

CE EMC TEST REPORT

According to

European Standard EN 55022:1998, EN 55011:1998 Group I 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) and EN 61000-6-2:2001
(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 : IPC

Model No. : MIC-3041

Applicant : **ADVANTECH CO., LTD.**
No. 1, Alley 20, Lane 26, Rueiguang Road,
Neihu District, Taipei, 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.

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History of this test report

Original Report Issue Date: June 02, 2003

☒ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description



CERTIFICATE OF COMPLIANCE

According to

European Standard EN 55022:1998, EN 55011:1998 Group I 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) and EN 61000-6-2:2001
(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)

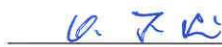
Equipment : IPC

Model No. : MIC-3041

Applicant : **ADVANTECH CO., LTD.**
No. 1, Alley 20, Lane 26, Rueiguang Road,
Neihu District, Taipei, 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 55022:1998, EN 55011:1998 Group I Class A, EN 61000-3-2:2000, EN 61000-3-3:1995/A1:2001 and EN 55024:1998/A1:2001 (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) and EN 61000-6-2:2001 (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 May 31, 2003 at **SPORTON International Inc.** LAB.

 June 06, 2003
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

ADVANTECH CO., LTD.

No. 1, Alley 20, Lane 26, Rueiguang Road,
Neihu District, Taipei, Taiwan, R.O.C.

1.2 Manufacturer

Same as 1.1.

1.3 Basic Description of Equipment under Test

Equipment : IPC
Model No. : MIC-3041
Trade Name : **ADVANTECH**
UTP Cable : Non-Shielded, 10m
Data Cable Type : Please see section 2.2 of this test report for details
Power Supply Type : Switching
AC Power Cable : Non-Shielded, 1.8m, 3 pin

1.4 Feature of Equipment under Test

Specifications

Backplane	6U Slot	6U CompactPCI x 6, transition x 6 (80mm, IEEE1101.11 compatible)						
	Bus	32-bit/33MHz, 64-bit/66MHz						
	V _{IO} Voltage	+3.3 V / +5 V (selectable)						
Cooling	Fan	1 (163 CFM) on the chassis bottom (Inlet) 2 (10 CFM) on the chassis top-rear (Outlet)						
	Blowers	1 (43 CFM) on the chassis top (Outlet)						
Device Bay	3.5"	2						
	CD-ROM	1						
	FDD	1						
Power Requirement	Input	AC 100-240 V @ 47-63 Hz, full range						
	Output	300W ATX with PFC						
		+3.3 V*	+5 V*	-5 V	+12 V	-12 V	+5 Vsb	
	Max. Load	20 A	32 A	0.5 A	16A	0.8 A	1.5 A	
	Min. Load	1.0 A	3.0 A	0.0 A	2.0 A	0.0 A	0.1A	
Reliability	MTBF(Hours)	CPU card	Backplane		Fan module		Power supply	
		100,000	800,000		50,000 @25°C		100,000 @70% load	
Serviceability	MTTR	5 minutes						

Features

- ✧ 4U-high enclosure for 6U CompactPCI™ board.
- ✧ 6-slots 6U CompactPCI™ Backplane W/H 110 CT bus.
- ✧ Support two Hot-swappable SCSI HDD bays.
- ✧ Supports rear I/O.
- ✧ Build-in IDE slim CD-ROM and floppy.
- ✧ 300W 1+1 redundant ATX power supply.
- ✧ Support Hot swappable fan modules.
- ✧ Option intelligent chassis management Module.

Other Peripheral

- ✧ **CPU** : Intel Pentium III 700MHz.
- ✧ **SCSI HDD** : Seagate / ST318451LC.
- ✧ **FDD** : NEC / FD1238T; 1.44MB.
- ✧ **CD-ROM** : Quanta / SCR-242.
- ✧ **Power Supply** (×2) : EMACS / R2A-6300P-R; 285W.

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 Class A & EN 55011 Group I Class A.
- b. The complete test system included remote workstation (x2), HITACHI Monitor, Genuine PS/2 Keyboard, LOGITECH USB Mouse, ACEEX Modem (x2) and EUT for EMI test.
The remote workstation included HITACHI Monitor, Genuine PS/2 Keyboard, LOGITECH PS/2 Mouse and FIC PC. – **for Mode 1, 2 tests**
- c. The complete test system included remote workstation (x3), HITACHI Monitor, Genuine PS/2 Keyboard, LOGITECH PS/2 Mouse, LOGITECH USB Mouse, ACEEX Modem (x3) and EUT for EMI test.
The remote workstation included HITACHI Monitor, Genuine PS/2 Keyboard, LOGITECH PS/2 Mouse and FIC PC. – **for Mode 3, 4 tests**
- d. The following test modes were performed : (***for Conduction at Radiation test***)
Mode 1 → **1024 x768, 60Hz, 48K; LAN: 100Mbps; Connect from Connectors at front side; Power x 1**
Mode 2 → **1024 x768, 60Hz, 48K; LAN: 100Mbps; Connect from Connectors at front side; Power x 2**
Mode 3 → **1024 x768, 60Hz, 48K; LAN: 100Mbps; Connect from Connectors at rear side; Power x 1**
Mode 4 → **1024 x768, 60Hz, 48K; LAN: 100Mbps; Connect from Connectors at rear side; Power x 2**
- e. The following test modes were performed : (***for Disturbances at Telecommunication Ports test***)
Mode 1 → **LAN : 100M; Connect from Connectors at front side**
Mode 2 → **LAN : 10M; Connect from Connectors at front side**
Mode 3 → **LAN : 100M; Connect from Connectors at rear side**
Mode 3 → **LAN : 10M; Connect from Connectors at rear side**
- f. The complete test system included remote workstation, SAMPO LCD Monitor, ViewSonic Monitor, LOGITECH PS/2 Keyboard, BTC PS/2 Keyboard, LOGITECH PS/2 Mouse, LOGITECH USB Mouse (x2), ACEEX Modem (x3) and EUT for EMS test.
The remote workstation included DELL Notebook PC.
- g. Test Mode → **1024 x768, 60Hz, 48K; LAN: 100Mbps; Power x 2** (***for EMS test***)
- h. 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 (HITACHI) -- for local and remote workstation

FCC ID	: N/A
Model No.	: CM753ET
Power Cord	: Shielded
Serial No.	: SP0003
Data Cable	: Shielded, 360 degree via metal backshells, 1.15m
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 2. -- PS/2 Keyboard (Genuine) -- for local and remote workstation

FCC ID	: N/A
Model No.	: K288
Serial No.	: SP0014
Data Cable	: Shielded, 1.3m
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 and remote workstation

FCC ID	: DZL211029
Model No.	: M-S34
Serial No.	: SP0015
Data Cable	: Shielded, 1.7m

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. -- USB Mouse (LOGITECH) -- for local workstation

FCC ID	: N/A
Model No.	: M-BE58
Serial No.	: SP0008
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 6. -- Personal Computer (FIC) -- for remote workstation

FCC ID	: N/A
Model No.	: P2L97
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0002
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

< EMS >

Support Unit 1. -- LCD Monitor (SAMPO) -- for local workstation

FCC ID	: N/A
Model No.	: PD-70FA
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0004
Data Cable	: Shielded, 1.65m
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 2. -- Monitor (ViewSonic) -- for local workstation

FCC ID	: N/A
Model No.	: VCDTS21553-3J
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0005
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 3. -- PS/2 Keyboard (LOGITECH) -- for local workstation

FCC ID	: N/A
Model No.	: Y-SP29
Serial No.	: SP0008
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. -- PS/2 Keyboard (BTC) -- for local workstation

FCC ID	: N/A
Model No.	: 7932
Serial No.	: SP0008
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 5. -- PS/2 Mouse (LOGITECH) -- for local workstation

FCC ID : DZL211029
Model No. : M-S34
Serial No. : SP0015
Data Cable : Shielded, 1.8m

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. -- USB Mouse (LOGITECH) -- for local workstation

FCC ID : N/A
Model No. : M-BE58
Serial No. : SP0008
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. -- Notebook PC (DELL) -- for remote workstation

FCC ID : N/A
Model No. : PP01L
Power Supply Type : Switching
Power Cord : Non-Shielded
Serial No. : SP0001
Remark : This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

3. Test Software

< EMI >

Two executive programs, "EMITEST.EXE & EMCTEST.EXE" under WIN XP, which generate a pattern were used as the test software.

The program 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 modem.
- e. 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 e.

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

< EMS >

An executive program, "EMITEST.EXE" under WIN XP, which generates 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 modem.
- e. 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 e.

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

4. General Information of Test

4.1 Test Facility

< EMI >

This test was carried out by SPORTON International Inc.

Test Site Location : No. 30-2, Lin 6, Diing-Fwu Tsuen, Lin-Kou-Hsiang,
Taipei Hsien, Taiwan, R.O.C.
TEL : 886-2-2601-1640
FAX : 886-2-2601-1695

Test Site No. : Conduction : CO01-LK; Radiation : OS03-LK

< EMS >

This test was carried out by SPORTON International Inc.

Test Site Location : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park,
Kwei-Shan Hsiag, Tao Yuan Hsien, Taiwan, R.O.C.
TEL : 886-3-327-3456
FAX : 886-3-318-0055

4.2 Test Voltage

230V / 50Hz

4.3 Standard for Methods of Measurement

EMI Test (Conduction and Radiation) : European Standard EN 55022 Class A
EMI Test (Conduction and Radiation) : European Standard EN 55011 Group I 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 & EN 61000-6-2
(ESD: IEC 61000-4-2, RS: IEC 61 000-4-3, 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
EMI Test (Conduction and Radiation) : European Standard EN 55011 Group I 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 & EN 61000-6-2
(ESD: IEC 61000-4-2, RS: IEC 61 000-4-3, 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

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

4.6 Test Distance

The test distance of radiated emission test from antenna to EUT is 10 M.

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 55011 & EN 55022. 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.

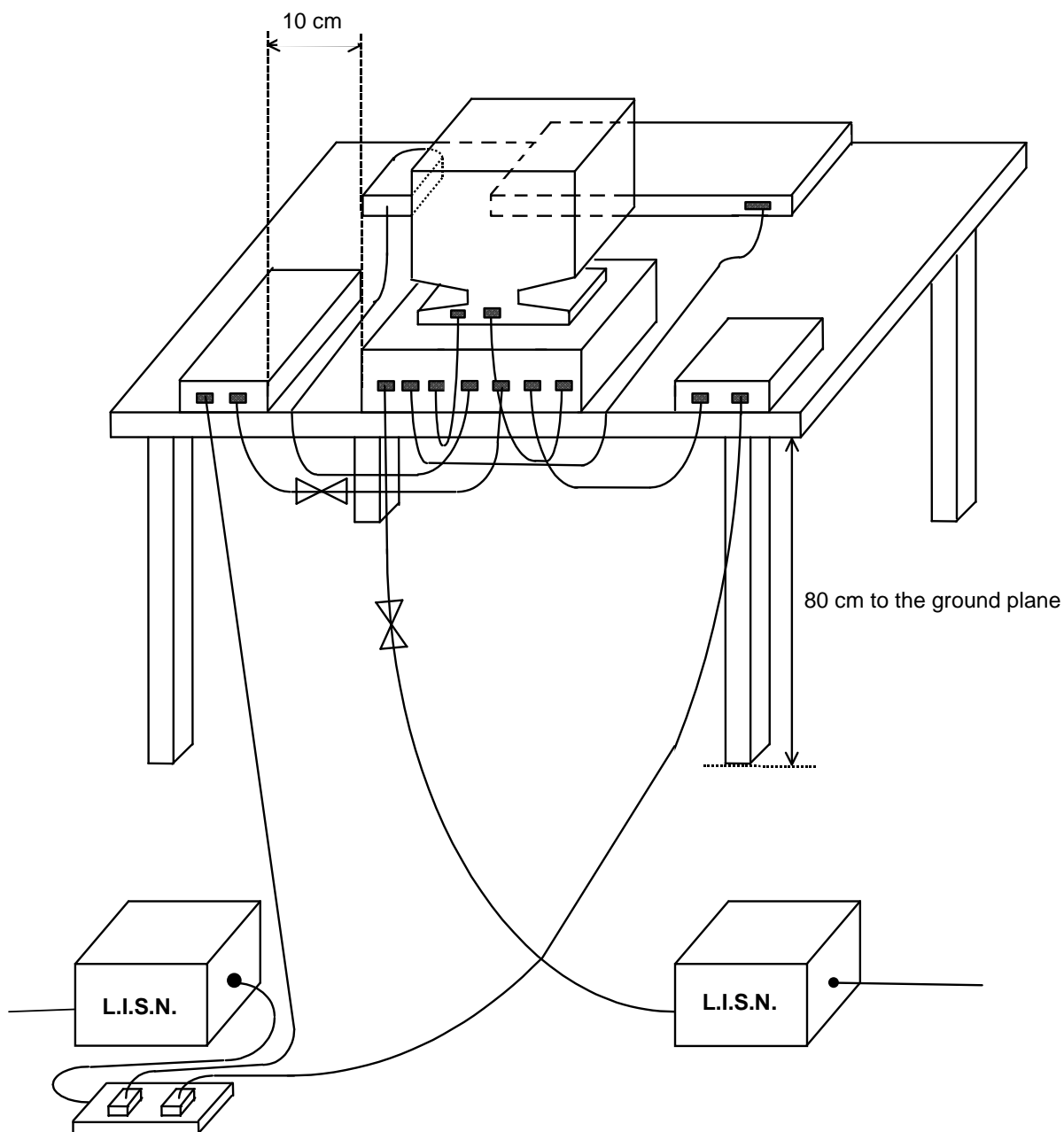
5.1 Description of Major Test Instruments

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

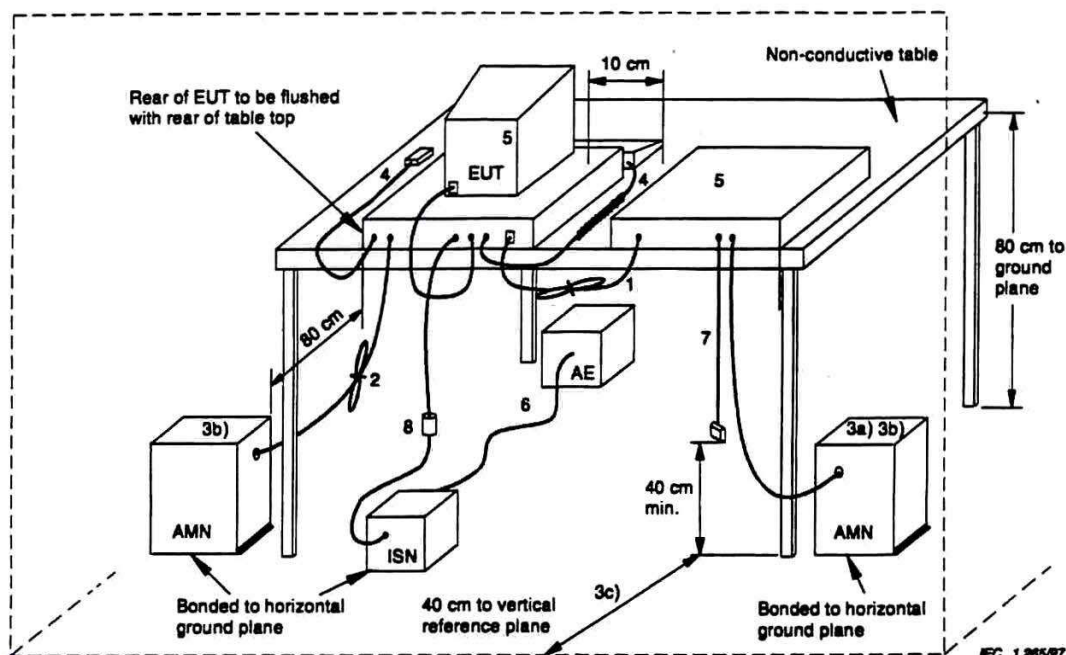
5.2 Test Procedures

- 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

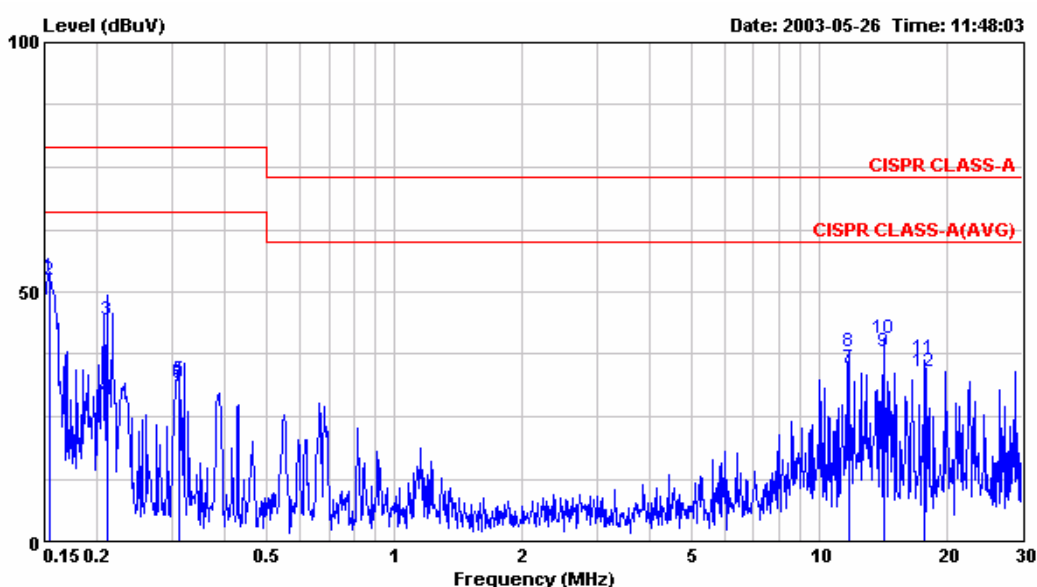
- 1) If cables, which hang closer than 40 cm to the horizontal metal groundplane, cannot be shortened to appropriate length, the excess shall be folded back and forth forming a bundle 30 cm to 40 cm long.
- 2) Excess mains cord shall be bundled in the centre or shortened to appropriate length.
- 3) EUT 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, mice, 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

5.5.1 Test mode : Mode 1

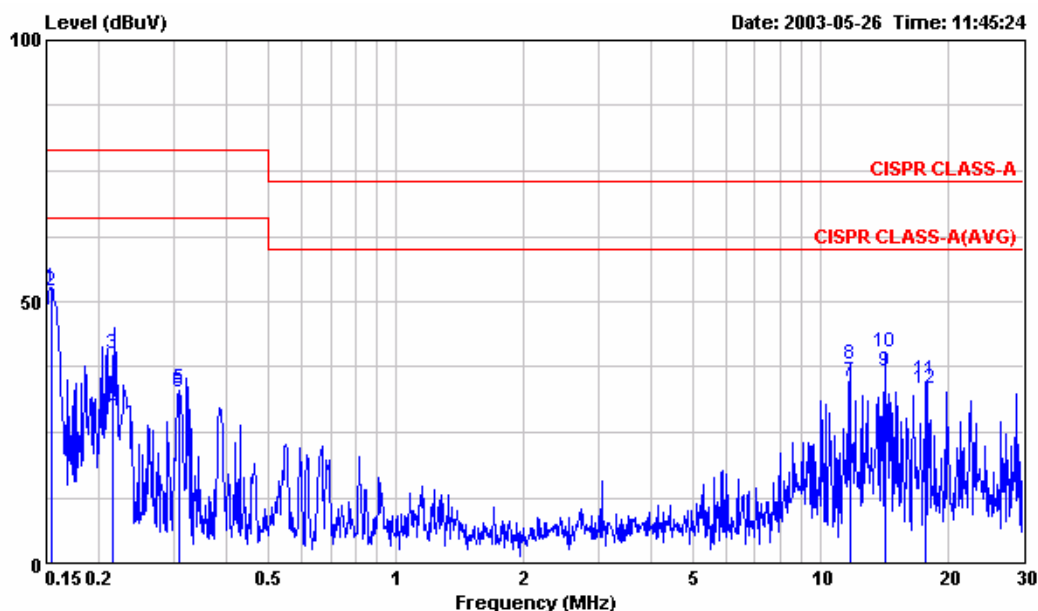
- Frequency Range of Test : from 0.15 MHz to 30 MHz
- Temperature : 24°C
- Relative Humidity : 61%
- All emissions not reported here are more than 10 dB below the prescribed limit.

