



FCC TEST REPORT

for

47 CFR Part 22H

Equipment : CDMA 2000 Mobile Phone
Trade Name : RH-104
Model No. : 1325
FCC ID : QMNRH-104
Tx Frequency Range : 824~849 MHz
Rx Frequency Range : 869~894 MHz
Max. ERP Power : 0.11 W
Emission Designator : 1M25F9W
Applicant : Nokia Inc.
12278 Scripps Summit Dr. San Diego CA 92131 USA

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- The data shown in this test report were carried out on Jan. 21, 2007 at **Sporton International Inc. LAB.**
- Report No.: FG6D0901-01, Report Version: Rev. 04

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History of this test report

Report Issue Date: Jan. 31, 2007

Report No.	Description



1. General Information

1.1. Applicant

Nokia Inc.

12278 Scripps Summit Dr. San Diego CA 92131 USA

1.2. Manufacturer

Foxconn International Holdings Limited

No. 2, 2nd DongHuan Road, 10th YouSong Industrial District, Longhua Town, Baoan, Shenzhen, Guangdong, China

1.3. Basic Description of Equipment under Test

Equipment	: CDMA 2000 Mobile Phone
Trade Name	: RH-104
Model No.	: 1325
Power Supply Type	: Switching, From battery 3.7V
AC Power Cord	: AC 120V, Wall-mount, 1.8 meter, 2 pin
Earphone	: Nokia, HS-9
Adapter	: Nokia, AC-3C
Battery	: Nokia, BL-4C

**1.2 Feature of Equipment under Test**

DUT Type :	CDMA 2000 Mobile Phone
Trade Name :	RH-104
Model Name :	1325
FCC ID :	QMNRH-104
Phone ESN Number :	00627114634
Tx Frequency :	824~849 MHz
Rx Frequency :	869~894 MHz
Maximum Output Power to Antenna :	25.40 dBm
Maximum ERP :	0.11 W (20.41 dBm)
HW ID:	2501
SW Version :	MK_GEN_QS02255_B1001
Antenna Type :	Fixed Internal
Antenna Gain :	-4.4 dBi
Digital Modulation Emission :	QPSK
Type of Emission :	1M25F9W
DUT Stage :	Identical Prototype

1.3 Report Date

EUT Received : Dec. 02, 2006

Report Date : Jan. 31, 2007

2. Test Configuration of Equipment under Test

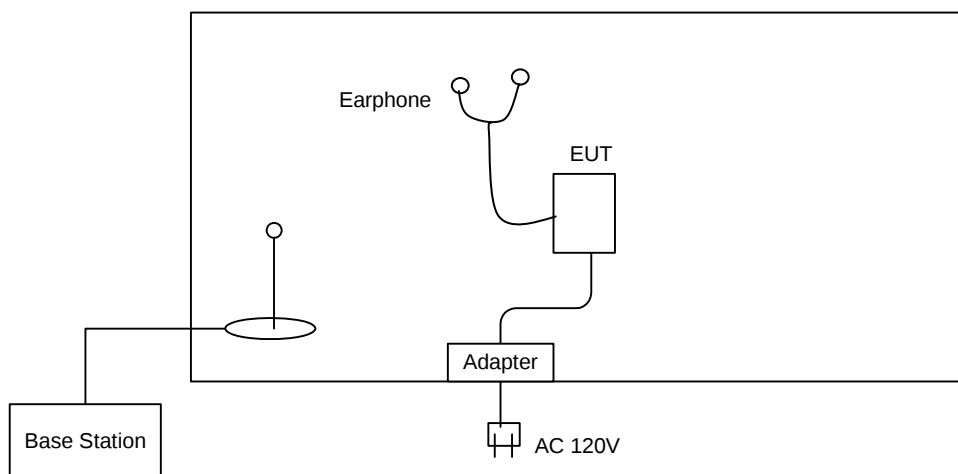
2.1 Test Manner

- The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range.
- During all testings, EUT is in link mode with base station emulator at maximum power level.
- Frequency range investigated: radiated emission 30MHz to 9000 MHz for CDMA2000 Cellular 850 band.

