

FCC TEST REPORT

for

47 CFR, Part 2, Part 15 and CISPR PUB. 22 Class A

Equipment : STPC Half Size CPU Card

Model No. : HSB-440I Series

FCC ID : N/A

Filing Type : Verification

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

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SPORTON International Inc.

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

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History of this test report

Original Report Issue Date: Apr. 11, 2003

No additional attachment.

Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

CERTIFICATE OF COMPLIANCE

for

47 CFR, Part 2, Part 15 and CISPR PUB. 22 Class A

Equipment : STPC Half Size CPU Card
Model No. : HSB-440I Series
FCC ID : N/A
Applicant : **AAEON TECHNOLOGY INC.**
5F, No. 135, Lane235, Pao Chiao, Rd.,
Taipei Hsintien, Taiwan, R.O.C

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 - 1992** and the energy emitted by this equipment was **passed CISPR PUB. 22, FCC Part 15** in both radiated and conducted emission class A limits. Testing was carried out on Apr. 08, 2003 at **SPORTON International Inc.** LAB.



K. J. Lin
Manager

SPORTON International Inc.

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

1. General Description of Equipment under Test

1.1. Applicant

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

1.2. Manufacturer

Same as 1.1

1.3. Basic Description of Equipment under Test

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

1.4. Feature of Equipment under Test

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

2. Test Configuration of Equipment under Test

2.1. Test Manner

- a. The EUT has been associated with peripherals pursuant to ANSI C63.4-1992 and configuration operated in a manner which tended to maximize its emission characteristics in a typical application.
- b. The complete test system included remote COMPAQ NOTEBOOK, VIEWSONIC Monitor, BTC PS/2 Keyboard, LOGITECH PS/2 MOUSE, HP PRINTER, ACEEX MODEM, AAEON Sever and EUT for EMI test.
- c. The following test modes were performed for EMI power line test:
Mode 1. LAN:100M, CPU : 133MHz
Mode 2. LAN:10M, CPU : 133MHz.
- d. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 2000MHz.

2.2. Description of Test System

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

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

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

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

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

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

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

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

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

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

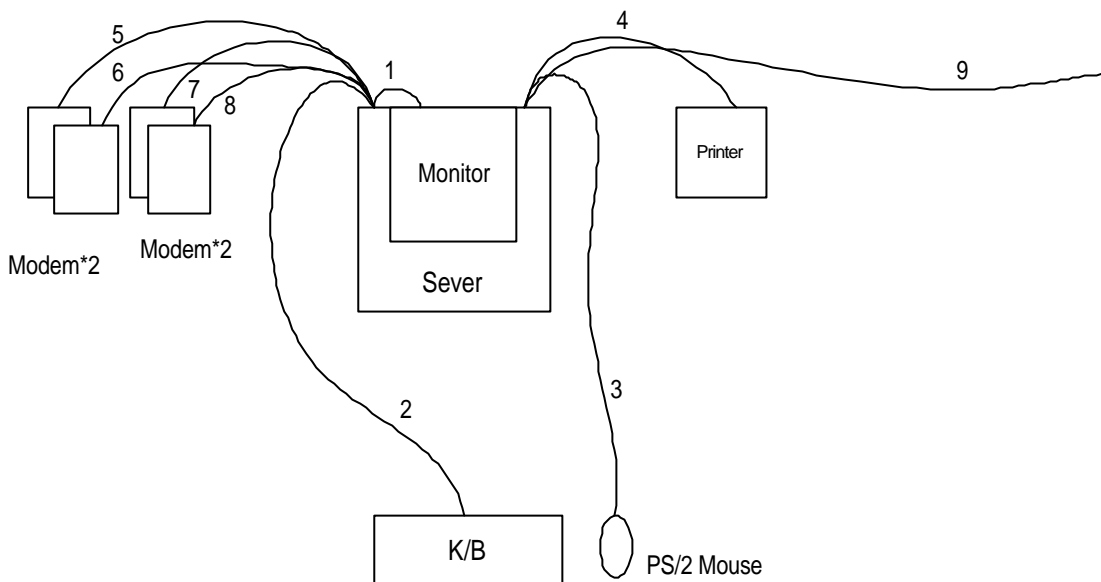
Support Unit 6. -- Notebook (COMPAQ) -- for remote workstation

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

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

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

2.3. Connection Diagram of Test System



1. The I/O cable is connected from Sever to the support unit 1.
2. The I/O cable is connected from Sever to the support unit 2.
3. The I/O cable is connected from Sever to the support unit 3.
4. The I/O cable is connected from Sever to the support unit 4.
5. The I/O cable is connected from Sever to the support unit 5.
6. The I/O cable is connected from Sever to the support unit 5.
7. The I/O cable is connected from Sever to the support unit 5.
8. The I/O cable is connected from Sever to the support unit 5.
9. The I/O cable is connected from Sever to remote workstation.

3. Test Software

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

The program was executed as follows:

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

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

4. General Information of Test

4.1. Test Facility

Test Site Location : No. 52, Hwa Ya 1St Road, Hwa Ya Technology Park,
Kwei-Shan Hsiang, TaoYuan Hsien, Taiwan, R.O.C.
TEL : 886-3-3273456
FAX : 886-3-3180055
Test Site No. : CO01-HY, 10CH01-HY

4.2. Test Voltage

115V/60Hz

4.3. Standard for Methods of Measurement

ANSI C63.4-1992

4.4. Test in Compliance with

CISPR PUB. 22 and FCC Part 15

4.5. Frequency Range Investigated

- a. Conduction: from 150 kHz to 30 MHz
- b. Radiation : from 30 MHz to 2,000 MHz

4.6. Test Distance

The test distance of radiated emission from antenna to EUT is 10 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 ANSI C63.4-1992 Section 3.1. 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 produced maximum conducted emissions.

