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

| | |
|---|---|
| **Test Report No.** | **: E065R-033** |
| **ARG No.** | **: A063A-176** |
| **Applicant** | **: Bluebird Soft Inc.** |
| **Address** | **: 558-5, Sinsa-Dong, Gangnam-Gu, Seoul, Korea** |
| **Manufacturer** | **: Bluebird Soft Inc.** |
| **Address** | **: 558-5, Sinsa-Gong, Gangnam-Gu, Seoul Korea** |
| **Type of Equipment** | **: PDA(Personal Digital Assistants)** |
| **FCC ID.** | **: SS4BIP150X** |
| **Model Name** | **: BM-150** |
| **Serial number** | **: None** |
| **Total page of Report** | **: 37 pages (including this page)** |
| **Date of Incoming** | **: April 20, 2006** |
| **Date of issue** | **: May 22, 2006** |

## 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.

Prepared by: Young-Min, Choi / Project Engineer
EMC Div.
ONETECH Corp.

Reviewed by: Y. K. Kwon/ Director
EMC Div.
ONETECH Corp.

 

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**EMC Testing Dept** : 307-51 Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyunggi-Do 464-860 Korea. (TEL: 82-31-765-8289 FAX: 82-31-766-2904)

## CONTENTS

**PAGE**



 

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# 1. VERIFICATION OF COMPLIANCE

| | |
|---|---|
| APPLICANT | : Bluebird Soft Inc. |
| ADDRESS | : 558-5, Sinsa-Dong, Gangnam-Gu, Seoul, Korea |
| CONTACT PERSON | : Mr. Myung-Hoon, Kim / Assistant Quality Manager |
| TELEPHONE NO | : +82-2-548-0740 |
| FCC ID | : SS4BIP150X |
| MODEL NO/NAME | : BM-150 |
| SERIAL NUMBER | : N/A |
| DATE | : May 22, 2006 |

| | |
|---|---|
| EQUIPMENT CLASS | ***DTS - DIGITAL TRANSMISSION SYSTEM*** |
| KIND OF EQUIPMENT | PDA(Personal Digital Assistants) |
| THIS REPORT CONCERNS | ORIGINAL GRANT |
| MEASUREMENT PROCEDURES | ANSI C63.4: 2003 |
| 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 | No. |
| FINAL TEST WAS CONDUCTED ON | 3 METER(S) OPEN AREA TEST SITE |

-. 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.

 

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# 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 |
| 15.109 | Radiated Emission Limits | Met the Limit / PASS |
| 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: 2003. 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 307-51 Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyunggi-Do, 464-080, Korea. Description details of test facilities were submitted to the Federal Communications Commission on August 30, 2005 (Registration Number: 340658), accredited by KOLAS (Korea Laboratory Accreditation Scheme, No: 85) and approved by TUV, DNV and MIC (Ministry of Information and Communications in Korea) according to the requirement of ISO17025.

 

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# 3. GENERAL INFORMATION

## 3.1 Product Description

The Bluebird Soft Inc., Model BM-150 (referred to as the EUT in this report) is a PDA (Personal Digital Assistants) which has 802.11b WLAN module and data uploading/downloading mode via USB port. The device is consists of cradle and the EUT and the cradle shall be connected to a personal computer, so the report for cradle shall be issued by other test report. The product specification described herein was obtained from product data sheet or user's manual.

| | |
|---|---|
| DEVICE TYPE | PDA(Personal Digital Assistants) |
| SPREAD SPECTRUM TYPE | DSSS |
| STANDARD | IEEE 802.11b |
| OPERATING FREQUENCY | 2412 - 2462 MHz |
| OUTPUT POWER | 15dBm |
| USED WLAN | MFG.: SAMSUNG, Model Name: SWL-2350C |
| DATA TRANSFER RATE | Max. 11 Mbps |
| CHANNEL | 11 Channels |
| MODULATION TYPE | DBPSK, DQPSK, CCK |
| ANTENNA | Planer Inverted F Antenna<br>Mfg.: KOSAN I&T / Model No.: KIN-DU2-BS01 |
| ANTENNA GAIN | -3 dBi |
| USED AC/DC ADAPTOR | Mfg.: AULT KOREA / Model No.: PW118KA0503N52 |
| LIST OF EACH OSC. ORCRY. FREQ.(FREQ.>=1MHz) | 13 MHz, 24.576 MHz, 26 MHz and 14.7456 MHz |
| NUMBER OF LAYER | 8 Layers |
| POWER REQUIREMENT | DC 5V, 3A from an AC/DC Adaptor |
| EXTERNAL CONNECTOR | FCI 19pin 0.8pitch IO receptacle socket |

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

No other model differences have been mentioned.

# 4. EUT MODIFICATIONS

None


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# 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 |
|---|---|---|---|
| WLAN Board | Samsung | SWL-2350C | N/A |
| Main Board | Bluebird Soft Inc | BM-150 Rev 0.1 | N/A |
| Camera Board | N/A | N/A | N/A |
| Key Board | Bluebird Soft Inc | BM150-Key | N/A |
| LCD | N/A | N/A | N/A |
| Cradle Main Board | SCR-150 | Hwail Elec. | N/A |
| Cradle Sub Board | KOSNEY_Sub | Hwail Elec. | 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 |
|---|---|---|---|---|
| BM-150 | Bluebird Soft Inc. | SS4BIP150X | PDA(Personal Digital Assistants) (EUT) | Cradle |
| BM-150 | Bluebird Soft Inc. | DoC | Cradle(EUT) | Host |
| PW118KA0503N52 | Ault Korea | N/A | AC/DC Adaptor | EUT |
| PP01L | Dell Computer | DoC | Notebook PC (HOST) | Cradle |
| 020-0470 | Cardinal | GDE0196 | Modem | Host |
| 2225C | HP | DS16XU2225 | Printer | Host |

## 5.4 Mode of operation during the test

The EUT has following 2 operating condition, so two modes were tested and each test results were recorded.

1. After connecting the EUT to the PC via USB cable, the data were continuously read and written from the PC to the EUT.

2. The EUT was operated with wireless LAN mode during the test.

 

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### 5.5 Configuration of Test System

**Line Conducted Test**: The EUT was connected to adaptor and the power of adaptor 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: 2003 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: 2003 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 installed inside of the EUT, 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 |
|---|---|
| Data were continuously read and write by USB Port | X |
| Wireless LAN mode | X |

### 6.2 General Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

| Operation Mode | The Worse operating condition |
|---|---|
| Data were continuously read and write by USB Port | X |
| Wireless LAN mode | X |

# 7. MIMIMUM 6dB BANDWIDTH

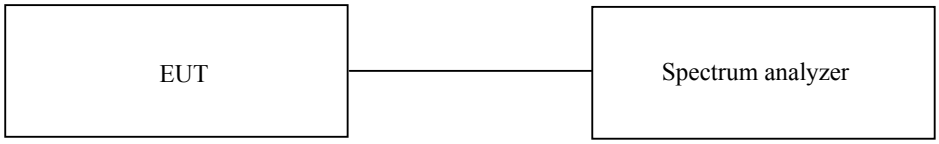
## 7.1 Operating environment

Temperature : 21 °C

Relative humidity : 39 %

## 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 | Last Cal. |
|---|---|---|---|---|---|
| ■ - | 8564E | HP | Spectrum Analyzer | 3650A00756 | July 18, 2005 |

All test equipment used is calibrated on a regular basis.



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## 7.4 Test data

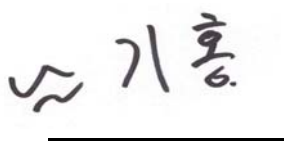
### 7.4.1 Test data for 821.11b

-. Test Date : May 01, 2006

-. Test Result : Pass

| CHANNEL | FREQUENCY(MHz) | MEASURED VLAUE (kHz) | LIMIT (kHz) | MARGIN (kHz) |
|---|---|---|---|---|
| Low | 2412 | 10530 | 500 | -10030 |
| Middle | 2437 | 10130 | 500 | -9630 |
| High | 2462 | 10470 | 500 | -9970 |

