

**SGS-CSTC Standards  
Technical Services  
(Shanghai)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.: SHEM110400036402  
Page: 1 of 68

## ***TEST REPORT***

**Application No. :** SHEM110400036402  
**Applicant:** Sierra Wireless Inc.  
**FCC ID:** N7NAC754S  
**Fundamental Frequency :** 2.4GHz ISM Band  
**Equipment Under Test (EUT):**  
Name: Mobile Hotspot  
Model No.: AirCard 754S  
**Standards:** FCC PART 15 SUBPART C, Section 15.247  
**Date of Receipt:** Apr. 11, 2011  
**Date of Test:** Apr. 11, 2011 to May 11, 2011  
**Date of Issue:** May 11, 2011  
**Test Result :** **PASS \***

\* In the configuration tested, the EUT complied with the standards specified above.



Tino Pan  
E&E Section Manager



Jim Xu  
EMC Project Engineer

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

The customer requested FCC tests for a 2.4GHz transmitter.			
Test	Test Requirement	Test Procedure	Result
AC Power Line Conducted Emission	FCC PART 15 Section 15.207(a)	ANSI C63.4,2003	PASS
Peak Output Power	FCC PART 15 Section 15.247(b)(3),(4)(c)	KDB 558074	PASS
6dB Bandwidth	FCC PART 15 Section 15.247(a)(2)	KDB 558074	PASS
Radiated Emission Band Edge	FCC PART 15 Section 15.247(d)	ANSI C63.4,2003 KDB 558074	PASS
Conducted Spurious Emission	FCC PART 15 Section 15.247(d)	KDB 558074	PASS
Radiated Spurious Emission	FCC PART 15 Section 15.247(d)	ANSI C63.4,2003 KDB 558074	PASS
Peak Power Density	FCC PART 15 Section 15.247(e)	KDB 558074	PASS
Antenna Requirement	FCC PART 15 Section 15.203	N/A	PASS

### 3 Contents

	Page
1 COVER PAGE .....	1
2 TEST SUMMARY .....	2
3 CONTENTS .....	3
4 GENERAL INFORMATION.....	4
4.1 CLIENT INFORMATION .....	4
4.2 DETAILS OF E.U.T. ....	4
4.3 DESCRIPTION OF SUPPORT UNITS.....	4
4.4 TEST LOCATION .....	4
4.5 TEST SOFTWARE AND PROGRAM FOR TEST MODE .....	4
4.6 OTHER INFORMATION REQUESTED BY THE CUSTOMER.....	4
4.7 TEST FACILITY .....	5
5 TEST RESULTS .....	6
5.1 TEST INSTRUMENTS.....	6
5.2 E.U.T. OPERATION.....	7
5.3 TEST PROCEDURE & MEASUREMENT DATA .....	8
5.3.1 <i>Antenna Requirement</i> .....	8
5.3.2 <i>Conducted Emission Test</i> .....	9
5.3.3 <i>Peak Output Power Measurement</i> .....	12
5.3.4 <i>6dB Bandwidth</i> .....	19
5.3.5 <i>Radiated Emission Band Edge</i> .....	30
5.3.6 <i>Conducted Spurious Emission Test</i> .....	34
5.3.7 <i>Spurious Radiated Emission Test</i> .....	47
5.3.8 <i>Peak Power Spectral Density</i> .....	58

## **4 General Information**

### **4.1 Client Information**

Applicant : Sierra Wireless Inc.  
Applicant Address: 13811 Wireless Way Richmond, British Columbia, Canada, V6V 3A4.  
Manufacturer: Sierra Wireless Inc.  
Manufacturer Address: 13811 Wireless Way Richmond, British Columbia, Canada, V6V 3A4.

### **4.2 Details of E.U.T.**

Name: Mobile Hotspot  
Model No.: AirCard 754S  
Power Supply: 5VDC (USB port supply)  
Frequency Band : 2.4GHz ISM Band  
Spread Spectrum: IEEE 802.11b:DSSS  
IEEE 802.11g :OFDM  
IEEE 802.11n\_20MHz :OFDM

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

<b>Name</b>	<b>Model No.</b>	<b>Remark</b>
Laptop	ThinkPad X100e	N/A
AC Adapter	Lenovo 65W 20V	N/A
Mouse	Lenovo M-UAE119	N/A
Monitor	IBM 6734-AC1	N/A

### **4.4 Test Location**

Tests were performed at:  
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.  
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.  
Tel: +86 21 6191 5666 Fax: +86 21 6191 5655  
No tests were sub-contracted.

### **4.5 Test Software and program for test mode**

Setup transmitting mode by the software "QPST" & "QRCT" and the program "AC753\_AC754\_WiFi\_test\_steps.docx" that supplied by the client.

### **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:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2011-07-29.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2012-03-17.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2011-09-29.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3172 and C-3514 respectively. Date of Registration: 2009-11-30. Date of Expiry: 2012-03-17.

## 5 Test Results

### 5.1 Test Instruments

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2010-6-4	2011-6-3
2	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2010-6-4	2011-6-3
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2011-3-12	2012-3-10
4	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2010-6-4	2011-6-3
5	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2010-10-9	2011-10-8
6	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY—2003P	--	2010-10-15	2011-10-14
7	CLAMP METER	FLUKE	316	86080010	2011-04-22	2012-04-20
8	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2010-10-15	2011-10-14
9	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2010-6-17	2011-6-16
11	Tunable Notch Filter	Wainwright instruments GmbH	WRCT1800.0/ 2000.0-0.2/40- 5SSK	11	2011-1-26	2012-1-25
12	Tunable Notch Filter	Wainwright instruments GmbH	WRCT800.0/88 0.0-0.2/40-5SSK	9	2011-1-26	2012-1-25
13	High pass Filter	FSCW	HP 12/2800- 5AA2	19A45-02	2011-4-8	2012-4-7
14	Low noise amplifier	TESEQ	LNA6900	70133	2010-7-6	2011-7-5
15	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2010-06-04	2011-06-03
16	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2010-05-07	2011-05-06

## **5.2 E.U.T. Operation**

Input voltage: 5VDC (USB port supply)

Operating Environment:

Temperature: 25.0 °C

Humidity: 45 % RH

Atmospheric Pressure: 1010 mbar

EUT Operation: The EUT has been tested under operating condition.

Test program was used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

802.11 b mode:Channel low (2412MHz) mid(2437MHz) high(2462MHz) with the worst case 1Mbps data rate was report for radiated spurious emission.

802.11 g mode:Channel low (2412MHz) mid(2437MHz) high(2462MHz) with the worst case 12Mbps data rate was report for radiated spurious emission.

802.11 n mode:Channel low (2412MHz) mid(2437MHz) high(2462MHz) with the worst case 12Mbps data rate was report for radiated spurious emission.

## **5.3 Test Procedure & Measurement Data**

### **5.3.1 Antenna Requirement**

<b>Test Requirement:</b>	FCC Part15 15.203
<b>Measurement Distance:</b>	3m (Semi-Anechoic Chamber)
<b>Requirements:</b>	An intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.The manufacturer may design the unit so that a broken antenna can be replaced by the user,but the use of a standard antenna jack or electrical connector is prohibited.This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211,15.213,15.217,15.219or 15.221.Further, this requirement does not apply to intentional radiators that must be professionally installed,such as perimeter protection systems and some field disturbance sensors,or to other Intentional radiators which,in accordance with Section 15.31(d), Must be measured at the installation site,However,the installer shall be responsible for ensuring that the proper antenna is employed so That the limits in this part are not exceeded.
<b>FCC Rules (Section15.203)</b>	Described how the EUT complies with the requirement that either its antenna is permanently attached,or that it employs a unique Antenna connector,for every antenna proposed for use with the EUT. The exception in those cases where EUT must be professionally Installed.In order to demonstrate that professional installation is Required,the following 3 points must be addressed: <ul style="list-style-type: none"><li>• The application(or intended use)of the EUT</li><li>• The installation requirements of the EUT</li><li>• The method by which the EUT will be marketed</li></ul>
<b>Conclusion</b>	The directional gains of antenna used for transmitting is 3.2 dBi, The RF transmitter uses an integrate antenna without connector.



### 5.3.2 Conducted Emission Test

**Test Requirement:** FCC Part15 15.207  
**Test date:** Apr. 15, 2011  
**Standard Applicable** According to section 15.207,frequency 150KHz to 30MHz shall not exceed the limit table as blew.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

**EUT Setup**

- 1.The conducted emission tests were performed in the test site,using the setup in accordance with the ANSI C63.4-2003.
- 2.EUT is charged with PC.The AC Power adaptor of PC was plug-in LISN.The rear of the EUT and periphearals were placed flushed with the rear of the tabletop.
- 3.The LISN was connected with 120V AC/60Hz power source.

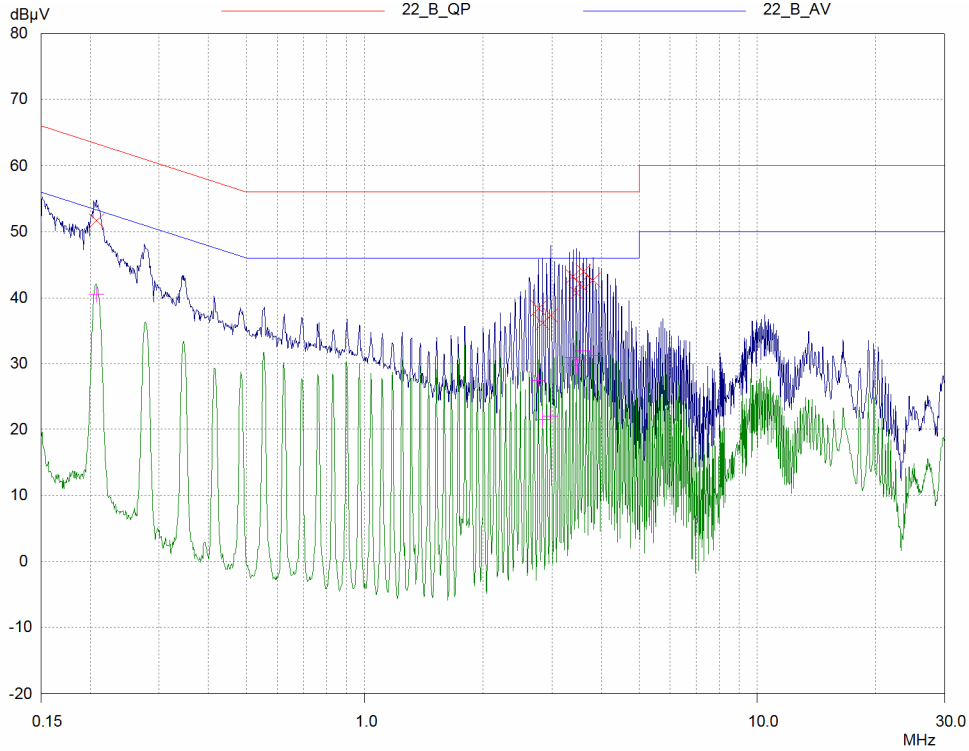
**Measurement Result**

Operation mode:Normal Link Mode  
Note:All test modes have been tested.  
Below is the worst case in 802.11g mode.

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 10 of 68

**L line:**



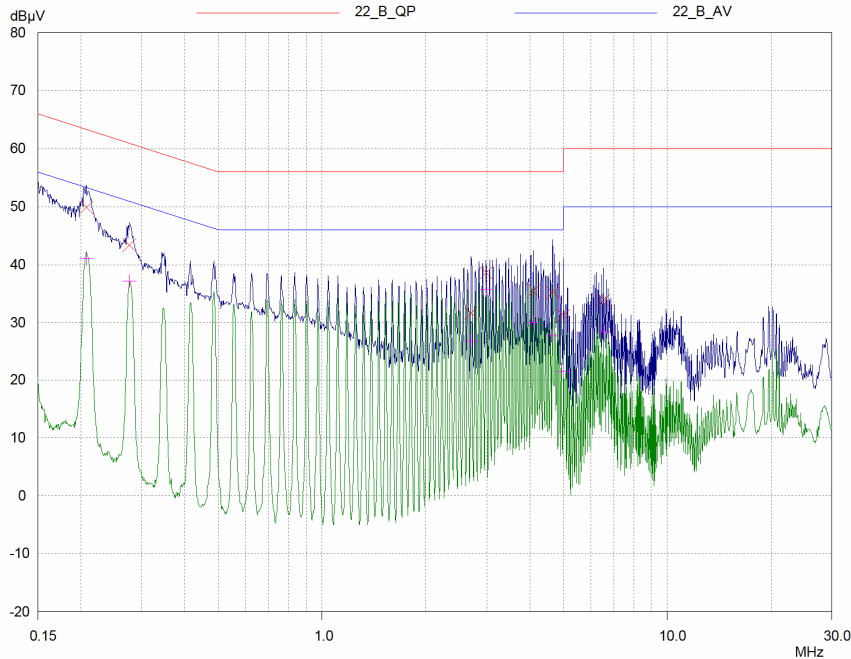
**Final Measurement Results**

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.20726	51.69	63.31	11.62
2.76504	38.43	56.00	17.57
2.83206	36.19	56.00	19.81
2.97103	37.38	56.00	18.62
3.38938	43.26	56.00	12.74
3.45771	40.79	56.00	15.21
3.52742	42.13	56.00	13.87
3.59854	43.97	56.00	12.03
3.80538	42.67	56.00	13.33

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.20726	40.54	53.31	12.77
2.76504	27.48	46.00	18.52
2.83206	21.46	46.00	24.54
2.97103	21.99	46.00	24.01
3.38938	30.97	46.00	15.03
3.45771	29.73	46.00	16.27
3.52742	30.58	46.00	15.42
3.59854	32.01	46.00	13.99
3.80538	31.29	46.00	14.71

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

**N Line:**



**Final Measurement Results**

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.20726	49.91	63.31	13.40
0.27627	43.37	60.93	17.56
2.69959	31.69	56.00	24.31
2.98292	38.62	56.00	17.38
4.08889	35.54	56.00	20.46
4.64605	35.21	56.00	20.79
4.99218	31.34	56.00	24.66
6.52303	33.91	60.00	26.09

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.20726	41.04	53.31	12.27
0.27627	37.15	50.93	13.78
2.69959	26.73	46.00	19.27
2.98292	35.67	46.00	10.33
4.08889	30.04	46.00	15.96
4.64605	27.62	46.00	18.38
4.99218	21.47	46.00	24.53
6.52303	28.34	50.00	21.66

### 5.3.3 Peak Output Power Measurement

<b>Test Requirement:</b>	FCC Part 15 15.247(a)(2),(b)
<b>Test date</b>	Apr 26, 2011 & May 11, 2011
<b>Standard Applicable:</b>	According to section 15.247(a)(2),(b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode. (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.  (c) Operation with directional antenna gains greater than 6 dBi. (1) Fixed point-to-point operation: (i) Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. (ii) Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

#### Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum.
3. Set the occur band to the entire emission bandwidth of the signal.
4. Record the max.channel power reading
5. Repeat above procedures until all the frequency measured were complete.

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 13 of 68

**Measurement Result:**

The test was performed with 802.11b, the data was shown the worst case 802.11b 1Mbps.

CH	Frequency (MHz)	Reading Power(dBm)	Cable Loss (dB)	Output Power (dBm)	Limit (dBm)	Result
LOW	2412	18.17	1.3	19.47	30	PASS
MID	2437	18.73	1.3	20.03	30	PASS
HIGH	2462	20.27	1.3	21.57	30	PASS

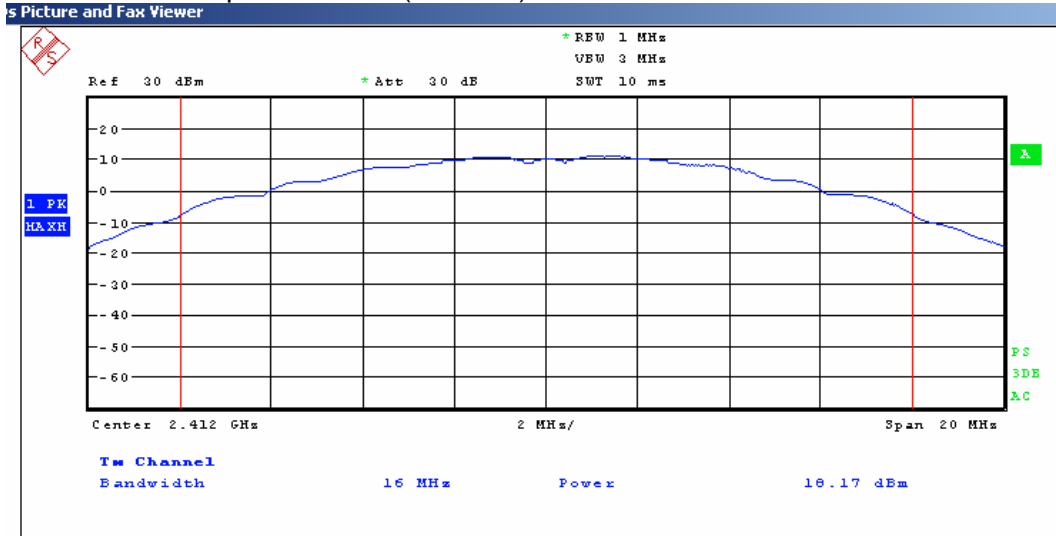
The test was performed with 802.11g, the data was shown the worst case 802.11g 6Mbps.

