Partial FCC RF Test Report

APPLICANT	:	Franklin Technology
EQUIPMENT	:	3G/4G USB adapter
BRAND NAME	:	Franklin
MODEL NAME	:	S600
FCC ID	:	XHG-S600
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 : 0.34 W CDMA2000 BC1 : 0.38 W

This is a partial report which is only valid combined with the integrated the 3G / 4G Module (Brand Name: Franklin / Model Name: M600, FCC ID: XHG-M600) Report.

The product was received on Mar. 10, 2011 and completely tested on Mar. 31, 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:

Roy Wu / Manager

Testing Laboratory 1190

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
FG131021A	Rev. 01	Initial issue of report	Apr. 12, 2011

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
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[Watts])	PASS	Under limit 8.15 dB at 3760 MHz

1 General Description

1.1 Applicant

Franklin Technology
906 JEI Platz, 459-11 Gasan-dong, Guncheon-gu, Seoul, Korea

1.2 Manufacturer

U-Media Communications, Inc.
9F, No. 1, Jin-shan 8th St., Hsinchu 300, Taiwan, R.O.C.

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	3G/4G USB adapter
Brand Name	Franklin
Model Name	S600
FCC ID	XHG-S600
Integrated Module	Brand Name : Franklin Model Name : M600
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 : 24.15 dBm CDMA2000 BC1 : 24.15 dBm
Maximum ERP/EIRP	CDMA2000 BC0 : 0.34 W (25.29 dBm) CDMA2000 BC1 : 0.38 W (25.79 dBm)
Antenna Type	detachable SMA dipole antenna
Type of Modulation	QPSK
EUT Stage	Identical Prototype

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 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.	**Sporton Site No.**	**FCC/IC Registration No.**
	03CH05-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	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 ■ 1xEV-DO Rev. A Link Mode
CDMA2000 BC1	■ 1xRTT Link Mode ■ 1xEV-DO Rev. A Link Mode

Note:

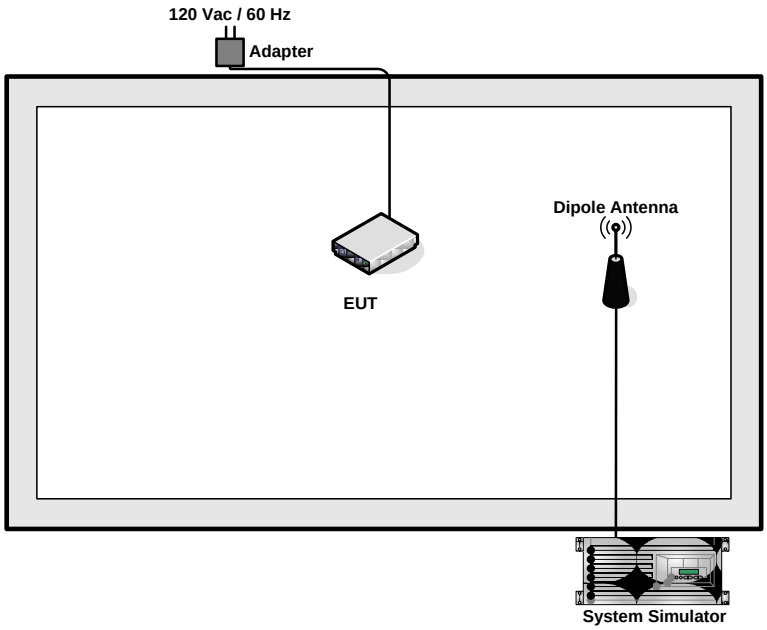
1. The maximum RF output power levels are 1xEV-DO Rev. A RETAP 12288K mode for CDMA2000 BC0 and 1xEV-DO Rev. A RETAP 2048K mode for CDMA2000 BC1 on QPSK Link; only these modes were used for all tests.

2. Only the radiated emission, ERP, and EIRP of the 3G / 4G module were performed in this report, and the conducted test cases can be referred to Franklin module report (FCC ID: XHG-M600).

