

FCC TEST REPORT

FCC ID : QE845070TX27

Applicant : Interactive Toy Concepts Limited

Address : 7th Floor, Eu Yan San Tower, 11-15 Chatham Road South, TST, Kowloon, Hong Kong

Equipment Under Test (EUT) :

Product description : RC Helicopter

Model No. : RC Helicopter

Standards : FCC 15 Subpart C Paragraph 15.227

Date of Test : July 28, 2009

Test Engineer : Zero Zhou

Reviewed By : 

PERPARED BY:

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3 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (25MHz to 1GHz)	FCC PART 15: 2007	ANSI C63.4: 2003	N/A	PASS
Conducted Emission (150KHz to 30MHz)	FCC PART 15: 2007	ANSI C63.4: 2003	N/A	N/A

4 General Information

4.1 Client Information

Applicant: Interactive Toy Concepts Limited
Address of Applicant: 7th Floor, Eu Yan San Tower, 11-15 Chatham Road South, TST, Kowloon, Hong Kong

Manufacturer: Interactive Toy Concepts Limited
Address: 7th Floor, Eu Yan San Tower, 11-15 Chatham Road South, TST, Kowloon, Hong Kong

4.2 General Description of E.U.T.

Product description: RC Helicopter
Model No.: RC Helicopter

4.3 Details of E.U.T.

Power Supply: TX: 9 VDC Battery

4.4 Description of Support Units

The EUT has been tested as an transmitter unit.

4.5 Standards Applicable for Testing

The customer requested FCC tests for a RC Helicopter. The standards used were FCC 15 Paragraph 15.227, Paragraph 15.205, 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:

- **IC – Registration No.:7760A**

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 No.:7760A,July 24,2008.

- **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 No.:880581, July 9, 2008

4.7 Test Location

All Emissions testswere 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	MY45114 943	W2008001	9k-26.5GHz	Aug-08	Aug-09	Wws20 081596	±1dB
Loop Antenna Charger 9kHz- 30MHz	Beijing Dazhi	ZN30900A	-	9kHz- 30MHz	Aug-08	Aug-09		±1dB
Trilog Broadband Antenne 30-3000 MHz	SCHWARZ BECK MESS- ELEKTROM / VULB9163	336	W2008002	30-3000 MHz	Aug-08	Aug-09		±1dB
Broad-band Horn Antenna 1- 18 GHz	SCHWARZ BECK MESS- ELEKTROM / VULB9163	667	W2008003	1-18GHz	Aug-08	Aug-09		f<10 GHz: ±1dB 10GHz<f <18 GHz: ±1.5dB
Broadband Preamplifier 0.5-18 GHz	SCHWARZ BECK MESS- ELEKTROM / BBV 9718	9718-148	W2008004	0.5-18GHz	Aug-08	Aug-09		±1.2dB
10m Coaxial Cable with N-male Connector s usable up to 18GHz,	SCHWARZ BECK MESS- ELEKTROM / AK 9515 H	-	-	-	Aug-08	Aug-09		-
10m 50 Ohm Coaxial Cable with N- plug,individual length,usable up to 3(5)GHz, Connector	SCHWARZ BECK MESS- ELEKTROM / AK 9513				Aug-08	Aug-09		
Positioning Controller	C&C LAB/ CC-C-IF				N/A	N/A		
Color	SUNSPO/				N/A	N/A		

Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Cert. No	Uncertainty
Monitor	SP-14C							
Test Receiver	ROHDE&SC HWARZ/ESPI	101155	W2005001	9k-3GHz	Aug-08	Aug-09	Wws20 080942	±1dB
EMI Receiver	Beijingkehuan	KH3931		9k-1GHz	Aug-08	Aug-09		
Two-Line V- Network	ROHDE&SC HWARZ/ENV216	100115	W2005002	50Ω/50μ H	Aug-08	Aug-09	Wws20 080941	±10%
V—LISN	SCHWARZ BECK MESS — ELEKTRON IK	NSLK 8128	8128-259	9k-30MHz	Aug-08	Aug-09		
Absorbing Clamp	ROHDE&SC HWARZ/ MDS-21	100205	W2005003	impandance 50Ω loss : 17 dB	Aug-08	Aug-09	Wws20 080943	±1dB
10m 50 Ohm Coaxial Cable with N- plug,individual length,usable up to 3(5)GHz, Connectors	SCHWARZ BECK MESS- ELEKTROM / AK 9514				Aug-08	Aug-09		

6 Conducted Emission Test

Product Name:	RC Helicopter
Test Requirement:	FCC Part15 Paragraph 15.207
Test Method:	Based on FCC Part15 Paragraph 15.207
Test Date:	N/A
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 Conducted Emission Test Result

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

7 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 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.

