

FCC TEST REPORT

FCC ID : WC2DS-971

Applicant : Wonders Technology Co.,Ltd.

Adress of Applicant : DOSS Industrial Zone,Qiping Kengdu Industrial Area Guihua Village,
Guanlan Town Baoan District,ShenZhen,China.

Equipment Under Test (EUT) :

Product description : Wireless Speaker

Model No. : DS-971,EC-W130

Operation Frequency :915MHz

Modulation Type :FM

Standards : FCC 15 Paragraph 15.249

Date of Test : June 30, 2009

Test Engineer : Zero.Zhou

Reviewed By : 

PERPARED BY:

Waltek Services (Shenzhen) Co., Ltd.

1/F, Fukangtai Building, West Baima Rd., Songgang Street, Baoan District, Shenzhen
518105, China

Tel :+86-755-27553488

Fax:+86-755-27553868

2 Contents

	Page
1 COVER PAGE.....	1
2 CONTENTS.....	2
3 TEST SUMMARY.....	4
4 GENERAL INFORMATION.....	5
4.1 CLIENT INFORMATION	5
4.2 GENERAL DESCRIPTION OF E.U.T.....	5
4.3 DETAILS OF E.U.T.	5
4.4 DESCRIPTION OF SUPPORT UNITS	5
4.5 STANDARDS APPLICABLE FOR TESTING.....	5
4.6 TEST FACILITY.....	6
4.7 TEST LOCATION.....	6
5 EQUIPMENT USED DURING TEST	7
6 CONDUCTED EMISSION TEST	9
6.1 TEST EQUIPMENT.....	9
6.2 TEST PROCEDURE	9
6.3 CONDUCTED TEST SETUP	10
6.4 EUT OPERATING CONDITION	10
6.5 CONDUCTED EMISSION LIMITS	11
6.6 CONDUCTED EMISSION TEST DATA.....	11
6.7 CONDUCTED EMISSION TEST SETUP VIEW.....	13
7 RADIATION EMISSION TEST.....	14
7.1 TEST EQUIPMENT.....	14
7.2 MEASUREMENT UNCERTAINTY.....	14
7.3 TEST PROCEDURE	14
7.4 RADIATED TEST SETUP.....	15
7.5 SPECTRUM ANALYZER SETUP.....	15
7.6 CORRECTED AMPLITUDE & MARGIN CALCULATION	16
7.7 SUMMARY OF TEST RESULTS.....	16
7.8 EUT OPERATING CONDITION	16
7.9 RADIATED EMISSIONS LIMIT.....	17
7.10 RADIATED EMISSIONS TEST RESULT.....	18
7.11 RADIATED EMISSION DATA	18
8 20-DB BANDWIDTH.....	20
9 RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND	21
10 PHOTOGRAPHS OF TESTING.....	23
11 PHOTOGRAPHS - CONSTRUCTIONAL DETAILS	24

- 11.1 EUT - COMPONENT VIEW24
- 11.2 EUT - FRONT VIEW24
- 11.3 EUT - BACK VIEW25
- 11.4 EUT-PCB1 - FRONT VIEW.....25
- 11.5 EUT-PCB1 - BACK VIEW26
- 12 FCC ID LABEL.....27**

3 Test Summary

Test Items	Test Requirement	Test Method	Limit / Severity	Result
Restricted Band	FCC Part 15:2007	ANSI C63.4: 2003	Note	PASS
20-dB Bandwidth	FCC Part 15:2007	ANSI C63.4: 2003	Note	PASS
Mains Terminal Disturbance Voltage, 150kHz to 30MHz	FCC Part 15:2007	ANSI C63.4: 2003	N/A	PASS
Radiation Emission, 30MHz to 10GHz	FCC Part 15:2007	ANSI C63.4: 2003	N/A	PASS

Note : denote that for more details of the EUT , please refer to the relating test items as below .

Remark : the methods of measurement in all the test items were according to ANSI C63.4: 2003.

4 General Information

4.1 Client Information

Applicant: Wonders Technology Co.,Ltd.
Address: DOSS Industrial Zone,Qiping Kengdu Industrial Area Guihua Village, Guanlan Town Baoan District,ShenZhen,China.

Manufacturer: Wonders Technology 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: Wireless Speaker
Model No.: DS-971, EC-W130
Model Description: The components of PCB are identical except color and appearance,DS-971 is test sample.
Frequency Range 915MHz-915MHz

4.3 Details of E.U.T.

Power Supply: AC 120V/60Hz

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 Wireless Speaker. The standards used were FCC 15 Paragraph 15.249,Paragraph 15.205, 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.

- **IC – Registration No.:IC 7760**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration IC7760,July 24, 2008.

4.7 Test Location

All Emissions testswere performed at:-

1/F, Fukangtai Building,West Baima Rd.,Songgang Street, Baoan District, Shenzhen 518105, Guangdong,China.

