



Report No.: RZA1103-0392RF02\_R1



# Part 24

# TEST REPORT

<b>Product Name</b>	m1000
<b>Model Name</b>	m1000
<b>FCC ID</b>	WA6M1000
<b>Client</b>	verykool USA Inc

**TA Technology (Shanghai) Co., Ltd.**



## GENERAL SUMMARY

<b>Product Name</b>	m1000	<b>Model Name</b>	m1000
<b>FCC ID</b>	WA6M1000		
<b>Report No.</b>	RZA1103-0392RF02_R1		
<b>Client</b>	verykool USA Inc		
<b>Manufacturer</b>	verykool USA Inc		
<b>Reference Standard(s)</b>	<p><b>FCC CFR47 Part 2 (2010-12)</b> Frequency Allocations And Radio Treaty Matters; General Rules And Regulations</p> <p><b>FCC CFR47 Part 24E (2010-12)</b> Personal Communications Services</p> <p><b>ANSI/TIA-603-C(2004)</b> Land mobile FM or PM Communications Equipment Measurements and Performance Standards.</p>		
<b>Conclusion</b>	<p>This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in Chapter 2 of this test report are below limits specified in the relevant standards.</p> <p>General Judgment: <b>Pass</b></p> <div style="text-align: right;">  <p>(Stamp) Date of issue: April 23<sup>rd</sup>, 2011</p> </div>		
<b>Comment</b>	The test result only responds to the measured sample.		

Approved by 杨伟中  
Yang Weizhong

Revised by 徐凯  
Xu Kai

Performed by 康玲玲  
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  
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Website: <http://www.ta-shanghai.com>  
E-mail: [yangweizhong@ta-shanghai.com](mailto:yangweizhong@ta-shanghai.com)

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**1.3. Applicant Information**

Company: verykool USA Inc  
Address: 4350 Executive Dr. #100, San Diego, CA 92121, USA  
City: San Diego  
Postal Code: 92121  
Country: USA  
Contact: Sunny Choi / Director of Product Management  
Telephone: 858-373-1635  
Fax: 858-373-1505

**1.4. Manufacturer Information**

Company: verykool USA Inc  
Address: 4350 Executive Dr. #100, San Diego, CA 92121, USA  
City: San Diego  
Postal Code: 92121  
Country: USA  
Telephone: 858-373-1635  
Fax: 858-373-1505

### 1.5. Information of EUT

#### General information

Name of EUT:	m1000		
IMEI:	356360040022848		
Hardware Version:	LQAMG82		
Software Version:	LQA00C1.1.0_MG82		
Antenna Type:	Internal Antenna		
Device Operating Configurations:			
Operating Mode(s):	GSM1900; (tested) WCDMA Band II; (tested)		
Test Modulation:	(GSM)GMSK; (WCDMA)QPSK		
GPRS Multislot Class:	10		
EGPRS Multislot Class:	12		
Maximum E.I.R.P.	GSM 1900: dBm WCDMA Band II: dBm		
Power Supply:	Battery or Charger		
Rated Power Supply Voltage:	5.0 V		
Extreme Voltage:	Minimum: 4.5 V    Maximum: 5.5 V		
Extreme Temperature:	Lowest: -30°C    Highest: +50°C		
Test Channel: (Low - Middle - High)	512 - 661 - 810 9262 – 9400 – 9538	(GSM 1900) (WCDMA Band II)	(tested) (tested)
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM1900	1850.2 ~ 1909.8	1930.2 ~ 1989.8
	WCDMA Band II	1852.4 ~ 1907.6	1932.4 ~ 1987.6

Equipment Under Test (EUT) is m1000 with internal antenna. The EUT is tested GSM1900 and WCDMA Band II 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 March 28, 2011 to April 2, 2011 and April 22, 2011.

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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

## 2.2. RF Power Output

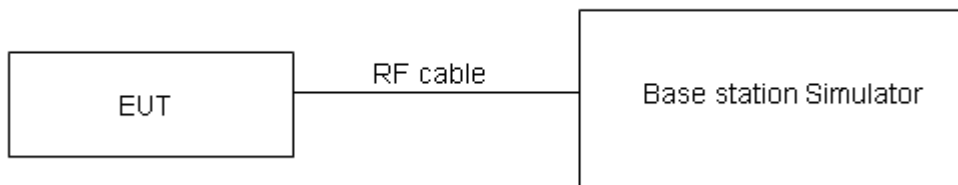
### Ambient condition

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.

### 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

GSM 1900		Conducted Power(dBm)		
		Channel 512	Channel 661	Channel 810
		1850.2(MHz)	1880(MHz)	1909.8(MHz)
GPRS (GMSK)	1TXslot	<b>30.02</b>	<b>29.93</b>	<b>29.83</b>
	2TXslots	27.34	27.29	27.19
EGPRS (GMSK)	1TXslot	<b>29.85</b>	<b>29.79</b>	<b>29.81</b>
	2TXslots	27.21	27.13	27.16
	3TXslots	26.18	26.11	26.09
	4TXslots	24.04	24.03	23.97
EGPRS (8-PSK)	1TXslot	<b>25.68</b>	<b>25.67</b>	<b>25.57</b>
	2TXslots	22.40	22.39	22.34
	3TXslots	20.29	20.29	20.12
	4TXslots	19.18	19.03	19.07

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.

WCDMA Band II	Conducted Power(dBm)		
	Channel 9262	Channel 9400	Channel 9538
	1852.4(MHz)	1880(MHz)	1907.6(MHz)
Results	22.75	22.70	22.76

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### 2.3. Effective Isotropic Radiated Power

#### Ambient condition

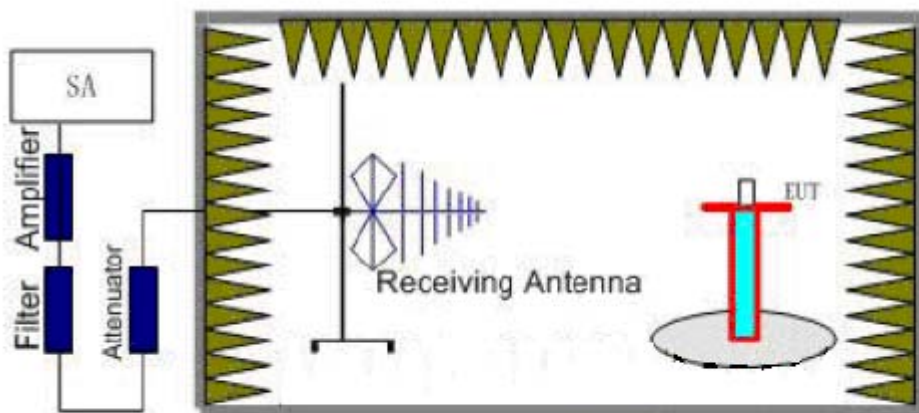
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### Methods of Measurement

The measurement procedures in TIA- 603C are used.

##### Step 1:

The measurement is carried out in the semi-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. The test setup refers to figure below.



##### Step 2:

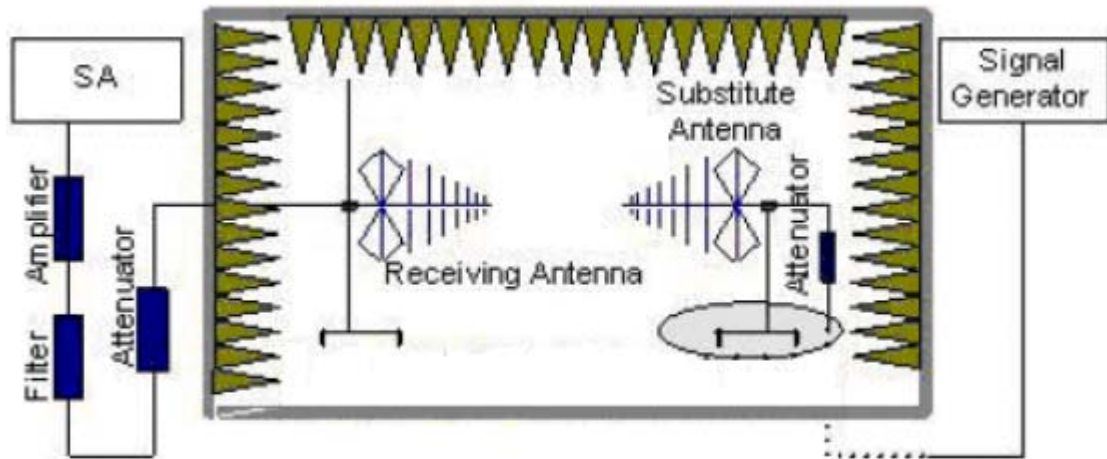
A dipole antenna shall be substituted in place of the EUT. The antenna will be driven by a signal generator with a adjustable S.G. applied through a 30dB amplifier and a Tx cable. Then the Analyzer reading which is equal to LVL is recorded while the antenna was moving up and down. The E.R.P. /E.I.R.P. of the EUT can be calculated through the level of the signal generator, Tx cable loss and the gain of the substitution antenna. The test setup refers to figure below.

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$E.R.P = S.G + 30 - Tx \text{ Cable loss} + \text{Substitution antenna gain} - 2.15$ .

$EIRP = E.R.P + 2.15$

### 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)	$\leq 2 \text{ W (33 dBm)}$
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### Measurement Uncertainty

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

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Test Results: Pass

	Channel	Polarization	LVL (dBm)	SG+30 (dBm)	Gain (dBi)	Cable Loss (dBm)	E.I.R.P. (dBm)
<b>GSM 1900 GPRS(GMSK)</b>	512	Vertical	-13.84	47.97	1.92	18.18	31.71
	661	Vertical	-14.67	45.51	1.94	18.27	29.18
	810	Vertical	-14.38	45.62	1.9	18.30	29.22
<b>GSM 1900 EGPRS(GMSK)</b>	512	Vertical	-15.94	47.88	1.92	18.18	31.62
	661	Vertical	-16.64	45.43	1.94	18.27	29.1
	810	Vertical	-17.51	45.59	1.9	18.30	29.19
<b>GSM 1900 EGPRS(8-PSK)</b>	512	Vertical	-22.49	40.04	1.92	18.18	23.78
	661	Vertical	-25.94	40.89	1.94	18.27	24.56
	810	Vertical	-23.96	41.15	1.9	18.30	24.75
<b>WCDMA Band II</b>	9262	Vertical	-26.66	39.82	1.92	18.18	23.65
	9400	Vertical	-25.62	40.39	1.94	18.27	24.06
	9538	Vertical	-23.35	41.06	1.92	18.30	24.63

Note: 1. E.R.P =S.G+30. - Tx Cable loss + Substitution antenna gain – 2.15.

2. EIRP= E.R.P+2.15

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## 2.4. Occupied Bandwidth

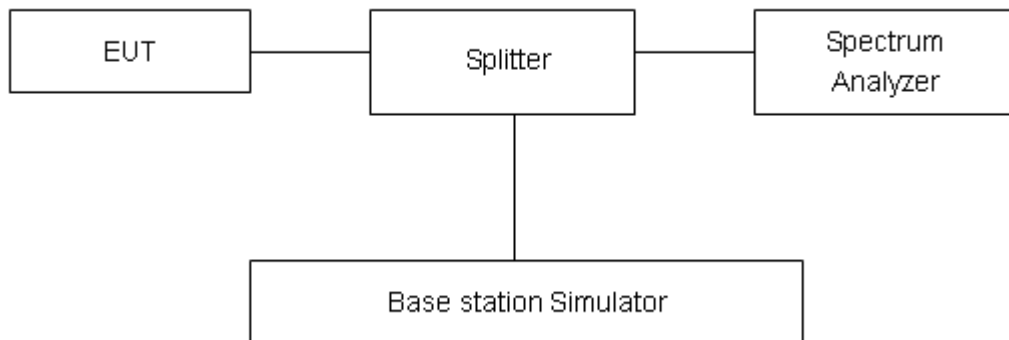
### Ambient condition

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 for GSM 1900 and RBW is set to 51kHz,VBW is set to 100kHz for WCDMA Band II.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  $k = 2$ .  $U = 624\text{Hz}$ .

