

FCC Part 15B Measurement and Test Report

For

BeiJing Hispot Technology Co. Ltd.

A2501 Yuanyangxinganxian, No.66 XiaGuangLi, Chaoyang. District,

Beijing, China

FCC ID: 2AKBR-H2

Test Rule(s): FCC Part 15 Subpart B

Product Description: hispot

Tested Model: H2

Report No.: STR16108007I-4

Tested Date: 2016-10-09 to 2016-11-02

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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.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: BeiJing Hispot Technology Co. Ltd.
Address of applicant: A2501 Yuanyangxinganxian, No.66 XiaGuangLi,
Chaoyang. District, Beijing, China

Manufacturer: BeiJing Hispot Technology Co. Ltd.
Address of manufacturer: A2501 Yuanyangxinganxian, No.66 XiaGuangLi,
Chaoyang. District, Beijing, China

General Description of EUT	
Product Name:	hispot
Brand Name:	hispot
Model No.:	H2
Adding Model(s):	/
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Rated Voltage:	DC 3.7V by battery
Rated Current:	2A
Rated Power:	10W
Power Adapter:	Model: A824A-120150U-EU1 Input: 100~240V.ac, 50/60Hz, 0.5A; Output: 5V.dc, 3A / 9V.dc, 2A / 12V.dc, 1.5A
Lowest Internal Frequency:	32.768KHz
Highest Internal Frequency:	1.5GHz

1.2 Test Standards

The following report is prepared on behalf of the BeiJing Hispot Technology Co. Ltd. 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 tested in 3 orthogonal positions and the worst case position data was reported. 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	Charge & Play mode	/
TM2	Download mode	/

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	0.98	Shielded	Without Core
HDMI Cable	1.03	Shielded	Without Core

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
U-disk	Kingston	G3	/
Notebook	Lenovo	E10	/

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

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2016-06-04	2017-06-03
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2016-06-04	2017-06-03
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2016-06-04	2017-06-03
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2016-06-04	2017-06-03
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2016-06-04	2017-06-03
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2016-06-04	2017-06-03
SEMT-1042	Horn Antenna	ETS	3117	00086197	2016-06-04	2017-06-03
SEMT-1121	Horn Antenna	ETS	3116B	00088203	2016-06-04	2017-06-03
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2016-06-04	2017-06-03
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2016-06-04	2017-06-03
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2016-06-04	2017-06-03
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2016-06-04	2017-06-03

2. SUMMARY OF TEST RESULTS

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

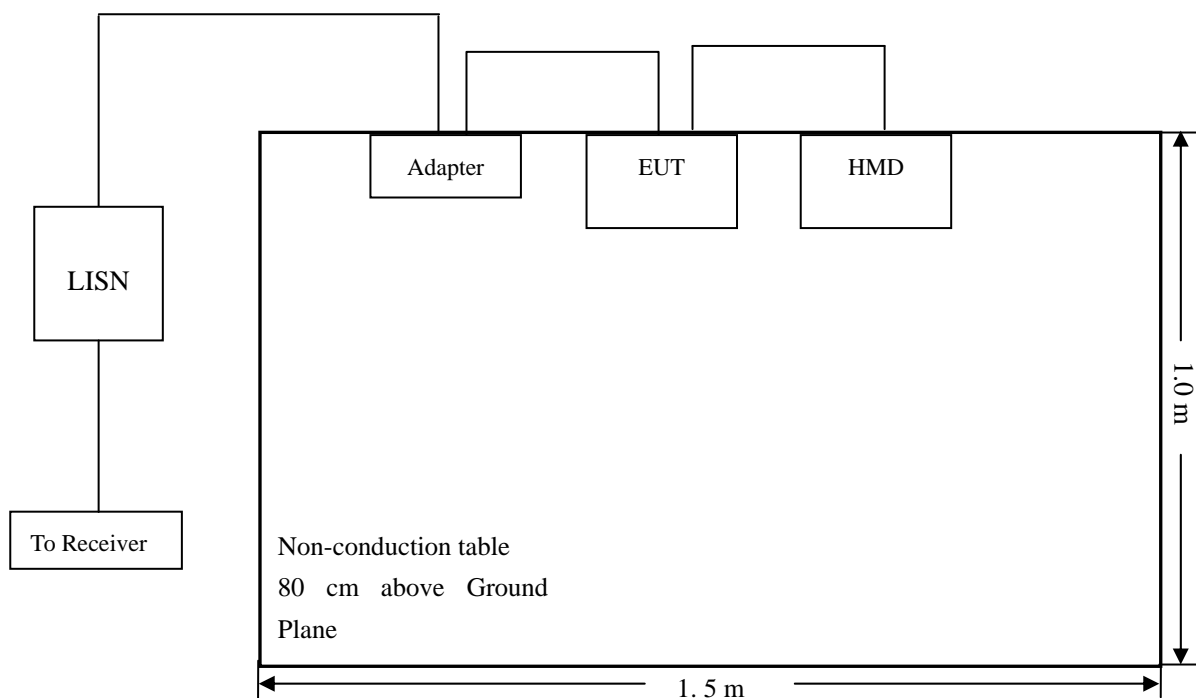
N/A: not applicable

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:

