DAT-P-174/04-00

CNAS L0447

Registration No.910917

TEST REPORT

Report No.: SRMC2009-H024-E0012

Product Name: GSM/GPRS/EDGE Tribands/WCDMA Digital Mobile Phone

Product Model: H31IA

Applicant: Inventec Appliances (Jiangning) Corporation

Manufacture: Inventec Appliances (Jiangning) Corporation

Specification: FCC Part 24E, Part 2 (October 1, 2008 edition)

FCC ID: UPMW310001

The State Radio Monitoring Center

State Radio Spectrum Monitoring and Testing Center

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

1.2 Information about the testing laboratory

Company: The State Radio Monitoring Center
State Radio Spectrum Monitoring and Testing Center
Address: No.80 Beilishi Road, Xicheng District, Beijing China
City: Beijing
Country or Region: China
Contacted person: Wang Junfeng
Tel +86 10 68009181 +86 10 68009202
Fax: +86 10 68009195 +86 10 68009205
Email: Wangjf@srrc.org.cn

1.3 Applicant's details

Company: Inventec Appliances (Jiangning) Corporation
Address 113, Jiangjun Road, Jiangning Economic and Technological Development Zone
City: Nanjing, Jiangsu
Country or Region: P.R.China
Grantee Code: UPM
Contacted person: William Zhang
Tel: +86 25 52262313
Fax: +86 25 52218366
Email: zhang.william@inventec-inc.com

1.4 Manufacturer's details

Company: Inventec Appliances (Jiangning) Corporation
Address 113, Jiangjun Road, Jiangning Economic and Technological Development Zone
City: Nanjing, Jiangsu
Country or Region: P.R.China
Grantee Code: UPM
Contacted person: William Zhang
Tel: +86 25 52262313
Fax: +86 25 52218366
Email: zhang.william@inventec-inc.com

1.5 Application details

Date of reception of test sample: 1st July 2009
Date of test: 1st July 2009 to 5th Aug 2009

1.6 Reference specification

FCC Part 24E, Part 2 (October 1, 2008 edition)

1.7 Information of EUT

1.7.1 General information

Name of EUT	GSM/GPRS/EDGE Tribands /WCDMA Digital Mobile Phone
FCC ID	UPMW310001
Frequency range	Tx:1850~1910MHz Rx:1930~1990MHz
Rated output power	30.0dBm
E.I.R.P.	27.4dBm
Modulation type	GMSK/8PSK
Emission Designator	300KGXW/300KG7W
Duplex mode	FDD
Duplex spacing:	80MHz
Antenna type	Integral
Power Supply	Battery or charger
Rated Power Supply Voltage	3.7V
Extreme Temperature	Lowest: -30°C Highest: +50°C
Extreme Voltage	Minimum: 3.6V Maximum: 4.2V
HW Version	5A
SW Version	1.00

1.7.2 EUT details

Name	Model	IMEI
GSM/GPRS/EDGE Tribands /WCDMA Digital Mobile Phone	H31IA	355753030000003

1.7.3 Auxiliary equipment details

Equipment	Charger
Manufacturer	SHENZHEN ANTHIN POWER SUPPLY CO., LTD.
Model Number	APW305UB-03-06

Equipment	Battery
Manufacturer	Leung's commumnication & electric products(guangzhou) ltd.
Model Number	PBH31IAZ10
Capacity	820mAh
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 Isotropic Radiated Power	24.232(c)	Pass
3	Occupied Bandwidth,	2.1049	Pass
4	Spurious Emissions at antenna terminals	2.1051/24.238(a)	Pass
5	Band Edges Compliance	2.1051/24.238(a)	Pass
6	Frequency Stability	2.1055/24.235	Pass
7	Radiated Spurious Emissions	2.1053/24.238(a)	Pass

This Test Report Is Issued by: Mr. Song Qizhu, Director of the test lab	Checked by:
Tested by:	Issued date: **2009.8.27**

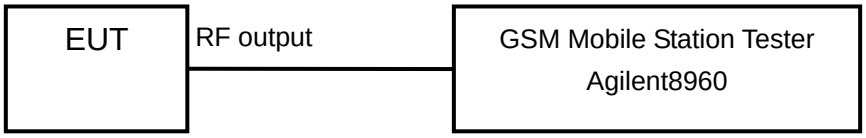
2.2 Test result

2.2.1 RF Power Output-FCC Part2.1046

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	52%	101.3kPa

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/GPRS MODE：

Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
1850.2	512	28.6
1880.0	661	28.9
1909.8	810	28.7

EDGE MODE：

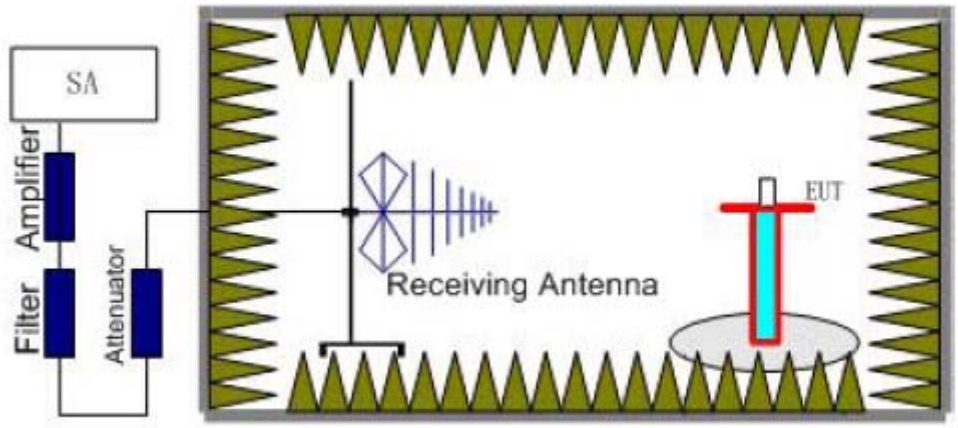
Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
1850.2	512	25.3
1880.0	661	25.5
1909.8	810	25.3

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

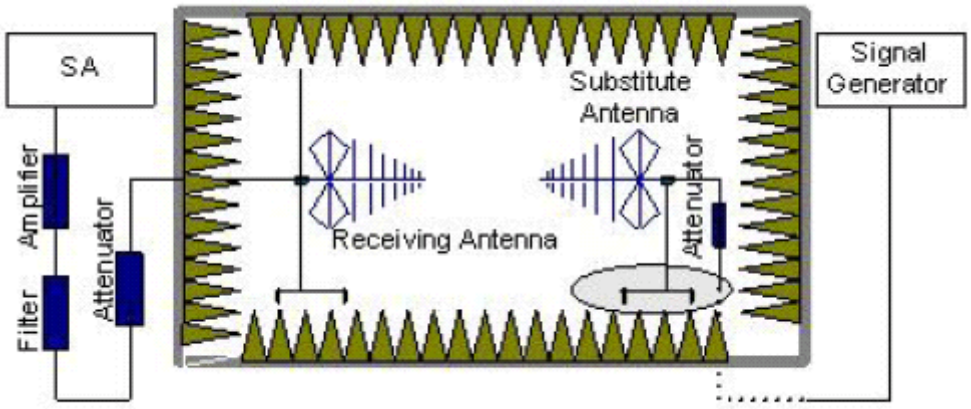
Ambient condition:

Temperature	Relative humidity	Pressure
23°C	52%	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	≤33dBm

Test result:

GSM/GPRS MODE：

Carrier frequency (MHz)	Channel No.	E.I.R.P. (dBm)
1850.2	512	27.2
1880.0	661	27.1
1909.8	810	27.4

EDGE MODE：

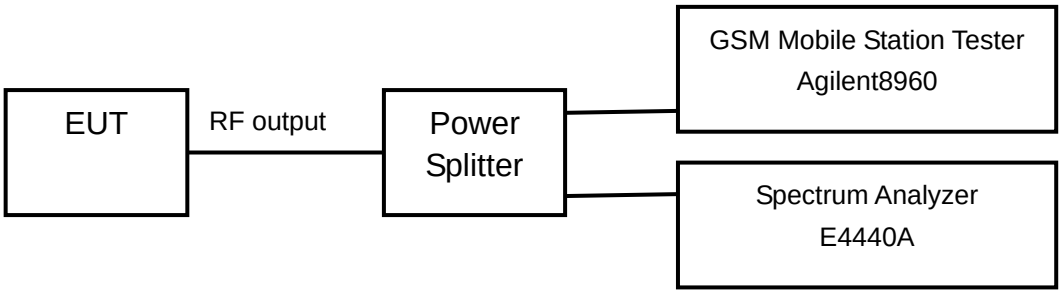
Carrier frequency (MHz)	Channel No.	E.I.R.P. (dBm)
1850.2	512	24.3
1880.0	661	23.8
1909.8	810	23.9

2.2.3 Occupied Bandwidth-FCC Part2.1049

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	52%	101.3kPa

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:

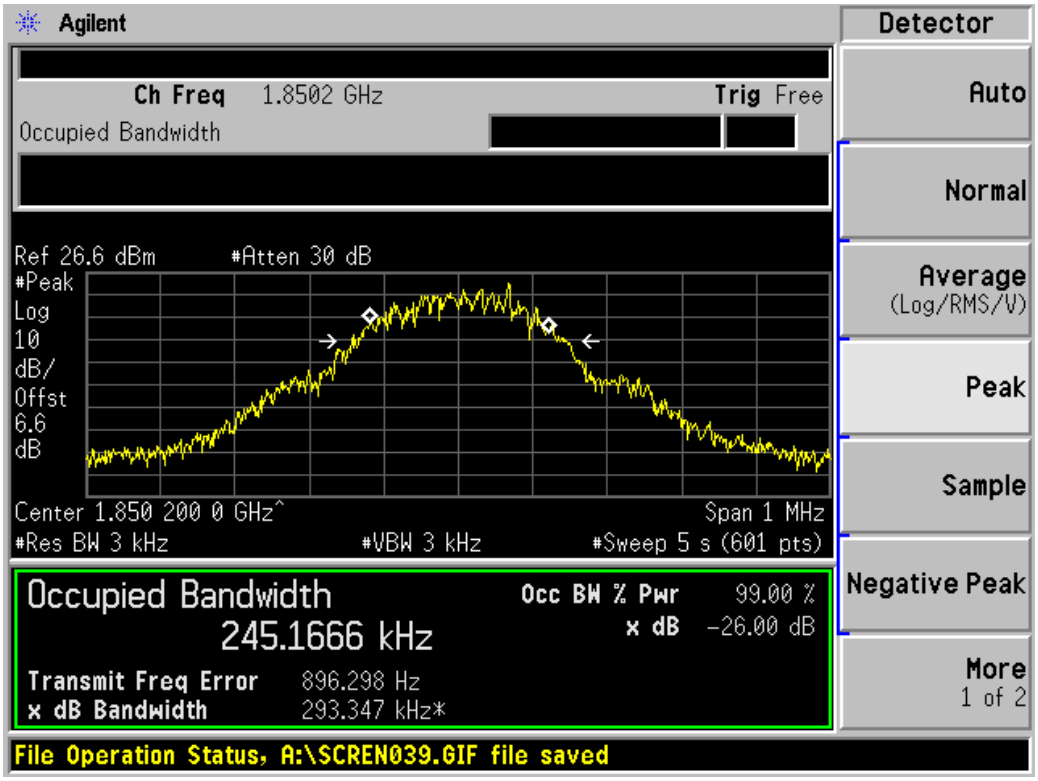
GSM/GPRS MODE：

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
1850.2	512	245.17
1880.0	661	243.16
1909.8	810	244.92

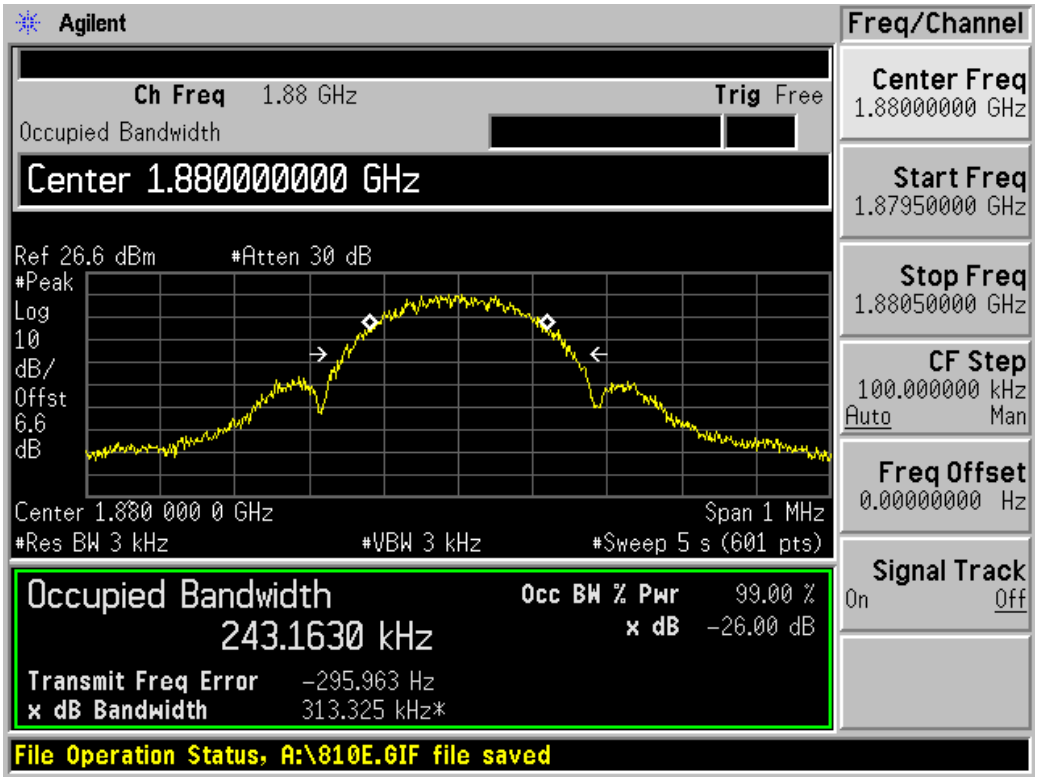
EDGE MODE：

Carrier frequency (MHz)	Channel No.	Bandwidth of 99% Power (kHz)
1850.2	512	245.19
1880.0	661	243.16
1909.8	810	241.89

