**Underwriters Laboratories Inc.**

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Project: 11CA60397
File: TC8312
Report: 11CA60397-FCC
Date: January 3,2012
Model: FS-A4206C (Basic), FS-A4206F

# FCC Certification Report

**For**

# 42” Color TFT LCD Monitor

**D&T Inc.**
**59-9 JANG-DONG, YUSEONG-GU, DAEJEON , 305-343, Korea**

**Summary of Test Results:**

| The following tests were performed on a sample submitted for evaluation of compliance with 47 CFR Part 15.107 (a) / 47 CFR Part 15.109 (g) Class B. | | | | |
|---|---|---|---|---|
| Test # | Test Name<br>Test Requirement/Specification | Compliant | Not Compliant | See Remark |
| 1 | AC Power line Conducted Emission Test | X | - | - |
| 2 | Radiated Emission Test | X | - | - |

**Conclusion:**

The tests listed in the Summary of Testing section of this report have been performed as a witness testing and the results recorded by UL Korea Ltd. in accordance with the procedures stated in each test requirement and specification. The test list was determined by the Applicant as being applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

The equipment under test has

☒ Met the technical requirements
☐ Not met the technical requirements

Tested by
Sung Hoon Baek, Project Engineer
Conformity Assessment Services – 3014ASEO
UL Korea Ltd.
January 3, 2012

Reviewed by
Jeawoon, Choi, Senior Project Engineer
Conformity Assessment Services – 3014ASEO
UL Korea Ltd.
January 3, 2012

**Test Report Details**

| | |
|---|---|
| Test Report No: | 11CA60397-FCC |
| File No | TC8352 |
| Tests Performed By: | UL Korea Ltd.<br>33rd FL. GFC Bldg. 737 Yeoksam-dong, Kangnam-ku, Seoul, 135-984, Korea |
| Test Site: | CHUNGBUK TECHNOPARK<br>685-3 Yangcheong-ri, Ochang-eub,Cheongwon-kun,Chungbuk-province,Republic of Korea<br>The test facility was deemed to have the environment and capabilities necessary to perform the tests included in the test package. |
| Applicant: | D&T Inc.<br>59-9, jang Dong, Yuseong Gu, Daejeon, 305-343, Korea |
| Manufacturer: | D&T Inc.<br>59-9, jang Dong, Yuseong Gu, Daejeon, 305-343, Korea |
| Factory | D&T Inc.<br>59-9, jang Dong, Yuseong Gu, Daejeon, 305-343, Korea |
| Trademark: | N/A |

| | |
|---|---|
| Applicant Contact: | ktpark@dntinc.co.kr |
| Phone: | 82-42-360-8000 |
| E-mail: | ktpark@dntinc.co.kr |
| Product Type: | 42” Color TFT LCD Monitor |
| Model Number: | FS-A4206C |
| Model Number multiple listing: | FS-A4206F<br>The manufacturer has declared to all the multiple Model names into the basic Model without any further evaluation by UL. |
| Product standards: | 47 CFR Part 15.107(a) / 47 CFR Part 15.109(g) Class B. |
| Test Procedure | ANSI C63.4 : 2003 |
| Sample Serial Number: | N/A |
| Sample Receive Date: | December 7, 2011 |
| Testing Start Date: | December 8, 2011 |
| Date Testing Complete: | December 19, 2011 |
| Test Report Date: | January 3, 2012 |
| **Overall Results:** | **Pass** |

UL Korea Ltd. reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this Model are manufactured with identical electrical and mechanical components. UL Korea Ltd. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from UL Korea Ltd. issued reports.

## REPORT DIRECTORY

# 1. General product description

## 1.1 Equipment Description

| Description: |
|---|
| 42” Color TFT LCD Monitor |

## 1.2 Details of Test Equipment (EUT)

| Equipment Configuration: | | | | |
|---|---|---|---|---|
| No. | Product Type | Manufacturer | Model | Comments |
| 1 | LCD Monitor | D&T Inc. | FS-A4206C/FS-A4206F | - |
| 2 | DVI - HDMI cable | - | - | 1 EA (Option) |
| 3 | AC Extension Cable | - | - | 3.0m (Option) |
| 4 | Serial Cable | - | - | Not User Port |

## 1.3 Technical Data:

| Specification | | |
|---|---|---|
| LCD PANEL | Type | A-si TFT Active matrix |
| | Display area | 930.4(H) mm X 523.26(V) mm |
| | Maximum Resolution | 1920X1080@120Hz |
| | Pixel pitch | 0.4845(H)mm X 0.4845(V)mm |
| | Display colors | 1073.7M (RGB 10-bit data) |
| | Contrast Ratio(Typ.) | 4000:1 |
| | Viewing Angle(Typ.) | 89/89/89/89 |
| | Response Time(Typ.) | 5ms |
| | Luminance(Typ.) | 500cd/m2 |
| Power Consumption | Maximum | 120W |
| | Standby Mode | Under 0.5W |
| Power | AC 100-240V~50-60Hz 1.2A Max | |
| Dimension | Size and weight | 1002.5X40X595 /17Kg(21Kg) |

