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# TEST REPORT

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Report No.: SRTC2012-H024-E0044

Product Name: GSM/GPRS Digital Mobile Phone

Product Model: ZTE-G S518G

Applicant: ZTE Corporation

Manufacturer: ZTE Corporation

Specification: FCC Part 24E, Part 22H, Part 2

(October 1, 2009 edition)

FCC ID: Q78-GS518G

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: 27<sup>th</sup> July 2012

Date of test: 30<sup>th</sup> July 2012 to 5<sup>th</sup> September 2012

## 1.6 Reference specification

FCC Part 24E, Part22H, Part 2 (October 1, 2009 edition)

## 1.7 Information of EUT

### 1.7.1 General information

Name of EUT	GSM/GPRS Digital Mobile Phone
FCC ID	Q78-GS518G
Frequency range	GSM850: Tx:824~849MHz Rx:869~894MHz PCS1900: Tx:1850~1910MHz Rx:1930~1990MHz
Rated output power	GSM850:33.0dBm PCS1900:30.0dBm
Modulation type	GMSK
Emission Designator	300KGXW
Duplex mode	FDD
Duplex spacing	GSM850:45MHz PCS1900:80MHz
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	GMAVb
SW Version	ZTE-EN-8S-P120A70V1.0.0

### 1.7.2 EUT details

Name	Model	IMEI
GSM/GPRS Digital Mobile Phone	ZTE-G S518G	867771010000071

### 1.7.3 Auxiliary equipment details

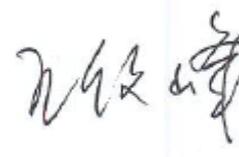
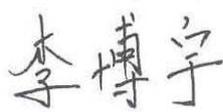
Equipment	Charger
Manufacturer	RUIDE
Model Number	STC-A22O50I400M5-C
Input Voltage	100V-240V a.c.
Output Voltage	5.0V d.c.
Frequency	50/60Hz

Equipment	Battery
Manufacturer	ZTE CORPORATION
Model Number	Li3707T42P3h463548
Capacity	720mAh
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 and Effective Isotropic Radiated Power	22.913(a)/24.232(c)	Pass
3	Occupied Bandwidth	2.1049	Pass
4	Emission Bandwidth	22.917(b)/24.238(b)	Pass
5	Spurious Emissions at antenna terminals	2.1051/22.917(a)/24.238(a)	Pass
6	Band Edges Compliance	2.1051/22.917(a)/24.238(a)	Pass
7	Frequency Stability	2.1055/22.355/24.235	Pass
8	Radiated Spurious Emissions	2.1053/22.917(a)/24.238(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:  <b>2012.09.11</b>

## 2.2 Test result

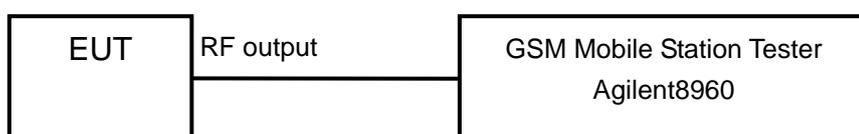
### 2.2.1 GSM850

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

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	42%	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 No128, No189 and No251 (Bottom, middle and top channels of GSM850 band)

Limits	$\leq 33\text{dBm}$
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Test result:

GSM MODE:

Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
824.2	128	32.2
836.4	189	32.1
848.8	251	32.2

GPRS MODE:

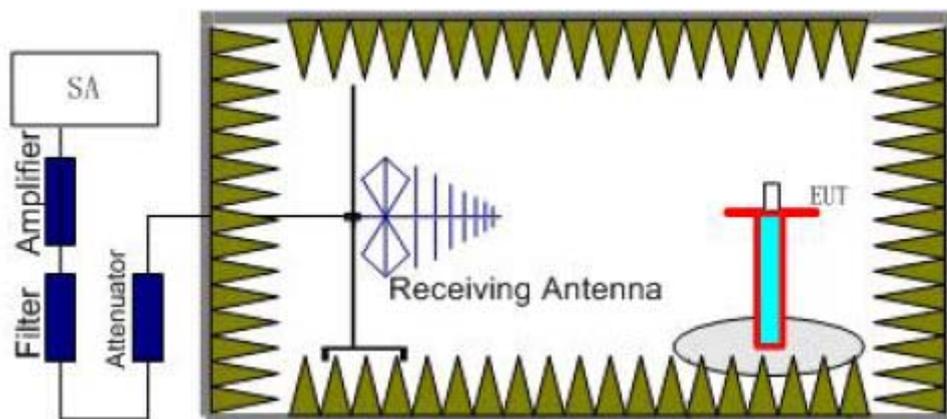
Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
824.2	128	29.0
836.4	189	28.9
848.8	251	28.9

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

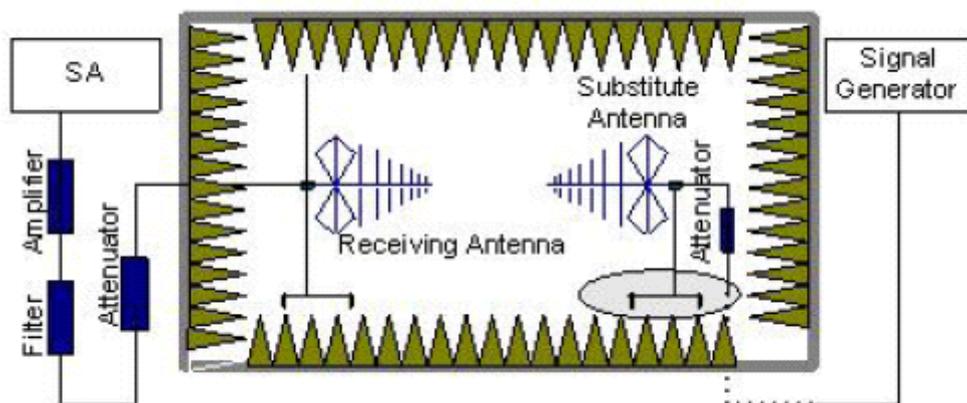
Ambient condition:

Temperature	Relative humidity	Pressure
26°C	43%	101.3kPa

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 No128, No189 and No251 (Bottom, middle and top channels of GSM850 band)

Limits	$\leq 38.5\text{dBm}$
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**Test result:**

**GSM MODE:**

Carrier frequency (MHz)	Channel No.	E.R.P. (dBm)
824.2	128	30.3
836.4	189	30.2
848.8	251	30.4

**GPRS MODE:**

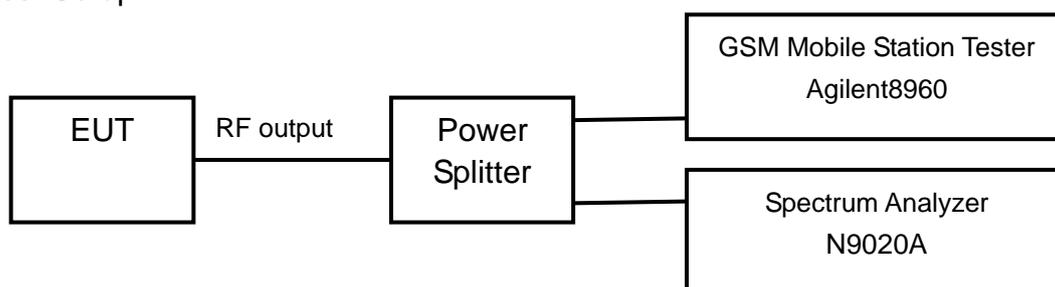
Carrier frequency (MHz)	Channel No.	E.R.P. (dBm)
824.2	128	26.8
836.4	189	26.7
848.8	251	26.7

### 2.2.1.3 Occupied Bandwidth-FCC Part2.1049

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	42%	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 No128, No189 and No251 (Bottom, middle and top channels of GSM850 band)

Limits: No specific occupied bandwidth requirements in part 2.1049

Test result:

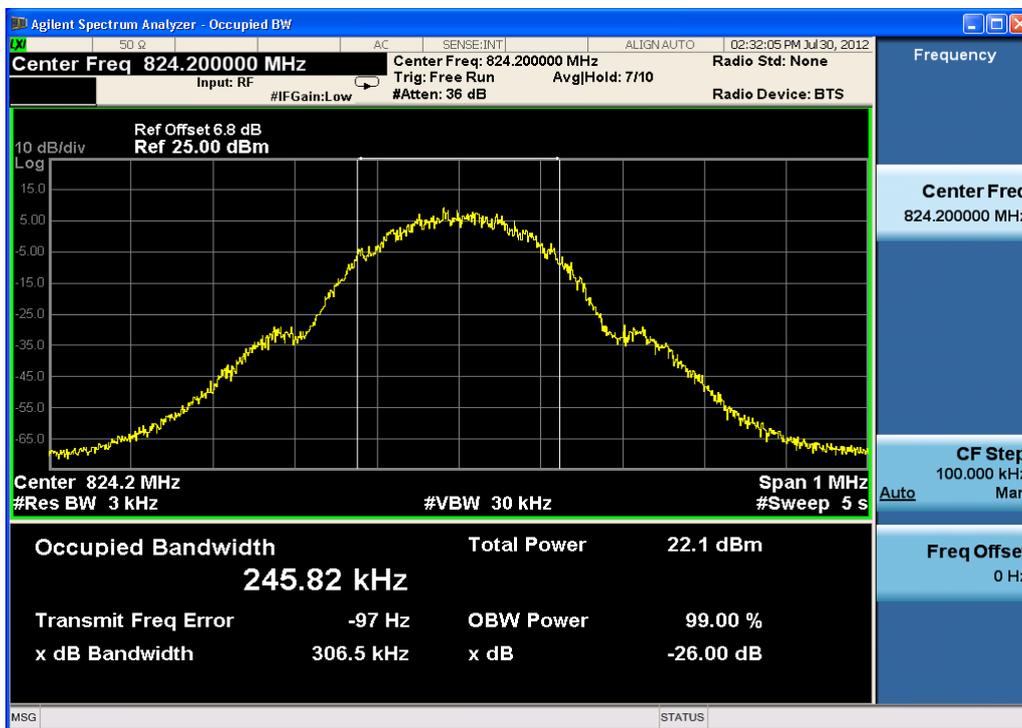
GSM MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
824.2	128	245.82
836.4	189	245.94
848.8	251	245.87

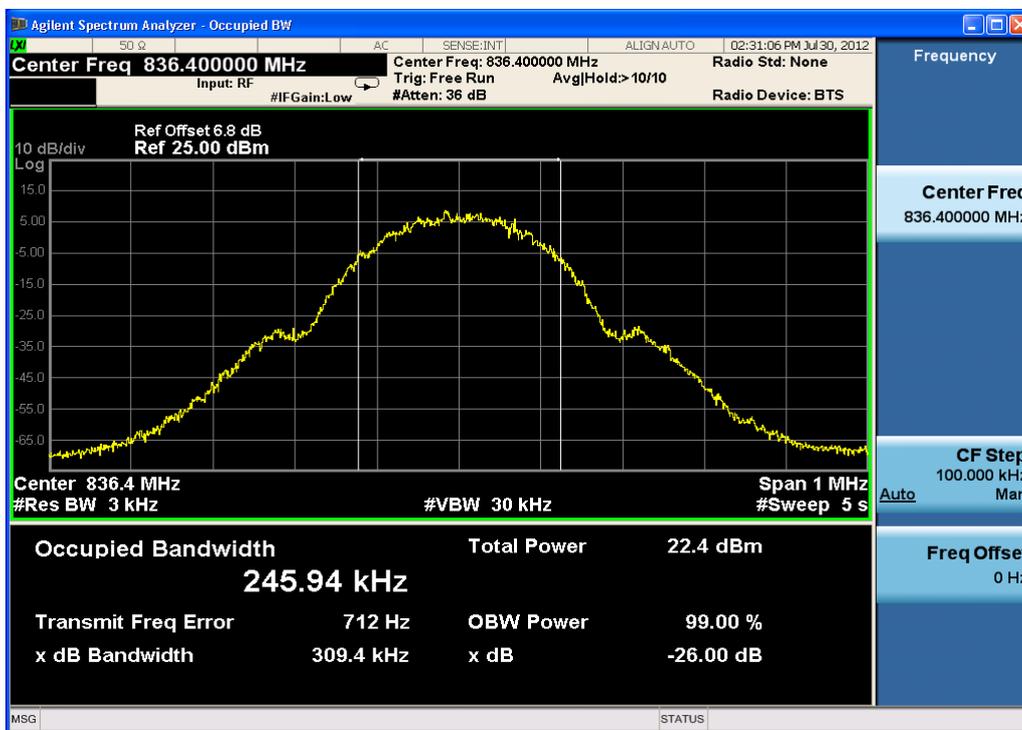
GPRS MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
824.2	128	244.32
836.4	189	243.19
848.8	251	244.24

