



FCC Part22H Test Report

Product Name : CDMA 1X Mobile Phone

Model No. : HUAWEI CM651

FCC ID : QISCM651

Applicant : HUAWEI TECHNOLOGIES CO., LTD.

Address : Bantian, Longgang District, Shenzhen, 518129
Guangdong, P. R. China

Date of Receipt : 21/02/2012

Test Date : 26/02/2012~27/02/2012

Issued Date : 01/03/2012

Report No. : 122S072R-HP-US-P07V01

Report Version : V 2.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF, NIST or any agency of the Government.

The test report shall not be reproduced except in full without the written approval of QueTek Corporation.

Test Report Certification

Issued Date : 01/03/2012

Report No. : 122S072R-HP-US-P07V01



Product Name : CDMA 1X Mobile Phone

Applicant : HUAWEI TECHNOLOGIES CO., LTD.

Address : Bantian, Longgang District, Shenzhen, 518129 Guangdong, P.
R. China

Manufacturer : HUAWEI TECHNOLOGIES CO., LTD.

Address : Bantian, Longgang District, Shenzhen, 518129 Guangdong, P.
R. China

Model No. : HUAWEI CM651

FCC ID : QISCM651

EUT Voltage : DC 3.7V

Brand Name : HUAWEI

Applicable Standard : FCC CFR Title 47 Part 2, TIA/EIA 603-C
FCC Part22 Subpart H

Test Result : Complied

Performed Location : Suzhou EMC Laboratory
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TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Registration Number: 800392

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(Engineering Manager: Marlin Chen)

Laboratory Information

We, **Quietek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	:	BSMI, NCC, TAF
Germany	:	TUV Rheinland
Norway	:	Nemko, DNV
USA	:	FCC, NVLAP
Japan	:	VCCI

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site : <http://www.quietek.com/tw/ctg/cts/accreditations.htm>
The address and introduction of Quietek Corporation's laboratories can be founded in our Web site : <http://www.quietek.com/>

If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

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No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen, Lin-Kou Shiang, Taipei, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com



Suzhou (China) Testing Laboratory :

No. 99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., Suzhou,China.
TEL : +86-512-6251-5088 / FAX : +86-512-6251-5098 E-Mail : service@quietek.com

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1. General Information

1.1. EUT Description

Product Name	CDMA 1X Mobile Phone
Model No.	HUAWEI CM651
Hardware Version	Ver.A
Software Version	CM651C03B103
Device Category	Portable
CDMA	
Support Band	CDMA2000 1X BC0
Uplink	824~849MHz
Downlink	869~894MHz
Antenna Type	Internal
Type of Modulation	QPSK
Peak Antenna Gain	2.5dBi
Bluetooth	
Bluetooth Frequency	2402~2480MHz
Bluetooth Version	V2.0
Type of modulation	FHSS
Data Rate	1Mbps(GFSK)
Antenna Gain	4.0dBi
Components	
Battery #1	Manufacturer: Harbin Coslight Power Co., Ltd. M/N: HB5D1 Rated Voltage and Capacitance: 3.7V/800mAh
Battery #2	Manufacturer: BYD M/N: HB5D1 Rated Voltage and Capacitance: 3.7V/800mAh
Adapter #1	Manufacturer: HKA M/N: HS-050040U6 Input: 100-240V~50/60Hz 0.2A Output: 5Vdc, 400mA
Adapter #2	Manufacturer: BYD M/N: HS-050040U6 Input: 100-240V~50/60Hz 0.2A Output: 5Vdc, 400mA

1.2. Mode of Operation

QuieTek 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
Mode 1: CDMA 2000 1X BC0 Link

Note:

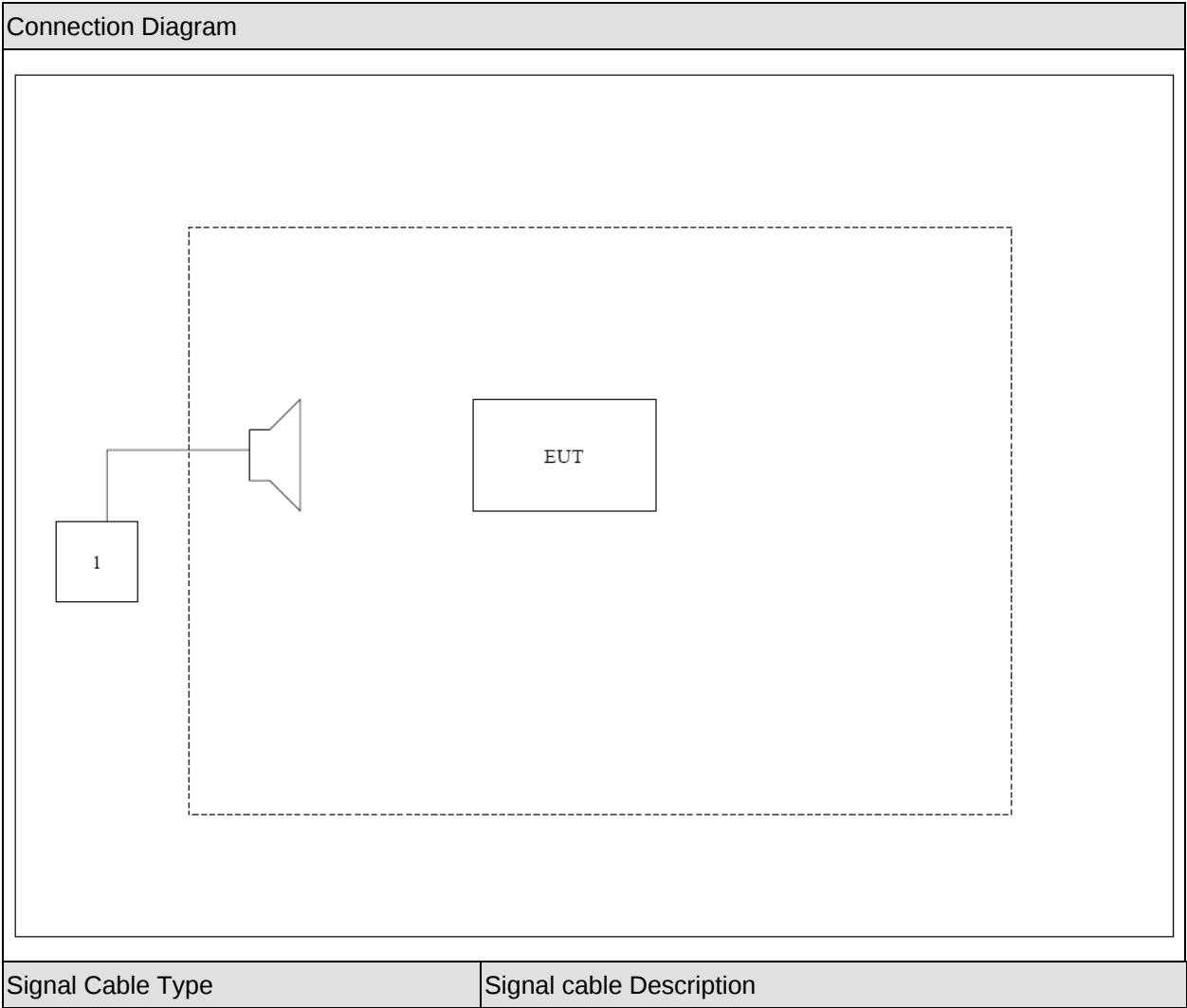
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. For the ERP/EIRP and radiated emission test, every axis (X, Y, Z) was verified, and show the worst result on this report.
3. This device is a composite device in accordance with Part 15 Subpart B regulations. The report number is 122S072R-HP-US-P01V02.