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



**Tested by: Ki-Hong, Nam / Test Engineer**



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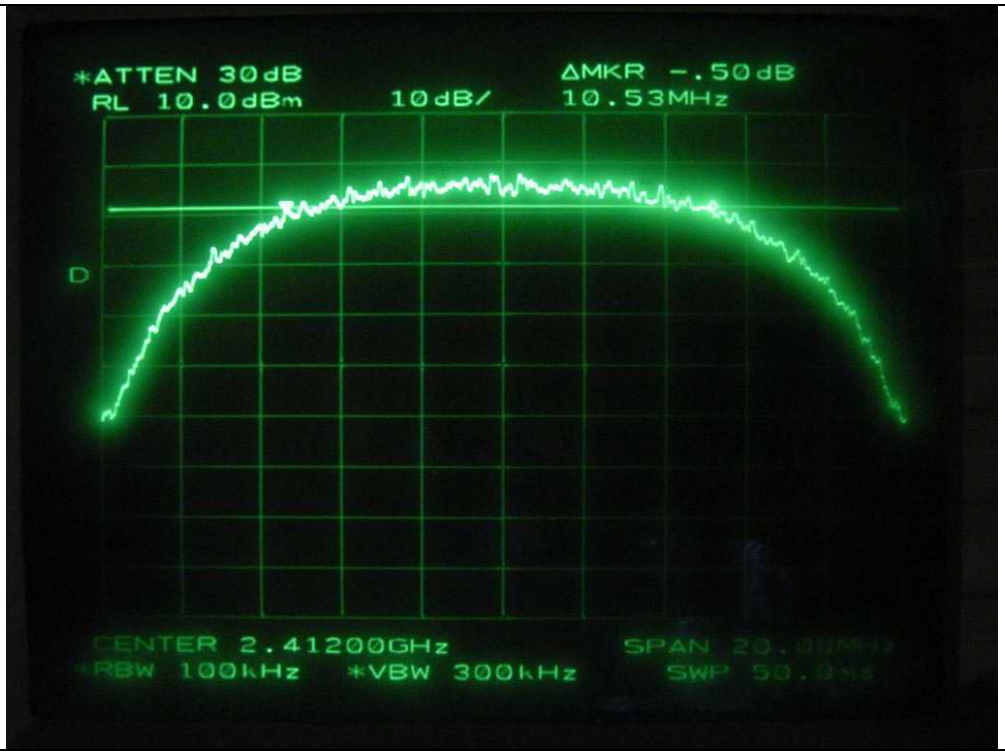
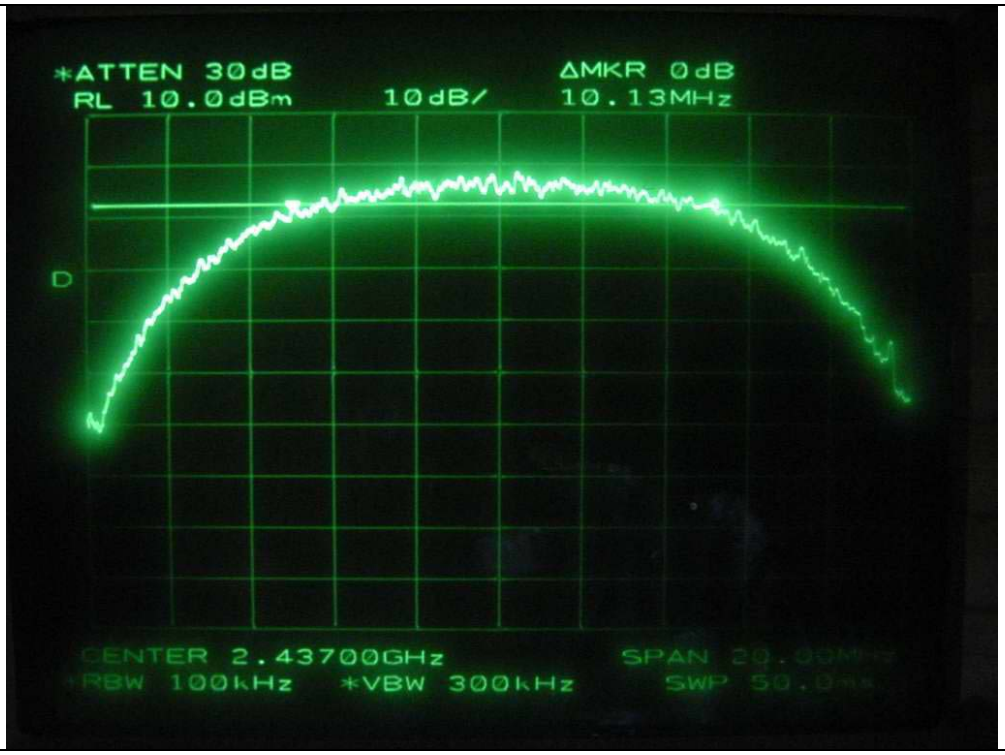



Low Channel




Middle Channel



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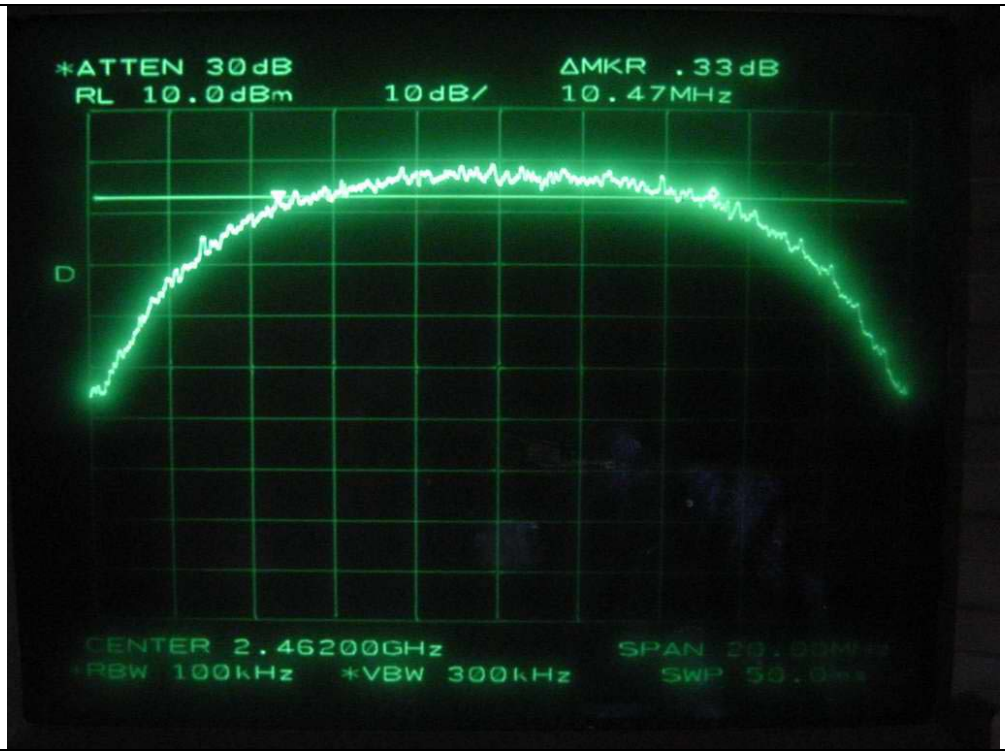


High Channel


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# 8. MAXIMUM PEAK OUTPUT POWER

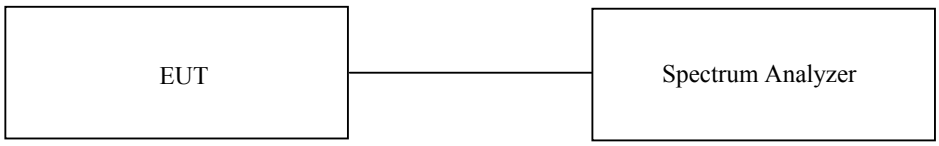
## 8.1 Operating environment

Temperature : 21 °C

Relative humidity : 39 %

## 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 | Last Cal. |
|---|---|---|---|---|---|
| ■ - | 8564E | HP | Spectrum Analyzer | 3650A00756 | July 10, 2005 |

All test equipment used is calibrated on a regular basis.



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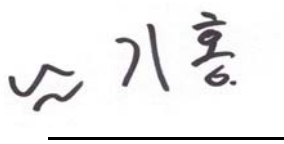
### 8.4 Test data

-. Test Date : May 01, 2006

-. Test Result : Pass

| CHANNEL | FREQUENCY (MHz) | 99% Occupied Bandwidth (MHz) | MEASURED VLAUE (dBm) | LIMIT (dBm) | MARGIN (dB) |
|---|---|---|---|---|---|
| Low | 2412 | 13.95 | 13.00 | 30.0 | -17.00 |
| Middle | 2437 | 13.88 | 13.90 | 30.0 | -16.10 |
| High | 2462 | 14.03 | 15.20 | 30.0 | -14.80 |

