ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H

OF

Product Name:	**CDMA TSY01**
Brand Name:	**N/A**
Marketing Name:	**biblio**
Model Difference:	**N/A**
FCC ID:	**WVS-RN10-J01**
Report No.:	**EH/2009/40001**
Issue Date:	**Apr. 13, 2009**
FCC Rule Part:	**2 , 22H**
Prepared for:	**Toshiba Corporation, Mobile Communications Co., Quality Management Division 1-1, Asahigaoka 3-Chome, Hino-Shi, Tokyo, 191-8555, Japan**
Prepared by:	**SGS Taiwan Ltd.** **Electronics & Communication Laboratory** **No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan.**

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VERIFICATION OF COMPLIANCE

Applicant:	Toshiba Corporation, Mobile Communications Co., Quality Management Division 1-1, Asahigaoka 3-Chome, Hino-Shi, Tokyo, 191-8555, Japan
Manufacturer:	Toshiba Corporation, Mobile Communications Co., Quality Management Division 1-1, Asahigaoka 3-Chome, Hino-Shi, Tokyo, 191-8555, Japan
Product Name:	CDMA TSY01
Brand Name:	N/A
Marketing Name:	biblio
Model Difference:	N/A
FCC ID Number:	WVS-RN10-J01
Report Number:	EH/2009/40001
Date of test:	Apr. 02, 2009 ~ Apr. 10, 2009
Date of EUT Received:	Apr. 02, 2009

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-C-2004 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rule FCC PART 22 subpart H .

The test results of this report relate only to the tested sample identified in this report.

Test By:	Sky Wang	***Date:***	Apr. 13, 2009
	Sky Wang/Asst. Supervisor		
Prepared By:	Alex Hsieh	***Date:***	Apr. 13, 2009
	Alex Hsieh / Sr. Engineer		
Approved By	Vincent Su	***Date:***	Apr. 13, 2009
	Vincent Su/Manager		

Version

Version No.	Date	Description
00	Apr. 13, 2009	Initial creation of document
01	May. 11, 2009	Revise test data for ERP

Table of Contents

1. GENERAL INFORMATION

1.1 Product Description

Type Name:	CDMA TSY01	
Brand Name:	N/A	
Marketing Name:	biblio	
Model Difference:	N/A	
Data Cable (USB)	N/A	
Simple Hands-free (SHF)	N/A	
Power Supply:	3.7 Vdc re-chargeable battery	
	Battery Model:	1UF463450F-TBH2-S, Brand: SANYO

CDMA 2000:

DUT Standards and Power:	CDMA2000	Frequency Range		Maximum Output Power
	Cellular Band	TX:	824.70-848.31 MHz	24.76 dBm
		RX:	869.70-893.37 MHz	

Final Amplifier Voltage and Current Information		DC voltage (V)	DC current (mA)
	CDMA 2000 Cellular	3.7Vdc	760
Type of Emission	1M28F9W		
MEID	A1000006EF0683		
Software Version	N/A		
Hardware Version	Ver.2.0		
Antenna Type	PIFA		

Bluetooth:

Bluetooth Version	☐ V1.1 (GFSK) ☐ V1.2 (GFSK) ☐ V2.0 (GFSK) ☐ V2.0 + EDR (GFSK + π/4DQPSK + 8DPSK) ☒ V2.1 + EDR (GFSK + π/4DQPSK + 8DPSK)
Frequency Range	2402 – 2480MHz
Channel number	79 channels max., 1MHz step
Rated Power	0.36 dBm (Peak)
Modulation type	Frequency Hopping Spread Spectrum
Antenna Designation	Metal Antenna / 1dBi.
Type of Emission	1M27F1D

The EUT is compliance with Bluetooth 2.1 with EDR

This test report applies for CDMA2000 cellular band

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: WVS-RN10-J01** filing to comply with Section Part 22 subpart H of the FCC CFR 47 Rules.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on FCC CFR 47 2.1046, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

1.4 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-1

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: TW1016.

1.5 Special Accessories

Not available for this EUT intended for grant.

1.6 Equipment Modifications

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Toshiba CDMA cellular phone FCC ID: WVS-RN10-J01 was Tested With AC Adapter and Headsets. The EUT was stayed in normal operation mode (RC3/SO55) with CMU200.The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Measurement at Antenna Port:

According to measurement procured TIA/EIA 603C, the EUT is placed on a turn table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

2.3.2 Radiated Emissions (ERP/EIRP):

According to measurement procured TIA/EIA 603C. The EUT is placed on a turn table which is 1.0 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements.

A standard antenna was used to replace the EUT and connect to the SG. Adjust the SG output level to reach the max emission level which were measured above.

2.4 Configuration of Tested System

Fig. 1-1 Configuration for Radiated Emission

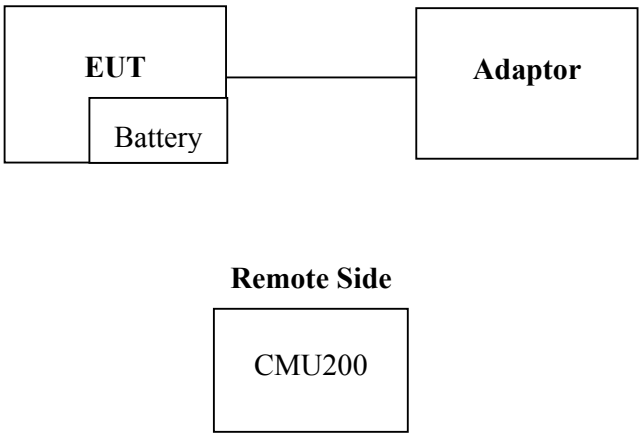


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Universal Radio Communication Tester	R&S	CMU200	102189	N/A	Un-shielded

3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a) §22.913(a)	RF Power Output	Compliant
§2.1046(a) §22.913(a)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% Occupied Bandwidth	Compliant
§2.1051 §22.917(a)	Out of Band Emissions at Antenna Terminals and Band Edge	Compliant
§2.1053 §22.917(a)	Field Strength of Spurious Radiation	Compliant
§2.1055(a)(1)(b)	Frequency Stability vs. Temperature	Compliant
§2.1055(d)(1)(2)	Frequency Stability vs. Voltage	Compliant

4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Set EUT power control “all up bits” for all test mode through base station.

EUT staying in continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing.

The field strength of spurious radiation emission was measured as EUT stand-up position (E1 mode) and lie down position (E1, E2 mode) for CDMA2000 BC0 and three enclosures (Pink, White, and Black) with power adaptor. The worst-case E2 mode for channels Low, Mid and High with Pink enclosure were reported.

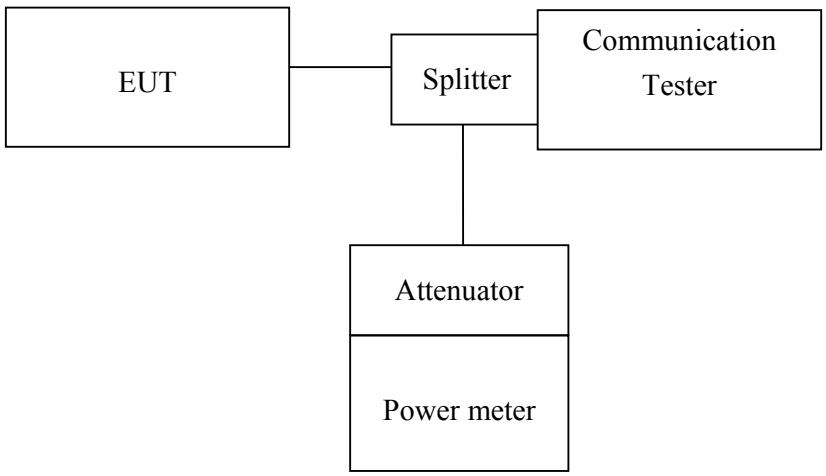
5. RF POWER OUTPUT MEASUREMENT

5.1 Standard Applicable

According to FCC §2.1046.

FCC 22.913(a) Mobile station are limited to 7W.

5.2 Test Set-up:



Note: *Measurement setup for testing on Antenna connector*

5.3 Measurement Procedure

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading.

