FCC TEST REPORT

FCC ID : WC2DS-609

Applicant : **Wonders Industrial Development (Shenzhen) Co., Ltd.**
DOSS Industrial Zone, Qiping Kengdu Industrial Area, Guihua Village, Guanlan Town, Baoan District, Shenzhen, China

Equipment Under Test (EUT) :

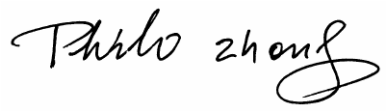
Product description : IPOD WIRELESS SPEAKER

Model No. : DS-609、DS-464、DS-492

Standards : FCC 15 Paragraph 15.249

Date of Test : June 20, 2008

Test Engineer : **Nunu Deng**

Reviewed By : 

PERPARED BY:
Waltek Services (Shenzhen) Co., Ltd.

8C,West Tower, Aidi Building, No.5003 Binhe Rd, Futian District, Shenzhen518045, Guangdong, China.

Tel: 86-755-83551033

Fax: 86-755-83552400

2 Contents

3 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (30MHz to 25GHz)	FCC PART 15: 2003	ANSI C63.4: 2003	Class B	PASS
Conducted Emission (150KHz to 30MHz)	FCC PART 15: 2003	ANSI C63.4: 2003	Class B	PASS

4 General Information

4.1 Client Information

Applicant:	**Wonders Industrial Development (Shenzhen) Co., Ltd.**
Address of Applicant:	DOSS Industrial Zone, Qiping Kengdu Industrial Area, Guihua Village, Guanlan Town, Baoan District, Shenzhen, China
Manufacturer:	**Wonders Industrial Development (Shenzhen) Co., Ltd.**
Address:	DOSS Industrial Zone, Qiping Kengdu Industrial Area, Guihua Village, Guanlan Town, Baoan District, Shenzhen, China

4.2 General Description of E.U.T.

Product description:	IPOD WIRELESS SPEAKER
Model No.:	DS-609、DS-464、DS-492

4.3 Details of E.U.T.

Power Supply:	Adapter input: 100-240V 50/60Hz Adapter output: 9V

4.4 Description of Support Units

The EUT has been tested as an independent unit.

4.5 Standards Applicable for Testing

The customer requested FCC tests for a IPOD WIRELESS SPEAKER. The standards used were FCC 15 Paragraph 15.249, Paragraph 15.207, Paragraph 15.209, Paragraph 15.31, Paragraph 15.33, Paragraph 15.35.

4.6 Test Facility

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

- **FCC – Registration No.: 880581**

  Waltek Services(Shenzhen) 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. Registration:880581, June 24, 2008.

4.7 Test Location

All Emissions tests were performed at:-
1/F, Fukangtai Building, West Baima Rd., Songgang Street, Baoan District, Shenzhen 518105,China

5 Equipment Used during Test

Equipment	Brand Name	Model	Related standards	Cal.Intal Months	Last Cal. Date	Serial No
3m Anechoic chamber						
EMC Analyzer	Agilent	E7405A	ISO9001:2000	12	Jan-08	MY45114943
Trilog Broadband Antenne 30-3000 MHz	SCHWARZBECK MESS-ELEKTROM	VULB9163	EN/ISO/IEC 17025 DIN EN ISO9001	12	Jan-08	336
Broad-band Horn Antenna 1-18 GHz	SCHWARZBECK MESS-ELEKTROM	BBHA 9120 D	EN/ISO/IEC 17025 DIN EN ISO9001	12	Jan-08	667
Broadband Preamplifier 0.5-18 GHz	SCHWARZBECK MESS-ELEKTROM	BBV 9718	EN/ISO/IEC 17025 DIN EN ISO9001	12	Jan-08	9718-148
10m Coaxial Cable with N-male Connectors usable up to 18GHz,	SCHWARZBECK MESS-ELEKTROM	AK 9515 H	EN/ISO/IEC 17025 DIN EN ISO9001	12	Jan-08	-
10m 50 Ohm Coaxial Cable with N-plug,individual length,usable up to 3(5)GHz, Connectors	SCHWARZBECK MESS-ELEKTROM	AK 9513	EN/ISO/IEC 17025 DIN EN ISO9001	12	Jan-08	-
Positioning Controller	C&C LAB	CC-C-IF	ISO9001	12	Jan-08	MF7802108
Color Monitor	SUNSPO	SP-14C	ISO9001	12	Jan-08	-
EMI Shielded Room						
Test Receiver	ROHDE&SCHWARZ	ESPI	ISO9001	12	Jan-08	101155
Two-Line V-Network	ROHDE&SCHWARZ	ENV216	ISO9001 EN/ISO/IEC 17025	12	Jan-08	100115
Absorbing Clamp	ROHDE&SC	MDS-21	ISO9001	12	Jan-08	100205