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



**Tested by: Ki-Hong, Nam / Test Engineer**



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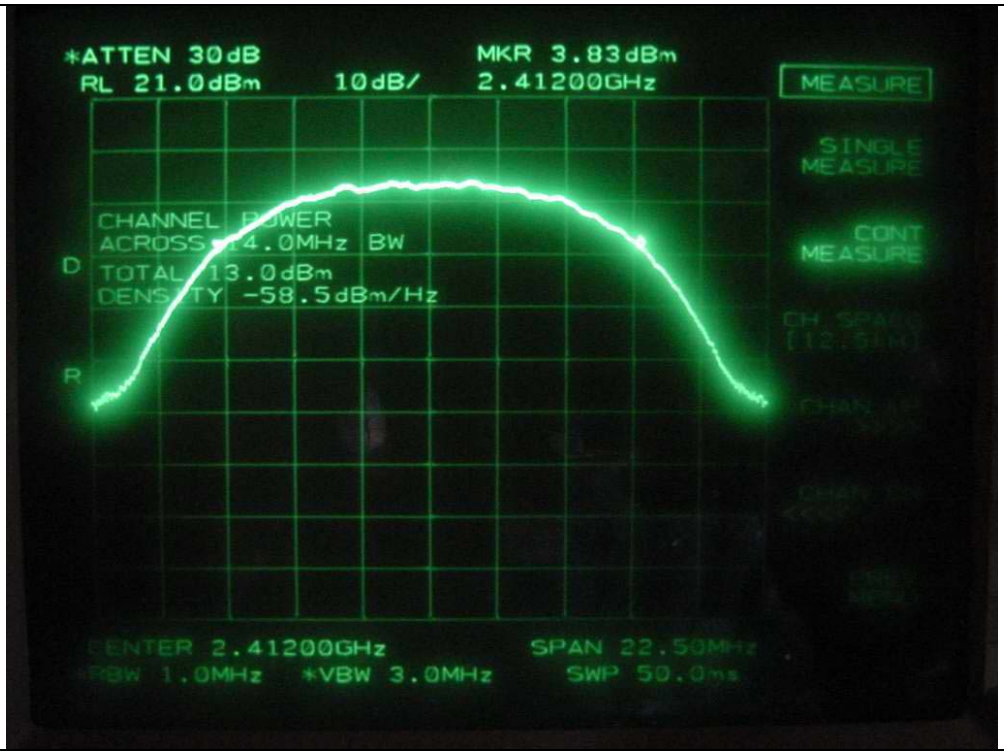
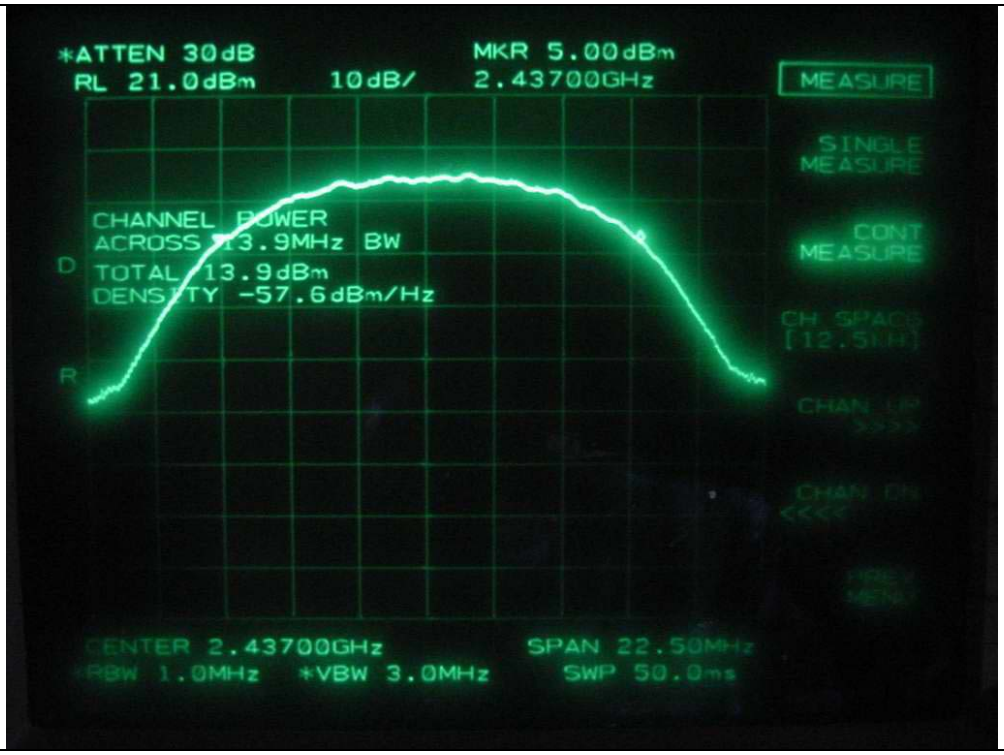



Low Channel




Middle Channel

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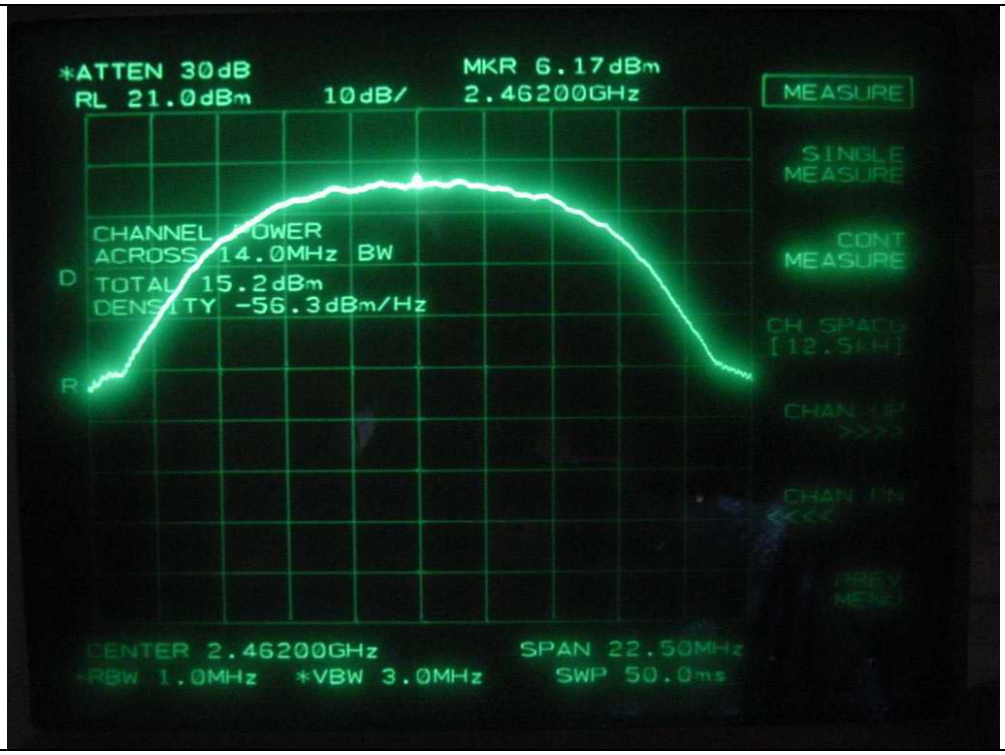


High Channel



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# 9. RADIO FREQUENCY EXPOSURE

## 9.1 RF Exposure Limit

According to the FCC rule §1.1310, the limit for General Population/Uncontrolled exposure is 1mW/cm² for the device operating 1,500~100,000 MHz.

## 9.2 EUT Description

| | |
|---|---|
| Kind of EUT | INDUSTRIAL PDA with WLAN 802.11b |
| Operating Frequency Band | ■ WLAN: 2412 ~ 2462 MHz<br>☐ WLAN: 5180 ~ 5320 MHz / 5500 ~ 5700 MHz<br>☐ WLAN: 5745 ~ 5825 MHz<br>☐ Bluetooth: 2402 ~ 2480MHz |
| Device Category | ■ Portable (<20cm separation) and Hand-held operation only<br>☐ Mobile (>20cm separation)<br>☐ Others |
| Max. Output Power | WLAN: 15.2 dBm (33.1mW) @ 2462 MHz |
| Used Antenna | Single Antenna |
| Used Antenna Gain | WLAN: -3 dBi |
| Exposure Evaluation Applied | ☐ MPE<br>☐ SAR<br>■ N/A |

## 9.3 Test Result

According to the rule, §1.1307(b) (1) and §2.1093,

SO, THE DEVICE MEETS THE RF EXPOSURE REQUIREMENT.

 

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# 10. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

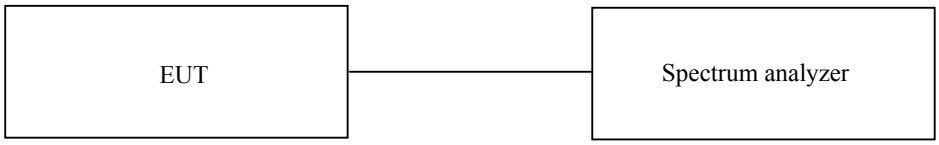
## 10.1 Operating environment

Temperature : 21 °C

Relative humidity : 39 %

## 10.2 Test set-up for conducted measurement

The antenna output of the EUT was connected to the spectrum analyzer. The resolution and video bandwidth is set to 100 kHz, and peak detection was used.




## 10.3 Test set-up for radiated measurement

The radiated emissions measurements were performed on the 3meters, open-field test site. The EUT was placed on a non-conductive turntable approximately 0.8 meters above the ground plane.

The frequency spectrum from 30MHz to 25GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 and 4.0 meters in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

## 10.4 Test equipment used

| | Model Number | Manufacturer | Description | Serial Number | Last Cal. |
|---|---|---|---|---|---|
| ■ - | 8564E | Hewlett-Packard | Spectrum Analyzer | 3650A00756 | July 18, 2005 |
| ■ - | 83051A | Agilent | Preamplifier | 3950M00201 | June 09, 2005 |
| ■ - | MA220 | HD | Turn Table | N/A | N/A |
| ■ - | HD240 | HD | Antenna Mast | N/A | N/A |
| ■ - | BBHA9170 | Schwarzbeck | Horn Antenna | BBHA9170178 | June 06, 2005 |
| ■ - | YSE 500B | YoungShin Eng. | Frequency Converter | 950413001 | N/A |
| ■ - | ETCR-10 | DaeHa | Automatic Voltage Com. | N/A | N/A |

All test equipment used is calibrated on a regular basis.

