



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

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- Report Version: Rev. 04B.

SPORTON International Inc.

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

SPORTON International Inc.

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Report Version: Rev. 04B

FCC ID: QMNRH-109



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History of This Test Report

Report Issue Date: May 06, 2008

Report No.	Description
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



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



2. Test Configuration of Equipment under Test

2.1 Test Manner

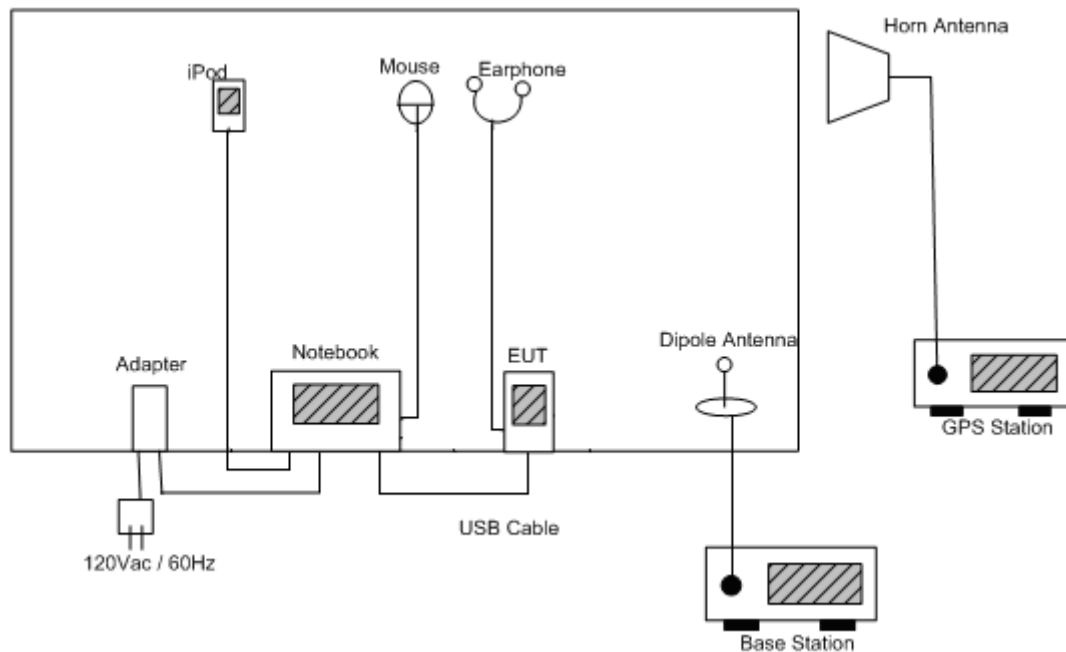
- a. The EUT has been setup pursuant to ANSI C63.4-2003 and configuration operated in a manner which tended to maximize its emission characteristics in a typical application.
- b. The complete test system refers to 2.2 for EMI test.
- c. The following test modes were tested for conduction test:
 - Mode 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 1Remark : 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 1Remark : 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

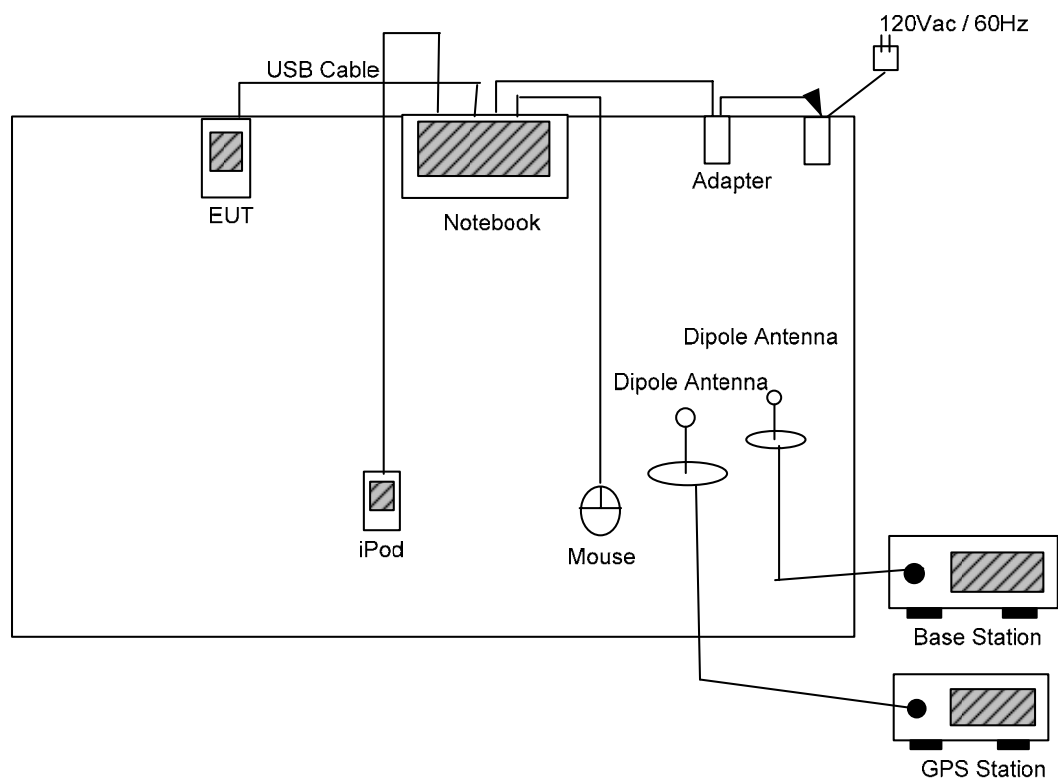
Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Base Station	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	Notebook	DELL	D400	E2K24GBRL	N/A	I/P: Unshielded, 1.8 m O/P: Shielded, 1.2m
3.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8
4.	(RS-232) Mouse	State	MS-303	DoC	Unshieled, 1.2m	N/A
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 1st 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.

