

# FCC Part 15B

## Measurement and Test Report

For

**HONGKONG UCLOUDLINK NETWORK TECHNOLOGY LIMITED**

**Unit D. 16F, Chenknang plaza 250 Hennessy Road, wanchai HongKong**

**FCC ID: 2AC88-G2**

**Test Rule(s):** FCC Part 15 Subpart B

**Product Description:** 4G Free Roaming Hotspot

**Tested Model:** G2

**Report No.:** STRD1506066I-6

**Tested Date:** 2015-06-12 to 2015-07-25

**Issued Date:** 2015-07-31

**Tested By:** Silin Chen / Engineer

*Silin chen*

**Reviewed By:** Lahm Peng / EMC Manager

*Lahm peng*

**Approved & Authorized By:** Jandy So / PSQ Manager

*Jandyso*

**Prepared By:**

**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**

<b>1. GENERAL INFORMATION.....</b>	<b>3</b>
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 TEST EQUIPMENT LIST AND DETAILS.....	5
<b>2. SUMMARY OF TEST RESULTS.....</b>	<b>6</b>
<b>3. CONDUCTED EMISSIONS.....</b>	<b>7</b>
3.1 MEASUREMENT UNCERTAINTY.....	7
3.2 TEST PROCEDURE.....	7
3.3 BASIC TEST SETUP BLOCK DIAGRAM.....	7
3.4 ENVIRONMENTAL CONDITIONS.....	8
3.5 SUMMARY OF TEST RESULTS/PLOTS.....	8
3.6 CONDUCTED EMISSIONS TEST DATA.....	8
<b>4. RADIATED EMISSIONS.....</b>	<b>11</b>
4.1 MEASUREMENT UNCERTAINTY.....	11
4.2 TEST PROCEDURE.....	11
4.3 TEST RECEIVER SETUP.....	12
4.4 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	12
4.5 ENVIRONMENTAL CONDITIONS.....	12
4.6 SUMMARY OF TEST RESULTS/PLOTS.....	12

## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment Under Test (EUT)

#### Client Information

Applicant: HONGKONG UCLOUDLINK NETWORK TECHNOLOGY LIMITED

Address of applicant: Unit D. 16F, Chenknang plaza 250 Hennessy Road, wanchai HongKong

Manufacturer: Shenzhen Ukelink New Technology co., Ltd

Address of manufacturer: 3rd Floor, A Part of Building 1, Shenzhen Software Industry Base, Nanshan district xuefu Road, Shenzhen City, Guangdong Province, P.R. China

General Description of EUT	
Product Name:	4G Free Roaming Hotspot
Trade Name:	GlocalMe
Model No.:	G2
Hardware version:	G2A_Main_Rev1.1
Software version:	G2_HTSV1.1.001.017.150804
<b>Main board:</b> <i>The EUT Main board support GSM850/900/DCS1800/PCS1900, WCDMA Band 1/2/5/8, LTE Band 1/3/5/7/8/17/20/39/40/41 function. It is intended for speech, Multimedia Message Service (MMS) transmission and 4G free roaming hotspot. It is equipped with GPRS/EDGE class 12 for GSM850/900/DCS1800/PCS1900, GPS, Bluetooth and Wi-Fi functions. For more information see the following datasheet</i>	
<b>Vice board:</b> <i>The EUT Vice board support GSM850/900/DCS1800/PCS1900, WCDMA Band 1/2/5/8. It is intended for system localization. It is equipped with GPRS/EDGE class 12 for GSM850/900/DCS1800/PCS1900 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:	3.7V
Rated Current:	6000mA
Rated Power:	/
Lowest Internal Frequency:	19.2MHz
Highest Internal Frequency:	1.4GHz
Classification of ITE:	Class B

## 1.2 Test Standards

The following report is prepared on behalf of the HONGKONG UCL OUDLINK NETWORK TECHNOLOGY LIMITED 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 C63.4-2009, 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 & Downloading	Connect to PC
TM2	Discharging	/

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	0.6	Shielded	Without Core

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 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

