

# 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-SP6020**

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

**Product Description:** Tablet

**Tested Model:** M66AYG-P

**Report No.:** STR14108021I-5

**Tested Date:** 2014-10-10 to 2014-10-17

**Issued Date:** 2014-10-17

**Tested By:** Lebron Wang / Engineer

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

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

**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.:	M66AYG-P
Adding Model(s):	SP6020

*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 M66AYG-P, but the circuit and the electronic construction do not change, declared by the manufacturer.*

#### Technical Characteristics of EUT

Rated Voltage:	DC 5V
Rated Current:	2A
Rated Power:	/
Power Adapter Model:	YN12W-0500200HU
Lowest Internal Frequency:	32.768KHz
Highest Internal Frequency:	1.0GHz
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 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
TM3	Camera	/

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	1.0	Unshielded	Without Core
Earphone Cable	1.1	Unshielded	Without Core

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook Computer	Lenovo	20007	EB12648265

Special Cable List and Details

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

## 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

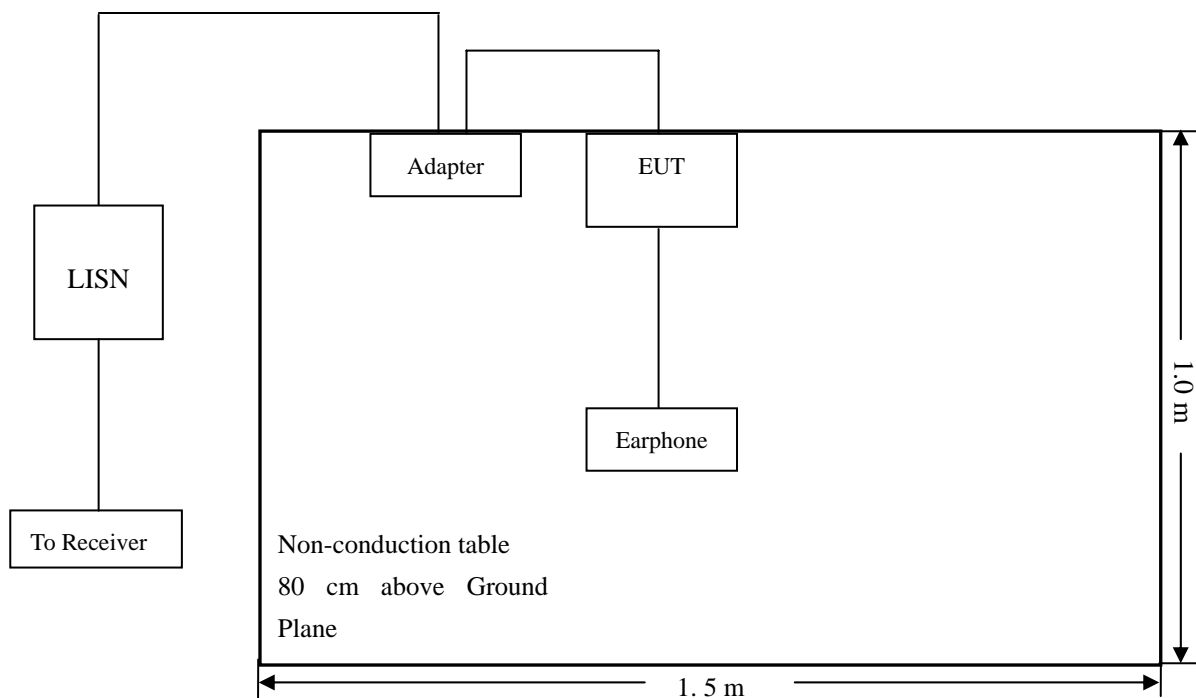
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2014-05-28	2015-05-27
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2014-05-28	2015-05-27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2014-05-28	2015-05-27

#### 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.

*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:

**-5.49 dB at 0.1500 MHz** in the **Neutral, TM2** Mode, **Peak** detector, 0.15-30MHz

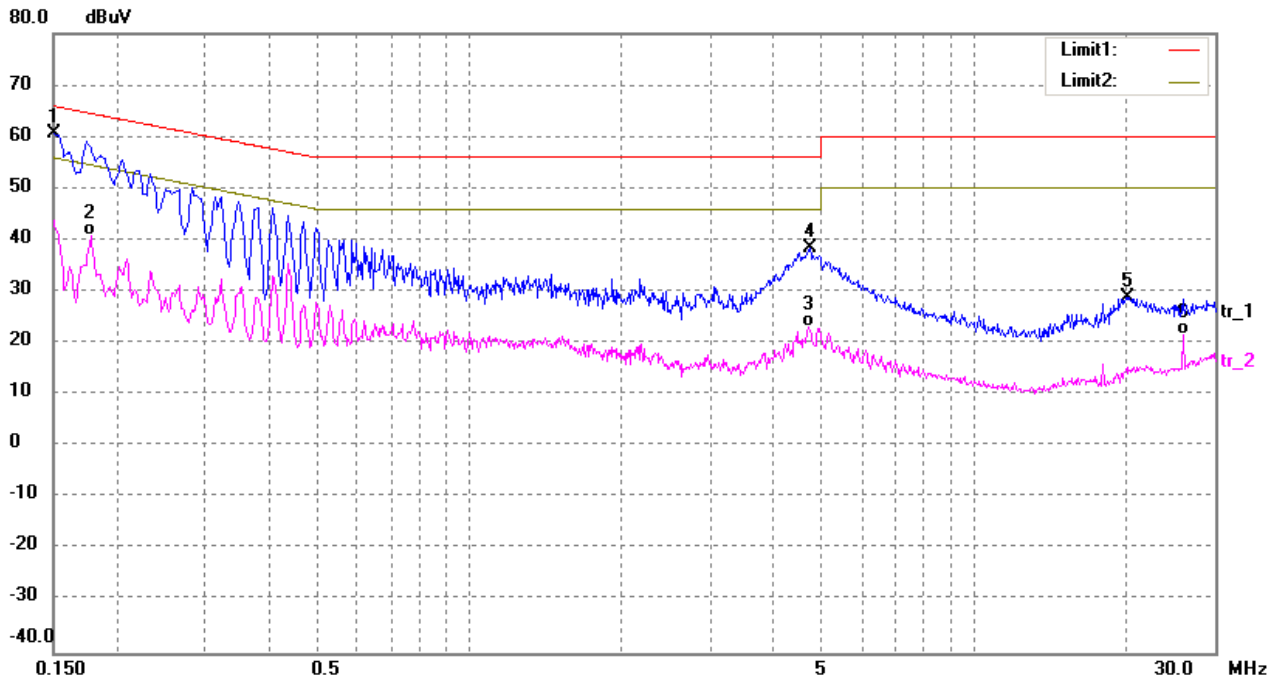
### 3.7 Conducted Emissions Test Data



### Plot of Conducted Emissions Test Data

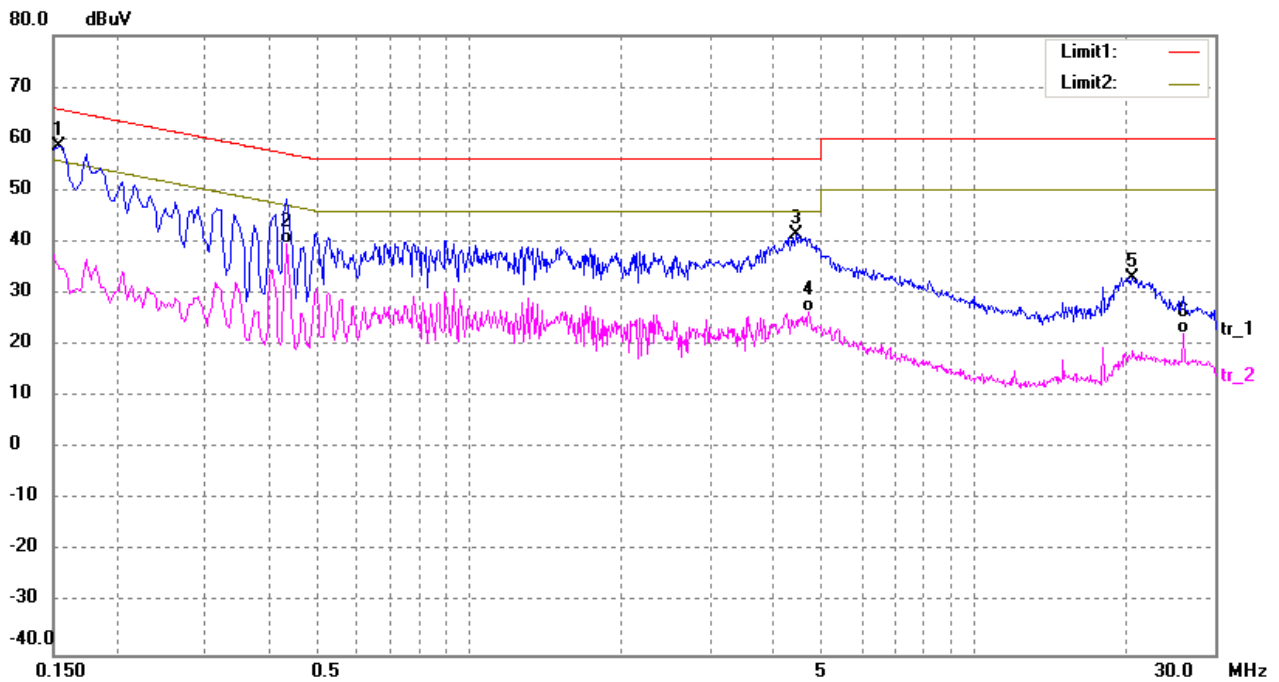
EUT: Tablet  
 Tested Model: M66AYG  
 Operating Condition: AC 120V/60Hz; Adapter DC 5V/2A  
 Comment: TM1

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	51.01	9.50	60.51	66.00	-5.49	peak
2	0.1780	31.47	9.50	40.97	54.58	-13.61	AVG
3	4.7100	13.27	10.00	23.27	46.00	-22.73	AVG
4	4.7260	28.45	10.00	38.45	56.00	-17.55	peak
5	20.2420	16.99	12.00	28.99	60.00	-31.01	peak
6	25.9980	8.60	13.00	21.60	50.00	-28.40	AVG

