

FCC PART 15.109
MEASUREMENT AND TEST REPORT
FOR

Hafeke GmbH & Co KG

Adolf-Hafele-Strasse 1, D-72202 Nagold, Germany

FCC ID: W7CELLIPTAUSB

| | |
|--|---|
| Report Concerns: Original Report | Equipment Type: Universal post base |
| Model: | <u>818.10.910</u> |
| Report No.: | <u>STR09038010I</u> |
| Test/Witness Engineer: | <u>Seven Song</u> |
| Test Date: | <u>2009-03-03 to 2009-03-07</u> |
| Issue Date: | <u>2009-03-10</u> |
| Prepared By: | SEM.Test Compliance Service Co., Ltd. 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C. (518101) |
| Approved & Authorized By: |  _____ Jandy So / PSQ Manager |

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by SEM.Test Compliance Service Co., Ltd.

TABLE OF CONTENTS

| | |
|---|-----------|
| 1. GENERAL INFORMATION..... | 3 |
| 1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)..... | 3 |
| 1.2 TEST STANDARDS..... | 3 |
| 1.3 RELATED SUBMITTAL(S)/GRANT(S) | 3 |
| 1.4 TEST METHODOLOGY | 4 |
| 1.5 TEST FACILITY | 4 |
| 1.6 EUT EXERCISE SOFTWARE | 4 |
| 1.7 ACCESSORIES EQUIPMENT LIST AND DETAILS | 4 |
| 1.8 EUT CABLE LIST AND DETAILS | 4 |
| 2. SUMMARY OF TEST RESULTS | 5 |
| 3. §15.107 (A)- CONDUCTED EMISSION | 6 |
| 3.1 MEASUREMENT UNCERTAINTY | 6 |
| 3.2 TEST EQUIPMENT LIST AND DETAILS | 6 |
| 3.3 TEST PROCEDURE..... | 6 |
| 3.4 BASIC TEST SETUP BLOCK DIAGRAM..... | 6 |
| 3.5 ENVIRONMENTAL CONDITIONS | 7 |
| 3.6 TEST RECEIVER SETUP | 7 |
| 3.7 SUMMARY OF TEST RESULTS/PLOTS | 7 |
| 3.7 CONDUCTED EMISSIONS TEST DATA..... | 7 |
| 4. §15.109(A)- RADIATED EMISSION | 10 |
| 4.1 MEASUREMENT UNCERTAINTY | 10 |
| 4.2 TEST EQUIPMENT LIST AND DETAILS | 10 |
| 4.3 TEST PROCEDURE..... | 10 |
| 4.4 TEST RECEIVER SETUP | 11 |
| 4.5 CORRECTED AMPLITUDE & MARGIN CALCULATION..... | 11 |
| 4.6 ENVIRONMENTAL CONDITIONS | 11 |
| 4.7 SUMMARY OF TEST RESULTS/PLOTS | 11 |

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

| | |
|--------------------------|--|
| Applicant: | Hafele GmbH & Co KG |
| Address of applicant: | Adolf-Hafele-Strasse 1, D-72202 Nagold, Germany |
| Manufacturer: | Telehof Electronics Instruments & Equipment (Shenzhen) Co., Ltd. |
| Address of manufacturer: | Section 1, 6/F., Building 207, Nanyou 2nd Industrial Estate, Nanshan District, Shenzhen, China |

General Description of E.U.T

| Items | Description |
|---|--|
| EUT Description: | Universal post base |
| Trade Name: | Ellipta |
| Model No.: | 818.10.910 |
| Adding Models: | 818.10.912, 818.10.914, 818.10.710, 818.10.712 818.10.714, 818.10.310, 818.10.312, 818.10.314 |
| Rated Voltage: | USB 5V |
| Rated Current: | 1 A |
| EUT Size: | 28.0X11.0X11.0 cm (Short) 56.0X11.0X11.0 cm (Long) |
| For more information refer to the circuit diagram form and the user's manual. | |

The test data is gathered from a production sample, provided by the manufacturer. Test is carried out with 818.10.910 since the other models listed in this report are different appearance without circuit and electronic construction changed, declared by the manufacture.

1.2 Test Standards

The following report is prepared on behalf of the Hafele GmbH & Co KG in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15.107, and 15.109 rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which results in lowering the emission/immunity, should be checked to ensure compliance has been maintained.

1.3 Related Submittal(s)/Grant(s)

No Related Submittal(s).