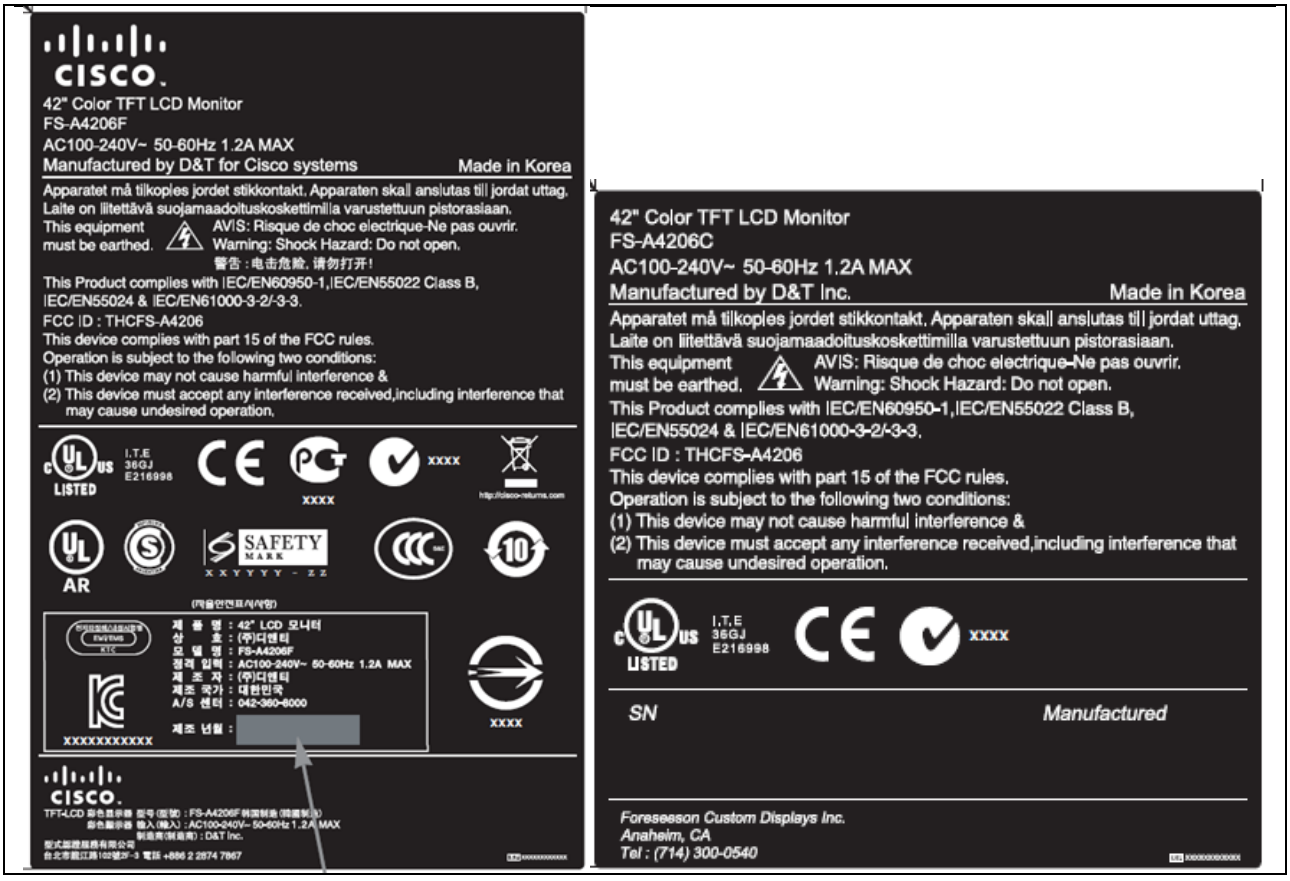
### 1.4 EUT Internal operating frequency

| Frequency (MHz) | Description | Frequency (MHz) | Description |
|---|---|---|---|
| 148.5 | Display Clock Frequency | 192.0 | Memory Clock frequency |
| 74.25 | LVDS clock frequency | 27.0 | Image processor operation x-tal frequency |
| 12.0 | FRC operation x-tal frequency | 7.3728 | u-COM operation x-tal frequency |

### 1.5 Technical descriptions and documents:

| No. | Document Title and Description |
|---|---|
| 1 | FS-A4206C (Basic), FS-A4206F User manual |
| ***Note:** The manufacturer provided the following document. | |

### 1.6 Equipment Marking Plate:



## 2. Test condition

### 2.1 Equipment Used During Test:

| Use* | Product Type | Manufacturer | Model | Comments |
|---|---|---|---|---|
| EUT | LCD Monitor | D&T Inc. | FS-A4206F | - |
| EUT | Extension Cable | - | X14U0163C12300DN | 3m, AC extension Cable |
| EUT | DVI-HDMI Cable | - | - | - |
| AE | Serial Cable | - | - | - |
| AE | Notebook | SAMSUNG | NT-R580 | - |
| AE | Notebook adapter | LISHIN INTERNATIONAL ENTERPRISE CORP. | 0455A1990 | - |
| AE | LCD Monitor | DELL. | 1908WFPF | Used for DVI out function |
| *** Note: EUT** - Equipment Under Test, **AE** - Auxiliary/Associated Equipment, **SIM** - Simulator (Not Subjected to Test) | | | | |

### 2.2 Input/output Ports:

| Port # | Name | Type* | Cable Max. >3m | Cable Shielded | Comments |
|---|---|---|---|---|---|
| 1 | Mains | AC | 4.8m | Unshielded | AC Power cord + AC power extension Cable(Option) |
| 2 | DVI In | I/O | 3m | Shielded with 2 Ferrite Core | 29 pin DVI-I |
| 3 | DVI Out | I/O | 1.8m | Shielded with 2 Ferrite Core | - |
| 4 | VGA In | I/O | 1.8 m | Shielded with 2 Ferrite Core | 15 pin D-Sub |
| *** Note:** *AC= AC Power Port, DC = DC Power Port , N/E = Non-Electrical, I/O = Signal Input or Output Port (Not Involved in Process Control), TP = Telecommunication Ports<br>* RS-232 port is used for service purpose only. No user interface port. | | | | | |

