

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

Test Report No. : E086R-009

AGR No. : A082A-164

Applicant : UTAS Inc.  
Address : Maga Valley #626-1, 799, Kwangyang-dong, Dongan-ku, Anyang, Kyunggi-do, 431-767, Korea

Manufacturer : UTAS Inc.  
Address : Maga Valley #626-1, 799, Kwangyang-dong, Dongan-ku, Anyang, Kyunggi-do, 431-767, Korea

Type of Equipment : Touch Screen Remote Controller

FCC ID. : V7K-IDC3500UT

Model Name : UX3500

Multiple Model Name : WZB35

Serial number : N/A

Total page of Report : 34 pages (including this page)

Date of Incoming : April 10, 2008

Date of issue : June 04, 2008


## 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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ONETECH Corp.

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## 1. VERIFICATION OF COMPLIANCE

APPLICANT : UTAS Inc.  
ADDRESS : Maga Valley #626-1, 799, Kwangyang-dong, Dongan-ku, Anyang, Kyunggi-do, 431-767, Korea  
CONTACT PERSON : Mr. Sun-Tae, Kim / Engineer  
TELEPHONE NO : +82-31-420-8839  
FCC ID : V7K-IDC3500UT  
MODEL NAME : UX3500  
BRAND NAME : UTAS/UTAS, WZB/VITY  
SERIAL NUMBER : N/A  
DATE : June 04, 2008

|   |  |
|---|--|
| EQUIPMENT CLASS   | <b><i>DTS – DIGITAL TRNSMISSION SYSTEM</i></b> |
| KIND OF EQUIPMENT                                       | Touch Screen Remote Controller                 |
| THIS REPORT CONCERNS                                    | ORIGINAL GRANT                                 |
| MEASUREMENT PROCEDURES                                  | ANSI C63.4: 2003                               |
| TYPE OF EQUIPMENT TESTED                                | PRE-PRODUCTION                                 |
| KIND OF EQUIPMENT<br>AUTHORIZATION REQUESTED            | CERTIFICATION                                  |
| EQUIPMENT WILL BE OPERATED<br>UNDER FCC RULES PART(S)   | FCC PART 15 SUBPART C Section 15.247           |
| MODIFICATIONS ON THE EQUIPMENT<br>TO ACHIEVE COMPLIANCE | None   |
| 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.

## 2. TEST SUMMARY

### 2.1 Test items and results

| SECTION           | TEST ITEMS  | RESULTS                |
|-------------------|---|------------------------|
| 15.247 (a) (2)    | Minimum 6 dB Bandwidth                              | Met the Limit / PASS   |
| 15.247 (b) (3)    | Maximum Peak Conducted 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                            | 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: 2003 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 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-862, Korea. Description details of test facilities were submitted to the Federal Communications Commission on August 31, 2005 (Registration Number: 92819 and 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.

### 3. GENERAL INFORMATION

#### 3.1 Product Description

The UTAS Inc., Model UX3500 (referred to as the EUT in this report) is a Touch Screen Remote Controller which has a function of data uploading/downloading and transmitter modes. This report is for transmitter function. And the report for the Peripheral Device for Class B Computing Device will be issued by other report. The product specification described herein was obtained from product data sheet or user's manual.

|  |  |
|--|--|
| DEVICE TYPE  | Touch Screen Remote Controller                   |
| OPERATING FREQUENCY                                  | 2 405 ~ 2 480 MHz                                |
| TEMPERATURE RANGE                                    | Operating: (-20 ~ 55) °C, Storage: (-40 ~ 70) °C |
| RATED RF OUTPUT POWER                                | 2.50 dBm   |
| NUMBER OF CHANNEL                                    | 16 Channels                                      |
| MAX. DATA TRANSFER RATE                              | 250 kbps   |
| MODULATION TYPE                                      | O-QPSK   |
| ANTENNA  | MFR.: AMOTECH, Model No.: ALA931C4               |
| ANTENNA CONNECTOR TYPE                               | Multilayer Chip Antenna                          |
| ANTENNA GAIN   | 0 dBi  |
| LIST OF EACH OSC. OR CRYSTAL.<br>FREQ.(FREQ.>=1 MHz) | 12 MHz and 8 MHz                                 |
| NUMBER OF LAYER                                      | 6 Layers: Main Board, 2 Layers: RF Board         |
| ELECTRICAL RATING                                    | DC 9 V, 2.0 A from an AC/DC Adaptor              |
| USED AC/DC ADAPTOR                                   | Mfr.: AULT Korea, Model Name: PW118              |

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

-. The following lists consist of the added model and their differences.

|                | Model Name | Model Differences   |
|----------------|------------|---|
| Basic Model    | UX3500     | -   |
| Multiple Model | WZB35      | The skill print logo at front decoration panel is the difference. |

### 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      | UTAS Inc.    | Caviar RF Ver03   | N/A    |
| LCD Panel       | N/A          | IM350DBN1A        | N/A    |
| RF Module Board | N/A          | N/A               | N/A    |

### 5.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested: None

### 5.3 Mode of operation during the test

For the testing, software used to control the EUT for staying in continuous transmitting and receiving mode is programmed. For final testing, the EUT was set at Low Channel (2 405 MHz), Middle Channel (2 440 MHz), and High Channel (2 480 MHz) data rate. To get a maximum emission levels from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes.

### 5.4 Configuration of Test System

**Line Conducted Test:** The EUT was connected to adaptor and the power line 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.

## 5.5 Antenna Requirement

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 antenna of the EUT is a chip antenna on the main board in 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 (Please check one only) |
|----------------|---|
| 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) |
|----------------|---|
| TX mode        | X   |



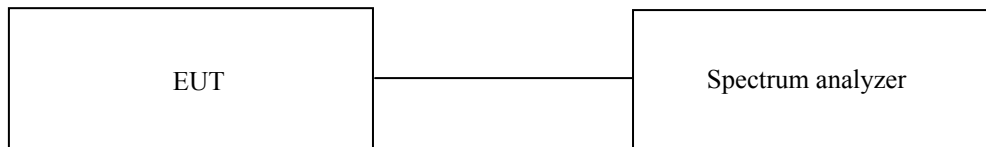
## 7. MINIMUM 6 dB BANDWIDTH

### 7.1 Operating environment

Temperature : 19 °C  
Relative humidity : 40 %R.H.

### 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 6 dB 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    | June 19, 2007 |

All test equipment used is calibrated on a regular basis.

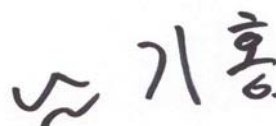
#### 7.4 Test data

-. Test Date : April 23, 2008

-. Test Result : Pass

| CHANNEL | FREQUENCY(MHz) | MEASURED VLAUE (kHz) | LIMIT (kHz) | MARGIN (kHz) |
|---------|----------------|----------------------|-------------|--------------|
| Low     | 2 405          | 1 600                | 500         | -1 100       |
| Middle  | 2 440          | 1 625                | 500         | -1 125       |
| High    | 2 480          | 1 617                | 500         | -1 117       |

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



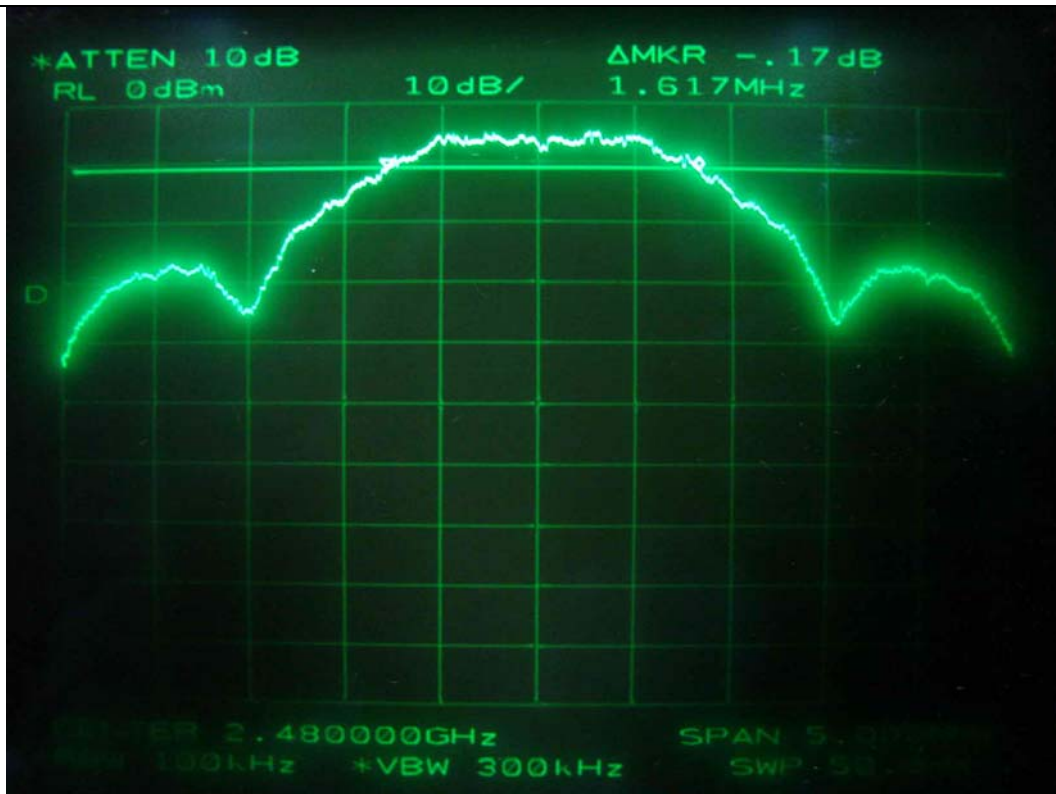
Tested by: Ki-Hong, Nam / Project Engineer



Low Channel



Middle Channel



High Channel

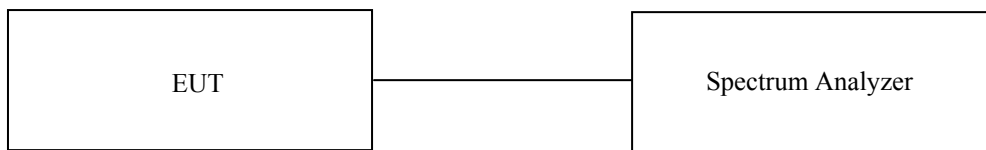
## 8. MAXIMUM PEAK OUTPUT POWER

### 8.1 Operating environment

Temperature : 19 °C  
Relative humidity : 40 %R.H.