CH	Frequency (MHz)	Reading Power(dBm)	Cable Loss (dB)	Output Power (dBm)	Limit (dBm)	Result
LOW	2412	19.77	1.3	21.07	30	PASS
MID	2437	20.58	1.3	21.88	30	PASS
HIGH	2462	20.56	1.3	21.86	30	PASS

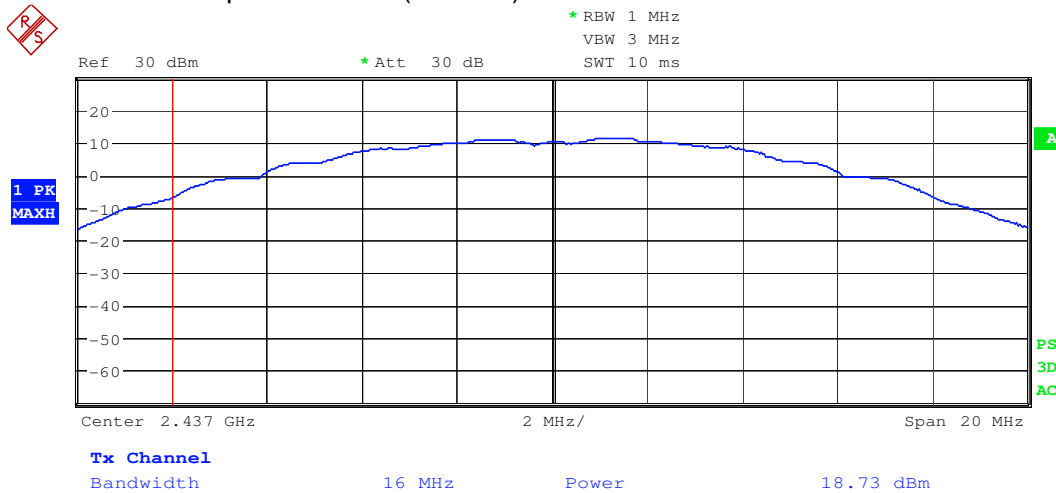
The test was performed with 802.11n\_20MHz, the data was shown the worst case 802.11n 7.2Mbps.

CH	Frequency (MHz)	Reading Power(dBm)	Cable Loss (dB)	Output Power (dBm)	Limit (dBm)	Result
LOW	2412	20.23	1.3	21.53	30	PASS
MID	2437	20.31	1.3	21.61	30	PASS
HIGH	2462	20.61	1.3	21.91	30	PASS

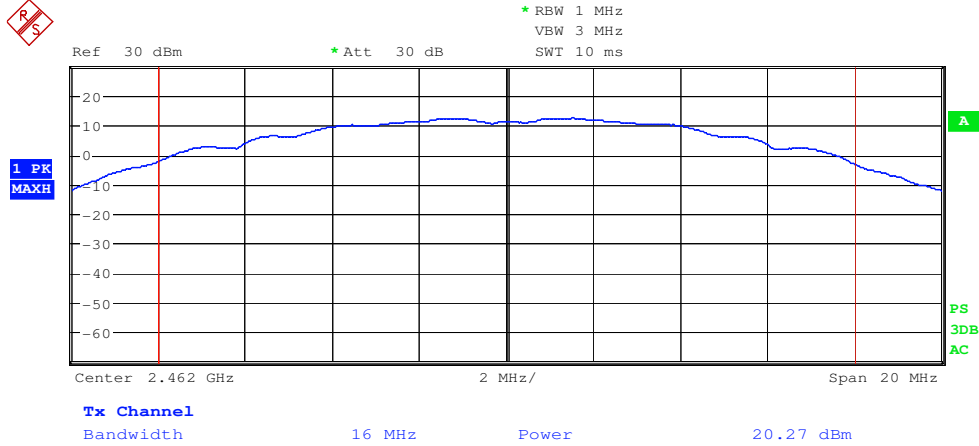
Peak Power Output Data Plot(CH Low)802.11b



Peak Power Output Data Plot(CH Mid)802.11b



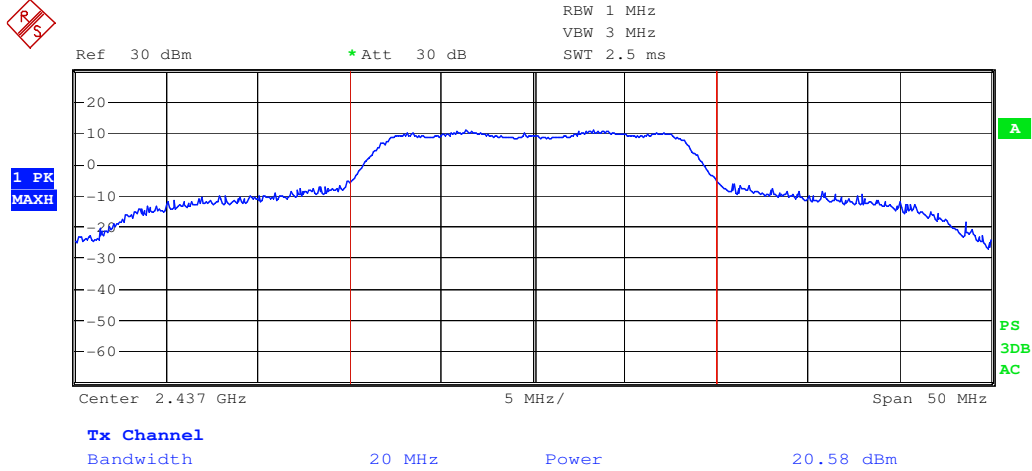
**Peak Power Output Data Plot(CH High)802.11b**



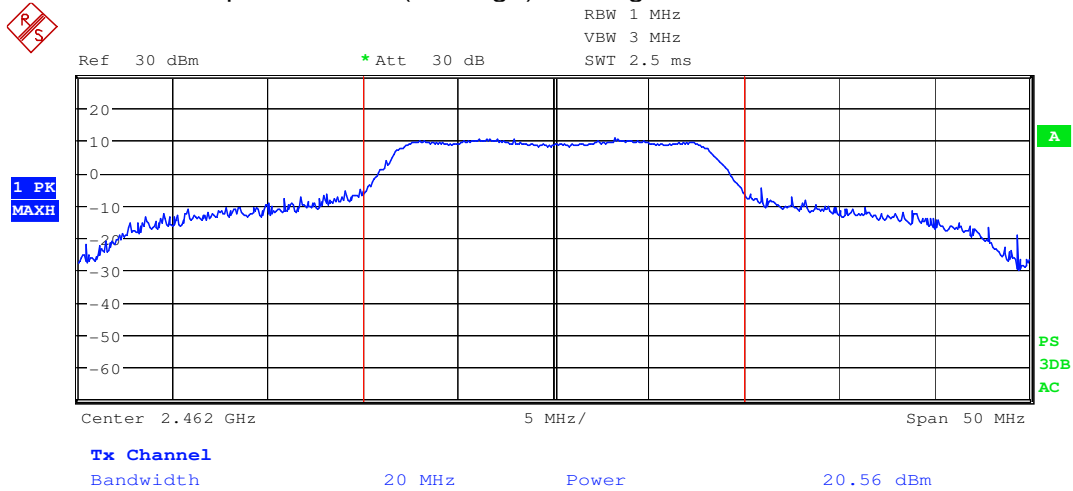
**Peak Power Output Data Plot(CH Low)802.11g**



**Peak Power Output Data Plot(CH Mid)802.11g**

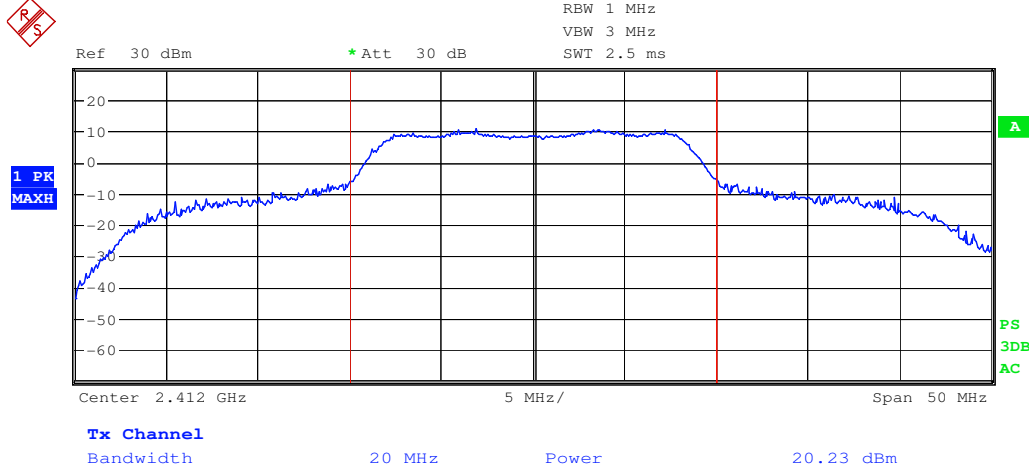


**Peak Power Output Data Plot(CH High)802.11g**

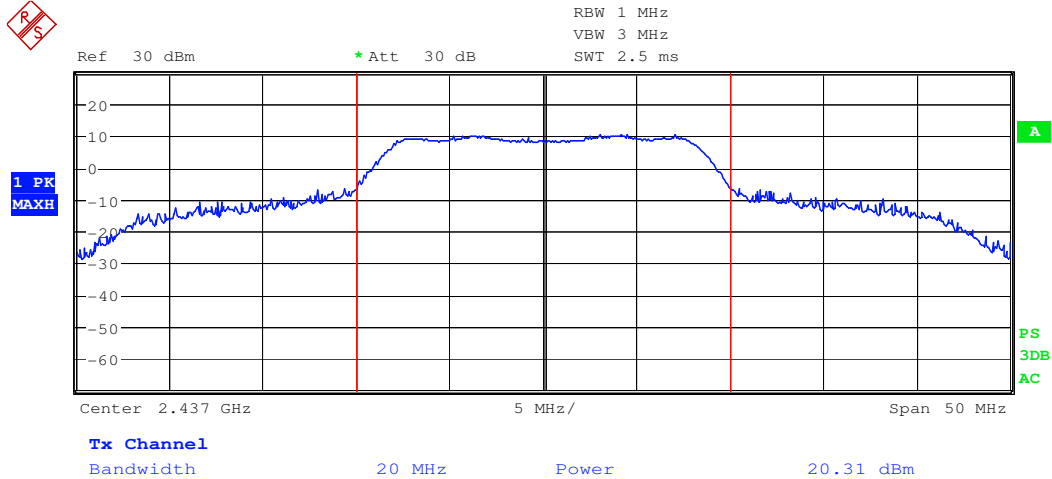




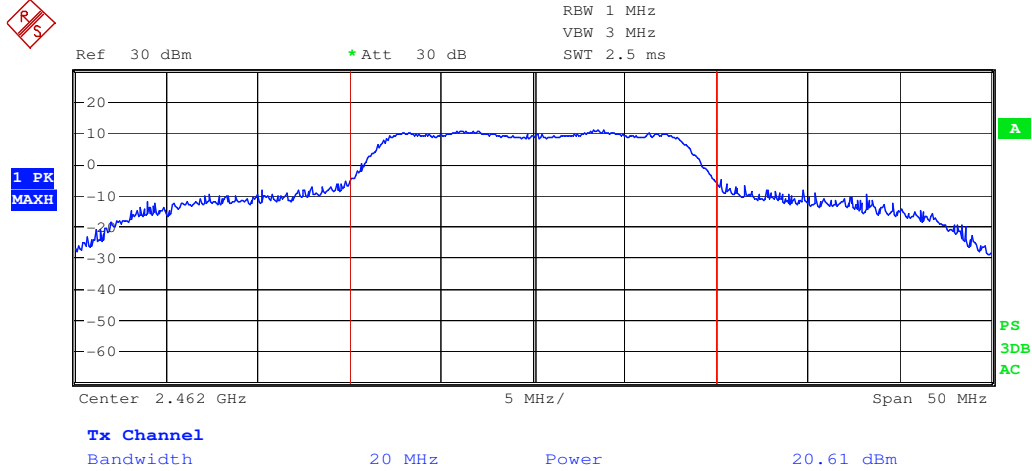
Peak Power Output Data Plot(CH Low)802.11n



Peak Power Output Data Plot(CH Mid)802.11n



Peak Power Output Data Plot(CH High)802.11n



#### **5.3.4 6dB Bandwidth**

- Test Requirement:** FCC Part15 247(a)(2)
- Test date:** Apr 26, 2011 & May 06, 2011
- Standard Applicable:** According to section 15.247(a)(2), Systems using digital modulation techniques may operate in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands. The minimum 6dB bandwidth shall be at least 500KHz.
- Measurement Procedure:**
1. Place the EUT on the table and set it in transmitting mode.
  2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
  3. Set the spectrum analyzer as RBW=100KHz, VBW =3\* RBW, Span=30/ 50MHz, Sweep=auto
  4. Mark the peak frequency and -6dB (upper and lower) frequency.
  5. Repeat above procedures until all frequency measured were complete.

**Measurement Result:**

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 20 of 68

The test was performed with 802.11b, the data was shown the worst case 802.11b 1Mbps.

CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
LOW	2412	7.37	500	PASS
MID	2437	7.21	500	PASS
HIGH	2462	8.49	500	PASS

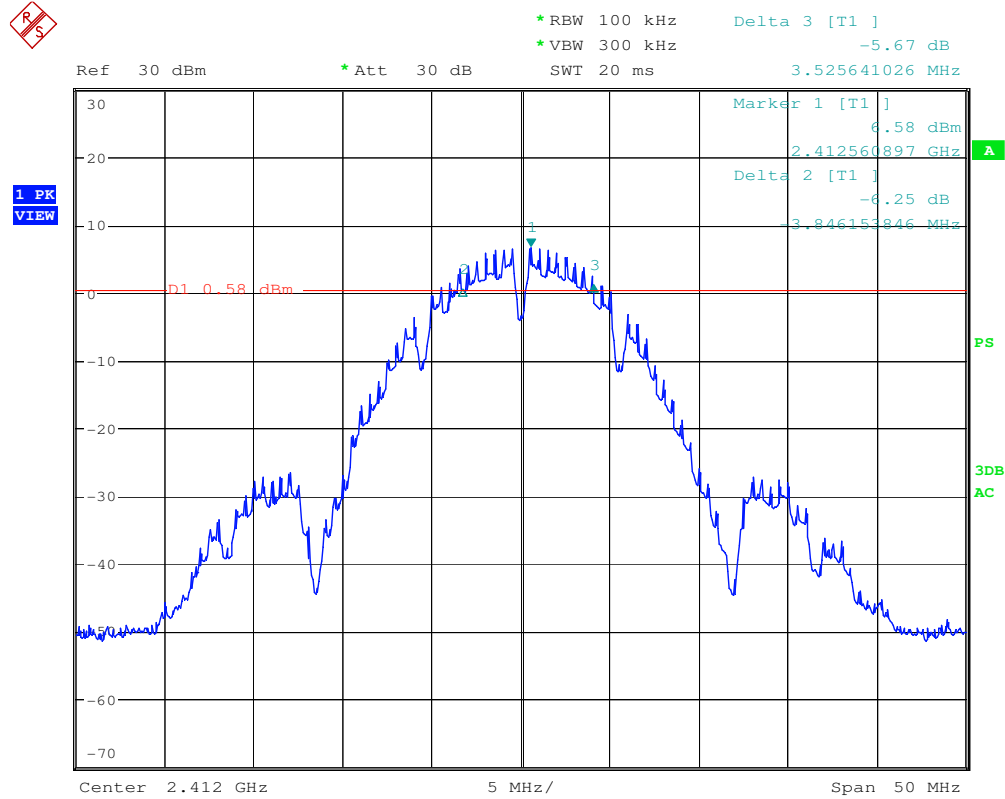
The test was performed with 802.11g, the data was shown the worst case 802.11g 6Mbps.

CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
LOW	2412	16.51	500	PASS
MID	2437	16.51	500	PASS
HIGH	2462	17.23	500	PASS

The test was performed with 802.11n\_20MHz, the data was shown the worst case 802.11n 7.2Mbps.

