

FCC Part 15B Measurement and Test Report

For

Inspero Inc.

Yanqi Street No. 31, Yanqi Economic Development Zone, Huairou District,

Beijing

FCC ID: 2AHJ6-HEARABLE

Test Rule(s):	<u>FCC Part 15 Subpart B</u>
Product Description:	<u>VINCI Hearable</u>
Tested Model:	<u>Hearable 1.0</u>
Report No.:	<u>STR16028058I-3</u>
Tested Date:	<u>2016-02-27 to 2016-03-06</u>
Issued Date:	<u>2016-03-15</u>
Tested By:	<u>Irving Liu / Engineer</u>
Reviewed By:	<u>Silin Chen / EMC Manager</u>
Approved & Authorized By:	<u>Jandy So / PSQ Manager</u>
Prepared By:	

Irving Liu

Silin Chen

Jandy So

Shenzhen SEM.Test Technology Co., Ltd.

1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road,
Bao'an District, Shenzhen, P.R.C. (518101)

Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

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 Shenzhen SEM.Test Technology Co., Ltd.

TABLE OF CONTENTS

1. GENERAL INFORMATION	3
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
1.2 TEST STANDARDS.....	4
1.3 TEST METHODOLOGY	4
1.4 TEST FACILITY	4
1.5 EUT SETUP AND OPERATION MODE	5
1.6 MEASUREMENT UNCERTAINTY	5
1.7 TEST EQUIPMENT LIST AND DETAILS	6
2. SUMMARY OF TEST RESULTS	7
3. CONDUCTED EMISSIONS	8
3.1 TEST PROCEDURE.....	8
3.2 BASIC TEST SETUP BLOCK DIAGRAM.....	8
3.3 ENVIRONMENTAL CONDITIONS	8
3.4 SUMMARY OF TEST RESULTS/PLOTS	8
3.5 CONDUCTED EMISSIONS TEST DATA.....	9
4. RADIATED EMISSIONS	13
4.1 TEST PROCEDURE	13
4.2 TEST RECEIVER SETUP	14
4.3 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	14
4.4 ENVIRONMENTAL CONDITIONS	14
4.5 SUMMARY OF TEST RESULTS/PLOTS	14

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Inspero Inc.
Address of applicant: Yanqi Street No. 31, Yanqi Economic Development Zone,
Huairou District, Beijing
Manufacturer: Inspero Inc.
Address of manufacturer: Yanqi Street No. 31, Yanqi Economic Development Zone,
Huairou District, Beijing

General Description of EUT	
Product Name:	VINCI Hearable
Trade Name:	VINCI
Model No.:	Hearable 1.0
Adapter Model:	Model:TS-C051
	INPUT:100-240V,50/60Hz,0.15A; OUTPUT:5V,1A
Hardware version:	vinci 1.0
Software version:	vinci 0.9
Device Category:	Portable Device
<i>The EUT Main board support GPRS 850/900/ GPRS 1800/ GPRS 1900, WCDMA Band 1/5 function. It is intended for Multimedia Message Service (MMS) transmission. It is equipped with GPRS class 12 for GPRS 850/900/ GPRS 1800/ GPRS 1900, GPS and Wi-Fi functions. For more information see the following datasheet</i>	
<i>Note: The test data is gathered from a production sample provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Rated Voltage:	DC 3.7V Battery
Battery Capacity:	2000mAh
Lowest Internal Frequency:	26.0MHz
Classification of ITE:	Class B

1.2 Test Standards

The following report is prepared on behalf of the Inspero Inc. 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, Subpart B, and section 15.205, 15.107, and 15.109 rules.

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

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, 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.

1.4 Test Facility

- **FCC – Registration No.: 934118**

Shenzhen SEM.Test Technology 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 934118.

- **Industry Canada (IC) Registration No.: 11464A**

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

- **CNAS Registration No.: L4062**

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C (518101)

1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark
TM1	Charging & Playing	With Adapter
TM2	Downloading	Connected to PC
TM3	/	/
TM4	/	/

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	0.8	Unshielded	Without Ferrite

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	E10	LR-63C8R

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	$\pm 2.88\text{dB}$
Transmitter Spurious Emissions	Radiated	$\pm 5.1\text{dB}$

1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Spectrum Analyzer	Agilent	E4407B	MY41440400	2015-06-17	2016-06-16
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2015-06-17	2016-06-16
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2015-06-17	2016-06-16
Amplifier	Agilent	8447F	3113A06717	2015-06-17	2016-06-16
Amplifier	C&D	PAP-1G18	2002	2015-06-17	2016-06-16
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2015-06-17	2016-06-16
Horn Antenna	ETS	3117	00086197	2015-06-17	2016-06-16
Loop Antenna	Schwarz beck	FMZB 1516	9773	2015-06-17	2016-06-16
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2015-06-17	2016-06-16
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2015-06-17	2016-06-16
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2015-06-17	2016-06-16

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 15.107 (a)	Conducted Emissions	Compliant
§ 15.109 (a)	Radiated Emissions	Compliant

