



TEST REPORT

Report No.: SRTC2012-H024-E0052

Product Name: CDMA 1X Digital Mobile Phone

Product Model: ZTE-C S188

Applicant: ZTE Corporation

Manufacturer: ZTE Corporation

Specification: FCC Part 22H, Part 2

(October 1, 2009 edition)

FCC ID: Q78-ZTECS188

The State Radio_monitoring_center Testing Center (SRTC)

No.80 Beilishi Road Xicheng District Beijing, China

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1. General information

1.1 Notes of the test report

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio_monitoring_center Testing Center (SRTC).

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 Testing Center (SRTC)
Address: No.80 Beilishi Road, Xicheng District, Beijing China
City: Beijing
Country or Region: China
Contacted person: Wang Junfeng
Tel: +86 10 68009181 +86 10 68009202
Fax: +86 10 68009195 +86 10 68009205
Email: wangjf@srrc.org.cn / wangjunfeng@srtc.org.cn

1.3 Applicant's details

Company: ZTE Corporation
Address: ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park,
Nanshan District, 518057
City: Shenzhen
Country or Region: P.R.China
Grantee Code: Q78
Contacted person: Min Zhang
Tel: +86-021-68897541
Fax: +86-021-50801070
Email: zhang.min13@zte.com.cn

1.4 Manufacturer's details

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

1.5 Application details

Date of reception of test sample: 5th Aug 2012

Date of test: 10th Aug 2012 to 11th Sep 2012

1.6 Reference specification

FCC Part 22H, Part 2 (October 1, 2009 edition)

1.7 Information of EUT

1.7.1 General information

Name of EUT	CDMA 1X Digital Mobile Phone
FCC ID	Q78-ZTECS188
Frequency range	Tx:824~849MHz Rx:869~894MHz
Rated output power	24.0dBm
Modulation type	OQPSK
Emission Designator	1M25F9W
Duplex mode	FDD
Duplex spacing	45MHz
Supported test mode	RC1/SO2, RC1/SO55, RC3/SO2, RC3/SO55
Antenna type	Fixed Internal
Power Supply	Battery or charger
Rated Power Supply Voltage	3.7V
Extreme Temperature	Lowest: -30°C Highest: +50°C
Extreme Voltage	Minimum: 3.5V Maximum: 4.2V
HW Version	cw1B
SW Version	VE_S188_RNTN01FV1.0.0B01

1.7.2 EUT details

Name	Model	MEID
CDMA 1X Digital Mobile Phone	ZTE-C S188	A100002311A718

1.7.3 Auxiliary equipment details

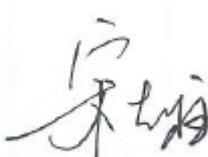
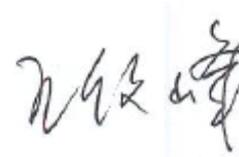
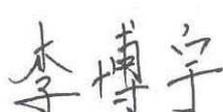
Equipment	Charger
Manufacturer	RUIDE
Model Number	STC-A22O50I700USBA-Z
Input Voltage	100V-240V a.c.
Output Voltage	5.0V d.c.
Frequency	50/60Hz

Equipment	Battery
Manufacturer	ZTE CORPORATION
Model Number	Li3710T42P3h553457
Capacity	1000mAh
Rated Voltage	3.7V d.c.

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	Emission Bandwidth	22.917(b)	Pass
5	Spurious Emissions at antenna terminals	2.1051/22.917(a)	Pass
6	Band Edges Compliance	2.1051/22.917(a)	Pass
7	Frequency Stability	2.1055/22.355	Pass
8	Radiated Spurious Emissions	2.1053/22.917(a)	Pass

This Test Report Is Issued by: Mr. Song Qizhu Director of the test lab 	Checked by: Mr. Wang Junfeng Deputy director of the test lab 
Tested by: Mr. Li Boyu Test engineer 	Issued date: 2012.09.12

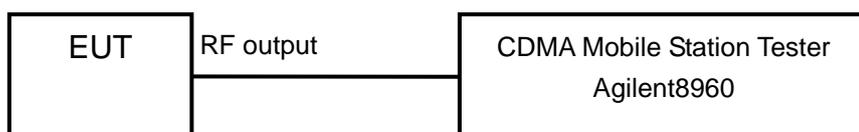
2.2 Test result

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	≤30dBm
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Test result:

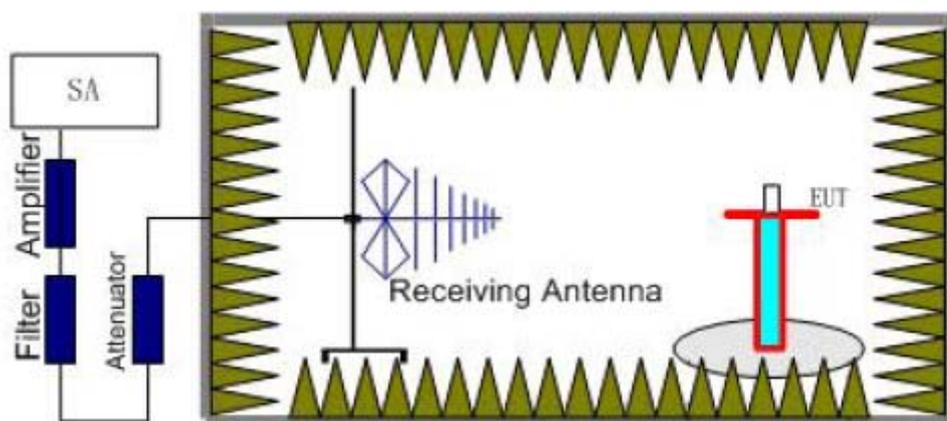
Carrier frequency (MHz)	Channel No.	Test Mode	RF Power Output (dBm)
824.70	1013	RC1/SO2	23.7
		RC1/SO55	23.7
		RC3/SO2	23.7
		RC3/SO55	23.8
836.52	384	RC1/SO2	23.6
		RC1/SO55	23.5
		RC3/SO2	23.6
		RC3/SO55	23.6
848.31	777	RC1/SO2	23.2
		RC1/SO55	23.2
		RC3/SO2	23.3
		RC3/SO55	23.3

