FCC TEST REPORT

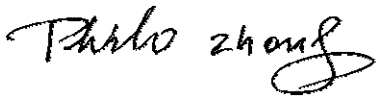
FCC ID : ZTJ-UH5
Applicant : Shenzhen Uniwisdom Technologies Co., Ltd.
Address : Bldg.91-94 3rd Industrial Zone, Lisonglang, Gongming Town, Bao'an District, Shenzhen, P.R.China

Equipment Under Test (EUT) :
Product Name : Wireless Microphone System
Model No. : UH-5; PV-1 U1 HH(Transmitter)

Standards : FCC Part 15 Subpart C:2009

Date of Test : July 18, 2011 ~ July 20, 2011
Date of Issue : July 26, 2011

Test Engineer : Hunk yan 

Reviewed By : Philo zhong 

Test Result	**: PASS**

Prepared 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

✧ The sample detailed above has been tested to the requirements of Council Directives ANSI C63.4:2003. The test results have been reviewed against the Directives above and found to meet their essential requirements.

2 Test Summary

FCC Part 15 Subpart C Requirements			
Test Items	**Test Requirement**	**Test Method**	**Result**
Conducted Emission (150KHz to 30MHz)	FCC Part 15.207	ANSI C63.4: 2003	N/A
Radiated Emission (30MHz to 10GHz)	FCC Part 15.209	ANSI C63.4: 2003	PASS
20dB Bandwidth	FCC Part 15.249	ANSI C63.4: 2003	PASS

3 Contents

4 General Information

4.1 Client Information

Applicant	: Shenzhen Uniwisdom Technologies Co., Ltd.
Address of Applicant	: Bldg.91-94 3rd Industrial Zone, Lisonglang, Gongming Town, Bao'an District, Shenzhen, P.R.China
Manufacturer	: Shenzhen Uniwisdom Technologies Co., Ltd.
Address of Manufacturer	: Bldg.91-94 3rd Industrial Zone, Lisonglang, Gongming Town, Bao'an District, Shenzhen, P.R.China

4.2 General Description of E.U.T.

Product Name	: Wireless Microphone System
Model No.	: UH-5; PV-1 U1 HH(Transmitter)
Differences describe	: The two models have the same circuit and apparence, they only have different model number.
Operation Frequency	: 906MHz ~ 928MHz

4.3 Details of E.U.T.

Technical Data:	: DC 9.0V Battery

4.4 Description of Support Units

The EUT has been tested as an independent unit. All the test was performed in the condition of DC 9.0V input.

4.5 Standards Applicable for Testing

The customer requested FCC tests for a Wireless Microphone System. The standards used were FCC Part 15 Subpart C:2009.

4.6 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: IC7760A**
  Waltek Services(Shenzhen) Co., Ltd. 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 7760A, Aug.03, 2010.

- **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, May 26, 2011.

4.7 Test Location

All the tests were performed at:
Waltek Services(Shenzhen) Co., Ltd. at 1/F, Fukangtai Building, West Baima Rd.,Songgang Street, Baoan District, Shenzhen, China