	HWARZ		EN/ISO/IEC 17025			
10m 50 Ohm Coaxial Cable with N-plug,individual length,usable up to 3(5)GHz, Connectors	SCHWARZBECK MESS-ELEKTROM	AK 9514	EN/ISO/IEC 17025 DIN EN ISO9001	12	Jan-08	-
Harmonic & Flicker Test						
Digital Power Analyzer	Em Test AG/Switzerland	DPA 500	EN/IEC JIS C 61000-3-2 EN/IEC 61000-3-3	12	Jan-08	V0745103095
Power Source	Em Test AG/Switzerland	ACS 500	IEC 61000-3-3 IEC61000-3-2	12	Jan-08	V0745103096
Electrostatic Discharge Test						
Electrostatic Discharge Simulator	Em Test AG/Switzerland	DITO	IEC 61000-4-2 ISO 10605	12	Jan-08	V0745103094
Radio-Frequency Conducted Immunity Test						
RF Generator	TESEQ GmbH	NSG4070	IEC61000-4-6	12	Jan-08	25781
CDN M-Type	TESEQ GmbH	CDN M016	IEC61000-4-6	12	Jan-08	25112
EM-Clamp	TESEQ GmbH	KEMZ 801	IEC61000-4-6	12	Jan-08	25453
Attenuator 6dB	TESEQ GmbH	ATN6050	IEC61000-4-6	12	Jan-08	25365
Calibrated Equipment	TESEQ GmbH	CAL 801	IEC61000-4-6	12	Jan-08	70348
Calibrated Equipment	TESEQ GmbH	CAL U100A	IEC61000-4-6	12	Jan-08	25018
Calibrated Equipment	TESEQ GmbH	TRA U150	IEC61000-4-6	12	Jan-08	25299
Fast Transient/Surges/Voltage Dips Short Interruptions and Voltage Variations Immunity Tests						
All Modules Generator	SCHAFFNER	6150	IEC61000-4-4 IEC61000-4-5 IEC61000-4-11	12	Jan-08	34579
Capacitive Coupling Clamp	SCHAFFNER	CDN 8014	IEC61000-4-4	12	Jan-08	25311
Signal and Data Line Coupling Network	SCHAFFNER	CDN 117	IEC61000-4-5	12	Jan-08	25627
AC Power Supply	TONGYUN	DTDGC-4		12	Jan-08	-

Electromagnetic Fields Radiation Exposure Test						
Exposure Level Tester ELT-400	Narda Safety TEST Solutions	2304/03	ISO 9001 ISO 10012-1	12	Jan-08	M-0155
Magnetic Field Probe 100cm^2	Narda Safety TEST Solutions	2300/90.10	ISO 9001 ISO 10012-1	12	Jan-08	M-1070

6 Conducted Emission Test

Product Name:	IPOD WIRELESS SPEAKER
Test Requirement:	FCC Part15 Paragraph 15.207
Test Method:	Based on FCC Part15 Paragraph 15.207
Test Date:	June 20, 2008
Frequency Range:	150 kHz to 30MHz
Class:	Class B
Detector:	Peak for pre-scan (9 kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

6.1 Test Equipment

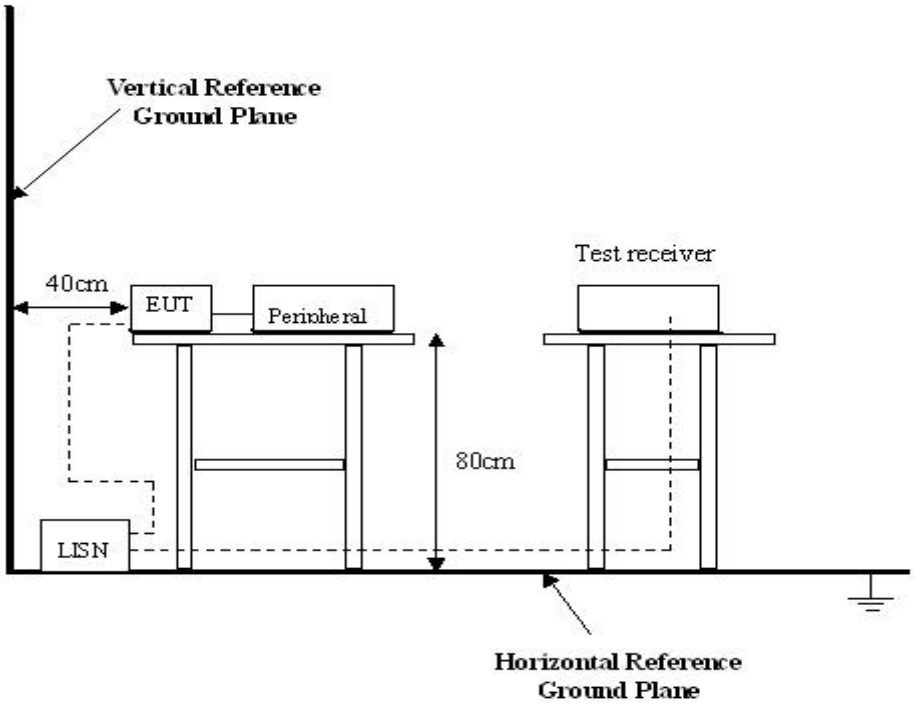
Please refer to Section 5 this report.

6.2 Test Procedure

1. The EUT was tested according to ANSI C63.4: 2003. The frequency spectrum from 150kHz to 30MHz was investigated.
2. The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

6.3 Conducted Test Setup

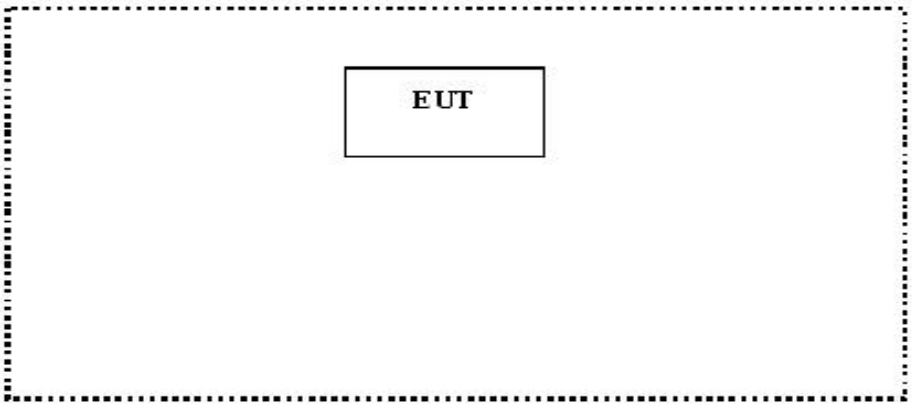
The conducted emission tests were performed using the setup accordance with the ANSI C63.4:2003, The specification used in this report was the FCC Part15 Paragraph 15.207 limits.