2.2 Test Mode

Application	CDMA2000 Cellular 850 band
Radiated Emission	☒ Mode 1: CDMA2000 Link Mode

2.3 Connection Diagram of Test System



2.4 Ancillary Equipment List

Item	Asset	Trade Name	Model Name	Power Cord
1.	Base Station	Agilent	E5515C	AC 100-240V



3. General Information of Test Site

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 : 886-3-318-0055
Test Site No : 03CH06-HY
FCC Reg. Num. : 101377

The chamber meets the characteristics of ANSI C63.4-2003. This site is on file with the FCC. The Industry Canada file number for this site is IC 4088.

3.1 Test Voltage

120V / 60Hz

3.2 Test in Compliance with

47 CFR Part 22H, and Part 2

3.3 Frequency Range Investigated

- a. Radiation: from 30 MHz to 9000 MHz for CDMA2000 Cellular 850 band.

3.4 Test Distance

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



4. Test Data and Test Result

4.1 List of Measurements and Examinations

FCC Rule	DESCRIPTION OF TEST	Result	Section
§22.913,	ERP / EIRP	Passed	4.2
§2.1053	Field Strength of Spurious Radiation	Passed	4.3



4.2 ERP / EIRP Measurement

Equivalent isotropic radiated power measurements by substitution method according to ANSI/TIA/EIA-603-C.

4.2.1 Measurement Instruments

As described in chapter 5 of this test report.

4.2.2 Test Procedure

1. The EUT was placed on a rotatable table with 1.0 meter height in an fully anechoic chamber.
2. The EUT was set 1.2 meters from the receiving antenna which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiated power.
4. The height of the receiving antenna is also kept at 1.0M height.
5. Taking the record of maximum ERP/EIRP.
6. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
7. The conducted power at the terminal of the dipole antenna is measured.
8. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
9. $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$

P_s (dBm) : Input power to substitution antenna.

G_s (dBi or dBd) : Substitution antenna Gain.

$E_t = R_t + AF$

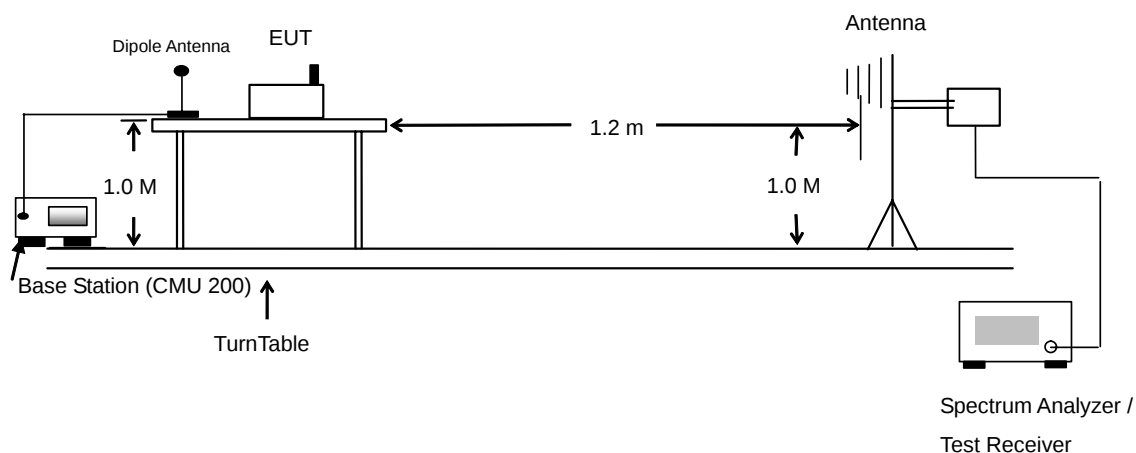
$E_s = R_s + AF$

AF (dB/m) : Receive antenna factor

R_t : The highest received signal in Spectrum Analyzer for EUT.

R_s : The highest received signal in spectrum analyzer for substitution antenna.

4.2.3 Test Setup Layout of ERP/EIRP



4.2.4 Test Result

Temperature : 24

Relative Humidity : 54%

Test Engineer : James Huang

CDMA2000 Cellular850 Band Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-37.25	-48.35	0.00	-0.76	10.34	0.01
836.40	-36.20	-48.28	0.00	-0.93	11.15	0.01
848.80	-36.90	-48.12	0.00	-1.08	10.14	0.01
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.20	-28.16	-48.05	0.00	-0.76	19.13	0.08
836.40	-26.67	-48.01	0.00	-0.93	20.41	0.11
848.80	-27.23	-47.97	0.00	-1.08	19.66	0.09

4.3 Field Strength of Spurious Radiation

Equivalent isotropic radiated Power Measurements by substitution method according to TIA/EIA-603.

