



EMC Test Report

**Product Name:
GSM Mobile Phone**

**Model Number:
HUAWEI G2101**

**Report No: SYBHZ(R)E048092010EB-1
FCC ID: QISG2100**

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Notice 1

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2. The laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
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Notice 2

Modification Information:

Modification Information

Modification Information	1	
	2	
	3	<i>Not Applicable!</i>
	4	
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1 Status

1.1 Product Information

CLIENT:	Huawei Technologies Co., Ltd.
ADDRESS:	Bantian Longgang District Shenzhen, P.R. China
MANUFACTURING DESCRIPTION	GSM Mobile Phone
MANUFACTURERS MODEL NUMBER	HUAWEI G2101

1.2 Test Site

Site 1:

EMC LABORATORY OF RELIABILITY LABORATORY OF HUAWEI TECHNOLOGIES CO., LTD

1.3 Test environment condition

Ambient temperature	20~25°C
Relative humidity	40%~52%
Atmospheric pressure	101kPa

2 Summary of Results

Table below shows a brief summary of the results obtained.

Summary of results

EUT Classification: Wireless Terminal				
Test Items	Test Configuration & Test Mode	Required Performance Criteria	Result	Site
<u>Radiated Spurious Emissions</u> Enclosure Port	TC1 (TM1-TM2)	N/A	Pass	Site1
Note: 1, Measurement taken is within the measurement uncertainty of measurement system. 2, TC = Test configuration				

3 Equipment Specification

3.1 General Description

Huawei GSM Mobile Phone HUAWEI G2101 is subscriber equipment in the GSM system. The frequency band is GSM850 and PCS1900. The Mobile Phone implements such functions as RF signal receiving /Transmitting, GSM protocol processing, voice, etc. Externally it provides earphone port ,SIM card interface.

The design of HUAWEI G2101 based on HUAWEI G2100. They are the same except shape.

3.1.1 Main Equipment Technical Data

Description:	GSM Mobile Phone
Models:	HUAWEI G2101
Input Rated Voltage	3.7V
Maximum Emission Power:	Max 30dBm
Rated Power	Normal 2W ,Max 3.2W
Dimensions	106.2mm (L)×45mm (W)×13mm (H)
Weight	About 70g

Sub-Assembly Identity

Mode		Work Frequency	
		Transmitt Frequency (MHz)	Receive Frequency (MHz)
GSM	GSM850	824 - 849	869 - 894
	PCS1900	1850-1910	1930-1990

3.2 Sub-Assembly Identity

Sub-Assembly Identity

Board				
Model Name	Qty.	Serial	Description	
HG1G2100M	1	020UGM4C03026382	Main board of Mobile Phone	
Accessory				
Name	Qty.	Manufacture	Serials number	Description
Adapter	1	Huawei Technologies Co., Ltd.	HKAA72306546	Adapter Model: HS-050040U2 Input Voltage : 100-240V 50/60Hz 0.2A Output Voltage:  5.0V 0.4A Rated Power: 2W
Rechargeable Li-ion	1	Huawei Technologies Co.,Ltd.	FDT9907XC3419154	Battery Model: HB5E1 Rated capacity: 700mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V

4 **System Configuration during EMC Test**

The Equipment under Test (EUT) was functioning correctly during all tests. The EUT was installed within the test site and was configured to simulate a typical user installation.

4.1 **Cables Used during Test**

Cable Used during Test

Cable	Quantity	Type of Cable
AC Power	1	Unshielded
Earphone	1	Unshielded

4.2 **Associated Equipment Used during Test**

Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Cal Date
Radio Communication Tester	CMU200	R&S	3608105673	2009-10-10

4.3 **Test Configurations and Test Mode**

4.3.1 **Test Configuration.**

The EUT will be connected to test system (Base Station Simulator) in order to simulate normal operating conditions (with reference to the guidance given in the standard for this type of equipment).

TC1:EUT powered with an adapter and connected to the test system (Base Station Simulator).

Configuration table

TC1	TM1~TM2
-----	---------

4.3.2 **Test Mode**

There were 2 test Modes. TM1 to TM2 were shown in the diagrams below:

TM1	operate in traffic mode GSM850;
TM2	operate in traffic mode GSM1900;

The EUT will be connected to test system (Base Station Simulator) in order to simulate normal operating conditions (with reference to the guidance given in the standard for this type of equipment).