5 Equipment Used during Test

Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Cert. No	Uncertainty
EMC Analyzer	Agilent/ E7405A	MY45114943	W2008001	9k-26.5GHz	Aug-2010	Aug-2011	Wws20081596	±1dB
Trilog Broadband Antenne	SCHWARZBECK MESS-ELEKTROM / VULB9163	336	W2008002	30-3000 MHz	Aug-2010	Aug-2011	-	±1dB
Broad-band Horn Antenna	SCHWARZBECK MESS-ELEKTROM / BBHA 9120D(1201)	667	W2008003	1-18GHz	Aug-2010	Aug-2011	-	f＜10 GHz：±1dB 10GHz＜f＜18 GHz：±1.5dB
Broadband Preamplifier	SCHWARZBECK MESS-ELEKTROM / BBV 9718	9718-148	W2008004	0.5-18GHz	Aug-2010	Aug-2011	-	±1.2dB
10m Coaxial Cable with N-male Connectors	SCHWARZBECK MESS-ELEKTROM / AK 9515 H	-	-	-	Aug-2010	Aug-2011	-	-
10m 50 Ohm Coaxial Cable	SCHWARZBECK MESS-ELEKTROM / AK 9513	-	-	-	Aug-2010	Aug-2011	-	-
Positioning Controller	C&C LAB/ CC-C-IF	-	-	-	N/A	N/A	-	-
Color Monitor	SUNSPO/ SP-14C	-	-	-	N/A	N/A	-	-
Test Receiver	ROHDE&SCHWARZ/ ESPI	101155	W2005001	9k-3GHz	Aug-2010	Aug-2011	Wws20080942	±1dB
EMI Receiver	Beijingkehuan	KH3931	-	9k-1GHz	Aug-2010	Aug-2011	-	-
Two-Line V-Network	ROHDE&SCHWARZ/ ENV216	100115	W2005002	50Ω/50μH	Aug-2010	Aug-2011	Wws20080941	±10%
Digital Power Analyzer	Em Test AG/Switzerland/ DPA 500	V0745103095	W2008012	Power：2000VA Vol-range：0-300V Freq_range：10-80Hz	Aug-2010	Aug-2011	Wwd20081185	Voltage distinguish:0.025% Power_freq distinguish:0.02Hz
Power Source	Em Test AG/Switzerland/ ACS 500	V0745103096	W2008013	Vol-range：0-300V Power_freq：10-80Hz				

Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Cert. No	Uncertainty
RF Generator	TESEQ GmbH/ NSG4070	25781	W2008008	Fraq-range：9K-1GHz RF voltage：-60 dBm-+10dBm	Aug-2010	Aug-2011	Wws20081890	Power_freq distinguish0.1Hz RFeletricity distinguish 0.1 B
CDN M-Type	TESEQ GmbH/ CDN M016	25112	W2008009	Voltage correct factor 9.5 dB	Aug-2010	Aug-2011	Wwc20082396	150K-80MHz：±1dB 80-230MHz:-2-+3dB
EM-Clamp	TESEQ GmbH/ KEMZ 801	25453	W2008010	Freq_range：0.15-1000 MHz	Aug-2010	Aug-2011	Wwc20082397	0.3-400 MHz：±4dB Other freq：±5dB
Attenuator 6dB	TESEQ GmbH/ ATN6050	25365	-	-	Aug-2010	Aug-2011	Wws20081597	-
All Modules Generator	SCHAFFNER/6150	34579	W2008006	voltage:200V-4.4KV Pulse current：100A-2.2KA	Aug-2010	Aug-2011	Wwc20082401	voltage: ±10% Pulse current：±10%
Capacitive Coupling Clamp	SCHAFFNER/ CDN 8014	25311	-	-	Aug-2010	Aug-2011	Wwc20082398	-
Signal and Data Line Coupling Network	SCHAFFNER/ CDN 117	25627	W2008011	1.2/50μS	Aug-2010	Aug-2011	Wwc20082399	-

6 Antenna Requirement

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

7 Conducted Emission

Test Requirement:	FCC Part15.207
Test Method:	ANSI C63.4:2003
Test Result:	N/A

Remark: Because the EUT is DC input, this test is not applicable.

8 Radiation Emission Data

Test Requirement:	FCC Part15.249
Test Method:	ANSI C63.4:2003
Test Result:	PASS
Frequency Range:	30MHz to 10GHz
Measurement Distance:	3m

8.1 Test Equipment

Plesse refer to Section 5 of this report.

