# FCC Test Report

# FCC ID: 2ACVK-14G1100A

**Product**： Kano Speaker Electronics

**Trade Name**： KANO

**Model Number**： 14G1100A

**Serial Model**： N/A

**Report No.**： NTEK-2014NT0811215F

**Prepared for**

Kano Computing Limited

69-89 Mile End Road, London E1 4TT, UK

**Prepared by**

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# TEST RESULT CERTIFICATION

| | | |
|---|---|---|
| **Applicant's name** | : | Kano Computing Limited |
| Address | : | 69-89 Mile End Road, London E1 4TT, UK |
| **Manufacturer's Name** | : | Kano Computing Limited |
| Address | : | 69-89 Mile End Road, London E1 4TT, UK |

**Product description**

| | | |
|---|---|---|
| Product name | : | Kano Speaker Electronics |
| Model and/or type reference | : | 14G1100A |
| **Standards** | : | FCC Part15B:01 Oct.2013<br>ANSI C63.4:2009 |

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with Part 15 of FCC Rules. And it is applicable only to the tested sample identified in the report.

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| | | |
|---|---|---|
| **Date of Test** | : | |
| Date (s) of performance of tests | : | 11 Aug. 2014 ~23 Aug. 2014 |
| Date of Issue | : | 23 Aug. 2014 |
| Test Result | : | **Pass** |

Testing Engineer : Eileen Liu.

(Eileen Liu)

Technical Manager : Brown Lu

(Brown Lu)

Authorized Signatory : Bill

(Bill Yao)

**Table of Contents** **Page**

1 . TEST SUMMARY 4
1.1 TEST FACILITY 5
1.2 MEASUREMENT UNCERTAINTY 5
2 . GENERAL INFORMATION 6
2.1 GENERAL DESCRIPTION OF EUT 6
2.2 DESCRIPTION OF TEST SETUP 8
2.3 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL 9
2.4 MEASUREMENT INSTRUMENTS LIST 10
3 . EMC EMISSION TEST 11
3.1 CONDUCTED EMISSION MEASUREMENT 11
3.1.1 POWER LINE CONDUCTED EMISSION 11
3.1.2 TEST PROCEDURE 12
3.1.3 TEST SETUP 12
3.1.4 EUT OPERATING CONDITIONS 12
3.1.5 TEST RESULTS 13
3.2 RADIATED EMISSION MEASUREMENT 15
3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT 15
3.2.2 TEST PROCEDURE 15
3.2.3 TEST SETUP 16
3.2.4 EUT OPERATING CONDITIONS 16
3.2.5 TEST RESULTS 17
3.2.6 TEST RESULTS(Above 1GHz) 19
4 . EUT TEST PHOTO 20

## 1. TEST SUMMARY

Test procedures according to the technical standards:

| EMC Emission | | | | |
|---|---|---|---|---|
| Standard | Test Item | Limit | Judgment | Remark |
| FCC Part15B:2013<br>ANSI C63.4: 2003 | Conducted Emission | Class B | PASS | |
| | Radiated Emission | Class B | PASS | |

NOTE:

(1) 'N/A' denotes test is not applicable in this Test Report

(2) For client's request and manual description, the test will not be executed.

1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd
Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.
FCC Registration Number:238937; IC Registration Number:9270A-1
CNAS Registration Number:L5516

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ± U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %.

A. Conducted Measurement :

| Test Site | Method | Measurement Frequency Range | U，(dB) | NOTE |
|---|---|---|---|---|
| NTEKC01 | ANSI | 150 KHz ~ 30MHz | 3.2 | |

B. Radiated Measurement :

| Test Site | Method | Measurement Frequency Range | U，(dB) | NOTE |
|---|---|---|---|---|
| NTEKA01 | ANSI | 30MHz ~ 1000MHz | 4.7 | |
| | | 1GHz ~6GHz | 5.0 | |

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

<table>
<tr><td>Equipment</td><td>Kano Speaker Electronics</td></tr>
<tr><td>Model Name</td><td>14G1100A</td></tr>
<tr><td>Additional Model Number(s)</td><td>N/A</td></tr>
<tr><td>Model Difference</td><td>N/A</td></tr>
<tr><td>Product Description</td><td>The EUT is a Kano Speaker Electronics.<br><br><table><tr><td>Connecting I/O port:</td><td>N/A</td></tr><tr><td>Operating frequency:</td><td>20kHz</td></tr></table><br>Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.</td></tr>
<tr><td>Power Source</td><td>DC Voltage</td></tr>
<tr><td>Adapter</td><td>N/A</td></tr>
<tr><td>Battery</td><td>N/A</td></tr>
</table>

