



# FCC Test Report

According to

## 47 CFR Part 15 Subpart B

**Equipment** : CDMA 2000 1xRTT Mobile Phone

**Trade Name** : Nokia

**Model No.** : RH-109

**FCC ID** : QMNRH-109

**Filing Type** : Certification

**Applicant** : Nokia Inc.

12278 Scripps Summit Dr. San Diego CA92131 USA

- The test result refers exclusively to the test presented test model / sample.
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- Report Version: Rev. 04B.

**SPORTON International Inc.**

**No. 52, Hwa Ya 1<sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.**

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**SPORTON International Inc.**

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Report Version: Rev. 04B

FCC ID: QMNRH-109



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### Appendix A. Photographs of EUT

### Appendix B. Setup Photographs



## **History of This Test Report**

Report Issue Date: May 06, 2008

| <b>Report No.</b> | <b>Description</b>                                     |
|-------------------|--|
| CB820515 R01      | Initial creation of document                           |
| CB820515 R02      | Add FCC rule   |
| CB820515 R03      | Add FCC ID and IC ID to footer of report               |
| CB820515 R04B     | Remove IC rule and change filing type to certification |
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Certificate No. : CB820515

# CERTIFICATE OF COMPLIANCE

According to

## 47 CFR Part 15 Subpart B

**Equipment** : CDMA 2000 1xRTT Mobile Phone

**Trade Name** : Nokia

**Model No.** : RH-109

**FCC ID** : QMNRH-109

**Filing Type** : Certification

**Applicant** : Nokia Inc.

12278 Scripps Summit Dr. San Diego CA92131 USA

### I HEREBY CERTIFY THAT:

The measurements shown in this test report were made in accordance with the procedures given in ANSI C63.4 - 2003 and the energy emitted by this equipment was passed FCC Part 15 B in both radiated and conducted emission class B limits. Testing was carried out on Apr. 08, 2008 at SPORTON International Inc. LAB.

Technical Reviewer  
Jones Tsai

Report Reviewer  
Roy Wu

**SPORTON International Inc.**

No. 52, Hwa Ya 1<sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



## 1. General Description of Equipment under Test

### 1.1 Applicant

**Nokia Inc.**  
12278 Scripps Summit Dr. San Diego CA92131 USA

### 1.2 Manufacturer

**Compal Communications(Nanjing) Co., Ltd.**  
Nanjing Jiangning Export Processing Zone (South Area) No.68-2 Suyuan Street

### 1.3 Basic Description of Equipment under Test

|            |                              |   |
|------------|------------------------------|---|
| Equipment  | CDMA 2000 1xRTT Mobile Phone |   |
| Trade Name | Nokia                        |   |
| Model No.  | RH-109                       |   |
| FCC ID     | QMNRH-109                    |   |
| AC Adapter | Manufacture                  | ASTEC   |
|            | Brand Name                   | NOKIA   |
|            | Model Name                   | AC-6U   |
|            | Power Rating                 | I/P: 100-240Vac, 50-60Hz, 150mA<br>O/P: 5.0Vdc, 550mA |
|            | AC Power Cord Type           | 1.7 meter shielded cable without ferrite core         |
| Battery    | Manufacture                  | PANASONIC   |
|            | Brand Name                   | NOKIA   |
|            | Model Name                   | BL-4B   |
|            | Power Rating                 | 3.7Vdc, 700mAh  |
|            | Type                         | Li-ion  |
| Earphone 1 | Manufacture                  | Hosiden   |
|            | Brand Name                   | NOKIA   |
|            | Model Name                   | HS-49   |
|            | Signal Line Type             | 1.7 meter non-shielded cable without ferrite core     |
| Earphone 2 | Manufacture                  | Hosiden   |
|            | Brand Name                   | NOKIA   |
|            | Model Name                   | HS-9  |
|            | Signal Line Type             | 1.3 meter non-shielded cable without ferrite core     |
| USB Cable  | Manufacture                  | CHENG UEI   |
|            | Brand Name                   | NOKIA   |
|            | Model Name                   | CA-101  |
|            | Signal Line Type             | 1.1 meter shielded cable with ferrite core            |

Remark: Above EUT's information was declared by manufacturer. Please refer to the specifications of manufacturer or User's Manual for more detailed features description.



## 1.4 Feature of Equipment under Test

| Product Feature & Specification  |  |
|--|--|
| <b>DUT Type</b>  | CDMA 2000 1xRTT Mobile Phone   |
| <b>Trade Name</b>  | Nokia  |
| <b>Model No.</b>   | RH-109   |
| <b>FCC ID</b>  | QMNRH-109  |
| <b>MEID</b>  | 268435456102522605   |
| <b>Tx Frequency</b>  | CDMA2000 Cellular : 824 MHz ~ 849 MHz<br>CDMA2000 AWS : 1710 ~ 1755 MHz<br>CDMA2000 PCS : 1850 MHz ~ 1910 MHz                                |
| <b>Rx Frequency</b>  | CDMA2000 Cellular : 869 MHz ~ 894 MHz<br>CDMA2000 AWS : 2110 ~ 2155 MHz<br>CDMA2000 PCS : 1930 MHz ~ 1990 MHz                                |
| <b>Maximum Output Power to Antenna</b>                                       | <b>CDMA2000 Cellular</b><br>RC3_SO55 : 24.31 dBm<br><b>CDMA2000 AWS</b><br>RC2_SO9 : 24.53 dBm<br><b>CDMA2000 PCS</b><br>RC5_SO9 : 24.24 dBm |
| <b>Type of Antenna Connector</b>   | N/A  |
| <b>Antenna Type</b>  | Fixed Internal   |
| <b>HW Version</b>  | 3200   |
| <b>SW Version</b>  | PL_2100T_GEN   |
| <b>Power Rating<br/>(DC/AC, Voltage and Current of RF<br/>element or PA)</b> | 500mA, 4.2V  |
| <b>Type of Modulation</b>  | QPSK   |



## 2. Test Configuration of Equipment under Test

### 2.1 Test Manner

a. The EUT has been setup pursuant to ANSI C63.4-2003 and configuration operated in a manner which tended to maximize its emission characteristics in a typical application.

b. The complete test system refers to 2.2 for EMI test.

c. The following test modes were tested for conduction test:

Mode 1 : CDMA2000 Cellular Idle Mode + GPS Rx + USB Link + Earphone 1

Mode 2 : CDMA2000 Cellular Idle Mode + GPS Rx + USB Link + Earphone 2

Mode 3 : CDMA2000 PCS Idle Mode + GPS Rx + USB Link + Earphone 1

Mode 4 : CDMA2000 AWS Idle Mode + GPS Rx + USB Link + Earphone 1

Remark : In Cellular band, the worst case of conducted emission is EUT with earphone 1. Only EUT with earphone 1 was used for testing in PCS and AWS bands.

d. The following test modes were tested for radiation test:

Mode 1 : CDMA2000 Cellular Idle Mode + GPS Rx + USB Link + Earphone 1

Mode 2 : CDMA2000 Cellular Idle Mode + GPS Rx + USB Link + Earphone 2

Mode 3 : CDMA2000 PCS Idle Mode + GPS Rx + USB Link + Earphone 1

Mode 4 : CDMA2000 AWS Idle Mode + GPS Rx + USB Link + Earphone 1

Remark : In Cellular band, the worst case of radiated emission is EUT with earphone 1. Only EUT with earphone 1 was used for testing in PCS and AWS bands.

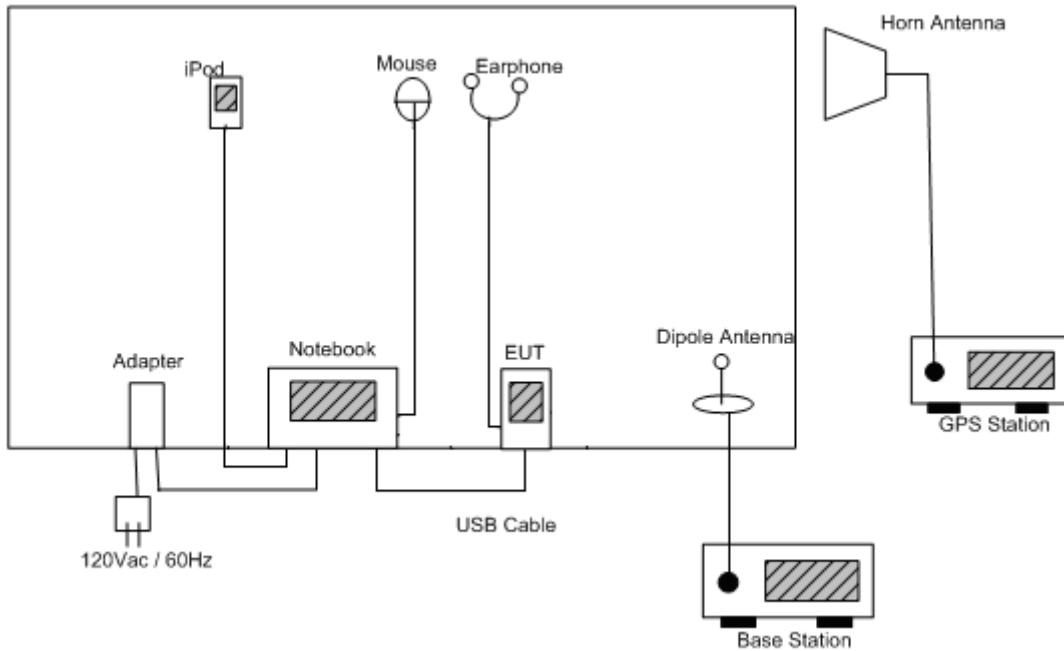
e. Frequency range investigated: conduction 150 kHz to 30 MHz, radiation 30 MHz to 13 GHz.

### 2.2 Description of Test System

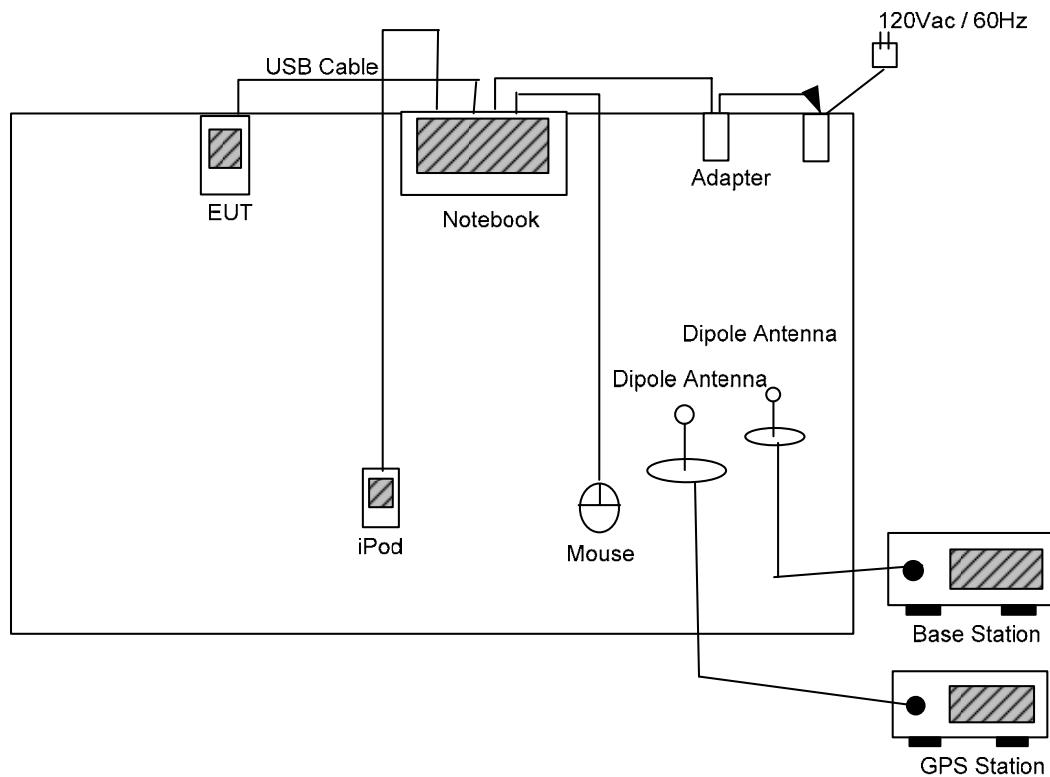
| Item | Equipment      | Trade Name | Model Name | FCC ID    | Data Cable       | Power Cord                                    |
|------|----------------|------------|------------|-----------|------------------|---|
| 1.   | Base Station   | R&S        | CMU 200    | N/A       | N/A              | Unshielded, 1.8 m                             |
| 2.   | Notebook       | DELL       | D400       | E2K24GBRL | N/A              | I/P: Unshielded, 1.8 m<br>O/P: Shielded, 1.2m |
| 3.   | GPS Station    | T&E        | GS-50      | N/A       | N/A              | Unshielded, 1.8                               |
| 4.   | (RS-232) Mouse | State      | MS-303     | DoC       | Unshielded, 1.2m | N/A   |
| 5.   | iPod           | Apple      | A1199      | DoC       | Shielded, 1.2m   | N/A   |
| 6.   | Dipole Antenna | N/A        | N/A        | N/A       | N/A              | N/A   |
| 7.   | Horn Antenna   | N/A        | N/A        | N/A       | N/A              | N/A   |

## 2.3 Connection Diagram of Test System

### <Radiated Emission>



### <Conducted Emission>





### 3. Test Software

The EUT is in CDMA2000 Idle mode controlled by Base Station Simulator.

