



# FCC TEST REPORT

Prepared For :	AC INTERNATIONAL CORP.
Product Name:	Wireless Transmitter Set
Model :	DWP-PCWTX
Prepared By :	Shenzhen BATT Testing Technology Co., Ltd. 11F, Bldg.B, Xinbaoyuan, Xinnanhu Commercial city, Bao'an District, Shenzhen, Guangdong, China. Tel: 86-755-27753991 Fax: 86-755-27754182
Test Date:	March 12,2014 to March 28, 2014
Date of Report :	March 31, 2014
Report No.:	BATT201403088FCC

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# 1 TEST CERTIFICATION

<b>Product:</b>	Wireless Transmitter Set
<b>Model:</b>	DWP-PCWTX
<b>Applicant:</b>	AC INTERNATIONAL CORP. 15830 EL PRADO RD., # B CHINO, CA 91708
<b>Factory:</b>	AC INTERNATIONAL CORP. 15830 EL PRADO RD., # B CHINO, CA 91708
<b>Trade Mark:</b>	
<b>Tested:</b>	March 12, 2014 to March 28, 2014
<b>Test Voltage:</b>	DC12V Powered by power supply
<b>Operational Frequency Range:</b>	915.55MHz
<b>Modulation Type:</b>	FSK
<b>Antenna:</b>	Dipole antenna with Gain 3.0 dBi
<b>Power Supply:</b>	Model No.: AD63130 Input: AC100-240V, 50/60Hz, 0.13A; Output: DC5V, 1A
<b>FCC ID:</b>	2AAV4DWP-PCWTX
<b>Applicable Standards:</b>	FCC Part 15.249

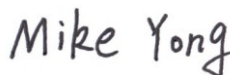
The test report was prepared by Shenzhen BATT Testing Technology Co., Ltd. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Prepared by :



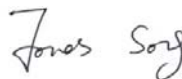
Hellen Xiao Assistant

Reviewer :



Mike Yong/Supervisor

Approved &amp; Authorized Signer :



Jones Song/ Manager



2.0	Test Equipments				
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWA RZ	ESPI 3	100379	2013-05-27	2014-05-26
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	2013-05-27	2014-05-26
Impuls-Begrenzer	ROHDE&SCHWA RZ	ESH3-Z2	100281	2013-05-27	2014-05-26
Loop Antenna	EMCO	6502	00042960	2013-05-27	2014-05-26
ESPI Test Receiver	ROHDE&SCHWA RZ	ESI26	838786/013	2013-05-27	2014-05-26
3m OATS	--	--	N/A	2013-05-27	2014-05-26
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170399	2013-05-27	2014-05-26
Horn Antenna	SCHWARZBECK	BBHA 9120	D143	2013-05-27	2014-05-26
Power meter	Anritsu	ML2487A	6K00003613	2013-05-27	2014-05-26
Power sensor	Anritsu	MA2491A	32263	2013-05-27	2014-05-26
Bilog Antenna	Schwarebeck	VULB916 3	9163/142	2013-05-27	2014-05-26
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2013-05-27	2014-05-26
9*6*6 Anechoic	--	--	N/A	2013-05-27	2014-05-26
EMI Test Receiver	RS	ESCS30	100139	2013-05-27	2014-05-26
LISN	RS	ESH2-Z5	100225	2013-05-27	2014-05-26
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2013-05-27	2014-05-26
Pre-Amplifier	A.H.	PAM-0126	1415261	2013-05-27	2014-05-26



### 3.0 Technical Details

#### 3.1 Summary of test results

**The EUT has been tested according to the following specifications:**

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.207	Conducted Emission Test	N/A	Complies
FCC Part 15 Subpart C Paragraph 15.249(a) & 15.249(b) Limit	Field Strength of Fundamental	PASS	Complies
FCC Part 15, Paragraph 15.209	Radiated Emission Test	PASS	Complies
FCC Part 15 Subpart C Paragraph 15.249(d) Limit	Band Edge Test	PASS	Complies

### 4.0 Test LAB Details

All Tests Performed at

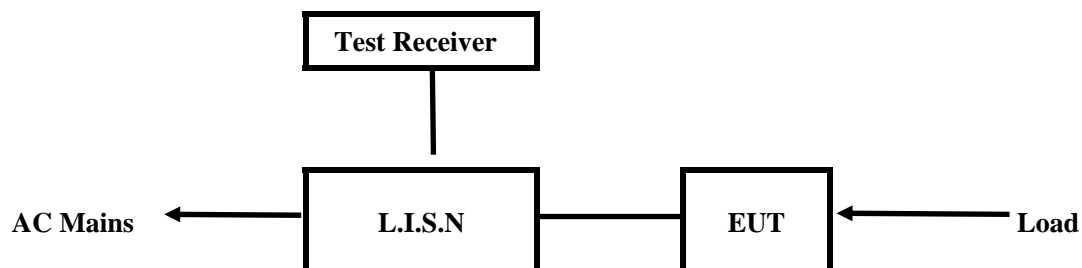
Name: Shenzhen Emtek Co., Ltd.

Address: Bldg. 69, Majialong Industry Zone,,Nanshan District,Shenzhen, Guangdong, 518052China

FCC Registration Number: 406365

## 5. Power Line Conducted Emission Test

### 5.1 Schematics of the test

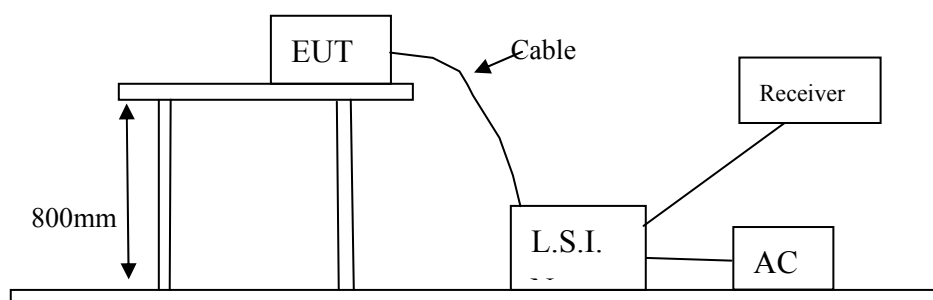


EUT: Equipment Under Test

### 5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2003.

Block diagram of Test setup



### 5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

One channels are provided to the EUT

#### A. EUT

Device	Manufacturer	Model	FCC ID
Wireless Transmitter Set	AC INTERNATIONAL CORP.	DWP-PCWTX	2AAV4DWP-PCWTX



## B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

## C. Peripherals

Device	Manufacturer	Model	FCC ID/DOC	Cable
N/A				

## 5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2003

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

## 5.5 Power line conducted Emission Limit according to Paragraph 15.207

Frequency(MHz)	Class A Limits (dBμV)		Class B Limits (dBμV)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ~ 0.50	79.0	66.0	66.0~56.0*	56.0~46.0*
0.50 ~ 5.00	73.0	60.0	56.0	46.0
5.00 ~ 30.00	73.0	60.0	60.0	50.0

- Notes:
1. \*Decreasing linearly with logarithm of frequency.
  2. The tighter limit shall apply at the transition frequencies