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	23.69	24.06	23.79	24.09	23.79	23.80
1xRTT RC3+SO55	23.73	24.04	23.74	24.01	23.70	23.62
1xRTT RC3+SO32	23.71	24.00	23.70	23.98	23.69	23.67
1xEVDO RTAP 9.6K	23.80	23.93	23.60	24.08	23.61	23.67
1xEVDO RTAP 38.4K	23.81	23.91	23.70	24.08	23.60	23.66
1xEVDO RTAP 153.6K	23.90	24.05	23.69	24.05	23.71	23.71
1xEVDO RETAP 128K	23.68	23.83	23.57	24.01	23.45	23.51
1xEVDO RETAP 2048K	23.79	24.09	23.72	**24.15**	23.82	23.78
1xEVDO RETAP 12288K	24.05	**24.15**	23.83	23.96	23.69	23.60

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

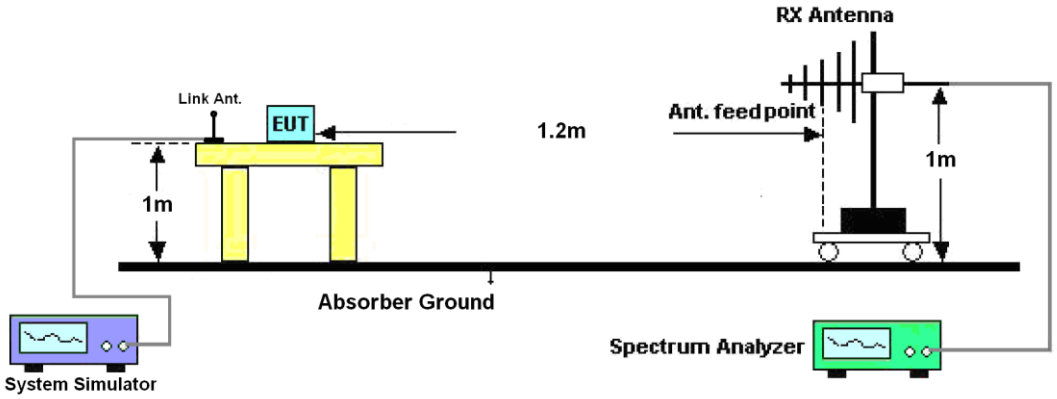
See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The EUT was placed on a turntable with 1.0 meter height in a fully anechoic chamber.
2. The EUT was set at 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 adjusted to look for the maximum ERP/EIRP.
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 = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs

   Ps (dBm)：Input power to substitution antenna.
   Gs (dBi or dBd)：Substitution antenna Gain.
   Et = Rt + AF
   Es = Rs + AF
   AF (dB/m)：Receive antenna factor
   Rt：The highest received signal in spectrum analyzer for EUT.
   Rs：The highest received signal in spectrum analyzer for substitution antenna.

3.1.4 Test Setup



3.1.5 Test Result of ERP

CDMA2000 BC0 1XEV-DO Rev. A_RETAP 12288K Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.70	-22.97	-48.12	0.00	-1.08	24.07	0.26
836.52	-22.21	-48.28	0.00	-0.93	25.14	0.33
848.31	-22.30	-48.35	0.00	-0.76	25.29	0.34
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
824.70	-35.53	-47.97	0.00	-1.08	11.36	0.01
836.52	-35.35	-48.01	0.00	-0.93	11.73	0.01
848.31	-35.48	-48.05	0.00	-0.76	11.81	0.02

3.1.6 Test Result of EIRP

CDMA2000 BC1 1XEV-DO Rev. A_RETAP 2048K Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1851.25	-28.05	-51.88	0.00	1.96	25.79	0.38
1880.00	-29.43	-52.99	0.00	2.00	25.56	0.36
1908.75	-31.38	-54.28	0.00	1.98	24.88	0.31
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1851.25	-34.22	-52.13	0.00	1.96	19.87	0.10
1880.00	-35.87	-53.17	0.00	2.00	19.30	0.09
1908.75	-37.14	-54.13	0.00	1.98	18.97	0.08

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 $43+10\log_{10}(P[Watts])$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