### 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    | June 19, 2007 |

All test equipment used is calibrated on a regular basis.

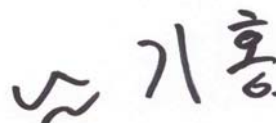
#### 8.4 Test data

- Test Date : April 23, 2008

- Test Result : Pass

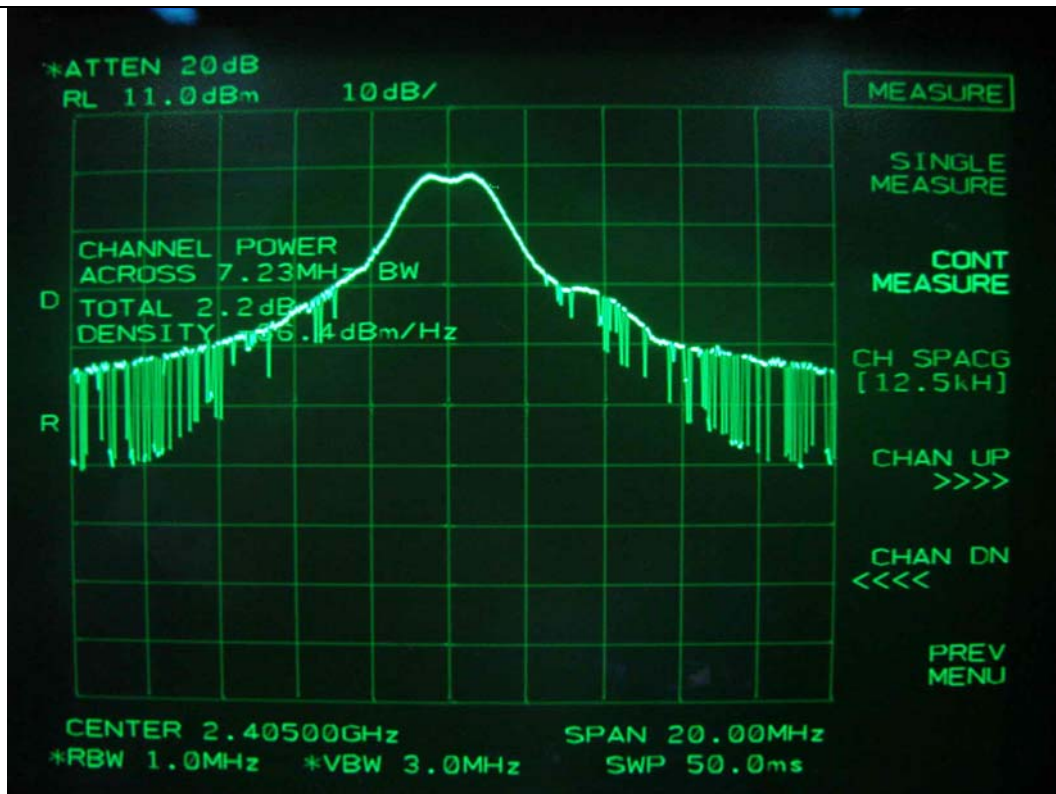
| CHANNEL | FREQUENCY<br>(MHz) | 99% Occupied<br>Bandwidth (MHz) | MEASURED<br>VLAUE (dBm) | LIMIT<br>(dBm) | MARGIN<br>(dB) |
|---------|--------------------|---------------------------------|-------------------------|----------------|----------------|
| Low     | 2 405              | 7.23                            | 2.20                    | 30.0           | -27.80         |
| Middle  | 2 440              | 7.23                            | 2.50                    | 30.0           | -27.50         |
| High    | 2 480              | 7.23                            | 2.20                    | 30.0           | -27.80         |