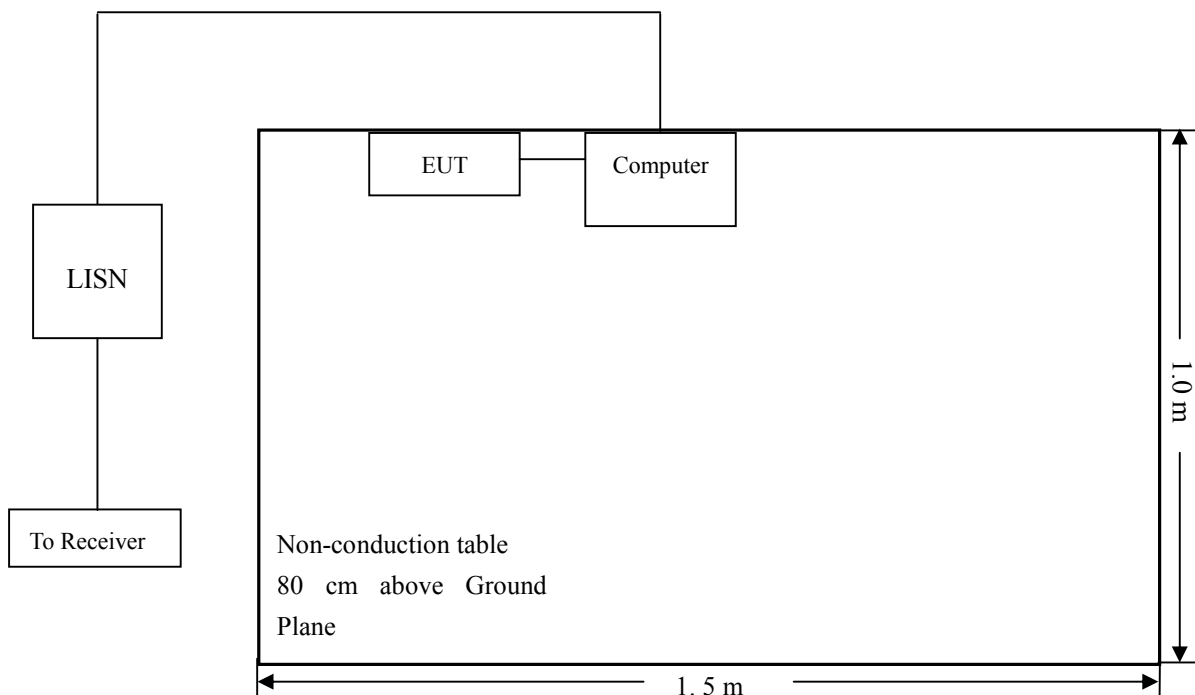
#### 3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is  $\pm 2.88$  dB.

#### 3.2 Test Procedure

Test is conducting under the description of ANSI C63.4-2009, 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.

