



FCC PART 15 SUBPART C TEST REPORT

FCC PART 15.247

Report Reference No.....: WE09080019

FCC ID..... : QIS-HG521

Compiled by

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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 Part 15.247: Operation within the bands 920-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz Direct Sequence System**

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

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

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Test item description : Home Gateway

Trade Mark: /

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

Listed Models: /

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

TEST REPORT

Test Report No. :	WE09080019	Sep 06, 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.

Test Result according to the standards on page 4:	Positive
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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. TEST STANDARDS

The tests were performed according to following standards:

[FCC Rules Part 15.247](#): Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample : Aug 25, 2009

Testing commenced on : Sep 01, 2008

Testing concluded on : Sep 05, 2008

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage : 120V / 60 Hz 115V / 60Hz
 12 V DC 24 V DC
 Other (specified in blank below)

DC 5V Adapter From AC 120V/60Hz

2.3. Short description of the Equipment under Test (EUT)

2.4GHz (EchoLife HG521of the Home Gateway)

For more details, refer to the user's manual of the EUT.

Serial number: Prototype

2.4. EUT operation mode

The EUT has been tested under typical operating condition.

2.5. EUT configuration

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

● - supplied by the manufacturer

○ - supplied by the lab

- Power Cable Length (m) : /
- Shield : /
- Detachable : /
- 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.

2.6. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: QISHG521** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

2.7. Modifications

No modifications were implemented to meet testing criteria.

2.8. 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

3. TEST ENVIRONMENT

3.1. 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.

3.2. Test Facility

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

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: August 02, 2007. Valid time is until March 29, 2012.

A2LA-Lab Cert. No. 2243.01

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is from Aug 24, 2005 to Sept 30, 2009.

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, Renewal date July 01, 2009.

IC-Registration No.: 5377

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377 on February 13th, 2009.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

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 17025:2005 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10, the Authorization is valid through April 25, 2009.

VCCI

The 3m Semi-anechoic chamber (12.2m×7.95m×6.7m) and Shielded Room (8m×4m×3m) of Shenzhen Huatongwei International Inspection Co., Ltd has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2484. Date of Registration: December 20, 2006. Valid time is until December 19, 2009.

Main Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-2726. Date of Registration: December 20, 2006. Valid time is until December 19, 2009.

DNV

Shenzhen Huatongwei International Inspection Co Ltd has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025(2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until 09 July, 2010.

3.3. 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>

3.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System

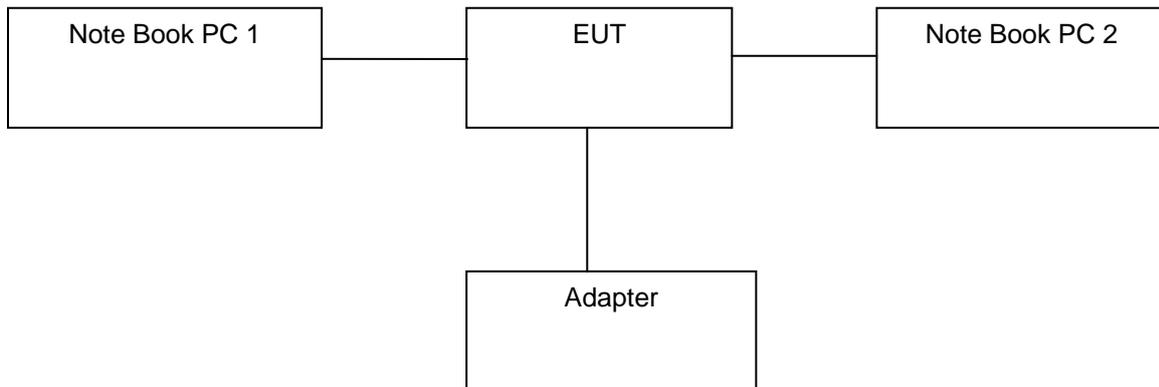


Table 2-1 Equipment Used in Tested System

No.	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	Notebook PC 1	TOSHIBA	TE2100	E85-02082	-----
2	Notebook PC 2	ASUS	I9100L	59NP00972	-----

3.5. Test Description

FCC PART 15		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.247(a)(2)	6dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF conducted emissions	PASS
FCC Part 15.247(b)	Maximum Peak Output Power	PASS
FCC Part 15.247(e)	Power Spectral Density	PASS
FCC Part 15.109/ 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band edge compliance of RF emissions	PASS

Remark: The measurement uncertainty is not included in the test result.

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel
AC Power Line Conducted Emissions	Normal Link	11 Mbps	7
Maximum Peak Conducted Output Power Power Spectral Density 6dB Spectrum Bandwidth Spurious RF conducted emissions	11b/DSSS	11 Mbps	1/7/13
	11g/OFDM	54 Mbps	1/7/13
	Draft 11n(20MHz)/OFDM	135 Mbps	1/7/13
	Draft 11n(40MHz)/OFDM	135 Mbps	3/6/9
Radiated Emissions 9kHz~1GHz	11b/DSSS	11 Mbps	1/7/13
	11g/OFDM	54 Mbps	1/7/13
	Draft 11n(20MHz)/OFDM	135 Mbps	1/7/13
	Draft 11n(40MHz)/OFDM	135 Mbps	3/6/9
Radiated Emissions 1GHz~10th Harmonic	11b/DSSS	11 Mbps	1/7/13
	11g/OFDM	54 Mbps	1/7/13
	Draft 11n(20MHz)/OFDM	135 Mbps	1/7/13
	Draft 11n(40MHz)/OFDM	135 Mbps	3/6/9
Band Edge Emissions	11b/DSSS	11 Mbps	1/13
	11g/OFDM	54 Mbps	1/13
	Draft 11n(20MHz)/OFDM	135 Mbps	1/13
	Draft 11n(40MHz)/OFDM	135 Mbps	3/9

3.6. 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:

Test	Range	Measurement Uncertainty	Notes
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.

3.7. Equipments Used during the Test

AC Power Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCS30	100038	2008/11
2	ARTIFICIAL MAINS	ROHDE & SCHWARZ	ESH2-Z5	100028	2008/11
3	PULSE LIMITER	ROHDE & SCHWARZ	ESHSZ2	100044	2008/11
4	EMI TEST SOFTWARE	ROHDE & SCHWARZ	ES-K1 1.71	N/A	2008/11

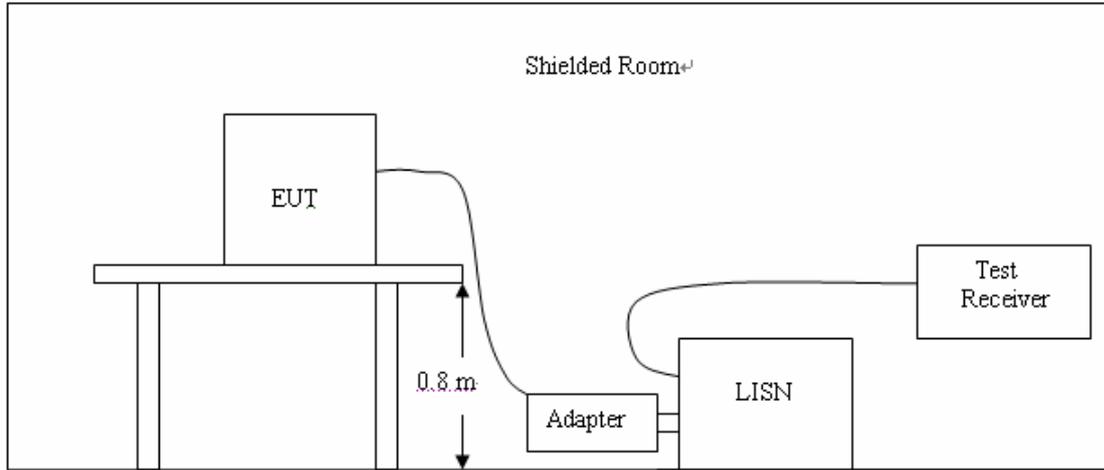
Radiated Emissions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA-BROADBAND ANTENNA	ROHDE & SCHWARZ	HL562	100015	2007/06
2	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2008/11
3	RF TEST PANEL	ROHDE & SCHWARZ	TS / RSP	335015/ 0017	2008/11
4	TURNTABLE	ETS	2088	2149	2008/11
5	ANTENNA MAST	ETS	2075	2346	2008/11
6	EMI TEST SOFTWARE	ROHDE & SCHWARZ	ESK1	N/A	2008/11

Maximum Peak Output Power / Power Spectral Density / 6dB Bandwidth / Band Edge Measurement/ Spurious RF conducted emissions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2008/11

4. TEST CONDITIONS AND RESULTS

4.1. Conducted Emissions Test

TEST CONFIGURATION



TEST 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.

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

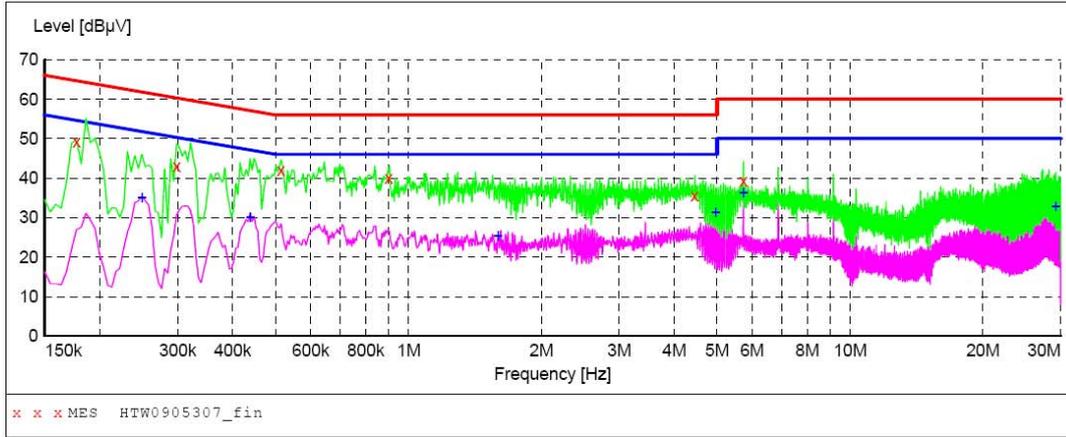
* Decreasing linearly with the logarithm of the frequency

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

TEST RESULTS

For #1 AC Adapter

SCAN TABLE: "Voltage (9K-30M)FIN"
 Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0905307_fin"

9/4/2009 10:57PM

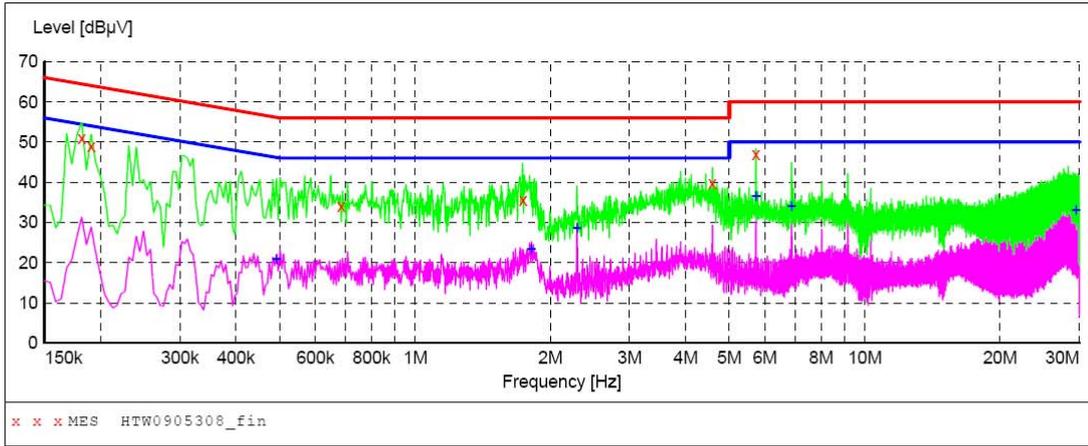
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.177000	49.20	10.5	65	15.4	QP	N	GND
0.298500	42.90	10.5	60	17.4	QP	N	GND
0.514500	42.00	10.4	56	14.0	QP	N	GND
0.901500	40.10	10.4	56	15.9	QP	N	GND
4.443000	35.60	10.6	56	20.4	QP	N	GND
5.734500	39.30	10.6	60	20.7	QP	N	GND

MEASUREMENT RESULT: "HTW0905307_fin2"

9/4/2009 10:57PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.249000	35.20	10.5	52	16.6	AV	N	GND
0.438000	30.10	10.4	47	17.0	AV	N	GND
1.594500	25.30	10.6	46	20.7	AV	N	GND
4.960500	31.40	10.6	46	14.6	AV	N	GND
5.730000	36.30	10.6	50	13.7	AV	N	GND
29.220000	32.90	11.3	50	17.1	AV	N	GND

SCAN TABLE: "Voltage (9K-30M) FIN"
 Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0905308_fin"

9/4/2009 11:00PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.181500	50.90	10.5	64	13.5	QP	L1	GND
0.190500	48.90	10.5	64	15.1	QP	L1	GND
0.685500	34.00	10.4	56	22.0	QP	L1	GND
1.738500	35.50	10.6	56	20.5	QP	L1	GND
4.582500	39.70	10.6	56	16.3	QP	L1	GND
5.730000	46.90	10.6	60	13.1	QP	L1	GND

MEASUREMENT RESULT: "HTW0905308_fin2"

9/4/2009 11:00PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.492000	21.00	10.4	46	25.1	AV	L1	GND
1.815000	23.30	10.6	46	22.7	AV	L1	GND
2.292000	28.70	10.6	46	17.3	AV	L1	GND
5.730000	36.50	10.6	50	13.5	AV	L1	GND
6.873000	34.20	10.6	50	15.8	AV	L1	GND
29.463000	33.10	11.3	50	16.9	AV	L1	GND

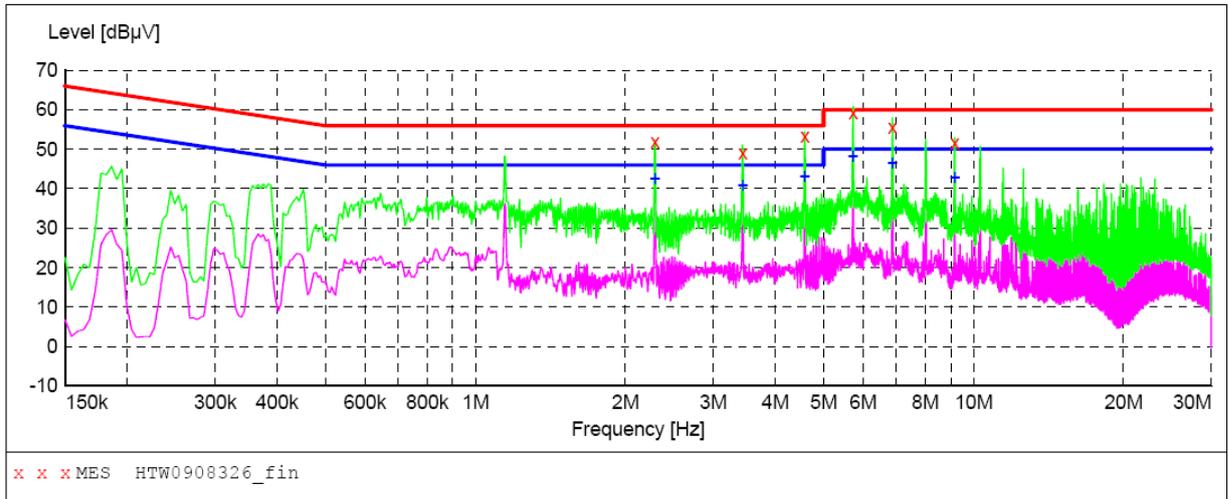
REMARKS :

1. Margin value = Limit value- Emission level
2. The EUT was set to be normal operation condition. Each Ethernet port was connected and data pay lead was transmitted at highest data rate. The RF chip can be operated in 802.11g and 802.11b and 802.11n mode. The rf chip will detect the environment and select the proper mode automatically. The WLAN function was set to normal operation condition.

For #2 AC Adapter

SCAN TABLE: "Voltage (9K-30M) FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0908326_fin"

9/8/2009 2:39PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
2.292000	51.80	10.6	56	4.2	QP	L1	GND
3.439500	49.00	10.6	56	7.0	QP	L1	GND
4.582500	53.40	10.6	56	2.6	QP	L1	GND
5.730000	59.30	10.6	60	0.7	QP	L1	GND
6.873000	55.60	10.6	60	4.4	QP	L1	GND
9.163500	51.70	10.8	60	8.3	QP	L1	GND

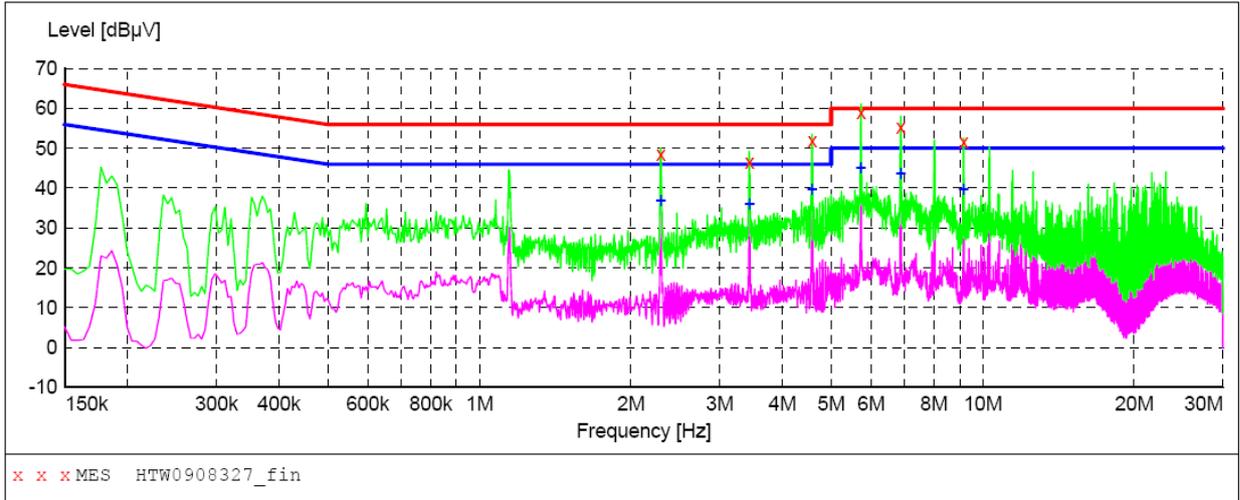
MEASUREMENT RESULT: "HTW0908326_fin2"

9/8/2009 2:39PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
2.292000	42.60	10.6	46	3.4	AV	L1	GND
3.439500	40.80	10.6	46	5.2	AV	L1	GND
4.578000	43.20	10.6	46	2.8	AV	L1	GND
5.725500	48.20	10.6	50	1.8	AV	L1	GND
6.877500	46.60	10.6	50	3.4	AV	L1	GND
9.163500	42.80	10.8	50	7.2	AV	L1	GND

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0908327_fin"

9/8/2009 2:42PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
2.292000	48.60	10.6	56	7.4	QP	N	GND
3.439500	46.60	10.6	56	9.4	QP	N	GND
4.582500	52.00	10.6	56	4.0	QP	N	GND
5.730000	58.90	10.6	60	1.1	QP	N	GND
6.873000	55.40	10.6	60	4.6	QP	N	GND
9.163500	51.50	10.8	60	8.5	QP	N	GND

MEASUREMENT RESULT: "HTW0908327_fin2"

9/8/2009 2:42PM

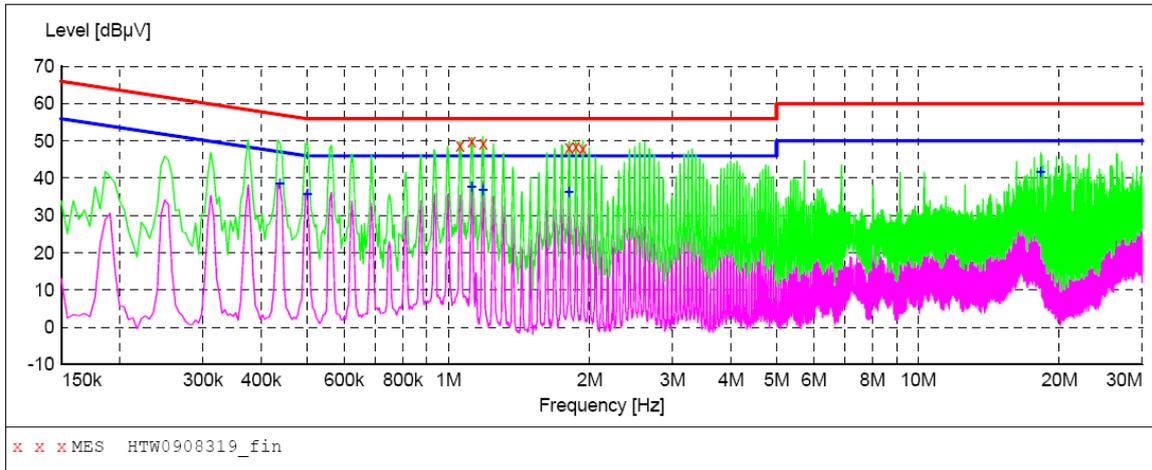
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
2.292000	36.90	10.6	46	9.1	AV	N	GND
3.439500	35.90	10.6	46	10.1	AV	N	GND
4.578000	39.80	10.6	46	6.2	AV	N	GND
5.725500	45.20	10.6	50	4.8	AV	N	GND
6.877500	43.80	10.6	50	6.2	AV	N	GND
9.159000	39.80	10.8	50	10.2	AV	N	GND

REMARKS :

1. Margin value = Limit value- Emission level
2. The EUT was set to be normal operation condition. Each Ethernet port was connected and data pay lead was transmitted at highest data rate. The RF chip can be operated in 802.11g and 802.11b and 802.11n mode. The rf chip will detect the environment and select the proper mode automatically. The WLAN function was set to normal operation condition.

For #3 AC Adapter

SCAN TABLE: "Voltage (9K-30M) FIN"
 Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0908319_fin"

9/8/2009 2:07PM

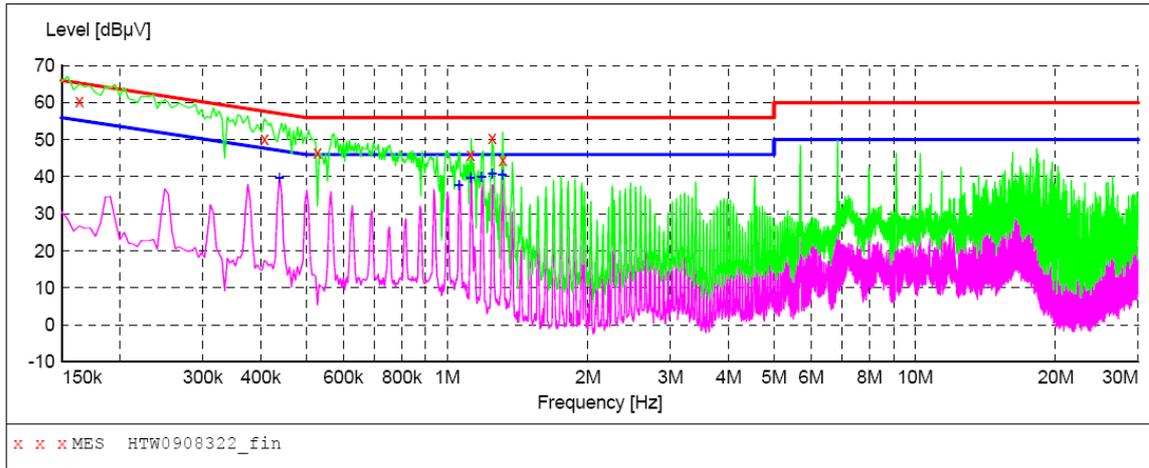
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
1.059000	48.70	10.5	56	7.3	QP	N	GND
1.122000	49.80	10.5	56	6.2	QP	N	GND
1.185000	49.40	10.5	56	6.6	QP	N	GND
1.806000	48.10	10.6	56	7.9	QP	N	GND
1.869000	48.40	10.6	56	7.6	QP	N	GND
1.932000	48.00	10.6	56	8.0	QP	N	GND

MEASUREMENT RESULT: "HTW0908319_fin2"

9/8/2009 2:07PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.438000	38.50	10.4	47	8.6	AV	N	GND
0.501000	35.70	10.4	46	10.3	AV	N	GND
1.122000	37.70	10.5	46	8.3	AV	N	GND
1.185000	36.80	10.5	46	9.2	AV	N	GND
1.806000	36.20	10.6	46	9.8	AV	N	GND
18.244500	41.70	10.9	50	8.3	AV	N	GND

SCAN TABLE: "Voltage (9K-30M) FIN"
 Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW0908322_fin"

9/8/2009 2:22PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.163500	60.40	10.5	65	4.9	QP	L1	GND
0.406500	50.30	10.4	58	7.4	QP	L1	GND
0.528000	46.50	10.4	56	9.5	QP	L1	GND
1.122000	45.90	10.5	56	10.1	QP	L1	GND
1.248000	50.40	10.5	56	5.6	QP	L1	GND
1.315500	44.50	10.6	56	11.5	QP	L1	GND

MEASUREMENT RESULT: "HTW0908322_fin2"

9/8/2009 2:22PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.438000	39.60	10.4	47	7.5	AV	L1	GND
1.059000	37.80	10.5	46	8.2	AV	L1	GND
1.122000	39.70	10.5	46	6.3	AV	L1	GND
1.185000	40.10	10.5	46	5.9	AV	L1	GND
1.248000	40.80	10.5	46	5.2	AV	L1	GND
1.311000	40.50	10.6	46	5.5	AV	L1	GND

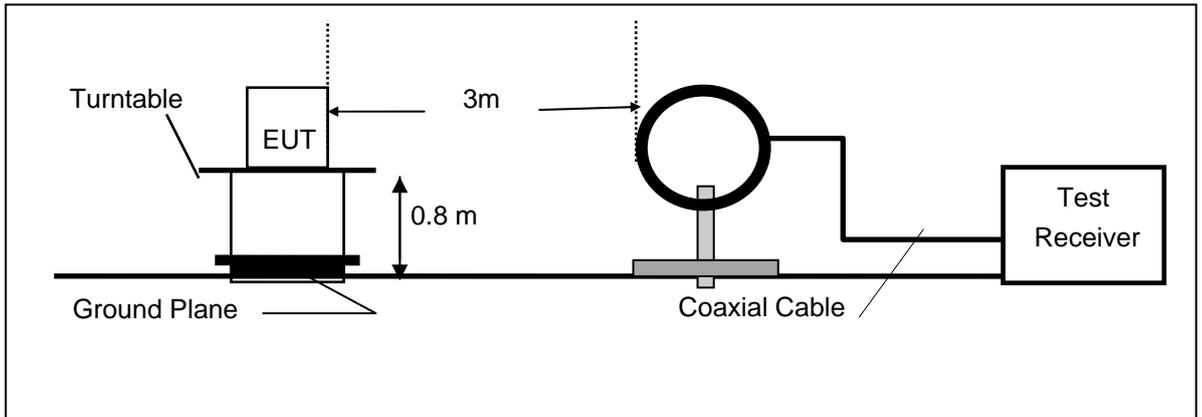
REMARKS :

1. Margin value = Limit value- Emission level
2. The EUT was set to be normal operation condition. Each Ethernet port was connected and data pay lead was transmitted at highest data rate. The RF chip can be operated in 802.11g and 802.11b and 802.11n mode. The rf chip will detect the environment and select the proper mode automatically. The WLAN function was set to normal operation condition.

