

# FCC Part 15B Measurement and Test Report

For

**UNISTAR TELECOM CO., LIMITED**

**7A01, Tianjing Building, Tian'an High-tech Plaza, Futian District,  
Shenzhen, China**

**FCC ID: 2AC9P-M2**

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

**Product Description:** Smart phone

**Tested Model:** M2

**Report No.:** STR14098128I-3

**Tested Date:** 2014-09-16 to 2014-09-28

**Issued Date:** 2014-10-10

**Tested By:** Silin Chen / Engineer

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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.

**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
<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 EQUIPMENT LIST AND DETAILS .....	7
3.3 TEST PROCEDURE.....	7
3.4 BASIC TEST SETUP BLOCK DIAGRAM.....	7
3.5 ENVIRONMENTAL CONDITIONS .....	8
3.6 SUMMARY OF TEST RESULTS/PLOTS .....	8
3.7 CONDUCTED EMISSIONS TEST DATA.....	8
<b>4. RADIATED EMISSIONS.....</b>	<b>13</b>
4.1 MEASUREMENT UNCERTAINTY .....	13
4.2 TEST EQUIPMENT LIST AND DETAILS .....	13
4.3 TEST PROCEDURE.....	13
4.4 TEST RECEIVER SETUP .....	14
4.5 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	14
4.6 ENVIRONMENTAL CONDITIONS .....	14
4.7 SUMMARY OF TEST RESULTS/PLOTS .....	14

## 1. GENERAL INFORMATION

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

#### Client Information

Applicant: UNISTAR TELECOM CO., LIMITED  
Address of applicant: 7A01, Tianjing Building, Tian'an High-tech Plaza, Futian District, Shenzhen, China  
Manufacturer: UNISTAR TELECOM CO., LIMITED  
Address of manufacturer: 7A01, Tianjing Building, Tian'an High-tech Plaza, Futian District, Shenzhen, China

General Description of EUT	
Product Name:	Smart phone
Trade Name:	KATA, UTTA, BAARNO
Model No.:	M2
Adding Model(s):	M2U, M2BS, U6, U6S, Grande, Breeze, MWG559 CITY, AX7Z
<i>Note: The test data is gathered from a production sample, provided by the manufacturer. The other model listed in the report has different appearance only of M2 without circuit and electronic construction changed, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Rated Voltage:	DC 5.0V
Rated Current:	1A
Rated Power:	/
Lowest Internal Frequency:	32.768KHz
Highest Internal Frequency:	24MHz
Classification of ITE:	Class B

## 1.2 Test Standards

The following report is prepared on behalf of the UNTSTAR TELECOM CO., LIMITE 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 C63.4-2003, 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 2<sup>nd</sup> 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 And Playing	Connect to Adapter, Earphone
TM2	Downloading	Connect to PC

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	1.05	Shielded	With Ferrite

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	E23	EB12648265
Adaptor	Astruml	SAPA05010EUU	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
Earphone	1.2	Unshielded	Without Ferrite

## 2. SUMMARY OF TEST RESULTS

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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.

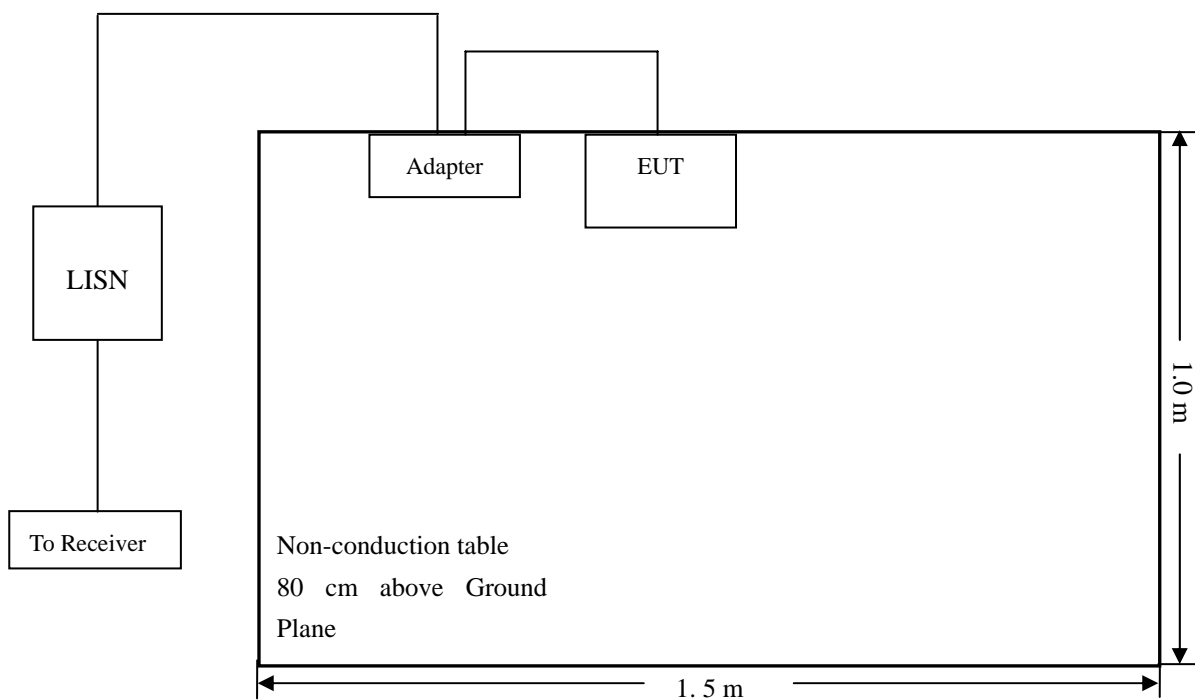
#### 3.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2014-05-28	2015-05-27
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2014-05-28	2015-05-27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2014-05-28	2015-05-27

