

Partial IC RF Test Report

APPLICANT : Acer Inc.
EQUIPMENT : 3G Module
BRAND NAME : Qualcomm
MODEL NAME : Gobi2000
IC : 1754F-GOBI2000A
STANDARD : IC RSS-132 Issue 2 and RSS-133 Issue 5
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 : 0.12 W
CDMA2000 BC1 : 0.35 W

This is a partial report which is only valid combined with the WWAN Module (Brand name: Qualcomm / Model name: GOBI2000) Report.

The product was received on May 25, 2011 and completely tested on Jun. 11, 2011. 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:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
CG081906-03TX	Rev. 01	Initial issue of report	Jun. 17, 2011

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 14.31 dB at 3760 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

Quanta Computer Inc.

1. No. 2, Lane 58, Sanzhuang Road, Songjiang Export Processing Zone, Shanghai, P.R. China
2. No. 4, Wen Ming 1st Street, Kuei Shan Hsiang, Taoyuan Shien 333, Taiwan, R.O.C.
3. No. 8, Dongjing Rd., Songjiang Industrial Zone, Shanghai, P.R. China
4. No. 4, Lane 58, Sanzhuang Road, Songjiang Export Processing Zone, Shanghai, P.R. China
5. North to Songsheng Road, Songjiang Industrial Zone, Shanghai, P.R. China
6. B#, No. 1 South Rongteng Road, Songjiang Export Processing Zone, Shanghai, P.R. China
7. Standard Factory, South to Valqua, Rongxin Road, Songjiang Export Processing Zone, Shanghai, P.R. China
8. C#, No. 1 South Rongteng Road, Songjiang Export Processing Zone, Shanghai, P.R. China
9. No. 6, Lane 66, Sanzhuang Road, Songjiang Export Processing Zone, Shanghai, P.R. China
10. No. 5, Lane 58, Sanzhuang Road, Songjiang Export Processing Zone, Shanghai, P.R. China
11. Huade Building, No.18, ChuangYe Rd., ShandDi Zone, HaiDian District, Beijing, P.R.C.
12. No. 68, Sanzhuang Road, Songjiang Export Processing Zone, Shanghai, P.R. China
13. 2F., C Building, XinYe Rd., Export Processing District In Torch, Zhongshan, Guangdong, P.R.C.

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	3G Module
Brand Name	Qualcomm
Model Name	Gobi2000
IC	1754F-GOBI2000A
Host Notebook Computer	Brand Name : Acer, Gateway, PackardBell Model Name : ZGB Marketing Name : Cromia 700 HW Version : M/B : C SW Version : BIOS: 03.61.0738.0060G1
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 : 24.47 dBm CDMA2000 BC1 : 25.44 dBm
Maximum ERP/EIRP	CDMA2000 BC0 : 0.12 W (20.78 dBm) CDMA2000 BC1 : 0.35 W (25.41 dBm)
HW Version	GOBI 2000, P4
SW Version	3599
Type of Modulation	QPSK
EUT Stage	Production Unit

Remark:

1. For other wireless features of this EUT, the test report will be issued separately.
2. This test report recorded only product characteristics and test results of PCS Licensed Transmitter (PCB).
3. 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	722060/4086B-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	Agilent	8960	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

Note:

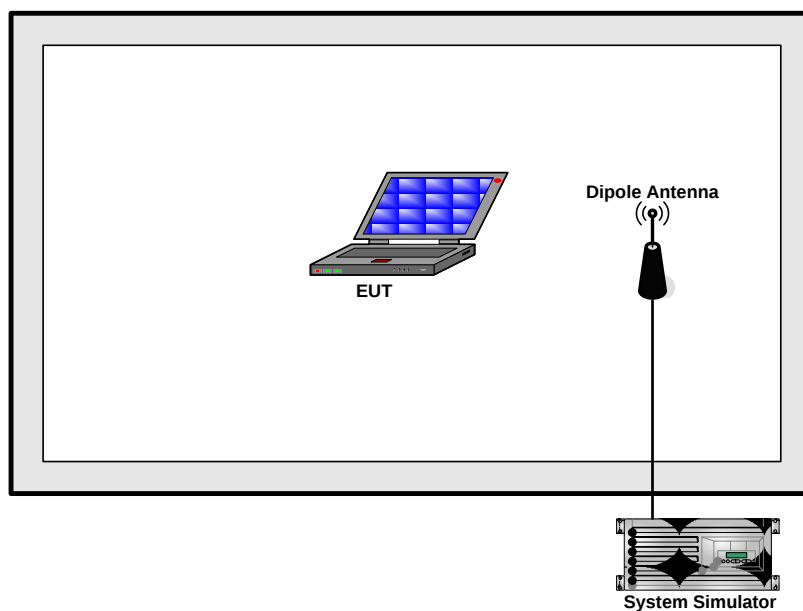
1. The maximum RF output power levels are 1xRTT RC3+SO55 mode for CDMA2000 BC1 on QPSK Link; only 1xRTT RC3+SO55 modes was used for all tests.
2. Because there are individual antennas for each WWAN, WLAN, and Bluetooth, the co-location test modes are not required.

