

Report No.: EH/2011/60023 Issue Date: Jul. 20, 2011

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ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H, PART 24 SUBPART E

OF

Product Name: CDMA FJ001

Brand Name: N/A

FJ001 Model Name:

Model Difference: N/A

FCC ID: YUW-FJ001

Report No.: EH/2011/60023

Issue Date: Jul. 20, 2011

FCC Rule Part: 2,22H

Prepared for: Fujitsu Toshiba Mobile Communications

Limited

1-1, Kamikodanaka 4-chome, Nakahara-ku,

Kawasaki

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

Fujitsu Toshiba Mobile Communications Limited **Applicant:**

1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki

Product Name: CDMA FJ001

FCC ID: YUW-FJ001

Brand Name: N/A

FJ001 **Model No.:**

Model Difference: N/A

File Number: EH/2011/60023

Jun. 21, 2011~ Jul, 19, 2011 Date of test:

Jun. 21, 2011 **Date of EUT Received:**

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 PART 22 subpart H.

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

Test By:	Nick Lin	Date:	Jul. 20, 2011	
Prepared By:	Nick Lin / Engineer Gigi yeh	Date:	Jul. 20, 2011	
Approved By:	Gigi Yeh / Clerk Jim Ch ang Jim Chang / Supervisor	Date: 	Jul. 20, 2011	

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Version

Version No.	Date	Description
00	Jul. 20, 2011	Initial creation of document

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GENERAL INFORMATION

General:

Product Name:	CDMA FJ001		
Brand Name:	N/A		
Model Name:	FJ001		
Model difference:	N/A		
	3.7Vdc Li-Ion battery or 5Vdc from AC/DC adapter		
Power Supply	Battery: 1. Model No.: FJ001UAA, Supplier: SANYO Ele		
	Adapter :	1. Model No.: 0203PQA, Supplier: MITSUMI	

GSM:

Cellular Phone Standards Frequency Range and	Operating Frequency	Rated Power	
Power:	CDMA 2000 Cellular 824.7MHz – 848.31MHz		24 dBm
Hardware Version:	Ver.2.0.0		
Software Version:	V68.21.01		
MEID:	234567891234		

Test mode	DC voltage (V)	DC current (mA)
CDMA 850	3.7 Vdc	237

This test report applies for CDMA2000 Cellular

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1.1 **Related Submittal(s) / Grant (s)**

This submittal(s) (test report) is intended for FCC ID: YUW-FJ001 filing to comply with Section Part 22 subpart H of the FCC CFR 47 Rules.

1.2 **Test Methodology**

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA 603C and FCC 47 CFR 2.1046, 2.1053.

1.3 **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-4

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.

1.4 **Special Accessories**

Not available for this EUT intended for grant.

1.5 **Equipment Modifications**

Not available for this EUT intended for grant.

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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 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 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.

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2.4. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2010	04/18/2012
Spectrum Analyzer	Agilent	E4440A	US41160416	01/25/2011	01/24/2012
Radio Communication Analyzer	R&S	CMU200	111787	12/07/2011	12/06/2013
800 – 1000MHz Filter	Micro-Tronics	BRM13462	001	01/05/2011	01/04/2012
1800 – 2000MHz Filter	Micro-Tronics	BRM13463	001	01/05/2011	01/04/2012
Temperature Chamber	TERCHY	MHG-120LF	911009	04/30/2010	04/29/2012
Temperature Chamber	GIANT FORCE	GTH-150-40- CP-AR	MAA0512-018	02/24/2010	02/23/2012
DC Block	Agilent	BLK-18	155452	01/05/2011	01/04/2012
Attenuator	Mini-Circuit	BW-S20W5	N/A	01/05/2011	01/04/2012
Attenuator	Mini-Circuit	BW-S10W5	N/A	01/05/2011	01/04/2012
Attenuator	Mini-Circuit	BW-S6W5	N/A	01/05/2011	01/04/2012
Splitter	Agilent	11636B	N/A	01/05/2011	01/04/2012
DC Power Supply	Chroma	41901	777188	04/15/2010	04/14/2012