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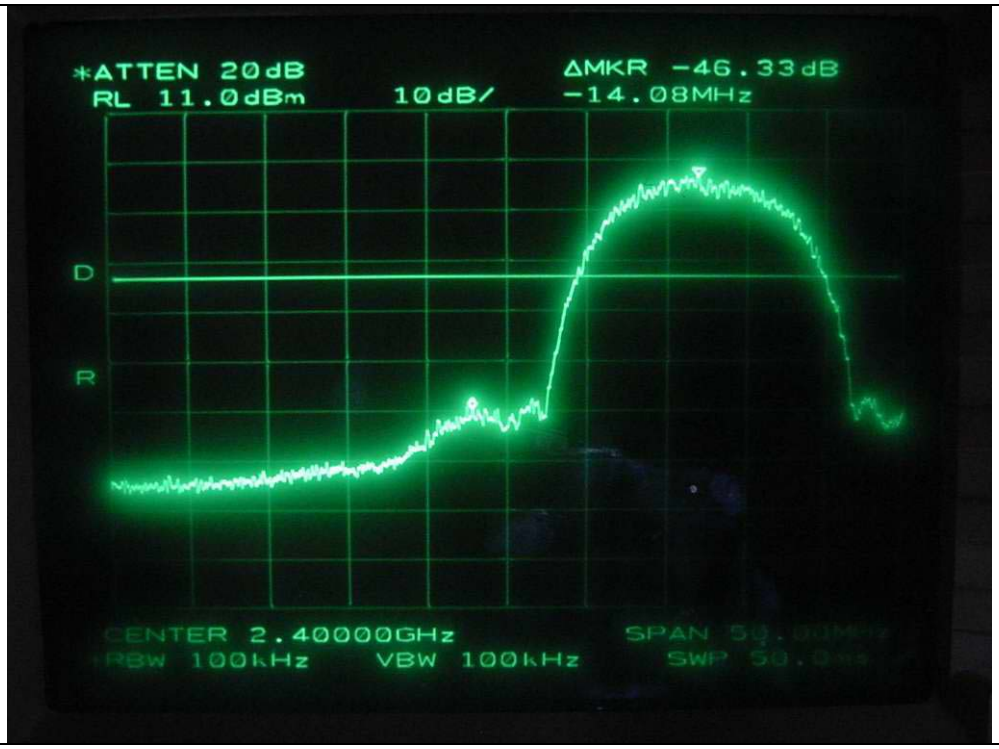
### 10.5. Test data for conducted emission




Low Channel


High Channel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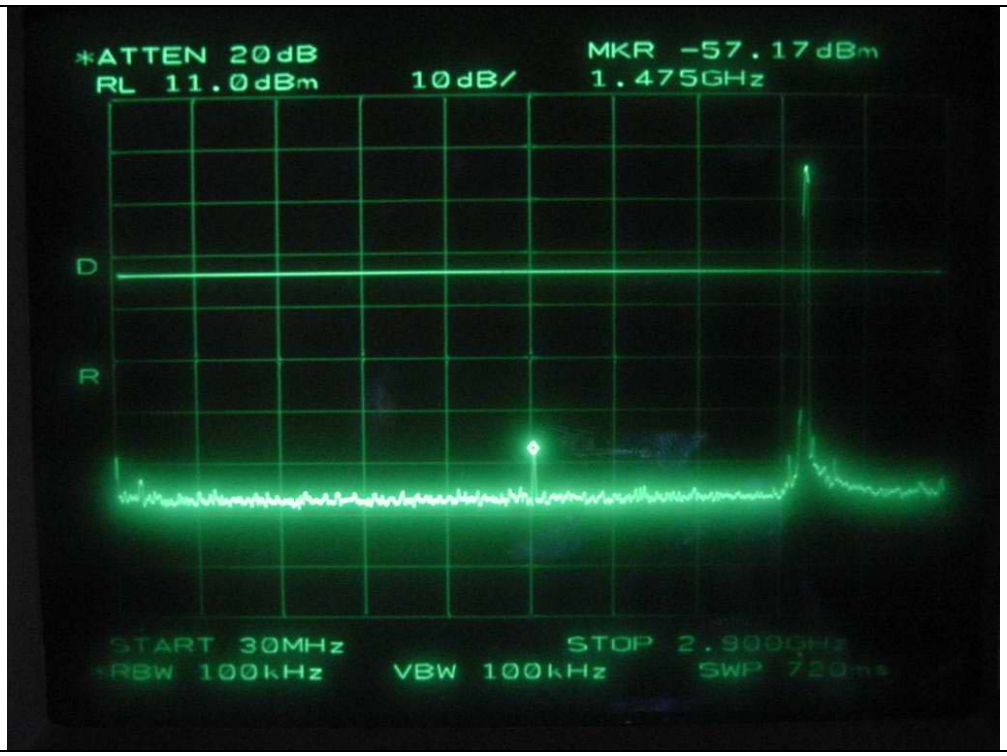
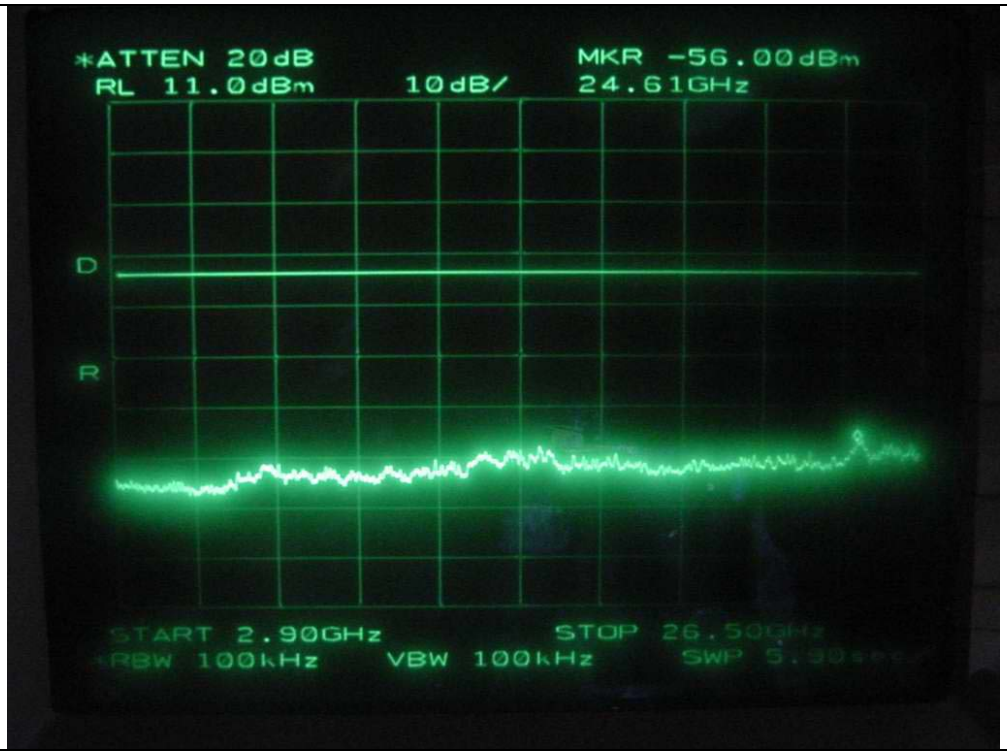



Low Channel




Low Channel



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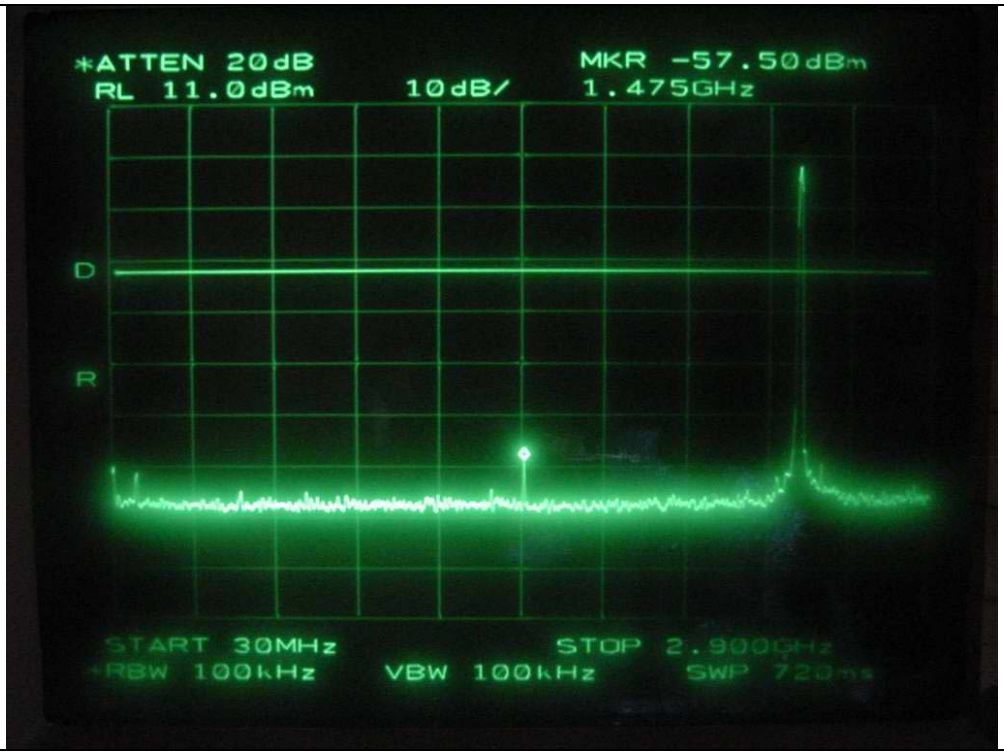
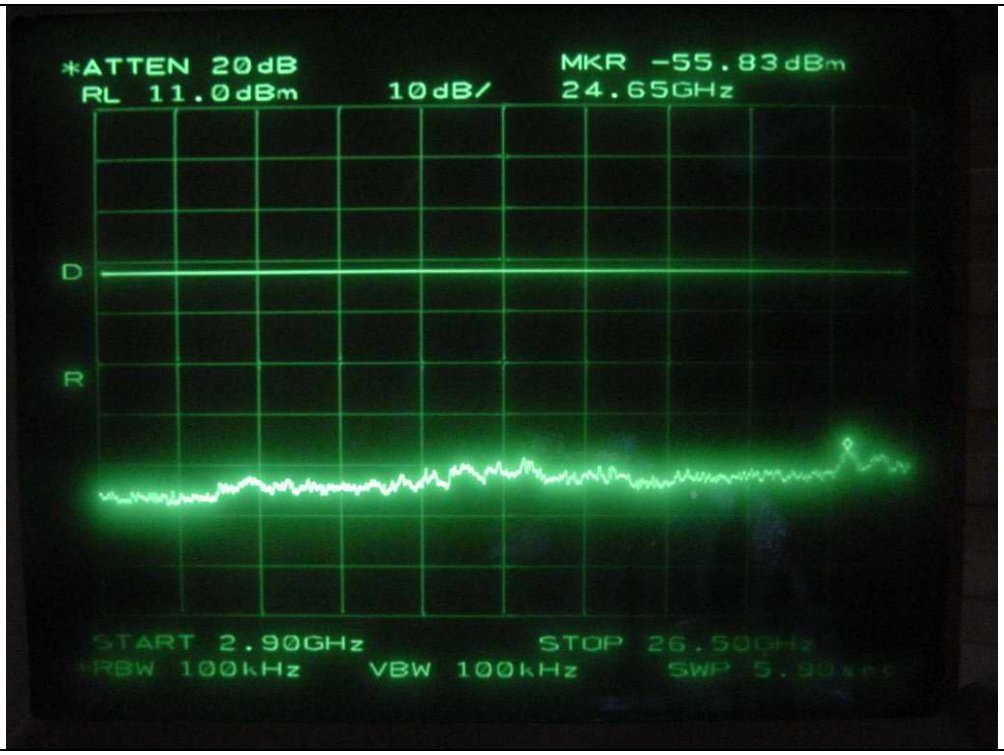



