Partial FCC RF Test Report

APPLICANT	:	Novatel Wireless
EQUIPMENT	:	Notebook PC
BRAND NAME	:	Dell
MODEL NAME	:	P17G-P17G001
FCC ID	:	PKRNVWE396-D
STANDARD	:	FCC 47 CFR Part 2, 22(H), 24(E), 27(L)
CLASSIFICATION	:	PCS Licensed Transmitter (PCB)
Tx/Rx FREQUENCY RANGE	:	GSM850 : 824.2 ~ 848.8 MHz / 869.2 ~ 893.8 MHz GSM1900 : 1850.2 ~ 1909.8 MHz / 1930.2 ~ 1989.8 MHz WCDMA Band V : 826.4 ~ 846.6 MHz / 871.4 ~ 891.6 MHz WCDMA Band IV : 1712.4 MHz ~ 1752.6 MHz 2112.4 MHz ~ 2152.6 MHz WCDMA Band II : 1852.4 ~ 1907.6 MHz / 1932.4 ~ 1987.6 MHz 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	:	GSM850 (GPRS 8) : 0.69 W GSM850 (EDGE 8) : 0.22 W GSM1900 (GPRS 8) : 1.35 W GSM1900 (EDGE 8) : 0.54 W WCDMA Band V (RMC 12.2Kbps) : 0.12 W WCDMA Band IV (RMC 12.2Kbps) : 0.36 W WCDMA Band II (RMC 12.2Kbps) : 0.42 W CDMA2000 BC0 (1xEV-DO Rev. 0) : 0.13 W CDMA2000 BC1 (1xEV-DO Rev. 0) : 0.35 W

This is a partial report which is only valid combined with the integrated the WWAN Module (Brand Name: QUALCOMM / Model Name: Gobi3000, FCC ID: J9CGOBI3000) Report.

The product was received on Apr. 07, 2011 and completely tested on Apr. 22, 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
FG140708	Rev. 01	Initial issue of report	Apr. 29, 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	-
3.1	§27.50(d)(2)	RSS-139 (6.4) SRSP-513(5.1.2)	Equivalent Isotropic Radiated Power	< 1 Watts	PASS	-
3.2	§2.1053 §22.917(a) §24.238(a) §27.53(g)	RSS-132 (4.5.1) RSS-133 (6.5.1) RSS-139 (6.5)	Field Strength of Spurious Radiation	< $43+10\log_{10}(P[Watts])$	PASS	Under limit 20.40 dB at 3760 MHz

1 General Description

1.1 Applicant

Novatel Wireless
6715 8th Street N.E. Suite 200, Calgary, Alberta, Canada T2E 7H7

1.2 Manufacturer

Dell Inc.
One Dell Way, Round Rock, TX 78682 U.S.A.

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Notebook PC
Brand Name	Dell
Model Name	P17G-P17G001
Integrated Module	Brand Name : Novatel Model Name : Novatel Wireless E396 HW Version : P4 SW Version : 1575
FCC ID	PKRNVWE396-D
Tx Frequency	GSM850 : 824 MHz ~ 849 MHz GSM1900 : 1850 MHz ~ 1910 MHz WCDMA Band V : 824 MHz ~ 849 MHz WCDMA Band IV : 1710 MHz ~ 1755 MHz WCDMA Band II : 1850 MHz ~ 1910 MHz CDMA2000 BC0 : 824 MHz ~ 849 MHz CDMA2000 BC1 : 1850 MHz ~1910 MHz
Rx Frequency	GSM850 : 869 MHz ~ 894 MHz GSM1900 : 1930 MHz ~ 1990 MHz WCDMA Band V : 869 MHz ~ 894 MHz WCDMA Band IV : 2110 MHz ~ 2155 MHz WCDMA Band II : 1930 MHz ~ 1990 MHz CDMA2000 BC0 : 869 MHz ~ 894 MHz CDMA2000 BC1 : 1930 MHz ~ 1990 MHz
Maximum Output Power to Antenna	GSM850 : 31.80 dBm GSM1900 : 29.26 dBm WCDMA Band V : 23.54 dBm WCDMA Band IV : 23.82 dBm WCDMA Band II : 23.97 dBm CDMA2000 BC0 : 24.07 dBm CDMA2000 BC1 : 24.13 dBm

Maximum ERP/EIRP	GSM850 (GPRS 8) : 0.69 W (28.40 dBm) GSM850 (EDGE 8) : 0.22 W (23.52 dBm) GSM1900 (GPRS 8) : 1.35 W (31.30 dBm) GSM1900 (EDGE 8) : 0.54 W (27.35 dBm) WCDMA Band V (RMC 12.2Kbps) : 0.12 W (20.72 dBm) WCDMA Band IV (RMC 12.2Kbps) : 0.36 W (25.57 dBm) WCDMA Band II (RMC 12.2Kbps) : 0.42 W (26.20 dBm) CDMA2000 BC0 (1xEV-DO Rev. 0) : 0.13 W (21.01 dBm) CDMA2000 BC1 (1xEV-DO Rev. 0) : 0.35 W (25.38 dBm)
Antenna Type	Fixed Internal Antenna
HW Version	AX1
SW Version	X21
Type of Modulation	GSM / GPRS : GMSK EDGE : 8PSK WCDMA : QPSK HSDPA : QPSK / 16QAM HSUPA : BPSK CDMA2000 : 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 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.
- 47 CFR Part 2, 22(H), 24(E), 27(L)
- ANSI / TIA / EIA-603-C-2004
- IC RSS-132 Issue 2
- IC RSS-133 Issue 5
- IC RSS-139 Issue 2

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU200	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 GSM850 and WCDMA Band V, and CDMA2000 BC0.
2. 30 MHz to 18000 MHz for WCDMA Band IV.
3. 30 MHz to 19000 MHz for GSM1900 and WCDMA Band II, and CDMA2000 BC1.

Test Modes	
Band	**Radiated TCs**
GSM 850	■ GPRS 8 Link ■ EDGE 8 Link
GSM 1900	■ GPRS 8 Link ■ EDGE 8 Link
WCDMA Band V	■ RMC 12.2Kbps Link
WCDMA Band IV	■ RMC 12.2Kbps Link
WCDMA Band II	■ RMC 12.2Kbps Link
CDMA2000 BC0	■ 1xEV-DO Rev. 0 Link Mode
CDMA2000 BC1	■ 1xEV-DO Rev. 0 Link Mode

Note:

1. The maximum power levels are GPRS multi-slot class 8 mode for GMSK link, EDGE multi-slot class 8 mode for 8PSK link, RMC 12.2Kbps mode for WCDMA band V, WCDMA band IV, and WCDMA band II, 1xEVDO Rev. 0 mode for CDMA2000 BC0 and CDMA2000 BC1 on QPSK Link; only these modes were used for all tests.
2. Only the radiated emission, ERP, and EIRP of the WWAN module were performed in this report, and the conducted test cases can be referred to QUALCOMM module report (FCC ID: J9CGOBI3000).

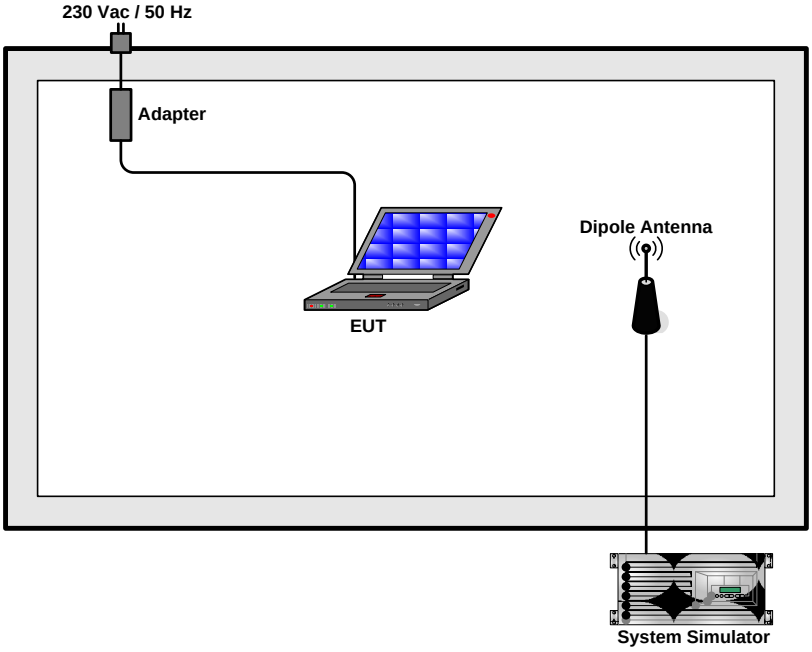
The conducted power tables are as follows:

Conducted Power (*Unit: dBm)						
Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency	824.2	836.4	848.8	1850.2	1880	1909.8
GPRS 8	31.76	31.67	31.80	29.07	29.26	29.11
GPRS 10	31.66	31.48	31.57	28.88	29.07	29.12
EGPRS 8	26.35	26.38	26.39	25.93	25.78	25.74
EGPRS 10	26.31	26.34	26.39	25.85	25.69	25.68

Conducted Power (*Unit: dBm)									
Band	WCDMA Band V			WCDMA Band II			WCDMA Band IV		
Tx Channel	4132	4182	4233	9262	9400	9538	1312	1413	1513
Rx Channel	4357	4408	4458	9662	9800	9938	1537	1638	1738
Frequency	826.4	836.4	846.6	1852.4	1880	1907.6	1712.4	1732.6	1752.6
RMC 12.2K	23.48	23.54	23.46	23.57	23.93	23.97	23.72	23.82	23.58
HSDPA Subtest-1	23.28	23.11	23.25	23.68	23.34	23.29	23.20	23.24	22.67
HSDPA Subtest-2	23.38	23.09	23.20	23.54	23.28	23.32	23.14	23.12	22.89
HSDPA Subtest-3	22.16	22.24	23.34	23.28	22.95	22.78	22.66	22.64	22.53
HSDPA Subtest-4	22.36	22.46	22.66	22.80	22.87	22.88	22.72	22.73	22.57
HSUPA Subtest-1	22.60	22.66	22.67	23.42	23.23	23.37	22.42	22.61	22.74
HSUPA Subtest-2	21.32	21.45	21.39	22.31	22.25	22.09	21.92	21.67	21.62
HSUPA Subtest-3	21.88	21.51	21.53	22.42	22.35	21.87	21.68	21.82	21.66
HSUPA Subtest-4	21.68	21.88	21.98	22.30	22.08	22.11	21.91	21.88	21.68
HSUPA Subtest-5	22.58	22.63	22.64	23.36	23.22	23.33	23.23	22.42	22.22

Conducted Power (*Unit: dBm)						
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	23.71	23.73	23.83	23.97	23.41	23.62
1xRTT RC3+SO55	23.74	23.86	23.84	23.94	23.79	23.60
1xRTT RC3+SO32 (FCH)	23.72	23.75	23.85	23.96	23.79	23.66
1xRTT RC3+SO32 (SCH)	23.72	23.86	23.87	23.96	23.81	23.63
1xEVDO RTAP 153.6K	23.88	23.89	24.07	24.13	24.00	23.81
1xEVDO RETAP 4096K	23.88	23.90	24.04	24.10	24.06	23.82

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. The EIRP of mobile transmitters are limited to 2 Watts for 1850~1910 MHz and 1 watt for 1710~1755 MHz.

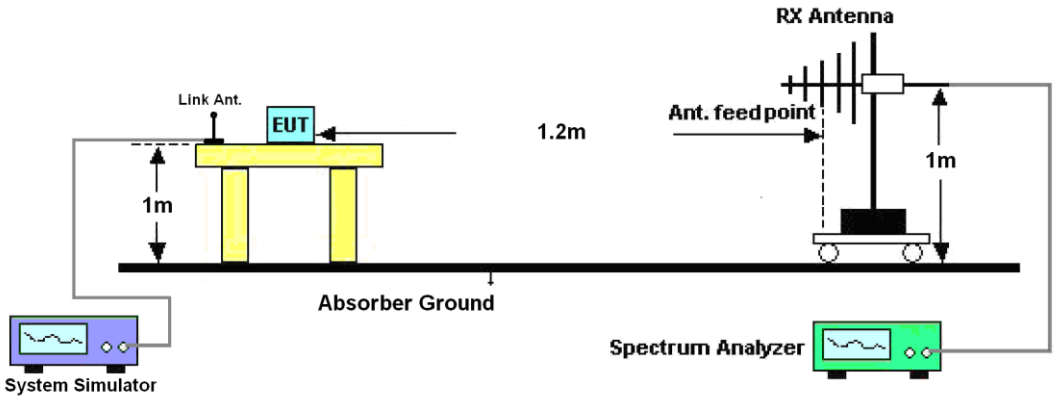
3.1.2 Measuring Instruments

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

GSM850 (GPRS 8) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
824.20	-20.33	-48.12	0.00	-1.08	26.71	0.47
836.40	-21.04	-48.28	0.00	-0.93	26.31	0.43
848.80	-20.64	-48.35	0.00	-0.76	26.95	0.50
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
824.20	-18.72	-47.97	0.00	-1.08	28.17	0.66
836.40	-19.04	-48.01	0.00	-0.93	28.04	0.64
848.80	-18.89	-48.05	0.00	-0.76	28.40	0.69

GSM850 (EDGE 8) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
824.20	-26.35	-48.12	0.00	-1.08	20.69	0.12
836.40	-26.65	-48.28	0.00	-0.93	20.70	0.12
848.80	-26.43	-48.35	0.00	-0.76	21.16	0.13
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
824.20	-23.37	-47.97	0.00	-1.08	23.52	0.22
836.40	-23.78	-48.01	0.00	-0.93	23.30	0.21
848.80	-24.20	-48.05	0.00	-0.76	23.09	0.20

WCDMA Band V (RMC 12.2Kbps) Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
826.40	-29.06	-48.12	0.00	-1.08	17.98	0.06
836.40	-28.87	-48.28	0.00	-0.93	18.48	0.07
846.60	-28.70	-48.35	0.00	-0.76	18.89	0.08
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
826.40	-26.63	-47.97	0.00	-1.08	20.26	0.11
836.40	-26.44	-48.01	0.00	-0.93	20.64	0.12
846.60	-26.57	-48.05	0.00	-0.76	20.72	0.12

CDMA2000 BC0 1xEVDO RTAP 153.6K Radiated Power ERP						
Horizontal Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
824.70	-28.34	-48.12	0.00	-1.08	18.70	0.07
836.52	-28.71	-48.28	0.00	-0.93	18.64	0.07
848.31	-28.32	-48.35	0.00	-0.76	19.27	0.08
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
824.70	-25.88	-47.97	0.00	-1.08	21.01	0.13
836.52	-26.56	-48.01	0.00	-0.93	20.52	0.11
848.31	-26.31	-48.05	0.00	-0.76	20.98	0.13

3.1.6 Test Result of EIRP

GSM1900 (GPRS 8) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1850.20	-23.70	-51.88	0.00	1.96	30.14	1.03
1880.00	-23.69	-52.99	0.00	2.00	31.30	1.35
1909.80	-26.22	-54.28	0.00	1.98	30.04	1.01
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1850.20	-24.04	-52.13	0.00	1.96	30.05	1.01
1880.00	-24.66	-53.17	0.00	2.00	30.51	1.12
1909.80	-26.08	-54.13	0.00	1.98	30.03	1.01

GSM1900 (EDGE 8) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1850.20	-26.76	-51.88	0.00	1.96	27.08	0.51
1880.00	-27.64	-52.99	0.00	2.00	27.35	0.54
1909.80	-29.66	-54.28	0.00	1.98	26.60	0.46
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1850.20	-27.41	-52.13	0.00	1.96	26.68	0.47
1880.00	-29.02	-53.17	0.00	2.00	26.15	0.41
1909.80	-31.36	-54.13	0.00	1.98	24.75	0.30

WCDMA Band IV (RMC 12.2Kbps) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1712.4	-29.56	-51.88	0.00	1.96	24.28	0.27
1732.6	-30.63	-52.99	0.00	2.00	24.36	0.27
1752.6	-31.33	-54.28	0.00	1.98	24.93	0.31
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1712.4	-29.58	-52.13	0.00	1.96	24.51	0.28
1732.6	-30.26	-53.17	0.00	2.00	24.91	0.31
1752.6	-30.54	-54.13	0.00	1.98	25.57	0.36

WCDMA Band II (RMC 12.2Kbps) Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1852.40	-28.11	-51.88	0.00	1.96	25.73	0.37
1880.00	-28.79	-52.99	0.00	2.00	26.20	0.42
1907.60	-31.05	-54.28	0.00	1.98	25.21	0.33
Vertical Polarization						
Frequency (MHz)	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBi)**	**EIRP (dBm)**	**EIRP (W)**
1852.40	-28.83	-52.13	0.00	1.96	25.26	0.34
1880.00	-30.36	-53.17	0.00	2.00	24.81	0.30
1907.60	-32.42	-54.13	0.00	1.98	23.69	0.23

