



Issue Date : October 6, 2003  
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## **EMC** EMISSION - TEST REPORT

JQA APPLICATION No. : KL80030385

Name of Product : PHS Cell Station

Model/Type No. : PBS-CS47

FCC ID : AEZPBS-CS47

Applicant : SANYO Electric Co., Ltd.

Address : 1-1, Sanyo-cho, Daito City, Osaka 574-8534, Japan

Manufacturer : SANYO Electric Co., Ltd.

Address : 1-1, Sanyo-cho, Daito City, Osaka 574-8534, Japan

Receive date of EUT : August 10, 2003

**Final Judgement** : **passed**

**TEST RESULTS IN THIS REPORT** are obtained in use of equipment that is traceable to National Institute of Advanced Industrial Science and Technology(AIST) under METI Japan and Communications Research Lab.(CRL) under MPHPT Japan.

**THE TEST RESULTS** only responds to the test sample. This test report shall not be reproduced except in full.

Authorized by:

Takashi Yamanaka, Director  
JQA KITA-KANSAI Testing Center

## **DIRECTORY**

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| Digital Device Class B, Part15                                 |                             |
| Conducted Emission                                             | 150 kHz - 30 MHz <u>62</u>  |
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## **TEST REGULATION**

FCC Rules and Regulations Part 24 (October 1, 2002)

1900 MHz systems

- - Narrowband PCS
- - Broadband PCS

### **Test procedure:**

The tests were performed according to FCC Rules and Regulations Part 2 (October 1, 2002), and ANSI C63.4 (2001).

## **GENERAL INFORMATION**

### **Test facility:**

- 1) Test Facility located at Kita-Kansai : 1st Open Site (3 m Site)  
Test Facility located at Kameoka : 1st Open Site (3, 10 and 30 m, on common plane)  
: 2nd Open Site (3 and 10 m, on common plane)

**FCC filing No. : 31040/SIT 1300F2**

- 2) KITA-KANSAI TESTING CENTER is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance established in Title 15, Part 285 Code of Federal Regulations.  
**NVLAP Lab Code: 200191-0**

### **Definitions for symbols used in this test report:**

- - Black box indicates that the listed condition, standard or equipment is applicable for this Report.
- - Blank box indicates that the listed condition, standard or equipment is not applicable for this Report.

### Description of the Equipment Under Test (EUT):

- 1) Name : PHS Cell Station
- 2) Model/Type No. : PBS-CS47
- 3) Product Type : Mass-Production(Serial No.: UTN00001)
- 4) Category : Broadband PCS
- 5) EUT Authorization : ○ - Verification ● - Certification ○ - D.o.C.
- 6) Transmitting Frequency : 1880.15 MHz (206 ch) - 1909.55 MHz (49 ch)
- 7) Receiving Frequency : 1880.15 MHz (206 ch) - 1909.55 MHz (49 ch)
- 8) Emission Designations : 286KDXW
- 9) Maximum RF Output Power : 171.40W(EIRP)
- 10) Power Rating : AC120V 60Hz 1φ-3 pin plug
- 11) Channel Numbers and Frequencies for PCS 1900MHz

The carrier spacing is 300 kHz.

The carrier frequency is designated by the absolute frequency channel number(ARFCN).

The carrier frequency is expressed in the equation shown as follows:

$$\text{TX frequency(in MHz)} = 1880.15 + 0.3 * (n - 206) \quad \text{where } n : \text{Channel Number}(206 \leq n \leq 255)$$

$$\text{TX frequency(in MHz)} = 1895.15 + 0.3 * (n - 1) \quad \text{where } n : \text{Channel Number}(1 \leq n \leq 49)$$

$$\text{RX frequency(in MHz)} = 1880.15 + 0.3 * (n - 206) \quad \text{where } n : \text{Channel Number}(206 \leq n \leq 255)$$

$$\text{RX frequency(in MHz)} = 1895.15 + 0.3 * (n - 1) \quad \text{where } n : \text{Channel Number}(1 \leq n \leq 49)$$

- 13) Modulation Type :  $\pi/4$  shift QPSK
- 14) Type of Communication System : TDMA-TDD

## TEST CONDITIONS

### Transmitter Power(TP) Measurement (§2.1046(a))

#### Test Procedure :

The Transmitter Power was measured with a power meter, one 30 dB attenuator and a short, low loss cable.

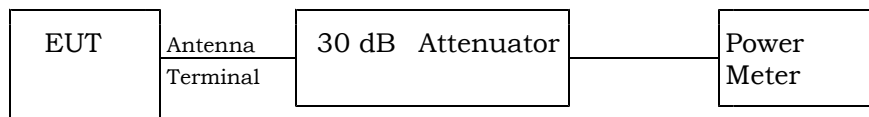


Fig.1 Trasmitter Powe Measurement

#### Test location :

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Mino-Shi, Osaka, 562-0027, Japan

● - Shielded room

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - Shielded room

#### Used test instruments and sites :

| Model No.            | Device ID   | Last Cal. Date | Cal. Interval |
|----------------------|-------------|----------------|---------------|
| ○ - 432B/8478B       | B - 24/B-43 |                |               |
| ● - E4417A           | B - 51      | August, 2003   | 1 Year        |
| ● - E9321A           | B - 52      | May, 2003      | 1 Year        |
| ● - E9300B accessory | B - 32      | June, 2003     | 1 Year        |
| ○ - 6-20             | D - 27      |                |               |
| ○ - 4T-10            | D - 73      |                |               |
| ○ - 4T-10            | D - 73      |                |               |
| ○ - 2-10             | D - 79      |                |               |
| ○ - 2-10             | D - 80      |                |               |
| ○ - 54-10            | D - 83      |                |               |
| ○ - 54-10            | D - 84      |                |               |
| ○ - 8566B            | A - 13      |                |               |
| ○ - 8593A            | A - 15      |                |               |
| ● - Cable            | C - 40 - 9  | June, 2003     | 1 Year        |

#### Environmental conditions :

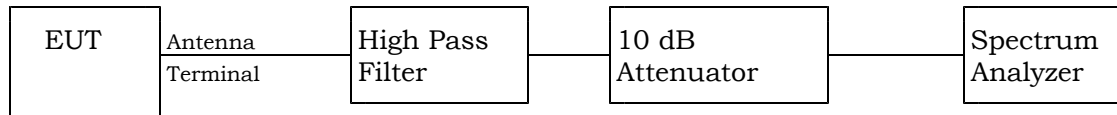
Temperature: 24 °C Humidity: 60 %

## Antenna Conducted Spurious Emission Measurement (§2.1051,§24.238))

### Test Procedure :

The Antenna Conducted Emission was measured with a spectrum analyzer. The test system is shown as follows:

- 1) Frequency Range : 2GHz - 6GHz



- 2) Frequency Range : 6GHz - 20GHz

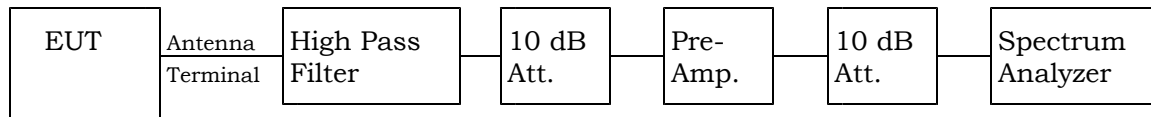


Fig.2 Antenna Conducted Spurious Emission Measurement

### Test location :

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Mino-Shi, Osaka, 562-0027, Japan

● - Shielded room

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - Shielded room

### Used test instruments:

| Model No.        | Device ID   | Last Cal. Date | Cal. Interval |
|------------------|-------------|----------------|---------------|
| ○ - MP721C       | D - 66      |                |               |
| ● - 4T-10        | D - 73      | May, 2003      | 1 Year        |
| ● - 4T-10        | D - 74      | May, 2003      | 1 Year        |
| ● - 2-10         | D - 40      | July, 2003     | 1 Year        |
| ○ - 2-10         | D - 79      |                |               |
| ○ - 2-10         | D - 80      |                |               |
| ● - UHP-127      | D - 42      | May, 2003      | 1 Year        |
| ○ - UHP-128      | D - 43      |                |               |
| ● - 8566B        | A - 13      | February, 2003 | 1 Year        |
| ○ - 8593A        | A - 15      |                |               |
| ● - DBL-0618N515 | A - 33      | May, 2003      | 1 Year        |
| ● - MZ5010C      | D - 81      | November, 2002 | 1 Year        |
| ● - 8673D        | B - 2       | April, 2003    | 1 Year        |
| ● - Cable        | C - 40 - 9  | June, 2003     | 1 Year        |
| ● - Cable        | C - 40 - 11 | May, 2003      | 1 Year        |
| ● - Cable        | C - 40 - 12 | May, 2003      | 1 Year        |

### Environmental conditions:

Temperature: 24 °C      Humidity: 60 %

## **Transmitter Power(EIRP) Measurement (§24.232)**

The measurement were performed shown as follows.

Step 1) The test was set-up shown as Fig.3(a). In order to obtain the maximum emission, the EUT is placed at the height 1.0m on the non-conducted support and the center of the Adaptive Array Antenna is set to 2.3m at the distance 3m from the receiving antenna(Horn Antenna) and rotated around 360 degrees. The receiving antenna height was varied from 1m to 4 m . Then the meter reading of the spectrum analyzer at the maximum emission was A dB( $\mu$ V).

The Details of Test-Arrangement on Radiated emission test (Drawings) is shown in page 34.

Step 2) The test was set-up shown as Fig.3(b). the center of the Adaptive Array Antenna was replaced to Horn antenna at the same polarized under the same condition as step 1. The RF power was fed to the transmitting Antenna(horn Antenna) through the RF amplifier from the signal generator. In order to obtain the maximum emission level, the height of the receiving antenna is varied from 1m to 4 m. The level of the signal generator was adjusted so that the meter reading of the spectrum analyzer at the maximum emission was A dB( $\mu$ V) ,same as the recorded level in Step1. Then the RF power into the substitution horn antenna was P(dBm).

The EIRP is calculated in the following equation.

$$\text{EIRP(dBm)} = P \text{ (dBm)} + G_h(\text{dBi})$$

Where,  $G_h(\text{dBi})$  : Gain of the substitution horn antenna

### Test location:

#### KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Mino-Shi, Osaka, 562-0027, Japan

○ - 1st open test site (3 meters)

#### KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

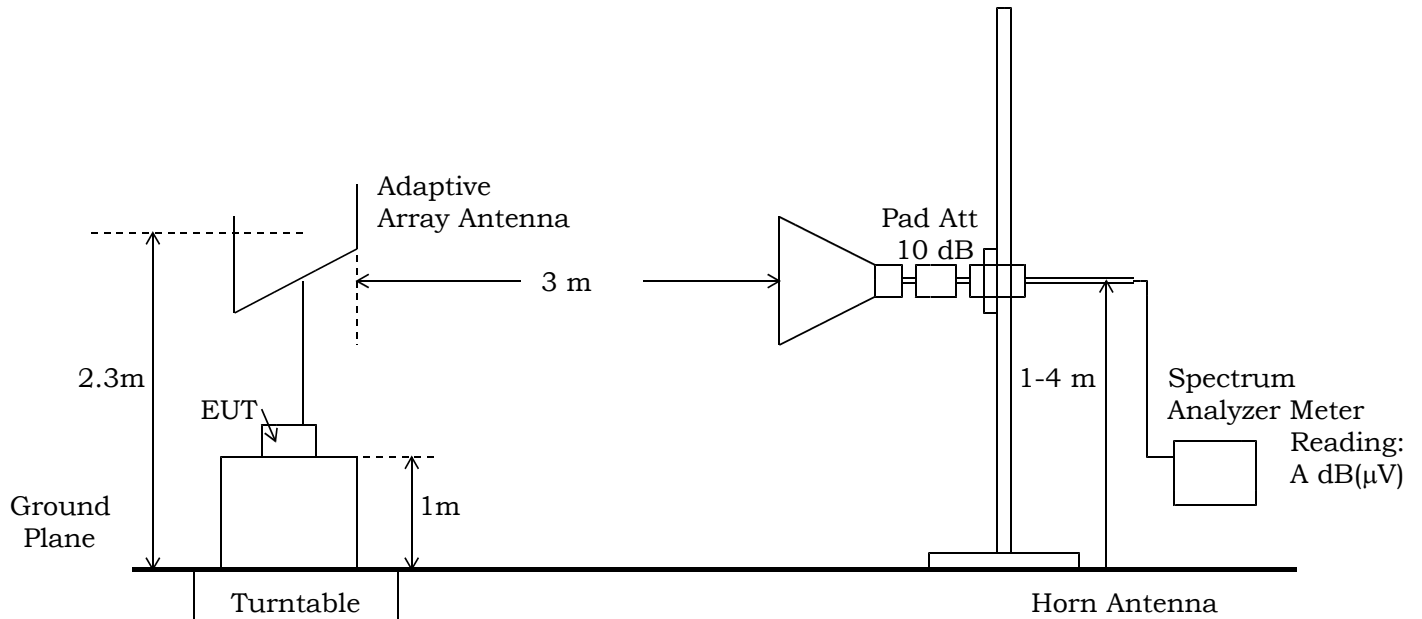
● - 1st open test site      ● - 3 m      ○ - 10 m      ○ - 30 m

○ - 2nd open test site      ○ - 3 m      ○ - 10 m

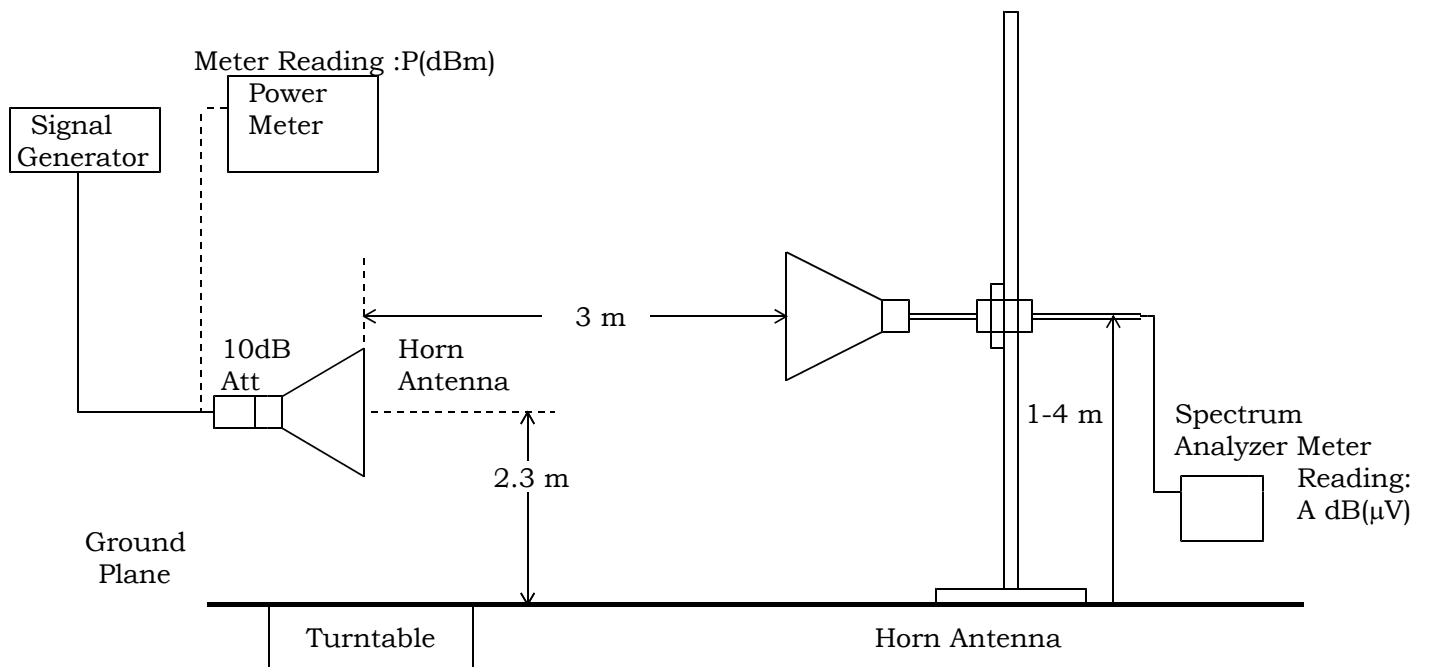
### Used test instruments:

| Model No.           | Device ID   | Last Cal. Date | Cal. Interval |
|---------------------|-------------|----------------|---------------|
| ○ - ESCS 30         | A - 1       |                |               |
| ○ - ESCS 30         | A - 9       |                |               |
| ● - 8566B           | A - 13      | February, 2003 | 1 Year        |
| ○ - 8593A           | A - 15      |                |               |
| ○ - ESV             | A - 6       |                |               |
| ● - 4T-10           | D - 73      | May, 2003      | 1 Year        |
| ○ - 4T-10           | D - 74      |                |               |
| ○ - 2-10            | D - 79      |                |               |
| ○ - 2-10            | D - 80      |                |               |
| ○ - WJ-6611-513     | A - 23      |                |               |
| ○ - WJ-6882-824     | A - 21      |                |               |
| ○ - DBL-0618N515    | A - 33      |                |               |
| ● - 91888-2         | C - 40 - 1  | May, 2003      | 1 Year        |
| ● - 91888-2         | C - 41 - 1  | May, 2003      | 1 Year        |
| ○ - 91889-2         | C - 41 - 2  |                |               |
| ○ - 94613-1         | C - 41 - 3  |                |               |
| ○ - 91891-2         | C - 41 - 4  |                |               |
| ○ - 94614-1         | C - 41 - 5  |                |               |
| ○ - 3160-09         | C - 48      |                |               |
| ○ - 355C            | D - 22      |                |               |
| ○ - 355D            | D - 23      |                |               |
| ○ - MZ5010C         | D - 81      |                |               |
| ● - Cable           | C - 40 - 11 | May, 2003      | 1 Year        |
| ● - Cable           | C - 40 - 12 | May, 2003      | 1 Year        |
| ○ - 432B/8478B      | B - 24/B-43 |                |               |
| ● - E4417A          | B - 51      | August, 2003   | 1 Year        |
| ● - E9321A          | B - 52      | May, 2003      | 1 Year        |
| ○ - ML2437A/ML2444A | B - 10/B-11 |                |               |
| ○ - 8673D           | B - 2       |                |               |
| ○ - MG3681A         | B - 3       |                |               |
| ● - 6062A           | B - 44      | May, 2003      | 1 Year        |

Temperature: 25 °C      Humidity: 58 %



(a) EUT



(b) Substitution Horn Antenna

Fig.3 Maximum Transmitter Power (EIRP) Measurement

## Unwanted Radiation Measurement (§2.1053,§24.238)

### - EIRP method -

Step 1) The spurious radiation for transmitter were measured at the distance 3m away from the EUT which was placed on a non-conducted support 1.0m in height and the center of the Adaptive Array Antenna was set to 2.3m. The receiving antenna was oriented for vertical polarization and varied from 1 m to 4 m until the maximum emission level was detected on the measuring instrument. The EUT was rotated 360 degrees until the maximum emission was received. The measurement was also repeated with the receiving antenna in the horizontal polarization.

