

APPLICATION FOR CERTIFICATION  
On Behalf of

Avnera Corporation

AM1G USB SENDER

Model Number: AVRB7101A

FCC ID: V3CAVRB7101A

Prepared for : Avnera Corporation  
16505 NW Bethany Court, Suite 100 Beaverton, Oregon  
97006, United States

Prepared By : Audix Technology (Shenzhen) Co., Ltd.  
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Report Number : ACS-F08398  
Date of Test : Aug.26~27, 2008  
Date of Report : Sep.22, 2008

## TABLE OF CONTENTS

| Description   | Page       |
|---|------------|
| <b>1. SUMMARY OF STANDARDS AND RESULTS .....</b>                  | <b>1-1</b> |
| 1.1. Description of Standards and Results.....                    | 1-1        |
| <b>2. GENERAL INFORMATION.....</b>                                | <b>2-1</b> |
| 2.1. Description of Device (EUT) .....                            | 2-1        |
| 2.2. Tested Supporting System Details .....                       | 2-2        |
| 2.3. Test Facility.....   | 2-3        |
| 2.4. Measurement Uncertainty .....                                | 2-3        |
| <b>3. POWER LINE CONDUCTED EMISSION TEST .....</b>                | <b>3-1</b> |
| 3.1. Test Equipments.....   | 3-1        |
| 3.2. Block Diagram of Test Setup .....                            | 3-1        |
| 3.3. Power Line Conducted Emission Test Limits .....              | 3-1        |
| 3.4. Configuration of EUT on Test .....                           | 3-1        |
| 3.5. Operating Condition of EUT.....                              | 3-2        |
| 3.6. Test Procedure.....  | 3-2        |
| 3.7. Power Line Conducted Emission Test Results.....              | 3-2        |
| <b>4. RADIATED EMISSION TEST .....</b>                            | <b>4-1</b> |
| 4.1. Test Equipment .....   | 4-1        |
| 4.2. Block Diagram of Test Setup .....                            | 4-1        |
| 4.3. Radiated Emission Limit.....                                 | 4-2        |
| 4.4. EUT Configuration on Test.....                               | 4-2        |
| 4.5. Operating Condition of EUT.....                              | 4-3        |
| 4.6. Test Procedure.....  | 4-3        |
| 4.7. Radiated Emission Test Results .....                         | 4-3        |
| <b>5. DEVIATION TO TEST SPECIFICATIONS .....</b>                  | <b>5-1</b> |
| <b>6. PHOTOGRAPH OF TEST .....</b>                                | <b>6-1</b> |
| 6.1. Photos of Power Line Conducted Emission Test .....           | 6-1        |
| 6.2. Photos of Radiated Emission Test (In Anechoic Chamber) ..... | 6-2        |
| <b>7. PHOTOGRAPH OF EUT .....</b>                                 | <b>7-1</b> |

## TEST REPORT CERTIFICATION

Applicant : Avnera Corporation  
 Manufacturer : Beautiful Enterprise Co., Ltd  
 EUT Description : AM1G USB SENDER  
 FCC ID : V3CAVRB7101A  
 (A) MODEL NO. : AVR B7101A  
 (B) SERIAL NO. : N/A  
 (C) POWER SUPPLY : DC 5V  
 (D) TEST VOLTAGE : DC 5V From PC AC 120V/60Hz

## Test Procedure Used:

FCC Rules and Regulations Part 15 Subpart B Class B 2007, ANSI C63.4-2003

The device described above is tested by Audix Technology (Shenzhen) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B Class B limits for radiated and conducted emissions. The test results are contained in this test report and Audix Technology (Shenzhen) Co., Ltd. is assumed full responsibility for the accuracy and completeness of tests. Also, this report shows that EUT is technically compliant with FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shenzhen) Co., Ltd.

Date of Test : Aug. 26~27, 2008

Prepared by :

Yo Yo Wang

Yo Yo Wang / Assistant

Reviewer :

Jamy Yu

Jamy Yu / Senior Engineer

Approved & Authorized Signer :



Ken Lu / Deputy Manager

## 1. SUMMARY OF STANDARDS AND RESULTS

### 1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

| EMISSION                           |                                       |         |         |
|------------------------------------|---------------------------------------|---------|---------|
| Description of Test Item           | Standard                              | Limits  | Results |
| Power Line Conducted Emission Test | FCC Part 15: 2006<br>ANSI C63.4: 2003 | Class B | PASS    |
| Radiated Emission Test             | FCC Part 15: 2006<br>ANSI C63.4: 2003 | Class B | PASS    |

## 2. GENERAL INFORMATION

### 2.1. Description of Device (EUT)

Description : AM1G USB SENDER

Model Number : AVR7101A

FCC ID : V3CAVRB7101A

Applicant : Avnera Corporation  
16505 NW Bethany Court, Suite 100 Beaverton, Oregon  
97006, United States

