28.90	9.58	0.09	AV
4.388	40.37	-46.63	87.00	30.60	9.56	0.21	QP
4.388	39.87	-34.13	74.00	30.10	9.56	0.21	AV
22.172	36.45	-50.55	87.00	26.50	9.51	0.45	QP
22.172	28.85	-45.15	74.00	18.90	9.51	0.45	AV
23.199	33.87	-53.13	87.00	23.90	9.51	0.47	QP
23.199	29.67	-44.33	74.00	19.70	9.51	0.47	AV

Test Engineer: Cash

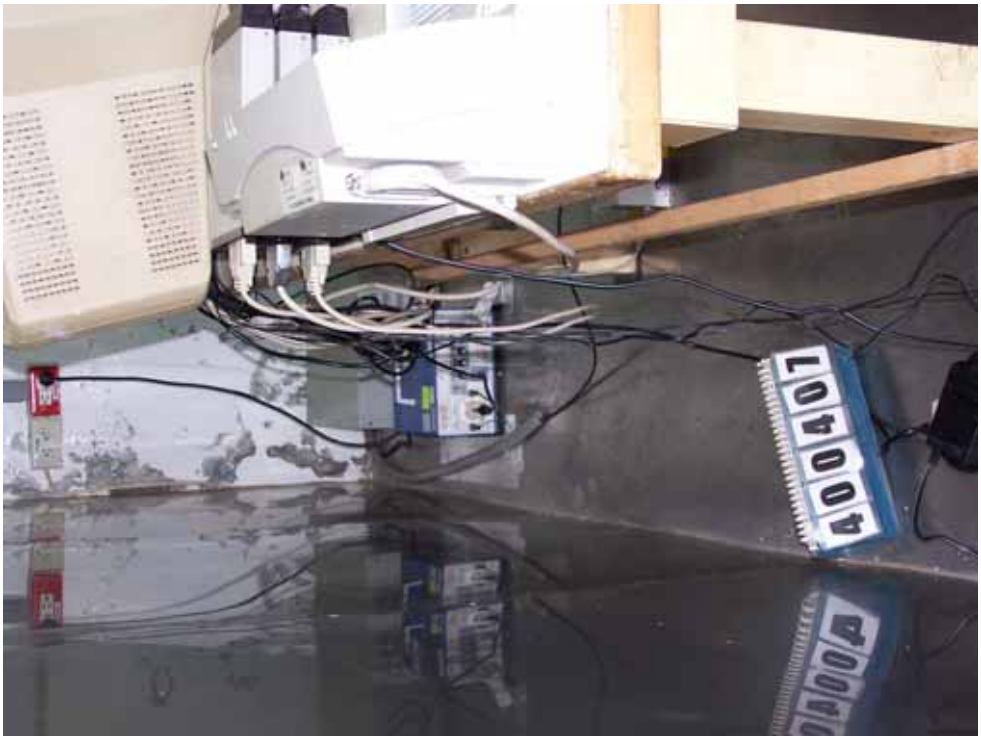
Cash Chu

5.7. Photographs of Conducted Powerline Test Configuration

- 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 61000-6-4. The EUT was placed on a nonmetallic stand, 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.

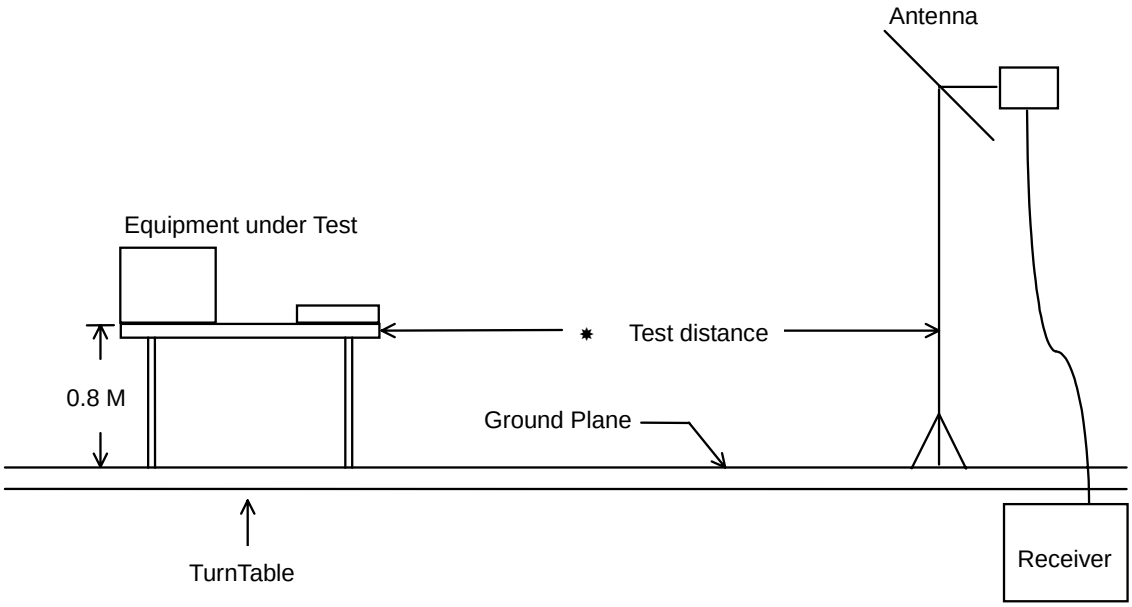
6.1. Description of Major Test Instruments

