

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
INTENTIONAL RADIATOR CERTIFICATION TO
FCC PART 15 SUBPART C REQUIREMENT**

OF

ADSL2+ROUTER

FCC ID: QISH3CSOHOXDR8X4G

MODEL No.: VDR824g(Representative model for test)

LISTED MODELS: WDR854g;VDR814g;

BRAND NAME: Aolynk

REPORT NO: TRE06050015

ISSUE DATE: June 20, 2006

Prepared for

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VERIFICATION OF COMPLIANCE

Applicant:	Huawei Technologies Co., Ltd. Bantian, Longgang District Shenzhen, Guangdong 518429 P.R. China
Product Description:	2.4GHz (Direct Sequence Spread Spectrum and Orthogonal Frequency Division Multiplex) Data Transceiver for WLAN application
Brand Name:	Aolynk
Model Number:	VDR824g(Representative model for test)
Listed Models:	WDR854g;VDR814g;
Serial Number:	N/A
File Number:	SQE06050015
Date of Test:	May 25, 2006 ~ June 20, 2006

We hereby certify that:

The above equipment was tested by SHENZHEN HUA TONG WEI INTERNATIONAL INSPECTION CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.247.

The test results of this report relate only to the tested sample identified in this report.

Approved By

Jimmy Li / Executive Manager
SHENZHEN HUA TONG WEI
INTERNATIONAL INSPECTION CO., LTD

Reviewed By

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

2.4GHz (Direct Sequence Spread Spectrum and Orthogonal Frequency Division Multiplex)

Data Transceiver for WLAN application

A major technical descriptions of EUT is described as following:

A). Operation Frequency: $2412\text{MHz} + 5 \times n$ (MHz), $n=0, 1, 2, \dots, 10$

B). Modulation: 802.11b : DSSS(CCK, DQPSK, DBPSK)

802.11g : OFDM(64QAM, 16AQM, QPSK, BPSK)

C). Antenna Designation: Dipole Antenna, Antenna gain : 3dBi

D). Power Supply: 120VAC/60Hz, Single phase /12VDC(From Power Adapter)

E). Power Cable: Unshielded cable, 1.8m

F). I/O Port: LAN Port $\times 4$, WAN Port $\times 1$, USB Port $\times 1$, Phone Port $\times 2$, ADSL Port $\times 1$

G). VDR824g is representative model for test, the following are difference of the series:

VDR824g is a ADSL2+ router with the function of ADSL2+ router, 2 VOIP ports, and IEEE802.11g.

WDR854g has the same electric and electronic structure as VDR824g except without the circuit of VOIP.

VDR814g has the same electric and electronic structure as VDR824g except without 1 VOIP port's software function.

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for FCC ID: QISH3CSOHOXDR8X4G filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules. The composite system (receiver) is compliance with Subpart B is authorized under a Declaration of Conformity procedure.

1.3 TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 TEST FACILITY

The fully anechoic chamber test site and conducted measurement facility used to collect the radiated data is located on the address of SHENZHEN HUA TONG WEI INTERNATIONAL INSPECTION CO., LTD Huatongwei Building, Keji Rd. 12 S., High-tech Park, Nanshan District, Shenzhen, Guangdong, P.R.China

The fully anechoic chamber Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003 and CISPR 22/EN 55022 requirements.

1.5 SPECIAL ACCESSORIES

Not available for this EUT intended for grant.

1.6 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

1.7 LABORATORY ACCREDITATIONS AND LISTINGS

NEMKO-Aut. No.: ELA125

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10.

CNAL-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed and proved to be in compliance with CNAL/AC01: 2003 Accreditation Criteria for Testing and Calibration

Laboratories (identical to ISO/IEC 17025: 1999 General Requirements) for the Competence of Testing and Calibration Laboratories.

FCC-Registration No.: 662850

Shenzhen Huatongwei International Inspection 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 662850, November 17,2003.

VCCI

The 3m Semi-anechoic chamber ($12.2\text{m} \times 7.95\text{m} \times 6.7\text{m}$) and Shielded Room ($8\text{m} \times 4\text{m} \times 3\text{m}$) of Shenzhen Huatongwei International Inspection Co., Ltd has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1920 and C-2067 respectively. Date of Registration: July 28, 2004. Valid time is until November 16, 2006.

The Shielded Room ($8\text{m} \times 4\text{m} \times 3\text{m}$) of Shenzhen Huatongwei International Inspection Co., Ltd has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-175 respectively. Date of Registration: July 28, 2004. Valid time is until July 27, 2007.

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT EXERCISE

The Transmitter was operated in the normal operating mode. the TX frequency was fixed which was for the purpose of the measurements.

2.3 CONFIGURATION OF TESTED SYSTEM

Fig. 2-1 Configuration of Tested System

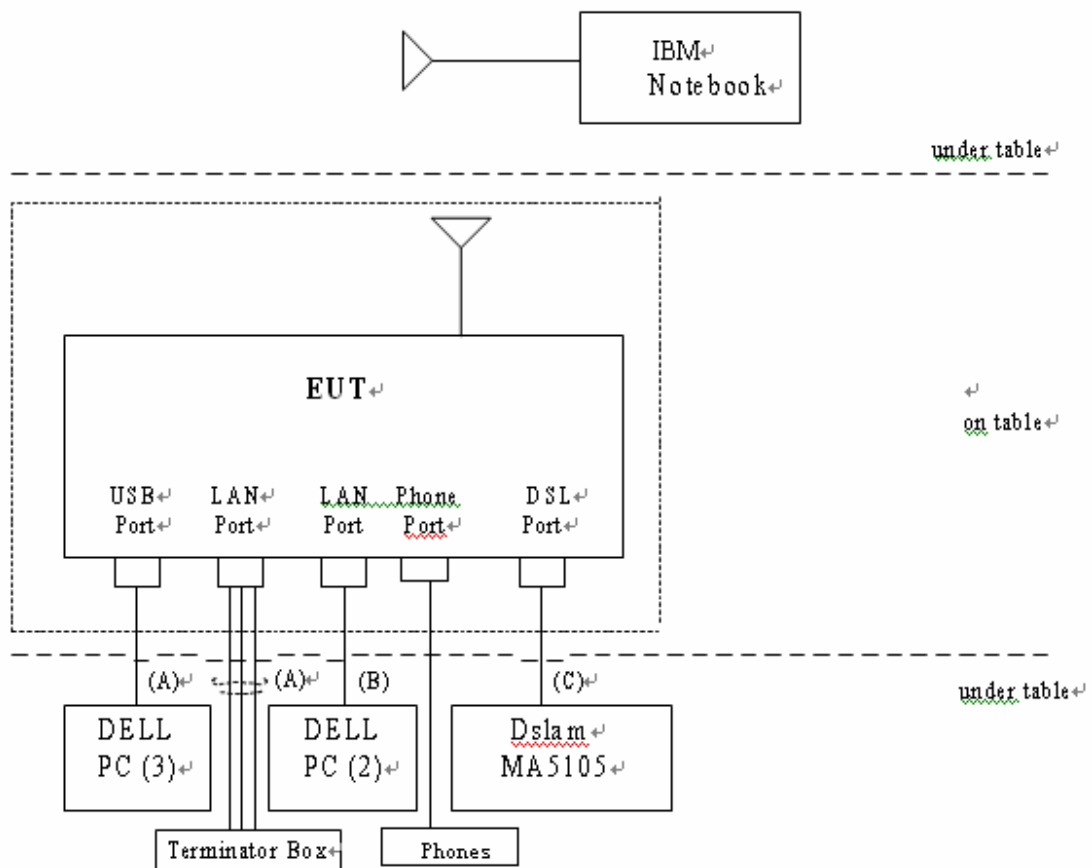


Table 2-1 Equipment Used in Tested System

No.	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	DSLAM	HUAWEI	MA 5105	-----	DoC
2	PC	DELL	MTC2	7RHQ712	DoC
3	PC	DELL	MTC2	7RHQ714	DoC
4	Notebook PC	IBM	R50e	L3-XGMC3	DoC

3. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications :

APPLIED STANDARD : FCC 47 C.F.R. Part 15, Subpart B and Subpart C			
Standard Section	Test Item and Limit	Result	REMARK
15.107 15.207	AC Power Conducted Emission Limit : 15.107	PASS	Meet the requirement of limit
15.247(a)(2)	Spectrum Bandwidth of a Orthogonal Frequency Division Multiplex System Limit : 6dB bandwidth > 500KHz	PASS	Meet the requirement of limit
15.247(b)	Maximum Peak Output Power Limit : max. 30dBm	PASS	Meet the requirement of limit
15.109 15.205 15.209	Transmitter Radiated Emissions Limit : Table 15.209	PASS	Meet the requirement of limit
15.247(e)	Power Spectral Density Limit : max. 8dBm	PASS	Meet the requirement of limit
15.247(d)	Out of Band Emission and Restricted Band Radiation Limit:20dB less than peak value of fundamental frequency Restricted band Limit:Table 15.209	PASS	Meet the requirement of limit

4. DESCRIPTION OF TEST MODES

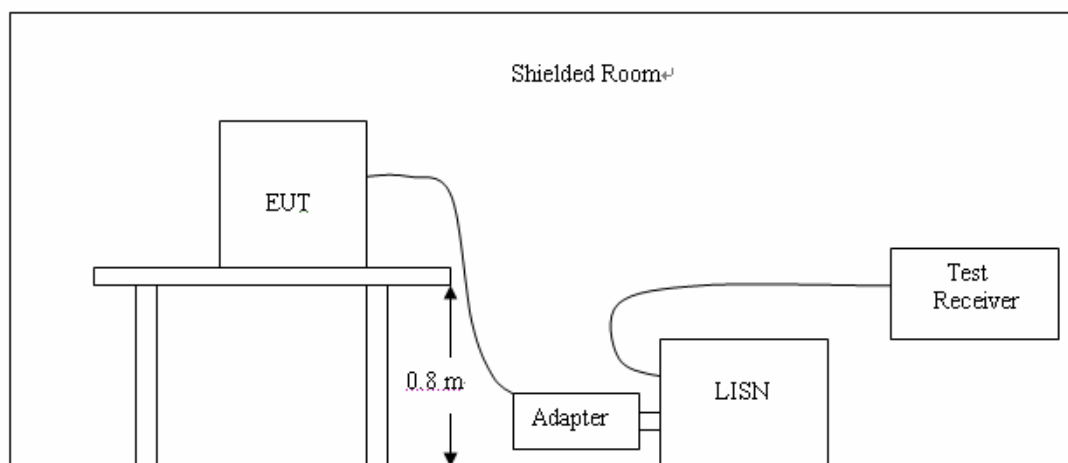
1. The EUT (VDR824g) has been tested under normal operating condition.
2. The EUT stay in continuous transmitting mode. FCC Continuous Transmit are chosen for testing.

5. CONDUCTED EMISSIONS TEST

5.1 MEASUREMENT PROCEDURE:

- 1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4.
- 2 Support equipment, if needed, was placed as per ANSI C63.4.
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4 The EUT received DC8V power from the adapter, the adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5 All support equipments received AC power from a second LISN, if any.
- 6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8 During the above scans, the emissions were maximized by cable manipulation.

5.2 TEST SET-UP (Block Diagram of Configuration)



5.3 MEASUREMENT EQUIPMENT USED:

Conducted Emission Test Site # 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCS30	100038	2005/11	2006/11
ARTIFICIAL MAINS	ROHDE & SCHWARZ	ESH2-Z5	100028	2005/11	2006/11
PULSE LIMITER	ROHDE & SCHWARZ	ESHSZ2	100044	2005/11	2006/11
EMI TEST SOFTWARE	ROHDE & SCHWARZ	ES-K1 1.71	N/A	2005/11	2006/11

Note: Each piece of equipment is scheduled for calibration once a year.

5.4 CONDUCTED POWER LINE EMISSION LIMIT

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following :

Frequency (MHz)	Maximum RF Line Voltage (dBµV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

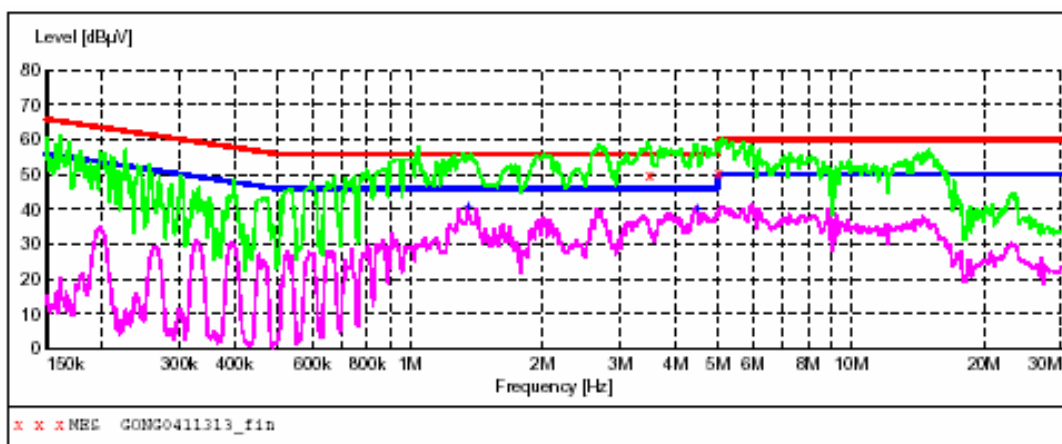
* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

5.5 MEASUREMENT RESULT:

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	25°C, 53%

LINE



MEASUREMENT RESULT: "GONG0411313_fin"

4/11/2006 7:32PM

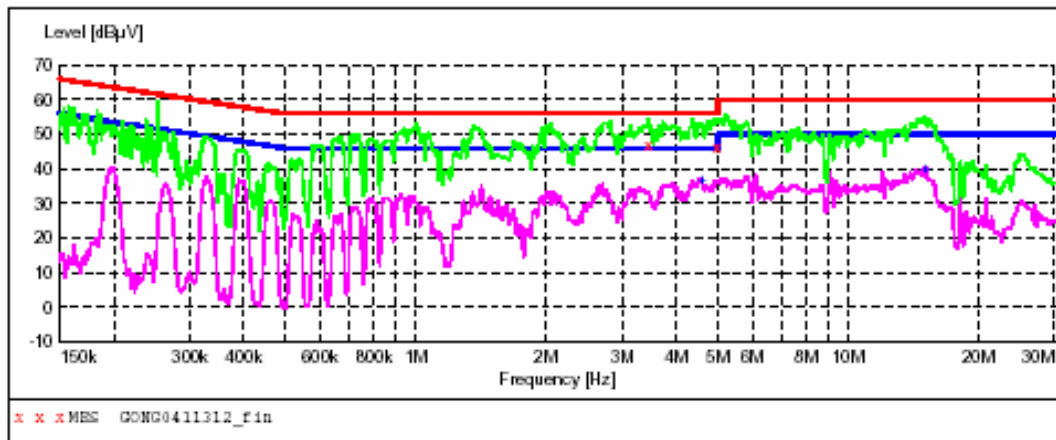
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PR
3.491409	49.70	10.5	56	6.3	QP	L1	GND
4.997180	50.70	10.5	56	5.3	QP	L1	GND

MEASUREMENT RESULT: "GONG0411313_fin2"

4/11/2006 7:32PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PR
1.352686	40.70	10.5	46	5.3	AV	L1	GND
4.469686	40.10	10.5	46	5.9	AV	L1	GND

NEUTRAL



MEASUREMENT RESULT: "GONG0411312_fin"

4/11/2006 7:28PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
3.463700	47.20	10.5	56	8.8	QP	N	GND
4.997180	46.40	10.5	56	9.6	QP	N	GND

MEASUREMENT RESULT: "GONG0411312_fin2"

4/11/2006 7:28PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
4.577820	36.90	10.5	46	9.1	AV	N	GND
15.006470	39.70	10.8	50	10.3	AV	N	GND

REMARKS :

1. Correction Factor = Insertion loss + cable loss
2. Margin value = Emission level – Limit value
3. The EUT was set to be normal operation condition. Each Ethernet port was connected and data payload was transmitted at highest data rate. The RF chip can be operated in 802.11g and 802.11b mode. The rf chip will detect the environment and select the proper mode automatically. The WLAN function was set to normal operation condition.