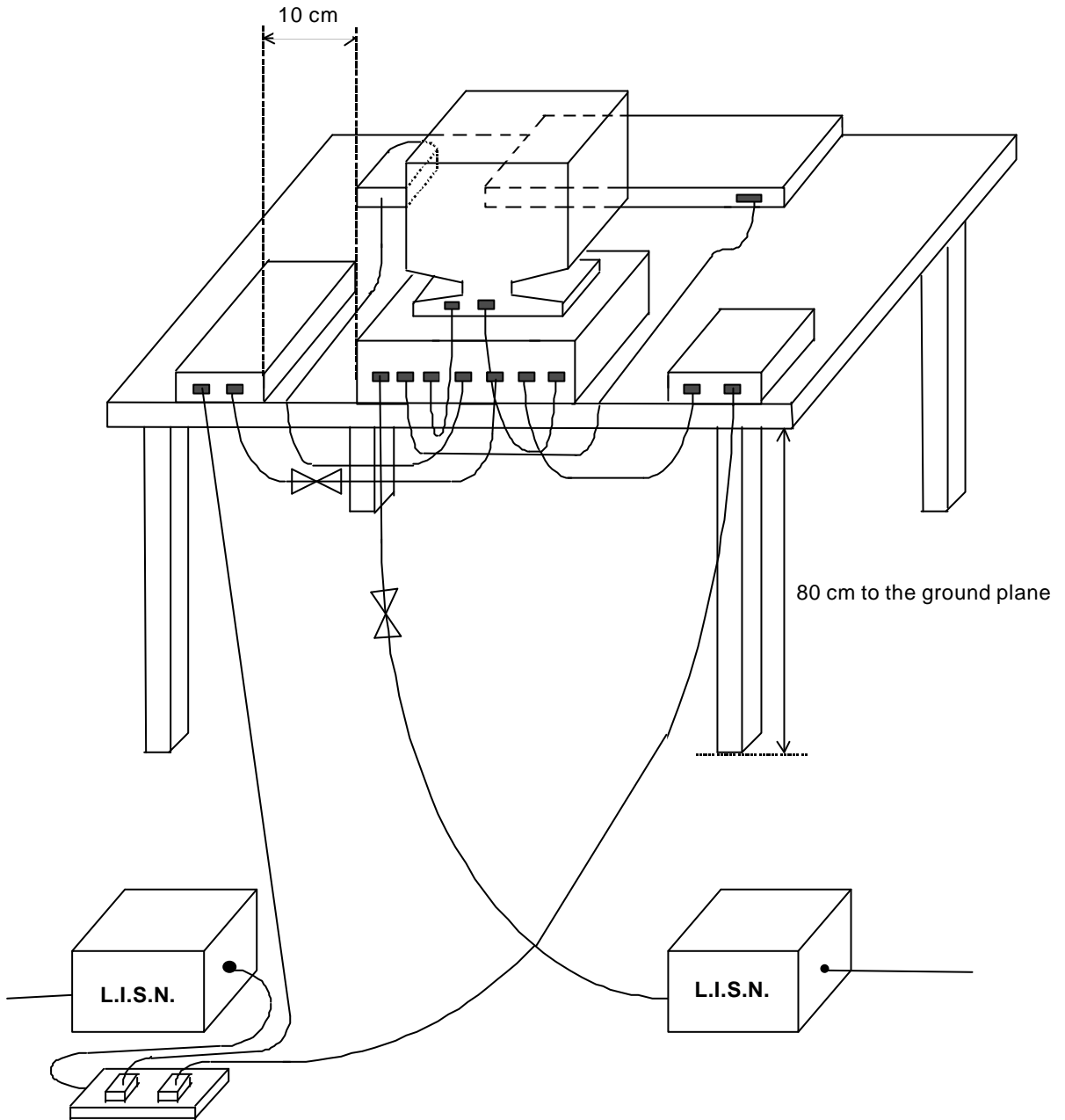
5.1. Major Measuring Instruments

- 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 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters 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 FCC 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. Test Result of AC Powerline Conducted Emission

5.4.1. Test Mode: Mode 1

- Frequency Range of Test : from 0.15 MHz to 30 MHz
- Temperature: 25.6°C
- Relative Humidity: 54%
- Test Date: Apr. 08, 2003

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

Frequency (MHz)	Line or Neutral	Meter Reading		Limits		Margin	
		Q.P. (dBuV)	A.V. (dBuV)	Q.P. (dBuV)	A.V. (dBuV)	Q.P. (dB)	A.V. (dB)
0.165	L	49.33	49.90	79.00	66.00	-29.67	-16.10
0.232	L	38.11	38.45	79.00	66.00	-40.89	-27.55
0.299	L	29.94	29.74	79.00	66.00	-49.06	-36.26
0.361	L	25.58	24.14	79.00	66.00	-53.42	-41.86
6.410	L	27.61	24.16	73.00	60.00	-45.39	-35.84
26.950	L	24.91	20.01	73.00	60.00	-48.09	-39.99
0.165	N	51.40	52.06	79.00	66.00	-27.60	-13.94
0.232	N	39.30	39.88	79.00	66.00	-39.70	-26.12
0.297	N	29.25	27.84	79.00	66.00	-49.75	-38.16
0.363	N	27.98	24.56	79.00	66.00	-51.02	-41.44
4.850	N	24.32	21.49	73.00	60.00	-48.68	-38.51
6.220	N	30.01	28.07	73.00	60.00	-42.99	-31.93


Test Engineer : 
 John Huang

5.4.2. Test Mode: Mode 2

- Frequency Range of Test : from 0.15 MHz to 30 MHz
- Temperature: 25.6°C
- Relative Humidity: 54%
- Test Date: Apr. 08, 2003

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

Frequency (MHz)	Line or Neutral	Meter Reading		Limits		Margin	
		Q.P. (dBuV)	A.V. (dBuV)	Q.P. (dBuV)	A.V. (dBuV)	Q.P. (dB)	A.V. (dB)
0.166	L	49.34	49.94	79.00	66.00	-29.66	-16.06
0.232	L	38.47	38.83	79.00	66.00	-40.53	-27.17
0.299	L	30.26	30.03	79.00	66.00	-48.74	-35.97
0.428	L	25.07	22.15	79.00	66.00	-53.93	-43.85
0.759	L	24.28	22.79	73.00	60.00	-48.72	-37.21
6.220	L	30.47	28.55	73.00	60.00	-42.53	-31.45
0.166	N	51.21	51.89	79.00	66.00	-27.79	-14.11
0.230	N	39.62	40.20	79.00	66.00	-39.38	-25.80
0.296	N	29.29	27.92	79.00	66.00	-49.71	-38.08
0.363	N	28.02	24.56	79.00	66.00	-50.98	-41.44
0.759	N	24.24	22.50	73.00	60.00	-48.76	-37.50
6.220	N	30.75	28.77	73.00	60.00	-42.25	-31.23

Test Engineer : 