Test Specification: Line

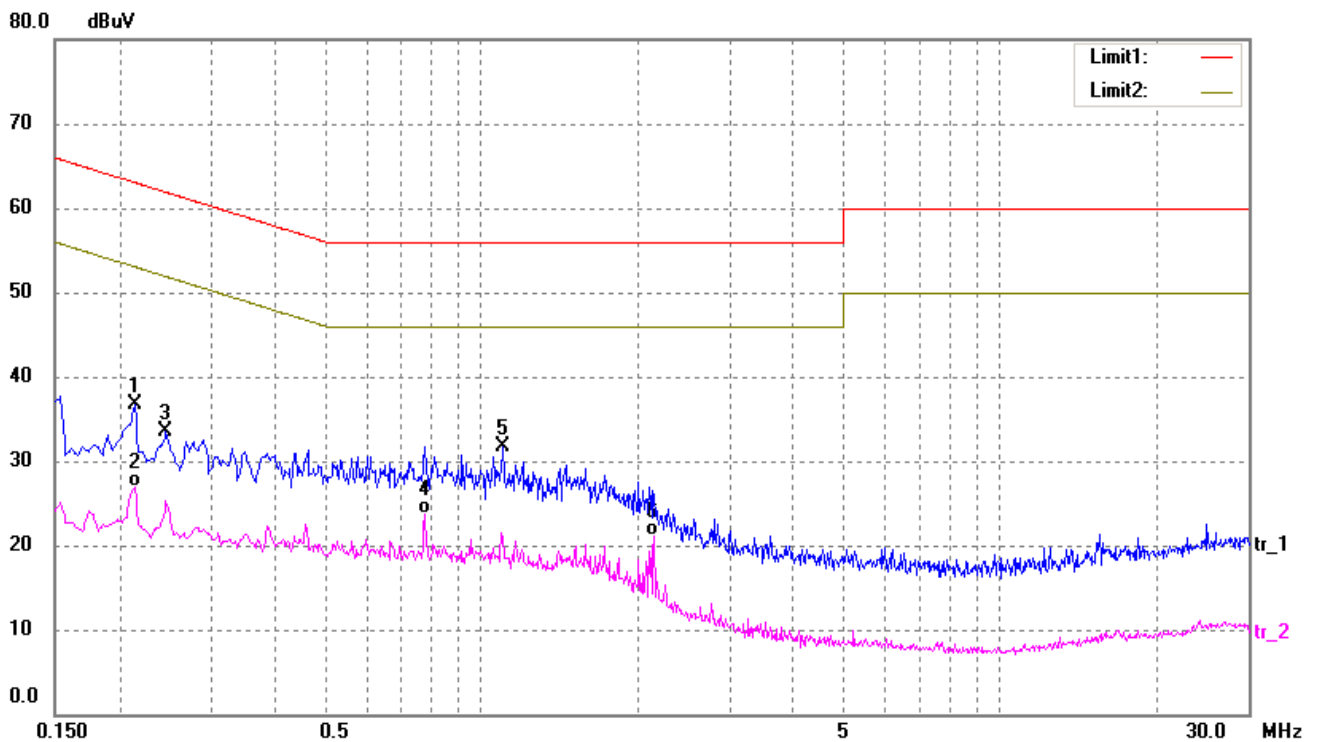


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1540	49.04	9.50	58.54	65.78	-7.24	peak
2	0.4340	30.26	9.50	39.76	47.18	-7.42	AVG
3	4.4380	31.45	10.00	41.45	56.00	-14.55	peak
4	4.7060	16.47	10.00	26.47	46.00	-19.53	AVG
5	20.5700	21.01	12.00	33.01	60.00	-26.99	peak
6	26.0020	9.29	13.00	22.29	50.00	-27.71	AVG

### Plot of Conducted Emissions Test Data

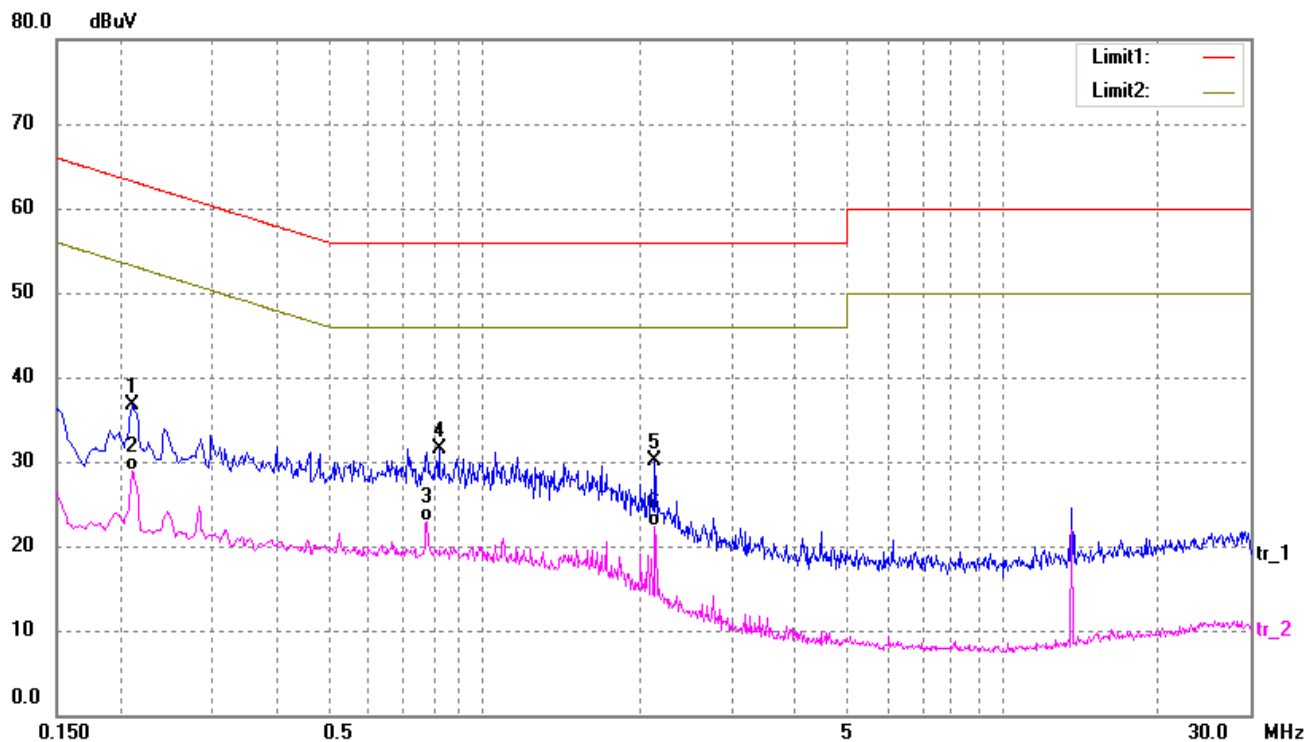
EUT: Tablet  
 Tested Model: M66AYG  
 Operating Condition: AC 120V/60Hz; Adapter DC 5V/2A  
 Comment: TM2