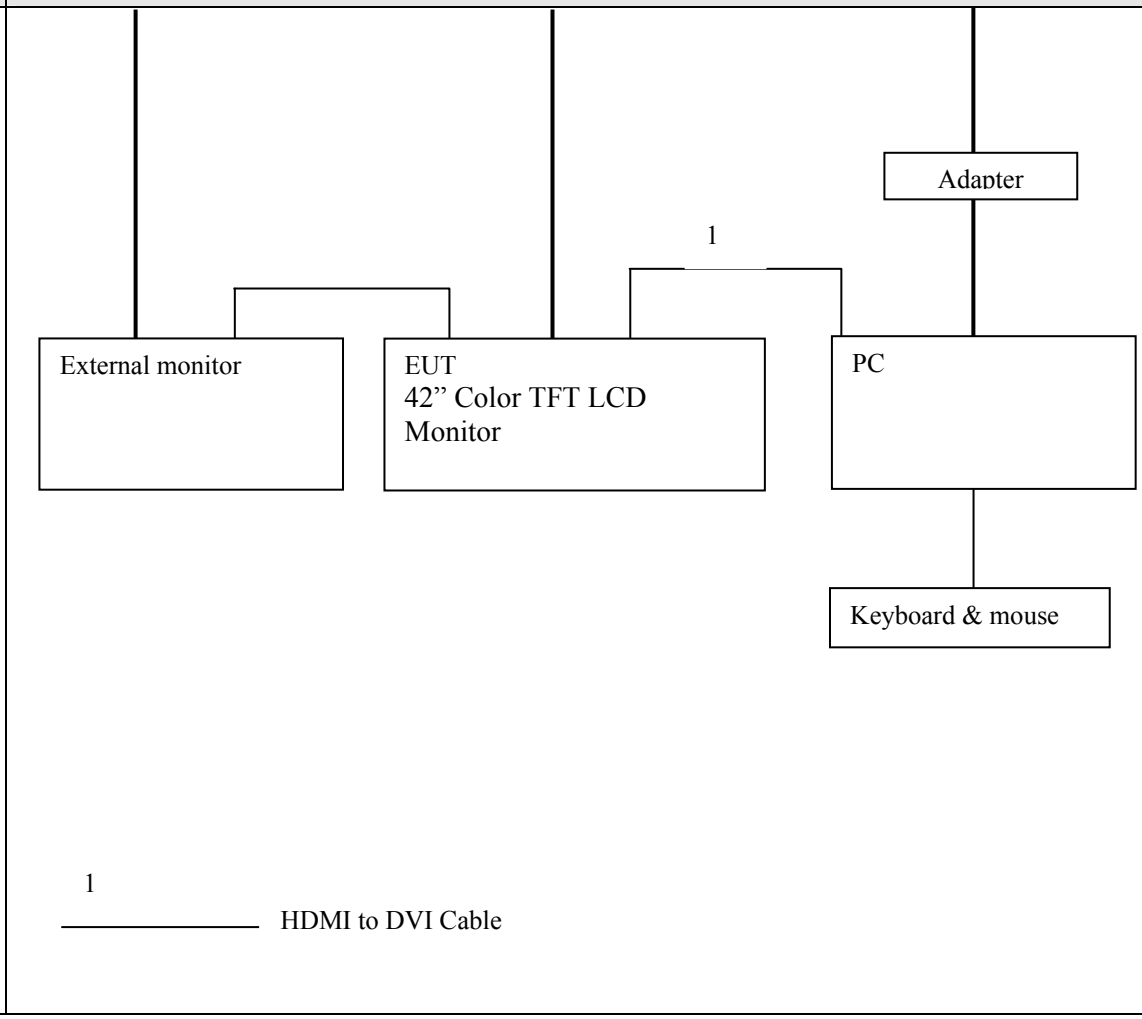
### 2.3 EUT Operation Modes:

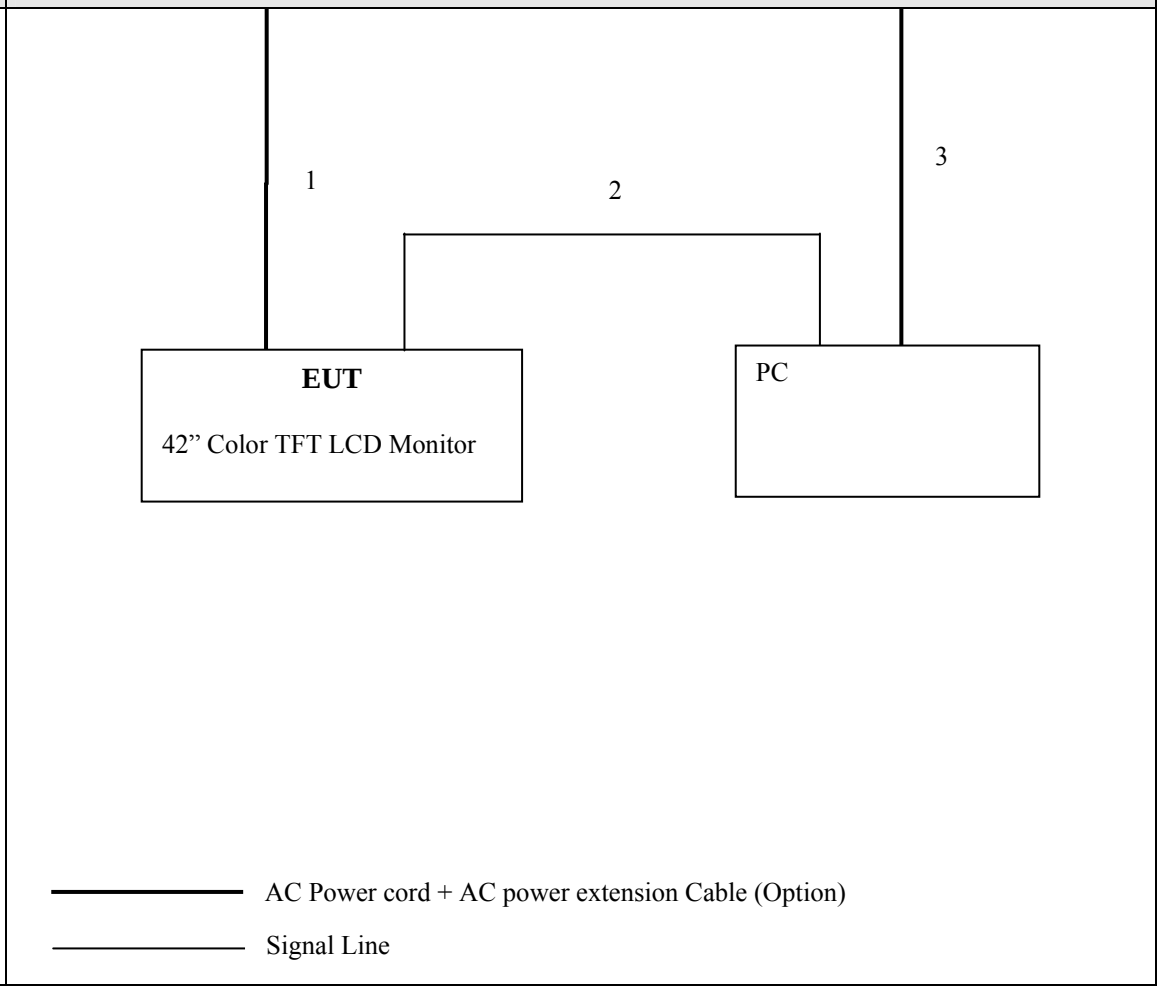
| Mode # | Mode | Comments |
|---|---|---|
| 1 | DVI In/Out Mode | - |
| 2 | VGA Mode | Worst case condition |
| ***Note**:<br>1. All the configuration described above has been investigated during the preliminary testing and selected one cases as worst-case condition for final measurements.<br>2. EUT have been performed under continuous displaying “H” Patten for configuration modes of 1 to 2 | | |