● RF Preamplifier	(HP 8447D)
RF Gain	25 dB
Signal Input	100KHz - 1.3 GHz
● Spectrum Analyzer	(HP 8568B)
Attenuation	10 dB
Start Frequency	30 MHz
Stop Frequency	1000 MHz
Resolution Bandwidth	120 KHz
Signal Input	100 Hz to 1.5 GHz
● Test Receiver	(HP 85650A)
Resolution Bandwidth	120 KHz
Frequency Band	30 MHz to 1 GHz
Quasi-Peak Detector	ON for Quasi-Peak Mode
	OFF for Peak Mode

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.

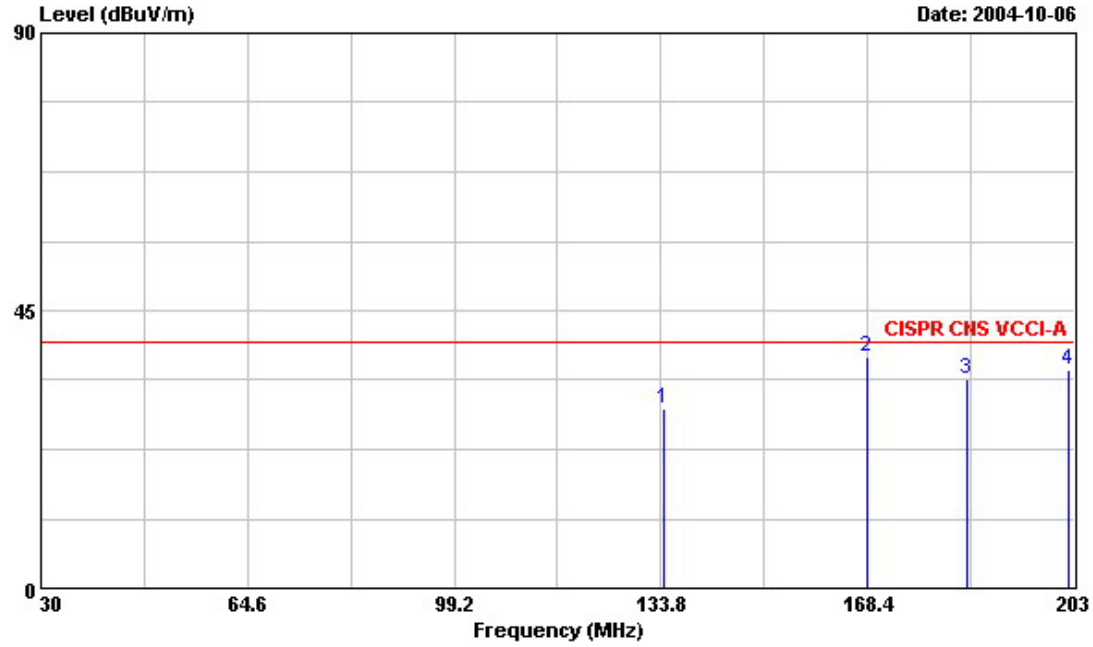
6.3. Typical Test Setup Layout of Radiated Emission



6.4. Test Result of Radiated Emission

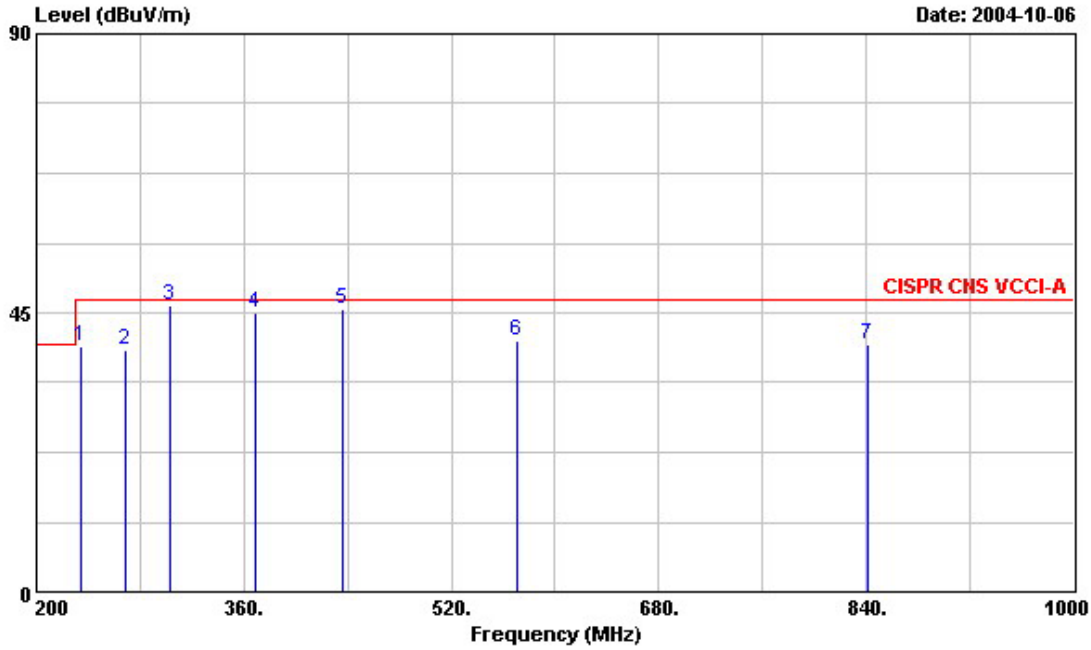
- Temperature: 28 °C
- Relative Humidity: 56 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