The Details of Test-Arrangement on Radiated emission test (Drawings) is shown in page 34.

This test was carried out using the loop antenna for up to 30MHz, using the half-wave dipole antenna for up to 1GHz and using the horn antenna for above 1GHz.

Step 2) The EIRP measurement was carried out with according to Step 2 in page 7 . Then the RF power in the substitution antenna half-wave dipole antenna for up to 1GHz and the substitution horn antenna for above 1GHz.

The EIRP is calculated in the following equation.

A) Up to 1GHz

$$\text{EIRP(dBm)} = P \text{ (dBm)} + G_d(\text{dBi}) - (\text{Balun Loss of the half-wave dipole Ant. (dB)}) + \text{Cable Loss(dB)}$$

Where,  $G_d(\text{dBi})$  : Gain of the substitution half-dipole antenna

B) Above 1GHz

$$\text{EIRP(dBm)} = P \text{ (dBm)} + G_h(\text{dBi})$$

Where,  $G_h(\text{dBi})$  : Gain of the substitution horn antenna

The ERP is calculated in the following equation.

$$\text{ERP[dBm]} = \text{EIRP (dBm)} - G_d(\text{dBi})$$

The respective calculated EIRP of the spurious and harmonics were compared with the EIRP and ERP of fundamental frequency by specified attenuation limits,  $43 + 10 \log_{10}(\text{TP in watt})[\text{dB}]$ . Where, TP = Transmitter power at the ANT OUT under test configuration as the handsfree unit used.

The tests were carried out under one test configuration as the handsfree unit used.

### Test location:

#### KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Mino-Shi, Osaka, 562-0027, Japan

○ - 1st open test site (3 meters)

#### KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

● - 1st open test site      ● - 3 m      ○ - 10 m      ○ - 30 m

○ - 2nd open test site      ○ - 3 m      ○ - 10 m

### Validation of Site Attenuation:

1) Last Confirmed Date : November 5, 2002

2) Interval : 1 Year

### Used test instruments :

| Model No.            | Device ID      | Last Cal. Date | Cal. Interval |
|----------------------|----------------|----------------|---------------|
| ○ - ESCS 30          | A - 1          |                |               |
| ○ - ESCS 30          | A - 9          |                |               |
| ○ - ESH 2            | A - 2          |                |               |
| ○ - ESH 2            | A - 3          |                |               |
| ○ - HFH2-Z2          | C - 2          |                |               |
| ● - HFH2-Z2          | C - 3          | July, 2003     | 1 Year        |
| ○ - ESV/ESV-Z3       | A - 7 / A - 17 |                |               |
| ○ - ESV/ESV-Z3       | A - 6 / A - 18 |                |               |
| ○ - ESV/ESV-Z3       | A - 4 / A - 20 |                |               |
| ● - ESV/ESV-Z3       | A - 8 / A - 19 | November, 2003 | 1 Year        |
| ○ - ESVS 10          | A - 5          |                |               |
| ○ - VHA9103/BBA9106  | C - 43         |                |               |
| ○ - UHALP9107        | C - 42         |                |               |
| ● - VHA9103/FBAB9177 | C - 25         | August, 2003   | 1 Year        |
| ● - UHALP9108-A1     | C - 28         | August, 2003   | 1 Year        |
| ● - Cable            | H - 1          | August, 2003   | 1 Year        |

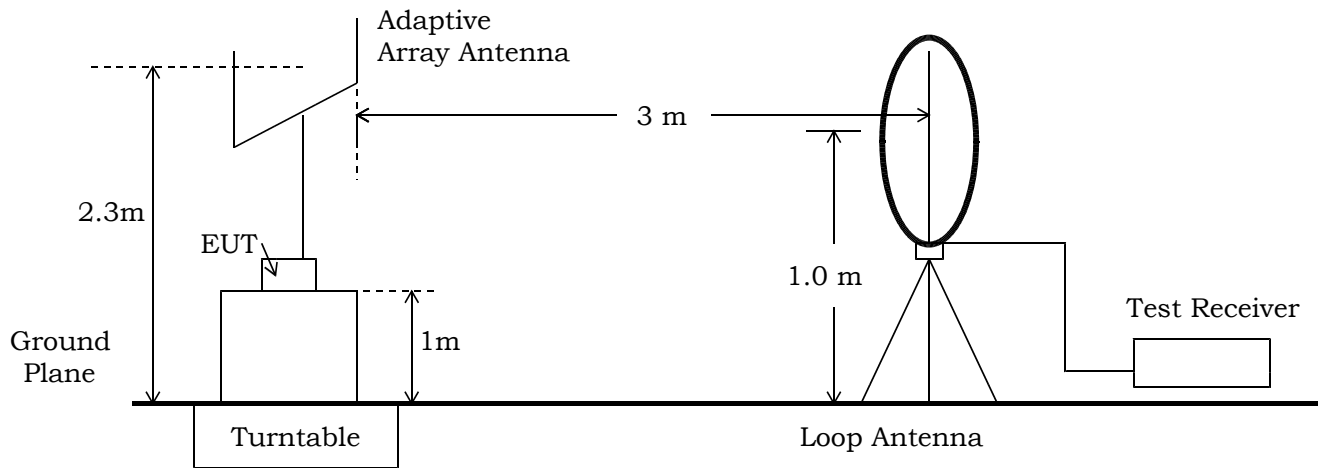
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**Used test instruments :**

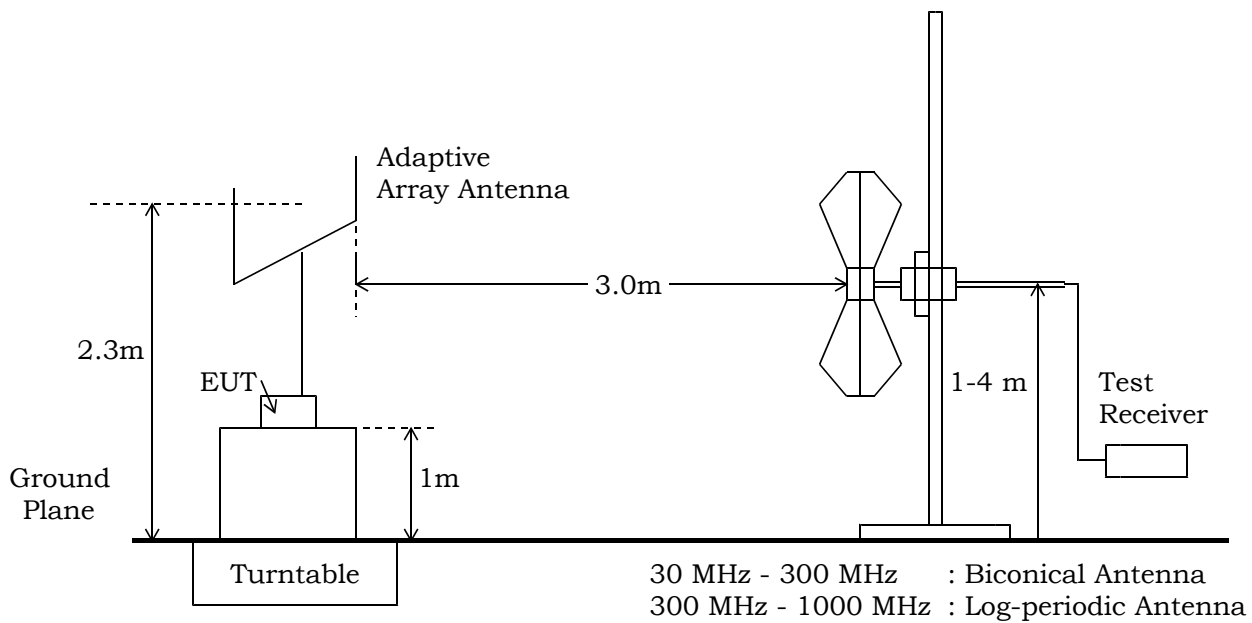
| Model No.        | Device ID   | Last Cal. Date | Cal. Interval |
|------------------|-------------|----------------|---------------|
| ● - 8566B        | A - 13      | February, 2003 | 1 Year        |
| ○ - 8593A        | A - 15      |                |               |
| ● - 4T-10        | D - 73      | May, 2003      | 1 Year        |
| ● - 4T-10        | D - 74      | May, 2003      | 1 Year        |
| ● - WJ-6611-513  | A - 23      | May, 2003      | 1 Year        |
| ● - WJ-6882-824  | A - 21      | May, 2003      | 1 Year        |
| ● - DBL-0618N515 | A - 33      | May, 2003      | 1 Year        |
| ● - 91888-2      | C - 41 - 1  | May, 2003      | 1 Year        |
| ● - 91889-2      | C - 41 - 2  | May, 2003      | 1 Year        |
| ● - 94613-1      | C - 41 - 3  | May, 2003      | 1 Year        |
| ● - 91891-2      | C - 41 - 4  | May, 2003      | 1 Year        |
| ● - 94614-1      | C - 41 - 5  | May, 2003      | 1 Year        |
| ○ - 3160-04      | C - 55      |                |               |
| ○ - 3160-05      | C - 56      |                |               |
| ○ - 3160-06      | C - 57      |                |               |
| ○ - 3160-07      | C - 58      |                |               |
| ○ - 3160-08      | C - 59      |                |               |
| ● - 3160-09      | C - 48      | November, 2002 | 1 Year        |
| ○ - 355C         | D - 22      |                |               |
| ○ - 355D         | D - 23      |                |               |
| ● - MZ5010C      | D - 81      | November, 2002 | 1 Year        |
| ● - 8673D        | B - 2       | April, 2003    | 1 Year        |
| ● - Cable        | C - 40 - 11 | May, 2003      | 1 Year        |
| ● - Cable        | C - 40 - 12 | May, 2003      | 1 Year        |
| ○ - UHP-127      | D - 42      |                |               |
| ● - UHP-128      | D - 43      | May, 2003      | 1 Year        |

**Environmental conditions :**

Temperature: 21 °C      Humidity: 73 %

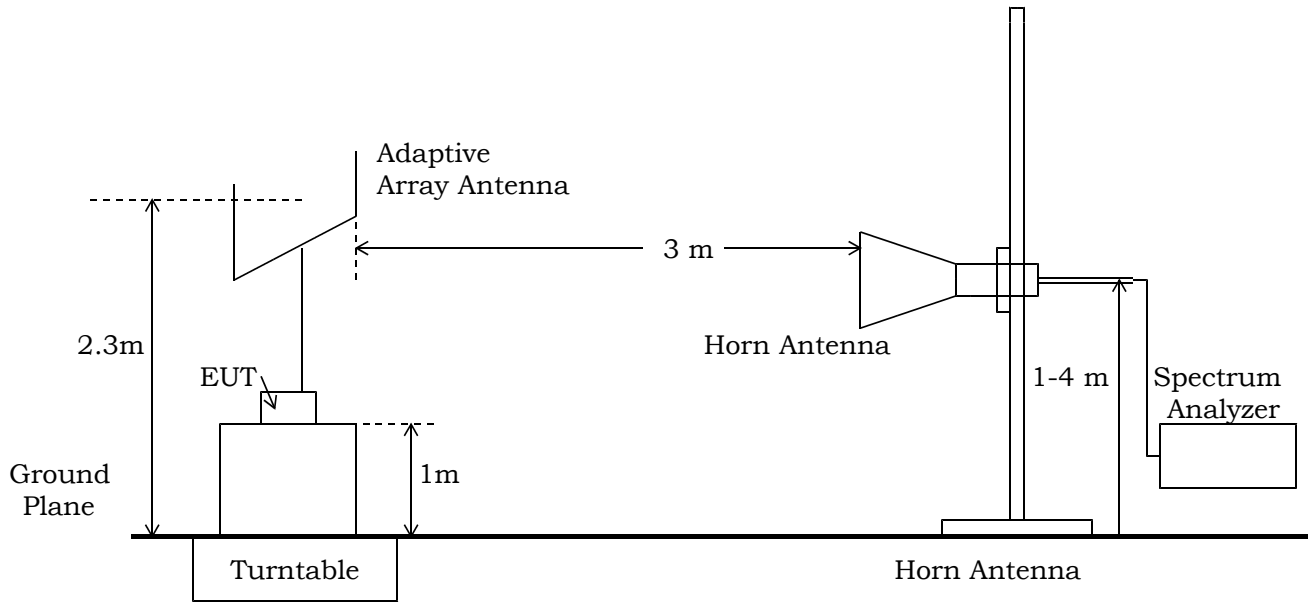


(a) Measurement set up for up to 30 MHz



(b) Measurement set up for up to 1 GHz

Fig.4 Unwanted Radiation Measurement



(c) Measurement set up for above 1GHz

Fig.4 Unwanted Radiation Measurement

## Occupied Bandwidth Measurement (§2.1049, §24.238)

### Test Procedure :

The measurement test-setup is shown in Fig.5.

The setting of the spectrum analyzer are shown as follows :

Res. Bandwidth : 10 kHz  
Video Bandwidth : 30 kHz  
Span : 1 MHz  
Sweep Time : AUTO  
Trace : Maxhold

### Test location :

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Mino-Shi, Osaka, 562-0027, Japan

● - Shielded room

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - Shielded room

### Used test instruments:

| Model No. | Device ID | Last Cal. Date | Cal. Interval |
|-----------|-----------|----------------|---------------|
| ○ - 4T-10 | D - 73    |                |               |
| ○ - 4T-10 | D - 74    |                |               |
| ● - 2-10  | D - 40    | June, 2003     | 1 Year        |
| ○ - 2-10  | D - 79    |                |               |
| ○ - 2-10  | D - 80    |                |               |
| ● - 8566B | A - 13    | February, 2003 | 1 Year        |
| ○ - 8593A | A - 15    |                |               |

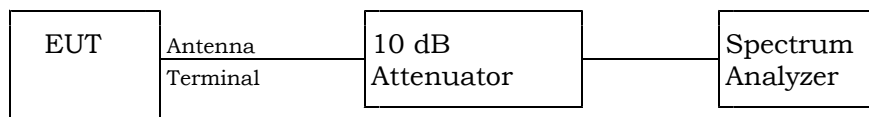


Fig.5 Occupied Bandwidth Measurement

### Environmental conditions:

Temperature: 24 °C      Humidity: 60 %

## Band-Edge Emission Measurement(\$22.917,\$24.238)

### Test Procedure :

The measurement test-setup is shown in Fig.6.