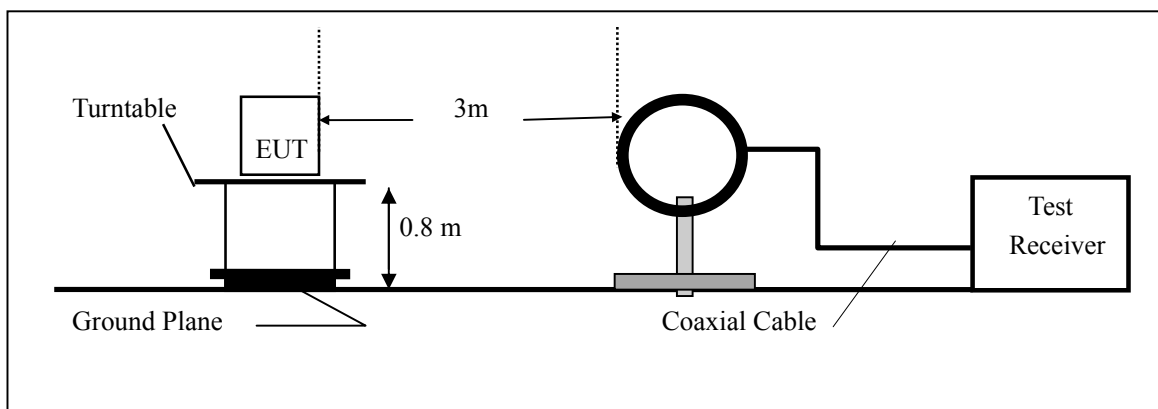
6. RADIATED EMISSION TEST

6.1 MEASUREMENT PROCEDURE

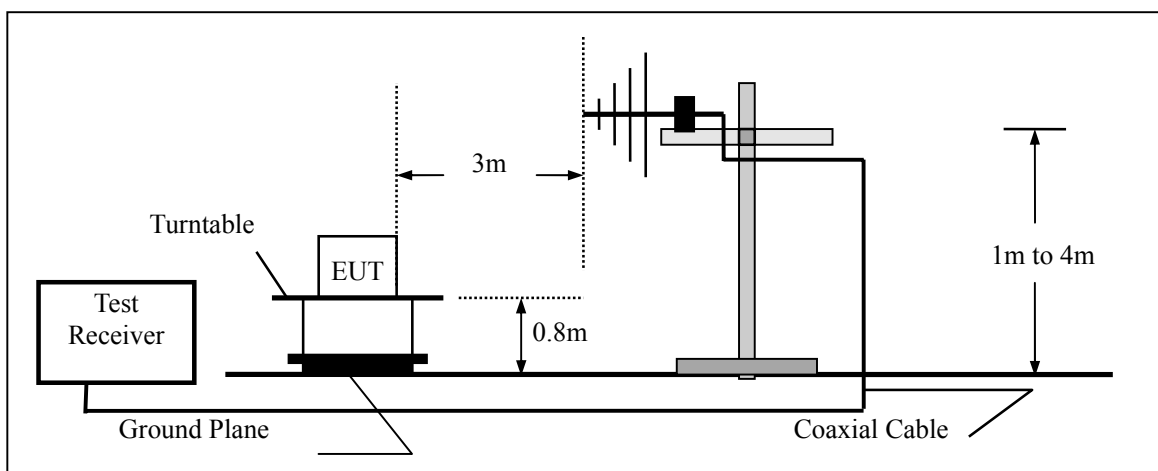
- 1 The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.

6.2 TEST SET-UP (Block Diagram of Configuration)

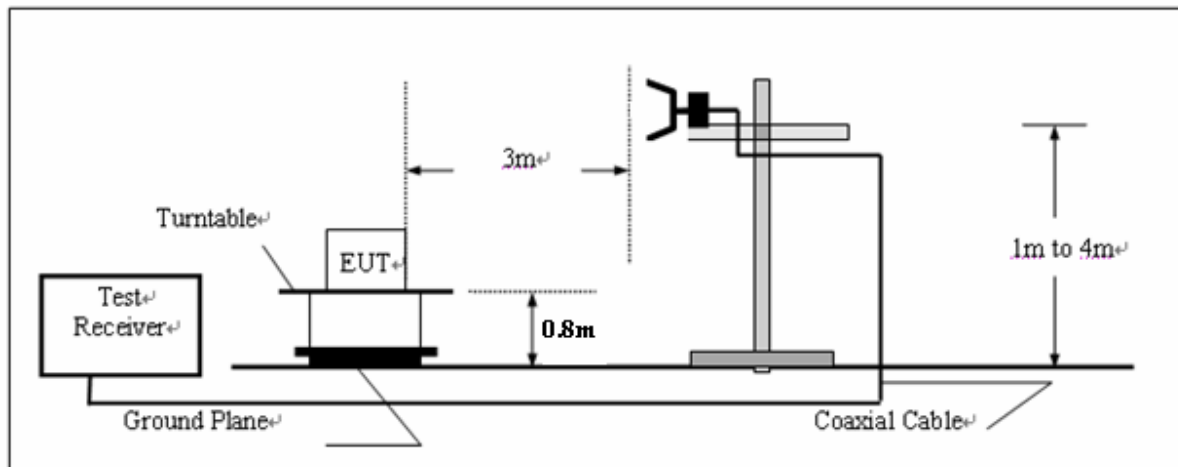
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



6.3 MEASUREMENT EQUIPMENT USED:

3/5 Anechoic Chamber Radiation Test Site # 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
ULTRA-BROADBAND ANTENNA	ROHDE & SCHWARZ	HL562	100015	2005/11	2006/11
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2005/11	2006/11
RF TEST PANEL	ROHDE & SCHWARZ	TS / RSP	335015/ 0017	N/A	N/A
TURNTABLE	ETS	2088	2149	N/A	N/A
ANTENNA MAST	ETS	2075	2346	N/A	N/A
EMI TEST SOFTWARE	ROHDE & SCHWARZ	ES-K1 1.71	N/A	2005/11	2006/11

Note: Each piece of equipment is scheduled for calibration once a year.

6.4 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

6.5 RADIATION LIMIT

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values :

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is 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 desired power.

6.6 MEASUREMENT RESULT

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

Frequency (MHz)	Ant/CL/ Amp.CF (dB)	Meter Reading at 3m(dBμV)		Limits (dBμV/m)	Emission Level at 3m(dBμV/m)	
		Horizontal	Vertical		Horizontal	Vertical
30.00	20.70	*	*	40.00	*	*
96.09	11.70	18.84	23.42	43.50	30.54	35.12
141.30	10.90	19.48	23.85	43.50	30.38	34.75
480.98	20.00	19.23	23.40	46.00	39.23	43.40
768.87	24.60	18.48	17.29	46.00	37.58	41.89
875.59	24.90	13.77	17.27	46.00	38.67	42.17
1000.00	24.30	*	*	54.00	*	*

REMARKS :

1. * Undetectable
2. The IF bandwidth of EMI Test Receiver was 120KHz for measuring from 30 MHz to 1 GHz and 1 MHz for measuring above 1 GHz

The frequency spectrum above 1 GHz for Transmitter was investigated. All emissions not reported are much lower than the prescribed limits. Readings are both peak and average values.

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

CH1 TX		Vertical polarity					
Freq. (MHz)	Reading (dBμV)	Ant/CL/ Amp.CF (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
* 2389.90	15.06	31.81	46.87	74.00	-27.13	P	1.00
* 2389.90	3.70	31.81	35.51	54.00	-18.49	A	1.00
2399.80	19.52	31.80	51.32	77.75	-26.43	P	1.00
2399.80	9.50	31.80	41.30	70.82	-29.52	A	1.00
2412.93	65.96	31.79	97.75	Fundamental Frequency		P	1.00
2412.93	59.03	31.79	90.82			A	1.00
* 1500.00	28.72	28.10	56.82	74.00	-17.18	P	1.00
* 1500.00	17.87	28.10	45.97	54.00	-8.21	A	1.00
* 4823.86	13.87	34.44	48.31	74.00	-25.69	P	1.00
* 4823.86	3.45	34.44	37.89	54.00	-16.10	A	1.00
7236.00	12.00	39.81	51.81	77.75	-25.94	P	1.00
7236.00	0.21	39.81	40.02	70.82	-30.80	A	1.00
9648.00	17.77	38.54	56.31	77.75	-21.44	P	1.00
9648.00	7.09	38.54	45.63	70.82	-25.79	A	1.00
*	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
16890.51	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
21716.37	-----	-----	-----	-----	-----	-----	1.00
24129.30	-----	-----	-----	-----	-----	-----	1.00

Note .

1. The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Remark "*" means that Restricted band.
5. The other emission levels were very low against the limit
6. The test limit distance is 3M limit.
7. For Wireless 802.11b mode at 11Mbps.

The frequency spectrum above 1 GHz for Transmitter was investigated. All emissions not reported are much lower than the prescribed limits. Readings are both peak and average values.

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

CH1 TX		Horizontal polarity					
Freq. (MHz)	Reading (dBμV)	Ant/CL/ Amp.CF (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
* 2389.90	13.15	31.81	44.96	74.00	-29.04	P	1.00
* 2389.90	0.58	31.81	32.39	54.00	-21.61	A	1.00
2399.80	12.31	31.80	44.11	69.78	-25.67	P	1.00
2399.80	2.15	31.80	33.95	58.41	-24.46	A	1.00
2412.93	57.99	31.79	89.78	Fundamental Frequency		P	1.00
2412.93	46.62	31.79	78.41			A	1.00
* 1500.00	17.73	28.10	45.83	74.00	-28.17	P	1.00
* 1500.00	7.55	28.10	35.65	54.00	-18.35	A	1.00
* 4823.86	8.91	34.44	43.35	74.00	-30.65	P	1.00
* 4823.86	1.15	34.44	35.59	54.00	-18.41	A	1.00
7236.00	7.61	39.81	47.42	69.78	-22.36	P	1.00
7236.00	0.51	39.81	40.32	58.41	-18.09	A	1.00
9648.00	8.11	38.54	46.65	69.78	-23.13	P	1.00
9648.00	0.81	38.54	39.35	58.41	-19.06	A	1.00
*	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
16871.54	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
21691.98	-----	-----	-----	-----	-----	-----	1.00
24102.20	-----	-----	-----	-----	-----	-----	1.00

Note .

1. The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Remark "*" means that Restricted band.
5. The other emission levels were very low against the limit
6. The test limit distance is 3M limit.
7. For Wireless 802.11b mode at 11Mbps.

The frequency spectrum above 1 GHz for Transmitter was investigated. All emissions not reported are much lower than the prescribed limits. Readings are both peak and average values.

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

CH6 TX		Vertical polarity					
Freq. (MHz)	Reading (dBμV)	Ant/CL/ Amp.CF (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
2435.92	67.36	31.76	99.12	Fundamental Frequency		P	1.00
2435.92	54.58	31.76	86.34			A	1.00
* 1500.00	24.25	28.10	52.35	74.00	-21.65	P	1.00
* 1500.00	20.21	28.10	48.31	54.00	-5.69	A	1.00
* 4874.07	8.37	34.77	43.14	74.00	-30.86	P	1.00
* 4874.07	2.07	34.77	36.84	54.00	-17.16	A	1.00
* 7311.01	6.56	39.78	46.34	74.00	-27.66	P	1.00
* 7311.01	2.09	39.78	41.87	54.00	-12.13	A	1.00
9747.98	11.15	38.53	49.68	79.12	-29.44	P	1.00
9747.98	3.81	38.53	42.34	66.34	-24.00	A	1.00
*	-----	-----	-----	-----	-----	-----	1.00
14615.52	-----	-----	-----	-----	-----	-----	1.00
17051.44	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
21923.28	-----	-----	-----	-----	-----	-----	1.00
24359.20	-----	-----	-----	-----	-----	-----	1.00

Note :

1. The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Remark "*" means that Restricted band.
5. The other emission levels were very low against the limit
6. The test limit distance is 3M limit.
7. For Wireless 802.11b mode at 11Mbps.

The frequency spectrum above 1 GHz for Transmitter was investigated. All emissions not reported are much lower than the prescribed limits. Readings are both peak and average values.

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

CH6 TX		Horizontal polarity					
Freq. (MHz)	Reading (dBμV)	Ant/CL/ Amp.CF (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
2435.92	59.67	31.76	91.43	Fundamental Frequency		P	1.00
2435.92	46.37	31.76	78.13			A	1.00
* 1500.00	22.13	28.10	50.23	74.00	-23.77	P	1.00
* 1500.00	16.38	28.10	44.48	54.00	-9.52	A	1.00
* 4874.07	9.77	34.77	44.54	74.00	-29.46	P	1.00
* 4874.07	0.27	34.77	35.04	54.00	-18.96	A	1.00
* 7311.01	8.68	39.78	48.46	74.00	-25.54	P	1.00
* 7311.01	1.01	39.78	40.79	54.00	-13.21	A	1.00
9747.98	9.64	38.53	48.17	71.43	-23.26	P	1.00
9747.98	1.12	38.53	39.65	58.13	-18.48	A	1.00
*	-----	-----	-----	-----	-----	-----	1.00
14626.08	-----	-----	-----	-----	-----	-----	1.00
17063.76	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
21939.12	-----	-----	-----	-----	-----	-----	1.00
24376.80	-----	-----	-----	-----	-----	-----	1.00

Note :

1. The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Remark "*" means that Restricted band.
5. The other emission levels were very low against the limit
6. The test limit distance is 3M limit.
7. For Wireless 802.11b mode at 11Mbps.

The frequency spectrum above 1 GHz for Transmitter was investigated. All emissions not reported are much lower than the prescribed limits. Readings are both peak and average values.

