

**FCC PART 15.249**  
**MEASUREMENT AND TEST REPORT**  
**FOR**

**HIDAKA (HK) CO., LTD.**

**ROOM 803, 8/F THE HARBOURFRONT TOWER 2, NO.18-22 TAK FUNG**  
**STREET HUNG HOM KOWLOON, HONG KONG**

**FCC ID: VJ6HI507B**

<b>Report Concerns:</b> Original Report	<b>Equipment Type:</b> 2.4 GHz Wireless Speaker
<b>Model:</b>	<u>HI-507B</u>
<b>Report No.:</b>	<u>STR07088002I</u>
<b>Test/Witness Engineer:</b>	<u>Lahm Peng</u>
<b>Test Date:</b>	<u>2007-08-07</u>
<b>Prepared By:</b>	<b>Shenzhen SEM.Test Compliance Service Co., Ltd.</b> Room 609-610, Baotong Building, Baomin 1 <sup>st</sup> Road, Baoan District, Shenzhen, Guangdong, P.R.C. (518133)
<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.

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## 1. GENERAL INFORMATION

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

#### Client Information

Applicant: HIDAKA (HK) CO., LTD.  
Address of applicant: ROOM 803, 8/F THE HARBOURFRONT TOWER 2,  
NO.18-22 TAK FUNG STREET HUNGHOM KOWLOON,  
HONG KONG

Manufacturer: HIDAKA (HK) CO., LTD.  
Address of applicant: ROOM 803, 8/F THE HARBOURFRONT TOWER 2,  
NO.18-22 TAK FUNG STREET HUNGHOM KOWLOON,  
HONG KONG

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

Items	Description
EUT Description:	2.4 GHz Wireless Speaker
Trade Name:	/
Model No.:	HI-507B
Rated Voltage:	DC 9V
Output Power:	<0dBm
Frequency Range:	2404-2479 MHz
Antenna Type:	Integral Antenna
Size:	30.0x16.0x5.5cm
For more information refer to the circuit diagram form and the user's manual.	

*The test data gathered are from a production sample, provided by the manufacturer.*

### 1.2 Test Standards

The following report is prepared on behalf of HIDAKA (HK) CO., LTD. in accordance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.249 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.249 of the Federal Communication Commissions rules.

**Maintenance of compliance** is the responsibility of the manufacturer. Any modification of the product, which results in lowering the emission, 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 emission level. The test modes were adapted with Low Channel, Middle Channel and High Channel, accordingly in reference to the Operating Instructions.

## 1.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

United States of American Federal Communications Commission (**FCC**), and the registration number is **556682**  
Certification and Engineering Bureau of Industry Canada for radio equipment testing with the registration number is **6002**.

All measurement required was performed at laboratory of SGS-CSTC Standards Technical Services Co., Ltd., No.1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China.

## 1.6 EUT Exercise Software

The EUT exercise program used during the testing was designed to exercise the system components. The test software is started while the whole system is on.

## 1.7 Accessories Equipment List and Details

Manufacturer	Description	Model	Serial Number
Ktec	Adapter	KSAFB0550050W1US	/
SBI	MP3	MP-CS200	/

## 1.8 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
Adapter DC Cable	0.95	Unshielded	Without Core
Earphone	0.8	Unshielded	Without Core
Audio Cable	1.45	Unshielded	Without Core

2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 15.203	Antenna Requirement	Compliant
§ 15.207	Conducted Emission	Compliant
§ 15.205	Restricted Band of Operation	Compliant
§ 15.209	Radiated Emission	Compliant
§ 15.249(a)	Field Strength	Compliant
§ 15.249(d)	Out of Band Emission	Compliant

### **3. §15.203 - ANTENNA REQUIREMENT**

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#### **3.1 Standard Applicable**

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

#### **3.2 Test Result**

This product has a permanent antenna, fulfill the requirement of this section.

## 4. §15.207 (a)- CONDUCTED EMISSION

### 4.1 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  $\pm 0.5$  dB.

### 4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESCS30	830245/009	2006-01-26	2008-01-25
Spectrum Analyzer	Agilent	E4402B	US41192821	2007-06-30	2008-06-29
AMN	Rohde & Schwarz	ESH2-Z5	100002	2006-01-26	2008-01-25
Limiter	Rohde & Schwarz	ESH3-Z2	357.8810.52	2006-01-26	2008-01-25
AMN	Rohde & Schwarz	ESH3-Z5	828304/014	2006-01-26	2008-01-25

