

# TEST REPORT

For

**Cellular Phone**

In conformity with

**FCC Part15B (01 Oct, 2009)**

**Model: CDMA CAY01**

**FCC ID: TYKNX6610**

**Test Item: Cellular Phone**

**Report No: RY1008P13R2**

**Issue Date: 13 Aug, 2010**

**Prepared for**

NEC CASIO Mobile Communications, Ltd.  
1753, Shimonumabe, Nakahara-Ku, Kawasaki, Kanagawa  
211-8666, Japan

**Prepared by**

RF Technologies Ltd.  
472, Nippa-cho, Kohoku-ku, Yokohama, 223-0057, Japan  
Telephone: +81+(0)45- 534-0645  
FAX: +81+(0)45- 534-0646

**This report shall not be reproduced, except in full, without the written permission of RF Technologies Ltd. The test results in this report apply only to the sample(s) tested. RF Technologies Ltd. is managed to ISO17025 and has the necessary knowledge and test facilities for testing according to the referenced standards.**

**Table of Contents**

|          |   |           |
|----------|---|-----------|
| <b>1</b> | <b>General information .....</b>                            | <b>3</b>  |
| 1.1      | Product description .....                                   | 3         |
| 1.2      | Test(s) performed/ Summary of test result .....             | 4         |
| 1.3      | Test facility .....   | 5         |
| 1.4      | Measurement uncertainty .....                               | 5         |
| 1.5      | Description of essential requirements and test results..... | 6         |
| 1.5.1    | Test requirements (FCC Part15B).....                        | 6         |
| 1.5.2    | Normal test conditions .....                                | 6         |
| 1.6      | Setup of equipment under test (EUT) .....                   | 7         |
| 1.6.1    | Test configuration of EUT .....                             | 7         |
| 1.6.2    | Operating condition: .....                                  | 7         |
| 1.6.3    | Setup diagram of tested system:.....                        | 8         |
| 1.7      | Equipment modifications .....                               | 8         |
| 1.8      | Deviation from the standard.....                            | 8         |
| <b>2</b> | <b>Test procedure and result.....</b>                       | <b>9</b>  |
| 2.1      | Radiated Emissions .....                                    | 9         |
| 2.2      | AC power line conducted emissions .....                     | 14        |
| <b>3</b> | <b>Test setup photographs.....</b>                          | <b>17</b> |
| <b>4</b> | <b>List of utilized test equipment/ calibration .....</b>   | <b>18</b> |

**History**

| Report No.  | Issue Date   | Revision Contents | Issued by |
|-------------|--------------|-------------------|-----------|
| RY1008P13R2 | 13 Aug, 2010 | Initial Issue     | T.Kato    |
|             |              |                   |           |

# 1 General information

## 1.1 *Product description*


|                        |   |
|------------------------|---|
| Test item              | : Cellular phone  |
| Manufacturer 1         | : FLEXTRONICS INDUSTRIAL CO., LTD.  |
| Address 1              | : Xin Qing Science & Technology Industrial Park, Jing An, Doumen, Zhuhai, Guangdong, P.R. China |
| Manufacturer 2         | : YAMAGATA CASIO CO., LTD.  |
| Address 2              | : 5400-1, Higashine-ko, Higashine-shi, Yamagata, Japan  |
| Manufacturer 3         | : TOKAI TEC CO., LTD.   |
| Address 3              | : 1410, Inada, Hitachinaka-shi, Ibaraki, Japan  |
| Model                  | : CDMA CAY01  |
| FCC ID                 | : TYKNX6610   |
| Description            | : CDMA2000 BC0 Cellular Phone   |
| Operating Frequency    | : 128MHz (Max)  |
| Receipt date of EUT    | : 30 Jul, 2010  |
| Nominal power voltages | : 3.7VDC (Lithium-ion battery)  |
| Serial numbers         | : SCAEE000132   |

**1.2 Test(s) performed/ Summary of test result**

Applicable Standard(s) : Part15 Subpart B (01 Oct,2009)  
Test(s) started : 03 Aug, 2010  
Test(s) completed : 10 Aug, 2010  
Purpose of test(s) : Certification of FCC  
  
Summary of test result : Complied

Note: The above judgment is only based on the measurement data and it does not include the measurement uncertainty. Accordingly, the statement below is applied to the test result. The EUT complies with the limit required in the standard in case that the margin is not less than the measurement uncertainty in the Laboratory. Compliance of the EUT is more probable than non-compliance is case that the margin is less than the measurement uncertainty in the Laboratory.

Test engineer

:   
T. Kato (Engineer, EMC Testing Department)

Reviewer

:   
K. Ohnishi (Manager, EMC Testing Department)

### 1.3 Test facility

The Federal Communications Commission has reviewed the technical characteristics of the test facilities at RF Technologies Ltd., located in 472, Nippa-cho, Kohoku-ku, Yokohama, 223-0057, Japan, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948, per 01 October, 2009.

The description of the test facilities has been filed under registration number 319924 at the Office of the Federal Communications Commission. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The list of all public test facilities is available on the Internet at <http://www.fcc.gov>.

Registered by Voluntary Control Council for Interference by Information Technology Equipment (VCCI).

Each registered facility number is as follows;

Test site (Semi-anechoic chamber 3m) R-2393

Test site (Shielded room) C-2617

Registered by Industry Canada (IC). The registered facility number is as follows;

Test site No.1(Semi-anechoic chamber 3m) : 6974A-1

Accredited by **National Voluntary Laboratory Accreditation Program** (NVLAP) for the emission tests stated in the scope of the certificate under Certificate Number 200780-0

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.