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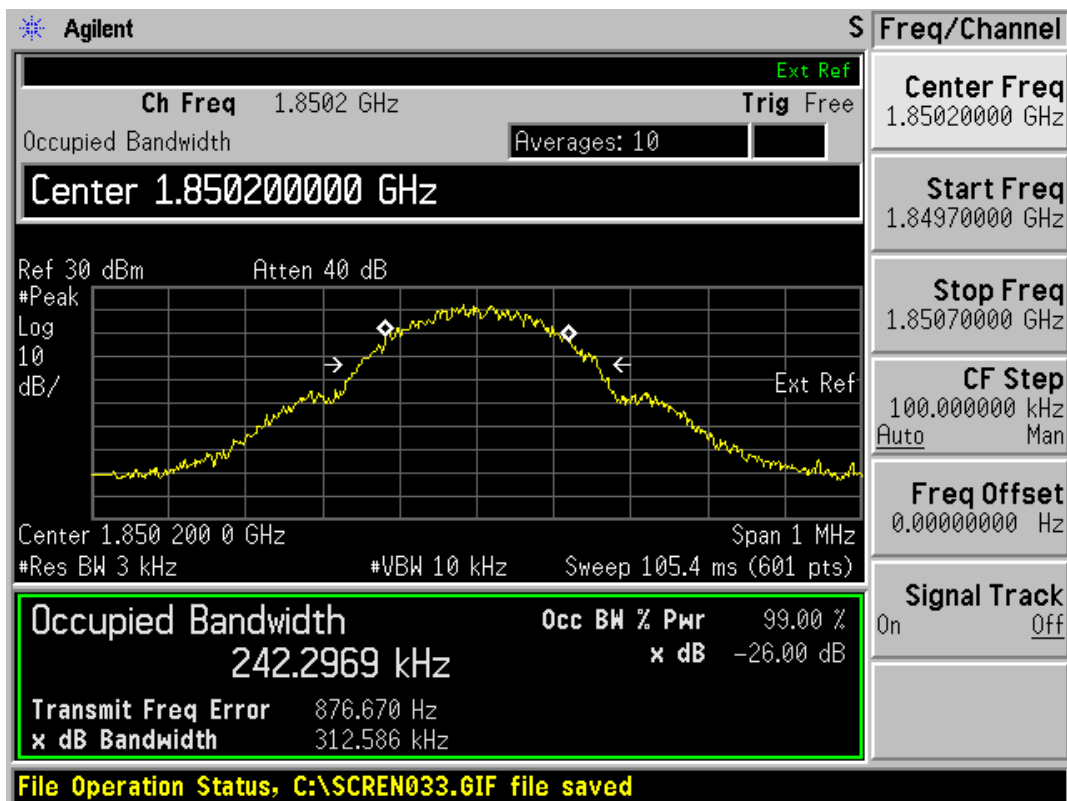
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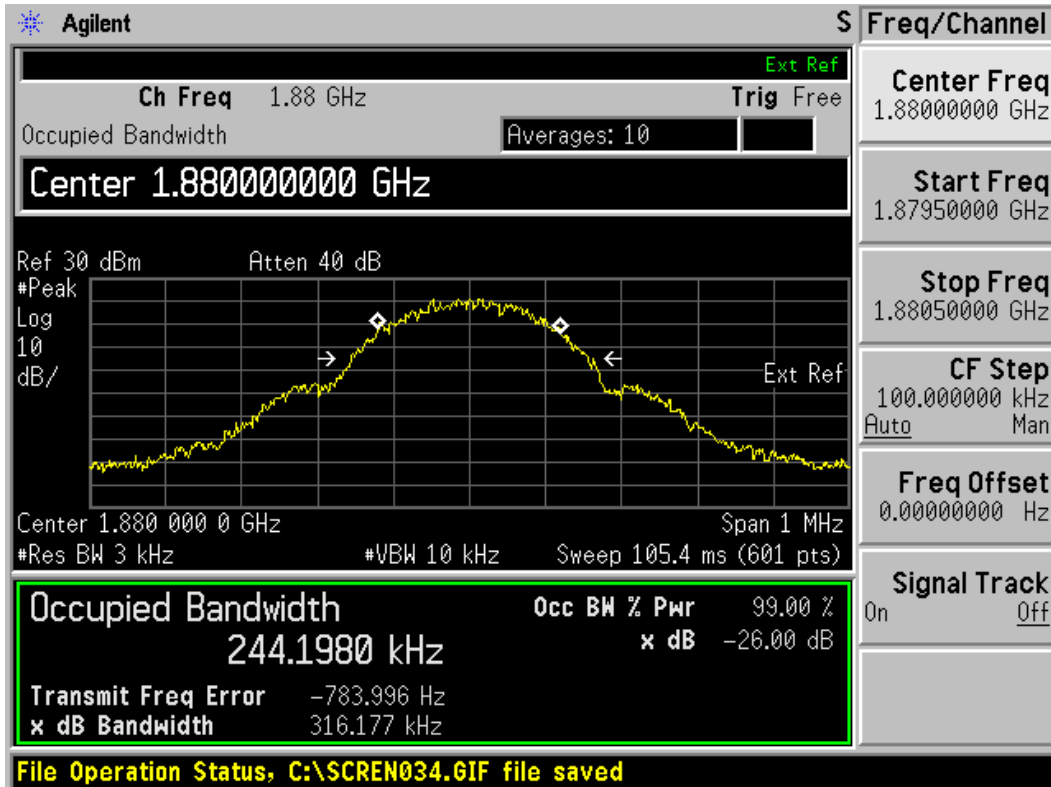
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## Test Result

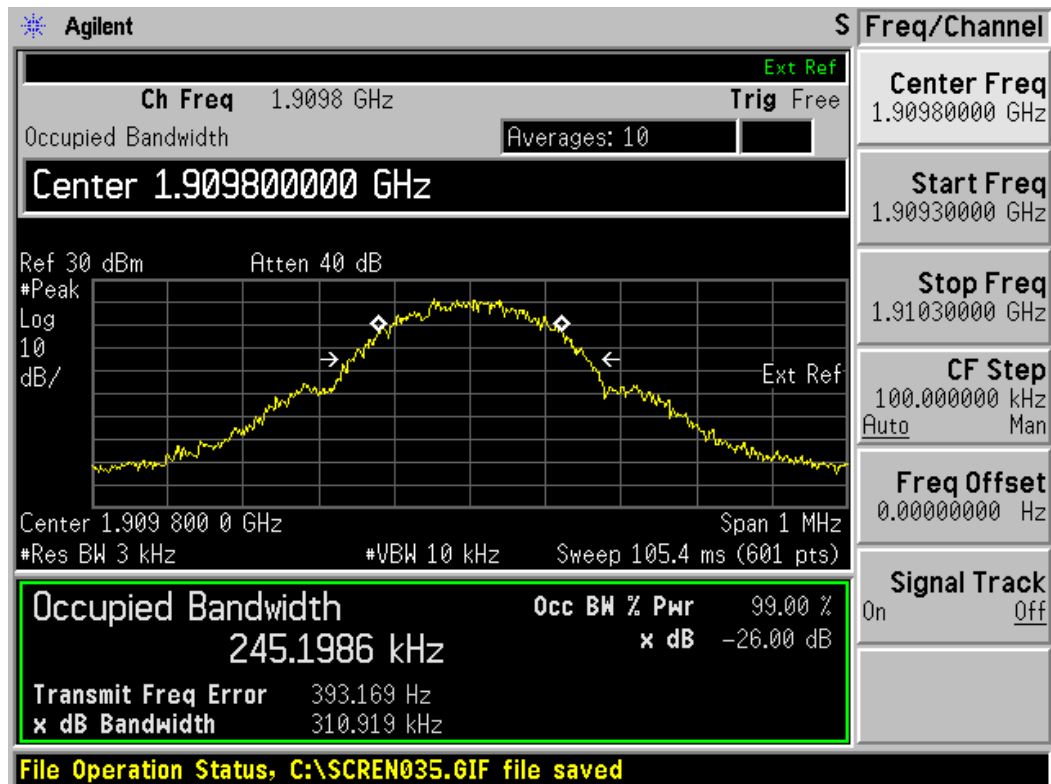
	Channel	Frequency (MHz)	99% Power Bandwidth (kHz)	-26dBc Bandwidth(kHz)
<b>GSM 1900 GPRS(GMSK)</b>	512	1850.2	242.2969	312.586
	661	1880.0	244.1980	316.177
	810	1909.8	245.1986	310.919
<b>GSM 1900 EGPRS(GMSK)</b>	512	1850.2	249.0496	314.391
	661	1880.0	245.1195	313.335
	810	1909.8	242.6593	313.503
<b>GSM 1900 EGPRS(8-PSK)</b>	512	1850.2	246.4758	302.174
	661	1880.0	248.7931	312.258
	810	1909.8	244.1927	305.142