1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	CMU200	R&S	CMU200	N/A	N/A

1.4. Configuration of Tested System



1.5. 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.

2. Technical Test

2.1. Summary of Test Result

- ☒ No deviations from the test standards
☐ Deviations from the test standards as below description:

For CDMA 2000 1X BC0 (FCC Part 22H & Part 2)

Emission			
Performed Item	Normative References	Test Performed	Deviation
Peak Output Power	FCC Part 22.913(a)(2) and Part 2.1046	Yes	No
Modulation Characteristic	FCC Part 2.1047(d)	Yes	No
Occupied Bandwidth	FCC Part 2.1049	Yes	No
Spurious Emission At Antenna Terminals (+/- 1MHz)	FCC Part 22.917(a) and Part 2.1049	Yes	No
Spurious Emission	FCC Part 22.917(b) and Part 2.1051, 2.1053	Yes	No
Frequency Stability Under Temperature & Voltage Variations	FCC Part 22.355 and 2.1055	Yes	No

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	23
Humidity (%RH)	25-75	52
Barometric pressure (mbar)	860-1060	950-1000

3. Peak Output Power

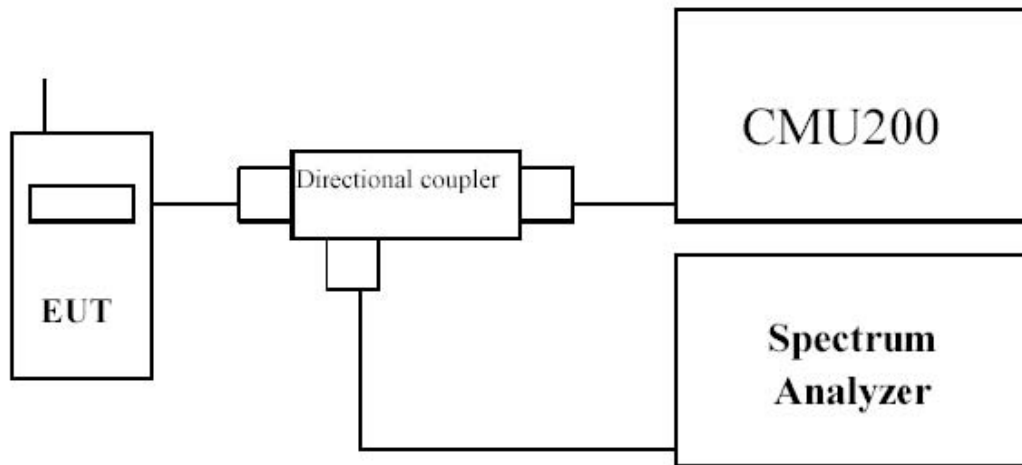
3.1. Test Equipment

Peak Output Power / AC-5

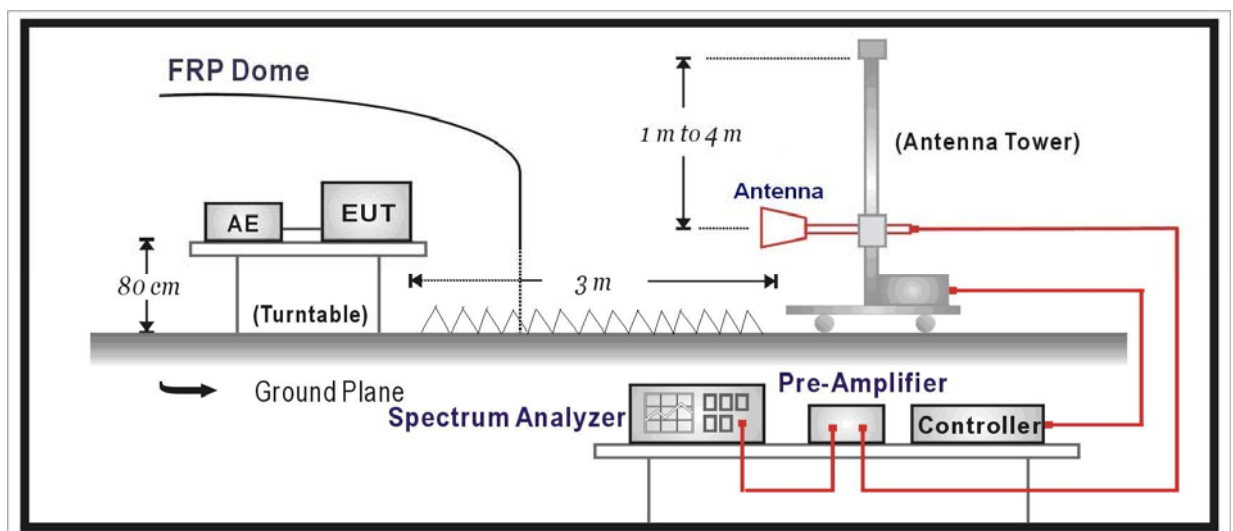
Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2012.04.10
Radio Communication Tester	R&S	CMU 200	117088	2012.04.29
Dual Directional Coupler	Agilent	778D	20160	2012.04.20
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2012.04.20
PSG Analog Signal Generator	Agilent	E8257D	MY44321116	2012.04.23
Preamplifier	QuieTek	AP-025C	CHM-0503006	2012.05.05
Preamplifier	Miteq	NSP1800-25	1364185	2012.05.05
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2012.10.18
Half Wave Tuned Dipole Antenna	COM-POWER	AD-100	40137	2013.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	737	2013.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2012.06.11
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2013.01.10

3.2. Test Setup

Conducted Power Measurement:



Radiated Power Measurement:



3.3. Limit

For FCC Part 22.913(a)(2):

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

3.4. Test Procedure

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.

- c) EUT Communicate with CMU200, then selects a channel for testing.
- d) Add a correction factor to the display of spectrum, and then test.

Radiated Power Measurement:

- e) The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- f) The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
- g) The output of the test antenna shall be connected to the measuring receiver.
- h) The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
- i) 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.
- j) The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- k) 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.
- l) The maximum signal level detected by the measuring receiver shall be noted.
- m) The transmitter shall be replaced by a substitution antenna.
- n) 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.
- o) The substitution antenna shall be connected to a calibrated signal generator.
- p) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- q) The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
- r) 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.
- s) The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
- t) 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.
- u) Test site anechoic chamber refer to ANSI C63.4: 2009.

Base station simulator settings for each test mode:

1. For 1xRTT

Use CDMA2000 Rev 6 protocol in R&S CMU200.

1) Test for Reverse/Forward TCH RC1, Reverse/Forward TCH RC2, and RC3 Reverse FCH and demodulation of RC 3, 4 and 5.

a. Set up a call using Fundamental Channel Test Mode 1 (RC1, SO 2) with 9600 bps data rate only.

b. As per C.S0011 or TIA/EIA-98-F Table 4.4.5.2-1, set the test parameters as shown in Table 4-1.

c. Send continuously '0' power control bits to the Gobi2000 Module.

d. Measure the output power at Gobi2000 Module antenna connector as recorded on the power meter with values corrected for cables losses.

e. Repeat step b through d for Fundamental Channel Test Mode:

i. RC1, SO55

ii. RC2, SO9

iii. RC2, SO55

iv. RC3, SO55

2) Test for RC 3 Reverse FCH, RC3 Reverse SCH0 and demodulation of RC 3, 4 and 5.

a. Set up a call using Supplemental Channel Test Mode 3 (RC 3, SO 32) with 9600 bps Fundamental Channel and 9600 bps SCH0 data rate.

b. As per C.S0011 or TIA/EIA-98-F Table 4.4.5.2-2, set the test parameters as shown in Table 4-2.

c. Send alternating '0' and '1' power control bit to the Gobi2000 Module

d. Determine the active channel configuration. If the desired channel configuration is not the active channel configuration, increase $\hat{I}_{or}$ by 1 dB and repeat the verification. Repeat this step until the desired channel configuration becomes active.

e. Measure the output power at the Gobi2000 Module antenna connector.

f. Decrease $\hat{I}_{or}$ by 0.5 dB.

g. Determine the active channel configuration. If the active channel configuration is the desired channel configuration, measure the output power at the Gobi2000 Module antenna connector.

h. Repeat step f and g until the output power no longer increases or the desired channel configuration is no longer active. Record the highest output power achieved with the desired channel configuration active.

i. Repeat step a through h ten times and average the result.