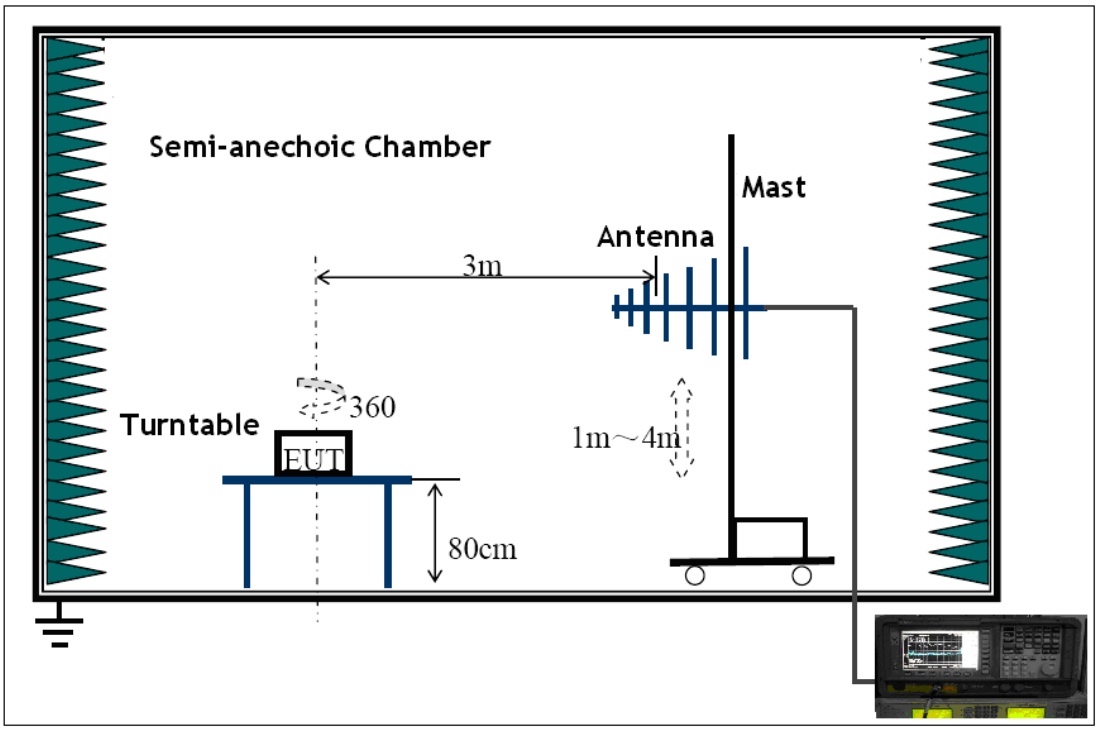
8.2 Measurement Uncertainty

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 EMC Lab is $\pm$5.03dB.

8.3 EUT 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 Part15.249 and Part 15.209 limits.



The EUT was placed on the test table in shielding room.

8.4 Spectrum Analyzer Setup

According to FCC Part15 B Rules, the system was tested 30 to 10000MHz.

Below 1GHz

Start Frequency	30 MHz
Stop Frequency	1000MHz
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

8.5 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X(normal uses) axis positioning. And all the modes was tested in the report.Only the worst case is shown in the report.

8.6 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

8.7 Radiated Emissions Limit

A. FCC Part 15.249 Limit

Fundamental Frequency (MHz)	Field Strength of Fundamental		Field Strength of Harmonic	
	mV/m	dBuV/m	uV/m	dBuV/m
902 – 928	50	94	500	54
2400 – 2483.5	50	94	500	54
5725 – 5875	50	94	500	54
24000 - 24250	250	108	2500	68

Note : (1) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
(2)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.
(3) 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.
(4) 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

B. FCC Part 15.209 Limit

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) In the Above Table,the tighter limit applies at the band edges.
(2) Distance refers to the distance in meters between the measuring instrument antenna.

8.8 Test Results

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 Mode:	TX On
Temperature:	25.5 °C
Humidity:	51%RH
Test Result:	PASS