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ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber					
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	R&S	FSP 40	100034	03/30/2011	03/29/2012
Bilog Antenna	SCHWAZBECK	VULB9160	3136	11/19/2009	11/18/2011
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/17/2010	07/16/2012
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/17/2010	07/16/2012
Horn antenna	SCHWAZBECK	BBHA 9120D	309/320	01/22/2010	01/21/2012
Signal Generator	R&S	SMR40	100210	02/10/2010	02/09/2012
Signal Generator	Agilent	E4438C	MY45093613	07/08/2011	07/07/2013
Pre-Amplifier	Agilent	8447D	1937A02834	01/05/2011	01/04/2012
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2011	01/04/2012
Attenuator	Mini-Circuit	BW-S20W5	001	01/05/2011	01/04/2012
Attenuator	Mini-Circuit	BW-S10W5	001	01/05/2011	01/04/2012
Attenuator	Mini-Circuit	BW-S6W5	001	01/05/2011	01/04/2012
Radio Communication Analyzer	R&S	CMU200	111787	12/07/2011	12/06/2013
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	01/05/2011	01/04/2012
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2011	01/04/2012
Filter 800-1000	Micro-Tronics	BRM13462	1	01/05/2011	01/04/2012
Filter 1800-2000	Micro-Tronics	BRM13463	1	01/05/2011	01/04/2012
3m Site	SGS	966 chamber	N/A	11/08/2010	11/09/2011
Spectrum Analyzer	R&S	FSP 40	100034	03/30/2011	03/29/2012
Bilog Antenna	SCHWAZBECK	VULB9160	3136	11/19/2009	11/18/2011

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2.5. Configuration of Tested System

Fig. 2-1 Configuration of Tested System (Fixed Channel)

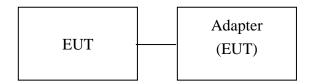


Fig. 2-2 Configuration of Tested System (Remote Side)

CMU 200

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	shielded	Un-shielded

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SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result	
§2.1046(a)			
§22.913(a)(2)	RF Conducted Power Output	Compliant	
§24.232(c)			
§2.1046(a)			
§22.913(a)(2)	ERP/EIRP measurement	Compliant	
§24.232(c)			
§2.1049(h)	99% Occupied Bandwidth	Compliant	
§2.1051	Out of Double Control of Automore Tour		
§22.917(a)	Out of Band Emissions at Antenna Terminals	Compliant	
§24.238(a)	minais		
§2.1053	Field Changeth of Canadana Dadiation		
§22.917(a)	Field Strength of Spurious Radiation (TX)	Compliant	
§24.238(a)	(IA)		
§2.1055(a)(1)			
§22.355	Frequency Stability vs. Temperature	Compliant	
§24.235			
§2.1055(d)(2)			
§22.355	Frequency Stability vs. Voltage	Compliant	
§24.235-			

Max ERP/EIRP measurement result:

	dBm	dB	W
CDMA CELL	27.09	ERP	0.512

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DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

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 (H mode) and lie down position (E1, E2 mode) for CDMA2000 with power adaptors. The worst-case of H position were reported.

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RF POWER OUTPUT MEASUREMENT 5

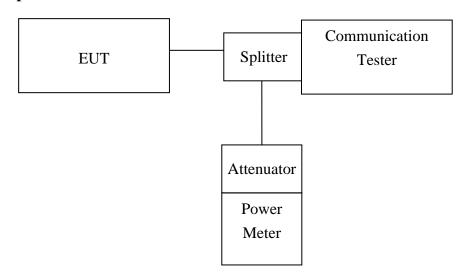
5.1 **Standard Applicable**

According to FCC §2.1046.

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

FCC 24.232(c) Peak Power Measurement.

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:**

Refer to section 2.4 in this report

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5.5 **Measurement Result:**

5.5.1 RF Conducted Output Power

5.5.1.1.: GSM (GMSK)

Result:

EUT Mode	Frequency (MHz)	СН	Peak Power (1DN 1UP)	Avg. Power (1DN 1UP)	
	(171112)		(dBm)	(dBm)	
CD344 2000	824.70	1013	25.00	23.94	
CDMA 2000	836.52	384	24.61	23.76	
Cellular	848.31	777	24.65	23.66	

Cable loss offset: 0.5 dB

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ERP, EIRP MEASUREMENT

6.1 **Standard Applicable**

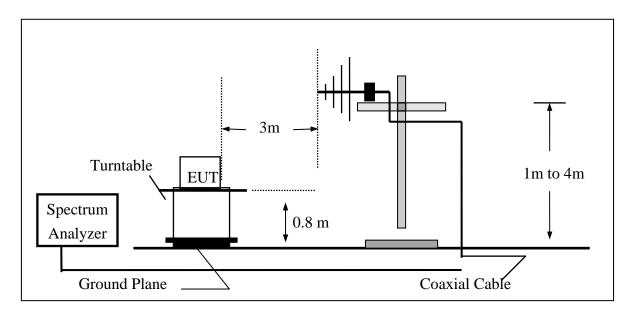
According to FCC §2.1046

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

FCC 24.232(c) Mobile station are limited to 2W EIRP.