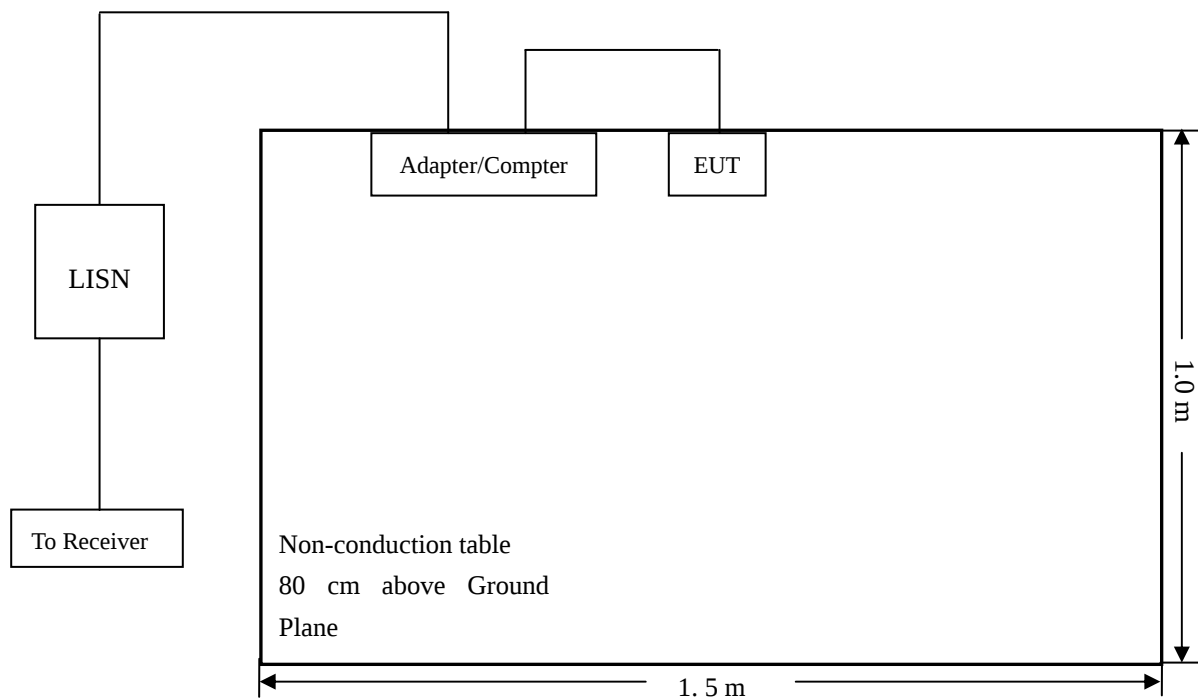
N/A: not applicable

3. Conducted Emissions

3.1 Test Procedure

Test is conducting under the description of ANSI C63.4-2014, 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.

3.2 Basic Test Setup Block Diagram



3.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

3.4 Summary of Test Results/Plots

According to the data in section 3.6, the EUT complied with the FCC Part 15.107(a) Conducted margin for a Class B device, with the *worst* margin reading of:

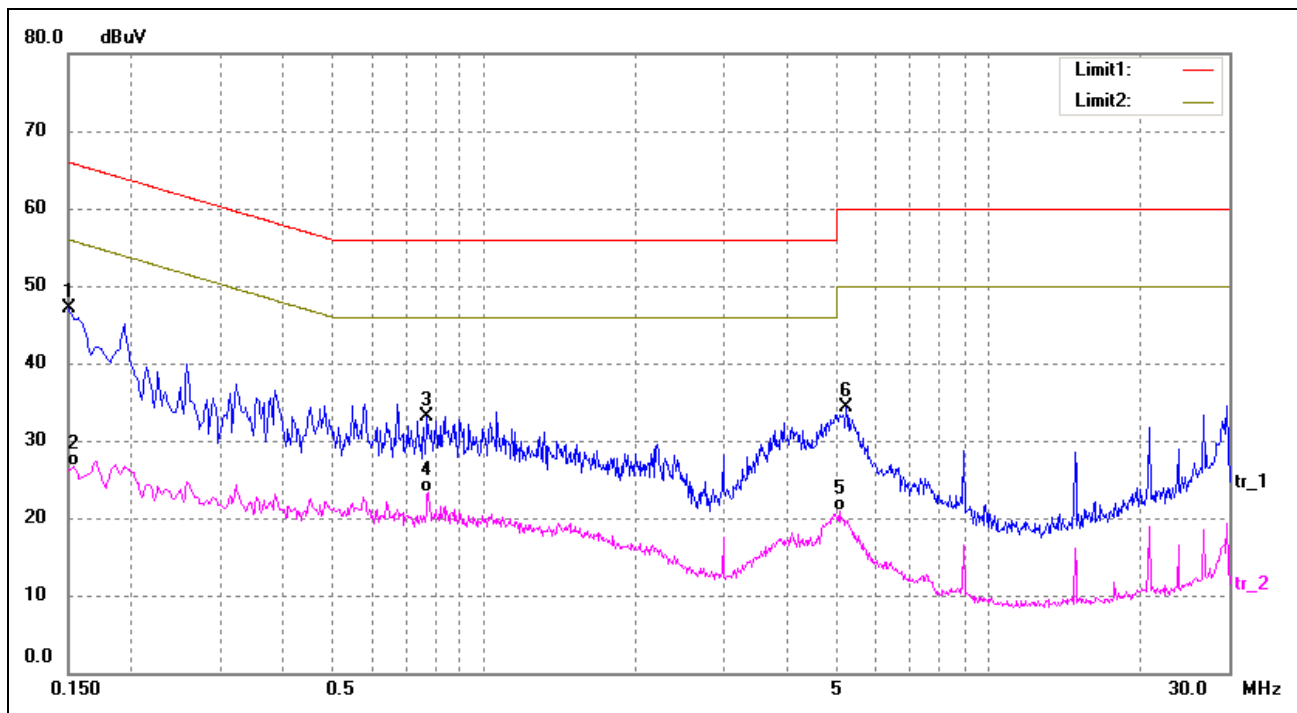
-10.05 dB at 0.1740 MHz in the **Neutral, Peak** detector, TM2, 0.15-30MHz

