

FCC TEST REPORT

for

CISPR PUB. 22 Class B

Equipment : NOTEBOOK PC

Model No. : 5XXXX (X=0~9, A~Z, BLANK)

FCC ID : L4PK5XXXCX12

Filing Type : Original Grant

Applicant : **KAPOK COMPUTER CO.**
No. 2-66, Sec. 2, Kwang-Fu Rd., Sun Chung City,
Taipei Hsien, Taiwan, R.O.C.

- The test result refers exclusively to the test presented test model / sample.
- 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, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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CERTIFICATE OF COMPLIANCE

for

CISPR PUB. 22 Class B

Equipment : NOTEBOOK PC

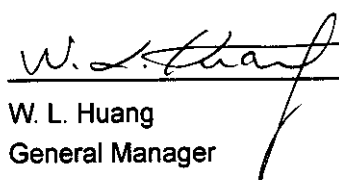
Model No. : 5XXXX (X=0~9, A~Z, BLANK)

FCC ID : L4PK5XXXCX12

Applicant : **KAPOK COMPUTER CO.**
No. 2-66, Sec. 2, Kwang-Fu Rd., Sun Chung City,
Taipei Hsien, Taiwan, R.O.C.

I HEREBY CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 - 1992** and the energy emitted by this equipment was **passed CISPR PUB. 22** both radiated and conducted emission class B limits. Testing was carried out on Apr. 6, 1999 at **SPORTON International Inc. LAB.** in Lin Kou.

 April 20, 99'

W. L. Huang
General 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

KAPOK COMPUTER CO.
No. 2-66, Sec. 2, Kwang-Fu Rd., Sun Chung City,
Taipei Hsien, Taiwan, R.O.C.

1.2. Manufacturer

Same as 1.1.

1.3. Basic Description of Equipment under Test

Equipment : NOTEBOOK PC
Model No. : 5XXXX (X=0~9, A~Z, BLANK)
FCC ID : L4PK5XXXCX12
Trade Name : KAPOK
Data cable : Shielded
Microphone data cable: Non-shielded
Earphone data cable : Non-Shielded
Power Supply Type : Switching
Input Power Cord : Non-Shielded, 1.8m
Output Power Card : Shielded, 1.2m

1.4. Feature of Equipment under Test

- Processor: Intel Celeron™ Processors 333MHz
- Memory: Two 144ins SODIMM sockets
- System BIOS: 256KB Flash ROM
- Display: -SVGA flat panel 12.1" TFT, resolution up to 1024x768, -CRT resolution up to 1280x1024x16M
- Storage: -3.5" 3-mode FDD/12.7mm(h) LS-120, CD-ROM (24X speed, 12.7mmH or 9.5mmH), -2.5" 12.7mm(h) HDD, support LBA mode
- Audio: -Built-in microphone, -Built-in 2 speaker
- PC Card Sockets: Two type II (PCI) PCMCIA 3.3V/5V Sockets
- Interface: -Built-in trackpad (PS/2), -One USB port, -One serial port, -One parallel port (LPT1), support ECP/EPP 1.7a and 1.9, -External CRT monitor, -One External keyboard/mouse (PS/2 type) port, -One headphone jack, -One microphone jack
- Power: -Full range AC adapter-AC in 100-240V, 47-63Hz, -Support one removable Ni-MH/Li-Ion Battery

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 SONY Monitor, DELL PS/2 Keyboard, HP Printer, ACEEX Modem, KOKA Microphone, BTC Keyboard, J-S Earphone and ILAN Adapter were connected to the EUT for EMI test.
- c. The Following display resolution were investigated during the compliance test:
 1. CRT display only (from 640x480 to 1280x1024)
 2. CRT and CRT display (from 640x480 to 800x600)
 3. Vertical frequency (60 Hz to 85 Hz)
- d. According to the above tests, we listed the following display modes as the worst cases:
 1. 1,280x1024 (non-interlanced 80 KHz), refresh rate 75 Hz.
 2. 800x600 (37.8 KHz), refresh rate 60 Hz.
 2. 640x480 (31.5 KHz), refresh rate 60 Hz.
- e. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 1,000 MHz.

