



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
FCC Part15B:01 Oct.2013
Standards : 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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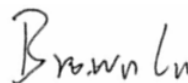
Date of Test :
Date (s) of performance of tests : 11 Aug. 2014 ~23 Aug. 2014
Date of Issue : 23 Aug. 2014
Test Result : **Pass**

Testing Engineer :



(Eileen Liu)

Technical Manager :



(Brown Lu)

Authorized Signatory :



(Bill Yao)

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1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC Part15B:2013 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 $y \pm U$, 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

Equipment	Kano Speaker Electronics	
Model Name	14G1100A	
Additional Model Number(s)	N/A	
Model Difference	N/A	
Product Description	The EUT is a Kano Speaker Electronics.	
	Connecting I/O port:	N/A
	Operating frequency:	20kHz
	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.	
Power Source	DC Voltage	
Adapter	N/A	
Battery	N/A	

2.1.1 DESCRIPTION OF TEST MODES

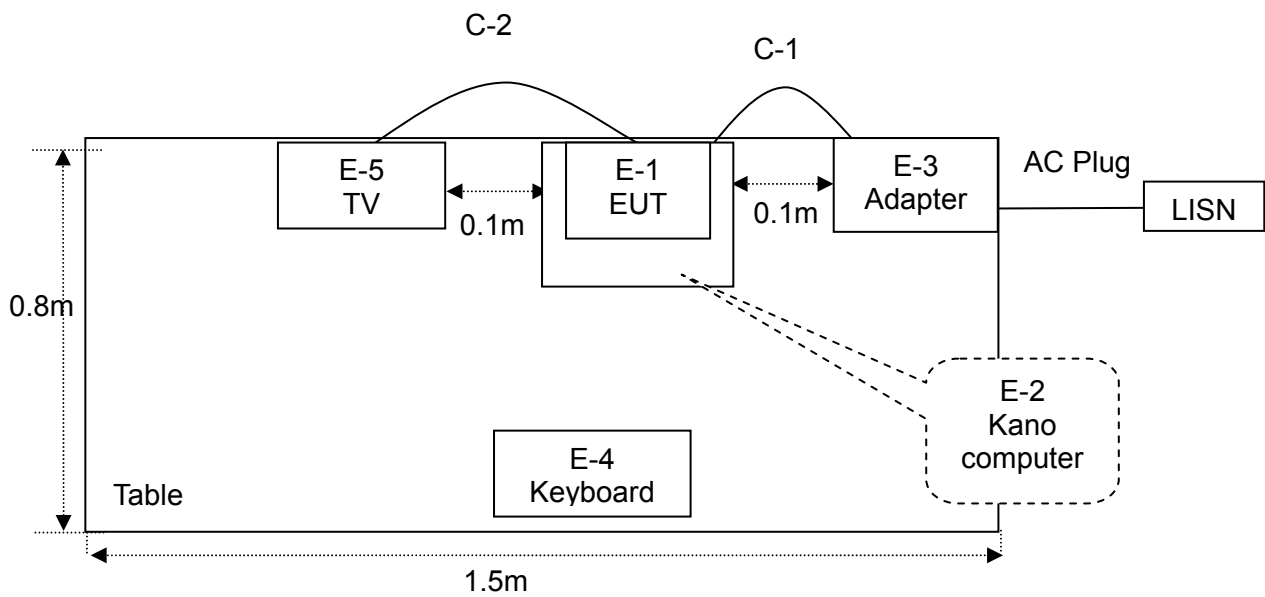
To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration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

