

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT  
INTENTIONAL RADIATOR CERTIFICATION TO  
FCC PART 15 SUBPART C REQUIREMENT**

*OF*

**HUAWEI Bluetooth Speaker**

**MODEL No.: AMBOX, W18BT, W18B, W18W**

**FCC ID: HBOAMBOX**

**Trademark: N/A**

**REPORT NO: ES121218108E-1**

**ISSUE DATE: August 15, 2013**

*Prepared for*

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## VERIFICATION OF COMPLIANCE

Applicant:	SHENZHEN FENDA TECHNOLOGY CO., LTD. Fenda Hi-Tech Park, Zhoushi Road, Shiyan Town, Baoan District, Shenzhen City, Guangdong, China
Manufacturer:	SHENZHEN FENDA TECHNOLOGY CO., LTD. Fenda Hi-Tech Park, Zhoushi Road, Shiyan Town, Baoan District, Shenzhen City, Guangdong, China
Product Description:	HUAWEI Bluetooth Speaker
Model Number:	AMBOX, W18BT, W18B, W18W (Note: All the model numbers are identical in circuitry and electrical, mechanical and physical construction; the only differences are the appearance color and model no. for trading purpose. We take AMBOX for test.)
Serial Number:	N/A
File Number:	ES121218108E-1
Date of Test:	August 9, 2013

### We hereby certify that:

The above equipment was tested by SHENZHEN EMTEK CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2009) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247.

The test results of this report relate only to the tested sample identified in this report.

Date of Test : August 9, 2013

Prepared by :   
Joe Xia/Editor

Reviewer :   
June Xie/Supervisor

Approve & Authorized Signer :   
Lisa Wang/Manager

## Table of Contents

<b>1.</b>	<b>GENERAL INFORMATION .....</b>	<b>4</b>
1.1	PRODUCT DESCRIPTION .....	4
1.2	RELATED SUBMITTAL(S) / GRANT (S) .....	4
1.3	TEST METHODOLOGY .....	4
1.4	SPECIAL ACCESSORIES .....	4
1.5	EQUIPMENT MODIFICATIONS .....	4
1.6	TEST FACILITY .....	5
<b>2.</b>	<b>SYSTEM TEST CONFIGURATION .....</b>	<b>6</b>
2.1	EUT CONFIGURATION .....	6
2.2	EUT EXERCISE .....	6
2.3	TEST PROCEDURE .....	6
2.4	LIMITATION .....	6
2.5	CONFIGURATION OF TESTED SYSTEM .....	8
2.6	EQUIPMENT USED IN TESTED SYSTEM .....	8
2.7	DESCRIPTION OF TEST MODES .....	8
<b>3.</b>	<b>SUMMARY OF TEST RESULTS .....</b>	<b>9</b>
<b>4.</b>	<b>CONDUCTED EMISSIONS TEST .....</b>	<b>10</b>
4.1	MEASUREMENT PROCEDURE: .....	10
4.2	TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	10
4.3	MEASUREMENT EQUIPMENT USED: .....	10
4.4	CONDUCTED EMISSION LIMIT .....	10
4.5	MEASUREMENT RESULT: .....	10
4.6	CONDUCTED MEASUREMENT PHOTOS: .....	10
<b>5.</b>	<b>RADIATED EMISSION TEST .....</b>	<b>11</b>
5.1	MEASUREMENT PROCEDURE .....	11
5.2	TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	12
5.3	MEASUREMENT EQUIPMENT USED: .....	13
5.4	MEASUREMENT RESULT .....	14

## 1. GENERAL INFORMATION

### 1.1 Product Description

A major technical descriptions of EUT is described as following:

- A). Operation Frequency: 2402-2480MHz
- B). Modulation: GFSK, 1/4 Π -DQPSK, 8DPSK
- C). Number of Channel: 79
- D). Channel space: 1MHz
- E). RF Output Power: 2.95dBm
- F). BIT Rate of Transmission: 1Mbps, 2Mbps, 3Mbps
- G). Antenna Type: PCB antenna
- H). Antenna GAIN: 0dBi
- H). Power Supply: DC 3.7V supplied by Lithium battery or USB 5V supplied by external power

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

This submittal(s) (test report) is intended for FCC ID: HBOAMBOX filing to comply with Section 15.247 of the FCC Part 15 Subpart C Rules.

### 1.3 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4 (2009) and FCC Public Notice DA 00-705. Radiated testing was performed at an antenna to EUT distance 3 meters.

### 1.4 Special Accessories

Not available for this EUT intended for grant.

### 1.5 Equipment Modifications

Not available for this EUT intended for grant.

