

FCC TEST REPORT

for

CISPR PUB. 22 CLASS B

EQUIPMENT : CARDEXpert SG4

MODEL NO. : 9821-01A

F C C I D : ICUVGA-GW821

FILING TYPE : Original Grant

APPLICANT : **GAINWARD CO., LTD.**
12F,#96,Hsin Tai Wu Rd. Sec.1,His-chih,
Taipei Hsien, Taiwan

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- Without the written authorization of the test lab., the Test Report may not be copied.
- Certificate or Test Report must not be used by the applicant to claim the product in this test report endorsement by NVLAP or any agency of U.S. government.

SPORTON INTERNATIONAL INC.

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

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CERTIFICATE OF COMPLIANCE

for

CISPR PUB. 22 CLASS B

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MODEL NO. : 9821-01A

F C C I D : ICUVGA-GW821

APPLICANT : **GAINWARD CO., LTD.**
12F, #96, Hsin Tai Wu Rd. Sec.1, His-chih,
Taipei Hsien, Taiwan

I HEREBY CERTIFY THAT :

The measurement shown in this 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 in both radiated and conducted emissions **Class B** limits. Testing was carried out on **APR. 21, 1999** at **SPORTON International Inc.**

Lenore Chang
President

SPORTON INTERNATIONAL INC.

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

1. GENERAL DESCRIPTION OF EQUIPMENT UNDER TEST

1.1. APPLICANT

GAINWARD CO., LTD.

12F,#96,Hsin Tai Wu Rd. Sec.1,His-chih,
Taipei Hsien, Taiwan

1.2. MANUFACTURER :

Same as 1.1

1.3. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

EQUIPMENT : CARDEXpert SG4

MODEL NO. : 9821-01A

FCC ID : ICUVGA-GW821

TRADE NAME : CARDEXpert

DATA CABLE : Shielded

POWER SUPPLY TYPE : N/A

POWER CORD : N/A

1.4. FEATURE OF EQUIPMENT UNDER TEST

- 128-bit S3 Savage4 3D/2D/Video Graphics Accelerator.
- 8/16/32 MB SDRAM Display Memory.
- Flat Panel Desktop Monitor Support(Flat Panel monitor dependent)
- Integrated 300MHz RAMDAC with Gamma Correction
- Sprite Anti-Aliasing, Reflection Mapping, Texture Morphing, Shadows, Procedural Textures and Atmospheric Effects
- Full Featured 2D Engine for Acceleration of BitBLT, Rectangle Fill, Panning/Scrolling and Hardware Cursor
- Maximum Resolution 1600x1200

2. TEST CONFIGURATION OF EQUIPMENT UNDER TEST

2.1. TEST MANNER

- a. The EUT has been associated with personal computer and 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 HITACHI monitor, DELL keyboard, PRIMAX PS/2 mouse, HP printer, ACEEX modem, ViewSonic LCD Monitor were connected to the FIC P.C. for EMI test.
- c. The following display resolution were investigated during the compliance test:
 - 1. LCD display (640x480 to 1024 x 768, 31.5KHz to 48KHz)
 - 2. CRT display (640x480 to 1600 x 1200, 31.5KHz to 106KHz)
- d. According to the above tests, we listed the following display modes as the worst cases:
 - 1. CRT display 1600 x 1200, 106KHz, 85Hz; 1280 x 1024, 91KHz, 85Hz
 - 2. LCD display 1024 x 768, 48KHz, 60Hz; 800 x 600, 48KHz, 60Hz
- e. Frequency range investigated: Conduction 150 KHz to 30 MHz, Radiation 30 MHz to 2000 MHz.