5.4 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2010
Spectrum Analyzer	Agilent	E4440A	US41160416	01/23/2008	01/22/2010
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2008	05/12/2010
DC Block	Agilent	BLK-18	155452	07/05/2008	07/04/2009
Attenuator	Mini-Circuit	BW-S20W5	N/A	07/05/2008	07/04/2009
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2008	07/04/2009
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2008	07/04/2009
Splitter	Agilent	11636B	N/A	07/05/2008	07/04/2009
DC Power Supply	HP	6038A	2929A-07548	06/27/2007	06/26/2009
DC Power Supply	Topward	3303D	981327	10/26/2007	10/25/2009

5.5 Measurement Result

EUT Mode	Frequency (MHz)	CH	Path Loss (dB)	Peak Power (dBm)	Average Power (dBm)
CDMA 2000 Cellular band (RC3/S055)	824.70	1013	0.00	24.64	24.46
	836.52	384	0.00	24.76	24.65
	848.31	777	0.00	24.63	24.58

Offset 0.6dB

6. ERP MEASUREMENT

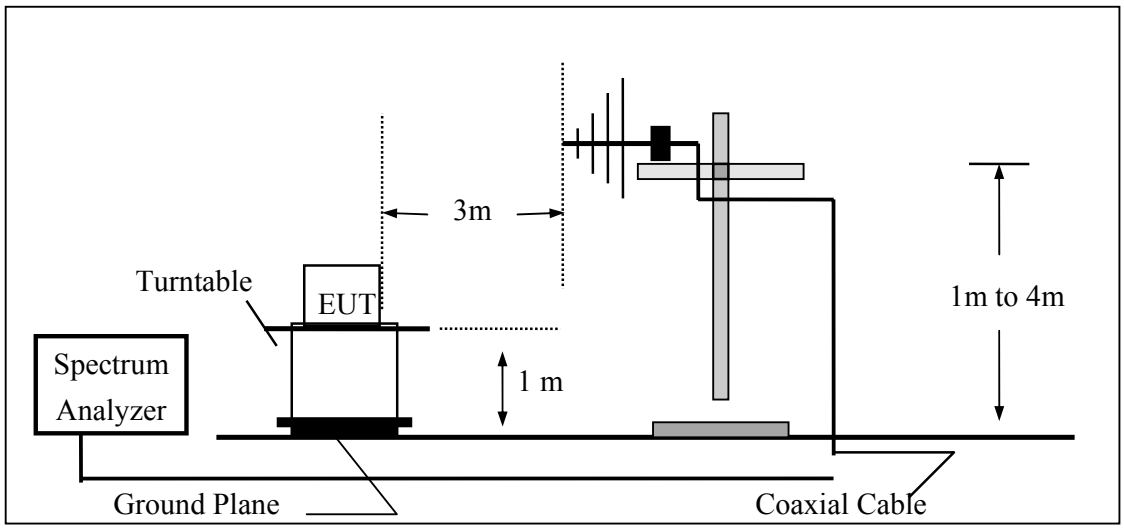
6.1 Standard Applicable

According to FCC §2.1046

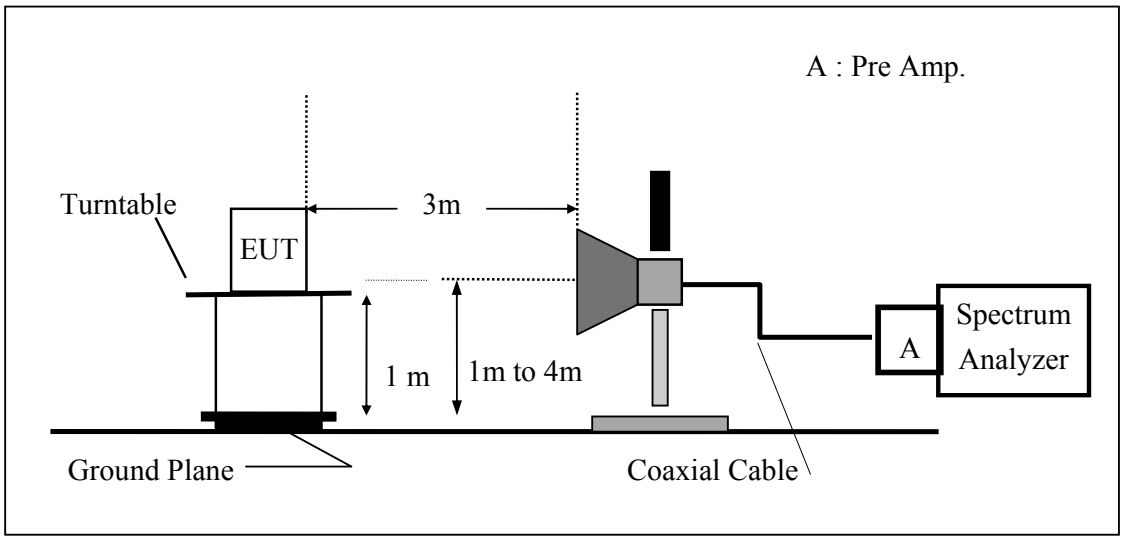
FCC 22.913(a) Mobile stations are limited to 7W ERP.

6.2 Test SET-UP (Block Diagram of Configuration)

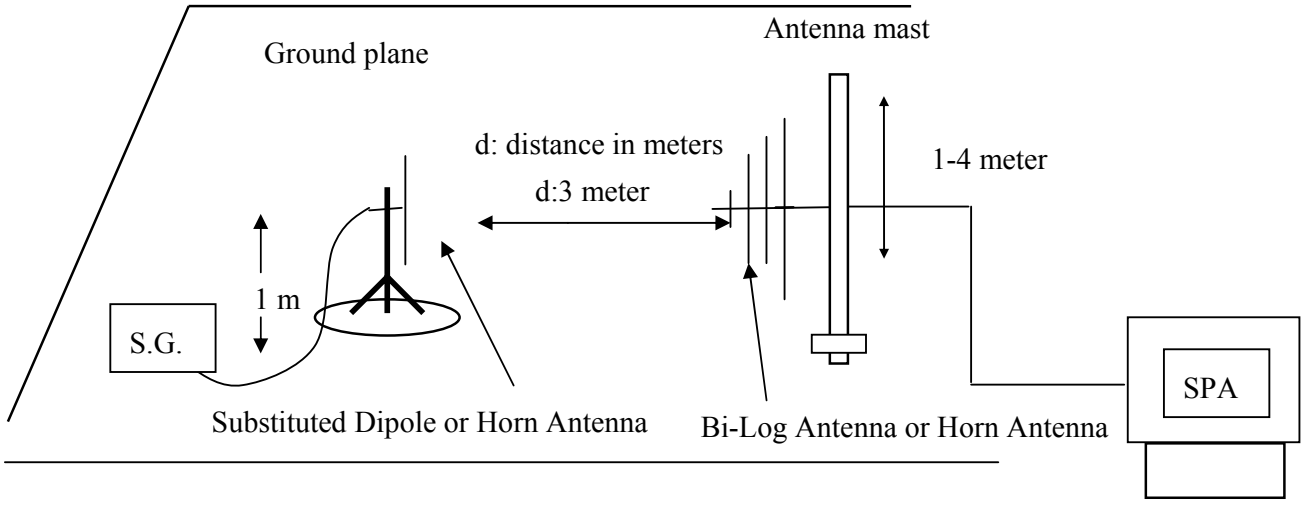
(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



(C) Substituted Method Test Set-UP



6.3 Measurement Procedure

The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.

During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824.70 – 848.31 MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable Loss (dB)

6.4 Measurement Equipment Used:

ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2009	02/11/2010
Bilog Antenna	SCHWAZBECK	VULB9160	9160-3136	11/15/2008	11/14/2009
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/10/2008	07/09/2010
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/10/2008	07/09/2010
Hor.n antenna	SCHWAZBECK	BBHA 9120D	309	01/22/2008	01/21/2010
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2008	05/08/2010
Signal Generator	R&S	SMR40	100210	01/22/2008	01/21/2010
Signal Generator	Agilent	E4438C	MY45093613	05/22/2008	05/21/2009
Pre-Amplifier	Agilent	8447D	1937A02834	11/30/2008	11/29/2009
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2009	01/04/2010
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2008	07/04/2009
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2008	07/04/2009
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2008	07/04/2009
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2008	05/13/2010
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2009	01/04/2010
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2009	01/04/2010
3m Site	SGS	966 chamber	N/A	11/08/2008	11/09/2009

6.5 Measurement Result

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
CDMA 2000 Cellular Band (RC3/S055)	824.70	1013	H	V	113.05	26.69	-7.88	3.63	15.18	38.45
				H	121.12	34.86	-7.88	3.63	23.36	38.45
			E1	V	120.55	34.19	-7.88	3.63	22.68	38.45
				H	115.39	29.13	-7.88	3.63	17.63	38.45
			E2	V	116.75	30.39	-7.88	3.63	18.88	38.45
				H	119.45	33.19	-7.88	3.63	21.69	38.45
	836.52	384	H	V	115.64	29.38	-7.88	3.65	17.85	38.45
				H	123.01	36.78	-7.88	3.65	25.25	38.45
			E1	V	122.15	35.89	-7.88	3.65	24.36	38.45
				H	117.43	31.20	-7.88	3.65	19.67	38.45
			E2	V	118.16	31.90	-7.88	3.65	20.37	38.45
				H	121.20	34.97	-7.88	3.65	23.44	38.45
	848.31	777	H	V	113.77	27.62	-7.88	3.67	16.07	38.45
				H	121.34	35.14	-7.88	3.67	23.59	38.45
			E1	V	121.09	34.93	-7.88	3.67	23.38	38.45
				H	115.10	28.90	-7.88	3.67	17.35	38.45
			E2	V	116.06	29.91	-7.88	3.67	18.36	38.45
				H	120.54	34.34	-7.88	3.67	22.79	38.45

Remark：

(1) The RBW,VBW of SPA for frequency

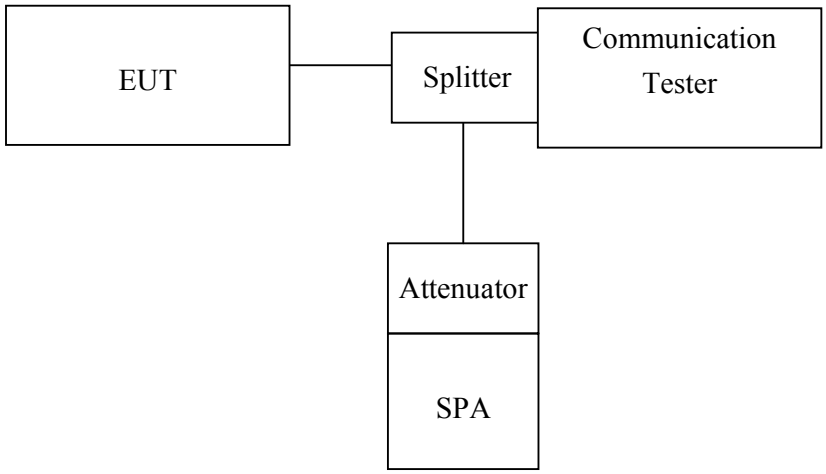
Below 1GHz was RBW=2 MHz, VBW=6 MHz.