6.2 **Test SET-UP (Block Diagram of Configuration)**

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



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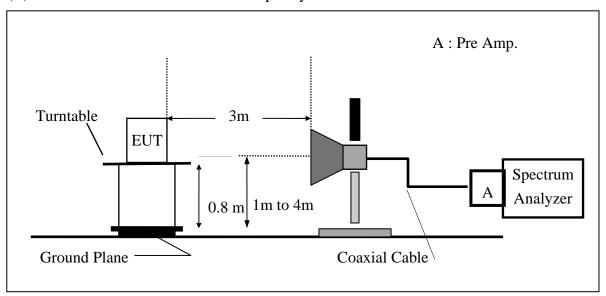
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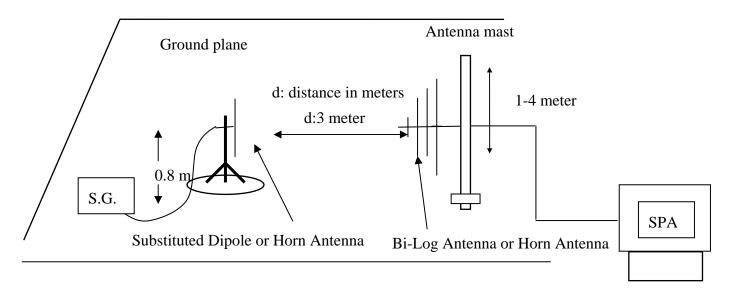
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(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



Substituted Method Test Set-UP



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6.3 **Measurement Procedure**

The EUT was placed on a 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 –850 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:

Refer to section 2.4 in this report

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6.5 **Measurement Result**

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
			Н	V	123.69	37.33	-7.88	3.63	25.82	38.45
			11	Н	112.79	26.53	-7.88	3.63	15.03	38.45
	024.70	1012	E1	V	110.49	24.13	-7.88	3.63	12.62	38.45
	824.70	1013	Li	Н	123.50	37.24	-7.88	3.63	25.74	38.45
			E2	V	112.00	25.64	-7.88	3.63	14.13	38.45
			LZ	Н	122.67	36.41	-7.88	3.63	24.91	38.45
		384	84 E1 E2	V	124.88	38.62	-7.88	3.65	27.09	38.45
CDMA				Н	113.89	27.66	-7.88	3.65	16.13	38.45
2000	836.52			V	111.85	25.59	-7.88	3.65	14.06	38.45
Cellular	630.32			Н	124.49	38.26	-7.88	3.65	26.73	38.45
				V	112.39	26.13	-7.88	3.65	14.60	38.45
			EZ	Н	123.46	37.23	-7.88	3.65	25.70	38.45
			Н	V	123.90	37.75	-7.88	3.67	26.20	38.45
			11	Н	112.97	26.77	-7.88	3.67	15.22	38.45
	848.31	777	E1	V	112.11	25.95	-7.88	3.67	14.40	38.45
	040.31		EI	Н	123.42	37.22	-7.88	3.67	25.67	38.45
			E2	V	111.42	25.27	-7.88	3.67	13.72	38.45
			L'A	Н	122.47	36.27	-7.88	3.67	24.72	38.45

Remark:

(1) The RBW, VBW of SPA for frequency

RBW = 5MHz, VBW = 8MHz

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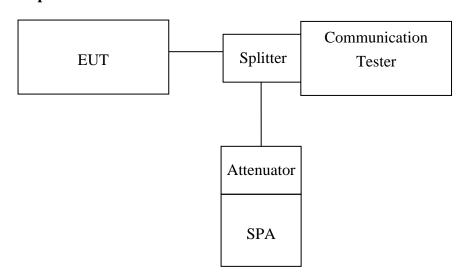
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7 99% OCCUPIED BANDWIDTH MEASUREMENT

7.1 **Standard Applicable**

According to FCC§2.1049(h).