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2140	27.28	9.50	36.78	63.05	-26.27	peak
2	0.2140	17.34	9.50	26.84	53.05	-26.21	AVG
3	0.2460	23.93	9.50	33.43	61.89	-28.46	peak
4	0.7780	13.96	9.78	23.74	46.00	-22.26	AVG
5	1.0940	21.70	10.00	31.70	56.00	-24.30	peak
6	2.1460	11.13	10.00	21.13	46.00	-24.87	AVG

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2100	27.21	9.50	36.71	63.21	-26.50	peak
2	0.2100	19.48	9.50	28.98	53.21	-24.23	AVG
3	0.7780	13.08	9.78	22.86	46.00	-23.14	AVG
4	0.8180	21.73	9.82	31.55	56.00	-24.45	peak
5	2.1420	20.07	10.00	30.07	56.00	-25.93	peak
6	2.1420	12.40	10.00	22.40	46.00	-23.60	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

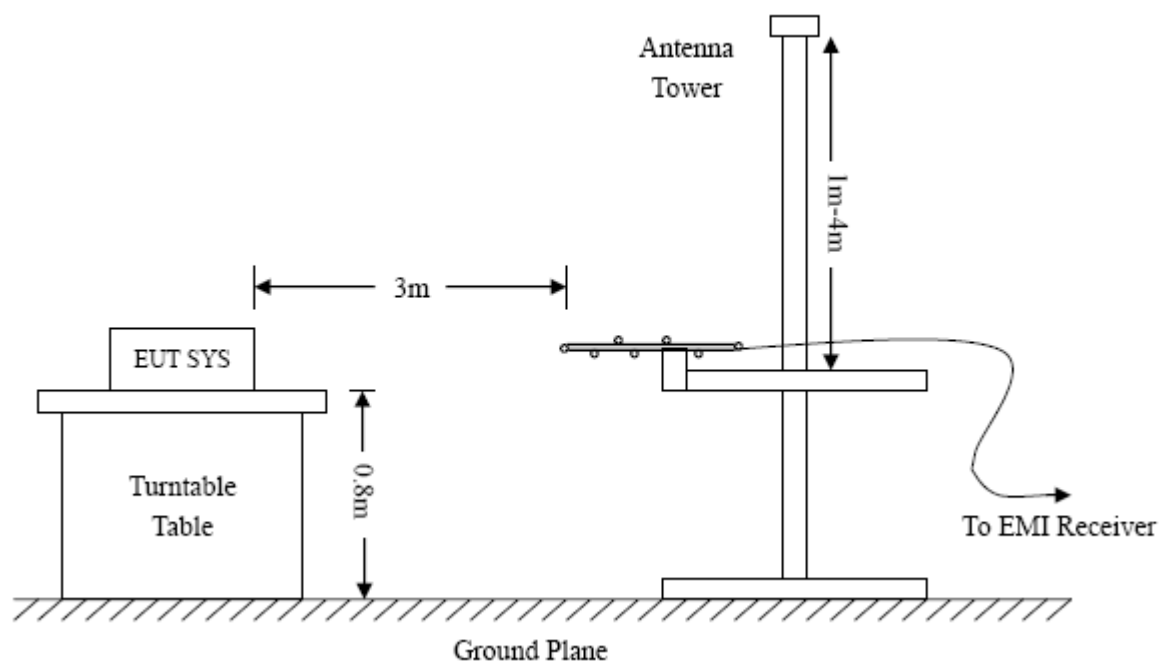
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2014-05-28	2015-05-27
EMI Test Receiver	R&S	ESVB	825471/005	2014-05-28	2015-05-27
Pre-amplifier	Agilent	8447F	3113A06717	2014-05-28	2015-05-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2014-05-28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