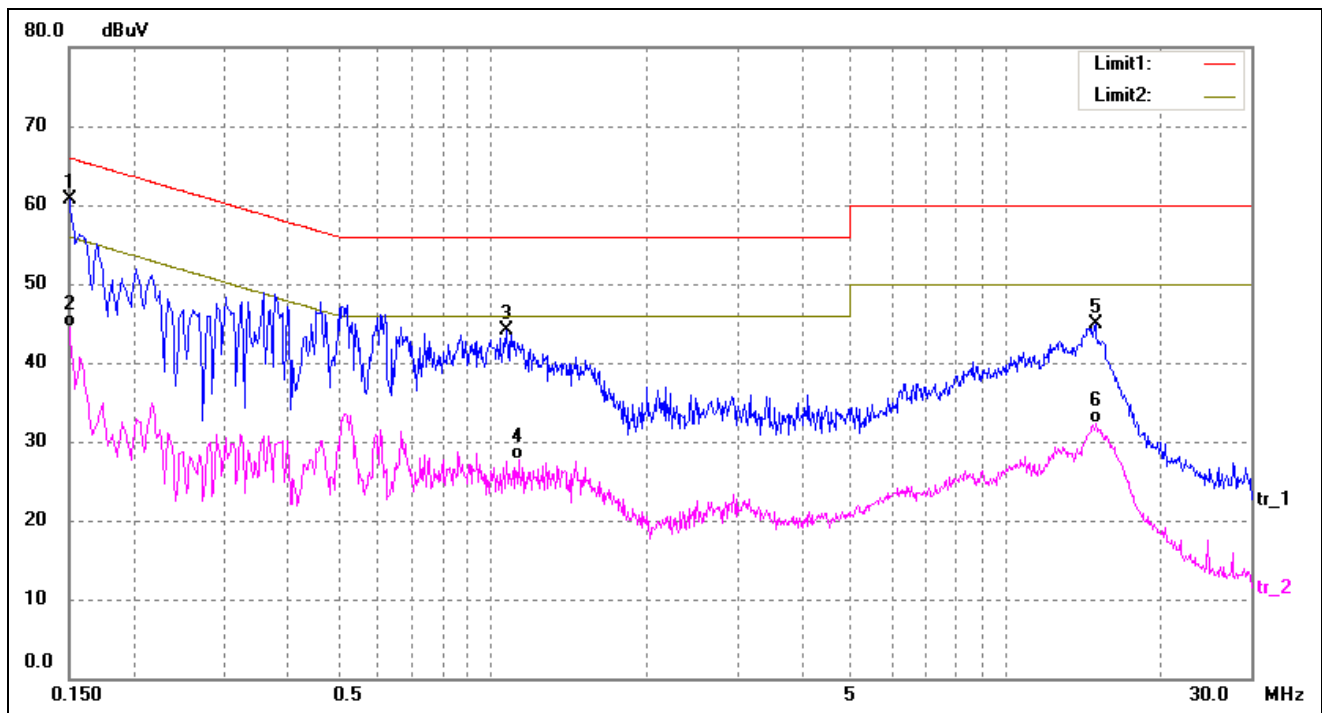
-5.33 dB at 0.1499 MHz in the Neutral, TM1 Mode, Peak detector, 0.15-30MHz

