



**SGS-CSTC Standards  
Technical Services Co., Ltd.**

588 West Jindu Road, Songjiang District, Shanghai, China

Telephone: +86 (0) 21 6191 5666  
Fax: +86 (0) 21 6191 5655  
Tino.Pan@sgs.com

Report No.: SHEMO09080092103  
Page 1 of 48

## ***TEST REPORT***

**Application No. :** SHEMO09080092103  
**Applicant:** Sagem Wireless  
**Address:** 2, rue du Petit Albi, BP 28250-95801 CERGY PONTOISE Cedex  
**FCC ID:** M9HPHIL  
**Fundamental Carrier Frequency :** 2.402GHz to 2.480GHz  
**Equipment Under Test (EUT):**  
Product Name: GSM Mobile Phone  
Brand Name: SAGEM  
Model Name: PHIL  
Type Name: PHIL  
**Standards:** FCC PART 15:2008 Subpart C  
**Date of Receipt:** Aug 10, 2009  
**Date of Test:** Aug 10, 2009 to Aug 13, 2009  
**Date of Issue:** Aug 13, 2009

<b>Test Result :</b>	<b>PASS *</b>
----------------------	---------------

\* In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 2 of this report for further detail.

Tino Pan  
E&E Section Manager  
SGS-CSTC Co., Ltd.

Bruce Zhan  
Project Engineer  
SGS-CSTC Co., Ltd.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at [www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm) and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at [www.sgs.com/terms\\_e-document.htm](http://www.sgs.com/terms_e-document.htm). Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only



## 2 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Occupied Bandwidth	FCC PART 15 :2008	Section 15.247 (a1)	PASS
Carrier Frequencies Separated	FCC PART 15 :2008	Section 15.247(a)(1)	PASS
Hopping Channel Number	FCC PART 15 :2008	Section 15.247(a)(1)(iii)	PASS
Dwell Time	FCC PART 15 :2008	Section 15.247(a)(1)(iii)	PASS
Maximum Peak Output Power	FCC PART 15 :2008	Section 15.247(b)(1)	PASS
Conducted Emission	FCC PART 15 :2008	Section 15.207	PASS
Conducted Spurious Emission (30MHz to 25GHz)	FCC PART 15 :2008	Section 15.209 &15.247(d)	PASS
Radiated Spurious Emission (30MHz to 25GHz)	FCC PART 15 :2008	Section 15.209 &15.247(d)	PASS
Band Edges Measurement	FCC PART 15 :2008	Section 15.247 (d) &15.205	PASS



### 3 Contents

	Page
<b>1 COVER PAGE .....</b>	<b>1</b>
<b>2 TEST SUMMARY .....</b>	<b>2</b>
<b>3 CONTENTS .....</b>	<b>3</b>
<b>4 GENERAL INFORMATION .....</b>	<b>4</b>
4.1 CLIENT INFORMATION .....	4
4.2 GENERAL DESCRIPTION OF E.U.T. ....	4
4.3 DESCRIPTION OF SUPPORT UNITS .....	4
4.4 STANDARDS APPLICABLE FOR TESTING .....	4
4.5 TEST LOCATION .....	4
4.6 OTHER INFORMATION REQUESTED BY THE CUSTOMER.....	5
4.7 TEST FACILITY .....	5
<b>5 EQUIPMENTS USED DURING TEST.....</b>	<b>6</b>
<b>6 TEST RESULTS .....</b>	<b>7</b>
6.1 E.U.T. TEST CONDITIONS.....	7
6.2 CONDUCTED EMISSIONS AT MAINS TERMINALS.....	7
6.3 OCCUPIED BANDWIDTH.....	10
6.4 CARRIER FREQUENCIES SEPARATED .....	12
6.5 HOPPING CHANNEL NUMBER .....	15
6.6 DWELL TIME .....	16
6.7 MAXIMUM PEAK OUTPUT POWER .....	19
6.8 RF EXPOSURE COMPLIANCE REQUIREMENT .....	22
6.8.1 <i>Standard requirement</i> .....	22
6.8.2 <i>EUT RF Exposure</i> .....	22
6.9 CONDUCTED SPURIOUS EMISSIONS .....	23
6.10 RADIATED SPURIOUS EMISSIONS .....	27
6.10.1 <i>Harmonic and other spurious emissions</i> .....	29
6.10.2 <i>Radiated Emissions which fall in the restricted bands</i> .....	33
6.11 BAND EDGES REQUIREMENT.....	35



## **4 General Information**

### **4.1 Client Information**

Applicant: Sagem Wireless  
Address of Applicant: 2, rue du Petit Albi, BP 28250-95801 CERGY PONTOISE Cedex

### **4.2 General Description of E.U.T.**

Product Name: GSM Mobile Phone  
Brand Name: SAGEM  
Model Name: PHIL  
Type Name: PHIL  
Number of Channels: 79 Channels  
Channel Separation: 1 MHz  
Type of Modulation: FHSS (Frequency Hopping Spread Spectrum)  
Dwell time: Per channel is less than 0.4s.  
Antenna Type: integral/dedicated  
Power Supply: Rechargeable Battery 3.9V inside  
Adapter information: Model: DCH3-050US  
Input: AC 110-230V, 50/60Hz, 120mA  
Output: DC 5.0V, 500mA  
Headset: Model: EMB-SGC714STKB, Reference: 179132056  
USB data cable: Model: CA9300664  
Reference: 189190175  
IMEI: 355362039950311  
Hardware Version: V0x  
Software Version: E N,MD  
IMEI: 355362039950329  
Hardware Version: V0x  
Software Version: E N,MD

### **4.3 Description of Support Units**

None.

### **4.4 Standards Applicable for Testing**

The customer requested FCC tests for the EUT.  
The standard used was FCC PART 15 Subpart C, ANSI C63.4:2003.

### **4.5 Test Location**

All tests were performed at:  
SGS-CSTC Standards Technical Services Co., Ltd., Shanghai EMC Laboratory



588 West Jindu Road, Songjiang District, Shanghai, China

Tel: +86 21 61915666 Fax: +86 21 61915655

No tests were sub-contracted.

#### **4.6 Other Information Requested by the Customer**

None.

#### **4.7 Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration **402683**, Feb 23, 2009. SGS-CSTC is an authorized test laboratory for the DoC process.



## 5 Equipments Used during Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	Spectrum Analyzer	Rohde & Schwarz	FSP-30	100324	2009-4-21	2010-4-20
2	EMI test receiver	Rohde & Schwarz	ESU40	100109	2009-6-4	2010-6-3
3	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2009-6-4	2010-6-3
4	Horn Antenna	Rohde & Schwarz	HF906	100284	2009-4-11	2010-4-10
5	Horn Antenna	Rohde & Schwarz	HF906	100285	2008-10-9	2009-10-8
6	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2009-6-4	2010-6-3
7	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2008-10-9	2009-10-8
8	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY—2003P	--	2008-10-15	2009-10-14
9	CLAMP METER	FLUKE	316	86080010	2009-04-27	2010-04-26
10	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2008-10-21	2009-10-20
11	Digital illuminance meter	TES electrical electronic Corp.	TES-1330A	050602219	2008-10-16	2009-10-15
12	TEMPERATURE& HUMIDITY BOX	KSON	THS-D2C-100	K40723	2008-11-18	2009-11-17
13	DC power	KIKUSUI	PMC35—3	NF100260	--	--
14	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2009-5-8	2010-5-7
15	UNIVERSAL RADIO COMMUNICATION TESTER	Rohde & Schwarz	CMU 200	105964	2009-4-14	2010-4-13

## 6 Test Results

### 6.1 E.U.T. test conditions

Power supply:	AC adapter or battery inside.
Requirements:	15.31(e) For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.
Type of antenna:	integral/dedicated
Operating Environment:	
Temperature:	20.0 -25.0 °C
Humidity:	38-52% RH
Atmospheric Pressure:	992 -1010 mbar

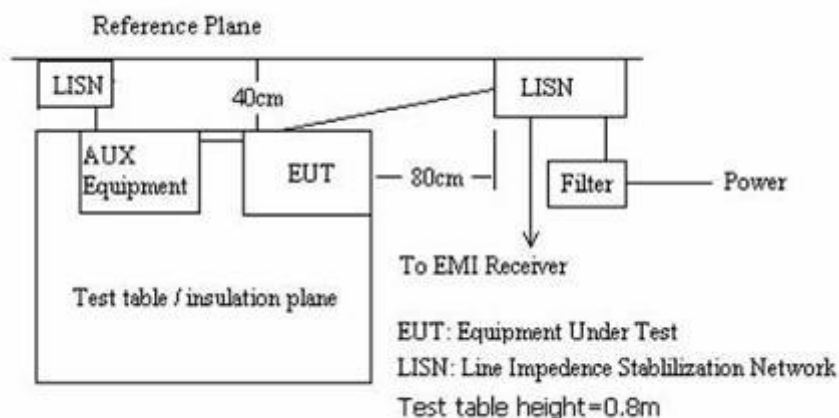
### 6.2 Conducted Emissions at Mains Terminals

Test Requirement:	FCC Part 15.207
Test Method:	ANSI C63.4
Test Date:	Aug 10, 2009
Frequency Range:	150KHz to 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak if maximised peak within 6dB of Quasi-Peak limit
EUT Operation:	Test the EUT in Bluetooth mode.

