



# CERTiTEK Standards Laboratory Co., Ltd.

386-1, Ho-Dong, Yongin-City, Kyungki-Do, Korea 449-100

Tel: +82-31-339-9970 Fax: +82-31-339-9855

<http://www.certitek.com/>



## EMC TEST REPORT For FCC



Test Report No. : CTK02-F170

Date of Issue : February 27, 2003

Model/Type No: : Digimax V3 and Digimax 3500 super

Kind of Product : Digital Camera

Applicant : Samsung Techwin Co.,Ltd.

Applicant Address : #145-3, Sandaewon 1-Dong, Sungnam-Shi, Kyonggi-Do, Korea

Manufacturer : 1. Samsung Techwin Co.,Ltd.  
2. TIANJIN SAMSUNG OPTO-ELECTRONICS Co., Ltd.

Manufacturer Address : 1. #145-3, Sandaewon 1-Dong, Sungnam-Shi, Kyonggi-Do, Korea  
2. No.7, Pingchang Rd, Nankai Dist., Tianjin, P.R.

Contact Person : Mr. G. S. Kim (Manager)

Telephone : +82-31-740-8253

Received Date : December 16, 2002

Test period : Start: February 18, 2003 End: February 25, 2003

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

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

CERTiTEK Standards Laboratory Co., Ltd. is accredited by Korea Laboratory Accreditation Scheme (KOLAS) which signed the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the above test item(s) and test method(s).

Tested by

Joon Pak  
EMC Test Engineer  
Date: February 27, 2003

Reviewed by

James Hong  
EMC Technical Manager  
Date: February 27, 2003



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### REPORT REVISION HISTORY

| Date              | Revision            | Page No |
|-------------------|---------------------|---------|
| February 27, 2003 | Issued (CTK02-F170) | 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 V3 and Digimax 3500 super.
- ☒ Tests performed on Model Digimax V3 were considered to be representative of Model(s) Digimax 3500 super.

### 1.0.2 Equipment Size, Mobility and Identification

Dimensions: 105.5 by 54.6 by 38.0 ☒ mm ☐ in  
Mobility: ☒ Hand-Held ☐ Table-top ☐ Floor-standing  
☐ -  
Serial No.: Not applicable

### 1.0.3 Electrical Ratings

Input: Adaptor – AC 100-250V, 50/60Hz  
EUT - DC 5.0V  
Output: Adaptor – DC 5.0V, 2.0A  
EUT - Not applicable

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

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

Voltage: AC 120V  
Frequency: 60Hz

### 1.0.5 Clock & Other Frequencies Utilized

DSP : 13.5MHz  
HOST CPU : 5.00MHz  
TG&CDS&AGC : 45.00MHz

## 1.1 Model Differences

Digimax V3 and Digimax 3500 super are identical to each other only except for model designation for the marketing purposes.

## 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 |
|------------------------|----------------------|----------------|-----------------|---------------|
| Adaptor (for EUT)      | Ault Korea           | PW115KA0500N52 | 13101005        | -             |
| Adaptor (for notebook) | LISHIN INTERNATIONAL | LSE8902A2060   | BJJKJH          | -             |
| Notebook PC            | I & B COM            | Slim 5360      | MB0VAA111100094 | -             |
| Keyboard (PS/2)        | World Com Mart       | KB120          | -               | D840902       |
| Mouse (Serial type)    | Microsoft            | BASM1          | 4475951-20000   | DoC           |
| CCTV Monitor           | KEC                  | TPM-233-02     | -               | -             |

☒ Cable Description

| # | Description                 | Ferrited | Length (m) | Other Details                     |
|---|-----------------------------|----------|------------|-----------------------------------|
| 1 | AC power cable, Unshielded  | No       | 1.8        | Connect to AC power               |
| 2 | AC power cable, Unshielded  | No       | 1.5        | Connect to AC power               |
| 3 | AC power cable, Unshielded  | No       | 1.5        | Connect to AC power               |
| 4 | DC output cable, Shielded   | Yes      | 1.5        | Between the adaptor and EUT       |
| 5 | DC output cable, Unshielded | Yes      | 1.5        | Between the adaptor and notebook  |
| 6 | USB cable, Shielded         | Yes      | 1.0        | Between the EUT and notebook      |
| 7 | Keyboard cable, Shielded    | No       | 1.5        | PS/2 type                         |
| 8 | Mouse cable, Shielded       | No       | 2.1        | Serial type                       |
| 9 | A/V port cable, Unshielded  | Yes      | 1.3        | Between the EUT and CCTV notebook |