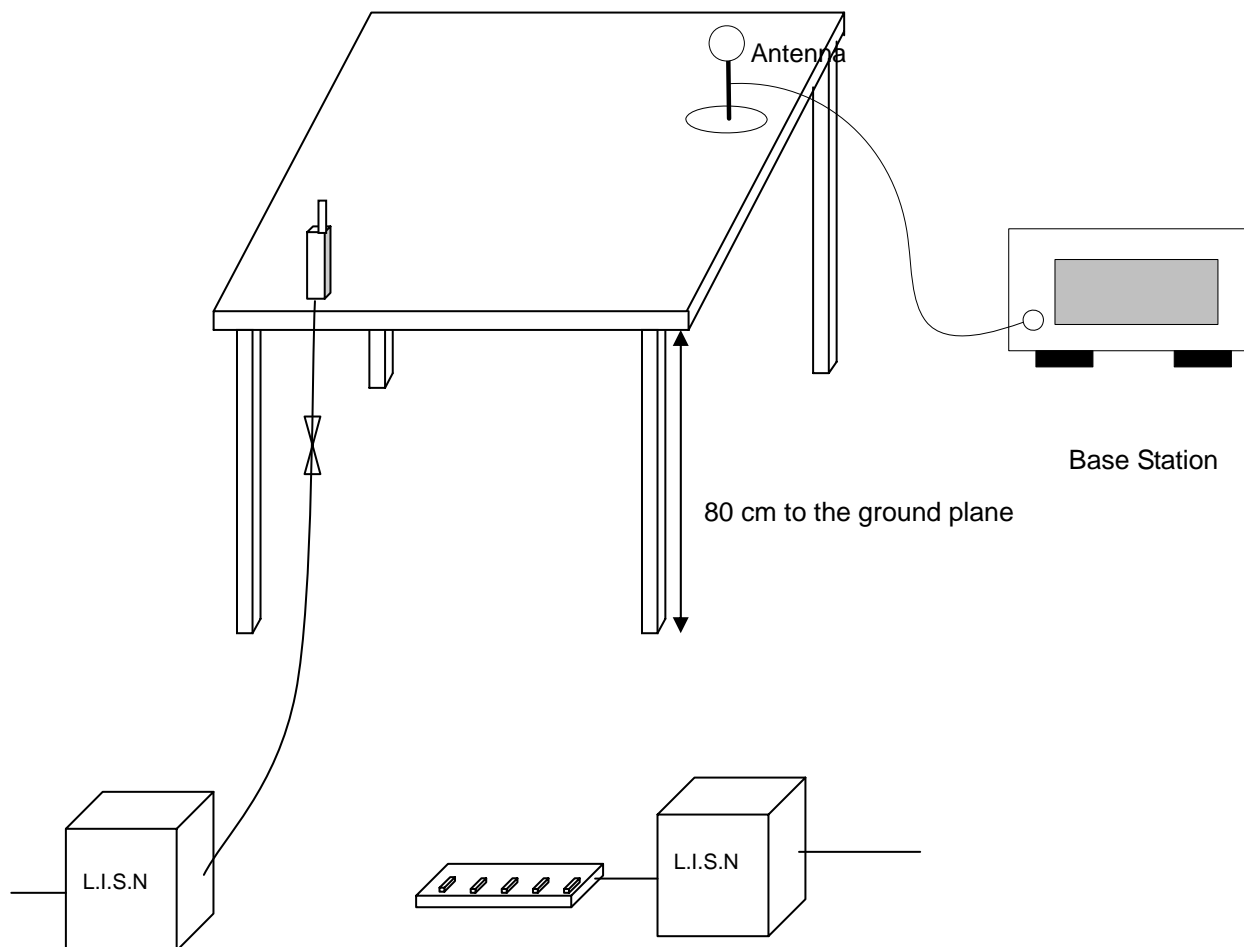
5.1 Major Measuring Instruments

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



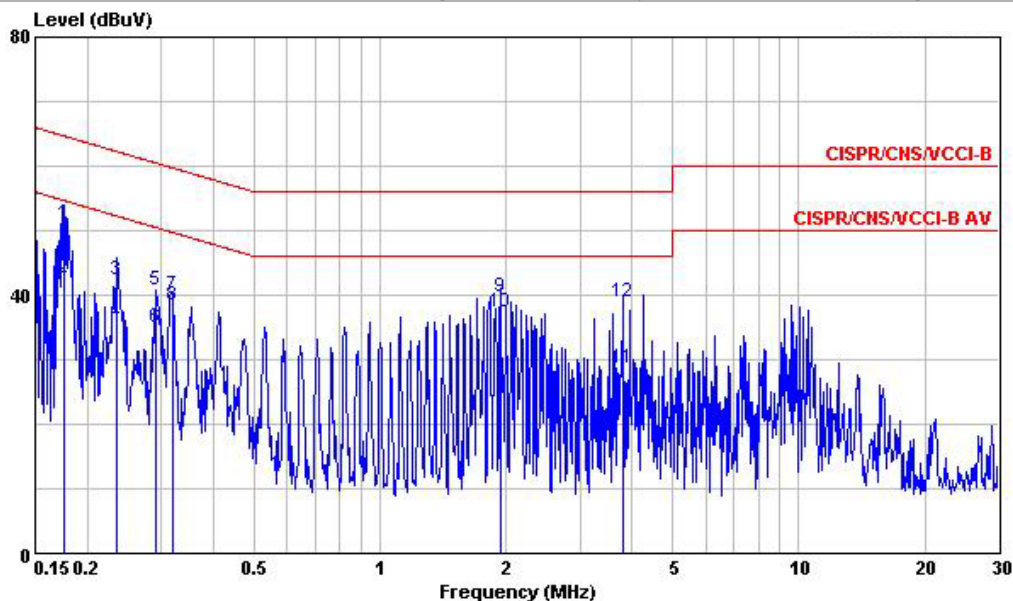


5.4 Test Result of AC Powerline Conducted Emission

5.4.1 Test Mode: Mode 1

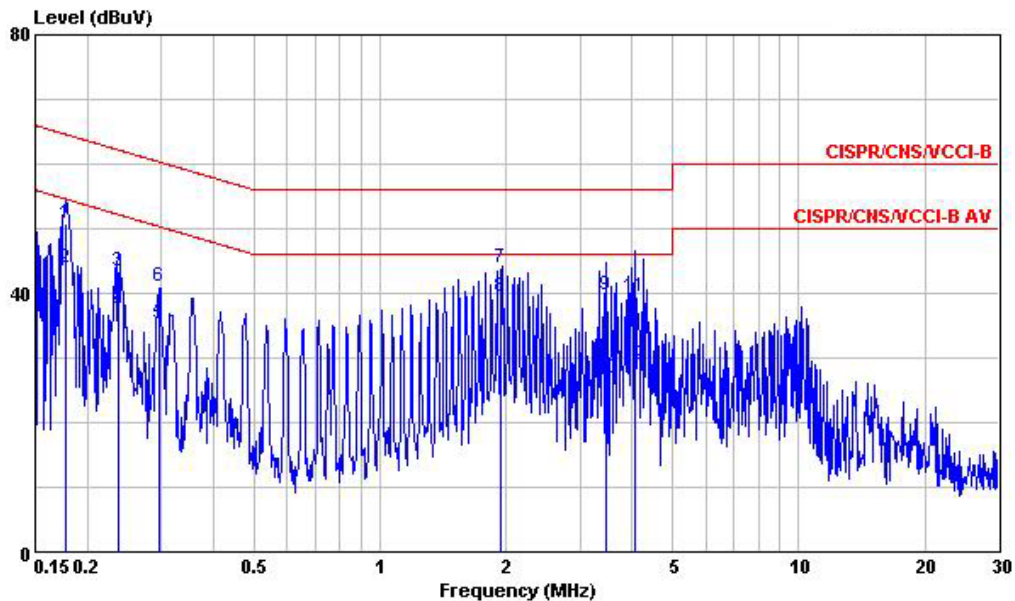
- Frequency Range of Test: from 0.15 MHz to 30 MHz
- Temperature: 26~27°C
- Relative Humidity: 36~37%
- Test Engineer: Happyer
- All emissions not reported here are more than 10 dB below the prescribed limit.

