

Partial FCC RF Test Report

APPLICANT : Acer Inc.
EQUIPMENT : 3G Module
BRAND NAME : Acer, Gateway, PackardBell
MODEL NAME : Gobi2000
FCC ID : HLZGOBI2000A
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION : PCS Licensed Transmitter (PCB)
Tx/Rx FREQUENCY RANGE : CDMA2000 BC0 : 824.70 ~ 848.31 MHz /
869.70 ~ 893.31 MHz
CDMA2000 BC1 : 1851.25 ~ 1908.75 MHz /
1931.25 ~ 1988.75 MHz
MAX. ERP/EIRP POWER : CDMA2000 BC0 : 0.09 W
CDMA2000 BC1 : 0.25 W

This is a partial report which is only valid combined with the Integrated WWAN Module (Brand name: Qualcomm / Model name: Gobi2000, FCC ID: J9CGOBI2000) Report.

The product was installed into Acer Notebook Computer (Brand Name: Acer, Gateway, PackardBell, Model Name: NAV80, Marketing Name: LT23 series) during test.

The product was received on May 17, 2010 and completely tested on May 31, 2010. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:



Roy Wu / Manager



SPORTON INTERNATIONAL INC.

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FCC ID : HLZGOBI2000A

Page Number : 1 of 20

Report Issued Date : Jun. 09, 2010

Report Version : Rev. 01



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG051731	Rev. 01	Initial issue of report	Jun. 09, 2010

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	§22.913(a)(2)	RSS-132(4.4) SRSP-503(5.1.3)	Effective Radiated Power	< 7 Watts	PASS	-
3.1	§24.232(c)	RSS-133 (6.4) SRSP-510(5.1.2)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.2	§2.1053 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Field Strength of Spurious Radiation	$< 43 + 10 \log_{10}(P[\text{Watts}])$	PASS	Under limit 12.22 dB at 3760.00 MHz

1 General Description

1.1 Applicant

Acer Inc.

8F, No. 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.

1.2 Manufacturer

1. Compal Electronics (China) Co., Ltd.

No. 988, Tong Feng East Rd., Kunshan Economics & Technical Development Zone, Kunshan, Jiangsu, P.R. China

2. Compal Information (Kunshan) Co., Ltd.

The Third Street, Kunshan Export Processing Zone, Jiangsu, P.R. China

3. Compal Information Technology (Kunshan) Co., Ltd.

No. 58, The 1st Street, Kunshan Export Processing Zone, Jiangsu, P.R. China

4. Compal Electronics Technology (Kunshan) Co., Ltd.

No. 25, The Third Street, Kunshan Export Processing Zone, Jiangsu, P.R. China

5. Kunshang Botai Electronics Co., Ltd.

No. 988, Tong Feng East Rd., Kunshan Economic & Technical Development Zone, Kunshan, Jiangsu, P.R. China

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	3G Module
Brand Name	Acer, Gateway, PackardBell
Model Name	Gobi2000
FCC ID	HLZGOBI2000A
Host Notebook Computer	Brand Name : Acer, Gateway, PackardBell Model Name : NAV80 Marketing Name : LT23 series HW Version : LA6222P, Rev1.0 (MB) SW Version : V3.00-CLKgen (BIOS)
Tx Frequency	CDMA2000 BC0 : 824 MHz ~ 849 MHz CDMA2000 BC1 : 1850 MHz ~1910 MHz
Rx Frequency	CDMA2000 BC0 : 869 MHz ~ 894 MHz CDMA2000 BC1 : 1930 MHz ~ 1990 MHz
Maximum Output Power to Antenna	CDMA2000 BC0 : 24.25 dBm CDMA2000 BC1 : 24.56 dBm
Maximum ERP/EIRP	CDMA2000 BC0 : 0.09 W (19.63 dBm) CDMA2000 BC1 : 0.25 W (23.93 dBm)
Antenna Type	PIFA Antenna
HW Version	P3 Rev C
SW Version	3574
Type of Modulation	QPSK
EUT Stage	Production Unit