Table 4-1 Parameters for Max. Power with a single traffic code channel, SR1

Parameter	Units	Value
$\hat{I}_{or}$	dBm/1.23 MHz	-104
(Pilot Ec) / I_{or}	dB	-7
(Traffic Ec) / I_{or}	dB	-7.4

Table 4-2 Parameters for Max. Power with multiple traffic code channel, SR1

Parameter	Units	Value
(Pilot Ec) / I_{or}	dB	-7
(Traffic Ec) / I_{or}	dB	-7.4

3.5. Uncertainty

The measurement uncertainty is defined as for Conducted Power Measurement ± 1.2 dB,
for Radiated Power Measurement ± 3.2 dB

3.6. Test Result

CDMA2000 1x

Mode	Test Case			BC0 (850MHz) Channel					
				Conducted Power (dBm)			ERP (dBm)		
	Num.	FWD RC/TAP	REV RC/TAP	1013	384	777	1013	384	777
1x	1	RC1	RC1 (SO2)	24.35	24.12	24.32	---	---	---
	2	RC1	RC1 (SO55)	24.34	24.11	24.32	---	---	---
	3	RC2	RC2 (SO9)	24.32	24.15	24.30	---	---	---
	4	RC2	RC2 (SO55)	24.31	24.14	24.28	---	---	---
	5	RC3	RC3 (SO55)	24.43	24.20	23.35	24.72	24.03	25.00
	6	RC3	RC3 (SO32)	24.42	24.19	24.34	---	---	---

Radiated Measurement

CDMA 2000 1X BC0

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 (824.70MHz)								
824.70	14.08	H	17.17	2.56	-0.02	14.59	38.50	-23.91
824.70	23.46	V	27.30	2.56	-0.02	24.72	38.50	-13.78
Middle Channel 384 (836.52MHz)								
836.52	13.32	H	16.60	2.59	0.10	14.11	38.50	-24.39
836.52	22.37	V	26.52	2.59	0.10	24.03	38.50	-14.47
High Channel 777 (848.31MHz)								
848.31	11.03	H	14.33	2.54	0.13	11.92	38.50	-26.58
848.31	23.49	V	27.41	2.54	0.13	25.00	38.50	-13.50

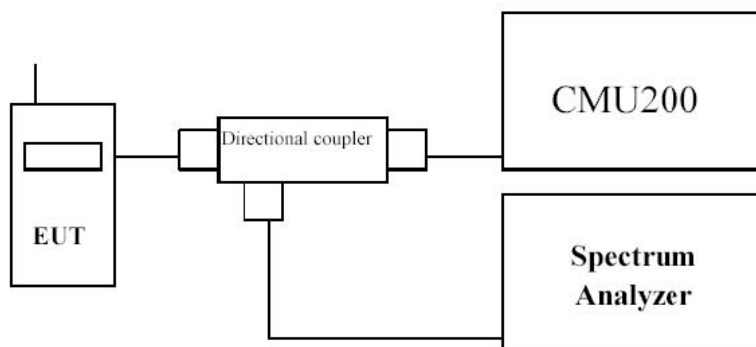
4. Modulation Characteristic

4.1. Test Equipment

Modulation Characteristic / AC-6

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2012.04.10
Radio Communication Tester	R&S	CMU 200	117088	2012.04.29
Dual Directional Coupler	Agilent	778D	20160	2012.04.20
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2012.04.20
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC6-TH	2013.01.10

4.2. Test Setup



4.3. Limit

N/A

4.4. Uncertainty

The measurement uncertainty is defined as 0.1%

4.5. Test Result

The modulation of CDMA was verified and confirmed compliance with requirement.

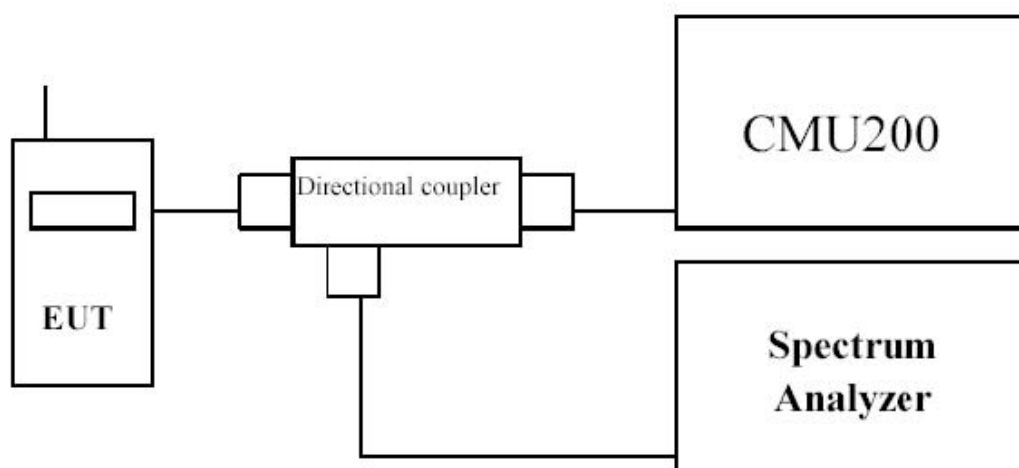
5. Occupied Bandwidth

5.1. Test Equipment

Occupied Bandwidth / AC-6

Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2012.04.10
Radio Communication Tester	R&S	CMU 200	117088	2012.04.29
Dual Directional Coupler	Agilent	778D	20160	2012.04.20
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2012.04.20
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC6-TH	2013.01.10

5.2. Test Setup



5.3. Limit

N/A

5.4. Test Procedure

Using Occupied Bandwidth measurement function of spectrum analyzer, and setting as follows:

For CDMA2000 1X BC0 test --- RBW = 30 kHz and VBW = 100 kHz

5.5. Uncertainty

The measurement uncertainty is defined as ± 10 Hz

5.6. Test Result

Product	CDMA 1X Mobile Phone		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: CDMA 2000 1X BC0 Link		
Date of Test	2012/02/27	Test Site	AC-6

Channel No.	Frequency (MHz)	-26dB Occupied Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
1013	824.70	1412	1270.5
384	836.52	1420	1269.0
777	848.31	1424	1275.7

Figure Channel 1013 (824.70MHz)