#### 3.3 Basic Test Setup Block Diagram



### 3.4 Environmental Conditions

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

### 3.5 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:

**-20.21 dB at 1.4620 MHz in the Line mode, QP detector, 0.15-30MHz**

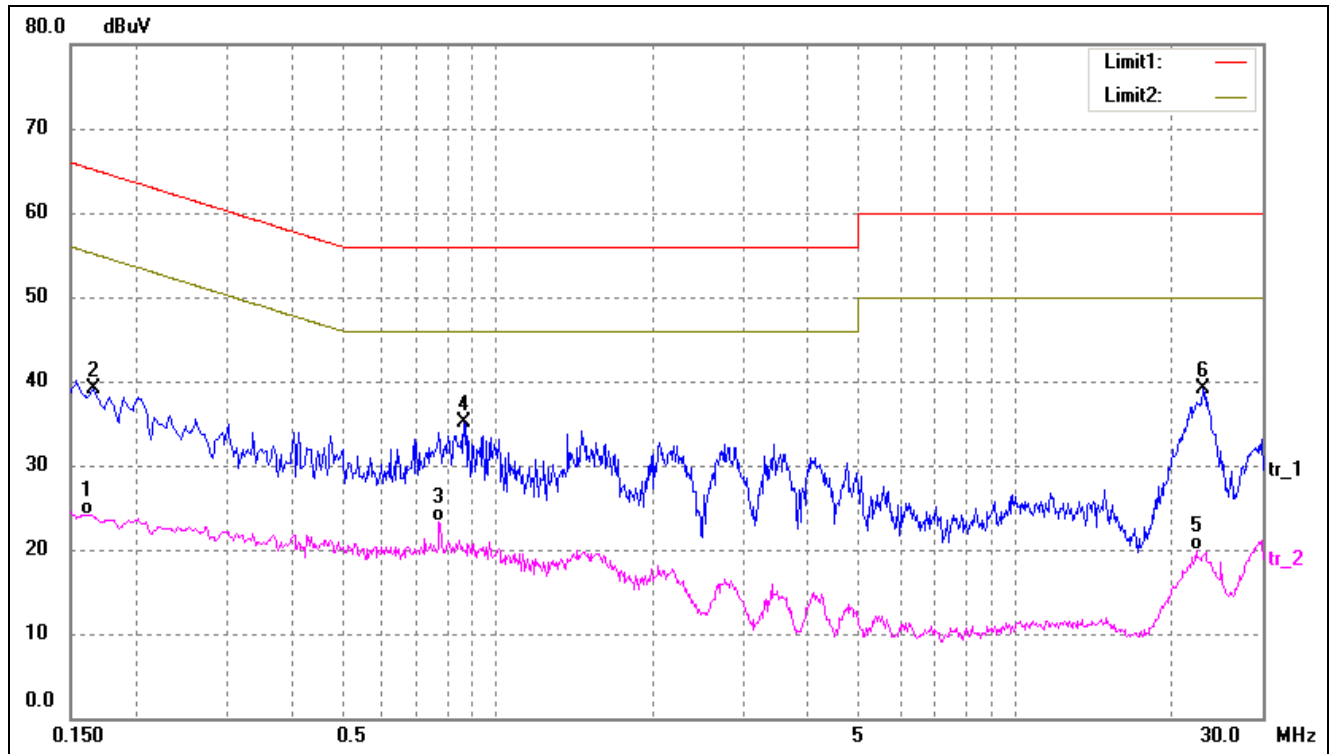
### 3.6 Conducted Emissions Test Data



### Plot of Conducted Emissions Test Data

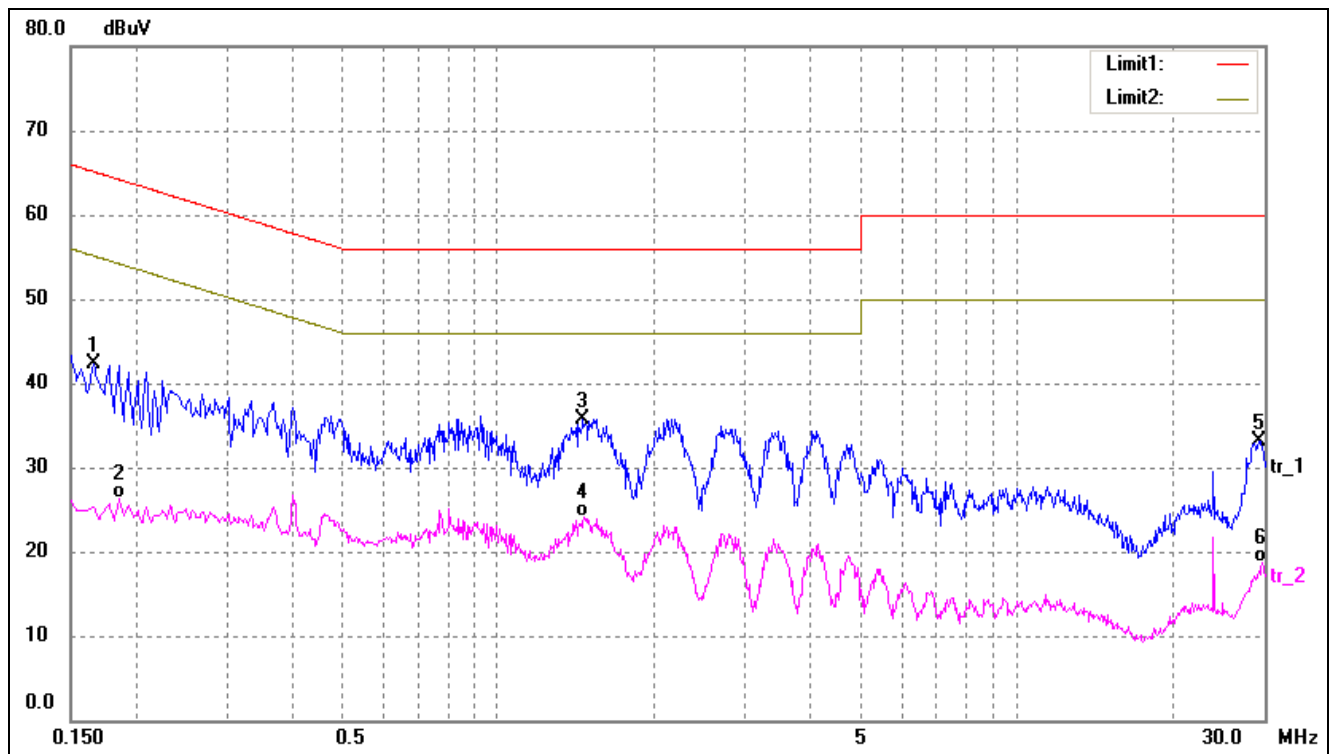
EUT: 4G Free Roaming Hotspot  
 Tested Model: G2  
 Operating Condition: TM1  
 Comment: AC 120V/60Hz; USB 5V