CDMA2000 BC1 1xEVDO RTAP 153.6K Radiated Power EIRP						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1851.25	-28.46	-51.88	0.00	1.96	25.38	0.35
1880.00	-30.41	-52.99	0.00	2.00	24.58	0.29
1908.75	-31.61	-54.28	0.00	1.98	24.65	0.29
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBi)	EIRP (dBm)	EIRP (W)
1851.25	-29.06	-52.13	0.00	1.96	25.03	0.32
1880.00	-29.98	-53.17	0.00	2.00	25.19	0.33
1908.75	-31.57	-54.13	0.00	1.98	24.54	0.28

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 (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

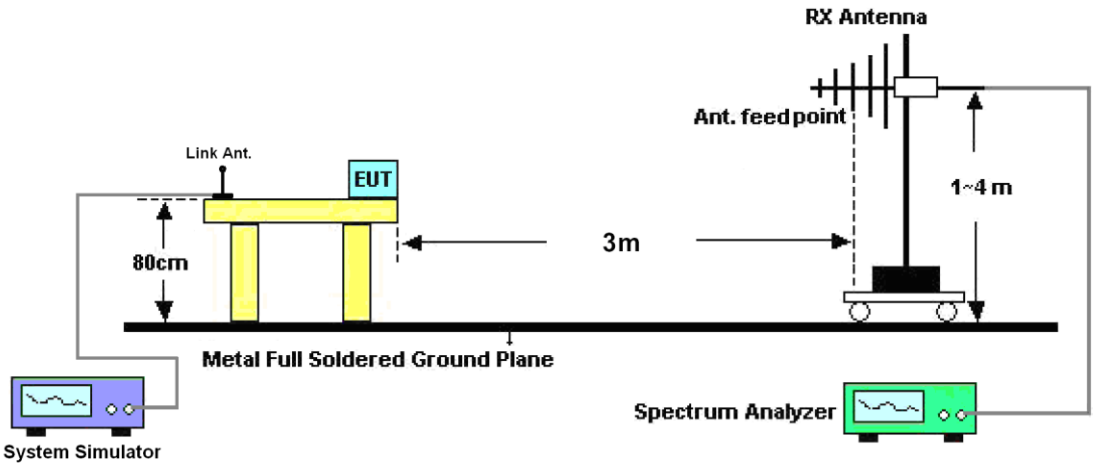
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

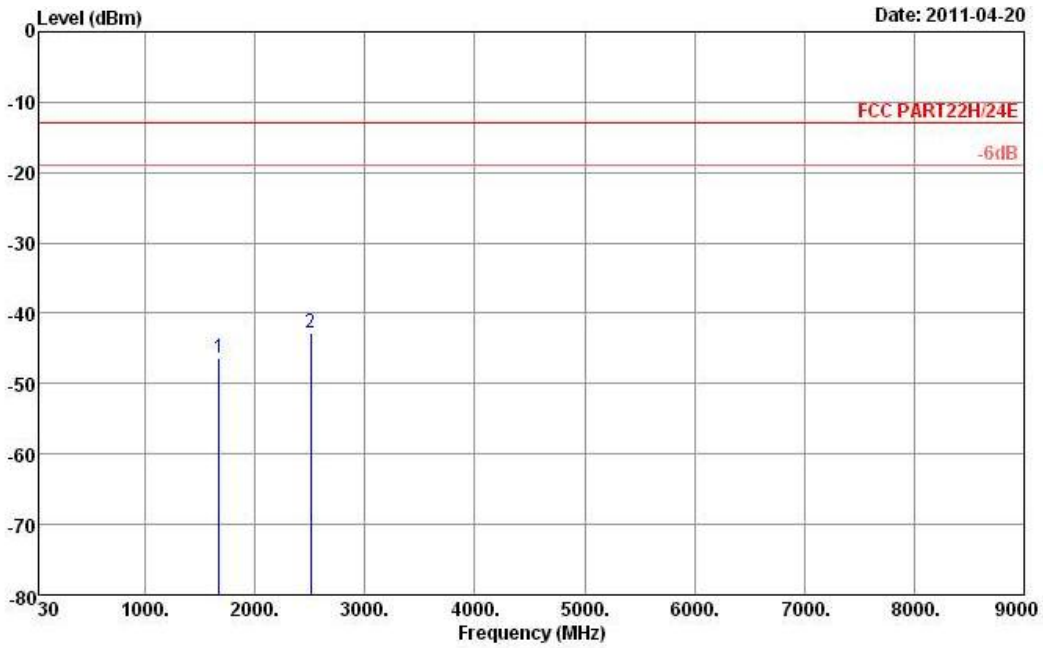
1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. 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



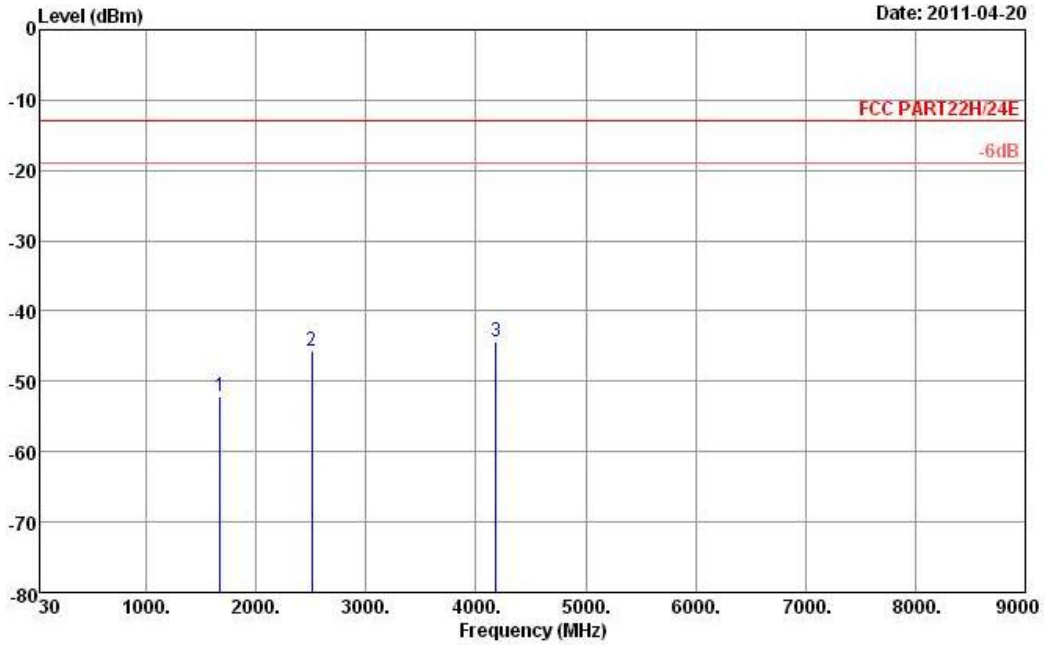
3.2.5 Test Result of Field Strength of Spurious Radiated

Band :	GSM850	**Temperature :**	20~23°C
Test Mode :	GPRS 8 Link	**Relative Humidity :**	45~50%
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	-46.33	-13	-33.33	-52.41	-47.52	2.15	5.49	H	Pass
2509	-42.72	-13	-29.72	-52.88	-44.61	2.38	6.41	H	Pass

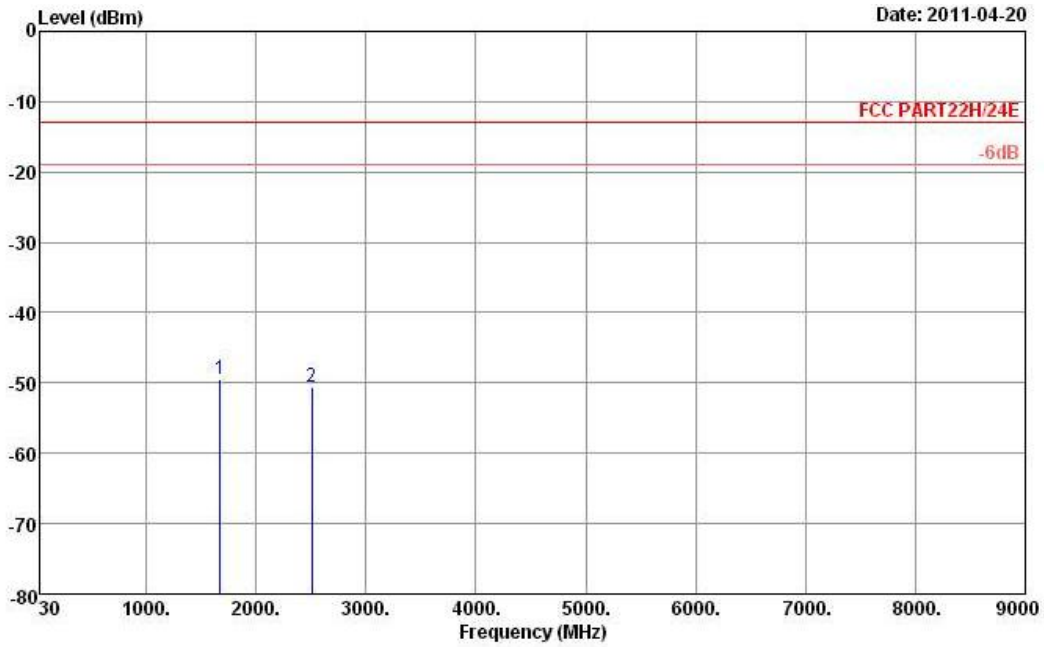
Band :	GSM850	**Temperature :**	20~23°C
Test Mode :	GPRS 8 Link	**Relative Humidity :**	45~50%
Test Engineer :	David Yang	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 VERTICAL
Project : FG 140708