The setting of the spectrum analyzer are shown as follows :

TX Frequency : 1880.15MHz/1909.55 MHz  
Band-edge Frequency : 1870.0MHz/1910.0 MHz  
Res. Bandwidth : 3 kHz  
Video Bandwidth : 10 kHz  
Span : 30 MHz/2 MHz  
Sweep Time : AUTO  
Trace : Maxhold

### Test location :

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Mino-Shi, Osaka, 562-0027, Japan

● - Shielded room

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - Shielded room

### Used test instruments:

|           |        |                |        |
|-----------|--------|----------------|--------|
| ○ - 4T-10 | D - 73 |                |        |
| ○ - 4T-10 | D - 74 |                |        |
| ● - 2-10  | D - 40 | June, 2003     | 1 Year |
| ○ - 2-10  | D - 79 |                |        |
| ○ - 2-10  | D - 80 |                |        |
| ● - 8566B | A - 13 | February, 2003 | 1 Year |
| ○ - 8593A | A - 15 |                |        |

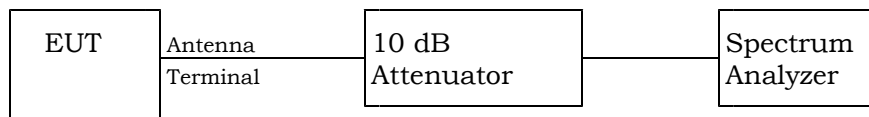


Fig.6 Band-Edge Emission Measurement

### Environmental conditions:

Temperature: 24 °C      Humidity: 60 %

## Frequency Stability Measurement(\$2.1055, §24.235)

### a) Frequency Stability Measurement versus Temperature

The EUT was placed in an environmental chamber and was tested in the range from -30 to +50 degrees Celsius. The EUT was stabilized at each temperature. The power(120VAC) supplied was applied to the transmitter and allowed to stabilize for 10 minutes. The transmitting frequency was measured at startup and 2 minutes, 5 minutes and 10 minutes after startup. This procedure was repeated from -30 to +50 degrees Celsius at the interval of 10 degrees.

### b) Frequency Stability Measurement versus Power Supply Voltage

The EUT was placed in an environmental chamber and was tested at the temperature of +20 degrees Celsius. The EUT was stabilized at the temperature. The power(120VAC),the power(102VAC, 85%) and the power(138VAC, 115%) was applied to the EUT allowed to stabilize for 10 minutes. The transmitting frequency was measured at startup and 2 minutes, 5 minutes and 10 minutes after startup.

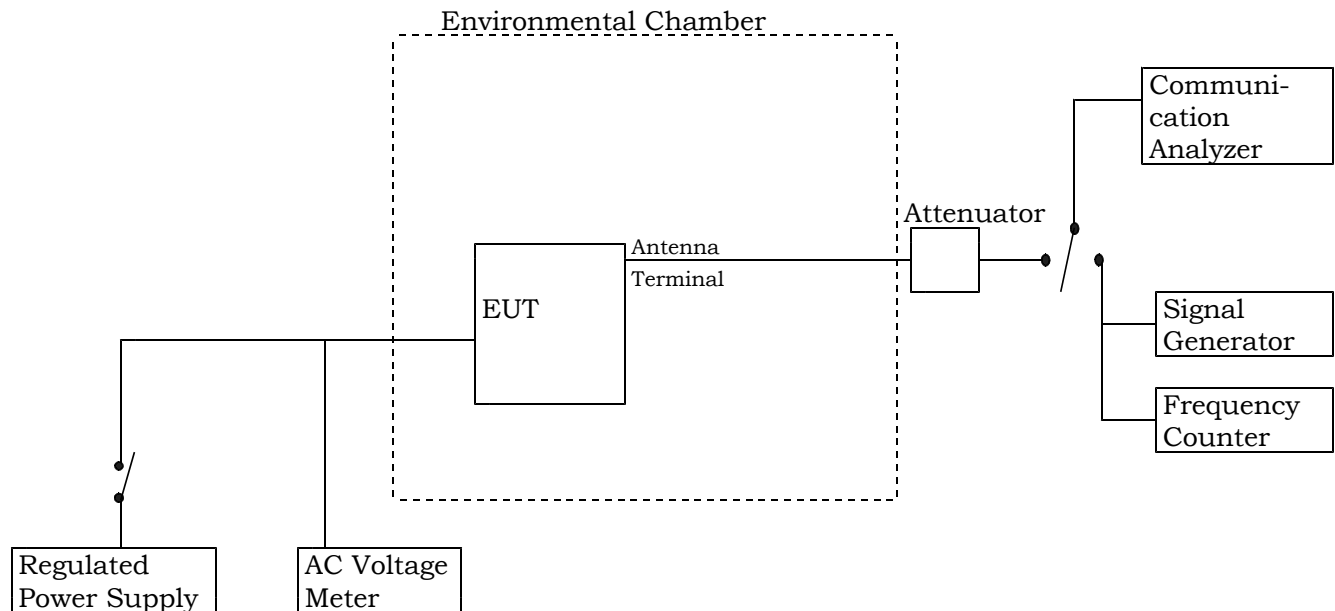


Fig.7 Frequency Stability Measurement

**Test location:**

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Mino-Shi, Osaka, 562-0027, Japan

○ - Shielded room

● - Environment Testing Room

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

○ - Shielded room

**Used test instruments and sites :**

| Model No.      | Device ID | Last Cal. Date | Cal. Interval |
|----------------|-----------|----------------|---------------|
| ● - PL-3G      | 02304009  | July, 2003     | 1 Year        |
| ● - EL100-06T4 | 14201089  | July, 2003     | 1 Year        |
| ○ - 2011-39    | B - 33    |                |               |
| ● - 2013-18    | B - 34    | April, 2003    | 1 Year        |
| ○ - 6032A      | F - 5     |                |               |
| ● - TR5212     | B - 30    | March, 2003    | 1 Year        |
| ● - CMU200     | 103210    | April, 2003    | 1 Year        |
| ● - MG3681A    | B - 3     | January, 2003  | 1 Year        |

## AC Powerline Conducted Emission Measurement

was performed in the following test site.

### Test location:

KITA-KANSAI Testing Center

7-7, Ishimaru, 1-Chome, Mino-Shi, Osaka, 562-0027, Japan

○ - Shielded room

KAMEOKA EMC Branch

9-1, Ozaki, Inukanno, Nishibetsuin-Cho, Kameoka-Shi, Kyoto, 621-0126, Japan

● - Shielded room

○ - On metal plane of open site

### Used test instruments and sites:

| Model No.         | Device ID | Last Cal. Date | Cal. Interval |
|-------------------|-----------|----------------|---------------|
| ○ - ESCS 30       | A - 1     | November, 2002 | 1 Year        |
| ○ - ESH 2         | A - 2     |                |               |
| ● - ESH 2         | A - 3     |                |               |
| ○ - KNW-407       | D - 6     |                |               |
| ○ - KNW-408       | D - 11    |                |               |
| ○ - KNW-242       | D - 7     | October, 2002  | 1 Year        |
| ○ - ESH3-Z5       | D - 12    |                |               |
| ● - KNW-341C      | D - 13    |                |               |
| ○ - KNW-408       | D - 14    |                |               |
| ○ - KNW-244C      | D - 77    |                |               |
| ○ - KNW-408       | D - 78    |                |               |
| ○ - ESH2-Z5       | D - 10    |                |               |
| ○ - ESH2-Z3       | D - 17    |                |               |
| ○ - 65 BNC-50-0-1 | H - 26    | October, 2002  | 1 Year        |
| ○ - 65 BNC-50-0-1 | H - 27    |                |               |
| ● - Cable         | H - 7     |                |               |
| ○ - Cable         | H - 8     |                |               |

### Environmental conditions:

Temperature: 25 °C      Humidity: 60 %

AC Powerline Conducted Emission 150 kHz - 30 MHz:

The preliminary test was performed according to the description of ANSI C63.4-2001 Sec.7.2.3 (Exploratory AC Powerline Conducted Emission Measurements) and Sec.6.2.1 (Tabletop Equipment Tests).

The preliminary test was carried out to investigate the frequency of the emission that has the highest amplitude relative to the limits within normal operating modes, cable positions, and a typical system configuration. In order to find out to the maximum emission, the preliminary test and a final test were performed in accordance with the following steps.

Step 1: One operation mode of the test system was setting.

Step 2: Using both of a spectrum analyzer and a test receiver, the emission's circumstance from the system was monitored in one of ten divided frequency bands of the specified frequency range (150 kHz - 30 MHz). The maximum emission in the band was found by changing the typical cable positions or cable manipulation under a typical system configuration and by selecting of current-carrying conductor. The level and the frequency at the one point which are regarded as relative high emission in the band was measured and recorded. This step was repeated until the ending frequency band.

Step 3: Return to step 1, if the other operation mode was possible to be setting.

Step 4: Based on the collected results, the operation mode produced the maximum emission was selected. The final test on the selected operation mode was performed. But if it was difficult to select the operation mode, the final tests on all operation modes were performed.

Step 5: Based on the same data, as result if the final measurement, at the worst point that has the highest amplitude relative to the limit the repeatability of the worst was reconfirmed.

The photographs of the test system setup on the worst point were taken and recorded.

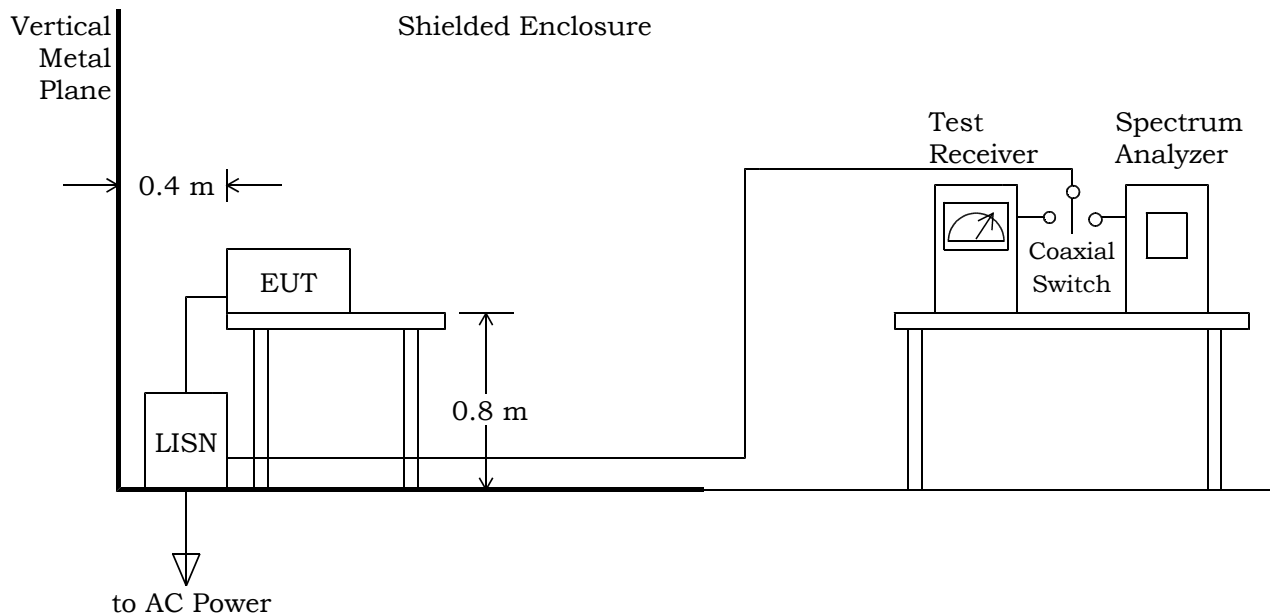


Fig.8 AC Powerline Conducted Emission Measurement

### **CONFIGURATION OF EUT**

**The Equipment Under Test (EUT) consists of :**

| Description      | Applicant<br>(Manufacturer)                            | Model No.<br>(Serial No.) | FCC ID      |
|------------------|--------------------------------------------------------|---------------------------|-------------|
| PHS Cell Station | SANYO Electric Co., Ltd.<br>(SANYO Electric Co., Ltd.) | PBS-CS47<br>(UTO00001)    | AEZPBS-CS47 |

**The measurement was carried out with the following equipment connected :**

| Description | Grantee/Distributor        | Model No.<br>(Serial No.) | FCC ID   |
|-------------|----------------------------|---------------------------|----------|
| Antenna 1   | MASPRO DENKOH CORPORATION  | AMSP0011<br>(1027991)     | N/A      |
| Antenna 2   | MASPRO DENKOH CORPORATION  | AMSP0011<br>(1027990)     | N/A      |
| Antenna 3   | MASPRO DENKOH CORPORATION  | AMSP0011<br>(1027989)     | N/A      |
| Antenna 4   | MASPRO DENKOH CORPORATION  | AMSP0011<br>(1027992)     | N/A      |
| GPS Antenna | Trimble Navigation Limited | Acutime2000<br>(12253054) | N/A(DoC) |

**Type of Interface Cable(s) and the AC Power Cord used with the EUT :**

|    | Description                                | Port  | Shielded Cable | Shell Material | Ferrite Core | Cable Length |
|----|--------------------------------------------|-------|----------------|----------------|--------------|--------------|
| 1  | EUT                                        | ANT 1 | YES            | Metal          | NO           | 1.2 m        |
|    | Antenna 1                                  | ---   |                | Metal          |              |              |
| 2  | EUT                                        | ANT 2 | YES            | Metal          | NO           | 1.2 m        |
|    | Antenna 2                                  | ---   |                | Metal          |              |              |
| 3  | EUT                                        | ANT 3 | YES            | Metal          | NO           | 1.2 m        |
|    | Antenna 3                                  | ---   |                | Metal          |              |              |
| 4  | EUT                                        | ANT 4 | YES            | Metal          | NO           | 1.2 m        |
|    | Antenna 4                                  | ---   |                | Metal          |              |              |
| 5  | EUT                                        | ANT 5 | YES            | Metal          | NO           | 1.2 m        |
|    | Antenna 1                                  | ---   |                | Metal          |              |              |
| 6  | EUT                                        | ANT 6 | YES            | Metal          | NO           | 1.2 m        |
|    | Antenna 2                                  | ---   |                | Metal          |              |              |
| 7  | EUT                                        | ANT 7 | YES            | Metal          | NO           | 1.2 m        |
|    | Antenna 3                                  | ---   |                | Metal          |              |              |
| 8  | EUT                                        | ANT 8 | YES            | Metal          | NO           | 1.2 m        |
|    | Antenna 4                                  | ---   |                | Metal          |              |              |
| 9  | EUT                                        | GPS   | YES            | Metal          | NO           | 15.0 m       |
|    | GPS Antenna                                | ---   |                | Metal          |              |              |
| 10 | EUT                                        | NT1   | YES            | Metal          | NO           | 20.0 m       |
|    | No termination                             | ---   |                | Metal          |              |              |
| 11 | EUT                                        | COMM  | YES            | Metal          | NO           | 12.0 m       |
|    | No termination                             | ---   |                | Metal          |              |              |
| 12 | AC Power Cord (EUT)<br>1 $\phi$ 3-pin plug | --    | YES            | --             | NO           | 1.4 m        |

## Test Configuration:

### Operation - mode of the EUT:

The tests were carried out under one modulation type shown as follows :  
Modulation type :  $\pi/4$  shift QPSK

The test configuration were shown as follows:

- 1) Maximum Transmitter Power(EIRP) and Unwanted Radiation  
The test configuration (Transmission Antenna System: ANT1-ANT4) is refer to page 31.  
The test configuration (Transmission Antenna System: ANT5-ANT8) is refer to page 32.
- 2) Digital Device Class B,FCC Part 15  
The test configuration is refer to page 33.

### Test system:

The EUT is 1900MHz PHS Cell Station.

The adaptive array antenna technology is applied to the PHS system , in order to effective use of available frequency, improves capacity of subscribers, and improves the transmission quality of the system.

The EUT has 11 ports shown as follows :

- 1) 4 ANT Set ports : Each of them is connected to the Antenna.(ANT1-ANT4)
- 2) 4 ANT Set ports : Each of them is connected to the Antenna.(ANT5-ANT8)
- 3) GPS port : is connected to the GPS Antenna.
- 4) NT1 port : is connected to No terminated cable.
- 5) COMM port : is connected to No terminated cable.

The specification of the antenna is shown as follows:

- 1) Type : Co-Linear antnna(Omni-direction)
- 2) Gain : 10dBi
- 3) Impedance :  $50\Omega$
- 4) VSWR : Less than 1.5
- 5) Cable : Length 1.2m , Attenuation 0.5dB/m

The specification of the adaptive array antenna systems is shown as follows:

- 1) Number of elements: 4
- 2) Array Gain : 6dB

The adaptive array antenna controls antenna pattern for desired user, by controlling the phase and amplitude of signals.

Maximizing signal from desire user : beam steering

Suppressing signals from undesired users : null steering

JQA Application No.: KL80030385  
Model No. : PBS-CS47  
FCC ID : AEZPBS-CS47

Regulation : CFR 47 FCC Rules Part 24  
Issue Date : October 6, 2003

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Page 24 of 63

**Special accessories:**

None

**Detailed Transmitter portion:**

Transmitting frequency : 1880.15 MHz(206ch) - 1909.55 MHz(49ch)  
Local frequency : 1636.20 MHz(206ch) - 1665.60 MHz(49ch), 9.6 MHz, 233.15 MHz

**Detailed Receiver portion:**

Receiving frequency : 1880.15 MHz(206ch) - 1909.55 MHz(49ch)  
Local frequency : 1636.20 MHz(206ch) - 1665.60 MHz(49ch), 9.6 MHz, 233.15 MHz

**Other Clock Frequency:**

TCXO : 19.2 MHz

### **EUT Modification**

- - No modifications were conducted by JQA to achieve compliance to applied levels.
- - To achieve compliance to applied levels, the following change(s) were made by JQA during the compliance test.

— The modification(s) will be implemented in all production models of this equipment. —

Applicant : N/A Date : N/A

Typed Name : N/A Position : N/A

### **Responsible Party**

— Responsible Party of Test Item(Product) —

Responsible party :

Contact Person :

\_\_\_\_\_  
Signatory

### **Deviation from Standard**

- - No deviations from the standard described in page 3.
- - The following deviations were employed from the standard described in page 3.