At the same time, the GPS function was continuously received signal from GPS base station.

In USB link mode, the EUT was tested with a notebook connected via USB interface port. The phone modem drivers were installed on the notebook to be able to communicate with the phone by sending a file to the phone using "EFS Explorer" program.

For associated equipment, the executive program, EMCTEST.EXE under WINXP installed in notebook generates a complete line of continuously repeating "H" pattern were used as the test software.

The programs were executed as follows:

- a. Turn on the power of all equipment.
- b. The notebook reads the test program from the hard disk drive and runs it.
- c. The notebook sends "H" messages to the panel, and the panel displays "H" patterns on the screen.
- d. The notebook sends "H" messages to the internal hard disk, and the hard disk reads and writes the message.
- e. Repeat the steps from b to d.



## 4. General Information of Test

### 4.1 Test Facility

Test Site Location : No. 52, Hwa Ya 1<sup>st</sup> Rd., Hwa Ya Technology Park,  
Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.  
TEL : 886-3-327-3456  
FAX : 886-3-328-4978  
Test Site No. : CO04-HY, 03CH06-HY  
FCC Designation No.: TW1022

### 4.2 Test Voltage

AC 120V / 60Hz

### 4.3 Standard for Methods of Measurement

ANSI C63.4-2003

### 4.4 Test Compliance

FCC Part 15 Subpart B

### 4.5 Frequency Range

- a. Conduction: from 150 kHz to 30 MHz
- b. Radiation: from 30 MHz to 13000MHz

### 4.6 Test Distance

The test distance of radiated emission from antenna to EUT is 3m.



## 5. Test of Conducted Powerline

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 kHz and return leads of the EUT according to the methods defined in ANSI C63.4-2003 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 5.3. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

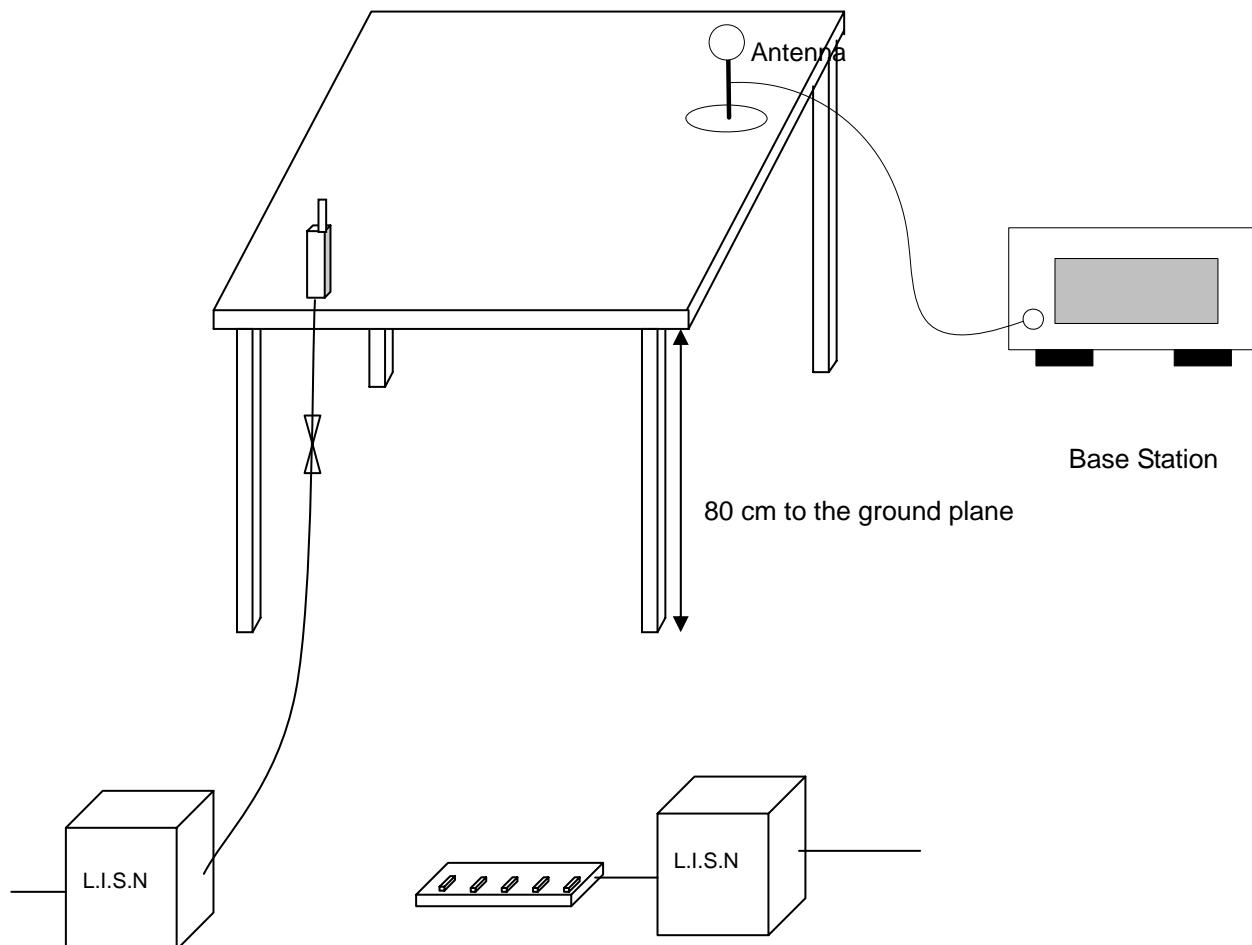
### 5.1 Major Measuring Instruments

As described in Chapter 7.

### 5.2 Test Procedures

- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- c. All the support units are connecting to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 kHz to 30 MHz was searched.
- h. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

### 5.3 Typical Test Setup Layout of Conducted Powerline



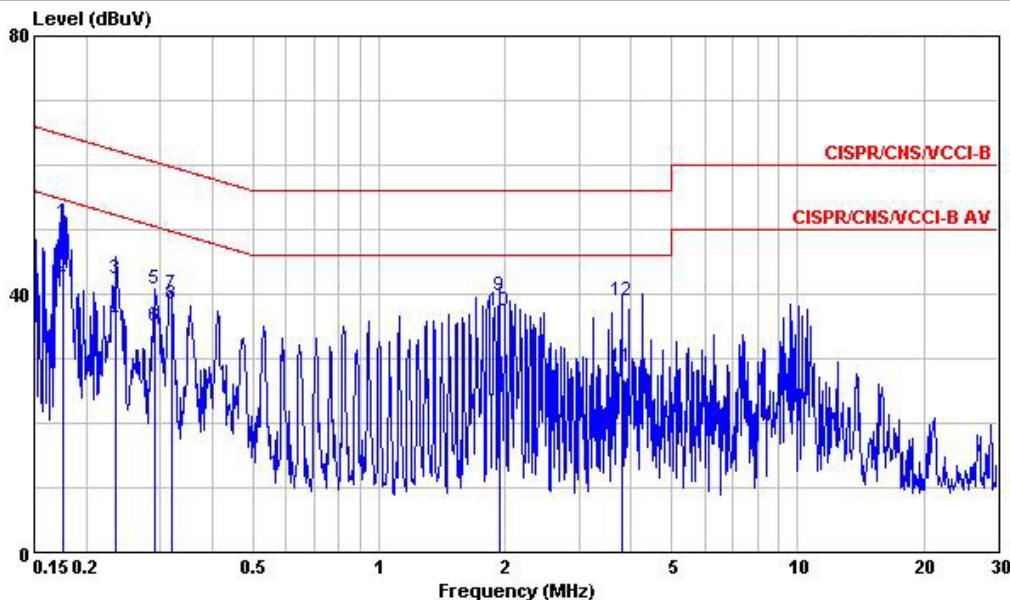


## 5.4 Test Result of AC Powerline Conducted Emission

### 5.4.1 Test Mode: Mode 1

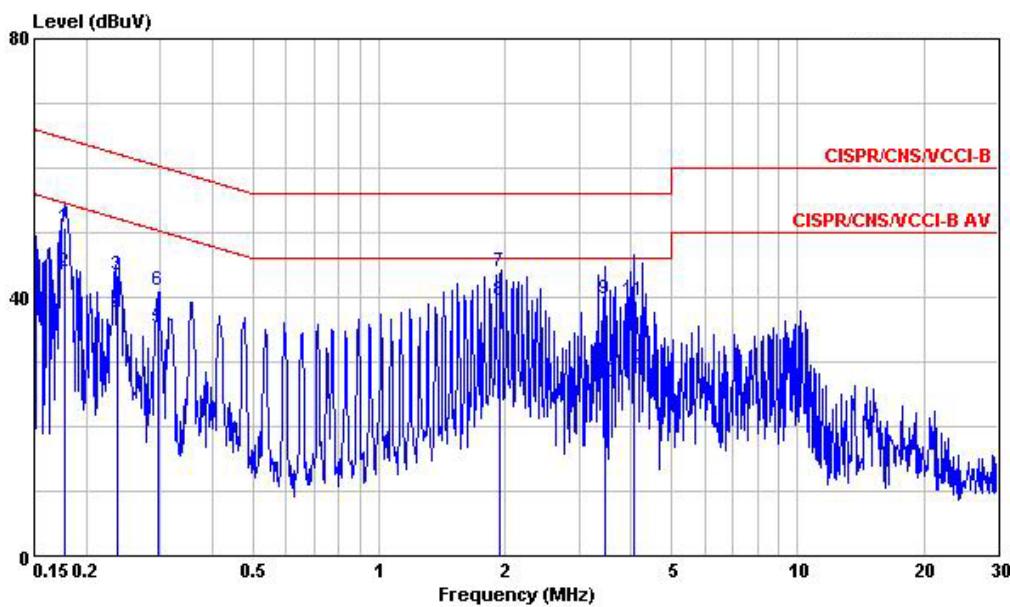
- Frequency Range of Test: from 0.15 MHz to 30 MHz
- Temperature: 26~27°C
- Relative Humidity: 36~37%
- Test Engineer: Happyer
- All emissions not reported here are more than 10 dB below the prescribed limit.