The conducted power table is as follows:

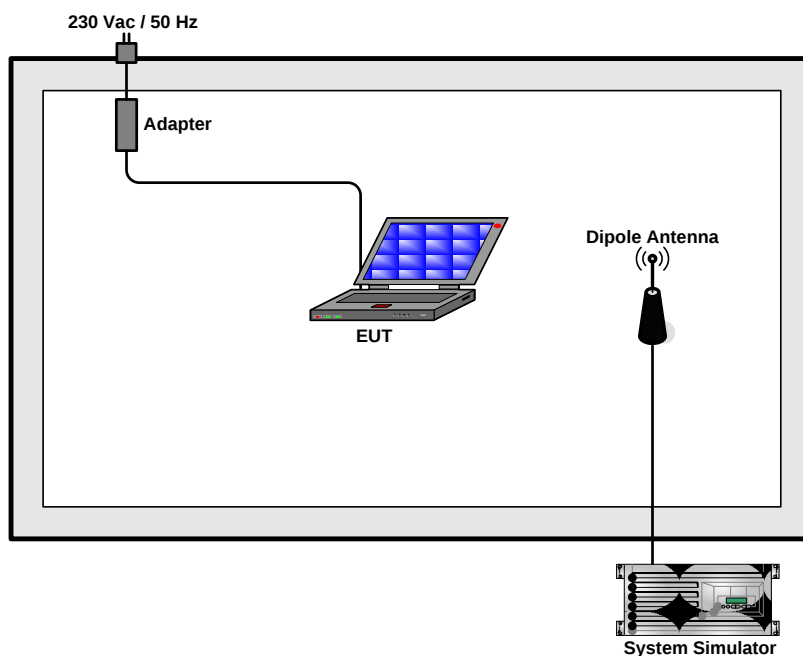
Conducted Power (*Unit: dBm)						
Band	CDMA2000 BC0			CDMA2000 BC1		
Channel	1013	384	777	25	600	1175
Frequency	824.7	836.52	848.31	1851.25	1880	1908.75
1xRTT RC1+SO55	24.25	24.36	24.29	24.69	25.18	24.80
1xRTT RC3+SO55	24.39	24.41	24.44	25.08	25.44	25.31
1xRTT RC3+SO32	24.30	24.38	24.41	25.05	25.33	25.26
1xEVDO RTAP 9.6K	24.44	24.47	24.41	24.53	24.67	24.79
1xEVDO RTAP 38.4K	24.41	24.40	24.41	24.41	24.80	24.88
1xEVDO RTAP 153.6K	24.40	24.32	24.34	24.73	24.94	25.06
1xEVDO RETAP 128K	23.84	23.96	24.03	24.26	24.49	24.43
1xEVDO RETAP 2048K	23.88	24.08	24.01	24.17	24.53	24.35
1xEVDO RETAP 12288K	23.89	24.08	23.96	24.21	24.30	24.82

2.2 Connection Diagram of Test System

<EUT Standalone>



<EUT with Adapter Mode>



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.