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

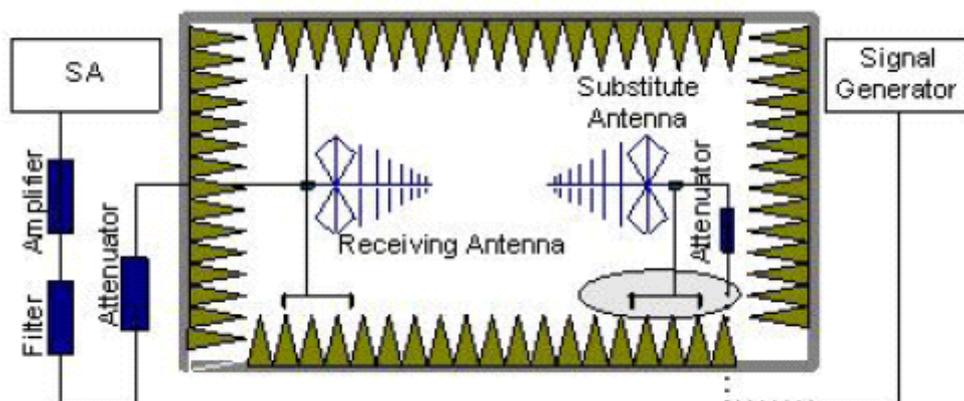
Ambient condition:

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	≤ 38.5dBm
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Test result:

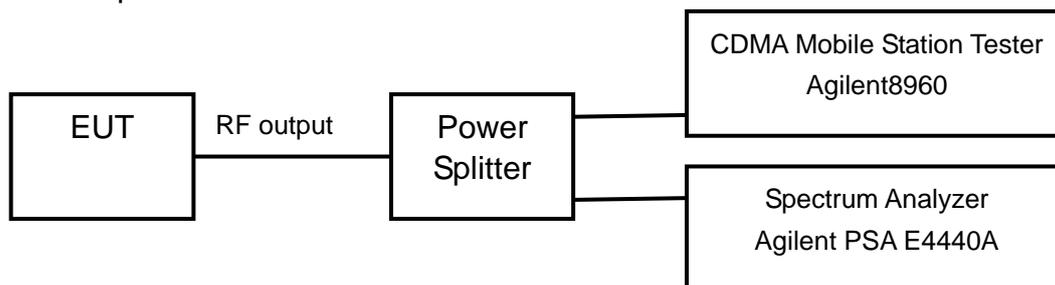
Carrier frequency (MHz)	Channel No.	Test Mode	E.R.P. (dBm)
824.70	1013	RC3/SO55	21.8
836.52	384	RC3/SO55	22.4
848.31	777	RC3/SO55	22.1

2.2.3 Occupied Bandwidth-FCC Part2.1049

Ambient condition:

Temperature	Relative humidity	Pressure
24°C	53%	101.9kPa

Test Setup:



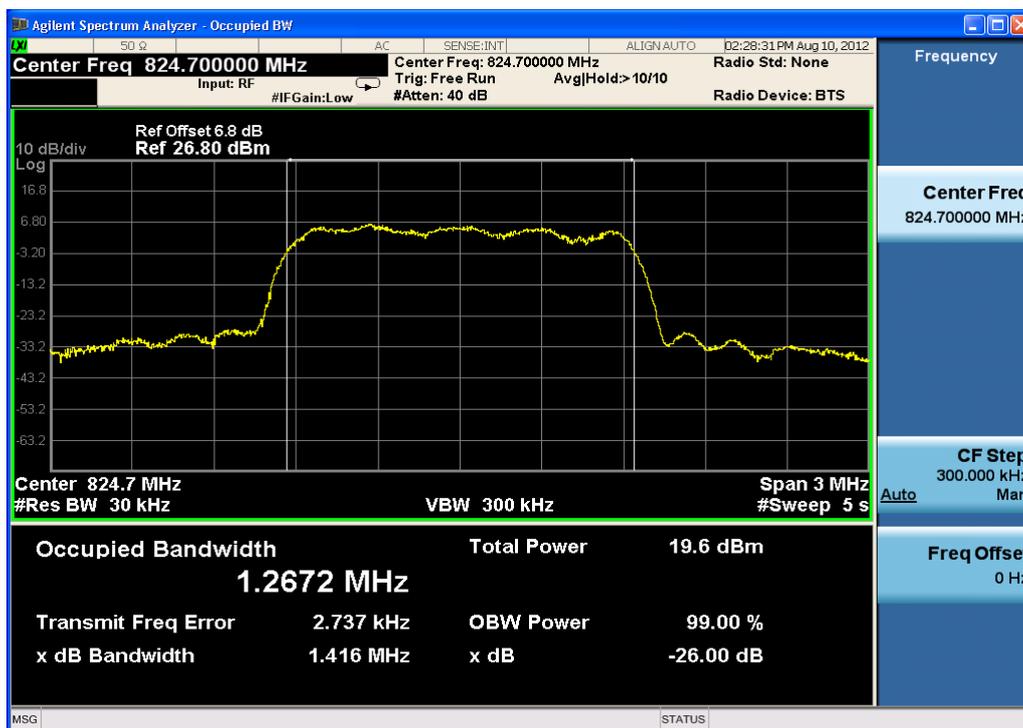
Test procedure:

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 30kHz 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.