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

CH11 TX		Vertical polarity					
Freq. (MHz)	Reading (dBμV)	Ant/CL/ Amp.CF (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
2462.63	65.95	31.74	97.69	Fundamental Frequency		P	1.00
2462.63	59.07	31.74	90.81			A	1.00
* 2483.50	24.66	31.72	56.38	74.00	-17.62	P	1.00
* 2483.50	16.22	31.72	47.94	54.00	-6.06	A	1.00
* 2483.60	21.55	31.72	53.27	74.00	-20.73	P	1.00
* 2483.60	10.59	31.72	42.31	54.00	-11.69	A	1.00
* 1500.00	30.61	28.10	58.71	74.00	-15.29	P	1.00
* 1500.00	19.44	28.10	47.54	54.00	-6.46	A	1.00
* 4923.78	15.11	35.10	50.21	74.00	-23.79	P	1.00
* 4923.78	6.22	35.10	41.32	54.00	-12.68	A	1.00
* 7386.05	13.61	39.75	53.36	74.00	-20.64	P	1.00
* 7386.05	4.42	39.75	44.17	54.00	-9.83	A	1.00
9847.85	10.85	38.52	49.37	77.69	-28.32	P	1.00
9847.85	2.63	38.52	41.15	70.81	-29.66	A	1.00
*	-----	-----	-----	-----	-----	-----	1.00
14775.78	-----	-----	-----	-----	-----	-----	1.00
17238.41	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
24626.30	-----	-----	-----	-----	-----	-----	1.00

Note :

1. The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Remark "*" means that Restricted band.
5. The other emission levels were very low against the limit
6. The test limit distance is 3M limit.
7. For Wireless 802.11b mode at 11Mbps.

The frequency spectrum above 1 GHz for Transmitter was investigated. All emissions not reported are much lower than the prescribed limits. Readings are both peak and average values.

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

CH11 TX		Horizontal polarity					
Freq. (MHz)	Reading (dBμV)	Ant/CL/ Amp.CF (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
2462.63	54.28	31.74	86.02	Fundamental Frequency		P	1.00
2462.63	42.37	31.74	74.11			A	1.00
* 2483.50	13.93	31.72	45.65	74.00	-28.35	P	1.00
* 2483.50	11.39	31.72	43.11	54.00	-10.89	A	1.00
* 2483.60	12.34	31.72	44.06	74.00	-29.94	P	1.00
* 2483.60	6.94	31.72	38.66	54.00	-15.34	A	1.00
* 1500.00	21.38	28.10	49.48	74.00	-24.52	P	1.00
* 1500.00	12.74	28.10	40.84	54.00	-13.60	A	1.00
* 4923.78	12.97	35.10	48.07	74.00	-25.93	P	1.00
* 4923.78	3.78	35.10	38.88	54.00	-15.12	A	1.00
* 7386.05	11.35	39.75	51.10	74.00	-22.90	P	1.00
* 7386.05	2.14	39.75	41.89	54.00	-12.11	A	1.00
9847.85	8.36	38.52	46.88	66.02	-19.14	P	1.00
9847.85	0.15	38.52	38.67	54.11	-15.44	A	1.00
*	-----	-----	-----	-----	-----	-----	1.00
14775.30	-----	-----	-----	-----	-----	-----	1.00
17237.85	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
24625.50	-----	-----	-----	-----	-----	-----	1.00

Note :

1. The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Remark "*" means that Restricted band.
5. The other emission levels were very low against the limit.
6. The test limit distance is 3M limit.
7. For Wireless 802.11b mode at 11Mbps.

The frequency spectrum above 1 GHz for Transmitter was investigated. All emissions not reported are much lower than the prescribed limits. Readings are both peak and average values.

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

CH1 TX		Vertical polarity					
Freq. (MHz)	Reading (dBμV)	Ant/CL/ Amp.CF (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
* 2389.90	14.38	31.81	46.19	74.00	-27.81	P	1.00
* 2389.90	3.25	31.81	35.06	54.00	-18.94	A	1.00
2399.80	18.64	31.80	50.44	76.12	-25.68	P	1.00
2399.80	10.01	31.80	41.81	69.55	-27.74	A	1.00
2413.35	64.33	31.79	96.12	Fundamental Frequency		P	1.00
2413.35	57.76	31.79	89.55			A	1.00
* 1500.00	26.89	28.10	54.99	74.00	-19.01	P	1.00
* 1500.00	16.31	28.10	44.41	54.00	-9.59	A	1.00
* 4824.00	12.14	34.44	46.58	74.00	-27.42	P	1.00
* 4824.00	2.38	34.44	36.82	54.00	-17.18	A	1.00
7236.00	11.05	39.81	50.86	76.12	-25.26	P	1.00
7236.00	1.07	39.81	40.88	69.55	-28.67	A	1.00
9647.85	16.54	38.54	55.08	76.12	-21.04	P	1.00
9647.85	6.38	38.54	44.92	69.55	-24.63	A	1.00
*	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
16890.51	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
21716.37	-----	-----	-----	-----	-----	-----	1.00
24129.30	-----	-----	-----	-----	-----	-----	1.00

Note :

1. The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Remark "*" means that Restricted band.
5. The other emission levels were very low against the limit
6. The test limit distance is 3M limit.
7. For Wireless 802.11g mode at 6Mbps.

The frequency spectrum above 1 GHz for Transmitter was investigated. All emissions not reported are much lower than the prescribed limits. Readings are both peak and average values.

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

CH1 TX		Horizontal polarity					
Freq. (MHz)	Reading (dBμV)	Ant/CL/ Amp.CF (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
* 2389.90	14.38	31.81	46.19	74.00	-27.81	P	1.00
* 2389.90	1.07	31.81	32.88	54.00	-21.12	A	1.00
2399.80	11.87	31.80	43.67	68.10	-24.43	P	1.00
2399.80	1.96	31.80	33.76	56.64	-22.88	A	1.00
2407.11	56.31	31.79	88.10	Fundamental Frequency		P	1.00
2407.11	44.85	31.79	76.64			A	1.00
* 1500.00	19.37	28.10	47.47	74.00	-26.53	P	1.00
* 1500.00	8.29	28.10	36.39	54.00	-17.61	A	1.00
* 4824.00	7.67	34.44	42.11	74.00	-31.89	P	1.00
* 4824.00	1.07	34.44	35.51	54.00	-18.49	A	1.00
7236.00	8.31	39.81	48.12	68.10	-19.88	P	1.00
7236.00	0.34	39.81	40.15	56.64	-16.49	A	1.00
9648.00	9.69	38.54	48.23	68.10	-19.87	P	1.00
9648.00	1.02	38.54	39.56	56.64	-17.08	A	1.00
*	-----	-----	-----	-----	-----	-----	1.00
14442.66	-----	-----	-----	-----	-----	-----	1.00
16849.77	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
21663.99	-----	-----	-----	-----	-----	-----	1.00
24071.10	-----	-----	-----	-----	-----	-----	1.00

Note :

1. The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Remark "*" means that Restricted band.
5. The other emission levels were very low against the limit
6. The test limit distance is 3M limit.
7. For Wireless 802.11g mode at 6Mbps.

The frequency spectrum above 1 GHz for Transmitter was investigated. All emissions not reported are much lower than the prescribed limits. Readings are both peak and average values.

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

CH6 TX		Vertical polarity					
Freq. (MHz)	Reading (dBμV)	Ant/CL/ Amp.CF (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
2442.99	64.29	31.76	96.05	Fundamental Frequency		P	1.00
2442.99	53.67	31.76	85.43			A	1.00
* 1500.00	26.13	28.10	54.23	74.00	-19.77	P	1.00
* 1500.00	23.87	28.10	51.97	54.00	-2.03	A	1.00
* 4873.95	7.69	34.77	42.46	74.00	-31.54	P	1.00
* 4873.95	1.97	34.77	36.74	54.00	-17.26	A	1.00
* 7310.97	5.34	39.78	45.12	74.00	-28.88	P	1.00
* 7310.97	1.31	39.78	41.09	54.00	-12.91	A	1.00
9747.69	10.38	38.53	48.91	76.05	-27.14	P	1.00
9747.69	3.27	38.53	41.80	65.43	-23.63	A	1.00
*	-----	-----	-----	-----	-----	-----	1.00
14657.94	-----	-----	-----	-----	-----	-----	1.00
17100.93	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
21986.91	-----	-----	-----	-----	-----	-----	1.00
24429.90	-----	-----	-----	-----	-----	-----	1.00

Note :

1. The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Remark "*" means that Restricted band.
5. The other emission levels were very low against the limit
6. The test limit distance is 3M limit.
7. For Wireless 802.11g mode at 6Mbps.

The frequency spectrum above 1 GHz for Transmitter was investigated. All emissions not reported are much lower than the prescribed limits. Readings are both peak and average values.

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

CH6 TX		Horizontal polarity					
Freq. (MHz)	Reading (dBμV)	Ant/CL/ Amp.CF (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
2435.92	59.67	31.76	91.43	Fundamental Frequency		P	1.00
2435.92	46.37	31.76	78.13			A	1.00
* 1500.00	22.13	28.10	50.23	74.00	-23.77	P	1.00
* 1500.00	16.38	28.10	44.48	54.00	-9.52	A	1.00
* 4874.07	9.77	34.77	44.54	74.00	-29.46	P	1.00
* 4874.07	0.27	34.77	35.04	54.00	-18.96	A	1.00
* 7311.01	8.68	39.78	48.46	74.00	-25.54	P	1.00
* 7311.01	1.01	39.78	40.79	54.00	-13.21	A	1.00
9747.98	9.64	38.53	48.17	71.43	-23.26	P	1.00
9747.98	1.12	38.53	39.65	58.13	-18.48	A	1.00
*	-----	-----	-----	-----	-----	-----	1.00
14626.08	-----	-----	-----	-----	-----	-----	1.00
17063.76	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
21939.12	-----	-----	-----	-----	-----	-----	1.00
24376.80	-----	-----	-----	-----	-----	-----	1.00

Note :

1. The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Remark "*" means that Restricted band.
5. The other emission levels were very low against the limit
6. The test limit distance is 3M limit.
7. For Wireless 802.11g mode at 6Mbps.

The frequency spectrum above 1 GHz for Transmitter was investigated. All emissions not reported are much lower than the prescribed limits. Readings are both peak and average values.

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

CH11 TX		Vertical polarity					
Freq. (MHz)	Reading (dBμV)	Ant/CL/ Amp.CF (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
2455.21	64.37	31.74	96.11	Fundamental Frequency		P	1.00
2455.21	56.98	31.74	88.72			A	1.00
* 2483.50	26.11	31.72	57.83	74.00	-16.17	P	1.00
* 2483.50	18.17	31.72	49.89	54.00	-4.11	A	1.00
* 2483.60	20.34	31.72	52.06	74.00	-21.94	P	1.00
* 2483.60	11.27	31.72	42.99	54.00	-11.01	A	1.00
* 1500.00	31.05	28.10	59.15	74.00	-14.85	P	1.00
* 1500.00	17.69	28.10	45.79	54.00	-8.21	A	1.00
* 4924.73	16.39	35.10	51.49	74.00	-22.51	P	1.00
* 4924.73	7.19	35.10	42.29	54.00	-11.71	A	1.00
* 7386.11	12.37	39.75	52.12	74.00	-21.88	P	1.00
* 7386.11	4.12	39.75	43.87	54.00	-10.13	A	1.00
9847.66	11.27	38.52	49.79	76.11	-26.32	P	1.00
9847.66	1.99	38.52	40.51	68.72	-28.21	A	1.00
*	-----	-----	-----	-----	-----	-----	1.00
14731.26	-----	-----	-----	-----	-----	-----	1.00
17186.47	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
24552.10	-----	-----	-----	-----	-----	-----	1.00

Note :

1. The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Remark "*" means that Restricted band.
5. The other emission levels were very low against the limit
6. The test limit distance is 3M limit.
7. For Wireless 802.11g mode at 6Mbps.

The frequency spectrum above 1 GHz for Transmitter was investigated. All emissions not reported are much lower than the prescribed limits. Readings are both peak and average values.

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

CH11 TX		Horizontal polarity					
Freq. (MHz)	Reading (dBμV)	Ant/CL/ Amp.CF (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
2462.63	56.17	31.74	87.91	Fundamental Frequency		P	1.00
2462.63	44.38	31.74	76.12			A	1.00
* 2483.50	19.19	31.72	50.91	74.00	-23.09	P	1.00
* 2483.50	9.67	31.72	41.39	54.00	-12.91	A	1.00
* 2483.60	12.89	31.72	44.61	74.00	-29.39	P	1.00
* 2483.60	3.67	31.72	35.39	54.00	-18.61	A	1.00
* 1500.00	21.07	28.10	49.17	74.00	-24.83	P	1.00
* 1500.00	9.37	28.10	37.47	54.00	-16.53	A	1.00
* 4923.78	9.99	35.10	45.09	74.00	-28.91	P	1.00
* 4923.78	3.11	35.10	38.21	54.00	-15.79	A	1.00
* 7386.05	10.37	39.75	51.10	74.00	-22.90	P	1.00
* 7386.05	3.11	39.75	50.12	54.00	-3.88	A	1.00
9847.85	6.54	38.52	45.06	67.91	-22.85	P	1.00
9847.85	0.38	38.52	38.90	56.12	-17.22	A	1.00
*	-----	-----	-----	-----	-----	-----	1.00
14784.90	-----	-----	-----	-----	-----	-----	1.00
17249.05	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
*	-----	-----	-----	-----	-----	-----	1.00
24641.50	-----	-----	-----	-----	-----	-----	1.00

Note :

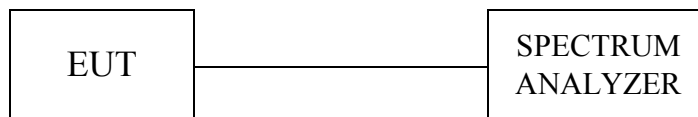
1. The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Remark "*" means that Restricted band.
5. The other emission levels were very low against the limit.
6. The test limit distance is 3M limit.
7. For Wireless 802.11g mode at 6Mbps.

7. 6DB BANDWIDTH MEASUREMENT

7.1 MEASUREMENT PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 300 KHz RBW and 1MHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

7.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



7.3 MEASUREMENT EQUIPMENT USED:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2005/11	2006/11

Note: Each piece of equipment is scheduled for calibration once a year.