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



Site : CO01-LK
 Condition : CISPR CLASS-A CO01 LISN-91-12-17 LINE
 EUT : IPC
 MODEL : (Connect from connectors at front side)
 POWER : 230V/50HZ(POWER*1)
 MEMO : 1024*768 LAN:100M

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.154	52.95	-26.05	79.00	52.85	0.10	0.00	QP
2	0.154	52.28	-13.72	66.00	52.18	0.10	0.00	Average
3	0.211	44.30	-34.70	79.00	44.19	0.10	0.01	QP
4	0.211	28.75	-37.25	66.00	28.64	0.10	0.01	Average
5	0.310	32.41	-46.59	79.00	32.25	0.10	0.06	QP
6	0.310	31.62	-34.38	66.00	31.46	0.10	0.06	Average
7	11.711	34.69	-25.31	60.00	33.87	0.52	0.30	Average
8	11.711	37.88	-35.12	73.00	37.06	0.52	0.30	QP
9	14.151	37.97	-22.03	60.00	37.01	0.66	0.30	Average
10	14.151	40.68	-32.32	73.00	39.72	0.66	0.30	QP
11	17.695	36.78	-36.22	73.00	35.54	0.88	0.36	QP
12	17.695	34.12	-25.88	60.00	32.88	0.88	0.36	Average



Site : CO01-LK
 Condition : CISPR CLASS-A CO01 LISN-91-12-17 NEUTRAL
 EUT : IPC
 MODEL : (Connect from connectors at front side)
 POWER : 230V/50HZ(POWER+1)
 MEMO : 1024*768 LAN:100M

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.154	52.77	-26.23	79.00	52.67	0.10	0.00	QP
2	0.154	52.11	-13.89	66.00	52.01	0.10	0.00	Average
3	0.216	40.05	-38.95	79.00	39.94	0.10	0.01	QP
4	0.216	29.17	-36.83	66.00	29.06	0.10	0.01	Average
5	0.307	33.28	-45.72	79.00	33.12	0.10	0.06	QP
6	0.307	32.75	-33.25	66.00	32.59	0.10	0.06	Average
7	11.710	34.65	-25.35	60.00	33.87	0.48	0.30	Average
8	11.710	37.84	-35.16	73.00	37.06	0.48	0.30	QP
9	14.153	36.78	-23.22	60.00	35.91	0.57	0.30	Average
10	14.153	40.43	-32.57	73.00	39.56	0.57	0.30	QP
11	17.691	35.03	-37.97	73.00	33.90	0.77	0.36	QP
12	17.691	33.33	-26.67	60.00	32.20	0.77	0.36	Average

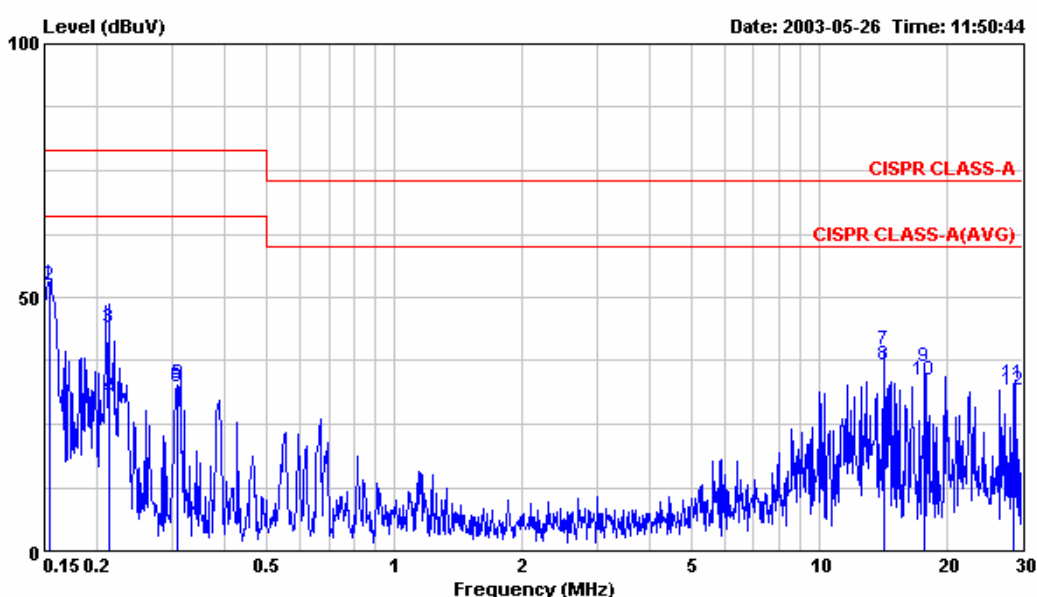
Test Engineer :

Neil Huang

5.5.2 Test mode : Mode 2

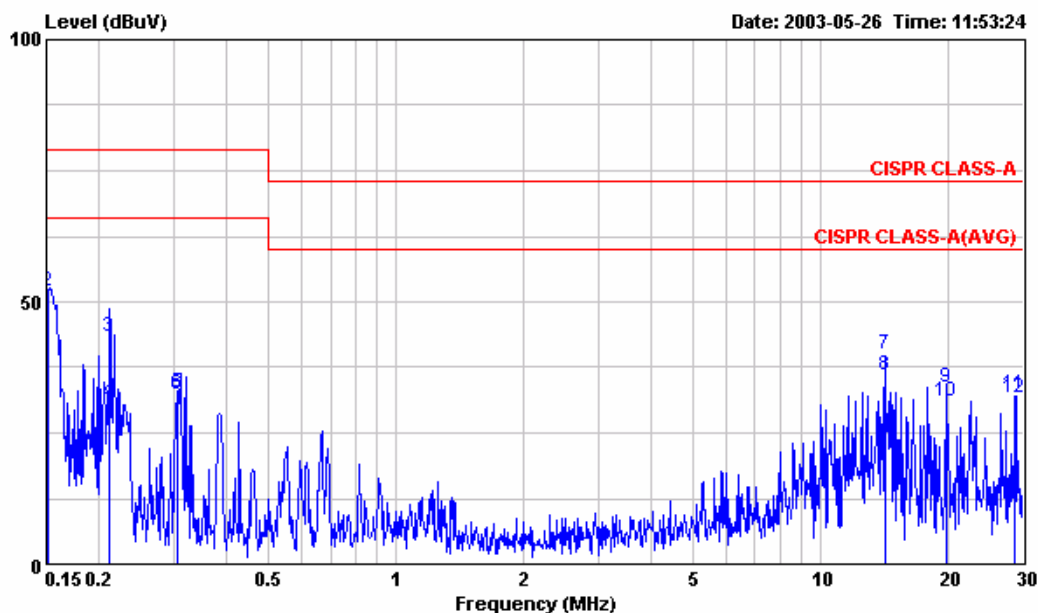
- Frequency Range of Test : from 0.15 MHz to 30 MHz
- Temperature : 24°C
- Relative Humidity : 61%
- All emissions not reported here are more than 10 dB below the prescribed limit.

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



Site : C001-LK
 Condition : CISPR CLASS-A C001 LISN-91-12-17 LINE
 EUT : IPC
 MODEL : (Connect from connectors at front side)
 POWER : 230V/50HZ(POWER*2)
 MEMO : 1024*768 LAN:100M

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.154	52.81	-26.19	79.00	52.71	0.10	0.00	QP
2	0.154	52.19	-13.81	66.00	52.09	0.10	0.00	Average
3	0.213	43.88	-35.12	79.00	43.77	0.10	0.01	QP
4	0.213	29.88	-36.12	66.00	29.77	0.10	0.01	Average
5	0.308	32.96	-46.04	79.00	32.80	0.10	0.06	QP
6	0.308	32.36	-33.64	66.00	32.20	0.10	0.06	Average
7	14.151	39.61	-33.39	73.00	38.65	0.66	0.30	QP
8	14.151	36.67	-23.33	60.00	35.71	0.66	0.30	Average
9	17.693	36.18	-36.82	73.00	34.94	0.88	0.36	QP
10	17.693	33.60	-26.40	60.00	32.36	0.88	0.36	Average
11	28.686	32.98	-40.02	73.00	30.96	1.52	0.50	QP
12	28.686	31.83	-28.17	60.00	29.81	1.52	0.50	Average



Site : C001-LK
 Condition : CISPR CLASS-A C001 LISN-91-12-17 NEUTRAL
 EUT : IPC
 MODEL : (Connect from connectors at front side)
 POWER : 230V/50HZ(POWER+2)
 MEMO : 1024*768 LAN:100M

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.152	52.45	-26.55	79.00	52.35	0.10	0.00	QP
2	0.152	51.85	-14.15	66.00	51.75	0.10	0.00	Average
3	0.212	43.25	-35.75	79.00	43.14	0.10	0.01	QP
4	0.212	30.78	-35.22	66.00	30.67	0.10	0.01	Average
5	0.306	32.80	-46.20	79.00	32.64	0.10	0.06	QP
6	0.306	32.19	-33.81	66.00	32.03	0.10	0.06	Average
7	14.153	39.97	-33.03	73.00	39.10	0.57	0.30	QP
8	14.153	35.91	-24.09	60.00	35.04	0.57	0.30	Average
9	19.710	33.63	-39.37	73.00	32.34	0.89	0.40	QP
10	19.710	31.14	-28.86	60.00	29.85	0.89	0.40	Average
11	28.684	32.33	-40.67	73.00	30.41	1.42	0.50	QP
12	28.684	31.65	-28.35	60.00	29.73	1.42	0.50	Average

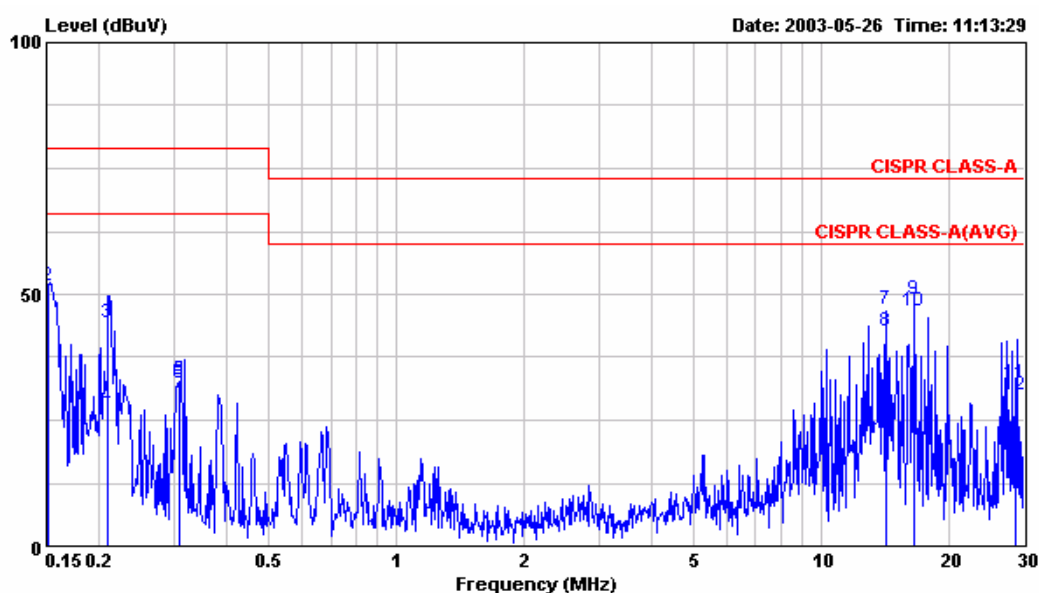
Test Engineer :

Neil Huang

5.5.3 Test mode : Mode 3

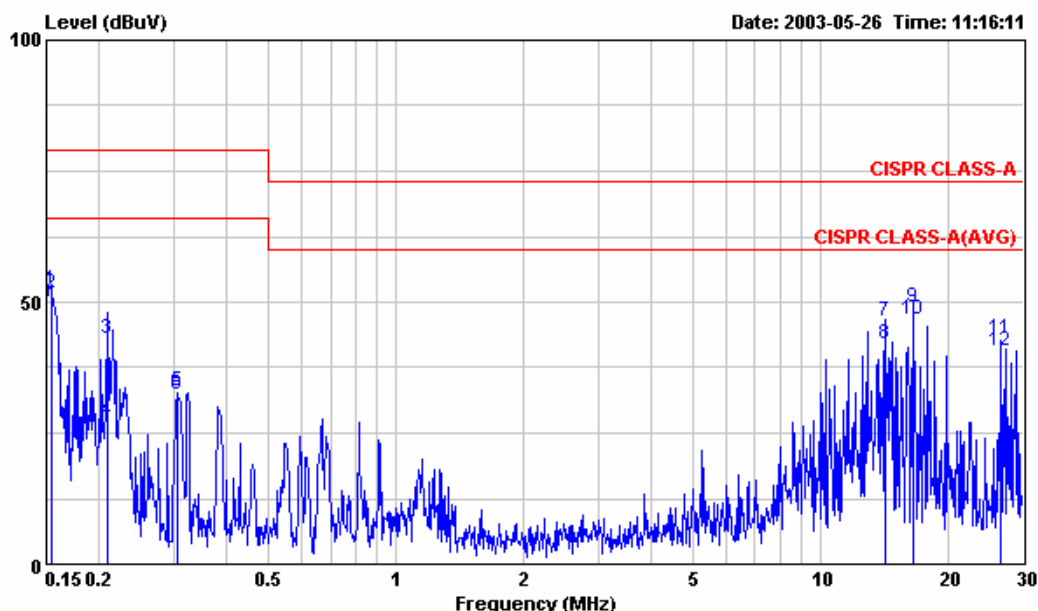
- Frequency Range of Test : from 0.15 MHz to 30 MHz
- Temperature : 24°C
- Relative Humidity : 61%
- All emissions not reported here are more than 10 dB below the prescribed limit.

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



Site : CO01-LK
 Condition : CISPR CLASS-A CO01 LISN-91-12-17 LINE
 EUT : IPC
 MODEL : (Connect from connectors at rear side)
 POWER : 230V/50HZ(POWER*1)
 MEMO : 1024*768 LAN:100M

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.152	52.43	-26.57	79.00	52.33	0.10	0.00	QP
2	0.152	51.76	-14.24	66.00	51.66	0.10	0.00	Average
3	0.209	44.22	-34.78	79.00	44.11	0.10	0.01	QP
4	0.209	27.72	-38.28	66.00	27.61	0.10	0.01	Average
5	0.307	32.88	-46.12	79.00	32.72	0.10	0.06	QP
6	0.307	32.36	-33.64	66.00	32.20	0.10	0.06	Average
7	14.152	46.86	-26.14	73.00	45.90	0.66	0.30	QP
8	14.152	42.74	-17.26	60.00	41.78	0.66	0.30	Average
9	16.473	48.85	-24.15	73.00	47.72	0.80	0.33	QP
10	16.473	46.52	-13.48	60.00	45.39	0.80	0.33	Average
11	28.746	32.24	-40.76	73.00	30.21	1.53	0.50	QP
12	28.746	29.92	-30.08	60.00	27.89	1.53	0.50	Average



Site : C001-LK
 Condition : CISPR CLASS-A C001 LISN-91-12-17 NEUTRAL
 EUT : IPC
 MODEL : (Connect from connectors at rear side)
 POWER : 230V/50HZ(POWER*1)
 MEMO : 1024*768 LAN:100M

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.154	52.41	-26.59	79.00	52.31	0.10	0.00	QP
2	0.154	51.76	-14.24	66.00	51.66	0.10	0.00	Average
3	0.209	43.11	-35.89	79.00	43.00	0.10	0.01	QP
4	0.209	27.38	-38.62	66.00	27.27	0.10	0.01	Average
5	0.305	32.96	-46.04	79.00	32.80	0.10	0.06	QP
6	0.305	32.25	-33.75	66.00	32.09	0.10	0.06	Average
7	14.154	46.43	-26.57	73.00	45.56	0.57	0.30	QP
8	14.154	41.92	-18.08	60.00	41.05	0.57	0.30	Average
9	16.472	49.03	-23.97	73.00	48.00	0.70	0.33	QP
10	16.472	46.82	-13.18	60.00	45.79	0.70	0.33	Average
11	26.608	42.88	-30.12	73.00	41.08	1.30	0.50	QP
12	26.608	40.54	-19.46	60.00	38.74	1.30	0.50	Average

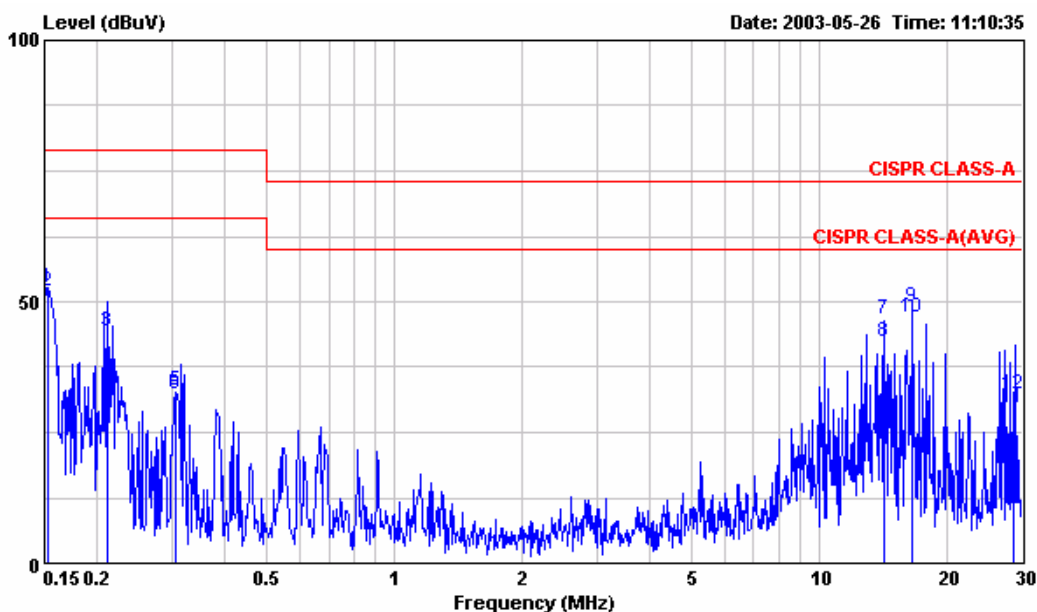
Test Engineer :

Neil Huang

5.5.4 Test mode : Mode 4

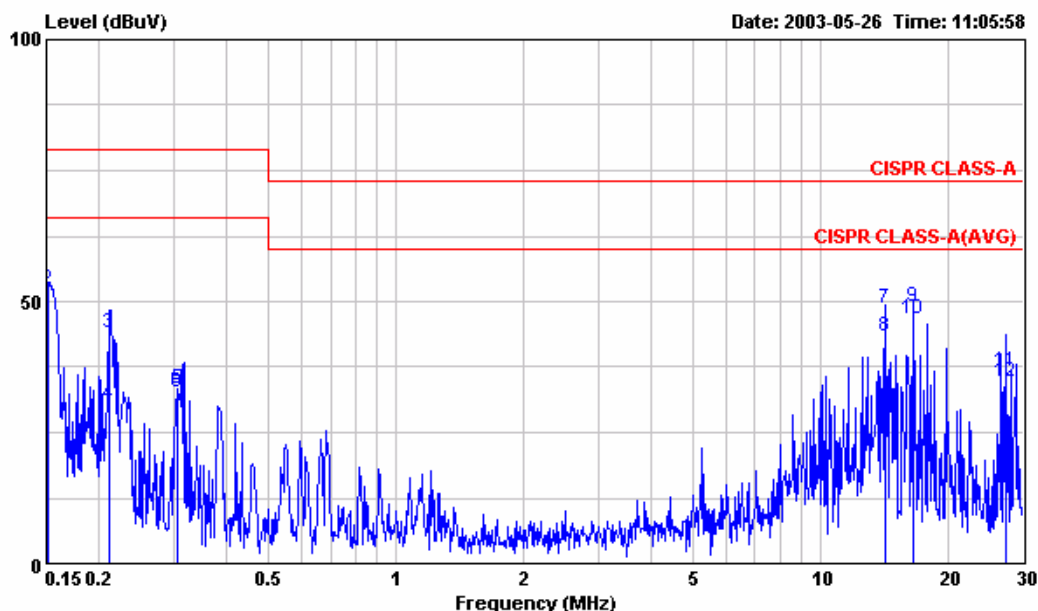
- Frequency Range of Test : from 0.15 MHz to 30 MHz
- Temperature : 24°C
- Relative Humidity : 61%
- All emissions not reported here are more than 10 dB below the prescribed limit.