2.2. DESCRIPTION OF TEST SYSTEM

Support Device 1. --- MONITOR (HITACHI)

FCC ID : M9U9705C97BMD
Model No. : CM803ET
Serial No. : SP1019
Data Cable : Shielded, 360 degree via metal backshells, 1.15m
Power Supply Type : Switching
Power Cord : Non-shielded

Support Device 2. --- KEYBOARD (DELL)

FCC ID : GYUM92SK
Model No. : AT101 (DE8M)
Serial No. : SP1009
Data Cable : Shielded, 360 degree via metal backshells, 1.9m

Support Device 3. --- PRINTER (HP)

FCC ID : B94C2642X
Model No. : Desk Jet 400
Serial No. : SP0037
Data Cable : Shielded, 360 degree via metal backshells, 1.35m
Power Supply Type : Linear, AC Adapter
Power Cord : Non-shielded

Support Device 4. -- MODEM (ACEEX)

FCC ID : IFAXDM1414
Model No. : DM1414
Power Supply Type : Linear, AC Adapter
Power Cord : Non-shielded
Serial No. : SP1019
Data Cable : Shielded, 360 degree via metal backshells, 1.15m

Support Device 5. – PS/2 MOUSE (PRIMAX)

FCC ID : EMJMUJSJQ
Model No. : MUS9J
Serial No. : SP1009
Data Cable : Shielded, 360 degree via metal backshells, 1.7m

Support Device 6. --- P.C. (FIC)

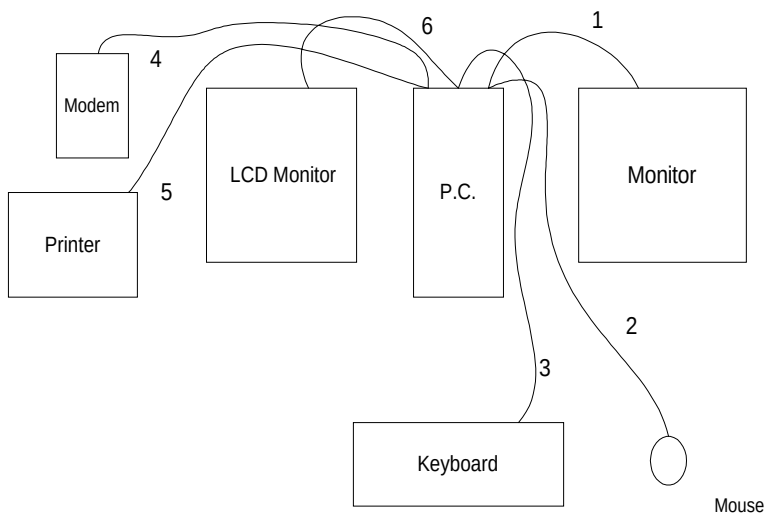
FCC ID : N/A
Model No. : P2L97
Serial No. : SP1005
Data Cable : Shielded
Power Cord : Non-shielded
Power Supply Type : Switching

(Remark : This support device was tested to comply with FCC standards and authorized under a declaration of conformity.)

Support Device 7. – LCD Monitor (ViewSonic)

FCC ID : N/A
Model No. : VPD150
Serial No. : SP1019
Data Cable : Shielded, 360 degree via metal backshells, 1.8m

(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 was connected from EUT to the support device 1.
2. The I/O cable was connected from the PC to the support device 5.
3. The I/O cable was connected from the PC to the support device 2.
4. The I/O cable was connected from the PC to the support device 4.
5. The I/O cable was connected from the PC to the support device 3.
6. The I/O cable was connected from EUT to the support device 7.

3. TEST SOFTWARE

An executive program, WINFCC.EXE under WIN 98, 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 floppy disk drive and runs it.
- c. The PC sends " H " messages to the monitor, and the monitor displays " H " patterns on the screen.
- d. The PC sends " H " messages to the printer, then the printer prints them on the paper.
- e. The PC sends " H " messages to the modem.
- f. The PC sends " H " messages to the internal Hard Disk, and the Hard Disk reads and writes the message.
- g. Repeat the steps from b to f.