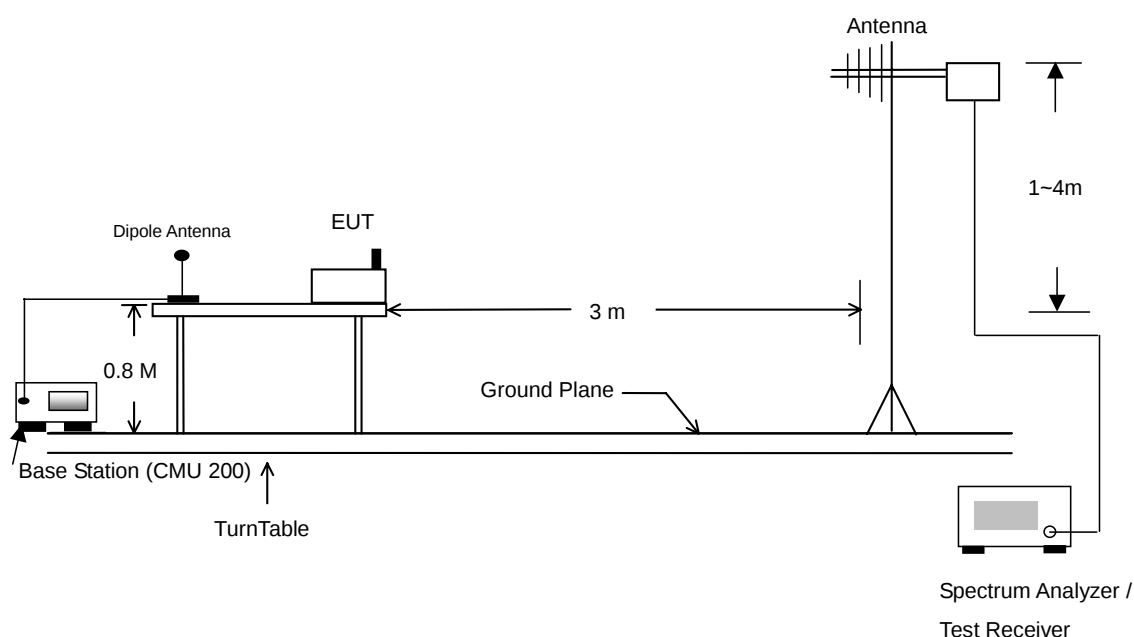
4.3.1 Measurement Instruments

As described in chapter 5 of this test report.

4.3.2 Test Procedure

1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to reach the maximum spurious emission for both horizontal and vertical polarizations.
5. Taking the record of maximum spurious emission.
6. A Horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. Emission level (dBm) = output power + substitution Gain.

4.3.3 Test Setup Layout



**4.3.4 Test Result**

- Temperature : 21.2
- Relative Humidity : 61%
- Test Mode : Mode 1
- Test Engineer: James Huang

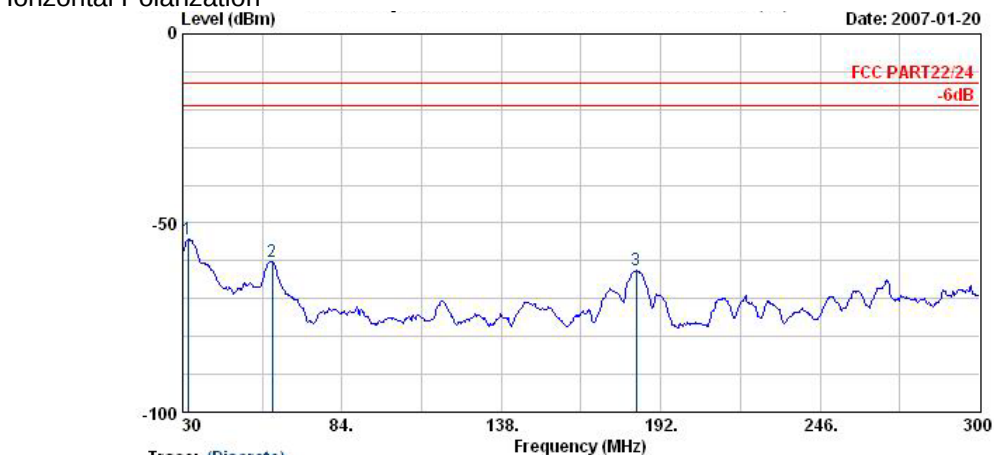
CDMA2000 Cellular850 Band with Radiated Spurious ERP							
H Polarization				V Polarization			
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)
31.890	-56.480	-13	-43.48	31.890	-52.510	-13	-39.51
60.240	-62.240	-13	-49.24	59.430	-58.980	-13	-45.98
183.630	-64.780	-13	-51.78	214.140	-64.680	-13	-51.68
444.900	-65.340	-13	-52.34	441.400	-62.680	-13	-49.68
1674.000	-49.660	-13	-36.66	1674.000	-59.350	-13	-46.35
2508.000	-56.950	-13	-43.95	2508.000	-58.710	-13	-45.71
3344.000	-53.040	-13	-40.04	3344.000	-55.560	-13	-42.56