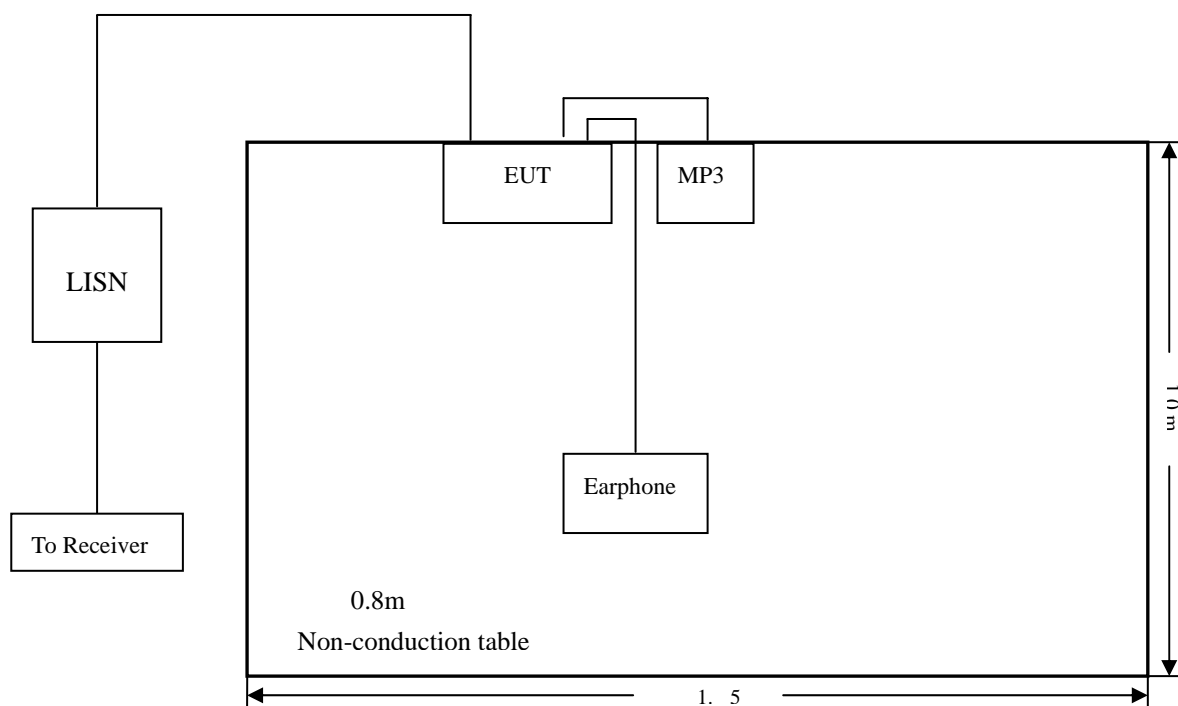
**Statement of Traceability:** All calibrations have been performed per the NVLAP requirements traceable to the NIST.

### 4.3 Test Procedure

The setup of EUT is according with ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 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 Basic Test Setup Block Diagram



#### 4.5 Environmental Conditions

Temperature:	21° C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

#### 4.6 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency ..... 150 kHz  
 Stop Frequency..... 30 MHz  
 Sweep Speed ..... Auto  
 IF Bandwidth..... 10 kHz  
 Quasi-Peak Adapter Bandwidth ..... 9 kHz  
 Quasi-Peak Adapter Mode ..... Normal

#### 4.7 Summary of Test Results/Plots

According to the data in section 4.8, the EUT complied with the FCC 15.207 Conducted margin for a the device, with the *worst* case reading of:

**-16.0 dB $\mu$ V at 0.480 MHz in the Middle Channel Transmitting, Line mode, 0.15-30MHz**

#### 4.8 Conducted Emissions Test Data

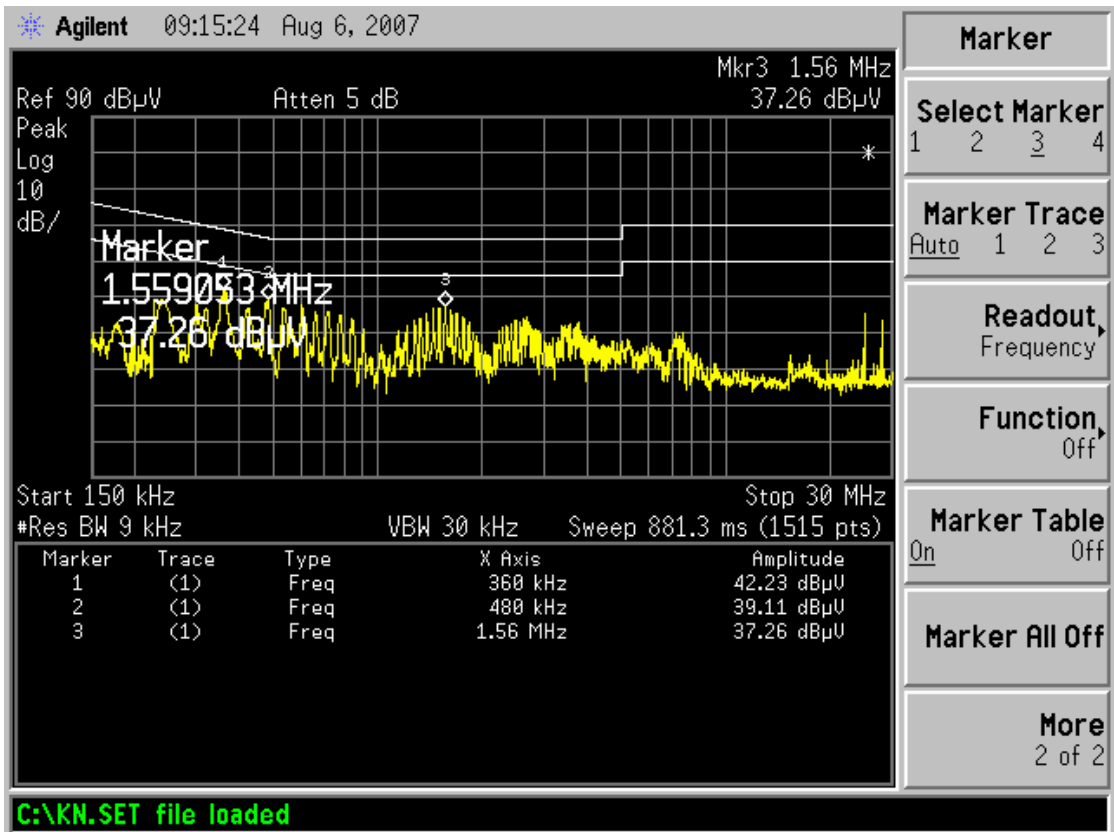
LINE CONDUCTED EMISSIONS				FCC 15.207	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB $\mu$ V	QP/Ave/Pk	Line/Neutral	dB $\mu$ V	dB
0.48	40.32	PK	Line	56.34	-16.0
0.36	42.33	PK	Line	58.73	-16.4
0.36	42.23	PK	Neutral	58.73	-16.5
0.48	39.11	PK	Neutral	56.34	-17.2
1.56	37.60	PK	Line	56.00	-18.4
1.56	37.26	PK	Neutral	56.00	-18.7

