



# Part 22

# TEST REPORT

<b>Product Name</b>	CDMA/LTE smartphone
<b>Model Name</b>	M931
<b>FCC ID</b>	QISM931
<b>Client</b>	Huawei Technologies Co., Ltd.
<b>Manufacturer</b>	Huawei Technologies Co., Ltd.
<b>Date of issue</b>	July 2, 2013

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

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

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**GENERAL SUMMARY**

<b>Reference Standard(s)</b>	<p><b>FCC CFR47 Part 2 (2012)</b> Frequency Allocations And Radio Treaty Matters;General Rules And Regulations</p> <p><b>FCC CFR 47 Part 22H (2012)</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 v02r01</b> Measurement Guidance for Certification of Licensed Digital Transmitters</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 杨伟中  
Director

Revised by 唐斌  
RF Manager

Performed by 王峰  
RF Engineer

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## **1. General Information**

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

**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.

**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.

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

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### 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  
Contact: Yang Weizhong  
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  
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  
City: Shenzhen  
Postal Code: 518129  
Country: P.R.China

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**1.5. Information of EUT**

**General information**

Product Name:	CDMA/LTE smartphone		
IMEI:	99000135010634		
Hardware Version:	Ver.D		
Software Version:	C8869LV100R001C558B105		
Antenna Type:	Internal Antenna		
Device Operating Configurations:			
Operating Mode(s):	CDMA Cellular:(tested)		
Test Modulation:	(CDMA)QPSK		
Maximum E.R.P.	CDMA Cellular: 22.28 dBm		
Power Supply:	Battery or Charger (AC adaptor)		
Rated Power Supply Voltage:	3.8V		
Extreme Voltage:	Minimum: 3.5V    Maximum: 4.2V		
Extreme Temperature:	Lowest: -10°C    Highest: +55°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

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## Auxiliary Equipment Details

### AE1: Battery

Model: HB5N1HA  
Manufacture: Huawei Technologies Co., Ltd.  
S/N: /

Equipment Under Test (EUT) is CDMA/LTE smartphone with internal antenna. The EUT is tested CDMA Cellular in this report.

This is a variant report, the original report number is RHA1209-0083RF01R1. The EUT in this report add to support BC0 EVDO by software, and hardware are the same. This report is only tested in the EV-DO mode, and the other test results are duplicated from the original 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 is performed from September 20, 2012 to October 10, 2012, and from June 8, 2013 to June 15, 2013.

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## 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. RF Power Output

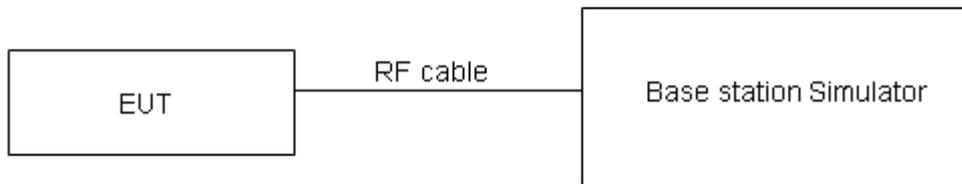
### Ambient condition

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.

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**Test Results**

CDMA Cellular		Average Conducted Power(dBm)		
		Channel 1013	Channel 384	Channel 777
		824.7(MHz)	836.52(MHz)	848.31(MHz)
RC3	SO55(Loopback)	24.03	23.94	24.28
	SO2(Loopback)	<b>24.23</b>	<b>24.14</b>	<b>24.42</b>
RC1	SO55(Loopback)	24.18	24.07	24.34
	SO2(Loopback)	24.04	23.92	24.28
RC3	SO32(+FCH-SCH)	24.18	24.07	24.41
	SO32(+SCH)	<b>24.21</b>	<b>24.08</b>	<b>24.44</b>
EV-DO (Rev.0)		<b>23.52</b>	<b>23.67</b>	<b>23.78</b>
EV-DO (Rev.A)		<b>23.60</b>	<b>23.66</b>	<b>23.79</b>
1X Advance	SO75(Loopback)	24.05	23.79	24.06
	SO73(Voice)	<b>24.13</b>	<b>24.02</b>	<b>24.25</b>

- 1) The maximum RF Output Power numbers are marks in bold.
- 2) The following testing based on the maximum RF Output Power.

### 2.3. Effective Radiated Power

#### Ambient condition

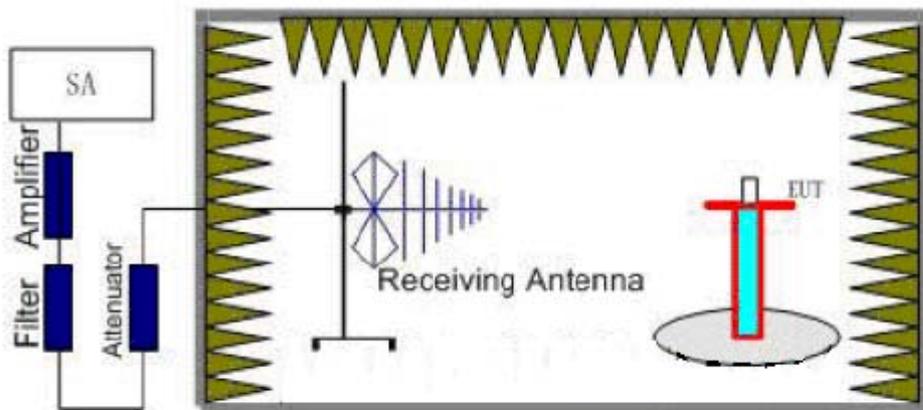
Temperature	Relative humidity
21°C ~25°C	40%~60%

#### Methods of Measurement

The measurement procedures in TIA- 603C are used.

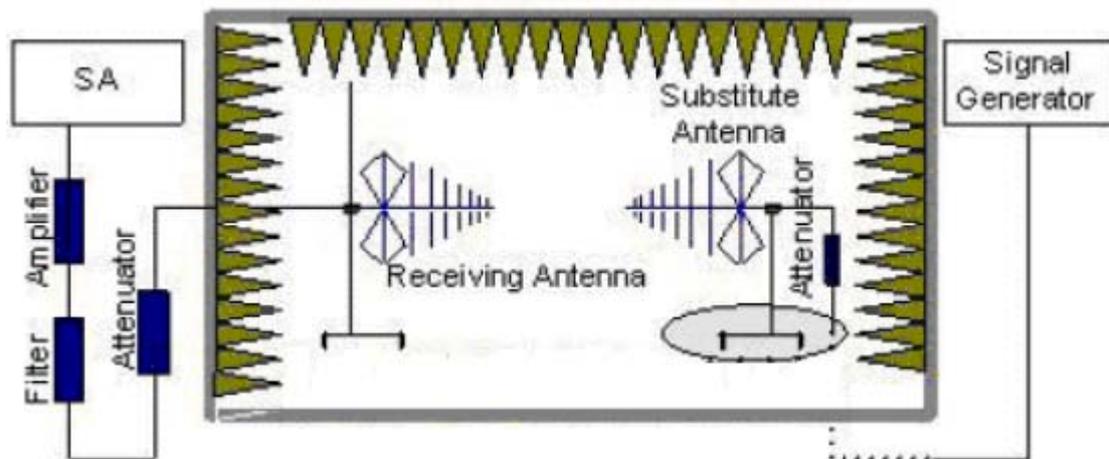
##### Step 1:

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.



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

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

**Limits**

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

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

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

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**Test Results: Pass**

CDMA Cellular	Channel	Polarization	LVL (dBm)	SG+30 (dBm)	Gain (dBi)	Cable Loss (dBm)	E.R.P. (dBm)
RC3 SO2(Loopback)	1013	Vertical	-25.79	34.04	1.06	15.17	17.78
	384	Vertical	-24.56	34.84	1.24	15.20	18.73
	777	Vertical	-25.79	34.19	1.38	15.24	21.18
RC3 SO32(+FCH-SCH)	1013	Vertical	-23.04	34.70	1.06	15.17	18.07
	384	Vertical	-25.26	33.54	1.24	15.20	18.77
	777	Vertical	-24.47	33.19	1.38	15.24	21.41
EVDO (Rev.0)	1013	Vertical	-23.75	36.95	1.06	15.17	20.69
	384	Vertical	-23.06	37.52	1.24	15.20	21.41
	777	Vertical	-24.35	36.26	1.38	15.24	20.25
EVDO (Rev.A)	1013	Vertical	-23.84	36.86	1.06	15.17	20.60
	384	Vertical	-23.09	37.49	1.24	15.20	21.38
	777	Vertical	-24.23	36.38	1.38	15.24	20.37
1X Advance(SO73)	1013	Vertical	-24.18	35.78	1.06	15.17	19.18
	384	Vertical	-24.46	35.34	1.24	15.20	19.29
	777	Vertical	-24.28	35.18	1.38	15.24	22.28

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

2. EIRP= E.R.P+2.15

## 2.4. Occupied Bandwidth

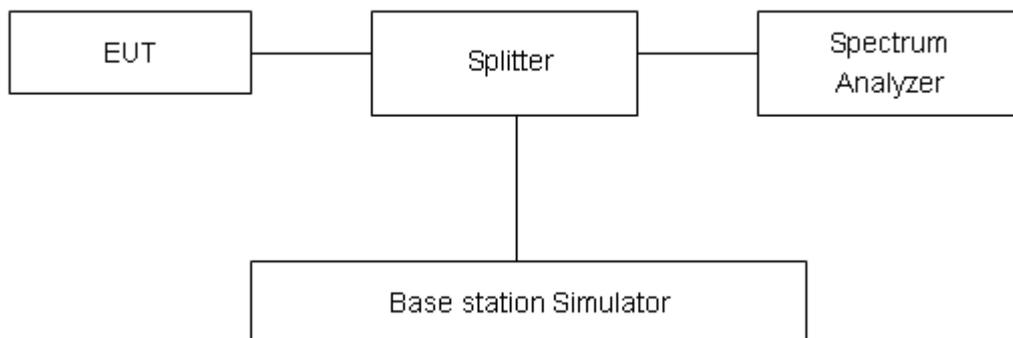
### Ambient condition

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  $k = 2$ ,  $U = 624\text{Hz}$ .