### 2.1.1 DESCRIPTION OF TEST MODES

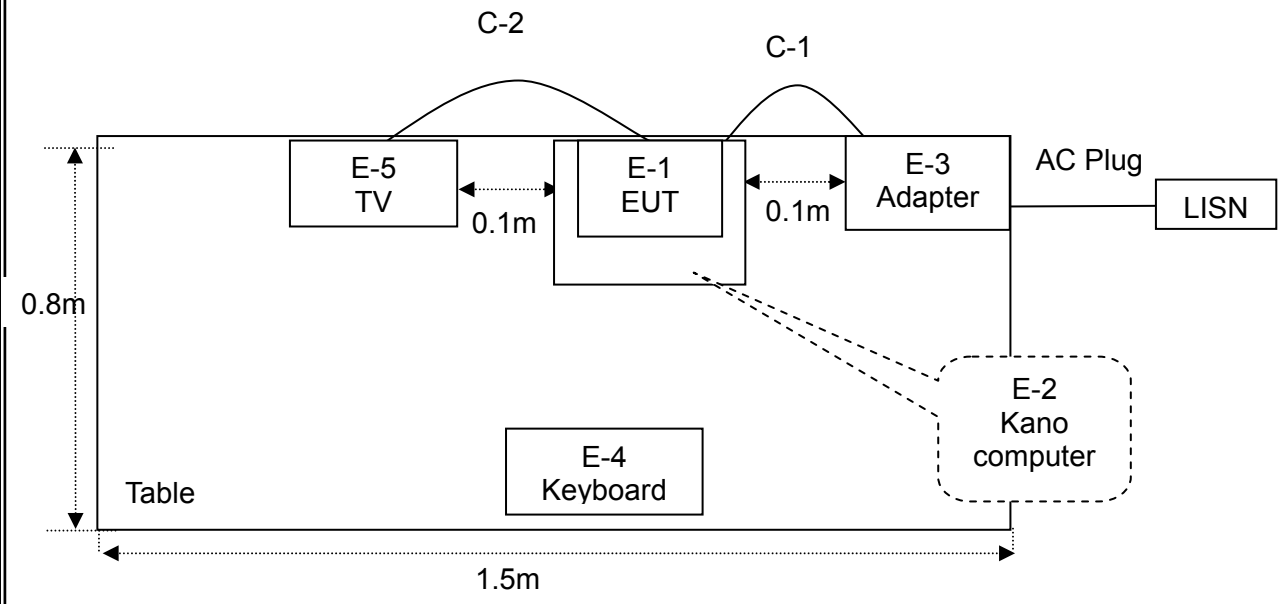
To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Pretest Mode | Description |
|---|---|
| Mode 1 | RUNNING |

| **For Conducted Test** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | RUNNING |

| **For Radiated Test** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | RUNNING |

## 2.2 DESCRIPTION OF TEST SETUP



## 2.3 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment | Brand | Model/Type No. | Series No. | Note |
|---|---|---|---|---|---|
| E-1 | Kano Speaker Electronics | KANO | 14G1100A | N/A | EUT |
| E-2 | Kano computer | KANO | 14441000A | N/A | |
| E-3 | Adapter | N/A | DSA-10CU-05050200 | N/A | |
| E-4 | Keyboard | N/A | KC-KBR101 | N/A | |
| E-5 | TV | SONY | KDL-24EX520 | 6450730 | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| Item | Shielded Type | Ferrite Core | Length | Note |
|---|---|---|---|---|
| C-1 | NO | NO | 1.2m | |
| C-2 | YES | YES | 0.8m | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) “YES” means “shielded” “with core”; “NO” means “unshielded” “without core”.

## 2.4 MEASUREMENT INSTRUMENTS LIST

### 2.4.1 CONDUCTED TEST SITE

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until | Calibration period |
|---|---|---|---|---|---|---|---|
| 1 | LISN | R&S | ENV216 | 101313 | Jul. 06, 2014 | Jul. 05, 2015 | 1 year |
| 2 | LISN | SCHWARZBECK | NNLK 8129 | 8129245 | Dec. 25, 2013 | Dec. 24, 2014 | 1 year |
| 3 | Pulse Limiter | SCHWARZBECK | VTSD 9561F | 9716 | Dec. 25, 2013 | Dec. 24, 2014 | 1 year |
| 4 | 50Ω Switch | ANRITSU CORP | MP59B | 6200983704 | Jul. 06, 2014 | Jul. 05, 2015 | 1 year |
| 5 | Test Cable | N/A | C01 | N/A | Jul. 06, 2014 | Jul. 05, 2015 | 1 year |
| 6 | Test Cable | N/A | C02 | N/A | Jul. 06, 2014 | Jul. 05, 2015 | 1 year |
| 7 | Test Cable | N/A | C03 | N/A | Jul. 06, 2014 | Jul. 05, 2015 | 1 year |
| 8 | EMI Test Receiver | R&S | ESCI | 101160 | Jul. 06, 2014 | Jul. 05, 2015 | 1 year |
| 9 | Passive Voltage Probe | ESH2-Z3 | R&S | 100196 | Jul. 06, 2014 | Jul. 05, 2015 | 1 year |
| 10 | Triple-Loop Antenna | EVERFINE | LIA-2 | 11020003 | Jul. 06, 2014 | Jul. 05, 2015 | 1 year |
| 11 | Absorbing Clamp | R&S | MDS-21 | 100423 | Jul. 08, 2014 | Jul. 07, 2015 | 1 year |

### 2.4.2 RADIATED TEST SITE

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until | Calibration period |
|---|---|---|---|---|---|---|---|
| 1 | Bilog Antenna | TESEQ | CBL6111D | 31216 | Jul. 06, 2014 | Jul. 05, 2015 | 1 year |
| 2 | Test Cable | N/A | R-01 | N/A | Dec. 25, 2013 | Dec. 24, 2014 | 1 year |
| 3 | Test Cable | N/A | R-02 | N/A | Dec. 25, 2013 | Dec. 24, 2014 | 1 year |
| 4 | EMI Test Receiver | R&S | ESCI-7 | 101318 | Jul. 06, 2014 | Jul. 05, 2015 | 1 year |
| 5 | Antenna Mast | EM | SC100_1 | N/A | N/A | N/A | N/A |
| 6 | Turn Table | EM | SC100 | 060531 | N/A | N/A | N/A |
| 7 | 50Ω Switch | Anritsu Corp | MP59B | 6200983705 | Jul. 06, 2014 | Jul. 05, 2015 | 1 year |
| 8 | Spectrum Analyzer | Aglient | E4407B | MY45108040 | Jul. 06, 2014 | Jul. 05, 2015 | 1 year |
| 9 | Horn Antenna | EM | EM-AH-10180 | 2011071402 | Jul. 06, 2014 | Jul. 05, 2015 | 1 year |
| 10 | Amplifier | EM | EM-30180 | 060538 | Jul. 06, 2014 | Jul. 05, 2015 | 1 year |

