

Attachment 2

FCC PART 15B TEST REPORT

REPORT NUMBER: FG08-050EAL

Report No. : FG08-050EAL (1/13)

EMI Test report

CATEGORY : EN55022(2006) / CISPR 22(2005) ; Class B
AS/NZS CISPR22 (2002)
FCC Part-15 (2007)
VCCI (2008)
EN301 489-17 V1.2.1, EN301 489-01 V1.4.1

MANUFACTURER : FUJITSU LIMITED
4-1-1, Kamikodanaka, Nakahara-ku, Kawasaki 211-8588 JAPAN


PRODUCT TYPE : Personal computer E8420 E8460
AC Adapter ADP-80NBA SEC80P2-19.0 SED100P2-19.0
SED110P2-19.0
Port Replicator FPCPR63
Wireless LAN 533AN HMW AR5BHB92
Bluetooth module EYTF3CS FS
UWB module RTU7305 BG1 HMC V1-4

TEST SITE : FUJITSU GENERAL EMC LABORATORY
1116, Suenaga, Takatsu-ku, Kawasaki 213-8502 JAPAN

DATE TESTED : April 14, 2008 23°C 35%

TESTED BY : Hiroyuki Aikawa

Above EUT conforms mentioned all regulations.

APPROVED BY :  DATE : April 30, 2008
Hiroyuki Shimano, President

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※ The description of the EUT and the system configuration in this report are provided by the client.



Accredited by NVLAP.
Authorized by TÜV SÜD PS.
Appointed by TÜV Rheinland Japan.
Registered on VCCI.

1. Description of EUT

The EUT: E8420 and E8460 personal computer using CPU; Core2 Duo T9600 2.8 GHz microprocessor has a 15 inch WSXGA+ LCD, a DVD-super multi drive and a system disk (80 GB×1). The EUT has the interface for IEEE1394③, RGB⑩, DVI, Mic-in②, Phone-out②, LAN⑦, Modem⑥, USB×6①⑤②③④⑤⑥, PC card slot, Express card slot Memory card slot, UWB, Bluetooth and wireless LAN.

The following EUT type codes are given according to the power rating of the AC adaptor attached to EUT.

| Type | Power rating of the AC adaptor |
|-------|---|
| E8420 | 80 W : SEC100P2-19.0, SED100P2-19.0, ADP-80NB A |
| E8460 | 100 W : SED110P2-19.0 |

The following wireless LAN module type codes are given according to the communication method.

| Type | Communication method. |
|-----------|-----------------------|
| 533AN_HMW | IEEE802.11a/ b/ g/ n |
| AR5BHB92 | IEEE802.11a/ b/ g |

Internal clock frequency : 4.000 MHz, 14.318 MHz, 24.576 MHz, 25.000 MHz, 27.000 MHz, 33.300 MHz, 48.000 MHz, 96.000 MHz, 100.000 MHz, 266.000 MHz

Input power : AC 100 V-240 V, 50 / 60 Hz, Single-phase 2 wires

The EUT is intended to use generally in the residential / domestic area or commercial and light industrial area; category class B.

1.1 Test system configuration

The measurement was performed using E8420 with internal wireless LAN module; 533AN_HMW or AR5BHB92, UWB module, Bluetooth module, external Port Replicator; FPCPR63 and all related equipments as the maximum personal computer systems shown in figure-1.

The EUT was selected from the pre-production line.

1.2 Operating condition

The following EUT and dependent devices were tested using "EMC.exe", "UWBPhy test", "CRTU" or "ART.exe" and "Blue test" program under continuous operating condition to obtain maximize emission.

| | | |
|-----------------------|---------------|---|
| ① PC-1 | LCD-1: | Displaying "H" character on screen (Maximum contrast / Luminescence Display resolution 1920×1200 / Refresh rate 60Hz) |
| | LAN: | Continuous transmission and receiving ping command (1000 M Max) |
| | Modem: | Downloading the data file, transmission and receiving ping command (56 k Max) |
| | HDD-1: | Reading / writing the test data |
| | Wireless LAN: | Continuous transmission of the RF signal |
| | Bluetooth: | Continuous transmission of the RF signal |
| | UWB: | Continuous transmission of the RF signal |
| | DVD: | Playing the test disk |
| ② PC memory card: | | Reading / writing the test data |
| ③ Exp memory card: | | Reading / writing the test data |
| ④ SD memory card: | | Reading / writing the test data |
| ⑤ LCD-2: | | Displaying "H" character on screen (Maximum contrast / Luminescence) |
| ⑥ Headset: | | Connecting only |
| ⑦ USB mouse: | | Connecting only |
| ⑧ USB memory(USB2.0): | | Reading / writing the test data (480 M Max) |
| ⑨ HDD-2(IEEE1394): | | Reading / writing the test data (480 M Max) |
| ⑩ PRN-1: | | Connecting only |
| ⑪ PRN-2: | | Connecting only |
| ⑫ PC-2: | | Continuous transmission and receiving ping command (1000 M Max) |
| ⑬ PC-3: | | Downloading the data file, transmission and receiving ping command (56 k Max) |

2. EMI test results summary

Applied standard: EN55022 (2006)

Limit value: Class B

The test samples met the class B limit of EN55022(2006) / CISPR22(2005) and applicable below regulations as shown the following highest 6 points of each emission profiles.

EN301 489-01 V1.4.1

Australia, New Zealand: AS/NZS CISPR22(2002)

U.S.A.: FCC Part-15(2007), Canada: CAN/CSA-CEI/TEC CISPR22-02

Japan: VCCI(2008), Taiwan: CSN 13438(2006)

The test result is effective in only the EUT.

2.1 Radiated emission (30 MHz to 1,000 MHz) : Measured at 10 m distance

2.1.1 Wireless module; 533AN_HMW

< AC 230 V / 50 Hz single phase >

| Freq. (MHz) | pol. | Noise level (QP; dB μ V/m) | Class B limit (QP; dB μ V/m) | Margin (dB) |
|----------------|-------|-----------------------------------|-------------------------------------|----------------|
| 30.28 | Vert | 27.5 | 30.0 | 2.5 |
| 56.35 | Vert | 28.5 | 30.0 | 1.5 |
| 67.50 | Vert | 26.0 | 30.0 | 4.0 |
| 120.08 | Vert | 26.1 | 30.0 | 3.9 |
| 701.00 | Horiz | 35.7 | 37.0 | 1.3 |
| 960.08 | Vert | 34.6 | 37.0 | 2.4 |

< AC 120 V / 60 Hz single phase >

| Freq. (MHz) | pol. | Noise level (QP; dB μ V/m) | Class B limit (QP; dB μ V/m) | Margin (dB) |
|----------------|-------|-----------------------------------|-------------------------------------|----------------|
| 30.28 | Vert | 26.8 | 30.0 | 3.2 |
| 56.35 | Vert | 28.5 | 30.0 | 1.5 |
| 67.50 | Vert | 26.0 | 30.0 | 4.0 |
| 120.08 | Vert | 26.1 | 30.0 | 3.9 |
| 701.00 | Horiz | 35.7 | 37.0 | 1.3 |
| 960.08 | Vert | 34.6 | 37.0 | 2.4 |