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



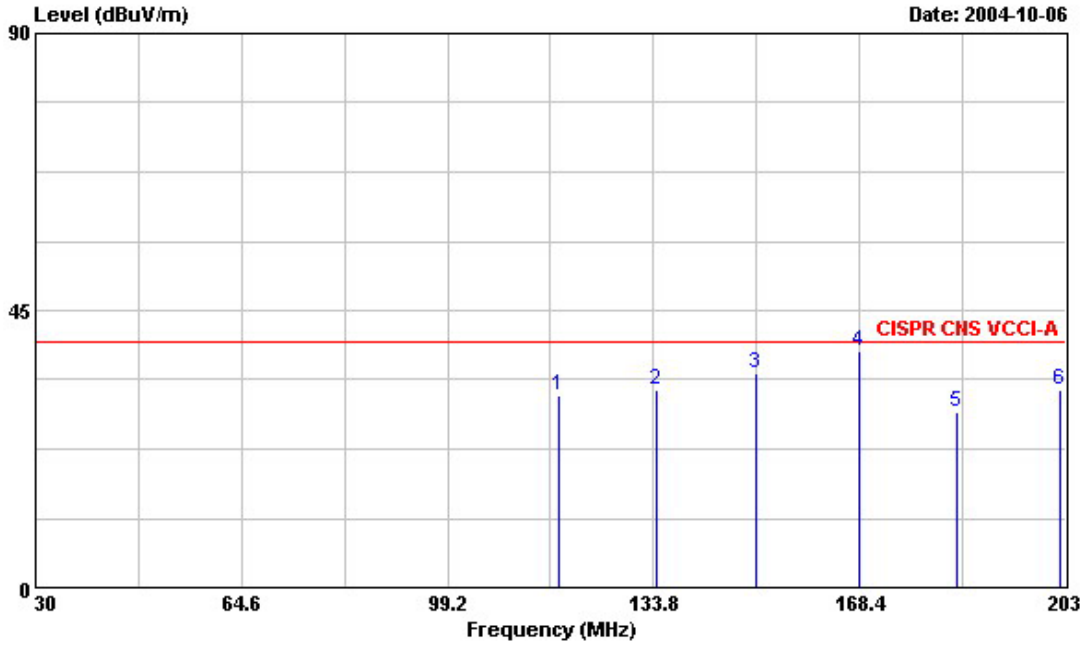

```
Site      : OS01-NH
Condition : CISPR CNS VCCI-A 10m OS01-ANT-01-05-2004 HORIZONTAL
EUT       : 84500A5 A18.1F.0  GX-MMX233
POWER     : SKYNET AXI-8071  AC 230V
MEMO      : EWIN98:EMCTEST
          : CRT ONLY  1280*1024 80K 75Hz
          : LAN:100M
```

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	134.320	29.09	-10.91	40.00	43.03	11.64	1.68	27.26	Peak	---	---
2	168.230	37.50	-2.50	40.00	52.96	9.64	1.92	27.02	QP	---	---
3	185.010	34.01	-5.99	40.00	50.03	8.91	1.97	26.90	Peak	---	---
4	201.960	35.47	-4.53	40.00	51.59	8.56	2.11	26.79	Peak	---	---