*Since the peak reading is lower than the average limit, the average reading can be omitted.*

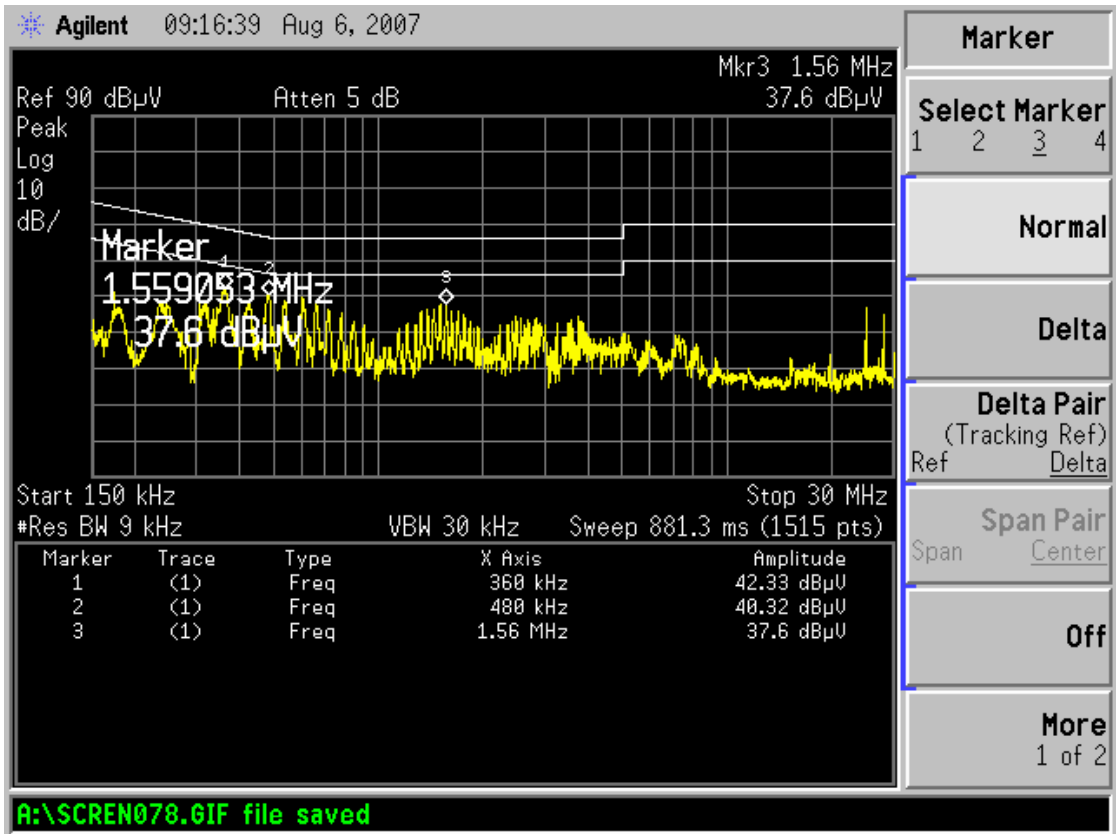


Plot of Conducted Emissions Test Data

Conducted Disturbance  
EUT: 2.4 GHz Wireless Speaker  
M/N: HI-507B  
Operating Condition: Transmitting  
Test Specification: N  
Comment: AC 120V/60 Hz



Conducted Disturbance  
EUT: 2.4 GHz Wireless Speaker  
M/N: HI-507B  
Operating Condition: Transmitting  
Test Specification: L  
Comment: AC 120V/60 Hz



## 5. §15.205, §15.209, §15.249 (a)- RADIATED EMISSION

### 5.1 Measurement Uncertainty

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is  $\pm 3.0$  dB.

### 5.2 Standard Applicable

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of fundamental (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

EMISSIONS RADIATED OUTSIDE OF THE SPECIFIED FREQUENCY BANDS, EXCEPT FOR HARMONICS, SHALL BE ATTENUATED BY AT LEAST 20 dB BELOW THE LEVEL OF THE FUNDAMENTAL OR TO THE GENERAL RADIATED EMISSION LIMITS IN 15.209,WHICHEVER IS THE LESSER ATTENUATION.

Emissions that fall in the restricted bands (15.205) must be less than 54dBuV/m otherwise the spurious and harmonics must be attenuated by at least 20dB.

