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## TEST REPORT

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Report No.: SRMC2010-H024-E0035

Product Name: CDMA 2000 Digital Mobile Phone

Product Model: ZTE-C R200

Applicant: ZTE Corporation

Manufacture: ZTE Corporation

Specification: FCC Part 22H, Part 2

(October 1, 2008 edition)

FCC ID: Q78-ZTECR200

The State Radio Monitoring Center

State Radio Spectrum Monitoring and Testing Center

No.80 Beilishi Road Xicheng District Beijing, China

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## 1. General information

### 1.1 Notes of the test report

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The test results relate only to individual items of the samples which have been tested.

### 1.2 Information about the testing laboratory

Company: The State Radio Monitoring Center  
State Radio Spectrum Monitoring and Testing Center  
Address: No.80 Beilishi Road, Xicheng District, Beijing China  
City: Beijing  
Country or Region: China  
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Email: wangjf@srrc.org.cn

### 1.3 Applicant's details

Company: ZTE Corporation  
Address: 10# TangYan Road South, Hi-Tech Industrial Park, 710065  
City: Xi'an  
Country or Region: P.R.China  
Grantee Code: Q78  
Contacted person: Wang Lei  
Tel: +86-029-88724011  
Fax: +86-029-88723249  
Email: wang.lei57@zte.com.cn

### 1.4 Manufacturer's details

Company: ZTE Corporation  
Address: Zhongxing Bldg, Hi-Tech Park, NanShan, 518057  
City: Shenzhen  
Country or Region: P.R.China  
Grantee Code: Q78  
Contacted person: Li Dezi  
Tel: +86-021-68895196  
Fax: +86-021-50801070  
Email: li.dezi@zte.com.cn

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## 1.5 Application details

Date of reception of test sample: 20<sup>th</sup> May 2010

Date of test: 21<sup>st</sup> May 2010 to 7<sup>th</sup> Jun 2010

## 1.6 Reference specification

FCC Part 22H, Part 2 (October 1, 2008 edition)

## 1.7 Information of EUT

### 1.7.1 General information

|                            |                                 |
|----------------------------|---------------------------------|
| Name of EUT                | CDMA 2000 Digital Mobile Phone  |
| FCC ID                     | Q78-ZTECR200                    |
| Frequency range            | Tx:824~849MHz<br>Rx:869~894MHz  |
| Rated output power         | 24.0dBm                         |
| E.R.P.                     | 22.7dBm                         |
| Modulation type            | OQPSK                           |
| Emission Designator        | 1M25F9W                         |
| Duplex mode                | FDD                             |
| Duplex spacing             | 45MHz                           |
| Antenna type               | Integral                        |
| Power Supply               | Battery or charger              |
| Rated Power Supply Voltage | 3.7V                            |
| Extreme Temperature        | Lowest: -30°C<br>Highest: +50°C |
| Extreme Voltage            | Minimum: 3.5V<br>Maximum: 4.2V  |
| HW Version                 | cm8B                            |
| SW Version                 | ZTR200MRT01                     |

### 1.7.2 EUT details

| Name                           | Model      | IMEI           |
|--------------------------------|------------|----------------|
| CDMA 2000 Digital Mobile Phone | ZTE-C R200 | A000000BECAED0 |

### 1.7.3 Auxiliary equipment details

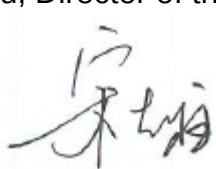
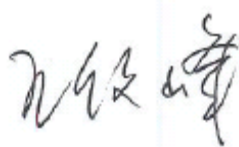
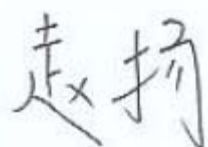
|              |                |
|--------------|----------------|
| Equipment    | Charger        |
| Manufacturer | GOWELL         |
| Model Number | STC-A22O50U8-C |

|               |                    |
|---------------|--------------------|
| Equipment     | Battery            |
| Manufacturer  | ZTE Corporation    |
| Model Number  | Li3709T42P3h453756 |
| Capacity      | 900mAh             |
| Rated Voltage | 3.7V               |

## 2. Test information

### 2.1 Summary of the test results

| No. | Test case                               | FCC reference    | Verdict |
|-----|-----------------------------------------|------------------|---------|
| 1   | RF Power Output                         | 2.1046           | Pass    |
| 2   | Effective Radiated Power                | 22.913(a)        | Pass    |
| 3   | Occupied Bandwidth                      | 2.1049           | Pass    |
| 4   | Spurious Emissions at antenna terminals | 2.1051/22.917(a) | Pass    |
| 5   | Band Edges Compliance                   | 2.1051/22.917(a) | Pass    |
| 6   | Frequency Stability                     | 2.1055/22.355    | Pass    |
| 7   | Radiated Spurious Emissions             | 2.1053/22.917(a) | Pass    |

|                                                                                                                                                                   |                                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| This Test Report Is Issued by:<br>Mr. Song Qizhu, Director of the test lab<br> | Checked by:<br> |
| Tested by:<br>                                                                 | Issued date:<br><b>2010.06.07</b>                                                                    |

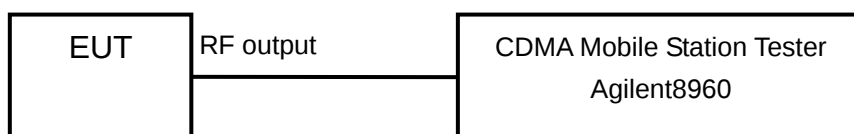
## 2.2 Test result

### 2.2.1 RF Power Output-FCC Part2.1046

Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 24°C        | 53%               | 101.9kPa |

Test Setup:



Test procedure:

After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. Then the test data can be read at the tester screen. The loss between RF output port of the EUT and the input port of the tester will be taken into consideration.

The measurement will be conducted at three channels No1013, No384 and No777 (Bottom, middle and top channels of CDMA 1X band)

| Limits | $\leq 30\text{dBm}$ |
|--------|---------------------|
|--------|---------------------|

Test result:

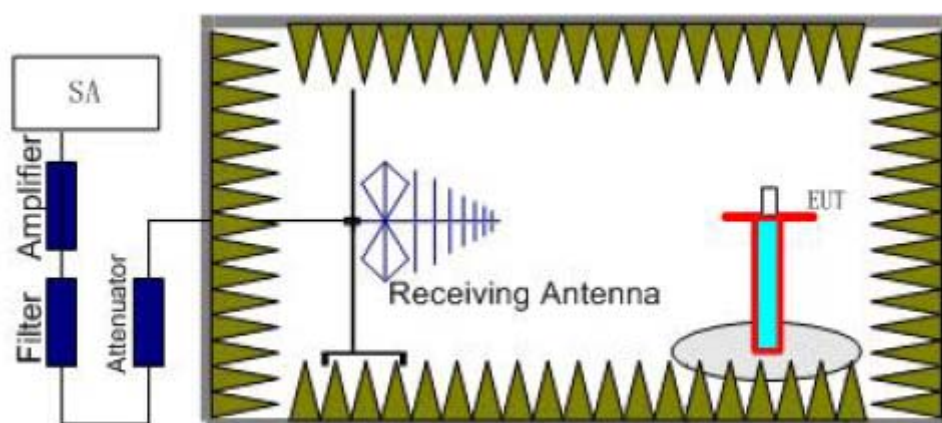
| Carrier frequency<br>(MHz) | Channel No. | Test Mode    | RF Power Output<br>(dBm) |
|----------------------------|-------------|--------------|--------------------------|
| 824.70                     | 1013        | RC1/SO2      | 23.8                     |
|                            |             | RC1/SO55     | 23.7                     |
|                            |             | RC3/SO2      | 23.8                     |
|                            |             | RC3/SO55     | 23.9                     |
|                            |             | RC3/SO32     | 23.7                     |
|                            |             | RTAP 9.6K    | 23.7                     |
|                            |             | RTAP 38.4K   | 23.8                     |
|                            |             | RTAP153.6K   | 23.7                     |
|                            |             | RETAP 128K   | 23.3                     |
|                            |             | RETAP 2048K  | 23.3                     |
|                            |             | RETAP 4096K  | 23.3                     |
|                            |             | RETAP 12288K | 23.3                     |
| 836.52                     | 384         | RC1/SO2      | 23.6                     |
|                            |             | RC1/SO55     | 23.6                     |
|                            |             | RC3/SO2      | 23.6                     |
|                            |             | RC3/SO55     | 23.6                     |
|                            |             | RC3/SO32     | 23.5                     |
|                            |             | RTAP 9.6K    | 23.3                     |
|                            |             | RTAP 38.4K   | 23.3                     |
|                            |             | RTAP153.6K   | 23.3                     |
|                            |             | RETAP 128K   | 23.2                     |
|                            |             | RETAP 2048K  | 23.2                     |
|                            |             | RETAP 4096K  | 23.2                     |
|                            |             | RETAP 12288K | 23.2                     |
| 848.31                     | 777         | RC1/SO2      | 23.6                     |
|                            |             | RC1/SO55     | 23.5                     |
|                            |             | RC3/SO2      | 23.6                     |
|                            |             | RC3/SO55     | 23.7                     |
|                            |             | RC3/SO32     | 23.5                     |
|                            |             | RTAP 9.6K    | 23.6                     |
|                            |             | RTAP 38.4K   | 23.7                     |
|                            |             | RTAP153.6K   | 23.6                     |
|                            |             | RETAP 128K   | 23.3                     |
|                            |             | RETAP 2048K  | 23.3                     |
|                            |             | RETAP 4096K  | 23.3                     |
|                            |             | RETAP 12288K | 23.3                     |

