



Product Service

RF - TEST REPORT

Report Number : **68/850.9.088.01** Date of Issue: 17 Nov 2009

Model : **PC-91008**

Product Type : Notebook

Applicant : Wanlida Group Co., Ltd.

Address : No. 618 Jiahe Road, Wanlida Industry Zone,
Xiamen Fujian, China 361006

Production Facility : Wanlida Group Co., Ltd.

Address : Wanlida Industry Zone, Nanjing, Fujian, China 363601

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including
Appendices : 20

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2 Details about the Test Laboratory

Details about the Test Laboratory

Company name: Jiangsu TÜV Product Service Ltd. – Shenzhen Branch
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Guangdong,
China

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3 Description of the Equipment Under Test

Description of the Equipment Under Test

Product:	Notebook
Model no.:	PC-91008
Serial number:	NIL
Options and accessories:	NIL
Rating:	DC 12V 3A, 36W AC Adaptor: Model: MPA-12030 Input: 100-240V ~ 50/60Hz 1A MAX Output: +12V DC 3A
Antenna:	Integral antenna inside the EUT, NOT accessible by end user Antenna Gain: 1dBi
RF Transmission Frequency:	2412-2462MHz
Description of the EUT:	A certified Wi-Fi module was installed in this Notebook PC-91008. The information of Wi-Fi module: Product Type: Wi-Fi module Module No.: WIFI-9002 FCC ID: SMFWIFI9002 Applicant: Wanlida Group Co., Ltd. Address: No. 618 Jiahe Road, Wanlida Industry Zone, Xiamen Fujian, China 361006

Auxiliary Equipment and Cable Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
LCD monitor	Lenovo	9227-AE1	V1TDB38
Keyboard	Lenovo	SK-8825 (L)	02553778
Mouse	Lenovo	MO28UOL	4418011108
Headphone	Ouyun	OH601	----
USB flash drive	Kingston	Data Traveller	----
SD card	Kingston	SD4/4GBFE	----
VGA cable	Lenovo	Shield	140cm
AC Power cable	Lenovo	Unshield	180cm

4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators
FCC Part 15 Subpart B	PART 15 - RADIO FREQUENCY DEVICES Subpart B - Unintentional Radiators



Product Service

5 Summary of Test Results

Technical Requirements				
FCC Part 15 Subpart C				
Test Condition	Pages	Test Result		
		Pass	Fail	N/A
15.107 15.207 Conducted Emission AC Power Port	8	☒	☐	☐
15.247 (b) (1) Conducted peak output power	12	☒	☐	☐
15.247(d) 15.209 15.109 Spurious radiated emissions	14	☒	☐	☐

6 General Remarks

Remarks

This submittal(s) (test report) is intended for the Class 2 permissive change of Wi-Fi module, Model No.: WIFI-9002, FCC ID: SMFWIFI9002.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

□ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

□ - **Does not** fulfill the general approval requirements.

Sample Received Date: 02 Nov 2009

Testing Start Date: 04 Nov 2009

Testing End Date: 12 Nov 2009

- Jiangsu TÜV Product Service Ltd. – Shenzhen Branch -

Reviewed by:

Prepared by:



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EMC Project Manager



Ken Li
EMC Test Engineer

7 Technical Requirement

7.1 Conducted Emission

Test Method

- 1 The EUT was placed on a table, which is 0.8m above ground plane
- 2 The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
- 3 Maximum procedure was performed to ensure EUT compliance
- 4 A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions from both sides of AC line