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

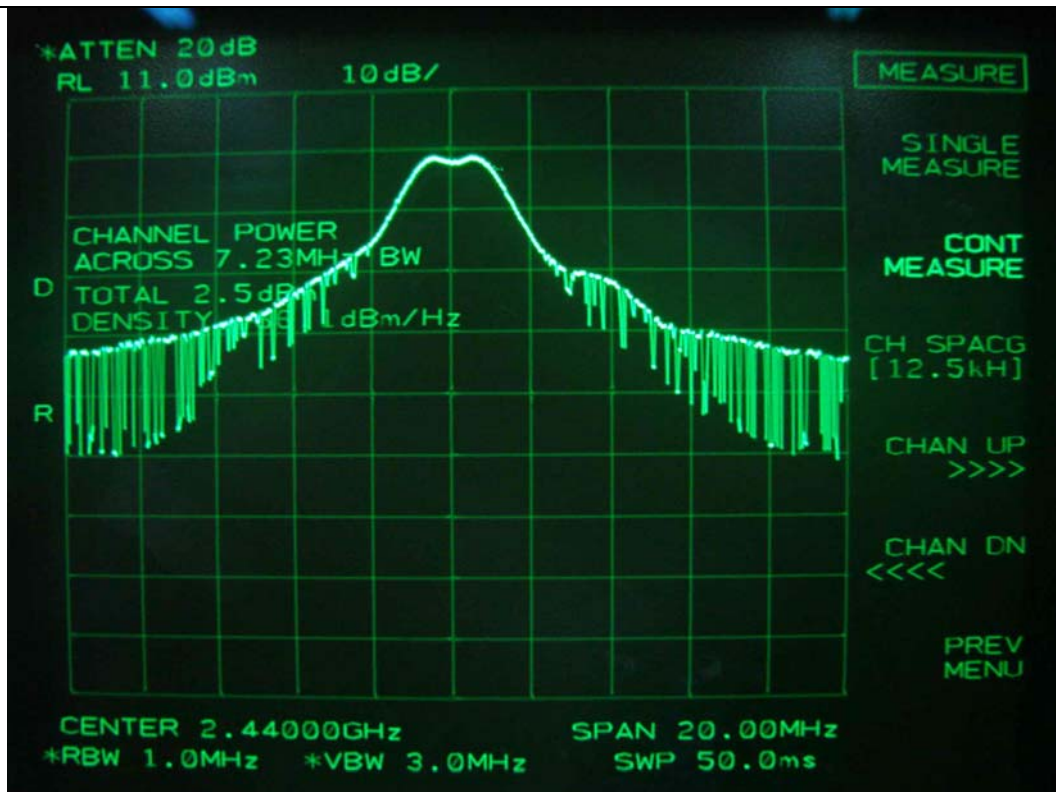


Tested by: Ki-Hong, Nam / Project Engineer

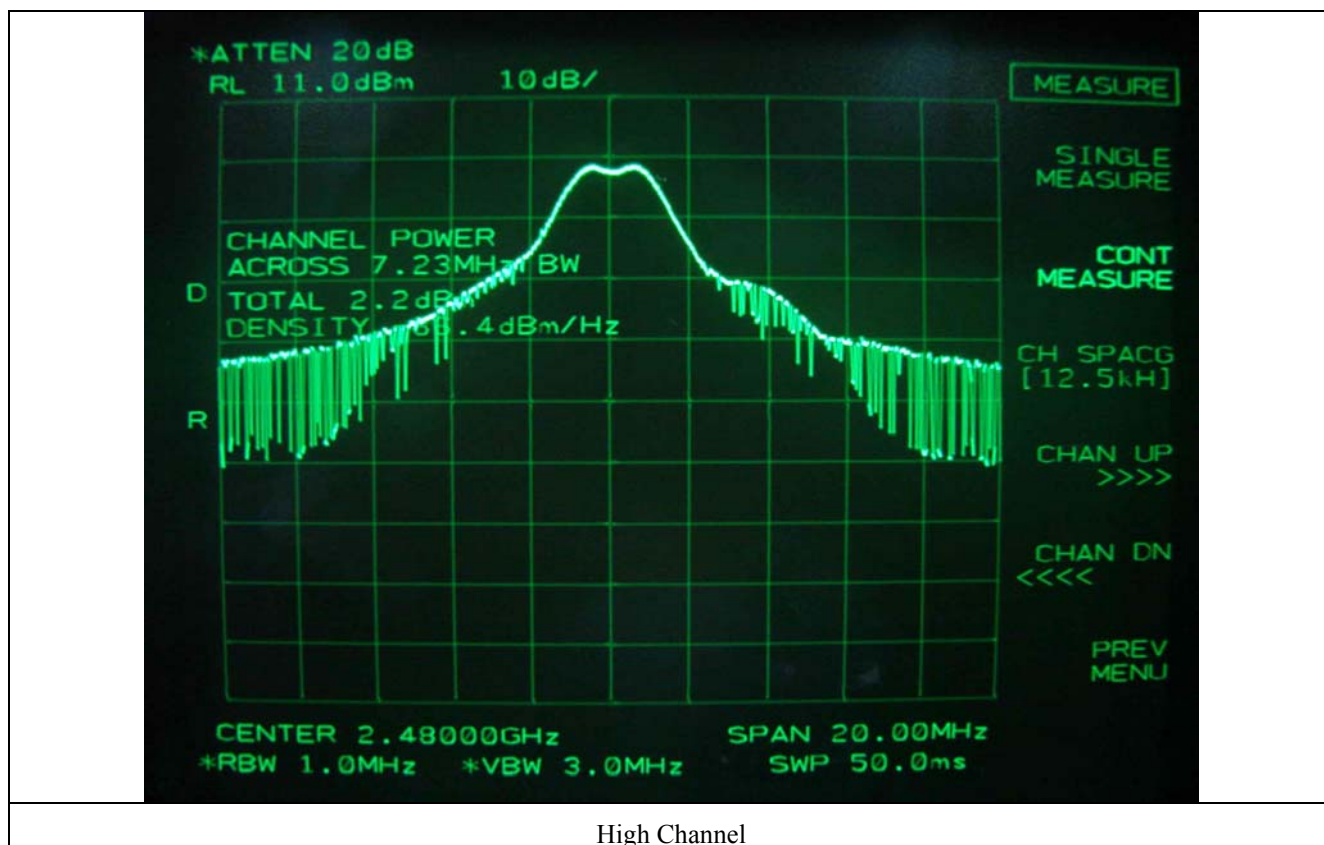




Low Channel



Middle Channel





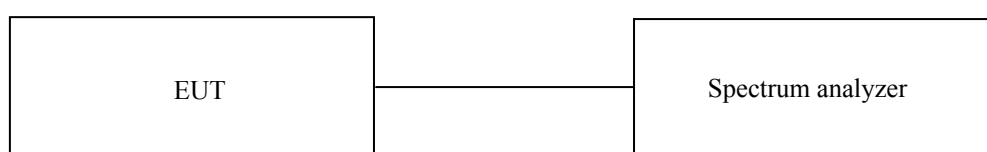
## 9. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

### 9.1 Operating environment

Temperature : 19 °C  
Relative humidity : 40 %R.H.

### 9.2 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.



### 9.3 Test set-up for radiated measurement

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

The frequency spectrum from 30 MHz to 25 GHz 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 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

### 9.4 Test equipment used

| Model Number     | Manufacturer    | Description            | Serial Number | Last Cal.         |
|------------------|-----------------|------------------------|---------------|-------------------|
| ■ - 8564E        | Hewlett-Packard | Spectrum Analyzer      | 3650A00756    | June 19, 2007     |
| ■ - 8447D        | Hewlett-Packard | Amplifier              | 2727A04987    | June 19, 2007     |
| □ - 83051A       | Agilent         | Preamplifier           | 3950M00201    | June 20, 2007     |
| ■ - F-40-5000-RF | RLC Electronics | Highpass Filter        | 0425          | July 15, 2007     |
| ■ - MA220        | HD              | Turn Table             | N/A           | N/A               |
| ■ - HD240        | HD              | Antenna Mast           | N/A           | N/A               |
| ■ - BBHA9120D    | Schwarzbeck     | Horn Antenna           | BBHA9120D294  | July 03, 2006(2Y) |
| ■ - 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.

### 9.5. Test data for conducted emission



Low Channel



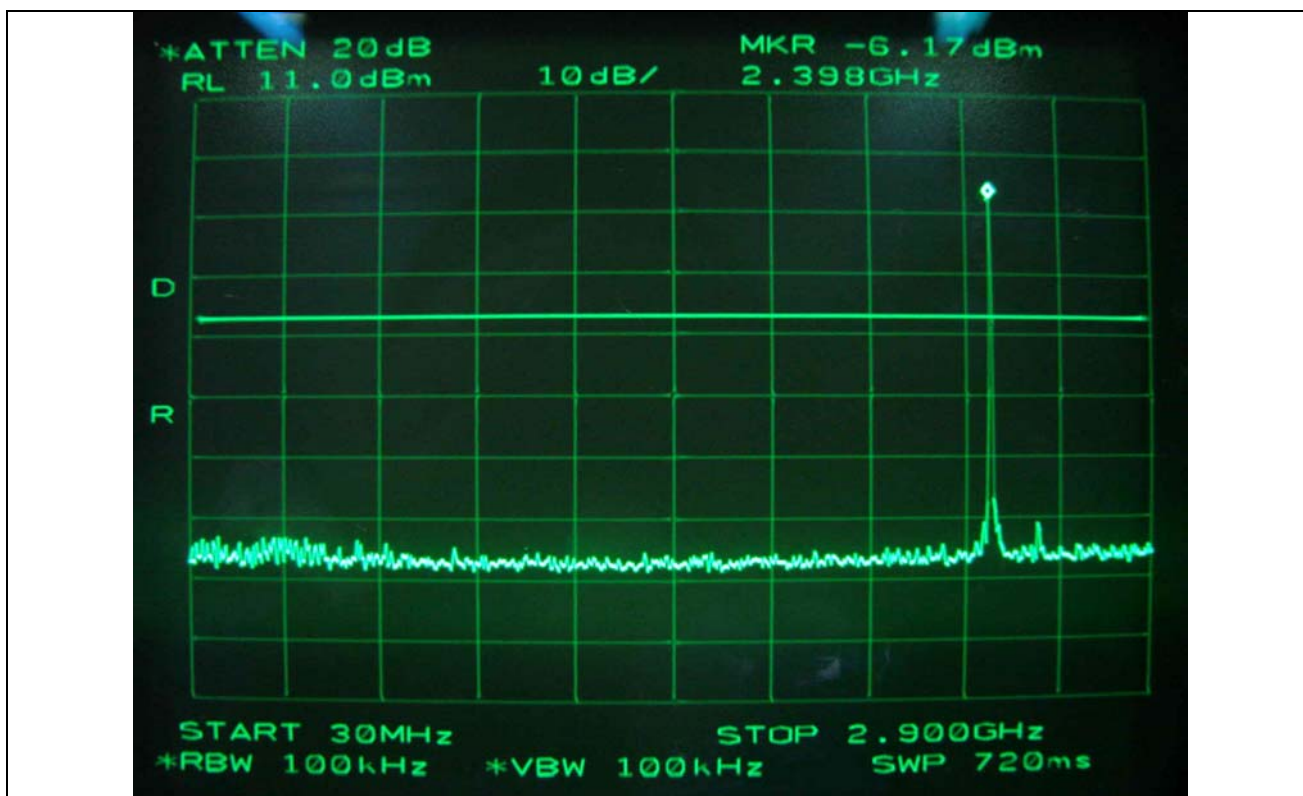
High Channel

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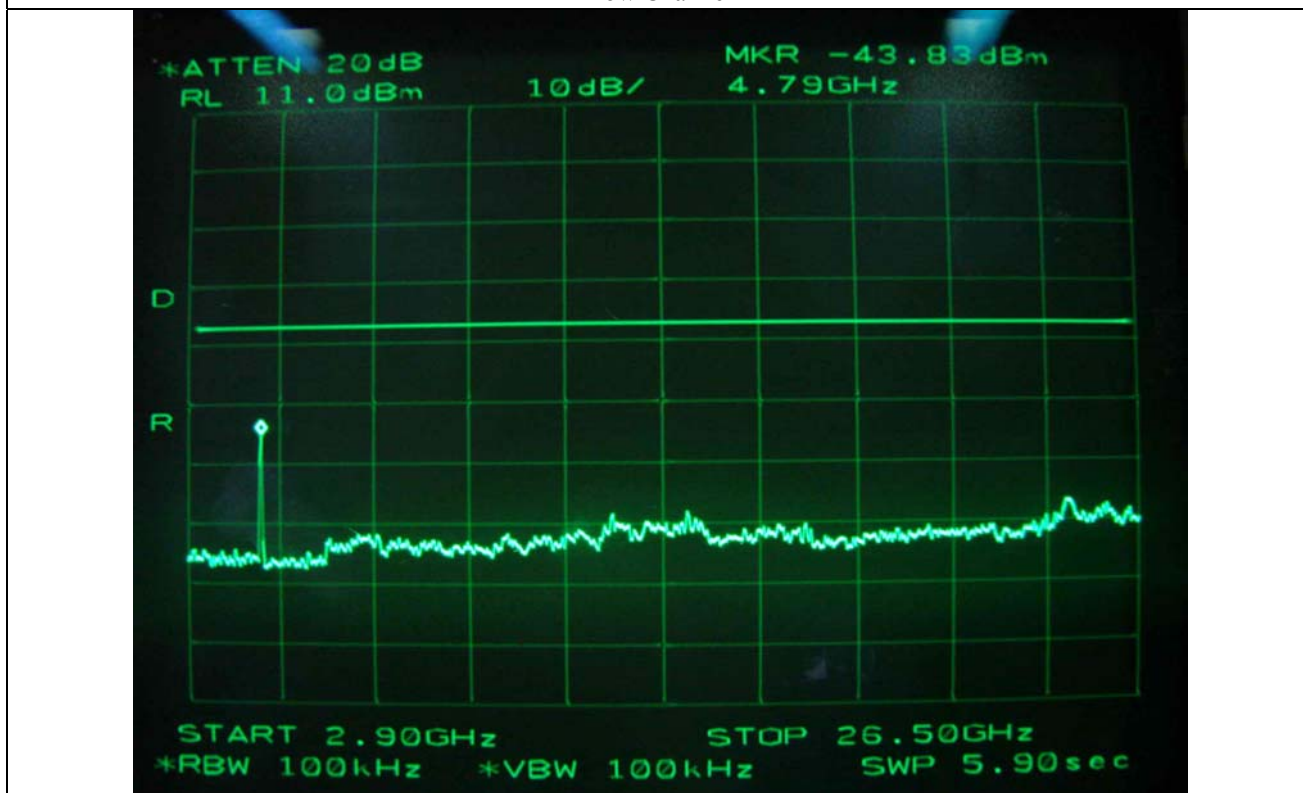
EMC-003 (Rev.1)

