



# Part 22

# TEST REPORT

<b>Product Name</b>	CDMA/LTE Smart phone
<b>Model Name</b>	HUAWEI H882L,H882L,Marina,Y301-A3
<b>FCC ID</b>	QISH882L
<b>Client</b>	Huawei Technologies Co., Ltd.
<b>Manufacturer</b>	Huawei Technologies Co., Ltd.
<b>Date of issue</b>	March 6, 2013

**TA Technology (Shanghai) Co., Ltd.**

**TA Technology (Shanghai) Co., Ltd.**  
**Test Report**

Report No.: RHA1301-0016RF01R1

Page 2 of 46

**GENERAL SUMMARY**

<b>Reference Standard(s)</b>	<p><b>FCC CFR47 Part 2 (2013)</b> Frequency Allocations And Radio Treaty Matters; General Rules And Regulations</p> <p><b>FCC CFR 47 Part 22H (2013)</b> Public Mobile Services(850MHz)</p> <p><b>ANSI/TIA-603-C(2004)</b> Land mobile FM or PM Communications Equipment Measurements and Performance Standards.</p> <p><b>KDB 971168 D01 Power Meas License Digital Systems v01</b> Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (&gt; 1 MHz) Digital Transmission Systems</p>
<b>Conclusion</b>	<p>This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in Chapter 2 of this test report are below limits specified in the relevant standards.</p> <p>General Judgment: <b>Pass</b></p>
<b>Comment</b>	<p>The test result only responds to the measured sample.</p>

Approved by 初伟中  
Director

Revised by 唐凯  
RF Manager

Performed by 王峰  
RF Engineer

## TABLE OF CONTENT

1. General Information .....	4
1.1. Notes of the test report .....	4
1.2. Testing laboratory .....	5
1.3. Applicant Information .....	5
1.4. Manufacturer Information .....	5
1.5. Information of EUT .....	6
1.6. Test Date .....	7
2. Test Information .....	8
2.1. Summary of test results .....	8
2.2. Test Mode .....	8
2.3. RF Power Output .....	9
2.4. Effective Radiated Power .....	11
2.5. Occupied Bandwidth .....	14
2.6. Band Edge Compliance .....	22
2.7. Peak-to-Average Power Ratio (PAPR) .....	28
2.8. Frequency Stability .....	36
2.9. Spurious Emissions at Antenna Terminals .....	37
2.10. Radiates Spurious Emission .....	37
3. Main Test Instruments .....	37

## **1. General Information**

### **1.1. Notes of the test report**

**TA Technology (Shanghai) Co., Ltd.** has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L2264.

**TA Technology (Shanghai) Co., Ltd.** has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 428261.

**TA Technology (Shanghai) Co., Ltd.** has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 8510A.

**TA Technology (Shanghai) Co., Ltd.** guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at TA Technology (Shanghai) Co., Ltd. at the time of execution of the test.

**TA Technology (Shanghai) Co., Ltd.** is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test. This report only refers to the item that has undergone the test.

This report standalone dose not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities. This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of **TA Technology (Shanghai) Co., Ltd.** and the Accreditation Bodies, if it applies.

If the electrical report is inconsistent with the printed one, it should be subject to the latter.

# TA Technology (Shanghai) Co., Ltd.

## Test Report

Report No.: RHA1301-0016RF01R1

Page 5 of 46

---

### 1.2. Testing laboratory

Company: TA Technology (Shanghai) Co., Ltd.  
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong  
City: Shanghai  
Post code: 201201  
Country: P. R. China  
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Telephone: +86-021-50791141/2/3  
Fax: +86-021-50791141/2/3-8000  
Website: <http://www.ta-shanghai.com>  
E-mail: [yangweizhong@ta-shanghai.com](mailto:yangweizhong@ta-shanghai.com)

### 1.3. Applicant Information

Company: Huawei Technologies Co., Ltd.  
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C  
City: Shenzhen  
Postal Code: 518129  
Country: P.R. China

### 1.4. Manufacturer Information

Company: Huawei Technologies Co., Ltd.  
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C  
City: Shenzhen  
Postal Code: 518129  
Country: P.R. China

**TA Technology (Shanghai) Co., Ltd.**  
**Test Report**

Report No.: RHA1301-0016RF01R1

Page 6 of 46

**1.5. Information of EUT**

**General information**

Product IMEI :	99000298000366		
Hardware Version:	HL1C8833LM		
Software Version:	H882L V100R001C378B160		
Antenna Type:	Internal Antenna		
Device Operating Configurations:			
Operating Mode(s):	CDMA Cellular; (tested)		
Support mode:	1x RTT/EVDO Rev.0/ Rev.A/1x Advance		
Test Modulation:	(CDMA)BPSK, QPSK, HPSK		
Maximum E.R.P.	CDMA Cellular: 20.43 dBm		
Power Supply:	Battery or Charger (AC adaptor)		
Rated Power Supply Voltage:	3.7V		
Extreme Voltage:	Minimum: 3.6V    Maximum: 4.2V		
Extreme Temperature:	Lowest: -10°C    Highest: +50°C		
Test Channel: (Low - Middle - High)	1013 - 384 - 777            (CDMA Cellular)            (tested)		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	CDMA Cellular	824.7 ~ 848.31	869.7 ~ 893.31

# TA Technology (Shanghai) Co., Ltd.

## Test Report

Report No.: RHA1301-0016RF01R1

Page 7 of 46

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### Auxiliary Equipment Details

#### AE1:Battery

Model: HB4W1H  
Manufacturer: Huawei Technologies Co., Ltd.  
S/N: MAICB01X19102164

#### AE2:Battery

Model: HB4W1H  
Manufacturer: Huawei Technologies Co., Ltd.  
S/N: MPCCA25919100430

Equipment under Test (EUT) is tested CDMA Cellular in this report.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

### 1.6. Test Date

The test performed from February 23, 2013 to February 28, 2013.

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## Test Report

## 2. Test Information

### 2.1. Summary of test results

Number	Test Case	Clause in FCC rules	Verdict
1	RF power output	2.1046	PASS
2	Effective Radiated Power	22.913(a)(2)	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	22.917	PASS
5	Frequency Stability	2.1055 / 22.355	PASS
6	Spurious Emissions at Antenna Terminals	2.1051 / 22.917(a)	PASS
7	Radiates Spurious Emission	2.1053 / 22.917 (a)	PASS

PASS: The EUT complies with the essential requirements in the standard.

FAIL: The EUT does not comply with the essential requirements in the standard.

### 2.2. Test Mode

During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation.

The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

During the ERP measurement, the highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna moved up and down over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.

Test Modes		
Band	Radiated Test Cases	Conducted Test Cases
CDMA Cellular	1x RTT(RC1 SO55)	1x RTT(RC1 SO55)
	EVDO (Rev.0) RTAP153.6 kbps	EVDO (Rev.0) RTAP153.6 kbps
	EVDO(Rev.A) RETAP 4096 bits	EVDO(Rev.A) RETAP 4096 bits
	1X Advance(SO75)	1X Advance(SO75)

Note: The maximum RF output power levels are RC1 SO55 for 1x RTT mode, RTAP153.6 kbps for EVDO (Rev.0) mode, RETAP 4096 bits for EVDO (Rev.A) mode, SO75 for 1X Advance mode, only these modes were used for all tests.

For RSE and CSE, only the maximum RF output power level is chosen.

### 2.3. RF Power Output

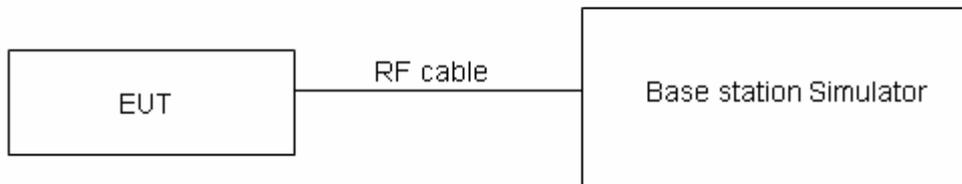
#### Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

#### Methods of Measurement

During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation.

#### Test Setup



The loss between RF output port of the EUT and the input port of the tester has been taken into consideration.

#### Limits

No specific RF power output requirements in part 2.1046.

#### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 0.4$  dB.

**TA Technology (Shanghai) Co., Ltd.**  
**Test Report**

Report No.: RHA1301-0016RF01R1

Page 10 of 46

**Test Results**

CDMA Cellular			Average Conducted Power(dBm)		
			Channel 1013	Channel 384	Channel 777
			824.7(MHz)	836.52(MHz)	848.31(MHz)
1x RTT	RC3	SO55(Loopback)	23.74	23.46	23.44
		SO2(Loopback)	23.73	23.45	23.43
		SO32(+FCH-SCH)	23.74	23.43	23.41
		SO32(+SCH)	23.72	23.42	23.39
	RC1	SO55(Loopback)	<b>23.76</b>	23.45	23.44
		SO2(Loopback)	23.76	23.44	23.43
1X Advance	SO75		<b>23.70</b>	23.58	23.63
	SO73		23.63	23.63	23.65
EV-DO (Rev.0)	RTAP	9.6 kbps	23.55	23.02	23.34
		38.4 kbps	23.56	23.00	23.31
		153.6 kbps	<b>23.58</b>	23.04	23.36
EVDO (Rev.A)	RETAP	128 bits	23.53	23.11	23.30
		2048 bits	23.51	23.12	23.31
		4096 bits	<b>23.54</b>	23.13	23.32

**Note:**

1) The maximum RF Output Power is marked in bold.

## 2.4. Effective Radiated Power

### Ambient condition

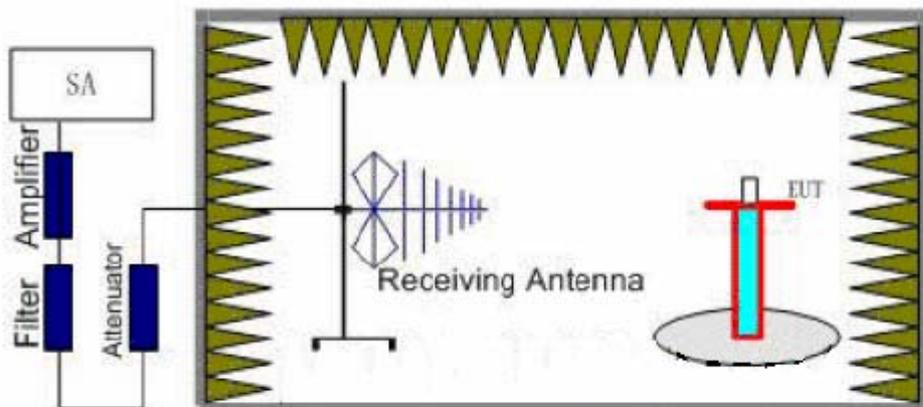
Temperature	Relative humidity
21°C ~25°C	40%~60%

### Methods of Measurement

The measurement procedures in TIA- 603C are used.

#### Step 1:

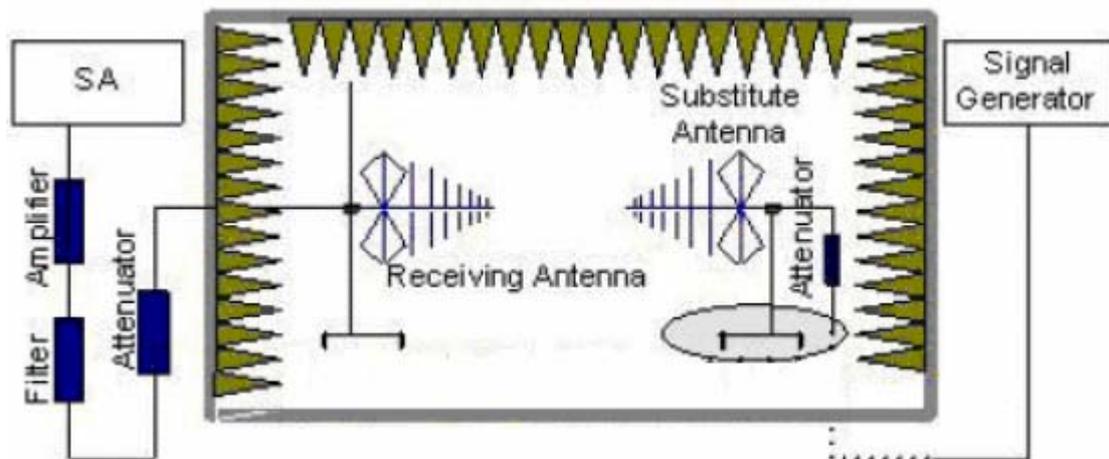
The measurement is carried out in the semi-anechoic chamber. EUT was placed on a 0.8 meters high non-conductive table at a 3 meters test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. A radio link shall be established between EUT and Tester. The output power of the cell signal of the tester will be decreased until the output power of the EUT reach a maximum value. A peak detector is used while RBW and VBW are both set to 3MHz. During the measurement, the highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna moved up and down over a range from 1 to 4 meters in both horizontally and vertically polarized orientations. The test setup refers to figure below.



#### Step 2:

A dipole antenna shall be substituted in place of the EUT. The antenna will be driven by a signal generator with a adjustable S.G. applied through a 30dB amplifier and a Tx cable. Then the Analyzer reading which is equal to LVL is recorded while the antenna was moving up and down. The E.R.P. /E.I.R.P. of the EUT can be calculated through the level of the signal generator, Tx cable loss and the gain of the substitution antenna. The test setup refers to figure below.

# TA Technology (Shanghai) Co., Ltd. Test Report



$$E.R.P = S.G + 30 - Tx \text{ Cable loss} + \text{Substitution antenna gain} - 2.15.$$

$$EIRP = E.R.P + 2.15$$

## Limits

Rule Part 22.913(a) specifies that "Mobile/portable stations are limited to 7 watts ERP".

Limit	$\leq 7 \text{ W}$ (38.45 dBm)
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## Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 1.19 \text{ dB}$

**TA Technology (Shanghai) Co., Ltd.**  
**Test Report**

Report No.: RHA1301-0016RF01R1

Page 13 of 46

**Test Results: Pass**

CDMA Cellular	Channel	Polarization	LVL (dBm)	SG+30 (dBm)	Gain (dBi)	Cable Loss (dB)	E.R.P. (dBm)
RC1 (SO55)	1013	Vertical	-25.34	35.52	1.06	15.17	19.26
	384	Vertical	-24.32	36.54	1.24	15.2	20.43
	777	Vertical	-25.49	36.03	1.38	15.24	20.02
EVDO (Rev.0)	1013	Vertical	-25.34	36.26	1.06	15.17	20.00
	384	Vertical	-24.32	36.15	1.24	15.2	20.04
	777	Vertical	-25.49	35.64	1.38	15.24	19.63
EVDO (Rev.A)	1013	Vertical	-25.34	36.21	1.06	15.17	19.95
	384	Vertical	-24.32	36.11	1.24	15.2	20.00
	777	Vertical	-25.49	35.59	1.38	15.24	19.58
1X Advance(SO75)	1013	Vertical	-25.34	36.38	1.06	15.17	20.12
	384	Vertical	-24.32	36.32	1.24	15.2	20.21
	777	Vertical	-25.49	35.78	1.38	15.24	19.77

Note: 1. E.R.P =S.G+30. - Tx Cable loss + Substitution antenna gain – 2.15.

2. EIRP= E.R.P+2.15

## 2.5. Occupied Bandwidth

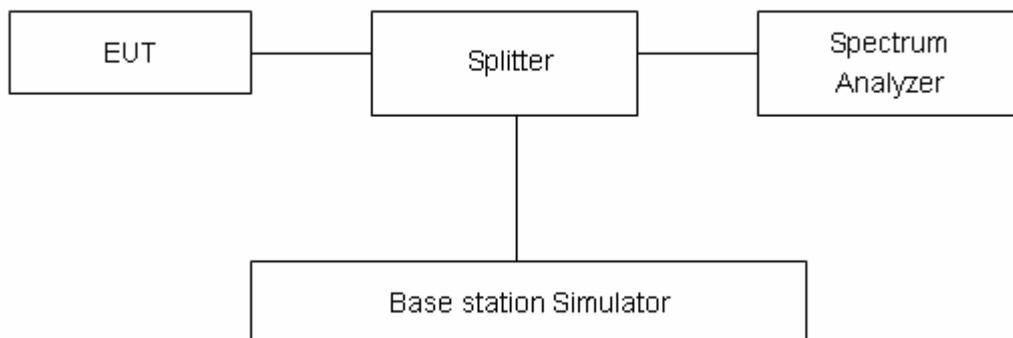
### Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

### Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer. RBW is set to 30kHz, VBW is set to 300kHz for CDMA Cellular. 99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

### Test Setup



### Limits

No specific occupied bandwidth requirements in part 2.1049.

### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 624\text{Hz}$ .

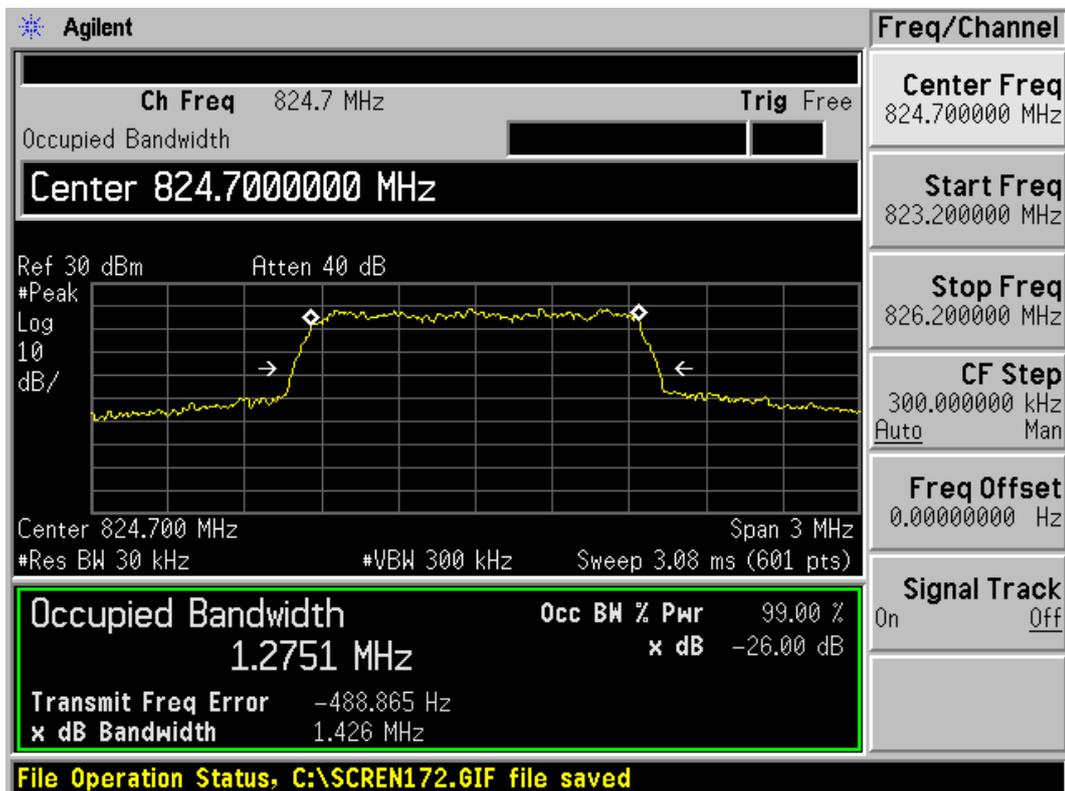
# TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RHA1301-0016RF01R1

Page 15 of 46

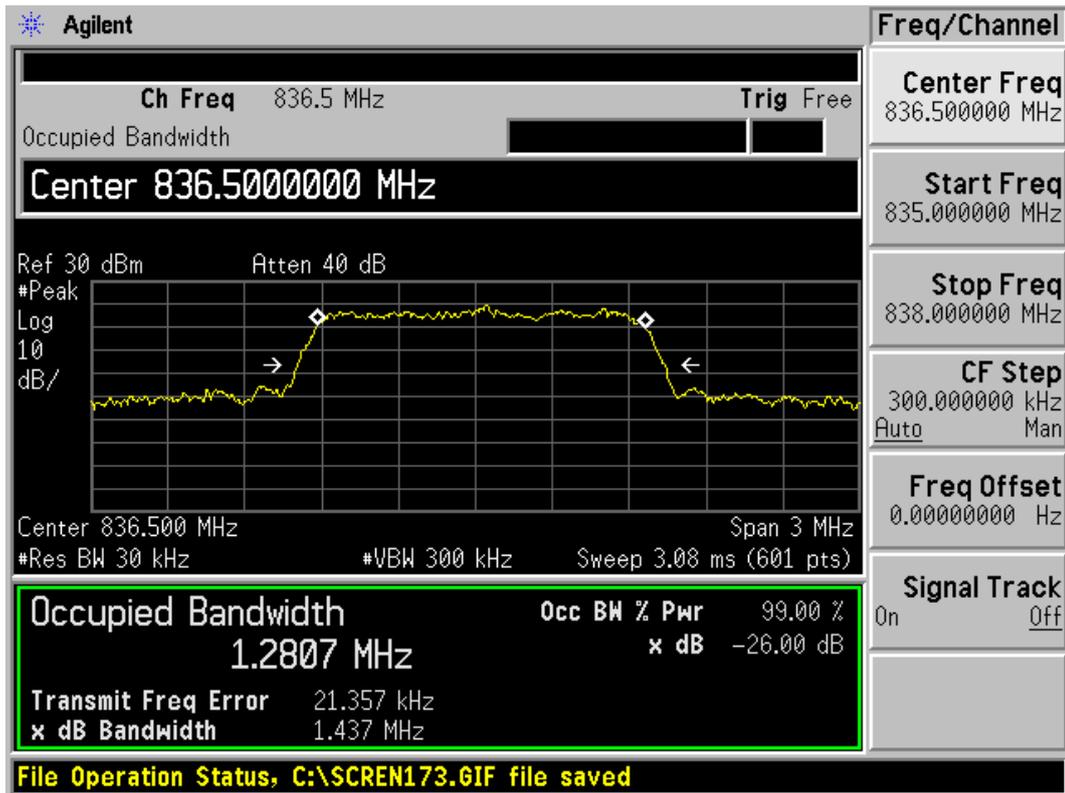
## Test Result

CDMA Cellular	Channel	Frequency (MHz)	99% Power Bandwidth (MHz)	-26dBc Bandwidth(MHz)
RC1 (SO55)	1013	824.7	1.2751	1.426
	384	836.52	1.2807	1.437
	777	848.31	1.2771	1.429
EVDO (Rev.0)	1013	824.7	1.2695	1.423
	384	836.52	1.2736	1.428
	777	848.31	1.2683	1.433
EVDO (Rev.A)	1013	824.7	1.2693	1.422
	384	836.52	1.2706	1.422
	777	848.31	1.2725	1.432
1X Advance(SO75)	1013	824.7	1.2734	1.430
	384	836.52	1.2662	1.431
	777	848.31	1.2720	1.431

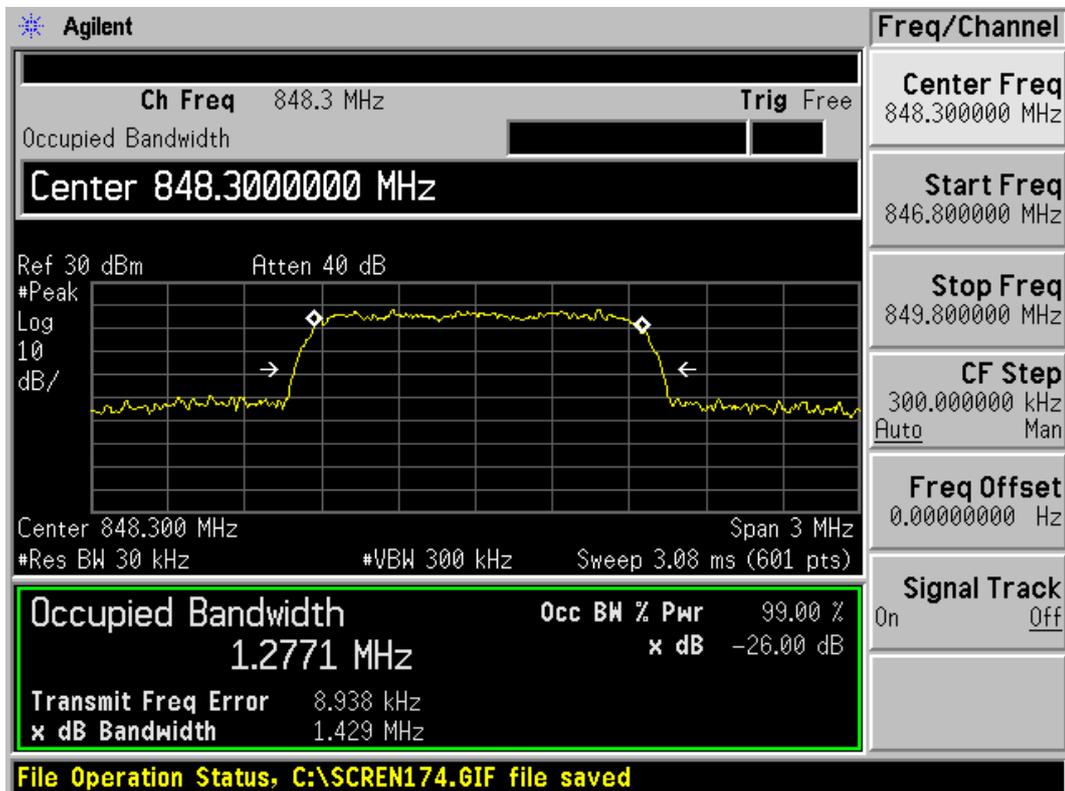


CDMA Cellular SO55 CH1013 Occupied Bandwidth

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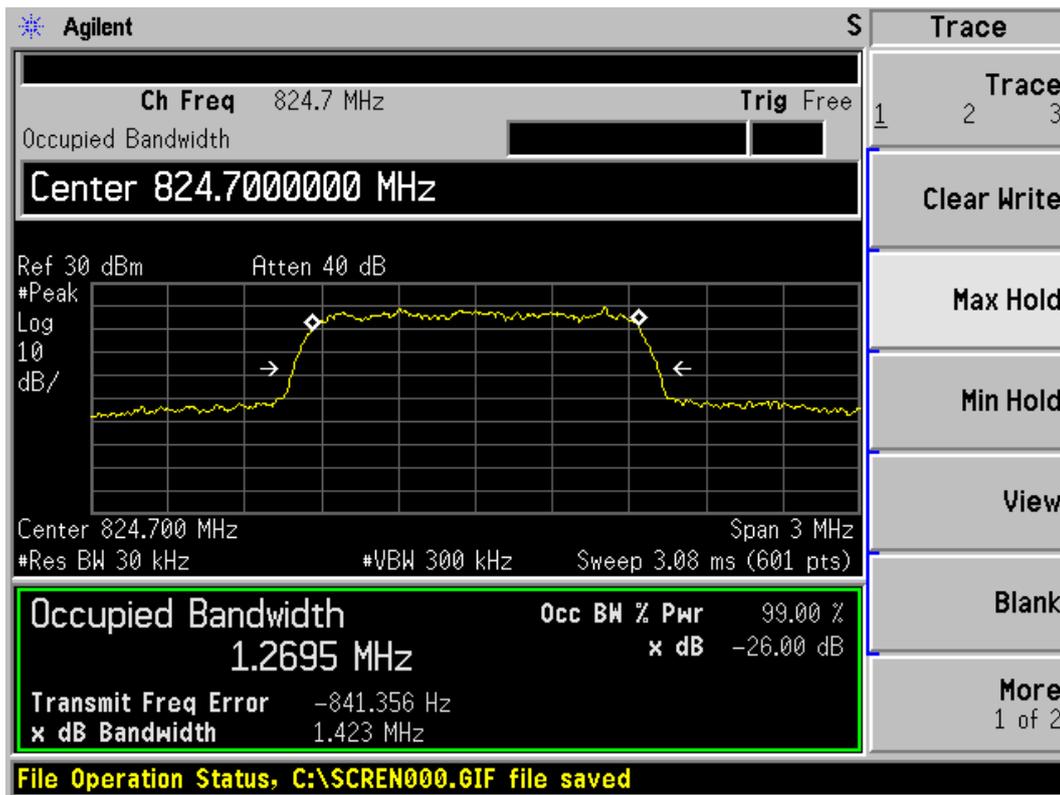