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

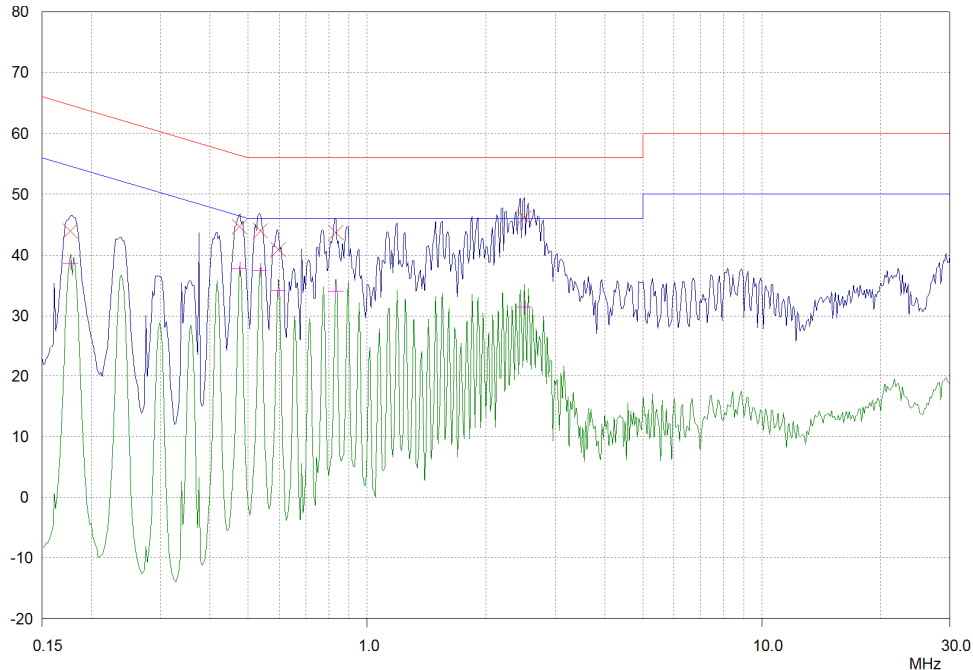
Plan View of Test Setup





LISN live line:

dBuV



Frequency MHz	QP Level dBuV	QP Limit dBuV	QP Delta dB
0.17732	43.94	64.61	20.67
0.47628	44.62	56.40	11.78
0.53675	43.95	56.00	12.05
0.59533	40.86	56.00	15.14
0.83196	43.66	56.00	12.34
2.49838	46.15	56.00	9.85

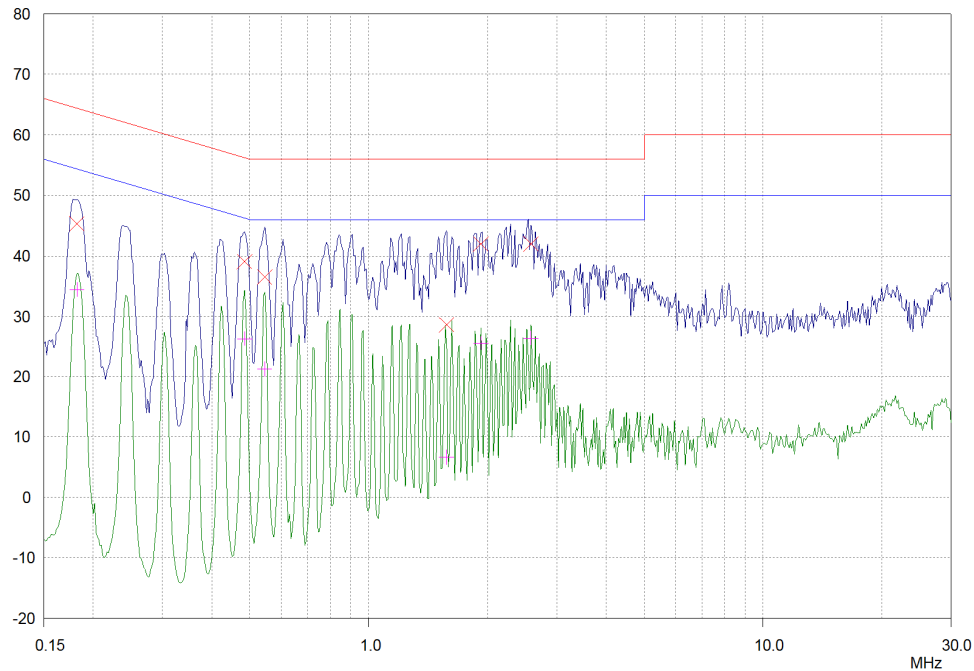
Frequency MHz	AV Level dBuV	AV Limit dBuV	AV Delta dB
0.17732	38.65	54.61	15.96
0.47628	37.74	46.40	8.66
0.53675	37.49	46.00	8.51
0.59533	34.17	46.00	11.83
0.83196	33.99	46.00	12.01
2.49838	31.40	46.00	14.60





LISN neutral line:

dBuV



Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB
0.18161	45.34	64.41	19.07
0.48393	39.03	56.27	17.24
0.54537	36.50	56.00	19.50
1.57379	28.65	56.00	27.35
1.9207	41.98	56.00	14.02
2.57929	41.99	56.00	14.01

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB
0.18161	34.41	54.41	20.00
0.48393	26.26	46.27	20.01
0.54537	21.15	46.00	24.85
1.57379	6.56	46.00	39.44
1.9207	25.51	46.00	20.49
2.57929	26.40	46.00	19.60

**TEST RESULTS: The unit does meet the FCC requirements.**

### 6.3 Occupied Bandwidth

Test Requirement:	FCC Part 15 C
Test Method:	Based on FCC Part15 C Section 15.247
Test Date:	Aug 11, 2009
Test Status:	Test in fixing operating frequency at lowest, Middle, highest channel.
Test Procedure:	

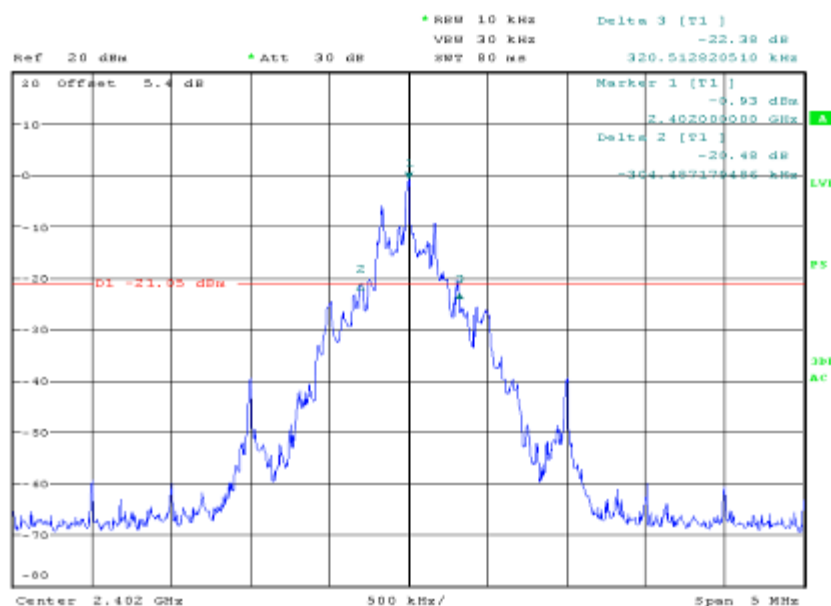
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: Span = approximately 2 to 3 times the 20dB bandwidth, centered on the hopping channel;
3. Set the spectrum analyzer: RBW  $\geq$  1% of the 20dB bandwidth (set 10kHz). VBW  $\geq$  RBW. Sweep = auto; Detector Function = Peak. Trace = Max Hold.
4. Mark the peak frequency and -20dB points.

**Test result:**

Test Channel	Bandwidth
Low	625kHz
Middle	617kHz
High	625kHz

Result plot as follows:

Lowest Channel:

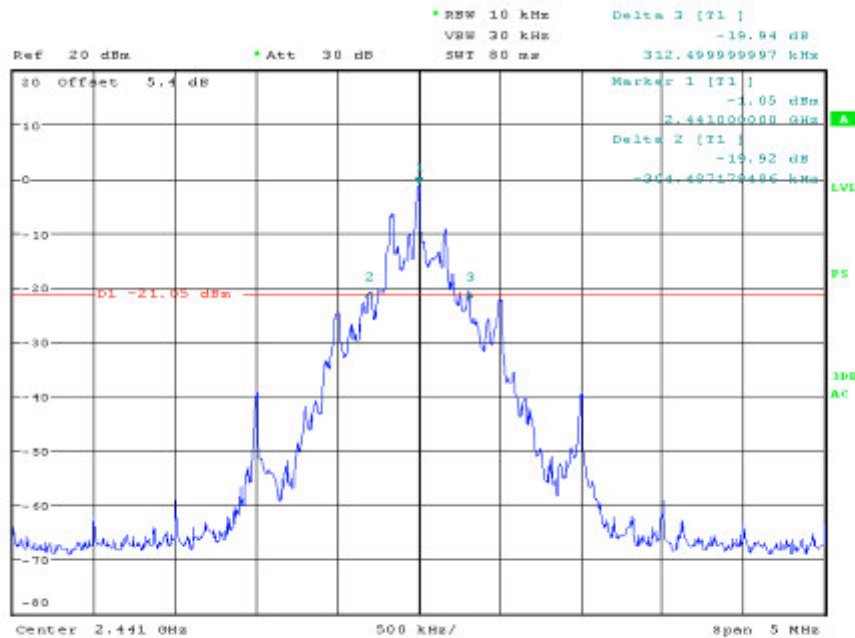




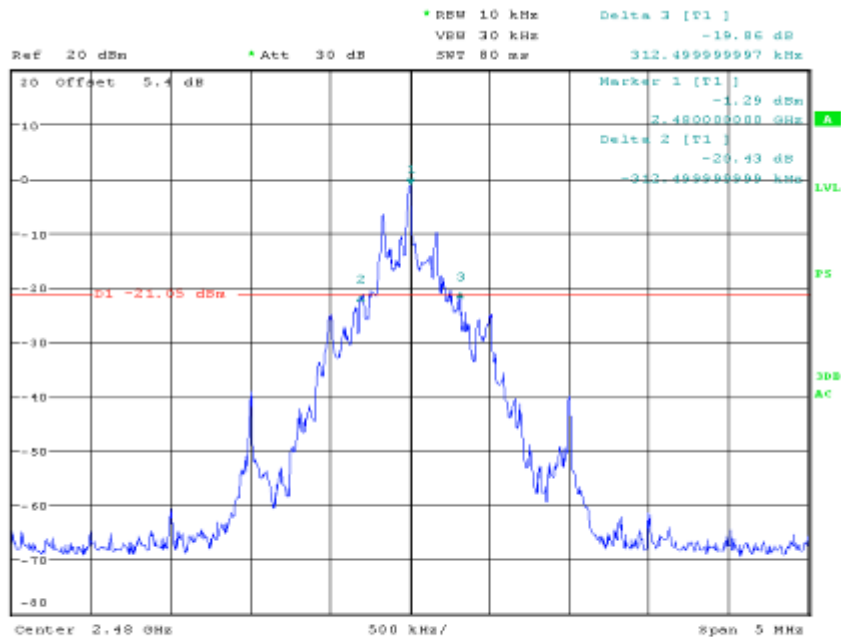
**SGS-CSTC Standards  
Technical Services Co., Ltd.**

ReportNo.: SHEMO09080092103  
Page: 11 of 48

Middle Channel:



Highest Channel:





#### **6.4 Carrier Frequencies Separated**

Test Requirement: FCC Part 15 C  
Test Method: Based on FCC Part15 C Section 15.247  
Test Date: Aug 11,2009  
Test requirements: Regulation 15.247(a),(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.  
Test Status: Test in hopping transmitting operating mode.

Test Procedure:

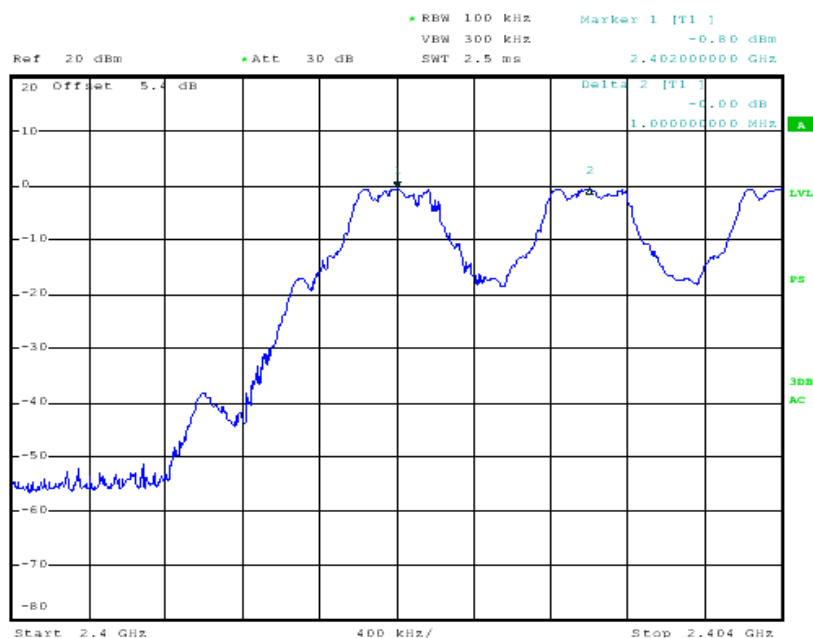
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW  $\geq$  1% of the span (set 100 kHz). VBW  $\geq$  RBW , Span = 6MHz. Sweep = auto; Detector Function = Peak. Trace = Max,hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

**Test result:**

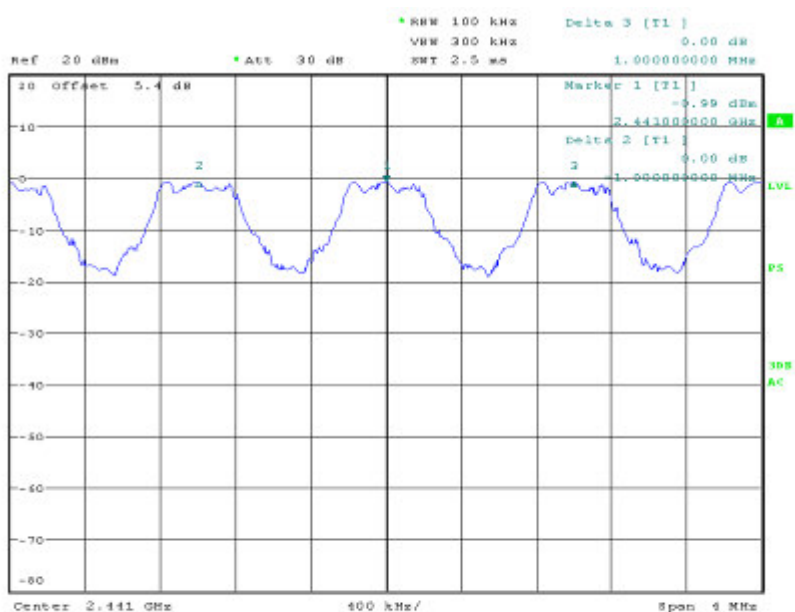
Test Channel	Carrier Frequencies Separated	PASS/FAIL
Lower Channels (channel 0 and channel 1)	1.0000MHz	PASS
Middle Channels (channel 39 and channel 40)	1.0000MHz	PASS
Upper Channels (channel 77 and channel 78)	1.0128MHz	PASS



1. Lowest Channels: **Carrier Frequencies Separated**

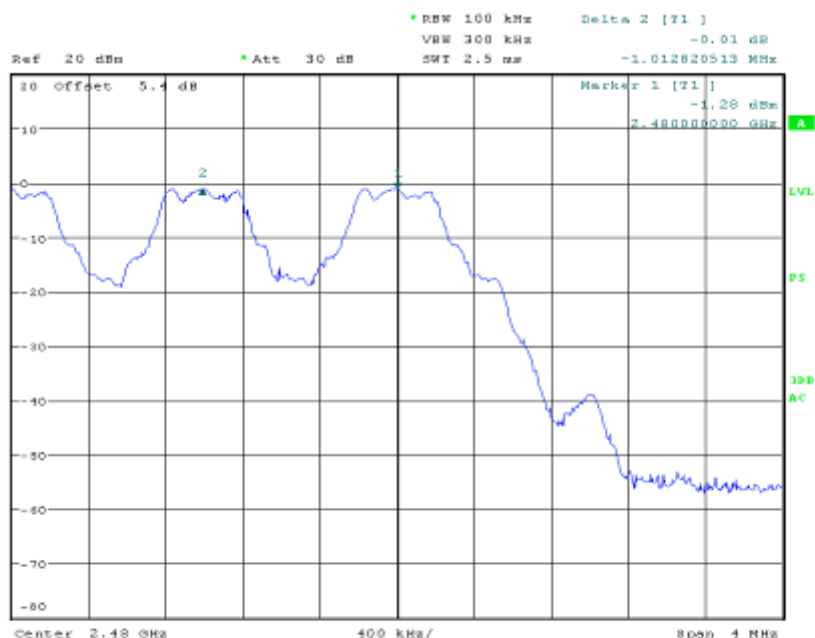


2. Middle Channels: **Carrier Frequencies Separated**





3. Highest Channels: **Carrier Frequencies Separated**





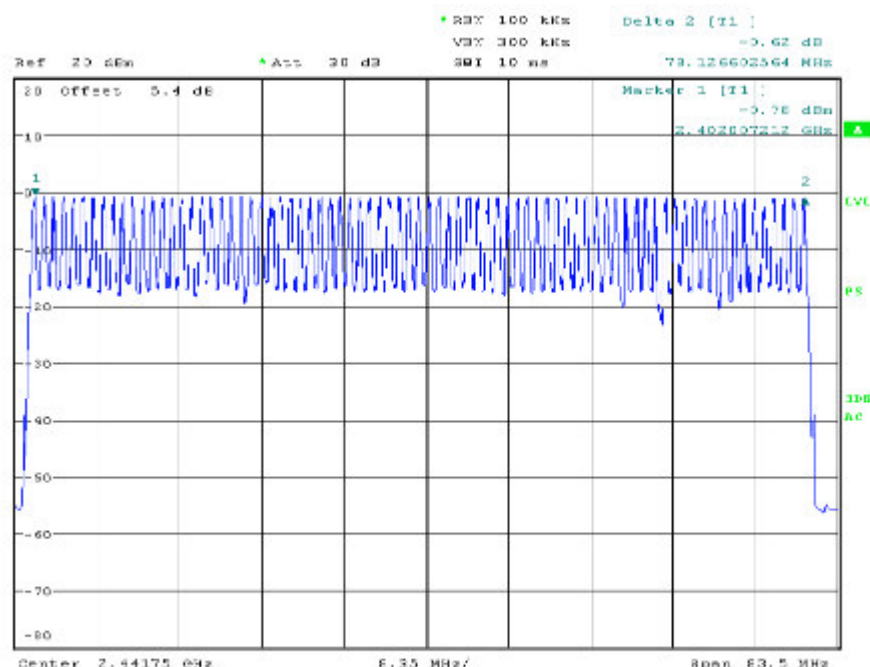
## 6.5 Hopping Channel Number

Test Requirement: FCC Part15 C  
Test Method: Based on FCC Part15 C Section 15.247  
Test Date: Aug 11, 2009  
Requirements: Regulation 15.247 (a) (1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.  
Test Status: Test in hopping transmitting operating mode.

### Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100 kHz. VBW = 300 kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: start frequency = 2400MHz. stop frequency = 2483.5MHz. Submit the test result graph.

**Test result:** Total channels are 79 channels.





## 6.6 Dwell Time

Test Requirement:	FCC Part 15 C
Test Method:	Based on FCC Part15 C Section 15.247 & DA 00-705
Test Date:	Aug 12, 2009
Test requirements:	Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.
Test Status:	Test in hopping transmitting operating mode.

### Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set spectrum analyzer span = 0. centered on a hopping channel;
3. Set RBW = 1MHz and VBW = 3MHz. Sweep = as necessary to capture the entire dwell time per hopping channel. Detector Function = Peak. Trace = Max hold;
4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s). An oscilloscope may be used instead of a spectrum analyzer.

### Test Result:

Dwell time = Pulse wide x (Hopping rate / Number of channels) x Period

The test period:  $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$

1. **Channel 0:** 2.402GHz  
time slot =  $2.9839 \text{ (ms)} \times (1600/(6 \times 79)) \times 31.6 = 318.28 \text{ ms}$
2. **Channel 39:** 2.441GHz  
time slot =  $2.9839 \text{ (ms)} \times (1600/(6 \times 79)) \times 31.6 = 318.28 \text{ ms}$
3. **Channel 78:** 2.480GHz  
time slot =  $2.9839 \text{ (ms)} \times (1600/(6 \times 79)) \times 31.6 = 318.28 \text{ ms}$

The results are not greater than 0.4 seconds.



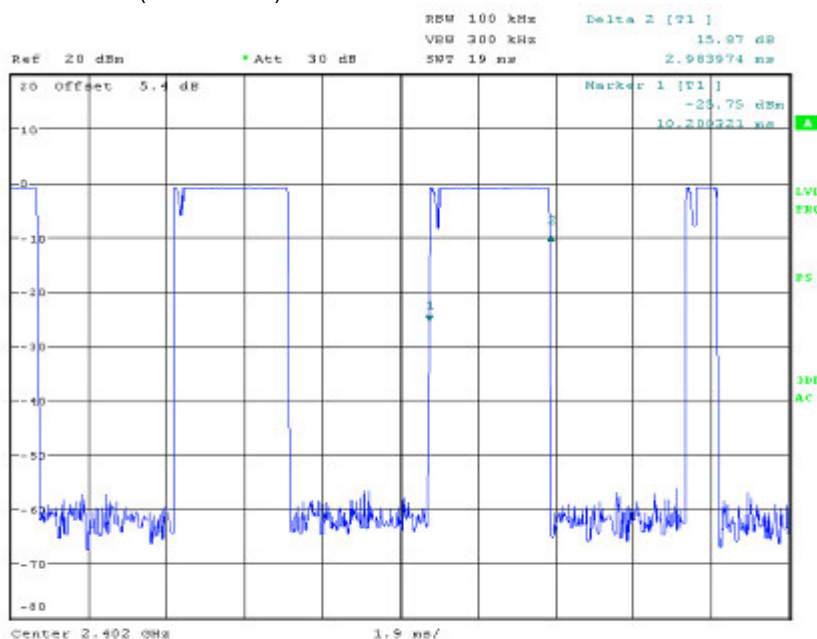


# SGS-CSTC Standards Technical Services Co., Ltd.

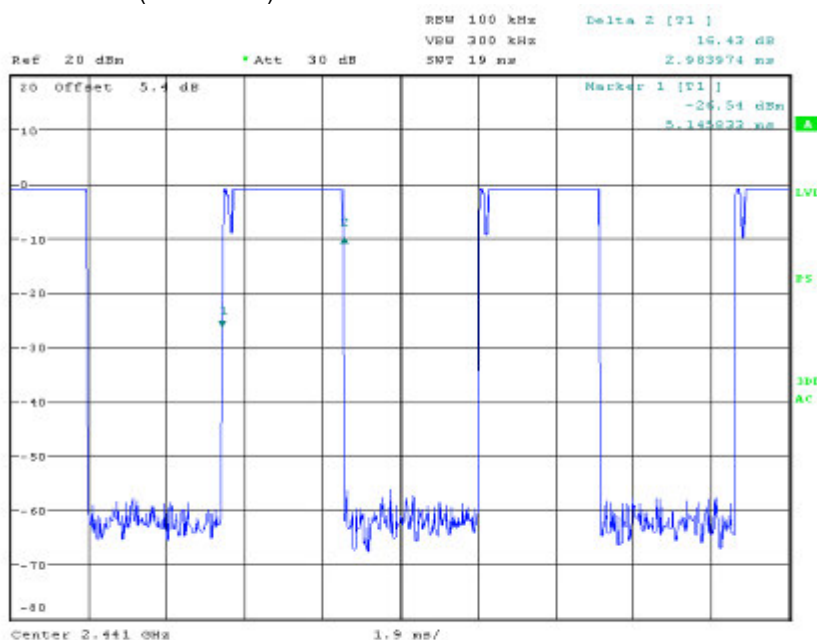
ReportNo.: SHEMO09080092103  
Page: 17 of 48

Please refer the graph as below:

## 1. Lowest channel (2.402 GHz):

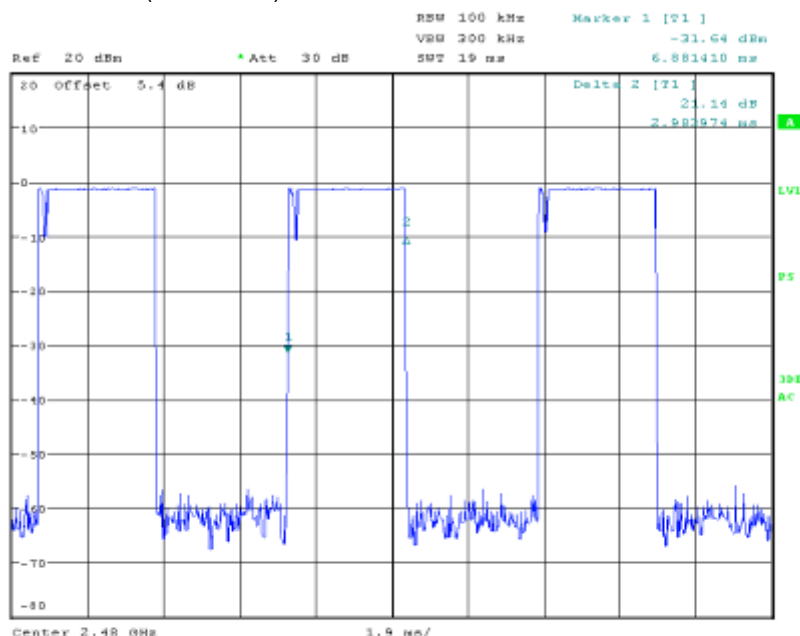


## 2. Middle Channel (2.441GHz)





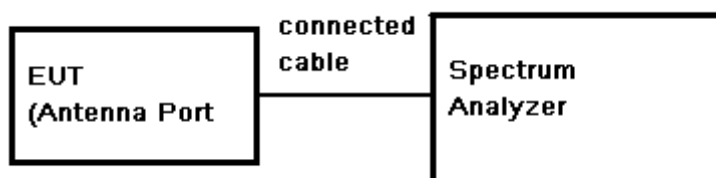
3 Highest Channel (2.480GHz)





## 6.7 Maximum Peak Output Power

Test Requirement: FCC Part 15.247  
Test Method: Base on ANSI 63.4.  
Test Date: Aug 12, 2009  
Test Limit: Regulation 15.247 (b)(1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.  
Refer to the result "Hopping channel number" of this document. The 1 watt (30.0dBm) limit applies.  
Test mode: Test in fixing frequency transmitting mode.  
Test Configuration:



- Test Procedure:
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
  2. Set the spectrum analyzer: RBW = 1 MHz. VBW = 3 MHz. Sweep = auto; Detector Function = Peak.
  3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.