## 5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

# A: Conducted Emission on Live Terminal (150kHz to 30MHz)

## EUT Operating Environment

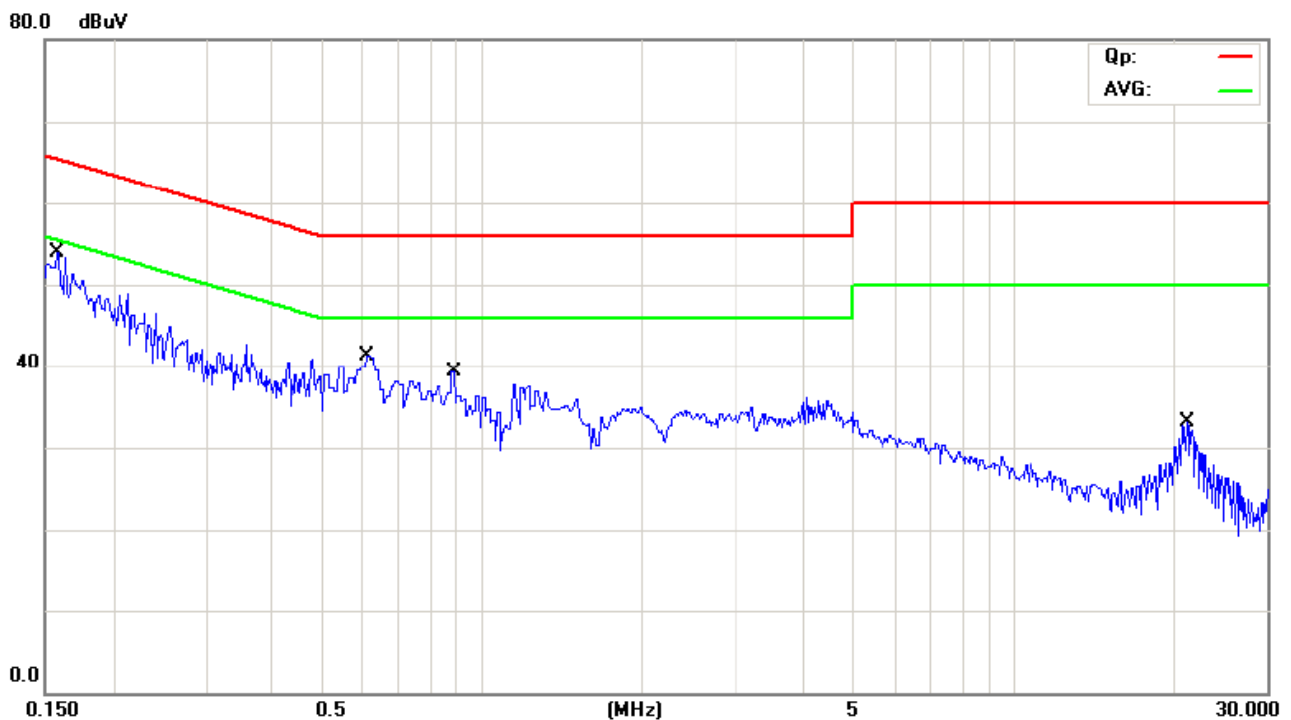
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keep Transmitting

Equipment Level: Class B

Results: PASS

Please refer to following diagram for individual



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1581	37.50	11.01	48.51	65.56	-17.05	QP	
2		0.1581	4.80	11.01	15.81	55.56	-39.75	AVG	
3		0.6057	23.30	11.48	34.78	56.00	-21.22	QP	
4		0.6057	-0.10	11.48	11.38	46.00	-34.62	AVG	
5		0.8762	20.50	11.77	32.27	56.00	-23.73	QP	
6		0.8762	-2.60	11.77	9.17	46.00	-36.83	AVG	
7		21.3611	17.20	11.18	28.38	60.00	-31.62	QP	
8		21.3611	-8.00	11.18	3.18	50.00	-46.82	AVG	



**B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)**

**EUT Operating Environment**

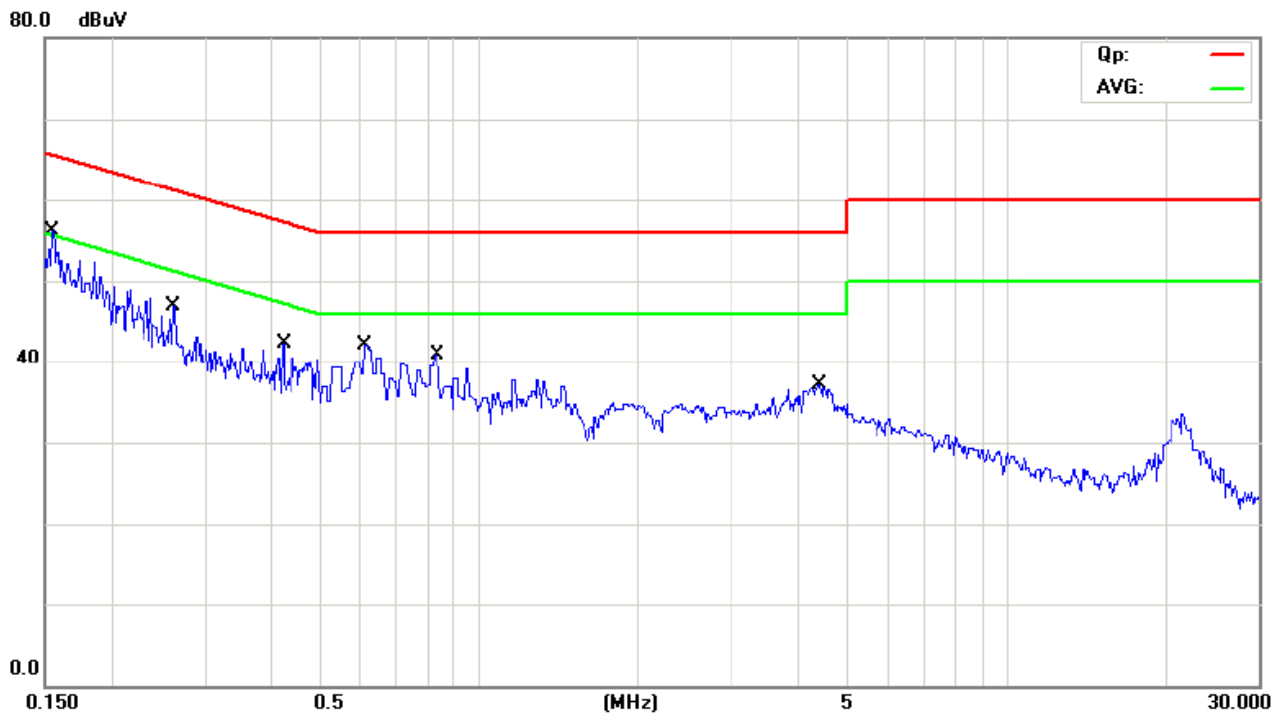
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

**EUT set Condition: Keep Transmitting**

**Equipment Level: Class B**

**Results: Pass**

Please refer to following diagram for individual



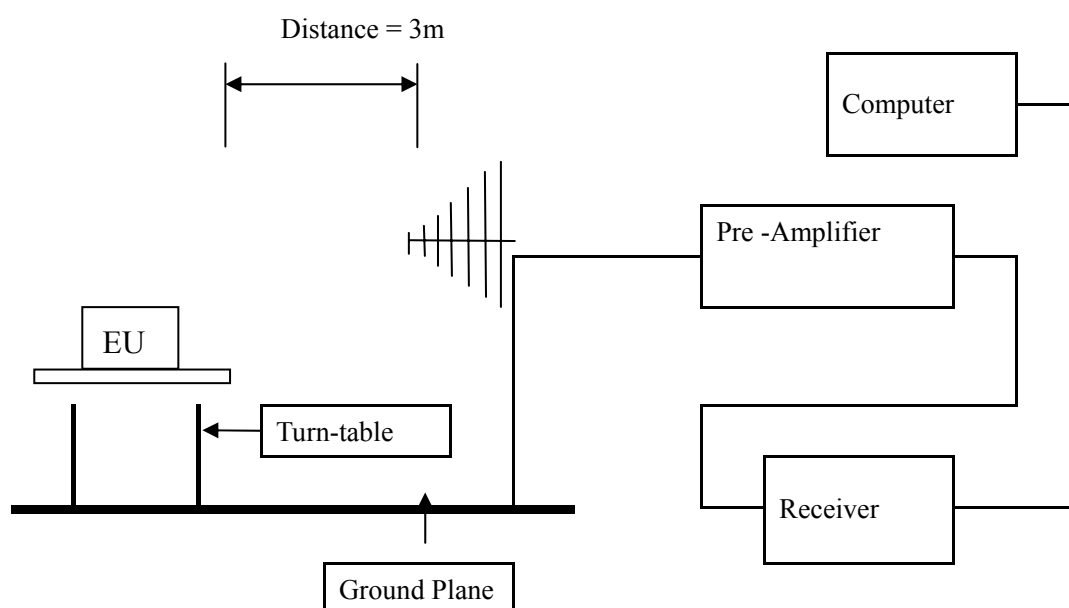
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1561	38.20	11.01	49.21	65.67	-16.46	QP	
2		0.1561	16.50	11.01	27.51	55.67	-28.16	AVG	
3		0.2623	26.70	11.12	37.82	61.36	-23.54	QP	
4		0.2623	5.60	11.12	16.72	51.36	-34.64	AVG	
5		0.4235	17.00	11.29	28.29	57.38	-29.09	QP	
6		0.4235	1.70	11.29	12.99	47.38	-34.39	AVG	
7		0.6117	26.70	11.49	38.19	56.00	-17.81	QP	
8		0.6117	4.80	11.49	16.29	46.00	-29.71	AVG	
9		0.8300	20.80	11.72	32.52	56.00	-23.48	QP	
10		0.8300	2.67	11.72	14.39	46.00	-31.61	AVG	
11		4.4048	19.20	13.26	32.46	56.00	-23.54	QP	
12		4.4048	1.78	13.26	15.04	46.00	-30.96	AVG	

## 6 Radiated Emission Test

### 6.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Emtek Laboratory. This site is on file with the FCC laboratory division, Registration No.406365
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.
- (3) The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz . Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) The antenna polarization: Vertical polarization and Horizontal polarization.

