

Report No.: RZA1012-2086RF02



# Part 24 TEST REPORT

Product Name

GSM /WCDMA dual mode mobile phone

WLPW110CBW

Model

W110

Shanghai Longcheer3g Technology Co.,Ltd



#### **GENERAL SUMMARY**

Product Name	GSM /WCDMA dual mode mobile phone	Model	W110		
FCC ID	WLPW110CBW	Report No.	RZA1012-2086RF02		
Client	Shanghai Longcheer3g Technology Co.,L	td			
Manufacturer	Shanghai Longcheer3g Technology Co.,L	td			
Reference Standard(s)	FCC CFR47 Part 2 (2010-12) Frequency Allocations And Radio Treaty Matters; General Rules And Regulations  FCC CFR47 Part 24E (2010-12) Personal Communications Services  ANSI/TIA-603-C(2004) Land mobile FM or PM Communications Equipment Measurements and Performance Standards.				
Conclusion	This portable wireless equipment has been the relevant standards. Test results in Colimits specified in the relevant standards.  General Judgment: Pass  (Stamp)  Date of		test report are below 技术		
Comment	The test result only responds to the measured sample.				

Approved by 相比	Revised by_	採凯	Performed by_	康在近
Yang Weizhong		Xu Kai		Kang Lingling

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#### 1. General Information

#### 1.1. Notes of the test report

**TA Technology (Shanghai) Co., Ltd.** guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at TA Technology (Shanghai) Co., Ltd. at the time of execution of the test.

**TA Technology (Shanghai) Co., Ltd.** is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test. This report only refers to the item that has undergone the test.

This report standalone dose not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities. This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of **TA Technology (Shanghai) Co., Ltd.** and the Accreditation Bodies, if it applies.

If the electrical report is inconsistent with the printed one, it should be subject to the latter.

#### 1.2. Testing laboratory

Company: TA Technology (Shanghai) Co., Ltd.

Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong

City: Shanghai

Post code: 201201

Country: P. R. China

Contact: Yang Weizhong

Telephone: +86-021-50791141/2/3

Fax: +86-021-50791141/2/3-8000 Website: http://www.ta-shanghai.com

E-mail: yangweizhong@ta-shanghai.com

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#### 1.3. Applicant Information

Company: Shanghai Longcheer3g Technology Co.,Ltd

Address: No.1, Building 5, 299 Bisheng Rd, Zhangjiang Hi-Tech Park, Pudong, Shanghai

City: Shanghai

Postal Code: 201204

Country: P.R. China

Contact Hu Zhengfang

Telephone: +86-21-64088898

Fax: +86-21-54970816

#### 1.4. Manufacturer Information

Company: Shanghai Longcheer3g Technology Co.,Ltd

Address: No.1, Building 5, 299 Bisheng Rd, Zhangjiang Hi-Tech Park, Pudong, Shanghai

City: Shanghai

Postal Code: 201204

Country: P.R. China

Telephone: +86-21-64088898

Fax: +86-21-54970816

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#### 1.5. Information of EUT

#### **General information**

Name of EUT:	GSM /WCDMA dual mode mobile phone				
IMEI:	355077010033420				
Hardware Version:	LQWM232A				
Software Version:	LQWHM01.1.0				
Antenna Type:	Internal Antenna				
Device Operating Configurations:					
Operating Mode(s):	GSM1900: (tested)				
GPRS Multi-slot Class:	10				
EGPRS Multi-slot Class:	10				
Maximum E.I.R.P.	27.27dBm				
Power Supply:	Battery or Charger				
Rated Power Supply Voltage:	3.8V				
Extreme Voltage:	Minimum: 3.5V Maximum: 4.2V				
Extreme Temperature:	Lowest: -30°C	Highest: +50°C			
Operating Frequency Range(s)	Mode	Tx (MHz)	Rx (MHz)		
Operating Frequency Nange(s)	GSM1900	GSM1900 1850.2 ~ 1909.8 1930.2 ~ 1989.8			

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#### Auxiliary equipment details

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AE1: Battery

Model: BL-4C-800mAh (UL)

Manufacturer: SHENZHEN BAK BATTERY CO.,LTD

S/N: BAK1101000123

Equipment Under Test (EUT) is GSM /WCDMA dual mode mobile phone with internal antenna. The EUT supports GSM1900 in this report.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

#### 1.6. Test Date

The test is performed from July 1, 2010 to July 13, 2010.