3.5 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

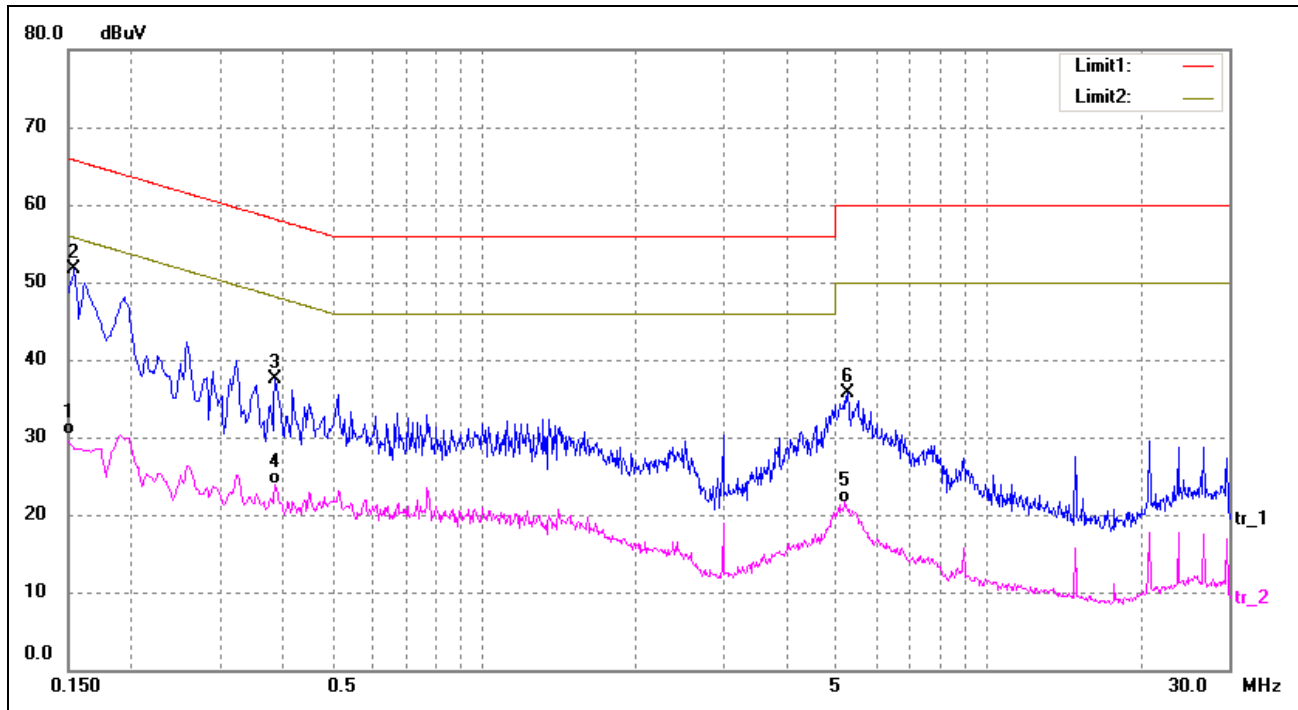
EUT: VINCI Hearable
 Tested Model: Hearable 1.0
 Operating Condition: TM1
 Comment: AC 120V/60Hz; Adapter DC 5V

Test Specification: Neutral



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1*	0.1500	37.67	9.50	47.17	66.00	-18.83	peak
2	0.1540	17.15	9.50	26.65	55.78	-29.13	AVG
3	0.7740	23.40	9.63	33.03	56.00	-22.97	peak
4	0.7780	13.66	9.63	23.29	46.00	-22.71	AVG
5	5.0780	10.67	10.24	20.91	50.00	-29.09	AVG
6	5.2340	24.06	10.25	34.31	60.00	-25.69	peak

