FCC TEST REPORT

for

PART 15, SUBPART B CLASS B

EQUIPMENT : Mini-Notebook PC

MODEL NO. : PW-9800

F C C I D : IVUSOYO-PW9800S

FILING TYPE : Original Grant

APPLICANT : **Soyo Tek Inc**
1209 John Reed Court
City of Industry, CA 91745

- 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.

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 NO. : F8O2203

CERTIFICATE OF COMPLIANCE

for

FCC PART 15, SUBPART B CLASS B

EQUIPMENT : Mini-Notebook PC

MODEL NO. : PW-9800

F C C I D : IVUSOYO-PW9800S

APPLICANT : **Soyo Tek Inc**
1209 John Reed Court
City of Industry, CA 91745

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*** both radiated and conducted emissions ***Class B*** limits.
Testing was carried out on ***Oct. 22, 1998*** at **SPORTON International Inc.**

NOV 03,98

W. L. Huang
General Manager

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

SOYO Computer Inc.
No. 21, Wu-kung 5 Rd., Hsing Chung City,
Taipei Hsien, Taiwan, R.O.C.

1.2. MANUFACTURER

Same as 1.1

1.3. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

EQUIPMENT : Mini-Notebook PC
MODEL NO. : PW-9800
TRADE NAME : SOYO
FCC ID : IVUSOYO-PW9800S
Mouse DATA CABLE : Shielded
Headphone, microphone DATA CABLE : Non-shielded
Output POWER CORD: Non-shielded
(Remark: A ferrite core is added on the adaptor data cable at EUT end.)
POWER SUPPLY TYPE : Switching
Input POWER CORD : Non-shielded

1.4. FEATURE OF EQUIPMENT UNDER TEST

- **CPU :** CYRIX, GXI –180BP 2.9V, 180MHz.
- **Memory :** 16MB DRAM expandable up to 32, 64, or 128MB.
- **System BIOS :** 256KB flash ROM.
- PCI Local Bus and hardware graphics accelerator for superior performance.
- **Display :** TORISAN / LM-DA53-22NSW (640 x R.G.B x 480 dots), (8.03" VGA, Color STN). LCD panel.

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, SILITEK keyboard, WINIC USB mouse, ACEEX modem, DYNAMIC microphone, ASCII Memory Card, J-S headphone and CD-ROM were connected to the EUT (for Printer Mode only).

c. The SONY monitor, SILITEK keyboard, WINIC USB mouse, ACEEX modem, DYNAMIC microphone, J-S headphone and FDD were connected to the EUT (for LCD + CRT with FDD Mode only).

d. The SOYO Mini-Notebook P.C. was tested in according with Cyrix, CPU : GXI-180BP 2.9V (180MHz).

e. The EUT applies one manufacturer LCD panels :

⇨ TORISAN / LM-DA53-22NSW (8.03" VGA, Color STN)

f. The following display resolution were investigated during the compliance test:

1. LCD and CRT display (640 x 480 resolution, 39KHz)
2. CRT display only (from 800 x 600 to 1024 x 768 , 60KHz)

g. The EUT applies one model adapters:

1. SOYO / SYS2011-5015

h. According to the above tests, we listed the following modes as the worst cases:

1. The EUT is installed with STN color, TORISAN 8.03" LCD panel, CPU (Cyrix, GXI-180BP 2.9V) running at 180MHz while the CRT display only at same time (1024 x 768, 60KHz, 75Hz).
2. The EUT is installed with STN color, TORISAN 8.03" LCD panel, CPU (Cyrix, GXI-180BP 2.9V) running at 180MHz while the LCD and CRT display at same time (640 x 480, 39KHz, 75Hz).
3. The EUT is installed with STN color, TORISAN 8.03" LCD panel, CPU (Cyrix, GXI-180BP 2.9V) running at 180MHz while the LCD and CRT display at same time (640 x 480, 39KHz, 75Hz with FDD).

⇨ These modes test results were included in this test report.

i. Frequency range investigated: Conduction 450 KHz to 30 MHz, Radiation 30 MHz to 2000 MHz.

