

TEST REPORT

Reference No...... : WTF15S1137578E
FCC ID : LPV-PAZ100
Applicant..... : Alford Industries Ltd
Address..... : Unit 2, 6/F, Yen Sheng Centre, 64 Hoi Yuen Road, Kwun Tong, Kowloon, Hong Kong
Manufacturer : Foshan Shunde Alford Electronics Co., Ltd
Address..... : Xinjiao Industrial Park, DaLiang, Shunde, Foshan, China
Product Name..... : Pet Training System
Model No...... : PAZ-100
Standards..... : FCC CFR47 Part 15.209: 2016
Date of Receipt sample : Nov. 17, 2015
Date of Test : Apr. 20, 2017- May 18, 2017
Date of Issue..... : May 24, 2017
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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2 Test Summary

Test Items	Test Requirement	Result
Radiated Spurious Emissions	15.205(a) 15.209	PASS
Bandwidth Measurement	15.205(a) 15.215(c)	PASS
Antenna Requirement	15.203	PASS

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4 General Information

4.1 General Description of E.U.T.

Product Name: : Pet Training System
Model No.: : PAZ-100
Model Difference: : N/A
Type of Modulation: : ASK
Frequency Range: : 125KHz
The Lowest Oscillator: : 125KHz
Antenna installation: : Loop Antenna

4.2 Details of E.U.T.

Technical Data: : DC 6V by 4*1.5 size"AA" battery

4.3 Test Facility

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

- **IC – Registration No.: 7760A-1**

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-1, October 15, 2015

- **FCC Test Site – Registration No.: 328995**

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 328995, December 3, 2014.

5 Equipment Used during Test

5.1 Equipments List

3m Semi-anechoic Chamber for Radiation Emissions						
Item	Equipment	Manufacturer	Model No.	Serial No	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	Sep.14,2016	Sep.13,2017
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Sep.14,2016	Sep.13,2017
3	Active Loop Antenna	Beijing Dazhi	ZN30900A	0703	Sep.14,2016	Sep.13,2017
4	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Sep.14,2016	Sep.13,2017
5	Amplifier	ANRITSU	MH648A	M43381	Sep.14,2016	Sep.13,2017
6	Cable	HUBER+SUHNER	CBL2	525178	Sep.14,2016	Sep.13,2017
RF Conducted Testing						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	Sep.12, 2016	Sep.11, 2017
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	Sep.12, 2016	Sep.11, 2017
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	Sep.12, 2016	Sep.11, 2017

5.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conducted Emissions	150kHz~30MHz	±3.64dB	(1)
Radiated Spurious Emissions	9KHz~30MHz	±3.03dB	(1)

(1)This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

6 Radiated Spurious Emissions

Test Requirement: FCC Part15 Paragraph 15.209 & 15.205

Test Method: ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

FCC Part15 Paragraph 15.209

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

6.1 EUT Operation

Operating Environment :

Temperature: 23.5 °C

Humidity: 51.1 % RH

Atmospheric Pressure: 101.2kPa

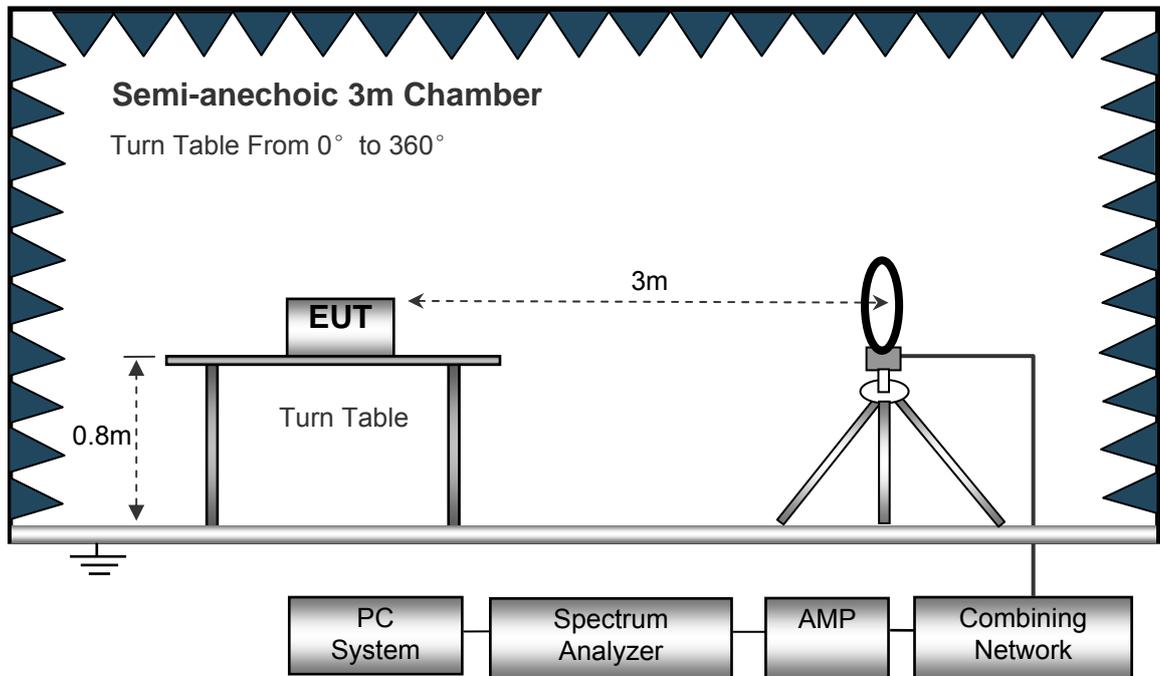
EUT Operation :