7. 99% OCCUPIED BANDWIDTH MEASUREMENT

7.1 Standard Applicable

According to §FCC 2.1049.

7.2 Test Set-up:



Note: *Measurement setup for testing on Antenna connector*

7.3 Measurement Procedure

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW (15/43KHz) was set to about 1% of emission BW, VBW= 3 times RBW(30/100KHz), -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

7.4 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2010
Spectrum Analyzer	Agilent	E4440A	US41160416	01/23/2008	01/22/2010
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2008	05/13/2010
Radio Communication Analyzer	Anritsu	MT8820A	6200307563	04/16/2008	04/15/2010
DC Block	Agilent	BLK-18	155452	07/05/2008	07/04/2009
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2008	07/04/2009
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2008	07/04/2009
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2008	07/04/2009
Splitter	Agilent	11636B	N/A	07/05/2008	07/04/2009
DC Power Supply	HP	6038A	2929A-07548	06/27/2007	06/26/2009
DC Power Supply	Topward	3303D	981327	10/26/2007	10/25/2009

7.5 Measurement Result:.

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
CDMA 2000 Cellular band (RC3/S055)	824.70	1013	1.2785
	836.52	384	1.2818
	848.31	777	1.2779

Figure 7-1: CDMA2000 band 800 Channel Low

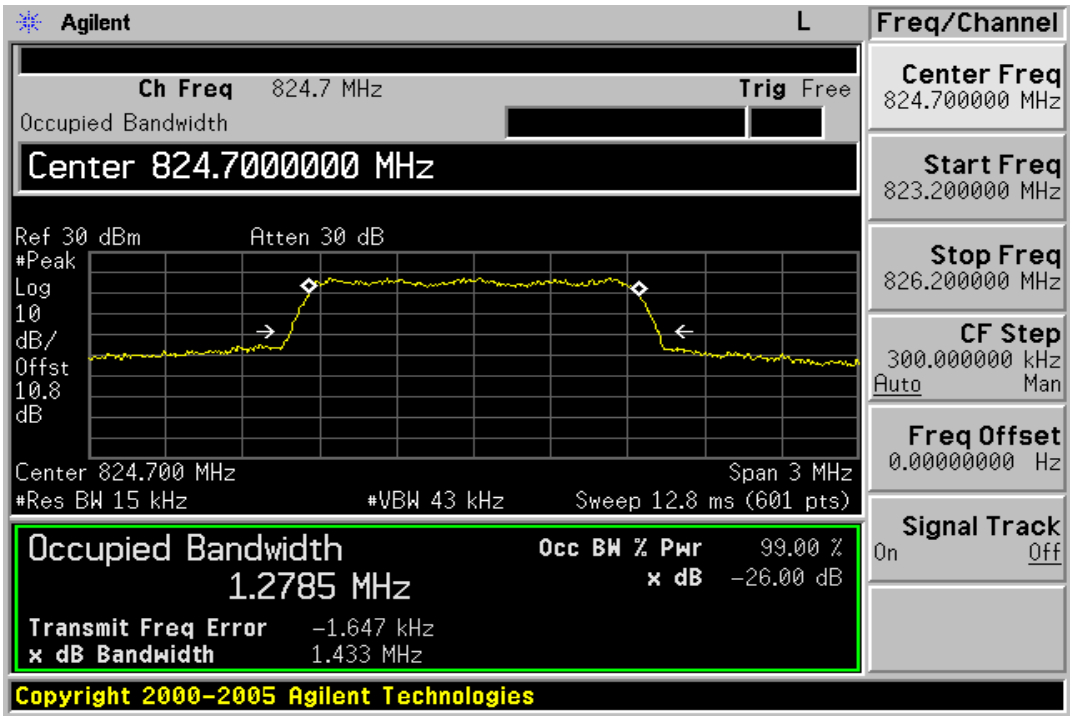


Figure 7-2: CDMA2000 band 800 Channel Mid

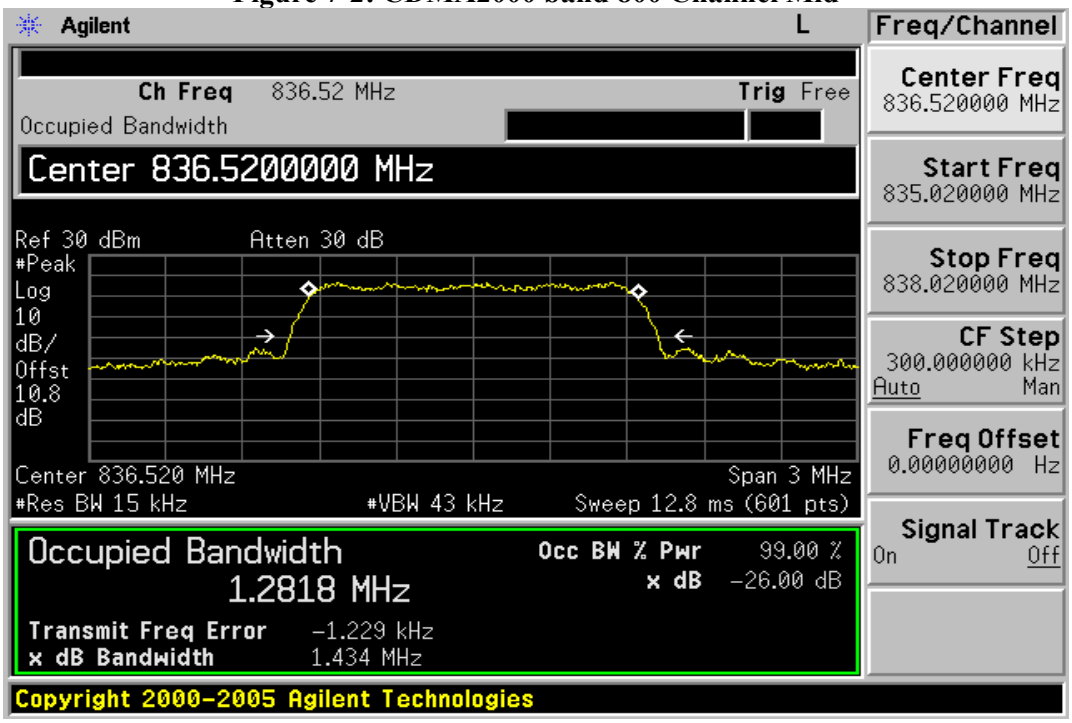
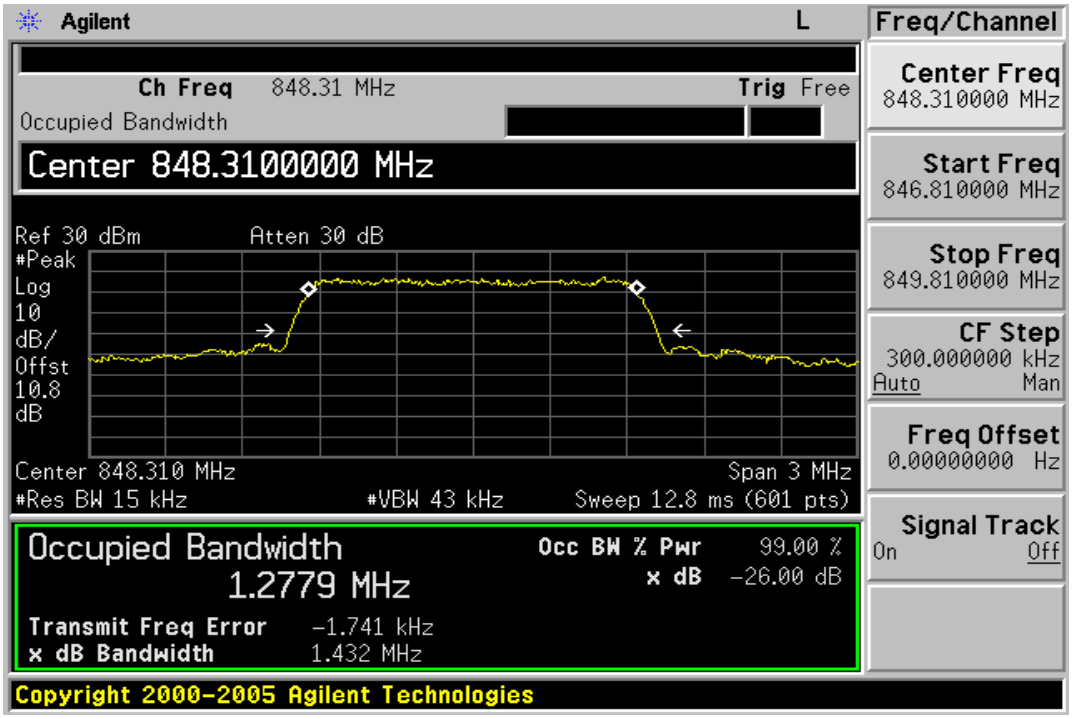