CDMA Cellular SO55 CH384 Occupied Bandwidth

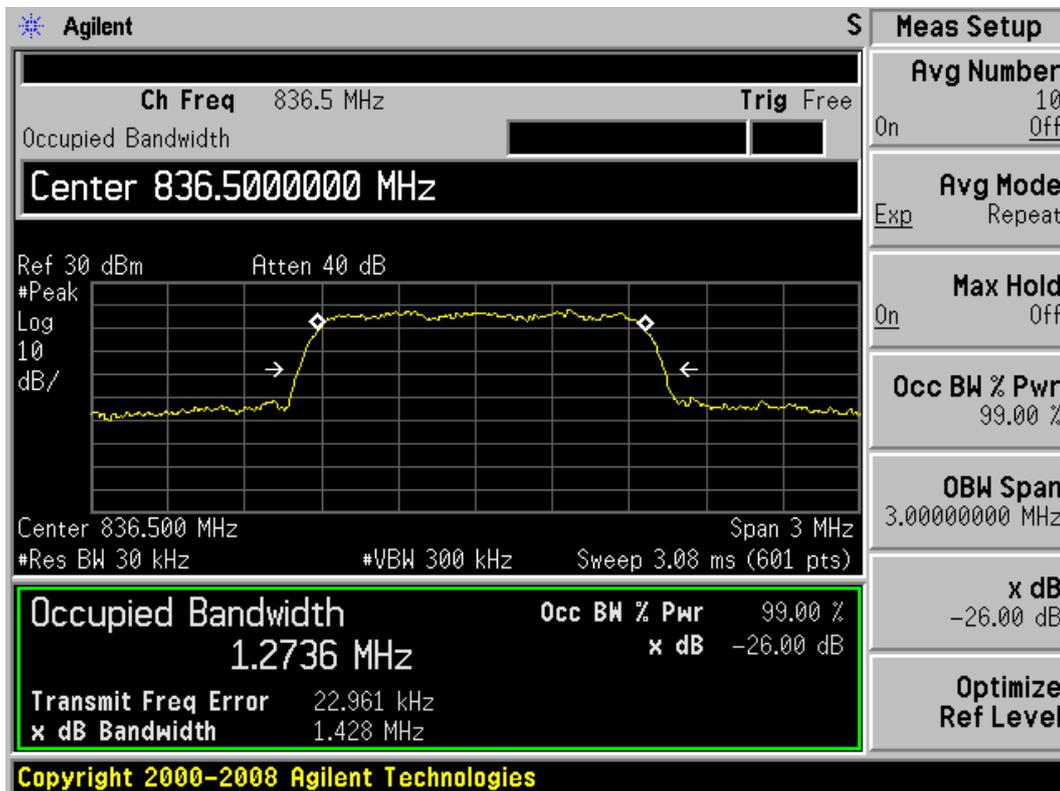


CDMA Cellular SO55 CH777 Occupied Bandwidth

# TA Technology (Shanghai) Co., Ltd. Test Report

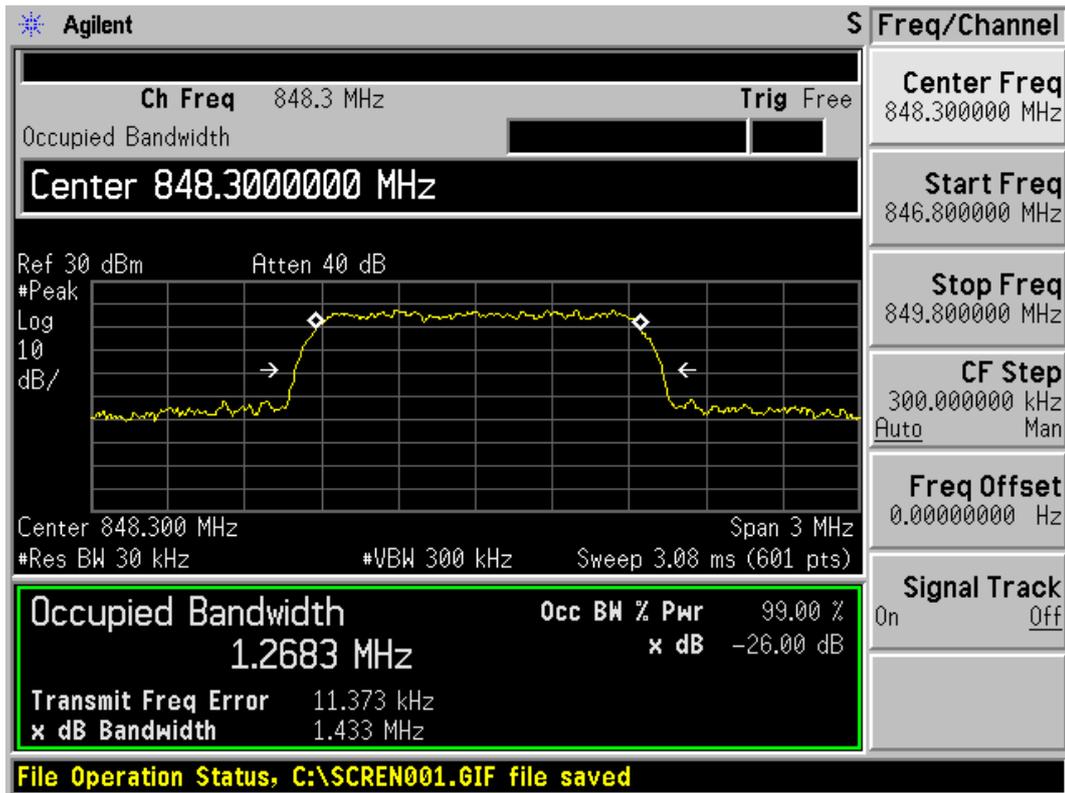


CDMA Cellular EVDO (Rev.0) CH1013 Occupied Bandwidth

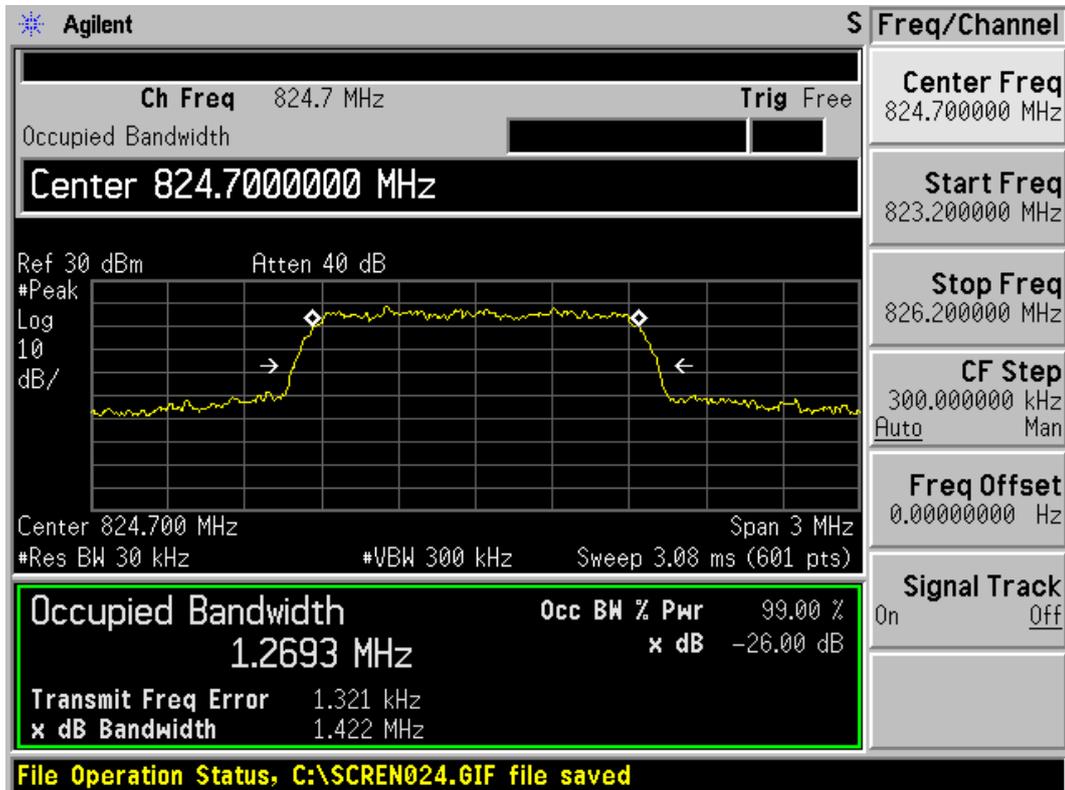


CDMA Cellular EVDO (Rev.0) CH384 Occupied Bandwidth

# TA Technology (Shanghai) Co., Ltd. Test Report

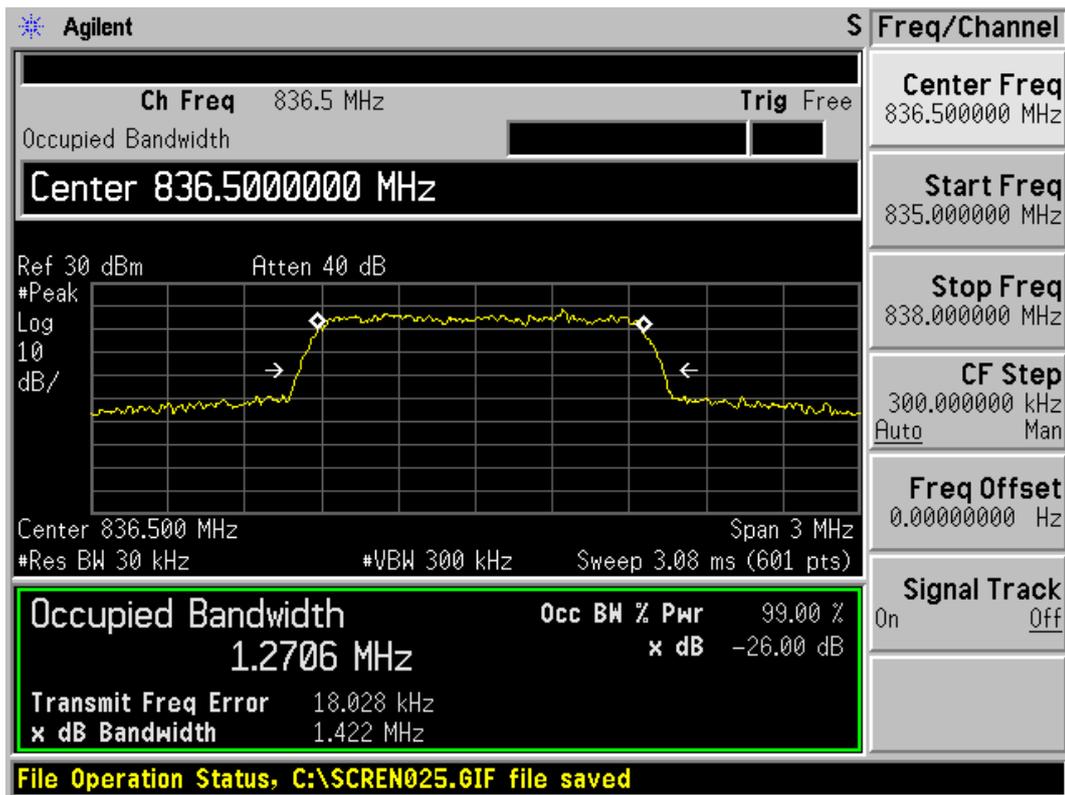


CDMA Cellular EVDO (Rev.0) CH777 Occupied Bandwidth

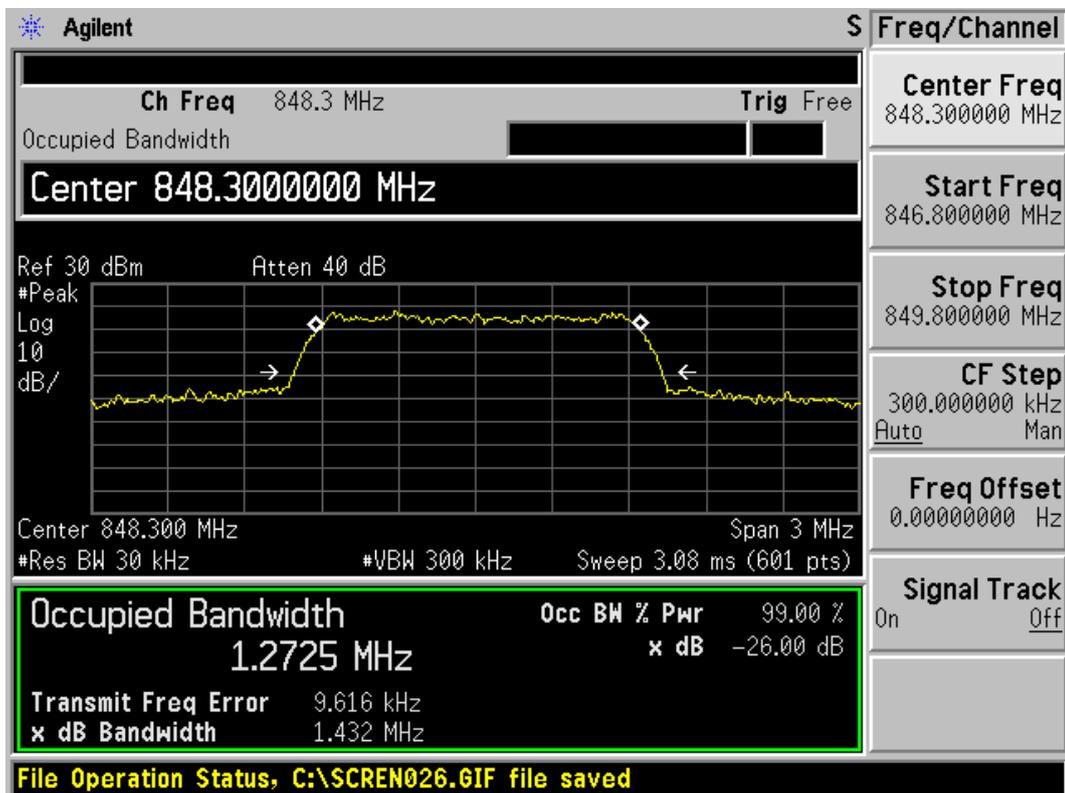


CDMA Cellular EVDO (Rev.A) CH1013 Occupied Bandwidth

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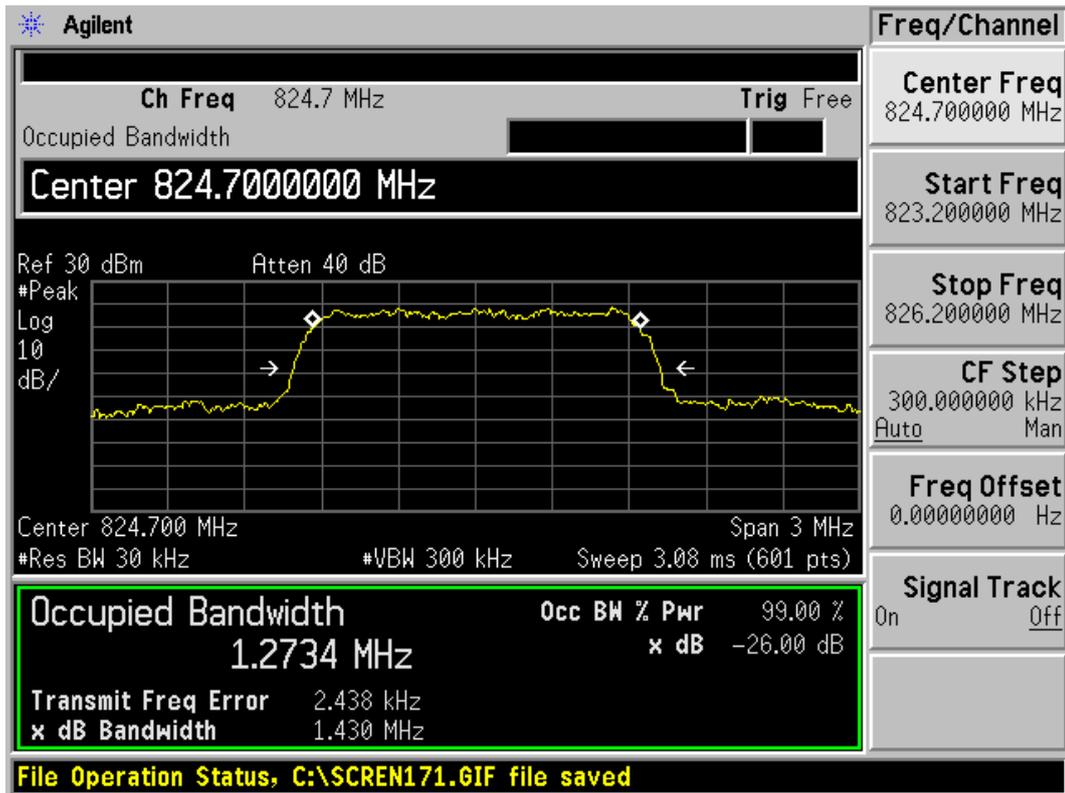