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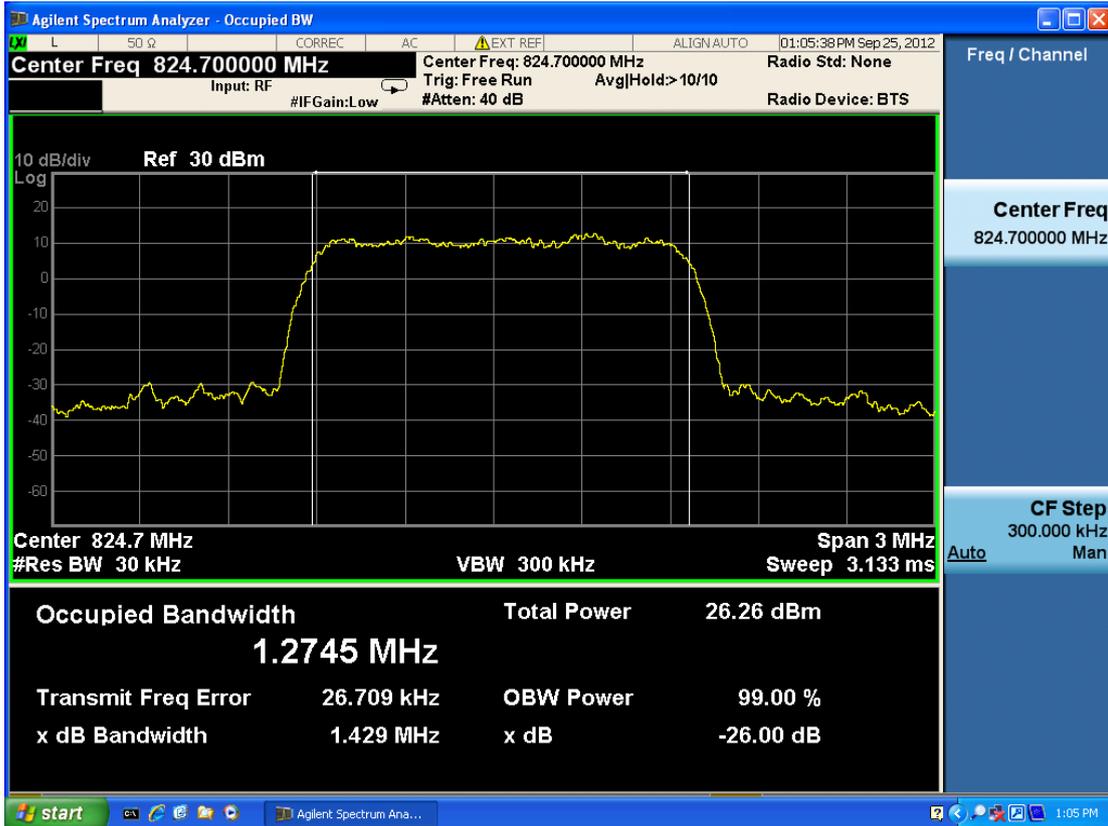
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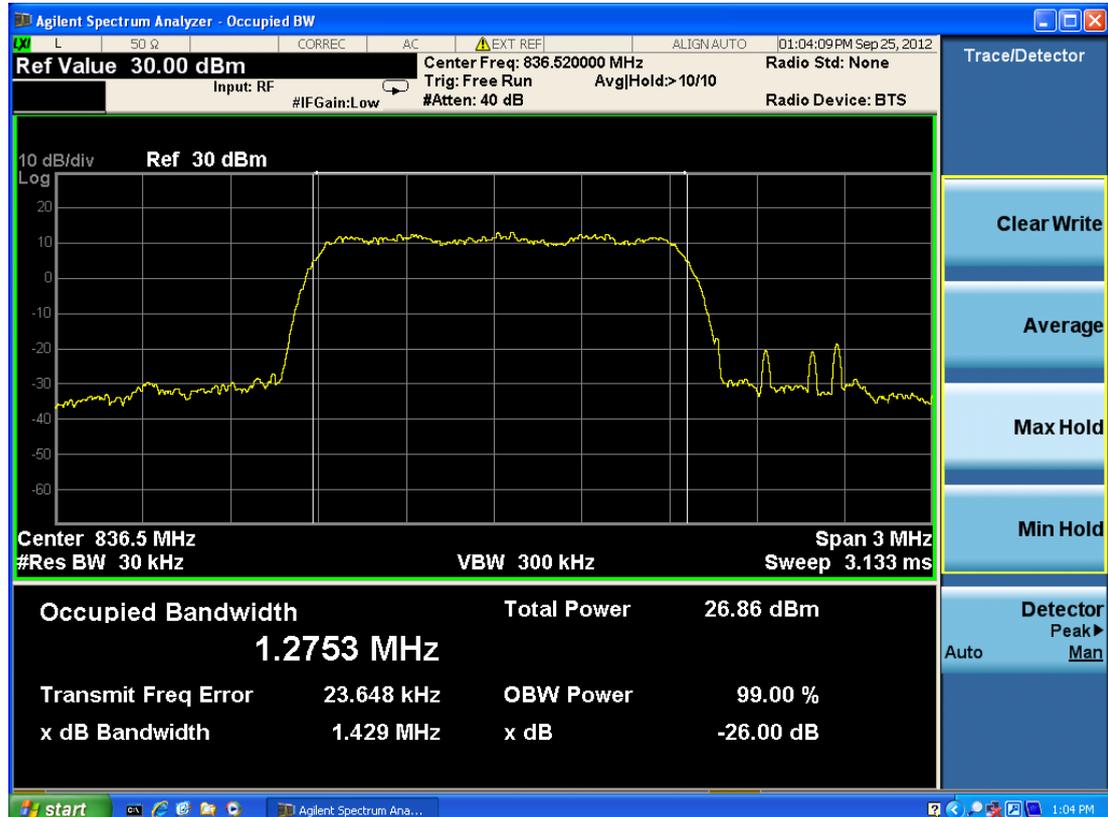
**Test Result**

<b>CDMA Cellular</b>	<b>Channel</b>	<b>Frequency (MHz)</b>	<b>99% Power Bandwidth (MHz)</b>	<b>-26dBc Bandwidth(MHz)</b>
RC3 SO2(Loopback)	1013	824.7	1.2745	1.429
	384	836.52	1.2753	1.429
	777	848.31	1.2713	1.433
RC3 SO32(+FCH-SCH)	1013	824.7	1.2752	1.422
	384	836.52	1.2685	1.431
	777	848.31	1.2714	1.430
EVDO (Rev.0)	1013	824.7	1.2724	1.421
	384	836.52	1.2708	1.418
	777	848.31	1.2708	1.419
EVDO (Rev.A)	1013	824.7	1.2696	1.423
	384	836.52	1.2692	1.420
	777	848.31	1.2652	1.420
1X Advance SO73	1013	824.7	1.2712	1.433
	384	836.52	1.2726	1.427
	777	848.31	1.2761	1.422