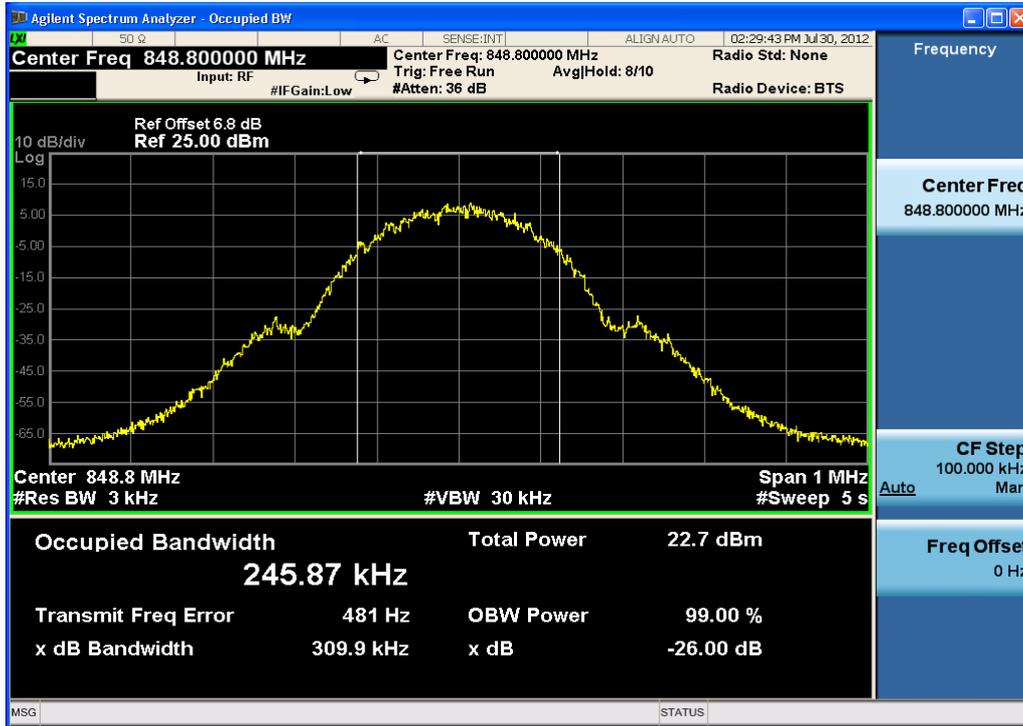
GSM MODE:



Channel 128

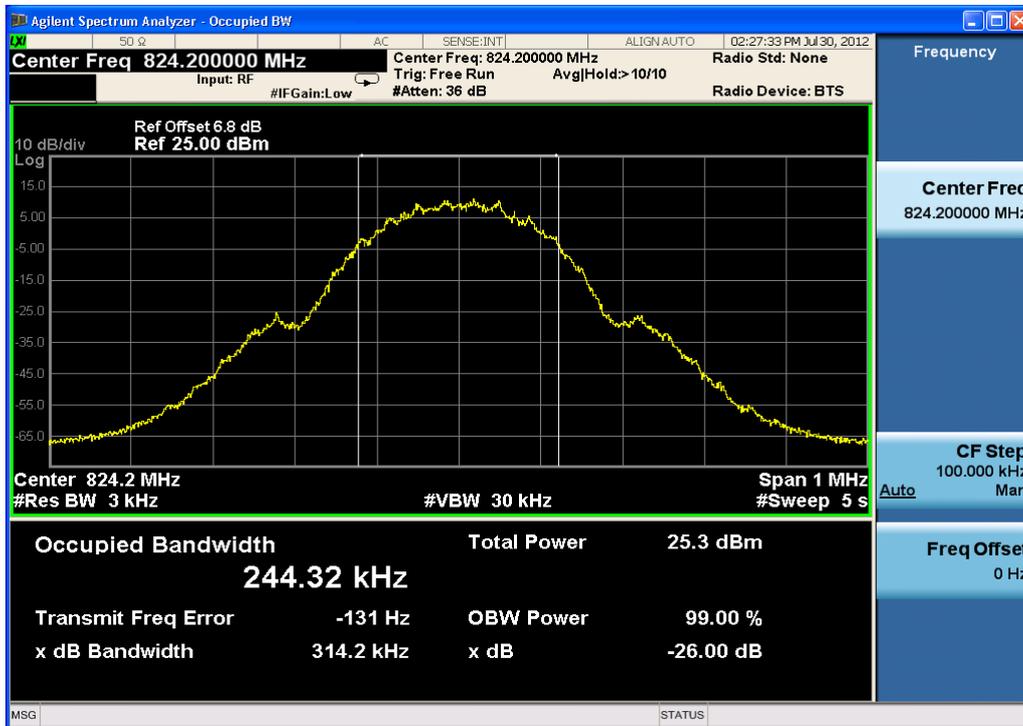


Channel 189

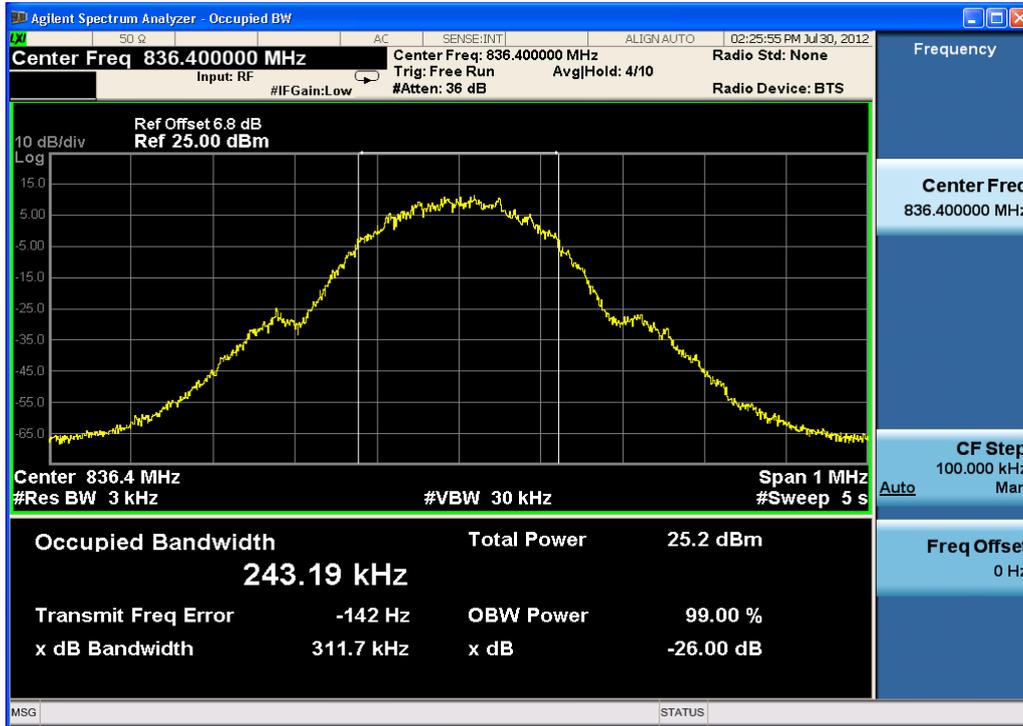


Channel 251

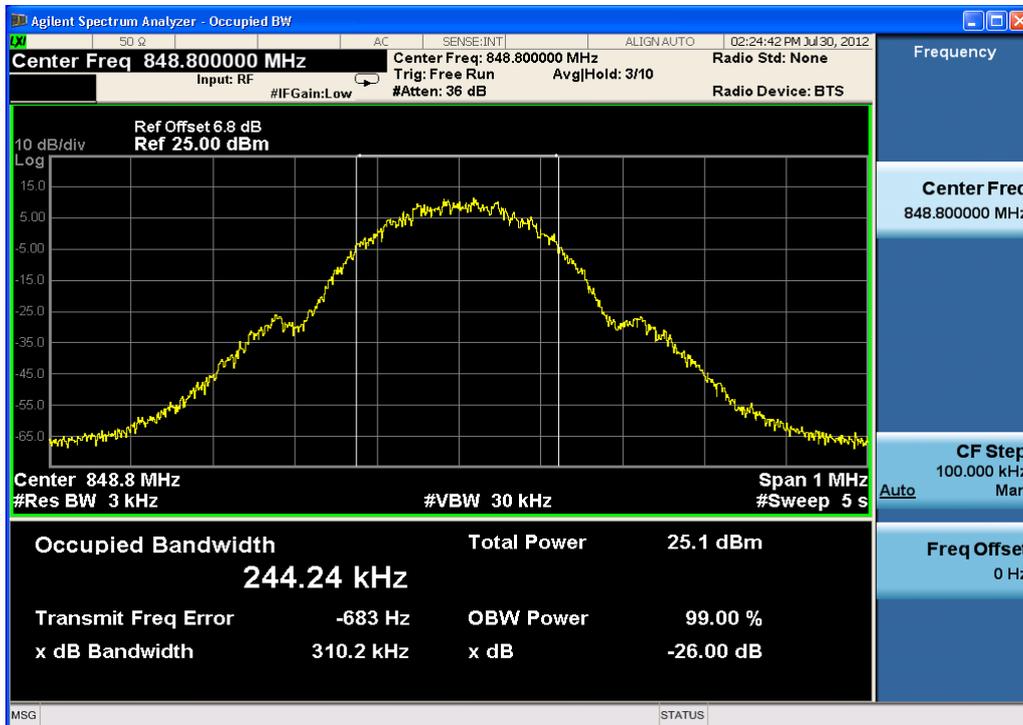
GPRS MODE:



Channel 128



Channel 189



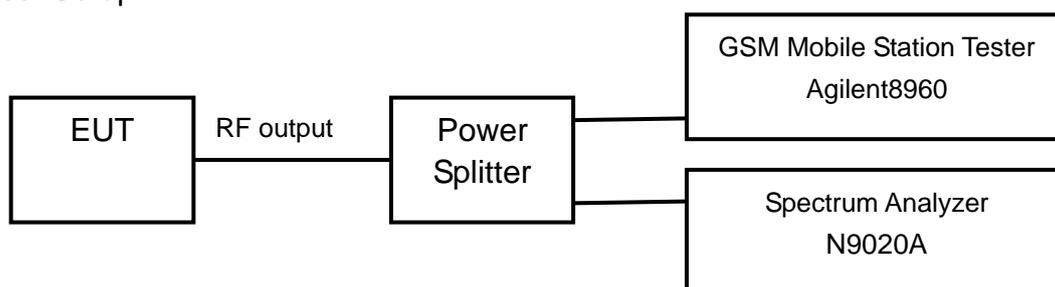
Channel 251

## 2.2.1.4 Emission Bandwidth-FCC Part22.917(b)

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	42%	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 3kHz on spectrum analyzer. The bandwidth of -26dB transmitter power can be read on spectrum analyzer. The measurement will be conducted at three channels No128, No189 and No251 (Bottom, middle and top channels of GSM850 band)

Limits: No specific emission bandwidth requirements in part 22.917(b)

Test result:

GSM MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dB transmitter power (kHz)
824.2	128	306.5
836.4	189	309.4
848.8	251	309.9

GPRS MODE:

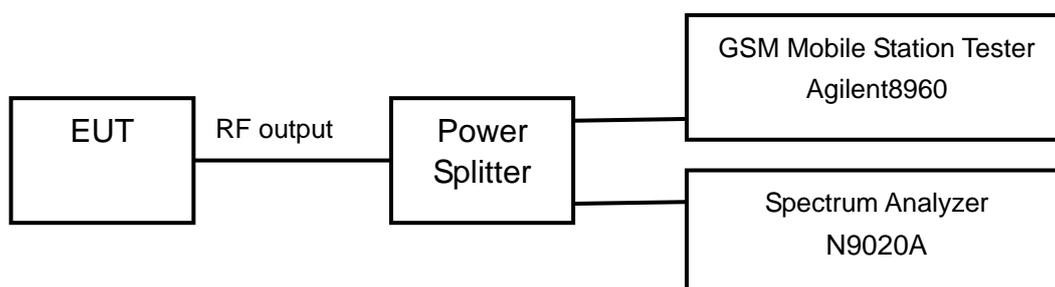
Carrier frequency (MHz)	Channel No.	Bandwidth of -26dB transmitter power (kHz)
824.2	128	314.2
836.4	189	311.7
848.8	251	310.2

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

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	42%	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.

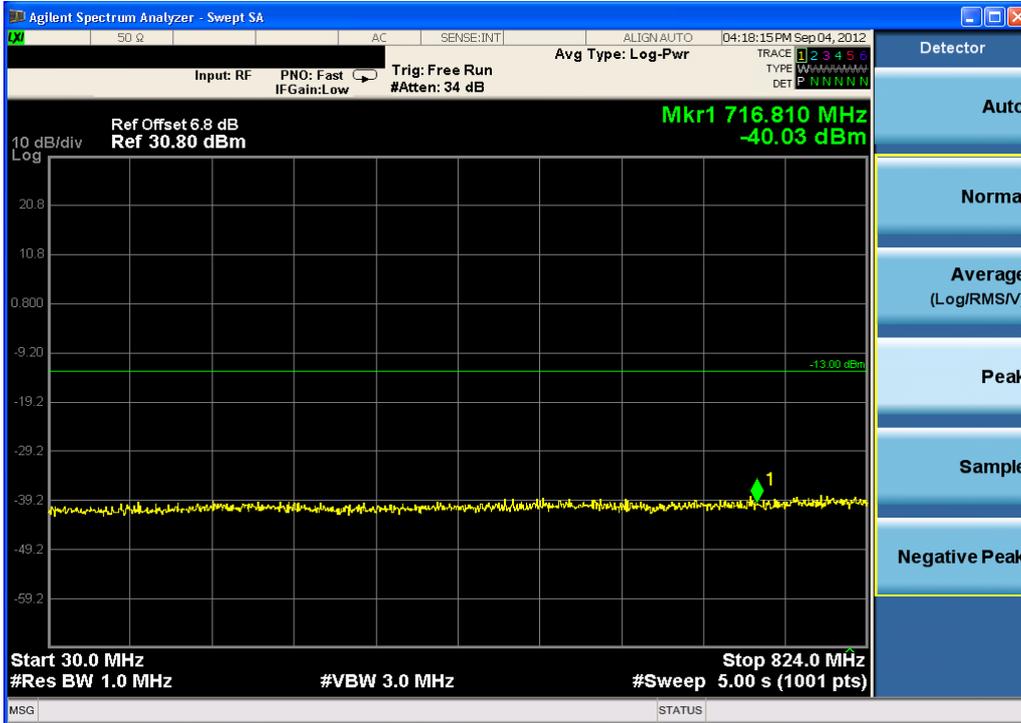
The measurement will be conducted at one channel No189 (middle channel of GSM850 band)