Figure 7-3: CDMA2000 band 800 Channel High



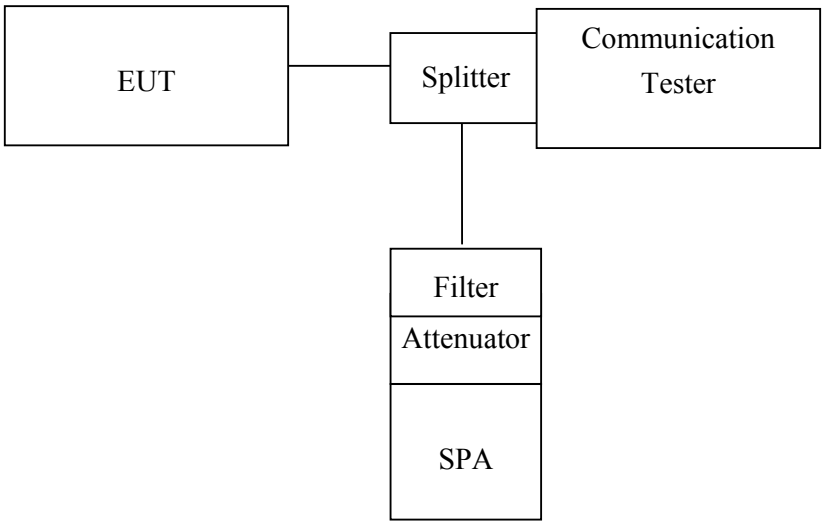
8. OUT OF BAND EMISSION AT ANTENNA TERMINALS

8.1 Standard Applicable

According to FCC §2.1051.

FCC §22.917(a), the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than 43 + 10 log (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm)

8.2 Test SET-UP



Note: *Measurement setup for testing on Antenna connector*

8.3 Measurement Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10 th harmonic. Limit = -13dBm

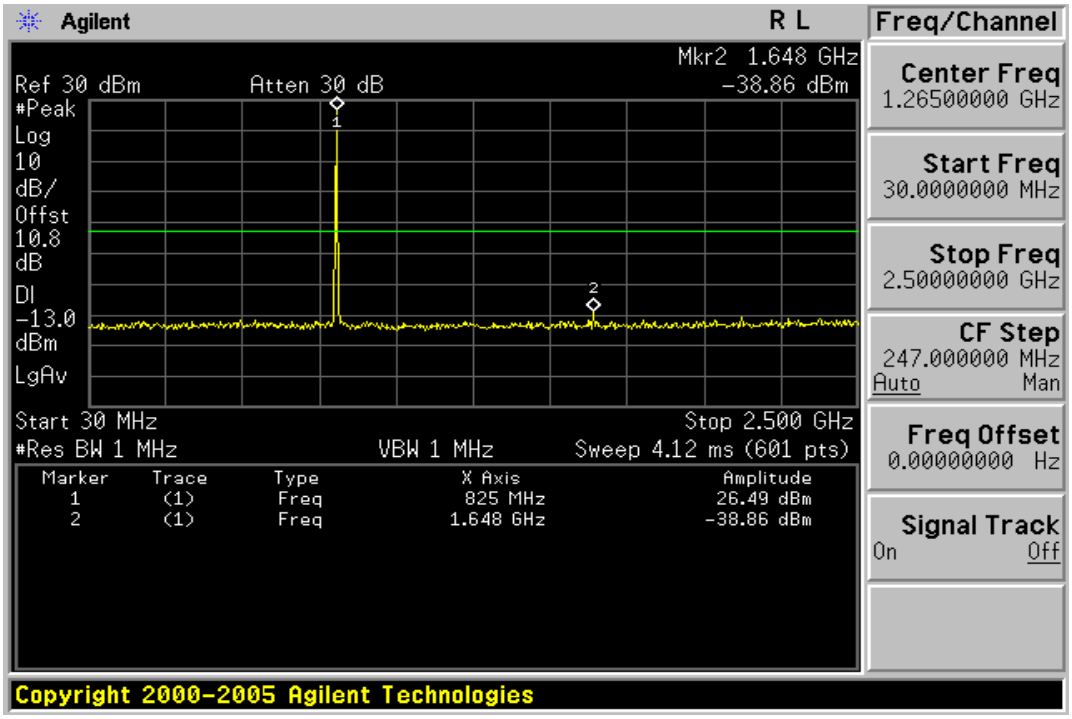
Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

8.4 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2008	04/18/2010
Spectrum Analyzer	Agilent	E4440A	US41160416	01/23/2008	01/22/2010
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2008	05/13/2010
800 – 1000MHz Filter	Micro-Tronics	BRM13462	001	01/05/2009	01/04/2010
1800 – 2000MHz Filter	Micro-Tronics	BRM13463	001	01/05/2009	01/04/2010
Temperature Chamber	TERCHY	MHG-120LF	911009	04/14/2008	04/13/2010
Temperature Chamber	GIANT FORCE	GTH-150-40-CP-AR	MAA0512-018	02/05/2008	02/04/2010
DC Block	Agilent	BLK-18	155452	07/05/2008	07/04/2009
Attenuator	Mini-Circuit	BW-S20W5	N/A	07/05/2008	07/04/2009
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2008	07/04/2009
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2008	07/04/2009
Splitter	Agilent	11636B	N/A	07/05/2008	07/04/2009
DC Power Supply	HP	6038A	2929A-07548	06/27/2007	06/26/2009
DC Power Supply	Topward	3303D	981327	10/26/2007	10/25/2009

8.5 Measurement Result

Figure 8-1: Out of Band emission at antenna terminals–CDMA2000 band 800 Channel Lowest



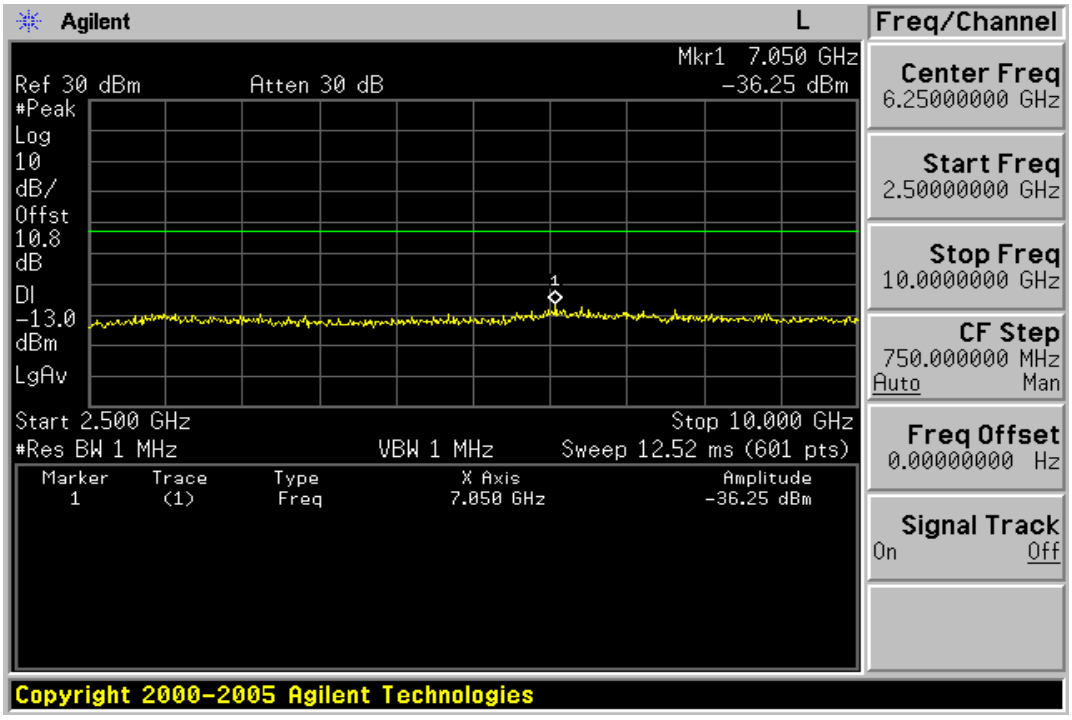
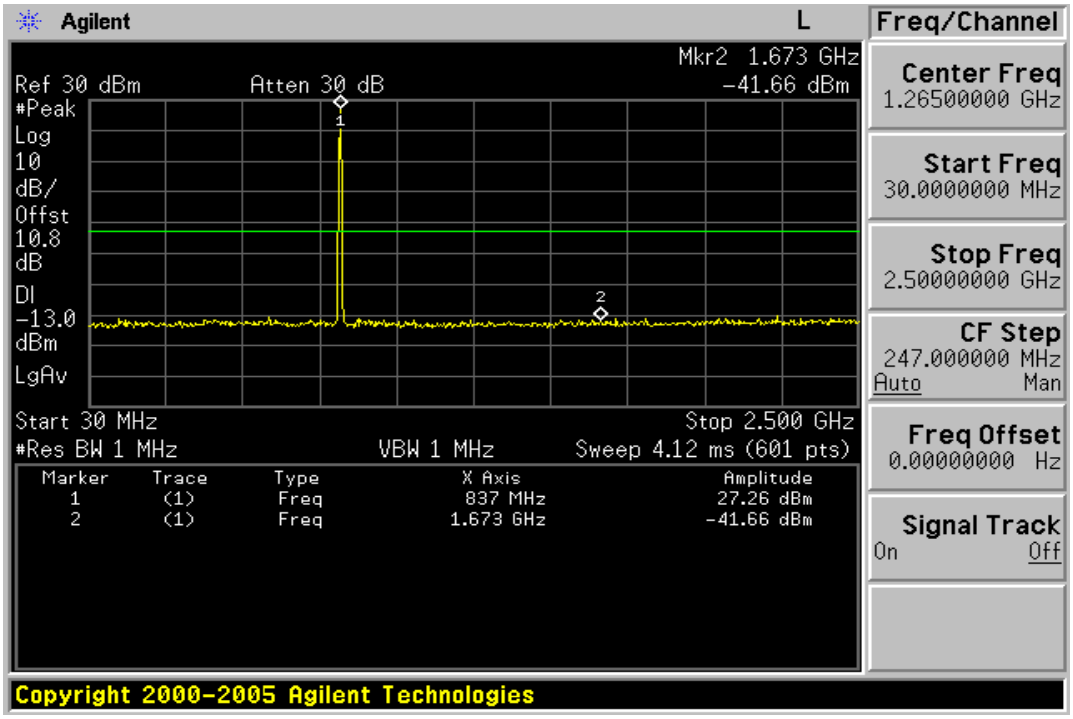