NVLAP LAB CODE 200780-0

### 1.4 Measurement uncertainty

The treatment of uncertainty is based on the general matters on the definition of uncertainty in “Guide to the expression of uncertainty in measurement (GUM)” published by ISO. The Lab’s uncertainty is determined by referring UKAS Publication LAB34: 2002 “The Expression of Uncertainty in EMC Testing” and CISPR16-4-2: 2003 “Uncertainty in EMC Measurements”.

The uncertainty of the measurement result in the level of confidence of approximately 95% (k=2) is as follows;

AC Power line emission :  $\pm 1.9$  dB

Radiated emission (30MHz - 1000MHz) :  $\pm 5.9$  dB

Radiated emission (1GHz - 20GHz):  $\pm 5.8$  dB

Temperature :  $\pm 1$  degree

Humidity :  $\pm 5$  %

## **1.5 Description of essential requirements and test results**

An overview of test requirements, as laid out in FCC Part15B are given below.

### **1.5.1 Test requirements (FCC Part15B)**

| Test Description                          | Section<br>in this report | Applicable | Result |
|---|---------------------------|------------|--------|
| Radiated emission (15.109)                | 2.1                       | Yes        | Pass   |
| AC power line conducted emission (15.107) | 2.2                       | Yes        | Pass   |

### **1.5.2 Normal test conditions**

Temperature(\*) : +15 degC to +35 degC  
Relative humidity(\*) : 20 % to 75 %  
Supply voltage : 3.7 VDC (Nominal)

\* When it is impracticable to carry out tests under these conditions, a note to this effect, stating the ambient temperature and relative humidity during the tests, must be stated separately.

## 1.6 Setup of equipment under test (EUT)

### 1.6.1 Test configuration of EUT

#### Equipment(s) under test:

|   | Item                       | Brand            | Model No.    | Serial No.  | FCC ID    |
|---|----------------------------|------------------|--------------|-------------|-----------|
| A | Cellular phone             | NEC CASIO        | CDMA CAY01   | SCAEE000132 | TYKNX6610 |
| B | Lithium-ion battery (3.7V) | NEC CASIO        | CAY01UAA     | None        | N/A       |
| C | AC adaptor                 | MITSUMI ELECTRIC | 0203PQA      | None        | N/A       |
| D | Cradle                     | NEC CASIO        | CA003PUA     | None        | N/A       |
| E | Notebook PC                | Panasonic        | CF-W8GWDNJR  | 9EKSA73340  | N/A       |
| F | Mouse                      | TOSHIBA          | G83C0001Y110 | LZE30201086 | N/A       |

#### Connected cable(s):

| No. | Item               | Brand              | Shielded<br>Yes/No | Ferrite<br>Core<br>Yes/No | Connector<br>Shielded<br>Yes/No | Length<br>(m) |
|-----|--------------------|--------------------|--------------------|---------------------------|---------------------------------|---------------|
| 1   | Charger cable (DC) | -                  | No                 | No                        | No                              | 1.5           |
| 2   | USB cable          | HIROSE<br>ELECTRIC | Yes                | Yes                       | No                              | 1.2           |
| 3   | Mouse cable        | -                  | No                 | No                        | No                              | 0.8           |
| 4   | Video out cable    | NEC CASIO          | No                 | No                        | No                              | 1.4           |

### 1.6.2 Operating condition:

[Configuration I ] USB connection

Cellular phone is connected to Notebook PC with USB cable.  
With this condition, emission level is tested during USB data communication.

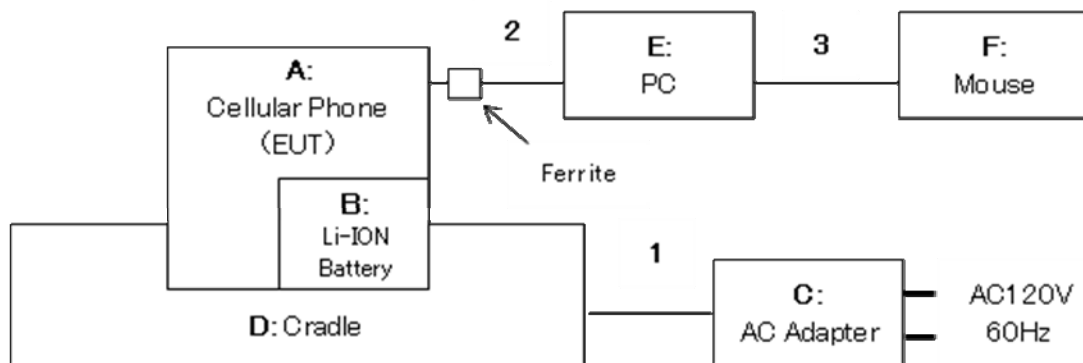
[Configuration II ] Movie play (Video cable)

Stored movie file in Micro SD card is played, and this data is also emitted from Video Out Cable.