#### Block diagram of Test setup



### 6.2 Configuration of The EUT

Same as section 5.3 of this report

### 6.3 EUT Operating Condition

Same as section 5.4 of this report.

### 6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

**A FCC Part 15 Subpart C Paragraph 15.249(a) Limit**

Fundamental Frequency (MHz)	Field Strength of Fundamental (3m)		Field Strength of Harmonics (3m)		
	mV/m	dBuV/m		uV/m	dBuV/m
902-928	50	94 (Average)	114 (Peak)	500	54 (Average) 74 (Peak)

- Note:
1. RF Field Strength (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.

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

Frequency Range (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 and the EUT
  4. All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz. As to 1G-10G, the final emission level got using PK and AV detector.

**6.5 Test result****A Fundamental & Harmonics Radiated Emission Data**

Product:	Wireless Transmitter Set	Test Mode:	Keep transmitting
Test Item:	Fundamental Radiated Emission Data	Temperature:	25℃
Test Voltage:	120V~	Humidity:	56%
Test Result:	Pass		

Frequency (MHz)	Emission PK/AV (dBuV/m)	Horiz /Vert	Limits PK/AV (dBuV/m)	Margin (dB)
915.55	81.19(PK)	V	114/94	-12.81
915.55	78.86(PK)	H	114/94	-15.14
1831.1	--	H/V	74/54	--
2746.65	--	H/V	74/54	--
3662.2	--	H/V	74/54	--
4577.75	--	H/V	74/54	--
5493.3	--	H/V	74/54	--
6408.85	--	H/V	74/54	--
7324.4	--	H/V	74/54	--
8239.95	--	H/V	74/54	--
9155.5	--	H/V	74/54	--

Note: (1) PK= Peak, AV= Average

(2) Emission Level = Reading Level + Antenna Factor + Cable Loss.

(3) Margin=Emission-Limits

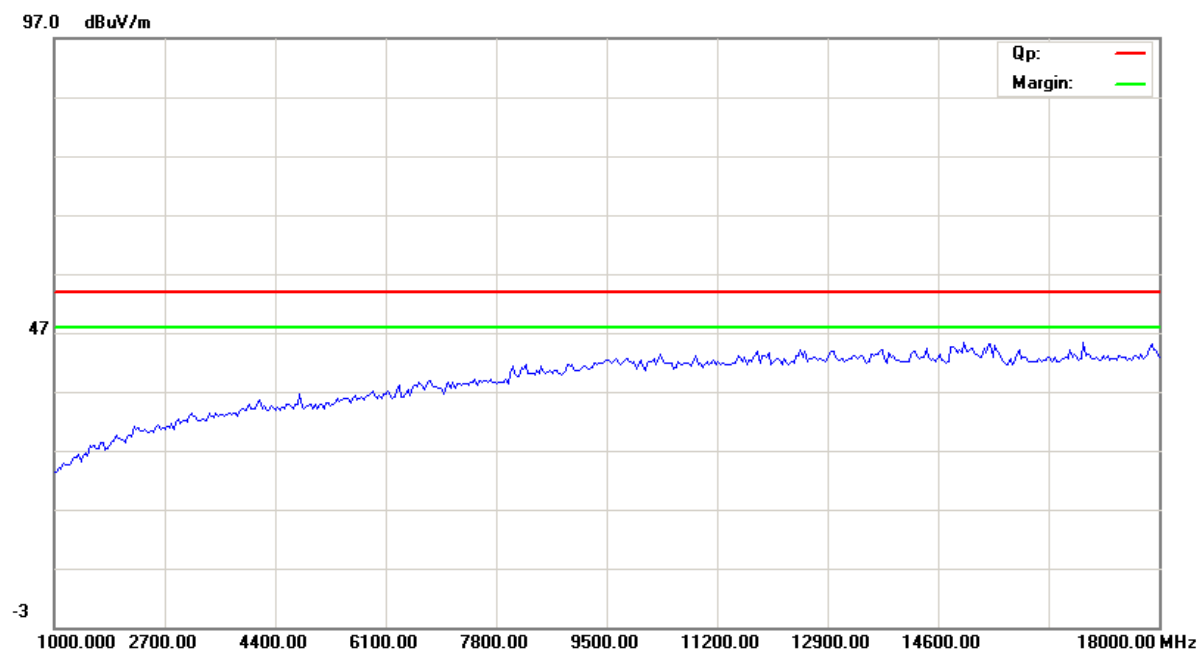
(4) According to section 15.35(b), the peak limit is 20dB higher than the average limit

(5) The measured PK value less than the AV limit.

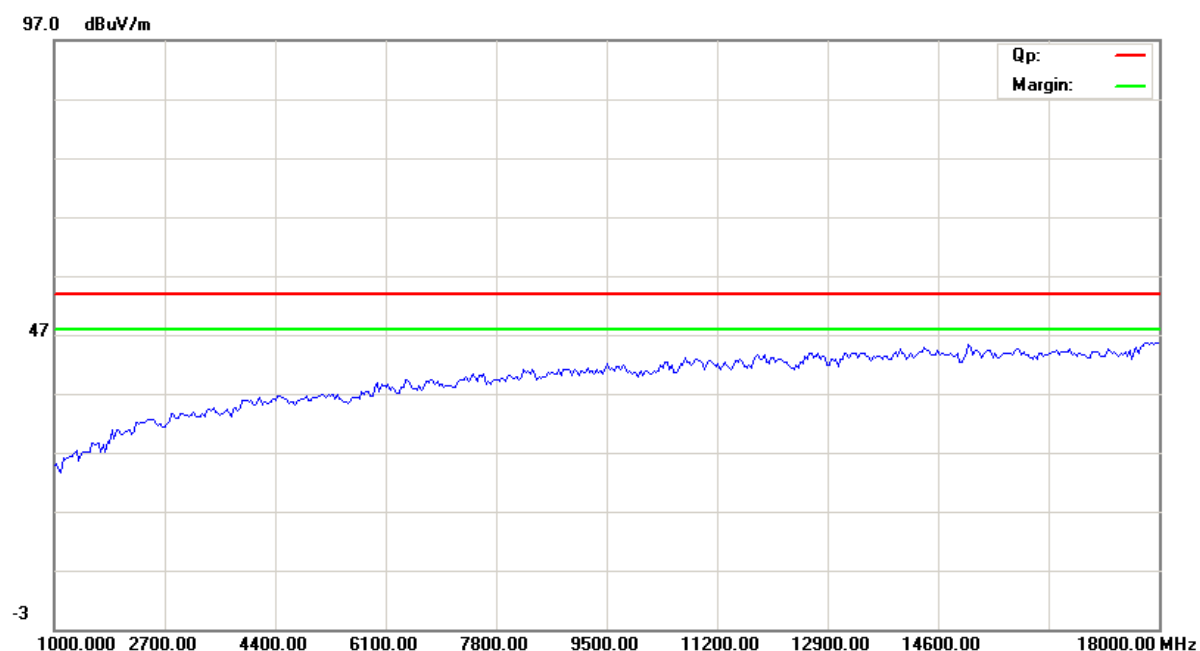
(6) For fundamental test, Peak detector is used. RBW=300kHz, VBW=1MHz