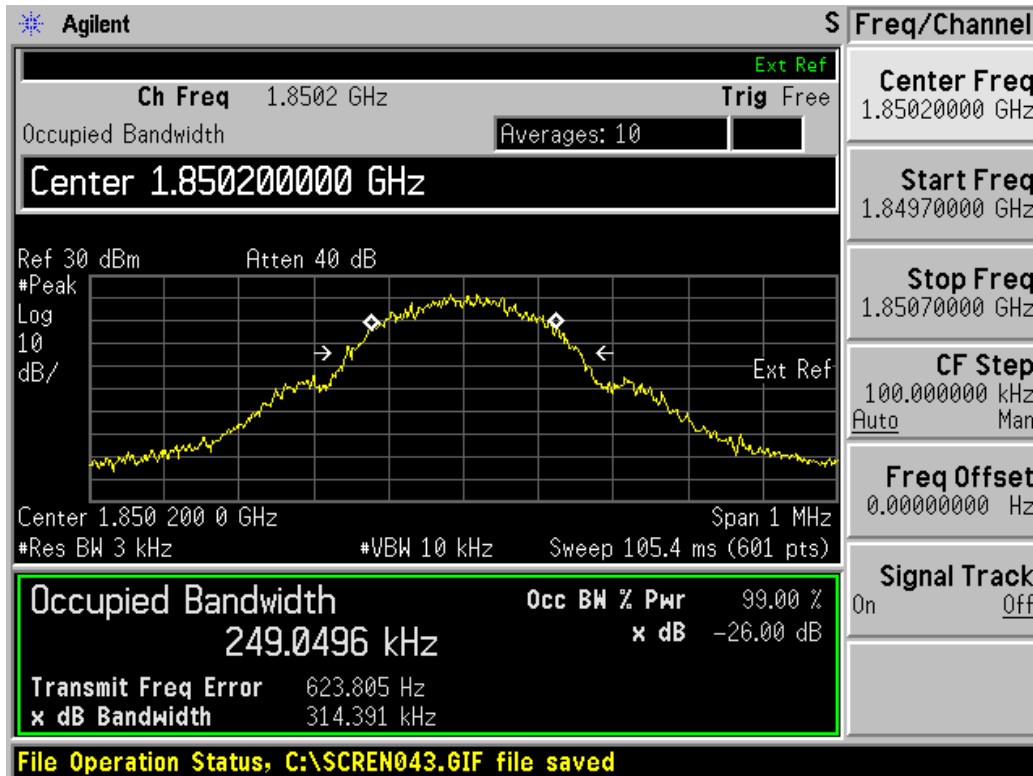
GSM1900 GPRS CH512 Occupied Bandwidth



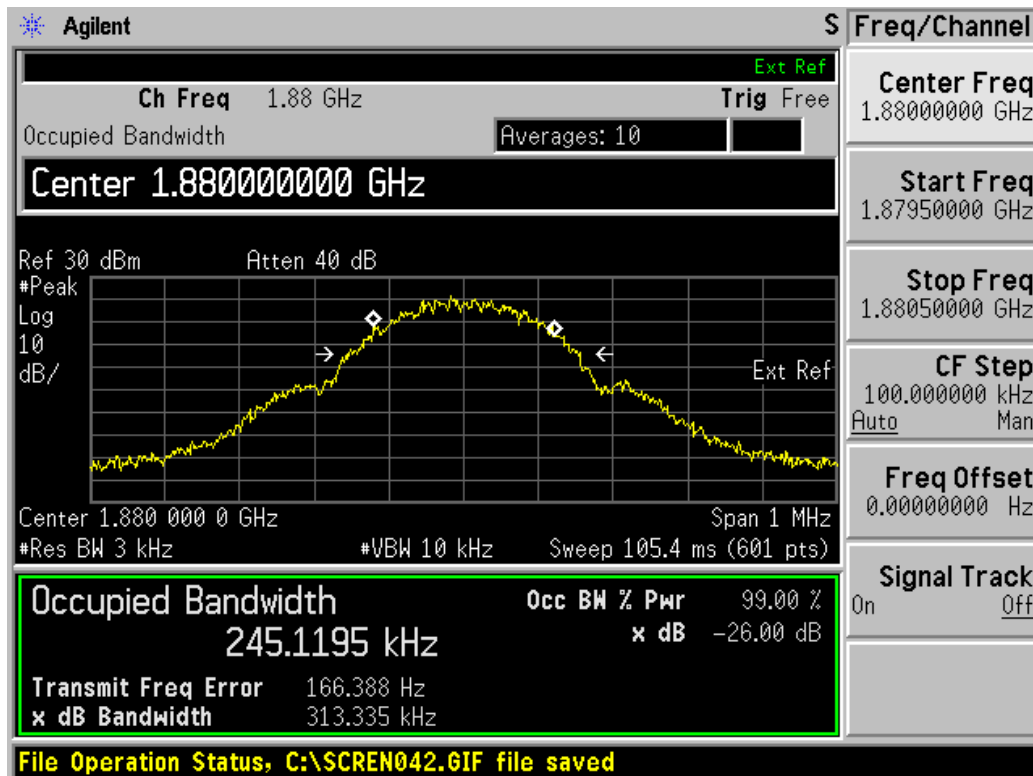
GSM 1900 GPRS CH661 Occupied Bandwidth



GSM 1900 GPRS CH810 Occupied Bandwidth



GSM1900 EGPRS(GMSK) CH512 Occupied Bandwidth



GSM 1900 EGPRS(GMSK) CH661 Occupied Bandwidth

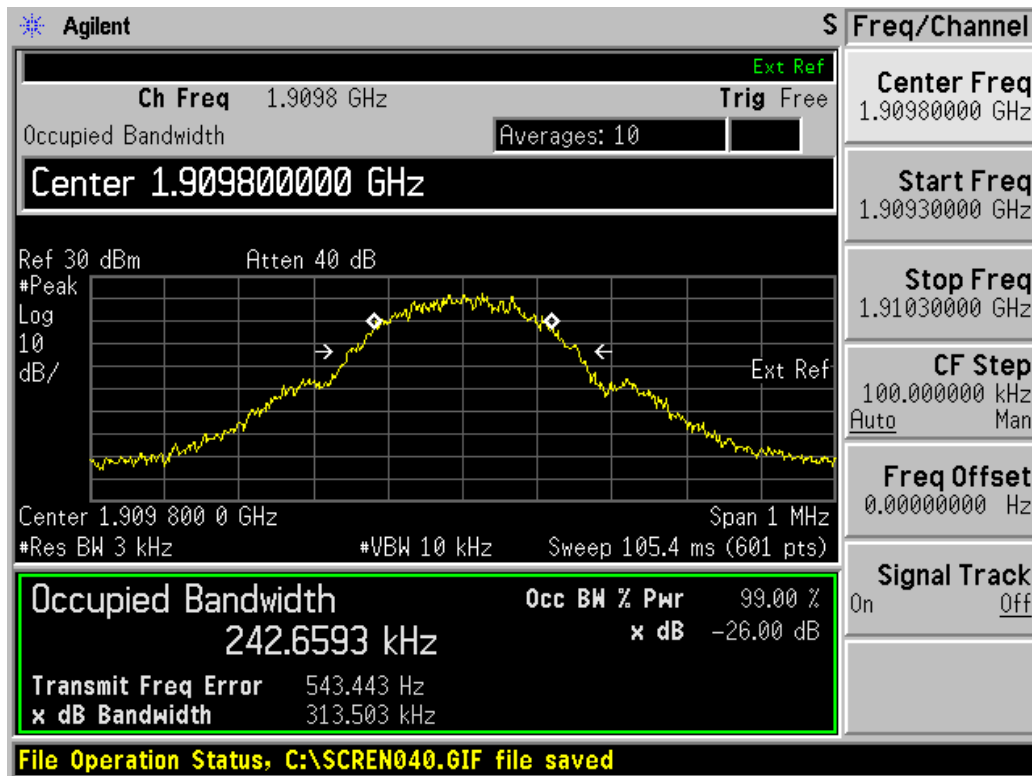


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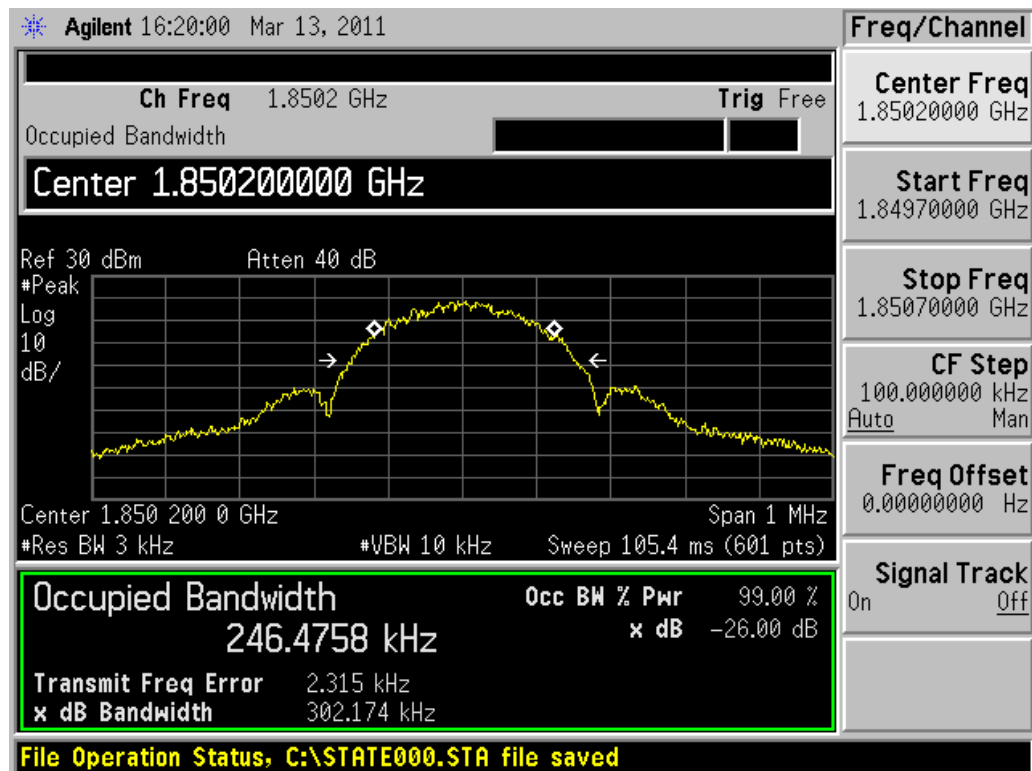
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GSM 1900 EGPRS(GMSK) CH810 Occupied Bandwidth



GSM1900 EGPRS(8-PSK) CH512 Occupied Bandwidth

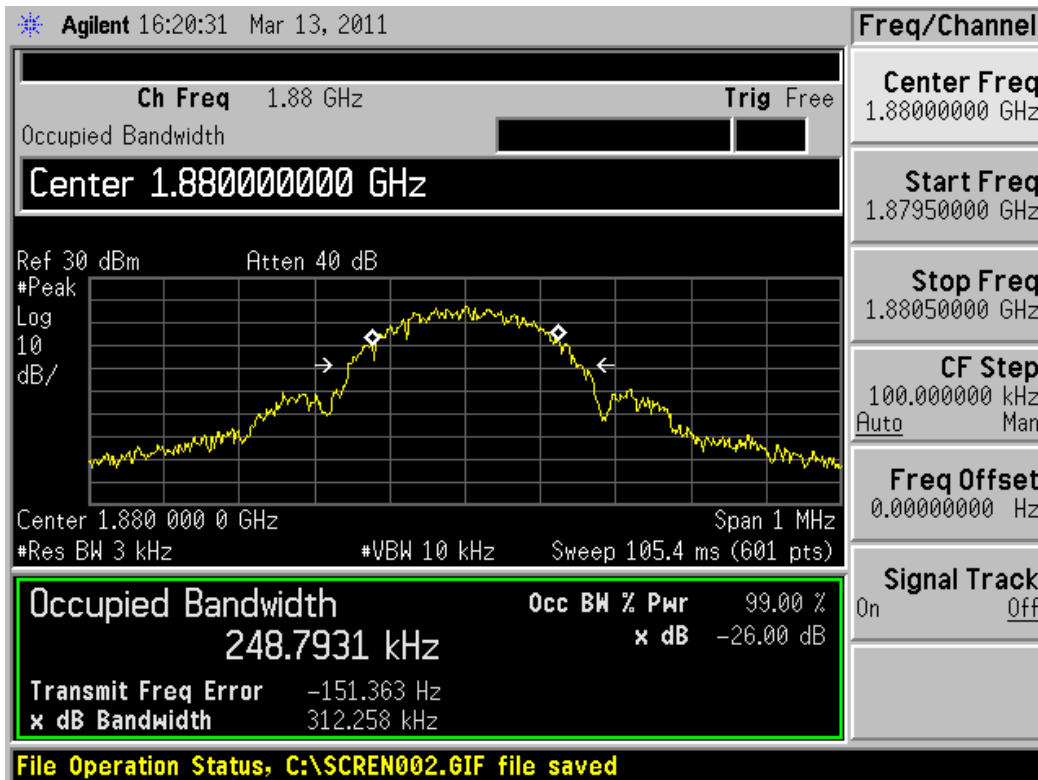
# TA Technology (Shanghai) Co., Ltd.

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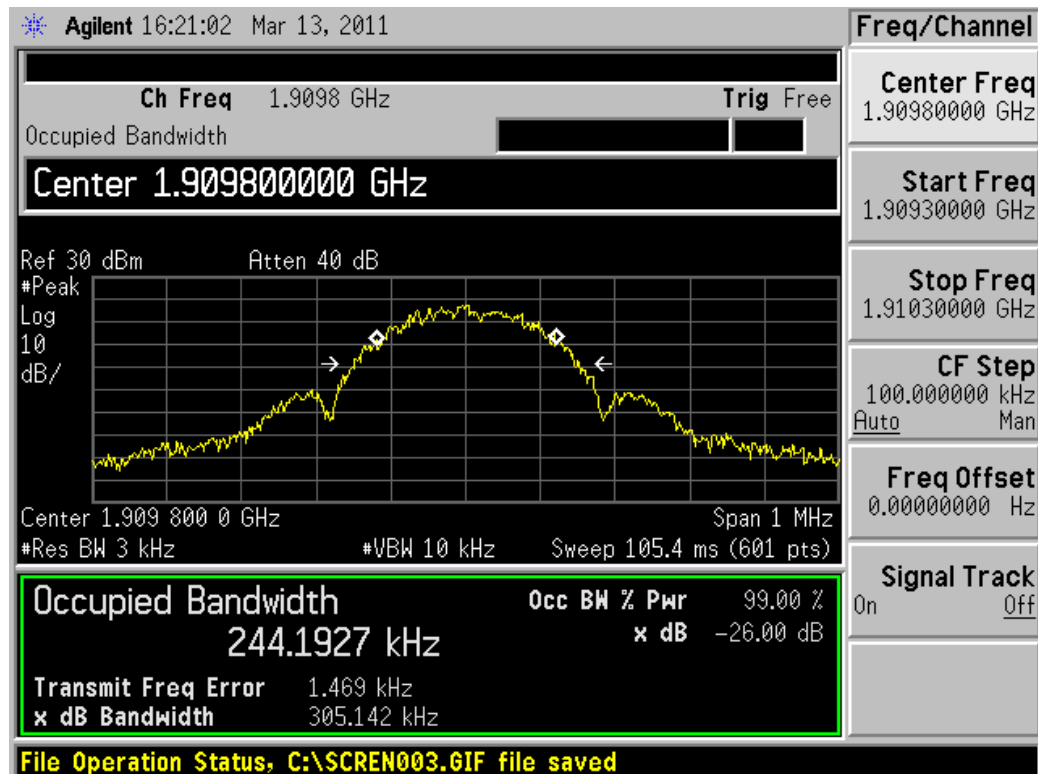
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GSM 1900 EGPRS(8-PSK) CH661 Occupied Bandwidth



GSM 1900 EGPRS(8-PSK) CH810 Occupied Bandwidth

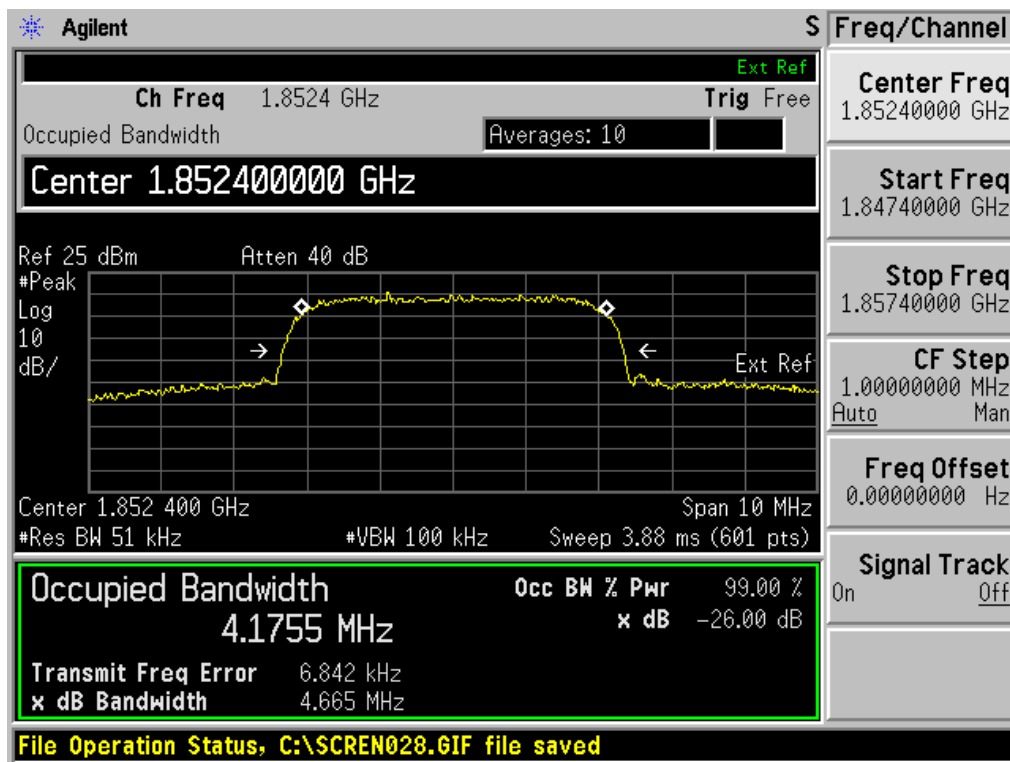
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	Channel	Frequency (MHz)	99% Power Bandwidth (MHz)	-26dBc Bandwidth(MHz)
<b>WCDMA Band II</b>	9262	1852.4	4.1755	4.665
	9400	1880	4.1800	4.660
	9538	1907.6	4.1837	4.671