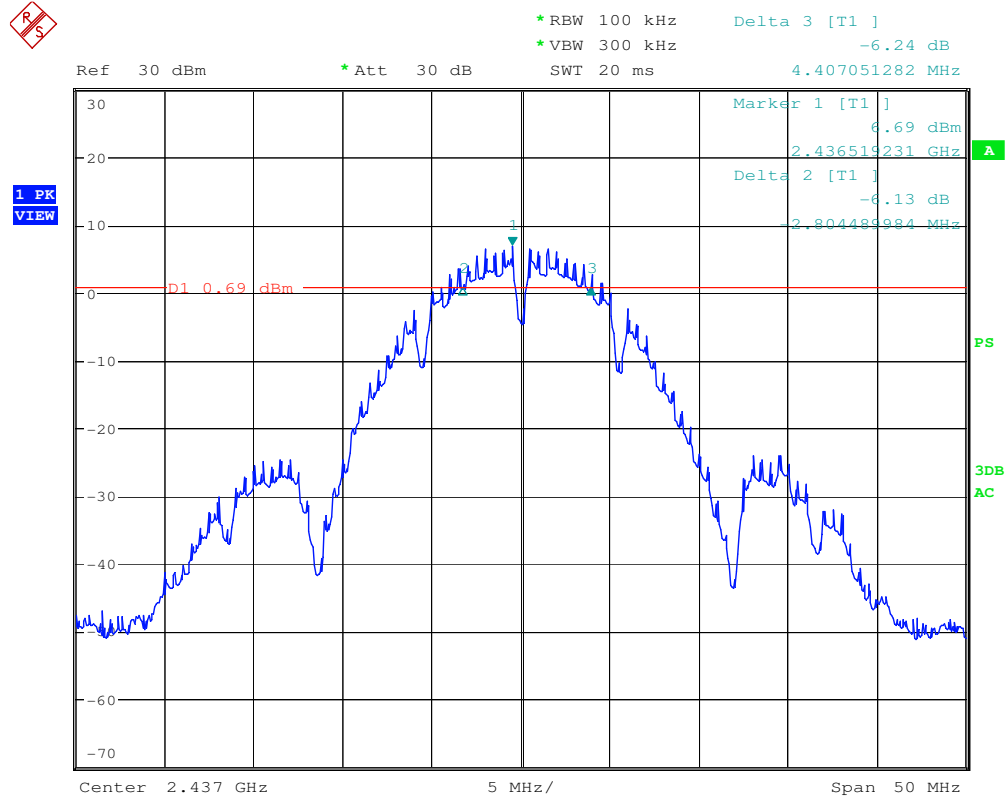
CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
LOW	2412	17.23	500	PASS
MID	2437	17.39	500	PASS
HIGH	2462	17.55	500	PASS

6dB Band Width Test Data CH-Low,802.11b,1M mode



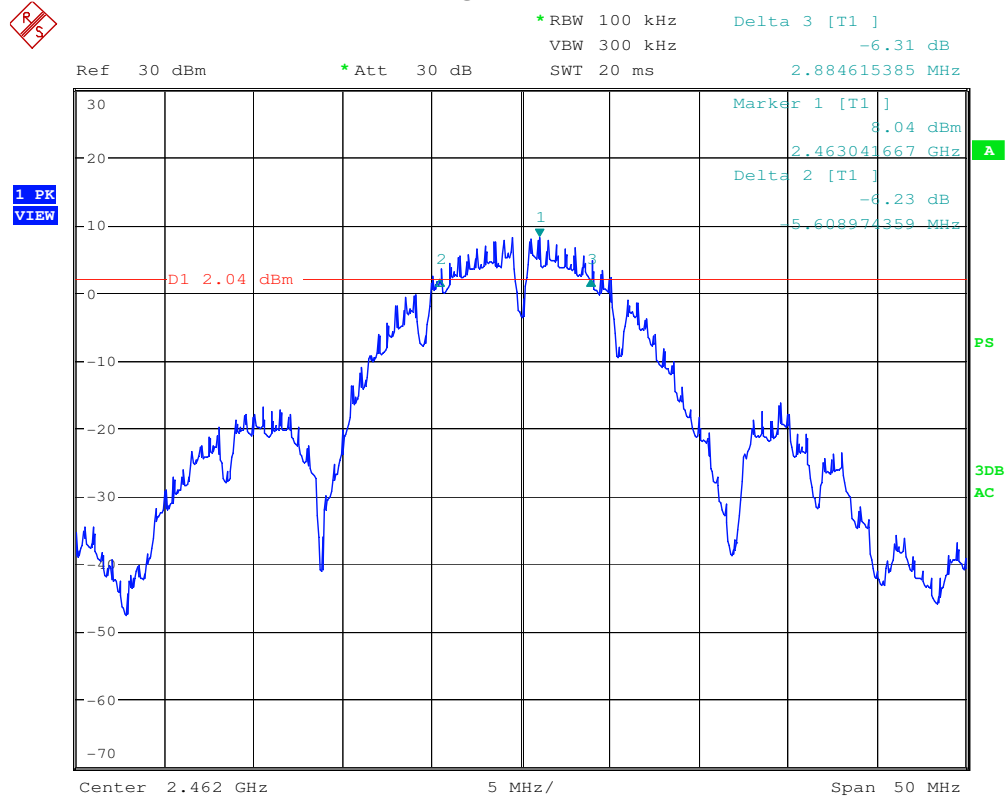
Date: 26.APR.2011 12:37:22

6dB Band Width Test Data CH-Mid,802.11b,1M mode



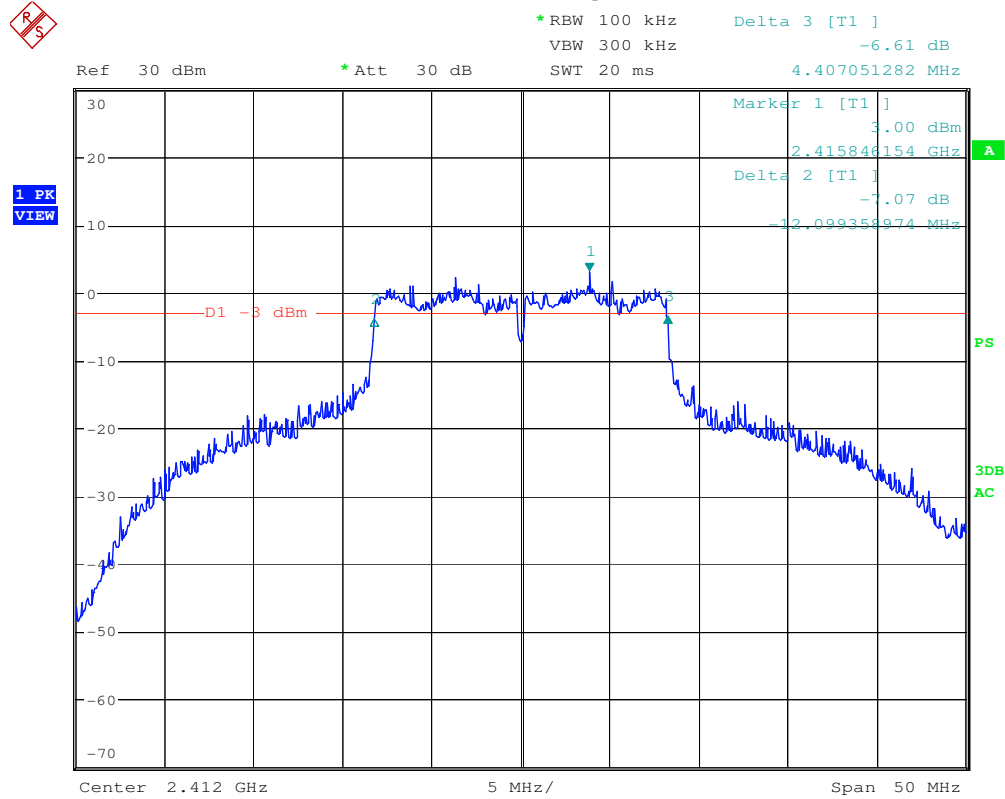
Date: 26.APR.2011 13:58:28

6dB Band Width Test Data CH-High,802.11b,1M mode



Date: 26.APR.2011 14:01:47

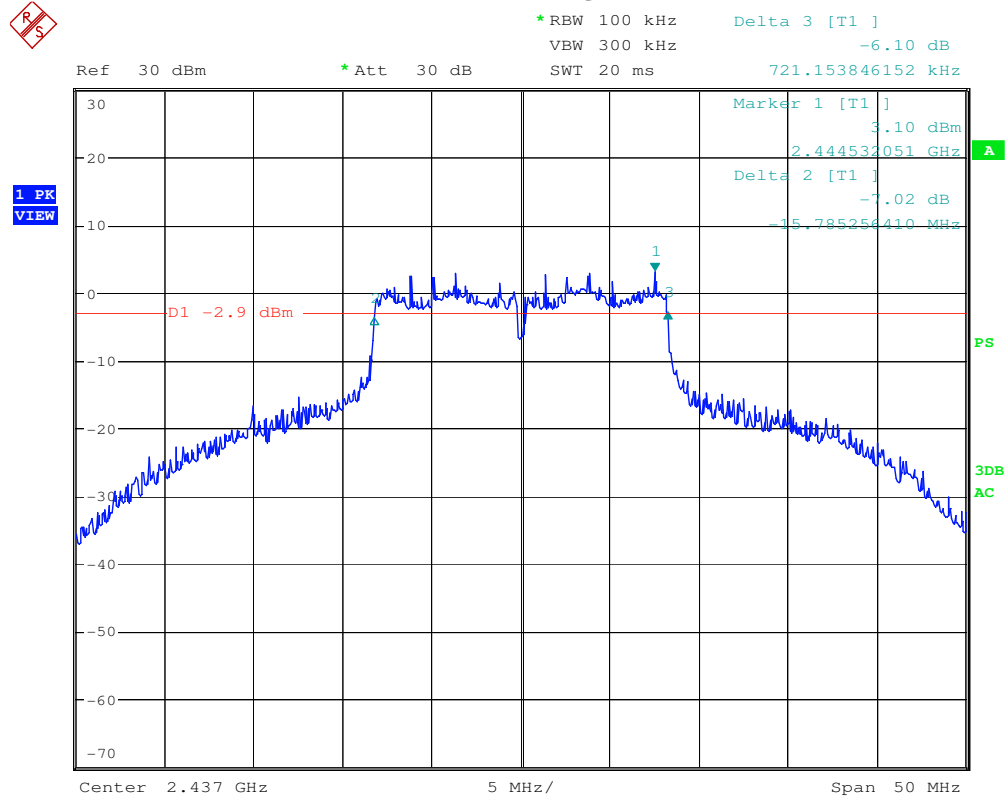
6dB Band Width Test Data CH-Low,802.11g,6M mode