Test Specification: Line

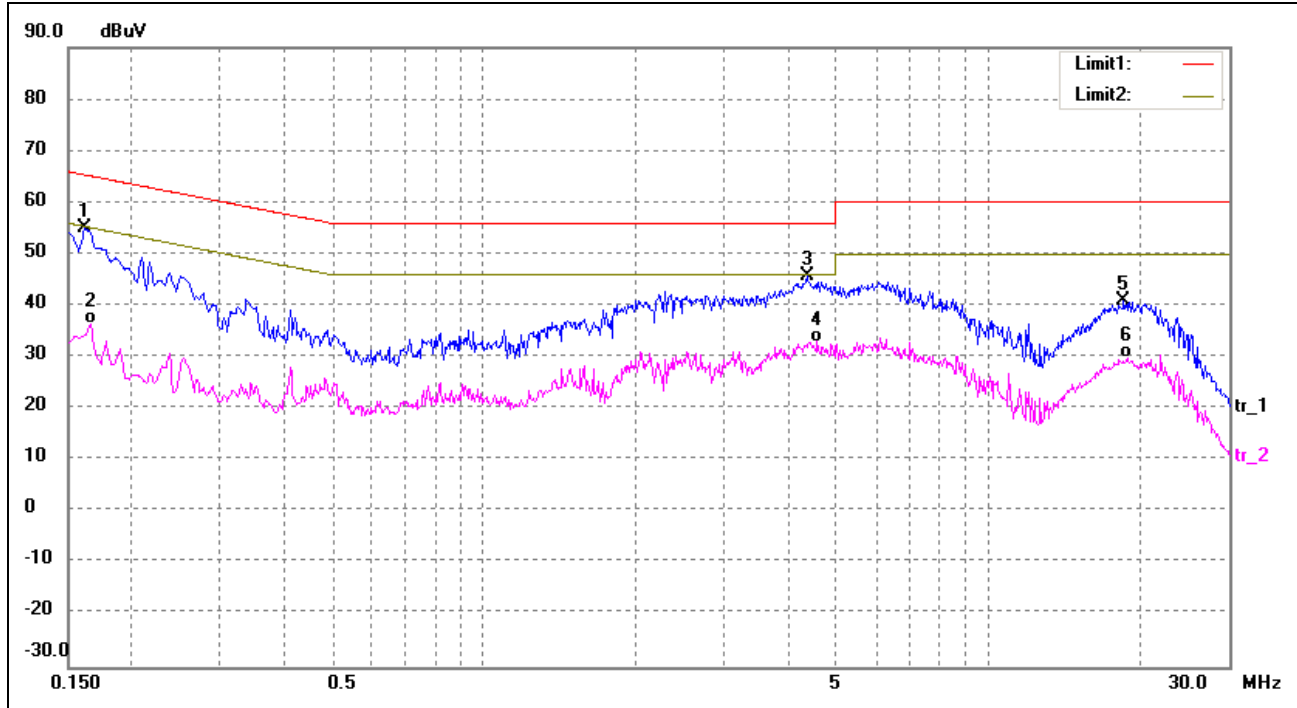


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	20.80	9.50	30.30	56.00	-25.70	AVG
2*	0.1540	42.27	9.50	51.77	65.78	-14.01	peak
3	0.3860	27.93	9.50	37.43	58.15	-20.72	peak
4	0.3860	14.32	9.50	23.82	48.15	-24.33	AVG
5	5.2060	11.36	10.24	21.60	50.00	-28.40	AVG
6	5.2700	25.40	10.25	35.65	60.00	-24.35	peak

Plot of Conducted Emissions Test Data

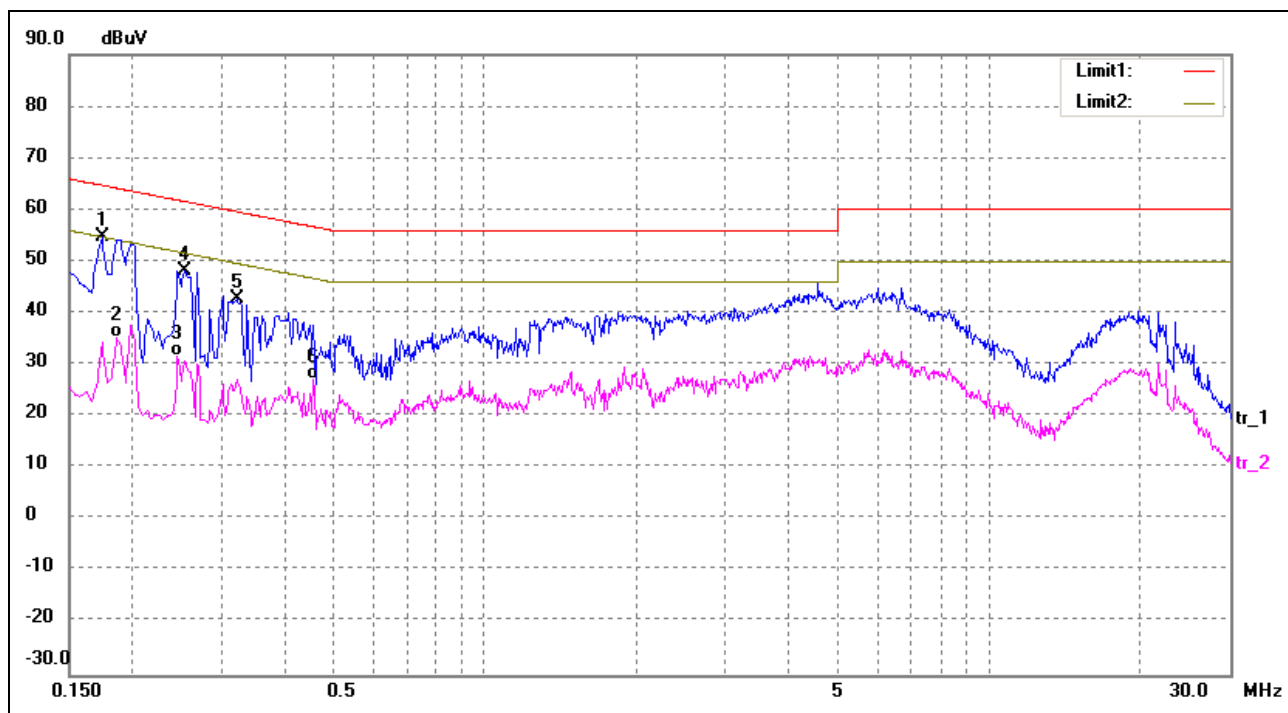
EUT: VINCI Hearable
 Tested Model: Hearable 1.0
 Operating Condition: TM2
 Comment: AC 120V/60Hz; USB 5V

