

**FCC PART 15.109**  
**MEASUREMENT AND TEST REPORT**  
**FOR**  
**Shanghai Multak Technology Co., LTD.**

4/F, No.71, 1066 North Qin Zhou Road. Shanghai, China

**FCC ID: URRSING-STAR**

<b>Report Concerns:</b> Original Report	<b>Equipment Type:</b> Wireless MICROPHONE
<b>Model:</b>	<u>MS61</u>
<b>Report No.:</b>	<u>STR08088101E-3</u>
<b>Test/Witness Engineer:</b>	<u>Jason</u>
<b>Test Date:</b>	<u>2008-08-21 to 2008-09-02</u>
<b>Issued Date:</b>	<u>2008-09-02</u>
<b>Prepared By:</b>	<b>SEM.Test Compliance Service Co., Ltd.</b> 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C. (518101)
<b>Approved &amp; Authorized By:</b>	 _____ Jandy So / PSQ Manager

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.

**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 .....	3
1.3 RELATED SUBMITTAL(S)/GRANT(S).....	3
1.4 TEST METHODOLOGY .....	3
1.5 TEST FACILITY .....	4
1.6 EUT EXERCISE SOFTWARE .....	4
1.7 ACCESSORIES EQUIPMENT LIST AND DETAILS .....	4
1.8 EUT CABLE LIST AND DETAILS .....	4
<b>2. SUMMARY OF TEST RESULTS .....</b>	<b>5</b>
<b>3. §15.107 (A)- CONDUCTED EMISSION .....</b>	<b>6</b>
3.1 MEASUREMENT UNCERTAINTY .....	6
3.2 TEST EQUIPMENT LIST AND DETAILS .....	6
3.3 TEST PROCEDURE.....	6
3.4 BASIC TEST SETUP BLOCK DIAGRAM.....	6
3.5 ENVIRONMENTAL CONDITIONS .....	7
3.6 SUMMARY OF TEST RESULTS/PLOTS .....	7
3.7 CONDUCTED EMISSIONS TEST DATA.....	7
<b>4. §15.109(A)- RADIATED EMISSION .....</b>	<b>10</b>
4.1 MEASUREMENT UNCERTAINTY .....	10
4.2 TEST EQUIPMENT LIST AND DETAILS .....	10
4.3 TEST PROCEDURE.....	10
4.4 TEST RECEIVER SETUP .....	11
4.5 CORRECTED AMPLITUDE & MARGIN CALCULATION .....	11
4.6 ENVIRONMENTAL CONDITIONS .....	11
4.7 SUMMARY OF TEST RESULTS/PLOTS .....	11

## 1. GENERAL INFORMATION

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

#### Client Information

Applicant: Shanghai Multak Technology Co., LTD.  
Address of applicant: 4/F, No.71, 1066 North Qin Zhou Road. Shanghai, China

Manufacturer: Shanghai Multak Technology Co., LTD.  
Address of manufacturer: 4/F, No.71, 1066 North Qin Zhou Road. Shanghai, China

#### General Description of E.U.T

Items	Description
EUT Description:	Wireless MICROPHONE
Trade Name:	/
Model No.:	MS61
Adding Models:	MS62
Rated Voltage:	DC 6V
Rated Current:	400mA
Size:	10.5x10x2.4 cm
For more information refer to the circuit diagram form and the user's manual.	

*The test data is gathered from a production sample provided by the manufacturer. Test is carried out with MS61 since the other models listed in this report are different appearance without circuit and electronic construction changed, declared by the manufacture.*

### 1.2 Test Standards

The following report is prepared on behalf of the Shanghai Multak Technology 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 15.107, and 15.109 rules.

**Maintenance of compliance** is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission/immunity, should be checked to ensure compliance has been maintained.

### 1.3 Related Submittal(s)/Grant(s)

No Related Submittal(s).

### 1.4 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.

The equipment under test (EUT) was configured to measure its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the Operating Instructions.

### 1.5 Test Facility

The 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 files which the Registration No.: **994117**. Measurement required was performed at laboratory of SEM.Test Compliance Service Co., Ltd. at 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C. (518101).

### 1.6 EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the system components. The test software, provided by the customer, is started while the EUT is on to simulate the normal work.