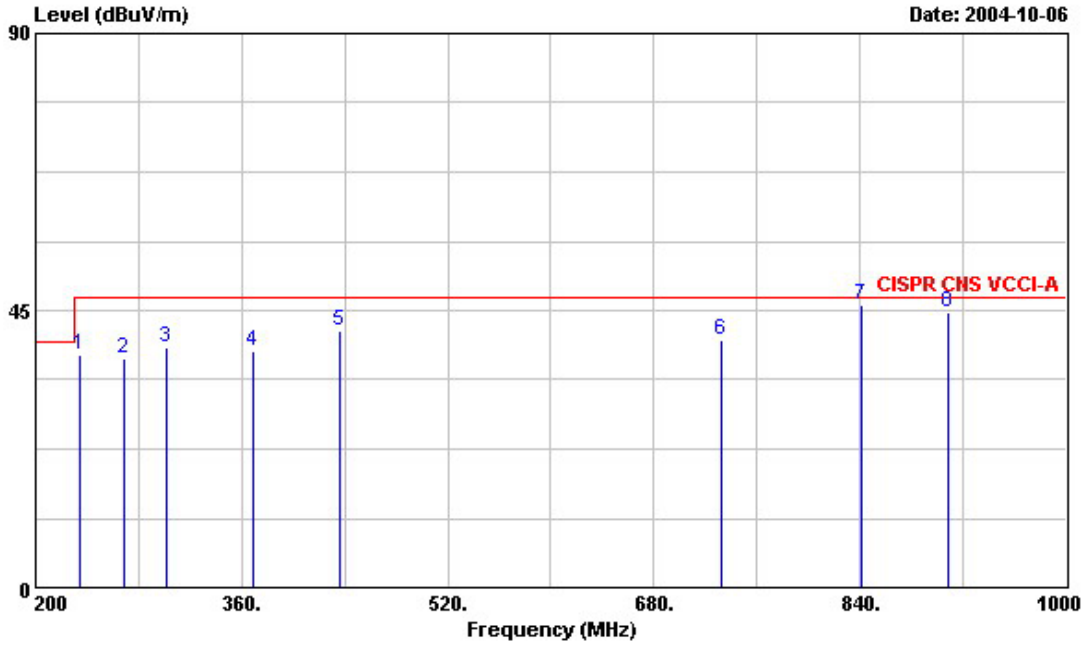
Site : OS01-NH
Condition : CISPR CNS VCCI-A 10m OS01-ANT-01-05-2004 HORIZONTAL
EUT : 84500A5 A18.1F.0 GX-MMX233
POWER : SKYNET AXI-8071 AC 230V
MEMO : EWIN98:EMCTEST
: CRT ONLY 1280*1024 80K 75Hz
: LAN:100M

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	234.400	39.62	-7.38	47.00	52.53	11.47	2.32	26.70	Peak	---	---
2	268.800	39.02	-7.98	47.00	50.29	12.77	2.55	26.59	Peak	---	---
3 @	302.806	46.15	-0.85	47.00	57.15	12.78	2.75	26.53	QP	150	175
4 @	368.800	45.02	-1.98	47.00	53.21	15.84	3.23	27.26	QP	---	---
5 @	436.000	45.55	-1.45	47.00	52.35	17.71	3.20	27.71	QP	---	---
6	570.400	40.36	-6.64	47.00	45.03	19.63	3.74	28.04	Peak	---	---
7	841.600	39.99	-7.01	47.00	40.87	21.24	5.60	27.72	Peak	---	---




```
Site      : OS01-NH
Condition : CISPR CNS VCCI-A 10m OS01-ANT-01-05-2004 VERTICAL
EUT       : 84500A5 A18.1F.0  GX-MMX233
POWER     : SKYNET AXI-8071  AC 230V
MEMO      : EWIN98:EMCTEST
          : CRT ONLY  1280*1024 80K 75Hz
          : LAN:100M
```

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	117.756	31.05	-8.95	40.00	45.52	11.34	1.57	27.38	Peak	---	---
2	134.320	32.03	-7.97	40.00	45.97	11.64	1.68	27.26	Peak	---	---
3	150.930	34.83	-5.17	40.00	49.04	11.14	1.79	27.14	Peak	---	---
4 @	168.222	38.51	-1.49	40.00	53.85	9.77	1.91	27.02	QP	---	---
5	184.840	28.57	-11.43	40.00	44.59	8.91	1.97	26.90	Peak	---	---
6	201.960	32.04	-7.96	40.00	48.16	8.56	2.11	26.79	Peak	---	---



Site : OS01-NH
Condition : CISPR CNS VCCI-A 10m OS01-ANT-01-05-2004 VERTICAL
EUT : 84500A5 A18.1F.0 GX-MMX233
POWER : SKYNET AXI-8071 AC 230V
MEMO : EWIN98:EMCTEST
: CRT ONLY 1280*1024 80K 75Hz
: LAN:100M

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	234.400	37.88	-9.12	47.00	50.79	11.47	2.32	26.70	Peak	---	---
2	268.800	37.09	-9.91	47.00	48.36	12.77	2.55	26.59	Peak	---	---
3	301.600	38.99	-8.01	47.00	50.02	12.74	2.75	26.52	Peak	---	---
4	368.800	38.35	-8.65	47.00	46.54	15.84	3.23	27.26	Peak	---	---
5	436.000	41.77	-5.23	47.00	48.57	17.71	3.20	27.71	Peak	---	---
6	732.800	40.31	-6.69	47.00	42.73	21.15	4.50	28.07	Peak	---	---
7 @	841.128	45.85	-1.15	47.00	46.76	21.22	5.59	27.72	QP	---	---
8 @	908.800	44.69	-2.31	47.00	44.35	22.64	5.29	27.59	QP	---	---

Test Engineer: _____
LOUIS LIN

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

As specified on clause 7 and figure Z1 of EN 61000-3-2:2000, the limits are not specified for equipment with a rated power of 75W or less.