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



Site : CO01-LK
 Condition : CISPR CLASS-A CO01 LISN-91-12-17 LINE
 EUT : IPC
 MODEL : (Connect from connectors at rear side)
 POWER : 230V/50HZ(POWER*2)
 MEMO : 1024*768 LAN:100M

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.153	52.75	-26.25	79.00	52.65	0.10	0.00	QP
2	0.153	52.02	-13.98	66.00	51.92	0.10	0.00	Average
3	0.211	44.46	-34.54	79.00	44.35	0.10	0.01	QP
4	0.211	29.88	-36.12	66.00	29.77	0.10	0.01	Average
5	0.306	33.06	-45.94	79.00	32.90	0.10	0.06	QP
6	0.306	32.36	-33.64	66.00	32.20	0.10	0.06	Average
7	14.153	46.68	-26.32	73.00	45.72	0.66	0.30	QP
8	14.153	42.22	-17.78	60.00	41.26	0.66	0.30	Average
9	16.472	48.95	-24.05	73.00	47.82	0.80	0.33	QP
10	16.472	46.87	-13.13	60.00	45.74	0.80	0.33	Average
11	28.747	29.59	-30.41	60.00	27.56	1.53	0.50	Average
12	28.747	32.30	-40.70	73.00	30.27	1.53	0.50	QP



Site : CO01-LK
 Condition : CISPR CLASS-A CO01 LISN-91-12-17 NEUTRAL
 EUT : IPC
 MODEL : (Connect from connectors at rear side)
 POWER : 230V/50HZ(POWER*2)
 MEMO : 1024*768 LAN:100M

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.152	52.91	-26.09	79.00	52.81	0.10	0.00	QP
2	0.152	52.19	-13.81	66.00	52.09	0.10	0.00	Average
3	0.211	43.90	-35.10	79.00	43.79	0.10	0.01	QP
4	0.211	30.22	-35.78	66.00	30.11	0.10	0.01	Average
5	0.306	33.22	-45.78	79.00	33.06	0.10	0.06	QP
6	0.306	32.64	-33.36	66.00	32.48	0.10	0.06	Average
7	14.152	48.70	-24.30	73.00	47.83	0.57	0.30	QP
8	14.152	43.39	-16.61	60.00	42.52	0.57	0.30	Average
9	16.472	49.01	-23.99	73.00	47.98	0.70	0.33	QP
10	16.472	46.82	-13.18	60.00	45.79	0.70	0.33	Average
11	27.402	36.58	-36.42	73.00	34.72	1.36	0.50	QP
12	27.402	34.55	-25.45	60.00	32.69	1.36	0.50	Average

Test Engineer :

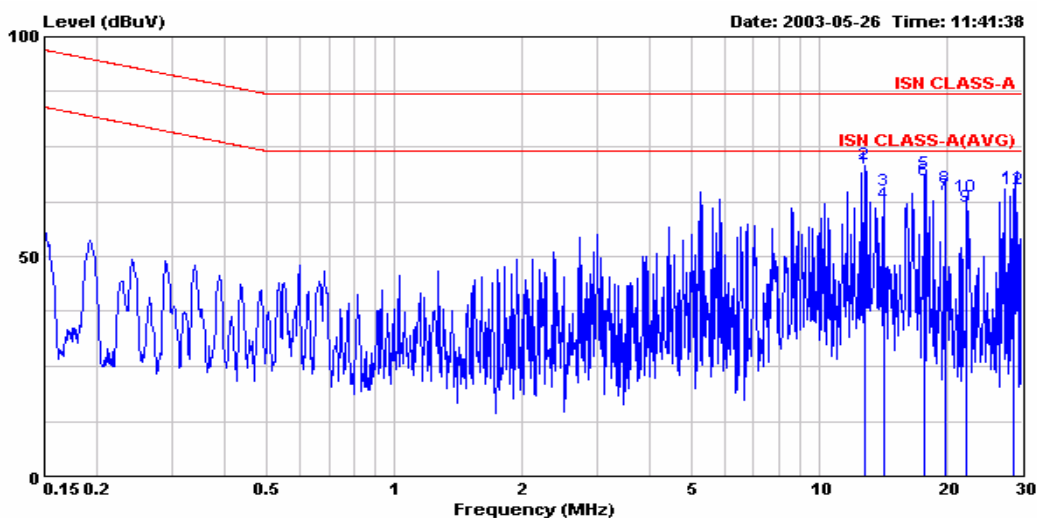
Neil
 Neil Huang

5.6 Test Result of Disturbances at Telecommunication Ports

5.6.1 Test mode : Mode 1

- Frequency Range of Test : from 0.15 MHz to 30 MHz
- Temperature : 24°C
- Relative Humidity : 61%
- All emissions not reported here are more than 10 dB below the prescribed limit.

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



Site : CO01-LK
 Condition : ISN CLASS-A
 EUT : IPC
 MODEL : (Connect from connectors at front side)
 POWER : 230V/50HZ
 MEMO : LAN:100M ISN A(60/35dB)

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
		dB		dBuV	dBuV	dB	dB	
1	12.749	70.07	-3.93	74.00	69.77	0.00	0.30	Average
2	12.749	71.13	-15.87	87.00	70.83	0.00	0.30	QP
3	14.153	65.01	-21.99	87.00	64.71	0.00	0.30	QP
4	14.153	61.98	-12.02	74.00	61.68	0.00	0.30	Average
5	17.695	69.04	-17.96	87.00	68.68	0.00	0.36	QP
6	17.695	67.23	-6.77	74.00	66.87	0.00	0.36	Average
7	19.713	64.06	-9.94	74.00	63.66	0.00	0.40	Average
8	19.713	65.53	-21.47	87.00	65.13	0.00	0.40	QP
9	22.216	61.42	-12.58	74.00	60.97	0.00	0.45	Average
10	22.216	63.63	-23.37	87.00	63.18	0.00	0.45	QP
11	28.688	65.80	-21.20	87.00	65.30	0.00	0.50	QP
12	28.688	65.32	-8.68	74.00	64.82	0.00	0.50	Average

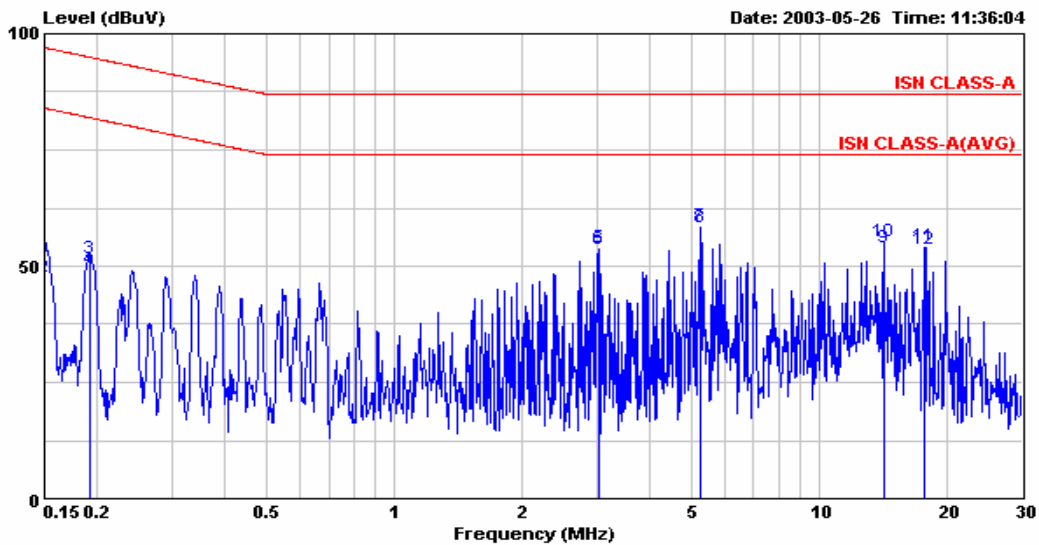
Test Engineer :

Neil Huang

5.6.2 Test mode : **Mode 2**

- Frequency Range of Test : from 0.15 MHz to 30 MHz
- Temperature : 24°C
- Relative Humidity : 61%
- All emissions not reported here are more than 10 dB below the prescribed limit.

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



Site : CO01-LK
Condition : ISN CLASS-A
EUT : IPC
MODEL : (Connect from connectors at front side)
POWER : 230V/50HZ
MEMO : LAN:10M ISN A(60/35dB)

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.150	52.45	-44.55	97.00	52.45	0.00	0.00	QP
2	0.150	47.76	-36.24	84.00	47.76	0.00	0.00	Average
3	0.192	51.80	-43.15	94.95	51.80	0.00	0.00	QP
4	0.192	49.41	-32.54	81.95	49.41	0.00	0.00	Average
5	3.037	54.01	-32.99	87.00	53.81	0.00	0.20	QP
6	3.037	53.69	-20.31	74.00	53.49	0.00	0.20	Average
7	5.237	58.76	-28.24	87.00	58.53	0.00	0.23	QP
8	5.237	58.40	-15.60	74.00	58.17	0.00	0.23	Average
9	14.153	53.86	-20.14	74.00	53.56	0.00	0.30	Average
10	14.153	55.17	-31.83	87.00	54.87	0.00	0.30	QP
11	17.695	54.20	-32.80	87.00	53.84	0.00	0.36	QP
12	17.695	53.76	-20.24	74.00	53.40	0.00	0.36	Average

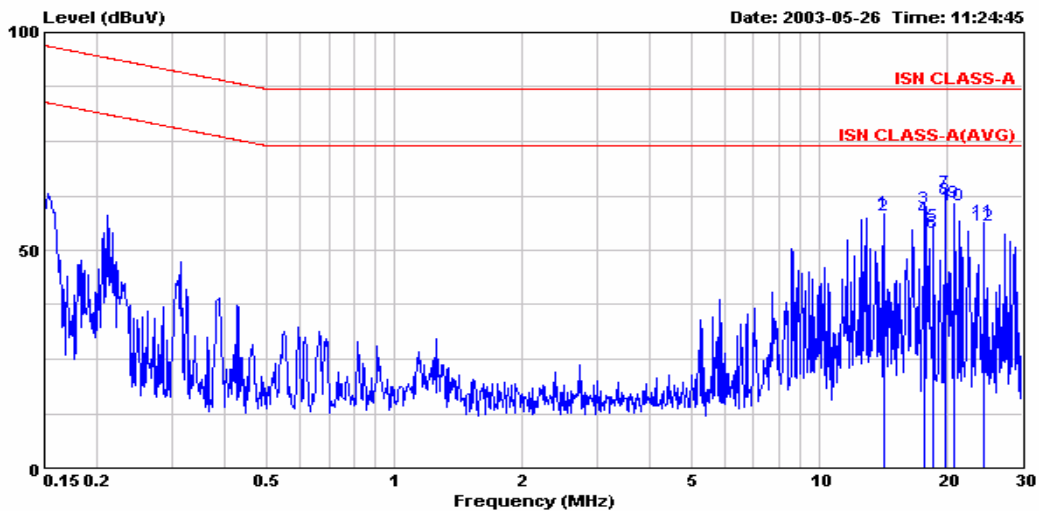
Test Engineer :

Neil
Neil Huang

5.6.3 Test mode : **Mode 3**

- Frequency Range of Test : from 0.15 MHz to 30 MHz
- Temperature : 24°C
- Relative Humidity : 61%
- All emissions not reported here are more than 10 dB below the prescribed limit.

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



Site : CO01-LK
 Condition : ISN CLASS-A
 EUT : IPC
 MODEL : (Connect from connectors at rear side)
 POWER : 230V/50HZ
 MEMO : LAN:100M ISN A(60/35dB)

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	14.154	58.83	-28.17	87.00	58.53	0.00	0.30	QP
2	14.154	58.01	-15.99	74.00	57.71	0.00	0.30	Average
3	17.697	59.70	-27.30	87.00	59.34	0.00	0.36	QP
4	17.697	57.25	-16.75	74.00	56.89	0.00	0.36	Average
5	18.491	55.68	-31.32	87.00	55.30	0.00	0.38	QP
6	18.491	53.97	-20.03	74.00	53.59	0.00	0.38	Average
7	19.712	63.28	-23.72	87.00	62.88	0.00	0.40	QP
8	19.712	61.62	-12.38	74.00	61.22	0.00	0.40	Average
9	20.810	61.01	-25.99	87.00	60.59	0.00	0.42	QP
10	20.810	60.29	-13.71	74.00	59.87	0.00	0.42	Average
11	24.353	56.58	-30.42	87.00	56.09	0.00	0.49	QP
12	24.353	55.72	-18.28	74.00	55.23	0.00	0.49	Average

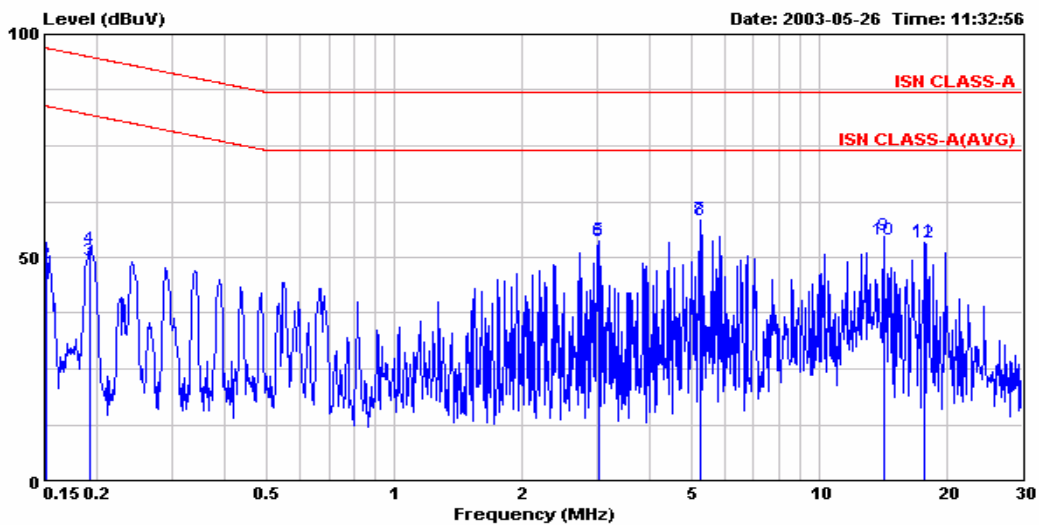
Test Engineer :

Neil Huang

5.6.4 Test mode : **Mode 4**

- Frequency Range of Test : from 0.15 MHz to 30 MHz
- Temperature : 24°C
- Relative Humidity : 61%
- All emissions not reported here are more than 10 dB below the prescribed limit.

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



Site : CO01-LK
 Condition : ISN CLASS-A
 EUT : IPC
 MODEL : (Connect from connectors at rear side)
 POWER : 230V/50HZ
 MEMO : LAN:10M ISN A(60/35dB)

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
		dB		dBuV	dB		dB	
1	0.151	52.69	-44.25	96.94	52.69	0.00	0.00	QP
2	0.151	48.56	-35.38	83.94	48.56	0.00	0.00	Average
3	0.192	49.50	-32.45	81.95	49.50	0.00	0.00	Average
4	0.192	52.07	-42.88	94.95	52.07	0.00	0.00	QP
5	3.039	54.01	-32.99	87.00	53.81	0.00	0.20	QP
6	3.039	53.63	-20.37	74.00	53.43	0.00	0.20	Average
7	5.236	58.76	-28.24	87.00	58.53	0.00	0.23	QP
8	5.236	58.33	-15.67	74.00	58.10	0.00	0.23	Average
9	14.153	55.11	-31.89	87.00	54.81	0.00	0.30	QP
10	14.153	53.86	-20.14	74.00	53.56	0.00	0.30	Average
11	17.696	53.64	-33.36	87.00	53.28	0.00	0.36	QP
12	17.696	53.20	-20.80	74.00	52.84	0.00	0.36	Average

Test Engineer :

Neil Huang

5.7 Photographs of Conducted Powerline Test Configuration

- The photographs show the configuration that generates the maximum emission.
< Mode 1, 2 >

FRONT VIEW



REAR VIEW



- The photographs show the configuration that generates the maximum emission.
< Mode 3, 4 >

FRONT VIEW



REAR VIEW



5.8 Photographs of Disturbances at Telecommunication Ports

- The photographs show the configuration that generates the maximum emission.
< Mode 1, 2 >

FRONT VIEW



REAR VIEW



- The photographs show the configuration that generates the maximum emission.
< Mode 3, 4 >

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 55011 & EN 55022. 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

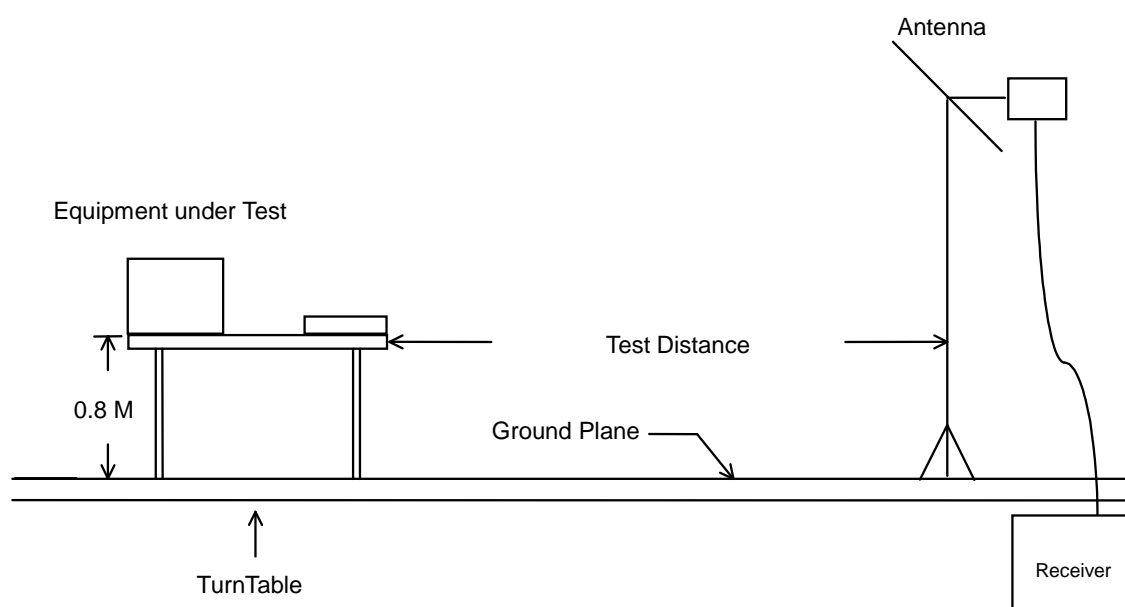
- Amplifier (HP 8447D)
 - RF Gain 25 dB
 - Signal Input 0.1 MHz -1.3 GHz