Remark:

1. This test report recorded only product characteristics and test results of PCS Licensed Transmitter (PCB).
2. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 52, Hwa Ya 1 st 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.	Sporton Site No.	FCC/IC Registration No.
	03CH07-HY	TW1022/4086B-1

1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ Preliminary Guidance for Receiving Applications for Certification of 3G Device. May 9, 2006.
- ♦ FCC 47 CFR Part 2, 22(H), 24(E)
- ♦ ANSI / TIA / EIA-603-C-2004
- ♦ IC RSS-132 Issue 2
- ♦ IC RSS-133 Issue 5

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B (DoC), recorded in a separate test report.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m

2 Test Configuration of Equipment Under Test

2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range.

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for CDMA2000 BC0.
2. 30 MHz to 19000 MHz for CDMA2000 BC1.

Test Modes	
Band	Radiated TCs
CDMA2000 BC0	■ 1xRTT Link Mode
CDMA2000 BC1	■ 1xRTT Link Mode
Remark: Only the radiated emission of the WWAN module in the host notebook computer was performed in this report, and the conducted test cases can be referred to Qualcomm module report (FCC ID: J9CGOBI2000).	

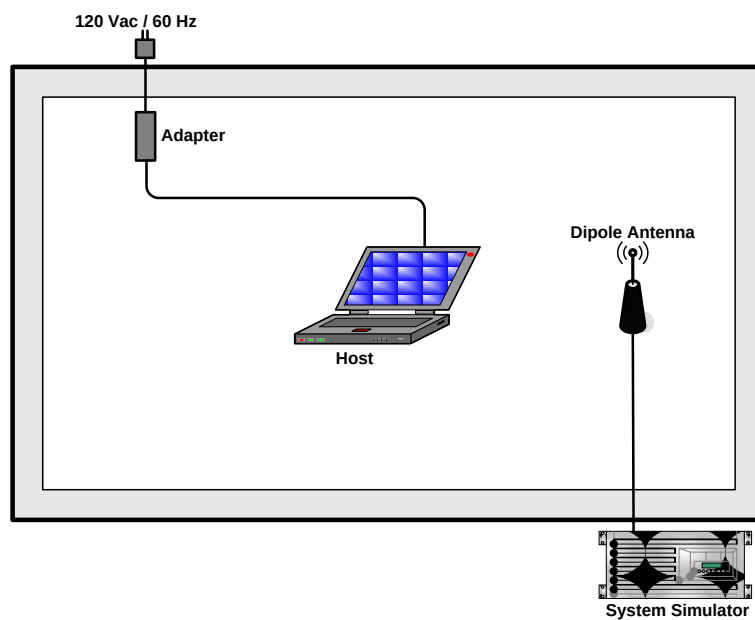
Note: The maximum RF output power levels are 1xRTT RC3+SO32 mode for CDMA2000 BC0 and CDMA2000 BC1 on QPSK Link; only these modes were used for all tests.

The conducted power table is as follows:

Conducted Power						
Band	CDMA2000 BC0			CDMA2000 BC1		
Channel	1013	384	777	25	600	1175
Frequency	824.70	836.52	848.31	1851.25	1880.00	1908.75
1xRTT RC1+SO55	24.16	23.84	23.89	24.17	24.51	24.20
1xRTT RC3+SO55	24.20	24.14	23.98	24.13	24.53	24.22
1xRTT RC3+SO32	24.25	24.05	23.89	24.12	24.56	24.17
1xEV-DO RTAP 9.6K	23.75	23.65	23.62	23.77	24.29	23.76
1xEV-DO RTAP 38.4K	23.83	23.70	23.61	23.89	24.32	23.87
1xEV-DO RTAP 153.6K	23.90	23.57	23.62	23.96	24.54	23.99
1xEV-DO RETAP 128K	23.56	23.24	23.28	23.54	24.09	23.4
1xEV-DO RETAP 2048K	23.52	23.36	23.47	23.61	24.18	23.56
1xEV-DO RETAP 12288K	23.46	23.24	23.23	23.68	24.19	23.45

(*Unit: dBm)

2.2 Connection Diagram of Test System



3 Test Result

3.1 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

3.1.1 Description of the ERP/EIRP Measurement

ERP/EIRP is measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The ERP of mobile transmitters must not exceed 7 Watts and the EIRP of mobile transmitters are limited to 2 Watts.

