

FCC TEST REPORT

for

CISPR PUB. 22 CLASS B

Equipment : Voice / Fax / Data Modem Card

MODEL : SF-1156IV/R6
NO.

F C C : DK4SF1156IVR6
I D

Filing Type : Original Grant

Applicant : GVC CORPORATION
14F, No. 76, Tun-Hwa S. Rd., Sec. 2,
Taipei, 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.

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

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MODEL NO. : SF-1156IV/R6

F C C : DK4SF1156IVR6
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Applicant : GVC CORPORATION
14F, No. 76, Tun-Hwa S. Rd., Sec. 2,
Taipei, Taiwan, R.O.C.

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 CLASS B** in both radiated and conducted emissions limits. Testing was carried out on Dec. 10, 1998 at **SPORTON International Inc.** in LIN KOU.

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**

GVC CORPORATION
14F, No. 76, Tun-Hwa S. Rd., Sec. 2,
Taipei, Taiwan, R.O.C.

1.2. MANUFACTURER

Same as 1.1

1.3. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment : Voice / FAX / DATA Modem Card
Model No. : DF-1156IV/R6
FCC ID : DK4SF1156IVR6
Trade Name : GVC
DATA CABLE : Non-Shielded
Power Supply Type : N/A
Power Cord : N/A

1.4. FEATURE OF EQUIPMENT UNDER TEST

- Communication Std.:
 - V.90, K56flex (56k model) for highest internet connection rates, 33.6kbps, 31.2kbps, V.34, V.32bis, V.22bis, V.22A / B, V.23, and V.21; Bell212A and 103
- Data Compression : V.42bis/MNP5
- FAX Group : Group 3 send and receive and T.30 protocol
- FAX Correction : EIA/TIA 578 Class 1, Class 1.0 (T.31) fax
- Error Correction : V.42/MNP2, 3, 4
- Host Interface : Plug and Play PCI bus interface
- DTE Speeds : 300-115200bps

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 HP Monitor, HP Printer, ACEEX Modem, SILITEK Keyboard, GERICO Telephone and EUT were connected to the FIC PC for EMI test.
- c. The phone jack of the EUT were connected to the GERICO telephone by telephone line and line jack was connected to the GERICO telephone by telephone line.
- d. Frequency range investigated: Conduction 150 KHz to 30 MHz, Radiation 30 MHz to 1000 MHz.

2.2. DESCRIPTION OF TEST SYSTEM

Support Device 1. --- MONITOR (HP)

FCC ID : ACJ93312116
Model No. : D2807A
Serial No. : SP1010
Data Cable : Shielded, 360 degree via metal backshells, 1.7m
Power Supply Type : Switching
Power Cord : Non-shielded

Support Unit 2. -- Printer (HP)

FCC ID : DSI6XU2225
Model No. : 2225C
Power Supply Type : Linear
Power Cord : N/A
Serial No. : SP0049
Data Cable : Braided-Shielded, 360 degree via metal backshells

Support Unit 3. -- Modem (ACEEX)

FCC ID : IFAXDM1414
Model No. : DM1414
Power Supply Type : Linear
Power Cord : N/A
Serial No. : SP0016
Data Cable : Shielded, 360 degree via metal backshells

Support Unit 4. -- Keyboard (SILITEK)

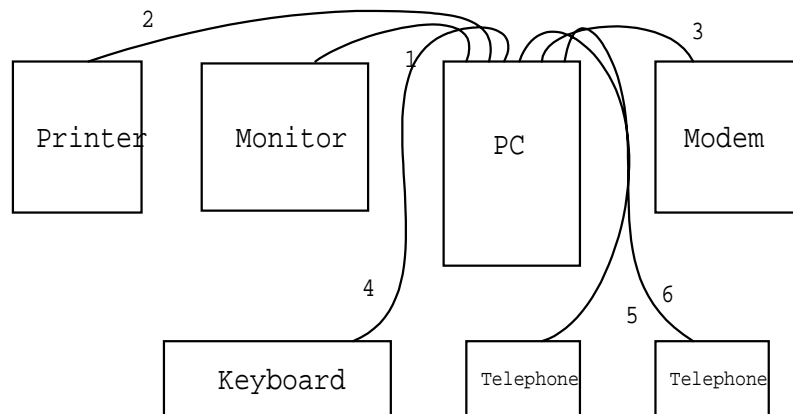
FCC ID : GYUR29SK
Model No. : SK-710W
Serial No. : SP0133
Data Cable : Shielded, 360 degree via metal backshells, 1.9m