Manufacturer : Beautiful Enterprise Co., Ltd  
26th Floor, Beautiful Group Tower, 77 Connaught Road  
Central, Hong Kong

Date of Test : Aug.26~27, 2008

Date of Receipt : Aug.24, 2008

Sample Type : Prototype production

## 2.2. Tested Supporting System Details

### 2.2.1.NOTEBOOK

|               |   |  |
|---------------|---|--|
| M/N           | : | PP09S  |
| S/N           | : | N/A  |
| Manufacturer  | : | DELL   |
| FCC           | : | By DoC   |
| Power Adaptor | : | Manufacturer: DELL,<br>M/N: LA65NS1-00<br>Cable: Unshielded, Detachable, 4.0m<br>(Bond one ferrite core) |

### 2.2.2.HDD

|              |   |                            |
|--------------|---|----------------------------|
| EMC CODE     | : | ACS-EMC-HDD03              |
| M/N          | : | F12-UF                     |
| S/N          | : | A0100215-5390030           |
| Manufacturer | : | Terasys                    |
| Data Cable   | : | Shielded, Detachable, 1.8m |
| FCC ID       | : | By DoC                     |
| BSMI ID      | : | 4912A022                   |

### 2.2.3.iPod

|              |   |                            |
|--------------|---|----------------------------|
| EMC CODE     | : | ACS-EMC-IP03               |
| M/N          | : | A1199                      |
| S/N          | : | YM711H3LVQ5                |
| Manufacturer | : | APPLE                      |
| Data Cable   | : | Shielded, Detachable, 1.0m |
| FCC ID       | : | By DoC                     |
| BSMI ID      | : | R33057                     |

### 2.3. Test Facility

|                           |   |
|---------------------------|---|
| Site Description          |   |
| Name of Firm              | : Audix Technology (Shenzhen) Co., Ltd.<br>No. 6, Ke Feng Rd., 52 Block, Shenzhen<br>Science & Industrial Park, Nantou,<br>Shenzhen, Guangdong, China |
| 3m Anechoic Chamber       | : Jun. 13, 2006 File on Federal<br>Communication Commission<br>Registration Number: 90454   |
| 3m & 10m Anechoic Chamber | : Jan. 31, 2007 File on Federal<br>Communication Commission<br>Registration Number: 794232  |
| EMC Lab.                  | : Accredited by DATech, German<br>Registration Number: DAT-P-091/99-01<br>Dec. 20, 2007   |
|                           | Accredited by NVLAP, USA<br>NVLAP Code: 200372-0<br>Apr.01, 2008  |

### 2.4. Measurement Uncertainty

| No. | Item  | MU      | Remark                    |
|-----|---|---------|---------------------------|
| 1   | Uncertainty for Conducted Emission Test                   | 2.02dB  |                           |
| 2   | Uncertainty for Radiation Emission test in<br>3m chamber  | 3.44 dB | Polarize: V               |
|     |   | 3.96 dB | Polarize: H               |
| 3   | Uncertainty for Radiation Emission test in<br>10m chamber | 3.46 dB | Distance: 10m Polarize: V |
|     |   | 3.82 dB | Distance: 10m Polarize: H |
|     |   | 3.64 dB | Distance: 3m Polarize: V  |
|     |   | 4.02 dB | Distance: 3m Polarize: H  |

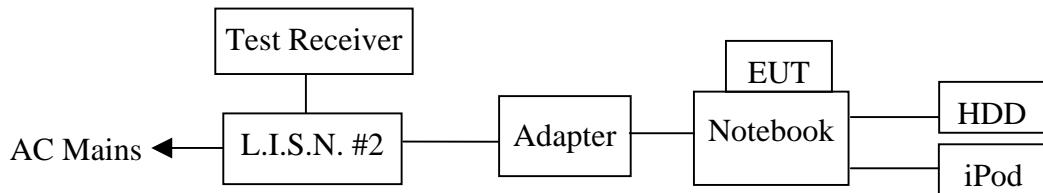
### 3. POWER LINE CONDUCTED EMISSION TEST

