ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H

OF

Product Name:	**RM-687**
Brand Name:	**Nokia**
Model Name:	**RM-687**
Model Difference:	**N/A**
FCC ID:	**QMNRM-687**
Report No.:	**EH/2010/30041**
Issue Date:	**Mar. 25, 2010**
FCC Rule Part:	**2 , 22H**
Prepared for:	**Nokia Inc.** **12278 Scripps Summit Dr.** **San Diego, CA 92131, USA**
Prepared by:	**SGS Taiwan Ltd.** **Electronics & Communication Laboratory** **No. 134, Wu Kung Rd., Wuku Industrial Zone,** **Taipei County, Taiwan.**

CERTIFICATION OF COMPLIANCE

Applicant:	Nokia Inc. 12278 Scripps Summit Dr., San Diego, CA 92131, USA
Manufacturer:	Compal Communications(Nanjing)Co.Ltd Nanjing Jiangning Export Processing Zone (South Area) No.68-2 Suyuan Street
Product Name:	RM-687
Brand Name:	Nokia
FCC ID:	QMNRM-687
Model No.:	RM-687
Model Difference:	N/A
File Number:	EH/2010/30041
Date of test:	Mar. 17, 2010 ~ Mar. 21, 2010
Date of EUT Received:	Mar. 17, 2010

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, Issue 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 PART 22 subpart H.

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

Test By:	Brian Chang	***Date:***	Mar. 25, 2010
	Brian Chang / Engineer		
Prepared By:	Gigi yeh	***Date:***	Mar. 25, 2010
	Gig Yeh / Clerk		
Approved By:	Vincent Su	***Date:***	Mar. 25, 2010
	Vincent Su / Manager		

Version

Version No.	Date	Description
00	Mar. 25, 2010	Initial creation of document

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1. GENERAL INFORMATION

1.1 Product Description

General:

Type Name:	RM-687	
Brand Name:	NOKIA	
Model Name:	RM-687	
Model Difference:	N/A	
Power Supply:	3.7 Vdc re-chargeable battery or 5Vdc by AC/DC power adapter	
	Battery Model:	BL-4C, Supplier: Samsung SDI Co., Ltd
	Adaptor Model:	AC-6U , Supplier: AstecC Aqencies LTD. Taiwan Branch (HK)

CDMA:

Cellular Phone Standards Frequency Range and Power:	CDMA2000 Cellular	824.70 ~ 848.31MHz	24.28 dBm
	EVDO Cellular	824.70 ~ 848.31MHz	24.05 dBm
Type of Emission:	1M27F9W		
MEID:	A0000001B35EA7		
Software Version:	SK_2250B_TLC		
Hardware Version:	2000		

Bluetooth:

Frequency Range:	2402 – 2480MHz
Bluetooth Version:	V2.1 + EDR (GFSK + π/4DQPSK + 8DPSK)
Channel number:	79 channels
Transmit Power:	3.84 dBm (Peak)
Modulation type:	Frequency Hopping Spread Spectrum
Antenna Designation:	PIFA Antenna, -2.5dBi.

Final amplifier voltage and current information

Test Mode	DC voltage (V)	DC current (mA)
CDMA 2000 Cellular	**3.7Vdc**	**130**
EVDO Cellular	**3.7Vdc**	**120**

The report applies for CDMA2000.

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: QMNRM-687** 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 of TIA/EIA 603C and FCC 47 CFR 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 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.

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: 94644.

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 Nokia CDMA2000 Phone was stayed in engineering mode (RC3/SO55)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 and TIA/EIA IS-98 for Mobile stations. The EUT is placed on a turn table which is 0.8 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

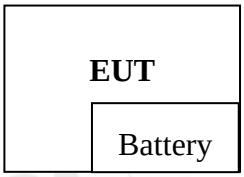


Fig. 1-2 Configuration for conducted Emission

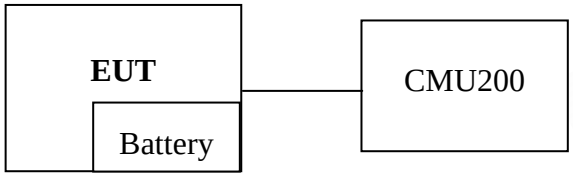


Fig. 1-3 Remote side

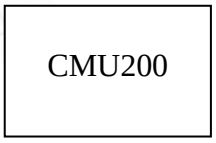


Table 2-1 Equipment Used in Tested System

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)	RF Conducted Power Output	Compliant
§2.1046(a) §22.913(a)(2)	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 (TX)	Compliant
§2.1055(a)(1) §22.355	Frequency Stability vs. Temperature	Compliant
§2.1055(d)(2) §22.355	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.

The Channel Low, Mid and High for each type of bands with rated data rate were chosen for full testing.

The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for CDMA2000 Cellular bands. The worst-case E1 mode for channels Low, Mid and High were reported.

The worse case was the CDMA2000 with RC3/SO55 for Cellular bands after testing all application configurations declared by the applicant.

5. RF POWER OUTPUT MEASUREMENT

5.1 Standard Applicable

According to FCC §2.1046.

FCC 22.913(a)(2) 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 Communication Tester by a low lost RF cable.

5.4 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Communication Test	R&S	CMU200	102189	05/13/208	05/12/2010
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	02/12/2010	02/13/2011

5.5 Measurement Uncertainty:

Conducted Output Power Test: ±1.3dBm.

5.6 Measurement Result

EUT Mode	Frequency (MHz)	CH	Reading (dBm)
CDMA2000 CELLULAR Band (RC3/SO55)	824.70	1013	24.01
	836.52	384	24.28
	848.31	777	24.23

EUT Mode	Frequency (MHz)	CH	Reading (dBm)
EVDO CELLULAR Band (Rate/Slot:153.6)	824.70	1013	23.95
	836.52	384	24.05
	848.31	777	23.95

6. ERP/EIRP MEASUREMENT

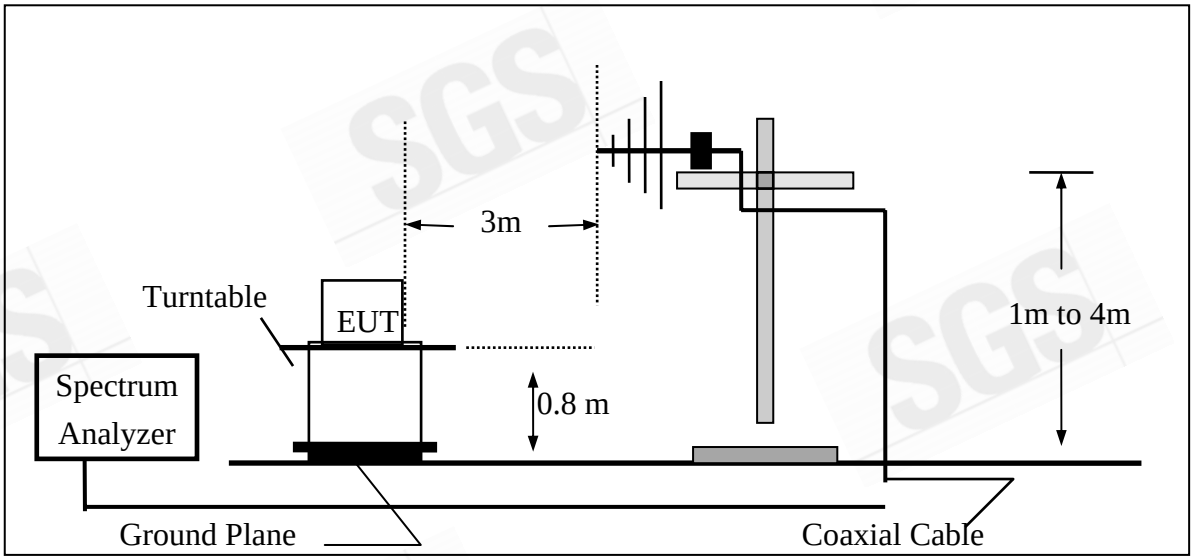
6.1 Standard Applicable

According to FCC §2.1046

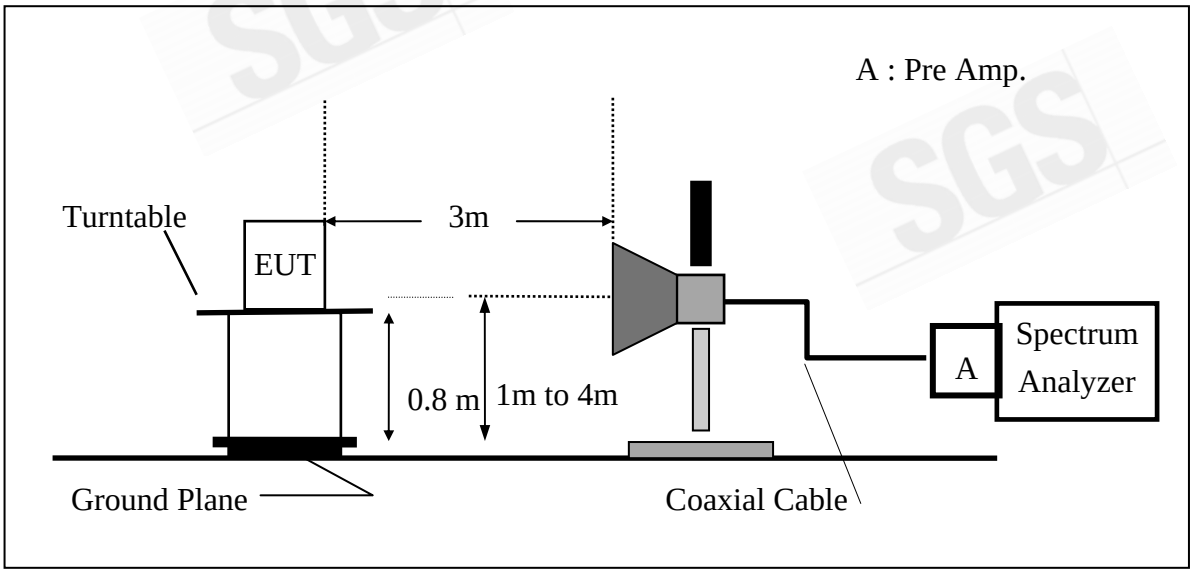
FCC 22.913(a)(2) Mobile station are limited to 7W ERP.