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	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
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



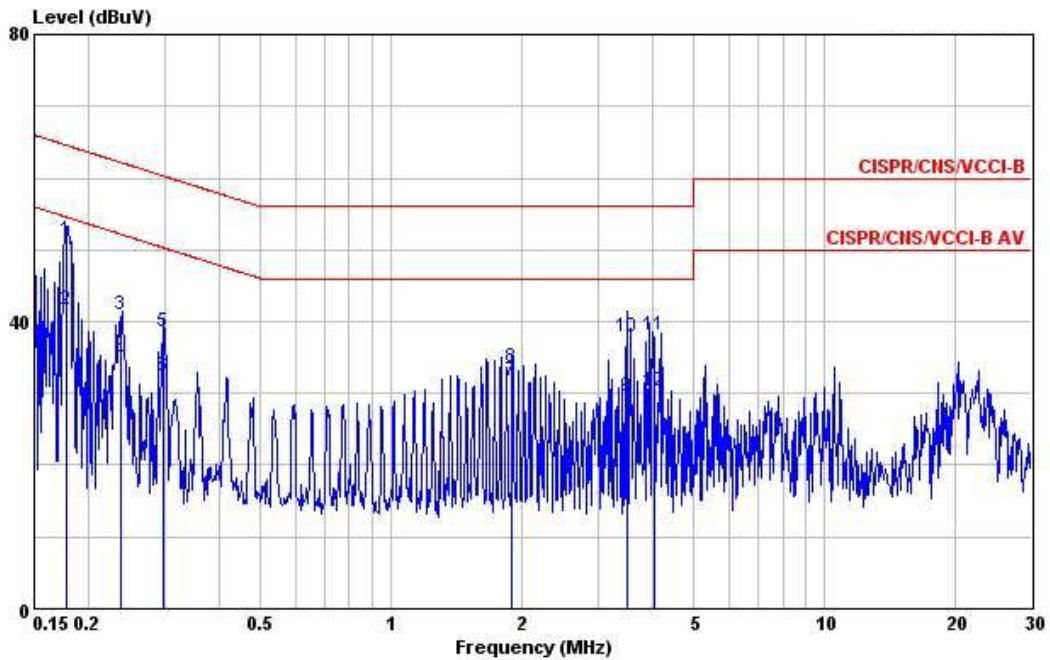
Site : CO04-HY
 Condition : CISPR/CNS/VCCI-B LISN 200704 99041 NEUTRAL
 EUT : Phone
 POWER: From System
 Model : FD820515
 Memo : CDMA 1xRTT Cellular Idle+GPS Rx+USB Link
 : +Earphone

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
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

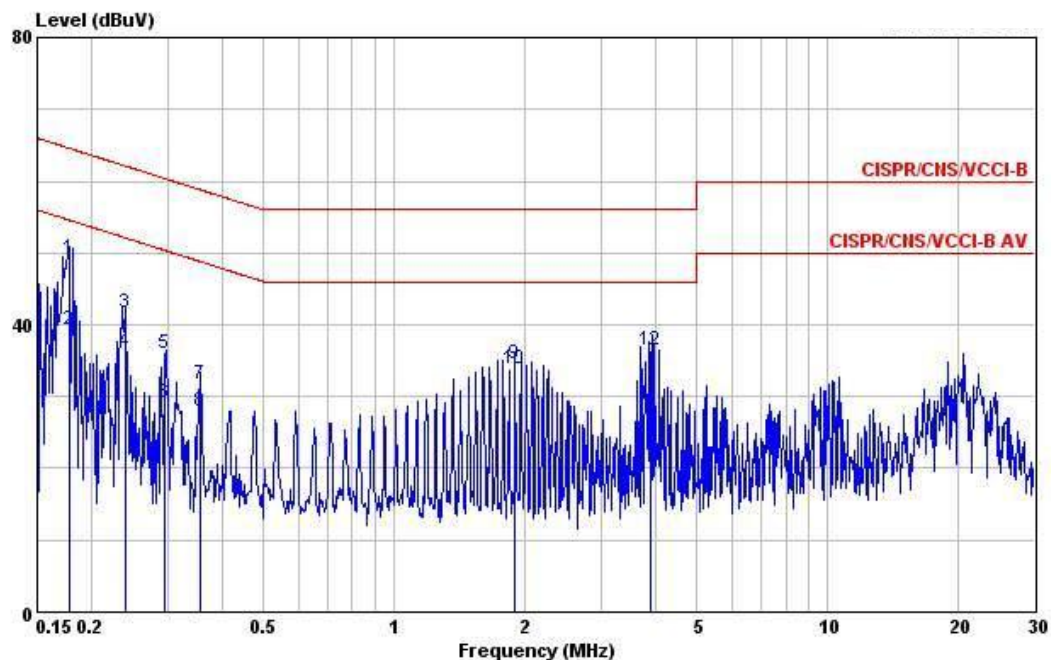
- Frequency Range of Test: from 0.15 MHz to 30 MHz
- Temperature: 26~27°C
- Relative Humidity: 36~37%
- Test Engineer: Happyer
- All emissions not reported here are more than 10 dB below the prescribed limit.