Middle Channel




Middle Channel



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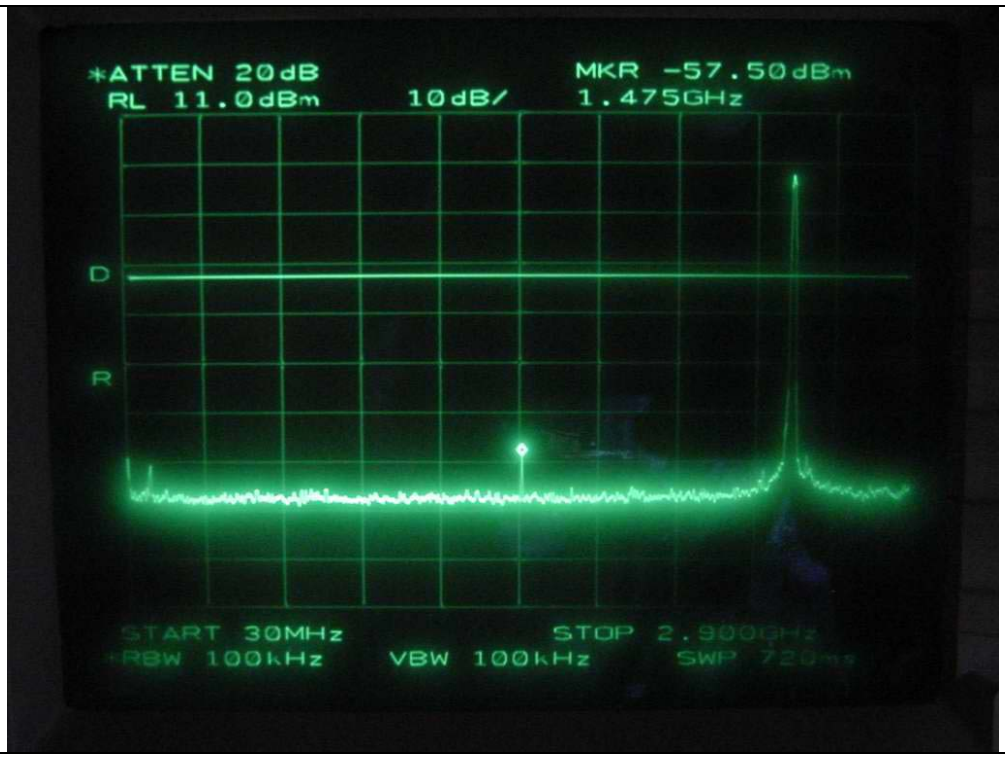
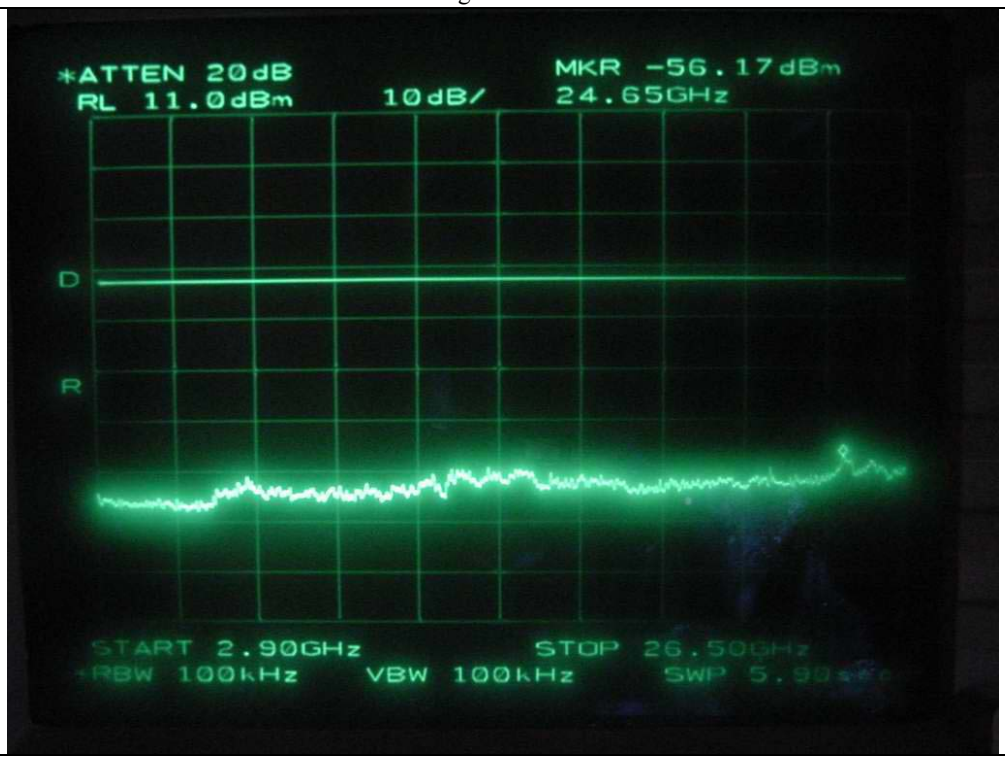



High Channel




High Channel



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### 10.6. Test data for radiated emission

### 10.6.1 Operating condition: 802.11b Mode

#### 10.6.1.1 Radiated Emission which fall in the Restricted Band

-. Test Date : May 03, 2006
-. Resolution bandwidth : 1 MHz for Peak and Average Mode
-. Video bandwidth : 1 MHz for Peak Mode, 10Hz for Average Mode
-. Frequency range : 1 GHz ~ 25GHz
-. Measurement distance : 3m
-. Operating Condition : Low / High Channel
-. Result : PASSED BY –26.23 dB at Low Channel

| Frequency (MHz) | Reading (dBuV) | Detector Mode | Ant. Pol. (H/V) | Ant. Factor | Cable Loss | Amp Gain | Dist. Factor | Total (dBuV/m) | Limits (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Test Data for Low Channel** | | | | | | | | | | |
| 2389.47 | 35.67 | Peak | H | 27.64 | 1.33 | 26.10 | | 38.54 | 74.0 | -35.46 |
| | 35.83 | Peak | V | | | | | 38.70 | 74.0 | -35.30 |
| | 24.83 | Average | H | | | | | 27.70 | 54.0 | -26.30 |
| | 24.90 | Average | V | | | | | 27.77 | 54.0 | -26.23 |
| **Test Data for High Channel** | | | | | | | | | | |
| 2483.50 | 35.17 | Peak | H | 27.59 | 1.33 | 26.10 | | 37.99 | 74.0 | -36.02 |
| | 35.33 | Peak | V | | | | | 38.15 | 74.0 | -35.86 |
| | 23.67 | Average | H | | | | | 26.49 | 54.0 | -27.52 |
| | 23.50 | Average | V | | | | | 26.32 | 54.0 | -27.69 |

Tabulated test data for Restricted Band

Remark: “H”: Horizontal, “V”: Vertical

**Tested by: Ki-Hong, Nam / Test Engineer**


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### 10.6.1.2 Spurious & Harmonic Radiated Emission

-. Test Date : May 03, 2006
-. Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
-. Video bandwidth : 1 MHz for Peak Mode, 10Hz for Average Mode
-. Frequency range : 1 GHz ~ 25 GHz
-. Measurement distance : 3m
-. Result : PASSED BY –22.32 dB at High Channel

| Frequency (GHz) | Reading (dBuV) | Detector Mode | Ant. Pol. (H/V) | Ant. Factor | Cable Loss | Amp Gain | Dist. Factor | Total (dBuV/m) | Limits (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Test Data for Low Channel** | | | | | | | | | | |
| 2.412 | 45.83 | Peak | V | 27.62 | 1.33 | | | 74.78 | - | |
| | 46.27 | Peak | V | | | | | 75.22 | - | |
| 4.824 | 34.10 | Peak | H | 31.30 | 2.67 | 26.10 | | 41.97 | 74.00 | -32.03 |
| | 23.50 | Average | H | | | | | 31.37 | 54.00 | -22.63 |
| **Test Data for Middle Channel** | | | | | | | | | | |
| 2.437 | 47.67 | Peak | V | 27.61 | 1.33 | | | 76.61 | - | |
| | 47.98 | Peak | V | | | | | 76.92 | - | |
| 4.874 | 33.95 | Peak | V | 31.37 | 2.67 | 26.10 | | 41.89 | 74.00 | -32.11 |
| | 23.50 | Average | H | | | | | 31.44 | 54.00 | -22.56 |
| **Test Data for High Channel** | | | | | | | | | | |
| 2.462 | 47.90 | Peak | H | 27.60 | 1.33 | | | 76.83 | - | |
| | 48.33 | Peak | V | | | | | 77.26 | - | |
| 4.924 | 33.50 | Peak | H | 31.44 | 2.67 | 26.10 | | 41.51 | 74.00 | -32.49 |
| | 23.67 | Average | H | | | | | 31.68 | 54.00 | -22.32 |

Tabulated test data for Restricted Band

Remark: “H”: Horizontal, “V”: Vertical

**Tested by: Ki-Hong, Nam / Test Engineer**


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# 11. PEAK POWER SPECTRUL DENSITY

## 11.1 Operating environment

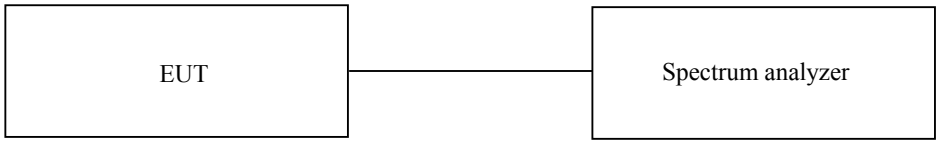
Temperature : 21 °C

Relative humidity : 39 %

## 11.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 3 kHz, the video bandwidth is set to 3 times the resolution bandwidth, and sweep time was set to span / 3 kHz. The sweep time was allowed to be longer than span / 3 kHz for a full response of the mixer in the spectrum analyzer.