- Spectrum Analyzer (ADVANTEST R3261C)
 - Attenuation 10 dB
 - Start Frequency 30 MHz
 - Stop Frequency 1000 MHz
 - Resolution Bandwidth 120 KHz
 - Signal Input 9 KHz - 2.6 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

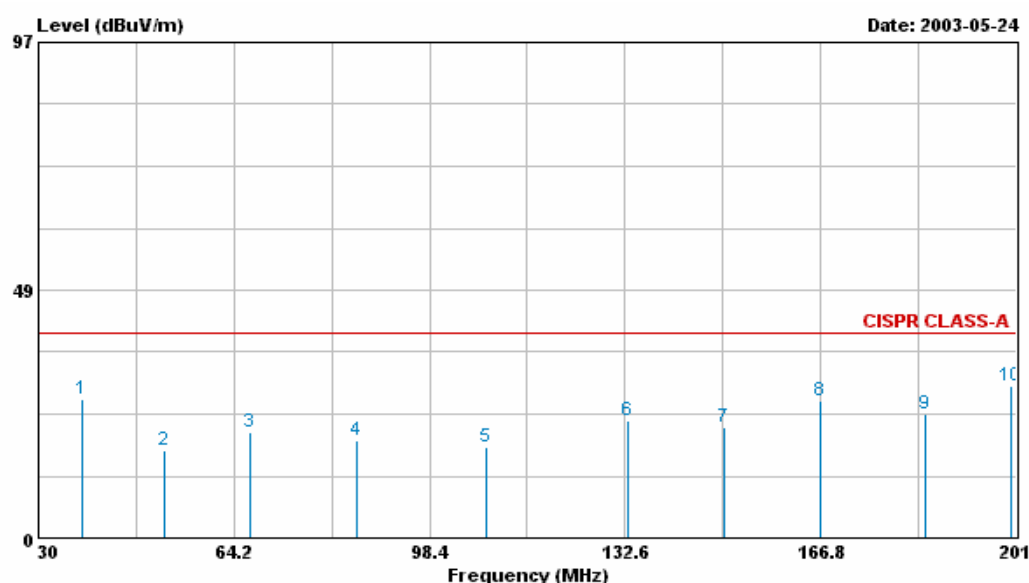


6.4 Test Result of Radiated Emission

6.4.1 Test mode : Mode 1

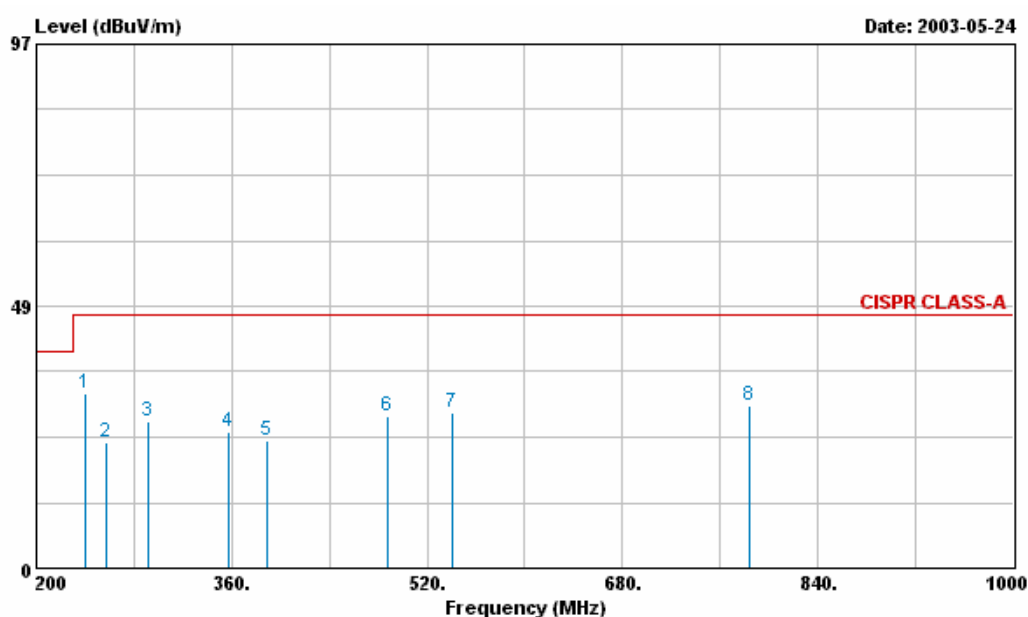
- Frequency Range of Test : from 30 MHz to 1000 MHz
- Temperature : 25°C
- Relative Humidity : 67%
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Read Level – Preamp Factor = Level

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



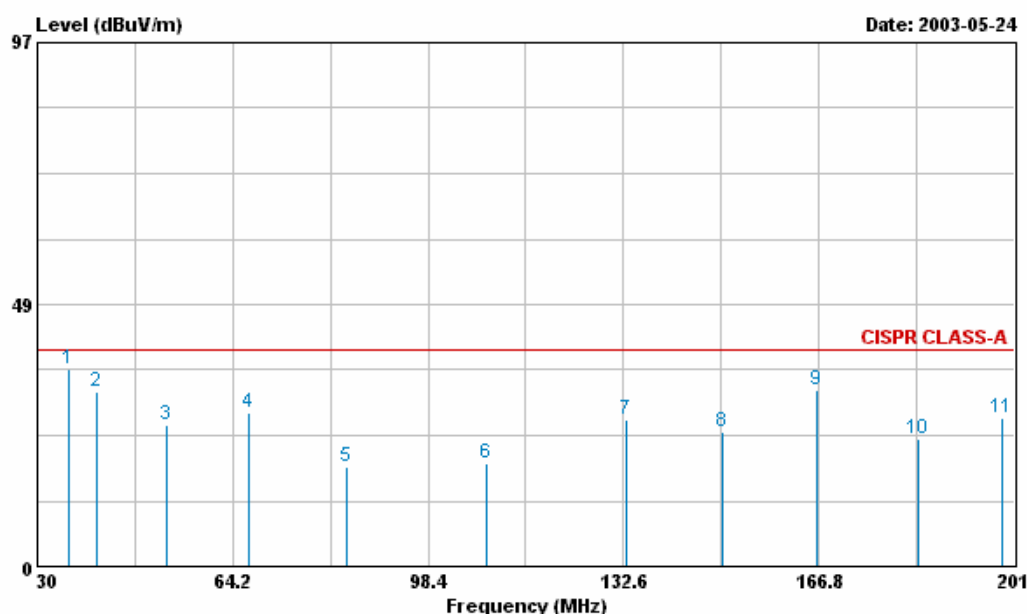
Site : OS03-LK
 Condition : CISPR CLASS-A 10m OLO3CHASE2674020817 HORIZONTAL
 EUT : IPC (Connect from connectors at front side)
 Power : 230VAC*1
 Memo : 1024*768 60Hz/48K
 : CPU:700MHz(P-3)
 : FULL SYSTEM LAN:100M

	Freq	Level	Over Limit	Limit	ReadAntenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	Pos	Pos
									cm	deg
1	37.700	27.02	-12.98	40.00	39.61	14.79	0.79	28.17	Peak	---
2	52.060	17.28	-22.72	40.00	36.85	7.76	0.87	28.20	Peak	---
3	66.940	20.75	-19.25	40.00	41.89	6.02	1.01	28.17	Peak	---
4	85.750	19.12	-20.88	40.00	37.42	8.61	1.22	28.13	Peak	---
5	108.320	17.93	-22.07	40.00	33.59	11.27	1.14	28.07	Peak	---
6	133.110	22.92	-17.08	40.00	37.63	11.94	1.32	27.97	Peak	---
7	149.870	21.62	-18.38	40.00	37.30	10.69	1.53	27.90	Peak	---
8	166.800	26.91	-13.09	40.00	43.35	9.99	1.40	27.83	Peak	---
9	185.100	24.18	-15.82	40.00	40.97	9.39	1.58	27.76	Peak	---
10 @	200.150	29.68	-10.32	40.00	46.62	9.18	1.58	27.70	Peak	---



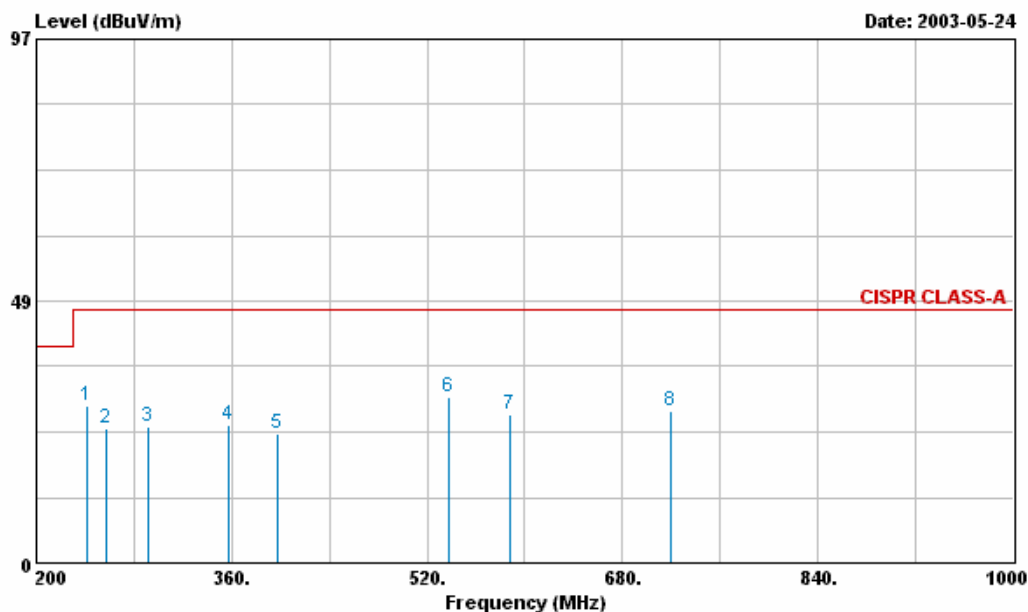
Site : OS03-LK
 Condition : CISPR CLASS-A 10m OL03CHASE2674020817 HORIZONTAL
 EUT : IPC (Connect from connectors at front side)
 Power : 230VAC*1
 Memo : 1024*768 60Hz/48K
 : CPU:700MHz(P-3)
 : FULL SYSTEM LAN:100M

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamplifier	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	240.000	32.42	-14.58	47.00	46.24	11.97	1.83	27.62	Peak	---	---
2	256.800	23.23	-23.77	47.00	36.10	12.76	1.96	27.59	Peak	---	---
3	291.200	27.30	-19.70	47.00	39.94	12.98	1.90	27.52	Peak	---	---
4	356.800	25.23	-21.77	47.00	36.24	14.70	2.19	27.90	Peak	---	---
5	389.600	23.56	-23.44	47.00	33.66	15.65	2.38	28.13	Peak	---	---
6	488.000	28.27	-18.73	47.00	37.12	16.94	2.59	28.38	Peak	---	---
7	540.800	28.66	-18.34	47.00	36.38	18.11	2.73	28.56	Peak	---	---
8	784.000	30.07	-16.93	47.00	37.30	18.14	3.43	28.80	Peak	---	---




Site : OS03-LK
Condition : CISPR CLASS-A 10m OLO3CHASE2674020817 VERTICAL
EUT : IPC (Connect from connectors at front side)
Power : 230VAC*1
Memo : 1024*768 60Hz/48K
: CPU:700MHz(P-3)
: FULL SYSTEM LAN:100M

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Factor Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	35.470	36.58	-3.42	40.00	48.17	15.84	0.73	28.16 Peak	100	348
2	40.430	32.22	-7.78	40.00	46.31	13.26	0.83	28.18 Peak	---	---
3	52.570	26.22	-13.78	40.00	45.79	7.76	0.87	28.20 Peak	---	---
4	66.940	28.55	-11.45	40.00	49.69	6.02	1.01	28.17 Peak	---	---
5	84.210	18.48	-21.52	40.00	37.00	8.42	1.19	28.13 Peak	---	---
6	108.660	18.98	-21.02	40.00	34.64	11.27	1.14	28.07 Peak	---	---
7	133.110	27.32	-12.68	40.00	42.03	11.94	1.32	27.97 Peak	---	---
8	150.040	25.01	-14.99	40.00	40.69	10.69	1.53	27.90 Peak	---	---
9	166.290	32.51	-7.49	40.00	48.95	9.99	1.40	27.83 Peak	---	---
10	184.240	23.46	-16.54	40.00	40.25	9.40	1.57	27.76 Peak	---	---
11	198.780	27.62	-12.38	40.00	44.55	9.19	1.58	27.70 Peak	---	---



Site : OS03-LK
 Condition : CISPR CLASS-A 10m OLO3CHASE2674020817 VERTICAL
 EUT : IPC (Connect from connectors at front side)
 Power : 230VAC*1
 Memo : 1024*768 60Hz/48K
 : CPU:700MHz(P-3)
 : FULL SYSTEM LAN:100M

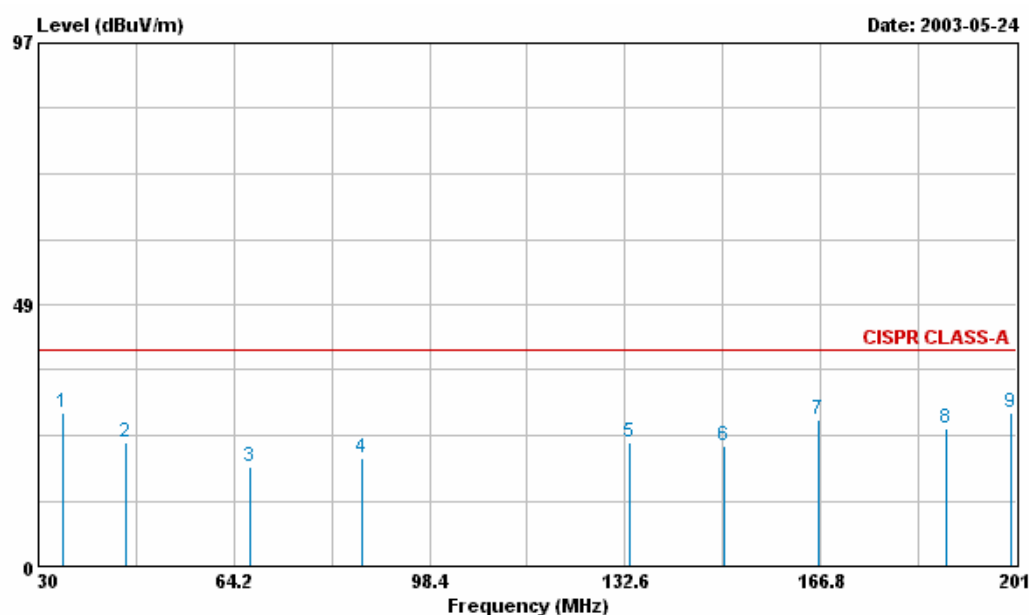
	Freq	Level	Over Limit	Limit	ReadAntenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	dB	dBuV/m	Level	Factor	Loss	Factor	Pos	Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	240.800	29.25	-17.75	47.00	42.99	12.04	1.84	27.62	Peak	---
2	256.800	24.83	-22.17	47.00	37.70	12.76	1.96	27.59	Peak	---
3	291.200	25.10	-21.90	47.00	37.74	12.98	1.90	27.52	Peak	---
4	357.600	25.46	-21.54	47.00	36.45	14.72	2.20	27.91	Peak	---
5	397.600	23.93	-23.07	47.00	33.85	15.87	2.40	28.19	Peak	---
6	537.600	30.60	-16.40	47.00	38.42	18.01	2.72	28.55	Peak	---
7	588.000	27.45	-19.55	47.00	34.08	19.27	2.85	28.75	Peak	---
8	719.200	28.03	-18.97	47.00	36.35	17.26	3.22	28.80	Peak	---

Test Engineer : 
 Kenny Chung

6.4.2 Test mode : **Mode 2**

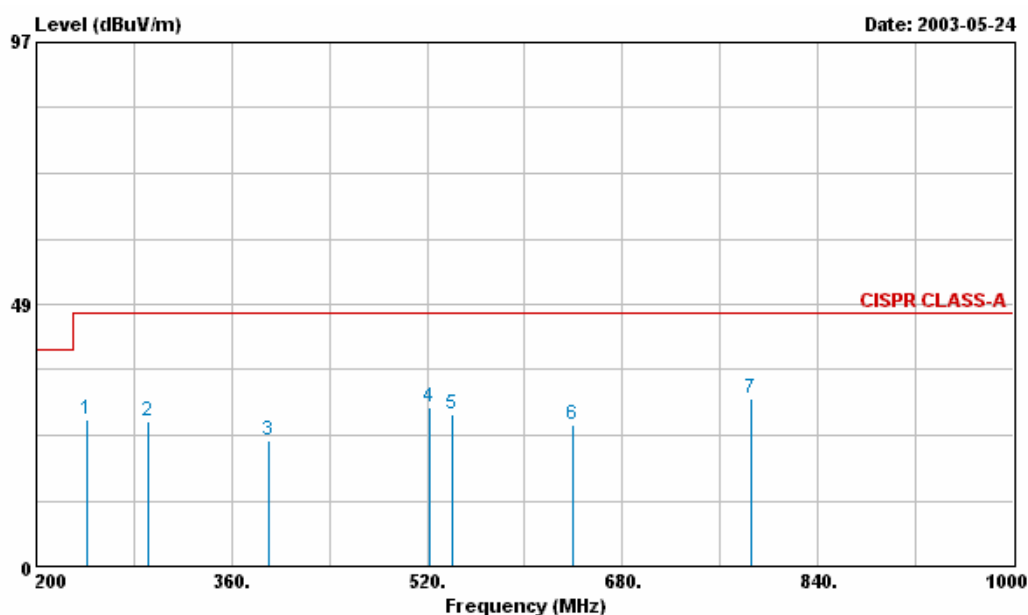
- Frequency Range of Test : from 30 MHz to 1000 MHz
- Temperature : 25°C
- Relative Humidity : 67%
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Read Level – Preamp Factor = Level

