

FCC TEST REPORT

for

PART 15, SUBPART B CLASS B

Equipment : MOUSE

MODEL NO. : EasyMouse+PS2

F C C I D : FSUGMZFR

Filing Type : Original Grant

APPLICANT : KYE SYSTEMS CORP.

No. 492, Sec. 5, Chung Hsin Rd., San Chung,
Taipei Hsien, 241, 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.

EXHIBIT B

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CERTIFICATE OF COMPLIANCE

for

FCC PART 15, SUBPART B CLASS B

Equipment : MOUSE

MODEL NO. : EasyMouse+PS2

F C C I D : FSUGMZFR

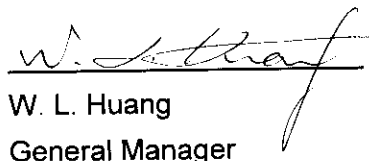
Filing Type : Original Grant

APPLICANT : **KYE SYSTEMS CORP.**

No. 492, Sec. 5, Chung Hsin Rd., San Chung,
Taipei Hsien, 241, 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 MAR. 31, 1998 at **SPORTON International Inc.** in LIN KOU.


W. L. Huang
General Manager

Apr 28, 98

SPORTON International Inc.

6F, No. 106, Hsin Tai Wu Rd., Sec. 1, Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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, KYE mouse and ACEEX modem were connected to the LEO PC.
- c. 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 (LEO)

FCC ID :N/A
Model No. :P2L97
Serial No. :SP1040
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
Model No. :DM-1414
Serial No. :SP0016
Data Cable :Shielded, 360 degree via metal backshells
Power Supply Type :Linear

Support Device 3. --- PRINTER (HP)

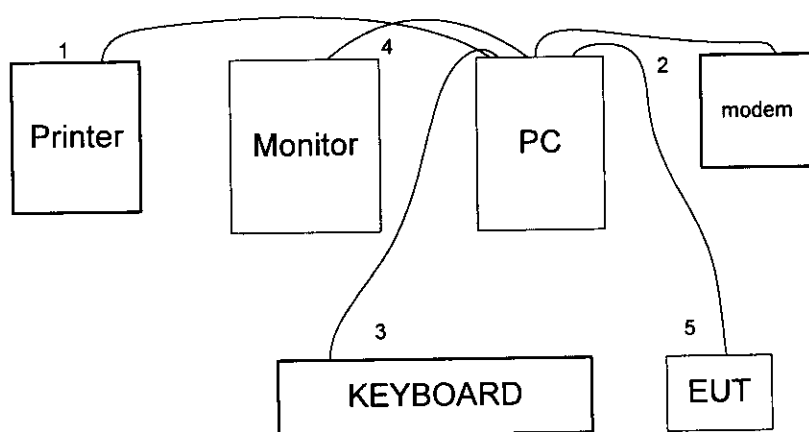
FCC ID :B94C2642X
Model No. :DESKJET 400
Serial No. :SP0003
Data Cable :Shielded, 360 degree via metal backshells
Power Supply Type :Linear

Support Device 4. --- MONITOR (SONY)

FCC ID :AK8GDM17SE2T
Model No. :GDM-17SE2T
Serial No. :SP1034
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

2.3. CONNECTION DIAGRAM OF TEST SYSTEM

1. The I/O cable is connected to the support device 3.
2. The I/O cable is connected to the support device 2.
3. The I/O cable is connected to the support device 5.
4. The I/O cable is connected to the support device 4.
5. The data cable is connected to the EUT.

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 g.

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.