## 3. EMC EMISSION TEST

### 3.1 CONDUCTED EMISSION MEASUREMENT

#### 3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

| FREQUENCY (MHz) | Class A (dBuV) | | Class B (dBuV) | |
|---|---|---|---|---|
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.15 -0.5 | 79.00 | 66.00 | 66 - 56 * | 56 - 46 * |
| 0.50 -5.0 | 73.00 | 60.00 | 56.00 | 46.00 |
| 5.0 -30.0 | 73.00 | 60.00 | 60.00 | 50.00 |

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

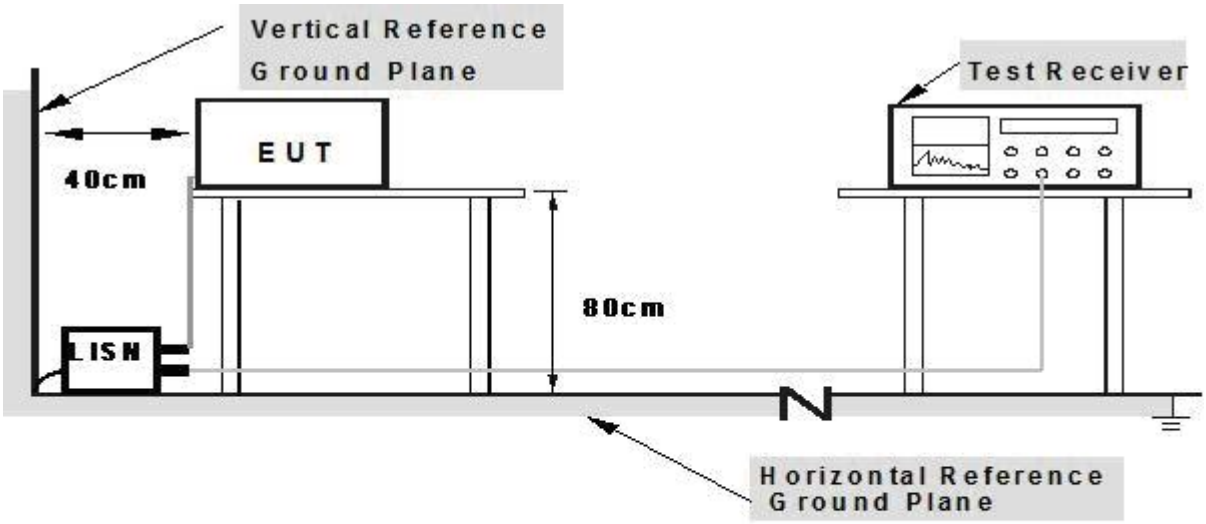
The following table is the setting of the receiver

| Receiver Parameters | Setting |
|---|---|
| Attenuation | 10 dB |
| Start Frequency | 0.15 MHz |
| Stop Frequency | 30 MHz |
| IF Bandwidth | 9 kHz |