## 2.2.2 Effective Radiated Power-FCC Part22.913(a)

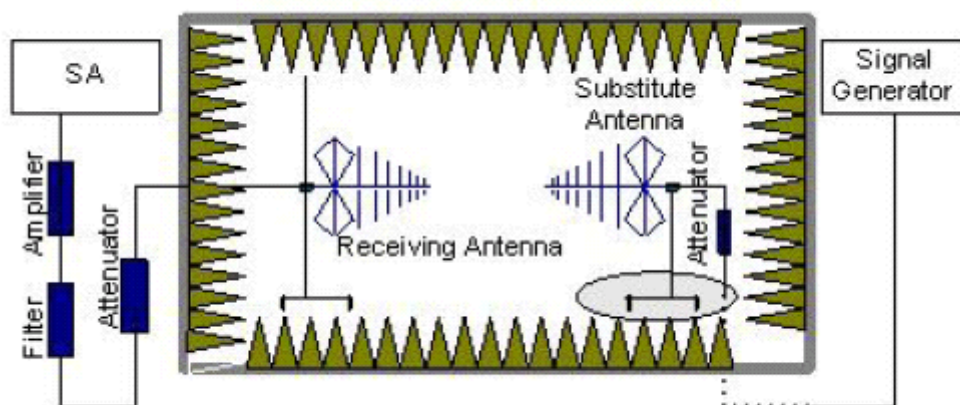
Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 24°C        | 53%               | 101.9kPa |

Test setup



Step 1



Step 2

Test procedure:

Step 1:

The measurement is carried out in the fully anechoic chamber. EUT was placed on a 2.4 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. The height of receiving antenna is 2.4m and varies in certain range to find the maximum power value. 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 RMS detector is used and RBW is set to 3MHz. Then the antenna height and turn table rotation is adjusted till the maximum power value is founded on spectrum analyzer or receiver.

Step 2:

A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator. To repeat the same procedure as step1 and the level of signal generator will be adjusted till the same power value on the spectrum analyzer or receiver. The ERP/EIRP of the EUT can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.

The measurement will be conducted at three channels No1013, No384 and No777 (Bottom, middle and top channels of CDMA 1X band) in RC3/SO55 test mode.

|        |                       |
|--------|-----------------------|
| Limits | $\leq 38.5\text{dBm}$ |
|--------|-----------------------|

Test result:

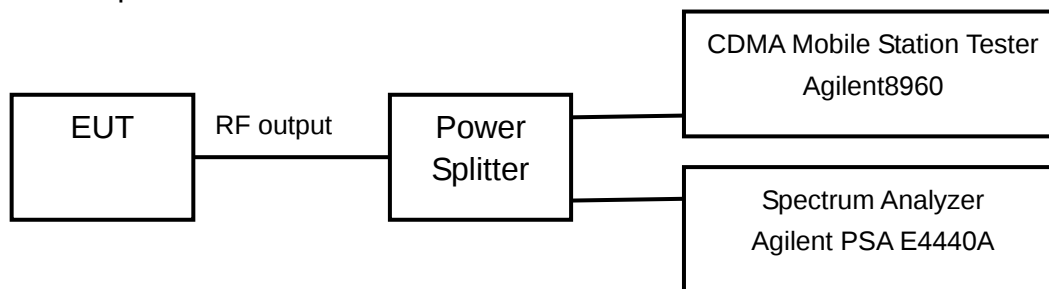
| Carrier frequency (MHz) | Channel No. | Test Mode | E.R.P. (dBm) |
|-------------------------|-------------|-----------|--------------|
| 824.70                  | 1013        | RC3/SO55  | 22.7         |
| 836.52                  | 384         | RC3/SO55  | 22.5         |
| 848.31                  | 777         | RC3/SO55  | 22.6         |

### 2.2.3 Occupied Bandwidth-FCC Part2.1049

Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 24°C        | 53%               | 101.9kPa |

Test Setup:



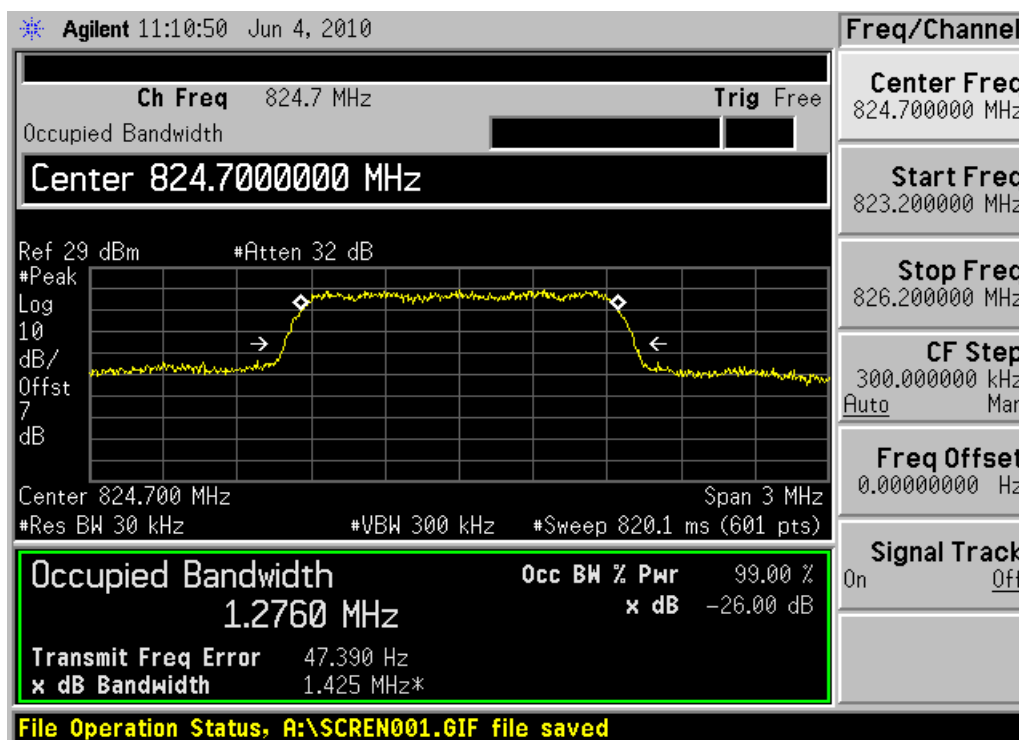
Test procedure:

After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. The occupied bandwidth is measured using spectrum analyzer. RBW is set to 3kHz on spectrum analyzer. The bandwidth of 99% power can be read on spectrum analyzer. The measurement will be conducted at three channels No1013, No384 and No777 (Bottom, middle and top channels of CDMA 1X band) in RC3/SO55 test mode.