The EUT meets the above condition, so it conforms to EN 61000-3-2.

8. Voltage Fluctuations Test

8.1. Standard

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

8.2. Test Procedure

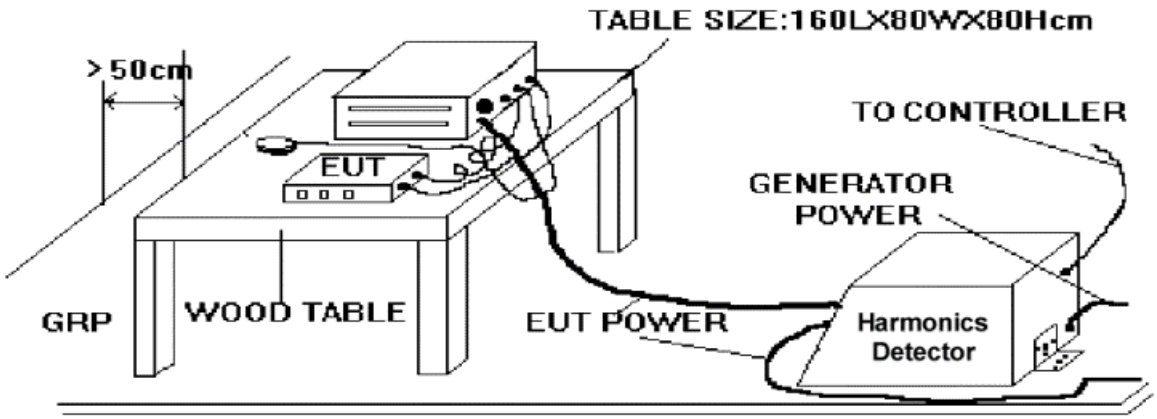
The equipment shall be tested under the conditions of **Clause 5.**

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 : 23 ℃
- Relative Humidity : 53 % RH
- Test Date : Oct. 08, 2004

Urms	= 228.9V	Freq	= 49.987	Range :	2 A
Irms	= 0.202 A	Ipk	= 0.939 A	Cf	= 4.647
P	= 19.68 W	Pap	= 46.28 VA	pf	= 0.425

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	:	3.30 %
	dtLim	: 3.30 %	dt>Lim	:	500ms

Test completed, Result: PASSED

Plt = 0.000

	Pst	P50s	P10s	P3s	P1s	P0.1s	dmax	dc	dt>Lim
1	0.072	0.010	0.010	0.010	0.010	0.010	0.000	0.020	0.000