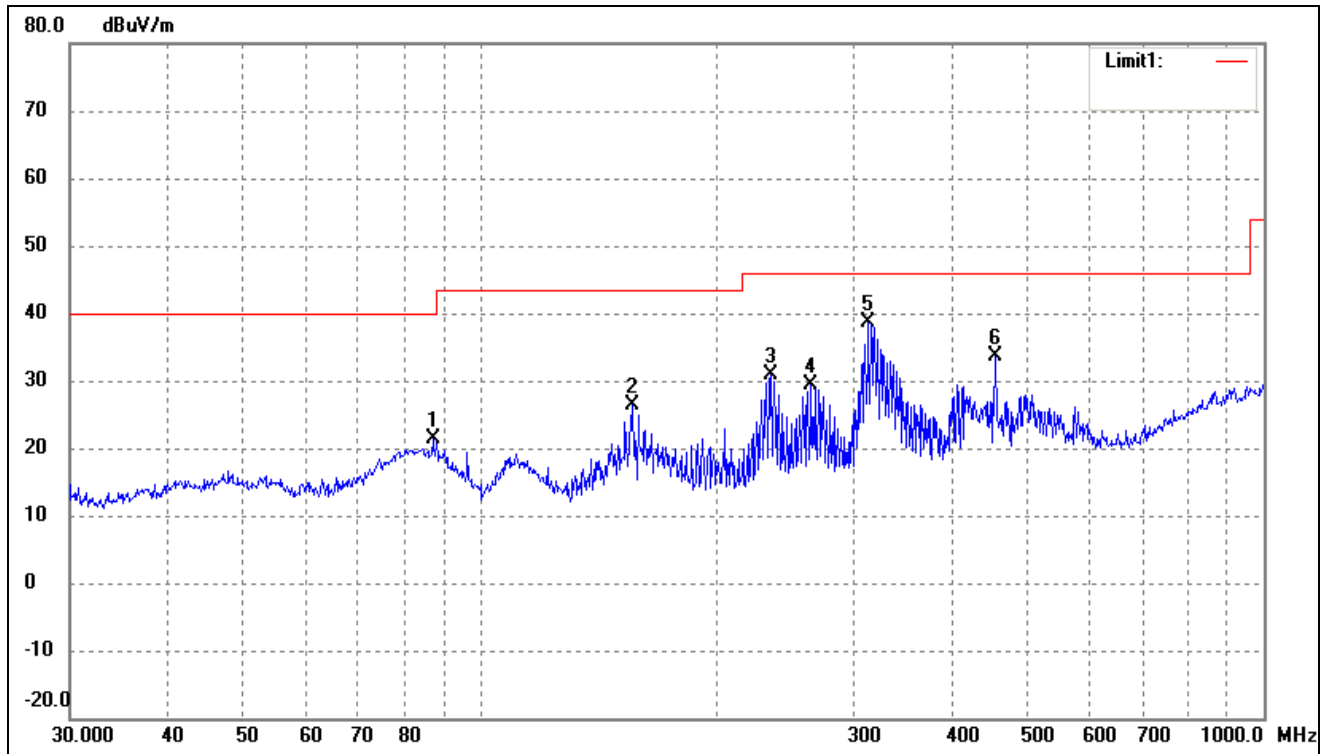
According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

**-5.07 dB at 79.2426 MHz in the Horizontal polarization, TM2 mode, 9 kHz to 6 GHz, 3Meters**

### Plot of Radiated Emissions Test Data

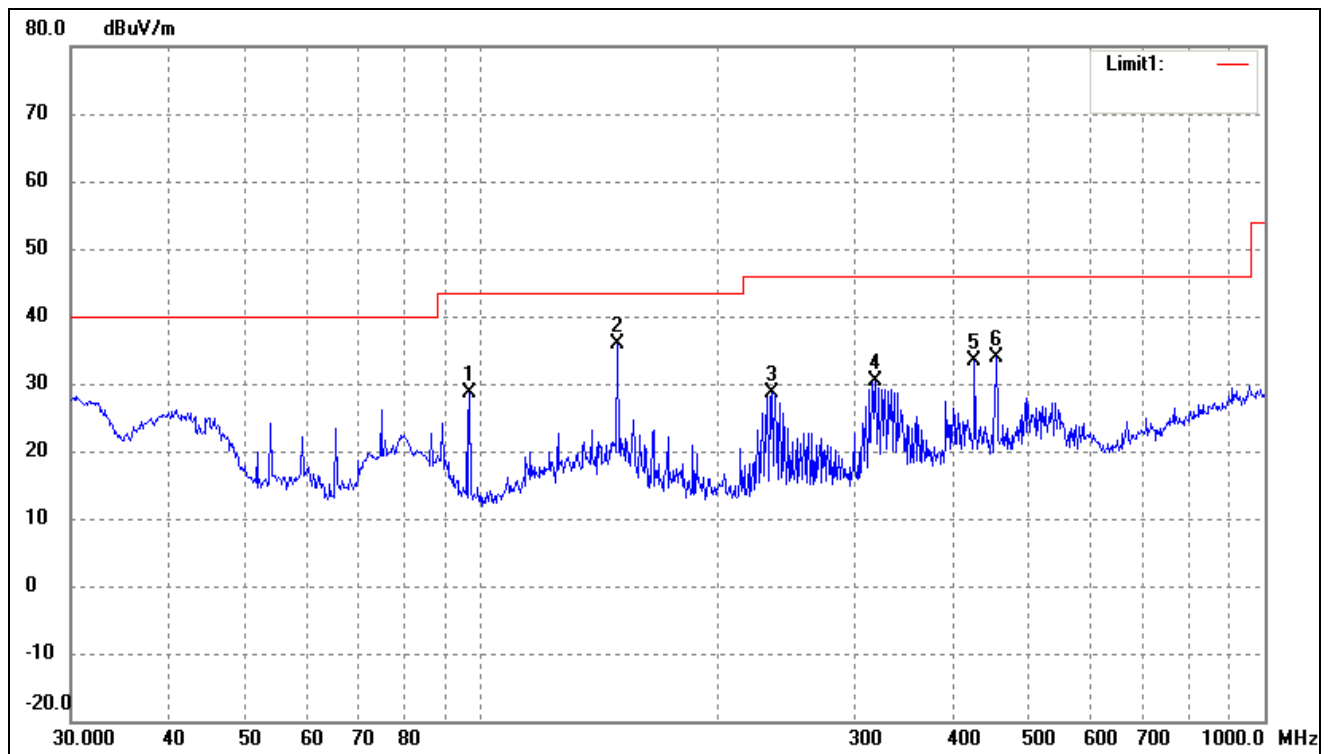
EUT: Tablet  
Tested Model: M66AYG-P  
Operating Condition: AC 120V/60Hz; Adapter DC 5V/2A  
Comment: TM1