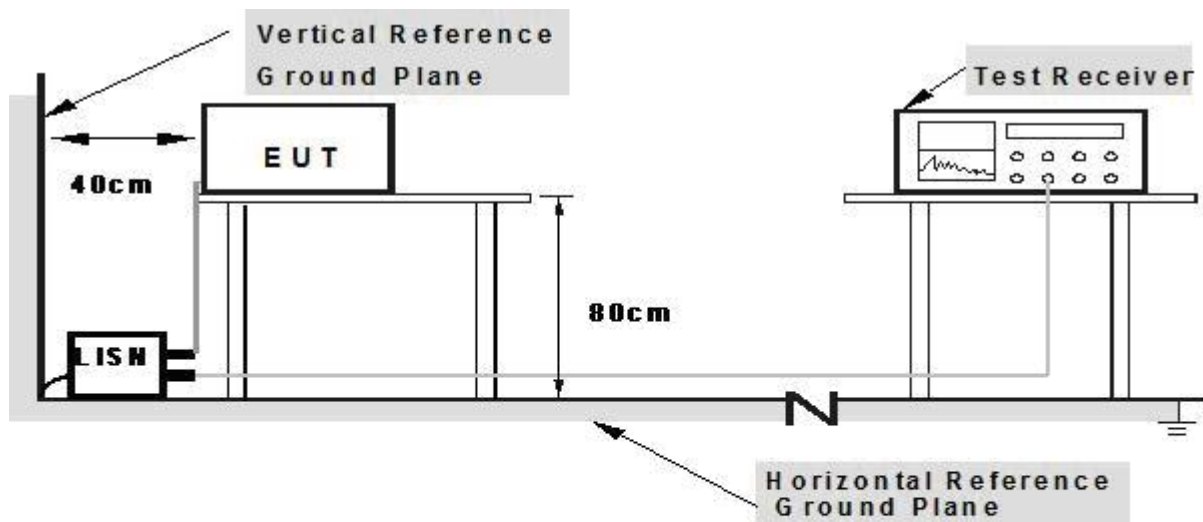
The following table is the setting of the receiver

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 cm 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 °C	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.