Limits	≤ -13dBm
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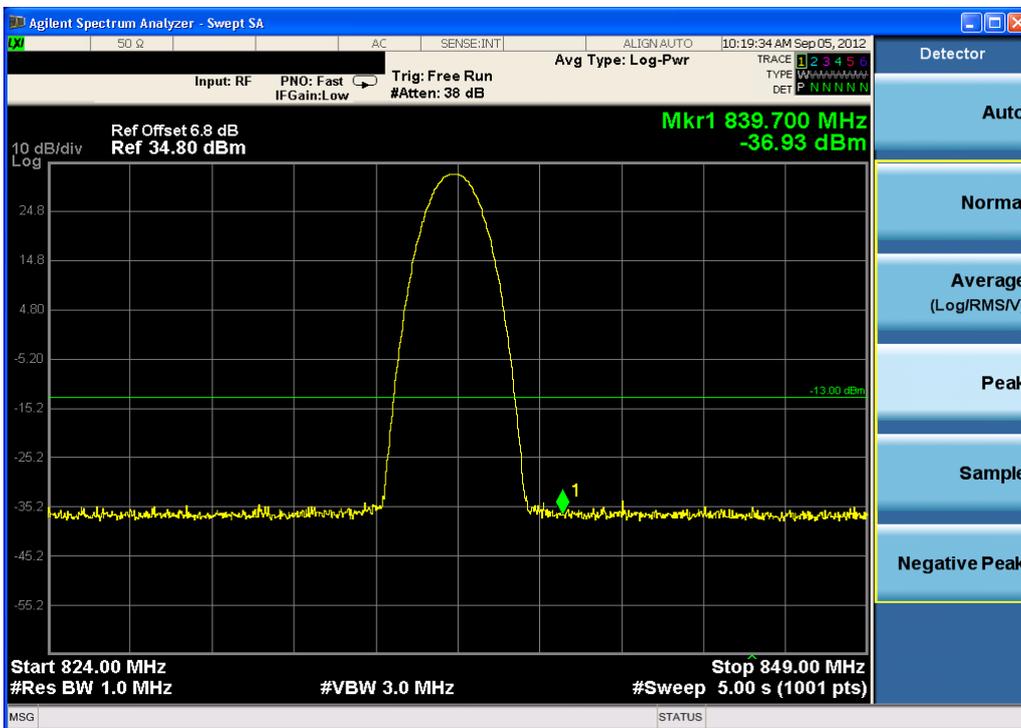
Test result:

Refer to the following figures.

GSM MODE:

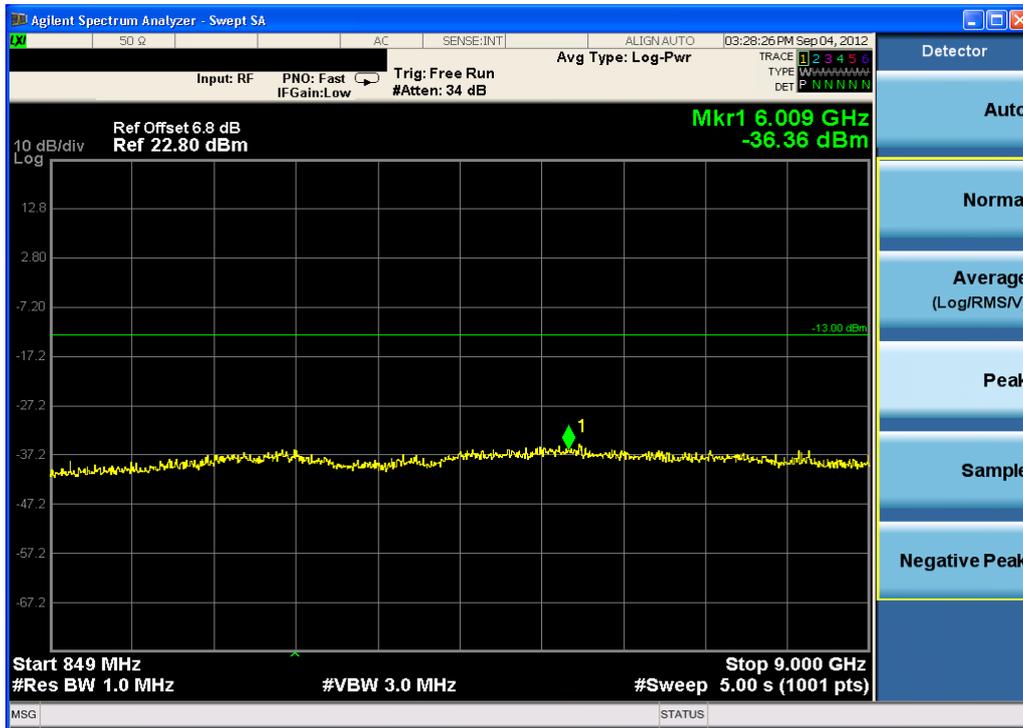


Channel 189, 30MHz~824MHz



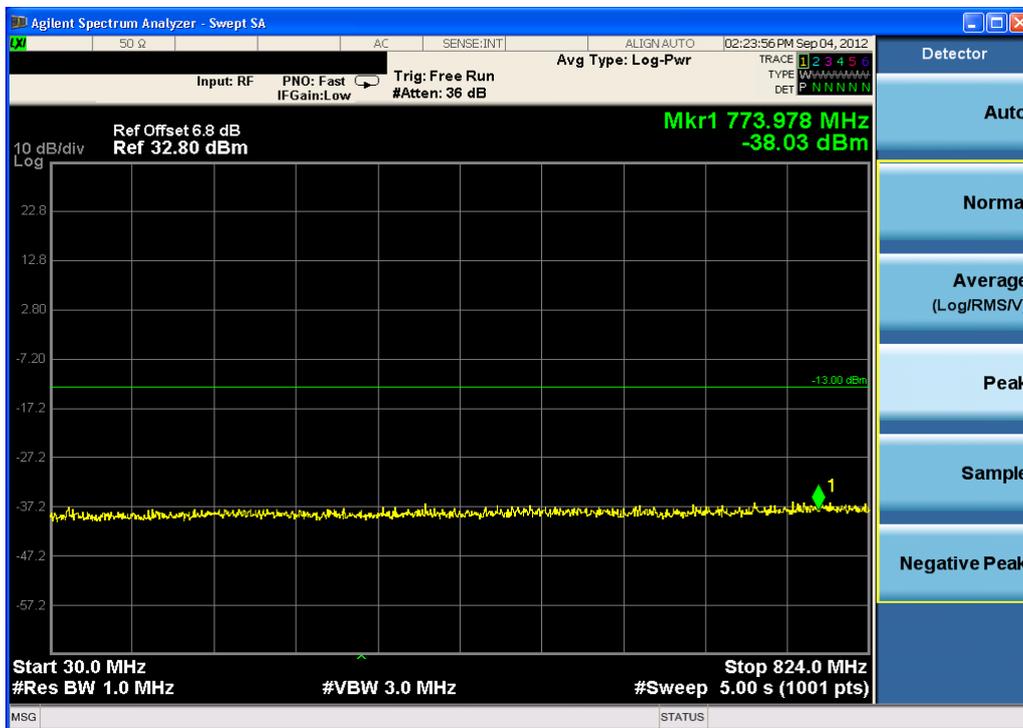
Channel 189, 824MHz~849MHz

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

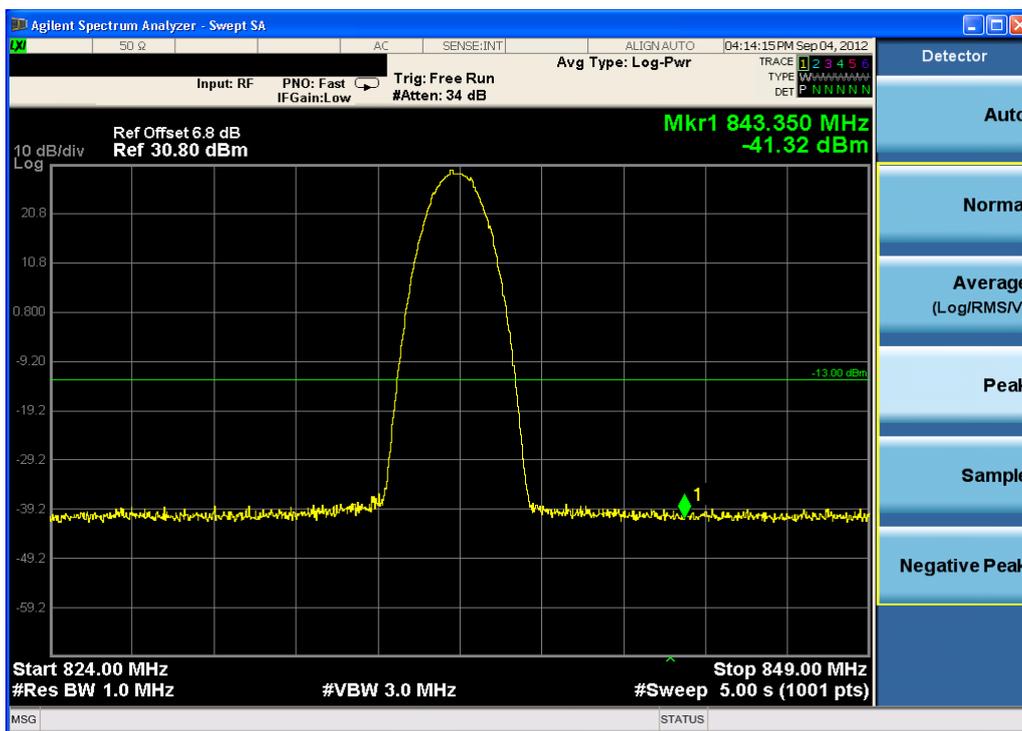


Channel 189, 849MHz~9GHz

GPRS MODE:

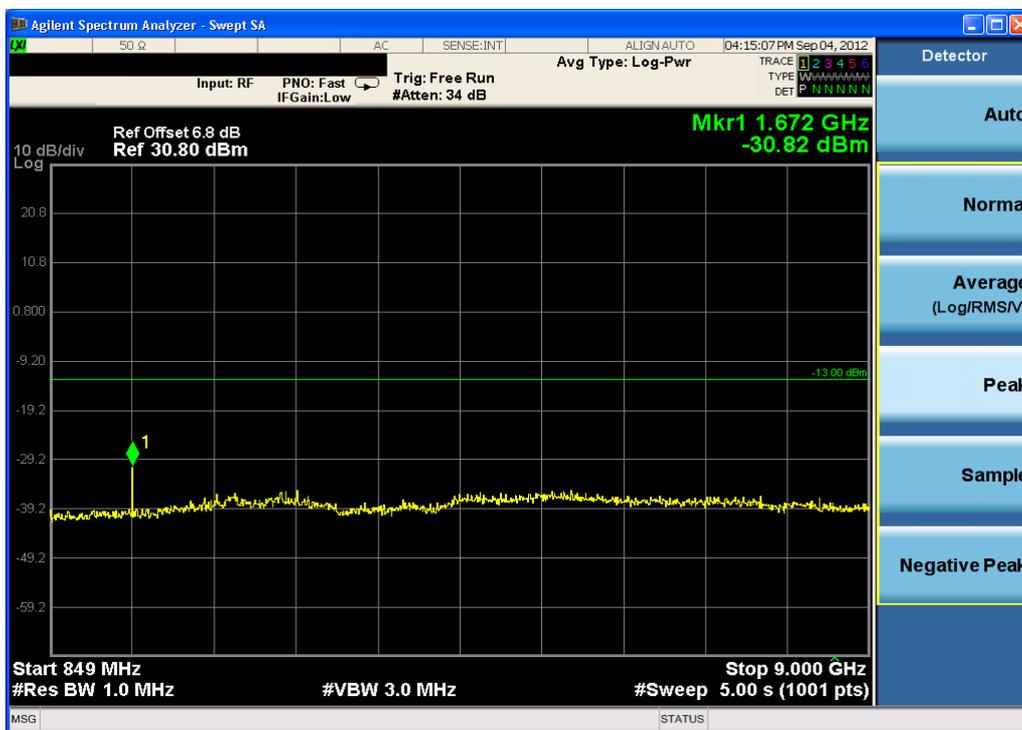


Channel 189, 30MHz~824MHz



Channel 189, 824MHz~849MHz

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



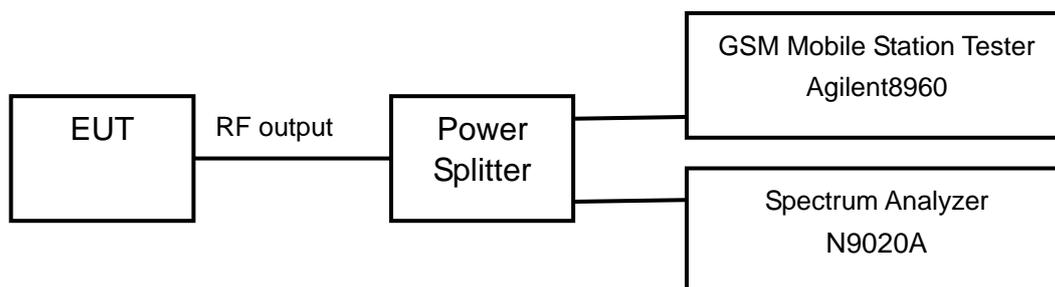
Channel 189, 849MHz~9GHz

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

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	42%	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.