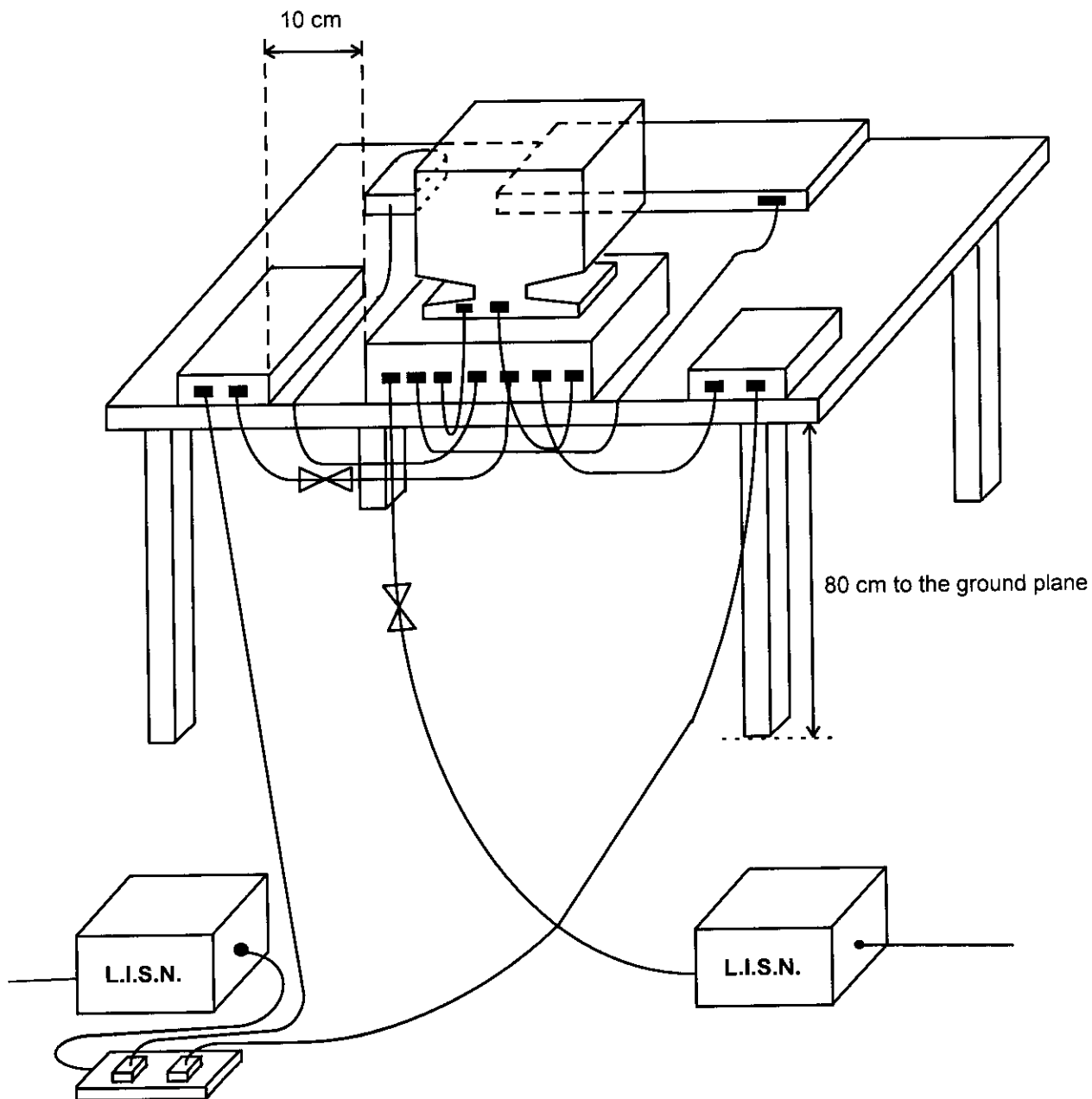
5.1. MAJOR MEASURING INSTRUMENTS

| | |
|-----------------|-----------|
| • Test Receiver | HP85462A |
| 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 receiver 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 : 19 °C
- Relative Humidity : 43% RH
- All emissions not reported here are more than 10 dB below the prescribed limit.
- Test Date : MAR. 31, 1998

The Conducted Emission test was passed at minimum margin

LINE 0.70MHz /40.70dBuV.