• Limit value ; CISPR22(2005)

• Measurement uncertainty : ± 3.3 dB (K=2, 95 %)

2.1.2 Wireless module; AR5BHB92

< AC 120 V / 60 Hz single phase >

| Freq. (MHz) | pol. | Noise level (QP; dB μ V/m) | Class B limit (QP; dB μ V/m) | Margin (dB) |
|----------------|-------|-----------------------------------|-------------------------------------|----------------|
| 30.28 | Vert | 26.2 | 30.0 | 3.8 |
| 51.55 | Vert | 27.8 | 30.0 | 2.2 |
| 120.40 | Vert | 25.5 | 30.0 | 4.5 |
| 125.35 | Horiz | 25.5 | 30.0 | 4.5 |
| 701.00 | Horiz | 35.7 | 37.0 | 1.3 |
| 960.08 | Vert | 34.6 | 37.0 | 2.4 |

• Limit value ; CISPR22(2005)

• Measurement uncertainty : ± 3.3 dB (K=2, 95 %)

2.2 Over 1 GHz RF Radiated emission (1 GHz to 14 GHz) : Measured at 3 m distance

<Wireless module; 533AN_HMW>

| Freq. (GHz) | Pol | Noise level | Class B limit | | Margin (dB to AV) |
|----------------|------|----------------|----------------|------|----------------------|
| | | (dB μ V/m) | (dB μ V/m) | | |
| | | Peak | Peak | A V | |
| 1.4600 | Vert | 42.6 | 74.0 | 54.0 | 11.4 |
| 1.4763 | Vert | 36.9 | 74.0 | 54.0 | 17.1 |
| 1.5134 | Vert | 43.7 | 74.0 | 54.0 | 10.3 |
| 1.7100 | Vert | 36.0 | 74.0 | 54.0 | 18.0 |
| 3.0030 | Vert | 37.6 | 74.0 | 54.0 | 16.4 |
| 3.8370 | Vert | 35.6 | 74.0 | 54.0 | 18.4 |

• Limit value ; FCC Part15 (2007)

2.3 AC power line conducted emission (150 kHz to 30 MHz)

2.3.1 Wireless module; 533AN_HMW

2.3.1.1 AC Adapter: ADP-80NB A

< AC 230 V / 50 Hz single phase >

| Freq. (MHz) | Line # | Noise level | Class B limit | | Margin (dB to AV) |
|----------------|--------|---------------|---------------|------|----------------------|
| | | (dB μ V) | (dB μ V) | | |
| | | Q P | Q P | A V | |
| 0.535 | # 1 | 41.6 | 56.0 | 46.0 | 4.4 |
| 0.540 | # 2 | 41.9 | 56.0 | 46.0 | 4.1 |
| 1.972 | # 1 | 38.9 | 56.0 | 46.0 | 7.1 |
| 2.101 | # 2 | 39.3 | 56.0 | 46.0 | 6.7 |
| 13.855 | # 1 | 43.4 | 60.0 | 50.0 | 6.6 |
| 13.855 | # 2 | 44.5 | 60.0 | 50.0 | 5.5 |

< AC 120 V / 60 Hz single phase >

| Freq. (MHz) | Line # | Noise level | Class B limit | | Margin (dB to AV) |
|----------------|--------|---------------|---------------|------|----------------------|
| | | (dB μ V) | (dB μ V) | | |
| | | Q P | Q P | A V | |
| 0.505 | # 1 | 38.7 | 56.0 | 46.0 | 7.3 |
| 0.613 | # 2 | 37.9 | 56.0 | 46.0 | 8.1 |
| 2.043 | # 1 | 38.0 | 56.0 | 46.0 | 8.0 |
| 2.272 | # 2 | 38.3 | 56.0 | 46.0 | 7.7 |
| 13.754 | # 2 | 42.4 | 60.0 | 50.0 | 7.6 |
| 13.932 | # 1 | 41.8 | 60.0 | 50.0 | 8.2 |

< AC 100 V / 50 Hz single phase >

| Freq. (MHz) | Line # | Noise level | Class B limit | | Margin (dB to AV) |
|----------------|--------|---------------|---------------|------|----------------------|
| | | (dB μ V) | (dB μ V) | | |
| | | Q P | Q P | A V | |
| 0.697 | # 2 | 38.4 | 56.0 | 46.0 | 7.6 |
| 0.729 | # 1 | 36.5 | 56.0 | 46.0 | 9.5 |
| 0.831 | # 2 | 36.4 | 56.0 | 46.0 | 9.6 |
| 1.944 | # 2 | 37.9 | 56.0 | 46.0 | 8.1 |
| 4.585 | # 1 | 37.2 | 60.0 | 50.0 | 8.8 |
| 13.620 | # 2 | 41.5 | 60.0 | 50.0 | 8.5 |

• Limit value; CISPR22(2005)

• Measurement uncertainty : ± 2.5 dB (K=2, 95 %)

2.3.1.2 AC Adapter: SEC100P2-19.0

< AC 230 V / 50 Hz single phase >

| Freq. (MHz) | Line # | Noise level (dB μ V) | | Class B limit (dB μ V) | | Margin (dB) | |
|----------------|--------|-----------------------------|------|-------------------------------|------|----------------|------|
| | | Q P | A V | Q P | A V | Q P | A V |
| 0.191 | # 1 | 55.0 | 49.2 | 64.0 | 54.0 | 9.0 | 4.8 |
| 0.191 | # 2 | 58.9 | 50.8 | 64.0 | 54.0 | 5.1 | 3.2 |
| 0.355 | # 1 | 43.0 | 29.4 | 58.8 | 48.8 | 15.8 | 19.4 |
| 0.355 | # 2 | 47.7 | 28.9 | 58.8 | 48.8 | 11.1 | 19.9 |
| 0.527 | # 2 | 43.3 | 26.0 | 56.0 | 46.0 | 12.7 | 20.0 |
| 3.021 | # 1 | 38.8 | 28.0 | 56.0 | 46.0 | 17.2 | 18.0 |

< AC 120 V / 60 Hz single phase >

| Freq. (MHz) | Line # | Noise level (dB μ V) | | Class B limit (dB μ V) | | Margin (dB to AV) |
|----------------|--------|------------------------------|-----|-------------------------------|------|----------------------|
| | | Q P | A V | Q P | A V | |
| 0.153 | # 1 | 50.3 | | 65.8 | 55.8 | 5.5 |
| 0.153 | # 2 | 51.2 | | 65.8 | 55.8 | 4.6 |
| 0.284 | # 2 | 44.8 | | 60.7 | 50.7 | 5.9 |
| 0.380 | # 1 | 39.5 | | 58.3 | 46.0 | 8.8 |
| 2.874 | # 2 | 33.1 | | 56.0 | 46.0 | 12.9 |
| 20.049 | # 2 | 31.8 | | 60.0 | 50.0 | 18.2 |

