Designated by Ministry of International Trade and Industry

KANSAI ELECTRONIC INDUSTRY DEVELOPMENT CENTER

HEAD OFFICE
6-8-7, NISHITEMMA
KITA-KU, OSAKA, 530 JAPAN

KEC

IKOMA
TESTING LABORATORY
10630, TAKAYAMA-CHO
IKOMA-CITY, NARA, 630-01 JAPAN

Corporate Juridical Person

ENGINEERING TEST REPORT

REPORT NO.A-009-99-A

Issued Date : March 1, 1999

This test report is to certify that the tested device properly complies with the requirements of:

FCC Rules and Regulations Part 15 Subpart B Unintentional Radiators.

The tests necessary to show compliance to the requirements were performed and these results met the specifications of requirement. The results of this report should not be construed to imply compliance of equipment other than that which was tested. Unless the laboratory permission, this report should not be copied in part.

1. Applicant

Company Name : Japan Computer Industry Inc.

Mailing Address : 1-6-20 Kosakahonmachi, Higashiosaka-shi, Osaka 577-0802 Japan

2. Identification of Tested Device

FCC ID : N6CZXE00495A
Device Name : LAN Card
Trade Name : OKI
Model Number : 41017801
Serial Number : 0001 : ☐ Production ☐ Pre-production ☒ Prototype
Date of Manufacture : December, 1998

3. Test Items and Procedure

☒ Conducted Emission Measurement
☒ Radiated Emission Measurement

Above all tests were performed under : ANSI C63.4-1992

4. Date

Receipt of Test Sample : February 3, 1999
Test Completed on : February 5, 1999

CERTIFIED BY : _____

Fumitoshi Nagaoka
Associate Director of Ikoma Testing Laboratory

ENGINEERING TEST REPORT

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1. GENERAL INFORMATION

1.1 Product Description

The OKI Model No. 41017801 (referred to as the EUT in this report) is a built-in type print server with LAN interface.

1) Technical Specifications
- ASIC : Falcon
- LAN Interface : 10 BASE or 100 BASE (Auto selectable)

2) Equipped Terminal
- 10/100 BASE : RJ45 connector type LAN interface

3) List of Oscillators used in the EUT
- 33 MHz (clock generator 4.125 MHz × 8 drive) : CPU and NIC driver clock
- 25 MHz, 125 MHz (clock generator 4.125 MHz × 8 drive) : 10/100 BASE PHY clock

4) Rated Power Supply : DC 5V (supplied from a printer)

1.2 Description for Equipment Authorization

1) Rules Part(s) under which Equipment operated

FCC Rule Part 15, Subpart B ; Unintentional Radiators ☐ Class A ☒ Class B Digital Device

2) Kind of Equipment Authorization

☒ Certification ☐ Verification ☐ DoC

3) Procedure of Application

☒ Original Equipment ☐ Modification

4) Highest Frequency used in the Device : 125 MHz

Upper Frequency of Radiated measurement Range is
☐ 1000 MHz.
☒ 2000 MHz.
☐ 5000 MHz.

1.3 Test Facility

All tests described in this report were performed by:

N a m e : KANSAI ELECTRONIC INDUSTRY DEVELOPMENT CENTER (KEC)
IKOMA TESTING LABORATORY
Open Test Site ☐ No.1 ☐ No.2 ☒ No.3 ☐ No.4
Shielded Room ☐ No.2 ☒ No.4

Address : 12128, Takayama-cho Ikoma-city, Nara, 630-0101 Japan

These test facilities have been filed with the FCC under the criteria of ANSI C63.4-1992. Also the laboratory has been authorized by ITI (Interference Technology International, UK), TUV Product Service (GER) and TUV Rheinland (GER) based on their criteria for testing laboraroty (EN45001).

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2 TESTED SYSTEM

2.1 Operation of EUT System

1. Turn on all devices.

2. Execute the test program of the MS-DOS prompt on the Windows95 from the two personal computers.

3. The following operations of the two personal computers are performed in parallel.

   (1) The operations of the personal computer 1.

   The following operations a) ~ d) are repeated.

   a) Printing the "H" patterns that is used white letters on a black background on the LCD. [(79×25) characters of "H" are displayed at full scale and repeat the scrolling "H" patterns.]

   b) Reading, writing and erasing the data on the built-in HDD

   c) Reading, writing and erasing the data on the built-in FDD

   d) Transmitting the "H" patterns to the external modem.

   (2) The operations of the personal computer 2.

   The following operations (a) ~ (c) are repeated.

   a) Transmitting the printing command data to the HUB at 10 Mbit/sec.

   b) The printing command data is fransferred from the HUB to the EUT at 100 Mbit/sec.

   c) The page printer prints the "H" patterns on A4 size paper.

[Note]

1) The status of the printing command data is displayed on the LCD of the personal computer 2.

2) Test progtam is prepared by the applicant.