Support Unit 5. -- Telephone (GERICO)

FCC ID : N/A
Model No. : GT-266
Serial No. : SP0134
Data Cable : Non-Shielded, 2.1m

Support Unit 6. -- Personal Computer (FIC)

FCC ID : N/A
Model No. : P55T2P4
Power Supply Type : Switching
Power Cord : Non-Shielded
Serial No. : SP0007
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 to the support unit 1.
2. The I/O cable is connected to the support unit 2.
3. The I/O cable is connected to the support unit 3.
4. The I/O cable is connected to the support unit 4.
5. The telephone cable is connected from EUT to the support unit 5.
6. The telephone cable is connected from EUT to the support unit 5.

3. TEST SOFTWARE

An executive program, FCC.EXE under DOS, which generates a complete line of continuously repeating "H" pattern is 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. in an openarea test site.

Openarea Test Site Location : No. 30-1, 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 1000 MHz

4.5. TEST DISTANCE

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

5. TEST OF CONDUCTED POWERLINE

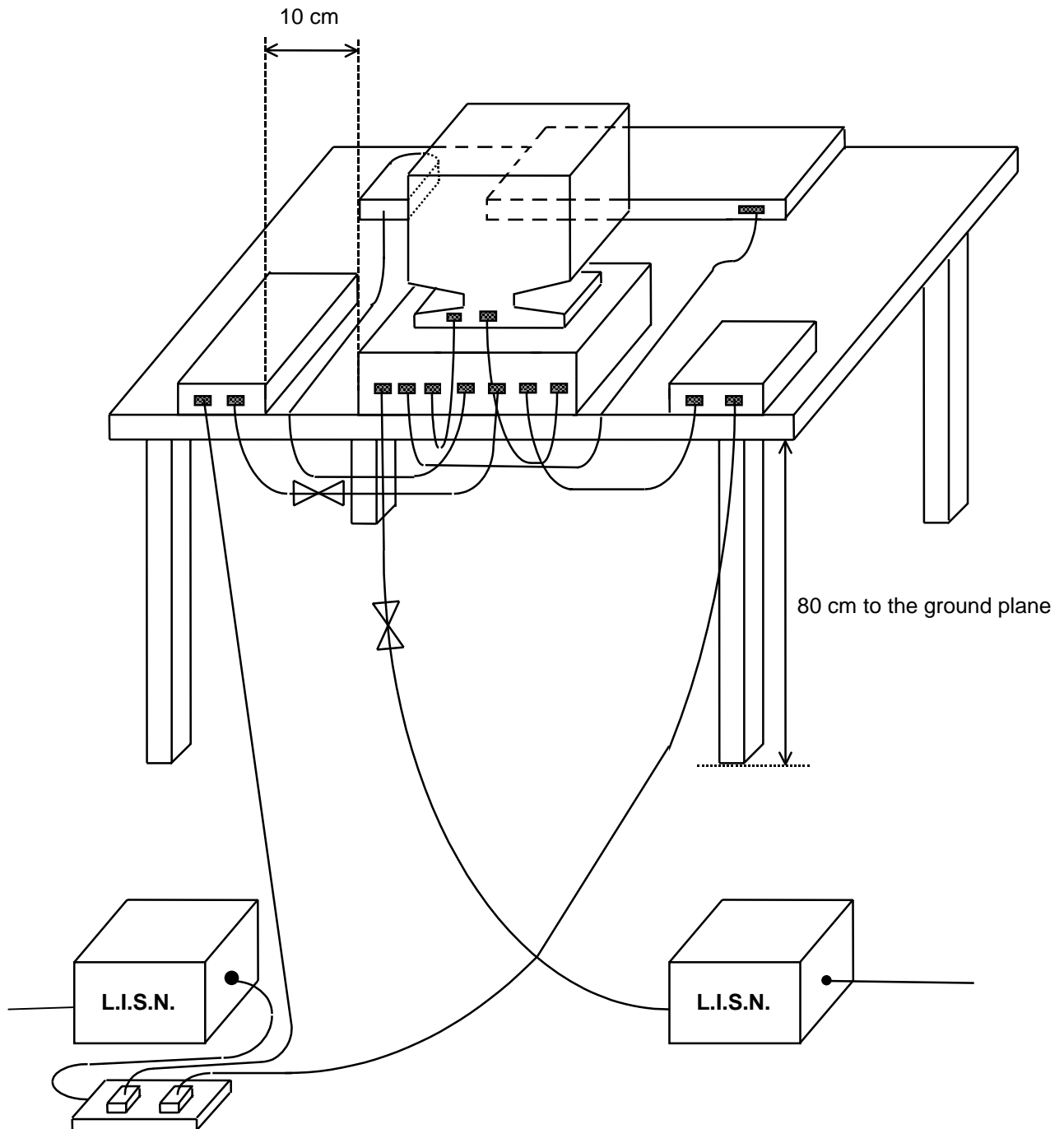
Conducted Emissions were measured from 150 KHz to 30 MHz with a bandwidth of 9 KHz on the 115 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-1992 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown 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	0.45 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 or average method and reported.

