

# FCC Part 15B

## Measurement and Test Report

For

**ELECTRONICS TECHNOLOGY(DONG GUAN) COMPANY LIMITED**

**No. 161, Xin Min Road, Tong Luo Wei Industrial Zone, Dong Guan**

**City, China**

**FCC ID: ZL9-M87GB2**

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

**Product Description:** Tablet

**Tested Model:** M87GB2-P(W)

**Report No.:** STR14128178I-4

**Tested Date:** 2014-12-18 to 2014-12-29

**Issued Date:** 2014-12-29

**Tested By:** Lebron Wang / Engineer

*Lebron Wang*

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

*Lahm peng*

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

*Jandyso*

**Prepared By:**

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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: ELECTRONICS TECHNOLOGY(DONG GUAN)  
COMPANY LIMITED

Address of applicant: No. 161, Xin Min Road, Tong Luo Wei Industrial  
Zone, Dong Guan City, China

Manufacturer: ELECTRONICS TECHNOLOGY(DONG GUAN)  
COMPANY LIMITED

Address of manufacturer: No. 161, Xin Min Road, Tong Luo Wei Industrial  
Zone, Dong Guan City, China

General Description of EUT	
Product Name:	Tablet
Trade Name:	/
Model No.:	M87GB2-P(W)
Adding Model(s):	PAD841W
<i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model M87GB2-P(W), but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Rated Voltage:	DC 5V
Rated Current:	2A
Rated Power:	10W
Power Adapter Model:	PGAE0500200U1UL
Lowest Internal Frequency:	32.768kHz
Highest Internal Frequency:	1.83GHz
Classification of ITE:	Class B

## 1.2 Test Standards

The following report is prepared on behalf of the ELECTRONICS TECHNOLOGY(DONG GUAN) COMPANY 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 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 & Playing	Connect To Adapter, Earphone
TM2	Downloading	Connect To U-Disk
TM3	Downloading	Connect To U-Disk

EUT Cable List and Details

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

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB OTG Cable	0.15	Shielded	Without Core
Earphone Cable	1.2	Unshielded	Without Core

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
TF Card	Kingston	4GB	/
U-Disk	SanDisk	2GB	/

## 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.

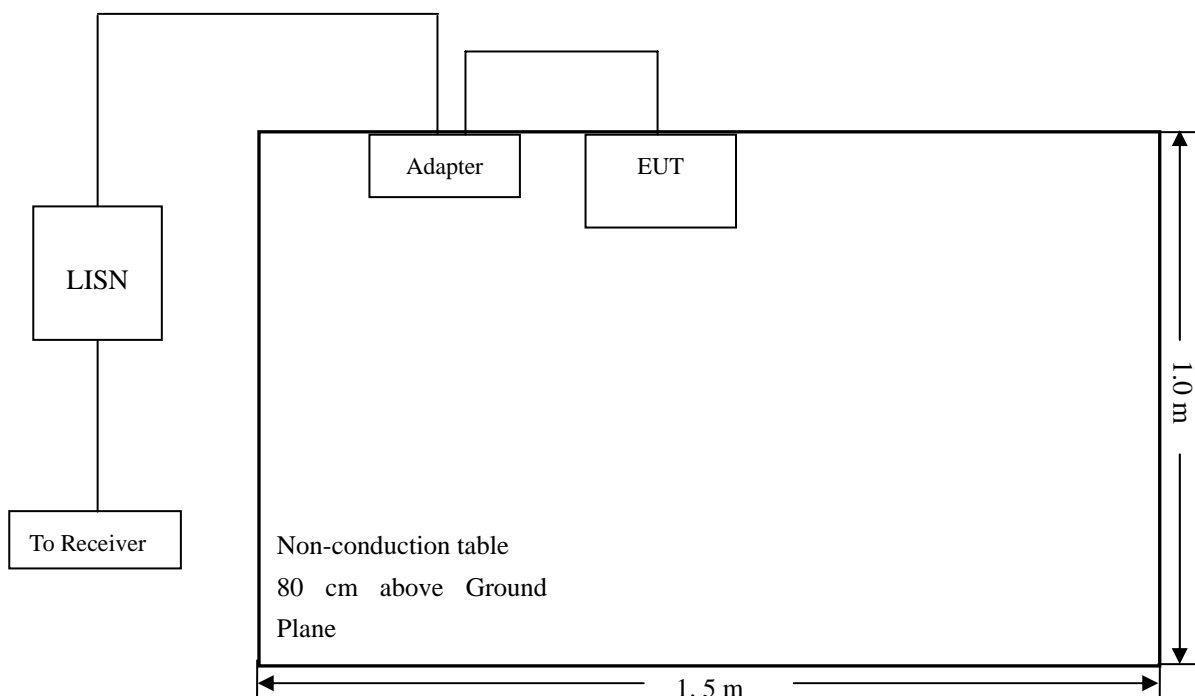
#### 3.2 Test Equipment List and Details

