FCC TEST REPORT

EXF

for

PART 15, SUBPART B CLASS B

Equipment : FAX/DATA/VOICE MODEM CARD

MODEL NO. : SF-1156HV/R21

F C C I D : DK4SF1156HVR21

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, Hsin Tai Wu Rd., Sec. 1, Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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CERTIFICATE NO. : F850704

CERTIFICATE OF COMPLIANCE

for

FCC PART 15, SUBPART B CLASS B

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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*** both radiated and conducted emissions class B limits. Testing was carried out on MAY. 12, 1998 at **SPORTON International Inc.** in LIN KOU.

Lenore C Chang May 20, 1998

Lenore Chang
President

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 : FAX/DATA/VOICE MODEM CARD
MODEL NO. :SF-1156HV/R21
FCC ID:DK4SF1156HVR21
TRADE NAME :GVC
Speaker, Microphone, Mouse,Telephone line DATA CABLE: Non-shielded
POWER SUPPLY TYPE : N/A
POWER CORD : N/A

1.4. FEATURE OF EQUIPMENT UNDER TEST

Communication Std.:

- V.34, V.32bis, V.32, V.29, V.27ter, V.22bis, V.23, V.22, V.21, V.17, Bell212/103

Data Compression:

- V.42bis/MNP5

Error Correction:V.42/MNP2-4

- FAX Group:Group III send/receive standard

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 DELL keyboard, SONY monitor, HP printer, J-S speaker, GENIUS mouse, TRANBON telephone, KOKA microphone, ROMEO telephone and ACEEX modem were connected to the F.I.C. PC.

c. The phone jack of the EUT were connected to the TRANBON telephone by telephone line and line jack was connected to the tranbon telephone by telephone line.

d. During the test, the monitor AC power cord was plugged into the PC computer-mounted AC outlet and a floor-mounted AC outlet to search the maximum emission.

e. Frequency range investigated: Conduction 450 KHz to 30 MHz, Radiation 30 MHz to 1000 MHz.

2.2. DESCRIPTION OF TEST SYSTEM

Support Device 1. --- PERSONAL COMPUTER (F.I.C.)

FCC ID	:N/A
Model No.	:P2L97
Serial No.	:SP1038
Data Cable	:Shielded, 360 degree via metal backshells.
Power Supply Type	:Switching
Power Cord	:Shielded

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

Support Device 2. --- MODEM (ACEEX)

FCC ID	:IFAXDM1414
Modem No.	:DM1414
Serial No.	:SP1015
Data Cable	: Shielded, 360 degree via metal backshells
Power Supply Type	:Linear

Support Device 3. --- PRINTER (HP)

FCC ID	:B94C2642X
Model No.	: DESKJET 400
Serial No.	:SP0002
Data Cable	:Shielded, 360 degree via metal backshells
Power Supply Type	:Linear

Support Device 4. --- MONITOR (SONY)

FCC ID	:AK8GDM17SE2T
Model No.	:GDM-17SE2T
Serial No.	:SP1040
Data Cable	:Shielded
Power Supply Type	:Switching
Power Cord	:Non-shielded

Support Device 5. --- KEYBOARD (DELL)

FCC ID	:GYUM92SK
Model No.	:AT101
Serial No.	:SP1008
Data Cable	:Shielded, 360 degree via metal backshells

Support Device 6. --- TELEPHONE (ROMEO)

FCC ID	:N/A
Model No.	:TE-302
Serial No.	:SP1011
Data Cable	: Non-shielded

Support Device 7. --- TELEPHONE (TRANBON)

FCC ID	:N/A
Model No.	:TE-003
Serial No.	:SP1009
Data Cable	: Non-shielded

Support Device 8. --- MOUSE (GENIUS)

FCC ID	:FSUGMZF6
Model No.	:NETMOUSE
Serial No.	:SP1007
Data Cable	: Non-shielded

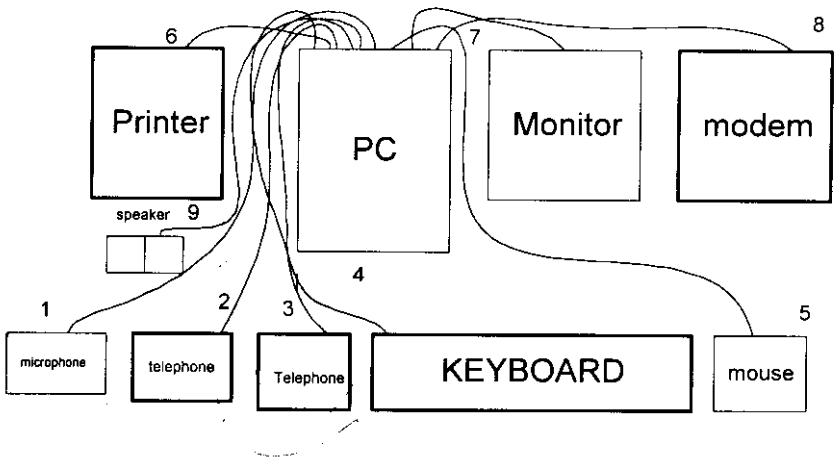
Support Device 9. --- MICROPHONE (KOKA)