6.2 Test SET-UP (Block Diagram of Configuration)

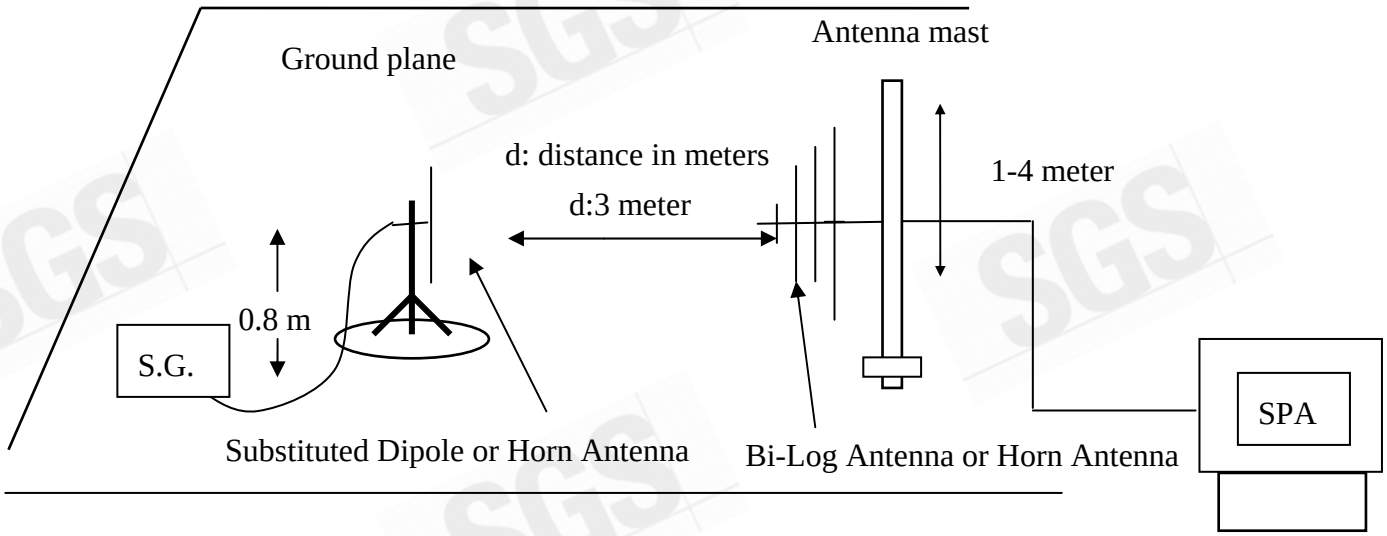
(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(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 824.2 –848.80MHz 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)

The measurement uncertainty is ±4.42dB.

6.4 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	MY45304525	01/25/2010	01/24/2011
Bilog Antenna	SCHWAZBECK	VULB9160	3158	11/29/2009	11/28/2011
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	05/09/2008	05/10/2010
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2008	05/08/2010
Signal Generator	R&S	SMR40	100210	01/22/2010	01/21/2012
Signal Generator	Agilent	E4438C	MY45093613	05/22/2009	05/21/2010
Pre-Amplifier	Agilent	8447D	1937A02834	11/30/2009	11/29/2010
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2010	01/04/2011
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2009	07/04/2010
Radio Communication Analyzer	R&S	CMU200	102189	05/13/208	05/12/2010
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	01/05/2010	01/04/2011
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2010	01/04/2011
3m Site	SGS	966 chamber	N/A	11/08/2009	11/09/2010

6.5 Measurement Result

Refer to following pages for detail.

6.5.1.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)
CDMA2000	824.70	1013	H	V	125.26	38.88	-7.87	3.62	27.38	38.45
				H	117.08	30.81	-7.87	3.62	19.31	38.45
			E1	V	112.62	26.24	-7.87	3.62	14.74	38.45
				H	125.60	39.33	-7.87	3.62	27.83	38.45
			E2	V	115.36	28.98	-7.87	3.62	17.48	38.45
				H	125.77	39.50	-7.87	3.62	28.00	38.45
	836.52	384	H	V	124.77	38.51	-7.88	3.65	26.99	38.45
				H	116.25	30.02	-7.88	3.65	18.49	38.45
			E1	V	111.95	25.69	-7.88	3.65	14.17	38.45
				H	125.83	39.60	-7.88	3.65	**28.07**	38.45
			E2	V	115.56	29.30	-7.88	3.65	17.78	38.45
				H	124.91	38.68	-7.88	3.65	27.15	38.45
	848.31	777	H	V	125.00	38.87	-7.88	3.68	27.32	38.45
				H	115.87	29.67	-7.88	3.68	18.12	38.45
			E1	V	112.03	25.90	-7.88	3.68	14.35	38.45
				H	125.51	39.31	-7.88	3.68	27.76	38.45
			E2	V	114.79	28.66	-7.88	3.68	17.11	38.45
				H	124.16	37.96	-7.88	3.68	26.41	38.45

Remark：

(1) The RBW,VBW of SPA for frequency

RBW=1.5M, VBW=1.5MHz

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
EVDO Cell	824.70	1013	H	V	123.70	37.32	-7.87	3.62	25.82	38.45
				H	116.09	29.82	-7.87	3.62	18.32	38.45
			E1	V	112.78	26.40	-7.87	3.62	14.90	38.45
				H	124.96	38.69	-7.87	3.62	27.19	38.45
			E2	V	113.30	26.92	-7.87	3.62	15.42	38.45
				H	123.91	37.64	-7.87	3.62	26.14	38.45
	836.52	384	H	V	123.96	37.70	-7.88	3.65	26.18	38.45
				H	114.84	28.61	-7.88	3.65	17.08	38.45
			E1	V	111.75	25.49	-7.88	3.65	13.97	38.45
				H	124.79	38.56	-7.88	3.65	27.03	38.45
			E2	V	114.57	28.31	-7.88	3.65	16.79	38.45
				H	123.09	36.86	-7.88	3.65	25.33	38.45
	848.31	777	H	V	123.46	37.33	-7.88	3.68	25.78	38.45
				H	114.66	28.46	-7.88	3.68	16.91	38.45
			E1	V	112.02	25.89	-7.88	3.68	14.34	38.45
				H	125.24	39.04	-7.88	3.68	**27.49**	38.45
			E2	V	113.75	27.62	-7.88	3.68	16.07	38.45
				H	121.10	34.90	-7.88	3.68	23.35	38.45

Remark：

(1) The RBW,VBW of SPA for frequency

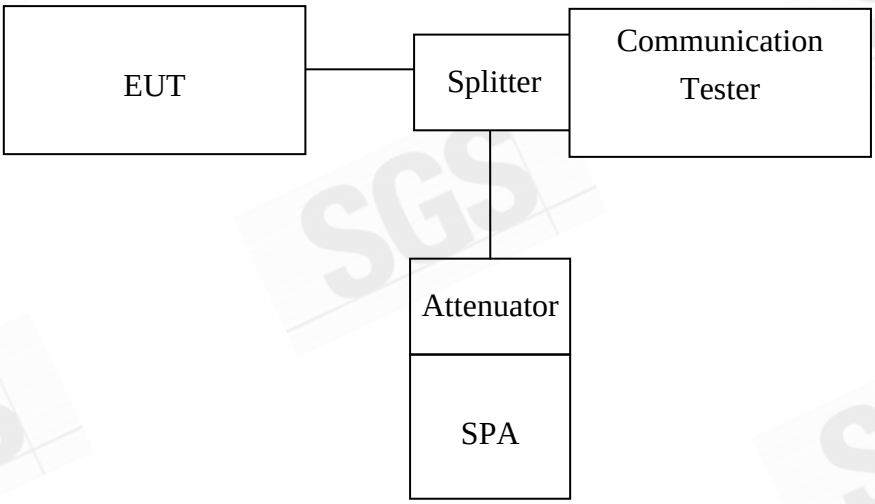
RBW=1.5M, VBW=1.5MHz

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 (10/30KHz) 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 Uncertainty

Frequency Tolerance : ±290Hz.

7.5 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4440A	US41160416	01/25/2010	01/24/2011
Radio Communication Analyzer	R&S	CMU200	102189	05/13/208	05/12/2010
Attenuator	Mini-Circuit	BW-S20W5	N/A	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2009	07/04/2010
Splitter	Agilent	11636B	N/A	07/05/2009	07/04/2010

7.6 Measurement Result:.

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
CDMA2000 Cellular	824.70	1013	1.2699
	836.52	384	1.2741
	848.31	777	1.2754

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
EVDO Cellular	824.70	1013	1.2674
	836.52	384	1.2696
	848.31	777	1.2686