Please refer to the following test plots for details:

### Horizontal



### Vertical



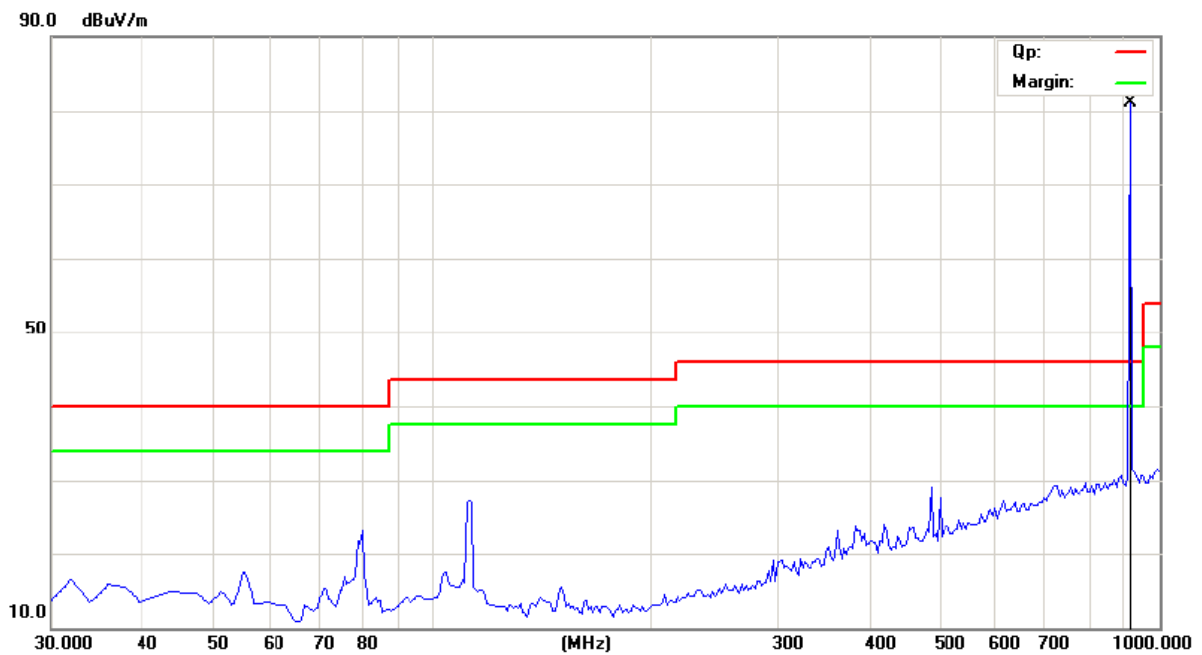
## B. General Radiated Emission Data

### Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

**Results: Pass**

Please refer to following diagram for individual



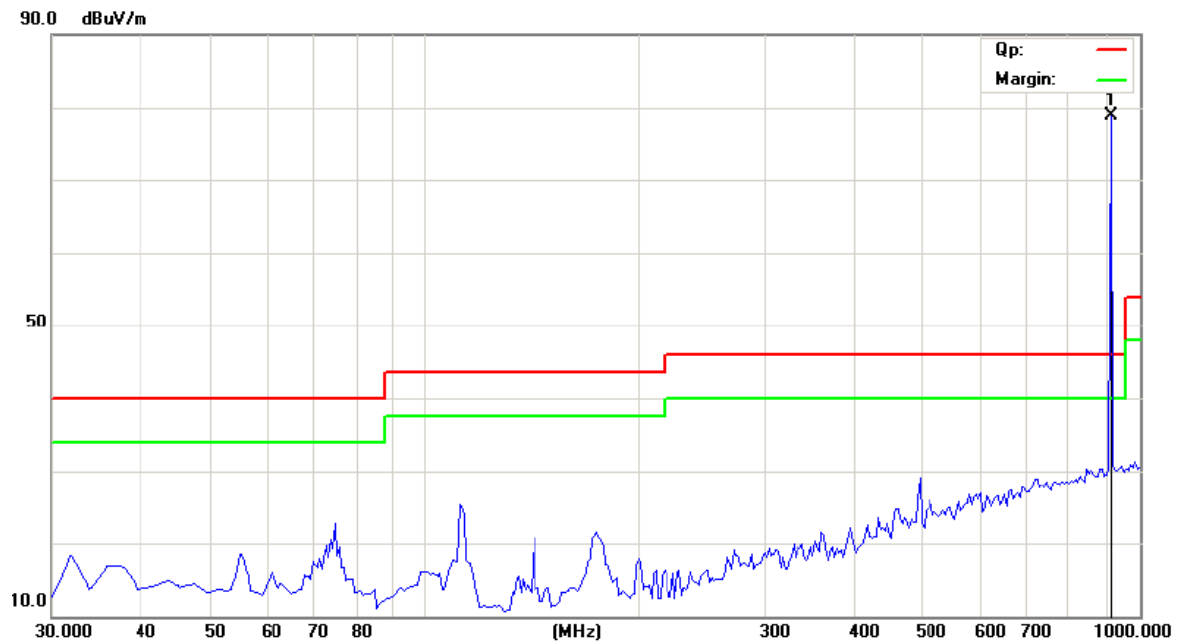
Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
--	--	V	--

# **Radiated Emission In Horizontal (30MHz---1000MHz)**

EUT set Condition: Keep Tx transmitting

**Results: Pass**

Please refer to following diagram for individual



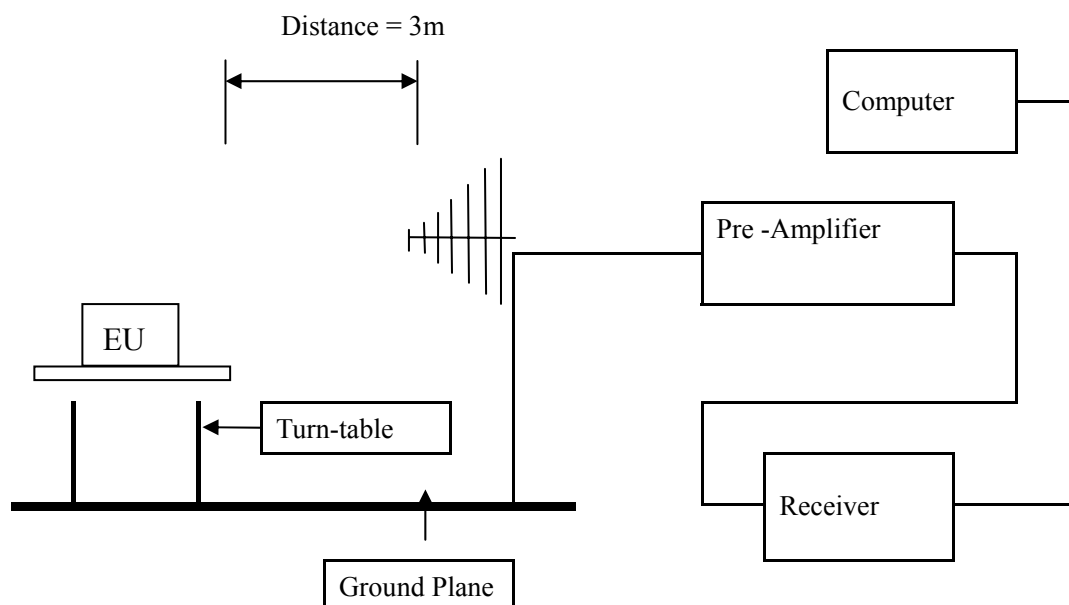
Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
--	--	H	--

## 7. Band Edge

### 7.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Emtek Laboratory. This site is on file with the FCC laboratory division, Registration No.406365
- (2) Set Spectrum as RBW=100kHz,VBW=300kHz and Peak detector used
- (3) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (4) The antenna polarization: Vertical polarization and Horizontal polarization.

### 7.2 Radiated Test Setup



For the actual test configuration , please refer to the related items – Photos of Testing

### 7.3 Configuration of The EUT

Same as section 5.3 of this report

### 7.4 EUT Operating Condition

Same as section 5.4 of this report.

### 7.5 Band Edge Limit

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 Section 15.209, whichever is the lesser attenuation.