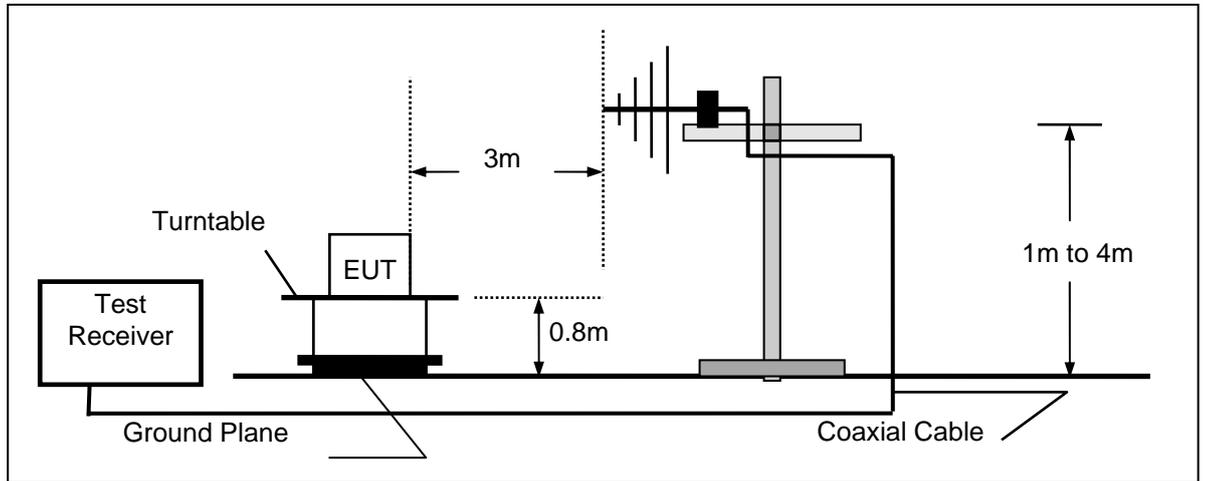
4.2. Radiated Emission Test

TEST CONFIGURATION

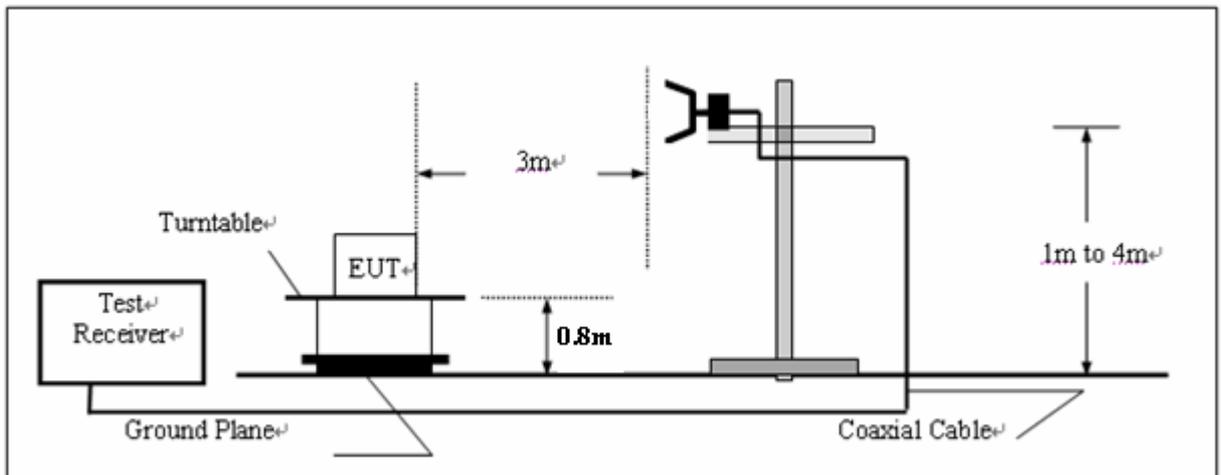
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



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



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



TEST 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.

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	

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.

TEST RESULTS

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	-18.9	*	*	40.00	*	*
105.82	-13.5	45.80	50.30	46.00	32.30	36.80
333.25	-10.6	50.10	44.10	46.00	39.50	33.40
356.57	-9.60	47.30	48.70	46.00	37.70	39.10
655.93	-3.10	40.70	40.00	46.00	37.60	36.90
690.93	-2.80	40.40	37.20	46.00	37.60	34.40
900.90	-2.90	41.30	39.20	46.00	38.40	36.30
1000.00	-2.70	*	*	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	09/05/2009
Test Mode	802.11b Channel 1	Detector Function	Peak(PK)/Average(AV)
Product Name	Home Gateway	Test By	Wenliang Li
Model Name	EchoLife HG521	TEMP&Humidity	25 °C, 53%

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1613.23	36.10 PK	74.00	-37.90	1.87 H	255	43.30	-7.20
1	1613.23	23.50 AV	54.00	-30.50	1.87 H	255	37.90	-7.20
2	2390.00	39.90 PK	74.00	-34.10	1.80 H	216	43.10	-3.40
2	2390.00	27.50AV	54.00	-26.50	1.80 H	216	30.90	-3.40
3	*2412.00	99.40 PK			1.67 H	360	102.80	-3.40
3	*2412.00	86.80 AV			1.67 H	360	97.60	-3.40
4	4824.00	60.00 PK	74.00	-24.00	1.49 H	331	56.80	3.20
4	4824.00	41.70 AV	54.00	-12.30	1.49 H	331	44.90	3.20
5	7236.00	54.20 PK	74.00	-19.80	1.03 H	152	44.80	9.40
5	7236.00	41.90 AV	54.00	-12.10	1.03 H	152	32.50	9.40
6	9648.00	62.60 PK	74.00	-11.40	1.53 H	140	50.00	12.60
6	9648.00	46.60 AV	54.00	-7.40	1.53 H	140	34.00	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1613.23	35.50 PK	74.00	-38.50	1.75 V	330	42.70	-7.20
1	1613.23	23.50 AV	54.00	-30.50	1.75 V	330	37.70	-7.20
2	2390.00	39.70 PK	74.00	-34.30	1.80 V	192	43.10	-3.40
2	2390.00	27.70AV	54.00	-26.30	1.80 V	192	31.10	-3.40
3	*2412.00	89.40 PK			1.67 V	124	92.80	-3.40
3	*2412.00	79.20 AV			1.67 V	124	84.60	-3.40
4	4824.00	52.90 PK	74.00	-21.10	1.46 V	110	51.40	3.20
4	4824.00	37.90 AV	54.00	-16.10	1.46 V	110	34.70	3.20
5	7236.00	54.60 PK	74.00	-19.40	1.21 V	340	45.20	9.40
5	7236.00	41.90 AV	54.00	-12.10	1.21 V	340	32.50	9.40
6	9648.00	61.00 PK	74.00	-13.00	1.73 V	20	48.40	12.60
6	9648.00	46.70 AV	54.00	-7.30	1.73 V	20	34.10	12.60

- REMARKS:**
1. Emission level (dBuV/m) =Raw Value (dBuV) + Correction Factor (dB/m)
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. “* “: Fundamental frequency
 7. For Wireless 802.11b mode at 11Mbps.

Company	Huawei Technologies Co.,Ltd.	Test Date	09/05/2009
Test Mode	802.11b Channel 7	Detector Function	Peak(PK)/Average(AV)
Product Name	Home Gateway	Test By	Wenliang Li
Model Name	ECHOLIFE HG521	TEMP&Humidity	25 ° C, 53%

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2442.00	94.00 PK			1.90 H	153	97.20	-3.20
1	*2442.00	82.30 AV			1.90 H	153	92.20	-3.20
2	4884.00	60.50 PK	74.00	-13.50	1.58 H	202	57.10	3.40
2	4884.00	39.70 AV	54.00	-14.30	1.58 H	202	36.50	3.40
3	7326.00	54.60 PK	74.00	-19.40	1.36 H	355	45.20	9.40
3	7326.00	41.60 AV	54.00	-15.40	1.36 H	355	32.20	9.40
4	9768.00	62.10 PK	74.00	-11.90	1.66 H	28	49.50	12.60
4	9768.00	47.50 AV	54.00	-6.50	1.66 H	28	34.90	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2442.00	93.70 PK			1.32 V	121	96.90	-3.20
1	*2442.00	82.20 AV			1.32 V	121	90.80	-3.20
2	4884.00	59.30 PK	74.00	-14.70	1.33 V	97	55.90	3.40
2	4884.00	39.20 AV	54.00	-14.80	1.33 V	97	35.80	3.40
3	7326.00	54.10 PK	74.00	-19.90	1.65 V	288	44.70	9.40
3	7326.00	41.90 AV	54.00	-12.10	1.65 V	288	32.50	9.40
4	9768.00	61.10 PK	74.00	-12.90	1.18 V	89	48.50	12.60
4	9768.00	47.60 AV	54.00	-6.40	1.18 V	89	35.00	12.60

- REMARKS:**
1. Emission level (dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. “* “: Fundamental frequency
 7. For Wireless 802.11b mode at 11Mbps.

Company	Huawei Technologies Co.,Ltd.	Test Date	09/05/2009
Test Mode	802.11b Channel 13	Detector Function	Peak(PK)/Average(AV)
Product Name	Home Gateway	Test By	Wenliang Li
Model Name	ECHOLIFE HG521	TEMP&Humidity	25 °C, 53%

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2472.00	103.90 PK			1.79 H	154	107.20	-3.30
1	*2472.00	88.20 AV			1.79 H	154	100.30	-3.30
2	2483.50	47.20 PK	74.00	-26.80	1.12 H	146	50.50	-3.30
2	2483.50	30.90 AV	54.00	-23.10	1.12H	146	34.20	-3.30
3	3895.79	44.10 PK	74.00	-29.90	1.50 H	341	42.70	1.40
3	3895.79	32.30 AV	54.00	-21.70	1.50 H	341	30.90	1.40
4	4924.00	60.10 PK	74.00	-13.90	1.46 H	100	56.30	3.80
4	4924.00	40.80 AV	54.00	-13.20	1.46 H	100	37.00	3.80
5	7386.00	54.10 PK	74.00	-19.90	1.22 H	190	44.70	9.40
5	7386.00	41.90 AV	54.00	-12.10	1.22 H	190	32.50	9.40
6	9848.00	61.30 PK	74.00	-12.70	1.47 H	113	48.70	12.60
6	9848.00	47.60 AV	54.00	-6.40	1.47 H	113	35.00	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2472.00	101.90 PK			1.28 V	247	105.20	-3.30
1	*2472.00	87.10 AV			1.28 V	247	100.10	-3.30
2	2483.50	40.20 PK	74.00	-33.80	1.72 V	150	43.50	-3.30
2	2483.50	28.30 AV	54.00	-25.70	1.72 V	150	31.60	-3.30
3	3895.79	44.10 PK	74.00	-29.90	1.50 V	299	42.70	1.40
3	3895.79	32.10 AV	54.00	-21.90	1.50 V	299	30.70	1.40
4	4924.00	59.00 PK	74.00	-15.00	1.07 V	90	55.20	3.80
4	4924.00	41.00 AV	54.00	-13.00	1.07 V	90	37.20	3.80
5	7386.00	54.20 PK	74.00	-19.80	1.31 V	29	44.80	9.40
5	7386.00	41.90 AV	54.00	-12.10	1.31 V	29	32.50	9.40
6	9848.00	61.50 PK	74.00	-12.50	1.68 V	222	48.90	12.60
6	9848.00	47.60 AV	54.00	-6.40	1.68 V	222	35.00	12.60

- REMARKS:**
1. Emission level (dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. "*" ": Fundamental frequency
 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	09/05/2009
Test Mode	802.11g Channel 1	Detector Function	Peak(PK)/Average(AV)
Product Name	Home Gateway	Test By	Wenliang Li
Model Name	ECHOLIFE HG521	TEMP&Humidity	25 °C, 53%

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	50.00 PK	74.00	-24.00	1.87 H	142	53.30	-3.30
1	2390.00	24.90 AV	54.00	-24.10	1.87 H	142	28.20	-3.30
2	*2412.00	100.30 PK			1.50 H	123	111.00	-3.30
2	*2412.00	86.50 AV			1.50H	123	103.80	-3.30
3	4824.00	56.40 PK	74.00	-17.60	1.32 H	216	52.60	3.80
3	4824.00	39.60 AV	54.00	-13.90	1.32 H	216	36.10	3.80
4	7236.00	54.40 PK	74.00	-19.60	1.43 H	176	45.00	9.40
4	7236.00	42.10 AV	54.00	-11.90	1.43 H	176	32.70	9.40
5	9648.00	61.50 PK	74.00	-12.50	1.08 H	72	48.90	12.60
5	9648.00	47.40 AV	54.00	-6.60	1.08 H	72	34.80	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	41.00 PK	74.00	-33.00	1.20 V	199	44.30	-3.30
1	2390.00	27.60 AV	54.00	-26.40	1.20 V	199	30.90	-3.30
2	*2412.00	98.20 PK			1.61 V	127	104.50	-3.30
2	*2412.00	85.60 AV			1.61 V	127	99.90	-3.30
3	4824.00	54.80 PK	74.00	-19.20	1.38 V	95	51.00	3.80
3	4824.00	40.10 AV	54.00	-13.90	1.38 V	95	36.80	3.80
4	7236.00	54.20 PK	74.00	-19.80	1.17 V	0	44.80	9.40
4	7236.00	42.10 AV	54.00	-11.90	1.17 V	0	32.70	9.40
5	9648.00	61.40 PK	74.00	-12.60	1.00 V	264	48.80	12.60
5	9648.00	47.50 AV	54.00	-6.50	1.00 V	264	34.90	12.60

- REMARKS:**
1. Emission level (dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. “* “: Fundamental frequency
 7. For Wireless 802.11g mode at 54Mbps.

Company	Huawei Technologies Co.,Ltd.	Test Date	09/05/2009
Test Mode	802.11g Channel 7	Detector Function	Peak(PK)/Average(AV)
Product Name	Home Gateway	Test By	Wenliang Li
Model Name	ECHOLIFE HG521	TEMP&Humidity	25 ° C, 53%

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2442.00	99.60 PK			1.47 H	100	110.80	-3.20
1	*2442.00	85.60 AV			1.47 H	100	103.80	-3.20
2	4884.00	54.20 PK	74.00	-19.80	1.39 H	214	50.80	3.40
2	4884.00	38.90 AV	54.00	-15.10	1.39 H	214	35.50	3.40
3	7326.00	54.30 PK	74.00	-23.20	1.20 H	0	44.90	9.40
3	7326.00	42.10 AV	54.00	-14.30	1.20 H	0	32.70	9.40
4	9768.00	62.00 PK	74.00	-12.00	1.15 H	163	48.40	12.60
4	9768.00	47.60 AV	54.00	-6.40	1.15 H	163	35.00	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2442.00	97.50 PK			1.31 V	122	108.70	-3.20
1	*2442.00	83.80 AV			1.31 V	122	101.00	-3.20
2	4884.00	53.80 PK	74.00	-20.20	1.24 V	100	50.40	3.40
2	4884.00	38.10 AV	54.00	-15.90	1.24 V	100	34.70	3.40
3	7326.00	54.30 PK	74.00	-19.80	1.09 V	356	44.90	9.40
3	7326.00	42.10 AV	54.00	-11.90	1.09 V	356	32.70	9.40
4	9768.00	61.20 PK	74.00	-12.80	1.57 V	26	48.60	12.60
4	9768.00	47.40 AV	54.00	-6.60	1.57 V	26	34.80	12.60

- REMARKS:**
1. Emission level (dBuV/m) =Raw Value (dBuV) + Correction Factor (dB/m)
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. “* “: Fundamental frequency
 7. For Wireless 802.11g mode at 54Mbps.

Company	Huawei Technologies Co.,Ltd.	Test Date	09/05/2009
Test Mode	802.11g Channel 13	Detector Function	Peak(PK)/Average(AV)
Product Name	Home Gateway	Test By	Wenliang Li
Model Name	ECHOLIFE HG521	TEMP&Humidity	25 °C, 53%

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2472.00	105.40 PK			1.89 H	156	112.70	-3.30
1	*2472.00	87.50 AV			1.89 H	156	106.20	-3.30
2	2483.50	47.30 PK	74.00	-26.70	1.12H	191	50.60	-3.30
2	2483.50	41.60 AV	54.00	-12.40	1.12 H	191	44.90	-3.30
3	4924.00	52.90 PK	74.00	-21.10	1.29 H	198	49.10	3.80
3	4924.00	40.20 AV	54.00	-13.80	1.29 H	198	36.40	3.80
4	7386.00	54.30 PK	74.00	-19.70	1.45 H	90	44.90	9.40
4	7386.00	42.60 AV	54.00	-11.40	1.45 H	90	33.20	9.40
5	9848.00	61.50 PK	74.00	-12.50	1.14 H	124	48.90	12.60
5	9848.00	46.90 AV	54.00	-7.10	1.14 H	124	34.30	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2472.00	102.00 PK			1.30 V	125	107.30	-3.30
1	*2472.00	85.30 AV			1.30 V	125	103.60	-3.30
2	2483.50	43.80 PK	74.00	-30.20	1.54 V	348	47.10	-3.30
2	2483.50	28.00 AV	54.00	-26.00	1.54 V	348	31.30	-3.30
3	4924.00	49.80 PK	74.00	-24.20	1.20 V	96	46.00	3.80
3	4924.00	37.80 AV	54.00	-16.20	1.20 V	96	34.00	3.80
4	7386.00	55.90 PK	74.00	-18.10	1.28 V	35	46.50	9.40
4	7386.00	37.80 AV	54.00	-16.20	1.28 V	35	28.40	9.40
5	9848.00	61.40 PK	74.00	-12.60	1.00 V	37	48.80	12.60
5	9848.00	47.60 AV	54.00	-6.40	1.00 V	37	35.00	12.60

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m)
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. “ * “ : Fundamental frequency
 7. For Wireless 802.11g mode at 54Mbps.

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	09/05/2009
Test Mode	Draft 802.11n (20MHz) Channel 1	Detector Function	Peak(PK)/Average(AV)
Product Name	Home Gateway	Test By	Wenliang Li
Model Name	ECHOLIFE HG521	TEMP&Humidity	25 °C, 53%

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	43.90 PK	74.00	-30.10	1.87 H	248	47.20	-3.30
1	2390.00	32.30 AV	54.00	-21.70	1.87 H	248	35.60	-3.30
2	*2412.00	101.70 PK			1.87 H	100	107.00	-3.30
2	*2412.00	85.50 AV			1.87 H	100	103.80	-3.30
3	4824.00	54.70 PK	74.00	-19.30	1.32 H	204	50.90	3.80
3	4824.00	39.40 AV	54.00	-14.60	1.32 H	204	35.60	3.80
4	7236.00	54.40 PK	74.00	-19.60	1.43 H	114	45.00	9.40
4	7236.00	42.10 AV	54.00	-11.90	1.43 H	114	32.50	9.40
5	9648.00	61.00 PK	74.00	-13.00	1.03 H	93	48.40	12.60
5	9648.00	47.90 AV	54.00	-6.10	1.03 H	93	35.30	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	43.90 PK	74.00	-30.10	1.50 V	123	47.20	-3.30
1	2390.00	32.30 AV	54.00	-21.70	1.50 V	123	35.60	-3.30
2	*2412.00	99.70 PK			1.61 V	123	105.00	-3.30
2	*2412.00	83.60 AV			1.61 V	123	99.90	-3.30
3	4824.00	53.10 PK	74.00	-20.90	1.00 V	100	49.30	3.80
3	4824.00	38.10 AV	54.00	-15.90	1.00 V	100	34.30	3.80
4	7236.00	54.50 PK	74.00	-19.50	1.61 V	236	45.10	9.40
4	7236.00	42.10 AV	54.00	-11.90	1.61 V	236	32.70	9.40
5	9648.00	61.40 PK	74.00	-12.50	1.38 V	116	48.80	12.60
5	9648.00	47.90 AV	54.00	-6.10	1.38 V	116	35.30	12.60

- REMARKS:**
1. Emission level (dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. “* “: Fundamental frequency
 7. For Wireless Draft 802.11n (20MHz) mode at 135Mbps.

Company	Huawei Technologies Co.,Ltd.	Test Date	09/05/2009
Test Mode	Draft 802.11n (20MHz) Channel 7	Detector Function	Peak(PK)/Average(AV)
Product Name	Home Gateway	Test By	Wenliang Li
Model Name	ECHOLIFE HG521	TEMP&Humidity	25 ° C, 53%

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2442.00	100.60 PK			1.30 H	120	107.80	-3.20
1	*2442.00	84.80 AV			1.30 H	120	103.80	-3.20
2	4884.00	56.00 PK	74.00	-18.00	1.39 H	194	52.60	3.40
2	4884.00	40.80 AV	54.00	-13.20	1.39 H	194	37.40	3.40
3	7326.00	54.30 PK	74.00	-19.70	1.47 H	248	44.90	9.40
3	7326.00	39.70 AV	54.00	-14.30	1.47 H	248	30.30	9.40
4	9768.00	61.10 PK	74.00	-12.90	1.05 H	36	48.50	12.60
4	9768.00	47.60 AV	54.00	-6.40	1.05 H	36	35.00	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2442.00	98.50 PK			1.31 V	122	105.70	-3.20
1	*2442.00	83.60 AV			1.31 V	122	101.00	-3.20
2	4884.00	53.30 PK	74.00	-20.70	1.24 V	181	49.90	3.40
2	4884.00	39.90 AV	54.00	-14.10	1.24 V	181	36.50	3.40
3	7326.00	54.40 PK	74.00	-19.60	1.55 V	346	45.00	9.40
3	7326.00	41.90 AV	54.00	-12.10	1.55 V	346	32.50	9.40
4	9768.00	62.10 PK	74.00	-11.90	1.07 V	335	49.50	12.60
4	9768.00	47.60 AV	54.00	-6.40	1.07 V	335	35.00	12.60

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m)
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. “* “: Fundamental frequency
 7. For WirelessDraft 802.11n (20MHz) mode at 135Mbps.

Company	Huawei Technologies Co.,Ltd.	Test Date	09/05/2009
Test Mode	Draft 802.11n (20MHz) Channel 13	Detector Function	Peak(PK)/Average(AV)
Product Name	Home Gateway	Test By	Wenliang Li
Model Name	ECHOLIFE HG521	TEMP&Humidity	25 °C, 53%

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2472.00	103.40 PK			1.89 H	122	106.70	-3.30
1	*2472.00	86.90 AV			1.89 H	122	104.20	-3.30
2	2483.50	44.50 PK	74.00	-29.50	1.25 H	354	47.80	-3.30
2	2483.50	32.10 AV	54.00	-21.90	1.25 H	354	35.40	-3.30
3	4924.00	54.60 PK	74.00	-19.40	1.00 H	217	50.80	3.80
3	4924.00	39.80 AV	54.00	-14.20	1.00 H	217	36.00	3.80
4	7386.00	54.30 PK	74.00	-19.70	1.52 H	0	44.90	9.40
4	7386.00	42.40 AV	54.00	-11.60	1.52 H	0	33.00	9.40
5	9848.00	60.80 PK	74.00	-13.20	1.41 H	118	48.20	12.60
5	9848.00	47.60 AV	54.00	-6.40	1.41 H	118	35.00	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2472.00	101.00 PK			1.30 V	125	104.30	-3.30
1	*2472.00	85.30 AV			1.30 V	125	101.60	-3.30
2	2483.50	58.60 PK	74.00	-15.40	1.03 V	153	61.90	-3.30
2	2483.50	40.80 AV	54.00	-13.20	1.03 V	153	44.10	-3.30
3	4924.00	55.40 PK	74.00	-18.60	1.27 V	100	51.60	3.80
3	4924.00	40.20 AV	54.00	-13.80	1.27 V	100	36.40	3.80
4	7386.00	54.60 PK	74.00	-19.40	1.41 V	0	45.20	9.40
4	7386.00	42.60 AV	54.00	-11.40	1.41 V	0	32.80	9.40
5	9848.00	61.80 PK	74.00	-12.20	1.00 V	187	49.20	12.60
5	9848.00	47.50 AV	54.00	-6.50	1.00 V	187	34.90	12.60

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m)
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. “ * “ : Fundamental frequency
 7. For Wireless Draft 802.11n (20MHz) mode at 135Mbps.