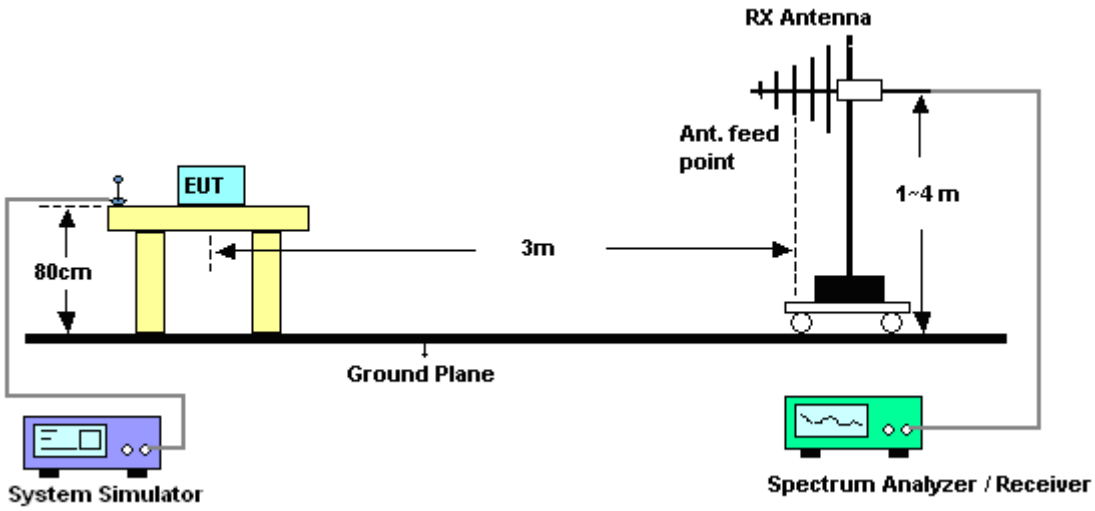
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

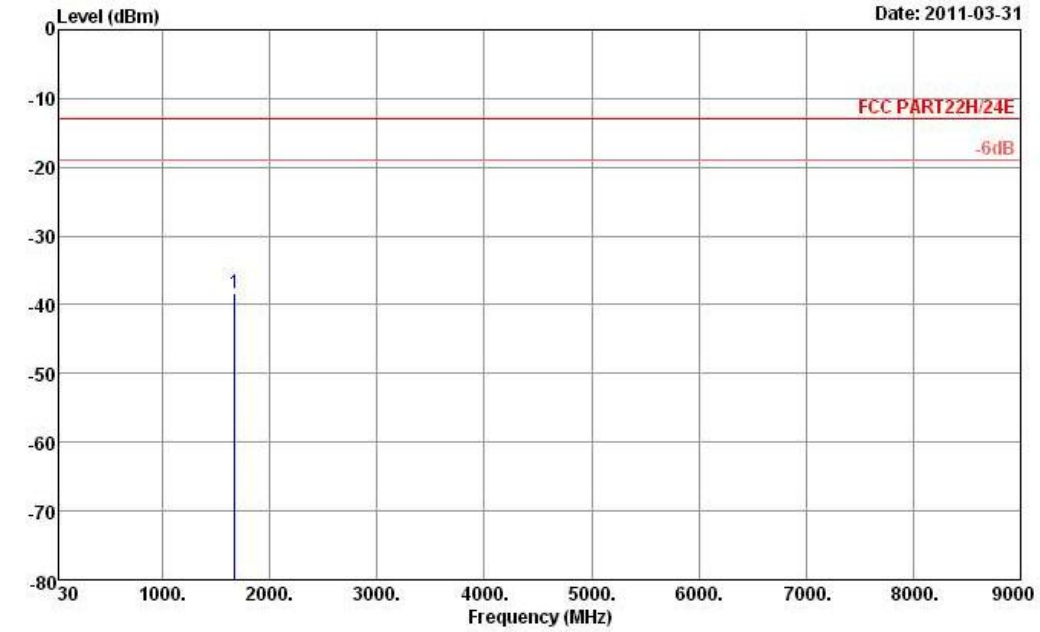
1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving 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. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
11. ERP (dBm) = EIRP - 2.15