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

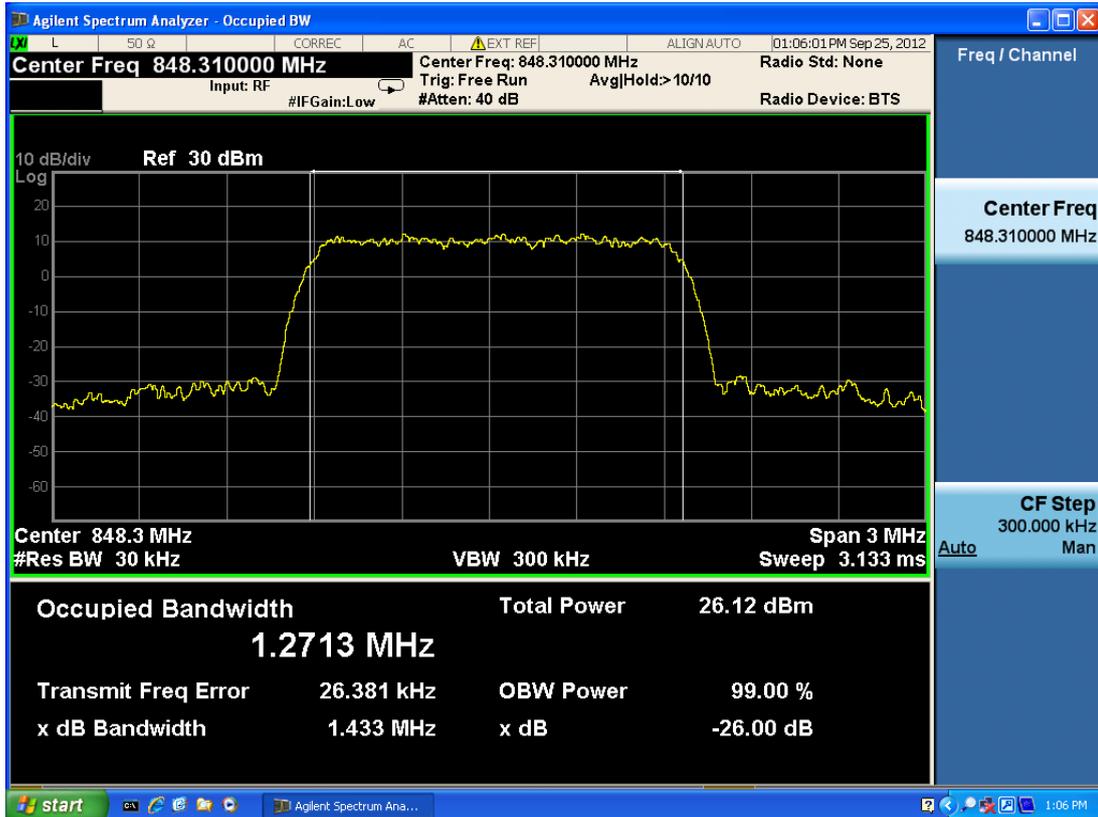


CDMA Cellular SO2 CH1013 Occupied Bandwidth

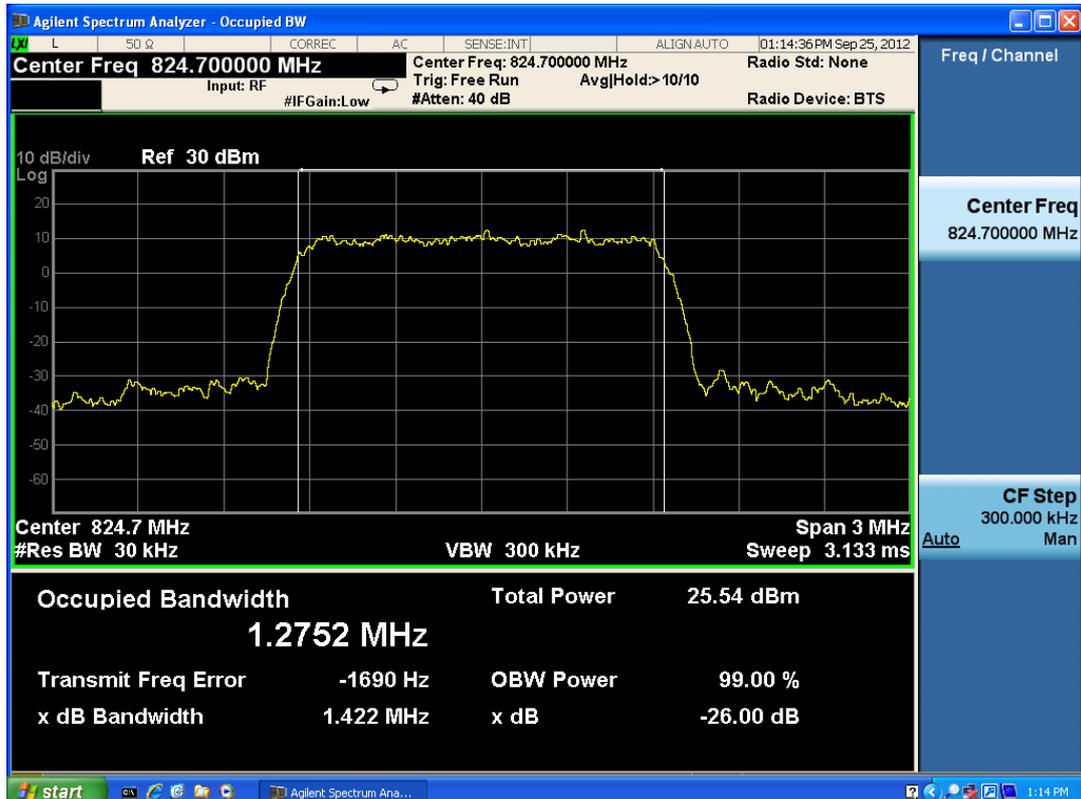


CDMA Cellular SO2 CH384 Occupied Bandwidth

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

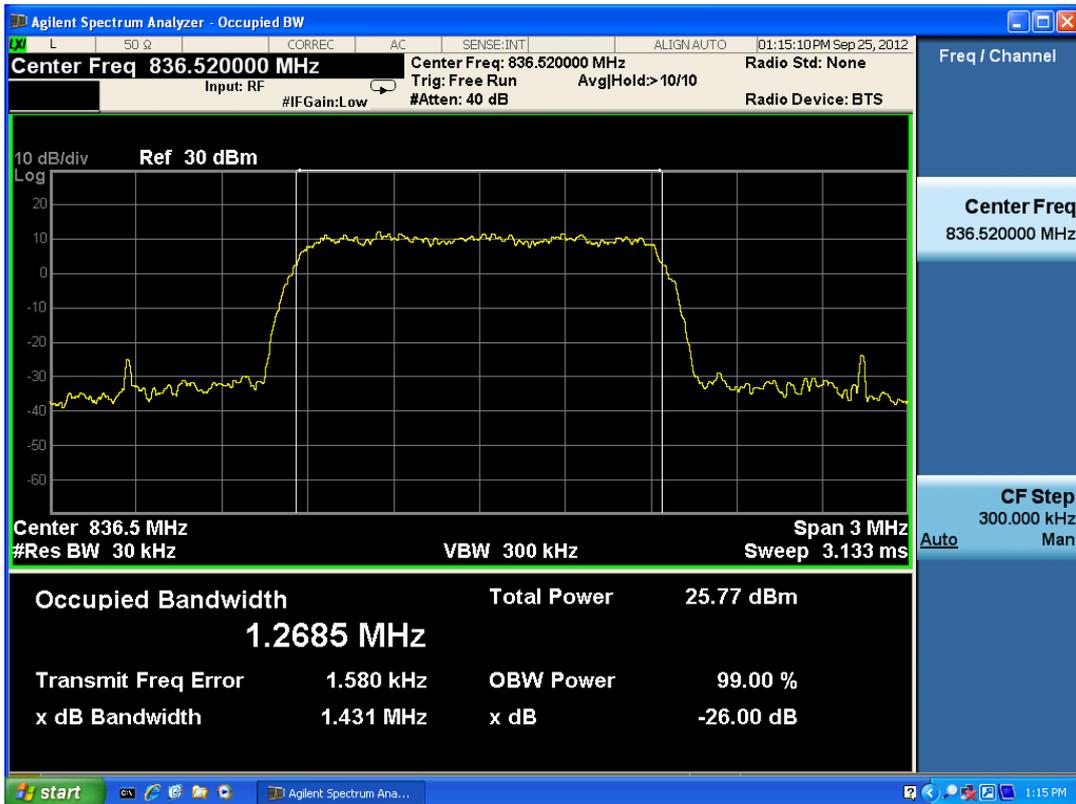


CDMA Cellular SO2 CH777 Occupied Bandwidth

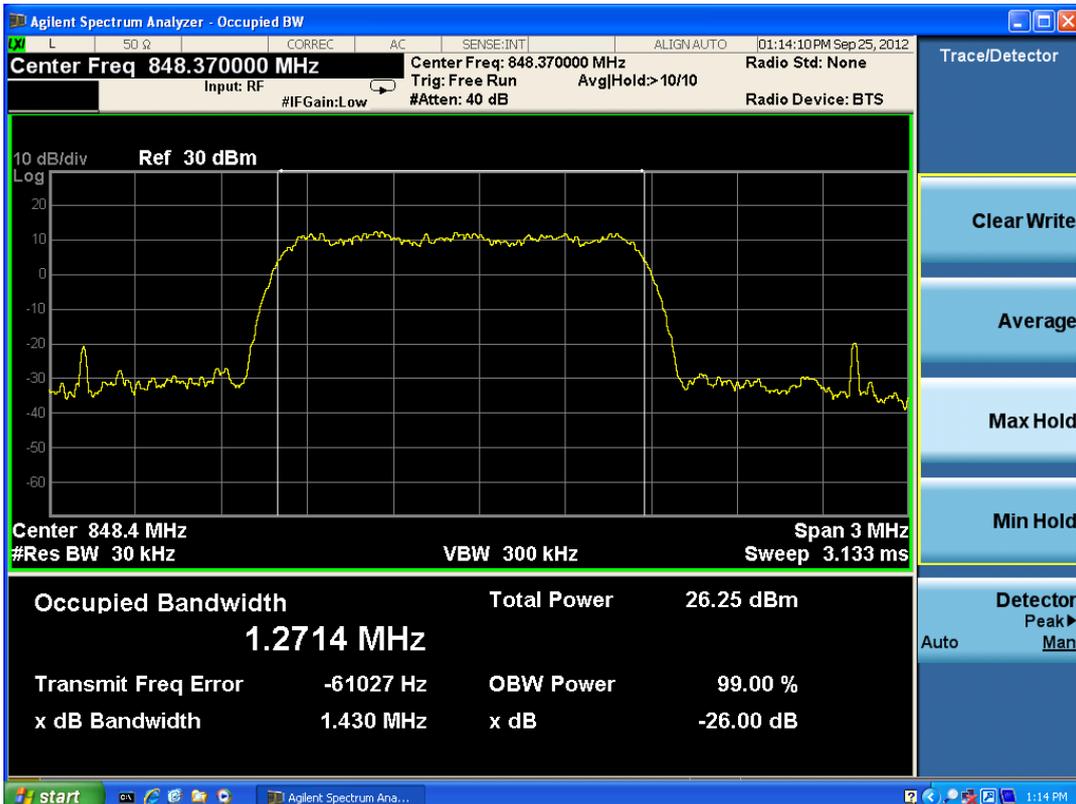


CDMA Cellular SO32 CH1013 Occupied Bandwidth

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

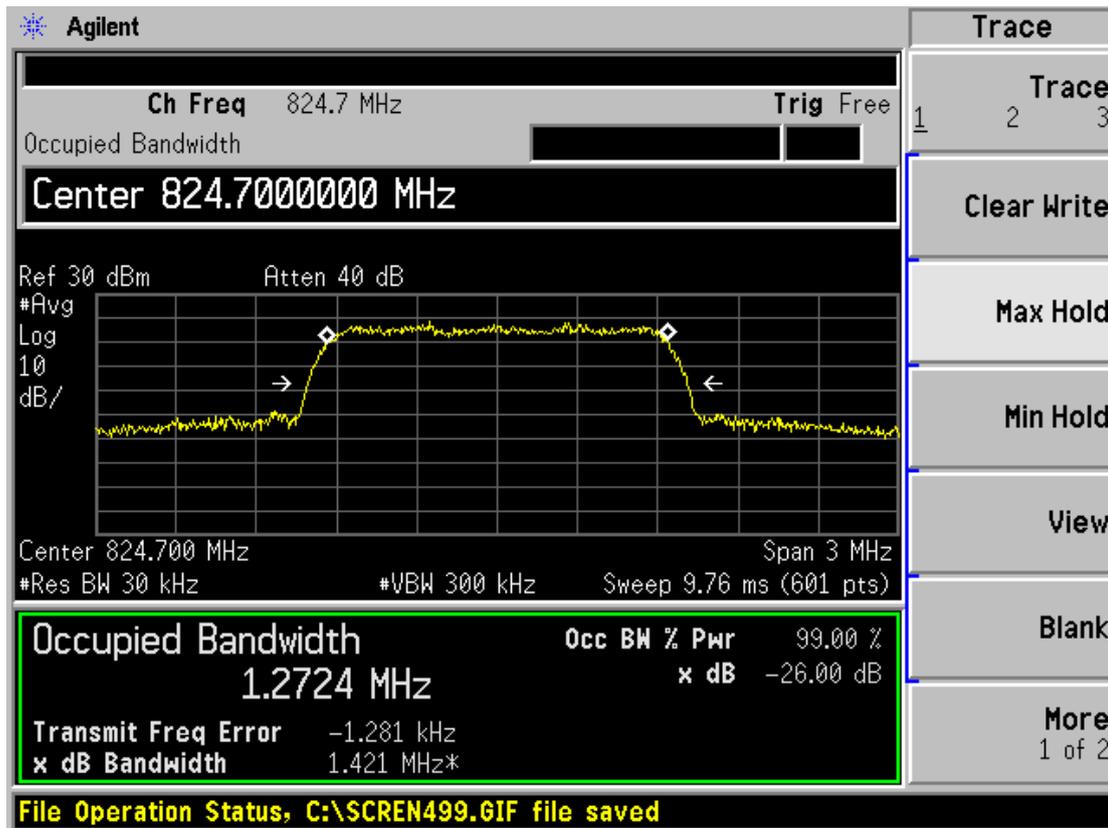


CDMA Cellular SO32 CH384 Occupied Bandwidth

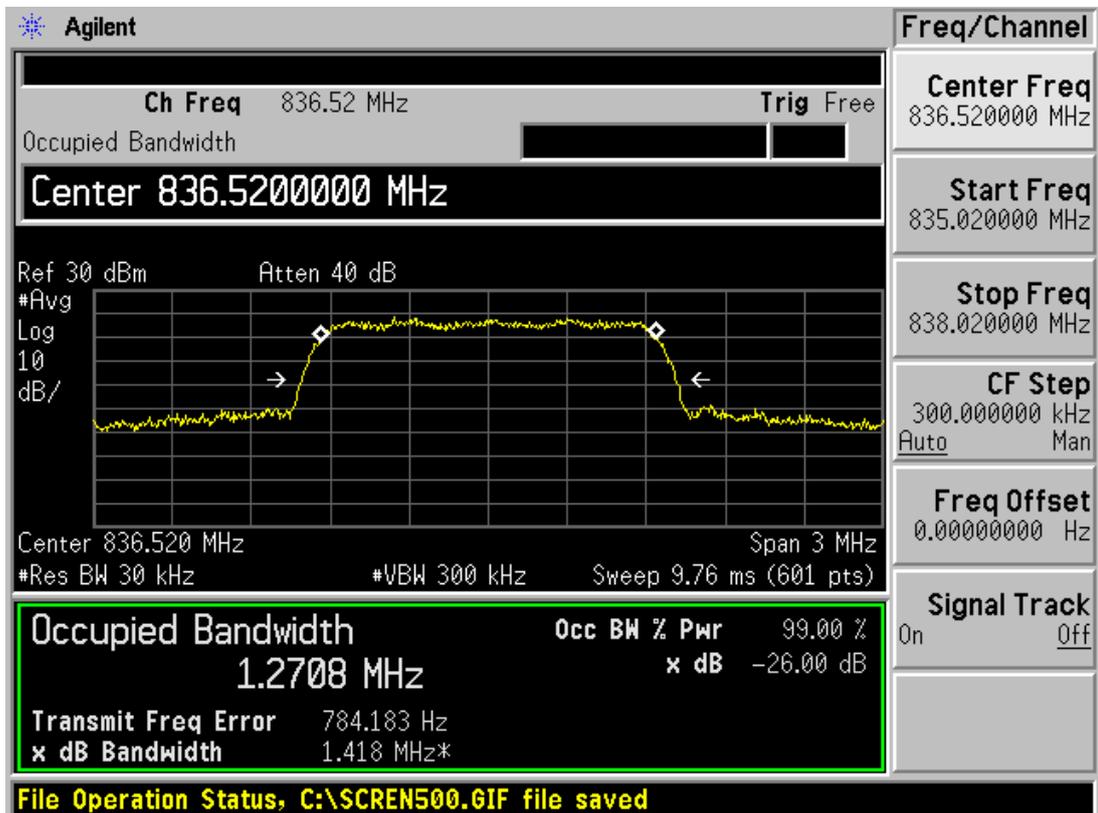