3.1.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP




**Note: 1.Support units were connected to second LISN.**
**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

3.1.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

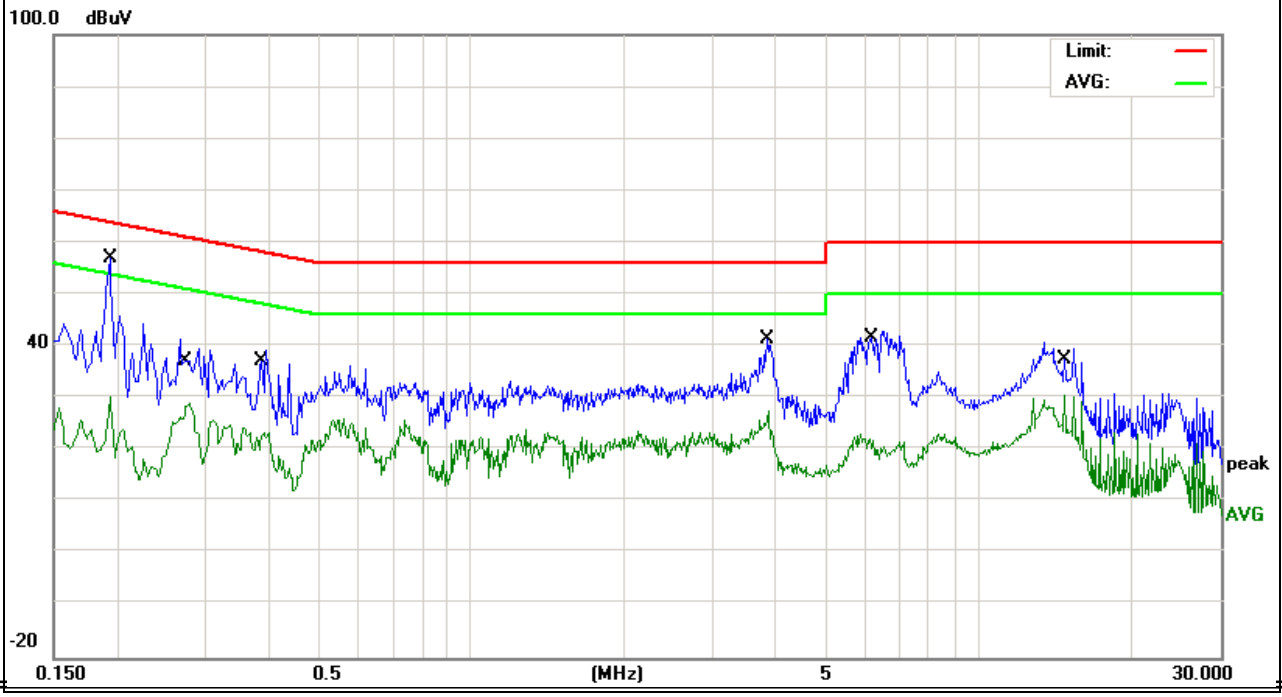
3.1.5 TEST RESULTS

| | | | |
|---|---|---|---|
| EUT： | Kano Speaker Electronics | Model Name. ： | 14G1100A |
| Temperature： | 26 ℃ | Relative Humidity： | 54% |
| Pressure： | 1010hPa | Test Date： | 2014-08-21 |
| Test Mode： | Mode 1 | Phase： | L |
| Test Voltage ： | DC 5V From the Kano computer Kit | | |

| Frequency | Reading Level | Correct Factor | Measure-ment | Limits | Margin | Remark |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV) | (dBμV) | (dB) | |
| 0.1940 | 47.52 | 9.52 | 57.04 | 63.86 | -6.82 | QP |
| 0.1940 | 20.79 | 9.52 | 30.31 | 53.86 | -23.55 | AVG |
| 0.2779 | 31.78 | 9.51 | 41.29 | 60.88 | -19.59 | QP |
| 0.2779 | 19.41 | 9.51 | 28.92 | 50.88 | -21.96 | AVG |
| 0.3899 | 29.74 | 9.52 | 39.26 | 58.06 | -18.80 | QP |
| 0.3899 | 13.93 | 9.52 | 23.45 | 48.06 | -24.61 | AVG |
| 3.8540 | 31.63 | 9.59 | 41.22 | 56.00 | -14.78 | QP |
| 3.8540 | 18.05 | 9.59 | 27.64 | 46.00 | -18.36 | AVG |
| 6.1018 | 33.31 | 9.64 | 42.95 | 60.00 | -17.05 | QP |
| 6.1018 | 12.57 | 9.64 | 22.21 | 50.00 | -27.79 | AVG |
| 14.7659 | 30.79 | 9.84 | 40.63 | 60.00 | -19.37 | QP |
| 14.7659 | 20.70 | 9.84 | 30.54 | 50.00 | -19.46 | AVG |

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

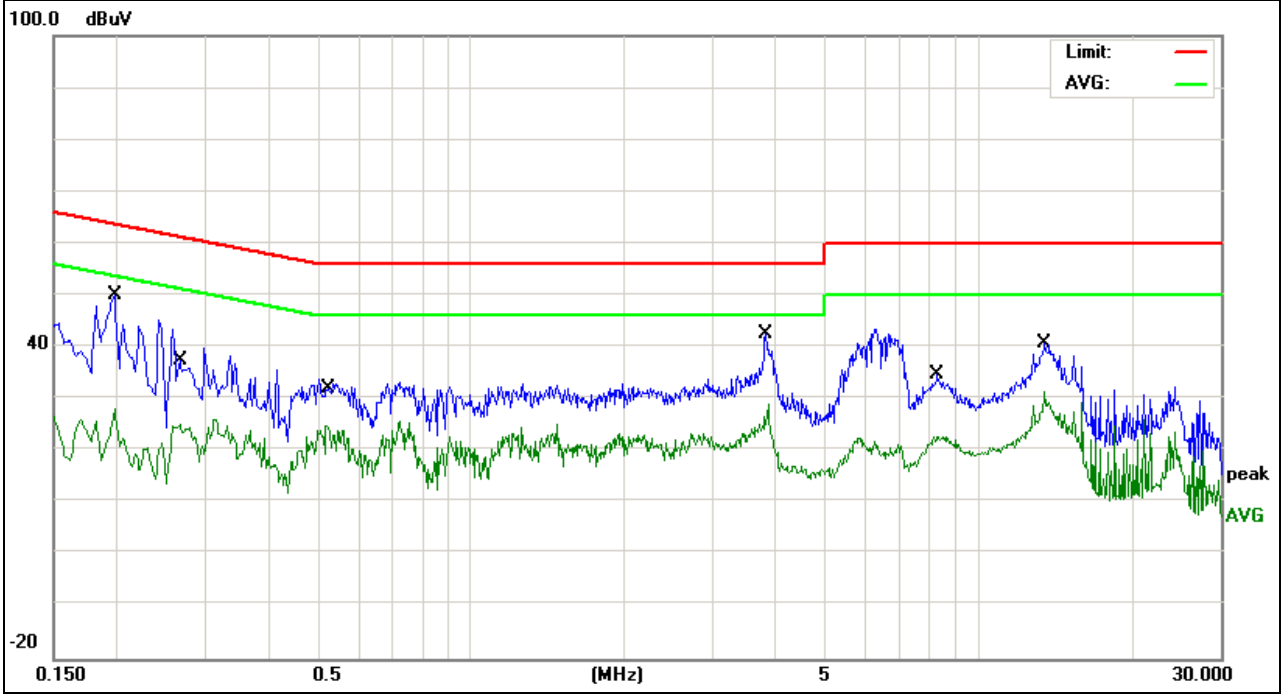


| | | | |
|---|---|---|---|
| EUT： | Kano Speaker Electronics | Model Name. ： | 14G1100A |
| Temperature： | 26 ℃ | Relative Humidity： | 54% |
| Pressure： | 1010hPa | Test Date： | 2014-08-21 |
| Test Mode： | Mode 1 | Phase： | N |
| Test Voltage ： | DC 5V From the Kano computer Kit | | |