Date: 6.MAY.2011 16:16:09

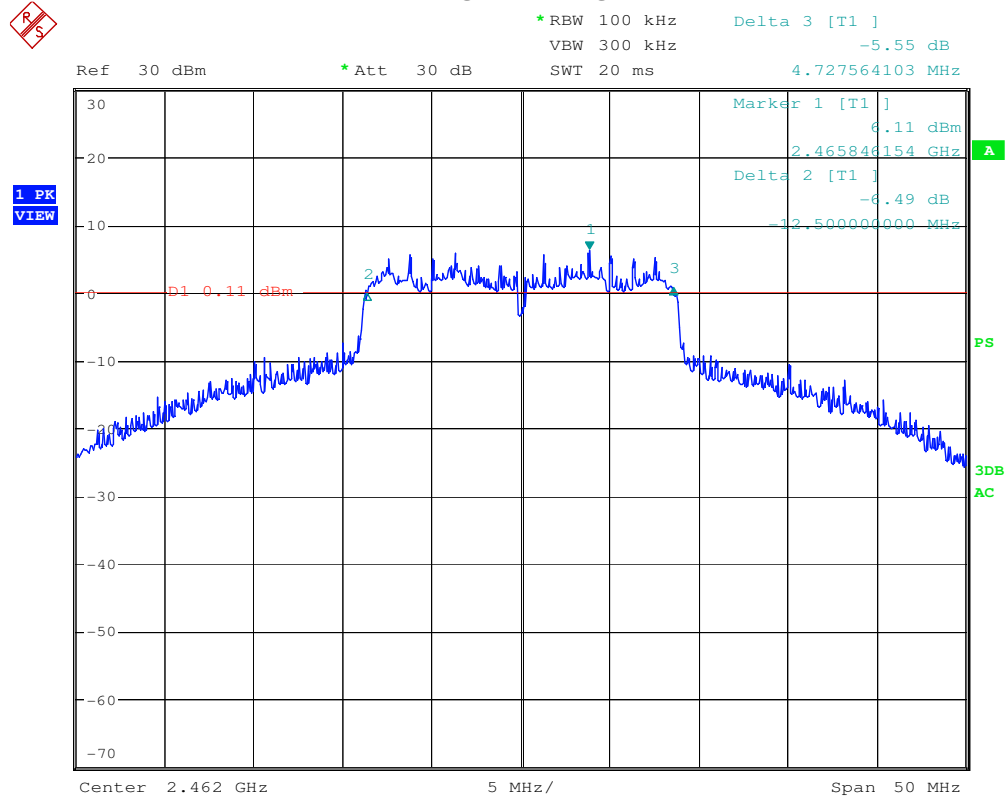


6dB Band Width Test Data CH-Mid,802.11g,12M mode



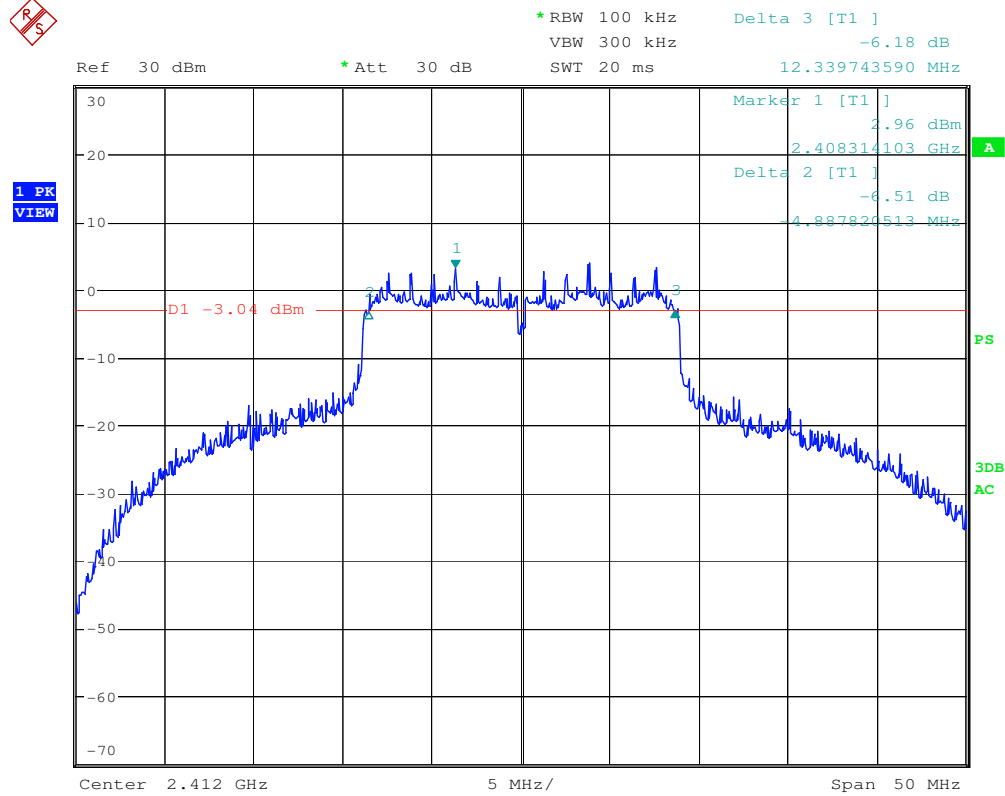
Date: 6.MAY.2011 16:19:14

6dB Band Width Test Data CH-High,802.11g,12M mode



Date: 26.APR.2011 14:16:02

6dB Band Width Test Data CH-Low,802.11n,7.2M mode

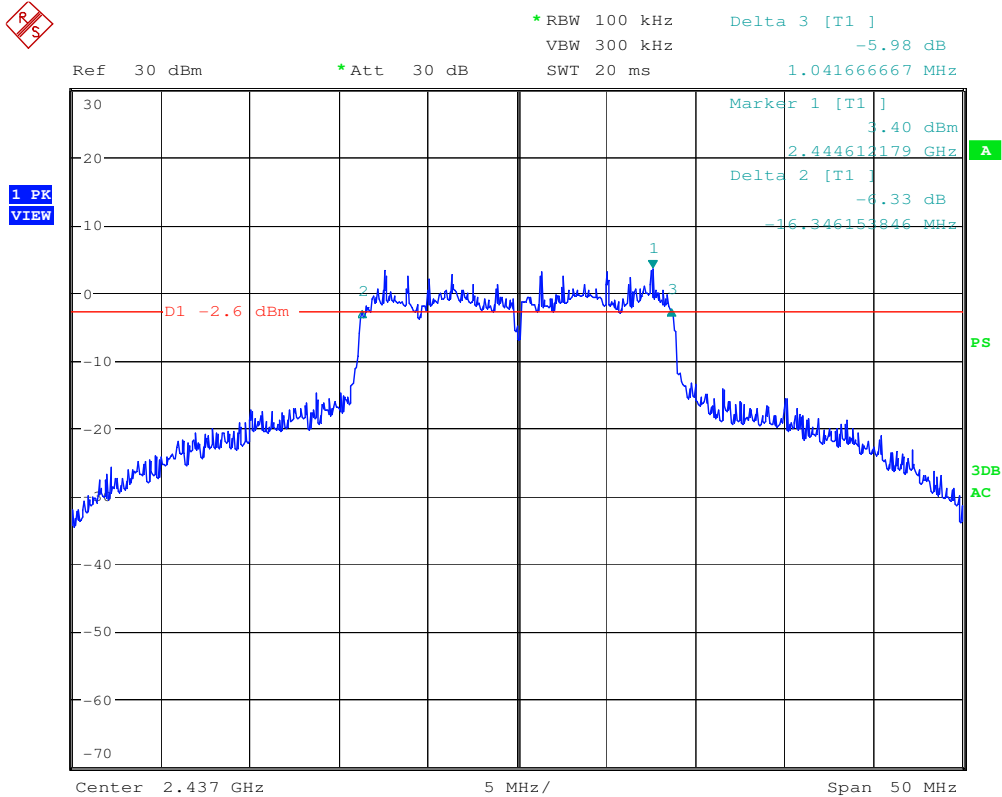


Date: 6.MAY.2011 16:22:30

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 28 of 68

**6dB Band Width Test Data CH-Mid,802.11n,7.2M mode**

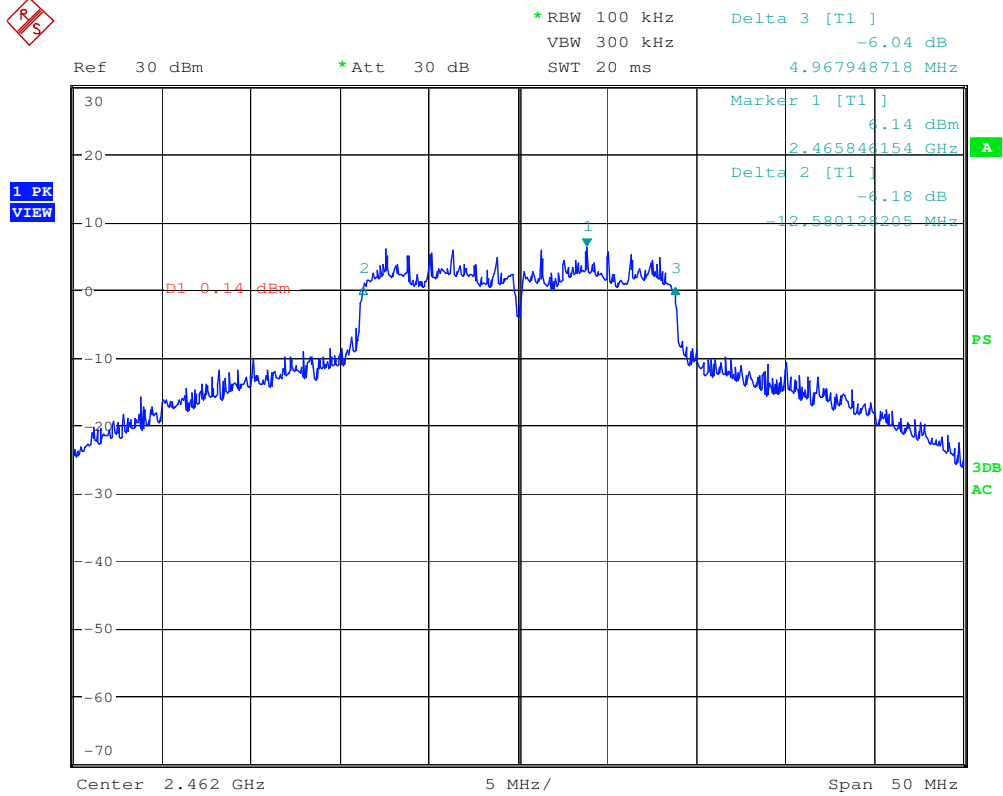


Date: 6.MAY.2011 16:21:00

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 29 of 68

**6dB Band Width Test Data CH-High,802.11n,7.2M mode**



Date: 26.APR.2011 14:25:42

### 5.3.5 Radiated Emission Band Edge

**Test Requirement:** FCC Part15 247(c)  
**Test date:** Apr 26, 2011 to May 11, 2011  
**Standard Applicable:** According to section 15.247(c),in any 100KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating,the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power,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 15.209(a).

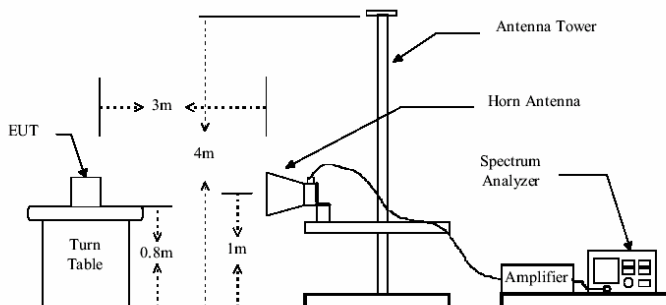
**Measurement Procedure:** The EUT was setup according to ANSI 63.4,2003 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47 CFR 15.247 requirements.The EUT is placed on a turn table which is 0.8 m above ground.The turn table is rotated 360 degrees to determine to the position of the maximum emission level.The EUT was positioned such that the distance from antenna to the EUT was 3 meters.The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level This is repeated for both horizontal and vertical polarization of the antenna.In order to find the maximum emission,all of the interface cables were manipulated according to ANSIC 63.4:2003 on radiated measurement.

Spectrum analyzer parameters setting as shown below:

(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

#### Radiated Emission Test Set-up Frequency Over 1GHz



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

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

**SGS-CSTC Standards  
Technical Services  
(Shanghai) Co., Ltd.**

Report No.: SHEM110400036402  
Page: 31 of 68

**Remark:** Factor= Antenna Factor+Cable Factor- Preamplifier Factor

**Measurement Result:**

**CH Low 802.11b Mode 1M**

**Horizontal, Peak Detector:**

Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2399.10	58.14	-10.04	48.10	74.00	25.90

**Horizontal, AV Detector:**

Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2399.10	55.34	-10.04	45.30	54.00	8.70

**Vertical, Peak Detector:**

Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2398.42	63.23	-10.04	53.19	74.00	20.81

**Vertical, AV Detector:**

Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2398.00	61.44	-10.04	51.40	54.00	2.60

**CH High 802.11b Mode 1M**

**Horizontal, Peak Detector:**

Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2483.5	42.09	-10.24	31.85	74.00	42.15

**Horizontal, AV Detector:**

Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.50	36.31	-10.24	26.07	54.00	27.93

**Vertical, Peak Detector:**

Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2483.5	47.53	-10.24	37.29	74.00	36.71

**Vertical, AV Detector:**

Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.5	43.06	-10.24	32.82	54.00	21.18

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 report refer only to the sample(s) tested and such sample(s) are retained for 90 days only

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 32 of 68

**CH Low 802.11g Mode 6M**

**Horizontal, Peak Detector:**

Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2400.0	43.61	-10.04	33.57	74	40.43

**Horizontal, AV Detector:**

Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2400.0	36.85	-10.04	26.81	54	27.19

**Vertical, Peak Detector:**

Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2400.0	50.04	-10.04	40.00	74	34

**Vertical, AV Detector:**

Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2400.0	43.18	-10.04	33.14	54	20.86

**CH High 802.11g Mode 6M**

**Horizontal, Peak Detector:**

Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2483.5	38.88	-10.24	28.64	74	45.36

**Horizontal, AV Detector:**

Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.50	29.65	-10.24	19.41	54	34.59

**Vertical, Peak Detector:**

Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2483.5	39.14	-10.24	28.90	74	45.1

**Vertical, AV Detector:**

Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.5	29.87	-10.24	19.63	54	34.37



**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 33 of 68

**CH Low 802.11n\_20MHz Mode 7.2M**

**Horizontal, Peak Detector:**

Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2400.0	59.04	-10.04	49.00	74.00	25.00

**Horizontal, AV Detector:**

Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2400.0	49.23	-10.04	39.19	54	14.81

**Vertical, Peak Detector:**

Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2400.0	67.97	-10.04	57.93	74	16.07

**Vertical, AV Detector:**

Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2400.0	60.66	-10.04	50.62	54	3.38

**CH High 802.11n\_20MHz Mode 7.2M**

**Horizontal, Peak Detector:**

Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2483.5	54.41	-10.24	44.17	74	29.83

**Horizontal, AV Detector:**

Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.50	42.63	-10.24	32.39	54	21.61

**Vertical, Peak Detector:**

Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2483.5	63.29	-10.24	53.05	74	20.95

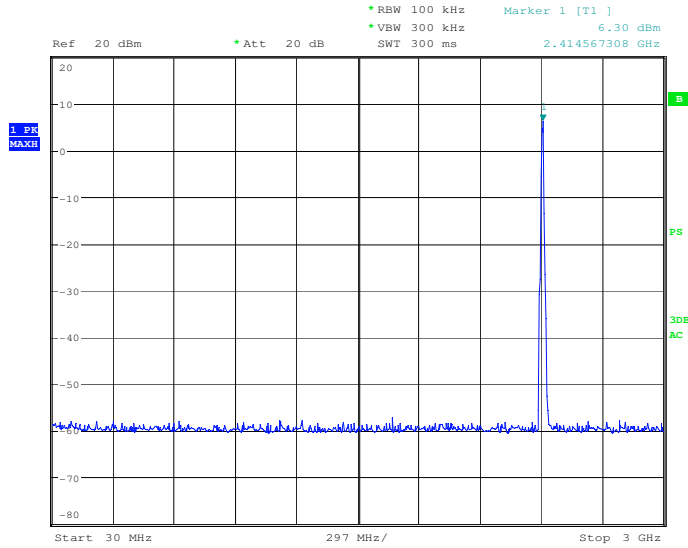
**Vertical, AV Detector:**

Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.5	54.33	-10.24	44.09	54	9.91

**5.3.6 Conducted Spurious Emission Test**

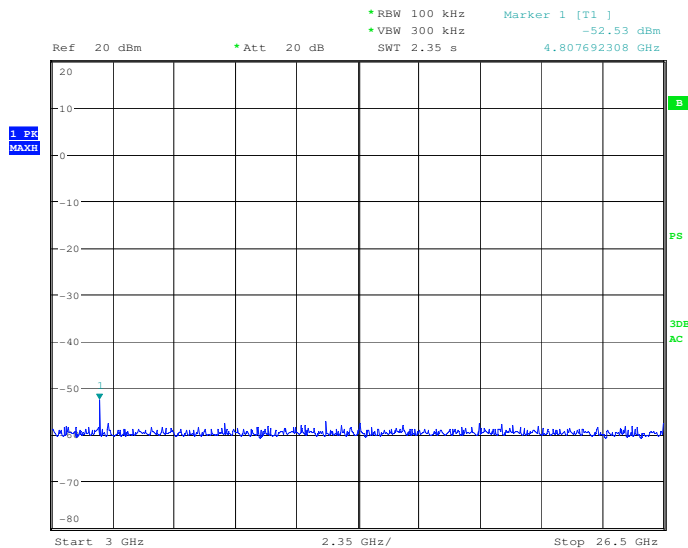
<b>Test Requirement:</b>	FCC Part15 247(c)
<b>Test date:</b>	Apr 27 to May 11, 2011
<b>Standard Applicable:</b>	According to section 15.247(c),in any 100KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating,the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power,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 15.209(a).
<b>Measurement Procedure:</b>	<ol style="list-style-type: none"><li>1. Place the EUT on the table and set it in transmitting mode.</li><li>2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.</li><li>3. Set center frequency of spectrum analyzer = operating frequency.</li><li>4. Set the spectrum analyzer as RBW=100KHz VBW=300KHz, Sweep = auto</li><li>6. Repeat above procedures until all frequency measured were complete.</li></ol>

**Measurement Result:**  
**Conducted spurious Emission Measurement Result (802.11b)1M**  
CH Low 30MHz-3GHz



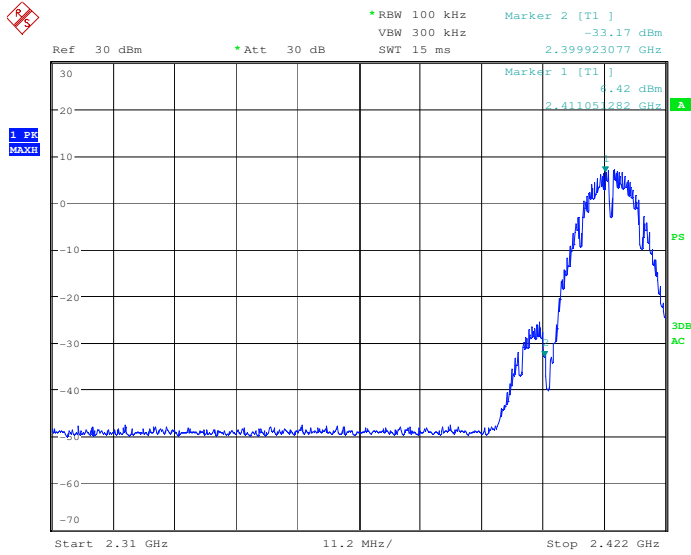
Date: 29.APR.2011 15:04:51

CH Low 3GHz-26.5GHz



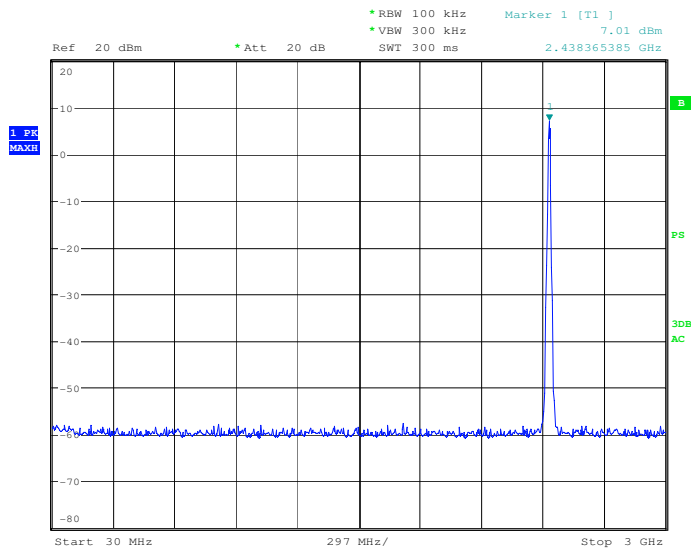
Date: 29.APR.2011 15:31:05

**Band Edge (Conducted Mode)**



Date: 27.APR.2011 15:40:46

**Ch Mid 30MHz-3GHz**

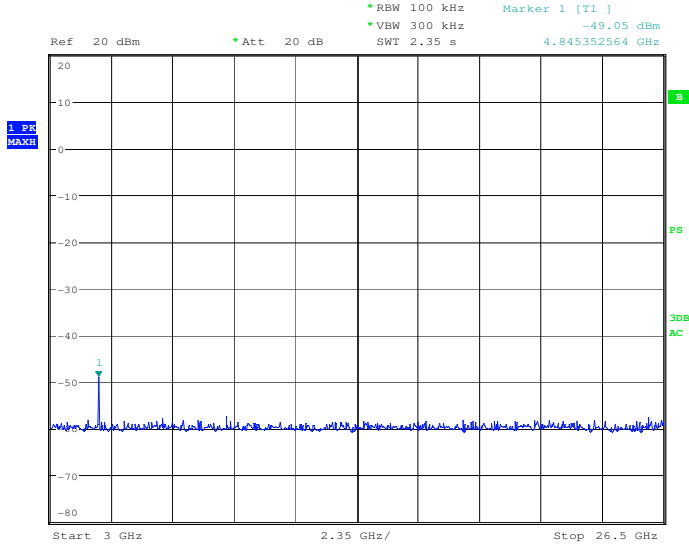


Date: 29.APR.2011 15:09:38

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

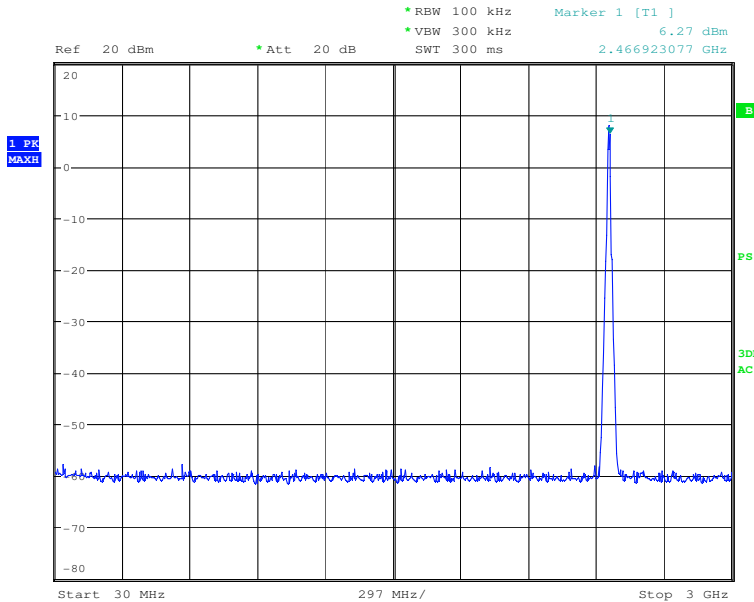
Report No.: SHEM110400036402  
Page: 37 of 68