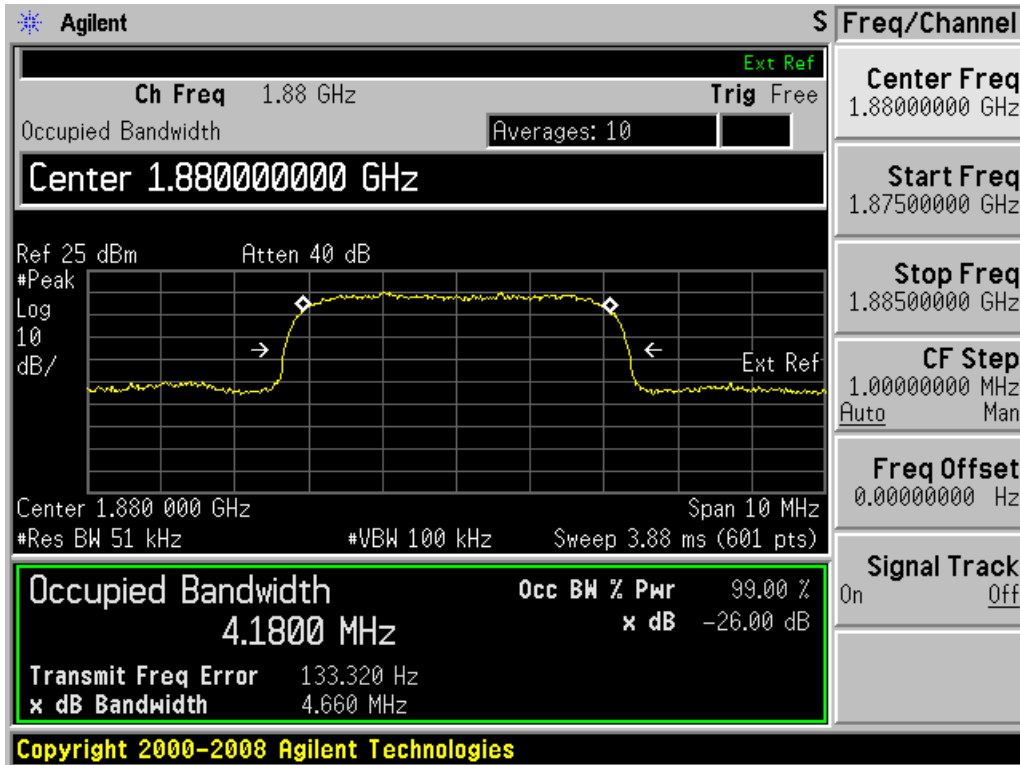
WCDMA Band II CH9262 Occupied Bandwidth

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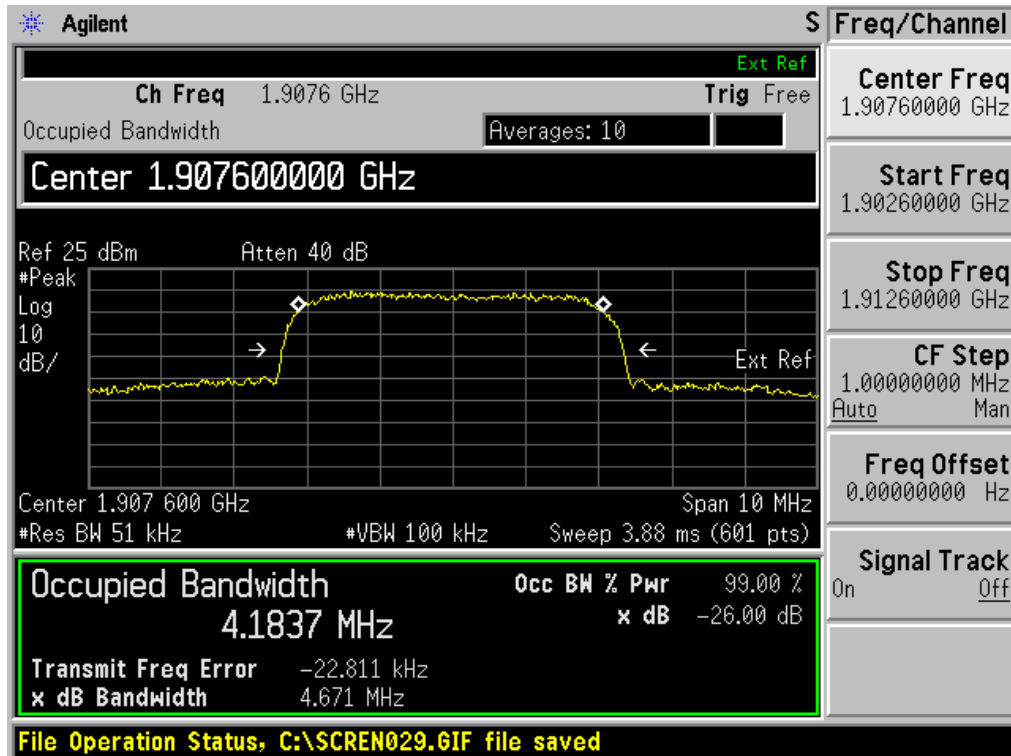
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WCDMA Band II CH9400 Occupied Bandwidth



WCDMA Band II CH9538 Occupied Bandwidth

**2.5. Band Edge Compliance**

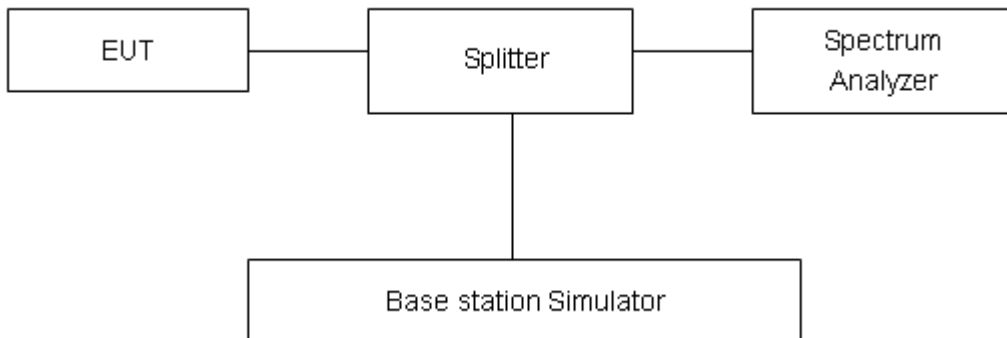
**Ambient condition**

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,VBW is set to 10kHz for GSM 1900 and RBW is set to 51kHz,VBW is set to 100kHz for WCDMA Band II. 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  $43 + 10 \log_{10} (P)$  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  $k = 1.96$ .  $U=0.684$ dB.

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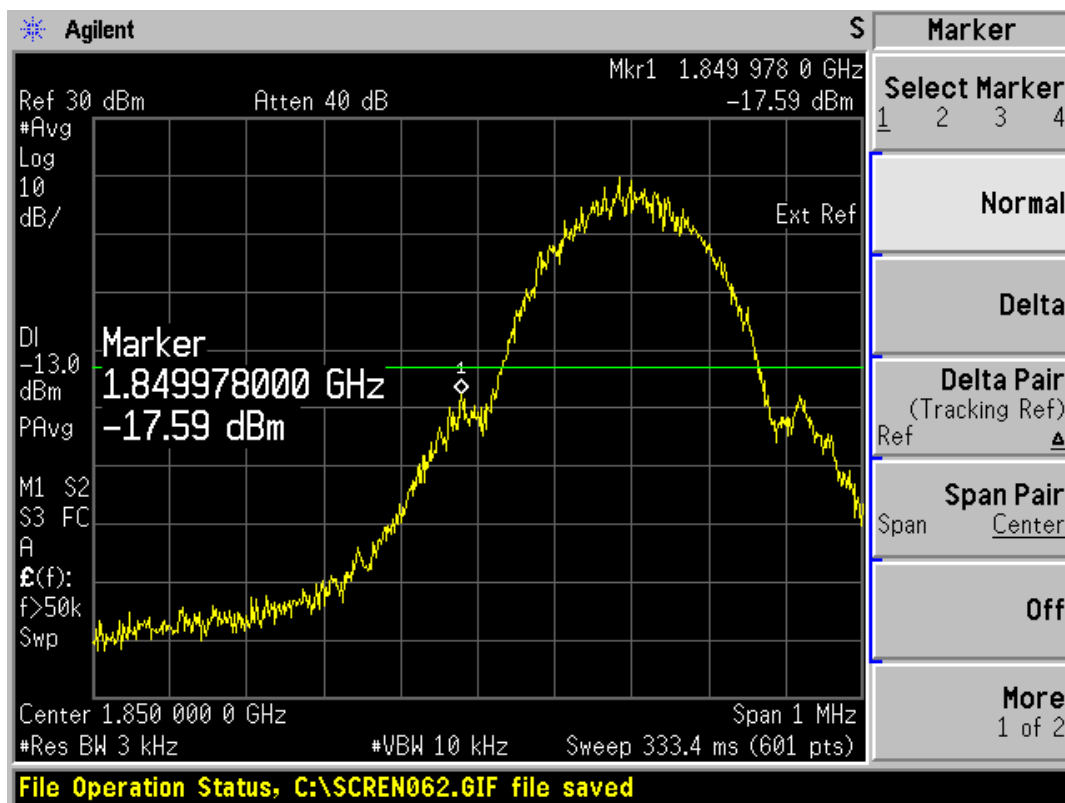
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**Test Result:**

	Frequency (MHz)	Reference value (dBm)	Limit	Conclusion
<b>GSM 1900 GPRS(GMSK)</b>	1849.98	-17.59	-13	PASS
	1910.02	-17.68	-13	PASS
<b>GSM 1900 EGPRS(GMSK)</b>	1850.00	-22.30	-13	PASS
	1910.02	-23.33	-13	PASS
<b>GSM 1900 EGPRS(8-PSK)</b>	1850.00	-22.89	-13	PASS
	1910.02	-24.31	-13	PASS