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:

**-8.72dB at 0.6620 MHz** in the **Neutral, QP** detector, 0.15-30MHz

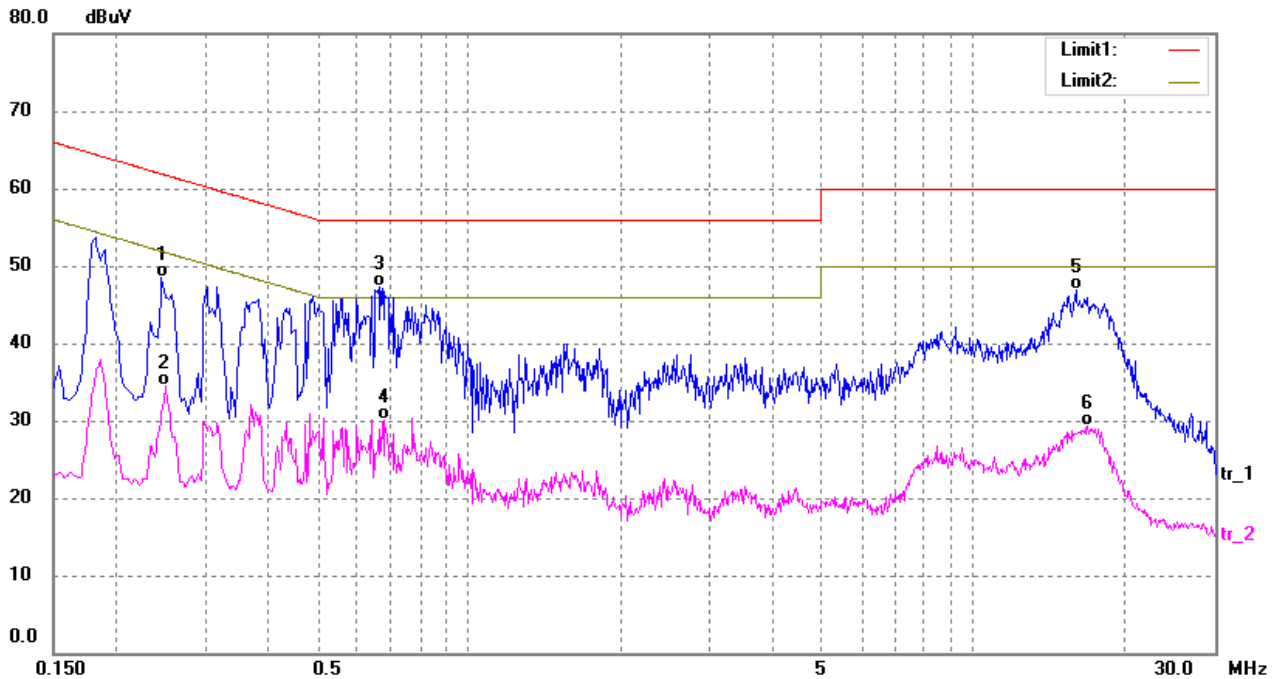
### 3.7 Conducted Emissions Test Data



### Plot of Conducted Emissions Test Data

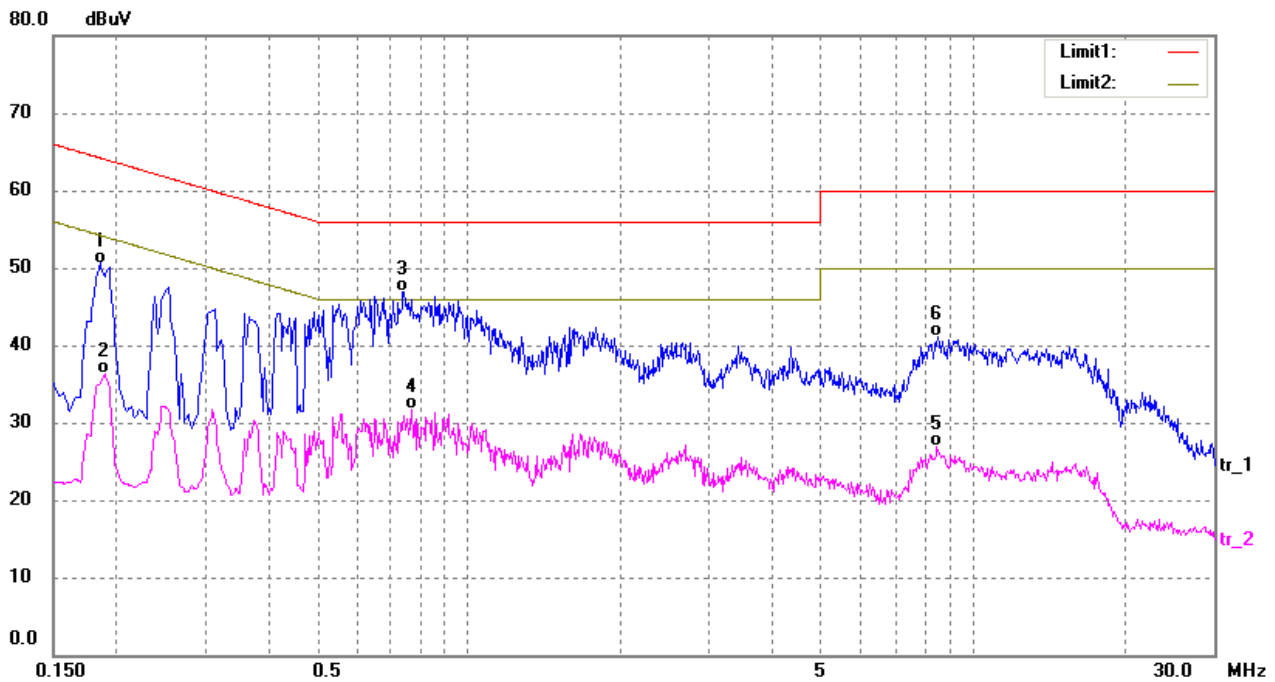
EUT: Tablet  
 Tested Model: M87GB2-P(W)  
 Operating Condition: AC 120V/60Hz; Adapter DC 5V/2A  
 Comment: TM1

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2460	39.03	9.50	48.53	61.89	-13.36	QP
2	0.2500	24.92	9.50	34.42	51.76	-17.34	AVG
3	0.6620	37.62	9.66	47.28	56.00	-8.72	QP
4	0.6820	20.44	9.68	30.12	46.00	-15.88	AVG
5	15.9660	35.72	11.19	46.91	60.00	-13.09	QP
6	16.7740	17.92	11.35	29.27	50.00	-20.73	AVG