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1620	14.66	9.50	24.16	55.36	-31.20	AVG
2	0.1660	29.59	9.50	39.09	65.16	-26.07	QP
3	0.7740	13.46	9.77	23.23	46.00	-22.77	AVG
4*	0.8660	25.27	9.87	35.14	56.00	-20.86	QP
5	22.3980	7.74	12.13	19.87	50.00	-30.13	AVG
6	23.1020	26.75	12.37	39.12	60.00	-20.88	QP

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1660	32.76	9.50	42.26	65.16	-22.90	QP
2	0.1860	16.71	9.50	26.21	54.21	-28.00	AVG
3*	1.4620	25.79	10.00	35.79	56.00	-20.21	QP
4	1.4700	14.11	10.00	24.11	46.00	-21.89	AVG
5	29.2500	20.09	13.00	33.09	60.00	-26.91	QP
6	29.7820	5.64	13.00	18.64	50.00	-31.36	AVG

## 4. Radiated Emissions

### 4.1 Measurement Uncertainty

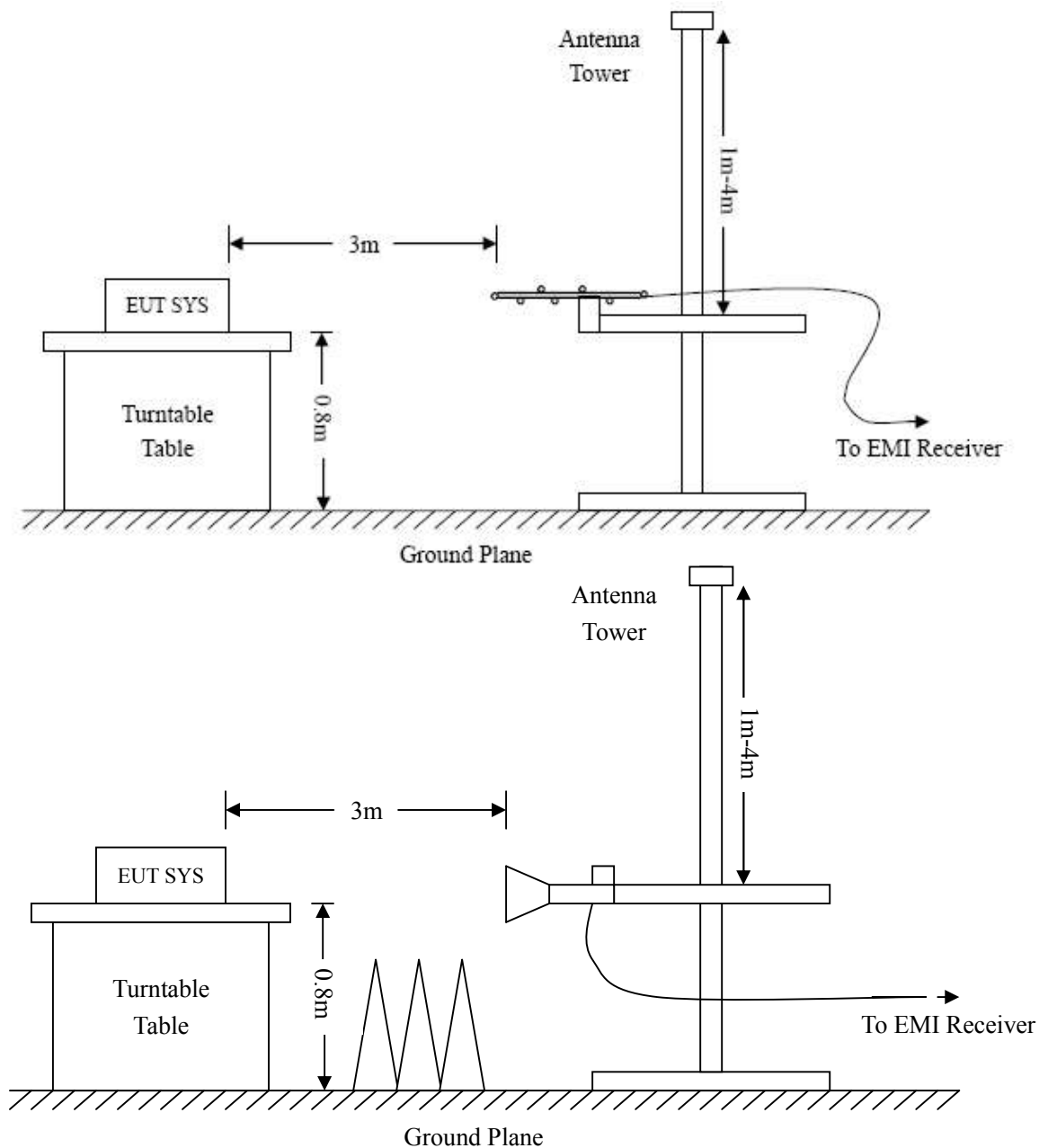
Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is  $\pm 5.10$  dB.

### 4.2 Test Procedure

The setup of EUT is according with per ANSI C63.4-2009 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.



### 4.3 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

### 4.4 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 $\mu$ V means the emission is 6dB $\mu$ V below the maximum limit for a Class B device. The equation for margin calculation is as follows:

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

### 4.5 Environmental Conditions

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

### 4.6 Summary of Test Results/Plots

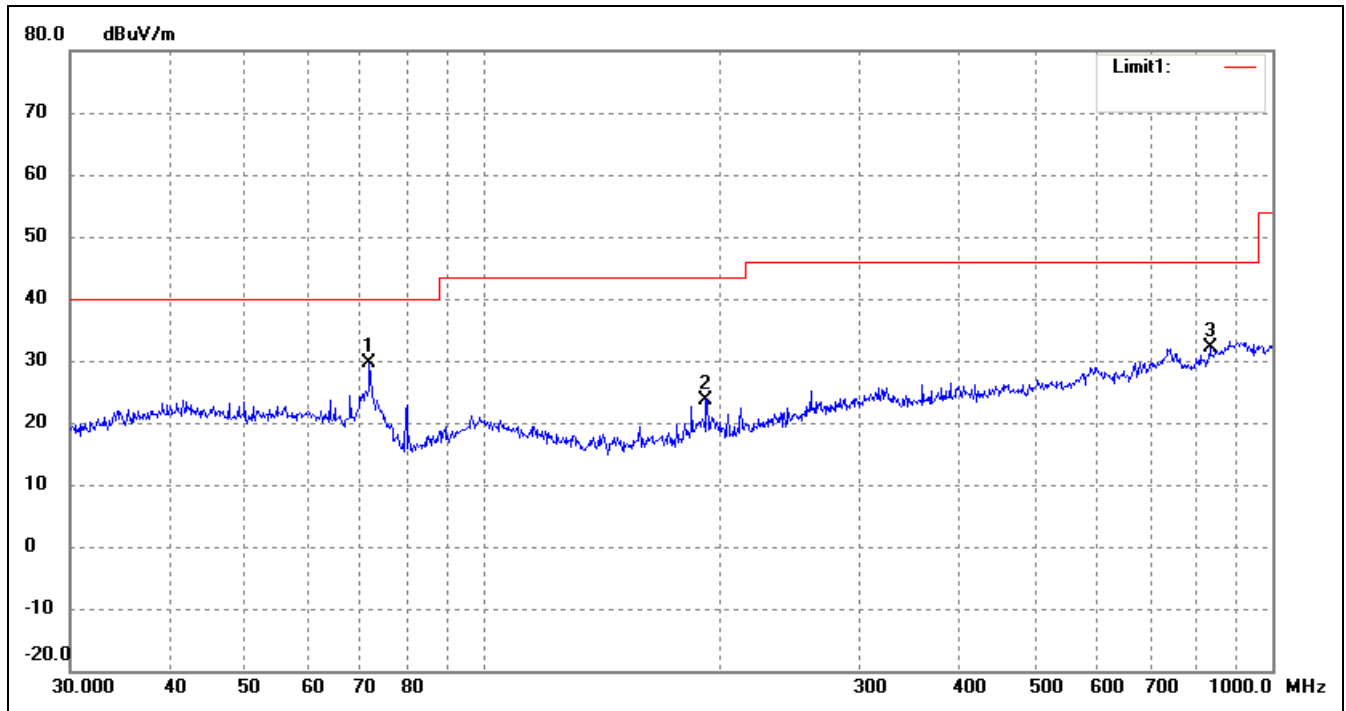
According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