### 1.6.3 Setup diagram of tested system:

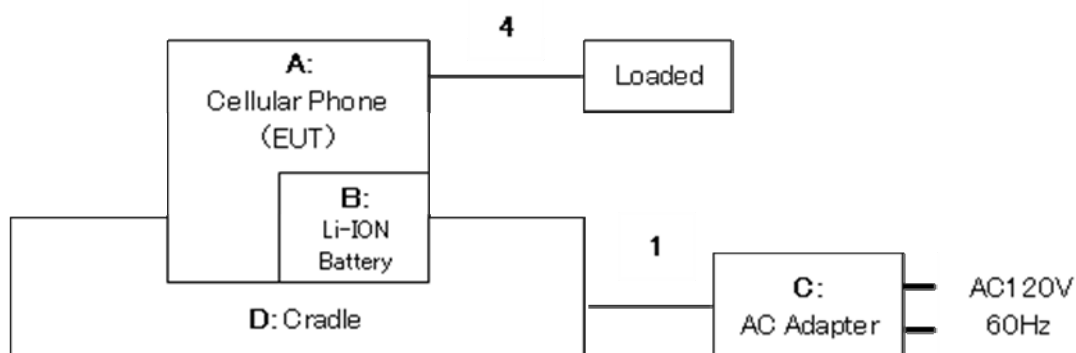
[Configuration I ]

USB connection



[Configuration II ]

Movie play



## 1.7 Equipment modifications

No modifications have been made to the equipment in order to achieve compliance with the applicable standards described in clause 1.2.

## 1.8 Deviation from the standard

No deviations from the standards described in clause 1.2.



## 2 Test procedure and result

### 2.1 Radiated Emissions

#### Reference Standard

Part15.109

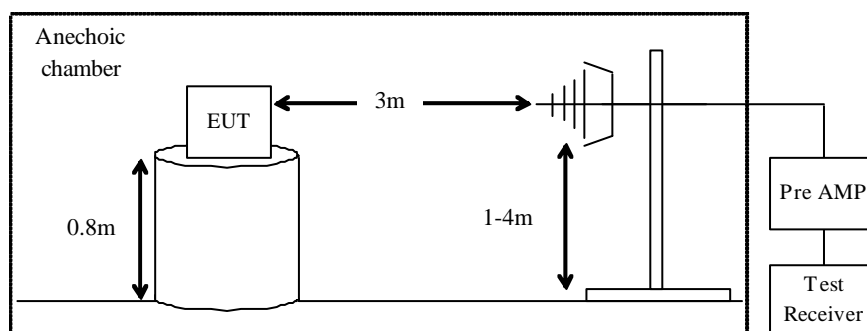
#### Test Conditions

Date: 03 Aug, 2010 (below 1GHz), 05 Aug, 2010 (above 1GHz)  
Ambient Temperature: 22 degC (03 Aug), 21 degC (05 Aug)  
Relative humidity: 55 % (03 Aug), 60 % (05 Aug)  
Test Voltage: 3.7 V

#### Test Method

- Test data is transmitted from EUT to Notebook PC with USB cable.
- Radiated spurious emission is received by receive antenna.
- Turn table is rotated 360deg.
- Maximum level of each spurious is measured by Test receiver.
- RBW of spectrum analyzer is set to 100kHz for 30 - 1000MHz, or 1MHz for above 1000MHz.
- Level is measured with QP detect for 30 - 1000MHz, or AVE detector for above 1000MHz.

#### Test Setup



#### Limit

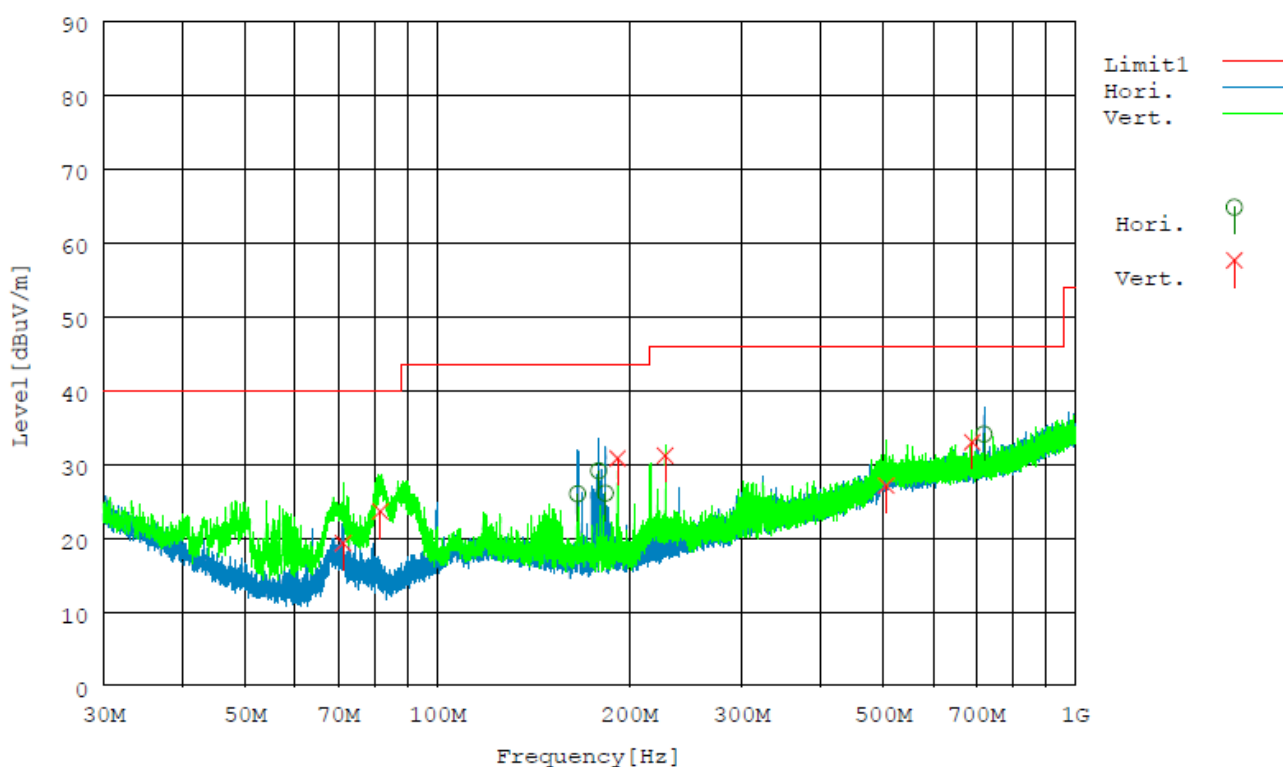
| Frequency [MHz] | Distance [m] | Field strength [ $\mu$ V/m] | Field strength [dB $\mu$ V/m] |
|-----------------|--------------|-----------------------------|-------------------------------|
| 30 - 88         | 3            | 100                         | 40.0                          |
| 88 - 216        | 3            | 150                         | 43.5                          |
| 216 - 960       | 3            | 200                         | 46.0                          |
| above 960       | 3            | 500                         | 53.9                          |