5 Equipment Used during Test

NO	Equipment Name	Manufacturer Model	Equipment No	Internal No	Specificati on	Cal. Date	Due Date	Cert. No	Uncertain ty
1.	EMC Analyzer	Agilent/ E7405A	MY45114943	W2008001	9k-26.5GHz	Aug-08	Aug-09	Wws20081596	±1dB
2.	Trilog Broadband Antenne 30-3000 MHz	SCHWARZBEC K MESS-ELEKTROM/ VULB9163	336	W2008002	30-3000 MHz	Aug-08	Aug-09		±1dB
3.	Broad-band Horn Antenna 1-18 GHz	SCHWARZBEC K MESS-ELEKTROM/ VULB9163	667	W2008003	1-18GHz	Aug-08	Aug-09		f < 10 GHz: ±1dB 10GHz < f < 18 GHz : ±1.5dB
4.	Broadband Preamplifier 0.5-18 GHz	SCHWARZBEC K MESS-ELEKTROM/ BBV 9718	9718-148	W2008004	0.5-18GHz	Aug-08	Aug-09		±1.2dB
5.	10m Coaxial Cable with N-male Connectors usable up to 18GHz,	SCHWARZBEC K MESS-ELEKTROM/ AK 9515 H	-	-	-	Aug-08	Aug-09		-
6.	10m 50 Ohm Coaxial Cable with N-plug, individual length, usable up to 3(5)GHz, Connector	SCHWARZBEC K MESS-ELEKTROM/ AK 9513				Aug-08	Aug-09		
7.	Positioning Controller	C&C LAB/ CC-C-IF							
8.	Color Monitor	SUNSP0/ SP-14C							
9.	Test Receiver	ROHDE&SCHWARZ/ ESPI	101155	W2005001	9k-3GHz	Aug-08	Aug-09	Wws20080942	±1dB
10.	EMI Receiver	Beijingkehuan	KH3931		9k-1GHz	Aug-08	Aug-09		
11.	Two-Line V-Network	ROHDE&SCHWARZ/ ENV216	100115	W2005002	50Ω/50 μH	Aug-08	Aug-09	Wws20080941	±10%

NO	Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Cert. No	Uncertainty
12.	V-LISN	SCHWARZBEC K MESS – ELEKTRONIK	NSLK 8128	8128-259	9k- 30MHz	Aug-08	Aug- 09		
13.	Absorbing Clamp	ROHDE&SCHW ARZ/ MDS-21	100205	W200500 3	impedance 50Ω loss : 17 dB	Aug-08	Aug- 09	Wws20 080943	±1dB
14.	10m 50 Ohm Coaxial Cable with N- plug, individual length, usable up to 3(5)GHz, Connectors	SCHWARZBEC K MESS- ELEKTROM/ AK 9514				Aug-08	Aug- 09		
15.	iPod Player	A1285	5K85004U3 R0			N/A	N/A		

6 Conducted Emission Test

Test Requirement:	FCC Part15 Paragraph 15.207
Test Method:	Based on ANSI 63.4:2003
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class:	Class B
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

6.1 Test Equipment

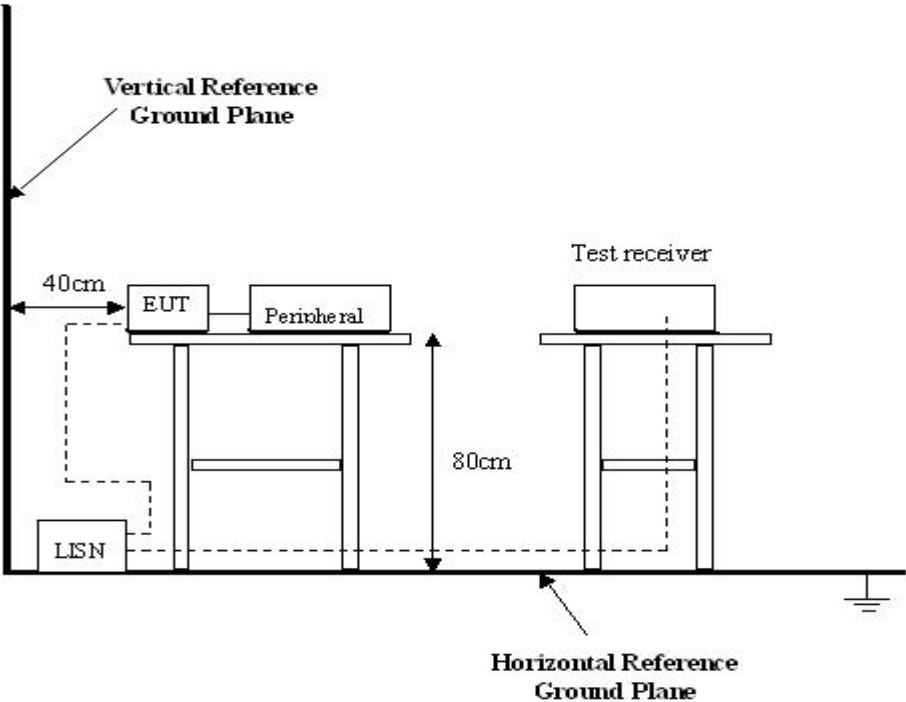
Please refer to Section 5 this report.