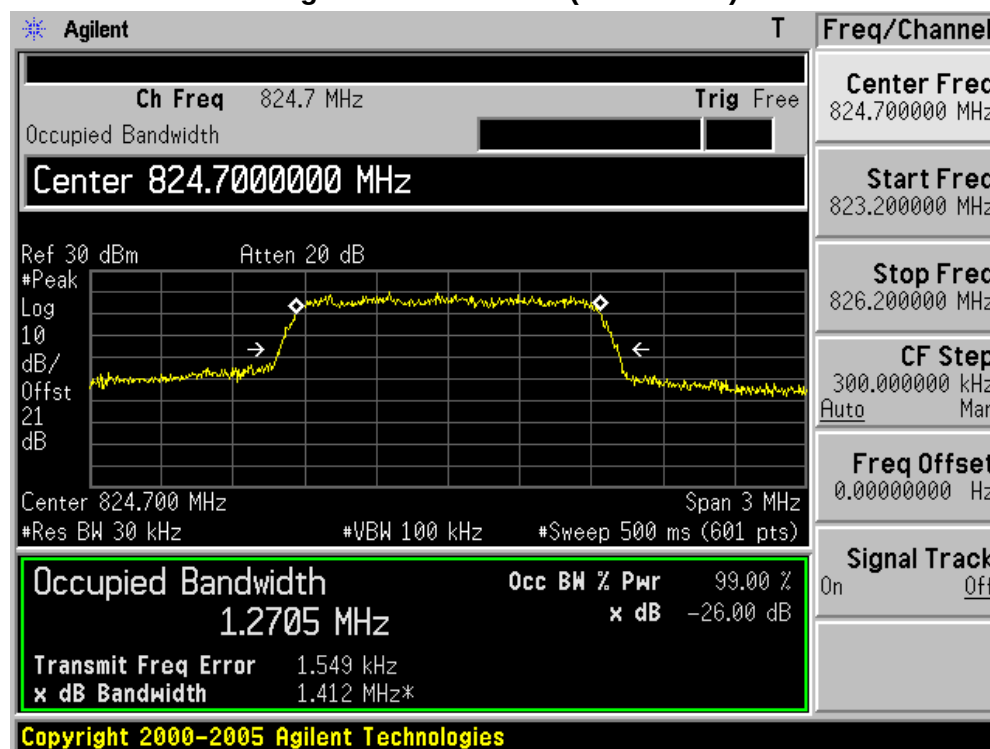


Figure Channel 384 (836.52MHz)

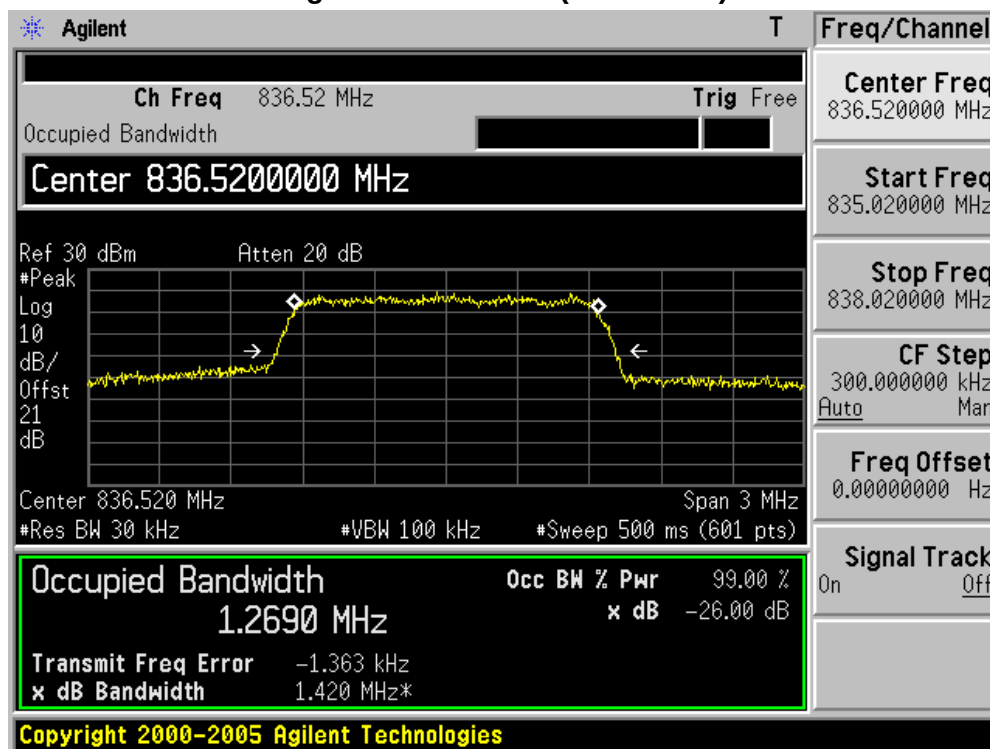
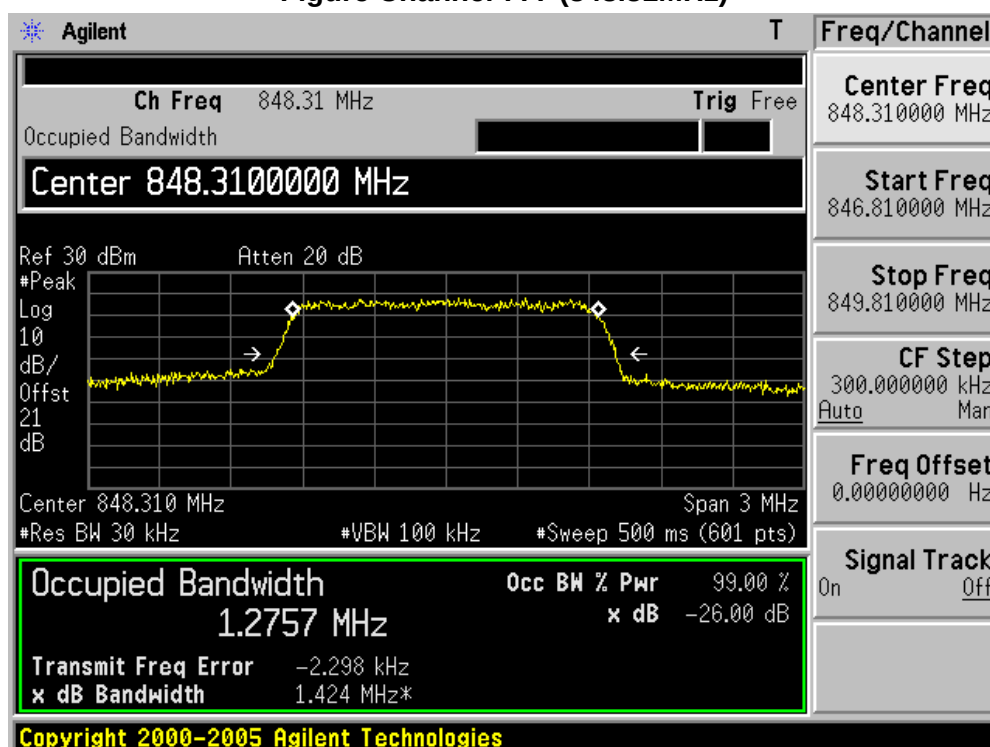


Figure Channel 777 (848.31MHz)



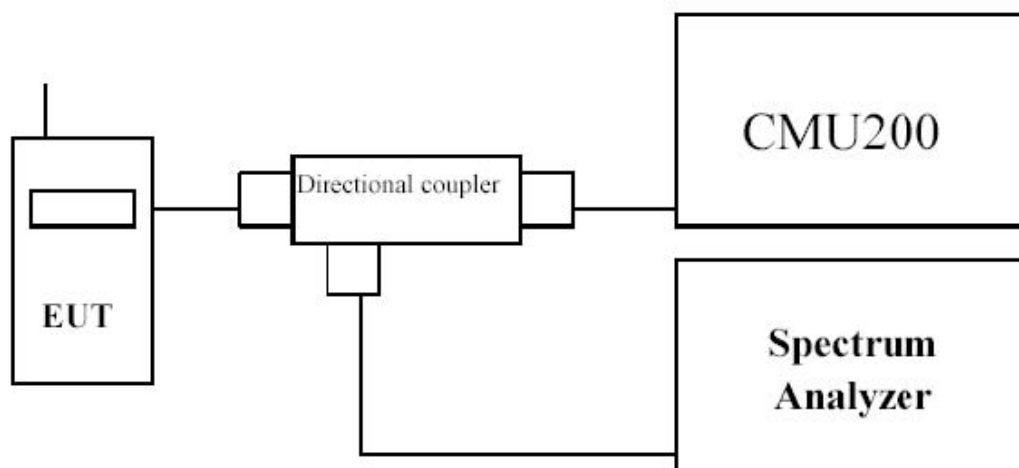
6. Spurious Emission At Antenna Terminals (+/- 1MHz)

6.1. Test Equipment

Spurious Emission At Antenna Terminals (+/- 1MHz) / AC-6

Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2012.04.10
Radio Communication Tester	R&S	CMU 200	117088	2012.04.29
Dual Directional Coupler	Agilent	778D	20160	2012.04.20
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2012.04.20
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC6-TH	2013.01.10

6.2. Test Setup



6.3. 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.