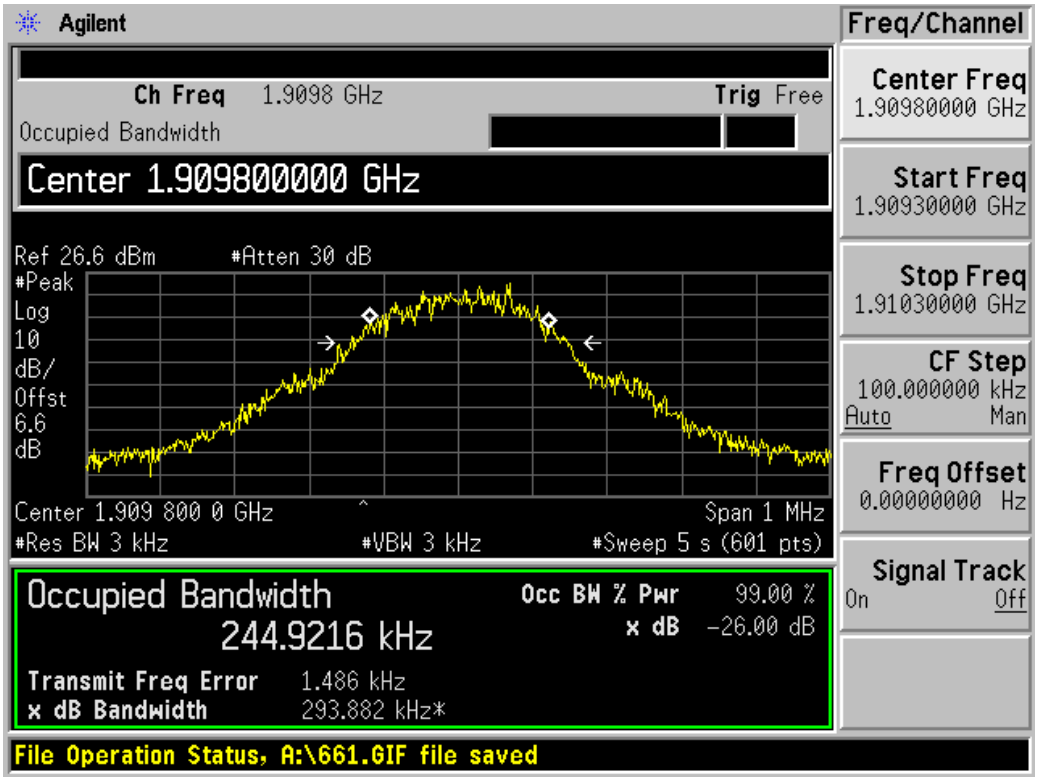
GSM/GPRS MODE：



Channel 512

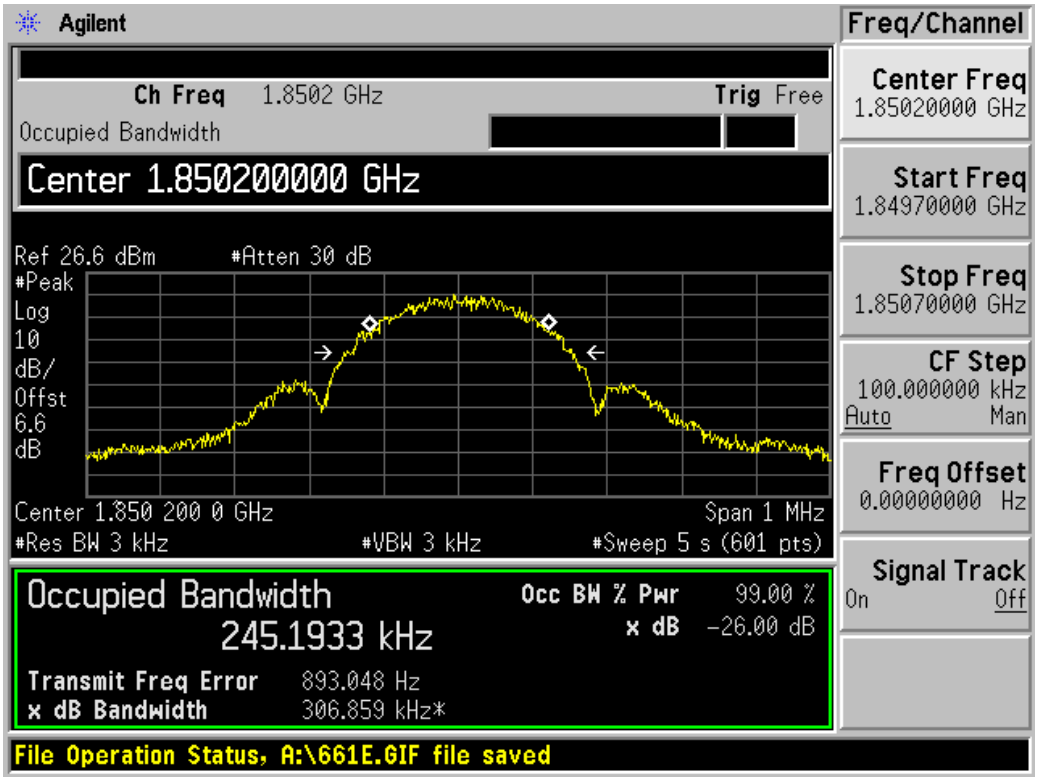


Channel 661

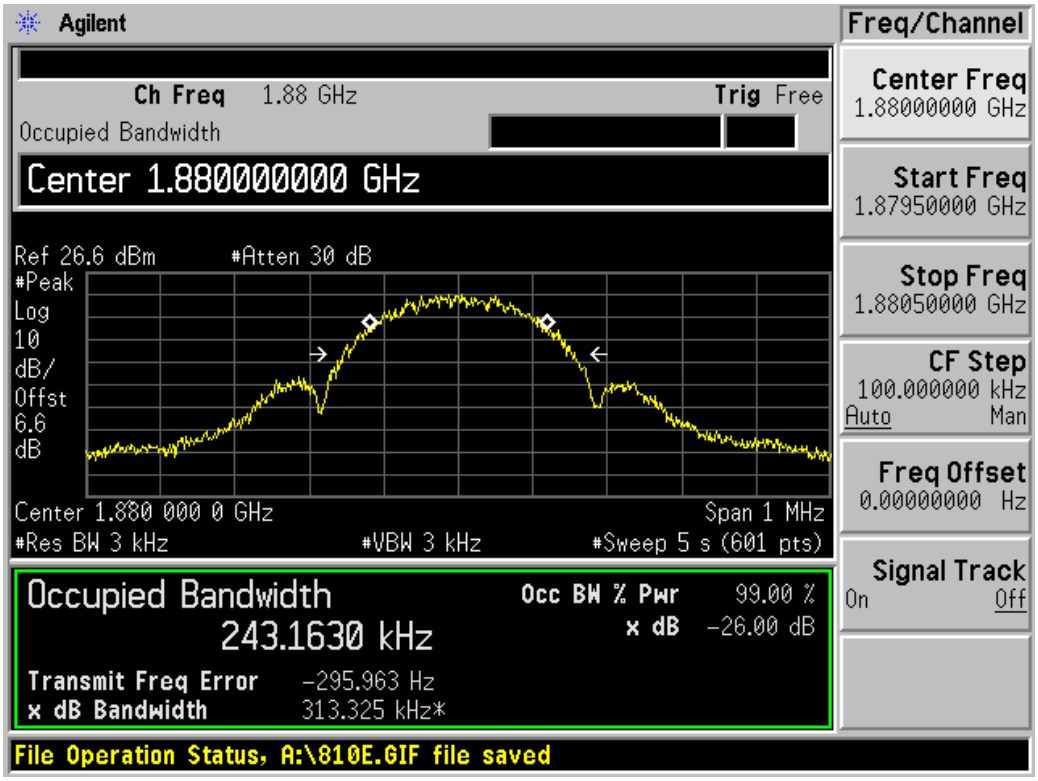


Channel 810

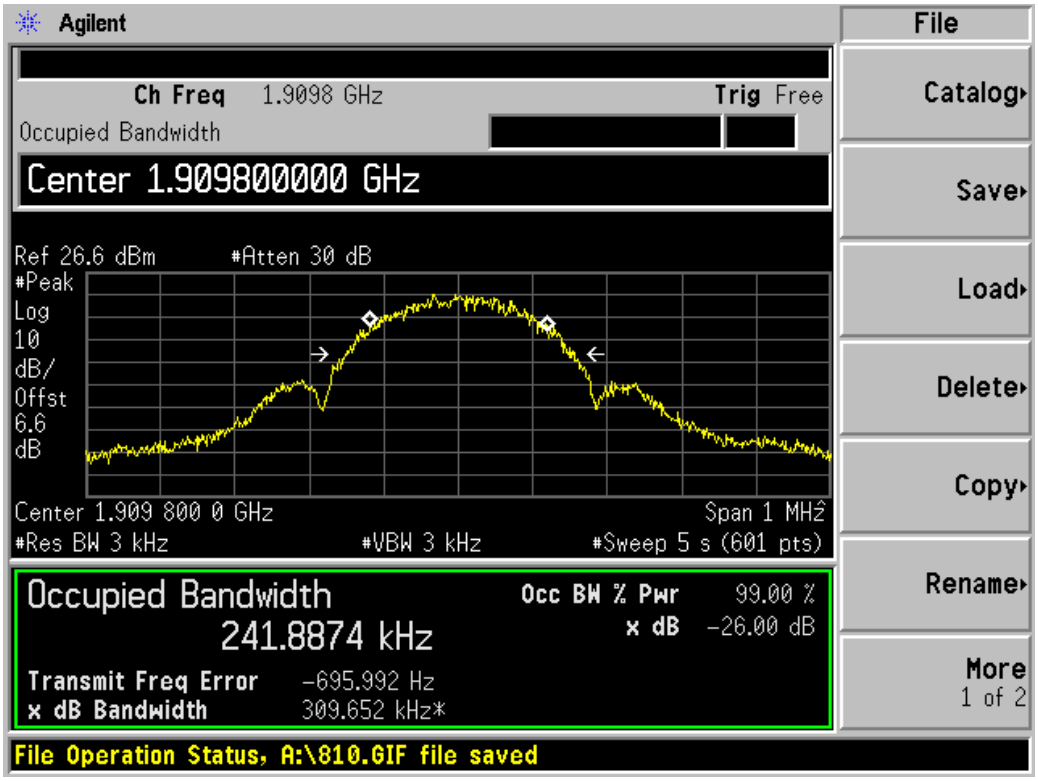
EDGE MODE：



Channel 512



Channel 661



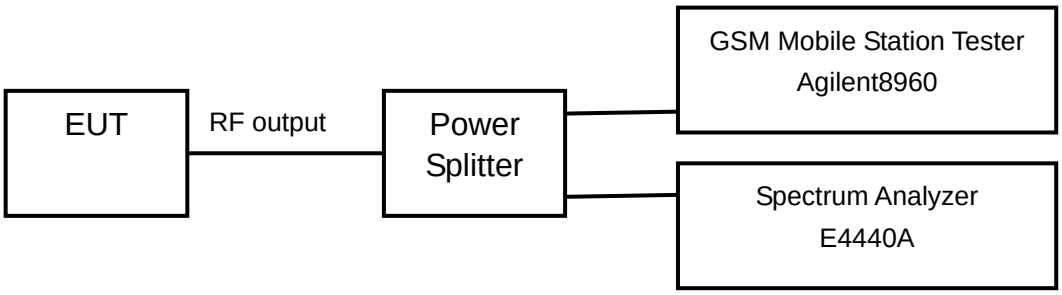
Channel 810

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

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	52%	101.3kPa

Test Setup:



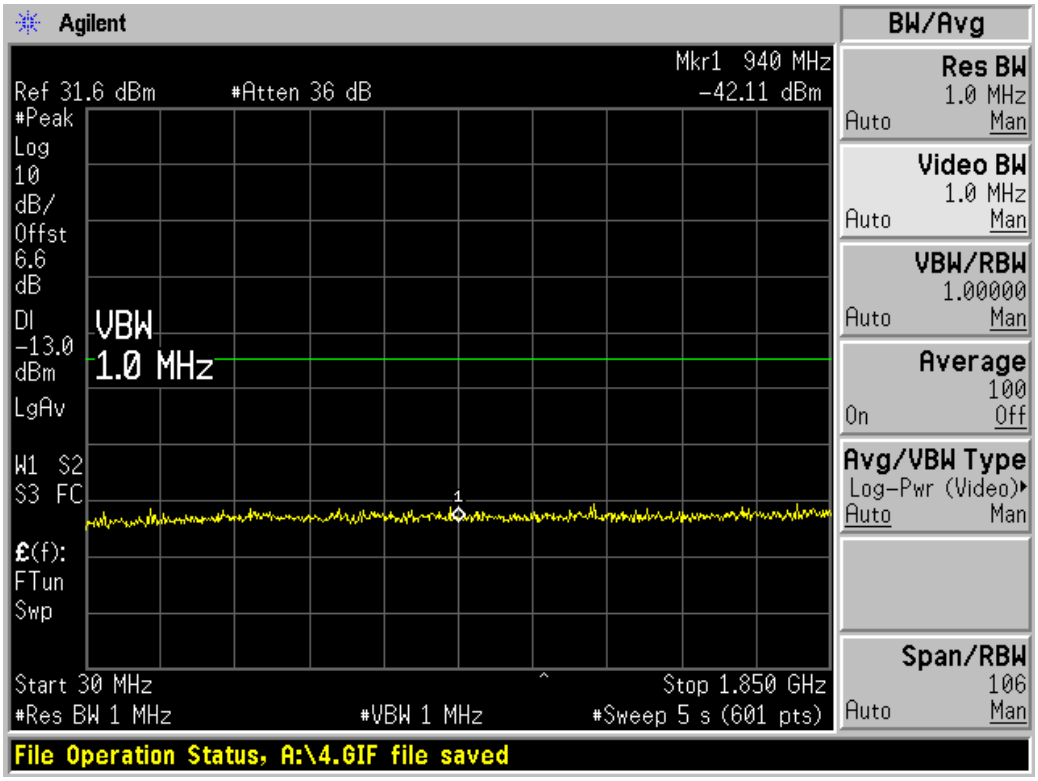
Test procedure:

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 one channel No661 (middle channel of PCS1900 band)

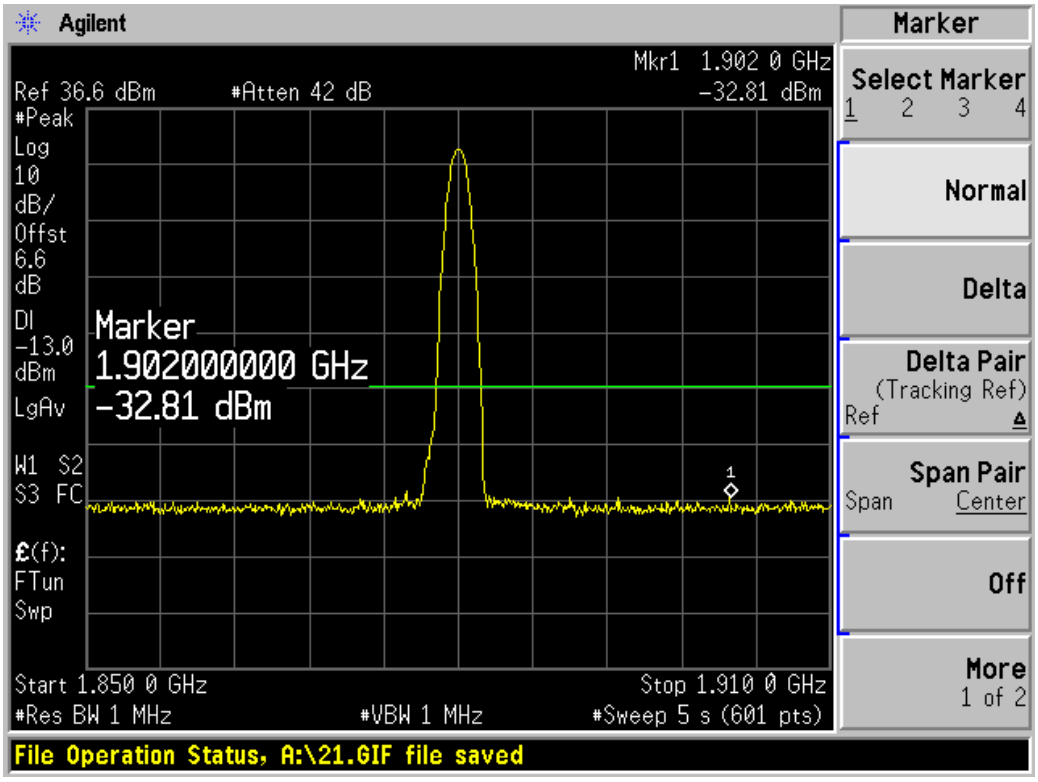
Limits	≤-13dBm

Test result:
Refer to the following figures.