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	09/05/2009
Test Mode	Draft 802.11n (40MHz) Channel 3	Detector Function	Peak(PK)/Average(AV)
Product Name	Home Gateway	Test By	Wenliang Li
Model Name	ECHOLIFE HG521	TEMP&Humidity	25 ° C, 53%

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	44.20 PK	74.00	-29.80	1.85 H	222	47.50	-3.30
1	2390.00	32.20 AV	54.00	-21.80	1.85 H	222	35.50	-3.30
2	*2422.00	102.70 PK			1.27 H	123	108.00	-3.30
2	*2422.00	86.50 AV			1.27 H	123	103.80	-3.30
3	4844.00	52.50 PK	74.00	-21.50	1.02 H	91	48.70	3.80
3	4844.00	38.10 AV	54.00	-15.90	1.02 H	91	34.30	3.80
4	7266.00	54.70 PK	74.00	-19.30	1.00 H	266	45.30	9.40
4	7266.00	42.60 AV	54.00	-11.40	1.00 H	266	33.20	9.40
5	9688.00	61.80 PK	74.00	-12.10	1.45 H	337	49.20	12.60
5	9688.00	47.60 AV	54.00	-6.40	1.45 H	337	35.00	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	43.70 PK	74.00	-30.30	1.23 V	80	47.00	-3.30
1	2390.00	32.30 AV	54.00	-21.70	1.23 V	80	35.60	-3.30
2	*2422.00	99.70 PK			1.60 V	127	105.00	-3.30
2	*2422.00	84.60 AV			1.60 V	127	99.90	-3.30
3	4844.00	52.20 PK	74.00	-21.80	1.38 V	211	48.40	3.80
3	4844.00	40.30 AV	54.00	-13.70	1.38 V	211	36.50	3.80
4	7266.00	54.10 PK	74.00	-19.90	1.57 V	57	44.70	9.40
4	7266.00	42.10 AV	54.00	-11.90	1.57 V	57	32.70	9.40
5	9688.00	61.70 PK	74.00	-12.30	1.00 V	249	49.10	12.60
5	9688.00	47.60 AV	54.00	-6.40	1.00 V	249	35.00	12.60

- REMARKS:**
1. Emission level (dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. “* “: Fundamental frequency
 7. For Wireless Draft 802.11n (40MHz) mode at 135Mbps.

Company	Huawei Technologies Co.,Ltd.	Test Date	09/05/2009
Test Mode	Draft 802.11n (40MHz) Channel 6	Detector Function	Peak(PK)/Average(AV)
Product Name	Home Gateway	Test By	Wenliang Li
Model Name	ECHOLIFE HG521	TEMP&Humidity	25 ° C, 53%

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	100.60 PK			1.47 H	100	106.80	-3.20
1	*2437.00	84.90 AV			1.47 H	100	103.80	-3.20
2	4874.00	51.40 PK	74.00	-22.60	1.39 H	198	48.00	3.40
2	4874.00	39.00 AV	54.00	-15.00	1.39 H	198	35.60	3.40
3	7311.00	54.10 PK	74.00	-19.90	1.20 H	203	44.70	9.40
3	7311.00	42.40 AV	54.00	-11.60	1.20 H	203	33.00	9.40
4	9748.00	62.10 PK	74.00	-11.80	1.62 H	56	49.50	12.60
4	9748.00	47.60 AV	54.00	-6.40	1.62 H	56	35.00	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	98.50 PK			1.30 V	122	104.80	-3.20
1	*2437.00	82.80 AV			1.30 V	122	101.10	-3.20
2	4874.00	49.40 PK	74.00	-24.60	1.55 V	96	46.00	3.40
2	4874.00	38.20 AV	54.00	-15.80	1.55 V	96	34.80	3.40
3	7311.00	55.20 PK	74.00	-18.80	1.29 V	26	45.80	9.40
3	7311.00	42.10 AV	54.00	-11.90	1.29 V	26	32.70	9.40
4	9748.00	62.20 PK	74.00	-11.70	1.00 V	299	49.60	12.60
4	9748.00	47.70 AV	54.00	-6.30	1.00 V	299	35.10	12.60

- REMARKS:**
1. Emission level (dBuV/m) =Raw Value (dBuV) + Correction Factor (dB/m)
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. “* “: Fundamental frequency
 7. For Wireless Draft 802.11n (40MHz) mode at 135Mbps.

Company	Huawei Technologies Co.,Ltd.	Test Date	09/05/2009
Test Mode	Draft 802.11n (40MHz) Channel 9	Detector Function	Peak(PK)/Average(AV)
Product Name	Home Gateway	Test By	Wenliang Li
Model Name	ECHOLIFE HG521	TEMP&Humidity	25 °C, 53%

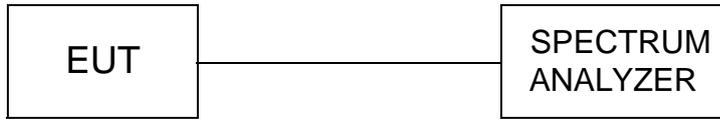
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	104.30 PK			1.89 H	153	105.60	-3.30
1	*2452.00	88.90 AV			1.89 H	153	101.20	-3.30
2	2483.50	43.70 PK	74.00	-30.20	1.55 H	127	47.00	-3.30
2	2483.50	32.40 AV	54.00	-21.60	1.55 H	127	35.70	-3.30
3	4904.00	55.00 PK	74.00	-19.00	1.22 H	204	51.20	3.80
3	4904.00	41.50 AV	54.00	-12.50	1.22H	204	37.70	3.80
4	7356.00	54.20 PK	74.00	-19.80	1.08 H	301	44.80	9.40
4	7356.00	42.10 AV	54.00	-11.90	1.08 H	301	32.70	9.40
5	9808.00	61.50 PK	74.00	-12.50	1.41 H	118	48.90	12.60
5	9808.00	47.50 AV	54.00	-6.50	1.41 H	118	34.90	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	100.20 PK			1.30 V	125	103.50	-3.30
1	*2452.00	86.30 AV			1.30 V	125	99.60	-3.30
2	2483.50	54.10 PK	74.00	-19.90	1.00 V	143	57.40	-3.30
2	2483.50	38.20 AV	54.00	-15.80	1.00 V	143	41.50	-3.30
3	4904.00	51.10 PK	74.00	-20.90	1.24 V	177	47.30	3.80
3	4904.00	39.90 AV	54.00	-14.10	1.24 V	177	36.10	3.80
4	7356.00	54.60 PK	74.00	-19.40	1.55 V	0	45.20	9.40
4	7356.00	41.90 AV	54.00	-12.10	1.55 V	0	32.50	9.40
5	9808.00	62.00 PK	74.00	-12.00	1.00 V	315	49.40	12.60
5	9808.00	47.60 AV	54.00	-6.40	1.00 V	315	35.00	12.60

- REMARKS:**
1. Emission level (dBuV/m) =Raw Value (dBuV) + Correction Factor (dB/m)
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. “ * “ : Fundamental frequency
 7. For Wireless Draft 802.11n (40MHz) mode at 135Mbps.

4.3. Maximum Peak Output Power

TEST CONFIGURATION



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.

LIMIT

The Maximum Peak Output Power Measurement is 30dBm.

TEST RESULTS

Company	Huawei Technologies Co.,Ltd.	Test Date	09/05/2009
Product Name	Home Gateway	Test By	Wenliang Li
Model Name	EchoLife HG521	TEMP&Humidity	25 °C, 53%

Data Rate (Mbps)	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass / Fail
1	2472	14.85	30	PASS
2	2472	14.97	30	PASS
5.5	2472	16.27	30	PASS
11	2472	17.46	30	PASS

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass / Fail
1	2412	15.74	30	PASS
7	2442	16.61	30	PASS
13	2472	17.46	30	PASS

Note: 1. For 802.11b Mode at 11M bps

Data Rate (Mbps)	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass / Fail
6	2472	18.50	30	PASS
9	2472	18.42	30	PASS
12	2472	18.08	30	PASS
18	2472	18.25	30	PASS
24	2472	18.72	30	PASS
36	2472	18.73	30	PASS
48	2472	18.90	30	PASS
54	2472	18.93	30	PASS

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass / Fail
1	2412	17.14	30	PASS
7	2437	17.97	30	PASS
13	2462	18.93	30	PASS

Note: 1. For 802.11g Mode at 54M bps

Data Rate (Mbps)	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass / Fail
6	2472	17.80	30	PASS
6.5	2472	17.75	30	PASS
13	2472	17.74	30	PASS
13.5	2472	17.78	30	PASS
19.5	2472	17.74	30	PASS
26	2472	17.75	30	PASS
27	2472	17.80	30	PASS
39	2472	17.74	30	PASS
40.5	2472	17.73	30	PASS
52	2472	18.24	30	PASS
54	2472	18.27	30	PASS
58.5	2472	18.27	30	PASS
65	2472	18.29	30	PASS
81	2472	18.27	30	PASS
108	2472	18.27	30	PASS
121.5	2472	18.28	30	PASS
135	2472	18.30	30	PASS

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass / Fail
1	2412	17.47	30	PASS
7	2442	18.27	30	PASS
13	2472	18.30	30	PASS

Note: 1. For Draft 802.11n (20MHz) Mode at 135M bps

Data Rate (Mbps)	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass / Fail
6	2437	16.26	30	PASS
6.5	2437	16.22	30	PASS
13	2437	16.24	30	PASS
13.5	2437	16.23	30	PASS
19.5	2437	16.21	30	PASS
26	2437	16.21	30	PASS
27	2437	16.23	30	PASS
39	2437	16.29	30	PASS
40.5	2437	16.32	30	PASS
52	2437	16.80	30	PASS
54	2437	16.83	30	PASS
58.5	2437	16.82	30	PASS
65	2437	16.84	30	PASS
81	2437	16.80	30	PASS
108	2437	16.82	30	PASS
121.5	2437	16.81	30	PASS
135	2437	16.86	30	PASS

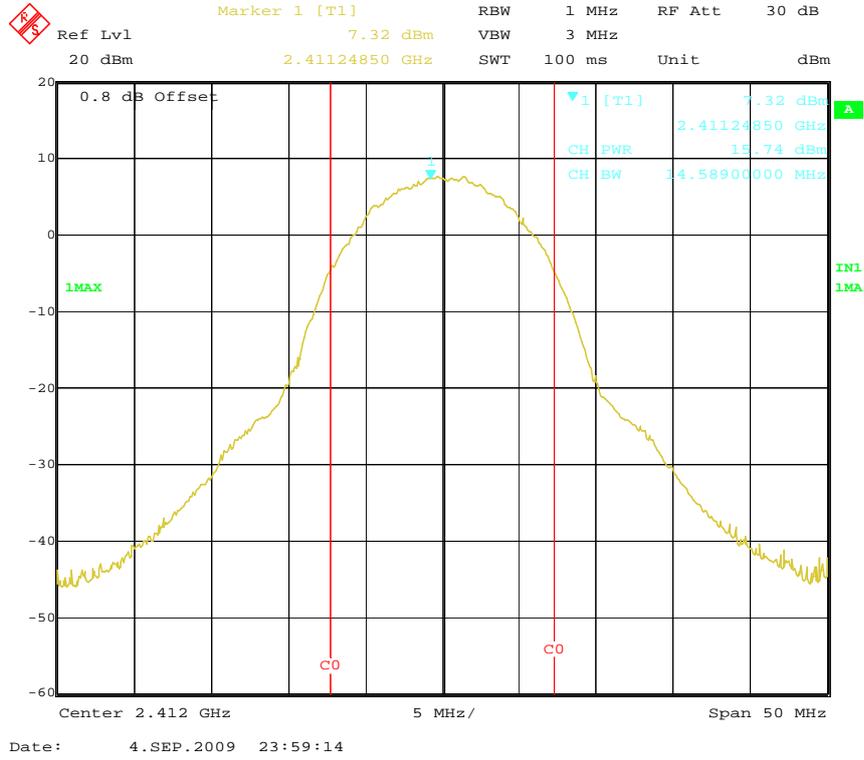
Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass / Fail
3	2422	15.71	30	PASS
6	2437	16.17	30	PASS
9	2452	16.86	30	PASS

Note: 1. For Draft 802.11n (40MHz) Mode at 135M bps

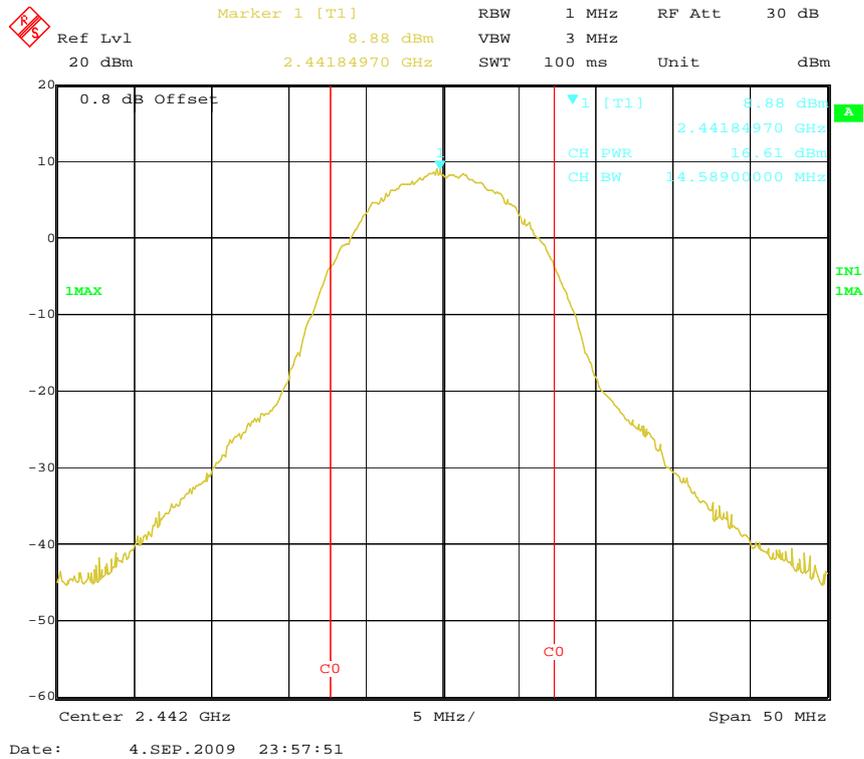
Photo of Maximum Peak Output Power Measurement

