

Issue Date : July 7, 2005
Page 1 of 36

EMC EMISSION - TEST REPORT

JQA APPLICATION No. : KL80050230

Name of Product : Cellular Telephone Handset

Model/Type No. : A5514SA

FCC ID : NRNA5514SA

Applicant : Tottri SANYO Electric Co., Ltd.

Address : 7-101, Tachikawa-cho, Tottori-city, Tottori, 680-8634, JAPAN

Manufacturer : Tottri SANYO Electric Co., Ltd.

Address : 7-101, Tachikawa-cho, Tottori-city, Tottori, 680-8634, JAPAN

Receive date of EUT : June 30, 2005

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 National Institute of Information and Communications Technology(NICT) under MPHPT Japan.

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

Authorized by:



Yuichi Fukumoto, Manager
JQA KITA-KANSAI Testing Center

DIRECTORY

	Page
A) Documentation	
Directory	<u>2</u>
Test Regulation / General Information	<u>3 - 4</u>
Test Conditions	<u>5 - 18</u>
Configuration of EUT / Operation mode of the EUT	<u>19 - 20</u>
EUT Modification / Responsible Party / Deviation from Standard	<u>21</u>
Test results / Measurement Uncertainty	<u>22 - 24</u>
Summary	<u>25</u>
Test System-Arrangement (Drawings)	<u>26</u>
Test-setup (Photographs) at worst case	<u>27</u>
B) Test data	
- CDMA800 -	
Transmitter Power(TP)	<u>28</u>
Antenna Conducted Spurious Emission	<u>29 - 30</u>
Transmitter Power(EIRP)	<u>31</u>
Unwanted Radiation	<u>32 - 33</u>
Occupied Bandwidth	<u>34</u>
Band-Edge Emission	<u>35</u>
Frequency Stability	<u>36</u>

TEST REGULATION

FCC Rules and Regulations Part 22 (October 1, 2004)

800 MHz systems (Part 22) : Cellular Radiotelephone

Test procedure:

The tests were performed according to FCC Rules and Regulations Part 2 (October 1, 2004), and ANSI C63.4 (2003).

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 : Cellular Telephone Handset
- 2) Model/Type No. : A5514SA
- 3) Product Type : Pre-production(Serial No.: HANA 1.8 00035)
- 4) Category : Broadband PCS
- 5) EUT Authorization : ○ - Verification ● - Certification ○ - D.o.C.
- 6) Transmitting Frequency : 824.700MHz (1013 ch) - 848.310MHz (777 ch)(CDMA800)
- 7) Receiving Frequency : 869.700MHz (1013 ch) - 893.310 MHz (777 ch)(CDMA800)
- 8) Integrated Antenna : Quarter Wave electrode type
- 9) Emission Designations : 1M29F9W(CDMA800)
- 10) Maximum RF Output Power : 0.135W(ERP)(CDMA800)
- 11) Power Rating : 3.7VDC
- 12) Channel Numbers and Frequencies :

Channel Numbers and Frequencies for 800MHz Systems(CDMA)

Block Designator	CDMA Channel Validity	CDMA Channel Number	Transmitting Center Frequency (MHz)
A" (1MHz)	Not Valid	991 - 1012	824.040 - 824.670
	Valid	1013 - 1023	824.700 - 825.000
A (10MHz)	Valid	1 - 311	825.030 - 834.330
	Not Valid	312 - 333	834.360 - 834.990
B (10MHz)	Not Valid	334 - 355	835.020 - 835.650
	Valid	356 - 644	835.680 - 844.320
	Not Valid	645 - 666	844.350 - 844.980
A' (1.5MHz)	Not Valid	667 - 688	845.010 - 845.640
	Valid	689 - 694	845.670 - 845.820
	Not Valid	695 - 716	845.850 - 846.480
B' (2.5MHz)	Not Valid	717 - 738	846.510 - 847.140
	Valid	739 - 777	847.170 - 848.310
	Not Valid	778 - 799	848.340 - 848.970

TEST CONDITIONS

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

Test Procedure :

The Transmitter Power was measured with a power meter, two 10 dB attenuators and a short, low loss cable.

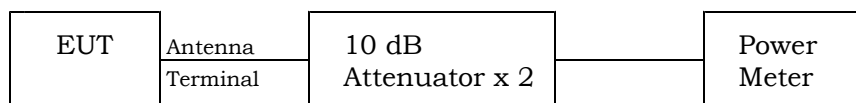


Fig.1 Transmitter Power Measurement

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
● - E4417A	B - 51	August, 2004	1 Year
○ - E9321A	B - 52		
● - E9323A	B - 59	August, 2004	1 Year
○ - 6-20	D - 27		
○ - 4T-10	D - 73		
○ - 4T-10	D - 74		
○ - 2-10	D - 79		
○ - 2-10	D - 80		
● - 54-10	D - 82	May, 2005	1 Year
● - 54-10	D - 83	May, 2005	1 Year

Environmental conditions :

Temperature: 25 °C Humidity: 70 %

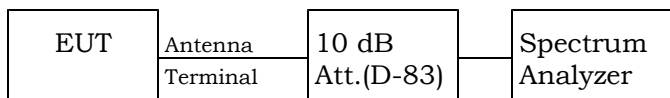
Antenna Conducted Spurious Emission Measurement (§2.1051,§22.917)

Test Procedure :

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

CDMA800

1) Frequency Range : 9kHz - 1.2GHz



2) Frequency Range : 1.2GHz - 10GHz

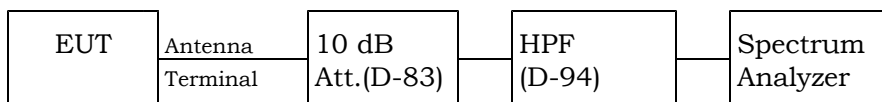


Fig.2 Antenna Conducted Spurious Emission Measurement

The setting of the spectrum analyzer are shown as follows :

Frequency Range	9kHz - 150kHz	150kHz - 30 MHz	30 MHz - 10 GHz
Res. Bandwidth	200 Hz	10 kHz	1 MHz
Video Bandwidth	1 kHz	30 kHz	3 MHz
Sweep Time	AUTO	AUTO	AUTO
Trace	Maxhold	Maxhold	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
○ - 8566B	A - 13	October, 2004	1 Year
● - E4446A	A - 39		
○ - 4T-10	D - 73		
○ - 4T-10	D - 74		
○ - 2-10	D - 79		
○ - 2-10	D - 80	May, 2005	1 Year
○ - 54-10	D - 82		
● - 54-10	D - 83		
○ - BRM50701	D - 93	February, 2005	1 Year
● - HPM5010S	D - 94		
○ - HPM13900	D - 95		
○ - HPM13899	D - 96		