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

The equipment under test (EUT) was configured to measure its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the Operating Instructions.

1.5 Test Facility

FCC – Registration No.: **994117**

SEM.Test Compliance Services Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 994117.

Industry Canada (IC) Registration No.: **7673A**

The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

1.6 EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the system components. The test software, provided by the customer, is started while the EUT is on to simulate the normal work. under the Windows XP terminal.

1.7 Accessories Equipment List and Details

| Manufacturer | Description | Model | Serial Number |
|--------------|-------------|------------|---------------|
| IBM | Notebook | T22 | LV14893 |
| TP-LINK | Modem | TM-EC5658V | KT99CTQC-508 |
| Lenovo | Printer | 3110 | OD65133711480 |

1.8 EUT Cable List and Details

| Cable Description | Length (M) | Shielded/Unshielded | With Core/Without Core |
|-------------------|------------|---------------------|------------------------|
| USB Cable | 1.5 | Shielded | With Core |

2. SUMMARY OF TEST RESULTS

| Description of Test | Result |
|--------------------------------|-----------|
| §15.107 (a) Conducted Emission | Compliant |
| §15.109(a) Radiated Emission | Compliant |

3. §15.107 (a)- CONDUCTED EMISSION

3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 1.5 dB.

3.2 Test Equipment List and Details

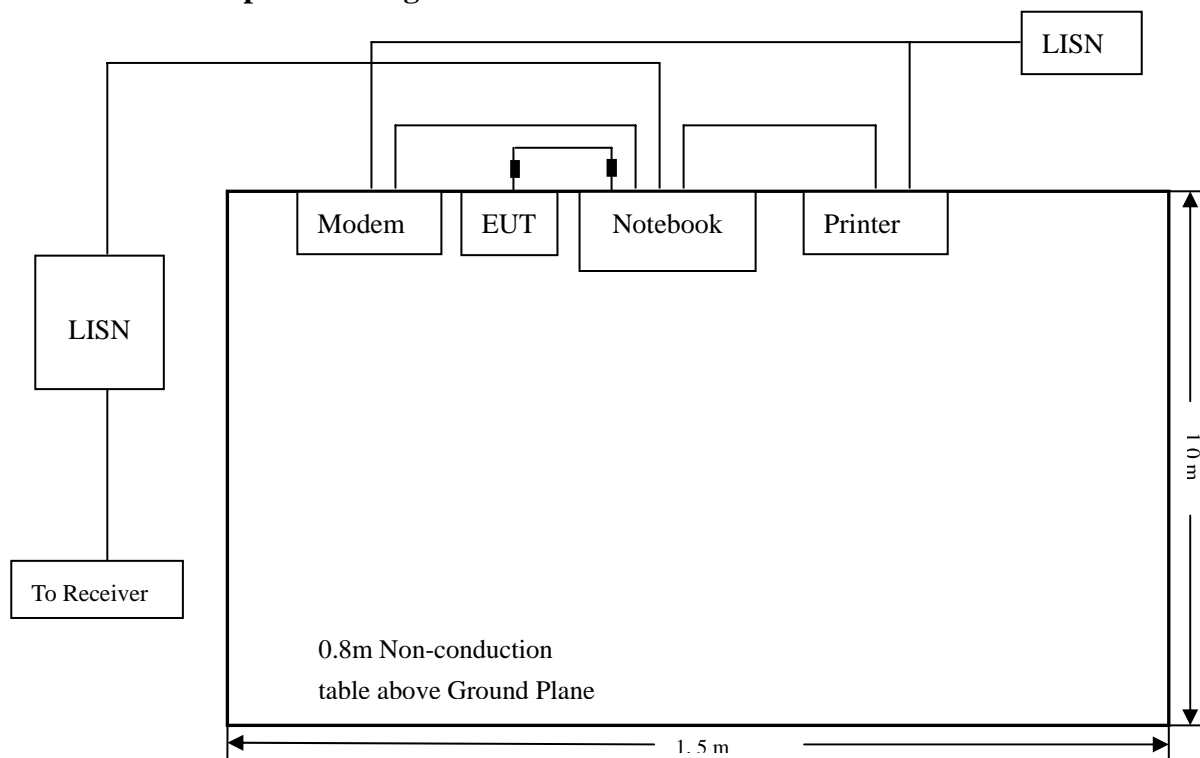
| Description | Manufacturer | Model | Serial Number | Cal. Date | Due. Date |
|-------------------|-----------------|----------|---------------|------------|------------|
| EMI Test Receiver | Rohde & Schwarz | ESPI | 101611 | 2008-07-08 | 2009-07-07 |
| L.I.S.N | Schwarz beck | NSLK8126 | 8126-224 | 2008-07-08 | 2009-07-07 |
| Pulse Limiter | Rohde & Schwarz | ESH3-Z2 | 100911 | 2008-07-08 | 2009-07-07 |
| AMN | Rohde & Schwarz | ESH3-Z5 | 828304/014 | 2008-07-08 | 2009-07-07 |

3.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.107 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.

