



ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

Test report file number : E04DR-079

Applicant : IPOne Inc.
Address : Gusang Bldg., 2F., 1009-5, Daechi-Dong, Gangnam-Gu, Seoul 135-280, Korea

Manufacturer : IPOne Inc.
Address : Gusang Bldg., 2F., 1009-5, Daechi-Dong, Gangnam-Gu, Seoul 135-280 Korea

Type of Equipment : Wireless LAN Access Point

FCC ID. : RV5AIRGATE5031

Model Name : AG5031

Serial number : None

Total page of Report : 63 pages (including this page)

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SUMMARY

The equipment complies with the regulation; **FCC Part 15 Subpart C Section 15.247.**

This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

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1. VERIFICATION OF COMPLIANCE

APPLICANT : IOne Inc.
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CONTACT PERSON : Sanghoon Kim / Principal Engineer
TELEPHONE NO : +82-2-3011-0934
FCC ID : RV5AIRGATE5031
MODEL NO/NAME : AG5031
SERIAL NUMBER : N/A
DATE : December 30, 2004

DEVICE TYPE	Wireless LAN Access Point - DIGITAL TRANSMISSION SYSTEM
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4/2001
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SUBPART C Section 15.247
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	NONE
FINAL TEST WAS CONDUCTED ON	3 METER(S) OPEN AREA TEST SITE

- This device has shown compliance with the conducted emissions limits in 15.207 adopted under FCC 02-107 (ET Docket 98-80). The device may be marketed after July 11, 2005 and is not affected by the 15.37(j) transition provisions.
- The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.



2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
15.247 (a) (2)	Minimum 6dB Bandwidth	Met the Limit / PASS
15.247 (b) (3)	Maximum Peak Output Power	Met the Limit / PASS
15.247 (b) (5)	Radio Frequency Exposure Level	Met the Limit / PASS
15.247 (c)	100 kHz Bandwidth Outside the Frequency Band	Met the Limit / PASS
15.247 (c)	Radiated Emission which fall in the Restricted Band	Met the Limit / PASS
15.247 (d)	Peak Power Spectral Density	Met the Limit / PASS
15.209 and 15.109	Radiated Emission Limits, General Requirement	Met the Limit / PASS
15.207 and 15.107	Conducted Limits	Met the Limit / PASS
15.203	Antenna Requirement	Met requirement / PASS

2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in section 2.1.

2.5 Test Methodology

Radiated testing was performed according to the procedures in ANSI C63.4/2001. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

2.6 Test Facility

The Electromagnetic compatibility measurement facilities are located on at 426-1 Daessangryung-Ri, Chowol-Myeon, Gwangju-Si, Gyeonggi-Do 464-080 Korea. Description details of test facilities were submitted to the Federal Communications Commission on January 18, 2002 (Registration Number: 92819 and 340658), accredited by KOLAS (Korea Laboratory Accreditation Scheme, No: 85) and approved by TUV, DNV, SEMKO and MIC (Ministry of Information and Communications in Korea) according to the requirement of ISO17025.