The maximum level from the EUT in a 3 kHz bandwidth was measured with above condition.




## 11.3 Test equipment used

| | Model Number | Manufacturer | Description | Serial Number | Last Cal. |
|---|---|---|---|---|---|
| ■ - | 8564E | Hewlett-Packard | Spectrum Analyzer | 3650A00756 | July 18, 2005 |

All test equipment used is calibrated on a regular basis.

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## 11.4 Test data

### 11.4.1 Test data for 821.11b

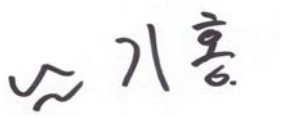
-. Test Date : May 02, 2006

-. Test Result : Pass

| CHANNEL | FREQUENCY(MHz) | MEASURED VLAUE (dBm) | LIMIT (dBm) | MARGIN (dB) |
|---|---|---|---|---|
| Low | 2412 | -16.67 | 8.00 | -24.67 |
| Middle | 2437 | -15.33 | 8.00 | -23.33 |
| High | 2462 | -14.67 | 8.00 | -22.67 |

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

See next page for measurement data.



**Tested by: Ki-Hong, Nam / Test Engineer**



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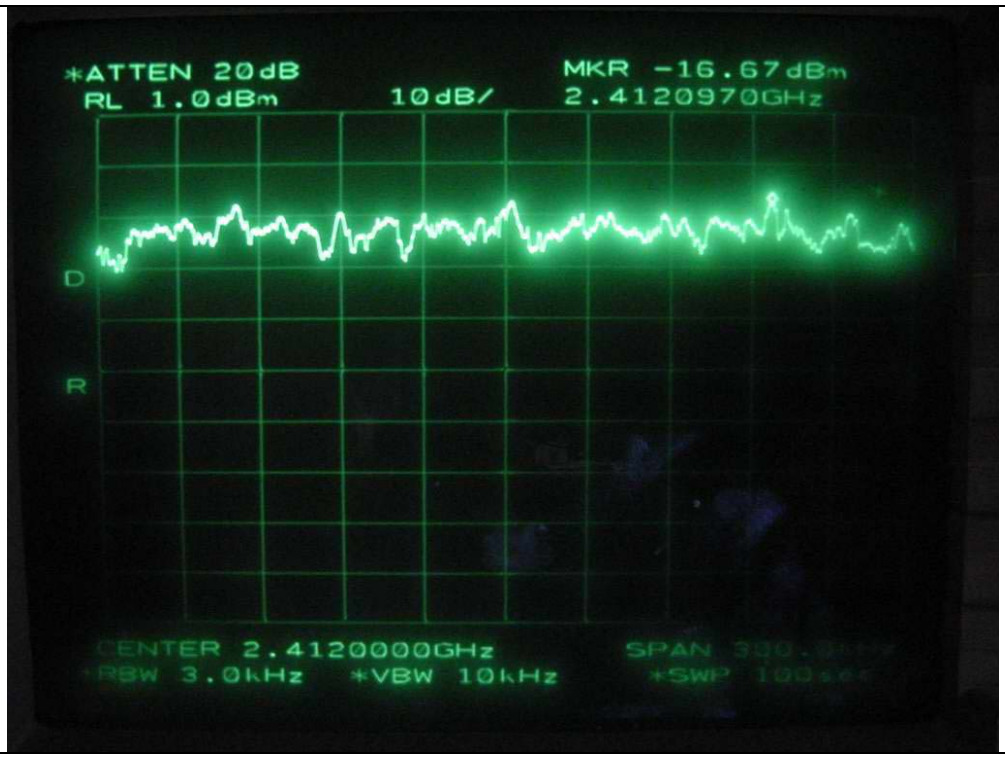
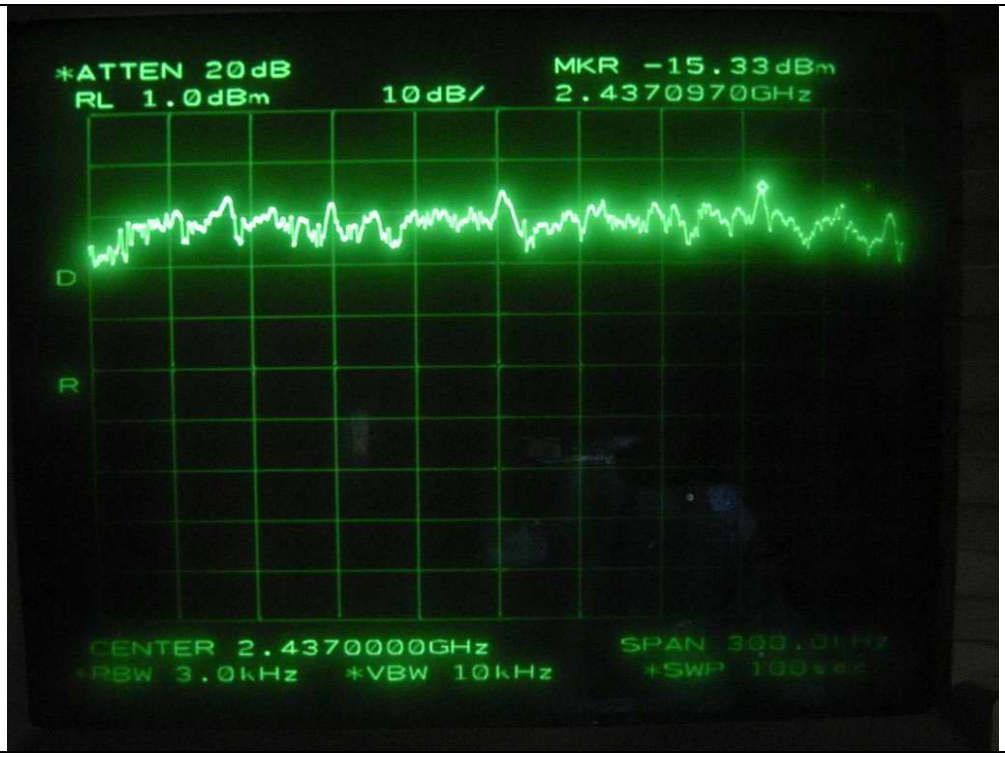



Low Channel




Middle Channel



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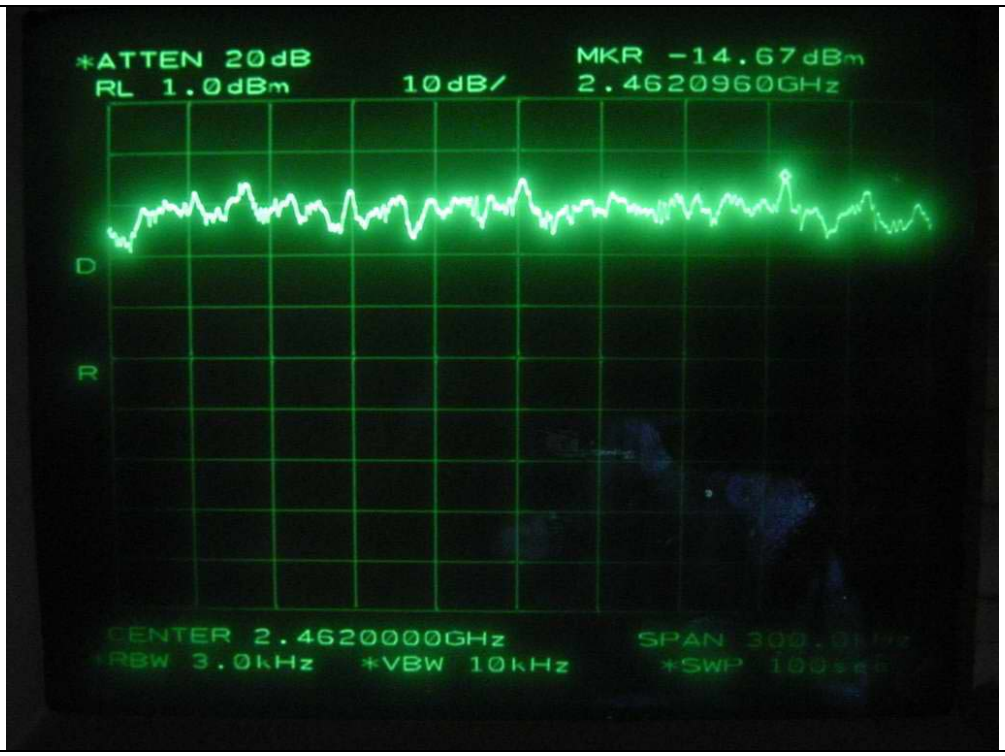


High Channel


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# 12. RADIATED EMISSION TEST, GENERAL REQUIREMENT

## 12.1 Operating environment

Temperature : 12 °C

Relative humidity : 66 %

## 12.2 Test set-up

The radiated emissions measurements were on the 3 meters, open-field test site. The EUT and other support equipment were placed on a non-conductive turntable above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

The frequency spectrum from 30MHz to 1000MHz was scanned and emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in height between 1.0 and 4.0 meters in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

## 12.3 Measurement uncertainty

Radiated emission electric field intensity, 30 MHz ~ 300 MHz : ± 4.43 dB

Radiated emission electric field intensity, 300 MHz ~ 1000 MHz : ± 3.80 dB

Measurement uncertainty is calculated in accordance with WECC 19-1990. The measurement uncertainty is given with a confidence of 95% with the coverage factor, k=2.