Note: For 802.11b Mode

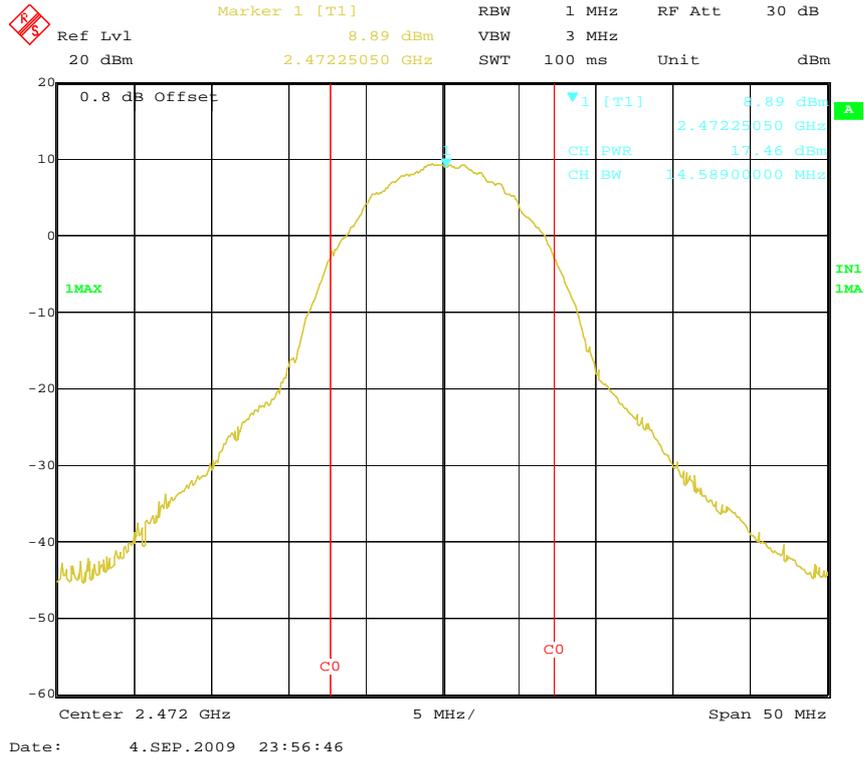
Channel 1



Channel 7

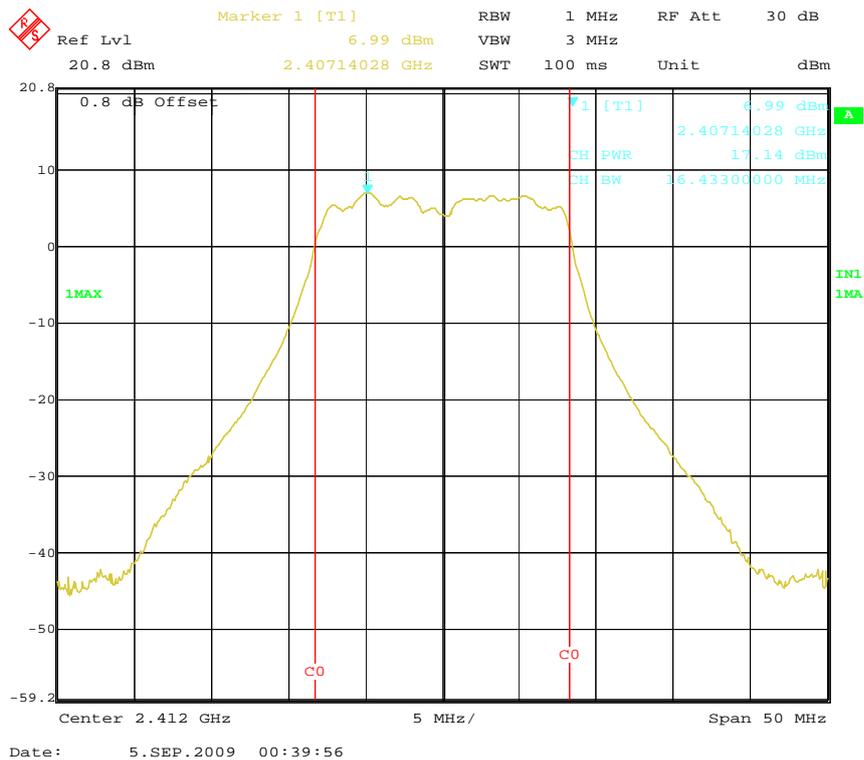


Channel 13

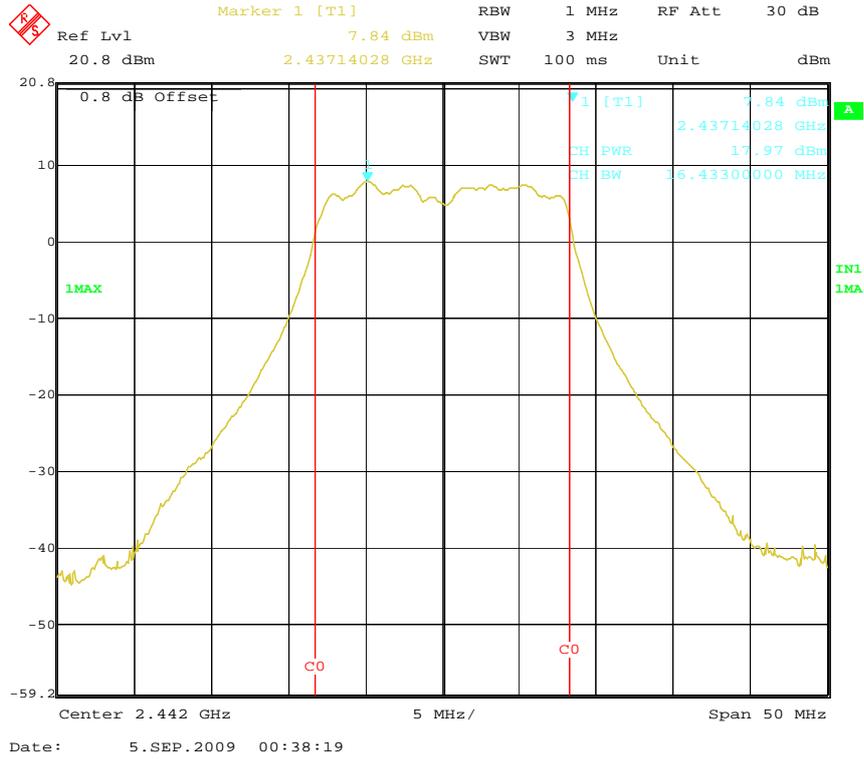


Note: For 802.11g Mode

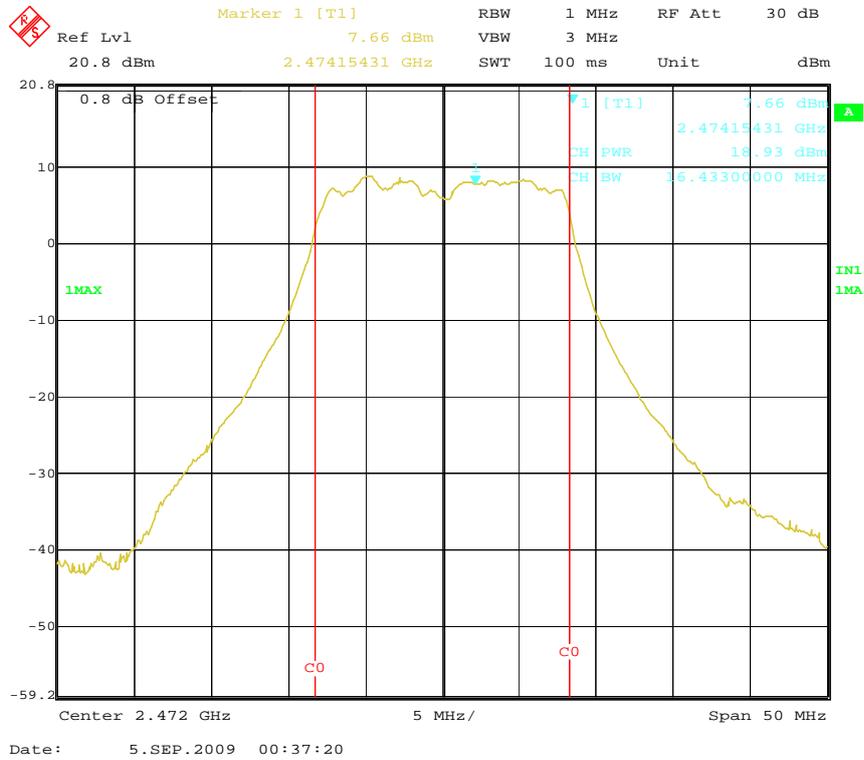
Channel 1



Channel 7

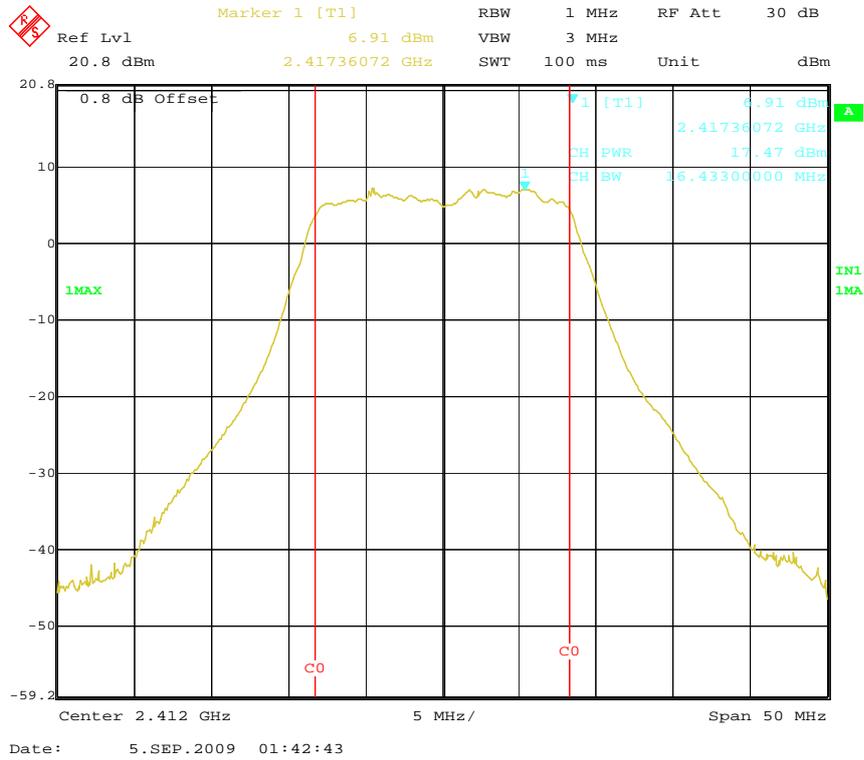


Channel 13

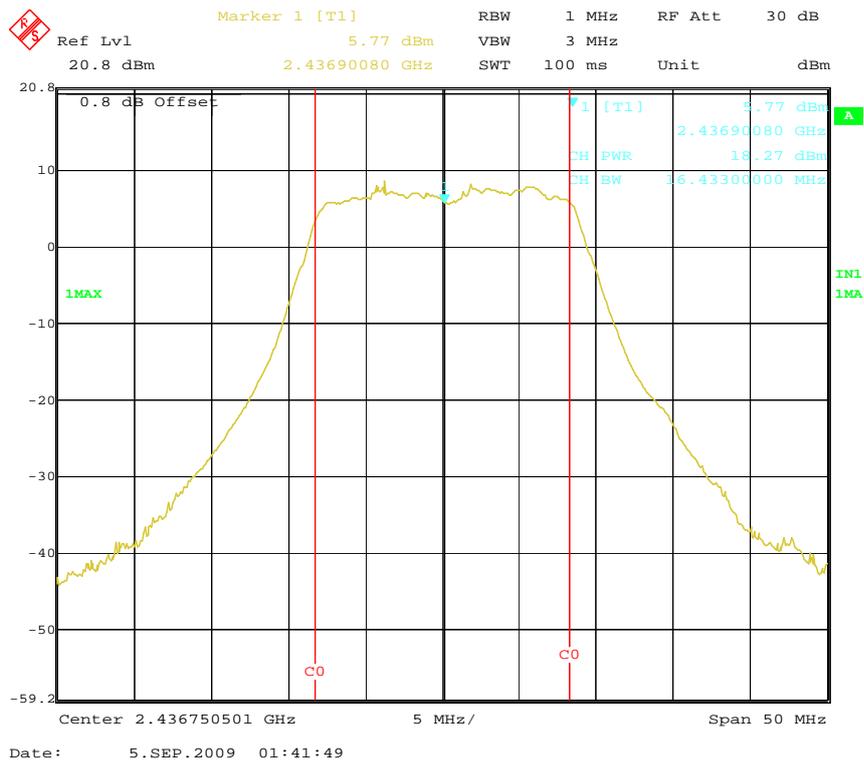


Note: For Draft 802.11n (20MHz) Mode

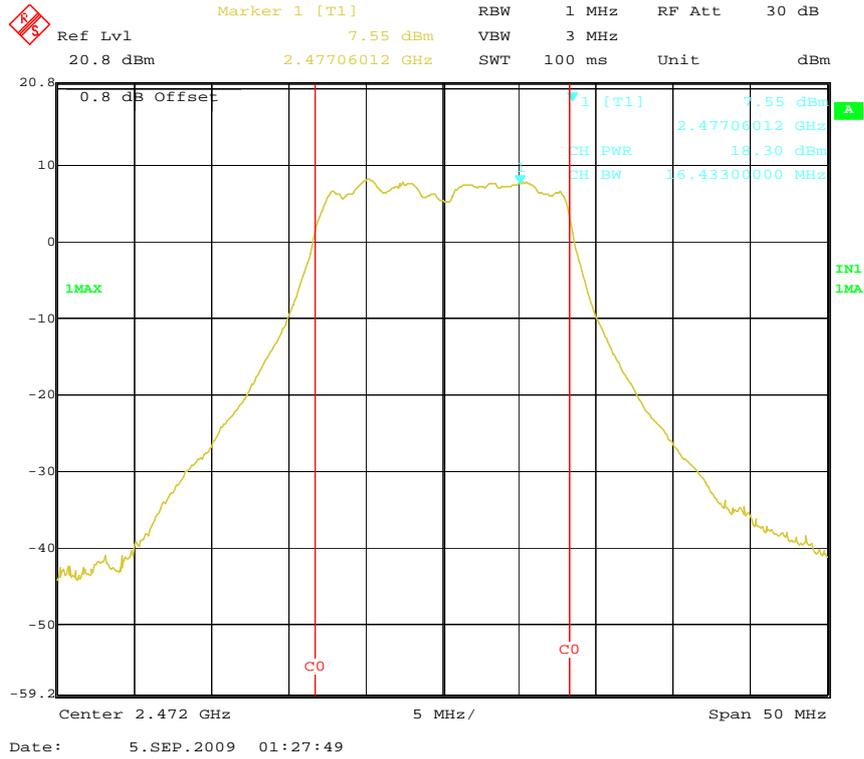
Channel 1



Channel 7

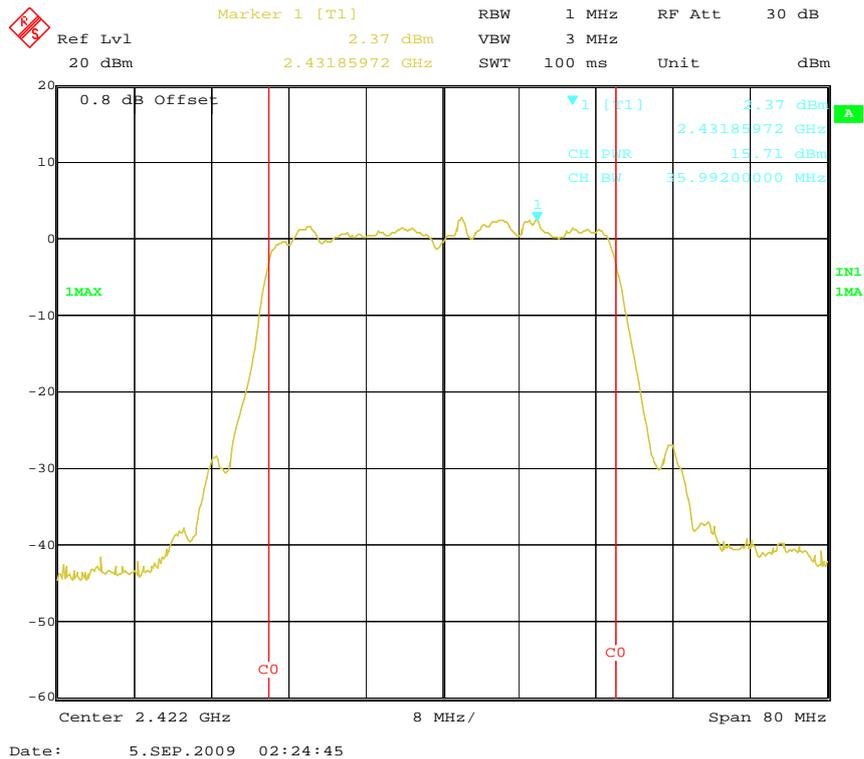


Channel 13

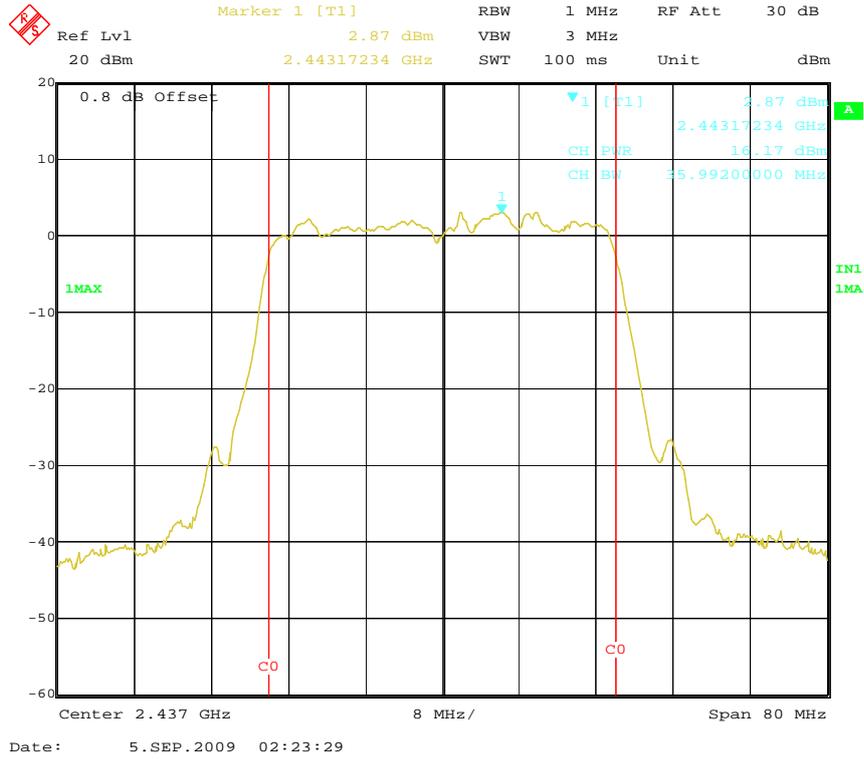


Note: For Draft 802.11n (40MHz) Mode

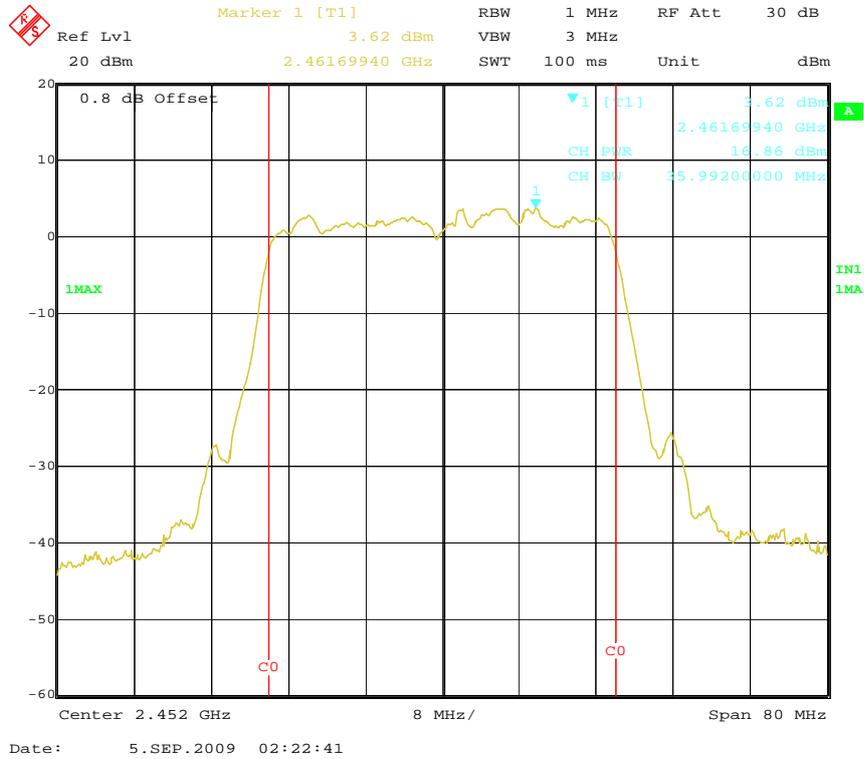
Channel 3



Channel 6

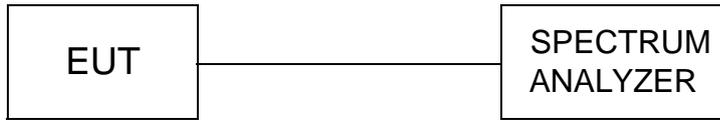


Channel 9



4.4. Power Spectral Density Measurement

TEST CONFIGURATION



TEST PROCEDURE

1. The transmitter output (antenna port) was connected to the spectrum analyser.
2. Set RBW of spectrum analyzer to 3kHz and VBW to 30kHz. Set Detector to Peak, Trace to Max Hold.
3. Mark the frequency with maximum peak power as the center of the display of the spectrum.
4. Set the span to 1.5MHz and the sweep time to 500s and record the maximum peak value.

LIMIT

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST RESULTS

Company	Huawei Technologies Co.,Ltd.	Test Date	09/05/2008
Product Name	Home Gateway	Test By	Wenliang Li
Model Name	EchoLife HG521	TEMP&Humidity	25 °C, 53%

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-4.18	8	PASS
7	2442	-6.80	8	PASS
13	2472	-1.58	8	PASS

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

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-17.98	8	PASS
7	2442	-17.00	8	PASS
13	2462	-15.98	8	PASS

Note: 1. For 802.11g mode at final test to get the worst-case emission at 54Mbps

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-16.07	8	PASS
7	2442	-15.05	8	PASS
13	2462	-14.30	8	PASS

Note: 1. For Draft 802.11n (20MHz) mode at final test to get the worst-case emission at 135Mbps

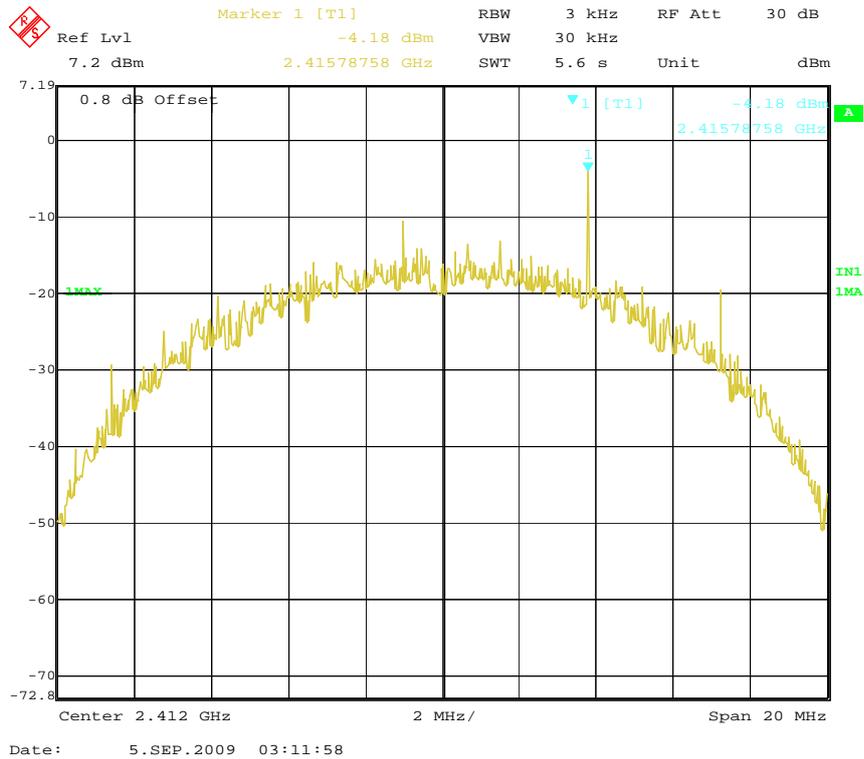
CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
3	2422	-20.61	8	PASS
6	2437	-20.09	8	PASS
9	2452	-19.39	8	PASS

Note: 1. For Draft 802.11n (40MHz) mode at final test to get the worst-case emission at 135Mbps

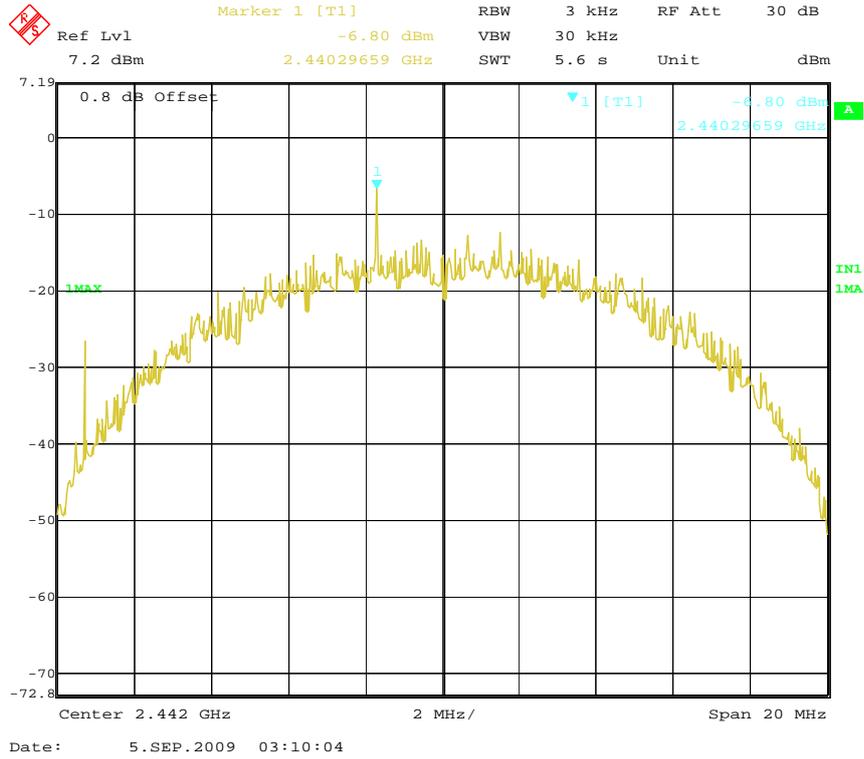
Photo of Power Spectral Density Measurement