< AC 100 V / 50 Hz single phase >

| Freq. (MHz) | Line # | Noise level (dB μ V) | | Class B limit (dB μ V) | | Margin (dB to AV) |
|----------------|--------|------------------------------|-----|-------------------------------|------|----------------------|
| | | Q P | A V | Q P | A V | |
| 0.158 | # 1 | 50.9 | | 65.6 | 55.6 | 4.7 |
| 0.158 | # 2 | 50.3 | | 65.6 | 55.6 | 5.3 |
| 0.316 | # 2 | 41.4 | | 59.8 | 49.8 | 8.4 |
| 0.319 | # 1 | 38.2 | | 59.7 | 49.7 | 11.5 |
| 0.397 | # 1 | 40.6 | | 57.9 | 47.9 | 7.3 |
| 3.235 | # 2 | 33.7 | | 56.0 | 46.0 | 12.3 |

• Limit value ; CISPR22(2005)

• Measurement uncertainty : ± 2.5 dB (K=2, 95 %)**2.3.1.3 AC Adapter: SED100P2-19.0**

< AC 230 V / 50 Hz single phase >

| Freq. (MHz) | Line # | Noise level (dB μ V) | | Class B limit (dB μ V) | | Margin (dB) | |
|----------------|--------|-----------------------------|------|-------------------------------|------|----------------|------|
| | | Q P | A V | Q P | A V | Q P | A V |
| 0.194 | # 1 | 47.1 | 30.1 | 63.9 | 53.9 | 16.8 | 23.8 |
| 0.210 | # 2 | 45.2 | 31.4 | 63.2 | 53.2 | 18.0 | 21.8 |
| 0.258 | # 2 | 43.6 | 28.7 | 61.5 | 51.5 | 18.3 | 22.8 |
| 0.322 | # 2 | 41.6 | 26.3 | 59.6 | 49.6 | 18.0 | 23.3 |
| 0.978 | # 2 | 42.6 | 27.2 | 56.0 | 46.0 | 13.4 | 18.8 |
| 1.100 | # 2 | 45.9 | 30.7 | 56.0 | 46.0 | 10.1 | 15.3 |

< AC 120 V / 60 Hz single phase >

| Freq. (MHz) | Line # | Noise level (dB μ V) | | Class B limit (dB μ V) | | Margin (dB to AV) | |
|----------------|--------|-----------------------------|-----|-------------------------------|------|----------------------|-----|
| | | Q P | A V | Q P | A V | Q P | A V |
| 0.196 | # 1 | 44.5 | | 63.8 | 53.8 | 9.3 | |
| 0.196 | # 2 | 46.8 | | 63.8 | 53.8 | 7.0 | |
| 0.392 | # 2 | 36.9 | | 58.0 | 48.0 | 11.1 | |
| 0.456 | # 2 | 37.8 | | 56.8 | 46.8 | 9.0 | |
| 0.518 | # 1 | 33.9 | | 56.0 | 46.0 | 12.1 | |
| 0.915 | # 2 | 38.6 | | 56.0 | 46.0 | 7.4 | |

< AC 100 V / 50 Hz single phase >

| Freq. (MHz) | Line # | Noise level (dB μ V) | | Class B limit (dB μ V) | | Margin (dB to AV) | |
|----------------|--------|-----------------------------|-----|-------------------------------|------|----------------------|-----|
| | | Q P | A V | Q P | A V | Q P | A V |
| 0.196 | # 2 | 45.0 | | 63.8 | 53.8 | 8.8 | |
| 0.205 | # 1 | 45.5 | | 63.4 | 53.4 | 7.9 | |
| 0.978 | # 2 | 38.4 | | 56.0 | 46.0 | 7.6 | |
| 0.984 | # 1 | 31.3 | | 56.0 | 46.0 | 14.7 | |
| 20.050 | # 2 | 31.6 | | 60.0 | 50.0 | 18.4 | |
| 22.023 | # 2 | 31.5 | | 60.0 | 50.0 | 18.5 | |

• Limit value; CISPR22(2005)

• Measurement uncertainty : ± 2.5 dB (K=2, 95 %)

2.3.1.4 AC Adapter: SED110P2-19.0

< AC 230 V / 50 Hz single phase >

| Freq. (MHz) | Line # | Noise level (dB μ V) | | Class B limit (dB μ V) | | Margin (dB) | |
|----------------|--------|-----------------------------|------|-------------------------------|------|----------------|------|
| | | Q P | A V | Q P | A V | Q P | A V |
| 0.185 | # 1 | 53.9 | 36.3 | 64.2 | 54.2 | 10.3 | 17.9 |
| 0.200 | # 2 | 59.9 | 46.6 | 63.6 | 53.6 | 3.7 | 7.0 |
| 0.320 | # 1 | 41.1 | 25.6 | 59.7 | 49.7 | 18.6 | 24.1 |
| 0.362 | # 2 | 52.0 | 32.2 | 58.7 | 48.7 | 6.7 | 16.5 |
| 0.532 | # 2 | 43.2 | 21.9 | 56.0 | 46.0 | 12.8 | 24.1 |
| 0.549 | # 2 | 43.5 | 26.3 | 56.0 | 46.0 | 12.5 | 19.7 |

< AC 120 V / 60 Hz single phase >

| Freq. (MHz) | Line # | Noise level (dB μ V) | | Class B limit (dB μ V) | | Margin (dB) | |
|----------------|--------|-----------------------------|------|-------------------------------|------|----------------|------|
| | | Q P | A V | Q P | A V | Q P | A V |
| 0.164 | # 2 | 50.6 | 34.5 | 65.3 | 55.3 | 14.7 | 20.8 |
| 0.207 | # 2 | 49.3 | 39.6 | 63.3 | 53.3 | 14.0 | 13.7 |
| 0.210 | # 1 | 47.2 | 41.9 | 63.2 | 53.2 | 16.0 | 11.3 |
| 0.329 | # 1 | 40.7 | 32.8 | 59.5 | 49.5 | 18.8 | 16.7 |
| 0.400 | # 2 | 47.1 | 30.8 | 57.9 | 47.9 | 10.8 | 17.1 |
| 0.496 | # 2 | 40.2 | 24.1 | 56.1 | 46.1 | 15.9 | 22.0 |

< AC 100 V / 50 Hz single phase >

| Freq. (MHz) | Line # | Noise level (dB μ V) | Class B limit (dB μ V) | | Margin (dB to AV) |
|----------------|--------|-----------------------------|-------------------------------|------|----------------------|
| | | | Q P | A V | |
| 0.340 | # 1 | 34.5 | 59.2 | 49.2 | 14.7 |
| 0.346 | # 2 | 40.3 | 59.1 | 49.1 | 8.8 |
| 0.355 | # 1 | 35.6 | 58.8 | 48.8 | 13.2 |
| 0.415 | # 2 | 37.2 | 57.6 | 47.6 | 10.4 |
| 0.471 | # 1 | 36.4 | 56.5 | 46.5 | 10.1 |
| 2.544 | # 2 | 33.7 | 56.0 | 46.0 | 12.3 |

- Limit value; CISPR22(2005)
- Measurement uncertainty : ± 2.5 dB (K=2, 95 %)