#### 3.3 Test Procedure

Test is conducting under the description of ANSI C63.4-2003, 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.

#### 3.4 Basic Test Setup Block Diagram



### 3.5 Environmental Conditions

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

### 3.6 Summary of Test Results/Plots

According to the data in section 3.7, the EUT complied with the FCC Part 15.107(a) Conducted margin for a Class B device, with the *worst* margin reading of:

**-5.51 dB at 2.3540 MHz** in the **Neutral** mode, **Peak** detector, **0.15-30MHz**

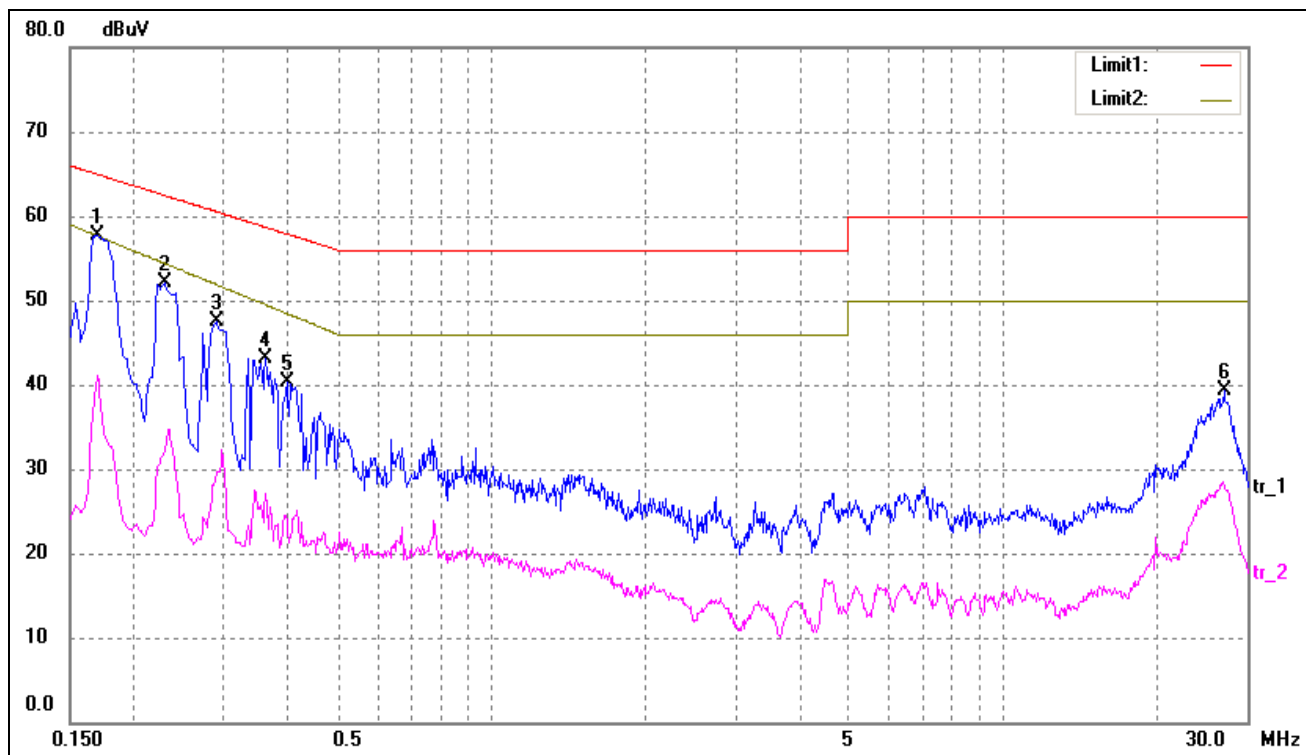