Note: For 802.11b Mode

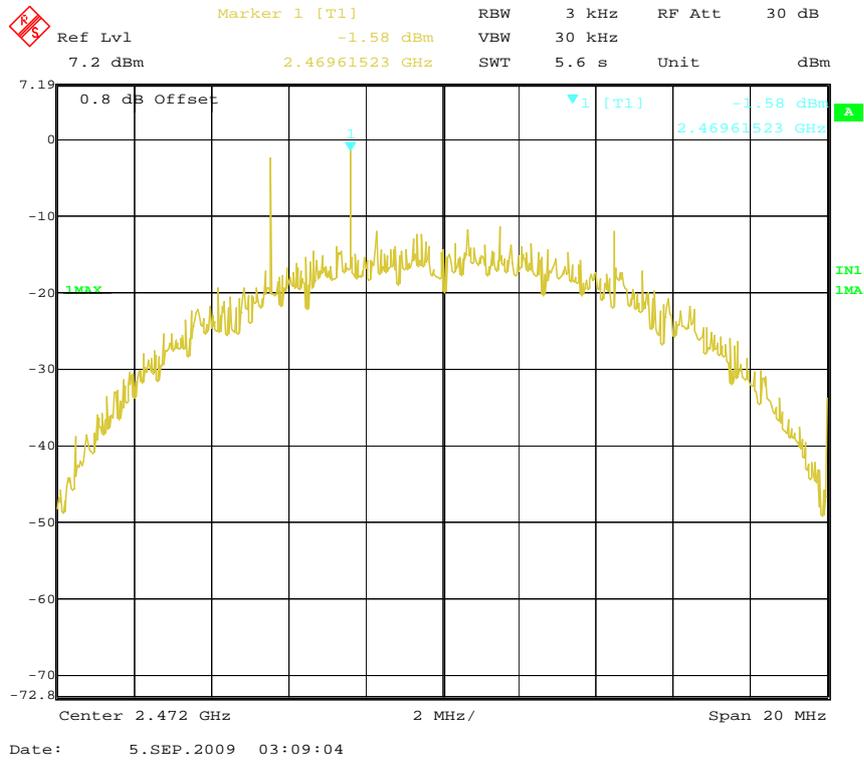
Channel 1



Channel 7

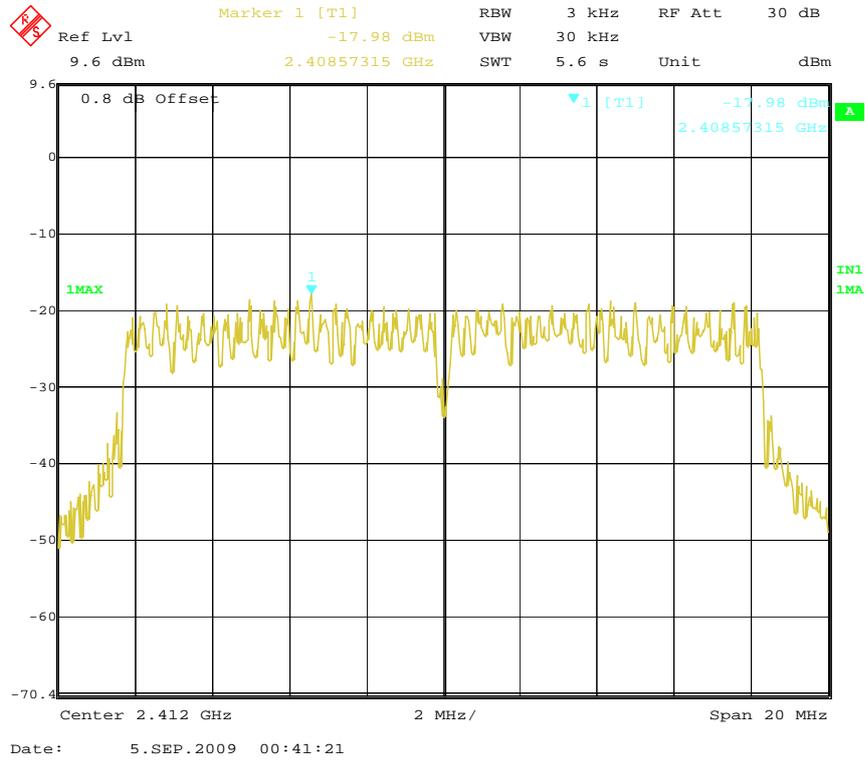


Channel 13

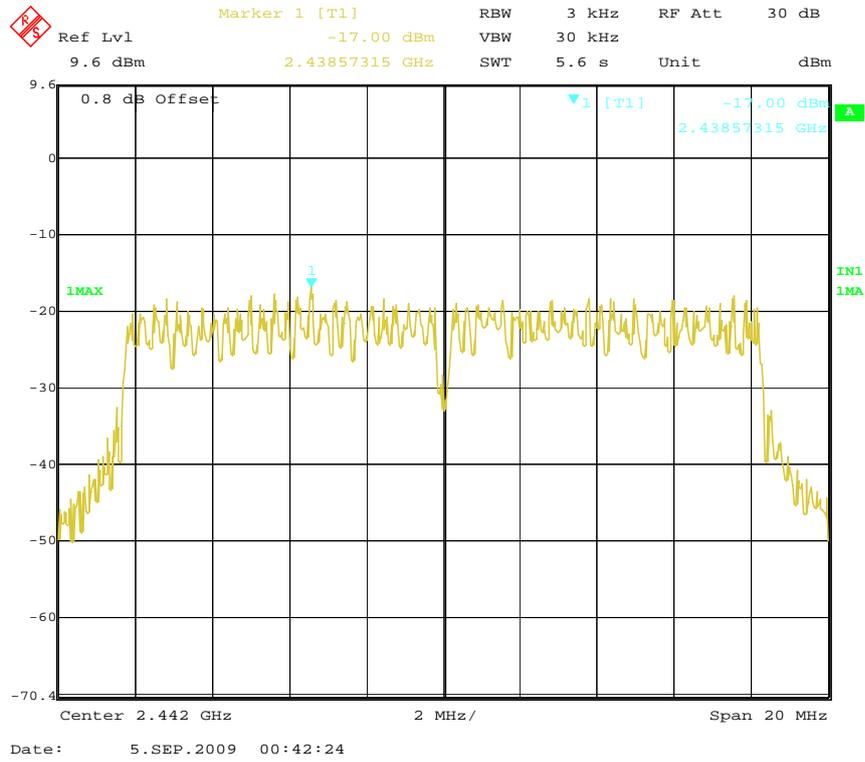


Note: For 802.11g Mode

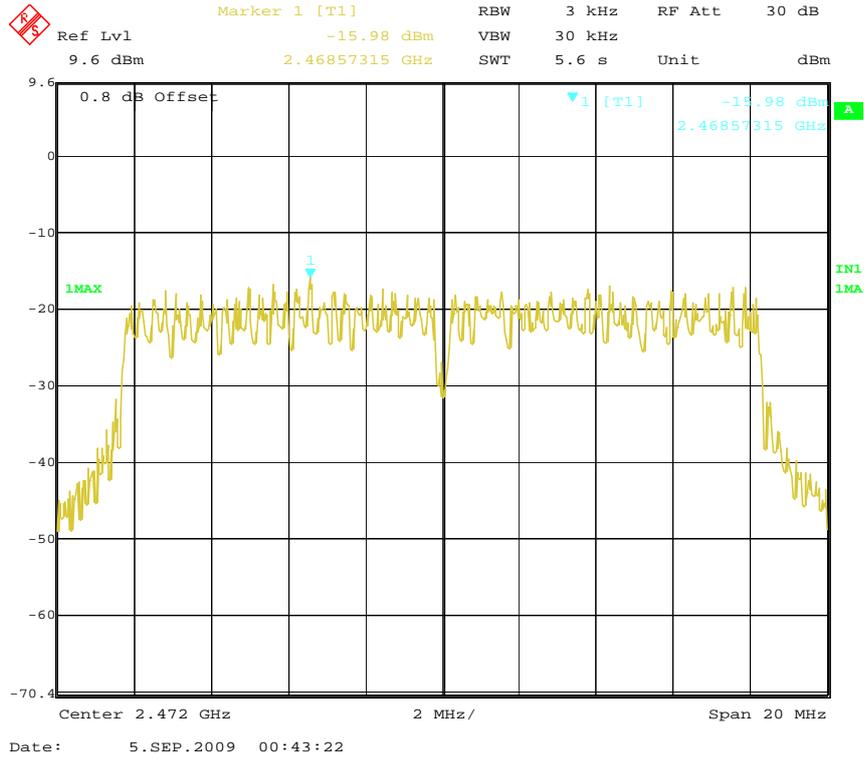
Channel 1



Channel 7

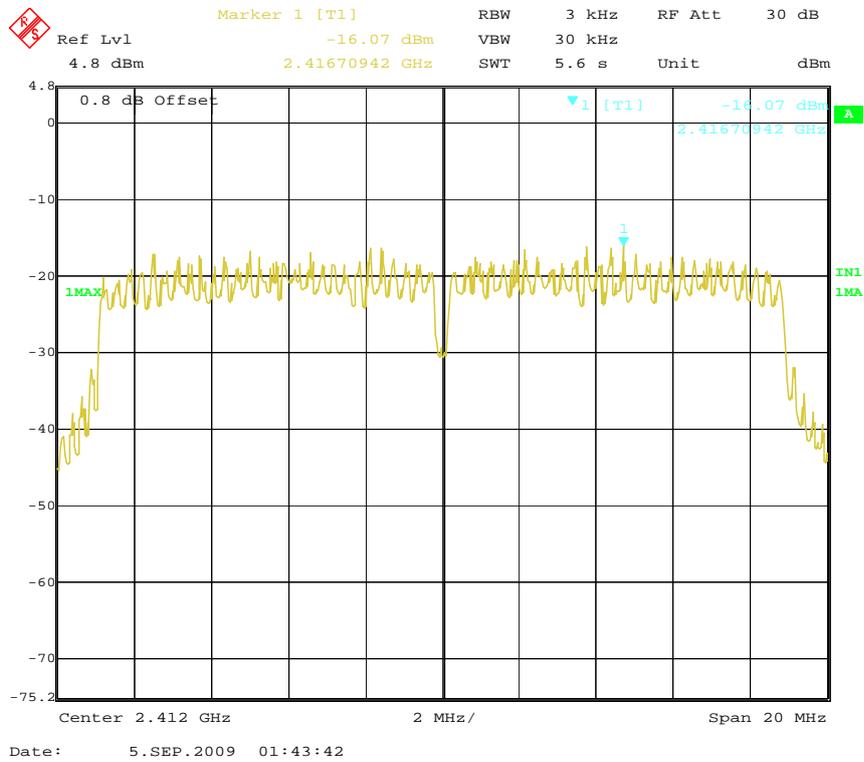


Channel 13

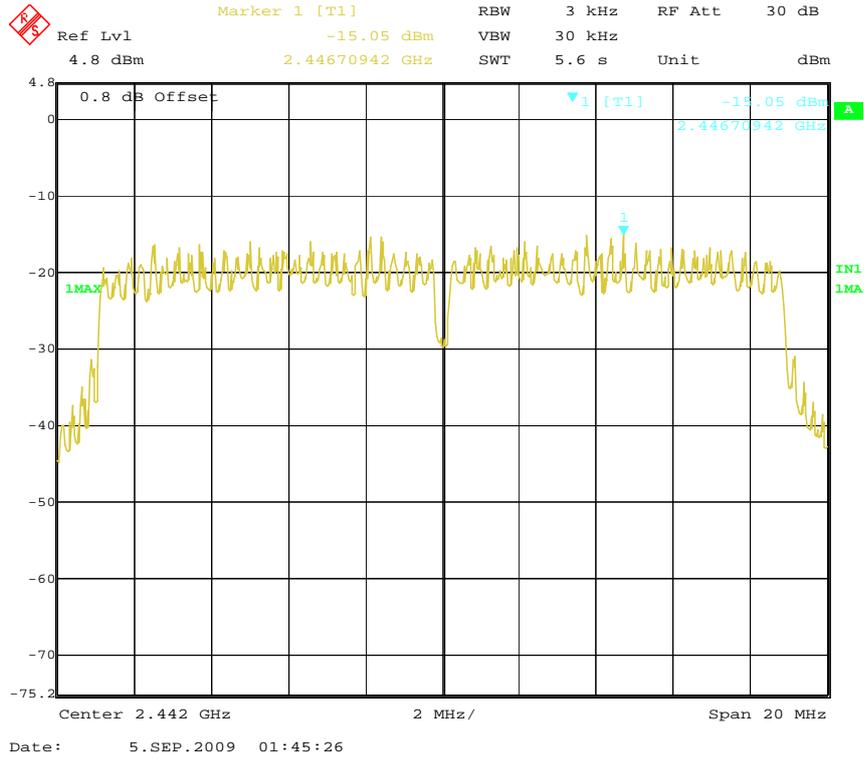


Note: For Draft 802.11n (20MHz) Mode

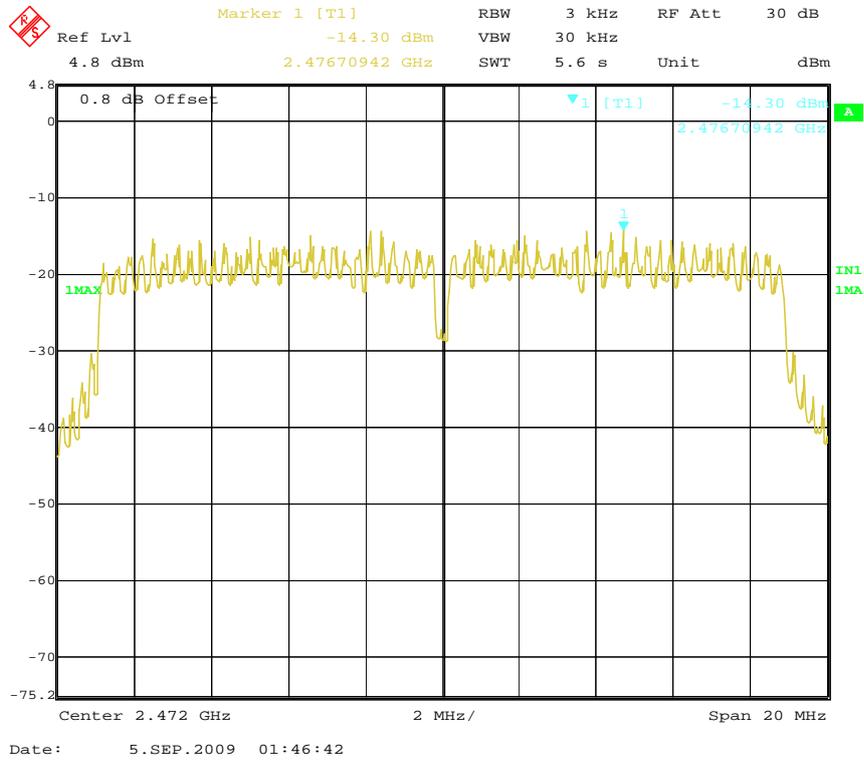
Channel 1



Channel 7

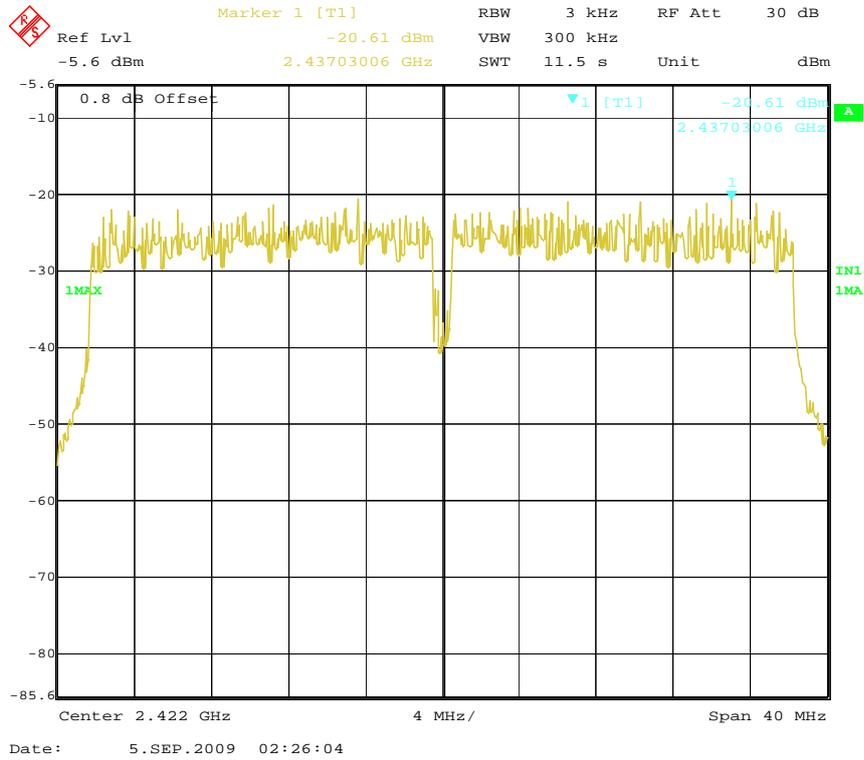


Channel 13

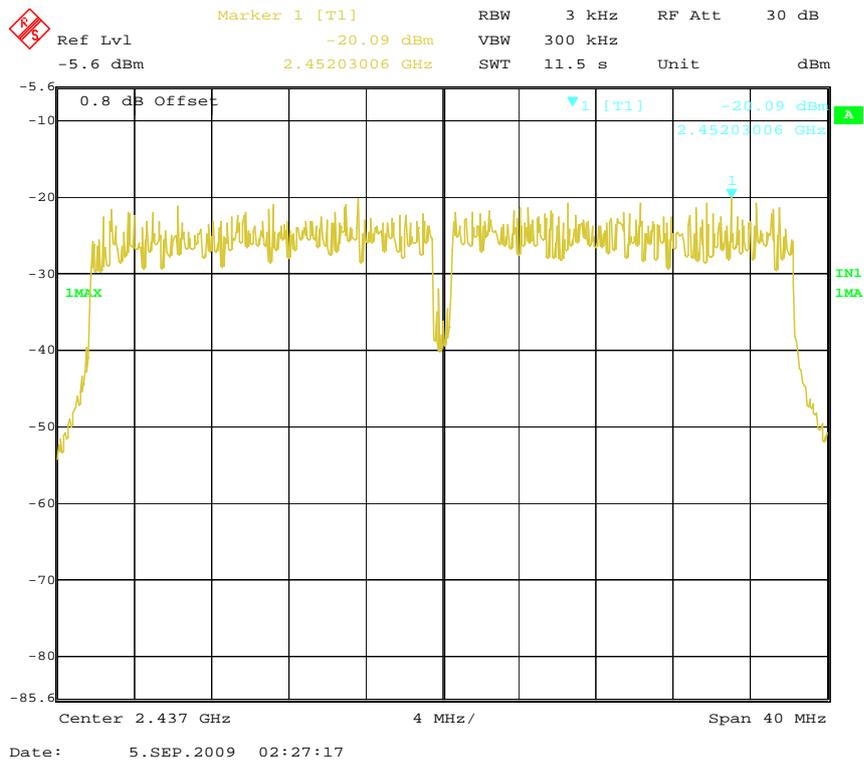


Note: For Draft 802.11n (40MHz) Mode

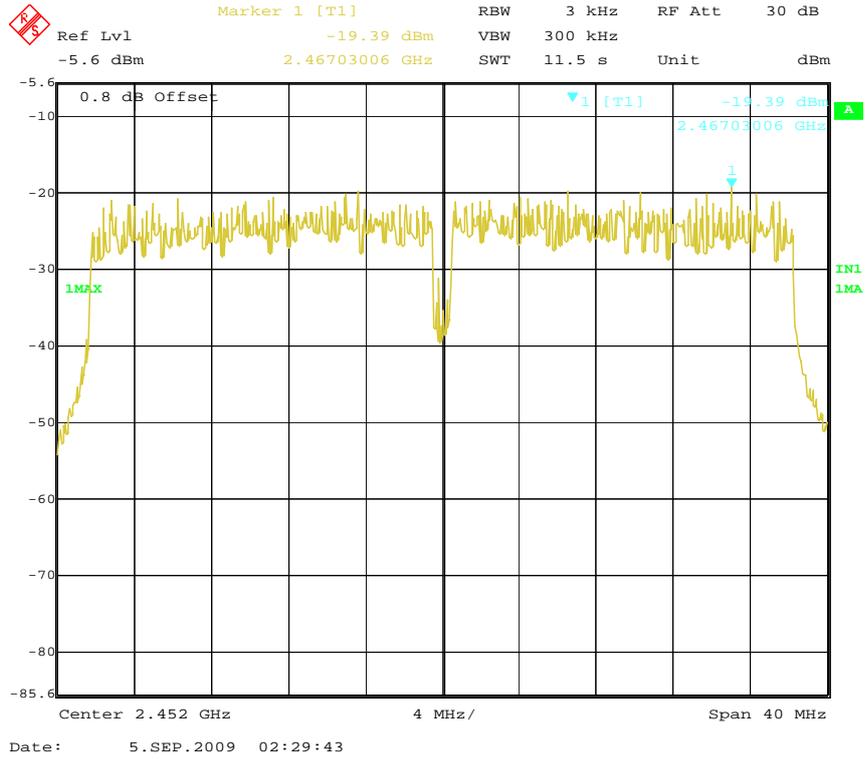
Channel 3



Channel 6

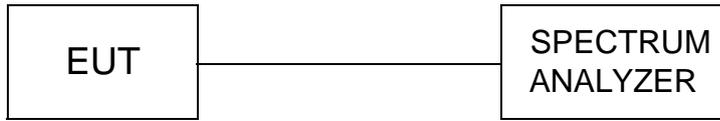


Channel 9



4.5. Band Edge Measurement

TEST CONFIGURATION



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=100kHz and VBM= 300KHz 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 100 kHz, to measure the conducted peak band edge.

LIMIT

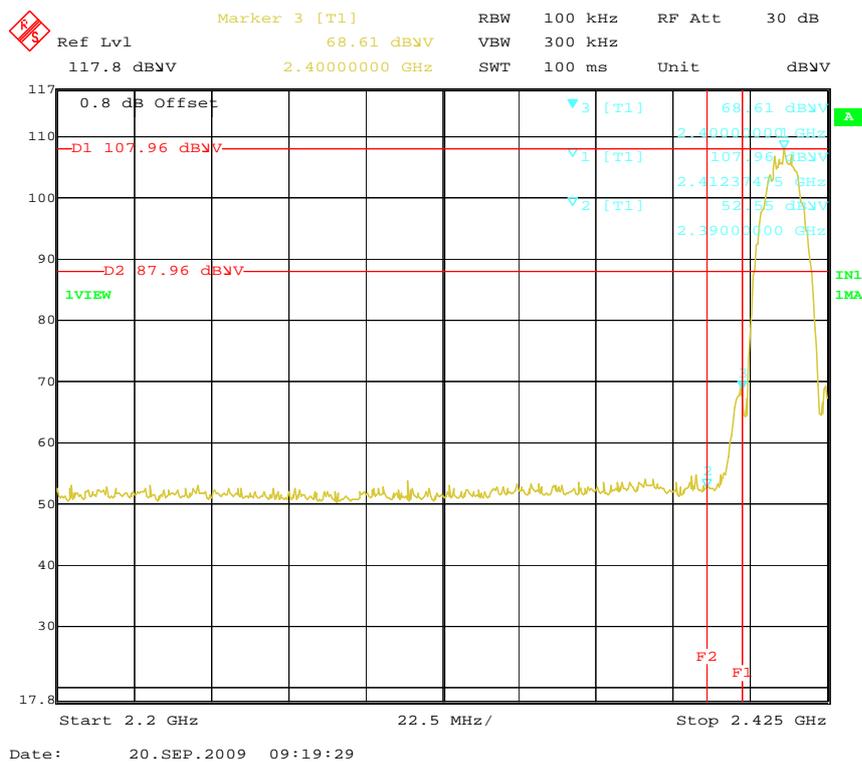
1. Below -20dB of the highest emission level in operating band.
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209(see Section 15.205(c)).

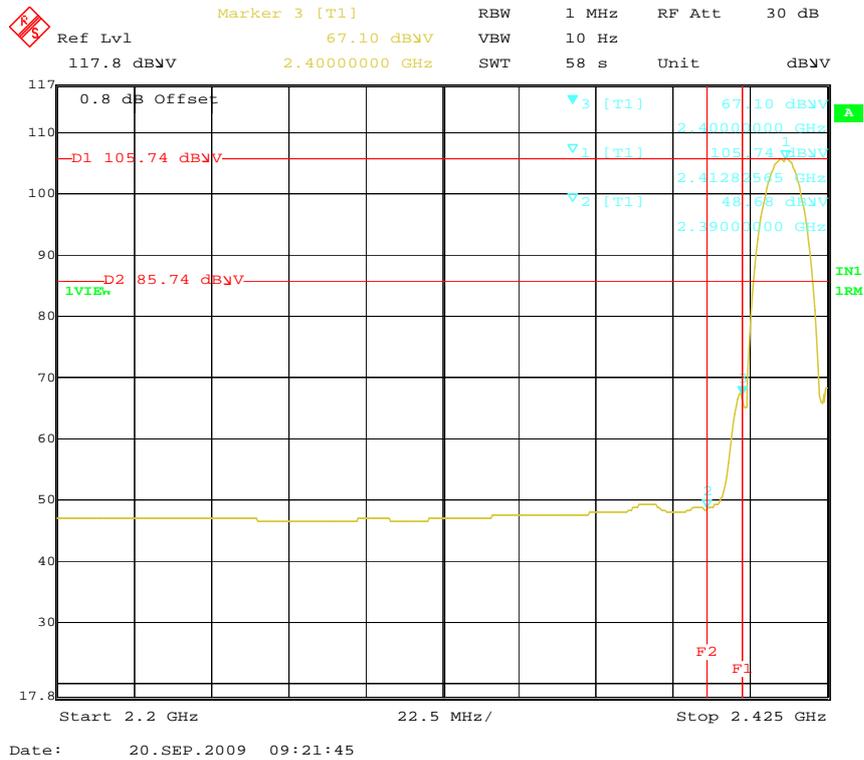
Frequency (MHz)	Limit Average (dBuV/m)	Limit Peak (dBuV/m)
Below 2390 or Above 2483.5	54	74

TEST RESULTS

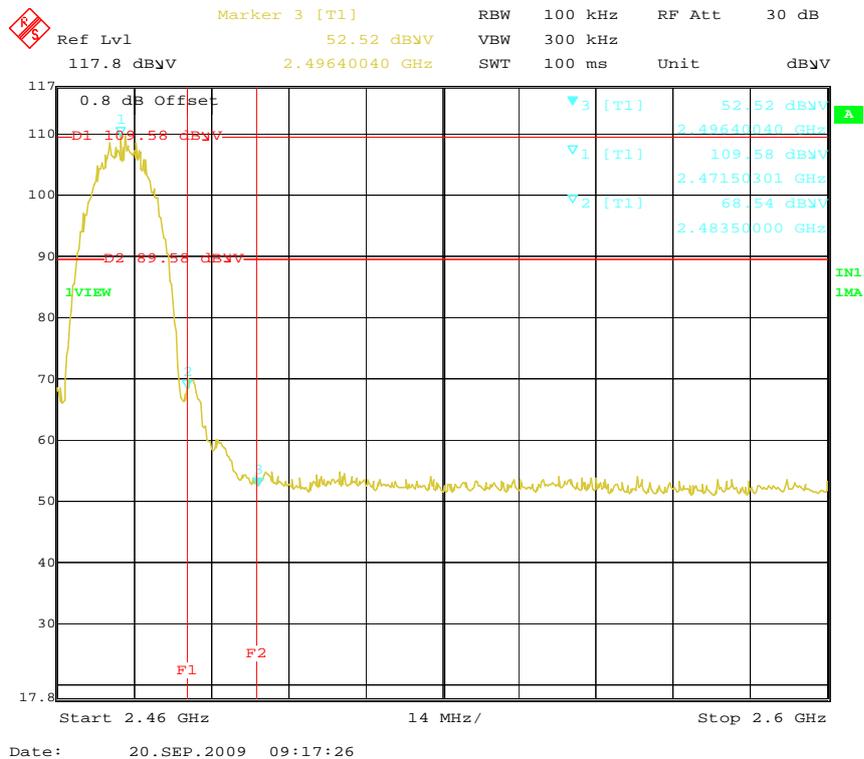
Photo of Band Edge Measurement

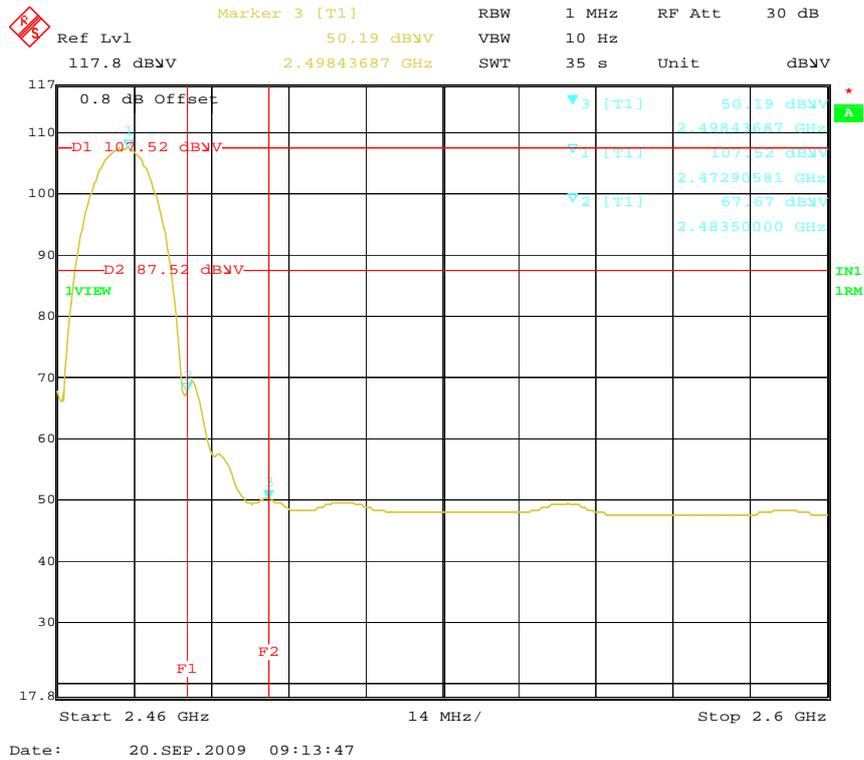
Note: For 802.11b Mode





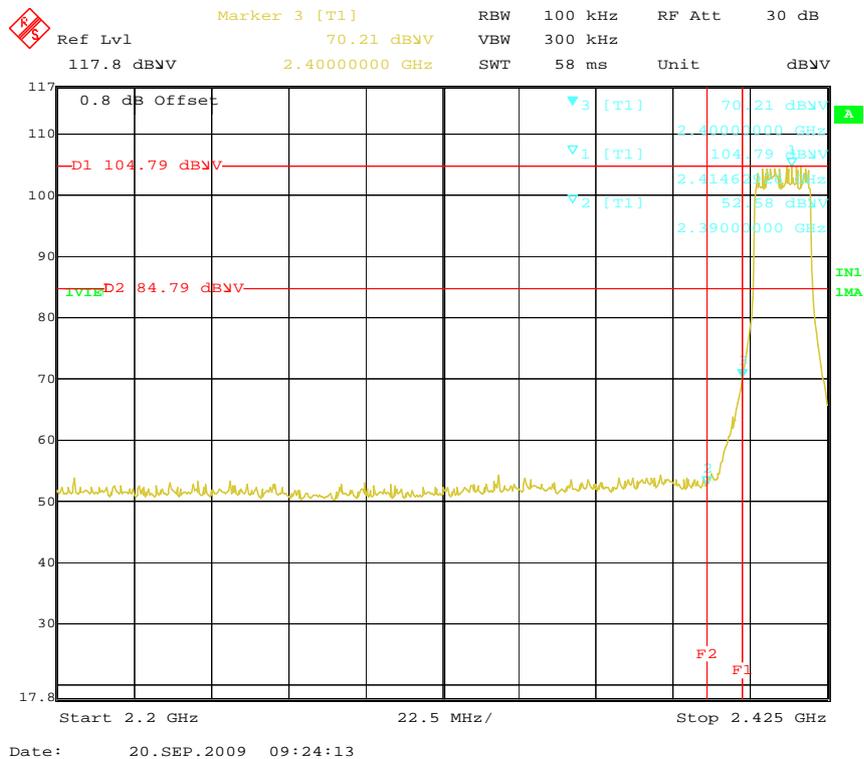
Results: Max carrier field strength PK 99.40dBuV/m, AV 86.80dBuV/m; At 2.390GHz, the deviation of PK plot is 55.41dB and the deviation of AV plot is 57.06dB; The field strength at 2.390GHz PK is 43.99dBuV/m and the field strength at 2.390GHz AV is 29.74 dBuV/m Which are fulfill the requirement of PK 74dBuV/m, AV 54dBuV/m.

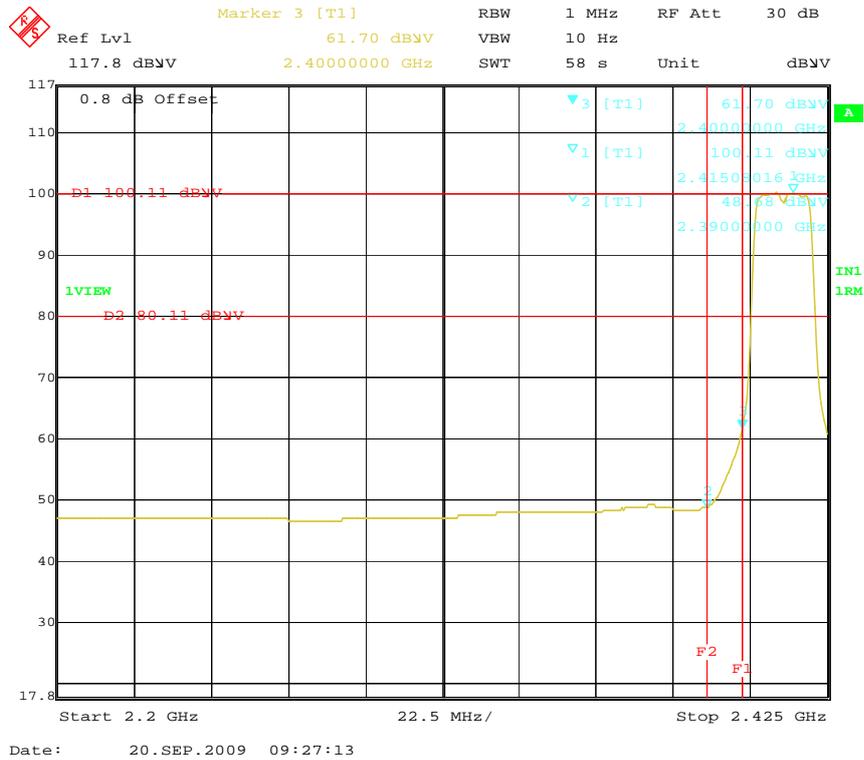




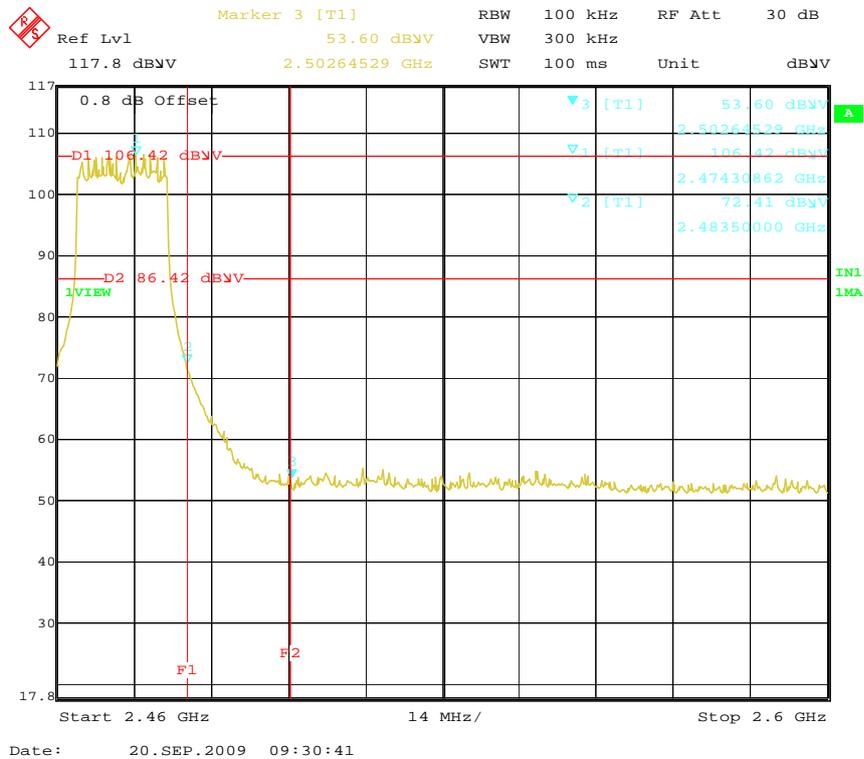
Results: Max carrier field strength PK 103.90dBuV/m, AV 88.20dBuV/m; At 2.4835GHz, the deviation of PK plot is 41.04dB and the deviation of AV plot is 39.85dB; The field strength at 2.4835GHz PK is 62.86dBuV/m and the field strength at 2.4835GHz AV is 50.75 dBuV/m Which are fulfill the requirement of PK 74dBuV/m, AV 54dBuV/m.