The test was performed in Transmitting mode, the test data were shown in the report.

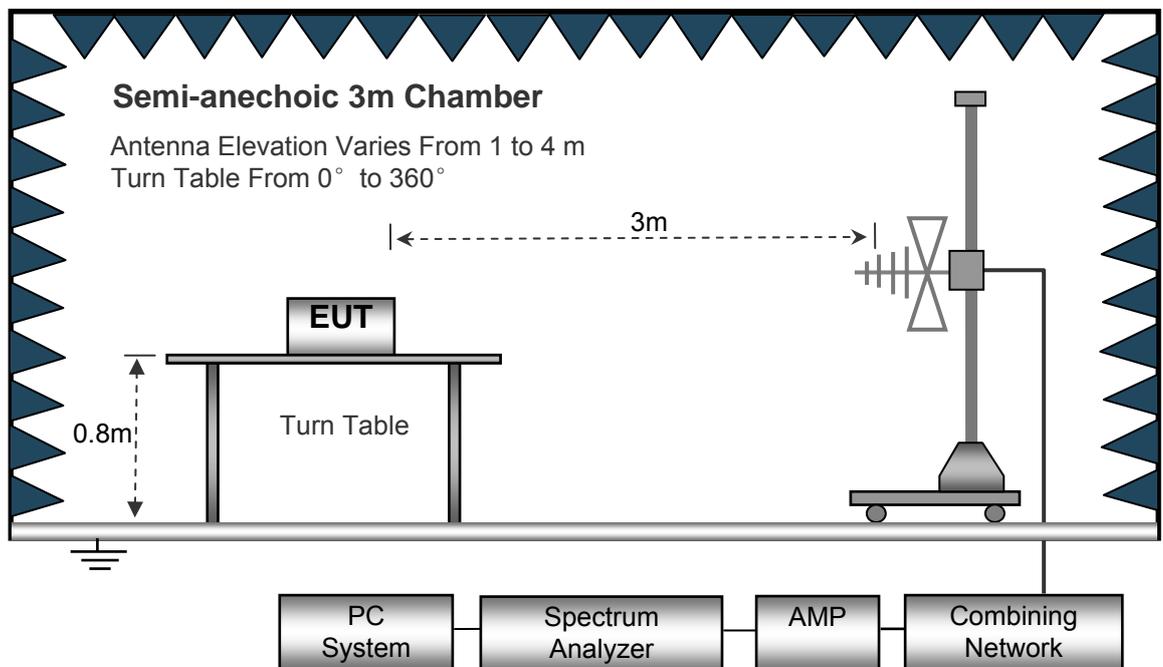
6.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10: 2013.