### 1.7 Accessories Equipment List and Details

Manufacturer	Description	Model	Serial Number
IBM	Notebook	T22	LV14893
TP-LINK	Modem	TM-EC5658V	KT99CTQC-508
Lenovo	Printer	3110	OD65133711480

### 1.8 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
Power Cable	1.0	Unshielded	With Core
USB Cable	1.2	Shielded	With Core

2. SUMMARY OF TEST RESULTS

Description of Test	Result
§15.107 (a) Conducted Emission	Compliant
§15.109(a) Radiated Emission	Compliant

### 3. §15.107 (a)- CONDUCTED EMISSION

#### 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  $\pm 1.5$  dB.

#### 3.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2008-01-25	2009-01-24
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2008-01-25	2009-01-24
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2008-01-25	2009-01-24
AMN	Rohde & Schwarz	ESH3-Z5	828304/014	2008-01-25	2009-01-24

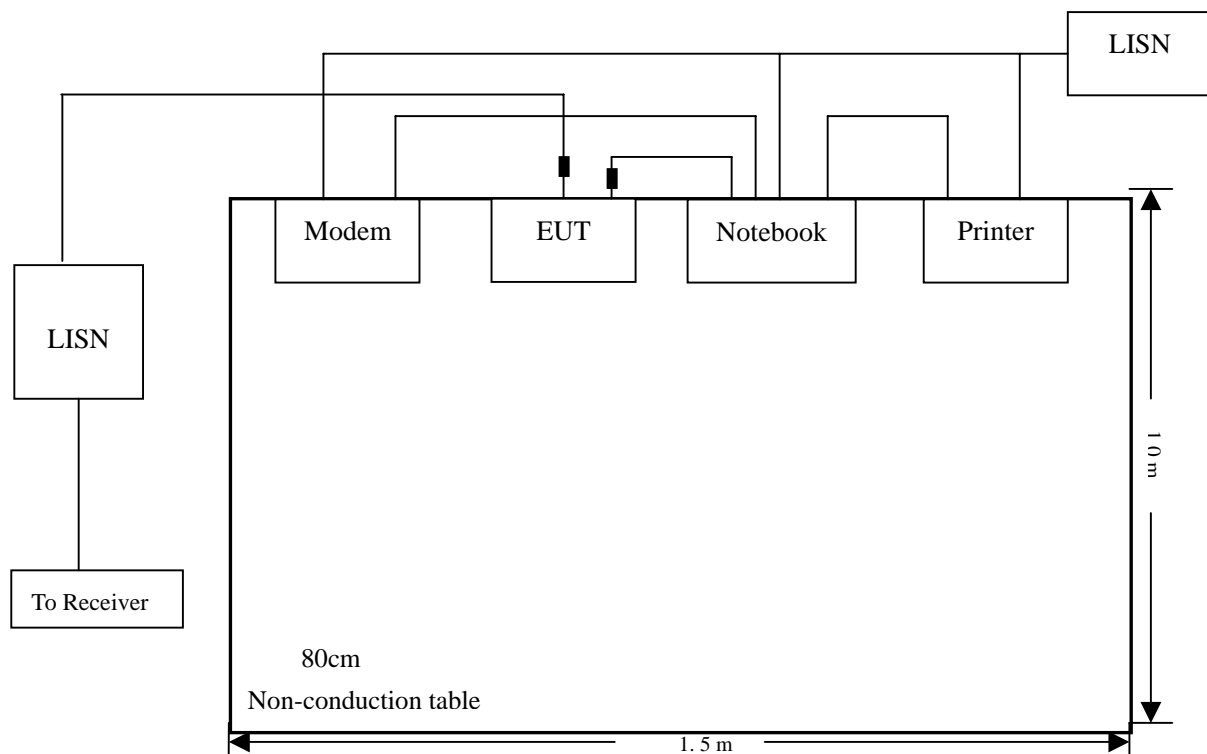
#### 3.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.107 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.