6.4 EUT Operating Condition

Operating condition is according to ANSI C63.4: 2003.

A. Setup the EUT and simulators as shown on follow.
B. Enable RF signal and confirm EUT active.
C. Modulate output capacity of EUT up to specification.



6.5 Conducted Emission Limits

66-56 dBμV/m between 0.15MHz & 0.5MHz

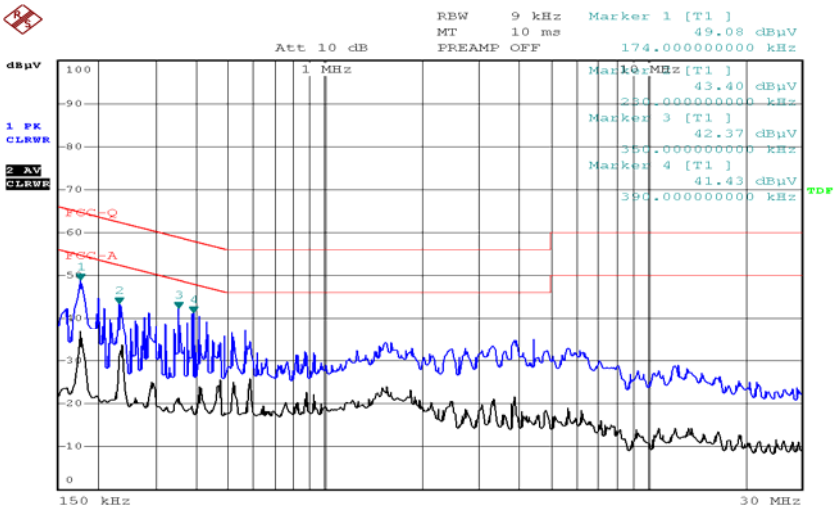
56 dBμV/m between 0.5MHz & 5MHz

60 dBμV/m between 5MHz & 30MHz

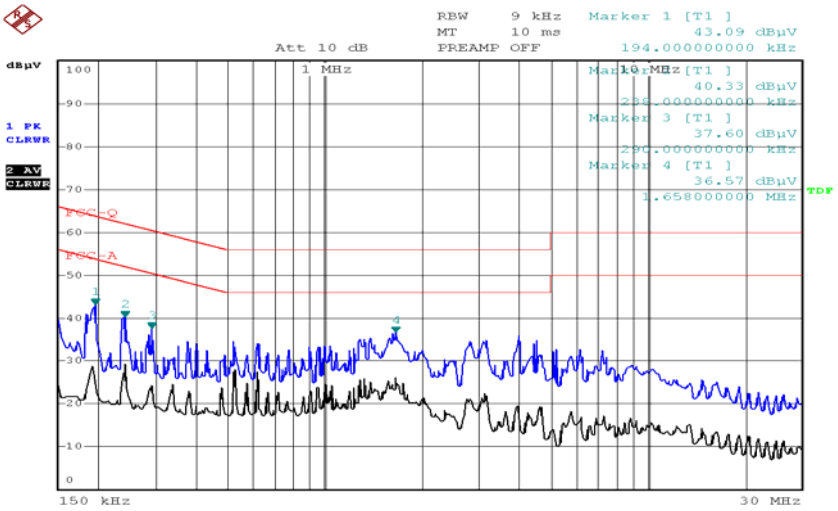
Note: In the above limits, the tighter limit applies at the band edges.

6.6 Conducted Emission Test Result

Live Line



Neutral Line



6.7 Measurement Data

Freq. MHz	Line	QP Reading dBuV	FCC 15 Limit dBuV	Margin dB	AV Reading dBuV	FCC 15 Limit dBuV	Margin dB
0.174	Live	49.08	64.78	15.7	37.98	57.40	19.42
0.230	Live	43.43	62.47	19.04	34.65	54.39	19.74
0.350	Live	42.37	59.01	16.64	25.73	49.85	24.12
0.390	Live	41.13	58.16	17.03	28.71	48.68	19.97
0.194	Neutral	43.09	63.89	20.08	28.79	54.16	25.37
0.238	Neutral	40.33	62.19	21.86	29.10	54.02	24.92
0.290	Neutral	37.60	60.56	22.96	26.37	51.88	25.51
1.658	Neutral	36.57	56.00	19.43	25.74	46.00	20.26

7 Radiation Emission Test

Product Name:	IPOD WIRELESS SPEAKER
Test Requirement:	FCC Part15 Paragraph 15.249
Test Method:	Based on FCC Part15 Paragraph 15.31 and Paragraph 15.33
Test Date:	June 20, 2008
Frequency Range:	30MHz to 10GHz
Measurement Distance:	3m
Detector:	Peak for pre-scan (120kHz resolution bandwidth)
	Quasi-Peak if maximised peak within 6dB of limit

7.1 Test Equipment

Please refer to Section 5 this report.

7.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase centre variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on ANSI C63.4: 2003, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Waltek Services EMC Lab is +4.0 dB.