3.4 Basic Test Setup Block Diagram



3.5 Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 25 °C |
| Relative Humidity: | 52% |
| ATM Pressure: | 1012 mbar |

3.6 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency 150 kHz
 Stop Frequency..... 30 MHz
 Sweep Speed Auto
 IF Bandwidth..... 10 kHz
 Quasi-Peak Adapter Bandwidth 9 kHz
 Quasi-Peak Adapter Mode Normal

3.7 Summary of Test Results/Plots

According to the data in section 3.8, the EUT complied with the FCC 15B Conducted margin for a Class B device, with the *worst* margin reading of:

-9.67 dB μ V at 0.210 MHz in the Neutral, Peak detector, 0.15-30MHz

3.7 Conducted Emissions Test Data

| LINE CONDUCTED EMISSIONS | | | | FCC 15.107 | |
|--------------------------|------------|-----------|--------------|------------|--------|
| Frequency | Amplitude | Detector | Phase | Limit | Margin |
| MHz | dB μ V | QP/Ave/Pk | Line/Neutral | dB μ V | dB |
| 0.210 | 53.44 | Pk | Neutral | 63.11 | -9.67 |
| 0.210 | 42.57 | Ave | Neutral | 53.20 | -10.63 |
| 0.174 | 53.30 | Pk | Line | 64.76 | -11.46 |
| 4.090 | 33.69 | Ave | Line | 45.99 | -12.30 |
| 0.634 | 32.98 | Ave | Neutral | 45.99 | -13.01 |
| 0.282 | 37.38 | Ave | Line | 50.75 | -13.37 |
| 4.798 | 32.13 | Ave | Neutral | 46.00 | -13.87 |
| 0.634 | 31.80 | Ave | Line | 46.00 | -14.20 |
| 1.342 | 29.27 | Ave | Neutral | 45.99 | -16.72 |
| 0.986 | 29.26 | Ave | Line | 45.99 | -16.73 |
| 7.122 | 32.81 | Ave | Line | 49.99 | -17.18 |
| 7.902 | 32.45 | Ave | Neutral | 49.99 | -17.54 |
| 3.594 | 38.05 | Pk | Line | 55.99 | -17.94 |
| 4.658 | 37.57 | Pk | Neutral | 55.99 | -18.42 |
| 0.390 | 39.31 | Pk | Line | 58.05 | -18.74 |

Emission attenuated more than 20dB of the limit is not reported.

