D-PL-12111-01-01

CNAS L0447

Registration No.910917

TEST REPORT

Report No.: SRTC2011-H024-E0057

Product Name: CDMA 1X-EVDO Digital Mobile Phone with Bluetooth

Product Model: Sonim XP3400-A-R1

Type Number: C21F007AA

Applicant: Sonim Technologies Inc.

Manufacturer: BYD COMPANY LIMITED

Specification: FCC Part 24E, Part 22H, Part 2 (October 1, 2009 edition)

FCC ID: WYPC21F007AA

The State Radio_monitoring_center Testing Center (SRTC)

No.80 Beilishi Road Xicheng District Beijing, China

Tel: 86-10-68009202 Fax: 86-10-68009205

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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
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1.3 Applicant's details

Company: Sonim Technologies Inc.
Address: 1875 S. Grant Street, Suite 620, San Mateo, CA 94402, USA
City: San Mateo
Country or Region: USA
Grantee Code: WYP
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Tel: +1 650 504 4411
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1.4 Manufacturer's details

Company: BYD COMPANY LIMITED
Address: Floor7, Building 5, No.3000 LongDong Avenue, Pudong District, Shanghai, 201203, P.R.China
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Country or Region: P.R.China
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Fax: +86-021-61009668
Email: wang.luhong@byd.com

1.5 Application details

Date of reception of test sample: 20th Jun 2011
Date of test: 21st Jun 2011 to 12th Jul 2011

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	CDMA 1X-EVDO Digital Mobile Phone with Bluetooth
FCC ID	WYPC21F007AA
Frequency range	CDMA800: Tx:824~849MHz Rx:869~894MHz PCS1900: Tx:1850~1910MHz Rx:1930~1990MHz
Rated output power	24.0dBm
Modulation type	OQPSK
Emission Designator	1M25F9W
Duplex mode	FDD
Duplex spacing	CDMA800:45MHz PCS1900:80MHz
Antenna type	Fixed Internal
Power Supply	Battery or charger
Rated Power Supply Voltage	3.8V
Extreme Temperature	Lowest: -30°C Highest: +50°C
Extreme Voltage	Minimum: 3.4V Maximum: 4.2V
HW Version	A
SW Version	E343B_1200B03

1.7.2 EUT details

Name	Model	Type Number	MEID
CDMA 1X-EVDO Digital Mobile Phone with Bluetooth	Sonim XP3400-A-R1	C21F007AA	A1000012909FE3

1.7.3 Auxiliary equipment details

Equipment	Charger
Manufacturer	DEE VAN ENTERPRISE CO., LTD
Model Number	DSA-3PFC-05 FEU 050065

Equipment	Battery
Manufacturer	Sunwoda Electronic Co., Ltd
Model Number	XP3.20-0001100
Capacity	1750mAh
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 and Equivalent Isotropically Radiated Power	22.913(a)/24.232(c)	Pass
3	Occupied Bandwidth	2.1049	Pass
4	Spurious Emissions at antenna terminals	2.1051/22.917(a)/24.238(a)	Pass
5	Band Edges Compliance	2.1051/22.917(a)/24.238(a)	Pass
6	Frequency Stability	2.1055/24.235/22.355	Pass
7	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: **2011.07.13**

2.2 Test result

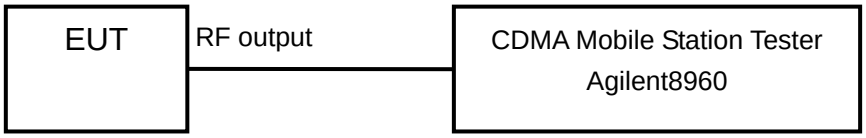
2.2.1 CDMA800

2.2.1.1 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 CDMA800 band)

Limits	≤30dBm

Test result:

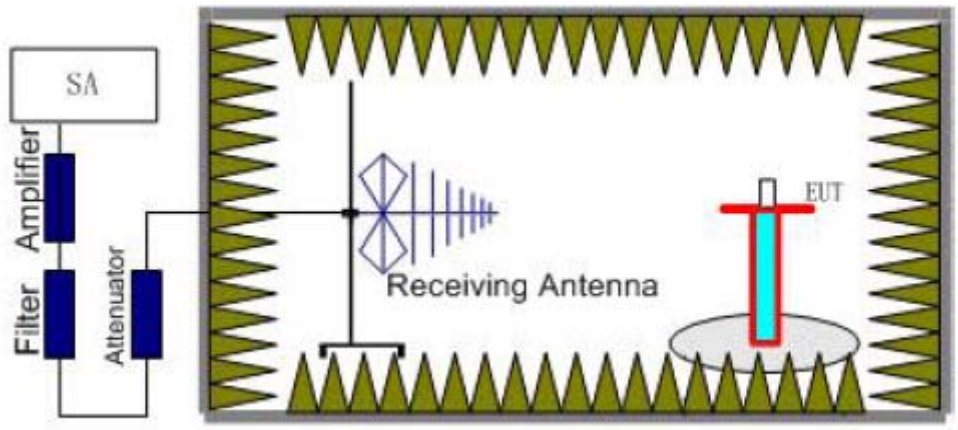
Carrier frequency (MHz)	Channel No.	Test Mode	RF Power Output (dBm)
824.70	1013	RC1/SO2	23.9
		RC1/SO55	23.9
		RC3/SO2	24.0
		RC3/SO55	23.9
		RC3/SO32	23.9
		RTAP 9.6K	24.0
		RTAP 38.4K	24.0
		RTAP153.6K	24.0
		RETAP 128K	24.0
		RETAP 2048K	24.1
		RETAP 4096K	24.1
		RETAP 12288K	**24.2**
836.52	384	RC1/SO2	23.9
		RC1/SO55	23.8
		RC3/SO2	23.9
		RC3/SO55	23.9
		RC3/SO32	23.8
		RTAP 9.6K	24.0
		RTAP 38.4K	23.9
		RTAP153.6K	24.0
		RETAP 128K	23.9
		RETAP 2048K	23.9
		RETAP 4096K	24.0
		RETAP 12288K	**24.0**
848.31	777	RC1/SO2	23.9
		RC1/SO55	23.8
		RC3/SO2	23.9
		RC3/SO55	23.9
		RC3/SO32	23.9
		RTAP 9.6K	24.0
		RTAP 38.4K	24.0
		RTAP153.6K	24.0
		RETAP 128K	24.1
		RETAP 2048K	24.2
		RETAP 4096K	24.1
		RETAP 12288K	**24.2**

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

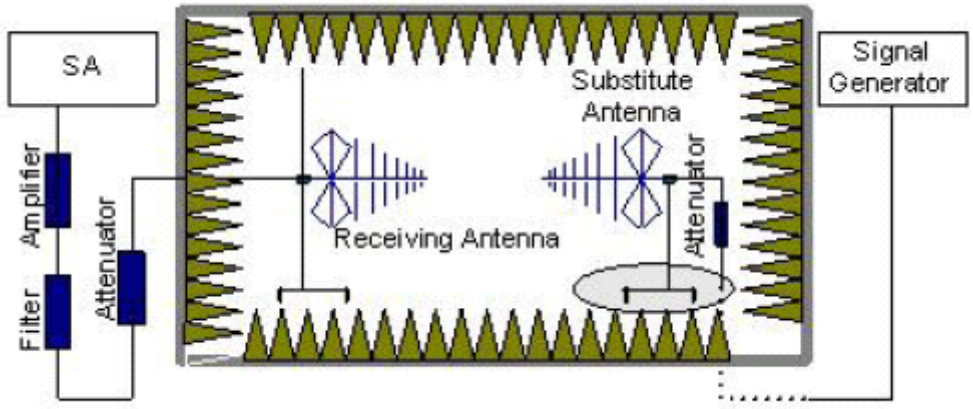
Ambient condition:

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 CDMA800 band) in RETAP 12288K test mode.

Limits	≤38.5dBm

Test result:

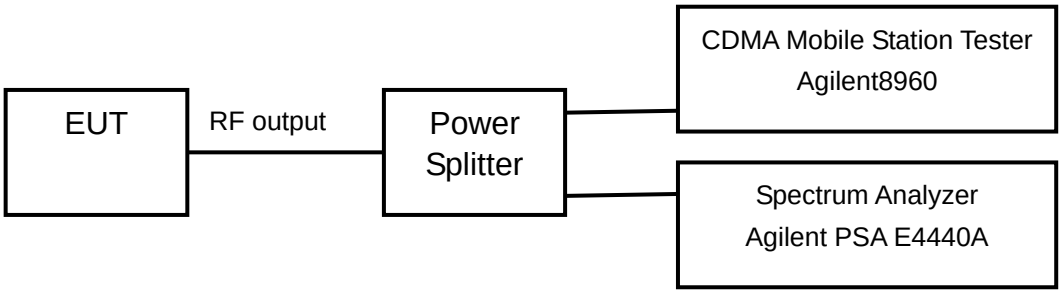
Carrier frequency (MHz)	Channel No.	Test Mode	E.R.P. (dBm)
824.70	1013	RETAP 12288K	21.0
836.52	384	RETAP 12288K	21.6
848.31	777	RETAP 12288K	22.8

2.2.1.3 Occupied Bandwidth-FCC Part2.1049

Ambient condition:

Temperature	Relative humidity	Pressure
24°C	53%	101.9kPa

Test Setup:



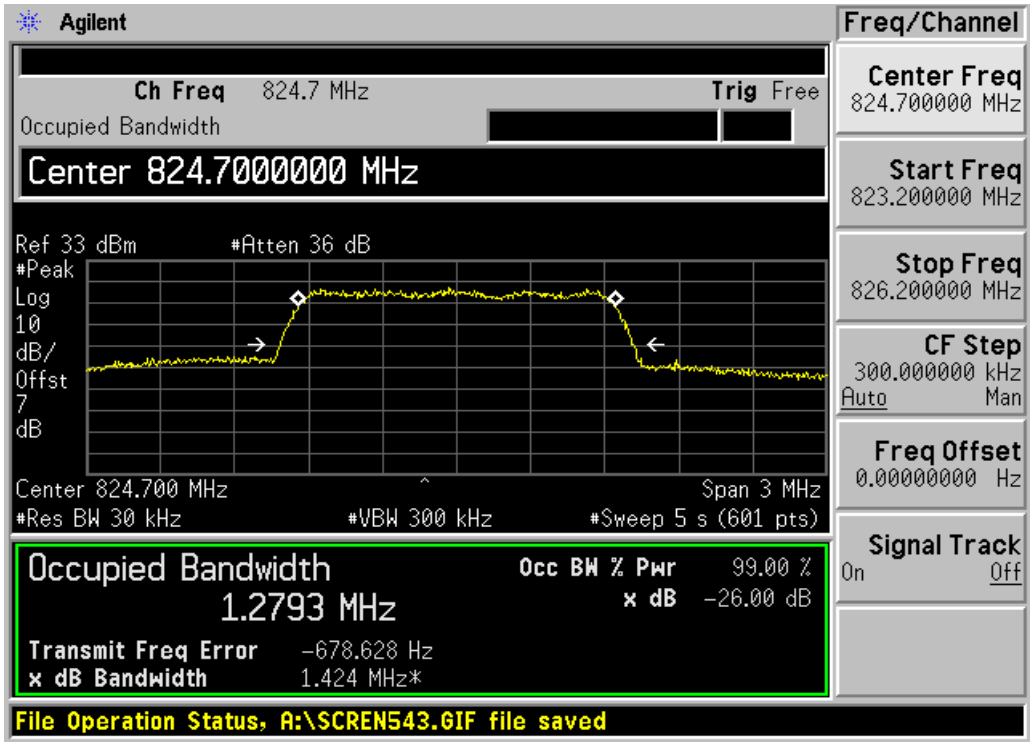
Test procedure:

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 CDMA800 band) in RETAP 12288K test mode.

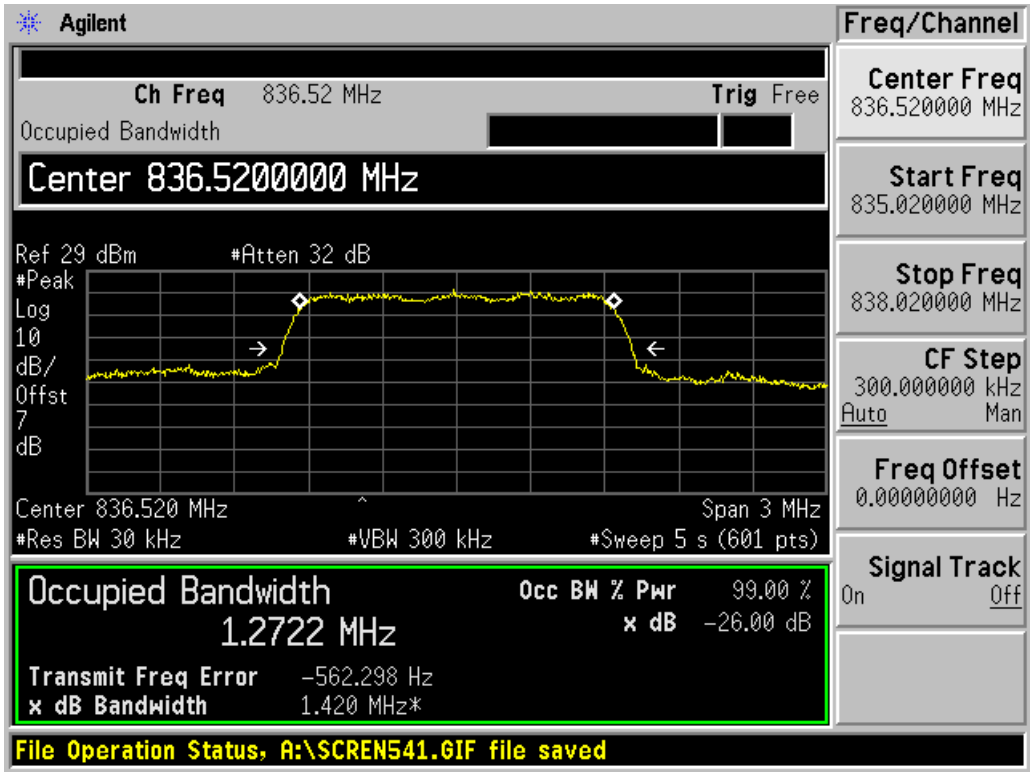
Limits: No specific occupied bandwidth requirements in part 2.1049

Test result:

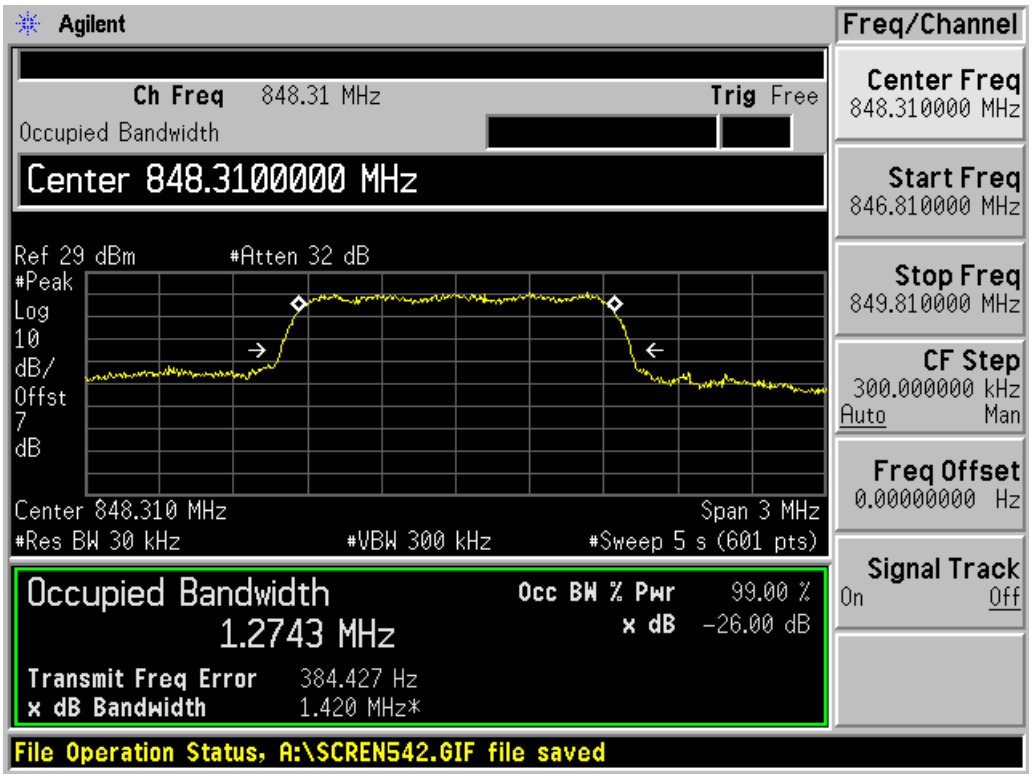
Carrier frequency (MHz)	Channel No.	Test Mode	Bandwidth of 99% Power (MHz)
824.70	1013	RETAP 12288K	1.2793
836.52	384	RETAP 12288K	1.2722
848.31	777	RETAP 12288K	1.2793



Channel 1013



Channel 384



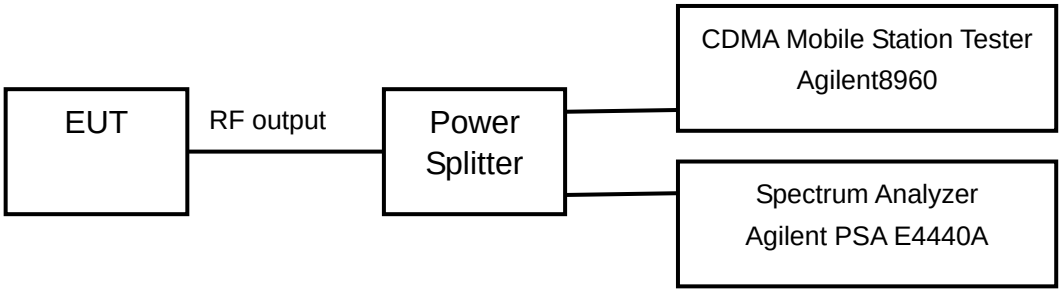
Channel 777

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

Ambient condition:

Temperature	Relative humidity	Pressure
24°C	53%	101.9kPa

Test Setup:

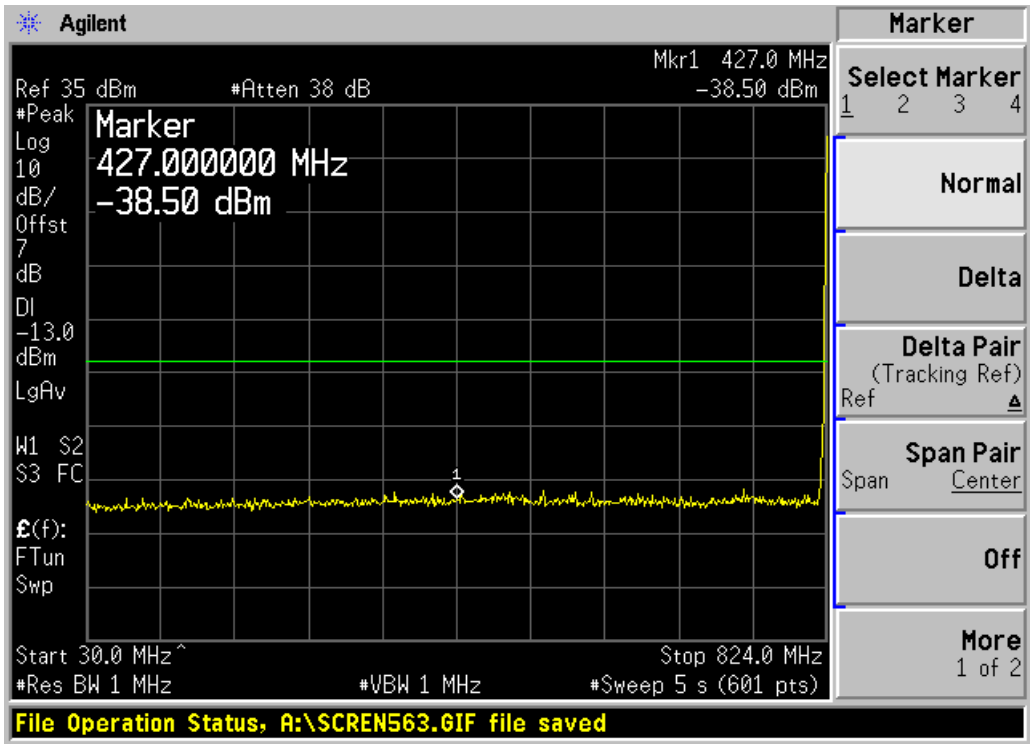


Test procedure:

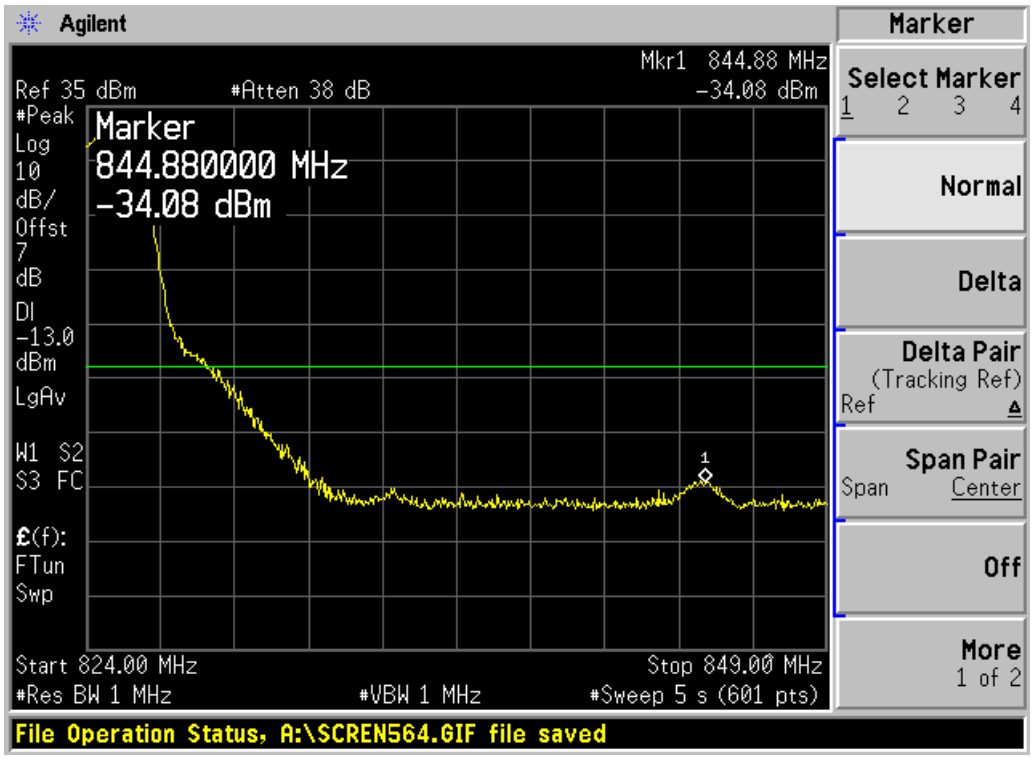
After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 30MHz to 9GHz (higher than the 10^{th} 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 CDMA800 band) in RETAP 12288K test mode.

Limits	≤-13dBm

Test result:
Refer to the following figures.

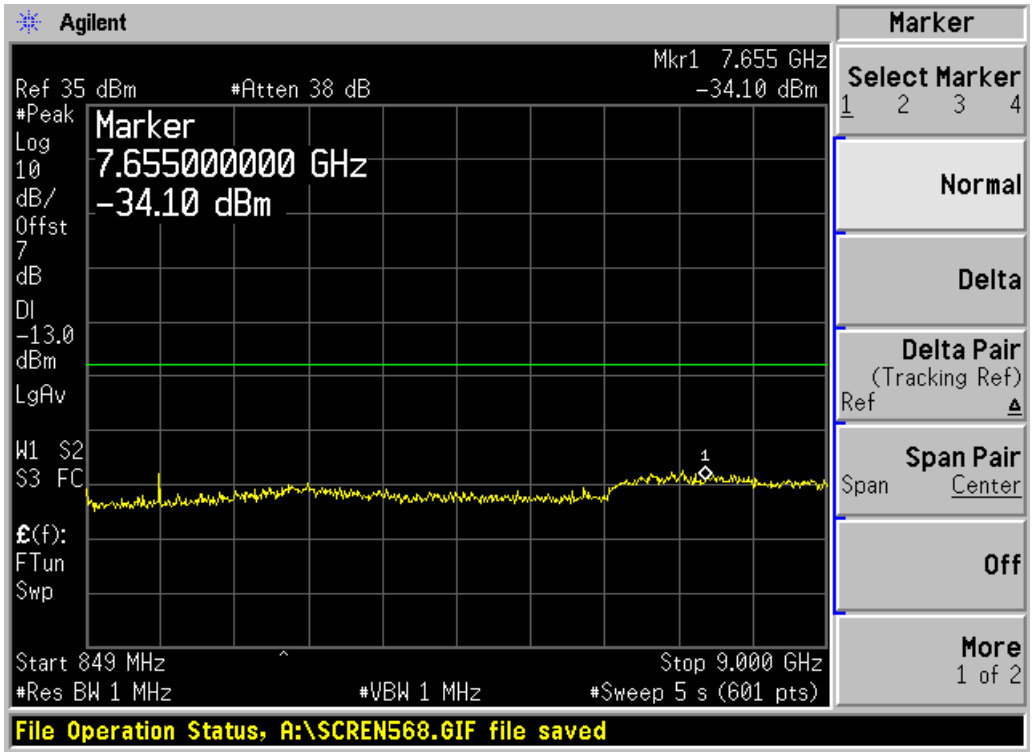


Channel 1013, 30MHz~824MHz

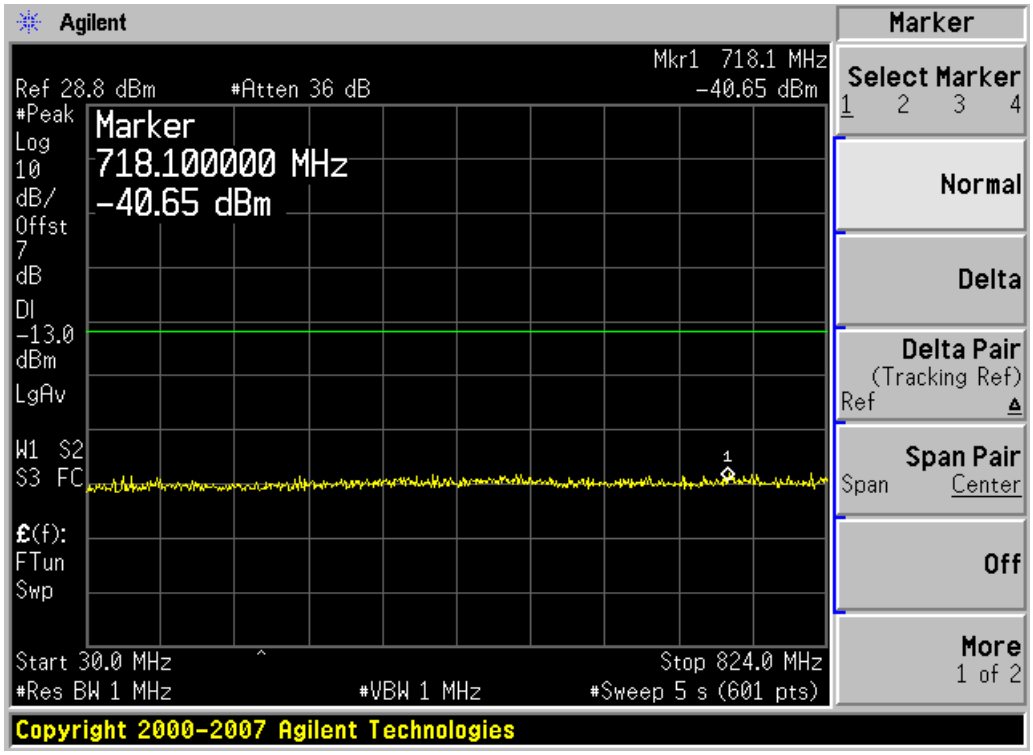


Channel 1013, 824MHz~849MHz

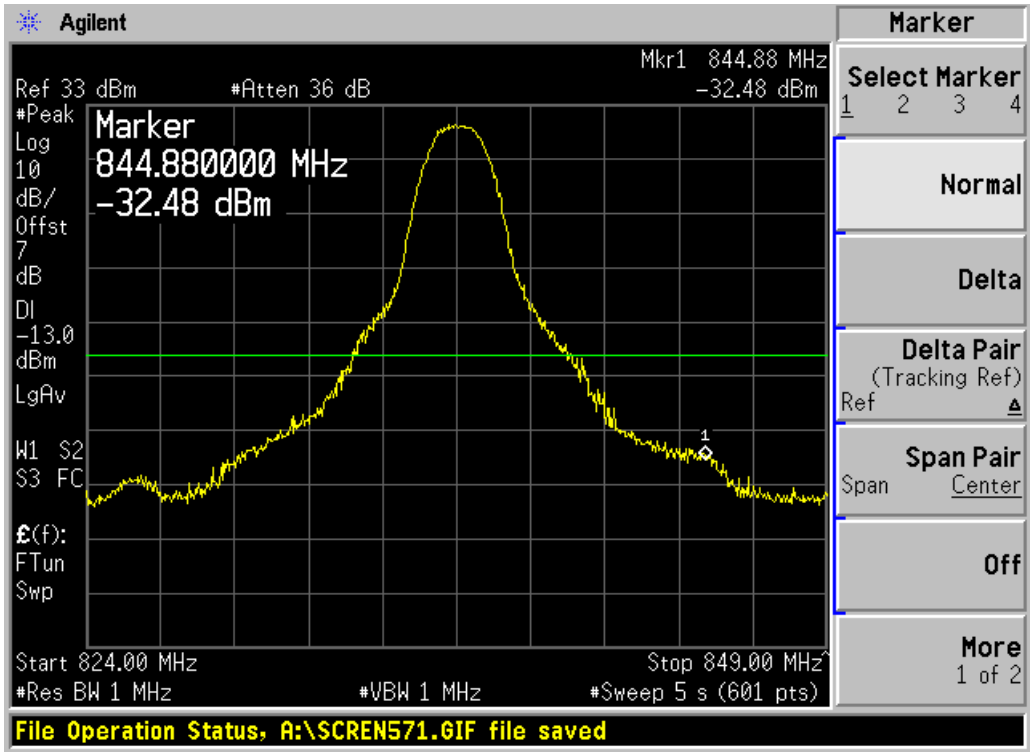
Note: The signal beyond the limit is carrier.