**-10.40 dB at 71.8320 MHz in the Horizontal polarization, TM1 Mode 9 kHz to 6 GHz, 3Meters**

### Plot of Radiated Emissions Test Data

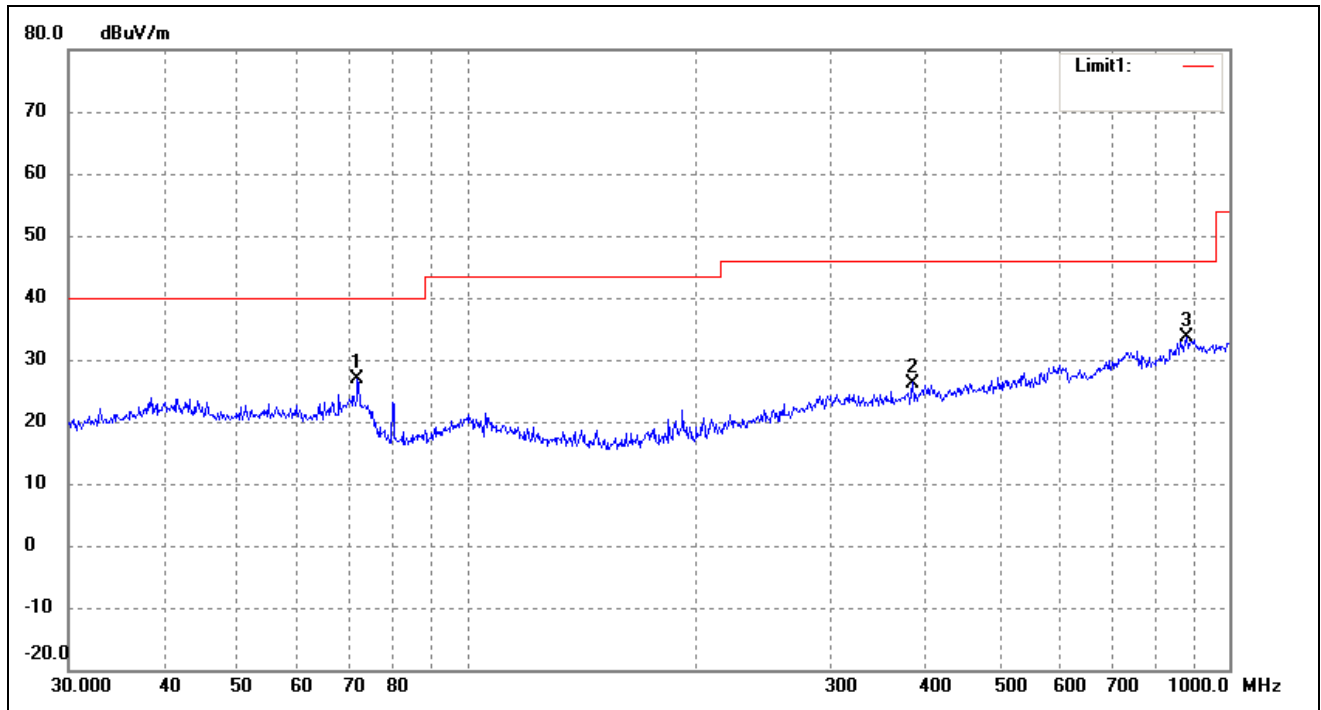
EUT: 4G Free Roaming Hotspot  
 Tested Model: G2  
 Operating Condition: TM1  
 Comment: AC 120V/60Hz, USB: DC5V