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	-52.05	-13	-39.05	-58.03	-53.24	2.15	5.49	V	Pass
2509	-45.74	-13	-32.74	-55.57	-47.63	2.38	6.41	V	Pass
4182	-44.38	-13	-31.38	-60.43	-48.32	3.26	9.35	V	Pass

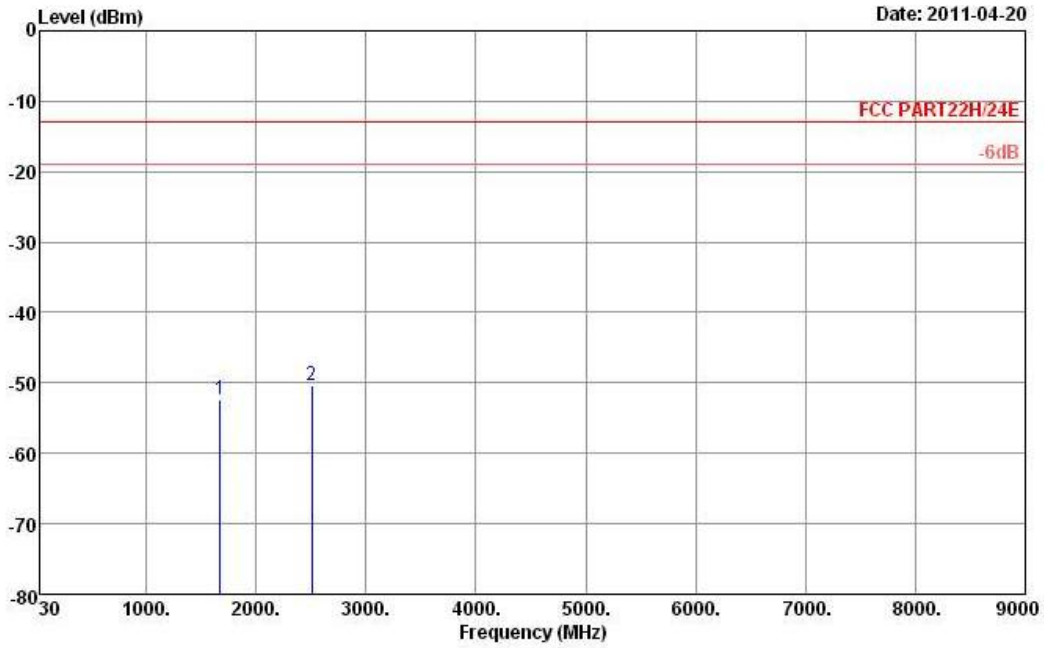
Band :	GSM850	**Temperature :**	20~23°C
Test Mode :	EDGE 8 Link	**Relative Humidity :**	45~50%
Test Engineer :	David Yang	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 HORIZONTAL
Project : FG 140708

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	-49.55	-13	-36.55	-56.36	-50.74	2.15	5.49	H	Pass
2509	-50.52	-13	-37.52	-60.51	-52.41	2.38	6.41	H	Pass

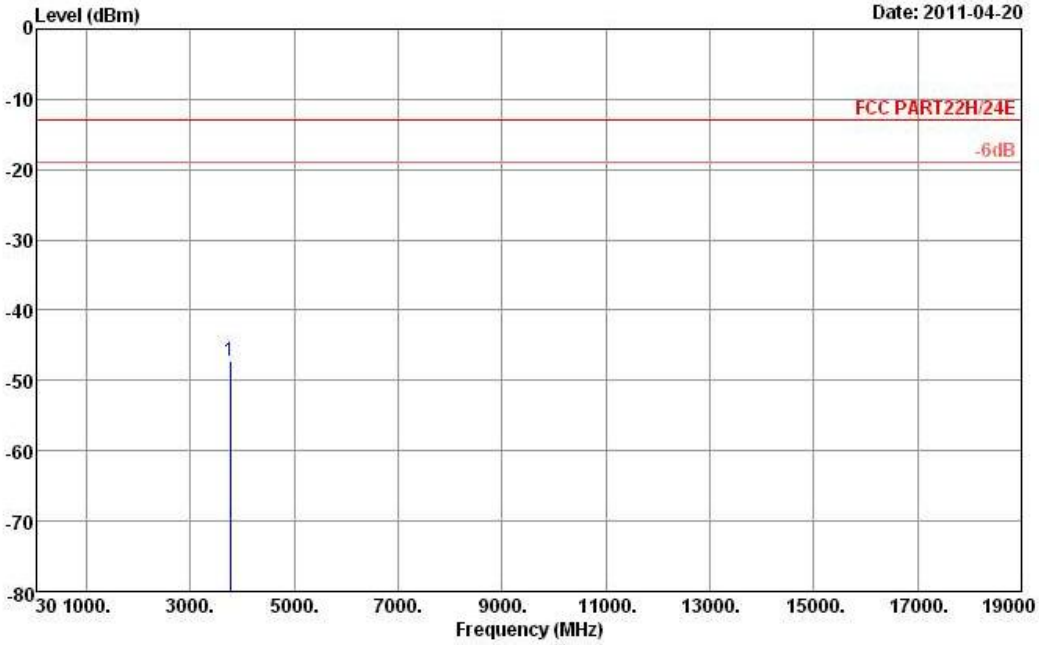
Band :	GSM850	**Temperature :**	20~23°C
Test Mode :	EDGE 8 Link	**Relative Humidity :**	45~50%
Test Engineer :	David Yang	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 VERTICAL
Project : FG 140708

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	-52.44	-13	-39.44	-58.8	-53.63	2.15	5.49	V	Pass
2509	-50.38	-13	-37.38	-60.83	-52.27	2.38	6.41	V	Pass

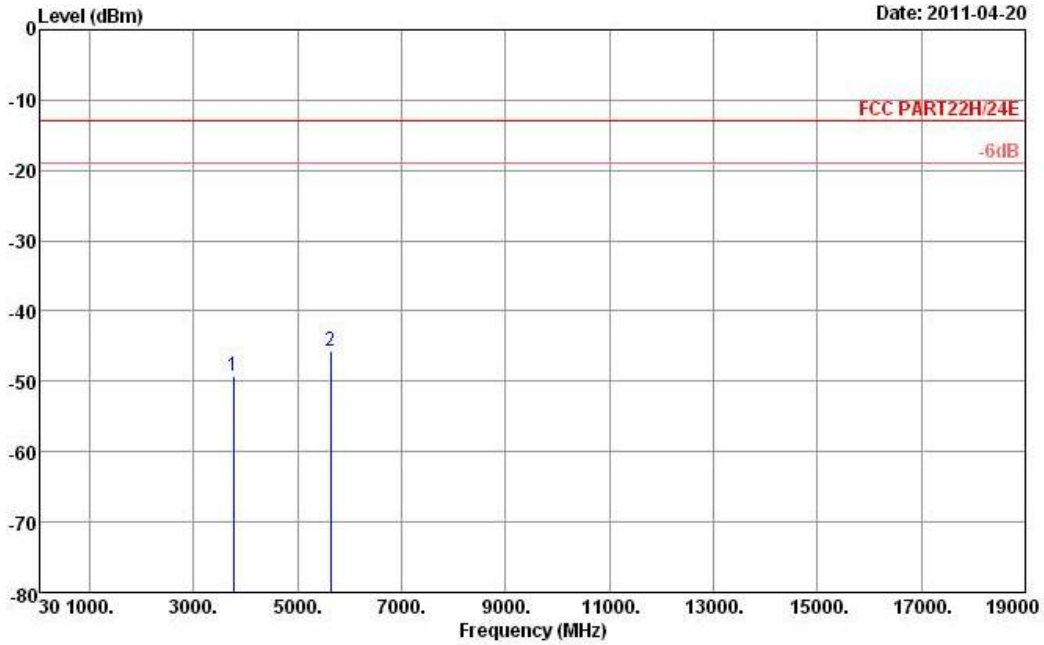
Band :	GSM1900	**Temperature :**	20~23°C
Test Mode :	GPRS 8 Link	**Relative Humidity :**	45~50%
Test Engineer :	David Yang	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 HORIZONTAL
Project : FG 140708