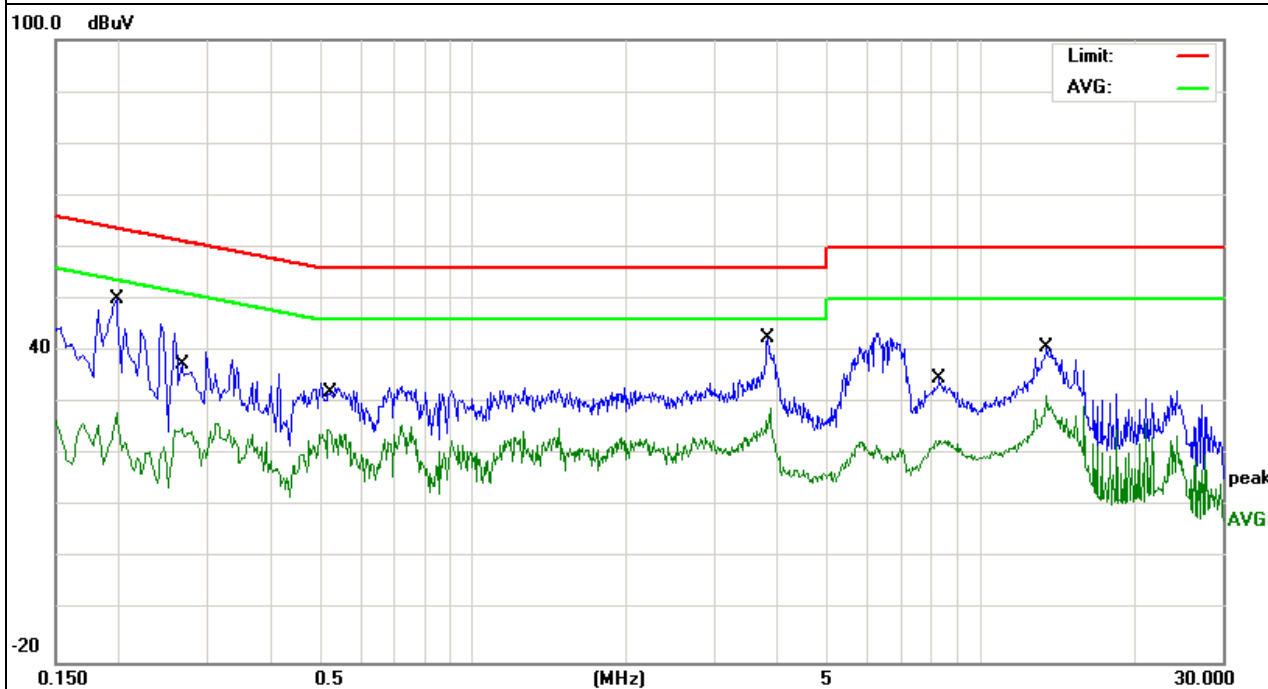


EUT :	Kano Speaker Electronics	Model Name. :	14G1100A
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2014-08-21
Test Mode :	Mode 1	Phase :	N
Test Voltage :	DC 5V From the Kano computer Kit		

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.

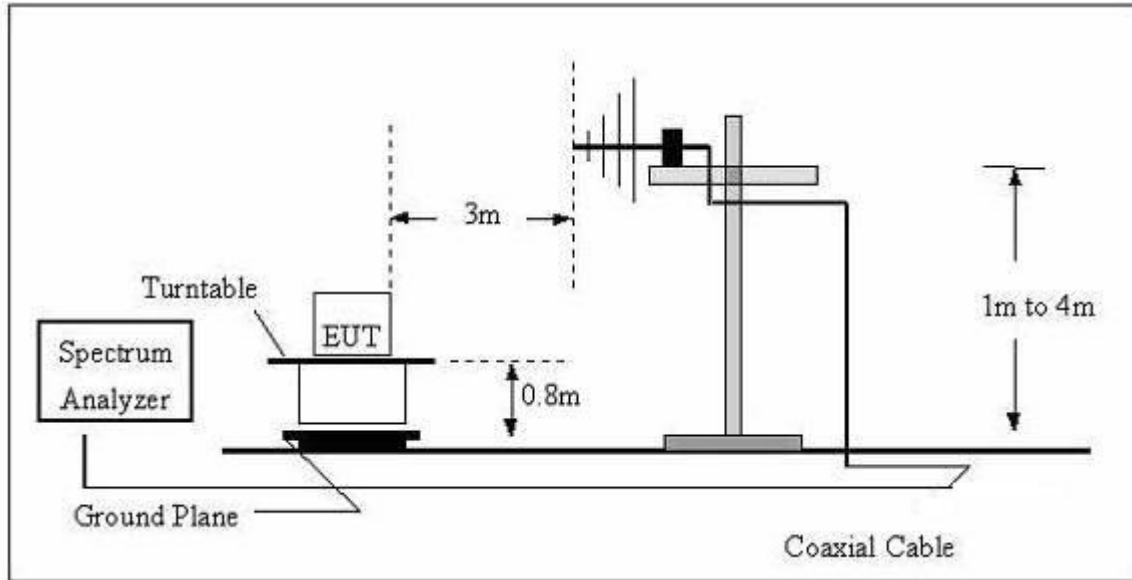
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the 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.