4.4 **Test conditions and test Connections**

4.4.1 **Test Conditions**

The EUT will be connected to test system (Base Station Simulator) in order to simulate normal operating conditions (with reference to the guidance given in the standard for this type of equipment).

4.4.2 **Test Connections**

Traffic Mode:

The EUT is required to be in the traffic mode, a call is set up according to the generic call set up procedure and enter the EUT into loop back test mode.

For GSM, the following conditions shall also be met:

The EUT shall be commanded to operate at maximum transmit power;

The downlink RXQUAL shall be monitored.
Assign channel frequency to an appropriate channel number.

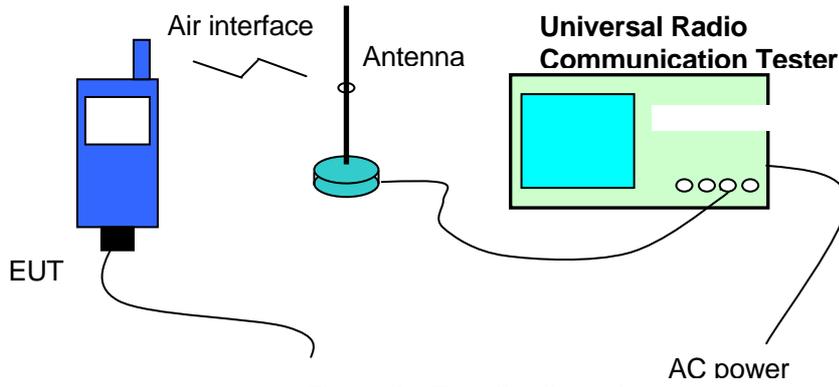


Figure 1.: Test Configuration

4.5 Radiated Spurious Emissions

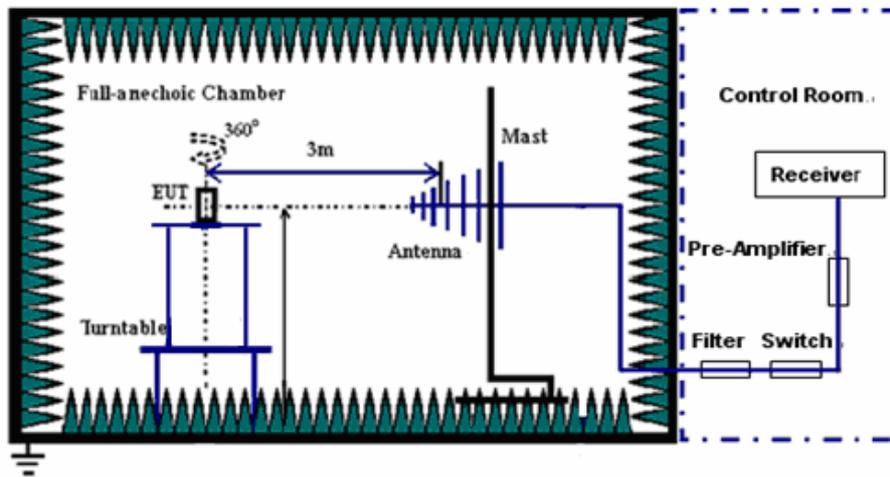
4.5.1 Test Procedure

A test site fulfilling the requirements of ITU-R Recommendation SM329-10 was used. The EUT was placed on a non-conducting support in the anechoic chamber and was operated from a power source via an RF filter to avoid radiation from the power leads.

Step 1:

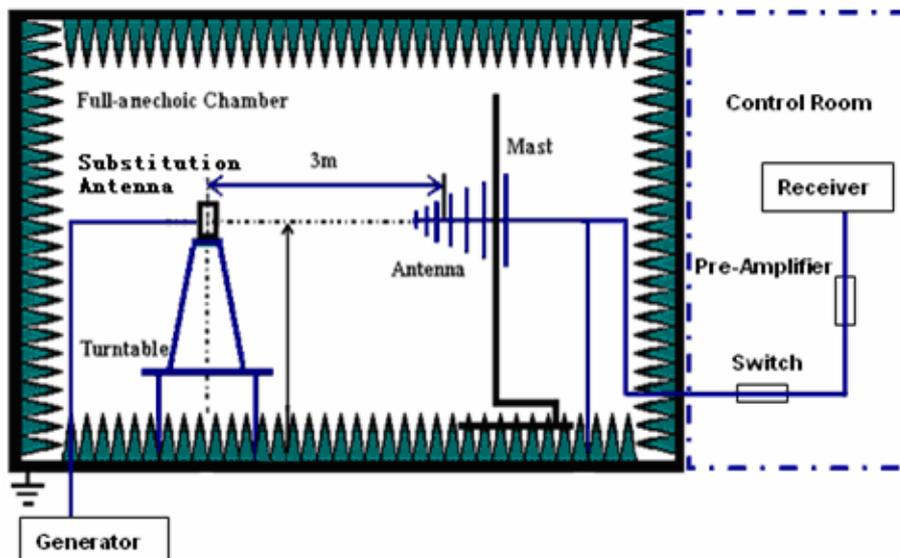
For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, EIRP shall be measured when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in 2.1033(c)(8). Connect the EUT to the BTS simulator via the air interface.

Test the Radiated maximum output power by the Test Receiver from test antenna.



Step 2:

Use substitution method to verify the maximum output power. The EUT is substituted by a dipole antenna. The dipole is connected to a signal generator. And then adjust the output level of the signal generator to get the same received power recorded in step1 on Test Receiver, and record the power level of Signal Generator. Of course, the cable loss at the test frequency should be compensated.



According to part 22.917, the defined measurement bandwidth as following:
22.917(b) Measurement procedure: Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.

Measurement bandwidth (RBW) for 9 kHz up to 150 kHz: 1 kHz;
Measurement bandwidth (RBW) for 150 kHz up to 30 MHz: 10 kHz;
Measurement bandwidth (RBW) for 30MHz up to 1 GHz: 100 kHz;
Measurement bandwidth (RBW) for 1GHz up to 18GHz: 1MHz;

Radiated Spurious Emissions Limits

Frequency band	Minimum requirement (E.R.P) traffic mode
9KHz~18GHz	-13dBm

According to part 24.238, the defined measurement bandwidth as following:

24.238(b) Measurement procedure: Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.

Measurement bandwidth (RBW) for 9 kHz up to 150 kHz: 1 kHz;
Measurement bandwidth (RBW) for 150 kHz up to 30 MHz: 10 kHz;
Measurement bandwidth (RBW) for 30MHz up to 26.5GHz: 1MHz;

Radiated Spurious Emissions Limits

Frequency band	Minimum requirement (E.R.P) traffic mode
9KHz~26.5GHz	-13dBm

No peak found in pre- test. All frequency points' margin is bigger than 20dB, so the substitution method isn't used.

Calculation Sample:

Substitution Results

Freq. [MHz]	Measure ment Value [dBm]	Substitution Antenna Type	Gain [dBd]	Cable Loss [dB]	Signal Generator Level [dBm]	Substitution Level [dBm]	FCC limit [dBm]	Result

Note: For get the E.R.P. (Efficient Radiated Power) in substitution method, the following formula should take to calculate it,

$$E.R.P. [dBm] = SGP [dBm] - Cable Loss [dB] + Gain [dBd]$$

NOTE: SGP- Signal Generator Level

4.5.2 Test Results

The EUT has met the requirements of FCC Part22/24 requirement.

5 Main Test Instruments

Main Test Equipments

Test item	Test Instrument	Model	Manufacturer	Cal-Date	Cal Interval (month)
RSE	EMI Test receiver	ESIB26	R&S	May.05.2010	12
	Broadband Antenna	CBL6112B	SCHAFFNER	Nov.30.2009	12
	Horn Antenna	3117	ETS-Lindgren	Oct.28.2009	12
	Horn Antenna	3160	ETS-Lindgren	Oct.28.2009	12
Software Information					
Test Item	Software Name	Manufacturer		Version	
RSE	EMC32	R&S		V5.10.99	