2.3.2 Wireless module; AR5BHB92**2.3.2.1 AC Adapter: ADP-80NB A**

< AC 120 V / 60 Hz single phase >

| Freq. (MHz) | Line # | Noise level (dB μ V) | Class B limit (dB μ V) | | Margin (dB to AV) |
|----------------|--------|-----------------------------|-------------------------------|------|----------------------|
| | | | Q P | A V | |
| 0.150 | # 2 | 49.3 | 66.0 | 56.0 | 6.7 |
| 0.506 | # 2 | 39.9 | 56.0 | 46.0 | 6.1 |
| 0.529 | # 1 | 40.7 | 56.0 | 46.0 | 5.3 |
| 0.740 | # 2 | 39.7 | 56.0 | 46.0 | 6.3 |
| 0.756 | # 1 | 36.6 | 56.0 | 46.0 | 9.4 |
| 2.426 | # 2 | 36.0 | 56.0 | 46.0 | 10.0 |

- Limit value; CISPR22(2005)
- Measurement uncertainty : ± 2.5 dB (K=2, 95 %)

2.4 Telecommunication line conducted emission

< Telecom port >

| Freq. (MHz) | Noise level (dB μ V) | Class B limit (dB μ V) | | Margin (dB to AV) |
|----------------|-----------------------------|-------------------------------|------|----------------------|
| | | Q P | A V | |
| 0.797 | 58.0 | 74.0 | 64.0 | 6.0 |
| 1.328 | 60.4 | 74.0 | 64.0 | 3.6 |
| 1.593 | 56.4 | 74.0 | 64.0 | 7.6 |
| 1.860 | 59.4 | 74.0 | 64.0 | 4.6 |
| 1.910 | 57.1 | 74.0 | 64.0 | 6.9 |
| 2.331 | 55.5 | 74.0 | 64.0 | 8.5 |

< LAN port >

| Freq. (MHz) | Noise level (dB μ A) | Class B limit (dB μ A) | | Margin (dB to AV) |
|----------------|-----------------------------|-------------------------------|------|----------------------|
| | | Q P | A V | |
| 0.167 | 14.1 | 39.1 | 29.1 | 15.0 |
| 2.122 | 3.5 | 30.0 | 20.0 | 16.5 |
| 7.924 | 5.4 | 30.0 | 20.0 | 14.6 |
| 13.480 | 4.7 | 30.0 | 20.0 | 15.3 |
| 14.211 | 5.2 | 30.0 | 20.0 | 14.8 |
| 16.228 | 9.0 | 30.0 | 20.0 | 11.0 |

- Limit value ; CISPR22(2005)

3. EUT modification under the test

The following countermeasures are added for the radiated emission measurement.
Three EMI filters; BLM15BB750SN1 are added to the Main board.

4. Measurement procedure and test equipment

The measurement was performed without deviation from CISPR22(2005).

4.1 Radiated emission

4.1.1 Radiated emission (30MHz~1,000MHz)

The EUT was set on the 80 cm height desk placed on the turntable in the 10 m RF semi-anechoic chamber. The PC-2 and HUB were placed at outside of the chamber to make usual install condition at the different place. The maximum noise level in the frequency range from 30 MHz to 1,000 MHz were measured by 10 m method with scanning the antenna height from 1 m to 4 m above the ground plane and rotating the EUT through 360 degrees for both horizontal and vertical polarization.

Preliminary measurement using spectrum analyzer peak detection was performed to arrange the minimum margin spectrum. The settings of the interface cables and the mouse were adjusted to obtain maximum level at the minimum margin spectrum. The final measurement was performed using the RFI receiver (CISPR Quasi-peak, 120 kHz band width) and calibrated broadband antennas or dipole antennas for the main spectrum that was obtained by the preliminary measurement.

| Test equipment | Manufacturer | Type | S/N | Cal. Date | Due. Date |
|---------------------------|-----------------|---------------|-------------|------------|------------|
| Bi Log antenna | Schwarzbeck | VULB9160 | 3118 | 2007.05.25 | 2008.05.25 |
| Dipole antenna | Schwarzbeck | VHA9103 | VHA91031573 | 2007.07.25 | 2009.07.25 |
| Dipole antenna | Schwarzbeck | UHA9105 | UHA91052119 | 2007.07.25 | 2009.07.25 |
| Field strength meter | Rohde & Schwarz | ESCS30 | 849650/001 | 2007.06.04 | 2008.06.04 |
| Spectrum analyzer | HP | 85422E | 3746A00242 | 2007.05.27 | 2008.05.27 |
| RF switch | Anritsu | MP59B | M87079 | 2007.05.07 | 2008.05.07 |
| RF cable | | CF013 | | 2007.05.07 | 2008.05.07 |
| 2nd semi-anechoic chamber | | Riken eletech | | 2008.01.04 | 2010.01.04 |
| EMI test program | FGE | Version 1.3 | | | |

4.1.2 Radiated emission (1 GHz~14 GHz)

The EUT was set on the 80 cm height non-reflective desk on the turntable. The radiated emission measurement from 1 GHz to 14 GHz; Operating rate 2.8 GHz was performed using the spectrum analyzer (Peak detection, 1MHz band width) and the horn antenna that was positioned at 3 m from the EUT for class B. The measurement was performed with both horizontal and vertical polarization, rotating the The measurement was performed with rotating the EUT through 360 degrees and fixing the antenna height to the 1 m for both horizontal and vertical polarization.

The measurement was performed using the RF signal "off" mode of the wireless LAN and Bluetooth.

| Test equipment | Manufacturer | Type | S/N | Cal. Date | Due. Date |
|-------------------|--------------|-----------|------------|------------|------------|
| Horn antenna | Schwarzbeck | BBHA9120D | 414 | 2007.02.23 | 2009.02.23 |
| Spectrum analyzer | Advantest | R3371A | 75060396 | 2007.05.27 | 2008.05.27 |
| Pre amplifier | HP | 8449B | 3008A01110 | 2007.03.24 | 2009.03.24 |

4.2 AC power line conducted emission

The conducted emission measurement was performed in the shielded room. The EUT was set on the 80 cm height wooden desk using the 50Ω/50μH artificial mains network: AMN ,and operated by AC 230 V/ 50 Hz, AC 120 V/ 60 Hz and AC 100 V/ 50 Hz. Preliminary measurement using spectrum analyzer peak detection was performed in the frequency range from 150 kHz to 30 MHz to arrange the minimum margin spectrum. The setting of the cables was adjusted to obtain maximum level at the minimum margin spectrum. The final measurement was performed using the RFI receiver (CISPR Quasi-peak, 9 kHz band width) ,and recorded the maximum value in the monitored interval of the main spectrum that was obtained by the preliminary measurement.

| Test equipment | Manufacturer | Type | S/N | Cal. Date | Due. Date |
|----------------------|-----------------|-------------|--------------|------------|------------|
| AMN | Kyoritsu | KNW-407 | 8-823-18 | 2007.09.07 | 2008.09.07 |
| Field strength meter | Rohde & Schwarz | ESCS30 | 849650/001 | 2007.06.04 | 2008.06.04 |
| Spectrum analyzer | HP | 85422E | 3746A00240 | 2007.05.27 | 2008.05.27 |
| RF switch | Rohde & Schwarz | PSU | 848290/005 | 2007.05.07 | 2008.05.07 |
| Band pass filter | Advantest | TR14202 | 03560025 | 2007.05.07 | 2008.05.07 |
| Transient limiter | Rohde & Schwarz | ESH3-Z2 | 0357.8810.54 | 2007.05.07 | 2008.05.07 |
| RF cable | ---- | CF009 | ---- | 2007.05.07 | 2008.05.07 |
| EMI test program | FGE | Version 1.3 | | | |

