

# FCC Part 15B

## Measurement and Test Report

For

**OLIVESKY INTERNATIONAL ELECTRONIC CO., LTD**

**5C11 Huafeng Times Plaza Bao'an 25 Area, Shenzhen, 518101 Guangdong**

**China.**

**FCC ID: 2AAL9M730DIQO**

**Test Standards:** FCC Part 15 Subpart B

**Product Description:** PCBA

**Tested Model:** M730

**Report No.:** STR13078098I-3

**Tested Date:** 2013-07-04 to 2013-07-25

**Issued Date:** 2013-07-26

**Tested By:** Seven Song / Engineer

*Seven Song*

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

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

*Jandyso*

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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 SEM.Test Compliance Service Co., Ltd

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## 1. GENERAL INFORMATION

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

**Client Information**

Applicant: OLIVESKY INTERNATIONAL ELECTRONIC CO., LTD  
Address of applicant: 5C11 Huafeng Times Plaza Bao'an 25 Area, Shenzhen,  
518101 Guangdong, China.

Manufacturer: OLIVESKY INTERNATIONAL ELECTRONIC CO., LTD  
Address of manufacturer: 5C11 Huafeng Times Plaza Bao'an 25 Area, Shenzhen,  
518101 Guangdong, China.

General Description of EUT	
Product Name:	PCBA
Trade Name:	
Model No.:	M730
Adding Models:	M730A, M730B, M730C, M730D,
<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 M730 without circuit and electronic construction changed, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Rated Voltage:	DC 12V
Highest Internal Frequency:	1GHz
Lowest Internal Frequency:	32.768 kHz
Classification of ITE:	Class B

## 1.2 Test Standards

The following report is prepared on behalf of the OLIVESKY INTERNATIONAL ELECTRONIC CO., LTD 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.: 994117**

SEM.Test Compliance Services 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 994117.

- **Industry Canada (IC) Registration No.: 7673A**

The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

- **CNAS Registration No.: L4062**

Shenzhen SEM.Test Electronics Service 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 3/F, Jinbao Commerce Building, Xin'an Fanshen 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	Playing	Color Bar with 1kHz Audio
TM2	Downloading	Test Software: WINTHRAX

### EUT Cable List and Details

Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

### Special Cable List and Details

Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable (to host)	1.0	Shielded	With Ferrite
USB Cable (to device)	0.1	Shielded	Without Ferrite
DC Power Cable	1.0	Unshielded	Without Ferrite

### Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
PC	Lenovo	E23	/
DC Power	LW	Apr-03	/

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.

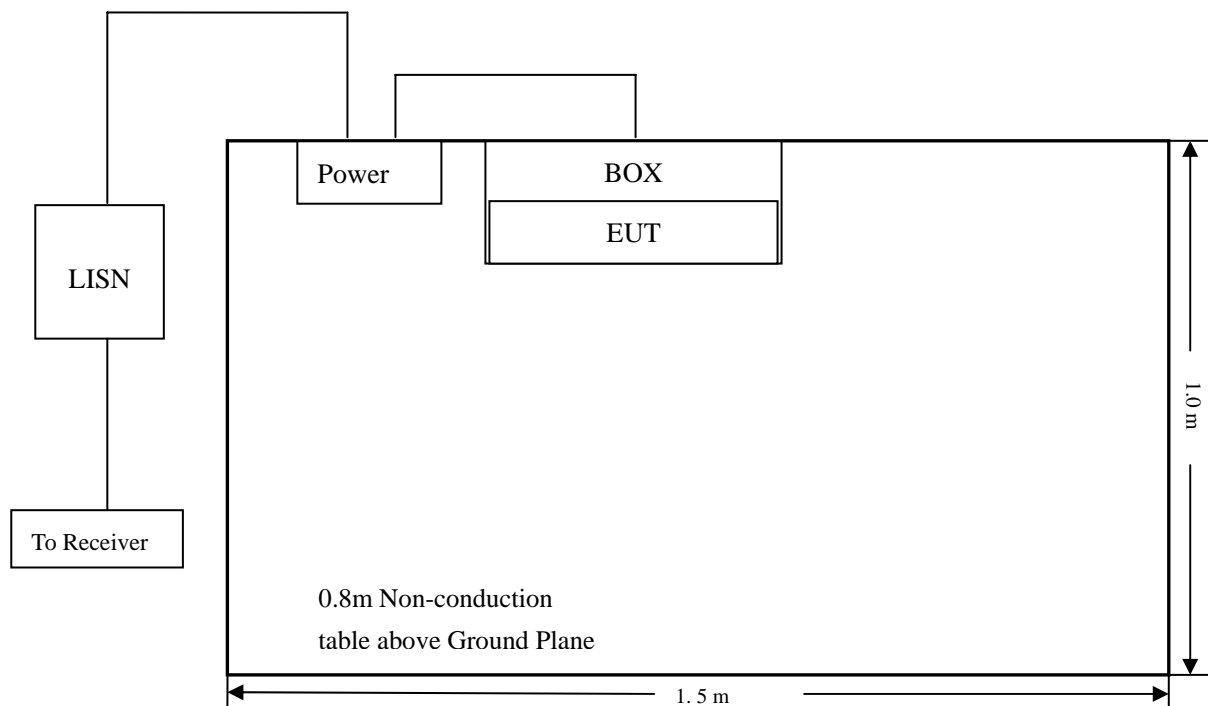
#### 3.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2013-05-07	2014-05-06
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2013-05-07	2014-05-06
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2013-05-07	2014-05-06