FCC ID	:N/A
Model No.	:SRM02
Serial No.	:SP1006
Data Cable	: Non-shielded

Support Device 10. --- SPEAKER (J-S)

FCC ID	:N/A
Model No.	:J-008
Serial No.	:SP1005
Data Cable	: Non-shielded,1.1m

2.3. CONNECTION DIAGRAM OF TEST SYSTEM



1. The I/O cable is connected from EUT to the support device 9.
2. The I/O cable is connected from EUT to the support device 7.
3. The I/O cable is connected from EUT to the support device 6.
4. The I/O cable is connected to the support device 5.
5. The I/O cable is connected to the support device 8.
6. The I/O cable is connected to the support device 3.
7. The I/O cable is connected to the support device 4.
8. The I/O cable is connected to the support device 2 .
9. The I/O cable is connected from EUT to the support device 10

3. TEST SOFTWARE

An executive program, FCC.EXE, 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, then 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

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 1000 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	HP 85462A
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.

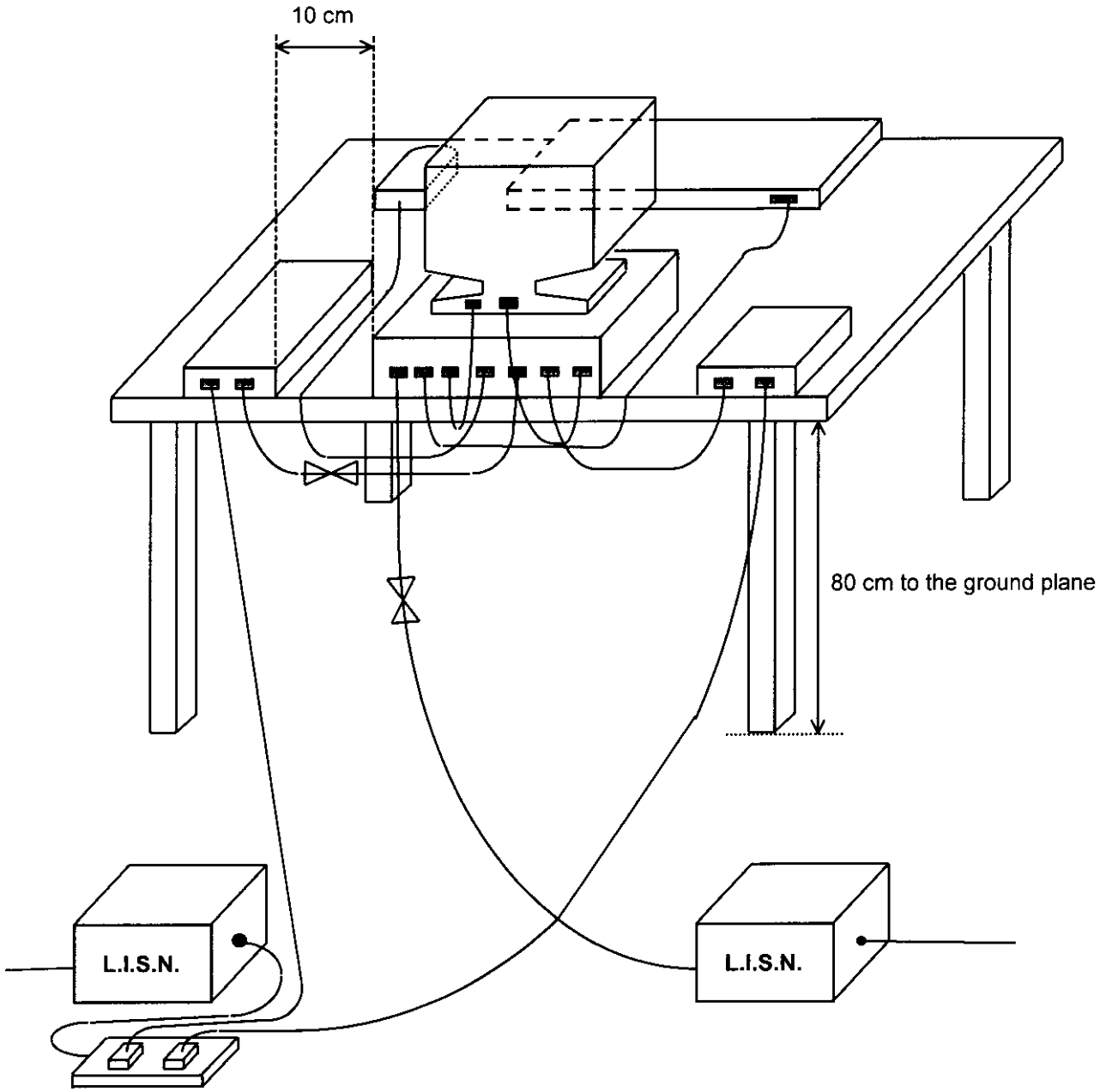
f. Both sides of AC line were checked for maximum conducted interference.