Test Data

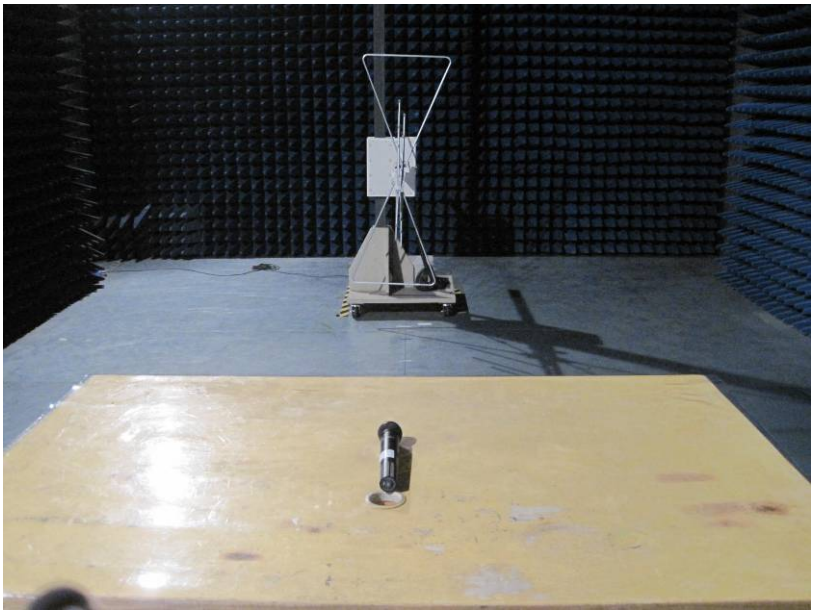
Frequency (MHz)	Detector	Ant. Pol	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Turntable Angle (°)
Low Channel: 906MHz							
906.00	Peak	V	104.42	114.00	-9.58	1.0	95
1812.00	Peak	V	48.28	74.00	-25.72	1.1	270
2718.00	Peak	V	46.37	74.00	-27.63	1.0	160
4530.00	Peak	V	44.72	74.00	-29.28	1.2	220
6342.00	Peak	V	44.26	74.00	-29.74	1.1	180
8154.00	Peak	V	42.15	74.00	-31.85	1.4	210
906.00	Peak	H	96.25	114.00	-17.75	1.8	240
1812.00	Peak	H	47.33	74.00	-26.67	1.5	80
2718.00	Peak	H	46.39	74.00	-27.61	2.0	190
4530.00	Peak	H	46.12	74.00	-27.88	2.2	140
6342.00	Peak	H	44.13	74.00	-29.87	1.9	60
8154.00	Peak	H	41.86	74.00	-32.14	1.7	310
906.00	AVG	V	88.52	94.00	-5.48	1.0	95
1812.00	AVG	V	37.14	54.00	-16.86	1.1	270
2718.00	AVG	V	36.12	54.00	-17.88	1.0	160
4530.00	AVG	V	32.15	54.00	-21.85	1.2	220
6342.00	AVG	V	31.87	54.00	-22.13	1.1	180
8154.00	AVG	V	30.61	54.00	-23.39	1.4	210
906.00	AVG	H	84.37	94.00	-9.63	1.8	240
1812.00	AVG	H	36.24	54.00	-17.76	1.5	80
2718.00	AVG	H	34.26	54.00	-19.74	2.0	190
4530.00	AVG	H	33.75	54.00	-20.25	2.2	140
6342.00	AVG	H	32.20	54.00	-21.80	1.9	60
8154.00	AVG	H	30.47	54.00	-23.53	1.7	310
Middle Channel: 915.4MHz							
915.40	Peak	V	104.14	114.00	-9.86	1.2	100
1830.80	Peak	V	49.52	74.00	-24.48	1.4	120