#### 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:

**-19.52 dB at 17.99 MHz** in the **Line** mode, **Average** detector Playing Mode, **0.15-30MHz**

### 3.7 Conducted Emissions Test Data



Plot of Conducted Emissions Test Data

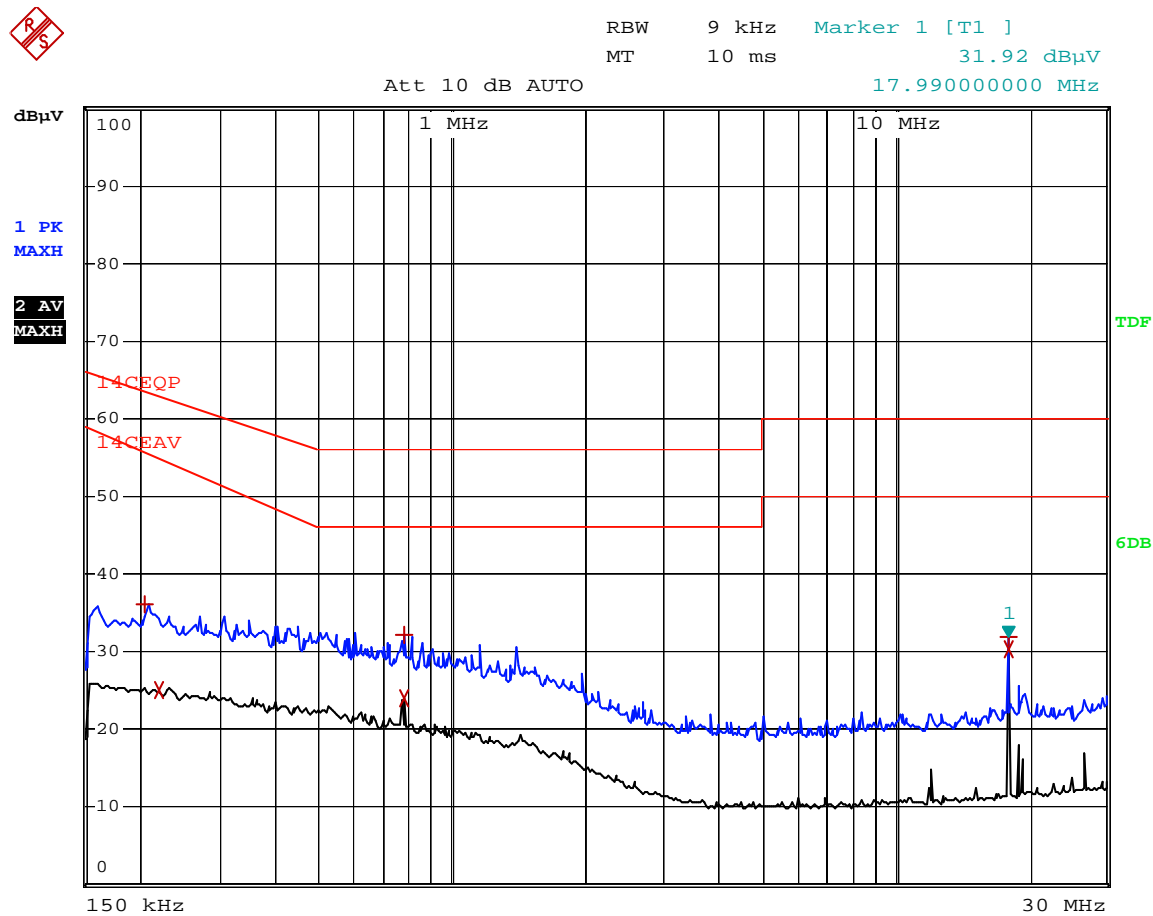
EUT:PCBA

Tested Model:M730

Operating Condition:Playing

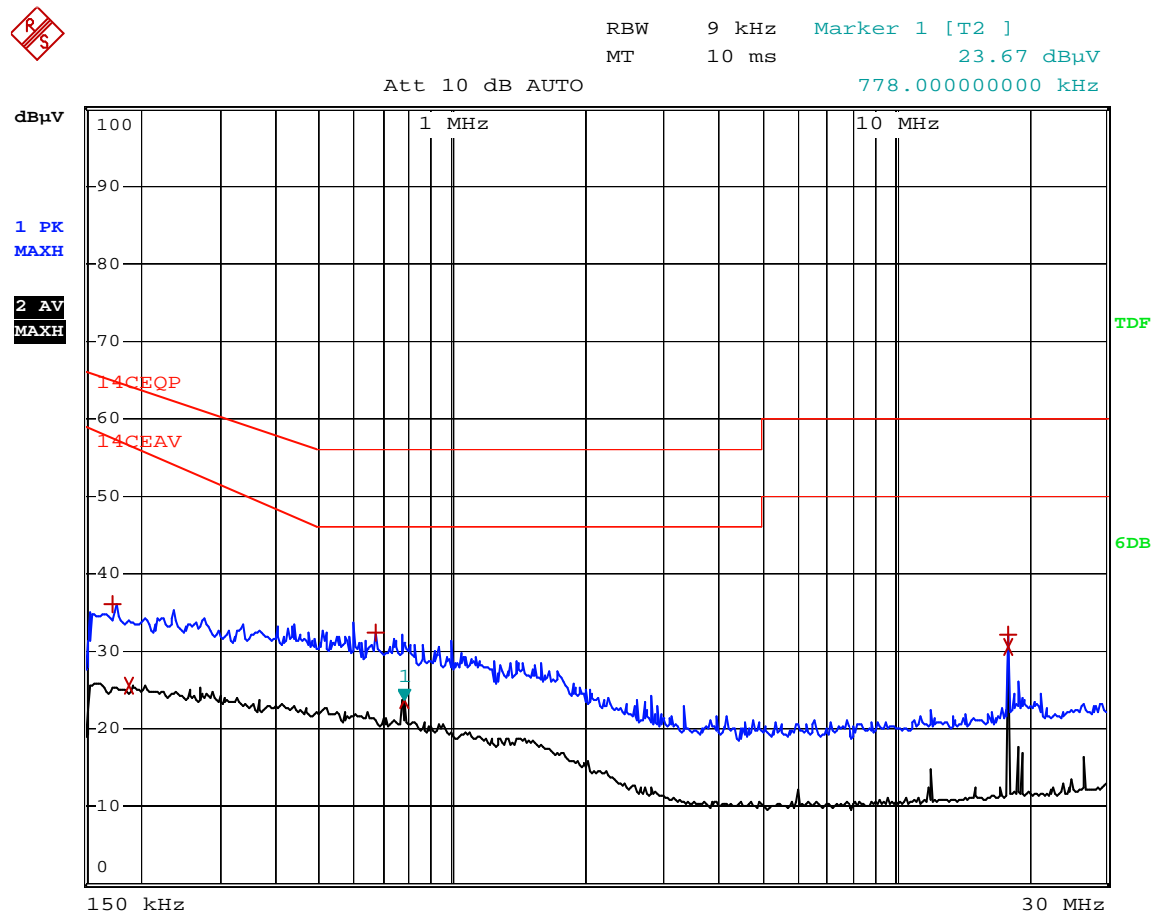
Comment:Input AC 120V/60Hz adapter, Output DC 12V