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



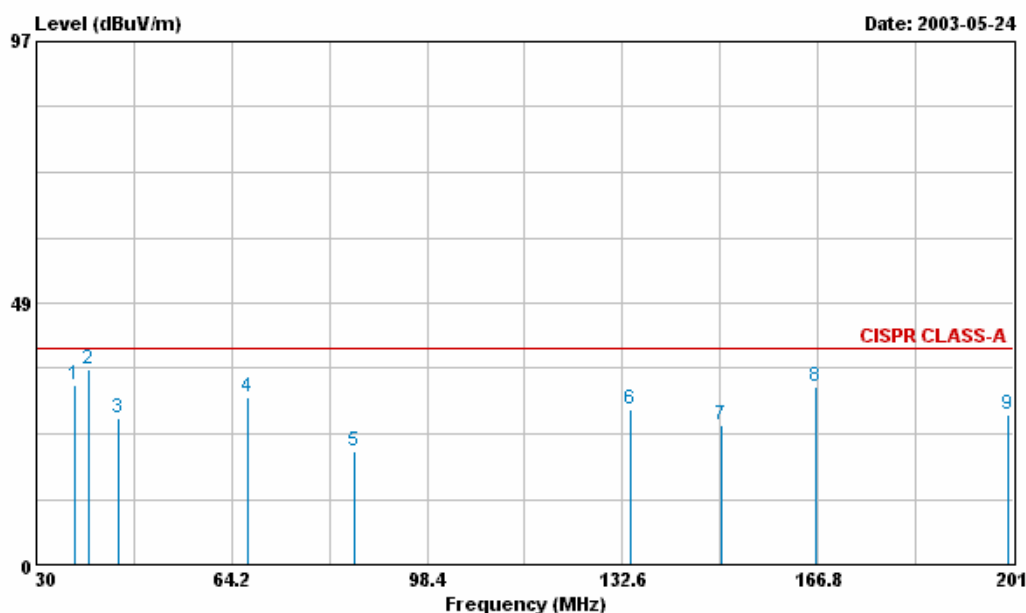
Site : OS03-LK
 Condition : CISPR CLASS-A 10m OL03CHASE2674020817 HORIZONTAL
 EUT : IPC (Connect from connectors at front side)
 Power : 230VAC*2
 Memo : 1024*768 60Hz/48K
 : CPU:700MHz(P-3)
 : FULL SYSTEM LAN:100M

	Freq	Level	Over Limit	Limit Line	ReadAntenna	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	34.280	28.55	-11.45	40.00	39.37	16.63	0.71	28.16 Peak	---	---
2	45.220	22.81	-17.19	40.00	39.39	10.85	0.76	28.19 Peak	---	---
3	66.940	18.35	-21.65	40.00	39.49	6.02	1.01	28.17 Peak	---	---
4	86.600	20.08	-19.92	40.00	38.20	8.80	1.21	28.13 Peak	---	---
5	133.460	23.10	-16.90	40.00	37.84	11.89	1.33	27.96 Peak	---	---
6	150.040	22.41	-17.59	40.00	38.09	10.69	1.53	27.90 Peak	---	---
7	166.460	27.31	-12.69	40.00	43.75	9.99	1.40	27.83 Peak	---	---
8	188.690	25.65	-14.35	40.00	42.47	9.33	1.59	27.74 Peak	---	---
9	200.150	28.58	-11.42	40.00	45.52	9.18	1.58	27.70 Peak	---	---



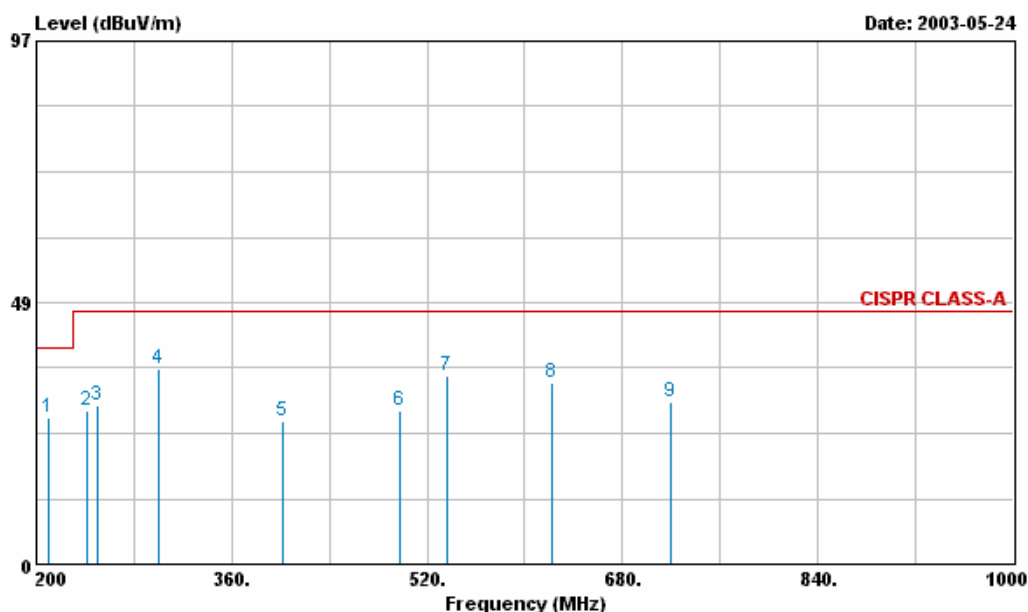
Site : OS03-LK
 Condition : CISPR CLASS-A 10m OL03CHASE2674020817 HORIZONTAL
 EUT : IPC (Connect from connectors at front side)
 Power : 230VAC*2
 Memo : 1024*768 60Hz/48K
 : CPU:700MHz(P-3)
 : FULL SYSTEM LAN:100M

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamplifier	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	241.600	27.11	-19.89	47.00	40.77	12.11	1.85	27.62	Peak	---	---
2	291.200	26.90	-20.10	47.00	39.54	12.98	1.90	27.52	Peak	---	---
3	390.400	23.18	-23.82	47.00	33.26	15.68	2.38	28.14	Peak	---	---
4	522.400	29.36	-17.64	47.00	37.52	17.65	2.68	28.49	Peak	---	---
5	540.800	28.06	-18.94	47.00	35.78	18.11	2.73	28.56	Peak	---	---
6	639.200	26.34	-20.66	47.00	33.47	18.58	3.09	28.80	Peak	---	---
7	784.800	30.88	-16.12	47.00	38.10	18.15	3.43	28.80	Peak	---	---



Site : OS03-LK
 Condition : CISPR CLASS-A 10m OLO3CHASE2674020817 VERTICAL
 EUT : IPC (**Connect from connectors at front side**)
 Power : 230VAC*2
 Memo : 1024*768 60Hz/48K
 : CPU:700MHz(P-3)
 : FULL SYSTEM LAN:100M

	Freq	Level	Over Limit	Limit	ReadAntenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	dB	dBuV/m	Level	Factor	Loss	Factor	Pos	Pos
					dBuV	dB/m	dB	dB	cm	deg
1	36.670	33.43	-6.57	40.00	45.52	15.32	0.76	28.17	Peak	---
2	39.230	36.25	-3.75	40.00	49.83	13.74	0.85	28.17	Peak	100 356
3	44.360	27.02	-12.98	40.00	43.12	11.34	0.75	28.19	Peak	---
4	66.940	31.15	-8.85	40.00	52.29	6.02	1.01	28.17	Peak	---
5	85.750	20.92	-19.08	40.00	39.22	8.61	1.22	28.13	Peak	---
6	133.970	28.66	-11.34	40.00	43.40	11.89	1.33	27.96	Peak	---
7	149.870	26.02	-13.98	40.00	41.70	10.69	1.53	27.90	Peak	---
8	166.460	32.91	-7.09	40.00	49.35	9.99	1.40	27.83	Peak	---
9	200.150	27.88	-12.12	40.00	44.82	9.18	1.58	27.70	Peak	---



Site : OS03-LK
 Condition : CISPR CLASS-A 10m OL03CHASE2674020817 VERTICAL
 EUT : IPC (Connect from connectors at front side)
 Power : 230VAC*2
 Memo : 1024*768 60Hz/48K
 : CPU:700MHz(P-3)
 : FULL SYSTEM LAN:100M

	Freq	Level	Over Limit	Limit Line	ReadAntenna 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	210.400	27.15	-12.85	40.00	43.28	9.93	1.62	27.68	Peak	---	---
2	241.600	28.51	-18.49	47.00	42.17	12.11	1.85	27.62	Peak	---	---
3	250.400	29.48	-17.52	47.00	42.41	12.72	1.95	27.60	Peak	---	---
4	300.000	36.37	-10.63	47.00	48.98	13.04	1.85	27.50	Peak	---	---
5	402.400	26.64	-20.36	47.00	36.49	15.96	2.40	28.21	Peak	---	---
6	497.600	28.32	-18.68	47.00	37.03	17.06	2.62	28.39	Peak	---	---
7	536.800	34.99	-12.01	47.00	42.82	17.99	2.72	28.54	Peak	---	---
8	622.400	33.68	-13.32	47.00	40.47	19.01	3.00	28.80	Peak	---	---
9	719.200	30.23	-16.77	47.00	38.55	17.26	3.22	28.80	Peak	---	---

Test Engineer :

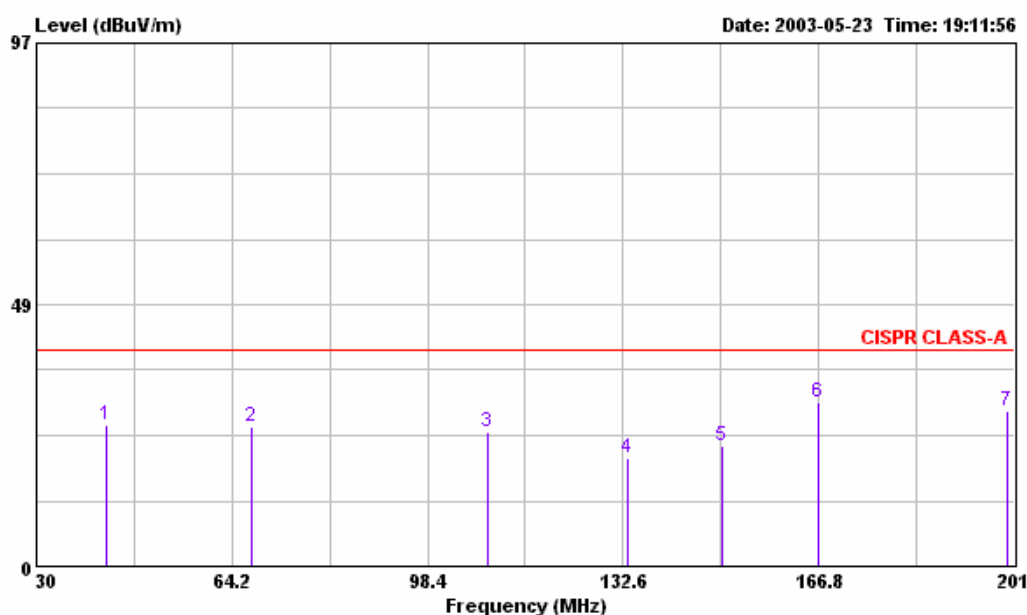
Kenny

Kenny Chung

6.4.3 Test mode : **Mode 3**

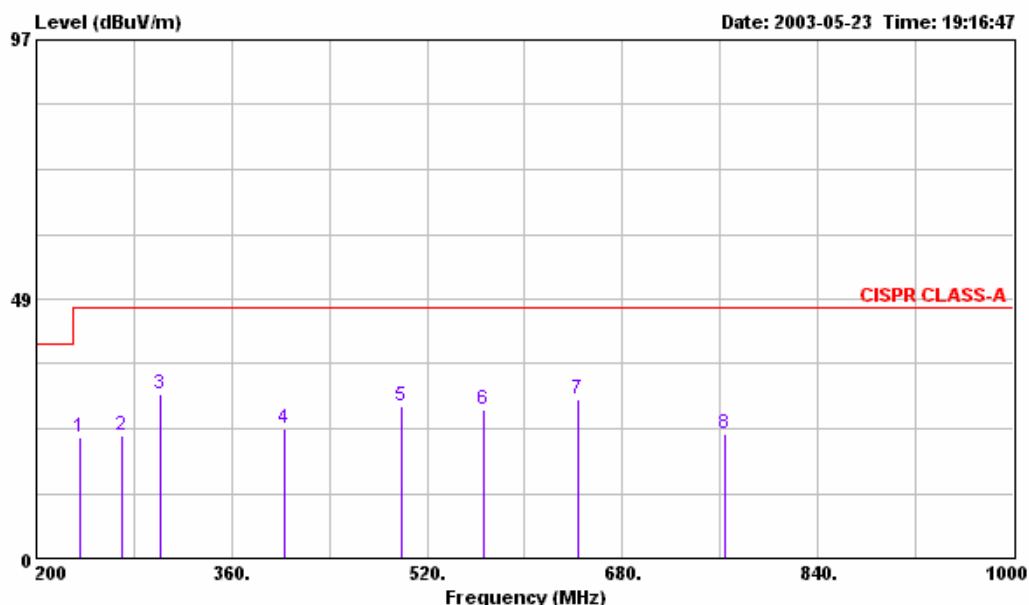
- Frequency Range of Test : from 30 MHz to 1000 MHz
- Temperature : 25°C
- Relative Humidity : 67%
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Read Level – Preamp Factor = Level

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



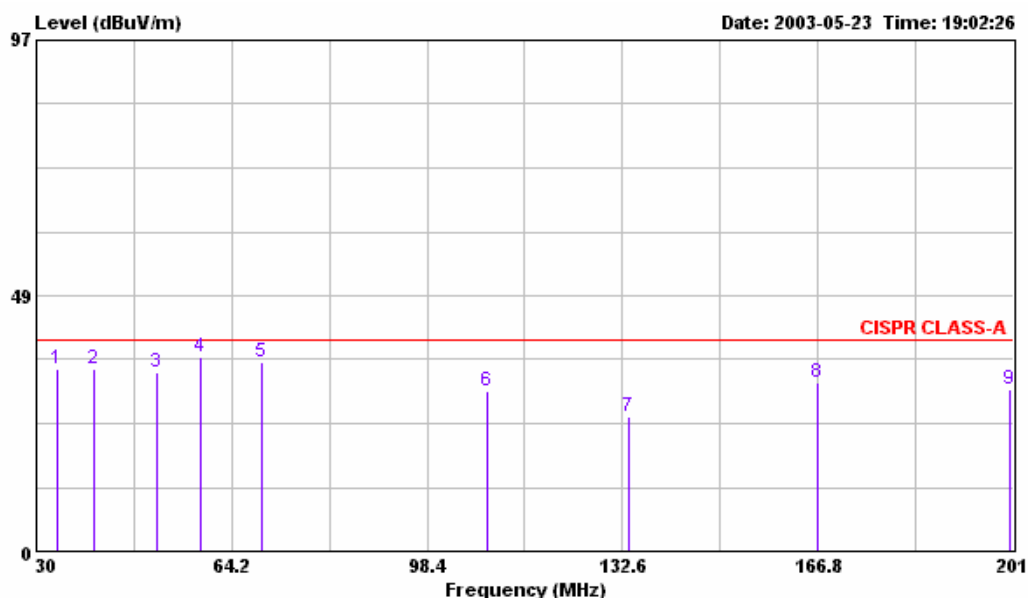
Site : OS03-LK
 Condition : CISPR CLASS-A 10m OL03CHASE2674020817 HORIZONTAL
 EUT : IPC (**Connect from connectors at rear side**)
 Power : 230VAC*1
 Memo : 1024*768 60HZ/48K
 : CPU:700MHz(P-3)
 : FULL SYSTEM LAN:100M

	Freq	Level	Over Limit	Limit	ReadAntenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m		dB	dBuV	Loss	Factor	Remark	Pos	Pos
				dBuV/m	dB/m	dB	dB		cm	deg
1	42.310	26.13	-13.87	40.00	41.22	12.30	0.79	28.18 Peak	---	---
2	67.620	25.79	-14.21	40.00	46.81	6.13	1.01	28.16 Peak	---	---
3	109.000	24.77	-15.23	40.00	40.43	11.27	1.14	28.07 Peak	---	---
4	133.460	20.05	-19.95	40.00	34.79	11.89	1.33	27.96 Peak	---	---
5	150.040	22.21	-17.79	40.00	37.89	10.69	1.53	27.90 Peak	---	---
6	166.800	30.36	-9.64	40.00	46.80	9.99	1.40	27.83 Peak	---	---
7	199.630	28.88	-11.12	40.00	45.82	9.18	1.58	27.70 Peak	---	---



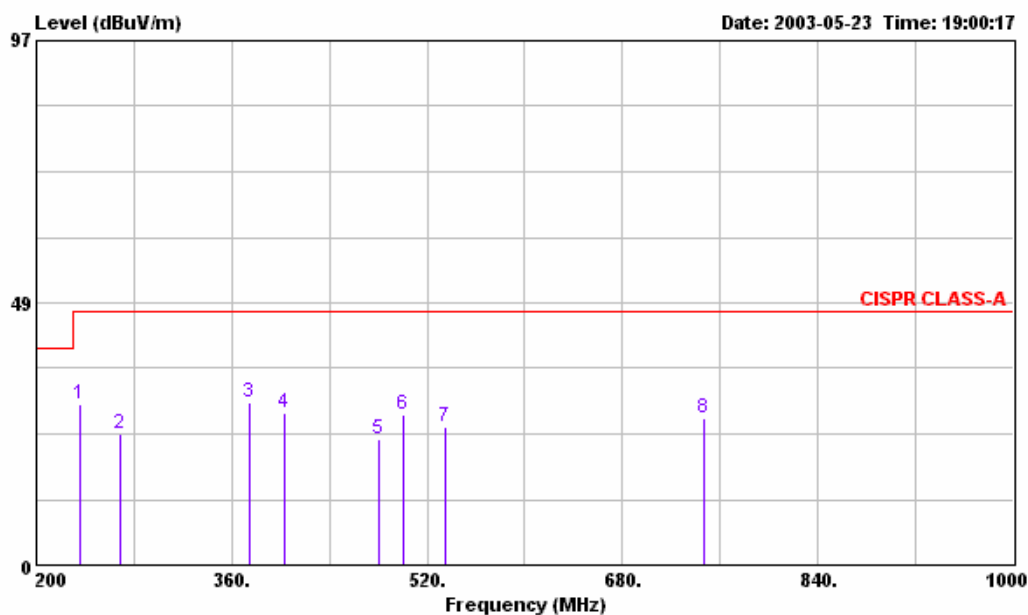
Site : OS03-LK
 Condition : CISPR CLASS-A 10m OL03CHASE2674020817 HORIZONTAL
 EUT : IPC(Connect from connectors at rear side)
 Power : 230VAC*1
 Memo : 1024*768 60HZ/48K
 : CPU:700MHz(P-3)
 : FULL SYSTEM LAN:100M

	Freq	Level	Over Limit	Limit	ReadAntenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	Pos	Pos
1	236.000	22.60	-24.40	47.00	36.74	11.70	1.79	27.63	Peak	---
2	270.400	23.08	-23.92	47.00	35.80	12.85	1.99	27.56	Peak	---
3	301.600	30.65	-16.35	47.00	43.19	13.10	1.87	27.51	Peak	---
4	403.200	24.37	-22.63	47.00	34.20	15.97	2.41	28.21	Peak	---
5	499.200	28.31	-18.69	47.00	37.00	17.08	2.63	28.40	Peak	---
6	566.400	27.67	-19.33	47.00	34.80	18.74	2.79	28.66	Peak	---
7	644.000	29.78	-17.22	47.00	37.00	18.46	3.12	28.80	Peak	---
8	764.000	23.21	-23.79	47.00	30.80	17.87	3.34	28.80	Peak	---



Site : OS03-LK
 Condition : CISPR CLASS-A 10m OL03CHASE2674020817 VERTICAL
 EUT : IPC (Connect from connectors at rear side)
 Power : 230VAC*1
 Memo : 1024*768 60HZ/48K
 : CPU:700MHz(P-3)
 : FULL SYSTEM LAN:100M

