



Shenzhen CTL Electromagnetic Technology Co., Ltd.  
Tel: +86-755-89486194 Fax: +86-755-26636041

## FCC PART 22 TEST REPORT

### FCC Part 22 Subpart H

**Report Reference No.**.....: **CTL1311271832-WU**

Compiled by

( position+printed name+signature)...: File administrators Jacky Chen

Jacky Chen

Name of the organization performing the tests

Test Engineer Tracy Qi

Tracy Qi

( position+printed name+signature)...:

Approved by

( position+printed name+signature)...: Manager Tracy Qi

Tracy Qi

Date of issue.....: Dec. 09, 2013

**Representative Laboratory Name** : **Shenzhen CTL Electromagnetic Technology Co., Ltd.**

Address.....: Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

**Test Firm**.....: **Bontek Compliance Testing Laboratory Ltd**

Address.....: 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

**Applicant's name**.....: **GFIVE MOBILE FZE**

Address.....: Unit 1, 16/F, Cable TV Tower, 9 Hoi Shing Road, Tusen Wan, N.T., Hong Kong, China

#### Test specification:

Standard .....: **FCC CFR Title 47 Part 2, Part 22H**

**EIA/TIA 603-C: 2004**

Master TRF.....: Dated 2011-01

**Shenzhen CTL Electromagnetic Technology Co., Ltd. All rights reserved.**

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen CTL Electromagnetic Technology Co., Ltd. is acknowledged as copyright owner and source of the material. Shenzhen CTL Electromagnetic Technology Co., Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

**Test item description** ..... : **CDMA 800MHz Mobile Phone**

**FCC ID**.....: **HEOE3240**

Trade Mark .....: Movilnet

Model/Type reference.....: E3240

#### CDMA 2000 1x RTT and EVDO

Transmit .....: BC0: 824~849MHz

Receive .....: BC0: 869~894MHz

Type of modulation .....: QPSK

#### Bluetooth

Work frequency .....: 2402~2480MHz

Version.....: V2.1+EDR

Type of modulation .....	FHSS
Data Rate.....	1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps(8DPSK)
Antenna Gain .....	1.0 dBi for CDMA 2000 BC0 0.5 dBi for Bluetooth
Antenna type .....	Internal
Result.....	<b>Positive</b>



**TEST REPORT**

<b>Test Report No. :</b>	<b>CTL1311271832-WU</b>	Dec. 09, 2013
		Date of issue

**Equipment under Test** : **CDMA 800MHz Mobile Phone**

**Model /Type** : **E3240**

**Applicant** : **GFIVE MOBILE FZE**

**Address** : Unit 1, 16/F, Cable TV Tower, 9 Hoi Shing Road, Tusen Wan, N.T., Hong Kong, China

**Manufacturer** **GFIVE MOBILE CO.,LTD**

**Address** Floor 1-5, Building F, No.9, East Zone, Shangxue Sci-tech Industrial Park, Bantian Street, Longgang District, Shenzhen City, China.

**Test Result** according to the standards on page 5:

**Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

## Contents

<b>1.</b>	<b><u>TEST STANDARDS</u></b>	<b>5</b>
<b>2.</b>	<b><u>SUMMARY</u></b>	<b>6</b>
2.1.	General Remarks	6
2.2.	Equipment Under Test	6
2.3.	Short description of the Equipment under Test (EUT)	6
2.4.	EUT operation mode	6
2.5.	EUT configuration	7
2.6.	Related Submittal(s) / Grant (s)	7
2.7.	Modifications	7
<b>3.</b>	<b><u>TEST ENVIRONMENT</u></b>	<b>8</b>
3.1.	Address of the test laboratory	8
3.2.	Test Facility	8
3.3.	Environmental conditions	8
3.4.	Configuration of Tested System	8
3.5.	EUT Exercise Software	9
3.6.	Statement of the measurement uncertainty	9
3.7.	Equipments Used during the Test	10
3.8.	Summary of Test Result	11
<b>4.</b>	<b><u>TEST CONDITIONS AND RESULTS</u></b>	<b>12</b>
4.1.	Peak Output Power	12
4.2.	Occupied Bandwidth	16
4.3.	Spurious Emission At Antenna Terminals (+/- 1MHz)	23
4.4.	Spurious Emission	27
4.5.	Frequency Stability under Temperature & Voltage Variations	41
<b>5.</b>	<b><u>TEST SETUP PHOTOS OF THE EUT</u></b>	<b>45</b>
<b>6.</b>	<b><u>EXTERNAL AND INTERNAL PHOTOS OF THE EUT</u></b>	<b>46</b>

## **1. TEST STANDARDS**

The tests were performed according to following standards:

[FCC Part 22 Subpart H:](#) Public Mobile Services

[EIA/TIA 603-C: 2004](#)

[FCC CFR Title 47 Part 2](#)



## 2. SUMMARY

### 2.1. General Remarks

Date of receipt of test sample : Nov. 29, 2013

Testing commenced on : Nov. 29, 2013

Testing concluded on : Dec. 07, 2013

### 2.2. Equipment Under Test

#### Power supply system utilised

Power supply voltage :   o 120V / 60 Hz                      o 115V / 60Hz  
                                  o 12 V DC                               o 24 V DC  
                                  o Other (specified in blank below)

DC 3.7V from battery

### 2.3. Short description of the Equipment under Test (EUT)

A CDMA 800MHz Mobile Phone with CDMA2000 and Bluetooth function.

For more details, refer to the user's manual of the EUT.

Serial number: Prototype

### 2.4. EUT operation mode

CTL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode	Channel	Frequency(MHz)
CDMA2000 Cellular	1013	824.70
	334	835.02
	777	848.31

Note:

1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

2. For the ERP/EIRP and radiated emission test, every axis (X, Y, Z) was verified, and show the worst result on this report.



## 2.5. EUT configuration

**The following peripheral devices and interface cables were connected during the measurement:**

- o - supplied by the manufacturer
- o - supplied by the lab
- o

Manufacturer :

Model No. :

## 2.6. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: HEOE3240 filing to comply with of the FCC Part 22 and Part 24 Rules.

## 2.7. Modifications

No modifications were implemented to meet testing criteria.



### 3. TEST ENVIRONMENT

#### 3.1. Address of the test laboratory

Bontek Compliance Testing Laboratory Ltd  
1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

#### 3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

##### IC Registration No.: 7631A

The 3m alternate test site of Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 7631A on March, 2011.

##### FCC-Registration No.: 338263

Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 338263, March 24, 2008.

#### 3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

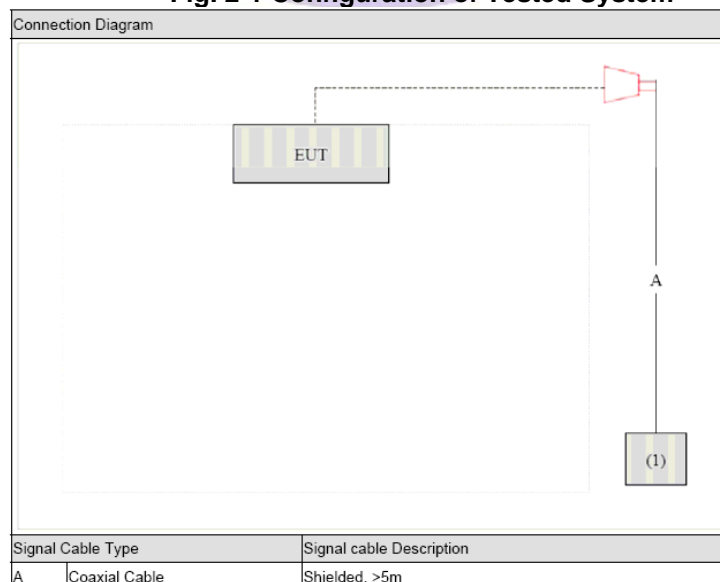
Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 950-1050mbar

#### 3.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System





### 3.5. EUT Exercise Software

1. Setup the EUT and simulators as shown on above.
2. Turn on the power of all equipment.
3. EUT Communicate with CMU200, then select channel to test.

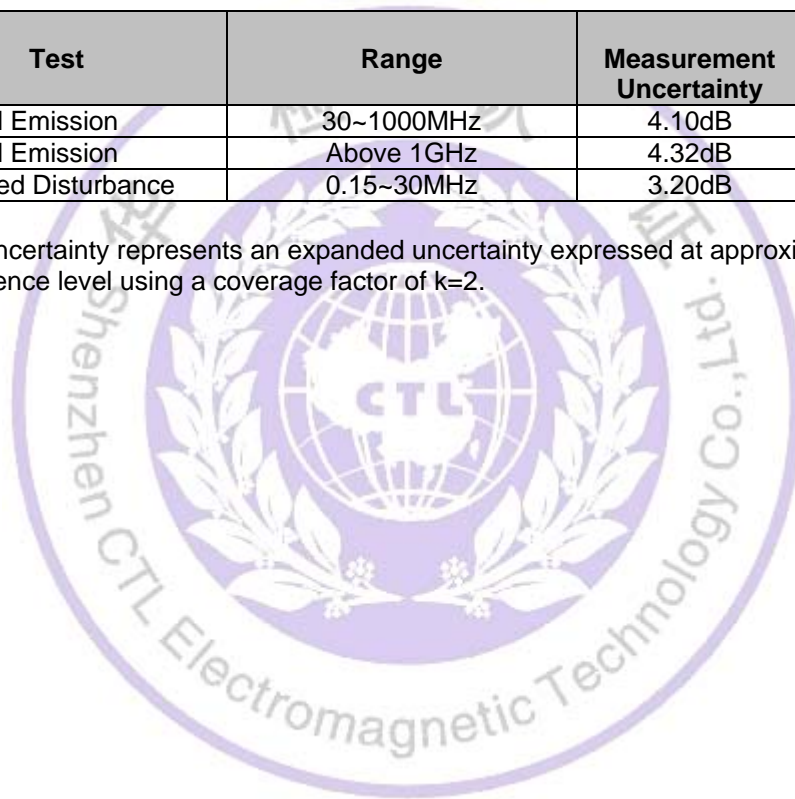
### 3.6. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Bontek Compliance Testing Laboratory Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Bontek laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	Above 1GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



### 3.7. Equipments Used during the Test

Item	Test Equipment	Manufacturer	Model No.	Last Cal.	Due. Date
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	2013/04/14	2014/04/13
2	Radio Communication Tester	ROHDE & SCHWARZ	CMU200	2013/04/14	2014/04/13
3	Dual Directional Coupler	Agilent	778D	2013/04/14	2014/04/13
4	10dB attenuator	SCHWARZBECK	MTAIMP-136	2013/04/14	2014/04/13
5	Tunable Bandreject filter	K&L	3TNF-800	2013/04/14	2014/04/13
6	Tunable Bandreject filter	K&L	5TNF-1700	2013/04/14	2014/04/13
7	High-Pass Filter	K&L	9SH10-2700/X12750-O/O	2013/04/14	2014/04/13
8	High-Pass Filter	K&L	41H10-1375/U12750-O/O	2013/04/14	2014/04/13
9	Coaxial Cable	Huber+Suhner	AC4-RF-H	2013/04/14	2014/04/13
10	AC Power Supply	IDRC	CF-500TP	2013/04/14	2014/04/13
11	DC Power Supply	IDRC	CD-035-020PR	2013/04/14	2014/04/13
12	RF Current Probe	FCC	F-33-4	2013/04/14	2014/04/13
13	Temperature /Humidity Meter	zhicheng	ZC1-2	2013/04/14	2014/04/13
14	MICROWAVE AMPLIFIER	HP	8349B	2013/04/14	2014/04/13
15	Amplifier	HP	8447D	2013/04/14	2014/04/13
16	SIGNAL GENERATOR	HP	8647A	2013/04/14	2014/04/13
17	Log Periodic Antenna	ELECTRO-METRICS	EM-6950	2013/04/14	2014/04/13
18	Horn Antenna	Schwarzbeck	BBHA9120A	2013/04/14	2014/04/13
19	EMI Test Receiver	R&S	ESPI	2013/04/14	2014/04/13
20	Loop Antenna	ZHINAN	ZN30900A	2013/04/14	2014/04/13
21	Horn Antenna	Schwarzbeck	BBHA9120D	2013/04/14	2014/04/13
22	Horn Antenna	Schwarzbeck	BBHA9170	2013/04/14	2014/04/13
23	Spectrum Analyzer	Agilent	E4446A	2013/04/14	2014/04/13
24	Wideband Peak Power Meter	Anritsu	ML2495A	2013/04/14	2014/04/13
25	Power Sensor	Anritsu	MA2411B	2013/04/14	2014/04/13
26	Climate Chamber	ESPEC	EL-10KA	2013/04/14	2014/04/13

### 3.8. Summary of Test Result

No deviations from the test standards

Description of Test Item	Standard	Results
Conducted Output power	FCC PART 2: 2.1046 FCC PART 22H: 22.913 (a)	PASS
Radiated Output power(erp/eirp)	FCC PART 22H:22.913 (a) FCC PART 24E:24.232(c)	PASS
Occupied bandwidth	FCC PART 2: 2.1049 FCC PART 22H: 22.917 (b)	PASS
Frequency stability	FCC PART 2: 2.1055 FCC PART 22H: 22.355	PASS
Conducted spurious emission (Antenna terminal)	FCC PART 2: 2.1051 FCC PART 22H: 22.917	PASS
Radiated spurious emissions	FCC PART 2: 2.1053 FCC PART 22H: 22.917	PASS