Test Engineer: Kero
Kero Kao

8.6. Photographs of Harmonics Test, Voltage Fluctuation and Flicker Test

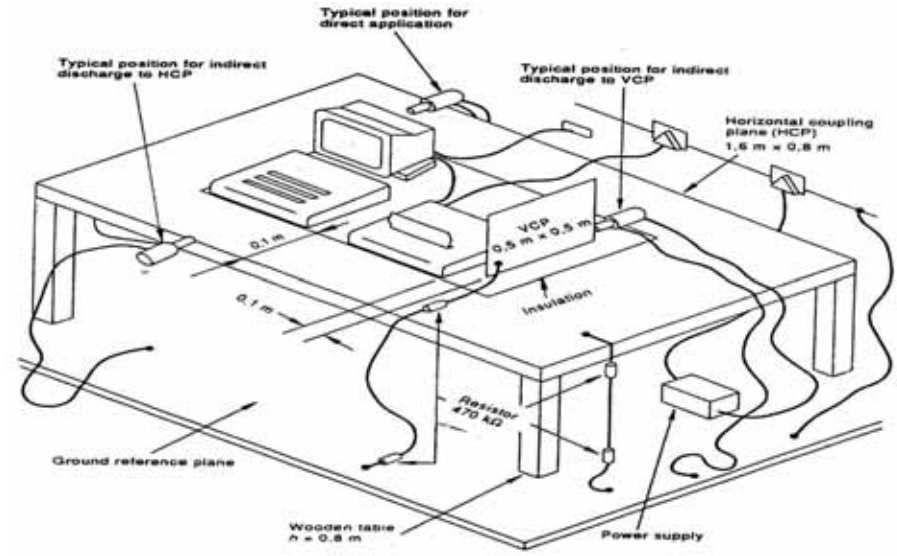
FRONT VIEW

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/A1:1998
- Product Standard : EN 61000-6-2:2001
- 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 : 23 °C
- Relative Humidity : 54 %
- Atmospheric Pressure : 97.8 kPa
- Test Date : Oct. 11, 2004
- 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 : 86 kPa (860 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.
LED	±2 / ±4 / ±8 KV	BY 10
Power Switch	±2 / ±4 / ±8 KV	BY 10
VGA Port	±2 / ±4 / ±8 KV	BY 10
Printer Port	±2 / ±4 / ±8 KV	BY 10
PS/2 Port	±2 / ±4 / ±8 KV	BY 10
MIC Jack	±2 / ±4 / ±8 KV	BY 10
Speaker Jack	±2 / ±4 / ±8 KV	BY 10
Line Port	±2 / ±4 / ±8 KV	BY 10
AC Socket	±2 / ±4 / ±8 KV	BY 10
USB Port	±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 10
Horizontal (At Left)	±2 / ±4 KV	BY 10
Horizontal (At Right)	±2 / ±4 KV	BY 10
Horizontal (At Rear)	±2 / ±4 KV	BY 10
Vertical (At Front)	±2 / ±4 KV	BY 10
Vertical (At Left)	±2 / ±4 KV	BY 10
Vertical (At Right)	±2 / ±4 KV	BY 10
Vertical (At Rear)	±2 / ±4 KV	BY 10
Case	±2 / ±4 KV	BY 10
Screw	±2 / ±4 KV	BY 10
Bracket	±2 / ±4 KV	BY 10
Com Port	±2 / ±4 KV	BY 10
RJ45 Port	±2 / ±4 KV	BY 10

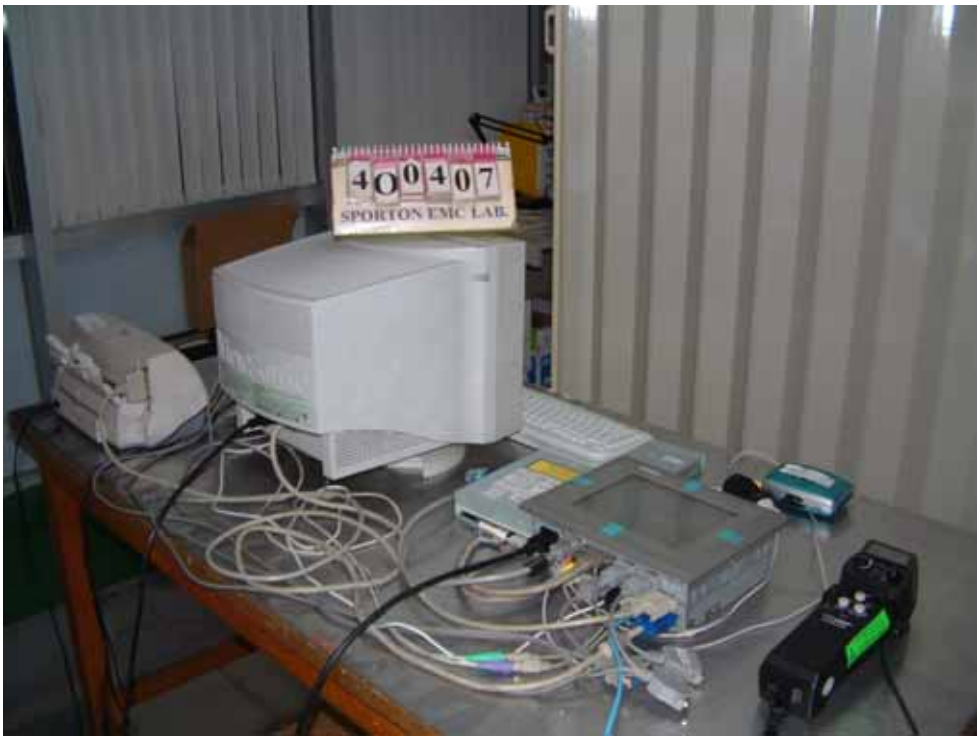
Test Engineer: Kero

Kero Kao

9.6. Photographs of Electrostatic Discharge Immunity Test

FRONT VIEW

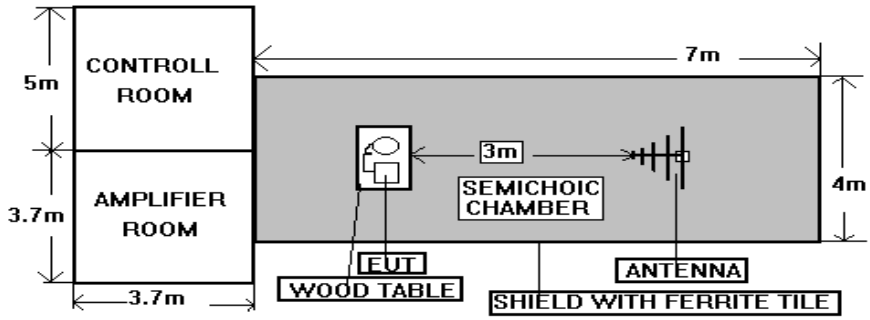
REAR VIEW



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/A1:1998
- Product Standard : EN 61000-6-2:2001
- Level : 3
- Frequency Range : 80-1000 MHz
- Field Strength : 10 V/m (Modulated 80% AM)
- Temperature : 25 °C
- Relative Humidity : 54 %
- Atmospheric Pressure : 97.8 kPa
- Test Date : Oct. 11, 2004
- 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