2.2. Description of Test System

Support Unit 1. -- Monitor (SONY)

FCC ID	: AK8GDM17SE2T
Model No.	: GDM-17SE2T
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0063
Data Cable	: Double-Shielded, 360 degree via metal backshells, 1.7m

Support Unit 2. -- PS/2 Keyboard (DELL)

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

FCC TEST REPORT**Report No. : F932908****Support Unit 3. -- Printer (HP)**

FCC ID : B94C2642X
Model No. : DeskJet 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 4. -- Modem (ACEEX)

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 5. -- Microphone (KOKA)

FCC ID : N/A
Model No. : SRM02
Serial No. : SP0057
Data Cable : Non-Shielded, 2.1m

Support Unit 6. -- Keyboard (BTC)

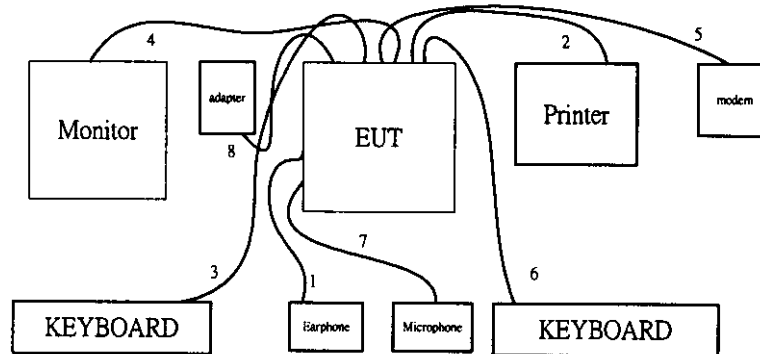
FCC ID : E5XKBUCP10410
Model No. : 7932
Serial No. : SP0130
Data Cable : Shielded, 360 degree via metal backshells, 1.55m

Support Unit 7. -- Earphone (J-S)

Model No. : HS-102
Serial No. : SP0123
Data Cable : Non-Shielded, 1.2m

Support Unit 8. -- Adapter (ILAN)

FCC ID : N/A
Model No. : F1960J

2.3. Connection Diagram of Test System

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

3. Test Software

Two executive program, EMITEST.EXE & WINFCC.EXE under WIN 98, which generate a complete line of continuously repeating " H " pattern were used as the test software.

The programs were executed as follows :

- a. Turn on the power of all equipment.
- b. The PC reads the test program from the 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.

An executive programs, CD Player Program under WIN98, was used as the test software.

4. General Information of Test

4.1. Test Facility

This test was carried out by SPORTON International Inc. in an openarea test site.

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 2,000 MHz

4.5. Test Distance

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

5. Test of Conducted Powerline

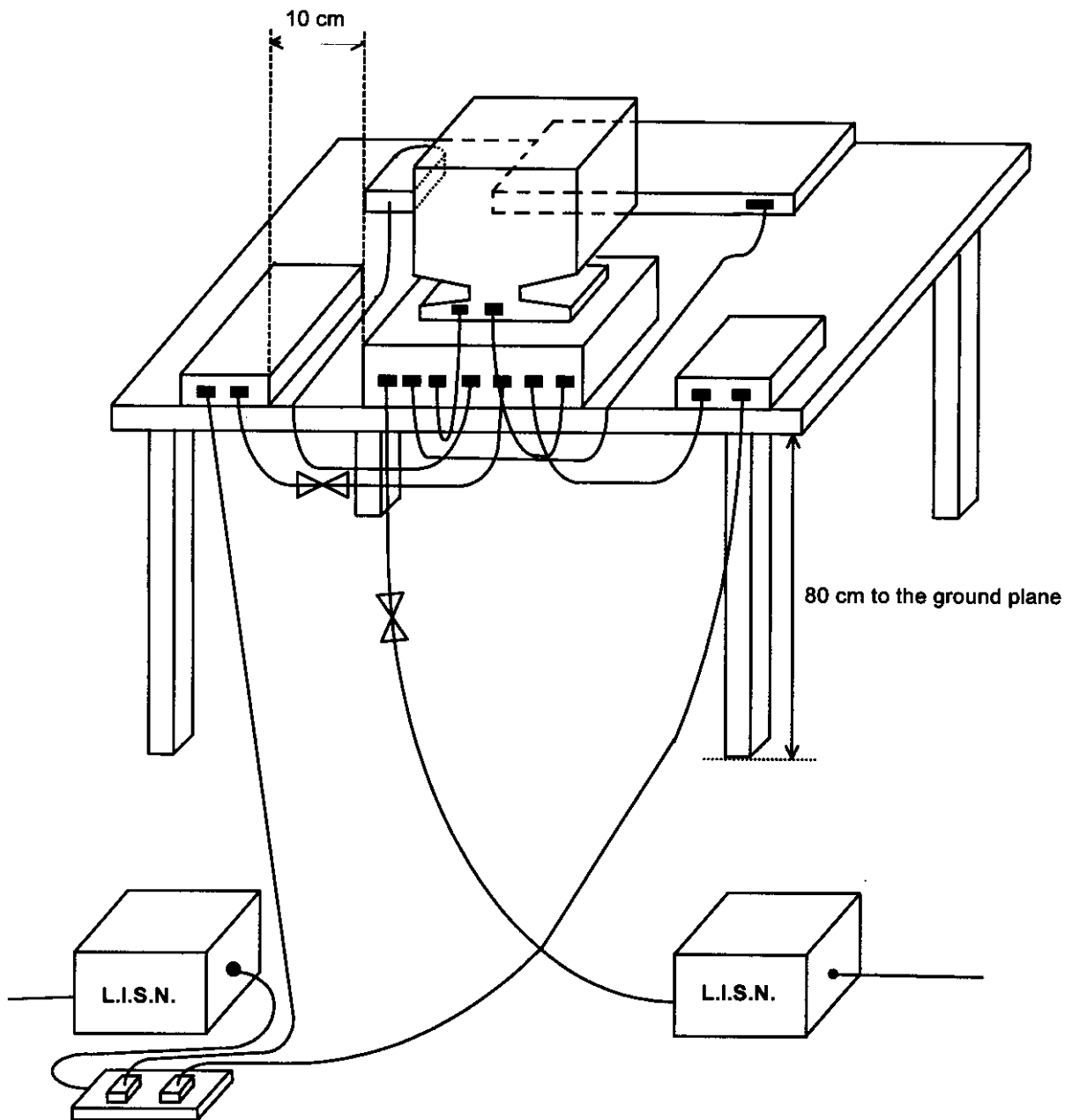
Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 115 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-1992 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in 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	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 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 one by one using the quasi-peak method and reported.