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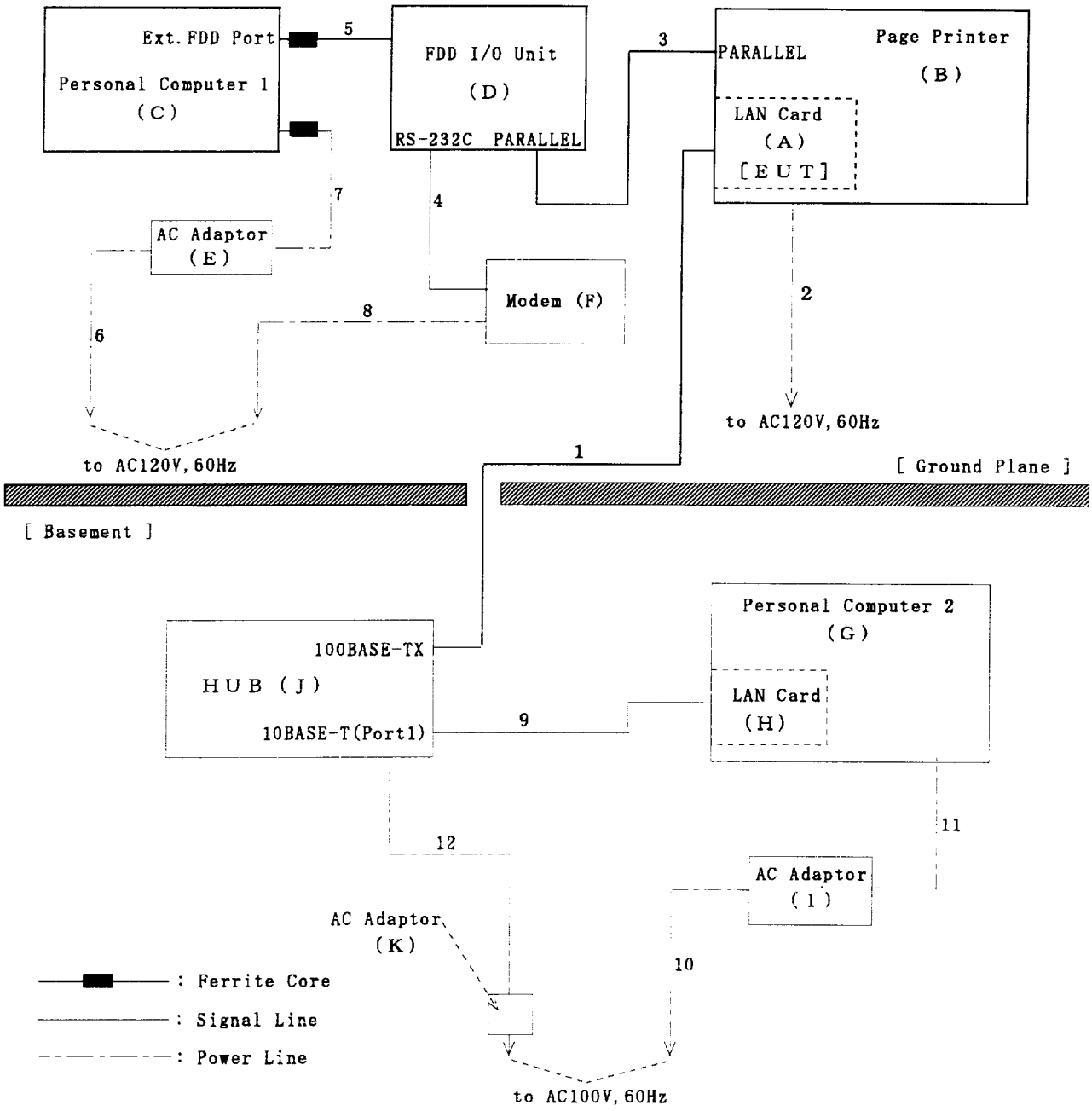
2.2 Block Diagram of EUT System



[Note]

1) The personal computer 2(G) and the HUB (J) were located at a distance sufficient that it does not contribute to measured level.
2) See 2.3 List of EUT System and 2.4 List of Cables.