3.2.4 Test Setup



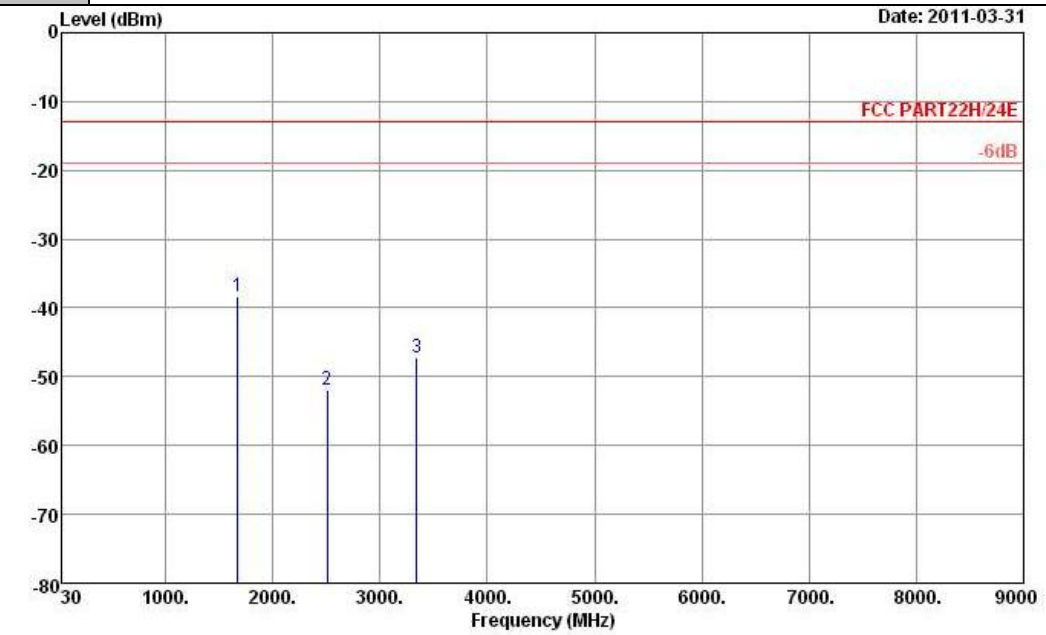
3.2.5 Test Result of Field Strength of Spurious Radiated

Band :	CDMA2000 BC0	**Temperature :**	23~24°C
Test Mode :	1xRTT RC1+SO55	**Relative Humidity :**	45~49%
Test Engineer :	Cona Huang	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



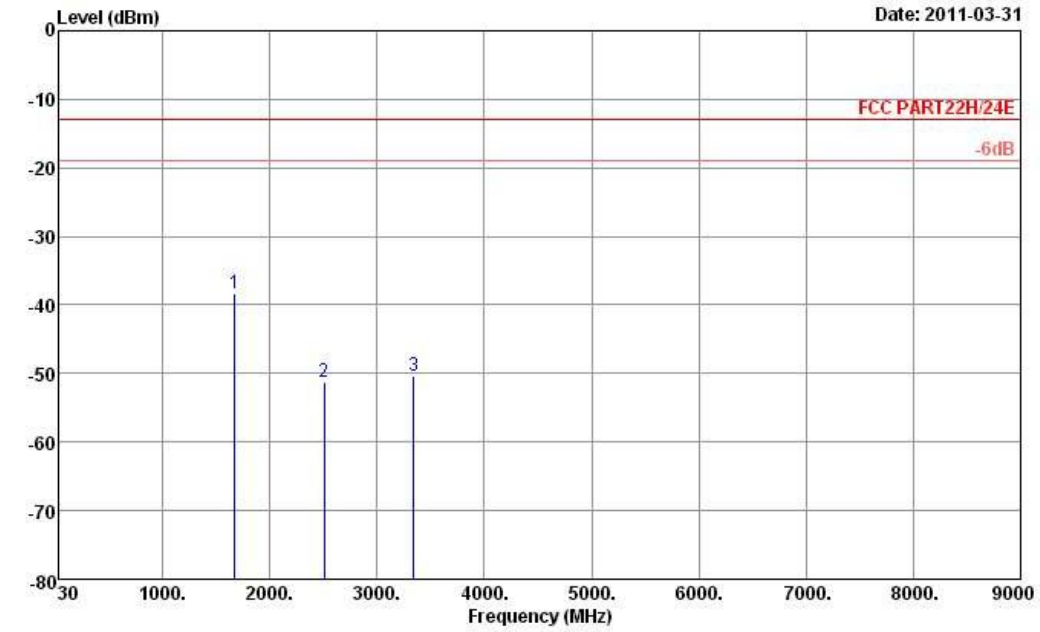
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-38.34	-13	-25.34	-44.29	-39.53	2.15	5.49	H	Pass