	Freq	Level	Over Limit	Limit	ReadAntenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	Pos	Pos
1	33.590	34.54	-5.46	40.00	45.36	16.63	0.71	28.16	Peak	---
2	40.090	34.70	-5.30	40.00	48.28	13.74	0.85	28.17	Peak	---
3	51.200	33.81	-6.19	40.00	53.12	8.06	0.83	28.20	Peak	---
4	58.711	36.72	-3.28	40.00	58.31	5.62	0.97	28.18	OP	100 59
5	69.500	35.79	-4.21	40.00	56.62	6.33	1.00	28.16	Peak	---
6	109.000	30.37	-9.63	40.00	46.03	11.27	1.14	28.07	Peak	---
7	133.630	25.54	-14.46	40.00	40.28	11.89	1.33	27.96	Peak	---
8	166.800	32.16	-7.84	40.00	48.60	9.99	1.40	27.83	Peak	---
9	200.320	30.73	-9.27	40.00	47.60	9.25	1.58	27.70	Peak	---



Site : OS03-LK
 Condition : CISPR CLASS-A 10m OLO3CHASE2674020817 VERTICAL
 EUT : IPC (Connect from connectors at rear side)
 Power : 230VAC*1
 Memo : 1024*768 60HZ/48K
 : CPU:700MHz(P-3)
 : FULL SYSTEM LAN:100M

	Freq	Level	Over Limit	Limit Line	ReadAntenna 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	235.200	29.86	-17.14	47.00	44.00	11.70	1.79	27.63	Peak	---	---
2	268.800	24.26	-22.74	47.00	36.99	12.84	1.99	27.56	Peak	---	---
3	374.400	29.92	-17.08	47.00	40.40	15.20	2.34	28.02	Peak	---	---
4	403.200	28.17	-18.83	47.00	38.00	15.97	2.41	28.21	Peak	---	---
5	480.000	23.26	-23.74	47.00	32.19	16.86	2.57	28.36	Peak	---	---
6	500.800	27.73	-19.27	47.00	36.41	17.09	2.63	28.40	Peak	---	---
7	535.200	25.54	-21.46	47.00	33.41	17.96	2.71	28.54	Peak	---	---
8	747.200	27.12	-19.88	47.00	35.02	17.63	3.27	28.80	Peak	---	---

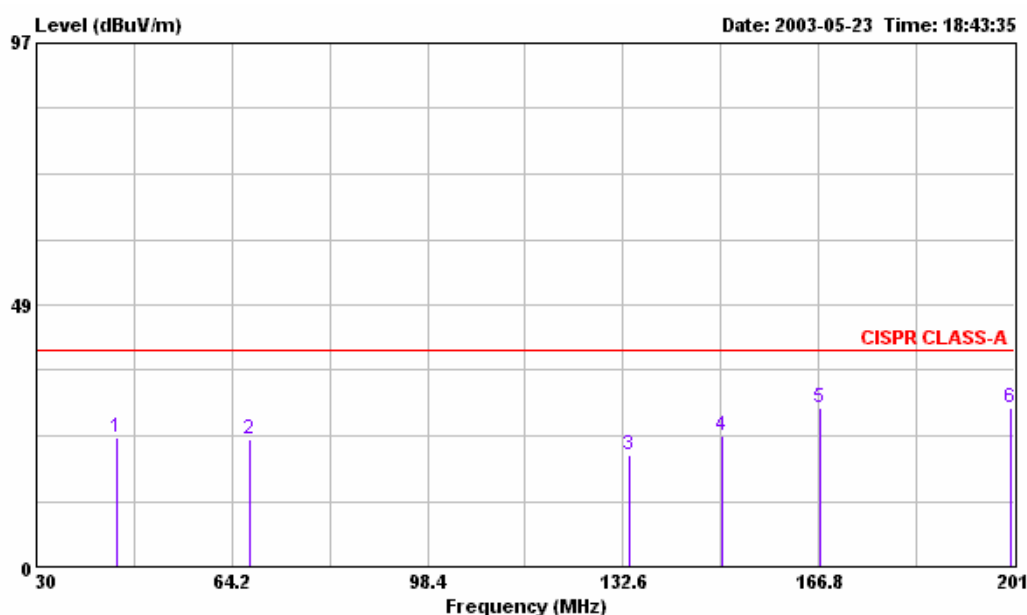
Test Engineer : 

Kenny Chung

6.4.4 Test mode : **Mode 4**

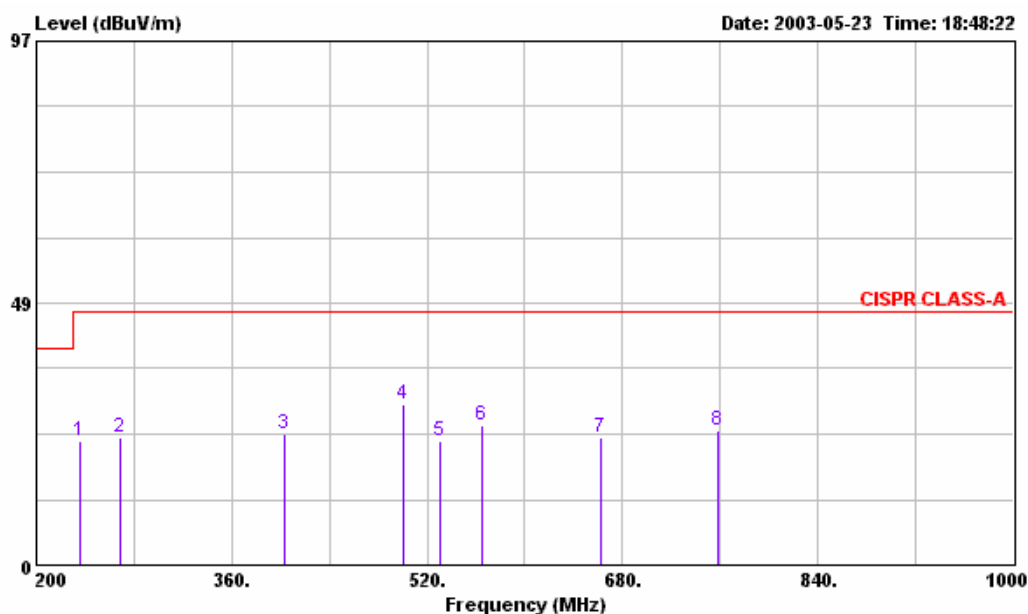
- Frequency Range of Test : from 30 MHz to 1000 MHz
- Temperature : 25°C
- Relative Humidity : 67%
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Read Level – Preamp Factor = Level

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



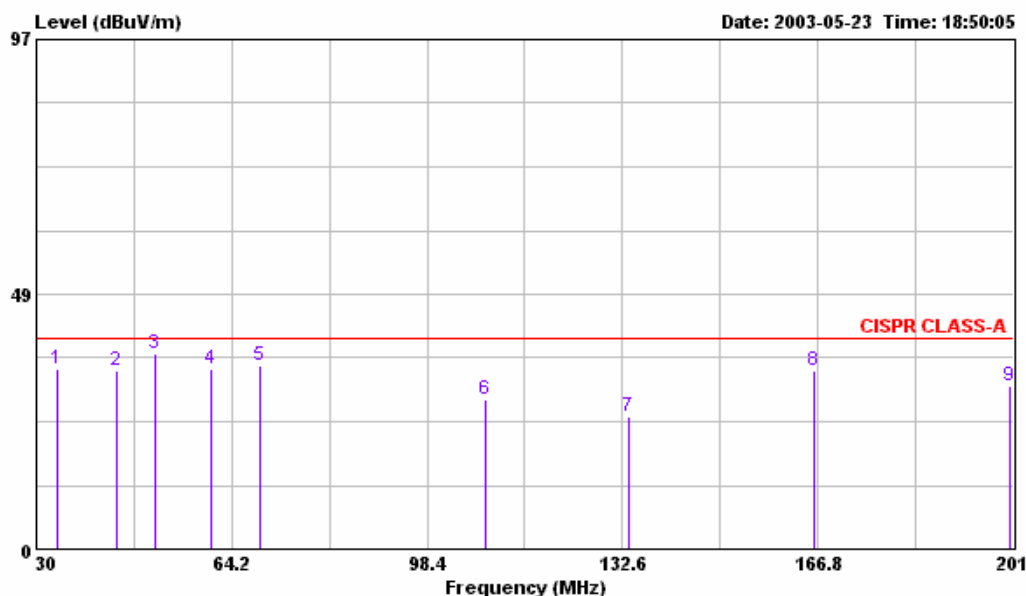
Site : OS03-LK
 Condition : CISPR CLASS-A 10m OL03CHASE2674020817 HORIZONTAL
 EUT : IPC (**Connect from connectors at rear side**)
 Power : 230VAC*2
 Memo : 1024*768 60HZ/48K
 : CPU:700MHz(P-3)
 : FULL SYSTEM LAN:100M

	Freq	Level	Over Limit	Limit	ReadAntenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	Pos	Pos
1	44.020	23.79	-16.21	40.00	39.38	11.82	0.77	28.18	Peak	---
2	67.280	23.55	-16.45	40.00	44.69	6.02	1.01	28.17	Peak	---
3	133.800	20.83	-19.17	40.00	35.57	11.89	1.33	27.96	Peak	---
4	149.870	24.32	-15.68	40.00	40.00	10.69	1.53	27.90	Peak	---
5	166.970	29.56	-10.44	40.00	46.00	9.99	1.40	27.83	Peak	---
6	200.320	29.53	-10.47	40.00	46.40	9.25	1.58	27.70	Peak	---



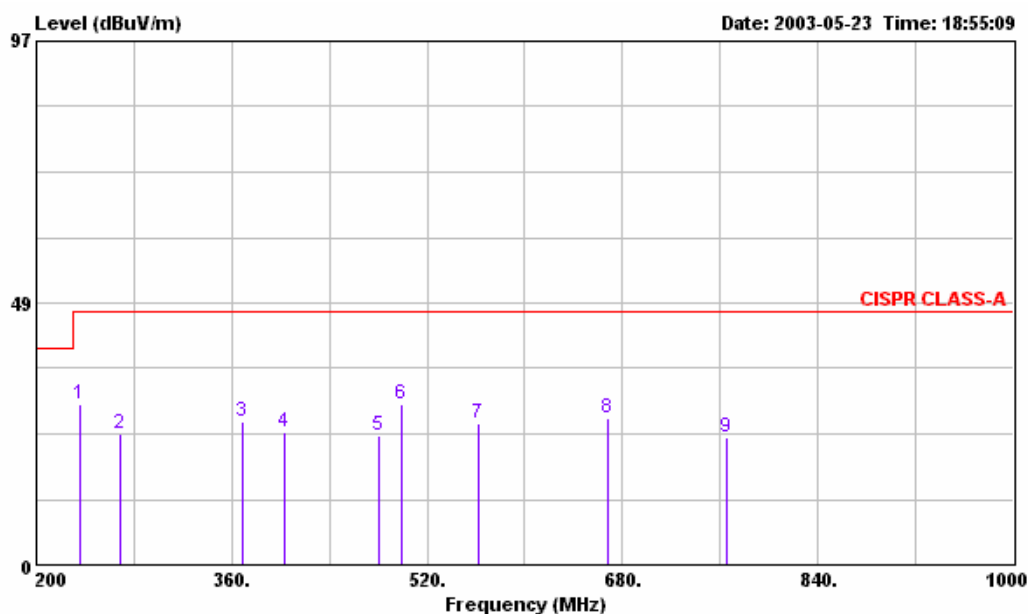
Site : OS03-LK
 Condition : CISPR CLASS-A 10m OL03CHASE2674020817 HORIZONTAL
 EUT : IPC (Connect from connectors at rear side)
 Power : 230VAC*2
 Memo : 1024*768 60HZ/48K
 : CPU:700MHz(P-3)
 : FULL SYSTEM LAN:100M

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamplifier	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	236.000	22.80	-24.20	47.00	36.94	11.70	1.79	27.63	Peak	---	---
2	268.800	23.46	-23.54	47.00	36.19	12.84	1.99	27.56	Peak	---	---
3	403.200	24.17	-22.83	47.00	34.00	15.97	2.41	28.21	Peak	---	---
4	500.800	29.73	-17.27	47.00	38.41	17.09	2.63	28.40	Peak	---	---
5	530.400	23.02	-23.98	47.00	31.00	17.84	2.70	28.52	Peak	---	---
6	564.800	25.83	-21.17	47.00	33.01	18.69	2.79	28.66	Peak	---	---
7	661.600	23.56	-23.44	47.00	31.19	18.01	3.16	28.80	Peak	---	---
8	758.400	24.91	-22.09	47.00	32.60	17.79	3.32	28.80	Peak	---	---



Site : OS03-LK
 Condition : CISPR CLASS-A 10m OLO3CHASE2674020817 VERTICAL
 EUT : IPC (Connect from connectors at rear side)
 Power : 230VAC*2
 Memo : 1024*768 60HZ/48K
 : CPU:700MHz(P-3)
 : FULL SYSTEM LAN:100M

	Freq	Level	Over Limit	Limit	ReadAntenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	Pos	Pos
1	33.590	34.14	-5.86	40.00	44.96	16.63	0.71	28.16	Peak	---
2	44.020	33.89	-6.11	40.00	49.48	11.82	0.77	28.18	Peak	---
3	50.860	37.30	-2.70	40.00	56.61	8.06	0.83	28.20	QP	100 337
4	60.610	34.21	-5.79	40.00	56.00	5.41	0.98	28.18	Peak	---
5	69.160	34.95	-5.05	40.00	55.88	6.23	1.00	28.16	Peak	---
6	108.660	28.56	-11.44	40.00	44.22	11.27	1.14	28.07	Peak	---
7	133.630	25.34	-14.66	40.00	40.08	11.89	1.33	27.96	Peak	---
8	166.120	33.97	-6.03	40.00	50.40	10.02	1.39	27.84	Peak	---
9	200.320	31.13	-8.87	40.00	48.00	9.25	1.58	27.70	Peak	---



Site : OS03-LK
 Condition : CISPR CLASS-A 10m OL03CHASE2674020817 VERTICAL
 EUT : IPC (Connect from connectors at rear side)
 Power : 230VAC*2
 Memo : 1024*768 60HZ/48K
 : CPU:700MHz(P-3)
 : FULL SYSTEM LAN:100M

	Freq	Level	Over Limit	Limit Line	ReadAntenna 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 @	236.000	29.90	-17.10	47.00	44.04	11.70	1.79	27.63	Peak	---	---
2	268.800	24.26	-22.74	47.00	36.99	12.84	1.99	27.56	Peak	---	---
3	368.800	26.54	-20.46	47.00	37.20	15.03	2.29	27.98	Peak	---	---
4	403.200	24.57	-22.43	47.00	34.40	15.97	2.41	28.21	Peak	---	---
5	480.000	24.06	-22.94	47.00	32.99	16.86	2.57	28.36	Peak	---	---
6	499.200	29.71	-17.29	47.00	38.40	17.08	2.63	28.40	Peak	---	---
7	561.600	26.05	-20.95	47.00	33.29	18.62	2.78	28.64	Peak	---	---
8	668.000	27.19	-19.81	47.00	35.00	17.83	3.16	28.80	Peak	---	---
9	765.600	23.64	-23.36	47.00	31.21	17.88	3.35	28.80	Peak	---	---

Test Engineer :

Kenny Chung

6.5 Photographs of Radiated Emission Test Configuration

- The photographs show the configuration that generates the maximum emission.
< Mode 1, 2 >

FRONT VIEW



REAR VIEW



- The photographs show the configuration that generates the maximum emission.
< Mode 3,4 >

FRONT VIEW



REAR VIEW



7. Harmonics Test

7.1 Standard

- Standard : EN 61000-3-2: 2000

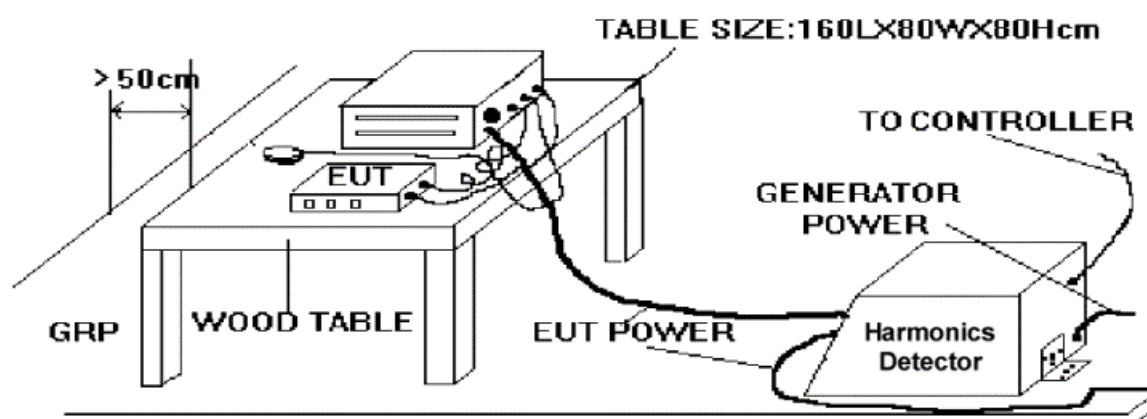
7.2 Test Procedure

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°C
- Relative Humidity : 57%
- Test Date : May 27, 2003

Urms = 228.5V Freq = 50.000 Range: 2 A
 Irms = 0.504A Ipk = 0.790A cf = 1.568
 P = 92.97W Pap = 115.2VA pf = 0.807
 THDi = 11.5 % THDu = 0.10 % Class A

Test - Time : 2min (100 %)

Test completed, Result: PASSED

Order	Freq. [Hz]	Iavg [A]	Iavg%L [%]	Imax [A]	Imax%L [%]	Limit [A]
1	50	0.4983		0.4999		
2	100	0.0000	0.0000	0.0002	0.0226	1.0800
3	150	0.0486	2.1123	0.0493	2.1442	2.3000
4	200	0.0000	0.0000	0.0002	0.0568	0.4300
5	250	0.0166	1.4563	0.0171	1.4991	1.1400
6	300	0.0000	0.0000	0.0001	0.0407	0.3000
7	350	0.0037	0.4756	0.0051	0.6658	0.7700
8	400	0.0000	0.0000	0.0001	0.0531	0.2300
9	450	0.0000	0.0000	0.0044	1.0986	0.4000
10	500	0.0000	0.0000	0.0001	0.0663	0.1840
11	550	0.0085	2.5894	0.0088	2.6634	0.3300
12	600	0.0000	0.0000	0.0004	0.2388	0.1533
13	650	0.0063	3.0227	0.0066	3.1390	0.2100
14	700	0.0000	0.0000	0.0001	0.0929	0.1314
15	750	0.0112	7.4870	0.0116	7.7311	0.1500
16	800	0.0000	0.0000	0.0001	0.1061	0.1150
17	850	0.0144	10.883	0.0146	11.068	0.1324
18	900	0.0000	0.0000	0.0002	0.2388	0.1022
19	950	0.0071	5.9787	0.0073	6.1849	0.1184
20	1000	0.0000	0.0000	0.0002	0.2654	0.0920
21	1050	0.0000	0.0000	0.0026	2.3926	0.1071
22	1100	0.0000	0.0000	0.0001	0.1460	0.0836
23	1150	0.0000	0.0000	0.0020	1.9965	0.0978
24	1200	0.0000	0.0000	0.0002	0.3184	0.0767
25	1250	0.0000	0.0000	0.0023	2.5770	0.0900
26	1300	0.0000	0.0000	0.0002	0.3450	0.0708
27	1350	0.0000	0.0000	0.0031	3.6621	0.0833
28	1400	0.0000	0.0000	0.0001	0.1858	0.0657
29	1450	0.0056	7.2374	0.0060	7.7094	0.0776
30	1500	0.0000	0.0000	0.0002	0.3981	0.0613
31	1550	0.0000	0.0000	0.0021	2.8592	0.0726
32	1600	0.0000	0.0000	0.0001	0.2123	0.0575
33	1650	0.0000	0.0000	0.0035	5.1921	0.0682
34	1700	0.0000	0.0000	0.0002	0.4511	0.0541
35	1750	0.0000	0.0000	0.0028	4.3674	0.0643
36	1800	0.0000	0.0000	0.0002	0.4777	0.0511
37	1850	0.0000	0.0000	0.0037	6.0221	0.0608
38	1900	0.0000	0.0000	0.0002	0.5042	0.0484
39	1950	0.0000	0.0000	0.0010	1.6927	0.0577
40	2000	0.0000	0.0000	0.0002	0.5307	0.0460

Test Engineer : 

Tiffany Wu

8. Voltage Fluctuations Test

8.1 Standard

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

8.2 Test Procedure

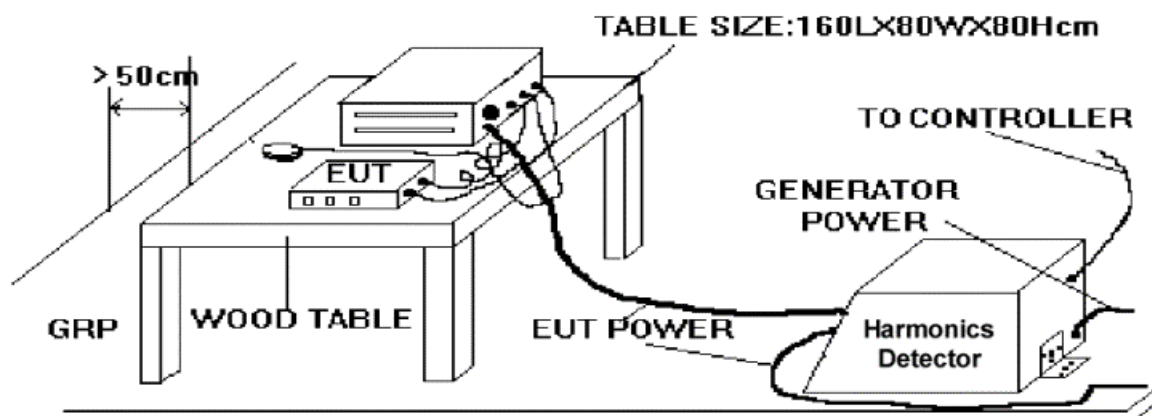
The equipment shall be tested under the conditions of **Clause 5**.