4. GENERAL INFORMATION OF TEST

4.1. TEST FACILITY

This test was carried out by SPORTON International Inc.

Openarea 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

4.2. STANDARD FOR METHODS OF MEASUREMENT

ANSI C63.4-1992

4.3 .TEST IN COMPLIANCE WITH

CISPR PUB. 22 CLASS B

4.4. FREQUENCY RANGE INVESTIGATED

- a. Conduction : from 150 KHz to 30 MHz
- b. Radiation : from 30 MHz to 2000 MHz.

4.5. TEST DISTANCE

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

5. TEST OF CONDUCTED POWERLINE

Conducted Emissions were measured from 150 KHz to 30 MHz with a bandwidth of 9 KHz on the 115 VAC power 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 Figure 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

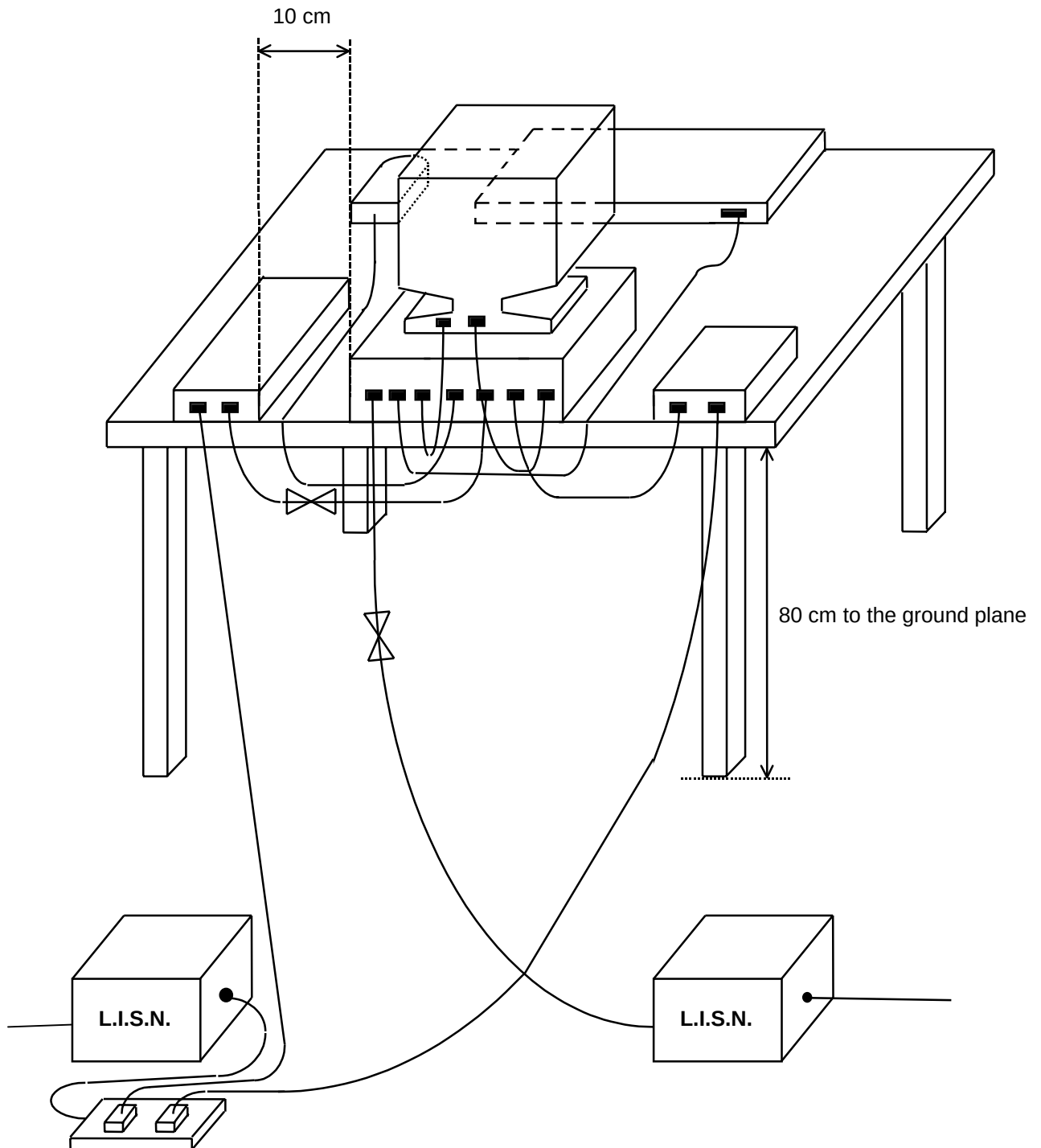
- Test Receiver (HP 8591EM)