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1860	41.10	9.50	50.60	64.21	-13.61	QP
2	0.1900	26.87	9.50	36.37	54.04	-17.67	AVG
3	0.7420	37.25	9.74	46.99	56.00	-9.01	QP
4	0.7700	21.88	9.77	31.65	46.00	-14.35	AVG
5	8.4660	16.82	10.00	26.82	50.00	-23.18	AVG
6	8.5420	31.19	10.00	41.19	60.00	-18.81	QP

## 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

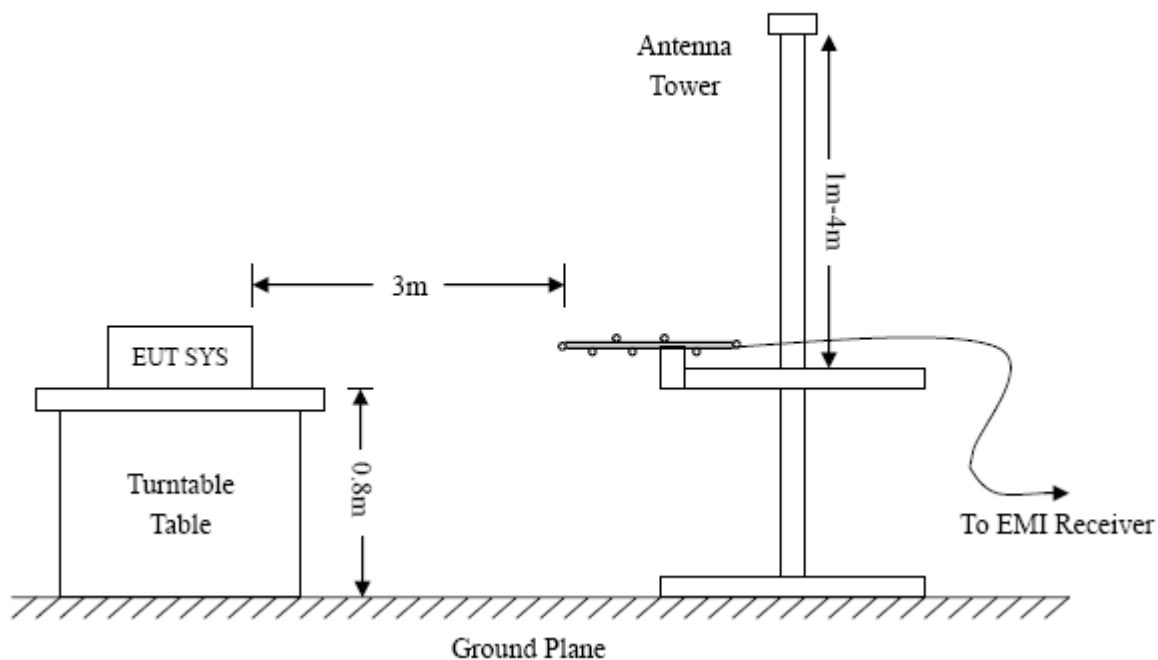
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2014-05-28	2015-05-27
EMI Test Receiver	R&S	ESVB	825471/005	2014-05-28	2015-05-27
Pre-amplifier	Agilent	8447F	3113A06717	2014-05-28	2015-05-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2014-05-28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