**The test that passed at the minimum margin was marked by a frame in the following data**



Site : CO04-HY  
Condition : CISPR/CNS/VCCI-B LISN 200704 99041 LINE  
EUT : Phone  
POWER: From System  
Model : FD820515  
Memo : CDMA 1xRTT Cellular Idle+GPS Rx+USB Link  
:+Earphone

| Freq<br>MHz | Level<br>dBuV | Over<br>Limit<br>dB | Limit<br>Line<br>dBuV | Read<br>Level<br>dBuV | LISN<br>Factor | Cable<br>Loss<br>dB | Remark  |        |
|-------------|---------------|---------------------|-----------------------|-----------------------|----------------|---------------------|---------|--------|
|             |               |                     |                       |                       |                |                     | Remark  | Remark |
| 1 0.1758420 | 51.14         | -13.54              | 64.68                 | 50.90                 | 0.10           | 0.14                | QP      |        |
| 2 0.1758420 | 42.75         | -11.93              | 54.68                 | 42.51                 | 0.10           | 0.14                | Average |        |
| 3 0.2353310 | 42.36         | -19.90              | 62.26                 | 41.98                 | 0.10           | 0.28                | QP      |        |
| 4 0.2353310 | 35.87         | -16.39              | 52.26                 | 35.49                 | 0.10           | 0.28                | Average |        |
| 5 0.2924290 | 40.78         | -19.68              | 60.46                 | 40.22                 | 0.10           | 0.46                | QP      |        |
| 6 0.2924290 | 35.01         | -15.45              | 50.46                 | 34.45                 | 0.10           | 0.46                | Average |        |
| 7 0.3183010 | 40.10         | -19.65              | 59.75                 | 39.46                 | 0.10           | 0.54                | QP      |        |
| 8 0.3183010 | 38.50         | -11.25              | 49.75                 | 37.86                 | 0.10           | 0.54                | Average |        |
| 9 1.940     | 39.73         | -16.27              | 56.00                 | 39.20                 | 0.10           | 0.43                | QP      |        |
| 10 1.940    | 37.48         | -8.52               | 46.00                 | 36.95                 | 0.10           | 0.43                | Average |        |
| 11 3.820    | 28.56         | -17.44              | 46.00                 | 28.13                 | 0.10           | 0.33                | Average |        |
| 12 3.820    | 39.01         | -16.99              | 56.00                 | 38.58                 | 0.10           | 0.33                | QP      |        |



Site : CO04-HY  
Condition : CISPR/CNS/VCCI-B LISN 200704 99041 NEUTRAL  
EUT : Phone  
POWER: From System  
Model : FD820515  
Memo : CDMA 1xRTT Cellular Idle+GPS Rx+USB Link  
:+Earphone

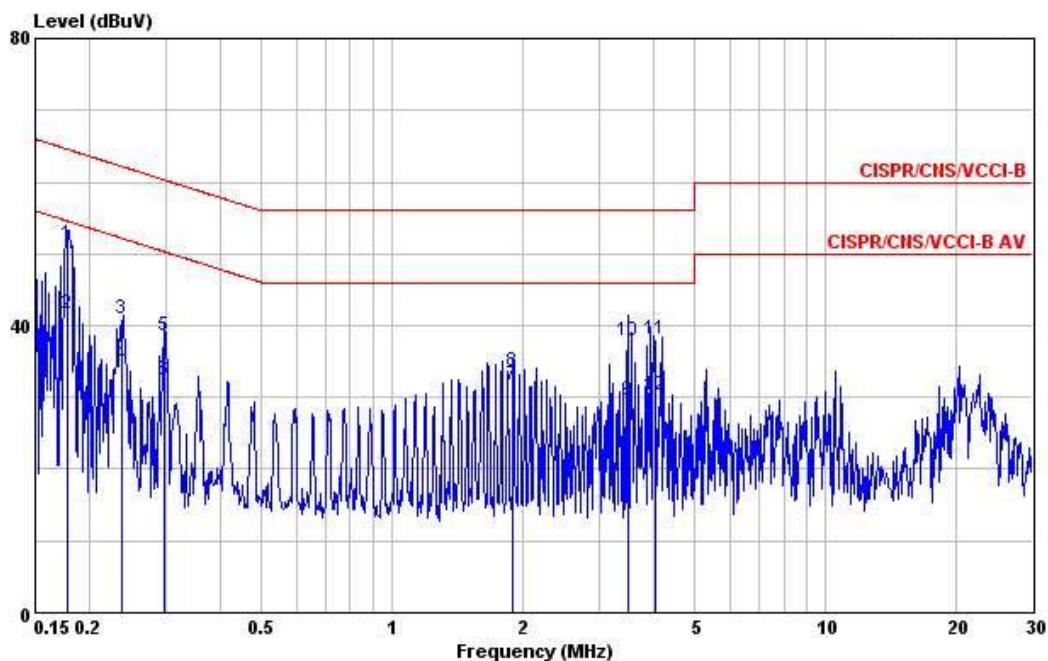
| Freq<br>MHz | Level<br>dBuV | Over<br>Limit<br>dB | Limit<br>Line<br>dBuV | Read<br>Level<br>dBuV | LISN<br>Factor | Cable<br>Loss<br>dB |              | Remark |
|-------------|---------------|---------------------|-----------------------|-----------------------|----------------|---------------------|--------------|--------|
|             |               |                     |                       |                       |                | Over<br>Limit<br>dB | Line<br>dBuV |        |
| 1 0.1777150 | 50.84         | -13.75              | 64.59                 | 50.60                 | 0.10           | 0.14                |              |        |
| 2 0.1777150 | 43.95         | -10.64              | 54.59                 | 43.71                 | 0.10           | 0.14                | Average      |        |
| 3 0.2378380 | 43.35         | -18.82              | 62.17                 | 42.96                 | 0.10           | 0.29                | QP           |        |
| 4 0.2378380 | 37.02         | -15.15              | 52.17                 | 36.63                 | 0.10           | 0.29                | Average      |        |
| 5 0.2961430 | 35.20         | -15.15              | 50.35                 | 34.62                 | 0.10           | 0.48                | Average      |        |
| 6 0.2961430 | 41.04         | -19.31              | 60.35                 | 40.46                 | 0.10           | 0.48                | QP           |        |
| 7 1.943     | 44.05         | -11.95              | 56.00                 | 43.52                 | 0.10           | 0.43                | QP           |        |
| 8 1.943     | 39.58         | -6.42               | 46.00                 | 39.05                 | 0.10           | 0.43                | Average      |        |
| 9 3.454     | 39.70         | -16.30              | 56.00                 | 39.18                 | 0.18           | 0.34                | QP           |        |
| 10 3.454    | 26.81         | -19.19              | 46.00                 | 26.29                 | 0.18           | 0.34                | Average      |        |
| 11 4.050    | 39.42         | -16.58              | 56.00                 | 38.90                 | 0.20           | 0.32                | QP           |        |
| 12 4.050    | 28.88         | -17.12              | 46.00                 | 28.36                 | 0.20           | 0.32                | Average      |        |



## 5.4.2 Test Mode: Mode 2

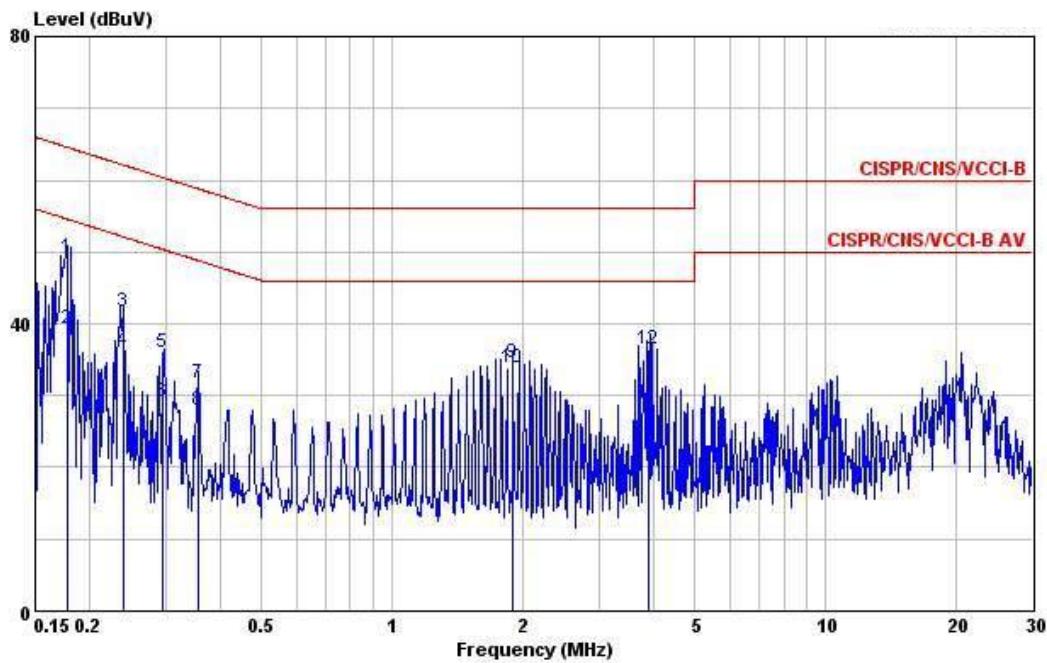
- Frequency Range of Test: from 0.15 MHz to 30 MHz
- Temperature: 26~27°C
- Relative Humidity: 36~37%
- Test Engineer: Happyer
- All emissions not reported here are more than 10 dB below the prescribed limit.

The test that passed at the minimum margin was marked by a frame in the following data



Site : CO04-HY  
Condition : CISPR/CNS/VCCI-B LISN 200704 99041 LINE  
EUT : Phone  
POWER: From System  
Model : FD820515  
Memo : CDMA 1xRTT Cellular Idle+GPS Rx  
:+USB Link+Earpiece 2

| Freq        | Level | Over Limit | Limit Line | Read Level | LISN Factor | Cable |         |
|-------------|-------|------------|------------|------------|-------------|-------|---------|
|             |       |            |            |            |             | dBuV  | dB      |
| 1 0.1786590 | 51.27 | -13.28     | 64.55      | 51.03      | 0.10        | 0.14  | QP      |
| 2 0.1786590 | 41.62 | -12.93     | 54.55      | 41.38      | 0.10        | 0.14  | Average |
| 3 0.2386720 | 40.90 | -21.24     | 62.14      | 40.51      | 0.10        | 0.29  | QP      |
| 4 0.2386720 | 34.53 | -17.61     | 52.14      | 34.14      | 0.10        | 0.29  | Average |
| 5 0.2986930 | 38.67 | -21.61     | 60.28      | 38.09      | 0.10        | 0.48  | QP      |
| 6 0.2986930 | 32.54 | -17.74     | 50.28      | 31.96      | 0.10        | 0.48  | Average |
| 7 1.897     | 31.61 | -14.39     | 46.00      | 31.08      | 0.10        | 0.43  | Average |
| 8 1.897     | 33.68 | -22.32     | 56.00      | 33.15      | 0.10        | 0.43  | QP      |
| 9 3.503     | 29.66 | -16.34     | 46.00      | 29.22      | 0.10        | 0.34  | Average |
| 10 3.503    | 37.78 | -18.22     | 56.00      | 37.34      | 0.10        | 0.34  | QP      |
| 11 4.034    | 37.99 | -18.01     | 56.00      | 37.57      | 0.10        | 0.32  | QP      |
| 12 4.034    | 30.39 | -15.61     | 46.00      | 29.97      | 0.10        | 0.32  | Average |