n/a = not available

### 1.4 Test Software

☐ Pinging

☒ Name : Digimax V4 Installer

### 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 (Used to EMI test-data)

## **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 C63.4-1992 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"/> 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 55014-1:1993 +A1:1997 +A2:1999                     | <input type="checkbox"/> Household appliances and similar |                                             |
|                                                                                | <input type="checkbox"/> Portable tools                   |                                             |
|                                                                                | <input type="checkbox"/> Semiconductor devices            |                                             |
| <input type="checkbox"/> EN 55014-1:2000                                       |                                                           |                                             |
| <input type="checkbox"/> EN 55014-2:1997                                       |                                                           |                                             |
| <input type="checkbox"/> EN 55015:1996 +A1:1997 +A2:1999                       |                                                           |                                             |
| <input type="checkbox"/> EN 55015:2000                                         |                                                           |                                             |
| <input type="checkbox"/> EN 55020:1994 +A11:1996 +A13:1999 +A14:1999           |                                                           |                                             |
| <input type="checkbox"/> EN 55020:1994 +A11:1996 +A12:1999 +A13:1999 +A14:1999 |                                                           |                                             |
| <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 +A1:2000                                | <input type="checkbox"/> Class A                          | <input type="checkbox"/> Class B            |
| <input type="checkbox"/> EN 61000-3-2:1995 +A1:1998 +A2:1998                   |                                                           |                                             |
| <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"/> VCCI V-3/99.05 : 1999                                 | <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 type="checkbox"/> AS 3548 (1992)                                        | <input type="checkbox"/> Class A                          | <input type="checkbox"/> Class B            |
| <input checked="" type="checkbox"/> CISPR 22 (1997)                            | <input type="checkbox"/> Class A                          | <input checked="" type="checkbox"/> Class B |



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## 2.1 Conducted Voltage Emissions

### Test Date

February 18, 2003

### Test Location

EMI-CE: Shielded Room

### Test Instruments

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

### Test Accessories

|                                                |      |            |            |
|------------------------------------------------|------|------------|------------|
| <input type="checkbox"/> LISN                  | EMCO | 3825/2     | 9206-1971  |
| <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 8.6 dBuV at 0.27 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

February 18, 2003

### 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

|                                                          |                 |        |            |
|----------------------------------------------------------|-----------------|--------|------------|
| <input checked="" type="checkbox"/> 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"/> Biconical Antenna                  | Schwarzbeck     | BBA9106 | 41-00201   |
| <input type="checkbox"/> Biconical Antenna                  | EMCO            | 3110B   | 9607-2564  |
| <input type="checkbox"/> Log-periodic Antenna               | EMCO            | 3146    | 9607-4567  |