2.2. DESCRIPTION OF TEST SYSTEM

Support Device 1. --- MONITOR (SONY)

FCC ID	: AK8GDM17SE2T
Model No.	: GDM-17SE2T
Serial No.	: SP1006
Data Cable	: Shielded, 360 degree via metal backshells, 1.75m
Power Supply Type	: Switching
Power Cord	: Non-shielded

Support Device 2. --- KEYBOARD (SILITEK)

FCC ID	: GYUR50SK
Model No.	: SK-2000
Serial No.	: SP1010
Data Cable	: Shielded, 360 degree via metal backshells, 1.5m

Support Device 3. -- USB MOUSE (WINIC)

FCC ID	: F4ZFDM-A50
Model No.	: FDM-A50
Serial No.	: SP1035
Data Cable	: Shielded, 360 degree via metal backshells, 1.6m

Support Device 4. -- MICROPHONE (DYNAMIC)

FCC ID	: N/A
Model No.	: S-122
Serial No.	: SP1023
Data Cable	: Non-shielded, 2.9m

Support Device 5. -- HEADPHONE (J-S)

FCC ID	: N/A
Model No.	: H-201
Serial No.	: SP1025
Data Cable	: Non-shielded, 1.1m

Support Device 6. -- MODEM (ACEEX)

FCC ID	: IFAXDM1414
Model No.	: DM1414
Power Supply Type	: Linear, AC Adapter
Power Cord	: Non-shielded
Serial No.	: SP1018
Data Cable	: Shielded, 360 degree via metal backshells, 1.75m

Support Device 7. --- PRINTER (HP) -- (for Printer Mode only)

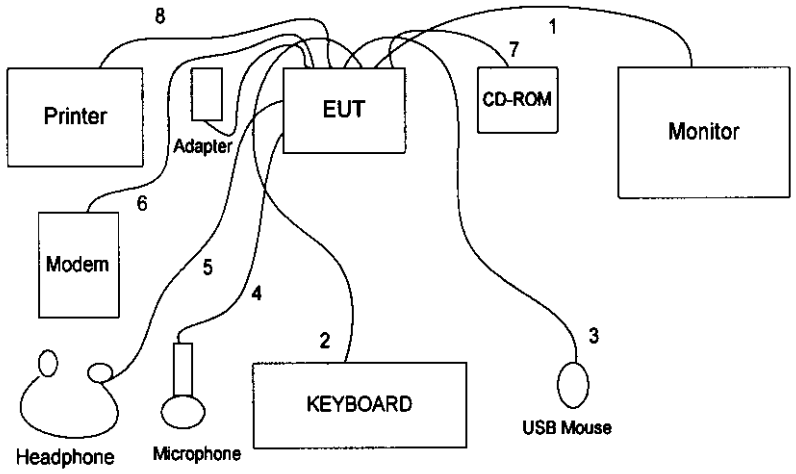
FCC ID	: DSI6XU2225
Model No.	: 2225C
Serial No.	: SP1017
Data Cable	: Shielded, 360 degree via metal backshells, 2.0m
Power Supply Type	: Linear
Power Cord	: Non-shielded

Support Device 8. --- Memory card (ASCII)

Model No.	: AF256-S
Remark	:This memory card is inserted in PCMCIA port.

2.3. CONNECTION DIAGRAM OF TEST SYSTEM

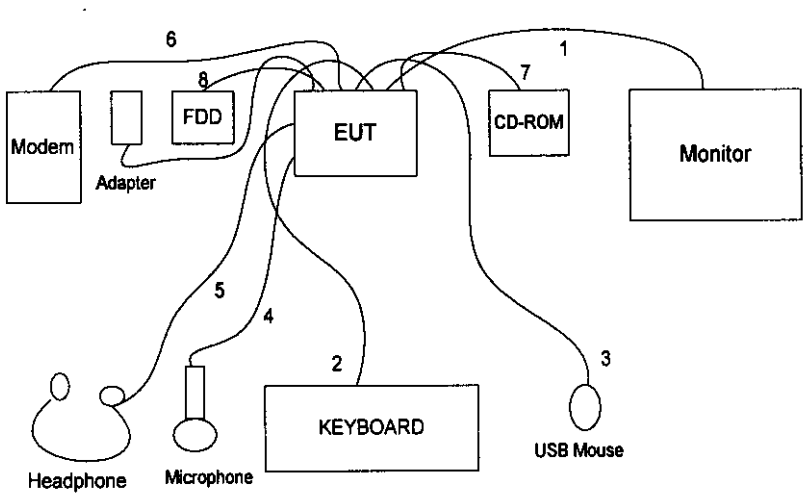
(for Printer Mode)