\_\_\_\_\_  
\_\_\_\_\_

## TEST RESULTS

### Transmitter Power(TP)

The transmitter power is 1.27 W at 1894.850 MHz  
Min. limit margin 19.0 dB at 1894.850 MHz  
Max. limit exceeding \_\_\_\_\_ dB at \_\_\_\_\_ MHz  
Uncertainty of measurement results +0.6 dB(2 $\sigma$ ) -0.6 dB(2 $\sigma$ )

Remarks: \_\_\_\_\_  
\_\_\_\_\_

### Antenna Conducted Spurious Emission

The requirements are **● - Passed** **○ - Not Passed**  
Min. limit margin More than 20.6 dB at 18801.500 MHz  
Max. limit exceeding \_\_\_\_\_ dB at \_\_\_\_\_ MHz  
Uncertainty of measurement results +2.4 dB(2 $\sigma$ ) -2.4 dB(2 $\sigma$ )

Remarks: \_\_\_\_\_  
\_\_\_\_\_

### Transmitter Power(EIRP)

The requirements are **○ - Passed** **○ - Not Passed**  
The Maximum EIRP is 171.40 W at 1894.85 MHz  
Min. limit margin 9.8 dB at 1894.85 MHz  
Max. limit exceeding \_\_\_\_\_ dB at \_\_\_\_\_ MHz  
Uncertainty of measurement results +1.3 dB(2 $\sigma$ ) -1.3 dB(2 $\sigma$ )

Remarks: \_\_\_\_\_  
\_\_\_\_\_

### **Unwanted Radiation (9 kHz - 20 GHz)**

The requirements are

● - Passed

○ - Not Passed

Min. limit margin

17.7 dB at 3789.700 MHz

Max. limit exceeding

at 3819.100 MHz  
dB at \_\_\_\_\_ MHz

Uncertainty of measurement results

9 kHz - 30 MHz  
30 MHz - 1 GHz  
1 GHz - 20 GHz

+2.5 dB(2σ)  
+3.6 dB(2σ)  
+3.1 dB(2σ)

-2.5 dB(2σ)  
-3.7 dB(2σ)  
-3.2 dB(2σ)

Remarks:

### **Occupied Bandwidth**

The requirements are

● - Passed

○ - Not Passed

The 26dB Bandwidth is

286 kHz at 1880.15 MHz

The results(Occupied Bandwidth)

Refer to pages\* 1 - 26

Uncertainty of measurement results at Frequency

±0.05 ppm(2σ)

Uncertainty of measurement results at Amplitude

±0.6 dB(2σ)

Remarks: \*: The Page is one in the Attachment A.

### **Band-Edge Emission**

The requirements are

● - Passed

○ - Not Passed

The Band-Edge level is

-63.6 dBc at 1910.00 MHz

The results(Band-edge Emission)

Refer to pages\* 27 - 35

Uncertainty of measurement results at Frequency

±0.05 ppm(2σ)

Uncertainty of measurement results at Amplitude

±0.6 dB(2σ)

Remarks: \*: The Page is one in the Attachment A.

**Minimum Save-distance**

Minimum Save-distance : 1.17 m

**Remarks:**

---

---

**Frequency Stability**

Max. Frequency Deviation : +1291.0 Hz at 1880.150 MHz

Uncertainty of measurement results ±0.05 ppm

**Remarks:**

---

---

**TEST RESULTS**  
**Digital Device Class B, Part15**

**AC Powerline Conducted Emission 150 kHz - 30 MHz**

| The requirements are               | ● - Passed                                | ○ - Not Passed |
|------------------------------------|-------------------------------------------|----------------|
| Min. limit margin                  | <u>26.8</u> dB at <u>2.47</u> MHz         |                |
| Max. limit exceeding               | <u>        </u> dB at <u>        </u> MHz |                |
| Uncertainty of measurement results | <u>+ 2.1</u> dB(2σ) <u>- 2.1</u> dB(2σ)   |                |

**Remarks:** \_\_\_\_\_  
\_\_\_\_\_

**Electromagnetic Field Radiated Emission 30 MHz - 1000 MHz**

| The requirements are               | ● - Passed                                | ○ - Not Passed |
|------------------------------------|-------------------------------------------|----------------|
| Min. limit margin                  | <u>13.7</u> dB at <u>500.0</u> MHz        |                |
| Max. limit exceeding               | <u>        </u> dB at <u>        </u> MHz |                |
| Uncertainty of measurement results | <u>+3.6</u> dB(2σ) <u>-3.7</u> dB(2σ)     |                |

**Remarks:** \_\_\_\_\_  
\_\_\_\_\_

## SUMMARY

### GENERAL REMARKS :

The EUT was tested according to the requirements of FCC Rules and Regulations Part 24 (October 1, 2002) under the test configuration, as shown in pages 31 - 34.

The conclusion for the test items of which are required by the applied regulation is indicated under the final judgement.

### FINAL JUDGEMENT :

The "as received" sample;

- - fulfill the test requirements of the regulation mentioned on page 3.
- - fulfill the test requirements of the regulation mentioned on page 3, but with certain qualifications.
- - doesn't fulfill the test regulation mentioned on page 3.

Begin of testing : August 25, 2003

End of testing : October 5, 2003

- JAPAN QUALITY ASSURANCE ORGANIZATION -

Approved by :

Issued by :



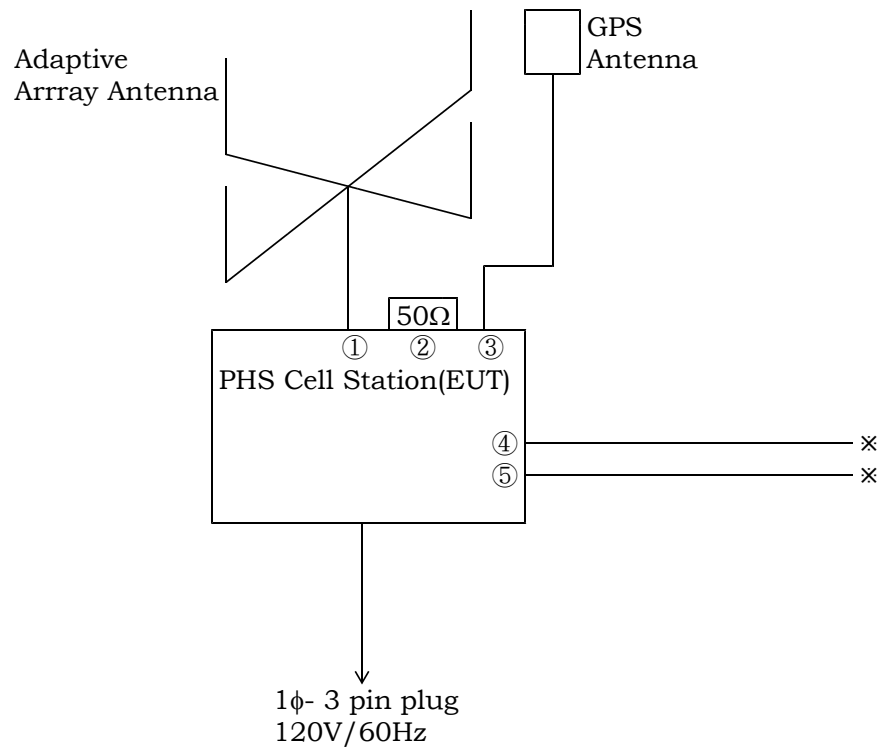
Akio Hosoda  
Manager  
EMC Div.  
JQA KITA-KANSAI Testing Center

Shigeru Kinoshita  
Deputy Manager  
EMC Div.  
JQA KITA-KANSAI Testing Center

### Test System-Arrangement (Drawings)

#### 1) FCC Part 24

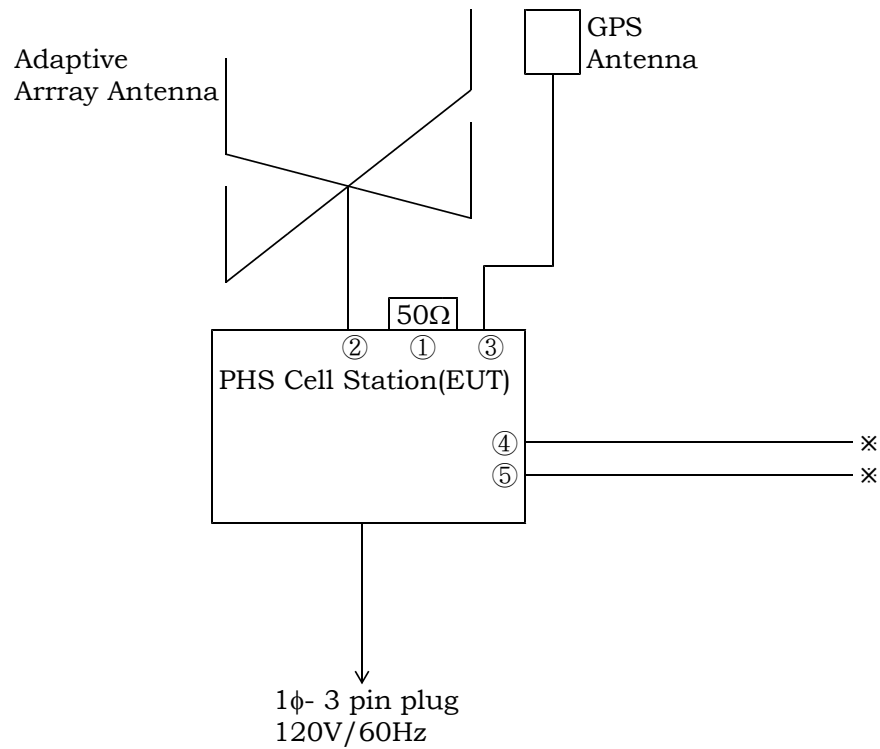
##### A) Transmission Antenna System: ANT1-ANT4



#### Note:

- ※ : No termination
- ① : ANT1/ANT2/ANT3/ANT4
- ② : ANT5/ANT6/ANT7/ANT8
- ③ : GPS
- ④ : NT1
- ⑤ : COMM

B) Transmission Antenna System: ANT5-ANT8

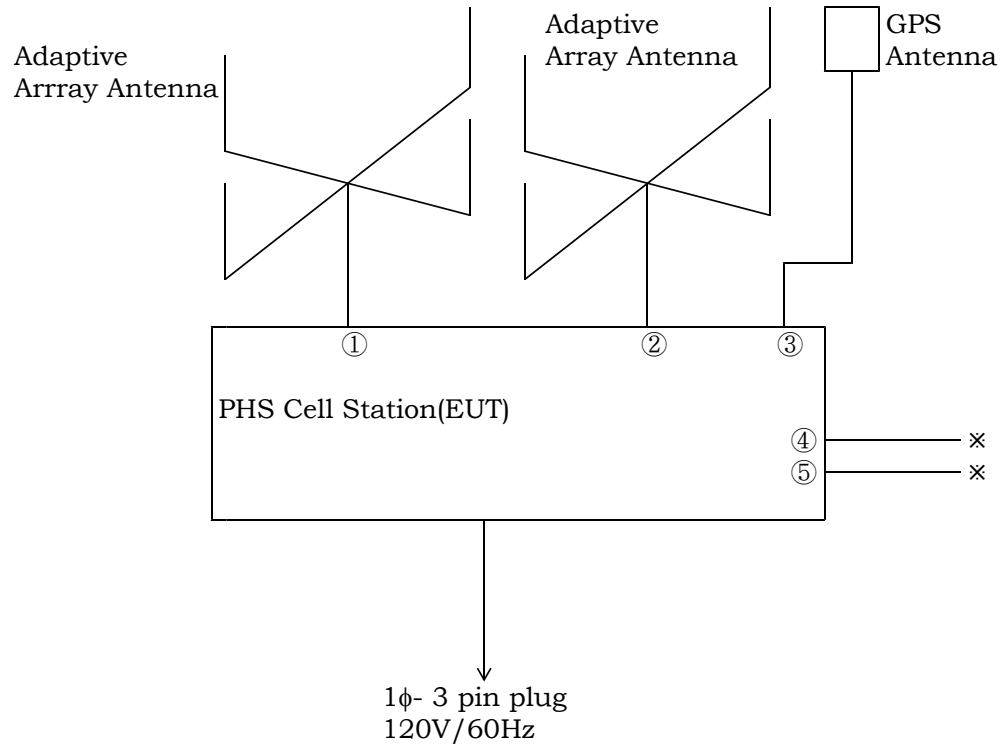


Note:

- ※ : No temination
- ① : ANT1/ANT2/ANT3/ANT4
- ② : ANT5/ANT6/ANT7/ANT8
- ③ : GPS
- ④ : NT1
- ⑤ : COMM

**Test System-Arrangement (Drawings)**

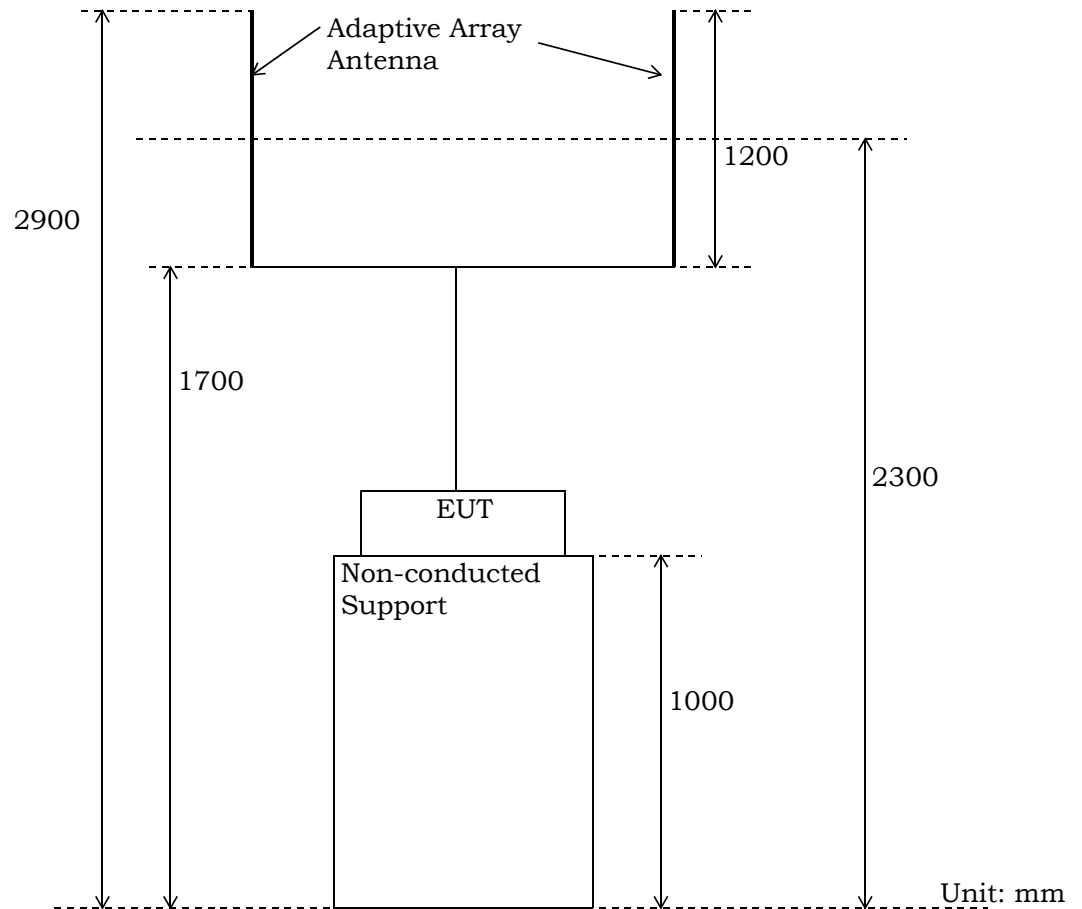
**2) Digital Device Class B,FCC Part 15**



Note:

- ※ : No temination
- ① : ANT1/ANT2/ANT3/ANT4
- ② : ANT5/ANT6/ANT7/ANT8
- ③ : GPS
- ④ : NT1
- ⑤ : COMM

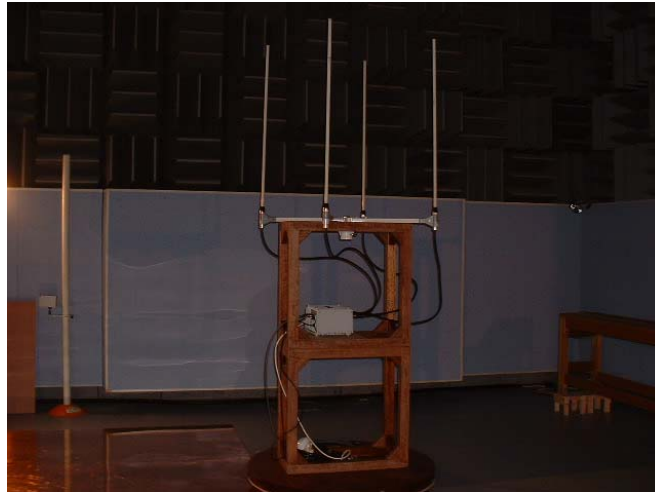
**Details of Test-Arrangement on Radiated emission test (Drawings)**