7.4 MEASUREMENT RESULTS:

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	12.12	0.5	PASS
6	2437	11.80	0.5	PASS
11	2462	11.52	0.5	PASS

Note : 1. For 802.11b Mode

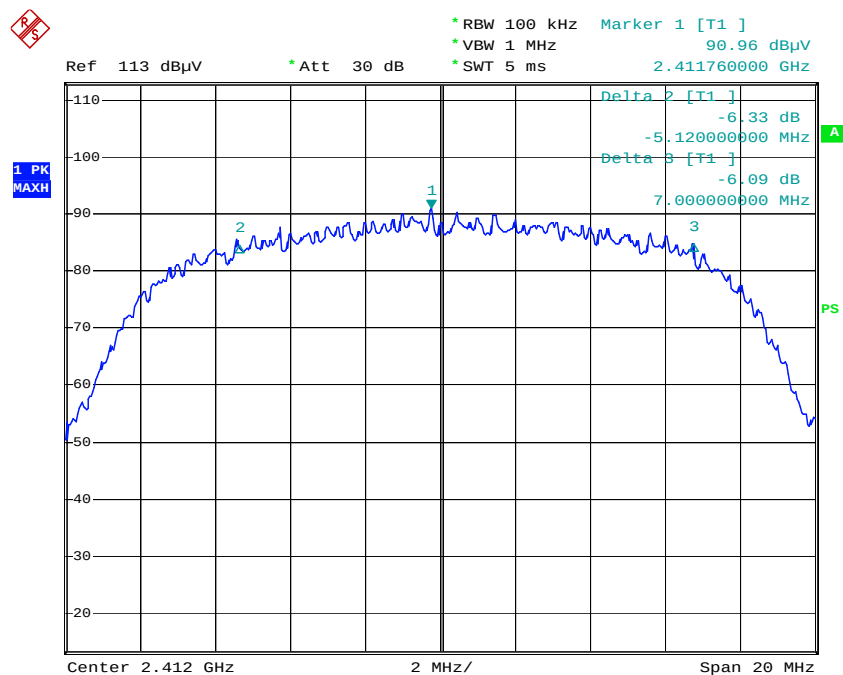
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	15.70	0.5	PASS
6	2437	15.76	0.5	PASS
11	2462	15.56	0.5	PASS

Note : 1. For 802.11g Mode

6 dB Bandwidth Test Plots :

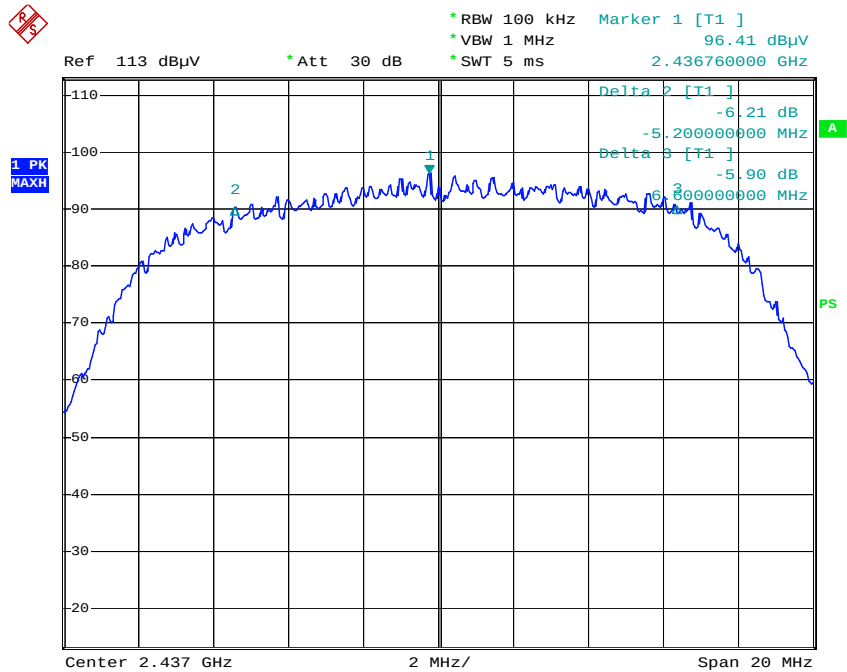
Note : For 802.11b Mode

Channel 1



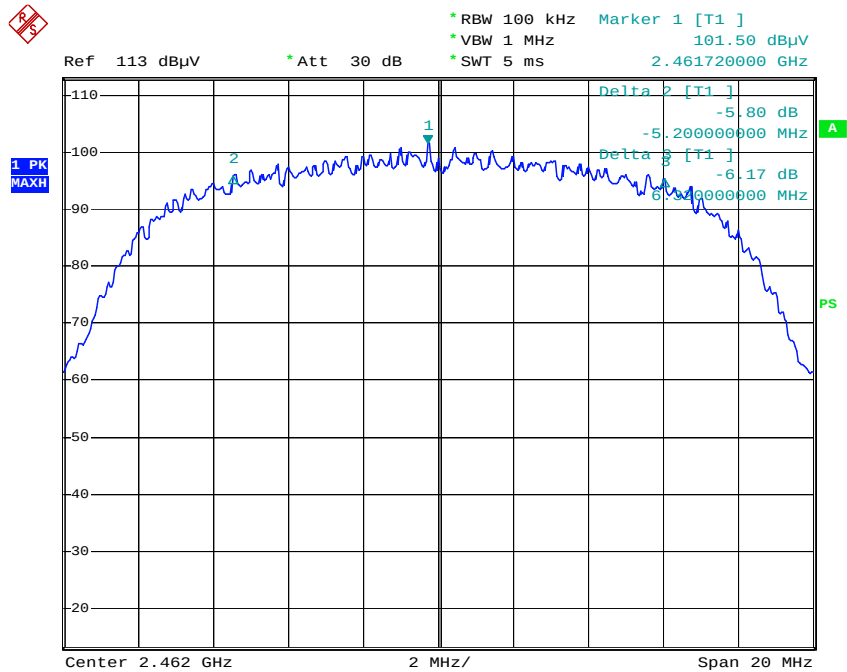
Date: 10.JUL.2006 17:20:18

Channel 6



Date: 10.JUL.2006 17:18:47

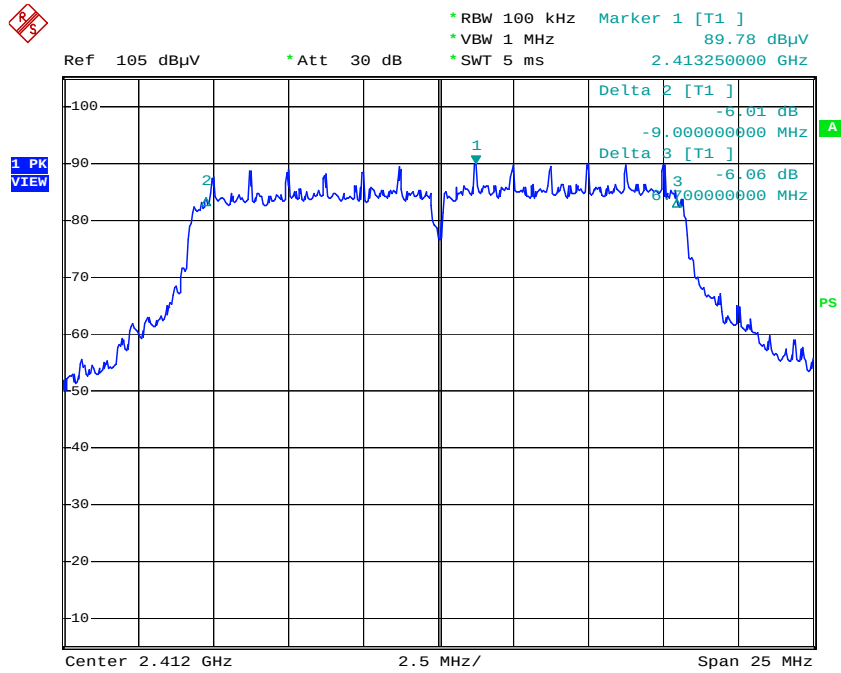
Channel 11



Date: 10.JUL.2006 17:16:40

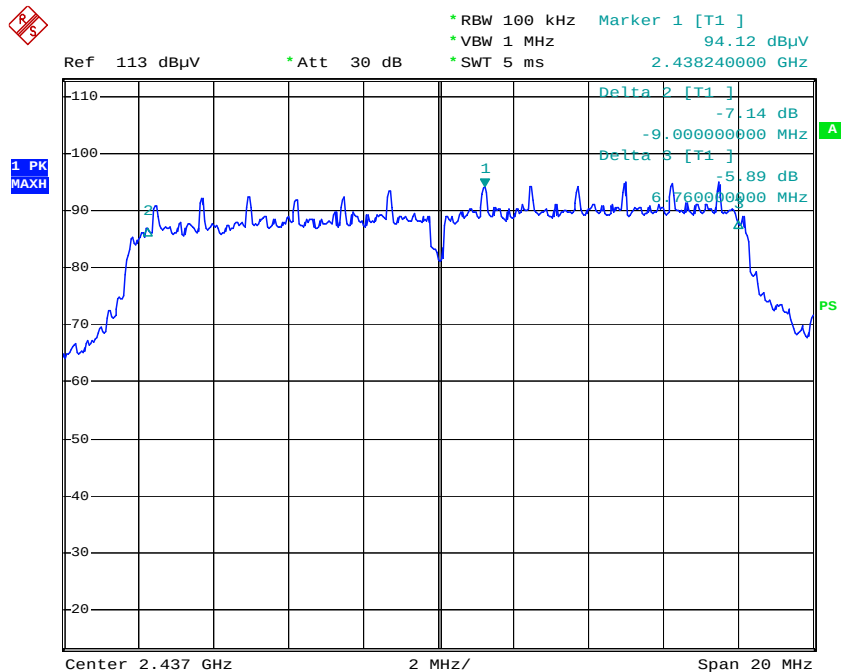
Note : For 802.11g Mode

Channel 1



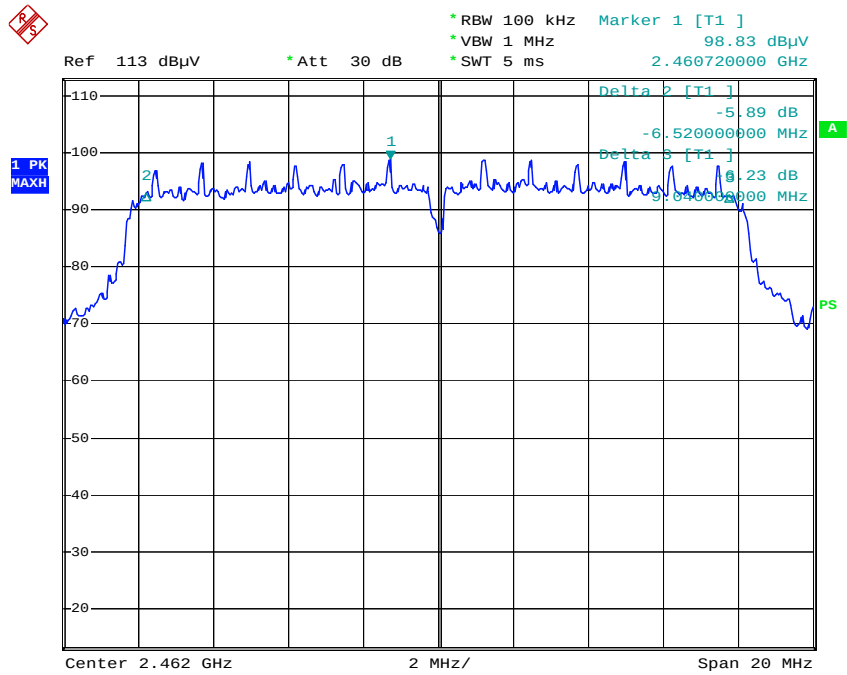
Date: 10.JUL.2006 17:05:14

Channel 6



Date: 10.JUL.2006 17:08:15

Channel 11



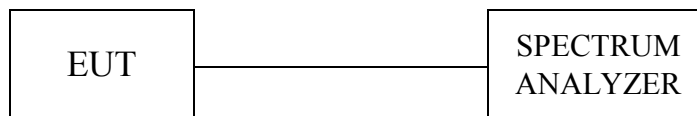
Date: 10.JUL.2006 17:10:28

8 MAXIMUM PEAK OUTPUT POWER

8.1 MEASUREMENT PROCEDURE

1. The spectrum shall be set as follows :
Span : 1.5 times channel integration bandwidth.
RBW : 1MHz
VBW : 3MHz
Detector : Peak
Sweep : Single trace
2. Compute the combined power of all signal responses contained in the trace by covering all the data points.
3. For 99% occupied BW, place the markers at the frequency at which 0.5% of the power lies to the right of the right marker and 0.5% of the power lies to the left of the left marker.
4. The peak output power is the channel power integrated over 99% bandwidth.

8.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



8.3 MEASUREMENT EQUIPMENT USED:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2005/11	2006/11

Note: Each piece of equipment is scheduled for calibration once a year.

8.4 LIMITS OF MAXIMUM PEAK OUTPUT POWER

The Maximum Peak Output Power Measurement is 30dBm.

8.5 MEASUREMENT RESULTS:

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass / Fail
1	2412	18.27	30	PASS
6	2437	18.35	30	PASS
11	2462	19.36	30	PASS

Note :1. For 802.11b Mode

2. At final test to get the worst-case emission at 11Mbps.

3. Cable loss = 1.2dB

4. The result basic equation calculation as follow :

$$\text{Peak Power Output} = \text{Peak Power Reading} + \text{Cable loss}$$

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass / Fail
1	2412	18.15	30	PASS
6	2437	18.32	30	PASS
11	2462	19.17	30	PASS

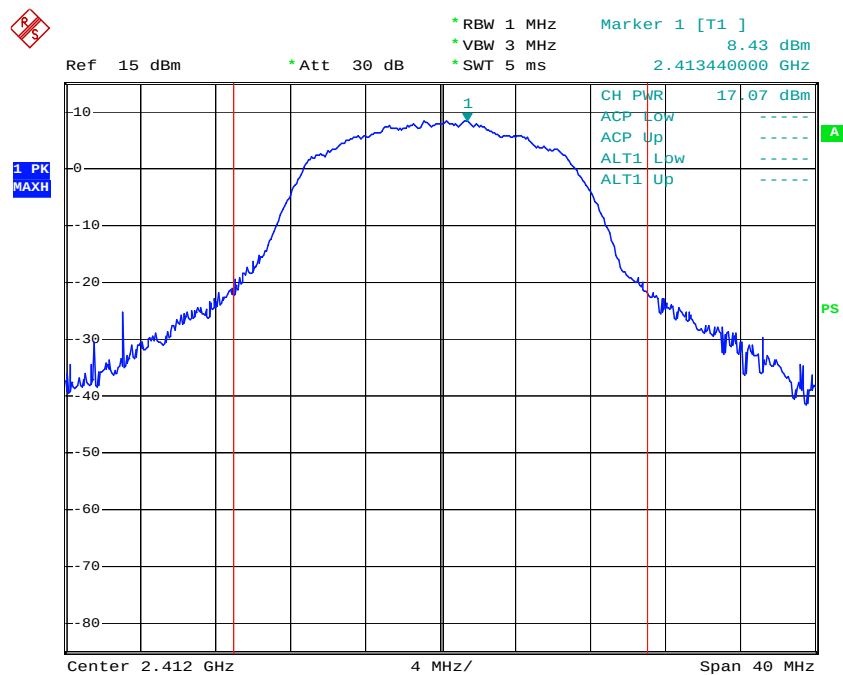
Note :1. For 802.11g Mode

2. At final test to get the worst-case emission at 6Mbps.

3. Cable loss = 1.2dB

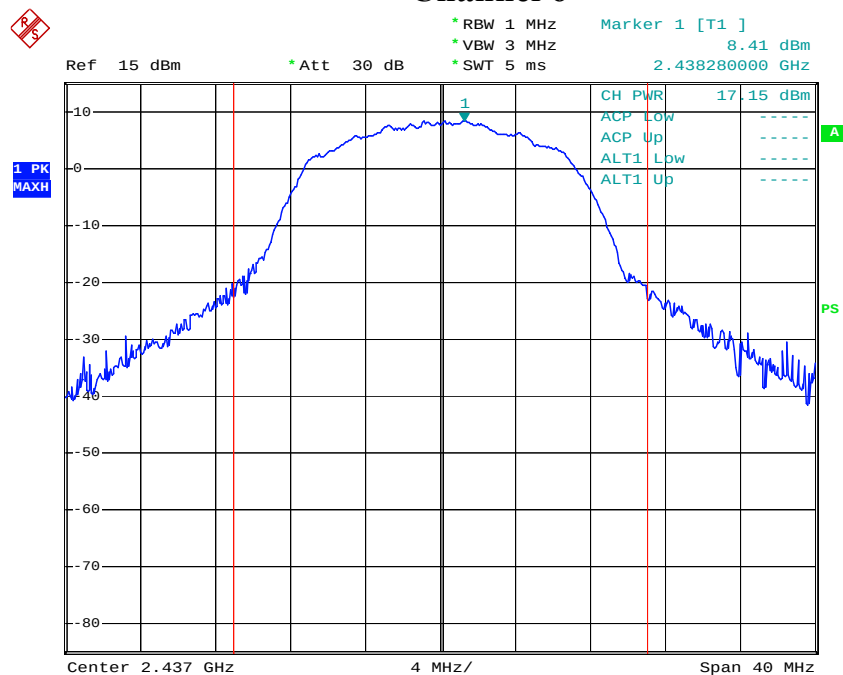
4. The result basic equation calculation as follow :

$$\text{Peak Power Output} = \text{Peak Power Reading} + \text{Cable loss}$$

Photo of Maximum Peak Output Power Measurement:**Note :** For 802.11b Mode**Channel 1**