### 5.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Rohde & Schwarz	EMI Test Receiver	ESIB26	830245/009	2007-01-26	2008-01-25
ETS.LINDGREN	Multi Controller	2090	57230	2007-01-26	2008-01-25
ETS.LINDGREN	Receiver Antenna	2175	57337	2007-01-26	2008-01-25
ETS.LINDGREN	50 ohm Coaxial Cable	SUCOFLEX 104	25498514	2007-01-26	2008-01-25
ETS.LINDGREN	Horn Antenna	3149	SEL0008	2007-01-26	2008-01-25

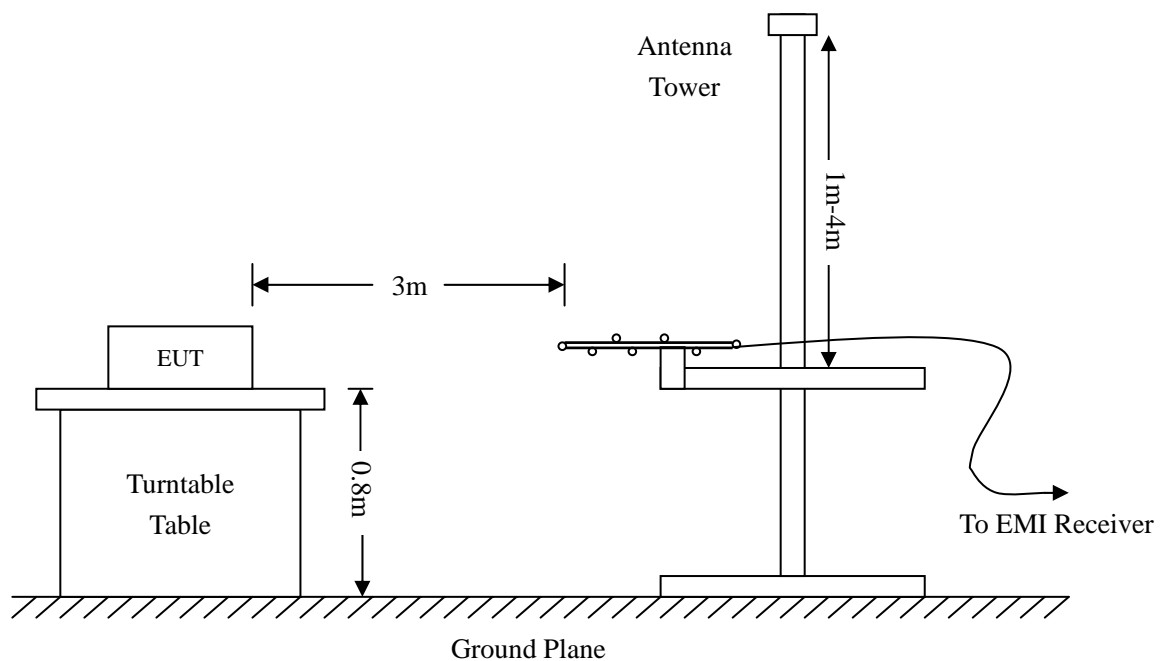
**Statement of Traceability:** All calibrations have been performed per the NVLAP requirements traceable to the NIST.

### 5.4 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 15.247(a) and FCC Part 15.209 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.



## 5.5 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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

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:

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

## 5.6 Environmental Conditions

Temperature:	26° C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

## 5.7 Summary of Test Results/Plots

According to the data below, the FCC Part 15.205, 15.209 and 15.249 standards, and had the worst margin of:

**-6.20 dB $\mu$ V at 4958 MHz in the Vertical polarization, 30 MHz to 25 GHz, 3Meters**

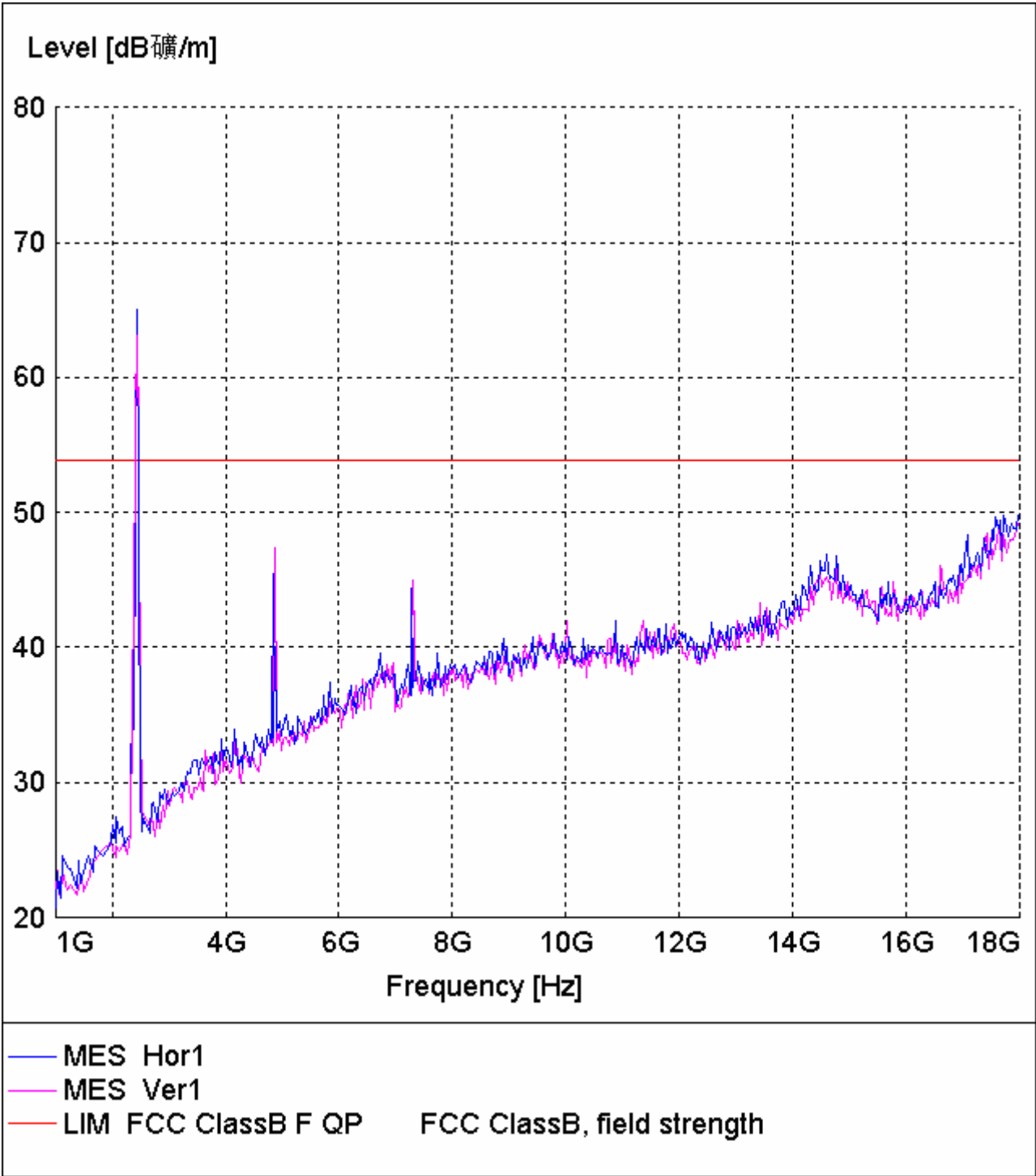
Frequency	Meter Reading	Detector	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier Gain	Corr. Ampl.	FCC Part 15.249 & 15.209	
MHz	dBuV	PK/QP/AV	Degree	Meter	H / V	dB	dB	dB	dBuV/m	Limit dBuV/m	Margin dB
Transmitting Low CH (2404MHz)											
4808	40.8	AV	60	1.3	V	34.1	5.2	33.0	47.1	54.0	-6.9
4808	39.3	AV	45	1.0	H	34.1	5.2	33.0	45.6	54.0	-8.4
7212	34.9	AV	56	1.4	V	37.4	6.1	33.5	44.9	54.0	-9.1
7212	34.5	AV	60	2.0	H	37.4	6.1	33.5	44.5	54.0	-9.5
2404	66.3	AV(Fund.)	135	1.2	H	29.1	3.7	34.0	65.1	94.0	-28.9
2404	64.0	AV(Fund.)	66	1.0	V	29.1	3.7	34.0	62.8	94.0	-31.2
Transmitting Middle CH (2439MHz)											
4878	41.3	AV	98	1.2	V	34.1	5.2	33.0	47.6	54.0	-6.4
7317	37.5	AV	60	1.3	V	37.4	6.1	33.5	47.5	54.0	-6.5
4878	33.9	AV	56	1.4	H	34.1	5.2	33.0	40.2	54.0	-13.8
7317	27.2	AV	185	1.2	H	37.4	6.1	33.5	37.2	54.0	-16.8
2439	68.1	AV(Fund.)	45	1.2	H	29.1	3.7	34.0	66.9	94.0	-27.1
2439	62.4	AV(Fund.)	60	1.3	V	29.1	3.7	34.0	61.2	94.0	-32.8
Transmitting High CH (2479MHz)											
4958	41.5	AV(Fund.)	45	1.0	V	34.1	5.2	33.0	47.8	54.0	-6.2
7437	36.6	AV	180	1.2	V	37.4	6.1	33.5	46.6	54.0	-7.4
7437	36.1	AV	270	1.0	H	37.4	6.1	33.5	46.1	54.0	-7.9
4958	39.1	AV	60	1.2	H	34.1	5.2	33.0	45.4	54.0	-8.6
2479	68.5	AV(Fund.)	60	1.0	V	29.1	3.7	34.0	67.3	94.0	-26.7
2479	68.3	AV(Fund.)	45	1.0	H	29.1	3.7	34.0	67.1	94.0	-26.9

Transmitting from 30MHz to 1GHz											
40.0	44.2	PK	45	1.0	V	14.3	0.6	26.25	32.8	40	-7.2
34.6	34.3	PK	45	1.2	V	24.1	0.6	26.29	32.7	40	-7.3
300.0	40.1	PK	180	1.2	H	13.9	1.6	24.7	30.9	46	-15.1
97.5	43.7	PK	45	1.0	H	8.2	0.9	25.99	26.8	43.5	-16.7
276.9	38.4	PK	45	1.2	H	13.8	1.5	24.76	28.9	46	-17.1
152.1	36.4	PK	60	1.0	H	13.1	1.1	25.51	25.1	43.5	-18.4
141.7	34.7	PK	180	1.2	V	13.8	1.1	25.58	24.0	43.5	-19.5
255.2	36.2	PK	60	1.0	V	12.4	1.3	24.82	25.1	46	-20.9

Note: Testing is carried out with frequency rang 30MHz to the tenth harmonics, which above 5<sup>th</sup> Harmonics is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4.