Plot of Conducted Emissions Test Data

Conducted Disturbance

EUT: Universal post base

M/N: 818.10.910

Operating Condition: Reading and Writing

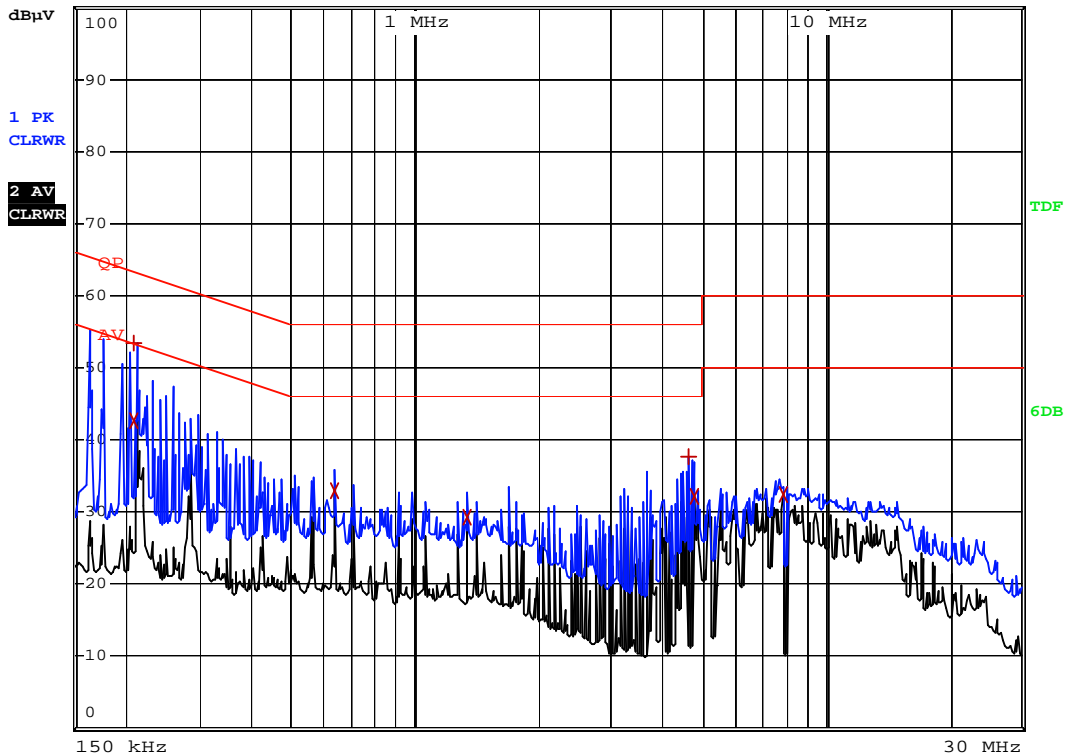
Test Specification: N

Comment: 120V/60Hz; USB 5V



RBW 9 kHz
MT 4 ms

Att 10 dB AUTO



Plot of Conducted Emissions Test Data

Conducted Disturbance

EUT: Universal post base

M/N: 818.10.910

Operating Condition: Reading and Writing

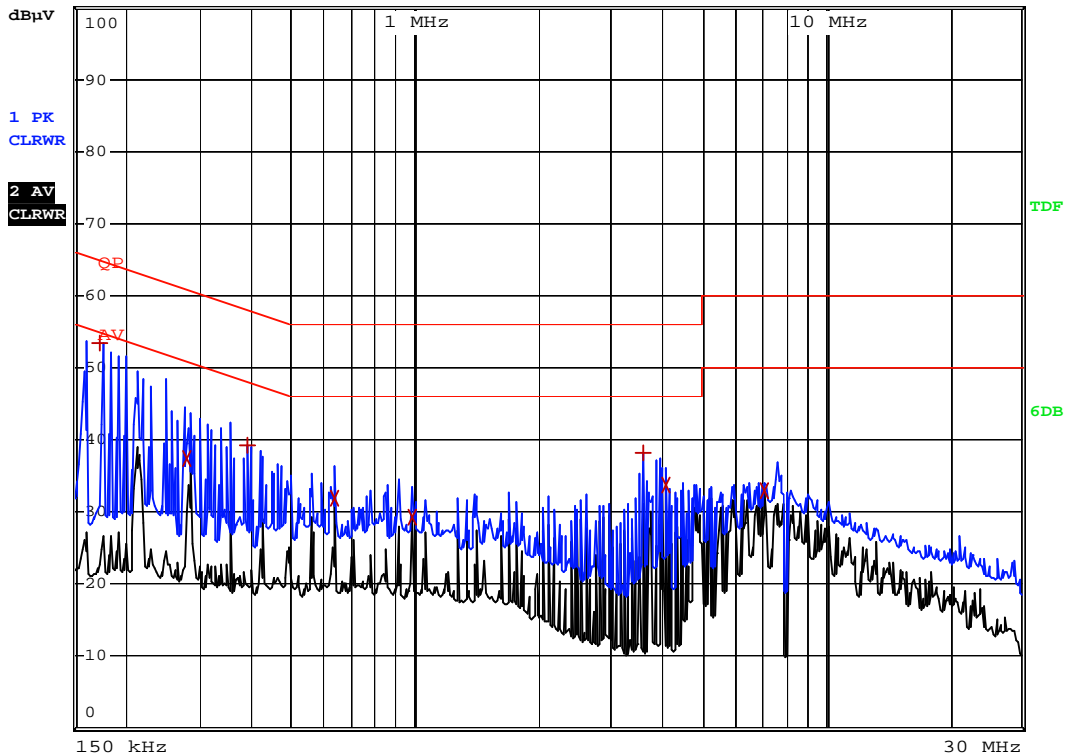
Test Specification: L

Comment: 120V/60Hz; USB 5V



RBW 9 kHz
MT 4 ms

Att 10 dB AUTO



4. §15.109(a)- RADIATED EMISSION

4.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 3.0 dB.

