

# ***FCC TEST REPORT***

**FCC ID** : HAP91360T49

**Applicant** : **Echo Toys Ltd**  
Room1108, Peninsula Centre, 67 Mody Road, Tsim Sha Tsui East, Kowloon  
HongKong

**Equipment Under Test (EUT) :**

Product description : OFF ROADER

Model No. : 91360

**Standards** : FCC 15 Paragraph 15.205, Paragraph 15.209, Paragraph 15.235,  
Paragraph 15.31, Paragraph 15.33, Paragraph 15.35.

**Date of Test** : April 29, 2005

**Test Engineer** : Jimmy Lee

**Reviewed By** : 

PERPARED BY:  
**Shenzhen Huatongwei International Inspection Co., Ltd**  
Keji S, 12th, Road, Hi-tech Industrial Park, Shenzhen, Guangdong, China

FCC Registration Number: 662850

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### 3 Test Summary

<b>Test</b>	<b>Test Requirement</b>	<b>Test Method</b>	<b>Class / Severity</b>	<b>Result</b>
Radiated Emission (30MHz to 1GHz)	FCC PART 15: 2003	ANSI C63.4: 1992	Class B	PASS
Conducted Emission (150KHz to 30MHz)	FCC PART 15: 2003	ANSI C63.4: 1992	Class B	N/A

## **4 General Information**

### **4.1 Client Information**

Applicant: **Echo Toys Ltd**  
Address of Applicant: Room1108, Peninsula Centre, 67 Mody Road, Tsim Sha Tsui East, Kowloon HongKong

### **4.2 General Description of E.U.T.**

Product description: OFF ROADER  
Model No.: 91360

### **4.3 Details of E.U.T.**

Power Supply: 9VDC Battery

### **4.4 Description of Support Units**

The EUT has been tested as an independent device unit.

### **4.5 Standards Applicable for Testing**

The customer requested FCC tests for a OFF ROADER. The standards used were FCC 15 Paragraph 15.205, Paragraph 15.209, Paragraph 15.235, 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.: 662850**

Shenzhen Huatongwei International Inspection 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 662850, November 17, 2003.

#### **4.7 Test Location**

All Emissions tests were performed at:-Shenzhen Huatongwei International Inspection Co., Ltd. at Keji S,12th,Road, Hi-tech Industrial Park, Shenzhen, Guangdong, China.

## 5 Equipment Used during Test

<b>Conducted Emission Test</b>						
<b>Item</b>	<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Cal. Date</b>	<b>Due date</b>
1	Shielding Room	ETS	8 x 4 x 4 m <sup>3</sup>	N0.2	N/A	N/A
2	LISN	Rohde & Schwarz	ESH2-Z5	100028	06-11-2004	05-11-2005
3	EMI Test Receiver	Rohde & Schwarz	ESCS30	100038	18-11-2004	17-11-2005
<b>Radiated Emission Test</b>						
<b>Item</b>	<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Cal. Date</b>	<b>Due date</b>
1	3m Semi- Anechoic Chamber	ETS	N/A	N/A	05-11-2004	04-11-2005
2	EMI Test Receiver	ROHDE & SCHWARZ	ESI 26	100009	05-11.2004	04-11-2005
3	EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	100038	05-11.2004	04-11-2005
4	EMI Test Software	ROHDE & SCHWARZ	ES-K1	N/A	N/A	N/A
5	Bilog Type Antenna	ETS	2075	2346	02-12-2004	01-12-2005
6	Horn Antenna	ROHDE & SCHWARZ	HF906	1000029	05-11.2004	04-11-2005
7	Ultra-Broadband Antenna	ROHDE & SCHWARZ	HL562	100015	02-12-2004	01-12-2005
<b>Common Used Equipment</b>						
<b>Item</b>	<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Series No.</b>	<b>Cal. Date</b>	<b>Due date</b>
1	Temperature, Humidity & Barometer	OREGON SCIENTIFIC	BA-888	20001 to20004	25-07-2004	25-07-2005
2	DMM	FLUKE	73	70681567 or 70671126	23-07-2004	23-07-2005

## 6 Conducted Emission Test

Product:	OFF ROADER
Test Requirement:	FCC Part15 Paragraph 15.207
Test Method:	Based on FCC Part15 Paragraph 15.207
Test Date:	.....
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