3. GENERAL INFORMATION

3.1 Product Description

The IPOne Inc., Model AG5031 (referred to as the EUT in this report) is an Access Point, which has 2 802.11a/b/g WLAN Module, 2 RJ-45 ports for WAN and Ethernet, and RS232C port for console. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Wireless LAN & ADSL Combo Device
SPREAD SPECTRUM TYPE	DSSS and OFDM
STANDARD	IEEE 802.11b + 802.11g + 802.11a
OPERATING FREQUENCY	2412-2462 MHz, 5.725 ~5.850GHz
OUTPUT POWER	802.11b: Typ. 20.0dBm, 802.11g : Typ. 18.0 dBm 802.11a: Typ. 18.0 dBm
DATA TRANSFER RATE	802.11b: 1, 2, 5.5, and 11 Mbps 802.11g; 6, 9, 12, 18, 24, 36, 48, and 54 Mbps 802.11a: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps
MODULATION TYPE	BBPSK, QPSK, CCK, 16-QAM and 64-QAM
DUTY CYCCLE	100%
ANTENNA	SMA Type
ANTENNA GAIN	2.0dBi
LIST OF EACH OSC. ORCRY. FREQ.(FREQ.>=1MHz)	25, 33 MHz
NUMBER OF LAYER	Main Board: 6 Layers
POWER REQUIREMENT	AC 100~240Vac, 2.4A from AC/DC Adapter
TEMPERATURE CONDITION	Operation: -100°C ~ 50°C, Storage: -20°C ~ 70°C
EXTERNAL CONNECTOR	2 SMA Type Antenna Connectors, DC Input Port, 2 RJ 45 ports (LAN/WAN), and RS232C Port (Console)

3.2 Alternative type(s)/model(s); also covered by this test report.

-. None

4. EUT MODIFICATIONS

-. None



5. SYSTEM TEST CONFIGURATION

5.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
MAIN BOARD	IPOne Inc.	AG5031DUPBA	N/A
MPCI Card for WLAN	GEMTEK	WMIA-139AG-V00	N/A

5.3 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	FCC ID	Description	Connected to
Airgate5031	IPOne Inc.	RV5AIRGATE5031	Wireless LAN Access Point (EUT)	HOST
HES12-050240-8	Hitron Electronics	N/A	AC/DC Adapter for EUT	EUT
PLL011	Dell Computer Corp.	DoC	Notebook PC (HOST)	EUT
ADP-70EB	Delta Electronics	N/A	AC/DC Adapter for Host	HOST
2225C	HP	DS16XU2225	Printer	HOST

5.4 Mode of operation during the test

The EUT has a detachable antenna, so the antenna was fitted in a manner typical of normal intended use and the transmitting signal was modulated as specified by the manufacturer. The transmitting signal was set at maximum output power. For transmitting and receiving the RF signal between HOST and Notebook PC, software using Hyper terminal program was used supplied by the manufacturer. Also the EUT has several data transfer rate, so the EUT was tested at each transfer rate, but the worst data was recorded in this test report.



5.5 Configuration of Test System

Line Conducted Test: The power cord of the EUT was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power lines Conducted Emission tests were performed by using the procedure in ANSI C63.4/2001 7.2.3 to determine the worse operating conditions.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.4/2001 8.3.1.1 and 13.1.4.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3meter open area test site.
The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

5.6 Antenna Requirement

For intentional device, according to 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.

Antenna Construction:

The transmitter antenna of the EUT is counter clockwise SMA Type, so no consideration of replacement by the user.



6. PRELIMINARY TEST

6.1 AC Power line Conducted Emissions Tests

During Preliminary Tests, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Stand-by mode	
TX mode	X

6.2 General Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

Operation Mode	The Worse operating condition (Please check one only)
Stand-by mode	
TX mode	X



7. MINIMUM 6dB BANDWIDTH

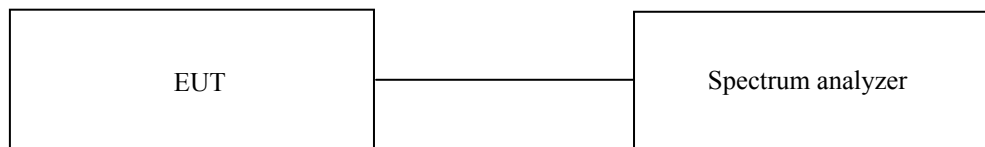
7.1 Operating environment

Temperature : 19°C

Relative humidity : 35 %

7.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, and peak detection was used. The 6dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 6 dB.



7.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Due Cal
■ -	8564E	HP	Spectrum Analyzer	3650A00756	July 10, 2005

All test equipment used is calibrated on a regular basis.