GSM/GPRS MODE：

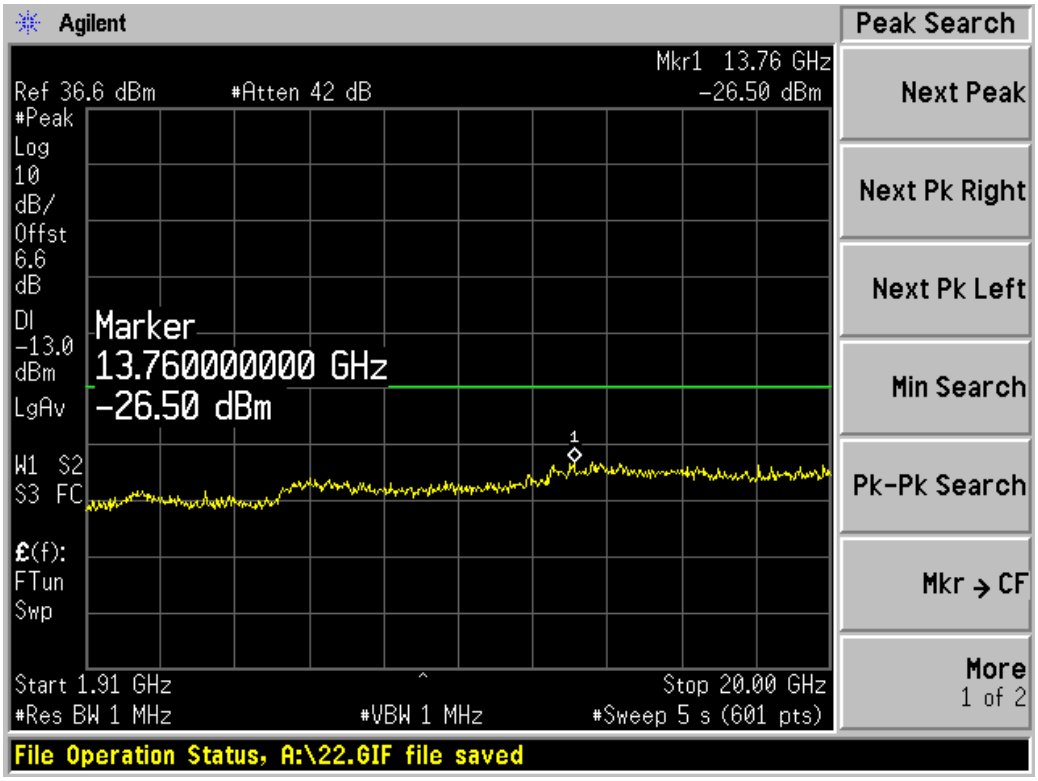


Channel 661, 30MHz~1850MHz



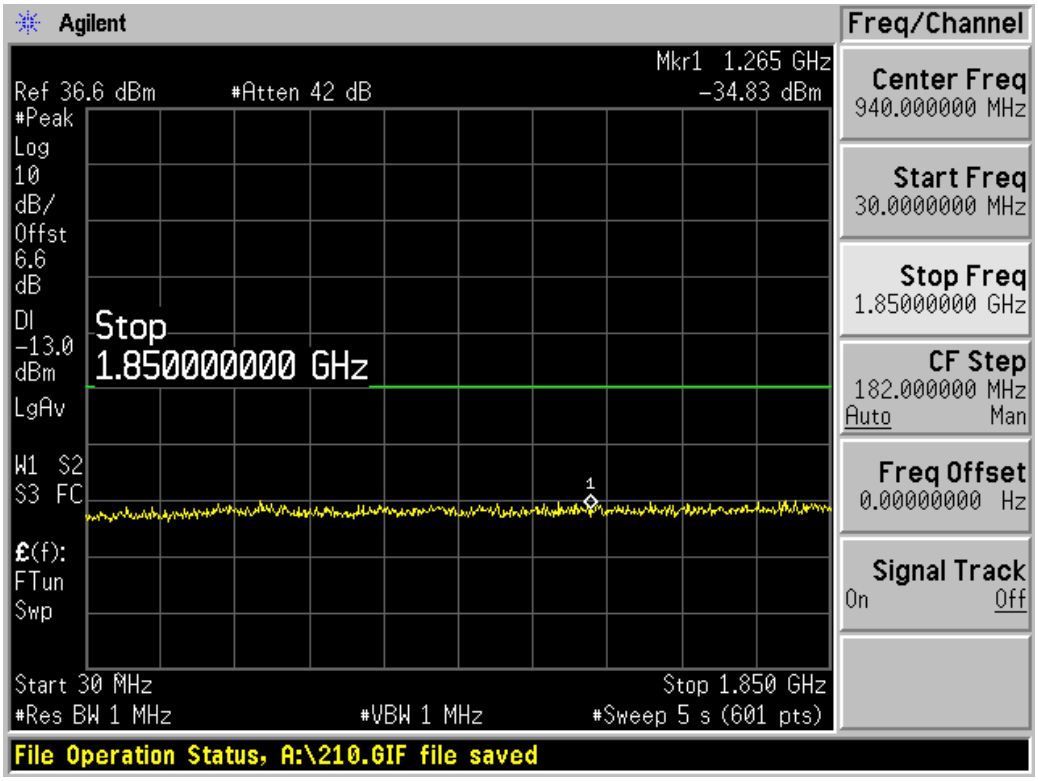
Channel 661, 1850MHz~1910MHz

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

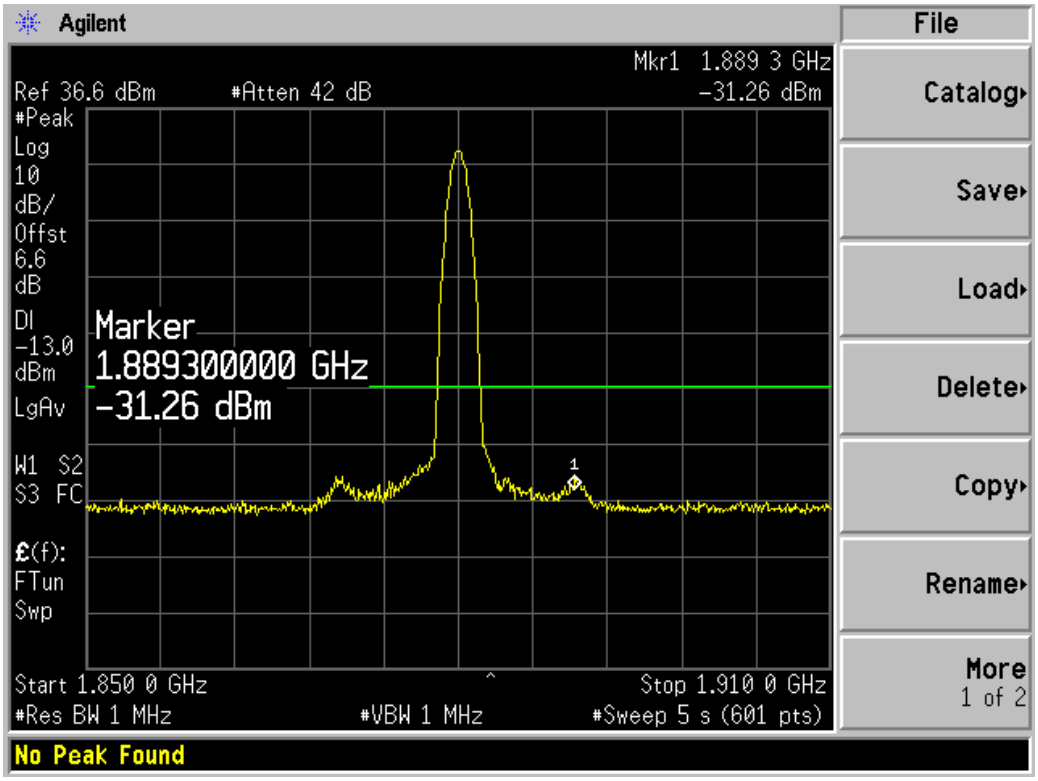


Channel 661, 1910MHz~20GHz

EDGE MODE：

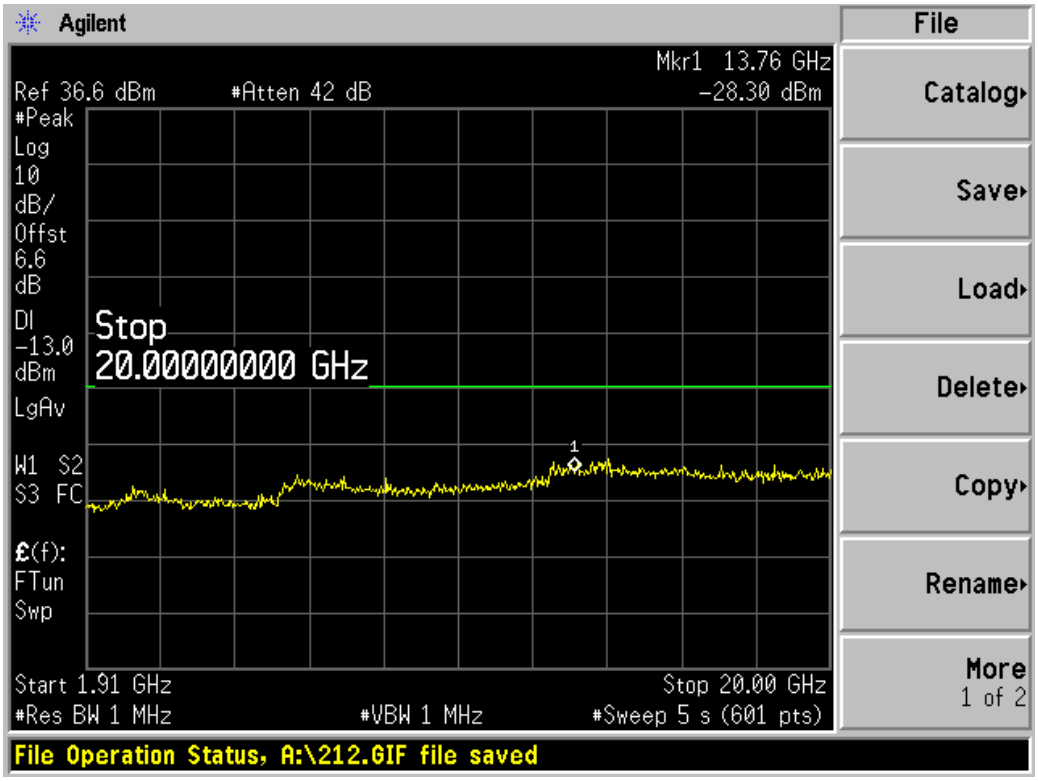


Channel 661, 30MHz~1850MHz



Channel 661, 1850MHz~1910MHz

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



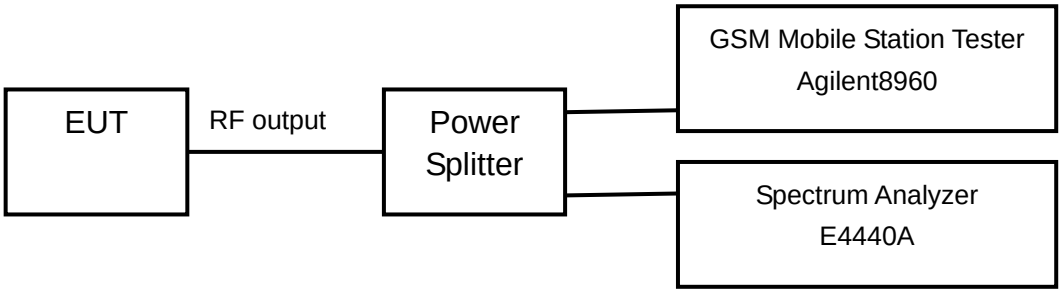
Channel 661, 1910MHz~20GHz

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

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	52%	101.3kPa

Test Setup:



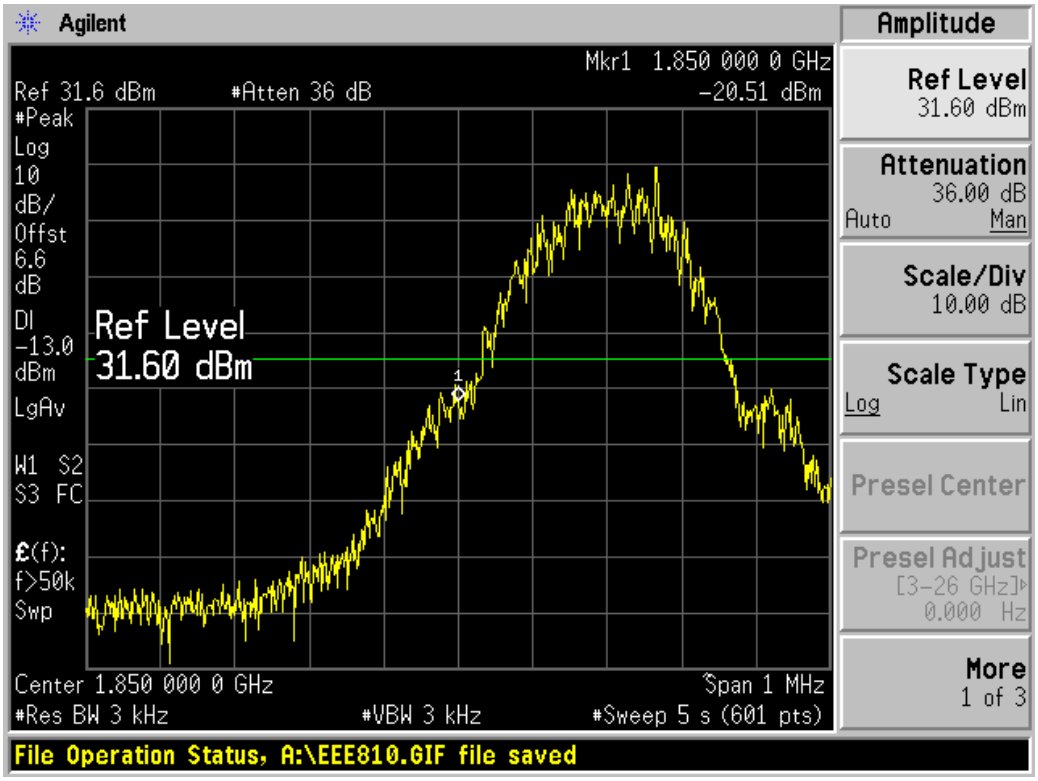
Test procedure:

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 No512 and No810 (Bottom and top channels of PCS1900 band)