 John Huang

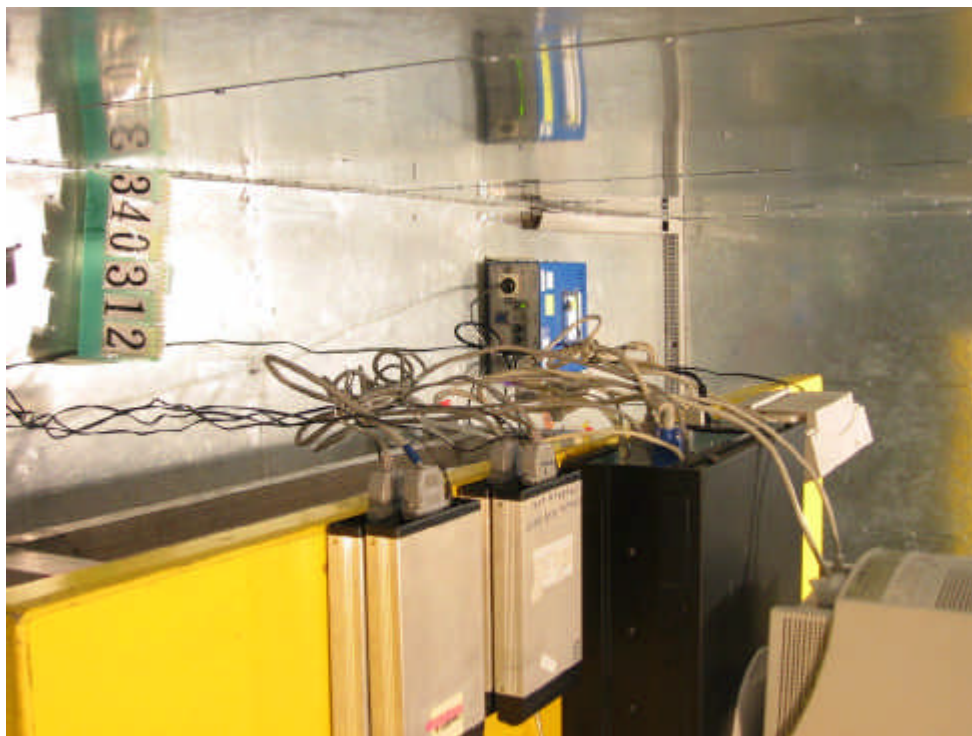
5.5. Photographs of Conducted Powerline Test Configuration

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

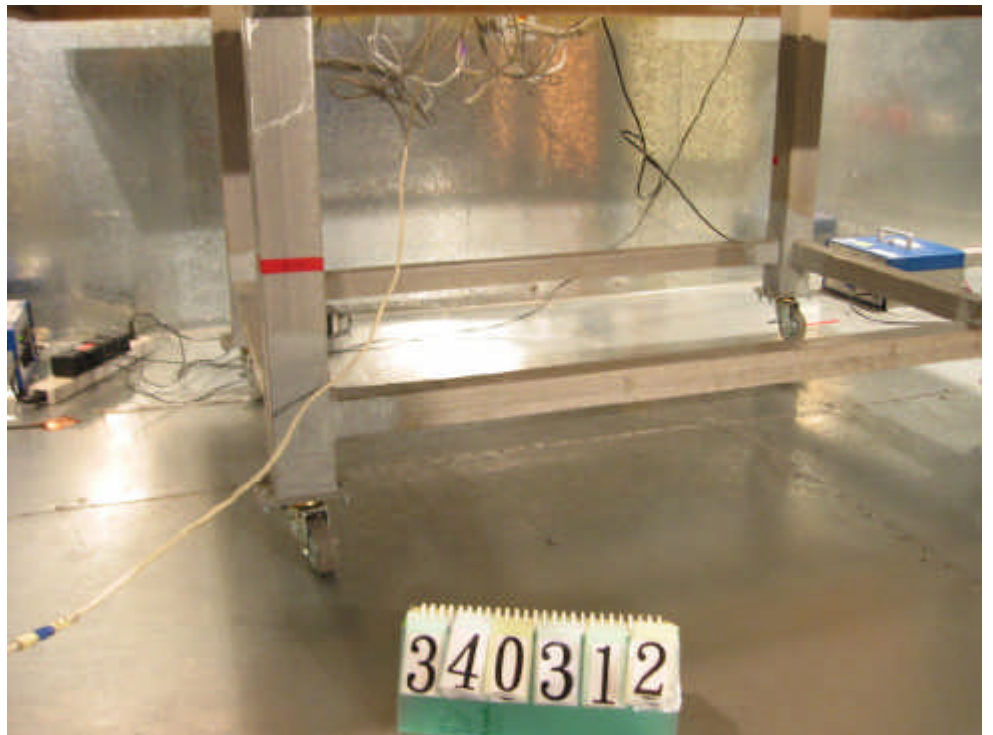
FRONT VIEW



REAR VIEW



SIDE VIEW



6. Test of Radiated Emission

Radiated emissions from 30 MHz to 2000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in ANSI C63.4-1992. 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. Major Measuring Instruments

- Amplifier (ADVENTEST BB525C)
 - RF Gain 30 dB
 - Signal Input 9 KHz to 3 GHz

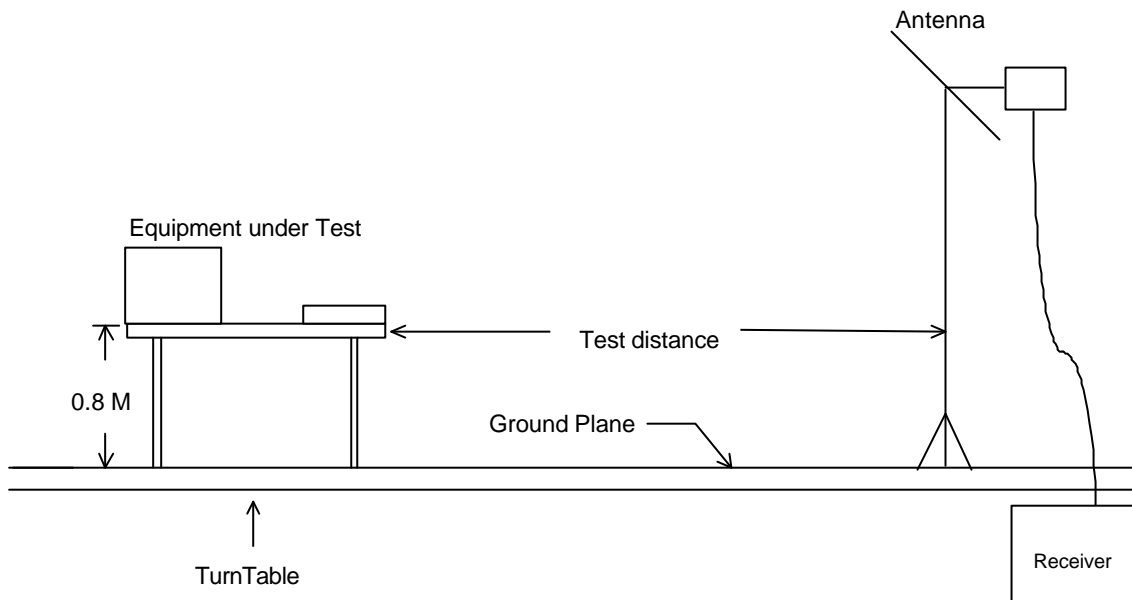
- Spectrum Analyzer (R&S FSP7)
 - Attenuation 10 dB
 - Start Frequency 30 MHz
 - Stop Frequency 1000 MHz
 - Resolution Bandwidth 120 KHz for below 1GHz
1 MHz for above 2GHz
 - Signal Input 9 KHz to 7 GHz