6.4. 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.

6.5. Uncertainty

The measurement uncertainty is defined as ± 1.2 dB.

6.6. Test Result

Product	CDMA 1X Mobile Phone		
Test Item	Spurious Emission At Antenna Terminals (+/- 1MHz)		
Test Mode	Mode 1: CDMA 2000 1X BC0 Link		
Date of Test	2012/02/27	Test Site	AC-6

Figure Channel 1013 (824.70MHz)

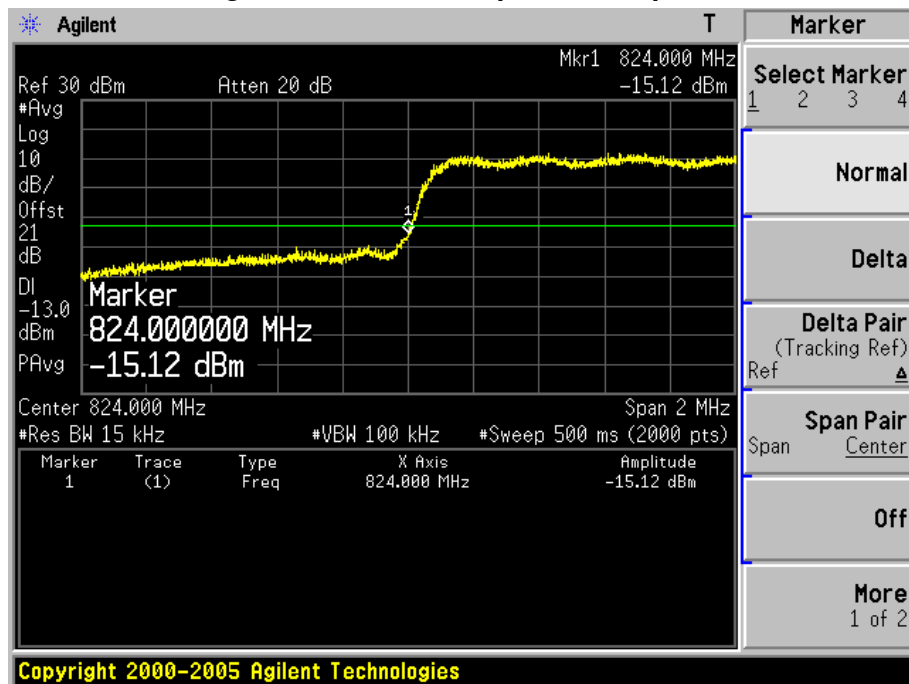
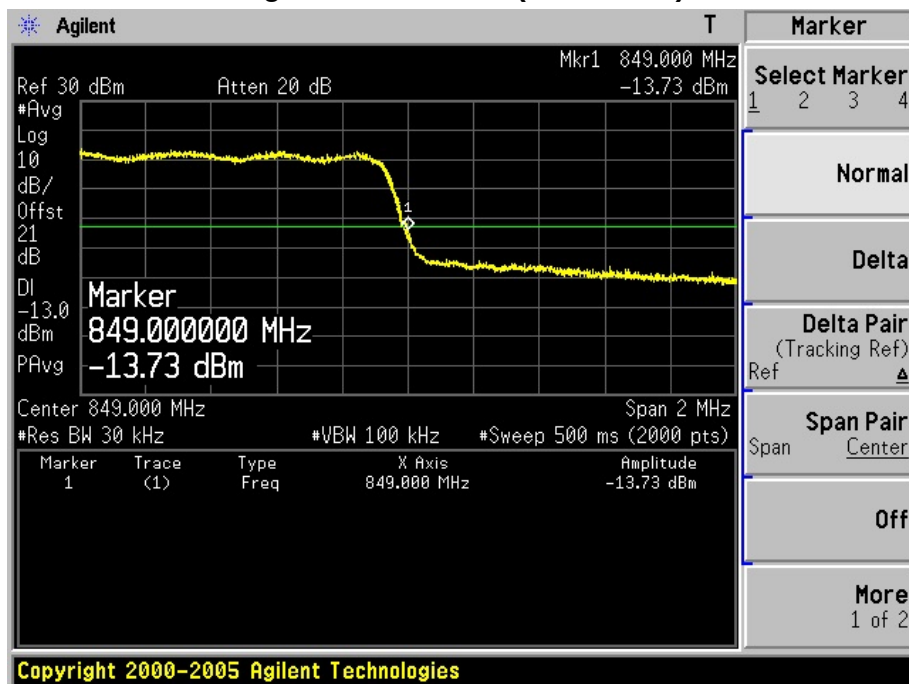


Figure Channel 777 (848.31MHz)