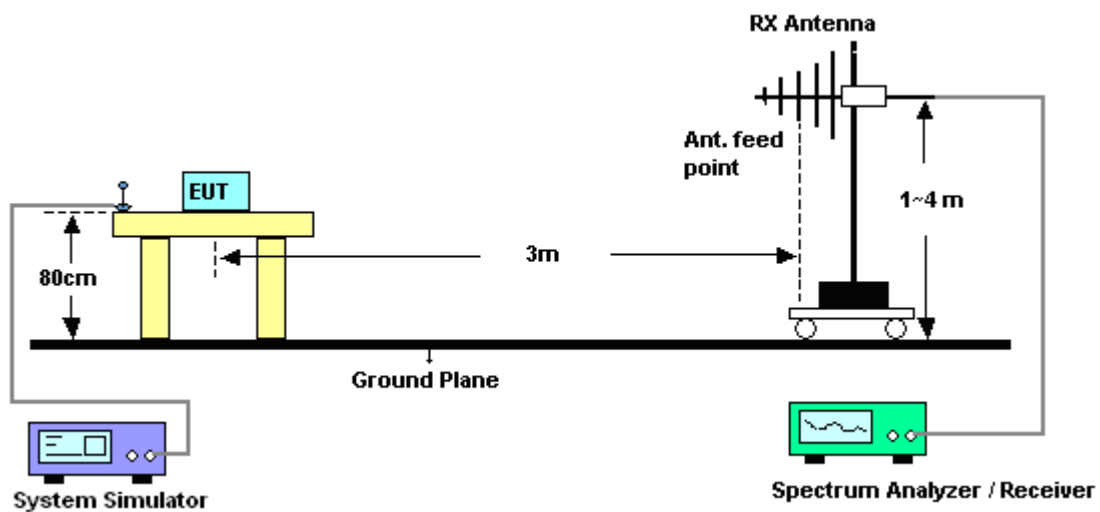
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The EUT was placed on an non-conductive rotating platform with 0.8 meter height in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW= 3MHz,VBW= 3MHz, and peak detector settings.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. The highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
3. Effective Isotropic Radiated Power(EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (substitution antenna) at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor, $EIRP = LVL + \text{Correction factor}$ and $ERP = EIRP - 2.15$.

3.1.4 Test Setup



3.1.5 Test Result of ERP

CDMA2000 BC0 1xRTT_RC3+SO32 Radiated Power ERP				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
824.70	-11.40	30.80	17.25	0.05
836.50	-11.26	31.21	17.80	0.06
848.30	-14.35	31.53	15.03	0.03
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
824.70	-11.06	32.84	19.63	0.09
836.50	-11.25	32.85	19.45	0.09
848.30	-13.04	34.11	18.92	0.08

* ERP = LVL (dBm) + Correction Factor (dB) – 2.15

3.1.6 Test Result of EIRP

CDMA2000 BC1 1xRTT_RC3+SO32 Radiated Power EIRP				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1851.30	-19.52	40.03	20.51	0.11
1880.00	-19.08	39.62	20.54	0.11
1908.80	-19.22	41.69	22.47	0.18
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1851.30	-20.81	44.51	23.70	0.23
1880.00	-19.23	43.16	23.93	0.25
1908.80	-20.64	43.98	23.34	0.22

* EIRP = LVL (dBm) + Correction Factor (dB)