- Test Receiver (R&S ESI 7)
 - Attenuation 10 dB
 - Start Frequency 30 MHz
 - Stop Frequency 1000 MHz
 - Resolution Bandwidth 120 KHz for below 1GHz
1 MHz for above 2GHz
 - Signal Input 20 Hz to 7 GHz

6.2. Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.

6.3. Typical Test Setup Layout of Radiated Emission



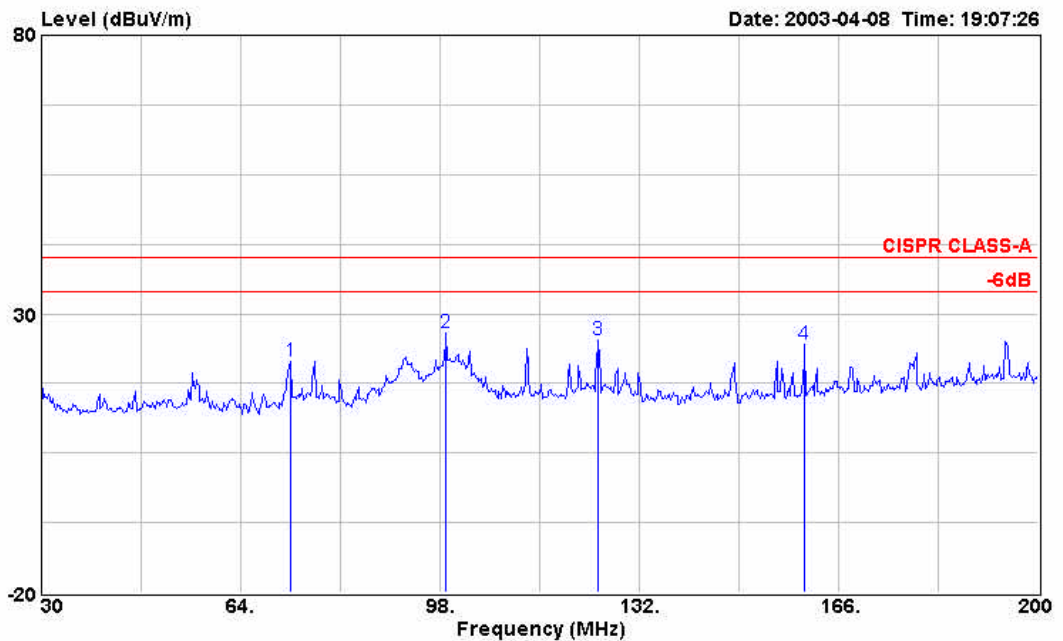
6.4. Test Result of Radiated Emission

6.4.1. Test mode : Mode 1

- Frequency Range of Test : from 30 MHz to 2,000 MHz
- Test Distance : 10M
- Temperature: 26.2°C
- Relative Humidity: 51 %
- Test Date: Apr. 08, 2003
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