Attenuation	0 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
Step MHz	0.007 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 and 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.
- i. If the emission level of the EUT in peak mode was 6 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 6 dB margin will be retested on by one using the quasi-peak method and reported.

5.3. TYPICAL TEST SETUP LAYOUT OF CONDUCTED POWERLINE



5.4. TEST RESULT OF AC POWERLINE CONDUCTED EMISSION

5.4.1 Test Mode : CRT Display, **1600x1200 106K/85Hz**

- Frequency Range of Test : from 0.15 MHz to 30 MHz
- All emissions not reported here are more than 10 dB below the prescribed limit.
- Temperature : 28•
- Relative Humidity : 61% RH
- Test Date : Apr. 21, 1999

The Conducted Emission test was passed at **NEUTRAL 0.202 MHz / 45.70 dBuV.**

Frequency (MHz)	Line or Neutral	Meter Reading				Limits				Margin	
		Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dB)	A.V. (dB)
0.400	L	33.70	30.90	48.42	35.08	57.85	47.85	780.47	246.81	-24.15	-16.95
0.473	L	35.00	32.90	56.23	44.16	56.46	46.46	665.09	210.32	-21.46	-13.56
0.619	L	34.20	32.00	51.29	39.81	56.00	46.00	630.96	199.53	-21.80	-14.00
0.202	N	45.70	44.80	192.75	173.78	63.52	53.52	1498.92	474.00	-17.82	-8.72
0.473	N	35.00	33.00	56.23	44.67	56.46	46.46	665.09	210.32	-21.46	-13.46
0.619	N	33.90	31.60	49.55	38.02	56.00	46.00	630.96	199.53	-22.10	-14.40

Test Engineer :

Peter Wang

5.4.2 Test Mode : CRT Display, 1280x1024 91K/85Hz

- Frequency Range of Test : from 0.15 MHz to 30 MHz
- All emissions not reported here are more than 10 dB below the prescribed limit.
- Temperature : 28•
- Relative Humidity : 61% RH
- Test Date : Apr. 12, 1999

The Conducted Emission test was passed at NEUTRAL 0.202 MHz / 45.60 dBuV.

Frequency (MHz)	Line or Neutral	Meter Reading				Limits				Margin	
		Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dB)	A.V. (dB)
0.474	L	34.70	32.60	54.33	42.66	56.45	46.45	664.42	210.11	-21.75	-13.85
0.620	L	34.10	31.90	50.70	39.36	56.00	46.00	630.96	199.53	-21.90	-14.10
0.837	L	29.80	27.00	30.90	22.39	56.00	46.00	630.96	199.53	-26.20	-19.00
0.202	N	45.60	44.80	190.55	173.78	63.53	53.53	1501.76	474.90	-17.93	-8.73
0.474	N	34.60	32.60	53.70	42.66	56.45	46.45	664.42	210.11	-21.85	-13.85
0.620	N	33.70	31.50	48.42	37.58	56.00	46.00	630.96	199.53	-22.30	-14.50

Test Engineer :

Peter Wang

5.4.3 Test Mode : LCD Display, **1024 x 768, 48K/60Hz**

- Frequency Range of Test : from 0.15 MHz to 30 MHz
- All emissions not reported here are more than 10 dB below the prescribed limit.
- Temperature : 28•
- Relative Humidity : 61% RH
- Test Date : Apr. 21, 1999

The Conducted Emission test was passed at NEUTRAL 0.545 MHz / 37.70 dBuV.