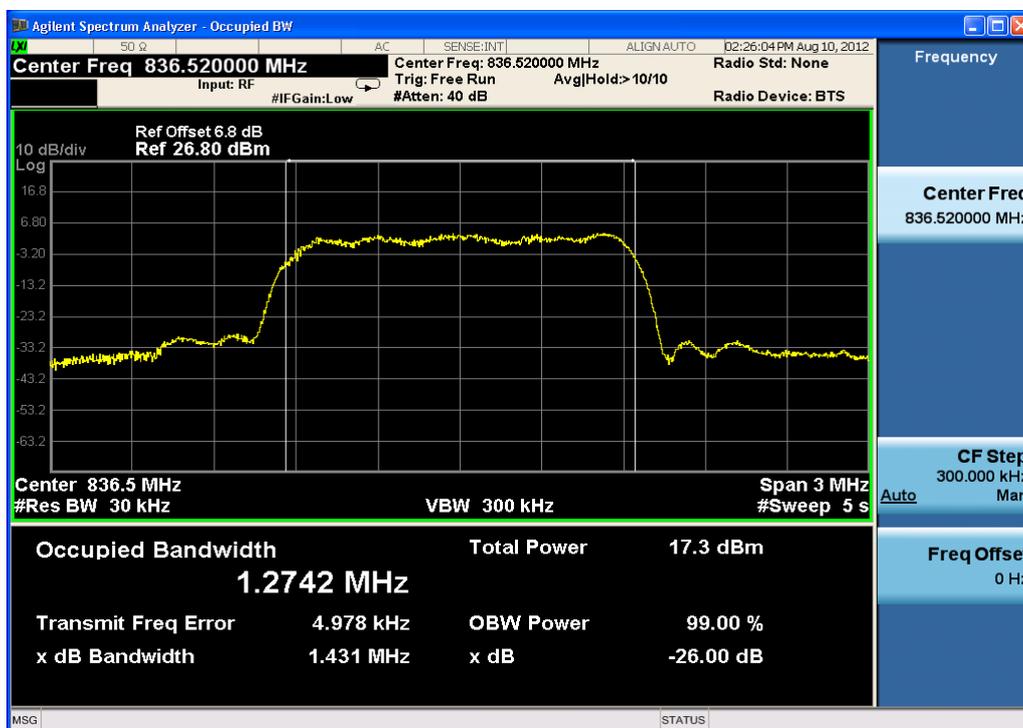
Limits: No specific occupied bandwidth requirements in part 2.1049

Test result:

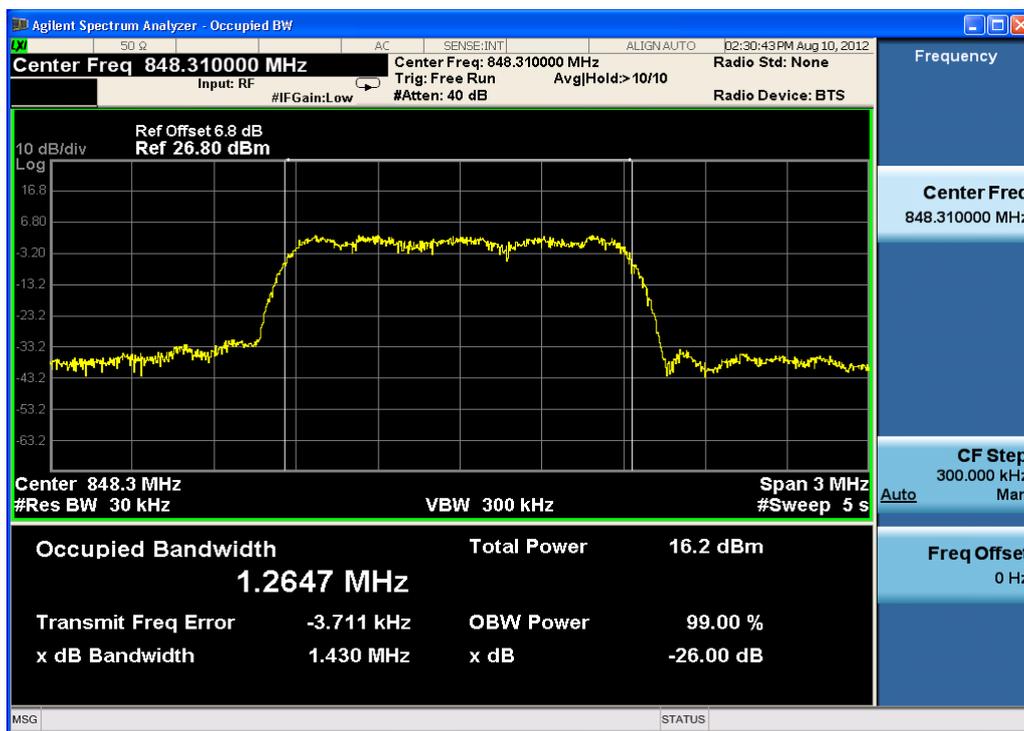
Carrier frequency (MHz)	Channel No.	Test Mode	Bandwidth of 99% Power (MHz)
824.70	1013	RC3/SO55	1.2672
836.52	384	RC3/SO55	1.2742
848.31	777	RC3/SO55	1.2647



Channel 1013



Channel 384



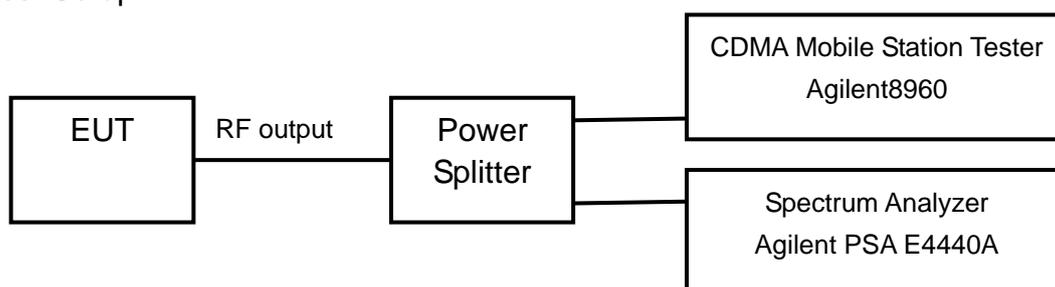
Channel 777

2.2.4 Emission Bandwidth-FCC Part22.917(b)

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 emission bandwidth is measured using spectrum analyzer. RBW is set to 30kHz on spectrum analyzer. The bandwidth of -26dB transmitter 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 emission bandwidth requirements in part 22.917(b)

Test result:

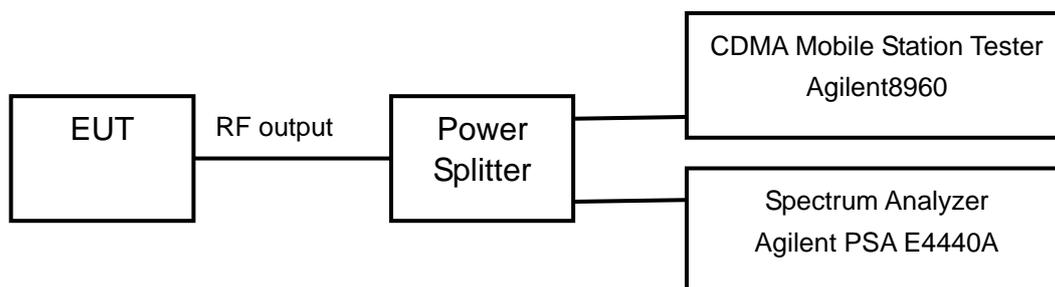
Carrier frequency (MHz)	Channel No.	Test Mode	Bandwidth of -26dB transmitter power (kHz)
824.70	1013	RC3/SO55	1.416
836.52	384	RC3/SO55	1.431
848.31	777	RC3/SO55	1.430