Figure 8-2: Out of Band emission at antenna terminals –CDMA2000 band 800 Channel Mid



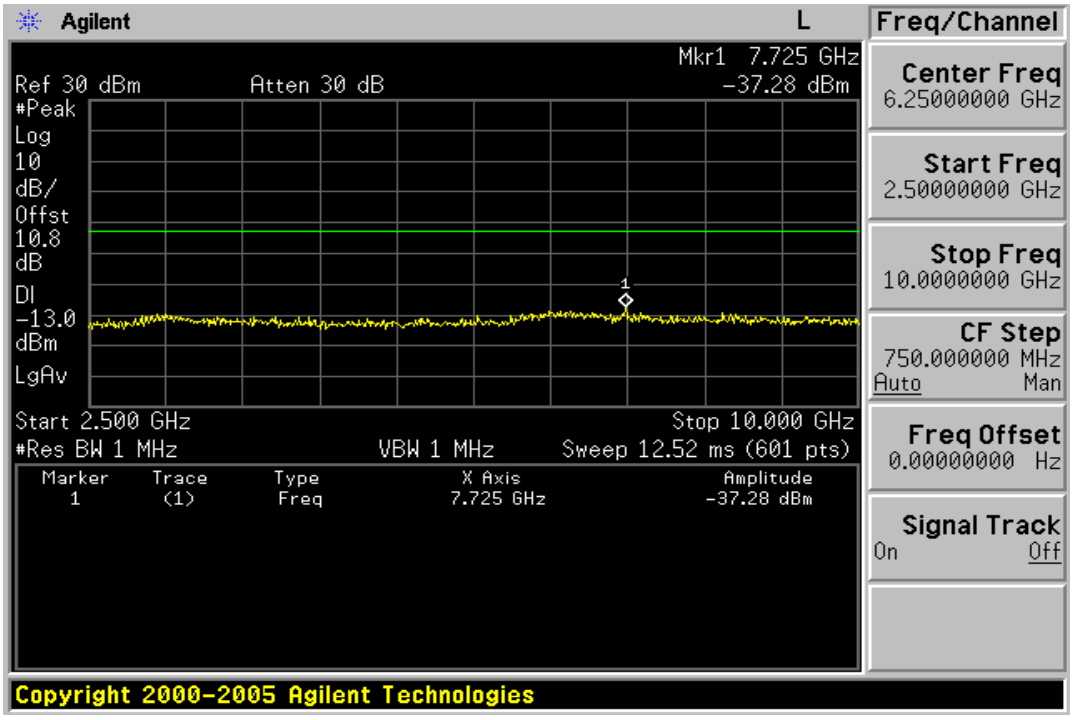
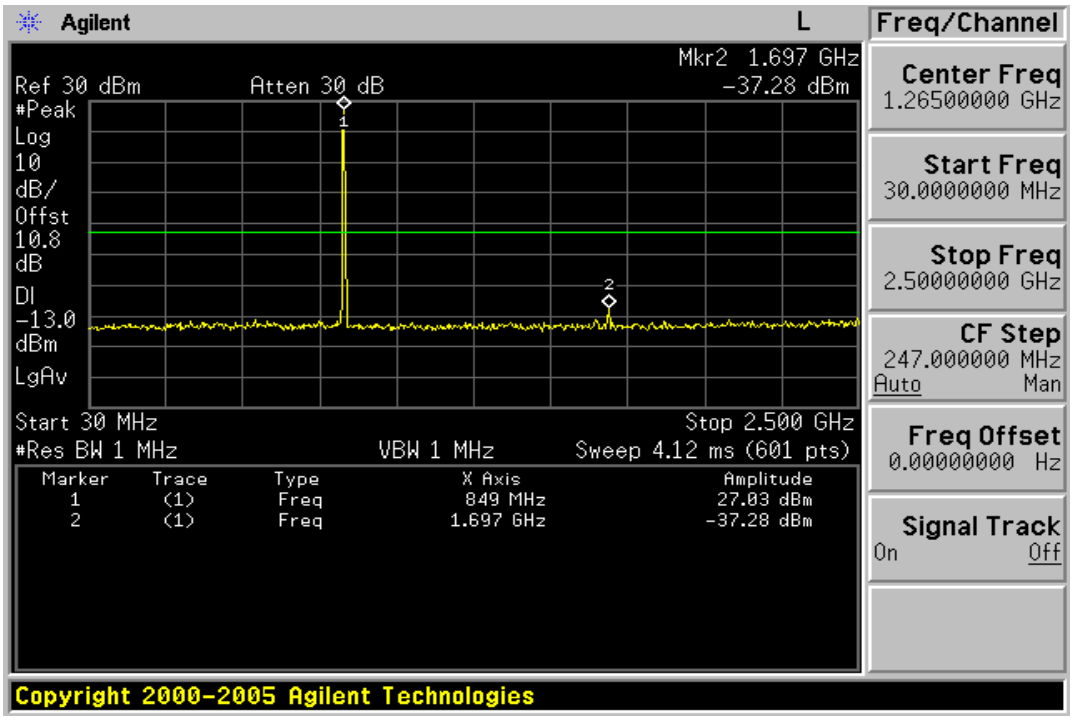


Figure 8-3: Out of Band emission at antenna terminals–CDMA2000 band 800 Channel Highest



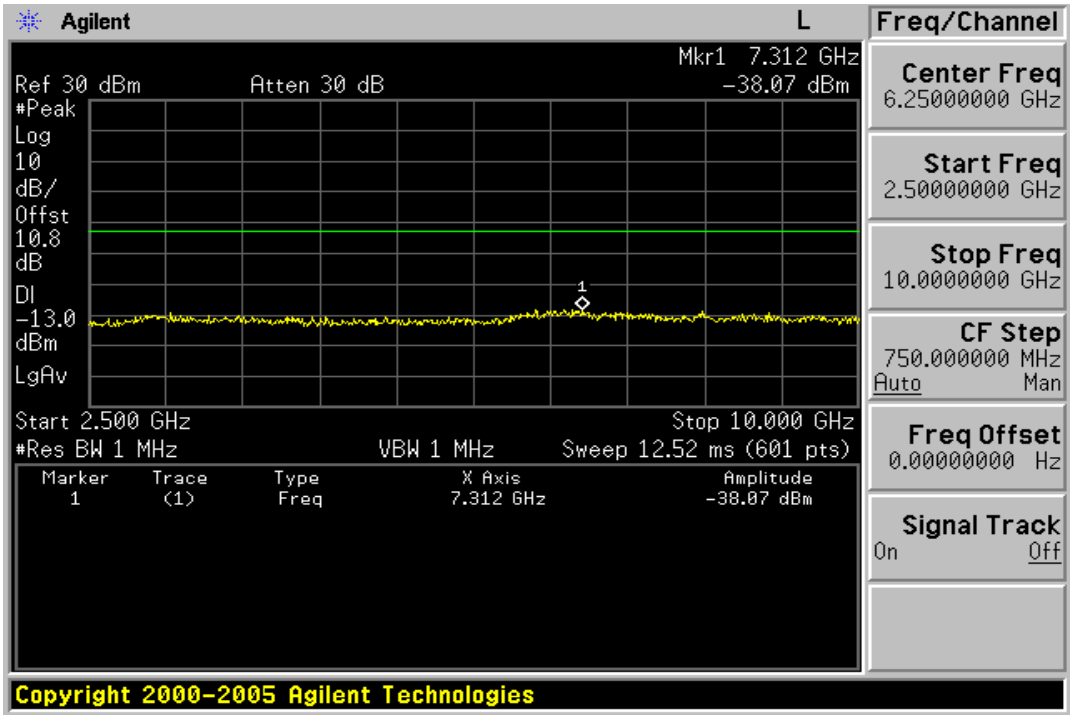


Figure 8-4: Band edge emission at antenna terminals –CDMA2000 band 800 Channel Lowest