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	87.1117	33.47	-11.99	21.48	40.00	-18.52	58	150	peak
2	156.4578	38.92	-12.55	26.37	43.50	-17.13	326	100	peak
3	234.9909	38.99	-8.06	30.93	46.00	-15.07	29	150	peak
4	264.7457	36.37	-7.07	29.30	46.00	-16.70	209	100	peak
5	313.2760	44.49	-5.74	38.75	46.00	-7.25	178	100	peak
6	454.3100	35.63	-2.11	33.52	46.00	-12.48	359	200	peak

Test Specification: Vertical



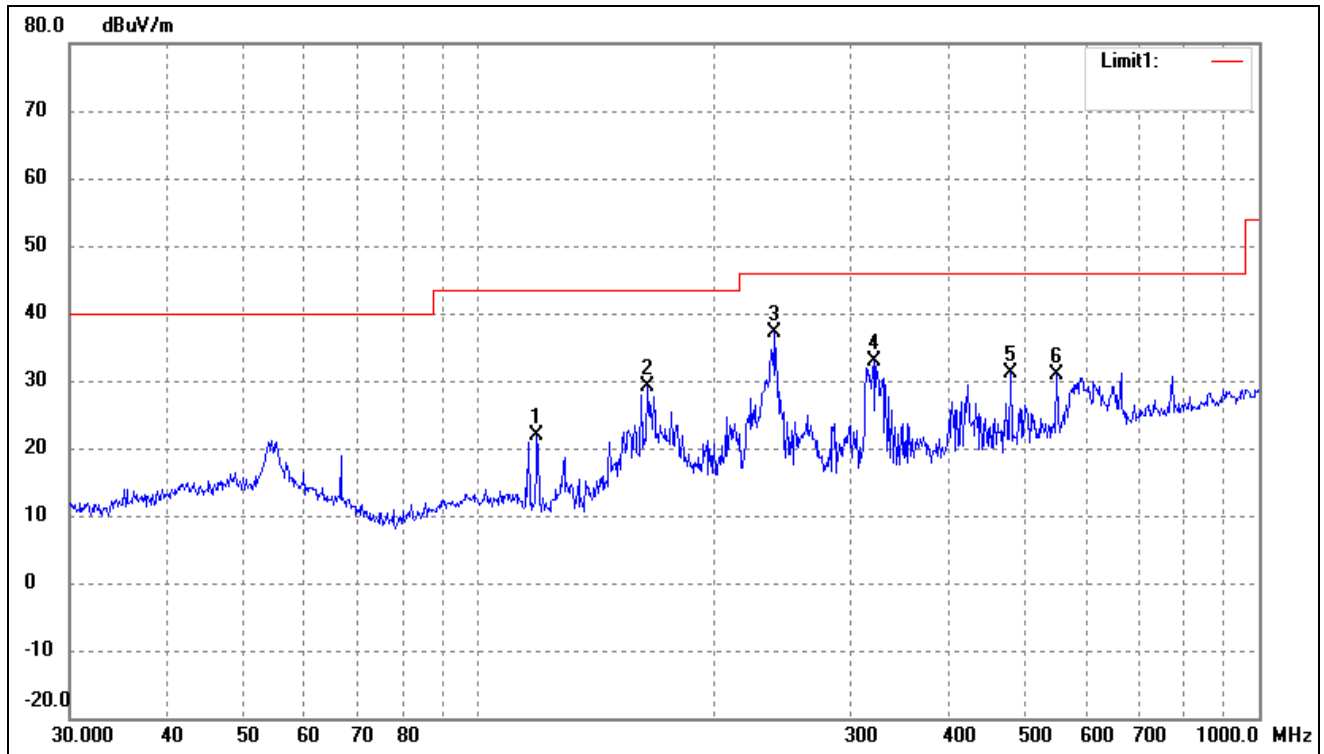
No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	96.7749	38.64	-9.95	28.69	43.50	-14.81	51	100	peak
2	149.4857	48.72	-12.96	35.76	43.50	-7.74	308	100	peak
3	234.9909	36.64	-8.06	28.58	46.00	-17.42	120	100	peak
4	318.8170	35.90	-5.57	30.33	46.00	-15.67	359	100	peak
5	426.5210	35.86	-2.39	33.47	46.00	-12.53	195	100	peak
6	454.3100	35.88	-2.11	33.77	46.00	-12.23	165	100	peak