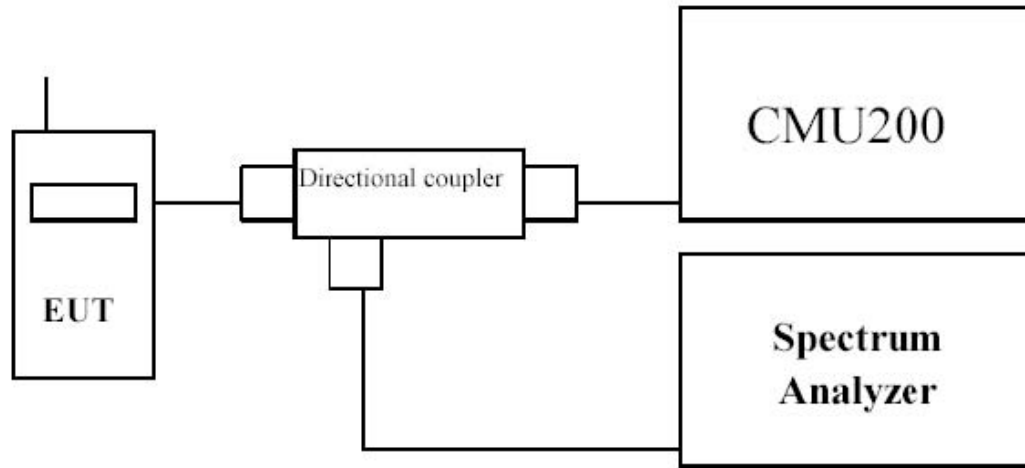


## 4. TEST CONDITIONS AND RESULTS

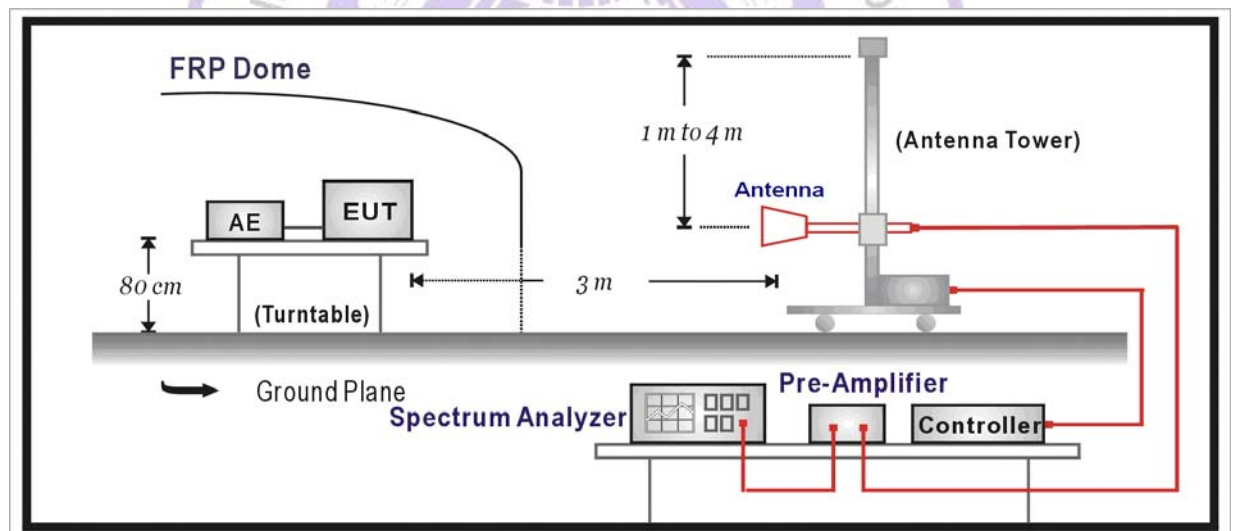
### 4.1. Peak Output Power

#### TEST CONFIGURATION

Conducted Power Measurement:



Radiated Power Measurement:



#### TEST PROCEDURE

The EUT was setup according to EIA/TIA 603C

##### **Conducted Power Measurement:**

- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMU200 by a Directional Couple.
- EUT Communicate with CMU200, then select a channel for testing.
- Add a correction factor to the display of spectrum, and then test.

**Radiated Power Measurement:**

1. The EUT was placed on an non-conductive rotating platform with 0.8 meter height in an anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW= 3MHz, VBW= 3MHz and peak detector settings.

2. During the measurement, the EUT was enforced in maximum power and linked with a base station. The highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.

3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (for frequency below 1GHz) or Horn antenna (for frequency above 1GHz) at same location with same polarize of receiver antenna and then a known power of each measure frequency from S.G. was applied into the dipole antenna or Horn antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Substitution antenna Loss (only for Dipole antenna) - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor,  $EIRP = LVL + \text{Correction factor}$  and  $ERP = EIRP - 2.15$

**LIMIT**

For FCC Part 22.913(a)(2):

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

**TEST RESULTS**

Mode	Test Case			BC0 (850MHz) Channel		
				Conducted Power (dBm)		
	Num.	FWD RC/TAP	REV RC/TAP	1013	384	777
1x RTT	1	RC1	RC1 (SO2)	25.04	24.81	24.96
	2	RC1	RC1 (SO55)	25.11	24.82	24.98
	3	RC2	RC2 (SO9)	25.08	24.86	25.01
	4	RC2	RC2 (SO55)	25.16	24.88	25.05
	5	RC3	RC3 (SO55)	25.11	24.93	25.04
	6	RC3	RC3 (SO32)	25.19	24.92	25.08
EVDO Rel0	7a	FTAP rate = 307kbps (2 slot, QPSK)	RTAP rate = 9.6kbps	24.93	24.77	24.88
	7b		RTAP rate = 19.2kbps	24.78	24.71	24.74
	7c		RTAP rate = 38.4kbps	24.68	24.62	24.69
	7d		RTAP rate = 76.8kbps	24.59	24.58	24.51
	7e		RTAP rate = 153.6kbps	24.53	24.57	24.56
EVDO Rev A	8a	FETAP rate = 307kbps (2 slot, ACK channel is transmitted at all the slots)	RETAP – payload size = 128	24.73	24.69	24.72
	8b		RETAP – payload size = 256	24.77	24.78	24.81
	8c		RETAP – payload size = 512	24.78	24.73	24.69
	8d		RETAP – payload size = 768	24.77	24.76	24.85
	8e		RETAP – payload size = 1024	24.73	24.68	24.83
	8f		RETAP – payload size = 1536	24.71	24.82	24.93
	8g		RETAP – payload size = 2048	24.74	24.67	24.82
	8h		RETAP – payload size = 3072	24.73	24.67	24.81
	8i		RETAP – payload size = 4096	24.68	24.71	24.68
	8j		RETAP – payload size = 6144	24.88	24.93	24.96
	8k		RETAP – payload size = 8192	24.82	24.83	24.88
	8l		RETAP – payload size = 12288	24.79	24.77	24.74

Note: All conducted measurements are based on an average detector.



## Radiated Measurement

## CDMA 2000 1x RTT BC0 Link

Frequency (MHz)	SA Reading (dBm)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 1013 (824.7MHz)								
824.70	-5.84	H	28.51	2.56	-0.02	25.93	38.50	-12.57
824.70	-17.80	V	17.44	2.56	-0.02	14.86	38.50	-23.64
Middle Channel 384 (836.52MHz)								
836.52	-6.23	H	28.38	2.59	0.10	25.89	38.50	-12.61
836.52	-18.84	V	16.67	2.59	0.10	14.18	38.50	-24.32
High Channel 777 (848.31MHz)								
848.31	-6.89	H	27.85	2.54	0.13	25.44	38.50	-13.06
848.31	-18.80	V	16.54	2.54	0.13	14.13	38.50	-24.37

ERP=SG Reading-Cable Loss+Gain

## CDMA 2000 EVDO Rel-0

Frequency (MHz)	SA Reading (dBm)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 1013 (824.7MHz)								
824.70	-5.84	H	27.45	2.56	-0.02	24.89	38.50	-12.57
824.70	-17.80	V	16.29	2.56	-0.02	13.73	38.50	-23.64
Middle Channel 384 (836.52MHz)								
836.52	-6.23	H	27.12	2.59	0.10	24.53	38.50	-12.61
836.52	-18.84	V	16.32	2.59	0.10	13.73	38.50	-24.32
High Channel 777 (848.31MHz)								
848.31	-6.89	H	26.98	2.54	0.13	24.44	38.50	-13.06
848.31	-18.80	V	17.03	2.54	0.13	14.49	38.50	-24.37

ERP=SG Reading-Cable Loss+Gain



## CDMA 2000 EVDO Rel-A

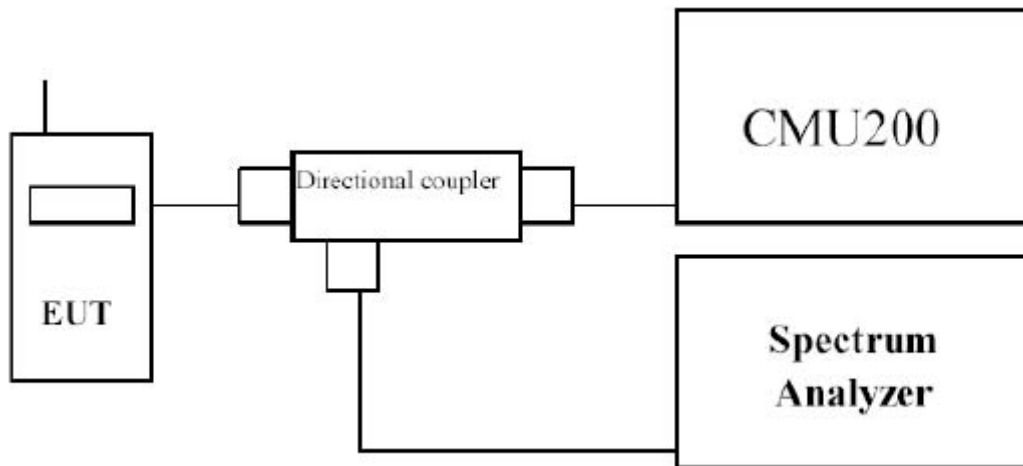
Frequency (MHz)	SA Reading (dBm)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 1013 (824.7MHz)								
824.70	-5.84	H	27.11	2.56	-0.02	24.55	38.50	-12.57
824.70	-17.80	V	17.02	2.56	-0.02	14.46	38.50	-23.64
Middle Channel 384 (836.52MHz)								
836.52	-6.23	H	27.57	2.59	0.10	24.98	38.50	-12.61
836.52	-18.84	V	16.16	2.59	0.10	13.57	38.50	-24.32
High Channel 777 (848.31MHz)								
848.31	-6.89	H	27.22	2.54	0.13	24.68	38.50	-13.06
848.31	-18.80	V	16.78	2.54	0.13	14.24	38.50	-24.37

ERP=SG Reading-Cable Loss+Gain



## 4.2. Occupied Bandwidth

### TEST CONFIGURATION

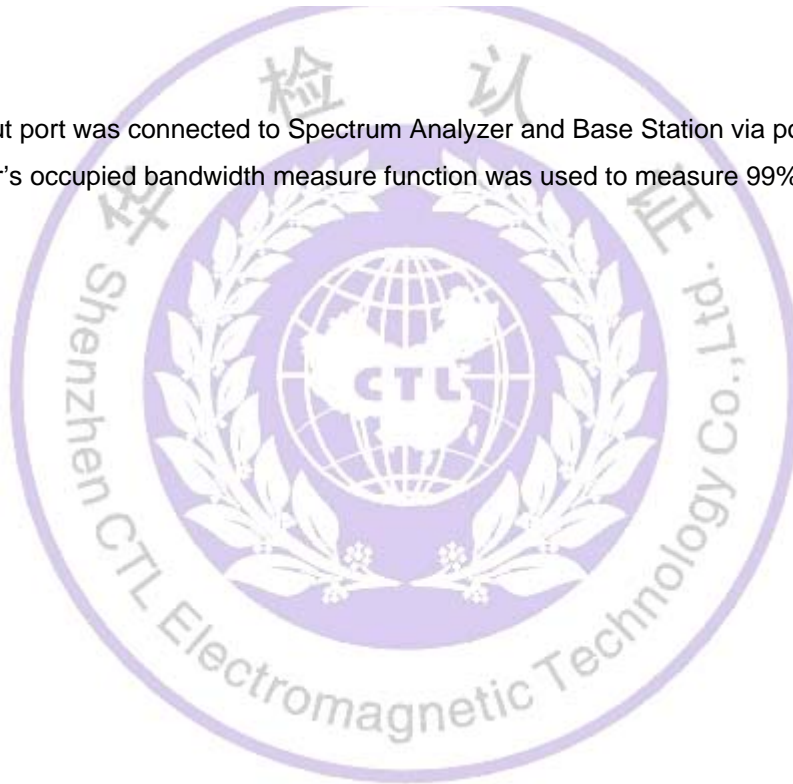


### TEST PROCEDURE

1. The EUT RF output port was connected to Spectrum Analyzer and Base Station via power divider.
2. Spectrum analyzer's occupied bandwidth measure function was used to measure 99% bandwidth and -26dBc bandwidth

### LIMIT

N/A



**TEST RESULTS**

Product	CDMA2000 Mobile Phone
Test Item	Occupied Bandwidth
Test Mode	Mode 1: CDMA 2000 1x RTT BC0 Link

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
1013	824.70	1452.0	1289.0
384	836.52	1448.0	1284.1
777	848.31	1433.0	1280.6

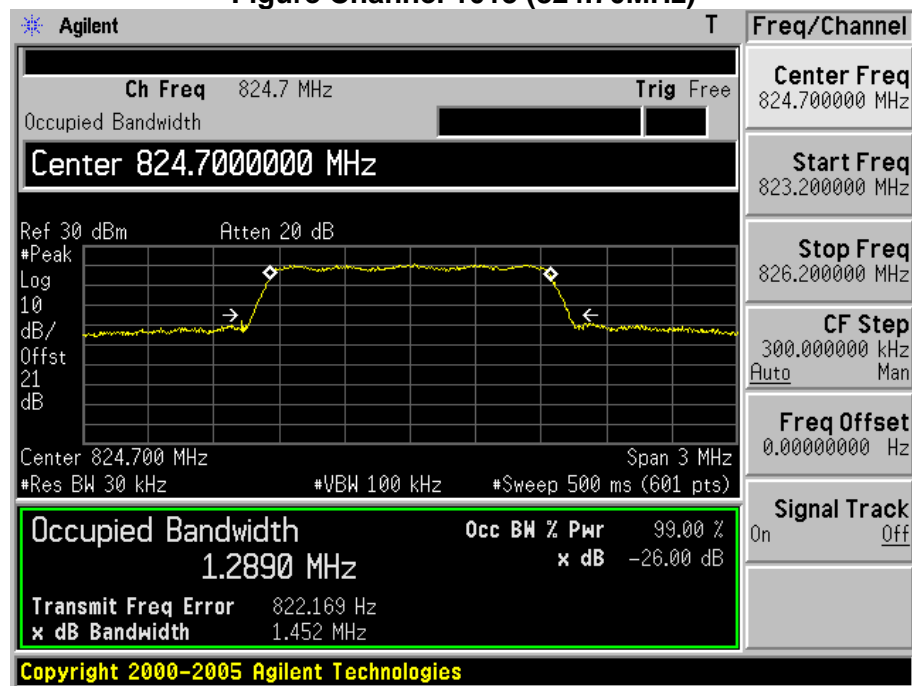
**Figure Channel 1013 (824.70MHz)**

Figure Channel 384 (836.52MHz)