8 Radiation Emission Test

Product Name:	RC Helicopter
Test Requirement:	FCC Part15 Paragraph 15.227
Test Method:	Based on FCC Part15 Paragraph 15.33
Frequency Range:	25MHz to 1GHz
Measurement Distance:	3m
Detector:	Peak for pre-scan (120kHz resolution bandwidth) Quasi-Peak if maximised peak within 6dB of limit

8.1 Test Equipment

Please refer to Section 5 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 ± 5.03 dB.

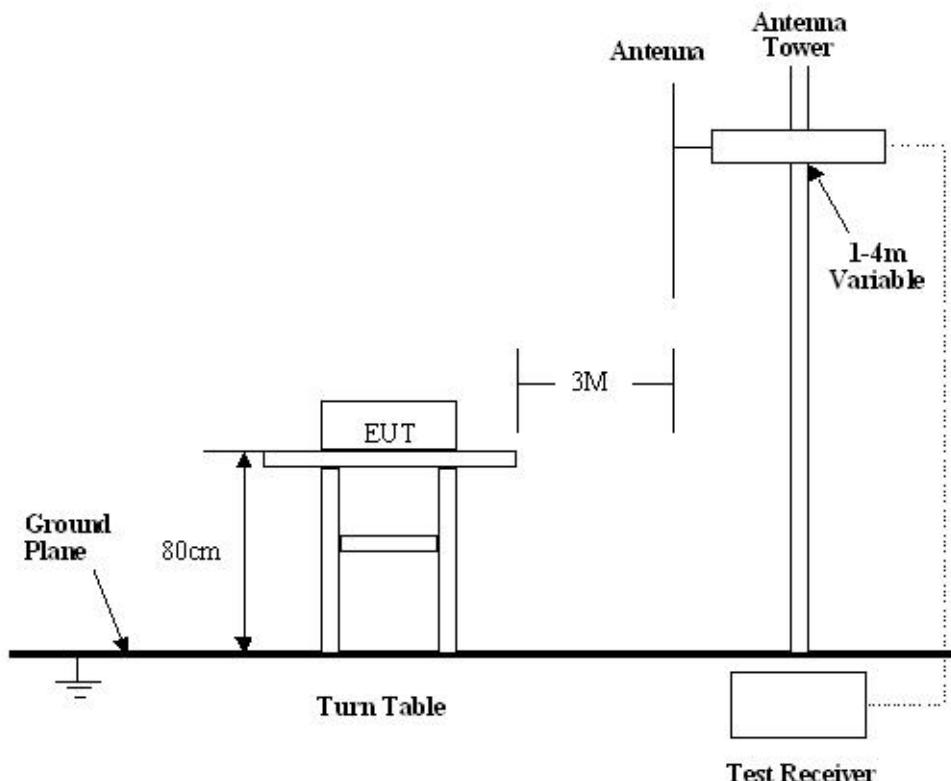
8.3 Test Procedure

1. New battery were installed in the equipment under test for radiated emissions test.
2. This is a handheld device, The radiation emission should be 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.
3. Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.
4. All data was recorded in the peak and average detection mode.
5. The EUT was under normal mode during the final qualification test and the configuration was used to represent the worst case results.

6. For below 30MHz, a loop antenna with its vertical plane is placed 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.
7. The device was rotated through three orthogonal axes to determine which attitude and configuration produce the highest emission during measurement.

8.4 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, Paragraph 15.227 limits.



8.5 Spectrum Analyzer Setup

According to FCC Part15 Paragraph 15.227 Rules, the system was tested to 1000 MHz.

Start Frequency	25 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

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:

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

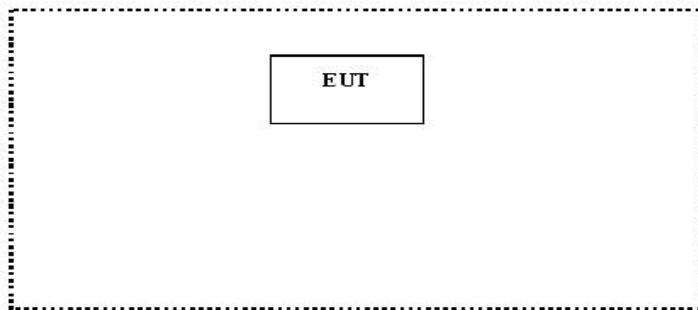
The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB μ V means the emission is 7dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

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

8.7 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.