The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



6.3 Spectrum Analyzer Setup

Below 30MHz

Sweep SpeedAuto
IF Bandwidth..... 10kHz
Video Bandwidth..... 10kHz
Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep SpeedAuto
DetectorPK
Resolution Bandwidth..... 100kHz
Video Bandwidth..... 300kHz

6.4 Test Procedure

1. The EUT is placed on a turntable. For below 1GHz, the EUT is 0.8m above ground plane; For above 1GHz, the EUT is 1.5m 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. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
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 tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

6.5 Summary of Test Results

Test Frequency: 9kHz ~ 30MHz Note: Correct factor = Cable loss + Antenna factor

Frequency	Receiver Reading (AV*)	Turn table Angle	RX Antenna		Correct factor	Extrapolation factor	Measurement results	FCC Part 15.209	
			Height	Polar			calculated	Limit	Margin
(MHz)	dB μ V @3m	Degree	m	H/V	dB/m	dB	dB μ V/m @300m	dB μ V/m @300m	(dB)
0.125	69.87	241	1.2	H	19.75	80	9.62	25.67	-16.05
0.125	57.26	156	1.5	V	19.75	80	-2.99	25.67	-28.66

*: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Frequency (MHz)	Receiver Reading	Detector	Correct factor	Extrapolation factor	Measurement results (calculated)	FCC Part 15.209	
	dB μ V@3m	PK/QP	dB/m	dB	dB μ V/m @30m	Limit	Margin
7.368	24.36	QP	21.41	40.00	5.77	29.54	-23.77
25.943	27.91	QP	20.36	40.00	8.27	29.54	-21.27

Test Frequency: 30MHz ~ 1GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.209	
				Height	Polar			Limit	Margin
(MHz)	(dB μ V)	(PK/QP /Ave)	Degree	(m)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
45.63	32.69	QP	61	1.6	H	-14.30	18.39	40.00	-21.61
45.63	34.85	QP	96	1.1	V	-14.30	20.55	40.00	-19.45
234.97	37.16	QP	257	1.9	H	-13.58	23.58	46.50	-22.92
234.97	41.99	QP	225	1.2	V	-13.58	28.41	46.50	-18.09
525.15	38.47	QP	58	1.9	H	-5.63	32.84	46.50	-13.66
525.15	41.18	QP	142	1.7	V	-5.63	35.55	46.50	-10.95

7 Bandwidth Measurement

Test Requirement: FCC Part15.215(C), Part15.205 (a)
 Test Method: ANSI C63.10: 2013

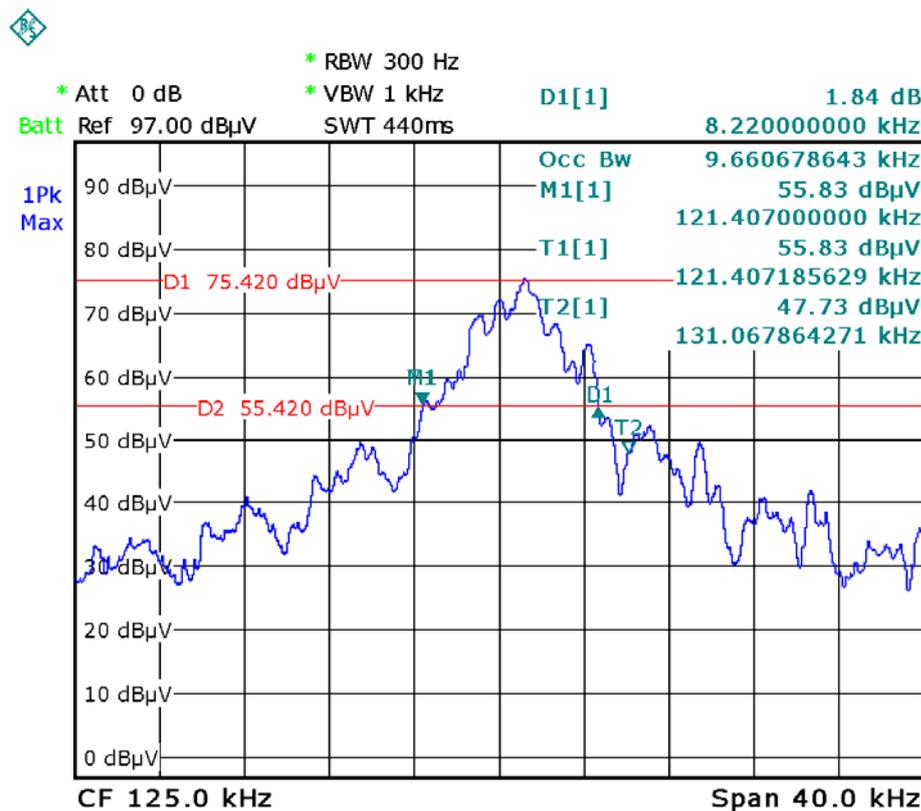
7.1 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak mode.
2. Bandwidth Measure the resolution bandwidth of 300 Hz and the video bandwidth of 1 KHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier and 99% Bandwidth.