2746.20	Peak	V	47.81	74.00	-26.19	1.5	280
4577.00	Peak	V	45.12	74.00	-28.88	1.3	75
6407.80	Peak	V	44.32	74.00	-29.68	1.1	160
8238.60	Peak	V	42.14	74.00	-31.86	1.5	240
915.40	Peak	H	94.96	114.00	-19.04	2.0	90
1830.80	Peak	H	48.02	74.00	-25.98	1.8	160
2746.20	Peak	H	45.89	74.00	-28.11	1.9	80
457 7.00	Peak	H	43.15	74.00	-30.85	2.2	270
6407.80	Peak	H	41.76	74.00	-32.24	2.1	300
8238.60	Peak	H	41.12	74.00	-32.88	1.7	210
915.40	AVG	V	88.36	94.00	-5.64	1.2	100
1830.80	AVG	V	38.78	54.00	-15.22	1.4	120
2746.20	AVG	V	35.32	54.00	-18.68	1.5	280
4577.00	AVG	V	34.55	54.00	-19.45	1.3	75
6407.80	AVG	V	32.50	54.00	-21.50	1.1	160
8238.60	AVG	V	31.02	54.00	-22.98	1.5	240
915.40	AVG	H	82.64	94.00	-11.36	2.0	90
1830.80	AVG	H	36.10	54.00	-17.90	1.8	160
2746.20	AVG	H	33.58	54.00	-20.42	1.9	80
4577.00	AVG	H	32.14	54.00	-21.86	2.2	270
6407.80	AVG	H	30.03	54.00	-23.97	2.1	300
8238.60	AVG	H	29.95	54.00	-24.05	1.7	210
High Channel: 927.2MHz							
927.20	Peak	V	103.96	114.00	-10.04	1.5	250
1854.40	Peak	V	49.27	74.00	-24.73	1.2	130
2781.60	Peak	V	48.74	74.00	-25.26	1.0	230
4636.00	Peak	V	46.60	74.00	-27.40	1.4	140
6490.40	Peak	V	45.84	74.00	-28.16	1.6	40
8344.80	Peak	V	43.42	74.00	-30.58	1.0	200
927.20	Peak	H	94.15	114.00	-19.85	2.4	210
1854.40	Peak	H	47.21	74.00	-26.79	2.1	140
2781.60	Peak	H	46.08	74.00	-27.92	1.9	220
4636.00	Peak	H	45.14	74.00	-28.86	1.7	50

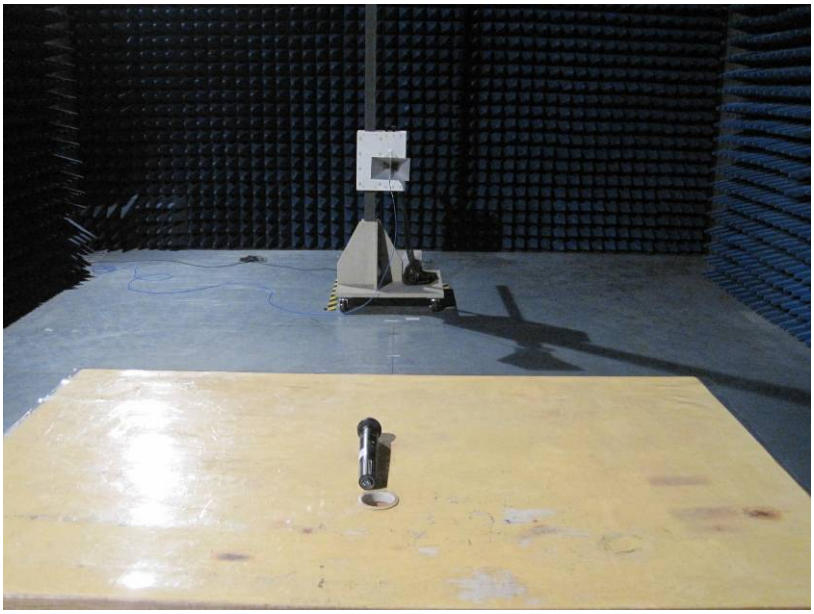
6490.40	Peak	H	43.09	74.00	-30.91	2.0	330
8344.80	Peak	H	42.22	74.00	-31.78	2.2	80
927.20	AVG	V	87.98	94.00	-6.02	1.5	250
1854.40	AVG	V	38.16	54.00	-15.84	1.2	130
2781.60	AVG	V	36.95	54.00	-17.05	1.0	230
4636.00	AVG	V	34.48	54.00	-19.52	1.4	140
6490.40	AVG	V	33.59	54.00	-20.41	1.6	40
8344.80	AVG	V	31.19	54.00	-22.81	1.0	200
927.20	AVG	H	83.25	94.00	-10.75	2.4	210
1854.40	AVG	H	35.33	54.00	-18.67	2.1	140
2781.60	AVG	H	34.11	54.00	-19.89	1.9	220
4636.00	AVG	H	33.51	54.00	-20.49	1.7	50
6490.40	AVG	H	31.74	54.00	-22.26	2.0	330
8344.80	AVG	H	30.36	54.00	-23.64	2.2	80