Environmental conditions:

Temperature: 21 °C Humidity: 70 %

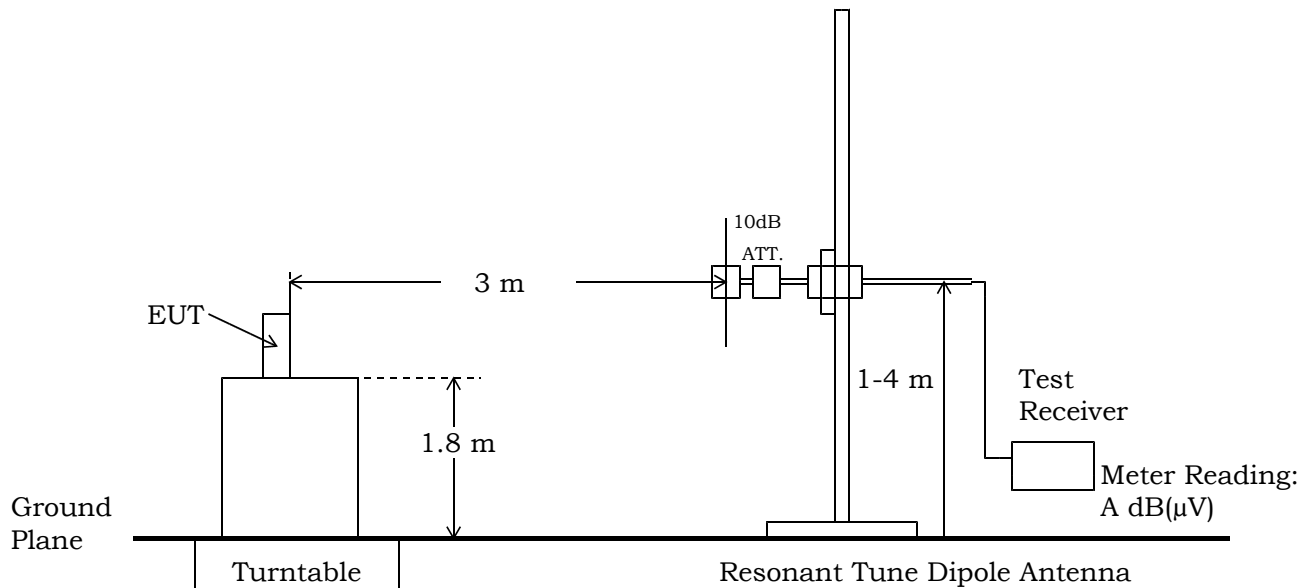
Transmitter Power (ERP) Measurement (§22.913)**Test Procedure :**

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 1.8m on the non-conducted support, at the distance 3m from the receiving antenna (Resonant Tuned Antenna) and rotated around 360 degrees. The receiving antenna height was varied from 1m to 4 m. The EUT on the table was placed to be maximum emission against the receiving antenna polarized (Vertical and Horizontal). Then the meter reading of the test receiver at the maximum emission was A dB(μ V).

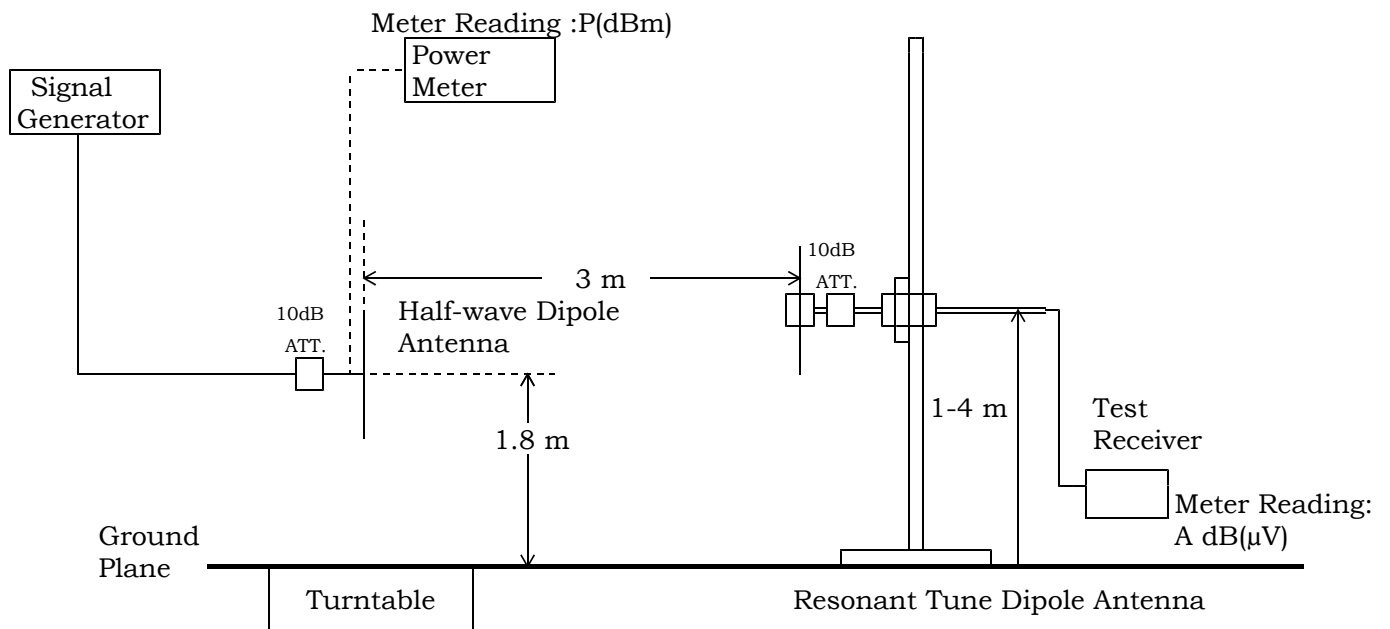
Step 2) The test was set-up shown as Fig.3 (b). The EUT was replaced to half-wave dipole antenna at the same polarization under the same condition as step 1. The RF power was fed to the transmitting Antenna (Half-wave Dipole Antenna) from the signal generator. In order to obtain the maximum emission 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 test receiver at the maximum emission was A dB(μ V), same as the recorded level in step 1. Then the RF power into the substitution half-wave dipole antenna was P(dBm).