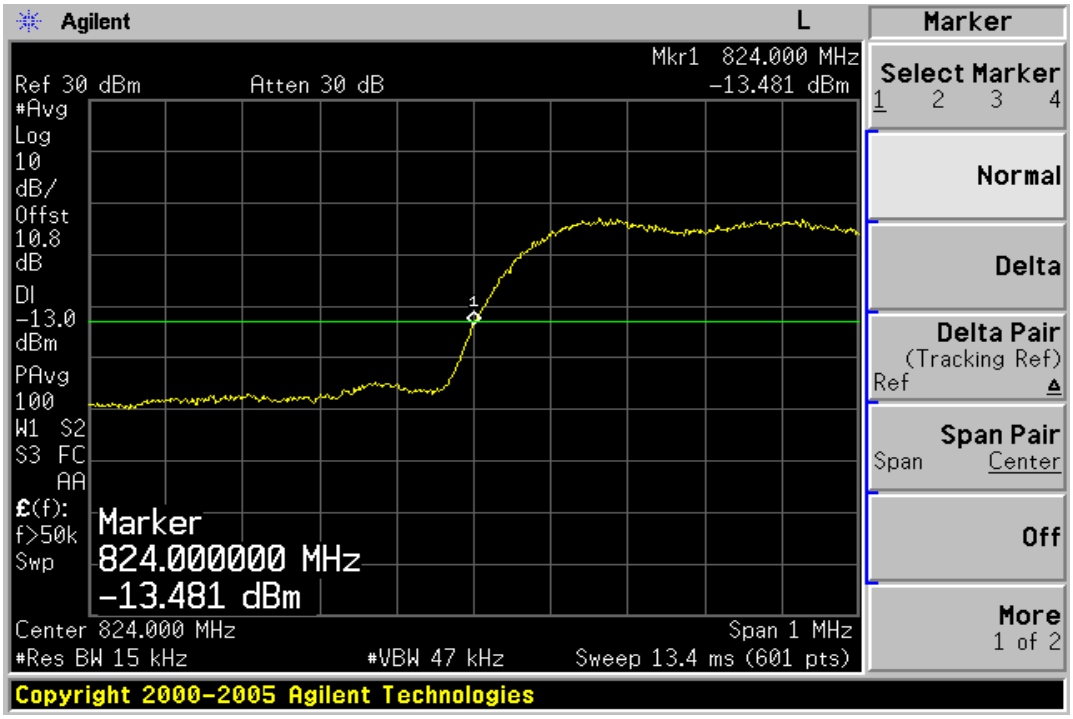
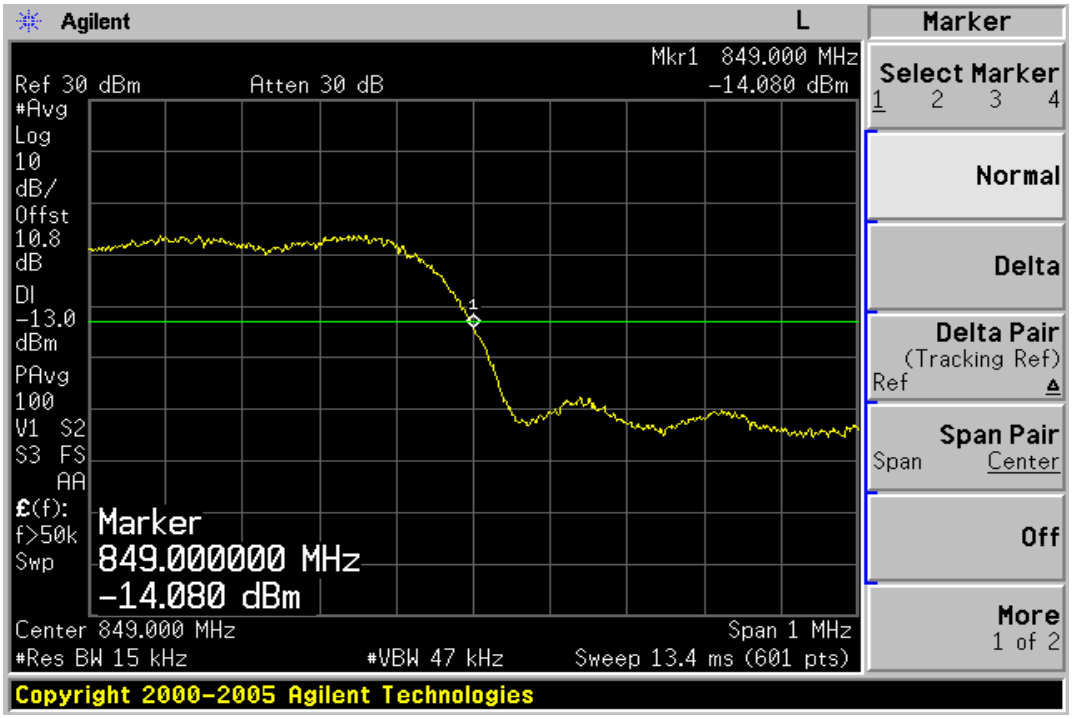


Figure 8-5: Band edge emission at antenna terminals –CDMA2000 band 800 Channel Highest



9. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

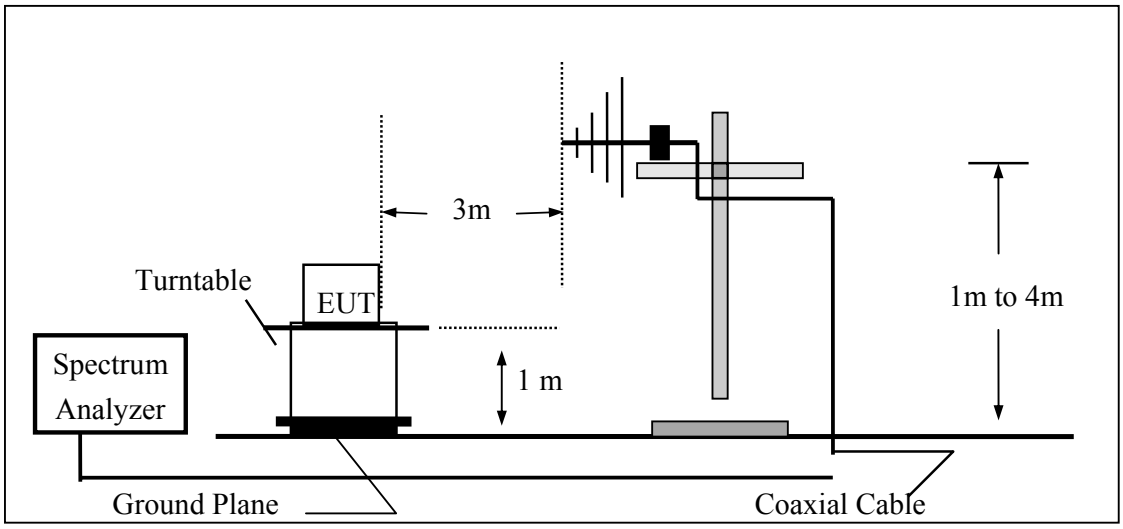
9.1 Standard Applicable

According to FCC §2.1053,

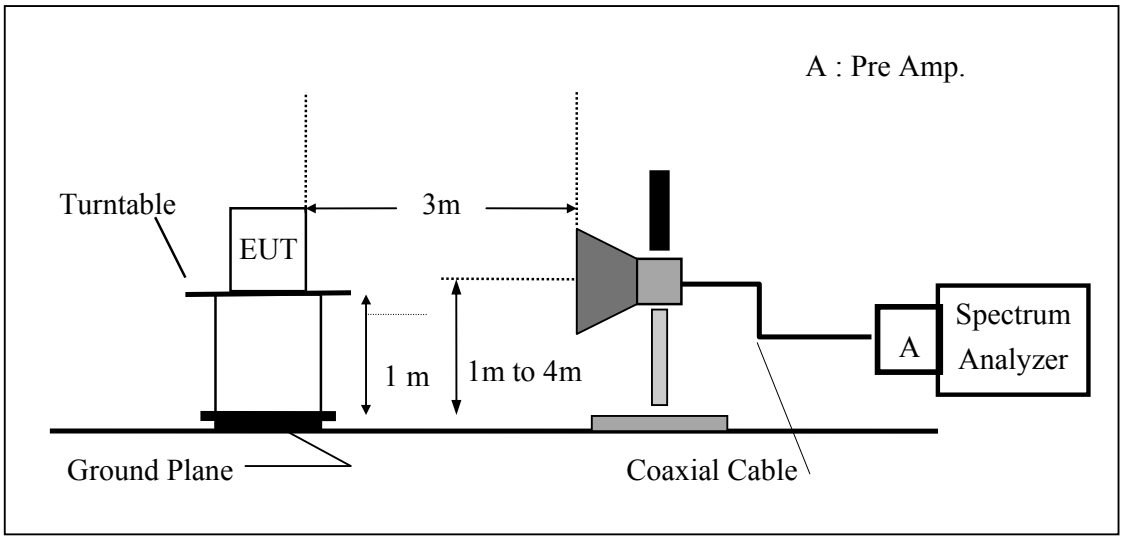
FCC §22.917(a), the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than 43 + 10 log (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm)