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(TEL: +82-31-746-8500, FAX: +82-31-746-8700)

**EMC Testing Dept** : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-862, Korea. (TEL: +82-31-765-8289, FAX: +82-31-766-2904)

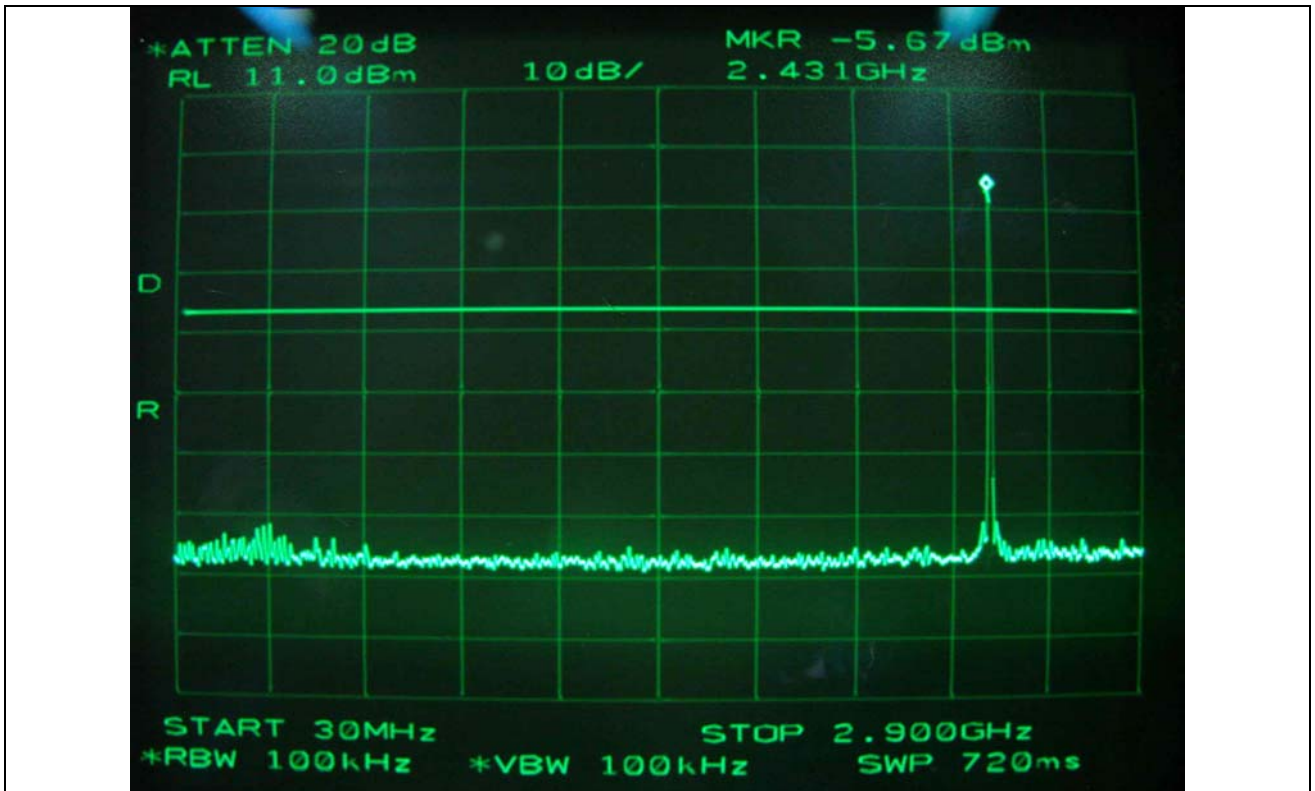


Low Channel

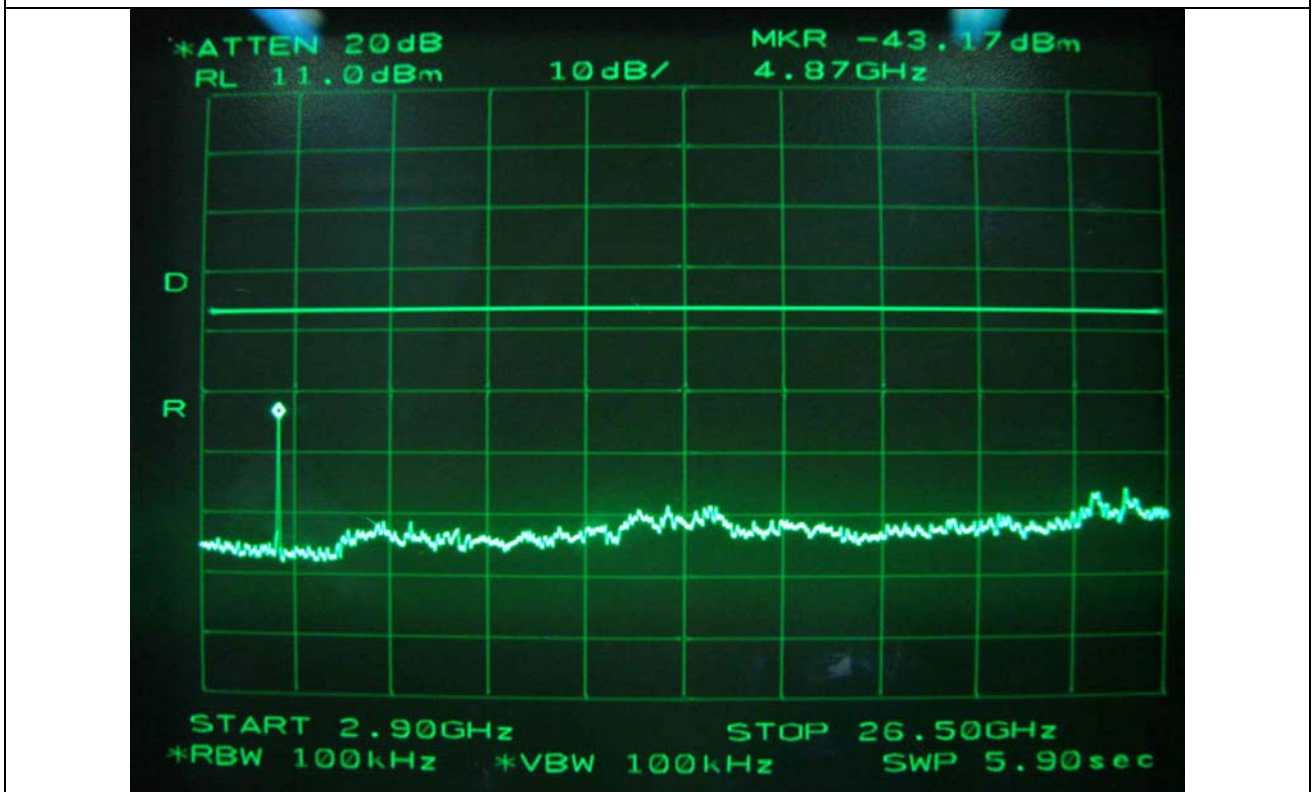


Low Channel

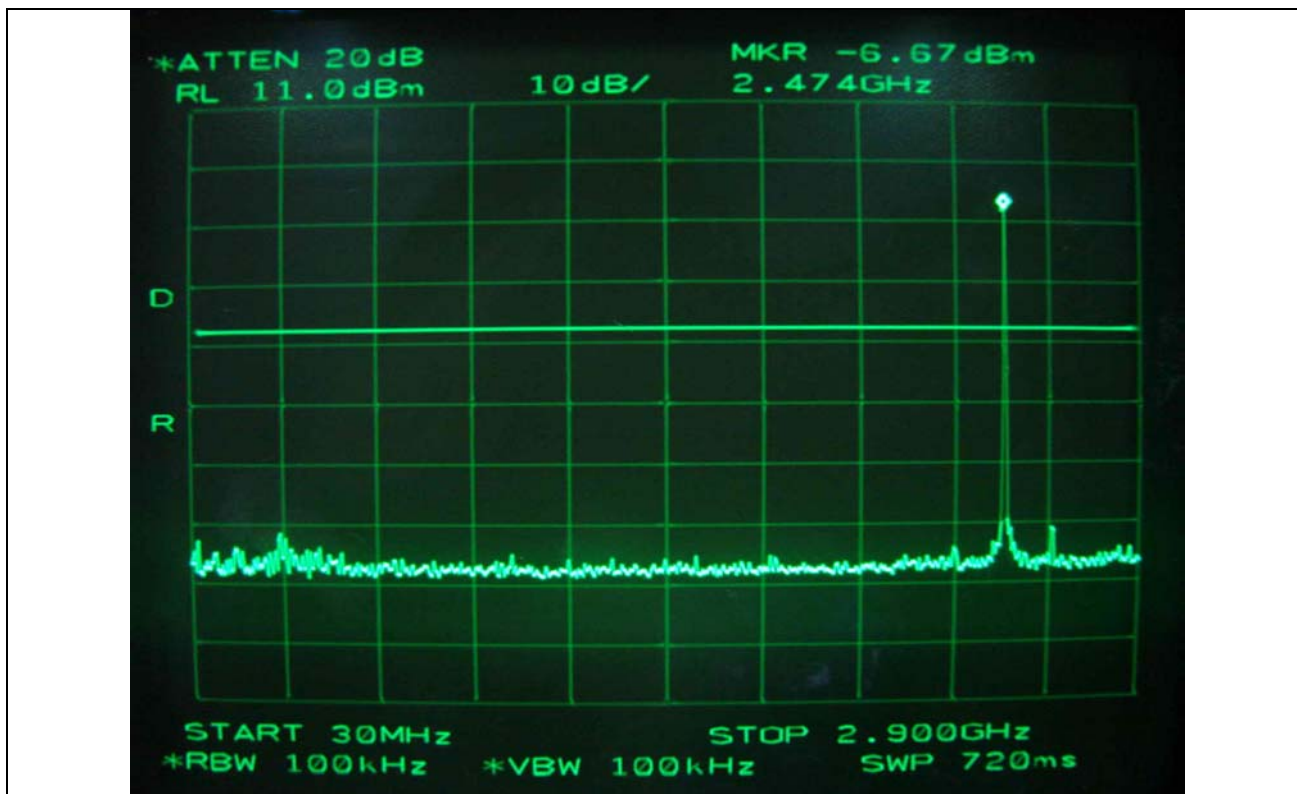




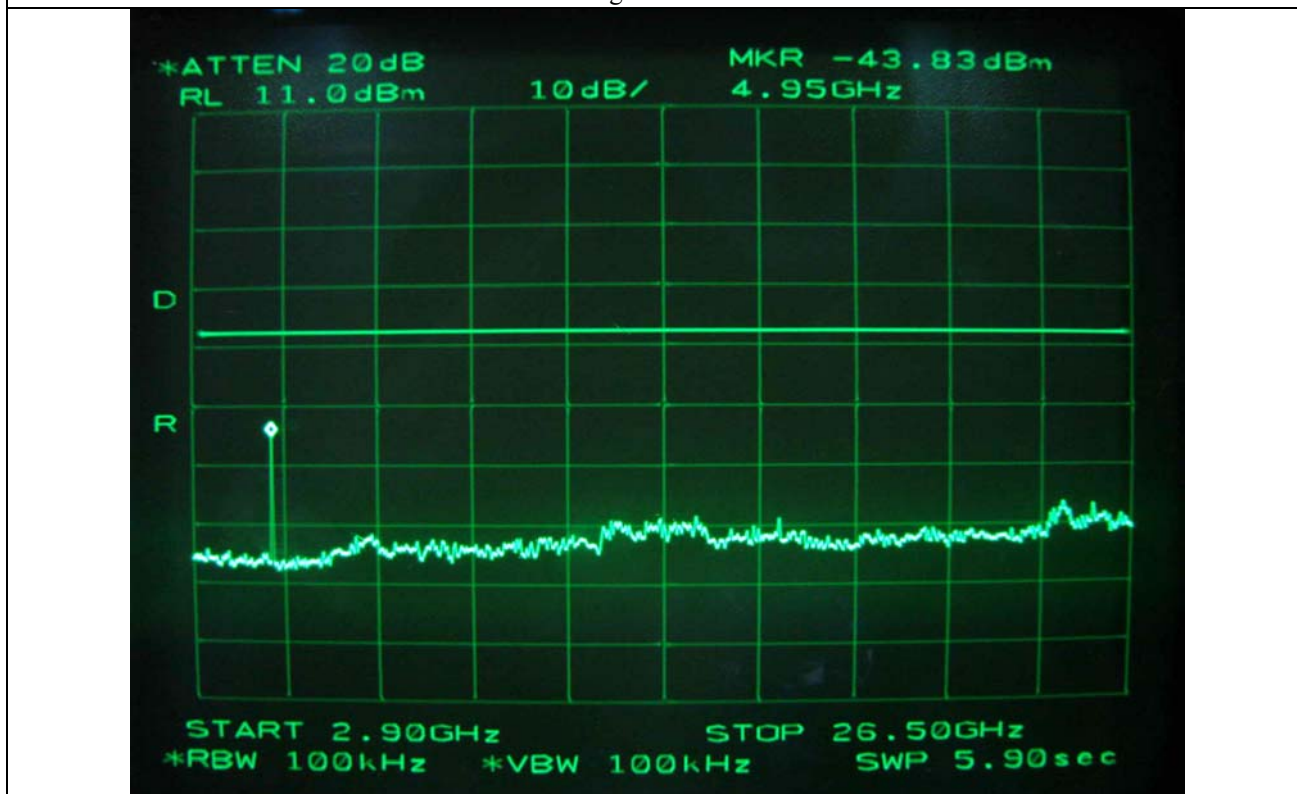
Middle Channel



Middle Channel



High Channel



High Channel

## 9.6. Test data for radiated emission

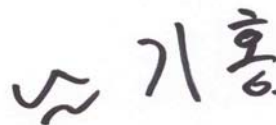
### 9.6.1 Radiated Emission which fall in the Restricted Band

- Test Date : April 25, 2008
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 25 GHz
- Measurement distance : 3 m
- Operating Condition : Low / High Channel
- Result : PASSED BY -23.34 dB at Low Channel

| Frequency<br>(MHz)         | Reading<br>(dBμV) | Detector<br>Mode | Ant. Pol.<br>(H/V) | Ant.<br>Factor | Cable<br>Loss | Amp<br>Gain | Dist.<br>Factor | Total<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) |
|----------------------------|-------------------|------------------|--------------------|----------------|---------------|-------------|-----------------|-------------------|--------------------|----------------|
| Test Data for Low Channel  |                   |                  |                    |                |               |             |                 |                   |                    |                |
| 2 390.00                   | 37.33             | Peak             | H                  | 27.26          | 3.83          | 26.10       |                 | 42.32             | 74.00              | -31.68         |
|                            | 25.50             | Average          | H                  |                |               |             |                 | 30.49             | 54.00              | -23.51         |
|                            | 37.50             | Peak             | V                  |                |               |             |                 | 42.49             | 74.00              | -31.51         |
|                            | 25.67             | Average          | V                  |                |               |             |                 | 30.66             | 54.00              | -23.34         |
| Test Data for High Channel |                   |                  |                    |                |               |             |                 |                   |                    |                |
| 2 483.50                   | 37.83             | Peak             | H                  | 27.55          | 3.83          | 26.10       |                 | 43.11             | 74.00              | -30.90         |
|                            | 25.33             | Average          | H                  |                |               |             |                 | 30.61             | 54.00              | -23.40         |
|                            | 37.67             | Peak             | V                  |                |               |             |                 | 42.95             | 74.00              | -31.06         |
|                            | 25.17             | Average          | V                  |                |               |             |                 | 30.45             | 54.00              | -23.56         |

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical



Tested by: Ki-Hong, Nam / Project Engineer

### 9.6.2 Spurious & Harmonic Radiated Emission

- Test Date : April 25, 2008
- 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, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 25 GHz
- Measurement distance : 3 m
- Result : PASSED BY -15.92 dB at High Channel