## 1.6 Test Facility

### Site Description

#### EMC Lab.

: Accredited by CNAS, 2010.10.29  
The certificate is valid until 2013.10.28  
The Laboratory has been assessed and proved to be in compliance with CNAS/CL01:2006(identical to ISO/IEC17025: 2005)  
The Certificate Registration Number is L2291

Accredited by TUV Rheinland Shenzhen 2010.5.25  
The Laboratory has been assessed according to the requirements ISO/IEC 17025

Accredited by FCC, October 28, 2010  
The Certificate Registration Number is 406365.

Accredited by Industry Canada, March 5, 2010  
The Certificate Registration Number is 4480A-2.

#### Name of Firm

: SHENZHEN EMTEK CO., LTD

#### Site Location

: Bldg 69, Majialong Industry Zone,  
Nanshan District, Shenzhen, Guangdong, China

## 2. System Test Configuration

### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-2009 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

#### 2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4-2009.

### 2.4 Limitation

#### (7) Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

**Note:**

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

**(8) Radiated Emission**

FCC Part 15, Subpart C Section 15.209 limit of radiated emission for frequency below 1000GHz. The emissions from an intentional radiator shall not exceed the field strength level specified in the following table:

<b>Frequency (MHz)</b>	<b>Field strength <math>\mu\text{V/m}</math></b>	<b>Distance(m)</b>	<b>Field strength at 3m <math>\text{dB}\mu\text{V/m}</math></b>
0.009~0.490	2400/F(KHz)	300	See the remark
0.490~1.705	2400/F(KHz)	30	
1.705~30.0	30	30	
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

- Remark: 1. Emission level in  $\text{dB}\mu\text{V/m}=20 \log (\text{uV/m})$   
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.  
3. Distance extrapolation factor  $=40 \log (\text{Specific distance/ test distance})(\text{dB})$ ;  
Limit line=Specific limits( $\text{dB}\mu\text{V}$ ) + distance extrapolation factor.

## 2.5 Configuration of Tested System

**Fig. 2-1 Configuration of Tested System**



## 2.6 Equipment Used in Tested System

Equipment	Mfr/Brand	Model/Type No.	FCC ID / IC	Series No.	Note
HUAWEI Bluetooth Speaker	FENDA	AMBOX	HBOAMBOX	N/A	EUT
Note Book	Lenovo	20020	FCC DoC	EB160764 41	

## 2.7 Description of test modes

The EUT has been tested under TX operating condition.

This EUT is a FHSS system, were conducted to determine the final configuration from all possible combinations. We use software control the EUT, Let EUT hopping on and transmit with highest power, All the modes GFSK, 1/4π-DQPSK, 8DPSK have been tested and the worst result was reported with modulation GFSK. 79 Channels are provided by EUT. The 3 channels of lower, medium and higher were chosen for test.

Channel	Frequency(MHz)
1	2402
40	2441
79	2480



### 3. Summary of Test Results

<b>FCC Rule</b>	<b>Description Of Test</b>	<b>Result</b>
15.207	AC Power Conducted Emission	N/A
15.247(d)	Radiated Emission	Pass

Note: (1) "N/A" denotes test is not applicable in this test report.

## 4. Conducted Emissions Test

### 4.1 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

### 4.2 Test SET-UP (Block Diagram of Configuration)

N/A

### 4.3 Measurement Equipment Used:

Conducted Emission Test Site # 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/29/2013	05/28/2014
L.I.S.N	Rohde & Schwarz	ESH2-Z5	834549/005	05/29/2013	05/28/2014
50ΩCoaxial Switch	Anritsu	MP59B	M20531	05/29/2013	05/28/2014

### 4.4 Conducted Emission Limit

#### (7) Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

#### Note:

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

### 4.5 Measurement Result:

Note: Not applicable, the EUT power supply from DC 3.7V Lithium battery.