Ch Mid 3GHz-26.5GHz



Date: 29.APR.2011 15:28:22

Ch High 30MHz-3GHz



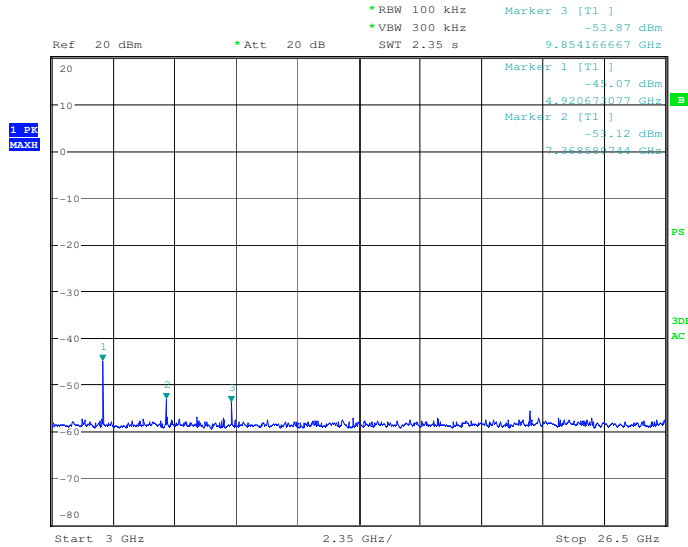
Date: 29.APR.2011 15:10:23

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

# SGS-CSTC Standards Technical Services (Shanghai)Co., Ltd.

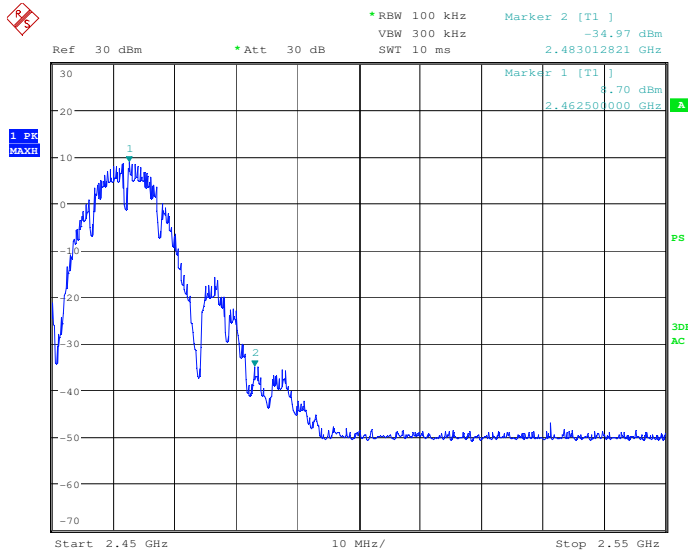
Report No.: SHEM110400036402  
Page: 38 of 68

## Ch High 3GHz-26.5GHz



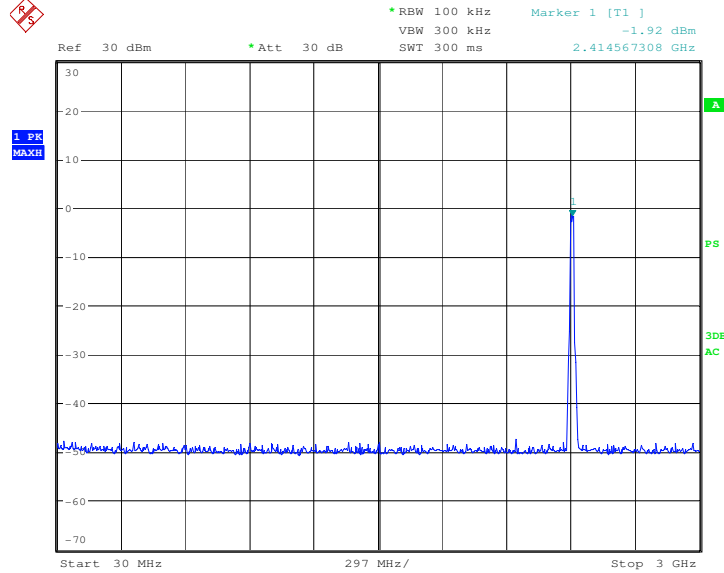
Date: 29.APR.2011 15:25:04

## Band Edge (Conducted Mode)

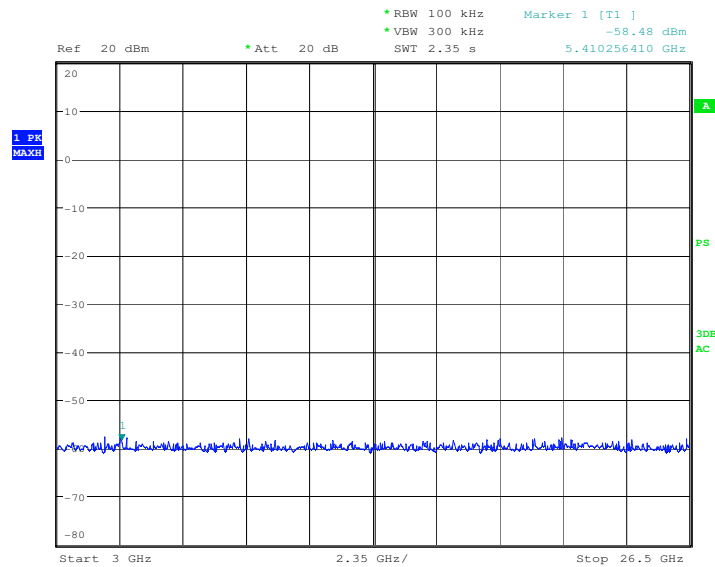


Date: 27.APR.2011 15:44:22

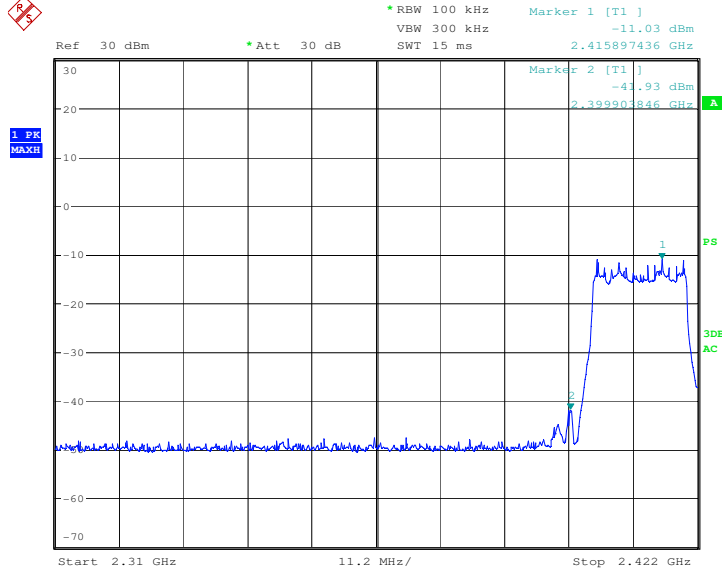
**Conducted Spurious Emission Measurement Result(802.11g),6M  
Ch Low 30MHz-3GHz**



**Ch Low 3GH-26.5GHz**

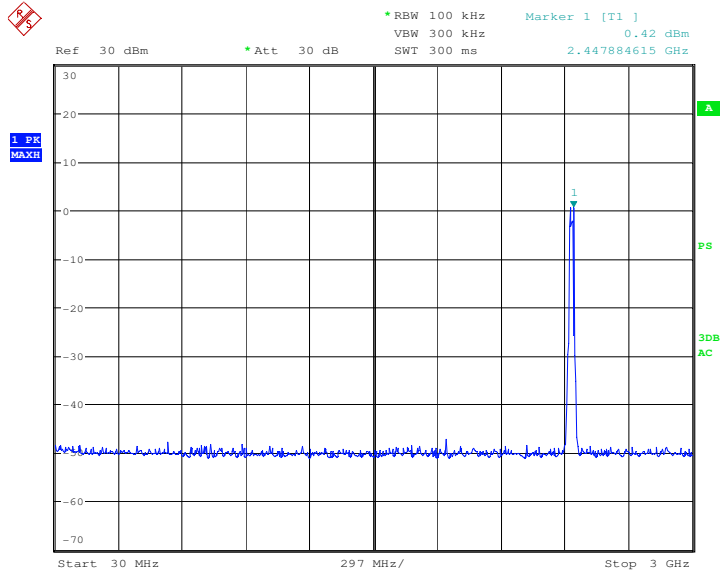


**Band Edge (Conducted Mode)**



Date: 11.MAY.2011 17:24:35

**Ch Mid 30MHz-3GHz**

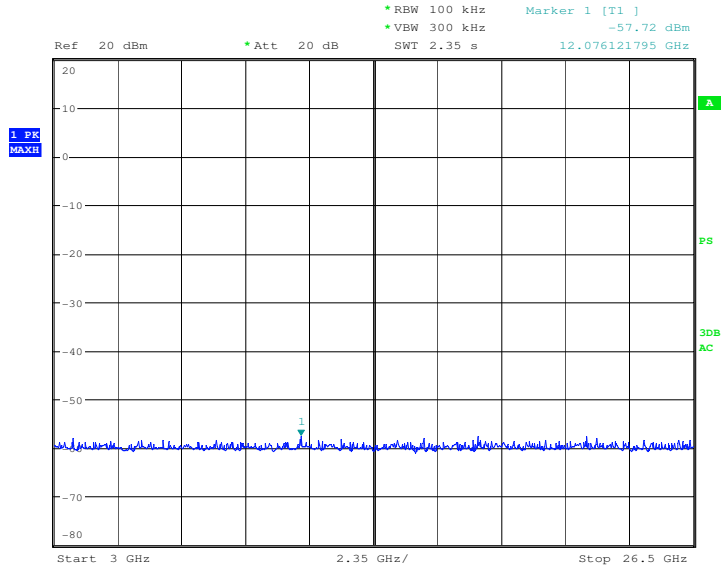




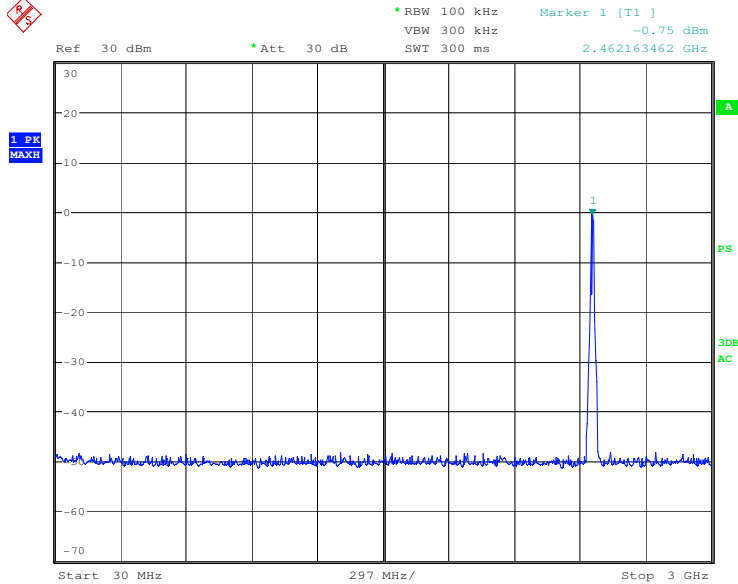
**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 41 of 68

Ch Mid 3GHz-26.5GHz



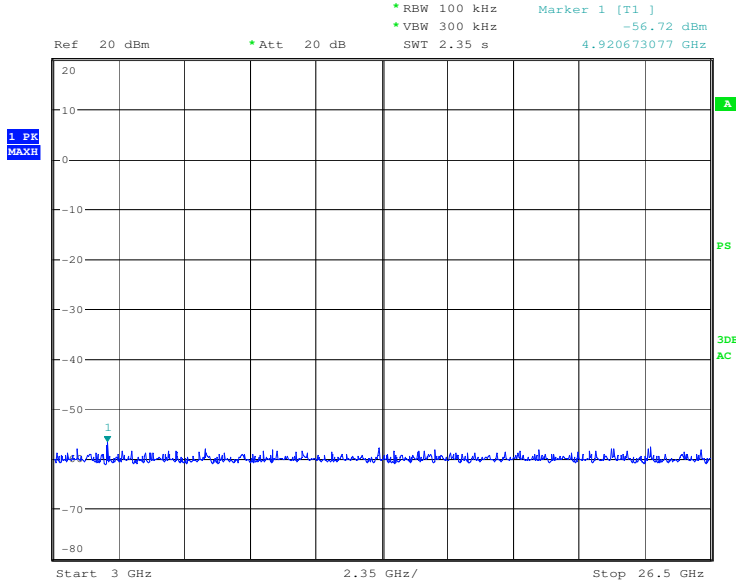
Ch High 30MHz-3GHz



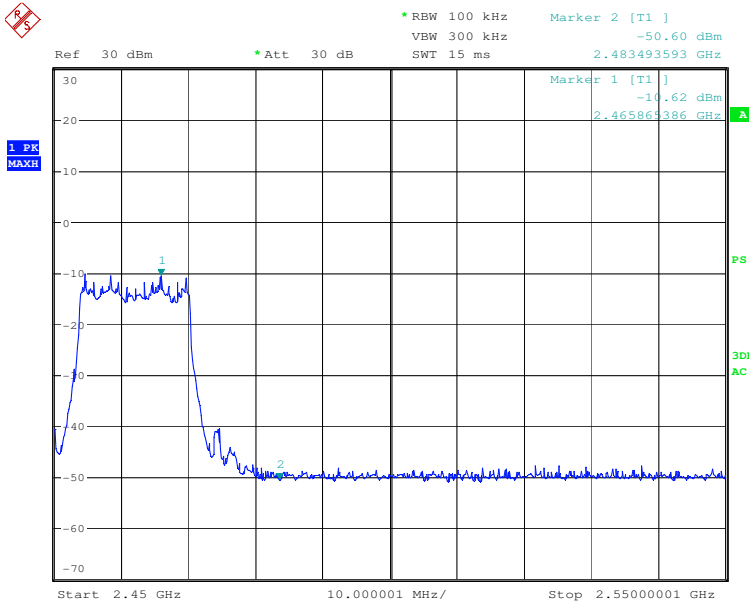
**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 42 of 68

Ch High 3GHz-26.5GHz

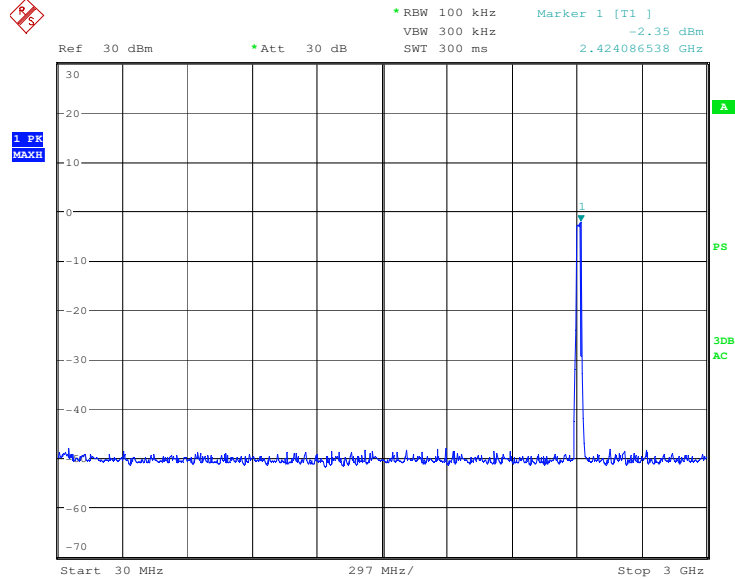


Band Edge (Conducted Mode)

