



## RF TEST REPORT

**Product Name** : ADSL2+ Wireless Router

**Model Number** : WDR814g

**FCC ID** : QISH3CSOHOWDR814G

**Applicant** : Huawei Technologies Co., Ltd.

**Address** : Bantian, Longgang District Shenzhen,  
Guangdong 518429 P.R.China

**Received Date** : March 14, 2005

**Tested Date** : March 14 ~ 30, 2005

Issued by

**Compliance Certification Services Inc.**  
**Hsinchu Lab.**

Rm. 258, Bldg. 17, NO.195, Sec.4 Chung HsingRd.,  
ChuTung Chen, Hsinchu, Taiwan 310, R.O.C

**TEL: (03) 591-8012**

**FAX: (03) 582-5720**

Notes :

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2. This report refers only to the specimen(s) submitted to testing, and be invalid as separately used.
3. This report is invalid without examination stamp and signature of this institute.
4. The tested specimen(s) will be preserved for thirty days from the data issued.
5. The report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.
6. **This report is transferred from 50314301-RP2.**





# Test Report Certification

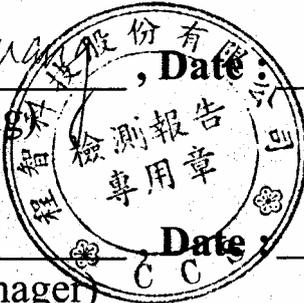
**Product Name** : ADSL2+ Wireless Router  
**Model Number** : WDR814g  
**FCC ID** : QISH3CSOHOWDR814G  
**Applicant** : Huawei Technologies Co., Ltd.

## Measurement Standard :

FCC 47 C.F.R. Part 15, Subpart B and Subpart C (2004),  
ANSI C63.4 (2003)  
CISPR 22, CLASS B, (1997) +A2 (2002)

**Tested By** : Chris Huang, **Date** : April 12, 2005  
                  (Chris Huang)

**Approved By** : C.F. Wu, **Date** : April 12, 2005  
                  (C.F.Wu, Manager)



WE HEREBY CERTIFY THAT: The measurements shown in the attachment were made in accordance with the procedures indicated, and the energy emitted by the equipment was found to be within the limits applicable. We assume full responsibility for the accuracy and completeness of these measurements and vouch for the qualifications of all persons taking them.



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## 1. GENERAL INFORMATION

### 1.1 General Statement

MEASUREMENT DEVIATION : Comply with standard in full

TRACEABILITY : This test result is traceable to National or International std.

### 1.2 General Description of EUT & Power

<b>Product Name</b>	ADSL2+ Wireless Router
<b>Model Number</b>	WDR814g
<b>Frequency Range</b>	2400MHz to 2483.5MHz
<b>Frequency Channel</b>	2412MHz + 5×n (MHz), n=0, 1, 2,.....10
<b>Channel Number</b>	11
<b>Channel Spacing</b>	5MHz
<b>Air Data Rate</b>	11Mbps(802.11b Mode), 54Mbps(802.11g Mode)
<b>Type of Modulation</b>	802.11b : DSSS(CCK, DQPSK, DBPSK) 802.11g : OFDM(64QAM, 16AQM, QPSK, BPSK)
<b>Frequency Selection</b>	by software / firmware
<b>Transmitter Classification</b>	Mobile device
<b>EUT Description</b>	2.4GHz (Direct Sequence Spread Spectrum and Orthogonal Frequency Division Multiplex) Data Transceiver for WLAN application
<b>Antenna Type</b>	Dipole Antenna, Antenna gain : 2dBi
<b>Power Source</b>	120VAC/60Hz, Single phase 12VDC(From Power Adapter)
<b>Power Cable</b>	Unshielded cable, 1.8m
<b>I/O Port</b>	LAN Port × 4 、 WAN Port × 1 、 USB Port × 1

Power Adapter :

No.	Manufacturer	Model Name	Power Input	Power Output
1	PHIHONG	PSA15R-120P	100~240VAC, 50/60Hz, 0.5A	12VDC, 1.25A
2	HON-KWANG	D12-1A	120VAC, 60Hz, 23W	12VDC, 1000mA

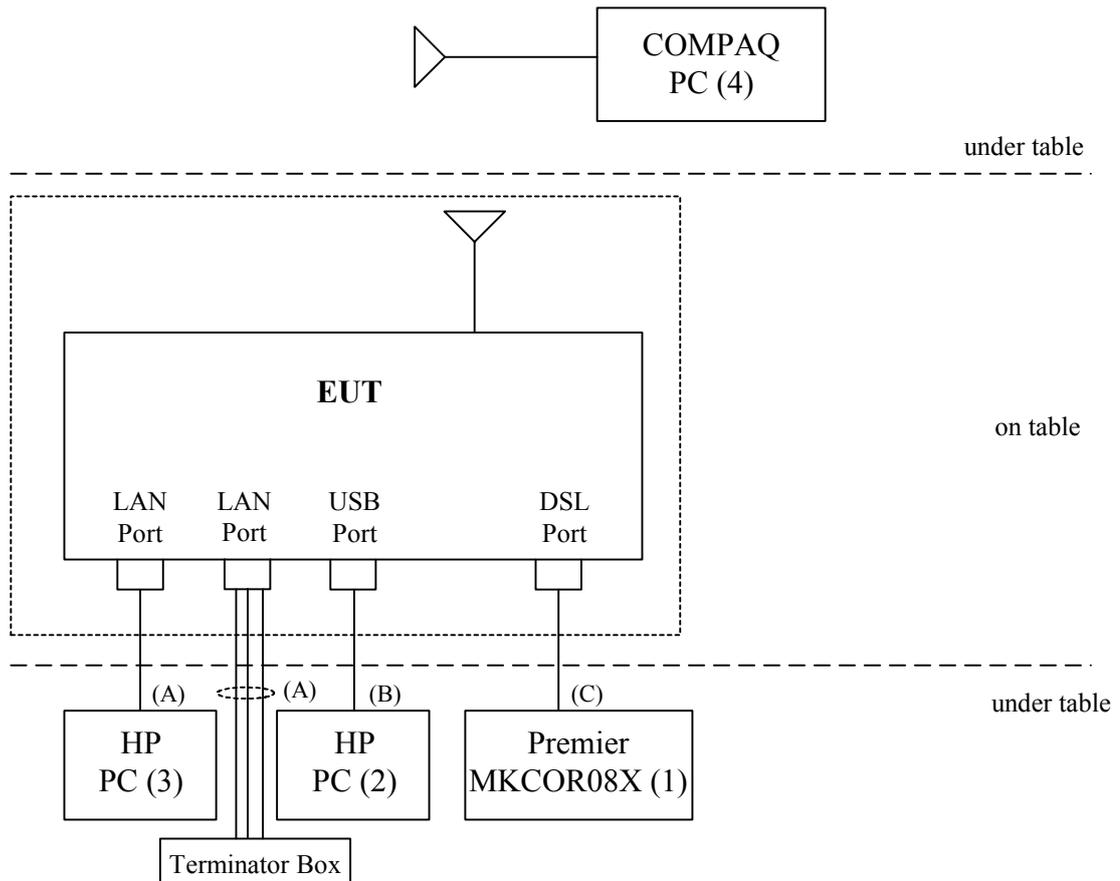


### 1.3 Description of Peripherals

No.	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	CO (Central office)	Premier Microelectronics	MKCOR08X	-----	DoC
2	PC	HP	t123d	TW31720190	DoC
3	PC	HP	t123d	TW31720220	DoC
4	Notebook PC	COMPAQ	N800V	5Y33KSQZMOYL	DoC

No.	Signal cable description
A	Unshielded RJ-45 cable, 15m
B	Unshielded USB cable, 10m
C	Unshielded RJ-11 cable, 15m

### 1.4 EUT & Peripherals Setup Diagram



The indicated numbers (1)(2)...,(A)...,please refer to item 1.3



## 1.5 EUT Operating Condition

1. Set up all computers like the setup diagram.
2. Run "Radioscope.exe".
3. Select "Ethernet user DLL interface at IP address", and fill IP address "192.168.1.1".
4. Push "Connect" button to connect to the WDR814g device.
5. Push "Init All" button to initiate the wireless module before any testing.
6. Tx Continuous
  - \* Right side - Select "General" tab
    - (1) Select your channel.
  - \* Left side - Select "TX" tab
    - (1) Select "FCC Continuous"
    - (2) Select "Tx Rate", '11 Mbit CCK' for 802.11b and '54 Mbit' for 802.11g.
    - (3) Push "TX" button to start TX transmission
7. Start test.



## 1.6 Description of Test Site

SITE DESCRIPTION :

FCC Certificate NO. : 90585  
BSMI Certificate NO. : SL2-IN-E-0002  
NVLAP Lab Code : 200118-0  
CNLA Certificate NO. : CNLA-ZL97018E  
VCCI Certificate NO. : R-1189, C-1250  
TÜV Rheinland Certificate NO. : 10008375

NAME OF SITE : Compliance Certification Services Inc. Hsinchu Lab.

SITE LOCATION : Rm.258, Bldg.17, NO.195 , Sec. 4, Chung Hsing Rd.,  
Chu-Tung Chen. Hsin-Chu, Taiwan 310 R.O.C.



## 1.7 Summary of Test Results

The EUT has been tested according to the following specifications :

<b>APPLIED STANDARD : FCC 47 C.F.R. Part 15, Subpart B and Subpart C</b>			
<b>Standard Section</b>	<b>Test Item and Limit</b>	<b>Result</b>	<b>REMARK</b>
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



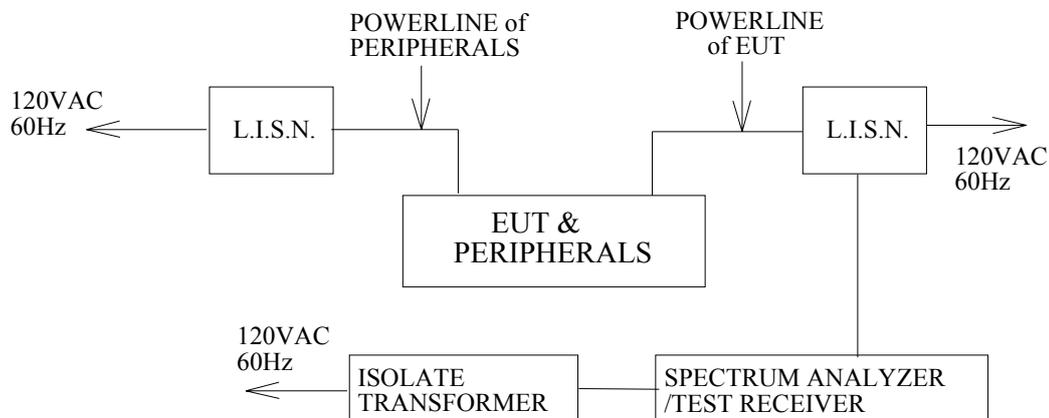
## 2. CONDUCTED POWERLINE TEST

### 2.1 Test Equipments

The following test equipments are used during the conducted powerline tests :

Manufacturer or Type	Model No.	Serial No.	Date of Calibration	Calibration Period	Remark
HP SPECTRUM ANALYZER & DISPLAY	8594E	3801A05627	April 26, 2004	1 Year	PRETEST
SOLAR ISOLATION TRANSFORMER	7032-1	N/A	N/A	N/A	FINAL
EMCO L.I.S.N.	3850/2	9311-1025 9401-1028	January 10, 2005 For Characteristic impedance	1 Year	FINAL
			May 18, 2004 For Insertion loss		
R & S TEST RECEIVER	ESHS30	838550/003	February 21, 2005	1 Year	FINAL
KEENE SHIELDED ROOM	5983	No.1	N/A	N/A	FINAL
R & S PULSE LIMIT	EHS3Z2	357.8810.52	July 10, 2004	1 Year	FINAL
N TYPE COAXIAL CABLE	-----	-----	July 10, 2004	1 Year	FINAL
50Ω TERMINATOR	-----	-----	July 10, 2004	1 Year	FINAL

### 2.2 Test Setup





## 2.3 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 (dB $\mu$ v)			
	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.

## 2.4 Test Procedure

The test procedure is performed in a 12ft×12ft×8ft(L×W×H) shielded room.

The EUT along with its peripherals were placed on a 1.0m(W)× 1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chasis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chasis ground also bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

## 2.5 Uncertainty of Conducted Emission

The uncertainty of conducted emission is  $\pm 2.1$ dB.

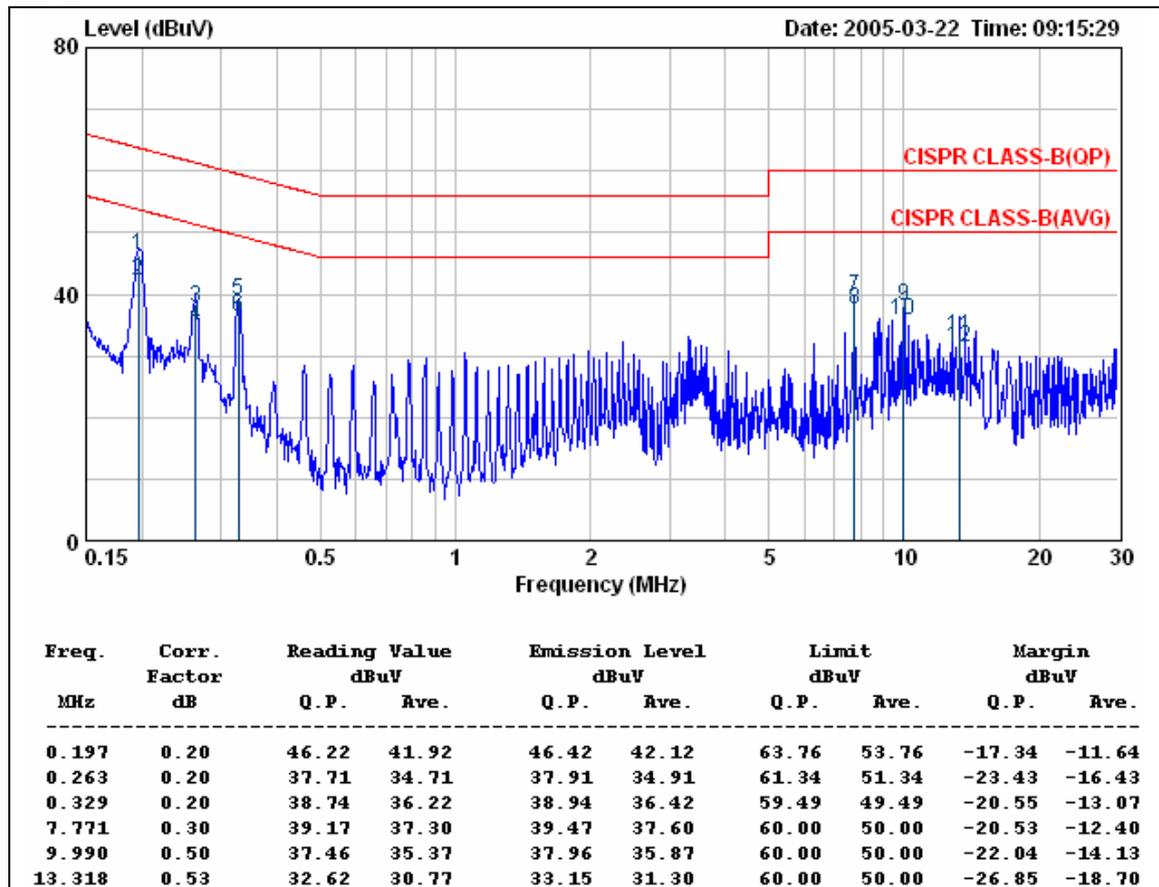


## 2.6 Conducted RF Voltage Measurement

The frequency spectrum from 0.15 MHz to 30 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