## Test Results

### Configuration I : USB connection

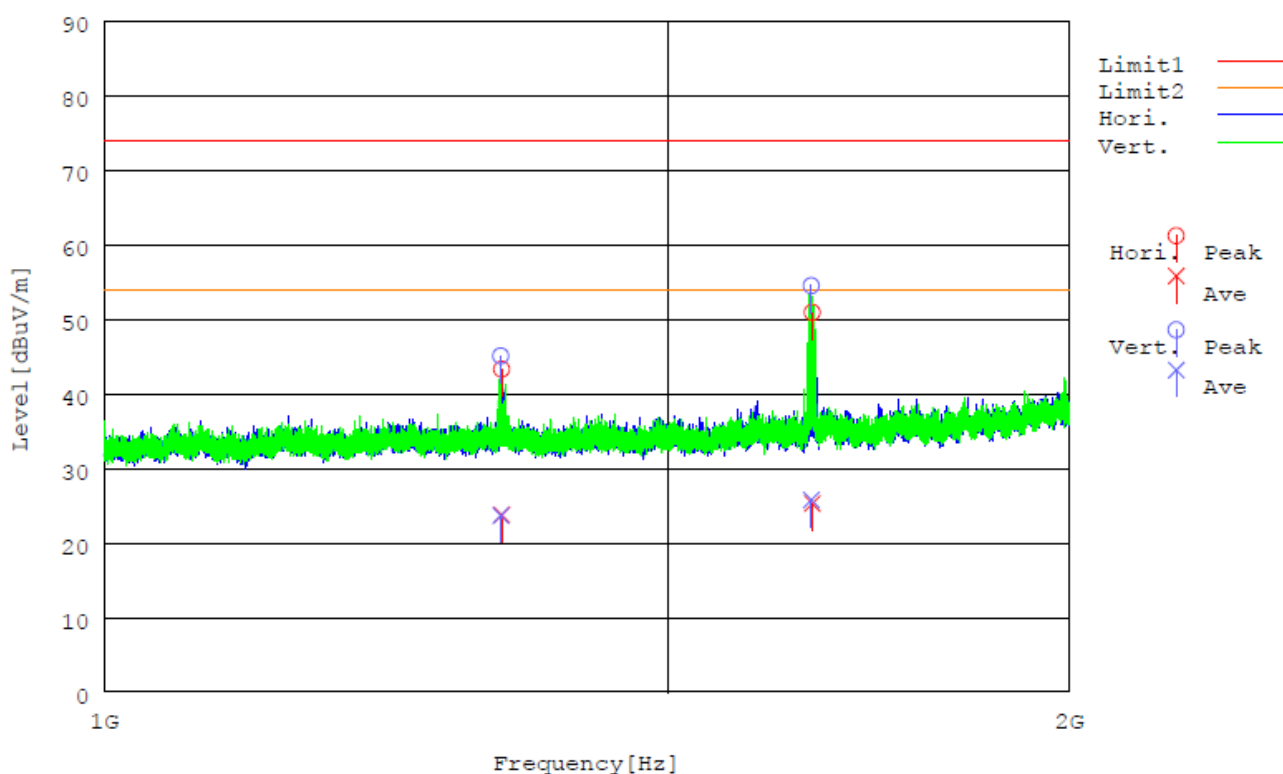
#### 30-1000 MHz

| Frequency [MHz] | Antenna | Reading [dBμV] | Factor [dB/m] | Loss [dB] | Gain [dB] | Field strength [dBμV/m] | Limit [dBμV/m] | Result |
|-----------------|---------|----------------|---------------|-----------|-----------|-------------------------|----------------|--------|
| 166.226         | Hori.   | 37.3           | 9.6           | 8.7       | 29.6      | 26.0                    | 43.5           | Pass   |
| 179.286         | Hori.   | 41.0           | 8.9           | 8.8       | 29.6      | 29.1                    | 43.5           | Pass   |
| 183.763         | Hori.   | 37.9           | 9.0           | 8.8       | 29.6      | 26.1                    | 43.5           | Pass   |
| 720.000         | Hori.   | 32.1           | 19.5          | 12.2      | 29.7      | 34.1                    | 46.0           | Pass   |
| 71.249          | Vert.   | 35.0           | 6.4           | 7.6       | 29.7      | 19.3                    | 40.0           | Pass   |
| 81.538          | Vert.   | 38.0           | 7.4           | 7.8       | 29.6      | 23.6                    | 40.0           | Pass   |
| 192.000         | Vert.   | 42.4           | 9.1           | 8.8       | 29.5      | 30.8                    | 43.5           | Pass   |
| 228.000         | Vert.   | 40.7           | 10.9          | 9.2       | 29.6      | 31.2                    | 46.0           | Pass   |
| 506.260         | Vert.   | 28.1           | 17.7          | 11.1      | 29.8      | 27.1                    | 46.0           | Pass   |
| 689.981         | Vert.   | 31.2           | 19.4          | 12.1      | 29.7      | 33.0                    | 46.0           | Pass   |