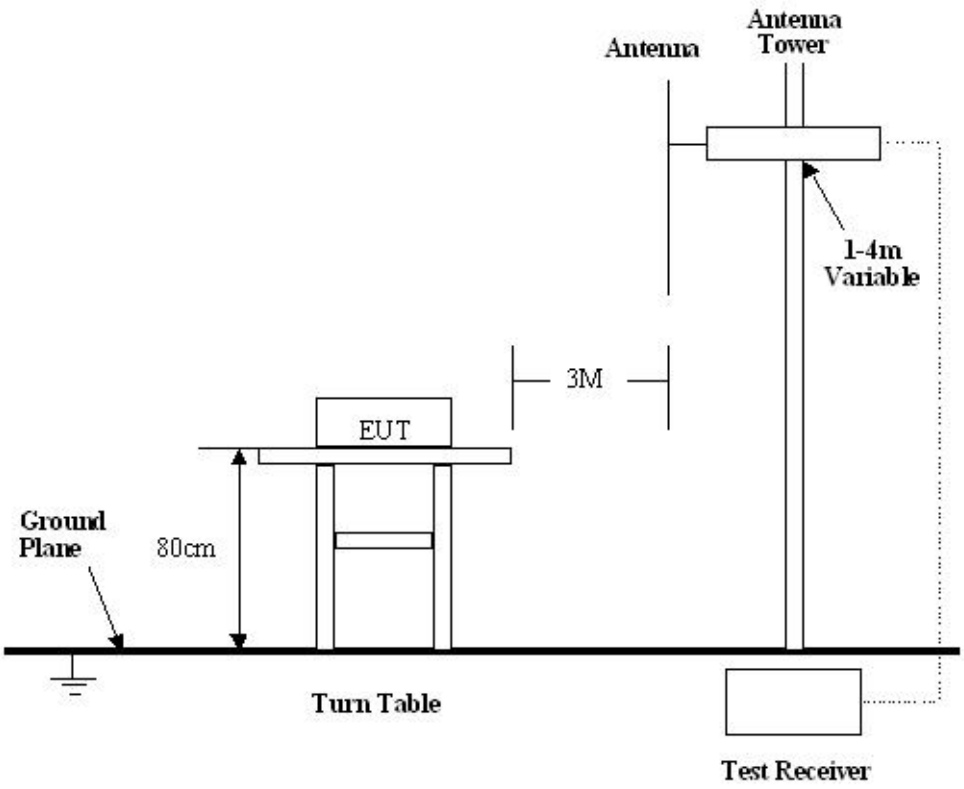
7.3 Test Procedure

1. Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.
2. All data was recorded in the peak and average detection mode.
3. The EUT was under normal mode during the final qualification test and the configuration was used to represent the worst case results.

4. According to the FCC Part 15 Paragraph 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 to the intentional radiator shall be considered sufficient to comply with the provisions of this section. This product has a permanent antenna, fulfill the requirement of this section.

7.4 Radiated Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4: 2003, The specification used in this report was the FCC Part15 Paragraph 15.249 and Paragraph 15.209 limits.



7.5 Spectrum Analyzer Setup

According to FCC Part15 Paragraph 15.249 Rules, the system was tested to 25000 MHz.

Start Frequency..... 30 MHz
Stop Frequency..... 25000 MHz
Sweep Speed Auto
IF Bandwidth..... 100 kHz
Video Bandwidth..... 1 MHz
Quasi-Peak Adapter Bandwidth ..... 120 kHz
Quasi-Peak Adapter Mode ..... Normal
Resolution Bandwidth 1MHz

7.6 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Class B Limit

7.7 Summary of Test Results

According to the data in section 7.10, the EUT complied with the FCC Part15 Paragraph 15.249 standards.

7.8 EUT Operating Condition

Same as section 6.4 of this report.

7.9 Radiated Emissions Limit

A. FCC Part 15 subpart C Paragraph 15.249 Limit

Fundamental Frequency	Field Strength of Fundamental		Field Strength of Harmonics	
	mV/m	dBuV/m	uV/m	dBuV/m
902-928MHz	50	94	500	54
2400-2483.5 MHz	50	94	500	54
5725-5875 MHz	50	94	500	54
24.0-24.25GHz	250	108	2500	68

Note: (1) RF Voltage(dBuV)=20 log RF Voltage(uV)

(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

(3)The emission limit in this paragraph is based on measurement instrumentaion employing an average detector.Measurement using instrumentation with a peak detector function,corresponding to 20dB above the maximum permitted average limit.

(4) Above 1GHz,do a Peak and average measurements for all emissions,Limit for peak is 94dBuvV/m,According to Part15.35(b) and average is 54BuvV/m.

B. Frequencies in restricted band are complied to limit on Paragraph 15.209

Frequency(MHZ)	Distance(m)	Field strength(dBuV/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note: (1) RF Voltage(dBuV)=20 log RF Voltage(uV)

(2) In the Above Table,the tighter limit applies at the band edges.

(3) Distance refers to the distance in meters between the measuring instrument antenna.

7.10 Radiated Emissions Test Result

Formula of conversion factors: the field strength at 3m was established by adding
The meter reading of the spectrum analyzer (which is set to read in units of dBuV)
To the antenna correction factor supplied by the antenna manufacturer. The antenna
Correction factors are stared in terms of dB. The gain of the pressletor was accounted
For in the spectrum analyser meter reading.

Example:

Freq(MHz)	Meter Reading +ACF=FS
33	20dBuV+10.36dB=30.36dBuV/m @3m

Radiated Emission Test Data

Test Voltage:	120VAC
Test Mode:	TX On
Temperature:	24 °C
Humidity:	52%RH
Test Result:	PASS

Remarks: 30-1000MHz radiation test no significant emissions above the equipment noise floor were detected.