Company	Huawei Technologies Co., Ltd.	Test Date	2005/03/22
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	25°C, 60%

LINE



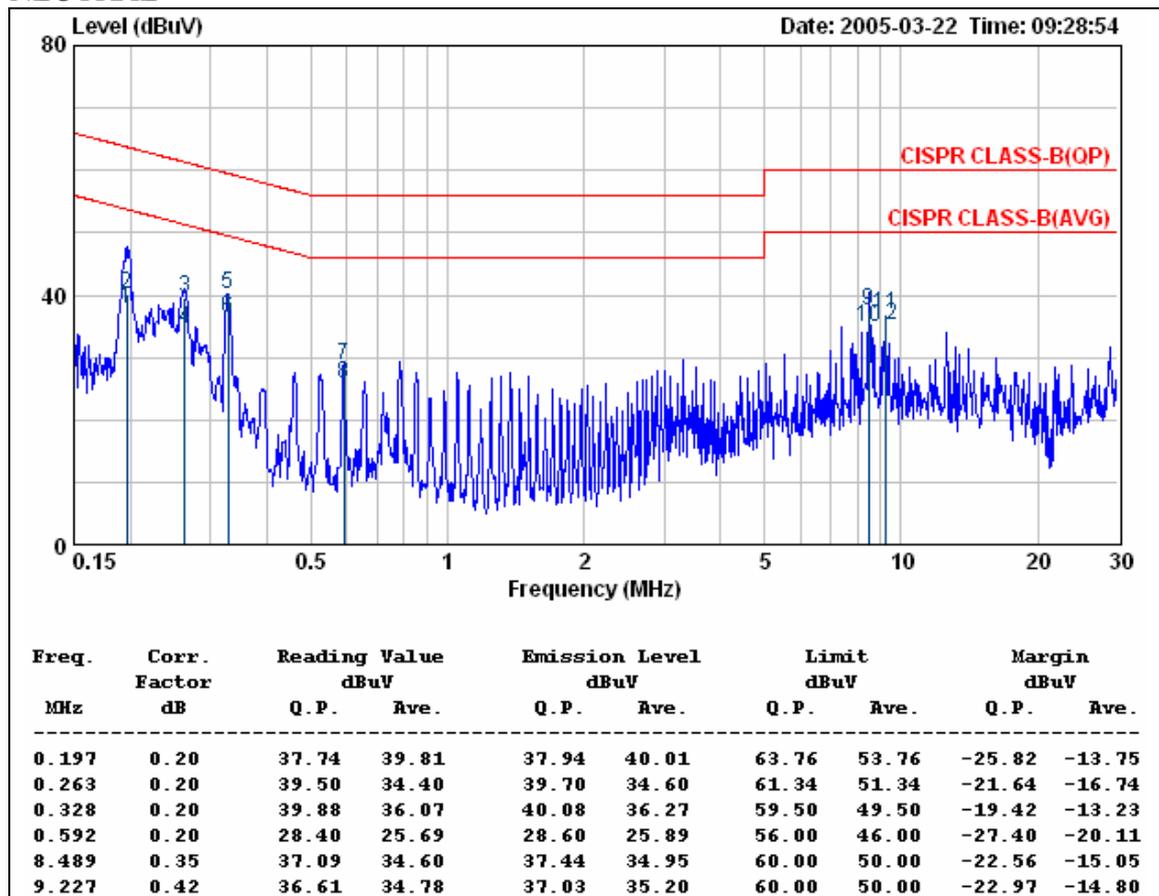
- REMARKS :
1. Correction Factor = Insertion loss + cable loss
  2. Margin value = Emission level – Limit value
  3. The EUT was set to be normal operation condition. Each Ethernet port was connected and data payload was transmitted at highest data rate. The RF chip can be operated in 802.11g and 802.11b mode. The rf chip will detect the environment and select the proper mode automatically. The WLAN function was set to normal operation condition.
  4. For Adapter : PHIHONG / PSA15R-120P



The frequency spectrum from 0.15 MHz to 30 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

Company	Huawei Technologies Co., Ltd.	Test Date	2005/03/22
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	25°C, 60%

## NEUTRAL



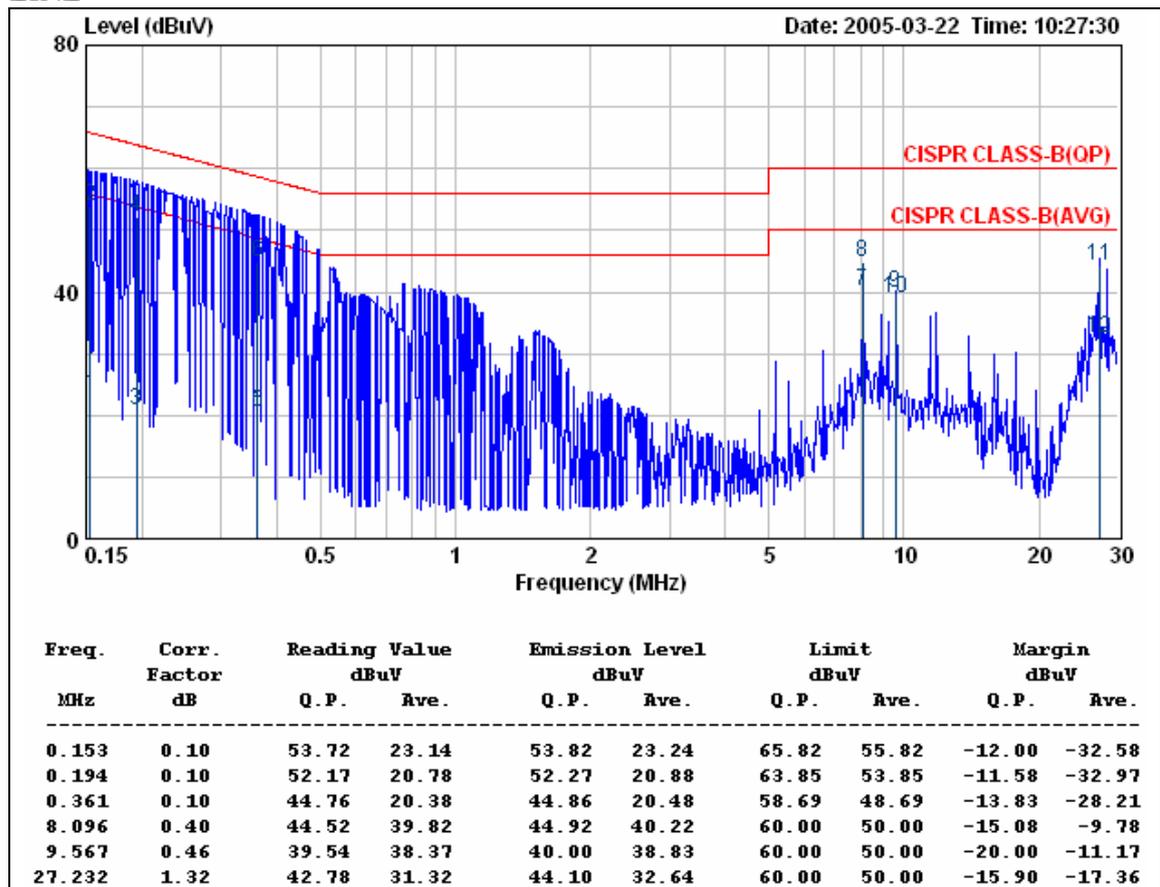
- REMARKS :
1. Correction Factor = Insertion loss + cable loss
  2. Margin value = Emission level – Limit value
  3. The EUT was set to be normal operation condition. Each Ethernet port was connected and data payload was transmitted at highest data rate. The RF chip can be operated in 802.11g and 802.11b mode. The rf chip will detect the environment and select the proper mode automatically. The WLAN function was set to normal operation condition.
  4. For Adapter : PHIHONG / PSA15R-120P



The frequency spectrum from 0.15 MHz to 30 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

Company	Huawei Technologies Co., Ltd.	Test Date	2005/03/22
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	25°C, 60%

## LINE



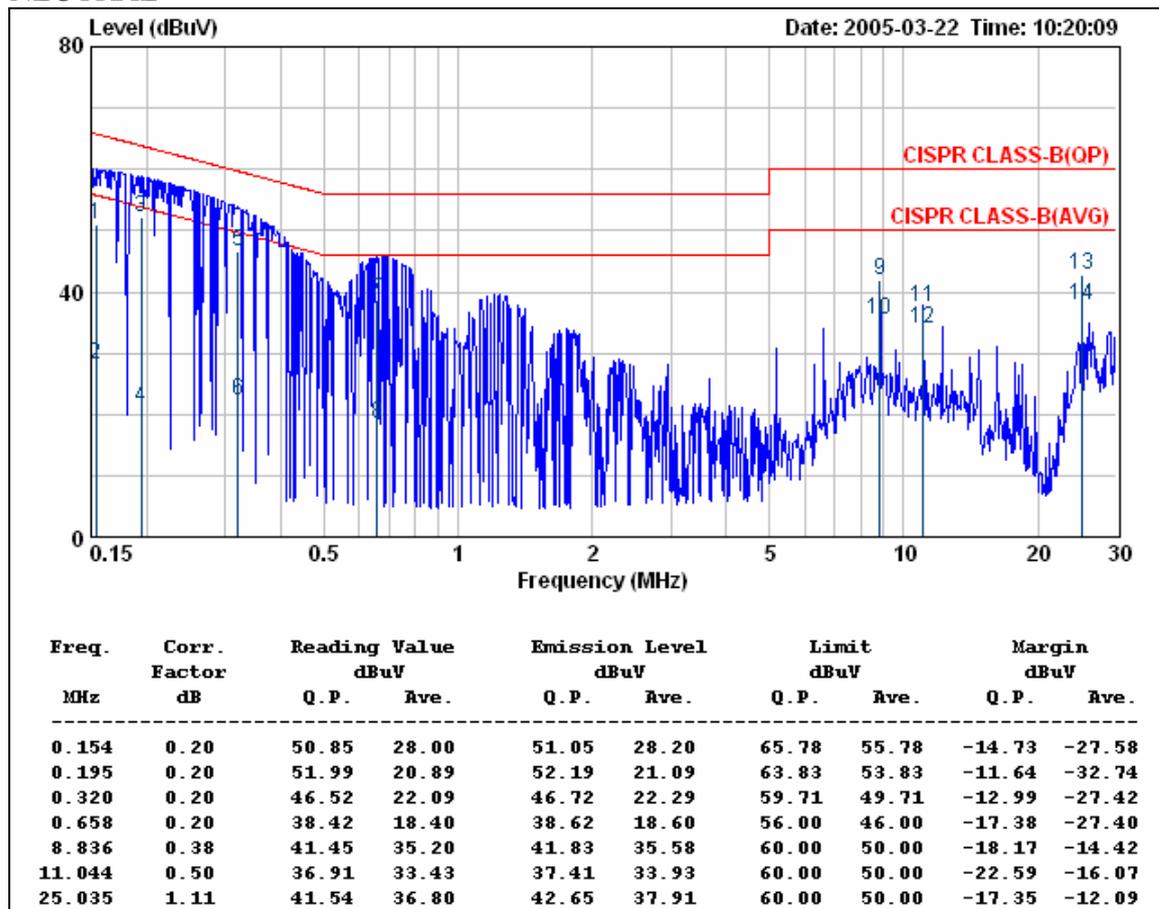
- REMARKS :
1. Correction Factor = Insertion loss + cable loss
  2. Margin value = Emission level – Limit value
  3. The EUT was set to be normal operation condition. Each Ethernet port was connected and data payload was transmitted at highest data rate. The RF chip can be operated in 802.11g and 802.11b mode. The rf chip will detect the environment and select the proper mode automatically. The WLAN function was set to normal operation condition.
  4. For Adapter : HON-KWANG / D12-1A



The frequency spectrum from 0.15 MHz to 30 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

Company	Huawei Technologies Co., Ltd.	Test Date	2005/03/22
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	25°C, 60%

## NEUTRAL



- 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.
  4. For Adapter : HON-KWANG / D12-1A

## 2.7 Photos of Conduction Test



### 3. RADIATED EMISSION TEST

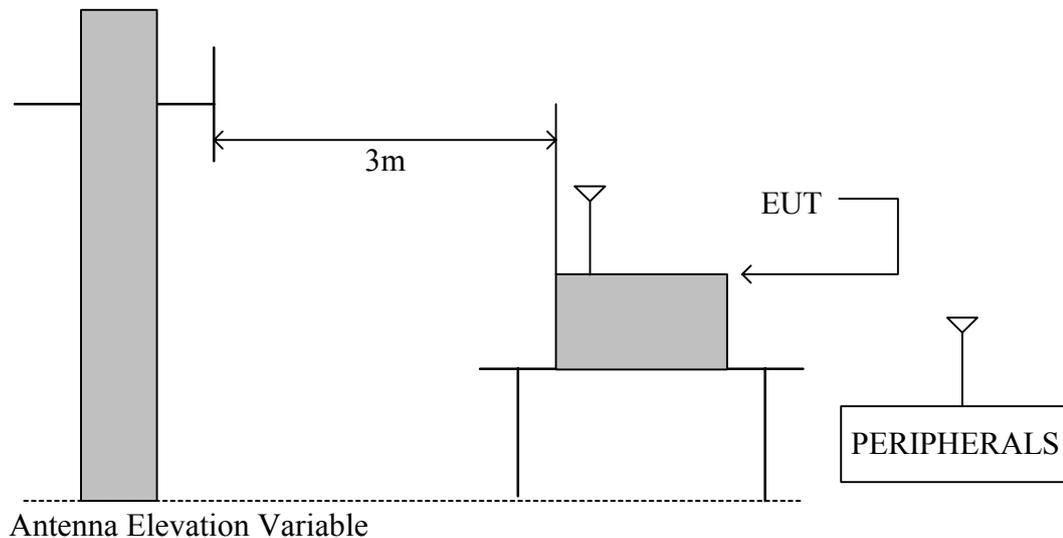
#### 3.1 Test Equipments

The following test equipments are utilized in making the measurements contained in this report.