Band :	CDMA2000 BC0	Temperature :	23~24°C
Test Mode :	1xRTT RC1+SO55	Relative Humidity :	45~49%
Test Engineer :	Cona Huang	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	-38.23	-13	-25.23	-44.09	-39.42	2.15	5.49	V	Pass
2509	-51.88	-13	-38.88	-61.43	-53.77	2.38	6.41	V	Pass
3345	-47.28	-13	-34.28	-58.89	-50.61	2.86	8.34	V	Pass

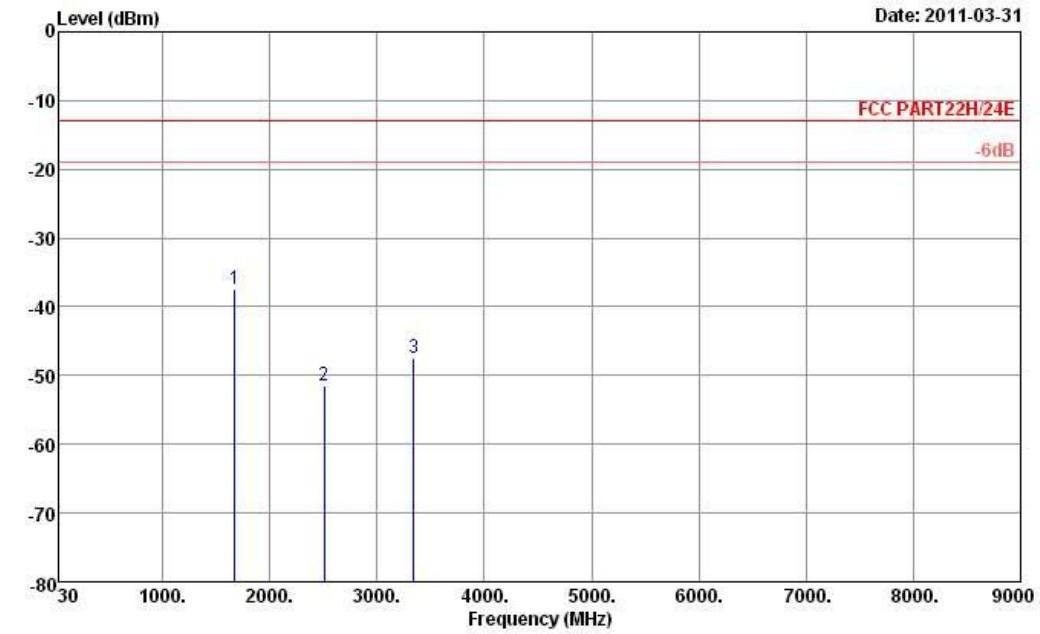
Band :	CDMA2000 BC0	Temperature :	23~24°C
Test Mode :	1XEV-DO Rev. A_RETAP 12288K	Relative Humidity :	45~49%
Test Engineer :	Cona Huang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 HORIZONTAL

