

# FCC Part 15B Measurement and Test Report

For

**SUPERDIGITAL TECHNOLOGY CO., LIMITED**

**19th Floor, Block B, Nanxian Building, Longhua New District, Shenzhen**

**518000, P.R. China**

**FCC ID: 2ACDFF12**

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

**Product Description:** Smart Phone

**Tested Model:** F12

**Report No.:** STR15038284I-5

**Tested Date:** 2015-03-28 to 2015-04-09

**Issued Date:** 2015-04-09

**Tested By:** Lebron Wang / Engineer

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

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

**Prepared By:**

*Lebron Wang*

*Lahm peng*

*Jandyso*

**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
<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>11</b>
4.1 MEASUREMENT UNCERTAINTY .....	11
4.2 TEST EQUIPMENT LIST AND DETAILS .....	11
4.3 TEST PROCEDURE.....	11
4.4 TEST RECEIVER SETUP .....	12
4.5 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	12
4.6 ENVIRONMENTAL CONDITIONS .....	12
4.7 SUMMARY OF TEST RESULTS/PLOTS .....	12

## 1. GENERAL INFORMATION

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

**Client Information**

Applicant: SUPERDIGITAL TECHNOLOGY CO., LIMITED  
Address of applicant: 19th Floor, Block B, Nanxian Building, Longhua New District, Shenzhen 518000, P.R. China  
Manufacturer: SUPERDIGITAL TECHNOLOGY CO., LIMITED  
Address of manufacturer: 19th Floor, Block B, Nanxian Building, Longhua New District, Shenzhen 518000, P.R. China

**General Description of EUT**

Product Name:	Smart Phone
Trade Name:	Superinworld
Model No.:	F12
Adding Model(s):	/

*Note: The test data is gathered from a production sample provided by the manufacturer.*

**Technical Characteristics of EUT**

Rated Voltage:	5.2V
Rated Current:	1400mA
Rated Power:	/
Power Adapter Model:	F12
Lowest Internal Frequency:	32.768KHz
Highest Internal Frequency:	1.5GHz
Classification of ITE:	Class B

## 1.2 Test Standards

The following report is prepared on behalf of the SUPERDIGITAL TECHNOLOGY CO., 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 C63.4-2003, 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 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	Connect to Adapter
TM2	Downloading	Connect to PC

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	1.0	Unshielded	Without Core
Earphone	1.0	Unshielded	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
/	/	/	/

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 Equipment List and Details

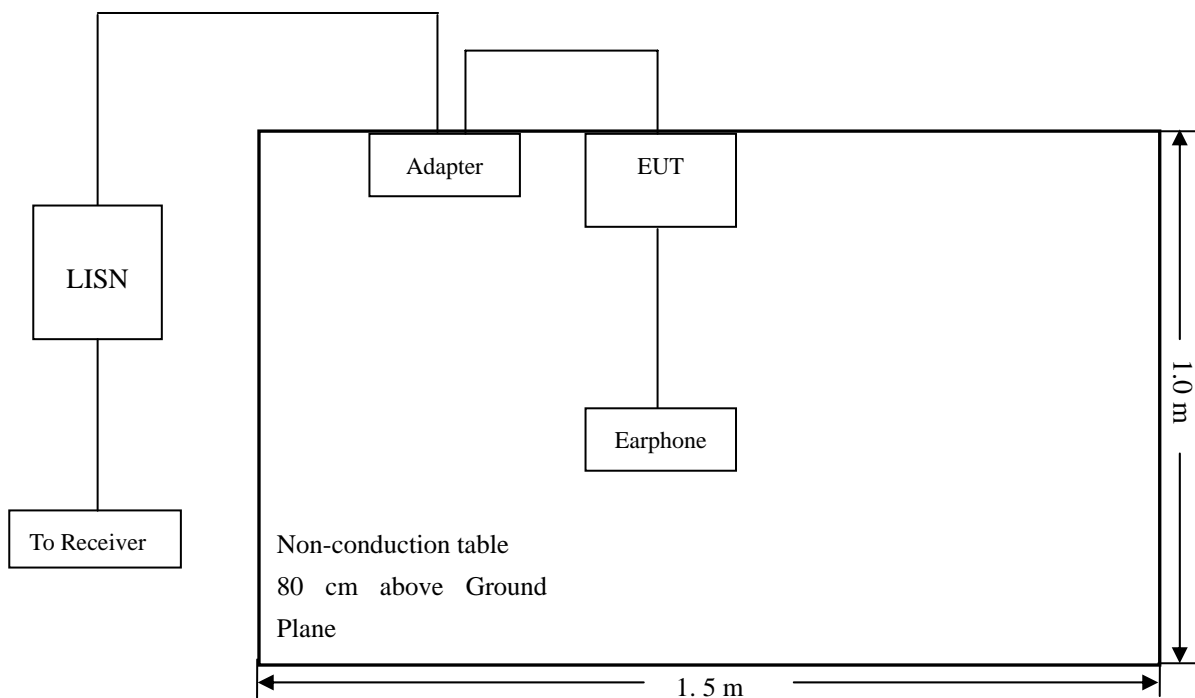
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2014-05-28	2015-05-27
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2014-05-28	2015-05-27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2014-05-28	2015-05-27