**SGS-CSTC Standards  
Technical Services Co., Ltd.**

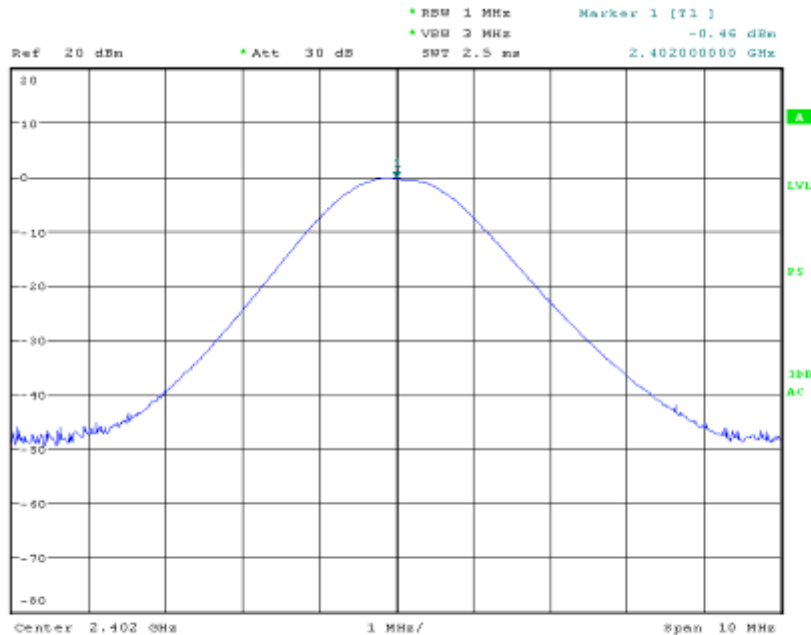
ReportNo.: SHEMO09080092103  
Page: 20 of 48

**Test Result:**

Test Channel	Fundamental Frequency (MHz)	Reading Power (dBm)	Cable Loss (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Lowest	2.402	-0.46	0.20	-0.26	30.0	30.26
Middle	2.441	-0.74	0.20	-0.54	30.0	30.54
Highest	2.480	-0.97	0.20	-0.77	30.0	30.77

Test result plot as follows:

Lowest Channel:

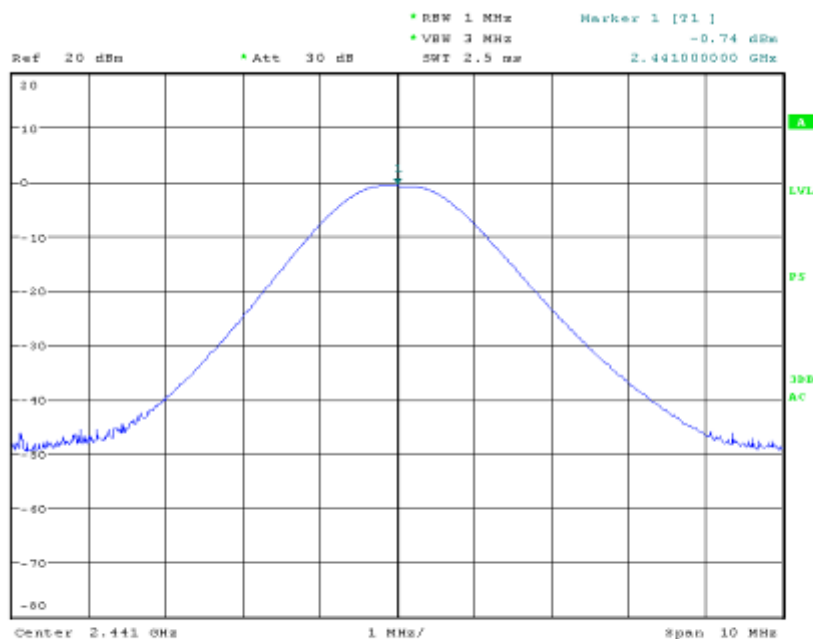




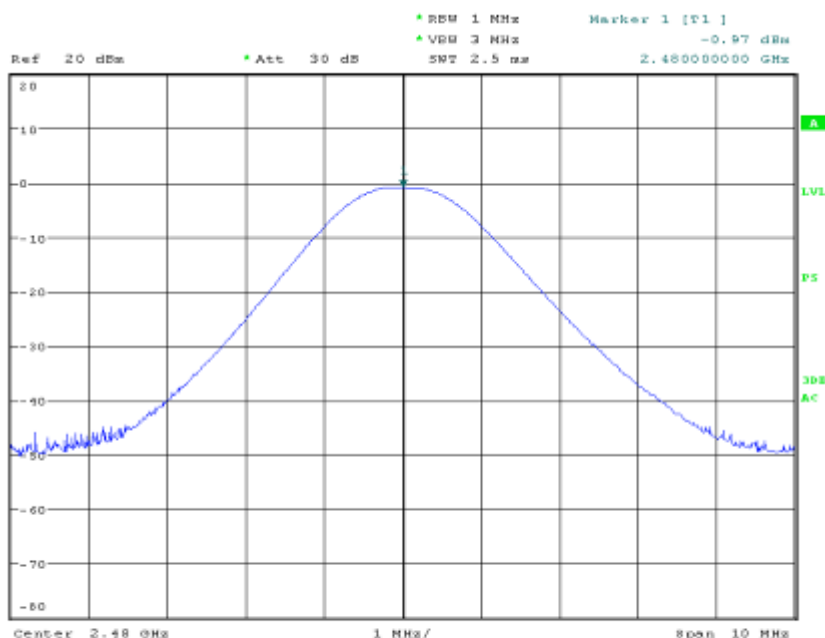
**SGS-CSTC Standards  
Technical Services Co., Ltd.**

ReportNo.: SHEMO09080092103  
Page: 21 of 48

Middle Channel:



Highest Channel:





## 6.8 RF Exposure Compliance Requirement

### 6.8.1 Standard requirement

15.247(b)(4) requirement:

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TCB Exclusion List (7 July 2002)

Exposure category	low threshold	high threshold
general population	(60/fGHz) mW. $d < 2.5$ cm (120/fGHz) mW. $d \geq 2.5$ cm	(900/fGHz) mW. $d < 20$ cm
occupational	(375/fGHz) mW. $d < 2.5$ cm (900/fGHz) mW. $d \geq 2.5$ cm	(2250/fGHz) mW. $d < 20$ cm

### 6.8.2 EUT RF Exposure

The Max Conducted Peak Output Power is **-0.26dBm(0.94mW)** in channel **0**;  
And the antenna is generally less than **-4.0dBi** PCB integrated in the actual use at the 2441MHz.

-4.0dB logarithmic terms convert to numeric result is nearly **0.398**;

According to the formula, calculate the EIRP test result:

$$\text{EIRP} = P \times G = 0.94 \text{ mW} \times 0.398 = 0.374 \text{ mW} \text{ ①}$$

SAR requirement:

$$S = 60 / f(\text{GHz}) = 60 / 2.4 = 25 \text{ mW} \text{ ②} ;$$

$$\text{①} < \text{②}.$$

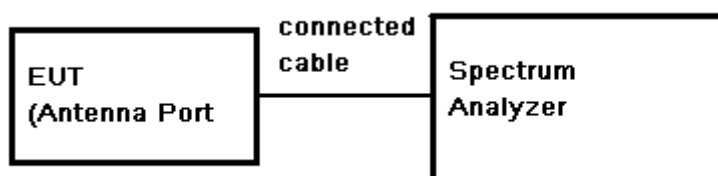
So the SAR report is not required.



## 6.9 Conducted Spurious Emissions

Test Requirement: FCC Part 15.247  
Test Method: Based on FCC Part15 C Section 15.247&15.209:  
Test Date: Aug 12, 2009  
Test requirements: (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. based on either an RF conducted or a radiated measurement. provided the transmitter demonstrates compliance with the peak conducted power limits.  
Test Status: Test the lowest. Middle, highest channel.

Test Configuration:



Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100KHz. VBW >= RBW. Sweep = auto; Detector Function = Peak (Max. hold).

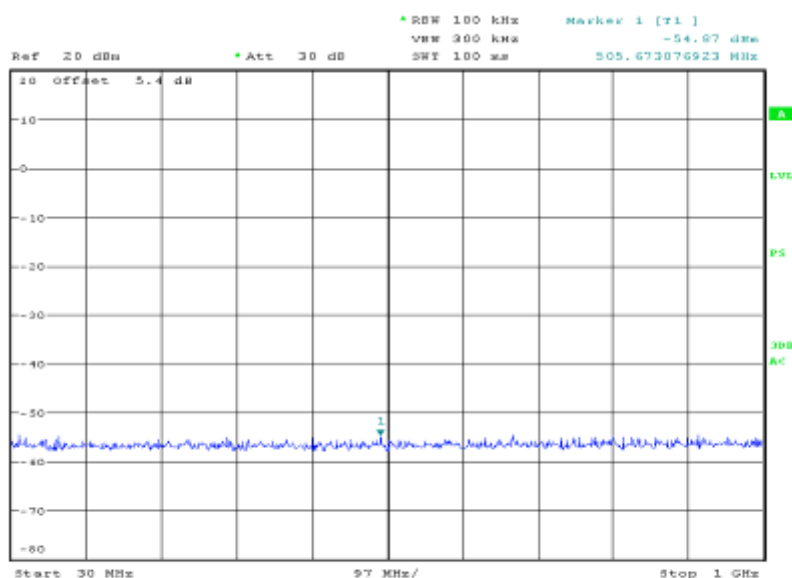


**SGS-CSTC Standards  
Technical Services Co., Ltd.**

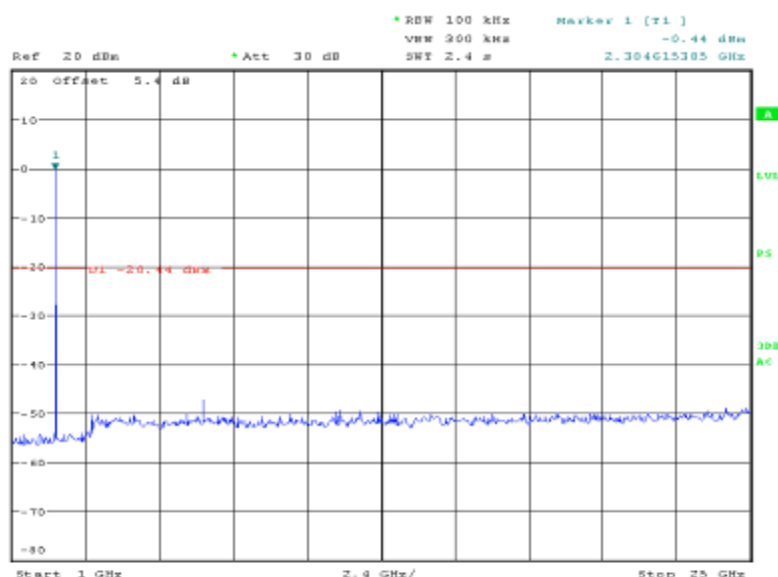
ReportNo.: SHEMO09080092103  
Page: 24 of 48