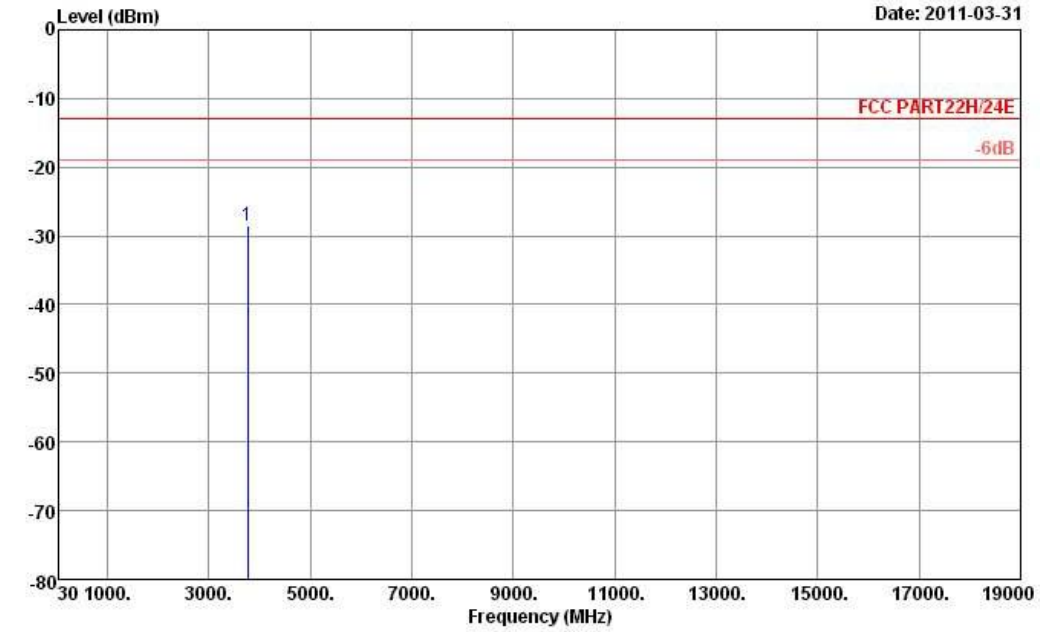
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-38.34	-13	-25.34	-44.75	-39.53	2.15	5.49	H	Pass
2509	-51.29	-13	-38.29	-61.87	-53.18	2.38	6.41	H	Pass
3345	-50.41	-13	-37.41	-62.47	-53.74	2.86	8.34	H	Pass

Band :	CDMA2000 BC0	Temperature :	23~24°C
Test Mode :	1XEV-DO Rev. A_RETAP 12288K	Relative Humidity :	45~49%
Test Engineer :	Cona Huang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



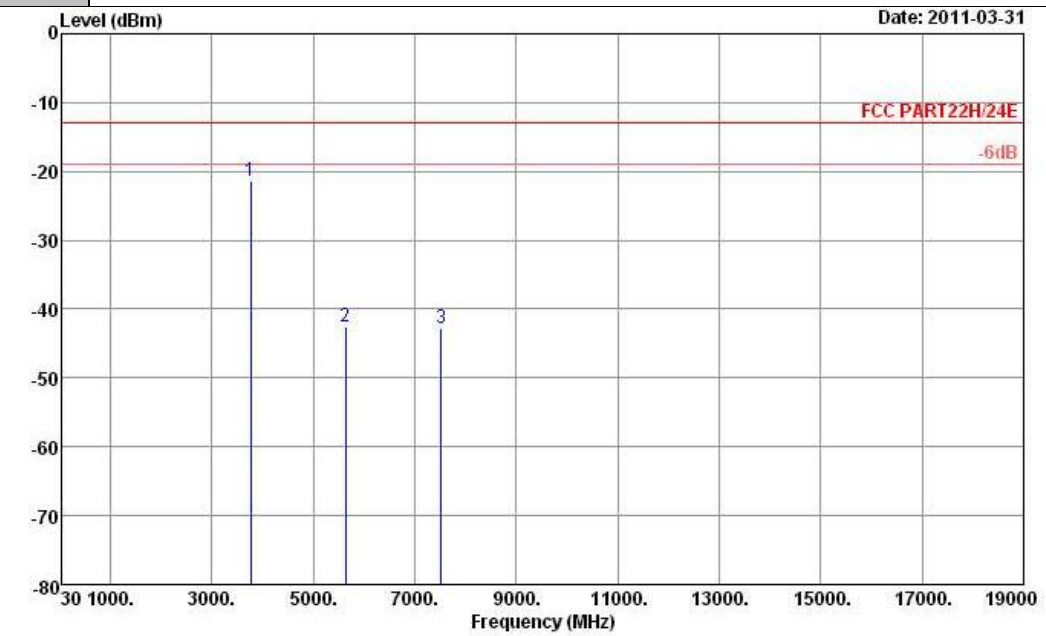
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-37.43	-13	-24.43	-43.29	-38.62	2.15	5.49	V	Pass
2509	-51.55	-13	-38.55	-61.47	-53.44	2.38	6.41	V	Pass
3345	-47.48	-13	-34.48	-58.88	-50.81	2.86	8.34	V	Pass