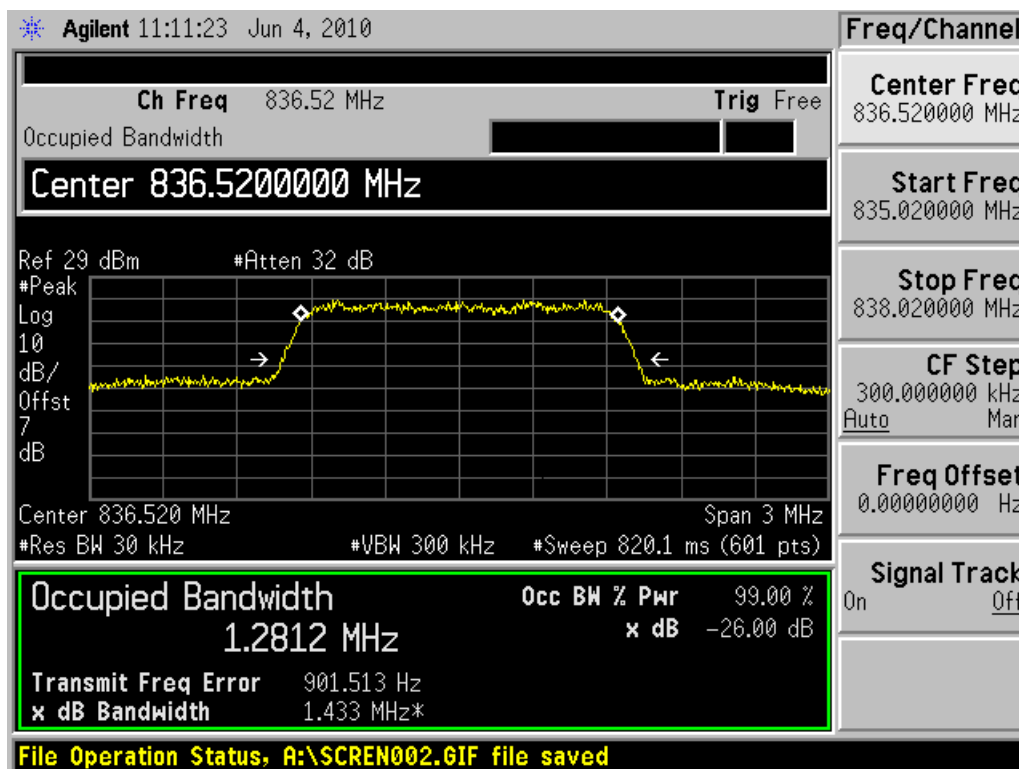
Limits: No specific occupied bandwidth requirements in part 2.1049

Test result:

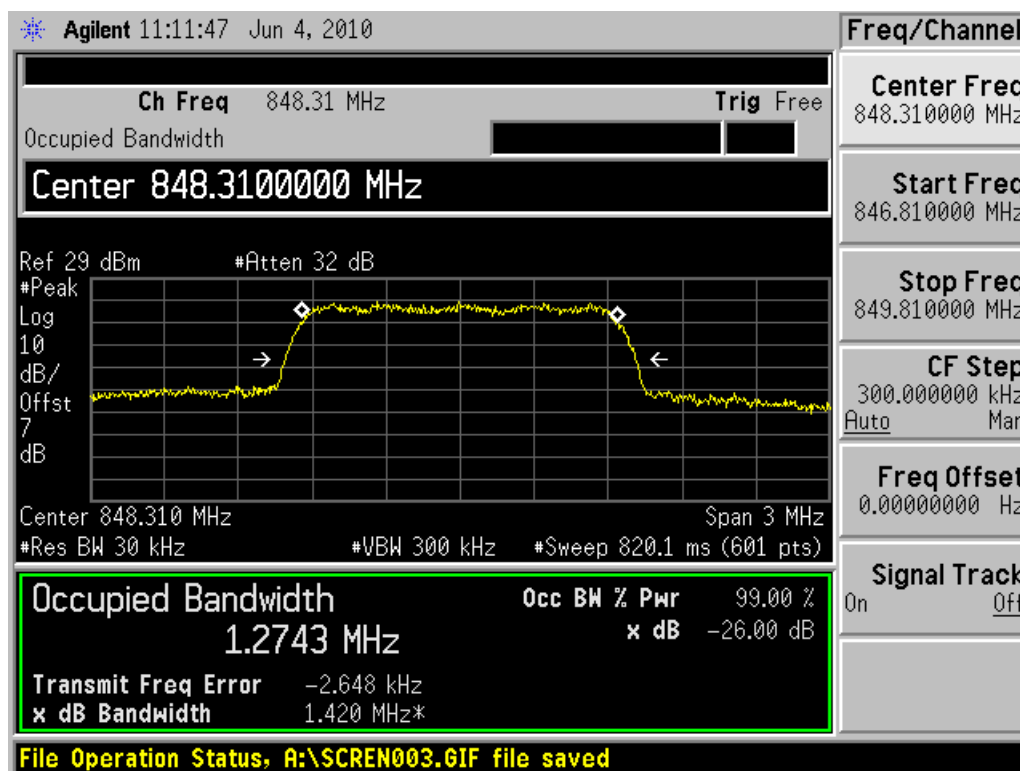
| Carrier frequency (MHz) | Channel No. | Test Mode | Bandwidth of 99% Power (MHz) |
|-------------------------|-------------|-----------|------------------------------|
| 824.70                  | 1013        | RC3/SO55  | 1.2760                       |
| 836.52                  | 384         | RC3/SO55  | 1.2812                       |
| 848.31                  | 777         | RC3/SO55  | 1.2743                       |



Channel 1013



Channel 384



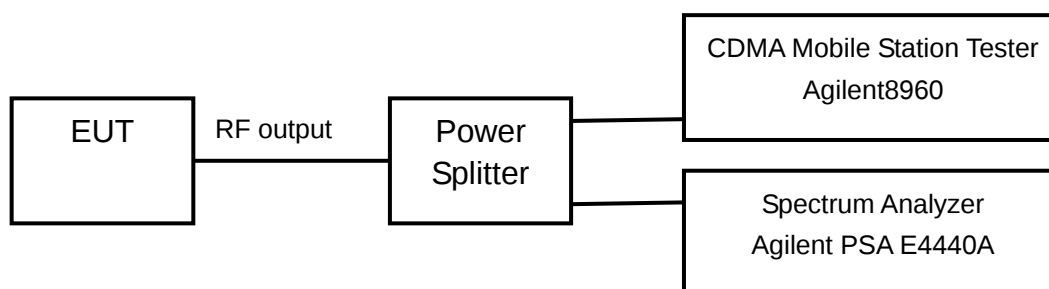
Channel 777

## 2.2.4 Spurious Emissions at antenna terminal-FCC Part2.1051/22.917(a)

Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 24°C        | 53%               | 101.9kPa |

Test Setup:



Test procedure:

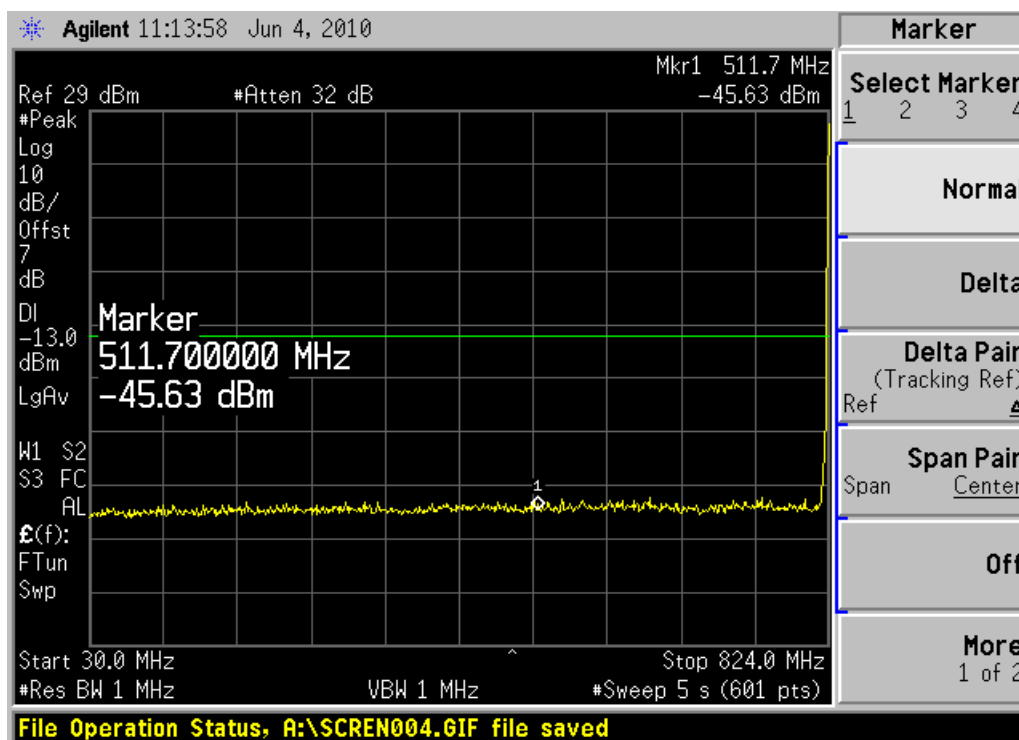
After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 30MHz to 9GHz (higher than the 10<sup>th</sup> harmonic of the carrier). The peak detector is used and RBW is set to 1MHz on spectrum analyzer.