Lowest Channel:

Below 1GHz:



Above 1GHz:





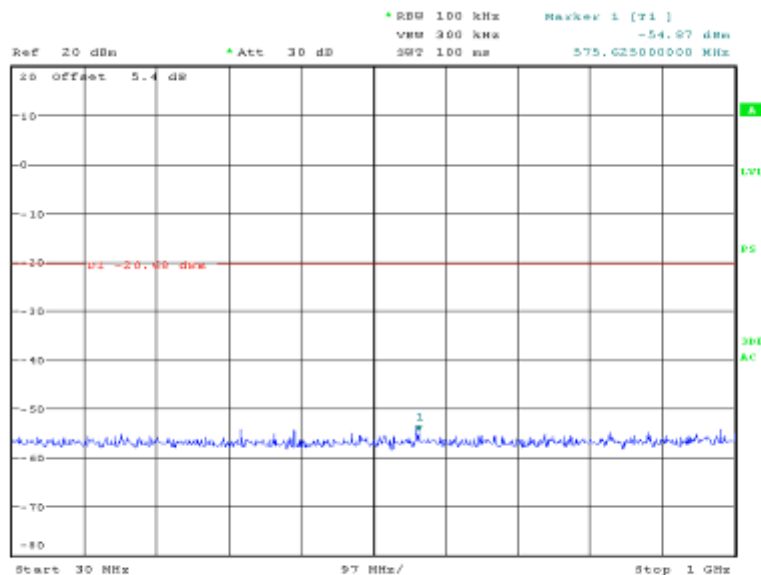


**SGS-CSTC Standards  
Technical Services Co., Ltd.**

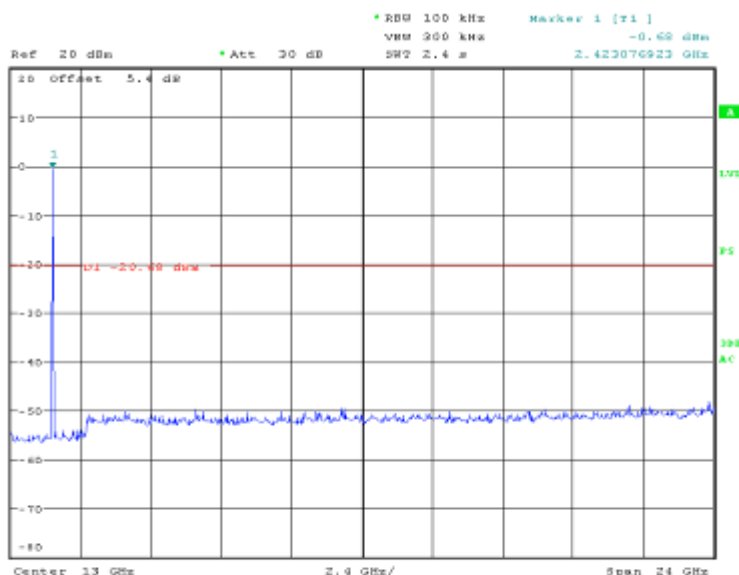
ReportNo.: SHEMO09080092103  
Page: 25 of 48

Middle Channel:

Below 1GHz



Above 1GHz



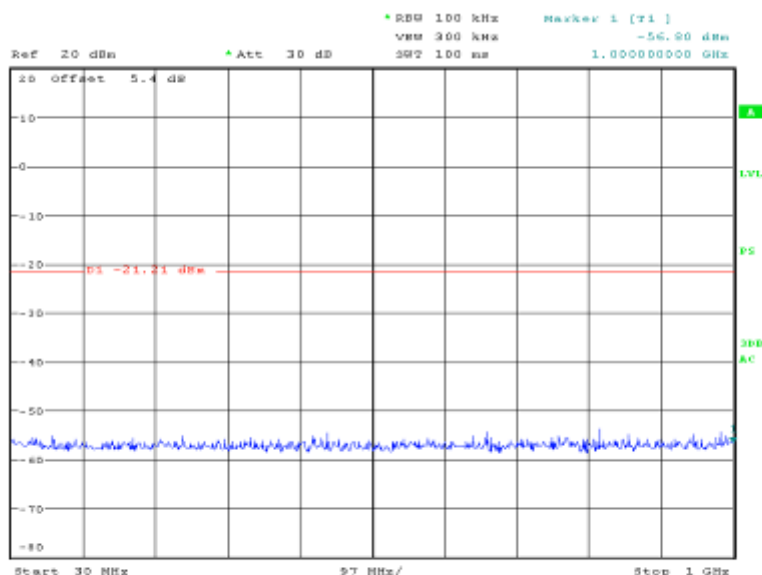


**SGS-CSTC Standards  
Technical Services Co., Ltd.**

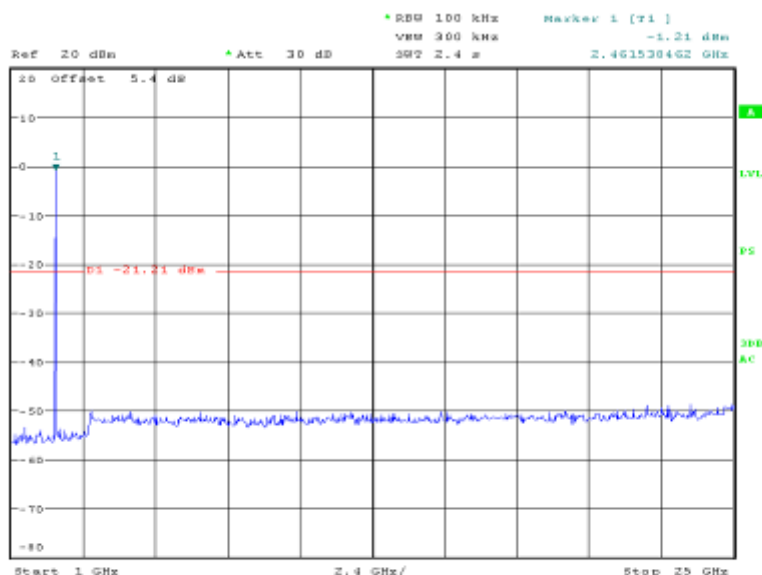
ReportNo.: SHEMO09080092103  
Page: 26 of 48

Highest Channel:

Below 1GHz



Above 1GHz

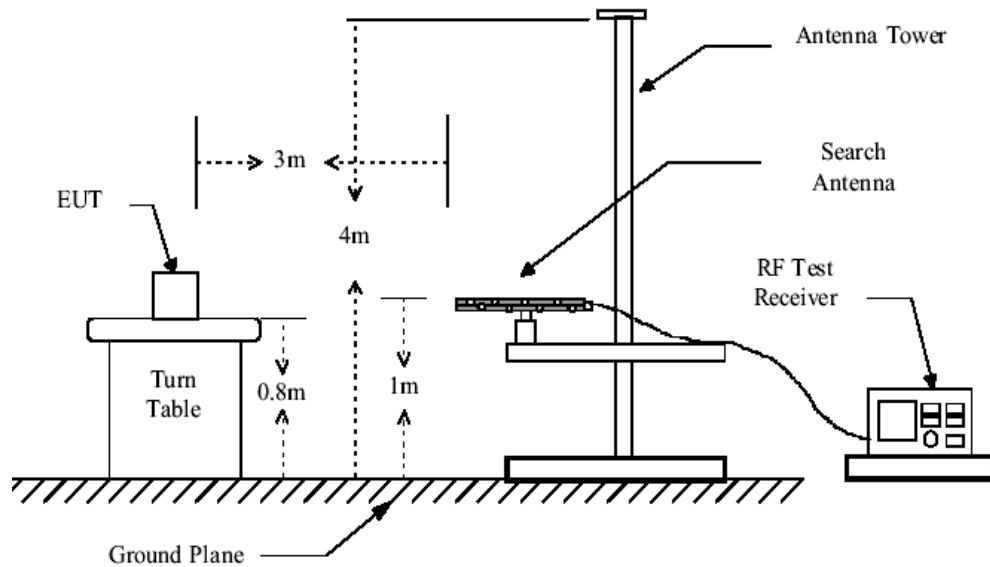




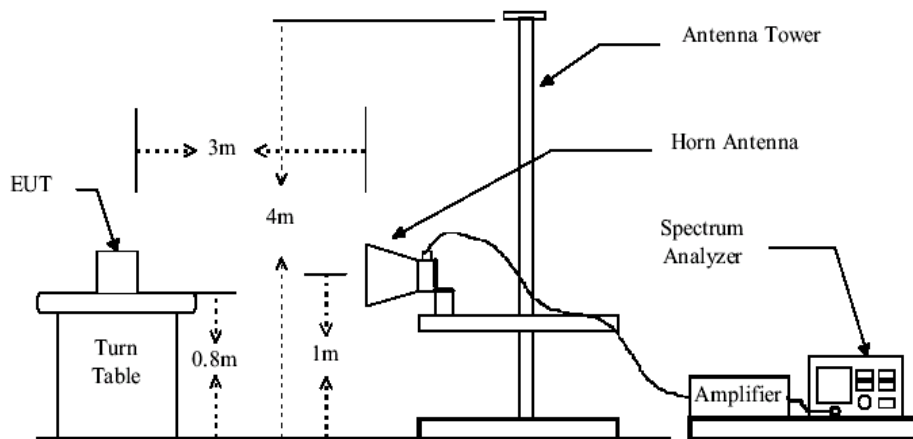
## 6.10 Radiated Spurious Emissions

Test Requirement:	FCC 15.247(d) & 15.209
Test Method:	ANSI C63.4 section 8 & 13
Test Date:	Aug 13, 2009
Test Status:	Test lowest channel, Middle, highest channel.
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber) Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz - 1000 MHz). 1MHz resolution bandwidth and Peak and Average-Peak detector apply (1000 MHz – 25GHz). Receive antenna scan height 1 m - 4 m. polarization Vertical / Horizontal
15.209 Limit:	40.0 dB $\mu$ V/m between 30MHz & 88MHz 43.5 dB $\mu$ V/m between 88MHz & 216MHz 46.0 dB $\mu$ V/m between 216MHz & 960MHz 54.0 dB $\mu$ V/m above 960MHz
15.247(d) limit:	(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that  Contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

**Test Configuration:**



30MHz to 1GHz radiated emissions test configuration



Above 1GHz radiated emissions test configuration

**Test Procedure:** The procedure used was ANSI Standard C63.4-2001. The receiver was scanned from 30MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.