#### 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.

*Note: Base on the calibrated result, for the impedance characteristic and insertion loss, the effect shall be ignored from the placed multiple outlet power strip between the device and LISN.*

#### 3.4 Basic Test Setup Block Diagram



### 3.5 Environmental Conditions

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

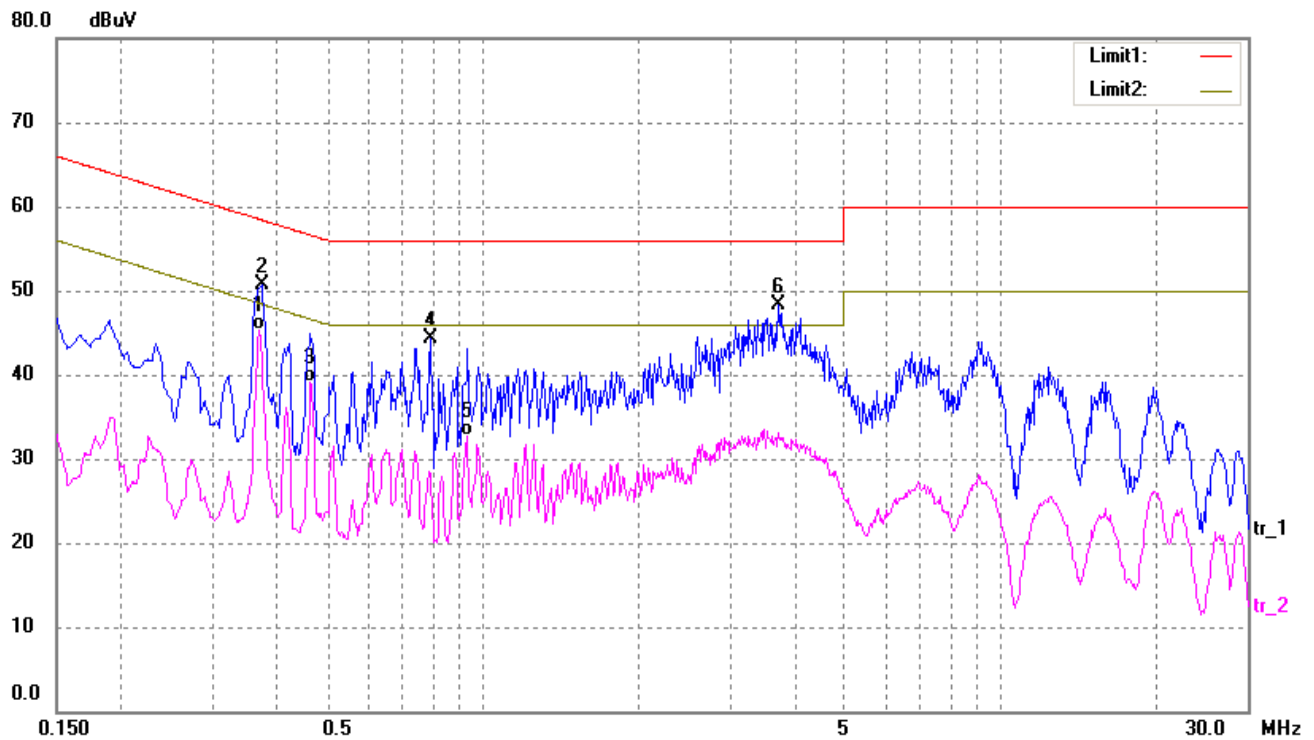