2.2.5 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:

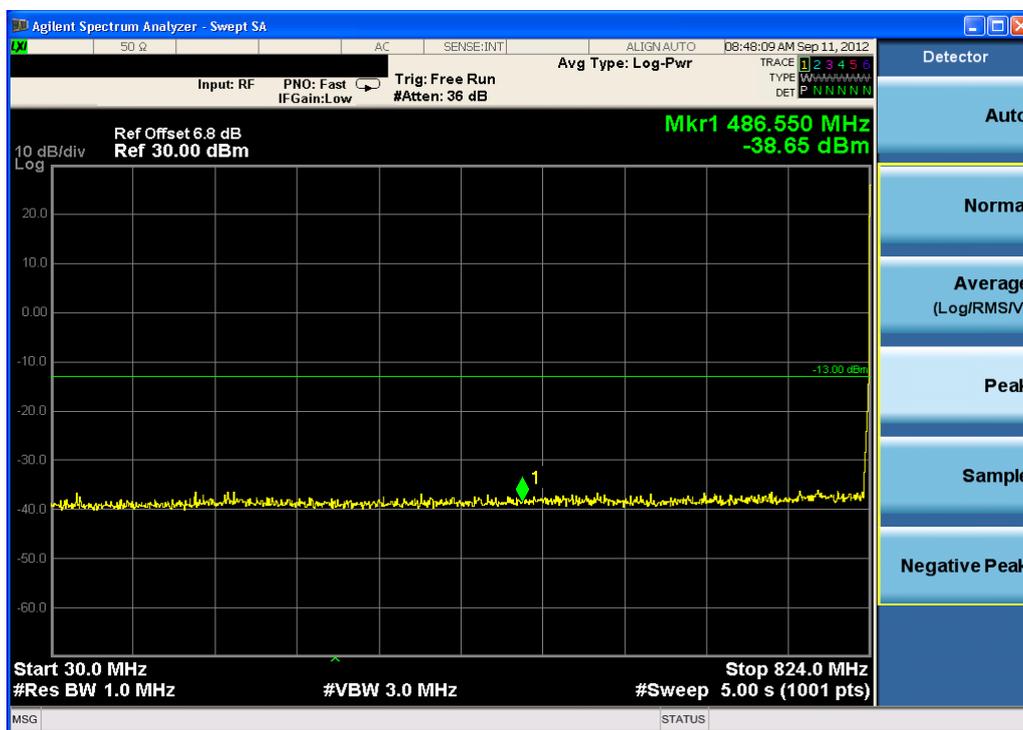
After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 30MHz to 9GHz (higher than the 10th 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.

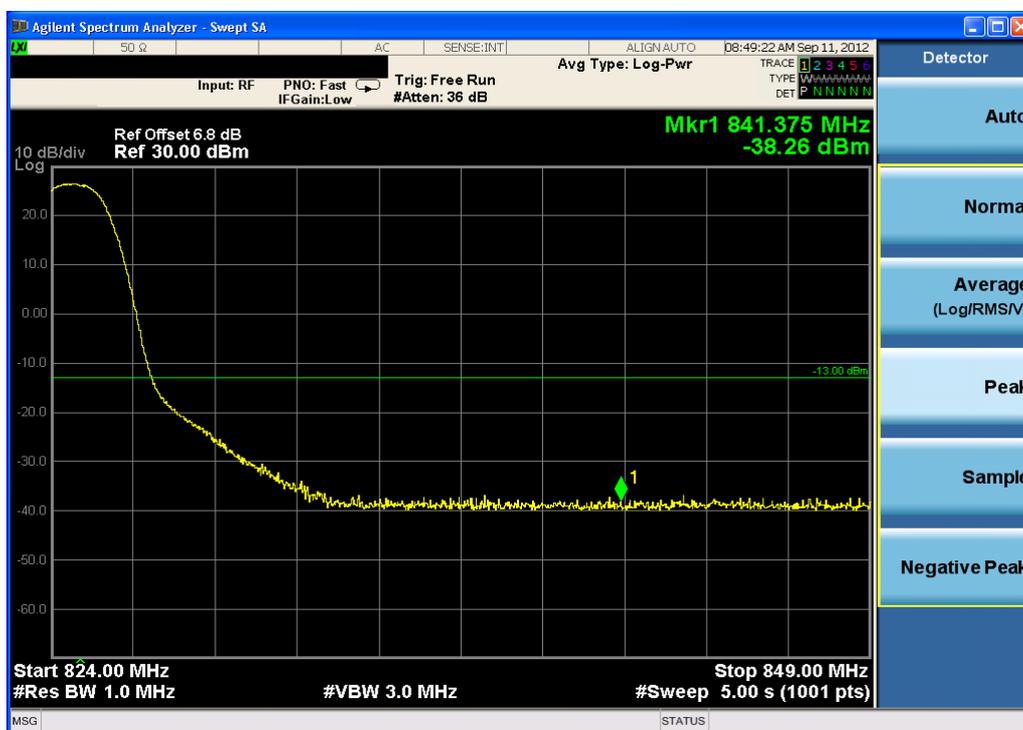
Limits	≤ -13dBm

Test result:

Refer to the following figures.