6.2 Test Procedure

1. The EUT was connected with signal generator and placed on a table.
2. The EUT was tested according to ANSI C63.4:2003. The frequency spectrum from 150kHz to 30MHz was investigated.
3. 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.
4. The EUT test was under the module of audio input, the device audio input source from iPod player playing with 1KHz signal.

6.3 Conducted Test Setup

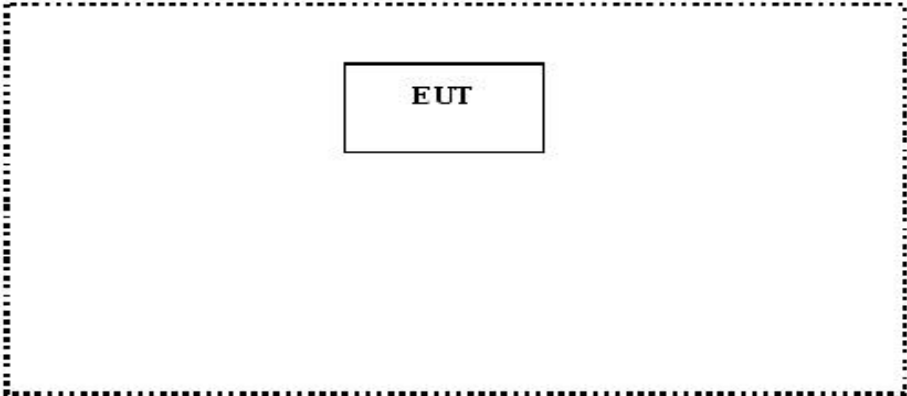
The conducted emission tests were performed using the setup accordance with the ANSI C63.4:2003, The specification used in this report was the FCC Part15 Paragraph 15.207 limits.



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 dB μ V between 0.15MHz & 0.5MHz