5.4. Test Result of AC Powerline Conducted Emission

5.4.1. Test mode : 640x480 31.5K/60Hz (CRT+LCD)

- Temperature : 20°C
- Relative Humidity : 65 %
- Test Date : Apr. 2, 1999

The Conducted Emission test was passed at minimum margin**LINE 2.360 MHz / 43.90 dBuV.**

Freq. (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)
1.889	L	43.40	40.90	147.91	110.92	56.00	46.00	630.96	199.53	-12.60	-5.10
2.360	L	43.90	42.50	156.68	133.35	56.00	46.00	630.96	199.53	-12.10	-3.50
0.203	N	50.30	43.40	327.34	147.91	63.47	53.47	1490.82	471.44	-13.17	-10.07
0.472	N	43.00	42.40	141.25	131.83	56.48	46.48	666.70	210.83	-13.48	-4.08
0.742	N	43.20	42.30	144.54	130.32	56.00	46.00	630.96	199.53	-12.80	-3.70
1.283	N	43.50	41.80	149.62	123.03	56.00	46.00	630.96	199.53	-12.50	-4.20

Test Engineer :

ALEX WU

5.4.2. Test mode : 800x600 60Hz/37.8K (CRT+LCD)

- Temperature : 20°C
- Relative Humidity : 65 %
- Test Date : Apr. 2, 1999

The Conducted Emission test was passed at minimum margin

LINE 2.289 MHz / 43.50 dBuV.

Freq. (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)
1.886	L	43.20	42.60	144.54	134.90	56.00	46.00	630.96	199.53	-12.80	-3.40
2.289	L	43.50	43.00	149.62	141.25	56.00	46.00	630.96	199.53	-12.50	-3.00
0.470	N	43.10	42.50	142.89	133.35	56.51	46.51	669.42	211.69	-13.41	-4.01
0.605	N	43.10	42.60	142.89	134.90	56.00	46.00	630.96	199.53	-12.90	-3.40
1.279	N	43.40	41.90	147.91	124.45	56.00	46.00	630.96	199.53	-12.60	-4.10
4.239	N	43.30	37.00	146.22	70.79	56.00	46.00	630.96	199.53	-12.70	-9.00

Test Engineer : Alex Wu
ALEX WU

5.4.3. Test mode : 1280x1024 75Hz/80K (CRT only)

- Temperature : 20°C
- Relative Humidity : 65 %
- Test Date : Apr. 6, 1999

The Conducted Emission test was passed at minimum margin

LINE 1.876 MHz / 43.50 dBuV.