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	-47.15	-13	-34.15	-61.31	-53.28	2.9292	9.06	H	Pass

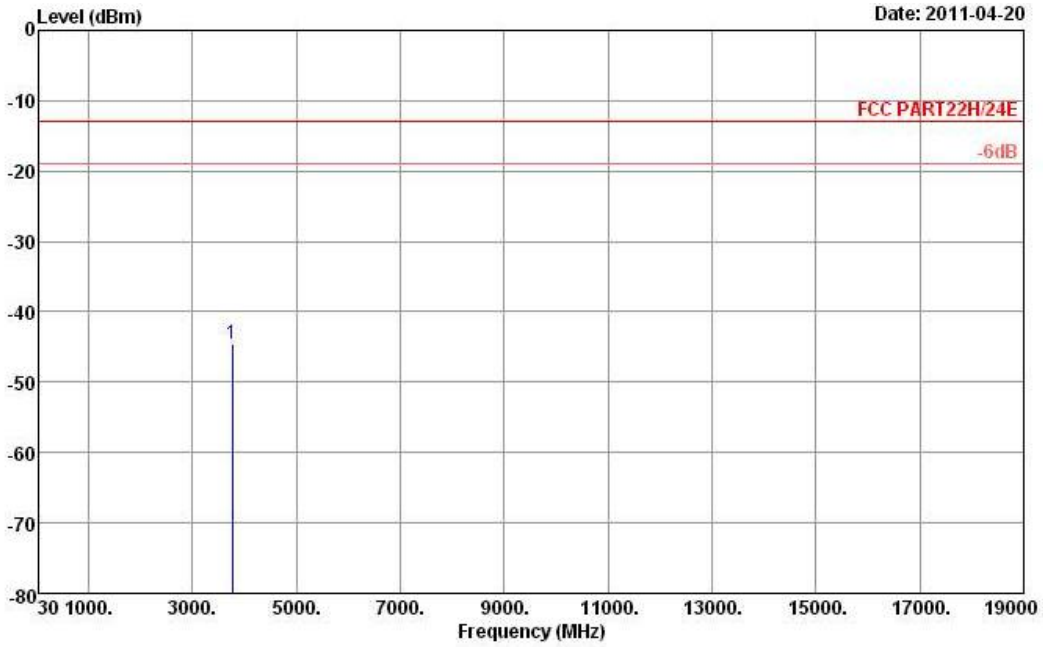
Band :	GSM1900	**Temperature :**	20~23°C
Test Mode :	GPRS 8 Link	**Relative Humidity :**	45~50%
Test Engineer :	David Yang	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 VERTICAL
Project : FG 140708

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	-49.30	-13	-36.30	-63.12	-55.43	2.9292	9.06	V	Pass
5636	-45.73	-13	-32.73	-65.16	-52.65	3.9072	10.83	V	Pass

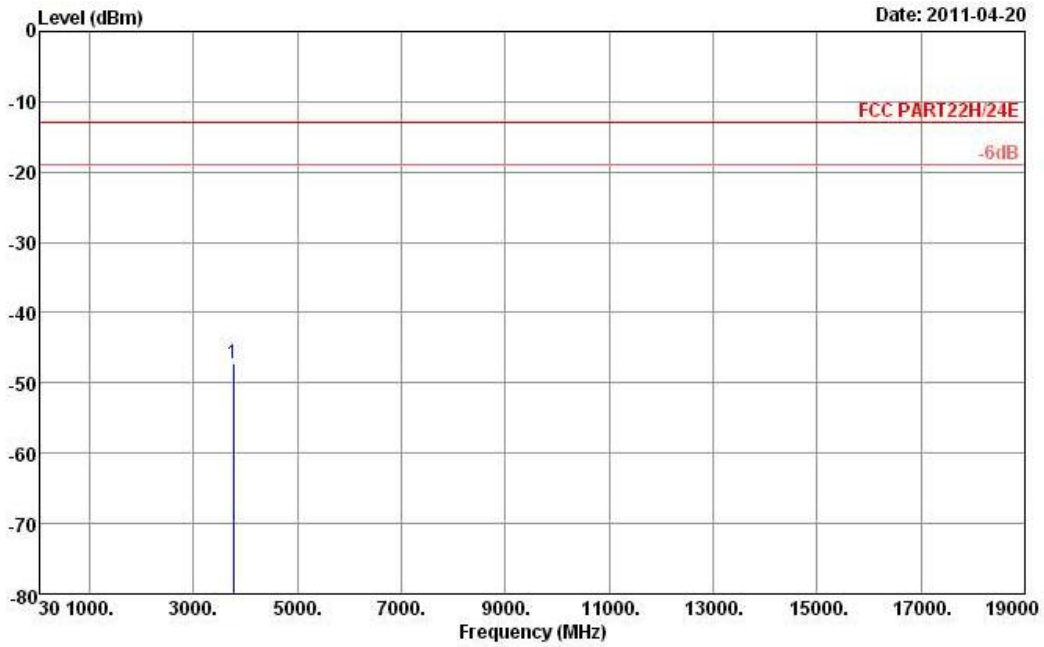
Band :	GSM1900	**Temperature :**	20~23°C
Test Mode :	EDGE 8 Link	**Relative Humidity :**	45~50%
Test Engineer :	David Yang	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 HORIZONTAL
Project : FG 140708

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	-44.49	-13	-31.49	-58.99	-50.62	2.9292	9.06	H	Pass

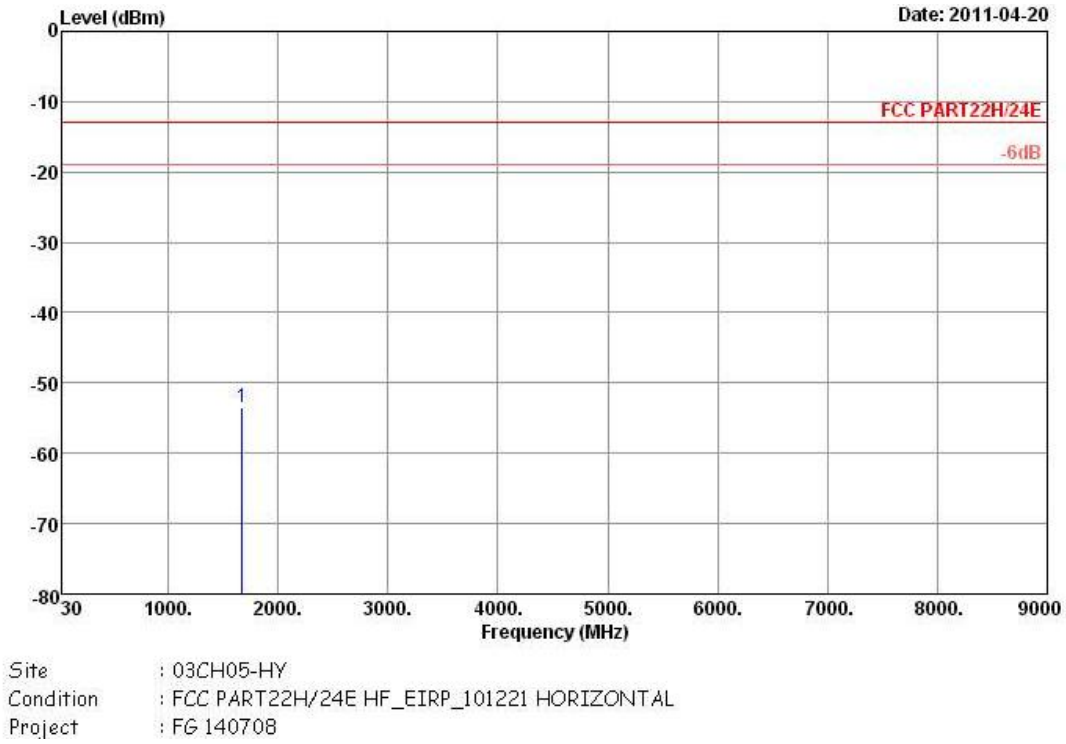
Band :	GSM1900	**Temperature :**	20~23°C
Test Mode :	EDGE 8 Link	**Relative Humidity :**	45~50%
Test Engineer :	David Yang	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 VERTICAL
Project : FG 140708