Test Specification:Neutral



EDIT PEAK LIST (Prescan Results)			
Trace1:	14CEQP		
Trace2:	14CEAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Max Peak	206 kHz	35.99	-27.36
2 Average	218 kHz	24.94	-30.01
2 Average	778 kHz	23.89	-22.10
1 Max Peak	778 kHz	32.16	-23.83
1 Max Peak	17.99 MHz	31.92	-28.07
2 Average	17.99 MHz	30.44	-19.55

Test Specification: Line



EDIT PEAK LIST (Prescan Results)			
Trace1:	14CEQP		
Trace2:	14CEAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Max Peak	174 kHz	36.14	-28.62
2 Average	190 kHz	25.65	-30.79
1 Max Peak	670 kHz	32.30	-23.69
2 Average	778 kHz	23.67	-22.32
1 Max Peak	17.99 MHz	32.07	-27.92
2 Average	17.99 MHz	30.47	-19.52

## 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

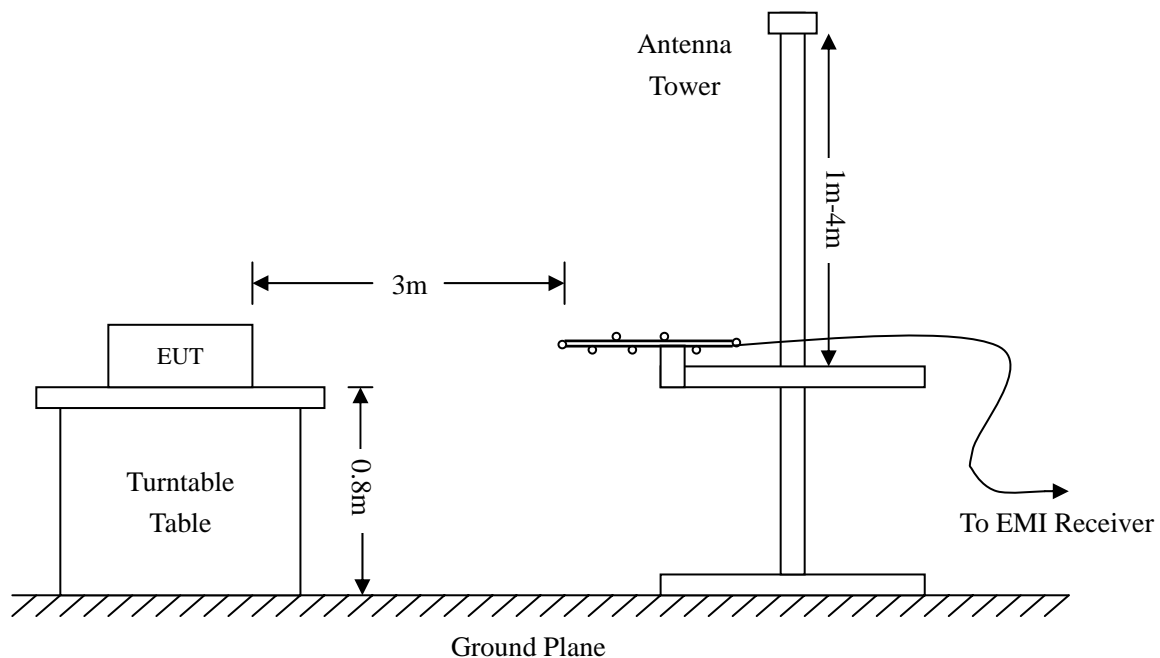
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2013-05-07	2014-05-06
EMI Test Receiver	R&S	ESVB	825471/005	2013-05-07	2014-05-06
Pre-amplifier	Agilent	8447F	3113A06717	2013-05-07	2014-05-06
Pre-amplifier	Compliance Direction	PAP-0118	24002	2013-05-07	2014-05-06
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2013-04-20	2014-04-19
Horn Antenna	ETS	3117	00086197	2013-04-20	2014-04-19
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2013-04-20	2014-04-19