### Frequency Range of Measurement

30 MHz to 1 GHz

### Instrument Settings

IF Band Width: 120 kHz

### Test Results

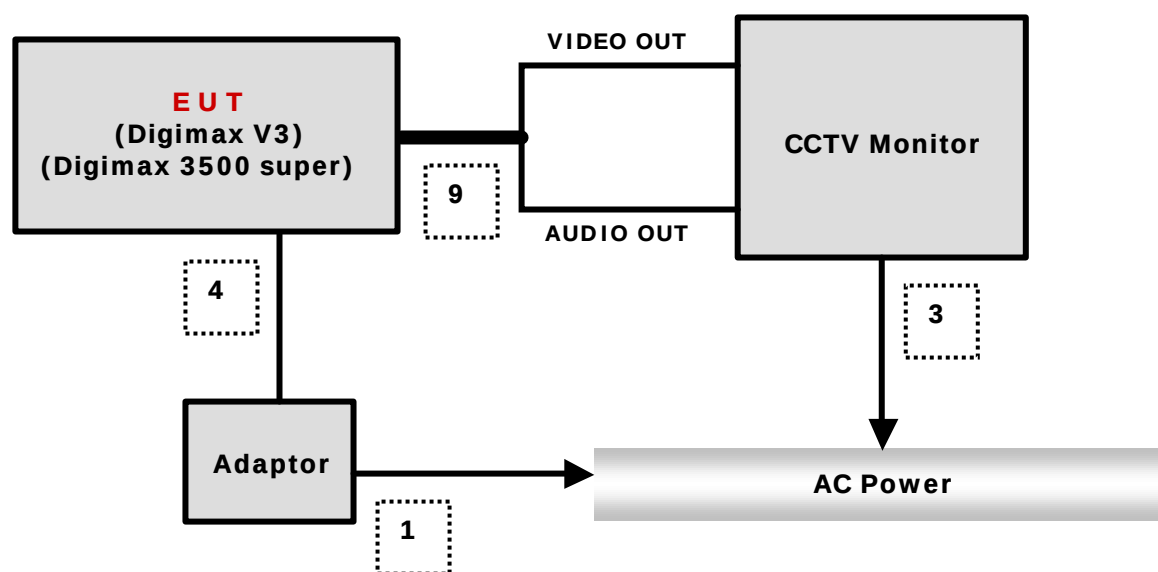
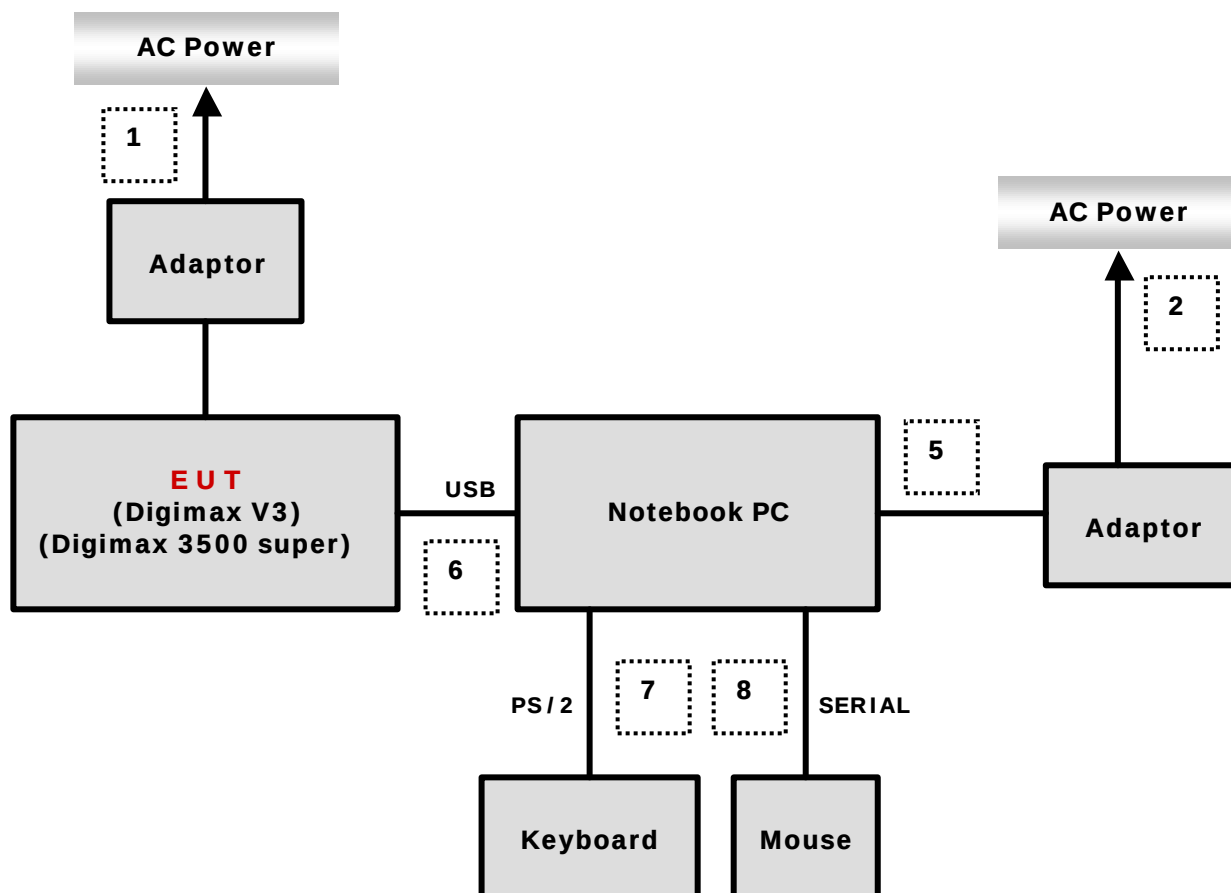
The requirements are:

- ☒ MET minimum margin is 3.56 dB (uV/m) at 473.32 MHz  
☐ NOT MET limit exceeded by maximum of \_\_\_\_ dB(uV/m) at \_\_\_\_ MHz  
☐ NOT APPLICABLE