8.9 Photograph – Radiation Emission Test Setup

Below 1GHz



Above 1GHz



9 20 dB Bandwidth

9.1 Test Equipment

Please refer to Section 5 of this report

9.2 Test Procedure

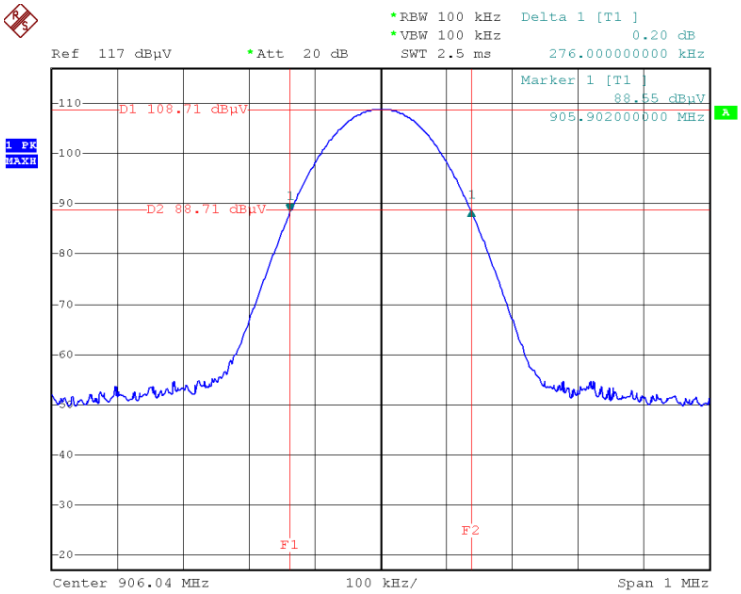
1. The EUT, peripherals were put on the turntable which table size is 1mX1.5m, table high 0.8m. All set up is according to ANSI C63.4: 2003.

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.

9.3 Test Result

Frequency (MHz)	Bandwidth (kHz)
906.0	276
915.4	276
927.2	274

Remark: The follow graph show the worst case 906MHz only.