### 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

During the radiated emission test for above 1GHz, the test receiver was set with the following configurations:

For peak detector:

RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:

RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

#### 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

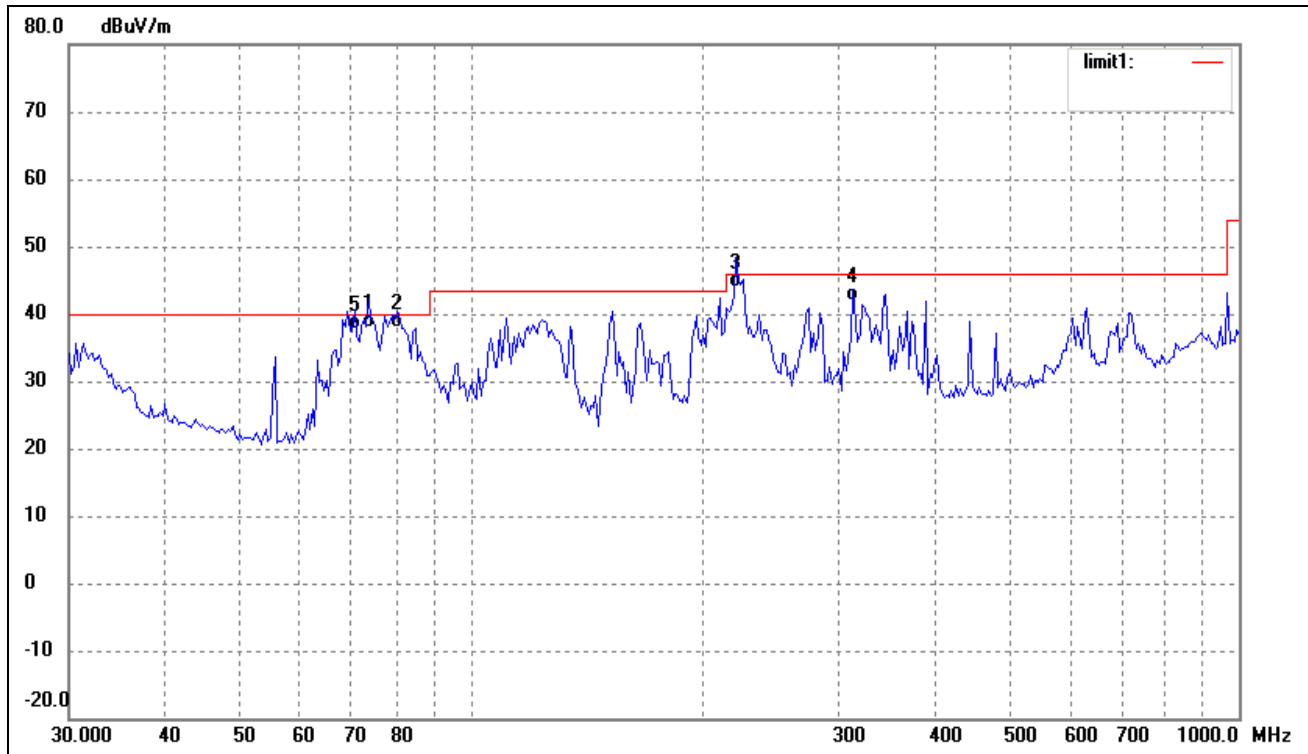
Temperature:	23 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