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2.3 List of EUT System

No	Device Name (Interface)	Model Number (Serial Number)	FCC ID (Trade Name)	Note	Remark
A	LAN Card (100 BASE)	41017801 (0001)	N6CZXE00495A (-)	Prototype Model Name : MLETB08	1)
B	Page Printer	N22001A (No.1)	DoC (OKI)	Prototype Model Name : OKIPAGE 24DX	
C	Personal Computer 1	PC-A150 (89019990)	DoC (SHARP)		
D	FDD I/O UNIT	CE-FD02 (-)	DoC (SHARP)		2)
E	AC Adaptor for Personal Computer 1	EA-J01V (C980705264A)	N/A (SHARP)		2)
F	Modem (RS-232C)	T1200-SD2 (S87309400)	D786JCT1200-SD2 (OmniTel Inc.)		
G	Personal Computer 2	PA1252J9 D (Y7026797)	N/A (TOSHIBA)	for JAPAN use only	
H	LAN Card (10 BASE-T)	DFL3410/12 (T974308969 09)	DoC (TDK)		
I	AC Adaptor for Personal Computer 2	PA2500U (0116702)	N/A (TOSHIBA)		3)
J	HUB	Switch 140 (7XTR010014)	DoC (3 Com)		
K	AC Adaptor for HUB	SLD81308J (0197)	N/A (SILICORE)		4)

[Attention]
N/A : Not Applicable

[Remark]
1) : EUT submitted for grant
2) : Accessory of the Personal Computer 1(C)
3) : Accessory of the Personal Computer 2(G)
4) : Accessory of HUB(J)

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2.4 List of Cables

No	Cable Name	Shielded (Y / N)	Length (m)	Note	Remark
1	100 BASE Cable	Y	20	Category 5 type	
2	AC Power Cord of Page Printer	N	3.0	3-wires type	
3	Parallel I/F Cable	Y	1.0		
4	RS-232C I/F Cable	Y	2.0		
5	FDD I/O UNIT Cable	Y	0.20	with one ferrite core, permanently attached to FDD I/O Unit	
6	Input Cord of AC Adaptor for Personal Computer 1	N	2.0	2-wires type	1)
7	Output Cord of AC Adaptor for Personal Computer 1	N	1.7	with one ferrite core, permanently attached to AC Adaptor	
8	AC Power Cord of Modem	N	1.9	3-wires type, permanently attached to Modem	
9	10 BASE-T Cable	N	2.0	Flat 15P ⇔ Modular 8P	2)
10	Input Cord of AC Adaptor for Personal Computer 2	N	1.95	2-wires type	
11	Output Cord of AC Adaptor for Personal Computer 2	N	1.8	2-wires type, permanently attached to AC Adaptor	
12	Output Cord of AC Adaptor for HUB	N	2.3	2-wires type, permanently attached to AC Adaptor	

[Remark]

1) : Accessory Cable of Personal Computer 1(C)

2) : Accessory cable of LAN Card(H)

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3. AC POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1 Reference Rule and Specification

FCC Rule Part 15, Section 15.107 [×] (a).
[ ] (b).

3.2 Test Procedure

1) Configurate the EUT System in accordance with ANSI C63.4-1992 section 7. See also the block diagram and the photographs of EUT System configuration in this report.

2) Connect the EUT's AC power cord to one Line Impedance Stabilization Network(LISN).

3) Any other equipment power cord are connected to a LISN different from the LISN used for the EUT.

4) Warm up the EUT System.

5) Activate the EUT System and run the software prepared for the test, if require.

6) Using a calibrated coaxial cable, connect the spectrum analyzer(*1) to the measuring port of the LISN for the EUT.

7) To find out an EUT System condition produces the maximum emission, the configuration of EUT System, the position of the cables, and the operation mode were changed under normal usage of the EUT.

8) The spectrum are scanned from 450 kHz to 30 MHz and collect the minimum six highest emissions on the spectrum analyzer relative to the limits.

9) The test receiver(*2) is connected to the LISN for the EUT, and the minimum six highest emissions recorded above are measured.

[Note]

(*1) : Spectrum Analyzer Set Up Conditions

Frequency range	:	450 kHz - 30 MHz
Resolution bandwidth	:	10 kHz
Video bandwidth	:	1 MHz
Detector function	:	Peak mode