CDMA Cellular EVDO (Rev.A) CH384 Occupied Bandwidth

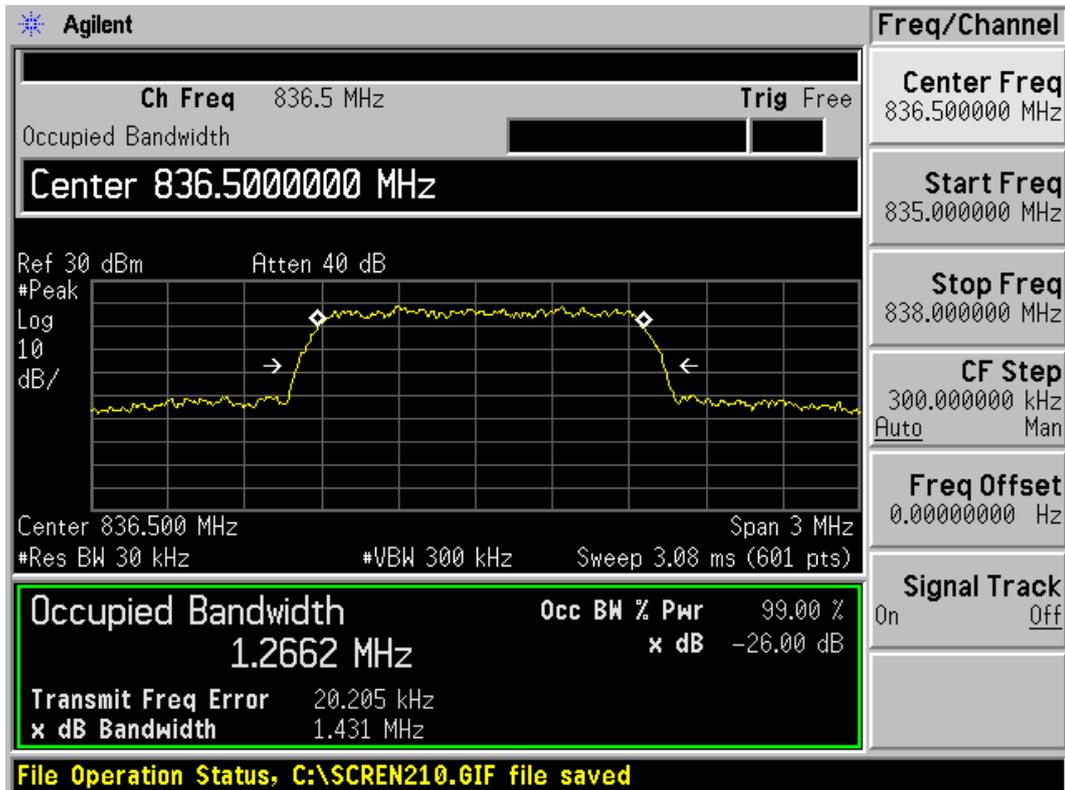


CDMA Cellular EVDO (Rev.A) CH777 Occupied Bandwidth

# TA Technology (Shanghai) Co., Ltd. Test Report

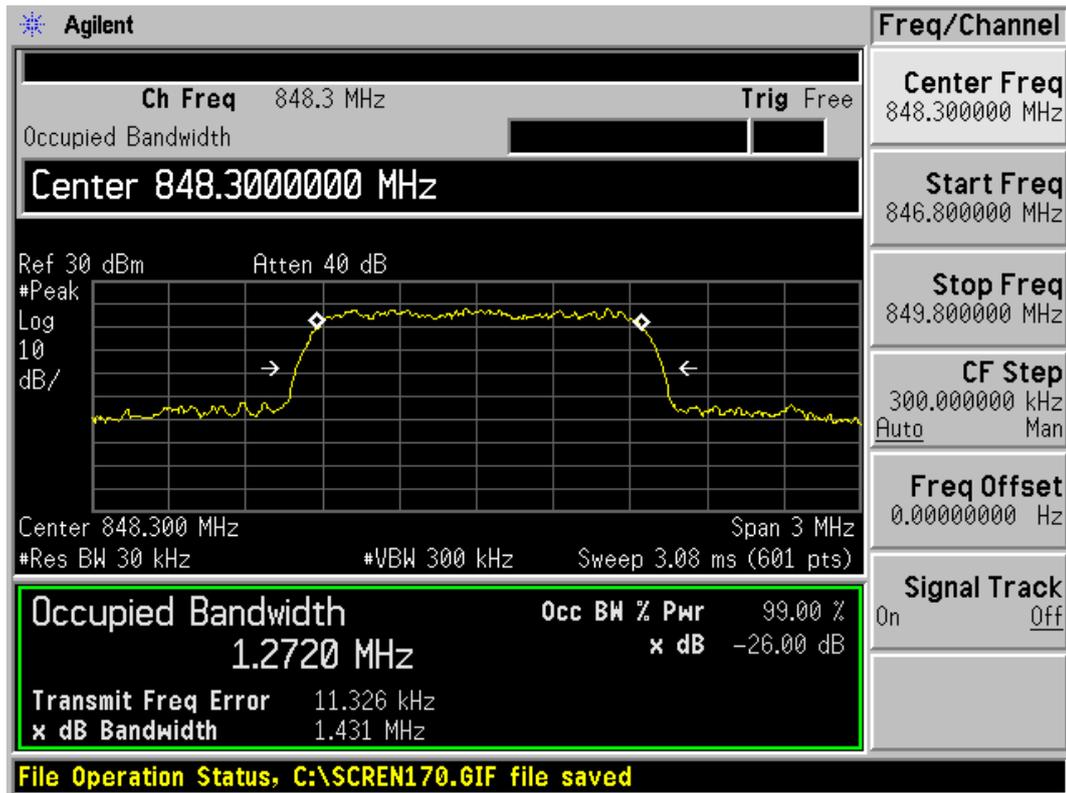


CDMA Cellular 1X Advance CH1013 Occupied Bandwidth



CDMA Cellular 1X Advance CH384 Occupied Bandwidth

# TA Technology (Shanghai) Co., Ltd. Test Report



CDMA Cellular 1X Advance CH777 Occupied Bandwidth

**2.6. Band Edge Compliance**

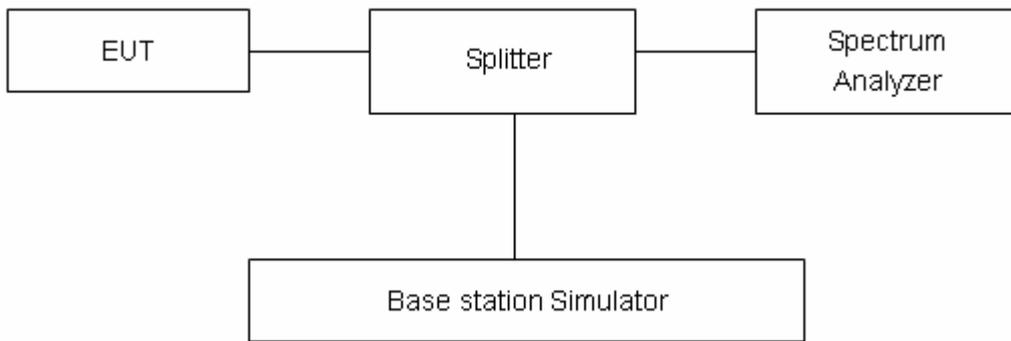
**Ambient condition**

Temperature	Relative humidity
21°C ~25°C	40%~60%

**Method of Measurement**

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured. The average detector is used. RBW is set to 30kHz, VBW is set to 300kHz for CDMA Cellular. Spectrum analyzer plots are included on the following pages.

**Test Setup**



**Limits**

Rule Part 22.917(a) specifies that “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.”

Limit	-13 dBm
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**Measurement Uncertainty**

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ ,  $U=0.684\text{dB}$ .

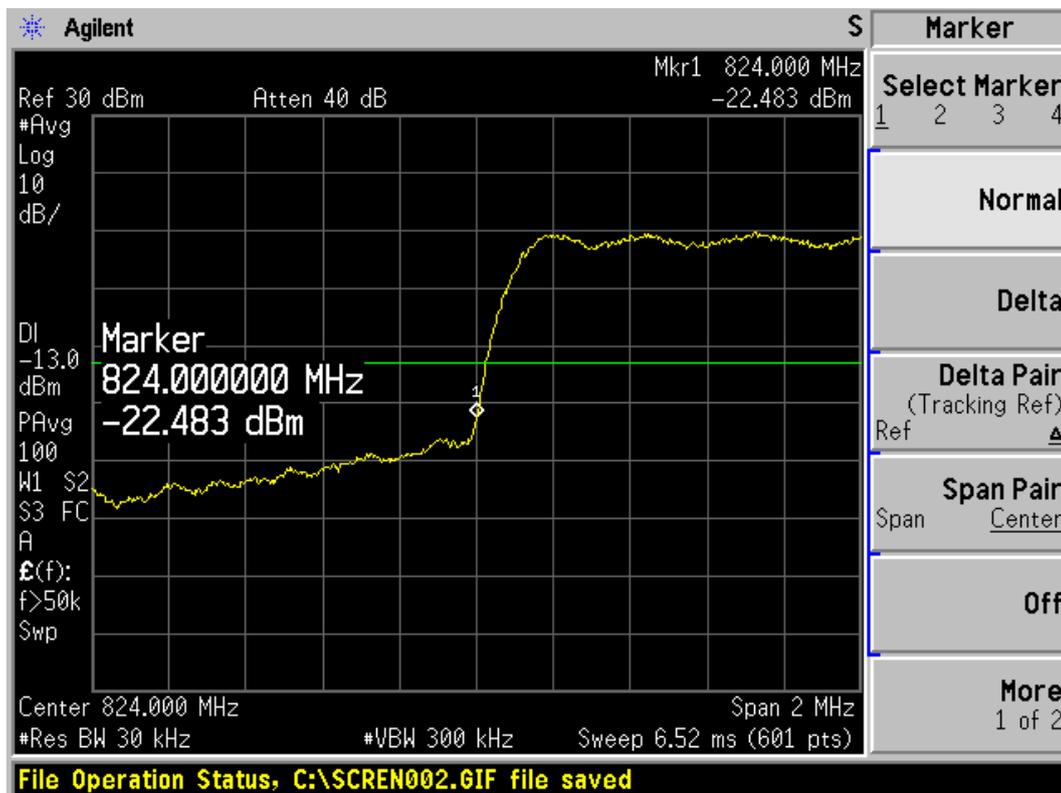
# TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RHA1301-0016RF01R1

Page 23 of 46

**Test Result:**

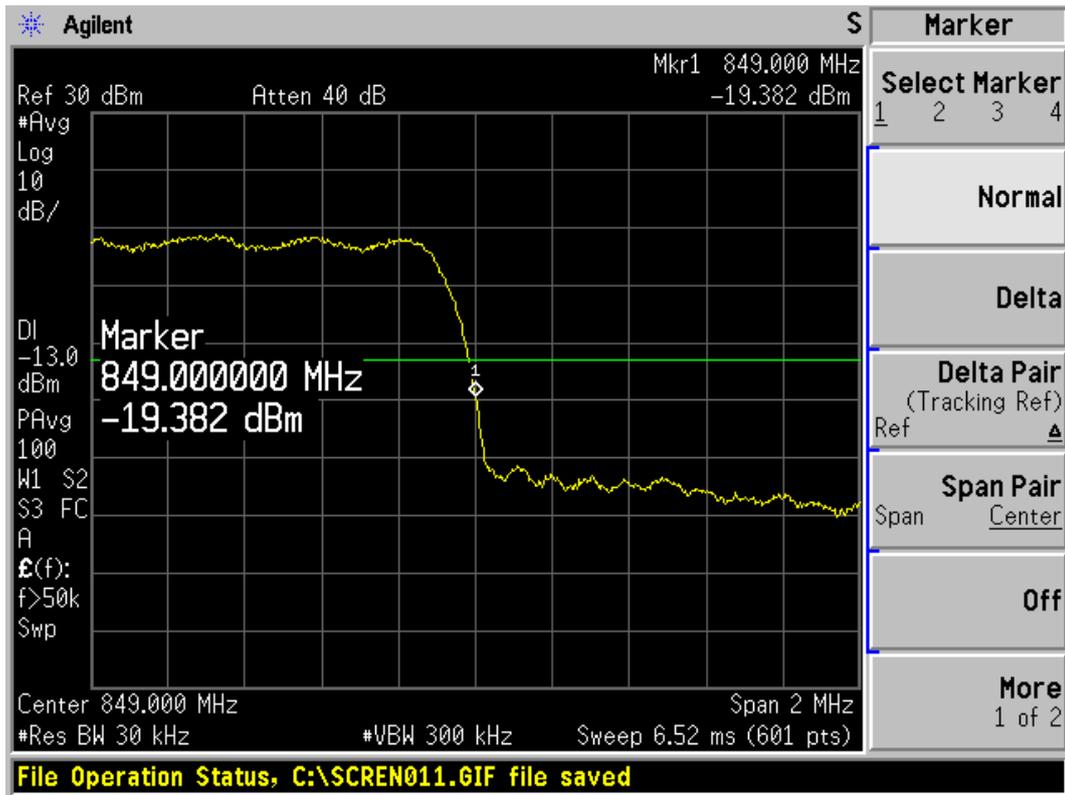
CDMA Cellular	Carrier frequency (MHz)	Reference value (dBm)	Limit	Conclusion
RC1 (SO55)	824.0	-22.483	-13	PASS
	849.0	-17.477	-13	PASS
EV-DO(Rev.0)	824.0	-23.307	-13	PASS
	849.0	-19.382	-13	PASS
EV-DO(Rev.A)	824.0	-22.960	-13	PASS
	849.0	-18.220	-13	PASS
1X Advance(SO75)	824.0	-22.391	-13	PASS
	849.0	-18.314	-13	PASS