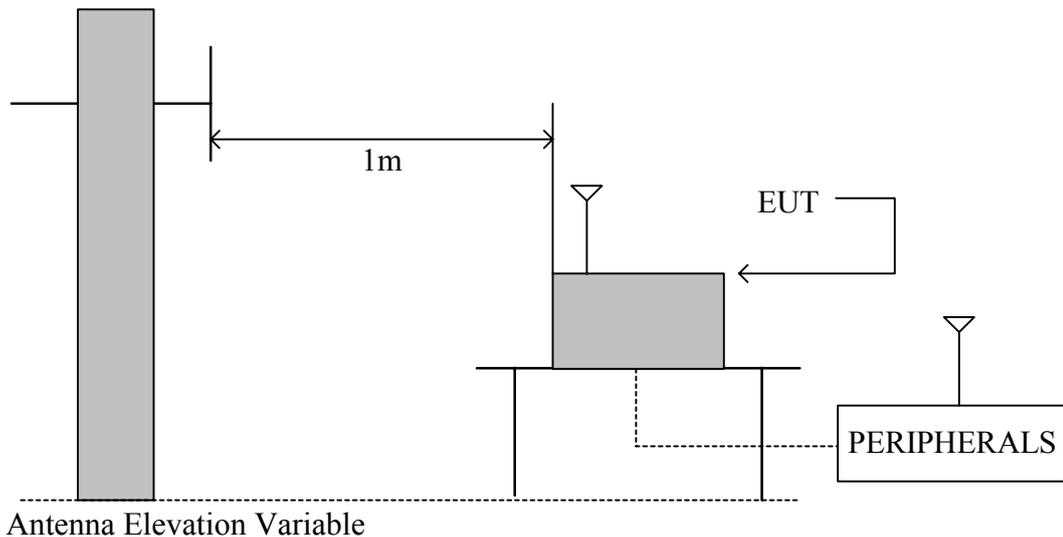
Manufacturer or Type	Model No.	Serial No.	Date of Calibration	Calibration Period	Remark
CHASE BI-LOG ANTENNA	CBL6112B	2421	June 15, 2004	1 Year	FINAL
R/S SPECTRUM ANALYZER	FSEK30	835253/002	September 06, 2004	1 Year	FINAL
OPEN SITE	-----	No.2	May 07, 2004	1 Year	FINAL
N TYPE COAXIAL CABLE	CHA9525	4	June 03, 2004	1 Year	FINAL
Horn Antenna	AH-118	10089	April 09, 2004	1 Year	FINAL
HP Pre-amplifier	8449B	3008A01471	November 24, 2004	1 Year	FINAL
HP High pass filter	84300/80038	002	CAL. ON USE	1 Year	FINAL
Horn Antenna	AH-840	3077	March 30, 2005	1 Year	FINAL

#### 3.2 Test Setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 to 1GHz.



The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz.



### 3.3 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.



### 3.4 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. During performing radiated emission below 1GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1GHz, the EUT was set 1 meters away from the interference-receiving antenna
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Note :

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

### 3.5 Uncertainty of Radiated Emission

The uncertainty of radiated emission is  $\pm 3.2$ dB.



### 3.6 Radiated RF Noise Measurement

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported are much lower than the prescribed limits.

All readings are quasi-peak values.

<b>Company</b>	Huawei Technologies Co., Ltd.	<b>Test Date</b>	2005/03/22
<b>Product Name</b>	ADSL2+ Wireless Router	<b>Test By</b>	Chris Huang
<b>Model Name</b>	WDR814g	<b>TEMP&amp;Humidity</b>	18.9°C, 74%

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading at 3m(dBμV)		Limits (dBμV/m)	Emission Level at 3m(dBμV/m)	
			Horizontal	Vertical		Horizontal	Vertical
30.00	17.01	0.97	*	*	40.00	*	*
124.99	12.95	2.21	15.90	22.30	43.50	31.06	37.46
200.02	9.80	3.14	17.40	18.60	43.50	30.34	31.54
249.99	12.72	4.01	24.20	19.80	46.00	40.93	36.53
374.99	17.18	4.71	23.10	22.50	46.00	45.00	44.40
437.48	18.19	4.98	19.10	16.90	46.00	42.27	40.07
750.00	20.13	6.54	7.50	10.50	46.00	34.17	37.17
999.96	21.84	7.66	8.10	9.20	54.00	37.60	38.70
1000.00	21.30	7.00	*	*	54.00	*	*

- REMARKS :
- \* Undetectable
  - Emission level (dBμV/m) = Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV).
  - The test data marked in gray background means the EUT emission data is located in the margin uncertainty range of emission limits.



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	2004/03/29
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	19.5°C, 79%

CH1 TX				Measurement Distance at 1m Horizontal polarity							
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
* 2389.90	13.40	31.81	3.57	0.00	9.50	0.00	39.28	74.00	-34.72	P	1.00
* 2389.90	3.70	31.81	3.57	0.00	9.50	0.00	29.58	54.00	-24.42	A	1.00
2399.90	24.00	31.80	3.58	0.00	9.50	0.00	49.88	77.75	-27.87	P	1.00
2399.90	13.50	31.80	3.58	0.00	9.50	0.00	39.38	70.82	-31.44	A	1.00
2412.93	71.88	31.79	3.58	0.00	9.50	0.00	97.75	Fundamental Frequency		P	1.00
2412.93	64.95	31.79	3.58	0.00	9.50	0.00	90.82			A	1.00
* 1500.00	59.66	28.10	2.89	35.60	9.50	0.00	45.55	74.00	-28.45	P	1.00
* 1500.00	57.39	28.10	2.89	35.60	9.50	0.00	43.28	54.00	-10.72	A	1.00
* 4823.86	45.46	34.44	5.08	35.16	9.50	2.00	42.33	74.00	-31.67	P	1.00
* 4823.86	33.03	34.44	5.08	35.16	9.50	2.00	29.90	54.00	-24.10	A	1.00
7236.00	44.66	39.81	6.74	35.65	9.50	2.00	48.05	77.75	-29.70	P	1.00
7236.00	32.32	39.81	6.74	35.65	9.50	2.00	35.71	70.82	-35.11	A	1.00
9648.00	46.78	38.54	8.29	36.44	9.50	0.61	48.28	77.75	-29.47	P	1.00
9648.00	34.10	38.54	8.29	36.44	9.50	0.61	35.60	70.82	-35.22	A	1.00
* 12064.65	-----	-----	-----	-----	9.50	0.80	-----	-----	-----	-----	1.00
* 14477.58	-----	-----	-----	-----	0.00	0.67	-----	-----	-----	-----	1.00
16890.51	-----	-----	-----	-----	0.00	0.43	-----	-----	-----	-----	1.00
* 19303.44	-----	-----	-----	-----	0.00	1.96	-----	-----	-----	-----	1.00
21716.37	-----	-----	-----	-----	0.00	0.81	-----	-----	-----	-----	1.00
24129.30	-----	-----	-----	-----	0.00	2.89	-----	-----	-----	-----	1.00

Note :

- The measurement was searched to 10<sup>th</sup> harmonic, Remark "-----" means that the emissions level is too low to be measured.
- AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
- Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
- Remark "\*" means that Restricted band.
- Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
- The result basic equation calculation is as follow:  
Level=Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
- The other emission levels were very low against the limit
- The test limit distance is 3M limit.
- 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	2004/03/29
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	19.5°C, 79%

CH1 TX				Measurement Distance at 1m Vertical polarity							
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
* 2389.90	22.10	31.81	3.57	0.00	9.50	0.00	47.98	74.00	-26.02	P	1.00
* 2389.90	10.10	31.81	3.57	0.00	9.50	0.00	35.98	54.00	-18.02	A	1.00
2399.90	37.20	31.80	3.58	0.00	9.50	0.00	63.08	89.07	-25.99	P	1.00
2399.90	26.80	31.80	3.58	0.00	9.50	0.00	52.68	82.28	-29.60	A	1.00
2410.22	83.20	31.79	3.58	0.00	9.50	0.00	109.07	Fundamental Frequency		P	1.00
2410.22	76.41	31.79	3.58	0.00	9.50	0.00	102.28			A	1.00
* 1500.00	64.48	28.10	2.89	35.60	9.50	0.00	50.37	74.00	-23.63	P	1.00
* 1500.00	61.95	28.10	2.89	35.60	9.50	0.00	47.84	54.00	-6.16	A	1.00
* 4823.91	45.73	34.44	5.08	35.16	9.50	2.00	42.60	74.00	-31.40	P	1.00
* 4823.91	34.69	34.44	5.08	35.16	9.50	2.00	31.56	54.00	-22.44	A	1.00
7236.02	46.30	39.81	6.74	35.65	9.50	2.00	49.69	89.07	-39.38	P	1.00
7236.02	33.69	39.81	6.74	35.65	9.50	2.00	37.08	82.28	-45.20	A	1.00
9648.00	46.34	38.54	8.29	36.44	9.50	0.61	47.84	89.07	-41.23	P	1.00
9648.00	34.30	38.54	8.29	36.44	9.50	0.61	35.80	82.28	-46.48	A	1.00
* 12051.10	-----	-----	-----	-----	9.50	0.80	-----	-----	-----	-----	1.00
14461.32	-----	-----	-----	-----	0.00	0.65	-----	-----	-----	-----	1.00
16871.54	-----	-----	-----	-----	0.00	0.42	-----	-----	-----	-----	1.00
* 19281.76	-----	-----	-----	-----	0.00	1.94	-----	-----	-----	-----	1.00
21691.98	-----	-----	-----	-----	0.00	0.82	-----	-----	-----	-----	1.00
24102.20	-----	-----	-----	-----	0.00	2.94	-----	-----	-----	-----	1.00

Note :

- The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
- AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
- Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
- Remark "\*" means that Restricted band.
- Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
- The result basic equation calculation is as follow:  
Level = Reading + AF + Cable – Preamp + Filter - Dist, Margin = Level - Limit
- The other emission levels were very low against the limit
- The test limit distance is 3M limit.
- 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	2004/03/29
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	19.5°C, 79%

CH6 TX				Measurement Distance at 1m Horizontal polarity							
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
2437.68	71.12	31.76	3.59	0.00	9.50	0.00	96.97	Fundamental Frequency		P	1.00
2437.68	64.17	31.76	3.59	0.00	9.50	0.00	90.02			A	1.00
* 1500.00	60.25	28.10	2.89	35.60	9.50	0.00	46.14	74.00	-27.86	P	1.00
* 1500.00	57.67	28.10	2.89	35.60	9.50	0.00	43.56	54.00	-10.44	A	1.00
* 4874.08	45.35	34.77	5.10	35.20	9.50	1.80	42.32	74.00	-31.68	P	1.00
* 4874.08	32.80	34.77	5.10	35.20	9.50	1.80	29.77	54.00	-24.23	A	1.00
* 7311.05	46.73	39.78	6.79	35.64	9.50	2.00	50.16	74.00	-23.84	P	1.00
* 7311.05	33.90	39.78	6.79	35.64	9.50	2.00	37.33	54.00	-16.67	A	1.00
9747.89	44.48	38.53	8.33	36.60	9.50	0.55	45.79	76.97	-31.19	P	1.00
9747.89	34.30	38.53	8.33	36.60	9.50	0.55	35.61	70.02	-34.42	A	1.00
* 12188.40	-----	-----	-----	-----	9.50	0.80	-----	-----	-----	-----	1.00
14626.08	-----	-----	-----	-----	0.00	0.60	-----	-----	-----	-----	1.00
17063.76	-----	-----	-----	-----	0.00	0.53	-----	-----	-----	-----	1.00
* 19501.44	-----	-----	-----	-----	0.00	2.20	-----	-----	-----	-----	1.00
21939.12	-----	-----	-----	-----	0.00	0.72	-----	-----	-----	-----	1.00
24376.80	-----	-----	-----	-----	0.00	2.50	-----	-----	-----	-----	1.00

Note :

- The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
- AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
- Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
- Remark "\*" means that Restricted band.
- Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
- The result basic equation calculation is as follow:  
Level = Reading + AF + Cable – Preamp + Filter - Dist, Margin = Level - Limit
- The other emission levels were very low against the limit
- The test limit distance is 3M limit.
- 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	2004/03/29
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	19.5°C, 79%

CH6 TX				Measurement Distance at 1m Vertical polarity							
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
2435.92	83.22	31.76	3.59	0.00	9.50	0.00	109.08	Fundamental Frequency		P	1.00
2435.92	76.38	31.76	3.59	0.00	9.50	0.00	102.24			A	1.00
* 1500.00	64.46	28.10	2.89	35.60	9.50	0.00	50.35	74.00	-23.65	P	1.00
* 1500.00	61.92	28.10	2.89	35.60	9.50	0.00	47.81	54.00	-6.19	A	1.00
* 4874.07	44.90	34.77	5.10	35.20	9.50	1.80	41.87	74.00	-32.13	P	1.00
* 4874.07	35.75	34.77	5.10	35.20	9.50	1.80	32.72	54.00	-21.28	A	1.00
* 7311.01	45.84	39.78	6.79	35.64	9.50	2.00	49.27	74.00	-24.73	P	1.00
* 7311.01	33.48	39.78	6.79	35.64	9.50	2.00	36.91	54.00	-17.09	A	1.00
9747.98	47.10	38.53	8.33	36.60	9.50	0.55	48.41	89.08	-40.67	P	1.00
9747.98	34.30	38.53	8.33	36.60	9.50	0.55	35.61	82.24	-46.63	A	1.00
* 12179.60	-----	-----	-----	-----	9.50	0.80	-----	-----	-----	-----	1.00
14615.52	-----	-----	-----	-----	0.00	0.61	-----	-----	-----	-----	1.00
17051.44	-----	-----	-----	-----	0.00	0.52	-----	-----	-----	-----	1.00
* 19487.36	-----	-----	-----	-----	0.00	2.18	-----	-----	-----	-----	1.00
21923.28	-----	-----	-----	-----	0.00	0.73	-----	-----	-----	-----	1.00
24359.20	-----	-----	-----	-----	0.00	2.53	-----	-----	-----	-----	1.00

Note :

- The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
- AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
- Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
- Remark "\*" means that Restricted band.
- Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
- The result basic equation calculation is as follow:  
Level = Reading + AF + Cable – Preamp + Filter - Dist, Margin = Level - Limit
- The other emission levels were very low against the limit
- The test limit distance is 3M limit.
- 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	2004/03/29
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	19.5°C, 79%