The ERP is calculated in the following equation.

$$\text{ERP[dBm]} = P \text{ (dBm)} - (\text{Balun Loss of the half-wave Dipole Ant. (dB)}) + \text{Cable Loss(dB)}$$



(a) EUT



(b) Half-wave Dipole Antenna

Fig.3 Maximum Transmitter Power (ERP) Measurement

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		
○ - 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		
● - E4446A	A - 39	October, 2004	1 Year
○ - ESVS 10	A - 5		
○ - KBA-511A	C - 13		
● - KBA-611	C - 19	August, 2004	1 Year
● - KBA-611	C - 22	August, 2004	1 Year
○ - VHA9103/BBA9106	C - 43		
○ - UHALP9107	C - 42		
○ - VHA9103/FBAB9177	C - 25		
○ - UHALP9108-A1	C - 28		
● - 2-10	D - 79	September, 2004	1 Year
● - 2-10	D - 80	September, 2004	1 Year
● - Cable	H - 6	August, 2004	1 Year
● - E4417A	B - 51	August, 2004	1 Year
○ - E9321A	B - 52		
● - E9323A	B - 59	August, 2004	1 Year
○ - 8673D	B - 2		
○ - MG3681A	B - 3		
● - 6062A	B - 44	May, 2005	1 Year

Temperature: 26 °C Humidity: 76 %

Unwanted Radiation Measurement (§2.1053,§22.917) - ERP method -

Test Procedure :

Step 1) The spurious radiation for transmitter were measured at the distance 3 m away from the EUT which was placed on a non-conducted support 1.0 m in height and was varying at three orthogonal axes. 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. This test was carried out using the loop antenna for up to 30 MHz, using the half-wave dipole antenna for up to 1GHz and using the horn antenna for above 1 GHz.

Step 2) The ERP measurement was carried out with according to Step 2 in page 9. Then the RF power in the substitution antenna half-wave dipole antenna for up to 1 GHz and the substitution horn antenna for above 1 GHz.

The EIRP is calculated in the following equation.

A) Up to 1 GHz

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

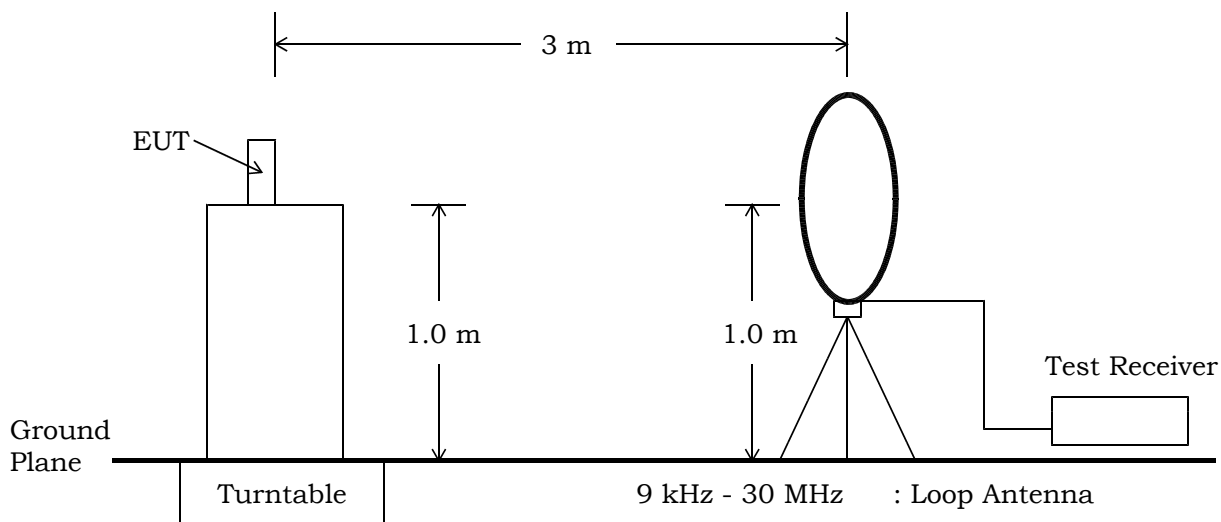
B) Above 1 GHz

$$\text{ERP(dBm)} = P \text{ (dBm)} + G_h(\text{dBi}) - G_d(\text{dBi})$$

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

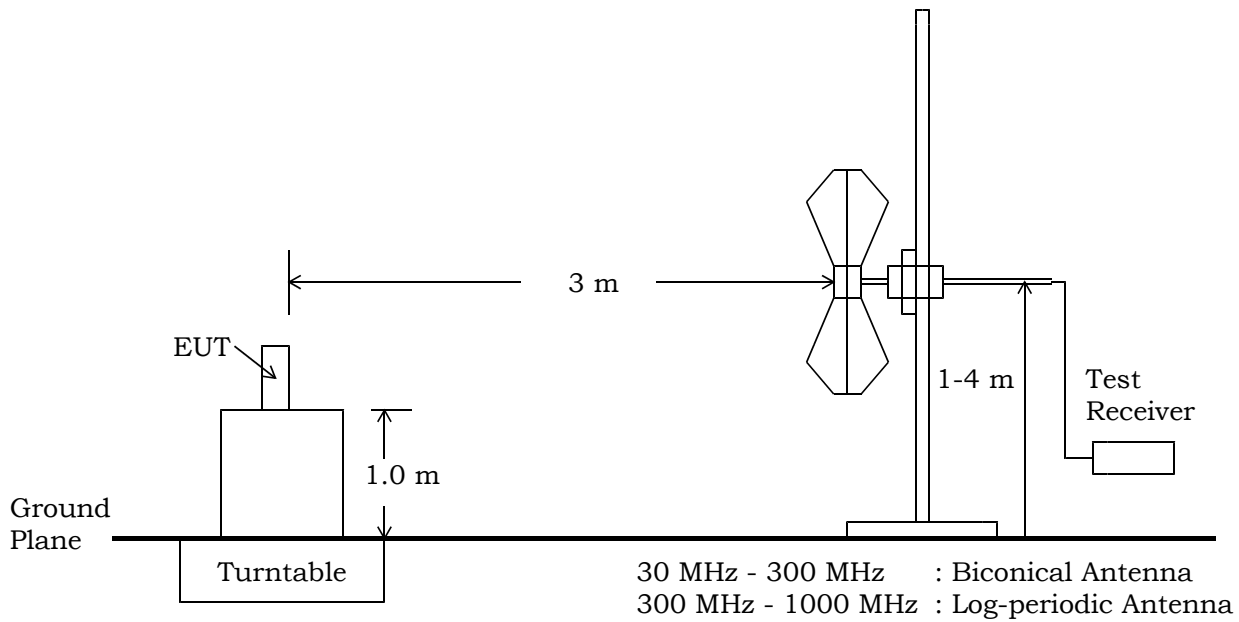
$G_d(\text{dBi})$: Gain of the substitution half-wave dipole antenna

The respective calculated ERP 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 hands free unit used.