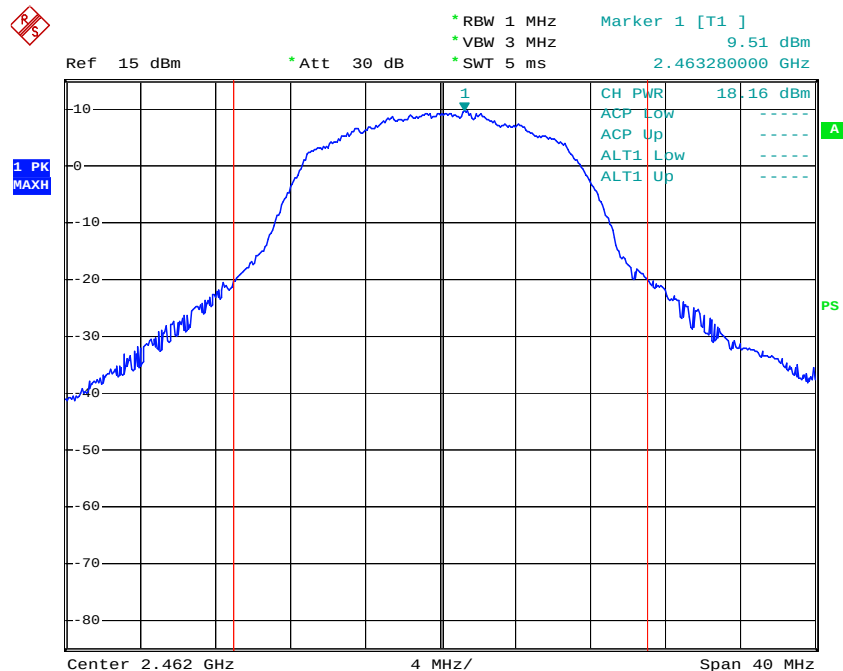
Date: 14.JUL.2006 20:43:06

Channel 6



Date: 14.JUL.2006 20:40:21

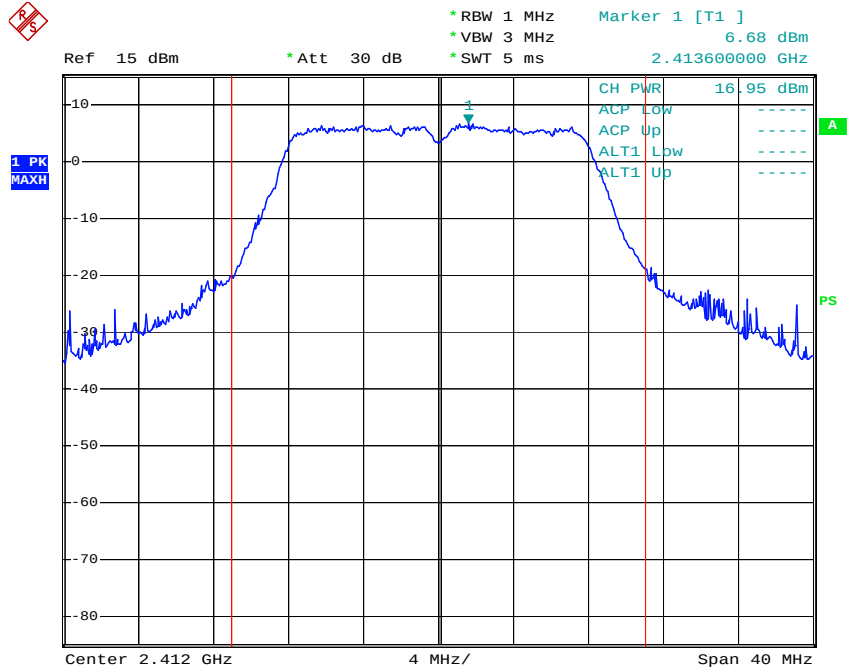
Channel 11



Date: 14.JUL.2006 20:38:29

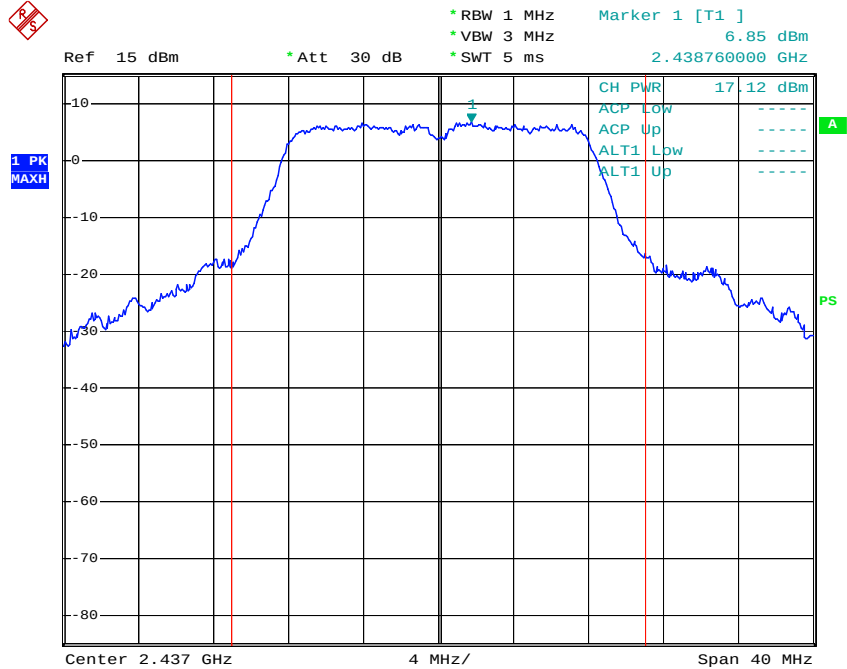
Note : For 802.11g Mode

Channel 1



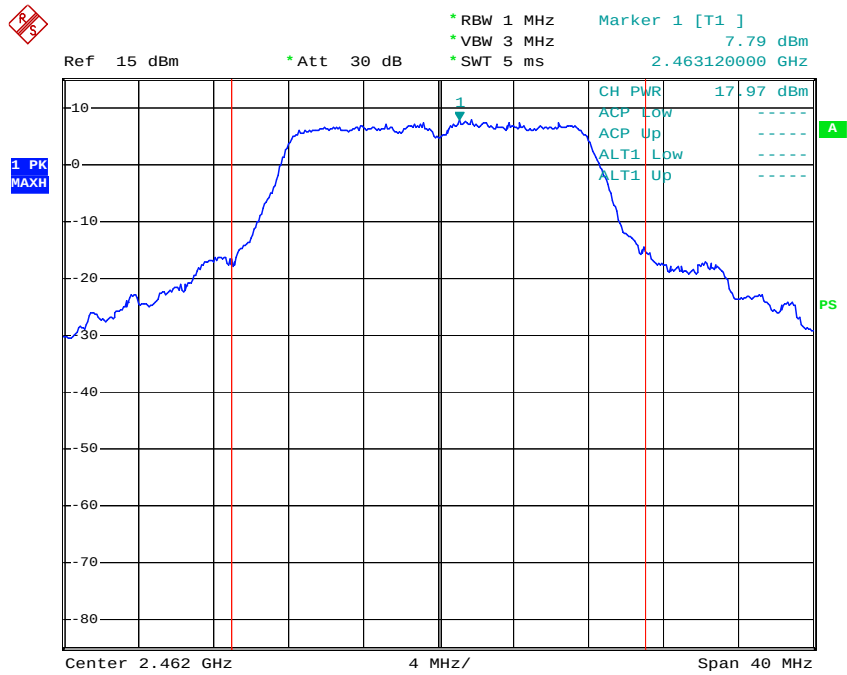
Date: 14.JUL.2006 20:35:45

Channel 6



Date: 14.JUL.2006 20:34:16

Channel 11



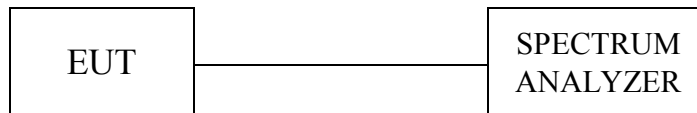
Date: 14.JUL.2006 20:36:46

9 POWER SPECTRAL DENSITY MEASUREMENT**9.1 MEASUREMENT PROCEDURE**

The transmitter output was connected to the spectrum analyzer, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3KHz RBW and 30KHz VBW, set sweep time=span / 3KHz.

The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span / 3KHz for a full response of the mixer in the spectrum analyzer.

9.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)**9.3 MEASUREMENT EQUIPMENT USED:**

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2005/11	2006/11

Note: Each piece of equipment is scheduled for calibration once a year.

9.4 LIMITS OF MAXIMUM PEAK OUTPUT POWER

The Maximum Power Spectral Density Measurement is 8dBm/3KHz.

9.5 MEASUREMENT RESULTS:

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Maximum Limit (dBm)	Pass / Fail
1	2412	-20.66	8	PASS
6	2437	-18.00	8	PASS
11	2462	-15.08	8	PASS

Note: 1. For 802.11b mode at final test to get the worst-case emission at 11Mbps.

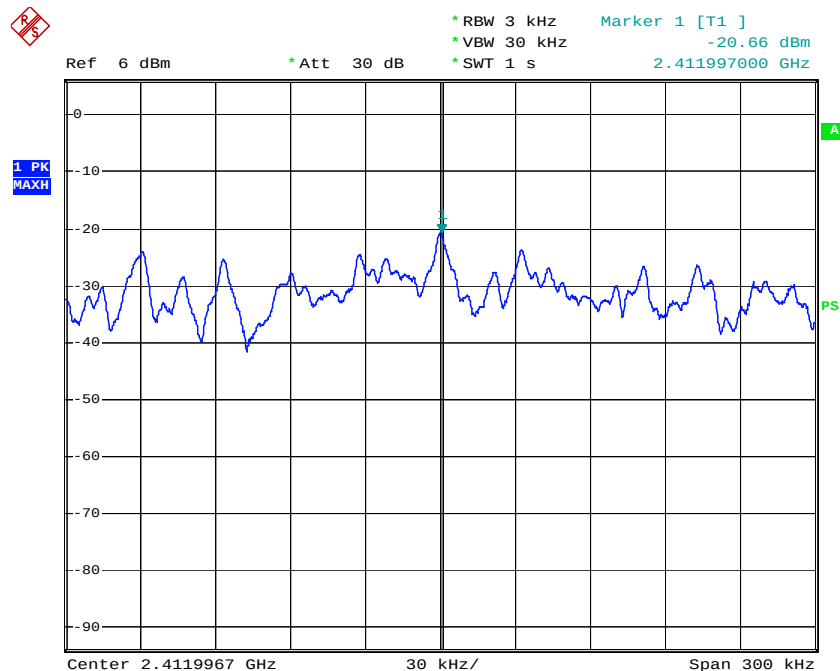
Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Maximum Limit (dBm)	Pass / Fail
1	2412	-29.31	8	PASS
6	2437	-27.96	8	PASS
11	2462	-28.23	8	PASS