g. The frequency range from 450 KHz to 30 MHz was searched.

h. Set the test-receiver system (HP 85462A) 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

- Frequency Range of Test : from 0.45 MHz to 30 MHz
- Temperature : 26℃
- Relative Humidity : 56% RH
- All emissions not reported here are more than 10 dB below the prescribed limit.
- Test Date : MAY. 12, 1998

The Conducted Emission test was passed at minimum margin

NEUTRAL 0.513MHz/44.90dBuV.

Frequency	Line / Neutral	Meter Reading		Limits		Margin
(MHz)		(dBuV)	(uV)	(dBuV)	(uV)	(dB)
0.513	L	43.90	156.68	48.00	251.19	-4.10
28.224	L	29.00	28.18	48.00	251.19	-19.00
0.513	N	44.9	175.79	48.00	251.19	-3.10
0.562	N	39.10	90.16	48.00	251.19	-8.90
0.719	N	33.50	47.32	48.00	251.19	-14.50
28.223	N	29.00	28.18	48.00	251.19	-19.00

Test Engineer : Alan Wu

7. ANTENNA FACTOR AND CABLE LOSS

Frequency (Mhz)	Antenna Factor (dB)	Cable Loss (dB)
30	-1.91	0.90
35	-0.50	0.92
40	0.61	1.04
45	1.40	1.28
50	2.39	1.10
55	3.54	1.11
60	4.40	1.30
65	4.84	1.40
70	5.59	1.37
75	6.21	1.24
80	7.60	1.51
85	7.73	1.60
90	8.22	1.60
95	8.90	1.70
100	9.36	1.70
110	10.01	1.70
120	10.41	1.90
130	10.84	1.90
140	11.42	1.91
150	11.91	2.01
160	12.25	2.11
170	12.72	2.21
180	13.02	2.30
190	13.50	2.30
200	14.05	2.40
220	15.11	2.50
240	16.81	2.60
260	17.51	2.71
280	17.70	2.90
300	17.89	2.91
320	18.00	3.10
340	18.33	3.20
360	19.44	3.30
380	20.31	3.40
400	21.19	3.50
450	21.10	3.70
500	22.21	4.10
550	23.42	4.30
600	24.01	4.50
650	25.11	4.70
700	26.00	4.90
750	26.41	5.11
800	27.10	5.50
850	27.51	5.60
900	27.90	5.80
950	28.01	5.90
1000	29.00	6.20

※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
Receiver RF Section	HP	85462A	3325A00108	9 KHz - 6.5 GHz	Oct. 22, 1997	Conduction
RF Filter Section	HP	85460A	3308A00104	9 KHz - 6.5 GHz	Oct. 22, 1997	Conduction
LISN	EMCO	3850/2	1035	50 ohm / 50 uH	Oct. 27, 1997	Conduction
LISN	KYORITSU	KNW-407	8-693-10	50 ohm / 50 uH	Oct. 04, 1997	Conduction
EMI Filter	CORCOM	MRI-2030	N/A	480 VAC / 30 A	N/A	Conduction
Receiver RF Section	HP	85462A	3325A00108	9 KHz - 6.5 GHz	Oct. 22, 1997	Conduction
Spectrum Analyzer (Site 3)	HP	8560E	3728A03185	30MHz - 2.9GHz	Sep. 24, 1997	Radiation
Amplifier (Site 3)	HP	8447D	2944A09068	0.1MHz -1.3GHz	Sep. 16, 1997	Radiation
Receiver (Site 3)	R&S	ESCS30	70-213-4258	9KHz - 2.75GHz	Dec. 19, 1997	Radiation
Half-wave dipole antenna (Site 3)	EMCO	3121C	9705-1285	28 M - 1GHz	May 19, 1997	Radiation
Turn Table (site 3)	EMCO	2080	9711-1090	0 ~ 360 degree	N/A	Radiation
Turn Table (site 3)	EMCO	2080	9710-2101	0 ~ 360 degree	N/A	Radiation
Antenna Mast (site 3)	EMCO	2075	9710-2101	1 m- 4 m	N/A	Radiation

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

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

- RF Preselector

Attenuation	0 dB
RF Gain	20 dB
Signal Input	Input 2 (for 20 MHz to 2 GHz)

- Spectrum Analyzer

Attenuation	0 dB
Start Frequency	30 MHz
Stop Frequency	1000MHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	Input 1 (for 30 MHz to 2.9 GHz)

- Quasi-Peak Adapter

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 3 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.