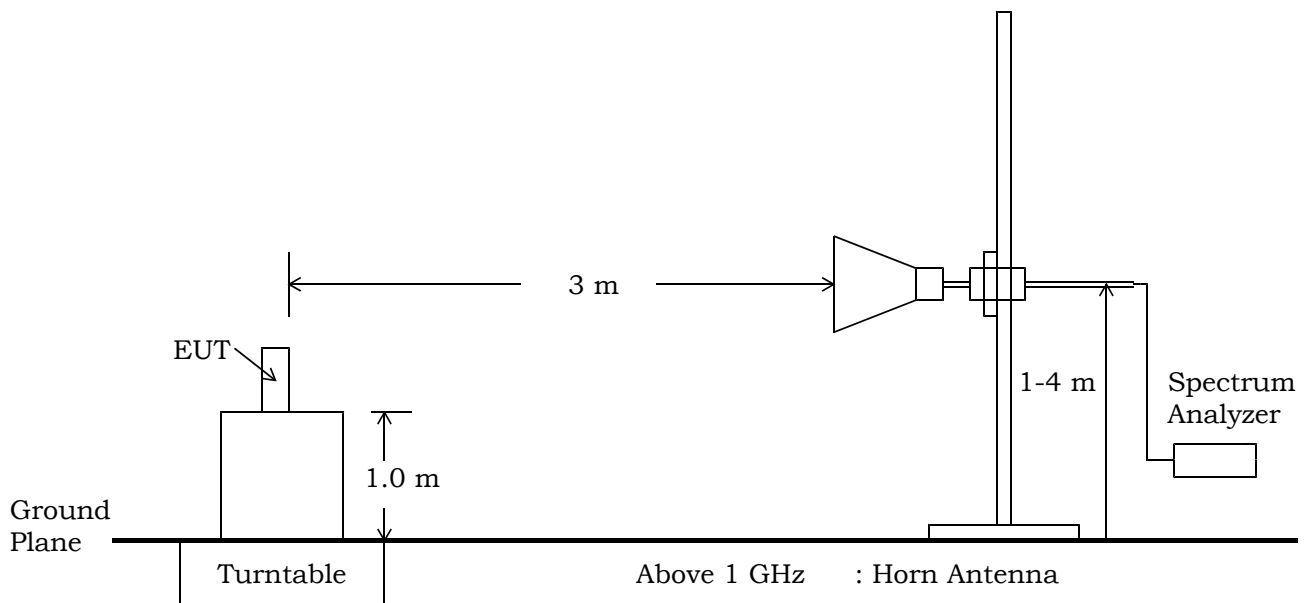


(a) Measurement set up for up to 30 MHz

Fig.4 Unwanted Radiation Measurement



(b) Measurement set up for up to 1 GHz



(c) Measurement set up for above 1GHz

Fig.4 Unwanted Radiation Measurement

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 : October 4, 2004

2) Interval : 1 Year

Used test instruments :

Model No.	Device ID	Last Cal. Date	Cal. Interval
● - ESCS 30	A - 1	August, 2004	1 Year
○ - ESCS 30	A - 9		
○ - ESH 2	A - 2		
○ - ESH 2	A - 3		
● - HFH2-Z2	C - 2	July, 2004	1 Year
○ - HFH2-Z2	C - 3		
● - Cable	H - 28	July, 2004	1 Year
○ - ESV/ESV-Z3	A - 6 / A - 20	August, 2004	1 Year
○ - ESVS 10	A - 5		
● - VHA9103/BBA9106	C - 43	August, 2004	1 Year
● - UHALP9107	C - 42	August, 2004	1 Year
● - VHA9103/FBAB9177	C - 27	August, 2004	
● - UHALP9108-A1	C - 26	August, 2004	
○ - KBA-511	C - 12		1 Year
○ - KBA-611	C - 22		1 Year
● - Cable	H - 5	August, 2004	1 Year

- continue -

Used test instruments :

Model No.	Device ID	Last Cal. Date	Cal. Interval
○ - 8566B	A - 13		
● - E4446A	A - 39	October, 2004	1 Year
● - 54-10	D - 82	May, 2005	1 Year
● - 54-10	D - 83	May, 2005	1 Year
○ - 4T-10	D - 73		
○ - 4T-10	D - 74		
● - WJ-6611-513	A - 23	May, 2005	1 Year
● - WJ-6882-824	A - 21	May, 2005	1 Year
● - DBL-0618N515	A - 33	May, 2005	1 Year
○ - ALN-22093545-1	A - 37		
● - 91888-2	C - 40 - 1	May, 2005	1 Year
● - 91889-2	C - 40 - 2	May, 2005	1 Year
● - 94613-1	C - 40 - 3	May, 2005	1 Year
● - 91891-2	C - 40 - 4	May, 2005	1 Year
○ - 94614-1	C - 40 - 5		
● - 91888-2	C - 41 - 1	May, 2005	1 Year
● - 91889-2	C - 41 - 2	May, 2005	1 Year
● - 94613-1	C - 41 - 3	May, 2005	1 Year
● - 91891-2	C - 41 - 4	May, 2005	1 Year
○ - 94614-1	C - 40 - 5		
○ - 3160-09	C - 48		
● - 8673D	B - 2	April, 2005	1 Year
● - Cable	C - 40 - 11	May, 2004	1 Year
● - Cable	C - 40 - 12	May, 2004	1 Year
● - Cable	C - 53	February, 2005	1 Year
● - HPM5010S	D - 94	February, 2005	1 Year
○ - HPM13900	D - 95		
○ - HPM13899	D - 96		
○ - Cable	C - 54		

Environmental conditions :Temperature: 26 °C Humidity: 76 %

Occupied Bandwidth Measurement (§2.1049, §22.917)

Test Procedure :

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

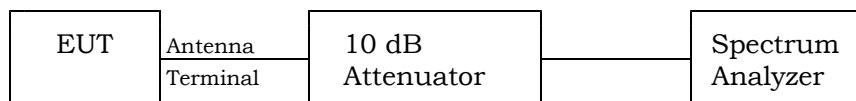


Fig.5 Occupied Bandwidth Measurement

The setting of the spectrum analyzer are shown as follows :