## 12.4 Test equipment used

| | Model Number | Manufacturer | Description | Serial Number | Last Cal. |
|---|---|---|---|---|---|
| ■ - | ESVS10 | Rohde & Schwarz | EMI Test Receiver | 827864/005 | Dec. 20, 2005 |
| ■ - | MA240 | HD GmbH | Antenna Master | N/A | N/A |
| ■ - | HD100 | HD GmbH | Position Controller | N/A | N/A |
| ■ - | DS420S | HD GmbH | Turn Table | N/A | N/A |
| ■ - | VHA9103 | Schwarzbeck | Biconical Antenna | 91031852 | Feb. 13, 2006 |
| ■ - | 9108-A(494) | Schwarzbeck | Log Periodic Antenna | 62281001 | Feb. 13, 2006 |

All test equipment used is calibrated on a regular basis.

 

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## 12.5 Test data

### 12.5.1 Operating Mode: Data were continuously read and write by USB Port

-. Type of Test : FCC Class B

-. Test Date : May 06, 2006

-. Resolution bandwidth : 120 kHz

-. Frequency range : 30MHz ~ 1000MHz

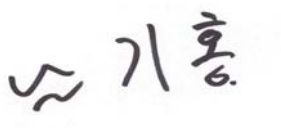
-. Measurement distance : 3m

-. Test result : Passed by -7.11 dB at 34.84 MHz

| Frequency (MHz) | Reading (dBuV) | Ant. Pol. (H/V) | Ant. Factor (dB/m) | Cable Loss | Emission Level(dBuV/m) | Limits (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 34.84 | 15.10 | V | 16.70 | 1.09 | 32.89 | 40.00 | -7.11 |
| 166.63 | 12.30 | V | 15.18 | 2.40 | 29.88 | 43.52 | -13.64 |
| 202.83 | 14.10 | H | 16.26 | 2.82 | 33.18 | 43.52 | -10.34 |
| 263.53 | 13.80 | H | 17.37 | 3.45 | 34.62 | 46.02 | -11.40 |
| 353.68 | 17.00 | H | 16.10 | 4.21 | 37.31 | 46.02 | -8.71 |
| 440.86 | 10.60 | H | 17.95 | 4.48 | 33.03 | 46.02 | -12.99 |

Tabulated test data for Radiated Electromagnetic Field

Remark: “H”: Horizontal, “V”: Vertical



**Tested by: Ki-Hong, Nam / Test Engineer**



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### 12.5.2 Operating Mode: Wireless LAN mode

-. Type of Test : FCC Class B

-. Test Date : May 06, 2006

-. Resolution bandwidth : 120 kHz

-. Frequency range : 30MHz ~ 1000MHz

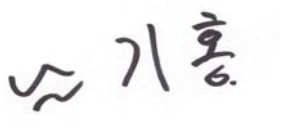
-. Measurement distance : 3m

-. Test result : Passed by -10.21 dB at 311.01 MHz

| Frequency (MHz) | Reading (dBuV) | Ant. Pol. (H/V) | Ant. Factor (dB/m) | Cable Loss | Emission Level(dBuV/m) | Limits (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 74.50 | 12.30 | V | 5.93 | 1.59 | 19.82 | 40.00 | -20.18 |
| 121.08 | 14.10 | H | 12.76 | 2.02 | 28.88 | 43.52 | -14.64 |
| 141.43 | 13.50 | H | 14.29 | 2.39 | 30.18 | 43.52 | -13.34 |
| 204.42 | 12.10 | H | 16.30 | 2.84 | 31.24 | 43.52 | -12.28 |
| 311.01 | 16.90 | V | 15.02 | 3.89 | 35.81 | 46.02 | -10.21 |
| 334.27 | 10.40 | H | 15.63 | 4.07 | 30.10 | 46.02 | -15.92 |

Tabulated test data for Radiated Electromagnetic Field

Remark: “H”: Horizontal, “V”: Vertical



**Tested by: Ki-Hong, Nam / Test Engineer**

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# 13. CONDUCTED EMISSION TEST

## 13.1 Operating environment

Temperature : 21 °C

Relative humidity : 38 %

## 13.2 Test set-up

The EUT was placed on a wooden table, 0.8 meters height above the floor. The EUT was connected to adaptor and the Power of adaptor was fed through a 50 ohm/ 50 uH Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

## 13.3 Measurement uncertainty

Conducted emission, quasi-peak detection : ± 2.93 dB

Conducted emission, average detection : ± 2.93 dB

Measurement uncertainty is calculated in accordance with WECC 19-1990. The measurement uncertainty is given with a confidence of 95% with the coverage factor, k=2.

## 13.4 Test equipment used

| | Model Number | Manufacturer | Description | Serial Number | Last Cal. |
|---|---|---|---|---|---|
| ■ - | ESHS10 | Rohde & Schwarz | EMI Test Receiver | 834467/007 | May 19, 2005 |
| ■ - | NSLK 8126 | Schwarzbeck | AMN | 8126-404 | Aug, 10, 2005 |
| ■ - | 3825/2 | EMCO | AMN | 9109-1867 | July 18, 2005 |

All test equipment used is calibrated on a regular basis.

 

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## 13.5 Test data

### 13.5.1Operating condition: Data were continuously read and write by USB Port

-. Type of Test : FCC Class B

-. Test Date : May 06, 2006

-. Resolution bandwidth : 9 kHz

-. Frequency range : 0.15MHz ~ 30MHz

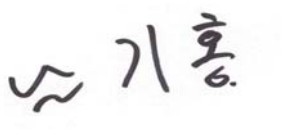
-. Test Result : PASSED BY –7.88 dB at 0.20 MHz with Peak Detector

| Frequency (MHz) | Line | Peak (dBuV) | | Margin (dB) |
|---|---|---|---|---|
| | | Emission level | Q.P Limits | |
| 0.20 | H | 55.73 | 63.61 | -7.88 |
| 0.27 | H | 46.00 | 61.27 | -15.27 |
| 0.40 | H | 39.40 | 57.85 | -18.45 |
| 0.67 | H | 35.83 | 56.00 | -20.17 |
| 2.61 | N | 40.52 | 56.00 | -15.48 |
| 23.66 | N | 40.24 | 60.00 | -19.76 |
| **Frequency (MHz)** | **Line** | **Average (dBuV)** | | **Margin (dB)** |
| | | **Emission level** | **Limits** | |
| 0.20 | H | 41.59 | 53.61 | -12.02 |
| 0.27 | H | 33.32 | 51.27 | -17.95 |
| 0.40 | H | 30.88 | 47.85 | -16.97 |
| 2.61 | N | 28.97 | 46.00 | -17.03 |

Line Conducted Emissions Tabulated Data

Remark : “H”: Hot Line, “N”: Neutral line

See next page for an overview sweep performed with peak and average detector.