### 2.4 Modes of Video resolution

| Mode # | | Resolution | Comments |
|---|---|---|---|
| 1 | DVI In/Out Mode | 1920 * 1080 @ 60Hz | - |
| 2 | VGA Mode | 1920 * 1080 @ 60Hz | Worst case condition (Range of Brightness: 100, Range of contrast: 100 And range of backlight: 100) |
| ***Note:** Video resolution where it refers from above is representative worst case. | | | |

### 2.5 Test Configuration:

| Mode # | DVI mode |
|---|---|
| 1 |  |

| Mode # | VGA mode |
|---|---|
| 2 |  |



**2.6 Power Interface:**

| Mode # | Voltage (V) | Current (A) | Power (W) | Frequency (DC/AC-Hz) | Comments |
|---|---|---|---|---|---|
| Rated | 100-240Vac | - | 120W (Max) | 50-60 | - |
| 1 | AC 120 V | - | - | 60 | - |

## 3. Result of testing:

| No | Test requirements | Standard | Results | Verdict |
|---|---|---|---|---|
| 1 | AC Power line Conducted Emission Test | 47 CFR Part 15.107(a) / 47 CFR Part 15.109(g) Class B | Met limit Class B | **Complied** |
| 2 | Radiated Emission Test | | Met limit Class B | **Complied** |
| *** Note:** This product has been tested in accordance with the measurement procedures specified 47 CFR Part 15.107 (a) / 47 CFR Part 15.109 (g) Class B at the CBTP EMC Laboratory and the test results has been shown to be complied with the EMC requirements specified in the standard above. | | | | |

## 4. Test Condition and Results

### 4.1 MAINS TERMINAL DISTURBANCE VOLTAGE TEST

| **TEST:** Limits of mains terminal disturbance voltage | | | | |
|---|---|---|---|---|
| Method | Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN. | | | |
| Parameters recorded during the test | | Laboratory Ambient Temperature | 21.2 °C | |
| | | Relative Humidity | 32.0 % | |
| - | | Frequency range on each side of line | Measurement Point | |
| Fully configured sample scanned over the following frequency range | | 0.15 MHz to 30 MHz | AC input port of Adapter | |

| **Limits - Class B** | | | | |
|---|---|---|---|---|
| Frequency (MHz) | Limit (dBμV) | | | |
| | Quasi-Peak | Result | Average | Result |
| 0.15 to 0.50 | 66 to 56 | **Pass** | 56 to 46 | **Pass** |
| 0.50 to 5 | 56 | **Pass** | 46 | **Pass** |
| 5 to 30 | 60 | **Pass** | 50 | **Pass** |

| **EUT Configuration Settings:** | | |
|---|---|---|
| EUT Operation Mode # (See 2.3) | EUT Configurations Mode # (See Section 2.5) | Power Interface Mode # (See Section 2.6) |
| 1 | 2 | 1 |

| **Conducted Emissions Test Equipment used:** | | | | |
|---|---|---|---|---|
| Description | Manufacturer | Model | Identifier | Cal. Due |
| Test Receiver | Rohde & Schwarz | ESCI | 100545 | 2012.05.26 |
| LISN | Rohde & Schwarz | ESH2-Z5 | 100146 | 2012.05.27 |
| LISN | Schwarzbeck | NNLK8129 | 8129162 | 2012.05.27 |
| Pulse Limiter | Rohde & Schwarz | ESH3-Z2 | 3057.8810.54 | 2012.05.27 |