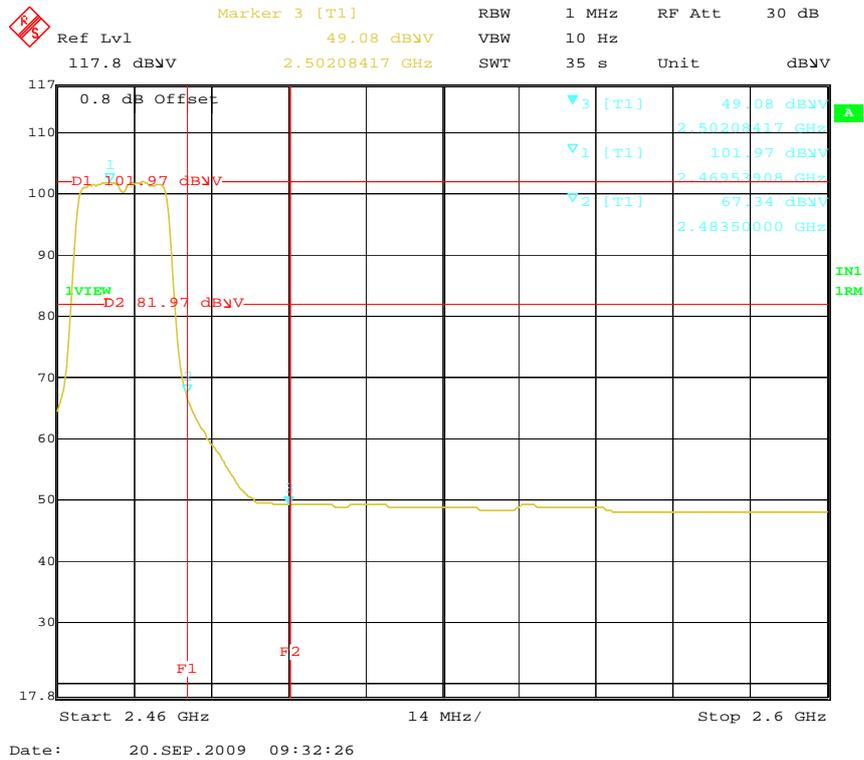
Note : For 802.11g Mode





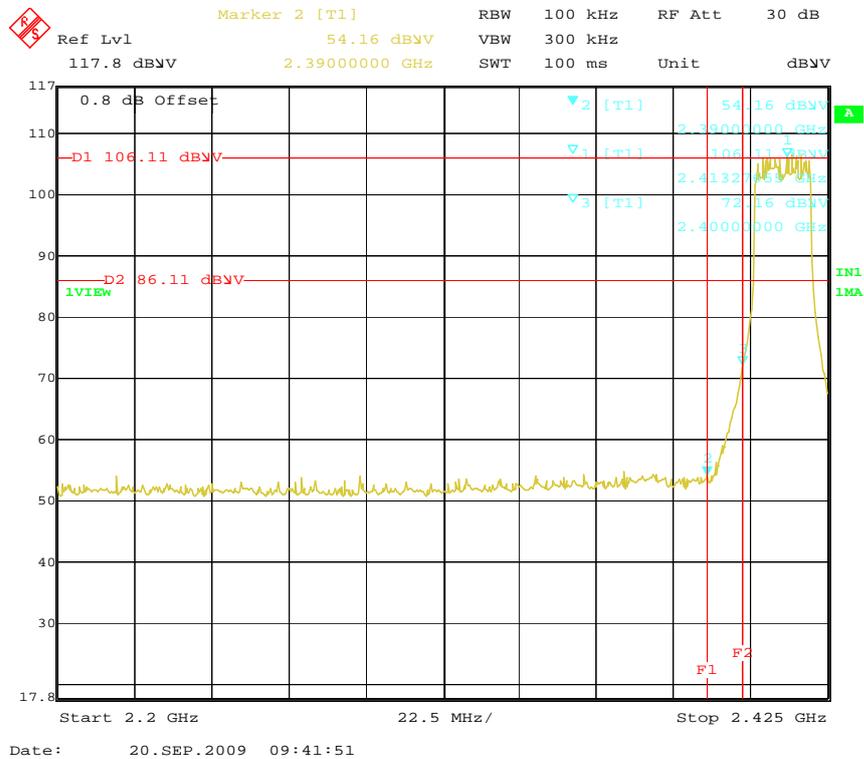
Results: Max carrier field strength PK 100.30dBuV/m, AV 86.50dBuV/m; At 2.390GHz, the deviation of PK plot is 52.21dB and the deviation of AV plot is 51.43dB; The field strength at 2.390GHz PK is 48.09dBuV/m and the field strength at 2.390GHz AV is 35.07dBuV/m Which are fulfill the requirement of PK 74dBuV/m, AV 54dBuV/m.

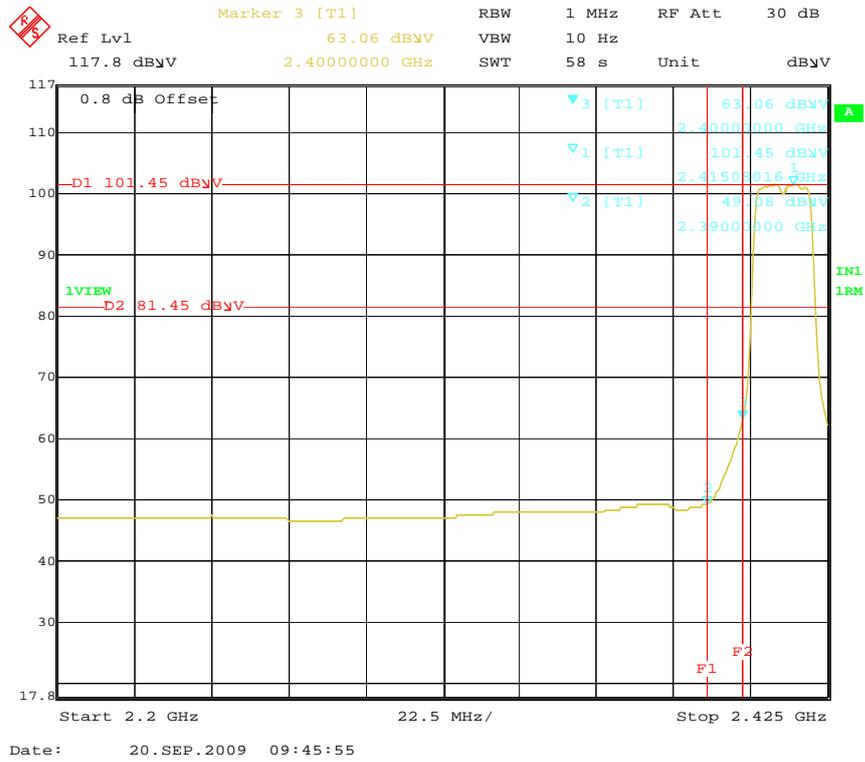




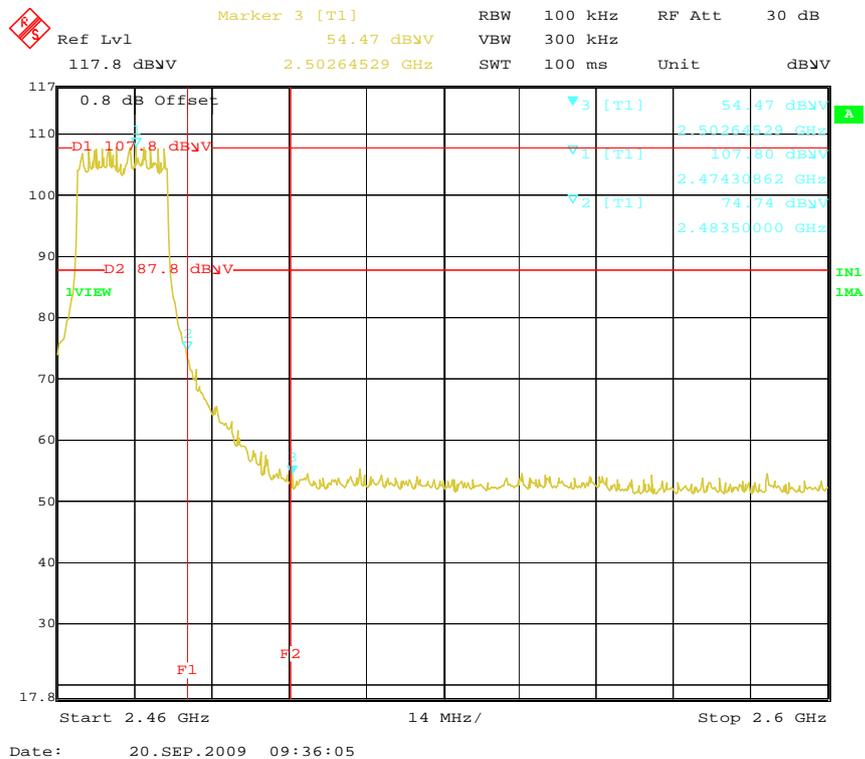
Results: Max carrier field strength PK 105.40dBuV/m, AV 87.50dBuV/m; At 2.4835GHz, the deviation of PK plot is 33.06dB and the deviation of AV plot is 34.63dB; The field strength at 2.4835GHz PK is 72.34dBuV/m and the field strength at 2.4835GHz AV is 52.87dBuV/m Which are fulfill the requirement of PK 74dBuV/m, AV 54dBuV/m.

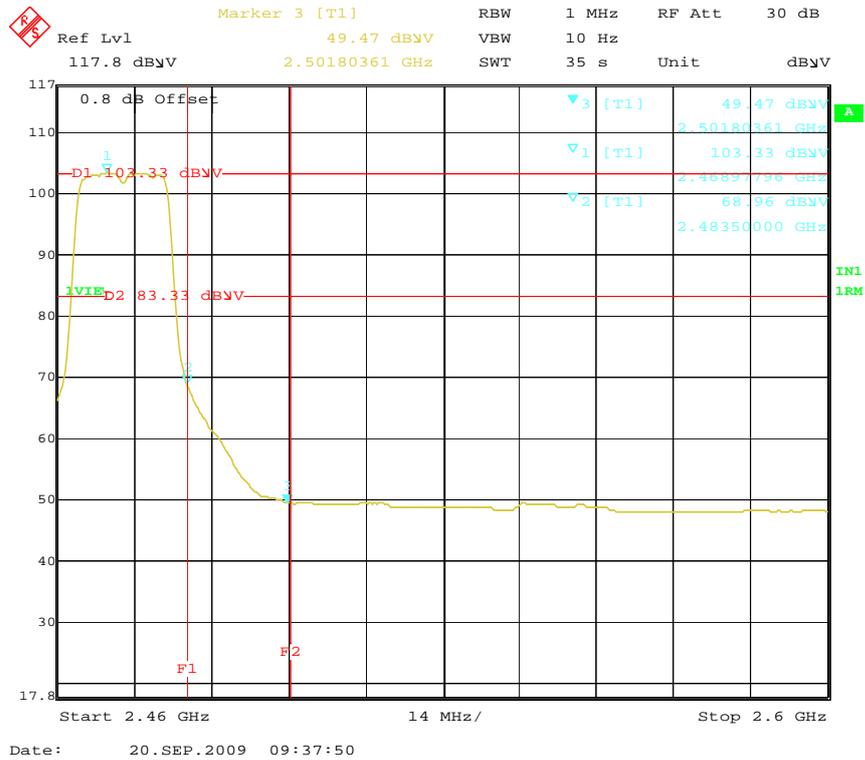
Note : For Draft 802.11n (20MHz) Mode





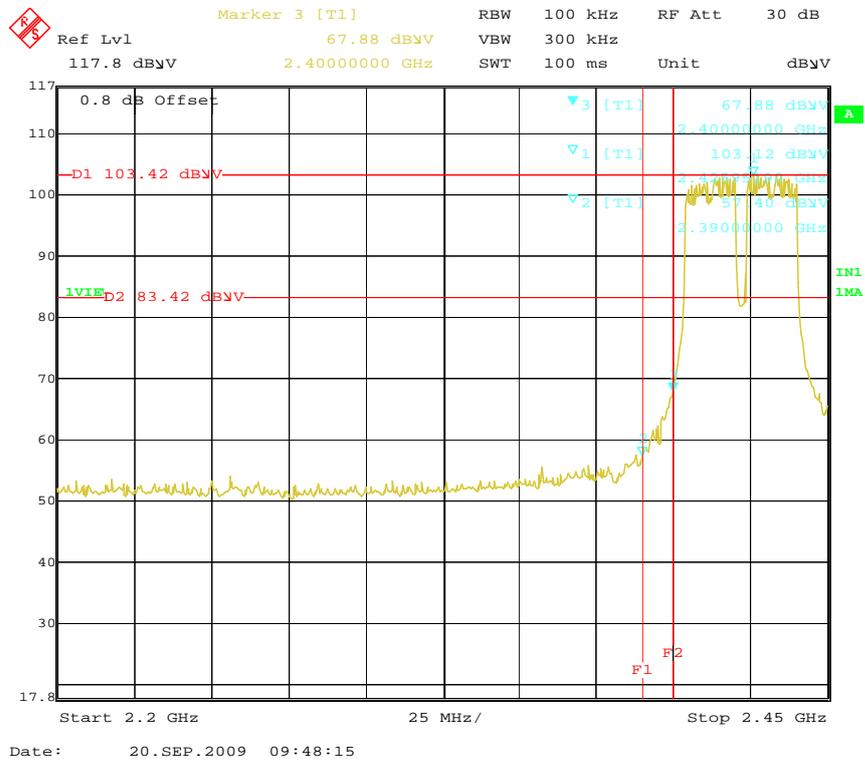
Results: Max carrier field strength PK 101.70dBuV/m, AV 85.50dBuV/m; At 2.390GHz, the deviation of PK plot is 51.95dB and the deviation of AV plot is 52.37dB; The field strength at 2.390GHz PK is 49.75dBuV/m and the field strength at 2.390GHz AV is 33.13dBuV/m Which are fulfill the requirement of PK 74dBuV/m, AV 54dBuV/m.

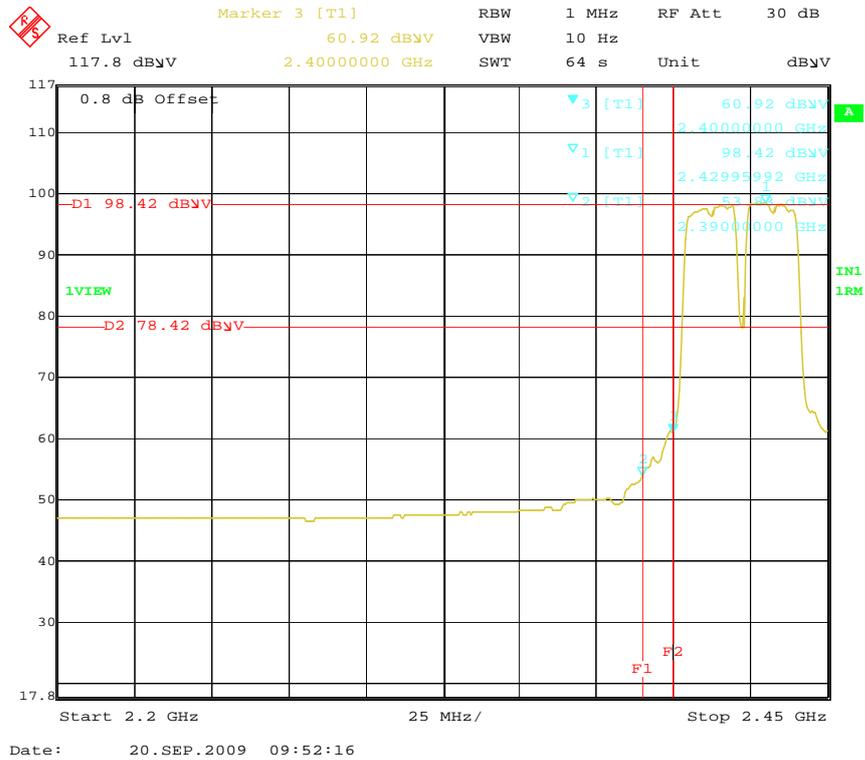




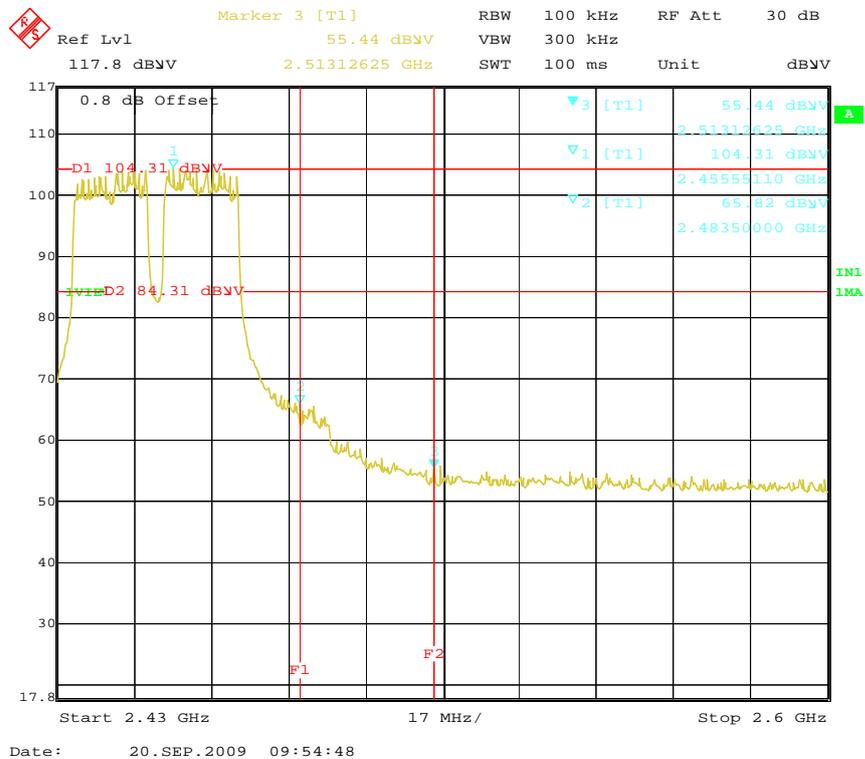
Results: Max carrier field strength PK 103.40dBuV/m, AV 86.90dBuV/m; At 2.4835GHz, the deviation of PK plot is 33.06dB and the deviation of AV plot is 34.37dB; The field strength at 2.4835GHz PK is 70.34dBuV/m and the field strength at 2.4835GHz AV is 52.53dBuV/m dBuV/m Which are fulfill the requirement of PK 74dBuV/m, AV 54dBuV/m.

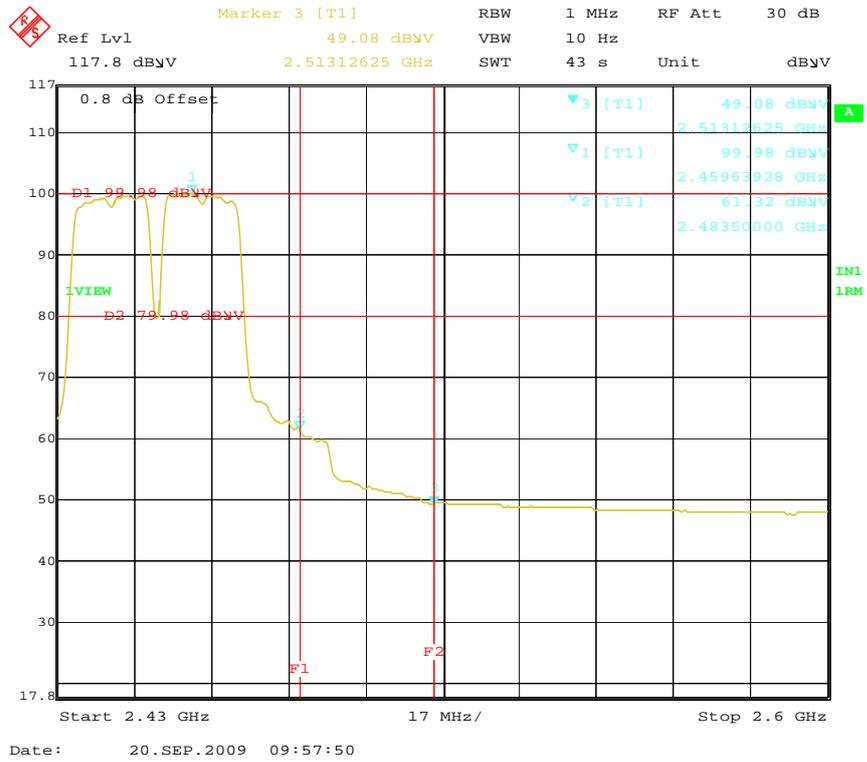
Note : For Draft 802.11n (40MHz) Mode





Results: Max carrier field strength PK 102.70dBuV/m, AV 86.50dBuV/m; At 2.390GHz, the deviation of PK plot is 38.49dB and the deviation of AV plot is 44.59dB; The field strength at 2.390GHz PK is 64.21dBuV/m and the field strength at 2.390GHz AV is 41.94 dBuV/m Which are fulfill the requirement of PK 74dBuV/m, AV 54dBuV/m.

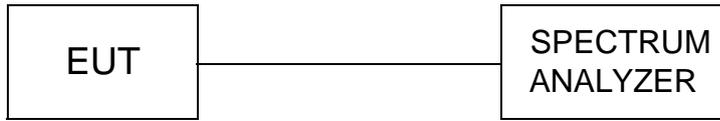




Results: Max carrier field strength PK 104.30dBuV/m, AV 88.90dBuV/m; At 2.4835GHz, the deviation of PK plot is 38.49dB and the deviation of AV plot is 38.66dB; The field strength at 2.4835GHz PK is 65.61dBuV/m and the field strength at 2.4835GHz AV is 50.24dBuV/m Which are fulfill the requirement of PK 74dBuV/m, AV 54dBuV/m.

4.6. Spurious RF conducted emissions

TEST CONFIGURATION



TEST PROCEDURE

The Spurious RF conducted emissions 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=100kHz and VBM= 300KHz to measure the peak field strength , and mwasure frequeny range from 30MHz to 26.5GHz.