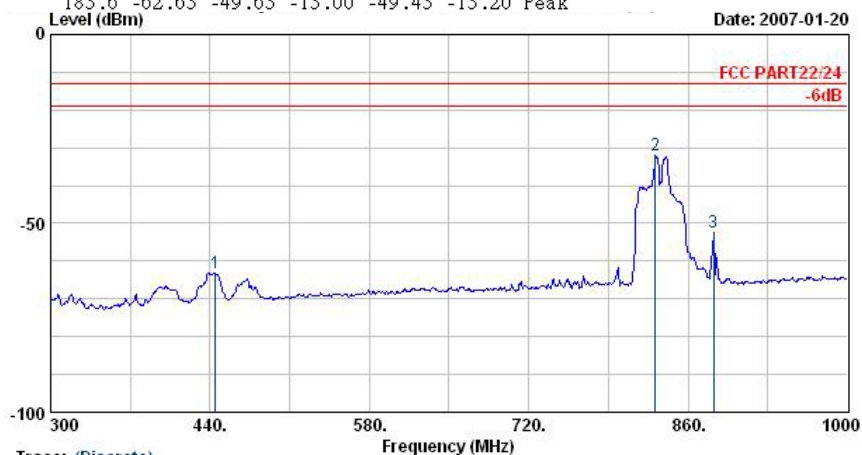
4.3.5 Test Data

4.3.5.1 Test Mode : Mode 1

Horizontal Polarization



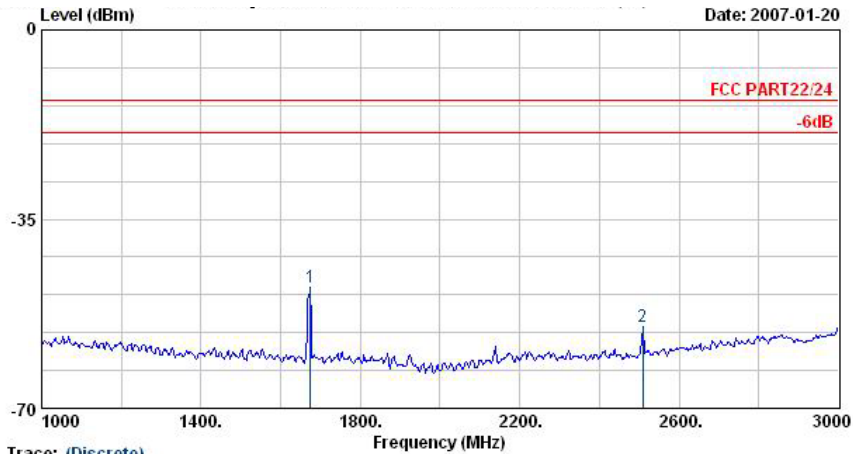
	Freq	Level	Over	Limit	Read	
	MHz	dBm	dB	dBm	dBm	Factor Remark
1 @	31.9	-54.33	-41.33	-13.00	-53.47	-0.86 Peak
2	60.2	-60.09	-47.09	-13.00	-47.69	-12.39 Peak
3	183.6	-62.63	-49.63	-13.00	-49.43	-13.20 Peak



	Freq	Level	Over	Limit	Read	
	MHz	dBm	dB	dBm	dBm	Factor Remark
1	444.9	-63.19	-50.19	-13.00	-57.32	-5.87 Peak
2 @	831.3	-32.11			-30.72	-1.39 Peak
3 @	882.4	-52.42			-51.53	-0.89 Peak

Remark:

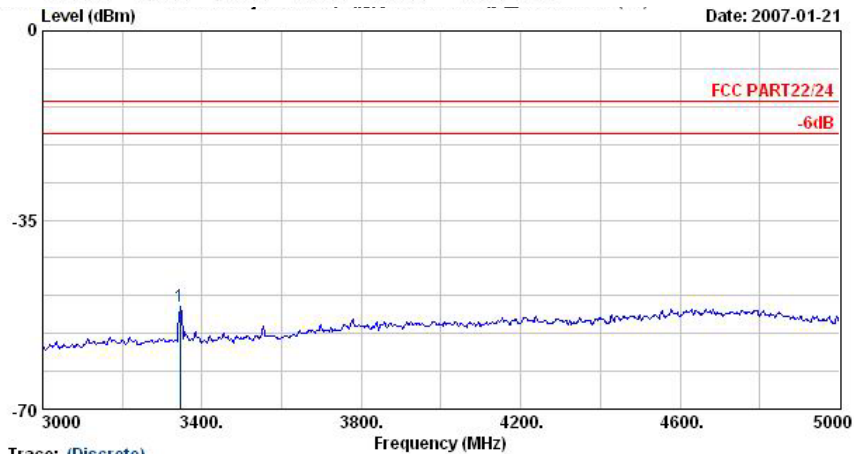
1. #1: MS Signal
2. #2: BS Signal



Trace: (Discrete)

Site : 03CH06-HY
Condition : HF-SPURIOUS HORIZONTAL
EUT : CDMA2000 Mobile Phone
Power : 120Vac/60Hz
Model : FG 6D0901-01
Memo : CDMA2000 Cellular Link Mode, CH384
+Adapter+Earphone
Plane : E2

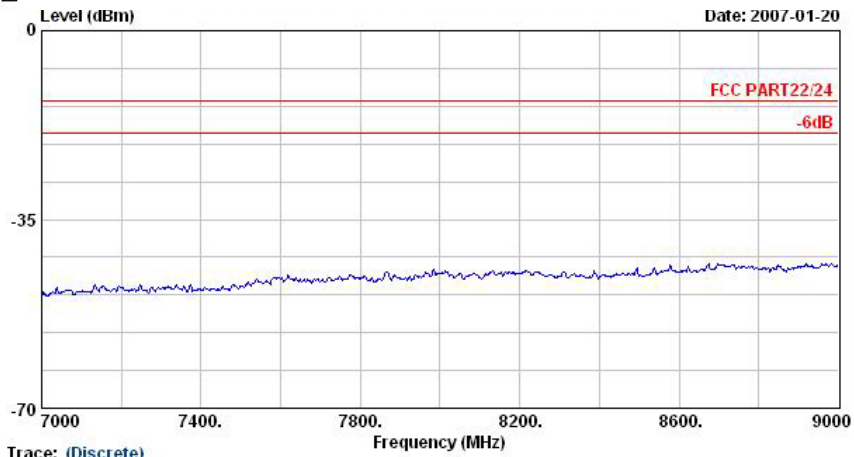
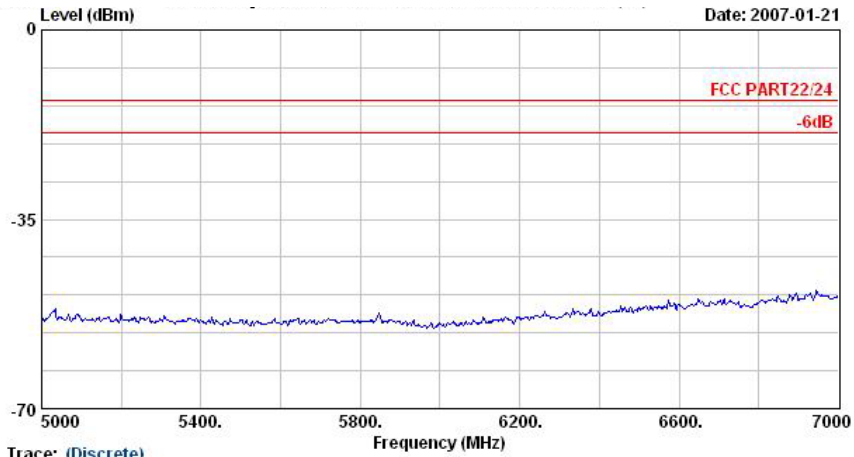
	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor Remark
			dB	dBm	dBm	dB
1 @	1674.0	-47.51	-34.51	-13.00	-47.73	0.22 Peak
2	2508.0	-54.80	-41.80	-13.00	-55.99	1.20 Peak