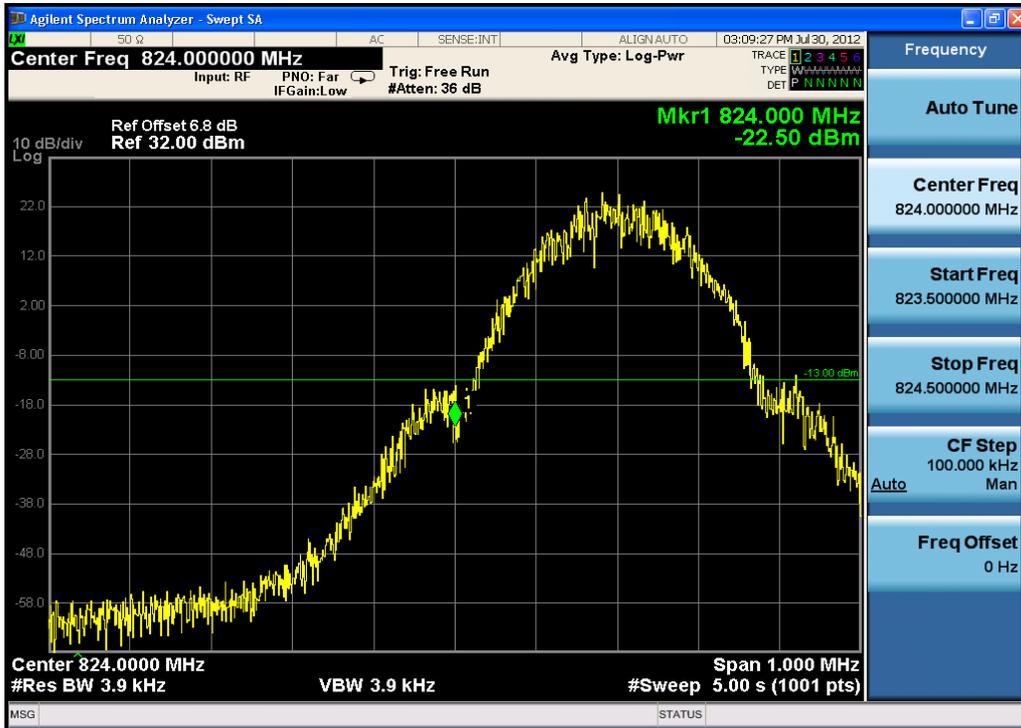
The measurement will be conducted at two channels No128 and No251 (Bottom and top channels of GSM850 band)

Limits	$\leq -13\text{dBm}$
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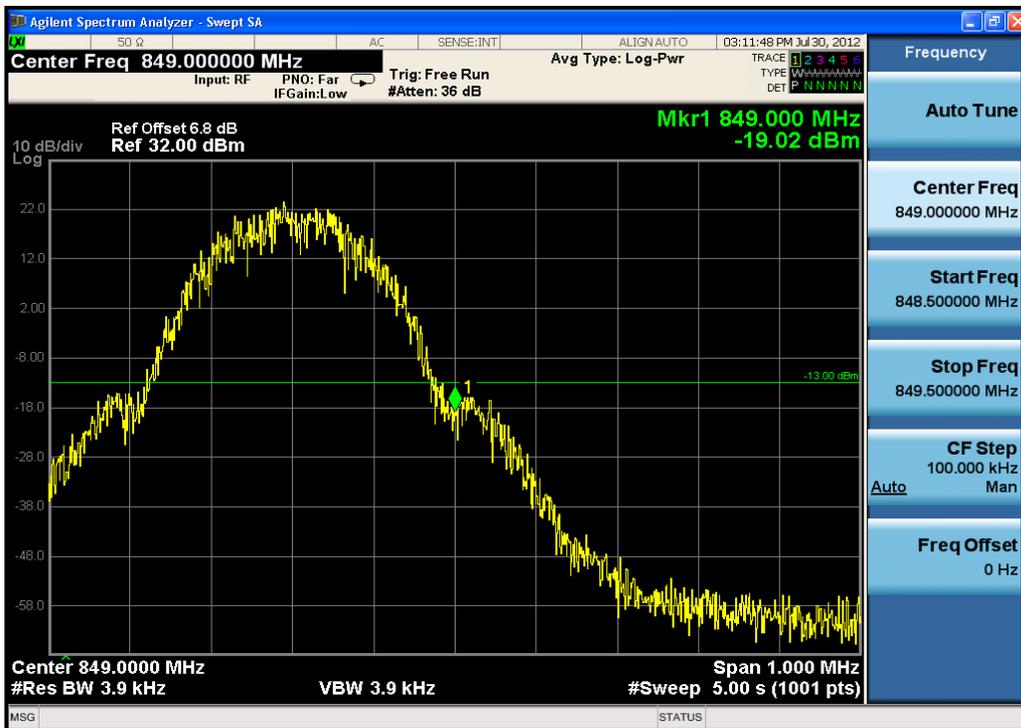
Test result:

Refer to the following figures.

GSM MODE:

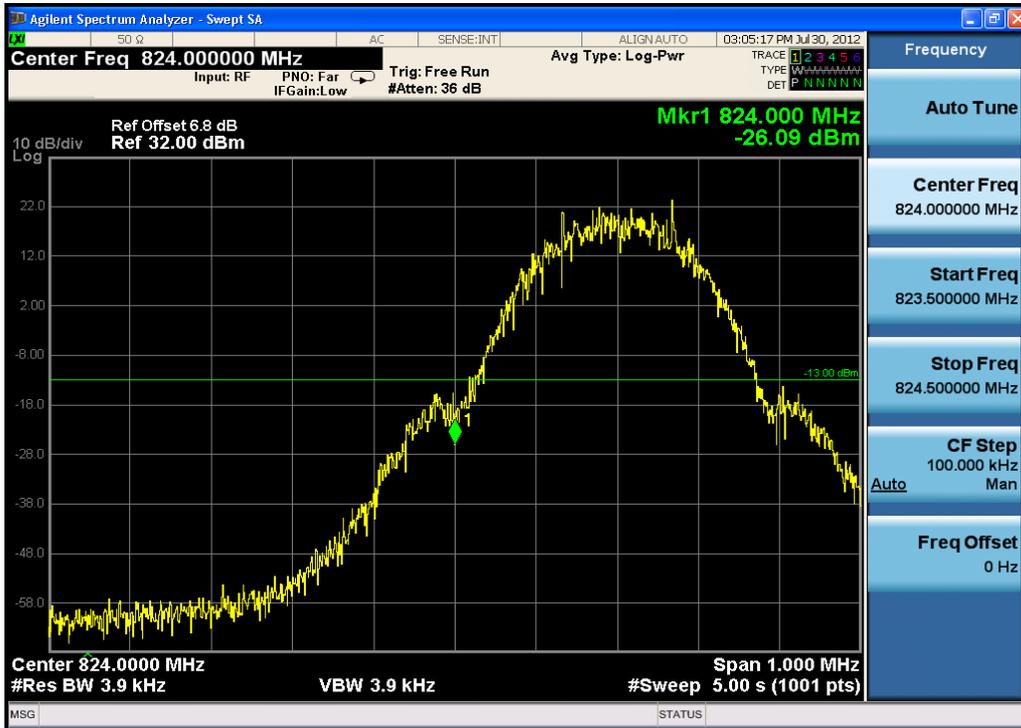


Channel 128

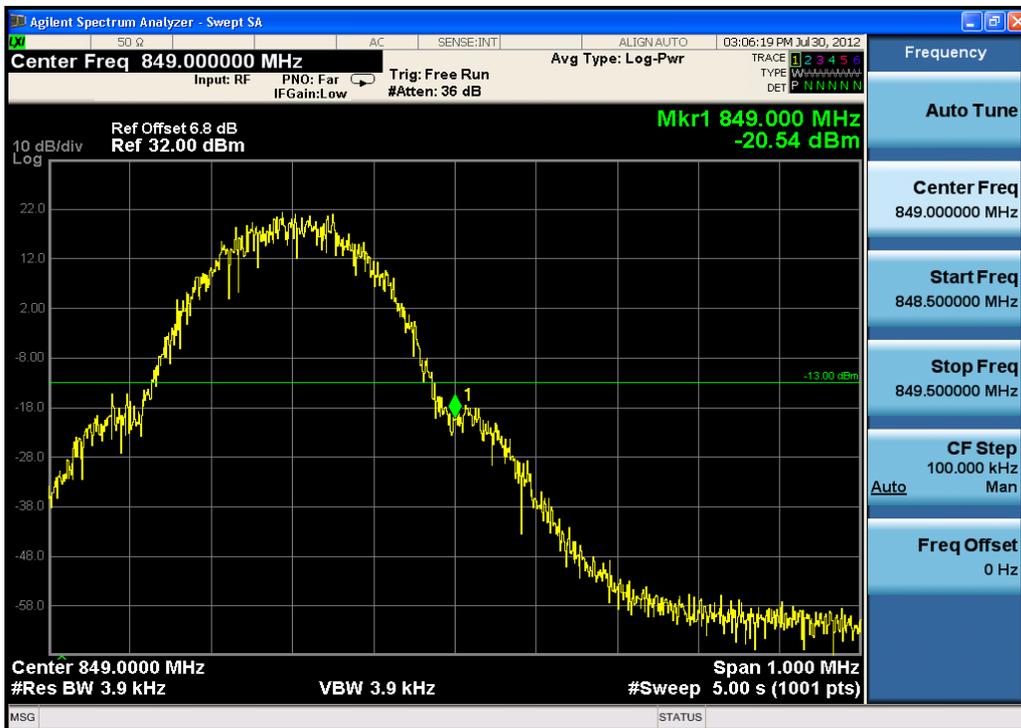


Channel 251

GPRS MODE:



Channel 128



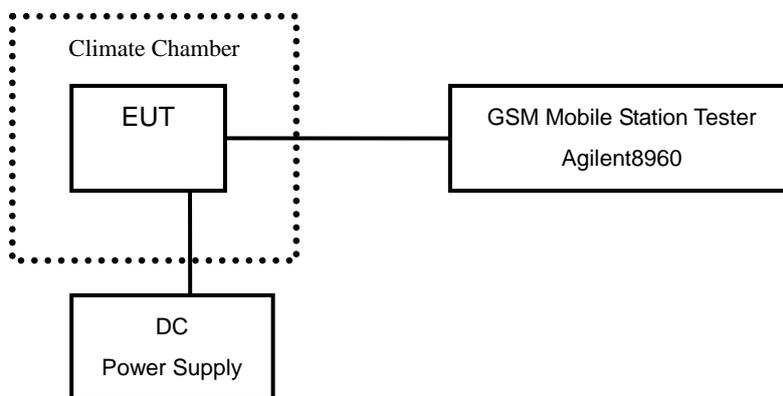
Channel 251

### 2.2.1.7 Frequency Stability-FCC Part2.1055/Part22.355

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	42%	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 No128, No189 and No251 (Bottom, middle and top channels of GSM850 band).

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

Test result:  
GSM MODE:

Temperature(° C)	Test Result (ppm)@3.7V		
	Channel 128	Channel 189	Channel 251
-30	0.005	0.006	0.013
-20	0.007	0.015	0.015
-10	0.004	0.004	0.016
0	0.008	0.012	0.005
+10	0.007	0.003	0.007
+20	0.011	0.008	0.008
+30	0.005	0.007	0.013
+40	0.013	0.010	0.006
+50	0.005	0.013	0.011

Voltage (V)	Test Result (ppm)@20°C		
	Channel 128	Channel 189	Channel 251
3.5	0.007	0.008	0.005
4.2	0.007	0.009	0.008

GPRS MODE:

Temperature(° C)	Test Result (ppm)@3.7V		
	Channel 128	Channel 189	Channel 251
-30	0.005	0.009	0.005
-20	0.006	0.005	0.012
-10	0.007	0.006	0.012
0	0.008	0.009	0.007
+10	0.006	0.008	0.012
+20	0.007	0.006	0.006
+30	0.011	0.012	0.014
+40	0.014	0.013	0.008
+50	0.010	0.011	0.007

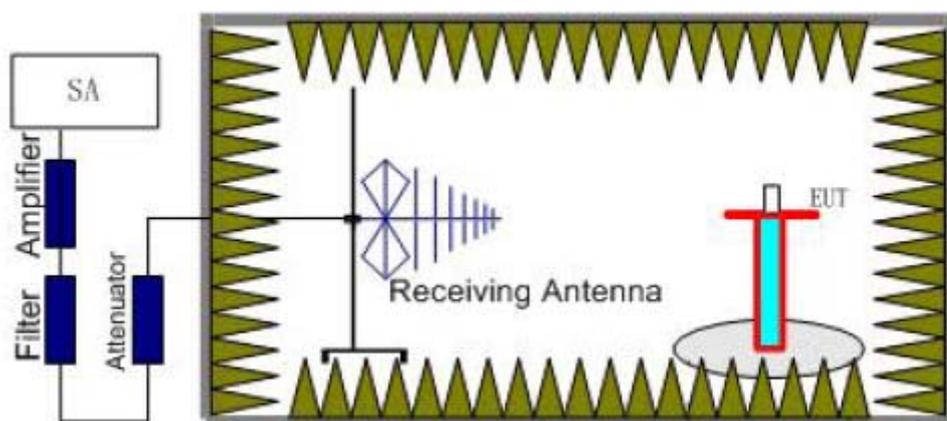
Voltage (V)	Test Result (ppm)@20°C		
	Channel 128	Channel 189	Channel 251
3.5	0.005	0.012	0.007
4.2	0.009	0.008	0.010

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

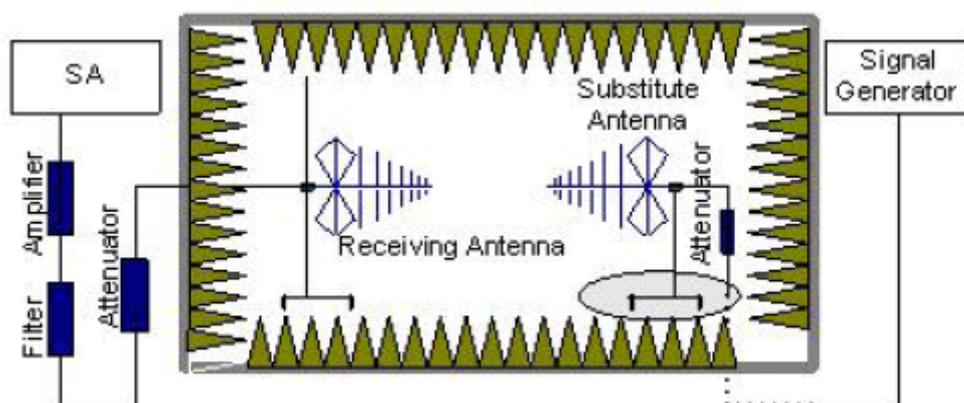
Ambient condition

Temperature	Relative humidity	Pressure
26°C	43%	101.3kPa

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 10<sup>th</sup> 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<sub>s</sub>: the level of the signal generator (dBm)