CDMA Cellular SO32 CH777 Occupied Bandwidth

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

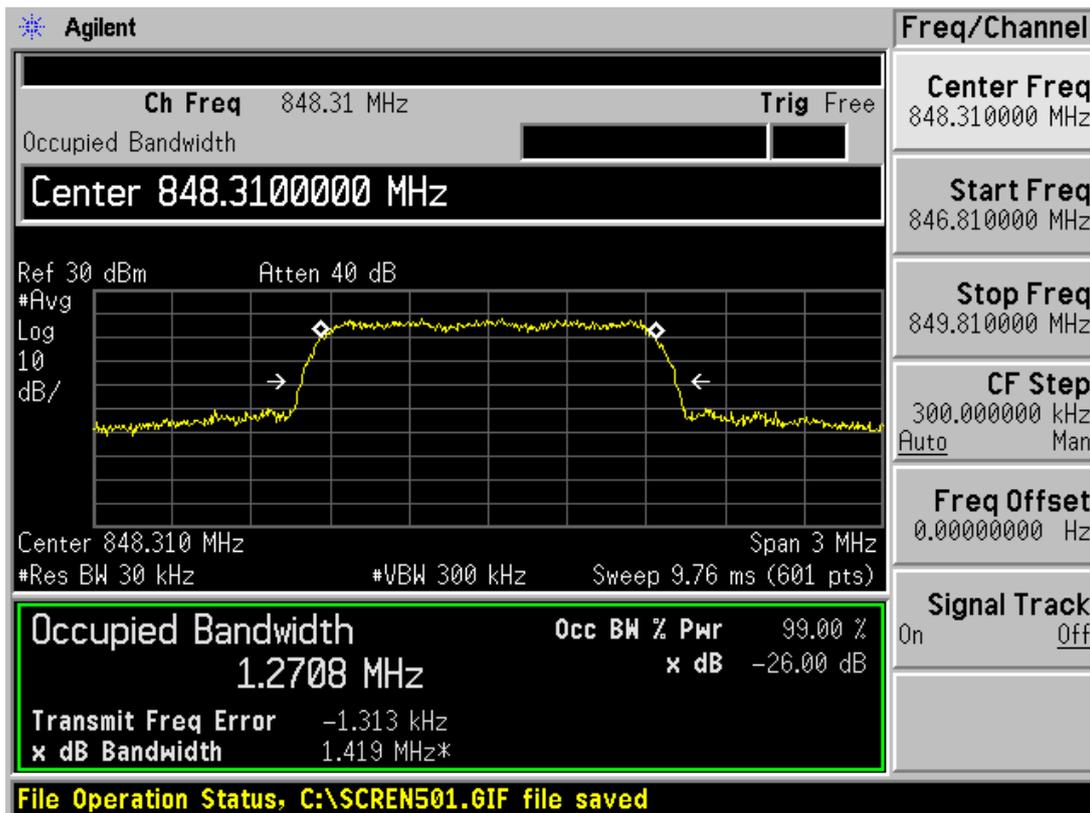


CDMA Cellular EVDO (Rev.0) CH1013 Occupied Bandwidth

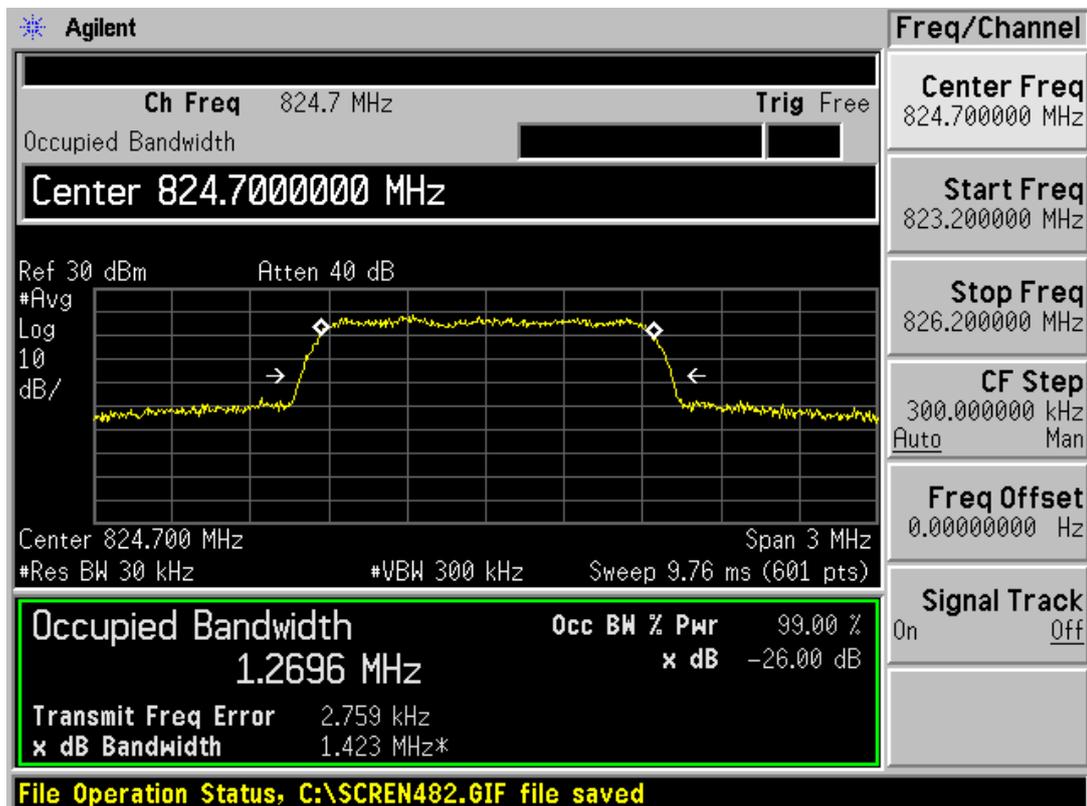


CDMA Cellular EVDO (Rev.0) CH384 Occupied Bandwidth

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

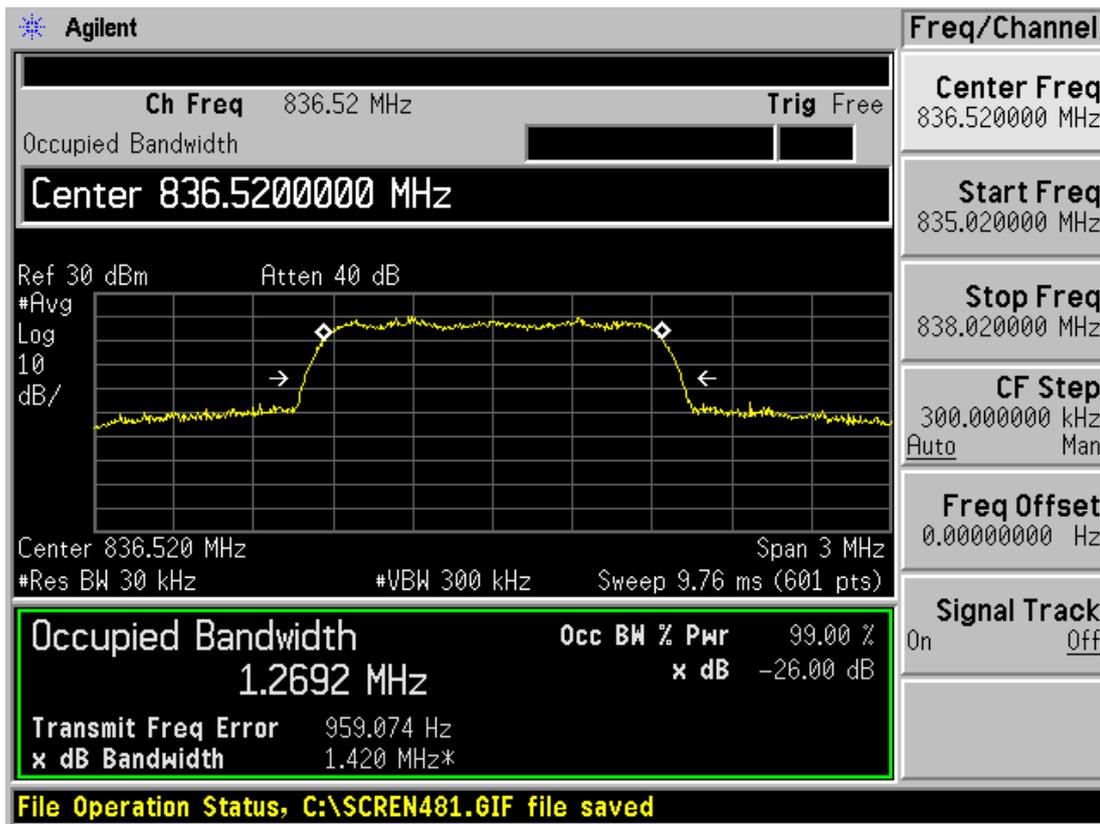


CDMA Cellular EVDO (Rev.0) CH777 Occupied Bandwidth

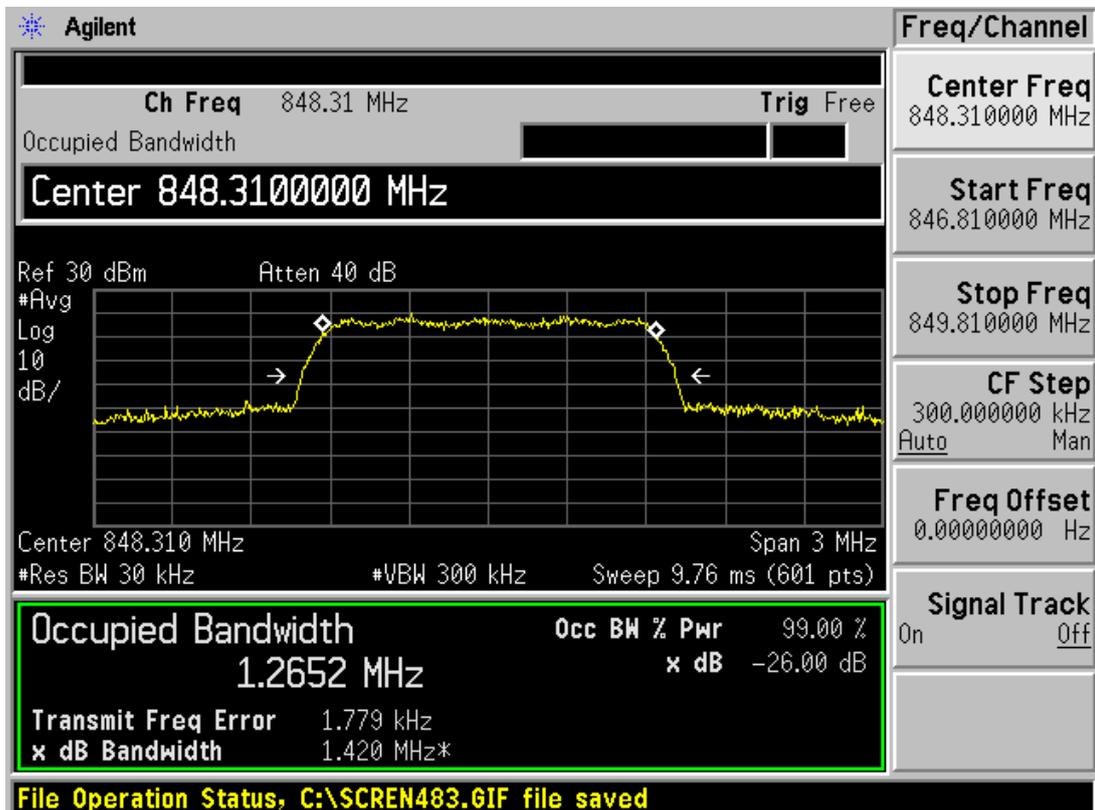


CDMA Cellular EVDO (Rev.A) CH1013 Occupied Bandwidth

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

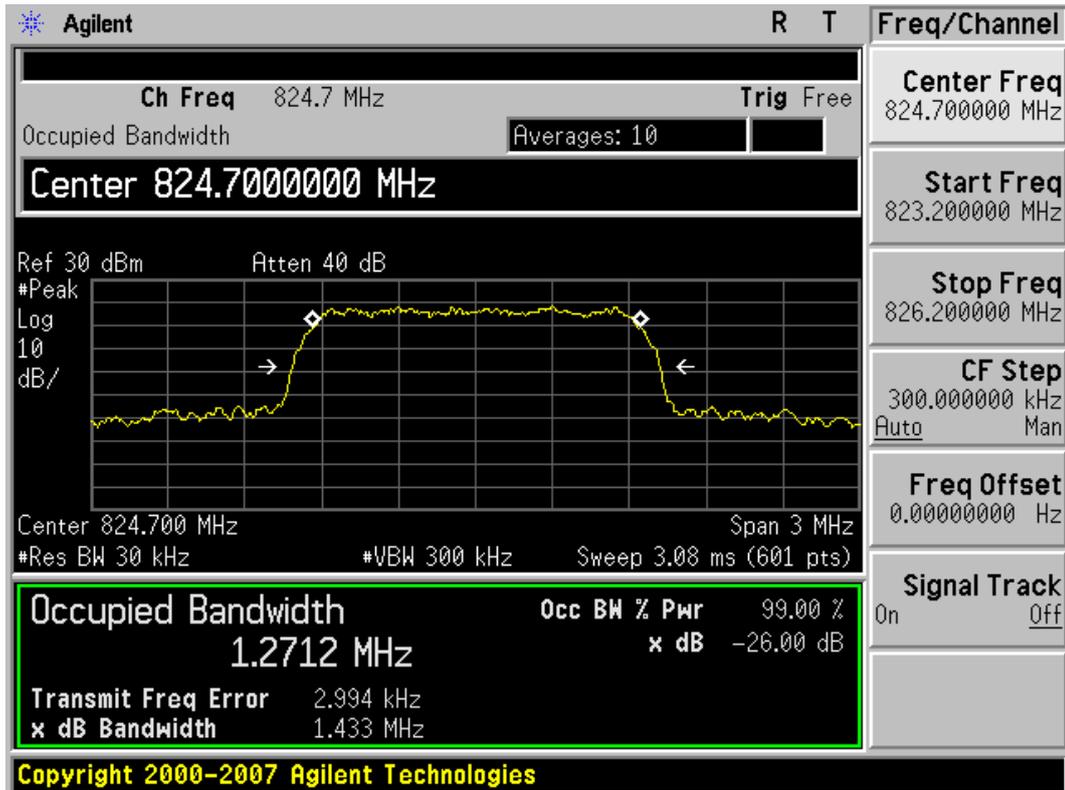