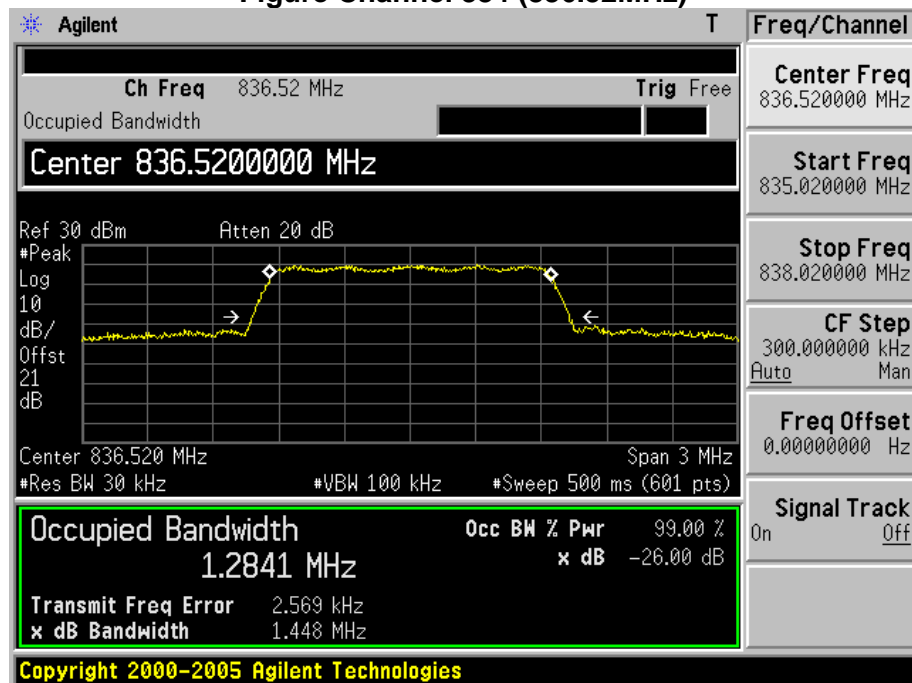
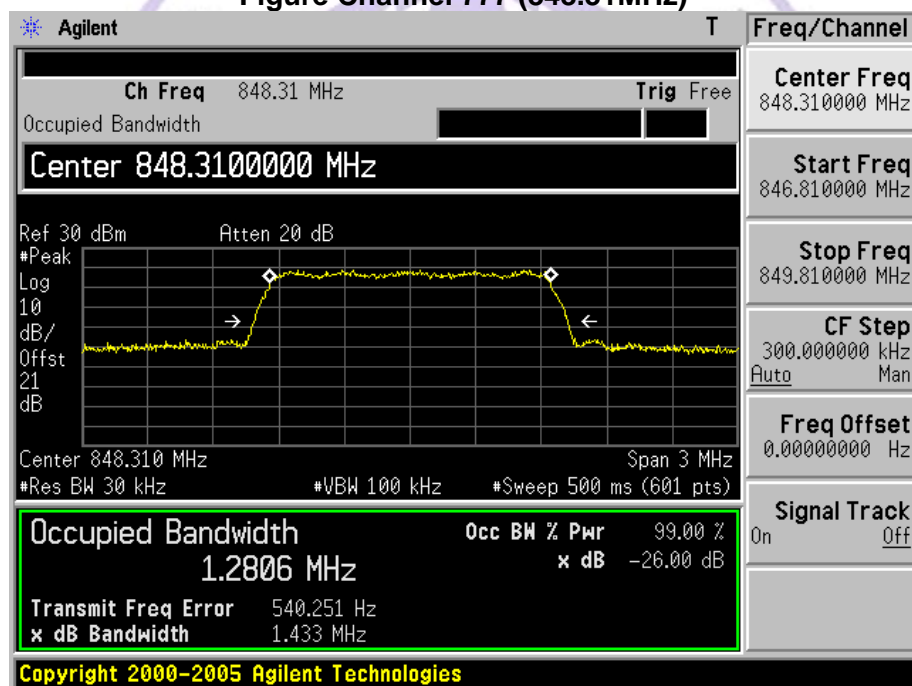


Figure Channel 777 (848.31MHz)



Product	CDMA2000 Mobile Phone
Test Item	Occupied Bandwidth
Test Mode	Mode 2: CDMA 2000 EVDO Rel-0 BC0 Link

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
1013	824.70	1419.0	1273.2
384	836.52	1427.0	1274.7
777	848.31	1419.0	1271.8

Figure Channel 1013 (824.70MHz)

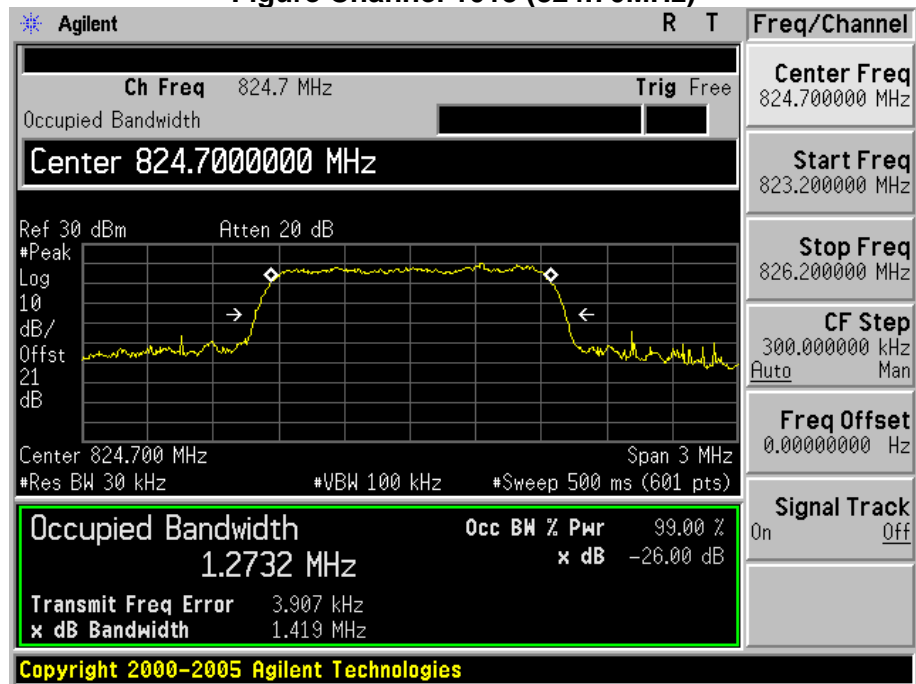


Figure Channel 384 (836.52MHz)

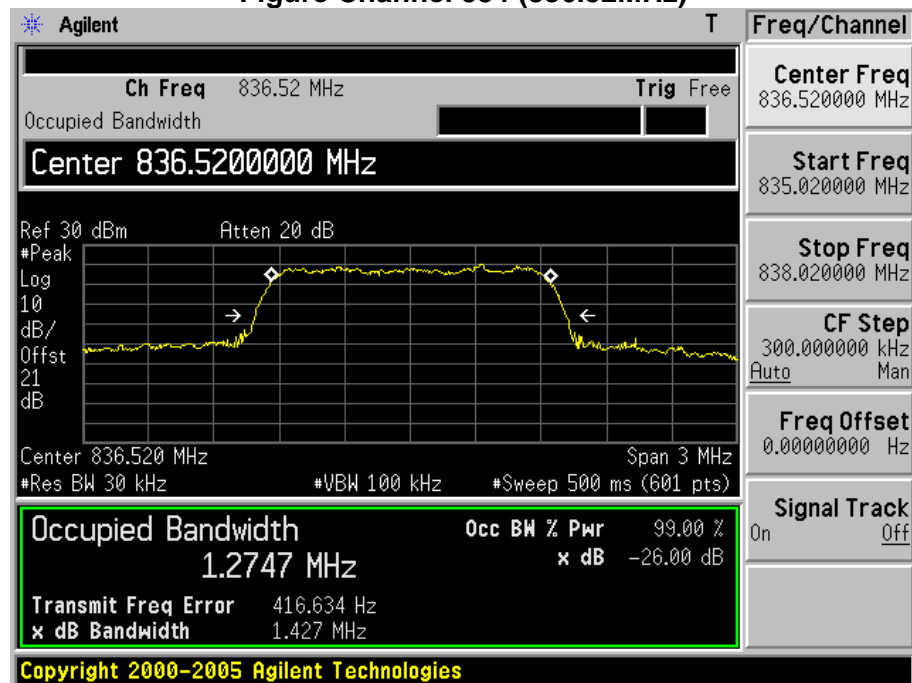
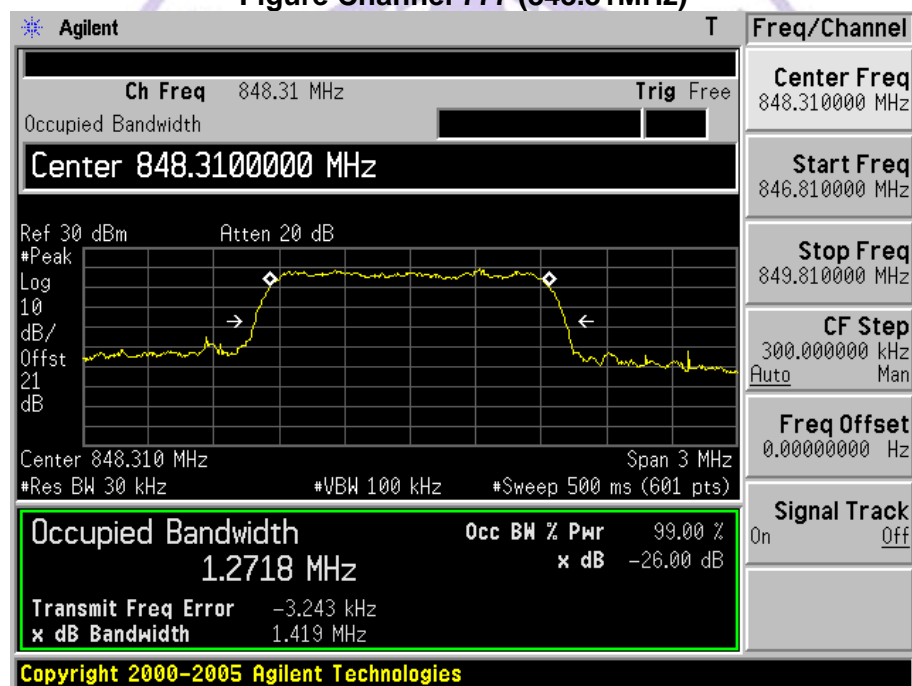


Figure Channel 777 (848.31MHz)





Product	CDMA2000 Mobile Phone
Test Item	Occupied Bandwidth
Test Mode	Mode 3 :CDMA 2000 EVDO Rel-A BC0 Link

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
1013	824.70	1420.0	1273.3
384	836.52	1430.0	1275.0
777	848.31	1424.0	1270.9

Figure Channel 1013 (824.70MHz)

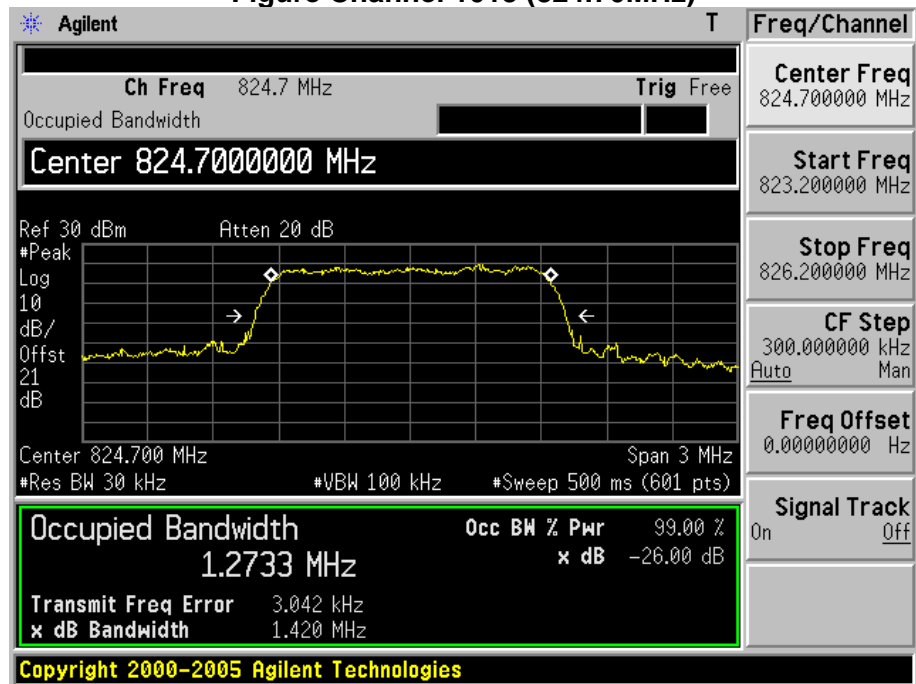


Figure Channel 384 (836.52MHz)

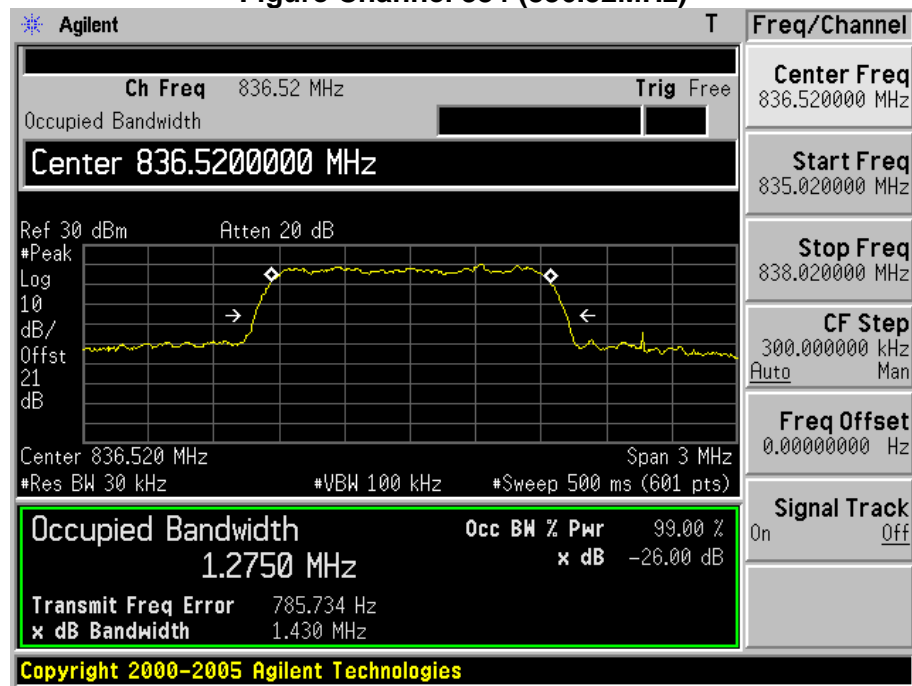
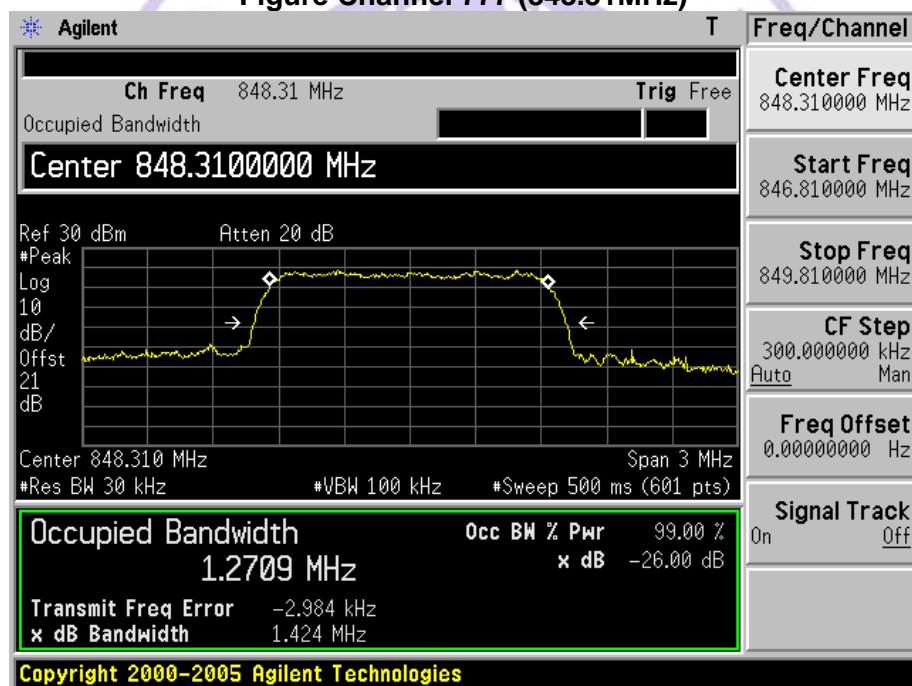
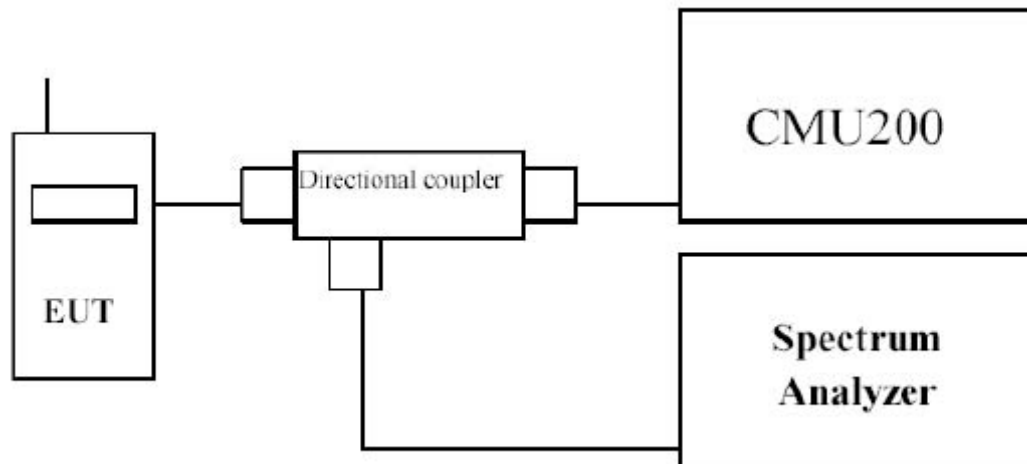