9.2 EUT Setup (Block Diagram of Configuration)

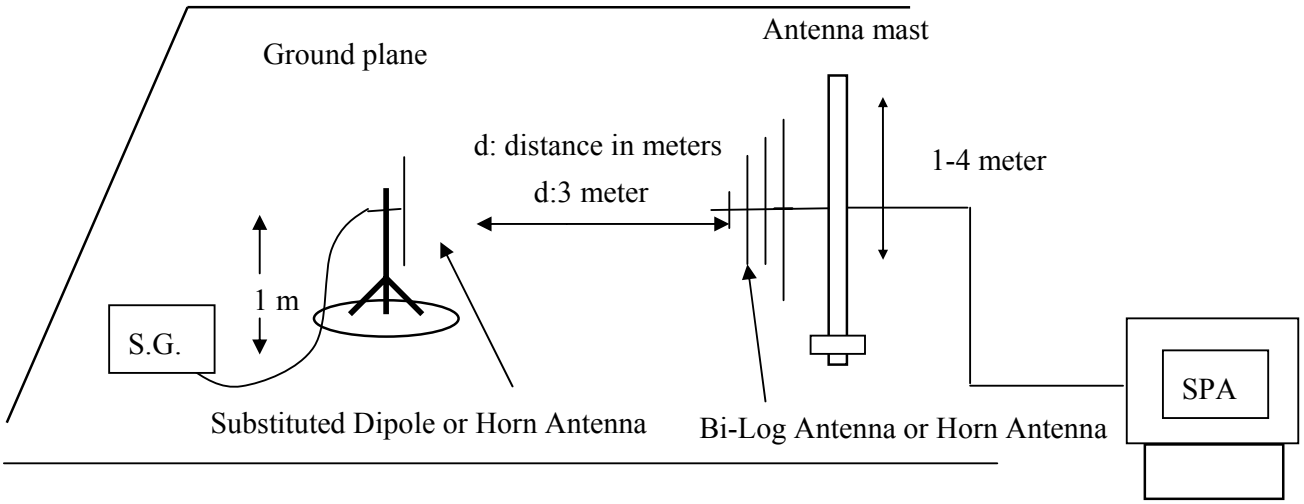
(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



(C) Substituted Method Test Set-UP



9.3 Measurement Procedure

The EUT was placed on a non-conductive, The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission were identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

ERP = S.G. output (dBm) + Antenna Gain(dBd) – Cable Loss (dB)

9.4 Measurement Equipment Used:

ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2009	02/11/2010
Bilog Antenna	SCHWAZBECK	VULB9160	9160-3136	11/15/2008	11/14/2009
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/10/2008	07/09/2010
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/10/2008	07/09/2010
Hor.n antenna	SCHWAZBECK	BBHA 9120D	309	01/22/2008	01/21/2010
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2008	05/08/2010
Signal Generator	R&S	SMR40	100210	01/22/2008	01/21/2010
Signal Generator	Agilent	E4438C	MY45093613	05/22/2008	05/21/2009
Pre-Amplifier	Agilent	8447D	1937A02834	11/30/2008	11/29/2009
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2009	01/04/2010
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2008	07/04/2009
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2008	07/04/2009
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2008	07/04/2009
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2008	05/13/2010
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2009	01/04/2010
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2009	01/04/2010
3m Site	SGS	966 chamber	N/A	11/08/2008	11/09/2009

9.5 Measurement Result

Refer to attach tabular data sheets.

Radiated Spurious Emission Measurement Result: CDMA2000 band 800 Mode

Operation Mode	: TX CH Low E2 Mode	Test Date:	Apr. 10, 2009
Fundamental Frequency	: 824.70 MHz	Test By:	Sky
Temperature	: 25℃	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	42.27	V	-59.90	-3.25	0.90	-64.04	-13.00	-51.04
90.14	52.43	V	-50.75	-7.75	1.27	-59.77	-13.00	-46.77
104.69	44.92	V	-56.57	-7.76	1.38	-65.71	-13.00	-52.71
169.68	37.16	V	-61.90	-7.82	1.64	-71.35	-13.00	-58.35
245.34	42.85	V	-57.22	-7.89	1.96	-67.07	-13.00	-54.07
329.73	37.43	V	-60.45	-7.75	2.28	-70.49	-13.00	-57.49
824.00	69.00	V	-17.39	-7.87	3.62	-28.89	-13.00	-15.89
1649.40	35.93	V	-68.65	9.29	5.23	-64.59	-13.00	-51.59
2474.10	38.53	V	-62.47	10.08	6.53	-58.92	-13.00	-45.92
3298.80	---	V		12.17	7.72		-13.00	
4123.50	---	V		12.61	8.86		-13.00	
4948.20	---	V		12.65	9.74		-13.00	
5772.90	---	V		13.56	10.54		-13.00	
6597.60	---	V		12.04	11.30		-13.00	
7422.30	---	V		11.49	12.10		-13.00	
8247.00	---	V		11.48	12.72		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark：

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: CDMA2000 band 800 Mode

Operation Mode	: TX CH Low E2 Mode	Test Date:	Apr. 10, 2009
Fundamental Frequency	: 824.70 MHz	Test By:	Sky
Temperature	: 25℃	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
39.70	44.31	H	-58.58	-2.79	0.89	-62.27	-13.00	-49.27
90.14	43.48	H	-60.25	-7.75	1.27	-69.27	-13.00	-56.27
101.78	39.92	H	-62.89	-7.76	1.37	-72.02	-13.00	-59.02
169.68	36.55	H	-62.75	-7.82	1.64	-72.20	-13.00	-59.20
250.19	39.54	H	-59.67	-7.89	1.99	-69.55	-13.00	-56.55
318.09	37.10	H	-60.39	-7.82	2.24	-70.45	-13.00	-57.45
824.00	77.20	H	-9.07	-7.87	3.62	-20.57	-13.00	-7.57
1649.40	38.41	H	-65.99	9.29	5.23	-61.93	-13.00	-48.93
2474.10	34.68	H	-66.22	10.08	6.53	-62.68	-13.00	-49.68
3298.80	---	H		12.17	7.72		-13.00	
4123.50	---	H		12.61	8.86		-13.00	
4948.20	---	H		12.65	9.74		-13.00	
5772.90	---	H		13.56	10.54		-13.00	
6597.60	---	H		12.04	11.30		-13.00	
7422.30	---	H		11.49	12.10		-13.00	
8247.00	---	H		11.48	12.72		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark：

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: CDMA2000 band 800 Mode

Operation Mode : TX CH Mid E2 Mode
Fundamental Frequency : 836.52 MHz
Temperature : 25℃
Humidity : 65%

Test Date: Apr. 10, 2009
Test By: Sky
Pol: Ver

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	41.42	V	-60.75	-3.25	0.90	-64.89	-13.00	-51.89
90.14	52.41	V	-50.77	-7.75	1.27	-59.79	-13.00	-46.79
104.69	45.32	V	-56.17	-7.76	1.38	-65.31	-13.00	-52.31
172.59	37.57	V	-61.75	-7.82	1.64	-71.21	-13.00	-58.21
242.43	43.30	V	-56.88	-7.88	1.95	-66.71	-13.00	-53.71
807.94	37.46	V	-49.10	-7.87	3.59	-60.56	-13.00	-47.56
1673.04	37.26	V	-67.30	9.36	5.27	-63.21	-13.00	-50.21
2509.56	36.14	V	-64.64	10.09	6.58	-61.14	-13.00	-48.14
3346.08	37.03	V	-61.83	12.27	7.79	-57.35	-13.00	-44.35
4182.60	---	V		12.62	8.93		-13.00	
5019.12	---	V		12.67	9.81		-13.00	
5855.64	---	V		13.68	10.62		-13.00	
6692.16	---	V		11.95	11.39		-13.00	
7528.68	---	V		11.45	12.20		-13.00	
8365.20	---	V		11.59	12.81		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark：

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: CDMA2000 band 800 Mode

Operation Mode : TX CH Mid E2 Mode
Fundamental Frequency : 836.52 MHz
Temperature : 25℃
Humidity : 65%

Test Date: Apr. 10, 2009
Test By: Sky
Pol: Hor

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
39.70	44.73	H	-58.16	-2.79	0.89	-61.85	-13.00	-48.85
90.14	42.36	H	-61.37	-7.75	1.27	-70.39	-13.00	-57.39
104.69	38.27	H	-64.24	-7.76	1.38	-73.38	-13.00	-60.38
172.59	36.95	H	-62.57	-7.82	1.64	-72.04	-13.00	-59.04
247.28	40.18	H	-59.17	-7.89	1.97	-69.03	-13.00	-56.03
332.64	37.05	H	-60.31	-7.74	2.29	-70.34	-13.00	-57.34
1673.04	36.30	H	-68.08	9.36	5.27	-63.98	-13.00	-50.98
2509.56	38.52	H	-62.18	10.09	6.58	-58.68	-13.00	-45.68
3346.08	38.02	H	-61.04	12.27	7.79	-56.56	-13.00	-43.56
4182.60	---	H		12.62	8.93		-13.00	
5019.12	---	H		12.67	9.81		-13.00	
5855.64	---	H		13.68	10.62		-13.00	
6692.16	---	H		11.95	11.39		-13.00	
7528.68	---	H		11.45	12.20		-13.00	
8365.20	---	H		11.59	12.81		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark：