CDMA Cellular EVDO (Rev.A) CH384 Occupied Bandwidth

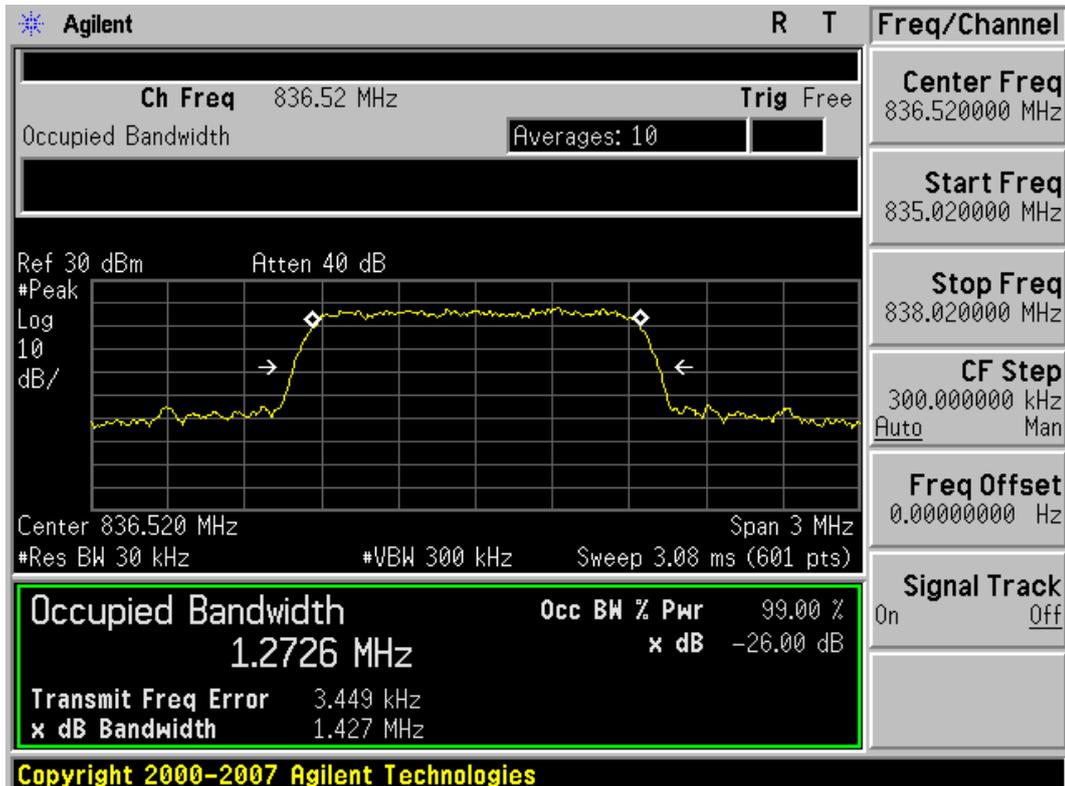


CDMA Cellular EVDO (Rev.A) CH777 Occupied Bandwidth

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

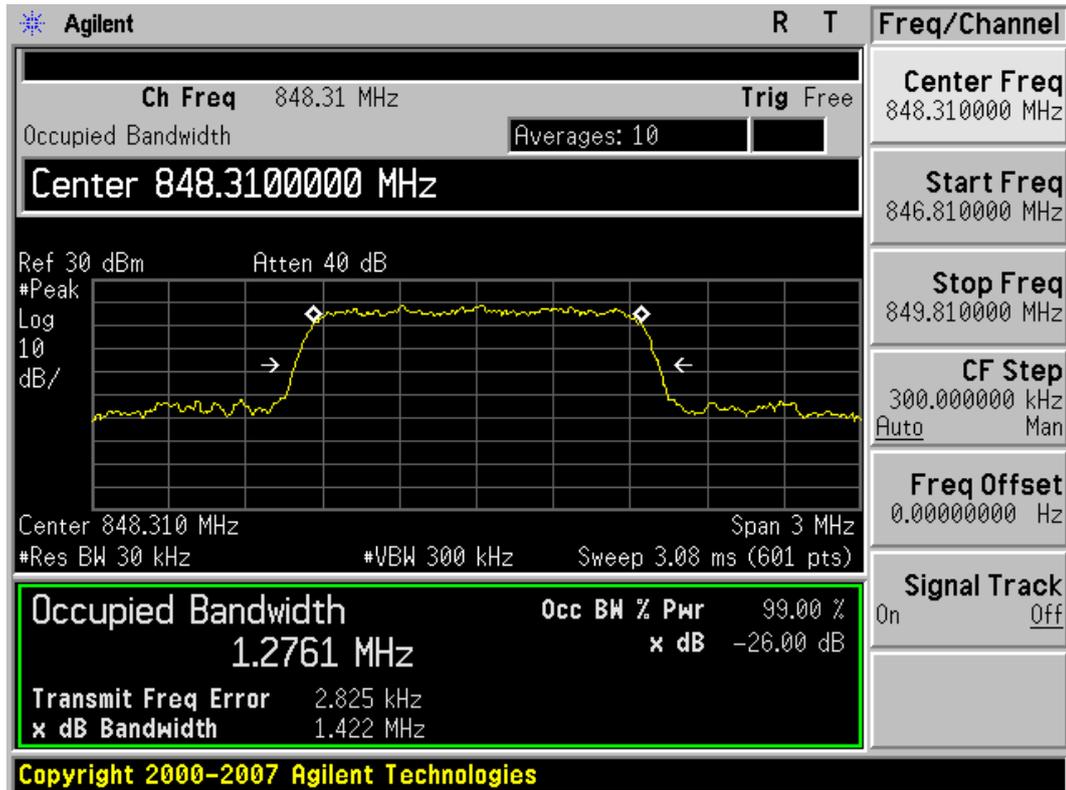


CDMA Cellular 1X Advance CH1013 Occupied Bandwidth



CDMA Cellular 1X Advance CH384 Occupied Bandwidth

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



CDMA Cellular 1X Advance CH777 Occupied Bandwidth

## 2.5. Band Edge Compliance

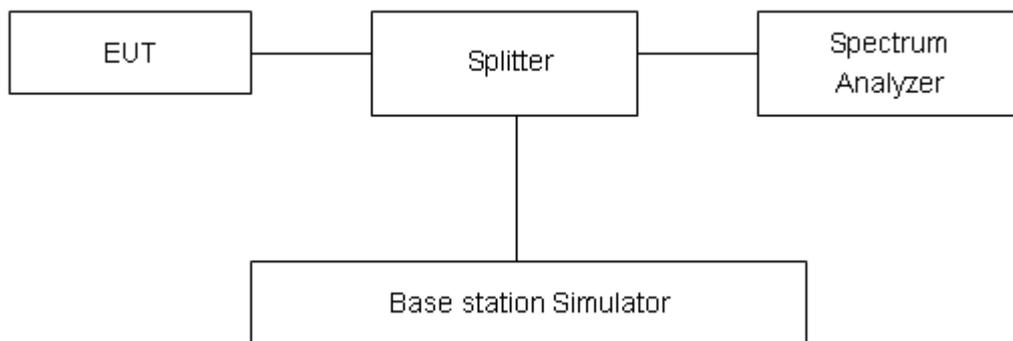
### Ambient condition

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  $k = 1.96$ ,  $U=0.684$ dB.