**Figure 1. Graphical representation for VGA Mode:**

Neutral Line

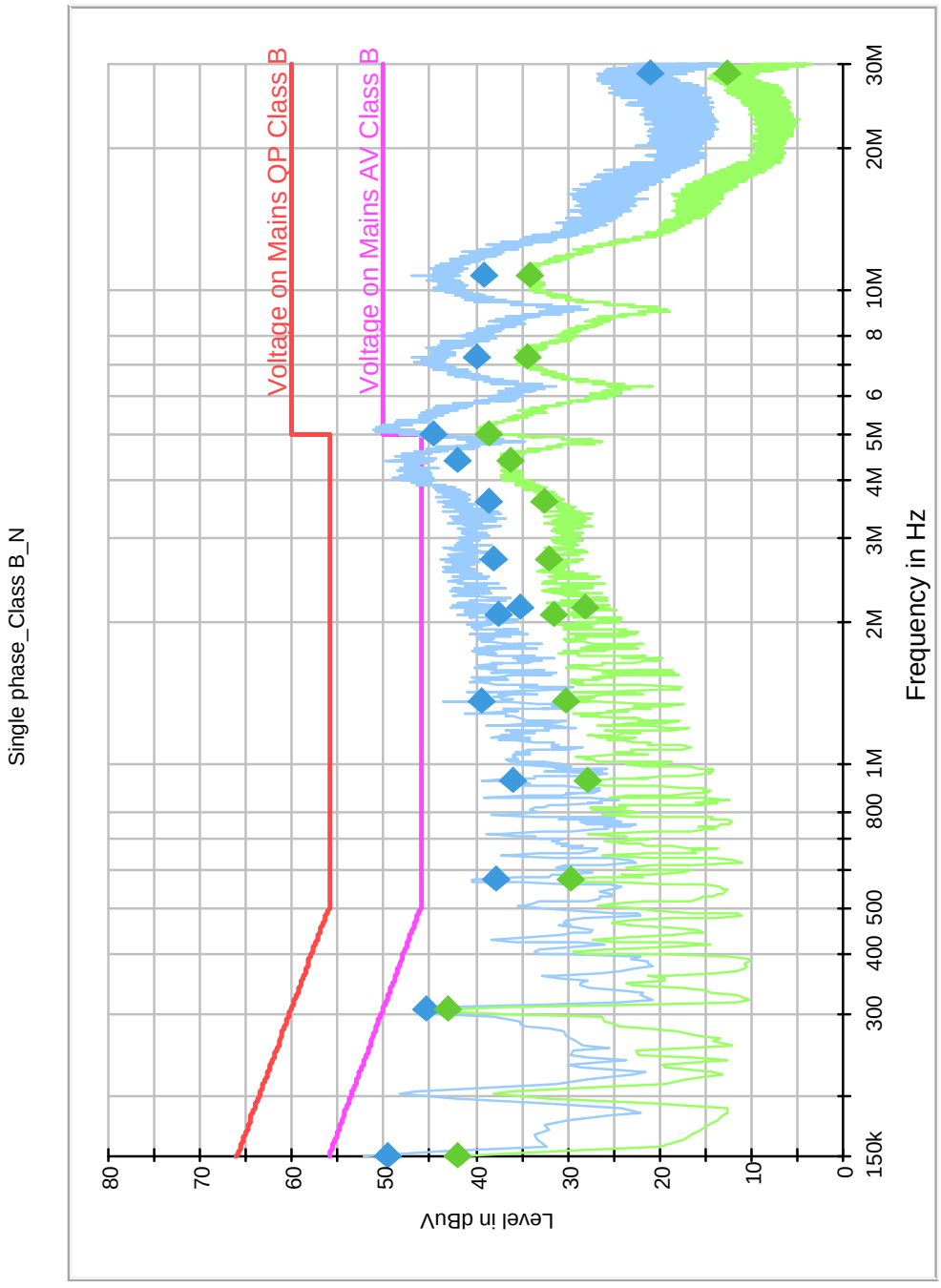


**Figure 2. Graphical representation for VGA Mode:**

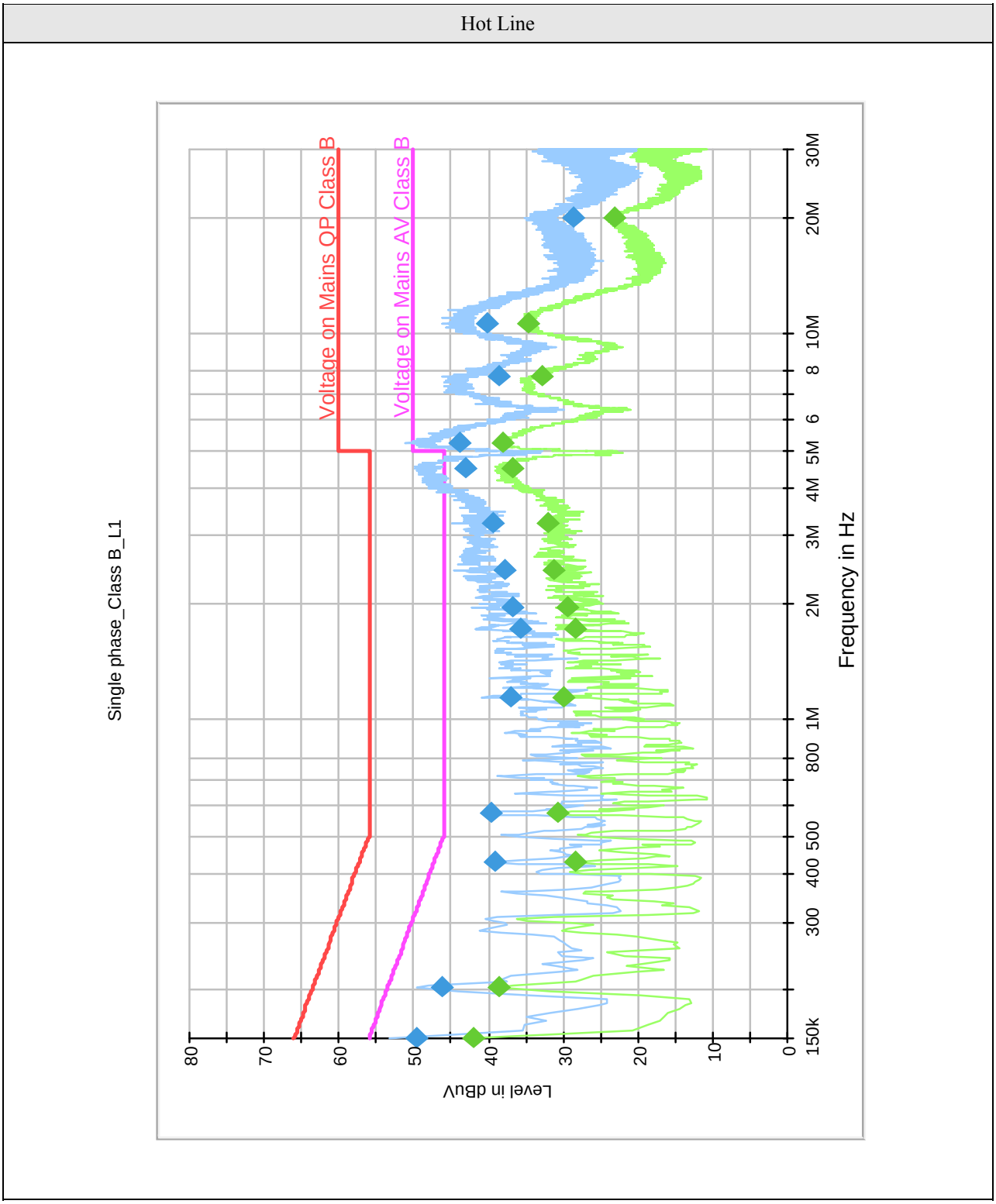


**Table 1. Test data of VGA Mode:**

| Test Frequency (MHz) | Correction Factor (dB) | | Reading value (dBuV) | | Line | Level (dBuV) | | Limit (dBuV) | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cable | LISN | QP | AV | | QP | AV | QP | AV | QP | AV |
| 0.150 | 9.88 | 0.12 | 39.70 | 32.10 | N | 49.70 | 42.10 | 66.00 | 56.00 | 16.30 | 13.90 |
| 0.202 | 9.88 | 0.12 | 36.20 | 28.60 | L | 46.20 | 38.60 | 64.00 | 54.00 | 17.80 | 15.40 |
| 0.306 | 9.87 | 0.13 | 35.50 | 33.10 | N | 45.50 | 43.10 | 60.00 | 50.00 | 14.50 | 6.90 |
| 0.574 | 9.85 | 0.15 | 29.70 | 20.70 | L | 39.70 | 30.70 | 56.00 | 46.00 | 16.30 | 15.30 |
| 1.358 | 9.91 | 0.19 | 29.40 | 20.00 | N | 39.50 | 30.10 | 56.00 | 46.00 | 16.50 | 15.90 |
| 3.218 | 9.96 | 0.24 | 29.10 | 21.80 | L | 39.30 | 32.00 | 56.00 | 46.00 | 16.70 | 14.00 |
| 3.570 | 9.95 | 0.25 | 28.50 | 22.30 | N | 38.70 | 32.50 | 56.00 | 46.00 | 17.30 | 13.50 |
| 4.362 | 9.92 | 0.28 | 31.90 | 25.90 | N | 42.10 | 36.10 | 56.00 | 46.00 | 13.90 | 9.90 |
| 4.466 | 9.92 | 0.28 | 32.80 | 26.60 | L | 43.00 | 36.80 | 56.00 | 46.00 | 13.00 | 9.20 |
| 4.994 | 9.90 | 0.30 | 34.50 | 28.40 | N | 44.70 | 38.60 | 56.00 | 46.00 | 11.30 | 7.40 |
| 5.238 | 9.89 | 0.31 | 33.70 | 27.90 | L | 43.90 | 38.10 | 60.00 | 50.00 | 16.10 | 11.90 |
| 10.638 | 9.93 | 0.47 | 29.60 | 24.20 | L | 40.00 | 34.60 | 60.00 | 50.00 | 20.00 | 15.40 |

*** Note:**
1. Margin (dB)= Limit (dBuV) - Level (dBuV)
2. If no frequencies are specified in the tables, no measurement for quasi-peak or average was necessary.

## 4.2 RADIATED DISTURBANCE

| **TEST:** Limits for radiated disturbance | | | |
|---|---|---|---|
