

FCC/NTT-11 DEC 11 1998

## FCC TEST REPORT

for

Part 15, Subpart B Class B

Equipment : VGA CARD  
Model No. : VF05  
FCC ID : I27MM-VF05A  
Filing Type : Original Grant  
Applicant : Biostar Microtech Int'l Corp  
2FL, No. 108-2 Min Chuan Road.,  
Hsin Tien City, Taipei Hsien, Taiwan, R.O.C.

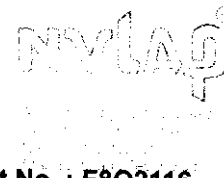
- The test result refers exclusively to the test presented test model / sample.
- Without the written authorization of the test lab., the Test Report may not be copied.

**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

### FCC Part 15, Subpart B Class B

Equipment : VGA CARD  
Model No. : VF05  
FCC ID : I27MM-VF05A  
Applicant : Biostar Microtech Int'l Corp  
2FL, No. 108-2 Min Chuan Road.,  
Hsin Tien 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** both radiated and conducted emission class B limits. Testing was carried out on Oct. 27, 1998 at **SPORTON International Inc. LAB** in Lin Kou.

  
Lenore Chang  
President

**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**

Biostar Microtech Int'l Corp  
2FL, No. 108-2 Min Chuan Road.,  
Hsin Tien City, Taipei Hsien, Taiwan, R.O.C.

### **1.2. Manufacturer**

Same as 1.1.

### **1.3. Basic Description of Equipment under Test**

Equipment	: VGA CARD
Model No.	: VF05
FCC ID	: I27MM-VF05A
Trade Name	: VNUS AGP
Data Cable	: Shielded
Power Supply Type	: N/A
Power Cord	: N/A

### **1.4. Feature of Equipment under Test**

- Screen resolution up to 1600x1200 at 85Hz with standard 230MHz RAMDAC
- Supports 4-, 8-Mbytes SGRAM or 16-Mbytes SDRAM
- VESA DDC2B support
- Full-featured 128-bit BitBlt Engine
- Source and destination chrome-keying for DirectDraw
- SGRAM color expansion support
- Full hardware setup of triangle parameters
- Support for multi-triangle strips and fans
- transparency and chrome-key with dedicated for mask
- Alpha blending of source and destination pixels
- Per-pixel atmospheric fog with programmable fog zongs
- High performance bilinear and trilinear texture filtering

## **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, HONEYWELL PS/2 Keyboard, GENIUS PS/2 Mouse, HP Printer and ACEEX Modem were connected to the FIC PC for EMI test.
- c. The following display resolution were investigated during the compliance test:
  1. Horizontal frequency (640x480 to 1,600x1,200, 31.47 KHz to 106KHz)
  2. Vertical frequency (60 Hz to 85 Hz)
- d. According to the above tests, we listed the following display modes as the worst cases:
  1. 1,280x1,024 (non-interlaced 95 KHz), refresh rate 85 Hz.
  2. 1,600x1,200 (non-interlaced 106 KHz), refresh rate 85 Hz.
- e. Frequency range investigated: conduction 450 KHz to 30 MHz, radiation 30 MHz to 2,000 MHz.

### **2.2. Description of Test System**

#### **Support Unit 1. -- Monitor (HITACHI)**

FCC ID	: N/A
Model No.	: CM803ET
Power Supply Type	: Switching
Power Cord	: N/A
Serial No.	: SP0096
Data Cable	: Shielded, 360 degree via metal backshells
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

#### **Support Unit 2. -- PS/2 Keyboard (Honeywell)**

FCC ID	: GJK101RX-6
Model No.	: PC7XL-AA
Power Supply Type	: N/A
Serial No.	: SP0018
Data Cable	: Shielded, 360 degree via metal backshells