| Frequency | Reading Level | Correct Factor | Measure-ment | Limits | Margin | Remark |
|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dBμV) | (dBμV) | (dB) | |
| 0.1980 | 40.64 | 9.51 | 50.15 | 63.69 | -13.54 | QP |
| 0.1980 | 18.52 | 9.51 | 28.03 | 53.69 | -25.66 | AVG |
| 0.2660 | 33.93 | 9.51 | 43.44 | 61.24 | -17.80 | QP |
| 0.2660 | 15.59 | 9.51 | 25.10 | 51.24 | -26.14 | AVG |
| 0.5180 | 24.34 | 9.53 | 33.87 | 56.00 | -22.13 | QP |
| 0.5180 | 15.27 | 9.53 | 24.80 | 46.00 | -21.20 | AVG |
| 3.8540 | 33.04 | 9.59 | 42.63 | 56.00 | -13.37 | QP |
| 3.8540 | 19.42 | 9.59 | 29.01 | 46.00 | -16.99 | AVG |
| 8.3340 | 33.88 | 9.70 | 43.58 | 60.00 | -16.42 | QP |
| 8.3340 | 13.02 | 9.70 | 22.72 | 50.00 | -27.28 | AVG |
| 13.4818 | 30.97 | 9.81 | 40.78 | 60.00 | -19.22 | QP |
| 13.4818 | 21.74 | 9.81 | 31.55 | 50.00 | -18.45 | AVG |

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



## 3.2 RADIATED EMISSION MEASUREMENT

### 3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

| FREQUENCY (MHz) | Class A (at 10m) | Class B (at 3m) |
|---|---|---|
| | dBuV/m | dBuV/m |
| 30 ~ 88 | 39.0 | 40.0 |
| 88 ~ 216 | 43.5 | 43.5 |
| 216 ~ 960 | 46.5 | 46.0 |
| Above 960 | 49.5 | 54.0 |

Notes:

(1) The limit for radiated test was performed according to as following: FCC PART 15B /ICES-003.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

### 3.2.2 TEST PROCEDURE

**Test Arrangement for Radiated Emissions up to 1 GHz**

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited test facility. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for quasi-peak detection (QP) at frequency below 1GHz.

**Test Arrangement for Radiated Emissions above 1 GHz.**

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna can be varied from one meter to four meters, the height of adjustment depends on the EUT height and the antenna 3dB beamwidth both, to detect the maximum value of the field strength.Both horizontal and vertical polarizations of the antenna are set to make the measurement.

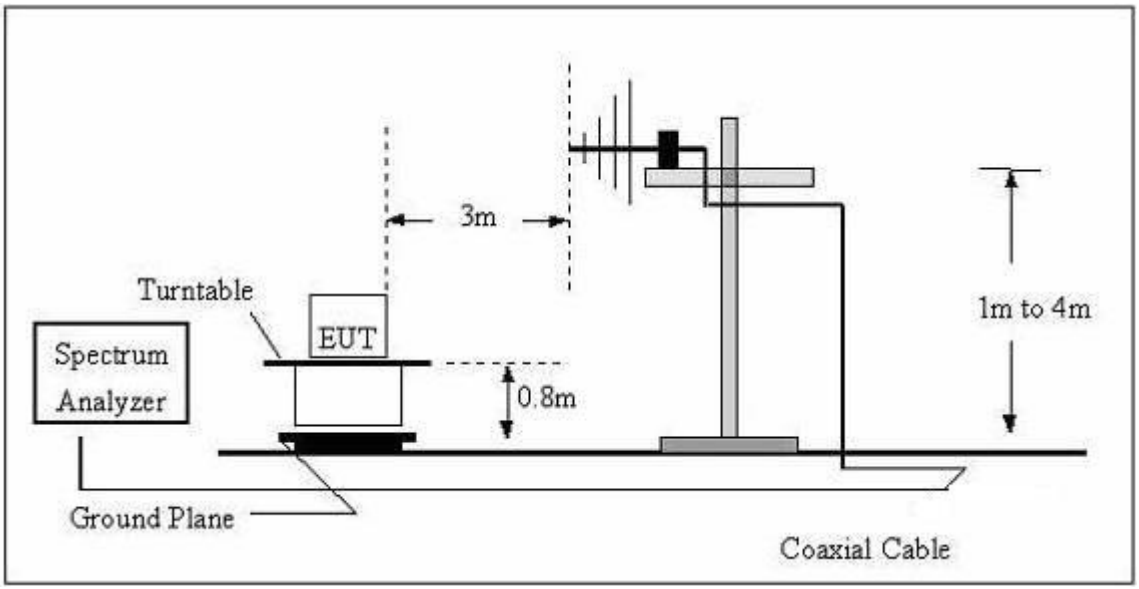
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights and the rotatable table was turned from 0 degrees to 360 degrees to find

the maximum reading.