The measurement will be conducted at three channels No1013, No384 and No777 (Bottom, middle and top channels of CDMA 1X band) in RC3/SO55 test mode.

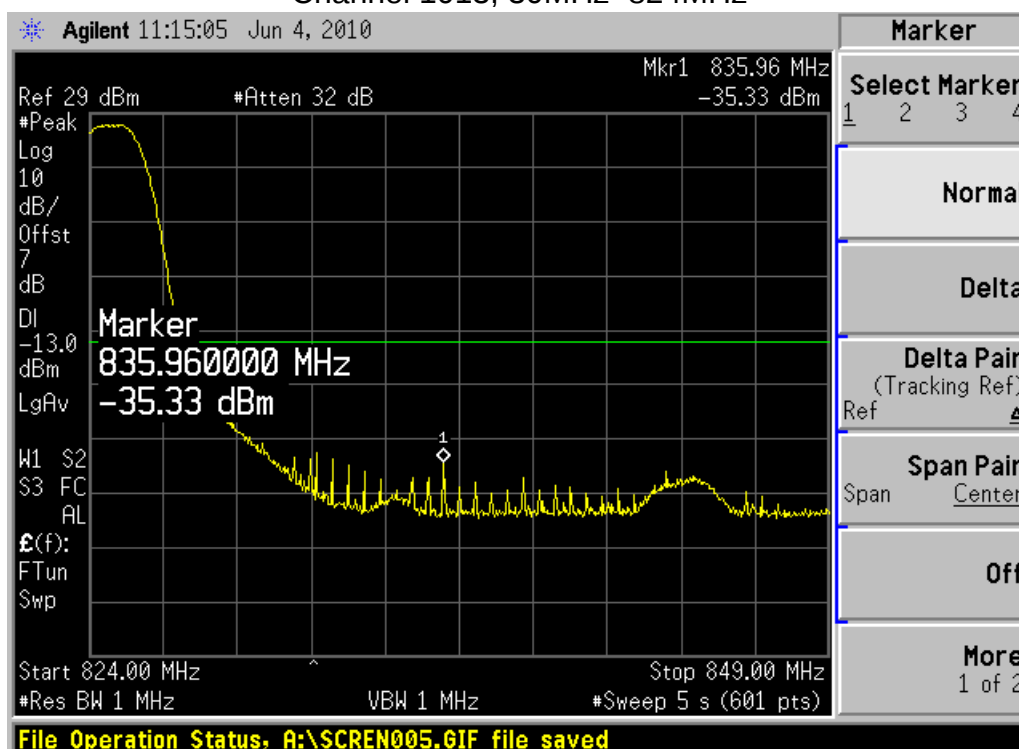
|        |          |
|--------|----------|
| Limits | ≤ -13dBm |
|--------|----------|

Test result:

Refer to the following figures.