4.3 Telecommunication line conducted emission

The conducted emission measurement was performed in the shielded room. The EUT was set on the 40 cm height wooden desk using the impedance stabilization network: ISN(LCL; 80 dB) for telecom port, the current probe for LAN port and operated by AC 230 V/ 50 Hz. Preliminary measurement using spectrum analyzer peak detection was performed in the frequency range from 150 kHz to 30 MHz to arrange the minimum margin spectrum. The setting of the cables was adjusted to obtain maximum level at the minimum margin spectrum. The final measurement was performed using the RFI receiver (CISPR Quasi-peak, 9 kHz band width), and recorded the maximum value in the monitored interval of the main spectrum that was obtained by the preliminary measurement.

| Test equipment | Manufacturer | Type | S/N | Cal. Date | Due. Date |
|----------------------|-----------------|-------------|--------------|------------|------------|
| ISN | Kyoritsu | KNW-2202 | 8S-2945-2 | 2007.09.03 | 2008.09.02 |
| Current probe | Rohde & Schwarz | EZ-17 | 100007 | 2007.12.21 | 2008.12.21 |
| Field strength meter | Rohde & Schwarz | ESCS30 | 849650/001 | 2007.04.25 | 2008.04.25 |
| Spectrum analyzer | HP | 85422E | 3746A00240 | 2007.04.24 | 2008.04.24 |
| RF switch | Rohde & Schwarz | PSU | 848290/005 | 2007.05.07 | 2008.05.07 |
| Band pass filter | Advantest | TR14202 | 03560025 | 2007.05.07 | 2008.05.07 |
| Transient limiter | Rohde & Schwarz | ESH3-Z2 | 0357.8810.54 | 2007.05.07 | 2008.05.07 |
| RF cable | ---- | CF009 | ---- | 2007.05.07 | 2008.05.07 |
| EMI test program | FGE | Version 1.3 | | | |

5. Test site and traceability

The FUJITSU GENERAL EMC LABORATORY performs the test for VCCI / EN / CISPR regulation and Fujitsu / Fujitsu General internal regulations. The test procedures and test facilities are comply with international standard. The laboratory is filed on VCCI (Japan), accredited from NVLAP (U.S.A.), authorized from TÜV SÜD PS (Germany) and appointed from TÜV Rheinland (Germany).

VCCI : 1st semi-anechoic chamber(R-753/C-776), 1st shielded room(C-777)
 Large shielded room(C-778)
 2nd semi-anechoic chamber(R-1460/C-1547), 2nd shielded room(C-1548)
 3rd shielded room(C-1549)

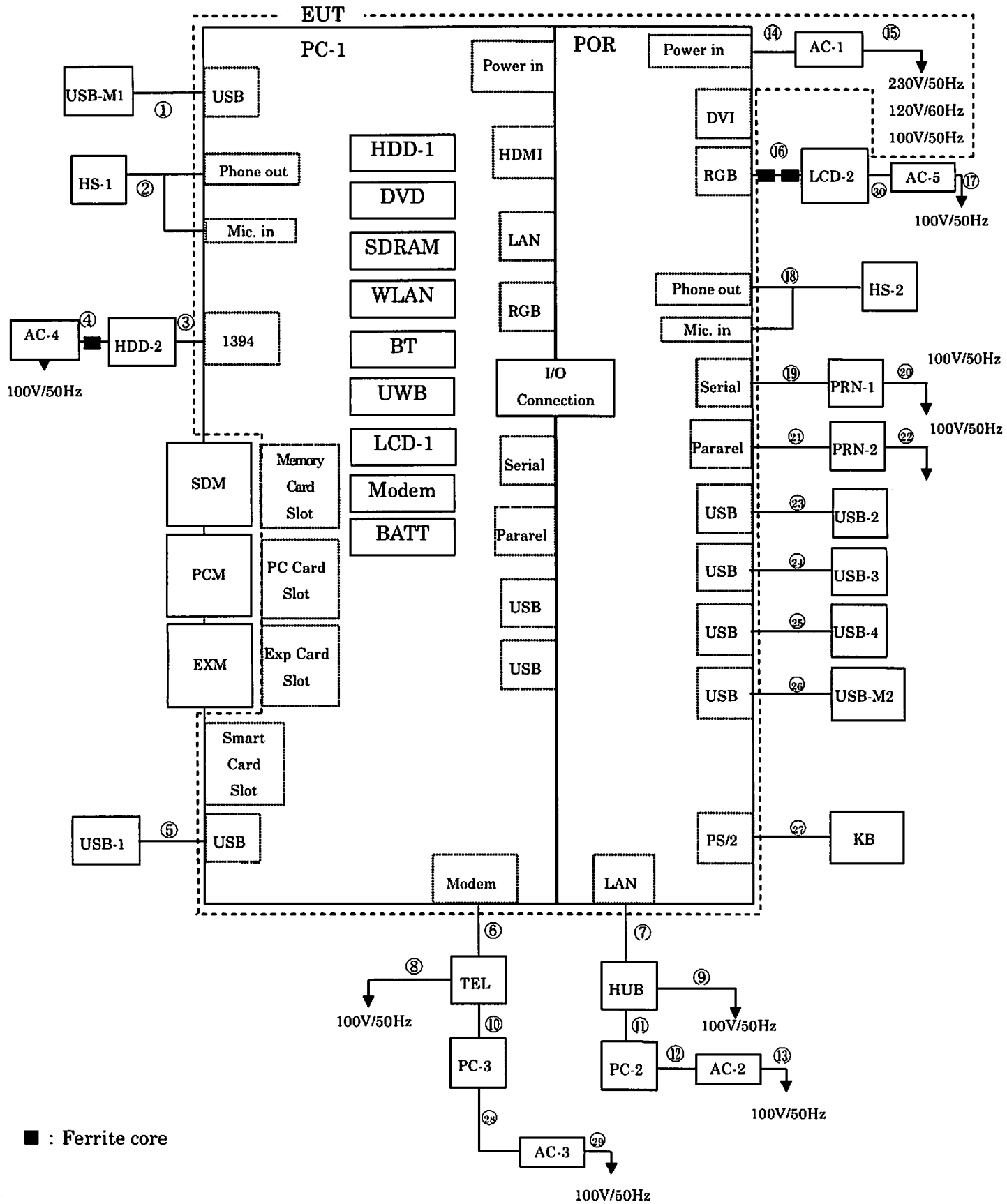
NVLAP : 1998.12.01 Accredited: Lab code 200373-0

TÜV SÜD PS : 1999.01.29 Authorized

TÜV Rheinland Japan : 2005.08.25 Appointed

The measuring equipments were used in the laboratory and test data are traceable to the national or international standard. Each equipment is maintain by periodical calibration and by daily check as a total measurement system to keep those accuracy.