#### **Support Unit 3. -- PS/2 Mouse (Genius)**

FCC ID	: FSUGMZFC
Model No.	: NETMOUSE
Power Supply Type	: N/A
Serial No.	: SP0062
Data Cable	: Non-Shielded

**Support Unit 4. -- Printer (HP)**

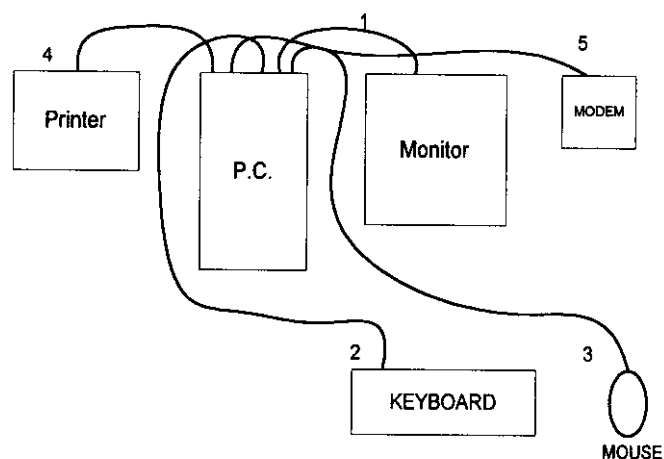
FCC ID : DSI6XU225  
Model No. : 2225C  
Power Supply Type : Linear  
Serial No. : SP0014  
Data Cable : Shielded, 360 degree via metal backshells

**Support Unit 5. -- Modem (ACEEX)**

FCC ID : IFAXDM1414  
Model No. : DM1414  
Power Supply Type : Linear  
Power Cord : N/A  
Serial No. : SP0015  
Data Cable : Shielded, 360 degree via metal backshells

**Support Unit 6. -- Personal Computer (FIC)**

FCC ID : N/A  
Model No. : P2L97 (AGP PC)  
Power Supply Type : Switching  
Power Cord : Non-Shielded  
Serial No. : SP0040  
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 I/O cable is connected to the support unit 5.

### **3. Test Software**

An executive program, WINFCC.EXE under WIN98, 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. 30-2, Lin 6, Diing-Fwu Tsuen, Lin-Kou-Hsiang,  
Tapei 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 2,000 MHz

### **4.5. Test Distance**

The test distance of radiated emission from antenna to EUT is 3 M.

## **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 section 5.3. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