### 3.6 Summary of Test Results/Plots

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:

**-2.53 dB** at **0.3700 MHz** in the **Line, Average** detector, 0.15-30MHz

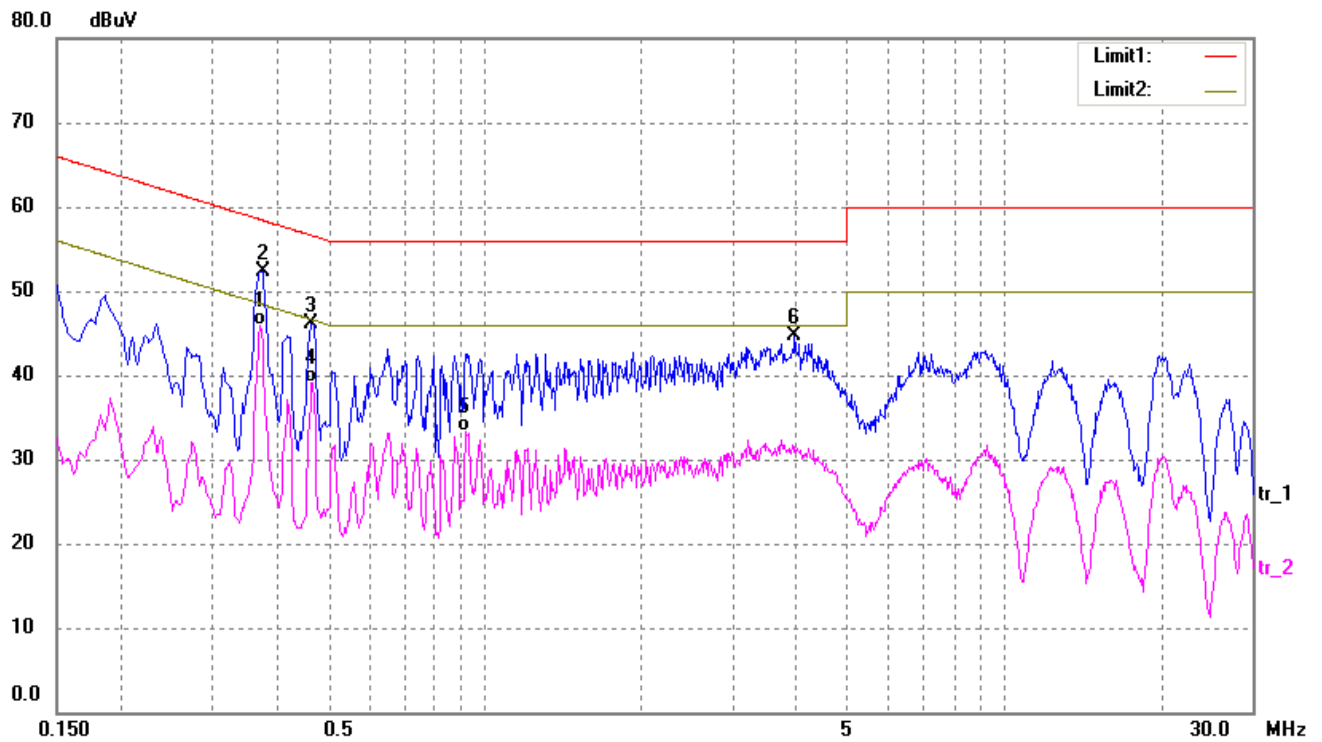
### 3.7 Conducted Emissions Test Data



**Plot of Conducted Emissions Test Data***EUT:* Smart Phone*Tested Model:* F12*Operating Condition:* TM1*Comment:* AC 120V/60Hz, Adapter DC 5.2V/800mA*Test Specification:* Neutral

