

## EMC TEST REPORT For FCC



Test Report No. : 2004030015

Date of Issue : March 23, 2004

Model/Type No. : Digimax V5

Kind of Product : Digital Camera

Applicant : Samsung Techwin Co., Ltd.

Applicant Address : 145-3 Sangdaewon 1 dong, Chungwon-ku, Sunghnam City,  
Kyungki-do, Korea

Manufacturer : 1) Samsung Techwin Co., Ltd.  
2) Tianjin Samsung Opto-Electronics Co., Ltd.

Manufacturer Address : 1) 42, Sungju-dong, Changwon City, Kyungnam, Korea  
2) 7 Pingchang Road, Nankai Dist., Tianjin, China

Contact Person : Kun-Sop, Kim (Manager)

Telephone : +82-31-740-8253

Received Date : March 19, 2004

Test period : Start: March 19, 2004 End: March 19, 2004

Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

The test results presented in this report relate only to the object tested.

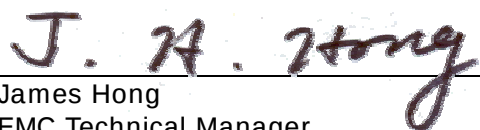
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Tested by



Young-Joon, Park  
EMC Test Engineer  
Date: March 23, 2004

Reviewed by



James Hong  
EMC Technical Manager  
Date: March 23, 2004

## REPORT REVISION HISTORY

| Date          | Revision            | Page No |
|---------------|---------------------|---------|
| Mar. 23, 2004 | (2004030015) Issued | All     |
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## 1.0 General Product Description

### 1.0.1 Tested Equipment

- ☒ Unless otherwise indicated, all tests were conducted on Model Digimax V5.
- ☐ Tests performed on Model \_\_\_\_\_ were considered to be representative of Model(s) \_\_\_\_\_.

### 1.0.2 Equipment Size, Mobility and Identification

Dimensions: 105.5 (W) by 54.6 (H) by 38.0 (D) ☒ mm ☐ in  
Mobility: ☒ Hand-Held ☐ Table-top ☐ Floor-standing  
Serial No.: Prototype

### 1.0.3 Electrical Ratings

Input: Adapter – AC 100-250V, 50/60Hz  
EUT - DC 5V  
Output: Adapter – DC 5V, 2.0A  
EUT - Not applicable

### 1.0.4 Test Voltage & Frequency (Using the adapter)

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage: 120Vac  
Frequency: 60Hz

### 1.0.5 Clock & Other Frequencies Utilized

49.09MHz, 13.5MHz, 108.0MHz, 32.768KHz

## 1.1 Model Differences

Not applicable

## 1.2 Device Modifications

The following modifications were necessary for compliance: Not applicable

### 1.3 EUT Configuration(s)

See Appendix A for individual test set-up configuration(s). The following peripheral devices and/or interface cables were connected during the measurement:

☒ Peripheral Devices

| Device           | Manufacturer                          | Model No.    | Serial No.      | FCC ID or DoC |
|------------------|---------------------------------------|--------------|-----------------|---------------|
| Notebook PC      | I & B Com                             | Slim 5360    | MB0VAA111100094 | DOC           |
| Adapter(1)       | LI SHIN INTERNATIONAL ENTERPRISE CORP | LAE9802A2060 | 2K1800657       | -             |
| Headset          | PLANTRONICS                           | LS1          | -               | -             |
| Keyboard         | SAMSUNG                               | SEM-DT35     | 3T011297        | DoC           |
| Serial Mouse     | Microsoft                             | BASM1        | 4476266-20000   | DoC           |
| Mouse (USB type) | SAMSUNG                               | OMS3CB       | 0303009875      | DoC           |

☒ Cable Description

| # | Description                         | Ferrite Core | Length (m) | Other Details                      |
|---|-------------------------------------|--------------|------------|------------------------------------|
| 1 | Adapter(1) Power Cable, Unshielded  | No           | 1.8        | Connect to AC Power                |
| 2 | Adapter(2) Power Cable, Unshielded  | No           | 1.8        | Connect to AC Power                |
| 3 | Adapter(1) Output Cable, Unshielded | Yes          | 1.5        | Between Notebook PC and Adapter(1) |
| 4 | Adapter(2) Output Cable, Unshielded | Yes          | 1.5        | Between EUT and Adapter(2)         |
| 5 | EUT USB Cable, Shielded             | Yes          | 1.5        | Between EUT and Notebook PC        |
| 6 | Serial Mouse Cable, Shielded        | No           | 1.8        | Connect to Notebook PC             |
| 7 | PS/2 Keyboard Cable, Shielded       | No           | 1.5        | Connect to Notebook PC             |
| 8 | Headset Cable, Unshielded           | No           | 2.0        | Connect to Notebook PC             |
| 9 | Keyboard cable, Shielded            | No           | 1.5        | PS/2 type                          |