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 Equipment Used:**

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7.5 **Measurement Result:**

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
	824.70	1013	1.2868
CDMA2000 Cellular	836.52	384	1.2814
Cenulai	848.31	777	1.2869

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Figure 7-1: CDMA2000 Cellular Channel Low

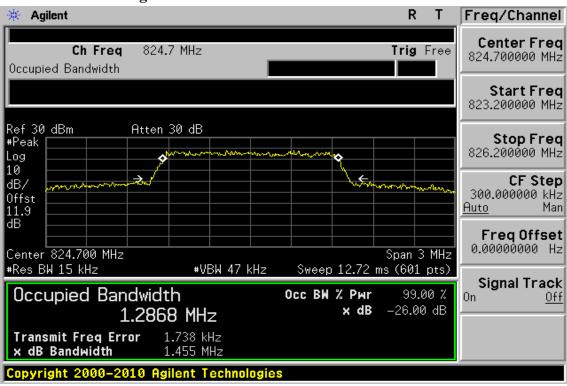
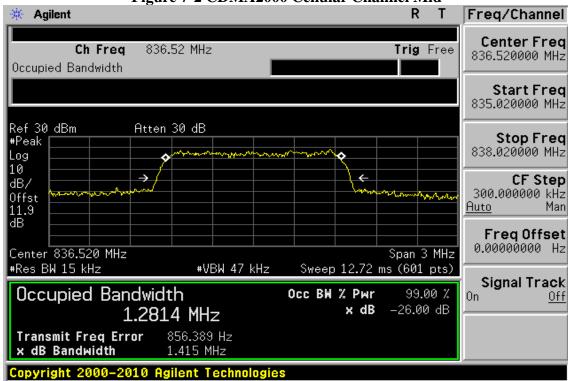


Figure 7-2 CDMA2000 Cellular Channel Mid



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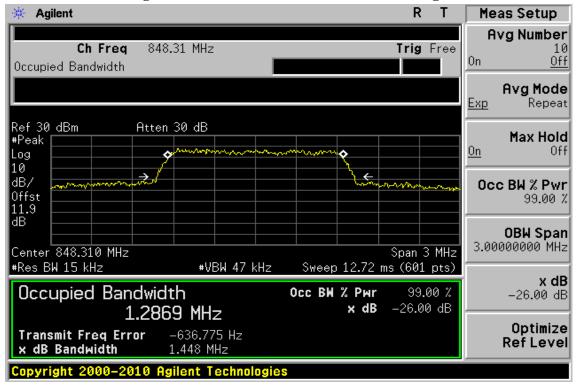
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Figure 7-3: CDMA2000 Cellular Channel High



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8 **OUT OF BAND EMISSION AT ANTENNA TERMINALS**

8.1 **Standard Applicable**

According to FCC §2.1051.

FCC §22.917(a), §24.238(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)

Test SET-UP 8.2

Refer to section 7.2 in this report

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:**

Refer to section 2.4 in this report

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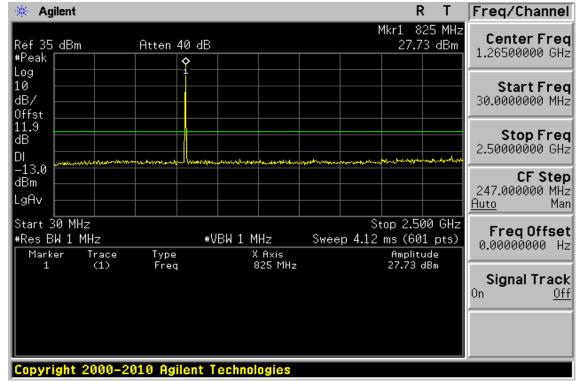


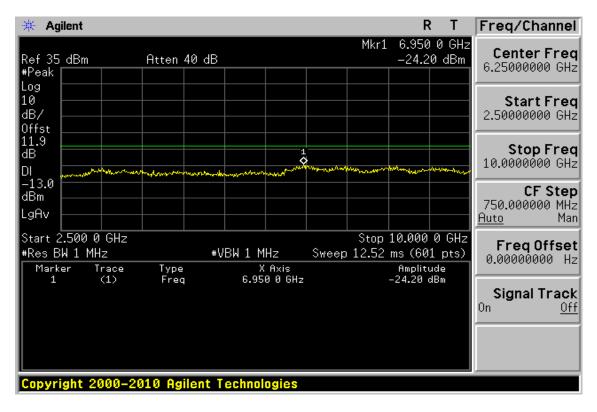
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8.5 **Measurement Result**

Figure 8-1: Out of Band emission at antenna terminals-CDMA2000 Cellular Channel Lowest