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1620	45.24	9.78	55.02	65.36	-10.34	peak
2	0.1660	26.93	9.54	36.47	55.16	-18.69	AVG
3*	4.3620	33.25	12.57	45.82	56.00	-10.18	peak
4	4.5780	20.28	12.72	33.00	46.00	-13.00	AVG
5	18.5580	29.11	11.71	40.82	60.00	-19.18	peak
6	18.8260	18.09	11.77	29.86	50.00	-20.14	AVG

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1740	45.66	9.06	54.72	64.77	-10.05	peak
2	0.1860	26.90	8.34	35.24	54.21	-18.97	AVG
3	0.2460	24.28	7.50	31.78	51.89	-20.11	AVG
4	0.2540	40.67	7.50	48.17	61.63	-13.46	peak
5	0.3220	35.40	7.50	42.90	59.66	-16.76	peak
6	0.4580	19.78	7.50	27.28	46.73	-19.45	AVG

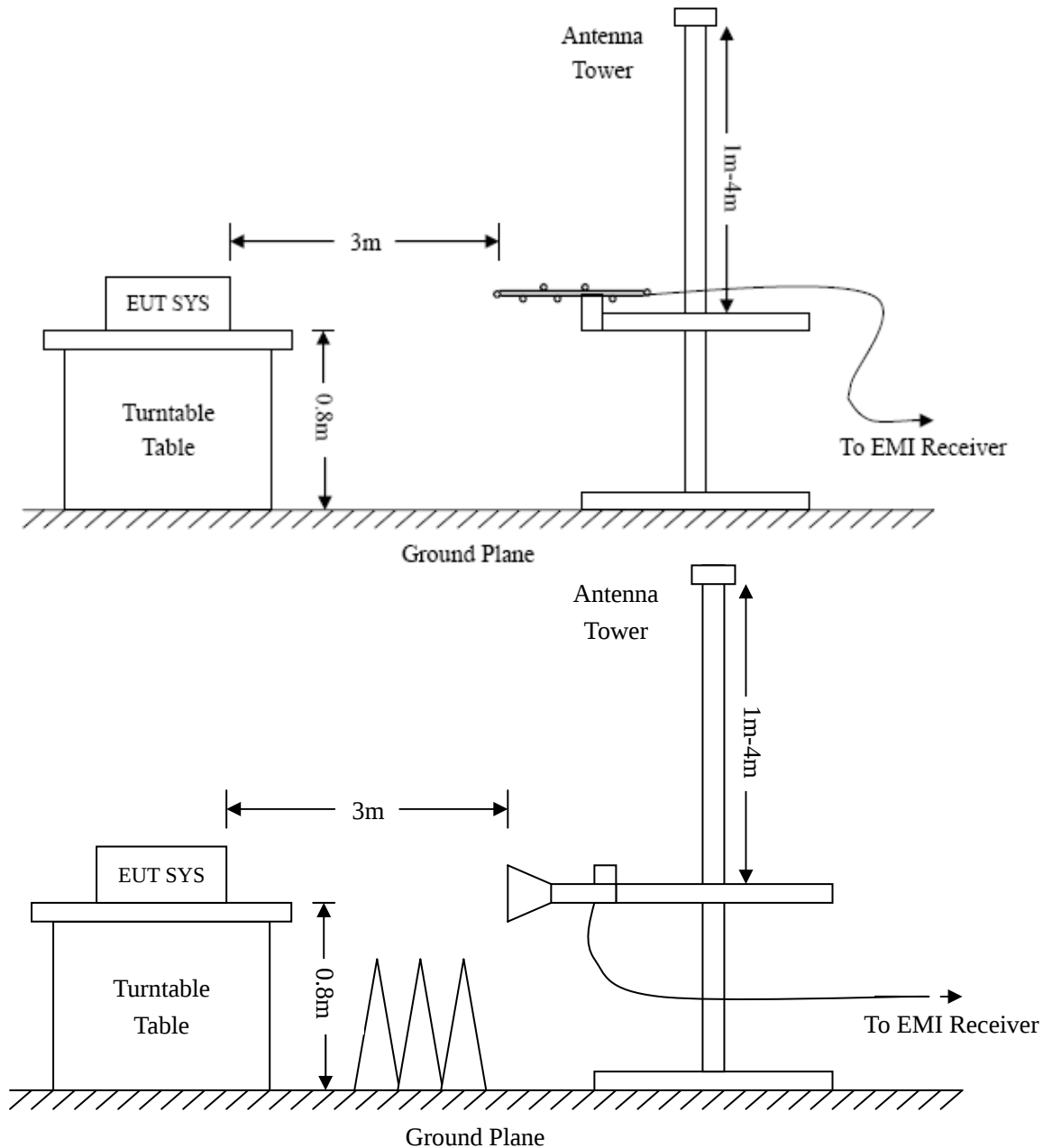
4. Radiated Emissions

4.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the 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.