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



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

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	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

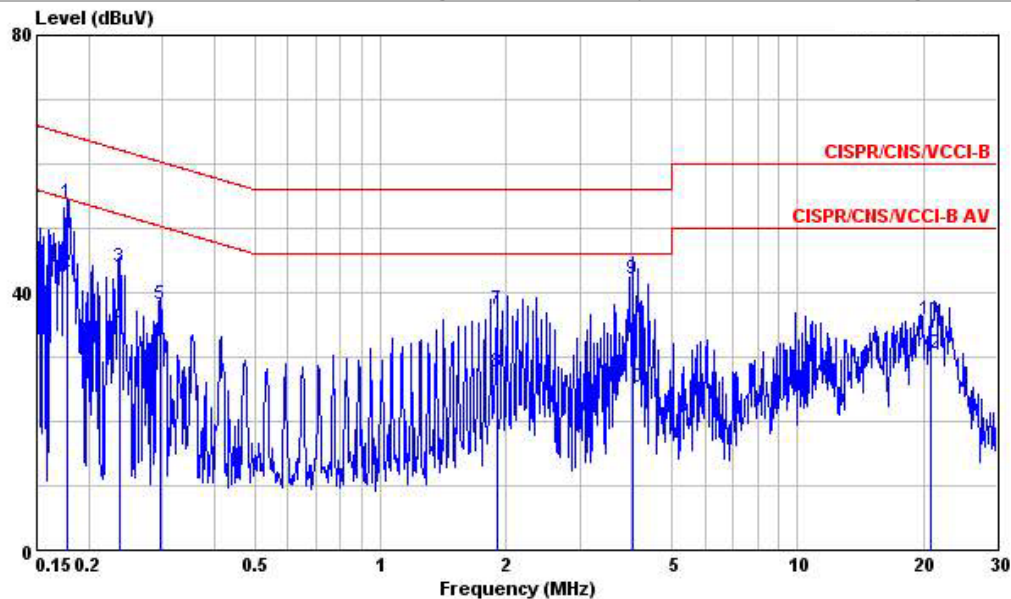
	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1786590	49.30	-15.25	64.55	49.06	0.10	0.14	QP
2	0.1786590	39.38	-15.17	54.55	39.14	0.10	0.14	Average
3	0.2391010	41.63	-20.50	62.13	41.24	0.10	0.29	QP
4	0.2391010	36.27	-15.86	52.13	35.88	0.10	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

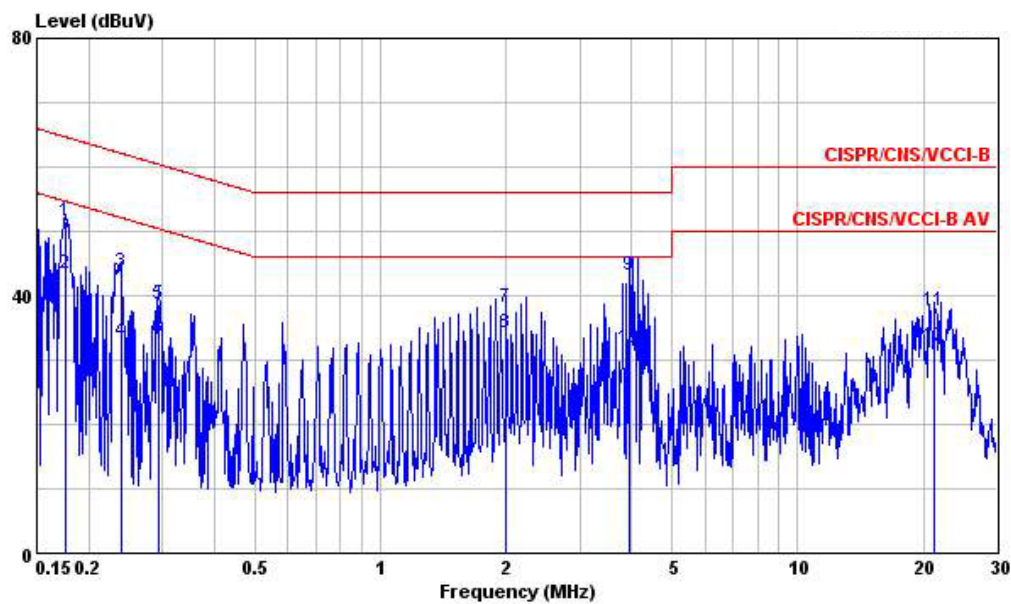
- Frequency Range of Test: from 0.15 MHz to 30 MHz
- Temperature: 26~27°C
- Relative Humidity: 36~37%
- Test Engineer: Happyer
- All emissions not reported here are more than 10 dB below the prescribed limit.

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



Site : C004-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	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
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 : C004-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

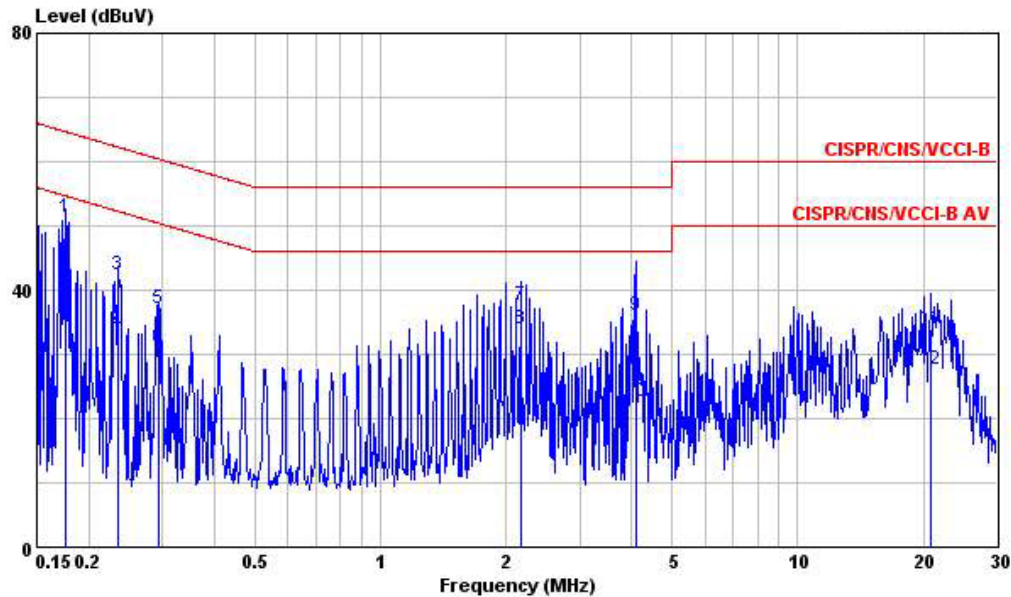
	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	@0.1758420	51.63	-13.05	64.68	51.41	0.08	0.14	QP
2	@0.1758420	43.38	-11.30	54.68	43.16	0.08	0.14	Average
3	0.2391010	43.59	-18.54	62.13	43.22	0.08	0.29	QP
4	0.2391010	32.95	-19.18	52.13	32.58	0.08	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