1. The I/O cable is connected from EUT to the support device 1.
2. The I/O cable is connected from EUT to the support device 2.
3. The I/O cable is connected from EUT to the support device 3.
4. The I/O cable is connected from EUT to the support device 4.
5. The I/O cable is connected from EUT to the support device 5.
6. The I/O cable is connected from EUT to the support device 6.
7. The I/O cable is connected to the EUT (CD-ROM).
8. The I/O cable is connected from EUT to the support device 8.

2.3.1. CONNECTION DIAGRAM OF TEST SYSTEM

(with FDD Mode)



1. The I/O cable is connected from EUT to the support device 1.
2. The I/O cable is connected from EUT to the support device 2.
3. The I/O cable is connected from EUT to the support device 3.
4. The I/O cable is connected from EUT to the support device 4.
5. The I/O cable is connected from EUT to the support device 5.
6. The I/O cable is connected from EUT to the support device 6.
7. The I/O cable is connected to the EUT (CD-ROM).
8. The I/O cable is connected to the EUT (FDD).

3. TEST SOFTWARE

An executive program, EMITEST.EXE and 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 (or LCD), and the monitor (or LCD) displays " H " patterns on the screen.
   (for LCD+CRT mode and CRT only mode)
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 g.

4. GENERAL INFORMATION OF TEST

4.1. TEST FACILITY

This test was carried out by SPORTON INTERNATIONAL INC.

Openarea Test Site Location : No. 3, Lane 238, Kang Lo Street, Nei Hwu District, Taipei 11424, Taiwan, R.O.C.

TEL : 886-2-2631-4739, FAX : 886-2-2631-9740

4.2. STANDARD FOR METHODS OF MEASUREMENT

ANSI C63.4-1992

4.3 .TEST IN COMPLIANCE WITH

FCC PART 15, SUBPART B CLASS B

4.4. FREQUENCY RANGE INVESTIGATED

a. Conduction : from 450 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 3M.