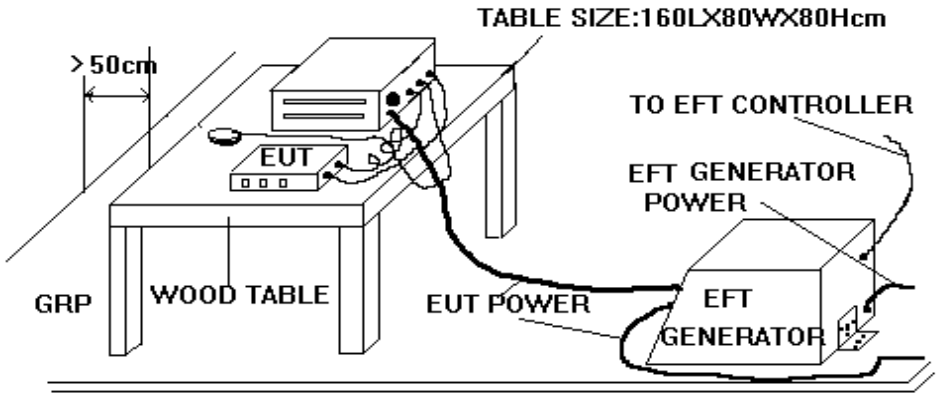
FRONT VIEW

REAR VIEW

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

- Final Test Result : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria: B
- Basic Standard : IEC 61000-4-4:1995
- Product Standard : EN 61000-6-2:2001
- Level : on Power Supply -- 3
  : on I/O signal, data and control line -- 3
- Test Voltage : on Power Supply -- ±0.5 / ±1.0 / ±2.0 KV
  : on I/O signal, data and control line -- ±0.25 / ±0.5 / ±1.0 KV
- Temperature : 23°C
- Relative Humidity : 53%
- Atmospheric Pressure : 97.8 kPa
- Test Date : Oct. 11, 2004
- Observation : Normal

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 : 86 kPa (860 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 : A
- Required Performance Criteria: B
- Basic Standard : IEC 61000-4-5:1995
- Product Standard : EN 61000-6-2:2001
- 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 : 23 °C
- Relative Humidity : 53 %
- Atmospheric Pressure : 97.8 kPa
- Test Date : Oct. 11, 2004
- Observation : Normal
- Remark : The test on RJ45 ports is not required due to the 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	＋	A	A	A	A	***PASS***
		－	A	A	A	A	***PASS***
2 KV	L - PE	＋	A	A	A	A	***PASS***
		－	A	A	A	A	***PASS***
	N - PE	＋	A	A	A	A	***PASS***
		－	A	A	A	A	***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 61000-6-2:2001
- Level : 3
- Test Voltage : 10 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 Telecom Ports
- Temperature : 23° C
- Relative Humidity : 53 %
- Atmospheric Pressure : 97.8 kPa
- Test Date : Oct. 11, 2004
- 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 80 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

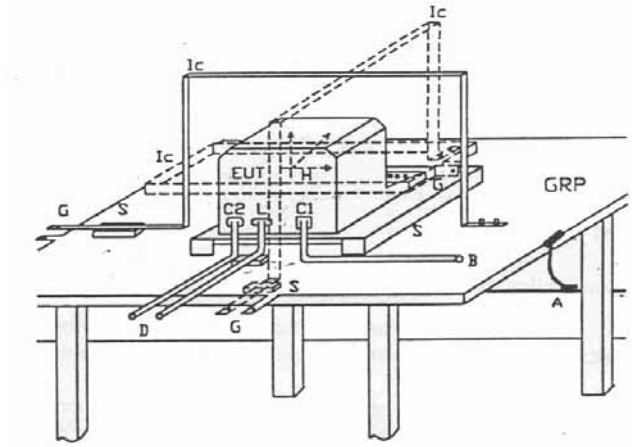
14. Power Frequency Magnetic Field Immunity Tests

- Final Test Result : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria: A
- Basic Standard : IEC 61000-4-8:1993
- Product Standard : EN 61000-6-2:2001
- Temperature : 24 °C
- Relative Humidity : 53 %
- Atmospheric Pressure : 97.8 kPa
- Test Date : Oct. 11, 2004
- Observation : Normal

14.1. Test Record

Power Frequency Magnetic Field	Testing Duration	Coil Orientation	Results
50Hz, 30A/m	1.0 Min	X-axis	Pass
50Hz, 30A/m	1.0 Min	Y-axis	Pass
50Hz, 30A/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 61000-6-2:2001
- Temperature : 23 °C
- Relative Humidity : 53 %
- Atmospheric pressure : 97.8 kPa
- Test Date : Oct. 11, 2004