Figure Channel 777 (848.31MHz)



### 4.3. Spurious Emission At Antenna Terminals (+/- 1MHz)

#### TEST CONFIGURATION



#### TEST PROCEDURE

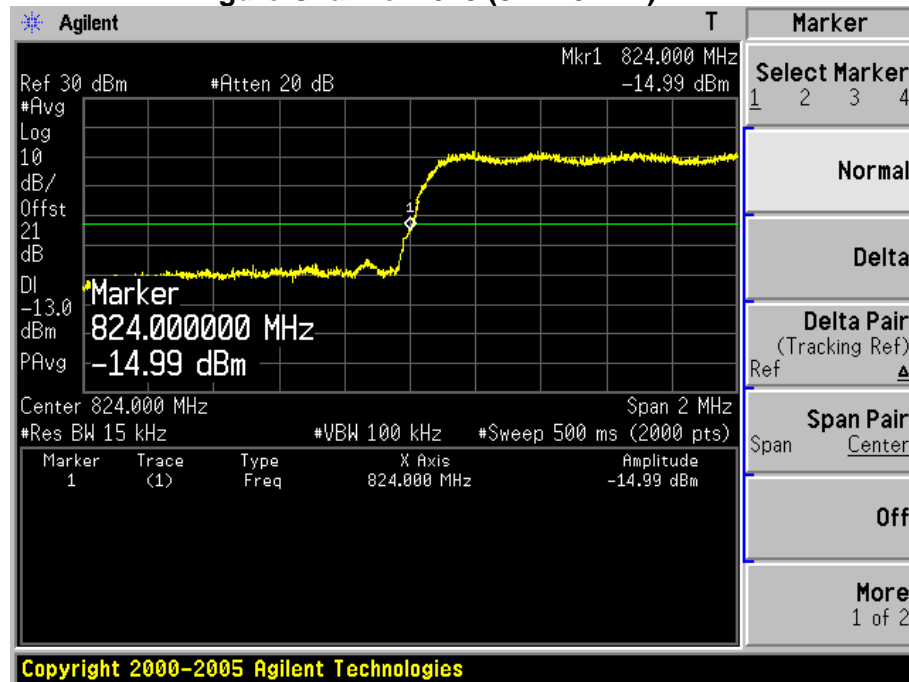
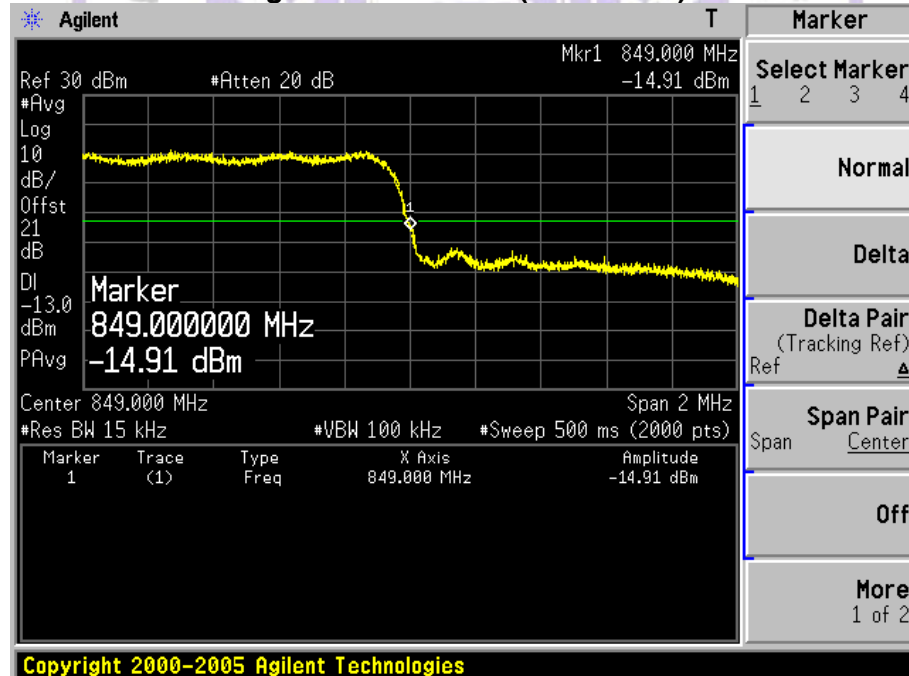
In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.

#### LIMIT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10\log(P)$  dB.

**TEST RESULTS**

Product	CDMA2000 Mobile Phone
Test Item	Spurious Emission At Antenna Terminals (+/- 1MHz)
Test Mode	Mode 1: CDMA 2000 1x RTT BC0 Link

**Figure Channel 1013 (824.70MHz)****Figure Channel 777 (848.31MHz)**

Product	CDMA 2000 Mobile Phone
Test Item	Spurious Emission At Antenna Terminals (+/- 1MHz)
Test Mode	Mode 2: CDMA 2000 EVDO Rel 0 BC0 Link

Figure Channel 1013 (824.70MHz)

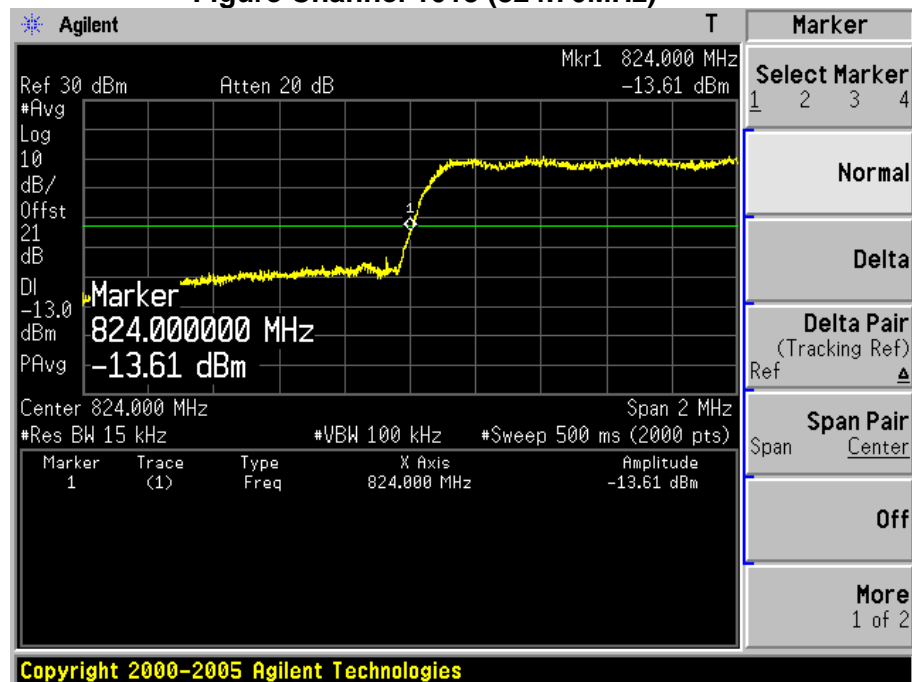
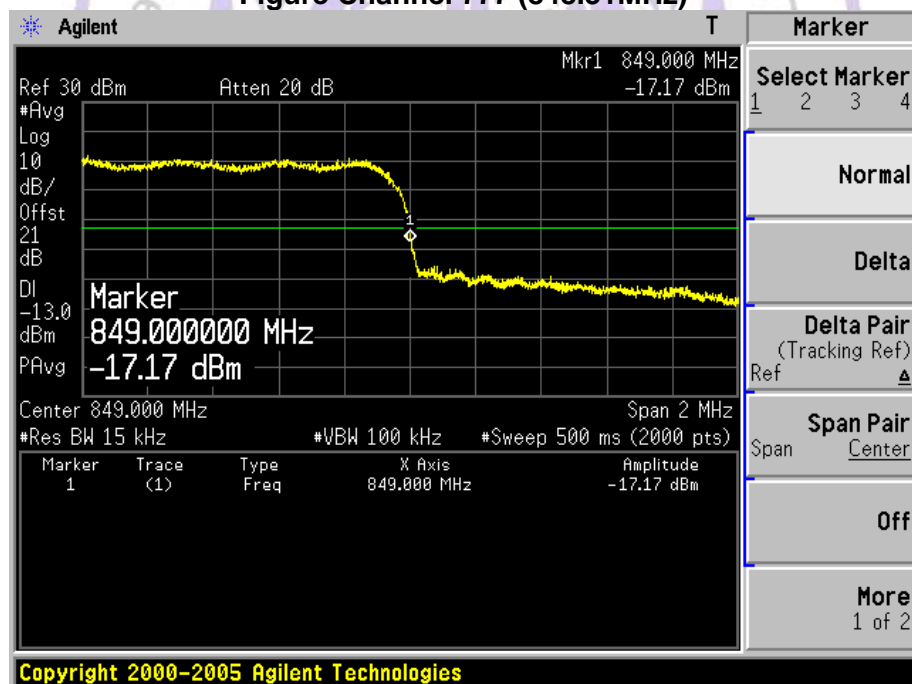


Figure Channel 777 (848.31MHz)



Product	CDMA 2000 Mobile Phone
Test Item	Spurious Emission At Antenna Terminals (+/- 1MHz)
Test Mode	Mode 3: CDMA 2000 EVDO Rel A BC0 Link

Figure Channel 1013 (824.70MHz)

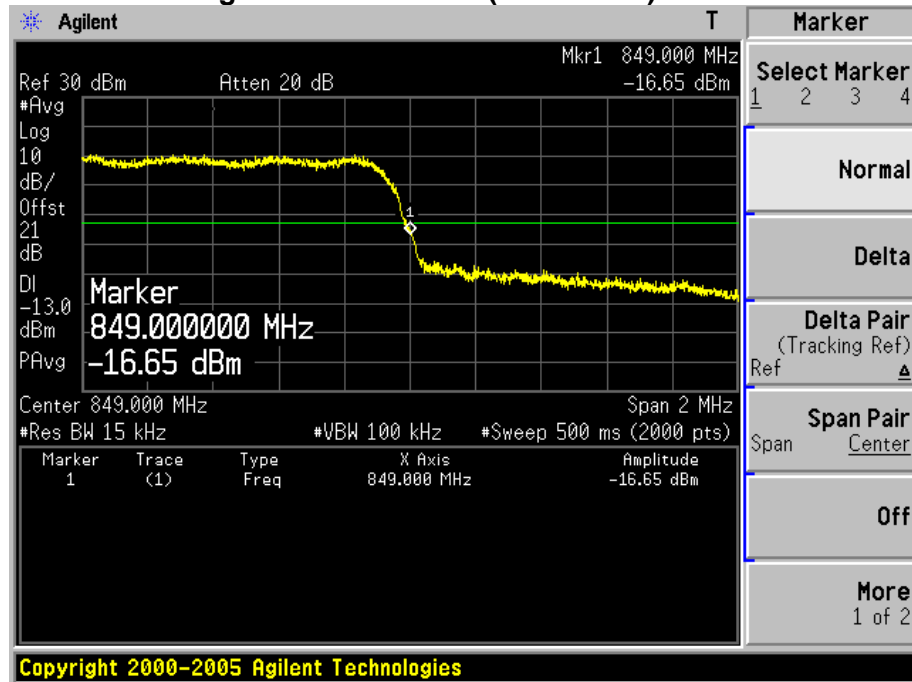
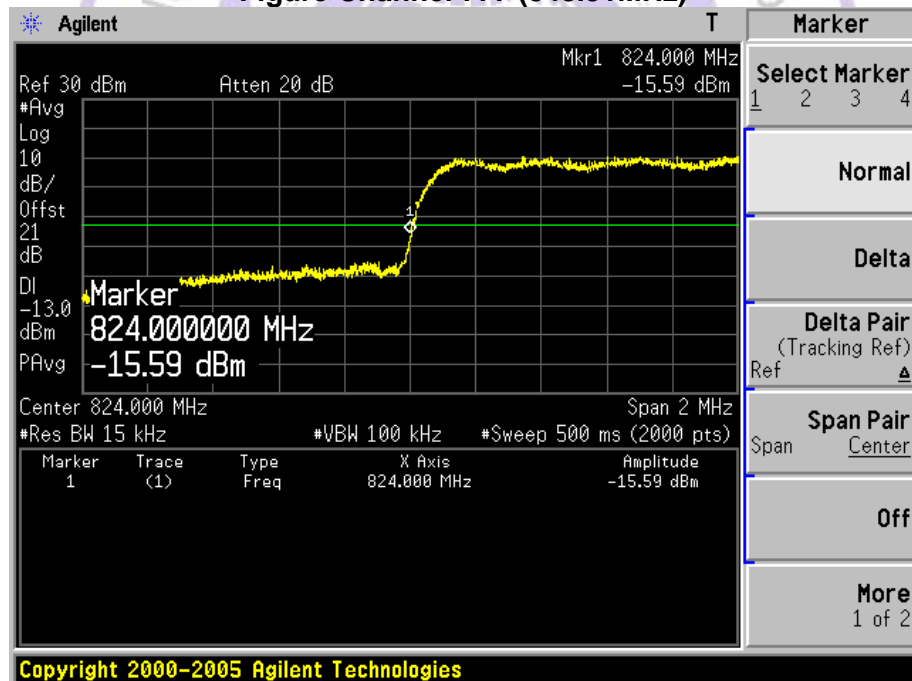