#### 3.1. Test Equipments

| Item | Equipment      | Manufacturer    | Model No. | Serial No.    | Last Cal.  | Cal. Interval |
|------|----------------|-----------------|-----------|---------------|------------|---------------|
| 1.   | Test Receiver  | Rohde & Schwarz | ESHS10    | 838693/001    | Dec.19, 07 | 1 Year        |
| 2.   | L.I.S.N.#2     | Kyoritsu        | KNW-407   | 8-1636-1      | May 10,08  | 1 Year        |
| 3.   | L.I.S.N.#3     | EMCO            | 3825/2    | 9006-1660     | May 10,08  | 1 Year        |
| 4.   | Terminator     | Hubersuhner     | 50Ω       | No. 1         | May 10,08  | 1 Year        |
| 5.   | RF Cable       | Fujikura        | 3D-2W     | LISN Cable 1# | Jul.08, 08 | 1/2 Year      |
| 6.   | Coaxial Switch | Anritsu         | MP59B     | M55367        | Jul.08, 08 | 1/2 Year      |
| 7.   | Pulse Limiter  | Rohde & Schwarz | ESH3-Z2   | 100340        | Jul.08, 08 | 1/2 Year      |

#### 3.2. Block Diagram of Test Setup

##### 3.2.1. Block diagram of connection between the EUT and simulators



(EUT: AM1G USB SENDER)

#### 3.3. Power Line Conducted Emission Test Limits

| Frequency       | Maximum RF Line Voltage    |                         |
|-----------------|----------------------------|-------------------------|
|                 | Quasi-Peak Level<br>dB(µV) | Average Level<br>dB(µV) |
| 150kHz ~ 500kHz | 66 ~ 56*                   | 56 ~ 46*                |
| 500kHz ~ 5MHz   | 56                         | 46                      |
| 5MHz ~ 30MHz    | 60                         | 50                      |

Notes: 1. \* Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

#### 3.4. Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

##### 3.4.1. AM1G USB SENDER (EUT)

Model Number : AVR B7101A

Serial Number : N/A

3.4.2. Support Equipment : As Tested Supporting System Detail, in Section 2.2.

### 3.5.Operating Condition of EUT

- 3.5.1.Setup the EUT and simulator as shown as Section 3.2.
- 3.5.2.Turn on the power of all equipment.
- 3.5.3.Let the EUT worked in test mode (TX mode) and measured it.

### 3.6.Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. #2).. Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4: 2003 on conducted Emission test.

The bandwidth of the R&S Test Receiver ESHS10 was set at 10kHz.

The frequency range from 150kHz to 30MHz was checked using a peak detector.

The all reading of measurement was with the Quasi-Peak detector and Average detector. (Remark: If the Average limit is met when using a Quasi-Peak detector, the Average detector is unnecessary)

EUT: AM1G USB SENDER

Model No. : AVR B7101A

Test Date: Aug.27, 2008

Temperature: 29.5°C

Humidity: 55%

The details of test modes are as follow:

| No. | Test Mode | Reference Test Data No. |    |
|-----|-----------|-------------------------|----|
|     |           | VA                      | VB |
| 1.  | TX mode   | #1                      | #2 |

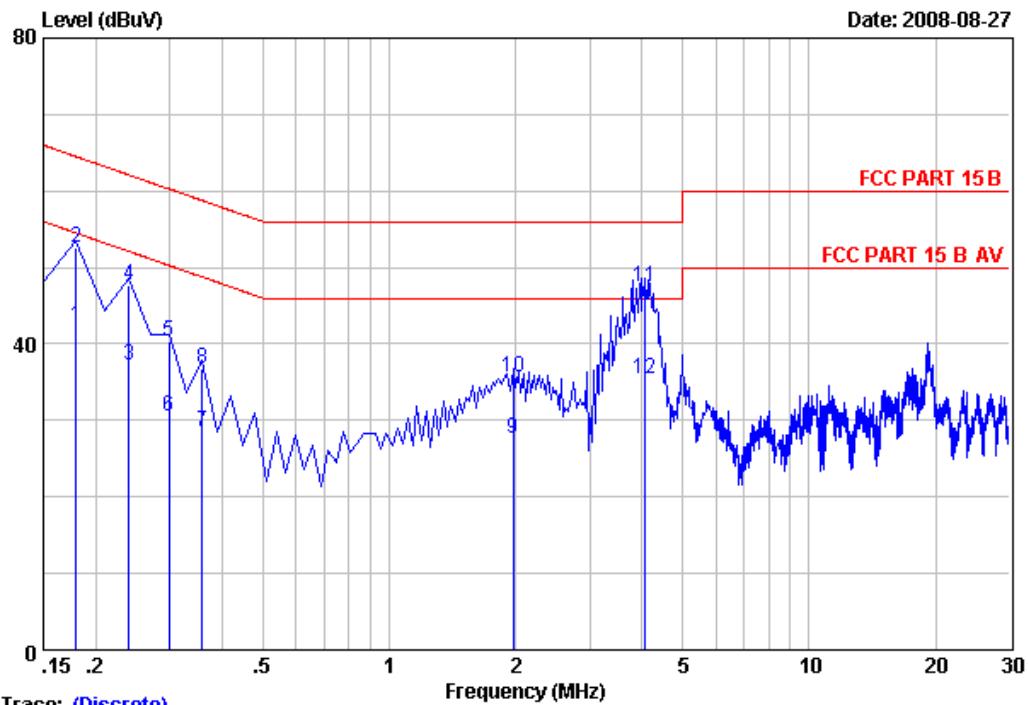
### 3.7.Power Line Conducted Emission Test Results