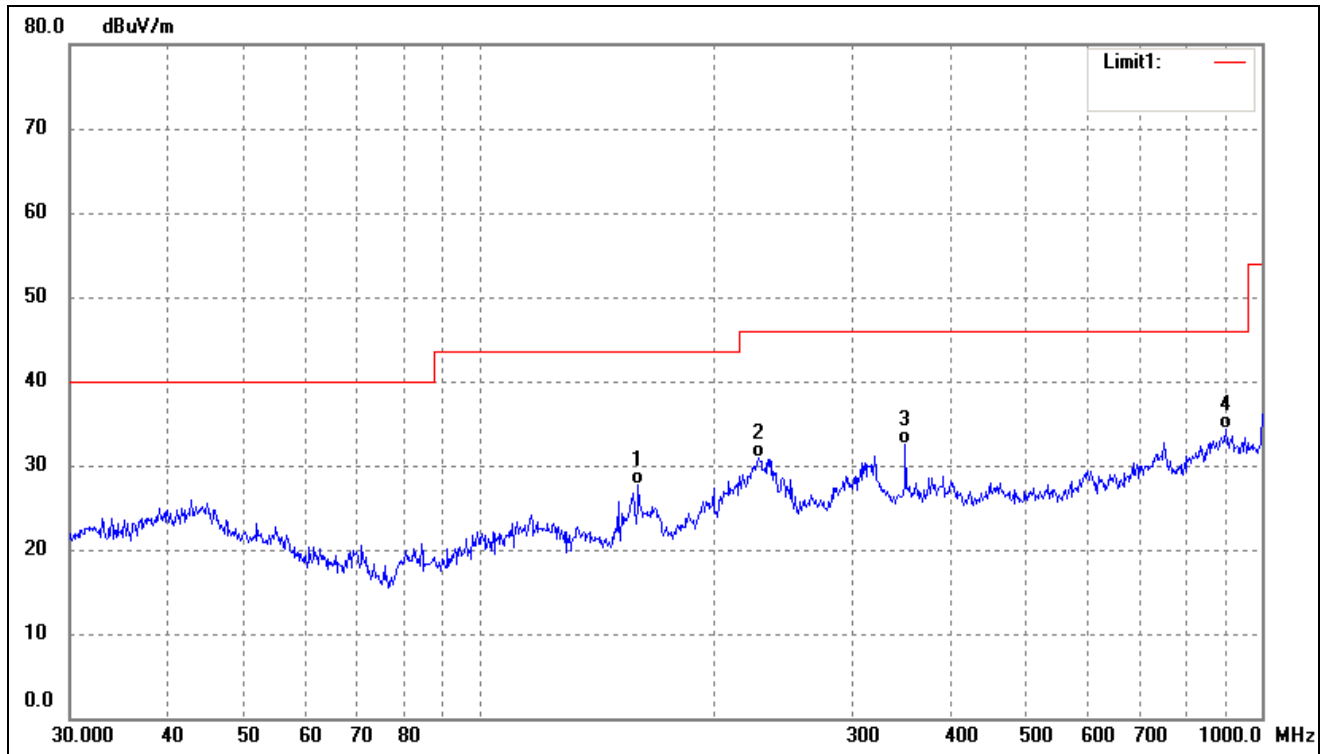
According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