4.2 Test Receiver Setup

Frequency :9kHz-30MHz

RBW=10KHz,

VBW =30KHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency :30MHz-1GHz

RBW=120KHz,

VBW=300KHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency :Above 1GHz

RBW=1MHz,

VBW=3MHz(Peak), 10Hz(AV)

Sweep time= Auto

Trace = max hold

Detector function = peak, AV

4.3 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 -6dB μ V means the emission is 6dB μ V below the maximum limit for a Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15.109(a) Limit}$$

4.4 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

4.5 Summary of Test Results/Plots

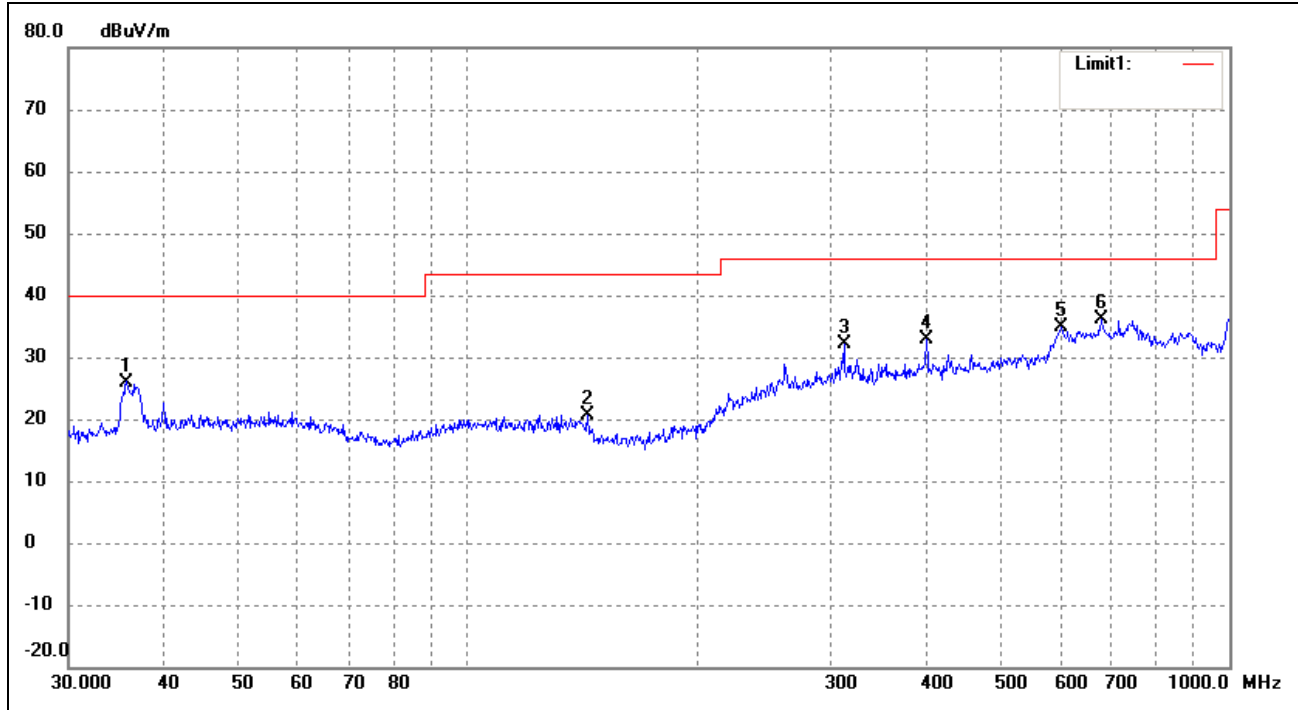
According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

-8.51 dB at 73.6170 MHz in the Vertical polarization, TM2 Mode 9 kHz to 6.5 GHz, 3Meters