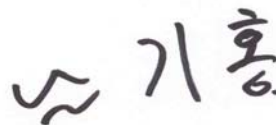
| Frequency<br>(MHz)           | Reading<br>(dBμV) | Detector<br>Mode | Ant. Pol.<br>(H/V) | Ant.<br>Factor | Cable<br>Loss | Amp<br>Gain | Dist.<br>Factor | Total<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) |
|------------------------------|-------------------|------------------|--------------------|----------------|---------------|-------------|-----------------|-------------------|--------------------|----------------|
| Test Data for Low Channel    |                   |                  |                    |                |               |             |                 |                   |                    |                |
| 2 405.00                     | 55.10             | Peak             | H                  | 27.30          | 3.83          |             |                 | 86.23             | -                  |                |
|                              | 54.17             | Peak             | V                  |                |               |             |                 | 85.30             | -                  |                |
| 4 810.00                     | 38.17             | Peak             | H                  | 31.60          | 6.54          | 26.10       |                 | 50.21             | 74.00              | -23.79         |
|                              | 25.83             | Average          | H                  |                |               |             |                 | 37.87             | 54.00              | -16.13         |
|                              | 38.00             | Peak             | V                  |                |               |             |                 | 50.04             | 74.00              | -23.96         |
|                              | 25.50             | Average          | V                  |                |               |             |                 | 37.54             | 54.00              | -16.46         |
| Test Data for Middle Channel |                   |                  |                    |                |               |             |                 |                   |                    |                |
| 2 440.00                     | 57.00             | Peak             | H                  | 27.42          | 3.83          |             |                 | 88.25             | -                  |                |
|                              | 55.33             | Peak             | V                  |                |               |             |                 | 86.58             | -                  |                |
| 4 880.00                     | 38.67             | Peak             | H                  | 31.74          | 6.59          | 26.10       |                 | 50.90             | 74.00              | -23.10         |
|                              | 25.83             | Average          | H                  |                |               |             |                 | 38.06             | 54.00              | -15.94         |
|                              | 38.50             | Peak             | V                  |                |               |             |                 | 50.73             | 74.00              | -23.27         |
|                              | 25.67             | Average          | V                  |                |               |             |                 | 37.90             | 54.00              | -16.10         |

Tabulated test data for Restricted Band

| Frequency<br>(MHz)                | Reading<br>(dB $\mu$ V) | Detector<br>Mode | Ant. Pol.<br>(H/V) | Ant.<br>Factor | Cable<br>Loss | Amp<br>Gain | Dist.<br>Factor | Total<br>(dB $\mu$ V/m) | Limits<br>(dB $\mu$ V/m) | Margin<br>(dB) |
|-----------------------------------|-------------------------|------------------|--------------------|----------------|---------------|-------------|-----------------|-------------------------|--------------------------|----------------|
| <b>Test Data for High Channel</b> |                         |                  |                    |                |               |             |                 |                         |                          |                |
| 2 480.00                          | 58.00                   | Peak             | H                  | 27.53          | 3.83          |             |                 | 89.36                   | -                        |                |
|                                   | 57.50                   | Peak             | V                  |                |               |             |                 | 88.86                   | -                        |                |
| 4 960.00                          | 38.33                   | Peak             | H                  | 31.87          | 6.64          | 26.10       |                 | 50.74                   | 74.00                    | -23.26         |
|                                   | 25.67                   | Average          | H                  |                |               |             |                 | 38.08                   | 54.00                    | -15.92         |
|                                   | 38.67                   | Peak             | V                  |                |               |             |                 | 51.08                   | 74.00                    | -22.92         |
|                                   | 25.33                   | Average          | V                  |                |               |             |                 | 37.74                   | 54.00                    | -16.26         |

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical



Tested by: Ki-Hong, Nam / Project Engineer



## 10. PEAK POWER SPECTRUL DENSITY

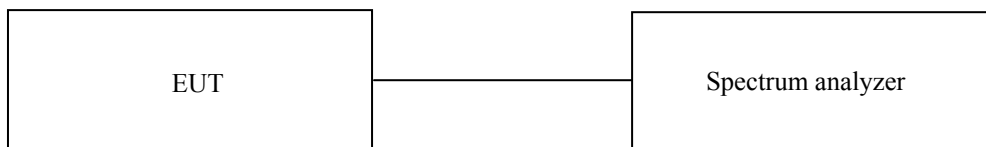
### 10.1 Operating environment

Temperature : 19 °C  
Relative humidity : 40 %R.H.

### 10.2 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.



### 10.3 Test equipment used

|     | Model Number | Manufacturer | Description       | Serial Number | Last Cal.     |
|-----|--------------|--------------|-------------------|---------------|---------------|
| ■ - | 8564E        | HP           | Spectrum Analyzer | 3650A00756    | June 19, 2007 |

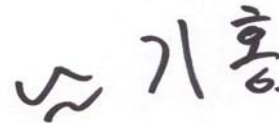
All test equipment used is calibrated on a regular basis.

#### 10.4 Test data

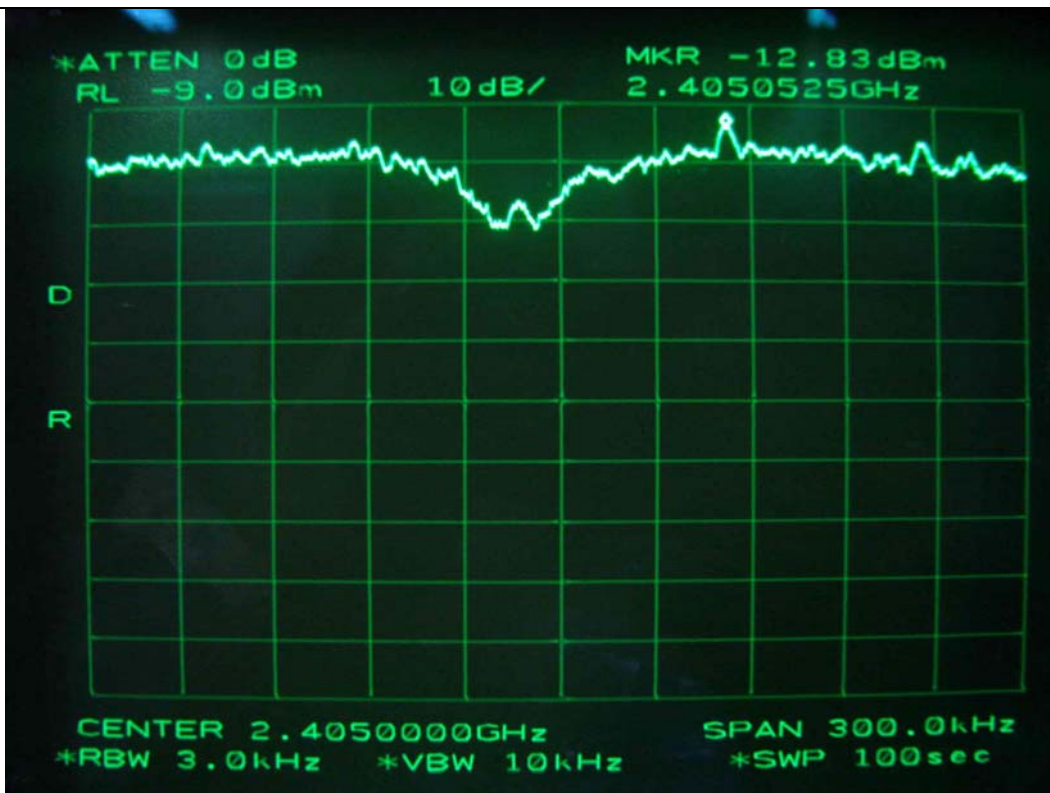
- Test Date : April 23, 2008  
- Test Result : Pass

| CHANNEL | FREQUENCY(MHz) | MEASURED VLAUE (dBm) | LIMIT (dBm) | MARGIN (dB) |
|---------|----------------|----------------------|-------------|-------------|
| Low     | 2 405          | -12.83               | 8.00        | -20.83      |
| Middle  | 2 440          | -14.50               | 8.00        | -22.50      |
| High    | 2 480          | -13.83               | 8.00        | -21.83      |

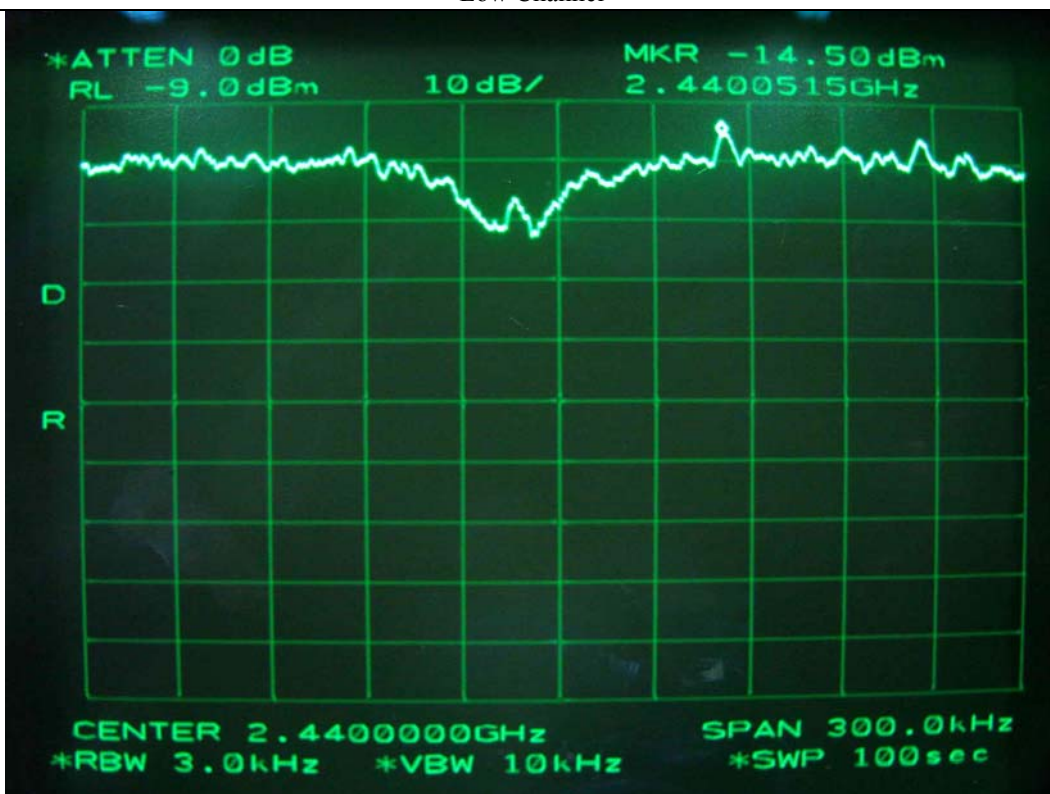
Remark: See next page for measurement data.