1GHz-10GHz Radiated Emission Data

Frequency (MHz)	Detector	Antenna Polarization	Emission Level (dBuV/m)	FCC 15 Subpart C Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Turntable Angle (°)
915.00	AV	Vertical	90.27	94.00	3.73	1.5	90
915.00	AV	Horizontal	80.16	94.00	13.84	1.5	120
1364.41	AV	Vertical	41.60	54.00	12.4	1.5	90
1828.04	AV	Vertical	48.48	54.00	5.52	1.5	90
2744.98	AV	Vertical	38.94	54.00	15.06	1.5	120
3659.87	AV	Vertical	34.01	54.00	19.99	1.5	45
4574.94	AV	Vertical	33.17	54.00	20.83	1.5	120
5490.01	AV	Vertical	33.78	54.00	20.22	1.5	180
6404.86	AV	Vertical	32.49	54.00	21.51	1.5	90
7320.15	AV	Vertical	33.04	54.00	20.96	1.5	60
8235.00	AV	Vertical	34.15	54.00	19.85	1.5	60
9150.00	AV	Vertical	34.58	54.00	19.42	1.5	60
1364.41	AV	Horizontal	32.02	54.00	21.98	1.5	180
1830.04	AV	Horizontal	31.47	54.00	22.53	1.5	45
2744.98	AV	Horizontal	38.53	54.00	15.47	1.5	45
3659.87	AV	Horizontal	34.21	54.00	19.79	1.5	180
4574.94	AV	Horizontal	33.79	54.00	20.21	1.5	45
5490.01	AV	Horizontal	32.07	54.00	21.93	1.5	60
6404.86	AV	Horizontal	33.15	54.00	20.85	1.5	120
7320.15	AV	Horizontal	33.75	54.00	20.25	1.5	90
8235.00	AV	Horizontal	33.14	54.00	20.86	1.5	90
9150.00	AV	Horizontal	33.27	54.00	20.73	1.5	90
915.00	PK	Vertical	91.62	114.00	22.38	1.5	90
915.00	PK	Horizontal	82.52	114.00	31.48	1.5	90
1364.41	PK	Vertical	42.30	74.00	31.7	1.5	120
1830.04	PK	Vertical	48.48	74.00	25.52	1.5	120
2774.98	PK	Vertical	39.12	74.00	34.88	1.5	90
3659.87	PK	Vertical	36.12	74.00	37.88	1.5	90
4574.94	PK	Vertical	36.57	74.00	37.43	1.5	45
5490.01	PK	Vertical	35.94	74.00	38.06	1.5	60
6404.86	PK	Vertical	35.27	74.00	38.73	1.5	60
7320.15	PK	Vertical	35.45	74.00	38.55	1.5	100
8235.00	PK	Vertical	34.51	74.00	39.49	1.5	120

9150.00	PK	Vertical	33.51	74.00	40.49	1.5	120
1364.41	PK	Horizontal	34.55	74.00	39.45	1.5	45
1830.53	PK	Horizontal	33.30	74.00	40.70	1.5	90
2774.70	PK	Horizontal	39.63	74.00	34.37	1.5	180
3659.87	PK	Horizontal	32.08	74.00	41.92	1.5	120
4574.94	PK	Horizontal	32.17	74.00	41.83	1.5	45
5490.01	PK	Horizontal	33.75	74.00	40.25	1.5	180
6404.86	PK	Horizontal	33.94	74.00	40.06	1.5	120
7320.15	PK	Horizontal	33.46	74.00	40.54	1.5	90
8235.00	PK	Horizontal	34.08	74.00	39.92	1.5	90
9150.00	PK	Horizontal	34.31	74.00	39.69	1.5	90

Note: Above 1GHz,do a Peak and average measurements for all emissions,Limit for peak is 74dBuvV/m,According to Part15.35(b) and average is 54BuvV/m.

8 Band Edge

8.1 Test Equipment

Please refer to Section 5 this report.

8.2 Test Procedure

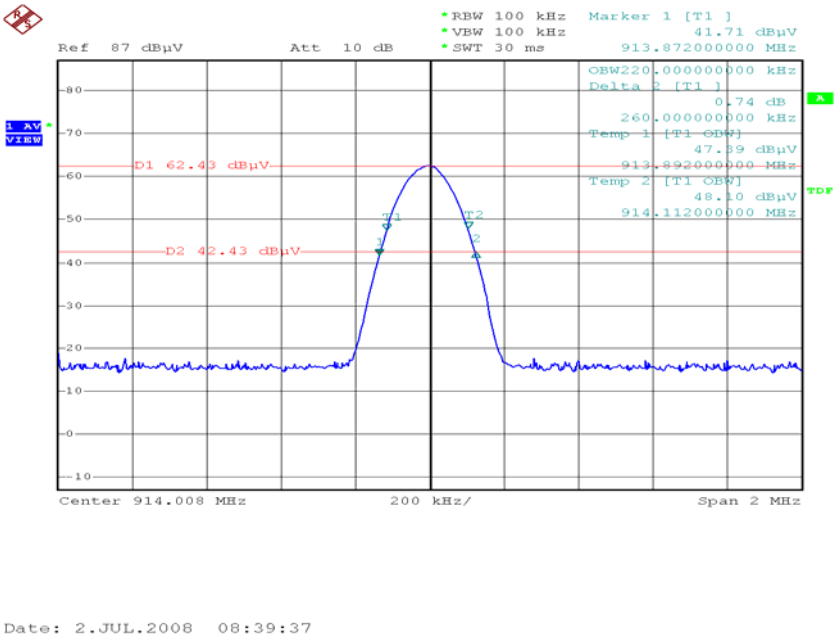
1. The EUT, peripherals were put on the turntable which table size is 1mX1.5m, table high 0.8m. All set up is according to ANSI C63.4: 2003.
2. The bandwidth of the fundamental frequency was measure by spectrum analyser with 100kHz RBW and 100kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power 20dB.

8.3 Band Edge

Requirements: FCC 15.249(d), the emission power at the START and STOP frequencies shall be at least 50dB below the level of the fundamental or to the general radiated emission limits in FCC 15.209.