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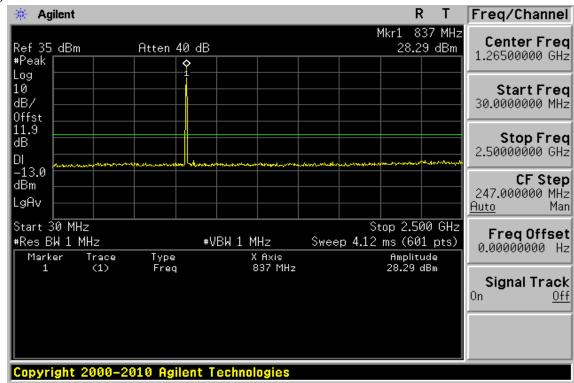
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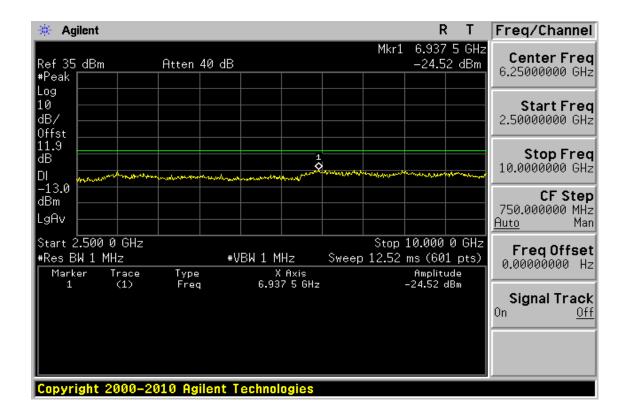


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Figure 8-2: Out of Band emission at antenna terminals -CDMA2000 Cellular Channel Mid





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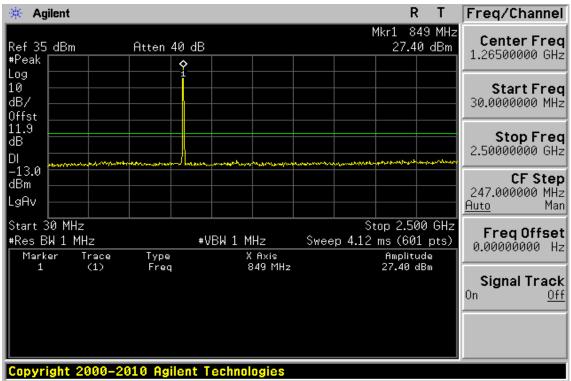
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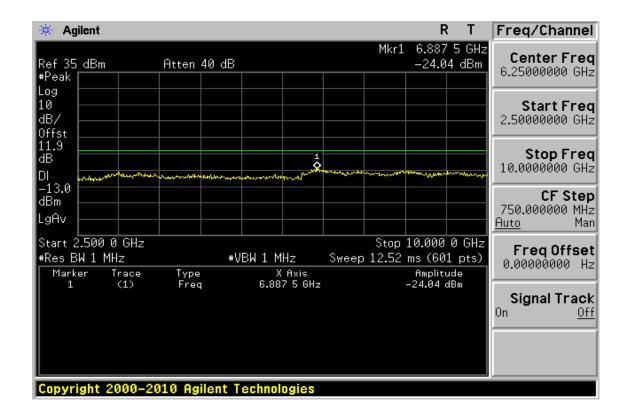


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Figure 8-3: Out of Band emission at antenna terminals-CDMA2000 Cellular Channel Highest





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Figure 8-4: Band edge emission at antenna terminals -CDMA2000 Cellular Channel Lowest

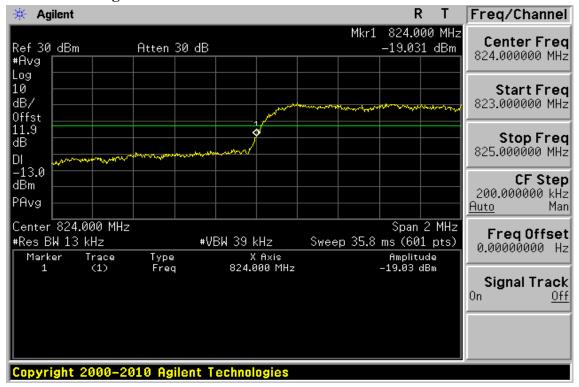
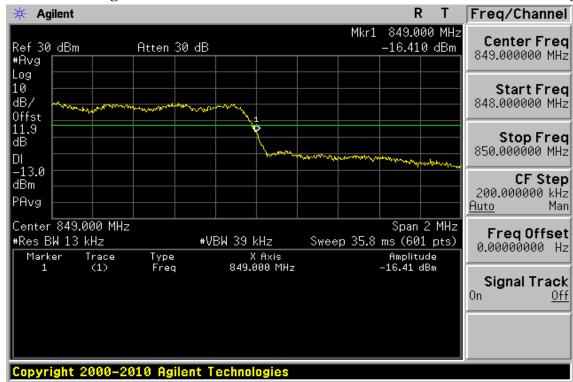