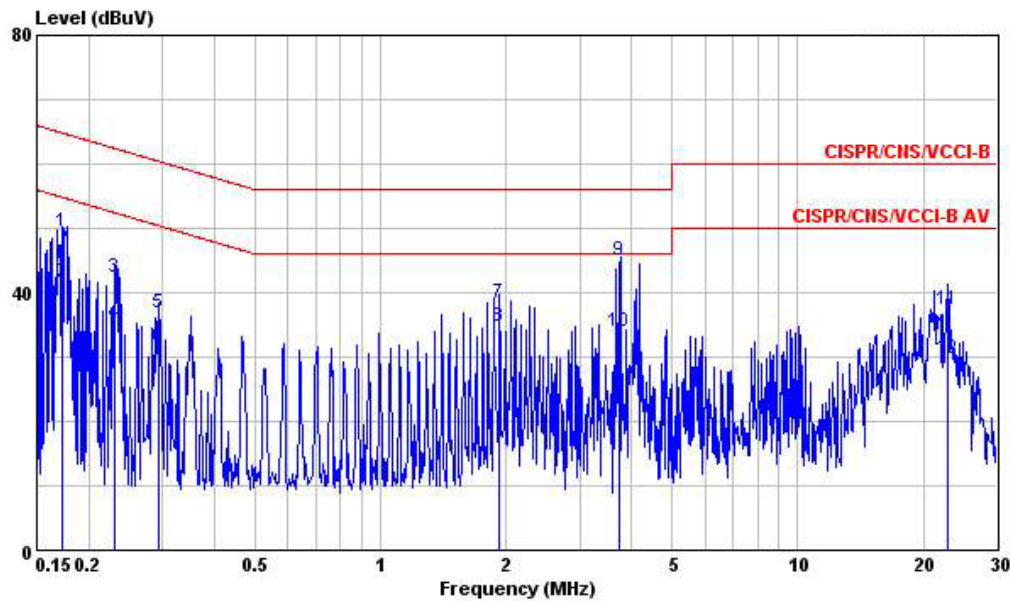
- Frequency Range of Test: from 0.15 MHz to 30 MHz
- Temperature: 26~27°C
- Relative Humidity: 36~37%
- Test Engineer: Happyer
- All emissions not reported here are more than 10 dB below the prescribed limit.

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	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	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 : C004-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	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
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.

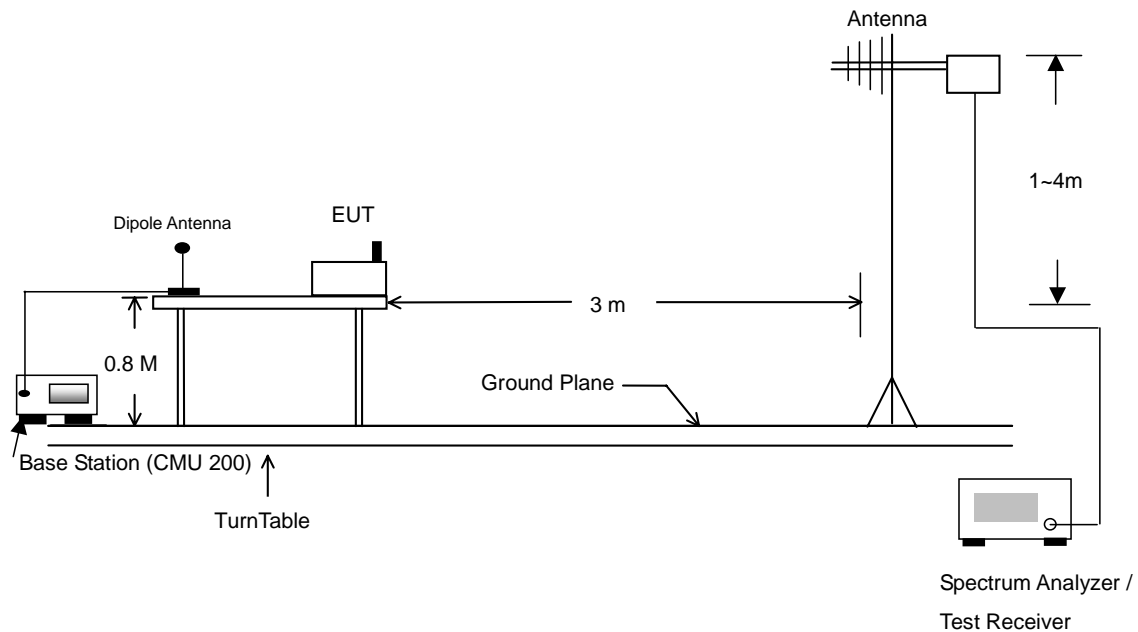
6.1 Major Measuring Instruments

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



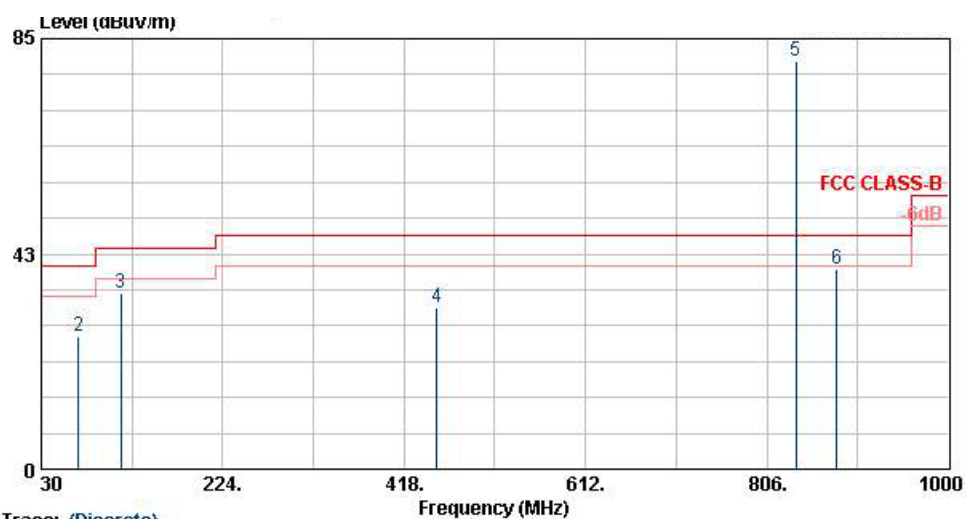


6.4 Test Result of Radiated Emission

6.4.1 Test Mode: Mode 1

- Test Distance: 3m
- Temperature: 25~26°C
- Relative Humidity: 40~42%
- Emission level (dBuV/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