### 3.7 Conducted Emissions Test Data



**Plot of Conducted Emissions Test Data**

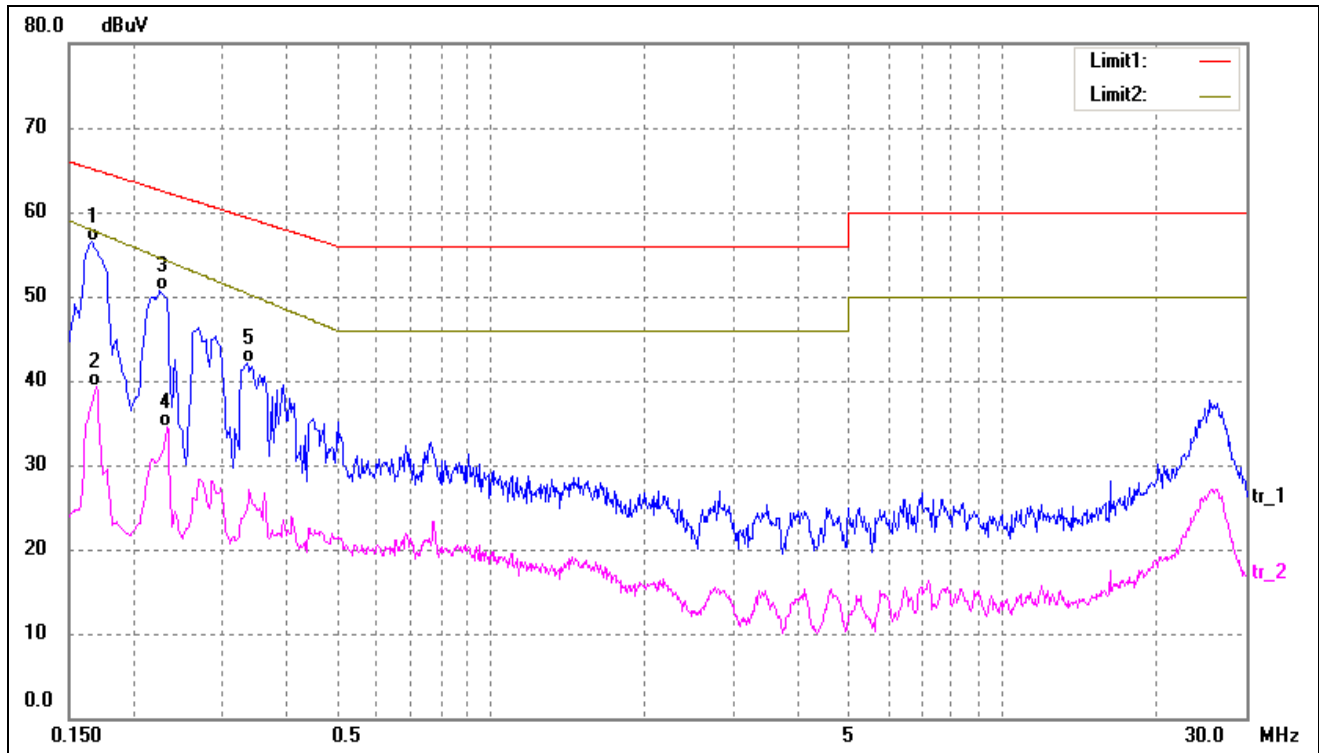
EUT: Smart phone  
 Tested Model: M2  
 Operating Condition: Charging and Playing  
 Comment: Adapter:DC5V

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1700	48.16	9.50	57.66	64.96	-7.30	peak
2	0.2300	42.66	9.50	52.16	62.45	-10.29	peak
3	0.2900	37.96	9.50	47.46	60.52	-13.06	peak
4	0.3620	33.59	9.50	43.09	58.68	-15.59	peak
5	0.3980	30.72	9.50	40.22	57.89	-17.67	peak
6	27.0580	26.31	13.00	39.31	60.00	-20.69	peak