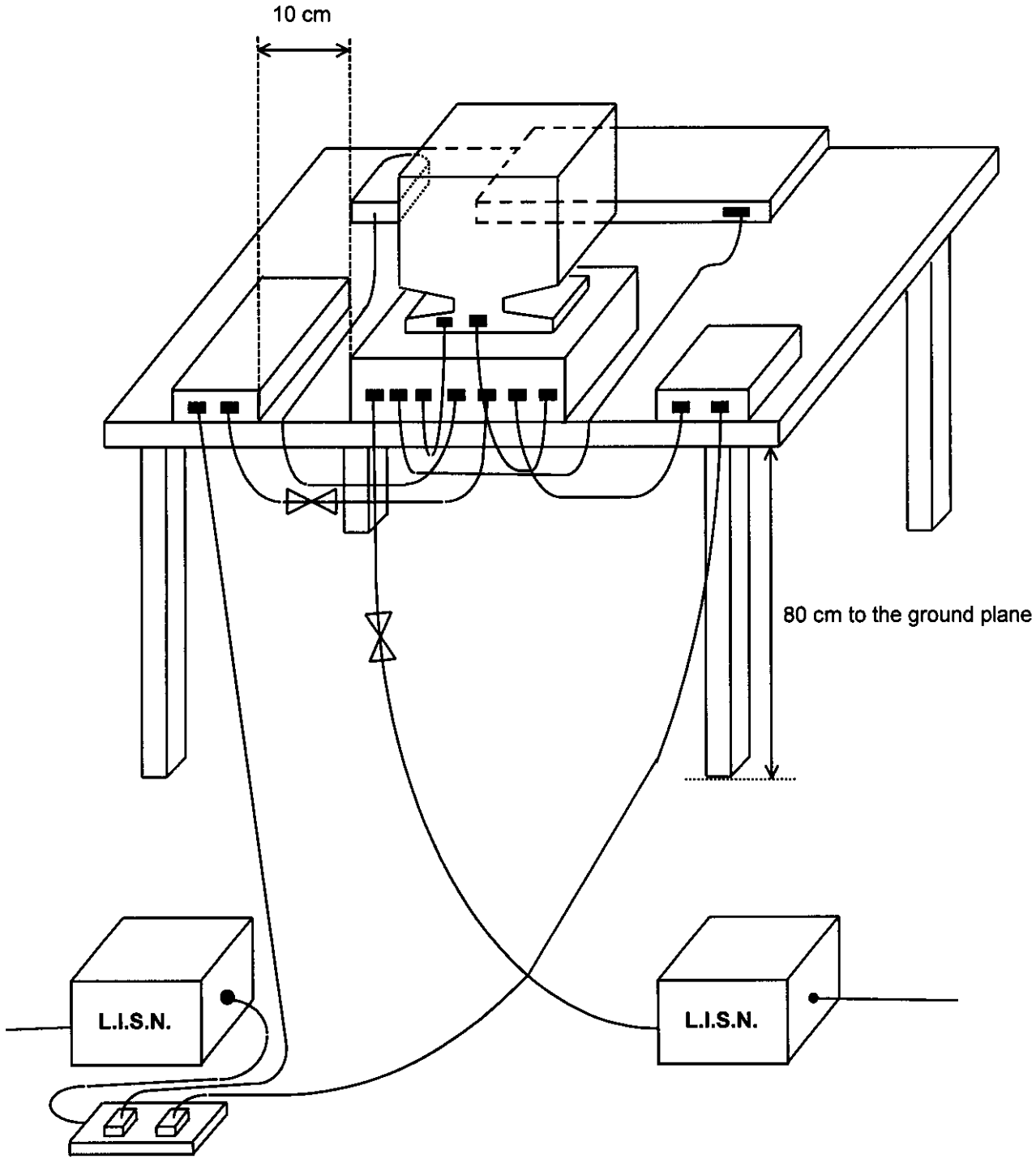
5. TEST OF CONDUCTED POWERLINE

Conducted Emissions were measured from 450 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	(R&S ESH3)
Attenuation	0 dB
Start Frequency	0.45 MHz
Stop Frequency	30 MHz
Step MHz	0.007 MHz
IF Bandwidth	9 KHz

5.3. TYPICAL TEST SETUP LAYOUT OF CONDUCTED POWERLINE



5.4. TEST RESULT OF AC POWERLINE CONDUCTED EMISSION

- Frequency Range of Test : from 0.45 MHz to 30 Mhz
- All emissions not reported here are more than 10 dB below the prescribed limit.
- Temperature : 30 ℃
- Relative Humidity : 64 % RH
- Test mode : ***CRT display only (1024 x 768, 60KHz, 75Hz)***
- Test Date : Oct. 21, 1998

The Conducted Emission test was passed at Line 3.35 MHz / 44.80 dBuV.

Frequency	Line /	Meter Reading		Limits		Margin
(MHz)	Neutral	(dBuV)	(uV)	(dBuV)	(uV)	(dB)
2.54	Line	44.30	164.06	48.00	251.19	-3.70
3.35	Line	44.80	173.78	48.00	251.19	-3.20
10.10	Line	42.90	139.64	48.00	251.19	-5.10
2.88	Neutral	43.60	151.36	48.00	251.19	-4.40
3.40	Neutral	44.20	162.18	48.00	251.19	-3.80
10.15	Neutral	44.80	173.78	48.00	251.19	-3.20

Test Engineer : Roxy Chou

Roxy Chou

5.4.1. TEST RESULT OF AC POWERLINE CONDUCTED EMISSION

- Frequency Range of Test : from 0.45 MHz to 30 Mhz
- All emissions not reported here are more than 10 dB below the prescribed limit.
- Temperature : 30 ℃
- Relative Humidity : 64 % RH
- Test mode : ***LCD and CRT display (640 × 480, 39KHz, 75Hz)***
- Test Date : Oct. 21, 1998

The Conducted Emission test was passed at Line 9.74 MHz / 44.20 dBuV.