8.4 Band Edge Test Result

Product Name: IPOD WIRELESS SPEAKER
Test Item: Band Edge Test
Test Voltage: 120VAC
Test Mode: TX On
Temperature: 24 °C
Humidity: 52%RH



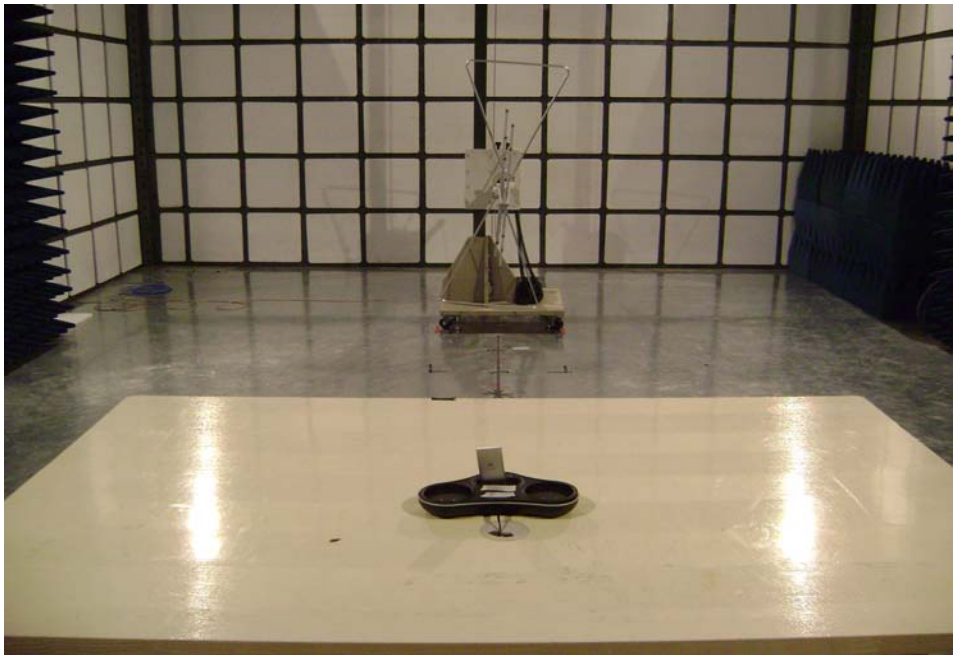
Note: (1) The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209.

(2) This device does meet the FCC requirement.