Test Specification: Line

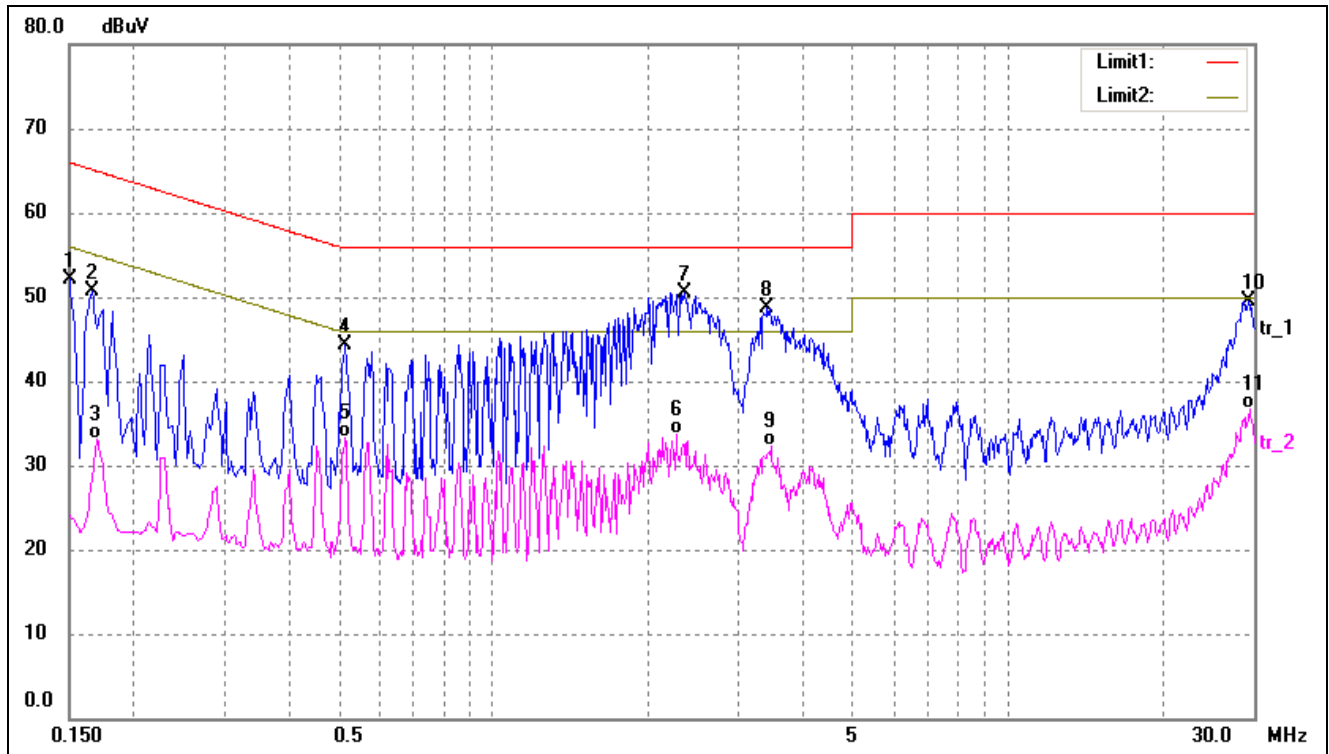


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1660	46.99	9.50	56.49	65.15	-8.66	QP
2	0.1700	29.90	9.50	39.40	57.64	-18.24	AVG
3	0.2260	41.15	9.50	50.65	62.59	-11.94	QP
4	0.2340	25.09	9.50	34.59	54.19	-19.60	AVG
5	0.3339	32.63	9.50	42.13	59.35	-17.22	QP

**Plot of Conducted Emissions Test Data**

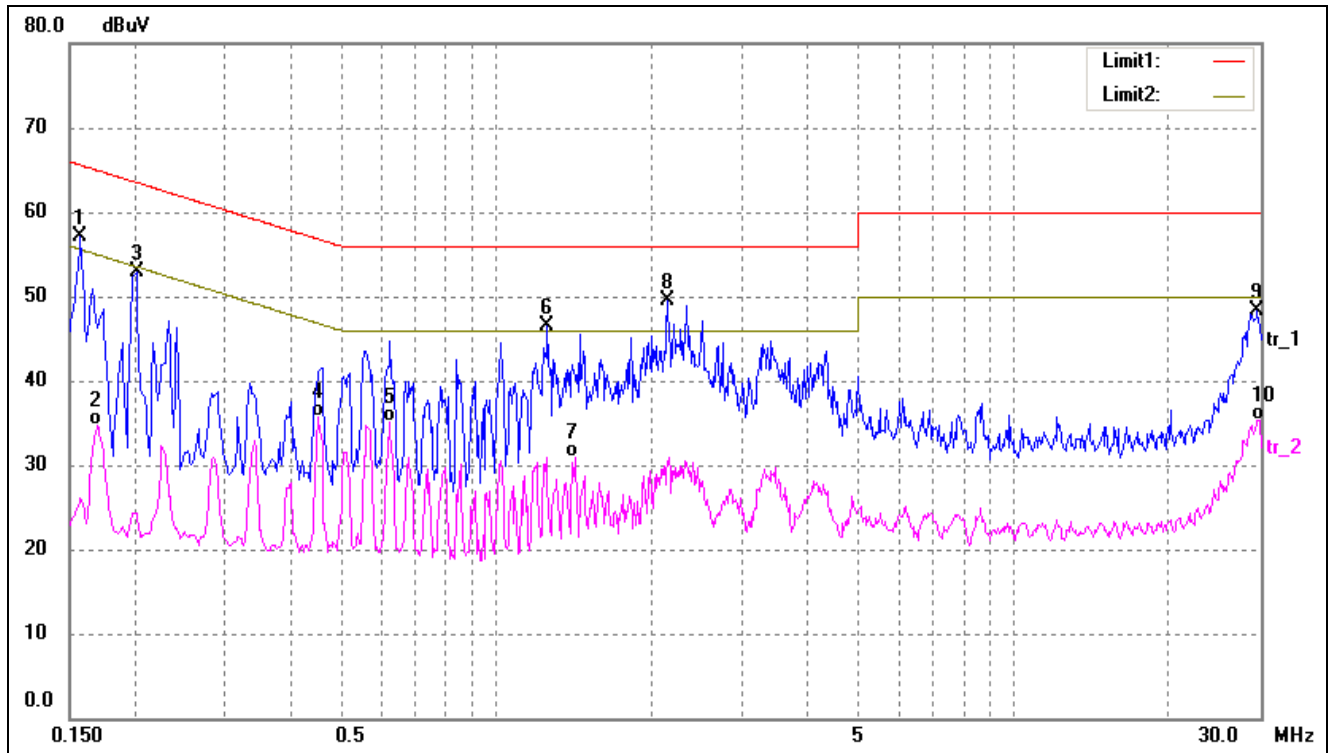
EUT: Smart phone  
 Tested Model: M2  
 Operating Condition: Downloading  
 Comment: USB 5V