3.5 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

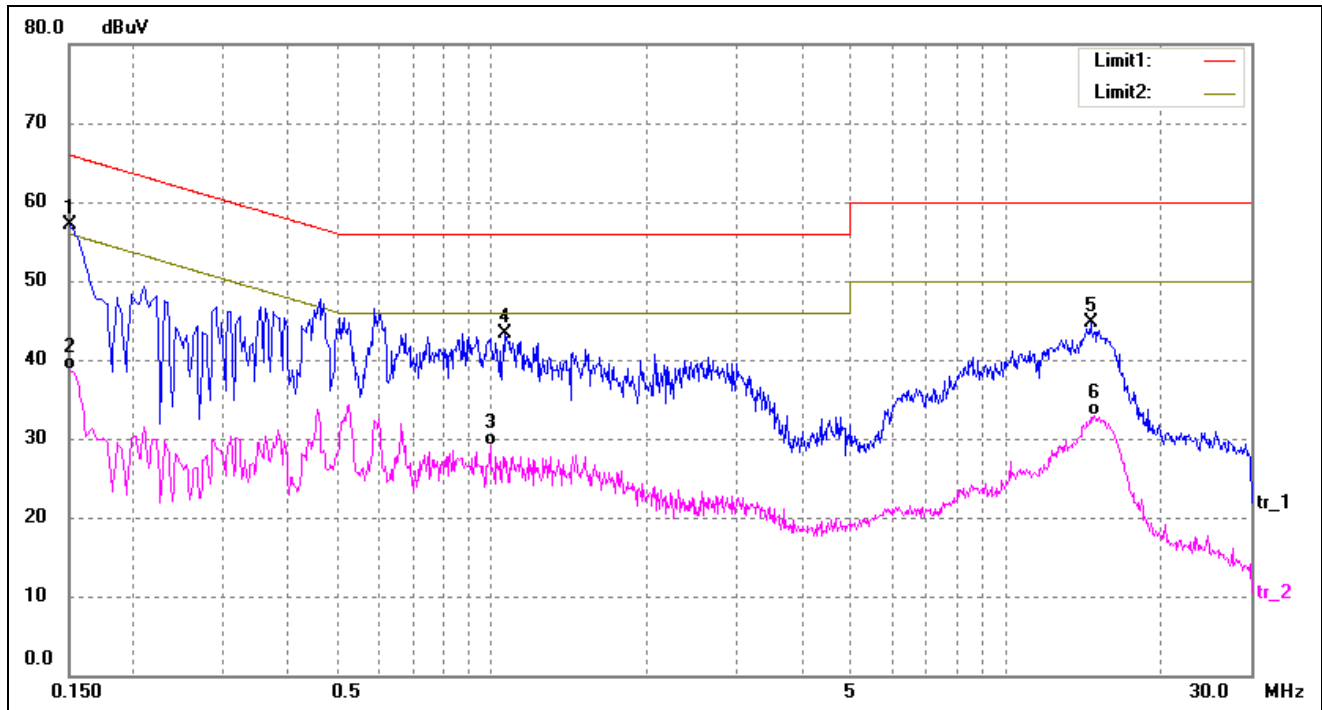
EUT: hispot
 Tested Model: H2
 Operating Condition: TM1
 Comment: AC 120V/60Hz; Adapter DC 5V

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1499	50.82	9.85	60.67	66.00	-5.33	QP
2	0.1499	34.66	9.85	44.51	56.00	-11.49	AVG
3	1.0700	34.29	9.76	44.05	56.00	-11.95	QP
4	1.1260	17.95	9.76	27.71	46.00	-18.29	AVG
5	14.9259	35.32	9.61	44.93	60.00	-15.07	QP
6	15.0419	22.61	9.61	32.22	50.00	-17.78	AVG