**7.6 Test Result**

Product:	Wireless Transmitter Set		Test Mode:	Keep transmitting
Mode	Keeping Transmitting		Test Voltage	120V~
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
902MHz	(dB $\mu$ V/m)	32.3(H)/ 34.6(V)	Limit	46(dB $\mu$ V/m)

Product:	Wireless Transmitter Set		Test Mode:	Keep transmitting
Mode	Keeping Transmitting		Test Voltage	120V~
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
928MHz	(dB $\mu$ V/m)	33.7(H)/ 35.2(V)	Limit	46(dB $\mu$ V/m)



## **8.0 Antenna Requirement**

### **Applicable Standard**

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 dipole antenna with reverse polarity SMA antenna connector. The antenna gain is 3.0dBi. It fulfill the requirement of this section.

Test Result: Pass

**9.0 20dB Bandwidth Measurement**

Product:	Wireless Transmitter Set	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	228kHz	--	--

**MARKER 1**

915.55 MHz

Ref 10 dBm

\* Att 20 dB

\* RBW 30 kHz

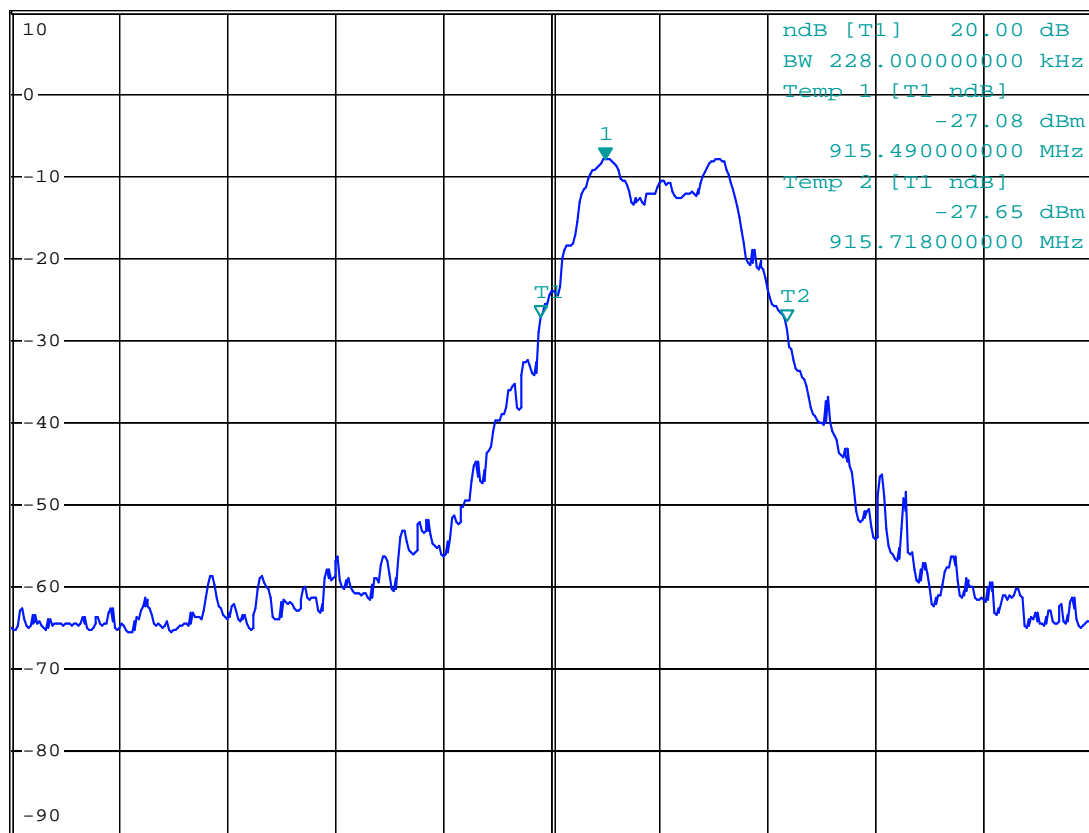
\* VBW 100 kHz

SWT 2.5 ms

Marker 1 [T1 ]

-7.95 dBm

915.55000000 MHz

**1 PK  
MAXH**

Center 915.5 MHz

100 kHz/

Span 1 MHz

Date: 30.MAR.2014 19:10:12

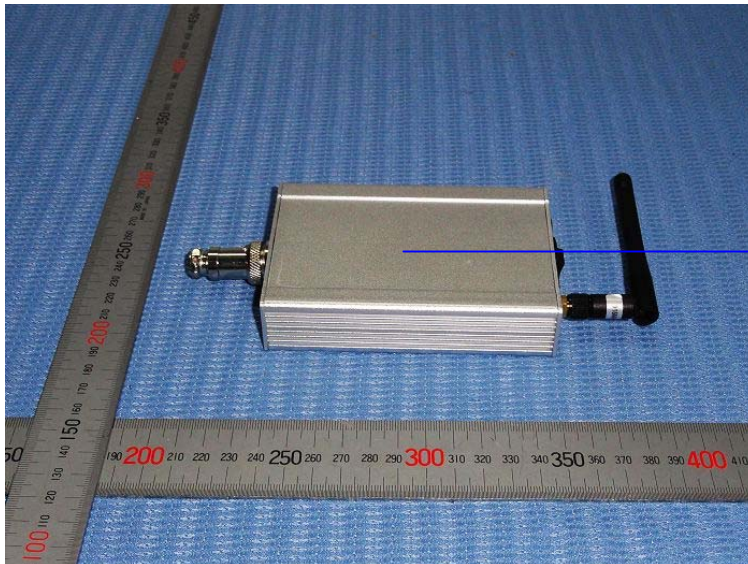
## 10.0 FCC ID Label

### FCC ID: 2AAV4DWP-PCWTX

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 label. 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.