Test Specification: Neutral



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.1500	42.58	9.50	52.08	66.00	-13.92	peak
2	0.1660	41.27	9.50	50.77	65.16	-14.39	peak
3	0.1700	23.67	9.50	33.17	54.96	-21.79	AVG
4	0.5180	34.82	9.52	44.34	56.00	-11.66	peak
5	0.5180	23.85	9.52	33.37	46.00	-12.63	AVG
6	2.2700	23.77	10.00	33.77	46.00	-12.23	AVG
7*	2.3540	40.49	10.00	50.49	56.00	-5.51	peak
8	3.4100	38.73	10.00	48.73	56.00	-7.27	peak
9	3.4620	22.37	10.00	32.37	46.00	-13.63	AVG
10	29.2420	36.54	13.00	49.54	60.00	-10.46	peak
11	29.4460	23.74	13.00	36.74	50.00	-13.26	AVG

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1580	47.62	9.50	57.12	65.57	-8.45	peak
2	0.1700	25.25	9.50	34.75	54.96	-20.21	AVG
3	0.2020	43.40	9.50	52.90	63.53	-10.63	peak
4	0.4540	26.21	9.50	35.71	46.80	-11.09	AVG
5	0.6220	25.58	9.62	35.20	46.00	-10.80	AVG
6	1.2580	36.48	10.00	46.48	56.00	-9.52	peak
7	1.4220	20.99	10.00	30.99	46.00	-15.01	AVG
8*	2.1540	39.51	10.00	49.51	56.00	-6.49	peak
9	29.5940	35.30	13.00	48.30	60.00	-11.70	peak
10	29.9700	22.35	13.00	35.35	50.00	-14.65	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 Equipment List and Details

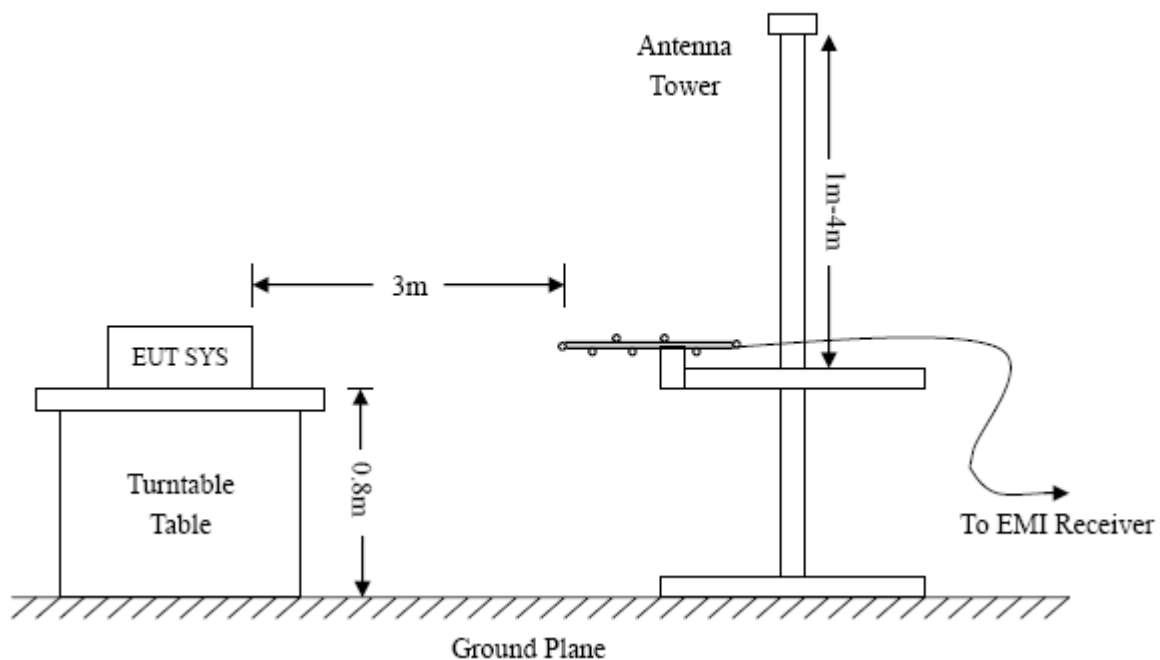
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2014-05-28	2015-05-27
EMI Test Receiver	R&S	ESVB	825471/005	2014-05-28	2015-05-27
Pre-amplifier	Agilent	8447F	3113A06717	2014-05-28	2015-05-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2014-05-28	2015-05-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2014-05-24	2015-05-23
Horn Antenna	ETS	3117	00086197	2014-05-24	2015-05-23
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2014-05-24	2015-05-23