Limit

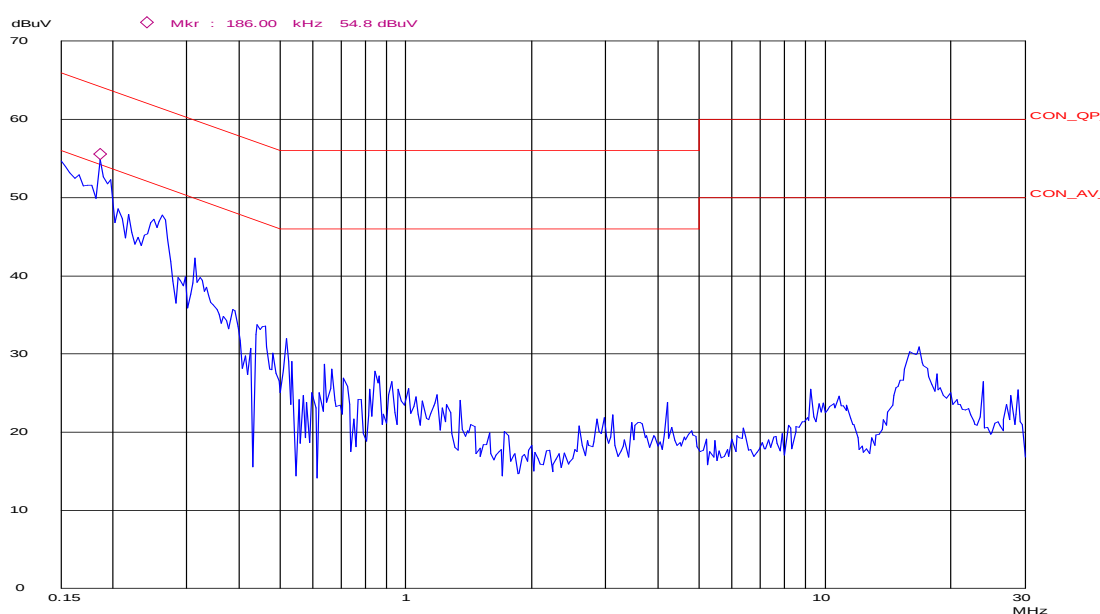
Frequency MHz	QP Limit dB μ V	AV Limit dB μ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Decreasing linearly with logarithm of the frequency

Conducted Emission

Conducted Disturbance

EUT: M/N:PC-91008
Op Cond: Run test program
Test Spec: L
Comment: AC 120V/60Hz



Frequency MHz	Cable Loss dB	Reading dBμV	QP Test result dBμV	QP Limit dBμV	Margin dB
0.150	9.8	37.0	46.8	66	19.2
0.187	9.8	38.7	48.5	64.2	15.7
0.263	9.8	34.0	43.8	61.3	17.5

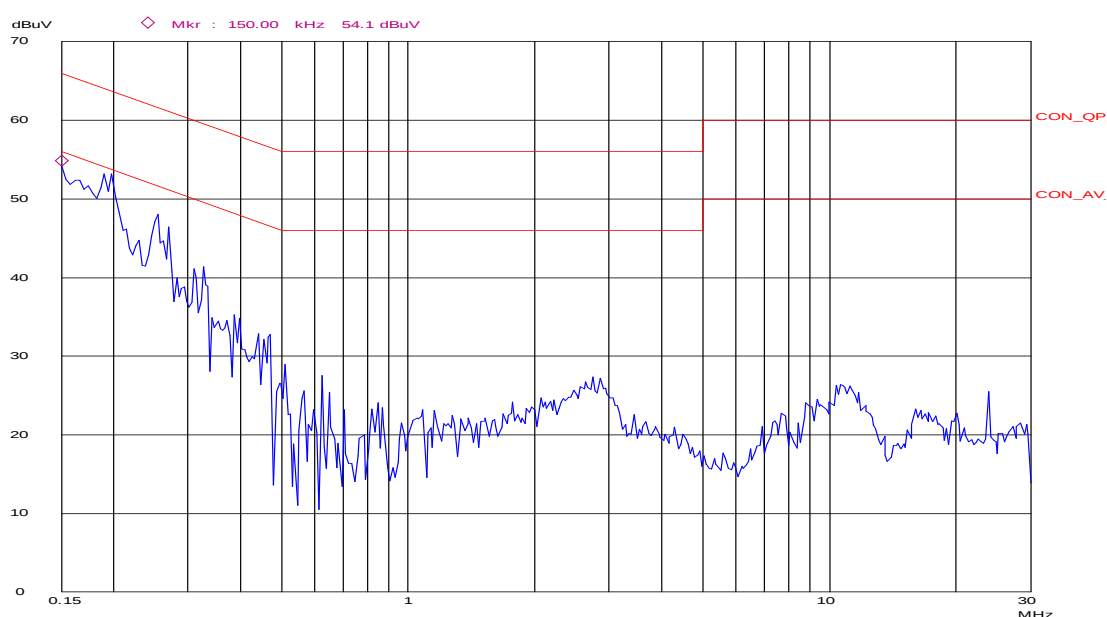
Frequency MHz	Cable Loss dB	Reading dBμV	AV Test result dBμV	AV Limit dBμV	Margin dB
0.150	9.8	9.3	19.1	56	36.9
0.187	9.8	21.3	31.1	54.2	23.1
0.263	9.8	17.6	27.4	51.3	23.9