Figure Channel 777 (848.31MHz)

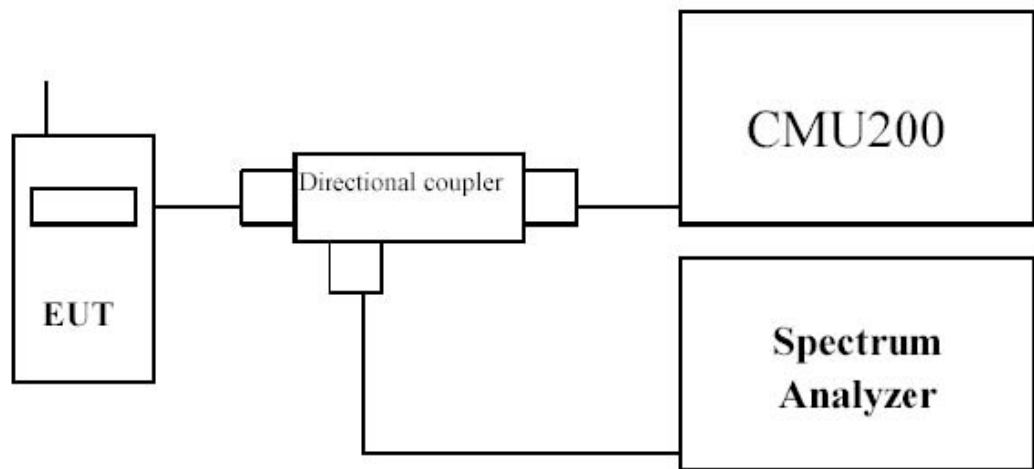




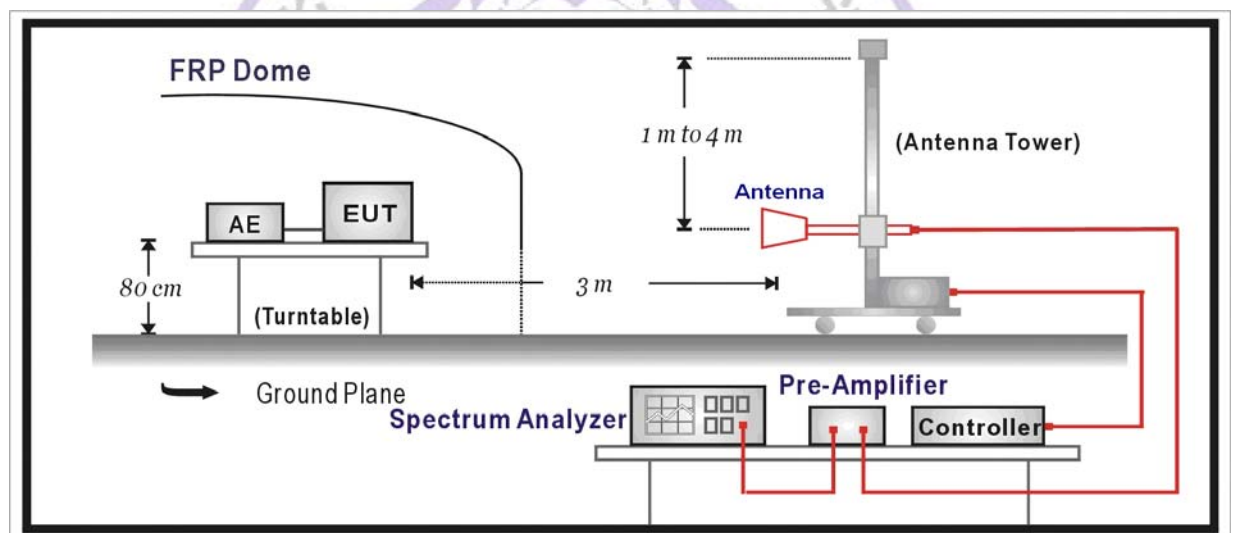
## 4.4. Spurious Emission

### TEST CONFIGURATION

Conducted Spurious Measurement:



Radiated Spurious Measurement:



### TEST PROCEDURE

The EUT was setup according to EIA/TIA 603C

#### **Conducted Spurious Measurement:**

- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMU200 by a Directional Couple.
- EUT Communicate with CMU200, then select a channel for testing.
- Add a correction factor to the display of spectrum, and then test.
- The resolution bandwidth of the spectrum analyzer was set at 100 kHz for Part 22 and 1MHz for Part 24, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic.

**Radiated Spurious Measurement:**

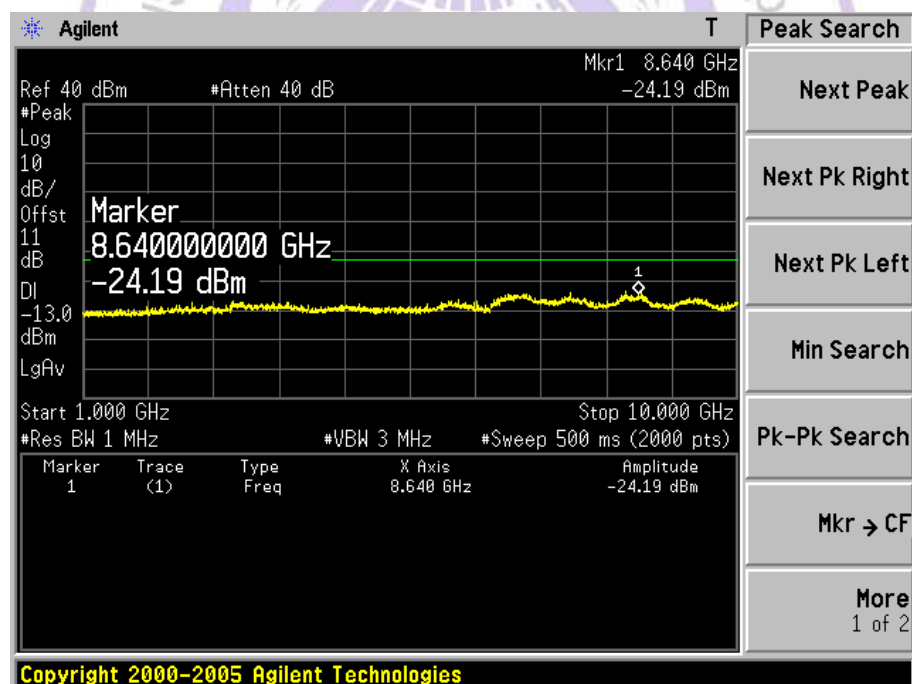
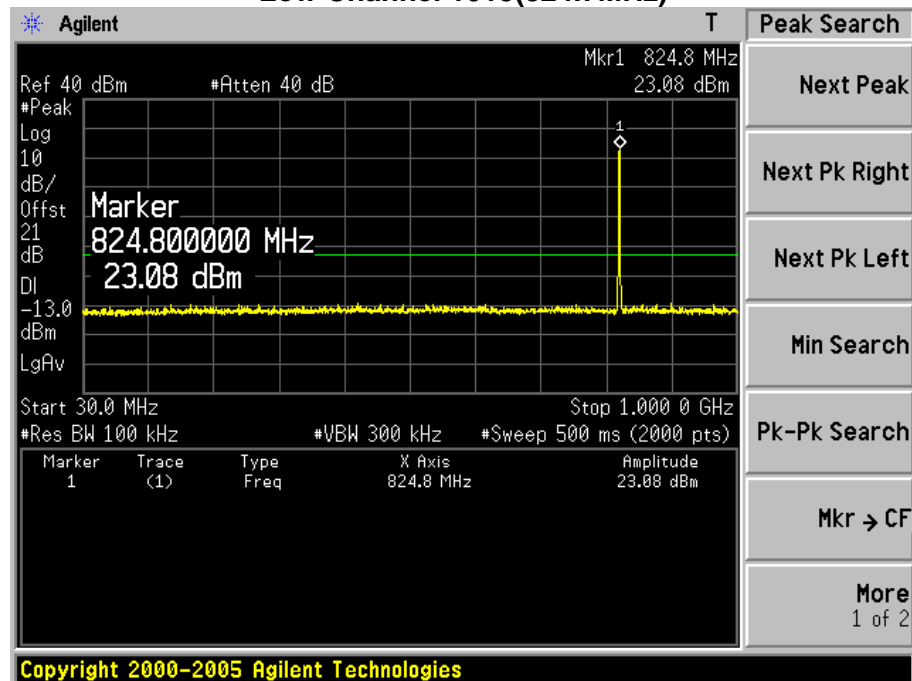
- a) The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- b) The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
- c) The output of the test antenna shall be connected to the measuring receiver.
- d) The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
- e) The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- f) The transmitter shall then be rotated through  $360^\circ$  in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- g) The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- q) The maximum signal level detected by the measuring receiver shall be noted.
- h) The transmitter shall be replaced by a substitution antenna.
- i) The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- j) The substitution antenna shall be connected to a calibrated signal generator.
- k) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- l) The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
- m) The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
- n) The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
- o) The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
- p) The resolution bandwidth of the spectrum analyzer was set at 100 kHz for Part 22 and 1MHz for Part 24. The frequency range was checked up to 10th harmonic.
- q) Test site anechoic chamber refer to ANSI C63.4: 2009

**LIMIT**

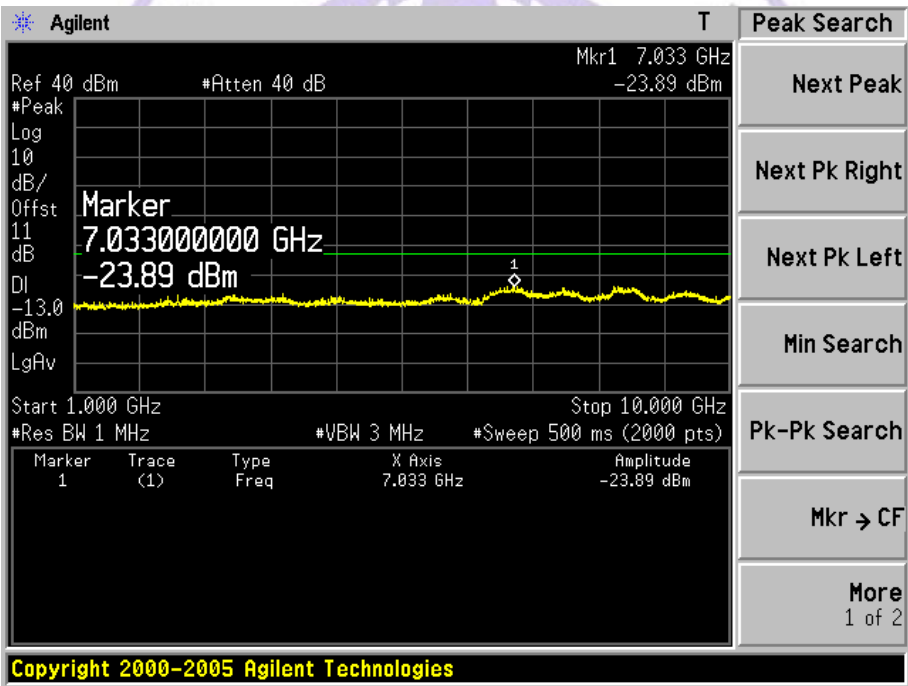
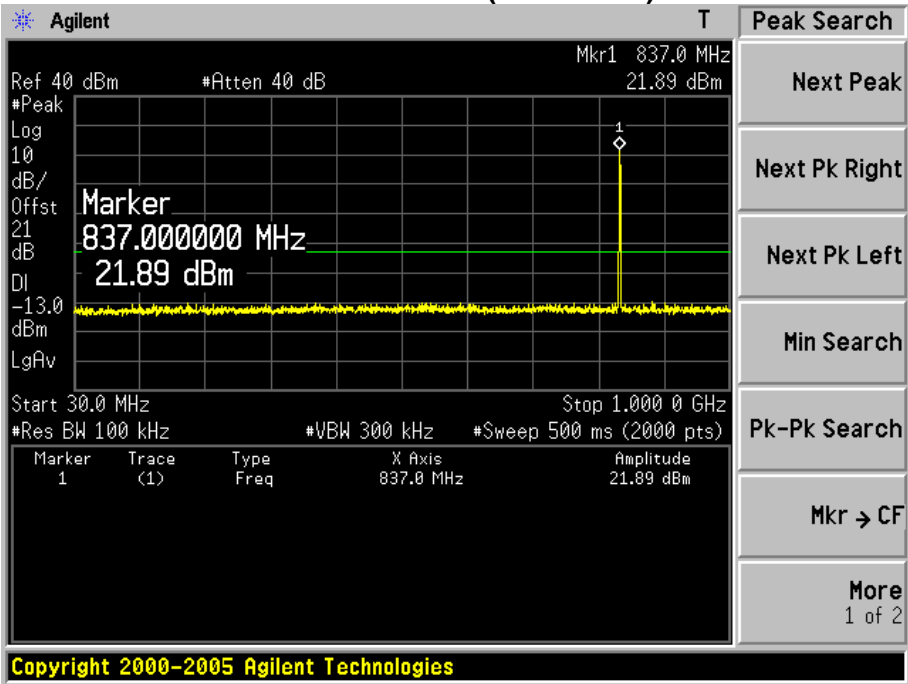
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10\log(P)$  dB.