3.2 Field Strength of Spurious Radiation Measurement

3.2.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43+10\log_{10}(P[\text{Watts}])$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

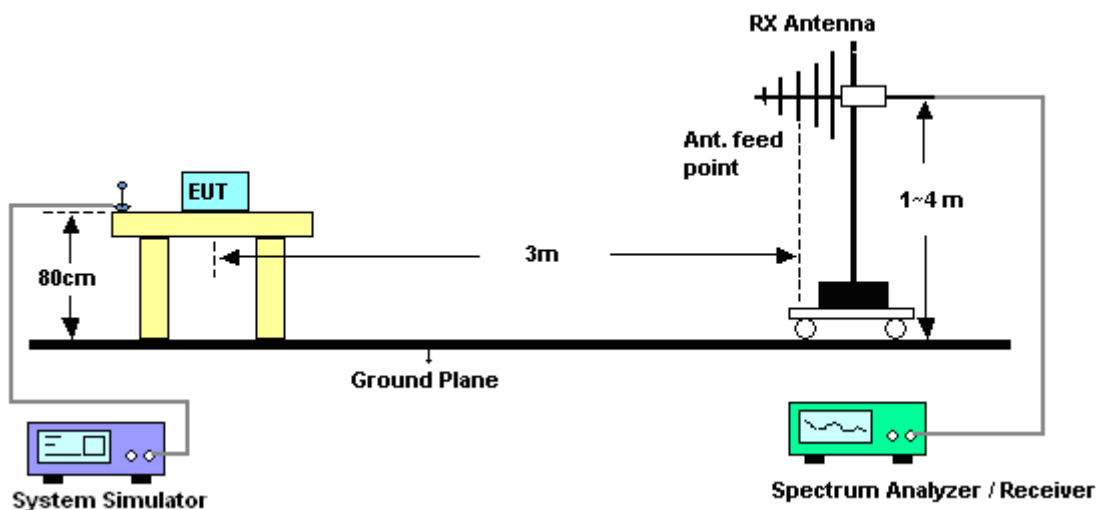
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

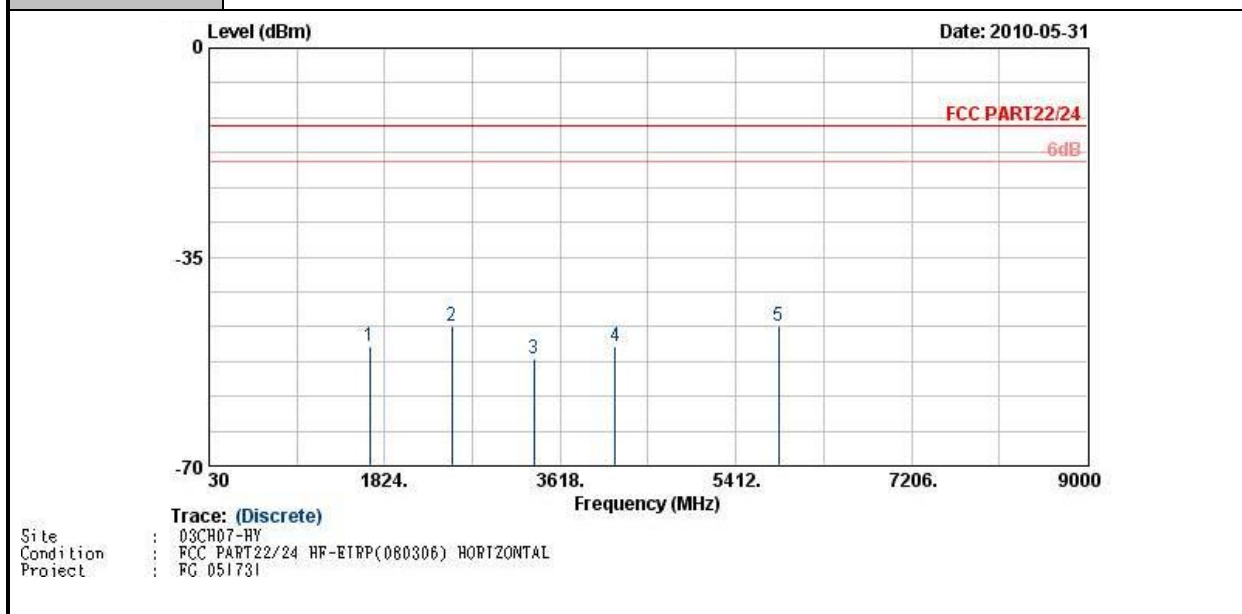
1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, Sweep = 500ms, 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. $\text{EIRP (dBm)} = \text{S.G. Power} - \text{Tx Cable Loss} + \text{Tx Antenna Gain}$
11. $\text{ERP (dBm)} = \text{EIRP} - 2.15$