Test Specification: Line

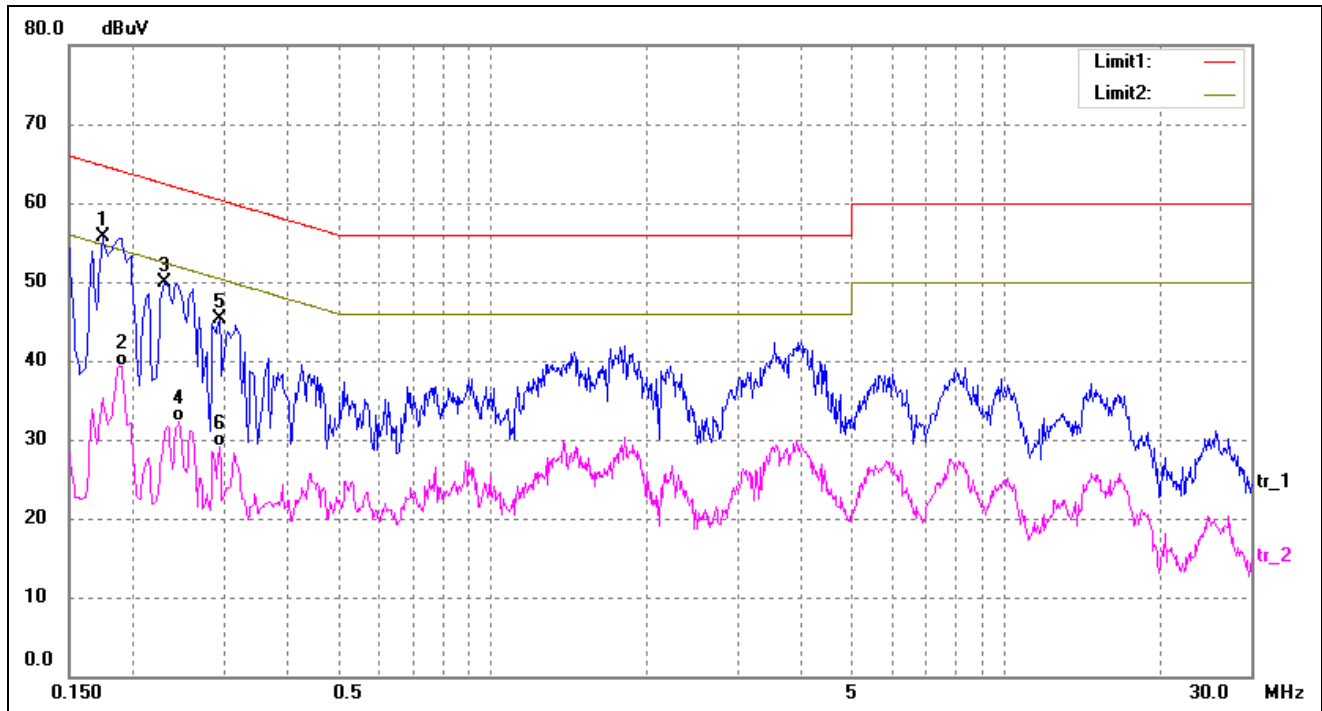


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1500	47.23	9.85	57.08	66.00	-8.92	QP
2	0.1500	28.94	9.85	38.79	56.00	-17.21	AVG
3	0.9940	19.26	9.76	29.02	46.00	-16.98	AVG
4	1.0620	33.61	9.76	43.37	56.00	-12.63	QP
5	14.6140	35.08	9.60	44.68	60.00	-15.32	QP
6	14.8940	23.21	9.61	32.82	50.00	-17.18	AVG

Plot of Conducted Emissions Test Data

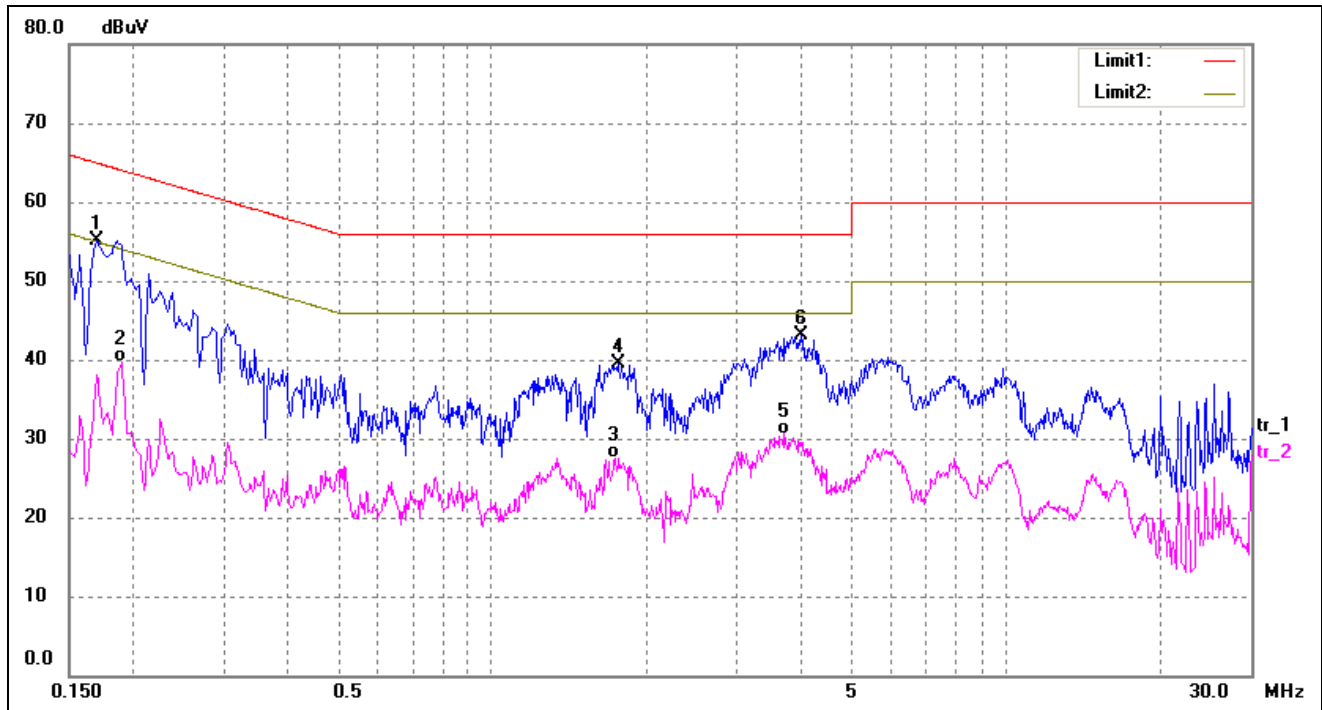
EUT: hispot
 Tested Model: H2
 Operating Condition: TM2
 Comment: AC 120V/60Hz; USB 5V

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1740	45.83	9.83	55.66	64.77	-9.11	QP
2	0.1900	29.49	9.81	39.30	54.04	-14.74	AVG
3	0.2300	40.11	9.80	49.91	62.45	-12.54	QP
4	0.2460	22.57	9.80	32.37	51.89	-19.52	AVG
5	0.2940	35.42	9.80	45.22	60.41	-15.19	QP
6	0.2940	19.28	9.80	29.08	50.41	-21.33	AVG