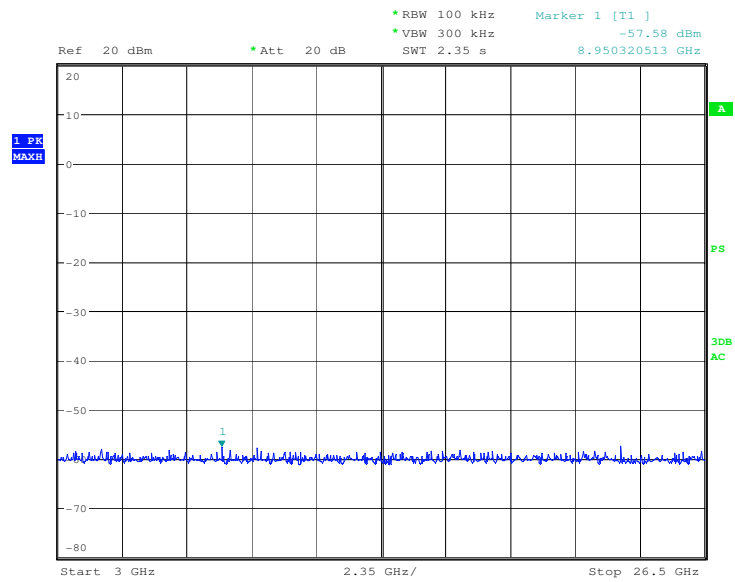


Date: 11.MAY.2011 17:26:15

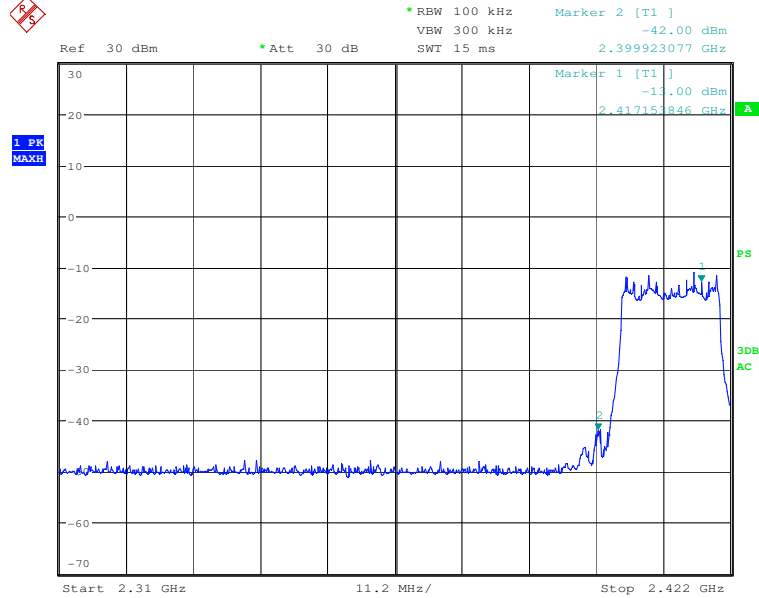
**Conducted Spurious Emission Measurement Result(802.11n\_20MHz),7.2M  
Ch Low 30MHz-3GHz**



**Ch Low 3GH-26.5GHz**

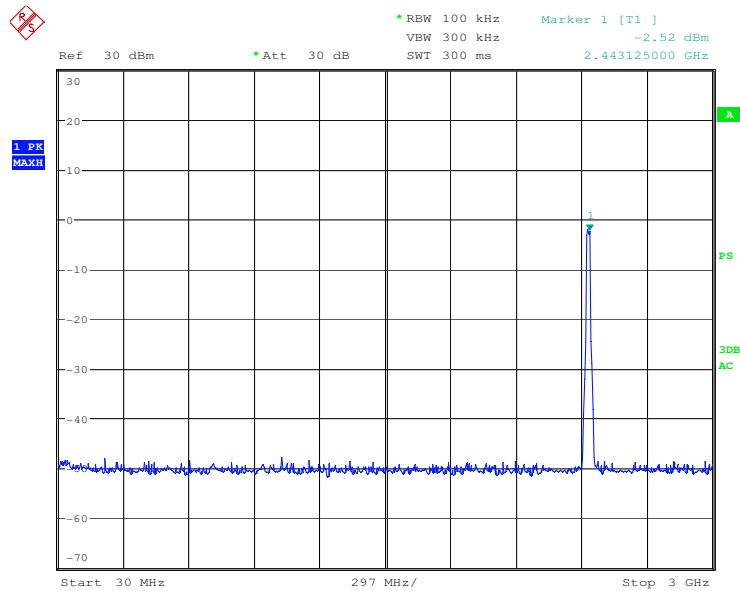


Band Edge (Conducted Mode)



Date: 11.MAY.2011 17:29:14

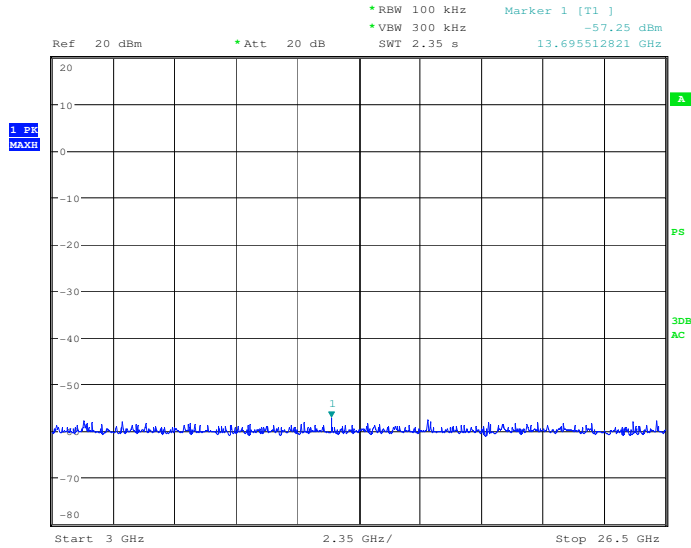
Ch Mid 30MHz-3GHz



**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

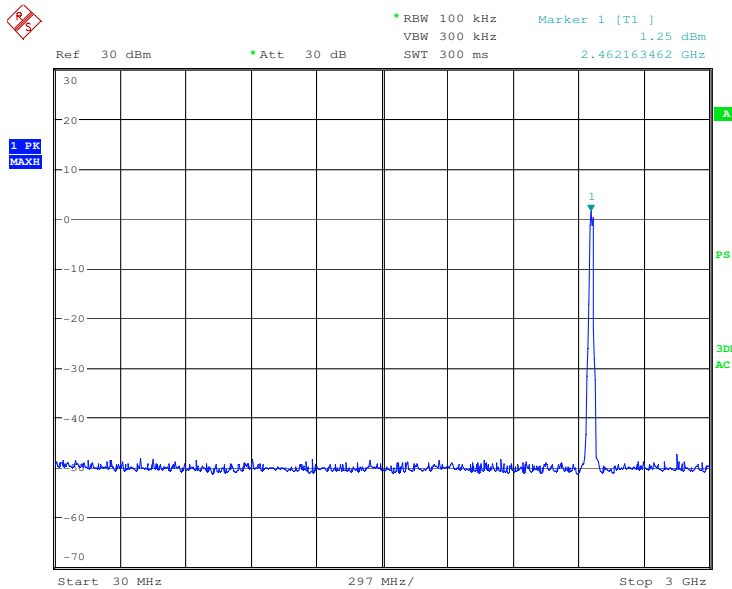
Report No.: SHEM110400036402  
Page: 45 of 68

Ch Mid 3GHz-26.5GHz



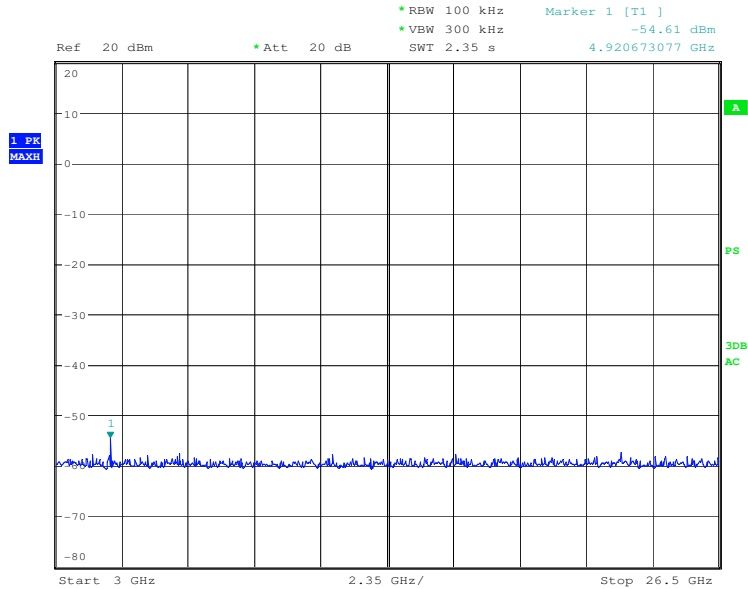
Date: 29.APR.2011 16:13:13

Ch High 30MHz-3GHz

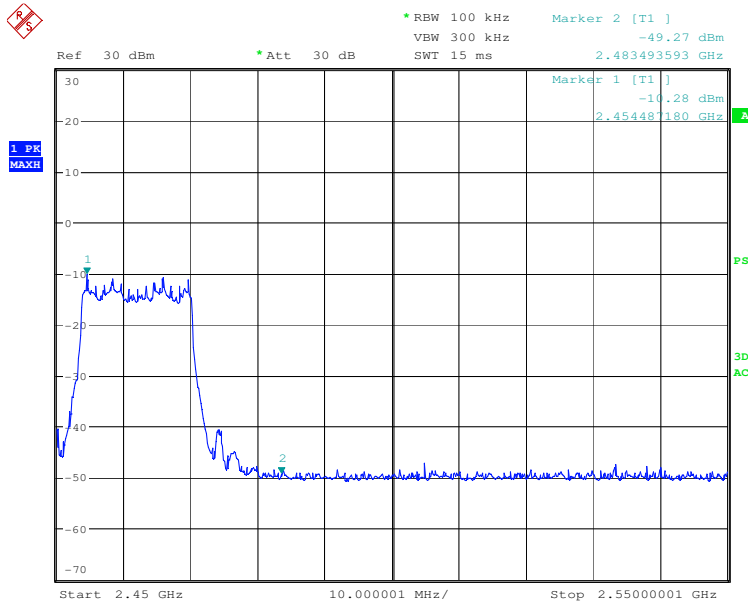


This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at [www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm) and, for electronic format documents, subject to Terms and Conditions for 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 report refer only to the sample(s) tested and such sample(s) are retained for 90 days only

Ch High 3GHz-26.5GHz



Band Edge (Conducted Mode)

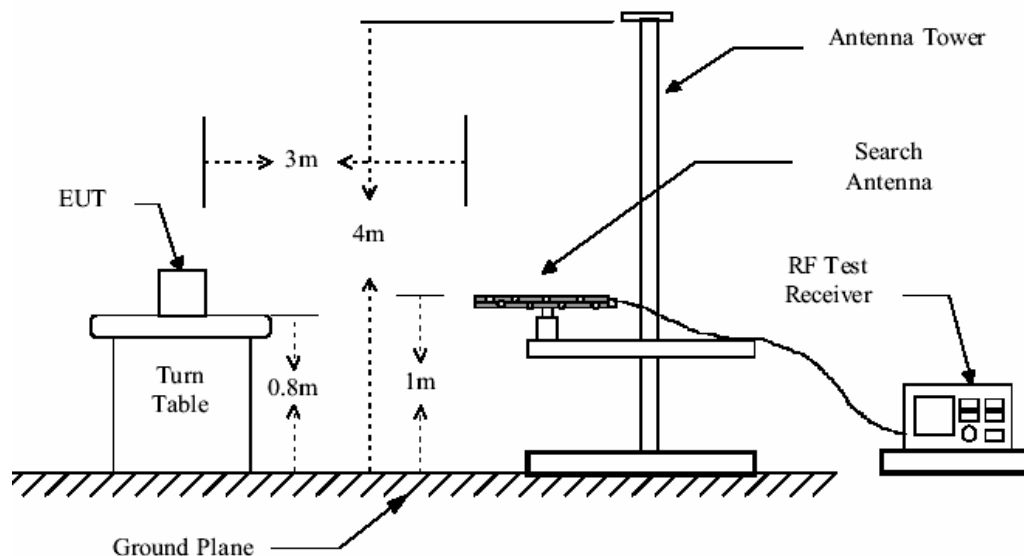


Date: 11.MAY.2011 17:27:41

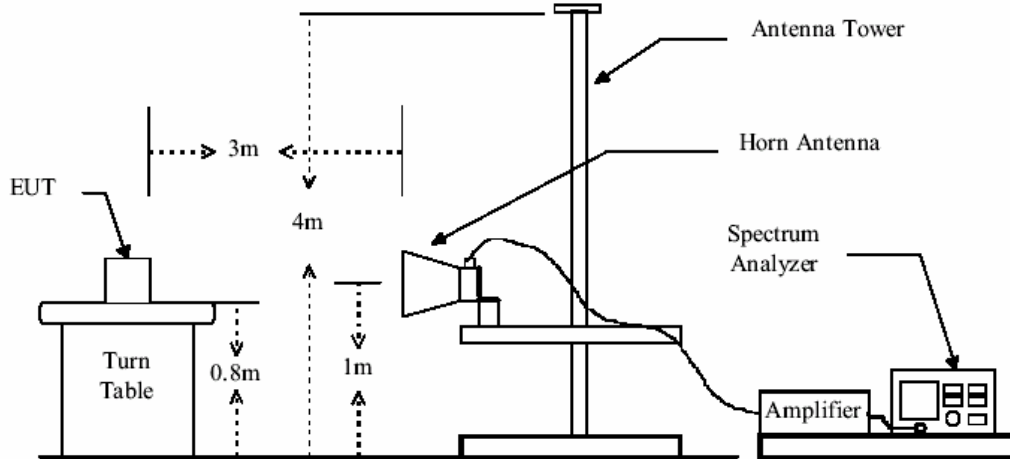
### 5.3.7 Spurious Radiated Emission Test

- Test Requirement:** FCC Part15 247(c)
- Test date:** May 3, 2011 to May 6, 2011
- Standard Applicable:** According to section 15.247(c),all other emissions outside these bands shall not exceed the general radiated emission limits specified in section15.209(a).And according to section 15.33(a)(1),for an intentional radiator operates below 10GHz,the frequency range of measurements:to the tenth harmonic of the highest fundamental frequency or to 40GHz,which is lower.
- Measurement Procedure:**
1. The EUT was placed on a turn table which is 0.8m above ground plane.
  2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
  3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.  
Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz - 1000 MHz). 1MHz resolution bandwidth and Peak detector apply (1000 MHz – 25GHz )  
Above 1GHz  
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO  
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO.
  4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
  5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
  6. Repeat above procedures until all frequency measured were complete.

**Radiated Test Set-up:**  
Radiated Emission Test Set-up,Frequency Below 1000MHz



Radiated Emission Test Set-up Frequency Over 1GHz.



Above 1GHz, we used a notch filter for 2.4GHz frequency band.

**30MHz~1GHz Spurious Emissions**

Quasi-Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dB $\mu$ V)	Emission Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Antenna polarization
168.13	14.1	1.44	24.53	40.64	31.65	43.50	Vertical
720.25	21.1	3.20	24.10	33.59	33.79	46.00	Vertical
799.79	21.9	3.40	24.04	32.88	34.14	46.00	Vertical
169.29	14.1	1.44	24.50	31.05	22.09	43.50	Horizontal
431.97	16.5	2.40	24.31	39.00	33.59	46.00	Horizontal
796.69	21.9	3.40	24.04	33.09	34.35	46.00	Horizontal

**Test Result: Pass**



**SGS-CSTC Standards  
Technical Services  
(Shanghai) Co., Ltd.**

Report No.: SHEM110400036402  
Page: 49 of 68

**Operation Mode: 802.11b TX CH Low 1M**

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

**Peak Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4824.0	31.0	6.7	1.7	43.4	38.0	34.0	74	Vertical
7236.0	35.8	8.3	1.2	43.1	37.7	39.9	74	V
9648.0	37.7	9.6	7.0	43.3	30.1	41.1	74	V
4824.0	31.0	6.7	1.7	43.4	36.6	32.6	74	Horizontal
7236.0	35.8	8.3	1.2	43.1	38.4	40.6	74	H
9648.0	37.7	9.6	7.0	43.3	30.8	41.8	74	H

**Average Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4824.0	31.0	6.7	1.7	43.4	28.9	24.9	54	Vertical
7236.0	35.8	8.3	1.2	43.1	28.8	31.0	54	V
9648.0	37.7	9.6	7.0	43.3	21.8	32.8	54	V
4824.0	31.0	6.7	1.7	43.4	28.7	24.7	54	Horizontal
7236.0	35.8	8.3	1.2	43.1	28.9	31.1	54	H
9648.0	37.7	9.6	7.0	43.3	22.2	33.2	54	H

The field strength is calculated by adding the Antenna Factor, Cable loss, Filter & Pre-amplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor + Filter - Pre-amplifier Factor.