## 1000-2000 MHz

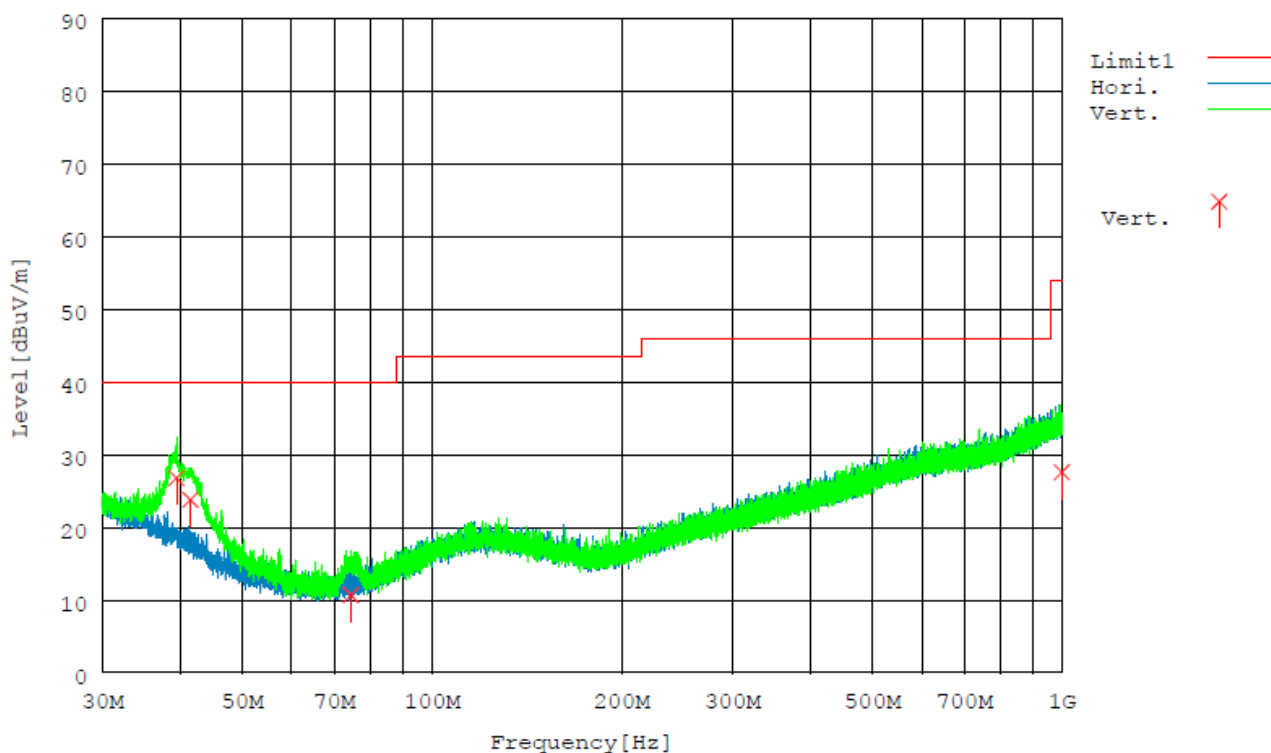
| Freq.<br>[MHz] | Ant.  | Reading<br>Peak<br>[dBμV] | Reading<br>Ave<br>[dBμV] | C.Factor<br>[dB] | Result<br>Peak<br>[dBμV/m] | Result<br>Ave<br>[dBμV/m] | Limit<br>Peak<br>[dBμV/m] | Limit<br>Ave<br>[dBμV/m] | Result |
|----------------|-------|---------------------------|--------------------------|------------------|----------------------------|---------------------------|---------------------------|--------------------------|--------|
| 1330.383       | Hori. | 53.5                      | 34.0                     | -10.2            | 43.3                       | 23.8                      | 73.9                      | 53.9                     | Pass   |
| 1662.967       | Hori. | 59.6                      | 34.0                     | -8.7             | 50.9                       | 25.3                      | 73.9                      | 53.9                     | Pass   |
| 1329.484       | Vert. | 55.3                      | 33.9                     | -10.2            | 45.1                       | 23.7                      | 73.9                      | 53.9                     | Pass   |
| 1661.767       | Vert. | 63.3                      | 34.6                     | -8.8             | 54.5                       | 25.8                      | 73.9                      | 53.9                     | Pass   |