LIMIT

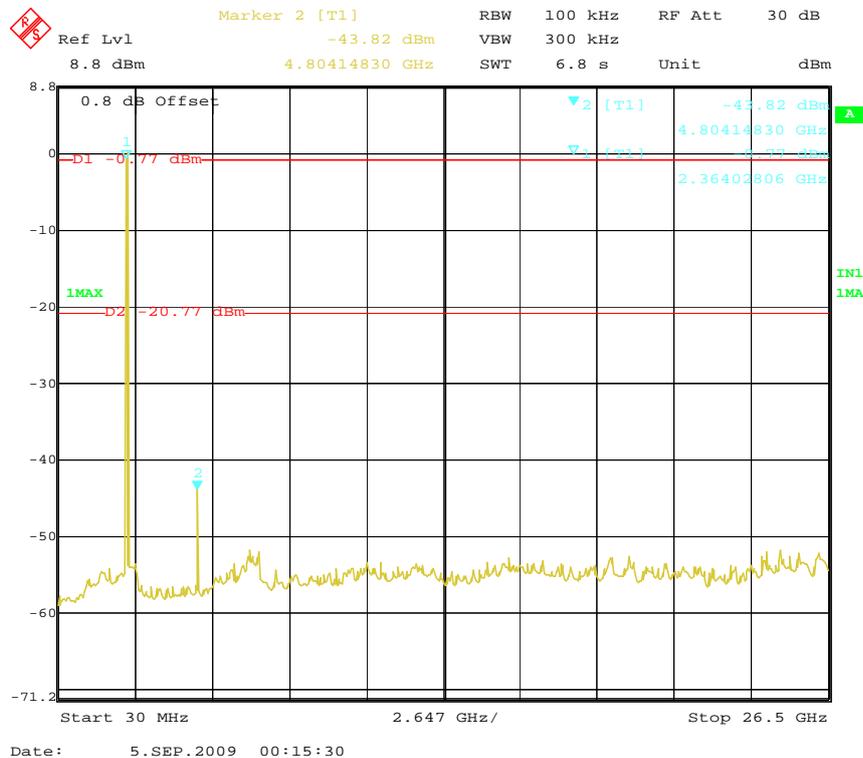
- 1. Below -20dB of the highest emission level in operating band.
- 2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

TEST RESULTS

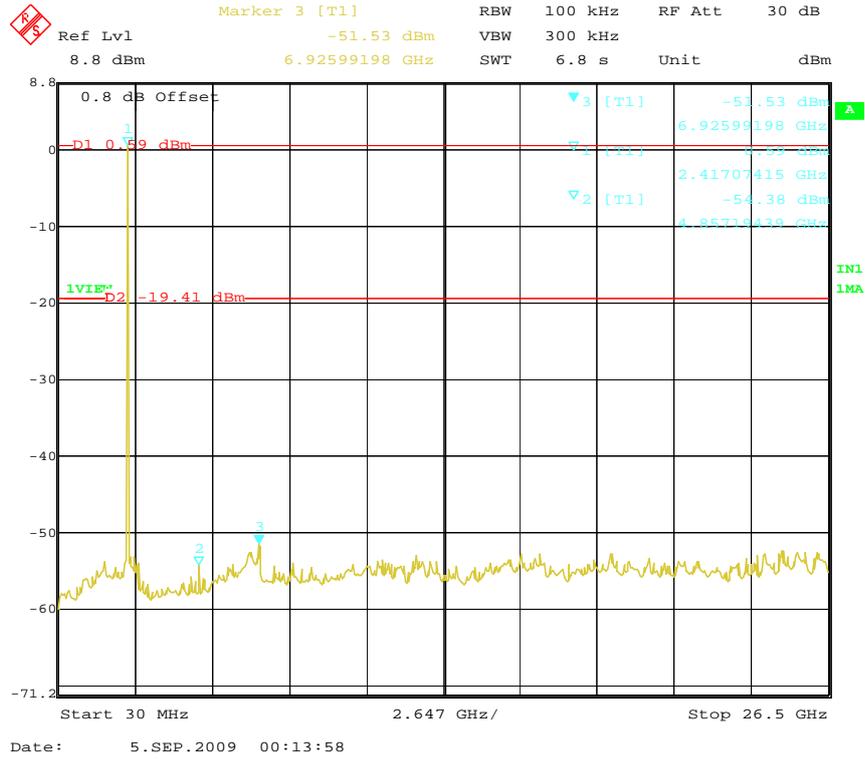
Photo of Spurious RF conducted emissions Measurement

Note: For 802.11b Mode

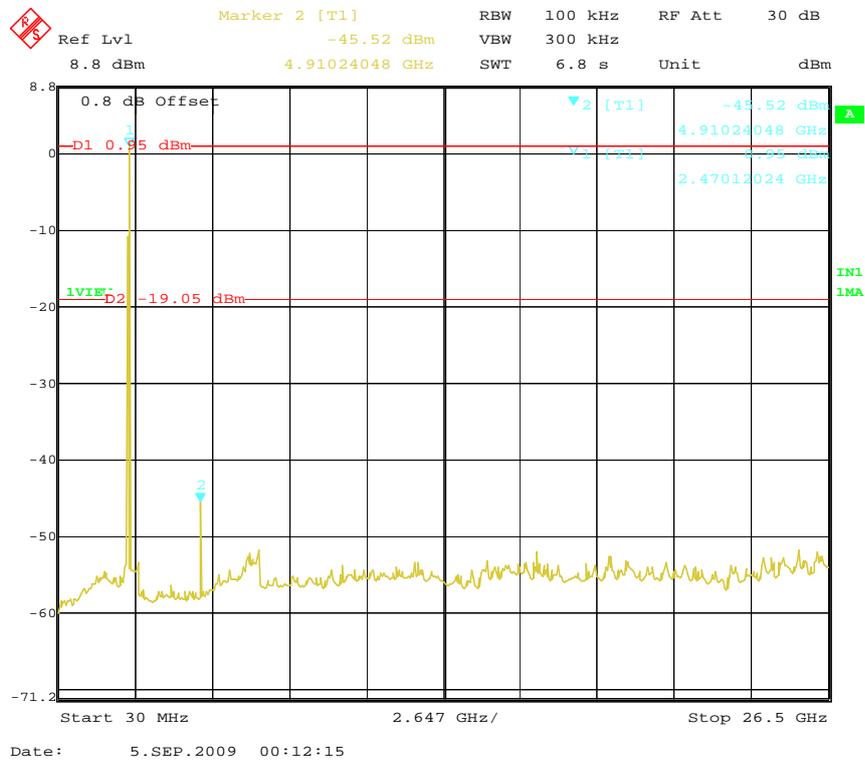
Channel 1



Channel 7

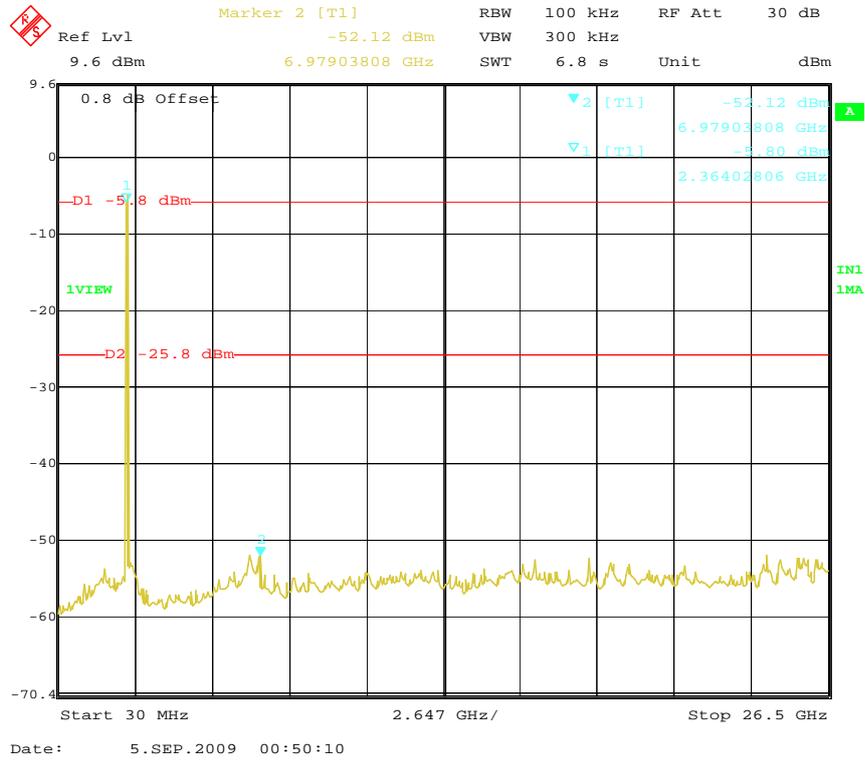


Channel 13

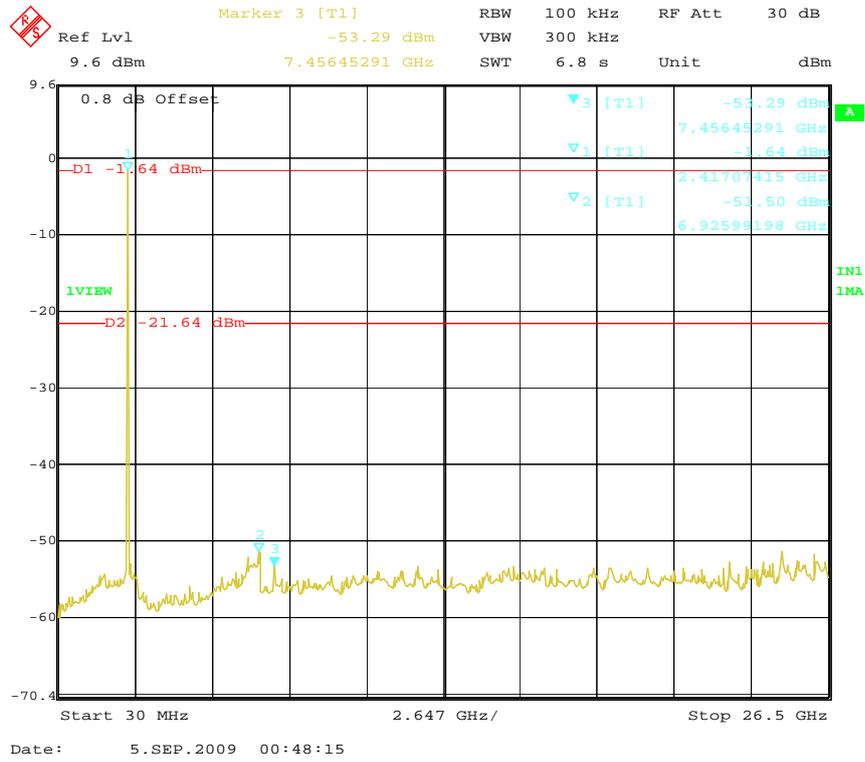


Note: For 802.11g Mode

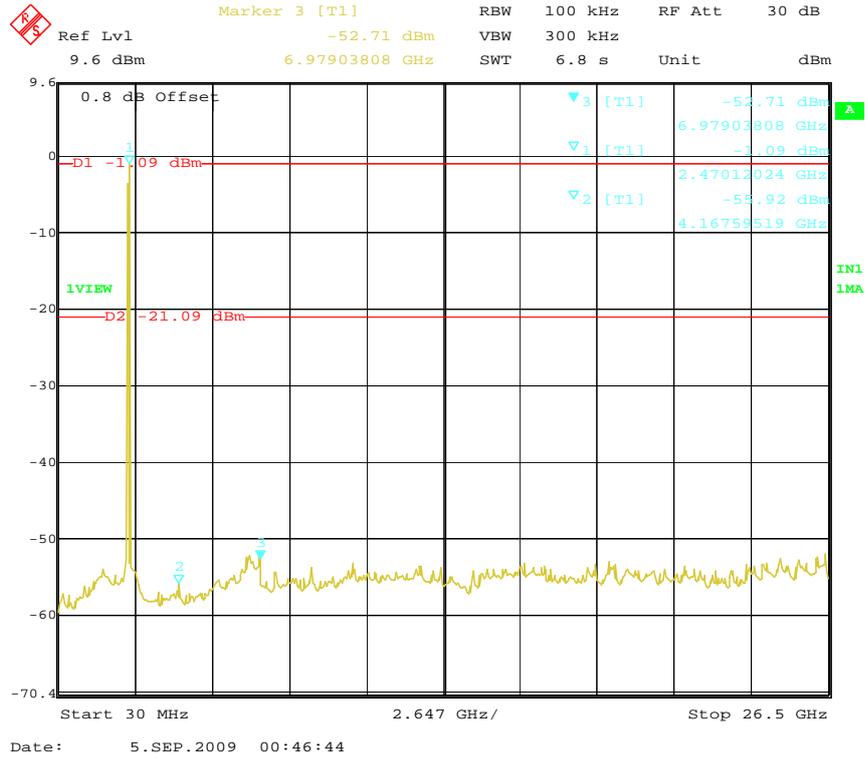
Channel 1



Channel 7

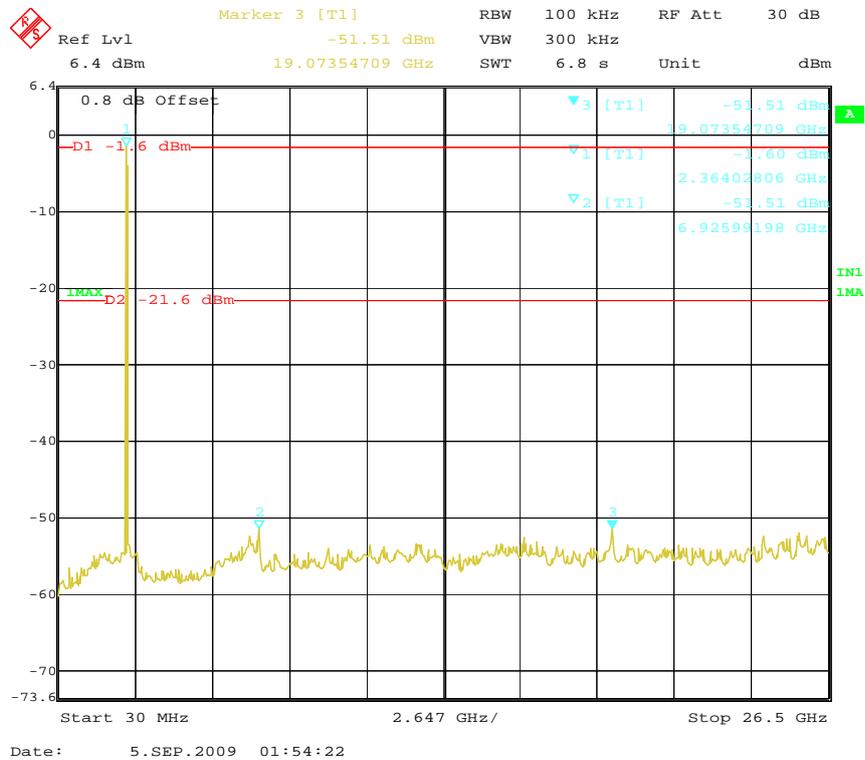


Channel 13

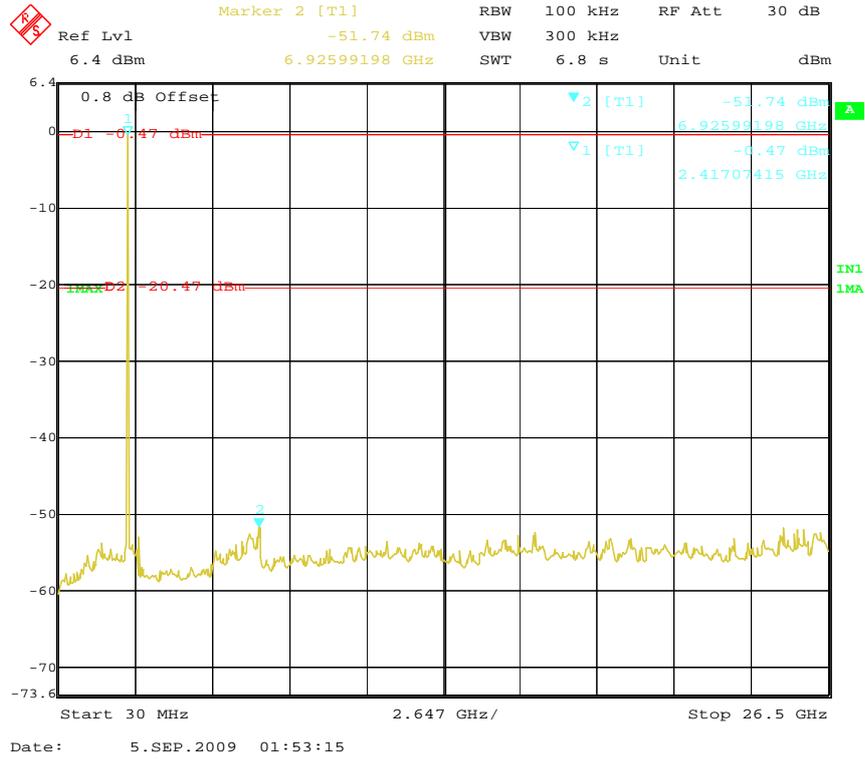


Note: For Draft 802.11n (20MHz) Mode

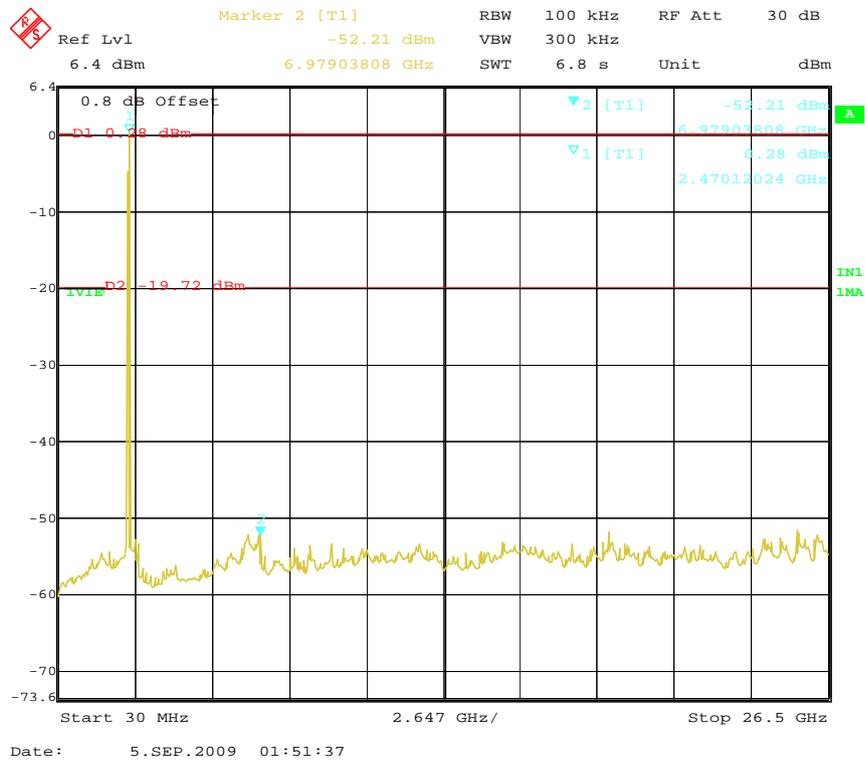
Channel 1



Channel 7

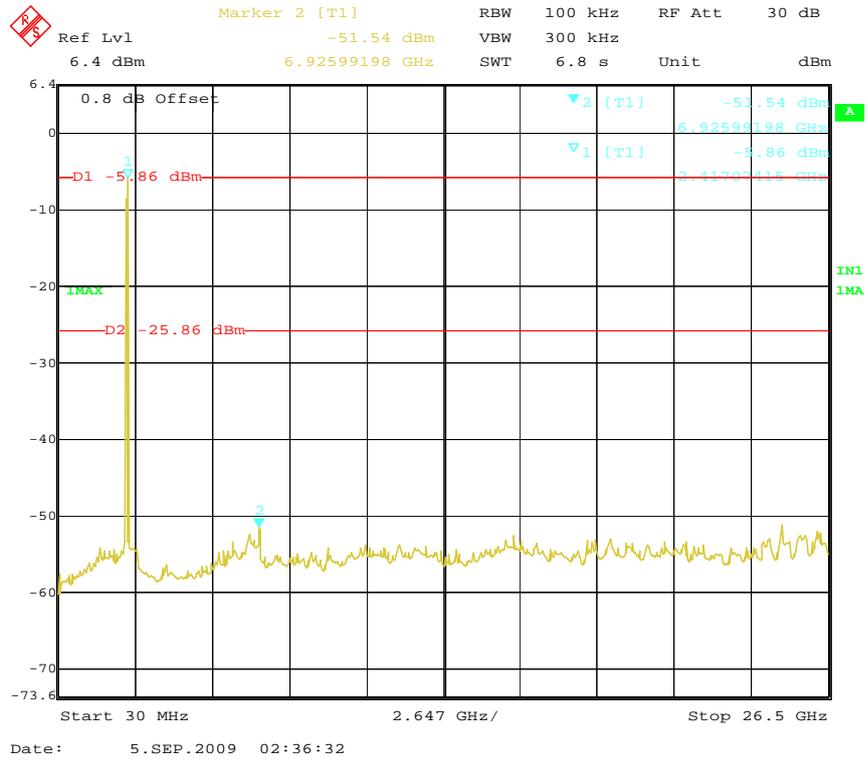


Channel 13

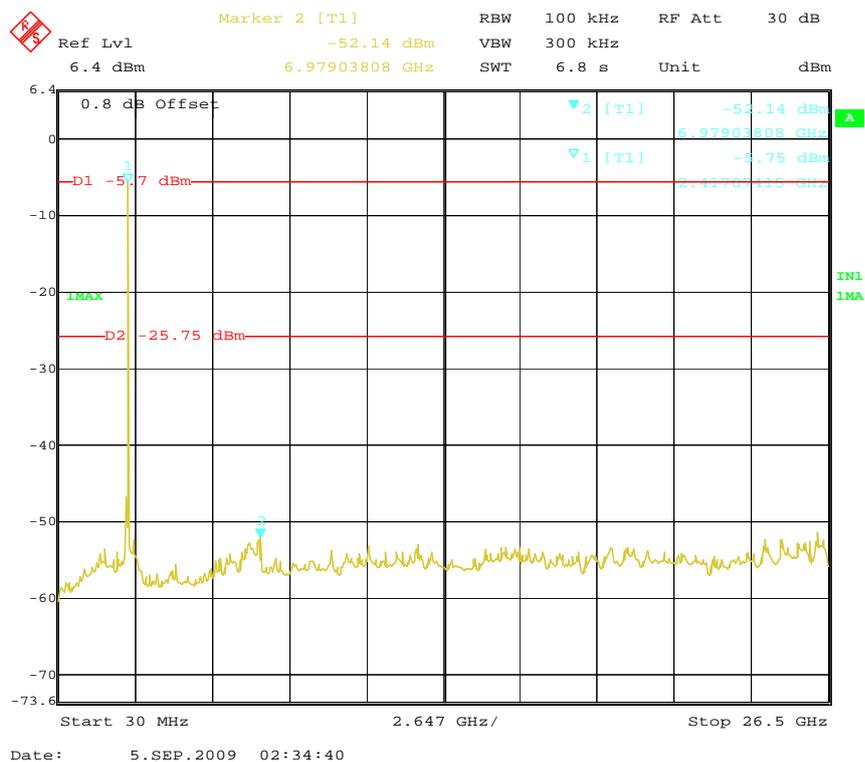


Note: For Draft 802.11n (40MHz) Mode

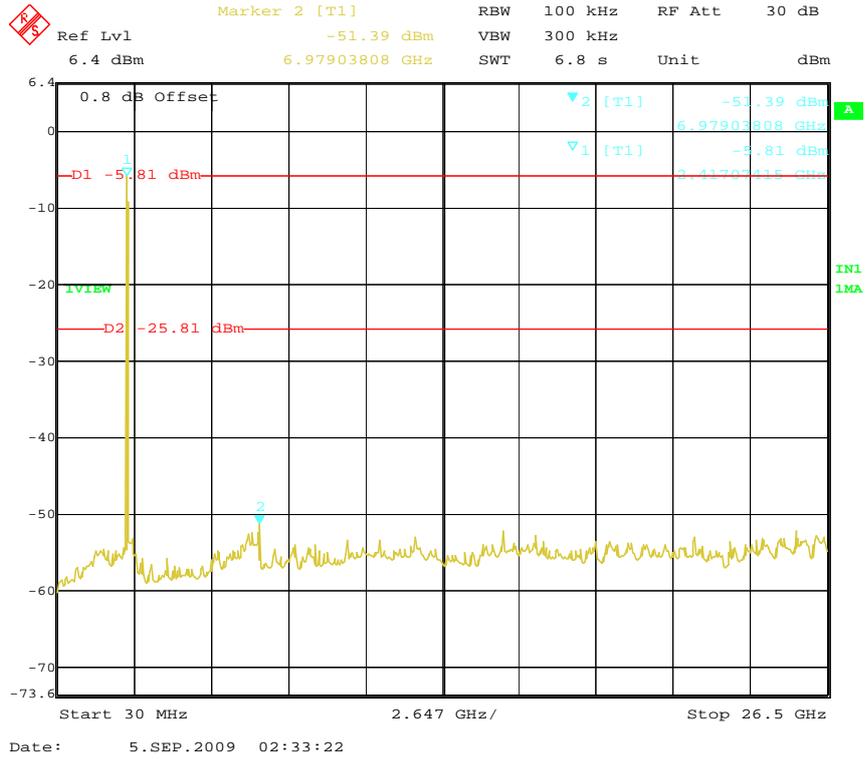
Channel 3



Channel 6

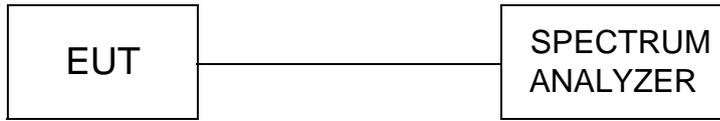


Channel 9



4.7. 6dB Bandwidth Measurement

TEST CONFIGURATION



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 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.