3.2.4 Test Setup



3.2.5 Test Result of Field Strength of Spurious Radiated

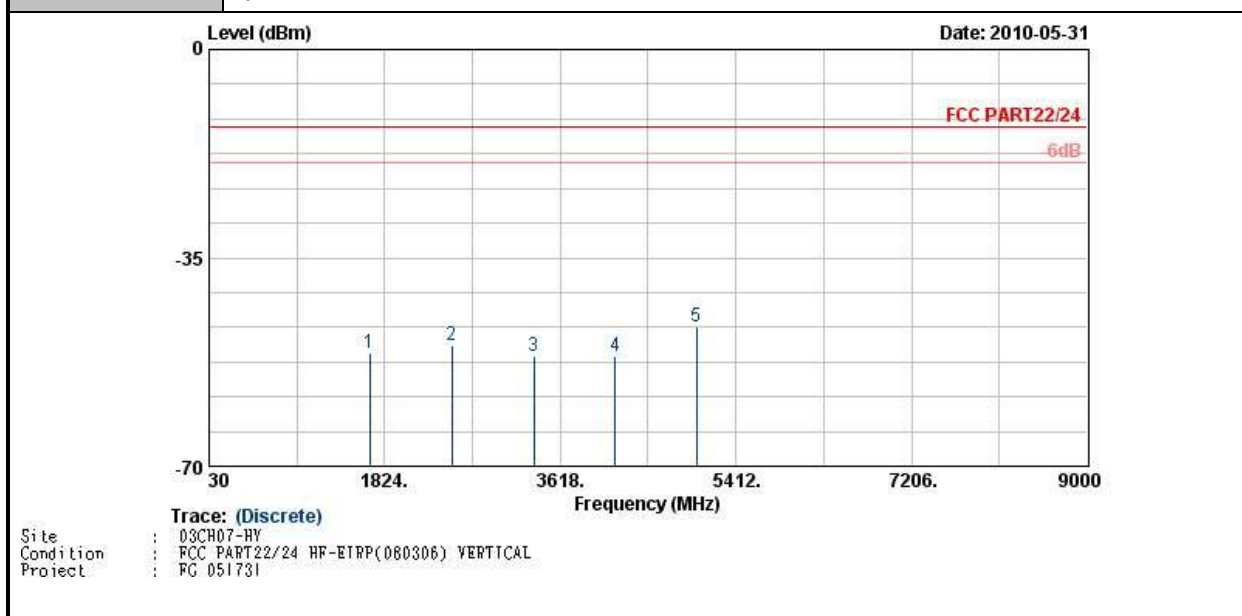
Band :	CDMA2000 BC0	Temperature :	24~25°C
Test Mode :	1xRTT_RC3+SO32	Relative Humidity :	44~45%
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1669.00	-49.96	-13.00	-36.96	-57.05	-49.81	3.39	5.39	H	Pass
2509.00	-46.49	-13.00	-33.49	-56.63	-46.75	3.71	6.12	H	Pass
3346.00	-52.16	-13.00	-39.16	-63.11	-54.88	3.13	8.00	H	Pass
4175.00	-50.07	-13.00	-37.07	-63.17	-53.91	3.01	9.00	H	Pass
5850.00	-46.46	-13.00	-33.46	-64.86	-50.33	4.38	10.40	H	Pass