### Test-Setup (Photographs) at worst case

#### 1) Part 24

Radiated Emission 1GHz - 20GHz:



Side View(Transmitter Antenna System: ANT1-ANT4)



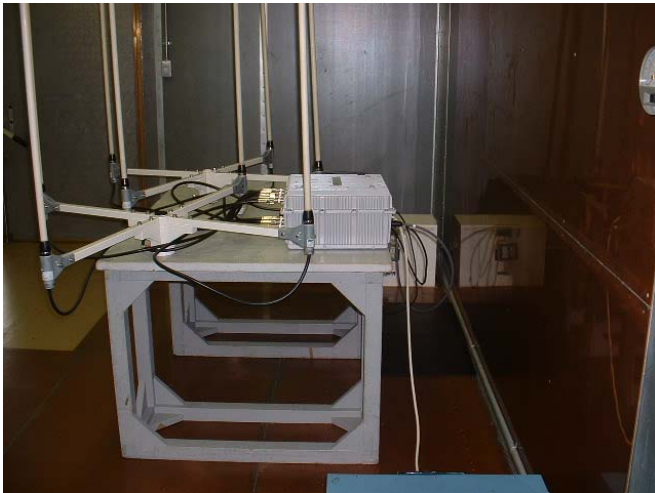
Side View(Transmitter Antenna System: ANT5-ANT8)

## 2) Digital Device Class B,FCC Part 15

Conducted Emission 150kHz - 30MHz:



Front View

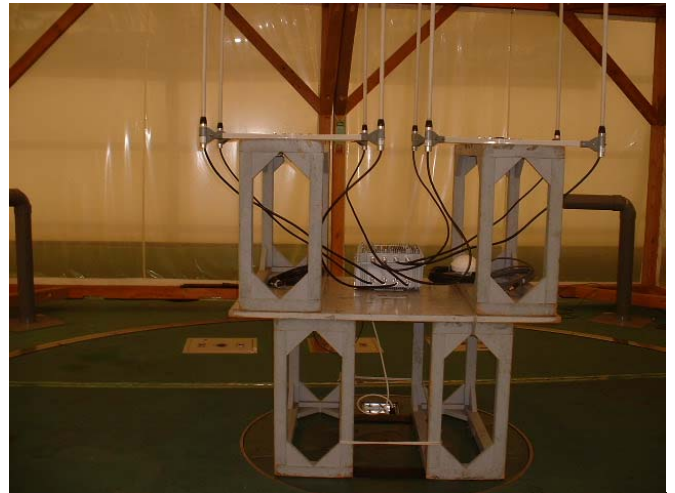


Side View

Radiated Emission 1GHz - 20GHz:



Front View



Rear View

## Transmitter Power(TP) Measurement

Test Date: September 18, 2003

Temp.: 24 °C ; Humi.: 60 %

| <b>1)Antenna Terminal :</b> |           | <b>ANT1</b>       |                    |              |      |        |        |
|-----------------------------|-----------|-------------------|--------------------|--------------|------|--------|--------|
| CH                          | Frequency | Correction Factor | Meter Reading Peak | Results Peak |      | Limits | Margin |
|                             | [MHz]     | [dB]              | [dBm]              | [dBm]        | [W]  | [W]    | [dB]   |
| 206                         | 1880.150  | 30.12             | 0.50               | 30.62        | 1.15 | 100.0  | +19.4  |
| 255                         | 1894.850  | 30.14             | 0.50               | 30.64        | 1.16 | 100.0  | +19.4  |
| 49                          | 1909.550  | 30.16             | 0.50               | 30.66        | 1.16 | 100.0  | +19.4  |
| <b>2)Antenna Terminal :</b> |           | <b>ANT2</b>       |                    |              |      |        |        |
| CH                          | Frequency | Correction Factor | Meter Reading Peak | Results Peak |      | Limits | Margin |
|                             | [MHz]     | [dB]              | [dBm]              | [dBm]        | [W]  | [W]    | [dB]   |
| 206                         | 1880.150  | 30.12             | 0.60               | 30.72        | 1.18 | 100.0  | +19.3  |
| 255                         | 1894.850  | 30.14             | 0.50               | 30.64        | 1.16 | 100.0  | +19.4  |
| 49                          | 1909.550  | 30.16             | 0.50               | 30.66        | 1.16 | 100.0  | +19.4  |
| <b>3)Antenna Terminal :</b> |           | <b>ANT3</b>       |                    |              |      |        |        |
| CH                          | Frequency | Correction Factor | Meter Reading Peak | Results Peak |      | Limits | Margin |
|                             | [MHz]     | [dB]              | [dBm]              | [dBm]        | [W]  | [W]    | [dB]   |
| 206                         | 1880.150  | 30.12             | 0.70               | 30.82        | 1.21 | 100.0  | +19.2  |
| 255                         | 1894.850  | 30.14             | 0.90               | 31.04        | 1.27 | 100.0  | +19.0  |
| 49                          | 1909.550  | 30.16             | 0.70               | 30.86        | 1.22 | 100.0  | +19.1  |
| <b>4)Antenna Terminal :</b> |           | <b>ANT4</b>       |                    |              |      |        |        |
| CH                          | Frequency | Correction Factor | Meter Reading Peak | Results Peak |      | Limits | Margin |
|                             | [MHz]     | [dB]              | [dBm]              | [dBm]        | [W]  | [W]    | [dB]   |
| 206                         | 1880.150  | 30.12             | 0.70               | 30.82        | 1.21 | 100.0  | +19.2  |
| 255                         | 1894.850  | 30.14             | 0.90               | 31.04        | 1.27 | 100.0  | +19.0  |
| 49                          | 1909.550  | 30.16             | 0.40               | 30.56        | 1.14 | 100.0  | +19.4  |

| 5)Antenna Terminal : |           | ANT5              |                    |              |      |        |        |
|----------------------|-----------|-------------------|--------------------|--------------|------|--------|--------|
| CH                   | Frequency | Correction Factor | Meter Reading Peak | Results Peak |      | Limits | Margin |
|                      | [MHz]     | [dB]              | [dBm]              | [dBm]        | [W]  | [W]    | [dB]   |
| 206                  | 1880.150  | 30.12             | 0.10               | 30.22        | 1.05 | 100.0  | +19.8  |
| 255                  | 1894.850  | 30.14             | 0.50               | 30.64        | 1.16 | 100.0  | +19.4  |
| 49                   | 1909.550  | 30.16             | 0.10               | 30.26        | 1.06 | 100.0  | +19.7  |

| 6)Antenna Terminal : |           | ANT6              |                    |              |      |        |        |
|----------------------|-----------|-------------------|--------------------|--------------|------|--------|--------|
| CH                   | Frequency | Correction Factor | Meter Reading Peak | Results Peak |      | Limits | Margin |
|                      | [MHz]     | [dB]              | [dBm]              | [dBm]        | [W]  | [W]    | [dB]   |
| 206                  | 1880.150  | 30.12             | 0.50               | 30.62        | 1.15 | 100.0  | +19.4  |
| 255                  | 1894.850  | 30.14             | 0.80               | 30.94        | 1.24 | 100.0  | +19.1  |
| 49                   | 1909.550  | 30.16             | 0.40               | 30.56        | 1.14 | 100.0  | +19.4  |

| 7)Antenna Terminal : |           | ANT7              |                    |              |      |        |        |
|----------------------|-----------|-------------------|--------------------|--------------|------|--------|--------|
| CH                   | Frequency | Correction Factor | Meter Reading Peak | Results Peak |      | Limits | Margin |
|                      | [MHz]     | [dB]              | [dBm]              | [dBm]        | [W]  | [W]    | [dB]   |
| 206                  | 1880.150  | 30.12             | 0.30               | 30.42        | 1.10 | 100.0  | +19.6  |
| 255                  | 1894.850  | 30.14             | 0.60               | 30.74        | 1.19 | 100.0  | +19.2  |
| 49                   | 1909.550  | 30.16             | 0.40               | 30.56        | 1.14 | 100.0  | +19.4  |

| 8)Antenna Terminal : |           | ANT8              |                    |              |      |        |        |
|----------------------|-----------|-------------------|--------------------|--------------|------|--------|--------|
| CH                   | Frequency | Correction Factor | Meter Reading Peak | Results Peak |      | Limits | Margin |
|                      | [MHz]     | [dB]              | [dBm]              | [dBm]        | [W]  | [W]    | [dB]   |
| 206                  | 1880.150  | 30.12             | 0.40               | 30.52        | 1.13 | 100.0  | +19.5  |
| 255                  | 1894.850  | 30.14             | 0.60               | 30.74        | 1.19 | 100.0  | +19.2  |
| 49                   | 1909.550  | 30.16             | 0.20               | 30.36        | 1.09 | 100.0  | +19.6  |

Sample of calculated result at 1894.850 MHz, as the Maximum Level Point:

Correction Factor = 30.14 dB

+ Meter Reading = 0.90 dBm

Result = 31.04 dBm :  $10^{(31.04/10)} = 1270 \text{ (mW)} = 1.27 \text{ (W)}$

Minimum Margin :  $10\text{Log}(100/1.27) = +19.0 \text{ (dB)}$

The point shown on "\_\_\_" is the Minimum Margin Point.

Note : 1. The correction factor includes the attenuator loss and the cable loss.

Tester : Shigeru Kinoshita

## Antenna Conducted Spurious Emission Measurement

Test Date: September 18, 2003

Temp.: 24 °C ; Humi.: 60 %

### Measurement Results:

#### 1) Antenna Terminal : ANT1

Transmitting Frequency :1880.150 MHz (206ch)

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3760.300           | 11.7                         | < -50.0                 | -13.0           | < -38.3 > +25.3  | A              | A                   |
| 5640.450           | 11.7                         | < -50.0                 | -13.0           | < -38.3 > +25.3  | A              | A                   |
| 7520.600           | -16.8                        | -45.9                   | -13.0           | -62.7 +49.7      | B              | B                   |
| 9400.750           | -16.7                        | -49.6                   | -13.0           | -66.3 +53.3      | B              | B                   |
| 11280.900          | -14.7                        | < -50.0                 | -13.0           | < -64.7 > +51.7  | B              | B                   |
| 13161.050          | -15.6                        | -43.6                   | -13.0           | -59.2 +46.2      | B              | B                   |
| 15041.200          | -16.1                        | -43.8                   | -13.0           | -59.9 +46.9      | B              | B                   |
| 16921.350          | -15.7                        | < -50.0                 | -13.0           | < -65.7 > +52.7  | B              | B                   |
| 18801.500          | 16.4                         | < -50.0                 | -13.0           | < -33.6 > +20.6  | C              | C                   |

Transmitting Frequency :1894.850 MHz (255ch)

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3789.700           | 11.8                         | < -50.0                 | -13.0           | < -38.2 > +25.2  | A              | A                   |
| 5684.550           | 11.6                         | -58.9                   | -13.0           | -47.3 +34.3      | A              | A                   |
| 7579.400           | -16.8                        | -44.2                   | -13.0           | -61.0 +48.0      | B              | B                   |
| 9474.250           | -16.7                        | < -50.0                 | -13.0           | < -66.7 > +53.7  | B              | B                   |
| 11369.100          | -15.4                        | < -50.0                 | -13.0           | < -65.4 > +52.4  | B              | B                   |
| 13263.950          | -15.7                        | < -50.0                 | -13.0           | < -65.7 > +52.7  | B              | B                   |
| 15158.800          | -16.1                        | -47.3                   | -13.0           | -63.4 +50.4      | B              | B                   |
| 17053.650          | -14.2                        | < -50.0                 | -13.0           | < -64.2 > +51.2  | B              | B                   |
| 18948.500          | 16.3                         | < -50.0                 | -13.0           | < -33.7 > +20.7  | C              | C                   |

Transmitting Frequency :1909.550 MHz (49ch)

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3819.100           | 11.8                         | -55.1                   | -13.0           | -43.3 +30.3      | A              | A                   |
| 5728.650           | 11.9                         | -60.1                   | -13.0           | -48.2 +35.2      | A              | A                   |
| 7638.200           | -16.8                        | -44.8                   | -13.0           | -61.6 +48.6      | B              | B                   |
| 9547.750           | -16.4                        | -53.2                   | -13.0           | -69.6 +56.6      | B              | B                   |
| 11457.300          | -15.7                        | < -50.0                 | -13.0           | < -65.7 > +52.7  | B              | B                   |
| 13366.850          | -15.4                        | < -50.0                 | -13.0           | < -65.4 > +52.4  | B              | B                   |
| 15276.400          | -15.8                        | < -50.0                 | -13.0           | < -65.8 > +52.8  | B              | B                   |
| 17185.950          | -14.7                        | < -50.0                 | -13.0           | < -64.7 > +51.7  | B              | B                   |
| 19095.500          | 15.9                         | < -50.0                 | -13.0           | < -34.1 > +21.1  | C              | C                   |

**2) Antenna Terminal : ANT2**

**Transmitting Frequency :1880.150 MHz (206ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3760.300           | 11.7                         | < -50.0                 | -13.0           | < -38.3          | > +25.3        | A                   |
| 5640.450           | 11.7                         | < -50.0                 | -13.0           | < -38.3          | > +25.3        | A                   |
| 7520.600           | -16.8                        | -47.3                   | -13.0           | -64.1            | +51.1          | B                   |
| 9400.750           | -16.7                        | -48.2                   | -13.0           | -64.9            | +51.9          | B                   |
| 11280.900          | -14.7                        | < -50.0                 | -13.0           | < -64.7          | > +51.7        | B                   |
| 13161.050          | -15.6                        | < -50.0                 | -13.0           | < -65.6          | > +52.6        | B                   |
| 15041.200          | -16.1                        | -46.1                   | -13.0           | -62.2            | +49.2          | B                   |
| 16921.350          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 18801.500          | 16.4                         | < -50.0                 | -13.0           | < -33.6          | > +20.6        | C                   |

**Transmitting Frequency :1894.850 MHz (255ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3789.700           | 11.8                         | < -50.0                 | -13.0           | < -38.2          | > +25.2        | A                   |
| 5684.550           | 11.6                         | < -50.0                 | -13.0           | < -38.4          | > +25.4        | A                   |
| 7579.400           | -16.8                        | -46.0                   | -13.0           | -62.8            | +49.8          | B                   |
| 9474.250           | -16.7                        | < -50.0                 | -13.0           | < -66.7          | > +53.7        | B                   |
| 11369.100          | -15.4                        | < -50.0                 | -13.0           | < -65.4          | > +52.4        | B                   |
| 13263.950          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 15158.800          | -16.1                        | < -50.0                 | -13.0           | < -66.1          | > +53.1        | B                   |
| 17053.650          | -14.2                        | < -50.0                 | -13.0           | < -64.2          | > +51.2        | B                   |
| 18948.500          | 16.3                         | < -50.0                 | -13.0           | < -33.7          | > +20.7        | C                   |

**Transmitting Frequency :1909.550 MHz (49ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3819.100           | 11.8                         | < -50.0                 | -13.0           | < -38.2          | > +25.2        | A                   |
| 5728.650           | 11.9                         | < -50.0                 | -13.0           | < -38.1          | > +25.1        | A                   |
| 7638.200           | -16.8                        | -47.9                   | -13.0           | -64.7            | +51.7          | B                   |
| 9547.750           | -16.4                        | -56.9                   | -13.0           | -73.3            | +60.3          | B                   |
| 11457.300          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 13366.850          | -15.4                        | < -50.0                 | -13.0           | < -65.4          | > +52.4        | B                   |
| 15276.400          | -15.8                        | < -50.0                 | -13.0           | < -65.8          | > +52.8        | B                   |
| 17185.950          | -14.7                        | < -50.0                 | -13.0           | < -64.7          | > +51.7        | B                   |
| 19095.500          | 15.9                         | < -50.0                 | -13.0           | < -34.1          | > +21.1        | C                   |

**3) Antenna Terminal : ANT3**

**Transmitting Frequency :1880.150 MHz (206ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3760.300           | 11.7                         | < -50.0                 | -13.0           | < -38.3          | > +25.3        | A                   |
| 5640.450           | 11.7                         | < -50.0                 | -13.0           | < -38.3          | > +25.3        | A                   |
| 7520.600           | -16.8                        | -46.0                   | -13.0           | -62.8            | +49.8          | B                   |
| 9400.750           | -16.7                        | -46.3                   | -13.0           | -63.0            | +50.0          | B                   |
| 11280.900          | -14.7                        | < -50.0                 | -13.0           | < -64.7          | > +51.7        | B                   |
| 13161.050          | -15.6                        | < -50.0                 | -13.0           | < -65.6          | > +52.6        | B                   |
| 15041.200          | -16.1                        | -42.7                   | -13.0           | -58.8            | +45.8          | B                   |
| 16921.350          | -15.7                        | < -57.2                 | -13.0           | < -72.9          | > +59.9        | B                   |
| 18801.500          | 16.4                         | < -50.0                 | -13.0           | < -33.6          | > +20.6        | C                   |