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1700	45.25	9.83	55.08	64.96	-9.88	QP
2	0.1900	29.94	9.81	39.75	54.04	-14.29	AVG
3	1.7420	17.82	9.74	27.56	46.00	-18.44	AVG
4	1.7620	29.73	9.74	39.47	56.00	-16.53	QP
5	3.7020	20.91	9.69	30.60	46.00	-15.40	AVG
6	4.0060	33.49	9.68	43.17	56.00	-12.83	QP

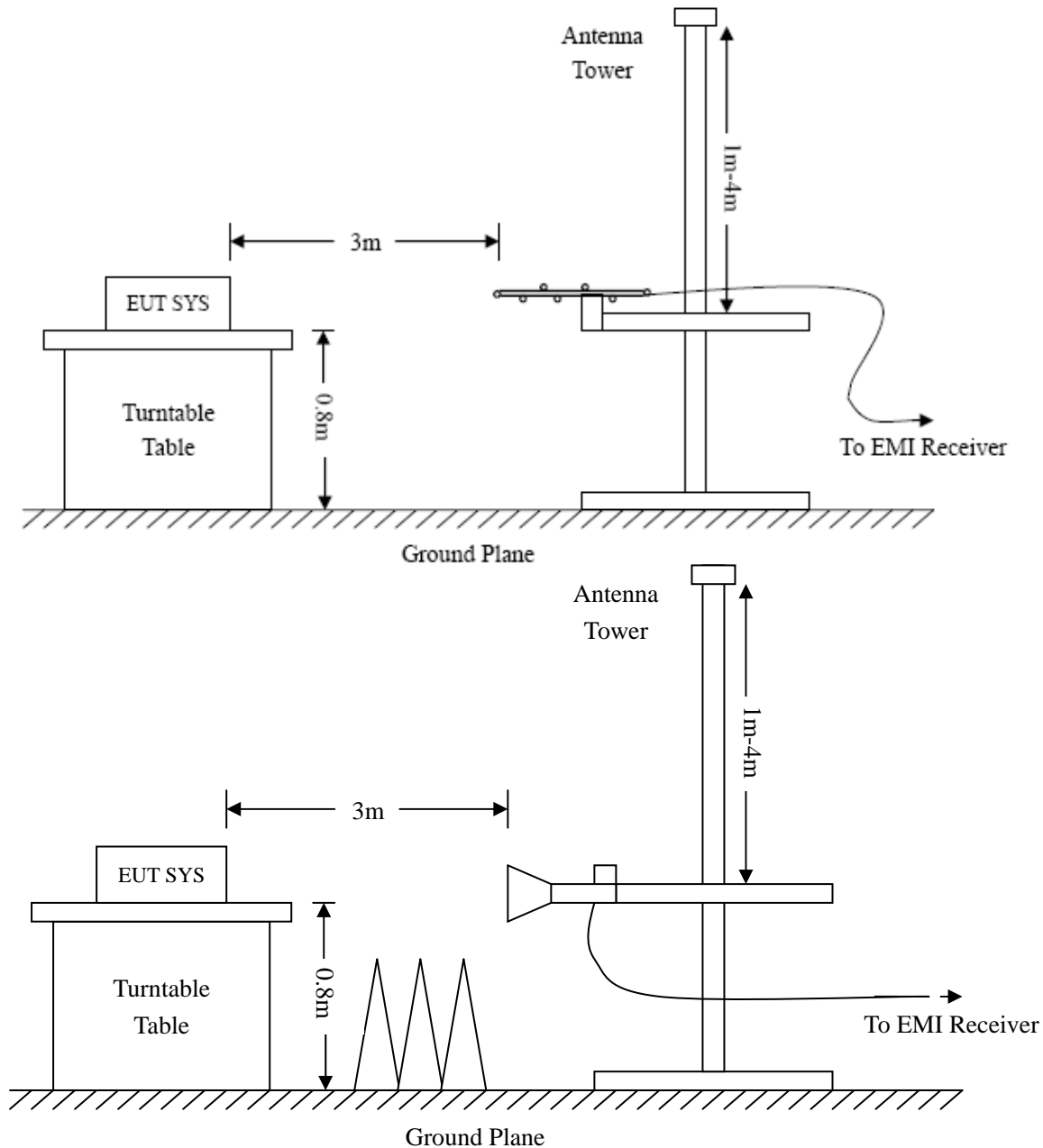
4. Radiated Emissions

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

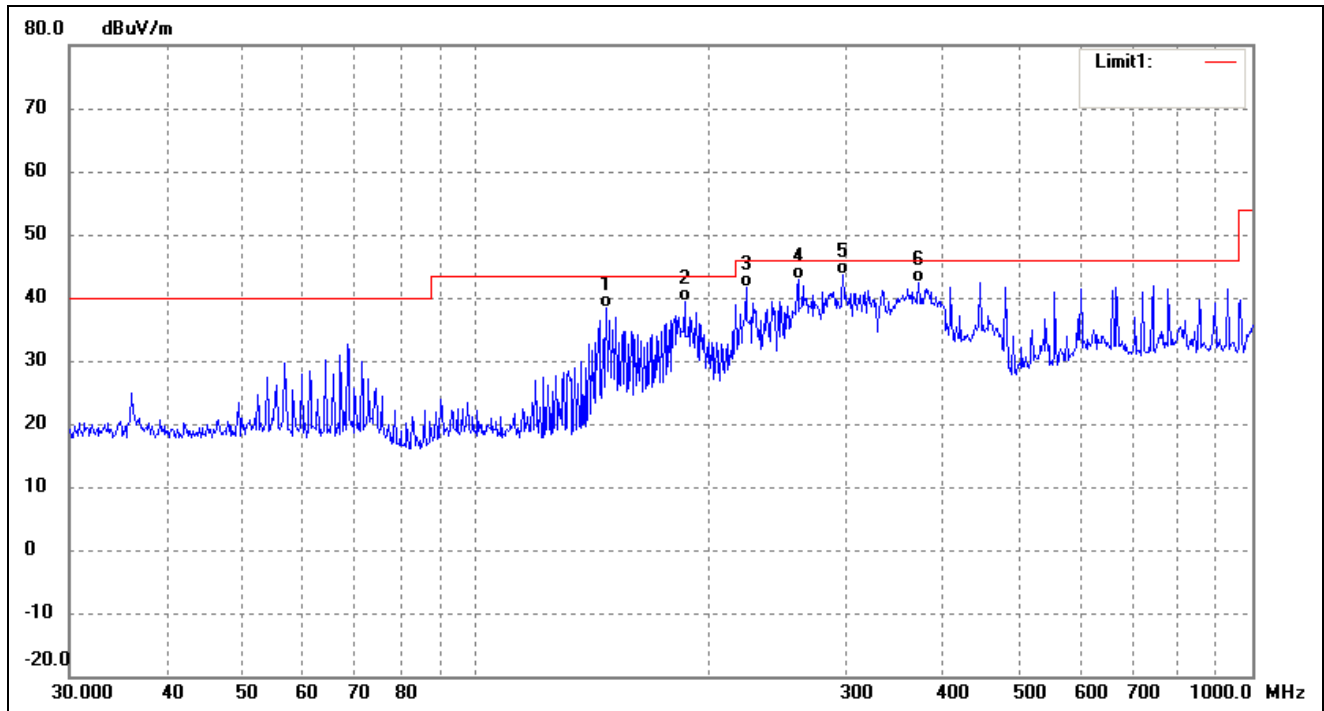
According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