Figure 8-5: Band edge emission at antenna terminals -CDMA2000 Cellular Channel Highest



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FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

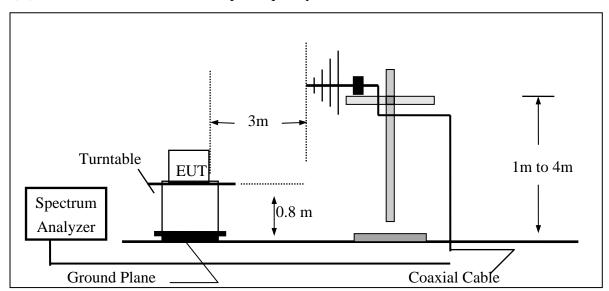
9.1 **Standard Applicable**

According to FCC §2.1053,

FCC §22.917(a),§24.238(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



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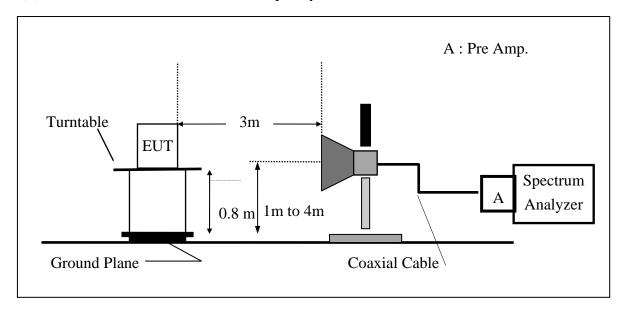
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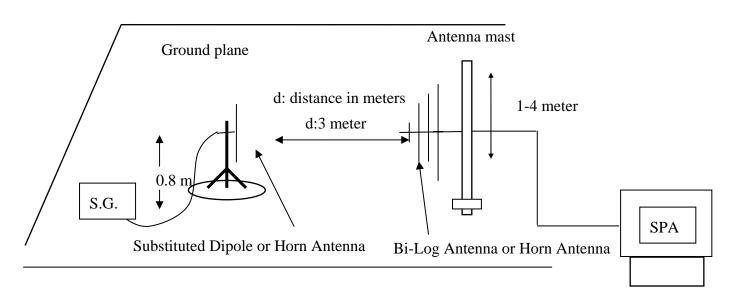
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(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



(C) Substituted Method Test Set-UP



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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 –850 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:

EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP 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) EIRP = S.G. output (dBm) + Antenna Gain(dBi) – Cable Loss (dB)

9.4 Measurement Equipment Used:

Refer to section 2.4 in this report

9.5 Measurement Result

Refer to attach tabular data sheets.

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Radiated Spurious Emission Measurement Result: CDMA 2000 Cellular Mode

Operation Mode : TX CH Low Mode Test Date: Jul. 15, 2011

Fundamental Frequency : 824.70MHz Test By: Nick Temperature Pol: Ver : 25

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
90.14	57.94	V	-45.24	-7.75	1.27	-54.26	-13.00	-41.26
102.75	54.09	V	-47.58	-7.76	1.37	-56.71	-13.00	-43.71
190.05	49.85	V	-51.04	-7.83	1.69	-60.55	-13.00	-47.55
260.86	48.28	V	-51.25	-7.90	2.03	-61.18	-13.00	-48.18
388.90	44.16	V	-51.81	-7.66	2.48	-61.95	-13.00	-48.95
684.75	45.37	V	-43.91	-7.84	3.25	-55.01	-13.00	-42.01
1649.40	62.80	V	-41.78	9.29	5.23	-37.72	-13.00	-24.72
2474.10	53.05	V	-47.95	10.08	6.53	-44.40	-13.00	-31.40
3298.80		V		10.08	6.51		-13.00	
4123.50		V		12.15	7.70		-13.00	
4948.20		V		12.62	8.91		-13.00	
5772.90		V		12.65	9.73		-13.00	
6597.60		V		13.55	10.54		-13.00	
7422.30		V		12.05	11.30		-13.00	
8247.00		V		11.49	12.10		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	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)

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Radiated Spurious Emission Measurement Result: CDMA 2000 Cellular Mode