**Transmitting Frequency :1894.850 MHz (255ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3789.700           | 11.8                         | < -50.0                 | -13.0           | < -38.2          | > +25.2        | A                   |
| 5684.550           | 11.6                         | < -50.0                 | -13.0           | < -38.4          | > +25.4        | A                   |
| 7579.400           | -16.8                        | -44.9                   | -13.0           | -61.7            | +48.7          | B                   |
| 9474.250           | -16.7                        | -49.1                   | -13.0           | -65.8            | +52.8          | B                   |
| 11369.100          | -15.4                        | < -50.0                 | -13.0           | < -65.4          | > +52.4        | B                   |
| 13263.950          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 15158.800          | -16.1                        | -47.8                   | -13.0           | -63.9            | +50.9          | B                   |
| 17053.650          | -14.2                        | < -50.0                 | -13.0           | < -64.2          | > +51.2        | B                   |
| 18948.500          | 16.3                         | < -50.0                 | -13.0           | < -33.7          | > +20.7        | C                   |

**Transmitting Frequency :1909.550 MHz (49ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3819.100           | 11.8                         | < -50.0                 | -13.0           | < -38.2          | > +25.2        | A                   |
| 5728.650           | 11.9                         | < -50.0                 | -13.0           | < -38.1          | > +25.1        | A                   |
| 7638.200           | -16.8                        | -45.3                   | -13.0           | -62.1            | +49.1          | B                   |
| 9547.750           | -16.4                        | < -50.0                 | -13.0           | < -66.4          | > +53.4        | B                   |
| 11457.300          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 13366.850          | -15.4                        | < -50.0                 | -13.0           | < -65.4          | > +52.4        | B                   |
| 15276.400          | -15.8                        | -49.2                   | -13.0           | -65.0            | +52.0          | B                   |
| 17185.950          | -14.7                        | -49.2                   | -13.0           | -63.9            | +50.9          | B                   |
| 19095.500          | 15.9                         | < -50.0                 | -13.0           | < -34.1          | > +21.1        | C                   |

**4) Antenna Terminal : ANT4**

**Transmitting Frequency :1880.150 MHz (206ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3760.300           | 11.7                         | -37.3                   | -13.0           | -25.6            | +12.6          | A                   |
| 5640.450           | 11.7                         | < -50.0                 | -13.0           | < -38.3          | > +25.3        | A                   |
| 7520.600           | -16.8                        | -48.9                   | -13.0           | -65.7            | +52.7          | B                   |
| 9400.750           | -16.7                        | < -50.0                 | -13.0           | < -66.7          | > +53.7        | B                   |
| 11280.900          | -14.7                        | < -50.0                 | -13.0           | < -64.7          | > +51.7        | B                   |
| 13161.050          | -15.6                        | < -50.0                 | -13.0           | < -65.6          | > +52.6        | B                   |
| 15041.200          | -16.1                        | -45.1                   | -13.0           | -61.2            | +48.2          | B                   |
| 16921.350          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 18801.500          | 16.4                         | < -50.0                 | -13.0           | < -33.6          | > +20.6        | C                   |

**Transmitting Frequency :1894.850 MHz (255ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3789.700           | 11.8                         | -39.6                   | -13.0           | -27.8            | +14.8          | A                   |
| 5684.550           | 11.6                         | < -50.0                 | -13.0           | < -38.4          | > +25.4        | A                   |
| 7579.400           | -16.8                        | -48.1                   | -13.0           | -64.9            | +51.9          | B                   |
| 9474.250           | -16.7                        | < -50.0                 | -13.0           | < -66.7          | > +53.7        | B                   |
| 11369.100          | -15.4                        | < -50.0                 | -13.0           | < -65.4          | > +52.4        | B                   |
| 13263.950          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 15158.800          | -16.1                        | -49.6                   | -13.0           | -65.7            | +52.7          | B                   |
| 17053.650          | -14.2                        | < -50.0                 | -13.0           | < -64.2          | > +51.2        | B                   |
| 18948.500          | 16.3                         | < -50.0                 | -13.0           | < -33.7          | > +20.7        | C                   |

**Transmitting Frequency :1909.550 MHz (49ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| BBB                | 11.8                         | -43.7                   | -13.0           | -31.9            | +18.9          | A                   |
| 5728.650           | 11.9                         | < -50.0                 | -13.0           | < -38.1          | > +25.1        | A                   |
| 7638.200           | -16.8                        | -48.4                   | -13.0           | -65.2            | +52.2          | B                   |
| 9547.750           | -16.4                        | < -50.0                 | -13.0           | < -66.4          | > +53.4        | B                   |
| 11457.300          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 13366.850          | -15.4                        | < -50.0                 | -13.0           | < -65.4          | > +52.4        | B                   |
| 15276.400          | -15.8                        | < -50.0                 | -13.0           | < -65.8          | > +52.8        | B                   |
| 17185.950          | -14.7                        | < -50.0                 | -13.0           | < -64.7          | > +51.7        | B                   |
| 19095.500          | 15.9                         | < -50.0                 | -13.0           | < -34.1          | > +21.1        | C                   |

**5) Antenna Terminal : ANT5**

**Transmitting Frequency :1880.150 MHz (206ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3760.300           | 11.7                         | -39.8                   | -13.0           | -28.1            | +15.1          | A                   |
| 5640.450           | 11.7                         | < -50.0                 | -13.0           | < -38.3          | > +25.3        | A                   |
| 7520.600           | -16.8                        | -48.4                   | -13.0           | -65.2            | +52.2          | B                   |
| 9400.750           | -16.7                        | < -50.0                 | -13.0           | < -66.7          | > +53.7        | B                   |
| 11280.900          | -14.7                        | < -50.0                 | -13.0           | < -64.7          | > +51.7        | B                   |
| 13161.050          | -15.6                        | < -50.0                 | -13.0           | < -65.6          | > +52.6        | B                   |
| 15041.200          | -16.1                        | -43.8                   | -13.0           | -59.9            | +46.9          | B                   |
| 16921.350          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 18801.500          | 16.4                         | < -50.0                 | -13.0           | < -33.6          | > +20.6        | C                   |

**Transmitting Frequency :1894.850 MHz (255ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3789.700           | 11.8                         | -44.7                   | -13.0           | -32.9            | +19.9          | A                   |
| 5684.550           | 11.6                         | < -50.0                 | -13.0           | < -38.4          | > +25.4        | A                   |
| 7579.400           | -16.8                        | -46.4                   | -13.0           | -63.2            | +50.2          | B                   |
| 9474.250           | -16.7                        | < -50.0                 | -13.0           | < -66.7          | > +53.7        | B                   |
| 11369.100          | -15.4                        | < -50.0                 | -13.0           | < -65.4          | > +52.4        | B                   |
| 13263.950          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 15158.800          | -16.1                        | -45.5                   | -13.0           | -61.6            | +48.6          | B                   |
| 17053.650          | -14.2                        | < -50.0                 | -13.0           | < -64.2          | > +51.2        | B                   |
| 18948.500          | 16.3                         | < -50.0                 | -13.0           | < -33.7          | > +20.7        | C                   |

**Transmitting Frequency :1909.550 MHz (49ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3819.100           | 11.8                         | -44.4                   | -13.0           | -32.6            | +19.6          | A                   |
| 5728.650           | 11.9                         | < -50.0                 | -13.0           | < -38.1          | > +25.1        | A                   |
| 7638.200           | -16.8                        | -47.5                   | -13.0           | -64.3            | +51.3          | B                   |
| 9547.750           | -16.4                        | < -50.0                 | -13.0           | < -66.4          | > +53.4        | B                   |
| 11457.300          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 13366.850          | -15.4                        | < -50.0                 | -13.0           | < -65.4          | > +52.4        | B                   |
| 15276.400          | -15.8                        | < -50.0                 | -13.0           | < -65.8          | > +52.8        | B                   |
| 17185.950          | -14.7                        | < -50.0                 | -13.0           | < -64.7          | > +51.7        | B                   |
| 19095.500          | 15.9                         | < -50.0                 | -13.0           | < -34.1          | > +21.1        | C                   |

**6) Antenna Terminal : ANT6**

**Transmitting Frequency :1880.150 MHz (206ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3760.300           | 11.7                         | -42.8                   | -13.0           | -31.1            | +18.1          | A                   |
| 5640.450           | 11.7                         | < -50.0                 | -13.0           | < -38.3          | > +25.3        | A                   |
| 7520.600           | -16.8                        | -49.1                   | -13.0           | -65.9            | +52.9          | B                   |
| 9400.750           | -16.7                        | < -50.0                 | -13.0           | < -66.7          | > +53.7        | B                   |
| 11280.900          | -14.7                        | < -50.0                 | -13.0           | < -64.7          | > +51.7        | B                   |
| 13161.050          | -15.6                        | < -50.0                 | -13.0           | < -65.6          | > +52.6        | B                   |
| 15041.200          | -16.1                        | -44.4                   | -13.0           | -60.5            | +47.5          | B                   |
| 16921.350          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 18801.500          | 16.4                         | < -50.0                 | -13.0           | < -33.6          | > +20.6        | C                   |

**Transmitting Frequency :1894.850 MHz (255ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3789.700           | 11.8                         | -42.7                   | -13.0           | -30.9            | +17.9          | A                   |
| 5684.550           | 11.6                         | < -50.0                 | -13.0           | < -38.4          | > +25.4        | A                   |
| 7579.400           | -16.8                        | -48.5                   | -13.0           | -65.3            | +52.3          | B                   |
| 9474.250           | -16.7                        | < -50.0                 | -13.0           | < -66.7          | > +53.7        | B                   |
| 11369.100          | -15.4                        | < -50.0                 | -13.0           | < -65.4          | > +52.4        | B                   |
| 13263.950          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 15158.800          | -16.1                        | -48.4                   | -13.0           | -64.5            | +51.5          | B                   |
| 17053.650          | -14.2                        | < -50.0                 | -13.0           | < -64.2          | > +51.2        | B                   |
| 18948.500          | 16.3                         | < -50.0                 | -13.0           | < -33.7          | > +20.7        | C                   |

**Transmitting Frequency :1909.550 MHz (49ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3819.100           | 11.8                         | -45.8                   | -13.0           | -34.0            | +21.0          | A                   |
| 5728.650           | 11.9                         | < -50.0                 | -13.0           | < -38.1          | > +25.1        | A                   |
| 7638.200           | -16.8                        | -48.3                   | -13.0           | -65.1            | +52.1          | B                   |
| 9547.750           | -16.4                        | < -50.0                 | -13.0           | < -66.4          | > +53.4        | B                   |
| 11457.300          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 13366.850          | -15.4                        | < -50.0                 | -13.0           | < -65.4          | > +52.4        | B                   |
| 15276.400          | -15.8                        | -49.6                   | -13.0           | -65.4            | +52.4          | B                   |
| 17185.950          | -14.7                        | < -50.0                 | -13.0           | < -64.7          | > +51.7        | B                   |
| 19095.500          | 15.9                         | < -50.0                 | -13.0           | < -34.1          | > +21.1        | C                   |

**7) Antenna Terminal : ANT7**

**Transmitting Frequency :1880.150 MHz (206ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3760.300           | 11.7                         | -41.4                   | -13.0           | -29.7            | +16.7          | A                   |
| 5640.450           | 11.7                         | < -50.0                 | -13.0           | < -38.3          | > +25.3        | A                   |
| 7520.600           | -16.8                        | -45.0                   | -13.0           | -61.8            | +48.8          | B                   |
| 9400.750           | -16.7                        | < -50.0                 | -13.0           | < -66.7          | > +53.7        | B                   |
| 11280.900          | -14.7                        | < -50.0                 | -13.0           | < -64.7          | > +51.7        | B                   |
| 13161.050          | -15.6                        | < -50.0                 | -13.0           | < -65.6          | > +52.6        | B                   |
| 15041.200          | -16.1                        | -46.2                   | -13.0           | -62.3            | +49.3          | B                   |
| 16921.350          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 18801.500          | 16.4                         | < -50.0                 | -13.0           | < -33.6          | > +20.6        | C                   |

**Transmitting Frequency :1894.850 MHz (255ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3789.700           | 11.8                         | -43.3                   | -13.0           | -31.5            | +18.5          | A                   |
| 5684.550           | 11.6                         | < -50.0                 | -13.0           | < -38.4          | > +25.4        | A                   |
| 7579.400           | -16.8                        | -44.7                   | -13.0           | -61.5            | +48.5          | B                   |
| 9474.250           | -16.7                        | < -50.0                 | -13.0           | < -66.7          | > +53.7        | B                   |
| 11369.100          | -15.4                        | < -50.0                 | -13.0           | < -65.4          | > +52.4        | B                   |
| 13263.950          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 15158.800          | -16.1                        | < -50.0                 | -13.0           | < -66.1          | > +53.1        | B                   |
| 17053.650          | -14.2                        | < -50.0                 | -13.0           | < -64.2          | > +51.2        | B                   |
| 18948.500          | 16.3                         | < -50.0                 | -13.0           | < -33.7          | > +20.7        | C                   |

**Transmitting Frequency :1909.550 MHz (49ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3819.100           | 11.8                         | -47.0                   | -13.0           | -35.2            | +22.2          | A                   |
| 5728.650           | 11.9                         | < -50.0                 | -13.0           | < -38.1          | > +25.1        | A                   |
| 7638.200           | -16.8                        | -45.2                   | -13.0           | -62.0            | +49.0          | B                   |
| 9547.750           | -16.4                        | < -50.0                 | -13.0           | < -66.4          | > +53.4        | B                   |
| 11457.300          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 13366.850          | -15.4                        | < -50.0                 | -13.0           | < -65.4          | > +52.4        | B                   |
| 15276.400          | -15.8                        | < -50.0                 | -13.0           | < -65.8          | > +52.8        | B                   |
| 17185.950          | -14.7                        | < -50.0                 | -13.0           | < -64.7          | > +51.7        | B                   |
| 19095.500          | 15.9                         | < -50.0                 | -13.0           | < -34.1          | > +21.1        | C                   |

**8) Antenna Terminal : ANT8**

**Transmitting Frequency :1880.150 MHz (206ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3760.300           | 11.7                         | -41.2                   | -13.0           | -29.5            | +16.5          | A                   |
| 5640.450           | 11.7                         | < -50.0                 | -13.0           | < -38.3          | > +25.3        | A                   |
| 7520.600           | -16.8                        | -47.4                   | -13.0           | -64.2            | +51.2          | B                   |
| 9400.750           | -16.7                        | < -50.0                 | -13.0           | < -66.7          | > +53.7        | B                   |
| 11280.900          | -14.7                        | < -50.0                 | -13.0           | < -64.7          | > +51.7        | B                   |
| 13161.050          | -15.6                        | < -50.0                 | -13.0           | < -65.6          | > +52.6        | B                   |
| 15041.200          | -16.1                        | -41.6                   | -13.0           | -57.7            | +44.7          | B                   |
| 16921.350          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 18801.500          | 16.4                         | < -50.0                 | -13.0           | < -33.6          | > +20.6        | C                   |

**Transmitting Frequency :1894.850 MHz (255ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3789.700           | 11.8                         | -42.6                   | -13.0           | -30.8            | +17.8          | A                   |
| 5684.550           | 11.6                         | < -50.0                 | -13.0           | < -38.4          | > +25.4        | A                   |
| 7579.400           | -16.8                        | -47.7                   | -13.0           | -64.5            | +51.5          | B                   |
| 9474.250           | -16.7                        | < -50.0                 | -13.0           | < -66.7          | > +53.7        | B                   |
| 11369.100          | -15.4                        | < -50.0                 | -13.0           | < -65.4          | > +52.4        | B                   |
| 13263.950          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 15158.800          | -16.1                        | -46.2                   | -13.0           | -62.3            | +49.3          | B                   |
| 17053.650          | -14.2                        | < -50.0                 | -13.0           | < -64.2          | > +51.2        | B                   |
| 18948.500          | 16.3                         | < -50.0                 | -13.0           | < -33.7          | > +20.7        | C                   |

**Transmitting Frequency :1909.550 MHz (49ch)**

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings<br>(dBm) | Limits<br>(dBm) | Results<br>(dBm) | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|-----------------|------------------|----------------|---------------------|
| 3819.100           | 11.8                         | -46.0                   | -13.0           | -34.2            | +21.2          | A                   |
| 5728.650           | 11.9                         | < -50.0                 | -13.0           | < -38.1          | > +25.1        | A                   |
| 7638.200           | -16.8                        | -46.5                   | -13.0           | -63.3            | +50.3          | B                   |
| 9547.750           | -16.4                        | < -50.0                 | -13.0           | < -66.4          | > +53.4        | B                   |
| 11457.300          | -15.7                        | < -50.0                 | -13.0           | < -65.7          | > +52.7        | B                   |
| 13366.850          | -15.4                        | < -50.0                 | -13.0           | < -65.4          | > +52.4        | B                   |
| 15276.400          | -15.8                        | -49.1                   | -13.0           | -64.9            | +51.9          | B                   |
| 17185.950          | -14.7                        | < -50.0                 | -13.0           | < -64.7          | > +51.7        | B                   |
| 19095.500          | 15.9                         | < -50.0                 | -13.0           | < -34.1          | > +21.1        | C                   |

Sample of calculated result at 18801.500 MHz, as the Minimum Margin point:

$$\begin{array}{rcl} \text{Correction Factor} & = & 16.4 \text{ dB} \\ +) \text{ Meter Reading} & = & <-50.0 \text{ dBm} \\ \hline \text{Result} & = & <-33.6 \text{ dBm} \end{array}$$

Minimum Margin :  $-13.0 - (<-33.6) = >20.6(\text{dB})$

The point shown on "\_\_\_" is the Minimum Margin Point.