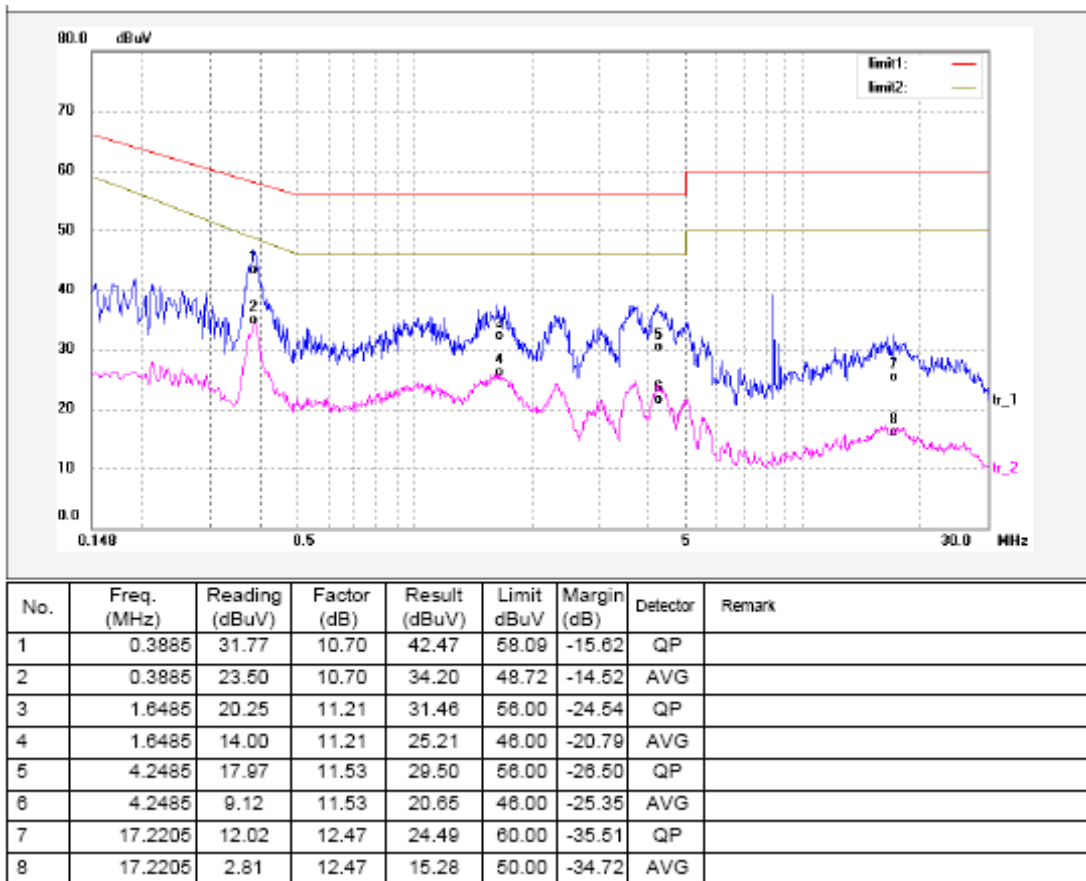
56 dB μ V between 0.5MHz & 5MHz

60 dB μ V between 5MHz & 30MHz

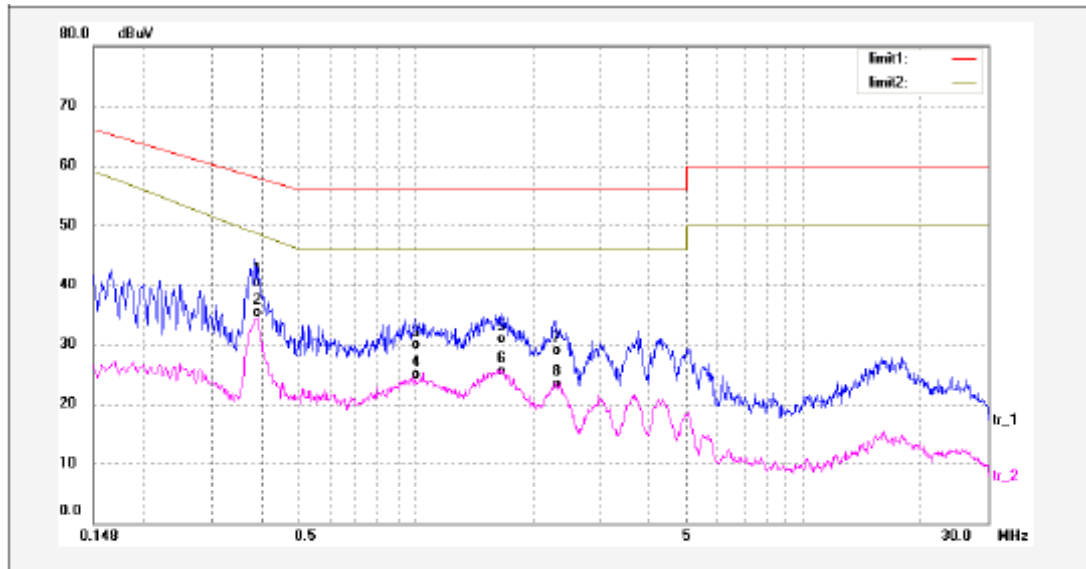
Note: In the above limits, the tighter limit applies at the band edges.

6.6 Conducted Emission Test Data

Live line



Nentual line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.3885	29.04	10.70	39.74	58.08	-18.35	QP	
2	0.3885	23.73	10.70	34.43	48.72	-14.29	AVG	
3	1.0005	17.97	11.19	29.16	56.00	-26.84	QP	
4	1.0005	12.82	11.19	24.01	46.00	-21.99	AVG	
5	1.6805	18.88	11.21	30.07	56.00	-25.93	QP	
6	1.6805	13.51	11.21	24.72	46.00	-21.28	AVG	
7	2.3085	16.84	11.26	28.10	56.00	-27.90	QP	
8	2.3085	11.21	11.26	22.47	46.00	-23.53	AVG	

6.7 Conducted Emission Test Setup View



7 Radiation Emission Test

Test Requirement:	FCC Part15 Paragraph 15.249
Test Method:	Based on ANSI 63.4:2003
Test Result:	PASS
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 center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

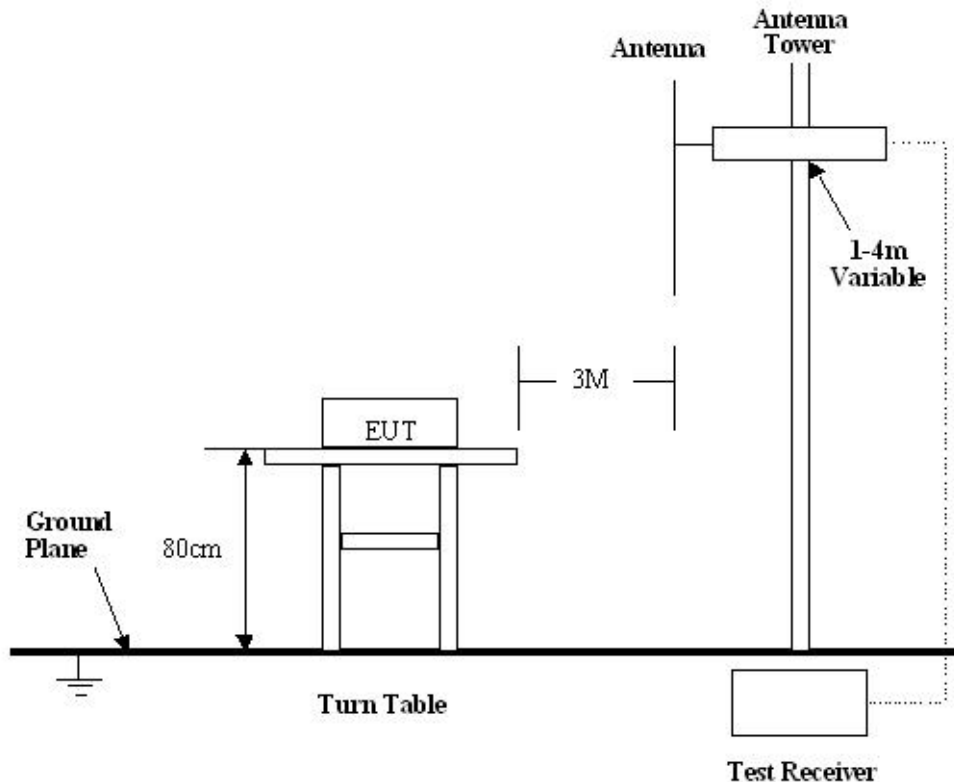
Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at WALTEK SERVICES EMC Lab is ± 5.03 dB.