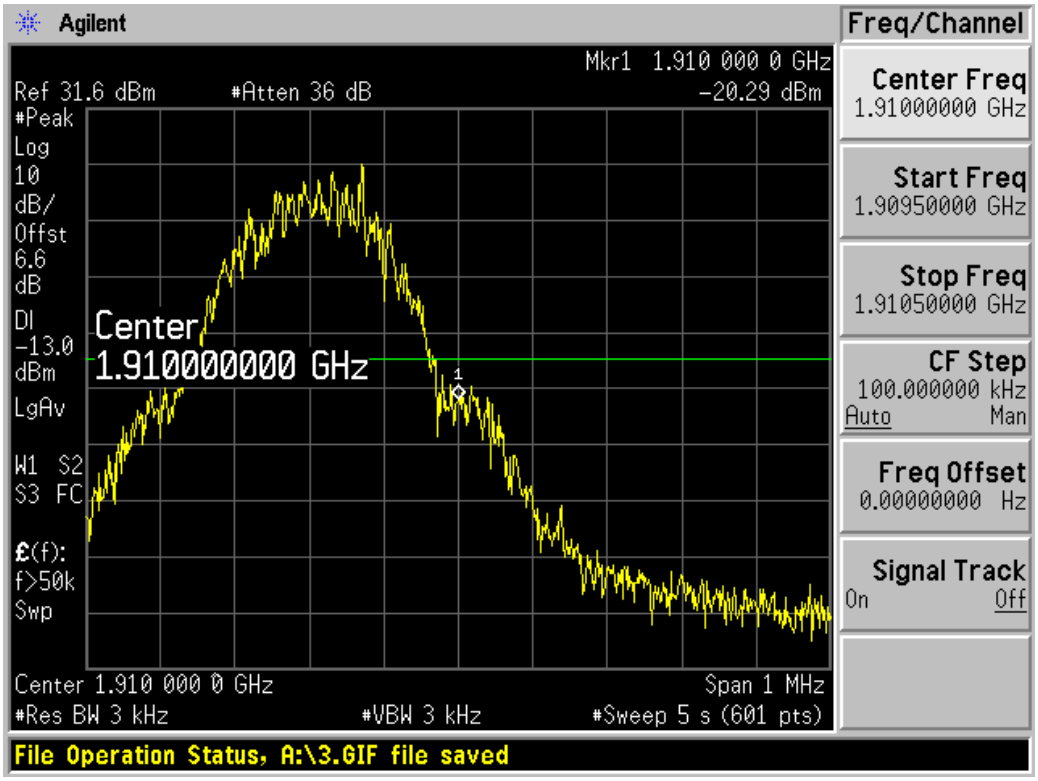
Limits	≤-13dBm

Test result:
Refer to the following figures.

GSM/GPRS MODE：

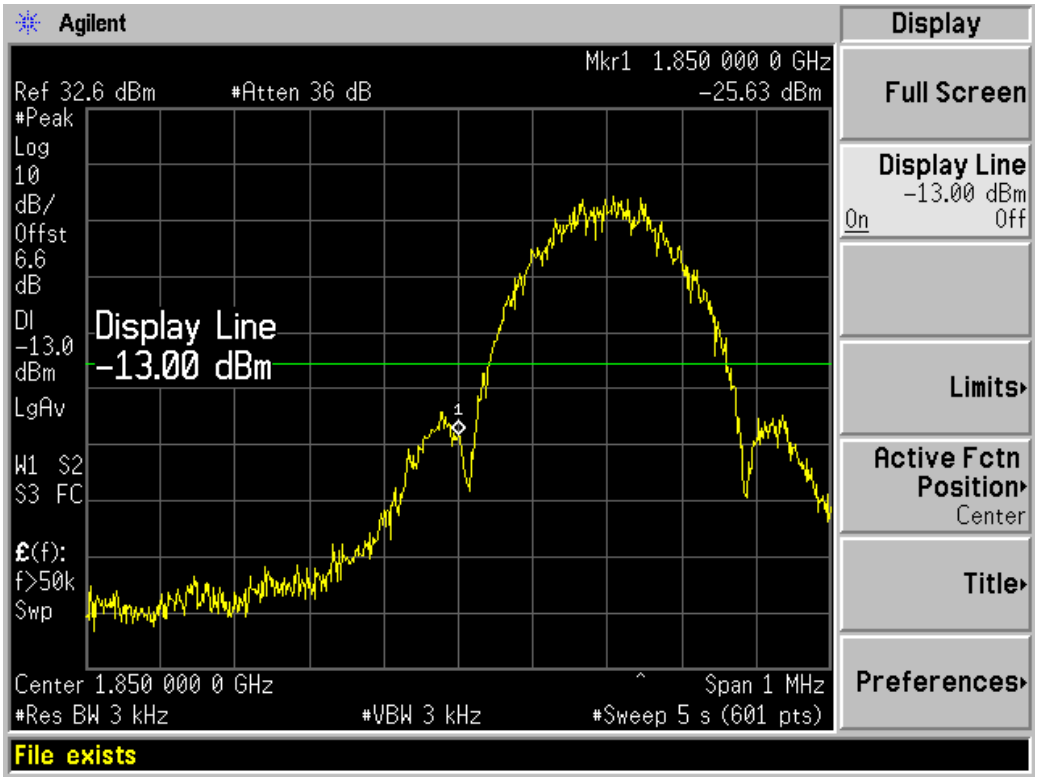


Channel 512

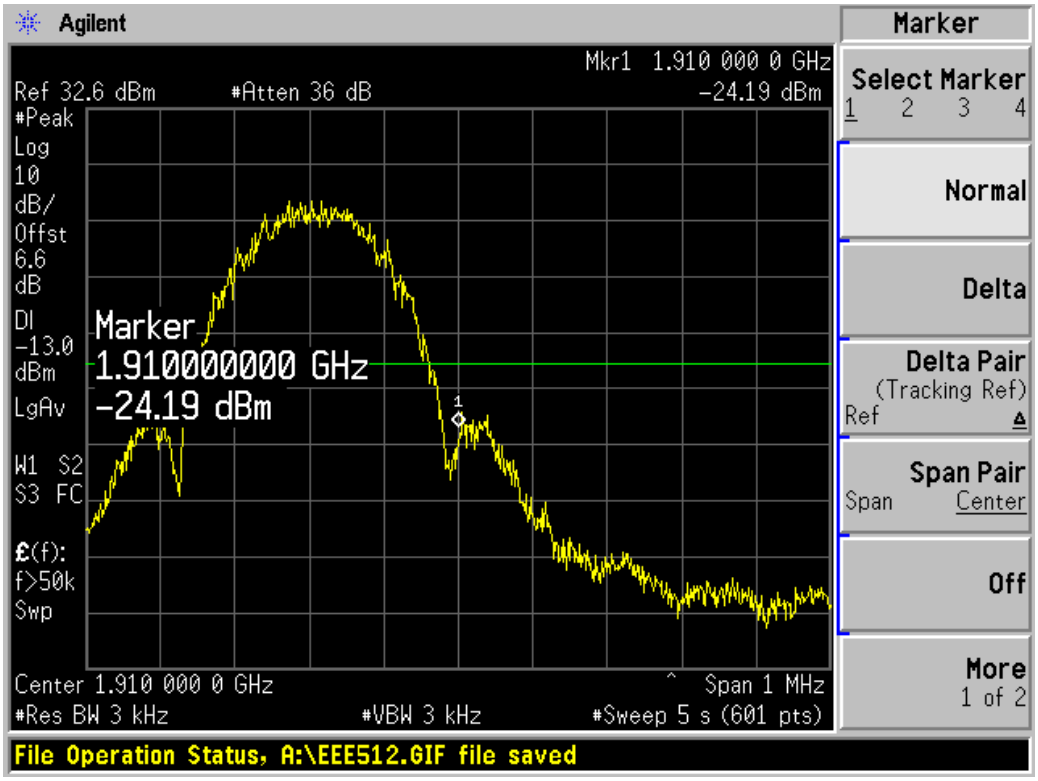


Channel 810

EDGE MODE：



Channel 512



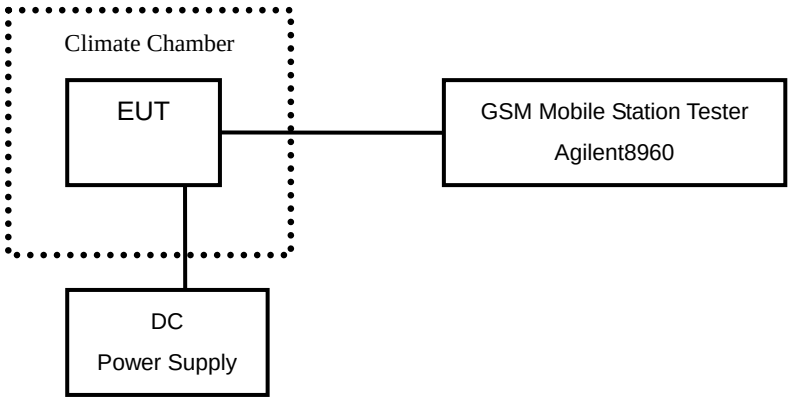
Channel 810

2.2.6 Frequency Stability-FCC Part2.1055/Part24.235

Ambient condition:

Temperature	Relative humidity	Pressure
23°C	52%	101.3kPa

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 3.6 to 4.2 V.