Freq. (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)
1.876	L	43.50	42.00	149.62	125.89	56.00	46.00	630.96	199.53	-12.50	-4.00
2.276	L	43.00	41.80	141.25	123.03	56.00	46.00	630.96	199.53	-13.00	-4.20
3.013	L	41.40	40.20	117.49	102.33	56.00	46.00	630.96	199.53	-14.60	-5.80
0.469	N	43.60	42.70	151.36	136.46	56.54	46.54	671.19	212.25	-12.94	-3.84
0.603	N	43.30	42.10	146.22	127.35	56.00	46.00	630.96	199.53	-12.70	-3.90
1.139	N	42.80	41.10	138.04	113.50	56.00	46.00	630.96	199.53	-13.20	-4.90

Test Engineer :



ALEX WU

6. Test of Radiated Emission

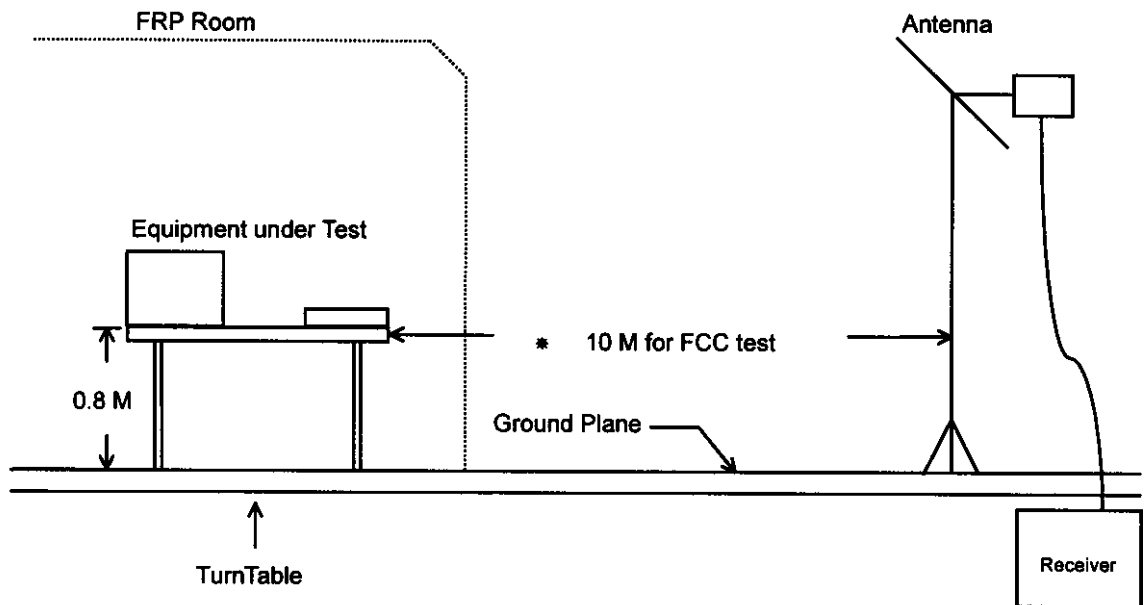
Radiated emissions from 30 MHz to 2,000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in ANSI C63.4-1992. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane, as shown in section 6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

6.1. Major Measuring Instruments

Amplifier	(HP 87405A)
Attenuation	0 dB
RF Gain	20 dB
Signal Input	10 MHz to 3 GHz
Spectrum Analyzer	(HP 8594A)
Attenuation	0 dB
Start Frequency	30 MHz
Stop Frequency	2,000 MHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	9 KHz to 2.9 GHz
Quasi-Peak Adapter	(HP 8594A)
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 Emission

6.4.1. Test mode : 640x480 31.5K/60Hz (CRT+LCD)

- Test Distance : 10 M
- Temperature : 18°C
- Relative Humidity : 79 %
- Test Date : Mar. 29, 1999
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Reading = Emission

The Radiated Emission test was passed at minimum margin

279.804 MHz / 33.95 dBuV (VERTICAL) Antenna Height 1.5 Meter, Turntable Degree 240 °.

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits		Emission (dBuV/m)	Level (uV/m)	Margin (dB)
					(dBuV/m)	(uV/m)			
39.972	V	13.95	0.80	12.10	30.00	31.62	26.85	22.00	-3.15
48.126	V	8.93	0.73	17.21	30.00	31.62	26.87	22.05	-3.13
279.804	V	13.24	1.70	19.01	37.00	70.79	33.95	49.83	-3.05
640.000	V	19.88	2.76	11.00	37.00	70.79	33.64	48.08	-3.36
224.000	H	10.84	1.54	14.31	30.00	31.62	26.69	21.60	-3.31
609.600	H	19.46	2.64	11.60	37.00	70.79	33.70	48.42	-3.30

Test Engineer :