Figure 7-1: CDMA2000 Cellular Channel 1013

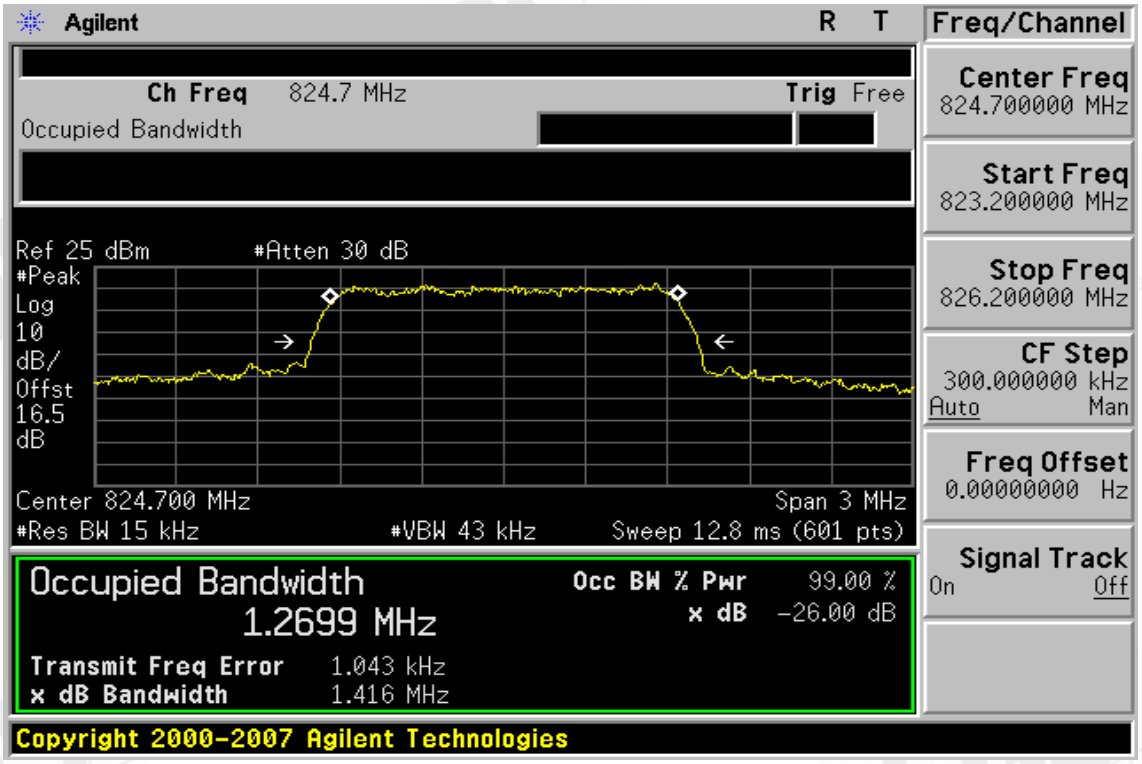


Figure 7-2 CDMA2000 Cellular Channel 384

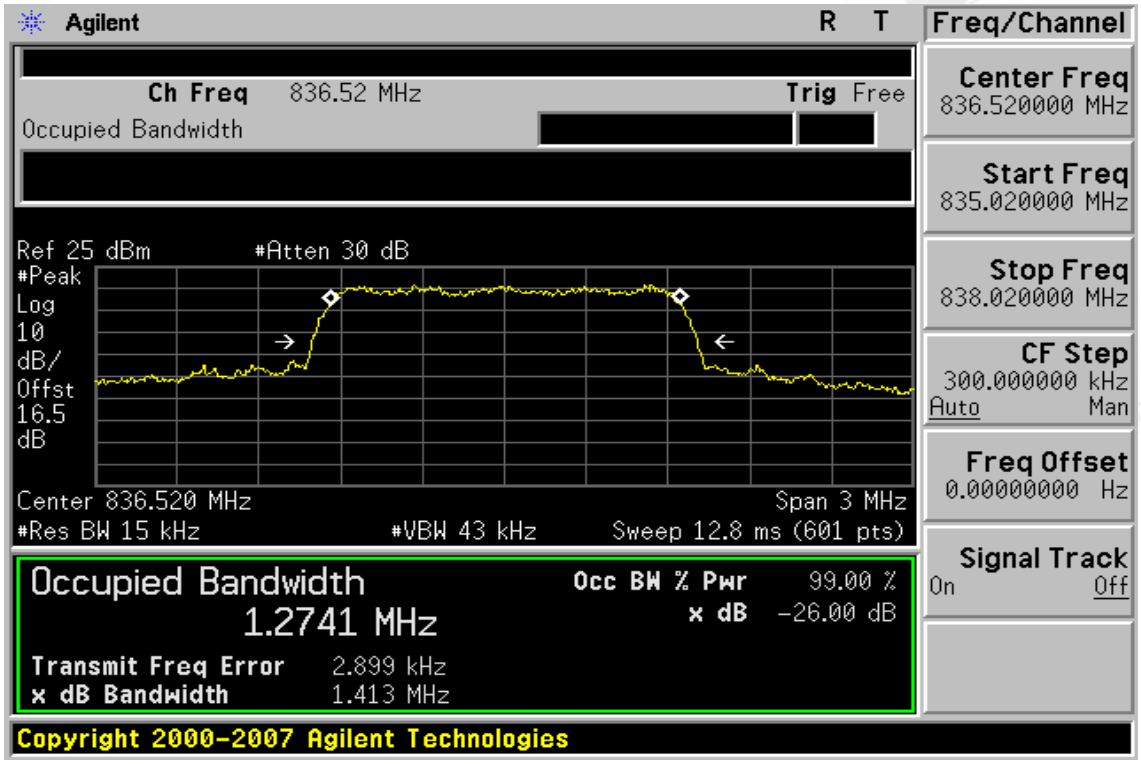


Figure 7-3: CDMA2000 Cellular Channel 777

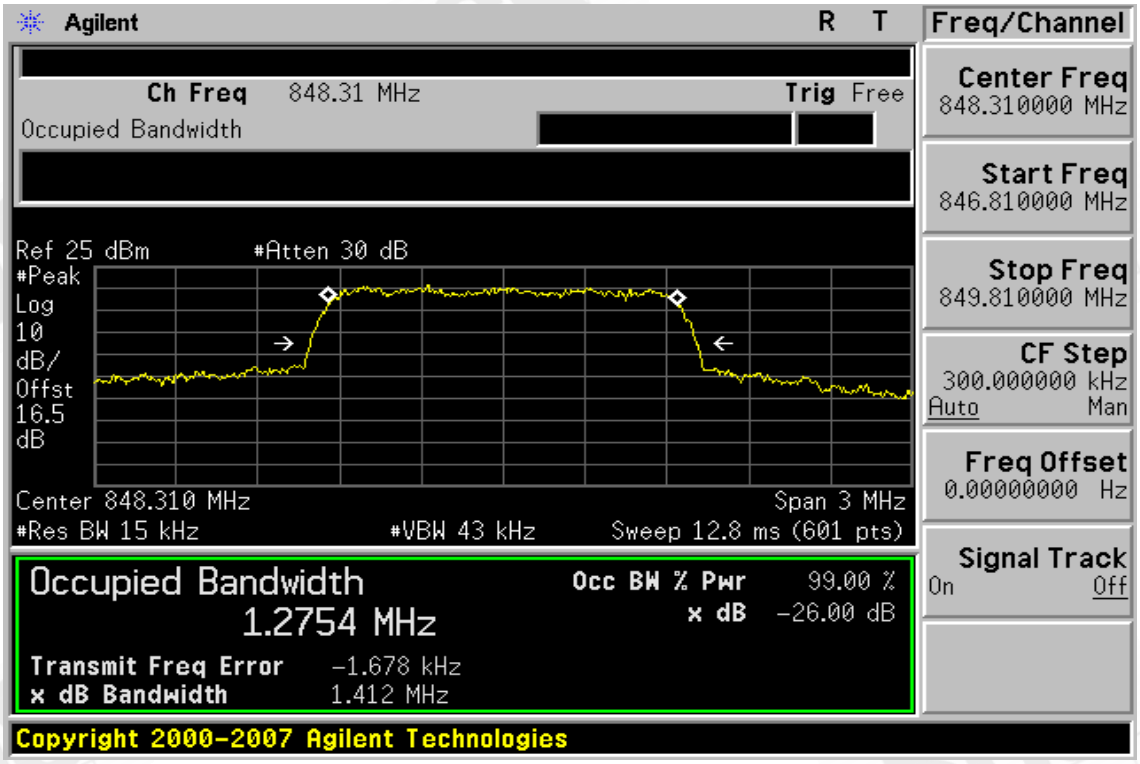


Figure 7-4: EVDO Cellular Channel 1013

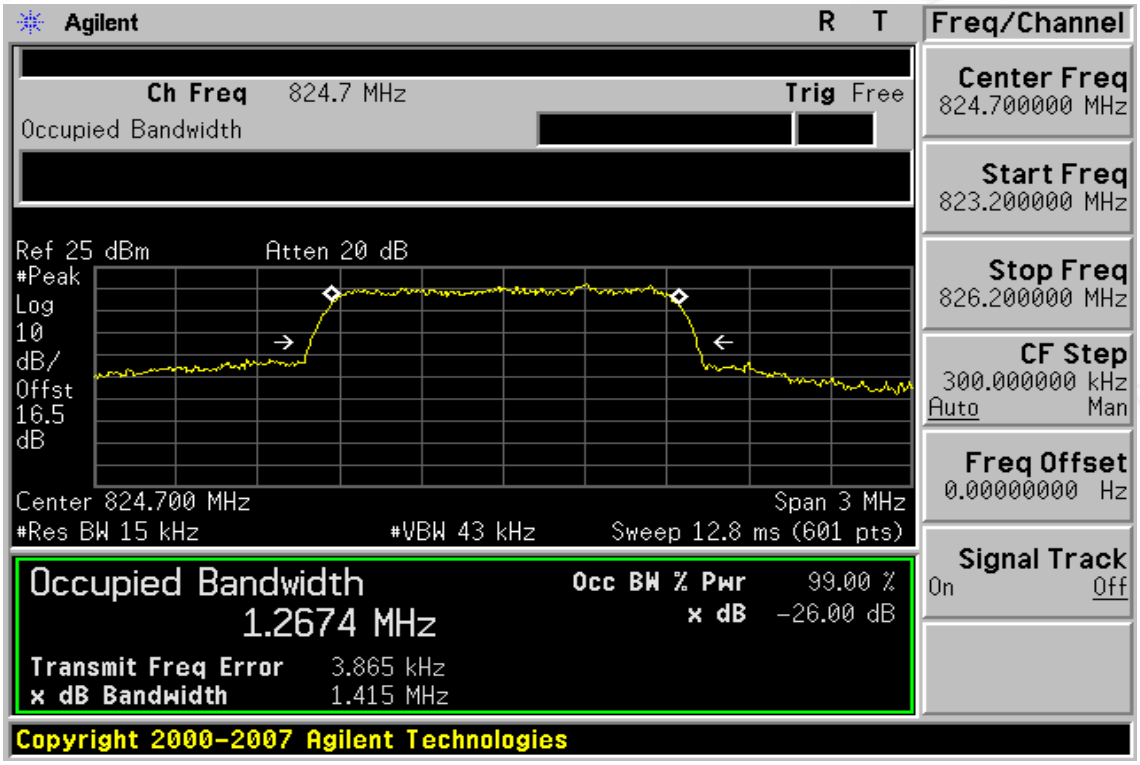


Figure 7-5: EVDO Cellular Channel 384

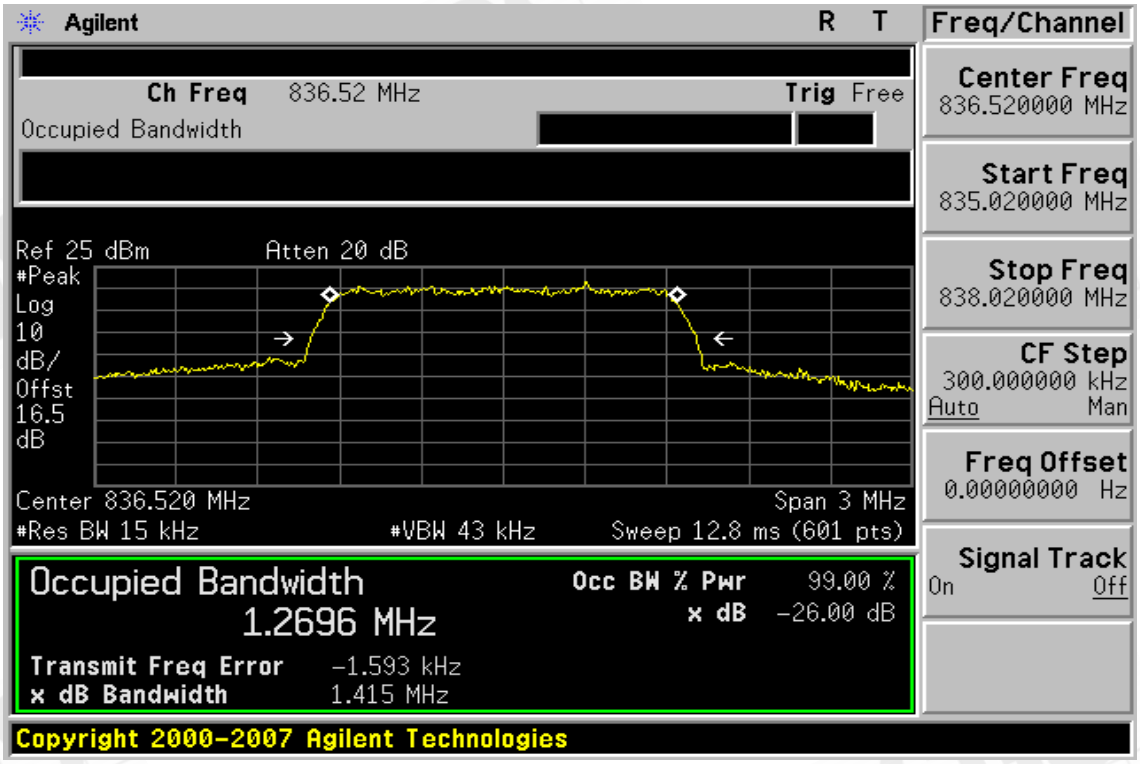
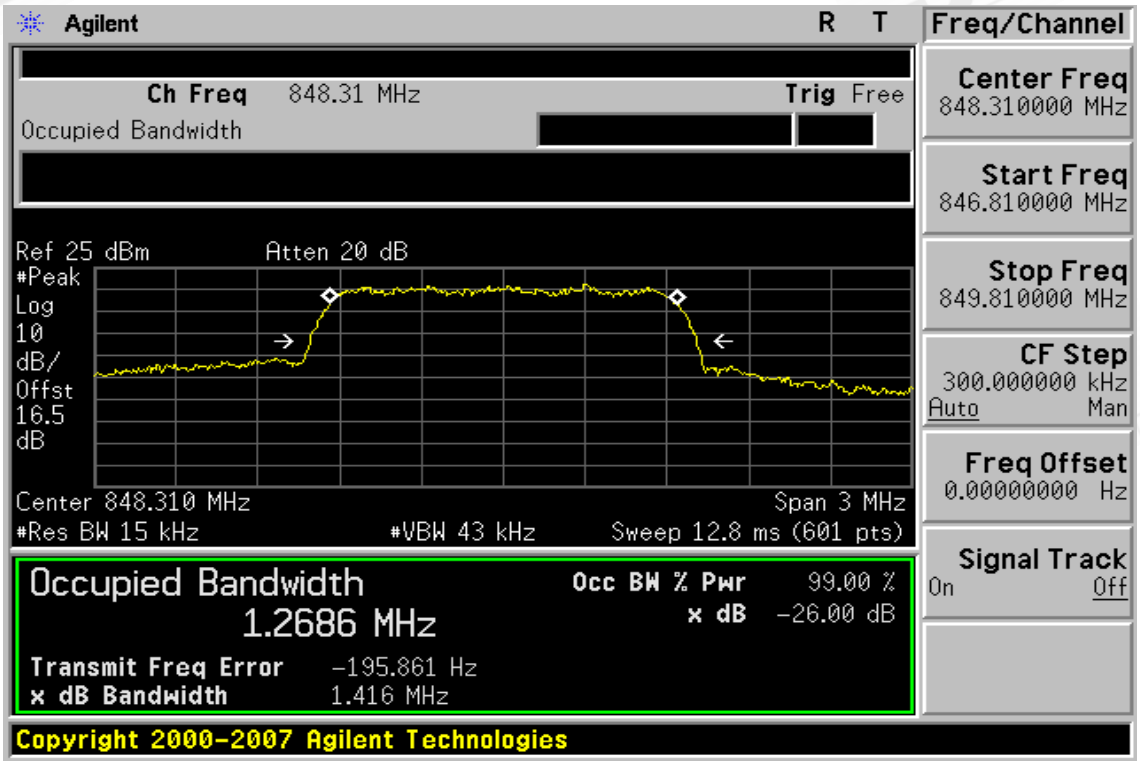


Figure 7-6: EVDO Cellular Channel 777



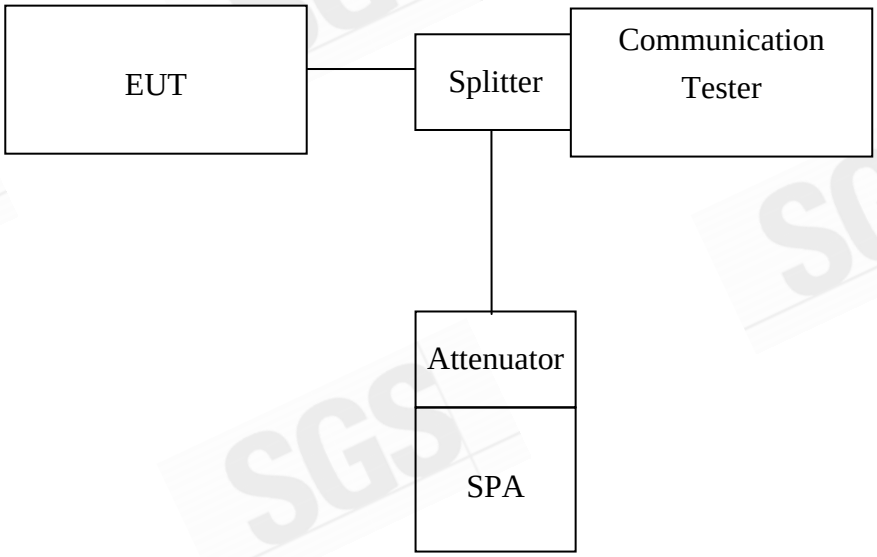
8. OUT OF BAND EMISSION AT ANTENNA TERMINALS

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.

The measurement uncertainty is ±1.8dB.