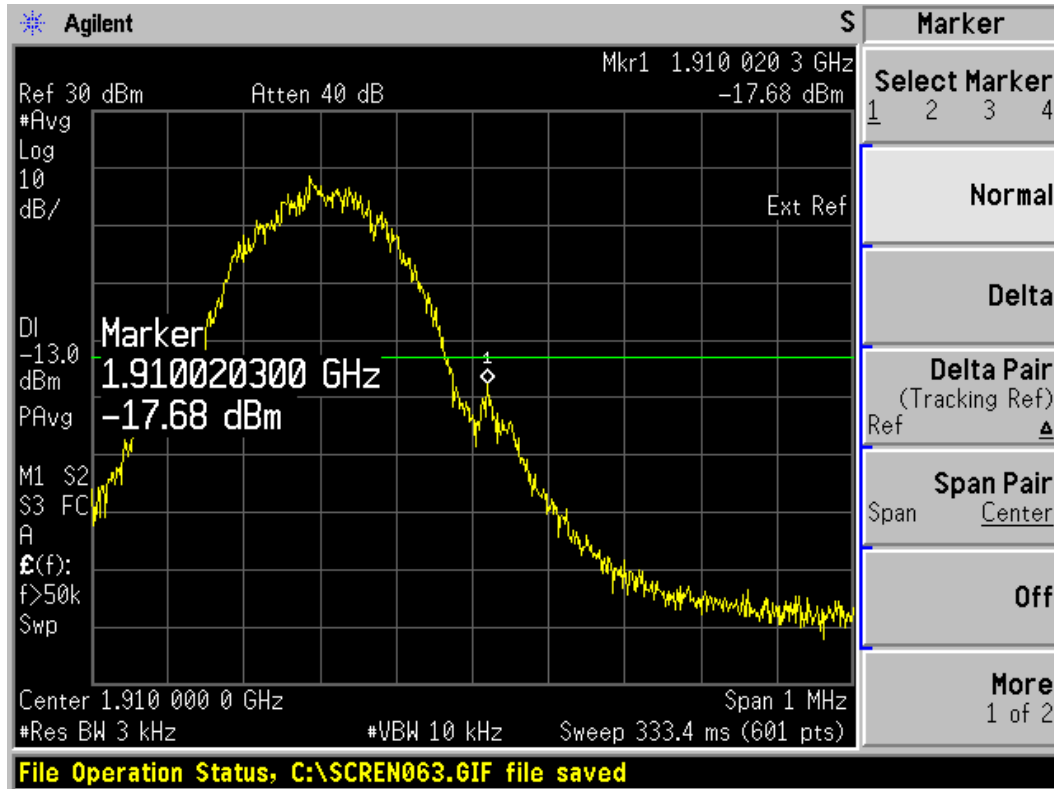
GSM 1900 GPRS 512 Channel

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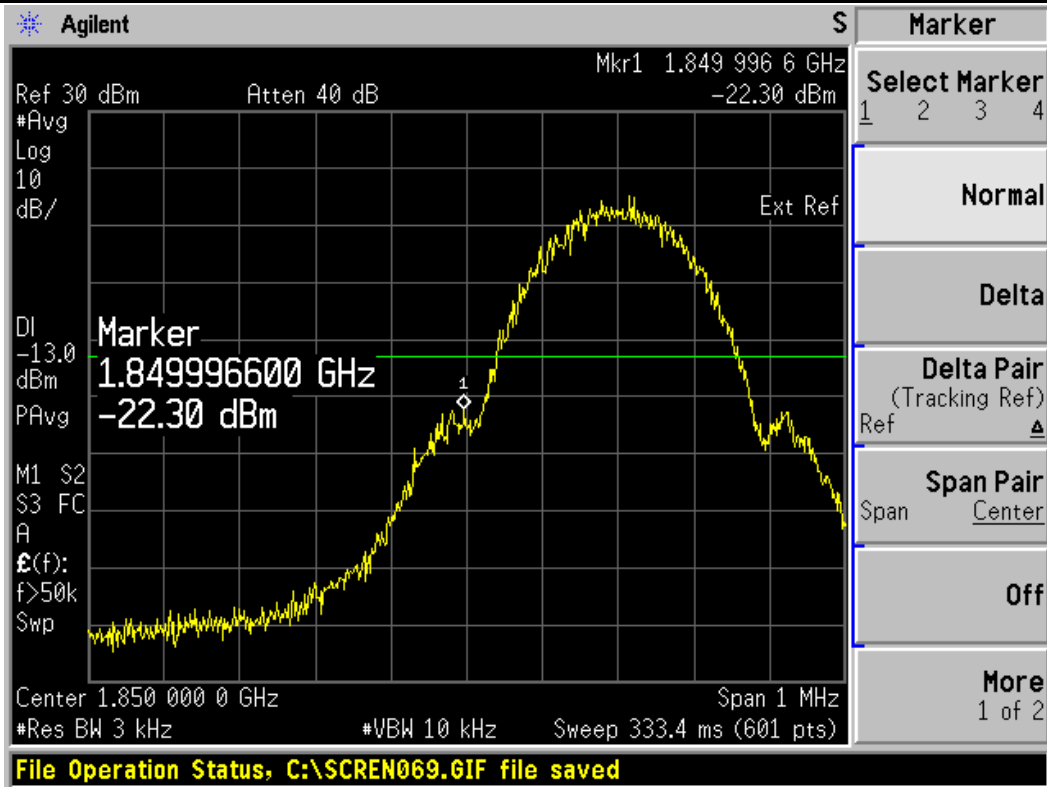
GSM1900 GPRS 810 Channel

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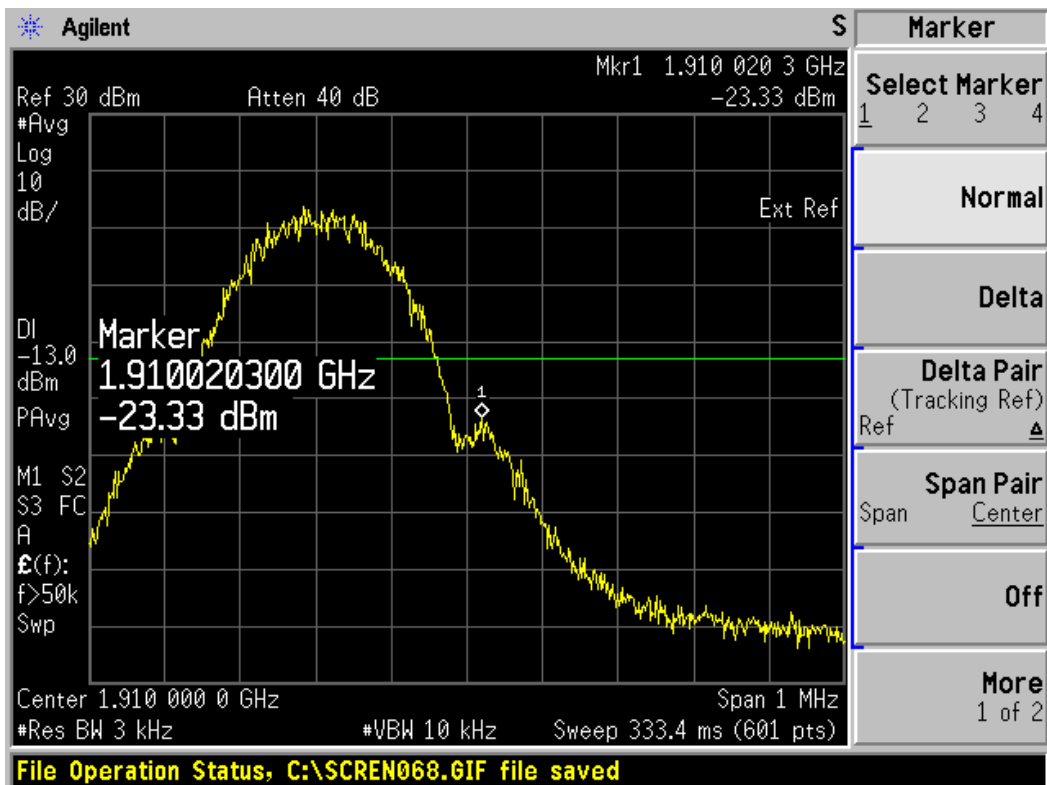
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GSM 1900 EGPRS(GMSK) 512 Channel



GSM1900 EGPRS(GMSK) 810 Channel

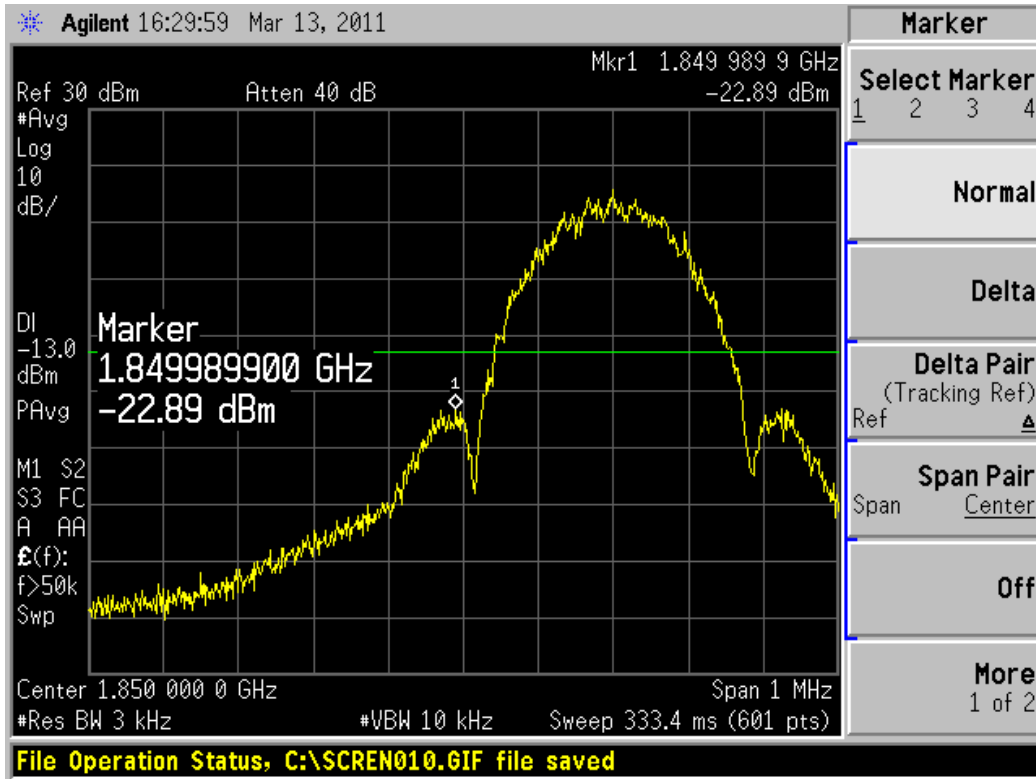


# TA Technology (Shanghai) Co., Ltd. Test Report

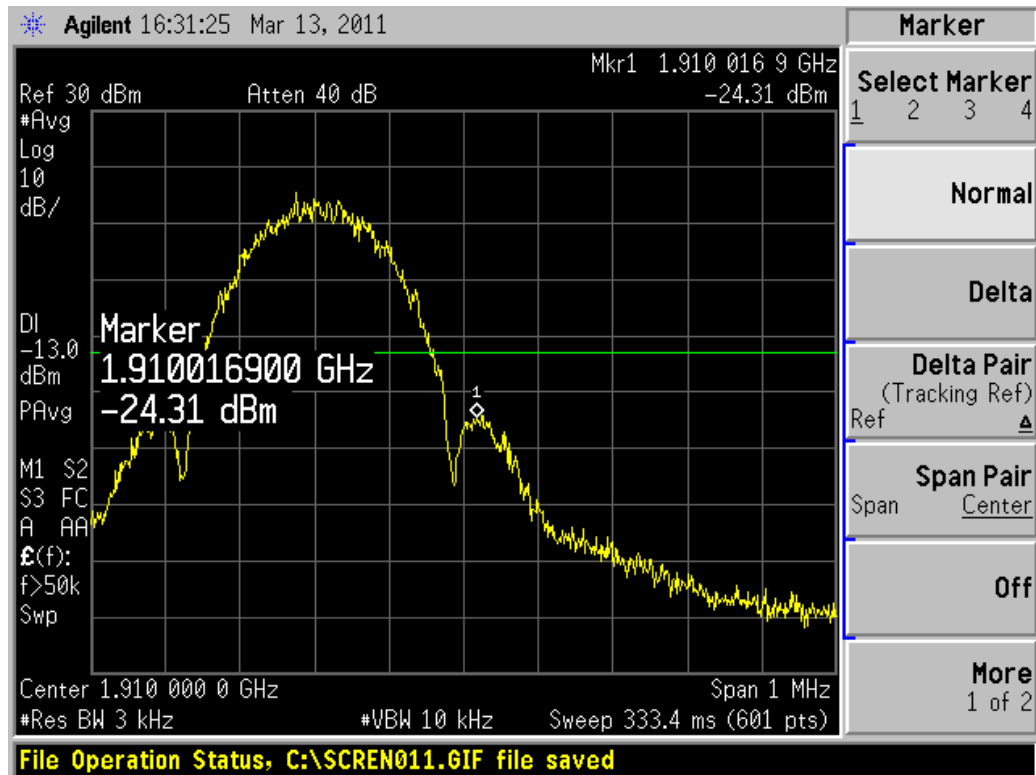
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GSM 1900 EGPRS(8-PSK) 512 Channel