**-1.98 dB at 480.5276 MHz in the Horizontal polarization, Downloading Mode, 9 kHz to 1 GHz, 3Meters**

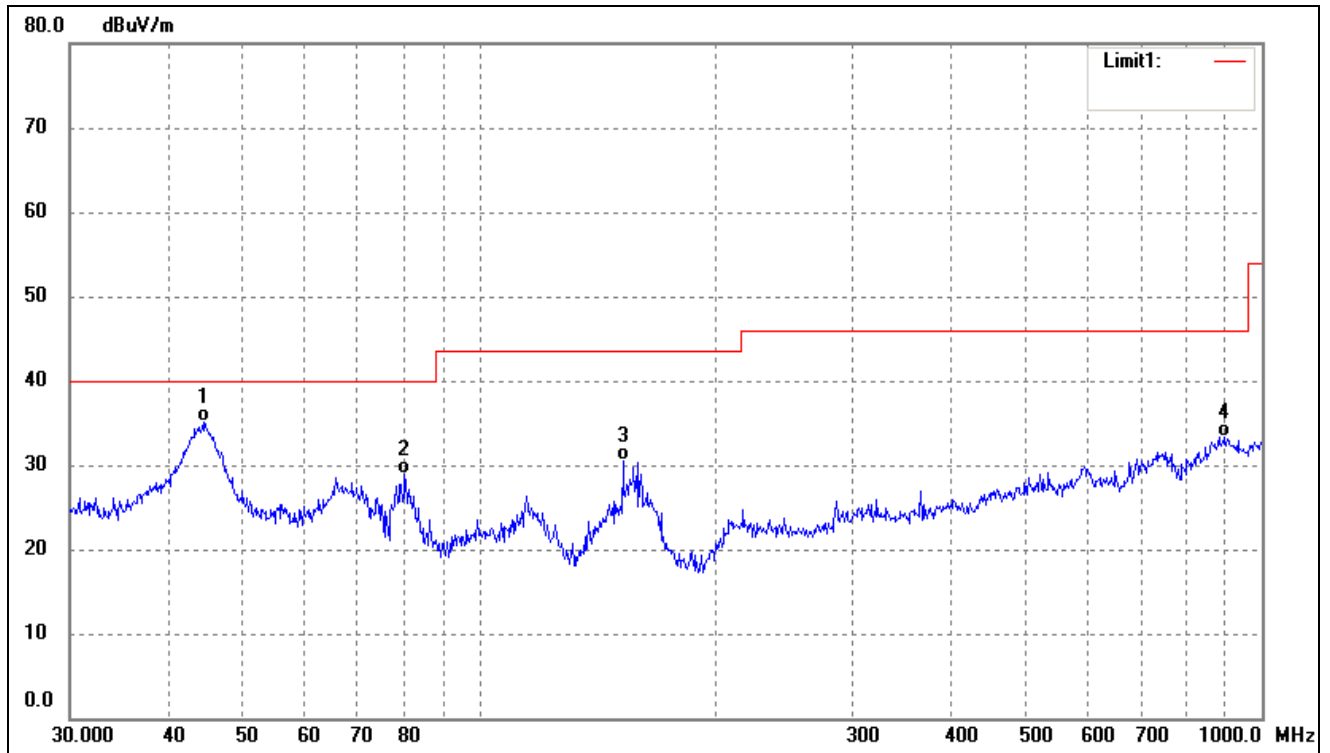
### Plot of Radiated Emissions Test Data

EUT: Tablet  
 Tested Model: M87GB2-P(W)  
 Operating Condition: AC 120V/60Hz; Adapter DC 5V/2A  
 Comment: Charging & Playing