### Plot of Radiated Emissions Test Data

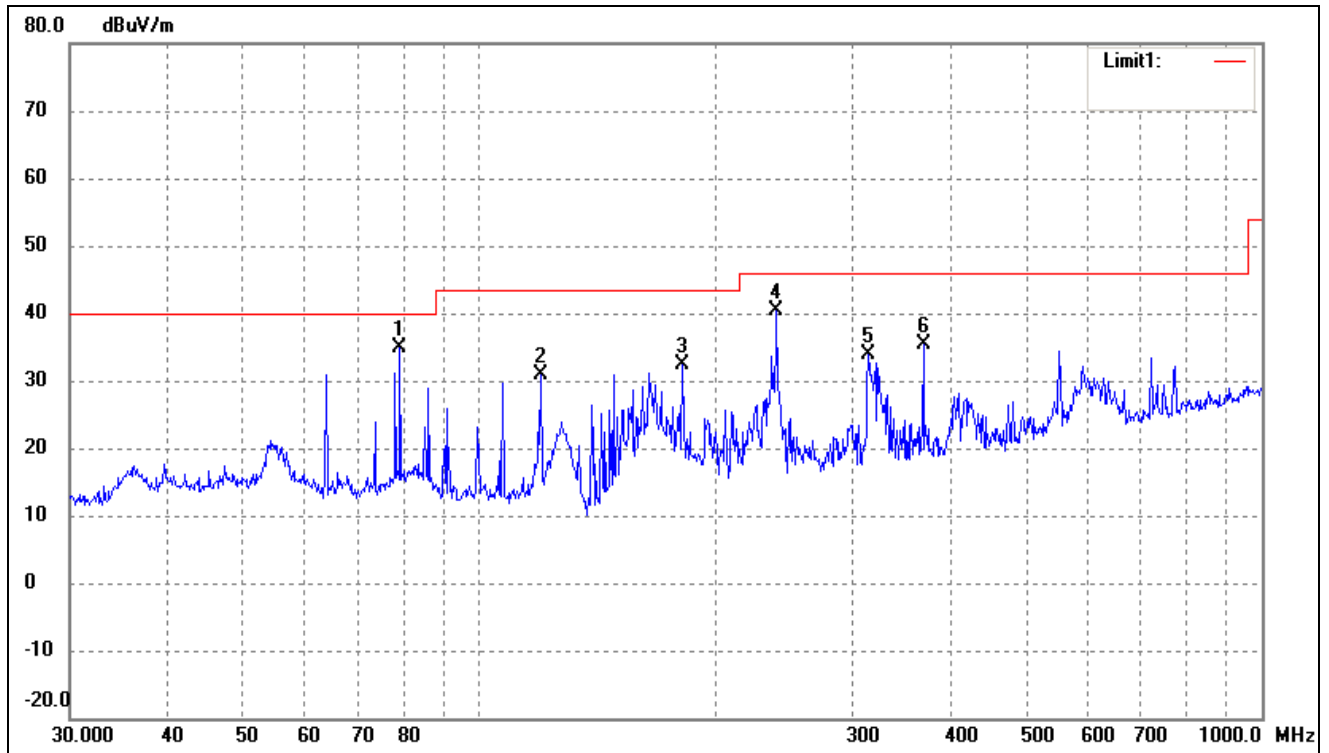
EUT: Tablet  
Tested Model: M66AYG-P  
Operating Condition: AC 120V/60Hz; Adapter DC 5V/2A  
Comment: TM2

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	119.0180	32.88	-11.10	21.78	43.50	-21.72	158	150	peak
2	164.9075	41.25	-12.09	29.16	43.50	-14.34	226	100	peak
3	239.9874	45.04	-7.79	37.25	46.00	-8.75	129	150	peak
4	321.0608	38.37	-5.47	32.90	46.00	-13.10	109	100	peak
5	480.5276	32.72	-1.55	31.17	46.00	-14.83	178	100	peak
6	550.9480	32.19	-1.36	30.83	46.00	-15.17	259	200	peak