8.8 Radiated Emissions Limit

A. FCC Part 15 subpart C Paragraph 15.227 Limit

Fundamental Frequency(MHZ)	Field Strength of Fundamental
	dBuV/m
27.145	80

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.

8.9 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 pressleter was accounted For in the spectrum analyser meter reading.

Example:

Freq(MHz) Meter Reading +ACF=FS
33 20dBuV+10.36dB=30.36dBuV/m @3m

8.10 Radiated Emission Test Data

Test Voltage:	9 VDC Battery
Test Mode:	TX On
Temperature:	25 °C
Humidity:	52%RH
Test Result:	PASS

(a) The field strength of any emission within this band shall not exceed 10,000 microvolts/meter

At 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limit peak emissions apply.

(b) The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209.

Frequency (MHz)	Antenna Polarization	Emission Level (dBuV/m)	FCC 15 Subpart C Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Turntable Angle (°)
27.145	Vertical	61.35	80.0	-18.65	1.5	120
27.145	Horizontal	58.69	80.0	-21.31	1.5	135
54.290	Horizontal	29.38	40.0	-10.62	1.5	130
81.435	Horizontal	28.32	40.0	-11.68	1.8	127
108.58	Horizontal	30.36	43.5	-13.14	1.5	130
135.725	Horizontal	33.98	43.5	-9.52	1.2	120
162.870	Horizontal	41.84	43.5	-1.66	1.5	110
190.015	Horizontal	31.35	43.5	-12.15	1.8	100
217.160	Horizontal	29.59	46.0	-16.41	1.5	110
244.305	Horizontal	27.49	46.0	-18.51	1.5	120
271.450	Horizontal	27.62	46.0	-18.38	1.5	125
54.290	Vertical	29.89	40.0	-10.11	1.5	130
81.435	Vertical	29.47	40.0	-10.53	1.8	120
108.58	Vertical	29.92	43.5	-13.58	1.8	120
135.725	Vertical	28.39	43.5	-15.11	1.5	130
162.870	Vertical	28.96	43.5	-17.04	1.2	130
190.015	Vertical	28.01	43.5	-17.99	1.2	120
217.160	Vertical	28.35	46.0	-17.65	1.5	130
244.305	Vertical	28.11	46.0	-17.89	1.5	120
271.450	Vertical	28.60	46.0	-17.40	1.5	120

9 Occupied Bandwidth

Rules of test : FCC Part15.227

Test mode: TX On

Temperature: 25 °C

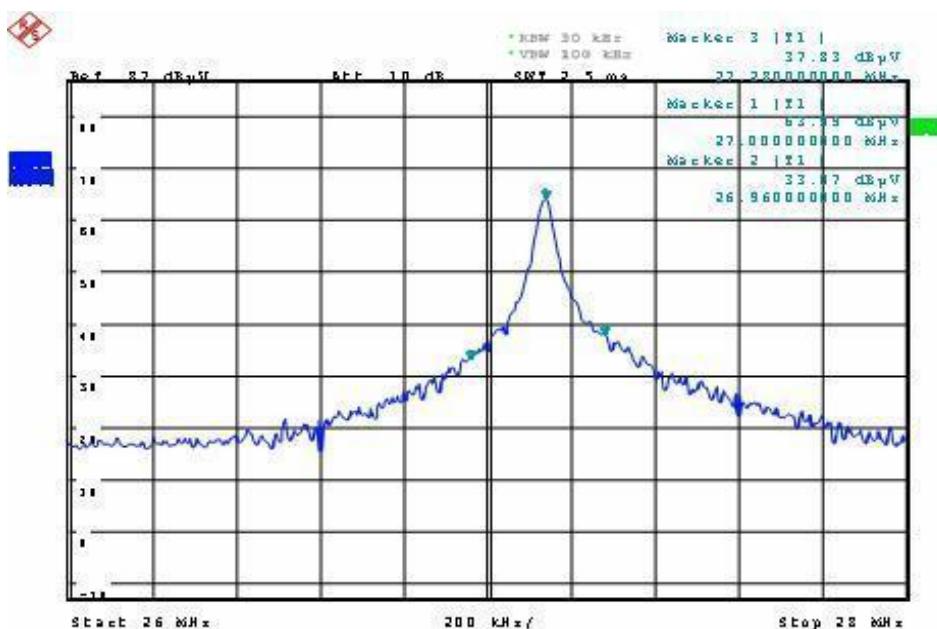
Humidity: 52%RH

9.1 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.
3. The result has been complied with the 15.227 (b), see the following plot:

Frequency MHz	Emission dB _B uV/m	Limit dB _B uV/m
26.96	37.83	49.5
27.28	33.07	49.5

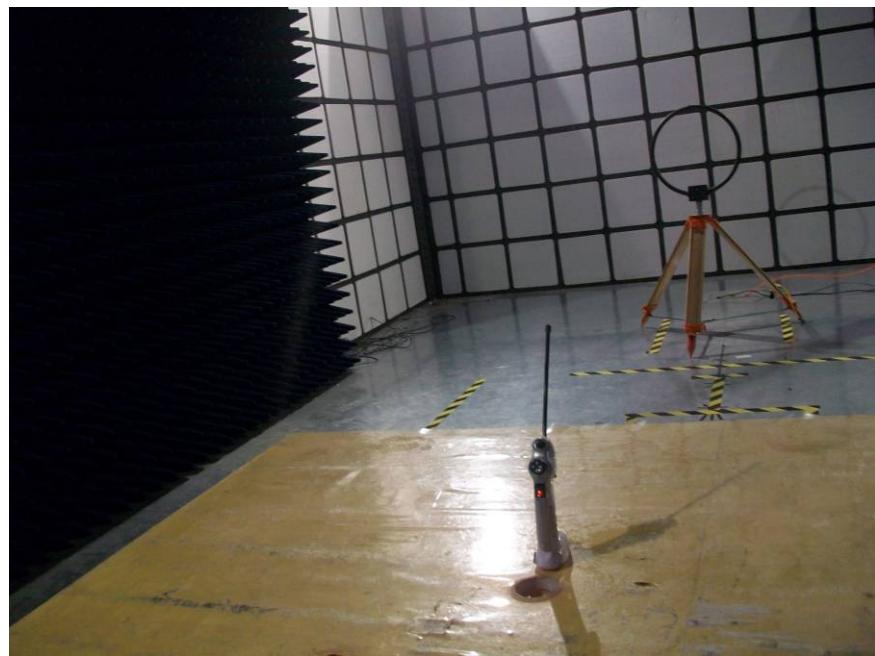
The graph as below.