7. Spurious Emission

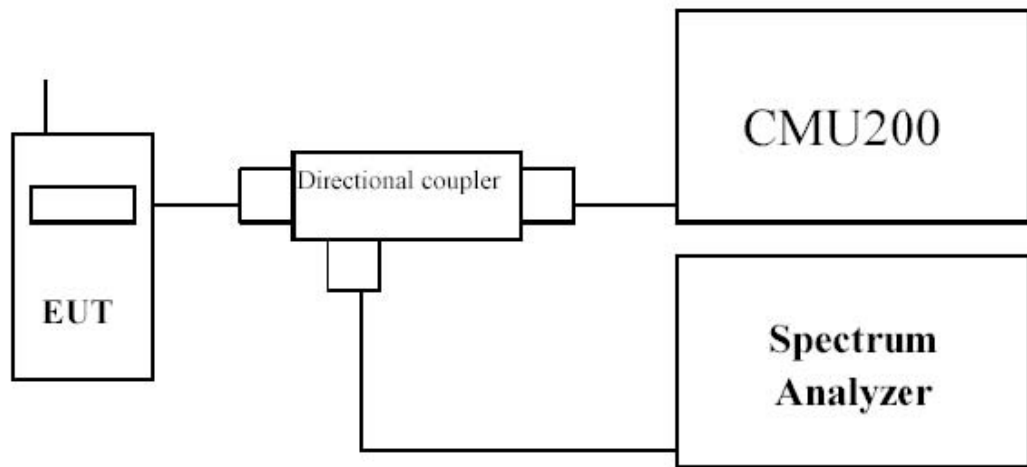
7.1. Test Equipment

Spurious Emission / AC-5

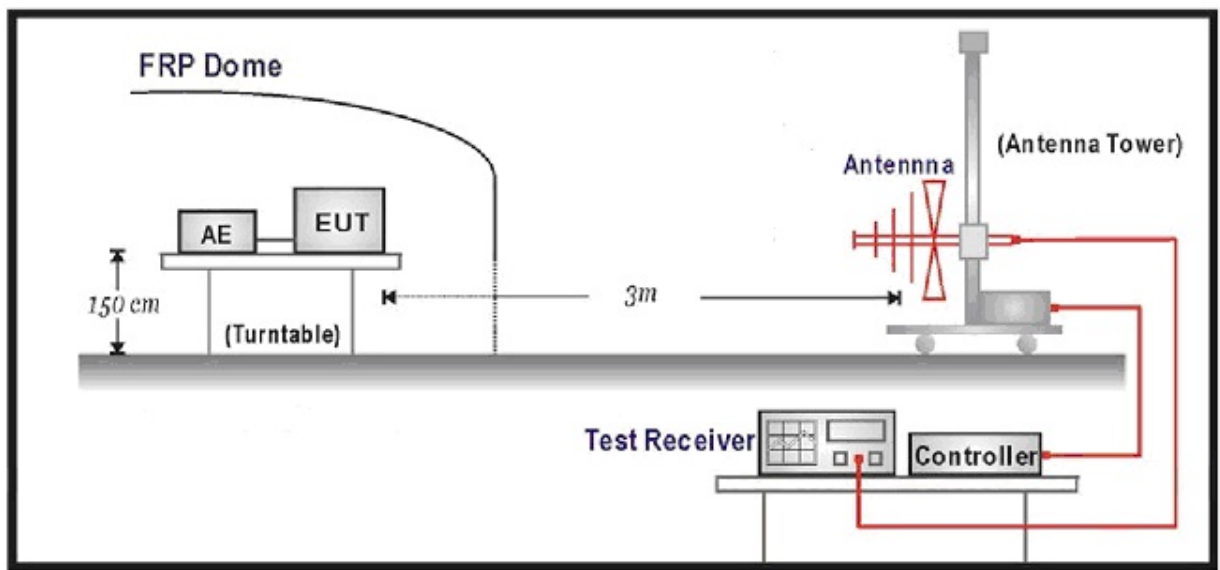
Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2012.04.10
Radio Communication Tester	R&S	CMU 200	117088	2012.04.29
Dual Directional Coupler	Agilent	778D	20160	2012.04.20
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2012.04.20
PSG Analog Signal Generator	Agilent	E8257D	MY44321116	2012.04.23
Preamplifier	QuieTek	AP-025C	CHM-0503006	2012.05.05
Preamplifier	Miteq	NSP1800-25	1364185	2012.05.05
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2012.10.18
Half Wave Tuned Dipole Antenna	COM-POWER	AD-100	40137	2013.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	737	2013.11.24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2012.06.11
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2013.01.10

7.2. Test Setup

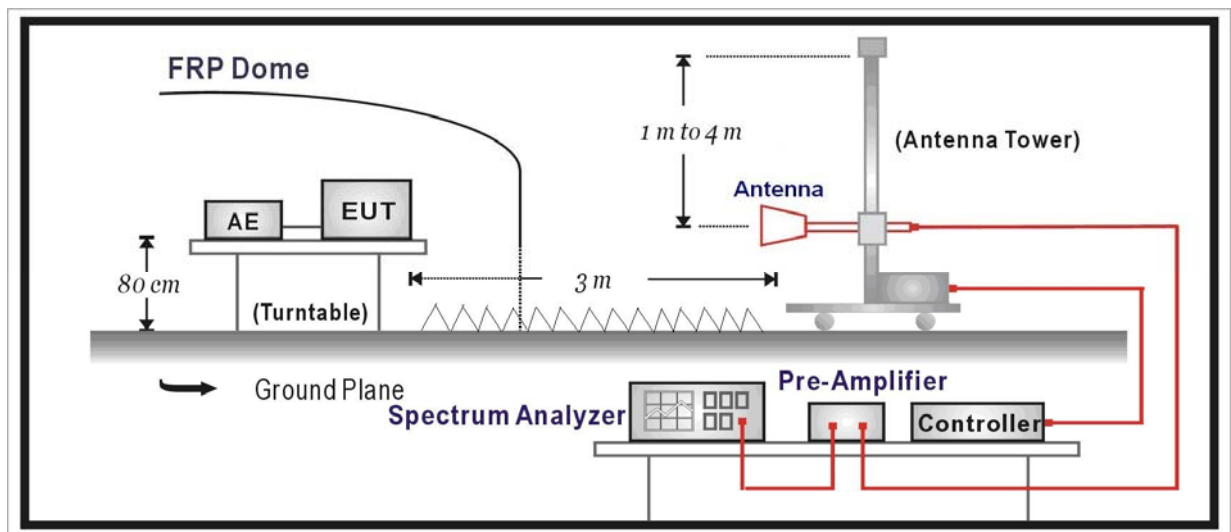
Conducted Spurious Emission Measurement:



Radiated Spurious Measurement: below 1GHz



Radiated Spurious Measurement: above 1GHz



7.3. 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.

7.4. Test Procedure

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 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic.

Radiated Spurious Measurement:

- The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
- The output of the test antenna shall be connected to the measuring receiver.
- 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° 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.
- v) 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 frequency range was checked up to 10th harmonic.
- q) Test site anechoic chamber refer to ANSI C63.4: 2009

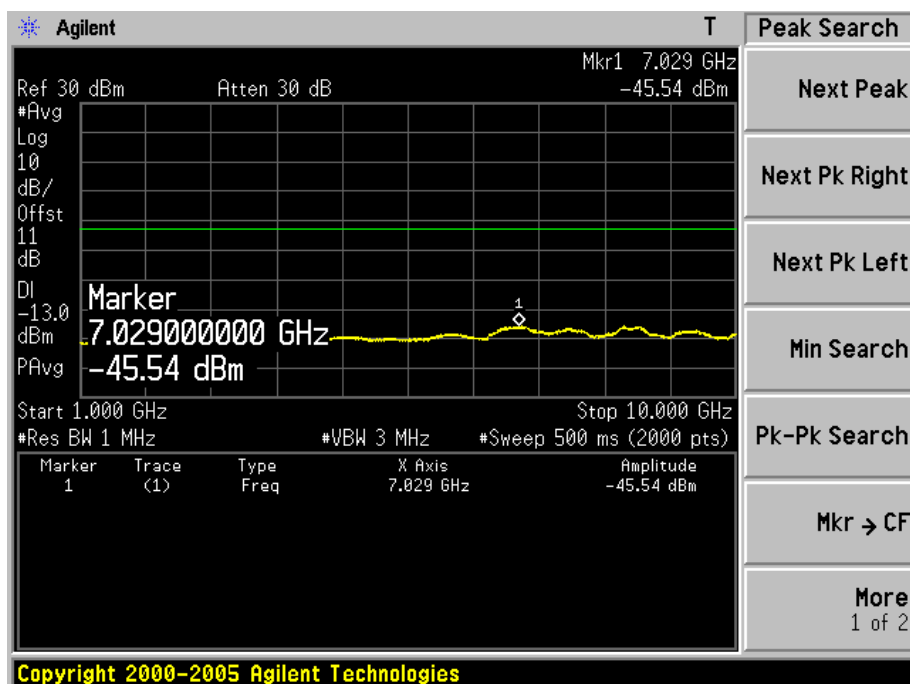
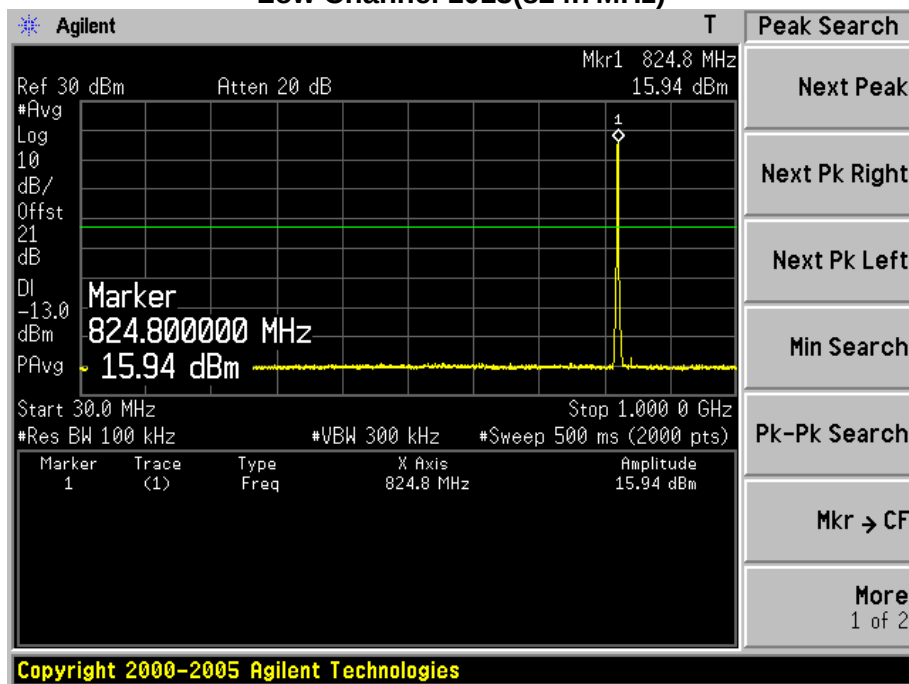
7.5. Uncertainty