Test Specification: Vertical

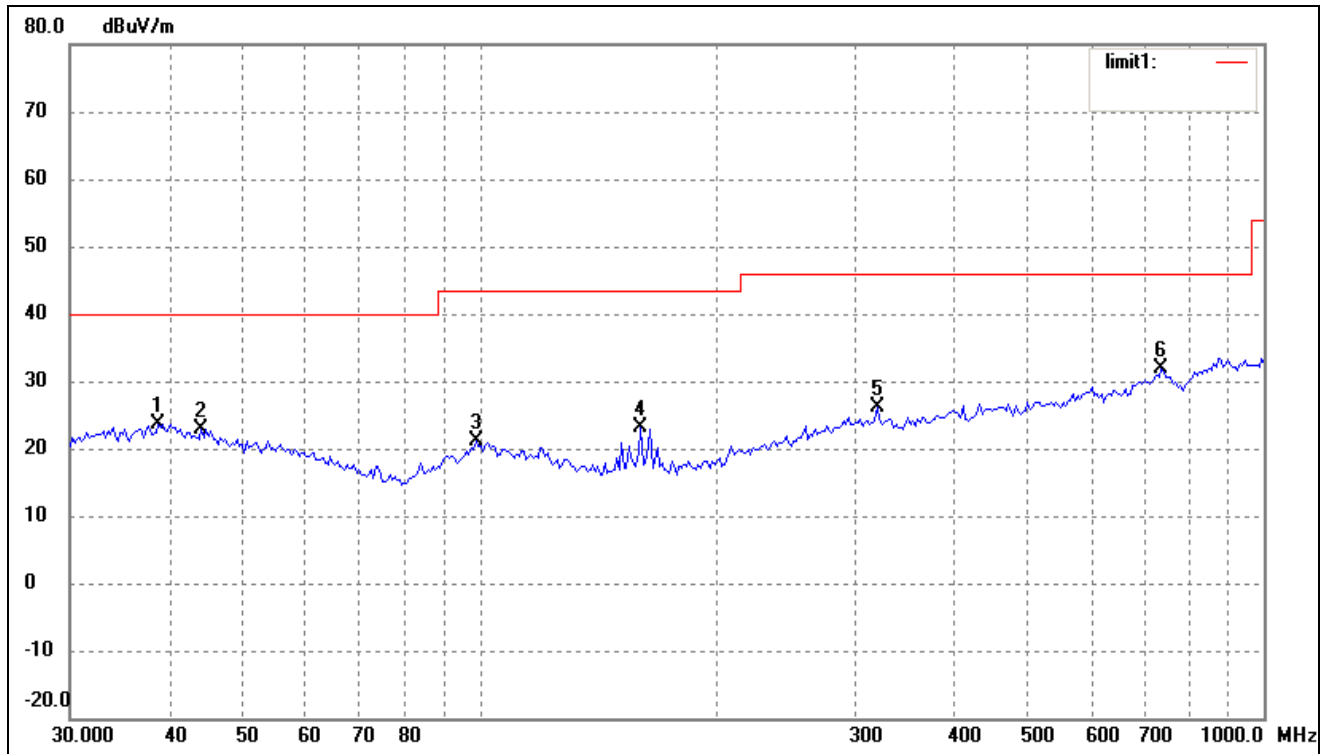


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	79.2426	48.45	-13.52	34.93	40.00	-5.07	51	100	peak
2	119.8556	42.09	-11.25	30.84	43.50	-12.66	308	100	peak
3	181.9202	43.22	-10.93	32.29	43.50	-11.21	120	100	peak
4	239.9874	48.20	-7.79	40.41	46.00	-5.59	359	100	peak
5	314.3765	39.58	-5.71	33.87	46.00	-12.13	195	100	peak
6	369.4047	39.29	-3.84	35.45	46.00	-10.55	359	100	peak

### Plot of Radiated Emissions Test Data

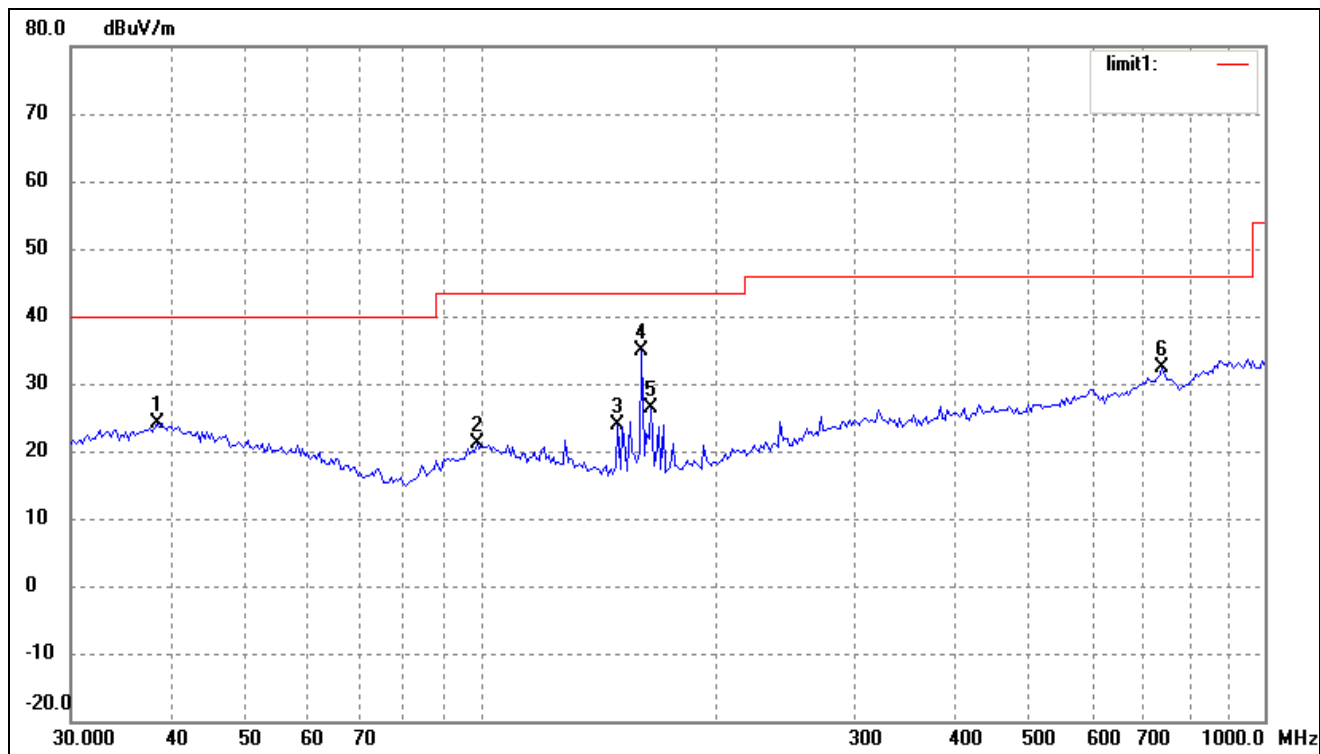
EUT: Tablet  
Tested Model: M66AYG-P  
Operating Condition: AC 120V/60Hz;DC 5V  
Comment: TM3

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	38.8879	14.63	9.06	23.69	40.00	-16.31	58	150	peak
2	44.1202	14.80	8.02	22.82	40.00	-17.18	326	100	peak
3	98.8326	15.39	5.84	21.23	43.50	-22.27	29	120	peak
4	160.3457	20.54	2.62	23.16	43.50	-20.34	209	100	peak
5	321.0608	16.84	9.26	26.10	46.00	-19.90	125	100	peak
6	739.6605	16.38	15.53	31.91	46.00	-14.09	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	38.6161	15.05	9.01	24.06	40.00	-15.94	51	100	peak
2	98.8326	15.39	5.84	21.23	43.50	-22.27	308	100	peak
3	149.4857	21.39	2.50	23.89	43.50	-19.61	120	100	peak
4	160.3457	32.25	2.62	34.87	43.50	-8.63	359	100	peak
5	164.9075	23.79	2.65	26.44	43.50	-17.06	178	100	peak
6	739.6605	16.94	15.53	32.47	46.00	-13.53	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 \*\*\*\*\*