Remark: Test Result= Reading + Cable Loss

Conducted Emission

Conducted Disturbance

EUT: M/N:PC-91008
Op Cond: Run test program
Test Spec: N
Comment: AC 120V/60Hz



Frequency MHz	Cable Loss dB	Reading dBμV	QP Test result dBμV	QP Limit dBμV	Margin dB
0.150	9.8	37.0	46.8	66	19.2
0.194	9.8	37.7	47.5	63.9	16.4
0.258	9.8	33.7	43.5	61.5	18

Frequency MHz	Cable Loss dB	Reading dBμV	AV Test result dBμV	AV Limit dBμV	Margin dB
0.150	9.8	8.5	18.3	56	37.7
0.194	9.8	23.2	33.0	53.9	20.9
0.258	9.8	16.4	26.2	51.5	25.3

Remark: Test Result= Reading + Cable Loss

Test Equipment List

Conducted Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2009-12-05
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100253	2009-12-05

7.2 Conducted peak output power

Test Method

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.

Limits for conducted peak output power measurements

Frequency Range MHz	Limit W	Limit dBm
2400-2483	≤1	≤30

Conducted peak output power

IEEE 802.11g Modulation Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2412MHz	20.20	Pass
CH6 2437MHz	19.70	Pass
CH11 2462MHz	20.06	Pass

IEEE 802.11b Modulation Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2412MHz	20.02	Pass
CH6 2437MHz	19.93	Pass
CH11 2462MHz	20.34	Pass

IEEE 802.11n HT20 Modulation Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2412MHz	19.45	Pass
CH6 2437MHz	19.55	Pass
CH11 2462MHz	19.57	Pass

IEEE 802.11n HT40 Modulation Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2422MHz	19.10	Pass
CH6 2437MHz	19.24	Pass
CH11 2452MHz	19.06	Pass

Test Equipment

Maximum transmit power Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum Analyzer	Agilent	E4446A	US44300459	2010-05-10

7.3 Spurious radiated emissions

Test Method

- 1 The EUT is placed on a turntable, which is 0.8m above ground plane.
- 2 The turntable shall be rotated for 360 degrees to determine the position of maximum emission level
- 3 EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 4 Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5 each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

Limit

Frequency MHz	Field Strength uV/m	Field Strength dBμV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

Spurious radiated emissions

IEEE 802.11g modulation (6 Mbps) CH1 2412MHz Test Result

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
35.235	1.2	16.5	15.7	33.4	Horizontal	40.0	QP	Pass
168.973	2.2	10.6	22.5	35.3	Horizontal	43.5	QP	Pass
68.224	1.4	7.2	25.4	34.0	Vertical	40.0	QP	Pass
267.335	2.8	13.2	21.8	37.8	Vertical	46.0	QP	Pass
4824.000	4.2	33.3	7.6	45.1	Horizontal	74	PK	Pass
4824.000	4.2	33.3	4.8	42.3	Horizontal	54	AV	Pass
7236.000	-	-	-	-	-	-	-	-
7236.000	-	-	-	-	-	-	-	-

IEEE 802.11g modulation (6 Mbps) CH6 2437MHz Test Result

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4874.000	4.3	33.3	6.2	43.8	Horizontal	74	PK	Pass
4874.000	4.3	33.3	1.4	39.0	Horizontal	54	AV	Pass
7311.000	-	-	-	-	-	-	-	-
7311.000	-	-	-	-	-	-	-	-

IEEE 802.11g modulation (6 Mbps) CH11 2462MHz Test Result

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4924.000	4.3	33.3	6.2	43.8	Horizontal	74	PK	Pass
4924.000	4.3	33.3	2.5	40.1	Horizontal	54	AV	Pass
7386.000	-	-	-	-	-	-	-	-
7386.000	-	-	-	-	-	-	-	-

Remark:

- (1) Emission Level= Cable Loss(include amplifier factor) + Antenna Factor + Reading
- (2) Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.

Radiated Emission

IEEE 802.11b modulation (1 Mbps) CH1 2412MHz Test Result

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
36.339	1.2	15.3	17.3	33.8	Horizontal	40.0	QP	Pass
168.376	2.2	10.6	22.5	35.3	Horizontal	43.5	QP	Pass
68.356	1.4	7.2	25.2	33.8	Vertical	40.0	QP	Pass
312.246	2.9	14.0	21.1	38.0	Vertical	46.0	QP	Pass
4824.000	4.2	33.3	11.5	49.0	Horizontal	74	PK	Pass
4824.000	4.2	33.3	7.8	45.3	Horizontal	54	AV	Pass
7236.000	-	-	-	-	-	-	-	-
7236.000	-	-	-	-	-	-	-	-

