



TEST REPORT

Report No.: SRTC2011-H024-E0051

Product Name: GSM/GPRS/EDGE/WCDMA

Digital Mobile Phone with Bluetooth

Marketing Name: one touch 905M

Product Model: MINI3G M

Applicant: TCT Mobile Limited

Manufacture: TCT Mobile Limited

Specification: FCC Part 22H, Part 2

(October 1, 2009 edition)

FCC ID: RAD204

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)
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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: TCT Mobile Limited
Address: 5F, E building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area
City: Shanghai
Country or Region: P.R.China
Grantee Code: RAD
Contacted Person: Gong Zhizhou
Tel: +86-21-61460890
Fax: +86-21-61460602
Email: zhizhou.gong@jrdcom.com

1.4 Manufacturer's details

Company: TCT Mobile Limited
Address: 5F, E building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area
City: Shanghai
Country or Region: P.R.China
Contacted Person: Gong Zhizhou
Tel: +86-21-61460890
Fax: +86-21-61460602
Email: zhizhou.gong@jrdcom.com

1.5 Application details

Date of reception of test sample: 8th Jun 2011

Date of test: 9th Jun 2011 to 12th Jun 2011

1.6 Reference specification

FCC Part22H, Part 2 (October 1, 2009 edition)

1.7 Information of EUT

1.7.1 General information

Name of EUT	GSM/GPRS/EDGE/WCDMA Digital Mobile Phone with Bluetooth
FCC ID	RAD204
Frequency range	WCDMA Band V: Tx:824~849MHz Rx:869~894MHz
Rated output power	24.0dBm
Modulation type	QPSK
Emission Designator	4M50F9W
Duplex mode	FDD
Duplex spacing	WCDMA Band V:45MHz
Antenna type	Integral
Power Supply	Battery or charger
Rated Power Supply Voltage	3.8V
Extreme Temperature	Lowest: -30°C Highest: +50°C
Extreme Voltage	Minimum: 3.5V Maximum: 4.2V
HW Version	PIO3
SW Version	sw160

1.7.2 EUT details

Product Name	Marketing Name	Product Model	IMEI
GSM/GPRS/EDGE/WCDMA Digital Mobile Phone with Bluetooth	one touch 905M	MINI3G M	01283500000187

1.7.3 Auxiliary equipment details

Equipment	Charger
Manufacturer	Ten Pao International Ltd.
Model Number	CBA3120AA0C2
Input Voltage	100V-240V a.c.
Output Voltage	5.0V d.c.
Frequency	50/60Hz

Equipment	Battery
Manufacturer	BYD LITHIUM BATTERY CO., LTD
Model Number	CAB3120000C1
Capacity	850mAh
Rated Voltage	3.7V d.c.

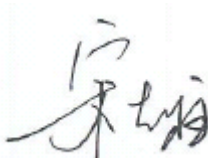
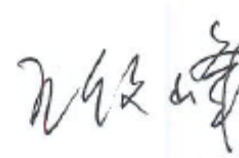

Equipment	Data Cable
Manufacturer	Shen Zhen Ju Wei Electronic Co.,LTD
Model Number	CDA3122001C1

Equipment	Data Cable
Manufacturer	Huizhou Shenghua Industry Co.,Ltd
Model Number	CDA3122001C2

2. Test information

2.1 Summary of the test results

No.	Test case	FCC reference	Verdict
1	RF Power Output	22.913(a)	Pass
2	Effective Radiated Power	22.913(a)	Pass
3	Occupied Bandwidth	2.1049(h)(i)	Pass
4	Emission Bandwidth	22.917(b)	Pass
5	Spurious Emissions at antenna terminals	2.1057/22.917	Pass
6	Band Edges Compliance	22.917(b)	Pass
7	Frequency Stability	2.1055	Pass
8	Radiated Spurious Emissions	2.1051/22.917	Pass

<p>This Test Report Is Issued by: Mr. Song Qizhu Director of the test lab</p> 	<p>Checked by: Mr. Wang Junfeng Deputy director of the test lab</p> 
<p>Tested by: Mr. Li Boyu Test engineer</p> 	<p>Issued date:</p> <p style="text-align: center;">2011.06.30</p>

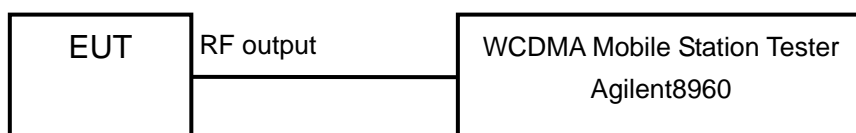
2.2 Test result

2.2.1 RF Power Output-FCC Part 22.913(a)

Ambient condition:

Temperature	Relative humidity	Pressure
21°C	44%	101.5kPa

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 No4132, No4183 and No4233 (Bottom, middle and top channels of WCDMA band V)

Limits	≤24dBm

Test result:

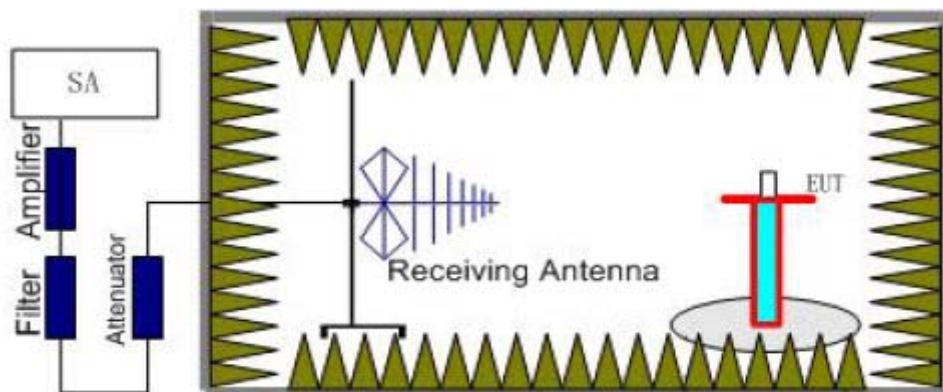
Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
826.4	4132	22.7
836.6	4183	22.5
846.6	4233	22.6