	CDMA800
Res. Bandwidth	30 kHz
Video Bandwidth	100 kHz
Span	3 MHz
Sweep Time	10msec

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
○ - 8566B	A - 13	October, 2004	1 Year
● - E4446A	A - 39		
○ - 4T-10	D - 73		
○ - 4T-10	D - 74		
○ - 2-10	D - 79		
○ - 2-10	D - 80	May, 2005	1 Year
○ - 54-10	D - 82		
● - 54-10	D - 83		

Environmental conditions:

Temperature: 21 °C Humidity: 70 %

Band-Edge Emission Measurement (§2.1049, §22.917)

Test Procedure :

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

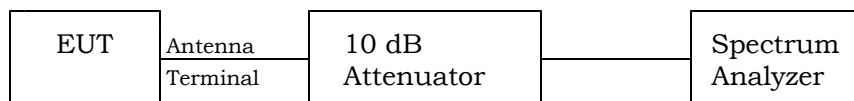


Fig.6 Band-Edge Emission Measurement

The setting of the spectrum analyzer are shown as follows :

	CDMA 800
TX Frequency	824.70 MHz / 848.31 MHz
Band-edge Frequency	824.0 MHz / 849.0 MHz
Res. Bandwidth	15 kHz
Video Bandwidth	15 kHz
Span	5 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:

○ - 8566B	A - 13		
● - E4446A	A - 39	October, 2004	1 Year
○ - 4T-10	D - 73		
○ - 4T-10	D - 74		
○ - 2-10	D - 79		
○ - 2-10	D - 80		
○ - 54-10	D - 82		
● - 54-10	D - 83	May, 2005	1 Year

Environmental conditions:

Temperature: 21 °C Humidity: 70 %

Frequency Stability Measurement (§2.1055, §24.235)**Test Procedure :****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 (3.7VDC) 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 (3.7VDC) and the power (3.35VDC, the Ending Voltage) 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.

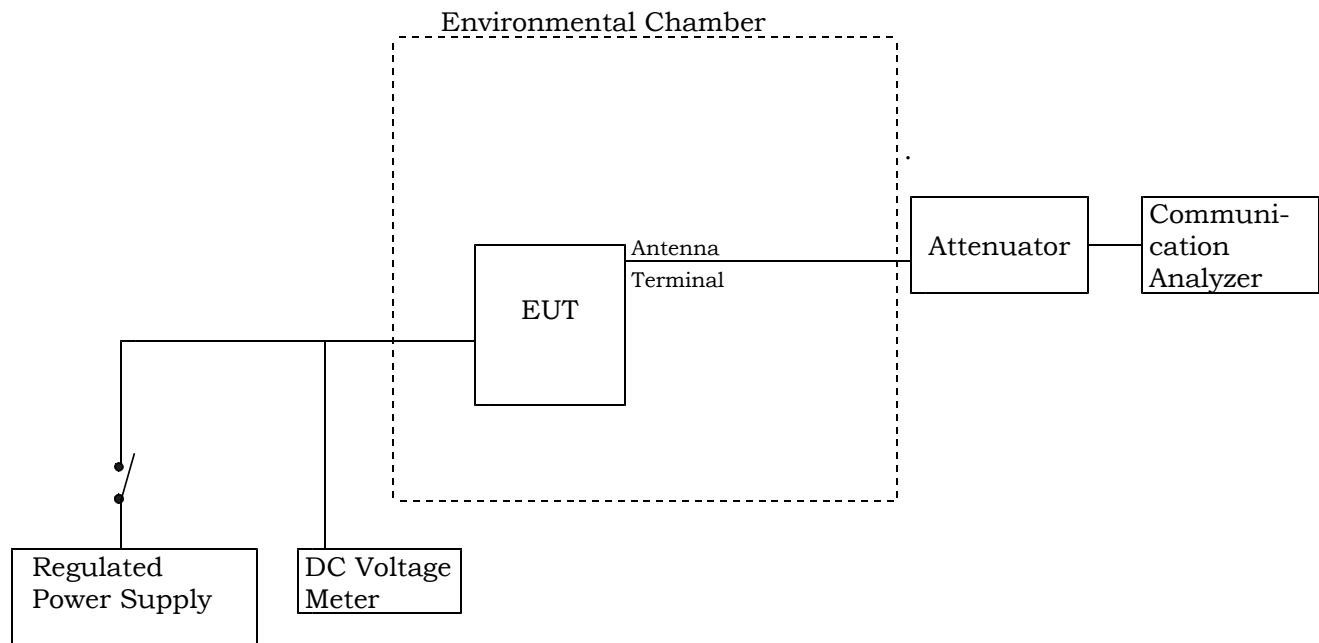


Fig.7 Frequency Stability Measurement

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-4K	G47001018-1	November, 2004	1 Year
● - SRF106AS00000M11	G47001018-3	November, 2004	1 Year
● - NL035-10	F - 4	April, 2005	1 Year
● - 6032A	F - 5	April, 2005	1 Year
● - CMU200	B - 21	April, 2005	1 Year
● - TR5212	B - 30	March, 2005	1 Year

CONFIGURATION OF EUT

The Equipment Under Test (EUT) consists of :

Description	Applicant (Manufacturer)	Model No. (Serial No.)	FCC ID
Celluar Telephone Handset	Tottori SANYO Electric Co., Ltd. (Tottori SANYO Electric Co., Ltd.)	A5514SA (HANA 1.8 00035)	NRNA5514SA
Lithium-ION Battery	Tottori SANYO Electric Co., Ltd. (SANYO Electric Co., Ltd.)	1UF553436F-SM TO-2 (---)	N/A
AC Adapter	Tottori SANYO Electric Co., Ltd. (Matsushita Battery Industrial Co., Ltd.)	DE-960BA (---)	N/A
Earphone	Tottori SANYO Electric Co., Ltd. (Foster Electric Co., Ltd.)	04SAQPA (---)	N/A

The measurement was carried out with the following equipment connected :

Description	Grantee/Distributor	Model No. (Serial No.)	FCC ID
None			

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	Cellular Telephone Handset	Interface	NO	--	NO	1.6 m
	DC Power Cord(AC Adapter)	---		--		
2	Cellular Telephone Handset	Earphone	NO	--	NO	1.6 m
	Earphone	---		--		

Test Configuration:**Operation - mode of the EUT:**

The tests were carried out under one modulation type shown as follows :
Modulation : CDMA

The Radiated Emission tests were carried under 3 test configurations in page 26 shown as follows:

	Test Configuration	The condition of the transmitting antenna
1	Single Unit	Integrated antenna
2	AC Adapter used	Integrated antenna
3	Earphone used	Integrated antenna

The test configuration on the worst data at the unwanted radiation measurement is Single Unit.