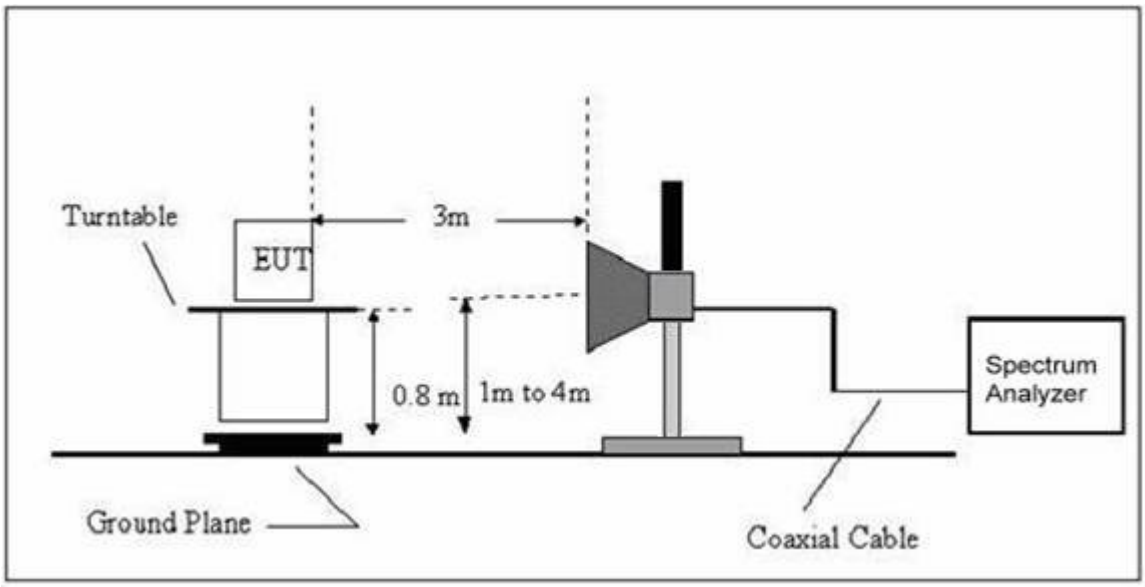
e. The spectrum analyzer system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz

3.2.3 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz




(B) Radiated Emission Test Set-Up Frequency Above 1GHz




3.2.4 EUT OPERATING CONDITIONS

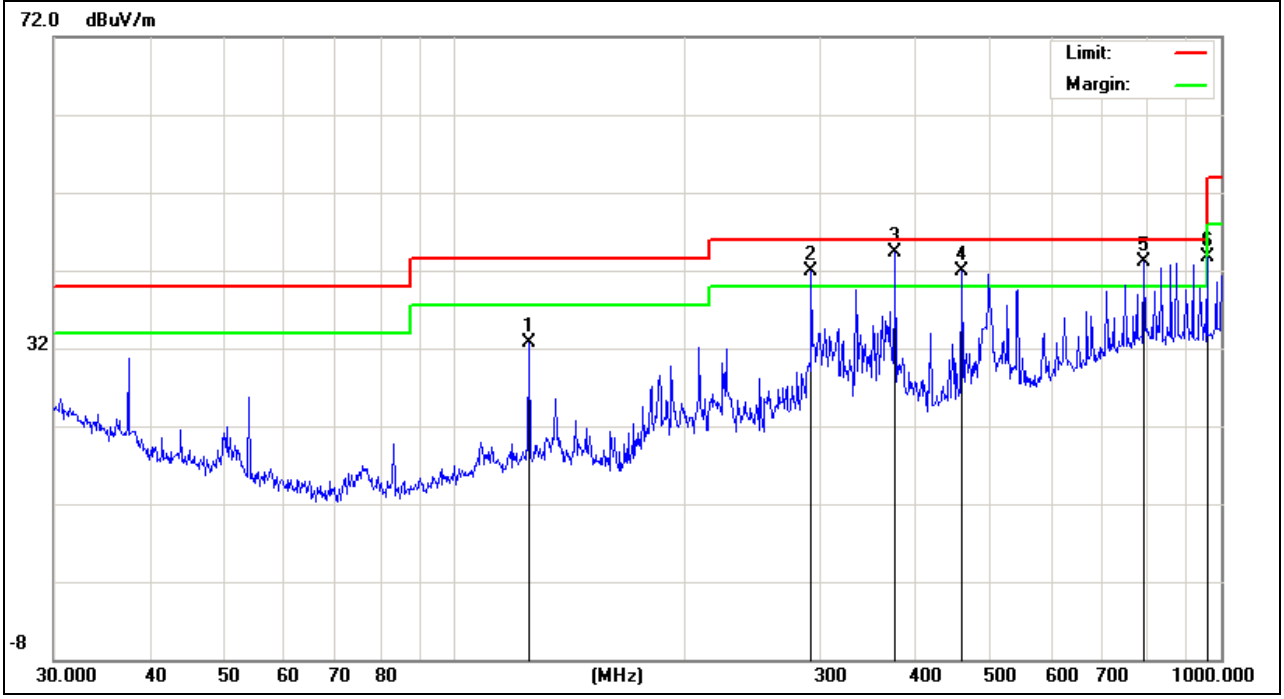
The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.5 TEST RESULTS

| | | | |
|---|---|---|---|
| EUT： | Kano Speaker Electronics | Model Name ： | 14G1100A |
| Temperature： | 24 ℃ | Relative Humidity： | 54% |
| Pressure： | 1010 hPa | Test Date： | 2014-08-21 |
| Test Mode ： | Mode 1 | Polarization： | Horizontal |
| Test Power ： | DC 5V From the Kano computer Kit | | |