L<sub>C</sub>: 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 No189 (middle channels of GSM850 band)

Limits	≤ -13dBm
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Test result:

GSM MODE:

Frequency (MHz)	Ps Signal generator level (dBm)	Lc Cable loss (dB)	G Antenna Gain (dB)	Pmea (dBm)	Limited (dBm)	Polarization
1673.67	-40.89	-4.6	8.6	-36.89	-13	Vertical
2550.77	-50.81	-5.9	9.3	-47.41	-13	Vertical
2556.74	-43.76	-5.7	8.6	-40.86	-13	Horizontal
2774.34	-36.76	-5.8	8.9	-33.66	-13	Vertical
6995.52	-42.81	-8.6	12.7	-38.71	-13	Vertical
7073.48	-45.07	-10.8	12.0	-43.87	-13	Vertical

GPRS MODE:

Frequency (MHz)	Ps Signal generator level (dBm)	Lc Cable loss (dB)	G Antenna Gain (dB)	Pmea (dBm)	Limited (dBm)	Polarization
1673.87	-34.3	-4.6	8.6	-30.3	-13	Vertical
2550.96	-46.1	-5.9	9.3	-42.7	-13	Vertical
2556.84	-39.4	-5.7	8.6	-36.5	-13	Horizontal
2774.36	-35.0	-5.8	8.9	-31.9	-13	Vertical
6995.54	-41.8	-8.6	12.7	-37.7	-13	Vertical
7073.43	-42.1	-10.8	12.0	-40.9	-13	Vertical

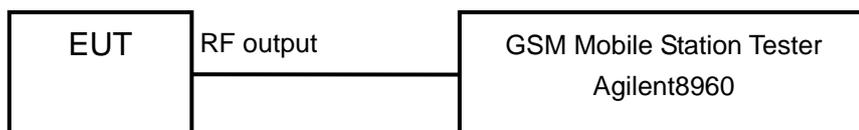
## 2.2.2 PCS1900

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

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	42%	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 No512, No661 and No810 (Bottom, middle and top channels of PCS1900 band)

Limits	≤30dBm

Test result:

GSM MODE:

Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
1850.2	512	28.8
1880.0	661	29.0
1909.8	810	29.1

GPRS MODE:

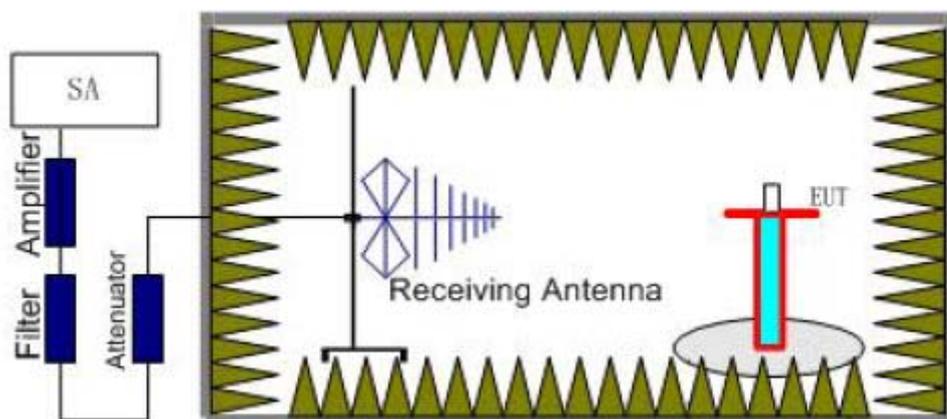
Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
1850.2	512	25.6
1880.0	661	25.8
1909.8	810	25.9

### 2.2.2.2 Effective Isotropic Radiated Power-FCC Part24.232(c)

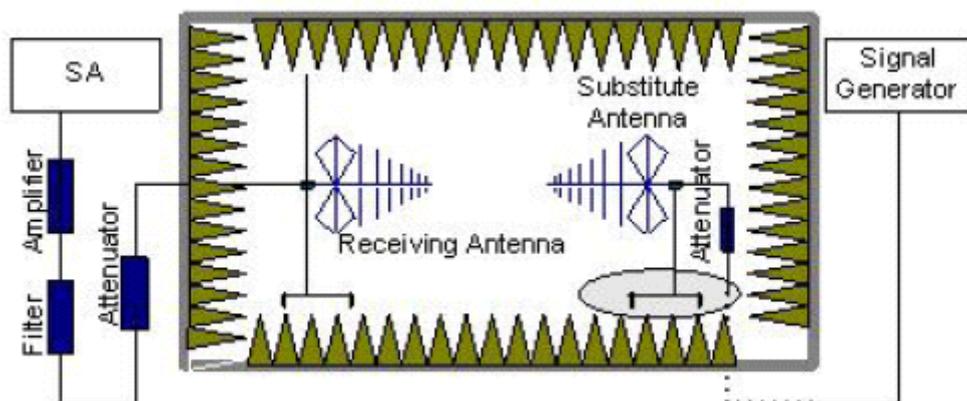
Ambient condition:

Temperature	Relative humidity	Pressure
26°C	43%	101.3kPa

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 No512, No661 and No810 (Bottom, middle and top channels of PCS1900 band)

Limits	$\leq 33\text{dBm}$
--------	---------------------

**Test result:**

**GSM MODE:**

Carrier frequency (MHz)	Channel No.	E.I.R.P. (dBm)
1850.2	512	27.6
1880.0	661	28.1
1909.8	810	27.5

**GPRS MODE:**

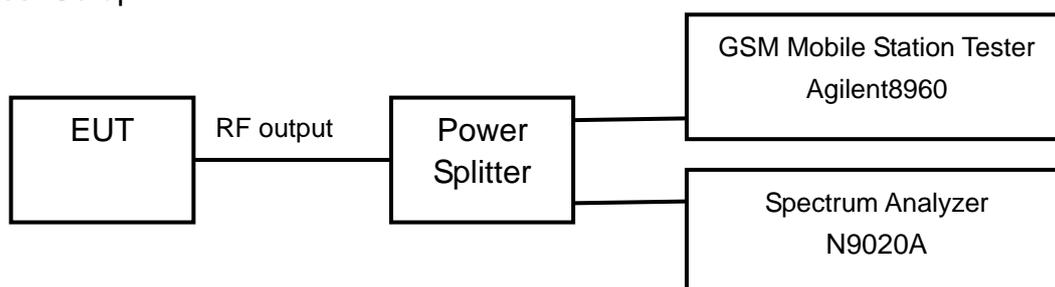
Carrier frequency (MHz)	Channel No.	E.I.R.P. (dBm)
1850.2	512	23.4
1880.0	661	23.5
1909.8	810	23.4

### 2.2.2.3 Occupied Bandwidth-FCC Part2.1049

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	42%	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 No512, No661 and No810 (Bottom, middle and top channels of PCS1900 band)

Limits: No specific occupied bandwidth requirements in part 2.1049

Test result:

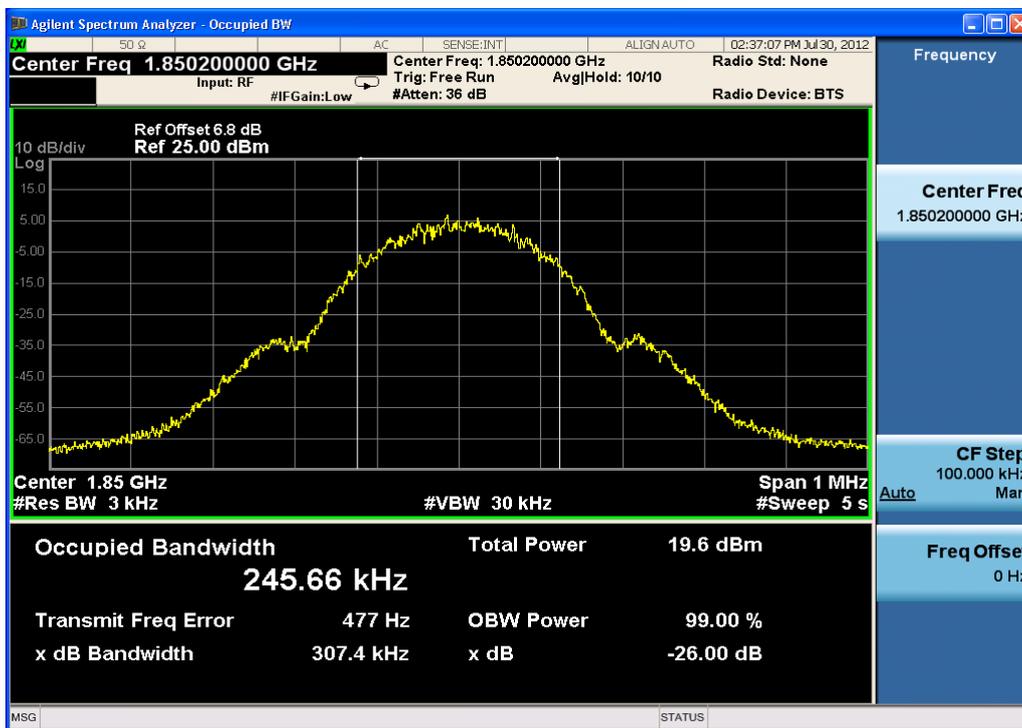
GSM MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
1850.2	512	245.66
1880.0	661	245.65
1909.8	810	246.68

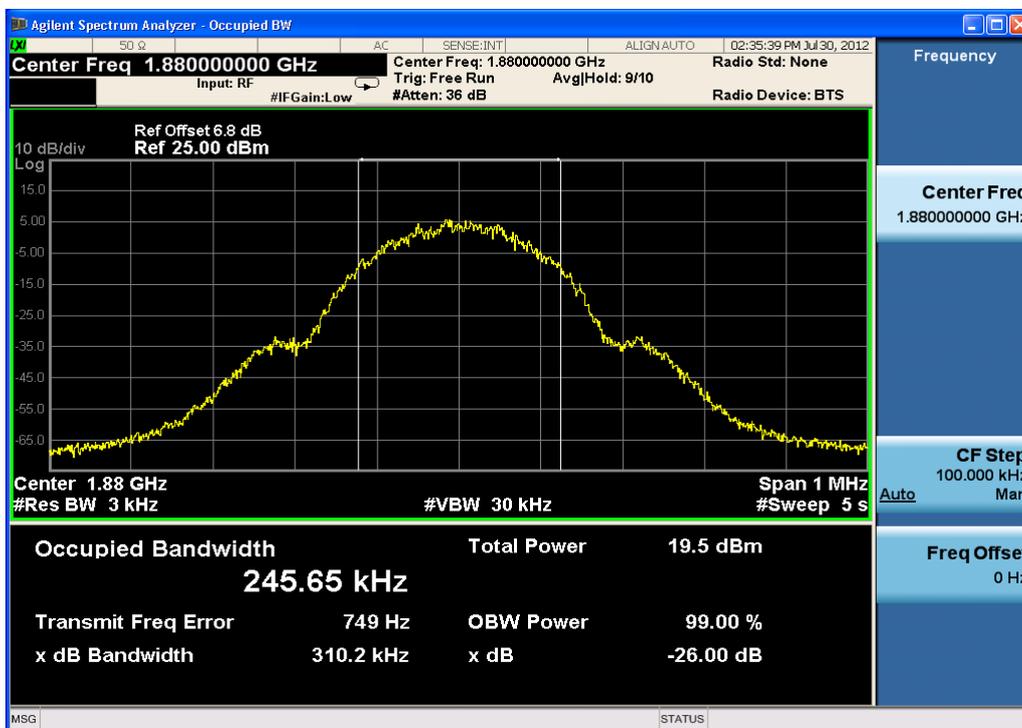
GPRS MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
1850.2	512	244.69
1880.0	661	243.51
1909.8	810	244.65

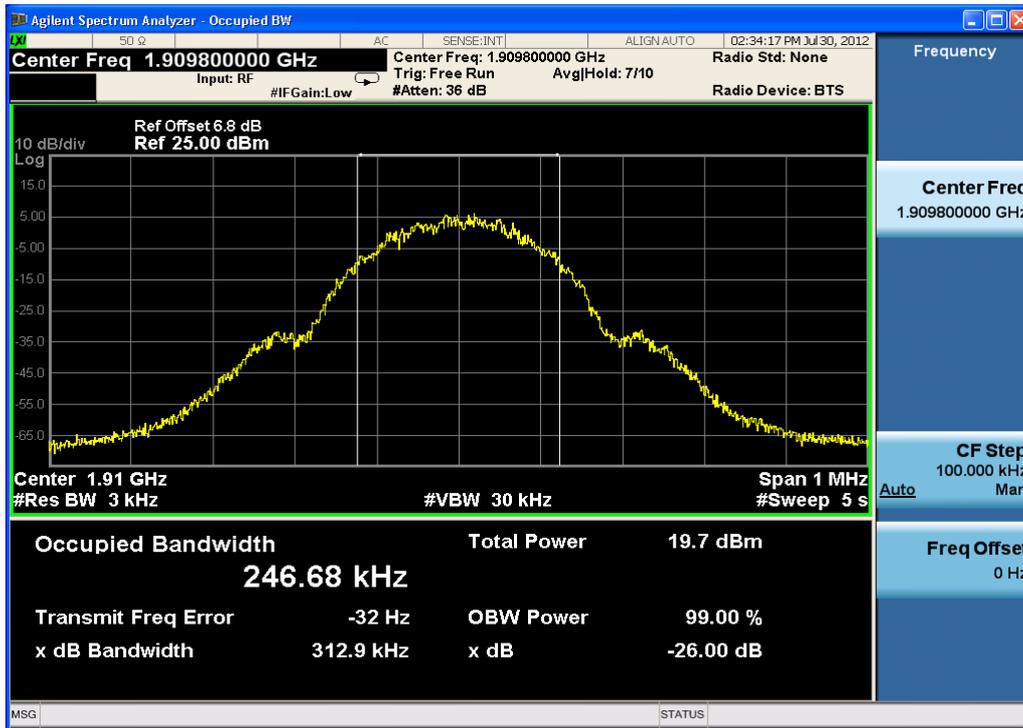
GSM MODE:



Channel 512

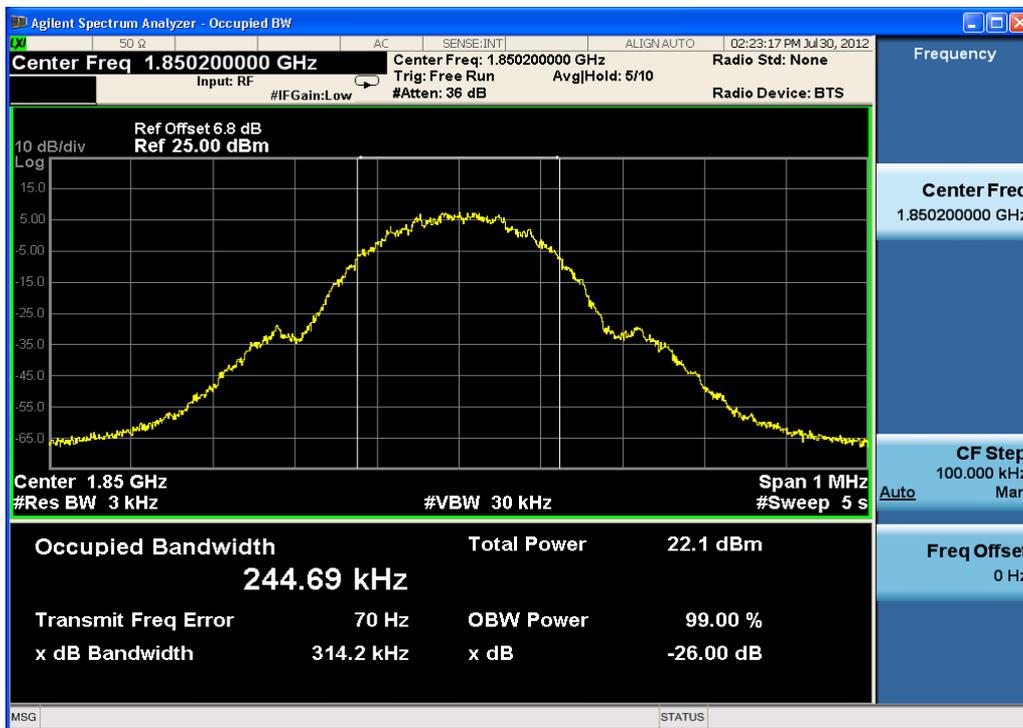


Channel 661

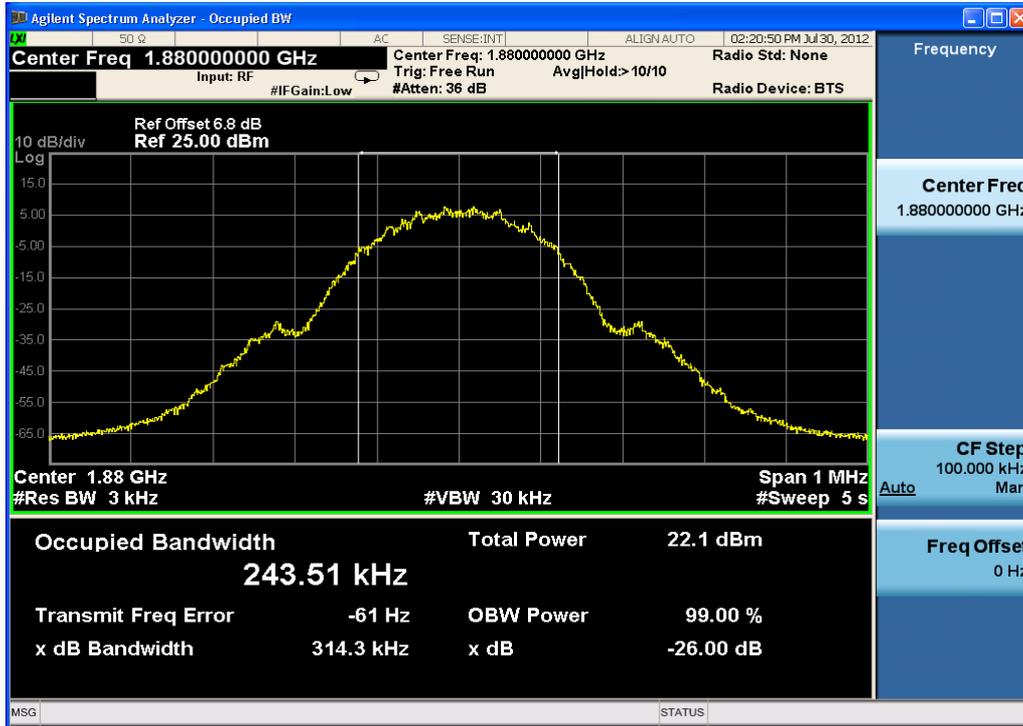


Channel 810

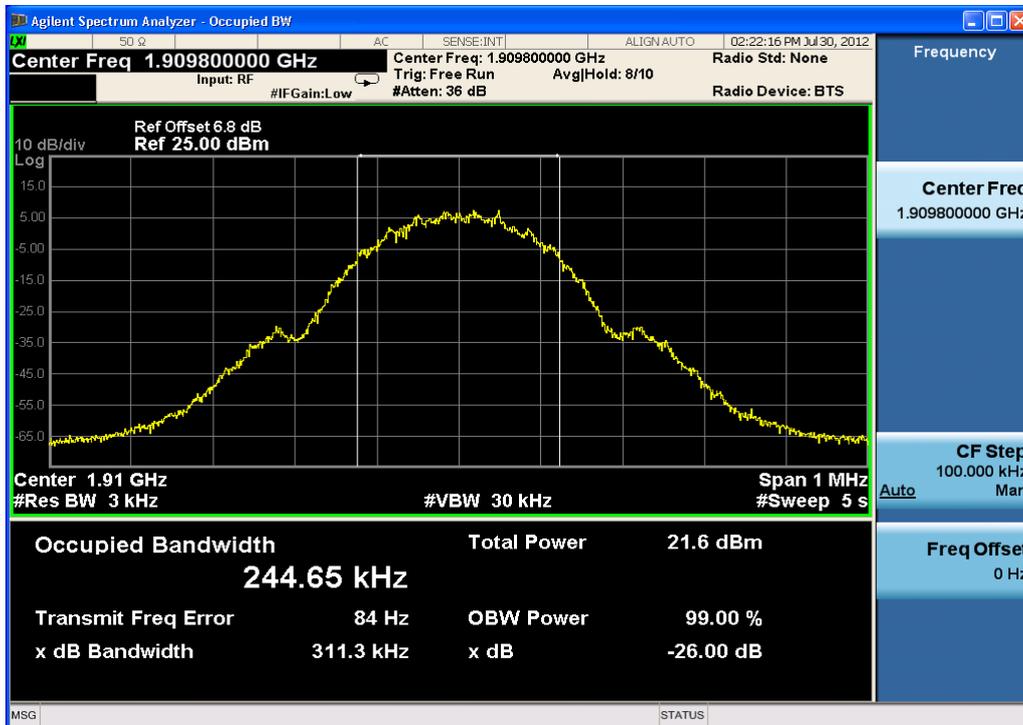
GPRS MODE:



Channel 512



Channel 661



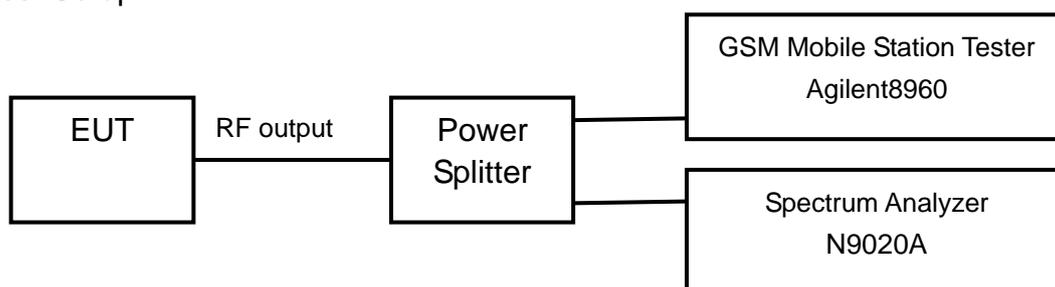
Channel 810

### 2.2.2.4 Emission Bandwidth-FCC Part24.238(b)

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	42%	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 3kHz on spectrum analyzer. The bandwidth of -26dB transmitter power can be read on spectrum analyzer. The measurement will be conducted at three channels No512, No661 and No810 (Bottom, middle and top channels of PCS1900 band)

Limits: No specific occupied bandwidth requirements in part 24.238(b)

Test result:

GSM MODE:

Carrier frequency (MHz)	Channel No.	Bandwidth of -26dB transmitter power (kHz)
1850.2	512	307.4
1880.0	661	310.2
1909.8	810	312.9

GPRS MODE:

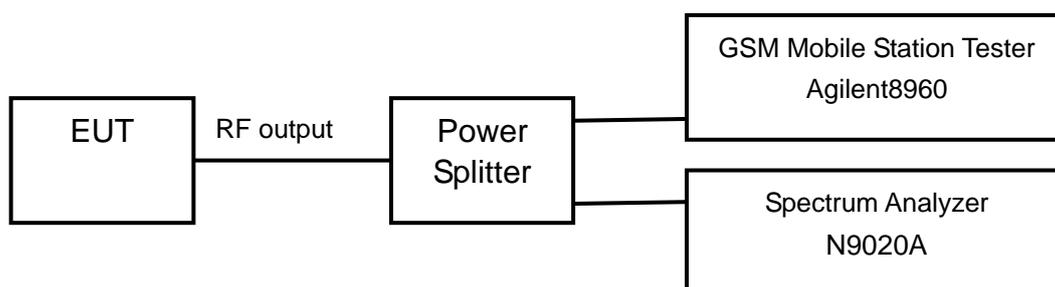
Carrier frequency (MHz)	Channel No.	Bandwidth of -26dB transmitter power (kHz)
1850.2	512	314.2
1880.0	661	314.3
1909.8	810	311.3

### 2.2.2.5 Spurious Emissions at antenna terminal-FCC Part2.1051/24.238(a)

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	42%	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 20GHz (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.

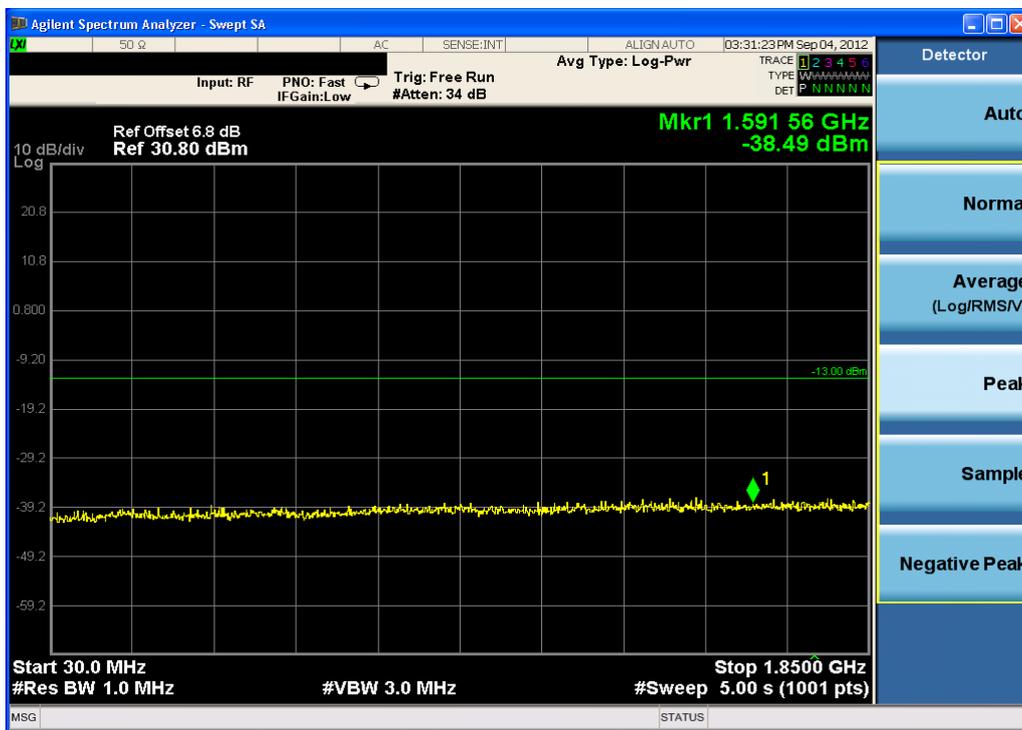
The measurement will be conducted at one channel No661 (middle channel of PCS1900 band)