Frequency	Line /	Meter Reading		Limits		Margin
(MHz)	Neutral	(dBuV)	(uV)	(dBuV)	(uV)	(dB)
2.60	Line	43.50	149.62	48.00	251.19	-4.50
4.45	Line	42.70	136.46	48.00	251.19	-5.30
9.74	Line	44.20	162.18	48.00	251.19	-3.80
1.52	Neutral	41.90	124.45	48.00	251.19	-6.10
2.94	Neutral	43.70	153.11	48.00	251.19	-4.30
4.14	Neutral	42.80	138.04	48.00	251.19	-5.20

Test Engineer : Roxy Chou

Roxy Chou

5.4.2. TEST RESULT OF AC POWERLINE CONDUCTED EMISSION

- Frequency Range of Test : from 0.45 MHz to 30 Mhz
- All emissions not reported here are more than 10 dB below the prescribed limit.
- Temperature : 30 ℃
- Relative Humidity : 64 % RH
- Test mode : ***LCD and CRT display with FDD (640 × 480, 39KHz, 75Hz)***
- Test Date : Oct. 21, 1998

The Conducted Emission test was passed at Line 2.50 MHz / 44.80 dBuV.

Frequency	Line /	Meter Reading		Limits		Margin
(MHz)	Neutral	(dBuV)	(uV)	(dBuV)	(uV)	(dB)
2.50	Line	44.80	173.78	48.00	251.19	-3.20
3.16	Line	44.50	167.88	48.00	251.19	-3.50
9.81	Line	43.90	156.68	48.00	251.19	-4.10
2.18	Neutral	44.40	165.96	48.00	251.19	-3.60
3.38	Neutral	43.20	144.54	48.00	251.19	-4.80
10.25	Neutral	42.90	139.64	48.00	251.19	-5.10