LIMIT

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST RESULTS

Company	Huawei Technologies Co.,Ltd.	Test Date	09/05/2009
Product Name	Home Gateway	Test By	Wenliang Li
Model Name	EchoLife HG521	TEMP&Humidity	25 °C, 53%

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	9.22	0.5	PASS
7	2442	9.21	0.5	PASS
13	2472	8.62	0.5	PASS

Note: 1. For 802.11b Mode

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.47	0.5	PASS
7	2442	16.47	0.5	PASS
13	2472	16.47	0.5	PASS

Note: 1. For 802.11g Mode

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	17.03	0.5	PASS
7	2442	17.19	0.5	PASS
13	2472	17.11	0.5	PASS

Note: 1. For Draft 802.11n (20MHz) Mode

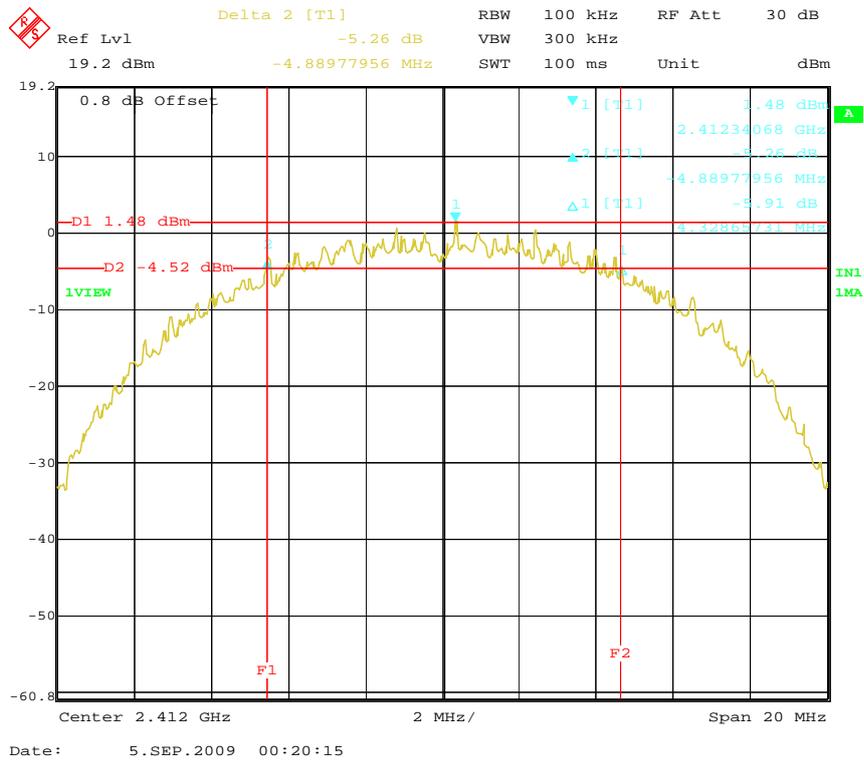
CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
3	2422	35.51	0.5	PASS
6	2437	35.51	0.5	PASS
9	2452	35.43	0.5	PASS

Note: 1. For Draft 802.11n (40MHz) Mode

6 dB Bandwidth Test Plots:

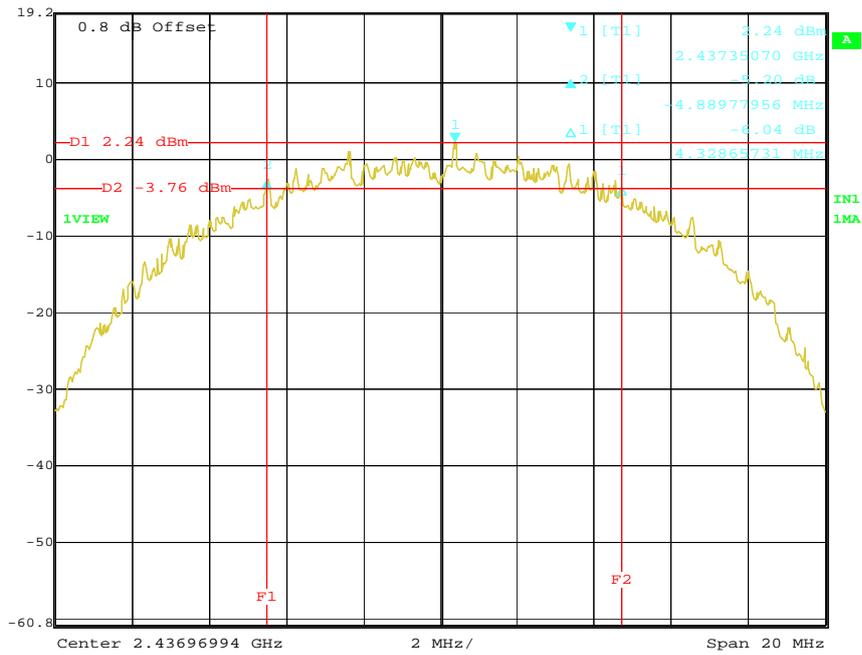
Note: For 802.11b Mode

Channel 1



Channel 7

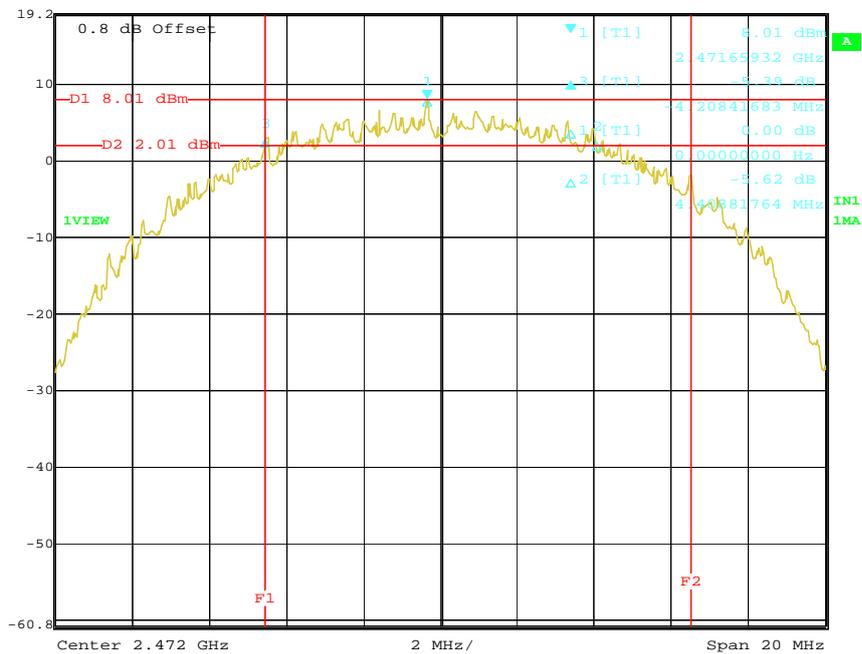
 Delta 2 [T1] RBW 100 kHz RF Att 30 dB
Ref Lvl -5.20 dB VBW 300 kHz
19.2 dBm -4.88977956 MHz SWT 100 ms Unit dBm



Date: 5.SEP.2009 00:22:39

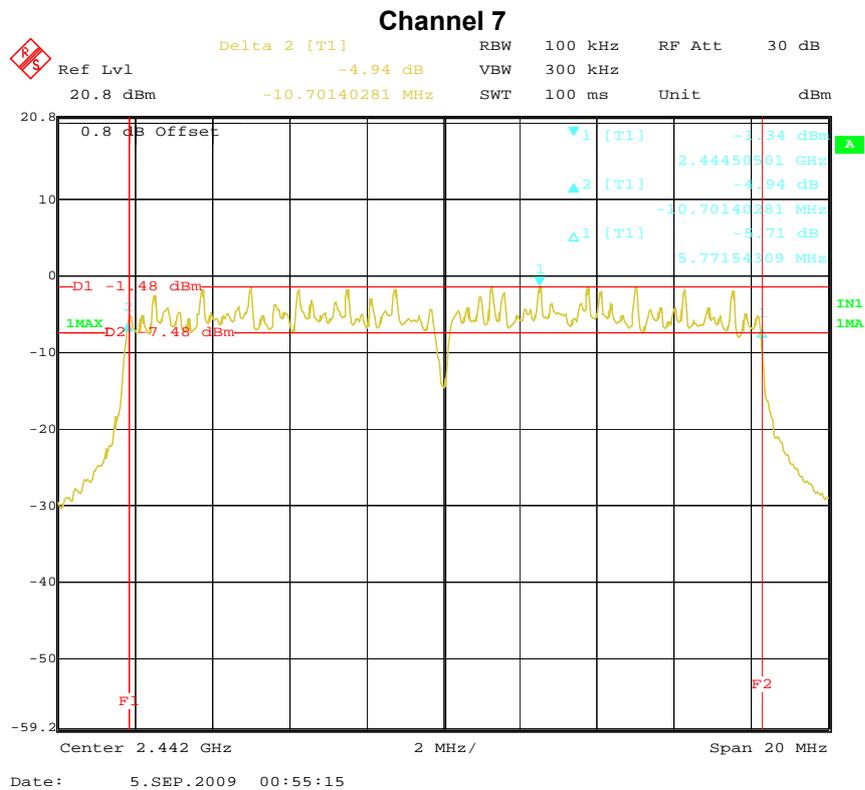
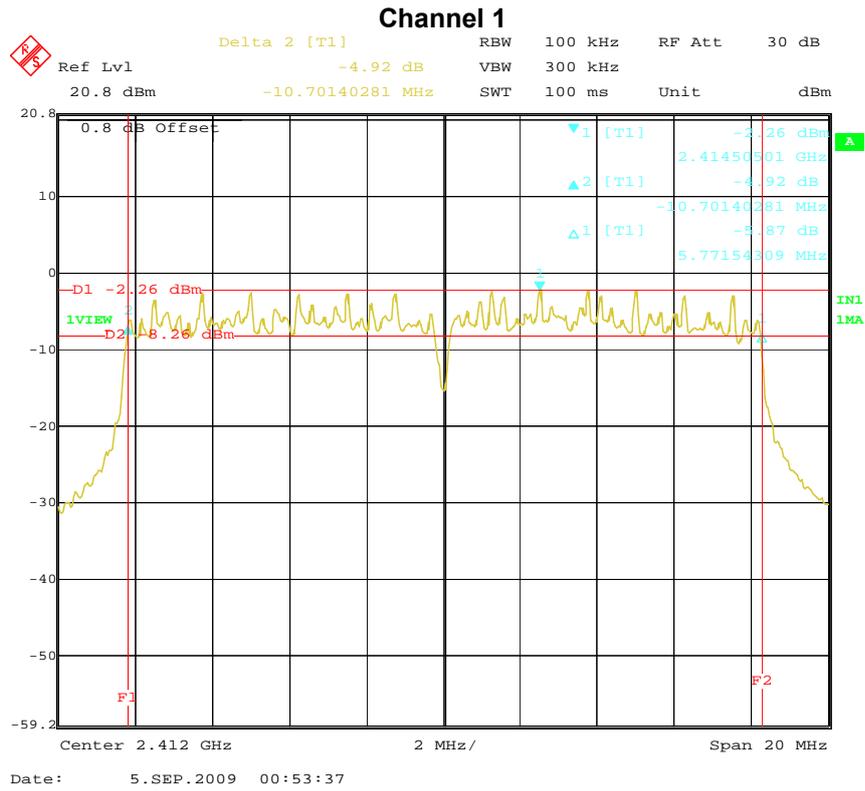
Channel 13

 Delta 3 [T1] RBW 100 kHz RF Att 30 dB
Ref Lvl -5.39 dB VBW 300 kHz
19.2 dBm -4.20841683 MHz SWT 100 ms Unit dBm

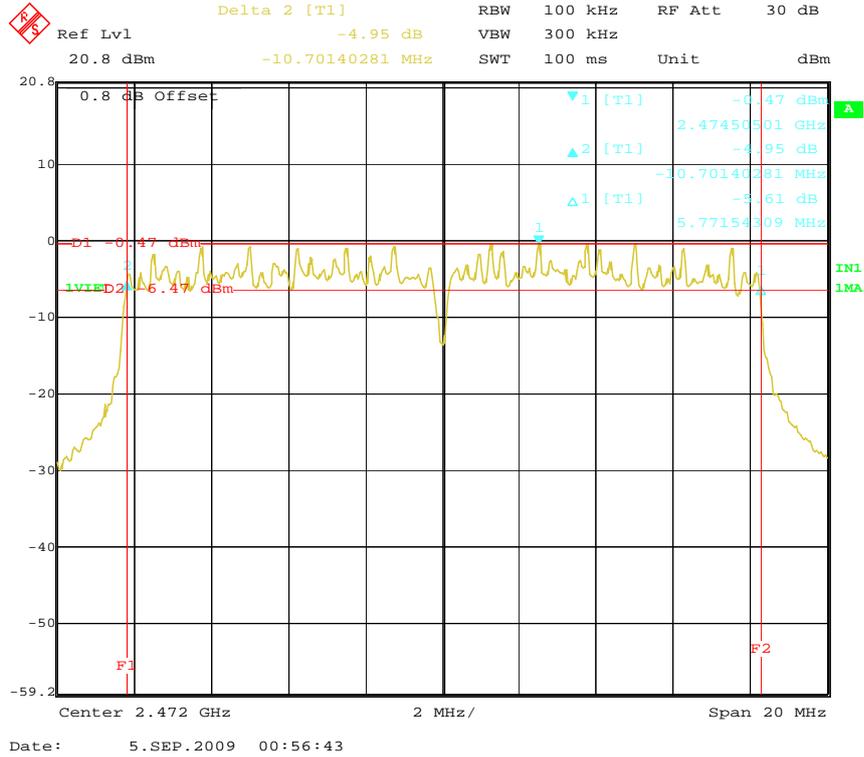


Date: 5.SEP.2009 00:25:04

Note : For 802.11g Mode

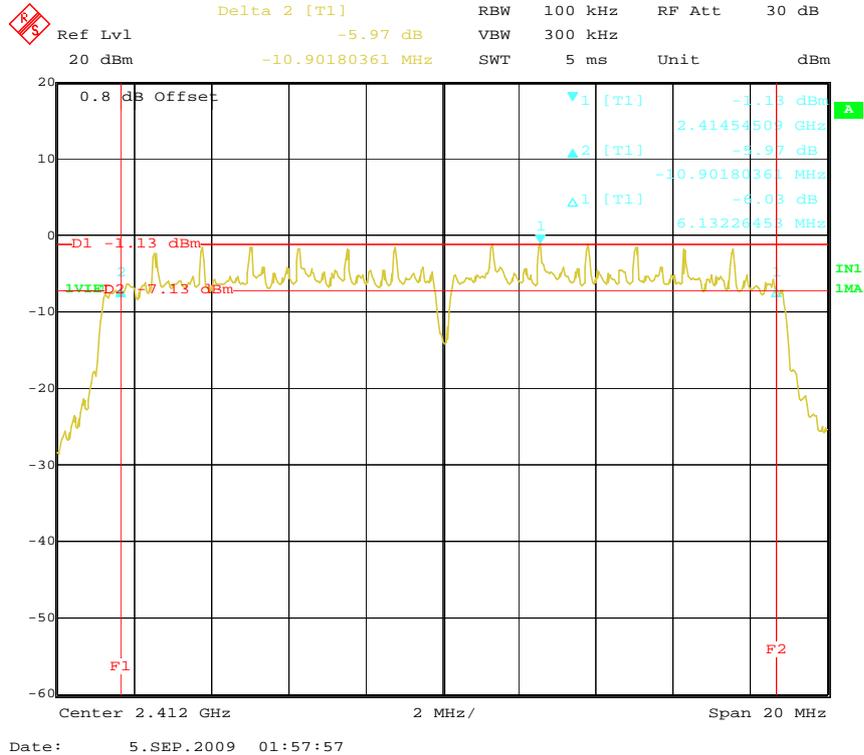


Channel 13



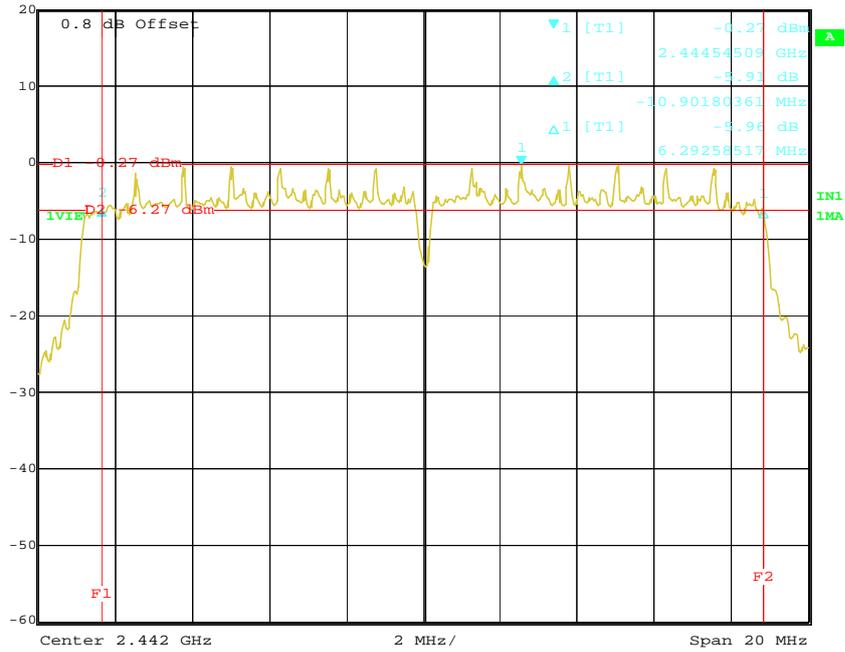
Note : For Draft 802.11n (20MHz) Mode

Channel 1



Channel 7

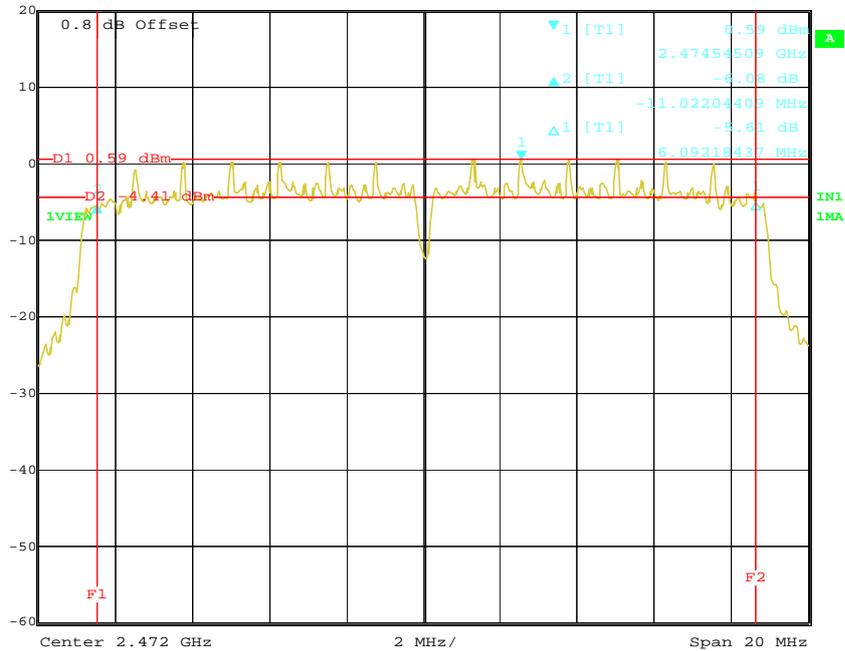
 Delta 2 [T1] RBW 100 kHz RF Att 30 dB
Ref Lvl -5.91 dB VBW 300 kHz
20 dBm -10.90180361 MHz SWT 5 ms Unit dBm



Date: 5.SEP.2009 01:59:48

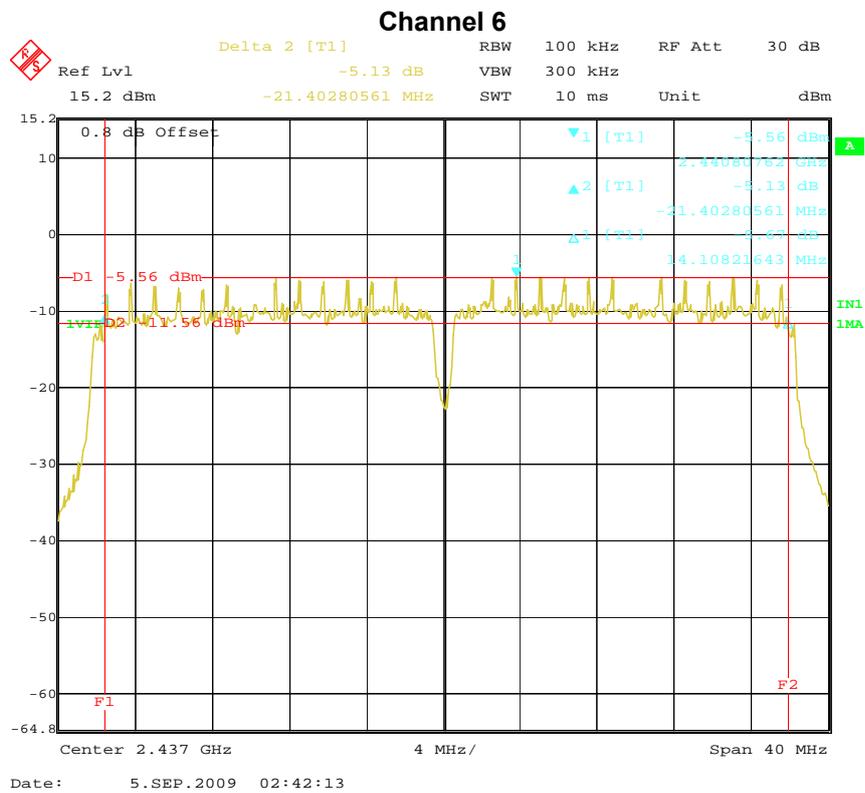
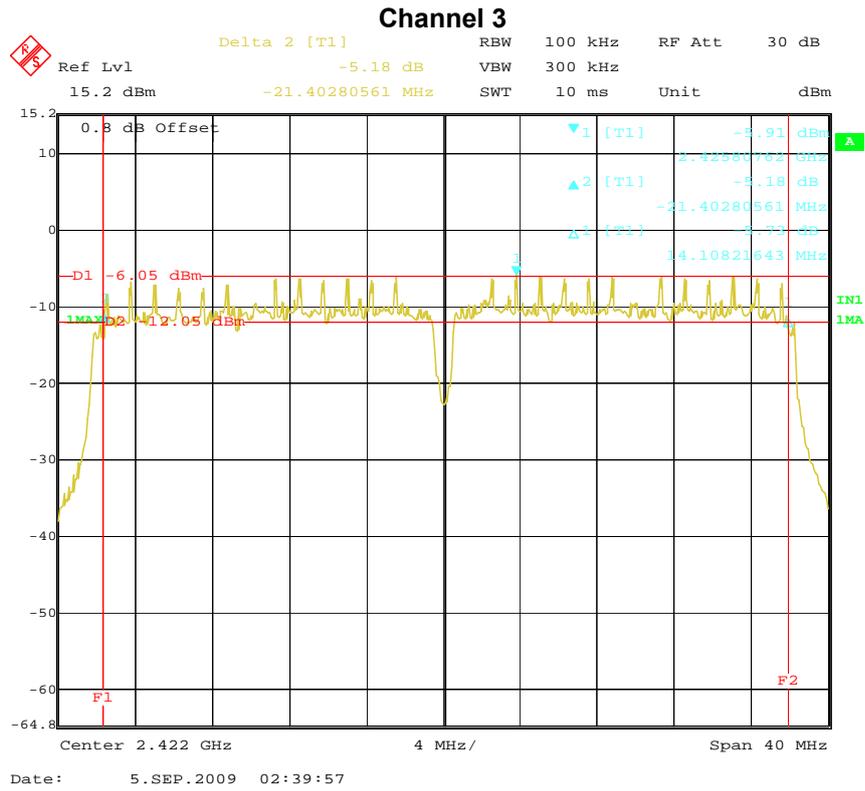
Channel 13

 Delta 2 [T1] RBW 100 kHz RF Att 30 dB
Ref Lvl -6.08 dB VBW 300 kHz
20 dBm -11.02204409 MHz SWT 5 ms Unit dBm



Date: 5.SEP.2009 02:01:29

Note : For Draft 802.11n (40MHz) Mode



4.8. Antenna Requirement

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.

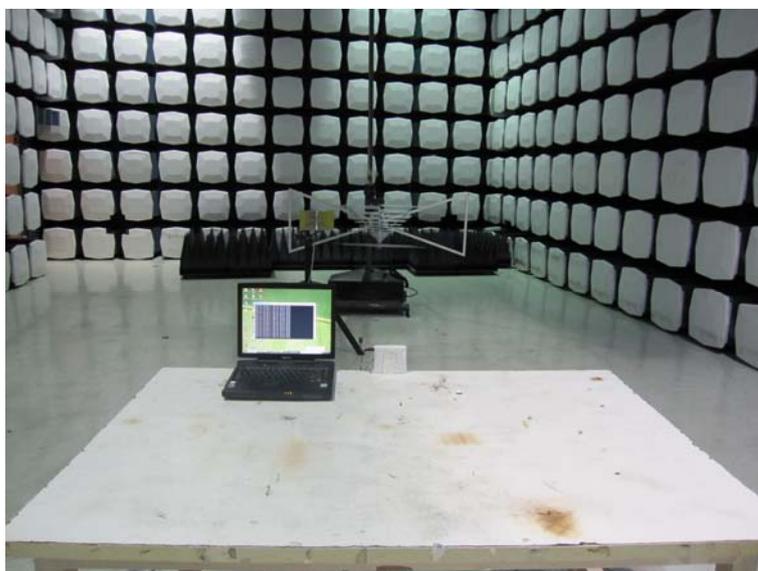
Refer to statement below for compliance.

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction

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

5. Test Setup Photos of the EUT



6. External and Internal Photos of the EUT

External Photos



#1 AC Adapter



#2 AC Adapter

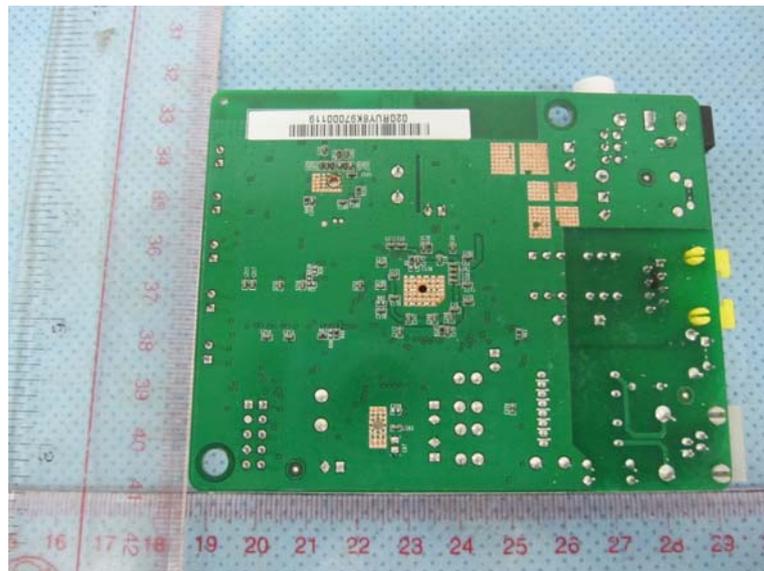


#3 AC Adapter



Internal Photos





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