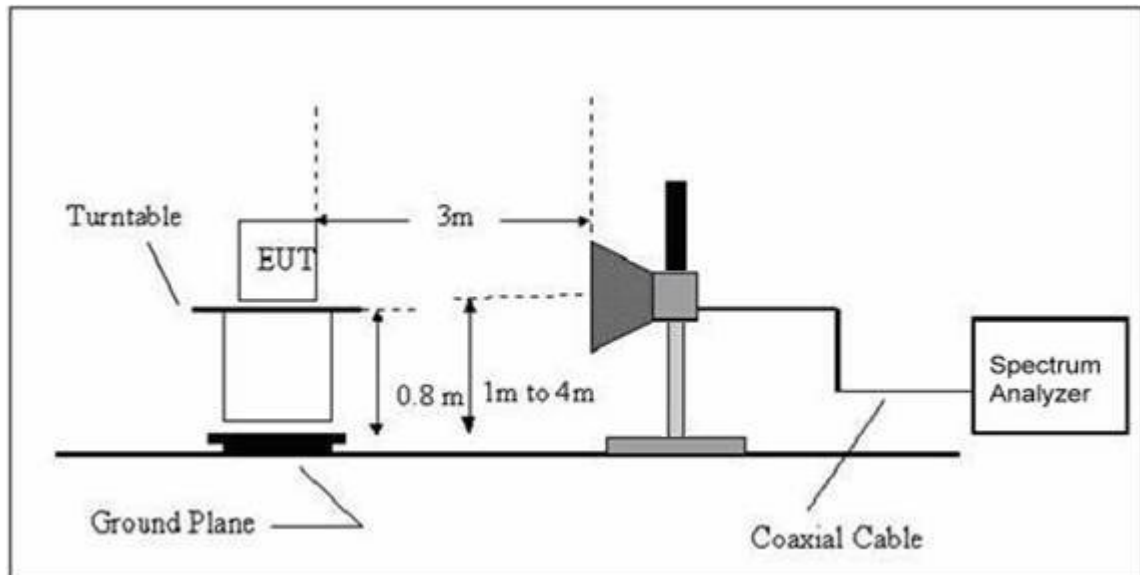
- e. The spectrum analyzer system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz

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.