Channel 1013, 849MHz~9GHz

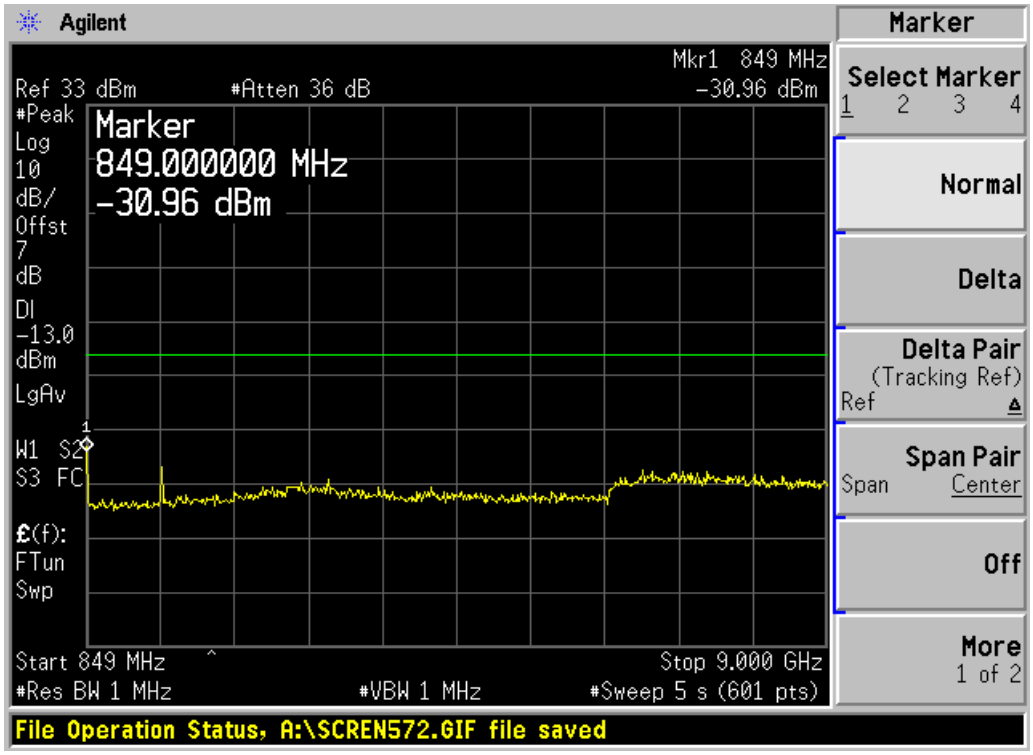


Channel 384, 30MHz~824MHz

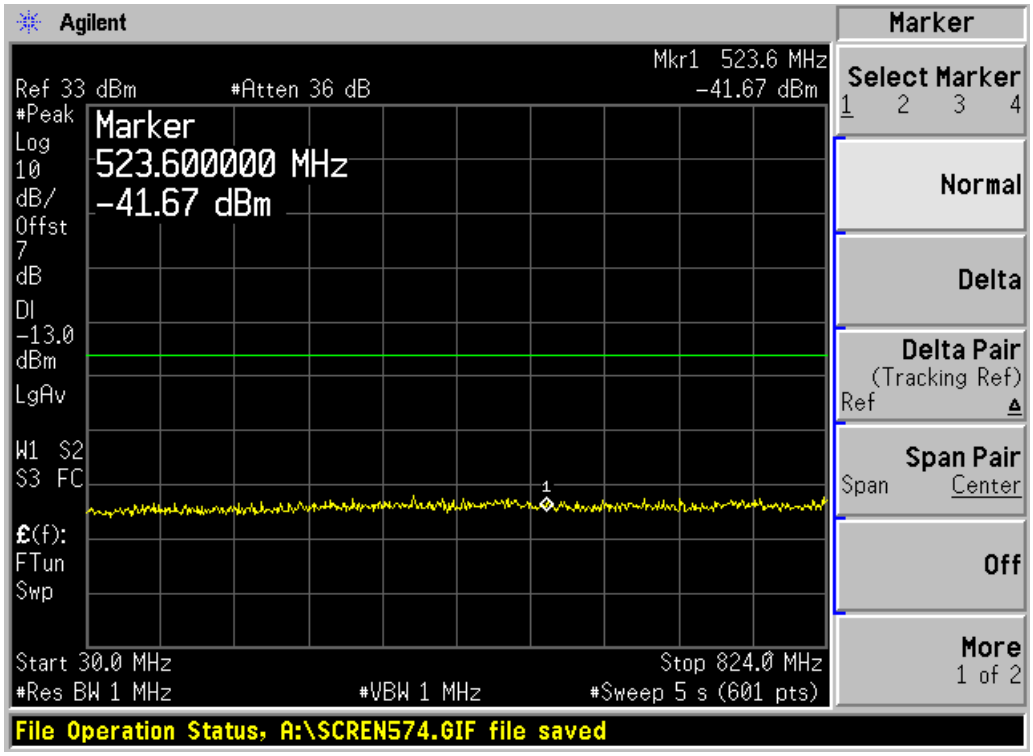


Channel 384, 824MHz~849MHz

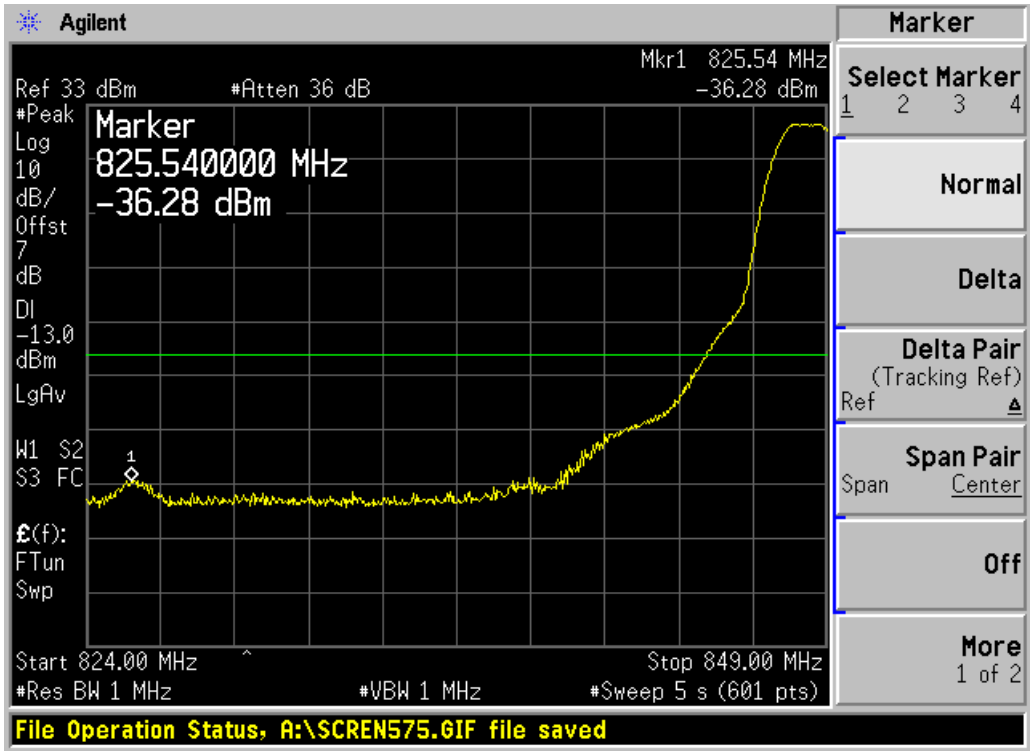
Note: The signal beyond the limit is carrier.



Channel 384, 849MHz~9GHz

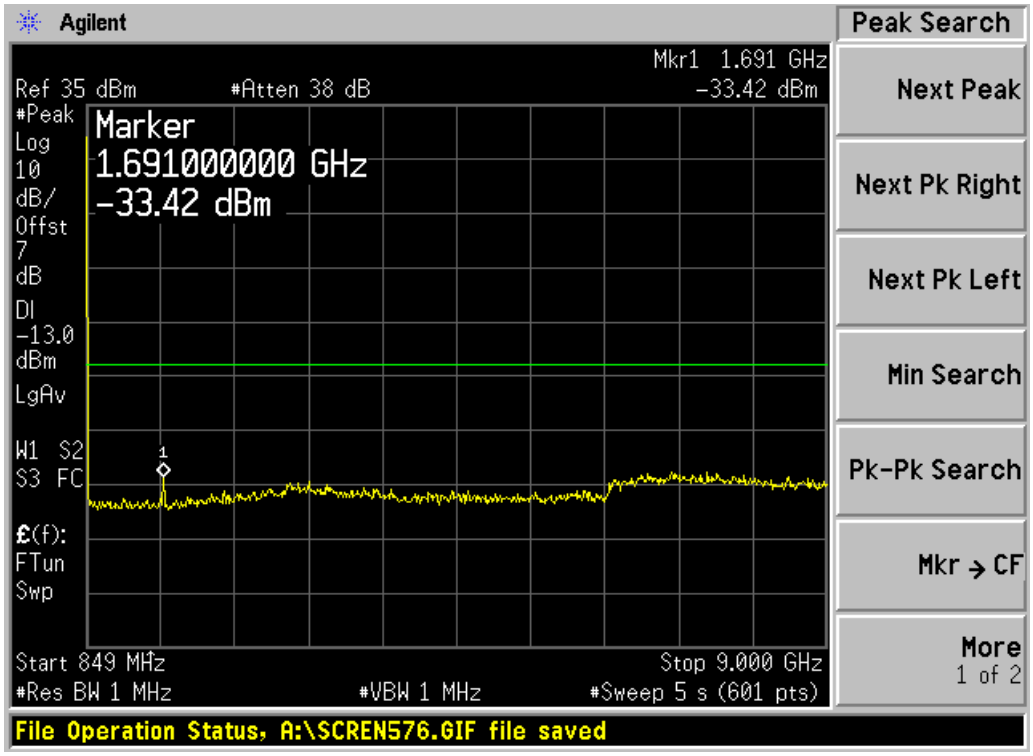


Channel 777, 30MHz~824MHz



Channel 777, 824MHz~849MHz

Note: The signal beyond the limit is carrier.



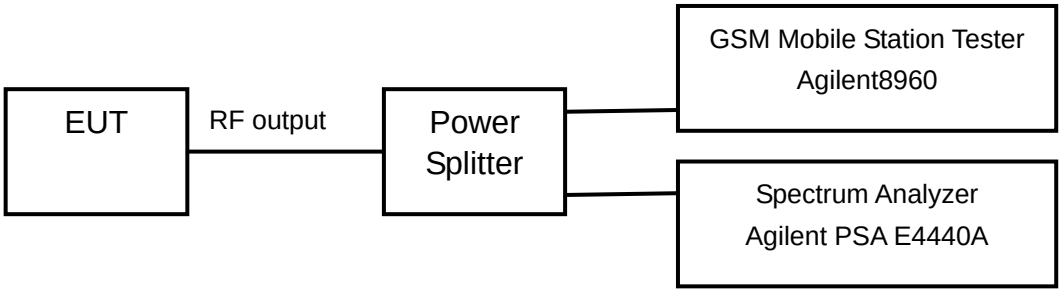
Channel 777, 849MHz~9GHz

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

Ambient condition:

Temperature	Relative humidity	Pressure
24°C	53%	101.9kPa

Test Setup:

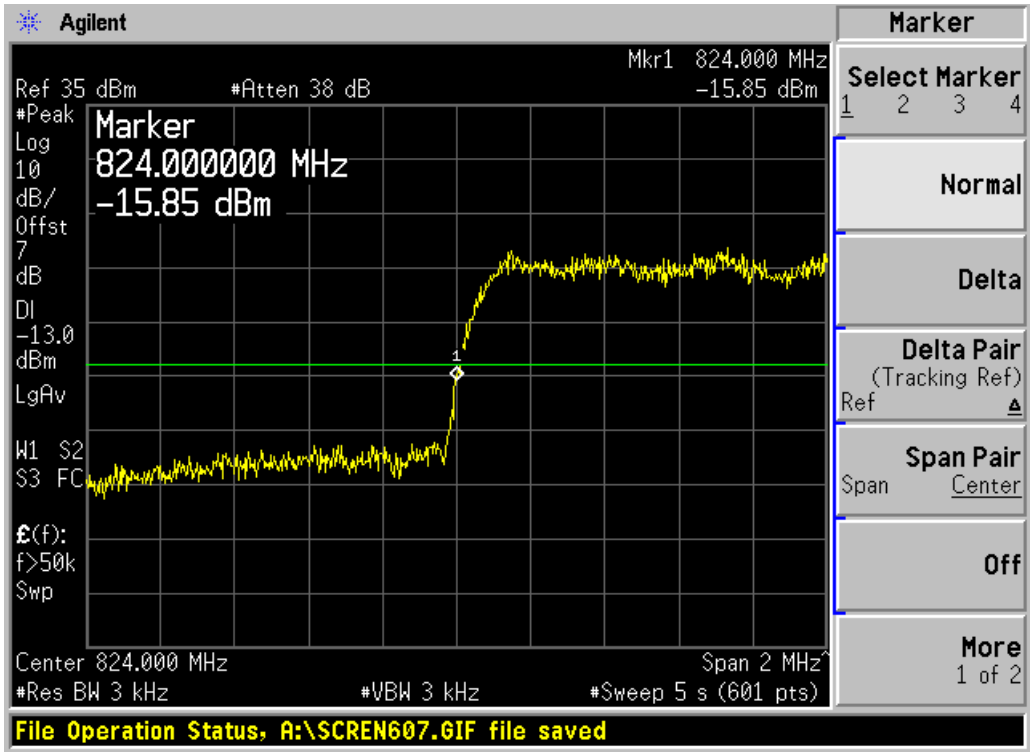


Test procedure:

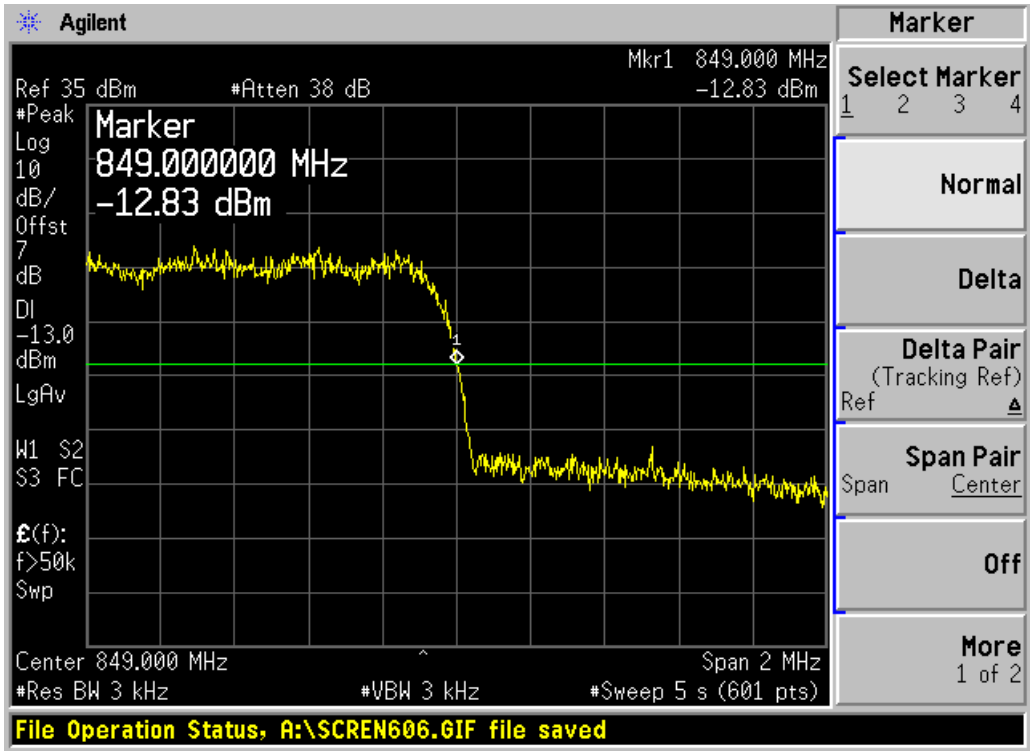
After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. The measurement is carried out using a spectrum analyzer. The peak detector is used and RBW is set to 3KHz on spectrum analyzer.
The measurement will be conducted at two channels No1013 and No777 (Bottom and top channels of CDMA800 band) in RETAP 12288K test mode.