-1.05 dB at 351.7078 MHz in the Horizontal polarization, TM2 Mode, 30MHz to 12.75 GHz, 3Meters

Plot of Radiated Emissions Test Data

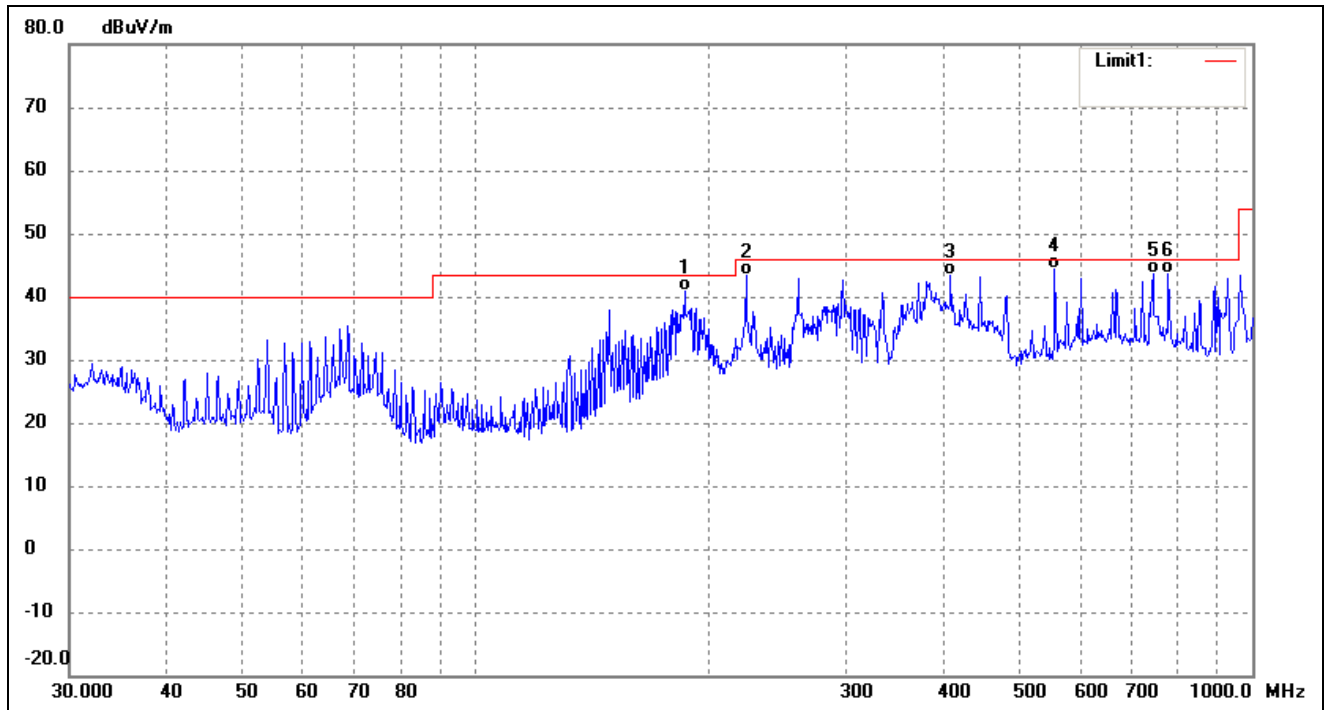
EUT: hispot
 Tested Model: H2
 Operating Condition: TM1
 Comment: AC 120V/60Hz; Adapter DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	147.4036	35.42	2.87	38.29	43.50	-5.21	23	100	QP
2	185.7880	36.79	2.70	39.49	43.50	-4.01	32	100	QP
3	222.9499	33.78	7.85	41.63	46.00	-4.37	42	100	QP
4	260.1444	33.09	9.69	42.78	46.00	-3.22	32	100	QP
5	297.2241	31.87	11.84	43.71	46.00	-2.29	142	100	QP
6	372.0045	30.53	11.84	42.37	46.00	-3.63	124	100	QP