| Method | A pretest was performed at 3m distances in an anechoic screened enclosure, scanning the frequency range, and locating any frequencies at the which EUT radiated. Frequency scans were conducted with a peak detector with horizontal and vertical polarization of the antenna. Measurements were done in the frequency range 30-1000 MHz. The main test was then conducted by measurements at each frequency found in the pretest. These measurements were done at an open area test site at 10m distances, with a quasi-peak detector. EUT was positioned on a wooden table 0.8m above the floor, at the edge of the turntable. Cables connected to EUT were fixed to cause maximum emission. A maximum emitting point for each frequency was found by turning EUT 0-360 degrees, and adjust the antenna height between 1-4m. A quasi-peak detector measurement was then done at the maximum emitting point. | | |
| Parameters recorded during the test | | Laboratory Ambient Temperature | 21.0 °C |
| | | Relative Humidity | 33.0 % |
| - | | Frequency range | Measurement Point |
| Fully configured sample scanned over the following frequency range | | 30 MHz to 2.0 GHz | 3 meter measurement distance |
| **Limits – Class B** | | | |
| Frequency (MHz) | | Limit (dBµV/m) | |
| | | Quasi-Peak | Results |
| 30 to 88 | | 40.00 | **Pass** |
| 88 to 216 | | 43.52 | **Pass** |
| 216 to 960 | | 46.02 | **Pass** |
| 960 to 2000 | | 53.97(Average), 73.97(Peak) | **Pass** |
| **EUT Configuration Settings:** | | | |
| EUT Operation Mode # (See 2.3) | | EUT Configurations Mode # (See Section 2.5) | Power Interface Mode # (See Section 2.6) |
| 1 | | 2 | 1 |

| **Radiated Emissions Test Equipment:** | | | | |
|---|---|---|---|---|
| Description | Manufacturer | Model | Identifier | Cal. Due |
| Test Receiver | Rohde & Schwarz | ESIB26 | 100359 | 2012.05.28 |
| BICONILOG ANT | Schaffner | CBL6112D | 22022 | 2012.10.07 |
| Position controller | Inn-co | CO 2000 | 11261105/L | - |
| Antenna Mast | Inn-co | MA 4000 | - | - |
| Turntable | Inn-co | DT 3000 | - | - |