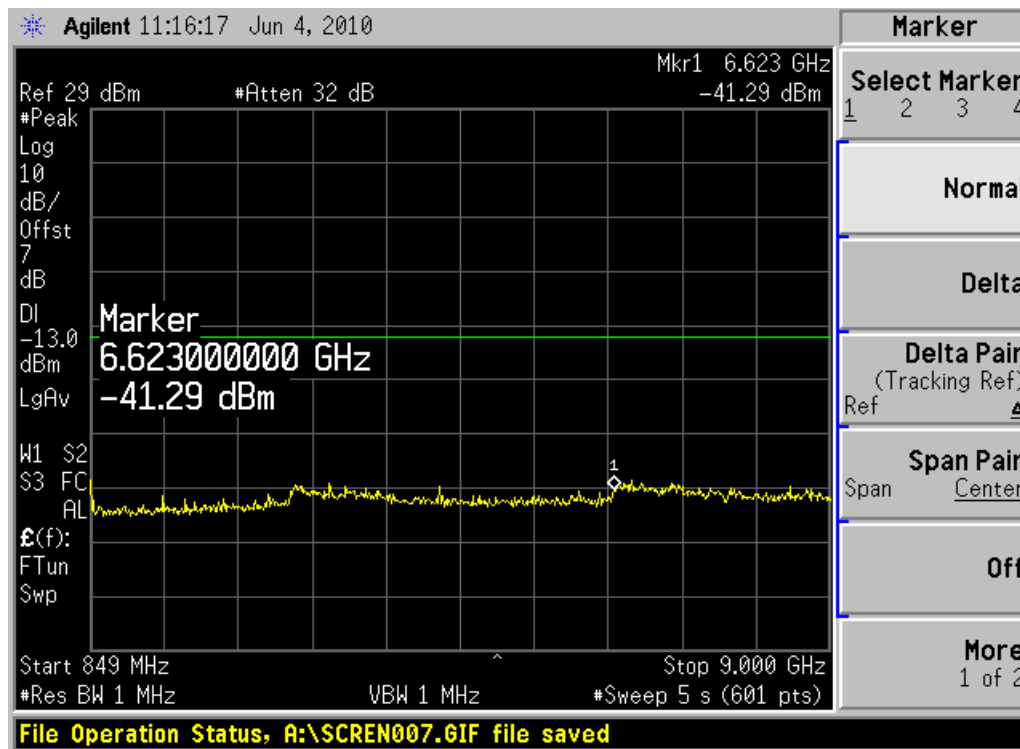


Channel 1013, 30MHz~824MHz

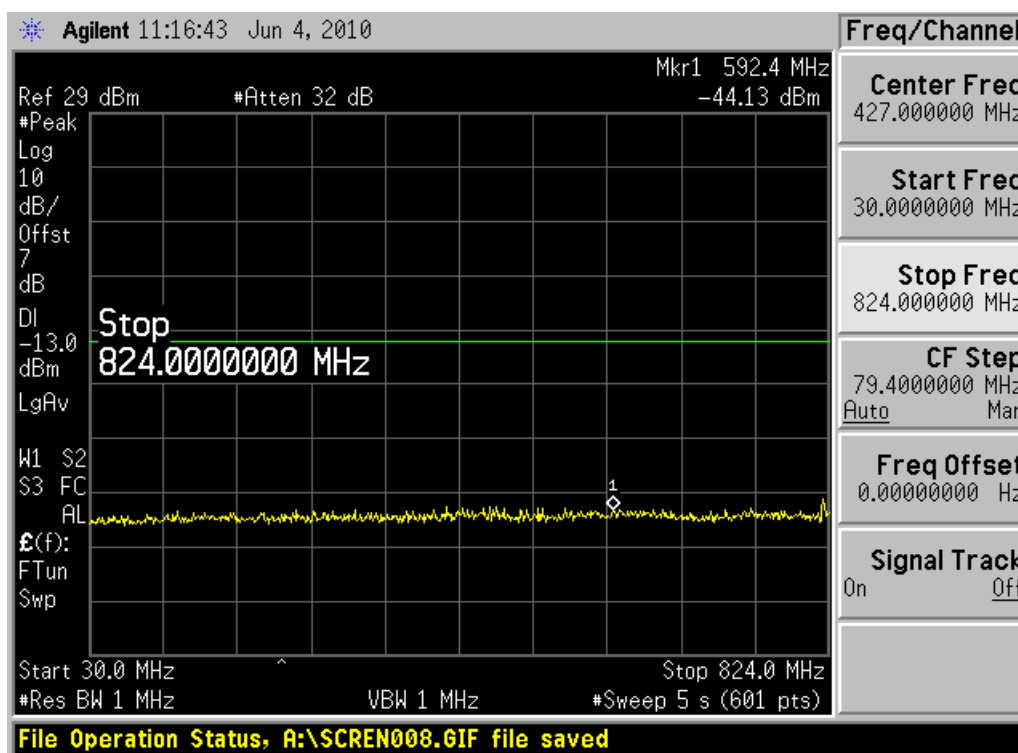


Channel 1013, 824MHz~849MHz

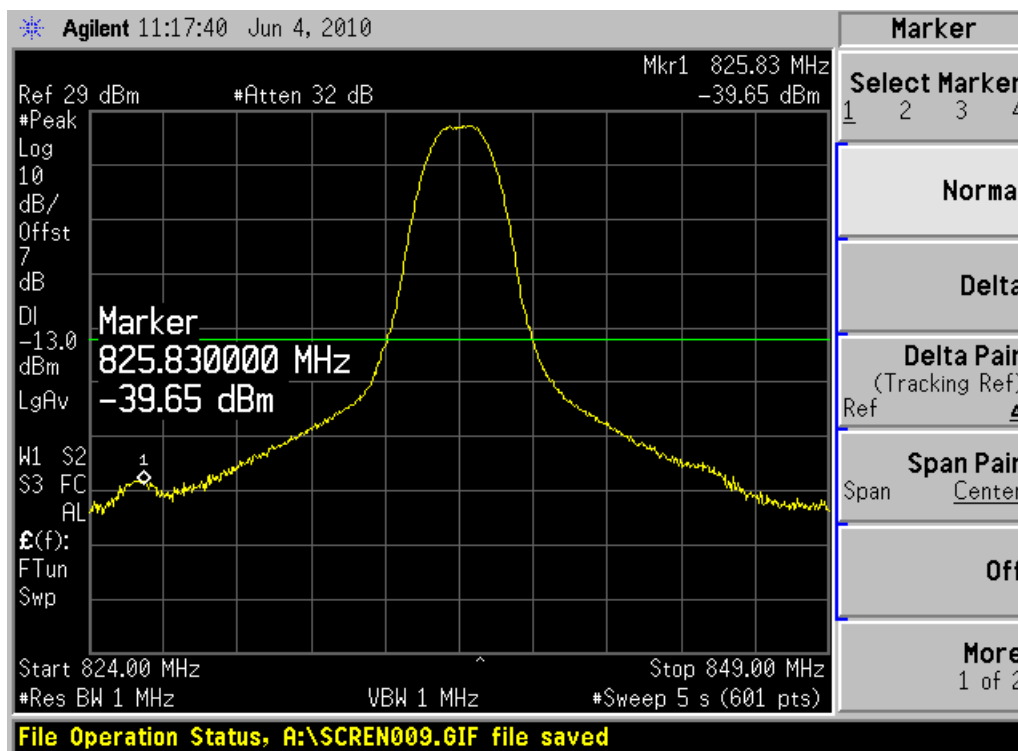
Note: The signal beyond the limit is carrier.