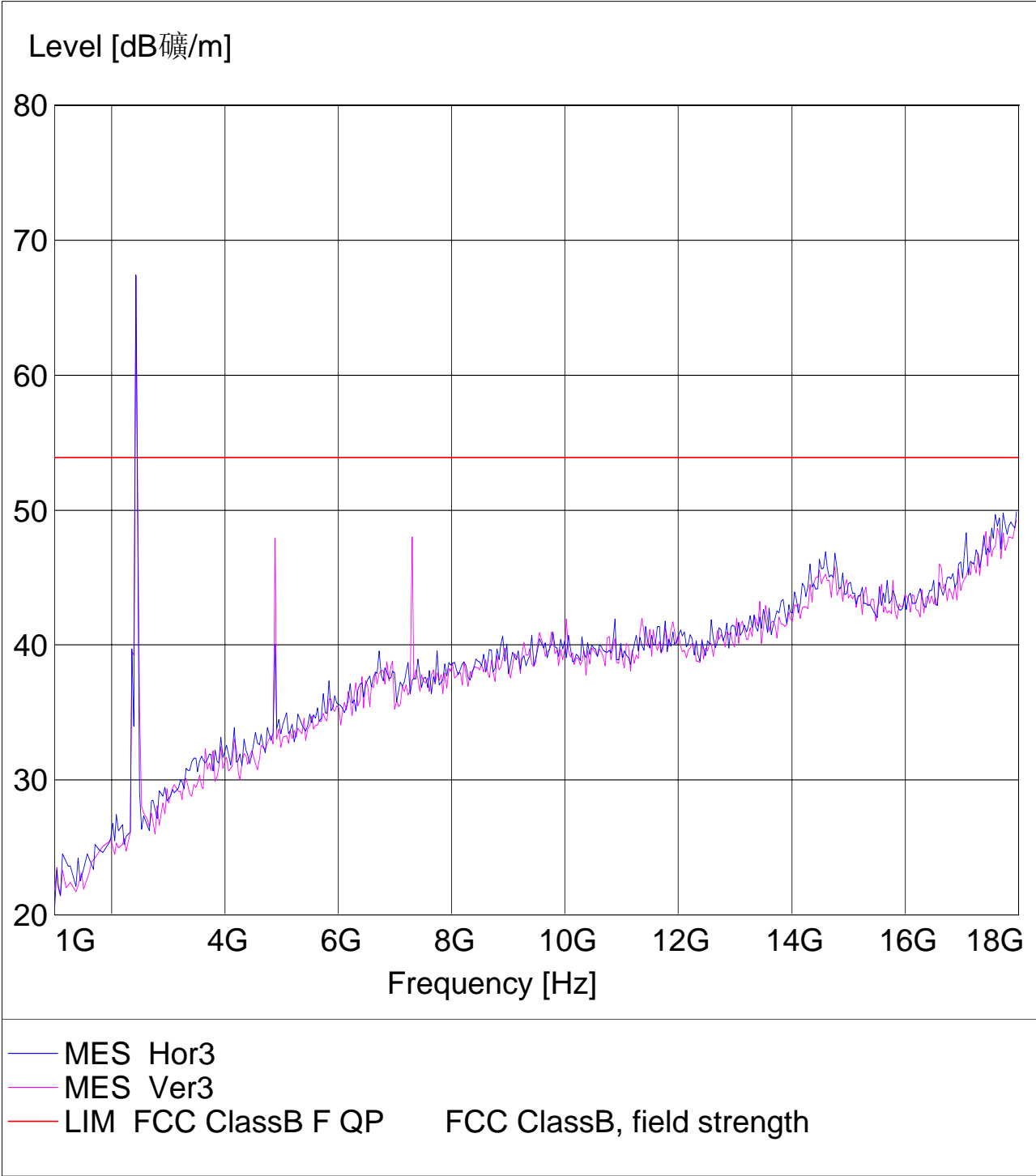
Plot of Radiation Emissions Test

Radiated Disturbance  
EUT: 2.4 GHz Wireless Speaker  
M/N: HI-507B  
Operating Condition: Transmitting above 1GHz  
Test Specification: Vertical & Horizontal (Low CH)  
Comment: AC 120V/60 Hz