15.1. Test Record of Voltage Interruption

Voltage	Phase Angle		% Reduction	Duration	Observation
(V)	0 °	180 °		(Periods)	
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	Duration	Observation
(V)	0 °	180 °		(Periods)	
230	A	A	60%	50, 5	Normal
230	A	A	30%	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	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 Analyzer	HP	8591EM	3536A00673	9 KHz - 30 MHz	Apr. 16, 2004	Conduction (CO01-NH)
LISN	Rolf Heine	NNB-2/16Z	99079	9 KHz - 30 MHz	Dec. 25, 2003	Conduction (CO01-NH)
LISN	KYORITSU	KNW-407	8-1010-15	9 KHz - 30 MHz	Nov. 28, 2003	Conduction (CO01-NH)
Power Filter	CORCOM	MR12030	N/A	30A*2	N/A	Conduction (CO01-NH)
RF Cable-CON	Suhner Switzerland	RG223/U	CB004	9KHz~30MHz	Dec. 18, 2003	Conduction (CO01-NH)
Impedance Stabilization Network	SCHAFFNER	T400	16851	150KHz – 230MHz	Jul. 09, 2004	Conduction (Telecommunication port)
Open Area Test Site	SPORTON	OATS-10	OS01-NH	30MHz~1GHz 10m	Mar. 13, 2004	Radiation (OS01-NH)
Spectrum Analyzer	HP	8568B	3634A03000	100Hz – 1.5GHz	Nov. 28, 2003	Radiation (OS01-NH)
Quasi-peak Adapter	HP	85650A	2521A00821	9KHz -1GHz	Apr. 12, 2004	Radiation (OS01-NH)
Amplifier	HP	8447D	2944A06292	0.1MHz ~ 1.3GHz	Mar. 15, 2004	Radiation (OS01-NH)
Bilog Antenna	SCHAFFNER	CBL6111C	2738	30MHz - 1GHz	Jan. 03, 2004	Radiation (OS01-NH)
Turn Table	EMCO	1060-1.211	9507-1805	0 ~ 360 degree	N/A	Radiation (OS01-NH)
Antenna Mast	EMCO	1051-1.2	9503-1876	1 m - 4 m	N/A	Radiation (OS01-NH)
RF Cable-R10m	BELDEN	RG8/U	CB001	30MHz~1GHz	Dec. 13, 2003	Radiation (OS01-NH)

※ Calibration Interval of instruments listed above is one year.

<EMS>

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
ESD Simulator	KEYTEK	MZ-15/EC	0406338	Air: 0 KV - 15 KV Contact: 0 KV -8KV	Jul. 16, 2004	ESD
Antenna	CHASE	CBL6121A	1027	26 MHz - 1 GHz	Dec. 08, 2003	RS
Field Strength Monitoring Antennas (Probe)	AR	FP3000A	16077	0.1 MHz - 1 GHz	Aug. 12, 2004	RS
RS immunity Test system	HP	EMS test System	2062	80 MHz - 1 GHz 3V/m, 10v/m	Dec. 08, 2003	RS
Amplifier	AR	100W 1000M3	16060	80 MHz - 1 GHz	Dec. 08, 2003	RS
Power Meter	EMC Automation	438A	3513U04050	100 KHz -4.2 GHz	Dec. 08, 2003	RS
Signal Generator	HP	8648A	3426A00771	100 KHz - 1 GHz	Dec. 04, 2003	RS
Power Sensor	HP	8481D	3318A13140	100 KHz - 1 GHz	Dec. 08, 2003	RS
Power Sensor	HP	8482A	3318A26464	100 KHz - 1 GHz	Dec. 08, 2003	RS
Attenuator	HP	8491A	53603	100 KHz - 1 GHz	Dec. 08, 2003	RS
EFT Generator	EMC -PARTNER	TRANSIENT -2000	TRA2000-376	0KV - 4.4 KV	Apr. 29, 2004	EFT
EFT/Clamp	EMC -PARTNER	CH4242	CNEFT1000 -200	0 KV -1 KV	N/A	EFT
Harmonic/Flicker Test System	EMC PARTNER	Harmonics -1000	HAR1000-41	4000VA 16A PEAK	Nov. 18, 2003	Harmonics, Flicker
SURGE Generator	EMC -PARTNER	TRANSIENT -2000	TRA2000-376	0 KV -6 KV/2Ω 0KV-500V/12Ω	Apr. 29, 2004	SURGE
Conducted Immunity Test System	FRANKONIA	CIT-10/75	1999010443	100KHz ~ 266MHz	Apr. 08, 2004	CS
Coupling and Decoupling Network	FRANKONIA	CDN M3	A3003012	150KHz ~ 230MHz	Apr. 10, 2004	CS
Coupling and Decoupling Network	FRANKONIA	CDN RJ45	A3023001	150KHz ~ 230MHz	Apr. 10, 2004	CS
Magnetic Generator	FCC (KEYTEK)	F-1000-4-8-G-125A	03007	30A//CONTINUOUS 100A/2Hrs 230A/30SEC	Apr. 13, 2004	PFMF
Magnetic field Immunity Loop	FCC (KEYTEK)	F-1000-4-8/9/10-L-M	03003	30A//CONTINUOUS 100A/2Hrs 230A/30SEC	Apr. 13, 2004	PFMF
DIP Generator	EMC -PARTNER	TRANSIENT -2000	TRA2000-376	230VA/50Hz/60Hz 0%Open/5S 0%Short/5S 40%0.10S 70%/0.01S	Apr. 29, 2004	DIP

※ Calibration Interval of instruments listed above is one year.

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.