**Tested by: Ki-Hong, Nam / Test Engineer**



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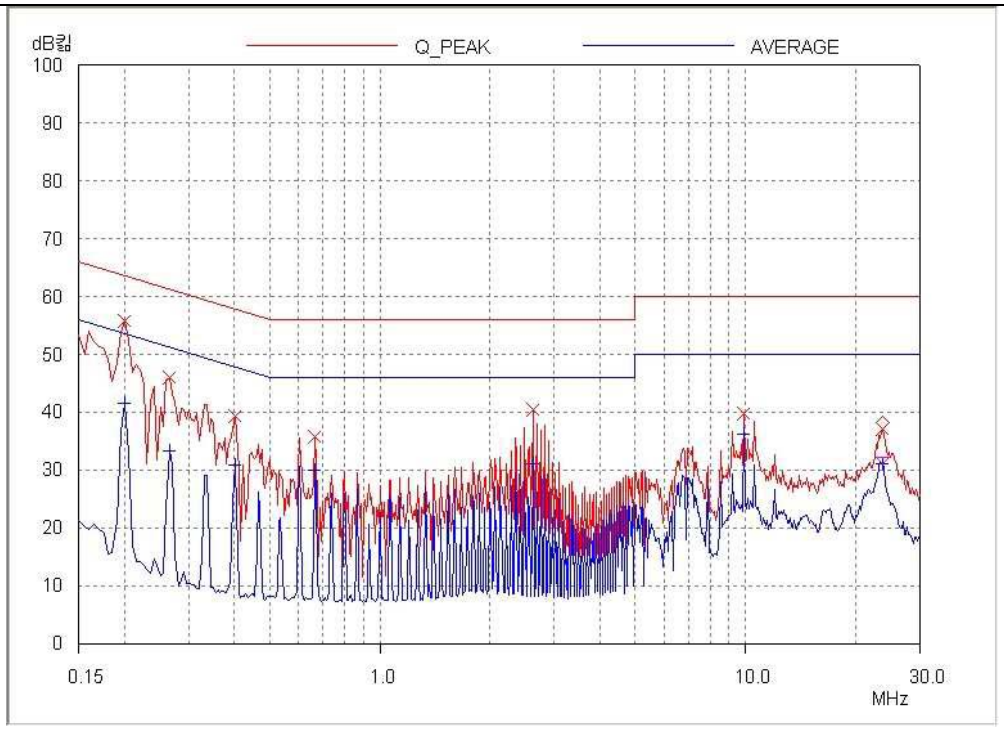
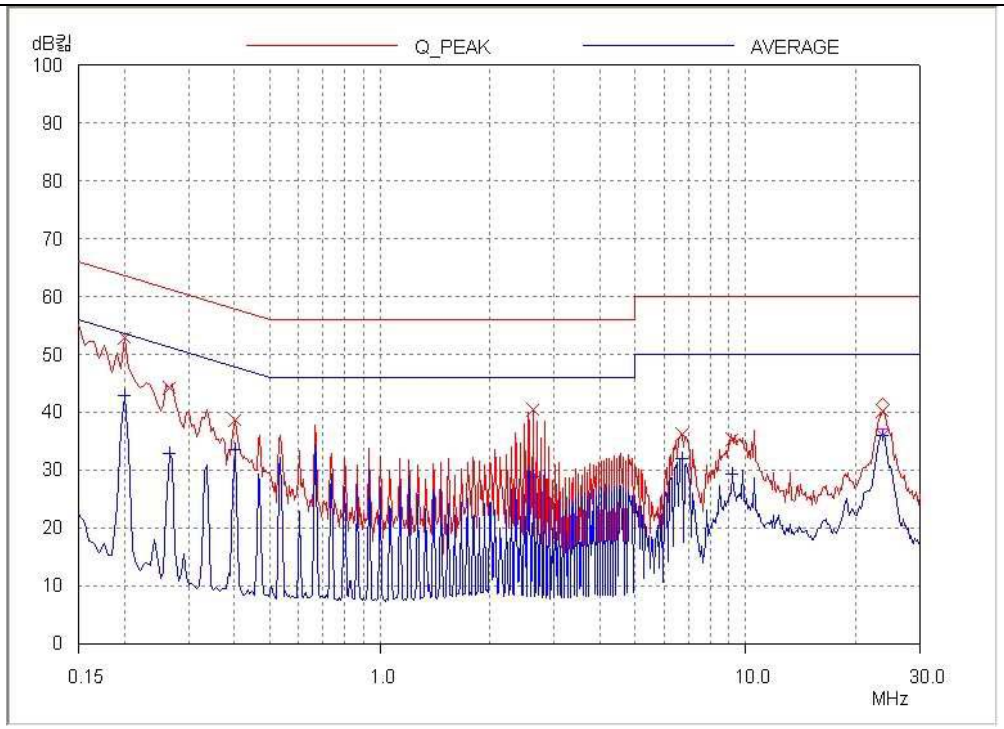
**EMC Testing Dept** : 307-51 Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyunggi-Do 464-860 Korea. (TEL: 82-31-765-8289 FAX: 82-31-766-2904)




HOT LINE




NEUTRAL LINE



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### 13.5.2Operating condition: Wireless LAN mode

-. Type of Test : FCC Class B

-. Test Date : May 06, 2004

-. Resolution bandwidth : 9 kHz

-. Frequency range : 0.15MHz ~ 30MHz

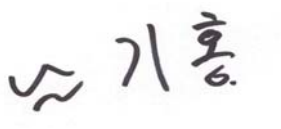
-. Test Result : PASSED BY –4.96 dB at 0.20 MHz with Peak Detector

| Frequency (MHz) | Line | Peak (dBuV) | | Margin (dB) |
|---|---|---|---|---|
| | | Emission level | Q.P Limits | |
| 0.20 | N | 58.65 | 63.61 | -4.96 |
| 0.27 | N | 48.68 | 61.27 | -12.59 |
| 0.33 | N | 42.65 | 59.45 | -16.80 |
| 0.40 | H | 39.88 | 57.85 | -17.97 |
| 23.88 | H | 38.89 | 60.00 | -21.11 |
| 24.08 | N | 35.67 | 60.00 | -24.33 |
| **Frequency (MHz)** | **Line** | **Average (dBuV)** | | **Margin (dB)** |
| | | **Emission level** | **Limits** | |
| 0.20 | N | 44.74 | 53.61 | -8.87 |
| 0.27 | N | 33.39 | 51.27 | -17.88 |
| 0.33 | N | 30.83 | 49.45 | -18.62 |
| 0.40 | H | 27.23 | 47.85 | -20.62 |

Line Conducted Emissions Tabulated Data

Remark : “H”: Hot Line, “N”: Neutral line

See next page for an overview sweep performed with peak and average detector.



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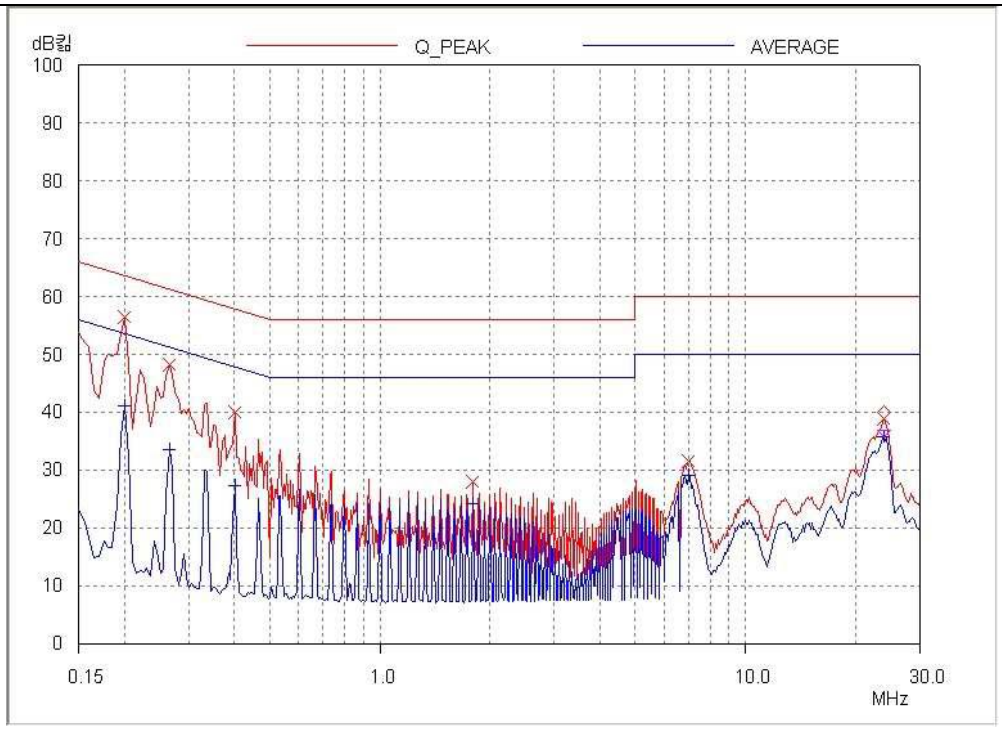
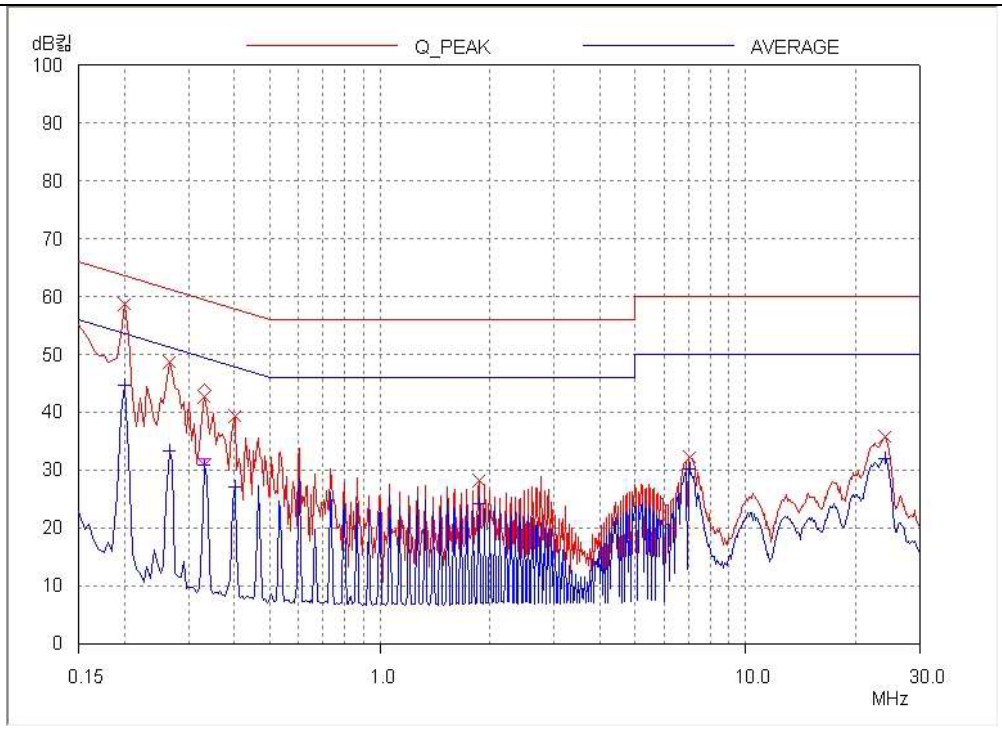



HOT LINE




NEUTRAL LINE



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