#### Mark Location:



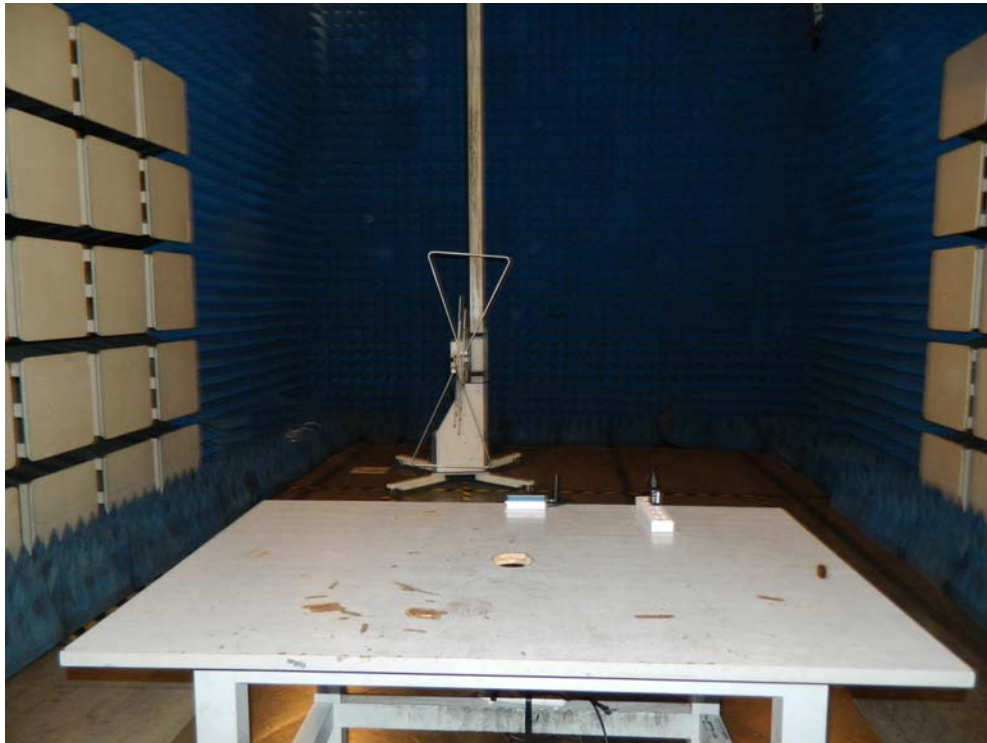
FCC ID Label Location

## 11 PHOTOGRAPHS OF THE TEST CONFIGURATION

### Conducted Emissions



### Radiated Emissions





## PHOTOGRAPHS OF EUT



Photo 1



Photo 2



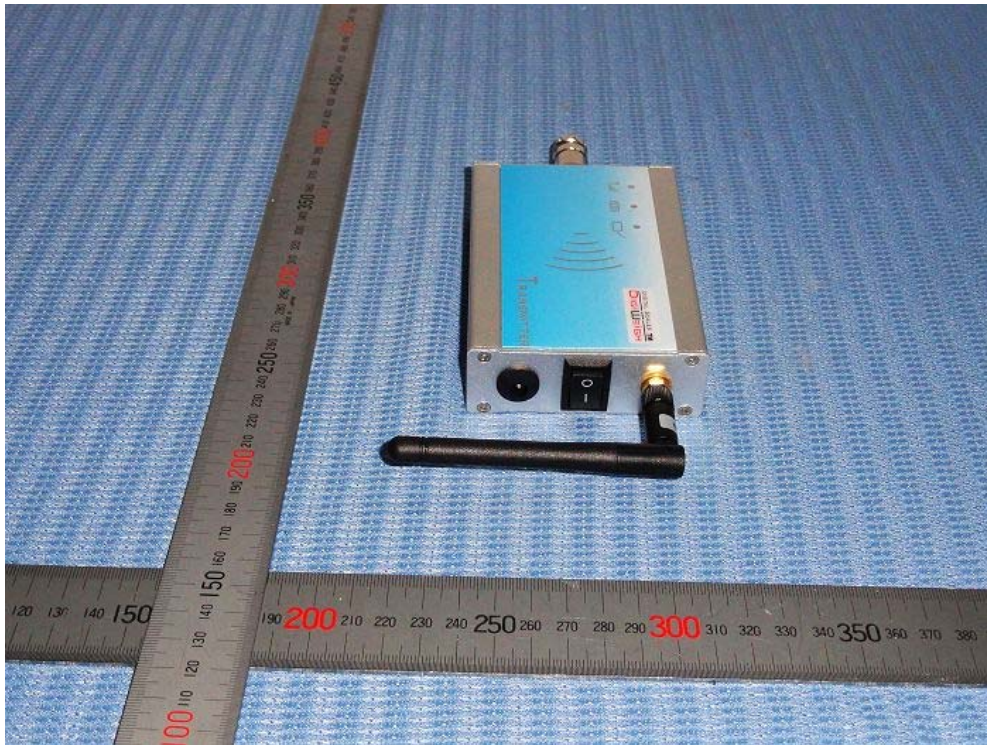


Photo 3