Plot of Radiated Emissions Test Data

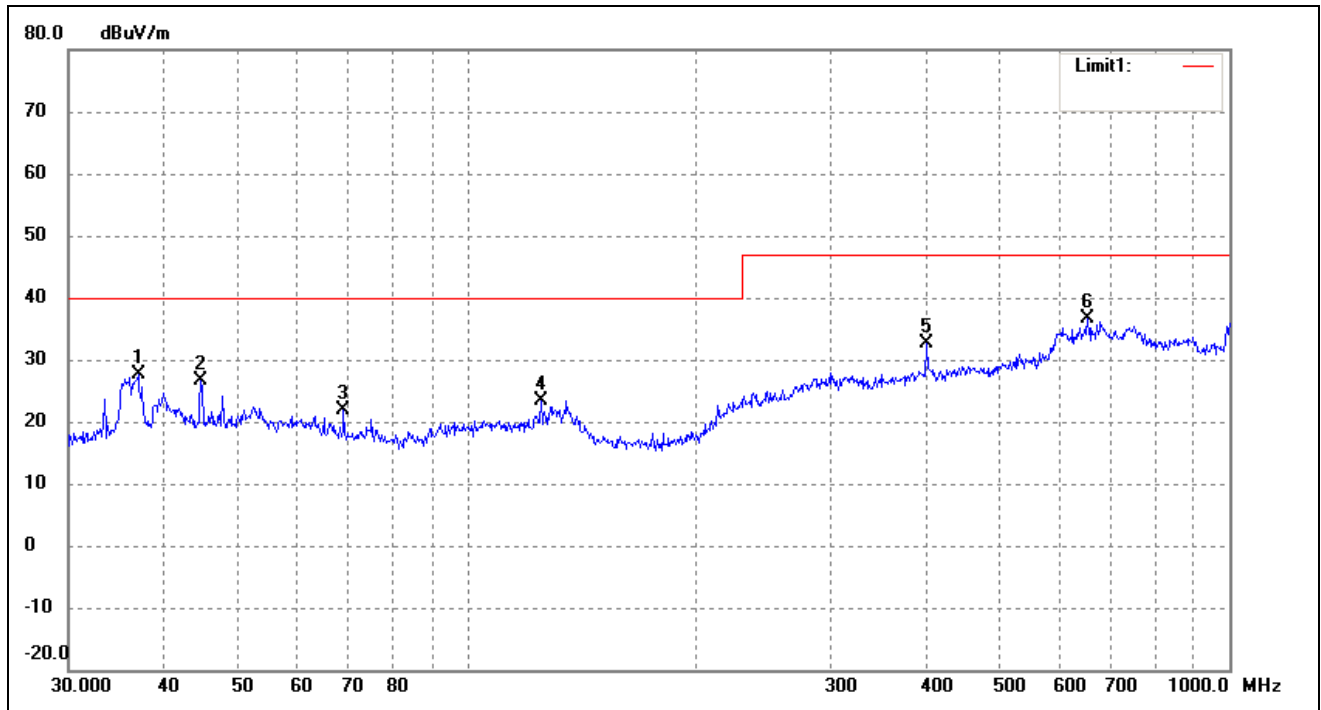
EUT: VINCI Hearable
 Tested Model: Hearable 1.0
 Operating Condition: TM1
 Comment: AC 120V/60Hz; Adapter DC 5V

Test Specification: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	()	(cm)	
1	35.7490	21.49	4.51	26.00	40.00	-14.00	0	150	peak
2	143.8295	17.46	3.26	20.72	43.50	-22.78	0	150	peak
3	312.1794	19.91	12.24	32.15	46.00	-13.85	0	150	peak
4	400.4319	19.73	13.12	32.85	46.00	-13.15	0	150	peak
5	601.4265	15.73	19.22	34.95	46.00	-11.05	0	150	peak
6	679.9600	16.79	19.26	36.05	46.00	-9.95	0	150	peak

Test Specification: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	()	(cm)	
1	37.0248	22.90	4.74	27.64	40.00	-12.36	360	100	peak
2	44.7433	21.34	5.26	26.60	40.00	-13.40	360	100	peak
3	68.8721	18.32	3.44	21.76	40.00	-18.24	360	100	peak
4	125.0066	18.78	4.61	23.39	40.00	-16.61	360	100	peak
5	400.4319	19.41	13.12	32.53	47.00	-14.47	360	100	peak
6	651.9417	18.22	18.32	36.54	47.00	-10.46	360	100	peak