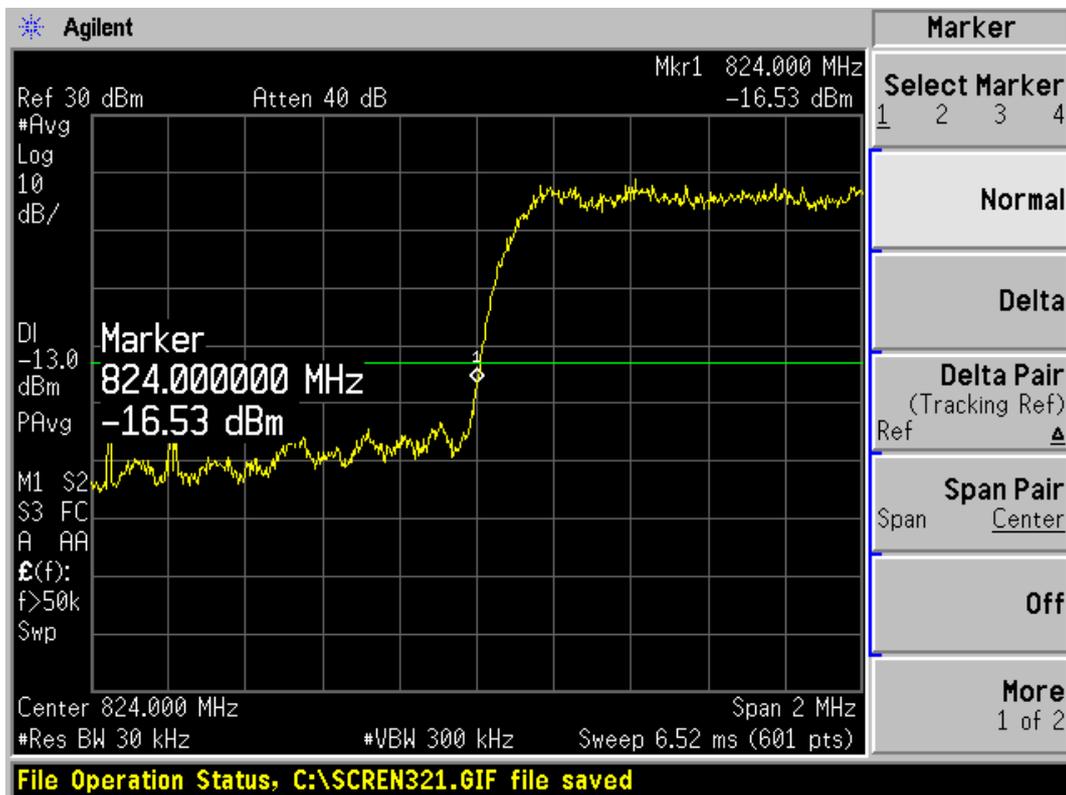
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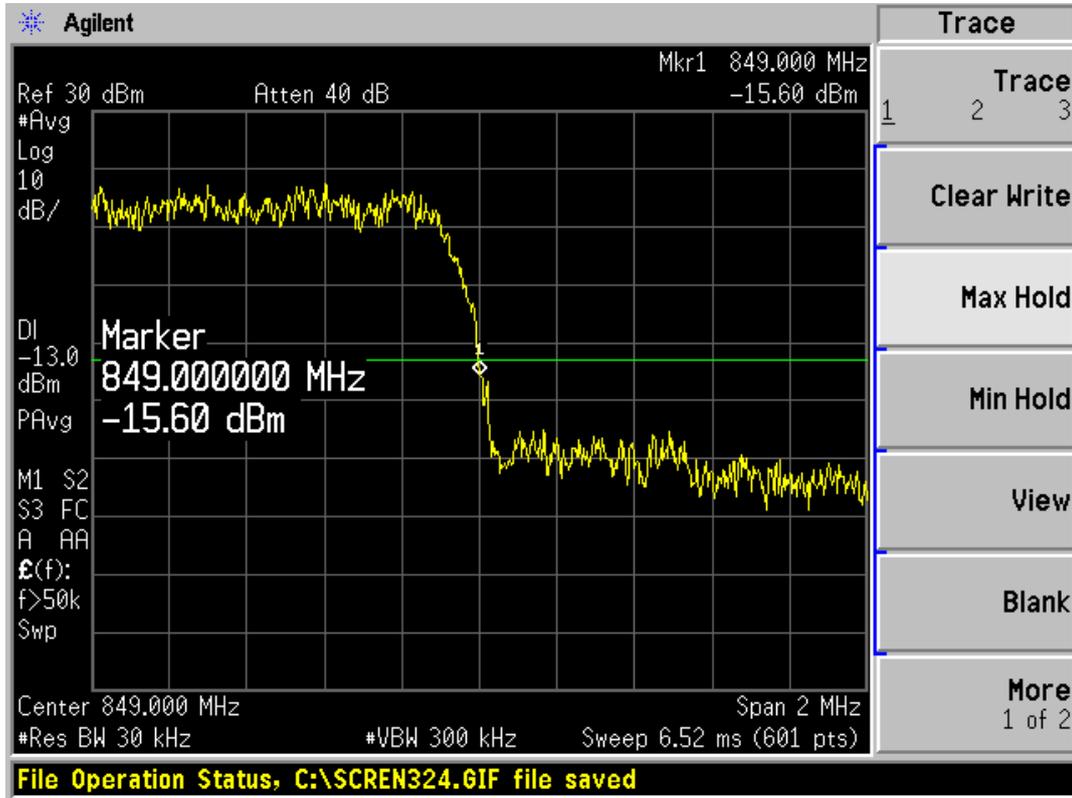
**Test Result:**

CDMA Cellular	Carrier frequency (MHz)	Reference value (dBm)	Limit	Conclusion
RC3 SO2(Loopback)	824.0	-16.53	-13	PASS
	849.0	-15.60	-13	PASS
RC3 SO32(+FCH-SCH)	824.0	-16.66	-13	PASS
	849.0	-14.81	-13	PASS
EVDO (Rev.0)	824.0	-22.229	-13	PASS
	849.0	-19.750	-13	PASS
EVDO (Rev.A)	824.0	-21.635	-13	PASS
	849.0	-20.416	-13	PASS
1X Advance SO73	824.0	-16.01	-13	PASS
	849.0	-17.38	-13	PASS

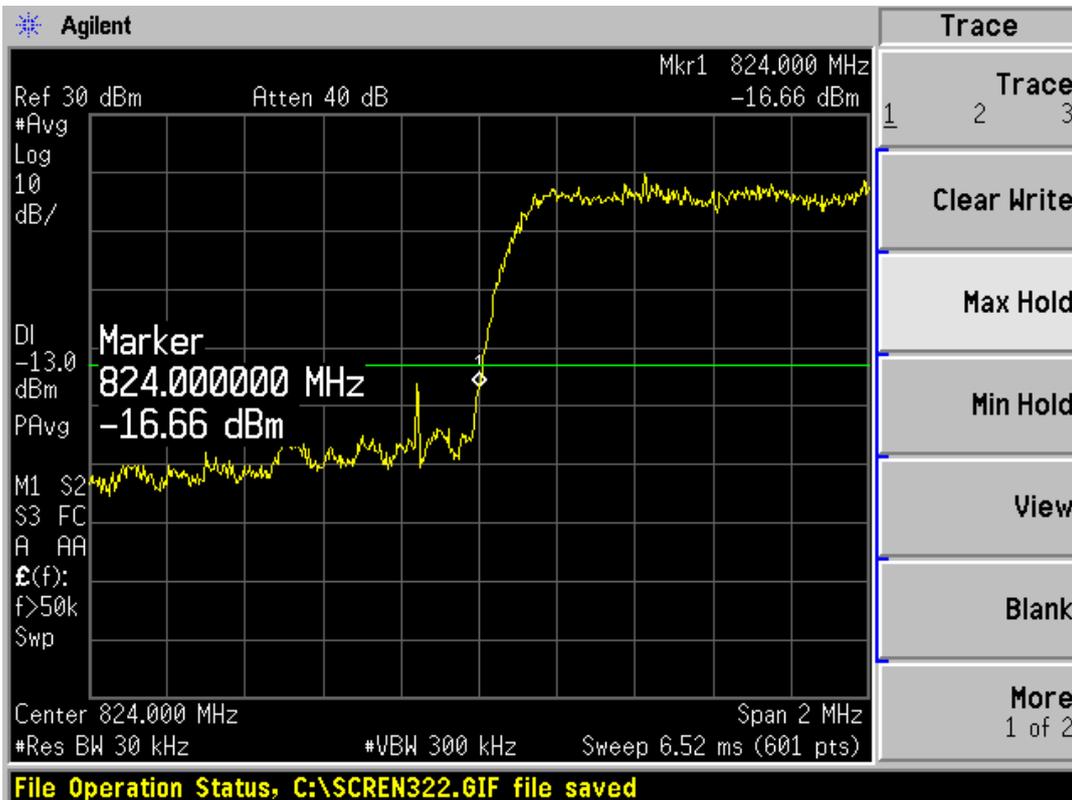


CDMA Cellular SO2 1013 Channel

TA Technology (Shanghai) Co., Ltd.  
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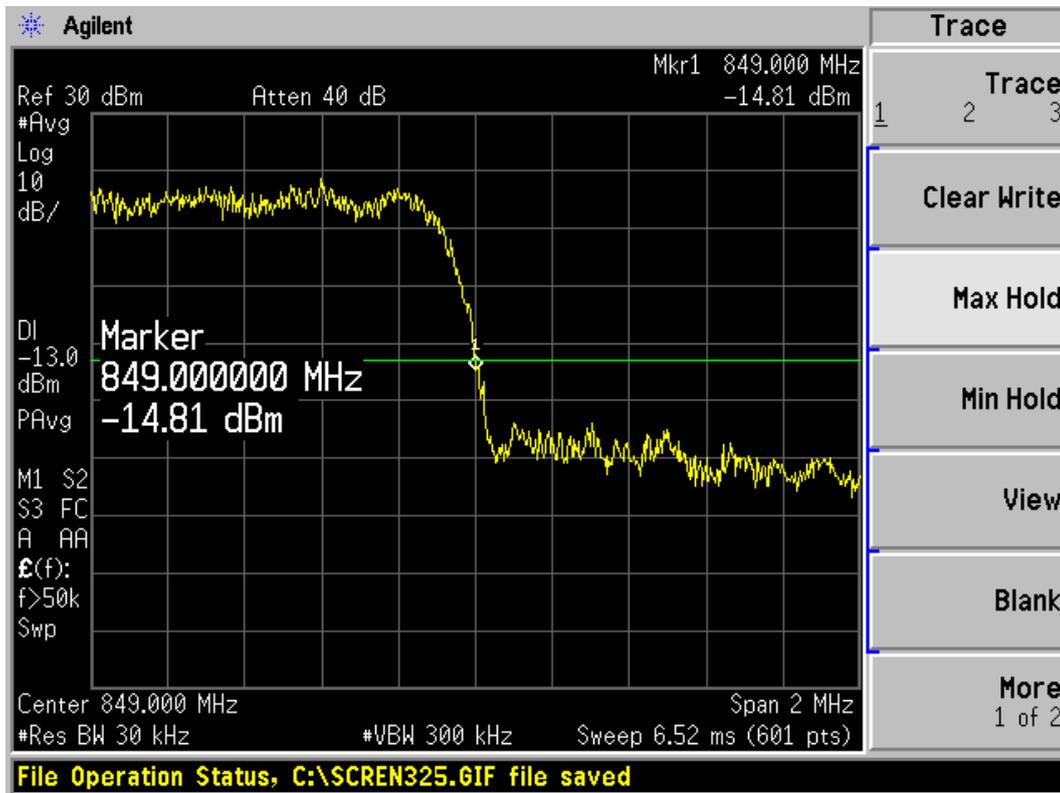


CDMA Cellular SO2 777 Channel



CDMA Cellular SO32 1013 Channel

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CDMA Cellular SO32 777 Channel