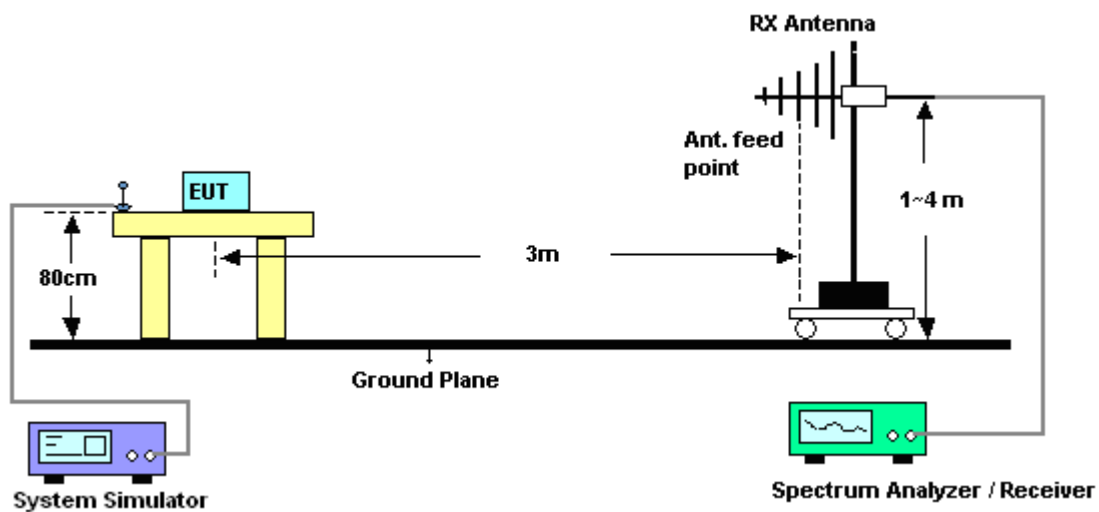
3.1.2 Measuring Instruments

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+SO55 Radiated Power ERP				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
824.70	-11.54	30.89	17.2	0.05
836.52	-11.15	31.13	17.83	0.06
848.31	-11.51	31.62	17.96	0.06
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
824.70	-13.76	35.93	20.02	0.10
836.52	-12.02	34.95	20.78	0.12
848.31	-12.15	34.71	20.41	0.11

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

3.1.6 Test Result of EIRP

CDMA2000 BC1 1xRTT_RC3+SO55 Radiated Power EIRP				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1851.25	-17.02	41.24	24.22	0.26
1880.00	-16.05	41.46	25.41	0.35
1908.75	-16.98	41.21	24.23	0.26
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1851.25	-19.61	41.52	21.91	0.16
1880.00	-19.38	43.1	23.72	0.24
1908.75	-20.06	42.73	22.67	0.18

* 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.

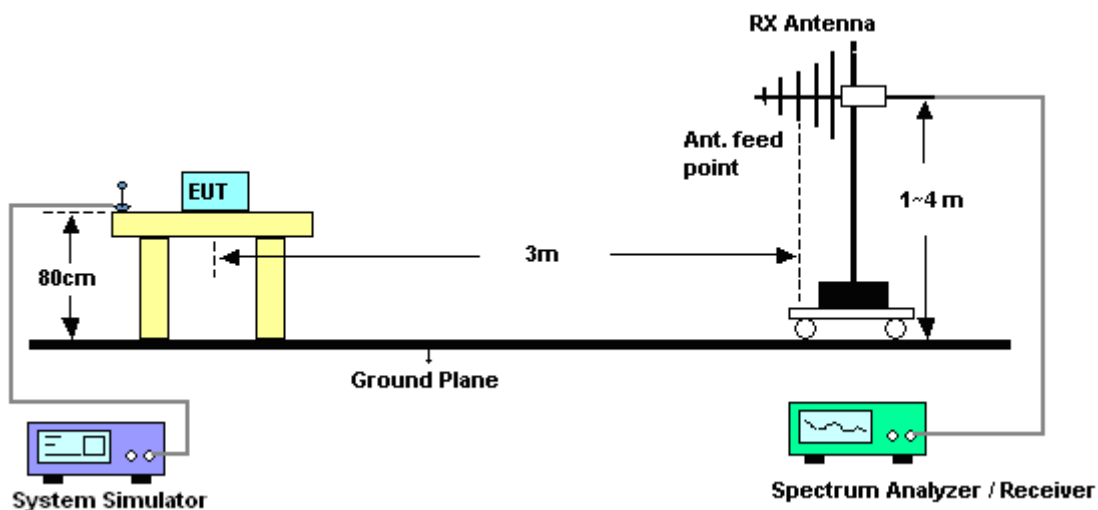
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