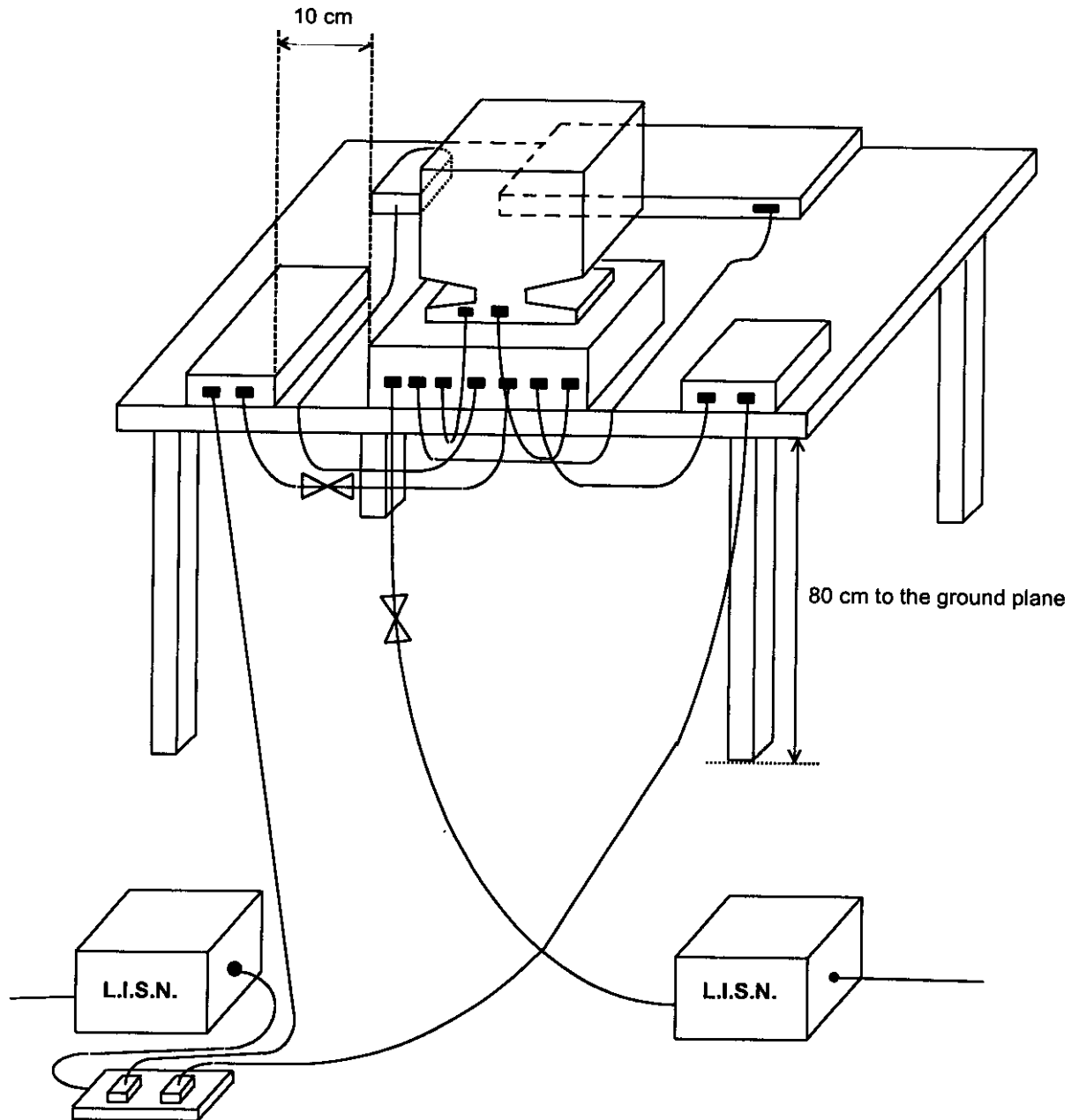
### **5.1. Major Measuring Instruments**

- Test Receiver ( R&S ESH3 )
  - Attenuation 0 dB
  - Start Frequency 0.45 MHz
  - Stop Frequency 30 MHz
  - Step MHz 0.007 MHz
  - IF Bandwidth 9 KHz

**5.2. 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 450 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.

**5.3. Typical Test Setup Layout of Conducted Powerline**



**5.4. Test Result of AC Powerline Conducted Emission**

5.4.1. Test mode : 1280x1024 85Hz/95K

- Temperature : 30°C
- Relative Humidity : 69 %
- Test Date : Oct. 27, 1998

**The Conducted Emission test was passed at minimum margin****NEUTRAL 29.680 MHz / 39.10 dBuV.**

Freq. (MHz)	Line/ Neutral	Meter Reading		Limits		Margin
		(dBuV)	(uV)	(dBuV)	(uV)	(dB)
0.510	L	33.10	45.00	48.00	251.19	-14.90
27.780	L	33.50	47.00	48.00	251.19	-14.50
29.820	L	38.20	81.00	48.00	251.19	-9.80
0.520	N	33.60	48.00	48.00	251.19	-14.40
27.650	N	32.80	44.00	48.00	251.19	-15.20
29.680	N	39.10	90.00	48.00	251.19	-8.90