Operation Mode : TX CH Low Mode Test Date: Jul. 15, 2011

Fundamental Frequency : 824.70MHz Test By: Nick Temperature Pol: Hor : 25

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
39.70	52.98	Н	-49.91	-2.79	0.89	-53.60	-13.00	-40.60
66.86	58.77	Н	-53.18	-0.89	1.13	-55.20	-13.00	-42.20
102.75	52.13	Н	-50.58	-7.76	1.37	-59.72	-13.00	-46.72
134.76	49.83	Н	-49.53	-7.79	1.52	-58.84	-13.00	-45.84
291.90	46.54	Н	-51.37	-7.92	2.14	-61.43	-13.00	-48.43
1649.40	53.33	Н	-51.07	9.29	5.23	-47.01	-13.00	-34.01
2474.10		Н		10.08	6.53		-13.00	
3298.80		Н		12.17	7.72		-13.00	
4123.50		Н		12.17	7.71		-13.00	
4948.20		Н		12.61	8.86		-13.00	
5772.90		Н		12.65	9.74		-13.00	
6597.60		Н		13.55	10.54		-13.00	
7422.30		Н		12.05	11.30		-13.00	
8247.00		Н		11.49	12.10		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	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)

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Radiated Spurious Emission Measurement Result: CDMA 2000 Cellular Mode

: TX CH Mid Mode Operation Mode Test Date: Jul. 15, 2011

Fundamental Frequency: 836.52MHz Nick Test By: Temperature : 25 Pol: Ver

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
39.70	52.88	V	-49.01	-2.79	0.89	-52.69	-13.00	-39.69
86.26	58.67	V	-44.63	-7.75	0.79	-53.17	-13.00	-40.17
102.75	53.84	V	-47.83	-7.76	1.37	-56.96	-13.00	-43.96
158.04	50.59	V	-47.42	-7.81	1.61	-56.84	-13.00	-43.84
222.06	44.30	V	-56.65	-7.86	1.83	-66.34	-13.00	-53.34
478.14	45.71	V	-48.34	-7.71	2.74	-58.79	-13.00	-45.79
1673.04	64.79	V	-39.77	9.36	5.27	-35.68	-13.00	-22.68
2509.56	54.81	V	-45.97	10.09	6.58	-42.47	-13.00	-29.47
3346.08	49.23	V	-49.63	12.27	7.79	-45.15	-13.00	-32.15
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	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	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)

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Radiated Spurious Emission Measurement Result: CDMA 2000 Cellular Mode

: TX CH Mid Mode Operation Mode Test Date: Jul. 15, 2011

Fundamental Frequency: 836.52MHz Nick Test By: Temperature : 25 Pol: Hor

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
41.64	54.24	Н	-49.27	-2.31	0.93	-52.51	-13.00	-39.51
88.20	57.98	Н	-45.73	-7.75	1.04	-54.52	-13.00	-41.52
102.75	50.96	Н	-51.75	-7.76	1.37	-60.89	-13.00	-47.89
154.16	51.87	Н	-46.22	-7.80	1.60	-55.63	-13.00	-42.63
199.75	53.71	Н	-47.92	-7.84	1.71	-57.47	-13.00	-44.47
303.54	44.91	Н	-52.72	-7.90	2.18	-62.80	-13.00	-49.80
1673.04	56.37	Н	-48.01	9.36	5.27	-43.91	-13.00	-30.91
2509.56	53.29	Н	-47.41	10.09	6.58	-43.91	-13.00	-30.91
3346.08		Н		12.27	7.79		-13.00	
4182.60		Н		12.62	8.93		-13.00	
5019.12		Н		12.67	9.81		-13.00	
5855.64		Н		13.68	10.62		-13.00	
6692.16		Н		11.95	11.39		-13.00	
7528.68		Н		11.45	12.20		-13.00	
8365.20		Н		11.59	12.81		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	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)

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Radiated Spurious Emission Measurement Result: CDMA 2000 Cellular Mode

: TX CH High Mode Operation Mode Test Date: Jul. 15, 2011

Fundamental Frequency: 848.31MHz Nick Test By: Temperature : 25 Pol: Ver

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
90.14	57.15	V	-46.03	-7.75	1.27	-55.05	-13.00	-42.05
119.24	57.29	V	-42.85	-7.78	1.45	-52.07	-13.00	-39.07
212.36	53.94	V	-47.37	-7.85	1.78	-57.00	-13.00	-44.00
390.85	44.63	V	-51.26	-7.66	2.48	-61.40	-13.00	-48.40
451.95	48.46	V	-45.48	-7.70	2.67	-55.84	-13.00	-42.84
652.74	41.80	V	-47.15	-7.81	3.17	-58.13	-13.00	-45.13
1696.62	69.91	V	-34.63	9.43	5.31	-30.50	-13.00	-17.50
2544.93	55.33	V	-45.32	10.19	6.63	-41.76	-13.00	-28.76
3393.24	49.15	V	-49.70	12.38	7.86	-45.19	-13.00	-32.19
4241.55		V		12.74	9.88		-13.00	
5089.86		V		13.81	10.70		-13.00	
5938.17		V		11.86	11.48		-13.00	
6786.48		V		11.40	12.27		-13.00	
7634.79		V		11.70	12.91		-13.00	
8483.10								

