



**MPE TEST REPORT**

**FCC Per 47 CFR 2.1091(b)**

**FCC ID** .....: **QIS-HG521**

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Date of issue.....: Sep 05, 2009

**Testing Laboratory Name** .....: **Shenzhen Huatongwei International Inspection Co., Ltd**

Address.....: Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China

**Applicant's name**.....: **Huawei Technologies Co.,Ltd.**

Address.....: Administration Building,Huawei Base,Bantian,Longgang District,Shenzhen 518129 P.R.C.

**Test specification:**

Standard .....: **FCC Per 47 CFR 2.1091(b)**

TRF Originator.....: Shenzhen Huatongwei International Inspection CO., Ltd

Master TRF.....: Dated 2006-06

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**Test item description** .....: Home Gateway

Trade Mark .....: /

Manufacturer .....: Huawei Technologies Co.,Ltd.

Model/Type reference.....: EchoLife HG521

Listed Models .....: /

Ratings.....: DC 5V Adapter From AC 120V/60Hz

Frequency Range .....: 2400-2483.5MHz

Result.....: **Positive**

**M P E T E S T R E P O R T**

<b>FCC ID :</b>	<b>QIS-HG521</b>	Sep 05, 2009
		Date of issue

Equipment under Test : Home Gateway

Model /Type : EchoLife HG521

Listed Models : /

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

Address : Administration Building,Huawei Base,Bantian,Longgang District,Shenzhen 518129 P.R.C.

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

Address : Administration Building,Huawei Base,Bantian,Longgang District,Shenzhen 518129 P.R.C.

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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# 1. SUMMARY

## 1.1. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer

- o - supplied by the lab

- o Power Cable Length (m) : /

Shield : /

Detachable : /

- o Multimeter Manufacturer : /

Model No. : /

- #1 AC Adapter

MODEL:UE05L1-050100SPAU  
 INPUT:100-240V~50/60Hz 0.2A MAX  
 OUTPUT:5.0V DC 1.0A  
 Power Cable:180cm  
 ◇ Shield      ◆ Unshield

- #2 AC Adapter

MODEL:HF-050100U3  
 INPUT:100-240V~50/60Hz 0.2A MAX  
 OUTPUT:5.0V DC 1A  
 Power Cable:180cm  
 ◇ Shield      ◆ Unshield

- #3 AC Adapter

MODEL: XKD-C1000IC5.0-6-US  
 INPUT:100-240V~50/60Hz 0.2A MAX  
 OUTPUT:5.0V DC 1A  
 Power Cable:180cm  
 ◇ Shield      ◆ Unshield

**Note: The #1 AC Adapter was used in the all test items.**

## 1.2. NOTE

1. The EUT is an 802.11b/g/n Home Gateway, The functions of the EUT listed as below:

	Test Standards	Reference Report
WLAN 802.11b/g,draft 802.11n	FCC Part 15 Subpart C (Section15.247)	WE09080019

2. The frequency bands used in this EUT are listed as follows:

Frequency Band(MHz)	2400-2483.5	5150-5350	5470-5725	5725-5850
802.11b	√	—	—	—
802.11g	√	—	—	—
Draft 802.11n(20MHz)	√	—	—	—
Draft 802.11n(40MHz)	√	—	—	—

3. The EUT incorporates a MIMO function,Physically,the EUT provides one completed transmitter and two receivers.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
Draft 802.11n (20MHz)	1TX
Draft 802.11n (40MHz)	1TX

## **2. TEST ENVIRONMENT**

### **2.1. Address of the test laboratory**

Shenzhen Huatongwei International Inspection Co., Ltd  
Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China  
Phone: 86-755-26715686 Fax: 86-755-26748089

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

### **2.2. Environmental conditions**

During the measurement the environmental conditions were within the listed ranges:

Temperature:	<u>15-35 ° C</u>
Humidity:	<u>30-60 %</u>
Atmospheric pressure:	<u>950-1050mbar</u>

### **2.3. Statement of the measurement uncertainty**

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

<b>Test</b>	<b>Range</b>	<b>Measurement Uncertainty</b>	<b>Notes</b>
Radiated Emission	30~1000MHz	4.22dB	(1)
Radiated Emission	1~12.75GHz	4.35dB	(1)
Conducted Disturbance	0.15~30MHz	3.29dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

## **3. Method of measurement**

### **3.1. Applicable Standard**

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

### 3.2. Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	6
3.0 – 30	1842/f	4.89/f	(900/f)*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 30	824/f	2.19/f	(180/f)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	/	/	f/1500	30
1500 – 100,000	/	/	1.0	30

F=frequency in MHz

\*=Plane-wave equivalent power density

### 3.3. MPE Calculation Method

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4\pi R^2$$

Where: S=power density

P=power input to antenna

G=power gain of the antenna in the direction of interest relative to an isotropic radiator

R=distance to the center of radiation of the antenna

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna is 2dBi, the RF power density can be obtained.

## 4. Test Result

For 802.11b

Mode	Minimum Separation Distance (20cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm <sup>2</sup> )	Power Density At 20 cm (mW/cm <sup>2</sup> )
2412	20.00	15.74	34.50	1.585	1.000	0.00944
2442	20.00	16.61	45.82	1.585	1.000	0.01254
2472	20.00	17.46	55.72	1.585	1.000	0.01525

For 802.11g

Mode	Minimum Separation Distance (20cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm <sup>2</sup> )	Power Density At 20 cm (mW/cm <sup>2</sup> )
2412	20.00	17.14	51.76	1.585	1.000	0.01417
2442	20.00	17.97	62.66	1.585	1.000	0.01715
2472	20.00	18.93	78.16	1.585	1.000	0.02139

For Draft 802.11n (20MHz)

Mode	Minimum Separation Distance (20cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm <sup>2</sup> )	Power Density At 20 cm (mW/cm <sup>2</sup> )
2412	20.00	17.47	55.85	1.585	1.000	0.01529
2442	20.00	18.27	67.14	1.585	1.000	0.01838
2472	20.00	18.30	67.61	1.585	1.000	0.01850

For Draft 802.11n (40MHz)

Mode	Minimum Separation Distance (20cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm <sup>2</sup> )	Power Density At 20 cm (mW/cm <sup>2</sup> )
2422	20.00	15.71	37.24	1.585	1.000	0.01019
2437	20.00	16.17	41.40	1.585	1.000	0.01133
2452	20.00	16.86	48.53	1.585	1.000	0.01328

### 5. Conclusion

The measurement results comply with the FCC Limit Per 47 CFR 2.1091 (b) for the controlled RF Exposure.

.....**End of Report**.....