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 $\pm 8\%$ 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°C
- Relative Humidity : 57%
- Test Date : May 27, 2003

Urms = 228.5V Freq = 50.000 Range: 2 A
Irms = 0.505A Ipk = 0.792A cf = 1.569
P = 93.06W Pap = 115.4VA pf = 0.807

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

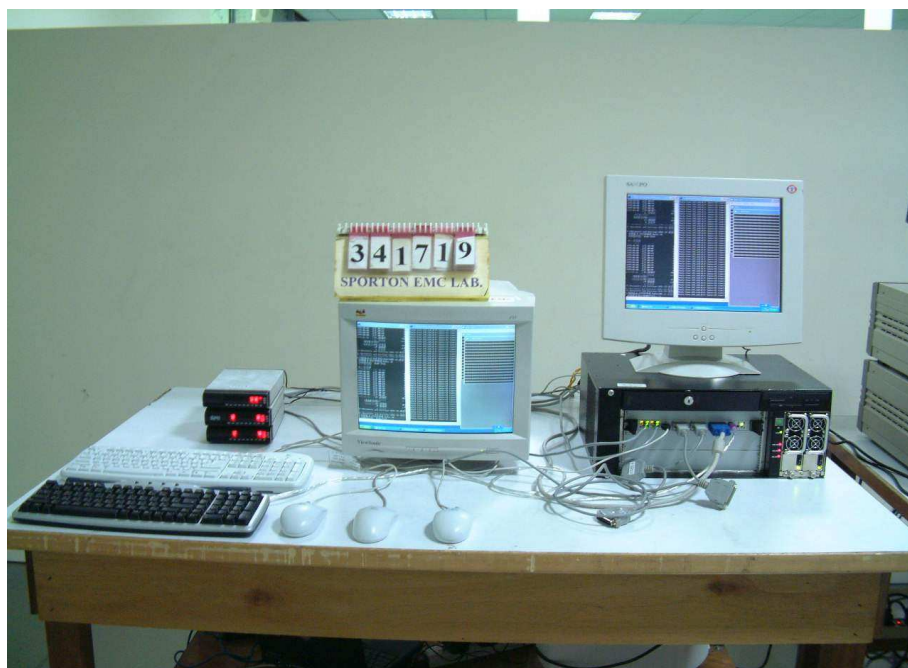
Limits : Plt : 0.65 Pst : 1.00
 dmax : 4.00 % dc : 3.00 %
 dtLim: 3.00 % dt>Lim: 200ms

Test Engineer : 

Tiffany Wu

8.6 Photographs Of Harmonics Test, Voltage Fluctuation And Flicker Test

FRONT VIEW



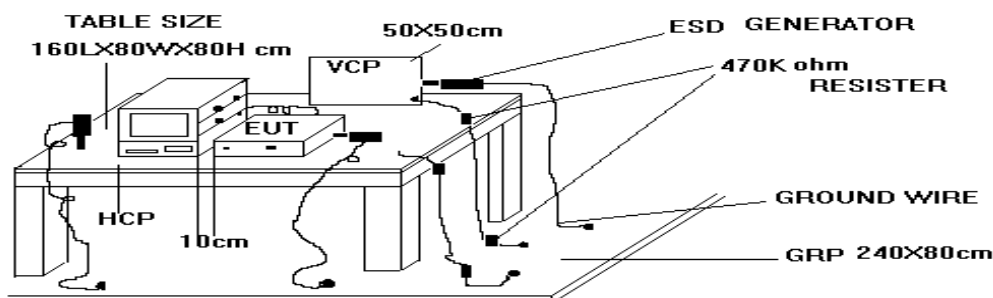
REAR VIEW



9. Electrostatic Discharge Immunity Test (ESD)

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : B
- Required performance criteria : B
- Basic Standard : IEC 61000-4-2:1995
- Product Standard : EN 55024:1998/A1:2001 & EN 61000-6-2:2001
- Level : 3 for air discharge
: 2 for contact discharge
- Test Voltage : $\pm 2 / \pm 4 / \pm 8$ KV for air discharge
: $\pm 2 / \pm 4$ KV for contact discharge
- Temperature : 24°C
- Relative Humidity : 58%
- Test Date : May 31, 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 following 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 resistor 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°C to 35°C;
 - 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.

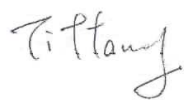
9.5 Test Points

9.5.1 Test Result of Air Discharge

Test Point	Voltage	Tested No.
Case	$\pm 2 / \pm 4 / \pm 8$ KV	BY 10
Bracket	$\pm 2 / \pm 4 / \pm 8$ KV	BY 10
DC Input Jack	$\pm 2 / \pm 4 / \pm 8$ KV	BY 10

9.5.2 Test Result of Contact Discharge

Polarity	Voltage	Tested No. (EN 55024)	Tested No. (EN 61000-6-2)
Horizontal (At Front)	$\pm 2 / \pm 4$ KV	BY 25	BY 10
Horizontal (At Left)	$\pm 2 / \pm 4$ KV	BY 25	BY 10
Horizontal (At Right)	$\pm 2 / \pm 4$ KV	BY 25	BY 10
Horizontal (At Rear)	$\pm 2 / \pm 4$ KV	BY 25	BY 10
Vertical (At Front)	$\pm 2 / \pm 4$ KV	BY 25	BY 10
Vertical (At Left)	$\pm 2 / \pm 4$ KV	BY 25	BY 10
Vertical (At Right)	$\pm 2 / \pm 4$ KV	BY 25	BY 10
Vertical (At Rear)	$\pm 2 / \pm 4$ KV	BY 25	BY 10
Case	$\pm 2 / \pm 4$ KV	BY 25	BY 10
Screw	$\pm 2 / \pm 4$ KV	BY 25	BY 10
Bracket	$\pm 2 / \pm 4$ KV	BY 25	BY 10
VGA Port	$\pm 2 / \pm 4$ KV	BY 25	BY 10
Com1 /Com2/Com3 Port	$\pm 2 / \pm 4$ KV	BY 25	BY 10
RJ45 Port	$\pm 2 / \pm 4$ KV	BY 25	BY 10
USB Port	$\pm 2 / \pm 4$ KV	BY 25	BY 10

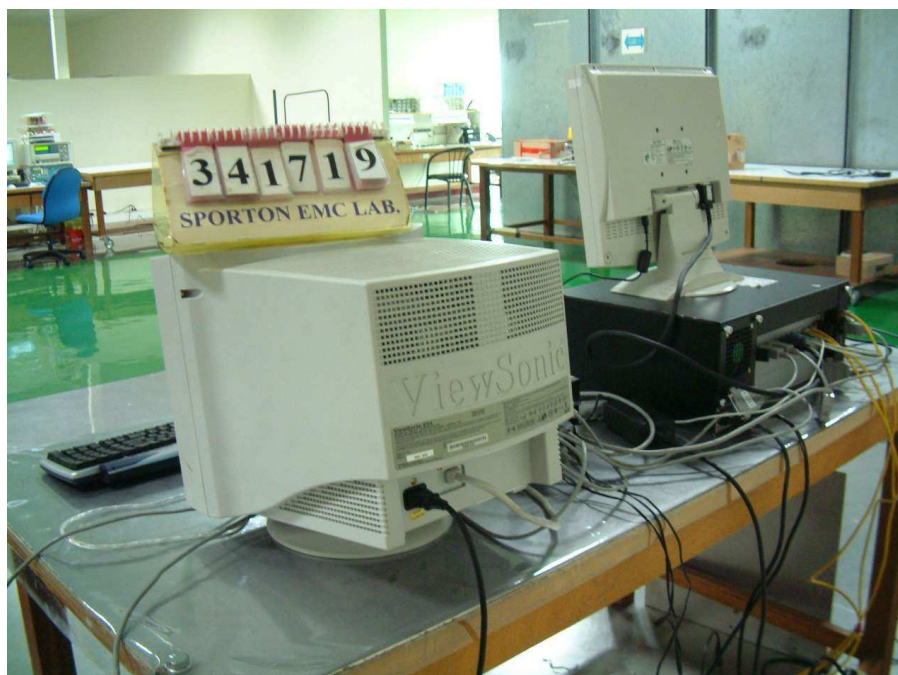
Test Engineer : 
Tiffany Wu

9.6 Photographs of Electrostatic Discharge Immunity Test

FRONT VIEW



REAR VIEW

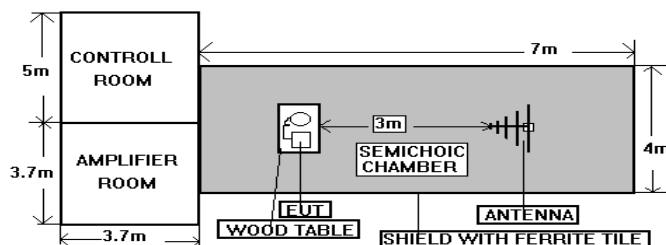


10. Radio Frequency Electromagnetic Field Immunity Test (RS)

- 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 : 23°C
- Relative Humidity : 57%
- Test Date : May 31, 2003
- Observation : Normal

- FINAL TEST RESULT : **PASS**
- Pass Performance Criteria : A
- Required performance criteria : A
- Basic Standard : IEC 61000-4-3:1995
- Product Standard : EN 61000-6-2:2001
- Level : 3
- Frequency Range : 80-1000 MHz
- Field Strength : 10 V/m (Modulated 80% AM)
- Temperature : 23°C
- Relative Humidity : 57%
- Test Date : May 31, 2003
- Observation : Normal

10.1 Test setup



NOTE : The SPORTON 7m x 4m x 4m semichoc 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 semichoc chamber.

10.2 Test Procedure

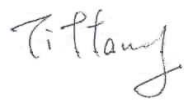
- The equipment to be tested is placed in the center of the enclosure on a wooden table. The equipment is then connected to power and signal leads according to pertinent installation instructions.
- The bilog antenna which is enabling the complete frequency range of 80-1000 MHz is placed 3m away from 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.
- 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.
- 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 : 

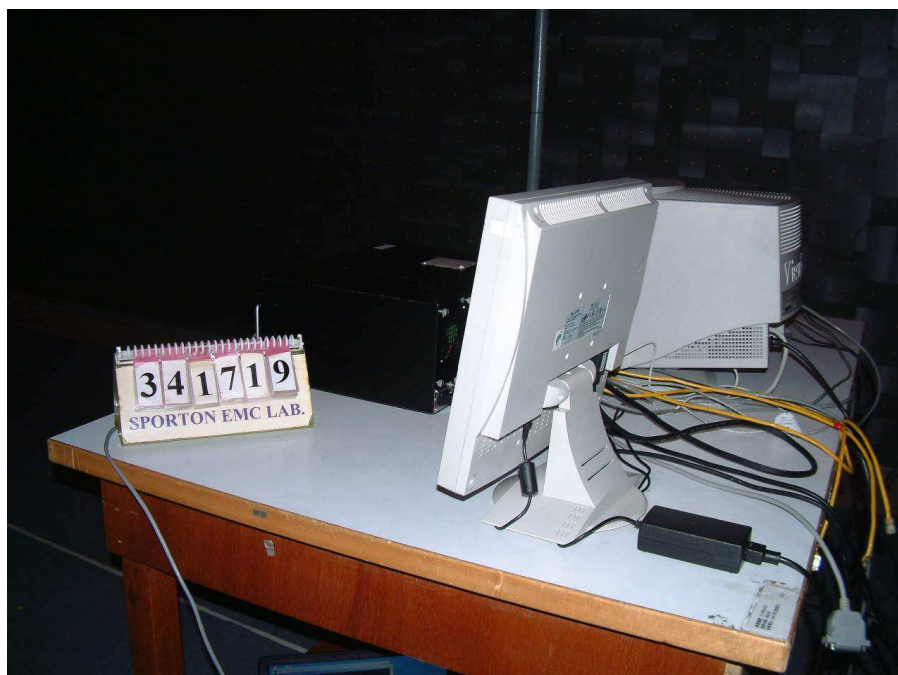
Tiffany Wu

10.4 Photographs of Radio Frequency Electromagnetic Field Immunity Test

FRONT VIEW



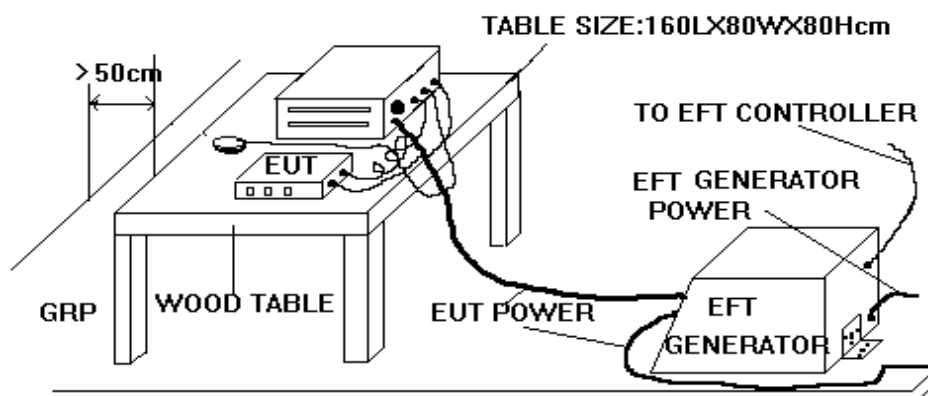
REAR VIEW



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 55024:1998/A1:2001
 - Level : on Power Supply -- 2
: on I/O signal, data and control line -- 2
 - Test Voltage : on Power Supply -- $\pm 0.5 / \pm 1.0$
: on I/O signal, data and control line -- $\pm 0.25 / \pm 0.5$
 - Temperature : 24°C
 - Relative Humidity : 58%
 - Test Date : May 31, 2003
 - Observation : Normal
-
- 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 -- $\pm 0.5 / \pm 1.0 / \pm 2.0\text{KV}$
: on I/O signal, data and control line -- $\pm 0.25 / \pm 0.5 / \pm 1.0\text{KV}$
 - Temperature : 24°C
 - Relative Humidity : 58%
 - Test Date : May 31, 2003
 - 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

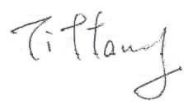
- a. In order to minimize the effect of environmental parameters on test results, the climatic conditions when test is carrying out shall comply with the following requirements:
 - ambient temperature: 15°C to 35°C;
 - relative humidity : 45% to 75%;
 - atmospheric pressure : 68 KPa (680 mbar) to 106 KPa (1060 mbar).
- i. In order to minimize the effect of environmental parameters on test results, the electromagnetic environment of the laboratory shall not influence the test results.
- j. 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.
- k. 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 :

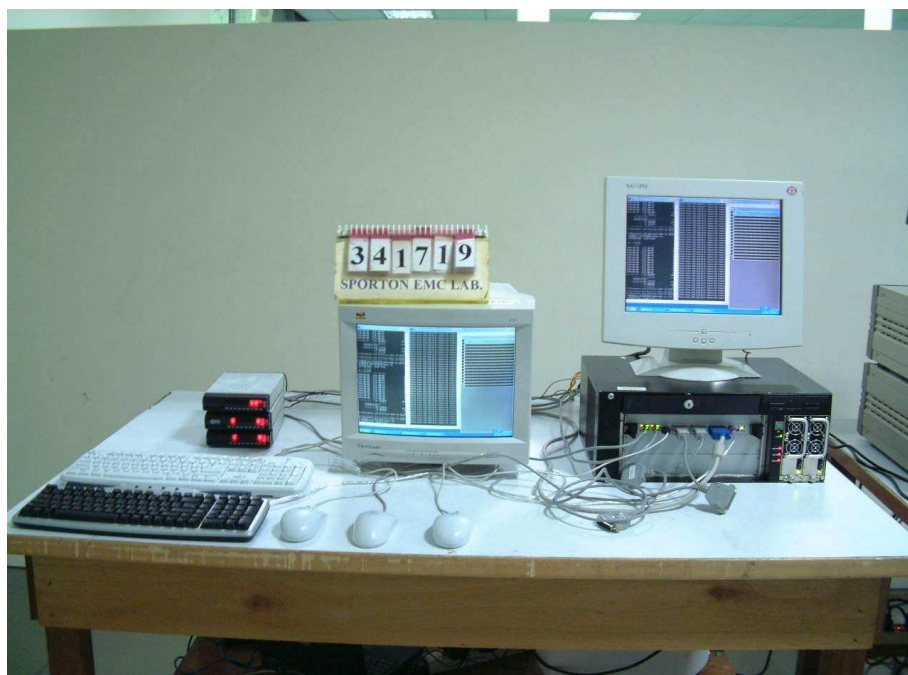
Open circuit output test voltage $\pm 10\%$		
Level	On Power Supply	On I/O signal, data and control line
1	0.5 KV	0.25 KV
2	1.0 KV	0.50 KV
3	2.0 KV	1.00 KV
4	4.0 KV	2.00 KV
X	Specified	Specified

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 : 
Tiffany Wu

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 55024:1998/A1:2001 & EN 61000-6-2:2001
- Surge wave form (Tr/Th) : 1, 2/50 (8/20) μ s
- Level : on RJ45 Ports – N/A
: on Input AC Power Port -- 3
- Test Voltage : on RJ45 Ports – N/A
: on Input AC Power Port -- $\pm 1.0 / \pm 2.0$ KV
- Temperature : 25°C
- Relative Humidity : 57%
- Test Date : May 31, 2003
- Observation : Normal
- Remark : *The test on RJ45 Ports are 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			
			0°	90°	180°	270°
1 KV	L - N	+	A	A	A	A
		—	A	A	A	A
2 KV	L - PE	+	A	A	A	A
		—	A	A	A	A
	N - PE	+	A	A	A	A
		—	A	A	A	A

⊕ Remark : PE = DC output GND

12.2 Test Level

Level	Open-circuit test voltage, $\pm 10\%$, 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

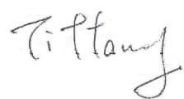
- a. Climatic conditions
The climatic conditions shall comply with the following requirements :
 - ambient temperature : 15 °C to 35 °C
 - relative humidity : 10 % to 75 %
 - atmospheric pressure : 86 kPa to 106 kPa (860 mbar to 1060 mbar)
- b. Electromagnetic conditions
The electromagnetic environment 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, they may be simulated. Under no circumstances may the test level exceed the product specification. The test shall be carried out according to 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.