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

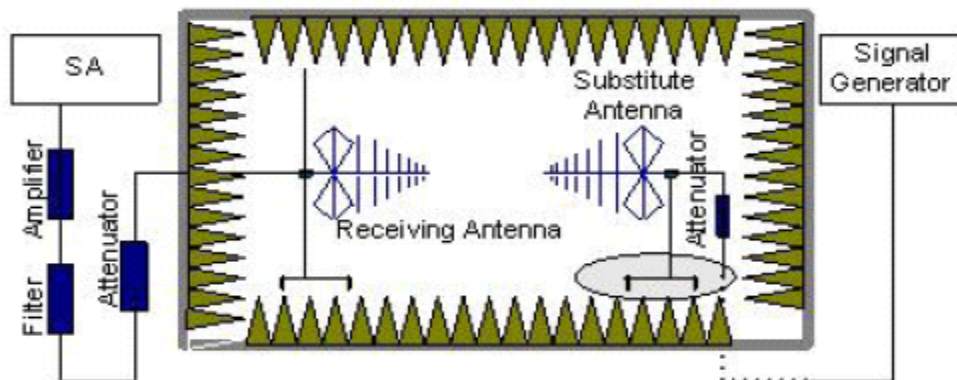
Ambient condition:

Temperature	Relative humidity	Pressure
21°C	44%	101.5kPa

Test setup:



Step 1



Step 2

Test procedure:

The measurements procedures in TIA-603C-2004 are used.

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 peak detector is used and

RBW is set to 3MHz. Then the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum power value on spectrum analyzer or receiver. And the maximum value of the receiver should be recorded as (Pr).

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.

A power (P_{mea}) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (P_{mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

A “reference path loss” should be calculated after test. The attenuation of “reference path loss” is the cable loss between the Signal Source with the Substitution Antenna (P_{ca}) and the Substitution Antenna Gain (G_a).

The measurement results are obtained as described below:

$$\text{Power (EIRP)} = P_{mea} + P_{ca} + G_a$$

This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP – 2.15 (dB).

The measurement will be done at three channels No4132, No4183 and No4233 (Bottom, middle and top channels of WCDMA band V)

Limits	≤ 38.5dBm
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Test result

Frequency (MHz)	Peak ERP (dBm)	P _{ca} Cable loss (dB)	G _a Antenna Gain (dB)	Correction (dB)	P _{mea} (dBm)	Polarization
826.4	21.9	-3.8	8.6	2.15	19.25	Vertical
836.6	22.1	-3.8	8.6	2.15	19.45	Vertical
846.6	22.4	-3.8	8.6	2.15	19.75	Vertical

Frequency: 846.6MHz

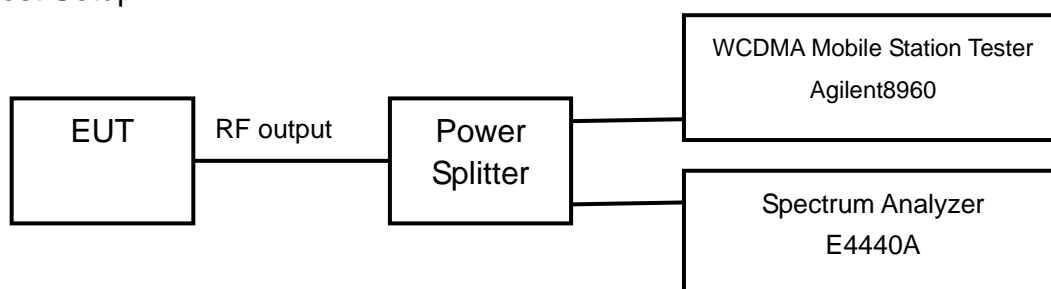
$$\text{Peak ERP (dBm)} = P_{mea} (19.75\text{dBm}) + P_{ca} (-3.8\text{dB}) + G_a (8.6\text{dB}) - 2.15\text{dB} = 22.4\text{dBm}$$

2.2.3 Occupied Bandwidth-FCC Part 2.1049(h)(i)

Ambient condition:

Temperature	Relative humidity	Pressure
21°C	44%	101.5kPa

Test Setup:



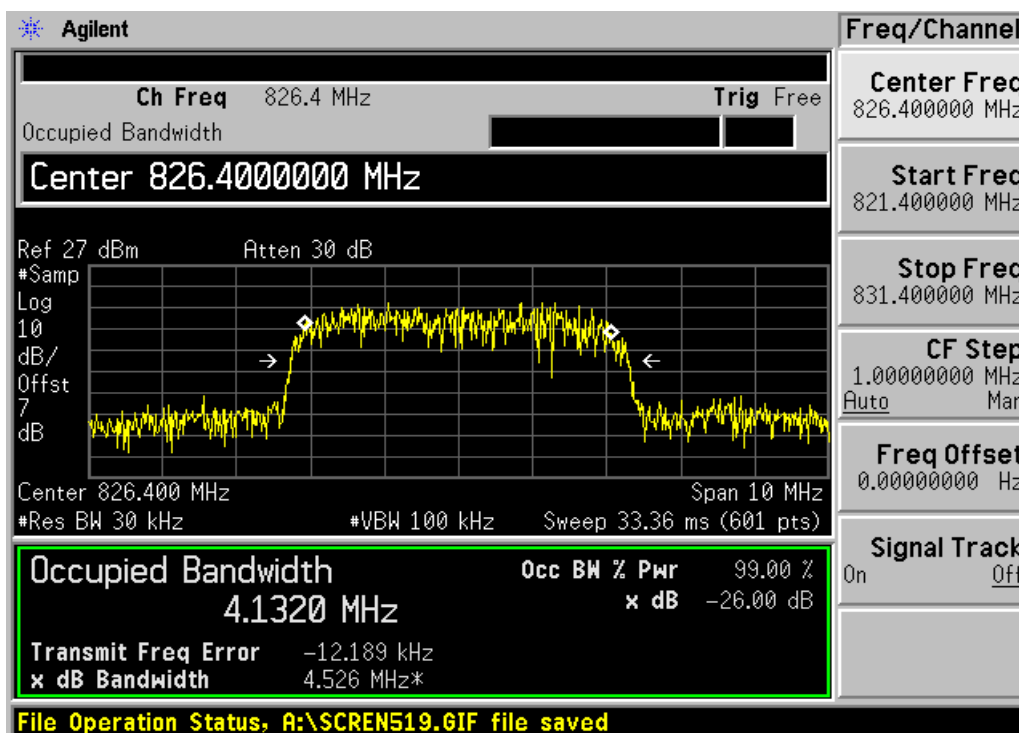
Test procedure:

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 No4132, No4183 and No4233 (Bottom, middle and top channels of WCDMA band V)