(*2) : Test Receiver Set Up Conditions

Detector function	:	Quasi-Peak / Average (if necessary)
IF bandwidth	:	10 kHz

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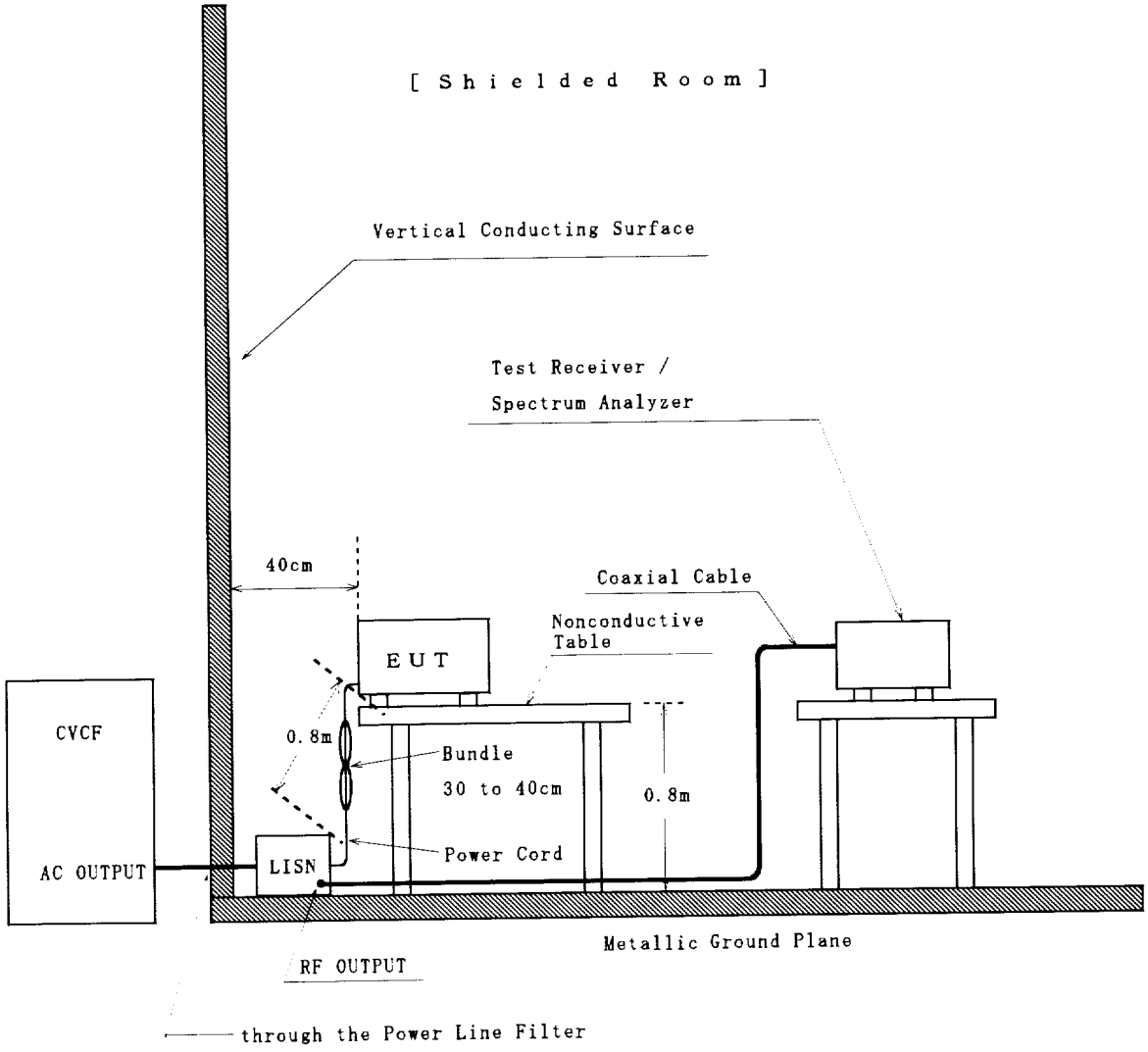
3.3 Test Configuration



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3.5 Test Results

1) Measurement with the quasi-peak detector and the average-peak detector.

Emission Frequency [MHz]	LISN Corr. Factor [dB]	Meter Reading [dBμV]		Maximum RF Voltage [dBμV]	Limits [dBμV]
		One-end to Ground	Other-end to Ground		
* 0.4500	0.1	46.0	47.6	47.7	48.0
0.5354	0.1	47.0	47.3	47.4	48.0
6.197	0.2	41.3	42.0	42.2	48.0
6.518	0.3	42.6	43.1	43.4	48.0
8.763	0.3	43.3	42.9	43.6	48.0
8.976	0.4	45.1	44.0	45.5	48.0
Additional measurement with the average detector at * marked frequencies					
0.4500	0.1	19.4	22.5	22.6	-

[Attention]

1) The EUT is designed to use as built-in a printer, and powered from a printer. Therefore, the conducted measurement of the EUT, tested under the AC power lines of the printer.
2) The measurement data(*) with quasi-peak detector is higher(more than 6dB) than the measured data with the average detector. Therefore, in accordance with ANSI C63.4-1992 section 11.5.2, the 13 dB reduced quasi-peak mode level is shown.

2) The 13dB reduced quasi-peak mode level

Emission Frequency [MHz]	LISN Corr. Factor [dB]	Meter Reading (13 dB reduced quasi-peak mode level) [dBμV]		Maximum RF Voltage [dBμV]	Limit [dBμV]
		One-end to Ground	Other-end to Ground		
0.4500	0.1	33.0	34.6	34.7	48.0

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[Note]
LISN Correction Factor includes the cable loss.

[Environment]
Temperature : 22°C Humidity : 22%

[Sample Calculation]
1) Measurement with the quasi-peak detector

Frequency	:	0.4500	[MHz]
Meter Reading	:	47.6	[dBμV] (at Other-end to Ground)
LISN Corr. Factor	:	0.1	[dB]

Then, RF voltage is calculated as follows.