### 1.4 Test Software

- ☐ Pinging  
☒ Not applicable

### 1.5 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

- ☐ Test program (H-Pattern) ☐ Test program (color bar)  
☐ Standby ☐ Test program (customer specific)  
☒ Practice operation : USB downloading mode  
AV output monitoring mode

### 1.6 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

### 1.7 Test Facility

The measurement facility is located at 386-1, Ho-Dong, Yongin-City, Kyungki-Do, Korea 449-100. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

## 1.8 Measurement Procedure

Preliminary AC power line conducted emissions tests were performed shielded room. To find worst mode, several typical mode and typical cable position were tested. Final AC power line conducted emissions test was performed shielded room. (location is same as Preliminary test)  
Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

Preliminary radiated emissions test were performed anechoic chamber (Distance of antenna and EUT was 3 m). To find worst mode, several typical mode and typical cable position were tested and peak level and frequency were recorded.

Final radiated emissions test was performed Open Area Test Site. Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

\* Measurement procedures was In accordance with ANSI C63.4-2001 7.2.3, 7.2.4, 8.3.1.1, 8.3.1.2

## 1.9 Laboratory Accreditations and Listings

| Country       | Agency | Scope of Accreditation                                                                                                                                                                                                                                                      | Logo                                                                                                    |
|---------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| USA           | FCC    | 3 and 10 meter Open Area Test Sites to perform FCC Part 15/18 measurements.                                                                                                                                                                                                 | <br>93250            |
| JAPAN         | VCCI   | 10 meter Open Area Test Site and one conducted site.                                                                                                                                                                                                                        | <br>R-948, C-986     |
| KOREA         | MIC    | EMI (CE, RE)<br>EMS (ESD, Burst, RS, Surge, CS,<br>Power-Frequency Susceptibility,<br>Voltage Dips and Short Interruptions)                                                                                                                                                 | <br>No. 51, KR0025   |
| International | KOLAS  | EMC                                                                                                                                                                                                                                                                         | <br>NO. 119         |
| Europe        | GLAS   | EMC<br>EN 55011, EN 55022, EN 55024, EN 61326,<br>EN 50130-4, EN 50081-1, EN 50081-2,<br>EN 50082-1, EN 50082-2, EN 61000-6-2,<br>EN 61000-4-2, EN 61000-4-3,<br>EN 61000-4-4, EN 61000-4-5,<br>EN 61000-4-6, EN 61000-4-8,<br>EN 61000-4-11, EN 61000-3-2,<br>EN 61000-3-3 | <br>No.13000796-02 |

## 2.0 Emissions Test Regulations

The emissions tests were performed according to following regulations:

- |                                                                                                                            |                                  |                                             |
|----------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------|
| <input type="checkbox"/> EN 50081-1:1992                                                                                   | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B            |
| <input type="checkbox"/> EN 61000-6-3:2001                                                                                 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B            |
| <input type="checkbox"/> EN 50081-2:1993                                                                                   | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B            |
| <input type="checkbox"/> EN 61000-6-4:2001                                                                                 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B            |
| <input type="checkbox"/> EN 50083-2:2001                                                                                   |                                  |                                             |
| <input type="checkbox"/> EN 55011:1998 +A1:1999                                                                            | <input type="checkbox"/> Group 1 | <input type="checkbox"/> Group 2            |
|                                                                                                                            | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B            |
| <input type="checkbox"/> EN 55013:1990 +A12:1994 +A13:1996 +A14:1999                                                       |                                  |                                             |
| <input type="checkbox"/> EN 55013:2001                                                                                     |                                  |                                             |
| <input type="checkbox"/> EN 55014-1:2000                                                                                   |                                  |                                             |
| <input type="checkbox"/> EN 55014-1:2000 +A1:2001                                                                          |                                  |                                             |
| <input type="checkbox"/> EN 55015:2000                                                                                     |                                  |                                             |
| <input type="checkbox"/> EN 55015:2000 +A1:2001                                                                            |                                  |                                             |
| <input type="checkbox"/> EN 55022:1994 +A1:1995 +A2:1997                                                                   | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B            |
| <input type="checkbox"/> EN 55022:1998                                                                                     | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B            |
| <input type="checkbox"/> EN 55022:1998 +A1:2000                                                                            | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B            |
| <input type="checkbox"/> EN 61000-3-2:1995 +A1:1998 +A2:1998 +A14:2000                                                     |                                  |                                             |
| <input type="checkbox"/> EN 61000-3-2:2000                                                                                 |                                  |                                             |
| <input type="checkbox"/> EN 61000-3-3:1995                                                                                 |                                  |                                             |
| <input type="checkbox"/> EN 61000-3-3:1995 +A1:2001                                                                        |                                  |                                             |
| <input type="checkbox"/> VCCI V-3/2003.04                                                                                  | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B            |
| <input type="checkbox"/> AS/NZS 3548:1995 +A1:1997 +A2:1997                                                                | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B            |
| <input checked="" type="checkbox"/> FCC Part 15 Subpart B                                                                  | <input type="checkbox"/> Class A | <input checked="" type="checkbox"/> Class B |
| <input checked="" type="checkbox"/> CISPR 22:1997                                                                          | <input type="checkbox"/> Class A | <input checked="" type="checkbox"/> Class B |
| The unit was tested to CISPR 22 and complied with the alternate methods allowed by FCC under paragraphs 15.107 and 15.109. |                                  |                                             |
| <input type="checkbox"/> CISPR 22:1997 +A1:2000                                                                            | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B            |

## 2.1 Conducted Voltage Emissions

### Test Date

March 19, 2004

### Test Location

EMI-CE: Shielded Room

### Test Instruments

|                                                          |                 |        |            |
|----------------------------------------------------------|-----------------|--------|------------|
| <input checked="" type="checkbox"/> Field Strength Meter | Rohde & Schwarz | ESHS30 | 828144/002 |
|----------------------------------------------------------|-----------------|--------|------------|

### Test Accessories

|                                                |      |            |            |
|------------------------------------------------|------|------------|------------|
| <input checked="" type="checkbox"/> LISN       | EMCO | 3825/2     | 9409-2246  |
| <input checked="" type="checkbox"/> LISN       | EMCO | 3825/2     | 9607-2574  |
| <input checked="" type="checkbox"/> Control PC | HP   | Vectra 500 | SG72000192 |

### Frequency Range of Measurement

☒ 150 kHz to 30 MHz  
☐ 450 kHz to 30 MHz

### Instrument Settings

IF Band Width: 9 kHz

### Test Results

The requirements are:

|                                         |                                                    |
|-----------------------------------------|----------------------------------------------------|
| <input checked="" type="checkbox"/> MET | minimum margin is 7.7 dBuV (average) at 0.41 MHz   |
| <input type="checkbox"/> NOT MET        | limit exceeded by maximum of ____ dBuV at ____ MHz |
| <input type="checkbox"/> NOT APPLICABLE |                                                    |

### Remarks

See Appendix A for test data.

## 2.2 Radiated Electric Field Emissions

### Test Date

March 19, 2004

### Test Location

- ☒ EMI-OATS: Testing was performed at a test distance of 10 m  
☐ EMI-OATS: Testing was performed at a test distance of 3 m

### Test Instruments

☒ Field Strength Meter Rohde & Schwarz ESVS30 826638/008

### Test Accessories

|                                                             |                 |         |            |
|-------------------------------------------------------------|-----------------|---------|------------|
| <input checked="" type="checkbox"/> ULTRA Broadband Antenna | Rohde & Schwarz | HL562   | 361324/014 |
| <input type="checkbox"/> Bi-conical Antenna                 | Schwarzbeck     | BBA9106 | 41-00201   |
| <input type="checkbox"/> Bi-conical Antenna                 | EMCO            | 3110B   | 9607-2564  |
| <input type="checkbox"/> Log-periodic Antenna               | EMCO            | 3146    | 9607-4567  |