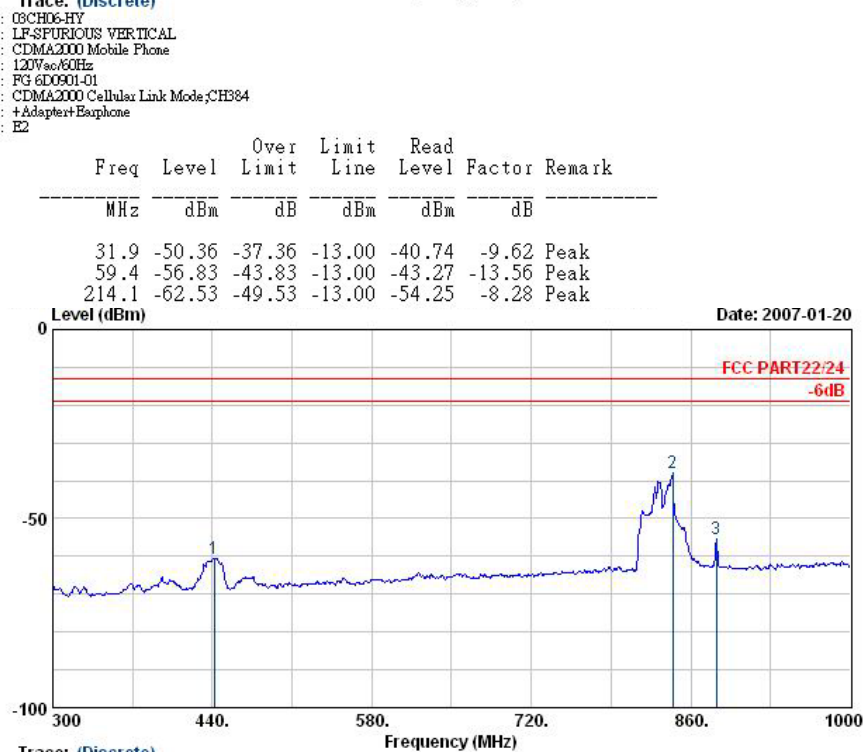
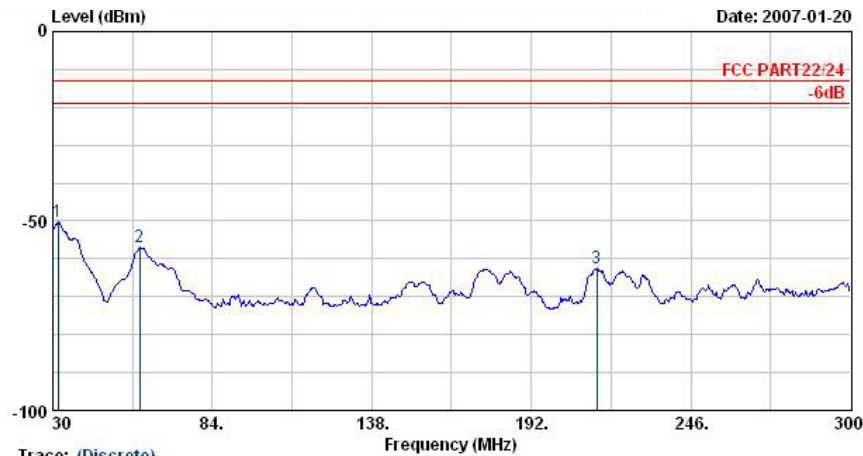


Trace: (Discrete)

Site : 03CH06-HY
Condition : HF-SPURIOUS HORIZONTAL
EUT : CDMA2000 Mobile Phone
Power : 120Vac/60Hz
Model : FG 6D0901-01
Memo : CDMA2000 Cellular Link Mode, CH384
+Adapter+Earphone
Plane : E2

	Freq	Level	Over	Limit	Read	
	MHz	dBm	Limit	Line	Level	Factor Remark
			dB	dBm	dBm	dB
1 @	3344.0	-50.89	-37.89	-13.00	-56.30	5.41 Peak