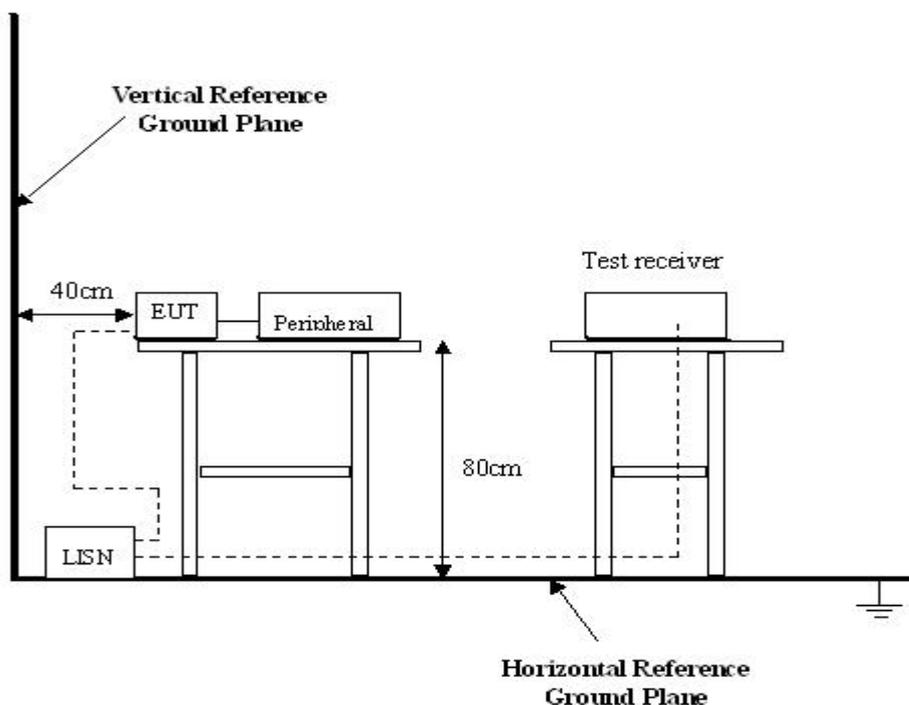
Please refer to Section 5 this report.

### 6.2 Test Procedure

1. The EUT was tested according to ANSI C63.4. 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

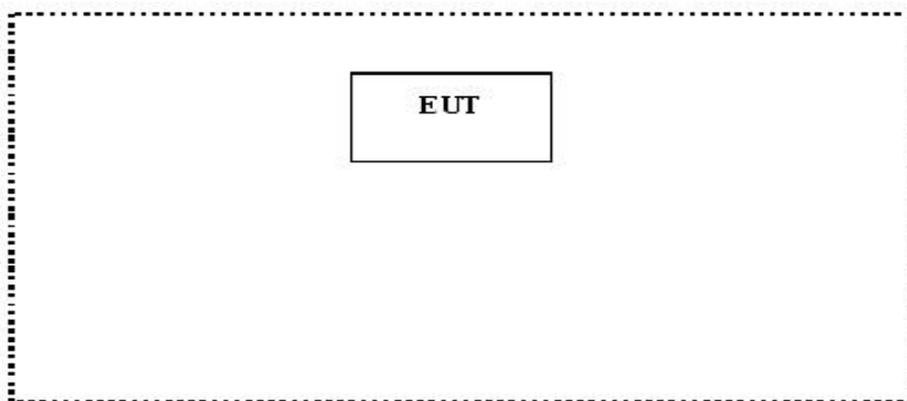
The conducted emission tests were performed using the setup accordance with the ANSI C63.4, The specification used in this report was the FCC Part15 Paragraph 15.207 limits.



### 6.4 EUT Operating Condition

Operating condition is according to ANSI C63.4.

- 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 $\mu$ V/m between 0.15MHz & 0.5MHz

56 dB $\mu$ V/m between 0.5MHz & 5MHz

60 dB $\mu$ V/m between 5MHz & 30MHz

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

## **6.6 Conducted Emission Test Result**

Owing to the DC operation of EUT, this test is not performed.

## 7 Radiation Emission Test

Product:	OFF ROADER
Test Requirement:	FCC Part15 Paragraph 15.209, Paragraph 15.235
Test Method:	Based on FCC Part15 Paragraph 15.33
Test Date:	April 29, 2005
Frequency Range:	30MHz to 1GHz
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.