GSM1900 EGPRS(8-PSK) 810 Channel

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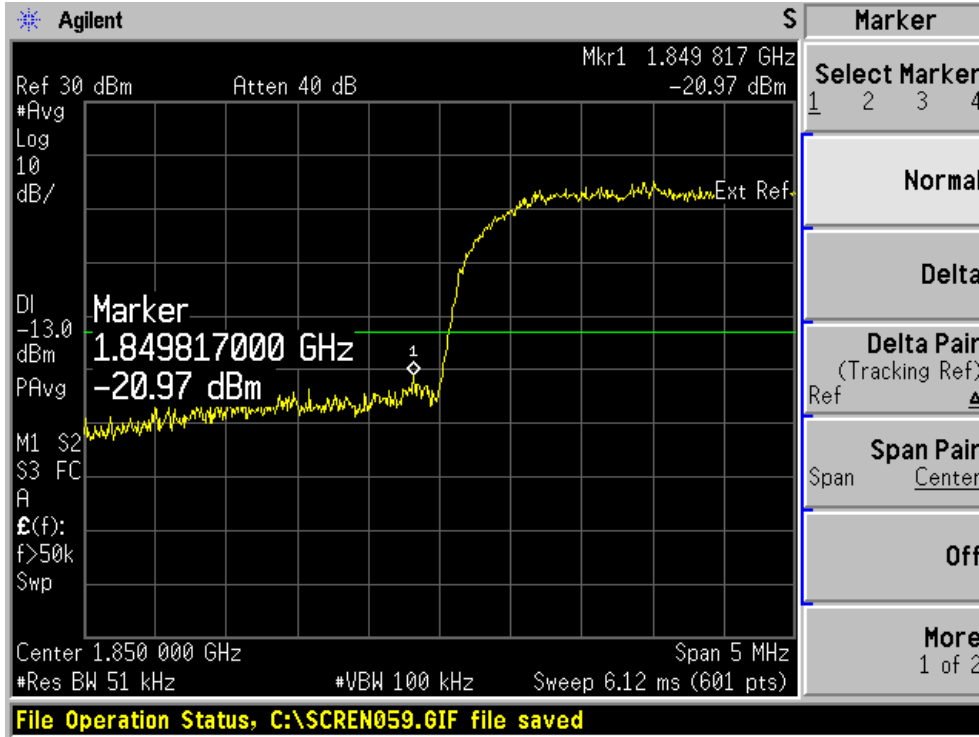
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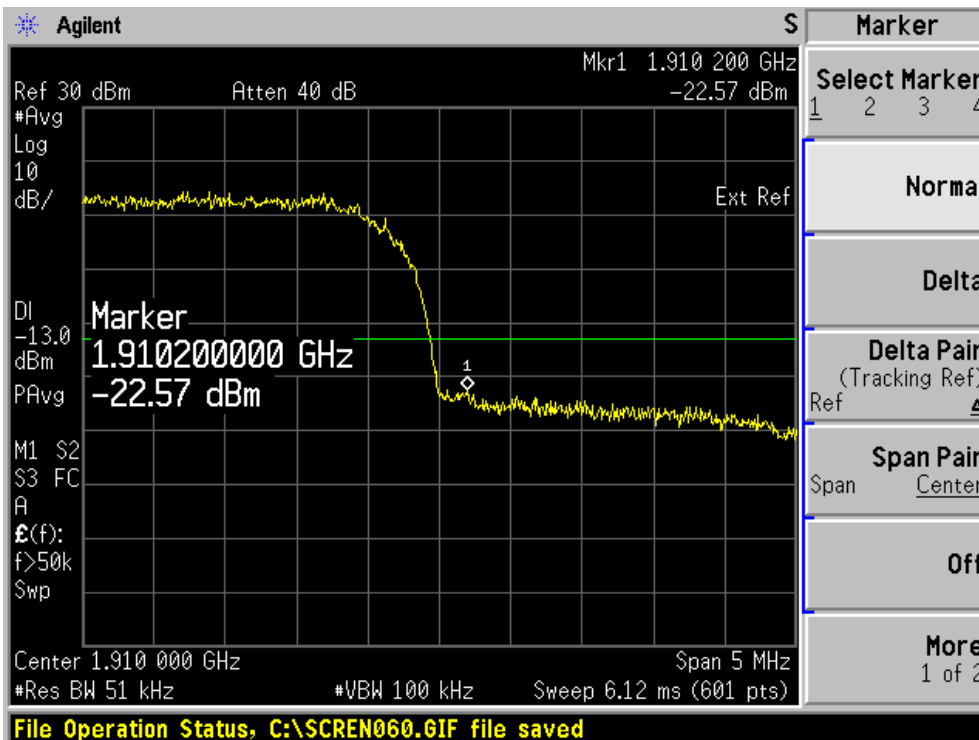
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	Frequency (MHz)	Reference value (dBm)	Limit	Conclusion
<b>WCDMA Band II</b>	1849.82	-20.97	-13	PASS
	1910.20	-22.57	-13	PASS



WCDMA Band II 9262 Channel



WCDMA Band II 9538 Channel

## 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)

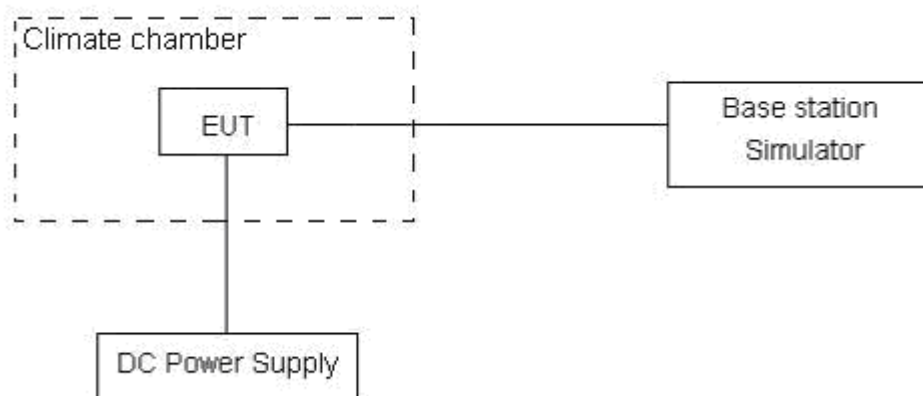
The frequency stability shall be measured with variation of primary supply voltage as follows:

(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 4.5 V and 5.5 V, with a nominal voltage of 5.0V.

### 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  $k = 3$ .  $U = 0.01\text{ppm}$ .

### Test Result

#### GSM1900

Temperature (° C)	Test Results (ppm) / 5.0 V Power supply
	Channel 661
-30	0.01879
-20	0.01913
-10	0.02132
0	0.01966
10	0.02347
20	0.02185
30	0.02239
40	0.01996
50	0.02154

Voltage (V)	Test Results(ppm) / 20° C
	Channel 661
4.5	0.02895
5.0	0.02185
5.5	0.02960

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### WCDMA Band II

Temperature (°C)	Test Results (ppm) / 5.0 V Power supply
	Channel 9400
-30	0.03917
-20	0.04141
-10	0.03331
0	0.03179
10	0.03947
20	0.04418
30	0.03319
40	0.03978
50	0.04418

Voltage (V)	Test Results(ppm) / 20°C
	Channel 9400
4.5	0.03919
5.0	0.04418
5.5	0.02929

**2.7. Spurious Emissions at Antenna Terminals**

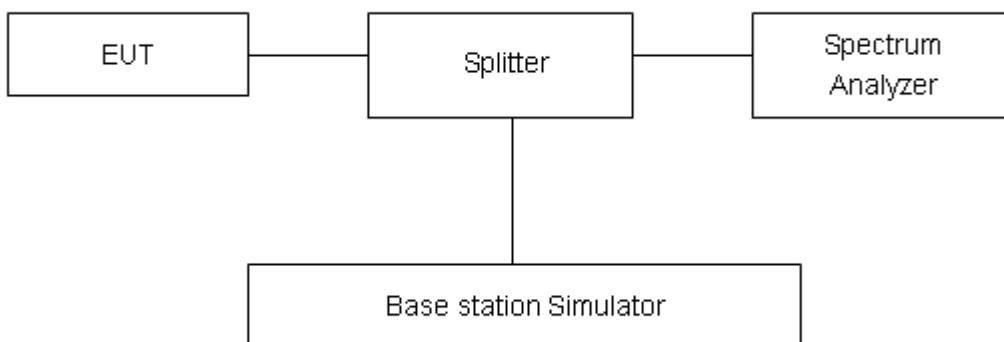
**Ambient condition**

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. For GSM 1900, RBW and VBW are set to 100 kHz, Sweep is set to ATUO. For WCDMA Band II, RBW and VBW are set to 100 kHz for the carrier frequency, or RBW and VBW are set to 1MHz (other frequency), 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  $43 + 10 \log_{10} (P)$  dB.”

Limit	-13 dBm
-------	---------

**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

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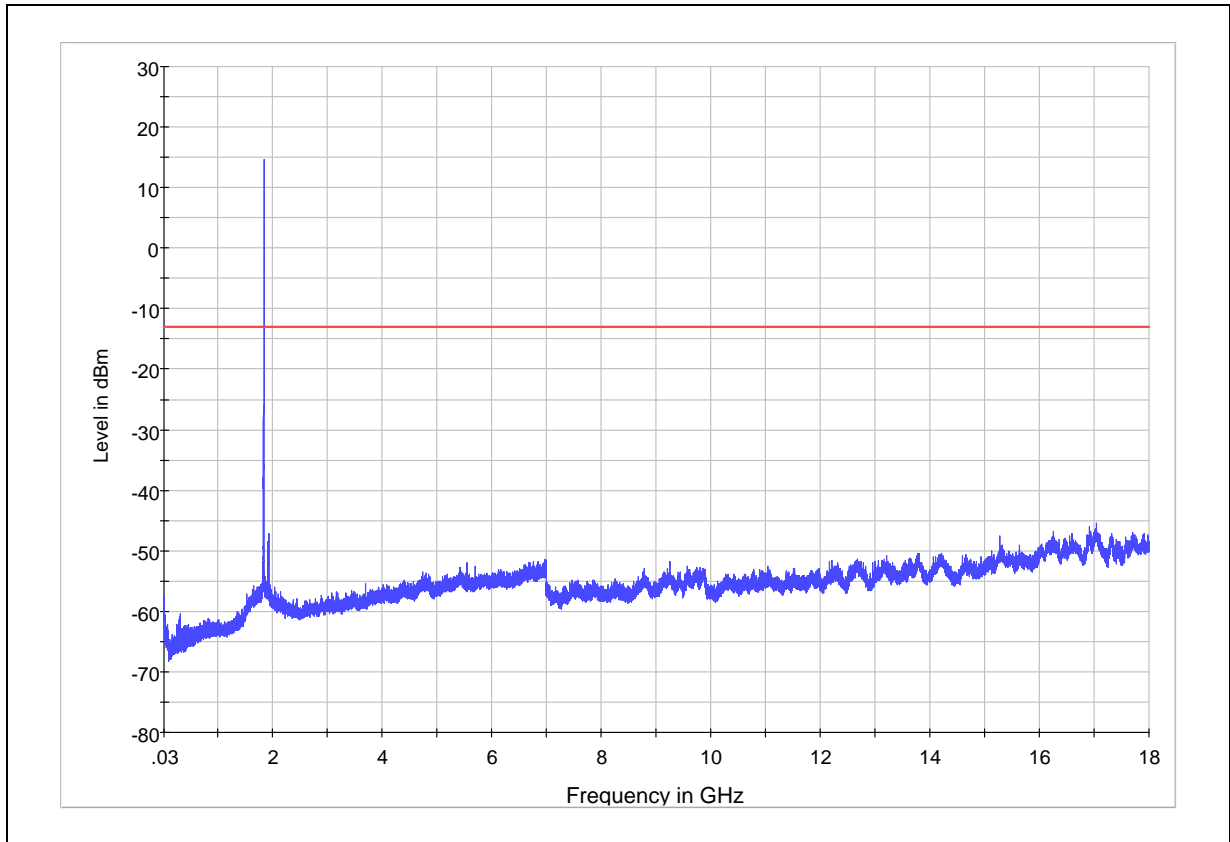
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### Test Result

GSM 1900 CH 512



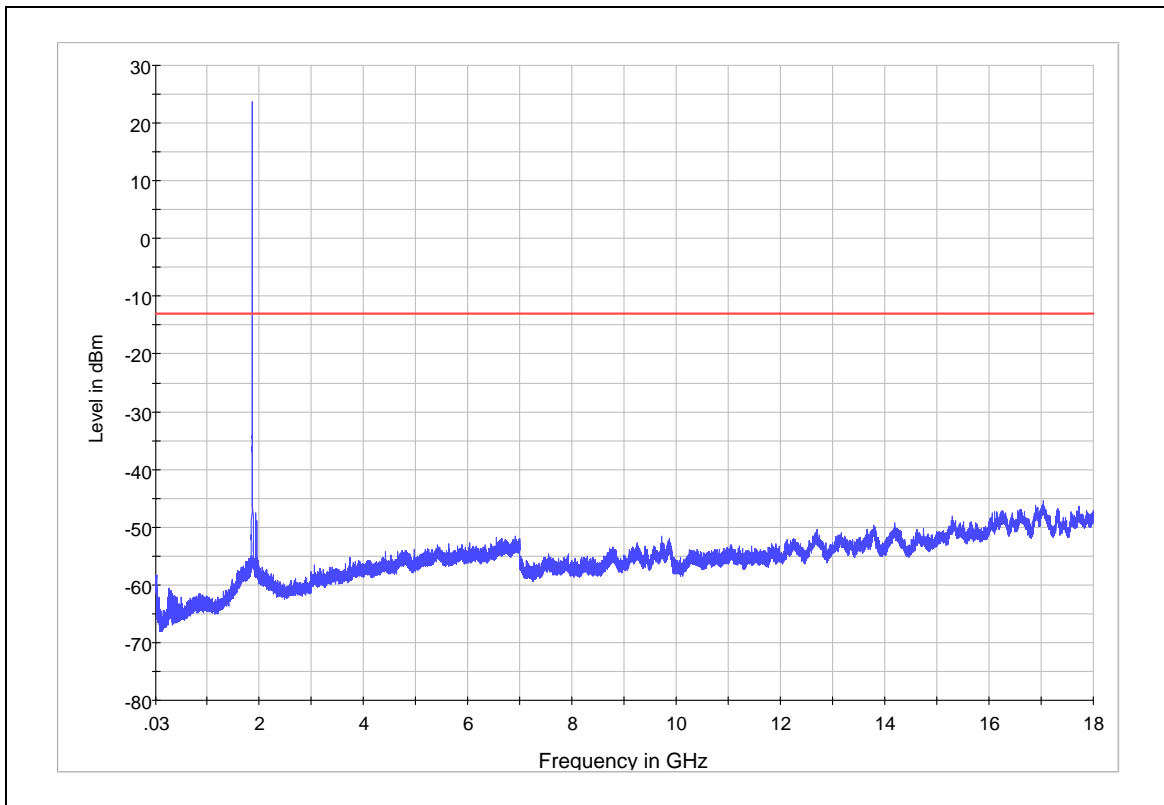
Note: The signal beyond the limit is carrier.  
GSM 1900 512 Channel 30MHz~18GHz

Harmonic	TX ch.512 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	3700.4	Nf	-13	/
3	5550.6	Nf	-13	/
4	7400.8	Nf	-13	/
5	9251	Nf	-13	/
6	11101.2	Nf	-13	/
7	12951.4	Nf	-13	/
8	14801.6	Nf	-13	/
9	16651.8	Nf	-13	/
10	18502	Nf	-13	/

Nf: noise floor

Note: The other Spurious RF conducted emissions level is no more than noise floor.