4.2 Test Equipment List and Details

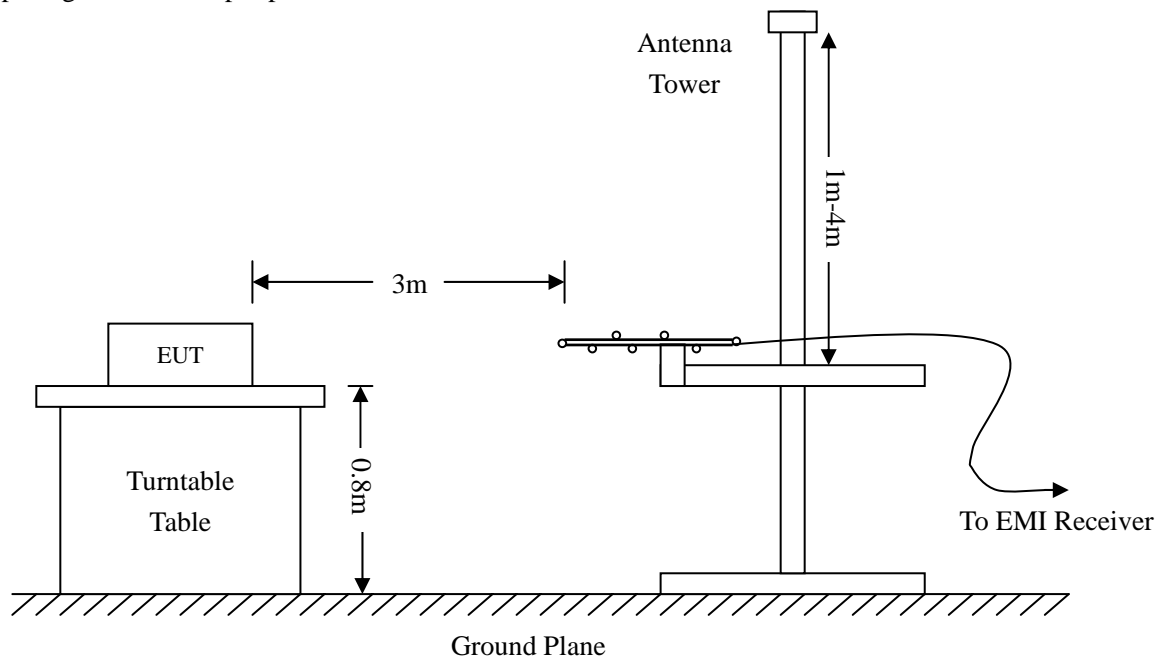
| Manufacturer | Description | Model | Serial Number | Cal. Date | Due. Date |
|--------------------------|---------------|-----------|---------------|------------|------------|
| Spectrum Analyzer | ROHDE&SCHWARZ | FSEA20 | DE25181 | 2008-07-08 | 2009-07-07 |
| Positioning Controller | C&C | CC-C-1F | N/A | 2008-07-08 | 2009-07-07 |
| Trilog Broadband Antenna | SCHWARZBECK | VULB9163 | 9163-333 | 2008-07-08 | 2009-07-07 |
| Horn Antenna | SCHWARZBECK | BBHX 9120 | 9120-426 | 2008-07-08 | 2009-07-07 |
| RF Switch | EM | EMSW18 | SW060023 | 2008-07-08 | 2009-07-07 |
| Amplifier | Agilent | 8447F | 3113A06717 | 2008-07-08 | 2009-07-07 |
| Coaxial Cable | SCHWARZBECK | AK9513 | 9513-10 | 2008-07-08 | 2009-07-07 |
| EMI Test Receiver | ROHDE&SCHWARZ | ESPI | 25498514 | 2008-07-08 | 2009-07-07 |

4.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.205 and FCC Part 15.109 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



4.4 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency 30 MHz
Stop Frequency..... 1000 MHz
Sweep Speed Auto
IF Bandwidth..... 10 kHz
Quasi-Peak Adapter Bandwidth 120 kHz
Quasi-Peak Adapter Mode Normal

4.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15B Limit}$$

4.6 Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 25 °C |
| Relative Humidity: | 54% |
| ATM Pressure: | 1011 mbar |