### Frequency Range of Measurement

30 MHz to 2 GHz

### Instrument Settings

IF Band Width: 120 kHz

### Test Results

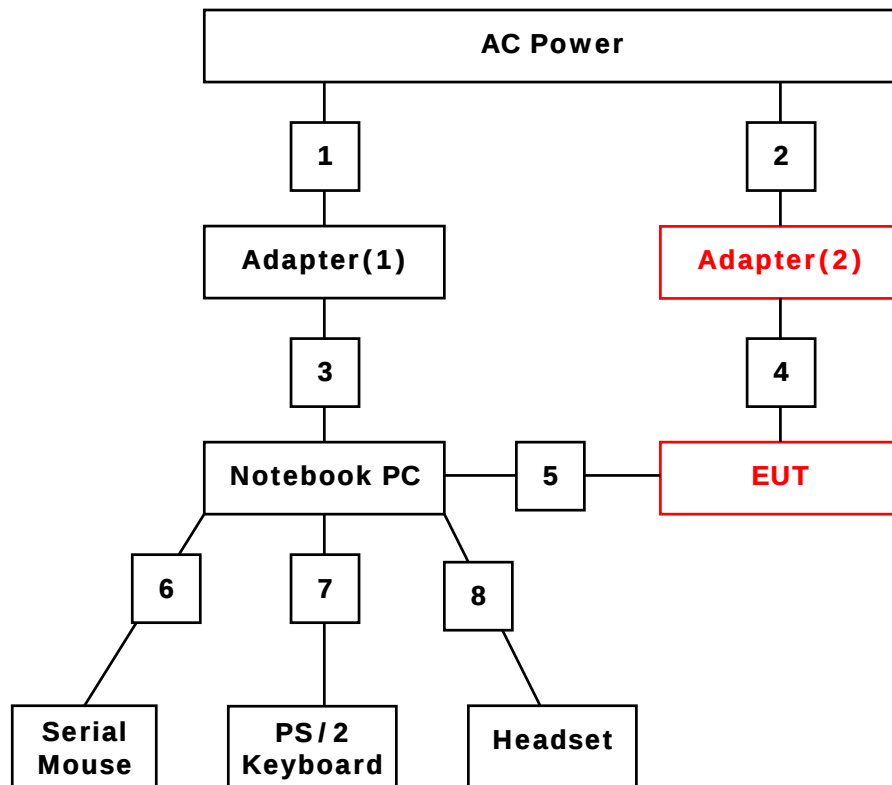
The requirements are:

- ☒ MET minimum margin is 4.8 dBuV/m at 648.21 MHz  
☐ NOT MET limit exceeded by maximum of \_\_\_\_ dBuV/m at \_\_\_\_ MHz  
☐ NOT APPLICABLE