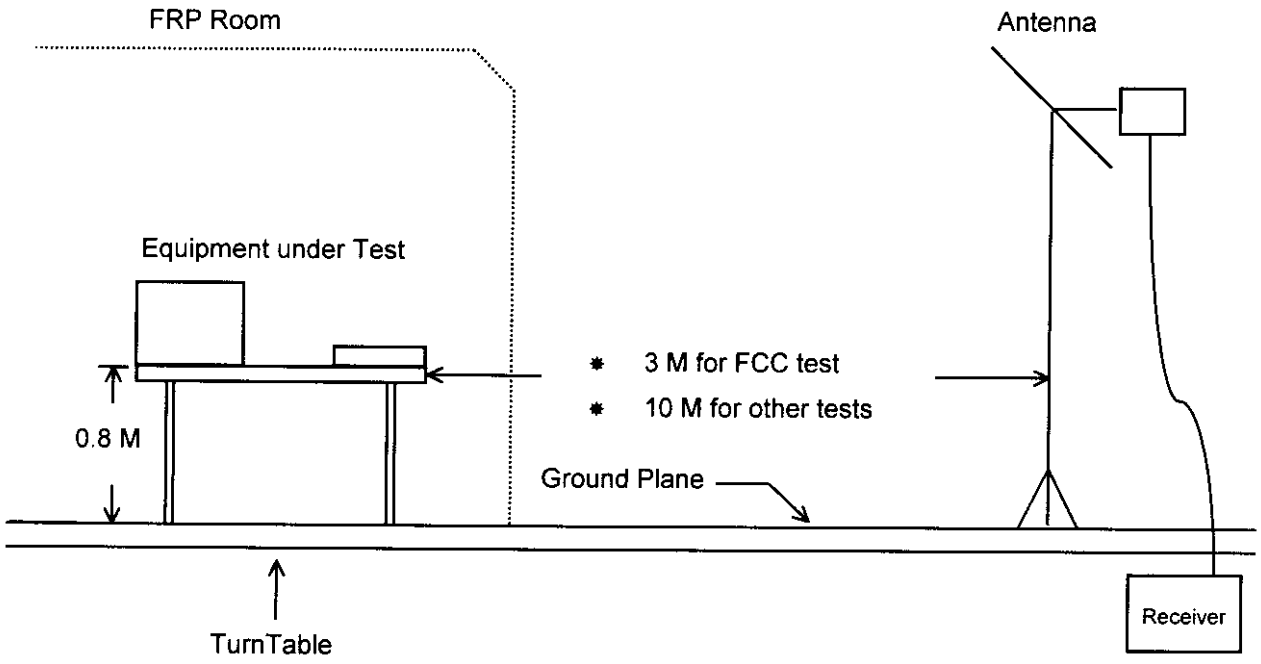
d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.

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

- Equipment meets the technical specifications of 15.109
- Frequency Range of Test : from 30 MHz to 1000 MHz
- Test Distance : 3 M
- Temperature : 31℃
- Relative Humidity : 40% RH
- Test Date :MAY. 11, 1998
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Sample Calculation at 480.70MHz
  Corrected Reading = 22.34+ 3.98+ 14.65= 40.98(dBuV/m)

The Radiated Emission test was passed at minimum margin

Vertical 218.600MHz /41.46dBuV

Antenna Height 1.5 Meter , Turntable Degree 147°

Frequency (MHz)	Polarity	Antenna Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV)	Limits (uV)	Emission (dBuV)	Level (uV)	Margin (dB)
218.60	V	14.29	2.40	24.77	46.00	200	41.46	118.30	-4.54
480.70	H	22.34	3.98	14.65	46.00	200	40.98	111.94	-5.02
479.10	V	22.35	3.97	13.71	46.00	200	40.03	100.35	-5.97
260.10	H	17.11	2.61	19.88	46.00	200	39.60	95.50	-6.40
536.60	V	23.20	4.32	11.92	46.00	200	39.44	93.76	-6.56
536.60	H	23.20	4.32	10.62	46.00	200	38.14	80.72	-7.86

Test Engineer : William Lee