6 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty

Items		Extended Uncertainty
RSE	ERP (dBm)	U=2.2dB; k=2

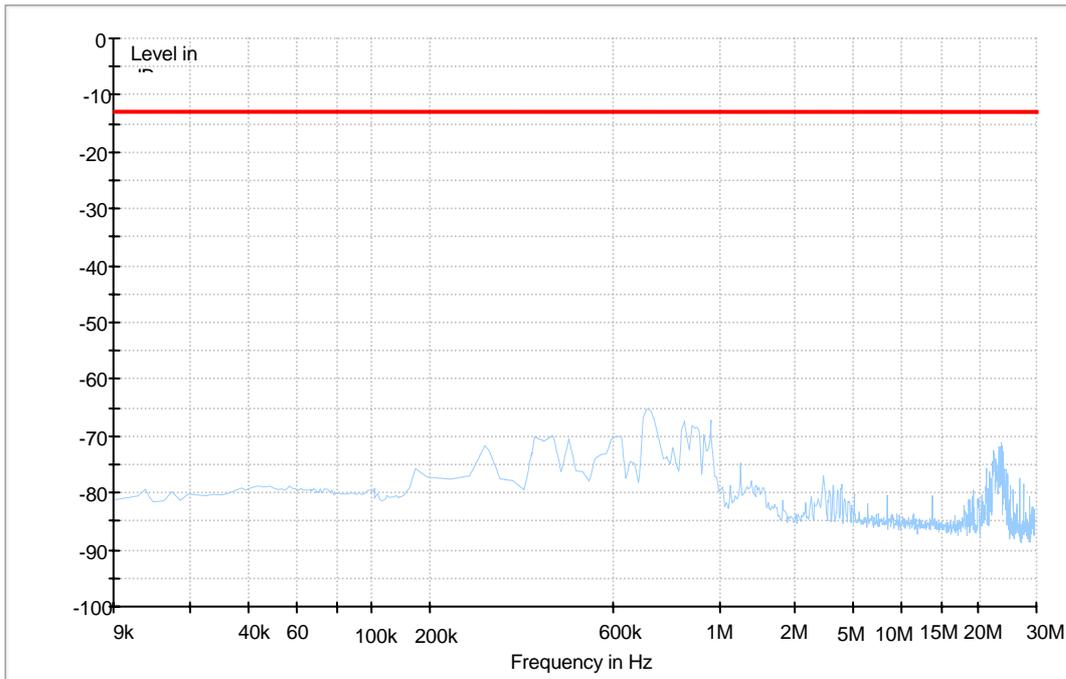
7 Graph and Data of Emission Test

7.1 Radiated Spurious Emission

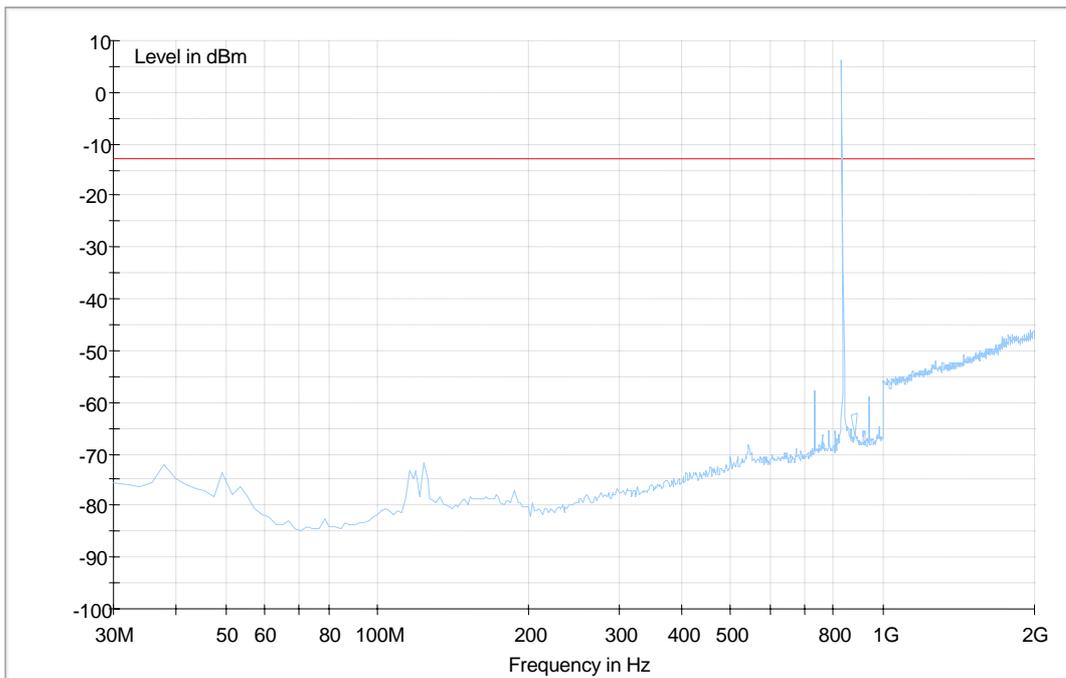
This test results are the maximum level of radiated spurious emissions in vertical and horizontal polarity. The highest peak exceeds the limit line is carrier frequency