Frequency (MHz)	Line or Neutral	Meter Reading				Limits				Margin	
		Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dB)	A.V. (dB)
0.399	L	39.20	37.40	91.20	74.13	57.87	47.87	782.72	247.52	-18.67	-10.47
0.545	L	37.20	35.80	72.44	61.66	56.00	46.00	630.96	199.53	-18.80	-10.20
0.693	L	36.40	32.10	66.07	40.27	56.00	46.00	630.96	199.53	-19.60	-13.90
0.399	N	39.80	38.00	97.72	79.43	57.87	47.87	782.72	247.52	-18.07	-9.87
0.545	N	37.70	36.40	76.74	66.07	56.00	46.00	630.96	199.53	-18.30	-9.60
0.693	N	35.90	32.10	62.37	40.27	56.00	46.00	630.96	199.53	-20.10	-13.90

Test Engineer :

Peter Wang

5.4.4 Test Mode : LCD Display **800 x 600, 48K/60Hz**

- Frequency Range of Test : from 0.15 MHz to 30 MHz
- All emissions not reported here are more than 10 dB below the prescribed limit.
- Temperature : 28•
- Relative Humidity : 61% RH
- Test Date : Apr. 21, 1999

The Conducted Emission test was passed at NEURAL 0.198 MHz / 44.90 dBuV.

Frequency (MHz)	Line or Neutral	Meter Reading				Limits				Margin	
		Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dB)	A.V. (dB)
0.401	L	39.50	37.90	94.41	78.52	57.84	47.84	780.10	246.69	-18.34	-9.94
0.547	L	36.70	35.20	68.39	57.54	56.00	46.00	630.96	199.53	-19.30	-10.80
0.198	N	45.70	44.90	192.75	175.79	63.68	53.68	1527.82	483.14	-17.98	-8.78
0.401	N	40.00	38.50	100.00	84.14	57.84	47.84	780.10	246.69	-17.84	-9.34
0.547	N	37.20	35.80	72.44	61.66	56.00	46.00	630.96	199.53	-18.80	-10.20
0.764	N	36.90	34.70	69.98	54.33	56.00	46.00	630.96	199.53	-19.10	-11.30

Test Engineer :

Peter Wang

5.5. PHOTOGRAPHS OF CONDUCTED POWERLINE TEST CONFIGURATION

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

CRT

FRONT VIEW



REAR VIEW



SIDE VIEW



LCD

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 Figure 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 (HP 87405A)

Attenuation	0 dB
RF Gain	25 dB
Signal Input	10 MHz to 3 GHz

- Spectrum Analyzer (HP 8560E)

Attenuation	0 dB
Start Frequency	30 MHz
Stop Frequency	2000 MHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	30 Hz to 2.9 GHz