Limits	≤-13dBm

Test result:
Refer to the following figures.



Channel 1013



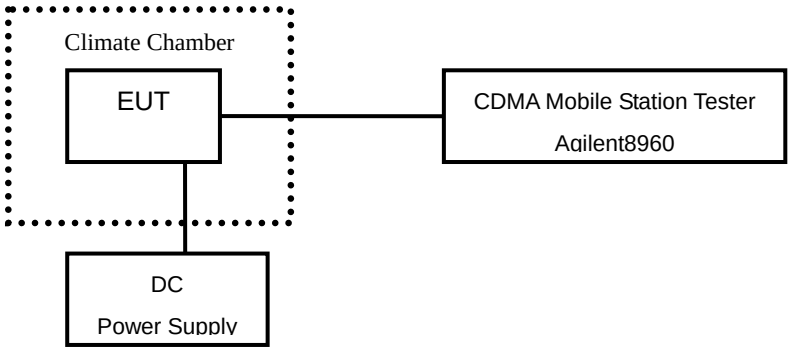
Channel 777

2.2.1.6 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 3.4 to 4.2 V. The measurement will be conducted at three channels No1013, No384 and No777 (Bottom, middle and top channels of CDMA800 band) in RETAP 12288K test mode.

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

Test Result:

Temperature(° C)	Test Result (ppm)@3.8V		
	Channel 1013	Channel 384	Channel 777
-30	0.010	0.010	0.003
-20	0.002	0.003	0.003
-10	0.000	0.000	0.000
0	0.001	0.001	0.007
+10	0.001	0.001	0.000
+20	0.003	0.003	0.011
+30	0.001	0.001	0.001
+40	0.001	0.001	0.011
+50	0.003	0.002	0.002

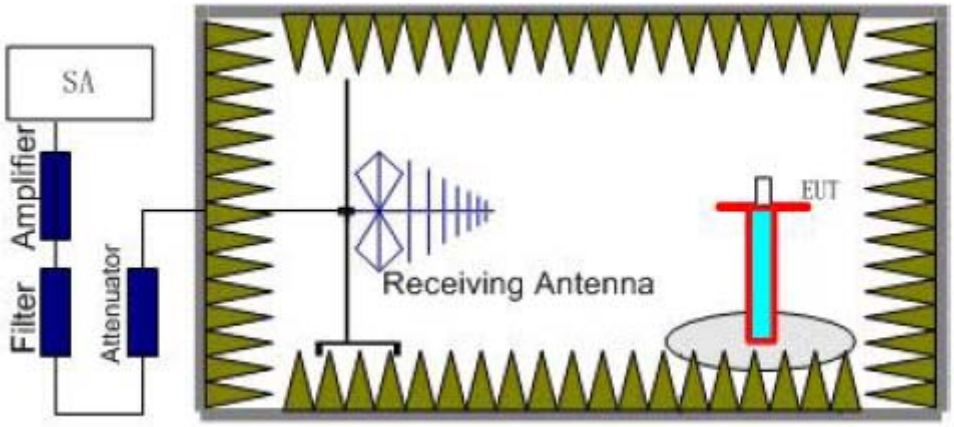
Voltage (V)	Test Result (ppm)@20°C		
	Channel 1013	Channel 384	Channel 777
3.4	0.002	0.002	0.001
4.2	0.002	0.001	0.001

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

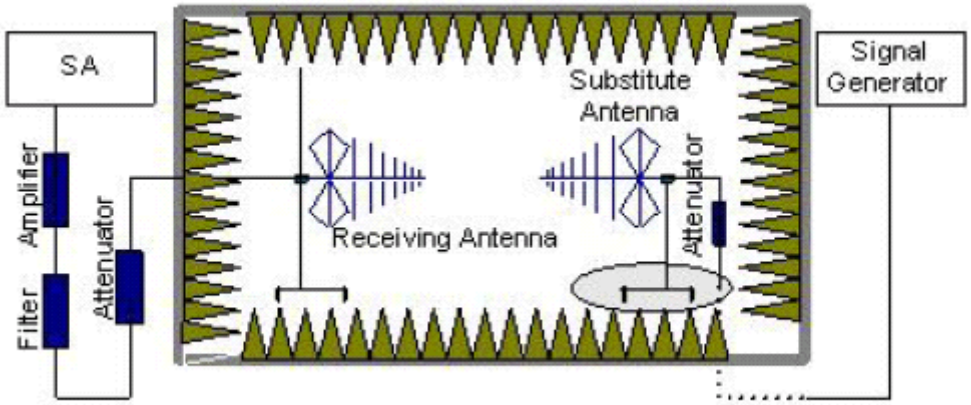
Ambient condition

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^{th} 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.

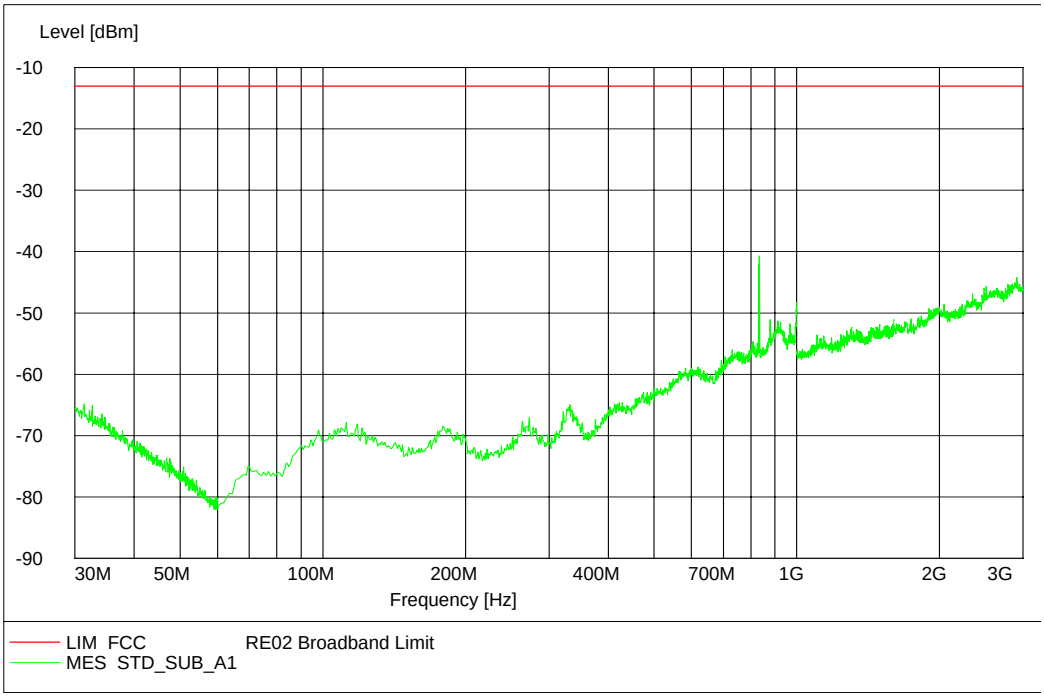
Calculation procedure:
The data of cable loss, antenna gain and air loss has been calibrated in full testing frequency range before the testing.

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_R: reading of the receiver (dBm)
L_C: Cable Lose (dB)
L_A: 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.
$P=P_R+L_C+L_A-G=-60+10+30-11=-31dBm$

The measurement will be conducted at one channel No384 (middle channel of CDMA CDMA800 band) in RETAP 12288K test mode.

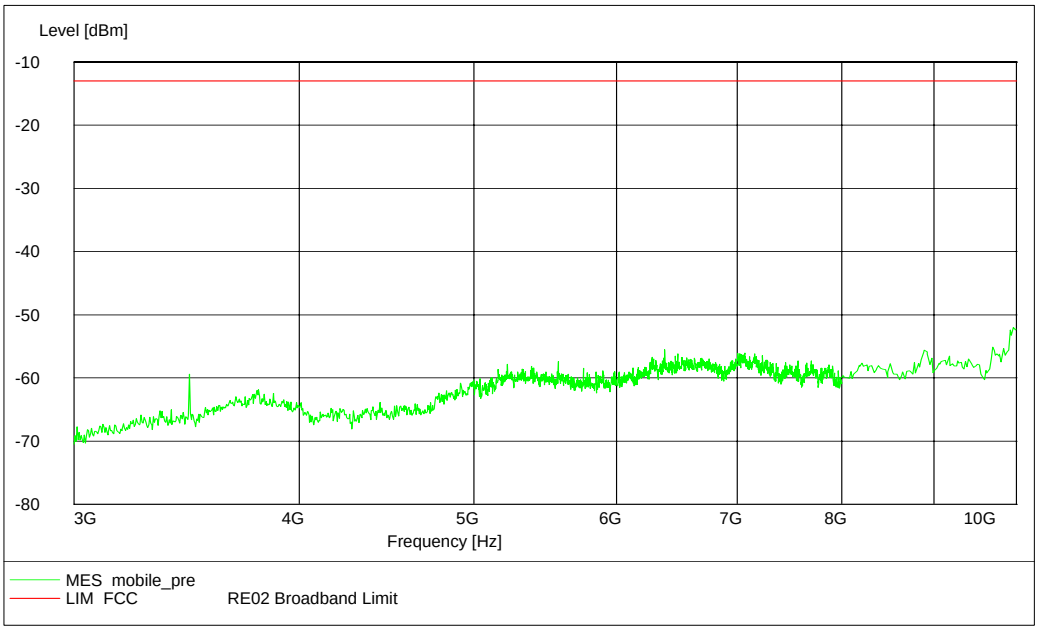
Limits	≤-13dBm

Test result:



Channel 384, 30MHz~3GHz

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



Channel 384, 3GHz~10GHz

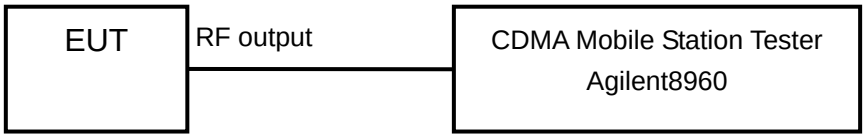
2.2.2 PCS1900

2.2.2.1 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 No25, No600 and No1175 (Bottom, middle and top channels of PCS1900 band)

Limits	≤30dBm

Test result:

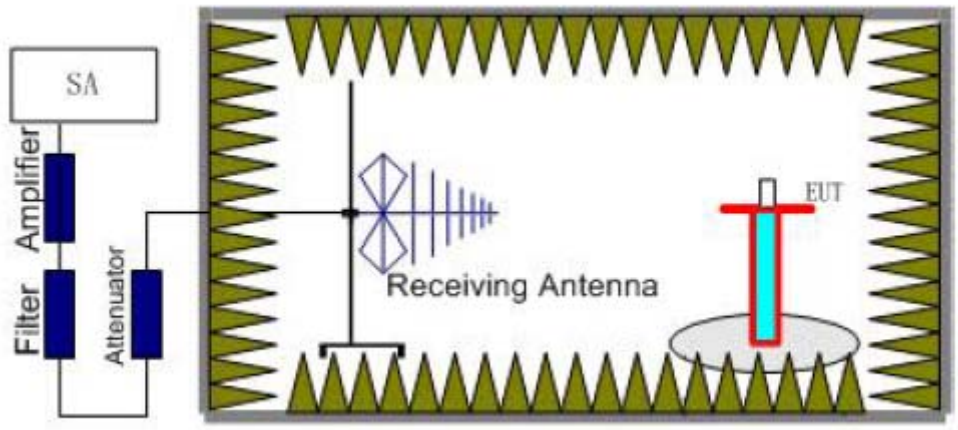
Carrier frequency (MHz)	Channel No.	Test Mode	RF Power Output (dBm)
1851.25	25	RC1/SO2	24.4
		RC1/SO55	24.4
		RC3/SO2	24.5
		RC3/SO55	24.5
		RC3/SO32	24.5
		RTAP 9.6K	24.4
		RTAP 38.4K	24.4
		RTAP153.6K	24.4
		RETAP 128K	24.5
		RETAP 2048K	24.6
		RETAP 4096K	24.7
		RETAP 12288K	**24.7**
1880.00	600	RC1/SO2	24.0
		RC1/SO55	24.0
		RC3/SO2	24.0
		RC3/SO55	24.0
		RC3/SO32	24.0
		RTAP 9.6K	24.3
		RTAP 38.4K	24.3
		RTAP153.6K	24.2
		RETAP 128K	24.3
		RETAP 2048K	24.3
		RETAP 4096K	24.4
		RETAP 12288K	**24.4**
1908.75	1175	RC1/SO2	23.7
		RC1/SO55	23.6
		RC3/SO2	23.6
		RC3/SO55	23.7
		RC3/SO32	23.7
		RTAP 9.6K	23.8
		RTAP 38.4K	23.8
		RTAP153.6K	23.9
		RETAP 128K	24.2
		RETAP 2048K	24.0
		RETAP 4096K	24.0
		RETAP 12288K	**24.2**

2.2.2.2 Effective Isotropic Radiated Power-FCC part 24.232(c)

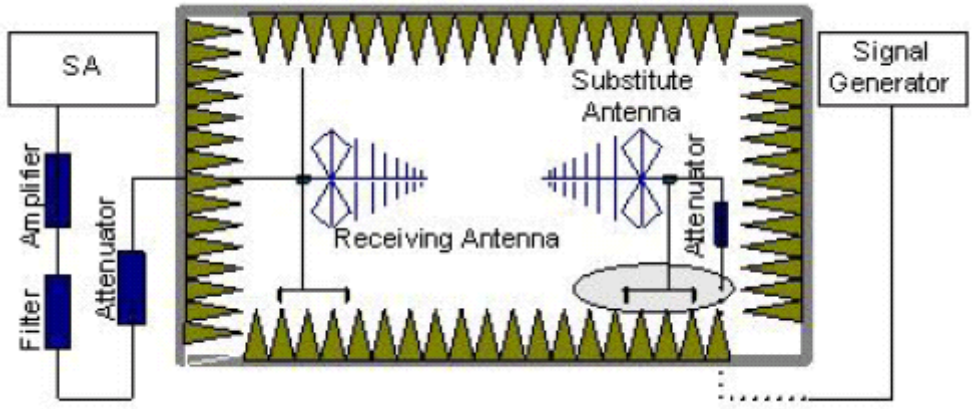
Ambient condition:

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 No25, No600 and No1175 (Bottom, middle and top channels of PCS1900 band) in RETAP 12288K test mode.