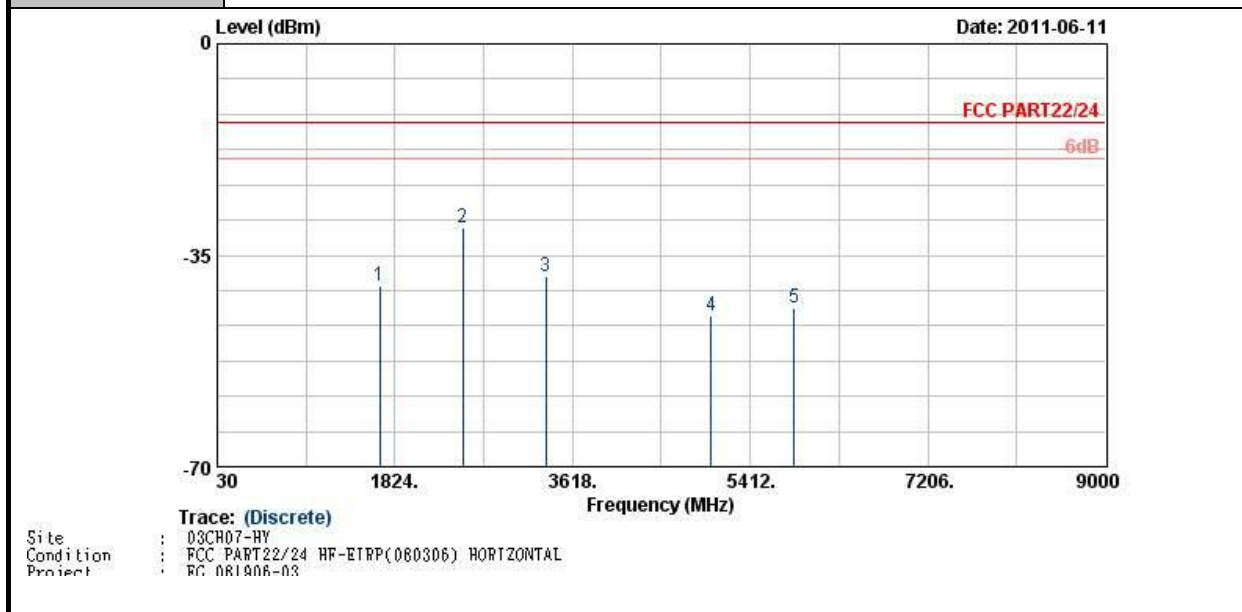
1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving 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



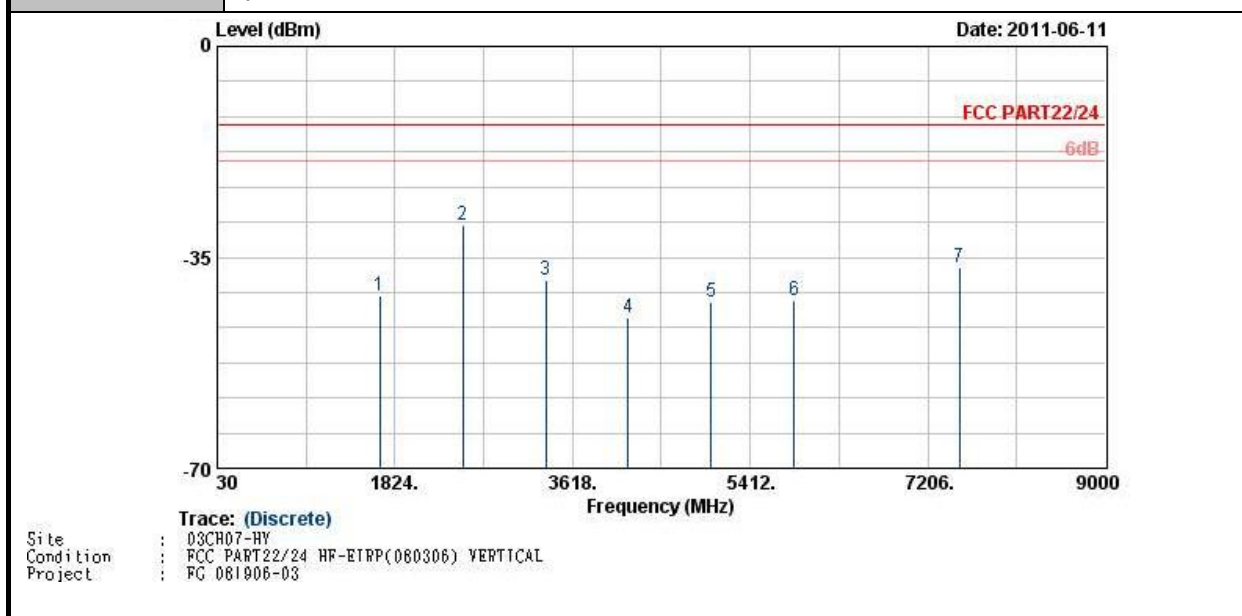
3.2.5 Test Result of Field Strength of Spurious Radiated