| Freq. (MHz) | Reading (dBuV) | Factor (dBuV) | Measurement (dBuV) | Limit (dBuV) | Over (dB) | Remark |
|---|---|---|---|---|---|---|
| 125.0066 | 20.80 | 11.99 | 32.79 | 43.50 | -10.71 | QP |
| 292.0583 | 27.76 | 14.06 | 41.82 | 46.00 | -4.18 | QP |
| 375.9385 | 26.99 | 17.31 | 44.30 | 46.00 | -1.70 | QP |
| 459.1144 | 22.39 | 19.48 | 41.87 | 46.00 | -4.13 | QP |
| 793.3958 | 15.81 | 27.24 | 43.05 | 46.00 | -2.95 | QP |
| 958.7943 | 16.38 | 27.36 | 43.74 | 46.00 | -2.26 | QP |

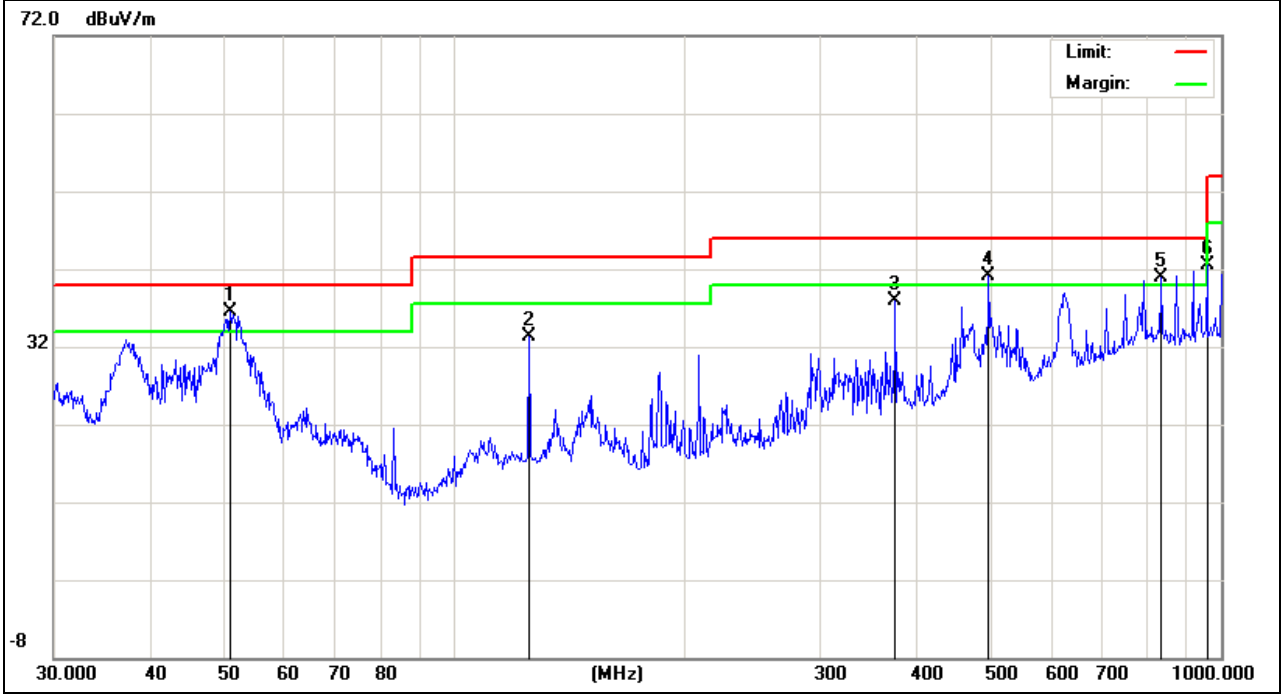
Remark:
Factor = Antenna Factor + Cable Loss - Amplifier.



| | | | |
|---|---|---|---|
| EUT： | Kano Speaker Electronics | Model Name ： | 14G1100A |
| Temperature： | 24 ℃ | Relative Humidity： | 54% |
| Pressure： | 1010 hPa | Test Date： | 2014-08-21 |
| Test Mode ： | Mode 1 | Polarization： | Vertical |
| Test Power ： | DC 5V From the Kano computer Kit | | |

| Freq. (MHz) | Reading (dBuV) | Factor (dBuV) | Measurement (dBuV) | Limit (dBuV) | Over (dB) | Remark |
|---|---|---|---|---|---|---|
| 50.9420 | 26.11 | 10.43 | 36.54 | 40.00 | -3.46 | QP |
| 125.0066 | 21.24 | 11.99 | 33.23 | 43.50 | -10.27 | QP |
| 375.9385 | 20.57 | 17.31 | 37.88 | 46.00 | -8.12 | QP |
| 497.6765 | 20.87 | 20.24 | 41.11 | 46.00 | -4.89 | QP |
| 836.2441 | 13.53 | 27.28 | 40.81 | 46.00 | -5.19 | QP |
| 958.7943 | 15.20 | 27.36 | 42.56 | 46.00 | -3.44 | QP |

Remark:
Factor = Antenna Factor + Cable Loss - Amplifier.