Site : CO04-HY

Condition : CISPR/CNS/VCCI-B LISN 200704 99041 NEUTRAL

EUT : Phone

POWER: From System

Model : FD820515

Memo : CDMA 1xRTT Cellular Idle+GPS Rx

:+USB Link+Earphone 2

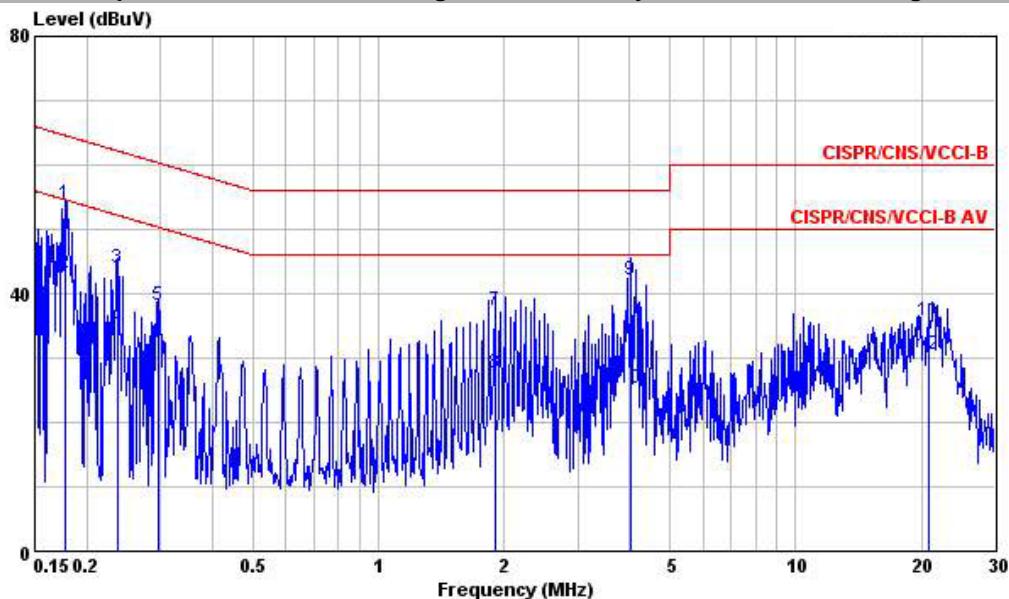
| Freq | MHz       | Over Level | Limit  | Read Line | LISN Level | Cable Factor | Remark |         |
|------|-----------|------------|--------|-----------|------------|--------------|--------|---------|
|      |           |            |        |           |            |              | dB     | dBuV    |
| 1    | 0.1786590 | 49.30      | -15.25 | 64.55     | 49.06      | 0.10         | 0.14   | QP      |
| 2    | 0.1786590 | 39.38      | -15.17 | 54.55     | 39.14      | 0.10         | 0.14   | Average |
| 3    | 0.2391010 | 41.63      | -20.50 | 62.13     | 41.24      | 0.10         | 0.29   | QP      |
| 4    | 0.2391010 | 36.27      | -15.86 | 52.13     | 35.88      | 0.10         | 0.29   | Average |
| 5    | 0.2957430 | 35.89      | -24.47 | 60.36     | 35.31      | 0.10         | 0.48   | QP      |
| 6    | 0.2957430 | 29.11      | -21.25 | 50.36     | 28.53      | 0.10         | 0.48   | Average |
| 7    | 0.3557620 | 31.72      | -27.11 | 58.83     | 30.99      | 0.10         | 0.63   | QP      |
| 8    | 0.3557620 | 28.05      | -20.78 | 48.83     | 27.32      | 0.10         | 0.63   | Average |
| 9    | 1.895     | 34.55      | -21.45 | 56.00     | 34.02      | 0.10         | 0.43   | QP      |
| 10   | 1.895     | 33.76      | -12.24 | 46.00     | 33.23      | 0.10         | 0.43   | Average |
| 11   | 3.908     | 28.78      | -17.22 | 46.00     | 28.26      | 0.20         | 0.32   | Average |
| 12   | 3.908     | 36.55      | -19.45 | 56.00     | 36.03      | 0.20         | 0.32   | QP      |



## 5.4.3 Test Mode: Mode 3

- Frequency Range of Test: from 0.15 MHz to 30 MHz
- Temperature: 26~27°C
- Relative Humidity: 36~37%
- Test Engineer: Happyer
- All emissions not reported here are more than 10 dB below the prescribed limit.

The test that passed at the minimum margin was marked by a frame in the following data



Site : CO04-HY  
Condition : CISPR/CNS/VCCI-B LISN 2008 0416 99041 LINE

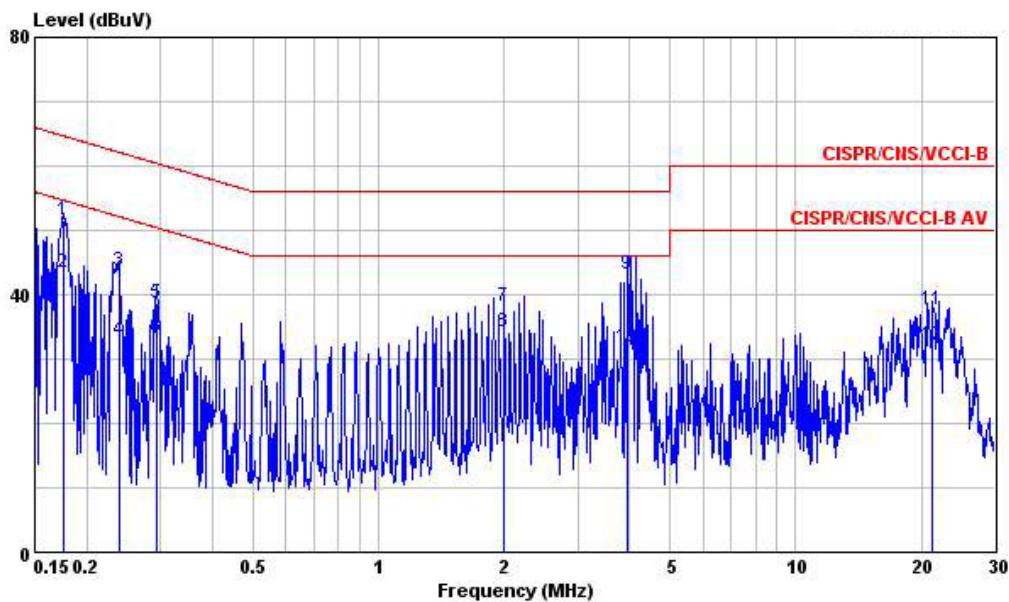
EUT : Phone

POWER: 120V/60Hz

Model : FD820515

Memo : CDMA 1xRTT PCS Idle+GPS Rx  
:+USB Link+Earphone

| Freq         | Over Limit | Limit  | Read Line | LISN  |        | Cable Loss | Remark  |
|--------------|------------|--------|-----------|-------|--------|------------|---------|
|              |            |        |           | Level | Factor |            |         |
| 1 @0.1777150 | 53.87      | -10.72 | 64.59     | 53.64 | 0.09   | 0.14       | QP      |
| 2 @0.1777150 | 43.08      | -11.51 | 54.59     | 42.85 | 0.09   | 0.14       | Average |
| 3 0.2365810  | 43.91      | -18.31 | 62.22     | 43.54 | 0.09   | 0.28       | QP      |
| 4 0.2365810  | 34.67      | -17.55 | 52.22     | 34.30 | 0.09   | 0.28       | Average |
| 5 0.2955450  | 38.27      | -22.10 | 60.37     | 37.70 | 0.10   | 0.47       | QP      |
| 6 0.2955450  | 32.28      | -18.09 | 50.37     | 31.71 | 0.10   | 0.47       | Average |
| 7 1.900      | 37.50      | -18.50 | 56.00     | 36.94 | 0.13   | 0.43       | QP      |
| 8 1.900      | 27.54      | -18.46 | 46.00     | 26.98 | 0.13   | 0.43       | Average |
| 9 @ 4.030    | 42.18      | -13.82 | 56.00     | 41.69 | 0.17   | 0.32       | QP      |
| 10 4.030     | 25.35      | -20.65 | 46.00     | 24.86 | 0.17   | 0.32       | Average |
| 11 20.810    | 35.90      | -24.10 | 60.00     | 35.44 | 0.43   | 0.03       | QP      |
| 12 20.810    | 30.65      | -19.35 | 50.00     | 30.19 | 0.43   | 0.03       | Average |



Site : CO04-HY  
Condition : CISPR/CNS/VCCI-B LISN 2008 0416 99041 NEUTRAL  
EUT : Phone  
POWER: 120V/60Hz  
Model : FD820515  
Memo : CDMA 1xRTT PCS Idle+GPS Rx  
: +USB Link+Earphone

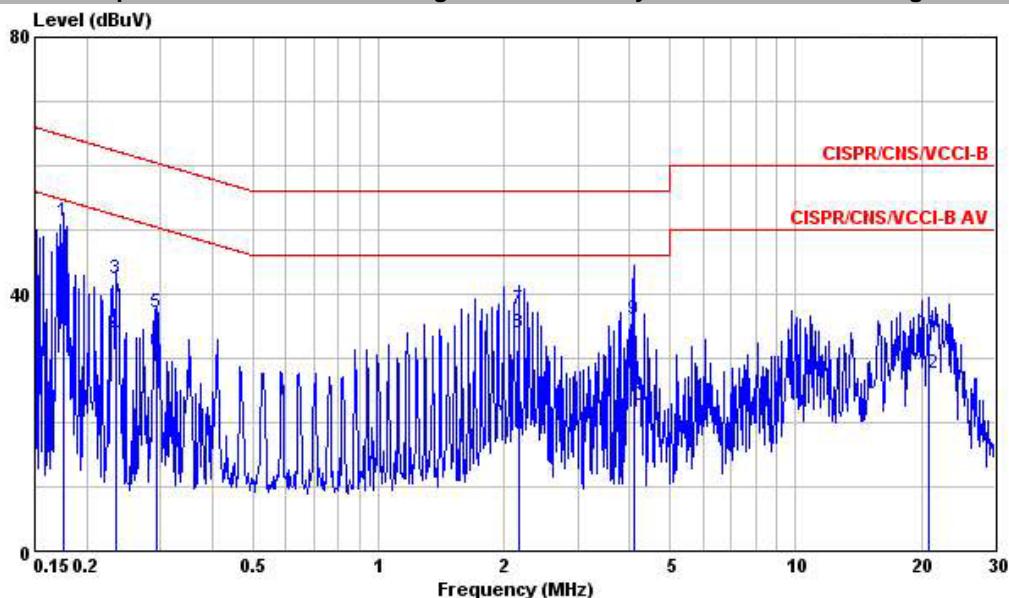
| Freq          | Level | Over Limit | Limit Line | Read Level | LISN Factor | Cable |         | Remark |
|---------------|-------|------------|------------|------------|-------------|-------|---------|--------|
|               |       |            |            |            |             | dBuV  | dB      |        |
| 1 @ 0.1758420 | 51.63 | -13.05     | 64.68      | 51.41      | 0.08        | 0.14  | QP      |        |
| 2 @ 0.1758420 | 43.38 | -11.30     | 54.68      | 43.16      | 0.08        | 0.14  | Average |        |
| 3 @ 0.2391010 | 43.59 | -18.54     | 62.13      | 43.22      | 0.08        | 0.29  | QP      |        |
| 4 @ 0.2391010 | 32.95 | -19.18     | 52.13      | 32.58      | 0.08        | 0.29  | Average |        |
| 5 @ 0.2939830 | 38.79 | -21.62     | 60.41      | 38.23      | 0.09        | 0.47  | QP      |        |
| 6 @ 0.2939830 | 33.41 | -17.00     | 50.41      | 32.85      | 0.09        | 0.47  | Average |        |
| 7 @ 2.000     | 38.16 | -17.84     | 56.00      | 37.61      | 0.12        | 0.43  | QP      |        |
| 8 @ 2.000     | 34.10 | -11.90     | 46.00      | 33.55      | 0.12        | 0.43  | Average |        |
| 9 @ 3.940     | 43.10 | -12.90     | 56.00      | 42.63      | 0.15        | 0.32  | QP      |        |
| 10 @ 3.940    | 31.73 | -14.27     | 46.00      | 31.26      | 0.15        | 0.32  | Average |        |
| 11 @ 21.260   | 37.70 | -22.30     | 60.00      | 37.23      | 0.44        | 0.03  | QP      |        |
| 12 @ 21.260   | 32.15 | -17.85     | 50.00      | 31.68      | 0.44        | 0.03  | Average |        |



## 5.4.4 Test Mode: Mode 4

- Frequency Range of Test: from 0.15 MHz to 30 MHz
- Temperature: 26~27°C
- Relative Humidity: 36~37%
- Test Engineer: Happyer
- All emissions not reported here are more than 10 dB below the prescribed limit.