Band :	CDMA2000 BC0	Temperature :	21~24°C
Test Mode :	1xRTT_RC3+SO55	Relative Humidity :	45~49%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



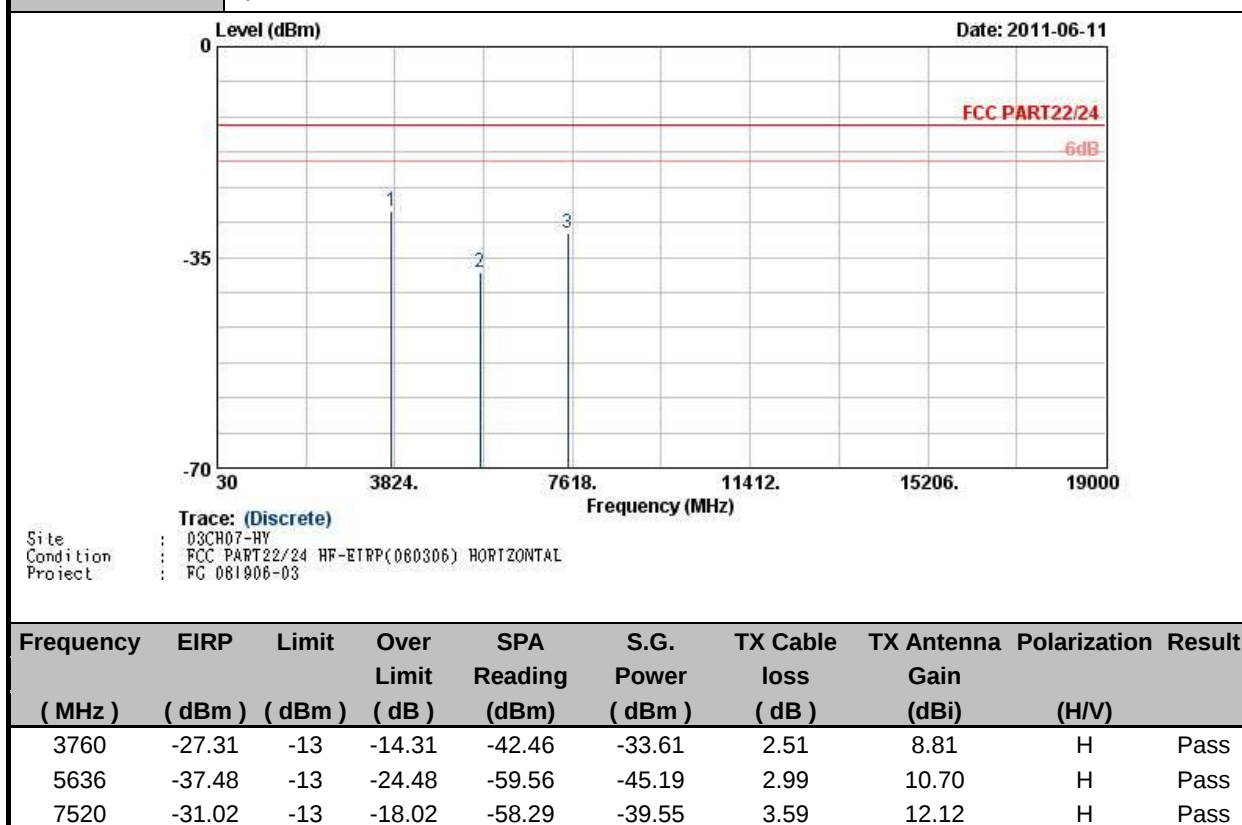
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-39.97	-13	-26.97	-49.75	-41.69	1.62	5.49	H	Pass
2509	-30.57	-13	-17.57	-44.8	-32.54	2.1	6.22	H	Pass
3345	-38.40	-13	-25.40	-52.5	-41.29	3.03	8.07	H	Pass
5018	-44.98	-13	-31.98	-63.72	-50.43	3.1	10.70	H	Pass
5854	-43.68	-13	-30.68	-64.59	-48.92	2.92	10.31	H	Pass

Band :	CDMA2000 BC0	Temperature :	21~24°C
Test Mode :	1xRTT_RC3+SO55	Relative Humidity :	45~49%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