### 4.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 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.



#### 4.4 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

#### 4.5 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:

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

#### 4.6 Environmental Conditions

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

#### 4.7 Summary of Test Results/Plots

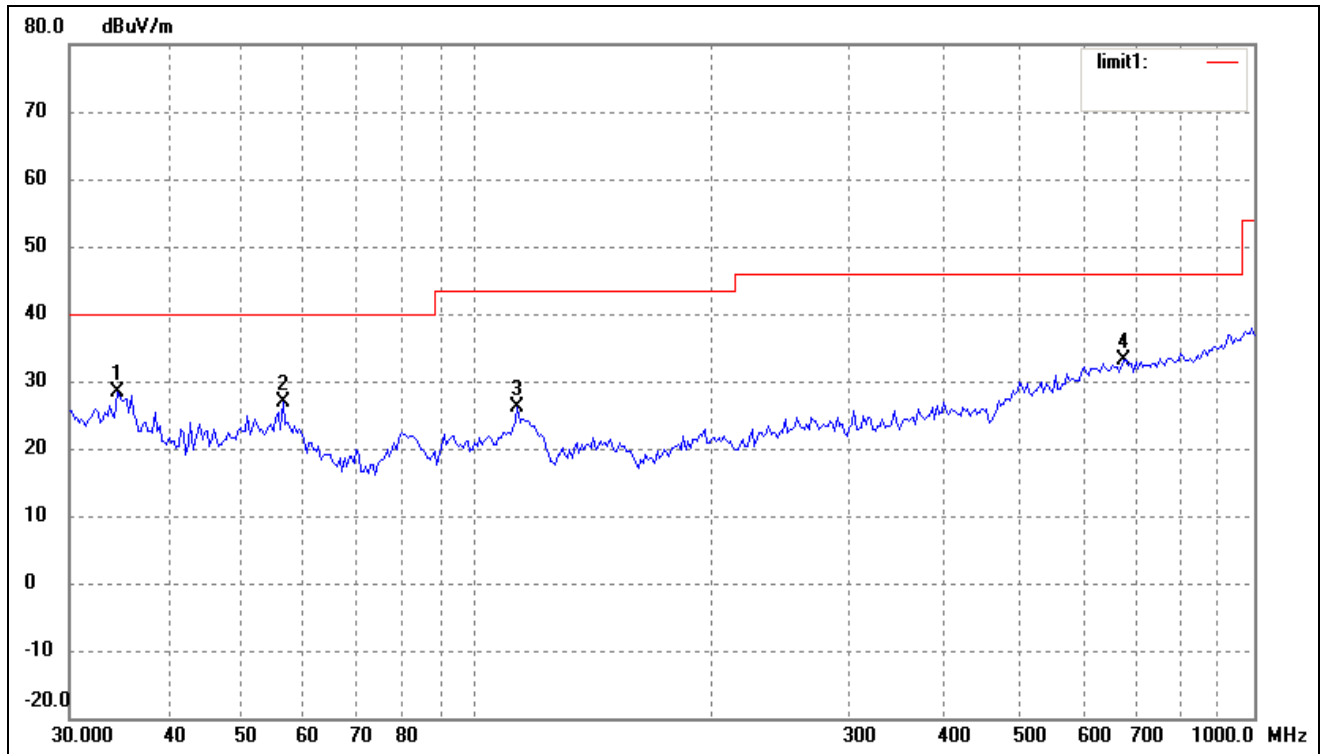
According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

**-2.56 dB at 556.7744 MHz in the Horizontal polarization, 9 kHz to 6 GHz, 3Meters**

**Plot of Radiated Emissions Test Data**

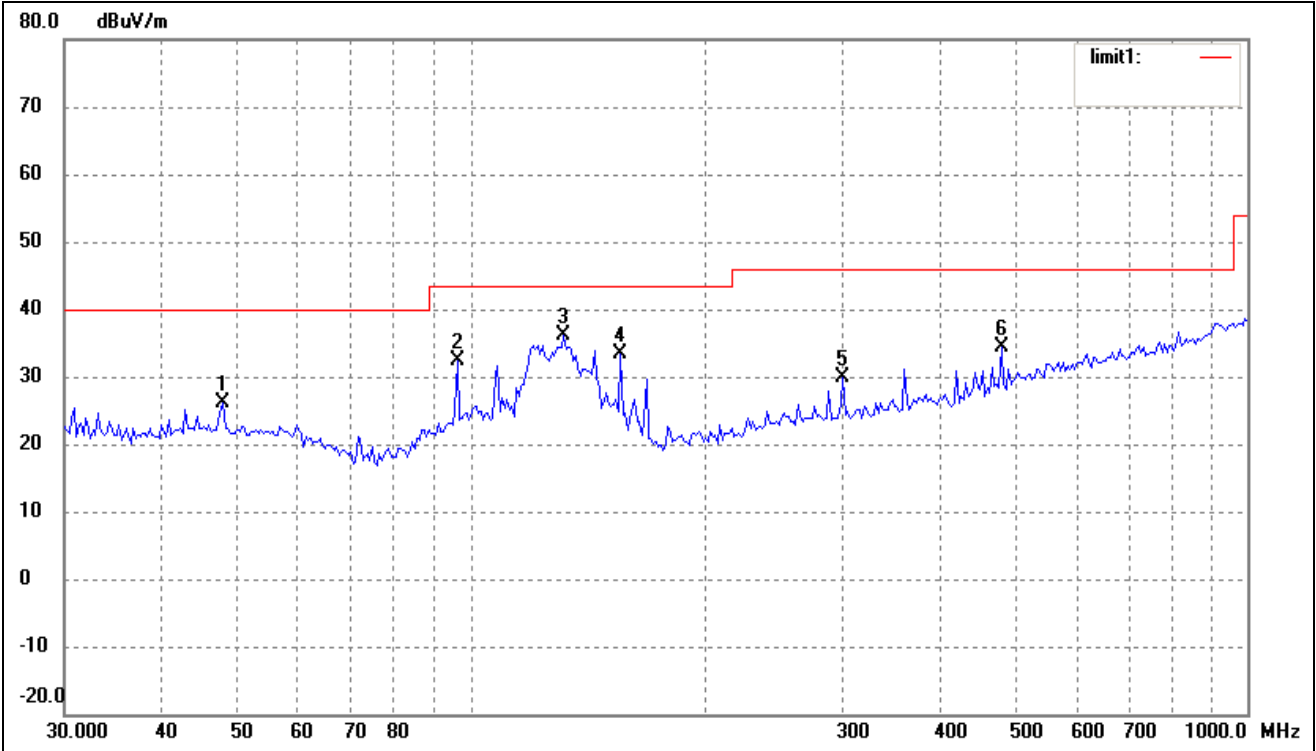
EUT: Smart phone  
 Tested Model: M2  
 Operating Condition: Charging And Playing  
 Comment: AC 120V/60Hz; Adapter DC 5V/2A