5.3. TYPICAL TEST SETUP LAYOUT OF CONDUCTED POWERLINE

5.4. TEST RESULT OF AC POWERLINE CONDUCTED EMISSION

- Frequency Range of Test : from 0.15 MHz to 30 MHz
- Temperature : 19•
- Relative Humidity : 65% RH
- Test date: Dec. 10, 1998
- All emissions not reported here are more than 10 dB below the prescribed limit.

The Conducted Emission test was passed at minimum margin

LINE 0.22MHz / 47.70dBuV.

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)
0.29	L	39.60	30.20	95.50	32.36	62.00	52.00	1258.93	398.11	-22.40	-21.80
0.22	L	47.70	46.70	242.66	216.27	64.00	54.00	1584.89	501.19	-16.30	-7.30
0.19	L	48.40	47.90	263.03	248.31	64.86	54.86	1749.27	553.17	-16.46	-6.96
0.29	N	38.80	29.50	87.10	29.85	62.00	52.00	1258.93	398.11	-23.20	-22.50
0.22	N	47.50	46.00	237.14	199.53	64.00	54.00	1584.89	501.19	-16.50	-8.00
0.19	N	48.30	47.50	260.02	237.14	64.86	54.86	1749.27	553.17	-16.56	-7.36

Test Engineer :

Peter Wang

5.5. PHOTOGRAPHS OF CONDUCTED POWERLINE TEST CONFIGURATION

FRONT VIEW

REAR VIEW

SIDE VIEW

6. TEST OF RADIATED EMISSION

Radiated emissions from 30 MHz to 1000MHz 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 8447D)

Attenuation	0 dB
RF Gain	20 dB
Signal Input	0.1 MHz to 1.3 GHz

- Spectrum Analyzer (ADVANTEST R3261C)

Attenuation	0 dB
Start Frequency	30 MHz
Stop Frequency	1000 MHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	9 KHz to 2.6 GHz

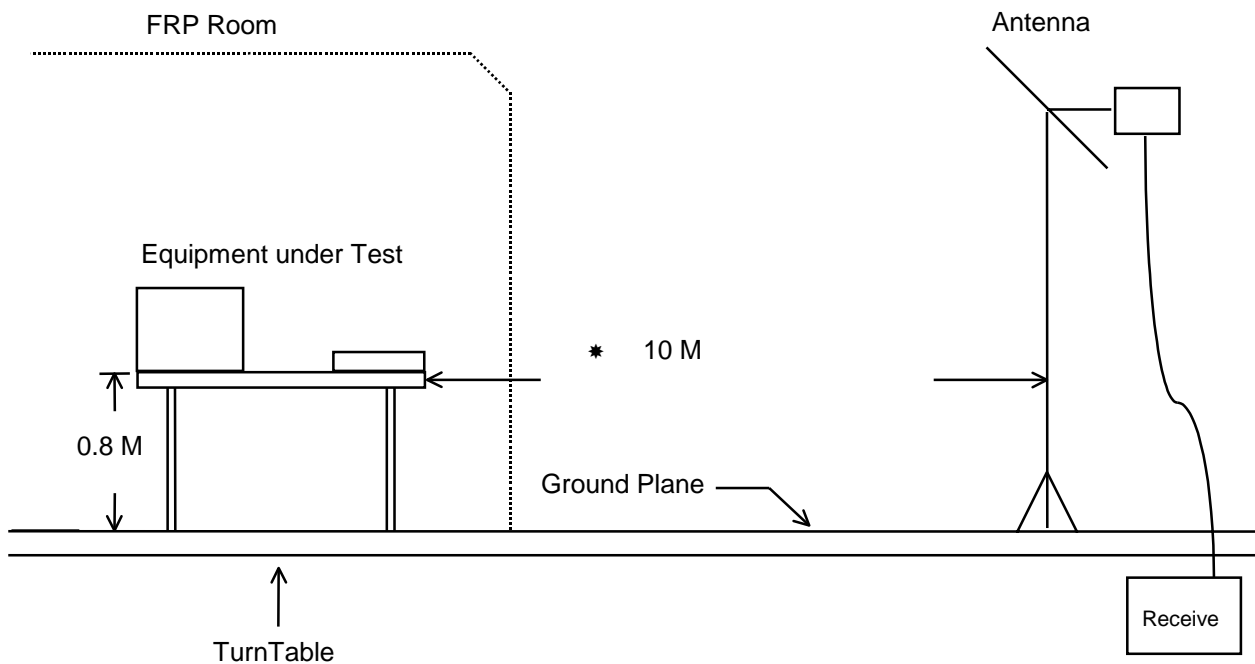
- Quasi-Peak Adapter (ADVANTEST R3261C)