The emission level of 5<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 50 of 68

**Operation Mode:802.11b TX CH Mid 1M**

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

**Peak Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4874.0	31.6	6.7	1.8	43.5	34.9	31.5	74	Vertical
7311.0	35.7	8.4	0.9	43.1	36.7	38.6	74	V
9748.0	37.9	9.7	7.2	43.0	29.6	41.4	74	V
4874.0	31.6	6.7	1.8	43.5	37.3	33.9	74	Horizontal
7311.0	35.7	8.4	0.9	43.1	37.3	39.2	74	H
9748.0	37.9	9.7	7.2	43.0	29.6	41.4	74	H

**Average Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4874.0	31.6	6.7	1.8	43.5	27.8	24.4	54	Vertical
7311.0	35.7	8.4	0.9	43.1	29.0	30.9	54	V
9748.0	37.9	9.7	7.2	43.0	19.9	31.7	54	V
4874.0	31.6	6.7	1.8	43.5	28.5	25.1	54	Horizontal
7311.0	35.7	8.4	0.9	43.1	29.1	31.0	54	H
9748.0	37.9	9.7	7.2	43.0	21.7	33.5	54	H

The field strength is calculated by adding the Antenna Factor, Cable Factor, Filter & Pre-amplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor + Filter - Pre-amplifier Factor.

The emission level of 5<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 51 of 68

**Operation Mode:802.11b TX CH High 1M**

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

**Peak Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4924.0	31.5	6.8	2.3	43.7	36.2	33.1	74	Vertical
7386.0	35.6	8.4	0.5	43.1	39.6	41.0	74	V
9848.0	38.0	9.8	7.3	42.7	30.1	42.5	74	V
4924.0	31.5	6.8	2.3	43.7	34.9	31.8	74	Horizontal
7386.0	35.6	8.4	0.5	43.1	37.4	38.8	74	H
9848.0	38.0	9.8	7.3	42.7	28.7	41.1	74	H

**Average Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4924.0	31.5	6.8	2.3	43.7	27.9	24.8	54	Vertical
7386.0	35.6	8.4	0.5	43.1	30.5	31.9	54	V
9848.0	38.0	9.8	7.3	42.7	20.7	33.1	54	V
4924.0	31.5	6.8	2.3	43.7	26.2	23.1	54	Horizontal
7386.0	35.6	8.4	0.5	43.1	29.8	31.2	54	H
9848.0	38.0	9.8	7.3	42.7	19.7	32.1	54	H

The field strength is calculated by adding the Antenna Factor, Cable Factor, Filter & Pre-amplifier. The basic equation with a sample calculation is as follows:

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} + \text{Filter} - \text{Pre-amplifier Factor}.$$

The emission level of 5<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 52 of 68

**Operation Mode:802.11g TX CH Low 6M**

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

**Peak Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4824.0	31.0	6.7	1.7	43.4	35.9	31.9	74	Vertical
7236.0	35.8	8.3	1.2	43.1	36.6	38.8	74	V
9648.0	37.7	9.6	7.0	43.3	29.7	40.7	74	V
4824.0	31.0	6.7	1.7	43.4	36.2	32.2	74	Horizontal
7236.0	35.8	8.3	1.2	43.1	36.8	39.0	74	H
9648.0	37.7	9.6	7.0	43.3	29.7	40.7	74	H

**Average Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4824.0	31.0	6.7	1.7	43.4	27.8	23.8	54	Vertical
7236.0	35.8	8.3	1.2	43.1	27.2	29.4	54	V
9648.0	37.7	9.6	7.0	43.3	21.5	32.5	54	V
4824.0	31.0	6.7	1.7	43.4	28.6	24.6	54	Horizontal
7236.0	35.8	8.3	1.2	43.1	28.4	30.6	54	H
9648.0	37.7	9.6	7.0	43.3	21.2	32.2	54	H

The field strength is calculated by adding the Antenna Factor, Cable Factor, Filter & Pre-amplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor + Filter - Pre-amplifier Factor.

The emission level of 5<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 53 of 68

**Operation Mode:802.11g TX CH Mid 6M**

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

**Peak Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4874.0	31.6	6.7	1.8	43.5	34.8	31.4	74	Vertical
7311.0	35.7	8.4	0.9	43.1	36.7	38.6	74	V
9748.0	37.9	9.7	7.2	43.0	29.9	41.7	74	V
4874.0	31.6	6.7	1.8	43.5	34.9	31.5	74	Horizontal
7311.0	35.7	8.4	0.9	43.1	38.0	39.9	74	H
9748.0	37.9	9.7	7.2	43.0	28.5	40.3	74	H

**Average Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4874.0	31.6	6.7	1.8	43.5	26.3	22.9	54	Vertical
7311.0	35.7	8.4	0.9	43.1	28.4	30.3	54	V
9748.0	37.9	9.7	7.2	43.0	20.5	32.3	54	V
4874.0	31.6	6.7	1.8	43.5	26.9	23.5	54	Horizontal
7311.0	35.7	8.4	0.9	43.1	28.5	30.4	54	H
9748.0	37.9	9.7	7.2	43.0	20.3	32.1	54	H

The field strength is calculated by adding the Antenna Factor, Cable Factor, Filter & Pre-amplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor + Filter - Pre-amplifier Factor.

The emission level of 5<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 54 of 68

**Operation Mode:802.11g TX CH High 6M**

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

**Peak Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4924.0	31.5	6.8	2.3	43.7	35.8	32.7	74	Vertical
7386.0	35.6	8.4	0.5	43.1	38.1	39.5	74	V
9848.0	38.0	9.8	7.3	42.7	29.7	42.1	74	V
4924.0	31.5	6.8	2.3	43.7	36.1	33.0	74	Horizontal
7386.0	35.6	8.4	0.5	43.1	39.2	40.6	74	H
9848.0	38.0	9.8	7.3	42.7	29.5	41.9	74	H

**Average Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4924.0	31.5	6.8	2.3	43.7	25.6	22.5	54	Vertical
7386.0	35.6	8.4	0.5	43.1	28.4	29.8	54	V
9848.0	38.0	9.8	7.3	42.7	20.6	33.0	54	V
4924.0	31.5	6.8	2.3	43.7	25.8	22.7	54	Horizontal
7386.0	35.6	8.4	0.5	43.1	28.6	30.0	54	H
9848.0	38.0	9.8	7.3	42.7	20.8	33.2	54	H

The field strength is calculated by adding the Antenna Factor, Cable Factor, Filter & Pre-amplifier. The basic equation with a sample calculation is as follows:

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} + \text{Filter-Pre-amplifier Factor}.$$

The emission level of 5<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 55 of 68

**Operation Mode:802.11n TX CH Low 7.2M**

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

**Peak Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4824.0	31.0	6.7	1.7	43.4	37.2	33.2	74	Vertical
7236.0	35.8	8.3	1.2	43.1	38.0	40.2	74	V
9648.0	37.7	9.6	7.0	43.3	30.9	41.9	74	V
4824.0	31.0	6.7	1.7	43.4	36.4	32.4	74	Horizontal
7236.0	35.8	8.3	1.2	43.1	36.8	39.0	74	H
9648.0	37.7	9.6	7.0	43.3	30.6	41.6	74	H

**Average Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4824.0	31.0	6.7	1.7	43.4	28.4	24.4	54	Vertical
7236.0	35.8	8.3	1.2	43.1	28.2	30.4	54	V
9648.0	37.7	9.6	7.0	43.3	20.4	31.4	54	V
4824.0	31.0	6.7	1.7	43.4	26.8	22.8	54	Horizontal
7236.0	35.8	8.3	1.2	43.1	27.8	30.0	54	H
9648.0	37.7	9.6	7.0	43.3	21.8	32.8	54	H

The field strength is calculated by adding the Antenna Factor, Cable Factor, Filter & Pre-amplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor + Filter - Pre-amplifier Factor.

The emission level of 5<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 56 of 68

**Operation Mode:802.11n TX CH Mid 7.2M**

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

**Peak Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4874.0	31.6	6.7	1.8	43.5	35.5	32.1	74	Vertical
7311.0	35.7	8.4	0.9	43.1	36.4	38.3	74	V
9748.0	37.9	9.7	7.2	43.0	29.2	41.0	74	V
4874.0	31.6	6.7	1.8	43.5	35.3	31.9	74	Horizontal
7311.0	35.7	8.4	0.9	43.1	37.2	39.1	74	H
9748.0	37.9	9.7	7.2	43.0	28.6	40.4	74	H

**Average Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4874.0	31.6	6.7	1.8	43.5	27.7	24.3	54	Vertical
7311.0	35.7	8.4	0.9	43.1	28.9	30.8	54	V
9748.0	37.9	9.7	7.2	43.0	19.8	31.6	54	V
4874.0	31.6	6.7	1.8	43.5	26.8	23.4	54	Horizontal
7311.0	35.7	8.4	0.9	43.1	28.9	30.8	54	H
9748.0	37.9	9.7	7.2	43.0	20.4	32.2	54	H

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

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

The emission level of 5<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.



**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 57 of 68

**Operation Mode:802.11n TX CH High 7.2M**

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

**Peak Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4924.0	31.5	6.8	2.3	43.7	33.8	30.7	74	Vertical
7386.0	35.6	8.4	0.5	43.1	38.3	39.7	74	V
9848.0	38.0	9.8	7.3	42.7	29.9	42.3	74	V
4924.0	31.5	6.8	2.3	43.7	36.4	33.3	74	Horizontal
7386.0	35.6	8.4	0.5	43.1	36.7	38.1	74	H
9848.0	38.0	9.8	7.3	42.7	29.0	41.4	74	H

**Average Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4924.0	31.5	6.8	2.3	43.7	25.8	22.7	54	Vertical
7386.0	35.6	8.4	0.5	43.1	29.9	31.3	54	V
9848.0	38.0	9.8	7.3	42.7	21.0	33.4	54	V
4924.0	31.5	6.8	2.3	43.7	27.9	24.8	54	Horizontal
7386.0	35.6	8.4	0.5	43.1	29.2	30.6	54	H
9848.0	38.0	9.8	7.3	42.7	20.4	32.8	54	H

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

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

The emission level of 5<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.

### **5.3.8 Peak Power Spectral Density**

<b>Test Requirement:</b>	FCC Part15 247(e)
<b>Test date:</b>	Apr. 26, 2011 & May 11, 2011
<b>Standard Applicable:</b>	According to section 15.247(e),For digitally modulated systems,the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dB in any 3KHz band during any time in terval of continuous transmission.This power spectral density shall be determined in accordance with the provisions of paragraph(b) of this section.The same method of determining the conducted output power shall be used to determine the powr spectral density.
<b>Measurement Procedure:</b>	The EUT was tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requiremnts. Set RBW=3KHz,Set VBW=10KHz,Sweep time=500s,Set detector=Peak detector.

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 59 of 68

**Measurement Result:**

The test was performed with 802.11b, the data was shown the worst case 802.11b 1Mbps.

CH	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Limit (dBm)	Result
LOW	2412	-4.87	1.3	-3.57	8	PASS
MID	2437	-4.95	1.3	-3.65	8	PASS
HIGH	2462	-3.75	1.3	-2.45	8	PASS

The test was performed with 802.11g, the data was shown the worst case 802.11g 6Mbps.

CH	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Limit (dBm)	Result
LOW	2412	-12.22	1.3	-10.92	8	PASS
MID	2437	-11.96	1.3	-10.66	8	PASS
HIGH	2462	-9.81	1.3	-8.51	8	PASS

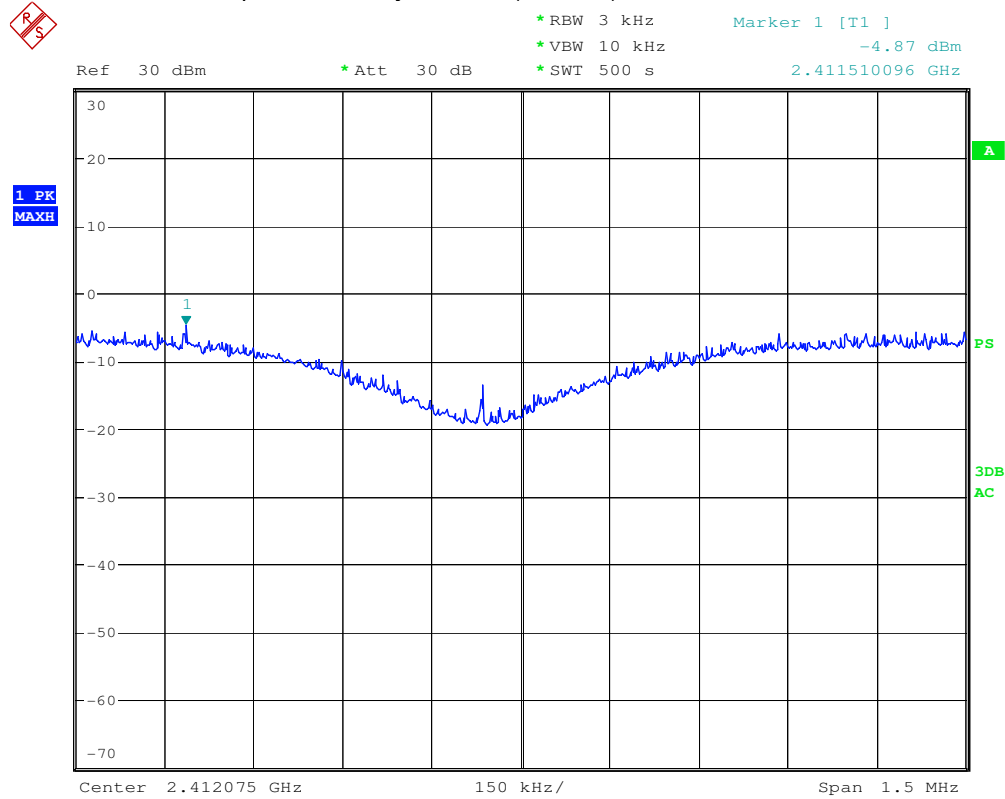
The test was performed with 802.11n\_20MHz, the data was shown the worst case 802.11n 7.2Mbps.