No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.3700	35.88	9.50	45.38	48.50	-3.12	AVG
2	0.3740	41.19	9.50	50.69	58.41	-7.72	peak
3	0.4660	29.60	9.50	39.10	46.58	-7.48	AVG
4	0.7940	34.50	9.79	44.29	56.00	-11.71	peak
5	0.9300	22.68	9.93	32.61	46.00	-13.39	AVG
6	3.7300	38.27	10.00	48.27	56.00	-7.73	peak

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.3700	36.47	9.50	45.97	48.50	-2.53	AVG
2	0.3740	42.90	9.50	52.40	58.41	-6.01	peak
3	0.4660	36.69	9.50	46.19	56.58	-10.39	peak
4	0.4660	29.65	9.50	39.15	46.58	-7.43	AVG
5	0.9220	23.39	9.92	33.31	46.00	-12.69	AVG
6	3.9620	34.64	10.00	44.64	56.00	-11.36	peak

## 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

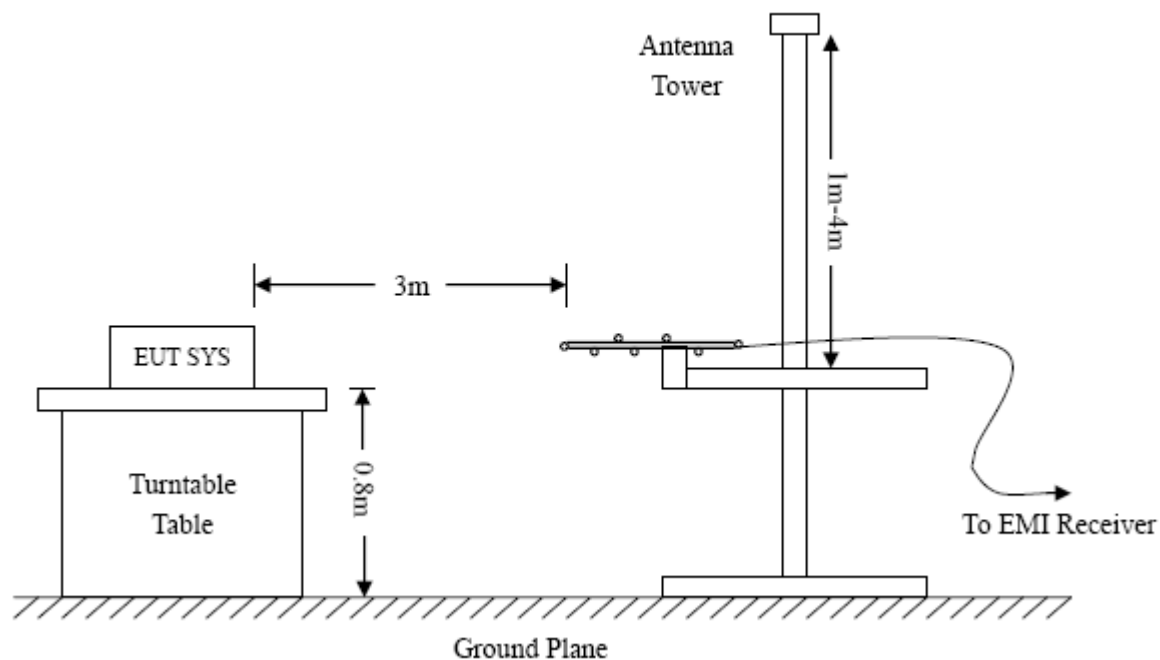
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2014-05-28	2015-05-27
EMI Test Receiver	R&S	ESVB	825471/005	2014-05-28	2015-05-27
Pre-amplifier	Agilent	8447F	3113A06717	2014-05-28	2015-05-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2014-05-28	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	2014-05-28	2015-05-27