7.1.1 For GSM 850

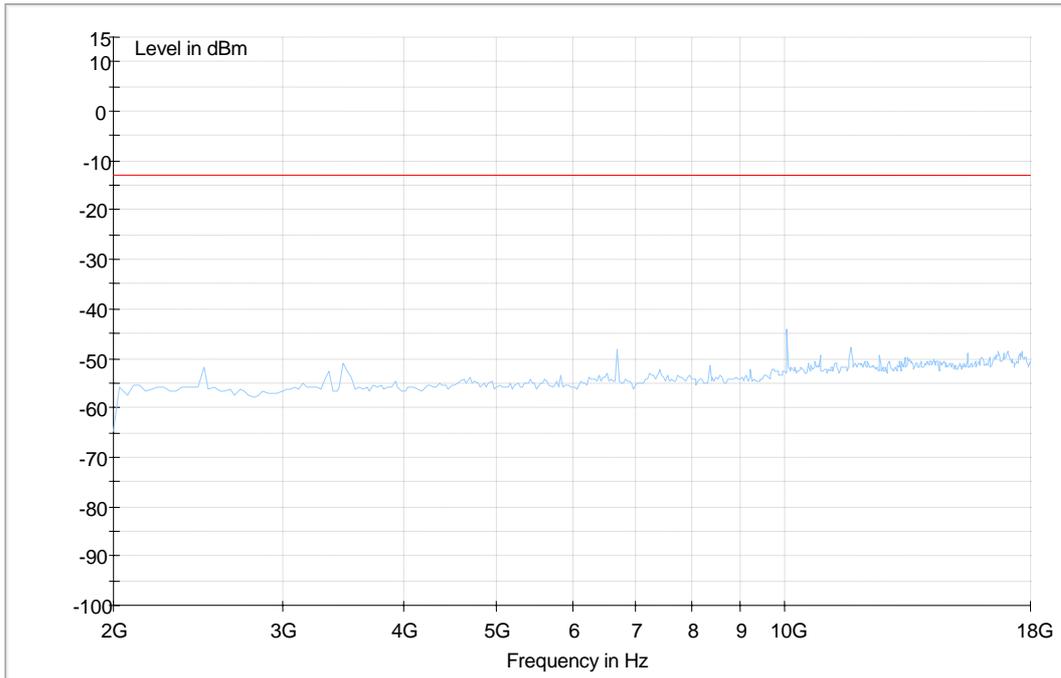
Traffic Mode (9kHz-30MHz)