1 The emission behaviors belong to narrowband spurious emission.

2 Remark"---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: CDMA2000 band 800 Mode

Operation Mode : TX CH High E2 Mode
Fundamental Frequency : 848.31 MHz
Temperature : 25℃
Humidity : 65%
Test Date: Apr. 10, 2009
Test By: Sky
Pol: Ver

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
38.73	41.58	V	-60.59	-3.25	0.90	-64.73	-13.00	-51.73
90.14	52.05	V	-51.13	-7.75	1.27	-60.15	-13.00	-47.15
101.78	45.41	V	-56.35	-7.76	1.37	-65.47	-13.00	-52.47
167.74	36.90	V	-61.98	-7.81	1.63	-71.43	-13.00	-58.43
242.43	42.91	V	-57.27	-7.88	1.95	-67.10	-13.00	-54.10
332.64	37.23	V	-60.62	-7.74	2.29	-70.65	-13.00	-57.65
849.00	71.69	V	-14.43	-7.88	3.68	-25.99	-13.00	-12.99
1696.62	36.41	V	-68.13	9.43	5.31	-64.00	-13.00	-51.00
2544.93	36.31	V	-64.34	10.19	6.63	-60.78	-13.00	-47.78
3393.24	38.86	V	-59.99	12.38	7.86	-55.48	-13.00	-42.48
4241.55	---	V		12.63	9.00		-13.00	
5089.86	---	V		12.74	9.88		-13.00	
5938.17	---	V		13.81	10.70		-13.00	
6786.48	---	V		11.86	11.48		-13.00	
7634.79	---	V		11.41	12.27		-13.00	
8483.10	---	V		11.69	12.91		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark：

1 The emission behaviors belong to narrowband spurious emission.
2 Remark"---" means that the emission level is too low to be measured
3 The result basic equation calculation is as follows:
4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)

Radiated Spurious Emission Measurement Result: CDMA2000 band 800 Mode

Operation Mode : TX CH High E2 Mode
Fundamental Frequency : 848.31MHz
Temperature : 25℃
Humidity : 65%

Test Date: Apr. 10, 2009
Test By: Sky
Pol: Hor

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
39.70	44.06	H	-58.83	-2.79	0.89	-62.52	-13.00	-49.52
90.14	44.45	H	-59.28	-7.75	1.27	-68.30	-13.00	-55.30
101.78	40.59	H	-62.22	-7.76	1.37	-71.35	-13.00	-58.35
164.83	36.28	H	-62.64	-7.81	1.63	-72.08	-13.00	-59.08
247.28	40.38	H	-58.97	-7.89	1.97	-68.83	-13.00	-55.83
315.18	37.77	H	-59.75	-7.83	2.23	-69.81	-13.00	-56.81
849.00	79.98	H	-6.21	-7.88	3.68	-17.77	-13.00	-4.77
1696.62	37.11	H	-67.24	9.43	5.31	-63.11	-13.00	-50.11
2544.93	35.87	H	-64.73	10.19	6.63	-61.17	-13.00	-48.17
3393.24	36.59	H	-62.44	12.38	7.86	-57.92	-13.00	-44.92
4241.55	---	H		12.63	9.00		-13.00	
5089.86	---	H		12.74	9.88		-13.00	
5938.17	---	H		13.81	10.70		-13.00	
6786.48	---	H		11.86	11.48		-13.00	
7634.79	---	H		11.41	12.27		-13.00	
8483.10	---	H		11.69	12.91		-13.00	

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

Remark：

1 The emission behaviors belong to narrowband spurious emission.
2 Remark"---" means that the emission level is too low to be measured
3 The result basic equation calculation is as follows:
4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)

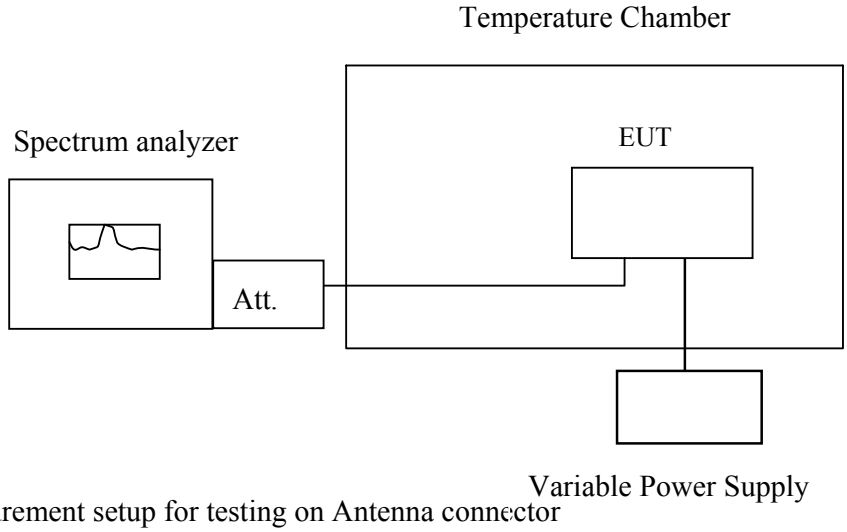
10. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

10.1 Standard Applicable

According to FCC §2.1055(a)(1)(b).

Frequency Tolerance: +/- 2.5 ppm

10.2 Test Set-up:



Note : Measurement setup for testing on Antenna connector

10.3 Measurement Procedure

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to –30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

10.4 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2008	05/12/2009
Radio Communication Analyzer	Anritsu	MT8820A	6200307563	04/16/2008	04/15/2010
Temperature Chamber	TERCHY	MHG-120LF	911009	04/14/2008	04/13/2010
Temperature Chamber	GIANT FORCE	GTH-150-40-CP-AR	MAA0512-018	02/05/2008	02/04/2010
DC Block	Agilent	BLK-18	155452	07/05/2008	07/04/2009
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2009	01/04/2010
DC Power Supply	HP	6038A	2929A-07548	06/27/2007	06/26/2009
DC Power Supply	Topward	3303D	981327	10/26/2007	10/25/2009

10.5 Measurement Result

Reference Frequency: CDMA2000 Cellular band Mid Channel 836.52 MHz @ 25℃				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (℃)	(MHz)		
3.7	-30	836.520014	-10.00	2091
3.7	-20	836.520009	-5.00	2091
3.7	-10	836.520000	4.00	2091
3.7	0	836.520001	3.00	2091
3.7	10	836.520003	1.00	2091
3.7	25	836.520004	0.00	2091
3.7	30	836.520006	-2.00	2091
3.7	40	836.520009	-5.00	2091
3.7	50	836.520008	-4.00	2091

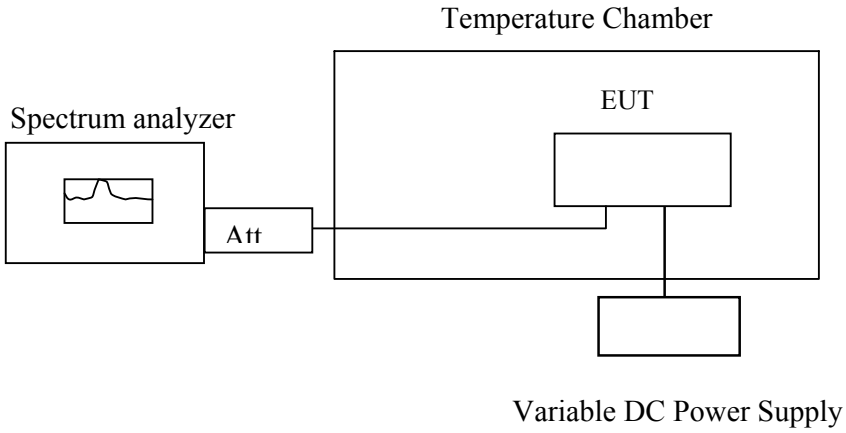
11. FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

11.1 Standard Applicable

According to FCC §2.1055(d)(1)(2)

Frequency Tolerance: +/- 2.5 ppm

11.2 Test Set-up:



Note: *Measurement setup for testing on Antenna connector*

11.3 Measurement Procedure

Set chamber temperature to 25℃. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.

11.4 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2008	05/12/2009
Radio Communication Analyzer	Anritsu	MT8820A	6200307563	04/16/2008	04/15/2010
Temperature Chamber	TERCHY	MHG-120LF	911009	04/14/2008	04/13/2010
Temperature Chamber	GIANT FORCE	GTH-150-40-CP-AR	MAA0512-018	02/05/2008	02/04/2010
DC Block	Agilent	BLK-18	155452	07/05/2008	07/04/2009
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2009	01/04/2010
DC Power Supply	HP	6038A	2929A-07548	06/27/2007	06/26/2009
DC Power Supply	Topward	3303D	981327	10/26/2007	10/25/2009

11.5 Measurement Result

Reference Frequency: CDMA2000 Cellular band Mid Channel 836.52 MHz @ 25℃				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply (Vdc)	Environment Temperature (℃)	Frequency (MHz)	Delta (Hz)	Limit (Hz)
4.26	25.00	836.520003	0.00	2091.00
3.70	25.00	836.520004	1.00	2091.00
3.15	25.00	836.519995	9.00	2091.00
3.14 (End Point)	25.00	836.519992	12.00	2091.00

Note: The battery is rated 3.7V dc.