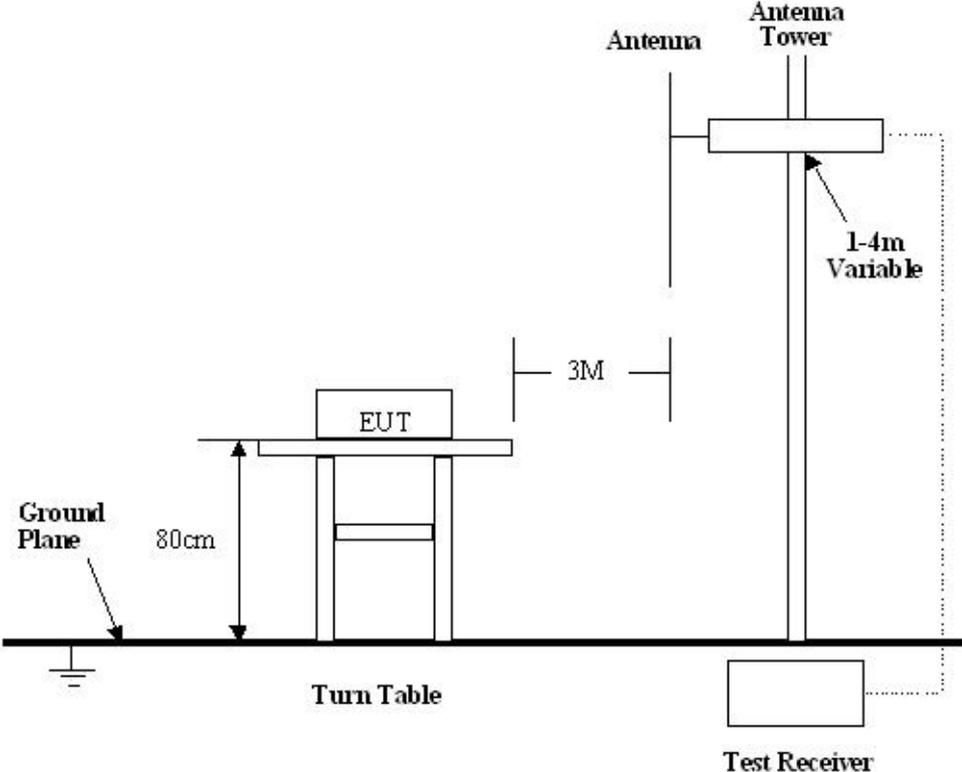
Based on ANSI C63.4, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at SZHTW is +4.0 dB.

### 7.3 Test Procedure

1. For the radiated emissions test, since the EUT does not have a power source, there was no connection to AC outlets.
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 detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB $\mu$ V of specification limits), and are distinguished with a "Qp" in the data table.
4. The EUT was under normal mode during the final qualification test and the configuration was used to represent the worst case results.

**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, The specification used in this report was the FCC Part15 Paragraph 15.209, Paragraph 15.235 limits.



**7.5 Spectrum Analyzer Setup**

According to FCC Part15 Paragraph 15.209, Paragraph 15.235 Rules, the system was tested to 1000 MHz.

- Start Frequency .....30 MHz
- Stop Frequency .....1000 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:

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

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB $\mu$ V means the emission is 7dB $\mu$ 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 7.10, the EUT complied with the FCC Part15 Paragraph 15.209 and Paragraph 15.235 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 15.235 Limit**

Fundamental Frequency(MHZ)	Field Strength of Fundamental
	dBuV/m
49.860	80.0

**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.

**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 analyser (which is set to read in units of dBuV)  
 To the antenna correction factor supplied by the antenna manufacturer. The antenna  
 Correction factors are stated in terms of dB.The gain of the presselector was accounted  
 For in the spectrum analyser meter reading.

Example:

$$\text{Freq(MHz) Meter Reading +ACF=FS}$$

$$33 \quad 20\text{dBuV}+10.36\text{dB}=30.36\text{dBuV/m @3m}$$

**A. Fundamental Radiated Emission Data for 49.860MHz**

Test Item: Fundamental Radiated Emission Data  
 Test Voltage: 9VDC Battery  
 Test Mode: TX On  
 Temperature: 24 °C  
 Humidity: 52%RH  
 Test Result: PASS

Frequency (MHz)	Antenna Polarization	Emission Level (dBuV/m)	FCC 15 Subpart C Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Turntable Angle ( ° )
49.860	Vertical	62.0	80.0	18.0	1.5	90
49.860	Horizontal	55.5	80.0	24.5	1.5	90