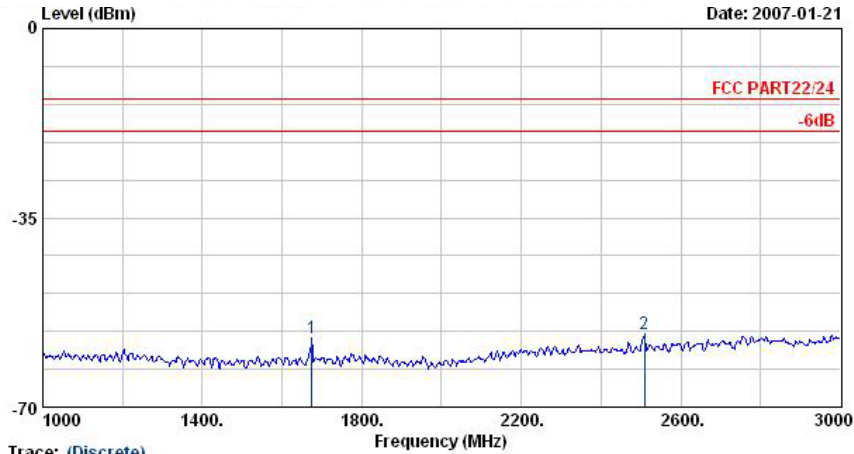
Vertical Polarization

Remark:

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



FCC TEST REPORT

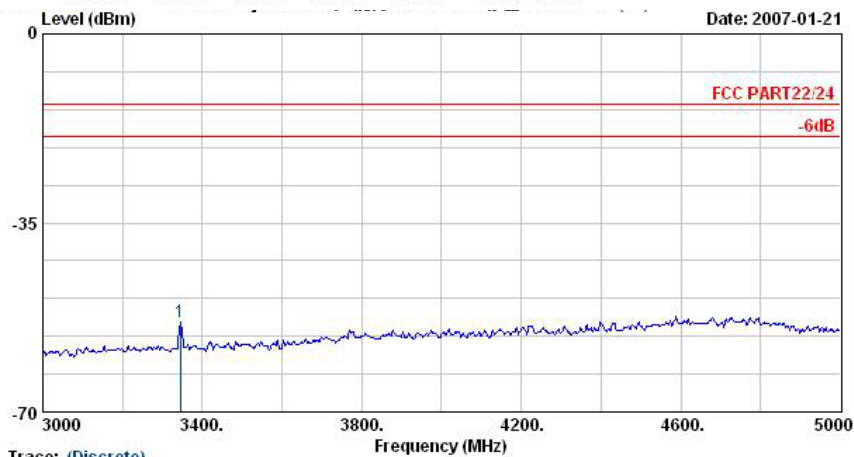
Report No. : FG6D0901-01



Trace: (Discrete)

Site : 09CH06-HY
Condition : HF-SPURIOUS VERTICAL
EUT : CDMA2000 Mobile Phone
Power : 120Vac/60Hz
Model : FG 6D0901-01
Memo : CDMA2000 Cellular Link Mode;CH384
Plane : +Adapter+Earphone
E2

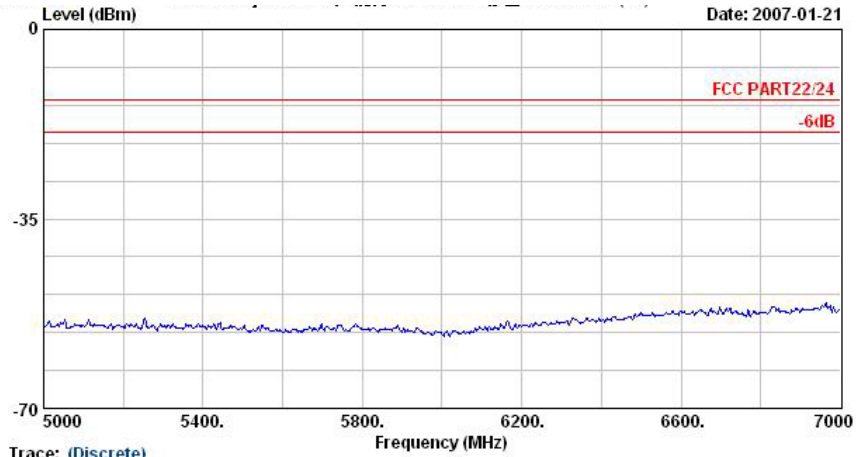
	Freq	Level	Over	Limit	Read		
	MHz	dBm	Limit	Line	Level	Factor	Remark
			dB	dBm	dBm	dB	
1	1674.0	-57.20	-44.20	-13.00	-56.72	-0.48	Peak
2	2508.0	-56.56	-43.56	-13.00	-58.83	2.27	Peak