Test Specification: Horizontal



Test Specification: Vertical

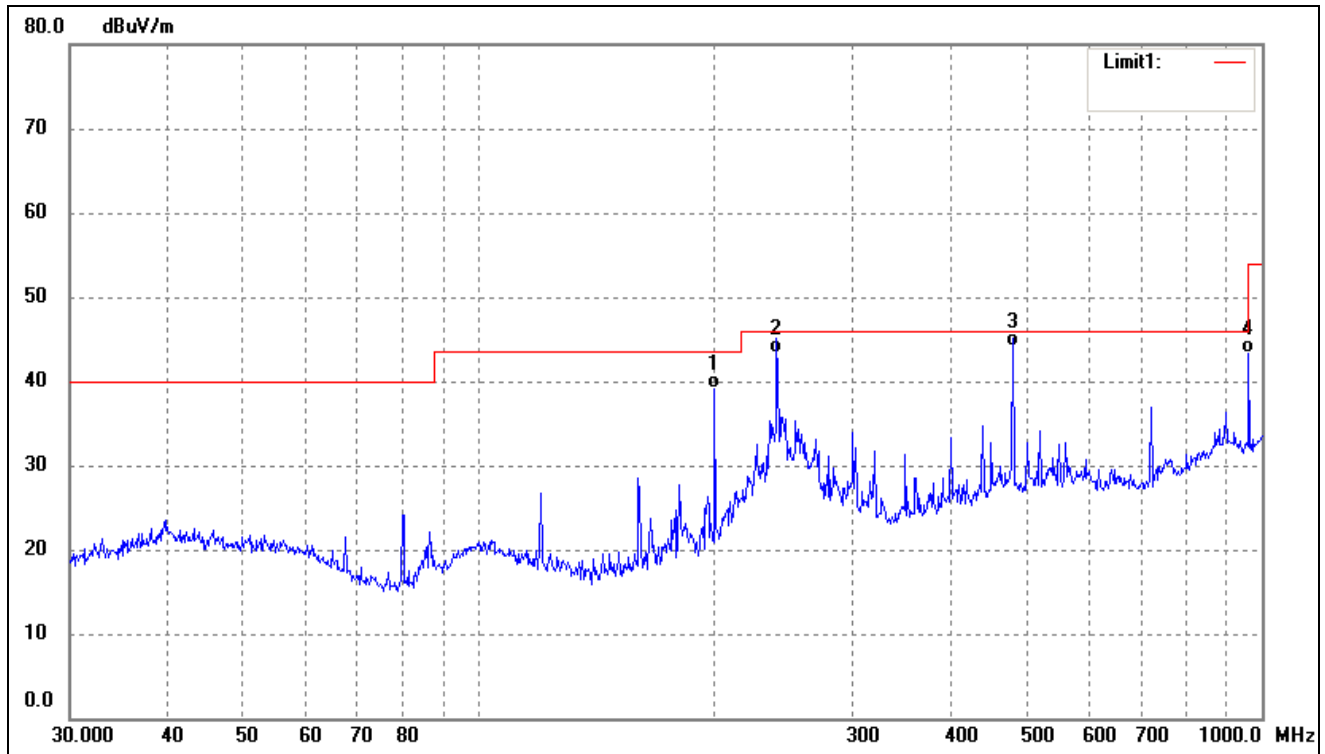


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	44.4308	27.21	7.93	35.14	40.00	-4.86	51	100	peak
2	80.3619	27.77	1.09	28.86	40.00	-11.14	308	100	peak
3	152.6641	27.95	2.53	30.48	43.50	-13.02	120	100	peak
4	893.8567	16.51	16.85	33.36	46.00	-12.64	359	100	peak

### Plot of Radiated Emissions Test Data

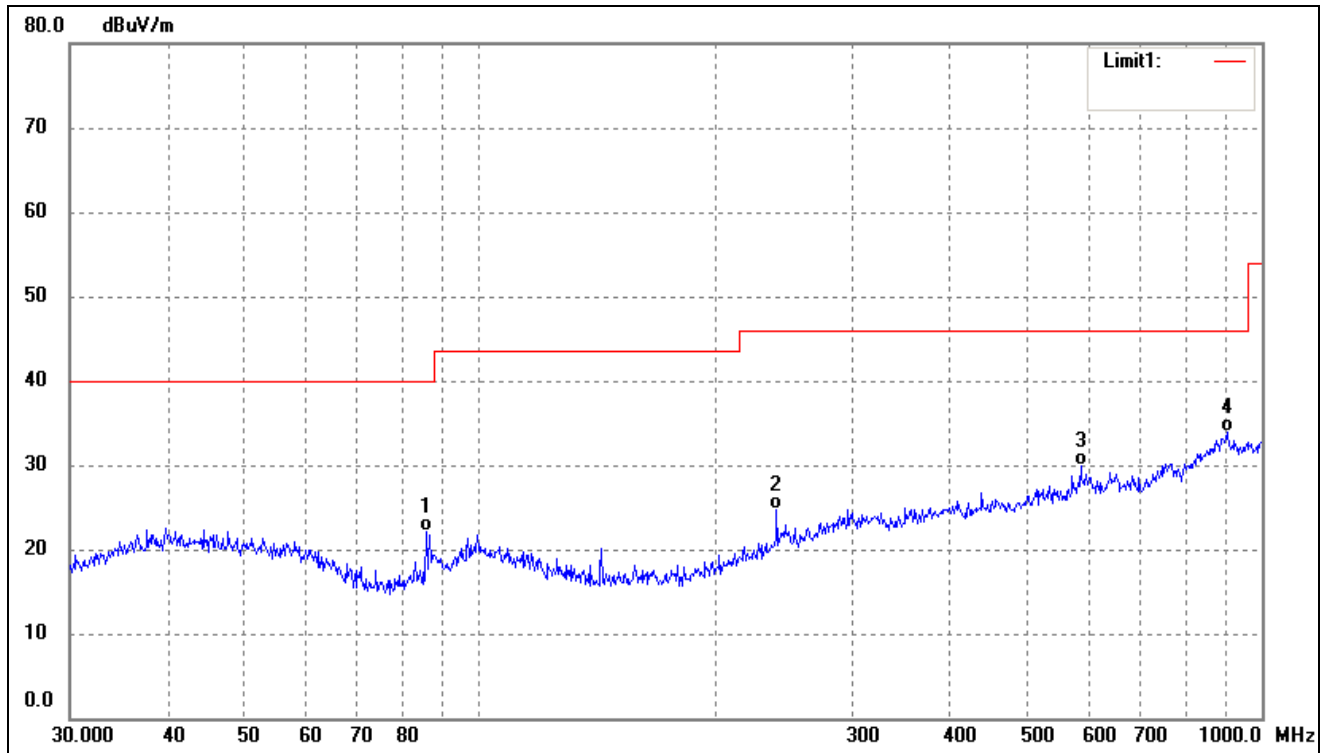
EUT: *Tablet*  
 Tested Model: *M87GB2-P(W)*  
 Operating Condition: *AC 120V/60Hz; USB DC 5V*  
 Comment: *Downloading*