7.2 Test Result

Frequency(KHz)	20dB Bandwidth Emission(KHz)	99% Bandwidth Emission(KHz)
125	8.22	9.66

Test Plot



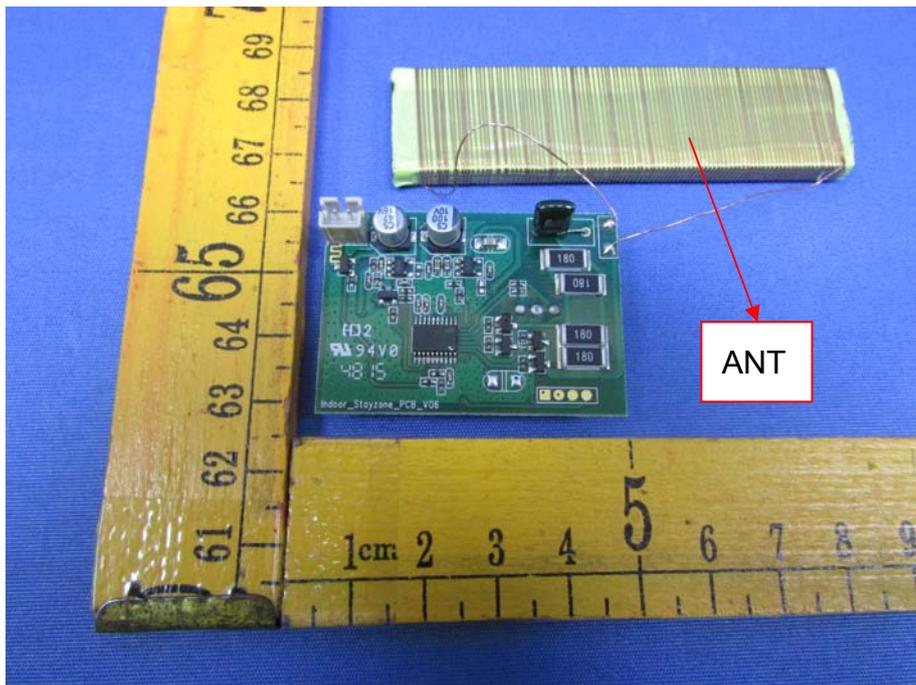
8 Antenna Requirement

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 §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 §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.

For intentional device, according to FCC 15 CFR Section 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.

Result:

The EUT has oneLoop antenna, Meets the requirements of FCC 15.203.