The test that passed at the minimum margin was marked by a frame in the following data



Site : CO04-HY

Condition : CISPR/CNS/VCCI-B LISN 2008 0416 99041 LINE

EUT : Phone

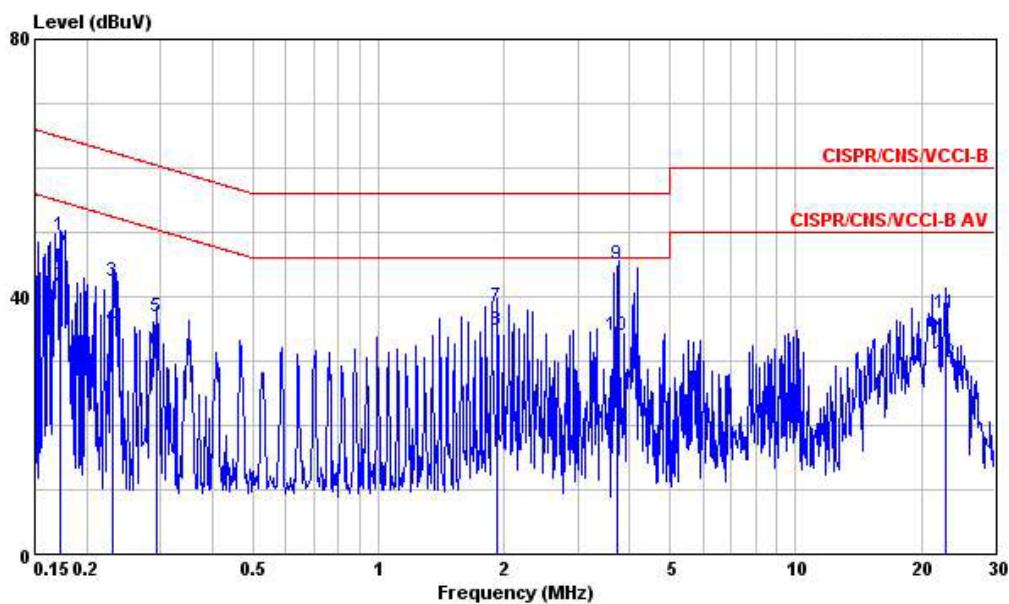
POWER: 120V/60Hz

Model : FD820515

Memo : CDMA 1xRTT AWS Idle+GPS Rx

:+USB Link+Earphone

| Freq         | Level | Over Limit | Limit Line | Read Level | LISN Factor | Cable Loss | Remark  |    |
|--------------|-------|------------|------------|------------|-------------|------------|---------|----|
|              |       |            |            |            |             |            | dBuV    | dB |
| 1 @0.1758420 | 51.44 | -13.24     | 64.68      | 51.21      | 0.09        | 0.14       | QP      |    |
| 2 @0.1758420 | 41.65 | -13.03     | 54.68      | 41.42      | 0.09        | 0.14       | Average |    |
| 3 0.2340870  | 42.29 | -20.01     | 62.30      | 41.92      | 0.09        | 0.28       | QP      |    |
| 4 0.2340870  | 33.31 | -18.99     | 52.30      | 32.94      | 0.09        | 0.28       | Average |    |
| 5 0.2939830  | 37.16 | -23.25     | 60.41      | 36.59      | 0.10        | 0.47       | QP      |    |
| 6 0.2939830  | 30.99 | -19.42     | 50.41      | 30.42      | 0.10        | 0.47       | Average |    |
| 7 2.170      | 37.60 | -18.40     | 56.00      | 37.05      | 0.13        | 0.42       | QP      |    |
| 8 @ 2.170    | 33.84 | -12.16     | 46.00      | 33.29      | 0.13        | 0.42       | Average |    |
| 9 4.110      | 36.10 | -19.90     | 56.00      | 35.61      | 0.17        | 0.32       | QP      |    |
| 10 4.110     | 22.55 | -23.45     | 46.00      | 22.06      | 0.17        | 0.32       | Average |    |
| 11 20.920    | 33.92 | -26.08     | 60.00      | 33.45      | 0.44        | 0.03       | QP      |    |
| 12 20.920    | 27.65 | -22.35     | 50.00      | 27.18      | 0.44        | 0.03       | Average |    |



Site : CO04-HY  
Condition : CISPR/CNS/VCCI-B LISN 2008 0416 99041 NEUTRAL  
EUT : Phone  
POWER: 120V/60Hz  
Model : FD820515  
Memo : CDMA 1xRTT AWS Idle+GPS Rx  
: +USB Link+Earphone

| Freq         | Level | Over Limit | Limit Line | Read Level | LISN | Cable  |         | Remark |
|--------------|-------|------------|------------|------------|------|--------|---------|--------|
|              |       |            |            |            |      | Factor | Loss    |        |
| 1 0.1730690  | 49.44 | -15.37     | 64.81      | 49.22      | 0.08 | 0.14   | QP      |        |
| 2 @0.1730690 | 41.49 | -13.32     | 54.81      | 41.27      | 0.08 | 0.14   | Average |        |
| 3 0.2316200  | 42.41 | -19.98     | 62.39      | 42.07      | 0.08 | 0.26   | QP      |        |
| 4 0.2316200  | 35.22 | -17.17     | 52.39      | 34.88      | 0.08 | 0.26   | Average |        |
| 5 0.2939830  | 36.91 | -23.50     | 60.41      | 36.35      | 0.09 | 0.47   | QP      |        |
| 6 0.2939830  | 31.62 | -18.79     | 50.41      | 31.06      | 0.09 | 0.47   | Average |        |
| 7 1.930      | 38.38 | -17.62     | 56.00      | 37.83      | 0.12 | 0.43   | QP      |        |
| 8 @ 1.930    | 34.82 | -11.18     | 46.00      | 34.27      | 0.12 | 0.43   | Average |        |
| 9 @ 3.739    | 44.95 | -11.05     | 56.00      | 44.47      | 0.15 | 0.33   | QP      |        |
| 10 @ 3.739   | 33.95 | -12.05     | 46.00      | 33.47      | 0.15 | 0.33   | Average |        |
| 11 22.780    | 37.32 | -22.68     | 60.00      | 36.84      | 0.46 | 0.02   | QP      |        |
| 12 22.780    | 29.76 | -20.24     | 50.00      | 29.28      | 0.46 | 0.02   | Average |        |



## **5.5 Photographs of Conducted Powerline Test Configuration**

Please refer to Appendix B



## 6. Test of Radiated Emission

Radiated emissions from 30 MHz to 13 GHz were measured with a bandwidth of 120 kHz and 1MHz according to the methods defines in ANSI C63.4-2003. The EUT was placed on a nonmetallic stand, 0.8 meter above the ground plane, as shown in section 6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

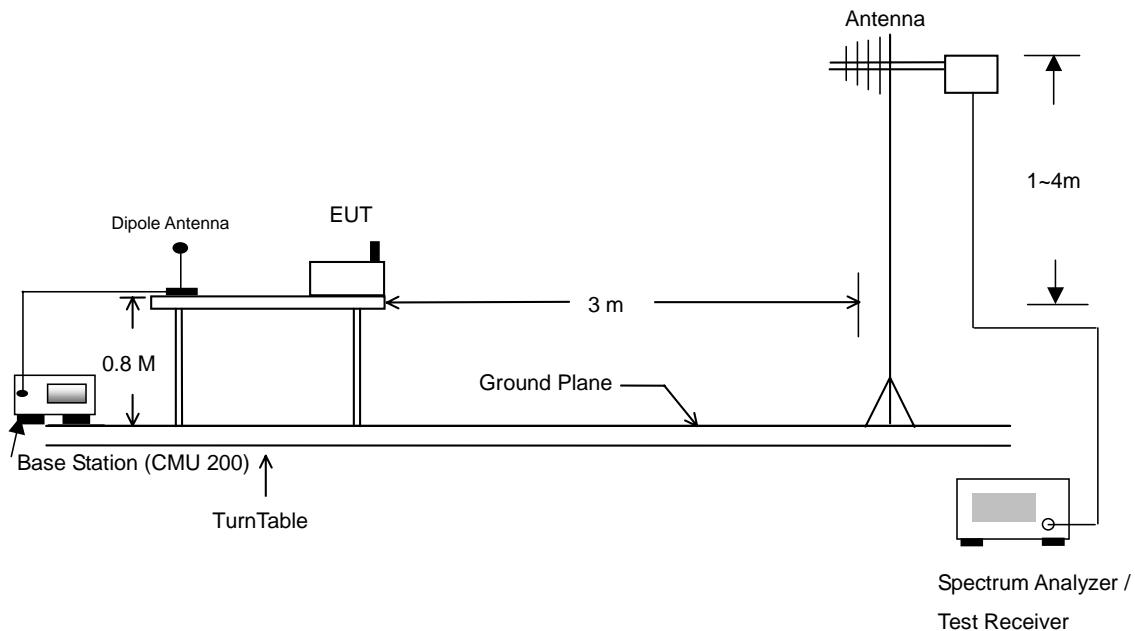
### 6.1 Major Measuring Instruments

As described in Chapter 7.

### 6.2 Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a Bi-Log antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both for horizontal polarization and vertical polarization of the antenna.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported.

### 6.3 Typical Test Setup Layout of Radiated Emission



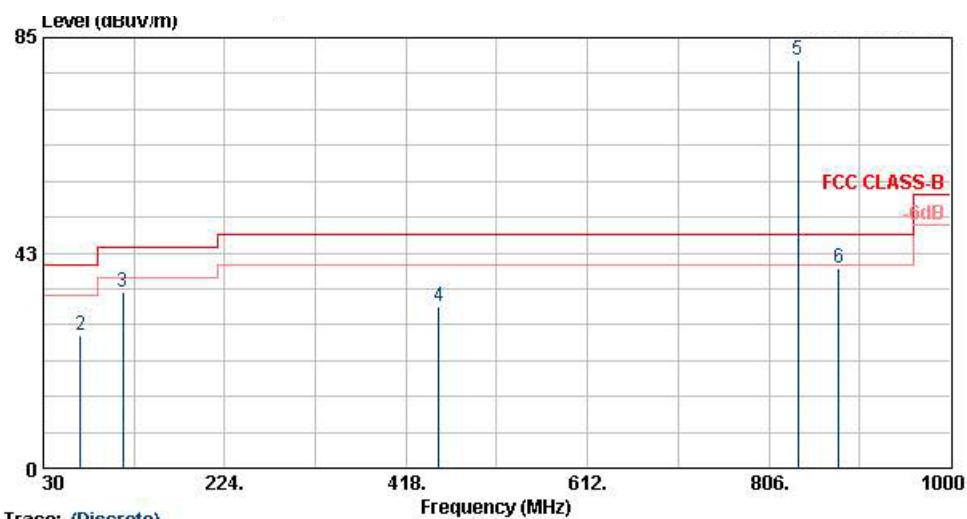


## 6.4 Test Result of Radiated Emission

### 6.4.1 Test Mode: Mode 1

- Test Distance: 3m
- Temperature: 25~26°C
- Relative Humidity: 40~42%
- Emission level (dB<sub>uV/m</sub>) = 20 log Emission level (uV/m)
- Test Engineer: Derek
- Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

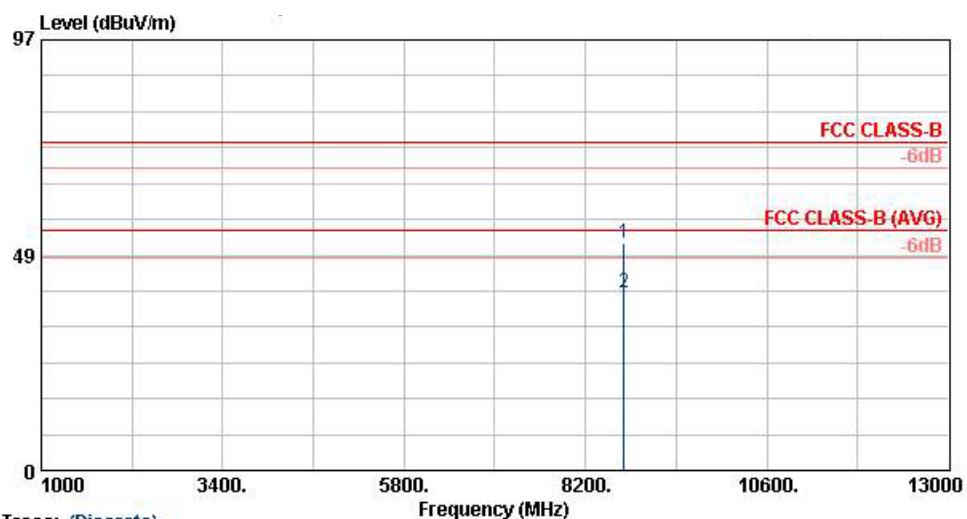
The test that passed at the minimum margin was marked by a frame in the following data



| Freq | Level  | Over Limit | Limit Line | Read  | Antenna Factor | Cable Loss | Preamp Factor | Ant Pos | Table Pos | Remark   |
|------|--------|------------|------------|-------|----------------|------------|---------------|---------|-----------|----------|
|      |        |            |            |       |                |            |               |         |           |          |
|      |        |            |            |       |                |            |               |         |           |          |
| 1    | 30.00  | 24.36      | -15.64     | 40.00 | 37.90          | 19.66      | 0.30          | 33.50   | ---       | --- Peak |
| 2    | 69.69  | 26.15      | -13.85     | 40.00 | 52.37          | 6.89       | 0.40          | 33.51   | ---       | --- Peak |
| 3 @  | 114.78 | 34.69      | -8.81      | 43.50 | 55.61          | 12.13      | 0.50          | 33.55   | 100       | 101 Peak |
| 4    | 453.30 | 32.06      | -13.94     | 46.00 | 47.76          | 16.64      | 0.87          | 33.21   | ---       | --- Peak |
| 5 @  | 836.90 | 80.67      |            |       | 92.04          | 20.08      | 1.20          | 32.65   | ---       | --- Peak |
| 6 @  | 880.30 | 39.39      |            |       | 50.45          | 20.39      | 1.30          | 32.75   | ---       | --- Peak |