Test system:

The EUT has 2 ports shown as follows :

- 1) Earphone port : is connected to the Earphone.
- 2) Interface port : is connected to the AC Adapter.

Special accessories:

None

Detailed Transmitter portion:

CDMA800

Transmitting frequency : 824.700 MHz(1013ch) - 848.310 MHz(777ch)

Local frequency : 824.700 MHz(1013ch) - 848.310 MHz(777ch)

Detailed Receiver portion:

CDMA800

Receiving frequency : 869.700 MHz(1013ch) - 893.310 MHz(777ch)

Local frequency : 1663.700 MHz(1013ch) - 1787.940 MHz(777ch)

Other Clock Frequency:

RTC : 32 kHz

TCXO : 19.2 MHz

CAMERA : 24 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
CDMA800**Transmitter Power(TP)**

The transmitter power is 564.9 mW at 824.73 MHz(Peak)
215.3 mW at 824.73 MHz(Average)
Uncertainty of measurement results at Amplitude ±0.19 dB(2σ)

Remarks: _____

Antenna Conducted Spurious Emission

The requirements are **● - Passed** **○ - Not Passed**
Min. limit margin 25.9 dB at 2509.47 MHz
Max. limit exceeding _____ dB at _____ MHz
Uncertainty of measurement results at Amplitude ±0.24 dB(2σ)

Remarks: _____

Transmitter Power(ERP)

The requirements are **● - Passed** **○ - Not Passed**
The Maximum ERP is 0.135 W at 848.31 MHz
Min. limit margin 17.2 dB at 848.31 MHz
Max. limit exceeding _____ dB at _____ MHz
Uncertainty of measurement results +1.3 dB(2σ) -1.3 dB(2σ)

Remarks: _____

Unwanted Radiation (9 kHz - 10 GHz)

The requirements are	● - Passed	○ - Not Passed
Min. limit margin	<u>5.8</u> dB at <u>4182.450</u> MHz	
Max. limit exceeding	<u> </u> dB at <u> </u> MHz	
Uncertainty of measurement results	9 kHz - 30 MHz <u>+2.5</u> dB(2σ)	<u>-2.5</u> dB(2σ)
	30 MHz - 1 GHz <u>+4.1</u> dB(2σ)	<u>-4.2</u> dB(2σ)
	1 GHz - 20 GHz <u>+3.1</u> dB(2σ)	<u>-3.2</u> dB(2σ)

Remarks: _____

Occupied Bandwidth

The requirements are	● - Passed	○ - Not Passed
The 26dB Bandwidth is	<u>1.41</u> MHz at <u>836.49</u> MHz	
The 99% Bandwidth is	<u>1.29</u> MHz at <u>836.49</u> MHz	
The results(Occupied Bandwidth)	Refer to pages* 2 - 4	
Uncertainty of measurement results at Frequency	<u>±5.0</u> kHz(2σ)	
Uncertainty of measurement results at Amplitude	<u>±0.24</u> 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	<u>-16.40</u> dBm at <u>824.00</u> MHz	
The results(Band-edge Emission)	Refer to pages* 6 - 7	
Uncertainty of measurement results at Frequency	<u>±17.4</u> kHz(2σ)	
Uncertainty of measurement results at Amplitude	<u>±0.24</u> dB(2σ)	

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



Frequency Stability

Frequency Stability : +0.02 ppm at 836.400 MHz
Min. limit margin 2.48 ppm at 836.400 MHz
Max. limit exceeding _____ ppm at _____ MHz
Uncertainty of measurement results ±10 Hz

Remarks:

SUMMARY

GENERAL REMARKS :

The EUT was tested according to the requirements of FCC Rules and Regulations Part 22 (October 1, 2004) under the test configuration, as shown in page 26.

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 : June 30, 2005

End of testing : July 5, 2005

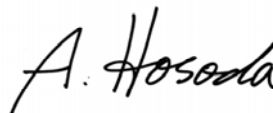
- JAPAN QUALITY ASSURANCE ORGANIZATION -

Reviewed by :



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

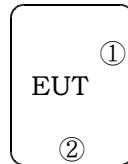
Tested by :



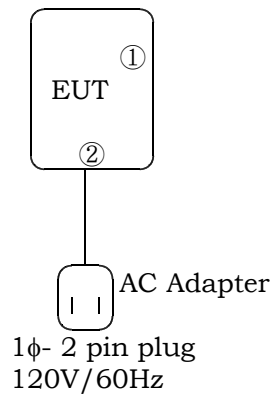
Akio Hosoda
Manager
EMC Div.
JQA KITA-KANSAI Testing Center

Test System-Arrangement (Drawings)

1) Single Unit



2) AC Adapter used



3) Earphone used



Note:

① : Earphone

② : Interface



JQA Application No. : KL80050230
Model No. : A5514SA
FCC ID : NRNA5514SA

Regulation : CFR 47 FCC Rules Part 22
Issue Date : July 7, 2005

Page 27 of 36

Test-Setup (Photographs) at worst case

This page is CONFIDENTIAL.
Refer to PDF(TestSetupPhoto_Part22H_NRNA5514A)

Transmitter Power (TP) Measurement (CDMA800)

Test Date: July 5, 2005
 Temp.: 25 °C, Humi: 70 %

Transmitting Frequency CH	[MHz]	Correction Factor [dB]	Meter Reading (Peak) [dBm]	Results (Peak) [dBm]	[mW]
1013	824.730	20.90	6.62	27.52	564.9
383	836.490	20.90	6.32	27.22	527.2
777	848.310	20.90	6.42	27.32	539.5

Transmitting Frequency CH	[MHz]	Correction Factor [dB]	Meter Reading (Average) [dBm]	Results (Average) [dBm]	[mW]
1013	824.730	20.90	2.43	23.33	215.3
383	836.490	20.90	2.18	23.08	203.2
777	848.310	20.90	2.26	23.16	207.0

Sample of calculated result at 824.730 MHz, as the Maximum Level point:

Correction Factor	=	20.90 dBm	
+) Meter Reading	=	6.62 dB	
Result	=	27.52 dBm	= 564.9 mW

The point shown on “ _____ ” is the Maximum Level Point.