**PASSED**



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Data: 1 File: D:\emc 002\DATA\2008 Test Data\B\ACS8Q1367.EMI (2)



Trace: (Discrete)

Site no :Audix No.1 Conduction Data no :1  
 Dis./Ant. :-- KNW407 1# VA  
 Limit :FCC PART 15 B  
 Env./Ins. :29.5°C/55% ESHS 10 Engineer :Sunny  
 EUT :AM1G USB SENDER M/N:AVRB7101A  
 Power Rating :DC 5V From PC input AC120V/60Hz  
 Test Mode :Tx Mode

| No | Freq<br>(MHz) | LISN           | Cable        | Emission          |                 |                  | Margin<br>(dB) | Remark  |
|----|---------------|----------------|--------------|-------------------|-----------------|------------------|----------------|---------|
|    |               | Factor<br>(dB) | Loss<br>(dB) | Reading<br>(dBuV) | Level<br>(dBuV) | Limits<br>(dBuV) |                |         |
| 1  | 0.18          | 0.29           | 10.15        | 32.00             | 42.44           | 54.49            | 12.05          | Average |
| 2  | 0.18          | 0.29           | 10.15        | 42.10             | 52.54           | 64.49            | 11.95          | QP      |
| 3  | 0.24          | 0.28           | 10.15        | 26.78             | 37.21           | 52.11            | 14.90          | Average |
| 4  | 0.24          | 0.28           | 10.15        | 37.23             | 47.66           | 62.11            | 14.45          | QP      |
| 5  | 0.30          | 0.26           | 10.15        | 29.88             | 40.29           | 60.26            | 19.97          | QP      |
| 6  | 0.30          | 0.26           | 10.15        | 20.09             | 30.50           | 50.26            | 19.76          | Average |
| 7  | 0.36          | 0.24           | 10.14        | 18.20             | 28.58           | 48.75            | 20.17          | Average |
| 8  | 0.36          | 0.24           | 10.14        | 26.41             | 36.79           | 58.75            | 21.96          | QP      |
| 9  | 1.97          | 0.10           | 10.15        | 17.30             | 27.55           | 46.00            | 18.45          | Average |
| 10 | 1.97          | 0.10           | 10.15        | 25.48             | 35.73           | 56.00            | 20.27          | QP      |
| 11 | 4.06          | 0.10           | 10.18        | 37.23             | 47.51           | 56.00            | 8.49           | QP      |
| 12 | 4.06          | 0.10           | 10.18        | 25.20             | 35.48           | 46.00            | 10.52          | Average |

Remarks: 1. Emission Level=LISN Factor+Cable Loss+Reading.

2. If the average limit is met when using a quasi-peak detector.  
 the EUT shall be deemed to meet both limits and measurement  
 with average detector is unnecessary.