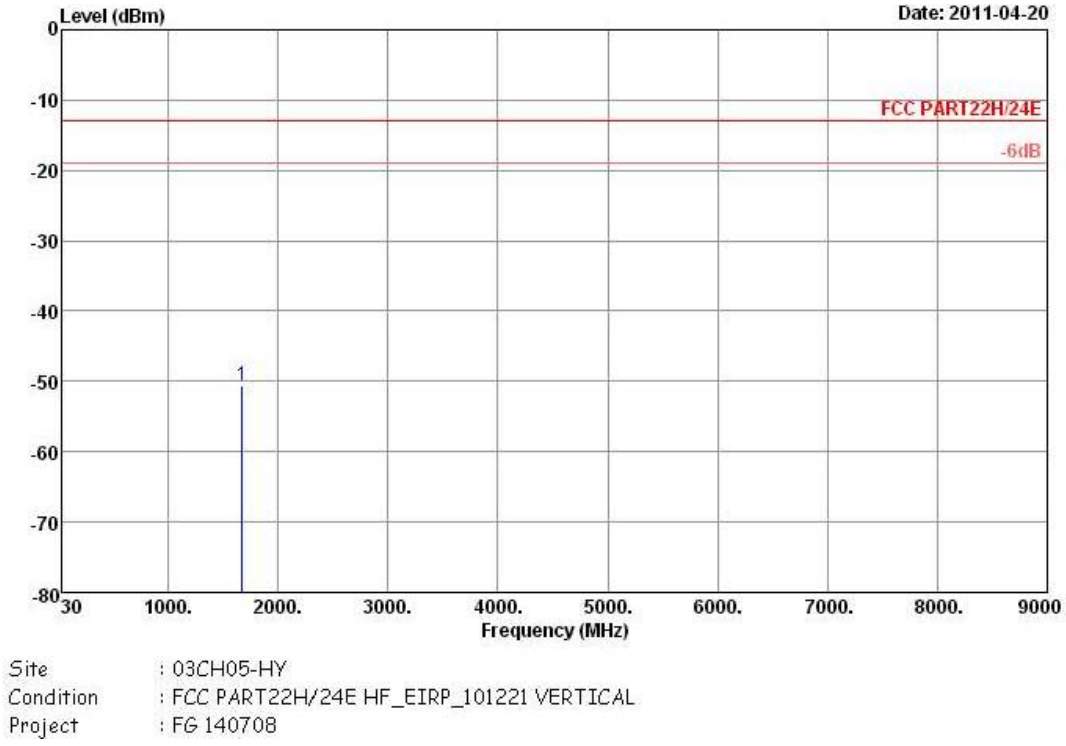
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-47.28	-13	-34.28	-61.38	-53.41	2.9292	9.06	V	Pass

Band :	WCDMA Band V	**Temperature :**	20~23°C
Test Mode :	RMC 12.2Kbps Link	**Relative Humidity :**	45~50%
Test Engineer :	David Yang	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



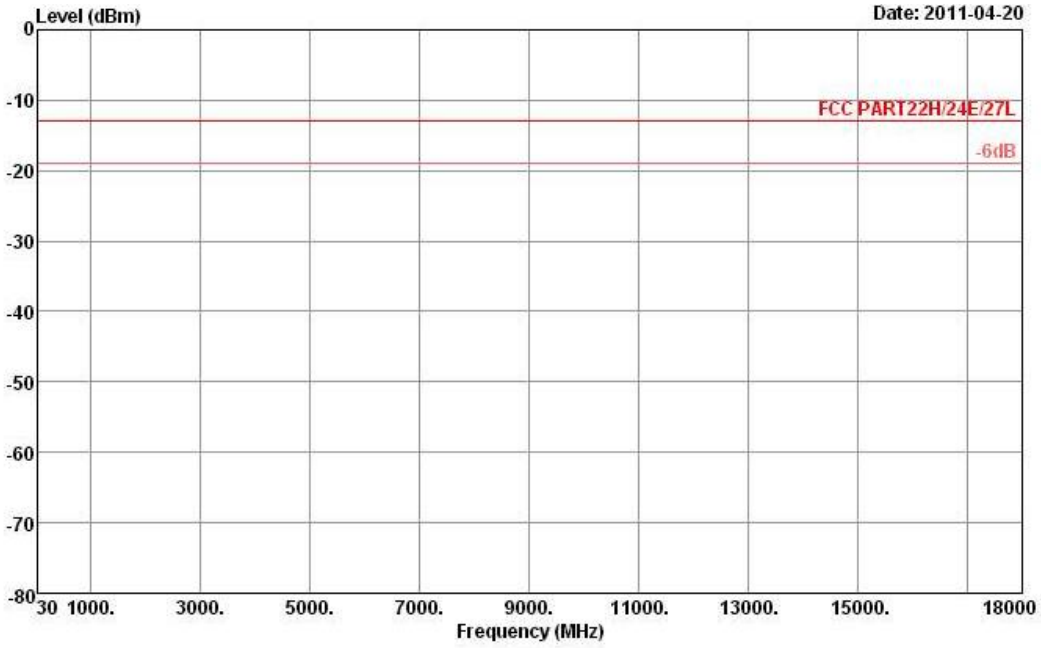
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-53.44	-13	-40.44	-58.85	-54.63	2.15	5.49	H	Pass

Band :	WCDMA Band V	**Temperature :**	20~23°C
Test Mode :	RMC 12.2Kbps Link	**Relative Humidity :**	45~50%
Test Engineer :	David Yang	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



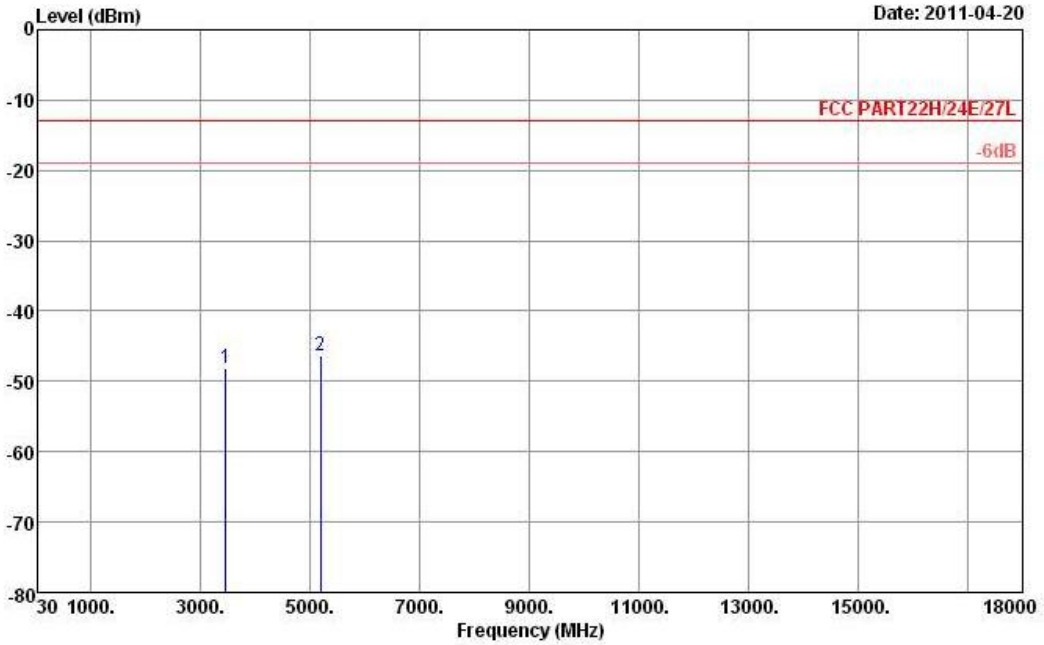
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-50.58	-13	-37.58	-57.37	-51.77	2.15	5.49	V	Pass

Band :	WCDMA Band IV	**Temperature :**	23~24°C
Test Mode :	RMC 12.2Kbps Link	**Relative Humidity :**	49~50%
Test Engineer :	Ivan Chiang	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line. Spurious emissions within 1000MHz ~ 10th harmonic were not found any signals.		