**TEST RESULTS**

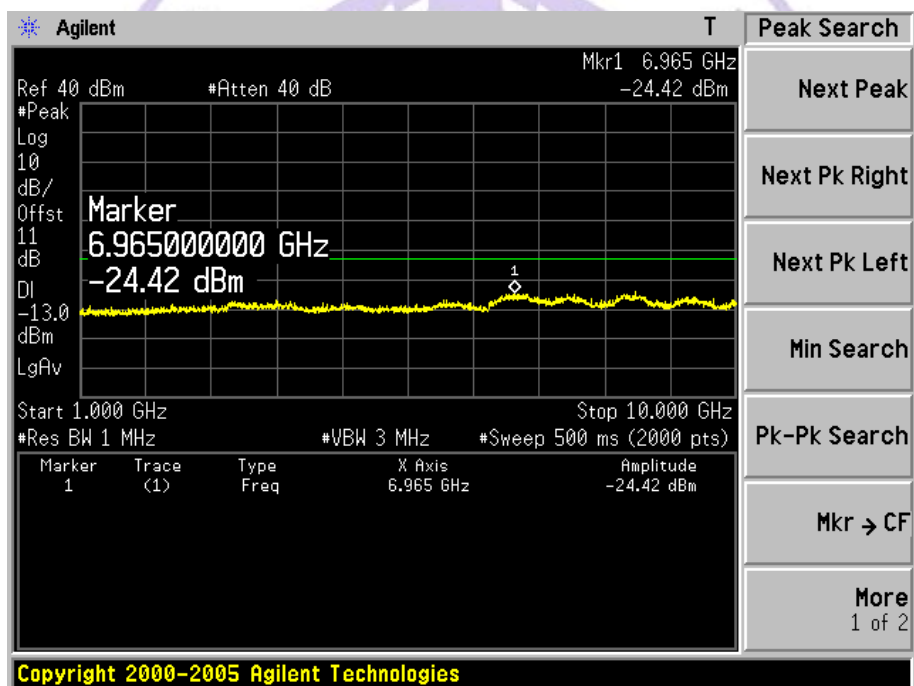
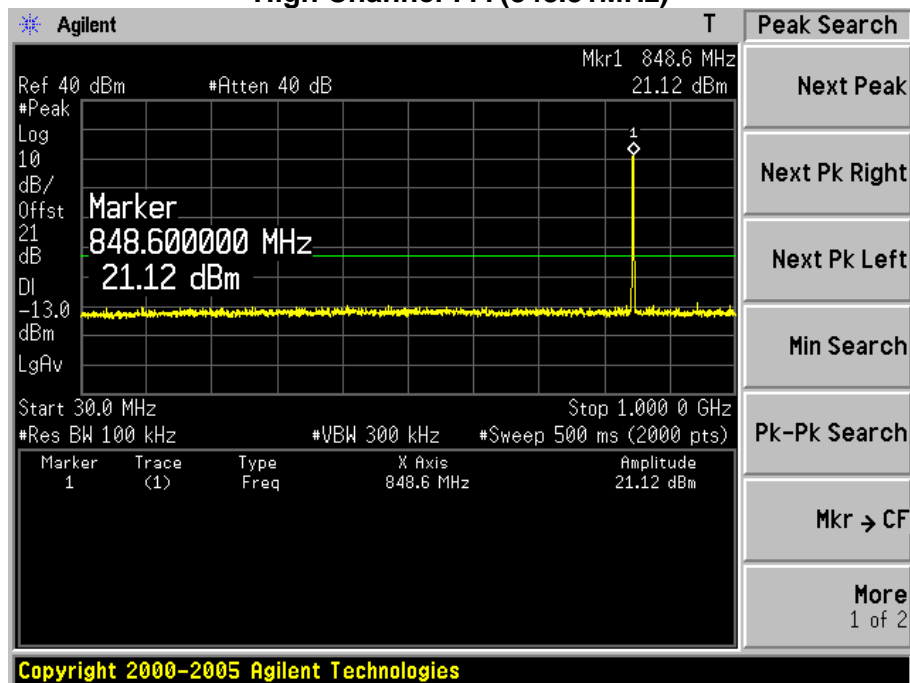
Product	CDMA2000 Mobile Phone
Test Item	Conducted Spurious Emission
Test Mode	Mode 1: CDMA 2000 1x RTT BC0 Link

**Low Channel 1013(824.7MHz)**

Mid Channel 384(836.52MHz)

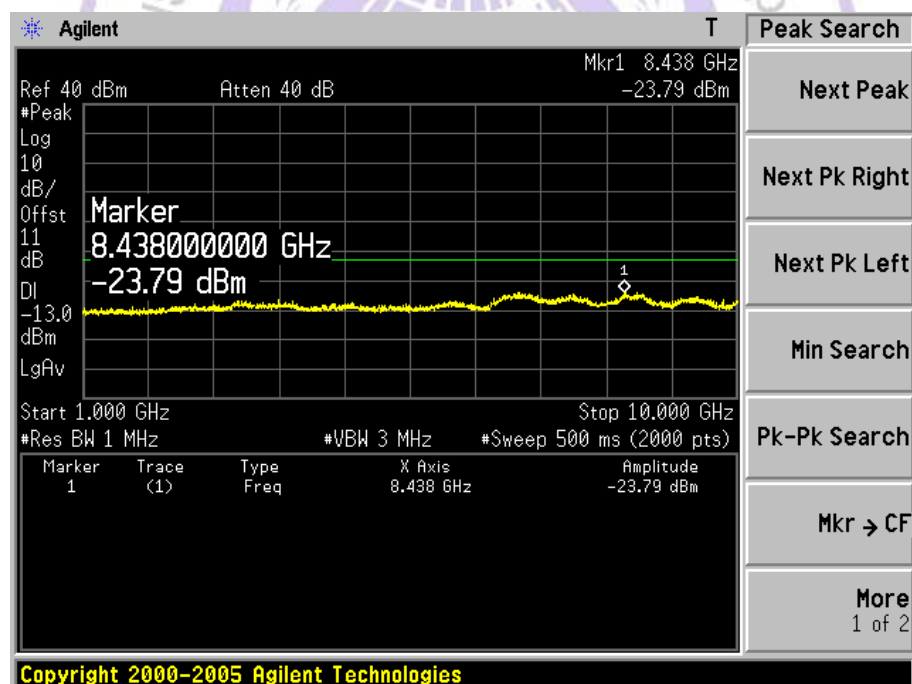
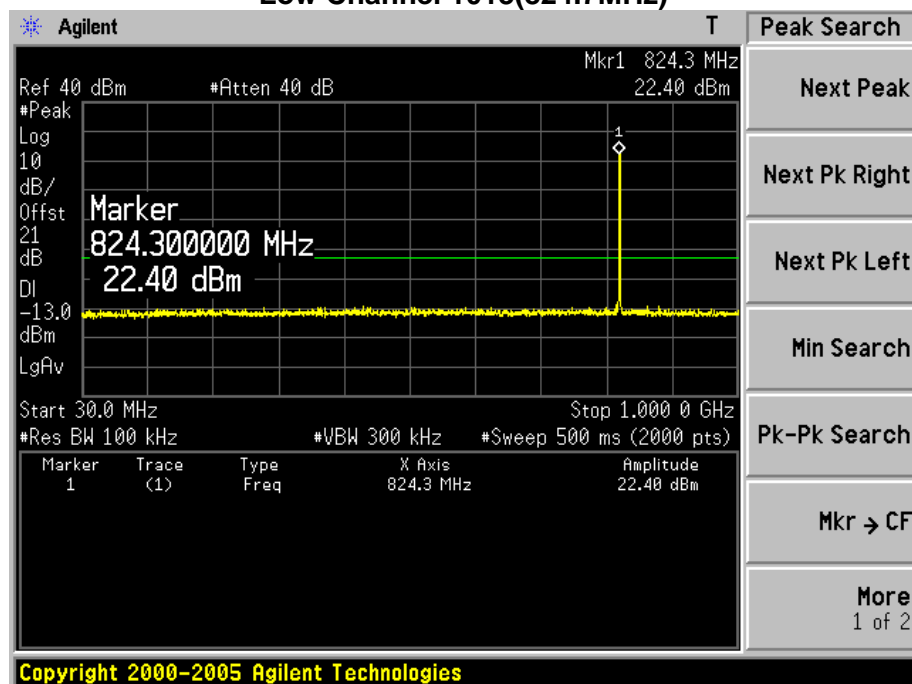


## High Channel 777(848.31MHz)



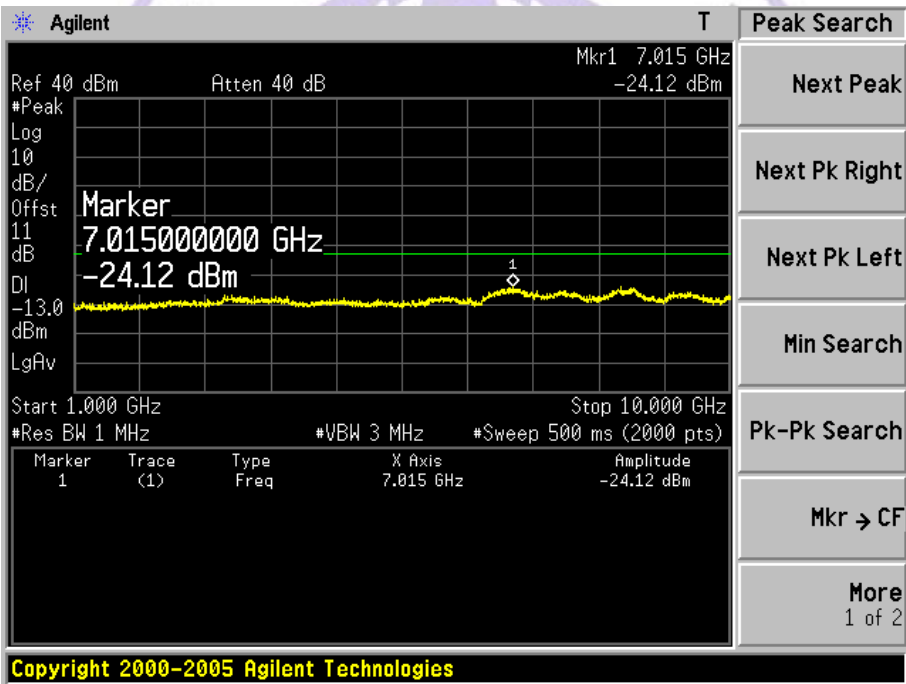
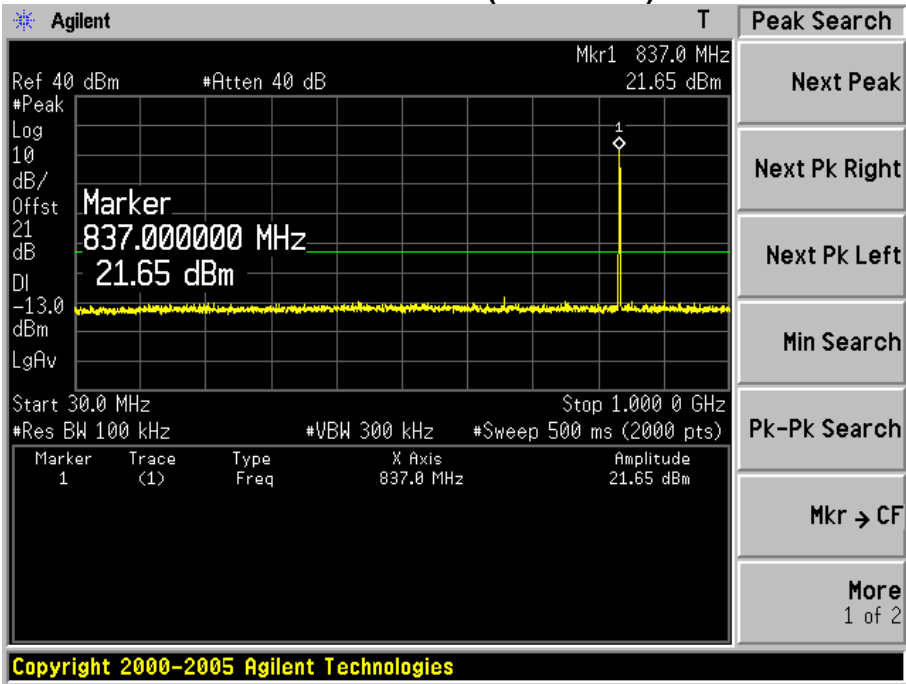
Product	CDMA 2000 Mobile Phone
Test Item	Conducted Spurious Emission
Test Mode	Mode 2: CDMA 2000 EVDO Rel-0 BC0 Link

### Low Channel 1013(824.7MHz)

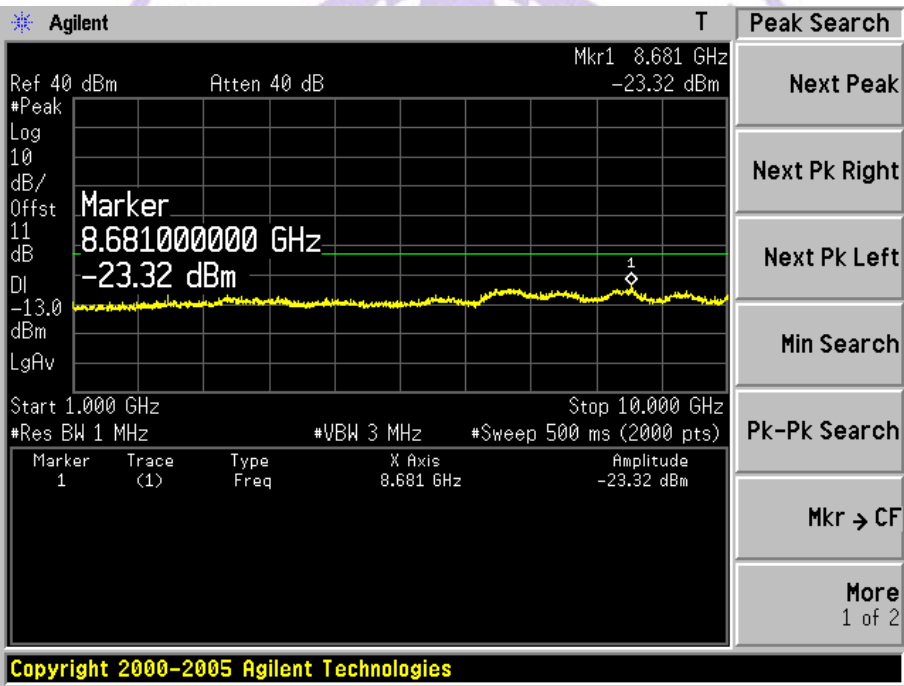
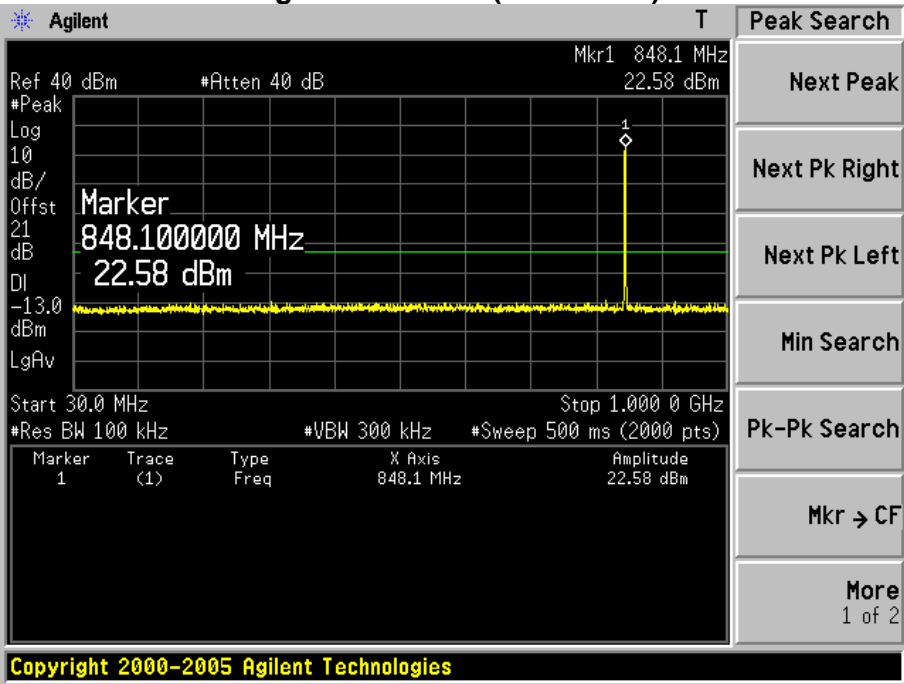