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#### 2. Test Information

#### 2.1. Summary of test results

Number	Test Case	Clause in FCC rules	Verdict
1	RF power output	2.1046	PASS
2	Effective Isotropic Radiated power	24.232	PASS
3	Occupied Bandwidth	2.1049	PASS
4	Band Edge Compliance	24.238	PASS
5	Frequency Stability	2.1055 / 24.235	PASS
6	Spurious Emissions at Antenna Terminals	2.1051 / 24.238	PASS
7	Radiates Spurious Emission	2.1053 / 24.238	PASS

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#### 2.2. RF Power Output

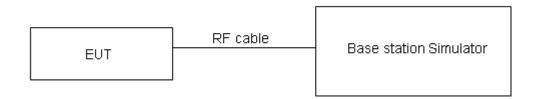
#### **Ambient condition**

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### **Methods of Measurement**

During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation. These measurements have been tested at following channels: 512,661,810 for GSM 1900.

#### **Test Setup**



The loss between RF output port of the EUT and the input port of the tester has been taken into consideration.

#### Limits

No specific RF power output requirements in part 2.1046.

#### **Measurement Uncertainty**

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2. U= 0.4 dB.

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**Test Results** 

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		Conducted Power(dBm)			
GSM 1900		Channel 512	Channel 661	Channel 810	
		1850.2(MHz)	1880(MHz)	1909.8(MHz)	
GSM	Results	28.77	29.29	29.79	
GPRS	1TXslot	28.77	29.29	29.80	
(GMSK)	2TXslots	26.80	27.32	27.83	
EGPRS	1TXslot	25.78	26.29	26.80	
(GMSK)	2TXslots	24.76	25.28	25.78	

#### Note:

- 1) The maximum RF Output Power numbers are marks in bold.
- 2)The following testing in GPRS/EGPRS is set to 1TXslot based on the maximum RF Output Power.

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#### 2.3. Effective Isotropic Radiated Power

#### **Ambient condition**

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### **Methods of Measurement**

Test procedure:

The measurement was done according to TIA/EIA 603C.

#### Step 1:

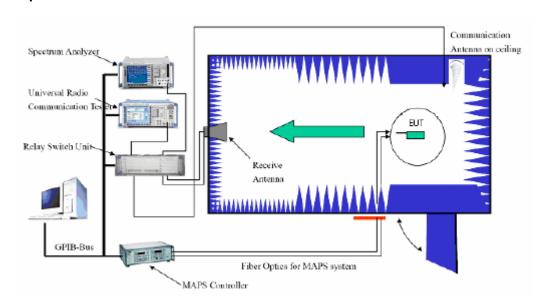
The measurement is carried out in a fully anechoic chamber. EUT was placed on a 0.8 meters high non-conductive table at a 3 meters test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. A radio link shall be established between EUT and Tester. The output power of the cell signal of the tester will be decreased until the output power of the EUT reach a maximum value. A peak detector is used while RBW and VBW are both set to 3MHz. During the measurement, the highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna moved up and down over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.

#### Step 2:

A dipole antenna shall be substituted in place of the EUT. The antenna will be driven by a signal generator with a known power S.G. applied through a Tx cable. Then the maximum Analyzer reading is recorded while the antenna was moving up and down. The E.R.P. /E.I.R.P. 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 correction factor (in dB)=S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading – 2.15. Then the EUT's E.R.P. was calculated with the correction factor, E.R.P. = LVL + Correction factor. The measurement will be conducted at three channels No.512, No.661, No.810 of GSM 1900.