7.3 Test Procedure

1. the adapter was used in the equipment under test for radiated emissions test.
2. Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.
3. All data was recorded in the peak and average detection mode.
4. The EUT was under working mode during the final qualification test and the configuration was used to represent the worst case results.
5. The EUT test was under the module of audio input, the device audio input source from iPod player playing with 1KHz signal.

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 15.209 limits and Paragraph 15.249 limits.



7.5 Spectrum Analyzer Setup

According to FCC Part15 Paragraph 15.249 Rules, the system was tested to 10000 MHz. Below 1GHz

Start Frequency	30 MHz
Stop Frequency	1000 MHz
Sweep Speed	Auto
IF Bandwidth.....	120 KHz
Video Bandwidth.....	100KHz
Quasi-Peak Adapter Bandwidth	120 KHz
Quasi-Peak Adapter Mode.....	Normal
Resolution Bandwidth	100KHz

Above 1GHz

Start Frequency	1000 MHz
Stop Frequency	10000MHz
Sweep Speed	Auto
IF Bandwidth.....	120 KHz
Video Bandwidth	1MHz
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:

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

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

$$\text{Margin} = \text{Corr. Ampl.} - \text{Class B Limit}$$

7.7 Summary of Test Results

According to the data in section 7.11, the EUT complied with the FCC Part15 Paragraph 15.249 standards.

7.8 EUT Operating Condition

The same as section 6.4 of this report.

Let the EUT work in test mode and test it.

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 instrumentation 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 74dBuV/m, According to Part 15.35(b) and average is 54BuV/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) $RF\ Voltage(dBuV) = 20 \log_{10} RF\ Voltage(uV)$
- (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.

915	AV	Horizontal	77.58	94.00	6.42	1.4	100
1830	AV	Horizontal	40.25	54.00	13.75	1.6	10
2745	AV	Horizontal	34.02	54.00	19.98	1.8	60
3660	AV	Horizontal	32.03	54.00	21.97	1.0	40
4575	AV	Horizontal	34.21	54.00	19.79	1.8	135
5490	AV	Horizontal	30.36	54.00	23.64	1.0	60
6405	AV	Horizontal	30.74	54.00	23.26	1.8	0
7320	AV	Horizontal	31.22	54.00	22.78	1.5	90
8235	AV	Horizontal	31.53	54.00	22.47	1.5	60
9150	AV	Horizontal	32.75	54.00	21.25	1.0	0
915	PK	Vertical	85.58	114.00	18.42	1.2	0
1830	PK	Vertical	46.00	74.00	28.00	1.1	10
2745	PK	Vertical	38.01	74.00	35.99	1.4	120
3660	PK	Vertical	37.42	74.00	36.58	1.7	120
4575	PK	Vertical	35.63	74.00	38.37	1.0	180
5490	PK	Vertical	36.22	74.00	37.78	1.5	0
6405	PK	Vertical	35.89	74.00	38.11	1.0	120
7320	PK	Vertical	38.67	74.00	35.33	1.8	0
8235	PK	Vertical	38.78	74.00	35.22	1.5	0
9150	PK	Vertical	33.02	74.00	40.98	1.2	50
915	PK	Horizontal	83.24	114.00	20.76	1.3	0
1830	PK	Horizontal	41.26	74.00	32.74	1.2	40
2745	PK	Horizontal	36.25	74.00	33.75	1.5	100
3660	PK	Horizontal	37.33	74.00	36.67	1.0	90
4575	PK	Horizontal	33.19	74.00	40.81	1.0	60
5490	PK	Horizontal	33.62	74.00	40.38	1.5	60
6405	PK	Horizontal	30.73	74.00	43.27	1.8	110
7320	PK	Horizontal	33.57	74.00	40.43	1.8	180
8235	PK	Horizontal	34.00	74.00	40.00	1.8	0
9150	PK	Horizontal	35.81	74.00	38.19	1.0	20