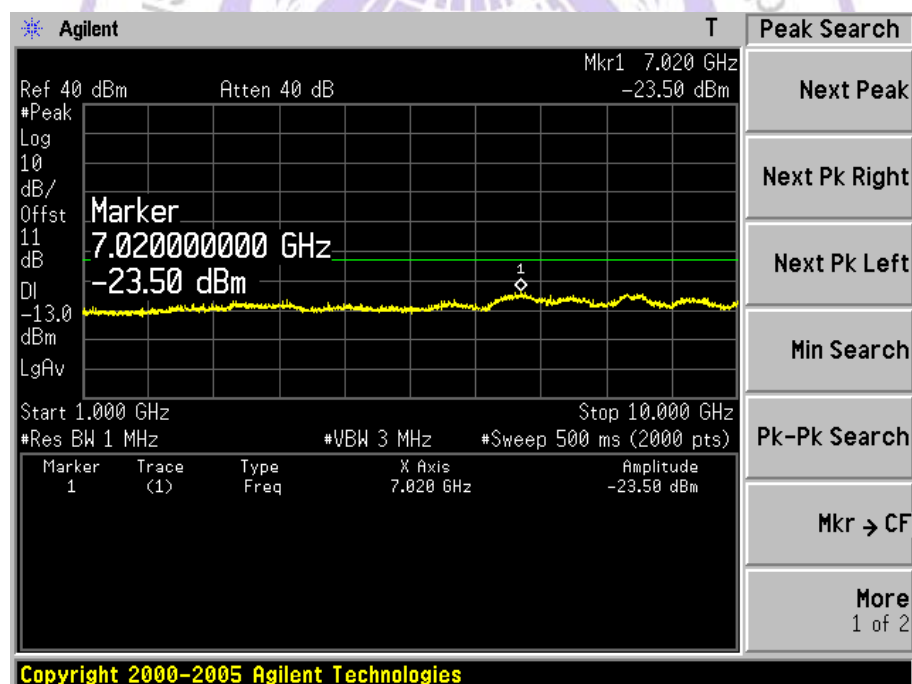
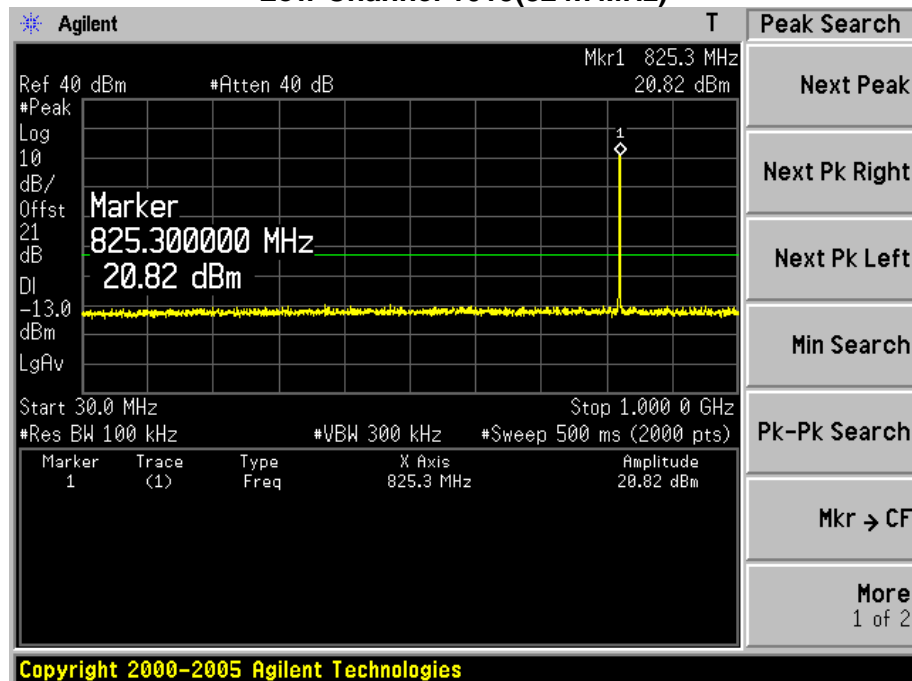
Mid Channel 384(836.52MHz)



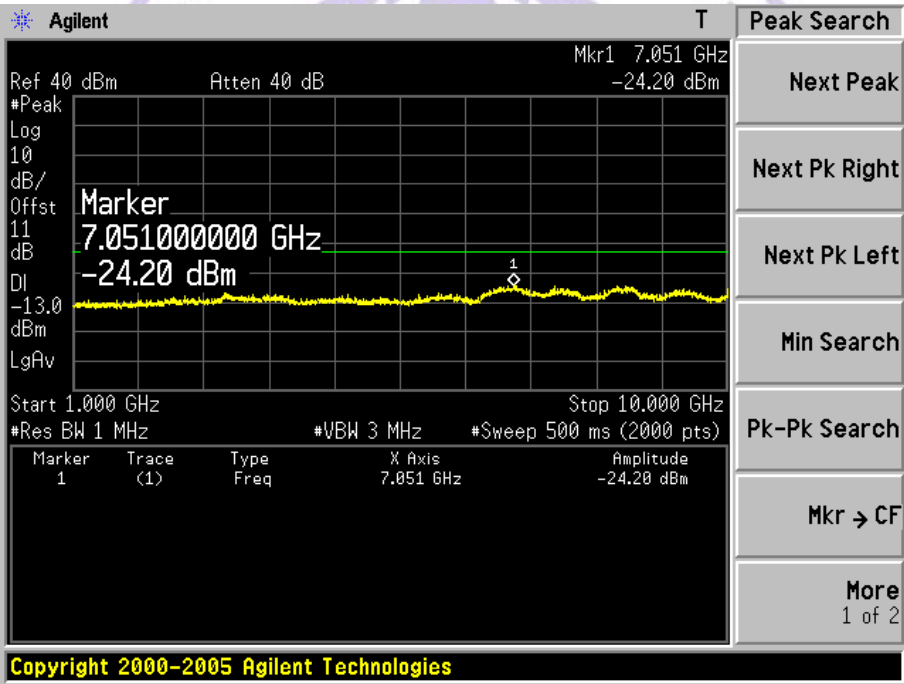
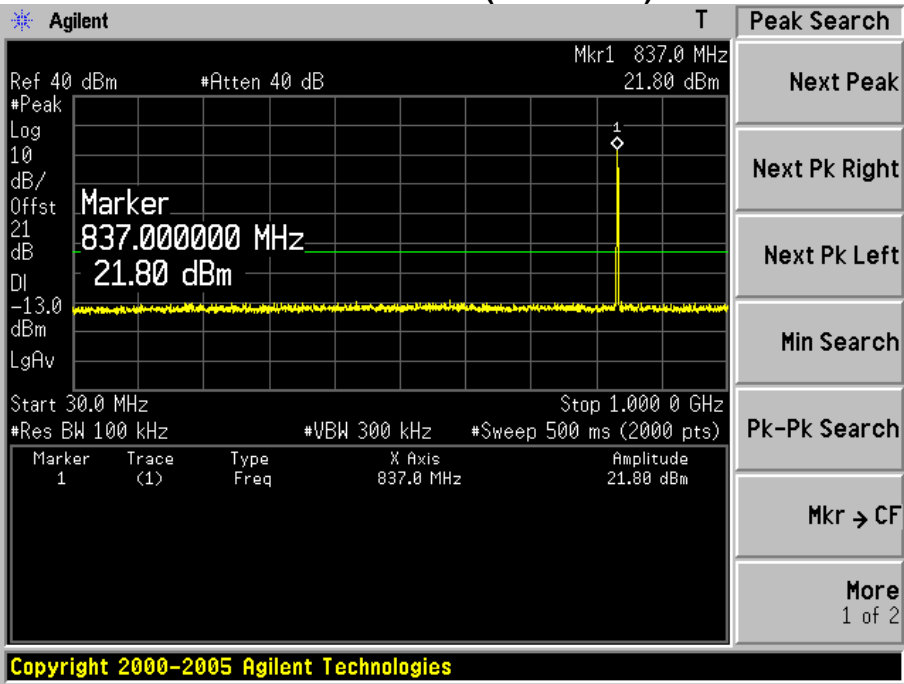
High Channel 777(848.31MHz)



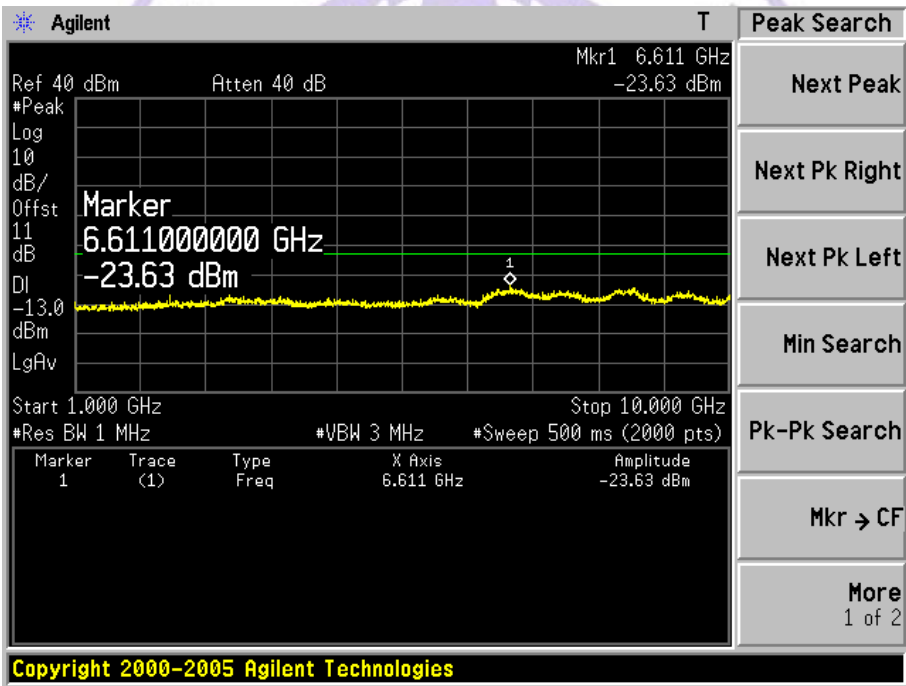
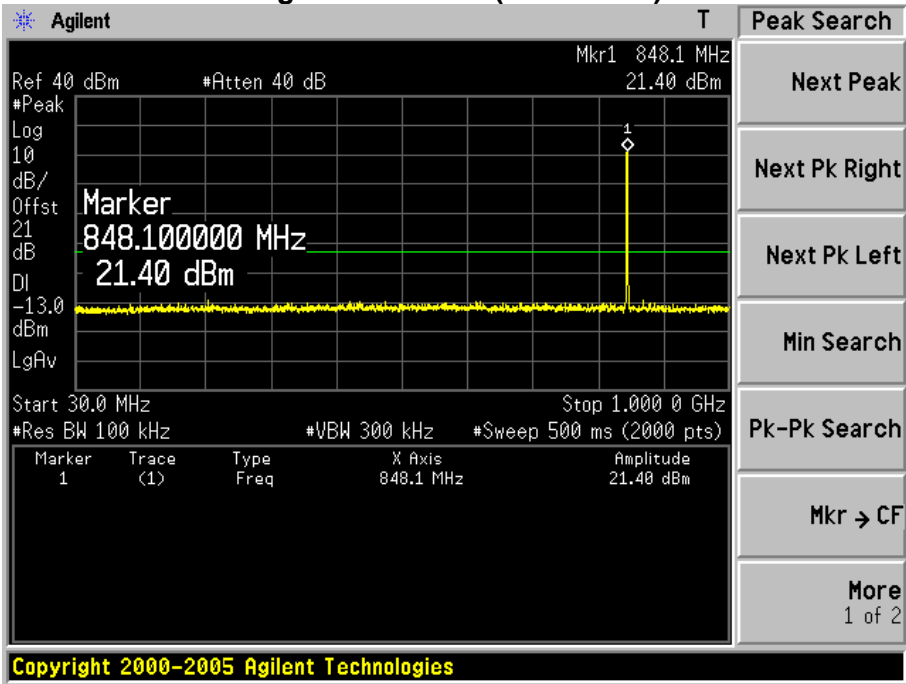
Product	CDMA 2000 Mobile Phone
Test Item	Conducted Spurious Emission
Test Mode	Mode 3: CDMA 2000 EVDO Rel-A BC0 Link

**Low Channel 1013(824.7MHz)**

Mid Channel 384(836.52MHz)



High Channel 777(848.31MHz)



Product	CDMA2000 Mobile Phone
Test Item	Radiated Spurious Emission
Test Mode	Mode 1: CDMA 2000 1x RTT BC0 Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 1013 (824.70MHz)								
1649.40	-61.25	V	-63.82	2.50	9.78	-56.54	-13.00	-43.54
2474.10	-63.93	V	-63.04	3.12	10.49	-55.67	-13.00	-42.67
1649.40	-60.58	H	-63.23	2.50	9.78	-55.95	-13.00	-42.95
2474.10	-63.06	H	-61.99	3.12	10.49	-54.62	-13.00	-41.62
Middle Channel 384 (836.52MHz)								
1672.64	-61.94	V	-64.60	2.51	9.94	-57.17	-13.00	-44.17
2508.96	-59.02	V	-58.33	3.18	10.61	-50.90	-13.00	-37.90
1672.64	-62.83	H	-65.49	2.51	9.94	-58.06	-13.00	-45.06
2508.96	-62.39	H	-61.76	3.18	10.61	-54.33	-13.00	-41.33
High Channel 777 (848.31MHz)								
1696.62	-62.03	V	-64.82	2.53	10.10	-57.25	-13.00	-44.25
2544.93	-59.67	V	-59.06	3.15	10.67	-51.54	-13.00	-38.54
1696.62	-60.89	H	-62.96	2.53	10.10	-55.39	-13.00	-42.39
2544.93	-63.60	H	-61.79	3.15	10.67	-54.27	-13.00	-41.27