Trace: (Discrete)

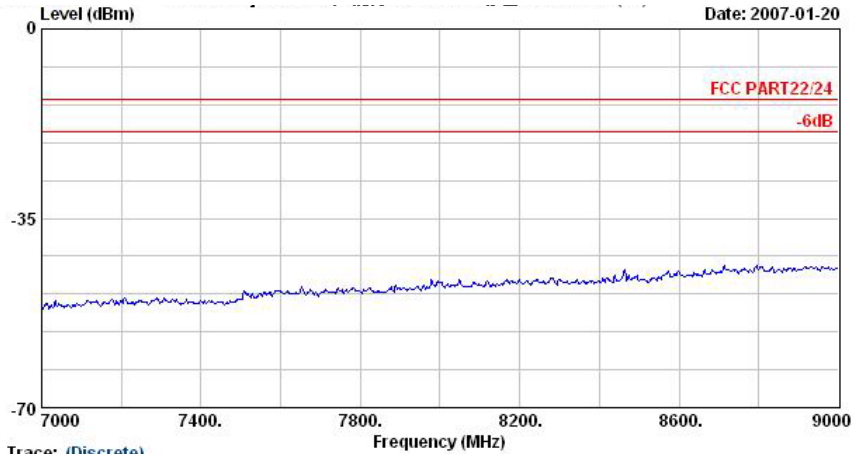
Site : 09CH06-HY
Condition : HF-SPURIOUS VERTICAL
EUT : CDMA2000 Mobile Phone
Power : 120Vac/60Hz
Model : FG 6D0901-01
Memo : CDMA2000 Cellular Link Mode;CH384
Plane : +Adapter+Earphone
E2

	Freq	Level	Over	Limit	Read		
	MHz	dBm	Limit	Line	Level	Factor	Remark
			dB	dBm	dBm	dB	
1 @	3344.0	-53.41	-40.41	-13.00	-57.87	4.47	Peak



Trace: (Discrete)

Site : 08CH06-HY
Condition : HF-SPURIOUS VERTICAL
EUT : CDMA2000 Mobile Phone
Power : 120Vac/60Hz
Model : FG 6D0901-01
Memo : CDMA2000 Cellular Link Mode;CH384
Memo : +Adapter+Earphone
Plane : E2



Trace: (Discrete)

Site : 08CH06-HY
Condition : HF-SPURIOUS VERTICAL
EUT : CDMA2000 Mobile Phone
Power : 120Vac/60Hz
Model : FG 6D0901-01
Memo : CDMA2000 Cellular Link Mode;CH384
Memo : +Adapter+Earphone
Plane : E2

**4. List of Measurement Equipments**

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum analyzer	Agilent	E4408B	MY44211030	9KHz-26.5GHz	Oct. 05, 2006	Oct. 04, 2007	Radiation (03CH06-HY)
Receiver	R&S	ESCS30	100356	9KHz-2.75GHz	Jul. 13, 2006	Jul. 12, 2007	Radiation (03CH06-HY)
Controller	INN-CO	CO2000	N/A	N/A	N/A	N/A	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Nov. 20, 2006	Nov. 19, 2007	Radiation (03CH06-HY)
Horn Antenna	Com-Power	AH118	071025	1G-18G	May 29, 2006	May 28, 2007	Radiation (03CH06-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	9170-249	14G - 40G	Jul. 22, 2006	Jul. 21, 2008	Radiation (03CH06-HY)
HF Amplifier	Agilent	8449B	3008A01917	1G - 26.5G	Sep. 13, 2006	Sep. 12, 2007	Radiation (03CH06-HY)
Amplifier	Mini Circuits	ZFL-2500VH	D092004	10~2500MHz	Jul. 20, 2006	Jul. 19, 2007	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0 ~ 360 degree	N/A	N/A	Radiation (03CH06-HY)
Antenna Mast	INN-CO	MM3000	114/8000604/L	1 m - 4 m	N/A	N/A	Radiation (03CH06-HY)

5. Uncertainty Evaluation

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

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 $U_c(y)$	1.27		
Measuring uncertainty for a level of confidence of 95% $U=2U_c(y)$	2.54		

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

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 = $20 \log(1 - \Gamma_1^2 * \Gamma_2^2)$	+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				

END OF TEST REPORT