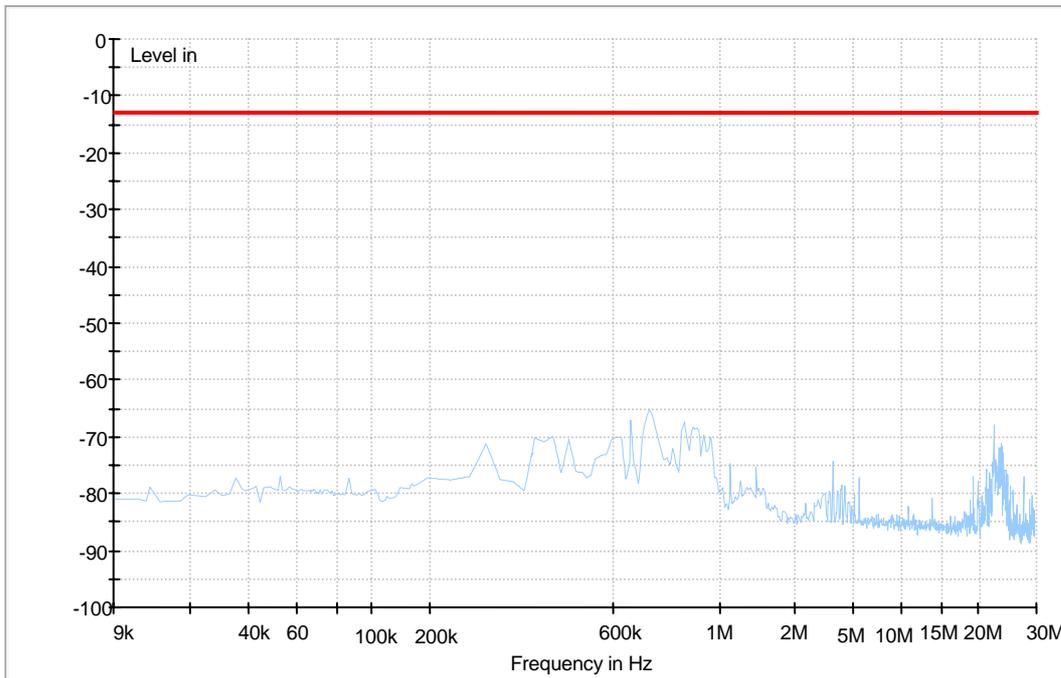
Traffic Mode (30MHz-2GHz)



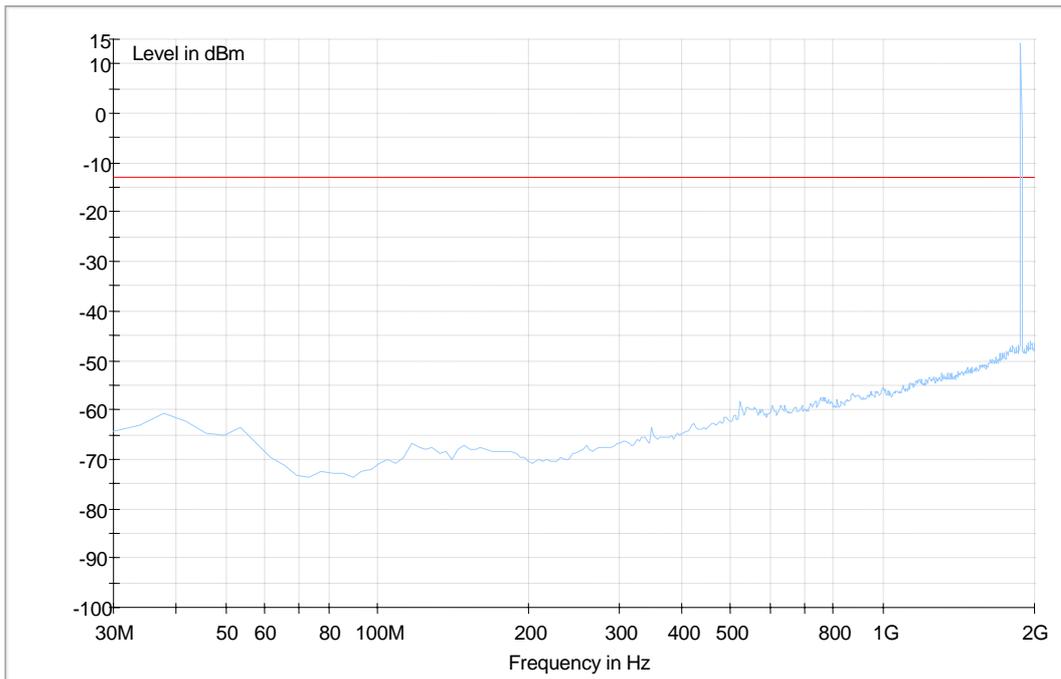
Traffic Mode (2GHz-18GHz)