Site : 03CH05-HY
Condition : FCC PART22H/24E/27L HF_EIRP_101221 HORIZONTAL
Project : FG 140708

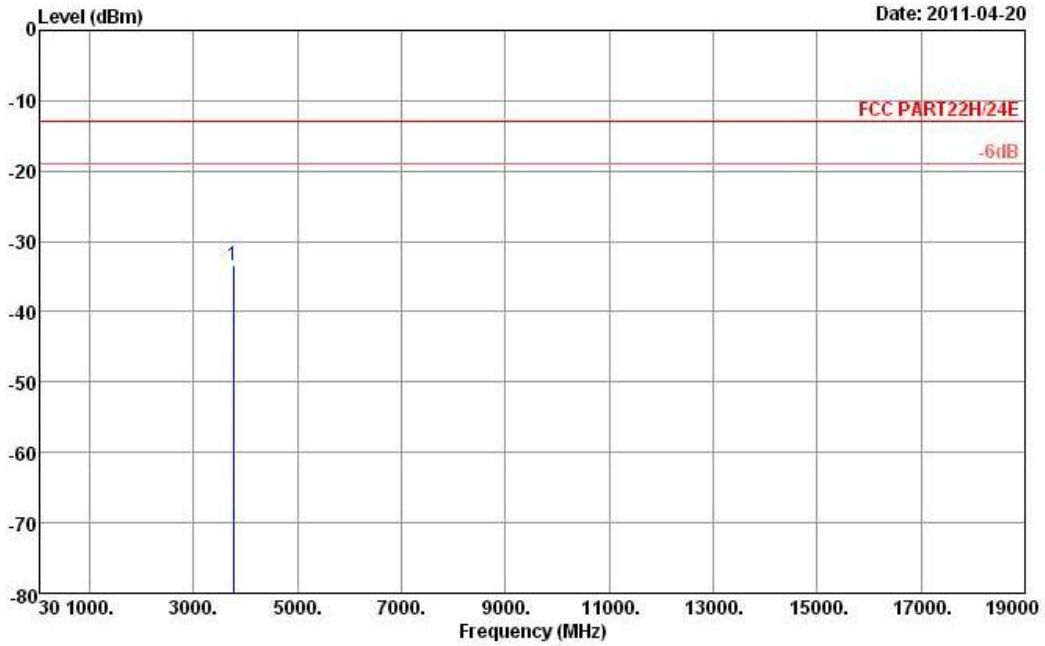
Band :	WCDMA Band IV	**Temperature :**	23~24°C
Test Mode :	RMC 12.2Kbps Link	**Relative Humidity :**	49~50%
Test Engineer :	Ivan Chiang	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E/27L HF_EIRP_101221 VERTICAL
Project : FG 140708

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
3465	-48.04	-13	-35.04	-60.59	-54.26	2.6578	8.88	V	Pass
5197	-46.25	-13	-33.25	-63.74	-53.17	3.8194	10.74	V	Pass

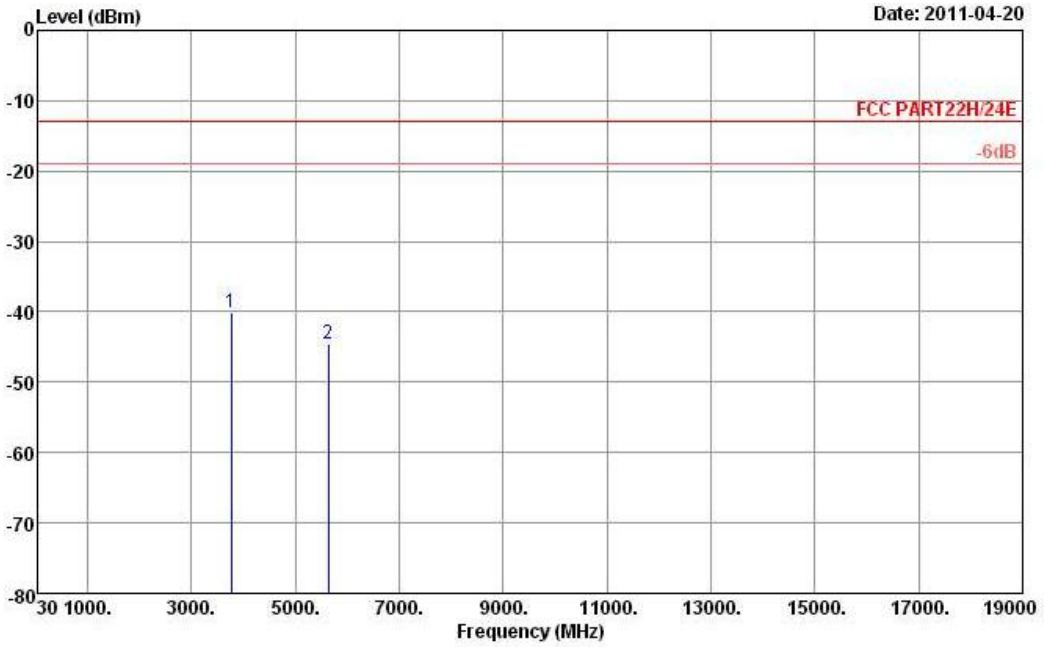
Band :	WCDMA Band II	**Temperature :**	20~23°C
Test Mode :	RMC 12.2Kbps Link	**Relative Humidity :**	45~50%
Test Engineer :	David Yang	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 HORIZONTAL
Project : FG 140708

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	-33.40	-13	-20.40	-47.49	-39.53	2.9292	9.06	H	Pass

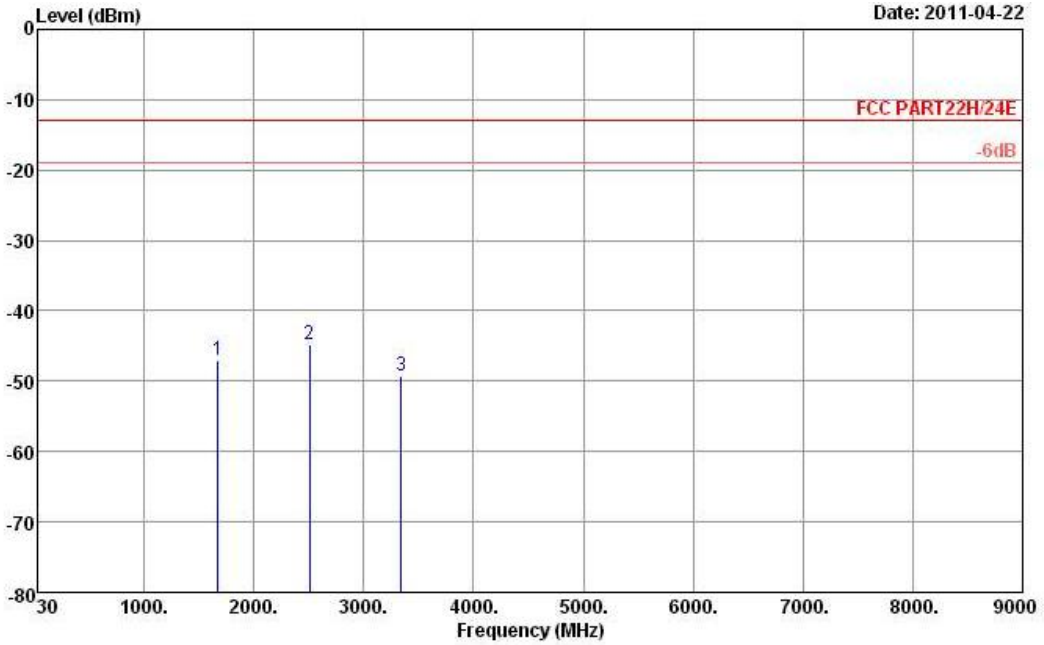
Band :	WCDMA Band II	**Temperature :**	20~23°C
Test Mode :	RMC 12.2Kbps Link	**Relative Humidity :**	45~50%
Test Engineer :	David Yang	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 VERTICAL
Project : FG 140708

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	-40.22	-13	-27.22	-53.61	-46.35	2.9292	9.06	V	Pass
5636	-44.50	-13	-31.50	-64.11	-51.42	3.9072	10.83	V	Pass