4.7 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC 15B Class B standards, and had the worst margin of:

-5.26 dBμV at 300.6988MHz in the Horizontal polarization, 30 MHz to 1 GHz, 3Meters

Plot of Radiation Emissions Test Data

Radiated Disturbance

EUT: Universal post base

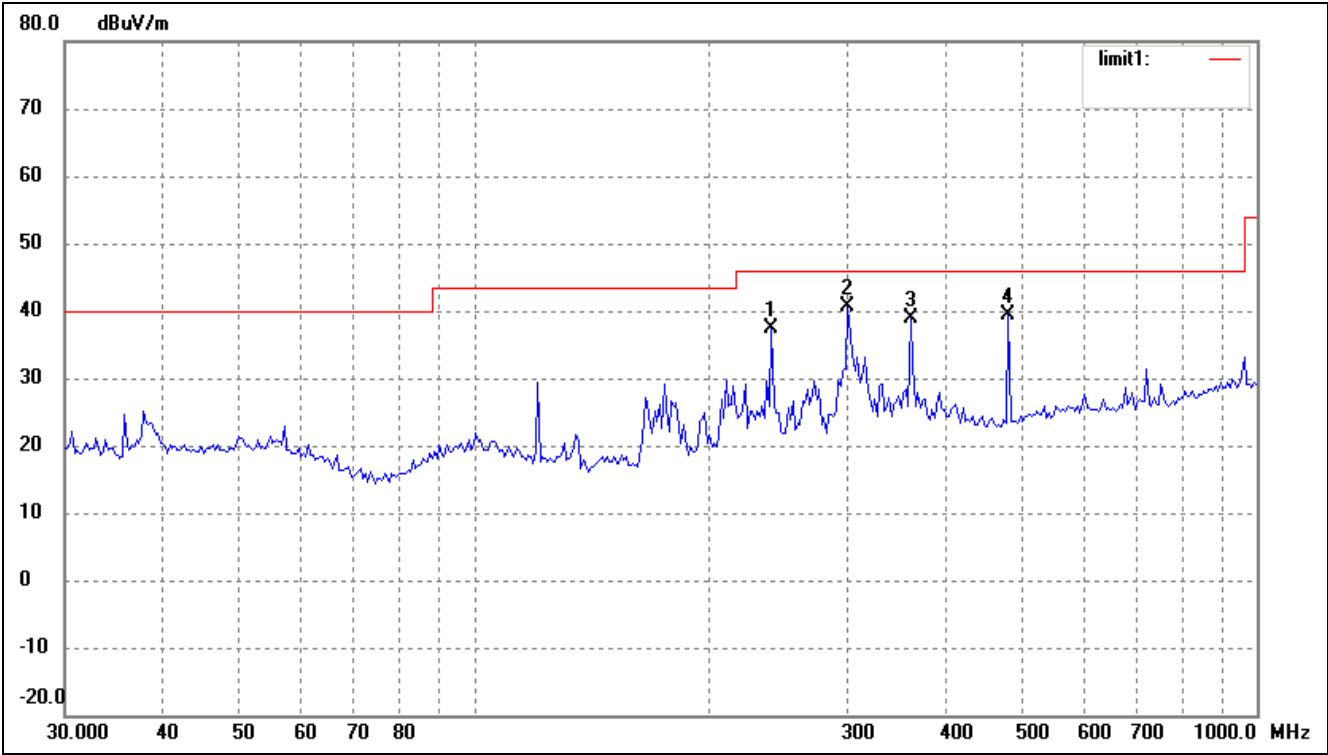
M/N: 818.10.910

Operating Condition: Reading and Writing

Test Specification: Horizontal & Vertical

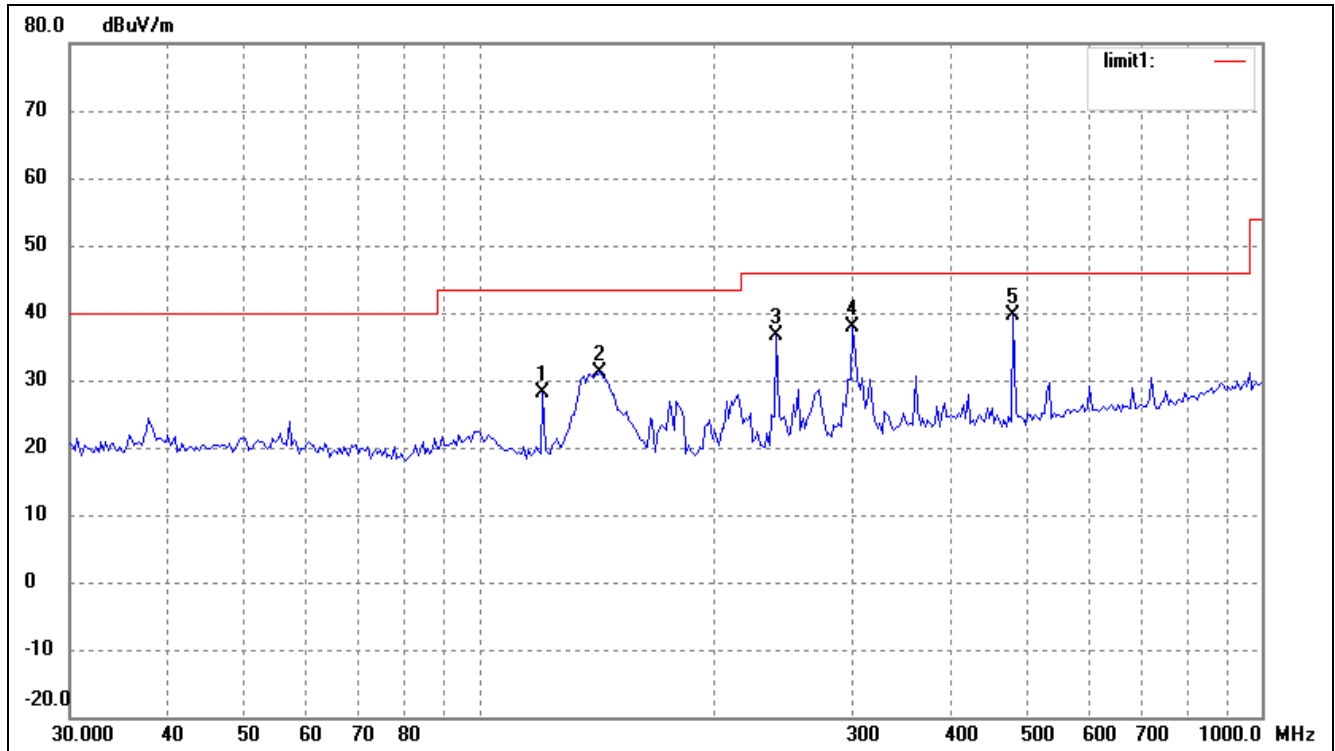
Comment: AC 120V/60Hz connect to PC, USB 5V

Horizontal



| No. | Frequency | Reading | Correct | Result | Limit | Margin | Degree | Height | Remark |
|-----|-----------|----------|------------|----------|----------|--------|--------|--------|--------|
| | (MHz) | (dBuV/m) | Factor(dB) | (dBuV/m) | (dBuV/m) | (dB) | (°) | (cm) | |
| 1 | 240.1442 | 29.87 | 7.44 | 37.31 | 46.00 | -8.69 | 113 | 100 | peak |