### 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:

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

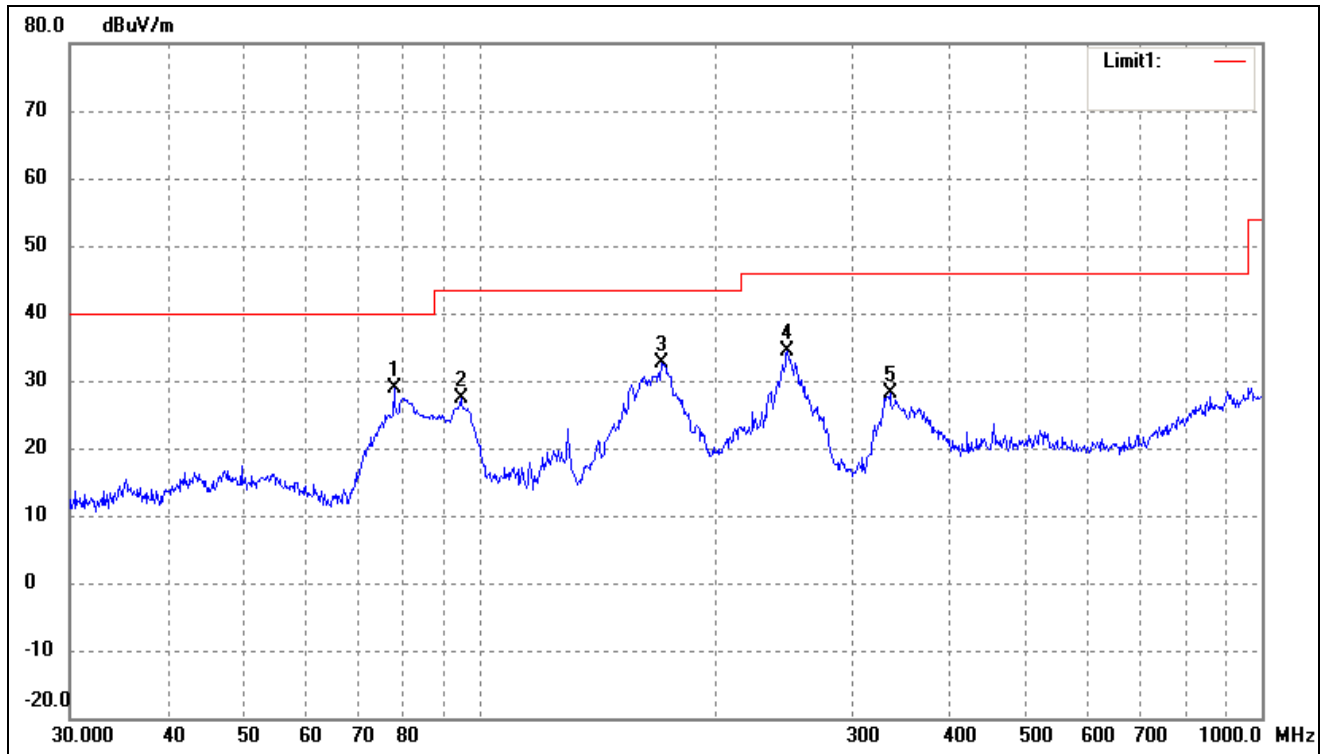
#### 4.6 Environmental Conditions

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

#### 4.7 Summary of Test Results/Plots

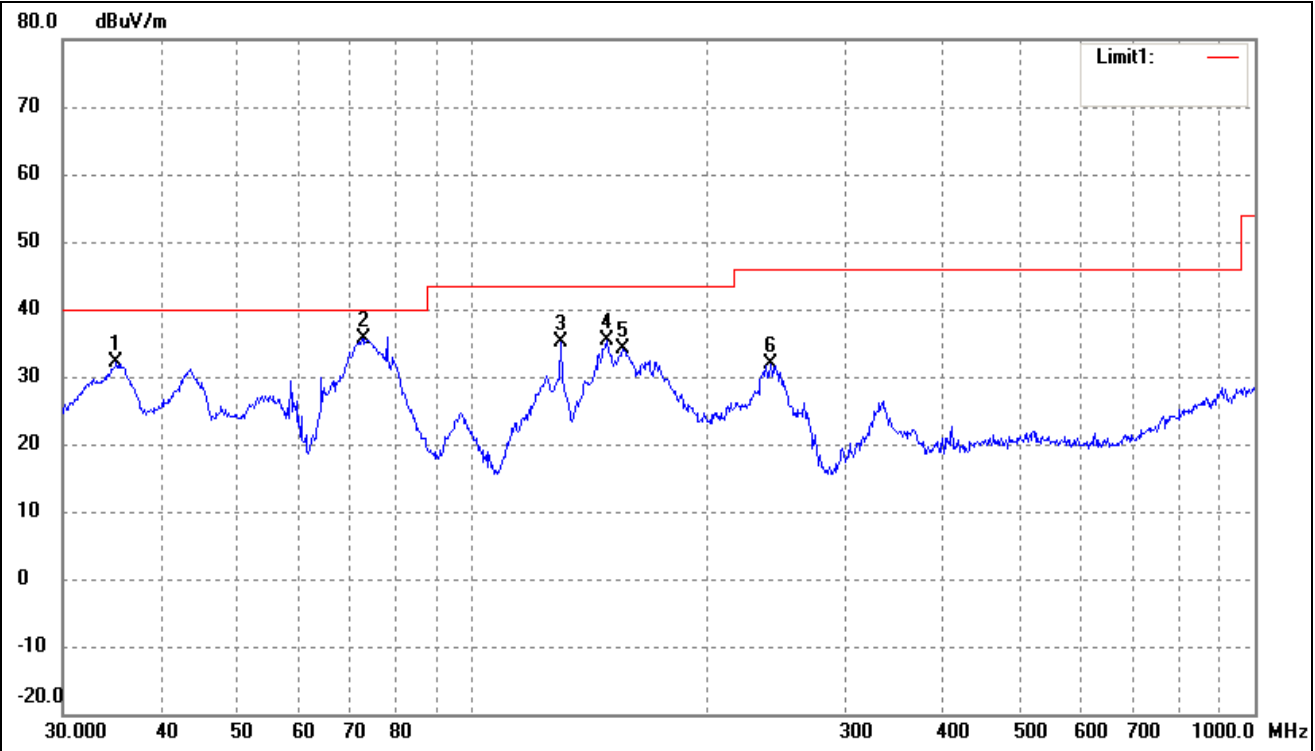
According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

**-1.41 dB at 54.6429 MHz in the Vertical polarization, TM2 mode, 9 kHz to 6 GHz, 3Meters**

**Plot of Radiated Emissions Test Data***EUT: Smart Phone**Tested Model: F12**Operating Condition: TM1**Comment: AC 120V/60Hz, Adapter DC 5.2V/800mA**Test Specification: Horizontal*

No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	77.8654	42.30	-13.54	28.76	40.00	-11.24	108	100	peak
2	94.7601	37.55	-10.25	27.30	43.50	-16.20	130	100	peak
3	171.3926	44.47	-11.74	32.73	43.50	-10.77	229	100	peak
4	247.6819	41.86	-7.55	34.31	46.00	-11.69	120	100	peak
5	334.8589	32.83	-4.80	28.03	46.00	-17.97	187	100	peak
6	77.8654	42.30	-13.54	28.76	40.00	-11.24	194	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	35.1278	42.03	-10.01	32.02	40.00	-7.98	251	100	peak
2	72.5917	48.18	-12.49	35.69	40.00	-4.31	308	100	peak
3	129.9226	47.86	-12.73	35.13	43.50	-8.37	120	100	peak
4	148.4410	48.44	-12.98	35.46	43.50	-8.04	359	100	peak
5	155.9101	46.75	-12.59	34.16	43.50	-9.34	152	100	peak
5	240.8304	39.59	-7.75	31.84	46.00	-14.16	164	100	peak