GSM 1900 CH 661



Note: The signal beyond the limit is carrier.  
GSM 1900 661 Channel 30MHz~18GHz

Harmonic	TX ch.661 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	3760	Nf	-13	/
3	5640	Nf	-13	/
4	7520	Nf	-13	/
5	9400	Nf	-13	/
6	11280	Nf	-13	/
7	13160	Nf	-13	/
8	15040	Nf	-13	/
9	16920	Nf	-13	/
10	18800	Nf	-13	/

Nf: noise floor

Note: The other Spurious RF conducted emissions level is no more than noise floor.



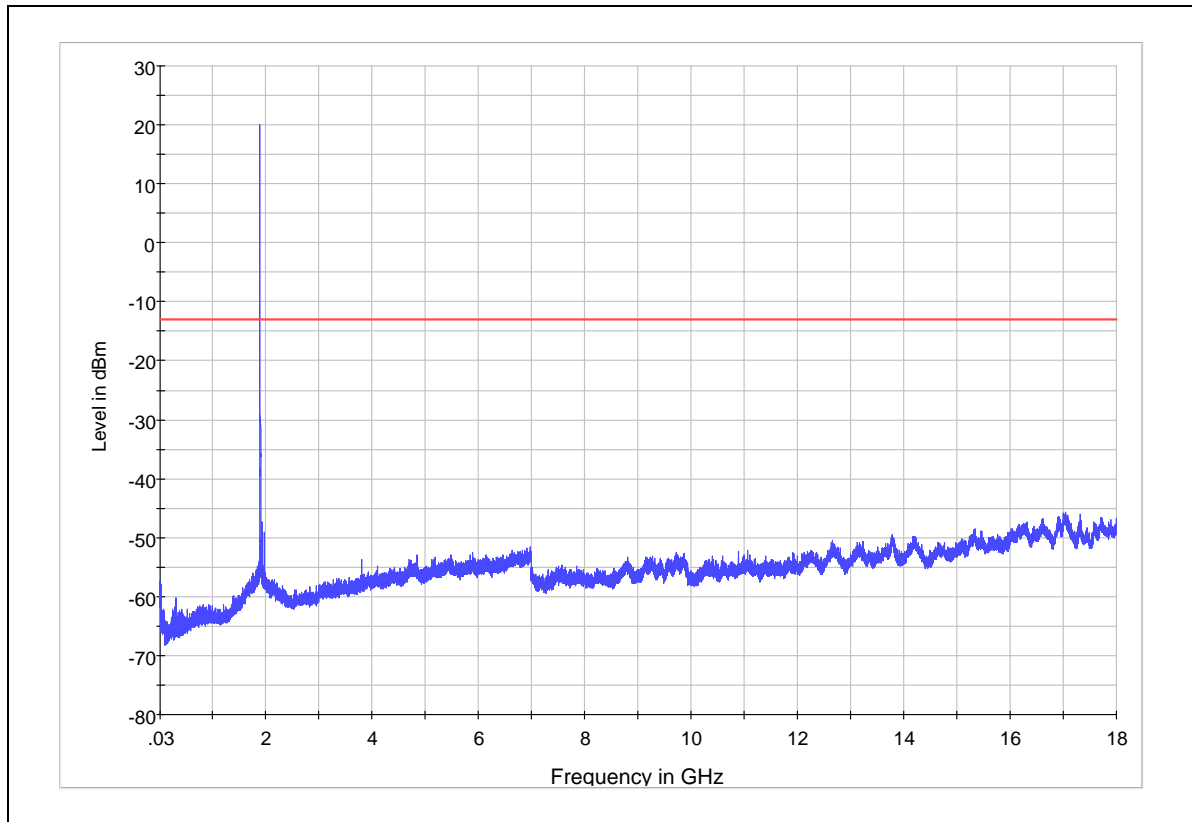
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GSM 1900 CH 810



Note: The signal beyond the limit is carrier.  
 GSM 1900 810 Channel 30MHz~18GHz

Harmonic	TX ch.810 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	3819.6	Nf	-13	/
3	5729.4	Nf	-13	/
4	7639.2	Nf	-13	/
5	9549	Nf	-13	/
6	11458.8	Nf	-13	/
7	13368.6	Nf	-13	/
8	15278.4	Nf	-13	/
9	17188.2	Nf	-13	/
10	19098	Nf	-13	/

Nf: noise floor

Note: The other Spurious RF conducted emissions level is no more than noise floor.

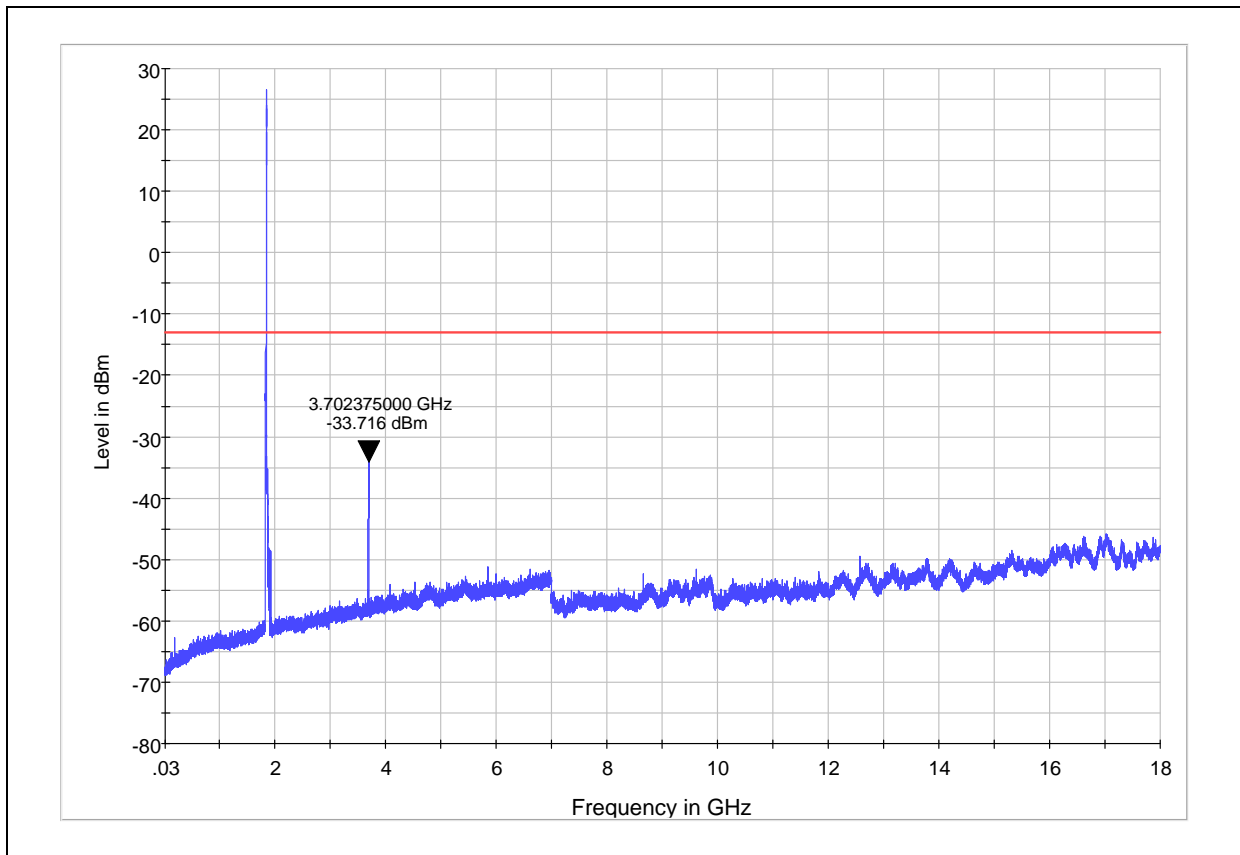
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WCDMA Band II CH9262



Note: The signal beyond the limit is carrier.  
WCDMA Band II 9262 Channel 30MHz~18GHz

Harmonic	TX ch.9262 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	3702.4	-33.72	-13	20.72
3	5557.2	Nf	-13	/
4	7409.6	Nf	-13	/
5	9262	Nf	-13	/
6	11114.4	Nf	-13	/
7	12966.8	Nf	-13	/
8	14819.2	Nf	-13	/
9	16671.6	Nf	-13	/
10	18524	Nf	-13	/

Nf: noise floor

Note: The other Spurious RF conducted emissions level is no more than noise floor.

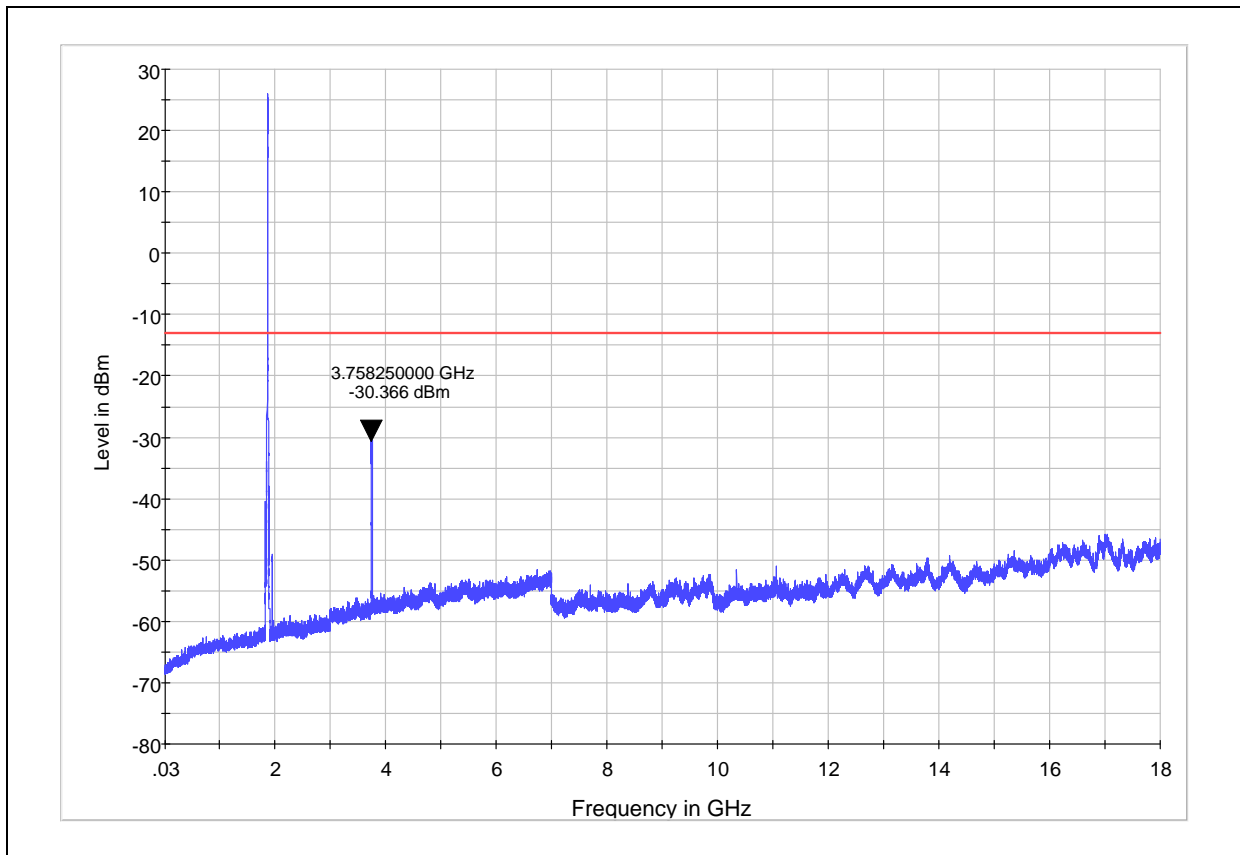
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WCDMA Band II CH9400



Note: The signal beyond the limit is carrier.  
WCDMA Band II 9400 Channel 30MHz~18GHz

Harmonic	TX ch.9400 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	3758.3	-30.37	-13	17.37
3	5640	Nf	-13	/
4	7520	Nf	-13	/
5	9400	Nf	-13	/
6	11280	Nf	-13	/
7	13160	Nf	-13	/
8	15040	Nf	-13	/
9	16920	Nf	-13	/
10	18800	Nf	-13	/

Nf: noise floor

Note: The other Spurious RF conducted emissions level is no more than noise floor.