Test Specification: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	71.8320	27.63	1.97	29.60	40.00	-10.40	42	100	QP
2	191.7450	20.46	3.29	23.75	43.50	-19.75	132	100	QP
3	833.3171	16.71	15.36	32.07	46.00	-13.93	168	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	71.8320	24.91	1.97	26.88	40.00	-13.12	59	100	QP
2	383.9318	16.87	9.38	26.25	46.00	-19.75	147	100	QP
3	878.3214	16.74	16.78	33.52	46.00	-12.48	236	100	QP

### Plot of Radiated Emissions Test Data

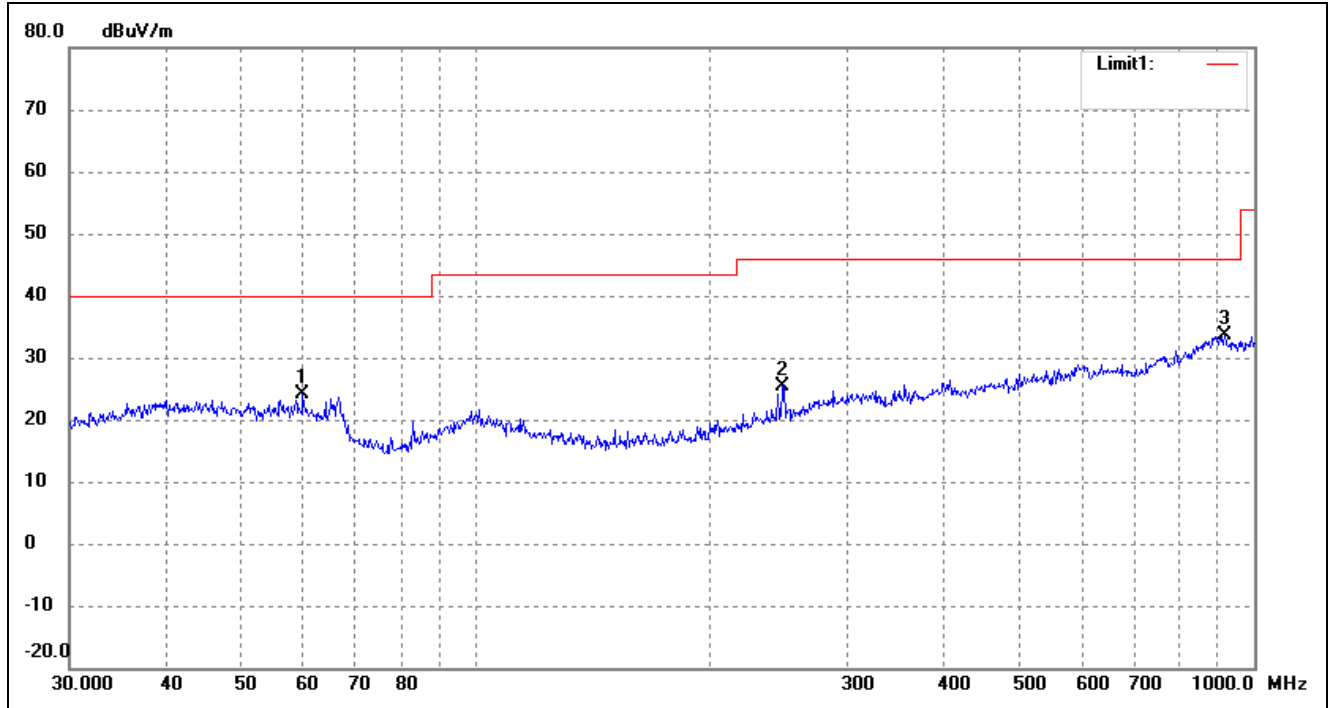
EUT: 4G Free Roaming Hotspot

Tested Model: G2

Operating Condition: TM2