Plot of Radiated Emissions Test Data

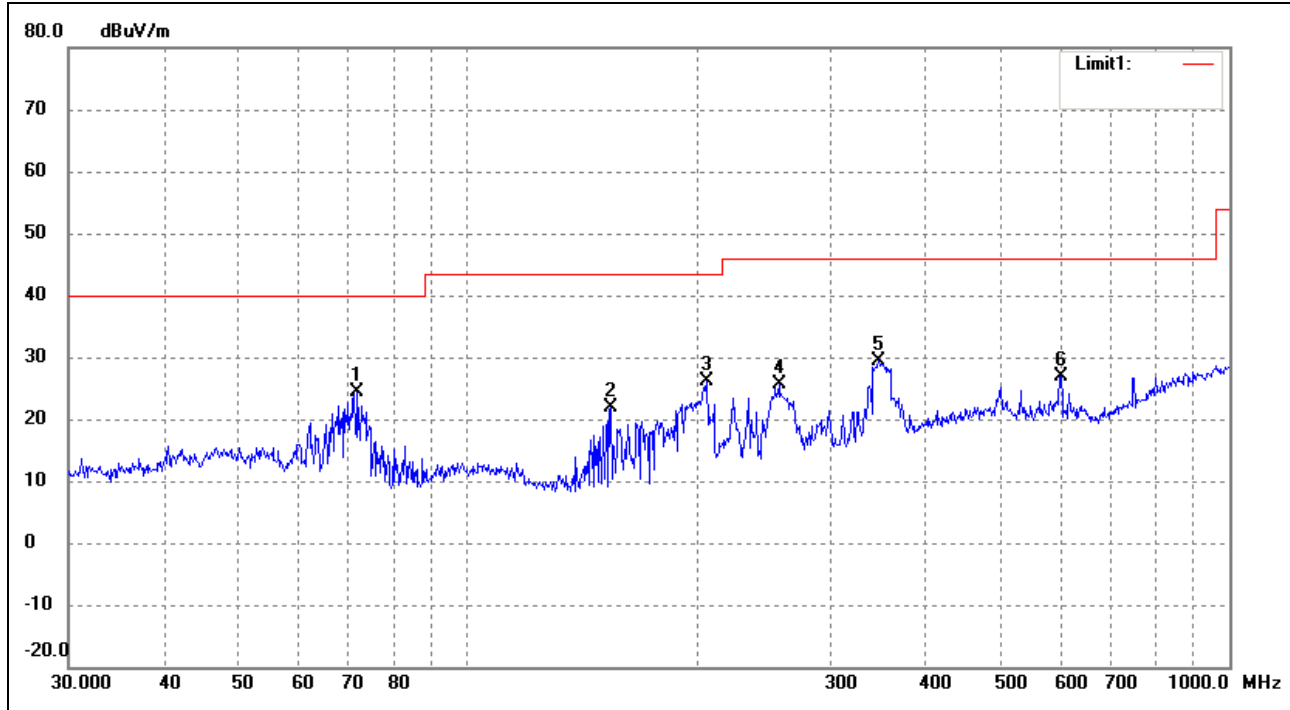
EUT: VINCI Hearable

Tested Model: Hearable 1.0

Operating Condition: TM2

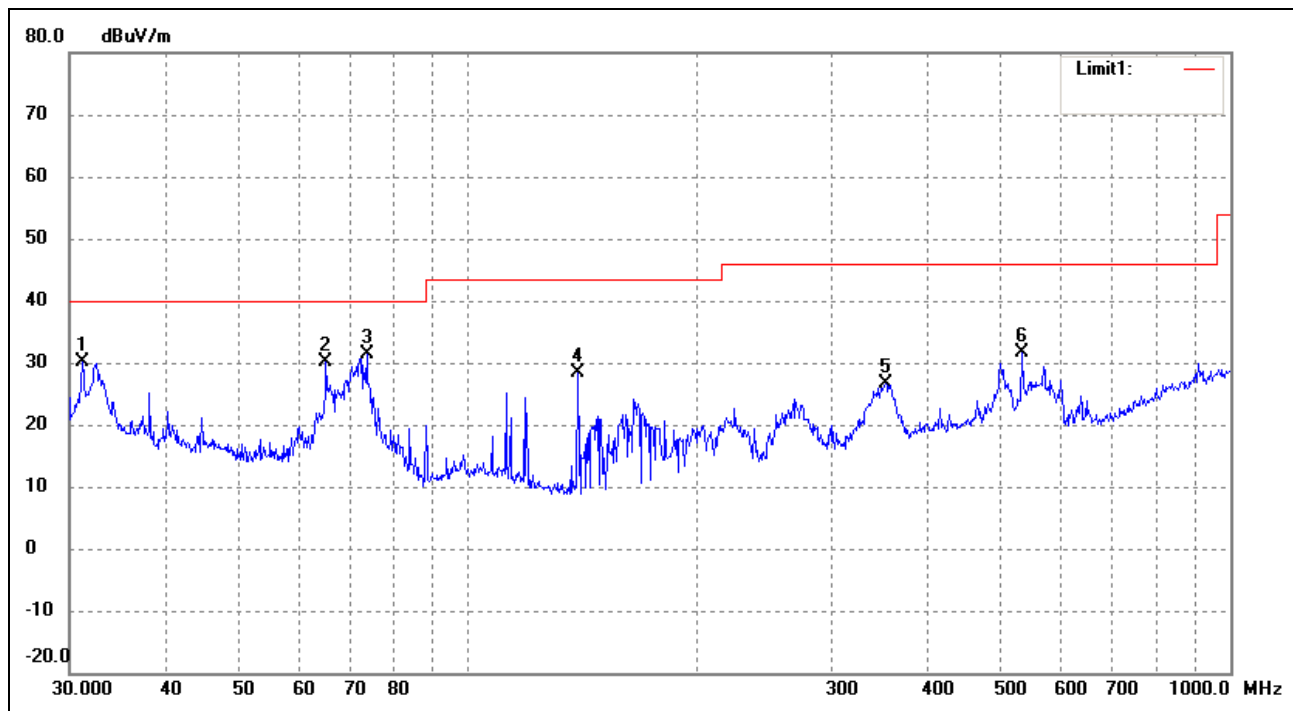
Comment: USB: DC5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1*	71.8320	36.67	-12.26	24.41	40.00	-15.59	102	100	QP
2	154.2786	34.63	-12.69	21.94	43.50	-21.56	114	100	QP
3	206.3976	35.04	-9.01	26.03	43.50	-17.47	127	100	QP
4	256.5211	32.80	-7.29	25.51	46.00	-20.49	166	100	QP
5	346.8092	33.76	-4.34	29.42	46.00	-16.58	184	100	QP
6	601.4265	28.69	-1.84	26.85	46.00	-19.15	201	100	QP

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	31.1798	40.67	-10.60	30.07	40.00	-9.93	114	100	QP
2	65.1145	39.95	-9.86	30.09	40.00	-9.91	127	100	QP
3*	73.6170	44.29	-12.80	31.49	40.00	-8.51	149	100	QP
4	139.3613	41.45	-13.13	28.32	43.50	-15.18	166	100	QP
5	352.9434	30.73	-4.21	26.52	46.00	-19.48	184	100	QP
6	531.9635	31.83	-0.32	31.51	46.00	-14.49	201	100	QP

Note: Testing is carried out with frequency rang 9kHz to the 6.5GHz, which above 1GHz is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4.

The measurements greater than 20dB below the limit from 9kHz to 30MHz and test data are not provided.

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