### Remarks

See Appendix A for test data

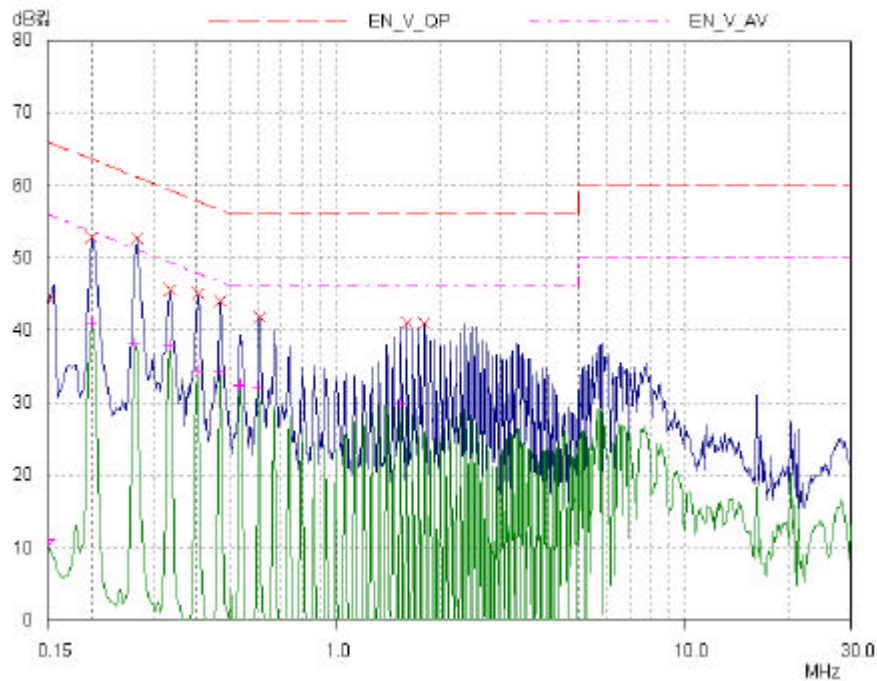
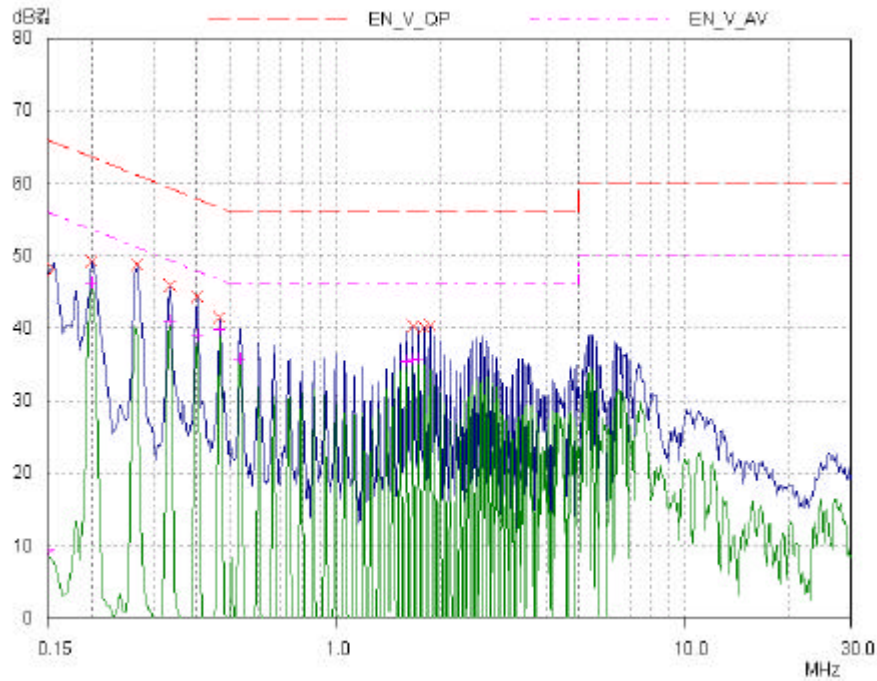
## Configuration