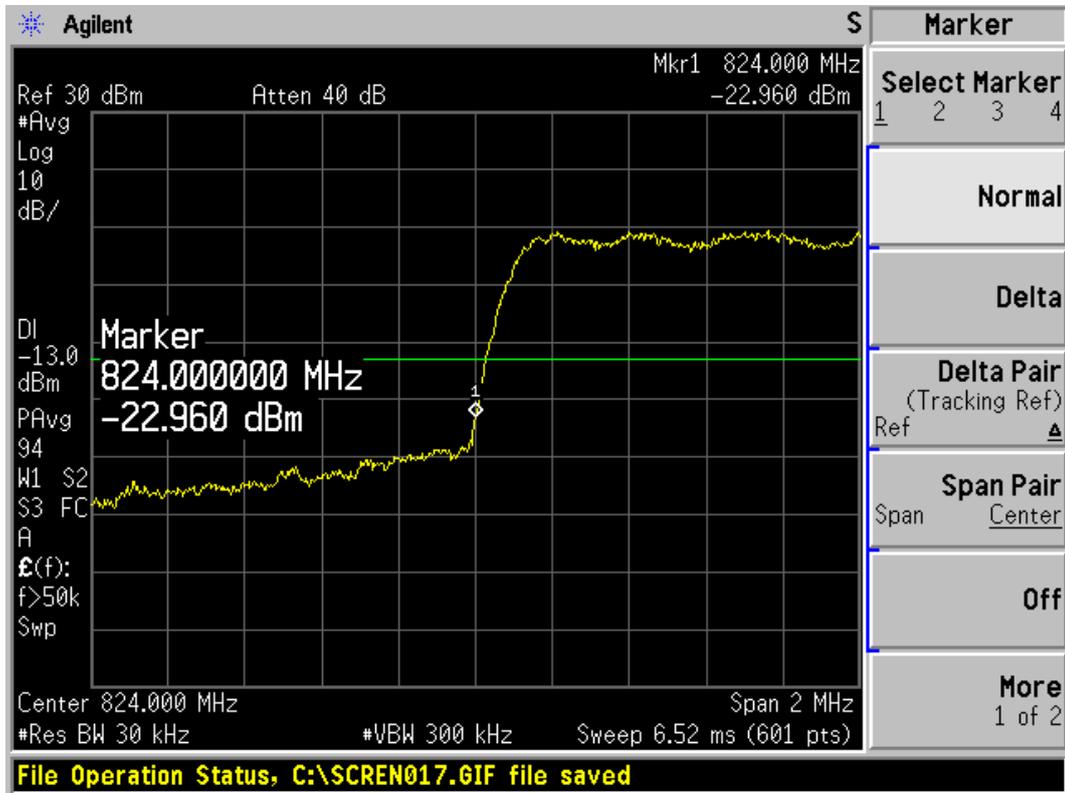
CDMA Cellular SO55 1013 Channel



# TA Technology (Shanghai) Co., Ltd. Test Report

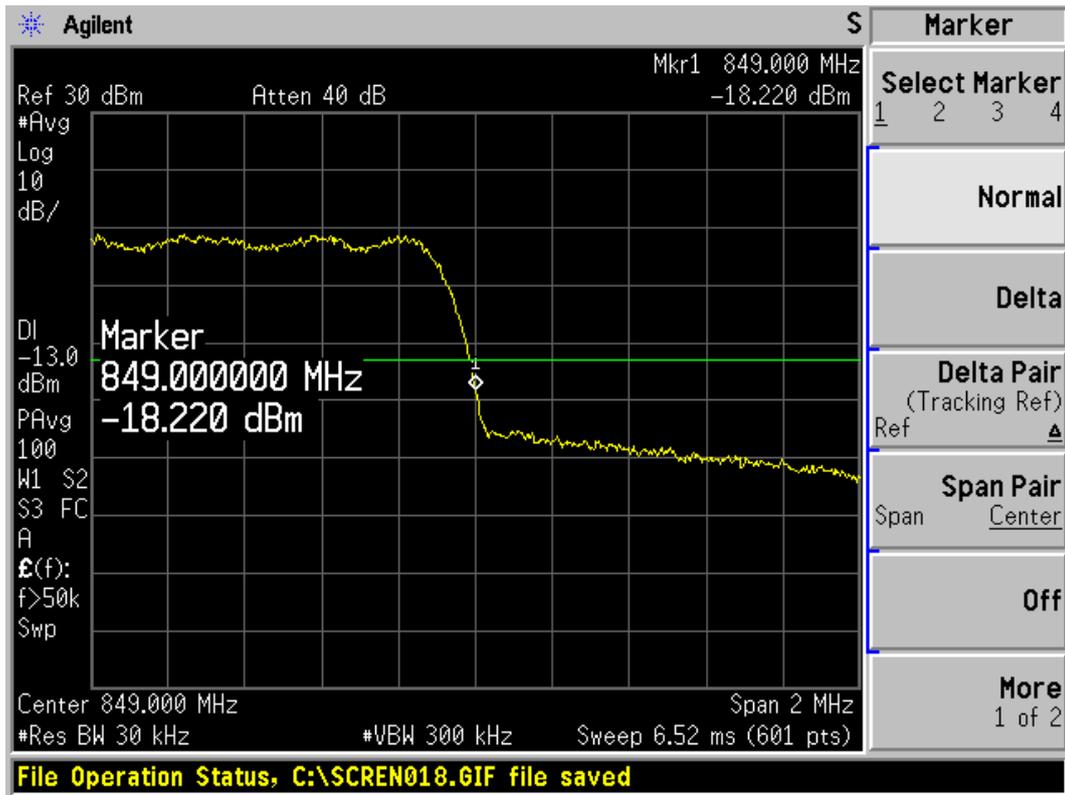


CDMA Cellular EV-DO(Rev.0) 777 Channel

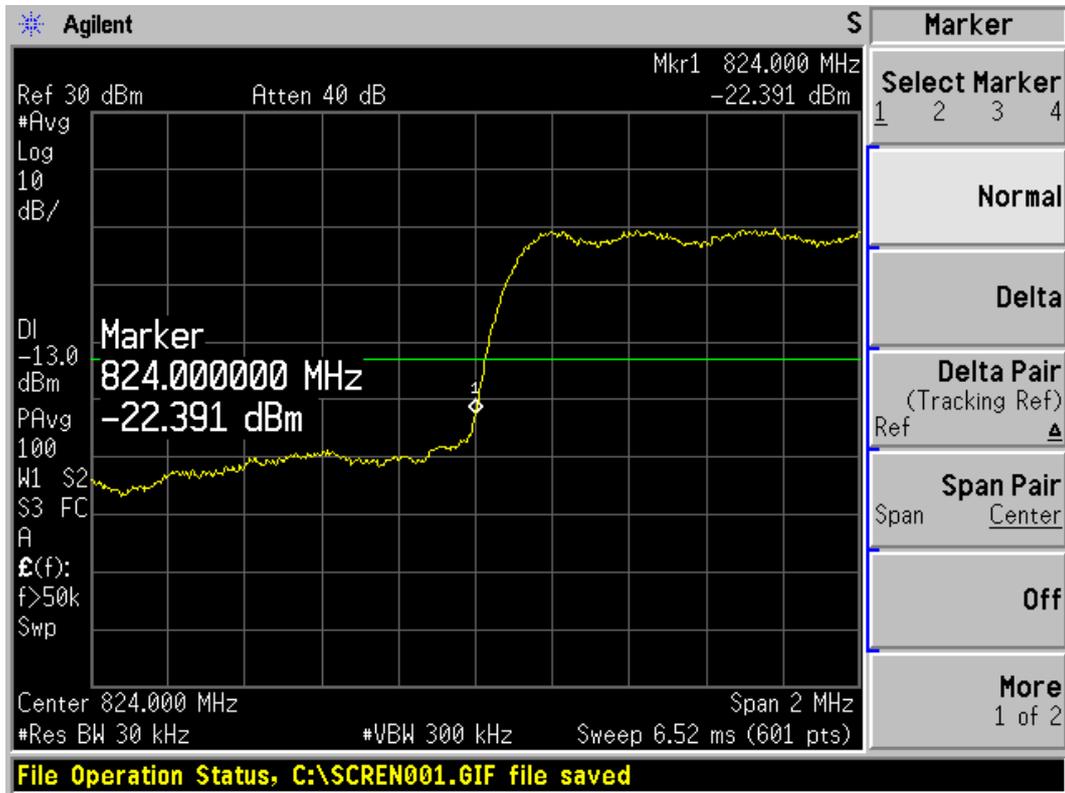


CDMA Cellular EV-DO(Rev.A) 1013 Channel

# TA Technology (Shanghai) Co., Ltd. Test Report

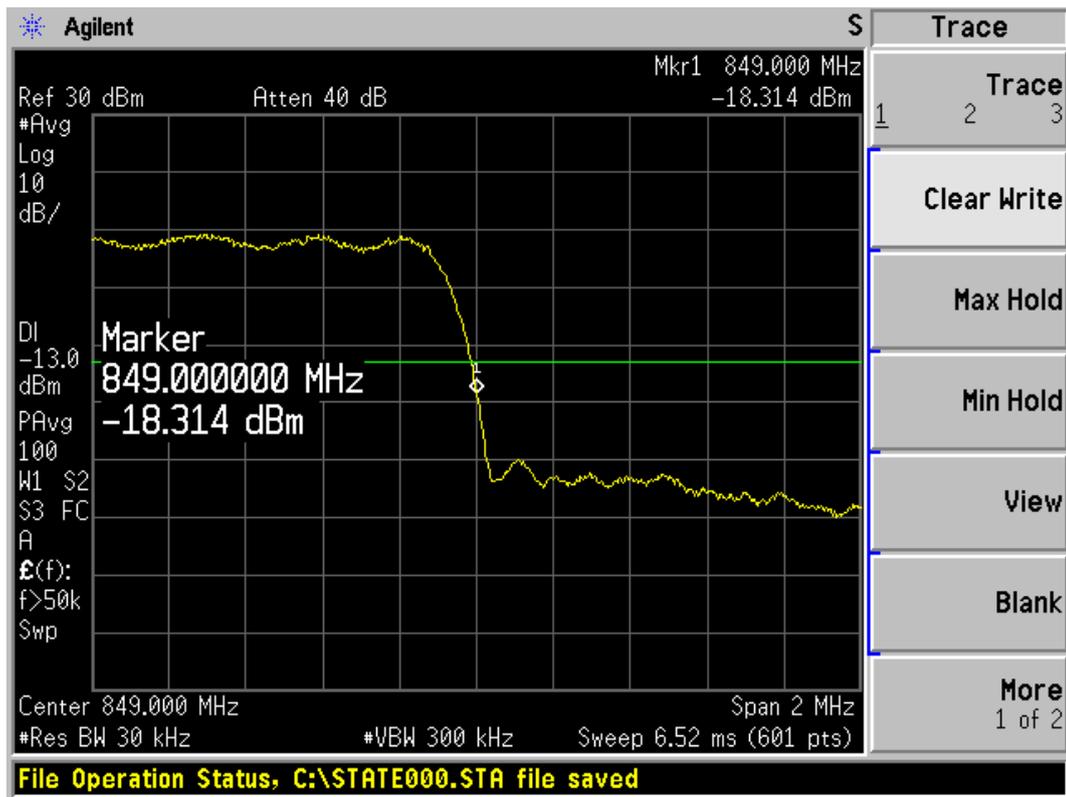


CDMA Cellular EV-DO(Rev.A) 777 Channel



CDMA Cellular 1X Advance 1013 Channel

TA Technology (Shanghai) Co., Ltd.  
Test Report



CDMA Cellular 1X Advance 777 Channel

## 2.7. Peak-to-Average Power Ratio (PAPR)

### Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

### Methods of Measurement

The measurement procedures in KDB971168 are used.

The inherent randomness of the power peaks in a noise-like signal makes it difficult to quantify the peak power using traditional measurement techniques for determining the peak power of an analog signal. The peak power of a digitally-modulated signal is predictable only on a statistical basis. Thus, for these types of signals, a statistical measurement of the peak power is necessary.

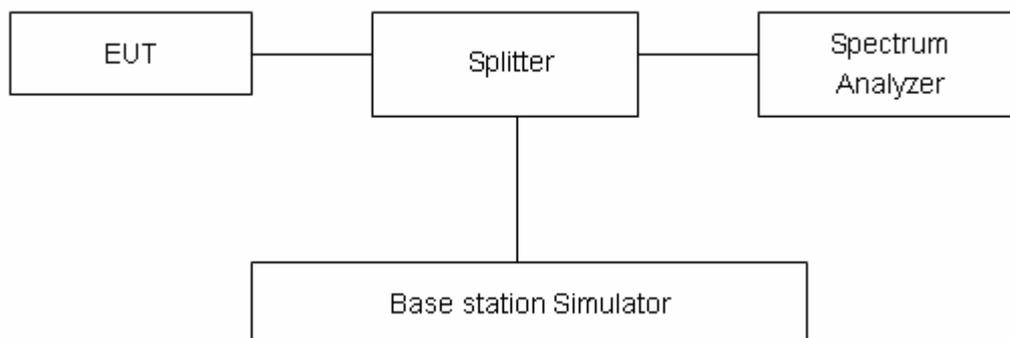
Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth.

Step 1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.

Step 2. Set the CCDF option in Spectrum analyzer.

Step 3. Record the maximum PAPR level associated with a probability of 0.1%.

### Test Setup



### Limits

No specific Peak-to-Average Ratio requirements in KDB 971168.

### Measurement Uncertainty

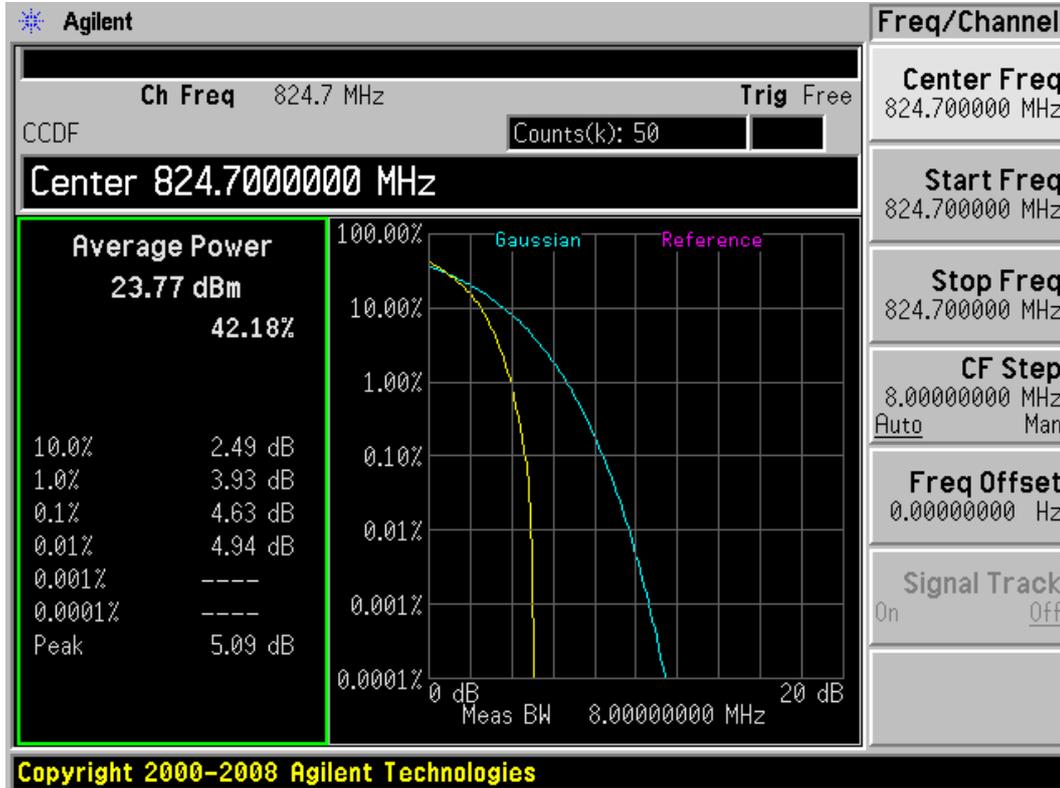
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 0.4$  dB.

# TA Technology (Shanghai) Co., Ltd.

## Test Report

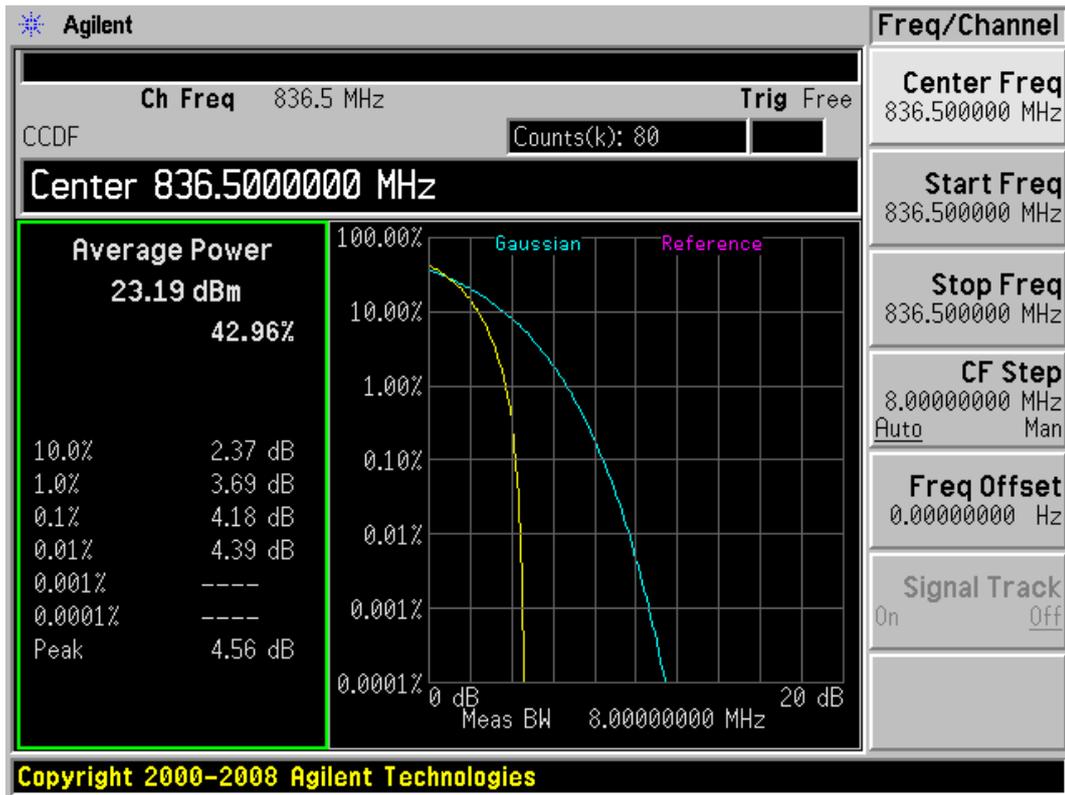
### Test Results

Mode	Channel	Frequency (MHz)	Test Result(dB)
CDMA Cellular RC1 SO55	1013	824.7	4.63
	384	836.52	4.18
	777	848.31	4.17
CDMA Cellular EVDO (Rev.0)	1013	824.7	4.22
	384	836.52	3.83
	777	848.31	3.93
CDMA Cellular EVDO (Rev.A)	1013	824.7	5.08
	384	836.52	5.32
	777	848.31	4.36
CDMA Cellular 1X Advance SO75	1013	824.7	3.77
	384	836.52	3.75
	777	848.31	3.74