### Remarks

See Appendix A for test data

## Configuration

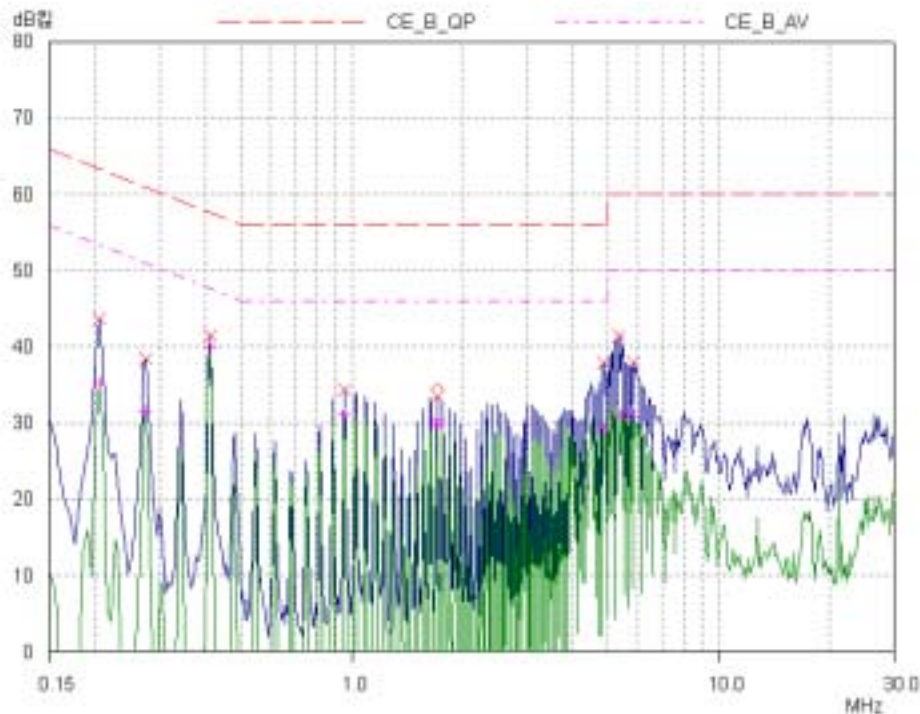
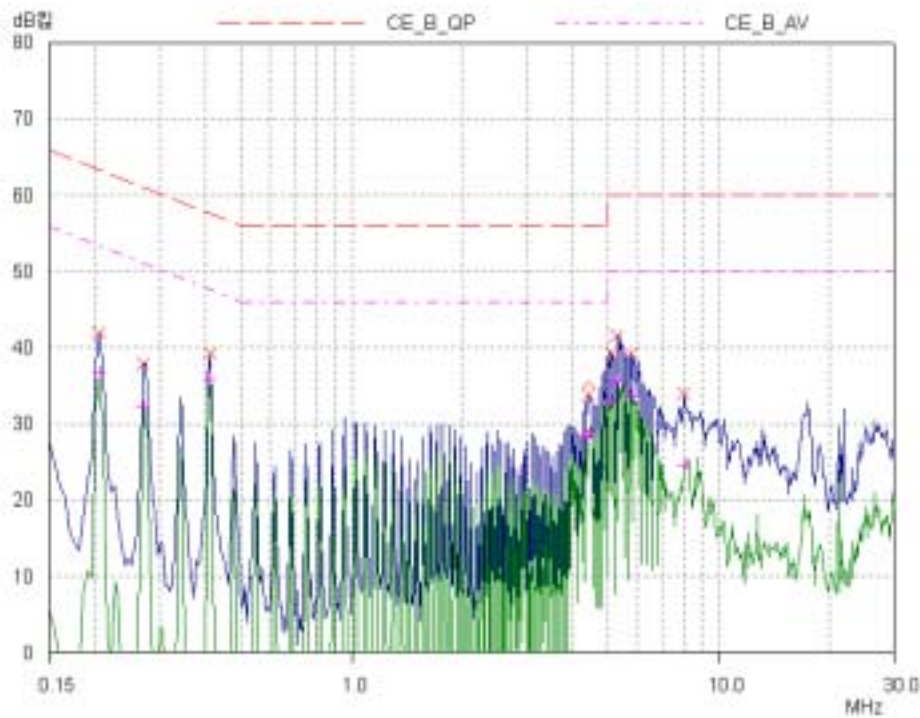