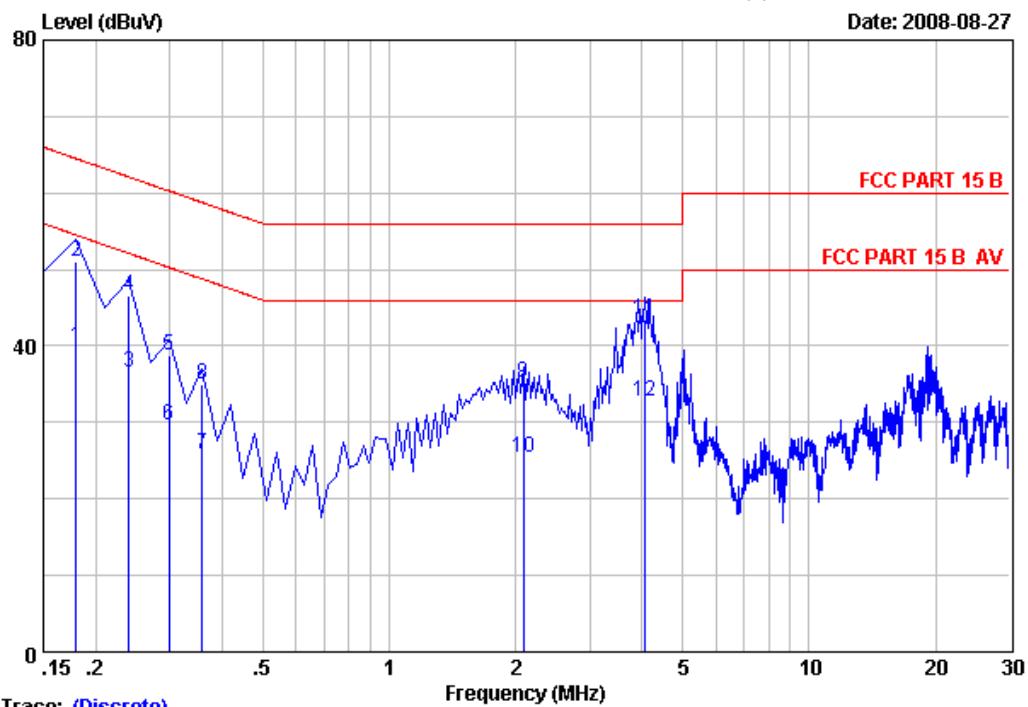


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Data: 2

File: D:\emc 002\DATA\2008 Test Data\B\ACS8Q1367.EMI (2)

Date: 2008-08-27



Trace: (Discrete)

Site no :Audix No.1 Conduction Data no :2  
 Dis./Ant. :-- KNW407 1# VB  
 Limit :FCC PART 15 B  
 Env./Ins. :29.5°C/55% ESHS 10 Engineer :Sunny  
 EUT :AM1G USB SENDER M/N:AVRB7101A  
 Power Rating :DC 5V From PC input AC120V/60Hz  
 Test Mode :Tx Mode

| No    | Freq<br>(MHz) | LISN           | Cable        | Emission          |                 |                  |                | Remark  |
|-------|---------------|----------------|--------------|-------------------|-----------------|------------------|----------------|---------|
|       |               | Factor<br>(dB) | Loss<br>(dB) | Reading<br>(dBuV) | Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) |         |
| <hr/> |               |                |              |                   |                 |                  |                |         |
| 1     | 0.18          | 0.15           | 10.15        | 29.60             | 39.90           | 54.49            | 14.59          | Average |
| 2     | 0.18          | 0.15           | 10.15        | 40.65             | 50.95           | 64.49            | 13.54          | QP      |
| 3     | 0.24          | 0.12           | 10.15        | 26.30             | 36.57           | 52.11            | 15.54          | Average |
| 4     | 0.24          | 0.12           | 10.15        | 36.41             | 46.68           | 62.11            | 15.43          | QP      |
| 5     | 0.30          | 0.14           | 10.15        | 28.59             | 38.88           | 60.26            | 21.38          | QP      |
| 6     | 0.30          | 0.14           | 10.15        | 19.30             | 29.59           | 50.26            | 20.67          | Average |
| 7     | 0.36          | 0.16           | 10.14        | 15.51             | 25.81           | 48.75            | 22.94          | Average |
| 8     | 0.36          | 0.16           | 10.14        | 24.78             | 35.08           | 58.75            | 23.67          | QP      |
| 9     | 2.09          | 0.03           | 10.15        | 24.95             | 35.13           | 56.00            | 20.87          | QP      |
| 10    | 2.09          | 0.03           | 10.15        | 15.20             | 25.38           | 46.00            | 20.62          | Average |
| 11    | 4.06          | 0.04           | 10.18        | 33.13             | 43.35           | 56.00            | 12.65          | QP      |
| 12    | 4.06          | 0.04           | 10.18        | 22.60             | 32.82           | 46.00            | 13.18          | Average |

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.

2.If the average limit is met when using a quasi-peak detector.  
the EUT shall be deemed to meet both limits and measurement  
with average detector is unnecessary.

## 4. RADIATED EMISSION TEST

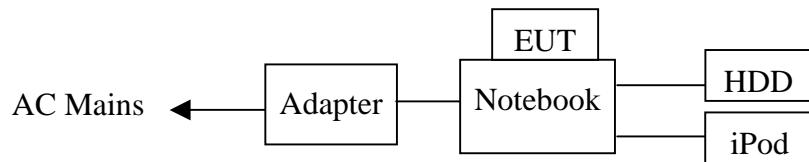
### 4.1. Test Equipment

The following test equipments are used during the radiated emission test:

| Item | Equipment      | Manufacturer    | Model No. | Serial No.      | Last Cal.  | Cal. Interval |
|------|----------------|-----------------|-----------|-----------------|------------|---------------|
| 1.   | 3#Chamber      | AUDIX           | N/A       | N/A             | Jun.09.08  | 1/2 Year      |
| 2.   | EMI Spectrum   | Agilent         | E7403A    | MY42000106      | May 10, 08 | 1 Year        |
| 3.   | Test Receiver  | Rohde & Schwarz | ESVS20    | 830350/005      | May 10, 08 | 1 Year        |
| 4.   | Amplifier      | HP              | 8447D     | 2648A04738      | Jul.08.08  | 1/2 Year      |
| 5.   | Bilog Antenna  | Schaffner       | CBL6112D  | 25237           | Feb.21, 08 | 1 Year        |
| 6.   | RF Cable       | JINGCHENG       | KLMR400   | 3# Chamber No.1 | Jul.08.08  | 1/2 Year      |
| 7.   | RF Cable       | JINGCHENG       | JBY400    | 3# Chamber No.2 | Jul.08.08  | 1/2 Year      |
| 8.   | RF Cable       | JINGCHENG       | JBY400    | 3# Chamber No.3 | Jul.08.08  | 1/2 Year      |
| 9.   | RF Cable       | JINGCHENG       | JBY400    | 3# Chamber No.4 | Jul.08.08  | 1/2 Year      |
| 10.  | Coaxial Switch | Anritsu         | MP59B     | M73989          | Jul.08.08  | 1/2 Year      |