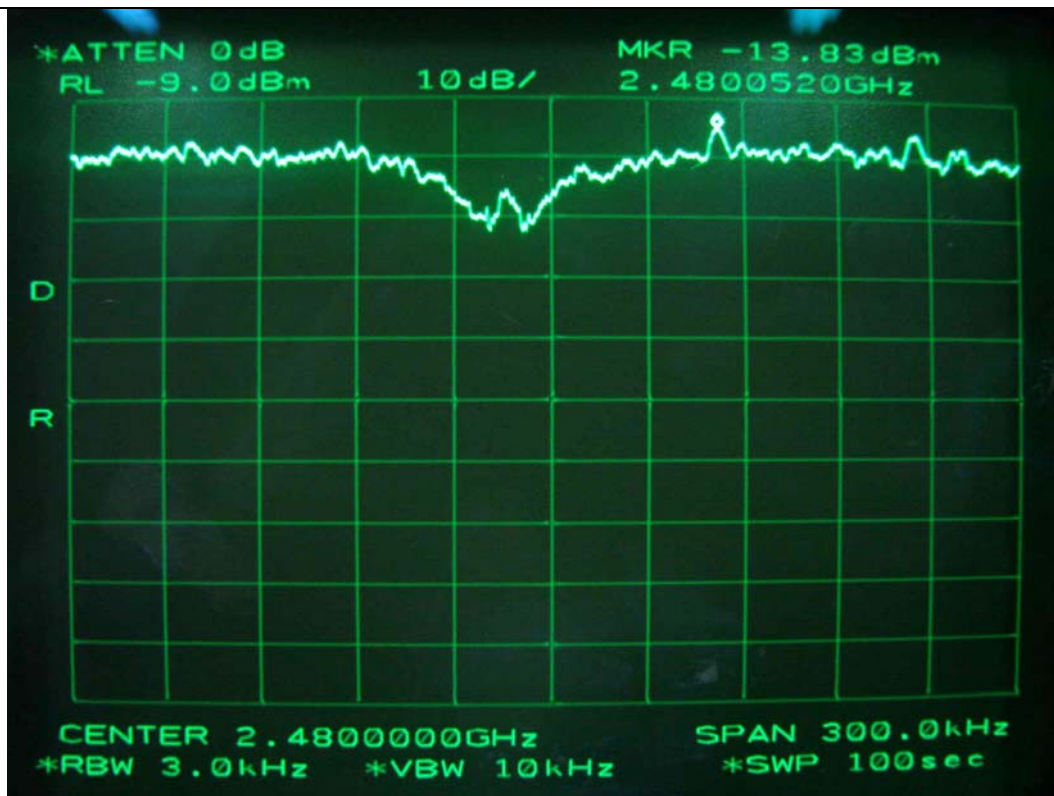
Tested by: Ki-Hong, Nam / Project Engineer



Low Channel



Middle Channel



High Channel

## 11. RADIATED EMISSION TEST FOR DIGITAL DEVICE PART

### 11.1 Operating environment

Temperature : 23 °C  
Relative humidity : 42 %R.H.

### 11.2 Test set-up

The radiated emissions measurements were on the 3 m, 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 30 MHz to 1 000 MHz 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 m in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

### 11.3 Test equipment used

| Model Number | Manufacturer    | Description          | Serial Number | Last Cal.     |
|--------------|-----------------|----------------------|---------------|---------------|
| ■ - ESVS10   | Rohde & Schwarz | EMI Test Receiver    | 827864/005    | Dec. 21, 2007 |
| ■ - 8566B    | HP              | Spectrum Analyzer    | 3407A08547    | June 20, 2007 |
| ■ - 8447D    | Hewlett Packard | Amplifier            | 2727A04987    | June 19, 2007 |
| ■ - 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           |
| ■ - 3110     | EMCO            | Biconical Antenna    | 9003-1121     | Jan. 18, 2008 |
| ■ - 3146     | EMCO            | Log Periodic Antenna | 9001-2614     | Jan. 18, 2008 |

All test equipment used is calibrated on a regular basis.

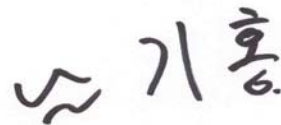
#### 11.4 Test data

- Test Date : August 30, 2007
- Resolution bandwidth : 120 kHz
- Frequency range : 30 MHz ~ 1 000 MHz
- Measurement distance : 3 m
- Test result : Passed by -7.44 dB at 158.88 MHz (Middle Channel)

| Frequency<br>(MHz)    | Reading<br>(dBuV) | Ant. Pol.<br>(H/V) | Ant. Factor<br>(dB/m) | Cable<br>Loss | Emission<br>Level(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) |
|-----------------------|-------------------|--------------------|-----------------------|---------------|---------------------------|--------------------|----------------|
| <b>Low Channel</b>    |                   |                    |                       |               |                           |                    |                |
| 108.00                | 18.80             | V                  | 11.47                 | 2.20          | 32.47                     | 43.52              | -11.05         |
| 118.40                | 19.50             | H                  | 12.81                 | 2.12          | 34.43                     | 43.52              | -9.09          |
| 124.97                | 15.00             | H                  | 13.41                 | 2.30          | 30.71                     | 43.52              | -12.81         |
| 158.88                | 18.30             | H                  | 15.15                 | 2.43          | 35.88                     | 43.52              | -7.64          |
| 293.58                | 15.00             | H                  | 19.11                 | 3.25          | 37.36                     | 46.02              | -8.66          |
| 394.36                | 18.83             | H                  | 14.39                 | 4.04          | 37.26                     | 46.02              | -8.76          |
| <b>Middle Channel</b> |                   |                    |                       |               |                           |                    |                |
| 108.00                | 18.50             | V                  | 11.47                 | 2.20          | 32.17                     | 43.52              | -11.35         |
| 118.40                | 19.67             | H                  | 12.81                 | 2.12          | 34.60                     | 43.52              | -8.92          |
| 124.97                | 15.33             | H                  | 13.41                 | 2.30          | 31.04                     | 43.52              | -12.48         |
| 158.88                | 18.50             | H                  | 15.15                 | 2.43          | 36.08                     | 43.52              | -7.44          |
| 293.58                | 14.00             | H                  | 19.11                 | 3.25          | 36.36                     | 46.02              | -9.66          |
| 394.36                | 18.00             | H                  | 14.39                 | 4.04          | 36.43                     | 46.02              | -9.59          |
| <b>High Channel</b>   |                   |                    |                       |               |                           |                    |                |
| 108.00                | 18.50             | V                  | 11.47                 | 2.20          | 32.17                     | 43.52              | -11.35         |
| 118.40                | 19.50             | H                  | 12.81                 | 2.12          | 34.43                     | 43.52              | -9.09          |
| 124.97                | 15.33             | H                  | 13.41                 | 2.30          | 31.04                     | 43.52              | -12.48         |
| 158.88                | 18.50             | H                  | 15.15                 | 2.43          | 36.08                     | 43.52              | -7.44          |
| 293.58                | 15.33             | H                  | 19.11                 | 3.25          | 37.69                     | 46.02              | -8.33          |
| 394.36                | 18.50             | H                  | 14.39                 | 4.04          | 36.93                     | 46.02              | -9.09          |

Tabulated test data for Radiated Electromagnetic Field

Remark: "H": Horizontal, "V": Vertical



Tested by: Ki-Hong, Nam / Project Engineer

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EMC-003 (Rev.1)

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## 12. CONDUCTED EMISSION TEST

### 12.1 Operating environment

Temperature : 24 °C  
Relative humidity : 42 %R.H.

### 12.2 Test set-up

The EUT was placed on a wooden table, 0.8 m height above the floor. The power of the EUT was connected through a 50 ohm/ 50  $\mu$ H + 5ohm Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

### 12.3 Test equipment used

|     | Model Number | Manufacturer    | Description       | Serial Number | Last Cal.     |
|-----|--------------|-----------------|-------------------|---------------|---------------|
| ■ - | ESHS10       | Rohde & Schwarz | EMI Test Receiver | 834467/007    | May 11, 2007  |
| ■ - | NSLK 8128    | Schwarzbeck     | AMN               | 8128-216      | July 04, 2007 |
| ■ - | 3825/2       | EMCO            | AMN               | 9109-1867     | June 21, 2007 |

All test equipment used is calibrated on a regular basis.