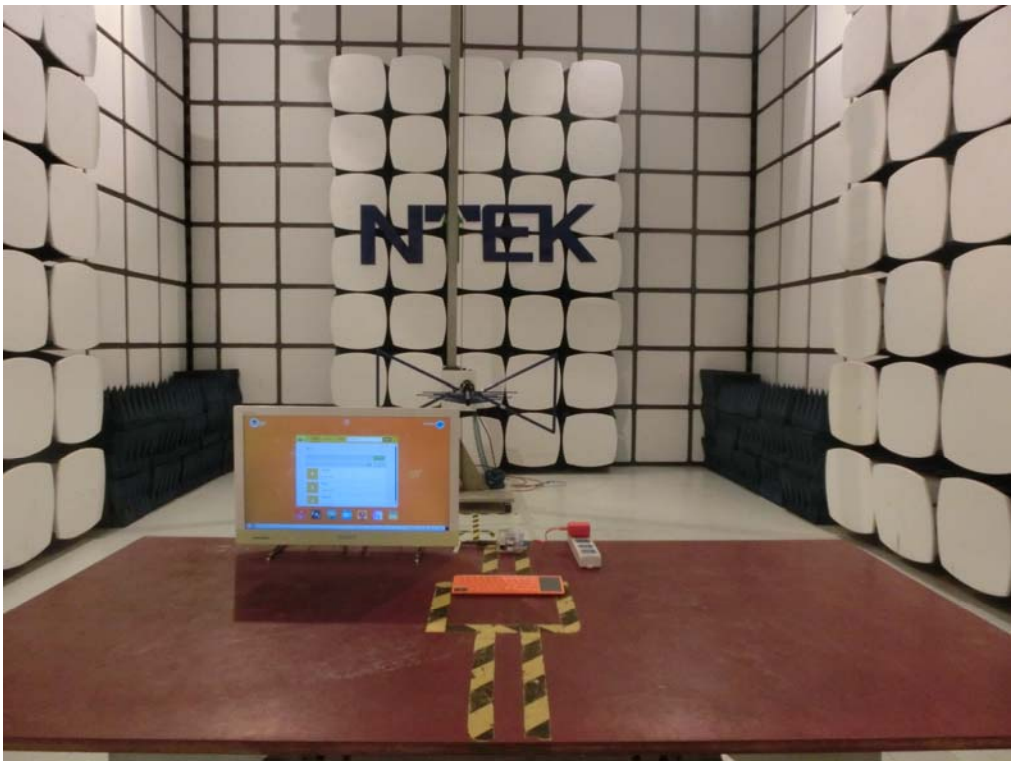


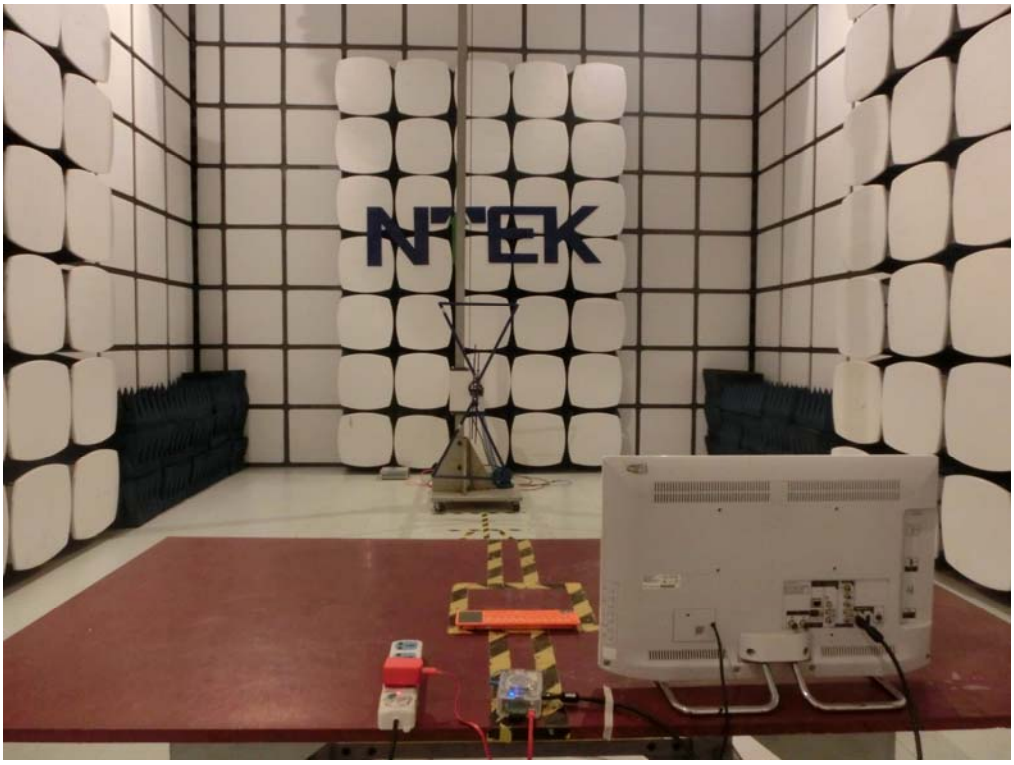
3.2.6 TEST RESULTS(Above 1GHz)

| | | | |
|---|---|---|---|
| EUT： | Kano Speaker Electronics | Model Name ： | 14G1100A |
| Temperature： | 24 ℃ | Relative Humidity： | 54% |
| Pressure： | 1010 hPa | Test Date : | N/A |
| Test Mode ： | N/A | Polarization : | N/A |
| Test Power ： | N/A | | |

## 4. EUT TEST PHOTO

**Radiated Measurement Photos**





**Conducted Measurement Photos**

**--End of the report--**