#### **Test Setup**



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#### Limits

Rule Part 24.232(b) specifies that "Mobile/portable stations are limited to 2 watts EIRP. Peak power" and Rule Part 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage".

Limit (EIRP)	≤ 2 W (33 dBm)

#### **Measurement Uncertainty**

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2. U= 1.19 dB

#### **Test Results**

	Channel	LVL (EUT)	S.G	Gain (dBi)	Cable Loss	Pr (dBm)	Correcti on Factor (dBm)	EIRP (dBm)
	512	-27.02	0	1.91	14.7	-67.38	54.59	22.51
GSM 1900	661	-28.03	0	1.94	14.72	-68.49	55.71	24.02
	810	-29.52	0	1.90	14.77	-70.05	57.18	26.18
GSM	512	-26.72	0	1.91	14.7	-67.38	54.59	22.52
1900+GPRS	661	-27.73	0	1.94	14.72	-68.49	55.71	23.86
1900+GFK5	810	-29.42	0	1.90	14.77	-70.05	57.18	26.44
GSM	512	-31.27	0	1.91	14.7	-67.38	54.59	23.90
1900+EGPRS	661	-32.56	0	1.94	14.72	-68.49	55.71	25.23
1900+EGFK3	810	-33.94	0	1.90	14.77	-70.05	57.18	27.27

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#### 2.4. Occupied Bandwidth

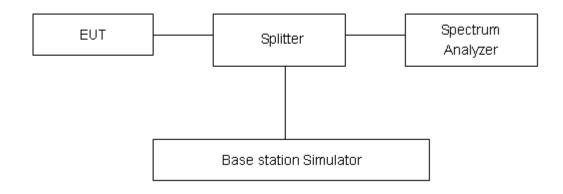
#### **Ambient condition**

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### **Method of Measurement**

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer. RBW is set to 3kHz,VBW is set to 10kHz on spectrum analyzer.99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

#### **Test Setup**



#### Limits

No specific occupied bandwidth requirements in part 2.1049.

#### **Measurement Uncertainty**

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2. U= 624Hz.

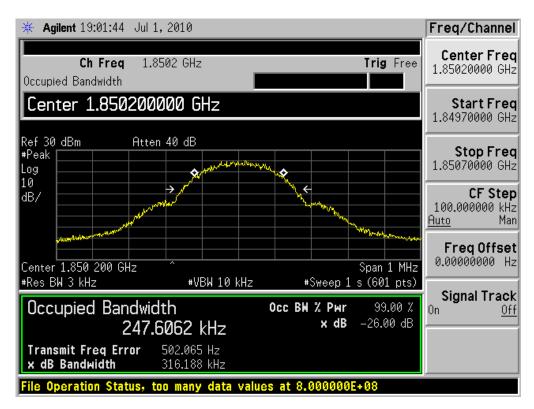
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#### **Test Result**

#### **GSM 1900**

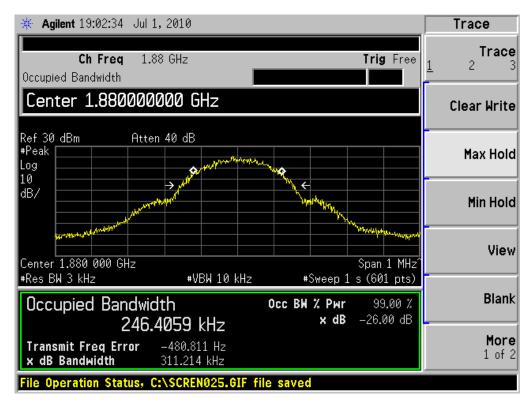
Channel	Frequency (MHz)	99% Power Bandwidth (kHz)	-26dBc Bandwidth(kHz)
512	1850.2	247.61	316.19
661	1880.0	246.41	311.21
810	1909.8	244.70	318.26