RF Voltage = 47.6 + 0.1 = 47.7 [dBμV]

2) Measurement with the average detector

Frequency	:	0.4500	[MHz]
Meter Reading	:	22.5	[dBμV] (at Other-end to Ground)
LISN Corr. Factor	:	0.1	[dB]

Then, RF voltage is calculated as follows.

RF Voltage = 22.5 + 0.1 = 22.6 [dBμV]

3) Quasi-peak RF voltage is compared with average detector at 0.4500 MHz

Quasi-peak RF voltage - Average RF voltage = 47.7 - 22.6 = 25.1 [dBμV] > 6 [dB]
Therefore, 13 dB reduced Quasi-peak mode level is shown as follows,

Frequency	:	0.4500	[MHz]
Meter Reading	:	34.6	[dBμV] (at Other-end to Ground)
LISN Corr. Factor	:	0.1	[dB]

Then, RF voltage is calculated as follows.

RF Voltage = 34.6 + 0.1 = 34.7 [dBμV]

[Summary of Test Results]
Minimum margin was 0.6 dB at 0.5354 MHz, other-end to ground.

Tested Date : February 4, 1998 Signature K. Masaoka
Kenji Masaoka

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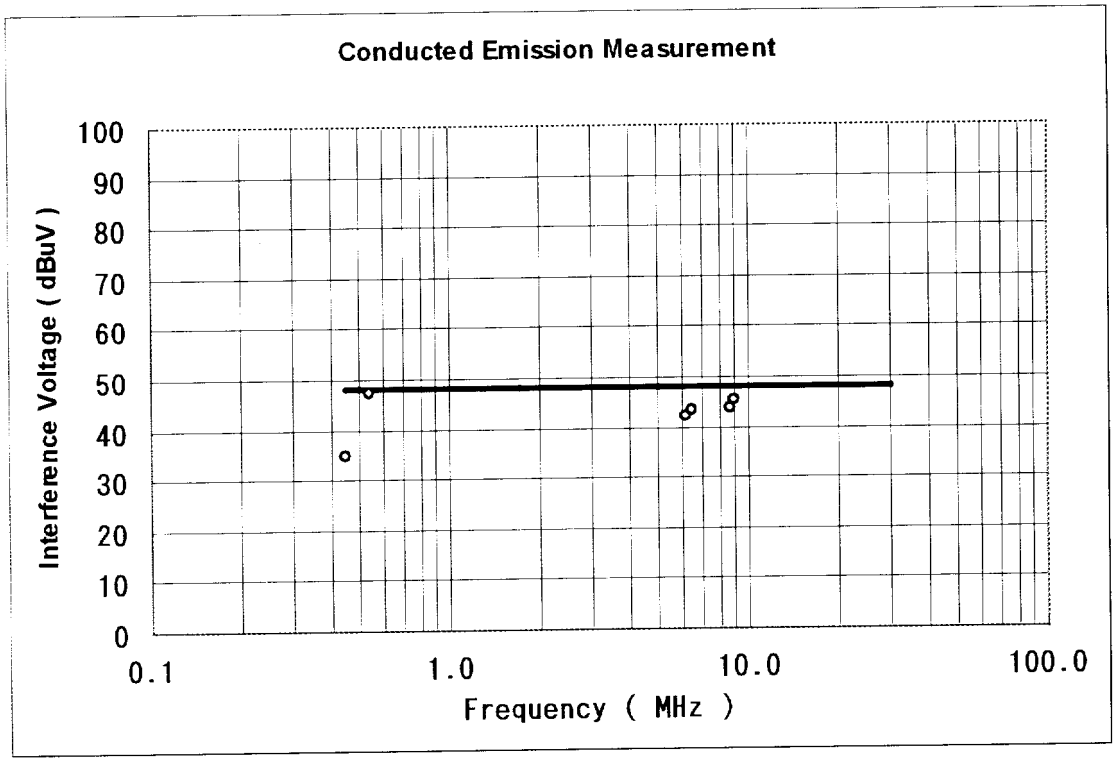
Test Data in Graph

Manufacturer	Japan Computer Industry Inc.
Model No.	41017801
Serial No.	0001
Reference Rule	FCC Part 15 subpart B class B
Test Mode	100 BASE mode
Shield No.	4th Shielded Room
LISN Type	KNW-407



[Note]

○ : Maximum RF Voltage

——— : Limit Line

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3.6 List of Test Instruments

Instrument	Manufacturer	Model No	Specifications	KEC Control No.	If used, checked by "X".	Last Cal.	Next Cal.
Test Receiver	Rohde & Schwarz	ESHS10	Frequency Range 9 kHz - 30 MHz	FS-67	☒	1998/10	1999/10
Spectrum Analyzer	Hewlett Packard	8568B	Frequency Range 100 Hz - 1.5 GHz	FS-46-3	☒	1998/6	1999/6
Line Impedance Stabiliza -tion Network for EUT	Kyoritsu	KNW-407	Frequency Range 150 kHz - 30 MHz Impedance 50 Ω / 50 μH Capacity AC250V,15A	FL-107	☒	1998/4	1999/4
Line Impedance Stabiliza -tion Network (Second LISN)	Kyoritsu	KNW-242	Frequency Range 10 kHz - 30 MHz Impedance 50Ω/50μH + 5Ω Capacity AC250V,15A	FL-110	☒	1998/4	1999/4

ENGINEERING TEST REPORT

4. RADIATED EMISSION MEASUREMENT

4.1 Reference Rule and Specification

FCC Rule Part 15, Section 15.109 [×](a) and (c).
[ ](b) and (c).