IEEE 802.11b modulation (1 Mbps) CH6 2437MHz Test Result

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4874.000	4.3	33.3	13.6	51.2	Horizontal	74	PK	Pass
4874.000	4.3	33.3	11.1	48.7	Horizontal	54	AV	Pass
7311.000	-	-	-	-	-	-	-	-
7311.000	-	-	-	-	-	-	-	-

IEEE 802.11b modulation (1 Mbps) CH11 2462MHz Test Result

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4924.000	4.3	33.3	16.9	54.4	Horizontal	74	PK	Pass
4924.000	4.3	33.3	11.6	49.2	Horizontal	54	AV	Pass
7386.000	-	-	-	-	-	-	-	-
7386.000	-	-	-	-	-	-	-	-

Remark:

- (1) Emission Level= Cable Loss(include amplifier factor) + Antenna Factor + Reading
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.

Radiated Emission

IEEE 802.11n HT20 modulation (6.5 Mbps) CH1 2412MHz Test Result

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
35.887	1.2	16.5	16.3	34.0	Horizontal	40.0	QP	Pass
230.119	2.6	11.5	21.9	35.9	Horizontal	46.0	QP	Pass
88.216	1.6	10.7	21.5	33.8	Vertical	43.5	QP	Pass
515.229	3.8	17.6	18.6	40.0	Vertical	46.0	QP	Pass
4824.000	4.2	33.3	8.2	45.7	Horizontal	74	PK	Pass
4824.000	4.2	33.3	5.2	42.7	Horizontal	54	AV	Pass
7236.000	-	-	-	-	-	-	-	-
7236.000	-	-	-	-	-	-	-	-

IEEE 802.11n HT20 modulation (6.5 Mbps) CH6 2437MHz Test Result

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4874.000	4.3	33.3	8.8	46.4	Horizontal	74	PK	Pass
4874.000	4.3	33.3	4.5	42.1	Horizontal	54	AV	Pass
7311.000	-	-	-	-	-	-	-	-
7311.000	-	-	-	-	-	-	-	-

IEEE 802.11n HT20 modulation (6.5 Mbps) CH11 2462MHz Test Result

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4924.000	4.3	33.3	8.0	45.6	Horizontal	74	PK	Pass
4924.000	4.3	33.3	3.5	41.1	Horizontal	54	AV	Pass
7386.000	-	-	-	-	-	-	-	-
7386.000	-	-	-	-	-	-	-	-

Remark:

- (1) Emission Level= Cable Loss(include amplifier factor) + Antenna Factor + Reading
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.

Radiated Emission

IEEE 802.11n HT40 modulation (13.5 Mbps) CH3 2422MHz Test Result

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
36.776	1.2	15.3	17.4	33.9	Horizontal	40.0	QP	Pass
230.118	2.6	11.5	24.6	38.6	Horizontal	46.0	QP	Pass
89.013	1.6	10.7	19.8	32.1	Vertical	43.5	QP	Pass
515.265	3.8	17.6	18.8	40.2	Vertical	46.0	QP	Pass
4844.000	4.2	33.3	9.0	46.5	Horizontal	74	PK	Pass
4844.000	4.2	33.3	5.0	42.5	Horizontal	54	AV	Pass
7266.000	-	-	-	-	-	-	-	-
7266.000	-	-	-	-	-	-	-	-

IEEE 802.11n HT40 modulation (13.5 Mbps) CH6 2437MHz Test Result

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4874.000	4.3	33.3	7.1	44.7	Horizontal	74	PK	Pass
4874.000	4.3	33.3	4.7	42.3	Horizontal	54	AV	Pass
7311.000	-	-	-	-	-	-	-	-
7311.000	-	-	-	-	-	-	-	-

IEEE 802.11n HT40 modulation (13.5 Mbps) CH9 2452MHz Test Result

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Result
4904.000	4.3	33.3	7.6	45.2	Horizontal	74	PK	Pass
4904.000	4.3	33.3	4.0	41.6	Horizontal	54	AV	Pass
7356.000	-	-	-	-	-	-	-	-
7356.000	-	-	-	-	-	-	-	-

Remark:

- (1) Emission Level= Cable Loss(include amplifier factor) + Antenna Factor + Reading
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.

Test Equipment List

Spurious radiated emissions Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DATE
Spectrum	Agilent	E4446A	US44300459	2010-05-10
SG	HP	83723B	US34490501	2010-05-10
Amp	HP	8449B	3008A02495	2010-05-24
Antenna	EMCO	3115	9607-4877	2010-05-27

8 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty

Items		Extended Uncertainty
RE	Field strength (dB μ V/m)	U=4.6dB; k=2(30MHz-1GHz)
CE	Disturbance Voltage (dB μ V)	U=3.3dB; k=2