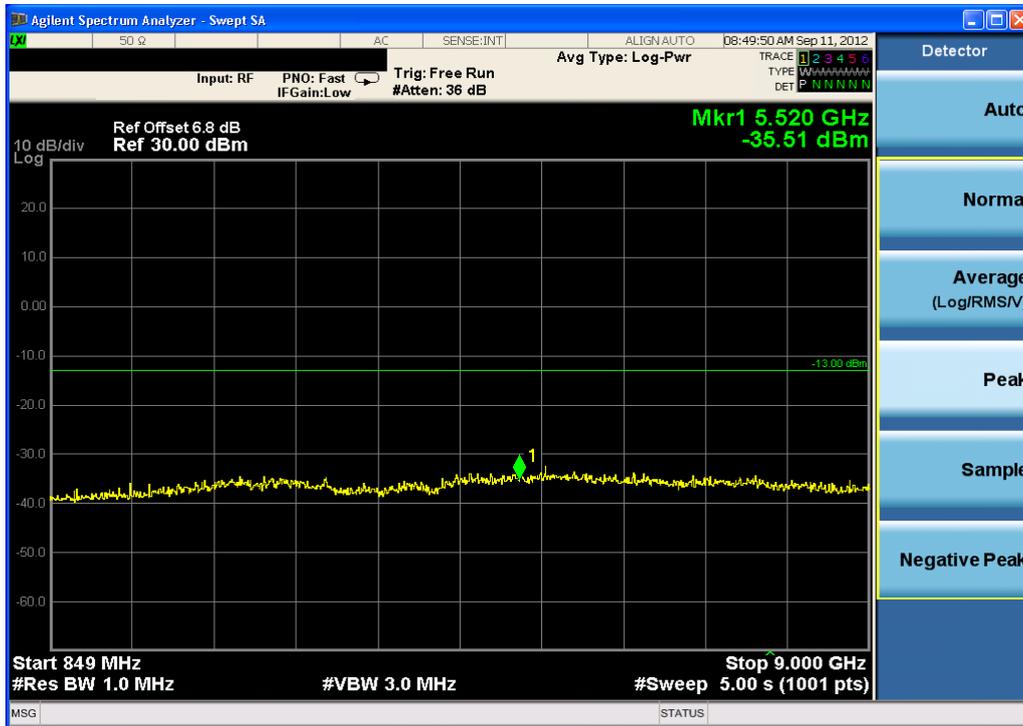


Channel 1013, 30MHz~824MHz

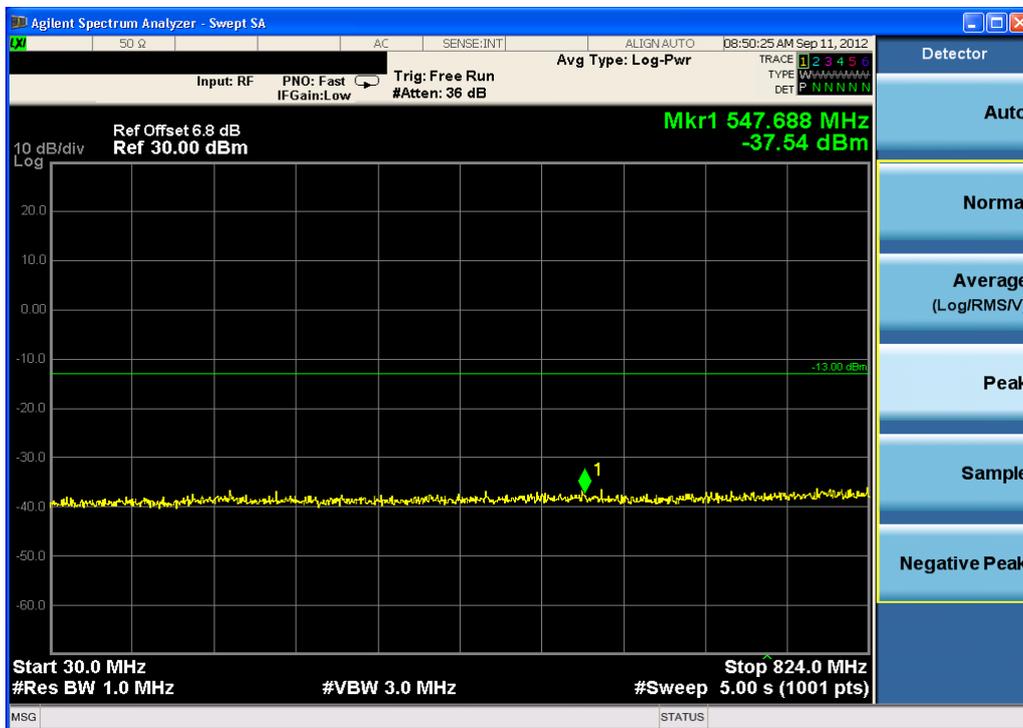


Channel 1013, 824MHz~849MHz

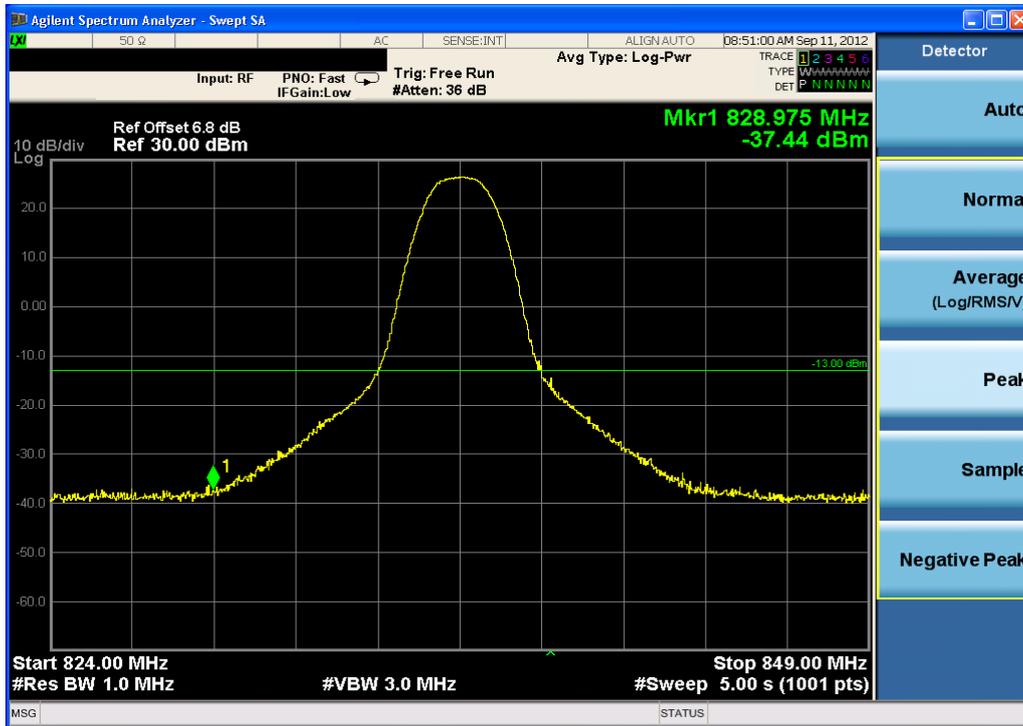
Note: The signal beyond the limit is carrier.