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

- For frequency 30-1Ghz equipment meets the CISPR PUB. 22 CLASS B limits.
- Test Distance : 10M
- Temperature : 18•
- Relative Humidity : 74% RH
- Test date: Dec. 10, 1998
- 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

227.20 MHz / 25.73 dBuV (Vertical)

Antenna Height 1.0 Meter , Turntable Degree 218°.

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)	
112.79	V	10.79	1.87	10.14	30.00	32	22.80	13.80	-7.20
200.52	V	9.11	2.30	11.35	30.00	32	22.76	13.74	-7.24
227.20	V	9.70	2.51	13.52	30.00	32	25.73	19.34	-4.27
200.00	H	9.10	2.30	11.33	30.00	32	22.73	13.69	-7.27
227.20	H	9.70	2.51	12.52	30.00	32	24.73	17.24	-5.27
301.60	H	13.64	2.91	14.96	37.00	71	31.50	37.58	-5.50

Test Engineer :

Peter Wang

6.5. PHOTOGRAPHS OF RADIATED EMISSION TEST CONFIGURATION

FRONT VIEW

REAR VIEW

7. ANTENNA FACTOR AND CABLE LOSS

Frequency (Mhz)	Antenna Factor (dB)	Cable Loss (dB)
30	-2.20	0.80
35	-0.70	0.82
40	0.51	0.94
45	1.30	1.00
50	2.39	1.00
55	3.14	1.11
60	4.40	1.20
65	5.14	1.20
70	5.59	1.20
75	6.11	1.30
80	7.10	1.40
85	7.53	1.40
90	8.22	1.40
95	8.80	1.40
100	9.36	1.50
110	10.11	1.60
120	10.41	1.70
130	10.74	1.80
140	11.42	1.91
150	11.91	2.01
160	12.25	2.01
170	12.22	2.21
180	13.02	2.30
190	13.50	2.30
200	14.05	2.40
220	14.31	2.40
240	15.11	2.50
260	17.11	2.61
280	17.50	2.70
300	17.99	3.11
320	18.10	3.10
340	19.13	3.20
360	20.14	3.30
380	21.81	3.40
400	22.29	3.60
450	22.40	3.80
500	22.31	4.10
550	23.42	4.40
600	24.01	4.60
650	25.11	5.00
700	26.00	5.30
750	26.51	5.51
800	27.10	5.70
850	27.51	5.90
900	27.90	6.20
950	30.01	6.30
1000	29.00	6.40

•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	Remark
EMC Receiver (site 1)	HP	8591EM	3536A00672	9 KHz - 18 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 2)	HP	8447D	2944A07523	0.1MHz -1.3GHz	Jan. 24, 1998	Radiation
Spectrum Analyzer (site 2)	ADVANTEST	R3261C	71720606	9KHz -2.6GHz	Mar. 18, 1998	Radiation
Bilog Antenna (Site 2)	CHASE	CBL6112A	2322	30MHz -2GHz	Jan. 21, 1998	Radiation
Half-wave dipole antenna (Site 2)	EMCO	3121C	9705-1285	28 M - 1GHz	May 19, 1998	Radiation
Turn Table (site 2)	EMCO	2080-1.23	9703-	0 ~ 360 degree	N/A	Radiation
Antenna Mast (site 2)	EMCO	2070-2	9703-2041	1 m- 4 m	N/A	Radiation