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

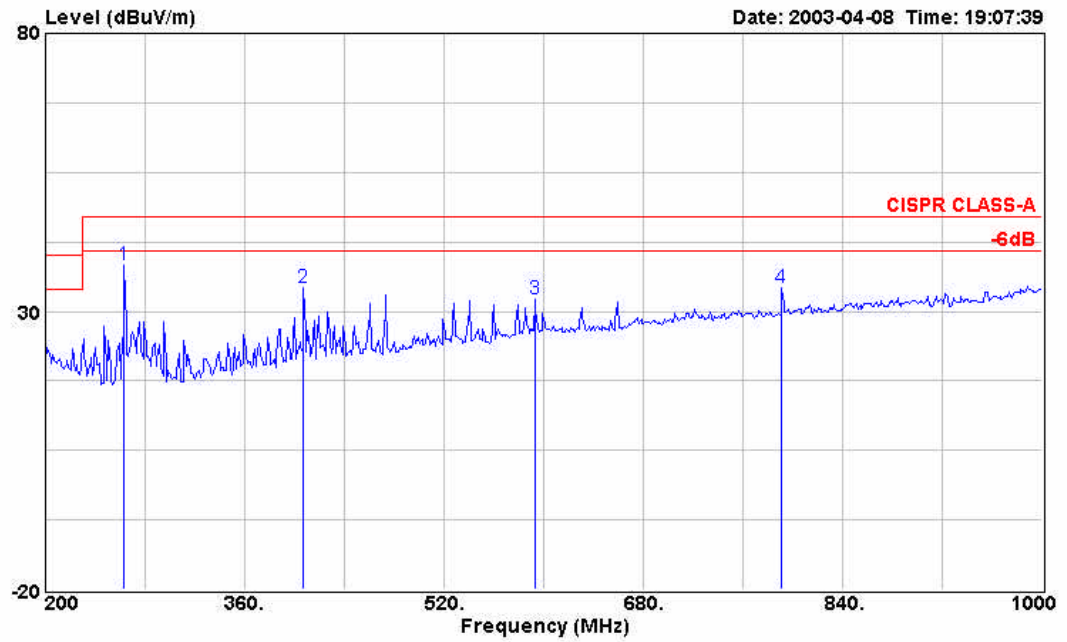
➤ Test Distance: 10M for 30MHz ~ 1GHz



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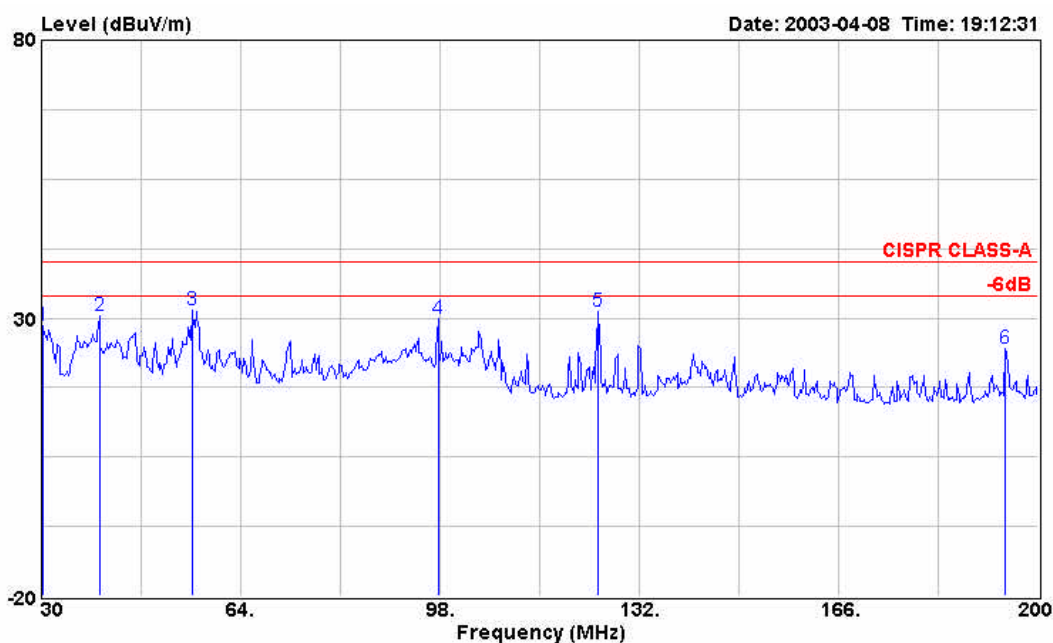
Site      : 10CH01-HY
Condition : CISPR CLASS-A 10m BICONICAL-9124-286 VERTICAL
EUT       : IPC CPU BOARD
Power     : 110Vac/60Hz
Memo      : HSB-4401
Memo      : LAN 100Mbps
Memo      :
Memo      :
    