**Plot of Radiated Emissions Test Data**

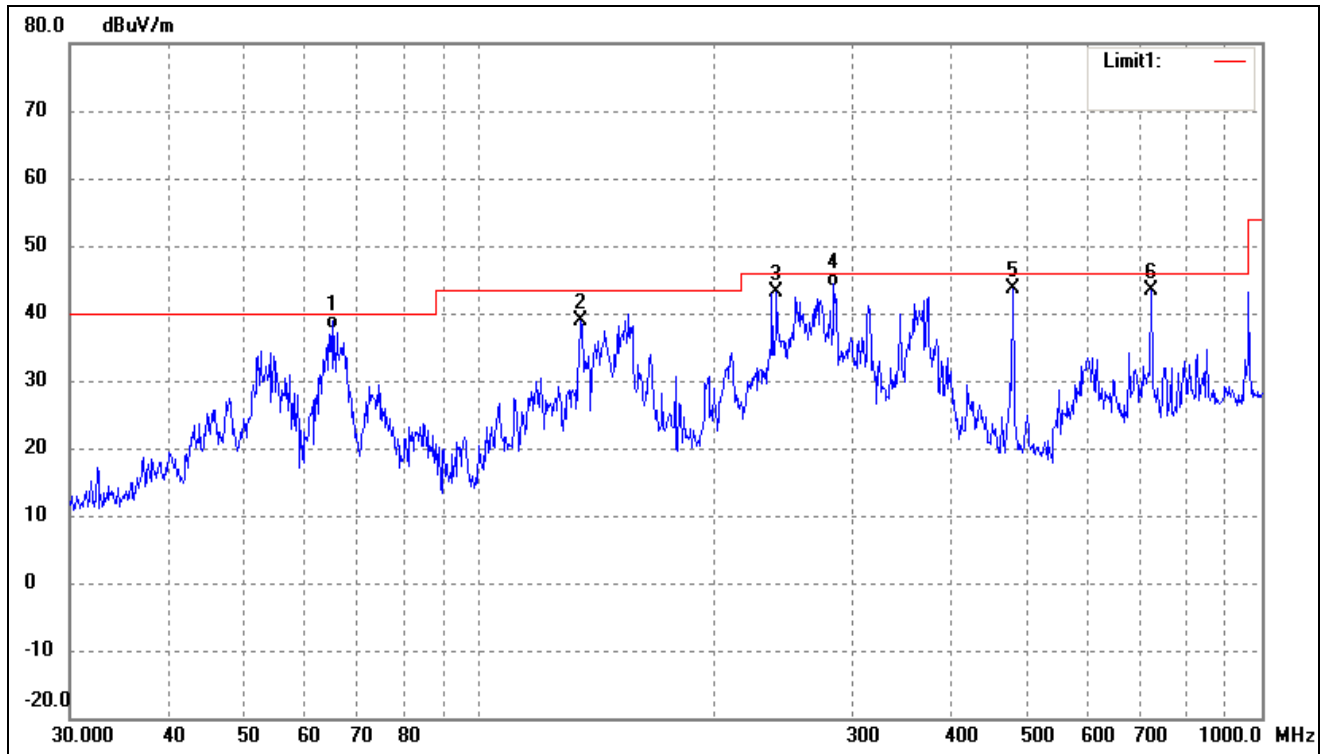
EUT: Smart Phone

Tested Model: F12

Operating Condition: TM2

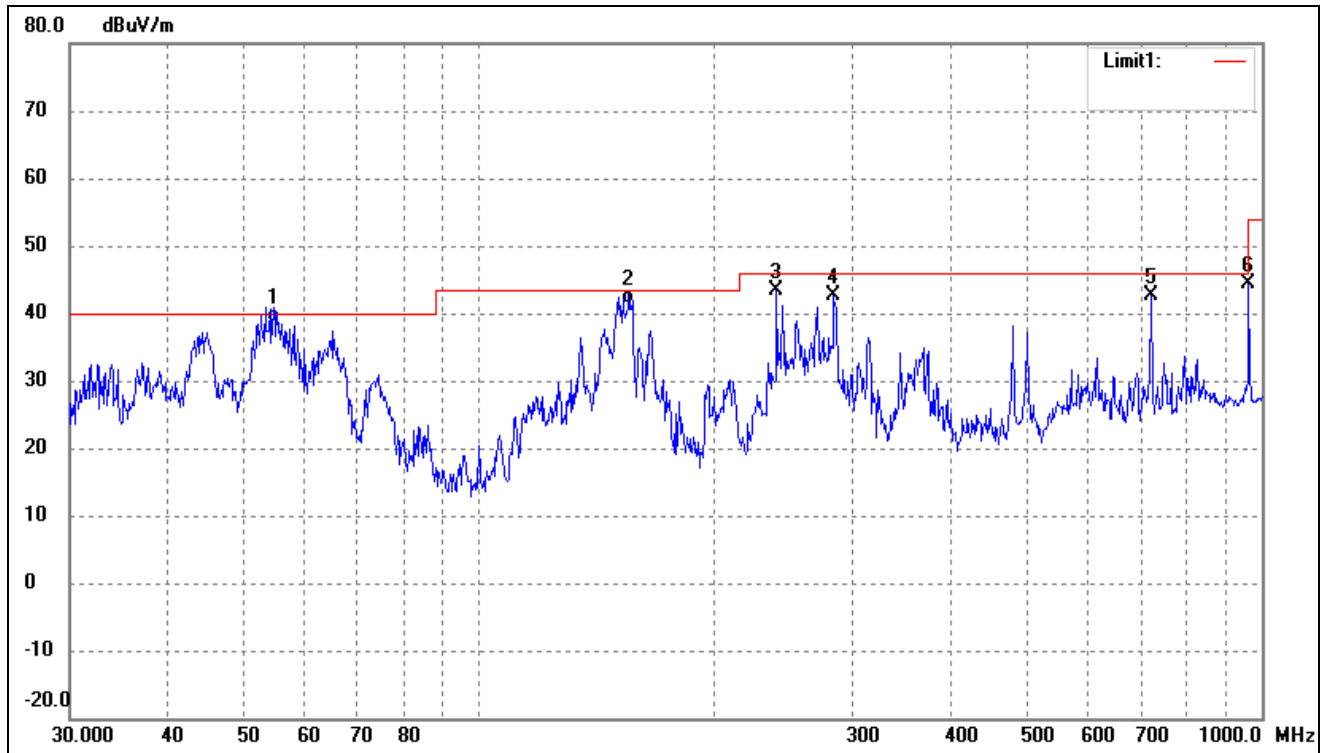
Comment: AC 120V/60Hz, USB DC 5V

Test Specification: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	65.1145	47.40	-9.86	37.54	40.00	-2.46	158	100	QP
2	135.0319	51.86	-12.95	38.91	43.50	-4.59	226	100	Peak
3	239.9874	50.96	-7.79	43.17	46.00	-2.83	129	150	Peak
4	283.9792	50.50	-6.72	43.78	46.00	-2.22	109	100	QP
5	480.5276	45.42	-1.70	43.72	46.00	-2.28	115	100	Peak
6	721.7259	43.38	-0.02	43.36	46.00	-2.64	145	100	Peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	54.6429	46.50	-7.91	38.59	40.00	-1.41	51	100	QP
2	155.3644	54.10	-12.62	41.48	43.50	-2.02	308	100	QP
3	239.9874	51.08	-7.79	43.29	46.00	-2.71	120	100	peak
4	283.9792	49.32	-6.72	42.60	46.00	-3.40	359	100	peak
5	721.7259	40.12	2.55	42.67	46.00	-3.33	178	100	peak
6	962.1623	38.31	6.01	44.32	54.00	-9.68	165	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 \*\*\*\*\*