**B. General Radiated Emission Data**

Test Item: General Radiated Emission Data  
 Test Voltage: 9VDC Battery  
 Test Mode: TX On  
 Temperature: 24 °C  
 Humidity: 52%RH  
 Test Result: PASS

Frequency (MHz)	Antenna Polarization	Emission Level (dBuV/m)	FCC 15 Subpart C Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Turntable Angle ( ° )
99.721368	Vertical	26.80	43.5	16.7	1.2	60
149.586473	Vertical	28.40	43.5	15.1	1.5	180
199.843448	Vertical	31.80	43.5	11.7	1.8	60
249.543322	Vertical	30.40	46.0	15.6	1.8	60
99.726473	Horizontal	25.90	43.5	17.6	1.2	90
149.793141	Horizontal	31.50	43.5	12.0	1.5	60
199.669498	Horizontal	30.70	43.5	12.8	2.0	45
249.469434	Horizontal	30.30	46.0	15.7	2.0	45

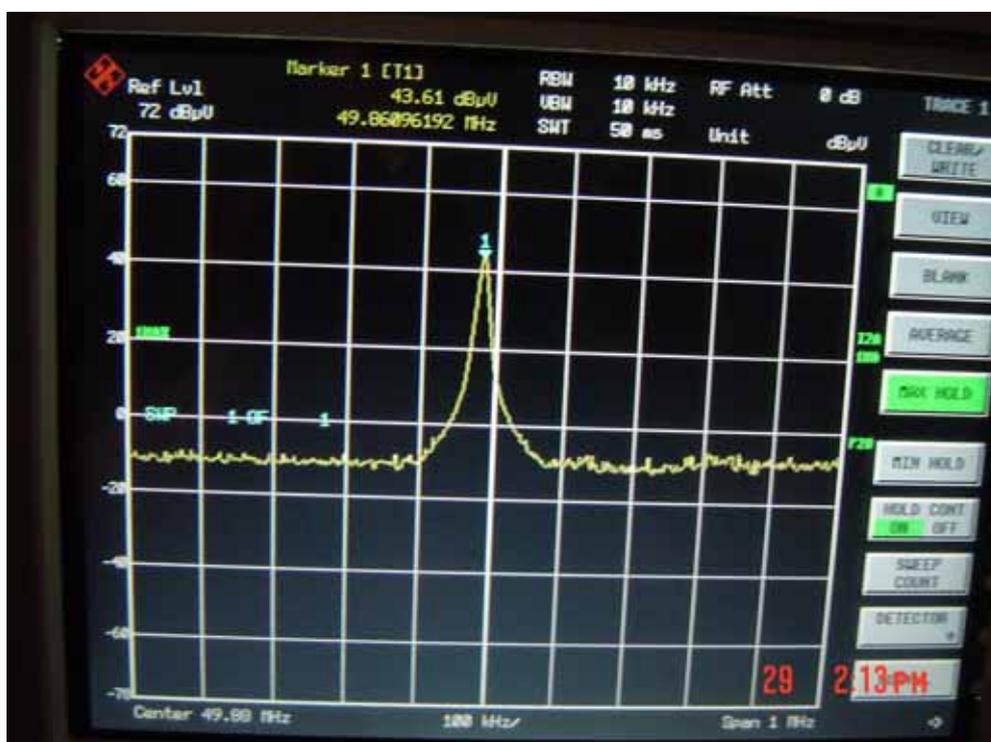
## 8 Occupied Bandwidth

Test Requirement: FCC Part15 C  
 Test Method: Based on FCC Part15 Paragraph 15.235  
 Operation winthin the band 49.45-50.45MHz  
 Test Date: April 29, 2005  
 Test mode: TX On  
 Temperature: 24 °C  
 Humidity: 52%RH

### 8.1 Test Procedure

1. The field strength of any emissions which appear outside of the band shall not exceed the general radiated emission limits in section 15.209.
2. The useful radiated emission form the EUT was detected by the spectrum analyser with peak detector.

The graph as below.