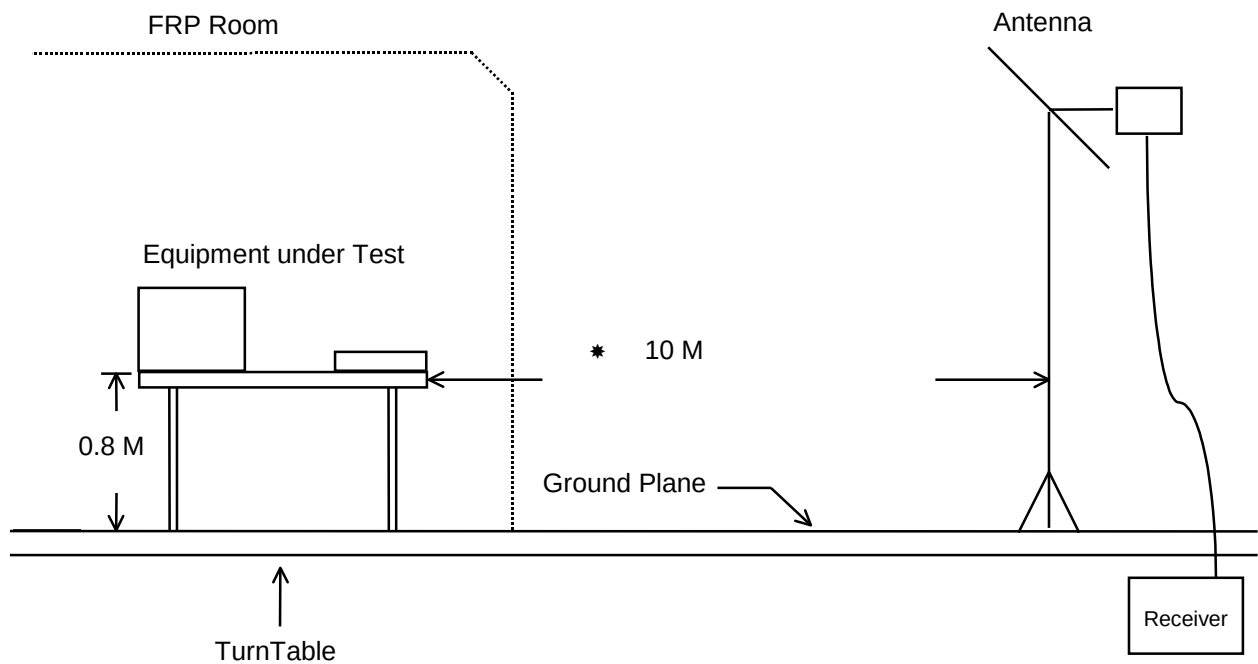
- Test Receiver (R&S ESCS30)

Resolution Bandwidth	120 KHz
Frequency Band	30 MHz to 1 GHz
Quasi-Peak Detector	ON for Quasi-Peak Mode
	OFF for Peak Mode

6.2. TEST PROCEDURES

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 6 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 6 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 EMISSION6.4.1 Test Mode : CRT Display, 1600 × 1200, 106K/85Hz

- Equipment meets the technical specifications of CISPR PUB. 22
- Frequency Range of Test : from 30 MHz to 2000 MHz
- Test Distance : 10 M
- Temperature : 27•
- Relative Humidity : 65 % RH
- Test Date : Apr. 16, 1999
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Sample Calculation at 670.042 MHz
Corrected Reading = 18.9 + 5.60 +5.44 = 29.94 (dBuV/m)

The Radiated Emission test was passed at minimum margin**Horizontal 735.396 MHz / 32.49 dBuV****Antenna Height 2.5 Meter , Turntable Degree 258^o.**

Frequency	Antenna	Cable	Reading	Limits	Emission	Level	Margin		
Polarity	Factor	Loss							
(MHz)	(dB/m)	(dB)	(dBuV)	(dBuV/m)	(uV/m)	(dBuV/m)	(uV/m)	(dB)	
670.042	H	18.90	5.60	5.44	37.00	71	29.94	31.41	-7.06
687.576	H	18.90	5.73	3.75	37.00	71	28.38	26.24	-8.62
735.396	H	19.48	5.99	7.02	37.00	71	32.49	42.12	-4.51
45.916	V	9.90	1.40	11.84	30.00	32	23.14	14.35	-6.86
200.405	V	8.30	3.00	12.50	30.00	32	23.80	15.49	-6.20
227.707	V	9.13	3.14	9.35	30.00	32	21.62	12.05	-8.38

Test Engineer :