Terry Chang
Terry Chang

6.4.2. Test mode : 800x600 60Hz/37.8K (CRT+LCD)

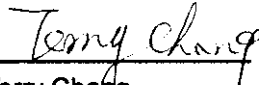
- Test Distance : 10 M
- Temperature : 18°C
- Relative Humidity : 79 %
- Test Date : Mar. 29, 1999
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Reading = Emission

The Radiated Emission test was passed at minimum margin

209.600 MHz / 26.95 dBuV (VERTICAL) Antenna Height 1.4 Meter, Turntable Degree 99 °.

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits		Emission (dBuV/m)	Level (uV/m)	Margin (dB)
					(dBuV/m)	(uV/m)			
209.600	V	9.60	1.45	15.90	30.00	31.62	26.95	22.26	-3.05
241.600	V	12.32	1.70	19.60	37.00	70.79	33.62	47.97	-3.38
449.600	V	16.44	2.30	15.00	37.00	70.79	33.74	48.64	-3.26
135.336	V	11.79	1.24	13.50	30.00	31.62	26.53	21.21	-3.47
229.839	H	11.33	1.60	13.70	30.00	31.62	26.63	21.45	-3.37
129.910	V	12.02	1.30	13.54	30.00	31.62	26.86	22.03	-3.14

Test Engineer :


Terry Chang

6.4.3. Test mode : 1280x1024 75Hz/80K (CRT only)

- Test Distance : 10 M
- Temperature : 18°C
- Relative Humidity : 79 %
- Test Date : Mar. 29, 1999
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Reading = Emission

The Radiated Emission test was passed at minimum margin

302.400 MHz / 33.37 dBuV (HORIZONTAL) Antenna Height 3 Meter, Turntable Degree 184 °.

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits		Emission (dBuV/m)	Level (uV/m)	Margin (dB)
					(dBuV/m)	(uV/m)			
110.541	V	12.06	1.10	13.00	30.00	31.62	26.16	20.32	-3.84
144.057	V	11.13	1.25	13.09	30.00	31.62	25.47	18.77	-4.53
302.400	H	13.36	1.81	18.20	37.00	70.79	33.37	46.61	-3.63
368.000	H	14.18	2.07	16.00	37.00	70.79	32.25	40.97	-4.75
992.000	H	21.20	3.70	7.10	37.00	70.79	32.00	39.81	-5.00
169.365	H	9.89	1.40	13.90	30.00	31.62	25.19	18.18	-4.81

Test Engineer : Terry Chang
Terry Chang

7. Antenna Factor & Cable Loss

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	17.9	0.8
35	16.1	0.8
40	14.0	0.8
45	10.5	0.8
50	7.9	0.7
55	6.7	0.8
60	5.5	0.9
65	5.5	0.8
70	5.6	0.9
75	6.5	1.0
80	7.5	0.9
85	8.5	1.0
90	9.4	1.0
95	10.4	1.0
100	11.5	1.1
110	12.1	1.1
120	12.6	1.1
130	12.0	1.3
140	11.6	1.2
150	10.5	1.3
160	10.5	1.3
170	9.8	1.4
180	9.2	1.5
190	9.0	1.4
200	8.8	1.4
220	10.5	1.5
240	12.2	1.7
260	13.1	1.7
280	13.2	1.7
300	13.4	1.8
320	13.4	1.9
340	13.4	2.0
360	13.9	2.0
380	14.9	2.1
400	15.6	2.2
450	16.4	2.3
500	16.6	2.4
550	19.7	2.8
600	19.3	2.6
650	20.0	2.8
700	19.5	2.8
750	18.5	3.1
800	17.8	3.4
850	18.3	3.1
900	20.5	3.3
950	21.4	3.7
1000	21.2	3.7
2000	31.57	6.2

8. List of Measuring Equipments Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	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 5)	HP	87405A	3207A01437	10MHz –3.0GHz	June 26, 1998	Radiation
Spectrum Analyzer (Site 5)	HP	8594A	3051A00172	9KHz –2.9GHz	Apr. 17, 1998	Radiation
Bilog Antenna (Site 5)	CHASE	CBL6112A	2287	30MHz -2GHz	Jan. 07, 1999	Radiation
Half-wave dipole antenna (Site 5)	EMCO	3121C	9705-1285	28 M - 1GHz	May 19, 1998	Radiation
Turn Table (site 5)	EMCO	2080	9711-2021	0 ~ 360 degree	N/A	Radiation
Antenna Mast (site 5)	EMCO	2075	9711-2115	1 m- 4 m	N/A	Radiation