**7.4 Test data****7.4.1 Test data for 802.11b**

-. Test Date : December 15, 2004

-. Test Result : Pass

CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (kHz)	LIMIT (kHz)	MARGIN (kHz)
Low	2412	11400	500	10900
Middle	2437	11700	500	11200
High	2462	11470	500	10970

Remark: See next page for an overview sweep performed with peak detector.

7.4.2 Test data for 802.11g

-. Test Date : December 15, 2004

-. Test Result : Pass

CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (kHz)	LIMIT (kHz)	MARGIN (kHz)
Low	2412	16630	500	16130
Middle	2437	16630	500	16130
High	2462	16670	500	16170

7.4.2 Test data for 802.11a

-. Test Date : December 15, 2004

-. Test Result : Pass

CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (kHz)	LIMIT (kHz)	MARGIN (kHz)
Low	5745	16630	500	16130
Middle	5785	16670	500	16170
High	5805	16670	500	16170

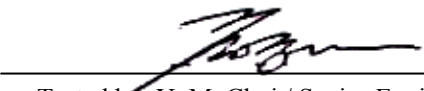

Tested by: Y. M. Choi / Senior Engineer6.



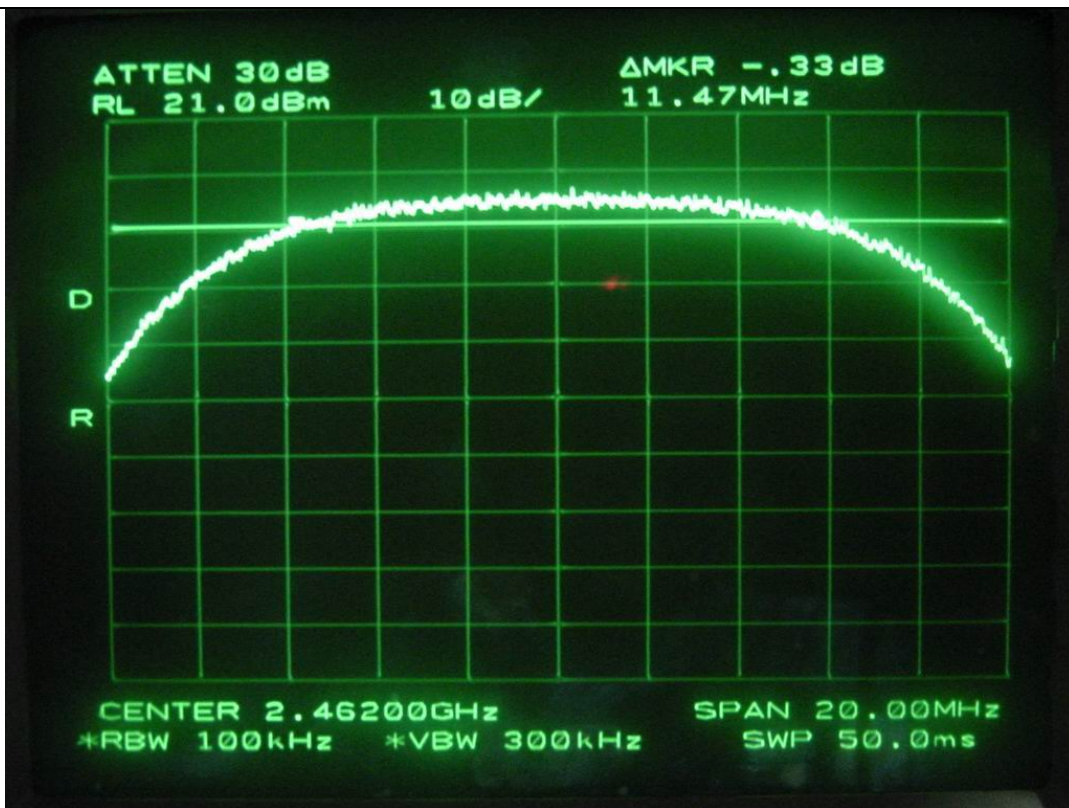
Photo of test data for 802.11b



Low Channel



Middle Channel



High Channel



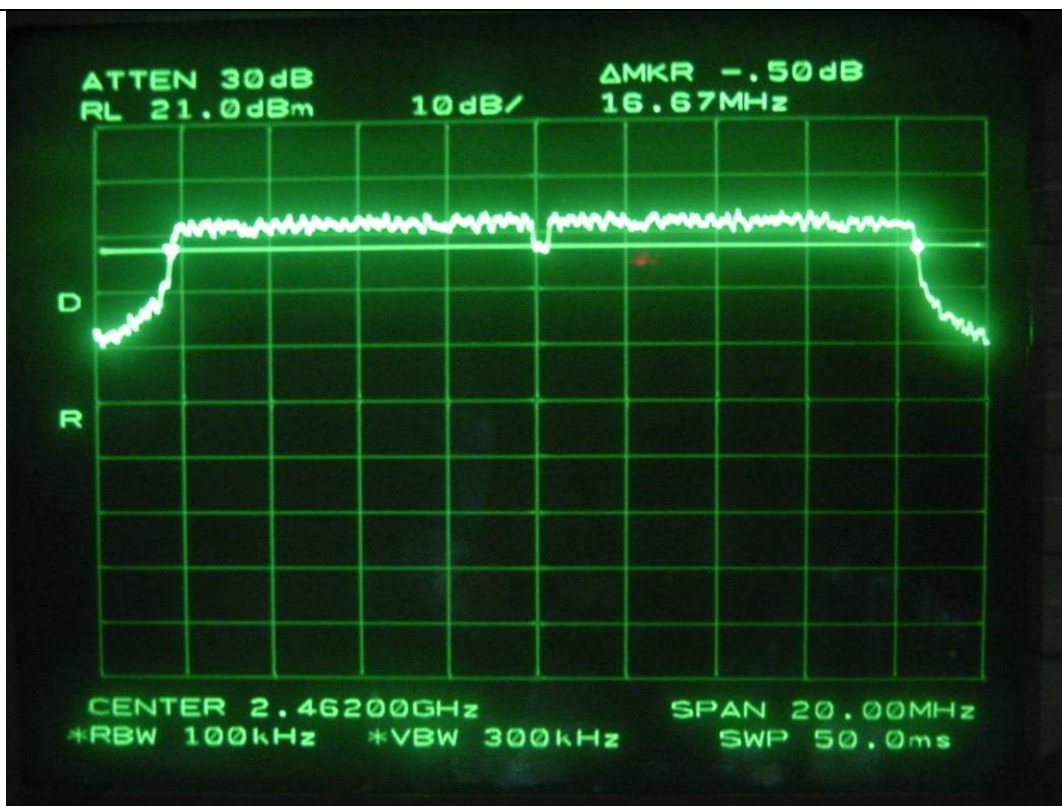
Photo of test data for 802.11g



Low Channel



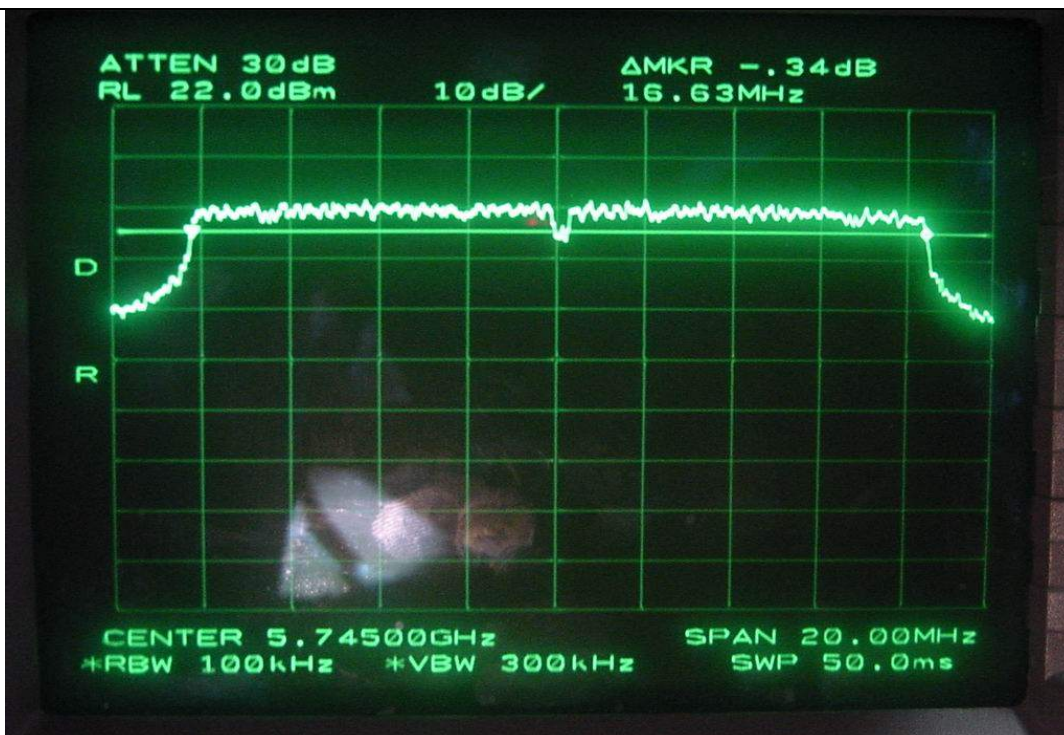
Middle Channel



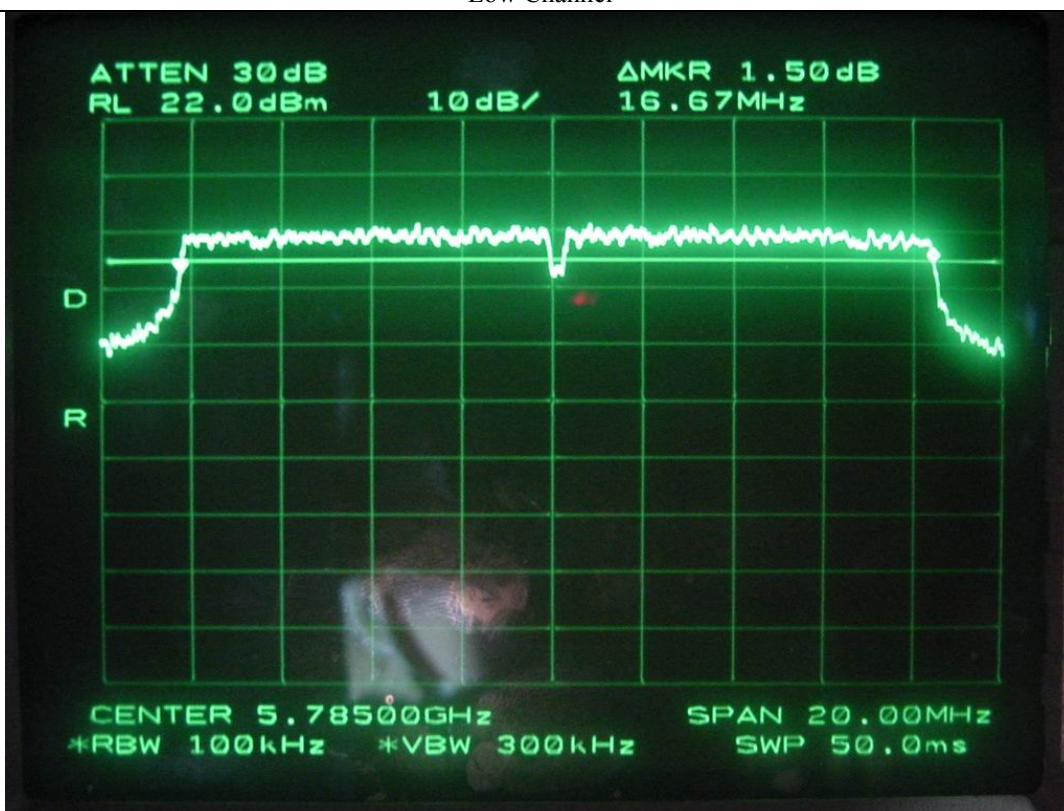
High Channel



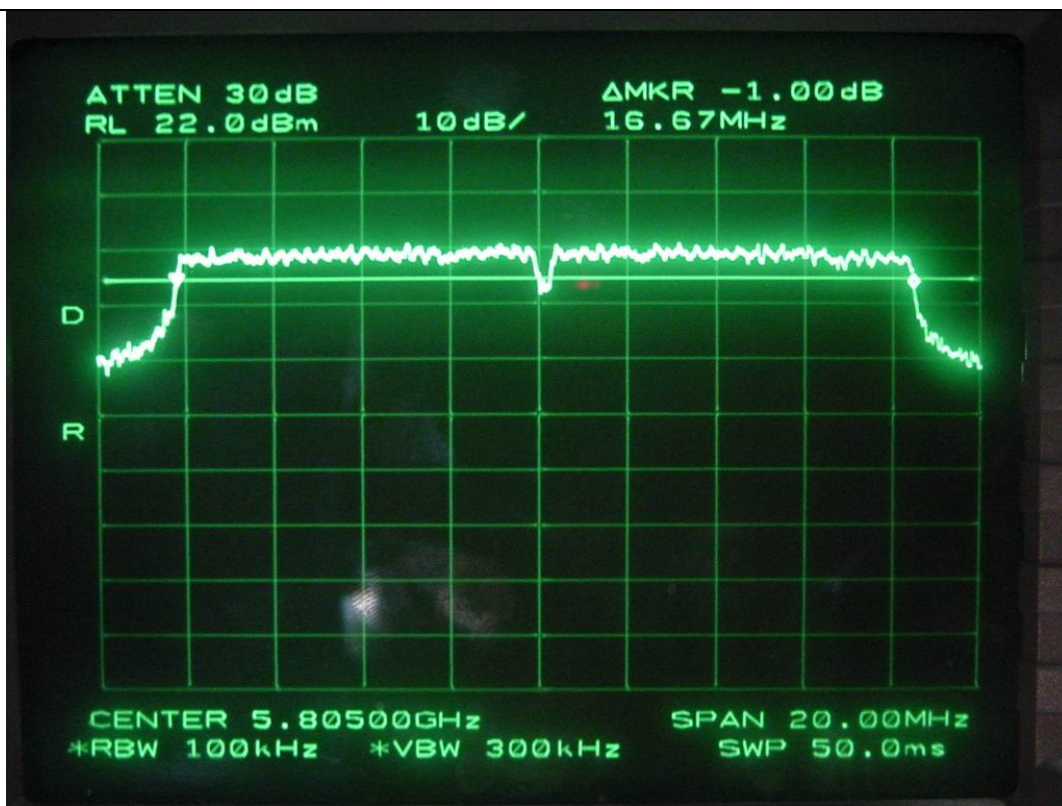
Photo of test data for 802.11a



Low Channel



Middle Channel



High Channel



8. MAXIMUM PEAK OUTPUT POWER

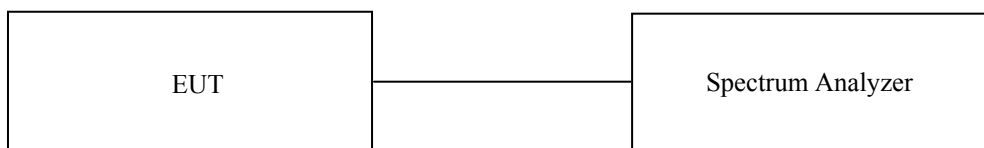
8.1 Operating environment

Temperature : 19°C

Relative humidity : 35 %

8.2 Test set-up

The maximum peak output power was measured with the spectrum analyzer connected to the antenna output of the EUT. The spectrum analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth. The EUT was operating in transmit mode at the appropriate center frequency.