CH11 TX				Measurement Distance at 1m Horizontal polarity							
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
2462.55	70.43	31.74	3.60	0.00	9.50	0.00	96.27	Fundamental Frequency		P	1.00
2462.55	63.60	31.74	3.60	0.00	9.50	0.00	89.44			A	1.00
* 2483.50	13.20	31.72	3.61	0.00	9.50	0.00	39.03	74.00	-34.97	P	1.00
* 2483.50	3.10	31.72	3.61	0.00	9.50	0.00	28.93	54.00	-25.07	A	1.00
* 2483.60	14.60	31.72	3.61	0.00	9.50	0.00	40.43	74.00	-33.57	P	1.00
* 2483.60	3.00	31.72	3.61	0.00	9.50	0.00	28.83	54.00	-25.17	A	1.00
* 1500.00	60.15	28.10	2.89	35.60	9.50	0.00	46.04	74.00	-27.96	P	1.00
* 1500.00	57.49	28.10	2.89	35.60	9.50	0.00	43.38	54.00	-10.62	A	1.00
* 4924.19	45.69	35.10	5.12	35.24	9.50	1.60	42.77	74.00	-31.23	P	1.00
* 4924.19	33.00	35.10	5.12	35.24	9.50	1.60	30.08	54.00	-23.92	A	1.00
* 7386.33	46.85	39.75	6.84	35.62	9.50	2.00	50.32	74.00	-23.68	P	1.00
* 7386.33	34.02	39.75	6.84	35.62	9.50	2.00	37.49	54.00	-16.51	A	1.00
9847.90	44.64	38.52	8.37	36.76	9.50	0.49	45.76	76.27	-30.52	P	1.00
9847.90	34.50	38.52	8.37	36.76	9.50	0.49	35.62	69.44	-33.83	A	1.00
* 12312.75	-----	-----	-----	-----	9.50	0.80	-----	-----	-----	-----	1.00
14775.30	-----	-----	-----	-----	0.00	0.48	-----	-----	-----	-----	1.00
17237.85	-----	-----	-----	-----	0.00	0.60	-----	-----	-----	-----	1.00
* 19700.40	-----	-----	-----	-----	0.00	2.40	-----	-----	-----	-----	1.00
* 22162.95	-----	-----	-----	-----	0.00	0.70	-----	-----	-----	-----	1.00
24625.50	-----	-----	-----	-----	0.00	2.12	-----	-----	-----	-----	1.00

Note :

- The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
- AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
- Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
- Remark "\*" means that Restricted band.
- Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
- The result basic equation calculation is as follow:  
Level = Reading + AF + Cable – Preamp + Filter - Dist, Margin = Level - Limit
- The other emission levels were very low against the limit
- The test limit distance is 3M limit.
- 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	2004/03/29
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	19.5°C, 79%

CH11 TX				Measurement Distance at 1m Vertical polarity							
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
2462.63	81.85	31.74	3.60	0.00	9.50	0.00	107.69	Fundamental Frequency		P	1.00
2462.63	74.97	31.74	3.60	0.00	9.50	0.00	100.81			A	1.00
* 2483.50	23.50	31.72	3.61	0.00	9.50	0.00	49.33	74.00	-24.67	P	1.00
* 2483.50	11.80	31.72	3.61	0.00	9.50	0.00	37.63	54.00	-16.37	A	1.00
* 2483.60	22.90	31.72	3.61	0.00	9.50	0.00	48.73	74.00	-25.27	P	1.00
* 2483.60	11.30	31.72	3.61	0.00	9.50	0.00	37.13	54.00	-16.87	A	1.00
* 1500.00	64.85	28.10	2.89	35.60	9.50	0.00	50.74	74.00	-23.26	P	1.00
* 1500.00	61.65	28.10	2.89	35.60	9.50	0.00	47.54	54.00	-6.46	A	1.00
* 4923.78	44.25	35.10	5.12	35.24	9.50	1.60	41.33	74.00	-32.67	P	1.00
* 4923.78	35.24	35.10	5.12	35.24	9.50	1.60	32.32	54.00	-21.68	A	1.00
* 7386.05	45.68	39.75	6.84	35.62	9.50	2.00	49.15	74.00	-24.85	P	1.00
* 7386.05	34.24	39.75	6.84	35.62	9.50	2.00	37.71	54.00	-16.29	A	1.00
9847.85	47.12	38.52	8.37	36.76	9.50	0.49	48.24	87.69	-39.46	P	1.00
9847.85	35.67	38.52	8.37	36.76	9.50	0.49	36.79	80.81	-44.03	A	1.00
* 12313.15	-----	-----	-----	-----	9.50	0.80	-----	-----	-----	-----	1.00
14775.78	-----	-----	-----	-----	0.00	0.48	-----	-----	-----	-----	1.00
17238.41	-----	-----	-----	-----	0.00	0.60	-----	-----	-----	-----	1.00
* 19701.04	-----	-----	-----	-----	0.00	2.40	-----	-----	-----	-----	1.00
* 22163.67	-----	-----	-----	-----	0.00	0.70	-----	-----	-----	-----	1.00
24626.30	-----	-----	-----	-----	0.00	2.12	-----	-----	-----	-----	1.00

Note :

- The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
- AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
- Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
- Remark "\*" means that Restricted band.
- Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
- The result basic equation calculation is as follow:  
Level = Reading + AF + Cable – Preamp + Filter - Dist, Margin = Level - Limit
- The other emission levels were very low against the limit
- The test limit distance is 3M limit.
- 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	2004/03/29
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	19.5°C, 79%

CH1 TX				Measurement Distance at 1m Horizontal polarity							
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
* 2389.90	31.40	31.81	3.57	0.00	9.50	0.00	57.28	74.00	-16.72	P	1.00
* 2389.90	10.30	31.81	3.57	0.00	9.50	0.00	36.18	54.00	-17.82	A	1.00
2399.90	46.20	31.80	3.58	0.00	9.50	0.00	72.08	77.67	-5.60	P	1.00
2399.90	28.00	31.80	3.58	0.00	9.50	0.00	53.88	68.53	-14.66	A	1.00
2407.11	71.80	31.79	3.58	0.00	9.50	0.00	97.67	Fundamental Frequency		P	1.00
2407.11	62.66	31.79	3.58	0.00	9.50	0.00	88.53			A	1.00
* 1500.00	59.16	28.10	2.89	35.60	9.50	0.00	45.05	74.00	-28.95	P	1.00
* 1500.00	57.28	28.10	2.89	35.60	9.50	0.00	43.17	54.00	-10.83	A	1.00
* 4824.00	45.59	34.44	5.08	35.16	9.50	2.00	42.46	74.00	-31.54	P	1.00
* 4824.00	33.48	34.44	5.08	35.16	9.50	2.00	30.35	54.00	-23.65	A	1.00
7236.00	45.19	39.81	6.74	35.65	9.50	2.00	48.58	77.67	-29.09	P	1.00
7236.00	33.03	39.81	6.74	35.65	9.50	2.00	36.42	68.53	-32.11	A	1.00
9648.00	43.85	38.54	8.29	36.44	9.50	0.61	45.35	77.67	-32.32	P	1.00
9648.00	33.90	38.54	8.29	36.44	9.50	0.61	35.40	68.53	-33.13	A	1.00
* 12035.55	-----	-----	-----	-----	9.50	0.80	-----	-----	-----	-----	1.00
14442.66	-----	-----	-----	-----	0.00	0.63	-----	-----	-----	-----	1.00
16849.77	-----	-----	-----	-----	0.00	0.41	-----	-----	-----	-----	1.00
* 19256.88	-----	-----	-----	-----	0.00	1.91	-----	-----	-----	-----	1.00
21663.99	-----	-----	-----	-----	0.00	0.83	-----	-----	-----	-----	1.00
24071.10	-----	-----	-----	-----	0.00	2.99	-----	-----	-----	-----	1.00

Note :

- The measurement was searched to 10<sup>th</sup> harmonic, Remark "-----" means that the emissions level is too low to be measured.
- AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
- Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
- Remark "\*" means that Restricted band.
- Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
- The result basic equation calculation is as follow:  
Level=Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
- The other emission levels were very low against the limit
- The test limit distance is 3M limit.
- 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	2004/03/29
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	19.5°C, 79%

CH1 TX				Measurement Distance at 1m Vertical polarity							
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
* 2389.90	42.90	31.81	3.57	0.00	9.50	0.00	68.78	74.00	-5.22	P	1.00
* 2389.90	21.40	31.81	3.57	0.00	9.50	0.00	47.28	54.00	-6.72	A	1.00
2399.90	57.00	31.80	3.58	0.00	9.50	0.00	82.88	88.15	-5.27	P	1.00
2399.90	39.10	31.80	3.58	0.00	9.50	0.00	64.98	79.23	-14.25	A	1.00
2413.35	82.28	31.79	3.58	0.00	9.50	0.00	108.15	Fundamental Frequency		P	1.00
2413.35	73.36	31.79	3.58	0.00	9.50	0.00	99.23			A	1.00
* 1500.00	63.10	28.10	2.89	35.60	9.50	0.00	48.99	74.00	-25.01	P	1.00
* 1500.00	62.10	28.10	2.89	35.60	9.50	0.00	47.99	54.00	-6.01	A	1.00
* 4824.00	44.90	34.44	5.08	35.16	9.50	2.00	41.77	74.00	-32.23	P	1.00
* 4824.00	33.03	34.44	5.08	35.16	9.50	2.00	29.90	54.00	-24.10	A	1.00
7236.00	44.96	39.81	6.74	35.65	9.50	2.00	48.35	88.15	-39.80	P	1.00
7236.00	33.26	39.81	6.74	35.65	9.50	2.00	36.65	79.23	-42.58	A	1.00
9647.85	45.89	38.54	8.29	36.44	9.50	0.61	47.39	88.15	-40.76	P	1.00
9647.85	33.69	38.54	8.29	36.44	9.50	0.61	35.19	79.23	-44.04	A	1.00
* 12066.75	-----	-----	-----	-----	9.50	0.80	-----	-----	-----	-----	1.00
* 14480.10	-----	-----	-----	-----	0.00	0.68	-----	-----	-----	-----	1.00
16893.45	-----	-----	-----	-----	0.00	0.44	-----	-----	-----	-----	1.00
* 19306.80	-----	-----	-----	-----	0.00	1.97	-----	-----	-----	-----	1.00
21720.15	-----	-----	-----	-----	0.00	0.81	-----	-----	-----	-----	1.00
24133.50	-----	-----	-----	-----	0.00	2.89	-----	-----	-----	-----	1.00

Note :

- The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
- AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
- Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
- Remark "\*" means that Restricted band.
- Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
- The result basic equation calculation is as follow:  
Level = Reading + AF + Cable – Preamp + Filter - Dist, Margin = Level - Limit
- The other emission levels were very low against the limit
- The test limit distance is 3M limit.
- 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	2004/03/29
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	19.5°C, 79%

CH6 TX				Measurement Distance at 1m Horizontal polarity							
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
2439.28	71.40	31.76	3.59	0.00	9.50	0.00	97.25	Fundamental Frequency		P	1.00
2439.28	61.83	31.76	3.59	0.00	9.50	0.00	87.68			A	1.00
* 1500.00	58.87	28.10	2.89	35.60	9.50	0.00	44.76	74.00	-29.24	P	1.00
* 1500.00	57.00	28.10	2.89	35.60	9.50	0.00	42.89	54.00	-11.11	A	1.00
* 4874.08	44.68	34.77	5.10	35.20	9.50	1.80	41.65	74.00	-32.35	P	1.00
* 4874.08	33.05	34.77	5.10	35.20	9.50	1.80	30.02	54.00	-23.98	A	1.00
* 7311.77	45.24	39.78	6.79	35.64	9.50	2.00	48.67	74.00	-25.33	P	1.00
* 7311.77	33.09	39.78	6.79	35.64	9.50	2.00	36.52	54.00	-17.48	A	1.00
9747.61	44.65	38.53	8.33	36.60	9.50	0.55	45.96	77.25	-31.29	P	1.00
9747.61	32.96	38.53	8.33	36.60	9.50	0.55	34.27	67.68	-33.41	A	1.00
* 12196.40	-----	-----	-----	-----	9.50	0.80	-----	-----	-----	-----	1.00
14635.68	-----	-----	-----	-----	0.00	0.59	-----	-----	-----	-----	1.00
17074.96	-----	-----	-----	-----	0.00	0.53	-----	-----	-----	-----	1.00
* 19514.24	-----	-----	-----	-----	0.00	2.21	-----	-----	-----	-----	1.00
21953.52	-----	-----	-----	-----	0.00	0.72	-----	-----	-----	-----	1.00
24392.80	-----	-----	-----	-----	0.00	2.47	-----	-----	-----	-----	1.00

Note :

- The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
- AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
- Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
- Remark "\*" means that Restricted band.
- Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
- The result basic equation calculation is as follow:  
Level = Reading + AF + Cable – Preamp + Filter - Dist, Margin = Level - Limit
- The other emission levels were very low against the limit
- The test limit distance is 3M limit.
- 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	2004/03/29
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	19.5°C, 79%

CH6 TX				Measurement Distance at 1m Vertical polarity							
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
2442.99	81.63	31.76	3.59	0.00	9.50	0.00	107.48	Fundamental Frequency		P	1.00
2442.99	72.20	31.76	3.59	0.00	9.50	0.00	98.05			A	1.00
* 1500.00	63.92	28.10	2.89	35.60	9.50	0.00	49.81	74.00	-24.19	P	1.00
* 1500.00	61.96	28.10	2.89	35.60	9.50	0.00	47.85	54.00	-6.15	A	1.00
* 4873.95	45.30	34.77	5.10	35.20	9.50	1.80	42.27	74.00	-31.73	P	1.00
* 4873.95	33.56	34.77	5.10	35.20	9.50	1.80	30.53	54.00	-23.47	A	1.00
* 7310.97	45.13	39.78	6.79	35.64	9.50	2.00	48.56	74.00	-25.44	P	1.00
* 7310.97	32.32	39.78	6.79	35.64	9.50	2.00	35.75	54.00	-18.25	A	1.00
9747.69	46.68	38.53	8.33	36.60	9.50	0.55	47.99	87.48	-39.49	P	1.00
9747.69	34.10	38.53	8.33	36.60	9.50	0.55	35.41	78.05	-42.64	A	1.00
* 12214.95	-----	-----	-----	-----	9.50	0.80	-----	-----	-----	-----	1.00
14657.94	-----	-----	-----	-----	0.00	0.57	-----	-----	-----	-----	1.00
17100.93	-----	-----	-----	-----	0.00	0.54	-----	-----	-----	-----	1.00
* 19543.92	-----	-----	-----	-----	0.00	2.24	-----	-----	-----	-----	1.00
21986.91	-----	-----	-----	-----	0.00	0.71	-----	-----	-----	-----	1.00
24429.90	-----	-----	-----	-----	0.00	2.41	-----	-----	-----	-----	1.00