4.2 Test Procedure

1) Configurate the EUT System in accordance with ANSI C63.4-1992 section 8. See also the block diagram and the photographs of EUT System configuration in this report.

2) If the EUT system is connected to a public power network, all power cords for the EUT System are connected the receptacle on the turn floor.

3) Warm up the EUT System.

4) Activate the EUT System and run the prepared software for the test, if require.

5) To find out the emissions of the EUT System, preliminary radiated measurement are performed at a closer distance than that specified for final radiated measurement using the Spectrum Analyzer(*1) and the broad band antenna. In the frequency above 1 GHz, it is performed using the spectrum analyzer(*2) and the horn antenna.

6) To find out an EUT System condition produces the maximum emission, the configuration of EUT System, the position of the cables, and the operation mode were changed under normal usage of the EUT.

7) The spectrum are scanned from 30 MHz to the upper frequency of measurement range, and collect the minimum six highest emissions on the spectrum analyzer relative to the total limits.

8) In final compliance test, the minimum six highest emissions recorded above are measured at the specified distance using the broad band antenna or the tuned dipole antenna and the test receiver(*3).
In the frequency above 1 GHz, the measurements are performed by the horn antenna and [ ] the test receiver(*4).
[×] the spectrum analyzer(*2) with pre-amplifier.

[Note]

(*1) : Spectrum Analyzer Set Up Conditions
Frequency range : 30 - 1000 MHz
Resolution bandwidth : 100 kHz
Detector function : Peak mode

(*2) : Spectrum Analyzer Set Up Conditions
Frequency range : 1 GHz - Upper frequency of measurement range
Resolution bandwidth : 1 MHz
Video bandwidth : 1 MHz
Attenuator : 10 dB
Detector function : Peak mode

(*3) : Test Receiver Set Up Conditions
Detector function : Quasi-Peak
IF bandwidth : 120 kHz

(*4) : Test Receiver Set Up Conditions
Detector function : Average
IF bandwidth : 1 MHz

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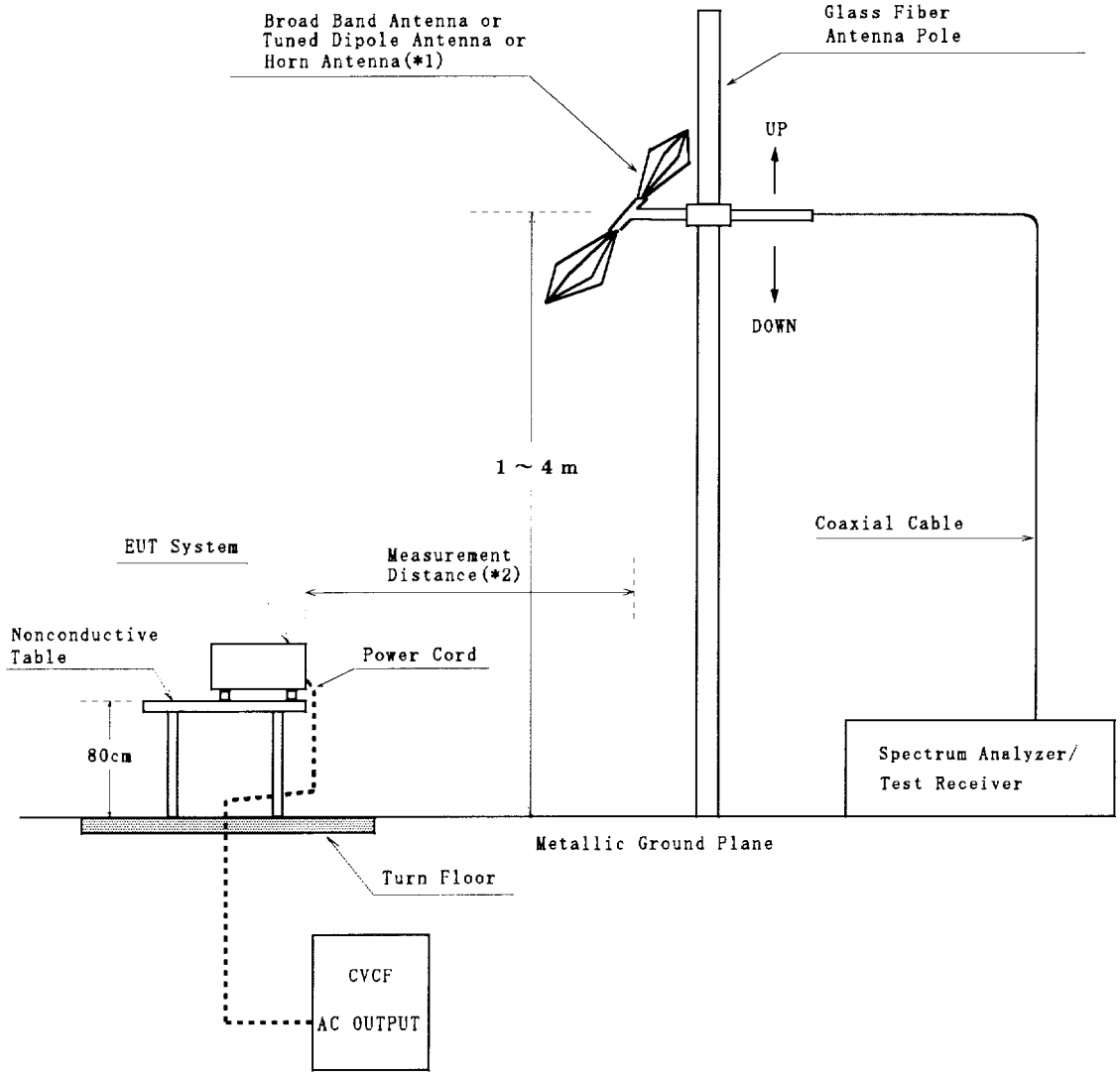
4.3 Test Configuration