CDMA Cellular EV-DO(Rev.0) 1013 Channel

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

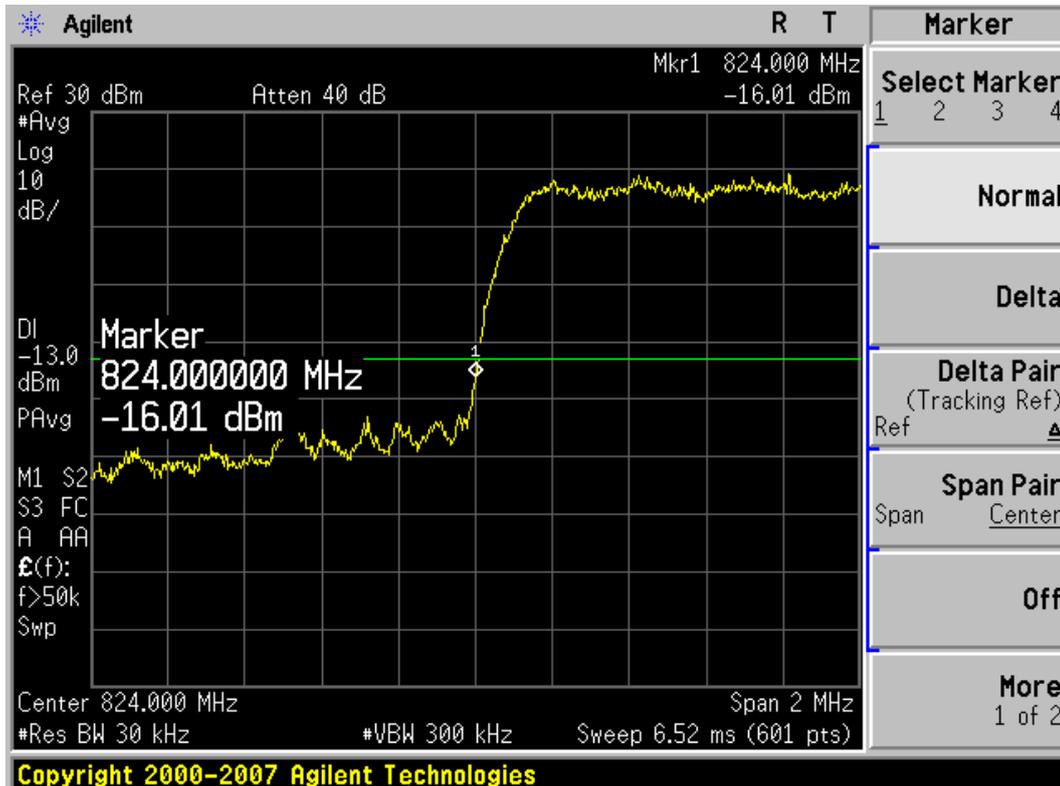


CDMA Cellular EV-DO(Rev.A) 1013 Channel

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

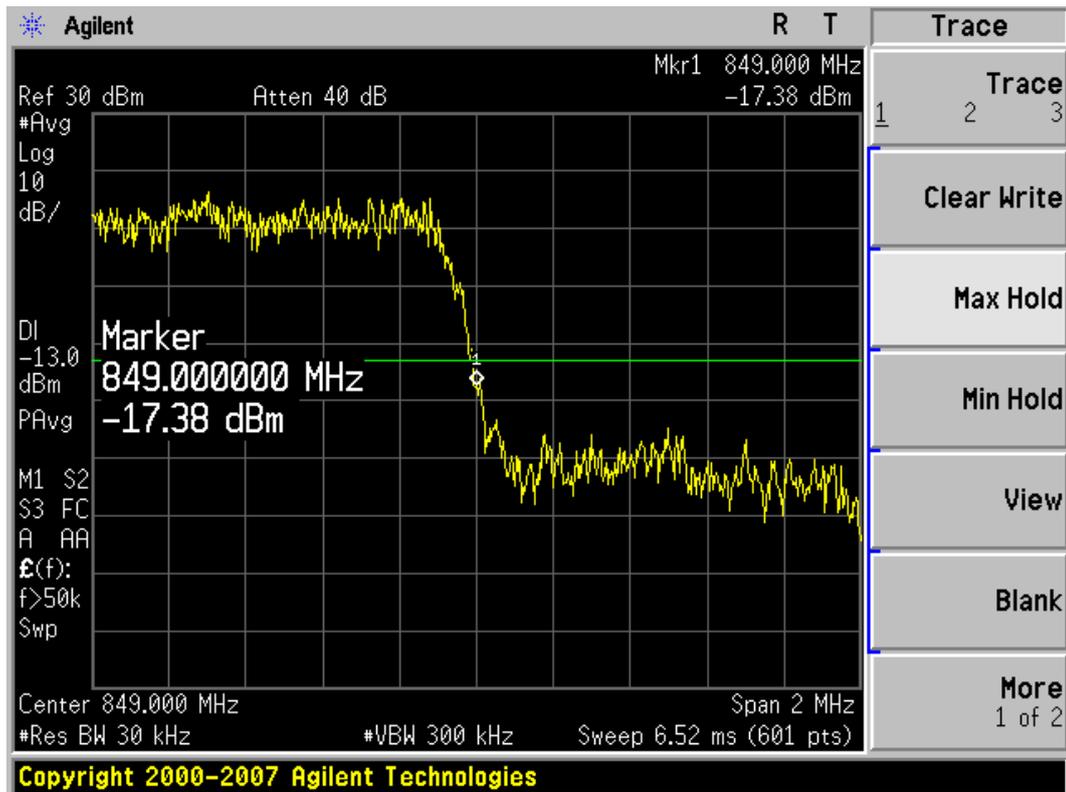


CDMA Cellular EV-DO(Rev.A) 777Channel



CDMA Cellular 1X Advance 1013 Channel

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



CDMA Cellular 1X Advance 777 Channel

## 2.6. 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)

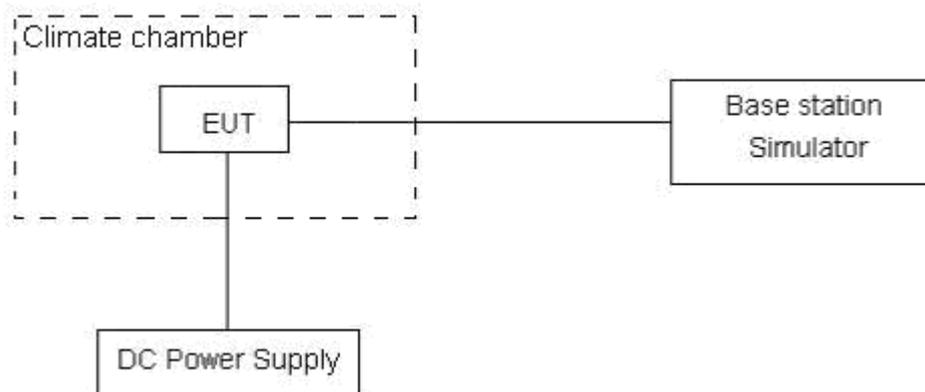
The frequency stability shall be measured with variation of primary supply voltage as follows:

(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 3.5 V and 4.2 V, with a nominal voltage of 3.8V.

### Test setup



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### 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	$\leq 2.5$ 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  $k = 3, U = 0.01$  ppm.

### Test Result

Temperature (°C)	Test Results (ppm) / 3.8V Power supply Channel 384				
	RC3 SO2(Loopback)	RC3 SO32(+FCH-SCH)	EV-DO Rev.0	EV-DO Rev.A	1X Advance SO73
-30	0.0018	0.0036	0.0059	0.0061	0.0068
-20	0.0026	0.0028	0.0037	0.0040	0.0042
-10	0.0012	0.0002	0.0010	0.0032	0.0076
0	0.0007	0.0003	0.0019	0.0034	0.0087
10	0.0017	0.0019	0.0027	0.0025	0.0028
20	0.0002	0.0021	0.0015	0.0019	0.0014
30	0.0019	0.0009	0.0021	0.0017	0.0028
40	0.0022	0.0019	0.0029	0.0039	0.0039
50	0.0037	0.0017	0.0035	0.0046	0.0044

Voltage (V)	Test Results(ppm) / 20°C Channel 384				
	RC3 SO2(Loopback)	RC3 SO32(+FCH-SCH)	EV-DO Rev.0	EV-DO Rev.A	1X Advance SO73
3.5	0.0019	0.0029	0.0031	0.0047	0.0038
3.8	0.0002	0.0021	0.0015	0.0019	0.0030
4.2	0.0009	0.0018	0.0029	0.0042	0.0033

## 2.7. Spurious Emissions at Antenna Terminals

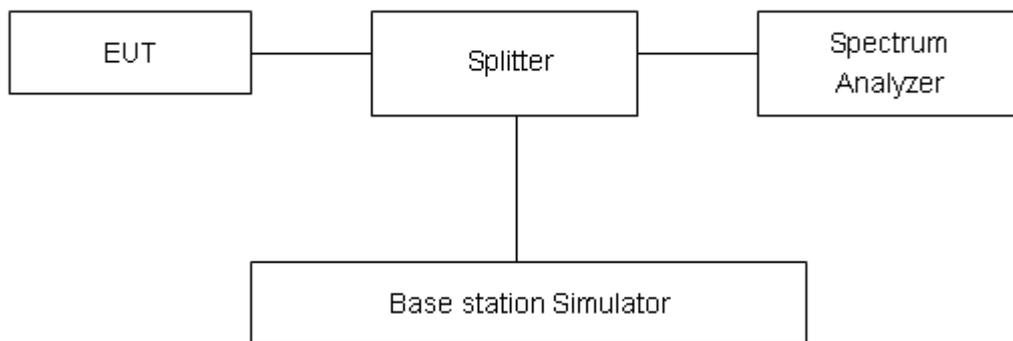
### Ambient condition

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  $k = 1.96$ .

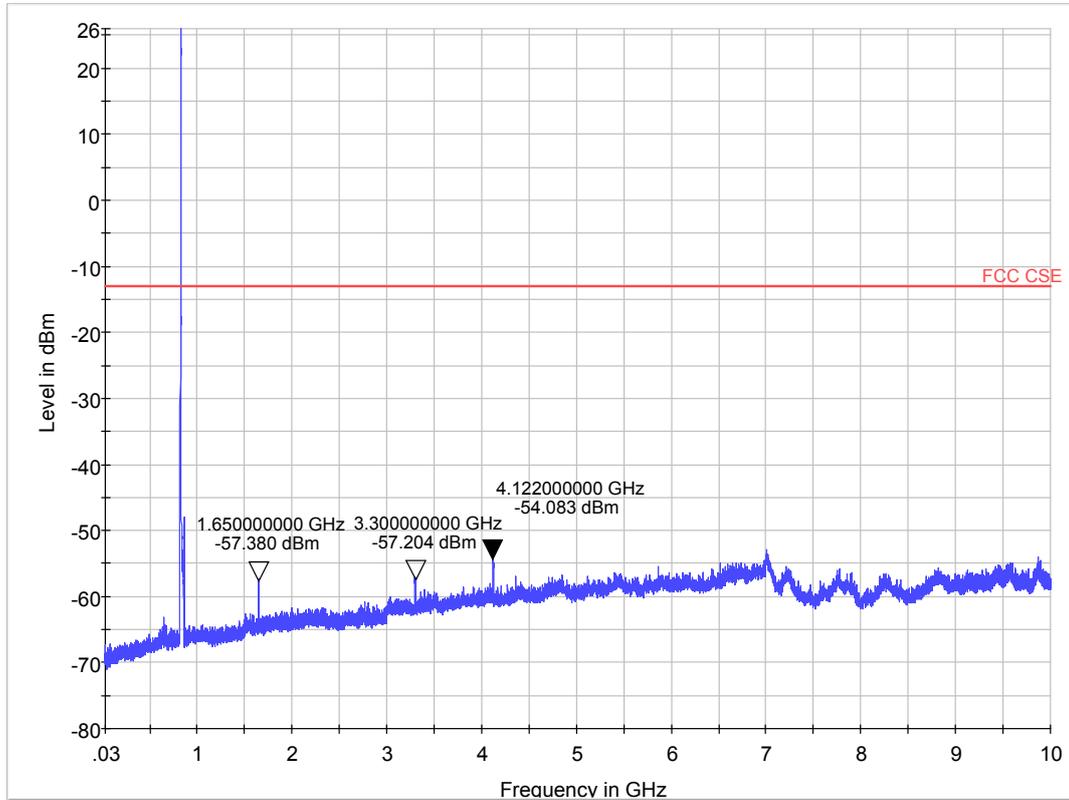
Frequency	Uncertainty
100kHz-2GHz	0.684 dB
2GHz-12.75GHz	1.407 dB