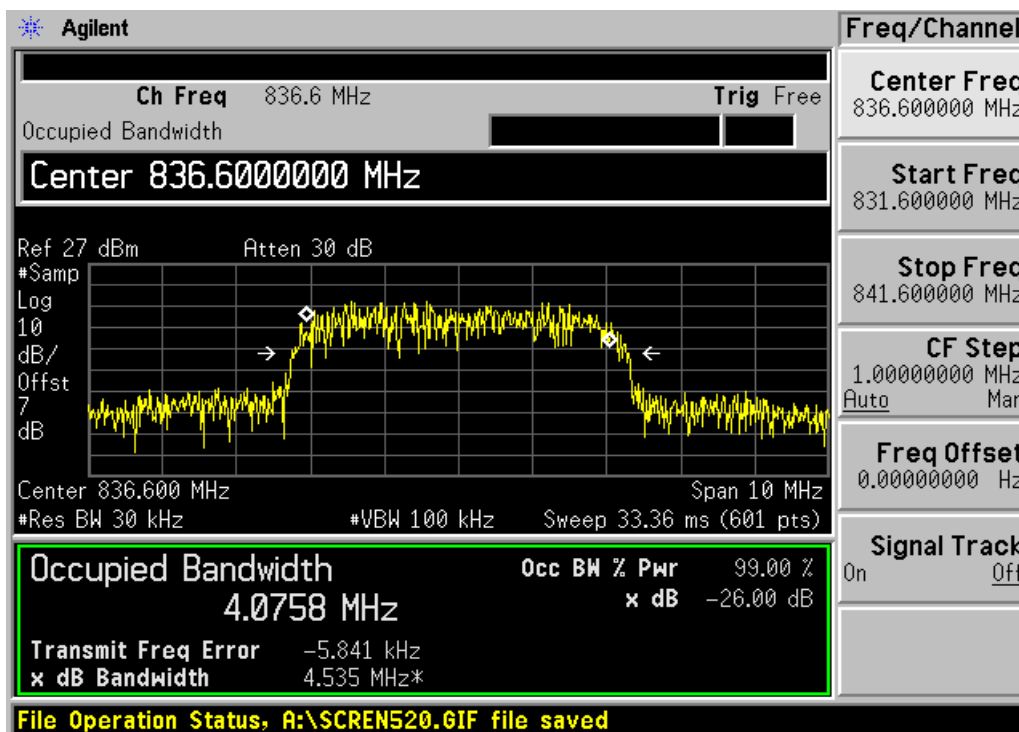
Limits: No specific occupied bandwidth requirements in part 2.1049

Test result:

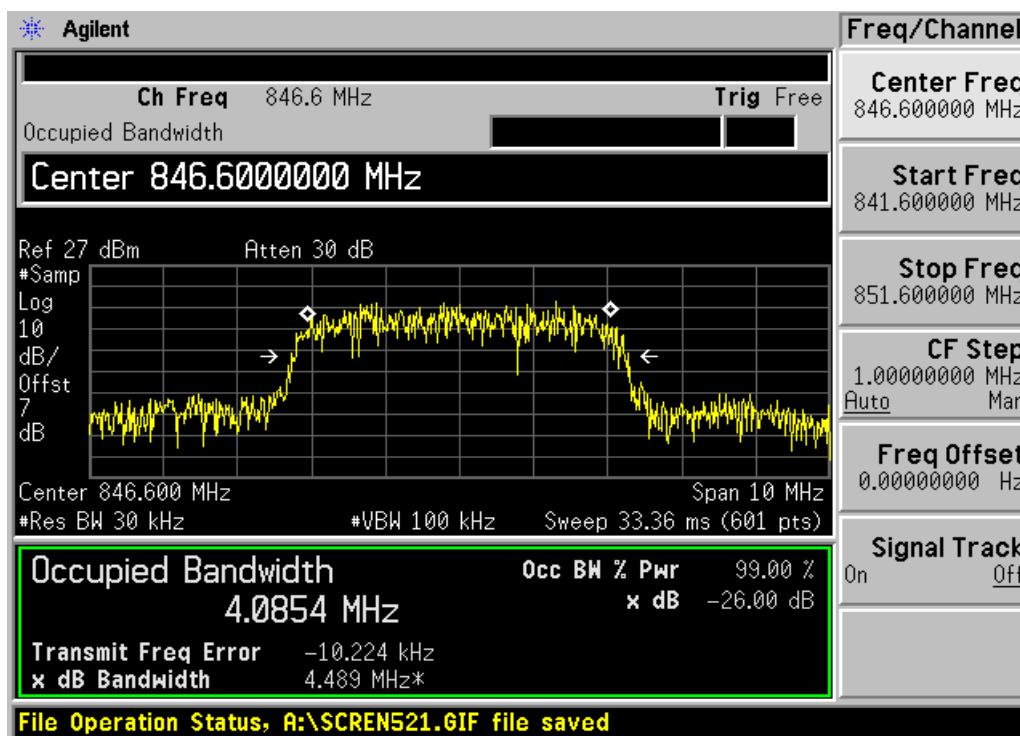
Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (MHz)
826.4	4132	4.1320
836.6	4183	4.0758
846.6	4233	4.0854



Channel 4132



Channel 4183



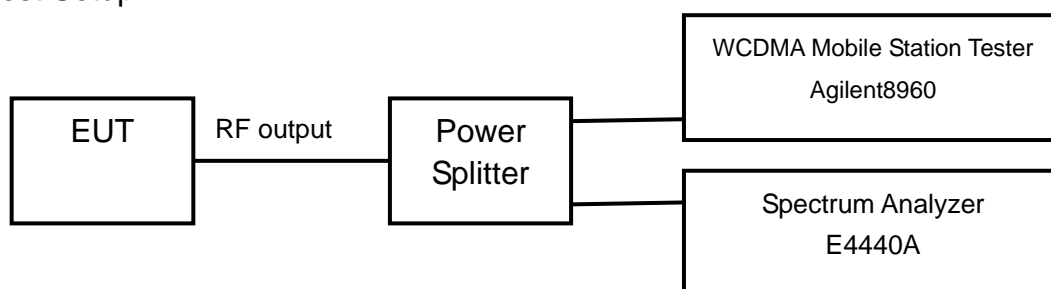
Channel 4233

2.2.4 Emission Bandwidth-FCC Part 22.917(b)

Ambient condition:

Temperature	Relative humidity	Pressure
21°C	44%	101.5kPa

Test Setup:



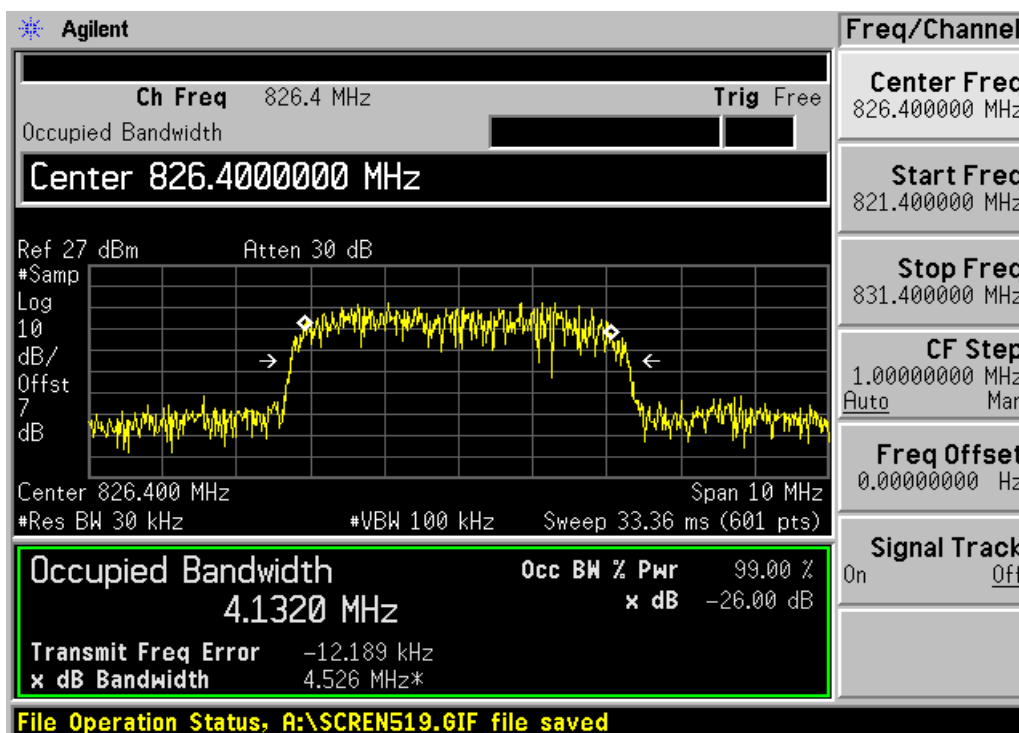
Test procedure:

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 -26dBc power can be read on spectrum analyzer. The measurement will be conducted at three channels No9262, No9400 and No9538 (Bottom, middle and top channels of WCDMA band V)

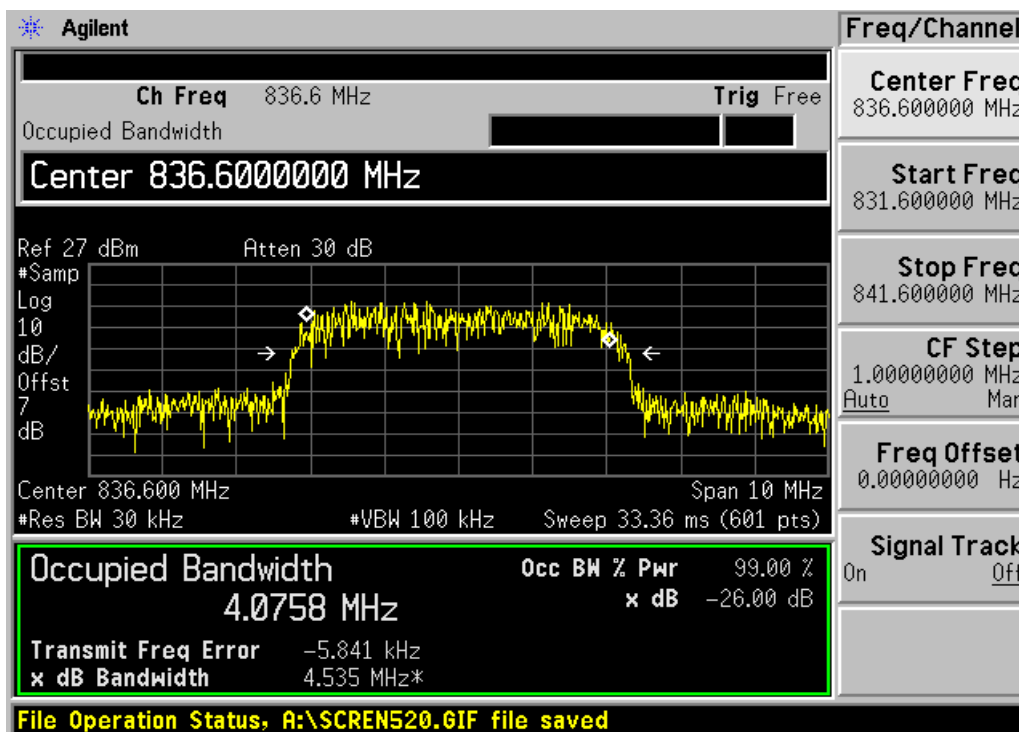
Limits: No specific occupied bandwidth requirements in part 22.917

Test result:

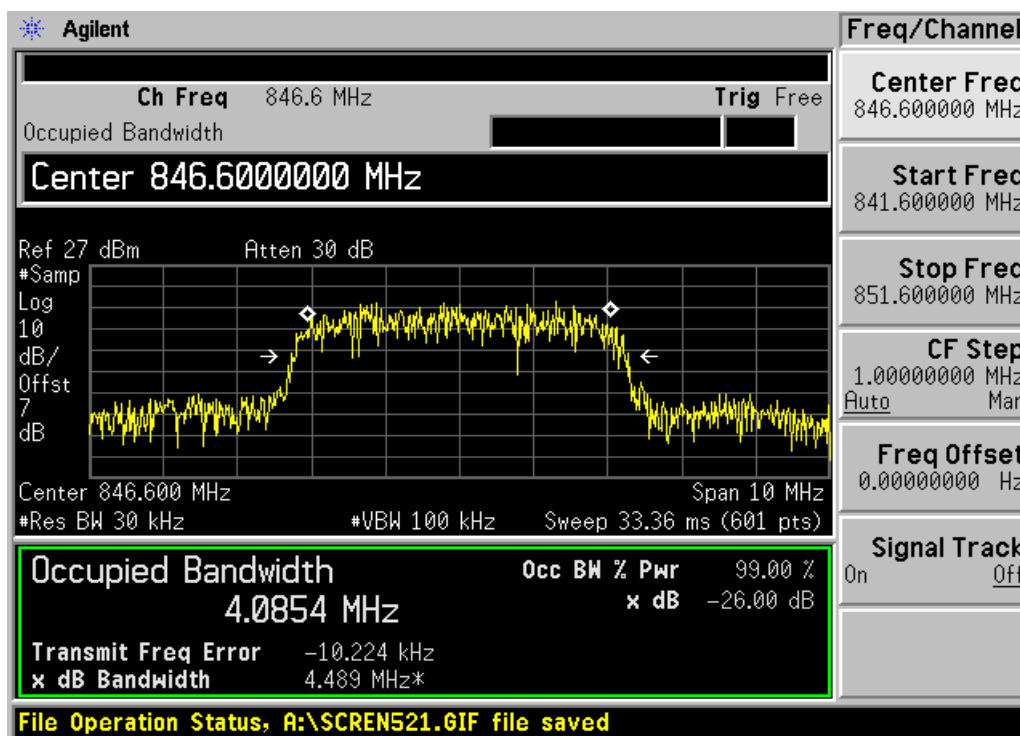
Carrier frequency (MHz)	Channel No.	Bandwidth of -26dBc Power (MHz)
826.4	4132	4.526
836.6	4183	4.535
846.6	4233	4.489