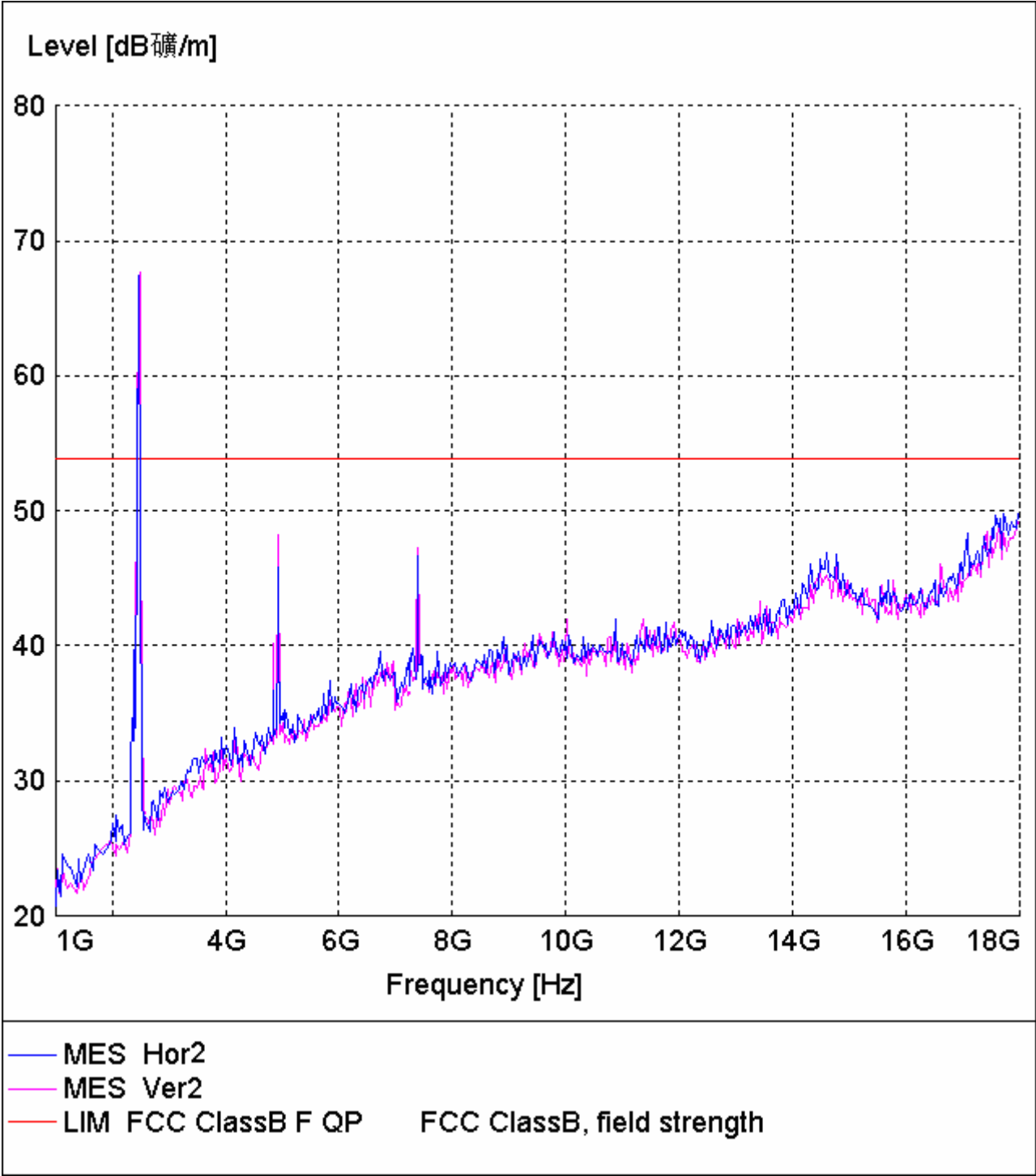




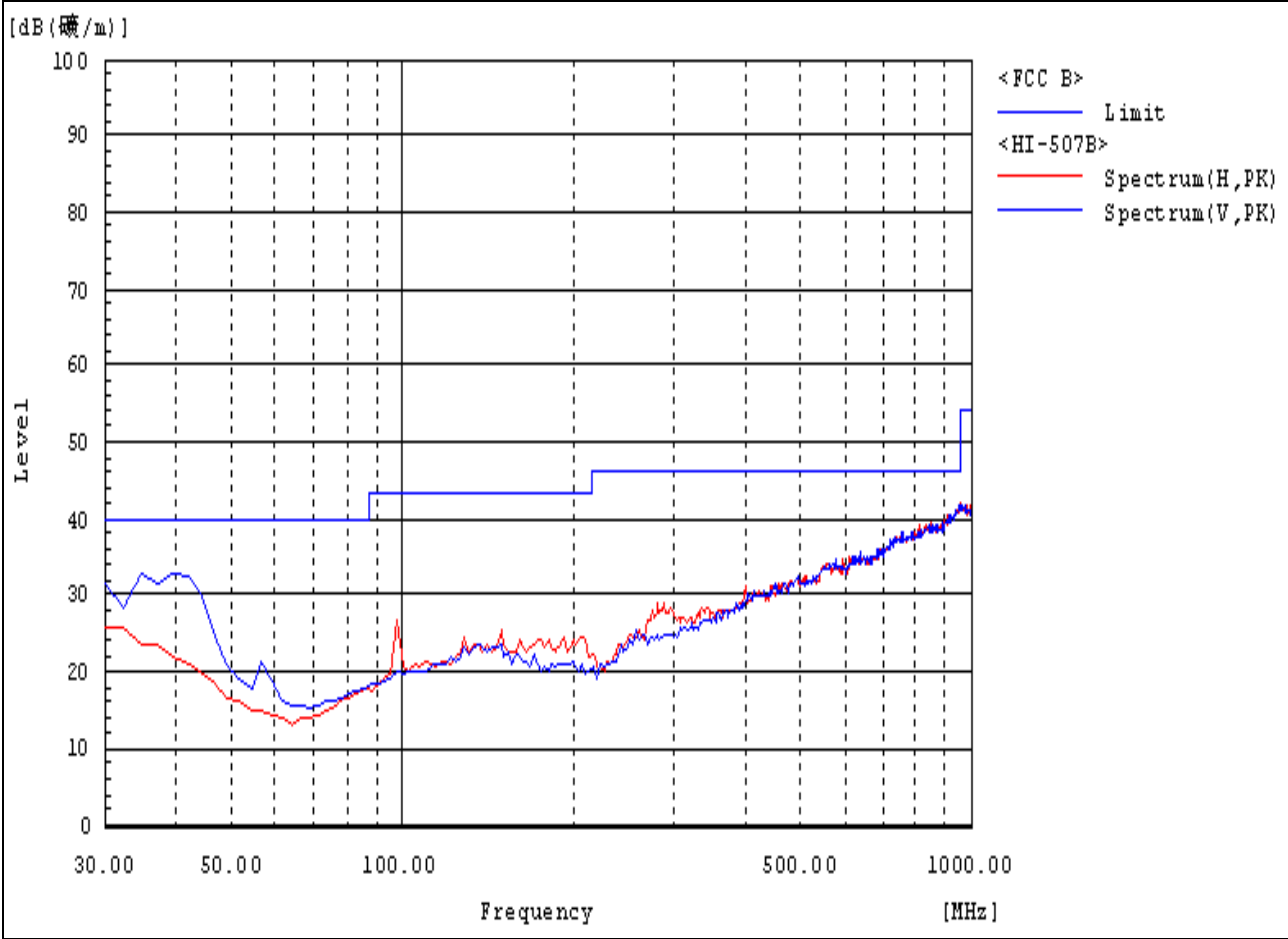
*Radiated Disturbance*  
*EUT: 2.4 GHz Wireless Speaker*  
*M/N: HI-507B*  
*Operating Condition: Transmitting above 1GHz*  
*Test Specification: Vertical & Horizontal (Middle CH)*  
*Comment: AC 120V/60 Hz*