8 20-dB Bandwidth

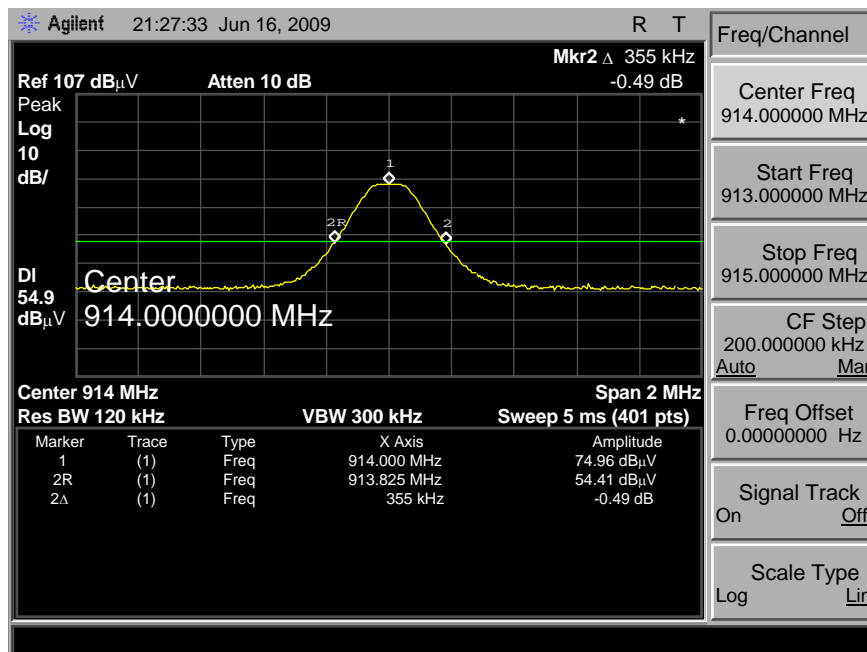
Test Requirement: FCC Part15 C
 Test Method: Based on FCC Part15 Paragraph 15.249
 Test Result: PASS
 Test mode: The EUT work in test mode(Tx) and test it

Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
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.

Test Result

Please refer the graph as below:



9 Radiated spurious emissions into adjacent restricted band

Test Requirement: FCC Part15 Paragraph 15.205
 Test Method: Based on FCC Part 15 Paragraph 15.249
 Test Result: PASS
 Requirements: The EUT work in test mode(Tx) and test it

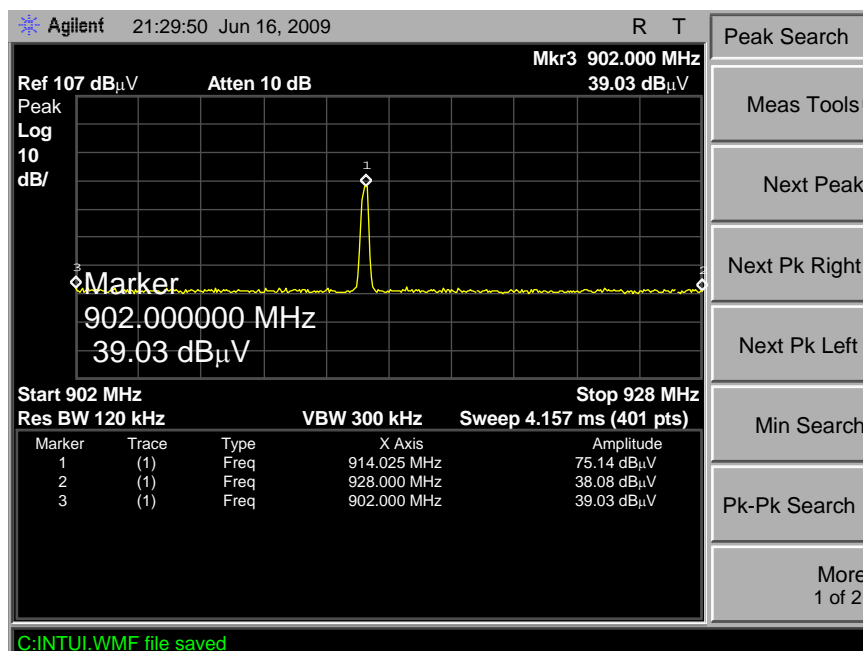
Requiments:

Emissions that fall in the restricted bands(15.205).Above 1000MHz, compliance with the emissions limits in section 15.209 shall be demonstrated based on the average value of the measured emissions,The provisions in section 15.35apply to these measurements.