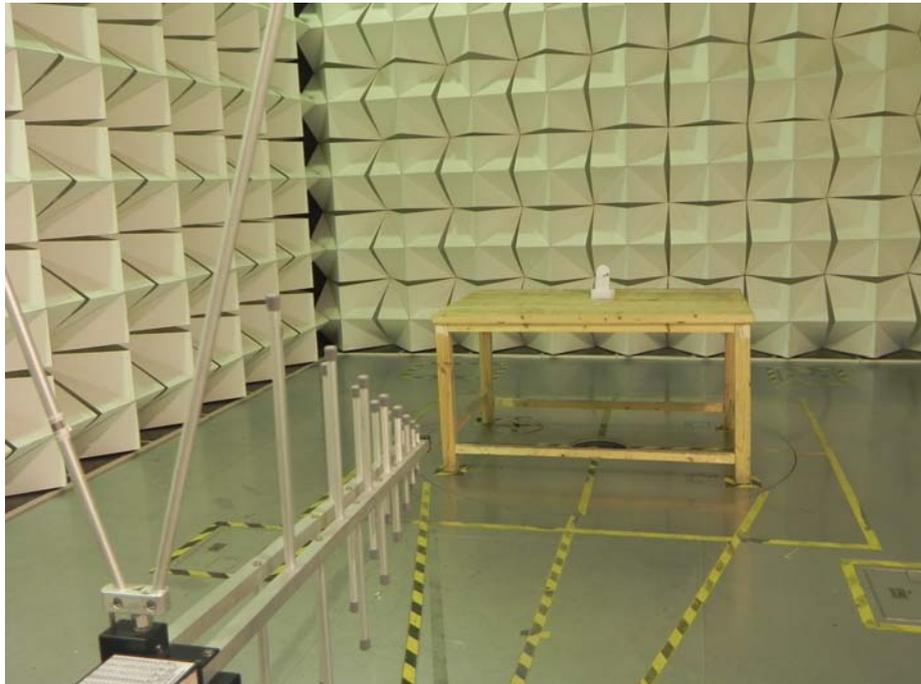
9 Model PAZ-100 Photographs of Testing

9.1 Radiation Emission Test Setup

For 9KHz to 30MHz



For 30MHz to 1000MHz



10 Photographs - Constructional Details

10.1 Model PAZ-100 External Photos

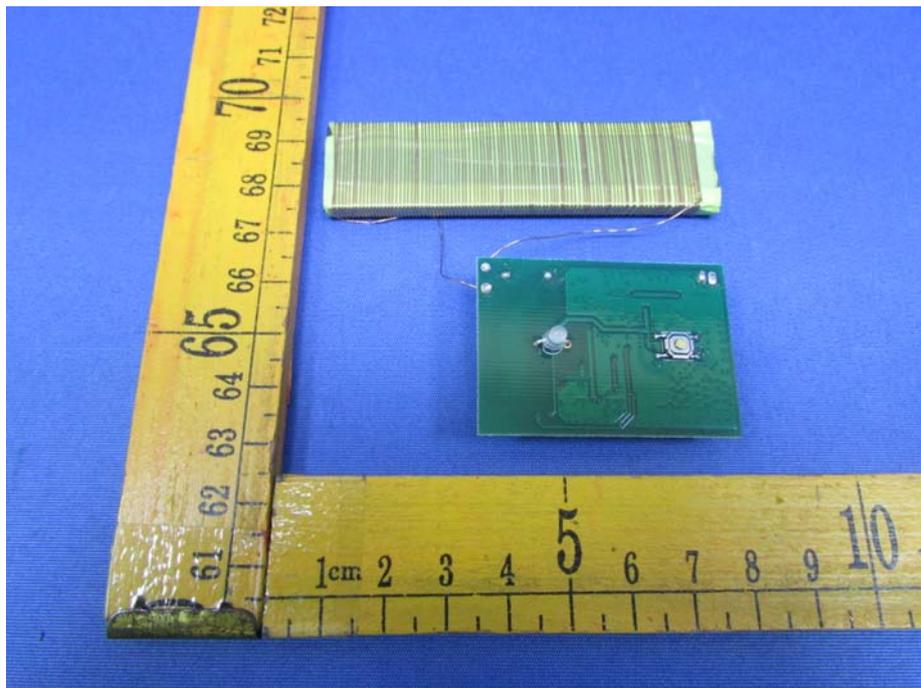
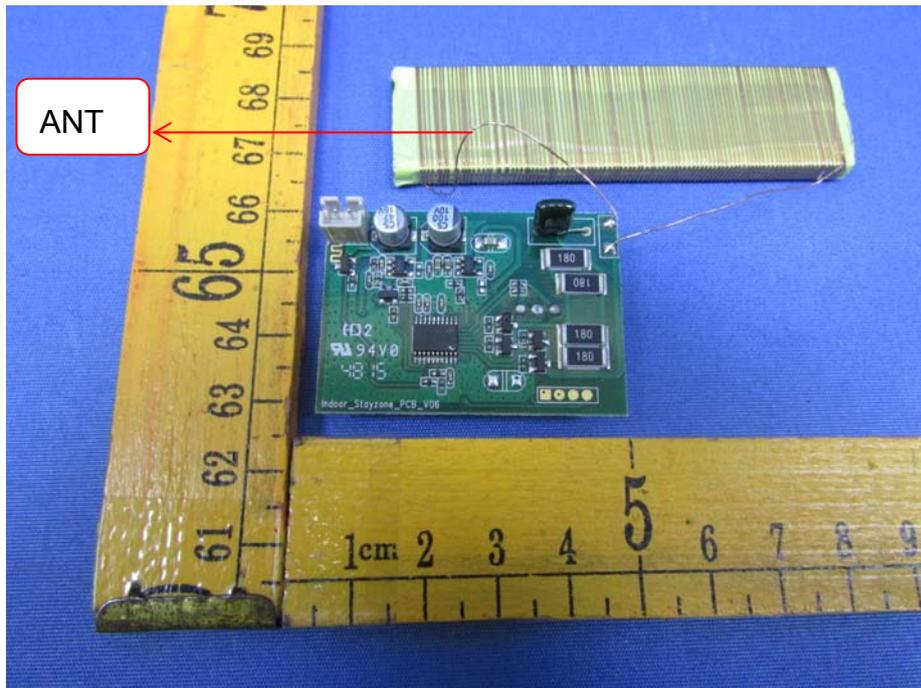






10.2 Model PAZ-100 Internal Photos





====End of Report====