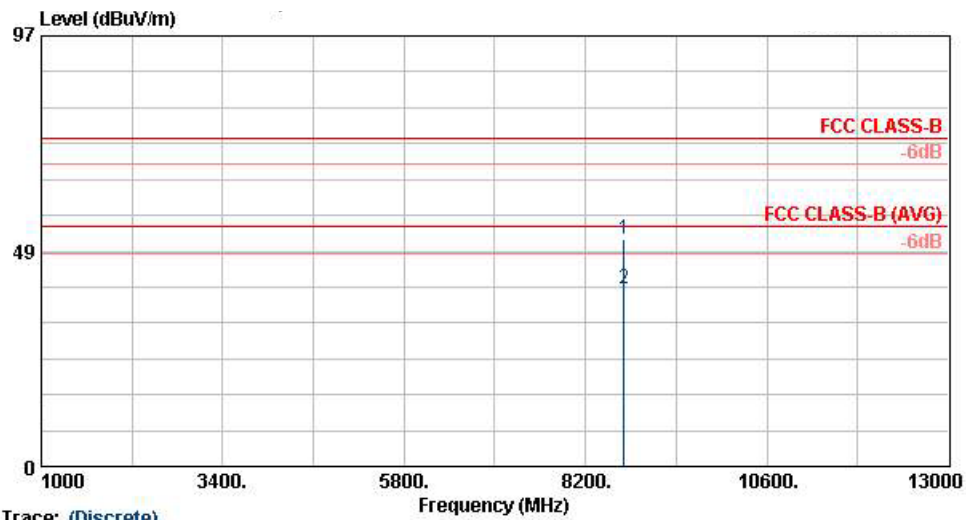
Trace: (Discrete)

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

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
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

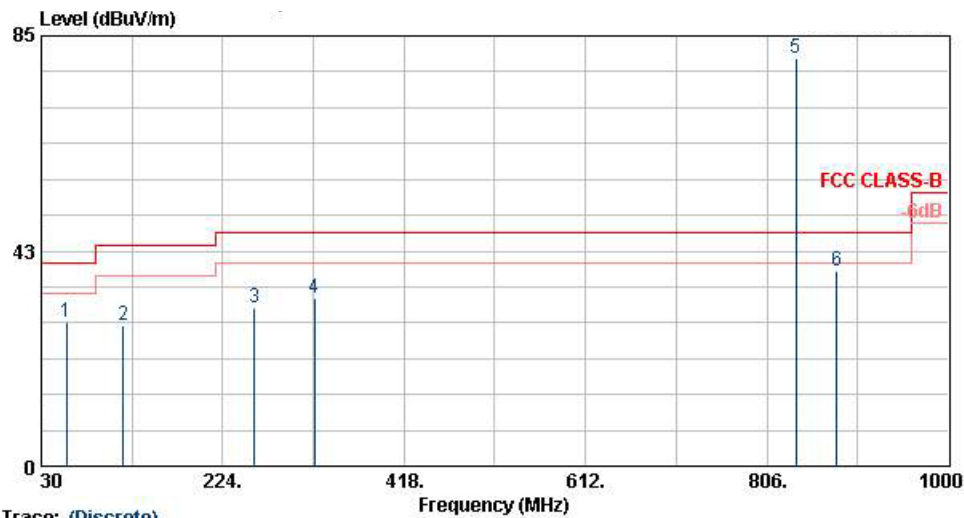
Remark:

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



Trace: (Discrete)
Site : 03CH06-HY
Condition : FCC CLASS-B 3m HF-ANT(8-18)-060918 HORIZONTAL
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	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
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



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 Cellular Idle + GPS Rx

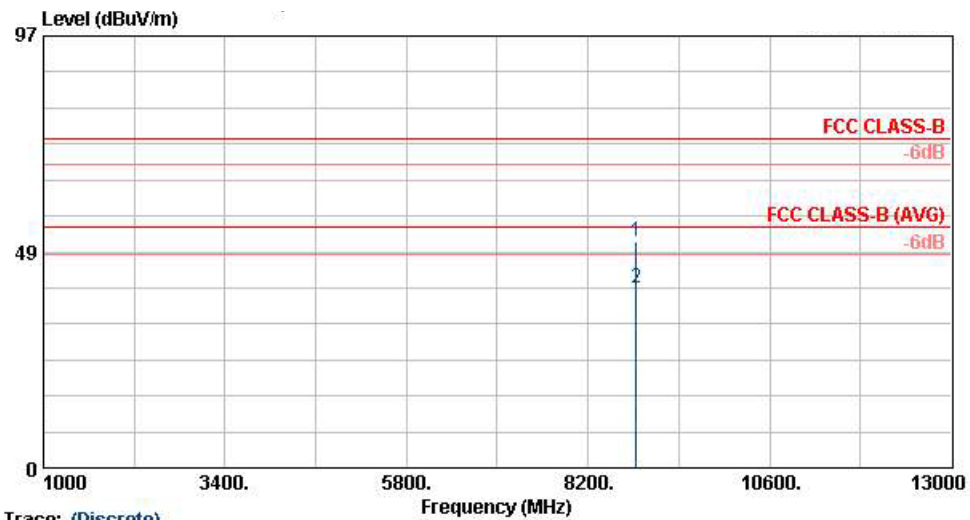
Plane : H

MEID : 266435456102522605

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB	dB	cm	deg	
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:

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



Trace: (Discrete)

Site : 03CH06-HY
 Condition : FCC CLASS-B 3m HF-ANT(8-16)-060918 VERTICAL
 EUT : Phone
 Power : From System
 Model : FD 820515
 Memo : CDMA 1XRTT Cellular Idle + GPS Rx
 : + USB Link + Earphone
 Plane : H
 MEID : 266435456102522605