### 4.6 Conducted Measurement Photos:

N/A

## 5. Radiated Emission Test

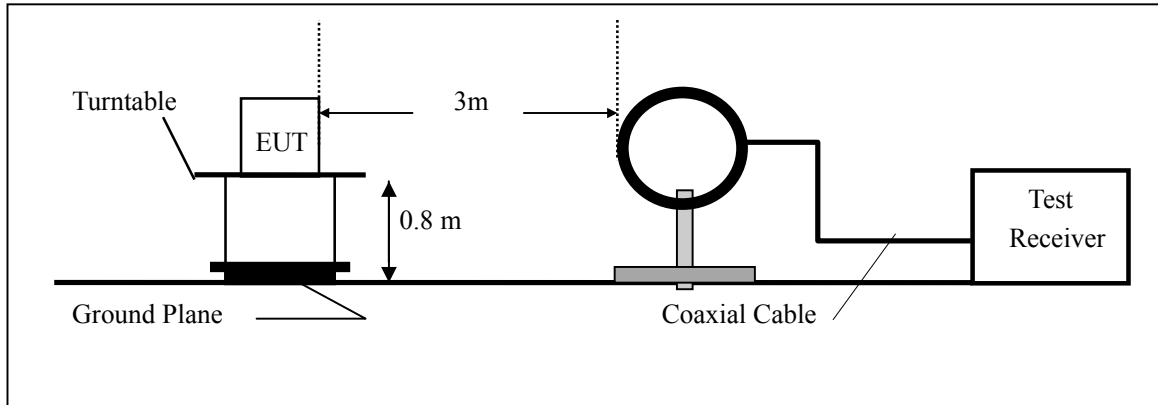
### 5.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured was complete.

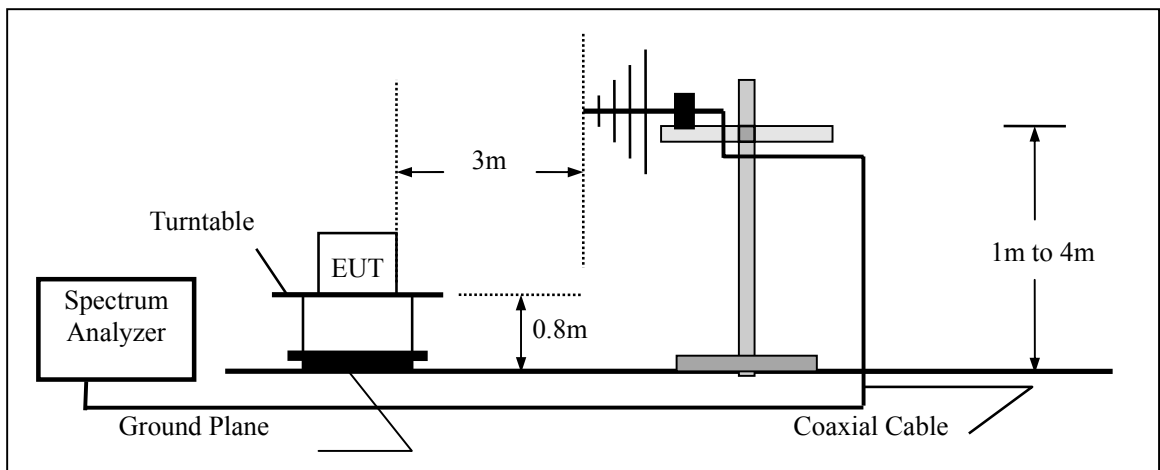
When spectrum scanned from 30 MHz to 1GHz setting resolution bandwidth 100 kHz and video bandwidth 300kHz. And spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 3MHz.

## 5.2 Test SET-UP (Block Diagram of Configuration)

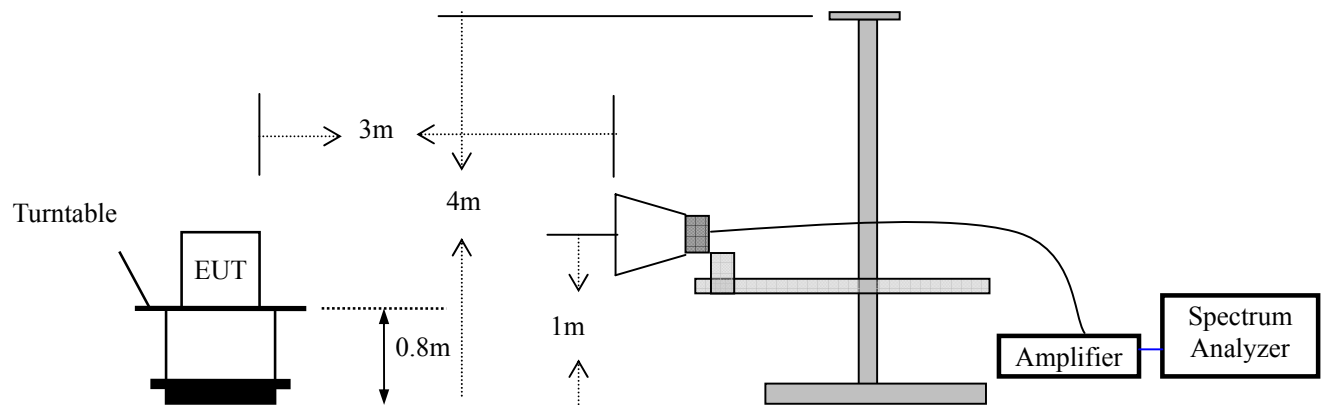
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