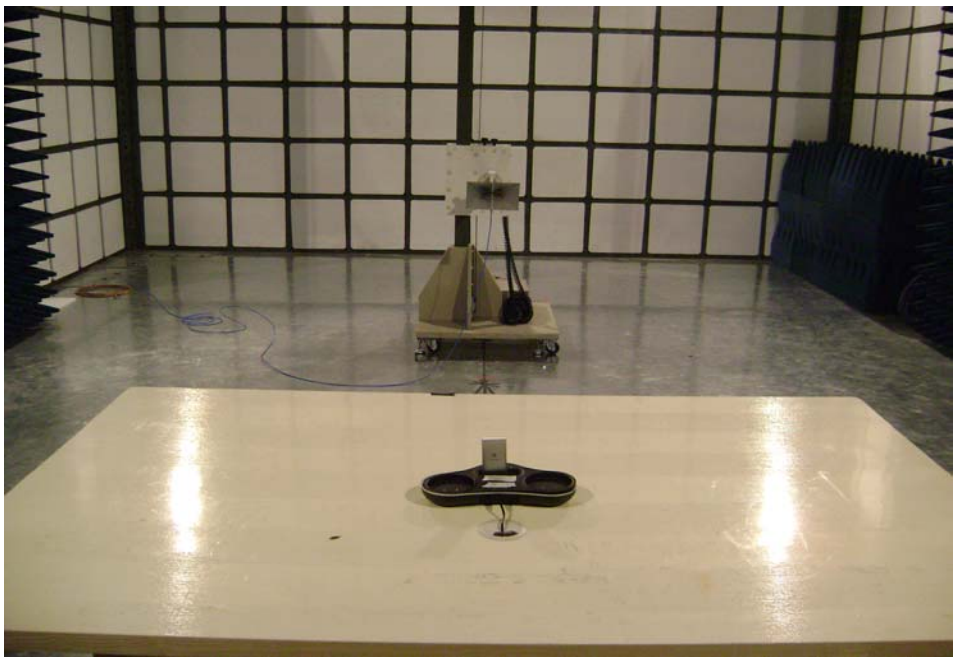
9 Photographs of Testing

9.1 Conducted Emission Test View

9.2 Radiation Emission Test View For 30MHz-1000MHz



9.3 Radiation Emission Test View For 1GHz-25GHz

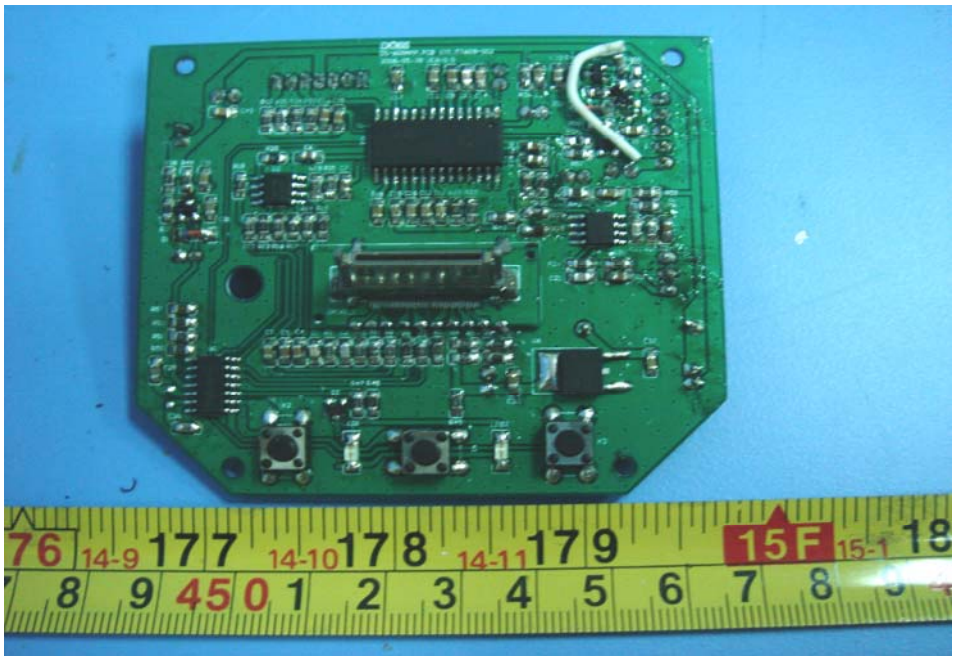


10 Photographs - Constructional Details

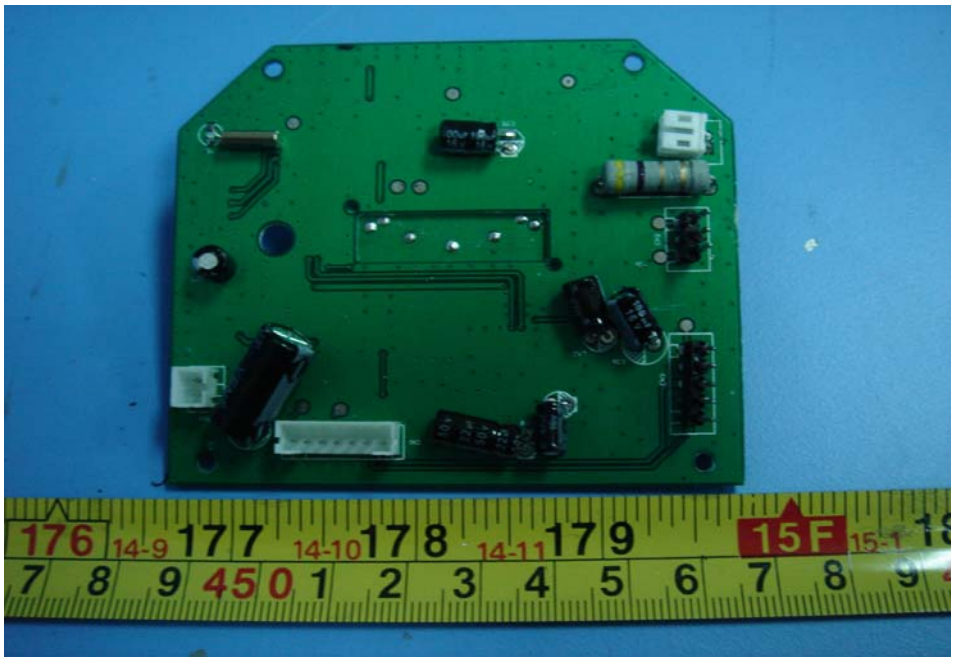
10.1 EUT - Front View

10.2 EUT - Back View

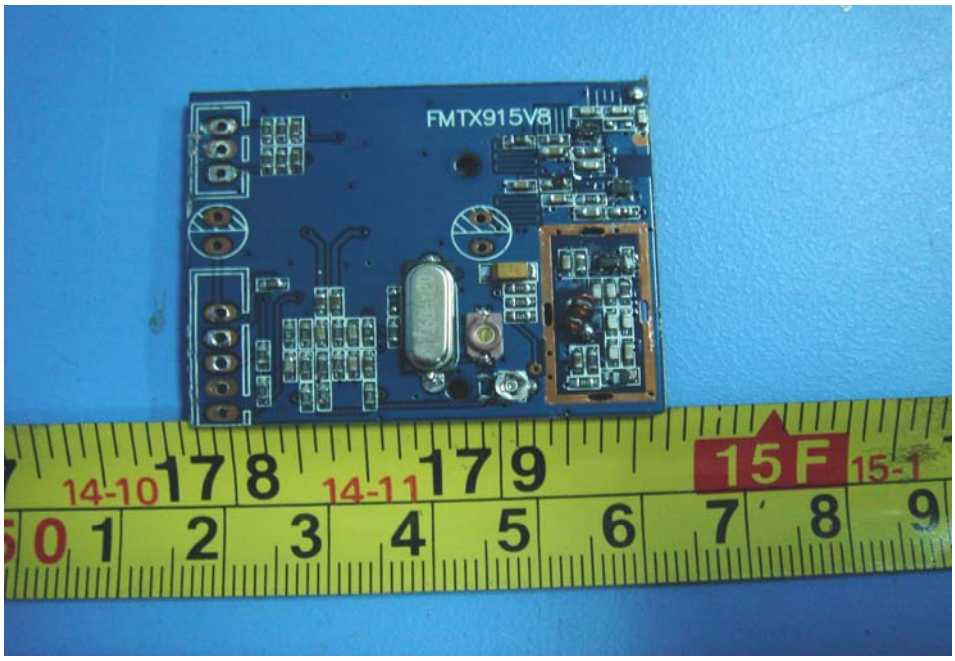
10.3 PCB1 - Front View



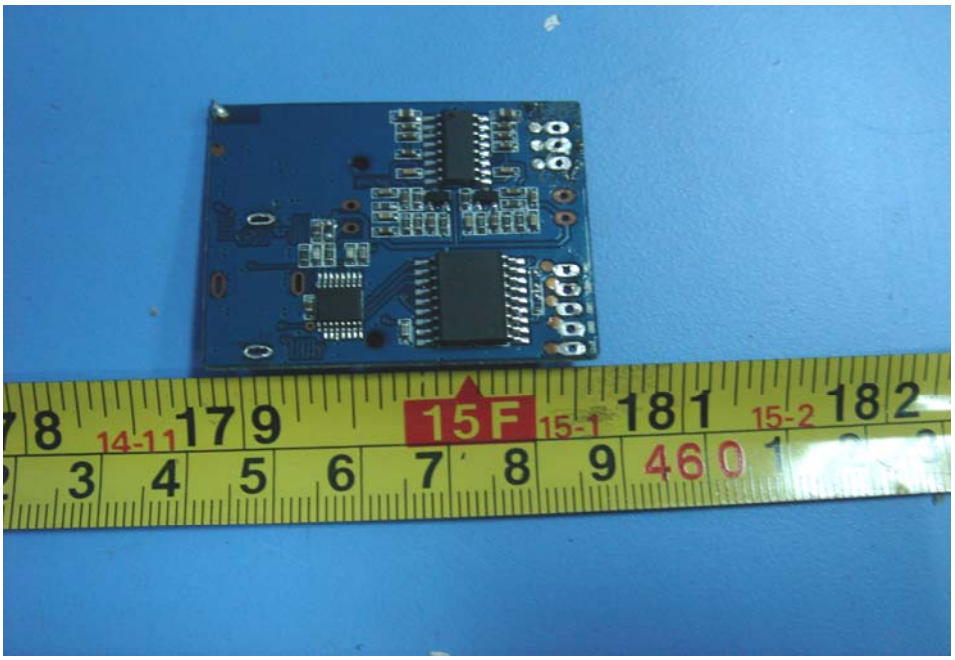