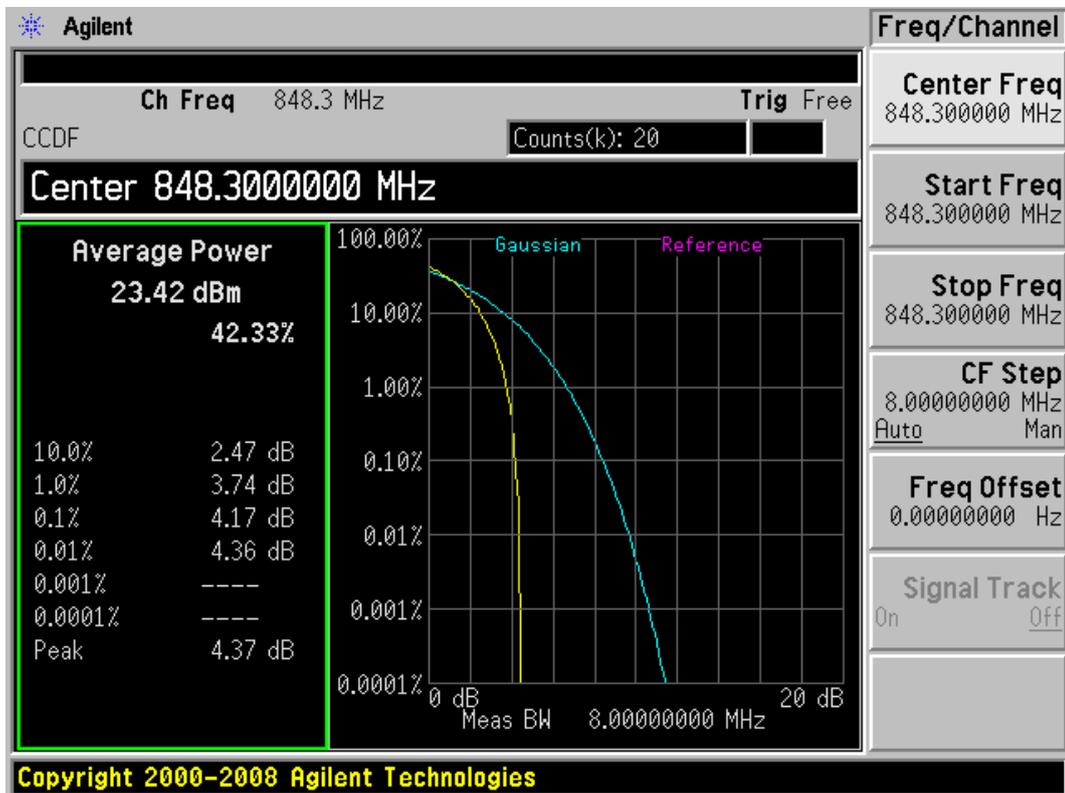


CDMA Cellular RC1 SO55 CH1013 Channel

# TA Technology (Shanghai) Co., Ltd. Test Report

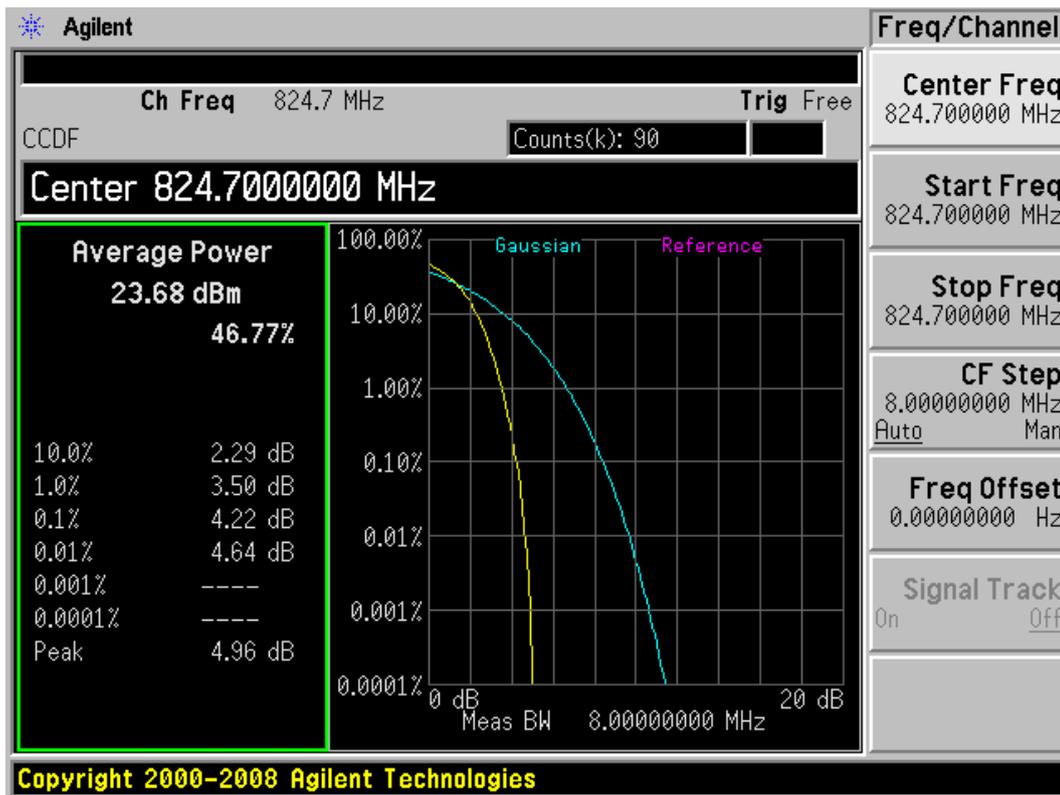


CDMA Cellular RC1 SO55 CH384 Channel

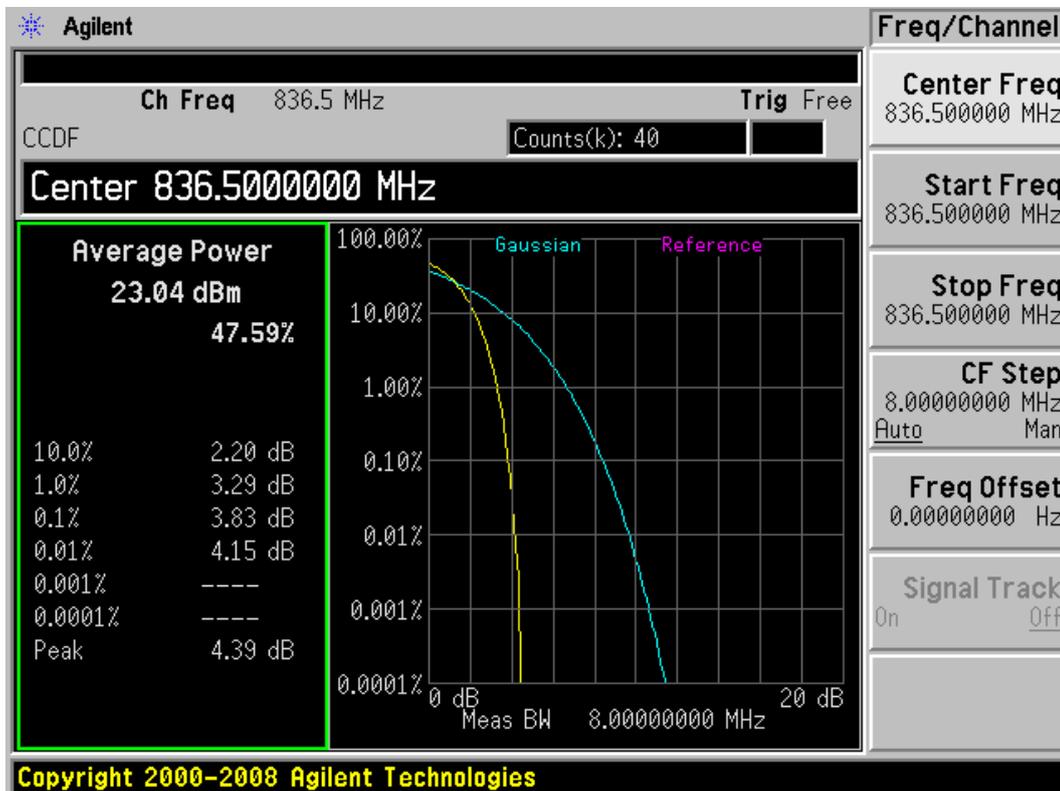


CDMA Cellular RC1 SO55 CH777 Channel

# TA Technology (Shanghai) Co., Ltd. Test Report

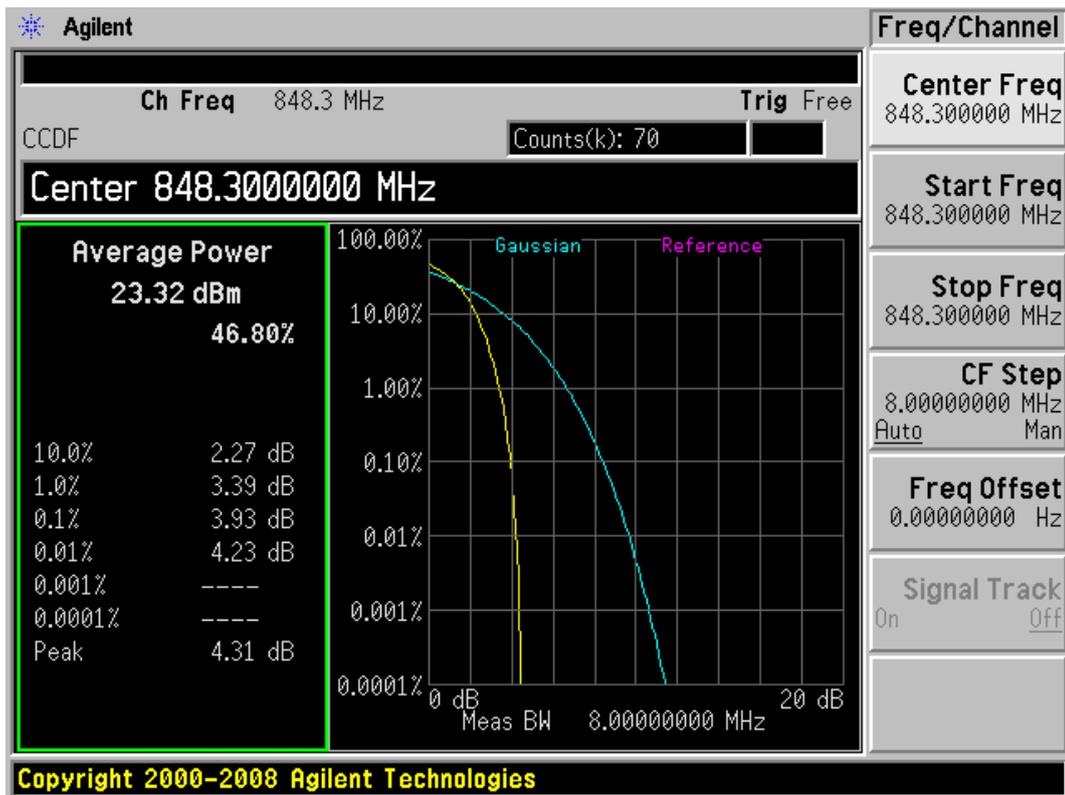


CDMA Cellular EVDO (Rev.0) CH1013 Channel

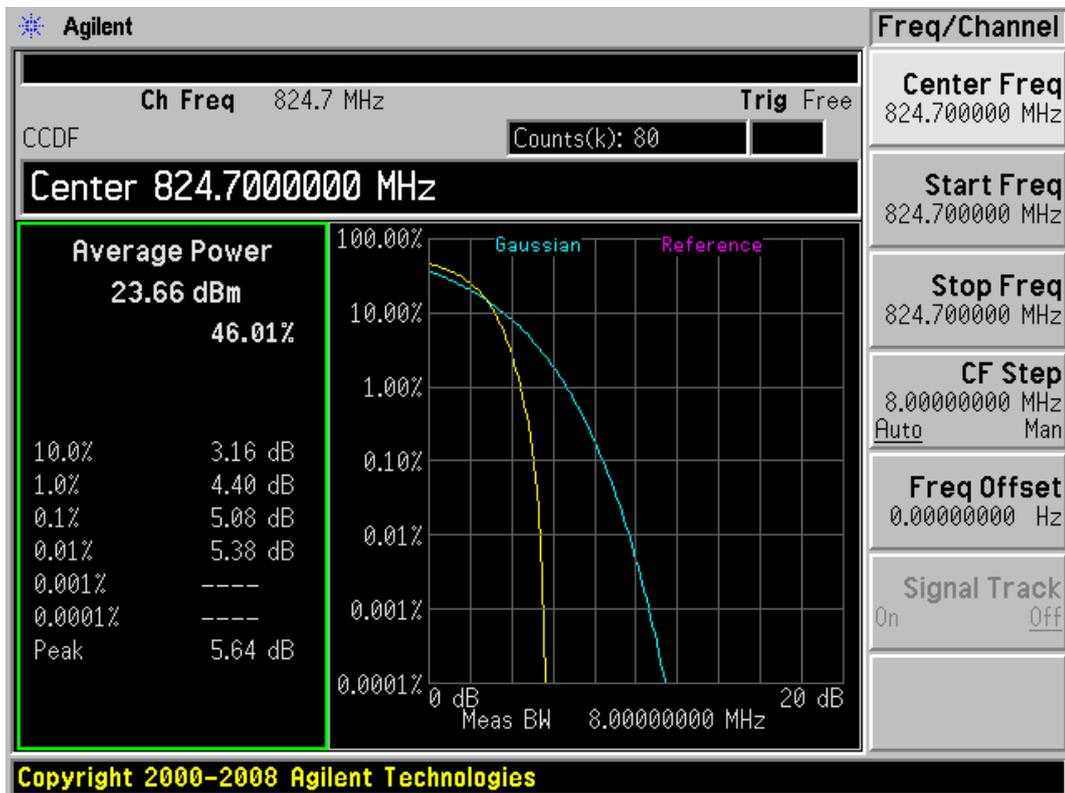


CDMA Cellular EVDO (Rev.0) CH384 Channel

# TA Technology (Shanghai) Co., Ltd. Test Report

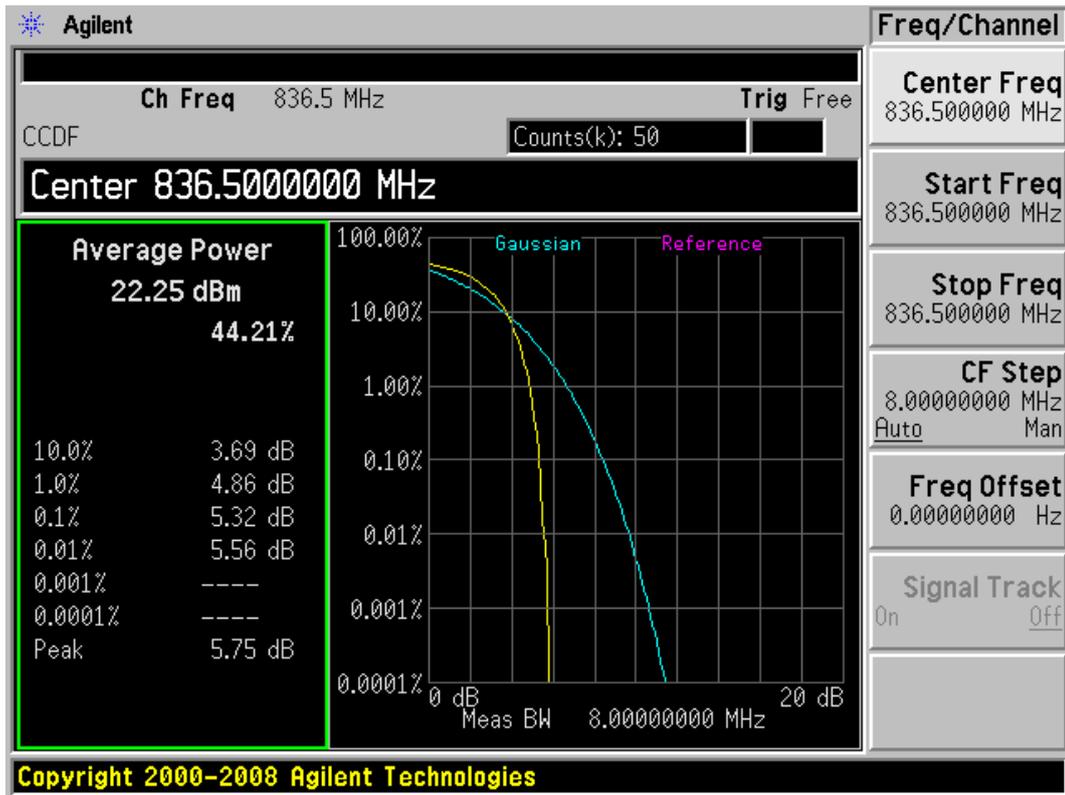


CDMA Cellular EVDO (Rev.0) CH777 Channel

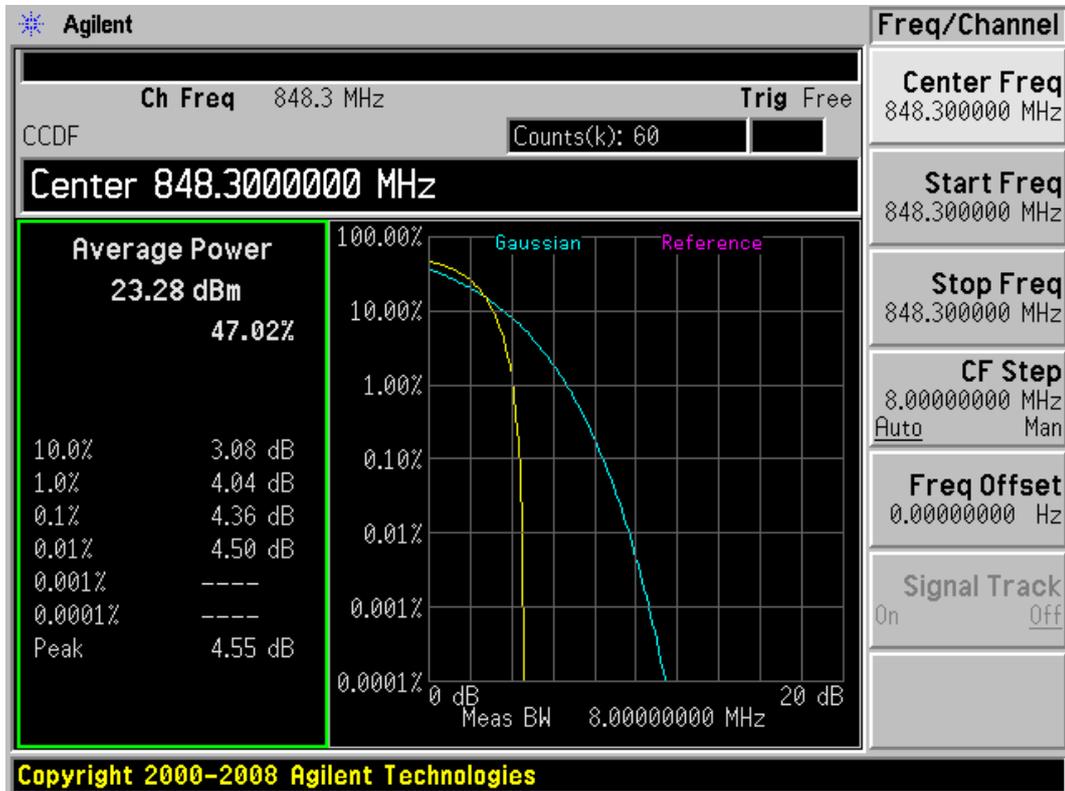


CDMA Cellular EVDO (Rev.A) CH1013 Channel

# TA Technology (Shanghai) Co., Ltd. Test Report

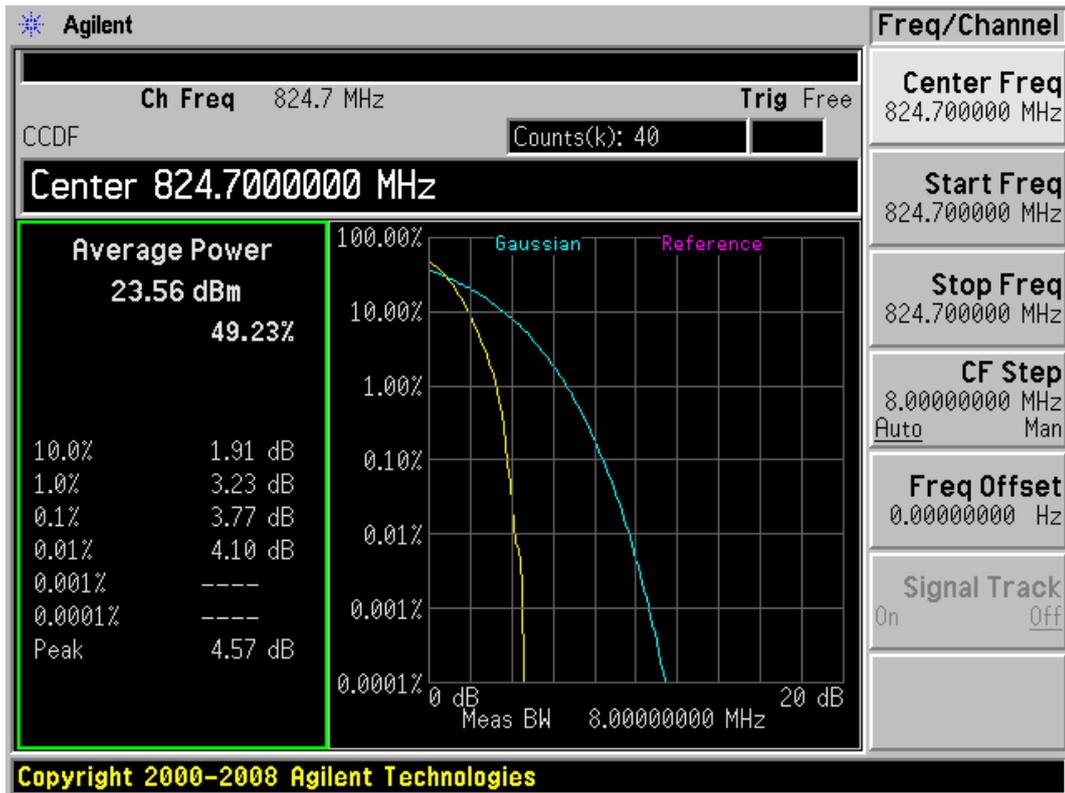


CDMA Cellular EVDO (Rev.A) CH384 Channel

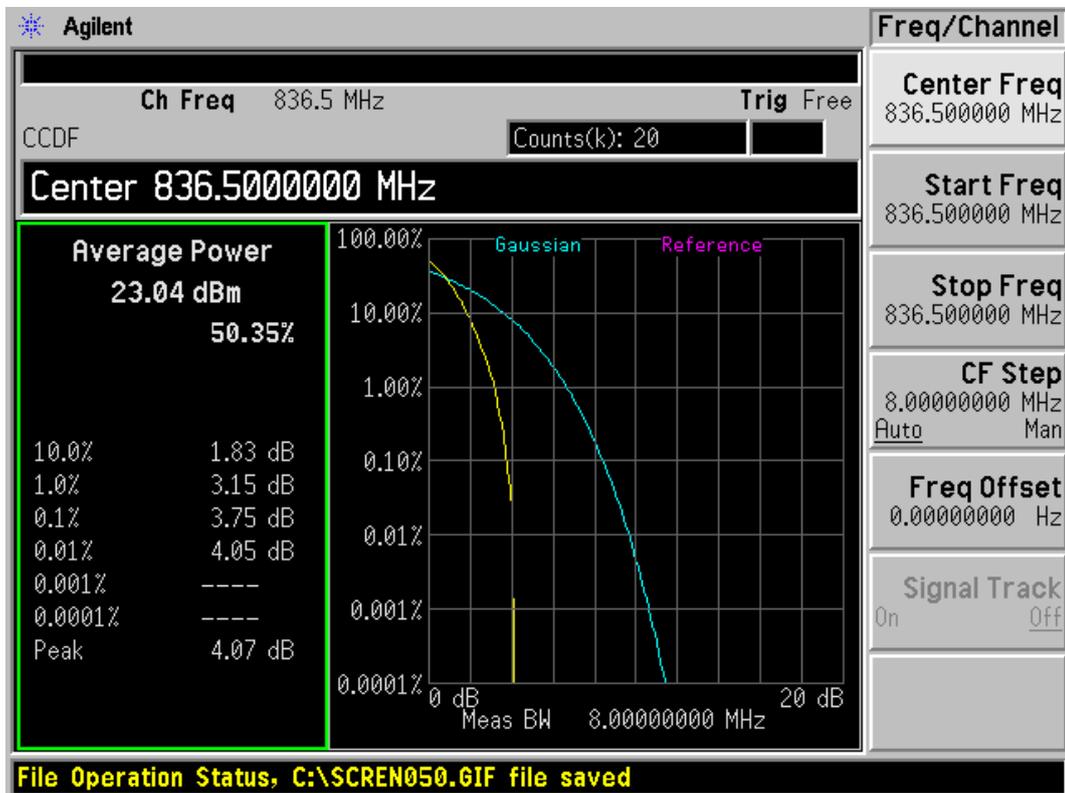


CDMA Cellular EVDO (Rev.A) CH777 Channel

# TA Technology (Shanghai) Co., Ltd. Test Report



CDMA Cellular 1X Advance SO75 CH1013 Channel

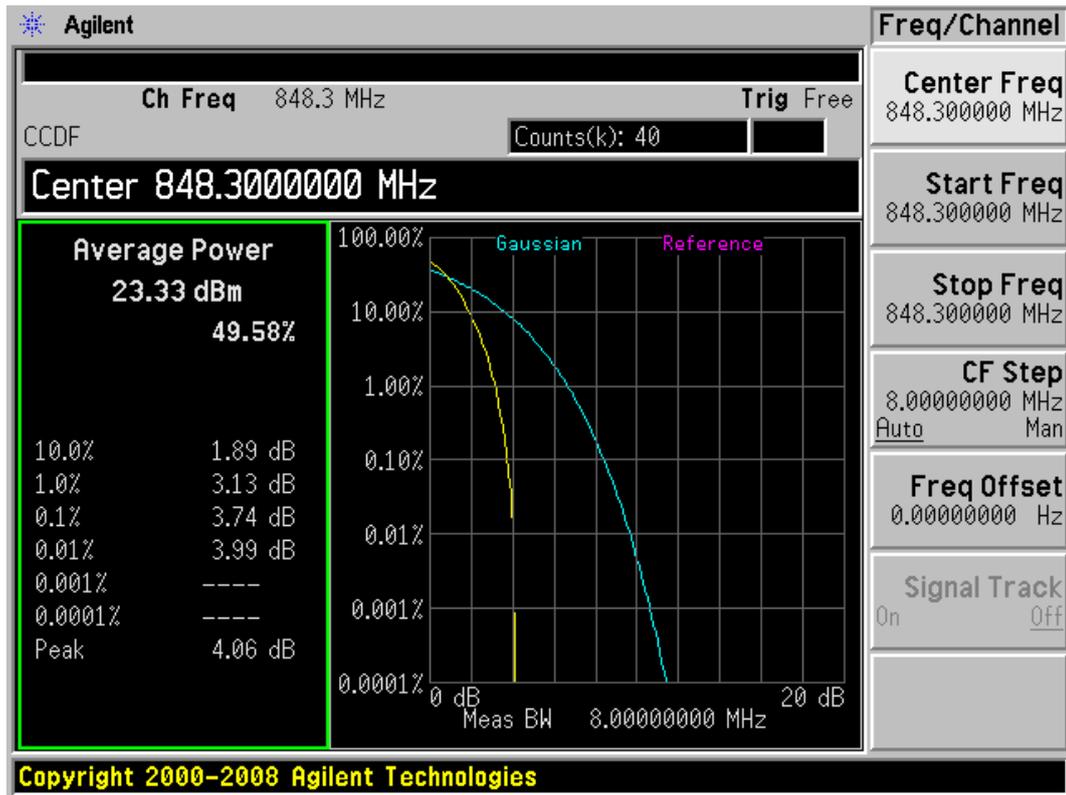


CDMA Cellular 1X Advance SO75 CH384 Channel

# TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RHA1301-0016RF01R1

Page 35 of 46



CDMA Cellular 1X Advance SO75 CH777 Channel

## 2.8. Frequency Stability

### Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

### Method of Measurement

#### 1. Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -30°C to +50°C in 10°C step size,

(1) With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours.

(2) Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.

(3) Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

#### 2. Frequency Stability (Voltage Variation)

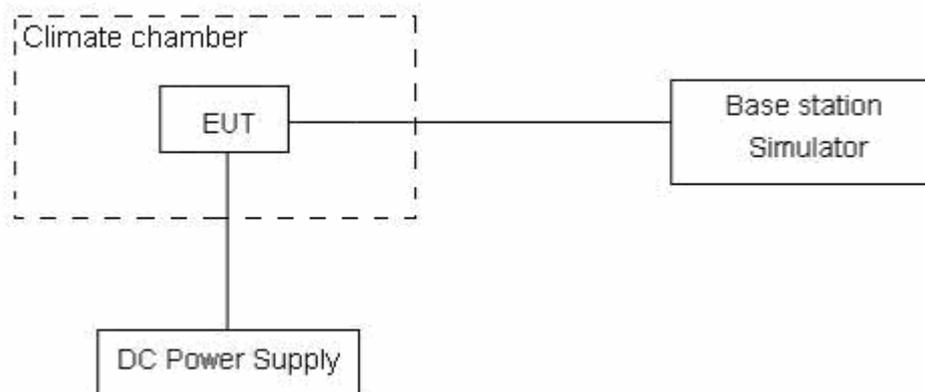