Limits	≤ -13dBm
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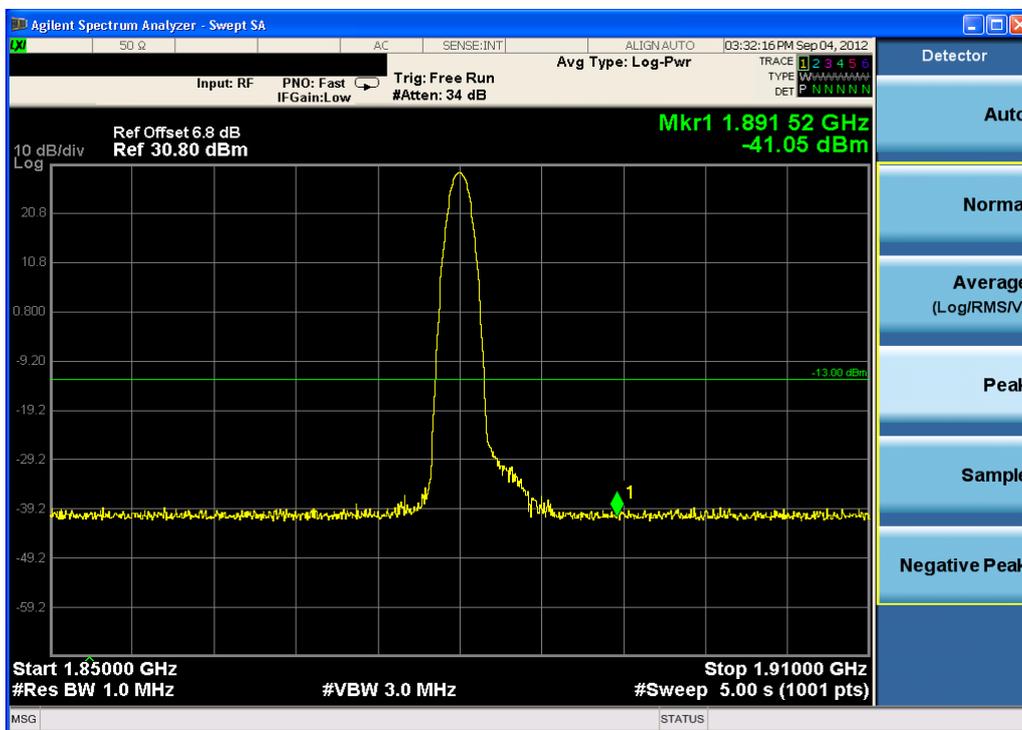
Test result:

Refer to the following figures.

GSM MODE:



Channel 661, 30MHz~1850MHz



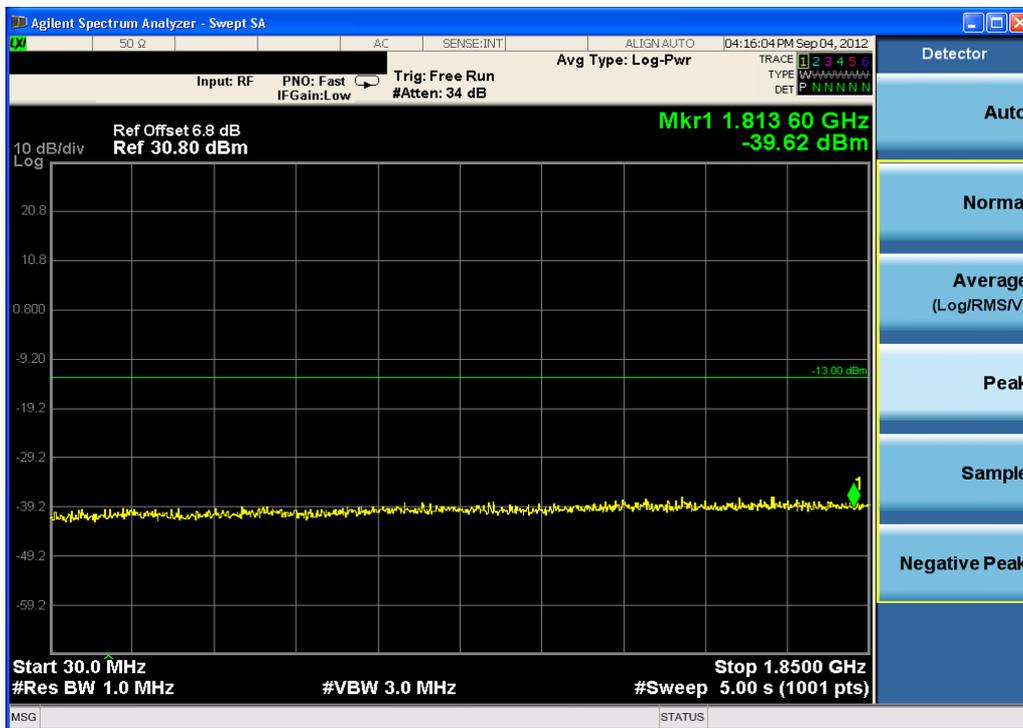
Channel 661, 1850MHz~1910MHz

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

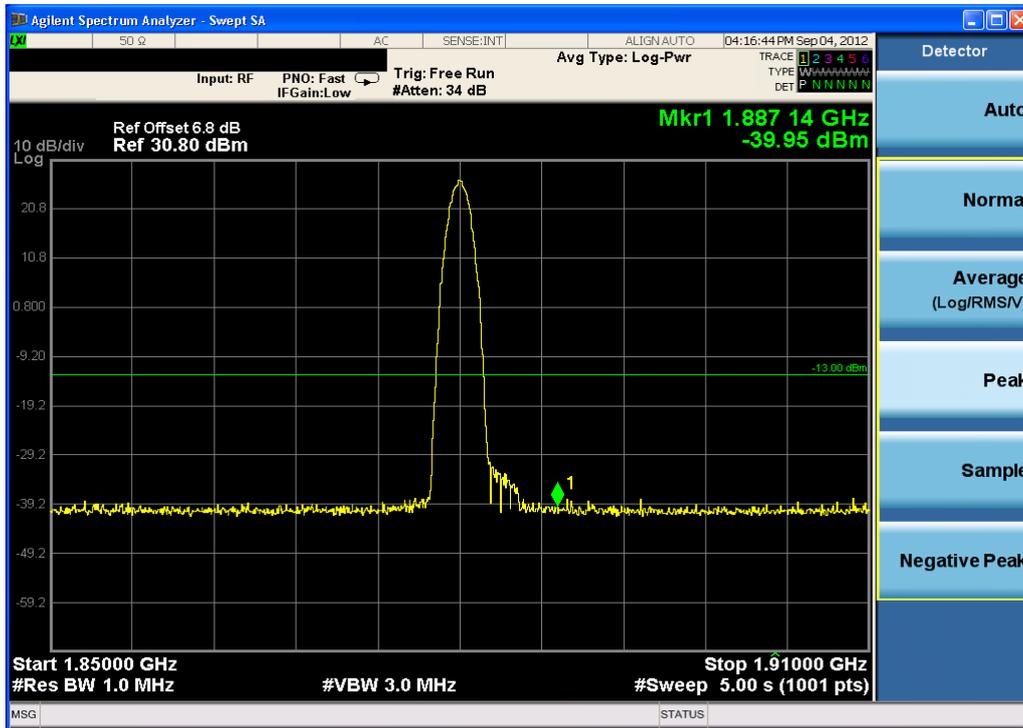


Channel 661, 1910MHz~20GHz

GPRS MODE:

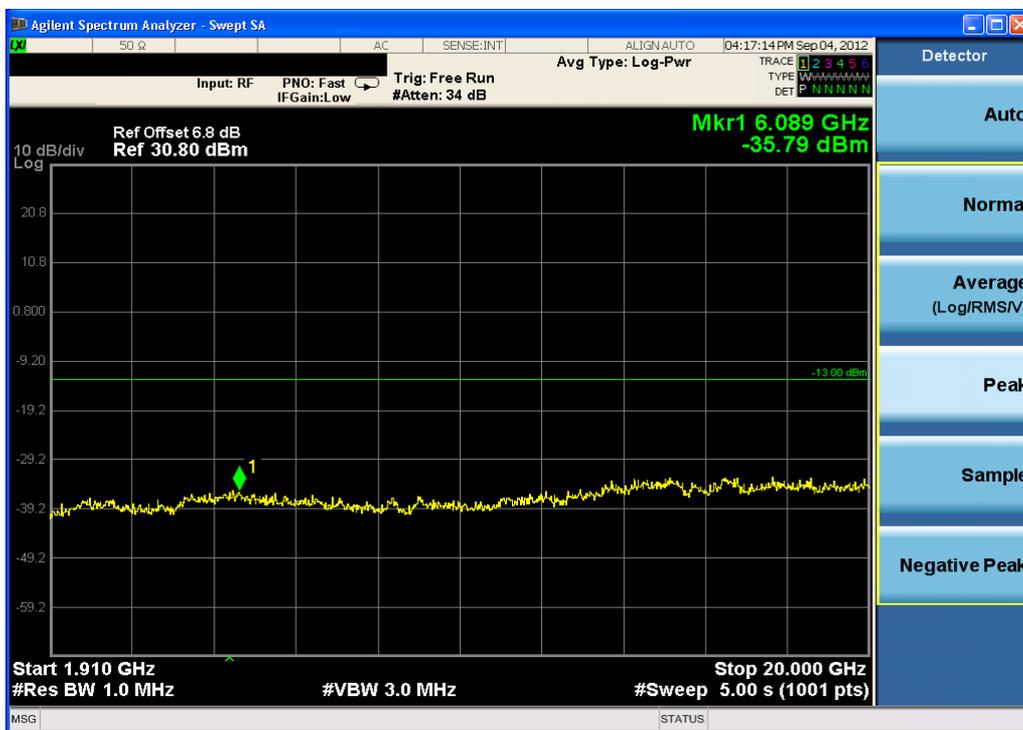


Channel 661, 30MHz~1850MHz



Channel 661, 1850MHz~1910MHz

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



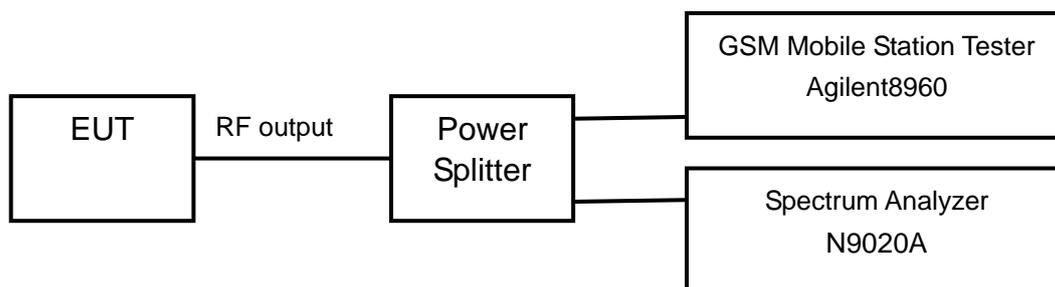
Channel 661, 1910MHz~20GHz

### 2.2.2.6 Band Edges Compliance-FCC Part2.1051/24.238(a)

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	42%	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.

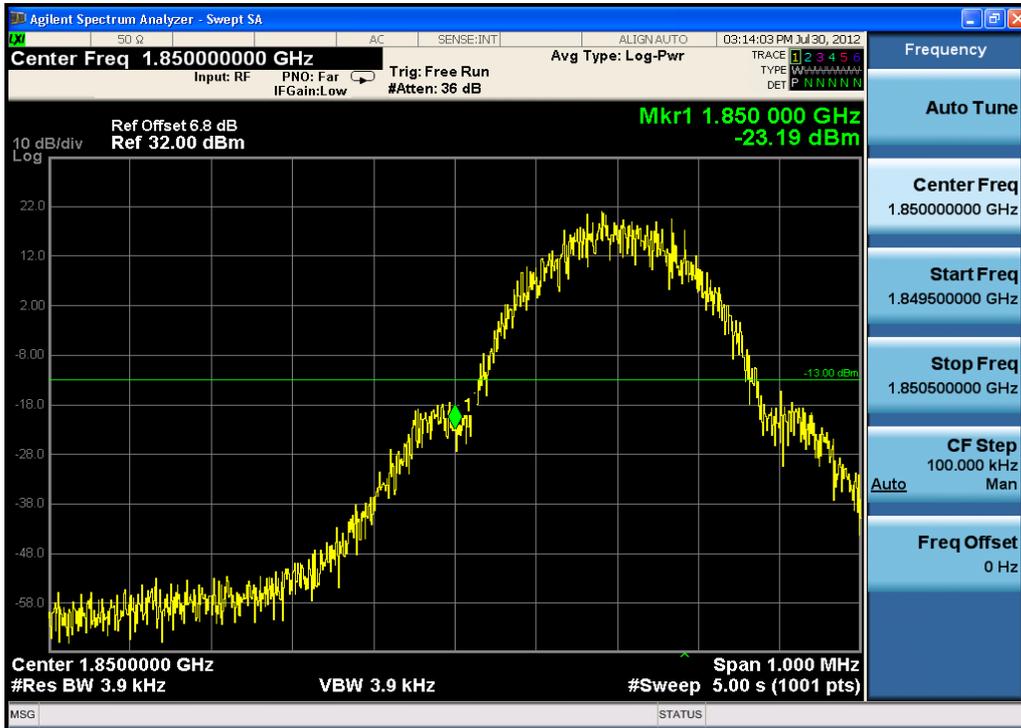
The measurement will be conducted at two channels No512 and No810 (Bottom and top channels of PCS1900 band)

Limits	$\leq -13\text{dBm}$
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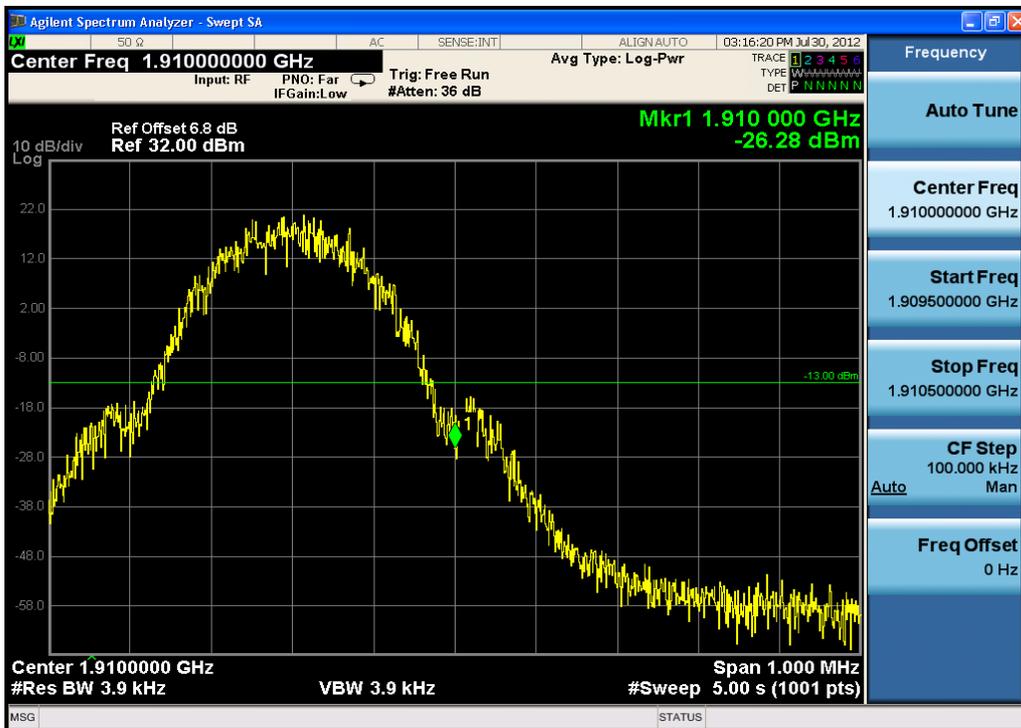
Test result:

Refer to the following figures.