Test Specification: Vertical

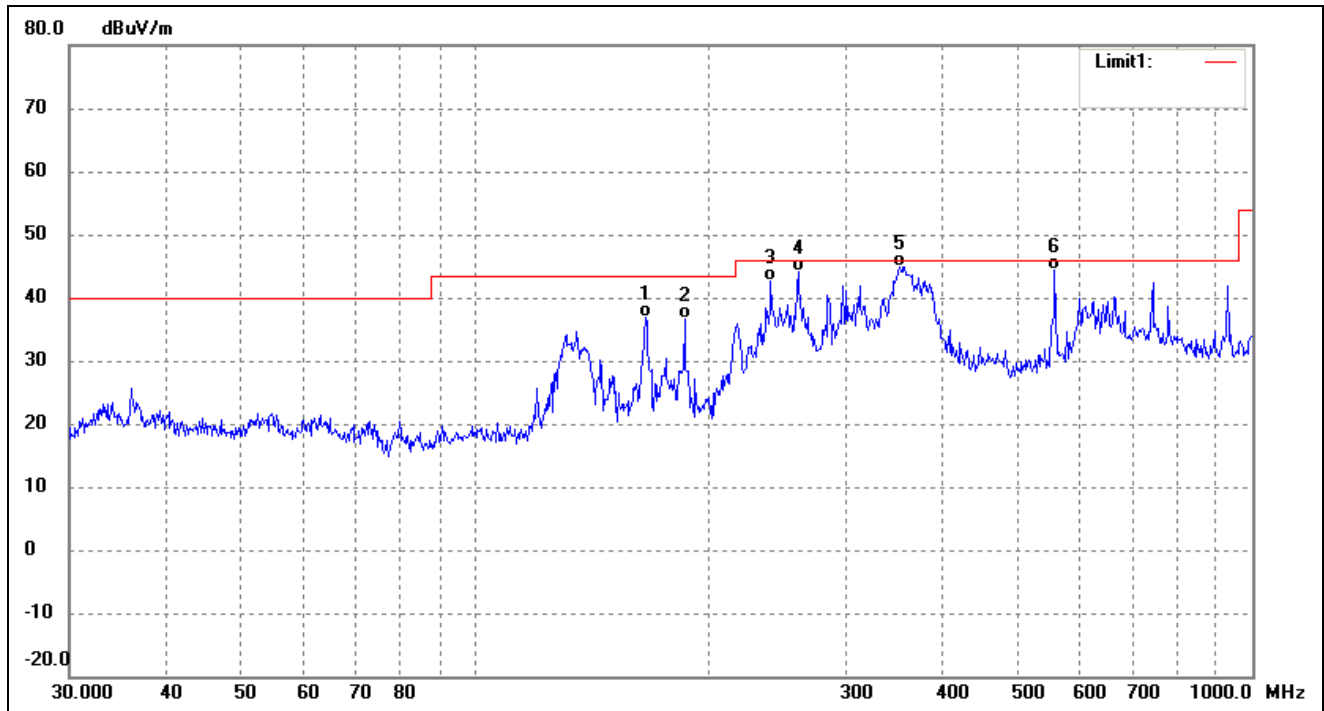


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	185.7880	38.25	2.70	40.95	43.50	-2.55	27	100	QP
2	222.9500	35.55	7.85	43.40	46.00	-2.60	124	100	QP
3	408.9460	31.14	12.33	43.47	46.00	-2.53	41	100	QP
4	556.7744	30.31	13.99	44.30	46.00	-1.70	124	100	QP
5	744.8659	24.73	18.81	43.54	46.00	-2.46	45	100	QP
6	779.6068	26.88	16.80	43.68	46.00	-2.32	35	100	QP