#### 3.4 Basic Test Setup Block Diagram



### 3.5 Environmental Conditions

Temperature:	18° C
Relative Humidity:	55%
ATM Pressure:	1012 mbar

### 3.6 Summary of Test Results/Plots

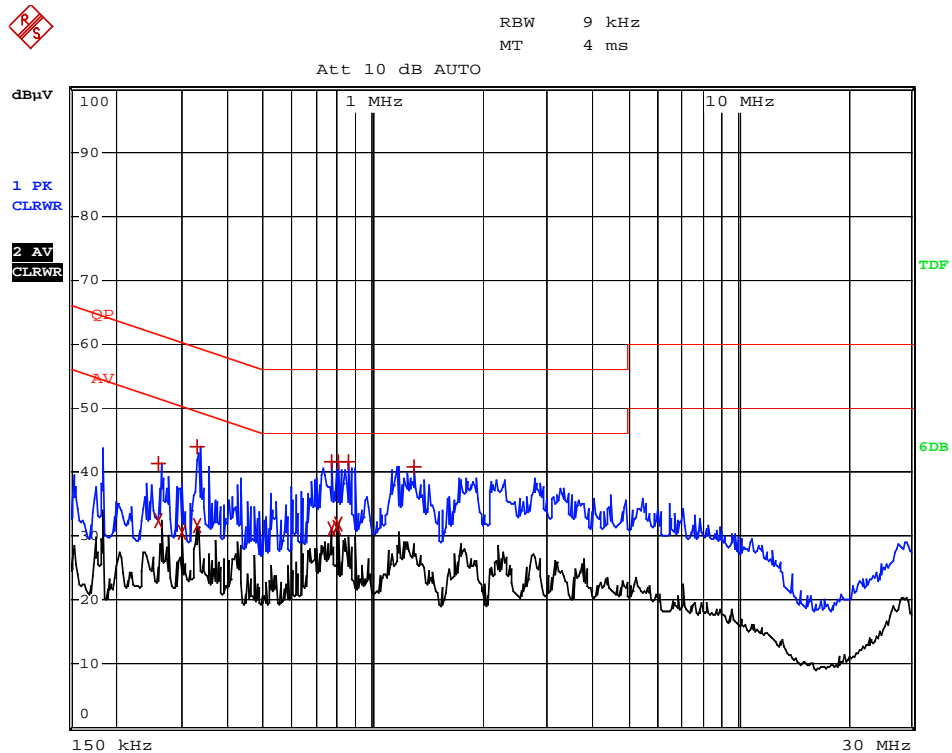
According to the data in section 3.8, the EUT complied with the FCC 15B Conducted margin for a Class B device, with the *worst* margin reading of:

**-7.0 dB $\mu$ V at 1.274 MHz in the Line mode, AV detector, 0.15-30MHz**

### 3.7 Conducted Emissions Test Data

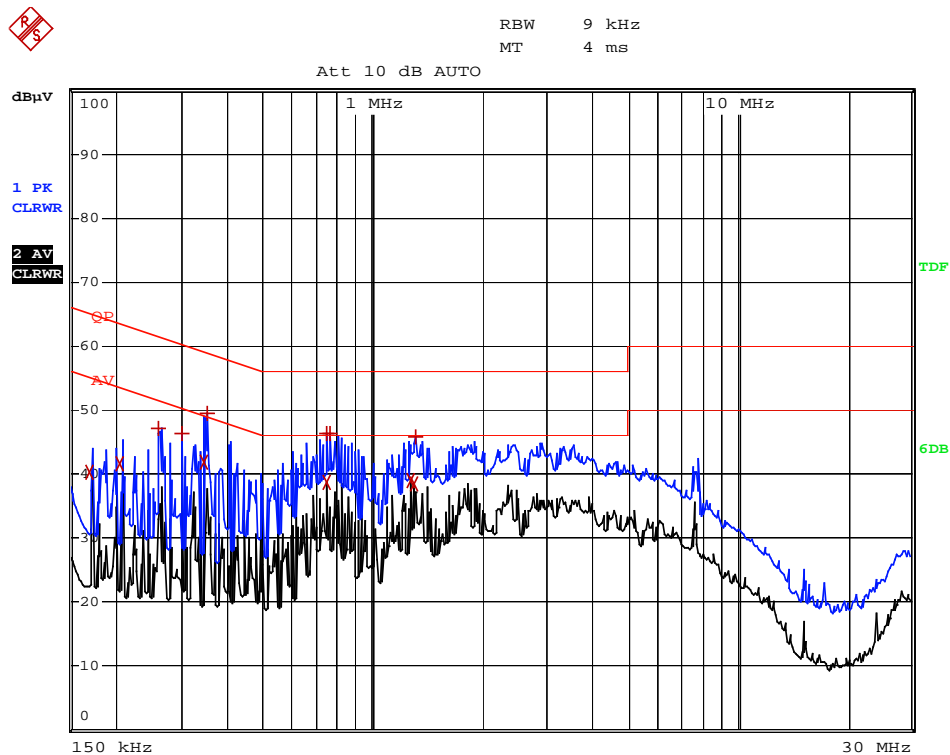
LINE CONDUCTED EMISSIONS				FCC 15B CLASS B	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB $\mu$ V	QP/Ave/Pk	Line/Neutral	dB $\mu$ V	dB
1.274	39.00	AV	Line	46.00	-7.0
0.750	38.69	AV	Line	46.00	-7.3
0.342	41.76	AV	Line	49.15	-7.4
1.294	38.46	AV	Line	46.00	-7.5
0.350	49.57	Peak	Line	58.96	-9.4
0.750	46.34	Peak	Line	56.00	-9.7
0.766	46.26	Peak	Line	56.00	-9.7
1.310	45.90	Peak	Line	56.00	-10.1
0.206	41.49	AV	Line	53.37	-11.9
0.298	46.24	Peak	Line	60.30	-14.1
0.806	31.77	AV	Neutral	46.00	-14.2
0.262	47.08	Peak	Line	61.37	-14.3
0.862	41.56	Peak	Neutral	56.00	-14.4
0.770	41.52	Peak	Neutral	56.00	-14.5
0.806	41.49	Peak	Neutral	56.00	-14.5
0.798	31.42	AV	Neutral	46.00	-14.6
0.170	40.31	AV	Line	54.96	-14.7
0.770	30.98	AV	Neutral	46.00	-15.0
1.294	40.93	Peak	Neutral	56.00	-15.1
0.334	43.98	Peak	Neutral	59.35	-15.4
0.330	31.57	AV	Neutral	49.45	-17.9
0.298	30.54	AV	Neutral	50.30	-19.8