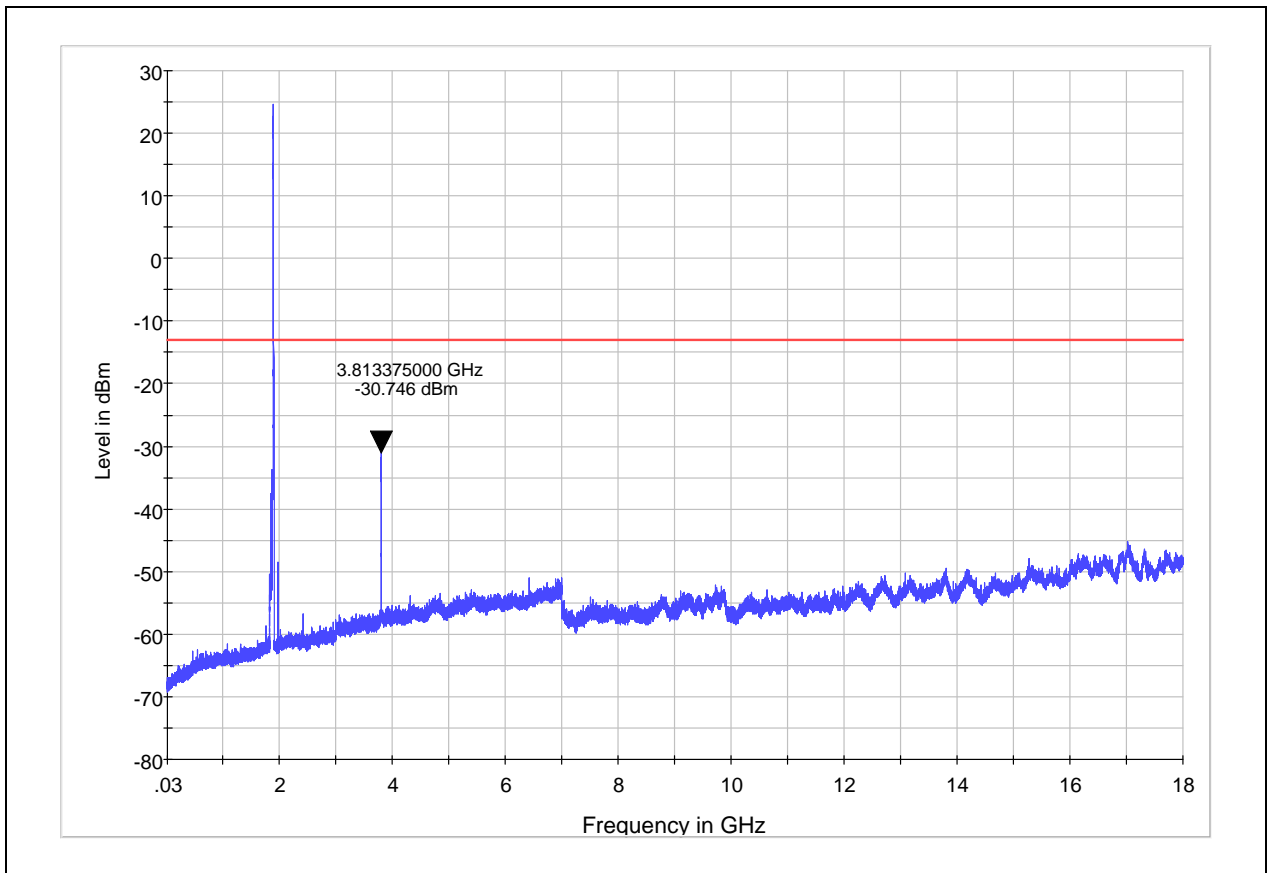
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WCDMA Band II CH9538



Note: The signal beyond the limit is carrier.  
WCDMA Band II 9538 Channel 30MHz~18GHz

Harmonic	TX ch.9538 Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
2	3813.4	-30.75	-13	17.75
3	5722.8	Nf	-13	/
4	7630.4	Nf	-13	/
5	9538	Nf	-13	/
6	11445.6	Nf	-13	/
7	13353.2	Nf	-13	/
8	15260.8	Nf	-13	/
9	17168.4	Nf	-13	/
10	19076	Nf	-13	/

Nf: noise floor

Note: The other Spurious RF conducted emissions level is no more than noise floor.

## 2.1. Radiates Spurious Emission

### Ambient condition

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

### Method of Measurement

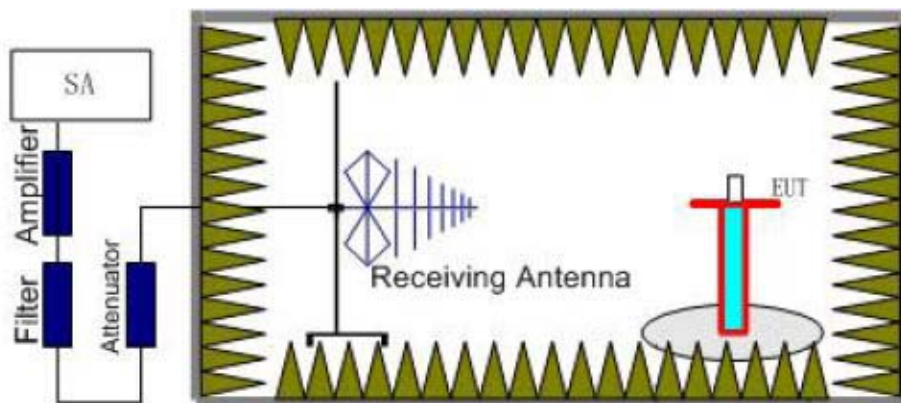
The measurements procedures in TIA -603C are used.

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

. The procedure of Radiates Spurious Emission is as follows:

Step 1:

The measurement is carried out in the full-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. The test setup refers to figure below.



Step 2:

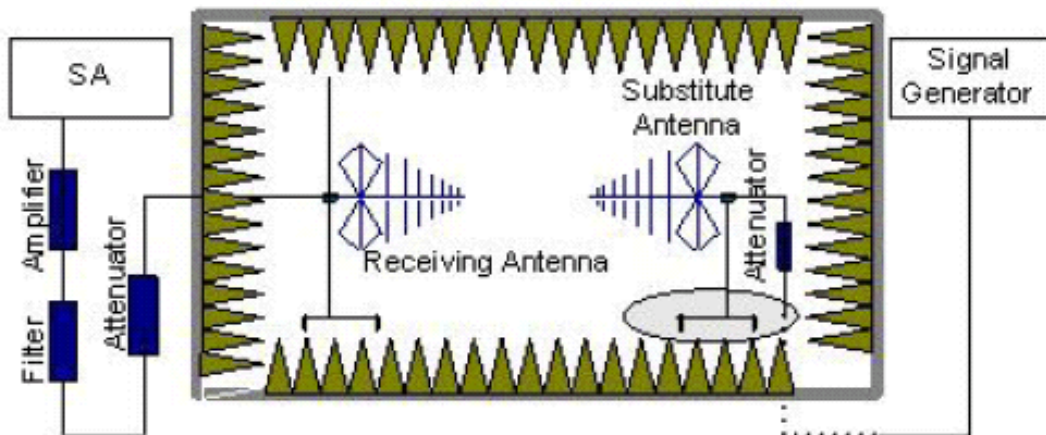
A dipole antenna shall be substituted in place of the EUT. The antenna will be driven by a signal generator with a adjustable S.G. applied through a Tx cable. Adjust the level of the signal generator output until the value of the receiver reach the previously recorded analyzer power level (LVL). Then The E.R.P. /E.I.R.P. of the EUT can be calculated through the level of the signal generator, Tx cable loss and the gain of the substitution antenna. The test setup refers to figure below.

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E.R.P (peak power) =S.G. - Tx Cable loss + Substitution antenna gain – 2.15.  
 EIRP= E.R.P+2.15

The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X 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
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**Measurement Uncertainty**

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

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### Test Result

GSM 1900 CH 512

Harmonic	TX ch.512 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3700.5	-31.87	16.8	11.05	-37.62	-13	24.62	180
3	5550.8	-32.78	18.1	12.65	-38.23	-13	25.23	180
4	7400.8	/	/	/	Nf	-13	/	/
5	9251	/	/	/	Nf	-13	/	/
6	11101	-22.68	22.4	15.95	-29.13	-13	16.13	135
7	12951.4	/	/	/	Nf	-13	/	/
8	14801.6	/	/	/	Nf	-13	/	/
9	16651.8	/	/	/	Nf	-13	/	/
10	18502	/	/	/	Nf	-13	/	/

Nf: noise floor

Note: The other Spurious RF Radiated emissions level is no more than noise floor.

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GSM 1900 CH 661

Harmonic	TX ch.661 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3760.1	-44.69	17.1	11.07	-50.72	-13	37.72	180
3	5640.4	-38.1	18.3	12.67	-43.73	-13	30.73	135
4	7520	/	/	/	Nf	-13	/	/
5	9400	/	/	/	Nf	-13	/	/
6	11280.5	-22.06	22.6	15.97	-28.69	-13	15.69	135
7	13160	/	/	/	Nf	-13	/	/
8	15040	/	/	/	Nf	-13	/	/
9	16920	/	/	/	Nf	-13	/	/
10	18800	/	/	/	Nf	-13	/	/

Nf: noise floor

Note: The other Spurious RF Radiated emissions level is no more than noise floor.



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GSM 1900 CH 810

Harmonic	TX ch.810 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3819.4	-43.7	18.1	12.07	-49.73	-13	36.73	180
3	5729.4	/	/	/	Nf	-13	/	/
4	7639.2	/	/	/	Nf	-13	/	/
5	9549	/	/	/	Nf	-13	/	/
6	11458.5	-27.69	23.2	17.16	-33.73	-13	20.73	135
7	13368.6	/	/	/	Nf	-13	/	/
8	15278.4	/	/	/	Nf	-13	/	/
9	17188.2	/	/	/	Nf	-13	/	/
10	19098	/	/	/	Nf	-13	/	/

Nf: noise floor

Note: The other Spurious RF Radiated emissions level is no more than noise floor.

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WCDMA Band II CH9262

Harmonic	TX ch.9262 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3706.9	-38.5	17.1	11.07	-44.53	-13	31.53	225
3	5561.3	-41.42	18.3	12.67	-47.05	-13	34.05	180
4	7409.6	/	/	/	Nf	-13	/	/
5	9262	/	/	/	Nf	-13	/	/
6	11114.4	/	/	/	Nf	-13	/	/
7	12966.8	/	/	/	Nf	-13	/	/
8	14819.2	/	/	/	Nf	-13	/	/
9	16671.6	/	/	/	Nf	-13	/	/
10	18524	/	/	/	Nf	-13	/	/

Nf: noise floor

Note: The other Spurious RF Radiated emissions level is no more than noise floor.

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WCDMA Band II CH9400

Harmonic	TX ch.9400 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3758.3	/	/	/	Nf	-13	/	/
3	5640	/	/	/	Nf	-13	/	/
4	7520	/	/	/	Nf	-13	/	/
5	9396	-35.05	21.6	14.75	-41.9	-13	28.9	135
6	11272.5	-35.25	22.8	15.97	-42.08	-13	29.08	225
7	13150.6	-35.3	23.7	16.55	-42.45	-13	29.45	180
8	15040	/	/	/	Nf	-13	/	/
9	16920	/	/	/	Nf	-13	/	/
10	18800	/	/	/	Nf	-13	/	/

Nf: noise floor

Note: The other Spurious RF Radiated emissions level is no more than noise floor.

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WCDMA Band II CH9538

Harmonic	TX ch.9538 Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3816.4	-35.77	17.2	11.05	-41.92	-13	28.92	225
3	5726.3	-39.92	18.5	12.65	-45.77	-13	32.77	180
4	7624.9	-38.2	19.8	13.83	-44.17	-13	31.17	225
5	9538	/	/	/	Nf	-13	/	/
6	11438	-36.03	22.8	15.97	-42.86	-13	29.86	135
7	13353.2	/	/	/	Nf	-13	/	/
8	15260.8	/	/	/	Nf	-13	/	/
9	17168.4	/	/	/	Nf	-13	/	/
10	19076	/	/	/	Nf	-13	/	/

Nf: noise floor

Note: The other Spurious RF Radiated emissions level is no more than noise floor.

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### 3. Main Test Instruments

No.	Name	Type	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\*\*\*\*\*

## ANNEX A: EUT Appearance and Test Setup

### A.1 EUT Appearance



a: EUT

Picture 1 EUT and Auxiliary

### A.2 Test Setup



Picture 2: Radiated Spurious Emissions Test setup