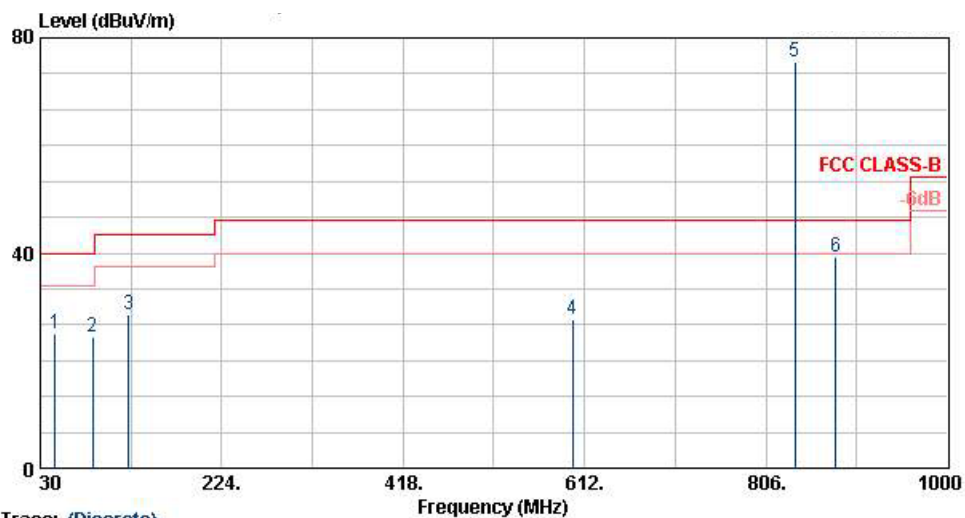
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	8834.00	50.79	-23.21	74.00	43.43	36.27	7.59	36.50	100	0 Peak
2	8834.00	40.21	-13.79	54.00	32.85	36.27	7.59	36.50	100	138 Average



6.4.2 Test Mode: Mode 2

- Test Distance: 3m
- Temperature: 25~26°C
- Relative Humidity: 40~42%
- Emission level (dBuV/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

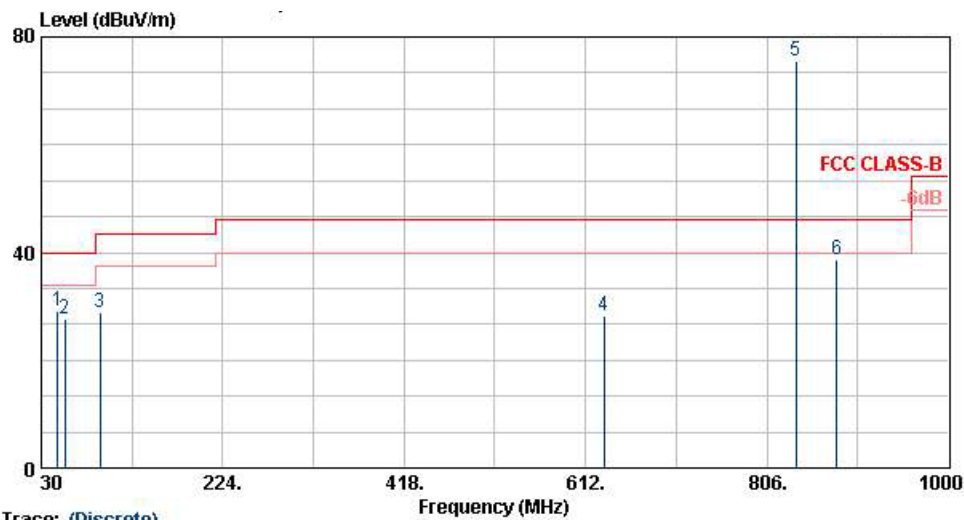


Site : 03CH06-HY
 Condition : FCC CLASS-B 3m LF-ANT(851121) HORIZONTAL
 EUT : Phone
 Power : From System
 Model : FD 820515
 Memo : CDMA 1XRTT Cellular Idle + GPS Rx
 : USB Link + Earphone 2
 Plane : H
 MEID : 266435456102522605

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
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:

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



Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC CLASS-B 3m LF-ANT(851121) VERTICAL
 EUT : Phone
 Power : From System
 Model : FD 820515
 Memo : CDMA 1XRTT Cellular Idle + GPS Rx
 : USB Link + Earphone 2
 Plane : H
 METD : 266435456102522605

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
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	---	---
3	92.64	28.74	-14.76	43.50	51.96	9.62	0.50	33.33	---	---
4	631.80	28.39	-17.61	46.00	41.74	18.60	1.01	32.96	---	---
5 @	836.90	75.49			86.86	20.08	1.20	32.65	---	---
6	880.30	38.58			49.64	20.39	1.30	32.75	---	---

Remark:

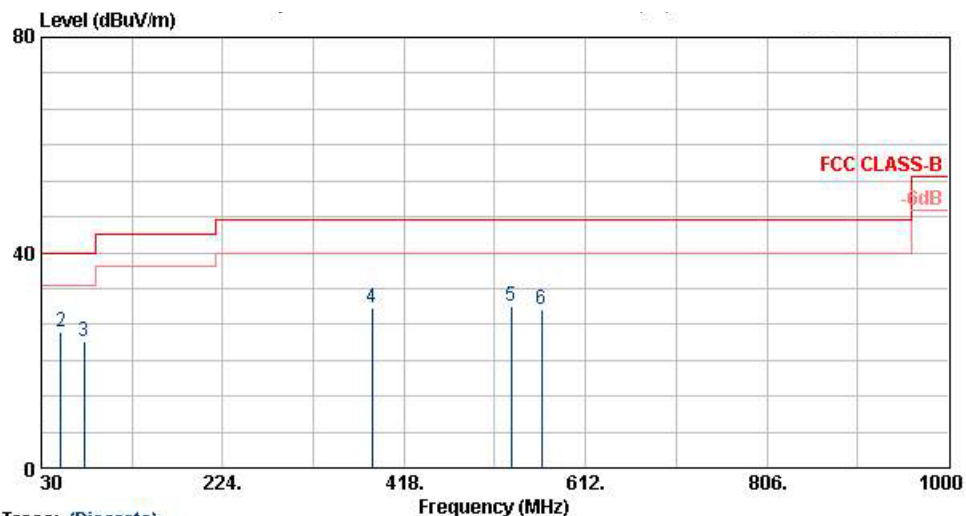
- #5: MS Signal.
- #6: BS Signal.
- The spurious emission above 1 GHz is too low to be taken.