[Open Site]



[Note]

1) (*1) : In frequency range above 1 GHz use only.
2) (*2) : Measurement distance is shown on 4.5 Test Results in this report.

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4.5 Test Results

Measurement Distance ☒ :3m ☐ :10m

Emission Frequency [MHz]	Antenna Factor [dB]	Meter Reading [dBμV] Horizontal Polarization	Meter Reading [dBμV] Vertical Polarization	Maximum Field Strength [dBμV/m]	Limits [dBμV/m]
38.03	15.5	3.2	18.3	33.8	40.0
125.00	14.8	11.1	16.2	31.0	43.5
135.78	15.5	16.8	15.2	32.3	43.5
211.09	18.4	12.4	7.2	30.8	43.5
295.77	21.9	10.6	10.2	32.5	46.0
419.37	18.9	8.7	12.9	31.8	46.0
600.00	22.6	13.7	15.9	38.5	46.0

[Note]
Antenna Factor includes the cable loss.

[Environment]
Temperature : 15°C Humidity : 45%

[Sample Calculation]
Frequency : 38.03 [MHz]
Meter Reading : 18.3 [dBμV] (at Vertical Polarization)
Antenna Factor : 15.5 [dB]

Then, Field Strength is calculated as follows.

Field Strength = 18.3 + 15.5 = 33.8 [dBμV/m]

[Summary of Test Results]
Minimum margin was 6.2 dB at 38.03 MHz, vertical polarization.

Tested Date : February 4, 1999

Signature K. Masaoka
Kenji Masaoka

ENGINEERING TEST REPORT

[above 1GHz]

Measurement Distance ☒ :3m ☐ :10m

Emission Frequency [MHz]	Antenna Factor [dB]	Amp Gain [dB]	Meter Reading [dBμV] Horizontal Polarization	Meter Reading [dBμV] Vertical Polarization	Maximum Field Strength [dBμV/m]	Limits [dBμV/m]
1174.96	24.2	37.0	50.2	49.8	37.4	54.0
1448.06	22.8	36.6	43.8	48.9	35.1	54.0
1649.95	22.4	36.3	45.6	42.5	31.7	54.0

[Note]

Antenna Factor includes the cable loss.

[Environment]

Temperature : 10°C Humidity : 62%

[Sample Calculation]

Frequency : 1174.96 [MHz]
Meter Reading : 50.2 [dBμV] (at Vertical Polarization)
Antenna Factor : 24.2 [dB]
Amp Gain : 37.0 [dB]

Then, Field Strength is calculated as follows.

Field Strength = 50.2 + 24.2 - 37.0 = 37.4 [dBμV/m]

[Summary of Test Results]

Minimum margin was 16.6 dB at 1174.96 MHz, horizontal polarization.