Remark:

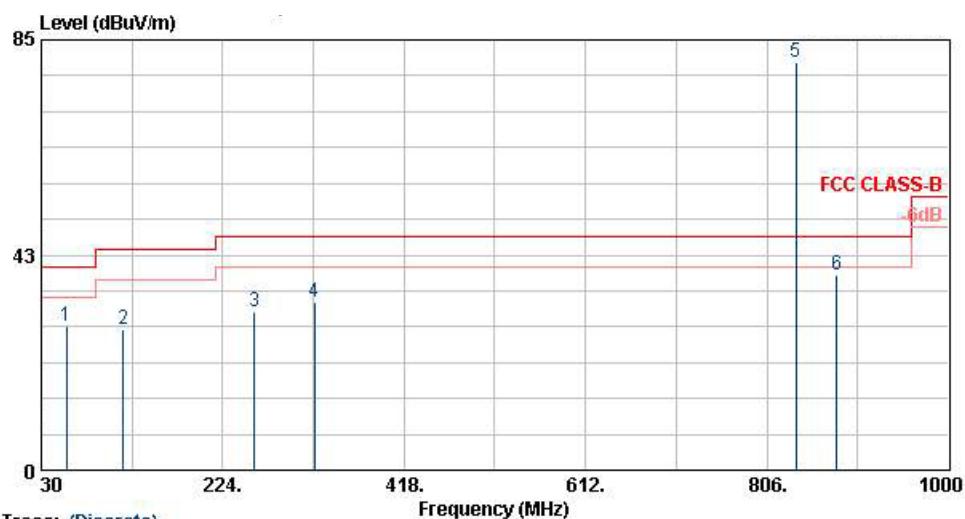
- #5: MS Signal.
- #6: BS Signal.



## Trace: (Discrete)

Site : 03CH06-HY  
Condition : FCC CLASS-B 3m HF-ANT(6-16)-060818 HORIZONTAL  
EUT : Phone  
Power : From System  
Model : FD 820515  
Memo : CDMA LXRTT Cellular Idle + GPS Rx  
Plane : + USB Link + Earphone  
METD : H  
: 266435456102522605

|   | Freq    | Level  | Over   | Limit  | Read  | Antenna | Cable | Preamp | Ant    | Table | Pos     | Pos | Remark |
|---|---------|--------|--------|--------|-------|---------|-------|--------|--------|-------|---------|-----|--------|
|   |         |        | Limit  | Line   | Level | Factor  | Cable | Loss   | Factor | Ant   |         |     |        |
|   | MHz     | dBuV/m | dB     | dBuV/m | dBuV  | dB/m    | dB    | dB     | dB     | cm    |         |     |        |
| 1 | 8708.00 | 51.23  | -22.77 | 74.00  | 44.13 | 36.08   | 7.45  | 36.42  | 100    | 0     | Peak    |     |        |
| 2 | 8708.00 | 40.10  | -13.90 | 54.00  | 32.99 | 36.08   | 7.45  | 36.42  | 100    | 125   | Average |     |        |

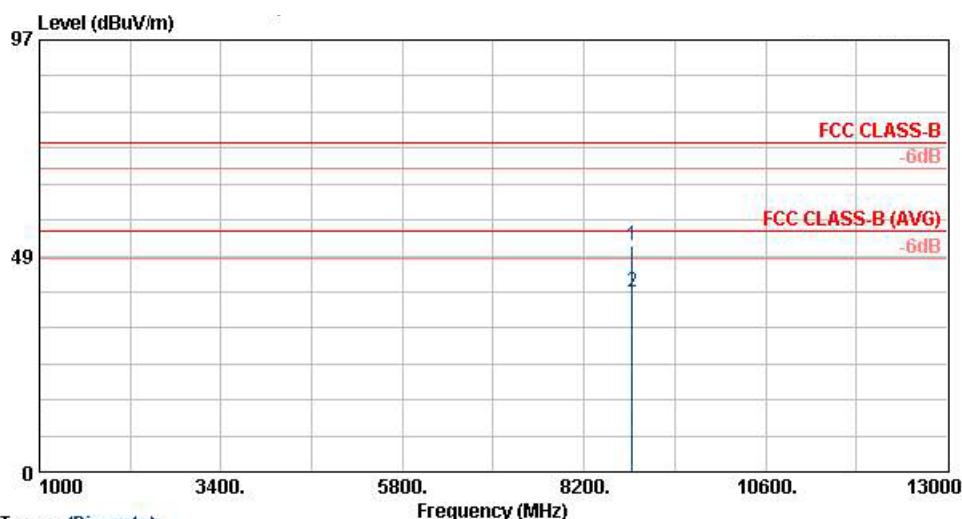


Site : 03CH06-HY  
 Condition : FCC CLASS-B 3m LF-ANT(051112) VERTICAL  
 EUT : Phone  
 Power : From System  
 Model : FD 820515  
 Memo : CDMA 1XRTT Cellular Idle + GPS Rx  
 + USB Link + Earphone  
 Plane : H  
 MEID : 266435456102522605

| Freq | Level | Over   | Limit  | Read   | Antenna | Cable | Preamp | Ant  | Table | Pos | Remark   |
|------|-------|--------|--------|--------|---------|-------|--------|------|-------|-----|----------|
|      |       | MHz    | dBuV/m | dB     | dBuV/m  | dBuV  | dB/m   | dB   | dB    |     |          |
| 1 @  |       | 56.73  | 28.53  | -11.47 | 40.00   | 54.45 | 7.06   | 0.40 | 33.38 | 100 | 321 Peak |
| 2    |       | 117.48 | 27.89  | -15.61 | 43.50   | 48.51 | 12.35  | 0.50 | 33.47 | --- | --- Peak |
| 3    |       | 257.88 | 31.13  | -14.87 | 46.00   | 51.44 | 12.42  | 0.70 | 33.42 | --- | --- Peak |
| 4 @  |       | 322.40 | 33.12  | -12.88 | 46.00   | 51.81 | 13.78  | 0.80 | 33.28 | --- | --- Peak |
| 5 @  |       | 836.90 | 80.68  |        |         | 92.04 | 20.08  | 1.20 | 32.65 | --- | --- Peak |
| 6 @  |       | 880.30 | 38.68  |        |         | 49.74 | 20.39  | 1.30 | 32.75 | --- | --- Peak |

## Remark:

1. #5: MS Signal.
2. #6: BS Signal.



## Trace: (Discrete)

Site : 03CH06-RV  
Condition : FCC CLASS-B 3m HF-ANT(B-18)-060918 VERTICAL  
EUT : Phone  
Power : From System  
Model : FD 820515  
Memo : CDMA 1XRTT Cellular Idle + GPS Rx  
Plane : + USB Link + Earphone  
METD : H  
: 268435456102522605

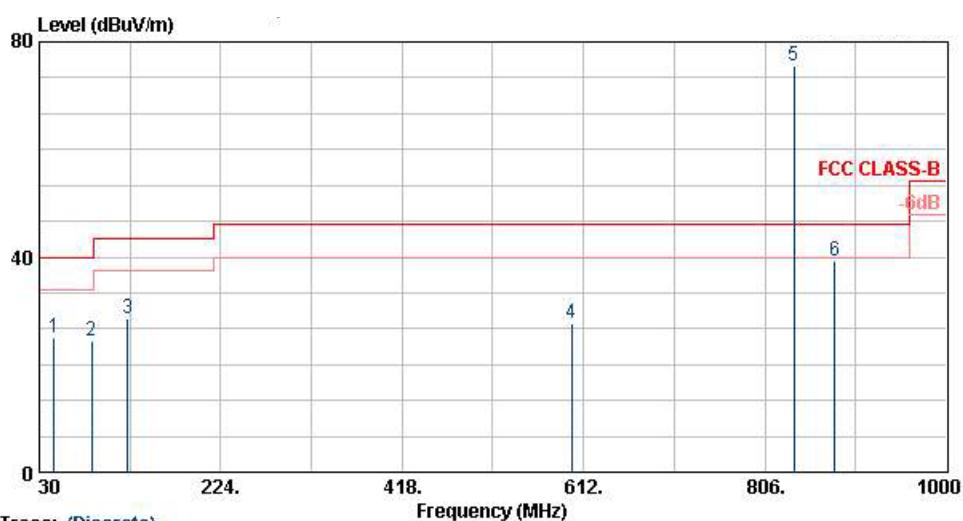
| Freq | Level   | Over  | Limit  | Read  | Antenna | Cable | Preamp | Ant   | Table | Pos | Remark  |
|------|---------|-------|--------|-------|---------|-------|--------|-------|-------|-----|---------|
|      |         | Limit | Line   |       |         |       |        |       | Pos   |     |         |
| MHz  | dBuV/m  | dB    | dBuV/m | dBuV  | dB/m    | dB    | dB     | cm    | deg   |     |         |
| 1    | 8834.00 | 50.79 | -23.21 | 74.00 | 43.43   | 36.27 | 7.59   | 36.50 | 100   | 0   | Peak    |
| 2    | 8834.00 | 40.21 | -13.79 | 54.00 | 32.85   | 36.27 | 7.59   | 36.50 | 100   | 138 | Average |



## 6.4.2 Test Mode: Mode 2

- Test Distance: 3m
- Temperature: 25~26°C
- Relative Humidity: 40~42%
- Emission level (dB<sub>uV/m</sub>) = 20 log Emission level (uV/m)
- Test Engineer: Derek
- Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

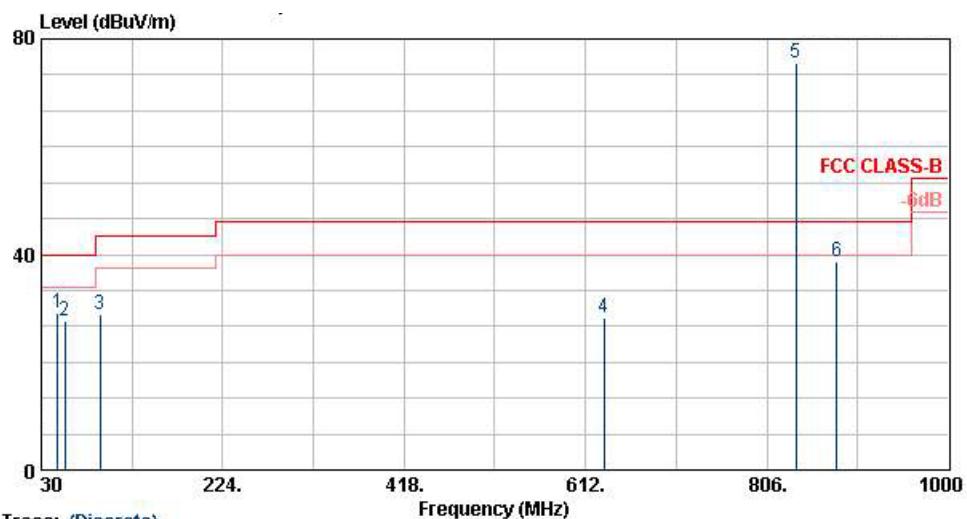
The test that passed at the minimum margin was marked by a frame in the following data



|     | Freq   | Level | Over   | Limit              | Read  | Antenna            | Cable | Preamp | Ant  | Table |      |
|-----|--------|-------|--------|--------------------|-------|--------------------|-------|--------|------|-------|------|
|     |        |       | MHz    | dB <sub>uV/m</sub> | dB    | dB <sub>uV/m</sub> | Level | Factor | Loss | Pos   | Pos  |
| 1   | 45.93  | 24.92 | -15.08 | 40.00              | 47.21 | 10.53              | 0.30  | 33.12  | ---  | ---   | Peak |
| 2   | 85.89  | 24.50 | -15.50 | 40.00              | 49.04 | 8.43               | 0.42  | 33.38  | ---  | ---   | Peak |
| 3   | 124.23 | 28.60 | -14.90 | 43.50              | 48.80 | 12.64              | 0.50  | 33.34  | 100  | 121   | Peak |
| 4   | 598.90 | 27.61 | -18.39 | 46.00              | 41.03 | 18.45              | 1.00  | 32.87  | ---  | ---   | Peak |
| 5 @ | 836.90 | 75.47 |        |                    | 86.84 | 20.08              | 1.20  | 32.65  | ---  | ---   | Peak |
| 6   | 880.30 | 39.21 |        |                    | 50.27 | 20.39              | 1.30  | 32.75  | ---  | ---   | Peak |

## Remark:

- #5: MS Signal.
- #6: BS Signal.
- The spurious emission above 1 GHz is too low to be taken.