CH	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Limit (dBm)	Result
LOW	2412	-12.06	1.3	-10.76	8	PASS
MID	2437	-12.17	1.3	-10.87	8	PASS
HIGH	2462	-11.87	1.3	-10.57	8	PASS

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

Report No.: SHEM110400036402  
Page: 60 of 68

802.11b 1M Power Spectral Density Test Plot(CH-Low)

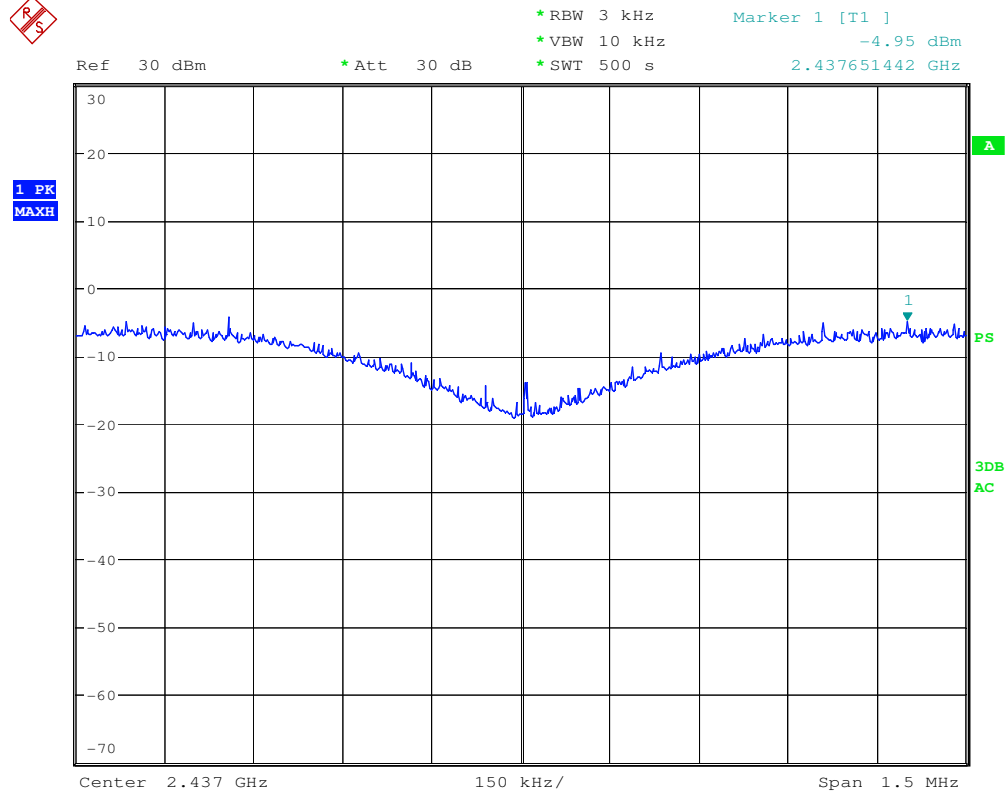


Date: 27.APR.2011 13:53:53

**SGS-CSTC Standards  
Technical Services  
(Shanghai)Co., Ltd.**

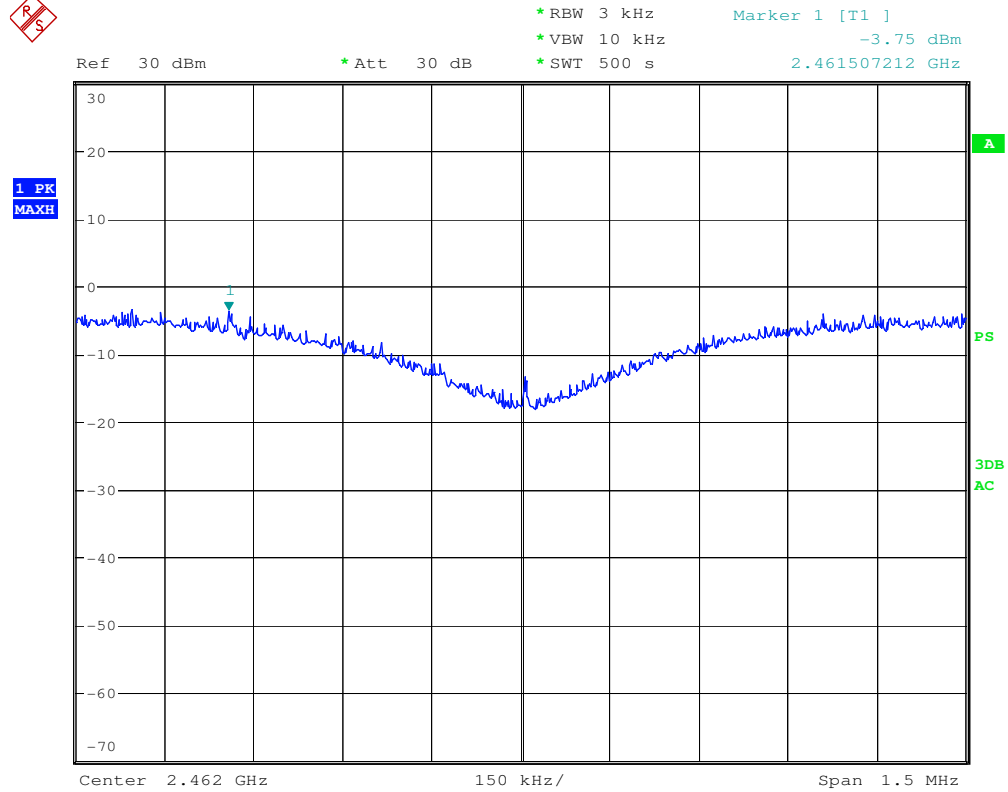
Report No.: SHEM110400036402  
Page: 61 of 68

802.11b 1M Power Spectral Density Test Plot(CH-Mid)



Date: 27.APR.2011 14:06:07

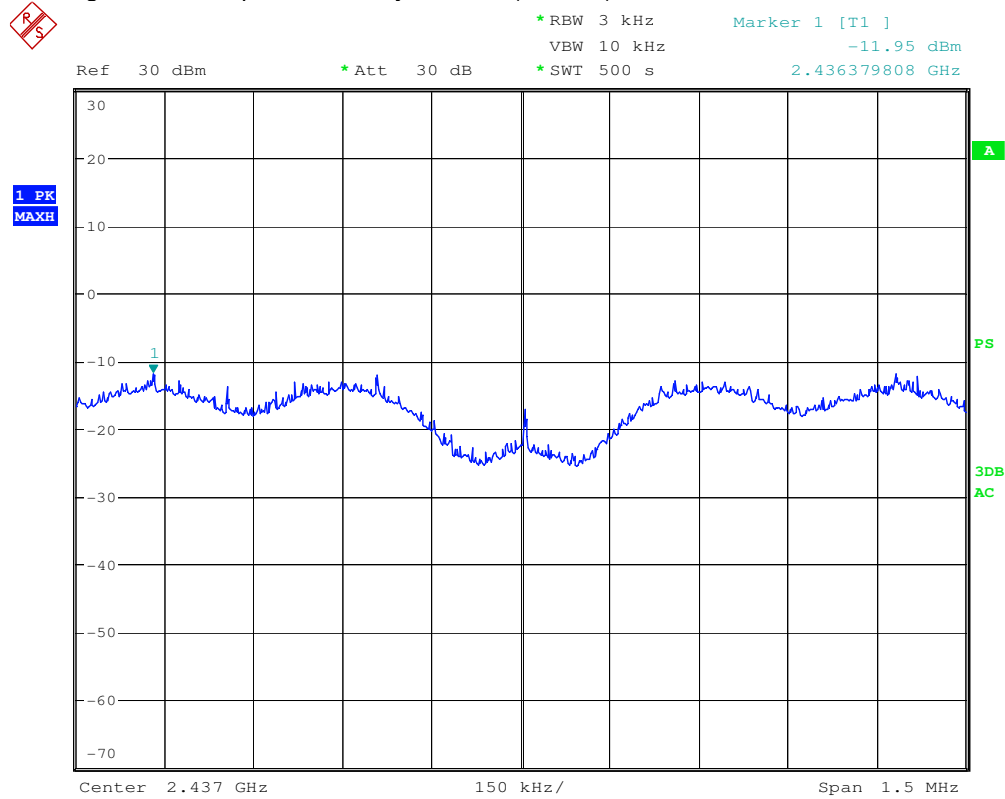
802.11b 1M Power Spectral Density Test Plot(CH-High)



Date: 26.APR.2011 16:50:09



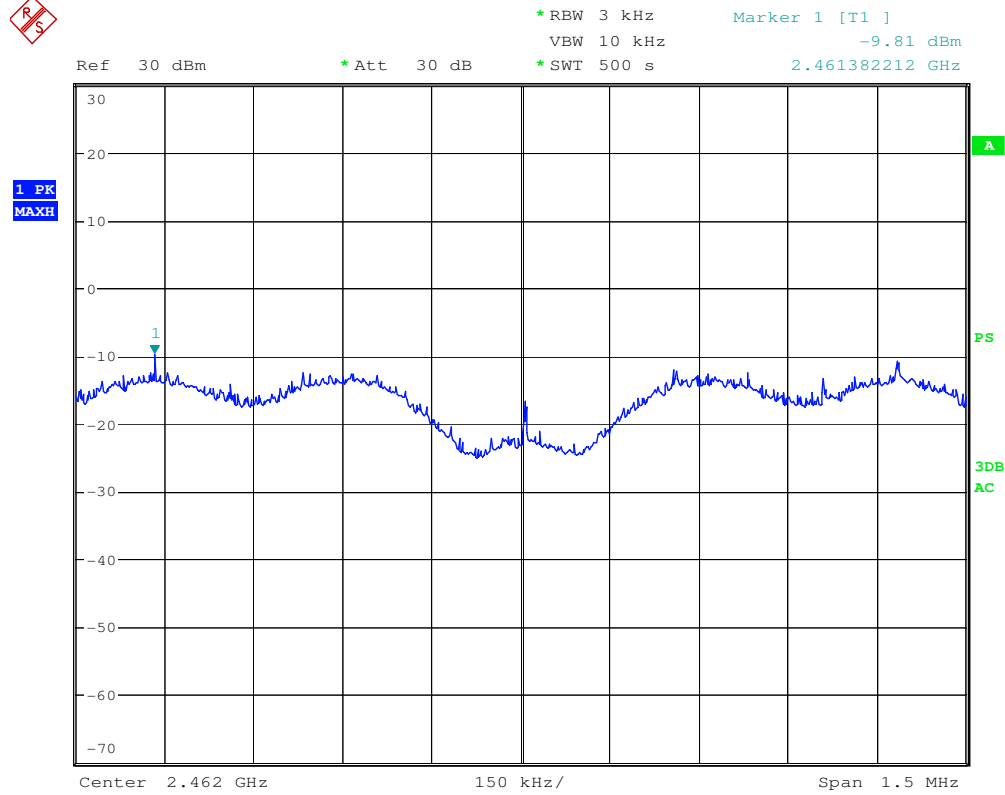
802.11g 6M Power Spectral Density Test Plot(CH-Mid)



Date: 11.MAY.2011 22:36:00

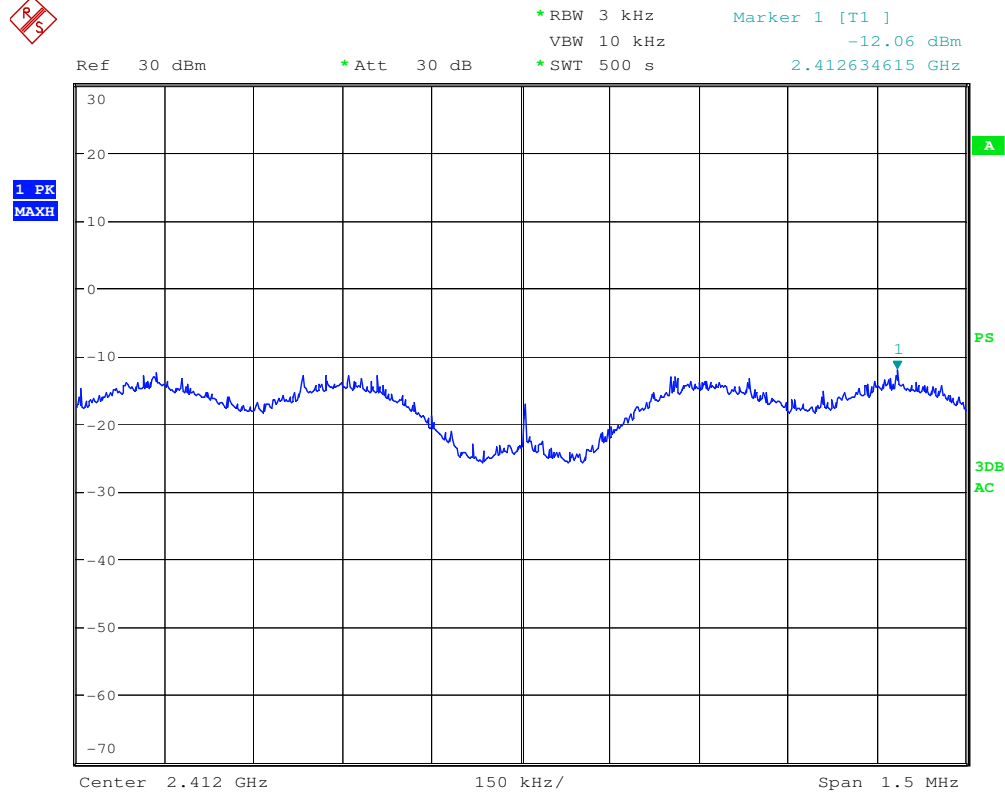


802.11g 6M Power Spectral Density Test Plot(CH-High)



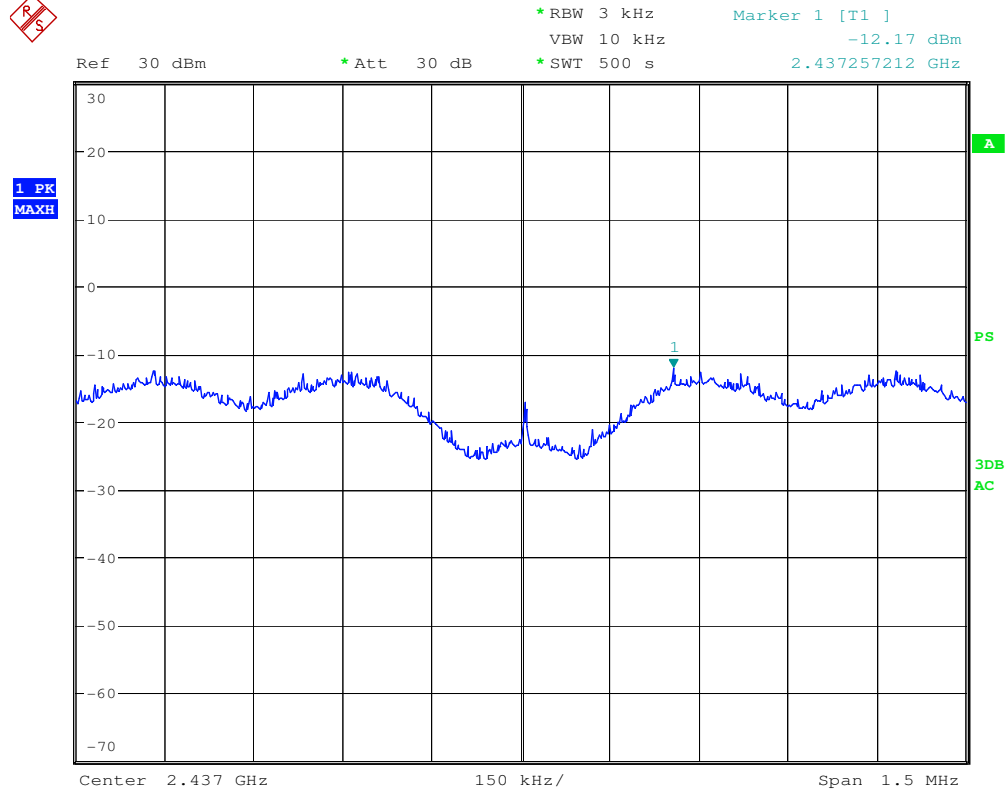
Date: 11.MAY.2011 22:24:25

802.11n\_20MHz 7.2M Power Spectral Density Test Plot(CH-Low)



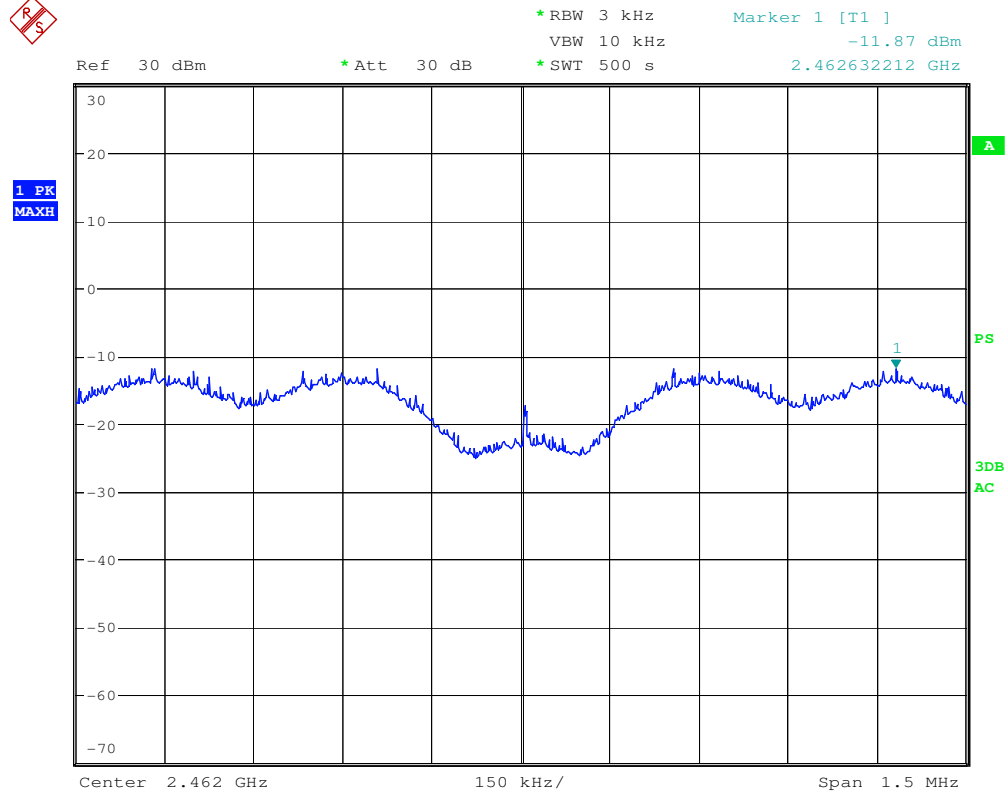
Date: 11.MAY.2011 22:57:20

802.11n\_20MHz 7.2M Power Spectral Density Test Plot(CH-Mid)



Date: 11.MAY.2011 23:07:09

802.11n\_20MHz 7.2M Power Spectral Density Test Plot(CH-High)



Date: 11.MAY.2011 23:17:00

**End of Report**