Channel 4132



Channel 4183



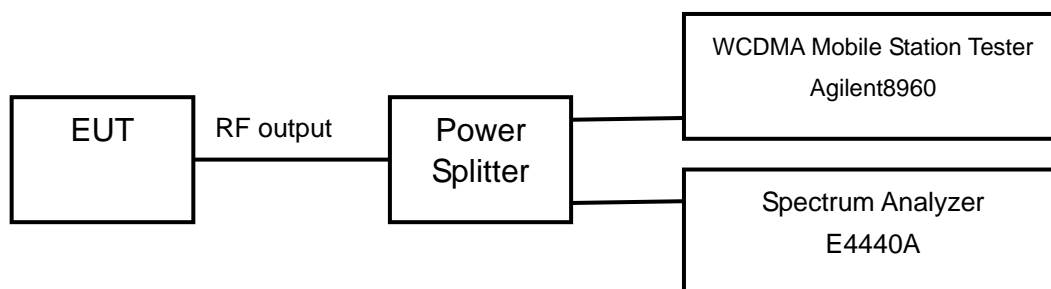
Channel 4233

2.2.5 Conducted Spurious Emissions-FCC Part 2.1057/Part 22.917

Ambient condition:

Temperature	Relative humidity	Pressure
21°C	44%	101.5kPa

Test Setup:



Test procedure:

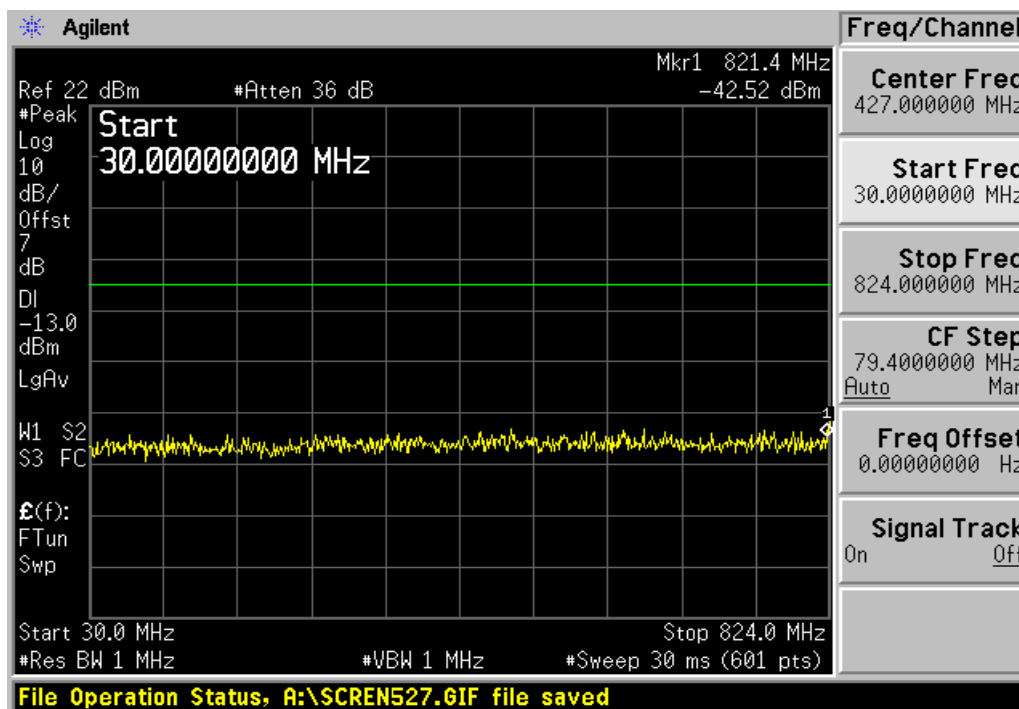
After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 30MHz to 9GHz (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 one channel No 4183 (middle channel of WCDMA band V)

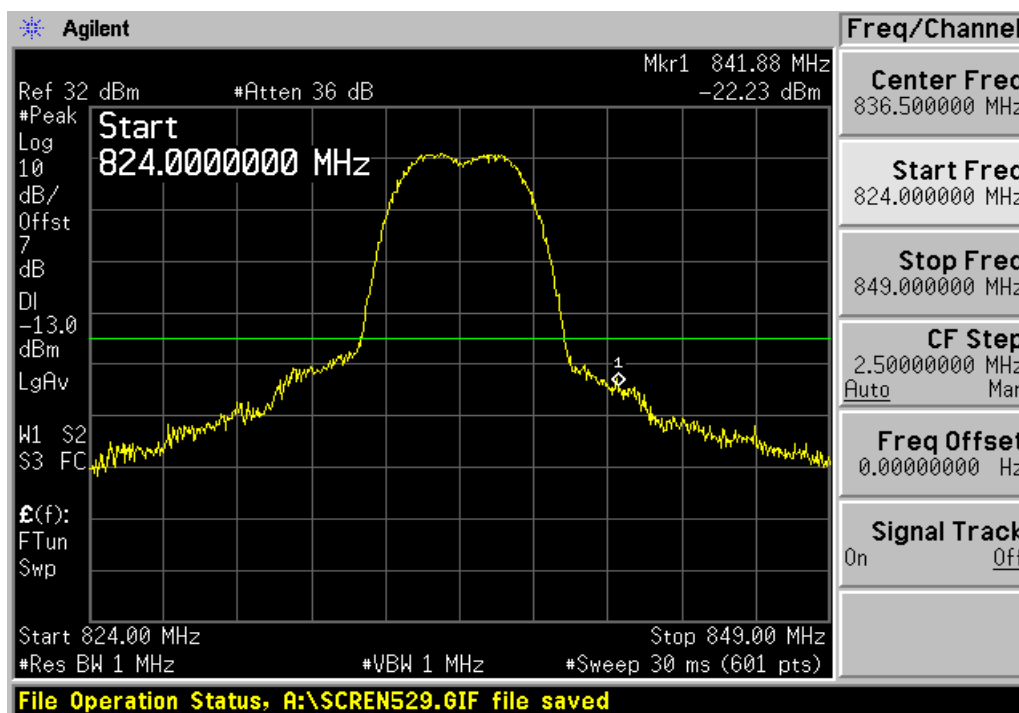
Limits	≤ -13dBm
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Test result:

Refer to the following figures.