Test procedure:

An in band field strength measurement of the fundamental emission using the RBW and detector function required by C63.4-2003 and FCC Rules.The procedure was repeated with an average detector and a plot made.The calculated field strength in the adjacent restricted band is presented below.

restricted band



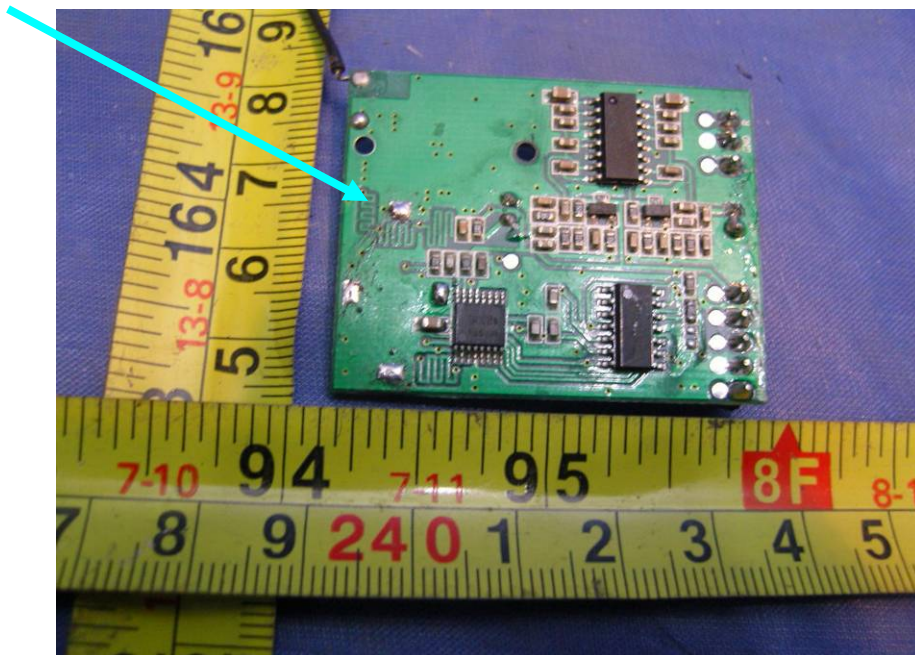
10 Antenna Requirement

According to FCC PART 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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

Antenna Description

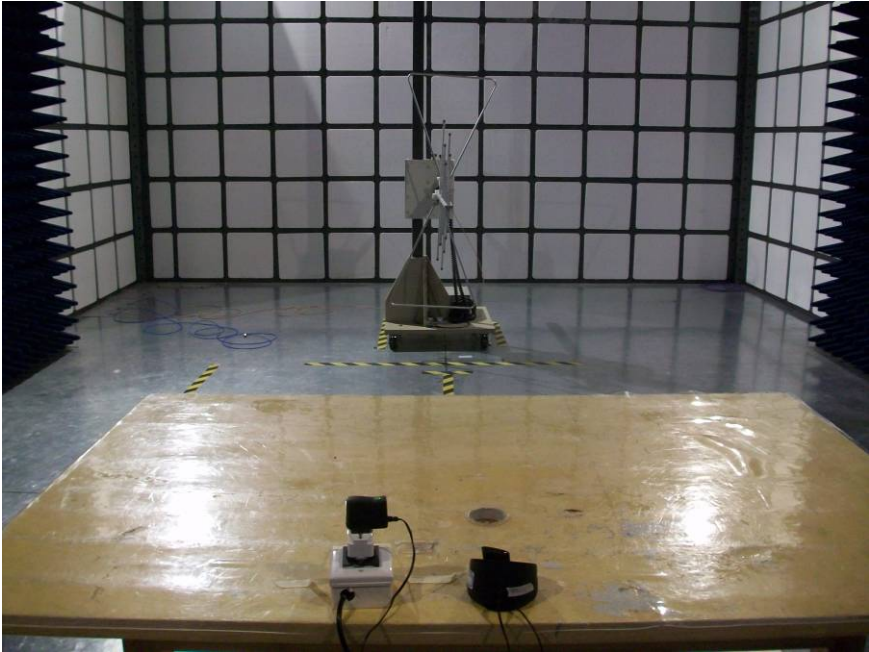
Antenna Type	Connector	Requirement/FCC PART15.203
Printed Antenna	Fixed(On Board)	Compliant