Channel 1013, 849MHz~9GHz

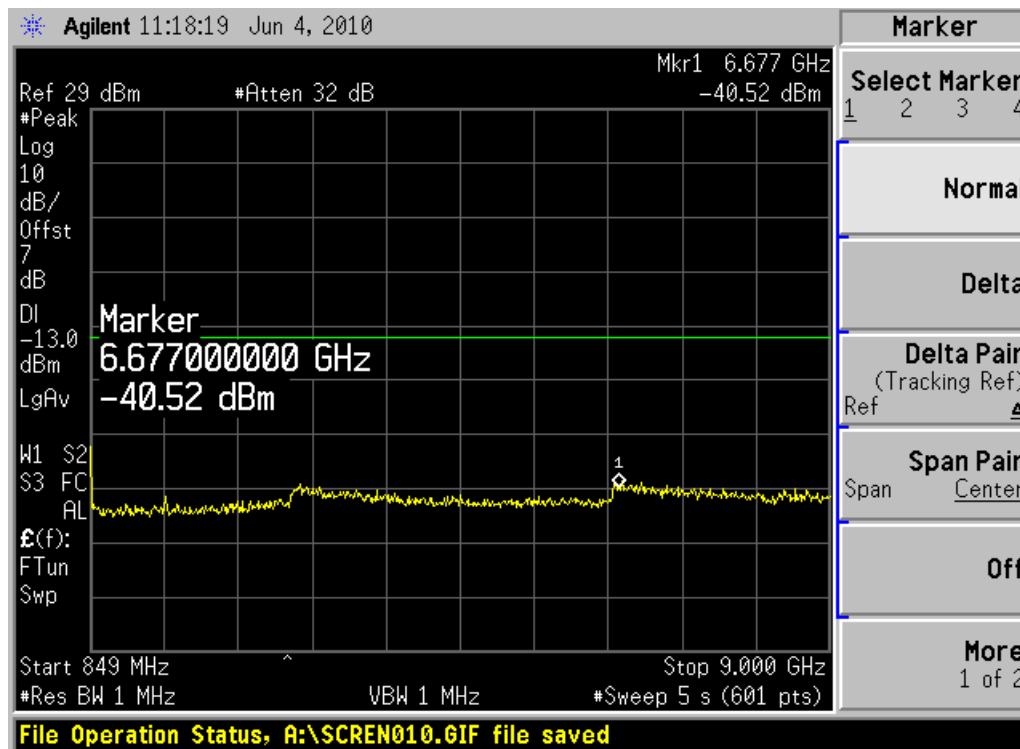


Channel 384, 30MHz~824MHz

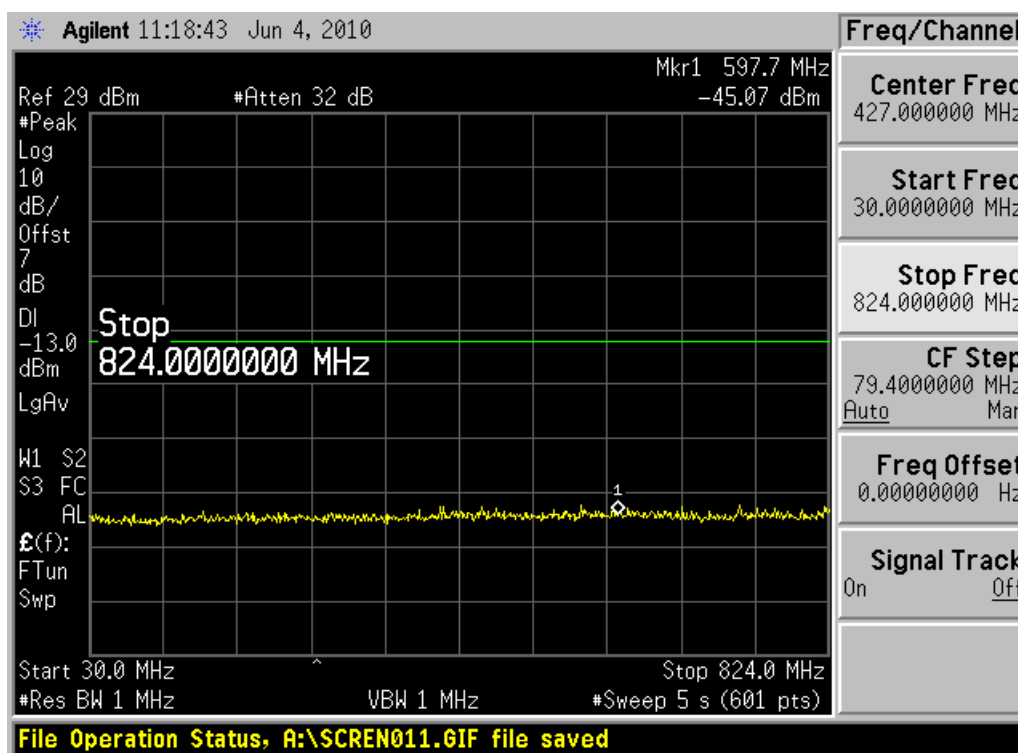


Channel 384, 824MHz~849MHz

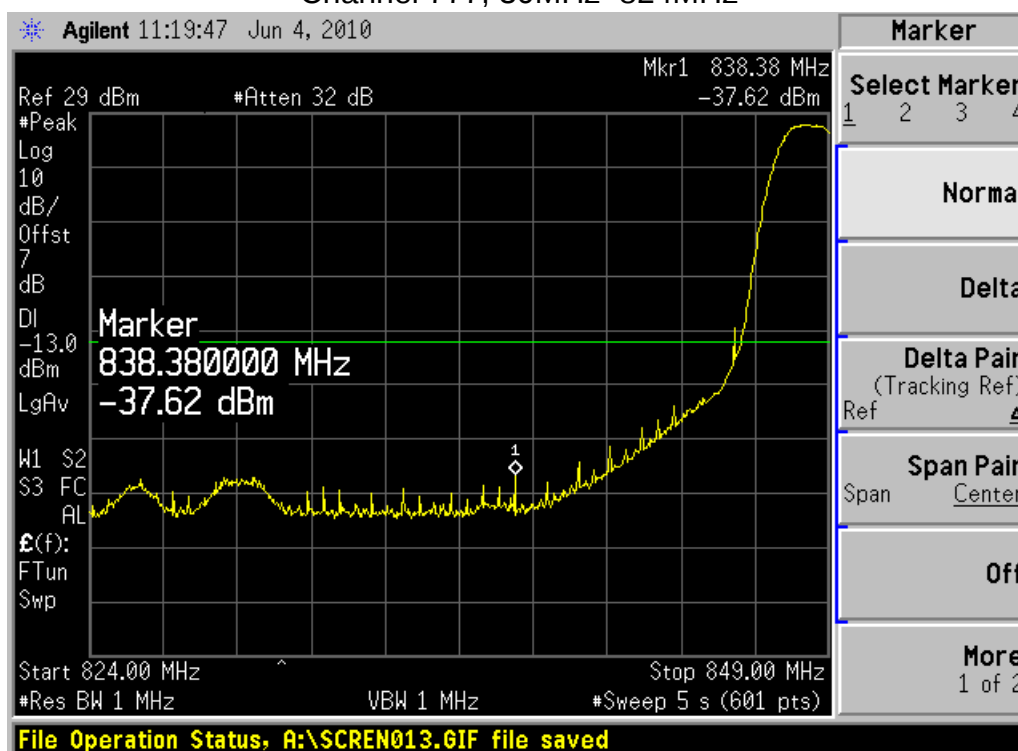
Note: The signal beyond the limit is carrier.



Channel 384, 849MHz~9GHz

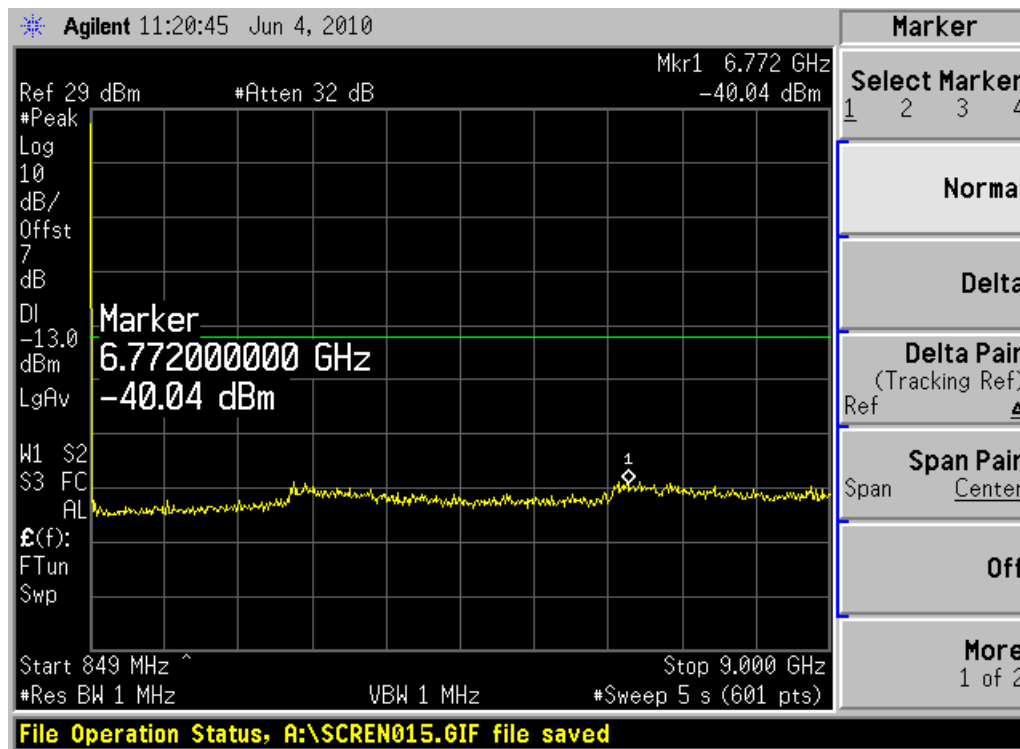


Channel 777, 30MHz~824MHz



Channel 777, 824MHz~849MHz

Note: The signal beyond the limit is carrier.



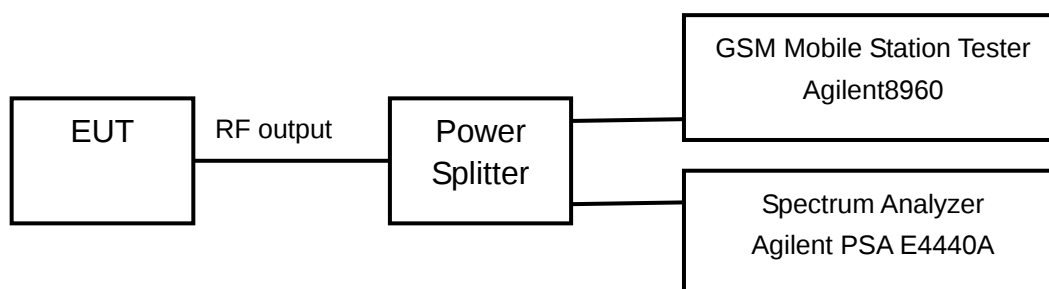
Channel 777, 849MHz~9GHz

## 2.2.5 Band Edges Compliance-FCC Part2.1051/22.917(a)

Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 24°C        | 53%               | 101.9kPa |

Test Setup:



Test procedure:

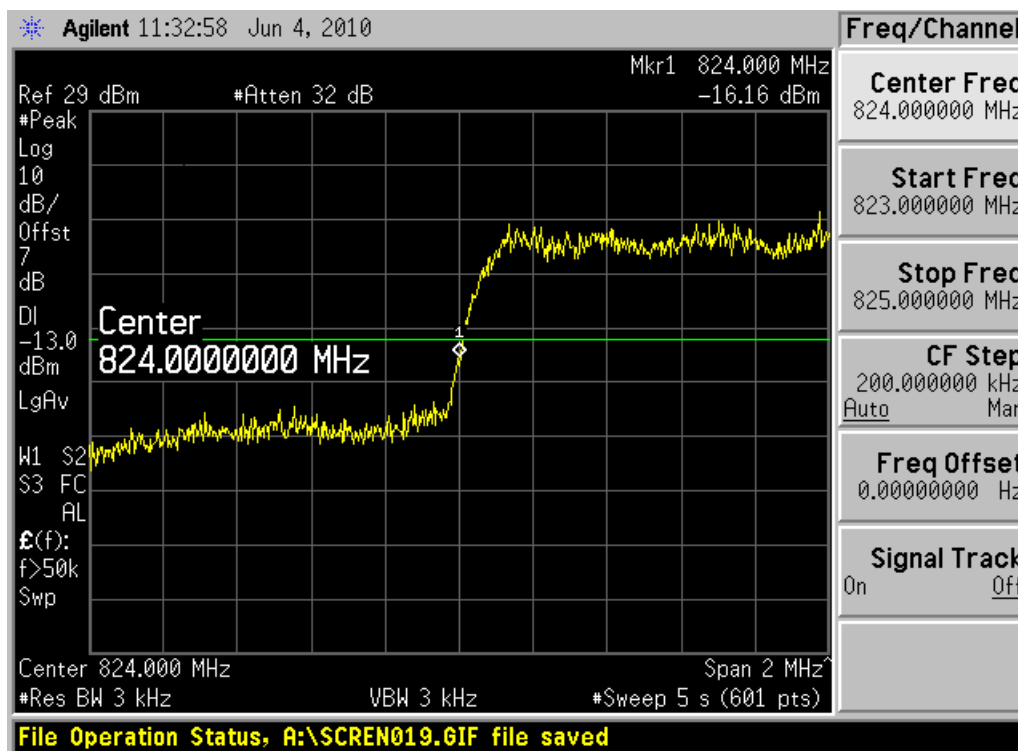
After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. The measurement is carried out using a spectrum analyzer. The peak detector is used and RBW is set to 3KHz on spectrum analyzer.

The measurement will be conducted at two channels No1013 and No777 (Bottom and top channels of CDMA 1X band) in RC3/SO55 test mode.