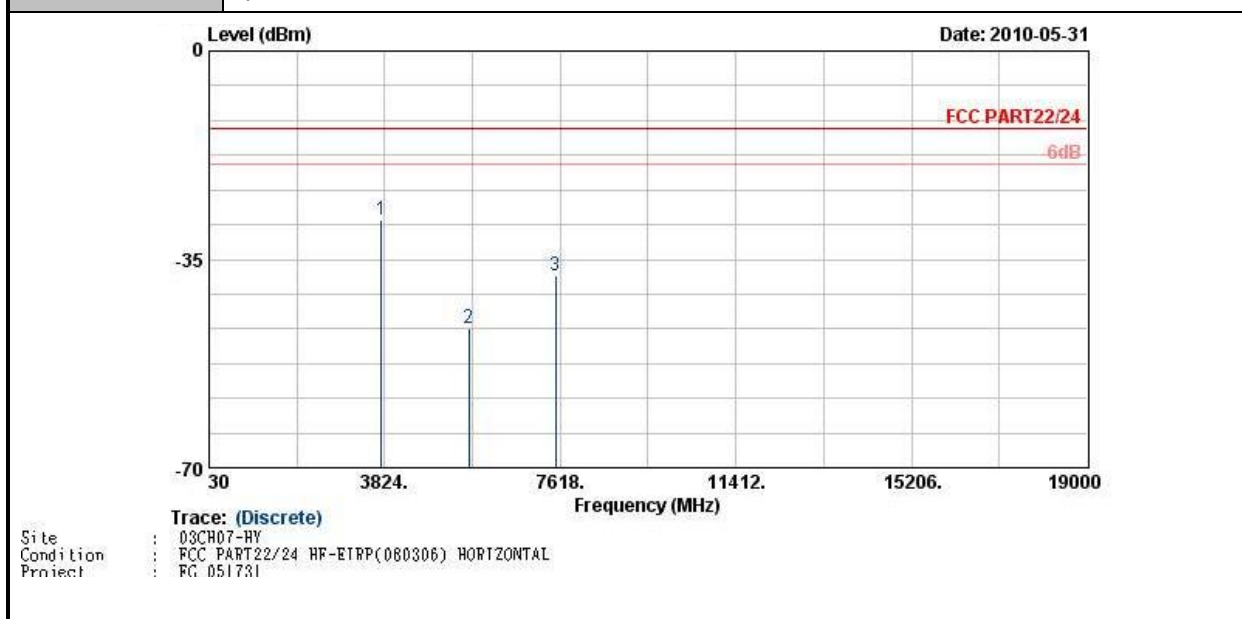


Band :	CDMA2000 BC0	Temperature :	24~25°C
Test Mode :	1xRTT_RC3+SO32	Relative Humidity :	44~45%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