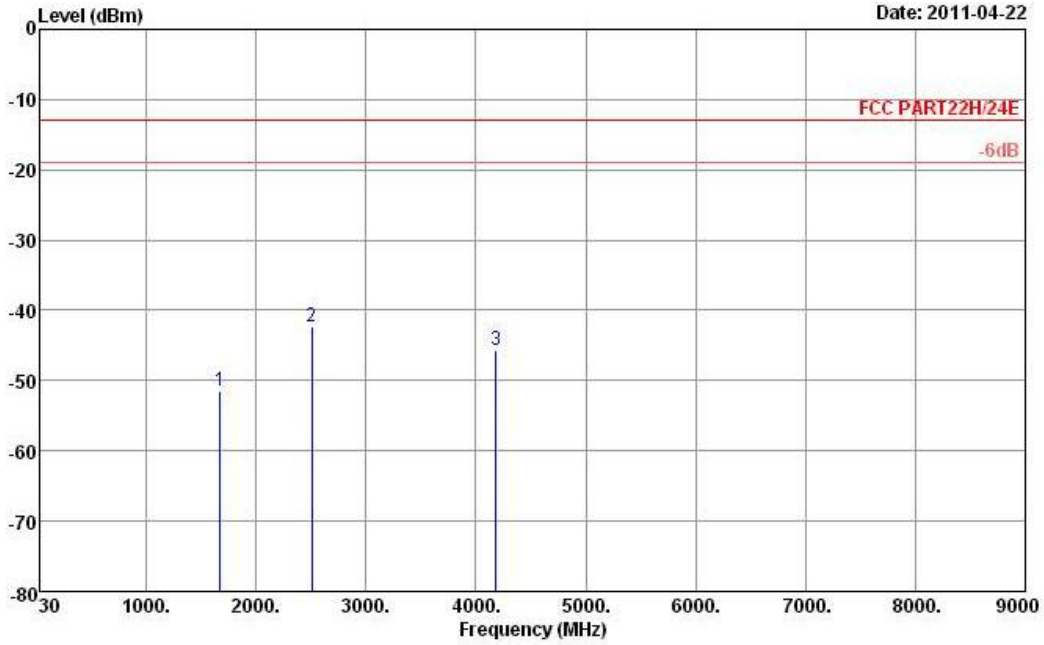
Band :	CDMA2000 BC0	**Temperature :**	20~23°C
Test Mode :	1xEVDO Rev. 0_RTAP 153.6K	**Relative Humidity :**	45~50%
Test Engineer :	David Yang	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 HORIZONTAL
Project : FG 140708

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	-46.98	-13	-33.98	-53.16	-48.17	2.15	5.49	H	Pass
2509	-44.69	-13	-31.69	-53.77	-46.58	2.38	6.41	H	Pass
3345	-49.16	-13	-36.16	-60.9	-52.49	2.86	8.34	H	Pass

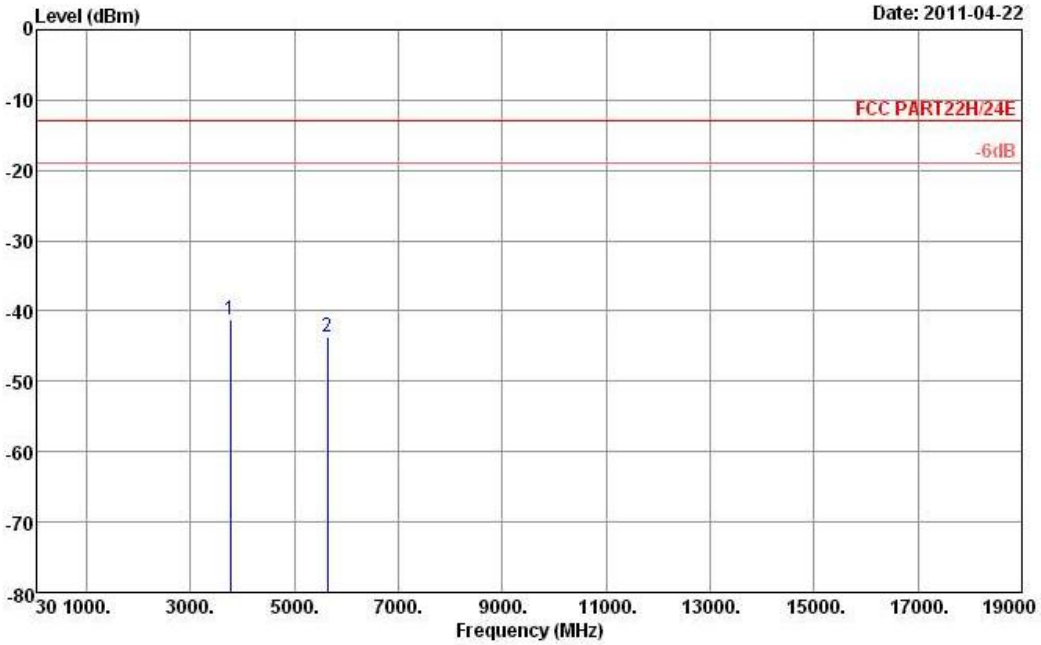
Band :	CDMA2000 BC0	**Temperature :**	20~23°C
Test Mode :	1xEVDO Rev. 0_RTAP 153.6K	**Relative Humidity :**	45~50%
Test Engineer :	David Yang	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 VERTICAL
Project : FG 140708

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	-51.44	-13	-38.44	-57.54	-52.63	2.15	5.49	V	Pass
2509	-42.32	-13	-29.32	-52.43	-44.21	2.38	6.41	V	Pass
4182	-45.69	-13	-32.69	-61.42	-49.63	3.26	9.35	V	Pass

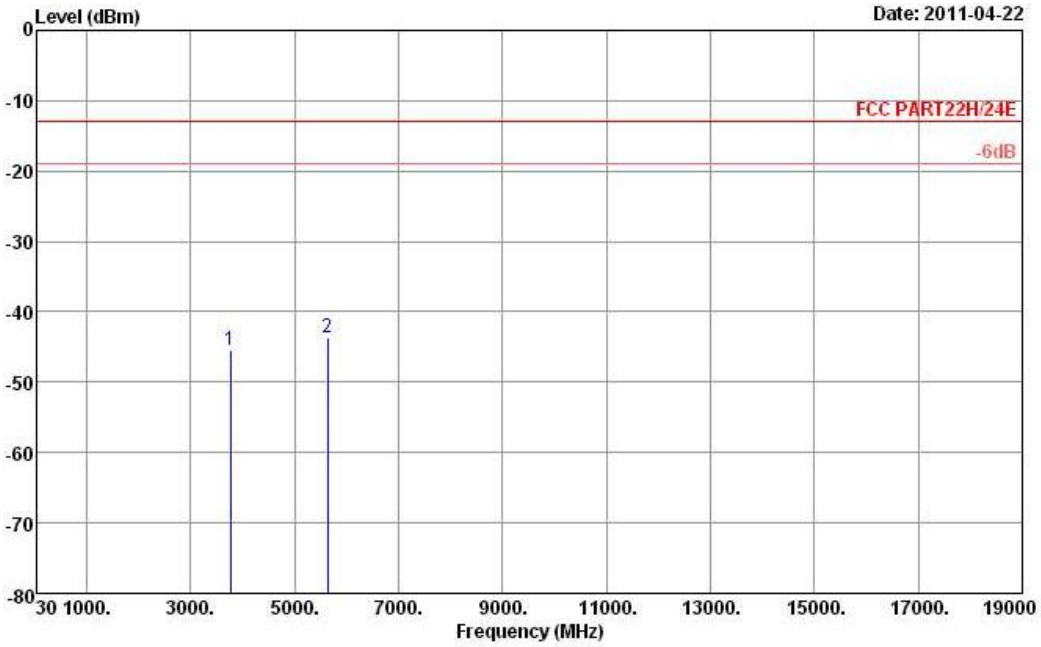
Band :	CDMA2000 BC1	**Temperature :**	20~23°C
Test Mode :	1xEVDO Rev. 0_RTAP 153.6K	**Relative Humidity :**	45~50%
Test Engineer :	David Yang	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 HORIZONTAL
Project : FG 140708

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	-41.23	-13	-28.23	-54.59	-47.36	2.9292	9.06	H	Pass
5636	-43.57	-13	-30.57	-62.22	-50.49	3.9072	10.83	H	Pass

Band :	CDMA2000 BC1	**Temperature :**	20~23°C
Test Mode :	1xEVDO Rev. 0_RTAP 153.6K	**Relative Humidity :**	45~50%
Test Engineer :	David Yang	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH05-HY
Condition : FCC PART22H/24E HF_EIRP_101221 VERTICAL
Project : FG 140708

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	-45.54	-13	-32.54	-59.08	-51.67	2.9292	9.06	V	Pass
5636	-43.63	-13	-30.63	-63.02	-50.55	3.9072	10.83	V	Pass

4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
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. 14, 2011	Apr. 13, 2012	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 $\Gamma 1$ = 0.197 Antenna VSWR $\Gamma 2$ = 0.194 Uncertainty = 20Log(1-$\Gamma 1$*$\Gamma 2$)	+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 EP140708 as below.