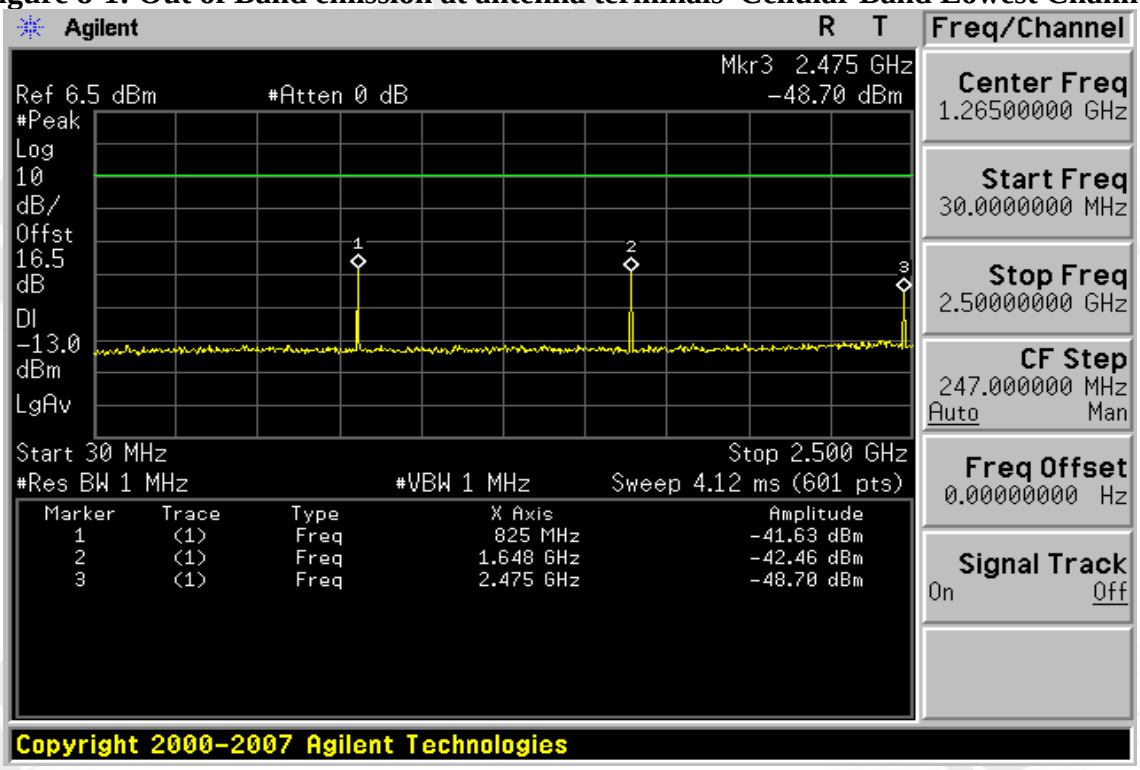
8.4 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4440A	US41160416	01/25/2010	01/24/2011
Radio Communication Analyzer	R&S	CMU200	102189	05/13/208	05/12/2010
800 – 1000MHz Filter	Micro-Tronics	BRM13462	001	01/05/2010	01/04/2011
1800 – 2000MHz Filter	Micro-Tronics	BRM13463	001	01/05/2010	01/04/2011
Temperature Chamber	TERCHY	MHG-120LF	911009	04/14/2008	04/13/2010
Temperature Chamber	GIANT FORCE	GTH-150-40-CP-AR	MAA0512-018	02/05/2010	02/04/2012
DC Block	Agilent	BLK-18	155452	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S20W5	N/A	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2009	07/04/2010
Splitter	Agilent	11636B	N/A	07/05/2009	07/04/2010