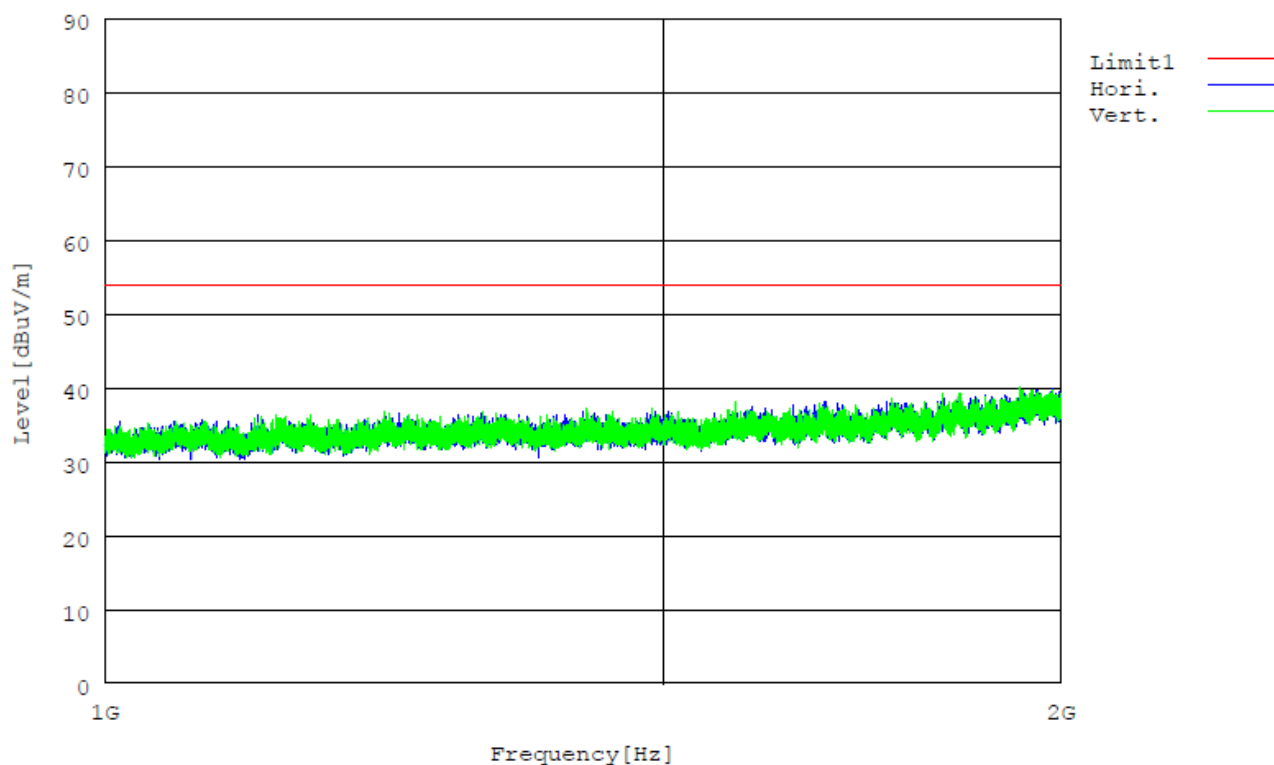
## Configuration II : Movie play

### 30-1000 MHz

| Frequency [MHz] | Antenna | Reading [dB $\mu$ V] | Factor [dB/m] | Loss [dB] | Gain [dB] | Field strength [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Result |
|-----------------|---------|----------------------|---------------|-----------|-----------|-------------------------------|----------------------|--------|
| 39.336          | Vert.   | 35.9                 | 13.4          | 7.2       | 29.7      | 26.8                          | 40.0                 | Pass   |
| 41.421          | Vert.   | 34.0                 | 12.3          | 7.2       | 29.7      | 23.8                          | 40.0                 | Pass   |
| 74.427          | Vert.   | 26.0                 | 6.7           | 7.7       | 29.7      | 10.7                          | 40.0                 | Pass   |
| 1000.000        | Vert.   | 21.0                 | 21.3          | 13.7      | 28.4      | 27.6                          | 53.9                 | Pass   |



## 1000-2000 MHz



### Test Equipment Used

| Equipment name  | RFT ID No.       |
|-----------------|------------------|
| RF cable        | CL11, CL23, CL24 |
| Receive Antenna | BA04, DH01       |
| Pre AMP         | PR03, PR12       |
| Test Receiver   | TR06             |

### Final Result

The EUT met the requirements of the standard for this test.

## 2.2 AC power line conducted emissions

### Reference Standard

Part15.107

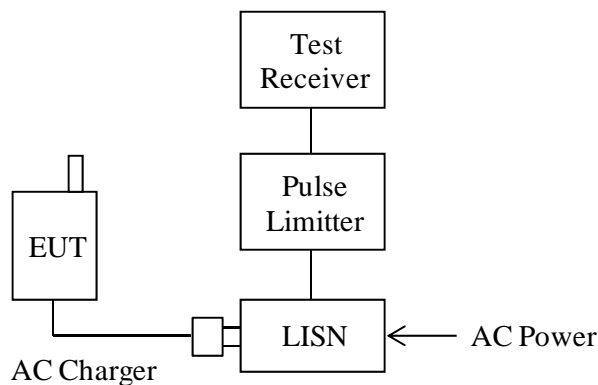
### Test Conditions

Date: 10 Aug, 2010  
Ambient Temperature: 27 degC  
Relative humidity: 60 %  
Test Voltage: 3.7 V

### Test Method

- Test data is transmitted from EUT to Notebook PC with USB cable.
- AC power is supplied to AC charger through LISN.
- AC charger is connected to EUT.
- AC Power Line emission is measured by EMI receiver.  
Both Va/Vb line are measured emission level.