Note :

- The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
- AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
- Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
- Remark "\*" means that Restricted band.
- Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
- The result basic equation calculation is as follow:  
Level = Reading + AF + Cable – Preamp + Filter - Dist, Margin = Level - Limit
- The other emission levels were very low against the limit
- The test limit distance is 3M limit.
- 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	2004/03/29
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	19.5°C, 79%

CH11 TX				Measurement Distance at 1m Horizontal polarity							
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
2464.15	69.68	31.74	3.60	0.00	9.50	0.00	95.52	Fundamental Frequency		P	1.00
2464.15	60.81	31.74	3.60	0.00	9.50	0.00	86.65			A	1.00
* 2483.50	31.60	31.72	3.61	0.00	9.50	0.00	57.43	74.00	-16.57	P	1.00
* 2483.50	10.60	31.72	3.61	0.00	9.50	0.00	36.43	54.00	-17.57	A	1.00
* 2483.60	31.80	31.72	3.61	0.00	9.50	0.00	57.63	74.00	-16.37	P	1.00
* 2483.60	10.20	31.72	3.61	0.00	9.50	0.00	36.03	54.00	-17.97	A	1.00
* 1500.00	59.18	28.10	2.89	35.60	9.50	0.00	45.07	74.00	-28.93	P	1.00
* 1500.00	57.56	28.10	2.89	35.60	9.50	0.00	43.45	54.00	-10.55	A	1.00
* 4923.46	45.68	35.09	5.12	35.24	9.50	1.61	42.76	74.00	-31.24	P	1.00
* 4923.46	33.54	35.09	5.12	35.24	9.50	1.61	30.62	54.00	-23.38	A	1.00
* 7386.02	45.35	39.75	6.84	35.62	9.50	2.00	48.82	74.00	-25.18	P	1.00
* 7386.02	33.24	39.75	6.84	35.62	9.50	2.00	36.71	54.00	-17.29	A	1.00
9847.78	44.52	38.52	8.37	36.76	9.50	0.49	45.64	75.52	-29.88	P	1.00
9847.78	34.05	38.52	8.37	36.76	9.50	0.49	35.17	66.65	-31.48	A	1.00
* 12320.75	-----	-----	-----	-----	9.50	0.80	-----	-----	-----	-----	1.00
14784.90	-----	-----	-----	-----	0.00	0.47	-----	-----	-----	-----	1.00
17249.05	-----	-----	-----	-----	0.00	0.60	-----	-----	-----	-----	1.00
* 19713.20	-----	-----	-----	-----	0.00	2.41	-----	-----	-----	-----	1.00
* 22177.35	-----	-----	-----	-----	0.00	0.70	-----	-----	-----	-----	1.00
24641.50	-----	-----	-----	-----	0.00	2.10	-----	-----	-----	-----	1.00

Note :

- The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
- AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
- Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
- Remark "\*" means that Restricted band.
- Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
- The result basic equation calculation is as follow:  
Level = Reading + AF + Cable – Preamp + Filter - Dist, Margin = Level - Limit
- The other emission levels were very low against the limit
- The test limit distance is 3M limit.
- 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	2004/03/29
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	19.5°C, 79%

CH11 TX				Measurement Distance at 1m Vertical polarity							
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
2455.21	81.62	31.74	3.60	0.00	9.50	0.00	107.47	Fundamental Frequency		P	1.00
2455.21	73.09	31.74	3.60	0.00	9.50	0.00	98.94			A	1.00
* 2483.50	44.80	31.72	3.61	0.00	9.50	0.00	70.63	74.00	-3.37	P	1.00
* 2483.50	22.90	31.72	3.61	0.00	9.50	0.00	48.73	54.00	-5.27	A	1.00
* 2483.60	44.20	31.72	3.61	0.00	9.50	0.00	70.03	74.00	-3.97	P	1.00
* 2483.60	22.70	31.72	3.61	0.00	9.50	0.00	48.53	54.00	-5.47	A	1.00
* 1500.00	63.61	28.10	2.89	35.60	9.50	0.00	49.50	74.00	-24.50	P	1.00
* 1500.00	62.02	28.10	2.89	35.60	9.50	0.00	47.91	54.00	-6.09	A	1.00
* 4924.73	45.89	35.10	5.12	35.24	9.50	1.60	42.97	74.00	-31.03	P	1.00
* 4924.73	33.48	35.10	5.12	35.24	9.50	1.60	30.56	54.00	-23.44	A	1.00
* 7386.11	45.62	39.75	6.84	35.62	9.50	2.00	49.09	74.00	-24.91	P	1.00
* 7386.11	33.48	39.75	6.84	35.62	9.50	2.00	36.95	54.00	-17.05	A	1.00
9847.66	46.20	38.52	8.37	36.76	9.50	0.49	47.32	87.47	-40.15	P	1.00
9847.66	33.69	38.52	8.37	36.76	9.50	0.49	34.81	78.94	-44.13	A	1.00
* 12276.05	-----	-----	-----	-----	9.50	0.80	-----	-----	-----	-----	1.00
14731.26	-----	-----	-----	-----	0.00	0.51	-----	-----	-----	-----	1.00
17186.47	-----	-----	-----	-----	0.00	0.57	-----	-----	-----	-----	1.00
* 19641.68	-----	-----	-----	-----	0.00	2.34	-----	-----	-----	-----	1.00
* 22096.89	-----	-----	-----	-----	0.00	0.70	-----	-----	-----	-----	1.00
24552.10	-----	-----	-----	-----	0.00	2.23	-----	-----	-----	-----	1.00

Note :

- The measurement was searched to 10th harmonic, Remark "-----" means that the emissions level is too low to be measured.
- AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
- Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
- Remark "\*" means that Restricted band.
- Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
- The result basic equation calculation is as follow:  
Level = Reading + AF + Cable – Preamp + Filter - Dist, Margin = Level - Limit
- The other emission levels were very low against the limit
- The test limit distance is 3M limit.
- For Wireless 802.11g mode at 6Mbps.



### 3.7 Photos of Open Site







## 4. 6dB BANDWIDTH MEASUREMENT

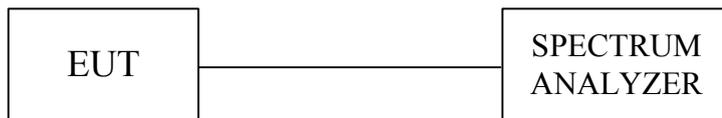
### 4.1 Test Equipments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration
ROHDE & SCHWARZ SPECTRUM ANALYZER	FSEK30	835253/002	September 06, 2004

Note :

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.2 Test Setup



### 4.3 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is >500KHz

### 4.4 Test 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 100 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.

### 4.5 Uncertainty of Conducted Emission

The uncertainty of conducted emission is  $\pm 200$ KHz.



#### 4.6 Test Results

Company	Huawei Technologies Co., Ltd.	Test Date	2005/03/29
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	17.9°C, 66%

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	13.62	0.5	PASS
6	2437	13.22	0.5	PASS
11	2462	13.18	0.5	PASS

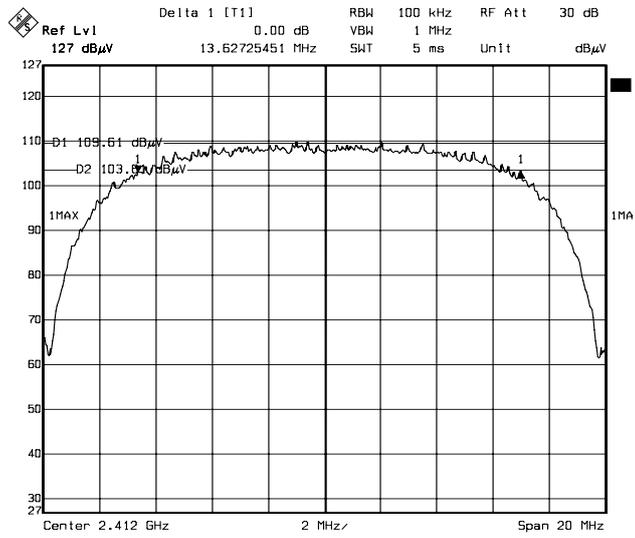
Note : 1. For 802.11b Mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.47	0.5	PASS
6	2437	16.46	0.5	PASS
11	2462	16.48	0.5	PASS

Note : 1. For 802.11g Mode

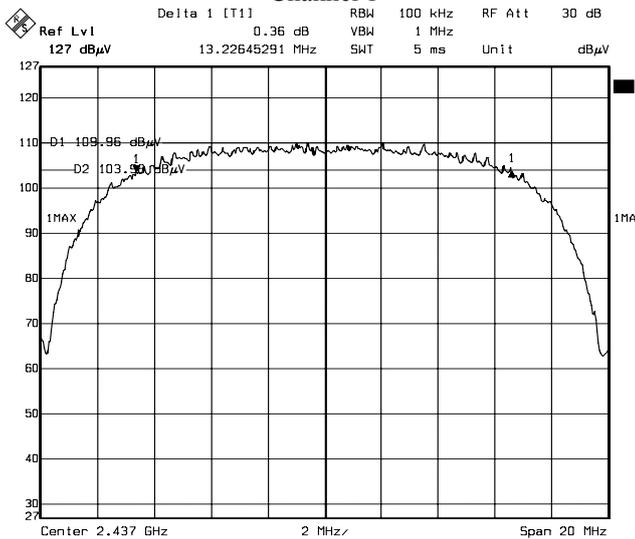


### 4.7 Photo of 6db Bandwidth Measurement



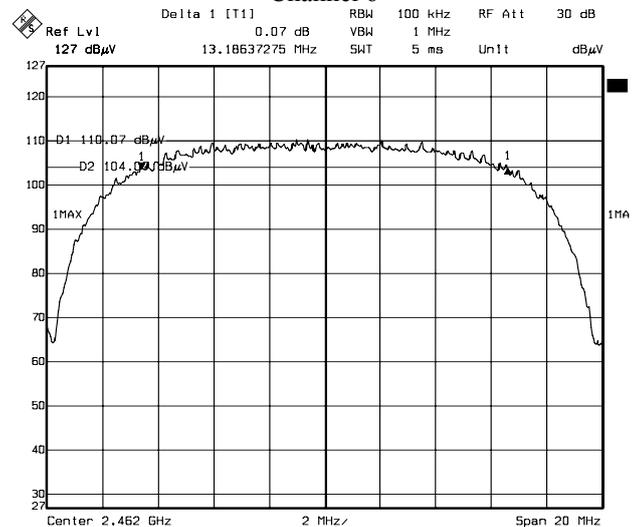
Date: 30.MAR.2005 09:46:11

#### Channel 1



Date: 30.MAR.2005 09:47:32

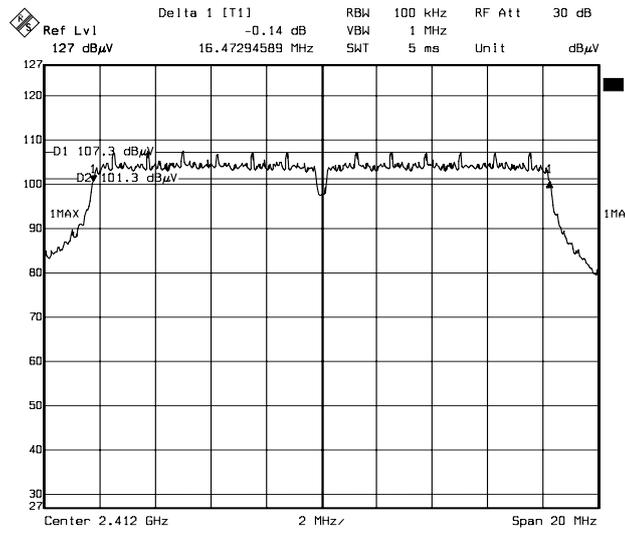
#### Channel 6



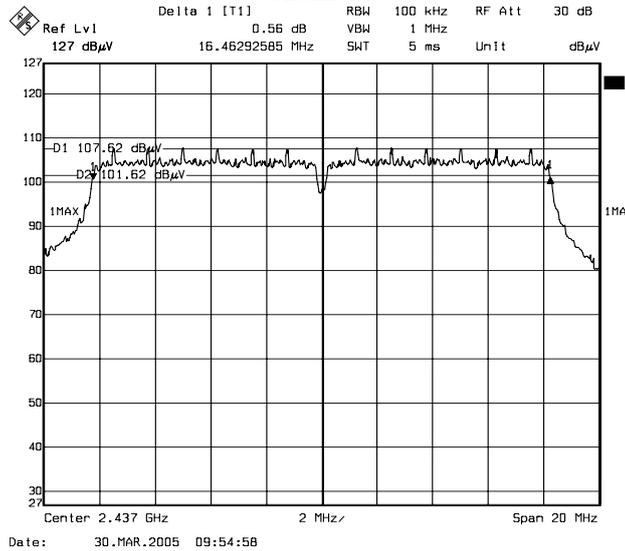
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#### Channel 11

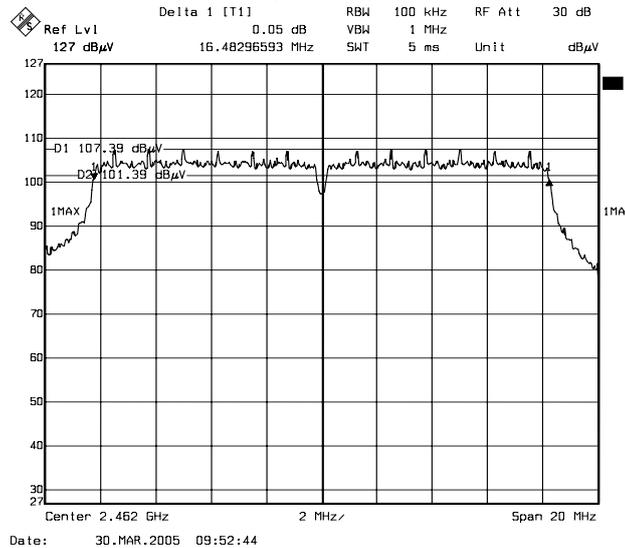
Note : For 802.11b Mode



### Channel 1



### Channel 6



### Channel 11

Note : For 802.11g Mode



## 5. MAXIMUM PEAK OUTPUT POWER

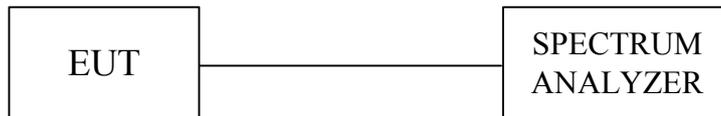
### 5.1 Test Equipments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration
ROHDE & SCHWARZ SPECTRUM ANALYZER	FSEK30	835253/002	September 06, 2004

Note :

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 5.2 Test Setup



### 5.3 Limits of Maximum Peak Output Power

The Maximum Peak Output Power Measurement is 30dBm.