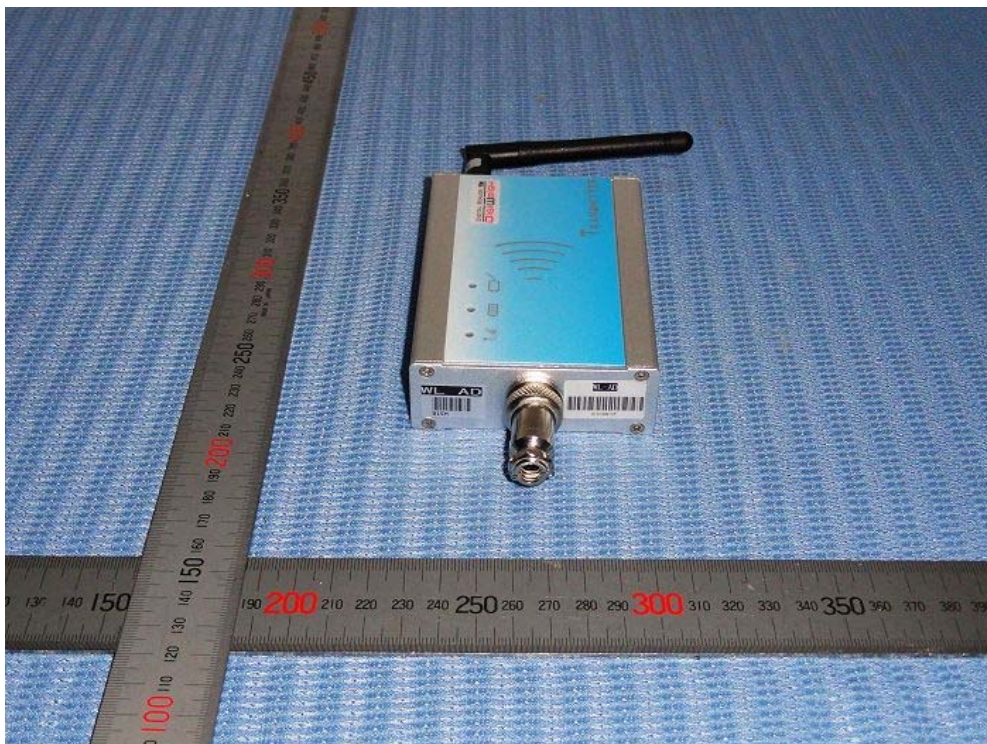


Photo 4



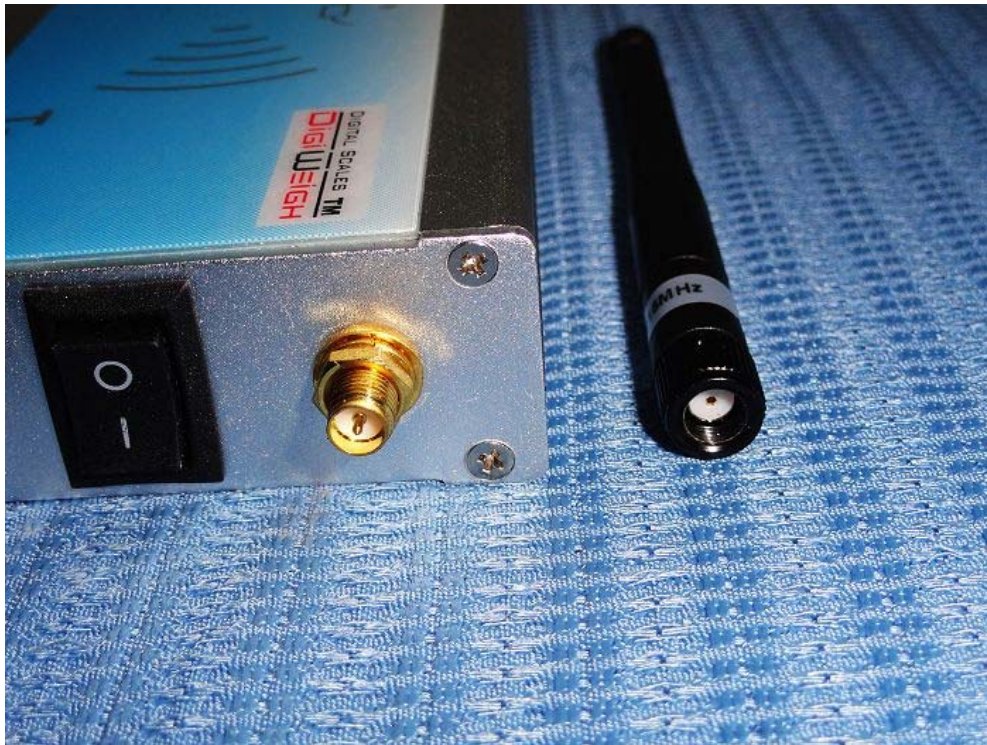


Photo 5



Photo 6



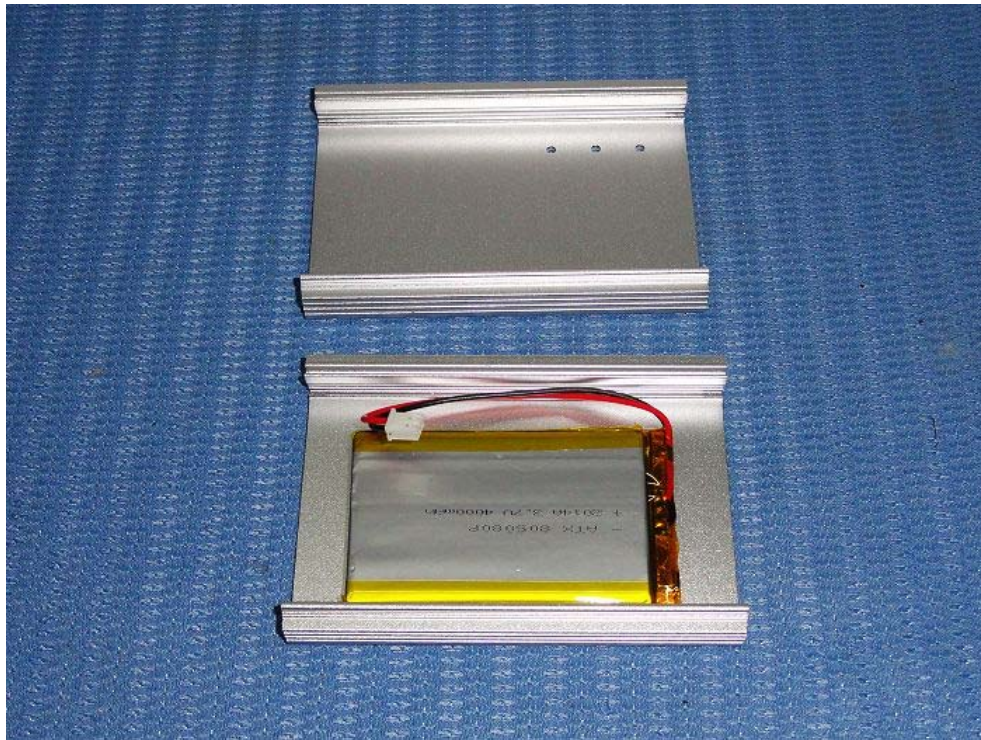


Photo 7

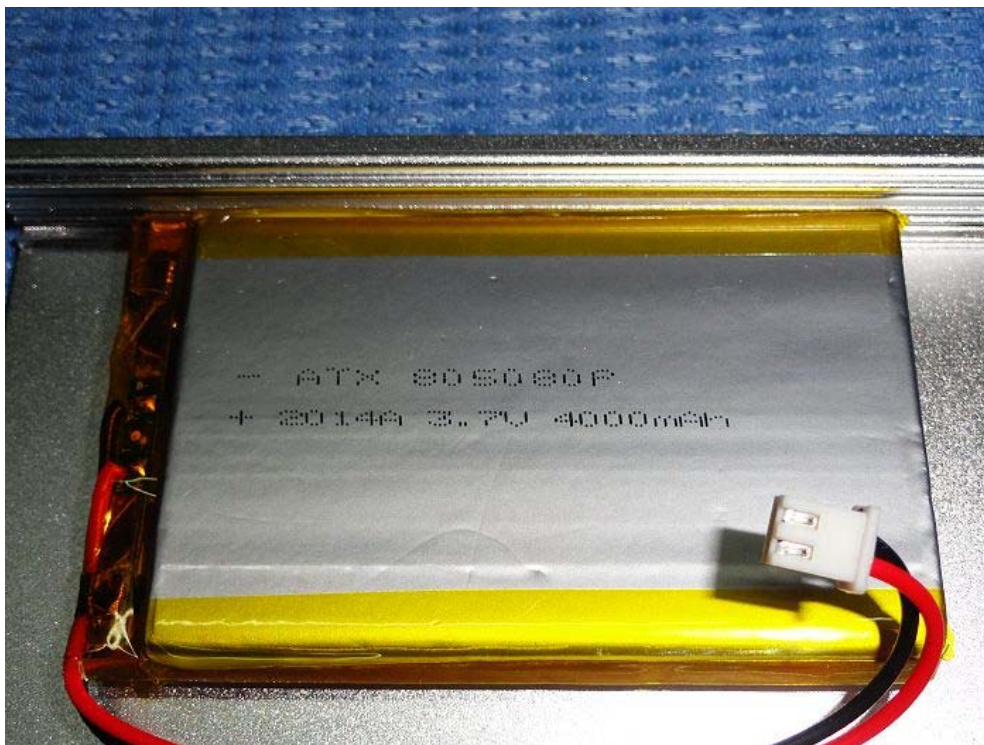


Photo 8



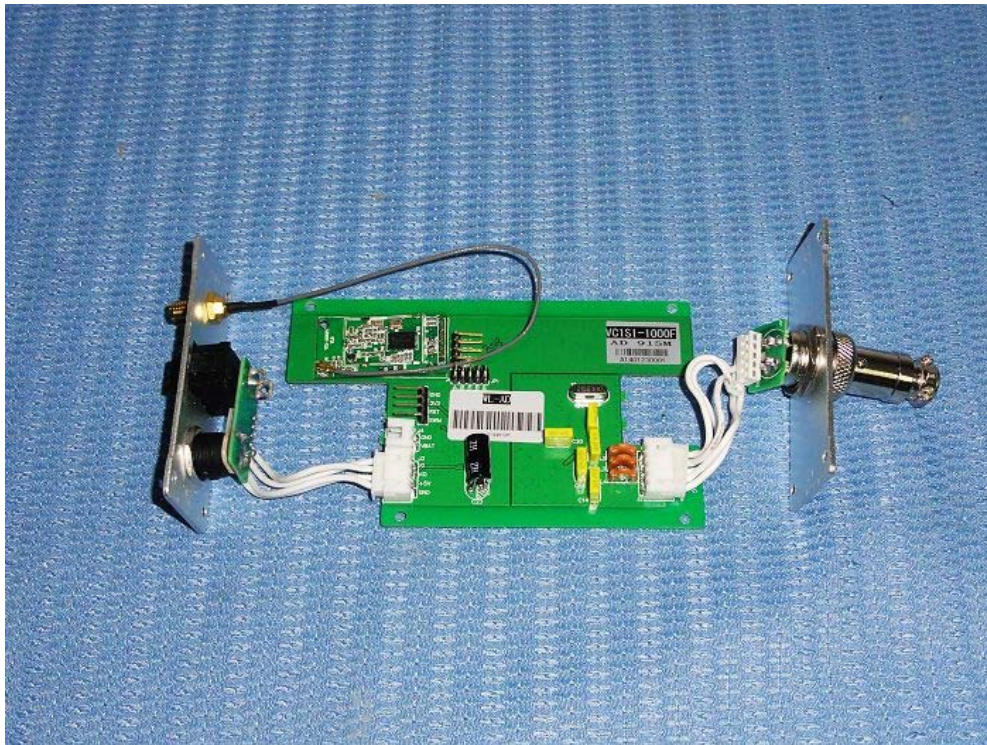


Photo 9



Photo 10