## Trace: (Discrete)

Site : 03CH06-HY  
 Condition : FCC CLASS-B 3m LF-ANT(951121) VERTICAL  
 EUT : Phone  
 Power : From System  
 Model : FD 820515  
 Memo : CDMA 1XRTT Cellular Idle + GPS Rx  
 USB Link + Earphone 2  
 Plane : H  
 METD : 268435456102522605

|     | Freq   | Level | Over   | Limit  | Read  | Antenna | Cable | Preamp | Ant  | Table | Remark |
|-----|--------|-------|--------|--------|-------|---------|-------|--------|------|-------|--------|
|     |        |       | MHz    | dBuV/m | dB    | Line    | Level | Factor | Loss | Pos   |        |
| 1   | 47.28  | 29.23 | -10.77 | 40.00  | 52.51 | 9.55    | 0.30  | 33.13  | 100  | 192   | Peak   |
| 2   | 55.38  | 27.78 | -12.22 | 40.00  | 53.40 | 7.35    | 0.40  | 33.37  | ---  | ---   | Peak   |
| 3   | 92.64  | 28.74 | -14.76 | 43.50  | 51.96 | 9.62    | 0.50  | 33.33  | ---  | ---   | Peak   |
| 4   | 631.80 | 28.39 | -17.61 | 46.00  | 41.74 | 18.60   | 1.01  | 32.96  | ---  | ---   | Peak   |
| 5 @ | 836.90 | 75.49 |        |        | 86.86 | 20.08   | 1.20  | 32.65  | ---  | ---   | Peak   |
| 6   | 880.30 | 38.58 |        |        | 49.64 | 20.39   | 1.30  | 32.75  | ---  | ---   | Peak   |

## Remark:

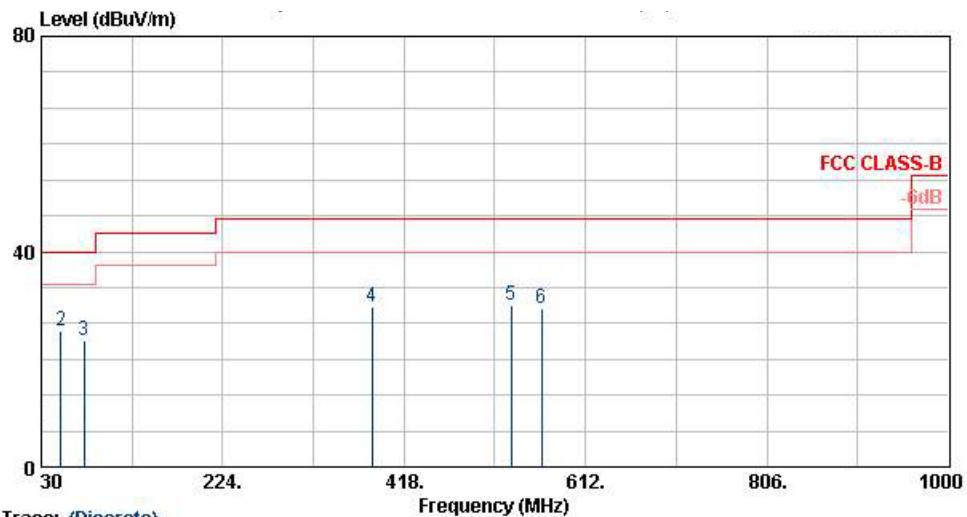
1. #5: MS Signal.
2. #6: BS Signal.
3. The spurious emission above 1 GHz is too low to be taken.



## 6.4.3 Test Mode: Mode 3

- Test Distance: 3m
- Temperature: 25~26°C
- Relative Humidity: 40~42%
- Emission level (dB<sub>uV/m</sub>) = 20 log Emission level (uV/m)
- Test Engineer: Derek
- Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

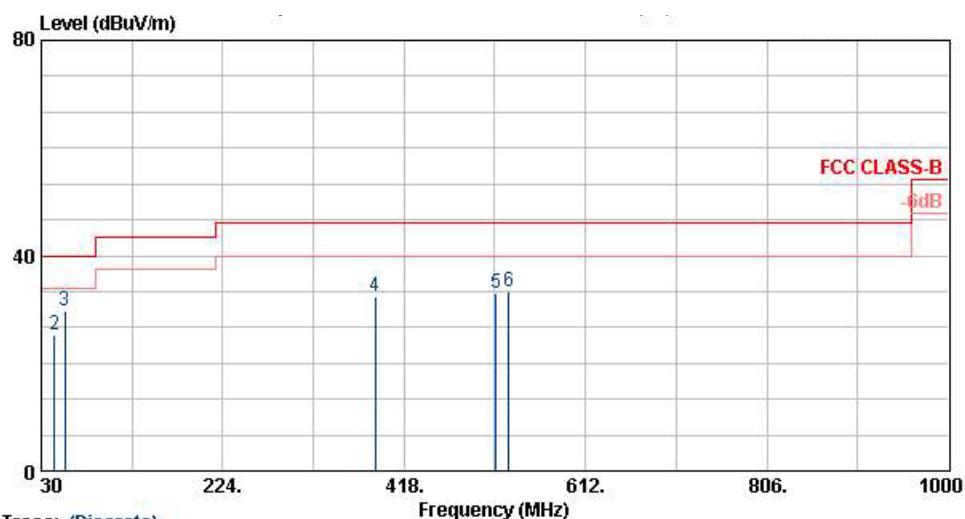
The test that passed at the minimum margin was marked by a frame in the following data



|   | Freq   | Level | Over   | Limit              | Read  | Antenna            | Cable            | Preamp | Ant | Table | Remark |
|---|--------|-------|--------|--------------------|-------|--------------------|------------------|--------|-----|-------|--------|
|   |        |       | MHz    | dB <sub>uV/m</sub> | dB    | dB <sub>uV/m</sub> | dB <sub>uV</sub> | dB/m   | dB  | cm    |        |
| 1 | 30.00  | 24.17 | -15.83 | 40.00              | 37.71 | 19.66              | 0.30             | 33.50  | --- | ---   | Peak   |
| 2 | 51.33  | 25.25 | -14.75 | 40.00              | 50.19 | 7.93               | 0.32             | 33.19  | 100 | 245   | Peak   |
| 3 | 75.63  | 23.47 | -16.53 | 40.00              | 49.34 | 7.23               | 0.42             | 33.52  | --- | ---   | Peak   |
| 4 | 383.30 | 29.83 | -16.17 | 46.00              | 46.72 | 15.34              | 0.87             | 33.10  | --- | ---   | Peak   |
| 5 | 532.40 | 29.92 | -16.08 | 46.00              | 44.43 | 17.76              | 0.93             | 33.19  | --- | ---   | Peak   |
| 6 | 565.30 | 29.42 | -16.58 | 46.00              | 43.35 | 18.11              | 1.00             | 33.03  | --- | ---   | Peak   |

Remark:

- The spurious emission above 1 GHz is too low to be taken.



Site : 03CH08-HY  
 Condition : FCC CLASS-B 3m LF-ANT(051121) VERTICAL  
 EUT : Phone  
 Power : From System  
 Model : FD 820515  
 Memo : CDMA 1XRTT PCS Idle + GPS Rx  
 + USB Link + Earphone  
 Plane : H  
 METD : 266435456102522605

|   | Freq   | Level  | Over Limit | Limit Line | Read  | Antenna Level | Cable Factor | Preamp | Ant | Table | Pos  | Pos | Remark |
|---|--------|--------|------------|------------|-------|---------------|--------------|--------|-----|-------|------|-----|--------|
|   |        |        |            |            |       |               |              |        |     |       |      |     |        |
|   | MHz    | dBuV/m | dB         | dBuV/m     | dBuV  | dB/m          | dB           | dB     | cm  | deg   |      |     |        |
| 1 | 30.00  | 25.24  | -14.76     | 40.00      | 38.78 | 19.66         | 0.30         | 33.50  | --- | ---   | Peak |     |        |
| 2 | 44.04  | 25.38  | -14.62     | 40.00      | 46.69 | 11.52         | 0.30         | 33.13  | --- | ---   | Peak |     |        |
| 3 | 55.38  | 29.72  | -10.28     | 40.00      | 55.34 | 7.35          | 0.40         | 33.37  | 100 | 133   | Peak |     |        |
| 4 | 386.80 | 32.39  | -13.61     | 46.00      | 49.21 | 15.44         | 0.83         | 33.09  | --- | ---   | Peak |     |        |
| 5 | 516.30 | 33.09  | -12.91     | 46.00      | 47.77 | 17.59         | 1.00         | 33.27  | --- | ---   | Peak |     |        |
| 6 | 530.30 | 33.23  | -12.77     | 46.00      | 47.78 | 17.74         | 0.91         | 33.20  | --- | ---   | Peak |     |        |

## Remark:

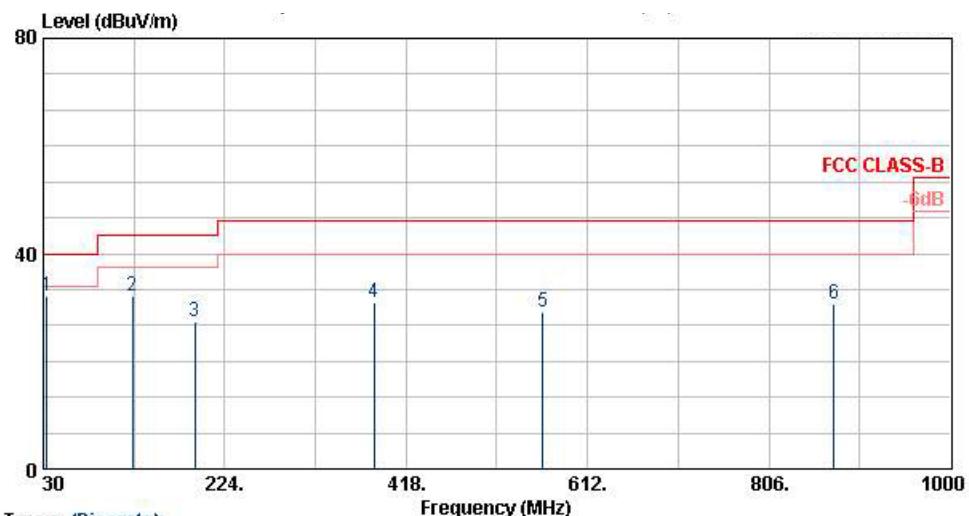
1. The spurious emission above 1 GHz is too low to be taken.