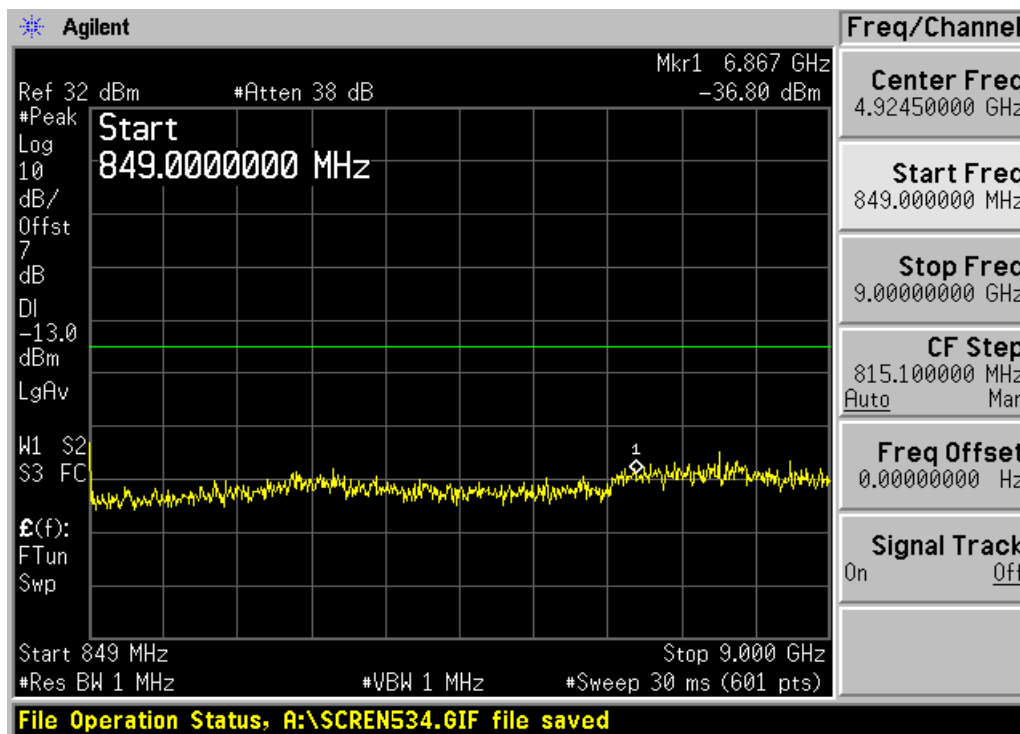


Channel 4183, 30MHz~824MHz



Channel 4183, 824MHz~849MHz

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



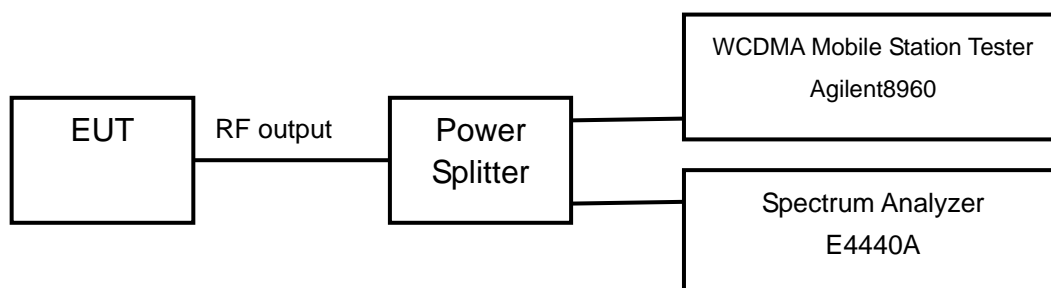
Channel 4183, 849MHz~9GHz

2.2.6 Band Edges Compliance-FCC Part 22.917(b)

Ambient condition:

Temperature	Relative humidity	Pressure
21°C	44%	101.5kPa

Test Setup:



Test procedure:

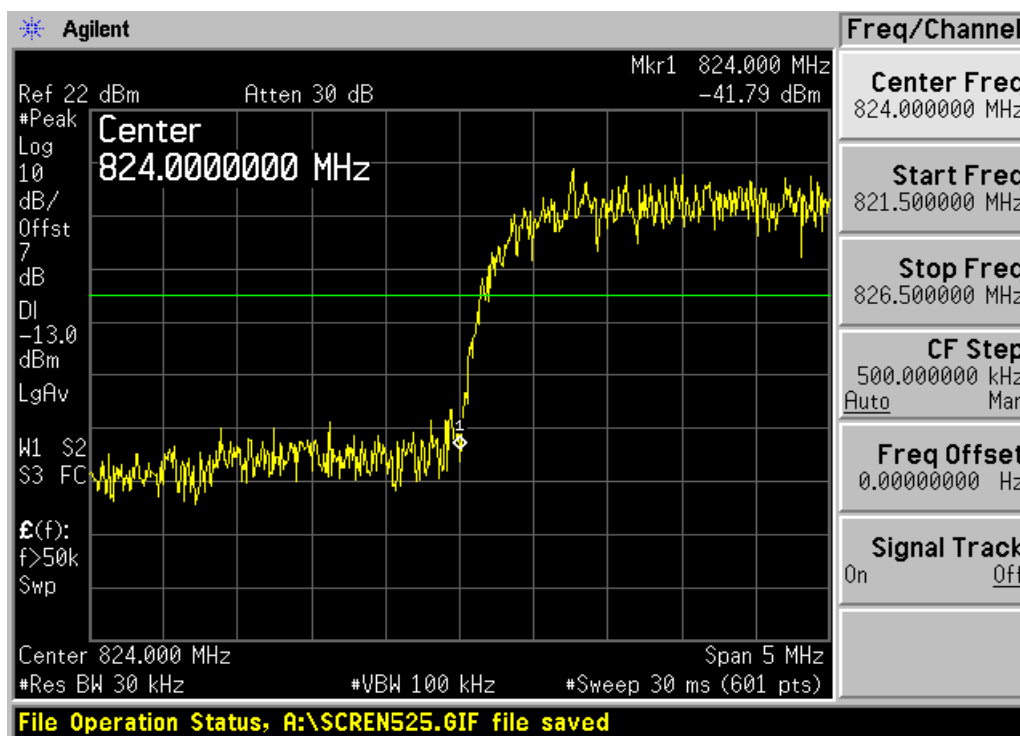
After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. The measurement is carried out using a spectrum analyzer. The peak detector is used and RBW is set to 30KHz on spectrum analyzer.