8.5. Measurement Result

Refer to next page for plots.

Figure 8-1: Out of Band emission at antenna terminals–Cellular Band Lowest Channel



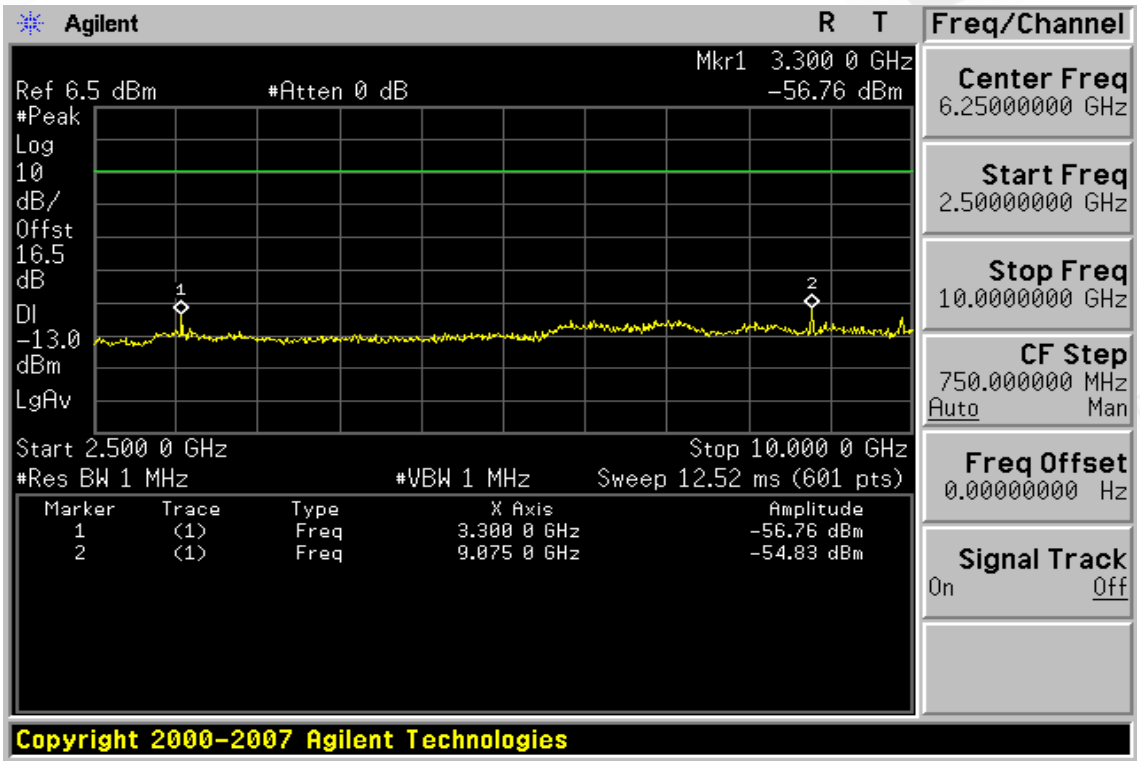
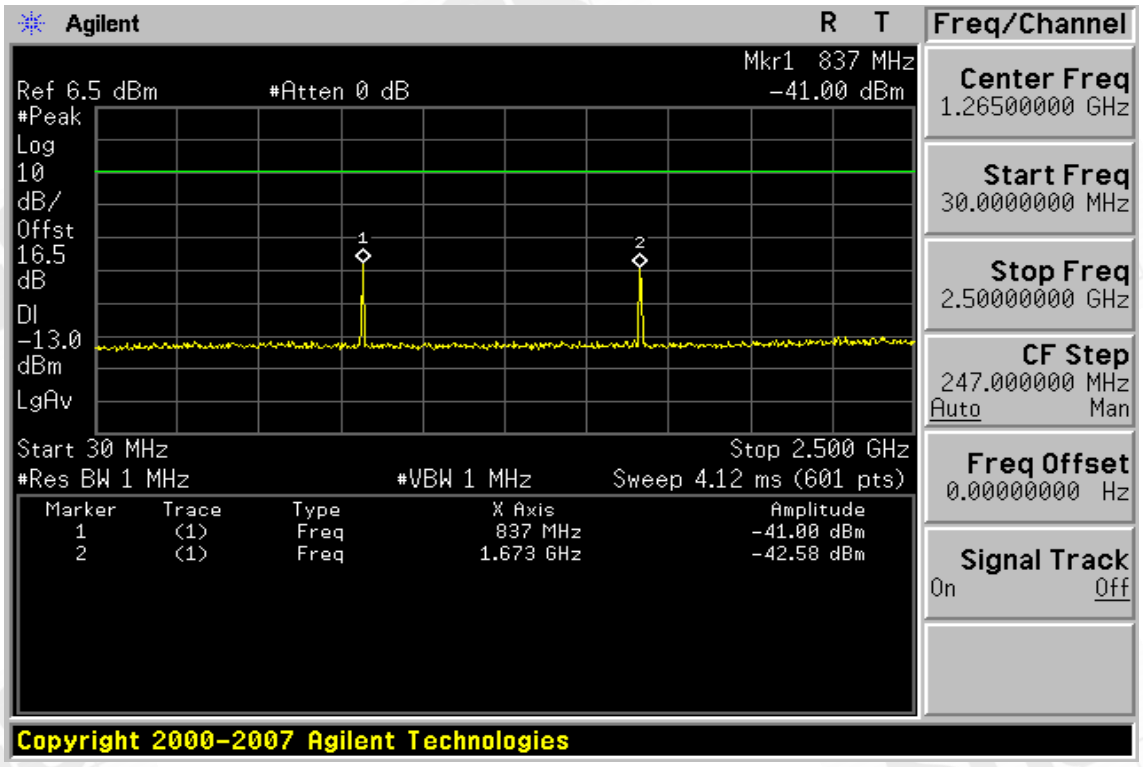