### 5.4 Test 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.



## 5.5 Uncertainty of Conducted Emission

The uncertainty of conducted emission is  $\pm 1.82\text{dB}$ .

## 5.6 Test Results

Company	Huawei Technologies Co., Ltd.	Test Date	2005/03/29
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	17.9°C, 66%

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass / Fail
1	2412	19.24	30	PASS
6	2437	19.04	30	PASS
11	2462	19.33	30	PASS

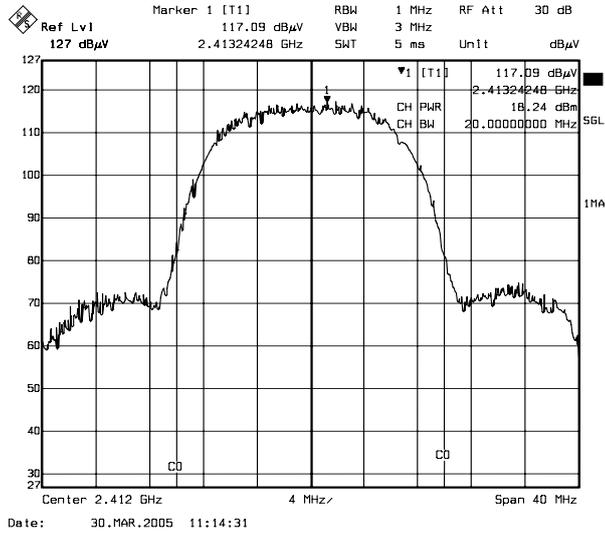
- Note :
1. For 802.11b Mode
  2. At final test to get the worst-case emission at 11Mbps.
  3. Cable loss = 1dB
  4. The result basic equation calculation as follow :  
Peak Power Output = Peak Power Reading + Cable loss

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass / Fail
1	2412	18.52	30	PASS
6	2437	18.28	30	PASS
11	2462	18.67	30	PASS

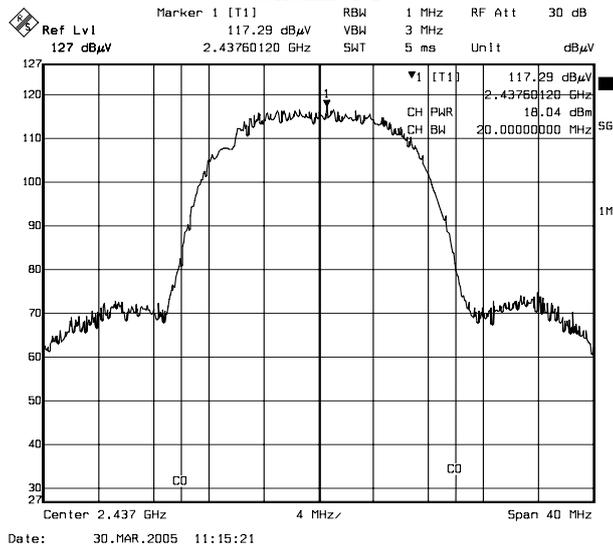
- Note :
1. For 802.11g Mode
  2. At final test to get the worst-case emission at 6Mbps.
  3. Cable loss = 1dB
  4. The result basic equation calculation as follow :  
Peak Power Output = Peak Power Reading + Cable loss



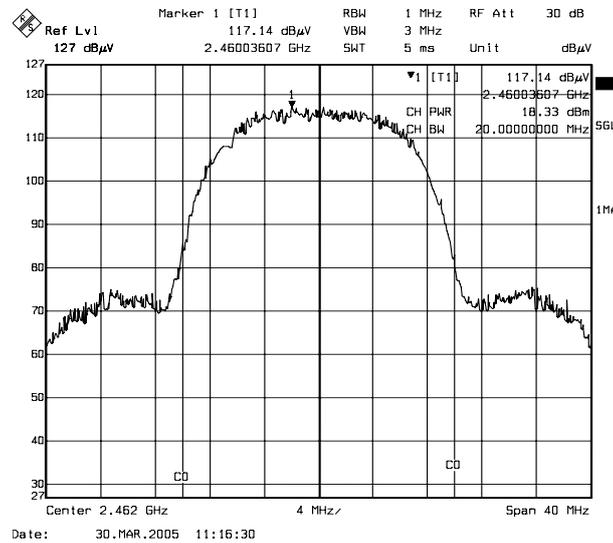
### 5.7 Photo of Maximum Peak Output Power Measurement



Channel 1

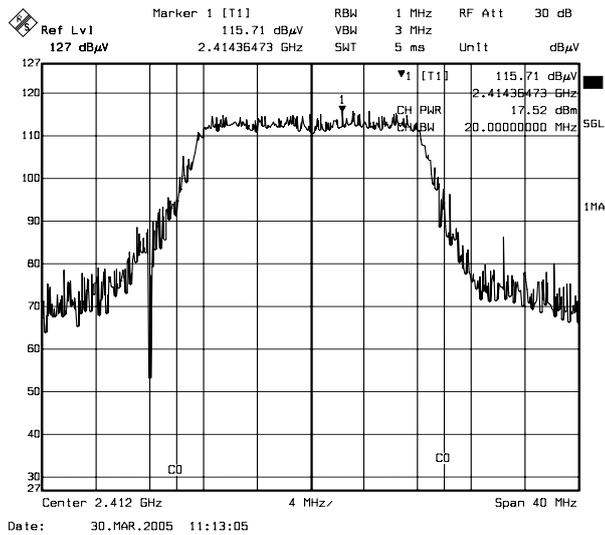


Channel 6

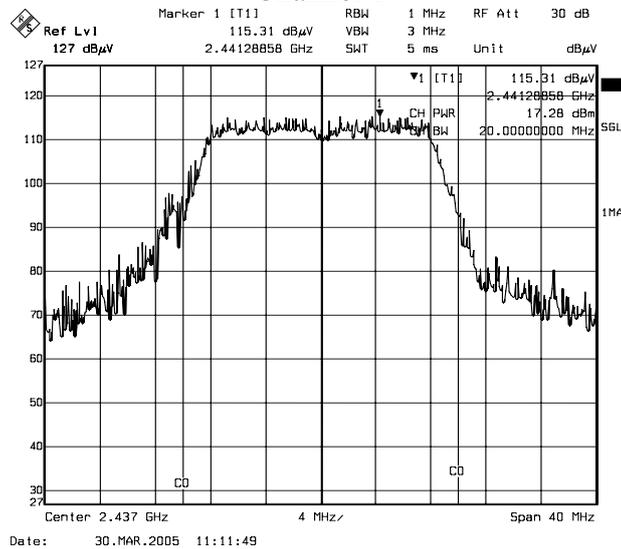


Channel 11

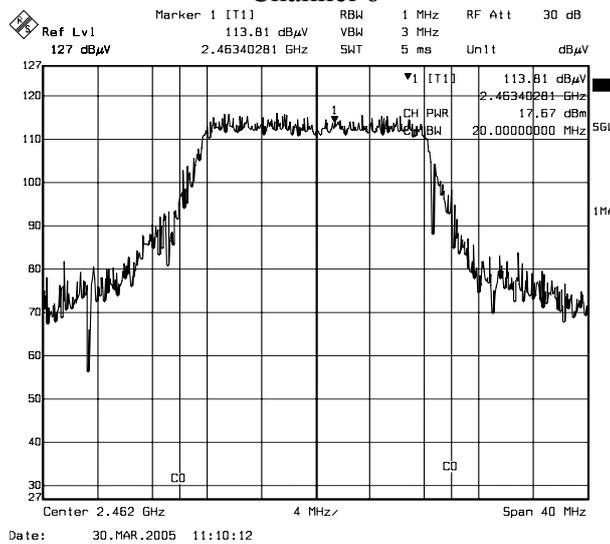
Note: For 802.11b Mode



Channel 1



Channel 6



Channel 11

Note: For normal 802.11g Mode



## 6. POWER SPECTRAL DENSITY MEASUREMENT

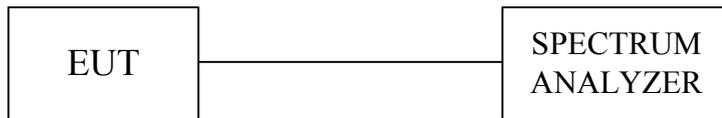
### 6.1 Test Equipments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration
ROHDE & SCHWARZ SPECTRUM ANALYZER	FSEK30	835253/002	September 06, 2004

NOTE :

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 6.2 Test Setup



### 6.3 Limits of Power Spectral Density Measurement

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



## 6.4 Test 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.

## 6.5 Uncertainty of Conducted Emission

The uncertainty of conducted emission is  $\pm 1.82$ dB.

## 6.6 Test Results

Company	Huawei Technologies Co., Ltd.	Test Date	2005/03/29
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	37.9°C, 26%

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Maximum Limit (dBm)	Pass / Fail
1	2412	-11.00	8	PASS
6	2437	-10.75	8	PASS
11	2462	-9.91	8	PASS

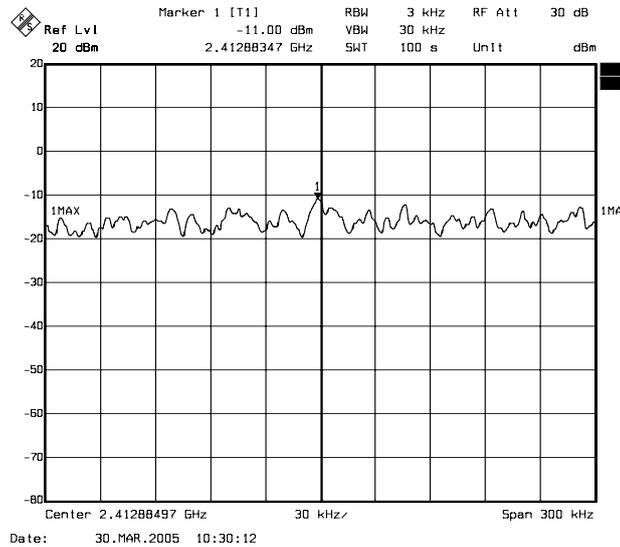
Note: 1. For 802.11b mode at final test to get the worst-case emission at 11Mbps.

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Maximum Limit (dBm)	Pass / Fail
1	2412	-12.46	8	PASS
6	2437	-12.67	8	PASS
11	2462	-12.05	8	PASS

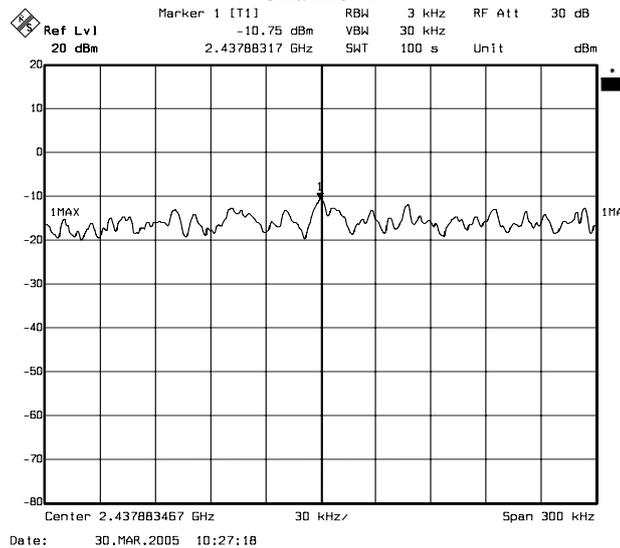
Note: 1. For 802.11g mode at final test to get the worst-case emission at 6Mbps



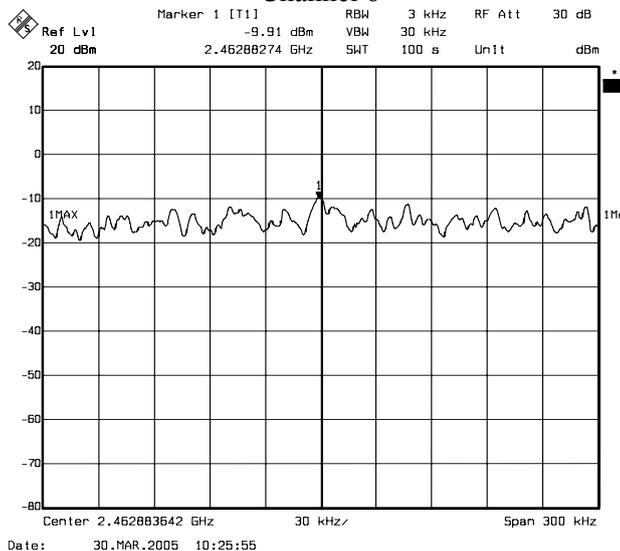
### 6.7 Photo of Power Spectral Density Measurement