Antenna Location

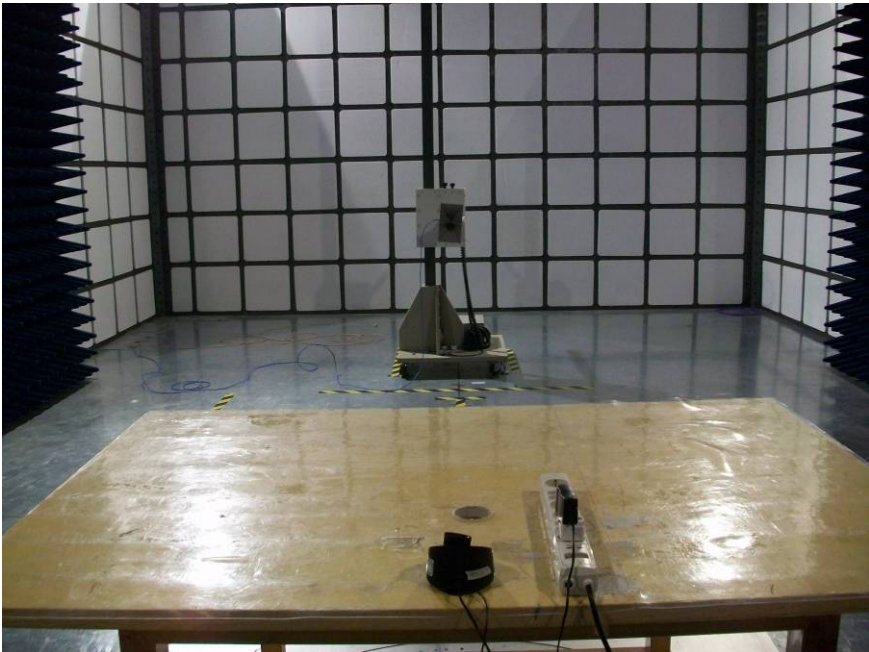


11 Photographs of Testing

Radiation Emission Test View For 30MHz-1000MHz



Radiation Emission Test View For 1GHz-1000GHz



12 Photographs - Constructional Details

12.1 EUT - Component View



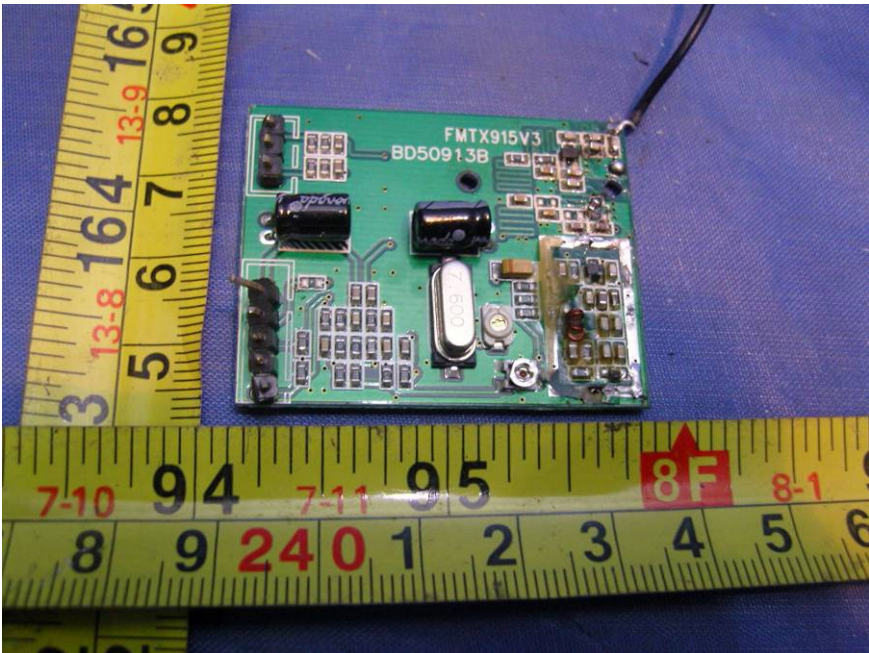
12.2 EUT - Front View



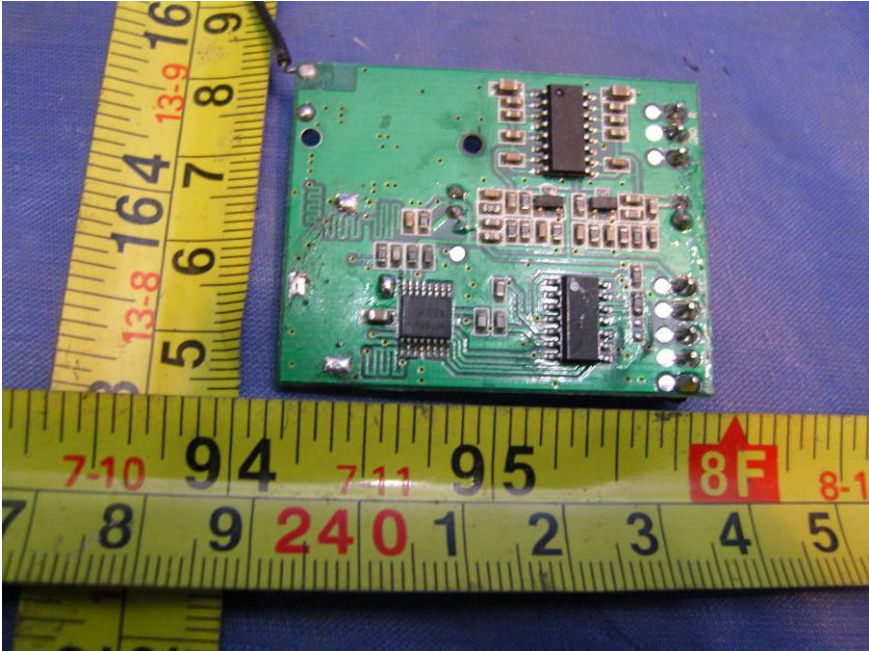
12.3 EUT - Back View



12.4 EUT-PCB1 - Front View



12.5 EUT-PCB1 - Back View



13 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