Band :	CDMA2000 BC1	Temperature :	23~24°C
Test Mode :	1xRTT RC1+SO55	Relative Humidity :	45~49%
Test Engineer :	Cona Huang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



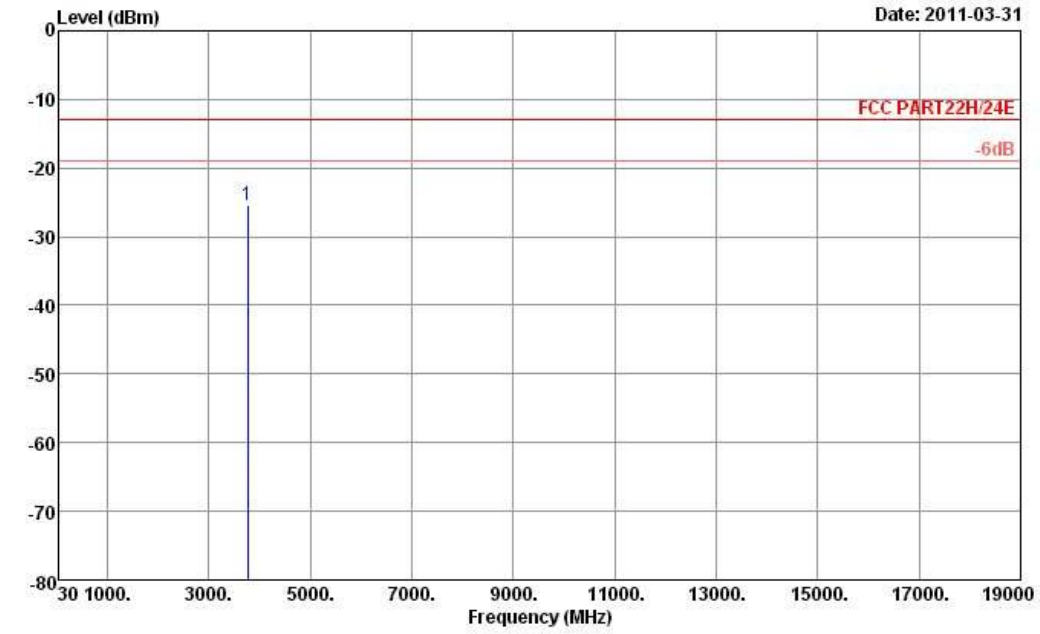
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-28.45	-13	-15.45	-42.49	-34.58	2.9292	9.06	H	Pass

Band :	CDMA2000 BC1	Temperature :	23~24°C
Test Mode :	1xRTT RC1+SO55	Relative Humidity :	45~49%
Test Engineer :	Cona Huang	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	-21.50	-13	-8.50	-35.19	-27.63	2.9292	9.06	V	Pass
5636	-42.55	-13	-29.55	-62.5	-49.47	3.9072	10.83	V	Pass
7520	-42.70	-13	-29.70	-64.04	-50.72	4.5988	12.62	V	Pass