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### Test Result

CDMA Cellular CH1013

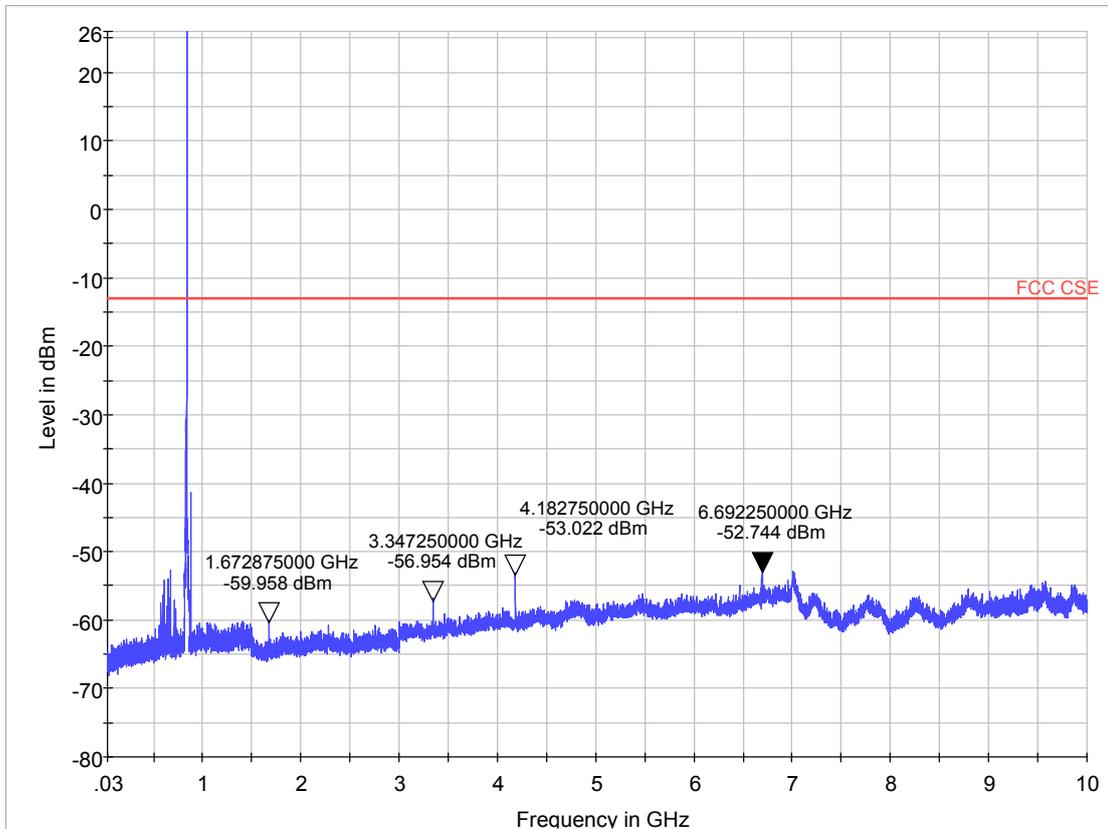


Note: The signal beyond the limit is carrier  
CDMA Cellular 1013 Channel 30MHz~10GHz

Harmonic	TX ch.1013 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	1650	-57.380	-13	44.38
4	3300	-57.204	-13	44.204
5	4122	-54.083	-13	41.083

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## CDMA Cellular CH384



Note: The signal beyond the limit is carrier  
CDMA Cellular 384 Channel 30MHz~10GHz

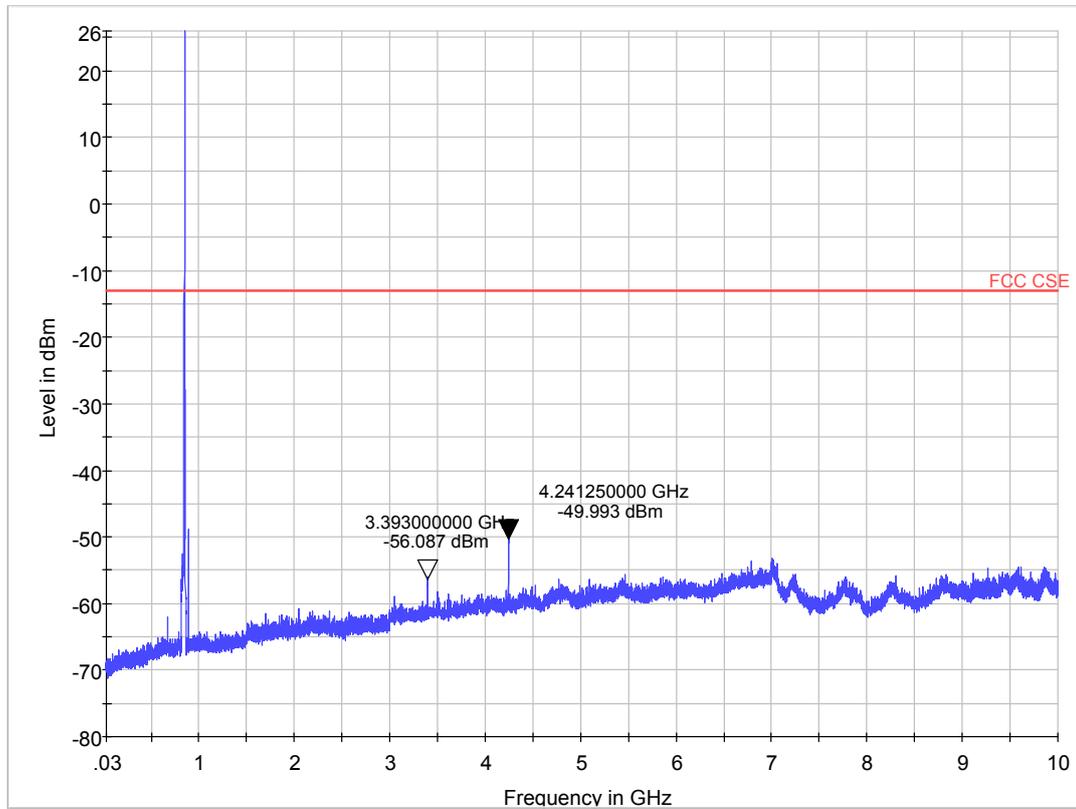
Harmonic	TX ch.384 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	1672.88	-59.958	-13	46.958
4	3347.25	-56.954	-13	43.954
5	4182.75	-53.022	-13	40.022
8	6692.25	-52.744	-13	39.744

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## CDMA Cellular CH777



Note: The signal beyond the limit is carrier  
CDMA Cellular 777 Channel 30MHz~10GHz

Harmonic	TX ch.777 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
4	3393.00	-56.087	-13	43.087
5	4241.25	-49.993	-13	36.993

## 2.8. Radiates Spurious Emission

### Ambient condition

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

### Method of Measurement

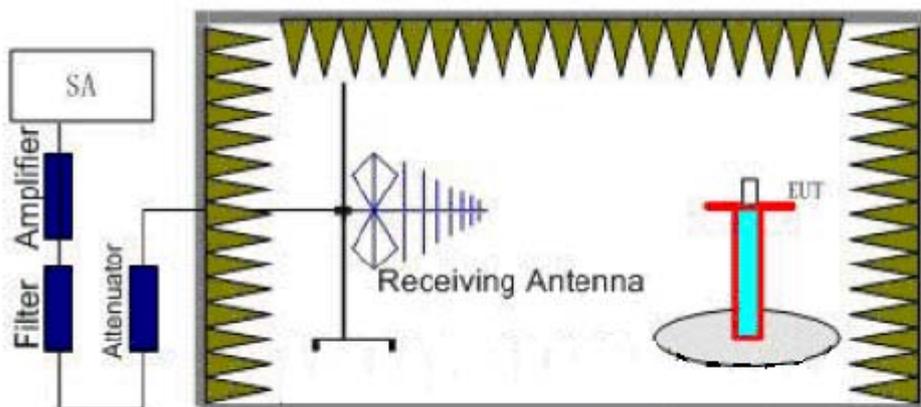
The measurements procedures in TIA -603C are used.

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:

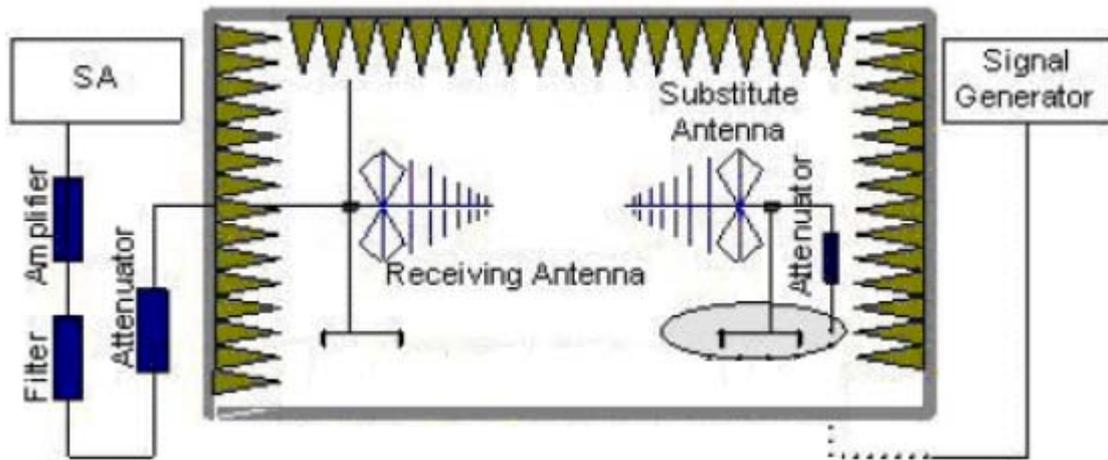
Step 1:

The measurement is carried out in the semi-anechoic chamber.. EUT was placed on a 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 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.



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

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.

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**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	1649.625	-52.86	2.00	10.15	-46.86	-13	33.86	90
3	2473.5	-55.27	2.51	11.35	-48.58	-13	35.58	270

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	1673.44	-54.25	2.00	10.75	-47.65	-13	34.65	45
3	2510.25	-52.15	2.51	11.05	-45.76	-13	32.76	180

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	1696.5	-53.53	2.00	10.15	-47.53	-13	34.53	270
3	2544.0	-49.94	2.51	11.05	-43.55	-13	30.55	270

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CDMA Cellular EV-DO(Rev.0) CH1013

Harmonic	TX ch.1013 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1650.2	-62.9	2	10.15	-56.90	-13	43.9	270
3	2474.1	-56.56	2.51	11.35	-49.87	-13	36.87	90

CDMA Cellular EV-DO(Rev.0) CH384

Harmonic	TX ch.384 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1672.5	-59.61	2	10.75	-53.01	-13	40.01	315
3	2510.75	-62.72	2.51	11.05	-56.33	-13	43.33	225

CDMA Cellular EV-DO(Rev.0) CH777

Harmonic	TX ch.777 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1695.9	-60.5	2	10.15	-54.50	-13	41.5	225
3	2545.1	-61.76	2.51	11.05	-55.37	-13	42.37	180

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CDMA Cellular EV-DO(Rev.A) CH1013

Harmonic	TX ch.1013 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1649.8	-62.29	2	10.15	-56.29	-13	43.29	270
3	2473.7	-61.15	2.51	11.35	-54.46	-13	41.46	315

CDMA Cellular EV-DO(Rev.A) CH384

Harmonic	TX ch.384 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1672.3	-61.58	2	10.75	-54.98	-13	41.98	225
3	2510.2	-63.8	2.51	11.05	-57.41	-13	44.41	315

CDMA Cellular EV-DO(Rev.A) CH777

Harmonic	TX ch.777 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1696.5	-59.87	2	10.15	-53.87	-13	40.87	270
3	2544.9	-63.25	2.51	11.05	-56.86	-13	43.86	90

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**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 BODY\*\*\*\*\*

## ANNEX A: EUT Appearance and Test Setup

### A.1 EUT Appearance



Picture 1 EUT

## A.2 Test Setup



Picture 2: Radiated Spurious Emissions Test setup