Test Specification: Horizontal



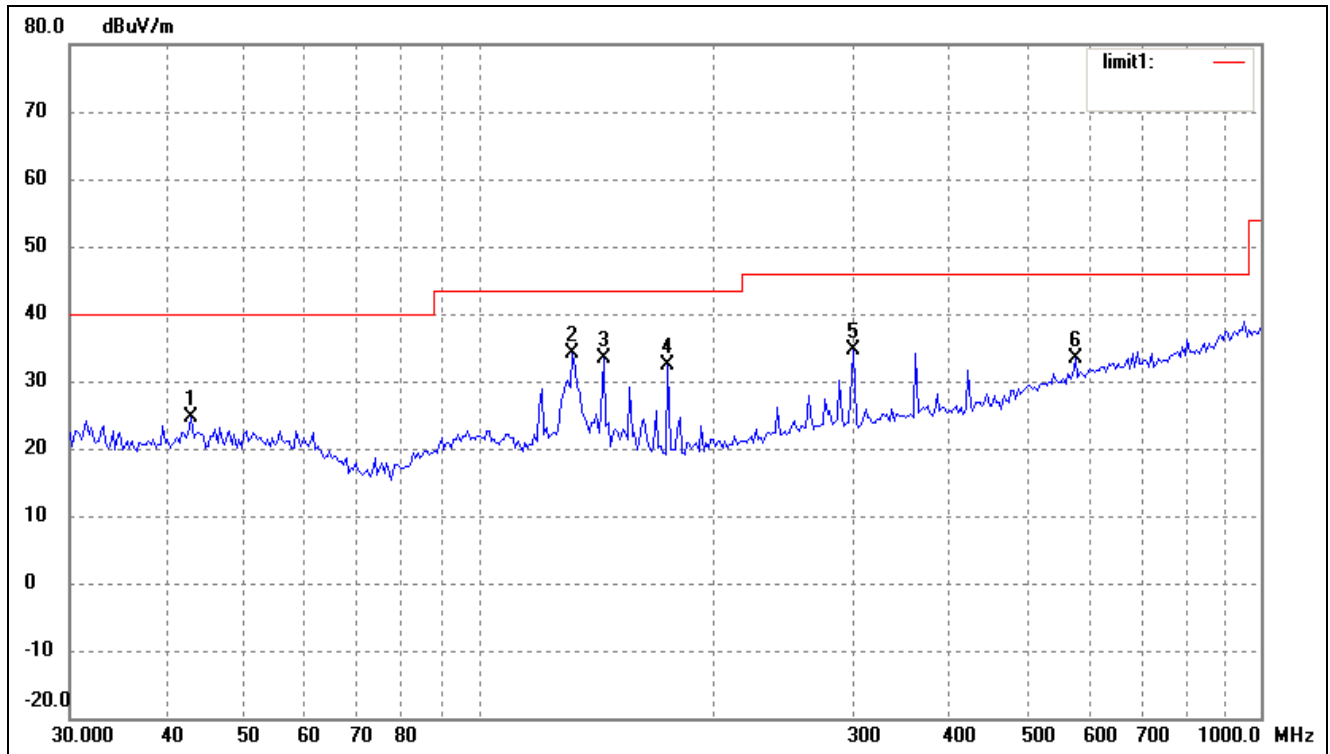
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	34.5172	21.65	6.77	28.42	40.00	-11.58	157	100	peak
2	56.3947	19.18	7.70	26.88	40.00	-13.12	157	100	peak
3	112.9196	18.93	7.11	26.04	43.50	-17.46	157	100	peak
4	679.9600	15.73	17.33	33.06	46.00	-12.94	157	100	peak