GSM1900 CH512 Occupied Bandwidth

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GSM 1900 CH661 Occupied Bandwidth



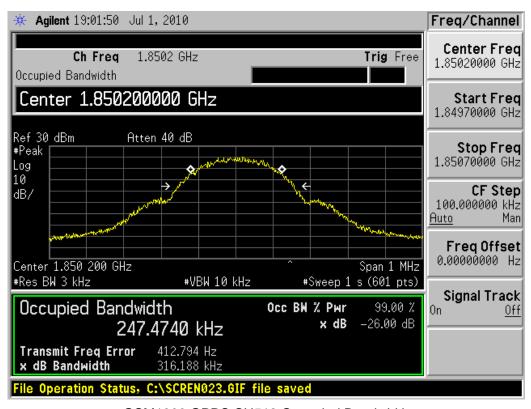
GSM 1900 CH810 Occupied Bandwidth

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#### GSM 1900 GPRS

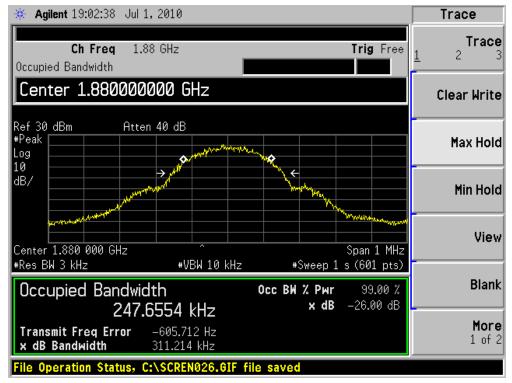
Channel	Frequency (MHz)	99% Power Bandwidth (kHz)	-26dBc Bandwidth(kHz)
512	1850.2	247.47	316.19
661	1880.0	247.66	311.21
810	1909.8	243.55	317.88



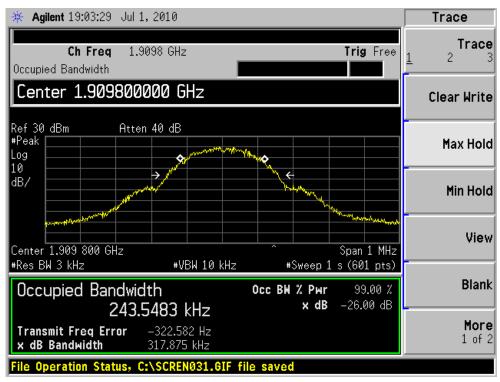
GSM1900 GPRS CH512 Occupied Bandwidth

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GSM 1900 GPRS CH661 Occupied Bandwidth



GSM 1900 GPRS CH810 Occupied Bandwidth

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#### GSM 1900 EGPRS

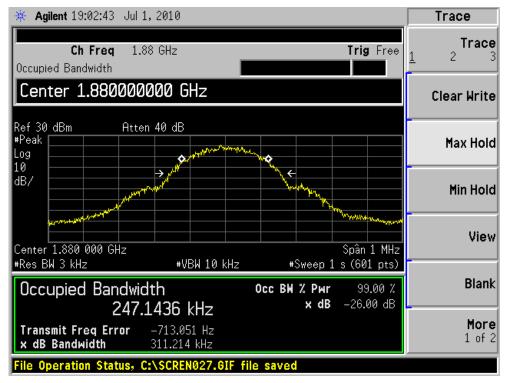
Channel	Frequency (MHz)	99% Power Bandwidth (kHz)	-26dBc Bandwidth(kHz)
512	1850.2	247.25	316.19
661	1880.0	247.14	311.21
810	1909.8	243.71	317.88