Note: The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.

Tester: Shigeru Kinoshita

Antenna-Conducted Spurious Emission Measurement (CDMA800)

Test Date: July 1, 2005
 Temp.: 21 °C, Humi: 70 %

CH	Transmitting Frequency [MHz]	Measured Frequency [MHz]	Corr. Factor [dB]	Meter Readings [dBm]	Limits [dBm]	Results [dBm]	Margin [dB]	Remarks
1013	824.730	1649.460	12.6	-62.4	-13.0	-49.8	+36.8	C
		2474.190	12.9	-59.0	-13.0	-46.1	+33.1	C
		3298.920	14.8	< -63.0	-13.0	< -48.2	> +35.2	C
		4123.650	14.4	< -63.0	-13.0	< -48.6	> +35.6	C
		4948.380	15.3	< -63.0	-13.0	< -47.7	> +34.7	C
		5773.110	16.2	< -63.0	-13.0	< -46.8	> +33.8	C
		6597.840	17.0	< -63.0	-13.0	< -46.0	> +33.0	C
		7422.570	20.3	< -63.0	-13.0	< -42.7	> +29.7	C
383	836.490	8247.300	21.2	< -63.0	-13.0	< -41.8	> +28.8	C
		1672.980	12.6	-59.2	-13.0	-46.6	+33.6	C
		2509.470	12.8	-51.7	-13.0	-38.9	+25.9	C
		3345.960	14.9	< -63.0	-13.0	< -48.1	> +35.1	C
		4182.450	14.8	< -63.0	-13.0	< -48.2	> +35.2	C
		5018.940	15.3	< -63.0	-13.0	< -47.7	> +34.7	C
		5855.430	16.3	< -63.0	-13.0	< -46.7	> +33.7	C
		6691.920	17.1	< -63.0	-13.0	< -45.9	> +32.9	C
777	848.310	7528.410	20.7	< -63.0	-13.0	< -42.3	> +29.3	C
		8364.900	21.5	< -63.0	-13.0	< -41.5	> +28.5	C
		1696.620	12.6	-57.1	-13.0	-44.5	+31.5	C
		2544.930	12.8	-59.5	-13.0	-46.7	+33.7	C
		3393.240	14.8	< -63.0	-13.0	< -48.2	> +35.2	C
		4241.550	15.1	< -63.0	-13.0	< -47.9	> +34.9	C
		5089.860	15.2	< -63.0	-13.0	< -47.8	> +34.8	C
		5938.170	16.4	< -63.0	-13.0	< -46.6	> +33.6	C
		6786.480	17.2	< -63.0	-13.0	< -45.8	> +32.8	C
		7634.790	20.8	< -63.0	-13.0	< -42.2	> +29.2	C
		8483.100	21.7	< -63.0	-13.0	< -41.3	> +28.3	C

Sample of calculated result at 2509.5 MHz, as the Minimum Margin point:

Corr. Factor	=	12.8 dB
+) Meter Reading	=	-51.7 dB(μV)
Result	=	-38.9 dB(μV)

Minimum Margin: -13.0 - (-38.9) = 25.9 (dB)

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

Applied Limits:

-13.0 [dBm] = $10\log(TP[mW]) - (43 + 10\log(tp[W])) = 10\log(TP[mW]) - (43 + (10 \log(TP[mW]) - 30))$

where $tp[W] = TP[mW] / 1000$: Transmitter power at antenna terminal

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

Correction factor details:

Cable Loss + 10dB Pad Att. [dB] (9 kHz - 1.2 GHz)

Cable Loss + 10dB Pad Att. + High Pass Filter Loss (D-94) [dB] (1.2 GHz - 10 GHz)

- Note: 1) The spectrum was scanned 9 kHz to 10 GHz and all emissions not reported were more than 20 dB below the applied limits.
 2) The spectrum analyzer displays were printed out in Attachment B.

Remarks:

	Detector Function	RES B.W.	V.B.W.	Sweep Time
A	Peak	10 kHz	30 kHz	20 msec.
B	Peak	100 kHz	300 kHz	20 msec.
C	Peak	1 MHz	3 MHz	20 msec.

Tester : _____ Shigeru Kinoshita

Transmitter Power (ERP) Measurement (CDMA800)

Test Date: June 30, 2005
 Temp.: 26 °C, Humi: 76 %

1. Measurement Results

CH	Transmitting Frequency [MHz]	Emission Measurement [dB(μV)]		Substitution Measurement [dB(μV)]		Supplied Power to Substitution Antenna [dBm]	Balun Loss of Substitution Antenna [dB]
		Hori. (Mh)	Vert. (Mv)	Hori. (Msh)	Vert. (Msv)		
1013	824.730	77.2	75.9	56.2	54.4	0.2	1.4
383	836.490	78.3	76.6	56.0	54.8	0.1	1.4
777	848.310	78.4	76.5	55.8	55.2	0.1	1.4

2. Calculation Results

CH	Transmitting Frequency [MHz]	Peak ERP [dBm]		Maximum Peak ERP [W]	Limits [dBm]	Margin [dB]
		Hori. (ERPh)	Vert. (ERPv)			
1013	824.730	19.8	20.2	0.105	38.5	+18.3
383	836.490	21.0	20.6	0.126	38.5	+17.5
777	848.310	21.3	20.0	0.135	38.5	+17.2

Sample of calculated result at 848.310 MHz, as the Minimum Margin point:

Emission Measurement Mh	=	78.4 dB(μV)
Substitution Measurement Msh	=	-55.8 dB(μV)
Supplied Power to Substitution Antenna	=	0.1 dBm
+) Balun Loss of Substitution Antenna	=	-1.4 dB
Result	=	21.3 dBm = 0.135 W

ERPh = Mh - Msh + Ps + Gs

ERPv = Mv - Msv + Ps + Gs

Minimum Margin: 38.5 - 21.3 = 17.2 (dB)

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

Remarks:

Detector Function	Resolution B.W.	V.B.W.	Sweep Time
Peak	1 MHz	3 MHz	AUTO

Tester: Akio Hosoda

Unwanted Radiation Measurement (CDMA800)