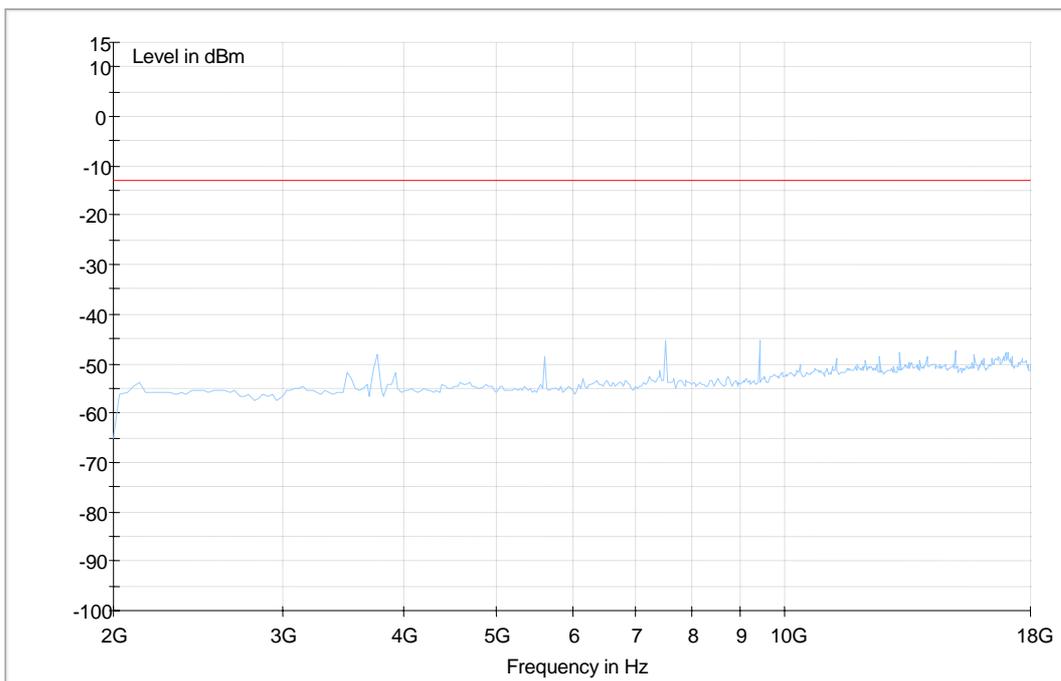
7.1.2 For GSM 1900
Traffic Mode (9kHz-30MHz)



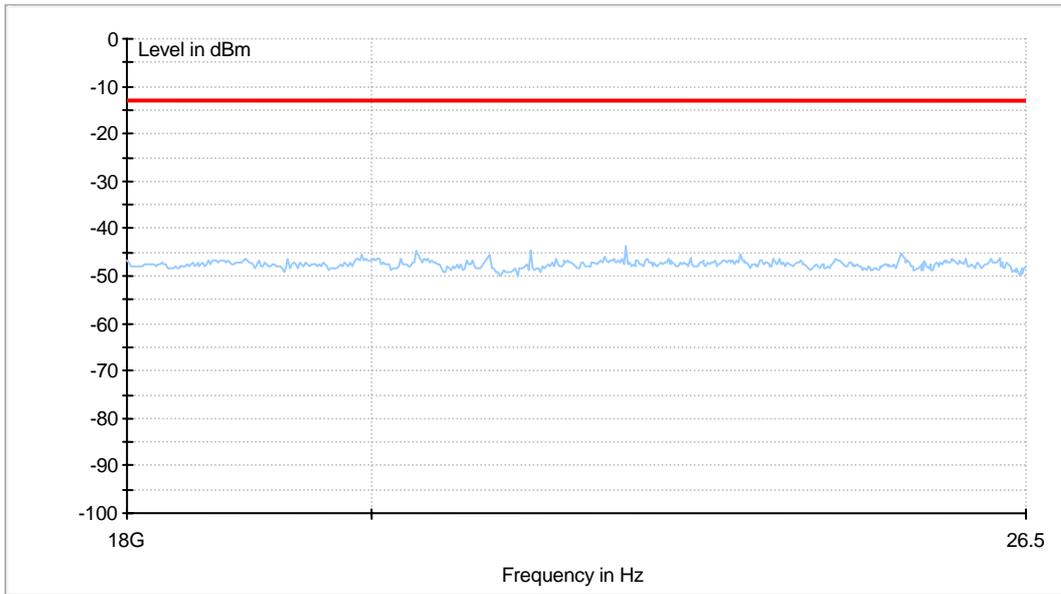
Traffic Mode (30MHz-2GHz)



Traffic Mode (2GHz-18GHz)



Traffic Mode (18GHz-26.5GHz)



END