Test Engineer : Roxy Chou

Roxy Chou

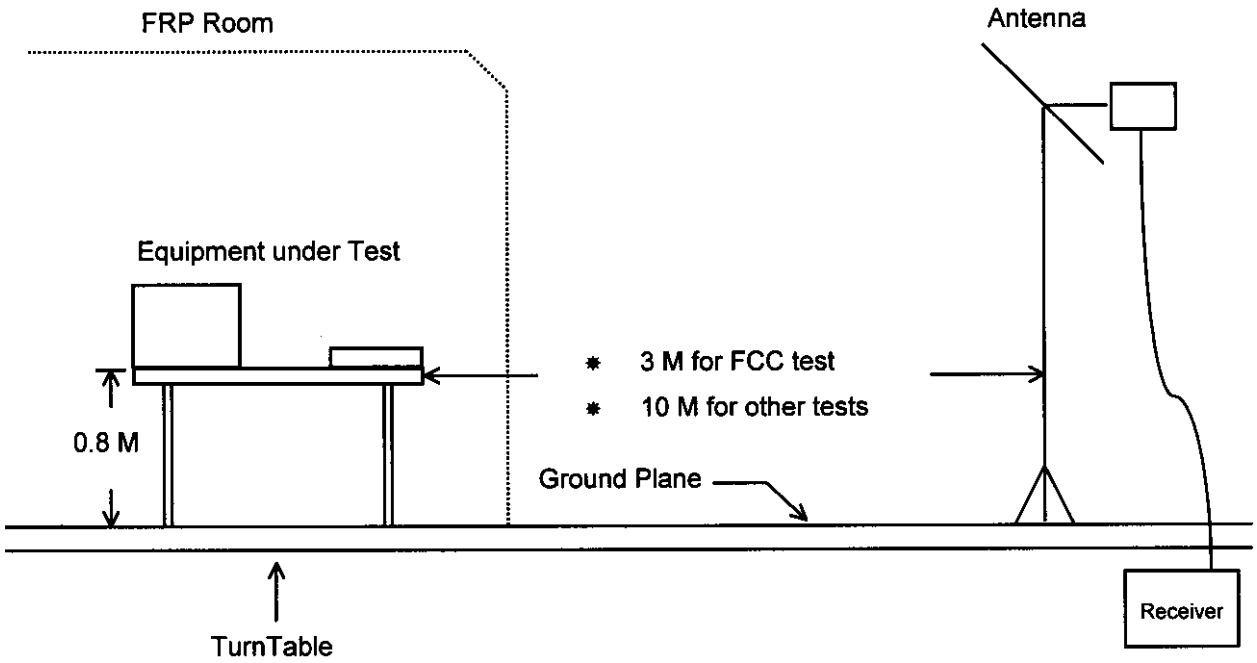
6. TEST OF RADIATED EMISSION

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	20 Hz to 1.5 GHz
Signal Input	10 MHz to 3 GHz
• Spectrum Analyzer	(HP 8594A)
Attenuation	0 dB
Start Frequency	30 MHz
Stop Frequency	2000 MHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	9 KHz to 2.9 GHz
• Spectrum Analyzer	(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

6.3. TYPICAL TEST SETUP LAYOUT OF RADIATED EMISSION



6.4. TEST RESULT OF RADIATED EMISSION

- Equipment meets the technical specifications of 15.109
- Frequency Range of Test : from 30 MHz to 2000 MHz
- Test Distance : 3 M
- Temperature : 30℃
- Relative Humidity : 68 % RH
- Test mode : ***CRT display only (1024 x 768, 60KHz, 75Hz)***
- Test Date : Oct. 21, 1998

- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Sample Calculation at 39.16 MHz
  Corrected Reading = 0.31 + 0.92 + 35.18 = 36.41 (dBuV/m)

The Radiated Emission test was passed at minimum margin

Horizontal 300.80 MHz / 42.34 dBuV

Antenna Height 4.0 Meter , Turntable Degree 43°.

Frequency (MHz)	Polarity	Antenna Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV)	Limits (uV)	Emission (dBuV)	Level (uV)	Margin (dB)
39.16	H	0.31	0.92	35.18	40.00	100	36.41	66.15	-3.59
200.48	H	14.06	2.40	20.43	43.50	150	36.89	69.90	-6.61
234.40	H	14.89	2.47	25.46	46.00	200	42.82	138.36	-3.18
300.80	H	17.99	3.11	21.24	46.00	200	42.34	130.92	-3.66
202.60	V	14.08	2.40	19.64	43.50	150	36.12	63.97	-7.38
400.98	V	22.29	3.60	16.79	46.00	200	42.69	136.30	-3.31

Test Engineer : Roxy Chou

Roxy Chou

6.4.1. TEST RESULT OF RADIATED EMISSION

- Equipment meets the technical specifications of 15.109
- Frequency Range of Test : from 30 MHz to 2000 MHz
- Test Distance : 3 M
- Temperature : 30℃
- Relative Humidity : 68 % RH
- Test mode : ***LCD and CRT display (640 x 480, 39KHz, 75Hz)***
- Test Date : Oct. 21, 1998

- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Sample Calculation at 600.80 MHz
  Corrected Reading = 24.03 + 4.61 + 12.48 = 41.11 (dBuV/m)

The Radiated Emission test was passed at minimum margin

Vertical 233.91 MHz / 42.49 dBuV

Antenna Height 1.0 Meter , Turntable Degree 47°.

Frequency (MHz)	Polarity	Antenna Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV)	Limits (uV)	Emission (dBuV)	Level (uV)	Margin (dB)
600.80	H	24.03	4.61	12.48	46.00	200	41.11	113.63	-4.89
51.42	V	2.60	1.03	32.13	40.00	100	35.76	61.38	-4.24
194.22	V	13.73	2.34	20.35	43.50	150	36.42	66.22	-7.08
200.00	V	14.05	2.40	18.93	43.50	150	35.38	58.75	-8.12
233.91	V	14.87	2.47	25.15	46.00	200	42.49	133.20	-3.51
300.72	V	17.99	3.11	18.91	46.00	200	40.01	100.12	-5.99

Test Engineer : Roxy Chou

Roxy Chou

6.4.2. TEST RESULT OF RADIATED EMISSION

- Equipment meets the technical specifications of 15.109
- Frequency Range of Test : from 30 MHz to 2000 MHz
- Test Distance : 3 M
- Temperature : 30℃
- Relative Humidity : 68 % RH
- Test mode : ***LCD and CRT display with FDD (640 x 480, 39KHz, 75Hz)***
- Test Date : Oct. 21, 1998

- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Sample Calculation at 200.80 MHz
  Corrected Reading =14.06 + 2.40 + 18.63 = 35.09 (dBuV/m)

The Radiated Emission test was passed at minimum margin

Vertical 366.40 MHz / 41.63 dBuV

Antenna Height 1.0 Meter , Turntable Degree 35°.