Note: 1. For 802.11g mode at final test to get the worst-case emission at 6Mbps

Photo of Power Spectral Density Measurement

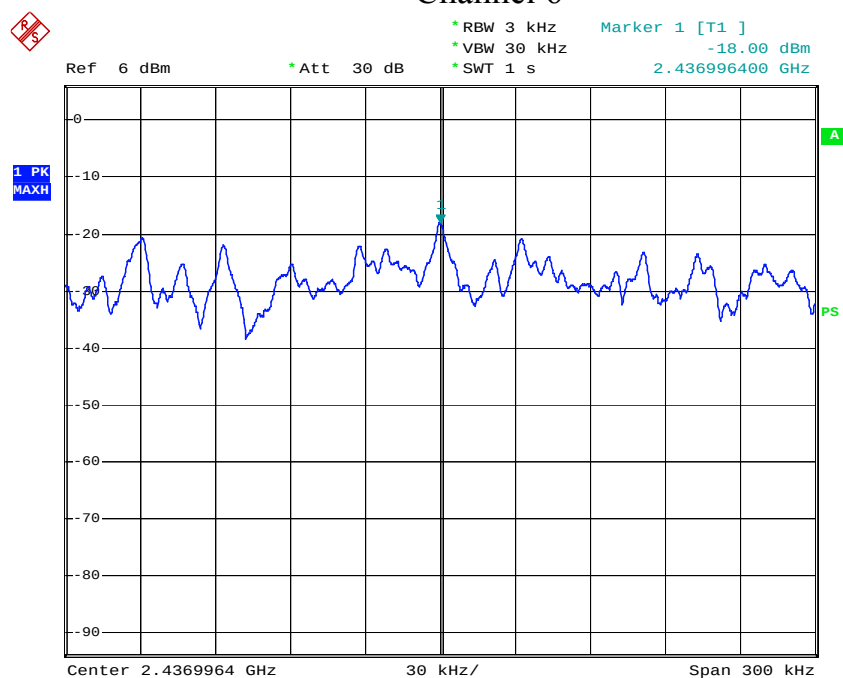
Note : For 802.11b Mode

Channel 1



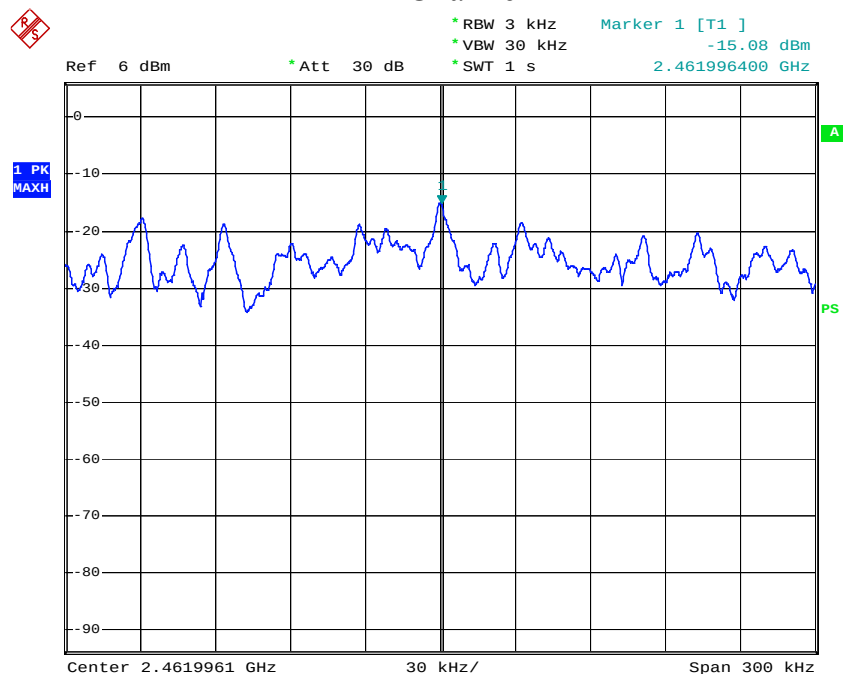
Date: 10.JUL.2006 17:57:47

Channel 6

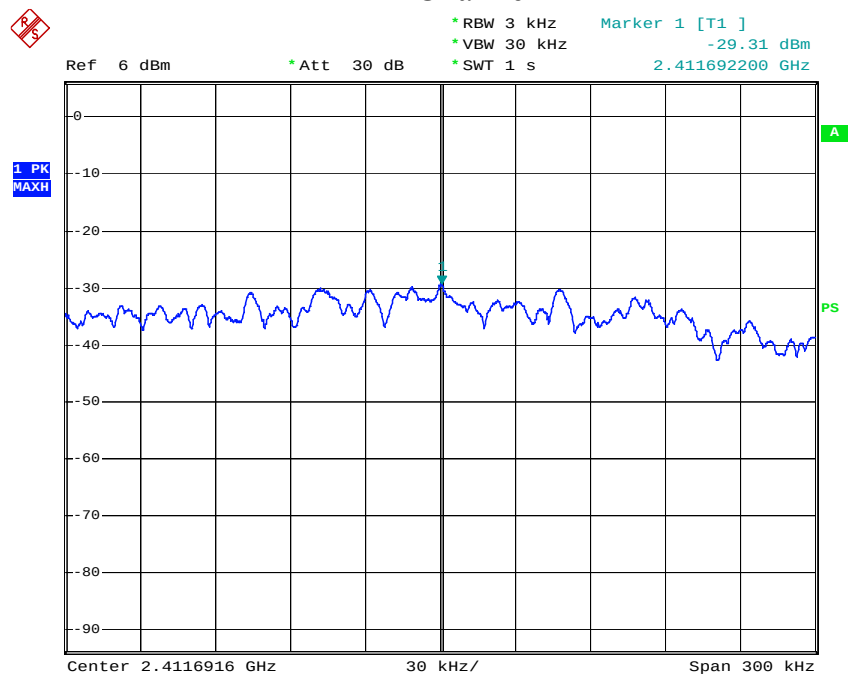


Date: 10.JUL.2006 17:56:37

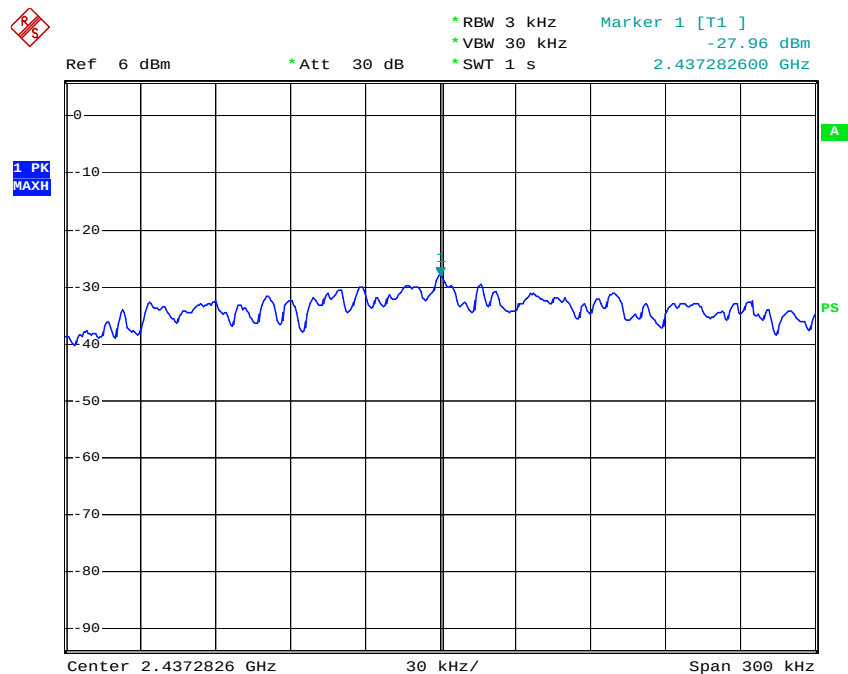
Channel 11



Date: 10.JUL.2006 17:58:58

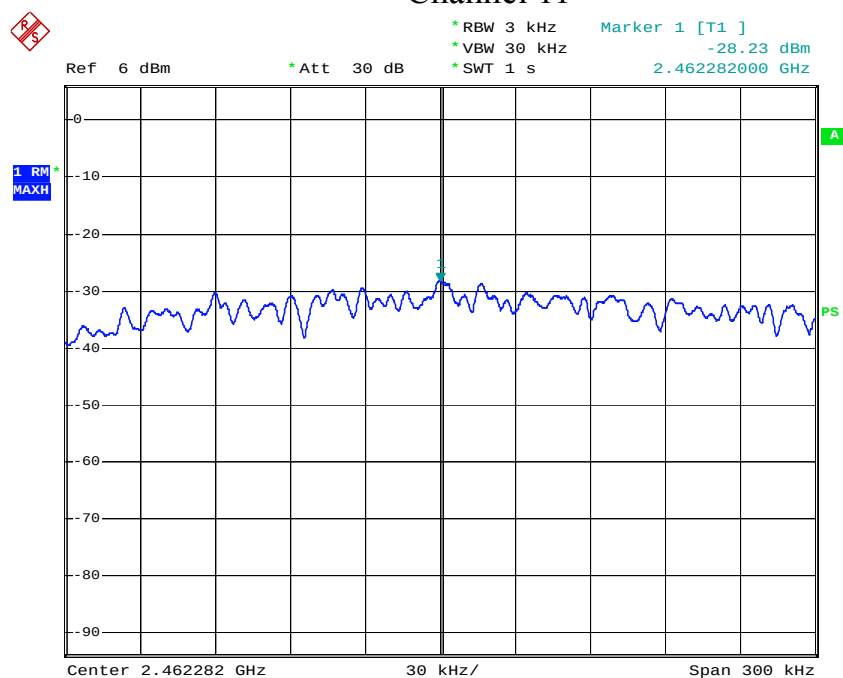
Note : For 802.11g Mode**Channel 1**

Date: 10.JUL.2006 17:53:34

Channel 6

Date: 10.JUL.2006 17:43:17

Channel 11

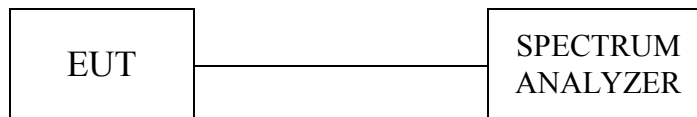


Date: 10.JUL.2006 17:50:38

10 BAND EDGE MEASUREMENT**10.1 MEASUREMENT PROCEDURE**

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.4 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW and VBM to 1MHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength.

The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW and VBW to 100kHz, to measure the conducted peak band edge.

10.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)**10.3 MEASUREMENT EQUIPMENT USED:**

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2005/11	2006/11

Note: Each piece of equipment is scheduled for calibration once a year.

10.4 LIMITS OF MAXIMUM PEAK OUTPUT POWER

1. Below -20dB of the highest emission level in operating band.
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

10.5 MEASUREMENT RESULTS:

A. Conducted

Refer to photo of out band Emission measurement

B. Radiated

Company	Huawei Technologies Co., Ltd.	Test Date	2006/06/12
Product Name	ADSL2+ Wireless Router	Test By	Tracy Qi
Model Name	VDR824g	TEMP&Humidity	23°C, 61%

For 802.11b mode

Refer to the section 6.6, the measured radiated band edge emissions are listed below :

Band edge Frequency (MHz)		Measured radiated band edge field strength (dBuV/m)		Radiated band edge field strength limit (dBuV/m)		Test result
		Horizontal	Vertical	Horizontal	Vertical	
2399.90	PK	44.11	51.32	69.78	77.75	PASS
	AV	33.95	41.30	58.41	70.82	
2483.50	PK	45.65	56.38	74.00	74.00	PASS
	AV	43.11	47.94	54.00	54.00	

For 802.11g mode

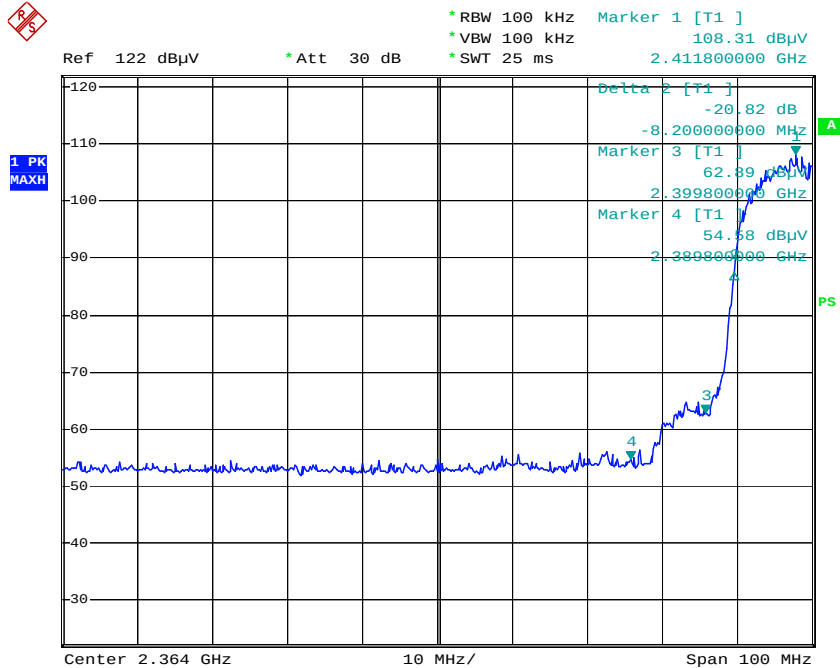
Refer to the section 6.6, the measured radiated band edge emissions are listed below :

Band edge Frequency (MHz)		Measured radiated band edge field strength (dBuV/m)		Radiated band edge field strength limit (dBuV/m)		Test result
		Horizontal	Vertical	Horizontal	Vertical	
2399.90	PK	43.68	50.44	68.10	76.12	PASS
	AV	33.76	41.81	56.64	69.55	
2483.50	PK	50.91	57.83	74.00	74.00	PASS
	AV	41.39	49.89	54.00	54.00	

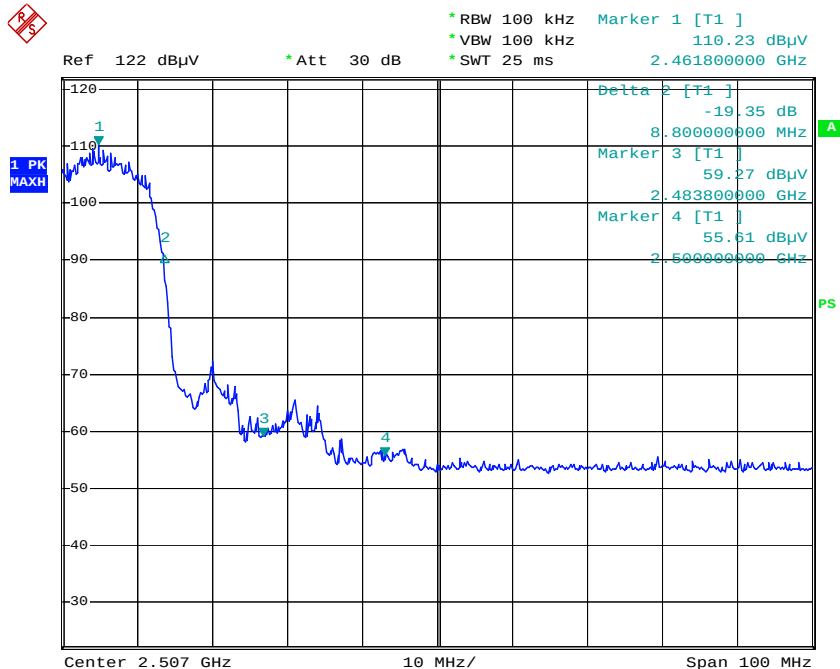
Note : 1. Radiated band edge field strength is measured with measurement procedure ANSI C63.4-2003.