Figure-1 System configuration and cables



Main EUT

| Code | Name | Type | S/N | Product |
|------|-------------------|---------------|-----------------------|---------|
| PC-1 | Personal computer | E8420 / E8460 | Pre-production sample | Fujitsu |

Related EUT

| | | | | |
|------|-----------------|---------------|------|---------|
| POR | Port Replicator | FPCPR63 | ---- | Fujitsu |
| AC-1 | AC adapter | ADP-80NB A | ---- | Fujitsu |
| | | SEC100P2-19.0 | ---- | Fujitsu |
| | | SED100P2-19.0 | ---- | Fujitsu |
| | | SED110P2-19.0 | ---- | Fujitsu |

Included device; PC-1

| Code | Name | Type | S/N | Product |
|-------|-----------------|-------------------------|------|-------------|
| HDD-1 | 80GB HDD | MHZ2080BH | ---- | Fujitsu |
| DVD | DVD-Super Multi | UJ-870A | ---- | Matsushita |
| SDRAM | 4096 MB | EBJ21UE8BAU0-AE-E×2 | ---- | ---- |
| WLAN | Wireless LAN | 533AN_HMW | ---- | Intel |
| | | AR5BHB92 | ---- | Atheros |
| BT | Bluetooth | EYTF3CS FS | ---- | TAOYO YUDEN |
| UWB | UWB module | RTU7305 BG1 HMC V1-4 | ---- | Realtek |
| LCD-1 | 15 inch WUXGA | LTN154P3-L02 | ---- | Samsung |
| Modem | Modem | MDC1.5 modem Model:D40 | ---- | Agere |
| BATT | Battery (8cell) | FPCBP176 14.4V 5200mA/h | ---- | Fujitsu |

Assisted equipment

| Code | Name | Type | S/N | Product |
|--------|-------------------|-----------------|---------------|--------------------|
| LCD-2 | LCD display | WBZA-H | YE1C019316 | FSC |
| HDD-2 | Head Disk | KC4020-N | 0004384 | FSC |
| HS-1 | Head set | GN 501FSC | ---- | FSC |
| HS-2 | Head set | GN 501FSC | ---- | FSC |
| PC-2 | Personal computer | FMV | ---- | Fujitsu |
| PC-3 | Personal computer | FMV | ---- | Fujitsu |
| HUB | Switching Hub | ETG-SH-8 | VD7000010513N | I·O DATA |
| PRN-1 | Printer | LX300+ | CLCY862131 | EPSON |
| PRN-2 | Printer | LX300+ | CLCY862208 | EPSON |
| AC-2 | AC adapter | FMV-AC322 | ---- | Fujitsu |
| AC-3 | AC adapter | FMV-AC322 | ---- | Fujitsu |
| AC-4 | AC adapter | ACTN-21 | ---- | Sunfone |
| AC-5 | AC adapter | 0218B1260 | ---- | Shin International |
| USB-1 | USB Mouse | M-BT69e | HCA52701556 | FSC |
| USB-2 | USB Mouse | M-BJ69e | HCA52701562 | FSC |
| USB-3 | USB Mouse | M-BJ69e | HCA52701578 | FSC |
| USB-4 | USB Mouse | M-BJ69e | HCA52701600 | FSC |
| USB-M1 | USB memory | Easy Disk 512MB | ---- | I·O DATA |
| USB-M2 | USB memory | Easy Disk 256MB | ---- | I·O DATA |
| PCM | PC memory card | 20 MB | ---- | SunDisk |
| EXM | Exp. memory Card | 512 MB | ---- | Lexar |
| SDM | SD memory card | 128 MB | ---- | Panasonic |

Cables SLD: Shielded NSLD: Non-shielded CAX: Coaxial

Connector MC: Metal NMC: Non-metal PMC: Point contact metal

| No. | I/O Port | Name | Type | Length | Cable type |
|-----|--------------------|------------------|-------|--------|-------------------------|
| ① | USB | USB cable | ----- | 1.0 m | SLD, MC |
| ② | Phone-out / Mic-in | Headset cable | ----- | 2.2 m | NSLD, MC |
| ③ | 1394 | IEE1394 cable | ----- | 1.0 m | SLD, MC |
| ④ | ----- | AC adaptor cable | ----- | 1.8 m | NSLD, NMC with core *1 |
| ⑤ | USB | USB mouse cable | ----- | 1.9 m | SLD, MC |
| ⑥ | modem | Modular cable | ----- | 20.0 m | NSLD, NMC |
| ⑦ | LAN | LAN cable | ----- | 20.0 m | SLD, MC |
| ⑧ | ----- | AC power cable | ----- | 2.0 m | 2P-NSLD |
| ⑨ | ----- | AC power cable | ----- | 2.0 m | 2P-NSLD |
| ⑩ | ----- | Modular cable | ----- | 2.0 m | NSLD, NMC |
| ⑪ | LAN | LAN cable | ----- | 1.0 m | SLD, MC |
| ⑫ | ----- | AC adaptor cable | ----- | 1.8 m | 2P-NSLD, NMC |
| ⑬ | ----- | AC power cable | ----- | 2.0 m | 2P-NSLD |
| ⑭ | ----- | AC adaptor cable | ----- | 1.8 m | NSLD, NMC |
| ⑮ | ----- | AC power cable | ----- | 2.0 m | 2P-NSLD |
| ⑯ | RGB | RGB cable | ----- | 1.8 m | SLD, MC with fixed core |
| ⑰ | ----- | AC power cable | ----- | 2.0 m | 3P-NSLD |
| ⑱ | Phone-out / Mic-in | Headset cable | ----- | 2.2 m | NSLD, MC |
| ⑲ | SERIAL | SERIAL cable | ----- | 2.0m | SLD, MC |
| ⑳ | ----- | AC power cable | ----- | 2.0 m | 3P-NSLD |
| ㉑ | RS232C | RS232C cable | ----- | 3.0m | SLD, MC |
| ㉒ | ----- | AC power cable | ----- | 2.0 m | 3P-NSLD |
| ㉓ | USB | USB mouse cable | ----- | 1.9 m | SLD, MC |
| ㉔ | USB | USB mouse cable | ----- | 1.9 m | SLD, MC |
| ㉕ | USB | USB mouse cable | ----- | 1.9 m | SLD, MC |
| ㉖ | USB | USB cable | ----- | 1.0 m | SLD, MC |
| ㉗ | ----- | AC adaptor cable | ----- | 1.8 m | 2P-NSLD, NMC |
| ㉘ | ----- | AC power cable | ----- | 2.0 m | 2P-NSLD |
| ㉙ | ----- | AC adaptor cable | ----- | 2.0 m | 2P-NSLD |

* 1: KITAGAWA industry Co.,Ltd; TFT-72SK

Appendix data (#08-050E: Total 52 pages)

1. Photograph #08-050E (6 pages)

• Radiated emission measurement

| | |
|--------------------|-------------|
| 30-1000 MHz(Front) | : Photo-1.1 |
| 30-1000 MHz (Back) | : Photo-1.2 |
| 1-14 GHz (Front) | : Photo-1.3 |