Frequency (MHz)	Polarity	Antenna Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV)	Limits (uV)	Emission (dBuV)	Level (uV)	Margin (dB)
200.80	H	14.06	2.40	18.63	43.50	150	35.09	56.82	-8.41
234.40	H	14.89	2.47	23.66	46.00	200	41.02	112.46	-4.98
194.39	V	13.74	2.34	19.53	43.50	150	35.62	60.39	-7.88
224.80	V	14.50	2.42	19.79	46.00	200	36.72	68.55	-9.28
366.40	V	20.67	3.33	17.62	46.00	200	41.63	120.64	-4.37
400.80	V	22.29	3.60	15.68	46.00	200	41.57	119.81	-4.43

Test Engineer : Roxy Chou

Roxy Chou

7. ANTENNA FACTOR AND CABLE LOSS

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	17.7	0.9
35	15.1	0.8
40	12.3	0.8
45	9.0	0.8
50	7.4	0.8
55	5.9	0.9
60	5.0	1.0
65	4.8	1.1
70	5.1	1.2
75	5.7	1.3
80	6.6	1.4
85	7.6	1.5
90	8.5	1.5
95	9.3	1.6
100	10.1	1.8
110	10.7	1.7
120	11.2	1.5
130	10.8	1.2
140	10.4	1.2
150	9.9	1.6
160	9.4	1.7
170	9.0	1.8
180	8.6	2.3
190	8.5	1.8
200	9.2	1.7
220	9.9	2.1
240	11.2	1.9
260	12.2	2.0
280	12.5	2.3
300	12.9	2.5
320	13.5	2.4
340	14.0	2.5
360	14.6	2.7
380	15.1	3.1
400	15.6	3.2
450	16.3	3.0
500	17.0	3.1
550	18.5	3.4
600	18.5	3.1
650	18.9	3.0
700	18.9	2.9
750	19.6	3.5
800	19.9	3.7
850	20.2	4.1
900	20.6	4.0
950	20.8	3.3
1000	21.4	3.9

※Remark : For frequency above 1000 MHz, we used low cable loss BNC cable to test.

8. LIST OF MEASURING INSTRUMENTS USED

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Test Receiver	R&S	ESH3	893495/013	9 KHz - 30MHz	April 13, 1998	Conduction
Test Receiver	R&S	ESVP	893610/003	20MHz - 1.3 GHz	April 13, 1998	Conduction
LISN	EMCO	3825/2	9510-2484	50 ohm / 50 μH	Nov. 29, 1997	Conduction
LISN	KYORITSU	KNW-407	8-1010-15	50 ohm / 50 μH	Nov. 10, 1997	Conduction
EMI Filter	CORCOM	MRI-2030	N/A	480VAC / 30A	N/A	Conduction
Spectrum Monitor	R & S	EZM	894987/011	N/A	April 13, 1998	Conduction
Amplifier (Site 1)	HP	87405A	3207A01437	10MHz ~3.0GHz	June 26, 1998	Radiation
Spectrum Analyzer (Site1)	HP	8594A	3051A00172	9KHz ~2.9GHz	Apr. 17, 1998	Radiation
Bilog Antenna (1)	CHASE	CBL6112A	2302	30MHz - 2GHz	Jan. 27, 1998	Radiation
Half-wave dipole antenna (1)	EMCO	3121C	8912-496	20MHz - 1GHz	Aug. 12, 1998	Radiation
Turn Table	EMCO	1060-1.211	9507-1805	0 ~360 degree	N/A	Radiation
Antenna Mast	EMCO	1051-1.2	9502-1868	1 m - 4 m	N/A	Radiation