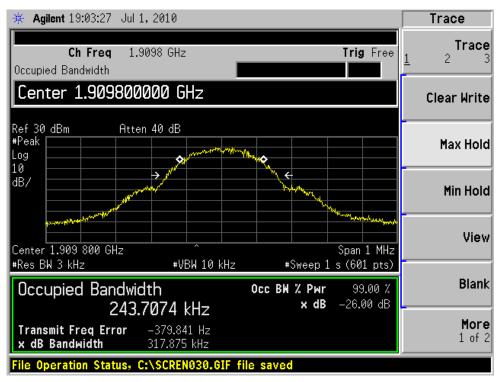
GSM1900 EGPRS CH512 Occupied Bandwidth

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GSM 1900 EGPRS CH661 Occupied Bandwidth



GSM 1900 EGPRS CH810 Occupied Bandwidth

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#### 2.5. Band Edge Compliance

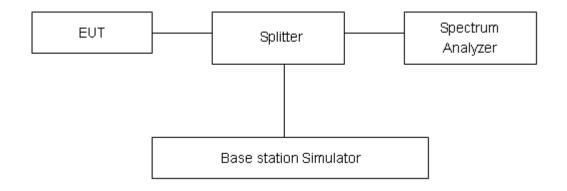
#### **Ambient condition**

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### **Method of Measurement**

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured. The Average detector is used and RBW is set to 3kHz on spectrum analyzer. Spectrum analyzer plots are included on the following pages.

#### **Test Setup**



#### Limits

Rule Part 24.238(a) specifies that "on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log10 (P) dB."

Limit	-13 dBm
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#### **Measurement Uncertainty**

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96. U=0.684dB.

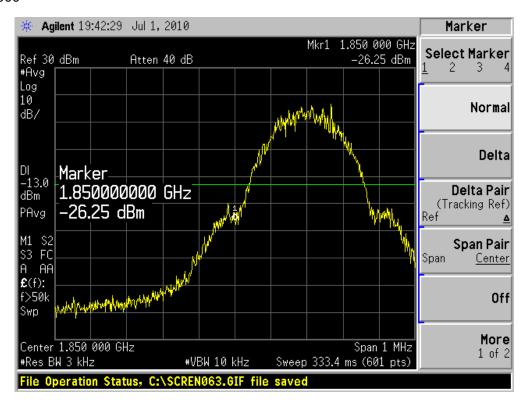
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#### **Test Result**

	Carrier frequency (MHz)	Reference value (dBm)	Limit	Conclusion
GSM 1900	1850.0	-26.25	-13	PASS
GSW 1900	1910.0	-22.22	-13	PASS
GSM	1850.0	-26.34	-13	PASS
1900+GPRS	1910.0	-23.02	-13	PASS
GSM	1850.0	-23.76	-13	PASS
1900+EGPRS	1910.0	23.51	-13	PASS

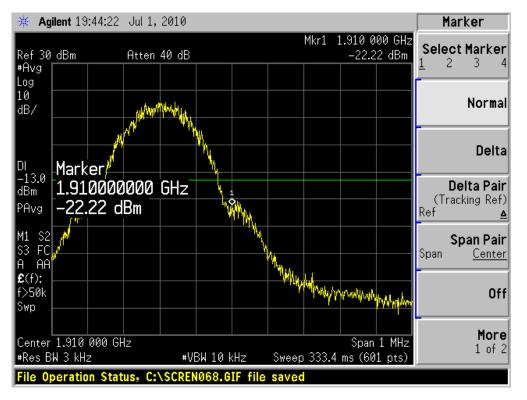
#### **GSM 1900**



GSM 1900 512 Channel

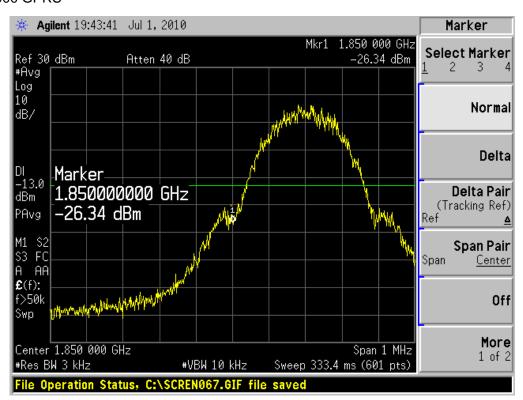
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GSM1900 810 Channel