Figure 8-2: Out of Band emission at antenna terminals –Cellular Band Mid Channel



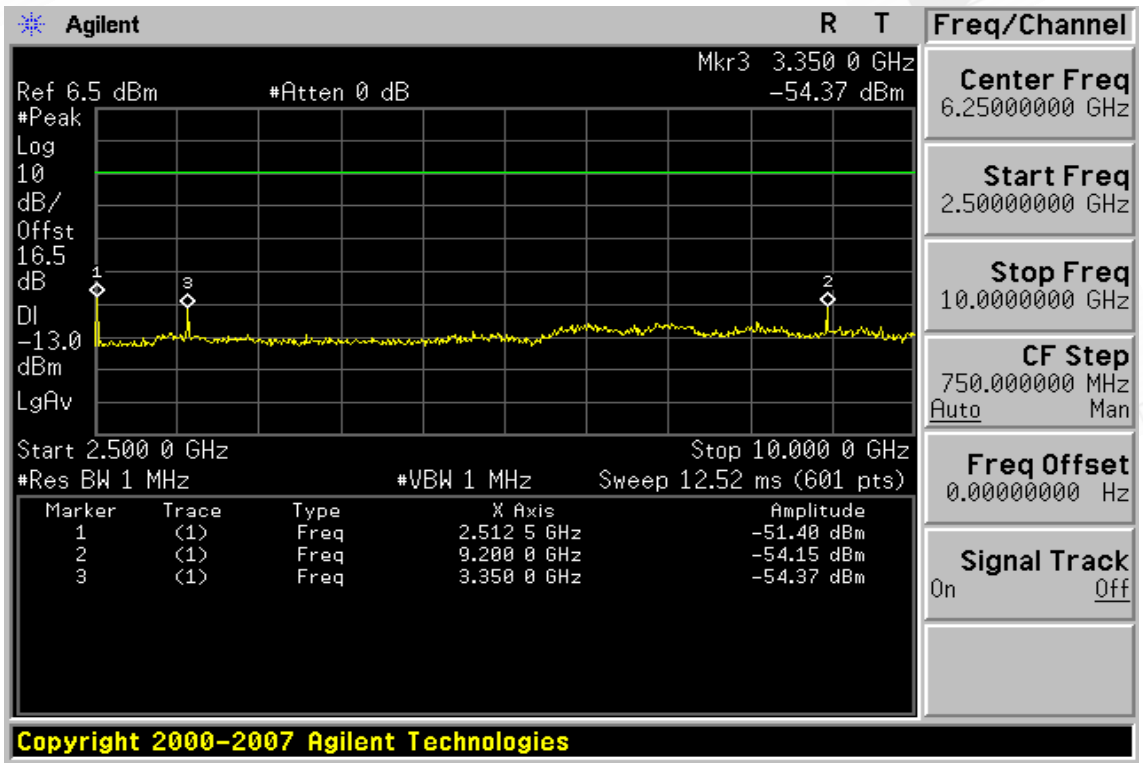
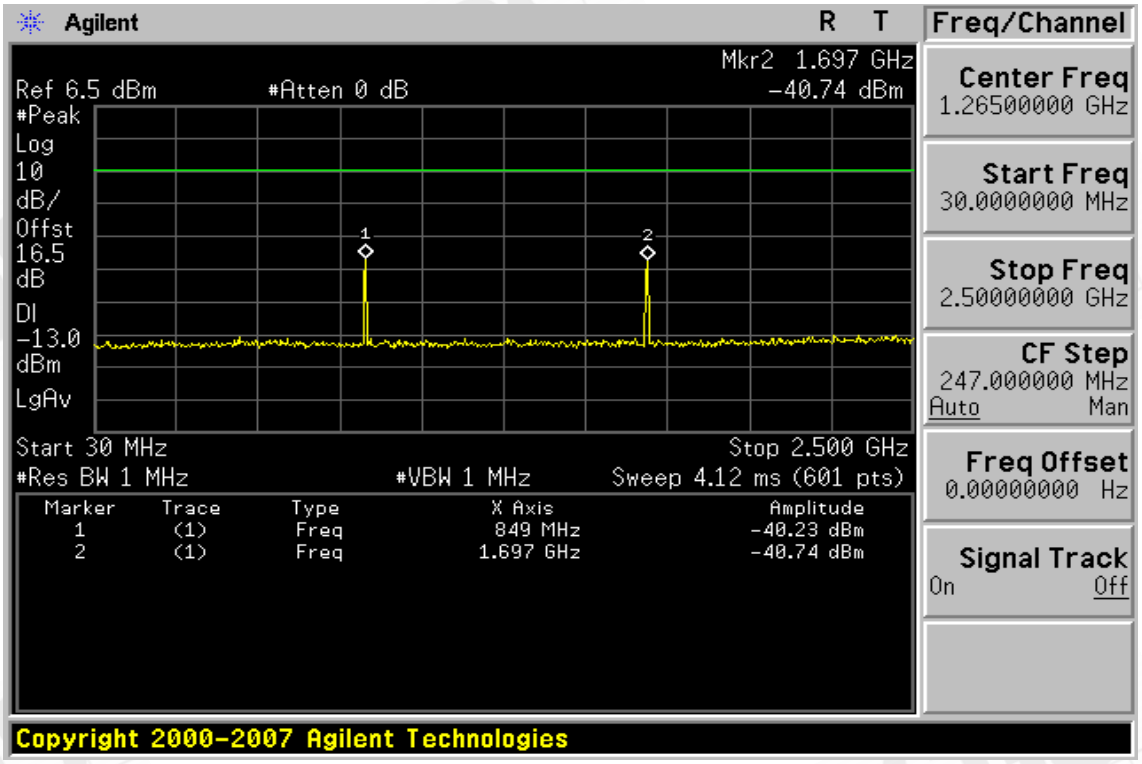


Figure 8-3: Out of Band emission at antenna terminals–Cellular Band Highest Channel



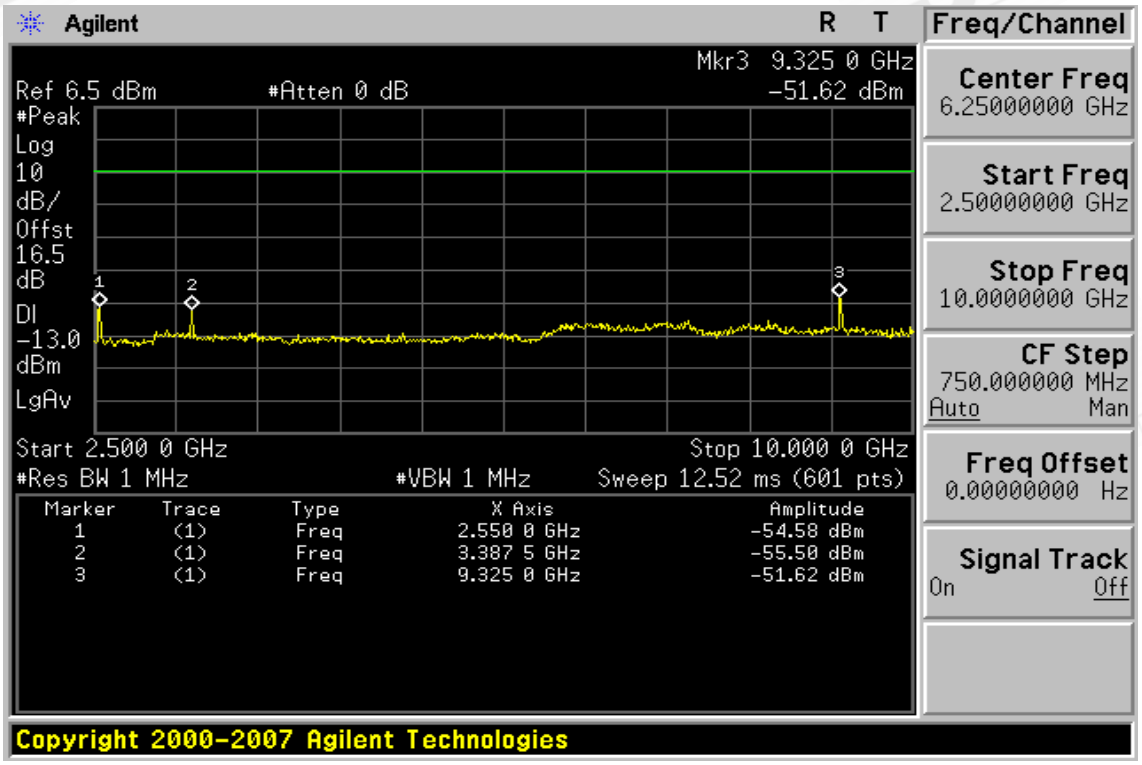


Figure 8-4: Band edge emission at antenna terminals –Cellular Band Channel Lowest

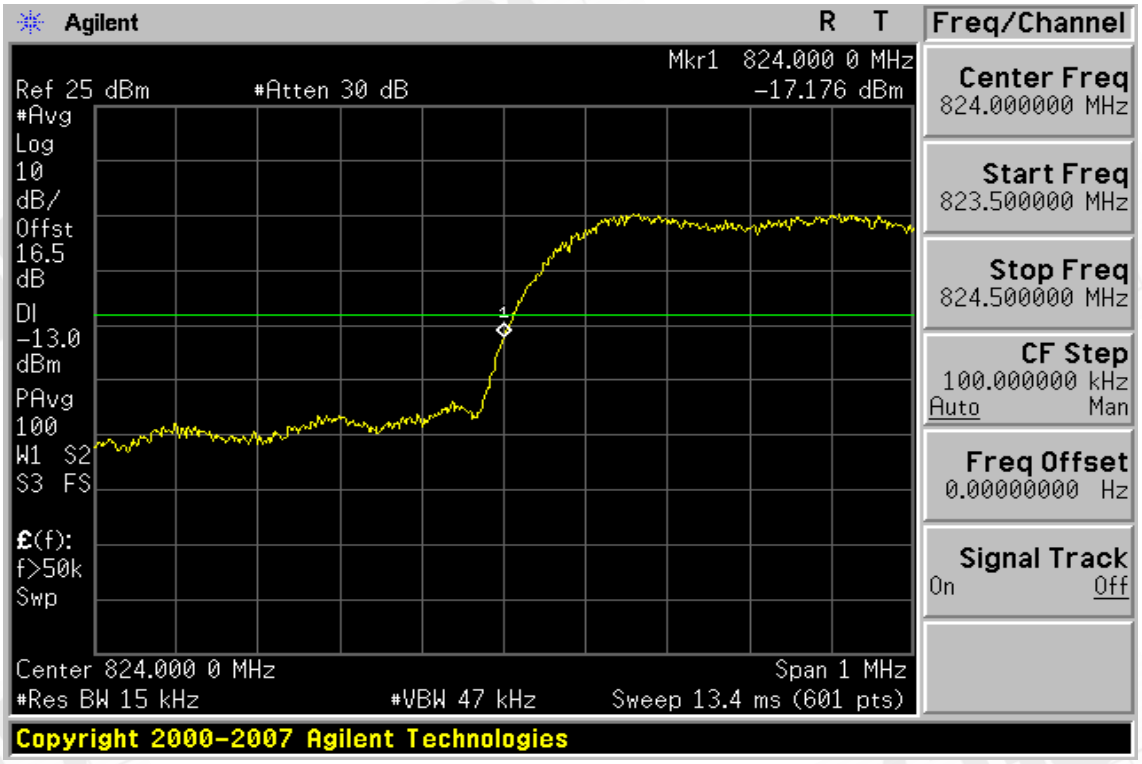


Figure 8-5: Band edge emission at antenna terminals –Cellular Band Channel Highest

9. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT(TX)