## APPENDIX A – TEST DATA

### Conducted Voltage Emissions (Quasi-Peak reading)

| Frequency<br>[MHz] | Correction<br>Factor |       | Line | Quasi-peak      |                   |                  |                | Average         |                   |                  |                |
|--------------------|----------------------|-------|------|-----------------|-------------------|------------------|----------------|-----------------|-------------------|------------------|----------------|
|                    | LISN                 | Cable |      | Limit<br>[dBuV] | Reading<br>[dBuV] | Result<br>[dBuV] | Margin<br>[dB] | Limit<br>[dBuV] | Reading<br>[dBuV] | Result<br>[dBuV] | Margin<br>[dB] |
| 0.21               | 0.1                  | 0.1   | H    | 63.4            | 41.7              | 41.9             | 21.5           | 53.4            | 36.5              | 36.7             | 16.7           |
| 0.21               | 0.1                  | 0.1   | N    | 63.4            | 43.4              | 43.6             | 19.8           | 53.4            | 35.1              | 35.2             | 18.2           |
| 0.27               | 0.1                  | 0.1   | H    | 61.1            | 37.7              | 37.9             | 23.3           | 51.1            | 31.9              | 32.1             | 19.0           |
| 0.28               | 0.1                  | 0.1   | N    | 61.0            | 38.2              | 38.4             | 22.6           | 51.0            | 31.2              | 31.4             | 19.5           |
| 0.41               | 0.1                  | 0.1   | N    | 57.6            | 41.2              | 41.4             | 16.2           | 47.6            | 39.7              | 39.9             | 7.7            |
| 0.41               | 0.1                  | 0.1   | H    | 57.6            | 39.1              | 39.3             | 18.3           | 47.6            | 35.6              | 35.8             | 11.8           |
| 0.96               | 0.1                  | 0.1   | N    | 56.0            | 34.1              | 34.3             | 21.7           | 46.0            | 31.0              | 31.2             | 14.8           |
| 1.71               | 0.1                  | 0.1   | N    | 56.0            | 33.3              | 33.5             | 22.5           | 46.0            | 29.3              | 29.5             | 16.5           |
| 4.37               | 0.2                  | 0.2   | H    | 56.0            | 33.5              | 33.9             | 22.1           | 46.0            | 27.9              | 28.3             | 17.7           |
| 4.85               | 0.2                  | 0.2   | N    | 56.0            | 37.5              | 37.9             | 18.1           | 46.0            | 28.9              | 29.3             | 16.7           |
| 5.05               | 0.2                  | 0.2   | H    | 60.0            | 38.9              | 39.3             | 20.7           | 50.0            | 32.5              | 32.9             | 17.1           |
| 5.25               | 0.2                  | 0.2   | H    | 60.0            | 41.2              | 41.6             | 18.4           | 50.0            | 35.0              | 35.4             | 14.6           |
| 5.32               | 0.2                  | 0.2   | N    | 60.0            | 41.0              | 41.4             | 18.6           | 50.0            | 30.6              | 31.0             | 19.1           |
| 5.73               | 0.3                  | 0.2   | H    | 60.0            | 38.8              | 39.3             | 20.7           | 50.0            | 33.1              | 33.6             | 16.4           |
| 5.80               | 0.3                  | 0.2   | N    | 60.0            | 37.4              | 37.9             | 22.1           | 50.0            | 30.3              | 30.8             | 19.2           |
| 7.99               | 0.3                  | 0.2   | H    | 60.0            | 33.6              | 34.1             | 25.9           | 50.0            | 24.1              | 24.6             | 25.4           |

\* If the average limit is met when a quasi-peak detector is used, the EUT shall be deemed to meet both limit and measurement with the average detector is unnecessary.



## Radiated Electric Field Emissions (Quasi-Peak reading)

| Frequency<br>[MHz] | Reading<br>[dBuV / m] | Pol. | Height<br>[m] | Correction<br>Factor |       | Limits<br>[dBuV / m] | Result<br>[dBuV / m] | Margin<br>[dB] |
|--------------------|-----------------------|------|---------------|----------------------|-------|----------------------|----------------------|----------------|
|                    |                       |      |               | Antenna              | Cable |                      |                      |                |
| 129.18             | 5.8                   | V    | 1.1           | 8.8                  | 2.4   | 30.0                 | 17.0                 | 13.0           |
| 171.87             | 8.6                   | V    | 1.0           | 7.1                  | 2.6   | 30.0                 | 18.3                 | 11.7           |
| 196.65             | 10.2                  | H    | 4.0           | 7.1                  | 2.9   | 30.0                 | 20.2                 | 9.8            |
| 200.03             | 6.8                   | H    | 4.0           | 7.2                  | 2.9   | 30.0                 | 16.9                 | 13.1           |
| 221.92             | 9.2                   | H    | 4.0           | 8.1                  | 3.0   | 30.0                 | 20.3                 | 9.7            |
| 224.65             | 6.8                   | H    | 4.0           | 8.2                  | 3.1   | 30.0                 | 18.1                 | 11.9           |
| 468.30             | 10.5                  | H    | 1.3           | 15.0                 | 4.6   | 37.0                 | 30.1                 | 6.9            |
| 480.46             | 10.0                  | H    | 2.2           | 15.2                 | 4.6   | 37.0                 | 29.8                 | 7.2            |
| 492.64             | 11.0                  | H    | 2.1           | 15.3                 | 4.8   | 37.0                 | 31.1                 | 5.9            |
| 504.82             | 9.4                   | H    | 2.0           | 15.6                 | 4.8   | 37.0                 | 29.8                 | 7.2            |
| 541.26             | 8.9                   | H    | 2.0           | 16.1                 | 4.9   | 37.0                 | 29.9                 | 7.1            |
| 648.21             | 8.9                   | H    | 1.8           | 17.8                 | 5.5   | 37.0                 | 32.2                 | 4.8            |