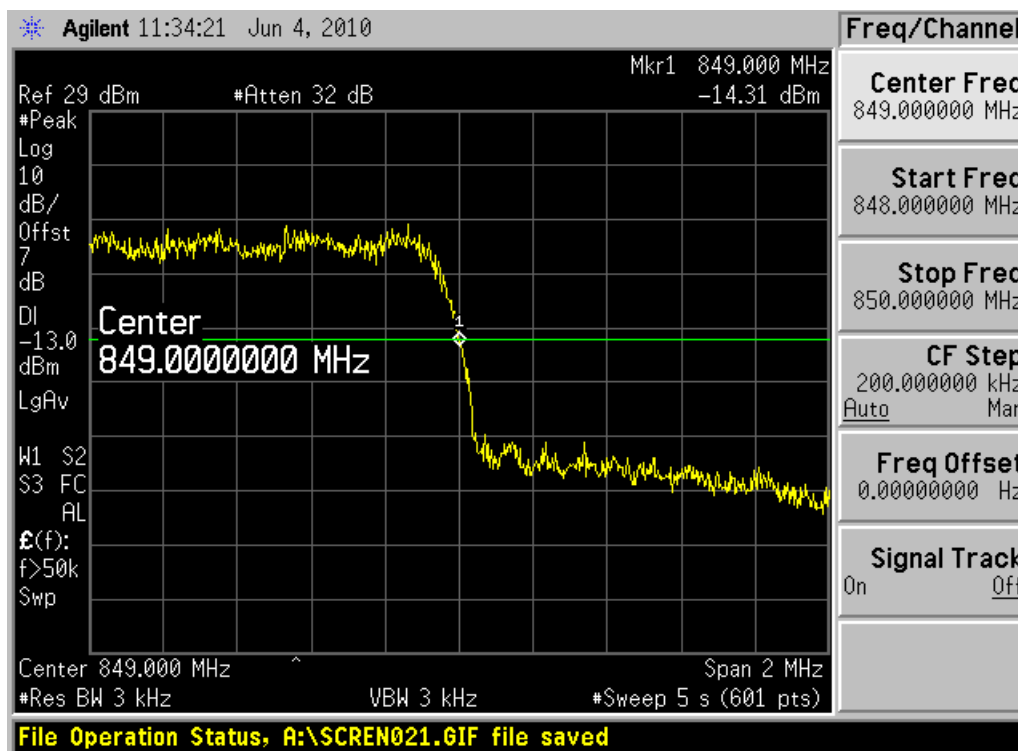
| Limits | $\leq -13\text{dBm}$ |
|--------|----------------------|
|--------|----------------------|

Test result:

Refer to the following figures.



Channel 1013



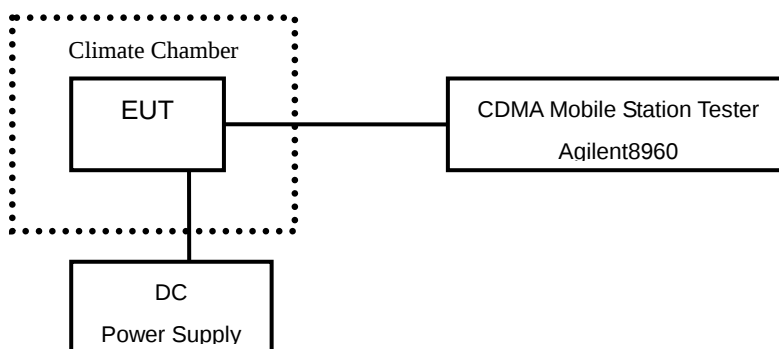
Channel 777

## 2.2.6 Frequency Stability-FCC Part2.1055/22.355

Ambient condition:

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 24°C        | 53%               | 101.9kPa |

Test setup:



Test Procedure:

A radio link shall be established between EUT and Tester. The tester will sample the transmitter RF output signal and measure its frequency. The temperature inside the climate chamber is varied from -30 to +50° C in 10° C step size, and also the DC power supply voltage to the EUT is varied from 3.5 to 4.2 V. The measurement will be conducted at three channels No1013, No384 and No777 (Bottom, middle and top channels of CDMA 1X band) in RC3/SO55 test mode.

Limits: No specific frequency stability requirements in part 2.1055 and part 22.355

Test Result:

| Temperature(° C) | Test Result (ppm)@3.7V |             |             |
|------------------|------------------------|-------------|-------------|
|                  | Channel 1013           | Channel 384 | Channel 777 |
| -30              | 0.002                  | 0.002       | 0.001       |
| -20              | 0.000                  | 0.001       | 0.003       |
| -10              | 0.002                  | 0.003       | 0.001       |
| 0                | 0.002                  | 0.001       | 0.004       |
| +10              | 0.005                  | 0.004       | 0.005       |
| +20              | 0.001                  | 0.002       | 0.006       |
| +30              | 0.002                  | 0.005       | 0.002       |
| +40              | 0.001                  | 0.001       | 0.003       |
| +50              | 0.004                  | 0.002       | 0.002       |

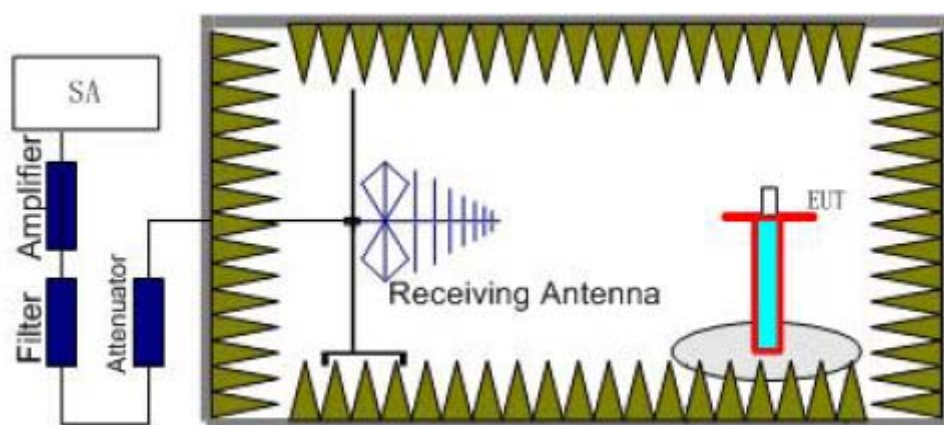
| Voltage (V) | Test Result (ppm)@20°C |             |             |
|-------------|------------------------|-------------|-------------|
|             | Channel 1013           | Channel 384 | Channel 777 |
| 3.5         | 0.002                  | 0.002       | 0.001       |
| 4.2         | 0.002                  | 0.001       | 0.001       |

## 2.2.7 Radiated Spurious Emissions-FCC Part2.1053/22.917(a)

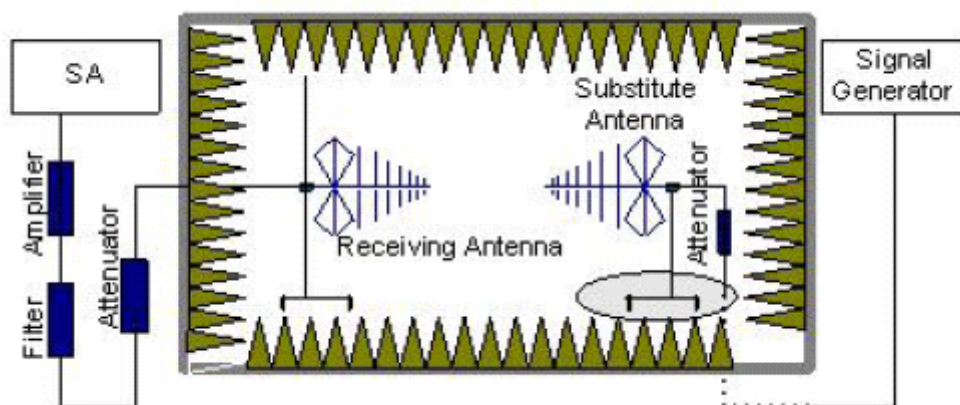
Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 24°C        | 53%               | 101.9kPa |

Test Setup:



Step 1



Step 2

Test procedure:

Step 1:

The measurement is carried out in the fully anechoic chamber. EUT was placed on a 2.4 meter high non-conductive table at a 3 meter test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. The height of receiving antenna is 2.4m and varies in certain range to find the maximum power value. 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. The measurement is carried out using a spectrum analyzer or receiver. The spectrum analyzer scans from 30MHz to 9GHz (higher than the 10<sup>th</sup> harmonic of the carrier). The peak detector is used and RBW is set to 1MHz on spectrum analyzer. Then the antenna height and turn table rotation is adjusted till the maximum power value is founded on spectrum analyzer or receiver. A notch filter is necessary in the band near to the carrier frequency. A high pass filter is needed to avoid the distortion of the testing equipment in the band above the carrier frequency.