6.4.3 Test Mode: Mode 3

- Test Distance: 3m
- Temperature: 25~26°C
- Relative Humidity: 40~42%
- Emission level (dBuV/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



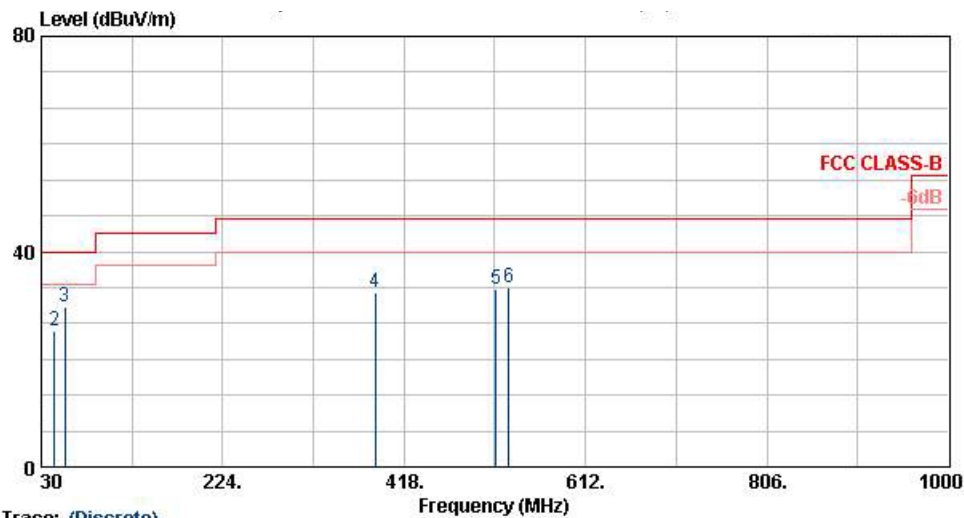
Trace: (Discrete)

Site : 03CH06-HY
 Condition : FCC CLASS-B 3m LF-ANT(951121) HORIZONTAL
 EUT : Phone
 Power : From System
 Model : FD 820515
 Memo : CDMA 1XRTT PCS Idle + GPS Rx
 + USB Link + Earphone
 Plane : H
 METD : 266435456102522605

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
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:

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



Site : 03CH06-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
 MEID : 266435456102522605

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Ant Pos	Table 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:

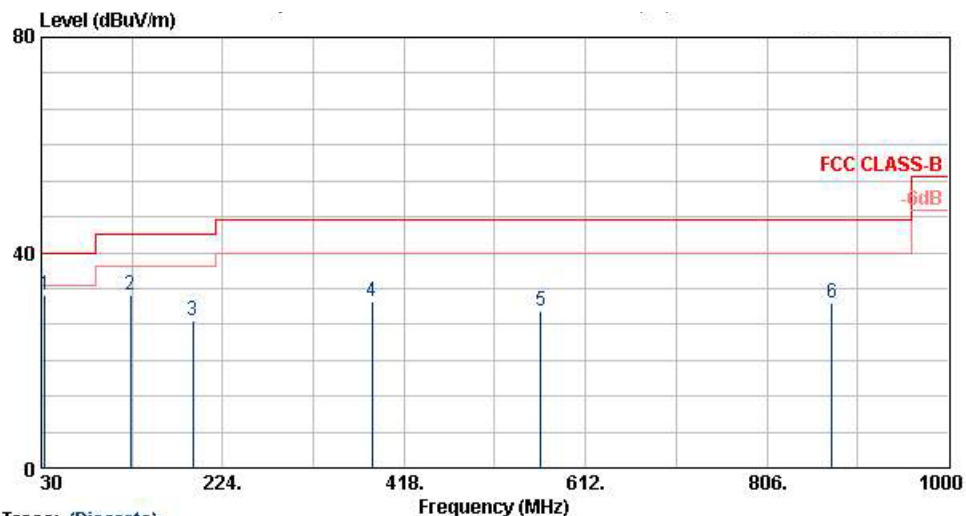
1. The spurious emission above 1 GHz is too low to be taken.



6.4.4 Test Mode: Mode 4

- Test Distance: 3m
- Temperature: 25~26°C
- Relative Humidity: 40~42%
- Emission level (dBuV/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

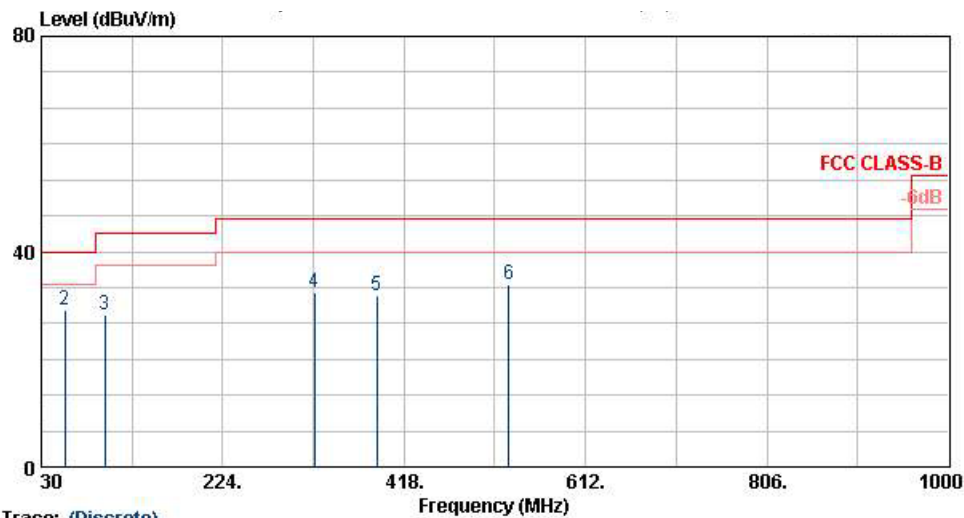


Site : 03CH06-HY
 Condition : FCC CLASS-B 3m LF-ANT(951121) HORIZONTAL
 EUT : Phone
 Power : From System
 Model : FD 820515
 Memo : CDMA 1XRTT AWS Idle + GPS Rx
 + USB Link + Earphone
 Plane : H
 MEID : 266435456102522605

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
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:

1. 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
 MEID : 266435456102522605

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
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-050	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
Combined standard uncertainty Uc(y)	1.13		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	2.26		

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
Combined standard uncertainty Uc(y)	1.27		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	2.54		

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

Contribution	Uncertainty of x_i		$u(x_i)$	C_i	$C_i * u(x_i)$
	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 Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20 \log(1 - \Gamma_1 * \Gamma_2 * \Gamma_3)$	+0.34/-0.35	U-shaped	0.244	1	0.244
Combined standard uncertainty $U_c(y)$	2.36				
Measuring uncertainty for a level of confidence of 95% $U = 2U_c(y)$	4.72				



9. Certificate of NVLAP Accreditation

United States Department of Commerce
National Institute of Standards and Technology

NVLAP[®]

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200079-0

Sporton International, Inc. Hwa Ya EMC Laboratory
Tao Yuan Hsien 333
TAIWAN

*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



Sally S. Bruce
For the National Institute of Standards and Technology

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