Test Configuration : Single Unit

Test Date: June 30, 2005
 Temp.: 26 °C, Humi: 76 %

CH	Transmitting Frequency [MHz]	Measured Frequency [MHz]	ERP [dBm]		Limits [dBm]	Margin [dB]	Remarks
			Hori.	Vert.			
1013	824.730	1649.460	-38.9	-43.9	-13.0	+25.9	C
		2474.190	-41.3	-43.4	-13.0	+28.3	C
		3298.920	-34.4	-34.0	-13.0	+21.0	C
		4123.650	-30.1	-31.0	-13.0	+17.1	C
		4948.380	-37.0	-37.6	-13.0	+24.0	C
		5773.110	-38.5	< -39.7	-13.0	+25.5	C
		6597.840	-38.6	< -39.9	-13.0	+25.6	C
		7422.570	< -38.2	< -38.2	-13.0	> +25.2	C
		8247.300	< -42.9	< -42.9	-13.0	> +29.9	C
383	836.490	1672.980	-37.5	-41.2	-13.0	+24.5	C
		2509.470	-30.7	-32.5	-13.0	+17.7	C
		3345.960	-34.2	-33.9	-13.0	+20.9	C
		4182.450	-18.8	-23.8	-13.0	+ 5.8	C
		5018.940	-35.9	-37.3	-13.0	+22.9	C
		5855.430	-28.5	-31.4	-13.0	+15.5	C
		6691.920	-38.0	-38.2	-13.0	+25.0	C
		7528.410	< -38.1	< -38.1	-13.0	> +25.1	C
		8364.900	< -43.0	< -43.0	-13.0	> +30.0	C
777	848.310	1696.620	-39.7	-41.5	-13.0	+26.7	C
		2544.930	-38.1	-39.9	-13.0	+25.1	C
		3393.240	-33.2	-32.3	-13.0	+19.3	C
		4241.550	-34.4	-32.3	-13.0	+19.3	C
		5089.860	-37.3	-38.7	-13.0	+24.3	C
		5938.170	-37.2	< -39.4	-13.0	+24.2	C
		6786.480	-37.2	-37.7	-13.0	+24.2	C
		7634.790	< -43.4	< -43.4	-13.0	> +30.4	C
		8483.100	< -43.1	-42.0	-13.0	+29.0	C

Sample of calculated result at 4182.5 MHz, as the Minimum Margin point:

Minimum Margin: $-13.0 - (-18.8) = 5.8$ (dB)

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

Applied Limits:

-13.0 [dBm] = $10\log(TP[mW]) - (43 + 10\log(tp[W])) = 10\log(TP[mW]) - (43 + (10 \log(TP[mW]) - 30))$

where $tp[W] = TP[mW] / 1000$: Transmitter power at antenna terminal

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

Test system connection setup:

Cable (9 kHz - 1 GHz)

Cable + 20dB Pad Att. + High Pass Filter (D-94) - Pre-Amplifier (1.0 GHz - 3.6 GHz)

Cable + 10dB Pad Att. + High Pass Filter (D-94) - Pre-Amplifier (7.6 GHz - 10 GHz)

Note: The spectrum was scanned 9 kHz to 10 GHz and all emissions not reported were more than 20 dB below the applied limits.

Remarks:

	Detector Function	RES B.W.	V.B.W.	Sweep Time
A	Peak	10 kHz	30 kHz	AUTO
B	Peak	100 kHz	300 kHz	AUTO
C	Peak	1 MHz	3 MHz	AUTO

Tester: _____ Akio Hosoda

Occupied Bandwidth Measurement CDMA800

Test Date: July 1, 2005

Temp.: 21 °C ; Humi.: 70 %

CH No.	Transmitting Frequency(MHz)	26dB Bandwidth	99% Bandwidth	Data Page*
1013	824.70	1.40 MHz	1.27 MHz	Page 2
383	836.49	1.41 MHz	1.29 MHz	Page 3
777	848.31	1.40 MHz	1.28 MHz	Page 4

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 CDMA800

Test Date: July 1, 2005Temp.: 21 °C ; Humi.: 70 %

1) Low Band-Edge Measurement

CH	Transmitting Frequency(MHz)	Band-Edge Frequency(MHz)	Band-Edge Level[dBm]	Data Page*
1013	824.70	824.00	-18.36	Page 6

2) High Band-Edge Measurement

CH	Transmitting Frequency(MHz)	Band-Edge Frequency(MHz)	Band-Edge Level[dBm]	Data Page*
777	848.31	849.0	-16.40	Page 7

- Note) 1. *: The Data Page is one in Attachment A.
2. The point shown on "_____" is the Minimum Point.

Tester : Shigeru Kinoshita

Frequency Stability Measurement (CDMA800)

Test Date: July 5, 2005

1. Frequency Stability Measurement versus Temperature

Transmitting Frequency : 836.490 MHz (383 ch)
 DC Supply Voltage : 3.7 VDC

Ambient Temperature [°C]	Startup	Deviation [ppm]			Limits [ppm]	Margin [ppm]
		2 minutes	5 minutes	10 minutes		
-30	- 0.02	+ 0.02	- 0.01	- 0.01	2.50	+ 2.48
-20	+ 0.01	+ 0.01	+ 0.01	+ 0.01	2.50	+ 2.49
-10	- 0.01	- 0.02	- 0.01	+ 0.02	2.50	+ 2.48
0	+ 0.01	+ 0.01	+ 0.01	- 0.01	2.50	+ 2.49
10	- 0.01	- 0.01	+ 0.01	+ 0.02	2.50	+ 2.48
20	+ 0.01	+ 0.01	+ 0.01	+ 0.01	2.50	+ 2.49
30	+ 0.01	- 0.01	- 0.01	+ 0.01	2.50	+ 2.49
40	+ 0.01	+ 0.01	+ 0.01	+ 0.01	2.50	+ 2.49
50	+ 0.01	+ 0.01	- 0.01	+ 0.01	2.50	+ 2.49

2. Frequency Stability Measurement versus Power Supply Voltage

Transmitting Frequency : 836.490 MHz (383 ch)
 DC Supply Voltage : 20 °C

Ambient Temperature [°C]	Startup	Deviation [ppm]			Limits [ppm]	Margin [ppm]
		2 minutes	5 minutes	10 minutes		
3.7	+ 0.01	+ 0.01	+ 0.01	+ 0.01	2.50	+ 2.49
3.35(Ending)	+ 0.01	+ 0.01	+ 0.01	+ 0.02	2.50	+ 2.48

Sample of calculated result at 836.490 MHz, as the Minimum Margin point:

Ambient Temperature : -30 °C / Startup

DC Supply Voltage : 3.7 VDC

Minimum Margin: $2.50 - 0.02 = 2.48$ (ppm)

The point shown on “ ____ ” is the Minimum Margin Point. The Maximum Deviation Point is shown on a thick letter.

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

Tester: Yuichi Fukumoto