Peter Wang

6.4.2. Test Mode : CRT Ddisplay, 1280x1024, 91K/ 85Hz

- Equipment meets the technical specifications of CISPR PUB. 22
- Frequency Range of Test : from 30 MHz to 2000 MHz
- Test Distance : 10 M
- Temperature : 27•
- Relative Humidity : 65 % RH
- Test Date : Apr. 16, 1999
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Sample Calculation at 670.042 MHz
Corrected Reading = 18.90+ 5.60 +5.94 = 30.44 (dBuV/m)

The Radiated Emission test was passed at minimum margin

Horizontal 670.042 MHz / 30.44 dBuV

Antenna Height 2.5 Meter , Turntable Degree 185⁰.

Frequency	Antenna	Cable	Reading	Limits	Emission	Level	Margin		
Polarity	Factor	Loss							
(MHz)	(dB/m)	(dB)	(dBuV)	(dBuV/m)	(uV/m)	(dBuV/m)	(uV/m)	(dB)	
670.042	H	18.90	5.60	5.94	37.00	71	30.44	33.27	-6.56
118.403	V	11.28	2.48	9.47	30.00	32	23.23	14.50	-6.77
168.400	V	8.66	2.79	8.67	30.00	32	20.12	10.14	-9.88
203.797	V	8.38	3.03	11.70	30.00	32	23.11	14.31	-6.89
466.010	V	16.57	4.62	7.13	37.00	71	28.32	26.06	-8.68
735.396	V	19.48	5.99	3.35	37.00	71	28.82	27.61	-8.18

Test Engineer :

Peter Wang

6.4.3. Test Mode : LCD Display, 1024 x 768, 48K/ 60Hz

- Equipment meets the technical specifications of CISPR PUB. 22
- Frequency Range of Test : from 30 MHz to 2000 MHz
- Test Distance : 10 M
- Temperature : 27•
- Relative Humidity : 65 % RH
- Test Date : Apr. 15, 1999
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Sample Calculation at 65.020 MHz
Corrected Reading = 4.8 + 1.60 + 19.84 = 26.24 (dBuV/m)

The Radiated Emission test was passed at minimum margin

Vertical 324.800 MHz / 33.72 dBuV

Antenna Height 1.0 Meter , Turntable Degree 219^o.

Frequency	Antenna	Cable	Reading	Limits	Emission	Level	Margin		
Polarity	Factor	Loss							
(MHz)	(dB/m)	(dB)	(dBuV)	(dBuV/m)	(uV/m)	(dBuV/m)	(uV/m)	(dB)	
65.020	V	4.80	1.60	19.84	30.00	32	26.24	20.51	-3.76
130.130	V	11.30	2.40	12.34	30.00	32	26.04	20.04	-3.96
162.600	V	9.14	2.71	12.67	30.00	32	24.52	16.83	-5.48
294.400	V	12.62	3.67	16.74	37.00	71	33.03	44.82	-3.97
324.800	V	13.48	3.73	16.51	37.00	71	33.72	48.53	-3.28
356.800	V	14.32	4.02	14.84	37.00	71	33.18	45.60	-3.82

Test Engineer :

Peter Wang

6.4.4. Test Mode : LCD Display, **800 x 600, 48K/ 60Hz**

- Equipment meets the technical specifications of CISPR PUB. 22
- Frequency Range of Test : from 30 MHz to 2000 MHz
- Test Distance : 10 M
- Temperature : 27•
- Relative Humidity : 65 % RH
- Test Date : Apr. 20, 1999
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Sample Calculation at 208.000 MHz
Corrected Reading = 8.46 + 3.05 + 13.74 = 25.25 (dBuV/m)

The Radiated Emission test was passed at minimum margin

Vertical 356.800 MHz / 33.12 dBuV

Antenna Height 1.0 Meter , Turntable Degree 192^o.