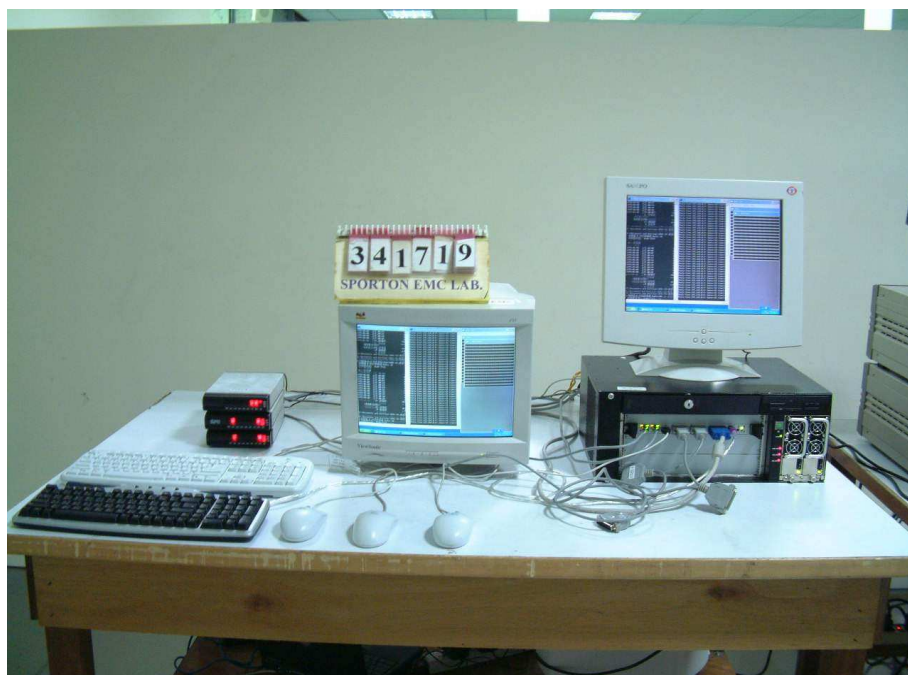
12.4 Operating Condition

Full system

Test Engineer : 
Tiffany Wu

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
- Test Port : on AC Power and RJ11 Ports
- Dwell time : 2.9 seconds
- Frequency step size : 1 %
- Coupling mode : CDN-M3 for AC power ports,
CDN-RJ45 for Signal / Telecommunication Ports
- Temperature : 23°C
- Relative Humidity : 55%
- Test Date : May 31, 2003
- Observation : *Normal*

- 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
- Test Port : on AC Power and RJ11 Ports
- Dwell time : 2.9 seconds
- Frequency step size : 1 %
- Coupling mode : CDN-M3 for AC power ports,
CDN-RJ45 for Signal / Telecommunication Ports
- Temperature : 23°C
- Relative Humidity : 55%
- Test Date : May 31, 2003
- Observation : *When testing at ± 10 V/m, from 0.15MHz to 80MHz, LAN was time out. After the test, the equipment continued to operate as intended without operator intervention.*

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

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



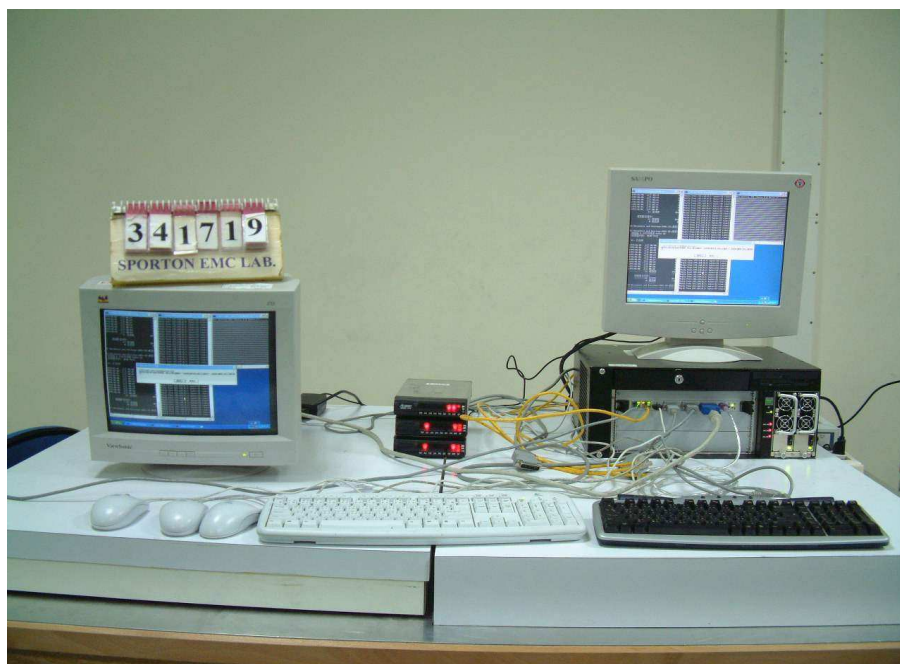
- g. In cases of dispute, the test procedure using a step size not exceeding 1% of the start and thereafter 1% of preceding frequency value shall take precedence.
- h. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.
- 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 : _____

Tiffany Wu

13.4 Photographs of Conducted Disturbances Induced by Radio-Frequency Field Immunity Test

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 & EN 61000-6-2:2001
- Temperature : 25°C
- Relative Humidity : 57%
- Test Date : May 31, 2003
- Observation : Normal

14.1 Test Record

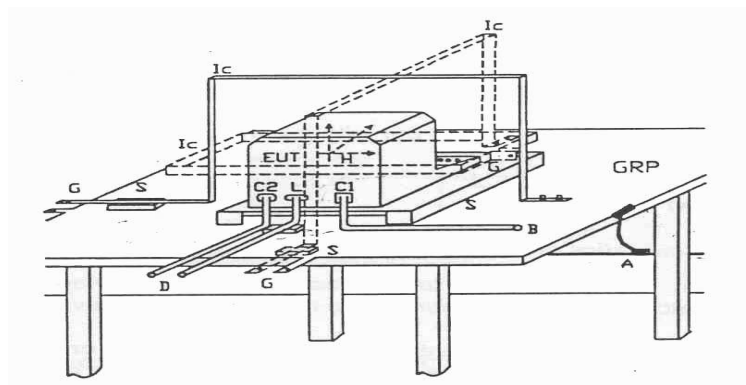
< EN 55024 >

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

< EN 61000-6-2 >

Power Frequency Magnetic Field	Testing duration	Coil Orientation
50/60Hz, 30A/m	1.0 Min	X-axis
50/60Hz, 30A/m	1.0 Min	Y-axis
50/60Hz, 30A/m	1.0 Min	Z-axis

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

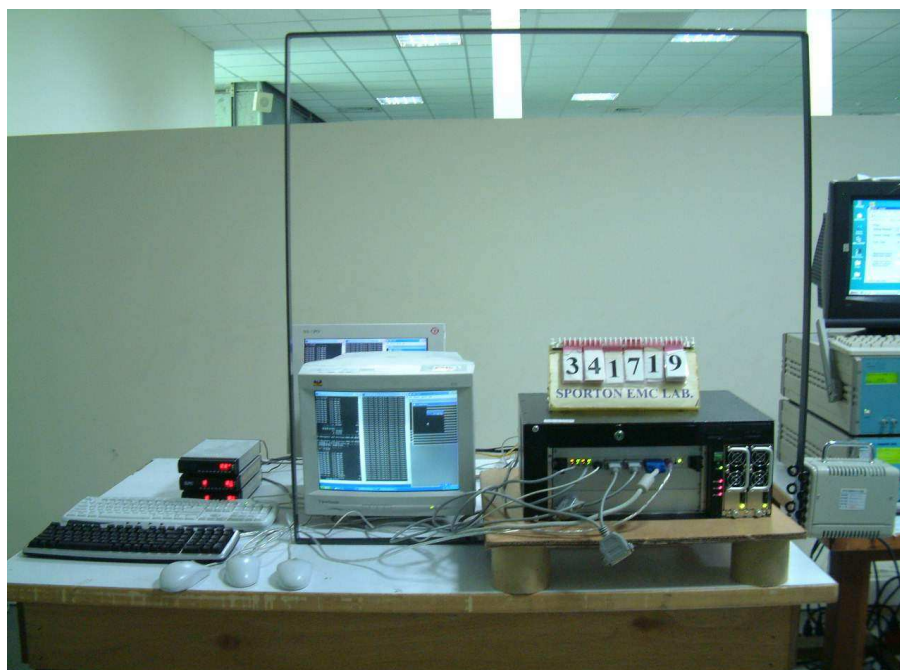
Test Engineer : _____

Tiffany

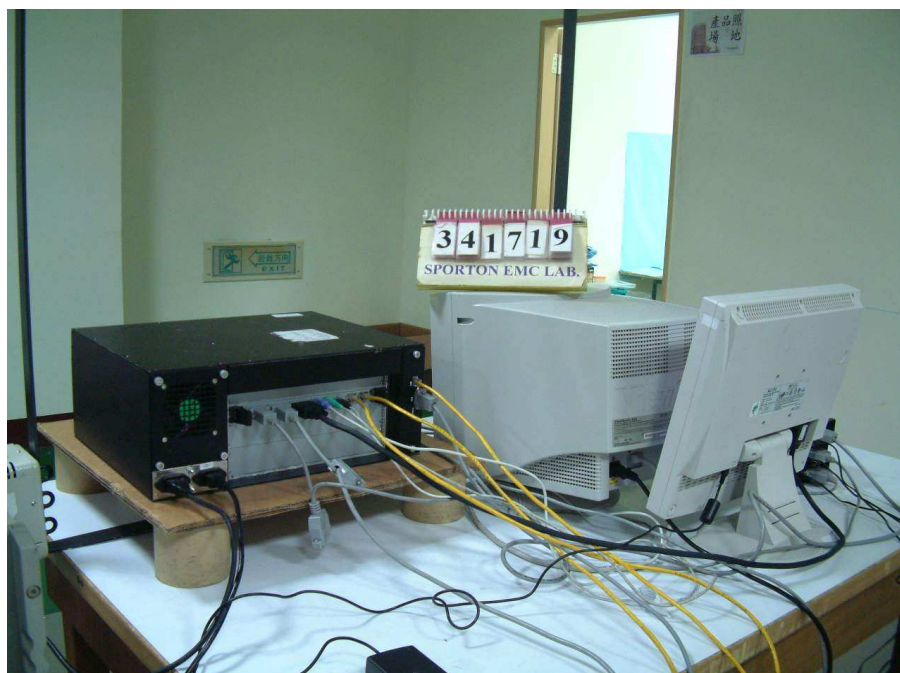
Tiffany Wu

14.3 Photographs of Power Frequency Magnetic Field Immunity Tests

FRONT VIEW



REAR VIEW



15. Voltage Dips and Voltage Interruption Immunity Tests

- FINAL TEST RESULT : **PASS**
- Pass performance Criteria : C for voltage interruption, A 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 & EN 61000-6-2:2001
- Temperature : 24°C
- Relative Humidity : 56%
- Test Date : May 31, 2003

15.1 Test Record of Voltage Interruption

< EN 55024 & EN 61000-6-2 >

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

15.2 Test Record of Voltage Dips

< EN 55024 >

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

< EN 61000-6-2 >

Voltage (V)	Phase Angle		% Reduction	periods (s)	Observation
	0 °	180 °			
230	A	A	60%	50	<i>Normal</i>
230	A	A	60%	5	<i>Normal</i>
230	A	A	30 %	0.5	<i>Normal</i>

15.3 Testing Requirement and Procedure

The test was based on IEC 61000-4-11:1994

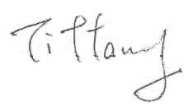
15.4 Test Conditions

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 μ s.
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

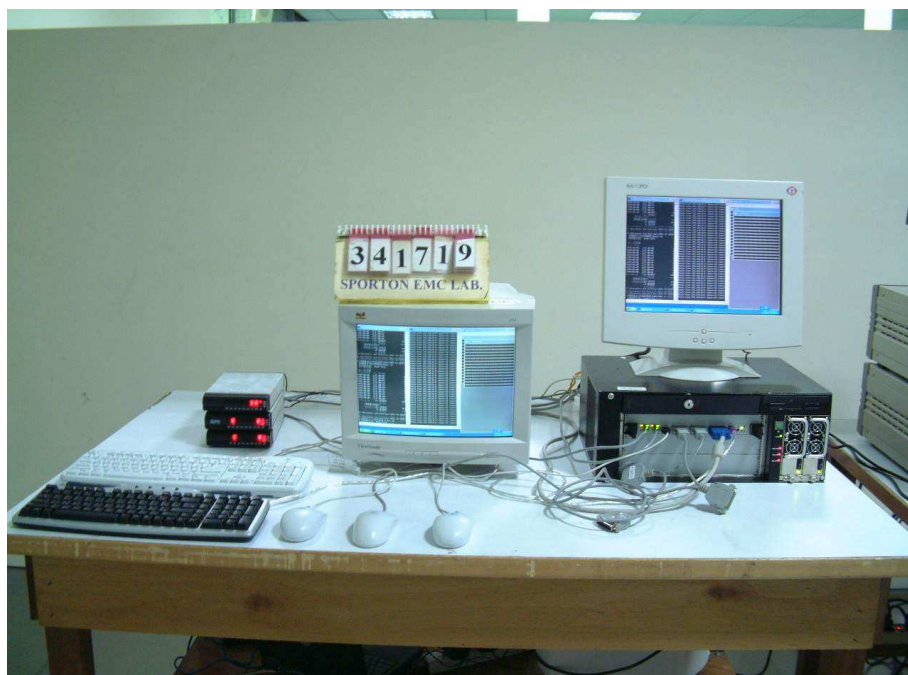
Full system

Test Engineer : 

Tiffany Wu

15.6 Photographs of Voltage Dips and Voltage Interruption Immunity Tests

FRONT VIEW



REAR VIEW



16. List of Measuring Equipment Used

< EMI >

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Receiver	R&S	ESCS 30	100174	9 KHz - 2.75 GHz	Dec. 12, 2002	Conduction (CO01-LK)
LISN	Telemeter	NNB-2/16Z	98009	9KHz ~ 30MHz	Dec.17, 2002	Conduction (CO01-LK)
LISN	Telemeter	NNB-2/16Z	98087	9KHz ~ 30MHz	Dec. 17, 2002	Conduction (CO01-LK)
RF Cable-CON	Suhner Switzerland	RG223/U	CB017	9KHz~30MHz	Jan. 08, 2003	Conduction (CO01-LK)
50 ohm BNC type Terminal	NOBLE	50ohm	TM002	50 ohm	May 19, 2003	Conduction (CO01-LK)
Impedance Stabilization Network	Schaffner	T400	16008	150KHz ~ 230MHz	May 19, 2003	Conduction (Telecommunication port)
Open Area Test Site	SPORTON	OATS-10	OS03-LK	30MHz~1GHz 10m,3m	Nov. 09, 2002	Radiation (OS03-LK)
Spectrum Analyzer	Advantest	R3261C	71720760	30MHz ~ 2.6GHz	Mar. 27, 2003	Radiation (OS03-LK)
Amplifier	HP	8447D	2944A09073	0.1MHz -1.3GHz	Sep. 27, 2002	Radiation (OS03-LK)
Bilog Antenna	CHASE	CBL6112B	2674	30MHz -2GHz	Aug. 17, 2002	Radiation (OS03-LK)
Turn Table	EMCO	2080	9711-2021	0 ~ 360 degree	N/A	Radiation (OS03-LK)
Antenna Mast	EMCO	2075	9711-2115	1 m- 4 m	N/A	Radiation (OS03-LK)
RF Cable-R10m	BELDEN	RG8/U	CB009	30MHz~1GHz	Jan. 30, 2003	Radiation (OS03-LK)
RF Cable-R03m	BELDEN	RG8/U	CB010	30MHz~1GHz	Jan. 30, 2003	Radiation (OS03-LK)

※ 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	9503213	Air: 0 KV - 15 KV Contact: 0 KV -8KV	May 28, 2003	ESD
Antenna	CHASE	CBL6121A	1027	26 MHz - 1 GHz	March.6.2003	RS01
Field Strength Monitoring Antennas (Probe)	AR	FP3000A	16077	0.1 MHz - 1 GHz	July 08.2002	RS
RS immunity Test system	HP	EMS test System	2062	80 MHz - 1 GHz 3V/m, 10v/m	Jun. 17, 2002	RS
Amplifier	AR	100W 1000M3	16060	80 MHz - 1 GHz	Nov. 27, 2002	RS
Power Meter	EMC Automation	438A	3513U04050	100 KHz -4.2 GHz	Nov. 26, 2002	RS
Signal Generator	HP	8648A	3426A00771	100 KHz - 1 GHz	Jan.17, 2003	RS
Power Sensor	HP	8481D	3318A13140	100 KHz - 1 GHz	Nov. 26, 2002	RS
Power Sensor	HP	8482A	3318A26464	100 KHz - 1 GHz	Nov. 26, 2002	RS
Attenuator	HP	8491A	53603	100 KHz - 1 GHz	Nov. 26, 2002	RS
EFT Generator	EMC -PARTNER	TRANSIENT -2000	TRA2000-376	0KV - 4.4 KV	May. 05, 2003	EFT
EFT/Clamp	EMC -PARTNER	CH4242	CNEFT1000 -200	0 KV -1 KV	Sep. 04, 2002	EFT
Harmonic/Flicker Test System	EMC PARTNER	Harmonics -1000	HAR1000-41	4000VA 16A PEAK	June. 24, 2002	Harmonics, Flicker
SURGE Generator	EMC -PARTNER	TRANSIENT -2000	TRA2000-376	0 KV -6 KV/2 Ω 0KV-500V/12 Ω	May. 05, 2003	SURGE
Conducted Immunity Test System	FRANKONIA	CIT-10	102C3115	100KHz ~ 266MHz	Apr. 01.2003	CS
Coupling and Decoupling Network	FRANKONIA	CDN M3	A3003012	150KHz ~ 230MHz	Apr. 04.2003	CS
Coupling and Decoupling Network	FRANKONIA	CDN RJ45	A3023001	150KHz ~ 230MHz	Apr. 07.2003	CS
Magnetic Generator	EMC -PARTNER	TRANSIENT -2000	TRA2000-376	230VA/50Hz/60Hz	May 05, 2003	Magnetic
DIP Generator	EMC -PARTNER	TRANSIENT -2000	TRA2000-376	230VA/50Hz/60Hz 0%Open/5S 0%Short/5S 40%/0.10S 70%/0.01S	May 05, 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.