8.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Due Cal
■ - 8564E	HP	Spectrum Analyzer	3650A00756	July 10, 2005

All test equipment used is calibrated on a regular basis.



8.4 Test data

8.4.1 Test data for 802.11b

-. Test Date : December 16, 2004

-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	99% Occupied Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2412	15.79	20.1	30.0	-9.9
Middle	2437	15.71	23.2	30.0	-6.8
High	2462	15.83	21.8	30.0	-8.2

Remark: See next page for an overview sweep performed with peak detector.

8.4.2 Test data for 802.11g

-. Test Date : December 16, 2004

-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	99% Occupied Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2412	18.60	26.0	30.0	-4.00
Middle	2437	18.56	26.6	30.0	-3.40
High	2462	18.60	25.8	30.0	-4.20

8.4.2 Test data for 802.11a

-. Test Date : December 16, 2004

-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	99% Occupied Bandwidth (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	5745	18.60	24.4	30.0	-5.60
Middle	5785	18.64	23.6	30.0	-6.40
High	5805	18.60	23.5	30.0	-6.50

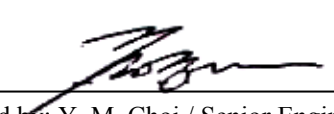

Tested by: Y. M. Choi / Senior Engineer6.

Photo of test data for 802.11b



Low Channel



Middle Channel



High Channel



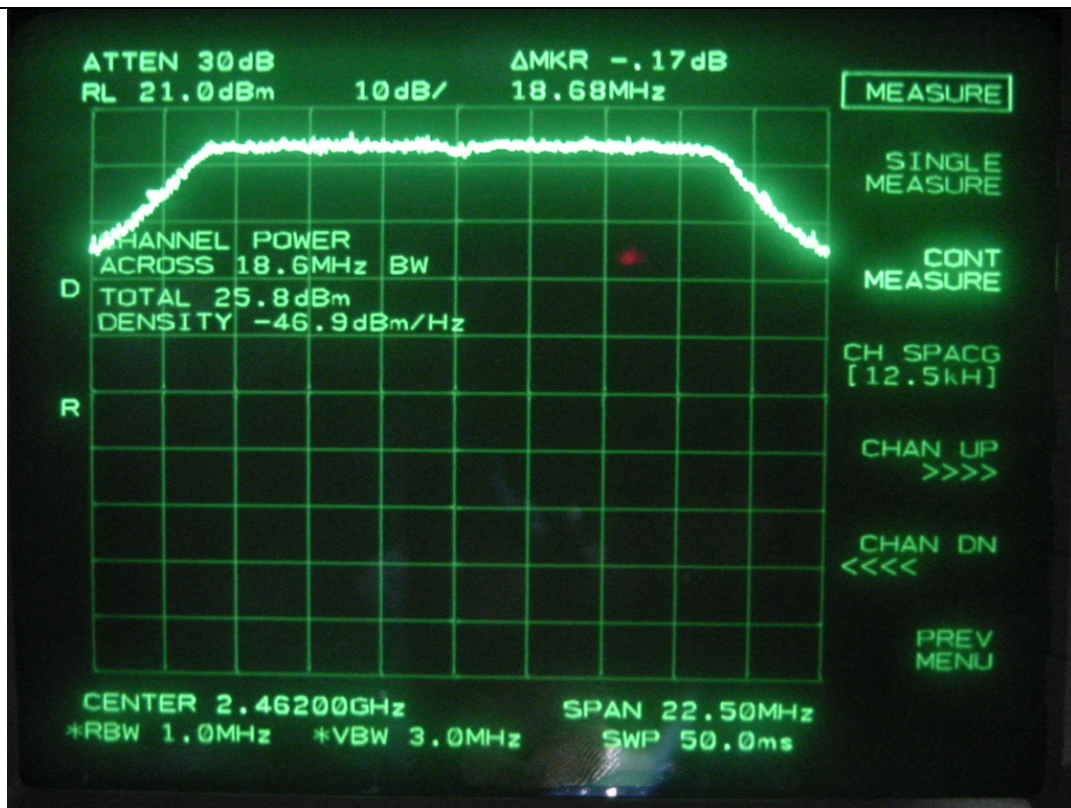
Photo of test data for 802.11g



Low Channel



Middle Channel



High Channel



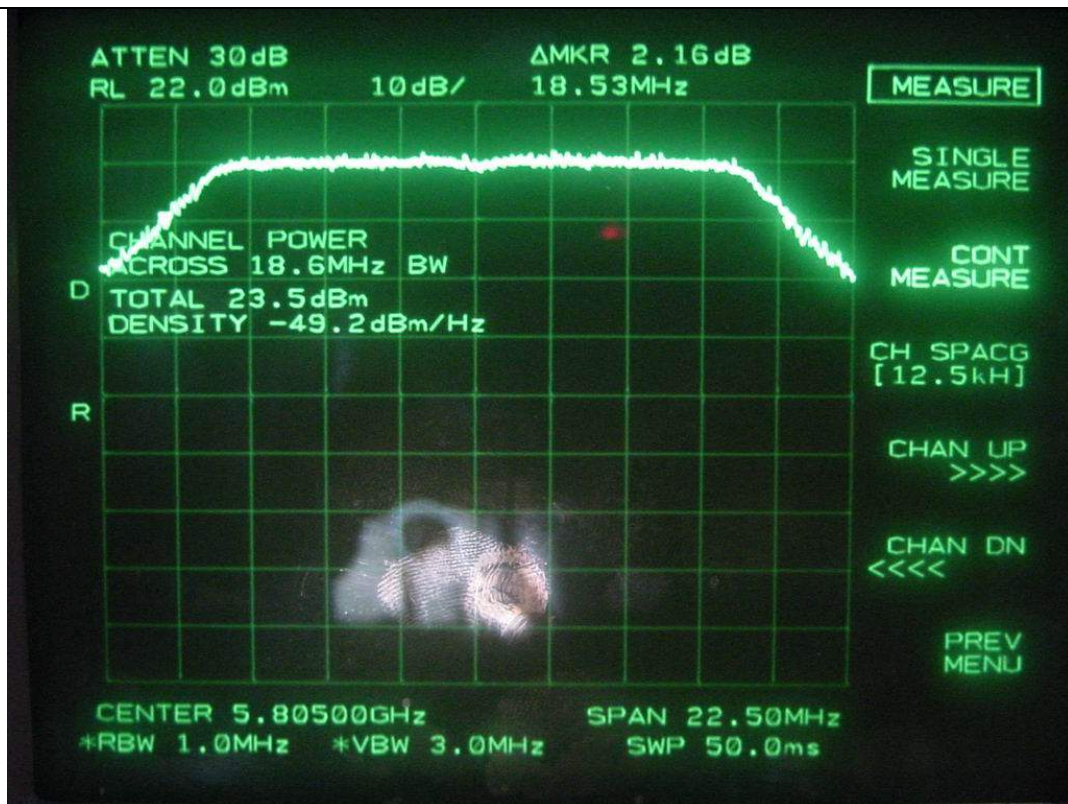
Photo of test data for 802.11a



Low Channel



Middle Channel



High Channel