| Frequency (MHz) | Line / Neutral | Meter Reading | | Limits | | Margin (dB) |
|----------------------|----------------|---------------|--------|----------|--------|------------------|
| | | (dBuV) | (uV) | (dBuV) | (uV) | |
| 0.70 | N | 40.50 | 105.93 | 48.00 | 251.19 | -7.50 |
| 0.88 | N | 40.40 | 104.71 | 48.00 | 251.19 | -7.60 |
| 1.18 | N | 40.30 | 103.51 | 48.00 | 251.19 | -7.70 |
| 0.70 | L | 40.70 | 108.39 | 48.00 | 251.19 | -7.30 |
| 0.88 | L | 40.50 | 105.93 | 48.00 | 251.19 | -7.50 |
| 1.18 | L | 40.10 | 101.16 | 48.00 | 251.19 | -7.90 |

Test Engineer :

Alex

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

| | |
|----------------------|----------------------------------|
| Model | 8568B |
| Attenuation | 0 dB |
| Start Frequency | 30 MHz |
| Stop Frequency | 1000MHz |
| Resolution Bandwidth | 1 MHz |
| Video Bandwidth | 1 MHz |
| Signal Input | Input 1 (for 100Hz to 1.5 GHz) |

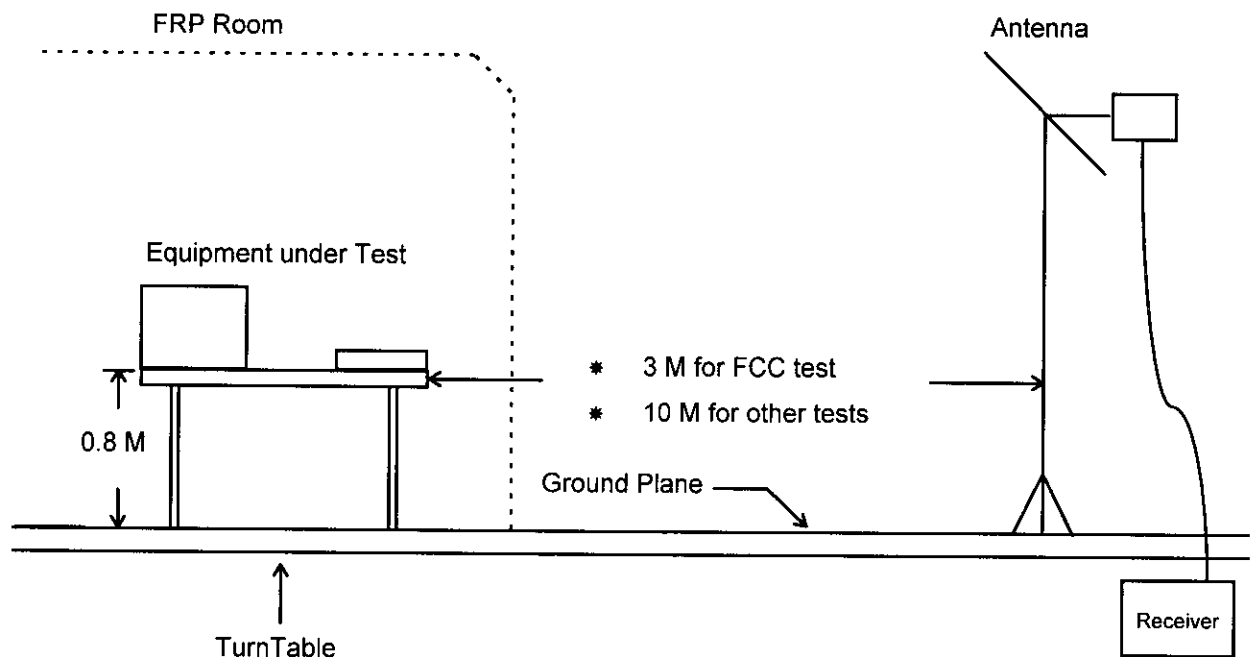
- Quasi-Peak Adapter

| | |
|----------------------|---|
| 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 (HP 8568B) 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 : 26 °C
- Relative Humidity :68% RH
- Test Date :MAR. 27, 1998
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Sample Calculation at 440.00MHz
Corrected Reading = 22.38+ 3.76+ 12.94= 39.08(dBuV/m)