Radiated Disturbance  
EUT: 2.4 GHz Wireless Speaker  
M/N: HI-507B  
Operating Condition: Transmitting above 1GHz  
Test Specification: Vertical & Horizontal (High CH)  
Comment: AC 120V/60 Hz



Radiated Disturbance  
EUT: 2.4 GHz Wireless Speaker  
M/N: HI-507B  
Operating Condition: Transmitting Below 1GHz  
Test Specification: Vertical & Horizontal (worse case)  
Comment: AC 120V/60 Hz



## 6. §15.249(b) OUT OF BAND EMISSIONS

### 6.1 Standard Applicable

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

### 6.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date	Due. Date
Agilent	Spectrum Analyzer	E4402B	US41192821	2007-06-30	2008-06-29
ETS.LINDGR EN	Receiver Antenna	2175	57337	2007-01-26	2008-01-25
ETS.LINDGR EN	50 ohm Coaxial Cable	SUCOFLEX 104	25498514	2007-01-26	2008-01-25
Rohde & Schwarz	Horn Antenna	HF906	100014	2007-01-26	2008-01-25

**Statement of Traceability:** All calibrations have been performed per the NVLAP requirements traceable to the NIST.

### 6.3 Test Procedure

As the radiation test, set the Lowest and Highest Transmitting Channel, observed the outside band of 2400MHz to 2438.5MHz, than mark the higher-level emission for comparing with the FCC rules.

### 6.4 Environmental Conditions

Temperature:	22° C
Relative Humidity:	54%
ATM Pressure:	1012 mbar

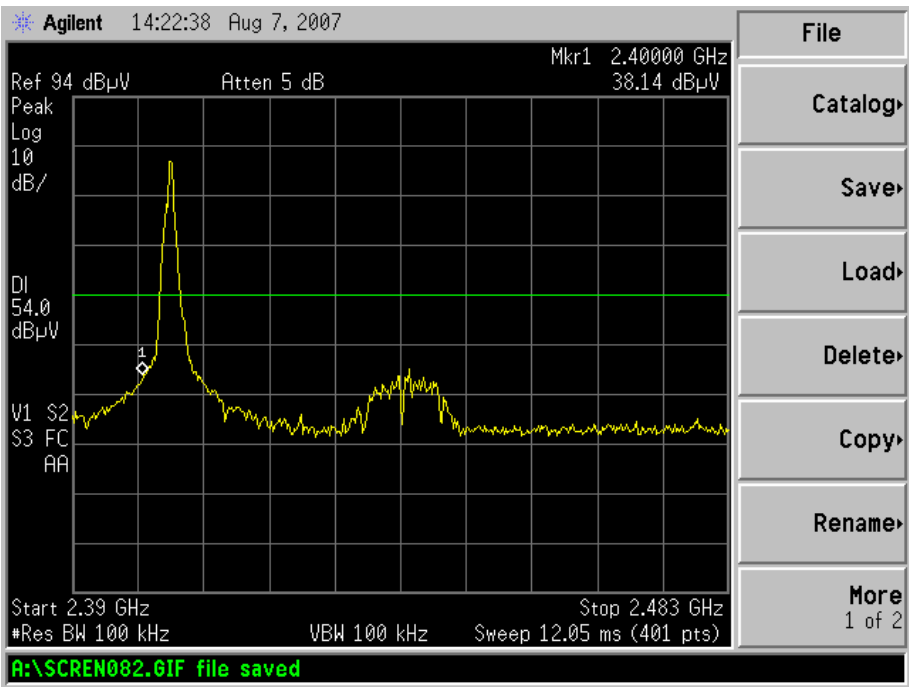
### 6.5 Summary of Test Results/Plots

Frequency MHz	Emission dB $\mu$ V/m	Limit dB $\mu$ V/m
2400.0	38.14	54
2438.5	34.96	54

#### Test Result Pass

Refer to the attached plots.

Lower Bandedge



Upper Bandedge