Test Engineer :   
ROXY CHOU

**FCC TEST REPORT**

Report No. : F8O2116

5.4.2. Test mode : 1600x1200 85Hz/106K

- Temperature : 30°C
- Relative Humidity : 69 %
- Test Date : Oct. 27, 1998

**The Conducted Emission test was passed at minimum margin****LINE 29.820 MHz / 38.20 dBuV.**

Freq. (MHz)	Line/ Neutral	Meter Reading		Limits		Margin
		(dBuV)	(uV)	(dBuV)	(uV)	(dB)
0.510	L	32.80	44.00	48.00	251.19	-15.20
27.780	L	34.50	53.00	48.00	251.19	-13.50
29.820	L	38.20	81.00	48.00	251.19	-9.80
0.510	N	33.20	46.00	48.00	251.19	-14.80
27.540	N	34.10	51.00	48.00	251.19	-13.90
29.700	N	37.80	78.00	48.00	251.19	-10.20

Test Engineer : Roxy Chou  
ROXY CHOU

## **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**

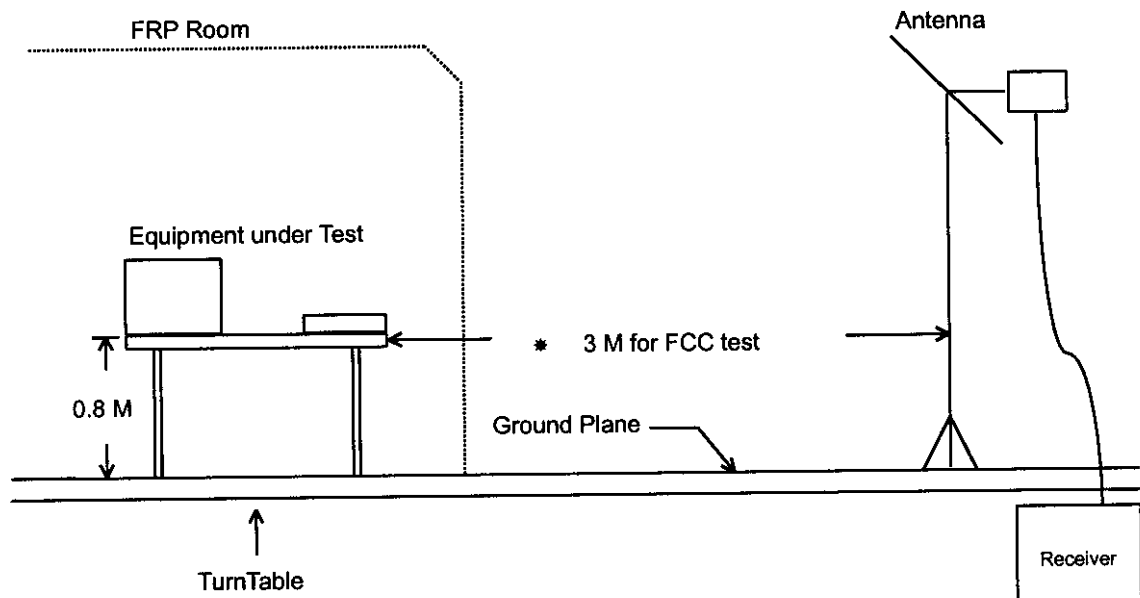
- Amplifier ( HP 87405A )
  - Attenuation 0 dB
  - RF Gain 25 dB
  - Signal Input 10 MHz to 3 GHz
  
- Spectrum Analyzer ( HP 8594A )
  - Attenuation 0 dB
  - Start Frequency 30 MHz
  - Stop Frequency 2000 MHz
  - Resolution Bandwidth 1 MHz
  - Video Bandwidth 1 MHz
  - Signal Input 9 KHz to 2.9 GHz
  
- 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

**6.2. 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**

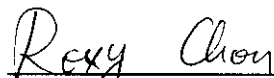
6.4.1. Test mode : 1280x1024 85Hz/95K

- Test Distance : 3 M
- Temperature : 32°C
- Relative Humidity : 71 %
- Test Date : Oct. 27, 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 minimum margin****192.900 MHz / 34.76 dBuV (VERTICAL) Antenna Height 4 Meter, Turntable Degree 130 °.**