Photo of Band Edge Measurement

Note : For 802.11b Mode

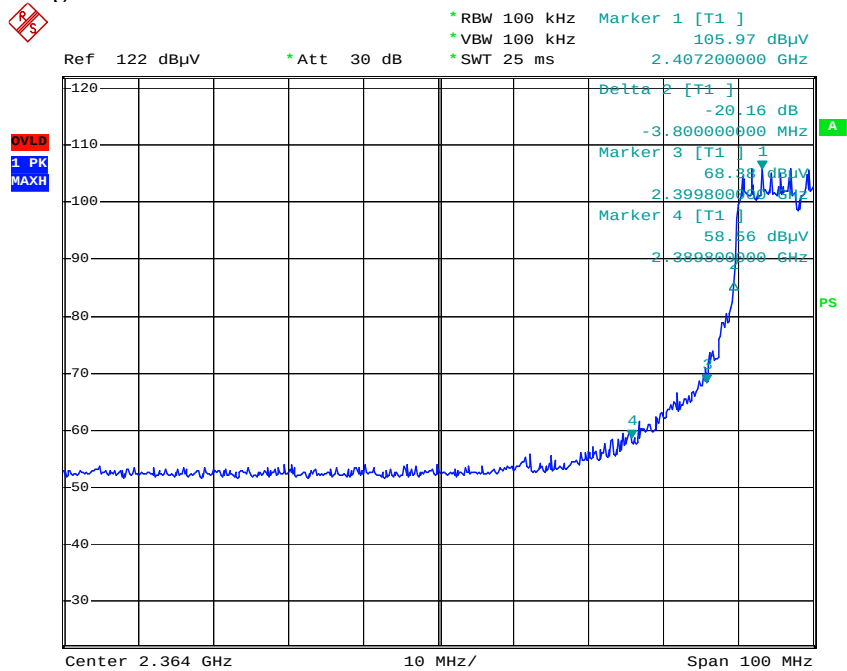


Date: 14.JUL.2006 20:48:41

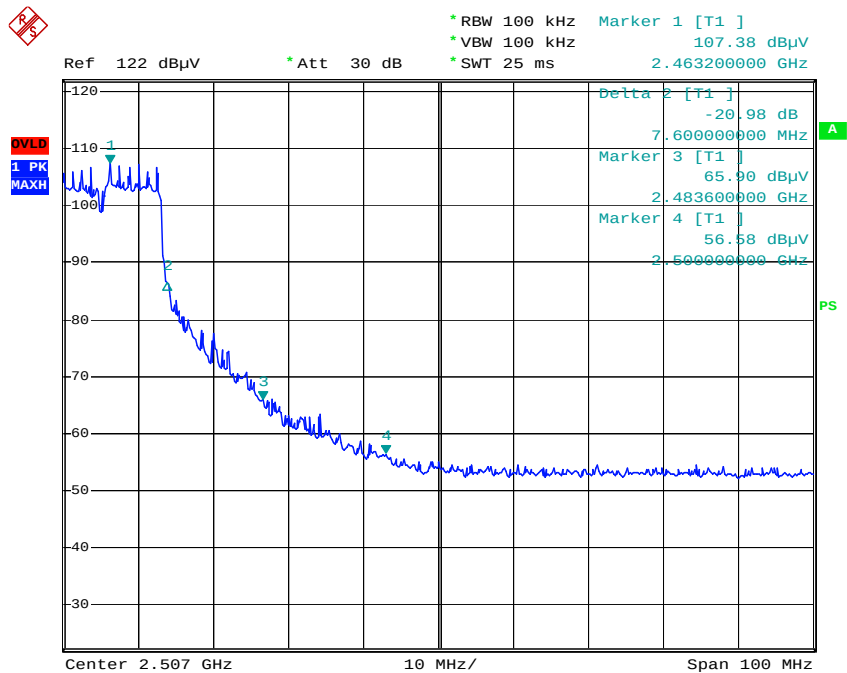


Date: 14.JUL.2006 20:51:13

Note : For 802.11g Mode



Date: 14.JUL.2006 20:58:13

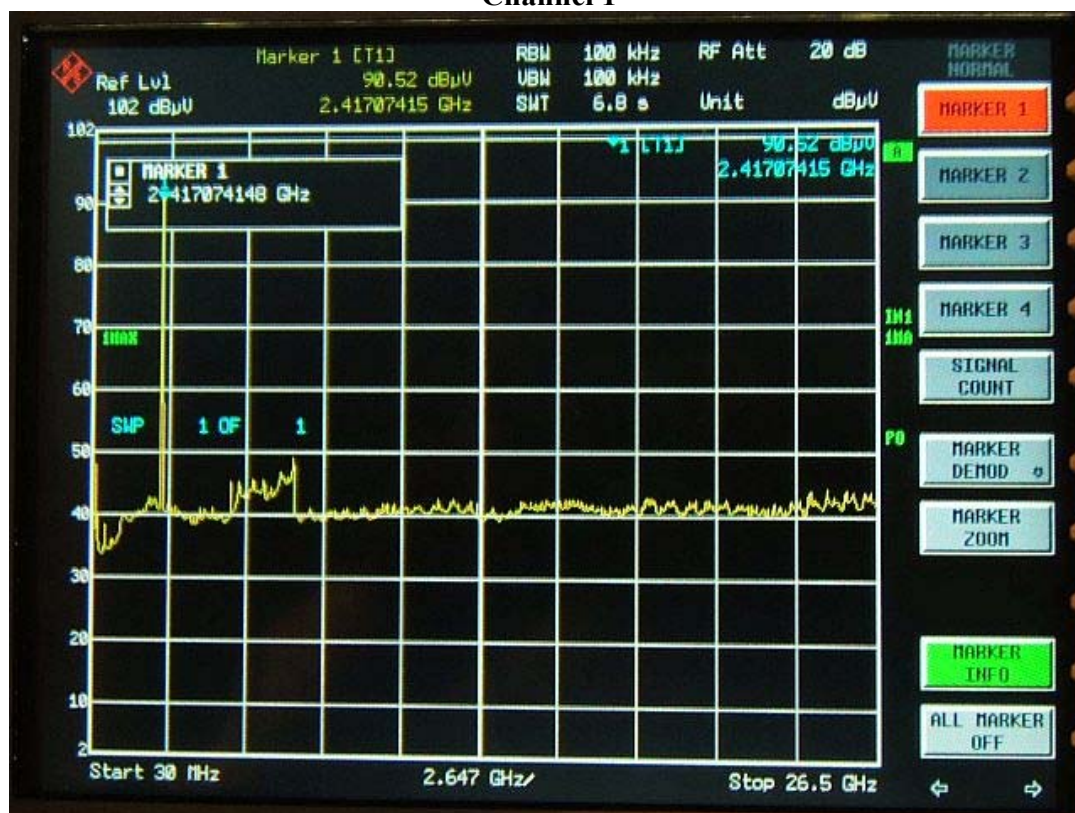


Date: 14.JUL.2006 20:55:58

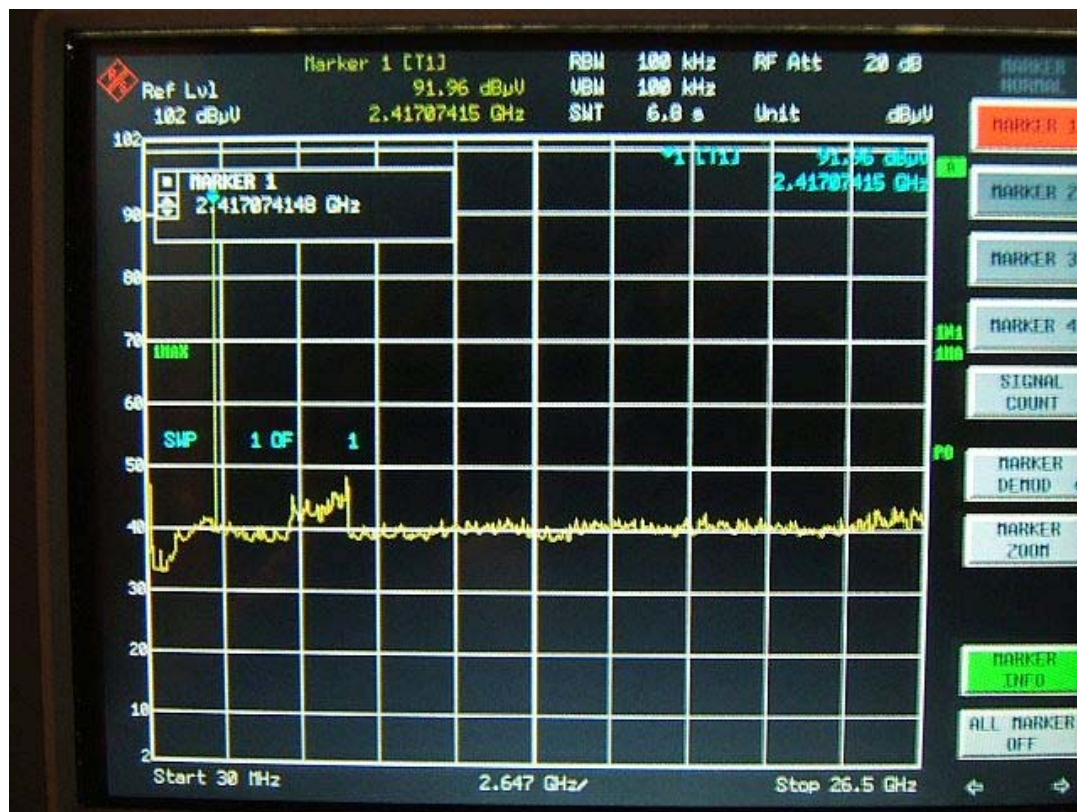
Out-of-band Spurious Emissions-conducted measurement