```

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	72.500	21.41	-18.59	40.00	44.09	10.11	1.26	34.05	Peak	---	---
2	99.020	26.63	-13.37	40.00	48.43	10.91	1.29	34.00	Peak	---	---
3	125.030	25.26	-14.74	40.00	47.50	10.45	1.31	34.00	Peak	---	---
4	160.220	24.39	-15.61	40.00	44.50	12.49	1.40	34.00	Peak	---	---



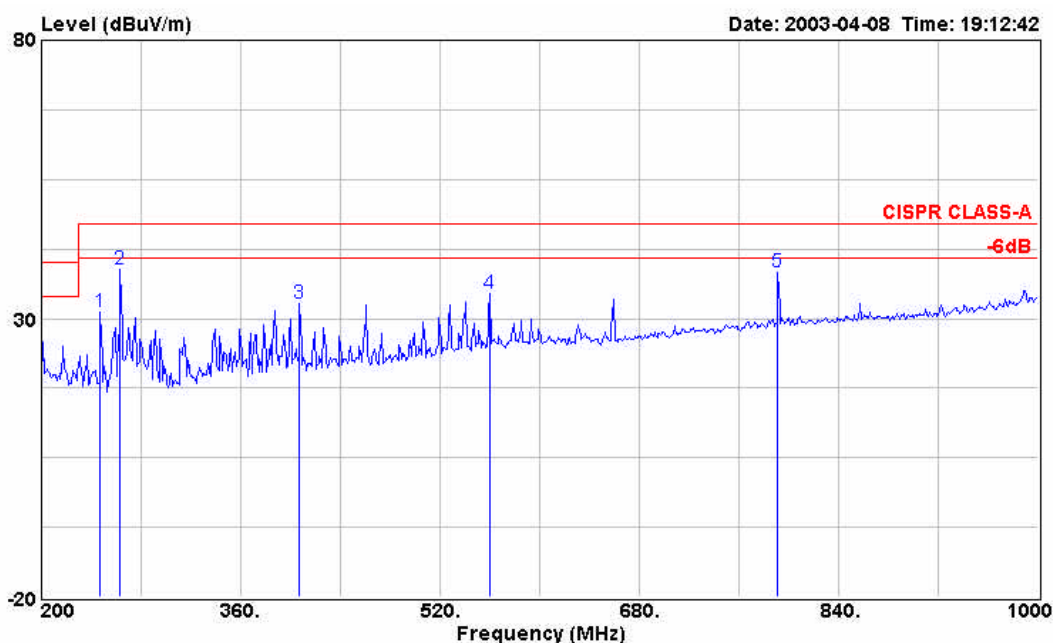
Site : 10CH01-HY
 Condition : CISPR CLASS-A 10m LOG-9111-206 VERTICAL
 EUT : IPC CPU BOARD
 Power : 110Vac/60Hz
 Memo : HSB-4401
 Memo : LAN 100Mbps
 Memo :
 Memo :

	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	263.200	38.35	-8.65	47.00	56.45	12.50	3.37	33.97	Peak	---	---
2	407.200	34.26	-12.74	47.00	47.44	16.06	4.34	33.58	Peak	---	---
3	592.800	32.18	-14.82	47.00	40.58	19.55	5.17	33.12	Peak	---	---
4	791.200	34.11	-12.89	47.00	39.65	21.19	5.78	32.51	Peak	---	---



Site : 10CH01-HY
 Condition : CISPR CLASS-A 10m BICONICAL-9124-286 HORIZONTAL
 EUT : IPC CPU BOARD
 Power : 110Vac/60Hz
 Memo : HSB-4401
 Memo : LAN 100Mbps
 Memo :
 Memo :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	30.340	28.64	-11.36	40.00	49.01	13.11	0.67	34.15	Peak	---	---
2	39.860	30.49	-9.51	40.00	52.56	11.15	0.90	34.12	Peak	---	---
3	55.670	31.37	-8.63	40.00	54.84	9.57	1.04	34.08	Peak	---	---
4	97.660	29.76	-10.24	40.00	51.88	10.67	1.21	34.00	Peak	---	---
5	125.030	31.08	-8.92	40.00	52.36	11.41	1.31	34.00	Peak	---	---
6	194.390	24.59	-15.41	40.00	44.12	12.81	1.66	34.00	Peak	---	---



Site : 10CH01-HY
 Condition : CISPR CLASS-A 10m LOG-9111-206 HORIZONTAL
 EUT : IPC CPU BOARD
 Power : 110Vac/60Hz
 Memo : HSB-4401
 Memo : LAN 100Mbps
 Memo :
 Memo :

	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	247.200	31.20	-15.80	47.00	49.23	12.75	3.22	34.00	Peak	---	---
2	263.200	38.74	-8.26	47.00	56.54	12.80	3.37	33.97	Peak	318	341
3	407.200	32.62	-14.38	47.00	46.18	15.68	4.34	33.58	Peak	---	---
4	560.000	34.54	-12.46	47.00	44.28	18.64	4.84	33.22	Peak	---	---
5	791.200	38.42	-8.58	47.00	44.63	20.52	5.78	32.51	Peak	---	---

- Test Distance: 3M for 1GHz ~ 2GHz
 Remark: Frequency from 1000MHz to 2000MHz, the emission emitted by the EUT is too low to be measured

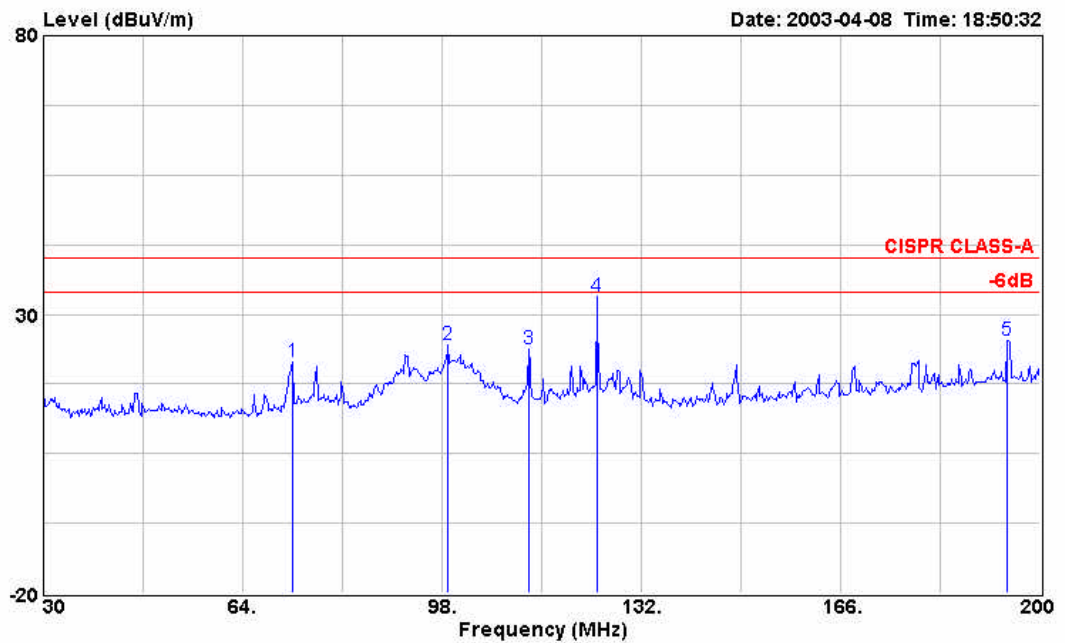
Test Engineer : _____
 Joke Yang

6.4.2. Test mode : Mode 2

- Frequency Range of Test : from 30 MHz to 2,000 MHz
- Test Distance : 10M
- Temperature: 26.2°C
- Relative Humidity: 51 %
- Test Date: Apr. 08, 2003
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

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

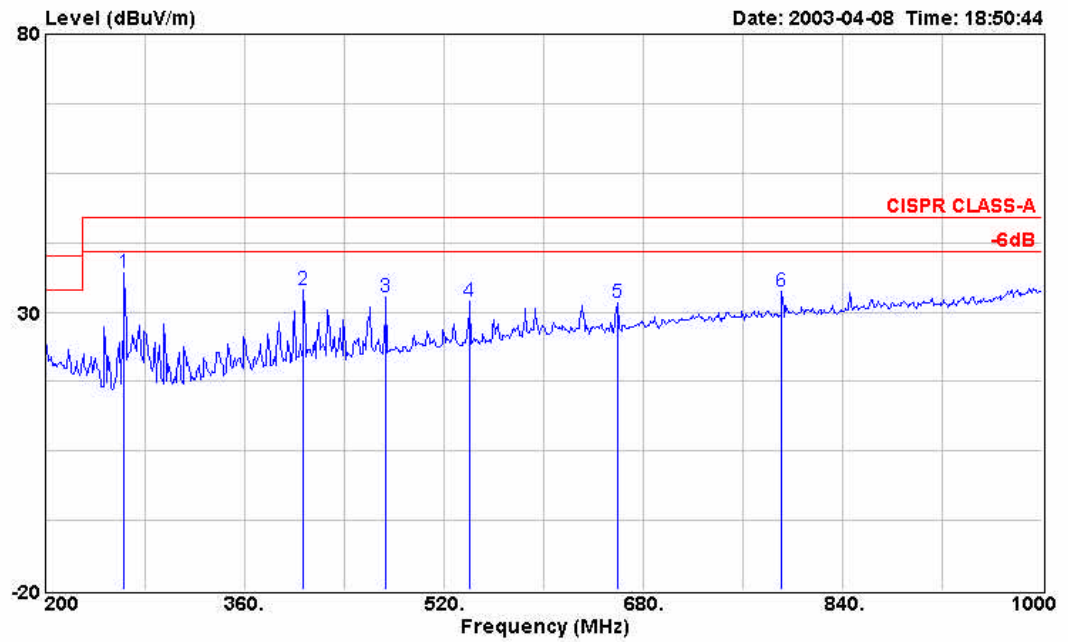
➤ Test Distance: 10M for 30MHz ~ 1GHz



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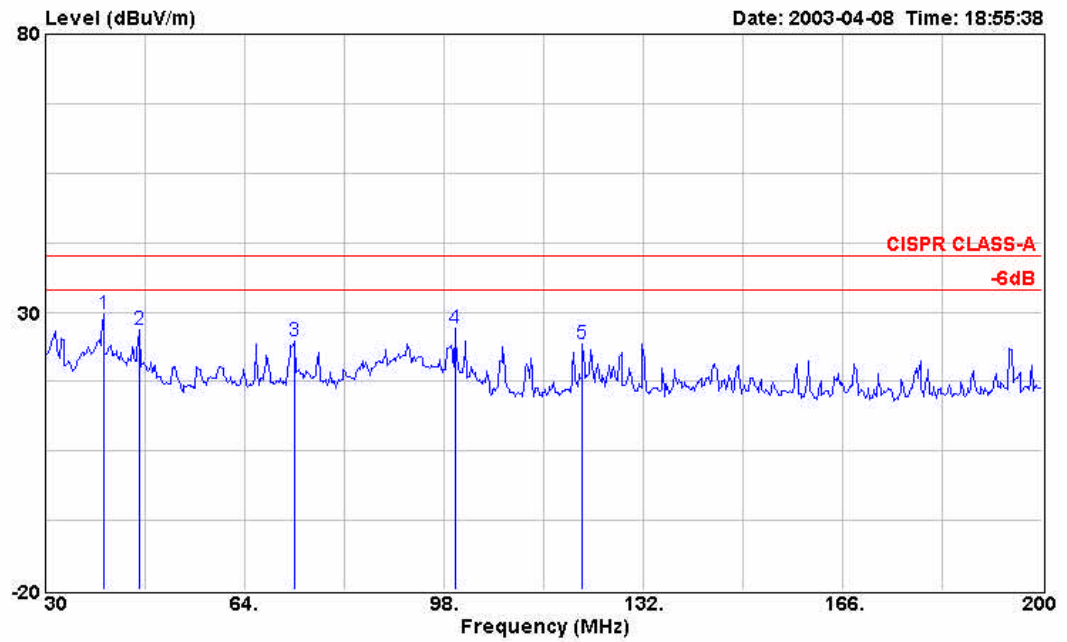
Site       : 10CH01-HY
Condition  : CISPR CLASS-A 10m BICONICAL-9124-286 VERTICAL
EUT       : IPC CPU BOARD
Power     : 110Vac/60Hz
Memo      : H8E-4401
Memo      : LAN 10Mbps
Memo      :
Memo      :
    
```