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

Test Result:

GSM/GPRS MODE：

Temperature(° C)	Test Result (ppm)@3.7V		
	Channel 512	Channel 661	Channel 810
-30	0.008	0.005	0.006
-20	0.003	0.002	0.004
-10	0.009	0.008	0.008
0	0.007	0.005	0.007
+10	0.005	0.006	0.006
+20	0.004	0.003	0.002
+30	0.007	0.008	0.009
+40	0.006	0.006	0.005
+50	0.010	0.011	0.011

Voltage (V)	Test Result (ppm)@20° C		
	Channel 512	Channel 661	Channel 810
3.6	0.001	0.002	0.005
4.2	0.001	0.004	0.003

EDGE MODE：

Temperature(° C)	Test Result (ppm)@3.7V		
	Channel 512	Channel 661	Channel 810
-30	0.007	0.008	0.008
-20	0.006	0.004	0.005
-10	0.010	0.010	0.009
0	0.002	0.004	0.005
+10	0.005	0.003	0.004
+20	0.005	0.004	0.004
+30	0.006	0.008	0.006
+40	0.003	0.004	0.006
+50	0.011	0.012	0.012

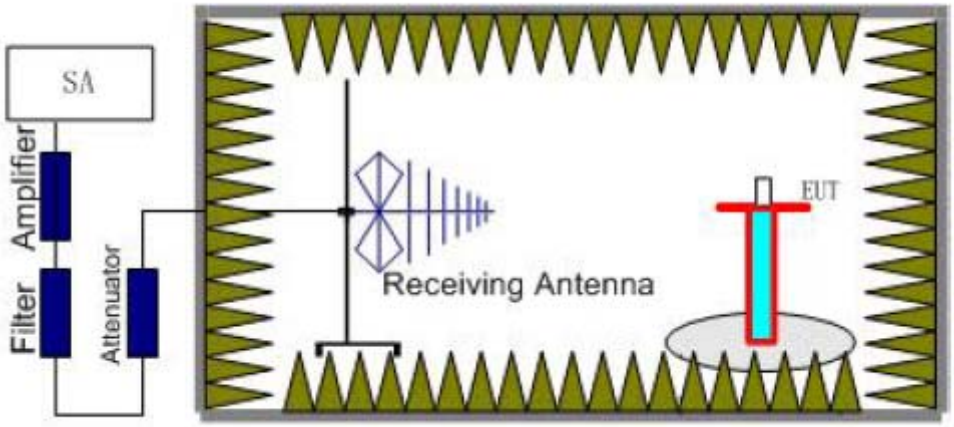
Voltage (V)	Test Result (ppm)@20° C		
	Channel 512	Channel 661	Channel 810
3.6	0.005	0.004	0.006
4.2	0.004	0.003	0.007

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

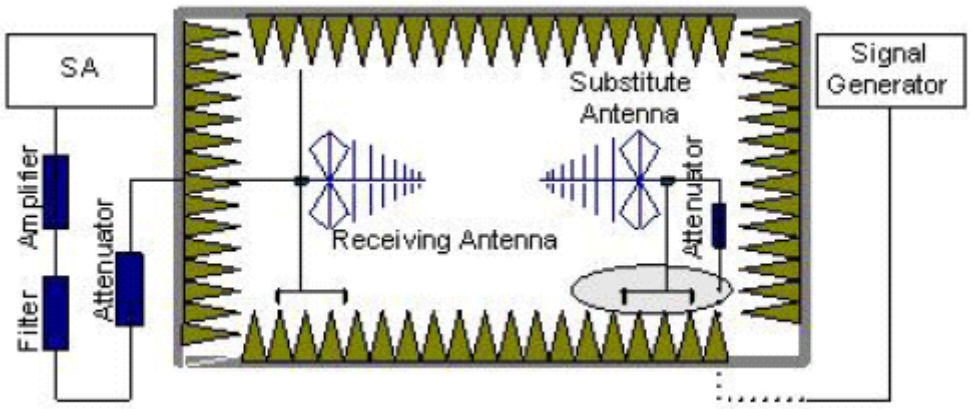
Ambient condition

Temperature	Relative humidity	Pressure
23°C	52%	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^{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.

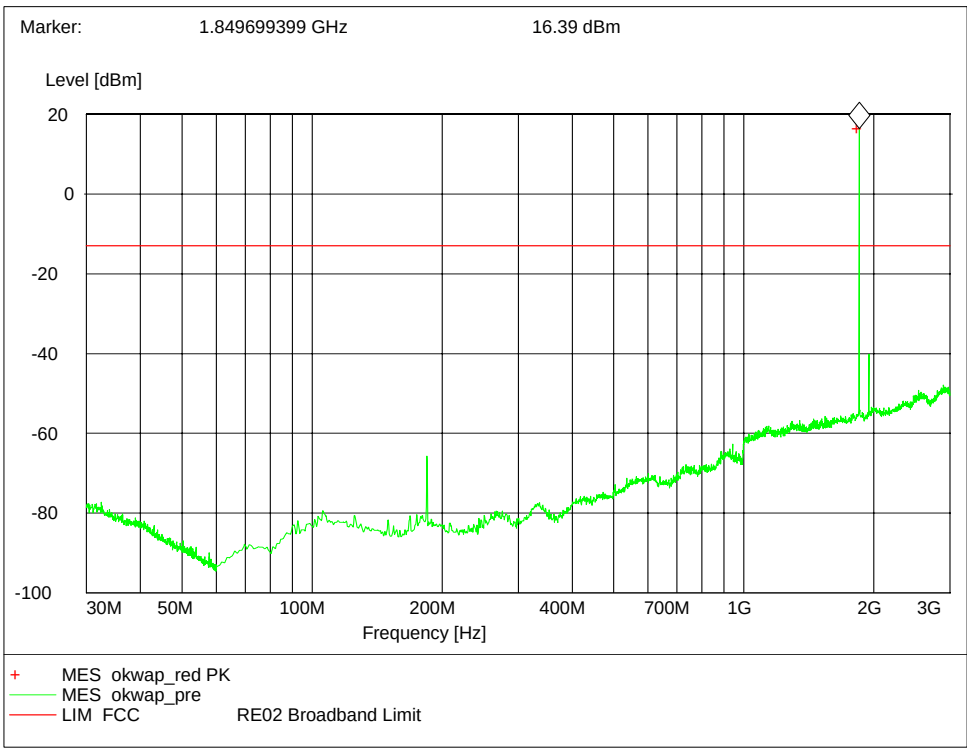
The power of the Radiated Spurious Emissions is calculated by adding the cable loss, antenna gain and air loss. The basic equation with a sample calculation is as followed:
$P=P_R+L_C+L_A-G$
Where
P: Power of the Radiated Spurious Emissions (dBm)
P_R: reading of the receiver (dBm)
L_C: Cable Lose (dB)
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 No661 (middle channels of PCS1900 band)

Limits	≤-13dBm

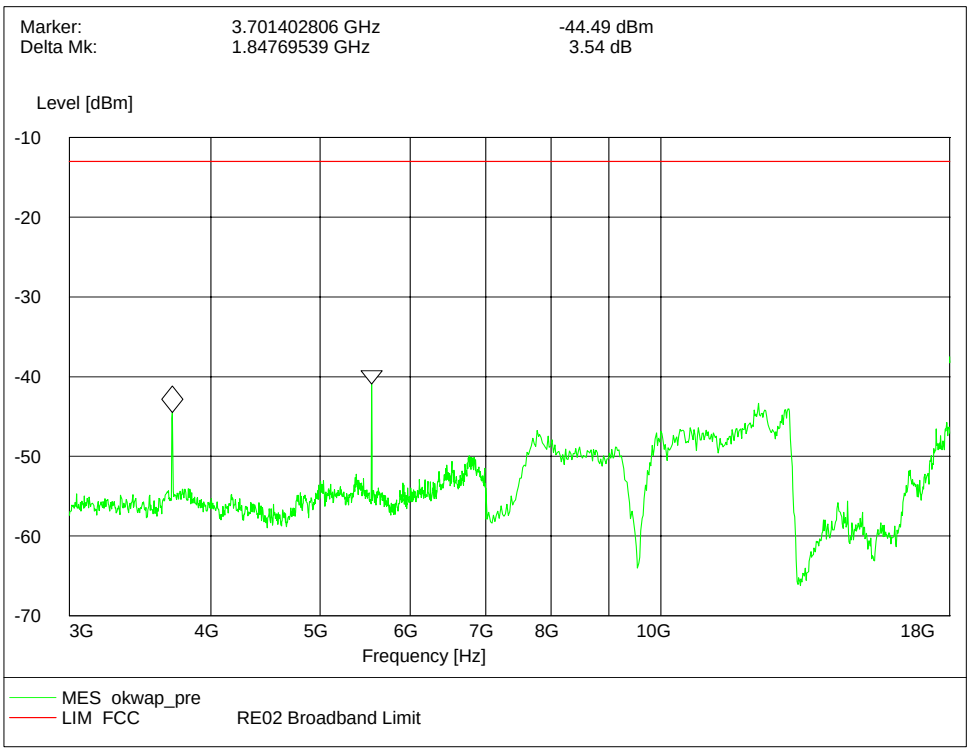
Test result:
Refer to the following figures.

GSM/GPRS MODE:

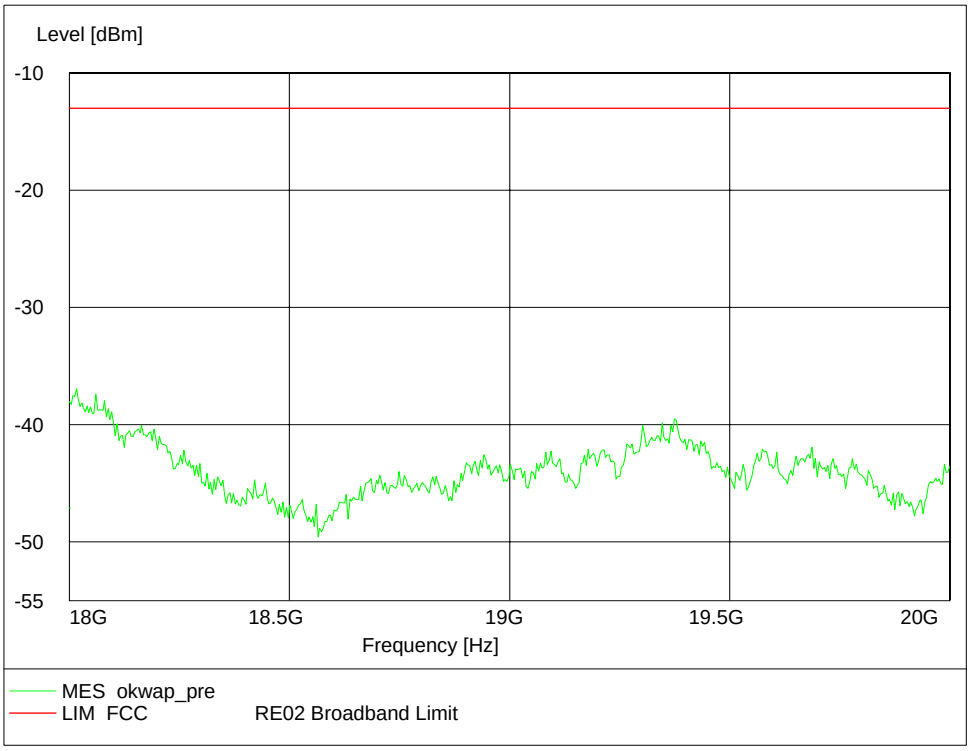


Channel 661, 30MHz~3GHz

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

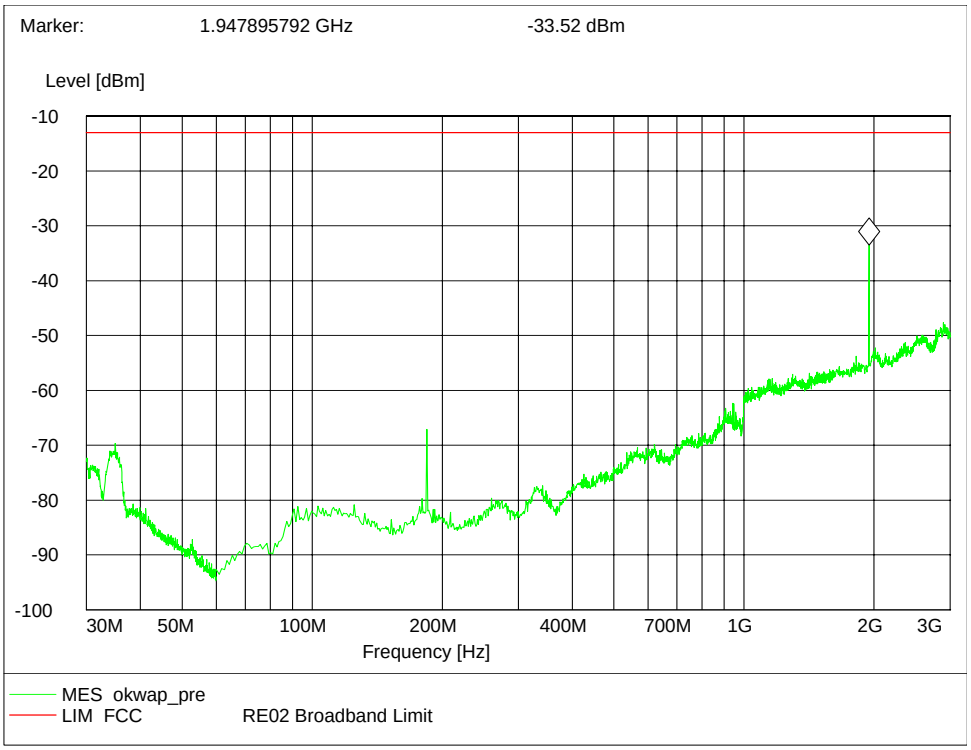


Channel 661, 3GHz~18GHz

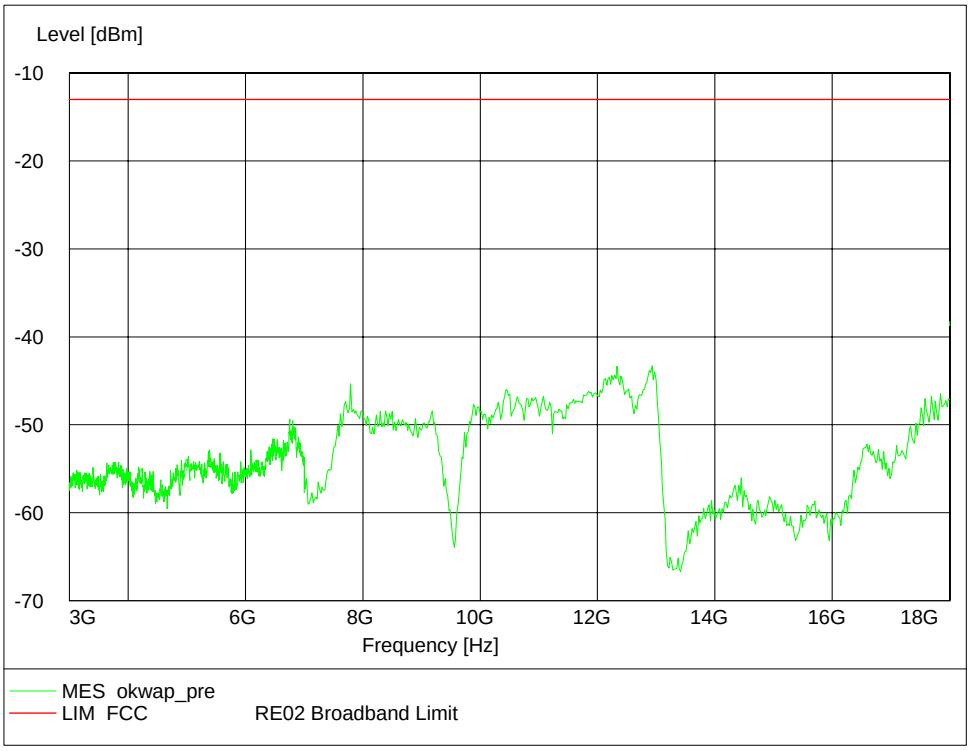


Channel 661, 18GHz~20GHz

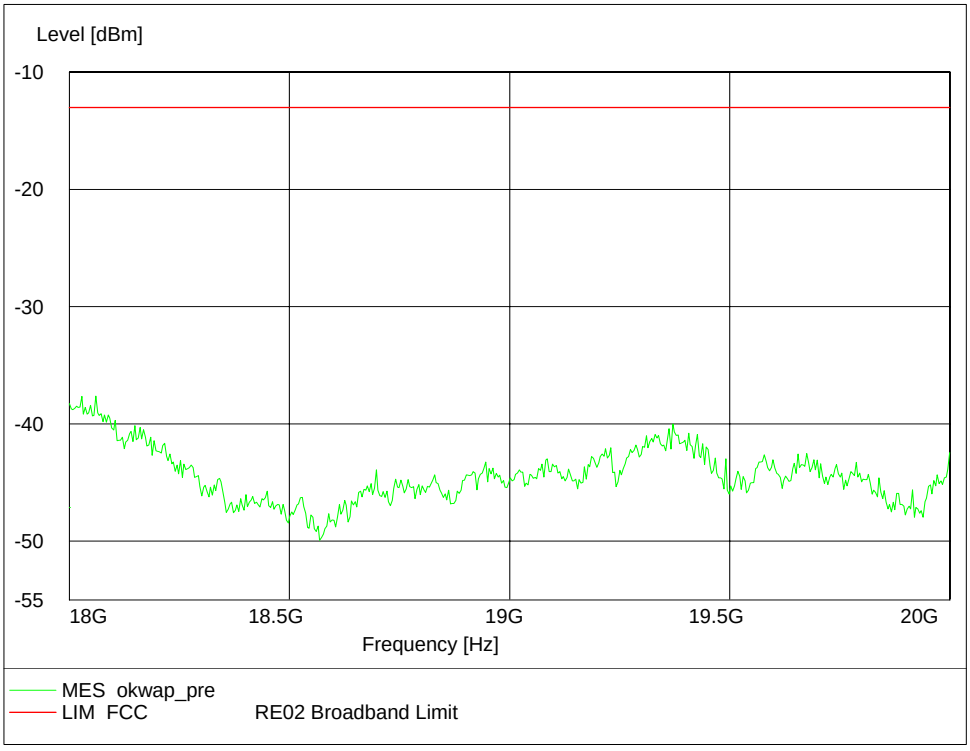
EDGE MODE:



Channel 661, 30MHz~3GHz



Channel 661, 3GHz~18GHz



Channel 661, 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. 2009
2	PSA E4440A Spectrum Analyzer	Agilent	MY41000183	19th Aug. 2009
3	66309B DC Power Supply	Agilent	MY43000461	19th Aug. 2009
4	1506A Power Splitter	Weinschel	MN154	19th Aug. 2009
5	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	19th Aug. 2009
6	ESI 40 EMI test receiver	R&S	100015	19th Aug. 2009
7	SMR 20 Signal generator	R&S	100086	19th Aug. 2009
8	CMU 200 Radio tester	R&S	100313	19th Aug. 2009
9	12.65m*8.03m*7.50m Fully-Anechoic Chamber	FRANKONIA	-----	19th Aug. 2009
10	HL562 Ultra log test antenna	R&S	100016	19th Aug. 2009
11	23.18m×16.88m×9.60m Semi-Anechoic Chamber	FRANKONIA	-----	19th Aug. 2009
12	HF 906 Double-Ridged Waveguide Horn Antenna	R&S	100030	19th Aug. 2009
13	HF 906 Double-Ridged Waveguide Horn Antenna	R&S	100029	19th Aug. 2009
14	PS2000 Turn Table	FRANKONIA	-----	19th Aug. 2009
15	MA260 Antenna Master	FRANKONIA	-----	19th Aug. 2009
16	SH-241Climatic Chamber	ESPEC	92000389	19th Aug. 2009
17	ES-K1EMI test software	R&S	-----	19th Aug. 2009
18	HL562 Receive antenna	R&S	100167	19th Aug. 2009

Appendix

Appendix1 Test Setup