• Conducted emission measurement

| | |
|---------------|-------------|
| AC Power port | : Photo-2.1 |
| Telecom port | : Photo-2.2 |
| LAN port | : Photo-2.3 |

• Label

| | | |
|-------------------|---------------|-------------|
| Personal computer | E8420 | : Photo-3.1 |
| AC Adapter | ADP-80NB A | : Photo-3.2 |
| | SEC100P2-19.0 | : Photo-3.3 |
| | SED100P2-19.0 | : Photo-3.4 |
| | SED110P2-19.0 | : Photo-3.5 |

• Internal view

: Photo-4

2. Test data (46 pages)

2.1 Radiated emission

2.1.1 Wireless LAN; 533AN_HMW

| | | |
|-------------|-----------------|--------------------------|
| 30-1000 MHz | AC 230 V/ 50 Hz | : #08-050E-RE1 (2 pages) |
| | AC 120 V/ 60 Hz | : #08-050E-RE2 (2 pages) |
| 1-12 GHz | | : #08-050E-GH (2 pages) |

2.1.2 Wireless LAN; AR5BHB92

| | | |
|-------------|-----------------|--------------------------|
| 30-1000 MHz | AC 120 V/ 60 Hz | : #08-050E-RE3 (2 pages) |
|-------------|-----------------|--------------------------|

2.2 Conducted emission

2.2.1 Wireless LAN; 533AN_HMW

| | | |
|---------------|-----------------------|---------------------------|
| ADP-80NB A | AC 230V/ 50Hz | : #08-050E-CE1 (2 pages) |
| | AC 120V/ 60Hz | : #08-050E-CE2 (2 pages) |
| | AC 100V/ 50Hz | : #08-050E-CE3 (2 pages) |
| SEC100P2-19.0 | AC 230V/ 50Hz QP Mode | : #08-050E-CE4 (2 pages) |
| | AV Mode | : #08-050E-CE5 (2 pages) |
| | AC 120V/ 60Hz | : #08-050E-CE6 (2 pages) |
| | AC 100V/ 50Hz | : #08-050E-CE7 (2 pages) |
| SED100P2-19.0 | AC 230V/ 50Hz QP Mode | : #08-050E-CE8 (2 pages) |
| | AV Mode | : #08-050E-CE9 (2 pages) |
| | AC 120V/ 60Hz | : #08-050E-CE10 (2 pages) |
| | AC 100V/ 50Hz | : #08-050E-CE11 (2 pages) |
| SED110P2-19.0 | AC 230V/ 50Hz QP Mode | : #08-050E-CE12 (2 pages) |
| | AV Mode | : #08-050E-CE13 (2 pages) |
| | AC 120V/ 60Hz QP Mode | : #08-050E-CE14 (2 pages) |
| | AV Mode | : #08-050E-CE15 (2 pages) |
| | AC 100V/ 50Hz | : #08-050E-CE16 (2 pages) |

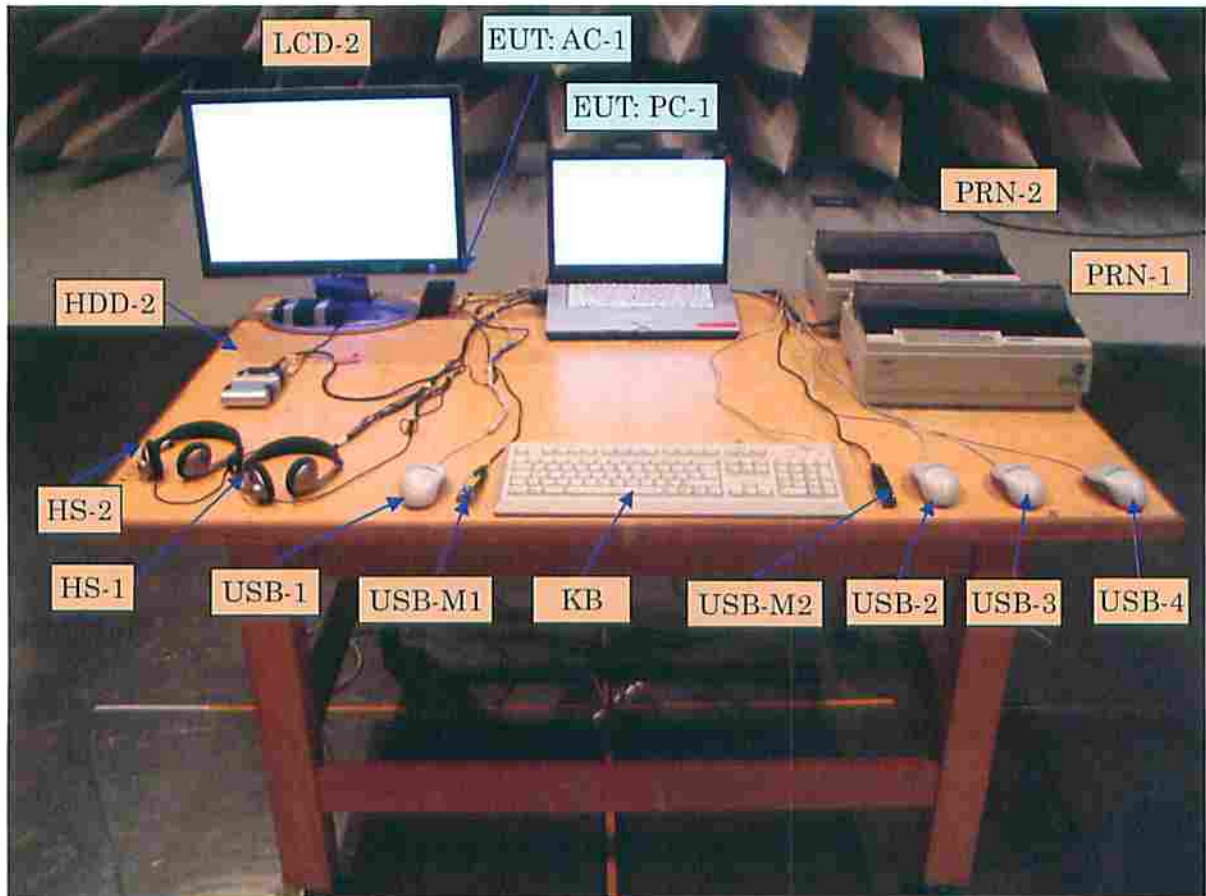
2.2.2 Wireless LAN; AR5BHB92

| | | |
|------------|---------------|---------------------------|
| ADP-80NB A | AC 120V/ 60Hz | : #08-050E-CE17 (2 pages) |
|------------|---------------|---------------------------|

2.3 Telecommunication line emission

| | |
|--------------|--------------------------|
| Telecom port | : #08-050E-TE1 (2 pages) |
| LAN port | : #08-050E-TE2 (2 pages) |

Photo-1.1 Radiated emission measurement for 30-1000 MHz (Front)



- HUB, TEL, PC-2 and PC-3 were set at outside of the chamber.