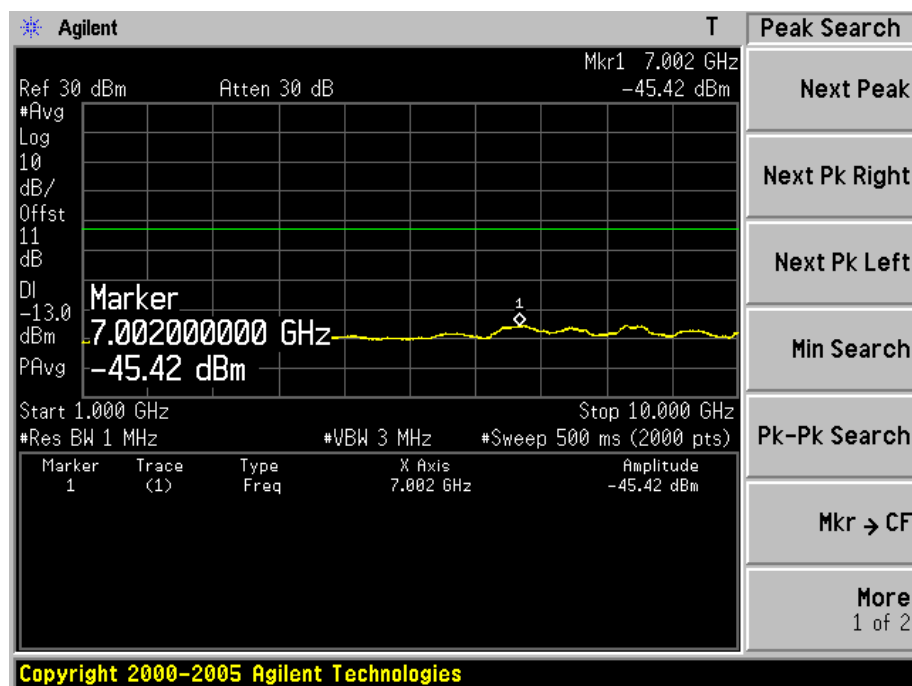
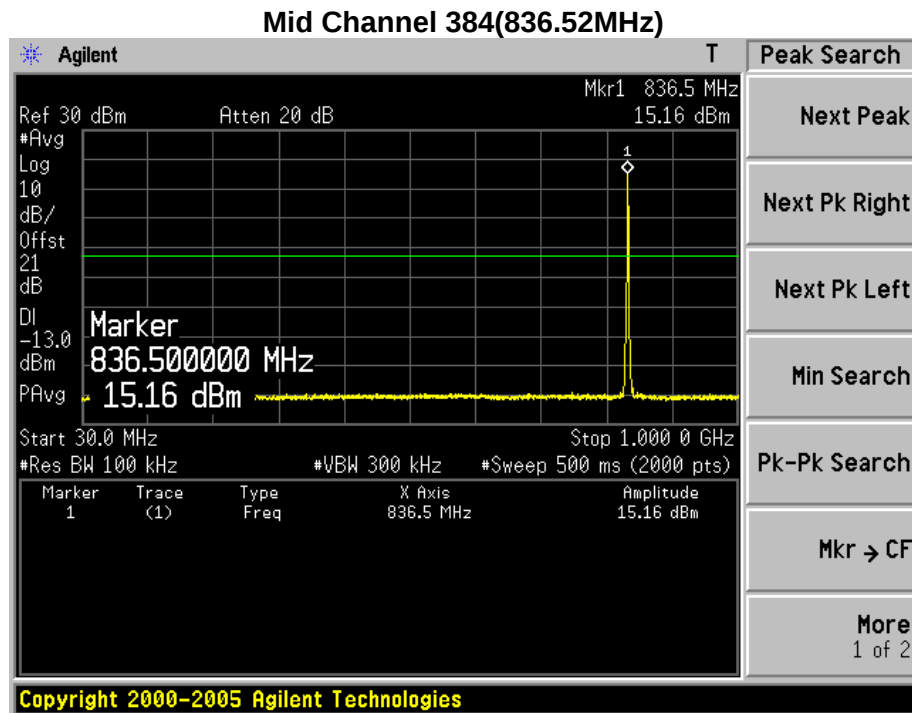
The measurement uncertainty is defined as 3.2 dB for Radiated Power Measurement.