The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery-operating end point which shall be specified by the manufacturer.

This transceiver is specified to operate with an input voltage of between 3.6 V and 4.2 V, with a nominal voltage of 3.7V.

### Test setup



# TA Technology (Shanghai) Co., Ltd.

## Test Report

### Limits

According to the Sec. 22.355, the frequency stability of the carrier shall be accurate to within 2.5 ppm of the received frequency for mobile stations.

Limits	$\leq 2.5 \text{ ppm}$
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### Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor  $k = 3, U = 0.01 \text{ ppm}$ .

### Test Result

Temperature (°C)	Test Results (ppm) / 3.7 V Power supply Channel 384			
	RC1 (SO55)	EV-DO(Rev.0)	EV-DO(Rev.A)	1X Advance(SO75)
-30	-0.0099	-0.0018	-0.0013	-0.0056
-20	-0.0038	-0.0067	-0.0062	-0.0105
-10	0.0002	-0.0027	-0.0023	-0.0066
0	-0.0041	-0.0112	-0.0108	-0.0151
10	-0.0091	-0.0093	-0.0088	-0.0132
20	-0.0033	-0.0106	-0.0102	-0.0145
30	-0.0013	-0.0078	-0.0073	-0.0116
40	-0.0065	-0.0135	-0.0130	-0.0173
50	-0.0020	-0.0096	-0.0091	-0.0134

Voltage (V)	Test Results(ppm) / 20°C Channel 384			
	RC1 (SO55)	EV-DO(Rev.0)	EV-DO(Rev.A)	1X Advance(SO75)
4.2	-0.0048	-0.0054	-0.0049	-0.0092
3.7	0.0011	-0.0026	-0.0022	-0.0065
3.6	-0.0066	-0.0048	-0.0043	-0.0086

## 2.9. Spurious Emissions at Antenna Terminals

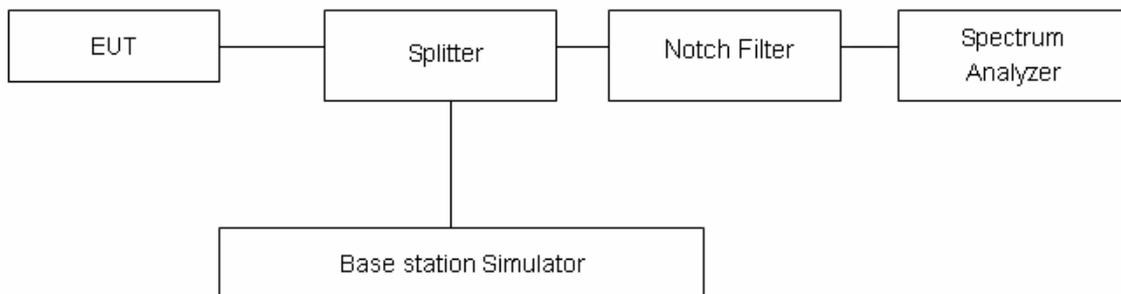
### Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

### Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 30MHz to the 10th harmonic of the carrier. The peak detector is used. For below 1GHz, RBW and VBW are set to 100 kHz, Sweep is set to ATUO. For above 1GHz, RBW and VBW are set to 1MHz, Sweep is set to ATUO.

### Test setup



### Limits

Rule Part 22.917(a) specifies that “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.”