### Test Setup



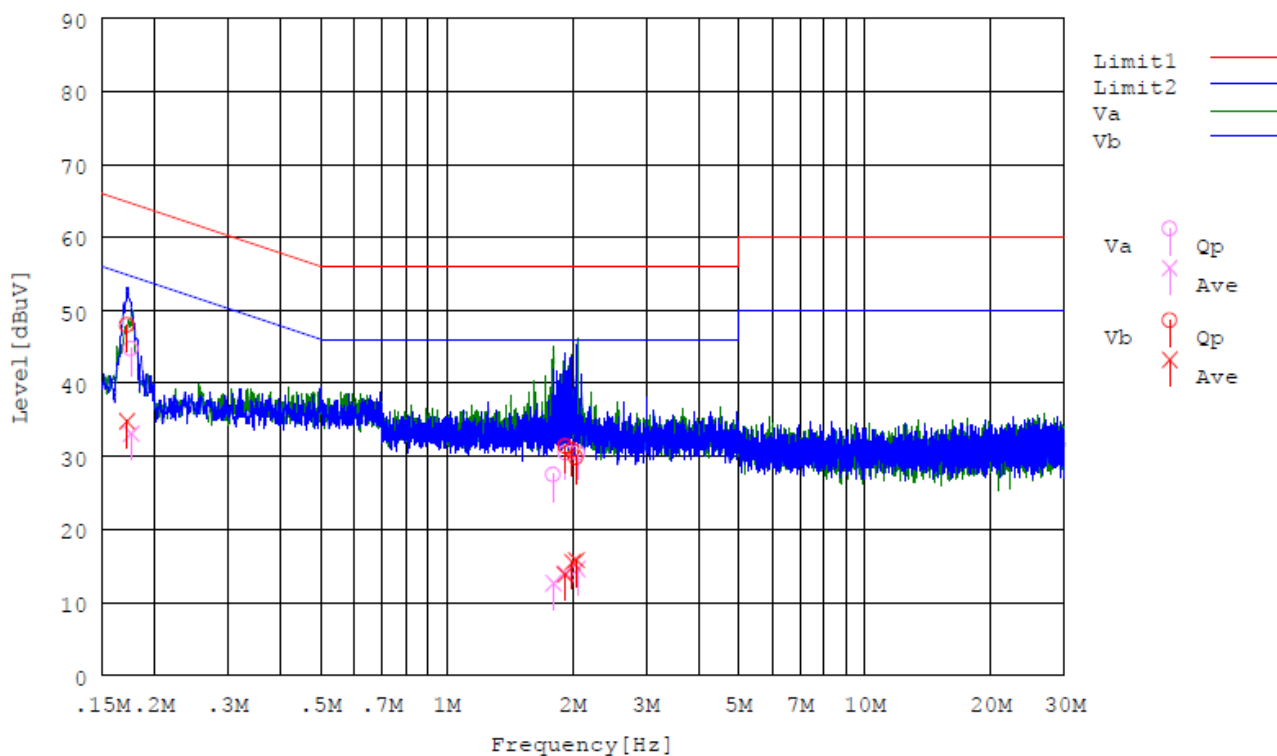
### Limit

| Frequency [MHz] | Limit QP [dBμV] | Limit Ave [dBμV] |
|-----------------|-----------------|------------------|
| 0.15 - 0.5      | 66 - 56         | 56 - 46          |
| 0.5 - 5         | 56              | 46               |
| 5 - 30          | 60              | 50               |