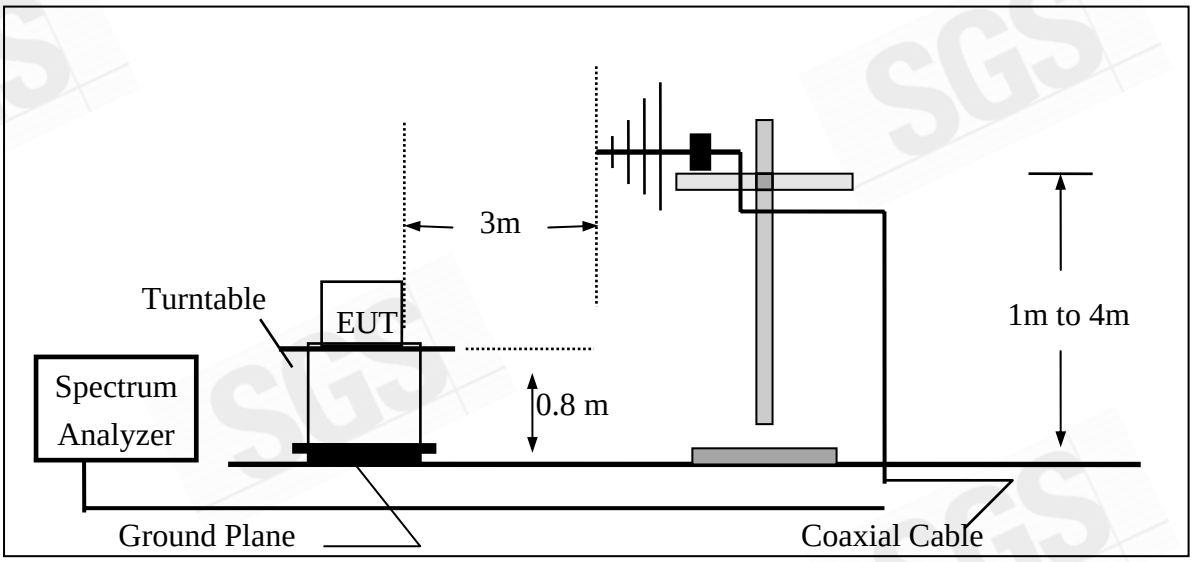
9.1 Standard Applicable

According to FCC §2.1053,

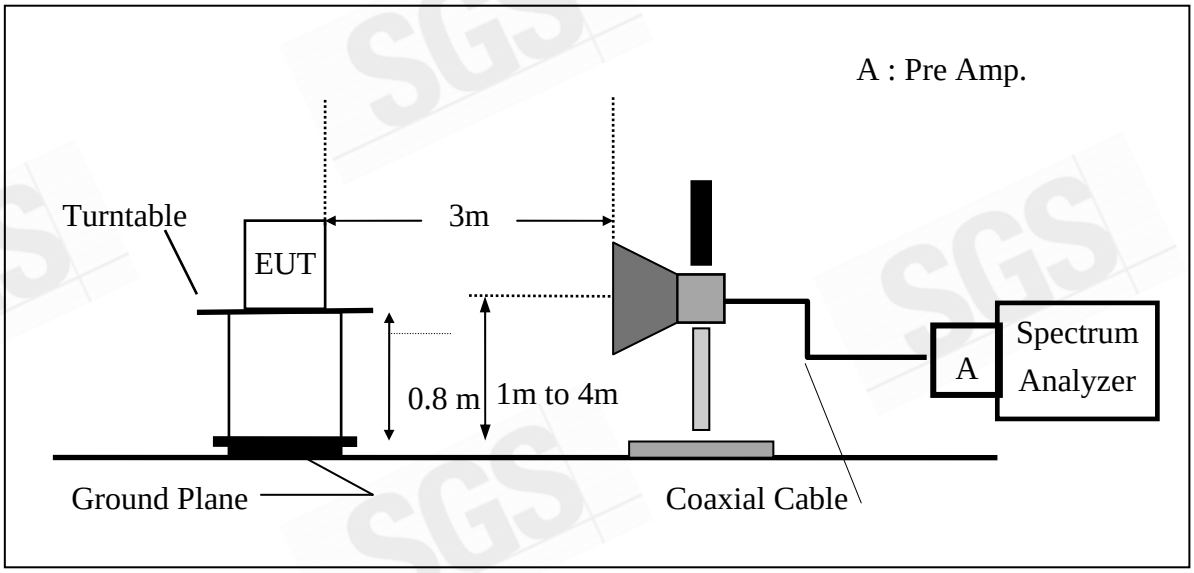
FCC §22.917(a), the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than 43 + 10 log (mean output power in watts) dBc below the mean power output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

9.2 EUT Setup (Block Diagram of Configuration)

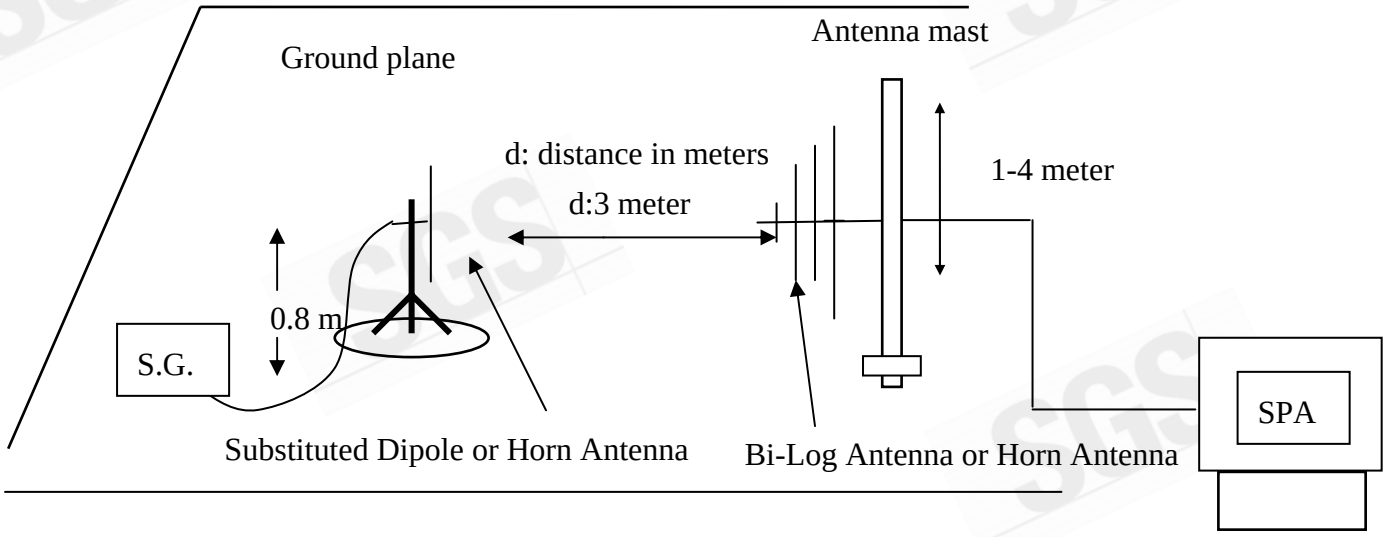
(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(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.

ERP in frequency band 824.2 –848.80.8MHz 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:

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:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	MY45304525	01/25/2010	01/24/2011
Bilog Antenna	SCHWAZBECK	VULB9160	3136	11/19/2009	11/18/2010
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	603	04/29/2009	04/28/2011
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2008	05/08/2010
Signal Generator	R&S	SMR40	100210	02/10/2010	02/09/2012
Signal Generator	Agilent	E4438C	MY45093613	06/11/2009	06/10/2010
Pre-Amplifier	Agilent	8447D	1937A02834	11/28/2009	11/27/2010
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2010	01/04/2011
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2009	07/04/2010
Radio Communication Analyzer	R&S	CMU200	102189	05/13/208	05/12/2010
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	01/05/2010	01/04/2011
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2010	01/04/2011
Filter 800-1000	Micro-Tronics	BRM13462	1	01/05/2010	01/04/2011
Filter 1800-2000	Micro-Tronics	BRM13463	1	01/05/2010	01/04/2011
3m Site	SGS	966 chamber	N/A	11/08/2009	11/09/2010

9.5 Measurement Result

Refer to attach tabular data sheets.

Radiated Spurious Emission Measurement Result: CDMA2000 Cellular Mode

Operation Mode	: TX CH 1013 E1 Mode	Test Date:	Mar. 19, 2010
Fundamental Frequency	: 824.70 MHz	Test By:	Brian
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)
53.28	36.69	V	-71.72	-0.55	1.11	-73.38	-13.00	-60.38
92.08	42.18	V	-60.75	-7.75	1.29	-69.79	-13.00	-56.79
104.69	43.41	V	-58.08	-7.76	1.38	-67.22	-13.00	-54.22
153.19	32.84	V	-64.74	-7.80	1.60	-74.14	-13.00	-61.14
599.39	33.59	V	-56.02	-7.79	3.03	-66.83	-13.00	-53.83
652.74	32.69	V	-56.26	-7.81	3.17	-67.24	-13.00	-54.24
824.00	64.82	V	-21.57	-7.87	3.62	-33.07	-13.00	-20.07
1649.40	39.81	V	-64.77	9.29	5.23	-60.71	-13.00	-47.71
2474.10	---	V		10.08	6.53		-13.00	
3298.80	---	V		12.17	7.72		-13.00	
3478.00	42.89	V	-55.94	12.56	8.00	-51.38	-13.00	-38.38
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 Cellular Mode

Operation Mode	: TX CH 1013 E1 Mode	Test Date:	Mar. 19, 2010
Fundamental Frequency	: 824.70 MHz	Test By:	Brian
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)
58.13	38.53	H	-71.90	-0.49	1.08	-73.47	-13.00	-60.47
92.08	38.93	H	-64.66	-7.75	1.29	-73.70	-13.00	-60.70
104.69	38.57	H	-63.94	-7.76	1.38	-73.08	-13.00	-60.08
153.19	32.52	H	-65.50	-7.80	1.60	-74.90	-13.00	-61.90
480.08	33.38	H	-60.25	-7.71	2.74	-70.70	-13.00	-57.70
550.89	33.13	H	-58.57	-7.76	2.96	-69.29	-13.00	-56.29
722.58	33.09	H	-58.76	-7.86	3.37	-70.00	-13.00	-57.00
824.00	78.62	H	-7.65	-7.87	3.62	-19.15	-13.00	-6.15
1649.40	36.06	H	-68.34	9.29	5.23	-64.28	-13.00	-51.28
2474.10	---	H		10.08	6.53		-13.00	
3298.80	---	H		12.17	7.72		-13.00	
3478.00	39.65	H	-59.32	12.56	8.00	-54.75	-13.00	-41.75
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 Cellular Mode

Operation Mode : TX CH 384 E1 Mode
Fundamental Frequency : 836.52 MHz
Temperature : 25℃
Humidity : 65%