#### 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:

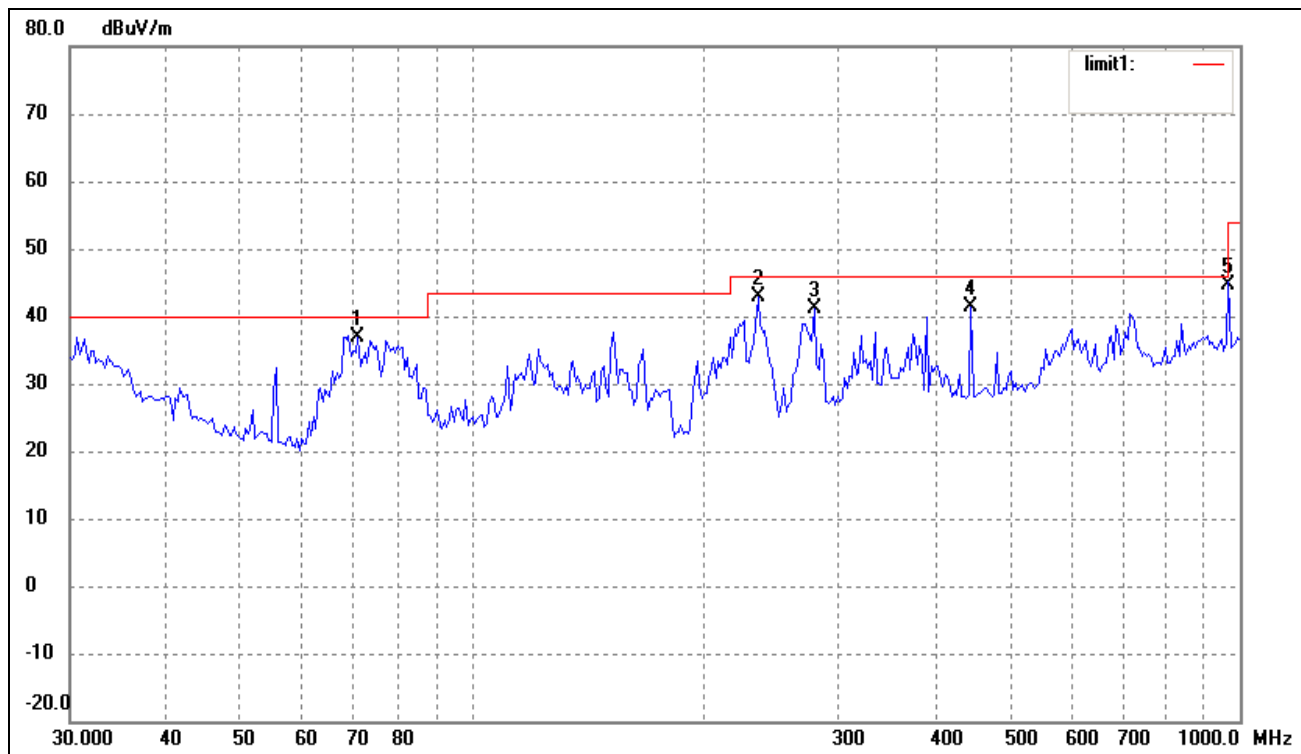
**-2.10 dB at 73.6170 MHz in the Horizontal polarization, Host-Playing from device mode, 9 kHz to 5 GHz, 3Meters**

**-2.40 dB at 396.2415 MHz in the Horizontal polarization, Device-Connect to PC Downloading mode, 9 kHz to 5 GHz, 3Meters**