Channel 1013, 849MHz~9GHz



Channel 384, 30MHz~824MHz

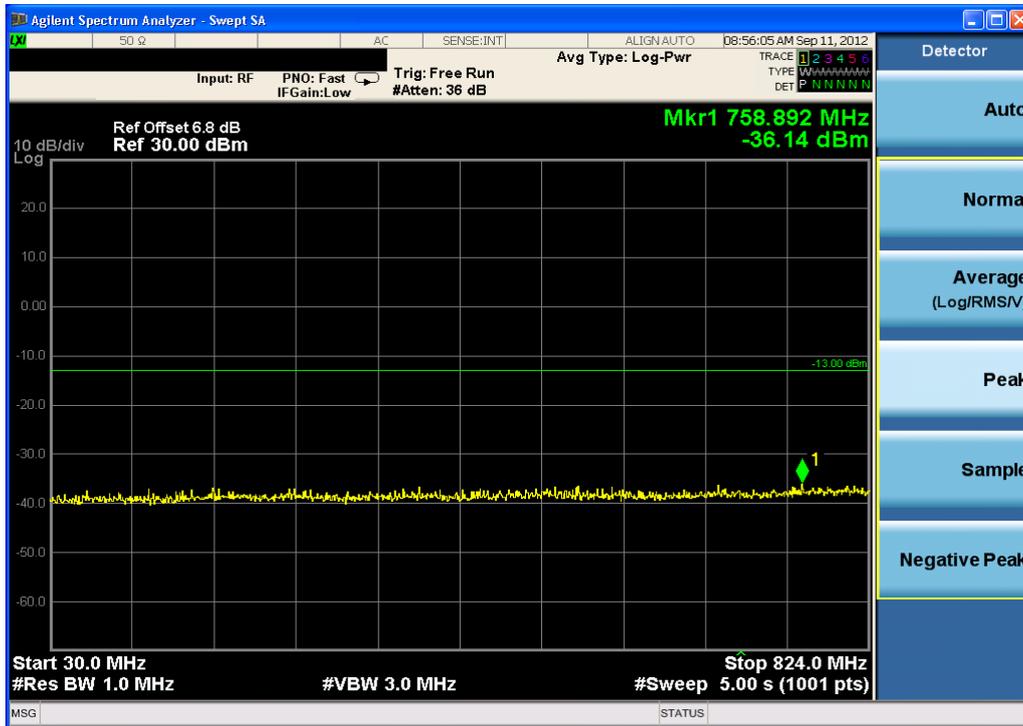


Channel 384, 824MHz~849MHz

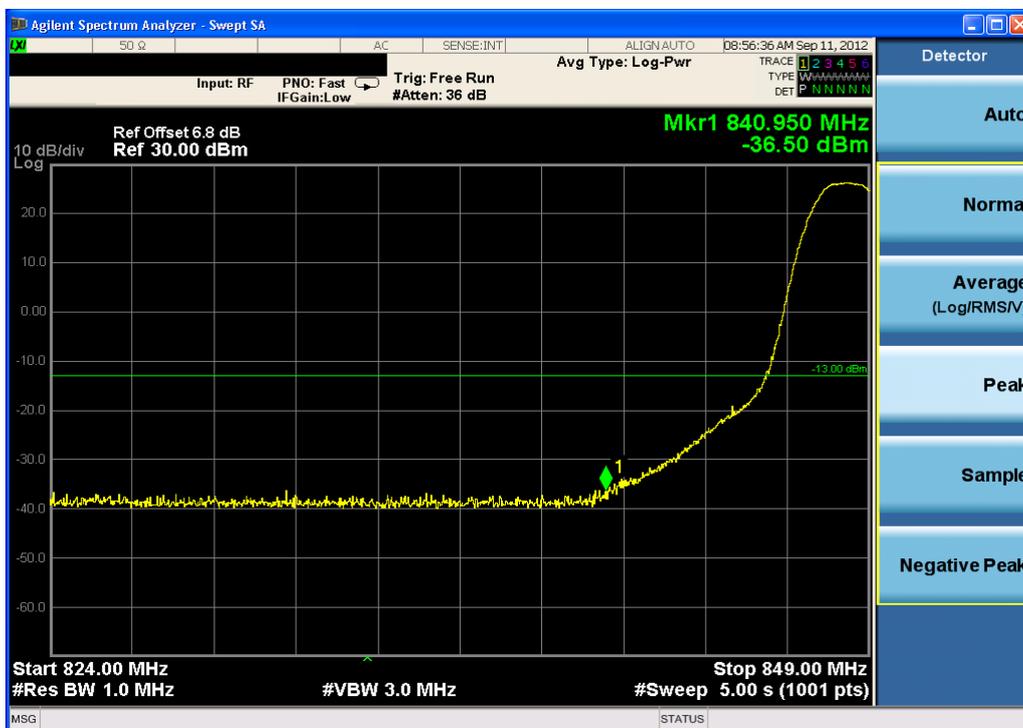
Note: The signal beyond the limit is carrier.