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	199.9856	35.40	3.67	39.07	43.50	-4.43	148	150	QP
2	239.9874	36.90	6.33	43.23	46.00	-2.77	152	100	QP
3	480.5276	33.90	10.12	44.02	46.00	-1.98	174	120	QP
4	962.1623	26.89	16.38	43.27	54.00	-10.73	225	100	QP

Test Specification: Vertical



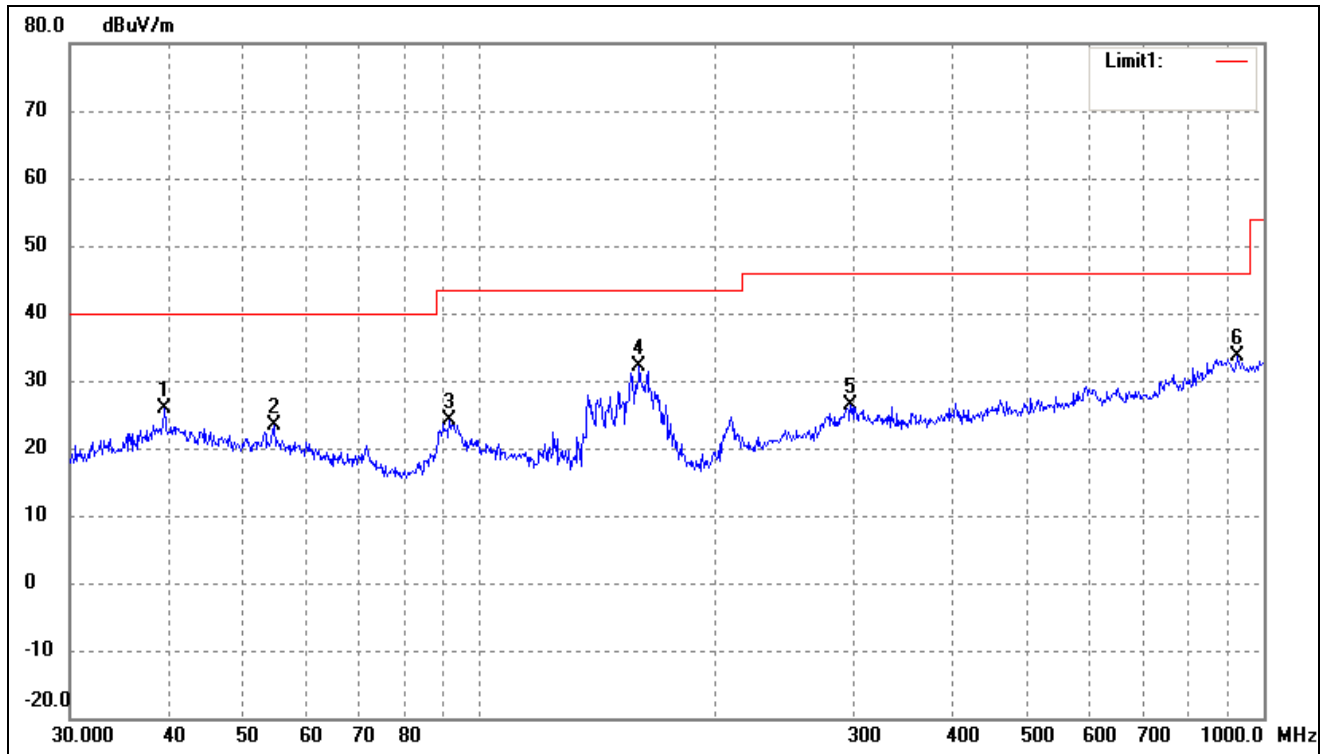
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	85.5977	19.69	2.47	22.16	40.00	-17.84	102	100	QP
2	239.9874	18.40	6.33	24.73	46.00	-21.27	154	100	QP
3	586.8437	17.06	12.83	29.89	46.00	-16.11	178	100	QP
4	903.3094	17.02	16.79	33.81	46.00	-12.19	136	100	QP