Photo-1.2 Radiated emission measurement for 30-1000 MHz (Back)

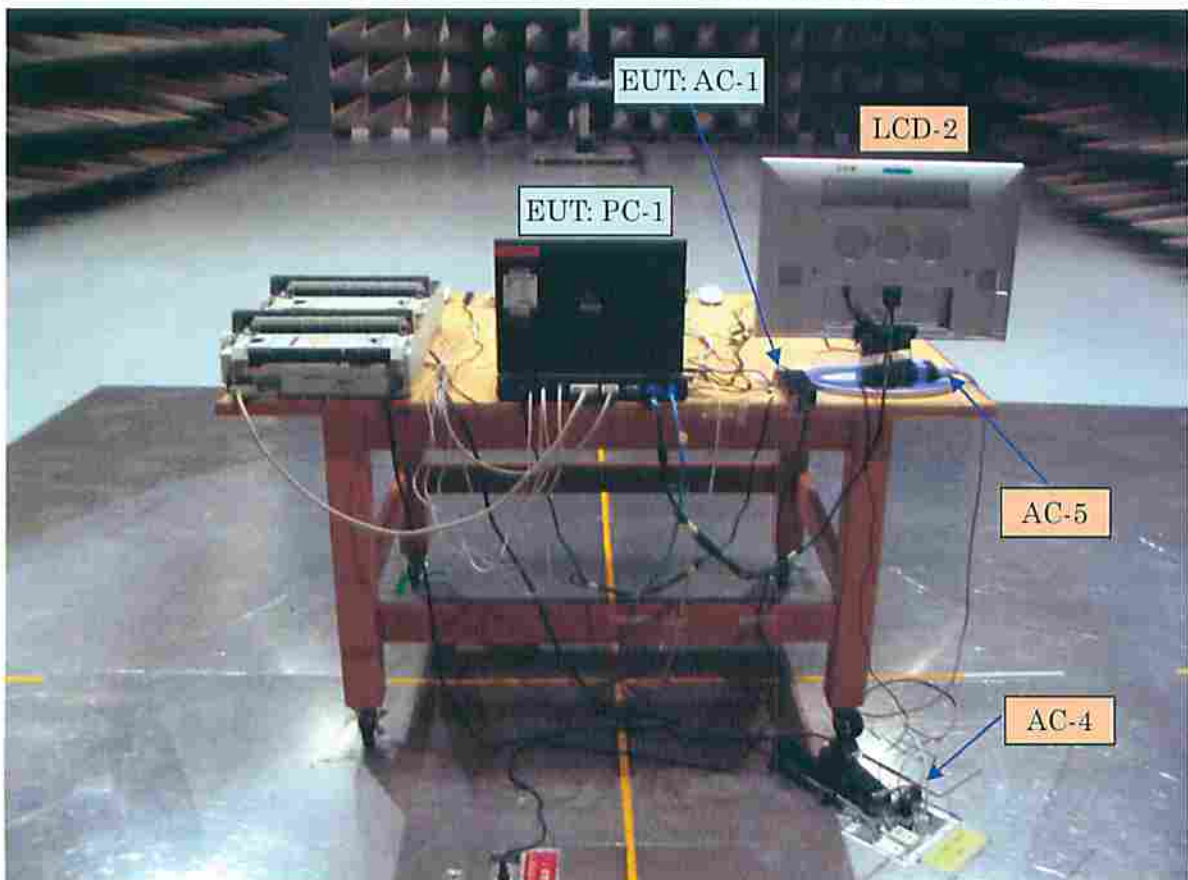


Photo-1.3 Radiated emission measurement for 1-14 GHz (Front)

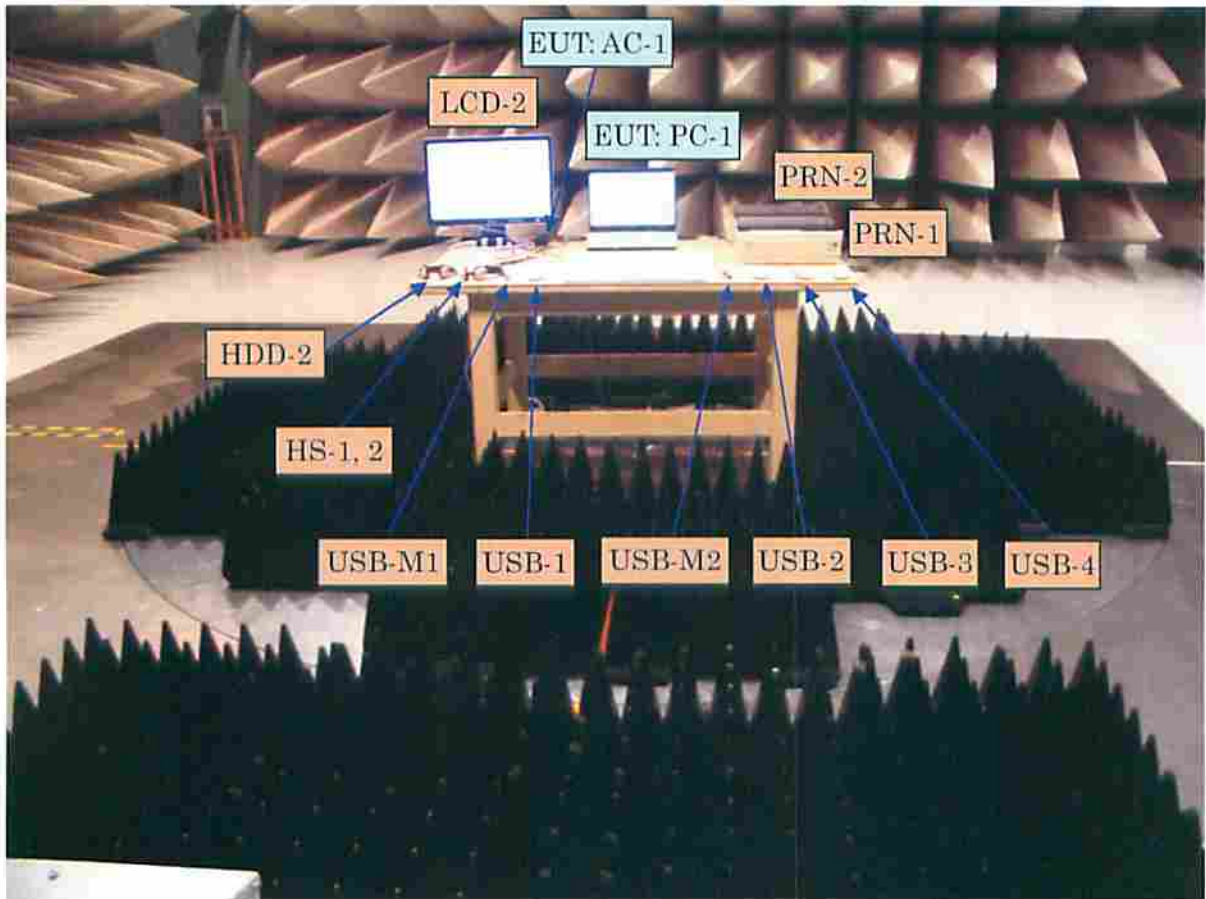


Photo-2.1 Conducted emission measurement