*Note: Emission attenuated more than 20dB is not reported.*

**Plot of Conducted Emissions Test Data***Conducted Disturbance**EUT: Wireless MICROPHONE**M/N: MS61**Operating Condition: Reading and Writing**Test Specification: N**Comment: AC 120V/60Hz; DC 6V adapter*

Date: 2.SEP.2008 13:41:46



**Plot of Conducted Emissions Test Data***Conducted Disturbance**EUT: Wireless MICROPHONE**M/N: MS61**Operating Condition: Reading and Writing**Test Specification: L**Comment: AC 120V/60Hz; DC 6V adapter*

Date: 2.SEP.2008 13:37:29

## 4. §15.109(a)- RADIATED EMISSION

### 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  $\pm 3.0$  dB.

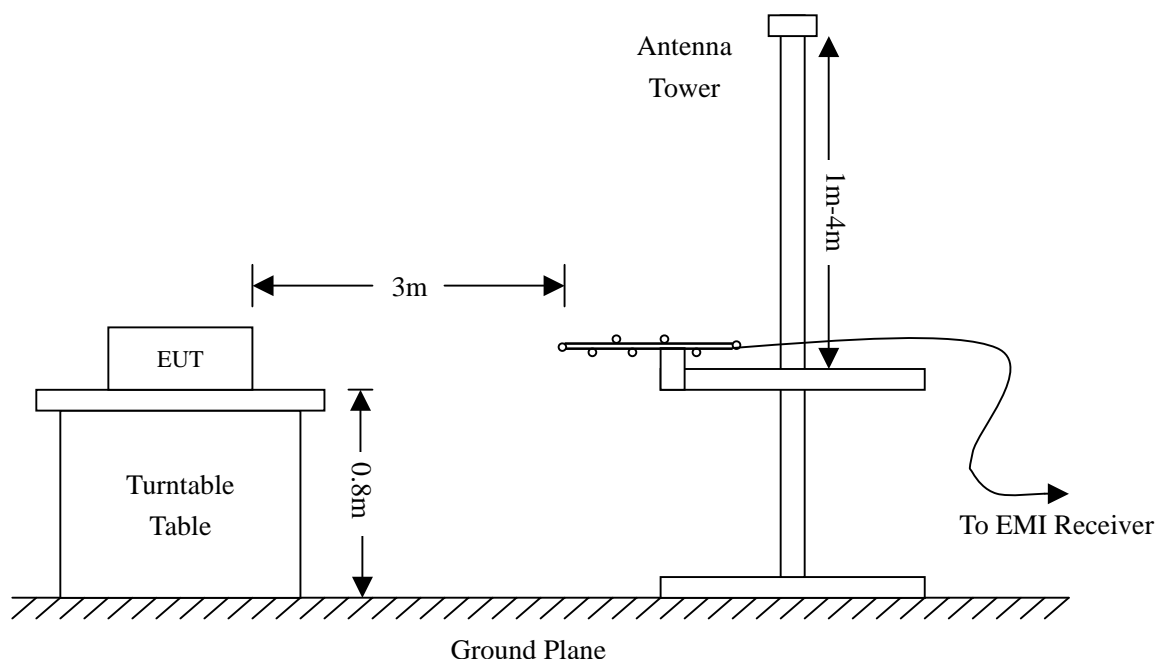
### 4.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEA20	DE25181	2008-01-25	2009-01-24
Positioning Controller	C&C	CC-C-1F	N/A	2008-01-25	2009-01-24
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2008-01-25	2009-01-24
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2008-01-25	2009-01-24
RF Switch	EM	EMSW18	SW060023	2008-01-25	2009-01-24
Amplifier	Agilent	8447F	3113A06717	2008-01-25	2009-01-24
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2008-01-25	2009-01-24
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	25498514	2008-01-25	2009-01-24