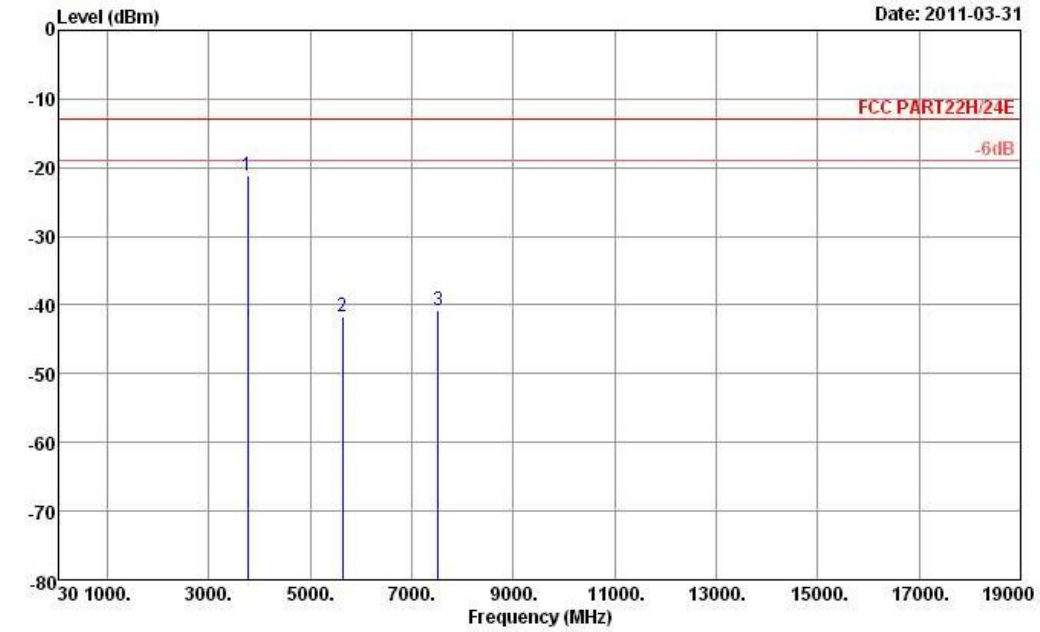
Band :	CDMA2000 BC1	Temperature :	23~24°C
Test Mode :	1XEV-DO Rev. A_RETAP 2048K	Relative Humidity :	45~49%
Test Engineer :	Cona Huang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 HORIZONTAL

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
3760	-25.44	-13	-12.44	-39.13	-31.57	2.9292	9.06	H	Pass

Band :	CDMA2000 BC1	Temperature :	23~24°C
Test Mode :	1XEV-DO Rev. A_RETAP 2048K	Relative Humidity :	45~49%
Test Engineer :	Cona Huang	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
3760	-21.15	-13	-8.15	-34.91	-27.28	2.9292	9.06	V	Pass
5636	-41.70	-13	-28.70	-61.31	-48.62	3.9072	10.83	V	Pass
7520	-40.69	-13	-27.69	-62.43	-48.71	4.5988	12.62	V	Pass

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
System Simulator	R&S	CMU200	117995	N/A	Jun. 08, 2009	Jun. 07, 2011	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 11, 2010	Jun. 10, 2011	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 13, 2010	Sep. 12, 2011	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 14, 2010	Sep. 13, 2011	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D35P	TBN-930701	N/A	Jul. 30,2010	Jul. 29, 2011	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP30	101352	9KHz-40GHz	Nov. 03, 2010	Nov. 02, 2011	Radiation (03CH05-HY)
Amplifier	COM-POWER	PA-103	161075	1KHz - 1GHz	Mar. 29, 2011	Mar. 28, 2012	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2725	30MHz ~ 1GHz	Nov. 06, 2010	Nov. 05, 2011	Radiation (03CH05-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 18, 2010	Oct. 17, 2011	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz- 26.5GHz	Apr. 15, 2010	Apr. 14, 2011	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 - 360 degree	N/A	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m - 4 m	N/A	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	00066584	1GHz ~ 18GHz	Aug. 05, 2010	Aug. 04, 2011	Radiation (03CH05-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Jul. 28, 2011	Radiation (03CH05-HY)
System Simulator	R&S	CMU200	117591	N/A	Oct. 18, 2010	Oct. 17, 2011	Radiation (03CH05-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 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=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 Γ1 = 0.197 Antenna VSWR Γ2 = 0.194 Uncertainty = 20Log(1-Γ1*Γ2)	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty Uc(y)	**2.36**				
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.72**				

Appendix A. Photographs of EUT

Please refer to Sporton report number EP131021 as below.