## 6.10.1 Harmonic and other spurious emissions

### 6.10.1.1 Test in low Channel in transmitting status

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
315	15.1	0.35	--	14.2	29.65	46.00	Vertical
945	23.3	0.52	--	12.7	36.52	46.00	Horizontal

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

#### Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4804	27.6	0.82	43.5	43.5	28.4	74	Vertical
7206	35.5	1.70	43.1	43.8	37.9	74	V
9608	37.7	2.02	43.0	45.0	41.7	74	V
4804	27.6	0.82	43.5	42.8	27.7	74	Horizontal
7206	35.5	1.70	43.1	43.1	37.2	74	H
9608	37.7	2.02	43.0	45.6	42.3	74	H

#### Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4804	27.6	0.82	43.5	34.1	19.0	54	Vertical
7206	35.5	1.70	43.1	32.2	26.3	54	V
9608	37.7	2.02	43.0	34.1	30.8	54	V
4804	27.6	0.82	43.5	32.4	17.3	54	Horizontal
7206	35.5	1.70	43.1	33.3	27.4	54	H
9608	37.7	2.02	43.0	34.7	31.4	54	H

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.



#### 6.10.1.2 Test in middle Channel in transmitting status

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
40.0	15.0	0.1	--	16.4	31.5	40.0	Vertical
42.0	15.1	0.1	--	16.3	31.5	40.0	Horizontal

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

##### Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4882	27.6	0.84	43.4	34.3	19.34	74.00	Vertical
7323	35.5	1.74	43.1	33.1	27.24	74.00	V
9764	37.7	2.05	43.0	34.7	31.45	74.00	V
4882	27.6	0.84	43.4	32.5	17.54	74.00	Horizontal
7323	35.5	1.74	43.1	34.2	28.34	74.00	H
9764	37.7	2.05	43.0	35.6	32.35	74.00	H

##### Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4882	27.6	0.84	43.4	24.1	9.14	54.00	Vertical
7323	35.5	1.74	43.1	23.7	17.84	54.00	V
9764	37.7	2.05	43.0	23.2	19.95	54.00	V
4882	27.6	0.84	43.4	24.6	9.64	54.00	Horizontal
7323	35.5	1.74	43.1	23.5	17.64	54.00	H
9764	37.7	2.05	43.0	25.1	21.85	54.00	H

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.



### 6.10.1.3 Test in high Channel in transmitting status

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
249.200	13.1	0.3	--	21.1	33.5	46.00	Vertical
249.190	13.1	0.3	--	20.4	33.8	46.00	Horizontal

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

#### Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4960	27.7	0.88	43.4	41.7	26.88	74.00	Vertical
7440	35.7	1.81	43.2	42.8	37.11	74.00	V
9920	37.9	2.15	43.1	45.2	42.15	74.00	V
4960	27.7	0.88	43.4	41.8	26.98	74.00	Horizontal
7440	35.7	1.81	43.2	42.6	36.91	74.00	H
9920	37.9	2.15	43.1	46.2	43.15	74.00	H

#### Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4960	27.7	0.88	43.4	31.5	16.68	54.00	Vertical
7440	35.7	1.81	43.2	32.6	26.91	54.00	V
9920	37.9	2.15	43.1	34.7	31.65	54.00	V
4960	27.7	0.88	43.4	31.9	17.08	54.00	Horizontal
7440	35.7	1.81	43.2	32.7	27.01	54.00	H
9920	37.9	2.15	43.1	35	31.95	54.00	H

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

Remark: No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.



**Remark:**

- 1). N/A: For this intentional radiator operates below 25 GHz. the spectrum shall be investigated to the tenth harmonic of the highest fundamental frequency. And above the third harmonic of this intentional radiator, the disturbance is very low. So the test result only displays to 3rd harmonic.
- 2). As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

**Test result: The unit does meet the FCC requirements.**





## 6.10.2 Radiated Emissions which fall in the restricted bands

Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	Base on ANSI 63.4
Test Date:	Aug 13, 2009
Measurement Distance:	3m (Semi-Anechoic Chamber)
Limit:	40.0 dBμV/m between 30MHz & 88MHz; 43.5 dBμV/m between 88MHz & 216MHz; 46.0 dBμV/m between 216MHz & 960MHz; 54.0 dBμV/m above 960MHz.
Detector:	Peak for pre-scan: 100kHz resolution bandwidth and 100kHz video bandwidth within 1GHz. 1MHz resolution bandwidth and 1MHz video bandwidth above 1GHz

### Test Result:

#### 1. Low Channel

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamplifier factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
1575	24.9	0.73	42.2	43.5	32.1	26.93	15.53
2205	26.3	0.82	42.3	44.6	32.7	29.42	17.52
2390	27.1	0.88	42.4	45.1	34.5	30.68	20.08
2483.5	27.4	0.97	42.4	44.8	34.3	30.77	20.27
2835	28.15	1.07	42.6	44.7	33.5	30.95	19.75

#### 2. Middle Channel

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamplifier factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
1575	24.9	0.73	42.2	43.4	33.1	26.83	16.53
2205	26.3	0.82	42.3	44.2	33.2	29.02	18.02
2390	27.1	0.88	42.4	44.4	31.9	29.98	17.48
2483.5	27.4	0.97	42.4	43.8	32.5	29.77	18.47
2835	28.15	1.07	42.6	45.1	33.5	31.35	19.75



**SGS-CSTC Standards  
Technical Services Co., Ltd.**

ReportNo.: SHEMO09080092103

Page: 34 of 48

**3. High Channel**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamplifier factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
1575	24.9	0.73	42.2	44.1	32.8	27.53	16.23
2205	26.3	0.82	42.3	44.5	33.4	29.32	18.22
2390	27.1	0.88	42.4	44.2	33.9	29.78	19.48
2483.5	27.4	0.97	42.4	45.3	34.6	31.27	20.57
2835	28.15	1.07	42.6	44.9	34.2	31.15	20.45

Remark: No any other emission which fall in restricted bands can be detected and be reported.

Section 15.205 Restricted bands of operation.

(a) Except as shown in paragraph (d) of this section. only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		

**Test result: The unit does meet the FCC requirements.**

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at [www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm) and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at [www.sgs.com/terms\\_e-document.htm](http://www.sgs.com/terms_e-document.htm). Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only



## **6.11 Band Edges Requirement**

Test Requirement:	FCC Part 15 C
Test Method:	Based on ANSI 63.4 Operation within the band 2400 – 2483.5 MHz
Test Date:	Aug 11, 2009
Requirements:	Section 15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Method of Measurement:	Set RBW of spectrum analyzer to 100 kHz and VBW of spectrum analyzer to 300 kHz with suitable frequency span including 100 kHz bandwidth from band edge. The band edges was measured and recorded.

The band edges was measured and recorded Result:

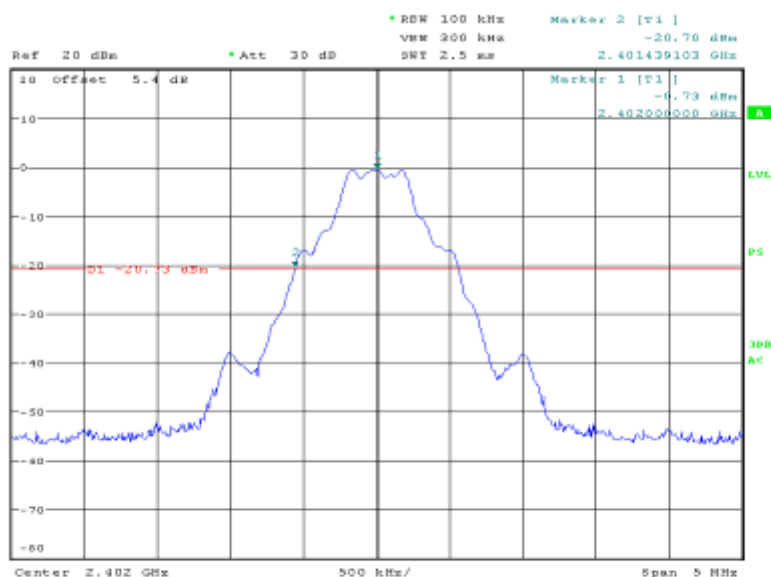
The Lower Edges attenuated more than 20dB.

The Upper Edges attenuated more than 20dB.