Photo 11

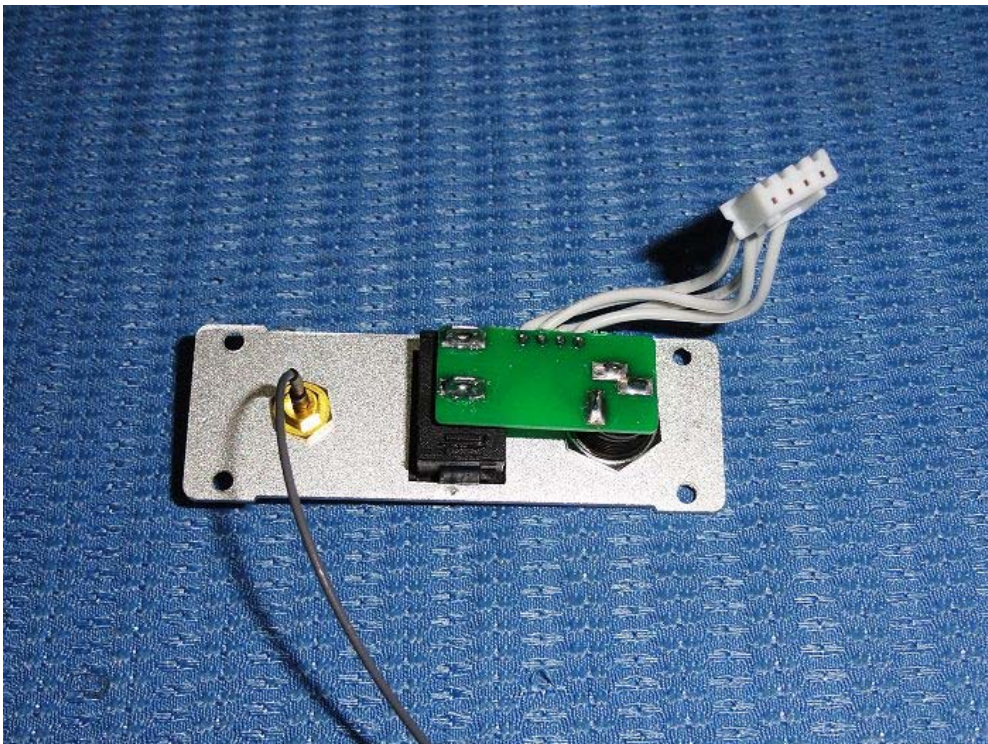


Photo 12





Photo 13

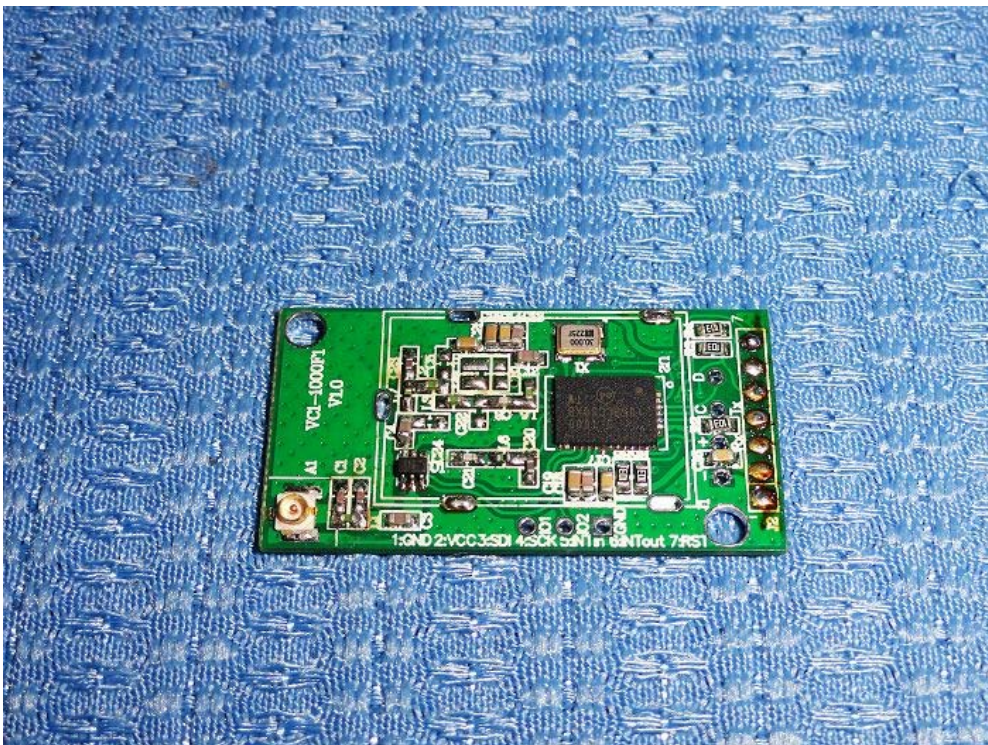


Photo 14





Photo 15

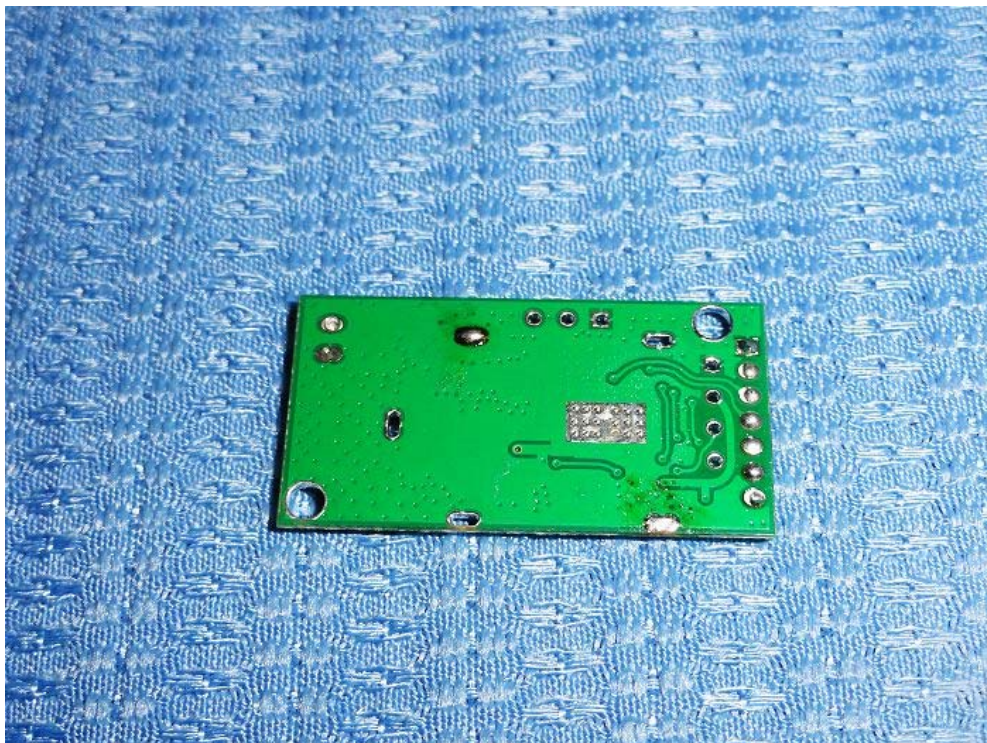


Photo 16



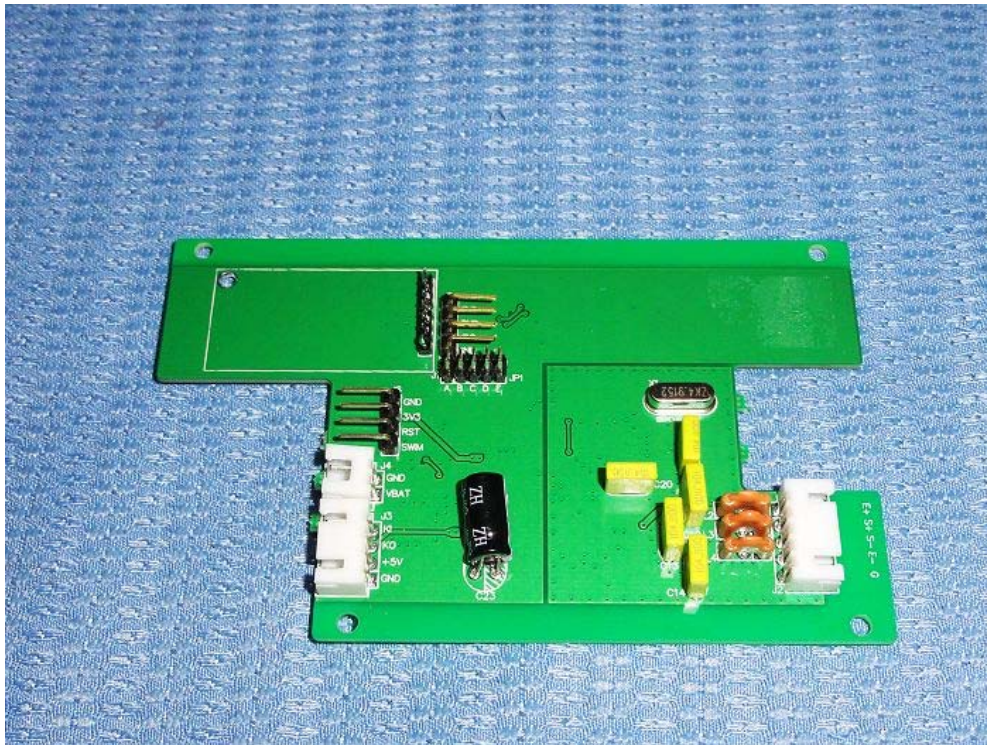


Photo 17



Photo 18



Photo 18

**The Report End**