Applied limits :

$$\begin{aligned} \text{Applied limits} &= 10\log[\text{TP}(\text{mW})] - [43 + 10\log[\text{tp}(\text{W})]] = 10\log[\text{TP}(\text{mW})] - [43 + (10\log[\text{TP}(\text{mW})] - 30)] \\ &= -13 \text{ [dBm]} \end{aligned}$$

Where  $\text{tp}(\text{W}) = \text{TP}(\text{mW}) / 1000$  : Transmitter Power at antenna terminal

$$10\log[\text{tp}(\text{W})] = 10\log[\text{TP}(\text{mW})] - 30$$

Note : 1. The spectrum was checked from 9 kHz up to 20 GHz.

2. All emissions not listed were found to be more than 20dB below the limit.

**Remarks:**

| Note 3 | Detector Function | RES. B.W | V.B.W | Sweep T | Span | Corr. Factor *                                      |
|--------|-------------------|----------|-------|---------|------|-----------------------------------------------------|
| A      | Peak (SP)         | 1 MHz    | 3 MHz | 20 msec | 0 Hz | CL+P10(D-40)<br>+HPF(D-42)                          |
| B      | Peak (SP)         | 1 MHz    | 3 MHz | 20 msec | 0 Hz | CL+P10(D-73)-Amp.(A-3<br>3)+P10(D-74)<br>+HPF(D-42) |
| C      | Peak (SP)         | 1 MHz    | 3 MHz | 20 msec | 0 Hz | CL+P10(D-73)-Amp.(A-3<br>3)+Mix.                    |

\*)CL: Cable Loss / P10: 10dB Att. / HPF: High Pass Filter Loss/ Amp.: Amplifier Gain/ Mix.: Mixer Conversion Loss

Tester : Shigeru Kinoshita

## Transmitter Power(EIRP) Measurement

Test Date: September 6, 2003  
Temp.: 25 °C ; Humi.: 58 %

### Measurement Results:

#### A)Transmission Antenna System : ANT1-ANT4

##### 1)Emission Measurement in Fig.3(a)

| CH  | Frequency<br>[MHz] | Meter Reading<br>[dBuV] |                |
|-----|--------------------|-------------------------|----------------|
|     |                    | Horizontal<br>Mh        | Vertical<br>Mv |
| 206 | 1880.150           | 96.93                   | 124.55         |
| 255 | 1894.850           | 97.55                   | 125.53         |
| 49  | 1909.550           | 97.33                   | 125.06         |

##### 2)Substitution Measurement in Fig.3(b)

| CH  | Frequency<br>[MHz] | Meter Reading<br>[dBuV] |                 | Supplied Power to<br>Substitution Antenna<br>[dBm]<br>Ps | Gain of<br>Substitution Antenna<br>[dBi]<br>Gs |
|-----|--------------------|-------------------------|-----------------|----------------------------------------------------------|------------------------------------------------|
|     |                    | Horizontal<br>Msh       | Vertical<br>Msv |                                                          |                                                |
| 206 | 1880.150           | 85.40                   | 85.45           | -2.08                                                    | 14.22                                          |
| 255 | 1894.850           | 85.55                   | 85.45           | -2.02                                                    | 14.28                                          |
| 49  | 1909.550           | 85.85                   | 85.95           | -1.95                                                    | 14.36                                          |

##### 3)Calculated Result

| CH  | Frequency<br>[MHz] | Peak EIRP [dBm]     |                   | Maximum<br>Peak EIRP<br>[W] | Limits<br>[W] | Margin<br>[dB] |
|-----|--------------------|---------------------|-------------------|-----------------------------|---------------|----------------|
|     |                    | Horizontal<br>EIRPh | Vertical<br>EIRPv |                             |               |                |
| 512 | 1880.150           | 23.67               | 51.24             | 133.05                      | 1640.0        | +10.9          |
| 661 | 1894.850           | 24.26               | 52.34             | 171.40                      | 1640.0        | + 9.8          |
| 49  | 1909.550           | 23.89               | 51.52             | 141.91                      | 1640.0        | +10.6          |

Sample of calculated result at 1894.850 MHz, as the Minimum Margin point:

|                                |   |                                                        |
|--------------------------------|---|--------------------------------------------------------|
| Meter Reading Mh in Fig.3(a)   | = | 125.53 dB(μV)                                          |
| Meter Reading -Msh in Fig.3(b) | = | -85.45 dB(μV)                                          |
| Supplied Power to Sub. Ant.    | = | -2.02 dB                                               |
| + Gain of Sub. Ant.            | = | 14.28 dB                                               |
| Result                         | = | 52.34 dBm                                              |
| Peak EIRP                      | = | 52.34 dBm : 10 <sup>(52.34-30) / 10</sup> = 171.40 (W) |

EIRPh = Mh - Msh + Ps + Gs

EIRPv = Mv - Msv + Ps + Gs

Minimum Margin : 10log(1640/171.40) = 9.8(dB)

The point shown on "\_\_\_" is the Minimum Margin Point.

#### Remarks:

| Note 3 | Detector Function | RES. B.W | V.B.W | Sweep T | Span |
|--------|-------------------|----------|-------|---------|------|
| A      | Peak (SP)         | 1 MHz    | 3MHz  | 20 msec | 0 Hz |

Tester : Akio Hosoda

## Transmitter Power(EIRP) Measurement

Test Date: September 6, 2003

Temp.: 25 °C ; Humi.: 58 %

### Measurement Results:

#### B)Transmission Antenna System : ANT5-ANT8

##### 1)Emission Measurement in Fig.3(a)

| CH  | Frequency | Meter Reading<br>[dBuV] |                |
|-----|-----------|-------------------------|----------------|
|     | [MHz]     | Horizontal<br>Mh        | Vertical<br>Mv |
| 206 | 1880.150  | 97.42                   | 124.41         |
| 255 | 1894.850  | 96.32                   | 125.09         |
| 49  | 1909.550  | 96.00                   | 124.67         |

##### 2)Substitution Measurement in Fig.3(b)

| CH  | Frequency | Meter Reading<br>[dBuV] |                 | Supplied Power to<br>Substitution Antenna<br>[dBm] | Gain of<br>Substitution Antenna<br>[dBi] |
|-----|-----------|-------------------------|-----------------|----------------------------------------------------|------------------------------------------|
|     | [MHz]     | Horizontal<br>Msh       | Vertical<br>Msv | Ps                                                 | Gs                                       |
| 206 | 1880.150  | 85.40                   | 85.45           | -2.08                                              | 14.22                                    |
| 255 | 1894.850  | 85.55                   | 85.45           | -2.02                                              | 14.28                                    |
| 49  | 1909.550  | 85.85                   | 85.95           | -1.95                                              | 14.36                                    |

##### 3)Calculated Result

| CH  | Frequency | Peak EIRP [dBm]     |                   | Maximum<br>Peak EIRP<br>[W] | Limits<br>[W] | Margin<br>[dB] |
|-----|-----------|---------------------|-------------------|-----------------------------|---------------|----------------|
|     | [MHz]     | Horizontal<br>EIRPh | Vertical<br>EIRPv |                             |               |                |
| 512 | 1880.150  | 24.16               | 51.10             | 128.82                      | 1640.0        | +11.0          |
| 661 | 1894.850  | 23.03               | 51.90             | 154.88                      | 1640.0        | +10.2          |
| 49  | 1909.550  | 22.56               | 51.13             | 129.72                      | 1640.0        | +11.0          |

Sample of calculated result at 1894.850 MHz, as the Minimum Margin point:

|                                |   |                                               |
|--------------------------------|---|-----------------------------------------------|
| Meter Reading Mh in Fig.3(a)   | = | 125.09 dB(μV)                                 |
| Meter Reading -Msh in Fig.3(b) | = | -85.45 dB(μV)                                 |
| Supplied Power to Sub. Ant.    | = | -2.02 dB                                      |
| + Gain of Sub. Ant.            | = | 14.28 dB                                      |
| Result                         | = | 51.90 dBm                                     |
| Peak EIRP                      | = | 51.90 dBm : $10^{(51.90-30)/10} = 154.88$ (W) |

EIRPh = Mh - Msh + Ps + Gs

EIRPv = Mv - Msv + Ps + Gs

Minimum Margin :  $10\log(1640/154.88) = 10.2$ (dB)

The point shown on "\_\_\_" is the Minimum Margin Point.

#### Remarks:

| Note 3 | Detector Function | RES. B.W | V.B.W | Sweep T | Span |
|--------|-------------------|----------|-------|---------|------|
| A      | Peak (SP)         | 1 MHz    | 3MHz  | 20 msec | 0 Hz |

Tester : Akio Hosoda

## Unwanted Radiation Measurement

Test Date: September 6, 2003

Temp.: 25 °C ; Humi.: 58 %

### Measurement Results:

#### A)Antenna Transmission System: ANT1-ANT4

Transmitting Frequency : 1880.150 MHz (206ch)

| Frequency<br>[MHz] | EIRP<br>[dBm] |         | Limits<br>[dBm] | Margin<br>[dB] | Remarks<br>(Note 3) |
|--------------------|---------------|---------|-----------------|----------------|---------------------|
|                    | Hori.         | Vert.   |                 |                |                     |
| 3760.300           | -34.6         | -31.6   | -13.0           | +18.6          | E                   |
| 5640.450           | -38.6         | -35.6   | -13.0           | +22.6          | B                   |
| 7520.600           | -37.3         | -37.3   | -13.0           | +24.3          | B                   |
| 9400.750           | < -52.6       | < -52.6 | -13.0           | > +39.6        | C                   |
| 11280.900          | < -52.1       | < -52.1 | -13.0           | > +39.1        | C                   |
| 13161.050          | < -46.2       | < -46.2 | -13.0           | > +33.2        | C                   |
| 15041.200          | < -46.2       | < -46.2 | -13.0           | > +33.2        | C                   |
| 16921.350          | < -48.2       | < -48.2 | -13.0           | > +35.2        | C                   |
| 18801.500          | < -43.6       | < -43.6 | -13.0           | > +30.6        | D                   |

#### A)Antenna Transmission System: ANT1-ANT4

Transmitting Frequency : 1894.850 MHz (255ch)

| Frequency<br>[MHz] | EIRP<br>[dBm] |         | Limits<br>[dBm] | Margin<br>[dB] | Remarks<br>(Note 3) |
|--------------------|---------------|---------|-----------------|----------------|---------------------|
|                    | Hori.         | Vert.   |                 |                |                     |
| 3789.700           | -33.7         | -30.7   | -13.0           | +17.7          | E                   |
| 5684.550           | -38.6         | -36.6   | -13.0           | +23.6          | B                   |
| 7579.400           | -37.8         | -37.8   | -13.0           | +24.8          | B                   |
| 9474.250           | < -52.5       | < -52.5 | -13.0           | > +39.5        | C                   |
| 11369.100          | < -52.1       | < -52.1 | -13.0           | > +39.1        | C                   |
| 13263.950          | < -46.0       | < -46.0 | -13.0           | > +33.0        | C                   |
| 15158.800          | < -46.7       | < -46.7 | -13.0           | > +33.7        | C                   |
| 17053.650          | < -47.9       | < -47.9 | -13.0           | > +34.9        | C                   |
| 18948.500          | < -43.6       | < -43.6 | -13.0           | > +30.6        | D                   |

**A)Antenna Transmission System: ANT1-ANT4**  
**Transmitting Frequency : 1909.55 MHz (49ch)**

| Frequency<br>[MHz] | EIRP<br>[dBm] |         | Limits<br>[dBm] | Margin<br>[dB] | Remarks<br>(Note 3) |
|--------------------|---------------|---------|-----------------|----------------|---------------------|
|                    | Hori.         | Vert.   |                 |                |                     |
| 3819.100           | -34.7         | -30.7   | -13.0           | +17.7          | E                   |
| 5728.650           | -38.7         | -36.7   | -13.0           | +23.7          | B                   |
| 7638.200           | -42.6         | -42.6   | -13.0           | +29.6          | B                   |
| 9547.750           | < -52.5       | < -52.5 | -13.0           | > +39.5        | C                   |
| 11457.300          | < -52.0       | < -52.0 | -13.0           | > +39.0        | C                   |
| 13366.850          | < -45.8       | < -45.8 | -13.0           | > +32.8        | C                   |
| 15276.400          | < -47.1       | < -47.1 | -13.0           | > +34.1        | C                   |
| 17185.950          | < -48.0       | < -48.0 | -13.0           | > +35.0        | C                   |
| 19095.500          | < -43.4       | < -43.4 | -13.0           | > +30.4        | D                   |

**B)Antenna Transmission System: ANT5-ANT8**

**Transmitting Frequency : 1880.150 MHz (206ch)**

| Frequency | EIRP<br>[dBm] |         | Limits | Margin  | Remarks  |
|-----------|---------------|---------|--------|---------|----------|
| [MHz]     | Hori.         | Vert.   | [dBm]  | [dB]    | (Note 3) |
| 3760.300  | -37.6         | -33.6   | -13.0  | +20.6   | E        |
| 5640.450  | -38.6         | -35.6   | -13.0  | +22.6   | B        |
| 7520.600  | -37.3         | -37.3   | -13.0  | +24.3   | B        |
| 9400.750  | < -52.6       | < -52.6 | -13.0  | > +39.6 | C        |
| 11280.900 | < -52.1       | < -52.1 | -13.0  | > +39.1 | C        |
| 13161.050 | < -46.2       | < -46.2 | -13.0  | > +33.2 | C        |
| 15041.200 | < -46.2       | < -46.2 | -13.0  | > +33.2 | C        |
| 16921.350 | < -48.2       | < -48.2 | -13.0  | > +35.2 | C        |
| 18801.500 | < -43.6       | < -43.6 | -13.0  | > +30.6 | D        |

**B)Antenna Transmission System: ANT5-ANT8**

**Transmitting Frequency : 1894.850 MHz (255ch)**

| Frequency | EIRP<br>[dBm] |         | Limits | Margin  | Remarks  |
|-----------|---------------|---------|--------|---------|----------|
| [MHz]     | Hori.         | Vert.   | [dBm]  | [dB]    | (Note 3) |
| 3789.700  | -31.7         | -33.7   | -13.0  | +18.7   | E        |
| 5684.550  | -38.6         | -38.6   | -13.0  | +25.6   | B        |
| 7579.400  | -37.8         | -37.8   | -13.0  | +24.8   | B        |
| 9474.250  | < -52.5       | < -52.5 | -13.0  | > +39.5 | C        |
| 11369.100 | < -52.1       | < -52.1 | -13.0  | > +39.1 | C        |
| 13263.950 | < -46.0       | < -46.0 | -13.0  | > +33.0 | C        |
| 15158.800 | < -46.7       | < -46.7 | -13.0  | > +33.7 | C        |
| 17053.650 | < -47.9       | < -47.9 | -13.0  | > +34.9 | C        |
| 18948.500 | < -43.6       | < -43.6 | -13.0  | > +30.6 | D        |

**B)Antenna Transmission System: ANT5-ANT8**

**Transmitting Frequency : 1909.55 MHz (49ch)**

| Frequency<br>[MHz] | EIRP<br>[dBm] |         | Limits<br>[dBm] | Margin<br>[dB] | Remarks<br>(Note 3) |
|--------------------|---------------|---------|-----------------|----------------|---------------------|
|                    | Hori.         | Vert.   |                 |                |                     |
| 3819.100           | -39.7         | -36.7   | -13.0           | +23.7          | E                   |
| 5728.650           | -38.7         | -38.7   | -13.0           | +25.7          | B                   |
| 7638.200           | -42.6         | -42.6   | -13.0           | +29.6          | B                   |
| 9547.750           | < -52.5       | < -52.5 | -13.0           | > +39.5        | C                   |
| 11457.300          | < -52.0       | < -52.0 | -13.0           | > +39.0        | C                   |
| 13366.850          | < -45.8       | < -45.8 | -13.0           | > +32.8        | C                   |
| 15276.400          | < -47.1       | < -47.1 | -13.0           | > +34.1        | C                   |
| 17185.950          | < -48.0       | < -48.0 | -13.0           | > +35.0        | C                   |
| 19095.500          | < -43.4       | < -43.4 | -13.0           | > +30.4        | D                   |

Sample of calculated result at 3789.700 MHz, as the Minimum Margin point:  
 Minimum Margin :  $-13.0 - (-30.7) = 17.7(\text{dB})$   
 The point shown on "\_\_\_" is the Minimum Margin Point.

**Applied limits :**

$$\text{Applied limits} = 10\log[\text{TP(mW)}] - [43 + 10\log[\text{tp(W)}]] = 10\log[\text{TP(mW)}] - [43 + (10\log[\text{TP(mW)}] - 30)]$$

$$= -13 [\text{dBm}]$$

Where  $\text{tp(W)} = \text{TP(mW)} / 1000$  : Transmitter Power at antenna terminal  
 $10\log[\text{tp(W)}] = 10\log[\text{TP(mW)}] - 30$

- Note : 1. The spectrum was checked from 9 kHz up to 20 GHz.  
 2. All emissions not listed were found to be more than 20dB below the limit.