### 5.3 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Rohde & Schwarz	FSP7	839511/010	05/29/2013	05/28/2014
Spectrum Analyzer	HP	E4407B	839840481	05/29/2013	05/28/2014
EMI Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/29/2013	05/28/2014
Pre-Amplifier	HP	8447D	2944A07999	05/29/2013	05/28/2014
Bilog Antenna	Schwarzbeck	VULB9163	142	05/29/2013	05/28/2014
Loop Antenna	ARA	PLA-1030/B	1029	05/29/2013	05/28/2014
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	05/29/2013	05/28/2014
Horn Antenna	Schwarzbeck	BBHA 9120	D143	05/29/2013	05/28/2014

**5.4 Measurement Result**

All the modulation modes were tested the data of the worst mode (GFSK) are recorded in the following pages and the others modulation methods do not exceed the limits.

Operation Mode: Bluetooth Mode Test Date : August 9, 2013  
 Frequency Range: 30MHz-1000MHz Temperature : 28 °C  
 Test Result: PASS Humidity : 65 %  
 Measured Distance: 3m Test By: WOLF

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
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Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Operation Mode: 2402MHz Test Date : August 9, 2013  
 Frequency Range: 30~1000MHz Temperature : 28 °C  
 Test Result: PASS Humidity : 65 %  
 Measured Distance: 3m Test By: KL

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Note
42.23	V	25.88	40.00	-14.12	QP
59.46	V	21.12	40.00	-18.88	QP
120.73	V	23.30	43.50	-20.20	QP
162.50	V	27.08	43.50	-16.42	QP
288.04	V	26.42	46.00	-19.58	QP
426.37	V	23.30	46.00	-22.70	QP
121.18	H	22.54	43.50	-20.96	QP
175.39	H	23.53	43.50	-19.97	QP
191.17	H	25.71	43.50	-17.79	QP
232.14	H	37.16	46.00	-8.84	QP
271.36	H	33.97	46.00	-12.03	QP
302.14	H	36.34	46.00	-9.66	QP

- Note:**
- (1) All Readings are Peak Value.
  - (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
  - (3) The average measurement was not performed when the peak measured data under the limit of average detection.
  - (4) EUT stood on the table position is the worst case result in the report.

Operation Mode: 2441MHz Test Date : August 9, 2013  
 Frequency Range: 30~1000MHz Temperature : 28 °C  
 Test Result: PASS Humidity : 65 %  
 Measured Distance: 3m Test By: KL

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Note
42.09	V	25.81	40.00	-14.19	QP
59.06	V	21.08	40.00	-18.92	QP
122.38	V	22.44	43.50	-21.06	QP
165.74	V	27.99	43.50	-15.51	QP
290.10	V	26.51	46.00	-19.49	QP
422.12	V	23.25	46.00	-22.75	QP
121.52	H	25.37	43.50	-18.13	QP
174.04	H	24.69	43.50	-18.81	QP
192.69	H	25.52	43.50	-17.98	QP
236.40	H	35.87	46.00	-10.13	QP
273.48	H	34.12	46.00	-11.88	QP
304.43	H	35.48	46.00	-10.52	QP

- Note:**
- (1) All Readings are Peak Value.
  - (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
  - (3) The average measurement was not performed when the peak measured data under the limit of average detection.
  - (4) EUT stood on the table position is the worst case result in the report.

Operation Mode: 2480MHz Test Date : August 9, 2013  
 Frequency Range: 30~1000MHz Temperature : 28 °C  
 Test Result: PASS Humidity : 65 %  
 Measured Distance: 3m Test By: KL

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Note
42.65	V	26.31	40.00	-13.69	QP
60.52	V	19.98	40.00	-20.02	QP
121.33	V	21.60	43.50	-21.90	QP
161.64	V	25.45	43.50	-18.05	QP
292.20	V	23.08	46.00	-22.92	QP
422.03	V	19.81	46.00	-26.19	QP
119.01	H	20.49	43.50	-23.01	QP
178.45	H	23.22	43.50	-20.28	QP
193.45	H	24.90	43.50	-18.60	QP
233.14	H	35.24	46.00	-10.76	QP
273.75	H	32.45	46.00	-13.55	QP
304.82	H	35.14	46.00	-10.86	QP

- Note:**
- (1) All Readings are Peak Value.
  - (2) Emission Level= Reading Level+Probe Factor +Cable Loss.
  - (3) The average measurement was not performed when the peak measured data under the limit of average detection.
  - (4) EUT stood on the table position is the worst case result in the report.