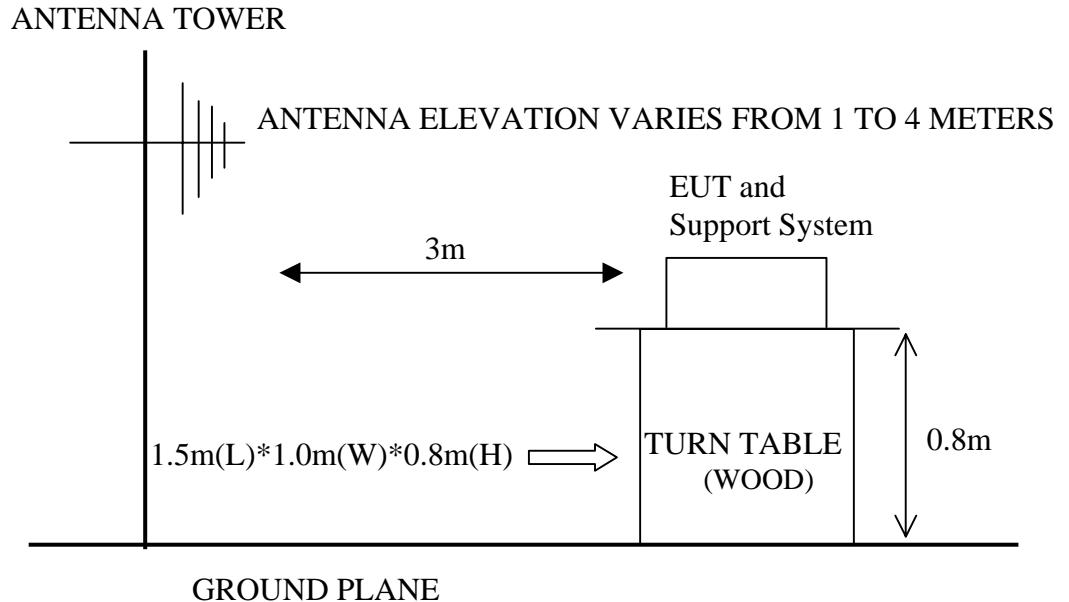
### 4.2. Block Diagram of Test Setup

#### 4.2.1. Block diagram of connection between the EUT and simulators



(EUT: AMIG USB SENDER)

#### 4.2.2.In Anechoic Chamber



#### 4.3.Radiated Emission Limit

| FREQUENCY<br>MHz | DISTANCE<br>Meters | FIELD STRENGTHS LIMIT |                |
|------------------|--------------------|-----------------------|----------------|
|                  |                    | $\mu$ V/m             | dB( $\mu$ V)/m |
| 30 ~ 88          | 3                  | 100                   | 40.0           |
| 88 ~ 216         | 3                  | 150                   | 43.5           |
| 216 ~ 960        | 3                  | 200                   | 46.0           |
| 960 ~ 1000       | 3                  | 500                   | 54.0           |

Remark :

- (1) Emission level  $\text{dB}\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$
- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

#### 4.4.EUT Configuration on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

##### 4.4.1. AM1G USB SENDER (EUT)

Model Number : AVRB7101A  
Serial Number : N/A

4.4.2. Support Equipment : As Tested Supporting System Detail, in Section 2.2.

## 4.5.Operating Condition of EUT

4.5.1.Setup the EUT and simulator as shown as Section 4.2.

4.5.2.Turn on the power of all equipment.

4.5.3.Let the EUT worked in test mode (TX mode) and measured it.

## 4.6.Test Procedure

The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4: 2003 on Radiated Emission test.

The bandwidth of the R&S Test Receiver ESVS20 was set at 120kHz. (For 30MHz to 1000MHz)

The frequency range from 30MHz to 1000MHz was pre-scanned with a peak detector and all final readings of measurement from Test Receiver are Quasi-Peak values.