| 2 | 300.6988 | 32.08 | 8.66 | 40.74 | 46.00 | -5.26 | 298 | 110 | QP |
| 3 | 360.9775 | 29.15 | 9.66 | 38.81 | 46.00 | -7.19 | 317 | 200 | peak |
| 4 | 481.5112 | 29.22 | 10.09 | 39.31 | 46.00 | -6.69 | 10 | 100 | peak |

Vertical



| No. | Frequency (MHz) | Reading (dBuV/m) | Correct Factor(dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Degree (°) | Height (cm) | Remark |
|-----|--------------------|---------------------|-----------------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| 1 | 120.6118 | 23.01 | 5.19 | 28.20 | 43.50 | -15.30 | 34 | 100 | peak |
| 2 | 142.7692 | 28.01 | 3.24 | 31.25 | 43.50 | -12.25 | 278 | 100 | peak |
| 3 | 240.1442 | 29.18 | 7.44 | 36.62 | 46.00 | -9.38 | 129 | 200 | peak |
| 4 | 300.6988 | 29.24 | 8.66 | 37.90 | 46.00 | -8.10 | 52 | 100 | peak |
| 5 | 481.5112 | 29.64 | 10.09 | 39.73 | 46.00 | -6.27 | 95 | 100 | peak |

***** END OF REPORT *****