The measurement will be conducted at two channels No4132 and No4233 (Bottom and top channels of WCDMA band V)

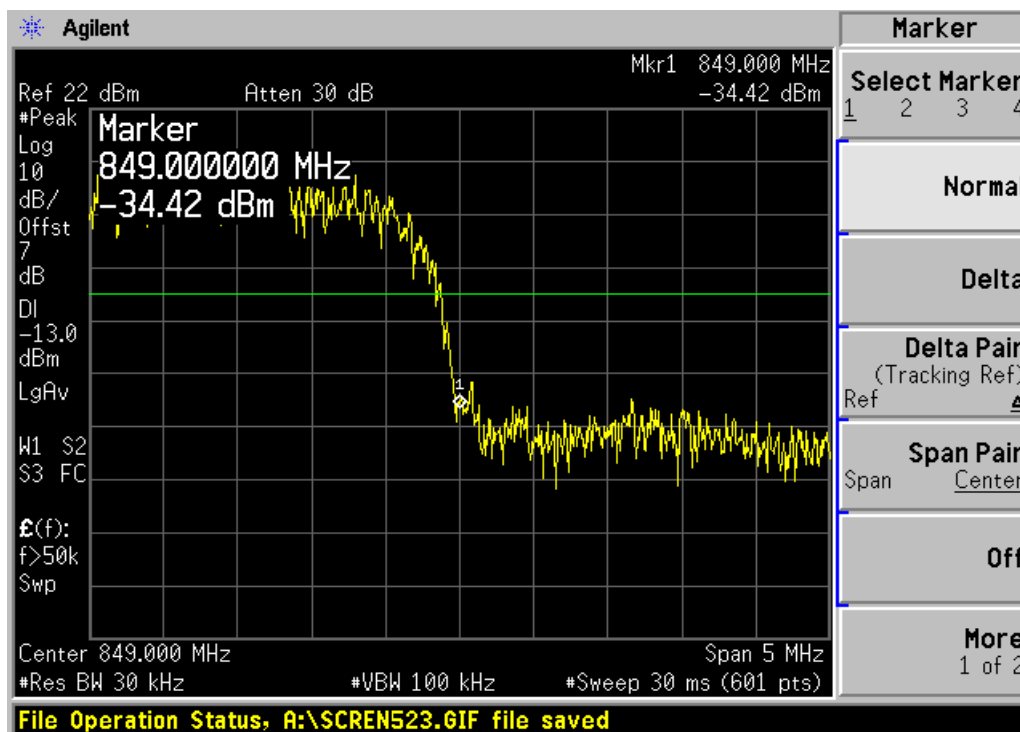
Limits	≤ -13dBm
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Test result:

Refer to the following figures.



Channel 4132



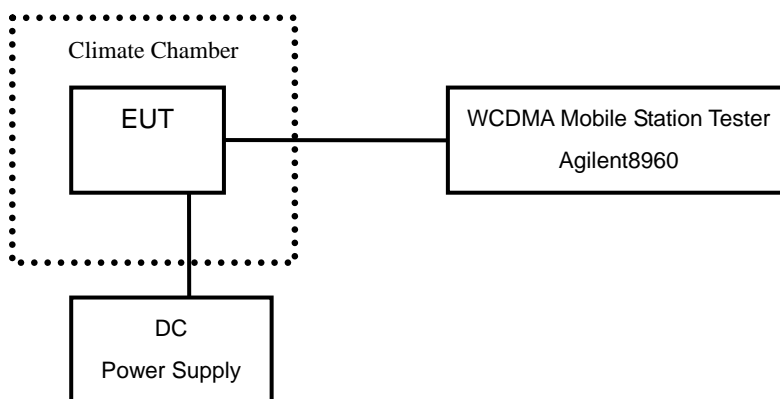
Channel 4233

2.2.7 Frequency Stability-FCC Part 2.1055

Ambient condition:

Temperature	Relative humidity	Pressure
21°C	44%	101.5kPa

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 No4132, No4183 and No4233 (Bottom, middle and top channels of WCDMA band V).

Limits: No specific frequency stability requirements in part 2.1055.

Test result:

Temperature(°C)	Test Result (ppm)@3.8V		
	Channel 4132	Channel 4183	Channel 4233
-30	0.000	0.001	0.002
-20	0.001	0.001	0.000
-10	0.001	0.000	0.002
0	0.004	0.002	0.002
+10	0.002	0.003	0.003
+20	0.001	0.005	0.000
+30	0.002	0.003	0.002
+40	0.005	0.003	0.001
+50	0.001	0.003	0.006

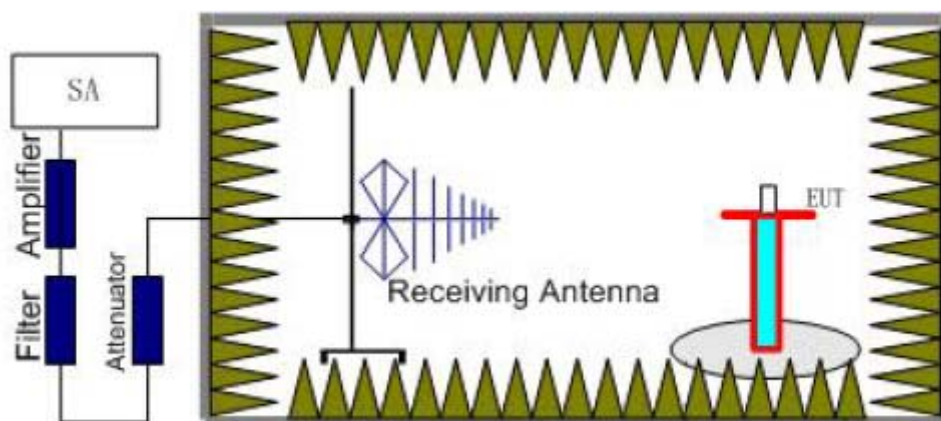
Voltage (V)	Test Result (ppm)@20°C		
	Channel 4132	Channel 4183	Channel 4233
3.5	0.001	0.001	0.002
4.2	0.003	0.003	0.001