Limit	-13 dBm
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### Measurement Uncertainty

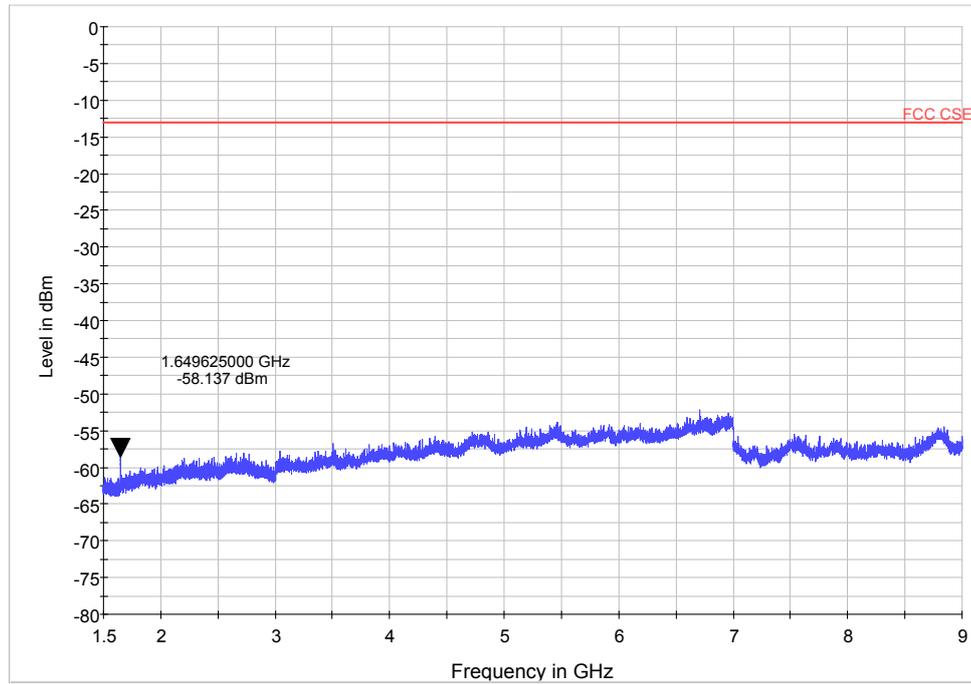
The assessed measurement uncertainty to ensure 99.75 % confidence level for the normal distribution is with the coverage factor  $k = 1.96$ .

Frequency	Uncertainty
100kHz-2GHz	0.684 dB
2GHz-12.75GHz	1.407 dB

# TA Technology (Shanghai) Co., Ltd. Test Report

## Test Result

CDMA Cellular CH1013



CDMA Cellular 1013 Channel 1.5GHz~9GHz

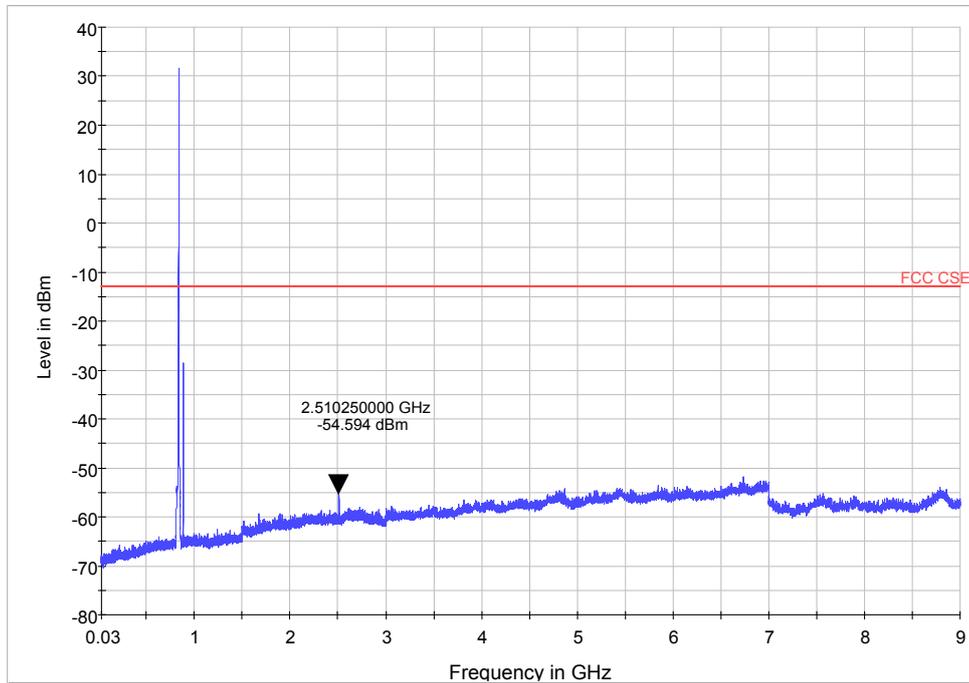
Harmonic	TX ch.1013 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	1649.6	-58.14	-13	45.14
3	2474.1	Nf	-13	/
4	3298.8	Nf	-13	/
5	4123.5	Nf	-13	/
6	4948.2	Nf	-13	/
7	5772.9	Nf	-13	/
8	6597.6	Nf	-13	/
9	7422.3	Nf	-13	/
10	8247	Nf	-13	/

Nf: noise floor

Note: The other Spurious RF conducted emissions level is no more than noise floor.

# TA Technology (Shanghai) Co., Ltd. Test Report

CDMA Cellular CH384



Note: The signal beyond the limit is carrier  
CDMA Cellular 384 Channel 30MHz~9GHz

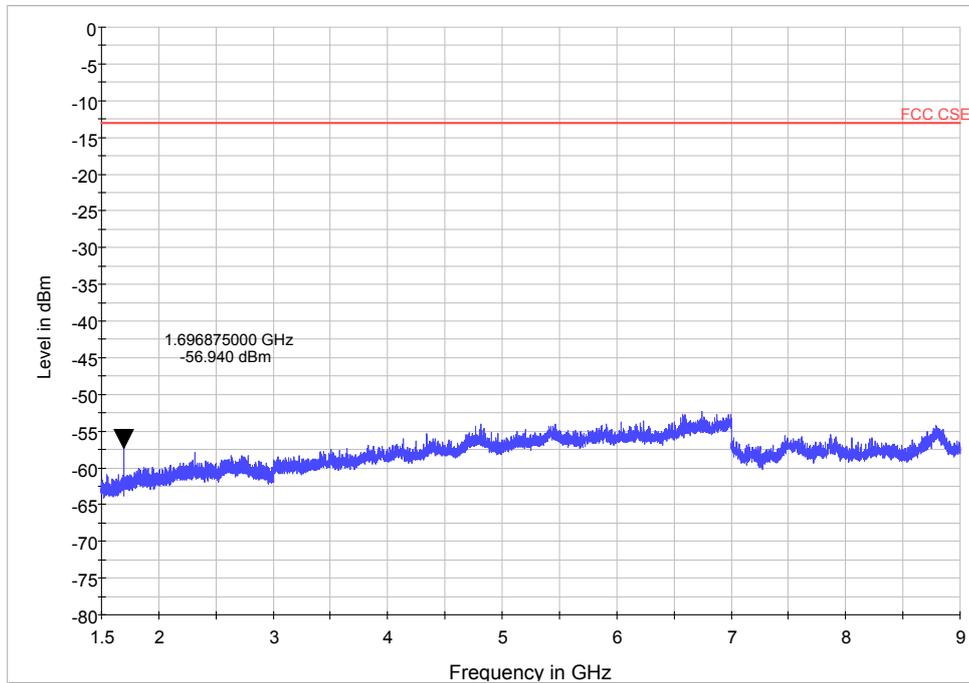
Harmonic	TX ch.384 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	1673.04	Nf	-13	/
3	2510.3	-54.59	-13	41.59
4	3346.08	Nf	-13	/
5	4182.6	Nf	-13	/
6	5019.12	Nf	-13	/
7	5855.64	Nf	-13	/
8	6692.16	Nf	-13	/
9	7528.68	Nf	-13	/
10	8365.2	Nf	-13	/

Nf: noise floor

Note: The other Spurious RF conducted emissions level is no more than noise floor.

# TA Technology (Shanghai) Co., Ltd. Test Report

CDMA Cellular CH777



CDMA Cellular 777 Channel 1.5GHz~9GHz

Harmonic	TX ch.777 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	1696.9	-56.94	-13	43.94
3	2544.93	Nf	-13	/
4	3393.24	Nf	-13	/
5	4241.55	Nf	-13	/
6	5089.86	Nf	-13	/
7	5938.17	Nf	-13	/
8	6786.48	Nf	-13	/
9	7634.79	Nf	-13	/
10	8483.1	Nf	-13	/

Nf: noise floor

Note: The other Spurious RF conducted emissions level is no more than noise floor.

## 2.10. Radiates Spurious Emission

### Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

### Method of Measurement

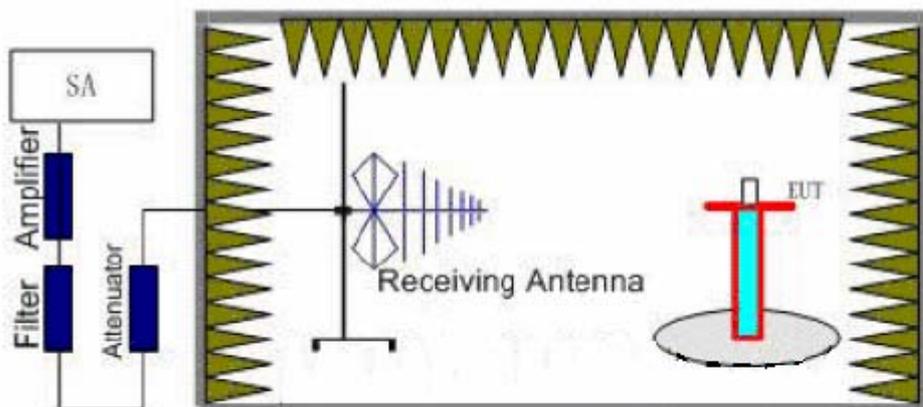
The measurements procedures in TIA -603C are used.

The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment.

The procedure of Radiates Spurious Emission is as follows:

Step 1:

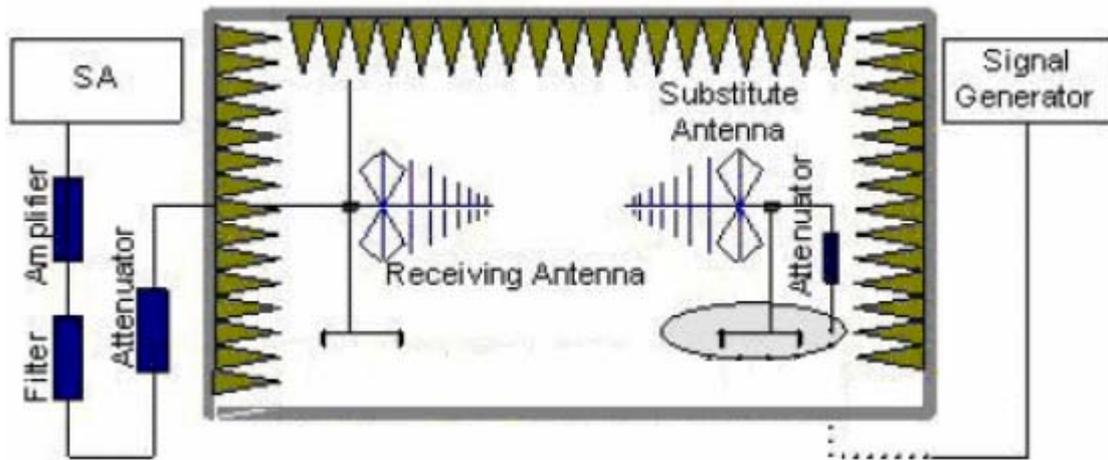
The measurement is carried out in the semi-anechoic chamber.. EUT was placed on a 1.5 meters high non-conductive table at a 3 meters test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. A radio link shall be established between EUT and Tester. The output power of the cell signal of the tester will be decreased until the output power of the EUT reach a maximum value. A peak detector is used while RBW and VBW are both set to 3MHz. During the measurement, the highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna moved up and down over a range from 1 to 4 meters in both horizontally and vertically polarized orientations. The test setup refers to figure below.



Step 2:

A dipole antenna shall be substituted in place of the EUT. The antenna will be driven by a signal generator with a adjustable S.G. applied through a Tx cable. Adjust the level of the signal generator output until the value of the receiver reach the previously recorded analyzer power level (LVL).Then The E.R.P. /E.I.R.P. of the EUT can be calculated through the level of the signal generator, Tx cable loss and the gain of the substitution antenna. The test setup refers to figure below.

# TA Technology (Shanghai) Co., Ltd. Test Report



$$\text{E.R.P (peak power)} = \text{S.G.} - \text{Tx Cable loss} + \text{Substitution antenna gain} - 2.15.$$

$$\text{EIRP} = \text{E.R.P} + 2.15$$

The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the antenna is vertical.

### Limits

Rule Part 22.917(a) specifies that “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.”

Limit	-13 dBm
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### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ ,  $U = 3.55$  dB.

**TA Technology (Shanghai) Co., Ltd.**  
**Test Report**

Report No.: RHA1301-0016RF01R1

Page 44 of 46

**Test Result**

CDMA Cellular CH1013

Harmonic	TX ch.1013 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1648.9	-55.98	2	10.15	-49.98	-13	36.98	0
3	2474.1	/	/	/	Nf	-13	/	/
4	3298.8	/	/	/	Nf	-13	/	/
5	4123.5	/	/	/	Nf	-13	/	/
6	4948.2	/	/	/	Nf	-13	/	/
7	5772.9	/	/	/	Nf	-13	/	/
8	6597.6	/	/	/	Nf	-13	/	/
9	7422.3	/	/	/	Nf	-13	/	/
10	8247	/	/	/	Nf	-13	/	/

Nf: noise floor

Note: The other Spurious RF Radiated emissions level is no more than noise floor.

# TA Technology (Shanghai) Co., Ltd.

## Test Report

Report No.: RHA1301-0016RF01R1

Page 45 of 46

CDMA Cellular CH384

Harmonic	TX ch.384 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1672.9	-53.48	2	10.75	-46.88	-13	33.88	180
3	2510.3	/	/	/	Nf	-13	/	/
4	3346.08	/	/	/	Nf	-13	/	/
5	4182.6	/	/	/	Nf	-13	/	/
6	5019.12	/	/	/	Nf	-13	/	/
7	5855.64	/	/	/	Nf	-13	/	/
8	6692.16	/	/	/	Nf	-13	/	/
9	7528.68	/	/	/	Nf	-13	/	/
10	8365.2	/	/	/	Nf	-13	/	/

Nf: noise floor

Note: The other Spurious RF Radiated emissions level is no more than noise floor.

CDMA Cellular CH777

Harmonic	TX ch.777 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1696.7	-50.63	2	10.15	-44.63	-13	31.63	0
3	2544.93	/	/	/	Nf	-13	/	/
4	3393.24	/	/	/	Nf	-13	/	/
5	4241.55	/	/	/	Nf	-13	/	/
6	5089.86	/	/	/	Nf	-13	/	/
7	5938.17	/	/	/	Nf	-13	/	/
8	6786.48	/	/	/	Nf	-13	/	/
9	7634.79	/	/	/	Nf	-13	/	/
10	8483.1	/	/	/	Nf	-13	/	/

Nf: noise floor

Note: The other Spurious RF Radiated emissions level is no more than noise floor.

**TA Technology (Shanghai) Co., Ltd.**  
**Test Report**

Report No.: RHA1301-0016RF01R1

Page 46 of 46

**3. Main Test Instruments**

No.	Name	Type	Manufacturer	Serial Number	Calibration Date	Valid Period
01	Base Station Simulator	CMU200	R&S	118133	2012-06-30	One year
02	Power Splitter	SHX-GF2-2-13	Hua Xiang	10120101	NA	NA
03	Spectrum Analyzer	E4445A	Agilent	MY46181146	2012-06-30	One year
04	Universal Radio Communication Tester	E5515C	Agilent	MY48367192	2012-06-30	One year
05	Signal Analyzer	FSV30	R&S	100815	2012-06-30	One year
06	Signal generator	SMB 100A	R&S	102594	2012-06-30	One year
07	EMI Test Receiver	ESCI	R&S	100948	2012-06-30	One year
08	Trilog Antenna	VUBL 9163	SCHWARZB ECK	9163-201	2010-06-20	Three years
09	Horn Antenna	HF907	R&S	100126	2012-07-01	Three years
10	Climatic Chamber	PT-30B	Re Ce	20101891	2010-09-10	Three years
11	Semi-Anechoic Chamber	9.6*6.7*6.6m	ETS-Lindgren	NA	NA	NA
12	EMI test software	ES-K1	R&S	NA	NA	NA

\*\*\*\*\*END OF REPORT \*\*\*\*\*