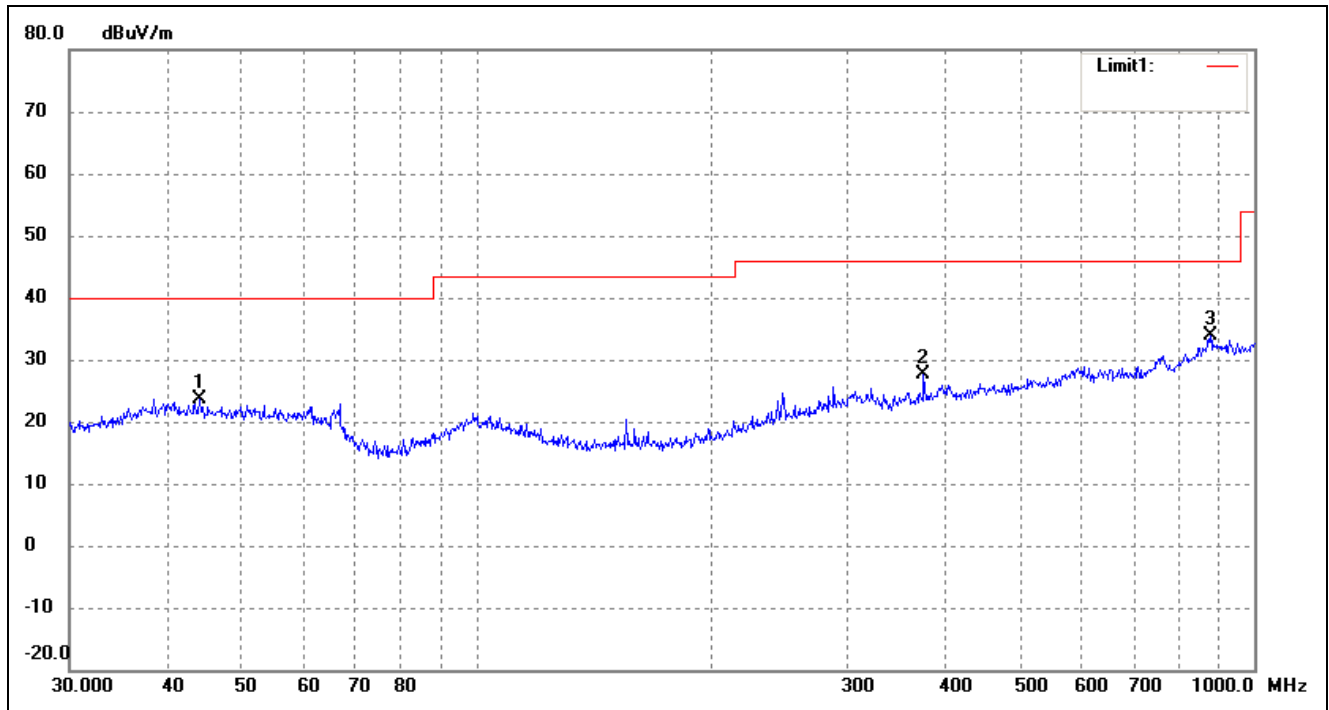
Comment: USB: DC5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	59.8588	16.74	7.38	24.12	40.00	-15.88	51	100	QP
2	247.6819	18.75	6.61	25.36	46.00	-20.64	124	100	QP
3	916.0687	17.17	16.56	33.73	46.00	-12.27	203	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	44.1202	15.81	7.85	23.66	40.00	-16.34	22	100	QP
2	375.9385	18.50	9.20	27.70	46.00	-18.30	146	100	QP
3	878.3214	17.11	16.78	33.89	46.00	-12.11	197	100	QP

Note: Testing is carried out with frequency rang 9kHz to the 6GHz, 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 \*\*\*\*\*