Step 2:

A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.

Calculation procedure:

The data of cable loss, antenna gain and air loss has been calibrated in full testing frequency range before the testing.

The power of the Radiated Spurious Emissions is calculated by adding the cable loss, antenna gain and air loss. The basic equation with a sample calculation is as followed:

$$P=P_R+L_C+L_A-G$$

Where

P: Power of the Radiated Spurious Emissions (dBm)

P<sub>R</sub>: reading of the receiver (dBm)

L<sub>C</sub>: Cable Lose (dB)

L<sub>A</sub>: Air loss (dB)

G: Antenna Gain (dBi)

Assumed the reading of the receiver is -60dBm. A cable lose of 10dB, an air lose of 30dB and an antenna gain of 11dBi are added.

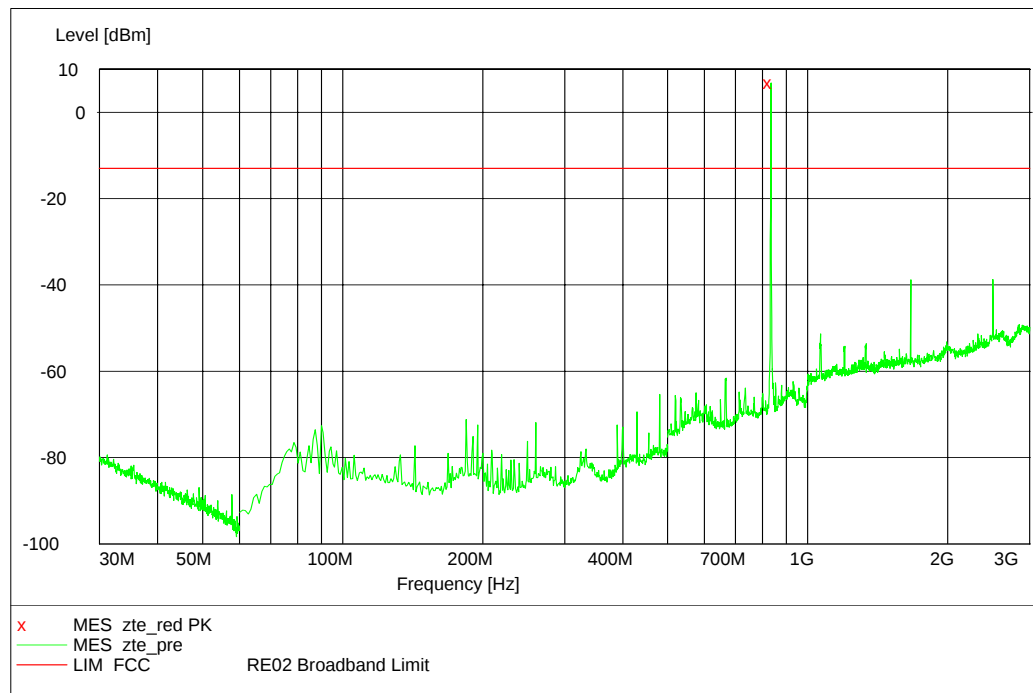
$$P=P_R+L_C+L_A-G=-60+10+30-11=-31\text{dBm}$$

The measurement will be conducted at one channel No384 (middle channel of CDMA 1X band) in RC3/SO55 test mode.

|        |          |
|--------|----------|
| Limits | ≤ -13dBm |
|--------|----------|

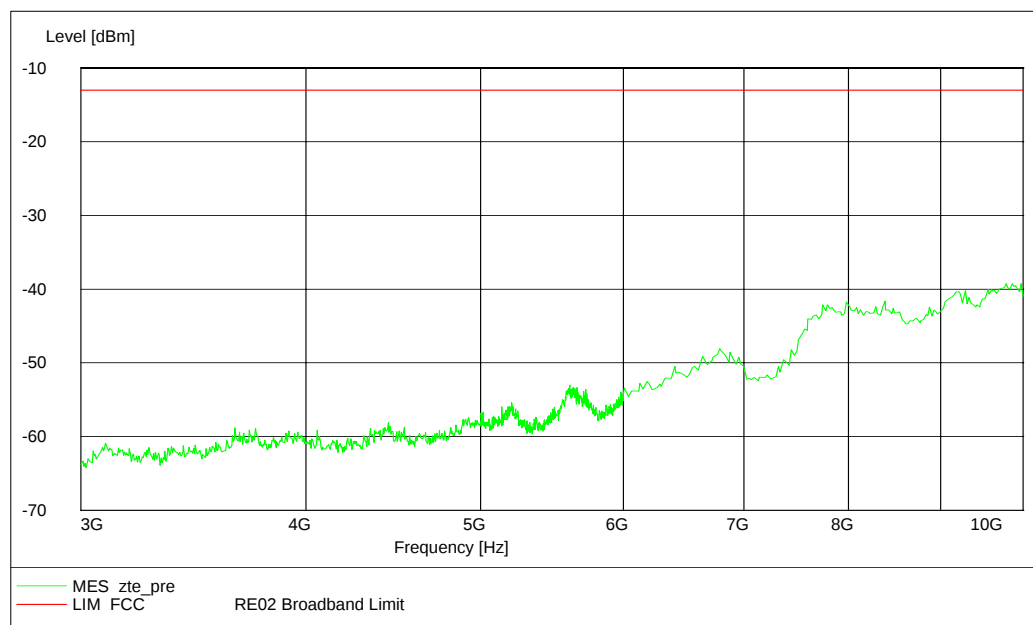
Test result:

Refer to the following figures.



### Channel 384, 30MHz~3GHz

Note: The signal beyond the limit is the base station simulator carrier.



### Channel 384, 3GHz~10GHz

### 2.3. List of test equipments

| No. | Name/Model                                  | Manufacturer | S/N        | Calibration Due Date       |
|-----|---------------------------------------------|--------------|------------|----------------------------|
| 1   | E5515C(8960) Mobile Station Tester          | Agilent      | GB44050904 | 19 <sup>th</sup> Aug. 2010 |
| 2   | PSA E4440A Spectrum Analyzer                | Agilent      | MY41000183 | 19 <sup>th</sup> Aug. 2010 |
| 3   | 66309B DC Power Supply                      | Agilent      | MY43000461 | 19 <sup>th</sup> Aug. 2010 |
| 4   | 1506A Power Splitter                        | Weinschel    | MN154      | 19 <sup>th</sup> Aug. 2010 |
| 5   | 9.080m×5.255m×3.525m Shielding room         | FRANKONIA    | -----      | 19 <sup>th</sup> Aug. 2010 |
| 6   | ESI 40 EMI test receiver                    | R&S          | 100015     | 19 <sup>th</sup> Aug. 2010 |
| 7   | SMR 20 Signal generator                     | R&S          | 100086     | 19 <sup>th</sup> Aug. 2010 |
| 8   | CMU 200 Radio tester                        | R&S          | 100313     | 19 <sup>th</sup> Aug. 2010 |
| 9   | 12.65m*8.03m*7.50m Fully-Anechoic Chamber   | FRANKONIA    | -----      | 19 <sup>th</sup> Aug. 2010 |
| 10  | HL562 Ultra log test antenna                | R&S          | 100016     | 19 <sup>th</sup> Aug. 2010 |
| 11  | 23.18m×16.88m×9.60m Semi-Anechoic Chamber   | FRANKONIA    | -----      | 19 <sup>th</sup> Aug. 2010 |
| 12  | HF 906 Double-Ridged Waveguide Horn Antenna | R&S          | 100030     | 19 <sup>th</sup> Aug. 2010 |
| 13  | HF 906 Double-Ridged Waveguide Horn Antenna | R&S          | 100029     | 19 <sup>th</sup> Aug. 2010 |
| 14  | PS2000 Turn Table                           | FRANKONIA    | -----      | 19 <sup>th</sup> Aug. 2010 |
| 15  | MA260 Antenna Master                        | FRANKONIA    | -----      | 19 <sup>th</sup> Aug. 2010 |
| 16  | SH-241Climatic Chamber                      | ESPEC        | 92000389   | 19 <sup>th</sup> Aug. 2010 |
| 17  | ES-K1EMI test software                      | R&S          | -----      | 19 <sup>th</sup> Aug. 2010 |
| 18  | HL562 Receive antenna                       | R&S          | 100167     | 19 <sup>th</sup> Aug. 2010 |

## **Appendix**

### Appendix1 Test Setup