Limits	≤38.5dBm

Test result:

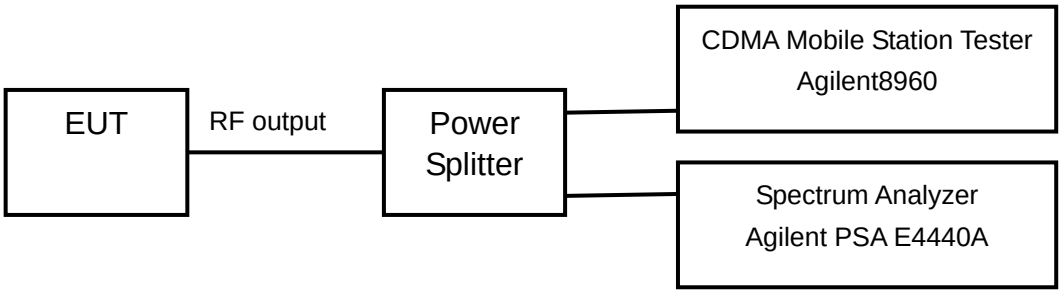
Carrier frequency (MHz)	Channel No.	Test Mode	E.I.R.P. (dBm)
1851.25	25	RETAP 12288K	21.6
1880.00	600	RETAP 12288K	20.1
1908.75	1175	RETAP 12288K	20.4

2.2.2.3 Occupied Bandwidth-FCC Part2.1049

Ambient condition:

Temperature	Relative humidity	Pressure
24°C	53%	101.9kPa

Test Setup:



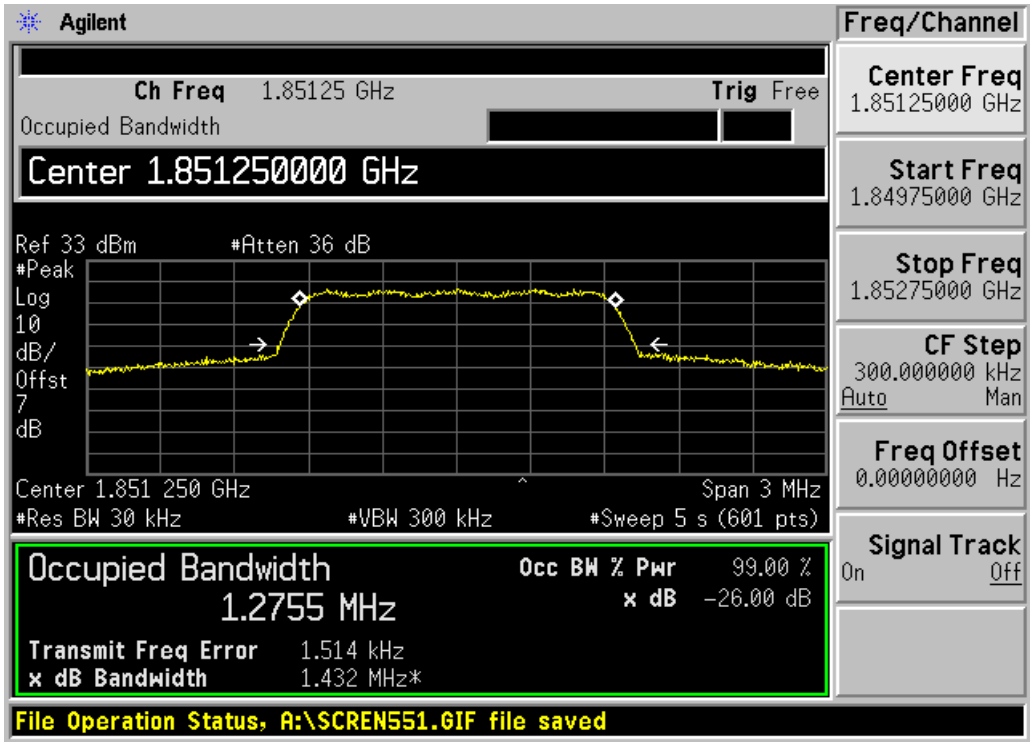
Test procedure:

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 No25, No600 and No1175 (Bottom, middle and top channels of PCS1900 band) in RETAP 12288K test mode.

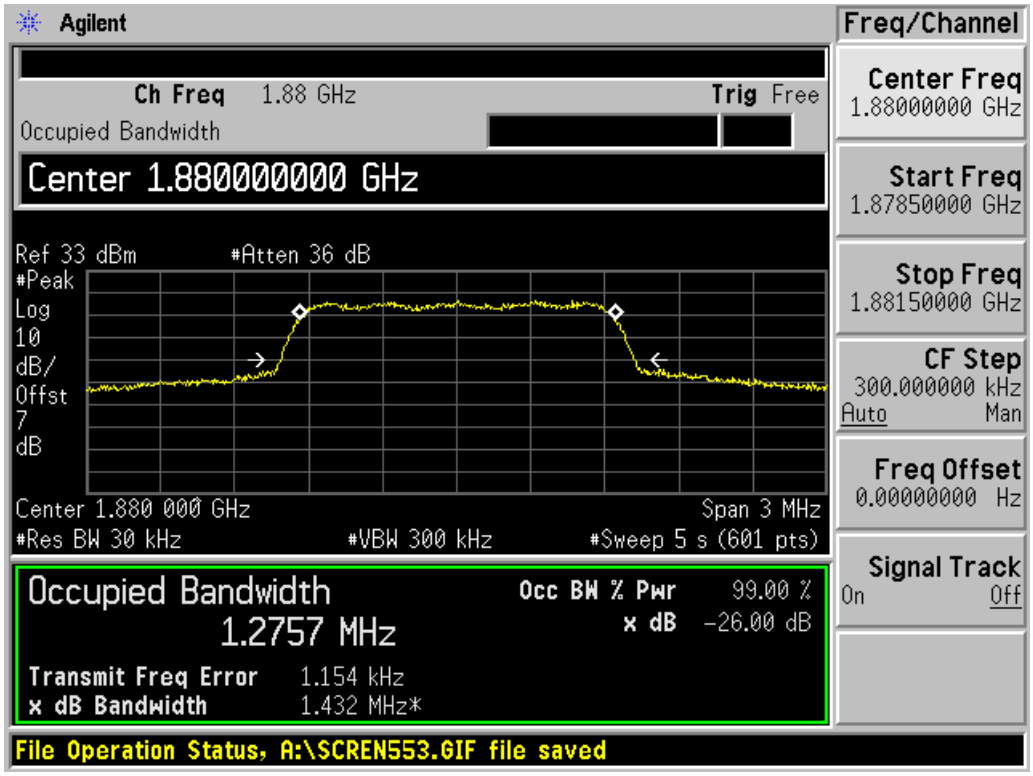
Limits: No specific occupied bandwidth requirements in part 2.1049

Test result:

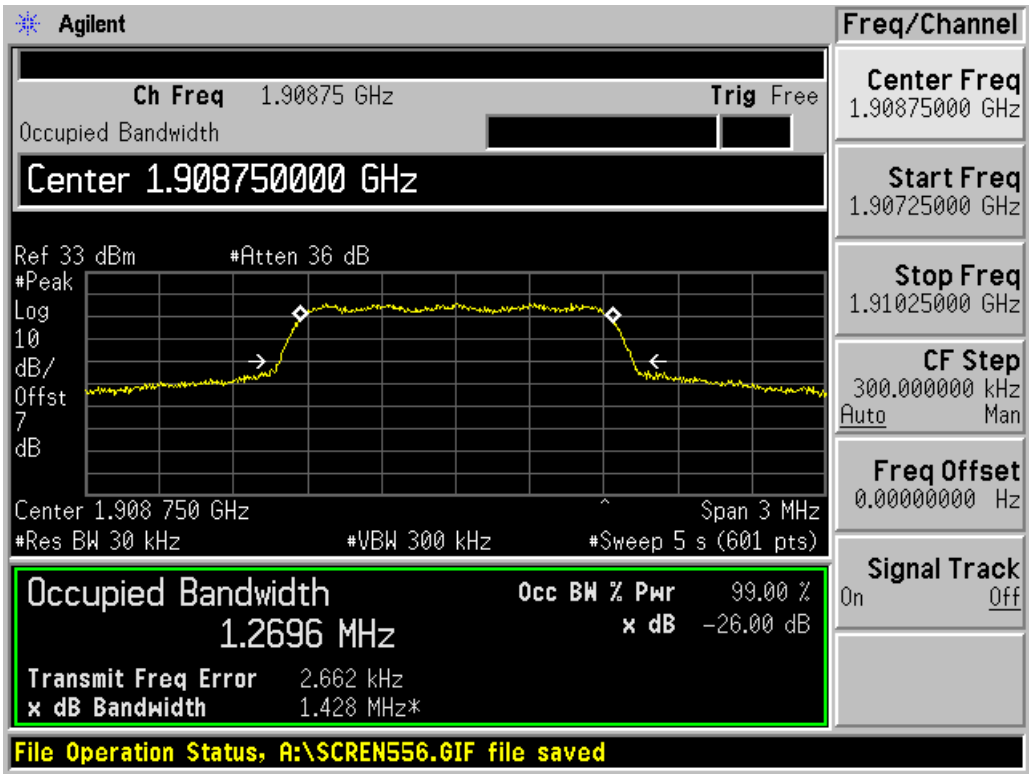
Carrier frequency (MHz)	Channel No.	Test Mode	Bandwidth of 99% Power (MHz)
1851.25	25	RETAP 12288K	1.2760
1880.00	600	RETAP 12288K	1.2812
1908.75	1175	RETAP 12288K	1.2743



Channel 25



Channel 600



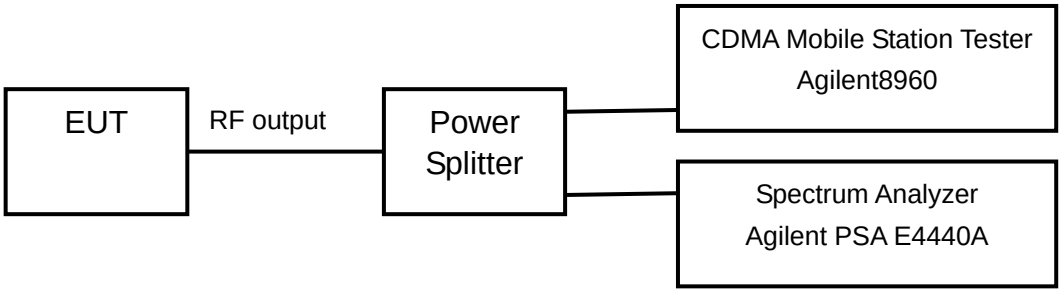
Channel 1175

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

Ambient condition:

Temperature	Relative humidity	Pressure
24°C	53%	101.9kPa

Test Setup:

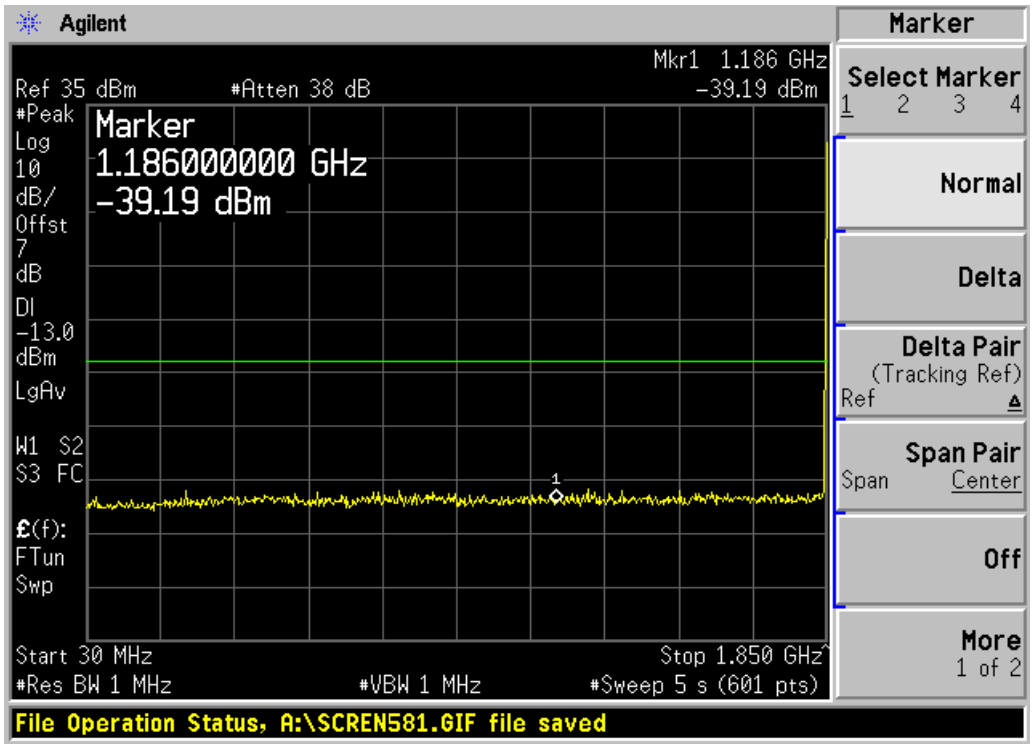


Test procedure:

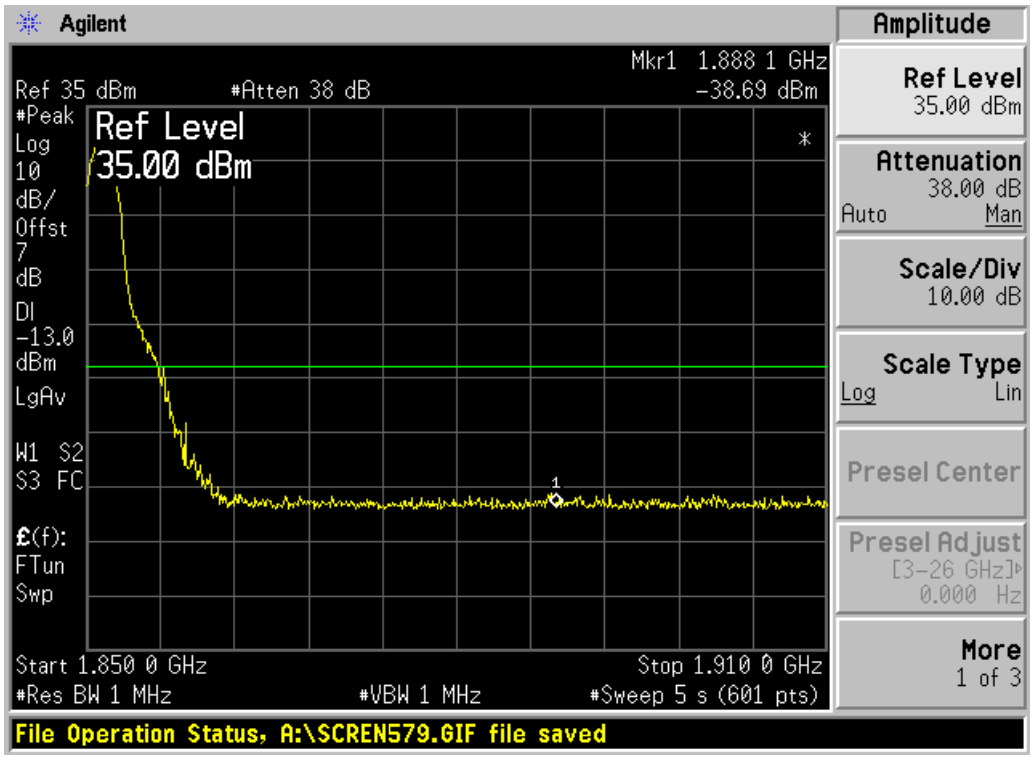
After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 30MHz to 20GHz (higher than the 10^{th} 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 No25, No600 and No1175 (Bottom, middle and top channels of PCS1900 band) in RETAP 12288K test mode.