#### GSM 1900 GPRS



GSM 1900 GPRS 512 Channel

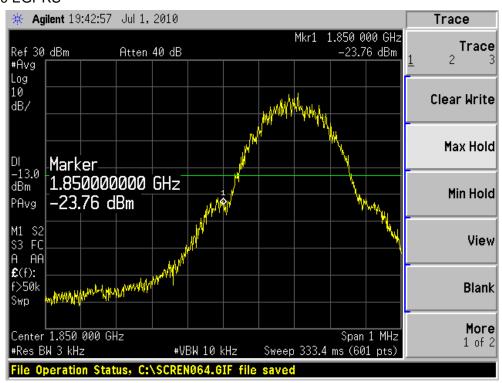
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GSM1900 GPRS 810 Channel

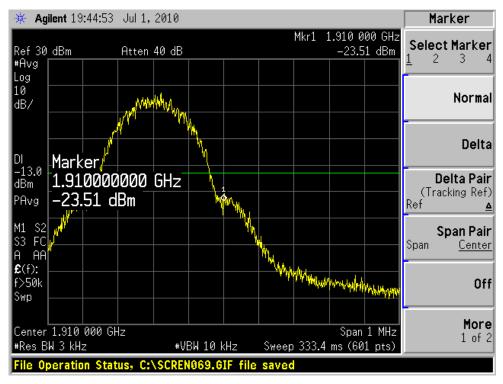
#### GSM 1900 EGPRS



GSM 1900 EGPRS 512 Channel

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GSM1900 EGPRS 810 Channel

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#### 2.6. Frequency Stability

#### **Ambient condition**

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### **Method of Measurement**

1. Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -30°C to +50°C in 10°C step size,

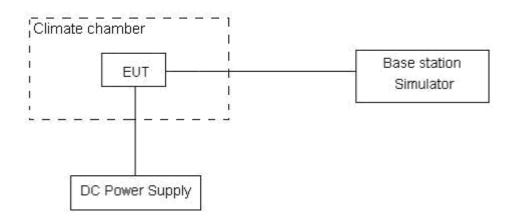
- (1) With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours.
- (2) Measure the carrier frequency with the test equipment in a "call mode". These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.
- (3) Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.
- 2. Frequency Stability (Voltage Variation)

The frequency stability shall be measured with variation of primary supply voltage as follows:

- (1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
- (2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery-operating end point which shall be specified by the manufacturer.

This transceiver is specified to operate with an input voltage of between 3.5 V and 4.2 V, with a nominal voltage of 3.8V.

#### **Test setup**



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#### Limits

No specific frequency stability requirements in part 24.235

#### **Measurement Uncertainty**

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor k = 3. U= 0.01ppm.

#### **Test Result**

#### **GSM 1900**

Temperature	Test Results (ppm) / 3.8 V Power supply	
(° C)	GSM 1900 Channel 661	
-30	0.037	
-20	0.051	
-10	0.029	
0	0.036	
10	0.019	
20	0.036	
30	0.029	
40	0.038	
50	0.045	

Voltage	Test Results(ppm) / 20° C
(V)	Channel 661
3.5	0.019
3.8	0.036
4.2	0.043

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#### 2.7. Spurious Emissions at Antenna Terminals

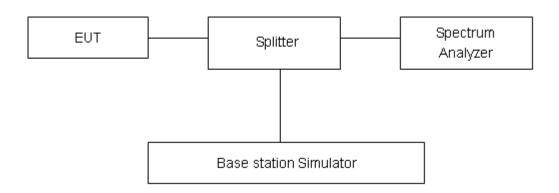
#### **Ambient condition**

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### **Method of Measurement**

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 30MHz to the 10th harmonic of the carrier. The peak detector is used. RBW and VBW are set to 100 kHz, Sweep is set to ATUO.