Frequency	Antenna	Cable	Reading	Limits	Emission	Level	Margin		
Polarity	Factor	Loss							
(MHz)	(dB/m)	(dB)	(dBuV)	(dBuV/m)	(uV/m)	(dBuV/m)	(uV/m)	(dB)	
208.000	H	8.46	3.05	13.74	30.00	32	25.25	18.30	-4.75
292.800	H	12.56	3.65	16.26	37.00	71	32.47	42.02	-4.53
208.000	V	8.46	3.05	14.07	30.00	32	25.58	19.01	-4.42
337.600	V	13.79	3.86	15.43	37.00	71	33.08	45.08	-3.92
356.800	V	14.32	4.02	14.78	37.00	71	33.12	45.29	-3.88
370.400	V	14.69	4.04	14.26	37.00	71	32.99	44.62	-4.01

Test Engineer :

Peter Wang

6.5. PHOTOGRAPHS OF RADIATED EMISSION TEST CONFIGURATION

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

CRT

FRONT VIEW



REAR VIEW



LCD

FRONT VIEW



REAR VIEW



7. ANTENNA FACTOR AND CABLE LOSS

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	18.1	1.4
35	15.2	1.4
40	12.6	1.4
45	9.9	1.5
50	7.5	1.5
55	5.8	1.5
60	5.0	1.6
65	4.8	1.6
70	5.1	1.7
75	5.7	1.8
80	6.7	1.8
85	7.8	1.9
90	8.8	2.0
95	9.3	2.1
100	10.0	2.2
110	11.2	2.4
120	11.3	2.6
130	11.3	2.4
140	10.7	2.5
150	9.9	2.6
160	9.3	2.6
170	8.5	2.8
180	8.4	3.1
190	8.2	3.0
200	8.3	3.1
220	8.4	3.1
240	10.9	3.2
260	13.0	3.4
280	12.4	3.5
300	12.8	3.8
320	13.3	3.8
340	13.8	3.9
360	14.4	4.1
380	15.0	4.2
400	15.5	4.3
450	16.2	4.5
500	17.4	4.9
550	19.1	5.0
600	18.4	5.2
650	18.9	5.5
700	18.9	5.9
750	19.7	6.0
800	19.7	6.2
850	20.4	6.4
900	20.5	6.6
950	20.9	6.9
1000	21.2	6.9
2000	26.4	10.5

8. LIST OF MEASURING EQUIPMENT USED

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration	Remark
EMC Receiver (site 1)	HP	8591EM	3536A00673	9 KHz – 1.8 GHz	Aug. 27, 1998	Conduction
LISN (site 1)	EMCO	3850/2	9510-1035	50 ohm / 50 uH	Oct. 23, 1998	Conduction
LISN (site 1)	KYORITSU	KNW-47	8-693-10	50 ohm / 50 uH	Oct. 23, 1998	Conduction
EMI Filter (site 1)	CORCOM	MRI-2030	N/A	480 VAC / 30 A	N/A	Conduction
Amplifier (Site 1)	HP	87405A	3207A01437	10MHz –3.0GHz	Jun. 26, 1998	Radiation
Spectrum Analyzer (site 1)	HP	8560E	3728A03186	30Hz – 2.9GHz	Sep. 18, 1998	Radiation
Receiver (Site 1)	R&S	ESCS30	70-213-4258	9KHz - 2.75GHz	Dec. 18, 1998	Radiation
Bilog Antenna (Site 1)	CHASE	CBL6112A	2442	30MHz -2GHz	Jul. 22, 1998	Radiation
Half-wave dipole antenna (site 1)	EMCO	3121C	9705-1285	28 M - 1GHz	May 19, 1998	Radiation
Turn Table (site 1)	EMCO	1060-1.211	9507-1805	0 ~ 360 degree	N/A	Radiation
Antenna Mast (site 1)	EMCO	2075	9806-2160	1 m - 4 m	N/A	Radiation

- The column of Remark indicates that the instruments used for conduction ("C") or radiation ("R") test.