**Remarks:**

| Note 3 | Detector Function | RES. B.W | V.B.W | Sweep T | Span | Corr. Factor *  |
|--------|-------------------|----------|-------|---------|------|-----------------|
| A      | Peak (SP)         | 1 MHz    | 3 MHz | 20 msec | 0 Hz | CL+P10          |
| B      | Peak (SP)         | 1 MHz    | 3 MHz | 20 msec | 0 Hz | CL+P20-Amp.     |
| C      | Peak (SP)         | 1 MHz    | 3 MHz | 20 msec | 0 Hz | CL+P10-Amp.     |
| D      | Peak (SP)         | 1 MHz    | 3 MHz | 20 msec | 0 Hz | P10-Amp.+Mix.   |
| E      | Peak (SP)         | 1 MHz    | 3 MHz | 20 msec | 0 Hz | CL+HPF+P20-Amp. |
| F      | Peak (ESV)        | 120 kHz  | --    | --      | --   | CL              |

\*)CL: Cable Loss/ P20: 20dB Att. / P10: 10dB Att. / Amp.: Amplifier Gain/ Mix.: Mixer Conversion Loss/  
 HPF : High Pass Filter loss

Tester : Akio Hosoda

## Occupied Bandwidth Measurement

Test Date: September 21, 2003

Temp.: 24 °C ; Humi.: 60 %

### 1)Ant teminal : ANT1

| CH<br>No. | Transmitting<br>Frequency(MHz) | 26dB<br>Bandwidth | Data<br>Page* |
|-----------|--------------------------------|-------------------|---------------|
| 206       | 1880.150                       | 282 kHz           | Page 3        |
| 255       | 1894.850                       | 282 kHz           | Page 4        |
| 49        | 1909.550                       | 282 kHz           | Page 5        |

### 2)Ant teminal : ANT2

| CH<br>No. | Transmitting<br>Frequency(MHz) | 26dB<br>Bandwidth | Data<br>Page* |
|-----------|--------------------------------|-------------------|---------------|
| 206       | 1880.150                       | 283 kHz           | Page 6        |
| 255       | 1894.850                       | 281 kHz           | Page 7        |
| 49        | 1909.550                       | 282 kHz           | Page 8        |

### 3)Ant teminal : ANT3

| CH<br>No. | Transmitting<br>Frequency(MHz) | 26dB<br>Bandwidth | Data<br>Page* |
|-----------|--------------------------------|-------------------|---------------|
| 206       | 1880.150                       | 282 kHz           | Page 9        |
| 255       | 1894.850                       | 281 kHz           | Page 10       |
| 49        | 1909.550                       | 282 kHz           | Page 11       |

### 4)Ant teminal : ANT4

| CH<br>No. | Transmitting<br>Frequency(MHz) | 26dB<br>Bandwidth | Data<br>Page* |
|-----------|--------------------------------|-------------------|---------------|
| 206       | 1880.150                       | 281 kHz           | Page 12       |
| 255       | 1894.850                       | 281 kHz           | Page 13       |
| 49        | 1909.550                       | 284 kHz           | Page 14       |

5)Ant teminal : ANT5

| CH<br>No. | Transmitting<br>Frequency(MHz) | 26dB<br>Bandwidth | Data<br>Page* |
|-----------|--------------------------------|-------------------|---------------|
| 206       | 1880.150                       | 283 kHz           | Page 15       |
| 255       | 1894.850                       | 282 kHz           | Page 16       |
| 49        | 1909.550                       | 281 kHz           | Page 17       |

6)Ant teminal : ANT6

| CH<br>No. | Transmitting<br>Frequency(MHz) | 26dB<br>Bandwidth | Data<br>Page* |
|-----------|--------------------------------|-------------------|---------------|
| 206       | 1880.150                       | 281 kHz           | Page 18       |
| 255       | 1894.850                       | 282 kHz           | Page 19       |
| 49        | 1909.550                       | 280 kHz           | Page 20       |

7)Ant teminal : ANT7

| CH<br>No. | Transmitting<br>Frequency(MHz) | 26dB<br>Bandwidth | Data<br>Page* |
|-----------|--------------------------------|-------------------|---------------|
| 206       | 1880.150                       | 283 kHz           | Page 21       |
| 255       | 1894.850                       | 281 kHz           | Page 22       |
| 49        | 1909.550                       | 281 kHz           | Page 23       |

8)Ant teminal : ANT8

| CH<br>No. | Transmitting<br>Frequency(MHz) | 26dB<br>Bandwidth | Data<br>Page* |
|-----------|--------------------------------|-------------------|---------------|
| 206       | 1880.150                       | 286 kHz           | Page 24       |
| 255       | 1894.850                       | 284 kHz           | Page 25       |
| 49        | 1909.550                       | 281 kHz           | Page 26       |

Note) 1. \*: The Data Page is one in Attachment A.

2. The point shown on " \_\_\_\_\_ " is the Maximum Margin Point.

Tester : Shigeru Kinoshita

## Band-Edge Emission Measurement

Test Date: September 21, 2003

Temp.: 24 °C ; Humi.: 60 %

### 1)Low Band-Edge Measurement

| Ant terinal | Transmitting<br>Frequency(MHz) | Band-Edge<br>Frequency(MHz) | Band-Edge<br>Level[dBc] | Data<br>Page* |
|-------------|--------------------------------|-----------------------------|-------------------------|---------------|
| ANT 1       | 1880.150                       | 1870.000                    | -81.1                   | Page 28       |
| ANT 2       | 1880.150                       | 1870.000                    | -82.3                   | Page 29       |
| ANT 3       | 1880.150                       | 1870.000                    | -80.5                   | Page 30       |
| ANT 4       | 1880.150                       | 1870.000                    | -80.9                   | Page 31       |
| ANT 5       | 1880.150                       | 1870.000                    | -83.6                   | Page 32       |
| ANT 6       | 1880.150                       | 1870.000                    | -82.6                   | Page 33       |
| ANT 7       | 1880.150                       | 1870.000                    | -82.4                   | Page 34       |
| ANT 8       | 1880.150                       | 1870.000                    | -81.3                   | Page 35       |

### 2)High Band-Edge Measurement

| Ant terinal | Transmitting<br>Frequency(MHz) | Band-Edge<br>Frequency(MHz) | Band-Edge<br>Level[dBc] | Data<br>Page* |
|-------------|--------------------------------|-----------------------------|-------------------------|---------------|
| ANT 1       | 1909.850                       | 1910.000                    | -67.9                   | Page 36       |
| ANT 2       | 1909.850                       | 1910.000                    | -63.6                   | Page 37       |
| ANT 3       | 1909.850                       | 1910.000                    | -66.9                   | Page 38       |
| ANT 4       | 1909.850                       | 1910.000                    | -67.2                   | Page 39       |
| ANT 5       | 1909.850                       | 1910.000                    | -64.3                   | Page 40       |
| ANT 6       | 1909.850                       | 1910.000                    | -64.3                   | Page 41       |
| ANT 7       | 1909.850                       | 1910.000                    | -64.9                   | Page 42       |
| ANT 8       | 1909.850                       | 1910.000                    | -64.6                   | Page 43       |

Note) 1. \*: The Data Page is one in Attachment A.

2. The point shown on " \_\_\_\_\_ " is the Maximum Margin Point.

Tester : Shigeru Kinoshita

## Frequency Stability Measurement

### Measurement Results:

Test Date: September 25-28, 2003

### Frequency Stability Measurement versus Temperature

|                            |         |               |             |              |
|----------------------------|---------|---------------|-------------|--------------|
| Reference Frequency:       |         | 1880.150 MHz  |             | (206ch)      |
| AC Supply Voltage : 120VAC |         |               |             |              |
| Ambient                    |         | Deviation(Hz) |             |              |
| Temperature                | Startup | 2 minutes     | 5 minutites | 10 minutites |
| (°C)                       |         |               |             |              |
| -30                        | +1291.0 | +1160.7       | +867.0      | +237.8       |
| -20                        | -116.8  | -313.3        | +522.1      | +10.1        |
| -10                        | -1011.7 | -520.1        | -1131.3     | -777.0       |
| 0                          | -209.2  | -1147.8       | -619.7      | +626.2       |
| 10                         | -297.2  | +426.2        | +624.7      | +434.9       |
| 20                         | +784.4  | +396.4        | +387.4      | +250.7       |
| 30                         | +925.3  | +681.5        | +650.9      | +533.3       |
| 40                         | +928.2  | +684.1        | +897.0      | +1296.8      |
| 50                         | +772.5  | +868.2        | +1068.1     | +1167.1      |

### Frequency Stability Measurement versus Temperature

|                       |         |               |             |              |
|-----------------------|---------|---------------|-------------|--------------|
| Reference Frequency:  |         | 1880.150 MHz  |             | (206ch)      |
| Ambient Temperature : |         | 20 °C         |             |              |
| AC Supply             |         | Deviation(Hz) |             |              |
| Voltage               | Startup | 2 minutes     | 5 minutites | 10 minutites |
| (VAC)                 |         |               |             |              |
| 102                   | +577.8  | +1109.2       | +741.7      | +891.3       |
| 120                   | +784.4  | +396.4        | +387.4      | +250.7       |
| 138                   | +242.0  | +1169.2       | +949.5      | +652.3       |

Note : The measurement were made after all of components of the oscillator sufficiently stabilized at each temperature.

Sample Caluculation at 1880.150 MHz ,-30°C 2minutes 120VAC) :  
 $((1880.1512910 - 1880.1500000) \times 10^6 = +1291.0 \text{ (Hz)})$   
The point shown on " \_\_\_\_ " is the Maximum Frequency Deviation.

Tester : Akio Hosoda

### Maximum Permissible Exposure(MPE) :

The limit for Maximum Permissible Exposure(MPE) at frequency of 1894.85 MHz is 1.00 mW/cm<sup>2</sup>. (1.00 mW/cm<sup>2</sup> for General Population/Uncotrolled enviroment in §1.1310.)

The conversion from power to power density uses the following equation :

$$PD = (TPG)/4\pi r^2 = EIRP/4\pi r^2$$
$$r = \text{SQRT}(EIRP/4\pi PD)$$

Where : PD : Power Density at the Minimum Save-distance(W/m<sup>2</sup>)

TP : Transmitt Power (W)

G : Numeric gain of the antenna

EIRP: Equivalent Isotropically Radiated Power

r : Minimum Save-distance(in m)

The conversion from mW/cm<sup>2</sup> to W/m<sup>2</sup> is: 1mW/cm<sup>2</sup> = 10W/m<sup>2</sup>

Maximum EIRP\*<sup>1</sup> : 171.40W

Note) \*<sup>1</sup> : Measured Value

#### Minimum Save-distance for MPE calculation

| Items                    | Value  |
|--------------------------|--------|
| EIRP (W)                 | 171.40 |
| PD (mW/cm <sup>2</sup> ) | 1.00   |
| PD (W/m <sup>2</sup> )   | 10.00  |
| r (m)                    | 1.17   |

MPE evaluation :

Minimum Save-distance : 1.17m

## AC Powerline Conducted Emission Measurement

### Class B Digital Device

Test Date: September 10, 2003  
Temp.: 25 °C ; Humi.: 60 %

| Frequency<br>[MHz] | Correction<br>Factor<br>[dB] | Meter Readings [dB(μV)] |    |       |    | Limits<br>[dB(μV)] |      | Results<br>[dB(μV)] |    | Margin<br>[dB] | Remarks<br>(Note 2) |
|--------------------|------------------------------|-------------------------|----|-------|----|--------------------|------|---------------------|----|----------------|---------------------|
|                    |                              | VA                      |    | VB    |    | QP                 | AV   | QP                  | AV |                |                     |
|                    |                              | QP                      | AV | QP    | AV | QP                 | AV   | QP                  | AV |                |                     |
| 0.15               | 0.2                          | 21.0                    | -  | 21.0  | -  | 66.0               | 56.0 | 21.2                | -  | +44.8          | A                   |
| 0.20               | 0.2                          | 27.0                    | -  | 27.0  | -  | 63.8               | 53.8 | 27.2                | -  | +36.6          | A                   |
| 0.21               | 0.2                          | 23.0                    | -  | 23.0  | -  | 63.2               | 53.2 | 23.2                | -  | +40.0          | A                   |
| 0.50               | 0.1                          | <10.0                   | -  | <10.0 | -  | 56.0               | 46.0 | <10.1               | -  | >+45.9         | A                   |
| 2.20               | 0.2                          | 22.0                    | -  | 22.0  | -  | 56.0               | 46.0 | 22.2                | -  | +33.8          | A                   |
| 2.47               | 0.2                          | 29.0                    | -  | 29.0  | -  | 56.0               | 46.0 | 29.2                | -  | +26.8          | A                   |
| 4.27               | 0.3                          | 15.0                    | -  | 15.0  | -  | 56.0               | 46.0 | 15.3                | -  | +40.7          | A                   |
| 5.00               | 0.4                          | <10.0                   | -  | <10.0 | -  | 56.0               | 46.0 | <10.4               | -  | >+45.6         | A                   |
| 10.00              | 0.5                          | <10.0                   | -  | <10.0 | -  | 60.0               | 50.0 | <10.5               | -  | >+49.5         | A                   |
| 30.00              | 0.9                          | <10.0                   | -  | <10.0 | -  | 60.0               | 50.0 | <10.9               | -  | >+49.1         | A                   |

Sample of calculated result at 2.47 MHz, as the Minimum Margin point:

Correction Factor = 0.2 dB  
+) Meter Reading = 29.0 dB(μV)  
Result = 29.2 dB(μV)

Minimum Margin : 56.0 - 29.2 = 26.8(dB)

The point shown on “      ” is the Minimum Margin Point.

Note 1:

1)The correction factor includes the LISN insertion loss and the cable loss.

#### Remarks:

| Note 2 | Detector Function | IF Bandwidth |
|--------|-------------------|--------------|
| A      | CISPR QP          | 9 kHz        |
| B      | Average           | 10 kHz       |

Tester : Akio Hosoda

## Electromagnetic Field Radiated Emission Measurement

### Class B Digital Device

Test Date: September 10, 2003

Temp.: 21 °C ; Humi.: 73 %

| Frequency<br>[MHz] | Antenna<br>Factor<br>[dB(1/m)] | Cable<br>Loss<br>[dB] | Meter Readings<br>[dB(μV)] |       | Limits<br>[dB(μV/m)] | Results<br>[dB(μV/m)] |       | Margin<br>[dB] | Remarks<br>(Note 1) |
|--------------------|--------------------------------|-----------------------|----------------------------|-------|----------------------|-----------------------|-------|----------------|---------------------|
|                    |                                |                       | Hori.                      | Vert. |                      | Hori.                 | Vert. |                |                     |
| 125.0              | 13.2                           | 2.1                   | 0.0                        | 4.5   | 43.5                 | 15.3                  | 19.8  | +23.7          | A                   |
| 192.0              | 16.5                           | 2.6                   | 6.5                        | 1.0   | 43.5                 | 25.6                  | 20.1  | +17.9          | A                   |
| 250.0              | 17.4                           | 3.0                   | 4.0                        | 2.0   | 46.0                 | 24.4                  | 22.4  | +21.6          | A                   |
| 268.8              | 17.7                           | 3.1                   | 2.0                        | 1.0   | 46.0                 | 22.8                  | 21.8  | +23.2          | A                   |
| 384.0              | 16.0                           | 3.8                   | 4.0                        | 4.0   | 46.0                 | 23.8                  | 23.8  | +22.2          | A                   |
| 422.4              | 16.7                           | 4.0                   | 0.0                        | 2.5   | 46.0                 | 20.7                  | 23.2  | +22.8          | A                   |
| 450.0              | 17.1                           | 4.2                   | <-4.0                      | -1.0  | 46.0                 | <17.3                 | 20.3  | +25.7          | A                   |
| 500.0              | 17.8                           | 4.5                   | 10.0                       | 9.0   | 46.0                 | 32.3                  | 31.3  | +13.7          | A                   |
| 625.0              | 19.6                           | 5.1                   | -2.0                       | -2.0  | 46.0                 | 22.7                  | 22.7  | +23.3          | A                   |
| 750.0              | 21.0                           | 5.7                   | 0.0                        | 3.0   | 46.0                 | 26.8                  | 29.7  | +16.3          | A                   |

Sample of calculated result at 500.0 MHz, as the Minimum Margin point:

|                   |   |               |
|-------------------|---|---------------|
| Antenna Factor    | = | 17.8 dB(1/m)  |
| Cable Loss        | = | 4.5 dB        |
| + ) Meter Reading | = | 10.0 dB(μV)   |
| Result            | = | 32.3 dB(μV/m) |

Minimum Margin : 46.0 - 32.3 = 13.7(dB)

The point shown on “ ” is the Minimum Margin Point.

#### Remarks:

| Note 1 | Detector Function | IF Bandwidth |
|--------|-------------------|--------------|
| A      | CISPR QP          | 120 kHz      |
| B      | Average           | 120 kHz      |
| C      | Average           | 12 kHz       |
| D      | Average           | 7.5 kHz      |

Tester : Akio Hosoda