	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor		Pos	Pos
			dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	72.500	21.47	-18.53	40.00	44.15	10.11	1.26	34.05	Peak	---	---
2	99.020	24.62	-15.38	40.00	46.42	10.91	1.29	34.00	Peak	---	---
3	112.790	23.70	-16.30	40.00	45.81	10.61	1.28	34.00	Peak	---	---
4	124.350	33.22	-6.78	40.00	55.48	10.44	1.30	34.00	Peak	100	174
5	194.390	25.27	-14.73	40.00	42.38	15.23	1.66	34.00	Peak	---	---



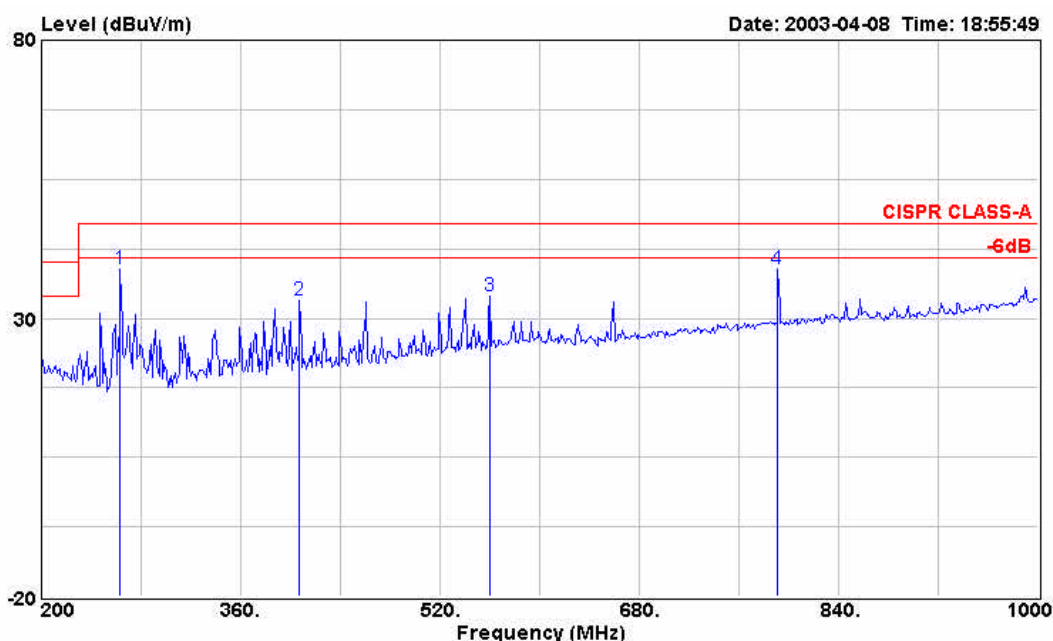
Site : 10CH01-HY
 Condition : CISPR CLASS-A 10m LOG-9111-206 VERTICAL
 EUT : IPC CPU BOARD
 Power : 110Vac/60Hz
 Memo : HSB-4401
 Memo : LAN 10Mbps
 Memo :
 Memo :

	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	263.200	37.07	-9.93	47.00	55.17	12.50	3.37	33.97	Peak	---	---
2	407.200	34.08	-12.92	47.00	47.26	16.06	4.34	33.58	Peak	---	---
3	473.600	32.76	-14.24	47.00	44.57	17.24	4.40	33.45	Peak	---	---
4	540.800	32.00	-15.00	47.00	42.18	18.15	4.94	33.27	Peak	---	---
5	659.200	31.61	-15.39	47.00	39.26	19.99	5.22	32.86	Peak	---	---
6	791.200	33.69	-13.31	47.00	39.23	21.19	5.78	32.51	Peak	---	---



Site : 10CH01-HY
 Condition : CISPR CLASS-A 10m BICONICAL-9124-286 HORIZONTAL
 EUT : IPC CPU BOARD
 Power : 110Vac/60Hz
 Memo : HSB-4401
 Memo : LAN 10Mbps
 Memo :
 Memo :

	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	39.860	29.60	-10.40	40.00	51.67	11.15	0.90	34.12	Peak	---	---
2	45.980	26.75	-13.25	40.00	49.81	10.24	0.80	34.10	Peak	---	---
3	72.500	24.70	-15.30	40.00	47.84	9.65	1.26	34.05	Peak	---	---
4	99.870	27.10	-12.90	40.00	48.96	10.82	1.32	34.00	Peak	---	---
5	121.630	24.30	-15.70	40.00	45.77	11.30	1.23	34.00	Peak	---	---