Channel 1

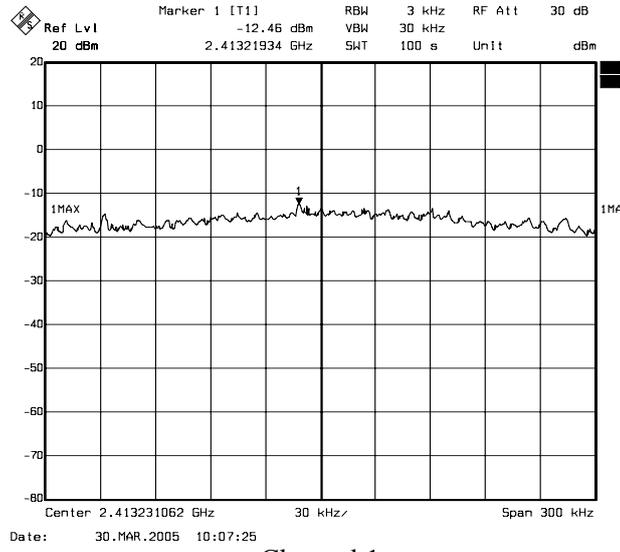


Channel 6

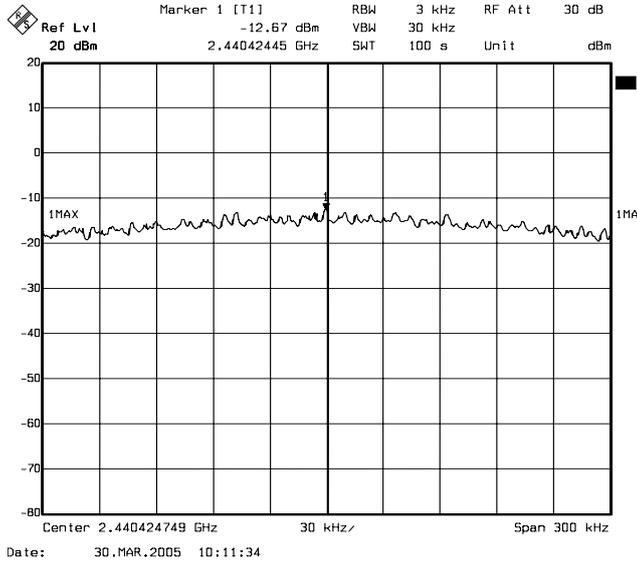


Channel 11

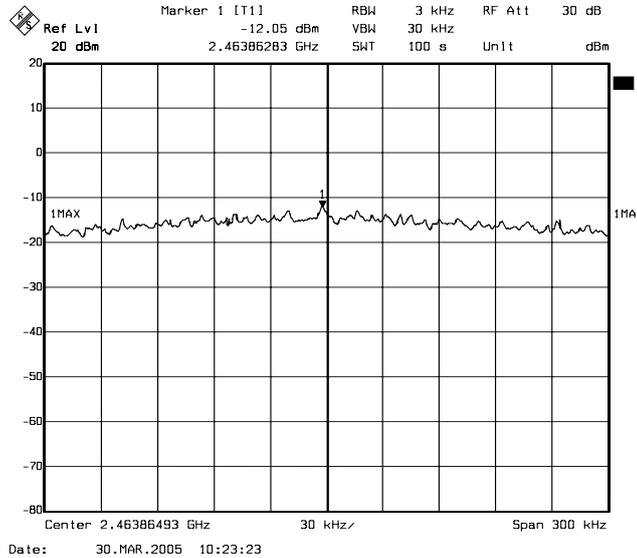
Note: 802.11b Mode (11Mbps)



Channel 1



Channel 6



Channel 11

Note: 802.11g Mode (6Mbps)



## 7. BAND EDGE MEASUREMENT

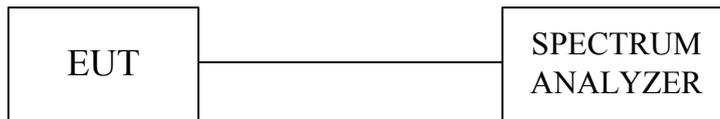
### 7.1 Test Equipments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration
ROHDE & SCHWARZ SPECTRUM ANALYZER	FSEK30	835253/002	September 06, 2004

Note :

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 7.2 Test Setup



### 7.3 Limits of Out of Band Emissions Measurement

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.

### 7.4 Test 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.

### 7.5 Uncertainty of Conducted Emission

The uncertainty of conducted emission is  $\pm 1.82$ dB.



## 7.6 Test Results

### A. Conducted

Refer to 7.7 photo of out band Emission measurement

### B. Radiated

Company	Huawei Technologies Co., Ltd.	Test Date	2005/03/29
Product Name	ADSL2+ Wireless Router	Test By	Chris Huang
Model Name	WDR814g	TEMP&Humidity	37.9°C, 26%

For 802.11b mode

Refer to the section 3.6, 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	49.88	63.08	77.75	89.07	PASS
	AV	39.38	52.68	70.82	82.28	
2483.50	PK	39.03	49.33	74.00	74.00	PASS
	AV	28.93	37.63	54.00	54.00	

For 802.11g mode

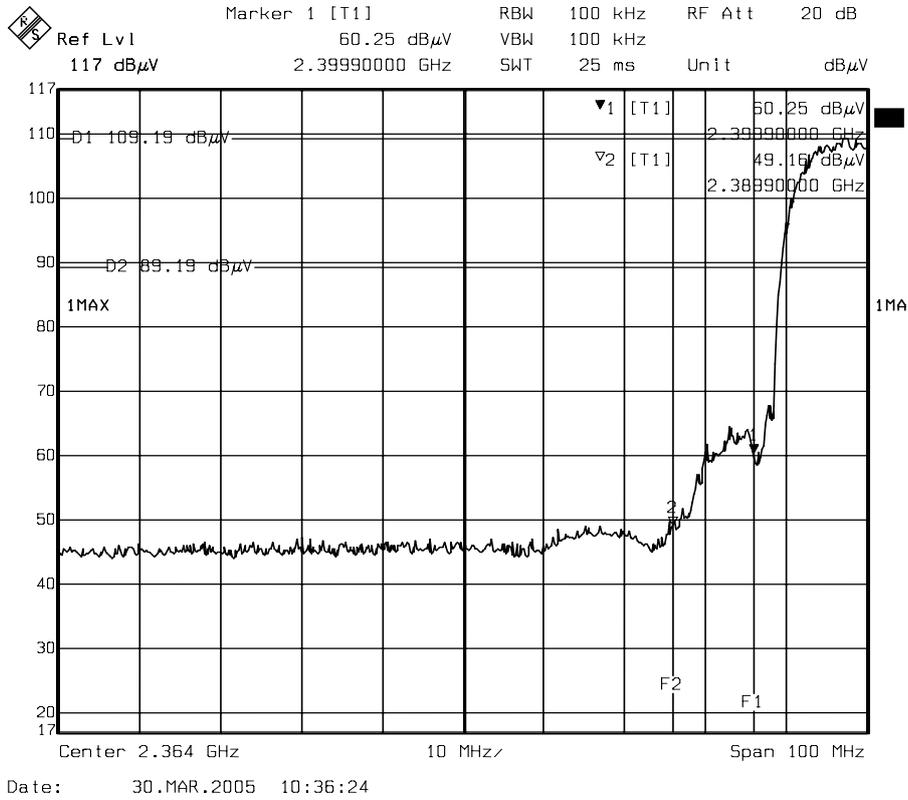
Refer to the section 3.6, the measured radiated band edge emissions are listed below :

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	72.08	82.88	77.67	88.15	PASS
	AV	53.88	64.98	68.53	79.23	
2483.50	PK	57.43	70.63	74.00	74.00	PASS
	AV	36.43	48.73	54.00	54.00	

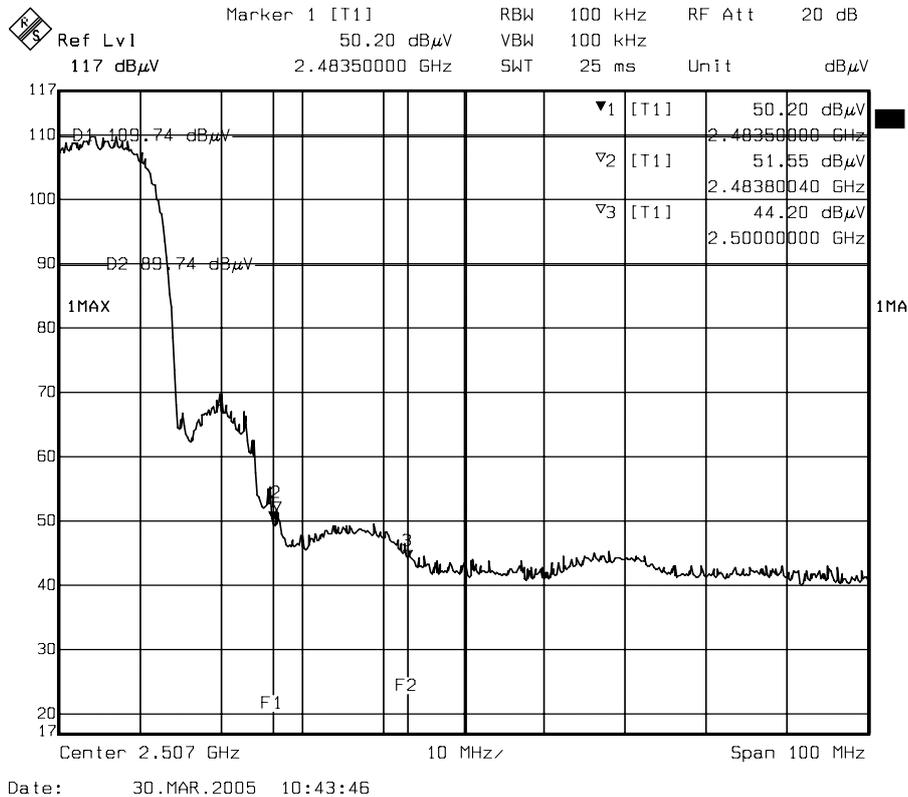
Note : 1. Radiated band edge field strength is measured with measurement procedure ANSI C63.4-2003.



### 7.7 Photo of Band Edge Measurement

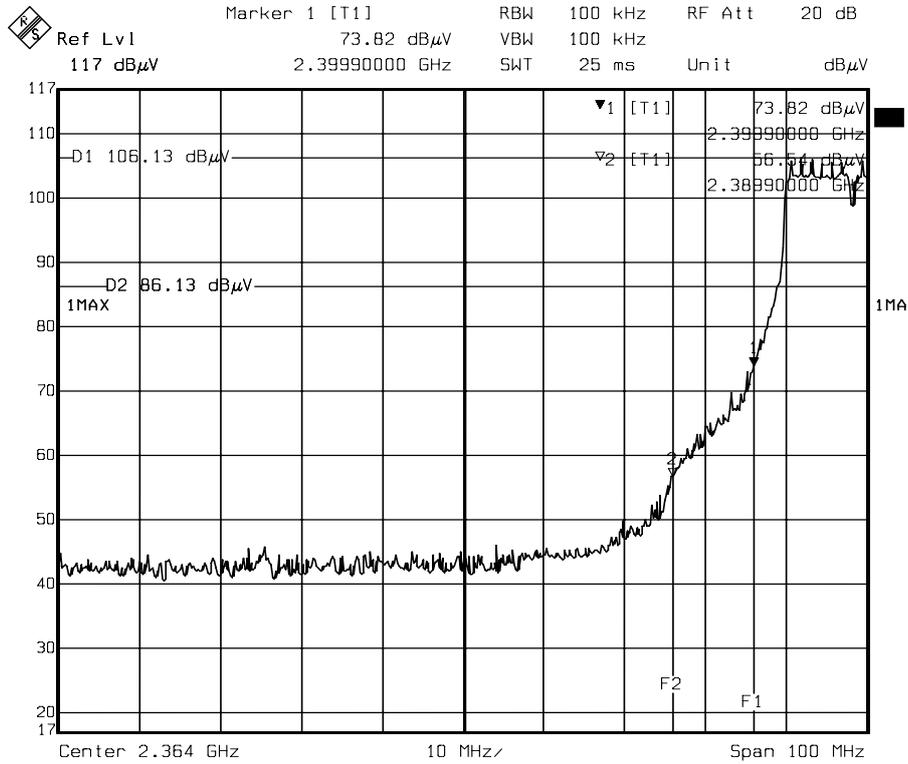


Lower Band Edge (Peak)



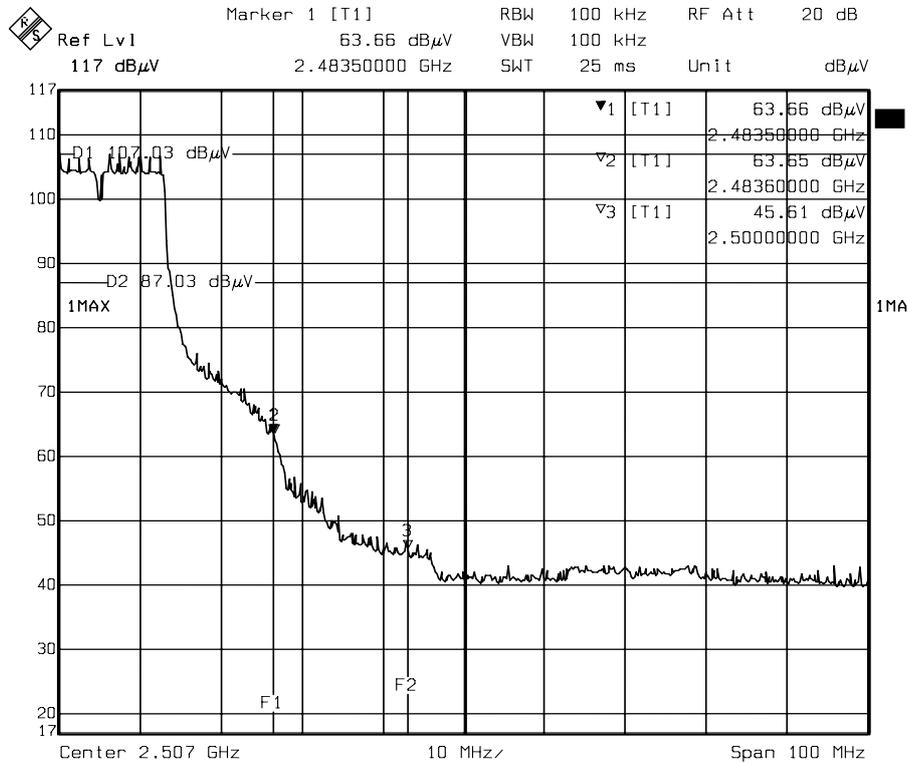
Higher Band Edge (Peak)