#### **Test setup**



#### Limits

Rule Part 24.238(a) specifies that "on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log10 (P) dB."

Limit	-13 dBm
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#### **Measurement Uncertainty**

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor k = 1.96.

Frequency	Uncertainty	
100kHz-2GHz	0.684 dB	
2GHz-12.75GHz	1.407 dB	

**Test Result: PASS** 

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**GSM 1900** 

	TX ch.512	Level	Limit
Harmonic	Frequency (MHz)	(dBm)	(dBm)
	1 requericy (Wir iz)	(dBIII)	(dBIII)
2	3700.5	-53.25	-13
3	5550.6	Nf	-13
4	7400.8	Nf	-13
5	9251	Nf	-13
6	11101.2	Nf	-13
7	12951.0	-47.04	-13
8	14801.6	Nf	-13
9	16651.8	Nf	-13
10	18501.3	-68.86	-13
Nf: noise floor			

Harmonic	TX ch.661 Frequency (MHz)	Level (dBm)	Limit (dBm)	
2	3759.8	-52.57 -13		
3	5640	Nf	-13	
4	7520	Nf	-13	
5	9400	Nf	-13	
6	11280	Nf	-13	
7	13160	-46.43	-13	
8	15040	Nf	-13	
9	16920	Nf	-13	
10	18800.5	-79.57	-13	
Nf: noise floor				

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Harmonic	TX ch.810 Level		Limit	
	Frequency (MHz)	(dBm)	(dBm)	
2	3819.4	-52.33	-13	
3	5729.4	Nf	-13	
4	7639.2	Nf	-13	
5	9549	Nf	-13	
6	11458.8	Nf	-13	
7	13369	-45.13	-13	
8	15278.4	Nf	-13	
9	17188.2	Nf	-13	
10 19097.5		-68.96	-13	
Nf: noise floor				

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#### 2.1. Radiates Spurious Emission

#### **Ambient condition**

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### **Method of Measurement**

The measurements procedures in TIA -603C are used.

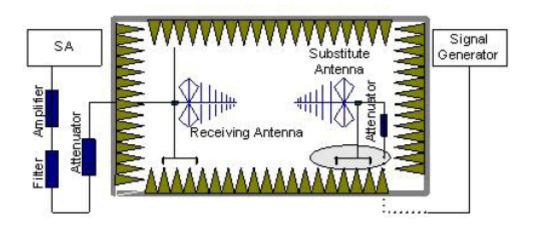
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The measurement will be conducted at channels 512,661,810 of GSM1900.

. The procedure of Radiates Spurious Emission is as follows:

#### 1. Pre-calibration

In an fully anechoic chamber, A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted at a 3 meter test distance from the receive antenna. An RF signal source is connected to the dipole with a Tx cable that has been constructed to not interfere with radiation pattern of the antenna. A known (measured) power (Pin) is applied to input of dipole, and the power received (Pr) is recorded from the spectrum analyzer.

"Reference Path loss" is established as Pin –Pr-Tx cable loss+ Substitution antenna gain.



#### 2. EUT Test

EUT was placed on a 1.5 meter high non – conductive table at a 3 meter test distance from the receive antenna. The height of receiving antenna is 1.5 m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the table and adjusting the receiving antenna polarization. The measurement is carried out using a spectrum analyzer .The radiated emission measurements of all non-harmonic and harmonic of the transmit frequency from 30MHz to the 10th harmonic were measured with peak detector. RBW is set to 100kHz and VBW is set to 300kHz for 30MHz to 1GHz. RBW is set to 100kHz,VBW is set to 30kHz for the carrier frequency, RBW is set to 1MHz and VBW is set to 3MHz for other frequency above 1GHz. 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. If the harmonic could not be detected above the noise floor, the ambient level was recorded.