	30MHz - 80MHz: 5.04dB		
Measurement uncertainty	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)

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Radiated Spurious Emission Measurement Result: CDMA 2000 Cellular Mode

: TX CH High Mode Operation Mode Test Date: Jul. 15, 2011

Fundamental Frequency: 848.31MHz Nick Test By: 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)
41.64	54.67	Н	-48.84	-2.31	0.93	-52.08	-13.00	-39.08
102.75	50.74	Н	-51.97	-7.76	1.37	-61.11	-13.00	-48.11
128.94	47.95	Н	-52.02	-7.78	1.49	-61.30	-13.00	-48.30
219.15	42.96	Н	-57.76	-7.86	1.82	-67.44	-13.00	-54.44
398.60	48.67	Н	-47.78	-7.66	2.51	-57.95	-13.00	-44.95
522.76	47.49	Н	-45.17	-7.74	2.87	-55.78	-13.00	-42.78
1696.62	60.38	Н	-43.97	9.43	5.31	-39.84	-13.00	-26.84
2544.93	51.78	Н	-48.82	10.19	6.63	-45.26	-13.00	-32.26
3393.24	46.08	Н	-52.95	12.38	7.86	-48.43	-13.00	-35.43
4241.55		Н		12.63	8.99		-13.00	
5089.86		Н		12.74	9.88		-13.00	
5938.17		Н		13.81	10.70		-13.00	
6786.48		Н		11.86	11.48		-13.00	
7634.79		Н		11.40	12.27		-13.00	
8483.10		Н		11.70	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)

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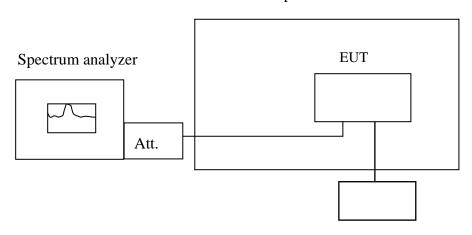
FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT 10

10.1 **Standard Applicable**

According to FCC §2.1055(a)(1) Frequency Tolerance: +/- 2.5 ppm

10.2 **Test Set-up:**

Temperature Chamber



Variable DC Power Supply

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:**

Refer to section 2.4 in this report

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10.5 **Measurement Result:**

Reference Frequency: CDMA 2000 Mid Channel 836.52 MHz @ 25°C					
Limit: +/- 2.5 ppm = 2091 Hz					
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Uz)	
Vdc	Temperature ($^{\circ}$ C)	(MHz)	Della (HZ)	Limit (Hz)	
3.7	-20	836.520010	-12.00	2091	
3.7	-10	836.519992	6.00	2091	
3.7	0	836.519998	0.00	2091	
3.7	10	836.519994	4.00	2091	
3.7	20	836.519996	2.00	2091	
3.7	30	836.519997	1.00	2091	
3.7	40	836.519996	2.00	2091	
3.7	50	836.519989	9.00	2091	
3.7	60	836.519995	3.00	2091	

Note: The battery is rated 3.7V dc.

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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:**

Refer to section 10.2 in this report

11.3 **Measurement Procedure**

Set chamber temperature to 25°C. 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:**

Refer to section 2.4 in this report

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11.5 **Measurement Result:**

Reference Frequency: CDMA 2000 Cell Mid Channel 836.52 MHz					
Limit: +/- 2.5 ppm = 2091 Hz					
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Uz)	
Vdc	Temperature (°ℂ)	(MHz)	Della (HZ)	Limit (Hz)	
4.2	25.00	836.5200013	-5.30	2091.00	
3.7	25.00	836.5199960	0.00	2091.00	
3.5	25.00	836.5200005	-4.50	2091.00	
2.7	25.00	026 5100616	24.40	2001.00	
shutdown point	25.00	836.5199616	34.40	2091.00	

Note: The battery is rated 3.7V dc.

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