## 9 Photographs of Testing

### 9.1 Radiation Emission Test View For 30MHz-1000MHz



## 10 Photographs - Constructional Details

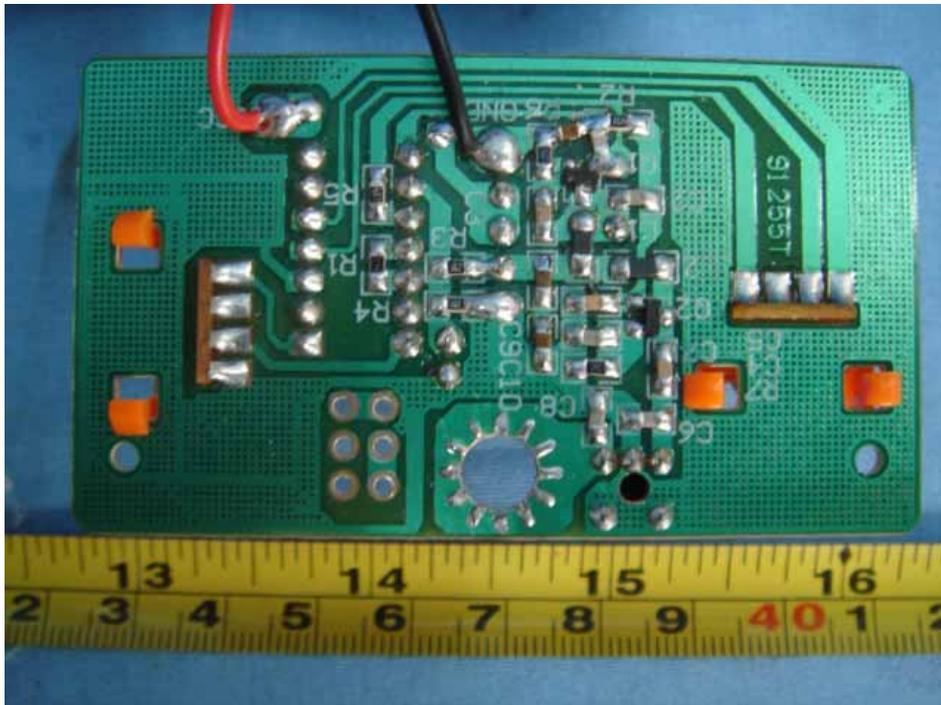
### 10.1 EUT - Front View



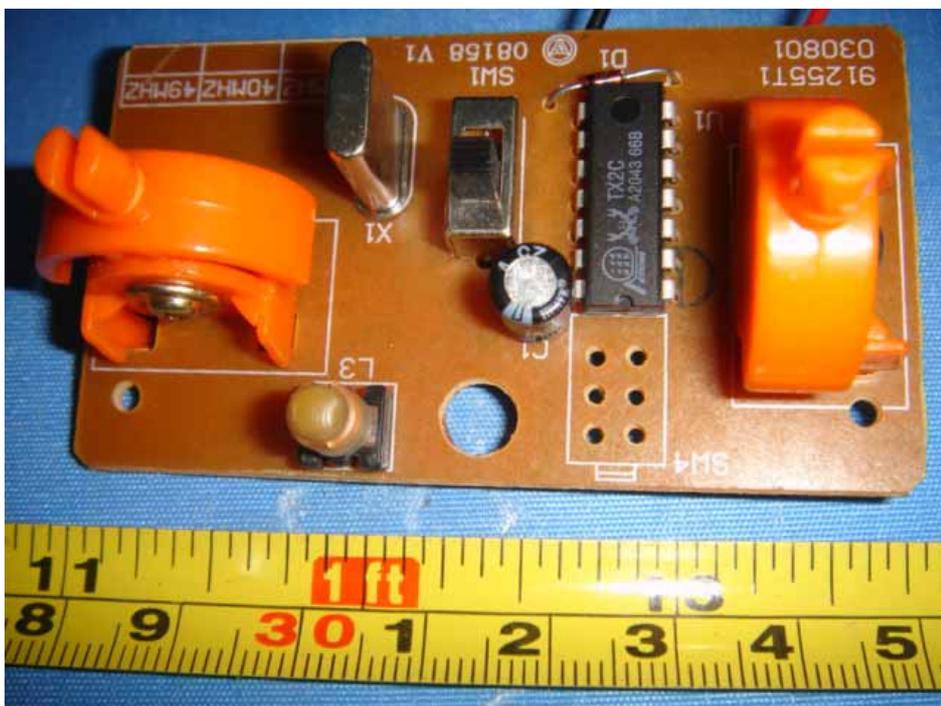
### 10.2 EUT - Back View



### 10.3 PCB - Solder View



### 10.4 PCB - Component 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