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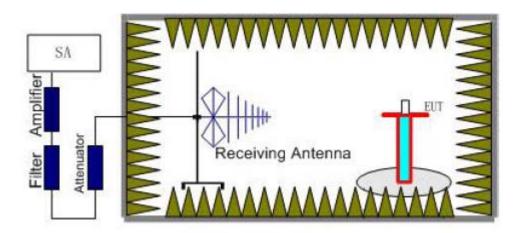
The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.

Calculation procedure:

RSE = Rx (dBm) + Reference Path loss

Rx: reading of the receiver

The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis) and docking mode. The worst emission was found in stand-up position (Z axis) and the antenna is vertical.



#### Limits

Rule Part 24.238(a) specifies that "on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log10 (P) dB."

Limit	-13 dBm
=	

#### **Measurement Uncertainty**

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96. U=3.16 dB.

Test Result

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#### **GSM 1900**

Harmonic	TX ch.512 Frequency (MHz)	Level (dBm)	Limit (dBm)			
2	3700.1	-45.71	-13			
3	5550.4	-39.90	-13			
4	7400.8	Nf	-13			
5	9251	Nf	-13			
6	11101.2	Nf	-13			
7	12951.4	-39.71	-13			
8	14801.6	Nf	-13			
9	16651.8	Nf	-13			
10	10 18502		-13			
Nf: noise floor	Nf: noise floor					

Harmonic	TX ch.661 Frequency (MHz)	Level (dBm)	Limit (dBm)	
2	3759.8	-47.71	-13	
3	5640.4	-38.53	-13	
4	7520	Nf	-13	
5	9400	Nf	-13	
6	11280	Nf	-13	
7	13160.3	-42.31	-13	
8	15040 Nf	Nf	-13	
9	16920	Nf	-13	
10	10 18800		-13	
Nf: noise floor				

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Harmonic	TX ch.810 Frequency (MHz)	Level (dBm)	Limit (dBm)	
2	3819.6	Nf	-13	
3	5729.3	-38.63	-13	
4	7639.2	Nf	-13	
5	9549	Nf	-13	
6	11458.8	Nf	-13	
7	13368	-41.09	-13	
8	15278.4	Nf	-13	
9	17188.2	Nf	-13	
10 19098		Nf -13		
Nf: noise floor				

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#### 3. Main Test Instruments

No.	Name	Туре	Manufacturer	Serial Number	Calibration Date	Valid Period
01	Base Station Simulator	CMU200	R&S	118133	2010-05-27	One year
02	Signal Analyzer	FSV	R&S	100815	2010-06-28	One year
03	Signal generator	SMR27	R&S	1606.6000.02	2010-06-28	One year
04	EMI Test Receiver	ESCI	R&S	100948	2010-07-01	One year
05	Trilog Antenna	VUBL 9163	SCHWARZB ECK	9163-201	2010-06-29	Two years
06	Horn Antenna	HF907	R&S	100126	2009-07-02	Two years
07	Power Splitter	11667A	Agilent	52960	NA	NA
08	DC Power Supply	GPS-3030D	GM	E877677	NA	NA
09	Climatic Chamber	ESS-SDH401	YIN HE	2006001	2011-02-21	One year
10	Semi-Anechoic Chamber	9.6*6.7*6.6m	ETS-Lindgren	NA	NA	NA
11	EMI test software	ES-K1	R&S	NA	NA	NA

\*\*\*\*\*END OF REPORT BODY\*\*\*\*\*

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#### **ANNEX A: EUT Appearance and Test Setup**

#### A.1 EUT Appearance



**Picture 1 EUT** 

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#### **A.2 Test Setup**



Picture 2: Radiated Spurious Emissions Test setup