### 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 15.205 and 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 conducted emission test, the test receiver was set with the following configurations:

Start Frequency ..... 30 MHz  
 Stop Frequency ..... 1000 MHz  
 Sweep Speed ..... Auto  
 IF Bandwidth ..... 10 kHz  
 Quasi-Peak Adapter Bandwidth ..... 120 kHz  
 Quasi-Peak Adapter Mode ..... Normal

#### 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 Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15B Limit}$$

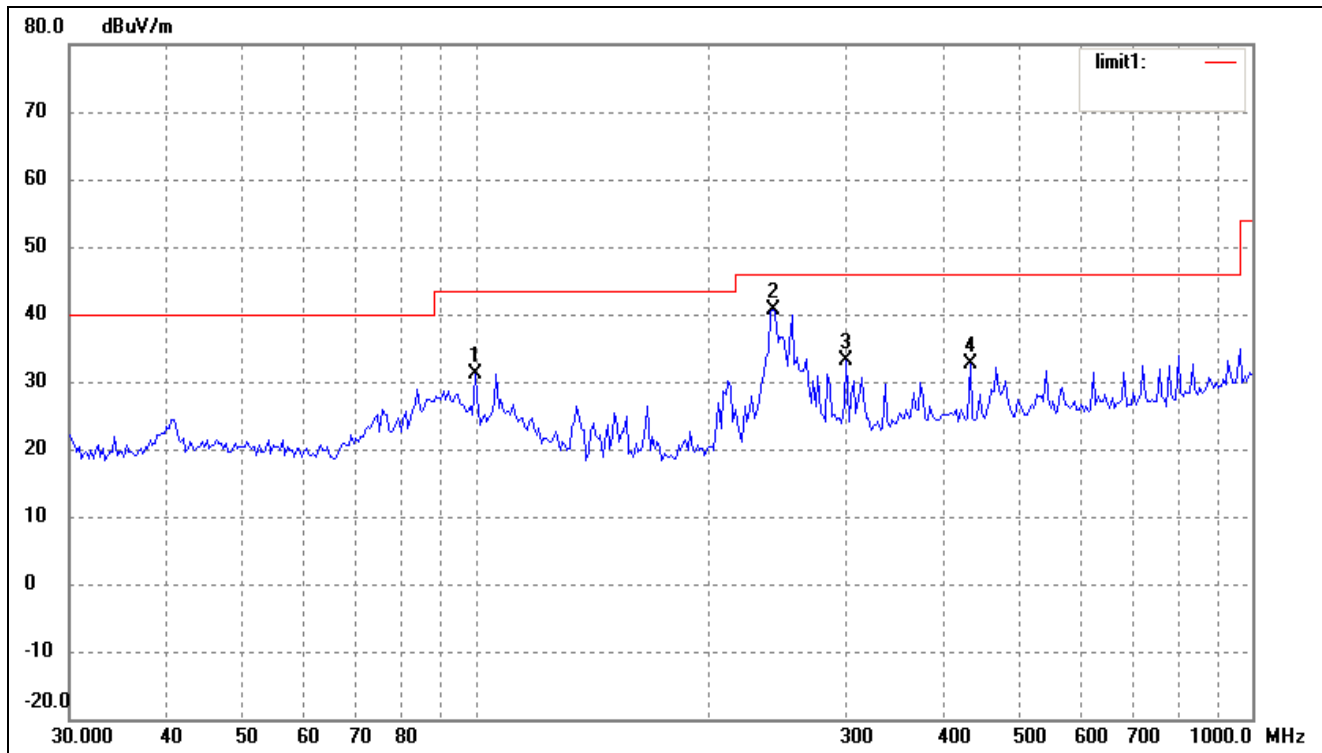
#### 4.6 Environmental Conditions

Temperature:	22° C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

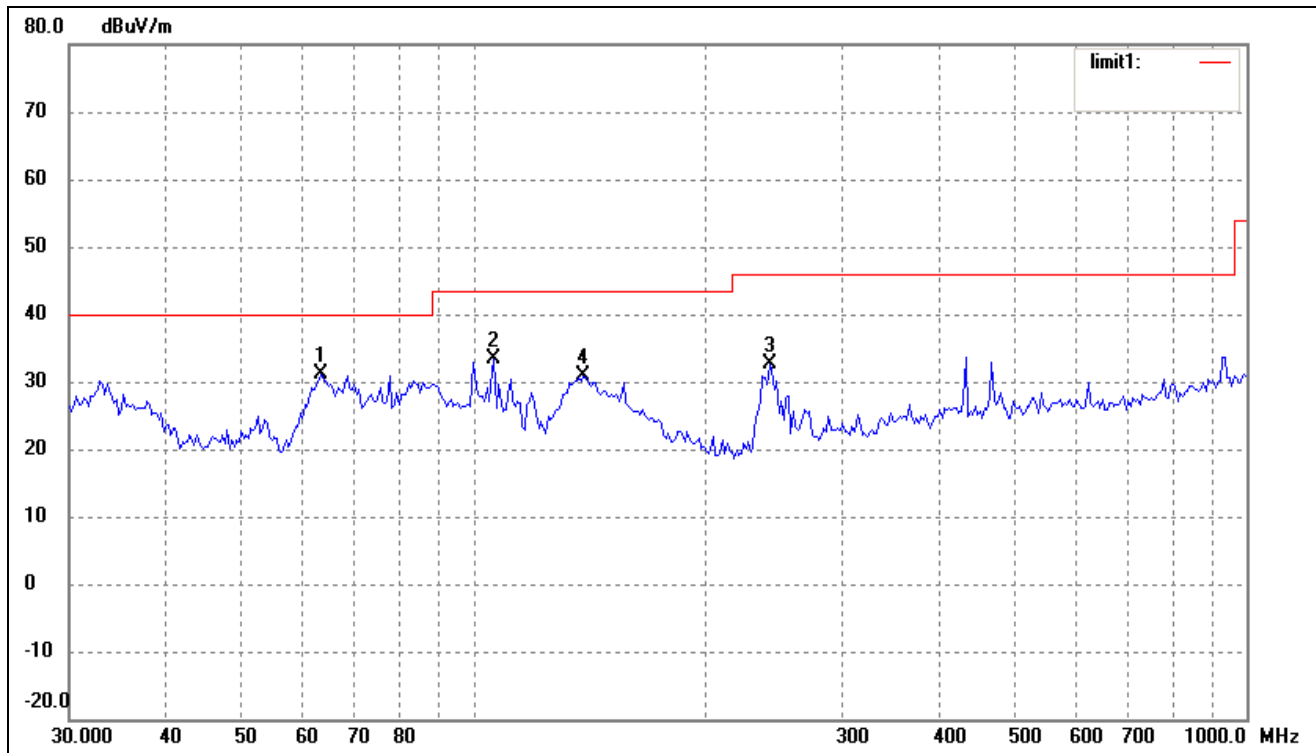
#### 4.7 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC 15B Class B standards, and had the worst margin of:

**-5.41dB $\mu$ V at 241.8377MHz in the Horizontal polarization, 30 MHz to 1 GHz, 3Meters**

**Plot of Conducted Emissions Test Data***Conducted Disturbance**EUT: Wireless MICROPHONE**M/N: MS61**Operating Condition: Reading and Writing**Test Specification: Horizontal & Vertical**Horizontal:*

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	99.7676	23.30	7.79	31.09	43.50	-12.41	261	100	peak
2	241.8377	33.04	7.49	40.53	46.00	-5.47	223	100	QP
3	300.6988	24.46	8.66	33.12	46.00	-12.88	257	100	peak
4	433.3397	22.18	10.54	32.72	46.00	-13.28	218	100	peak

**Plot of Conducted Emissions Test Data***Conducted Disturbance**EUT: Wireless MICROPHONE**M/N: MS61**Operating Condition: Reading and Writing**Test Specification: Horizontal & Vertical**Vertical:*

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	63.6312	25.35	5.74	31.09	40.00	-8.91	228	100	peak
2	106.2812	26.18	7.26	33.44	43.50	-10.06	230	100	peak
3	241.8377	25.10	7.49	32.59	46.00	-13.41	224	100	peak
4	138.8120	27.46	3.30	30.76	43.50	-12.74	253	100	peak

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