## APPENDIX A – TEST DATA

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

| Frequency<br><br>[MHz] | Correction<br>Factor |       | Line | Quasi-peak |         |        |        | Average |         |        |        |
|------------------------|----------------------|-------|------|------------|---------|--------|--------|---------|---------|--------|--------|
|                        |                      |       |      | Limit      | Reading | Result | Margin | Limit   | Reading | Result | Margin |
|                        | LISN                 | Cable |      | [dBuV]     | [dBuV]  | [dBuV] | [dB]   | [dBuV]  | [dBuV]  | [dBuV] | [dB]   |
| 0.15                   | 2.2                  | 0.1   | H    | 66.0       | 46.6    | 48.9   | 17.1   | 56.0    | 5.3     | 7.6    | 48.4   |
| 0.20                   | 1.7                  | 0.1   | N    | 63.6       | 50.9    | 52.7   | 10.9   | 53.6    | 39.1    | 40.9   | 12.7   |
| 0.26                   | 0.8                  | 0.1   | N    | 61.4       | 48.7    | 49.6   | 11.8   | 51.4    | 37.0    | 37.9   | 13.5   |
| 0.27                   | 0.8                  | 0.1   | N    | 61.1       | 51.6    | 52.5   | 8.6    | 51.1    | 36.0    | 36.9   | 14.2   |
| 0.33                   | 0.7                  | 0.1   | H    | 59.5       | 45.1    | 45.9   | 13.6   | 49.5    | 40.0    | 40.8   | 8.7    |
| 0.40                   | 0.6                  | 0.1   | H    | 57.9       | 43.6    | 44.3   | 13.6   | 47.9    | 38.2    | 38.9   | 9.0    |
| 0.60                   | 0.5                  | 0.1   | N    | 56.0       | 40.8    | 41.4   | 14.6   | 46.0    | 31.5    | 32.1   | 13.9   |
| 1.53                   | 0.3                  | 0.1   | N    | 56.0       | 40.0    | 40.4   | 15.6   | 46.0    | 29.4    | 29.8   | 16.2   |
| 1.60                   | 0.3                  | 0.1   | N    | 56.0       | 40.5    | 40.9   | 15.1   | 46.0    | 28.8    | 29.2   | 16.8   |
| 1.66                   | 0.3                  | 0.1   | H    | 56.0       | 39.8    | 40.2   | 15.8   | 46.0    | 35.0    | 35.4   | 10.6   |
| 1.80                   | 0.3                  | 0.1   | N    | 56.0       | 40.5    | 40.9   | 15.1   | 46.0    | 25.4    | 25.8   | 20.2   |
| 2.33                   | 0.3                  | 0.1   | N    | 56.0       | 40.3    | 40.7   | 15.3   | 46.0    | 28.4    | 28.8   | 17.2   |
| 5.26                   | 0.3                  | 0.1   | H    | 60.0       | 38.2    | 38.6   | 21.4   | 50.0    | 33.1    | 33.5   | 16.5   |
| 5.33                   | 0.3                  | 0.1   | H    | 60.0       | 39.0    | 39.4   | 20.6   | 50.0    | 33.8    | 34.2   | 15.8   |
| 5.39                   | 0.3                  | 0.1   | H    | 60.0       | 38.4    | 38.8   | 21.2   | 50.0    | 33.9    | 34.3   | 15.7   |
| 5.46                   | 0.3                  | 0.1   | H    | 60.0       | 37.8    | 38.2   | 21.8   | 50.0    | 32.9    | 33.3   | 16.7   |
| 5.53                   | 0.3                  | 0.1   | H    | 60.0       | 37.8    | 38.2   | 21.8   | 50.0    | 32.4    | 32.8   | 17.2   |
| 5.80                   | 0.3                  | 0.1   | N    | 60.0       | 44.6    | 45.0   | 15.0   | 50.0    | 27.9    | 28.3   | 21.7   |



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| 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 |                      |                      |                |
| 78.63              | 8.8                   | V    | 1.0           | 8.10                 | 1.70  | 30.0                 | 18.64                | 11.36          |
| 101.64             | 7.0                   | V    | 1.0           | 9.35                 | 1.90  | 30.0                 | 18.23                | 11.77          |
| 135.38             | 8.4                   | V    | 1.0           | 8.40                 | 2.30  | 30.0                 | 19.13                | 10.87          |
| 202.84             | 8.4                   | H    | 4.0           | 7.35                 | 2.80  | 30.0                 | 18.53                | 11.47          |
| 213.61             | 7.5                   | H    | 4.0           | 7.80                 | 2.90  | 30.0                 | 18.16                | 11.84          |
| 216.35             | 7.7                   | H    | 4.0           | 7.95                 | 2.90  | 30.0                 | 18.53                | 11.47          |
| 473.32             | 14.0                  | H    | 3.2           | 15.00                | 4.40  | 37.0                 | 33.44                | 3.56           |
| 648.31             | 8.6                   | H    | 3.7           | 17.80                | 5.50  | 37.0                 | 31.89                | 5.11           |
| 756.84             | 7.2                   | H    | 3.8           | 19.00                | 6.10  | 37.0                 | 32.32                | 4.68           |
| 811.00             | 6.9                   | H    | 3.0           | 19.60                | 6.60  | 37.0                 | 33.08                | 3.92           |
| 919.57             | 3.1                   | V    | 2.2           | 20.80                | 6.70  | 37.0                 | 30.64                | 6.36           |
| 972.00             | 4.9                   | H    | 3.5           | 21.10                | 7.00  | 37.0                 | 33.01                | 3.99           |