For frequency range 30MHz~1000MHz, EUT with the following test modes were measured within Anechoic Chamber and all the scanning waveform were on section 4.7, which include:

Test Date: Aug.26, 2008                    Temperature: 24°C                    Humidity: 56%

The details of test modes are as follows:

| No. | Test Mode | Reference Test Data No. |          |
|-----|-----------|-------------------------|----------|
|     |           | Horizontal              | Vertical |
| 1.  | TX mode   | #2                      | #1       |

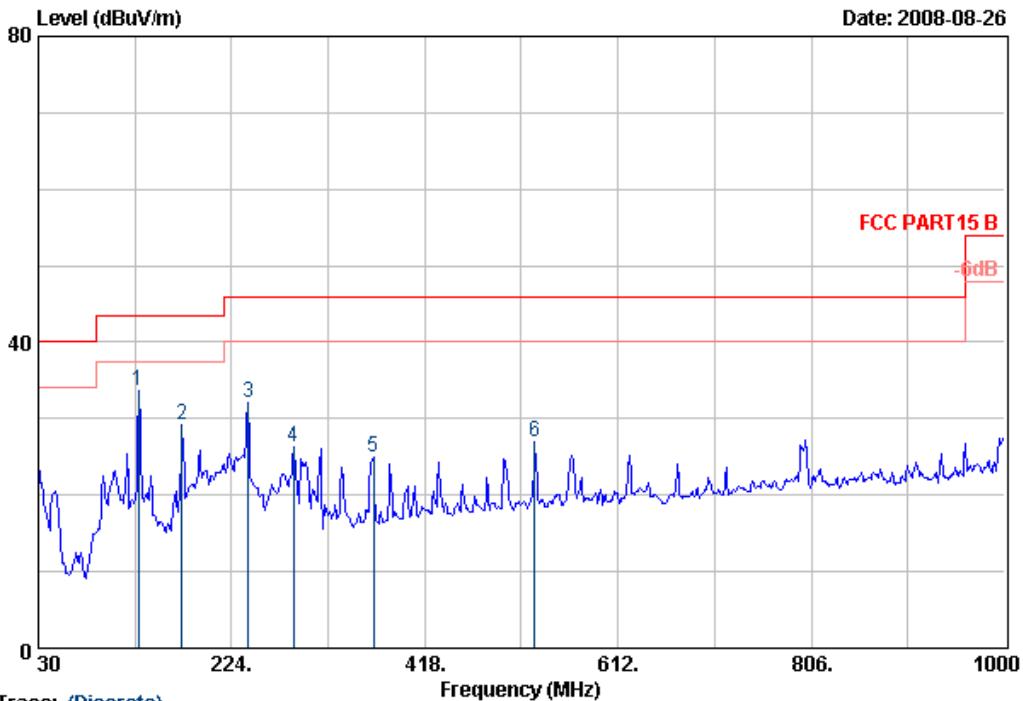
## 4.7.Radiated Emission Test Results

**PASSED**



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Data: 2 File: D:\2008 Report Data\B\ACS8Q1367.EMI (2)



Trace: (Discrete)

Site no. : 3# Chamber Radiation Data no. : 2  
 Dis. / Ant. : 3m CBL6112D Ant. pol. : HORIZONTAL  
 Limit : FCC PART15 B  
 Env. / Ins. : 24°C/56% ESVS20 Engineer : Sunny  
 EUT : AM1G USB SENDER M/N:AVRB7101A  
 Power Rating : DC 5V From PC input AC120V/60Hz  
 Test Mode : Tx Mode

| Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Emission                |                         |                          |                |        |
|----------------|--------------------------|-----------------------|-------------------------|-------------------------|--------------------------|----------------|--------|
|                |                          |                       | Reading<br>(dB $\mu$ V) | Level<br>(dB $\mu$ V/m) | Limits<br>(dB $\mu$ V/m) | Margin<br>(dB) | Remark |
| 1 130.88       | 11.09                    | 1.16                  | 21.41                   | 33.66                   | 43.50                    | 9.84           | QP     |
| 2 174.53       | 8.51                     | 1.27                  | 19.47                   | 29.25                   | 43.50                    | 14.25          | QP     |
| 3 240.49       | 10.11                    | 1.46                  | 20.42                   | 31.99                   | 46.00                    | 14.01          | QP     |
| 4 286.08       | 11.68                    | 1.55                  | 13.02                   | 26.25                   | 46.00                    | 19.75          | QP     |
| 5 366.59       | 13.42                    | 1.76                  | 9.82                    | 25.00                   | 46.00                    | 21.00          | QP     |
| 6 528.58       | 15.86                    | 2.09                  | 8.95                    | 26.90                   | 46.00                    | 19.10          | QP     |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.