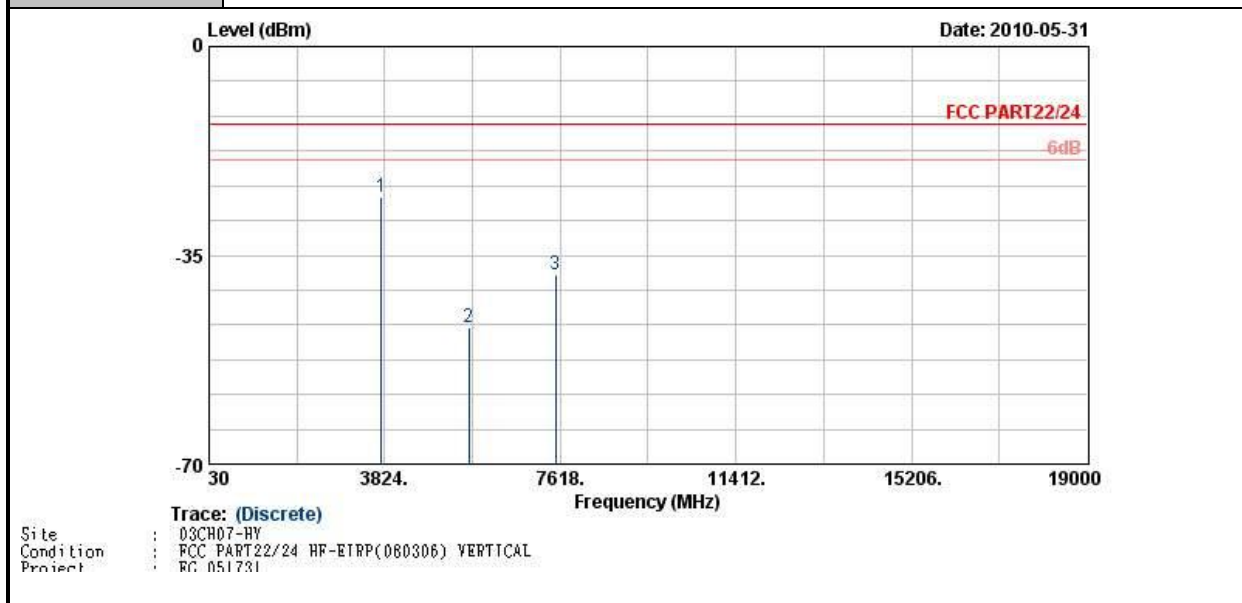
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1669.00	-50.88	-13.00	-37.88	-57.90	-50.73	3.39	5.39	V	Pass
2509.00	-49.63	-13.00	-36.63	-60.22	-49.89	3.71	6.12	V	Pass
3346.00	-51.44	-13.00	-38.44	-63.88	-54.16	3.13	8.00	V	Pass
4175.00	-51.64	-13.00	-38.64	-65.57	-55.48	3.01	9.00	V	Pass
5010.00	-46.65	-13.00	-33.65	-61.56	-51.62	2.61	9.73	V	Pass

Band :	CDMA2000 BC1	Temperature :	24~25°C
Test Mode :	1xRTT_RC3+SO32	Relative Humidity :	44~45%
Test Engineer :	Kay Wu	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760.00	-28.46	-13.00	-15.46	-43.51	-30.98	4.88	7.40	H	Pass
5636.00	-46.48	-13.00	-33.48	-64.07	-49.74	5.55	8.81	H	Pass
7520.00	-37.81	-13.00	-24.81	-59.75	-40.88	6.64	9.71	H	Pass

Band :	CDMA2000 BC1	Temperature :	24~25°C
Test Mode :	1xRTT_RC3+SO32	Relative Humidity :	44~45%
Test Engineer :	Kay Wu	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760.00	-25.22	-13.00	-12.22	-43.27	-28.25	4.88	7.91	V	Pass
5636.00	-47.18	-13.00	-34.18	-65.10	-51.40	5.55	9.77	V	Pass
7520.00	-38.13	-13.00	-25.13	-60.33	-42.30	6.64	10.81	V	Pass

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 31, 2009	Oct. 30, 2010	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP	101067	9KHz ~ 30GHz	Dec. 04, 2009	Dec. 03, 2010	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 20, 2009	Aug. 19, 2010	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA917025 1	15GHz- 40GHz	Oct. 14, 2009	Oct. 13, 2010	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec.09,2009	Dec. 08, 2010	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32dB. GAIN	Mar. 27, 2010	Mar. 26, 2011	Radiation (03CH07-HY)
System Simulator	R&S	CMU200	117997	N/A	May 14, 2009	May 13, 2011	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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-Shape	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 (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=2)	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 = $20\log(1-\Gamma_1\Gamma_2)$	+0.34 / -0.35	U-Shape	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				



Appendix A. Photographs of EUT

Please refer to Sporton report number EP051731 as below.