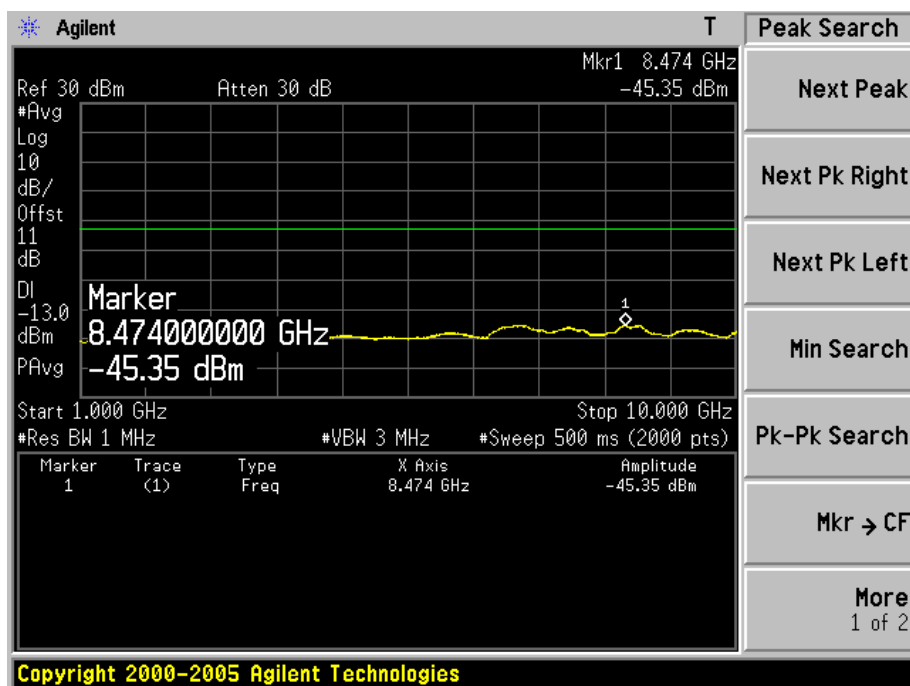
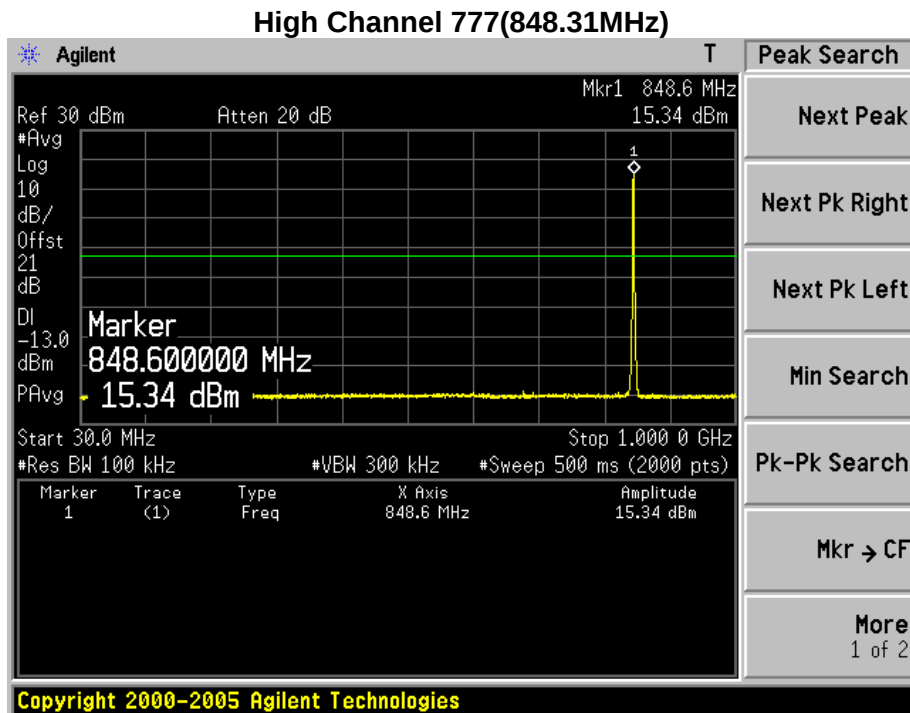
7.6. Test Result

Product	GSM Mobile Phone		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 1: CDMA 2000 1X BC0 Link		
Date of Test	2012/02/27	Test Site	TR-8

Low Channel 1013(824.7MHz)







Product	CDMA 1X Mobile Phone		
Test Item	Radiated Spurious Emission		
Test Mode	Mode 1: CDMA 2000 1X BC0 Link		
Date of Test	2012/02/27	Test Site	AC-5

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	-59.98	V	-61.76	3.28	9.75	-55.29	-13.00	-42.29
2474.10	-60.40	V	-58.51	4.10	10.48	-52.13	-13.00	-39.13
1649.40	-55.70	H	-57.53	3.28	9.75	-51.06	-13.00	-38.06
2474.10	-63.05	H	-60.99	4.10	10.48	-54.61	-13.00	-41.61
Middle Channel 384 (836.52MHz)								
1673.04	-60.78	V	-62.64	3.32	9.95	-56.01	-13.00	-43.01
2509.56	-63.56	V	-62.30	3.81	10.62	-55.49	-13.00	-42.49
1673.04	-56.35	H	-57.94	3.32	9.95	-51.31	-13.00	-38.31
2509.56	-63.15	H	-61.51	3.81	10.62	-54.70	-13.00	-41.70
High Channel 777 (848.31MHz)								
1696.62	-57.41	V	-59.33	3.35	10.06	-52.62	-13.00	-39.62
2544.93	-62.87	V	-60.31	4.19	10.68	-53.82	-13.00	-40.82
1696.62	-58.00	H	-59.20	3.35	10.06	-52.49	-13.00	-39.49
2544.93	-63.59	H	-60.77	4.19	10.68	-54.28	-13.00	-41.28

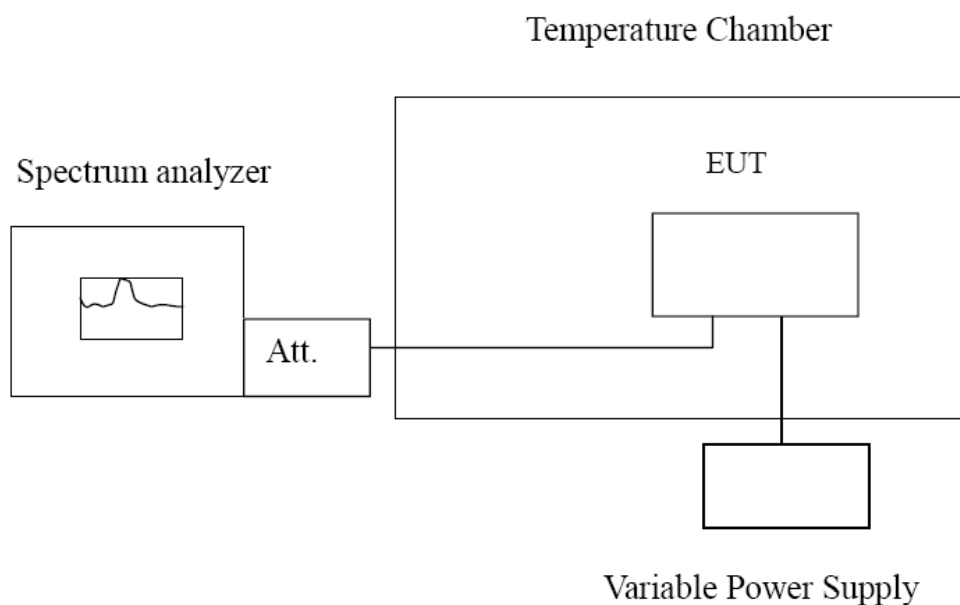
8. Frequency Stability Under Temperature & Voltage Variations

8.1. Test Equipment

Frequency Stability Under Temperature & Voltage Variations / AC-6

Instrument	Manufacturer	Type No.	Serial No	Cali. Due Date
PSA Series Spectrum Analyzer	Agilent	E4440A	MY49420184	2012.04.10
Radio Communication Tester	R&S	CMU 200	117088	2012.04.29
Dual Directional Coupler	Agilent	778D	20160	2012.04.20
10dB Coaxial Coupler	Agilent	87300C	MY44300299	2012.04.20
DC Power Supply	IDRC	CD-035-020PR	977272	2012.09.22
Temperature & Humidity Chamber	Gaoyu	TH-1P-B	WIT-05121302	2013.01.13
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC6-TH	2013.01.10

8.2. Test Setup



8.3. Limit

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

Limit	$< \pm 2.5 \text{ ppm}$
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8.4. Test Procedure

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.

8.5. Uncertainty

The measurement uncertainty is defined as $\pm 10 \text{ Hz}$.

8.6. Test Result

Product	CDMA 1X Mobile Phone		
Test Item	Frequency Stability Under Temperature & Voltage Variations		
Test Mode	Mode 1: CDMA 2000 1X BC0 Link		
Date of Test	2012/02/27	Test Site	AC6

Frequency Stability under Temperature

Temperature Interval (°C)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
-30	836.52	42	± 2091
-20	836.52	-39	± 2091
-10	836.52	-25	± 2091
0	836.52	22	± 2091
10	836.52	20	± 2091
20	836.52	-23	± 2091
30	836.52	28	± 2091
40	836.52	30	± 2091
50	836.52	32	± 2091

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Deviation (Hz)	Limit (Hz)
4.200	836.52	-31	± 2091
3.700	836.52	-23	± 2091
3.500	836.52	-35	± 2091