EIRP=SG Reading-Cable Loss+Gain



Product	CDMA 2000 Mobile Phone
Test Item	Radiated Spurious Emission
Test Mode	Mode 2: CDMA 2000 EVDO Rel-0 BC0 Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 1013 (824.70MHz)								
1649.40	-62.53	V	-65.11	2.50	9.78	-57.83	-13.00	-44.83
2474.10	-63.99	V	-63.10	3.12	10.49	-55.73	-13.00	-42.73
1649.40	-58.52	H	-61.21	2.50	9.78	-53.93	-13.00	-40.93
2474.10	-63.90	H	-62.83	3.12	10.49	-55.46	-13.00	-42.46
Middle Channel 384 (836.52MHz)								
1672.64	-59.03	V	-61.70	2.51	9.94	-54.27	-13.00	-41.27
2508.96	-60.57	V	-59.87	3.18	10.61	-52.44	-13.00	-39.44
1672.64	-58.90	H	-61.32	2.51	9.94	-53.89	-13.00	-40.89
2508.96	-62.75	H	-61.73	3.18	10.61	-54.30	-13.00	-41.30
High Channel 777 (848.31MHz)								
1696.62	-60.93	V	-63.71	2.53	10.10	-56.14	-13.00	-43.14
2544.93	-62.62	V	-61.09	3.15	10.67	-53.57	-13.00	-40.57
1696.62	-58.35	H	-60.40	2.53	10.10	-52.83	-13.00	-39.83
2544.93	-63.57	H	-61.78	3.15	10.67	-54.26	-13.00	-41.26

EIRP=SG Reading-Cable Loss+Gain



Product	CDMA 2000 Mobile Phone
Test Item	Radiated Spurious Emission
Test Mode	Mode 3: CDMA 2000 EVDO Rel-A BC0 Link

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Low Channel 1013 (824.70MHz)								
1649.40	-60.05	V	-62.65	2.50	9.78	-55.37	-13.00	-42.37
2474.10	-64.10	V	-63.22	3.12	10.49	-55.85	-13.00	-42.85
1649.40	-58.59	H	-61.16	2.50	9.78	-53.88	-13.00	-40.88
2474.10	-64.00	H	-62.94	3.12	10.49	-55.57	-13.00	-42.57
Middle Channel 384 (836.52MHz)								
1672.64	-60.57	V	-63.24	2.51	9.94	-55.81	-13.00	-42.81
2508.96	-61.93	V	-61.30	3.18	10.61	-53.87	-13.00	-40.87
1672.64	-57.64	H	-60.06	2.51	9.94	-52.63	-13.00	-39.63
2508.96	-63.19	H	-62.16	3.18	10.61	-54.73	-13.00	-41.73
High Channel 777 (848.31MHz)								
1696.62	-61.84	V	-64.63	2.53	10.10	-57.06	-13.00	-44.06
2544.93	-63.66	V	-62.13	3.15	10.67	-54.61	-13.00	-41.61
1696.62	-59.51	H	-61.57	2.53	10.10	-54.00	-13.00	-41.00
2544.93	-63.07	H	-61.28	3.15	10.67	-53.76	-13.00	-40.76

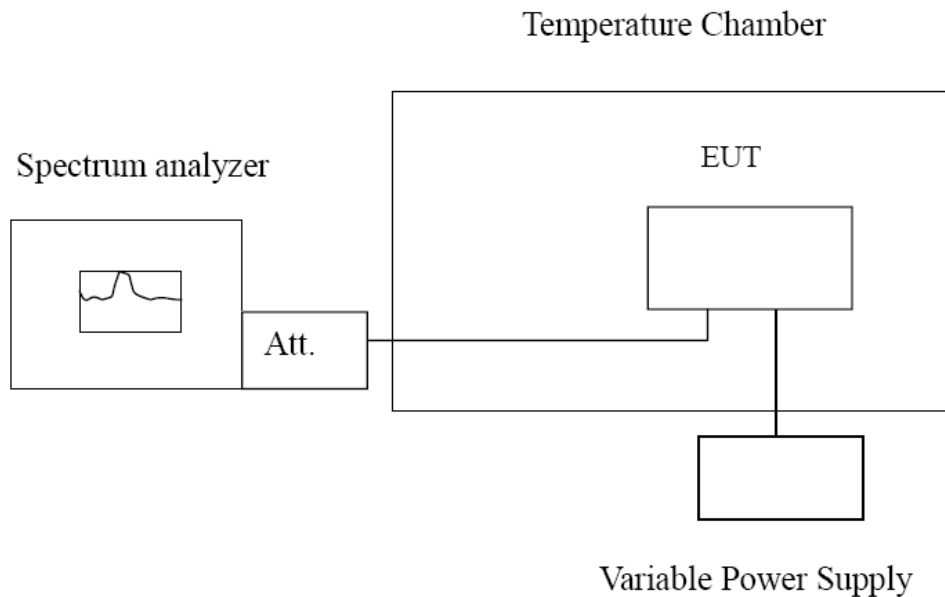
EIRP=SG Reading-Cable Loss+Gain





## 4.5. Frequency Stability under Temperature & Voltage Variations

### TEST CONFIGURATION



### TEST PROCEDURE

The EUT was setup according to EIA/TIA 603C

#### **Frequency Stability Under Temperature Variations:**

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 20°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.

#### **Frequency Stability Under Voltage Variations:**

Set chamber temperature to 20°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 specify extreme voltage variation ( $\pm 15\%$ ) and endpoint, record the maximum frequency change.

### LIMIT

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Limit <  $\pm 2.5$  ppm

**TEST RESULTS**

Product	CDMA2000 Mobile Phone
Test Item	Frequency Stability Under Temperature & Voltage Variations
Test Mode	Mode 1: CDMA 2000 1x RTT BC0 Link

## Frequency Stability under Temperature

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	836.52	26	± 2091.3
-20	836.52	39	± 2091.3
-10	836.52	28	± 2091.3
0	836.52	77	± 2091.3
10	836.52	-36	± 2091.3
20	836.52	-33	± 2091.3
30	836.52	-32	± 2091.3
40	836.52	45	± 2091.3
50	836.52	-27	± 2091.3

## Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
4.200	836.52	-33	± 2091.3
3.700	836.52	-14	± 2091.3
3.500	836.52	-25	± 2091.3

Product	CDMA2000 Mobile Phone
Test Item	Frequency Stability Under Temperature & Voltage Variations
Test Mode	Mode 2: CDMA 2000 EVDO Rel-0 BC0 Link

## Frequency Stability under Temperature

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	836.52	39	± 2091.3
-20	836.52	-12	± 2091.3
-10	836.52	31	± 2091.3
0	836.52	28	± 2091.3
10	836.52	26	± 2091.3
20	836.52	57	± 2091.3
30	836.52	-62	± 2091.3
40	836.52	39	± 2091.3
50	836.52	-44	± 2091.3

## Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
4.200	836.52	-23	± 2091.3
3.700	836.52	16	± 2091.3
3.500	836.52	39	± 2091.3

Product	CDMA2000 Mobile Phone
Test Item	Frequency Stability Under Temperature & Voltage Variations
Test Mode	Mode 3: CDMA 2000 EVDO Rel-A BC0 Link

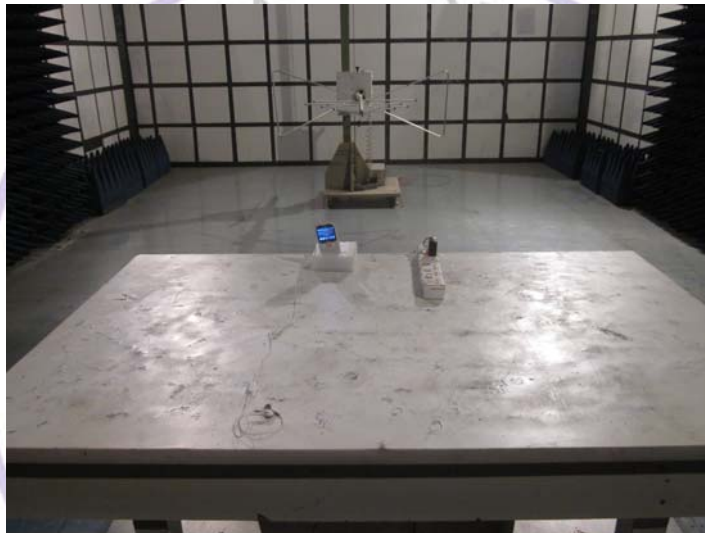
## Frequency Stability under Temperature

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	836.52	-39	± 2091.3
-20	836.52	26	± 2091.3
-10	836.52	11	± 2091.3
0	836.52	-55	± 2091.3
10	836.52	28	± 2091.3
20	836.52	-30	± 2091.3
30	836.52	-22	± 2091.3
40	836.52	-16	± 2091.3
50	836.52	-72	± 2091.3

## Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
4.200	836.52	63	± 2091.3
3.700	836.52	-58	± 2091.3
3.500	836.52	-46	± 2091.3

## 5. Test Setup Photos of the EUT





## 6. External and Internal Photos of the EUT

### External Photos of EUT

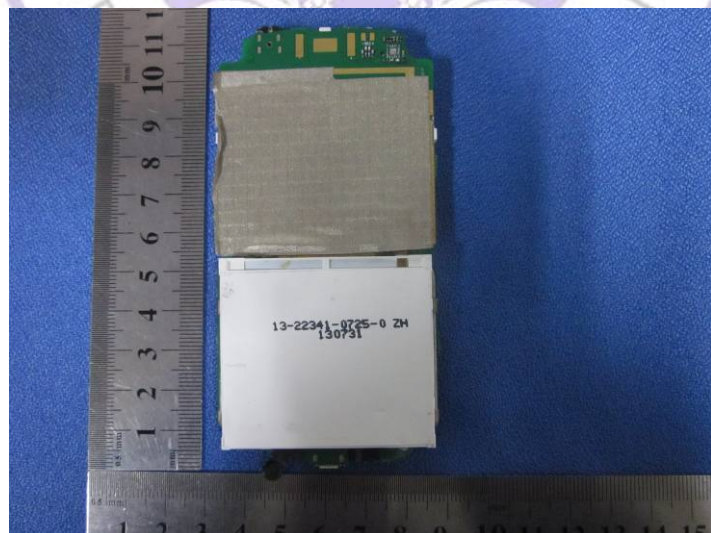
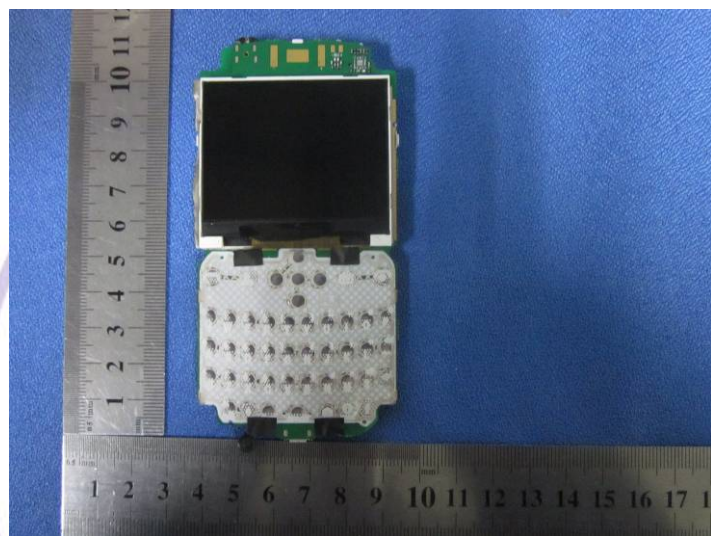




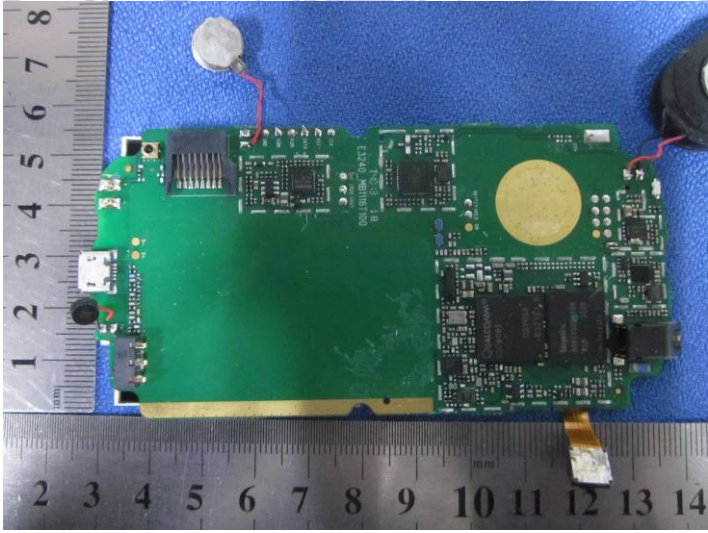
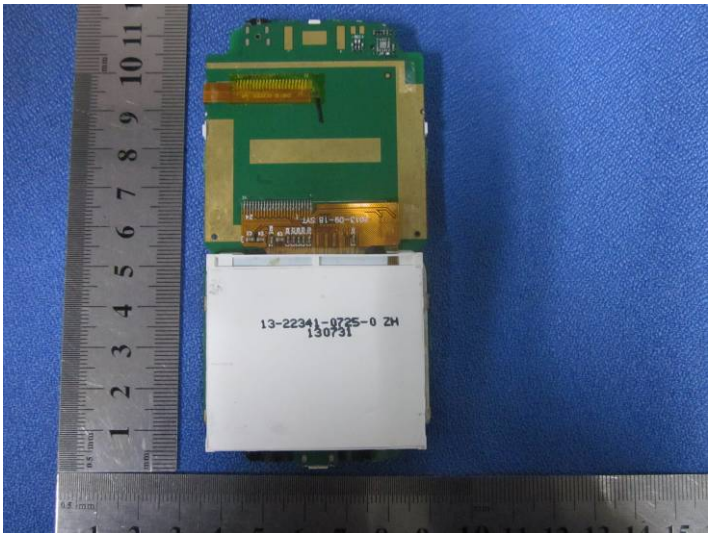


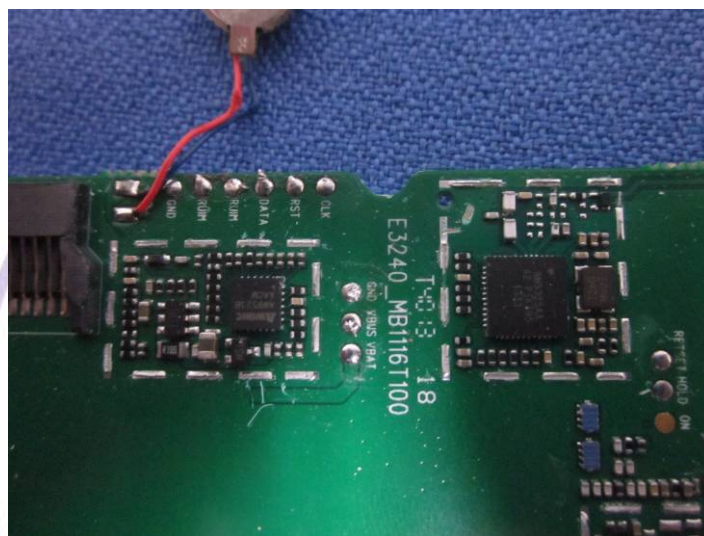


Internal Photos of EUT









.....End of Report.....