**Figure 3. Graphical representation, 30 MHz to 1000 MHz**

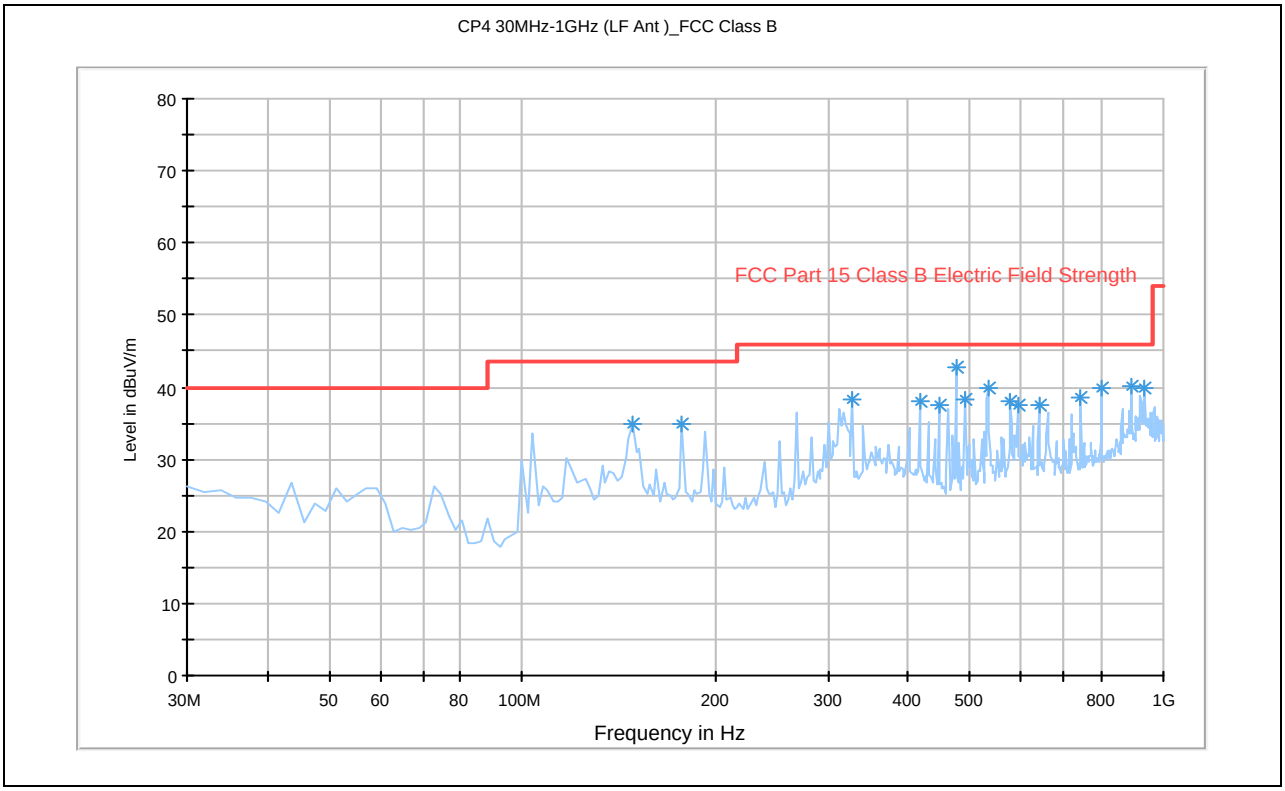



**Table 2. Radiated emission Test data for VGA Mode, 30 to 1000MHz:**

| Test Frequency (MHz) | Meter Reading (dBuV) | Detector (Pk/QP) | Polarity (V/H) | Azimuth (Degrees) | Antenna Height (m) | Cable Loss Factor (dB) | Antenna Factor (dB/m) | Level dBuV/m | Limit dBuV/m | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 148.52 | 20.23 | QP | V | 0.00 | 1.00 | 2.32 | 10.48 | 33.03 | 43.52 | 10.49 |
| 326.72 | 24.25 | QP | H | 330.00 | 1.00 | 2.68 | 14.42 | 41.35 | 46.02 | 4.67 |
| 445.52 | 19.90 | QP | V | 358.00 | 1.00 | 3.89 | 16.41 | 40.20 | 46.02 | 5.82 |
| 475.22 | 21.70 | QP | V | 358.00 | 1.00 | 4.30 | 16.70 | 42.70 | 46.02 | 3.32 |
| 532.88 | 12.35 | QP | V | 250.00 | 1.00 | 4.62 | 17.38 | 34.35 | 46.02 | 11.67 |
| 576.96 | 14.81 | QP | V | 0.00 | 2.00 | 4.64 | 17.96 | 37.41 | 46.02 | 8.61 |
| 593.73 | 12.02 | QP | V | 7.00 | 2.00 | 4.62 | 18.18 | 34.82 | 46.02 | 11.21 |
| 742.51 | 15.10 | QP | V | 0.00 | 1.00 | 5.77 | 18.33 | 39.20 | 46.02 | 6.82 |
| 891.00 | 13.41 | QP | H | 271.00 | 2.00 | 6.87 | 18.83 | 39.11 | 46.02 | 6.91 |

*** Note:**
1. Margin (dB)= Limit (dBuV) - Level (dBuV)
2. If no frequencies are specified in the tables, no measurement for quasi-peak or average was necessary.