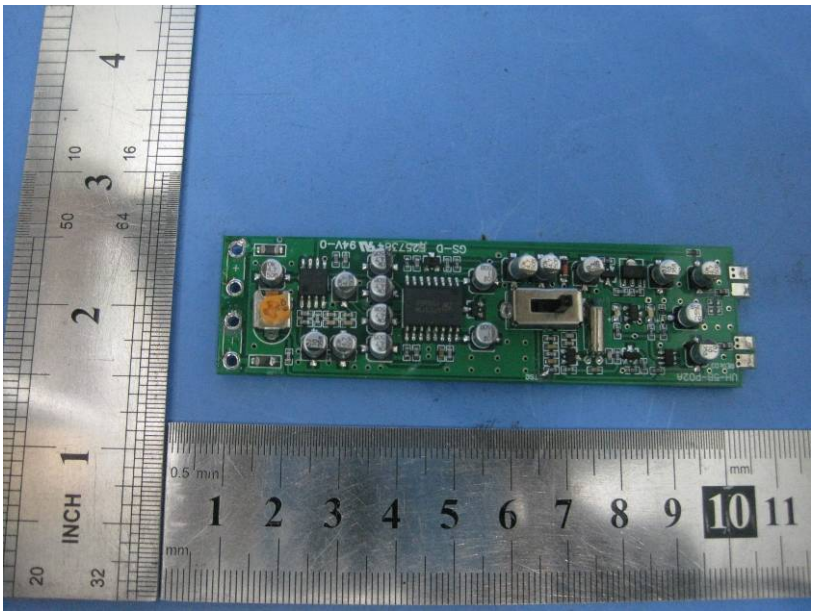
10 Photographs - Constructional Details

10.1 EUT – Front View

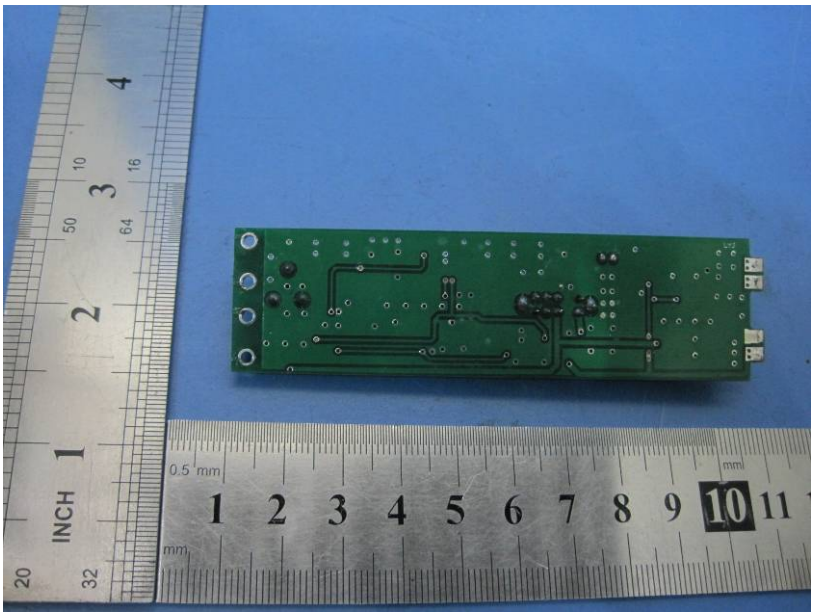
10.2 EUT – Back View

10.3 EUT – Open View

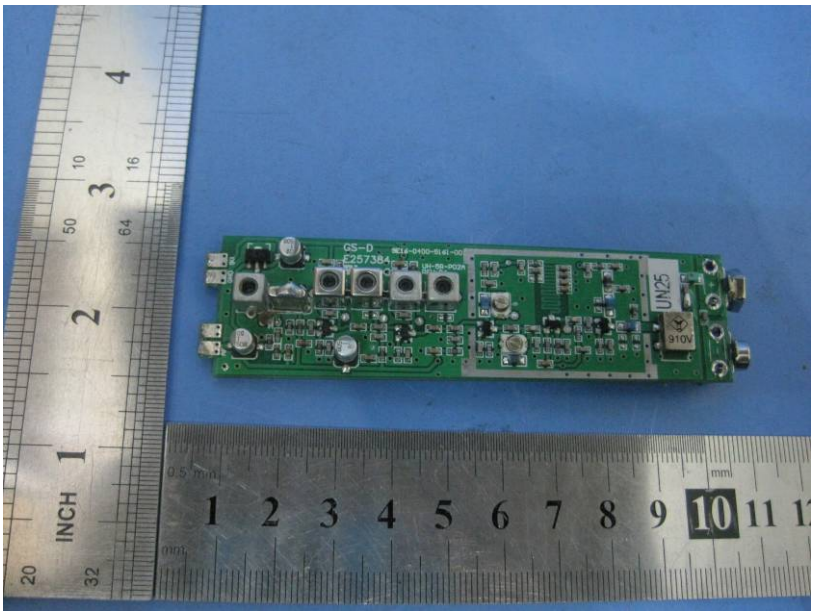
10.4 PCB1 – Front View



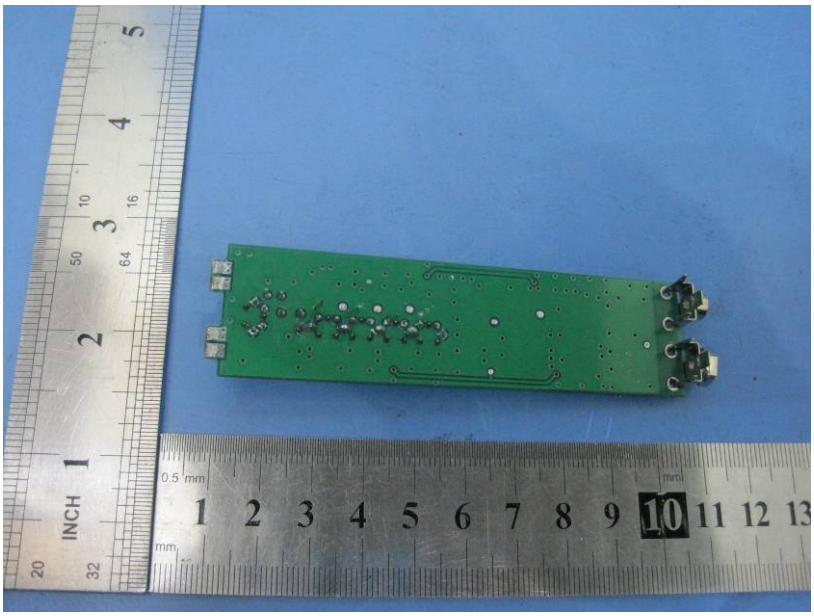