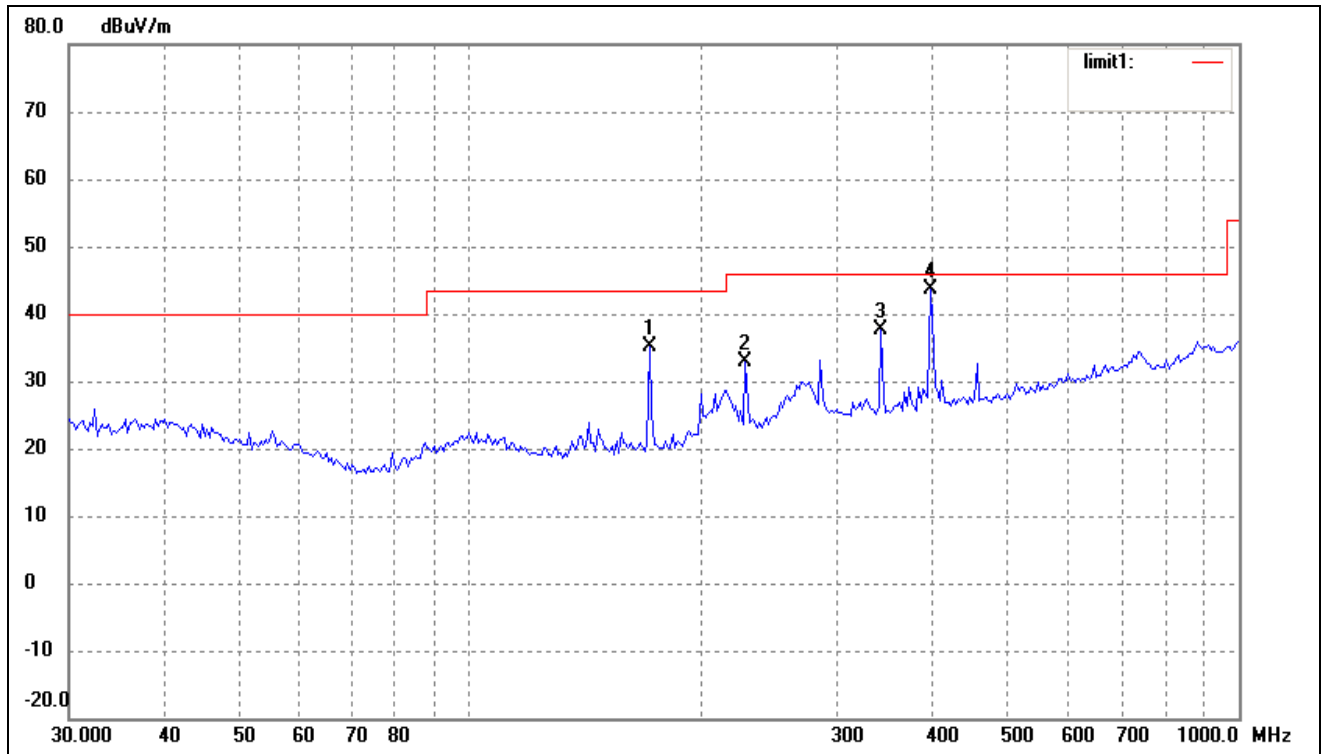
**Plot of Radiated Emissions Test Data***EUT:* PCBA*Tested Model:* M730*Operating Condition:* Connect to PC Downloading*Comment:* Input AC 120V/60Hz adapter, Output DC 12V*Test Specification:* Horizontal

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	73.6170	35.80	2.10	37.90	40.00	-2.10	274	100	QP
2	80.0806	36.20	1.69	37.89	40.00	-2.11	168	100	QP
3	221.3921	38.00	6.00	44.00	46.00	-2.00	279	200	QP
4	314.3765	31.50	10.40	41.90	46.00	-4.10	185	200	QP
5	70.5836	35.30	2.45	37.75	40.00	-2.25	360	200	QP