**Figure 4. Graphical representation, 1.0 GHz to 2.0 GHz**

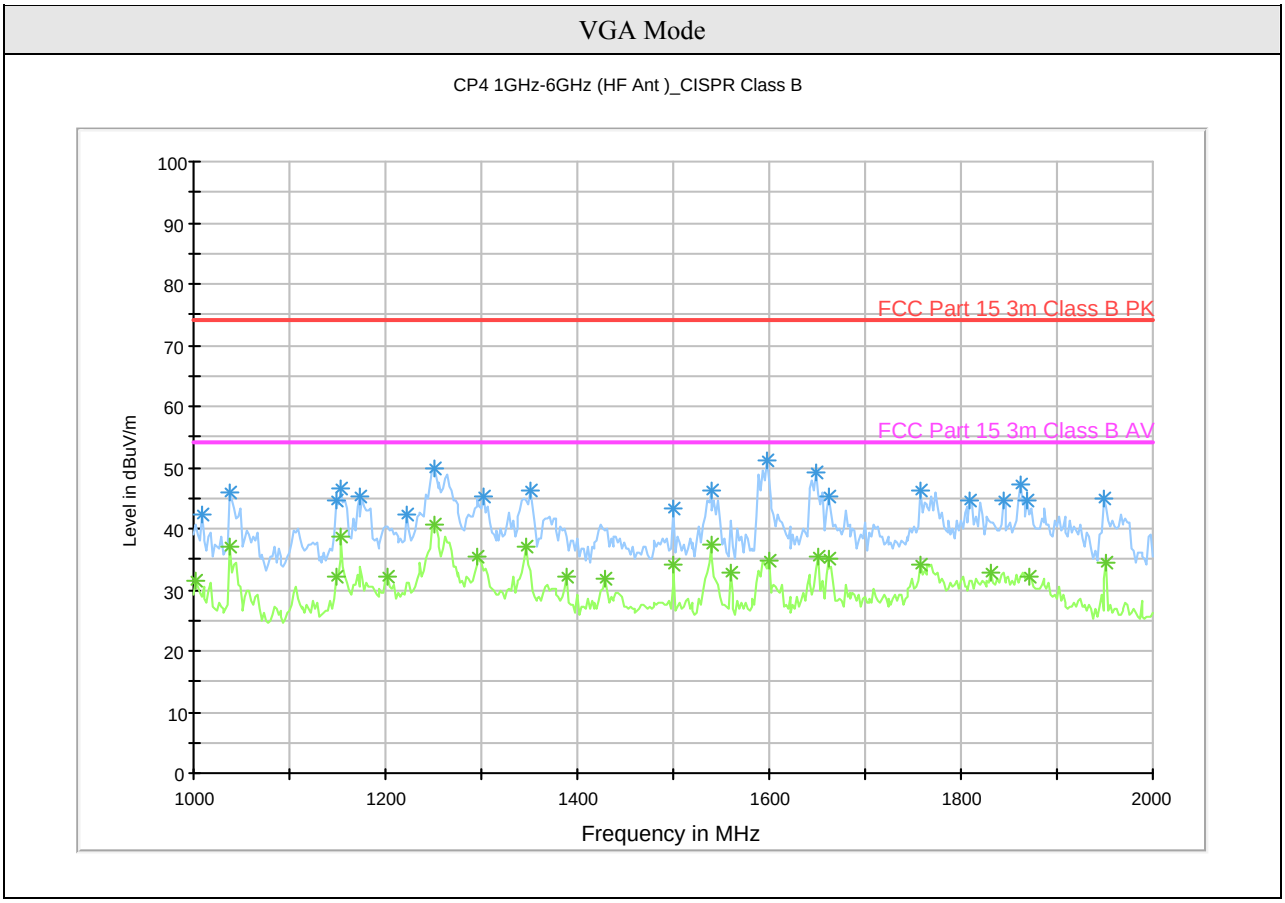



**Table 3. Radiated emission Peak Test data, VGA Mode, 1.0 GHz to 2.0 GHz**

| Frequency (GHz) | Correction Factor | | | Antenna Height (m) | Peak | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Antenna (dB/m) | Amp (dB) | Cable (dB) | | Polarity | Limit (dBuV/m) | Reading (dBuV) | Result (dBuV) | Margin (dB) |
| 1.038 | 25.07 | 24.04 | 4.77 | 2.00 | H | 73.97 | 41.10 | 46.90 | 27.07 |
| 1.154 | 25.21 | 24.17 | 5.26 | 1.50 | V | 73.97 | 39.40 | 45.70 | 28.27 |
| 1.251 | 25.32 | 23.99 | 5.67 | 1.00 | H | 73.97 | 44.00 | 51.00 | 22.97 |
| 1.347 | 25.43 | 23.88 | 5.35 | 1.50 | H | 73.97 | 40.40 | 47.30 | 26.67 |
| 1.539 | 25.66 | 23.95 | 6.59 | 1.50 | H | 73.97 | 38.90 | 47.20 | 26.77 |
| 1.597 | 25.72 | 24.05 | 6.63 | 1.00 | H | 73.97 | 39.70 | 48.00 | 25.97 |
| 1.952 | 26.13 | 24.38 | 7.15 | 1.00 | H | 73.97 | 37.30 | 46.20 | 27.77 |

**Table 3. Radiated emission Average Test data, VGA Mode, 1.0 GHz to 2.0 GHz**

| Frequency (GHz) | Correction Factor | | | Antenna Height (m) | Average | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Antenna (dB/m) | Amp (dB) | Cable (dB) | | Polarity | Limit (dBuV/m) | Reading (dBuV) | Result (dBuV) | Margin (dB) |
| 1.038 | 25.07 | 24.04 | 4.77 | 2.00 | H | 53.97 | 28.80 | 34.60 | 19.37 |
| 1.154 | 25.21 | 24.17 | 5.26 | 1.50 | V | 53.97 | 28.10 | 34.40 | 19.57 |
| 1.251 | 25.32 | 23.99 | 5.67 | 1.00 | H | 53.97 | 33.60 | 40.60 | 13.37 |
| 1.347 | 25.43 | 23.88 | 5.35 | 1.50 | H | 53.97 | 28.60 | 35.50 | 18.47 |
| 1.539 | 25.66 | 23.95 | 6.59 | 1.50 | H | 53.97 | 22.60 | 30.90 | 23.07 |
| 1.597 | 25.72 | 24.05 | 6.63 | 1.00 | H | 53.97 | 28.50 | 36.80 | 17.17 |
| 1.952 | 26.13 | 24.38 | 7.15 | 1.00 | H | 53.97 | 24.80 | 33.70 | 20.27 |

## Appendix A: Test Facility

MIC: Designated as a testing laboratory by Radio Research Laboratory in accordance with the Regulation on Designation of Testing Laboratory for Information and Communication Equipment. Registration No. : KR0017

KOLAS: Accredited by Korea Laboratory Accreditation Scheme (KOLAS) as Testing Laboratory in accordance with the provisions of Article 23 of the National Standards Act. These criteria encompass the requirements of ISO/IEC 17025:2000. For a scope listing search at http://kolas.kats.go.kr/02_english/m02_01_s01.asp?OlapCode=KOLU19

FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland and accepted in a letter dated July 17, 2005 (Reg. No. 553281). As a Conformity Assessment Body (CAB), our organization is designated to perform compliance testing on equipment subject to Declaration Of Conformity (DOC) and Certification under Part 15 and 18 of the Commission's Rules in a letter dated July 14, 2005.

VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: (Radiated Emissions) R-2414, (Conducted Emissions) C-2641.

## Appendix B: Measurement Uncertainties

| Test | Uncertainty |
|---|---|
| Radiated Emissions | U = k * Uc(xi) = 4.20 dB |
| Conducted Emissions | U= k * Uc(xi) = 3.14 dB |