Frequency (MHz)	Polarity	Antenna Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Limits		Emission (dBuV)	Level (uV)	Margin (dB)
					(dBuV)	(uV)			
179.300	H	9.00	2.00	23.00	43.50	149.62	33.90	50.00	-9.60
192.900	H	9.00	2.00	24.00	43.50	149.62	34.76	55.00	-8.74
202.400	H	9.00	2.00	22.00	43.50	149.62	33.32	46.00	-10.18
179.300	V	9.00	2.00	21.00	43.50	149.62	32.30	41.00	-11.20
191.800	V	9.00	2.00	21.00	43.50	149.62	31.51	38.00	-11.99
200.000	V	9.00	2.00	23.00	43.50	149.62	34.48	53.00	-9.02

Test Engineer :

  
ROXY CHOU

**6.4.2. Test mode : 1600x1200 85Hz/106K**

- Test Distance : 3 M
- Temperature : 32°C
- Relative Humidity : 71 %
- Test Date : Oct. 27, 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 minimum margin**

**201.600 MHz / 35.21 dBuV (VERTICAL) Antenna Height 4 Meter, Turntable Degree 145 °.**

Frequency (MHz)	Polarity	Antenna Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Limits		Emission (dBuV)	Level (uV)	Margin (dB)
					(dBuV)	(uV)			
171.800	H	10.00	2.00	18.00	43.50	149.62	29.81	31.00	-13.69
192.900	H	9.00	2.00	22.00	43.50	149.62	32.76	43.00	-10.74
201.600	H	9.00	2.00	24.00	43.50	149.62	35.21	58.00	-8.29
233.600	H	10.00	3.00	23.00	46.00	199.53	36.07	64.00	-9.93
185.700	V	9.00	2.00	18.00	43.50	149.62	29.32	29.00	-14.18
201.600	V	9.00	2.00	24.00	43.50	149.62	34.61	54.00	-8.89

Test Engineer : Roxy Chou  
ROXY CHOU

**7. Antenna Factor & Cable Loss**

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	17.7	0.9
35	15.6	1.1
40	13.0	1.0
45	10.1	1.2
50	8.0	1.2
55	6.4	1.2
60	6.1	1.2
65	5.9	1.4
70	6.4	1.3
75	6.3	1.5
80	7.2	1.5
85	7.5	1.6
90	8.5	1.6
100	10.1	1.7
110	10.4	1.9
120	11.8	1.8
130	11.2	2.3
140	11.7	2.0
150	11.9	2.2
160	10.5	2.1
180	9.0	2.0
200	9.1	2.3
225	9.5	2.5
250	11.8	2.6
300	13.6	2.9
350	14.8	3.1
400	16.3	3.4
450	17.3	3.7
500	17.7	3.7
550	19.5	3.9
600	20.0	4.1
650	20.4	4.3
700	21.0	4.6
750	21.4	4.9
800	22.1	4.8
850	22.9	5.0
900	22.7	5.1
950	24.1	5.3
1000	24.9	5.5
2000	26.4	9.7

## 8. List of Measuring Equipments 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
LISN	EMCO	3825/2	9510-2484	50 ohm / 50 $\mu$ H	Nov. 29, 1997	Conduction
LISN	KYORITSU	KNW-407	8-1010-15	50 ohm / 50 $\mu$ H	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
RF Preselector (Site 1)	HP	85685A	2926A00951	20MHz -1.5GHz	July 18, 1998	Radiation
Spectrum Analyzer (site 1)	HP	8568B	2928A04713	100Hz - 1.5GHz	July 18, 1998	Radiation
Quasi-peak Adapter (site 1)	HP	85650A	2811A01285	9KHz -1 GHz	Jul. 18, 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