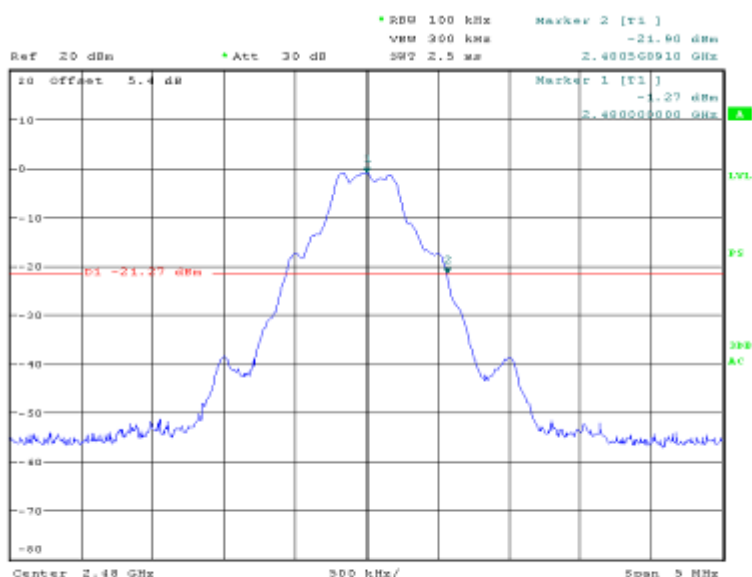
The graph as below. represents the emissions take for this device.



Lowest Channel:



Highest Channel:



**Test result: The unit does meet the FCC requirements.**

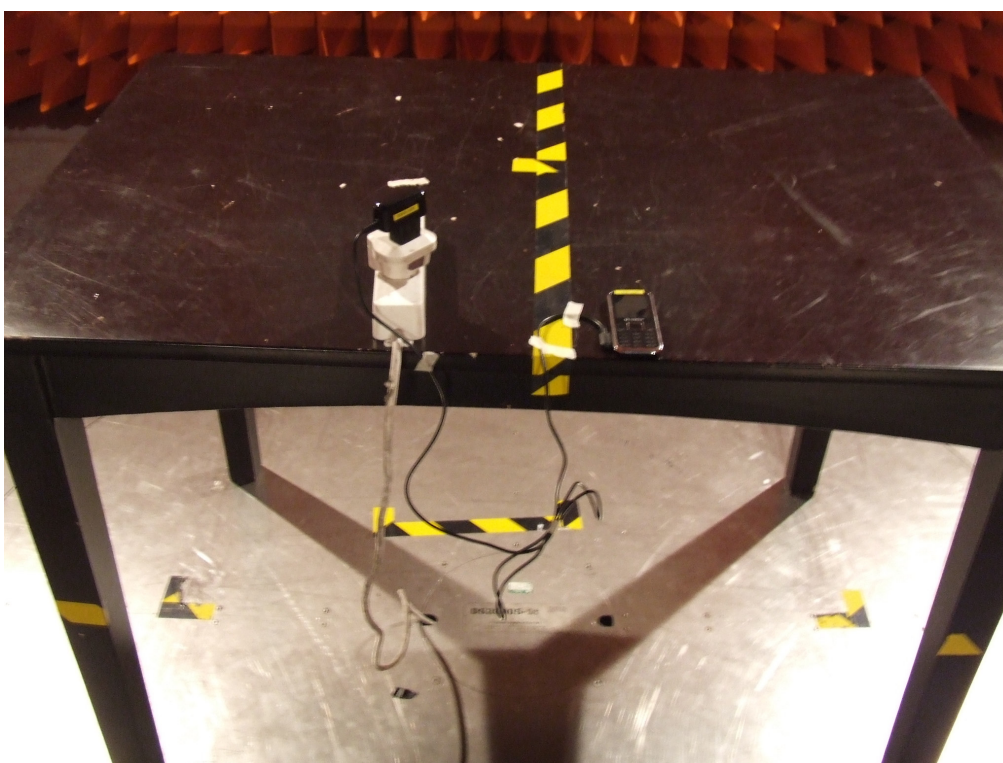
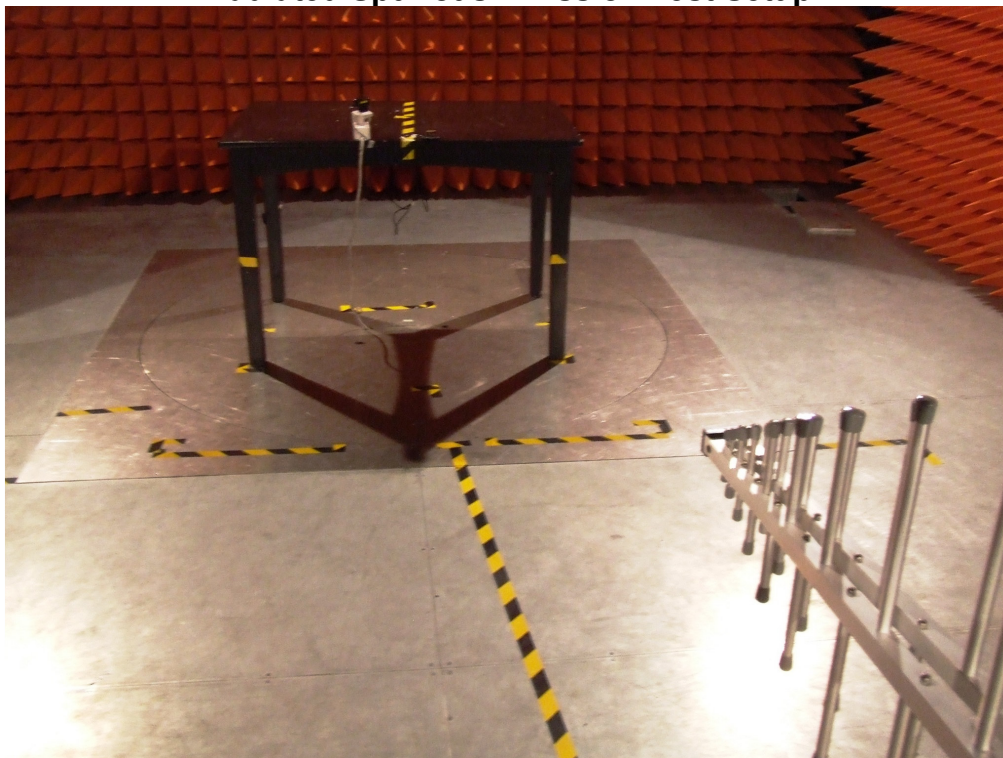
This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at [www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm) and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at [www.sgs.com/terms\\_e-document.htm](http://www.sgs.com/terms_e-document.htm). Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only



## **APPENDIX 1 PHOTOGRAPHS OF SETUP**



### **Radiated Spurious Emission Test Setup**



### Conducted Emission Test Setup





## **APPENDIX 2 PHOTOGRAPHS OF EUT**



*All of EUT*



*Top View of EUT*



***Bottom View of EUT-1***



***Side View of EUT-2***





***Side View of EUT-3***



***Side View of EUT-4***





*Side View of EUT-5*



*Adapter*



### *Battery*



### *Open View of EUT-1*





*Open View of EUT-2*



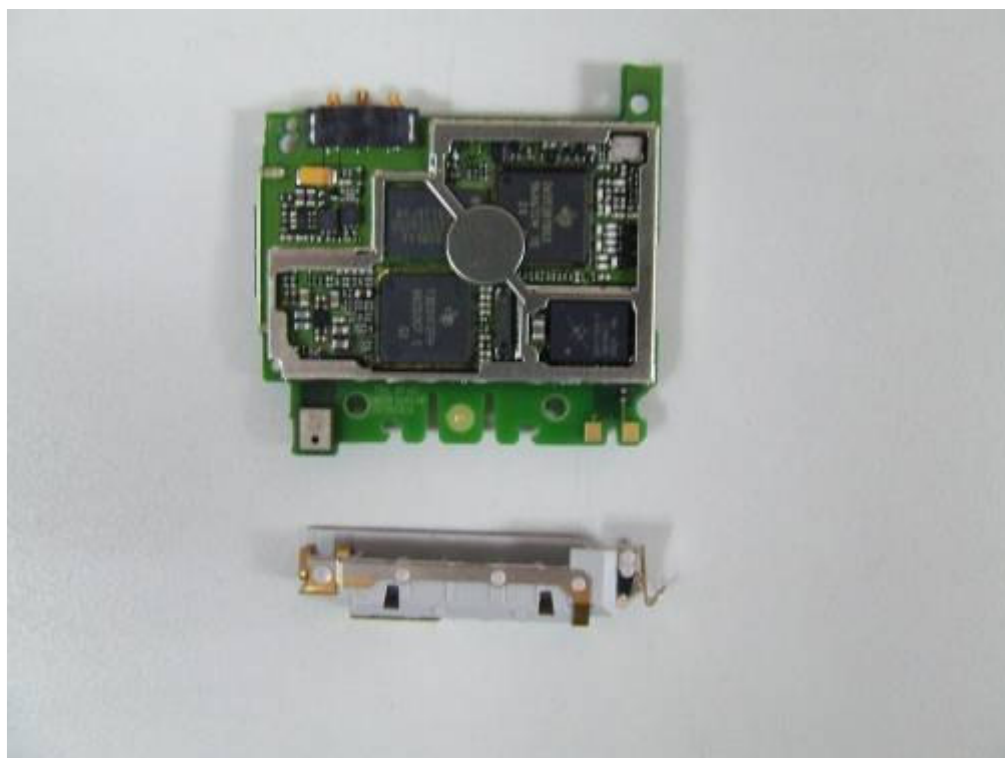
*Open View of EUT-3*



***Internal of EUT-1***



***Internal of EUT-2***



***Internal of EUT-3***



***Internal of EUT-4***



***~End of Report~***