Channel 384, 849MHz~9GHz

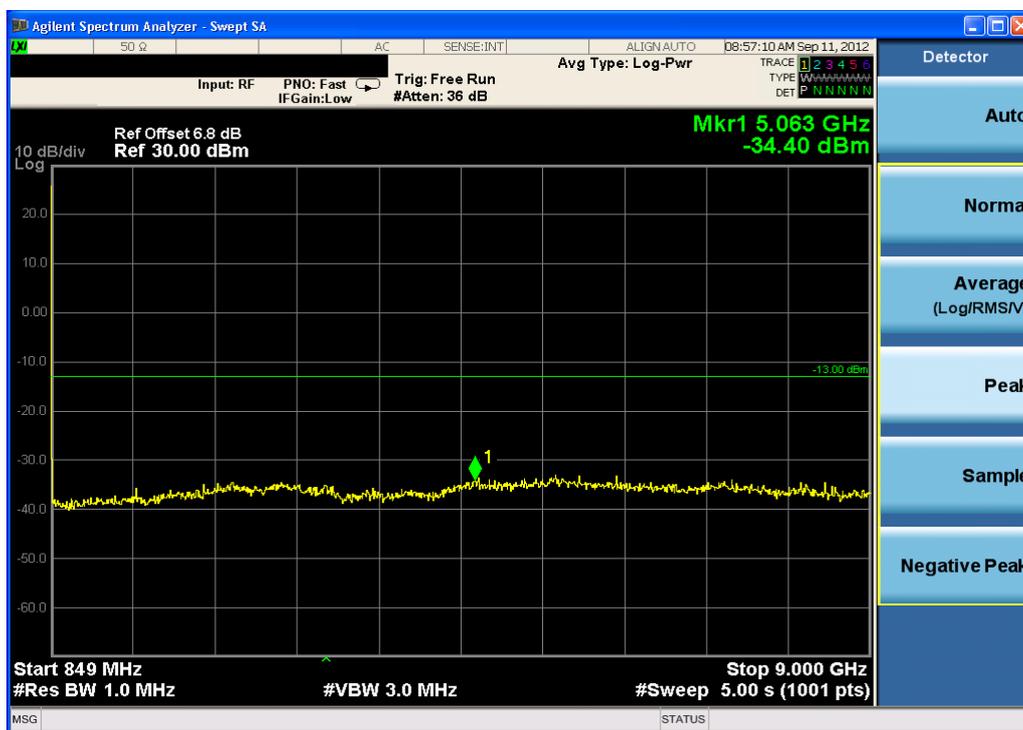


Channel 777, 30MHz~824MHz



Channel 777, 824MHz~849MHz

Note: The signal beyond the limit is carrier.



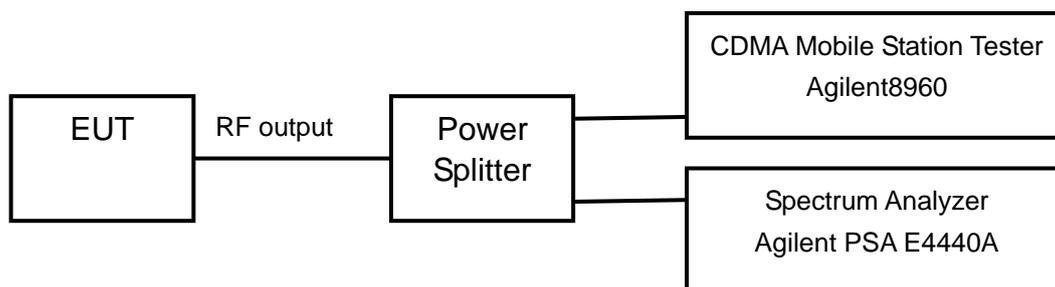
Channel 777, 849MHz~9GHz

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

Ambient condition:

Temperature	Relative humidity	Pressure
24°C	53%	101.9kPa

Test Setup:



Test procedure:

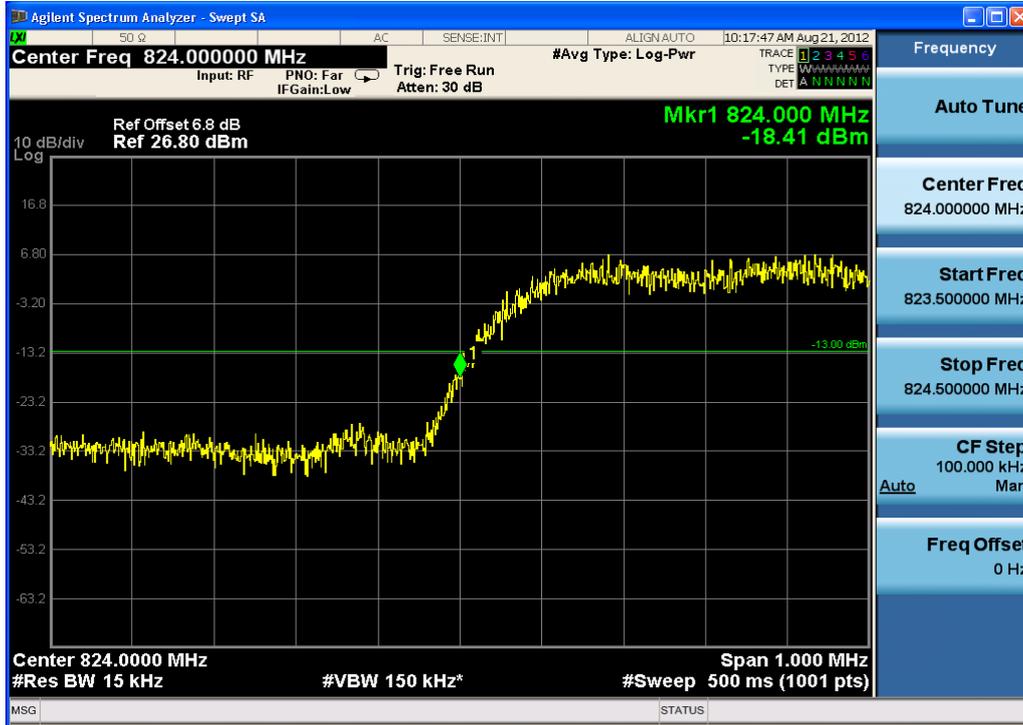
After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. The measurement is carried out using a spectrum analyzer. The RBW is set to at least 1% of the emission bandwidth 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	≤ -13dBm
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Test result:

Refer to the following figures.