GSM MODE:

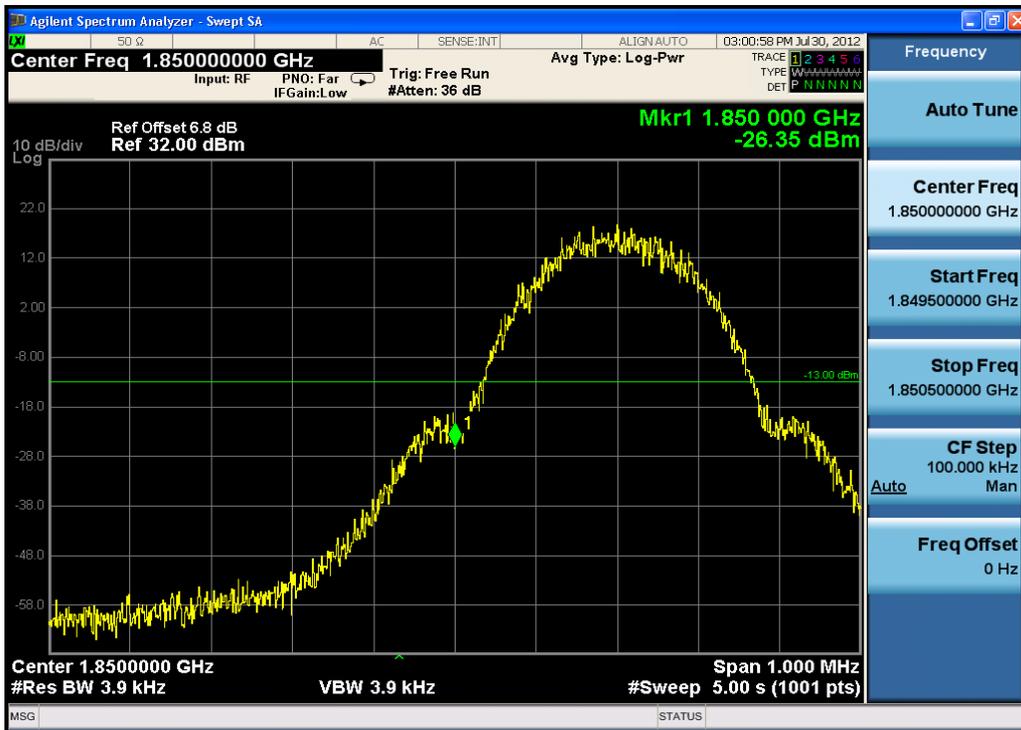


Channel 512

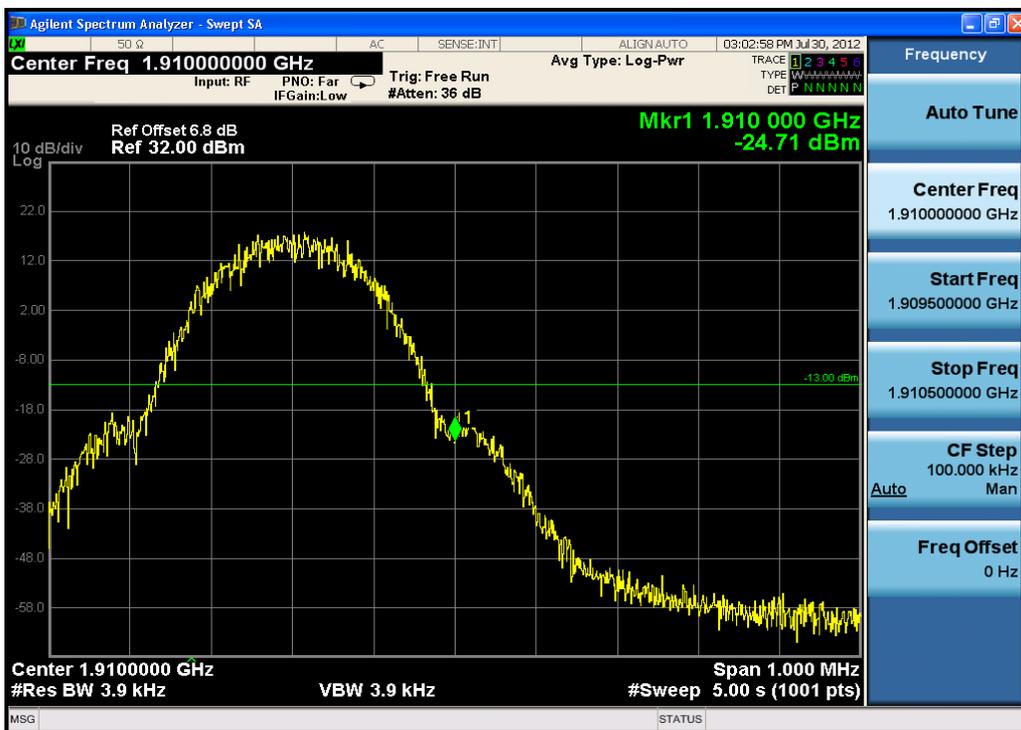


Channel 810

GPRS MODE:



Channel 512



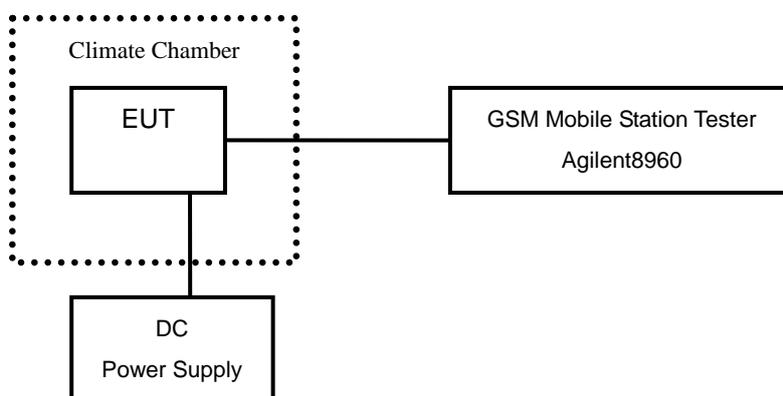
Channel 810

### 2.2.2.7 Frequency Stability-FCC Part2.1055/Part24.235

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	42%	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 No512, No661 and No810 (Bottom, middle and top channels of PCS1900 band).

Limits: No specific frequency stability requirements in part 2.1055 and part 24.235.

Test result:  
GSM MODE:

Temperature(° C)	Test Result (ppm)@3.7V		
	Channel 512	Channel 661	Channel 810
-30	0.005	0.012	0.010
-20	0.006	0.006	0.005
-10	0.007	0.012	0.008
0	0.012	0.007	0.007
+10	0.011	0.006	0.009
+20	0.009	0.007	0.012
+30	0.008	0.011	0.013
+40	0.007	0.010	0.011
+50	0.009	0.008	0.007

Voltage (V)	Test Result (ppm)@20° C		
	Channel 512	Channel 661	Channel 810
3.5	0.008	0.008	0.009
4.2	0.007	0.007	0.008

GPRS MODE:

Temperature(° C)	Test Result (ppm)@3.7V		
	Channel 512	Channel 661	Channel 810
-30	0.007	0.010	0.011
-20	0.008	0.015	0.006
-10	0.008	0.006	0.005
0	0.004	0.008	0.010
+10	0.006	0.006	0.012
+20	0.010	0.012	0.009
+30	0.011	0.013	0.008
+40	0.004	0.011	0.010
+50	0.009	0.005	0.006

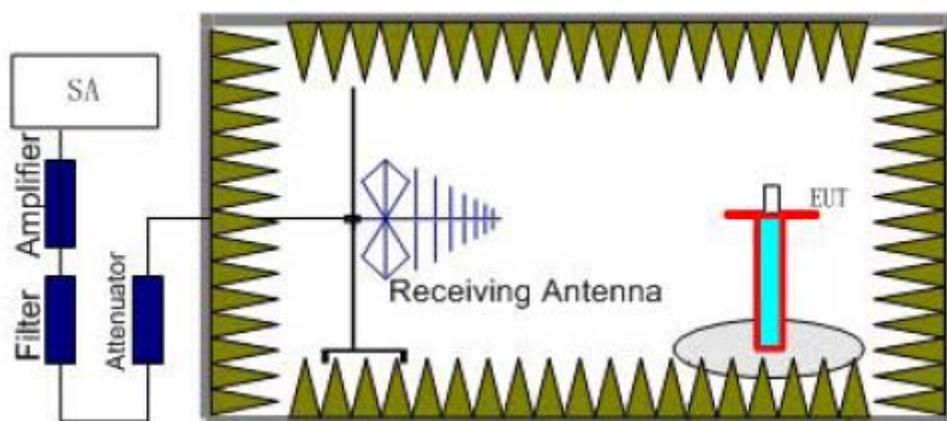
Voltage (V)	Test Result (ppm)@20° C		
	Channel 512	Channel 661	Channel 810
3.5	0.008	0.012	0.008
4.2	0.010	0.006	0.007

### 2.2.2.8 Radiated Spurious Emissions-FCC Part2.1053/24.238(a)

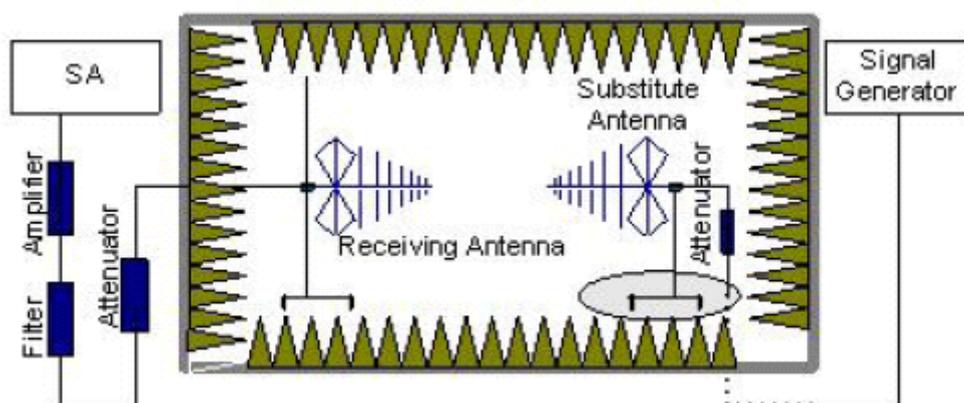
Ambient condition

Temperature	Relative humidity	Pressure
26°C	43%	101.3kPa

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 10<sup>th</sup> 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<sub>s</sub>: the level of the signal generator (dBm)

L<sub>C</sub>: 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 No661 (middle channels of PCS1900 band).

Limits	≤ -13dBm
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Test result:

GSM MODE:

Frequency (MHz)	Ps Signal generator level (dBm)	Lc Cable loss (dB)	G Antenna Gain (dB)	Pmea (dBm)	Limited (dBm)	Polarization
1673.67	-34.5	-4.6	8.6	-30.5	-13	Vertical
2550.77	-46.2	-5.9	9.3	-42.8	-13	Vertical
2556.74	-39.4	-5.7	8.6	-36.5	-13	Horizontal
2774.34	-34.9	-5.8	8.9	-31.8	-13	Vertical
6995.52	-41.6	-8.6	12.7	-37.5	-13	Vertical
7073.48	-42.3	-10.8	12.0	-41.1	-13	Vertical

GPRS MODE:

Frequency (MHz)	Ps Signal generator level (dBm)	Lc Cable loss (dB)	G Antenna Gain (dB)	Pmea (dBm)	Limited (dBm)	Polarization
1673.87	-34.3	-4.6	8.6	-30.3	-13	Vertical
2550.96	-46.1	-5.9	9.3	-42.7	-13	Vertical
2556.84	-39.4	-5.7	8.6	-36.5	-13	Horizontal
2774.36	-35.0	-5.8	8.9	-31.9	-13	Vertical
6995.54	-41.8	-8.6	12.7	-37.7	-13	Vertical
7073.43	-42.1	-10.8	12.0	-40.9	-13	Vertical

### 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