Limits	≤-13dBm

Test result:
Refer to the following figures.

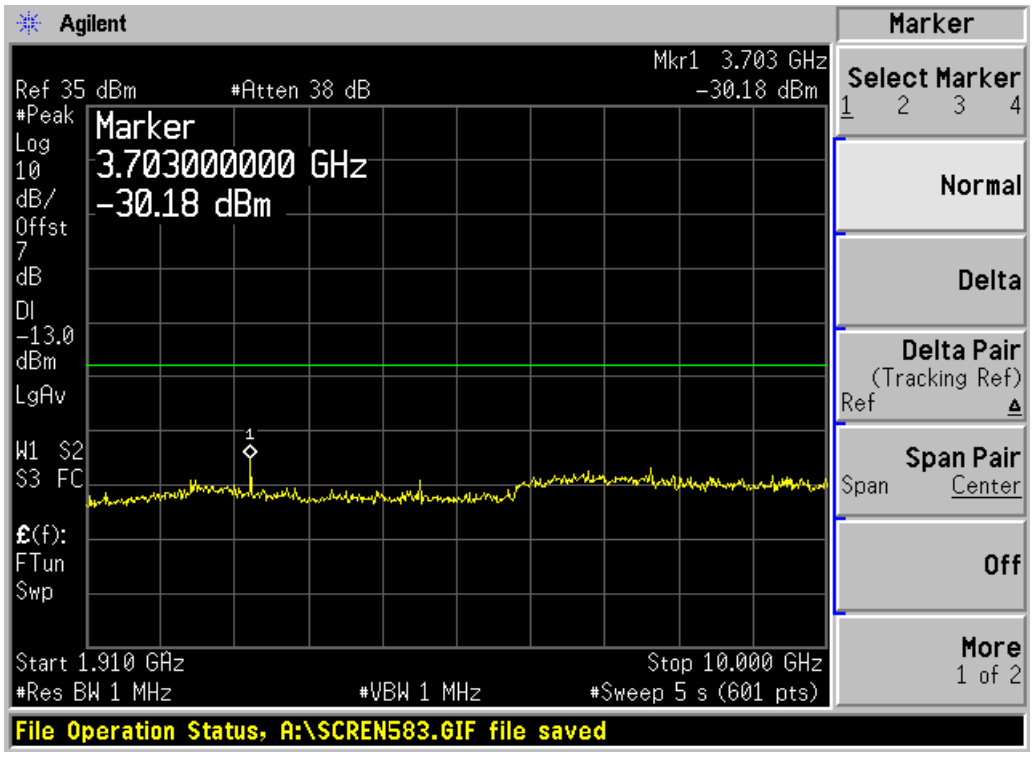


Channel 25, 30MHz~1.85GMHz

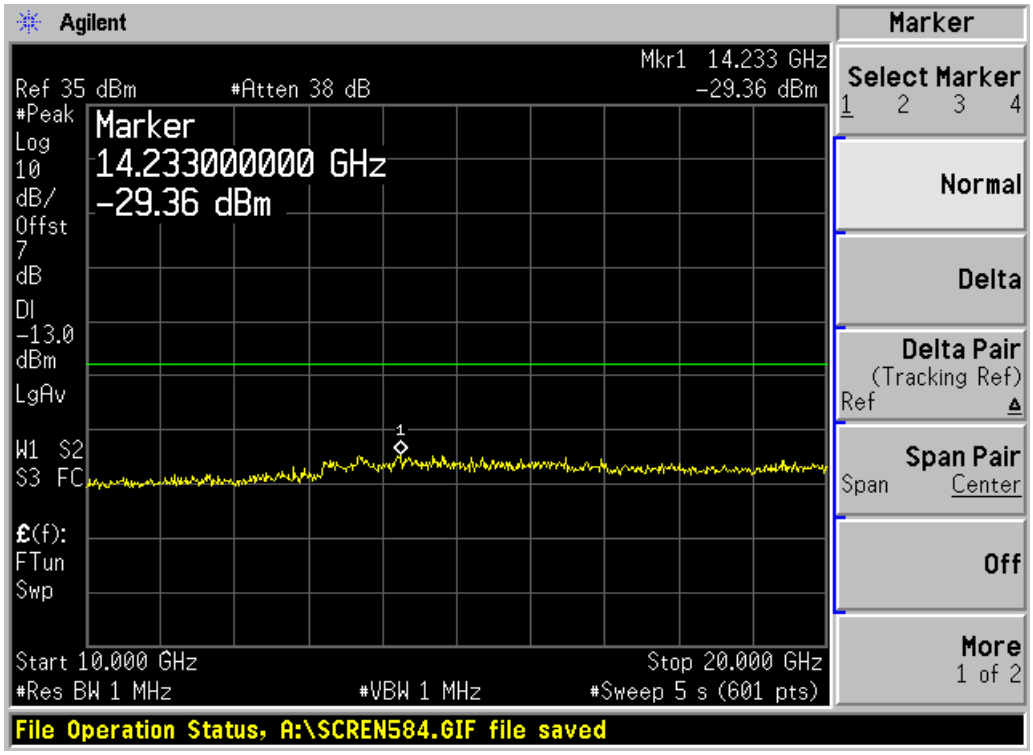


Channel 25, 1.85GHz~1.91GHz

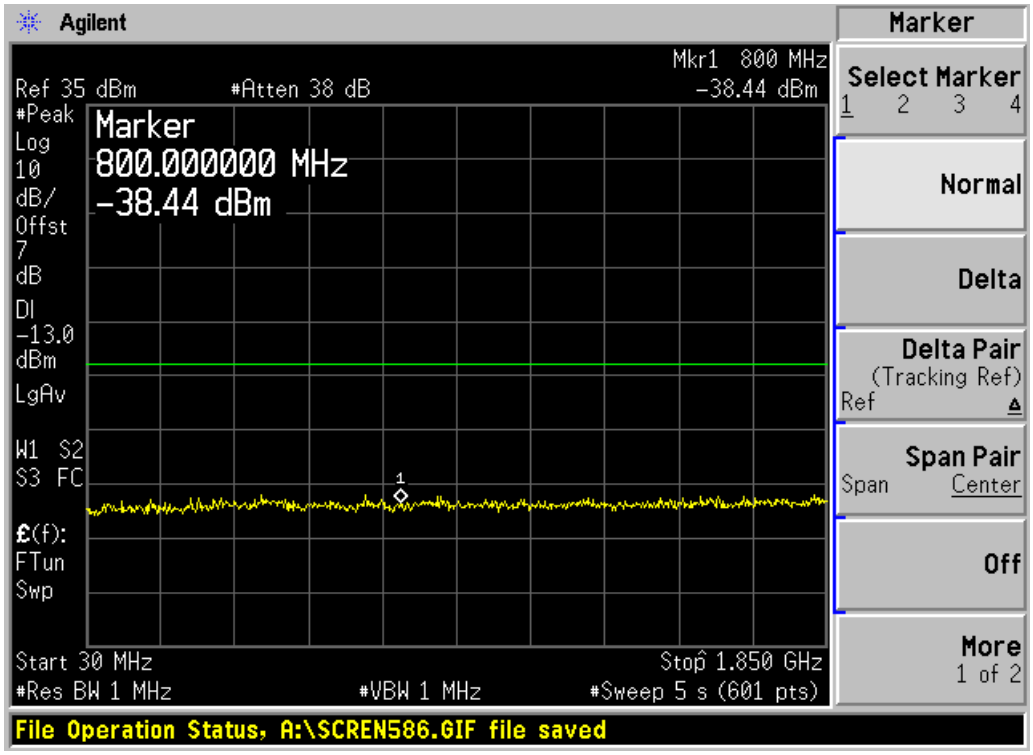
Note: The signal beyond the limit is carrier.