## Test Results

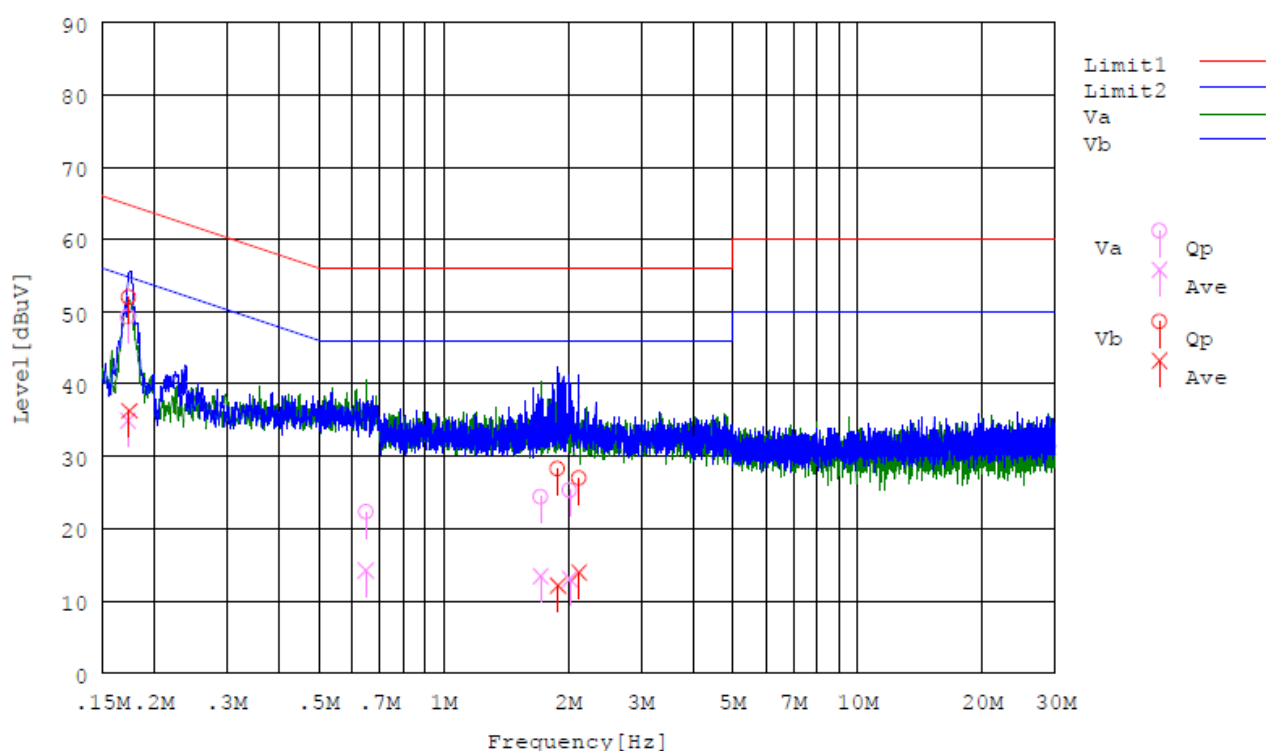
### Configuration I : USB connection

| Frequency [MHz] | Line [Va/Vb] | QP Reading [dBμV] | Ave Reading [dBμV] | Factor [dB] | QP Result [dBμV] | Ave Result [dBμV] | QP Limit [dBμV] | Ave Limit [dBμV] | Result |
|-----------------|--------------|-------------------|--------------------|-------------|------------------|-------------------|-----------------|------------------|--------|
| 0.176           | Va           | 34.6              | 23.0               | 10.1        | 44.7             | 33.1              | 64.7            | 54.7             | Pass   |
| 1.800           | Va           | 17.5              | 2.6                | 10.0        | 27.5             | 12.6              | 56.0            | 46.0             | Pass   |
| 1.920           | Va           | 20.5              | 4.0                | 10.0        | 30.5             | 14.0              | 56.0            | 46.0             | Pass   |
| 2.056           | Va           | 20.4              | 4.6                | 10.0        | 30.4             | 14.6              | 56.0            | 46.0             | Pass   |
| 0.172           | Vb           | 37.9              | 24.7               | 10.1        | 48.0             | 34.8              | 64.9            | 54.9             | Pass   |
| 1.919           | Vb           | 21.4              | 3.8                | 10.0        | 31.4             | 13.8              | 56.0            | 46.0             | Pass   |
| 1.997           | Vb           | 20.9              | 5.5                | 10.0        | 30.9             | 15.5              | 56.0            | 46.0             | Pass   |
| 2.040           | Vb           | 19.8              | 5.8                | 10.0        | 29.8             | 15.8              | 56.0            | 46.0             | Pass   |



## Configuration II : Movie Play

| Frequency [MHz] | Line [Va/Vb] | QP Reading [dBμV] | Ave Reading [dBμV] | Factor [dB] | QP Result [dBμV] | Ave Result [dBμV] | QP Limit [dBμV] | Ave Limit [dBμV] | Result |
|-----------------|--------------|-------------------|--------------------|-------------|------------------|-------------------|-----------------|------------------|--------|
| 0.173           | Va           | 39.2              | 24.8               | 10.1        | 49.3             | 34.9              | 64.8            | 54.8             | Pass   |
| 0.649           | Va           | 12.3              | 4.2                | 10.0        | 22.3             | 14.2              | 56.0            | 46.0             | Pass   |
| 1.714           | Va           | 14.4              | 3.4                | 10.0        | 24.4             | 13.4              | 56.0            | 46.0             | Pass   |
| 2.014           | Va           | 15.3              | 3.0                | 10.0        | 25.3             | 13.0              | 56.0            | 46.0             | Pass   |
| 0.174           | Vb           | 41.8              | 26.2               | 10.1        | 51.9             | 36.3              | 64.8            | 54.8             | Pass   |
| 1.884           | Vb           | 18.2              | 2.1                | 10.0        | 28.2             | 12.1              | 56.0            | 46.0             | Pass   |
| 2.121           | Vb           | 16.9              | 3.9                | 10.0        | 26.9             | 13.9              | 56.0            | 46.0             | Pass   |



## Test Equipment Used

| Equipment name | RFT ID No. |
|----------------|------------|
| EMI Receiver   | TR06       |
| LISN           | LN05       |
| RF cable       | CL18       |

## Final Result

The EUT met the requirements of the standard for this test



## 4 List of utilized test equipment/ calibration

| RFT ID No. | Kind of Equipment and Precision   | Manufacturer         | Model No. | Serial Number | Calibration Date | Calibrated until |
|------------|-----------------------------------|----------------------|-----------|---------------|------------------|------------------|
| AC01(EM)   | Anechoic Chamber (1st test room)  | JSE                  | 203397C   | -             | 2010/4/10        | 2011/4/30        |
| AC01(EG)   | Anechoic Chamber (1st test room)  | JSE                  | 203397C   | -             | 2009/11/14       | 2010/11/30       |
| BA04       | Biological Antenna                | SCHAFFNER            | CA2855    | 2903          | 2010/1/19        | 2011/1/31        |
| CL11       | Antenna Cable for RE              | RFT                  | -         | -             | 2010/5/24        | 2011/5/31        |
| CL18       | Antenna Cable for CE              | RFT                  | -         | -             | 2010/5/15        | 2011/5/31        |
| CL23       | RF Cable 0.5m                     | SUCOFLEX             | SF104PE   | 48773/4PE     | 2010/6/15        | 2011/6/30        |
| CL24       | RF Cable 5.0m                     | SUCOFLEX             | SF104PE   | 48775/4PE     | 2010/6/15        | 2011/6/30        |
| DH01       | DRG Horn Antenna                  | A.H. Systems         | SAS-571   | 785           | 2010/1/20        | 2012/1/31        |
| LN05       | LISN                              | Kyoritsu             | KNW-407F  | 8-1773-2      | 2010/5/21        | 2011/5/31        |
| PR03       | Pre. Amplifier                    | Anritsu              | MH648A    | M41984        | 2010/5/19        | 2011/5/31        |
| PR12       | Pre. Amplifier (1-26G)            | Agilent Technologies | 8449B     | 3008A02513    | 2010/1/25        | 2011/1/31        |
| TR06       | Test Receiver<br>(F/W : 3.93 SP2) | Rohde & Schwarz      | ESU26     | 100002        | 2009/9/16        | 2010/9/30        |

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.