Test Specification: Vertical



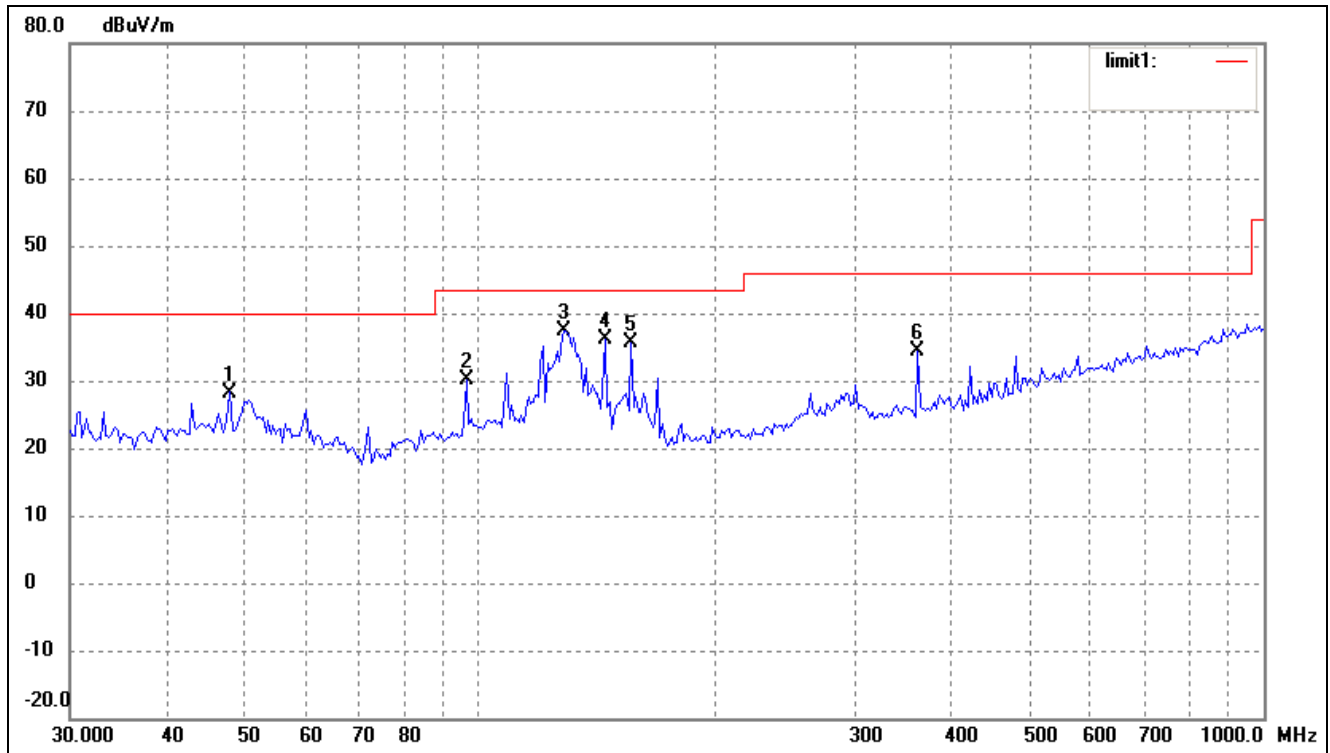
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	47.9940	18.14	8.07	26.21	40.00	-13.79	54	100	peak
2	96.0986	24.35	8.14	32.49	43.50	-11.01	54	100	peak
3	131.7577	31.71	4.46	36.17	43.50	-7.33	54	100	peak
4	155.9101	29.06	4.35	33.41	43.50	-10.09	54	100	peak
5	301.4224	20.06	9.78	29.84	46.00	-16.16	54	100	peak
6	482.2156	21.65	12.67	34.32	46.00	-11.68	54	100	peak



**Plot of Radiated Emissions Test Data***EUT:* Smart phone*Tested Model:* M2*Operating Condition:* Downloading*Comment:* AC 120V/60Hz; Adapter DC 5V/2A*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	42.8998	16.47	8.20	24.67	40.00	-15.33	112	100	peak
2	131.7577	29.65	4.46	34.11	43.50	-9.39	112	100	peak
3	144.3348	29.40	4.01	33.41	43.50	-10.09	112	100	peak
4	174.4241	27.09	5.22	32.31	43.50	-11.19	112	100	peak
5	301.4224	24.86	9.78	34.64	46.00	-11.36	112	100	peak
6	578.6699	17.10	16.18	33.28	46.00	-12.72	112	100	peak

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	47.9940	20.18	8.07	28.25	40.00	-11.75	41	100	peak
2	96.0986	21.94	8.14	30.08	43.50	-13.42	41	100	peak
3	128.1130	32.51	4.82	37.33	43.50	-6.17	41	100	peak
4	144.3348	32.23	4.01	36.24	43.50	-7.26	41	100	peak
5	155.9101	31.23	4.35	35.58	43.50	-7.92	41	100	peak
6	361.7139	23.41	10.91	34.32	46.00	-11.68	41	100	peak

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 \*\*\*\*\*