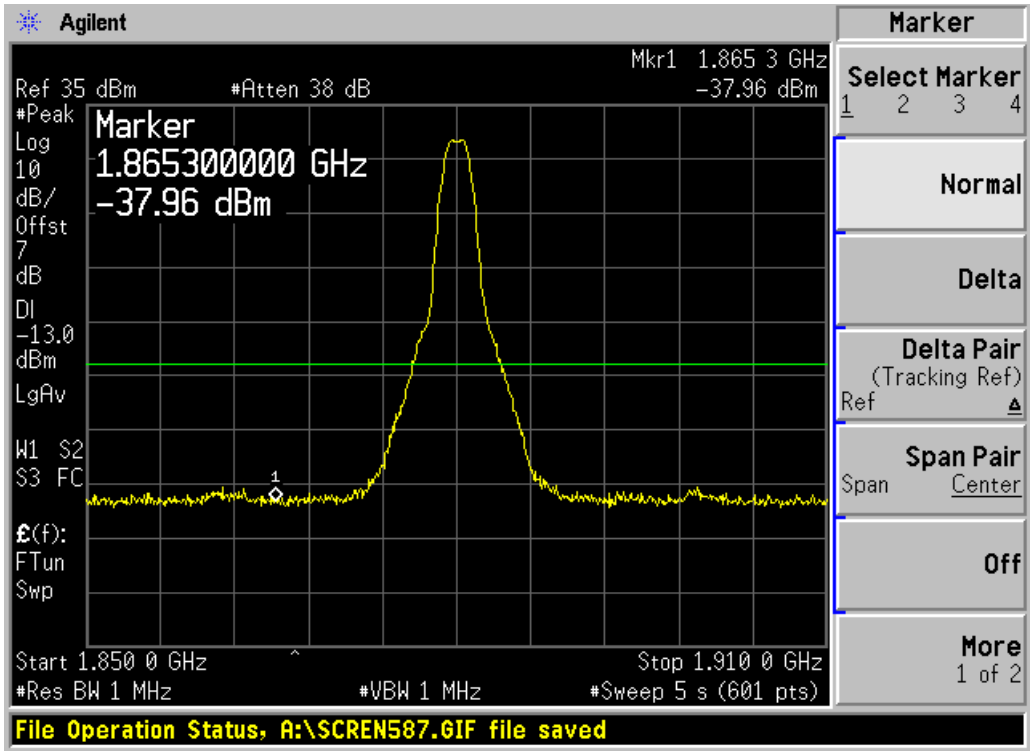
Channel 25, 1.91GHz~10GHz



Channel 25, 10GHz~20GHz

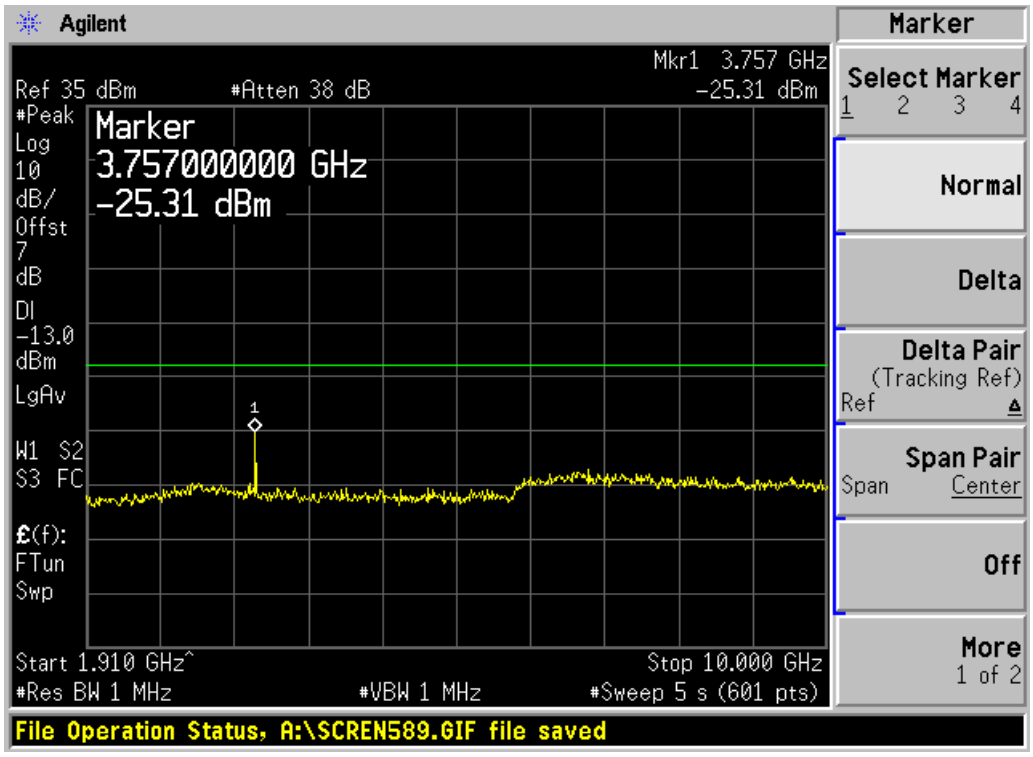


Channel 600, 30MHz~1.85GHz

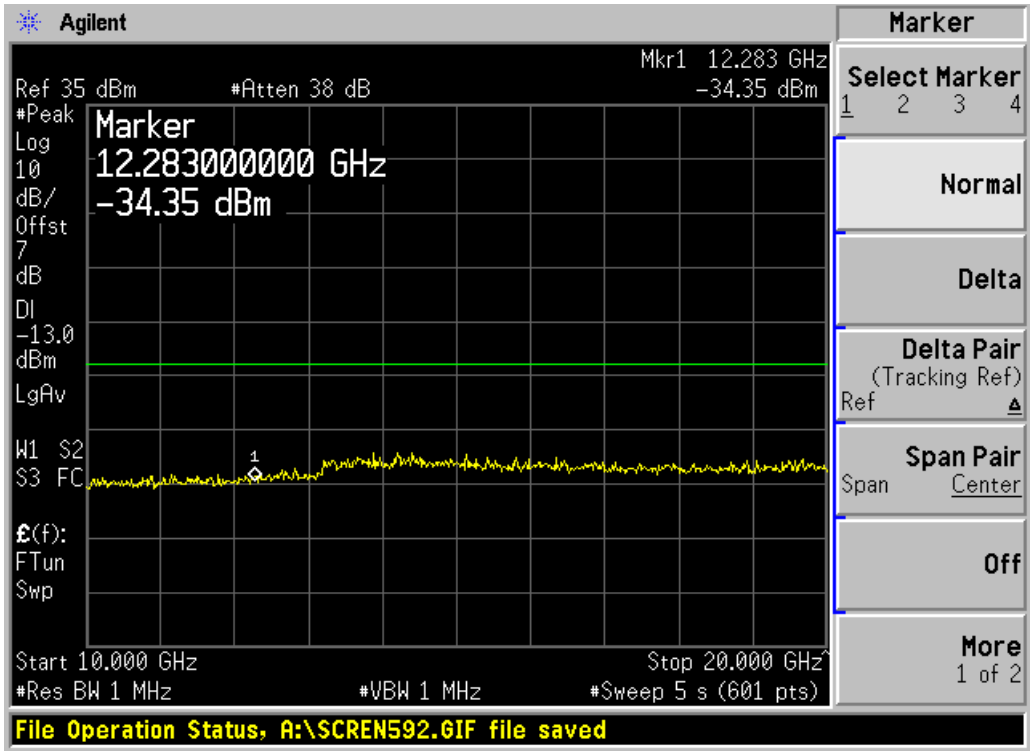


Channel 600, 1.85GHz~1.91GHz

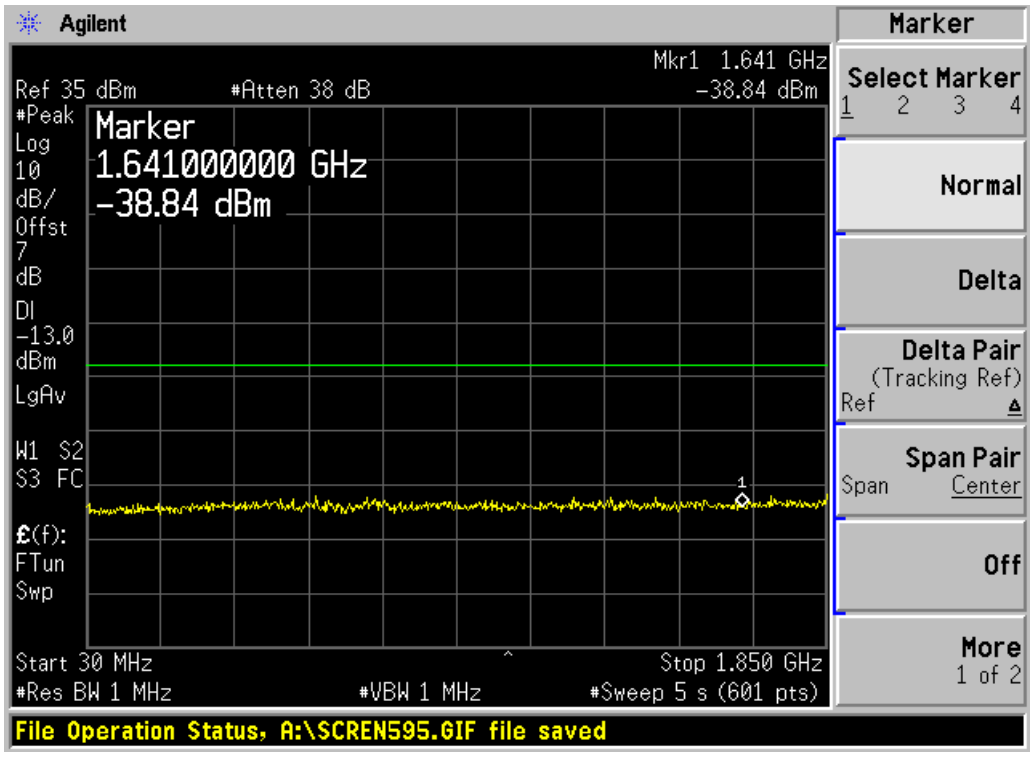
Note: The signal beyond the limit is carrier.



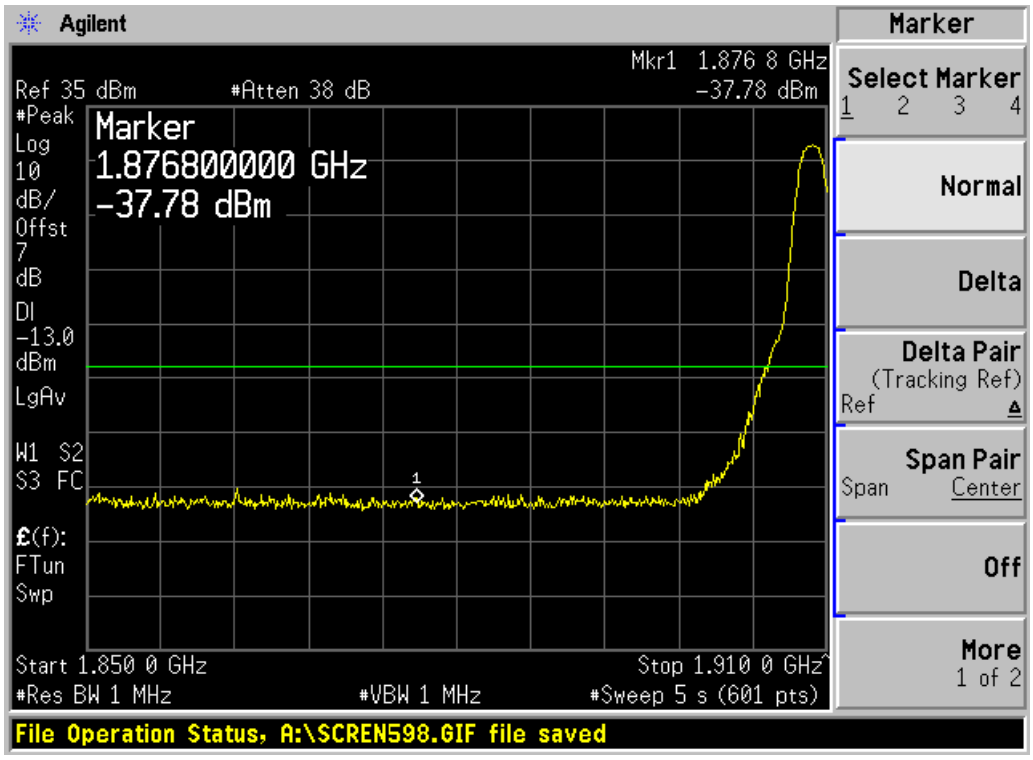
Channel 600, 1.91GHz~10GHz



Channel 600, 10GHz~20GHz

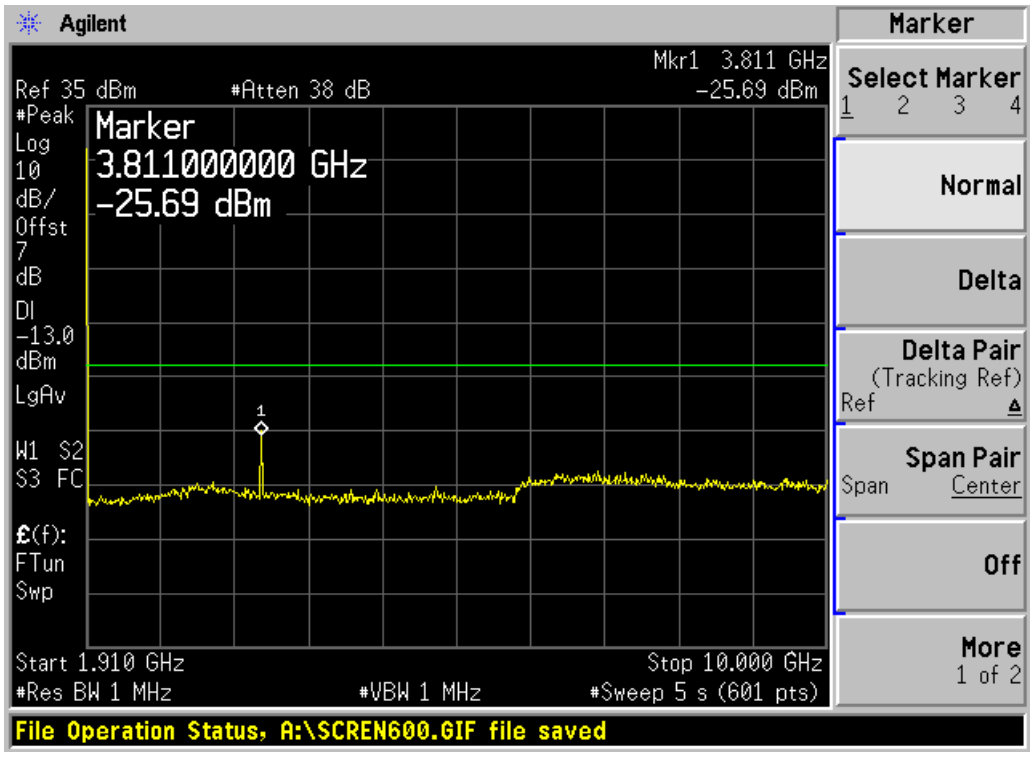


Channel 1175, 30MHz~1.85GHz

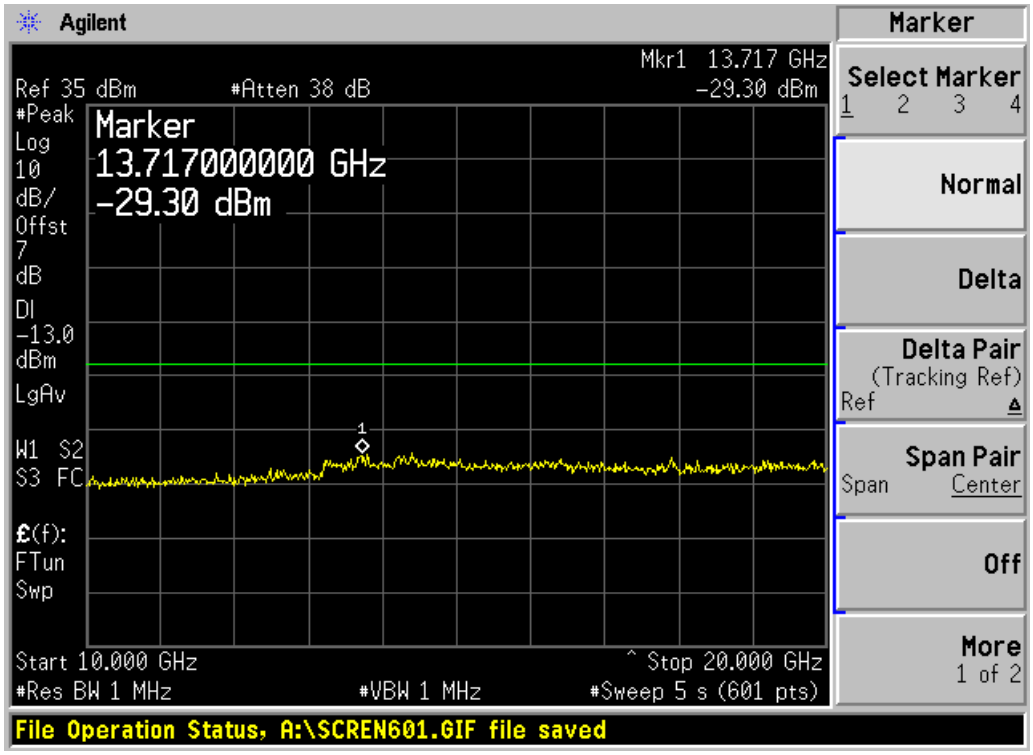


Channel 1175, 1.85GHz~1.91GHz

Note: The signal beyond the limit is carrier.



Channel 1175, 1.91GHz~10GHz



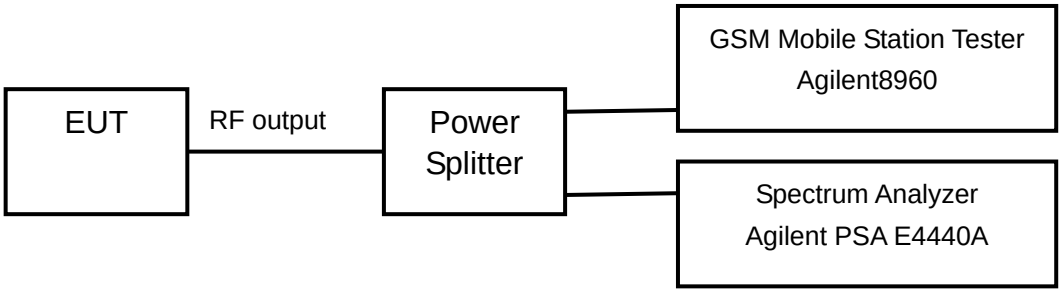
Channel 1175, 10GHz~20GHz

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

Ambient condition:

Temperature	Relative humidity	Pressure
24°C	53%	101.9kPa

Test Setup:

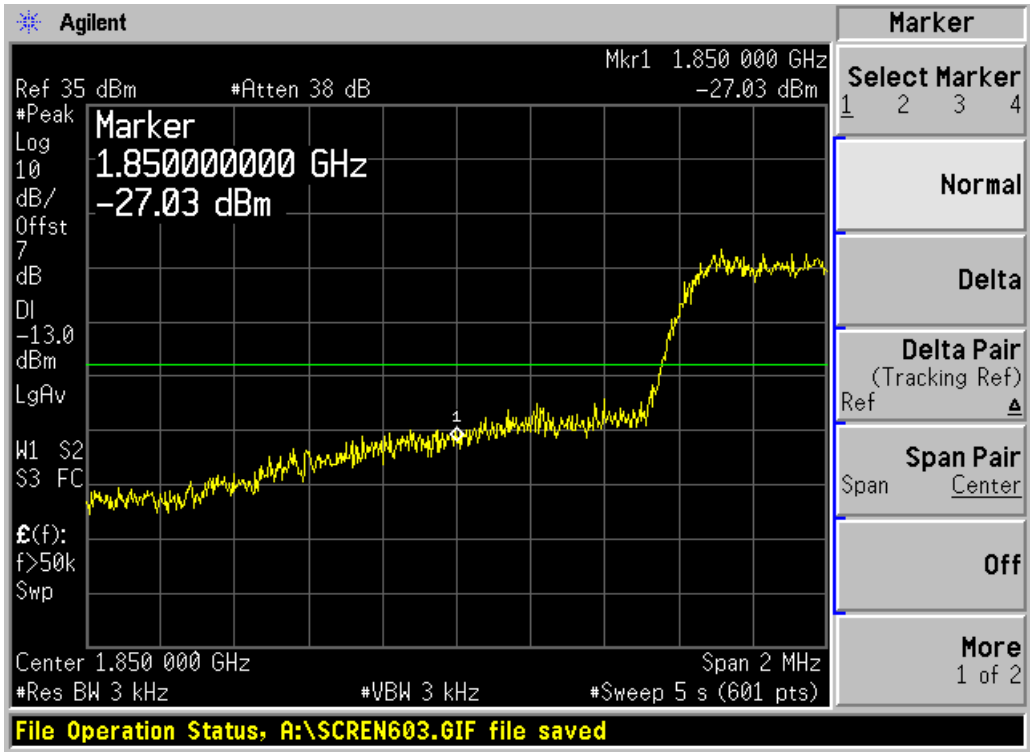


Test procedure:

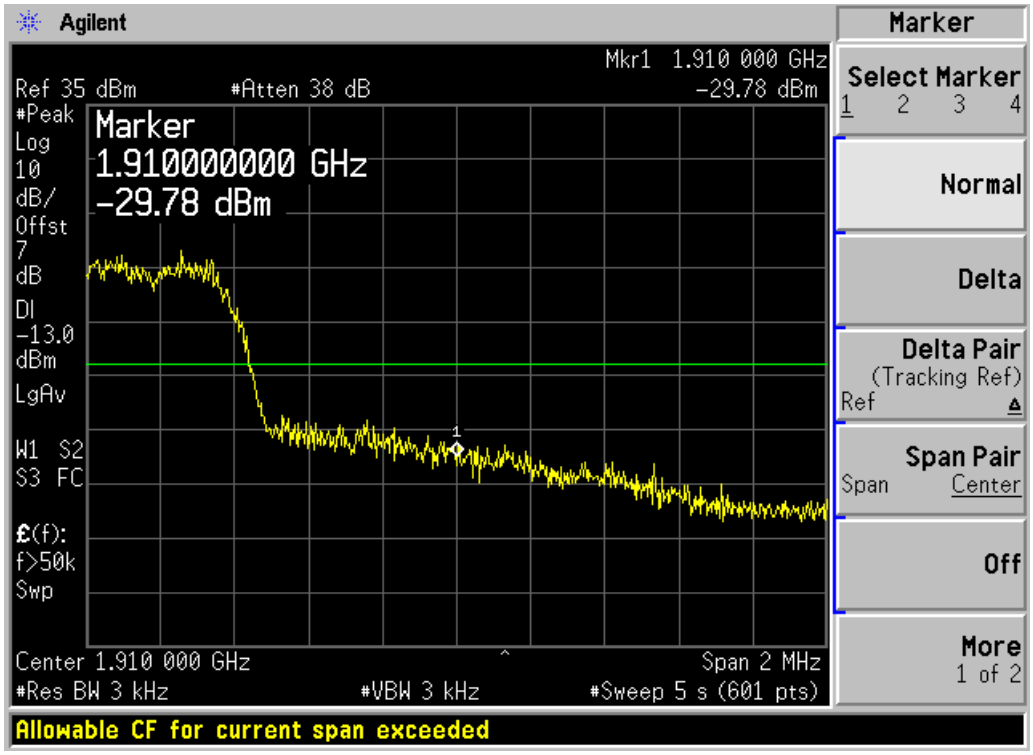
After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. The measurement is carried out using a spectrum analyzer. The peak detector is used and RBW is set to 3KHz on spectrum analyzer.
The measurement will be conducted at two channels No25 and No1175 (Bottom and top channels of PCS1900 band) in RETAP 12288K test mode.

Limits	≤-13dBm

Test result:
Refer to the following figures.



Channel 25



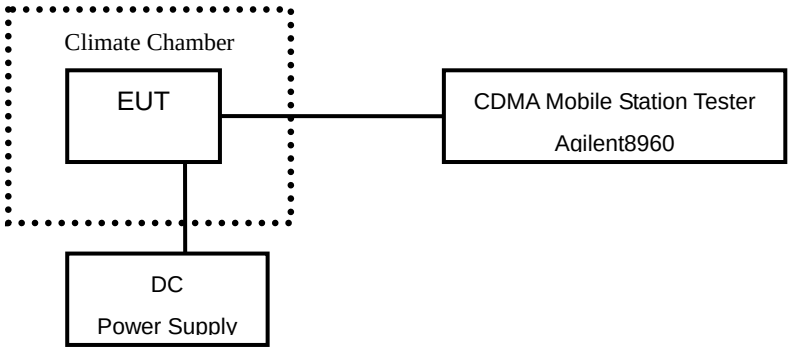
Channel 1175

2.2.2.6 Frequency Stability-FCC Part2.1055/24.235

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 3.4 to 4.2 V. The measurement will be conducted at three channels No25, No600 and No1175 (Bottom, middle and top channels of PCS1900 band) in RETAP 12288K test mode.

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

Test Result:

Temperature(° C)	Test Result (ppm)@3.8V		
	Channel 25	Channel600	Channel 1175
-30	0.004	0.006	0.004
-20	0.000	0.000	0.000
-10	0.004	0.001	0.001
0	0.001	0.001	0.000
+10	0.006	0.000	0.001
+20	0.003	0.002	0.001
+30	0.008	0.000	0.001
+40	0.001	0.001	0.000
+50	0.003	0.001	0.003

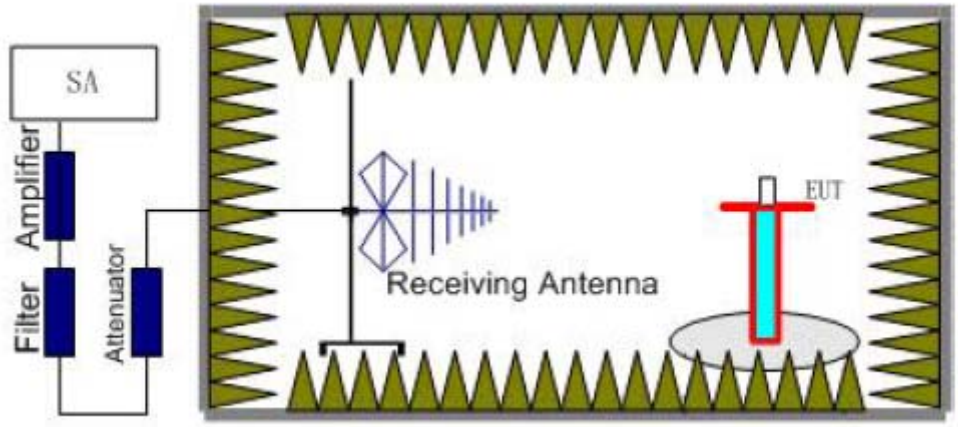
Voltage (V)	Test Result (ppm)@20°C		
	Channel 25	Channel 600	Channel1175
3.4	0.005	0.006	0.003
4.2	0.005	0.002	0.002

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

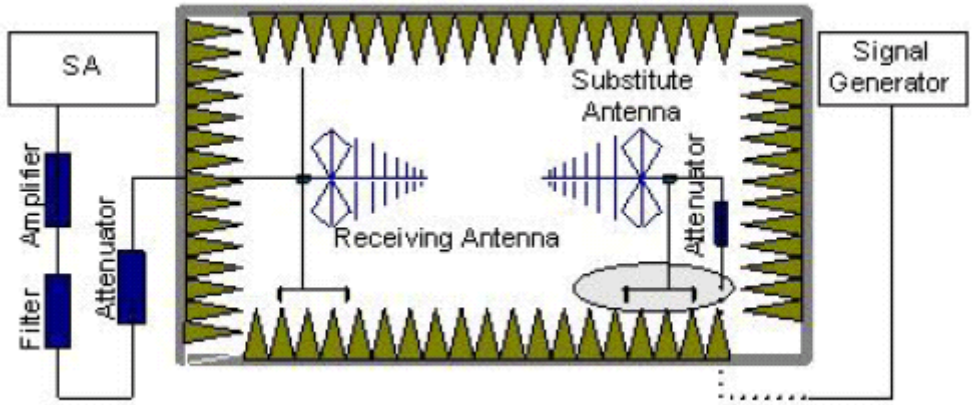
Ambient condition

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 10^{th} 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.

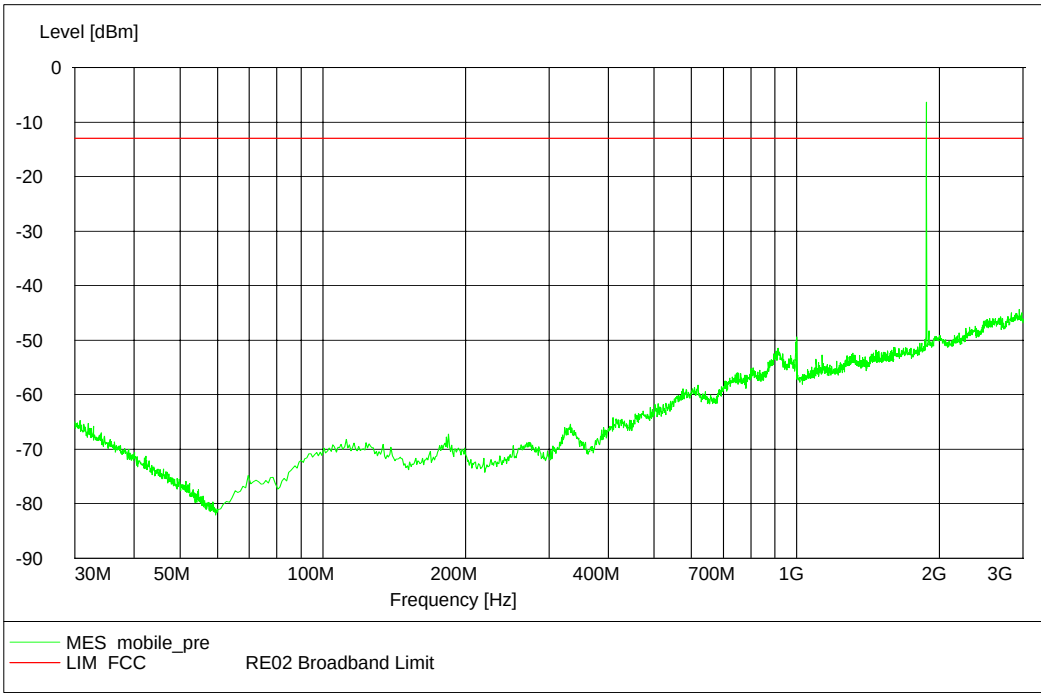
Calculation procedure:
The data of cable loss, antenna gain and air loss has been calibrated in full testing frequency range before the testing.

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_R: reading of the receiver (dBm)
L_C: Cable Lose (dB)
L_A: 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.
$P=P_R+L_C+L_A-G=-60+10+30-11=-31dBm$

The measurement will be conducted at one channel No600 (middle channel of PCS1900 band) in RETAP 12288K test mode.

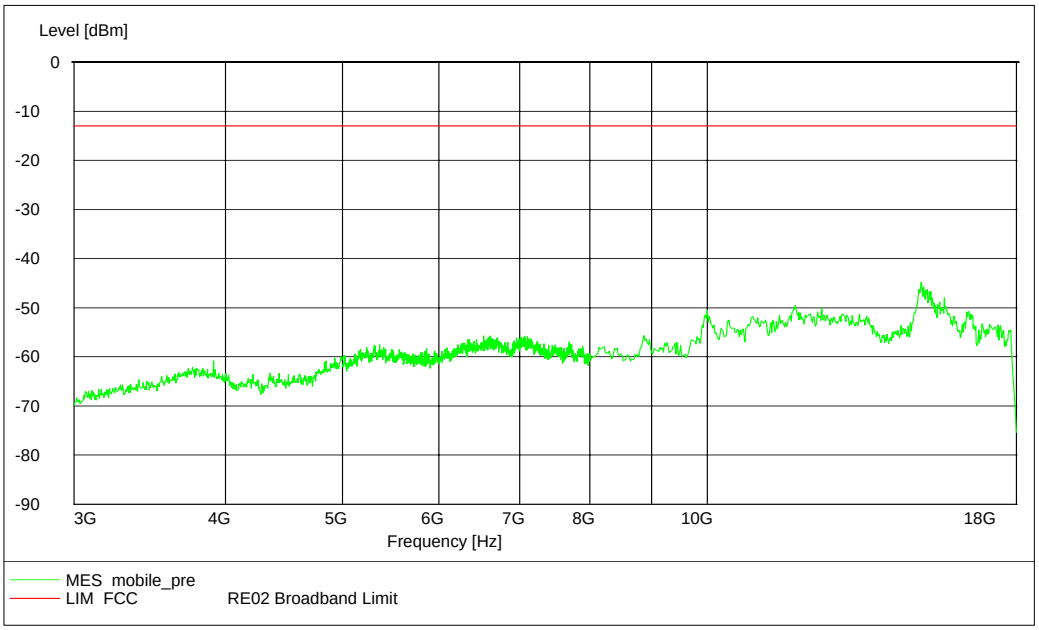
Limits	≤-13dBm

Test result:

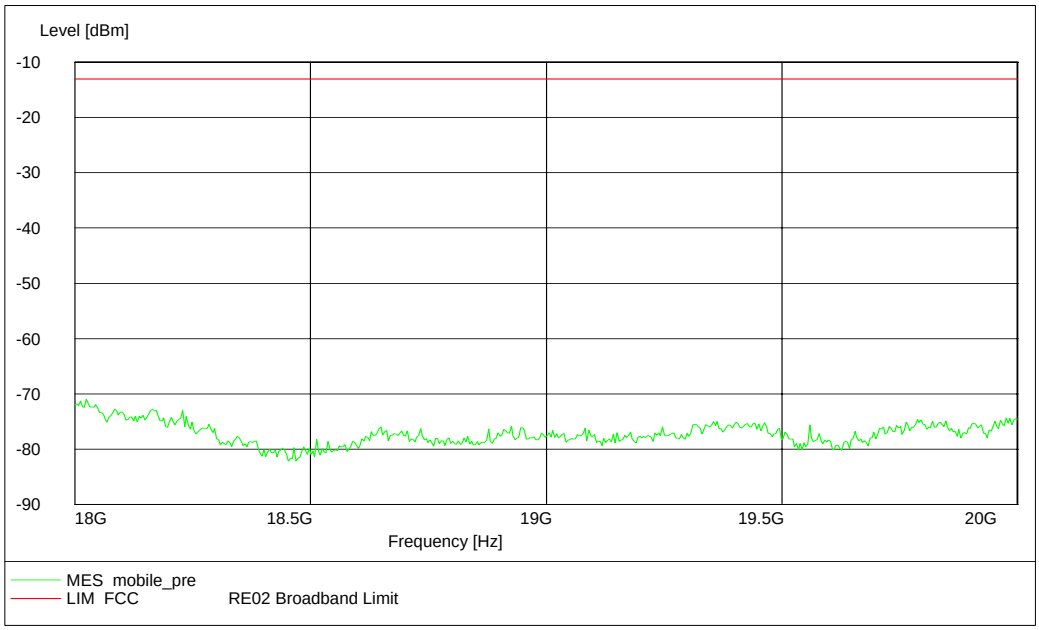


Channel 600, 30MHz~3GHz

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



Channel 600, 3GHz~18GHz



Channel 600, 18GHz~20GHz

2.3. List of test equipments

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

Appendix

Appendix1 Test Setup