Site : 10CH01-HY
 Condition : CISPR CLASS-A 10m LOG-9111-206 HORIZONTAL
 EUT : IPC CPU BOARD
 Power : 110Vac/60Hz
 Memo : HSB-4401
 Memo : LAN 10Mbps
 Memo :
 Memo :

	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	263.200	38.73	-8.27	47.00	56.53	12.80	3.37	33.97	Peak	---	---
2	407.200	33.31	-13.69	47.00	46.87	15.68	4.34	33.58	Peak	---	---
3	560.000	33.86	-13.14	47.00	43.60	18.64	4.84	33.22	Peak	---	---
4	791.200	38.90	-8.10	47.00	45.11	20.52	5.78	32.51	Peak	---	---

- Test Distance: 3M for 1GHz ~ 2GHz
 Remark: Frequency from 1000MHz to 2000MHz, the emission emitted by the EUT is too low to be measured

Test Engineer : _____
 Joke Yang

6.5. Photographs of Radiated Emission Test Configuration

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

FRONT VIEW



REAR VIEW



7. Antenna Factor & Cable Loss

Frequency (MHz)	HORIZONTAL Antenna Factor (dB)	HORIZONTAL Cable Loss (dB)	VERTICAL Antenna Factor (dB)	VERTICAL Cable Loss (dB)
30	13.20	0.68	12.02	0.68
35	11.85	0.58	10.96	0.58
40	11.13	0.91	10.46	0.91
45	10.28	0.79	10.39	0.79
50	10.09	0.82	11.10	0.82
55	9.51	1.06	10.26	1.06
60	9.93	0.97	9.42	0.97
65	9.73	1.25	9.45	1.25
70	9.63	1.14	10.33	1.14
75	9.66	1.32	9.90	1.32
80	9.65	1.15	9.66	1.15
85	9.86	1.05	10.30	1.05
90	10.16	1.49	10.46	1.49
95	10.49	1.03	10.45	1.03
100	10.83	1.32	11.03	1.32
110	11.04	1.33	10.70	1.33
120	11.25	1.18	10.37	1.18
130	11.56	1.43	10.53	1.43
140	11.87	1.47	10.68	1.47
150	12.16	1.74	11.58	1.74
160	12.45	1.39	12.48	1.39
170	12.06	1.57	13.27	1.57
180	11.67	1.34	14.04	1.34
190	12.46	1.87	14.87	1.87
200	15.92	1.43	17.04	1.43
200	15.92	2.88	17.04	2.88
220	14.58	3.33	15.12	3.33
240	13.23	3.03	13.21	3.03
260	12.75	3.34	12.45	3.34
280	13.07	3.54	12.76	3.54
300	13.38	3.48	13.07	3.48
320	14.03	3.78	13.75	3.78
340	14.68	3.62	14.44	3.62
360	15.13	4.00	15.01	4.00
380	15.35	3.76	15.46	3.76
400	15.58	4.14	15.92	4.14
450	16.29	4.30	16.91	4.30
500	17.18	4.92	17.61	4.92
550	18.51	5.03	18.27	5.03
600	19.10	4.93	19.77	4.93
650	19.09	5.14	19.86	5.14
700	19.46	5.37	20.52	5.37
750	20.23	5.66	21.22	5.66
800	20.58	5.92	21.18	5.92
850	21.30	6.07	21.85	6.07
900	21.13	6.36	21.93	6.36
950	21.91	6.46	22.00	6.46
1000	22.53	6.54	23.23	6.54

8. List of Measuring Equipment Used

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

Calibration Interval of instruments listed above is one year.

9. Uncertainty of Test Site

Uncertainty of Radiated Emission Measurement

Contribution	Probability Distribution	3m	10m
Antenna factor calibration	normal(k=2)	± 1	± 1
cable loss calibration	normal(k=2)	± 0.3	± 0.3
RCV/SPA specification	rectangular	± 2	± 2
Antenna Directivity	rectangular	± 3	± 0.5
Antenna Factor V.S. Height	rectangular	± 2	± 2
Antenna Factor Interpolation for Frequency	rectangular	± 0.25	± 0.25
site imperfection	rectangular	± 2	± 2
Mismatch Receiver VSWR $\Gamma_1=0.09$ Antenna VSWR $\Gamma_2=0.67$ Uncertainty= $20\log(1-\Gamma_1\Gamma_2)$	U-shaped	± 0.54	± 0.54
combined standard uncertainty $U_e(y)$	normal	± 2.7	± 2.2
Measuring uncertainty for a level of confidence of 95% $U=2U_e(y)$	normal (k=2)	± 5.4	± 4.4

$U = \{ (1/2)^2 + (0.3/2)^2 + (2^2 + 0.5^2 + 2^2 + 0.25^2 + 2^2) / 3 + (0.54)^2 / 2 \} = 2.2$ for 10m test distance

$U = \{ (1/2)^2 + (0.3/2)^2 + (2^2 + 3^2 + 2^2 + 0.25^2 + 2^2) / 3 + (0.54)^2 / 2 \} = 2.7$ for 3m test distance

Uncertainty of Conducted Emission Measurement

Contribution	Probability Distribution	150KHz – 30MHz
Cable and I/P attenuator calibration	normal(k=2)	± 0.3
RCV/SPA specification	rectangular	± 2
LISN coupling specification	rectangular	± 1.5
Transducer factor frequency interpolation	rectangular	± 0.2
Mismatch Receiver VSWR $\Gamma_1=0.09$ LISN VSWR $\Gamma_2=0.33$ Uncertainty= $20\log(1-\Gamma_1\Gamma_2)$	U-shaped	0.2
combined standard uncertainty $U_e(y)$	normal	± 1.66
Measuring uncertainty for a level of confidence of 95% $U=2U_e(y)$	normal (k=2)	± 3.32

$U = \{ (0.3/2)^2 + (2^2 + 1.5^2 + 0.2^2) / 3 + (0.2)^2 / 2 \} = 1.66$

Appendix B. Normalized Site Attenuation

Calibrated by

Austrian Research Centers

SEIBERSDORF



ACCREDITED TESTING LABORATORY (NR. 32)
for Electromagnetic Compatibility

TEST REPORT NO. EH-H16/01

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

Ordered by: **SIDT Europe**

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

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

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

L/C N°: **OACAB1-00016.00**

Technical responsibility:

Date: **25.06.2001**

Test performed by:

Number of Pages: **48**

Comments:

The test results refers exclusively to the test subject.

The production or transmission of extracts of the present report is subject to authorisation by the testing laboratory

APPENDIX A. Photographs of EUT