### Plot of Radiated Emissions Test Data

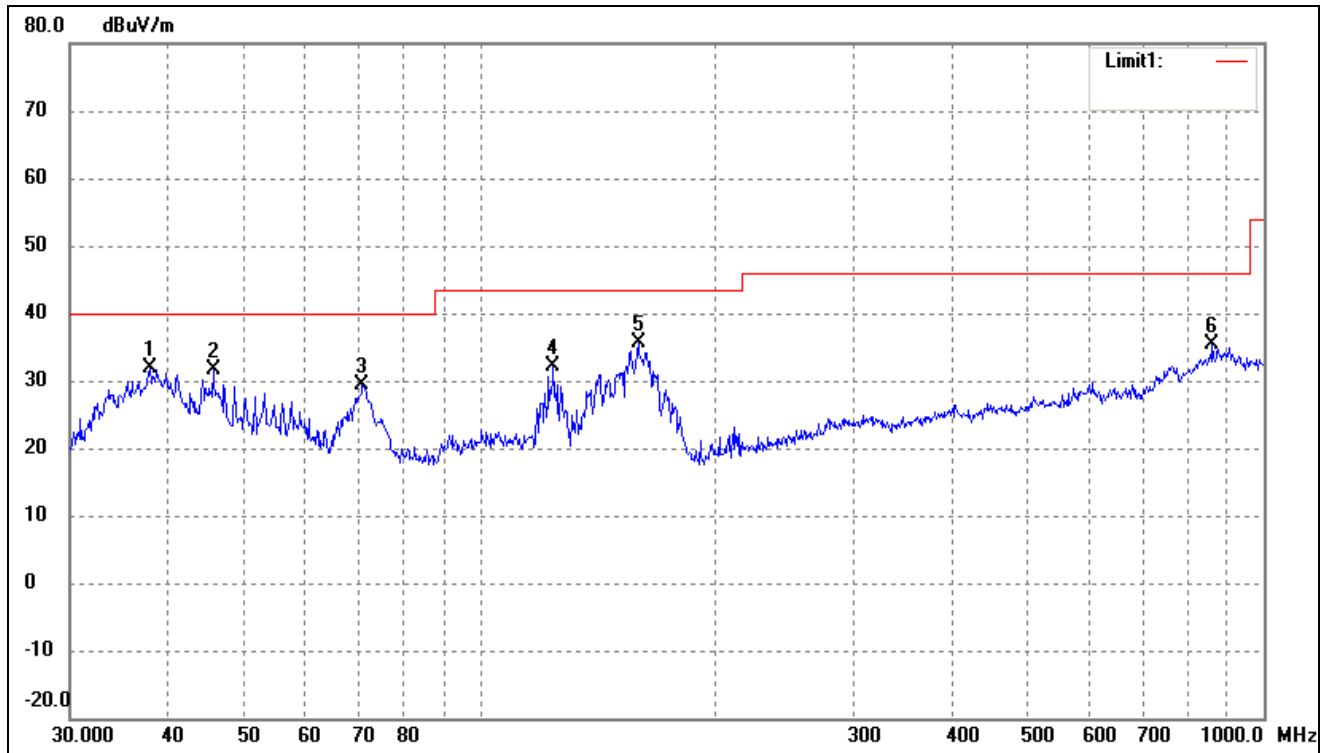
EUT: *Tablet*  
 Tested Model: *M87GB2-P(W)*  
 Operating Condition: *AC 120V/60Hz; USB DC 5V*  
 Comment: *Camera*

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	39.5756	18.68	7.13	25.81	40.00	-14.19	58	150	peak
2	54.6428	17.50	5.85	23.35	40.00	-16.65	326	100	peak
3	91.4949	20.06	3.99	24.05	43.50	-19.45	29	150	peak
4	159.7844	29.42	2.62	32.04	43.50	-11.46	209	100	peak
5	297.2241	17.32	9.06	26.38	46.00	-19.62	145	100	peak
6	925.7563	17.14	16.40	33.54	46.00	-12.46	359	200	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	37.9450	23.06	8.90	31.96	40.00	-8.04	51	100	peak
2	45.6948	24.15	7.55	31.70	40.00	-8.30	308	100	peak
3	70.8315	27.17	2.09	29.26	40.00	-10.74	120	100	peak
4	124.1329	28.35	3.69	32.04	43.50	-11.46	359	100	peak
5	159.2249	33.03	2.62	35.65	43.50	-7.85	145	100	peak
6	860.0352	19.03	16.29	35.32	46.00	-10.68	359	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 \*\*\*\*\*