## 12.4 Test data

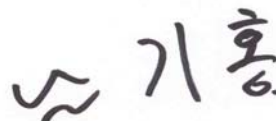
- Test Date : April 14, 2008
- Resolution bandwidth : 9 kHz
- Frequency range : 0.15 MHz ~ 30 MHz
- Test Result : PASSED BY -9.75 dB at 0.75 MHz under peak mode

| Frequency (MHz) | Line | Peak (dBμV)    |        | Margin (dB) | Average (dBμV) |        | Margin (dB) |
|-----------------|------|----------------|--------|-------------|----------------|--------|-------------|
|                 |      | Emission level | Limits |             | Emission level | Limits |             |
| 0.26            | N    | 46.84          | 61.27  | -14.43      | 36.16          | 51.27  | -15.11      |
| 0.30            | N    | 47.65          | 60.24  | -12.59      | 37.31          | 50.24  | -12.93      |
| 0.31            | H    | 49.09          | 59.97  | -10.88      | 39.58          | 49.97  | -10.39      |
| 0.75            | H    | 46.25          | 56.00  | -9.75       | 34.10          | 46.00  | -11.90      |
| 0.77            | N    | 46.17          | 56.00  | -9.83       | 34.67          | 46.00  | -11.33      |
| 0.96            | H    | 42.22          | 56.00  | -13.78      | 30.78          | 46.00  | -15.22      |

Line Conducted Emissions Tabulated Data

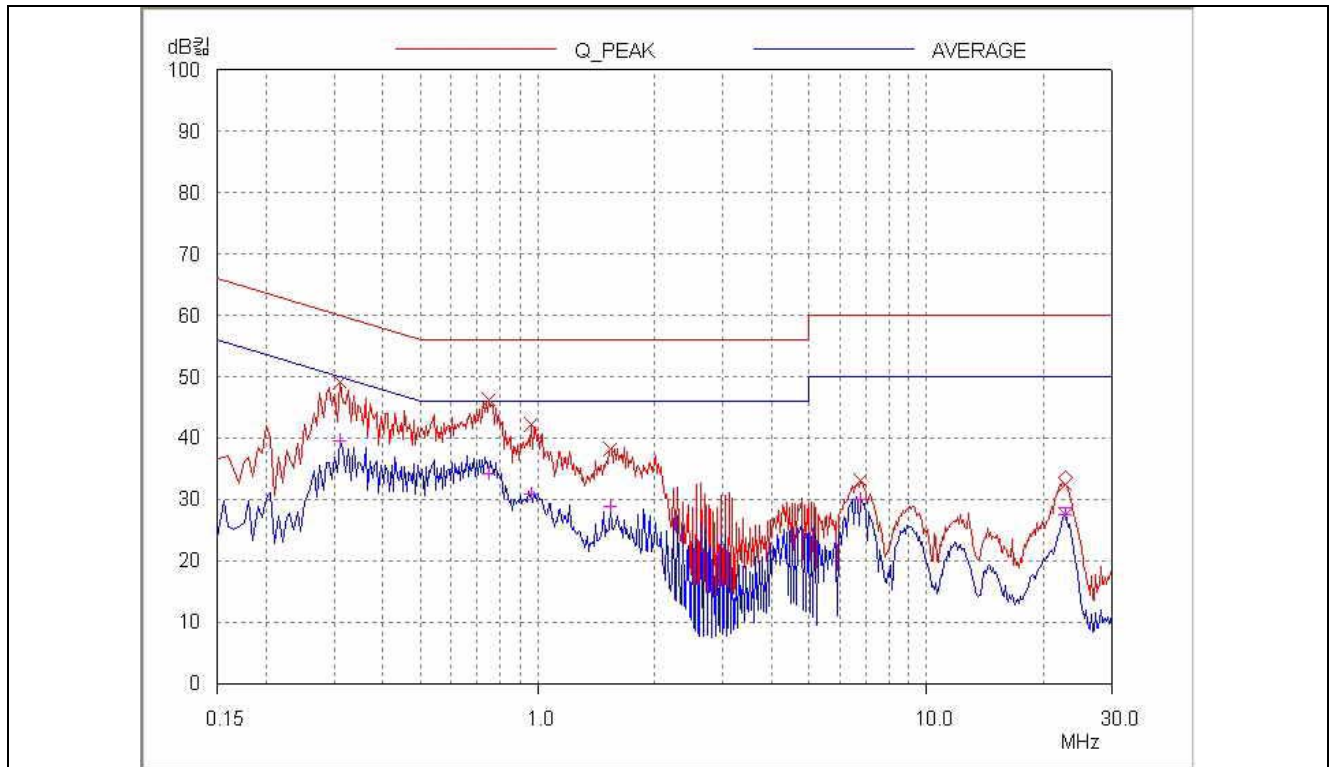
Remark : "H": Hot Line, "N": Neutral line

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

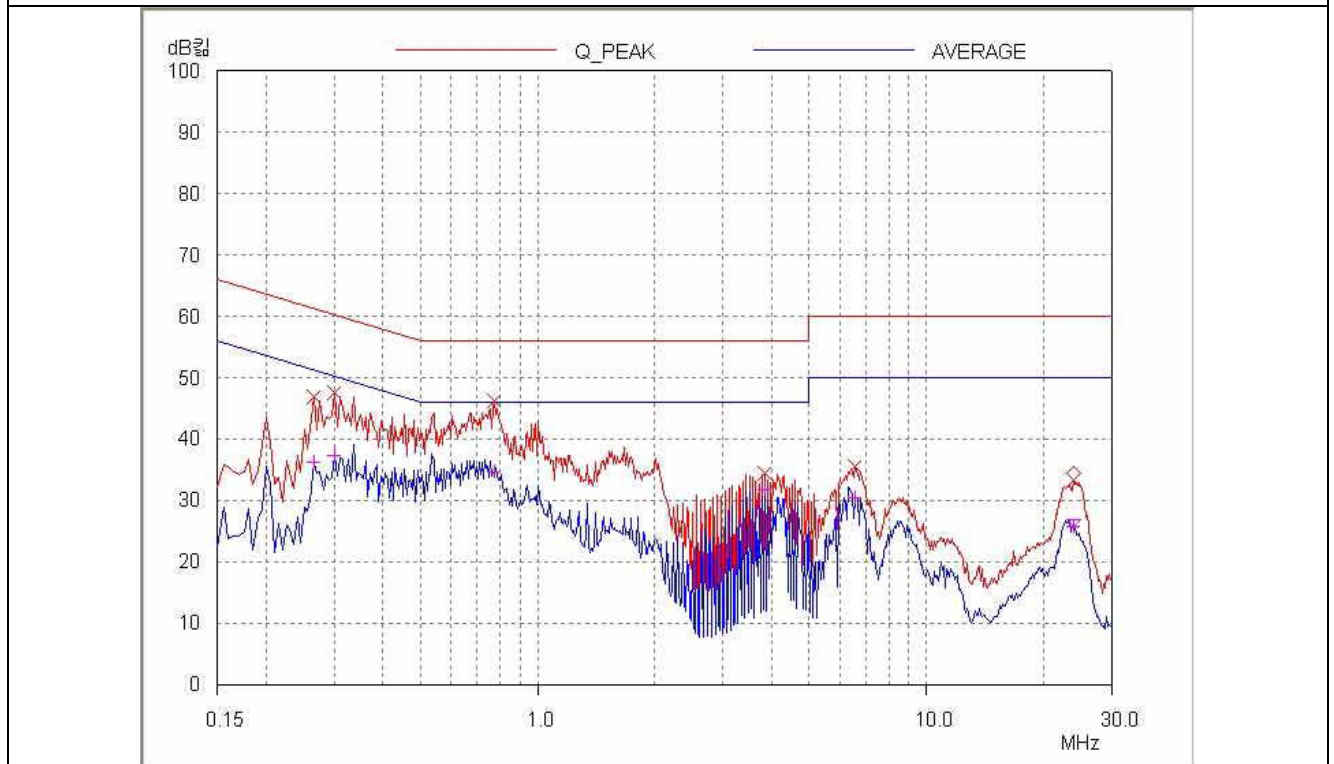


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**HOT LINE**



**NEUTRAL LINE**

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## 13. RADIO FREQUENCY EXPOSURE

### 13.1 RF Exposure Limit

According to the FCC rule §1.1310, the limit for General Population/Uncontrolled exposure is 1 mW/cm<sup>2</sup> for the device operating 1,500 MHz ~ 100 000 MHz.

### 13.2 EUT Description

|                             |  |
|-----------------------------|--|
| Kind of EUT                 | Touch Screen Remote Controller   |
| Operating Frequency Band    | <input checked="" type="checkbox"/> WLAN: 2 400 MHz ~ 2 483.5 MHz<br><input type="checkbox"/> WLAN: 5 180 MHz ~ 5 320 MHz / 5 500 MHz ~ 5 700 MHz<br><input type="checkbox"/> WLAN: 5 745 MHz ~ 5 825 MHz<br><input type="checkbox"/> Bluetooth: 2 400 MHz ~ 2 483.5 MHz |
| Device Category             | <input type="checkbox"/> Portable (<20 cm separation)<br><input checked="" type="checkbox"/> Mobile (>20 cm separation)<br><input type="checkbox"/> Others   |
| Max. Output Power           | 2.50 dBm(1.778 3 mW) at 2 440 MHz  |
| Used Antenna                | MFR.: AMOTECH, Model No.: ALA931C4   |
| Used Antenna Gain           | 0 dBi  |
| Exposure Evaluation Applied | <input checked="" type="checkbox"/> MPE<br><input type="checkbox"/> SAR<br><input type="checkbox"/> N/A  |

### 13.3 Test Result

See attached MPE calculation