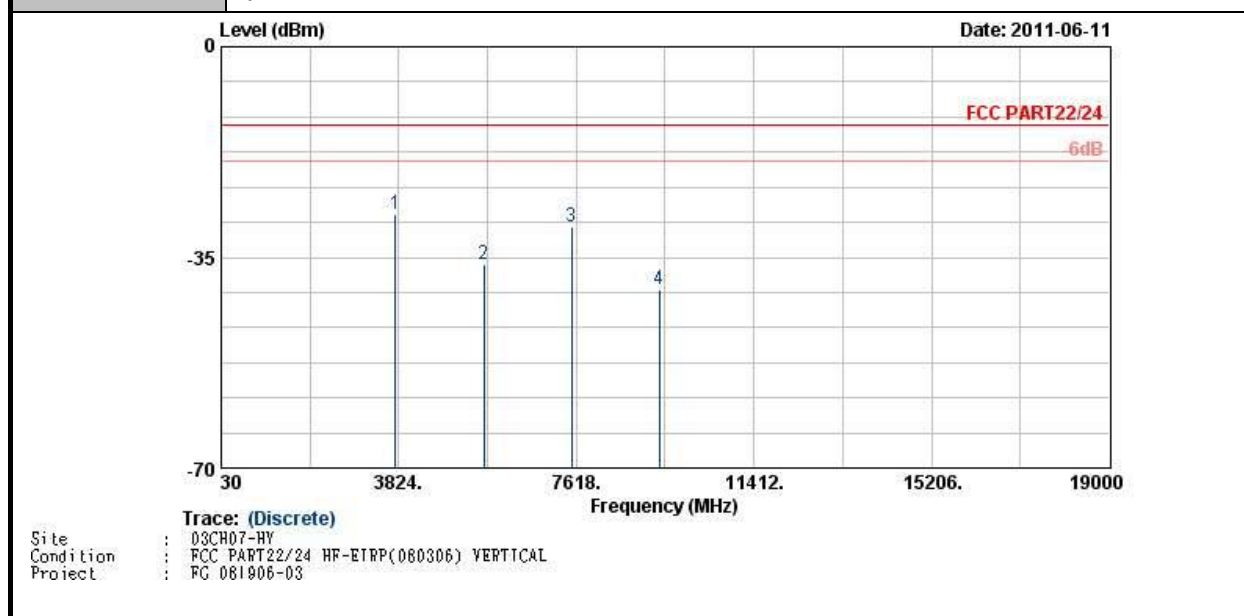


Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-41.49	-13	-28.49	-52.41	-43.21	1.62	5.49	V	Pass
2509	-29.71	-13	-16.71	-43.87	-31.68	2.1	6.22	V	Pass
3345	-38.69	-13	-25.69	-55.63	-41.58	3.03	8.07	V	Pass
4182	-45.08	-13	-32.08	-62.65	-49.62	2.52	9.21	V	Pass
5018	-42.37	-13	-29.37	-61.8	-47.82	3.1	10.70	V	Pass
5854	-42.05	-13	-29.05	-63.52	-47.29	2.92	10.31	V	Pass
7527	-36.81	-13	-23.81	-64.2	-43.26	3.52	12.12	V	Pass

Band :	CDMA2000 BC1	Temperature :	21~24°C
Test Mode :	1xRTT_RC3+SO55	Relative Humidity :	45~49%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Band :	CDMA2000 BC1	Temperature :	21~24°C
Test Mode :	1xRTT_RC3+SO55	Relative Humidity :	45~49%
Test Engineer :	David Yang	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	-27.97	-13	-14.97	-44.35	-34.27	2.51	8.81	V	Pass
5636	-36.21	-13	-23.21	-56.75	-43.92	2.99	10.70	V	Pass
7520	-30.02	-13	-17.02	-57.72	-38.55	3.59	12.12	V	Pass
9396	-40.37	-13	-27.37	-67.07	-49.47	4.1	13.20	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, 2010	Oct. 30, 2011	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP	101067	9KHz ~ 30GHz	Dec. 03, 2010	Dec. 02, 2011	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 19, 2010	Aug. 18, 2011	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA917025 1	15GHz- 40GHz	Oct. 18, 2010	Oct. 17, 2011	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec. 06, 2010	Dec. 05, 2011	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32dB. GAIN	Mar. 29, 2011	Mar. 28, 2012	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Jul. 28, 2011	Radiation (03CH07-HY)
System Simulator	Agilent	E5515C (8960)	MY48360820	N/A	Aug. 16, 2009	Aug. 15, 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 = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+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 EP081906-03 as below.