2. The emission levels that are 20dB below the official limit are not reported.

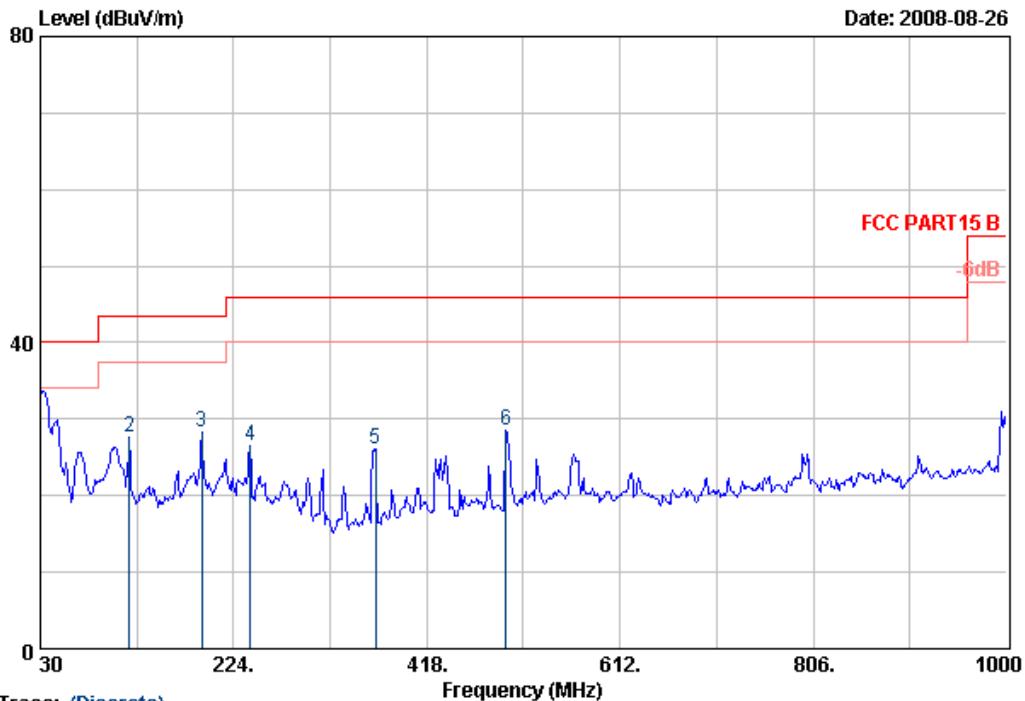
3. The worst emission was detected at 130.88MHz with corrected signal level of 33.66dB $\mu$ V/m (Limit is 43.50dB $\mu$ V/m) when the antenna was at horizontal polarization and at 1m high and the turntable was at 150°.

4. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.



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Data: 1 File: D:\2008 Report Data\B\ACS8Q1367.EMI (2)



Trace: (Discrete)

Site no. : 3# Chamber Radiation Data no. : 1  
 Dis. / Ant. : 3m CBL6112D Ant. pol. : VERTICAL  
 Limit : FCC PART15 B  
 Env. / Ins. : 24°C/56% ESVS20 Engineer : Sunny  
 EUT : AM1G USB SENDER M/N:AVRB7101A  
 Power Rating : DC 5V From PC input AC120V/60Hz  
 Test Mode : Tx Mode

| Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Emission                |                         |                          |                |        |
|----------------|--------------------------|-----------------------|-------------------------|-------------------------|--------------------------|----------------|--------|
|                |                          |                       | Reading<br>(dB $\mu$ V) | Level<br>(dB $\mu$ V/m) | Limits<br>(dB $\mu$ V/m) | Margin<br>(dB) | Remark |
| 1 30.00        | 19.92                    | 0.68                  | 13.39                   | 33.99                   | 40.00                    | 6.01           | QP     |
| 2 119.24       | 11.12                    | 1.11                  | 15.37                   | 27.60                   | 43.50                    | 15.90          | QP     |
| 3 191.99       | 8.04                     | 1.30                  | 18.90                   | 28.24                   | 43.50                    | 15.26          | QP     |
| 4 240.49       | 10.11                    | 1.46                  | 14.96                   | 26.53                   | 46.00                    | 19.47          | QP     |
| 5 366.59       | 13.42                    | 1.76                  | 10.95                   | 26.13                   | 46.00                    | 19.87          | QP     |
| 6 497.54       | 15.63                    | 2.04                  | 10.81                   | 28.48                   | 46.00                    | 17.52          | QP     |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.

2. The emission levels that are 20dB below the official limit are not reported.

3. The worst emission was detected at 30.00MHz with corrected signal level of 33.99dB $\mu$ V/m (Limit is 40.00dB $\mu$ V/m) when the antenna was at vertical polarization and at 1m high and the turntable was at 330°.

4. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

## 5. DEVIATION TO TEST SPECIFICATIONS

[ NONE]