For 802.11b Mode

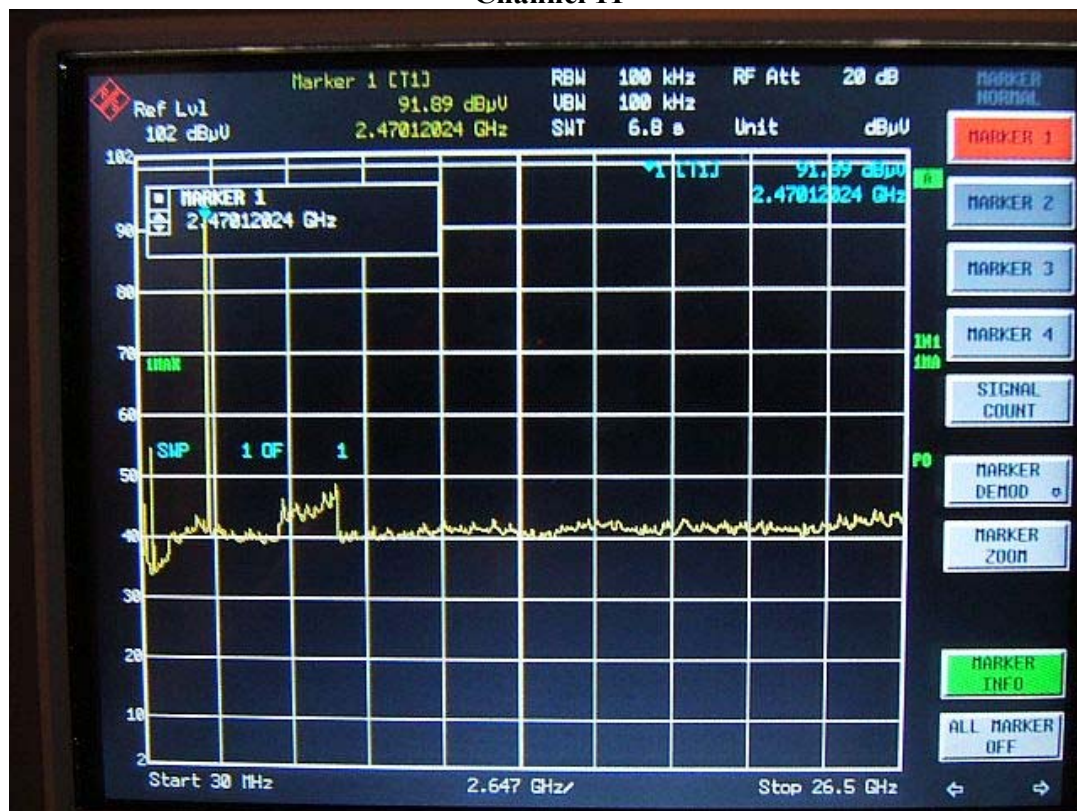
Channel 1



Channel 6

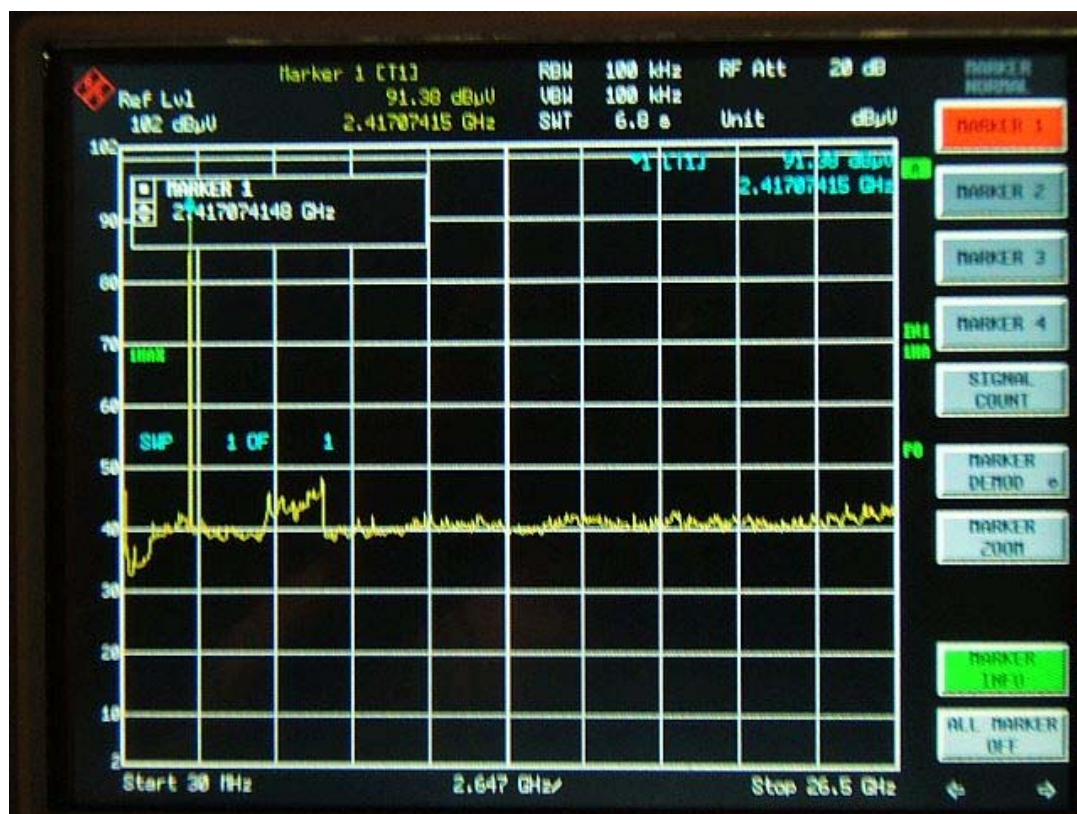


Channel 11

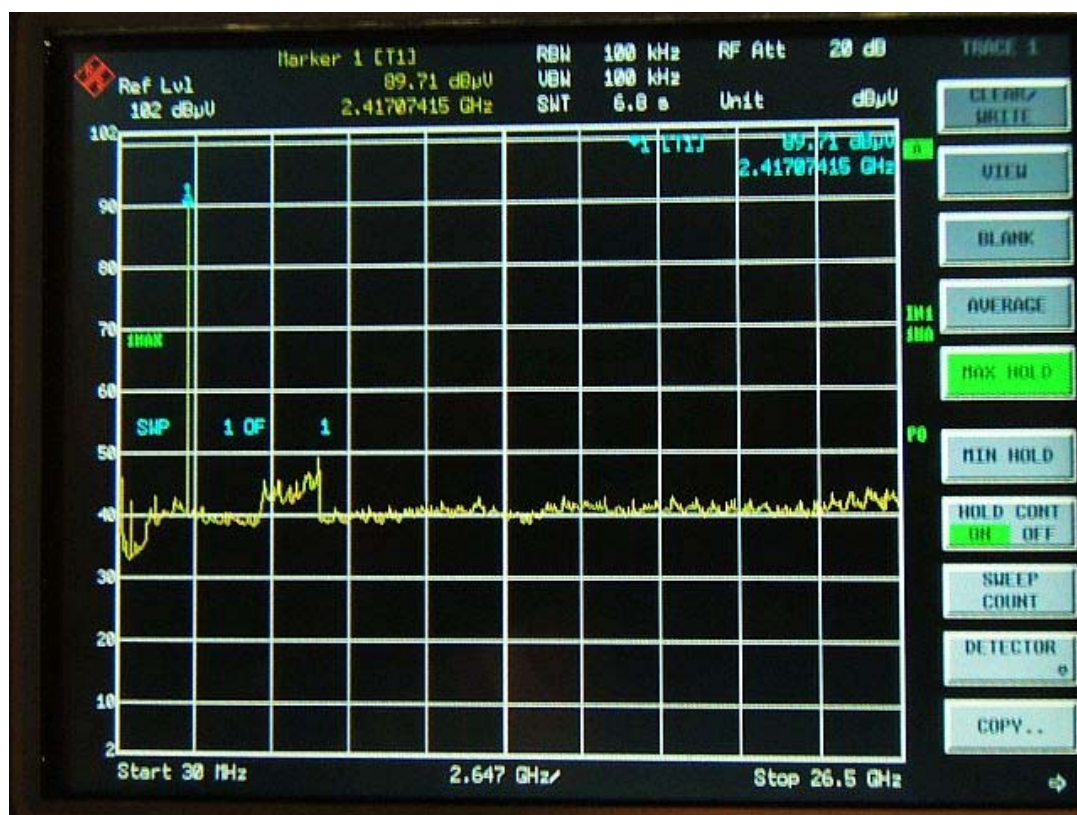


For 802.11g Mode

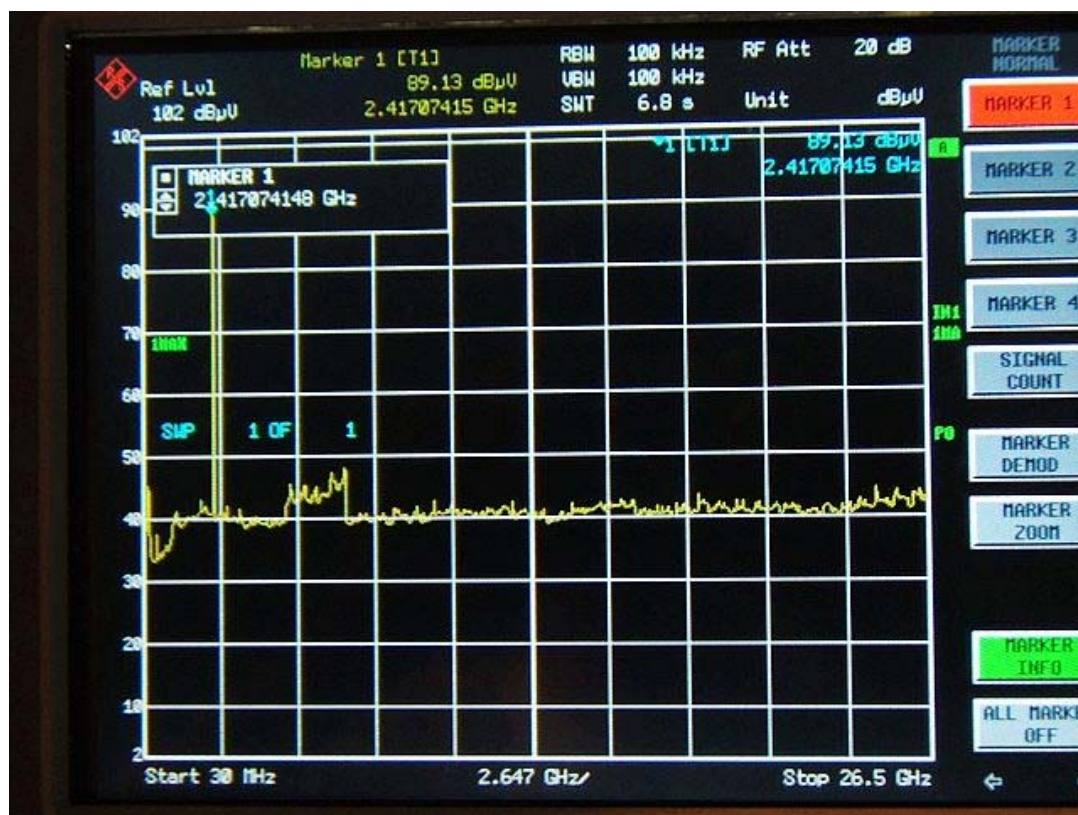
Channel 1



Channel 6



Channel 11



11. ANTENNA REQUIREMENT

11.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Refer to statement below for compliance.

The antenna for this device is an integral antenna that the end user cannot remove.

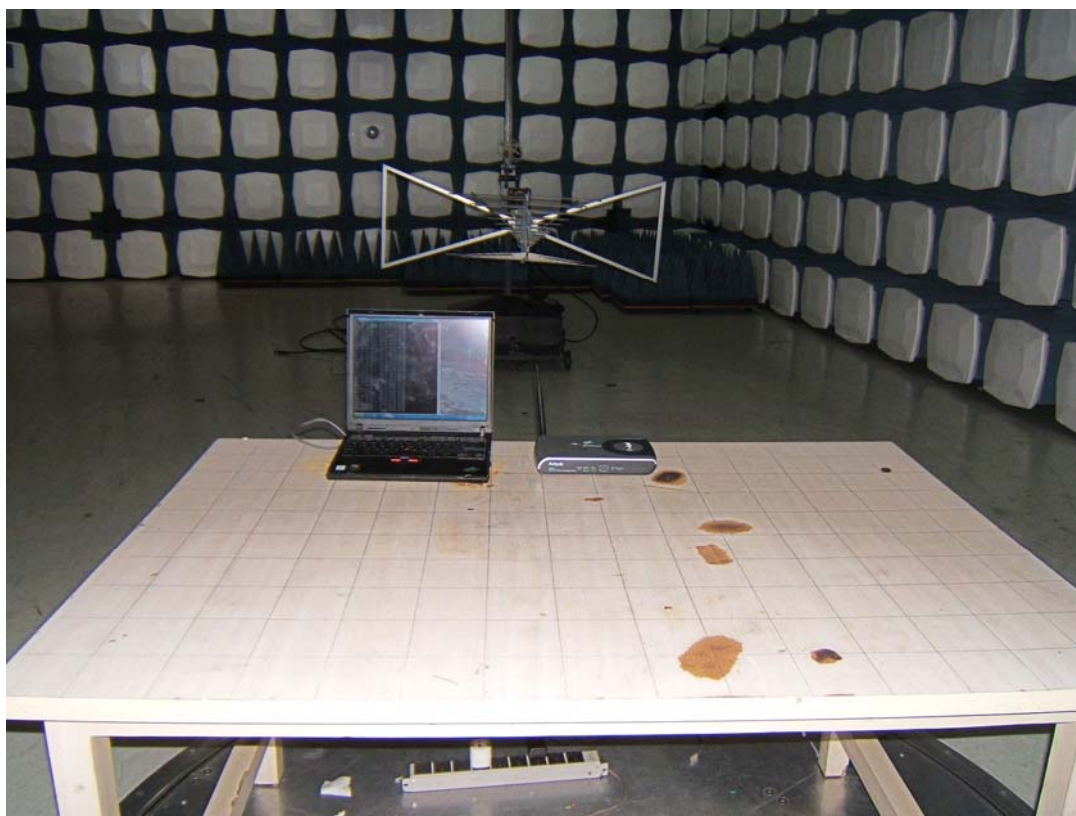
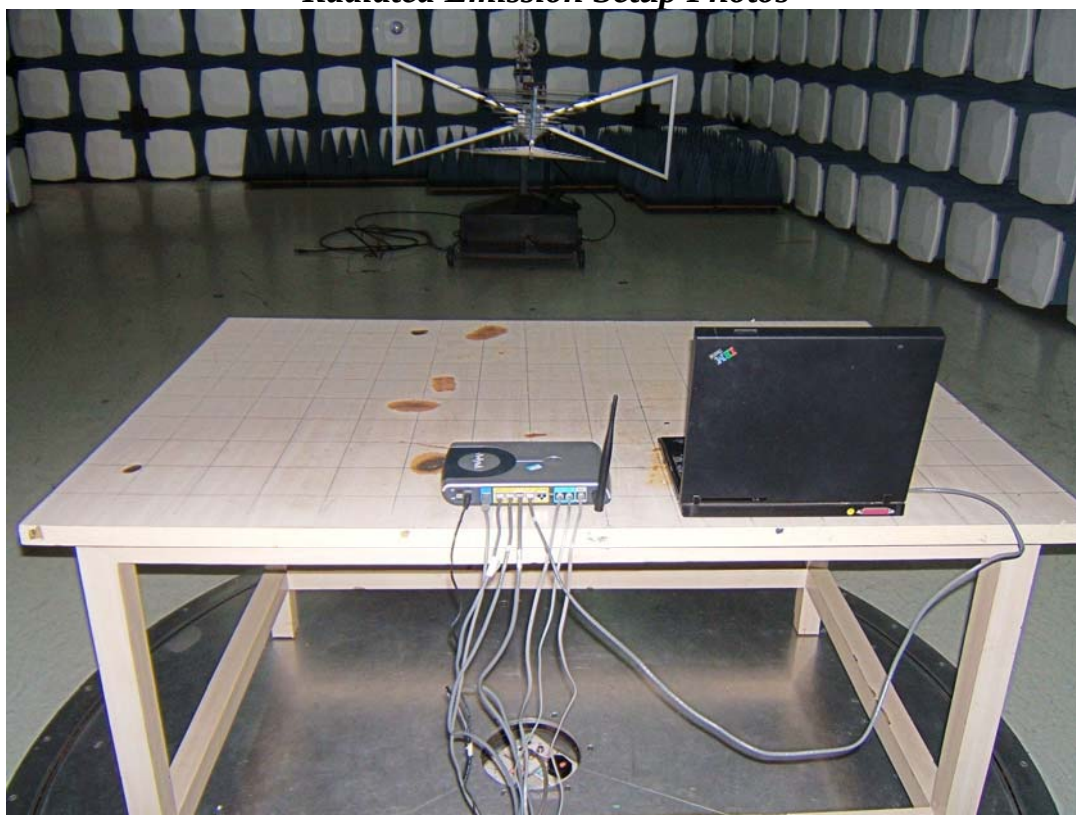
11.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Dipole antenna. The maximum Gain of the antenna only 3dBi.

APPENDIX 1

PHOTOGRAPHS OF SET UP

Radiated Emission Setup Photos



Conducted Emission Setup Photo



APPENDIX 2

PHOTOGRAPHS OF EUT

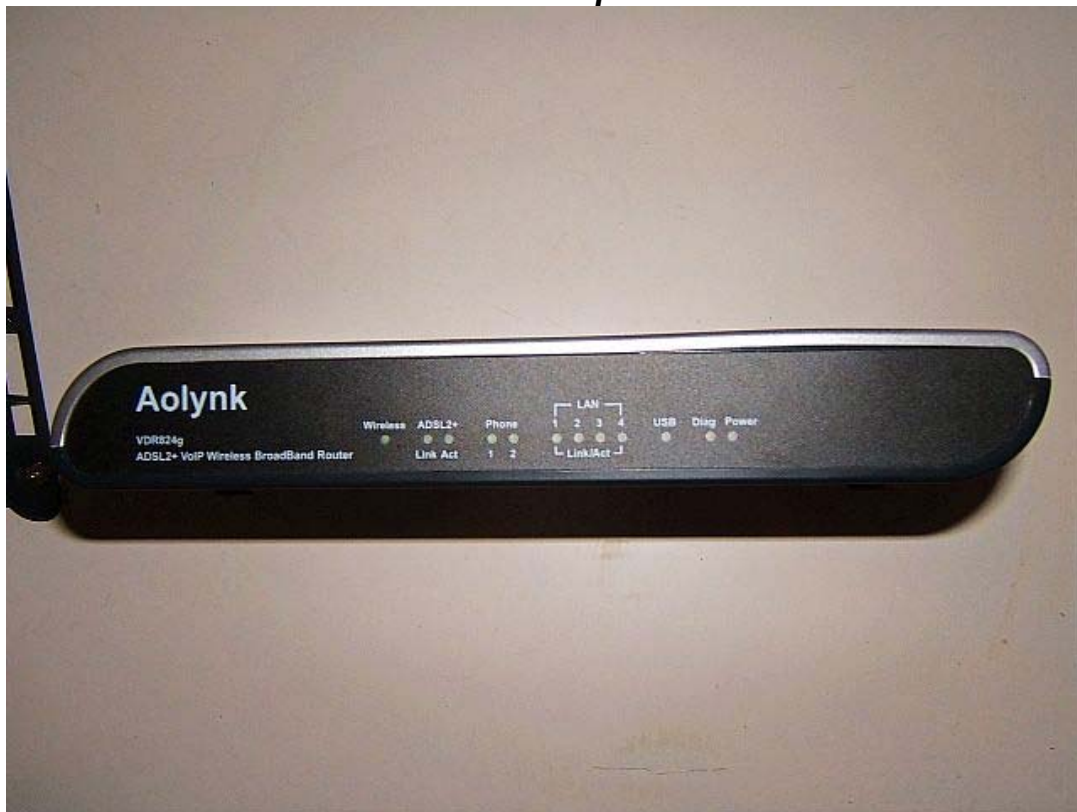
Top View of EUT



Bottom View of EUT



Front View of EUT



Back View of EUT



Left View of EUT



Right View of EUT



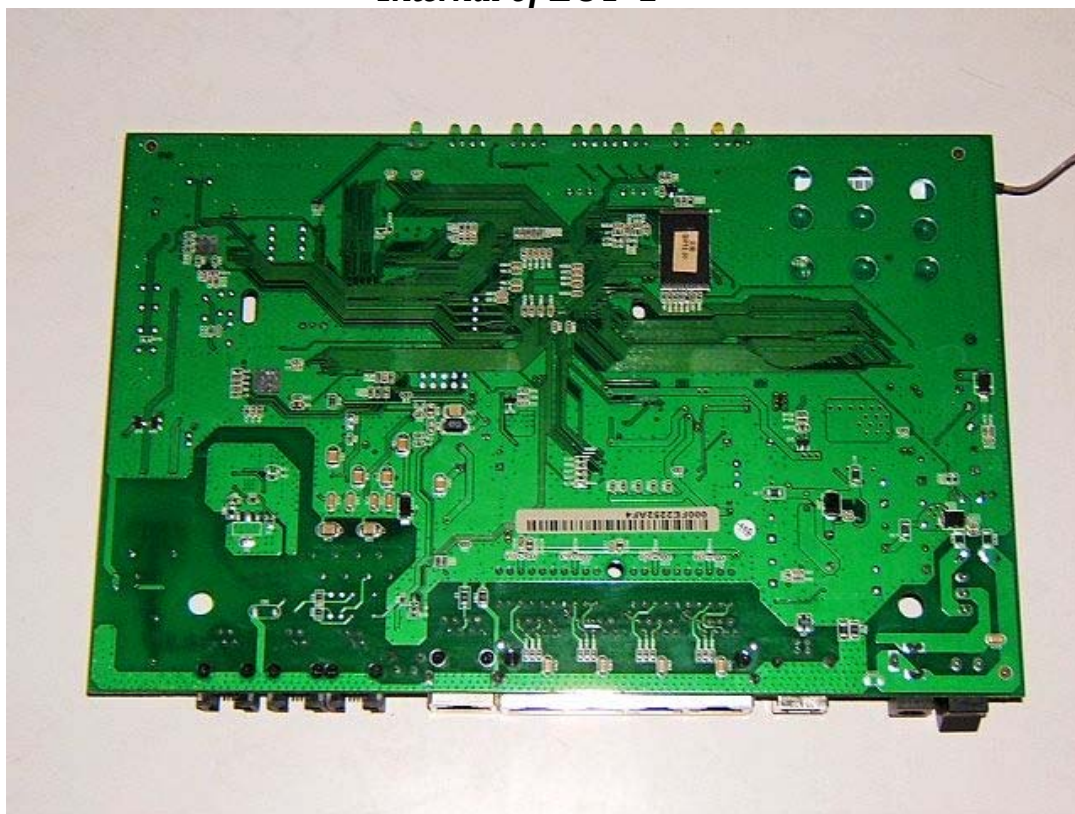
Internal of EUT- Open



Internal of EUT- 1



Internal of EUT-2



Internal of EUT-3



Internal of EUT-4



Internal of EUT-5



Internal of EUT-6