10.4 PCB1 - Back View



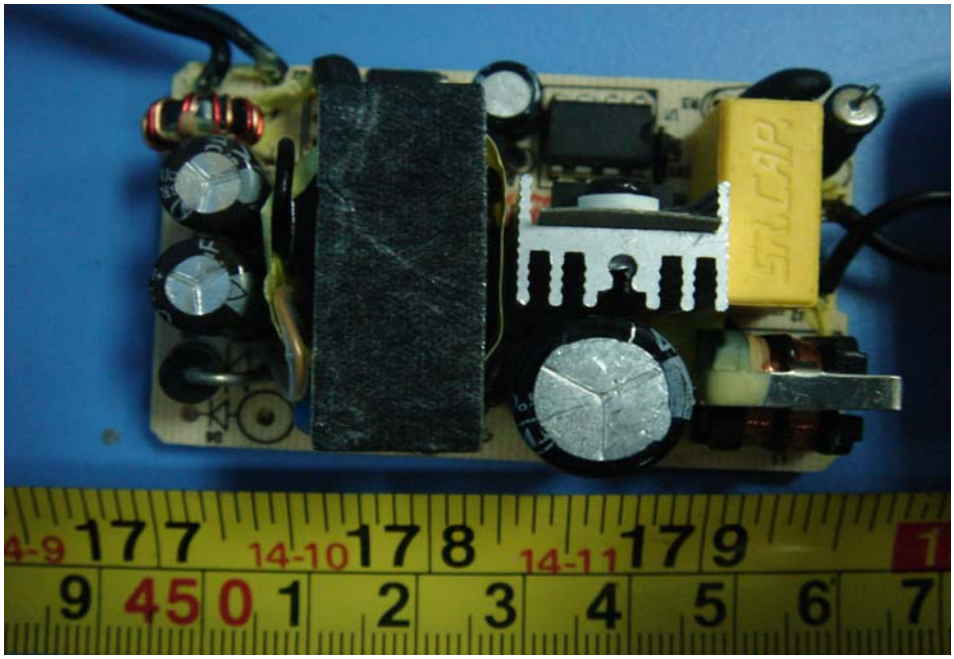
10.5 PCB2 - Front View



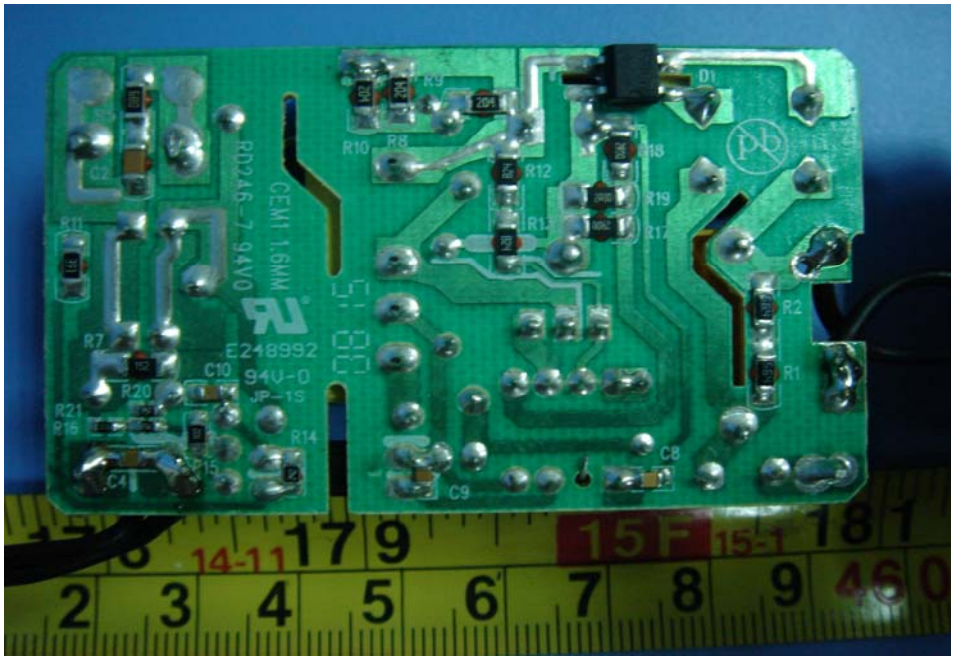
10.6 PCB2 - Back View



10.7 Adapter PCB - Front View



10.8 Adapter PCB - Back View



11 FCC ID Label

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The Label must not be a stick-on paper. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Proposed Label Location on EUT

EUT Bottom View/proposed FCC Mark Location