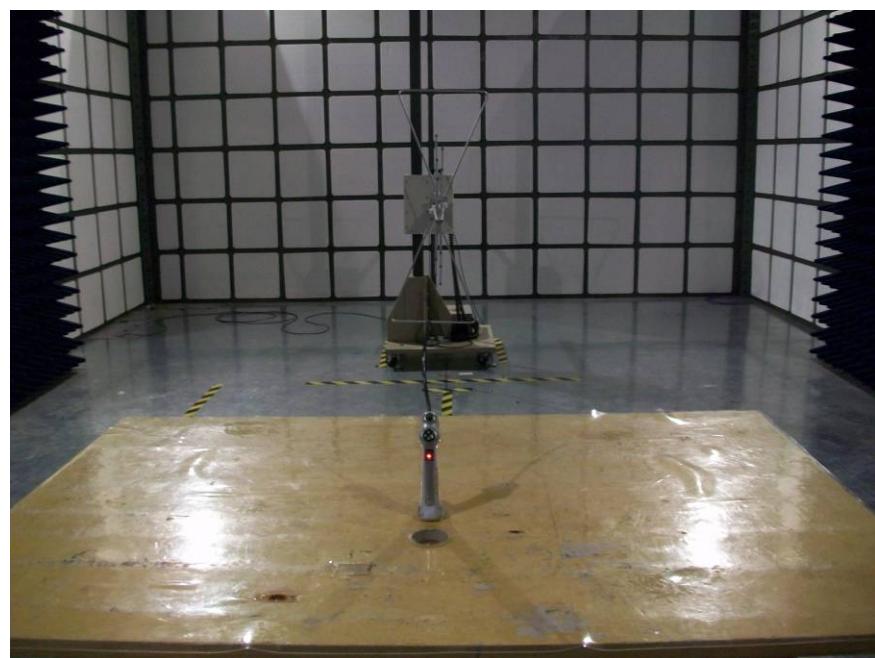
10 Photographs of Testing

10.1 Radiation Emission Test Setup View

25MHz-30MHz



30MHz-1GHz



11 Photographs - Constructional Details

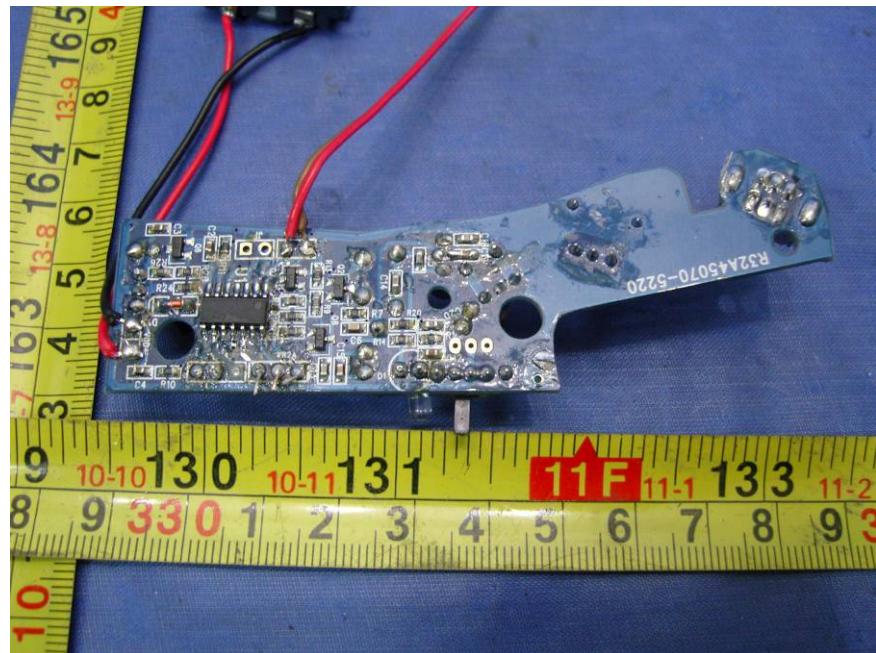
11.1 EUT - Side View



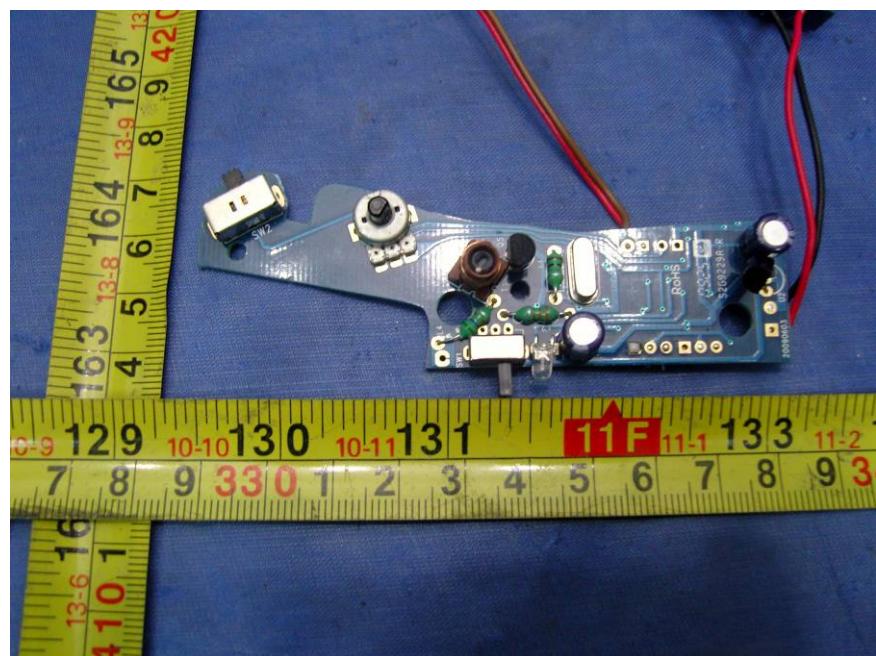
11.2 EUT - Front View



11.3 PCB- Front View



11.4 PCB- Back View



12 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 Label Location