Note : For 802.11b Mode



Date: 30.MAR.2005 10:38:13

### Lower Band Edge (Peak)



Date: 30.MAR.2005 10:40:21

### Higher Band Edge (Peak)

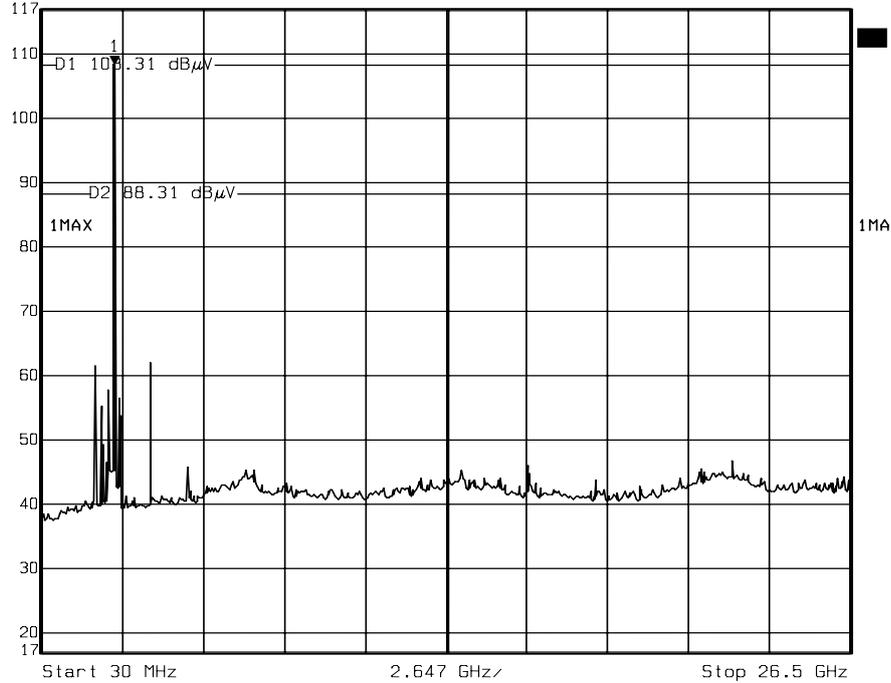
Note : For 802.11g Mode



### Out-of-band Spurious Emissions-conducted measurement

#### For 802.11b Mode

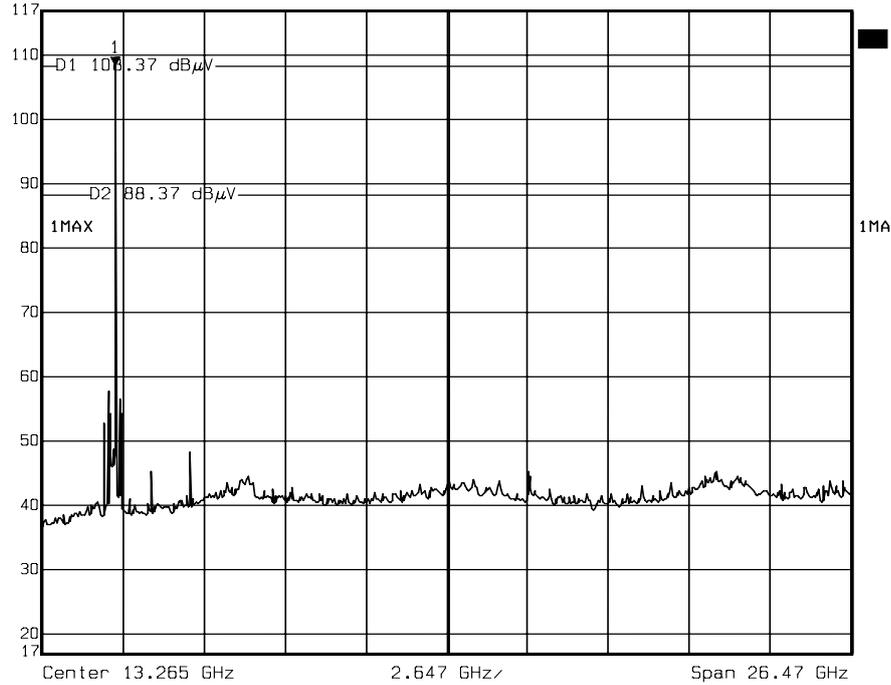
Marker 1 [T1] RBW 100 kHz RF Att 20 dB  
Ref Lvl 108.31 dB $\mu$ V VBW 100 kHz  
117 dB $\mu$ V 2.41707415 GHz SWT 6.8 s Unit dB $\mu$ V



Date: 30.MAR.2005 10:53:48

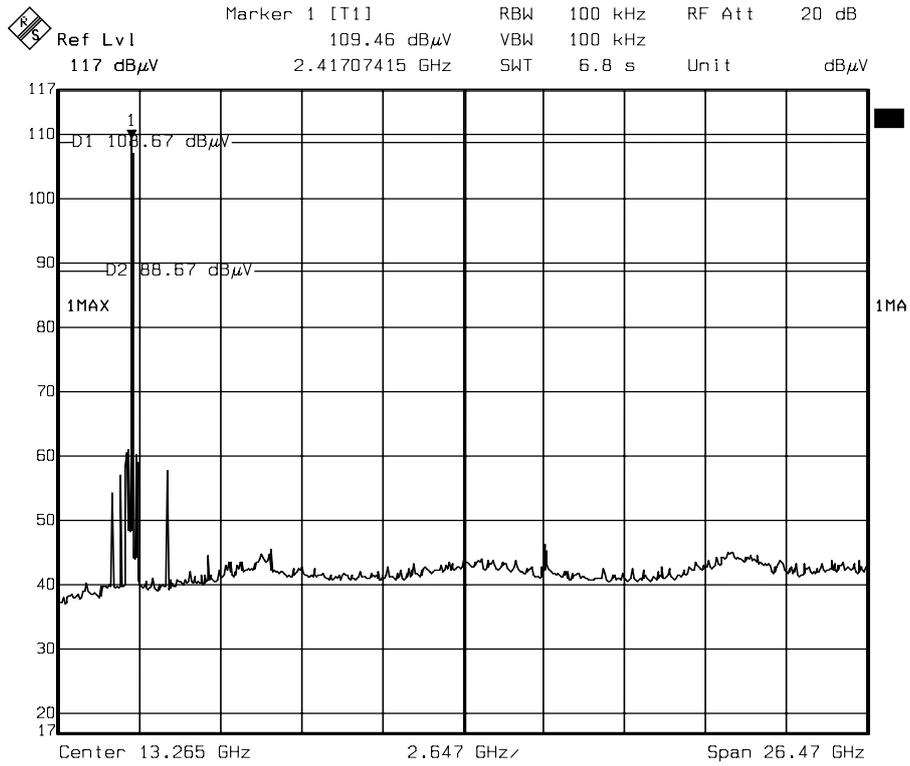
Channel 1

Marker 1 [T1] RBW 100 kHz RF Att 20 dB  
Ref Lvl 108.37 dB $\mu$ V VBW 100 kHz  
117 dB $\mu$ V 2.41707415 GHz SWT 6.8 s Unit dB $\mu$ V



Date: 30.MAR.2005 10:50:29

Channel 6



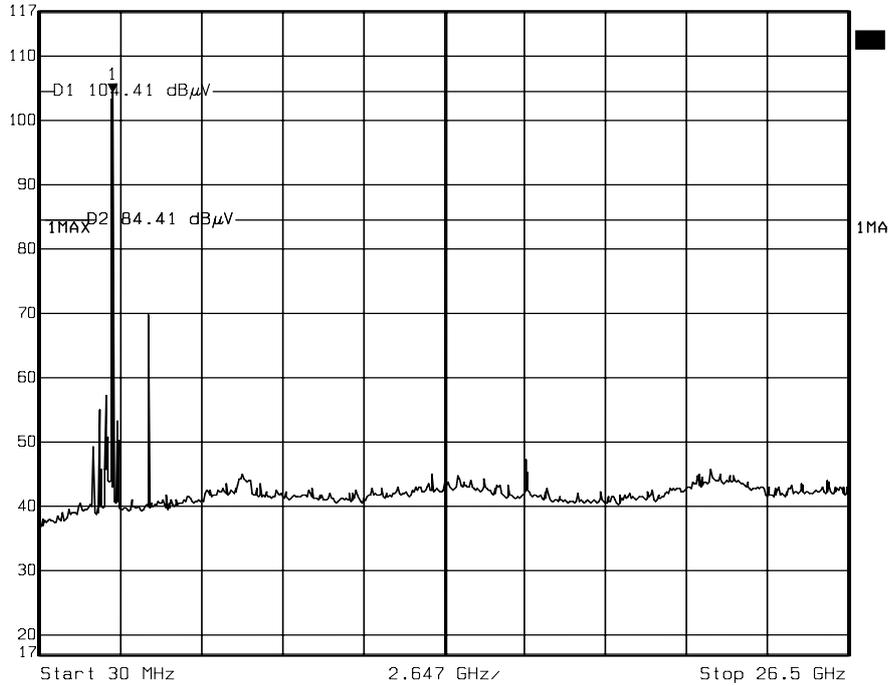
Date: 30.MAR.2005 10:48:47

Channel 11



### For 802.11g Mode

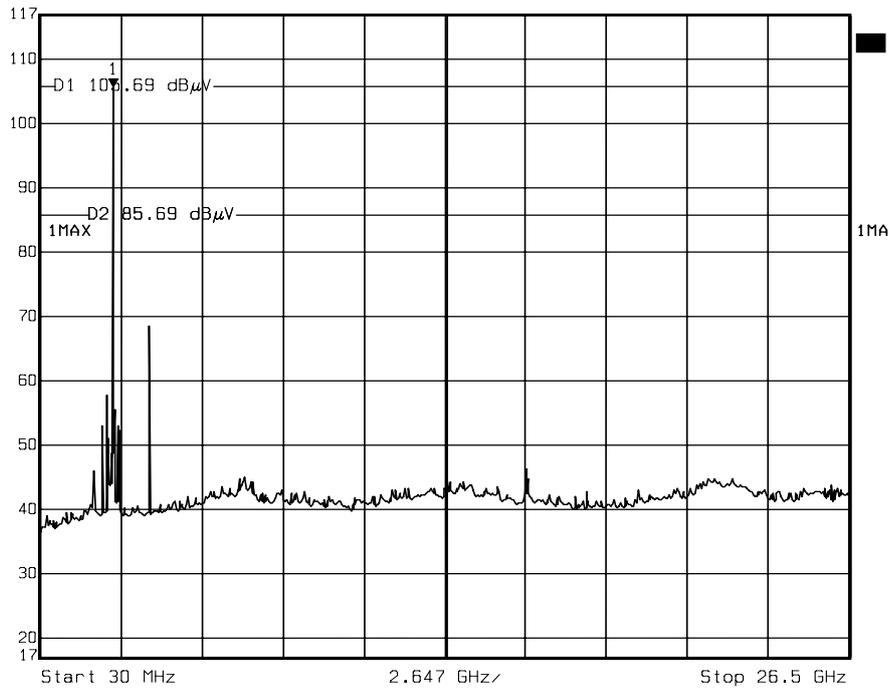
 Marker 1 [T1] RBW 100 kHz RF Att 20 dB  
Ref Lvl 104.41 dB $\mu$ V VBW 100 kHz  
117 dB $\mu$ V 2.41707415 GHz SWT 6.8 s Unit dB $\mu$ V



Date: 30.MAR.2005 10:56:22

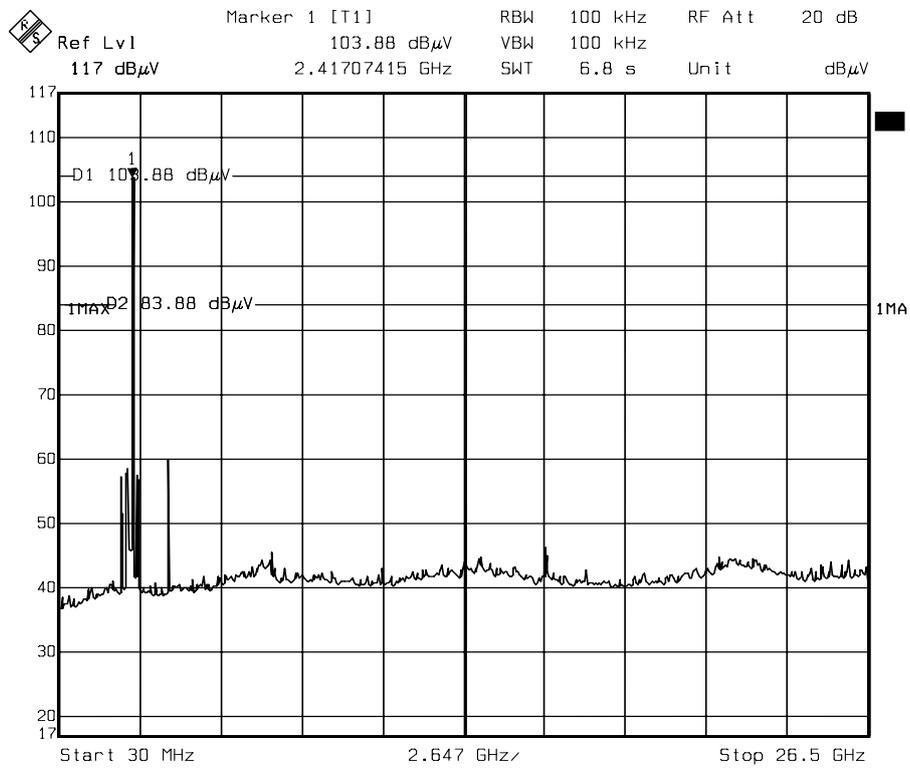
### Channel 1

 Marker 1 [T1] RBW 100 kHz RF Att 20 dB  
Ref Lvl 105.69 dB $\mu$ V VBW 100 kHz  
117 dB $\mu$ V 2.41707415 GHz SWT 6.8 s Unit dB $\mu$ V



Date: 30.MAR.2005 10:57:40

### Channel 6



Date: 30.MAR.2005 10:58:52

Channel 11



## **8. ANTENNA REQUIREMENT**

### **8.1 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.

### **8.2 Antenna Connected Construction**

The antenna used in this product is Dipole antenna. The maximum Gain of the antenna only 2dBi



## 9. RF EXPOSURE EVALUATION

According to FCC 1.1310 : The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b) LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time
(A) Limits for Occupational / Control Exposures				
300-1,500	--	--	F/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Population / Uncontrol Exposures				
300-1,500	--	--	F/1500	6
1,500-100,000	--	--	1	30

### 9.1 Friis Formula

Friis transmission formula :  $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$P_i = 3.1416$

r = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance "r" where the MPE limit is reached.

### 9.2 EUT Operating Condition

A software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



### 9.3 Test Result of RF Exposure Evaluation

Test Item : RF Exposure Evaluation Data

Test Mode : Normal Operation

#### 9.3.1 Antenna Gain

Antenna Gain : The maximum Gain measured in fully anechoic chamber is 2dBi linear scale.

#### 9.3.2 Output Power into Antenna & RF Exposure Evaluation Distance

Channel	Channel Frequency (MHz)	Output Power to Antenna (dBm)	Antenna Gain	Power Density at 20cm (mW/cm <sup>2</sup> )	LIMITS (mW/cm <sup>2</sup> )
CH 1	2412	19.24	2	0.026469	1
CH 6	2437	19.04	2	0.025277	1
CH 11	2462	19.33	2	0.027023	1

Note : 1. For 802.11b Mode (11Mbps)

- The power density Pd (4th column) at a distance of 20cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm<sup>2</sup>. The EUT is classified as mobile product. So, RF exposure limit warning or SAR test are not required.

Channel	Channel Frequency (MHz)	Output Power to Antenna (dBm)	Antenna Gain	Power Density at 20cm (mW/cm <sup>2</sup> )	LIMITS (mW/cm <sup>2</sup> )
CH 1	2412	18.52	2	0.022425	1
CH 6	2437	18.28	2	0.021219	1
CH 11	2462	18.67	2	0.023213	1

Note : 1. For 802.11g Mode (6Mbps).

- The power density Pd (4th column) at a distance of 20cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm<sup>2</sup>. The EUT is classified as mobile product. So, RF exposure limit warning or SAR test are not required.