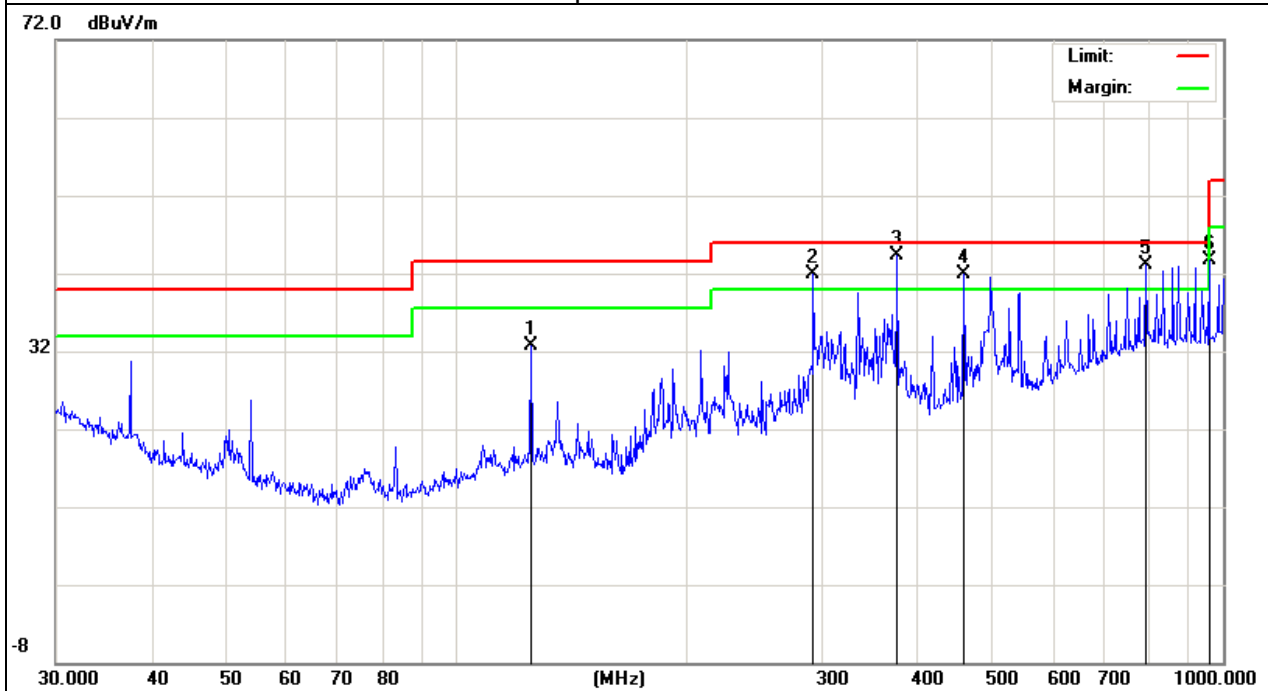
3.2.5 TEST RESULTS

EUT :	Kano Speaker Electronics	Model Name :	14G1100A
Temperature :	24 °C	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.

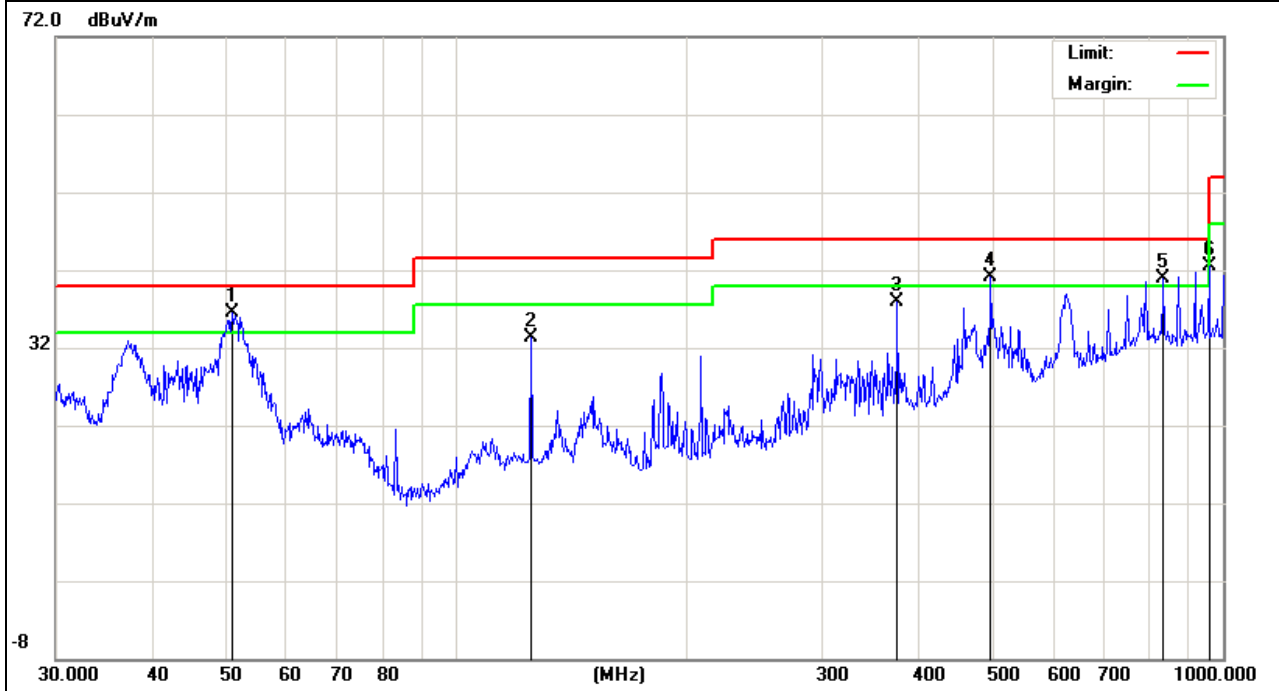


EUT :	Kano Speaker Electronics	Model Name :	14G1100A
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2014-08-21
Test Mode :	Mode 1	Polarization :	Vertical
Test Power :	DC 5V From the Kano computer Kit		

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 °C	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--