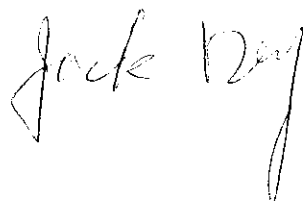
The Radiated Emission test was passed at minimum margin

Horizontal 80.62MHz/34.07dBuV

Antenna Height 3Meter , Turntable Degree 170°

| Frequency (MHz) | Polarity | Antenna Factor (dB) | Cable Loss (dB) | Reading (dBuV) | Limits (dBuV) | (uV) | Emission Level (dBuV) | (uV) | Margin (dB) |
|----------------------|----------|-----------------------------|-------------------------|---------------------|--------------------|--------|-------------------------------|--------|------------------|
| 40.77 | H | 0.63 | 0.95 | 31.71 | 40.00 | 100 | 33.29 | 46.18 | -6.71 |
| 80.62 | H | 7.15 | 1.40 | 25.52 | 40.00 | 100 | 34.07 | 50.52 | -5.93 |
| 48.13 | V | 1.98 | 1.00 | 29.25 | 40.00 | 100 | 32.23 | 40.88 | -7.77 |
| 85.75 | V | 7.63 | 1.40 | 24.03 | 40.00 | 100 | 33.06 | 44.98 | -6.94 |
| 292.00 | V | 17.79 | 2.95 | 18.61 | 46.00 | 200 | 39.35 | 92.79 | -6.65 |
| 440.00 | V | 22.38 | 3.76 | 12.94 | 46.00 | 200 | 39.08 | 89.95 | -6.92 |

Test Engineer :



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. | Characteristic | Calibration date | Remark |
|--------------------------------|--------------|------------|------------|------------------|------------------|--------|
| Receiver RF Section | HP | 85462A | 3325A00108 | 9 KHz - 6.5 GHz | Oct. 22, 1997 | C |
| RF Section | HP | 85460A | 3308A00104 | 9 KHz - 6.5 GHz | Oct. 22, 1997 | C |
| LISN | EMCO | 3850/2 | 1035 | 50 ohm / 50 uH | Oct. 27, 1997 | C |
| LISN | KYORITSU | KNW-407 | 8-693-10 | 50 ohm / 50 uH | Oct. 04, 1997 | C |
| EMI Filter | CORCOM | MRI-2030 | N/A | 480 VAC / 30 A | N/A | C |
| EMI Filter | CORCOM | MRI-2030 | N/A | 480 VAC / 30 A | N/A | C |
| Spectrum Analyzer (Site 1) | HP | 8568B | 2732A04100 | 100Hz - 1500GHz | Jun 17, 1997 | R |
| Quasi-peak Adapter (site 1) | HP | 85650A | 2811A01116 | 9KHz -1 GHz | Jun. 17, 1997 | R |
| Amplifier (Site 1) | HP | 8447D | 2944A08291 | 0.1 MHz -1.3 GHz | Nov. 12, 1997 | R |
| Bilog Antenna (Site 1) | CHASE | CBL6111 | 1378 | 30 MHz -1000 MHz | Aug. 11, 1997 | R |
| Half-wave dipole antenna | EMCO | 3121C | 9705-1285 | 28M-1GHZ | May. 19, 1997 | R |
| Turn Table (site 1) | EMCO | 1060-1.211 | 9508-1805 | 0 ~ 360 degree | N/A | R |
| Antenna Mast (site 1) | EMCO | 1051-1.2 | 9502-1868 | 1 m- 4 m | N/A | R |

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