Channel 1013



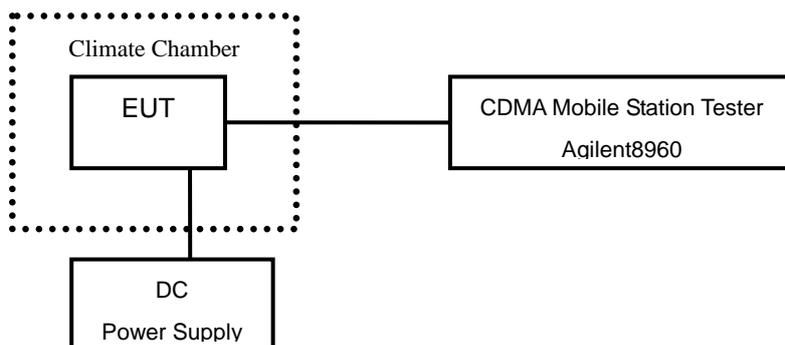
Channel 777

2.2.7 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	0.006	0.005	0.008
-20	0.004	0.001	0.002
-10	0.004	0.002	0.004
0	0.004	0.002	0.001
+10	0.004	0.005	0.002
+20	0.002	0.004	0.002
+30	0.006	0.008	0.004
+40	0.004	0.007	0.006
+50	0.002	0.007	0.004

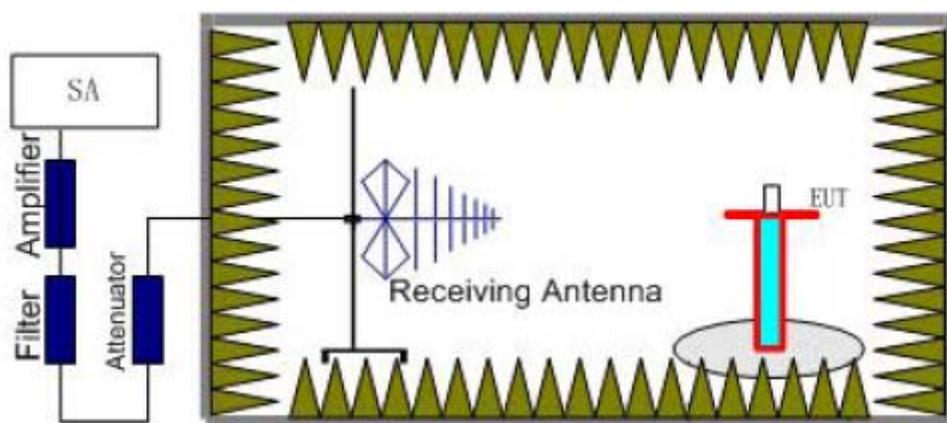
Voltage (V)	Test Result (ppm)@20°C		
	Channel 1013	Channel 384	Channel 777
3.5	0.005	0.010	0.006
4.2	0.008	0.007	0.013

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

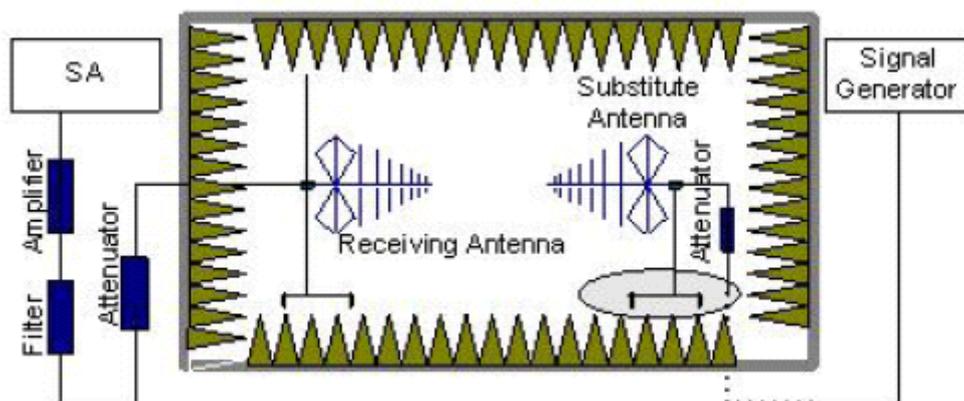
Ambient condition

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 20GHz (higher than the 10th harmonic of the carrier). The peak detector is used and RBW is set to 1MHz on spectrum analyzer. According to ANSI C63.4-2009, VBW is set to a value equal to three times of the RBW 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 (frequency of 30MHz to 1GHz) or double-ridged (frequency of above 1GHz) 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 and the gain of the substitution antenna.

Calculation procedure:
 The data of cable loss and substitution antenna gain 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 the level of the signal generator. The basic equation with a sample calculation is as followed:

$$P = P_s + L_C + G$$

Where

P: Power of the Radiated Spurious Emissions (dBm)

P_s: the level of the signal generator (dBm)

L_C: Cable Lose (dB)

G: Antenna Gain (dBi)

Assumed the level of the signal generator is -30dBm. A cable lose of -10dB and an antenna gain of 11dBi are added.

$$P = P_s + L_C + G = -30 + (-10) + 11 = -29 \text{ dBm}$$

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

Limits	≤ -13dBm
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Test result:

Frequency (MHz)	Ps Signal generator level (dBm)	Lc Cable loss (dB)	G Antenna Gain (dB)	Pmea (dBm)	Limited (dBm)	Polarization
2060.47	-42.9	-5.6	8.6	-39.9	-13	Vertical
2554.86	-38.2	-5.7	8.6	-35.3	-13	Horizontal
2764.31	-39.5	-5.8	8.9	-36.4	-13	Vertical
2812.12	-40.8	-5.8	8.9	-37.7	-13	Vertical
7000.98	-44.6	-8.6	12.7	-40.5	-13	Vertical
9976.23	-40.2	-11.8	13.6	-38.4	-13	Horizontal

2.3. List of test equipments

No.	Name/Model	Manufacturer	S/N	Calibration Due Date
1	E5515C(8960) Mobile Station Tester	Agilent	MY48367401	2013.8.19
2	N9020A Spectrum Analyzer	Agilent	MY48010771	2013.8.19
3	DC Power Supply E3645A	Agilent	MY40000740	2013.8.19
4	Power Splitter 11850C	Agilent	026057	2013.8.19
5	12.65m×8.03m×7.50m Fully-Anechoic Chamber	FRANKONIA	-----	-----
6	Turn table Diameter:1m	HD	-----	-----
7	Antenna master FAC(MA4.0)	MATURO	-----	-----
8	HF 906 Double-Ridged Waveguide Horn Antenna	R&S	100030	2013.8.19
9	HF 906 Double-Ridged Waveguide Horn Antenna	R&S	100029	2013.8.19
10	HL562 Ultra log antenna	R&S	100016	2013.8.19
11	3160-09 Receive antenna	SCHWARZ-BECK	002058-002	2013.8.19
12	ESI 40 EMI test receiver	R&S	100015	2013.8.19
13	CMU 200 Radio tester	R&S	114667	2013.8.19
14	SMR 20 Signal generator	R&S	100086	2013.8.19

Appendix

Appendix1 Test Setup