10.5 PCB1 – Back View



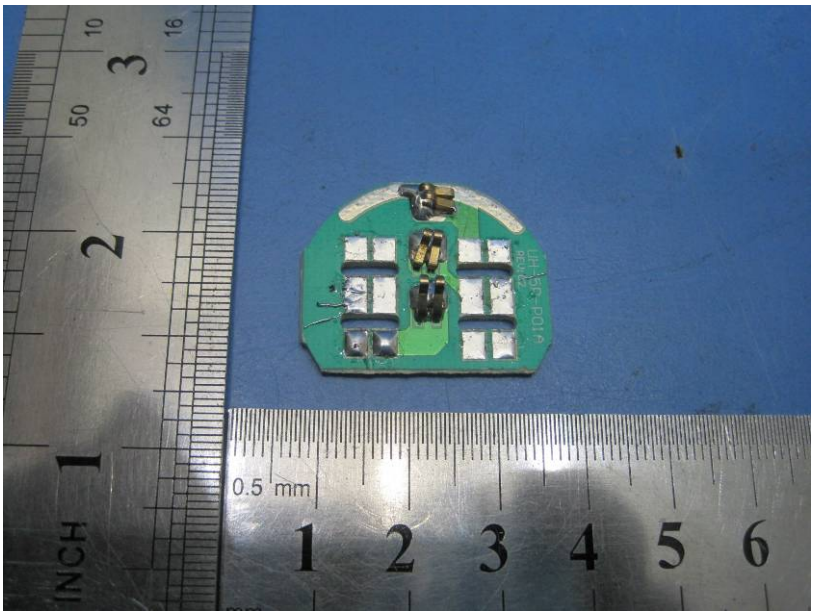
10.6 PCB2 – Front View



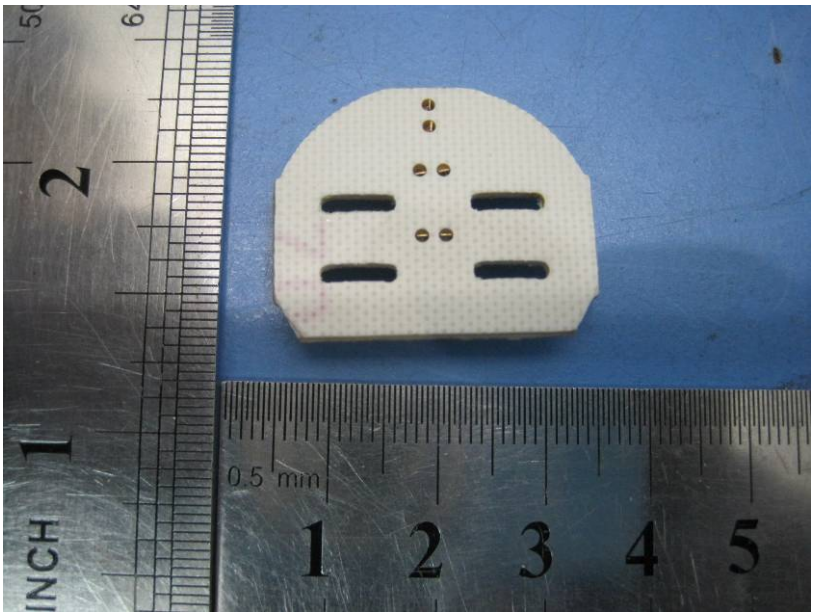
10.7 PCB2 – Back View



10.8 PCB3 – Front View



10.9 PCB3 – Back View



11 FCC 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.