## 6.4.4 Test Mode: Mode 4

- Test Distance: 3m
- Temperature: 25~26°C
- Relative Humidity: 40~42%
- Emission level (dB<sub>UV</sub>/m) = 20 log Emission level (uV/m)
- Test Engineer: Derek
- Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

The test that passed at the minimum margin was marked by a frame in the following data



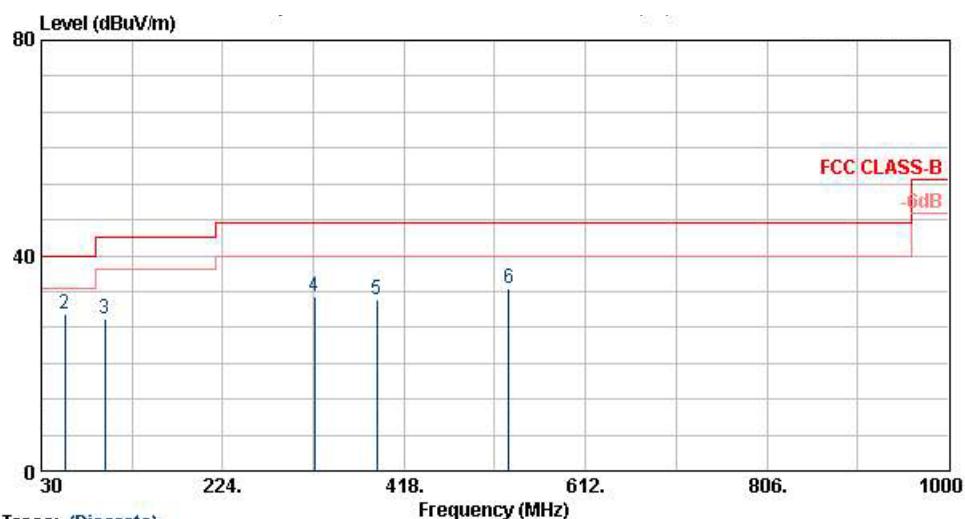
## Trace: (Discrete)

Site : 03CH06-HY  
 Condition : FCC CLASS-B 3m LF-ANT(951121) HORIZONTAL  
 EUT : Phone  
 Power : From System  
 Model : FD 820515  
 Memo : CDMA 1XRTT AWS Idle + GPS Rx  
 + USB Link + Earphone  
 Plane : H  
 METD : 268435456102522605

| Freq | Level  | Over  | Limit               | Read  | Antenna             | Cable            | Preamp | Ant   | Table | Remark   |
|------|--------|-------|---------------------|-------|---------------------|------------------|--------|-------|-------|----------|
|      |        | MHz   | dB <sub>UV</sub> /m | dB    | dB <sub>UV</sub> /m | dB <sub>UV</sub> | dB/m   | dB    | cm    |          |
| 1    | 33.78  | 32.25 | -7.75               | 40.00 | 48.45               | 16.84            | 0.30   | 33.34 | 100   | 179 Peak |
| 2    | 125.58 | 32.26 | -11.24              | 43.50 | 52.57               | 12.50            | 0.50   | 33.31 | ---   | --- Peak |
| 3    | 191.73 | 27.33 | -16.17              | 43.50 | 50.94               | 9.36             | 0.60   | 33.57 | ---   | --- Peak |
| 4    | 383.30 | 31.03 | -14.97              | 46.00 | 47.92               | 15.34            | 0.87   | 33.10 | ---   | --- Peak |
| 5    | 563.90 | 29.26 | -16.74              | 46.00 | 43.21               | 18.09            | 1.00   | 33.04 | ---   | --- Peak |
| 6    | 875.40 | 30.65 | -15.35              | 46.00 | 41.73               | 20.36            | 1.30   | 32.74 | ---   | --- Peak |

## Remark:

- The spurious emission above 1 GHz is too low to be taken.



## Trace: (Discrete)

Site : 03CH06-HY  
 Condition : FCC CLASS-B 3m LF-ANT(051121) VERTICAL  
 EUT : Phone  
 Power : From System  
 Model : FD 820515  
 Memo : CDMA 1XRTT AWS Idle + GPS Rx  
 + USB Link + Earphone  
 Plane : H  
 METD : 266435456102522605

|     | Freq   | Level | Over   | Limit  | Read  | Antenna | Cable | Preamp | Ant | Table | Pos  | Remark |
|-----|--------|-------|--------|--------|-------|---------|-------|--------|-----|-------|------|--------|
|     |        |       | MHz    | dBuV/m | dB    | dBuV/m  | dBuV  | dB/m   | dB  | cm    |      |        |
| 1   | 30.00  | 25.47 | -14.53 | 40.00  | 39.01 | 19.66   | 0.30  | 33.50  | --- | ---   | Peak |        |
| 2 @ | 55.38  | 29.21 | -10.79 | 40.00  | 54.83 | 7.35    | 0.40  | 33.37  | 100 | 184   | Peak |        |
| 3   | 98.04  | 28.28 | -15.22 | 43.50  | 50.46 | 10.60   | 0.50  | 33.28  | --- | ---   | Peak |        |
| 4   | 322.40 | 32.54 | -13.46 | 46.00  | 51.23 | 13.78   | 0.80  | 33.28  | --- | ---   | Peak |        |
| 5   | 388.90 | 31.83 | -14.17 | 46.00  | 48.61 | 15.49   | 0.81  | 33.08  | --- | ---   | Peak |        |
| 6   | 530.30 | 33.98 | -12.02 | 46.00  | 48.53 | 17.74   | 0.91  | 33.20  | --- | ---   | Peak |        |

## Remark:

1. The spurious emission above 1 GHz is too low to be taken.



## **6.5 Photographs of Radiated Emission Test Configuration**

Please refer to Appendix B



## 7. List of Measuring Equipment

| Instrument                | Manufacturer | Model No.    | Serial No.                | Characteristics | Calibration Date | Due Date      | Remark                |
|---------------------------|--------------|--------------|---------------------------|-----------------|------------------|---------------|-----------------------|
| EMC Receiver              | R&S          | ESCS 30      | 100174                    | 9kHz – 2.75GHz  | Mar. 03, 2008    | Mar. 02, 2009 | Conduction (CO04-HY)  |
| LISN                      | MessTec      | NNB-2/16Z    | 99079                     | 9kHz – 30MHz    | Mar. 31, 2008    | Mar. 30, 2009 | Conduction (CO04-HY)  |
| LISN (Support Unit)       | EMCO         | 3810/2NM     | 9703-1839                 | 9kHz – 30MHz    | Mar. 22, 2008    | Mar. 21, 2009 | Conduction (CO04-HY)  |
| RF Cable-CON              | UTIFLEX      | 3102-26886-4 | CB049                     | 9kHz – 30MHz    | Apr. 20, 2007    | Apr. 19, 2008 | Conduction (CO04-HY)  |
| ISN                       | SCHAFFNER    | ISN T400     | 21653                     | 9kHz – 30MHz    | Mar. 27, 2008    | Mar. 26, 2009 | Conduction (CO04-HY)  |
| EMI Filter                | LINDGREN     | LRE-2030     | 2651                      | < 450 Hz        | N/A              | N/A           | Conduction (CO04-HY)  |
| Spectrum Analyzer         | Agilent      | E4408B       | MY44211028                | 9KHz-26.5GHz    | Oct. 17, 2007    | Oct. 16, 2008 | Radiation (03CH06-HY) |
| EMI Test Receiver         | R&S          | ESCS30       | 100356                    | 9KHz-2.75GHz    | Jul. 26, 2007    | Jul. 25, 2008 | Radiation (03CH06-HY) |
| Bilog Antenna             | SCHAFFNER    | CBL6112B     | 2885                      | 30MHz -2GHz     | Dec. 01, 2007    | Nov. 30, 2008 | Radiation (03CH06-HY) |
| Double Ridge Horn Antenna | Com-Power    | AH118        | 071025                    | 1G~18G          | Jun. 04, 2007    | Jun. 03, 2008 | Radiation (03CH06-HY) |
| SHF-EHF Horn              | SCHWARZBECK  | BBHA 9170    | 9170-251                  | 14G - 40G       | Oct. 17, 2007    | Oct. 16, 2008 | Radiation (03CH06-HY) |
| Pre Amplifier             | Agilent      | 8449B        | 3008A01917                | 1G - 26.5G      | Nov. 22, 2007    | Nov. 21, 2008 | Radiation (03CH06-HY) |
| PreAmplifier              | EMEC         | PA303        | PA303-SMA-0 <sub>50</sub> | 100K~3GHz       | Nov. 26, 2007    | Nov. 25, 2008 | Radiation (03CH06-HY) |
| Base Station Simulator    | R & S        | CMU200       | 103937                    | Third-Band      | Oct. 19, 2007    | Oct. 18, 2008 | Radiation (03CH06-HY) |



## 8. Uncertainty of Evaluation

### Uncertainty of Conducted Emission Measurement (150 KHz ~ 30 MHz)

| Contribution   | Uncertainty of $x_i$ |                          | $u(x_i)$ |
|--|----------------------|--------------------------|----------|
|  | dB                   | Probability Distribution |          |
| Receiver reading   | 0.10                 | Normal(k=2)              | 0.05     |
| Cable loss   | 0.10                 | Normal(k=2)              | 0.05     |
| AMN insertion loss   | 2.50                 | Rectangular              | 0.63     |
| Receiver Spec  | 1.50                 | Rectangular              | 0.43     |
| Site imperfection  | 1.39                 | Rectangular              | 0.80     |
| Mismatch   | +0.34/-0.35          | U-shape                  | 0.24     |
| <b>Combined standard uncertainty <math>U_c(y)</math></b>                             | <b>1.13</b>          |                          |          |
| <b>Measuring uncertainty for a level of confidence of 95% <math>U=2U_c(y)</math></b> | <b>2.26</b>          |                          |          |

### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

| Contribution   | Uncertainty of $x_i$ |                          | $u(x_i)$ |
|--|----------------------|--------------------------|----------|
|  | dB                   | Probability Distribution |          |
| Receiver reading   | 0.41                 | Normal(k=2)              | 0.21     |
| Antenna factor calibration   | 0.83                 | Normal(k=2)              | 0.42     |
| Cable loss calibration   | 0.25                 | Normal(k=2)              | 0.13     |
| Pre Amplifier Gain calibration   | 0.27                 | Normal(k=2)              | 0.14     |
| RCV/SPA specification  | 2.50                 | Rectangular              | 0.72     |
| Antenna Factor Interpolation for Frequency   | 1.00                 | Rectangular              | 0.29     |
| Site imperfection  | 1.43                 | Rectangular              | 0.83     |
| Mismatch   | +0.39/-0.41          | U-shaped                 | 0.28     |
| <b>Combined standard uncertainty <math>U_c(y)</math></b>                             | <b>1.27</b>          |                          |          |
| <b>Measuring uncertainty for a level of confidence of 95% <math>U=2U_c(y)</math></b> | <b>2.54</b>          |                          |          |



## Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

| Contribution   | Uncertainty of $x_i$ |                          | $u(x_i)$ | $Ci$ | $Ci * u(x_i)$ |
|--|----------------------|--------------------------|----------|------|---------------|
|  | dB                   | Probability Distribution |          |      |               |
| Receiver reading   | ±0.10                | Normal(k=1)              | 0.10     | 1    | 0.10          |
| Antenna factor calibration   | ±1.70                | Normal(k=2)              | 0.85     | 1    | 0.85          |
| Cable loss calibration   | ±0.50                | Normal(k=2)              | 0.25     | 1    | 0.25          |
| Receiver Correction  | ±2.00                | Rectangular              | 1.15     | 1    | 1.15          |
| Antenna Factor Directional   | ±1.50                | Rectangular              | 0.87     | 1    | 0.87          |
| Site imperfection  | ±2.80                | Triangular               | 1.14     | 1    | 1.14          |
| Mismatch<br>Receiver VSWR $\Gamma 1= 0.197$<br>Antenna VSWR $\Gamma 2= 0.194$<br>Uncertainty=20log(1- $\Gamma 1 * \Gamma 2 * \Gamma 3$ ) | +0.34/-0.35          | U-shaped                 | 0.244    | 1    | 0.244         |
| <b>Combined standard uncertainty <math>U_c(y)</math></b>   | <b>2.36</b>          |                          |          |      |               |
| <b>Measuring uncertainty for a level of confidence of 95%    <math>U=2U_c(y)</math></b>  | <b>4.72</b>          |                          |          |      |               |



## 9. Certificate of NVLAP Accreditation

United States Department of Commerce  
National Institute of Standards and Technology



### Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200079-0

**Sportun International, Inc. Hwa Ya EMC Laboratory**

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*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,  
listed on the Scope of Accreditation, for:*

#### ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.  
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality  
management system (refer to joint ISO-ILAC-IAF Communiqué dated 18 June 2005).*

2008-01-01 through 2008-12-31

Effective dates



*Dee S. Bruce*  
For the National Institute of Standards and Technology

NVLAP-01C (REV. 2006-09-13)