Tested Date : February 5, 1999

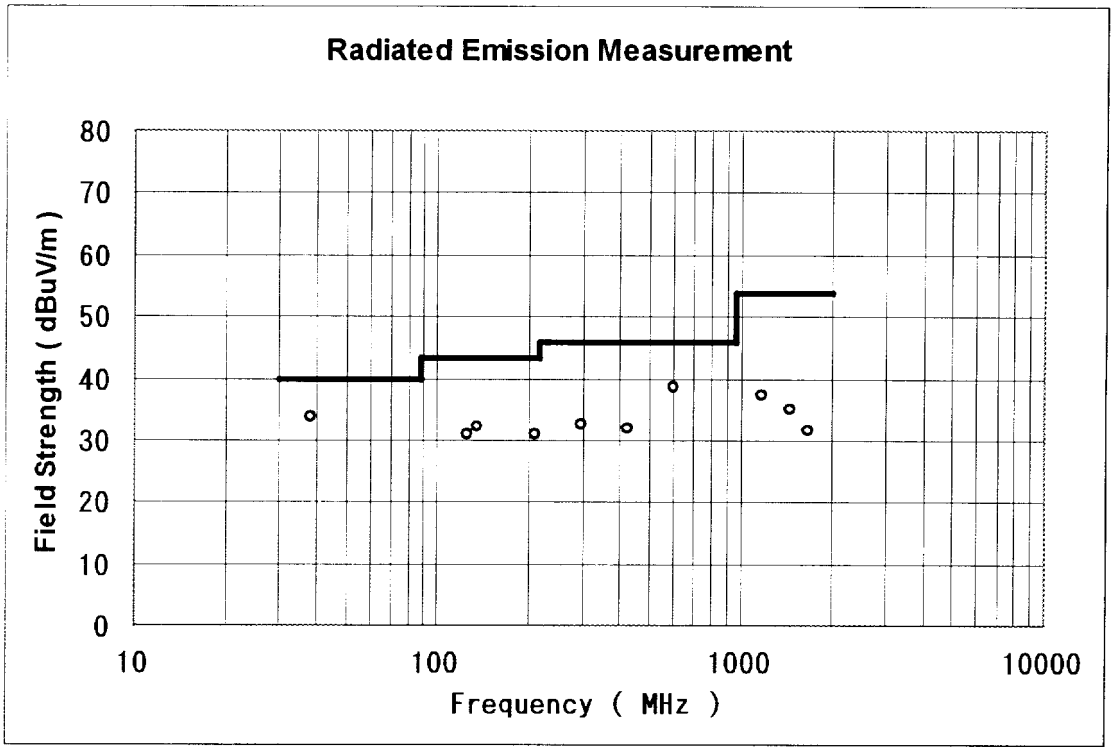
Signature K. Masaoka

Kenji Masaoka

ENGINEERING TEST REPORT

Test Data in Graph

Manufacturer	Japan Computer Industry Inc.
Model No.	41017801
Serial No.	0001
Reference Rule	FCC part 15 subpart B class B
Test Mode	100 BASE mode
Test Site	3rd Site
Measured Distance	3m



[Note] ○ : Maximum Field Strength
——— : Limit Line

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4.6 List of Test Instruments

Instrument	Manufacturer	Model No	Specifications	KEC Control No.	if used checked by "X".	Last Cal.	Next Cal.
Test Receiver	Rohde & Schwarz	ESVS10	Frequency Range 20 MHz - 1000 MHz	FS-66	☒	1998/5	1999/5
Spectrum Analyzer	Advantest	R3261B	Frequency Range 9 kHz - 3.6 GHz	SA-30	☒	1998/7	1999/7
Pre-Amplifier	Hewlett Packard	8449B	Frequency Range 1 GHz - 26.5 GHz	AM-52	☒	1998/4	1999/4
Biconical Antenna	Schwarzbeck	BBA9106	Frequency Range 30 MHz - 300 MHz	AN-79	☒	1998/2	1999/2
Log-Periodic Antenna	Schwarzbeck	UHALP 9108A	Frequency Range 300 MHz - 1 GHz	AN-216	☒	1998/2	1999/2
Tuned Dipole Antenna	Kyoritsu	KBA-511S	Frequency Range 25 MHz - 500 MHz	AN-134	☐	1998/2	1999/2
	Kyoritsu	KBA-611S	Frequency Range 500 MHz - 1 GHz	AN-136	☐	1998/2	1999/2
Horn Antenna	Raven	91888-2	Frequency Range 1 GHz - 2 GHz	AN-167	☒	1997/11	1999/11

Federal Communications Commission
EQUIPMENT APPROVAL SERVICES
P.O.Box 358315
Pittsburgh, PA 15251－5315

Subject : Class_B digital device certification

FCC ID : N6CZXE00495A
Business name : Japan Computer Industry Inc
Product name : Network Adapter Card
Model name : MLETB08
Trademark : MLETB08
Standard : FCC Part15 Subpart B

Dear Sirs
We hand in following document for certificate.

1 ・ Form159
2 ・ Form731
3 ・ Explanation of device
4 ・ Test report

We are awaiting your early certification for us.

Sincerely

K. Matsumoto

Keiji matsumoto
Senior manager
Japan Computer Industry Inc

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3.4 Photographs of EUT System Configuration

FRONT VIEW