Test Date: Mar. 19, 2010
Test By: Brian
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)
53.28	36.93	V	-71.48	-0.55	1.11	-73.14	-13.00	-60.14
92.08	42.06	V	-60.87	-7.75	1.29	-69.91	-13.00	-56.91
104.69	42.76	V	-58.73	-7.76	1.38	-67.87	-13.00	-54.87
153.19	33.05	V	-64.53	-7.80	1.60	-73.93	-13.00	-60.93
615.88	32.81	V	-56.55	-7.80	3.07	-67.42	-13.00	-54.42
783.69	32.25	V	-54.55	-7.87	3.54	-65.96	-13.00	-52.96
1673.04	42.44	V	-62.12	9.36	5.27	-58.03	-13.00	-45.03
2509.56	---	V		10.09	6.58		-13.00	
3346.08	---	V		12.27	7.79		-13.00	
3513.00	41.23	V	-57.54	12.61	8.05	-52.98	-13.00	-39.98
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 belongs 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 Cellular Mode

Operation Mode : TX CH 384 E1 Mode
Fundamental Frequency : 836.52 MHz
Temperature : 25℃
Humidity : 65%

Test Date: Mar. 19, 2010
Test By: Brian
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)
58.13	38.51	H	-71.92	-0.49	1.08	-73.49	-13.00	-60.49
90.14	39.14	H	-64.59	-7.75	1.27	-73.61	-13.00	-60.61
104.69	38.13	H	-64.38	-7.76	1.38	-73.52	-13.00	-60.52
145.43	32.85	H	-65.40	-7.80	1.57	-74.76	-13.00	-61.76
644.98	33.60	H	-56.22	-7.81	3.15	-67.17	-13.00	-54.17
720.64	33.45	H	-58.04	-7.86	3.36	-69.27	-13.00	-56.27
1673.04	38.04	H	-66.34	9.36	5.27	-62.24	-13.00	-49.24
2509.56	---	H		10.09	6.58		-13.00	
3346.08	---	H		12.27	7.79		-13.00	
3513.00	39.22	H	-59.67	12.61	8.05	-55.11	-13.00	-42.11
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 Cellular Mode

Operation Mode : TX CH 777 E1 Mode
Fundamental Frequency : 848.31 MHz
Temperature : 25℃
Humidity : 65%

Test Date: Mar. 19, 2010
Test By: Brian
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)
58.13	38.33	V	-72.17	-0.49	1.08	-73.73	-13.00	-60.73
92.08	41.64	V	-61.29	-7.75	1.29	-70.33	-13.00	-57.33
104.69	43.10	V	-58.39	-7.76	1.38	-67.53	-13.00	-54.53
154.16	32.44	V	-65.22	-7.80	1.60	-74.63	-13.00	-61.63
589.69	33.15	V	-57.02	-7.78	3.02	-67.82	-13.00	-54.82
693.48	33.82	V	-55.55	-7.85	3.27	-66.68	-13.00	-53.68
850.00	66.78	V	-19.33	-7.88	3.68	-30.89	-13.00	-17.89
1696.62	41.50	V	-63.04	9.43	5.31	-58.91	-13.00	-45.91
2544.93	---	V		10.19	6.63		-13.00	
3393.24	---	V		12.38	7.86		-13.00	
3569.00	40.86	V	-57.66	12.61	8.13	-53.18	-13.00	-40.18
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 Cellular Mode

Operation Mode : TX CH 777 E1 Mode
Fundamental Frequency : 848.31 MHz
Temperature : 25℃
Humidity : 65%

Test Date: Mar. 19, 2010
Test By: Brian
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)
58.13	37.42	H	-73.01	-0.49	1.08	-74.58	-13.00	-61.58
92.08	38.81	H	-64.78	-7.75	1.29	-73.82	-13.00	-60.82
104.69	39.15	H	-63.36	-7.76	1.38	-72.50	-13.00	-59.50
155.13	33.69	H	-64.48	-7.80	1.60	-73.88	-13.00	-60.88
591.63	33.55	H	-57.32	-7.78	3.02	-68.12	-13.00	-55.12
698.33	33.14	H	-54.56	-7.86	3.29	-65.70	-13.00	-52.70
850.00	79.77	H	-6.42	-7.88	3.68	-17.98	-13.00	-4.98
1696.62	41.85	H	-62.50	9.43	5.31	-58.37	-13.00	-45.37
2544.93	---	H		10.19	6.63		-13.00	
3393.24	---	H		12.38	7.86		-13.00	
3569.00	39.28	H	-59.36	12.61	8.13	-54.87	-13.00	-41.87
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)

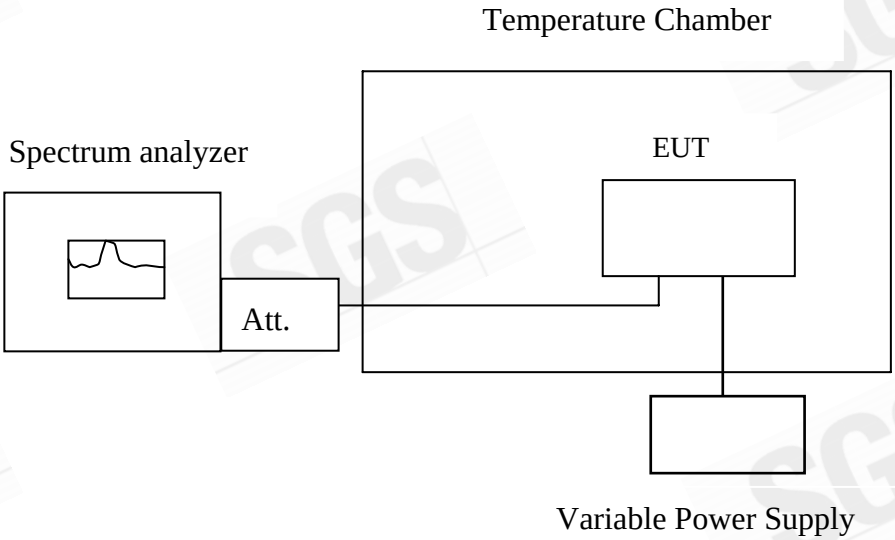
10. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

10.1 Standard Applicable

According to FCC §2.1055(a)(1)

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^{o}C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to –30^{o}C. After the temperature stabilized for approximately 30 minutes re-corded the frequency. Repeat step measure with 10^{o}C increased per stage until the highest temperature of +50^{o}C reached.

10.4 Measurement Uncertainty

Frequency Tolerance : ±290Hz.

10.5 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4440A	US41160416	01/25/2010	01/24/2011
Radio Communication Analyzer	R&S	CMU200	102189	05/13/208	05/12/2010
Temperature Chamber	TERCHY	MHG-120LF	911009	04/14/2008	04/13/2010
Temperature Chamber	GIANT FORCE	GTH-150-40-CP-AR	MAA0512-018	02/05/2010	02/04/2012
DC Block	Agilent	BLK-18	155452	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S20W5	N/A	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2009	07/04/2010
Splitter	Agilent	11636B	N/A	07/05/2009	07/04/2010
DC Power Supply	Chroma	41901	777188	04/17/2008	04/16/2010

10.6 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	836.519988	10.00	2091
3.7	-20	836.519963	35.00	2091
3.7	-10	836.519985	13.00	2091
3.7	0	836.519972	26.00	2091
3.7	10	836.519986	12.00	2091
3.7	20	836.519998	0.00	2091
3.7	30	836.519970	28.00	2091
3.7	40	836.519987	11.00	2091
3.7	50	836.519965	33.00	2091

Note: The battery is rated 3.7V dc.

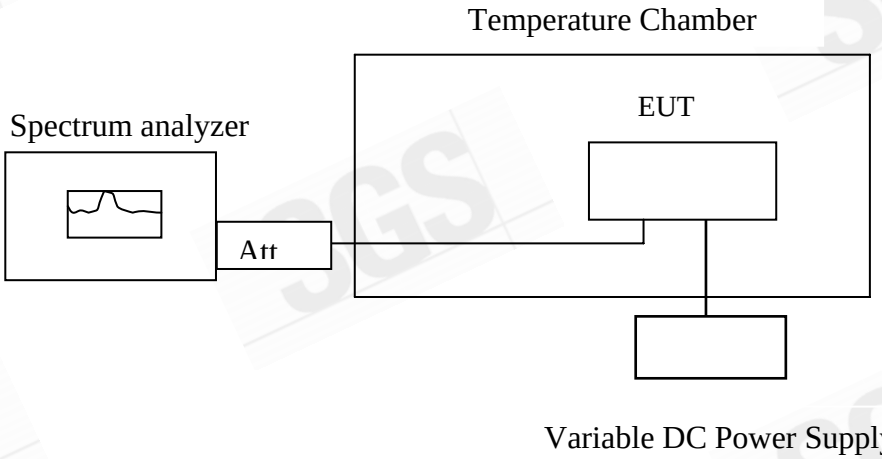
11. FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

11.1 Standard Applicable

According to FCC §2.1055(d)(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 Uncertainty

Frequency Tolerance : ±290Hz.

11.5 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E4440A	US41160416	01/25/2010	01/24/2011
Radio Communication Analyzer	R&S	CMU200	102189	05/13/208	05/12/2010
Temperature Chamber	TERCHY	MHG-120LF	911009	04/14/2008	04/13/2010
Temperature Chamber	GIANT FORCE	GTH-150-40-CP-AR	MAA0512-018	02/05/2010	02/04/2012
DC Block	Agilent	BLK-18	155452	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S20W5	N/A	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2009	07/04/2010
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2009	07/04/2010
Splitter	Agilent	11636B	N/A	07/05/2009	07/04/2010
DC Power Supply	Chroma	41901	777188	04/17/2008	04/16/2010

11.6 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)		
4.3	25.00	836.519964	23.00	2091.00
3.7	25.00	836.519987	0.00	2091.00
3.2	25.00	836.519959	28.00	2091.00
2.8 (End Point)	25.00	836.519980	7.00	2091.00