Test Specification: Vertical

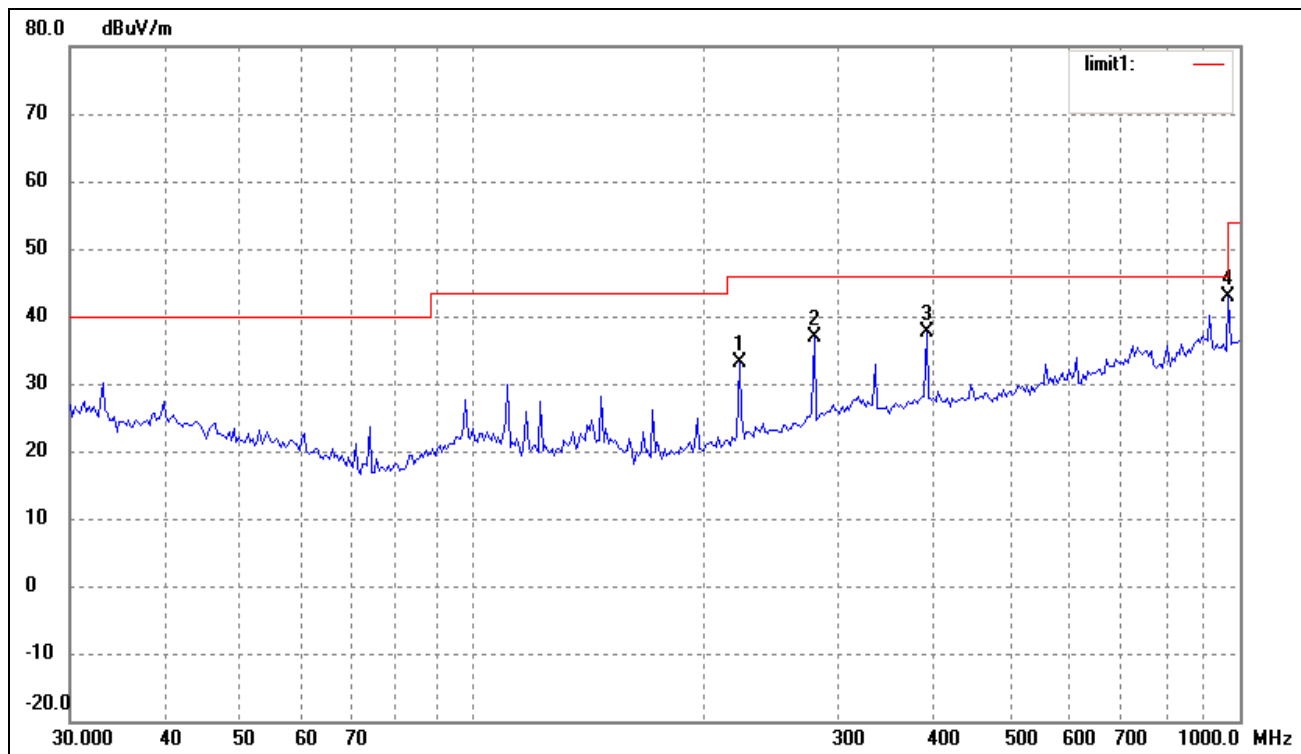


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	71.0803	34.37	2.39	36.76	40.00	-3.24	336	100	peak
2	235.8164	36.00	6.77	42.77	46.00	-3.23	268	100	peak
3	279.0436	31.97	9.17	41.14	46.00	-4.86	345	100	peak
4	446.4141	30.07	11.41	41.48	46.00	-4.52	92	100	peak
5	960.5000	26.46	18.19	44.65	54.00	-9.35	360	100	peak

**Plot of Radiated Emissions Test Data***EUT:* PCBA*Tested Model:* M730*Operating Condition:* Playing*Comment:* Input AC 120V/60Hz adapter, Output DC 12V*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	170.7926	31.52	3.70	35.22	43.50	-8.28	268	100	peak
2	227.6906	26.62	6.33	32.95	46.00	-13.05	336	100	peak
3	341.9786	27.54	10.16	37.70	46.00	-8.30	360	100	peak
4	396.2415	32.23	11.37	43.60	46.00	-2.40	183	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	222.9502	27.07	6.08	33.15	46.00	-12.85	360	100	peak
2	279.0436	27.71	9.17	36.88	46.00	-9.12	85	100	peak
3	390.7226	26.58	11.12	37.70	46.00	-8.30	224	100	peak
4	965.5421	24.40	18.37	42.77	54.00	-11.23	168	100	peak

Note: Testing is carried out with frequency rang 9kHz to 5GHz, which above 9kHz to 30MHz and above 1GHz spurious are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

\*\*\*\*\* END OF REPORT \*\*\*\*\*