2.2.8 Radiated Spurious Emissions-FCC Part 2.1053/Part 22.917

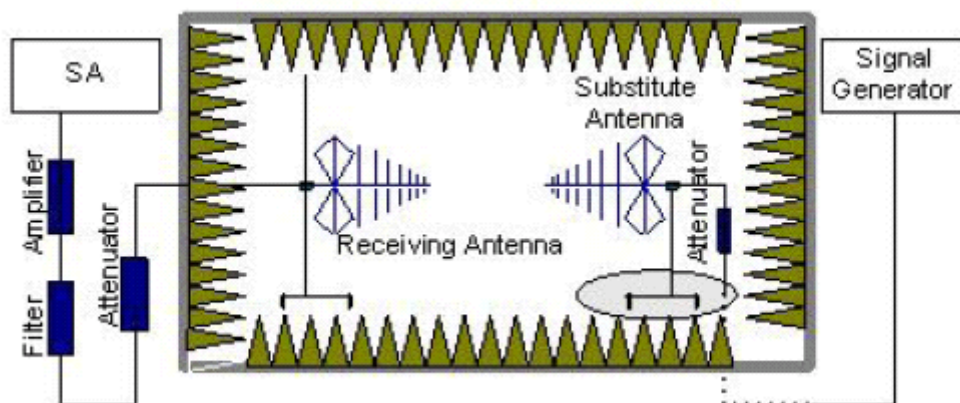
Ambient condition

Temperature	Relative humidity	Pressure
21°C	44%	101.5kPa

Test Setup:



Step 1



Step 2

Test procedure:

The measurements procedures in TIA-603C-2004 are used.

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

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. 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.

A power (P_{mea}) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

A “reference path loss” should be calculated after test. The attenuation of “reference path loss” is the cable loss between the Signal Source with the Substitution Antenna (P_{ca}) and the Substitution Antenna Gain (G_a).

Calculation procedure:

The data of cable loss and 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 and antenna gain. The basic equation with a sample calculation is as followed:

$$\text{Power(EIRP)} = P_{mea} + P_{ca} + G_a$$

This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15 \text{ (dB)}$.

Assumed the power of signal source record is -20dBm. A cable loss of -30dB, and an antenna gain of 11dB are added.

$$P=P_{\text{mea}}+P_{\text{ca}}+G_{\text{a}}=(-20\text{dBm})+(-30\text{dB})+(11\text{dB})=-39\text{dBm}$$

The measurement will be done at carrier frequencies that pertain to bottom (Channel 4132), middle (Channel 4183) and top (Channel 4233) channels of WCDMA band V.

Test result

Channel 4132:

Frequency (MHz)	Power (dBm)	Pca Cable loss (dB)	Ga Antenna Gain (dB)	Pmea (dBm)	Limited (dBm)	Polarization
1657.60	-21.8	-4.6	8.3	-25.5	-13	Vertical
1668.99	-22.3	-4.8	8.3	-25.8	-13	Horizontal
2587.18	-35.2	-5.7	8.6	-38.1	-13	Vertical
2809.06	-32.8	-6.3	9.1	-35.6	-13	Horizontal
11792.39	-45.2	-13.7	13.8	-45.3	-13	Vertical
17893.26	-39.8	-15.9	12.4	-36.3	-13	Vertical

Channel 4183:

Frequency (MHz)	Power (dBm)	Pca Cable loss (dB)	Ga Antenna Gain (dB)	Pmea (dBm)	Limited (dBm)	Polarization
1671.74	-21.69	-4.6	8.3	-25.39	-13	Vertical
1674.54	-22.09	-4.8	8.3	-25.59	-13	Vertical
2600.80	-35.65	-5.7	8.6	-38.55	-13	Vertical
2800.40	-32.92	-6.3	9.1	-35.72	-13	Horizontal
11807.61	-45.39	-13.7	13.8	-45.49	-13	Horizontal
17899.64	-40.08	-15.9	12.4	-36.58	-13	Vertical

Channel 4233:

Frequency (MHz)	Power (dBm)	Pca Cable loss (dB)	Ga Antenna Gain (dB)	Pmea (dBm)	Limited (dBm)	Polarization
1686.36	-21.7	-4.6	8.3	-25.4	-13	Vertical
1687.19	-22.6	-4.8	8.3	-26.1	-13	Horizontal
2601.66	-35.5	-5.7	8.6	-38.4	-13	Vertical
2792.39	-33.3	-6.3	9.1	-36.1	-13	Vertical
11824.93	-45.2	-13.7	13.8	-45.3	-13	Vertical
17907.04	-39.9	-15.9	12.4	-36.4	-13	Vertical

2.3. List of test equipments

No.	Name/Model	Manufacturer	S/N	Calibration Due Date
1	E5515C(8960) Mobile Station Tester	Agilent	GB44050904	19 th Aug. 2011
2	PSA E4440A Spectrum Analyzer	Agilent	MY41000183	19 th Aug. 2011
3	66309B DC Power Supply	Agilent	MY43000461	19 th Aug. 2011
4	1506A Power Splitter	Weinschel	MN154	19 th Aug. 2011
5	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	19 th Aug. 2011
6	ESI 40 EMI test receiver	R&S	100015	19 th Aug. 2011
7	SMR 20 Signal generator	R&S	100086	19 th Aug. 2011
8	CMU 200 Radio tester	R&S	100313	19 th Aug. 2011
9	12.65m*8.03m*7.50m Fully-Anechoic Chamber	FRANKONIA	-----	19 th Aug. 2011
10	HL562 Ultra log test antenna	R&S	100016	19 th Aug. 2011
11	23.18m×16.88m×9.60m Semi-Anechoic Chamber	FRANKONIA	-----	19 th Aug. 2011
12	HF 906 Double-Ridged Waveguide Horn Antenna	R&S	100030	19 th Aug. 2011
13	HF 906 Double-Ridged Waveguide Horn Antenna	R&S	100029	19 th Aug. 2011
14	PS2000 Turn Table	FRANKONIA	-----	19 th Aug. 2011
15	MA260 Antenna Master	FRANKONIA	-----	19 th Aug. 2011
16	SH-241 Climatic Chamber	ESPEC	92000389	19 th Aug. 2011
17	ES-K1 EMI test software	R&S	-----	19 th Aug. 2011
18	HL562 Receive antenna	R&S	100167	19 th Aug. 2011

Appendix

Appendix1 Test Setup