Plot of Radiated Emissions Test Data

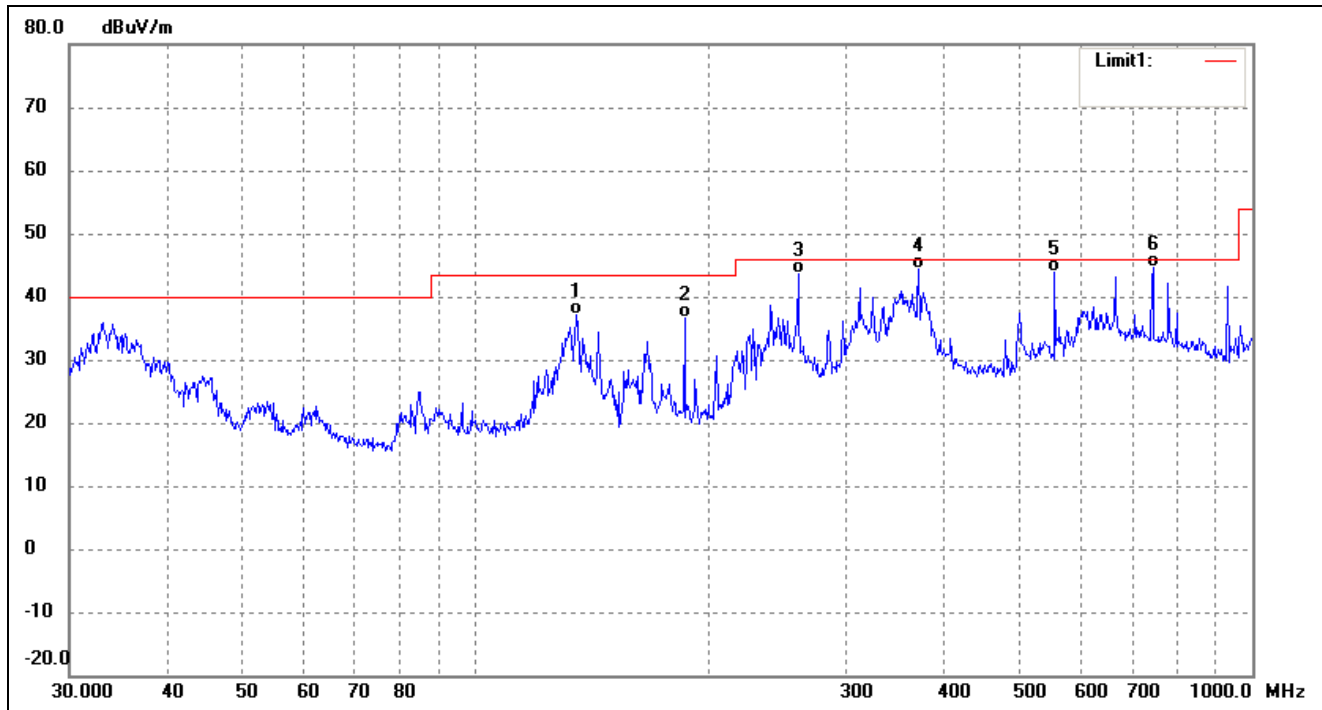
EUT: hispot
Tested Model: H2
Operating Condition: TM2
Comment: AC 120V/60Hz; USB 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	165.4866	34.37	2.45	36.82	43.50	-6.68	52	100	QP
2	185.7880	34.02	2.70	36.72	43.50	-6.78	59	100	QP
3	239.9874	33.71	8.93	42.64	46.00	-3.36	314	100	QP
4	260.1444	34.46	9.69	44.15	46.00	-1.85	124	100	QP
5	351.7078	33.26	11.69	44.95	46.00	-1.05	11	100	QP
6	556.7744	30.29	13.99	44.28	46.00	-1.72	41	100	QP

Test Specification: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	()	(cm)	
1	135.0319	33.46	3.56	37.02	43.50	-6.48	41	100	QP
2	185.7880	34.03	2.70	36.73	43.50	-6.77	196	100	QP
3	260.1444	34.05	9.69	43.74	46.00	-2.26	94	100	QP
4	372.0045	32.47	11.84	44.31	46.00	-1.69	14	100	QP
5	556.7744	29.81	13.99	43.80	46.00	-2.20	55	100	QP
6	744.8659	25.94	18.81	44.75	46.00	-1.25	13	100	QP

Note: Testing is carried out with frequency rang 30MHz to the 12.75GHz, which above 1GHz is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4.

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