

FCC TEST REPORT

FCC ID : QE871218TX49

Applicant : **Interactive Toy Concepts Limited**
7th Floor, Eu Yan Sang Tower, 11-15 Chatham Road South, Tsim Sha Tsui,
Hong Kong

Equipment Under Test (EUT) :

Product description : RC Helicopter

Model No. : 71218; 60-396; 6018742

Standards : FCC 15 Subpart C Paragraph 15.235

Date of Test : July 7,2008

Test Engineer : Nunu.Deng

Reviewed By :



PERPARED BY:

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3 **Test Summary**

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (30MHz to 1GHz)	FCC PART 15: 2003	ANSI C63.4: 2003	N/A	PASS
Conducted Emission (150KHz to 30MHz)	FCC PART 15: 2003	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 Sang Tower, 11-15 Chatham Road South, Tsim Sha Tsui, Hong Kong
Manufacturer:	Interactive Toy Concepts Limited
Address of Manufacturer:	7th Floor, Eu Yan Sang Tower, 11-15 Chatham Road South, Tsim Sha Tsui, Hong Kong

4.2 General Description of E.U.T.

Product description:	RC Helicopter
Model No.:	71218; 60-396; 6018742

4.3 Details of E.U.T.

Power Supply:	TX: 9 VDC Battery
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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 RC Helicopter. The standards used were FCC 15 Paragraph 15.235, 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:

- **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. June 24, 2008.

4.7 Test Location

All Emissions tests were performed at:-

1/F, Fukangtai Building, West Baima Rd., Songgang Street,
Baoan District, Shenzhen 518105, China

5 Equipment Used during Test

Equipment	Brand Name	Model	Related standards	Cal.Intal Months	Last Cal. Date	Serial No
3m Anechoic chamber						
EMC Analyzer	Agilent	E7405A	ISO9001:2000	12	Jan-08	MY4511494 3
Trilog Broadband Antenne 30-3000 MHz	SCHWARZB ECK MESS- ELEKTROM	VULB9163	EN/ISO/IEC 17025 DIN EN ISO9001	12	Jan-08	336
Broad-band Horn Antenna	SCHWARZB ECK MESS- ELEKTROM	BBHA 9120 D	EN/ISO/IEC 17025 DIN EN ISO9001	12	Jan-08	667
Broadband Preamplifier	SCHWARZB ECK MESS- ELEKTROM	BBV 9718	EN/ISO/IEC 17025 DIN EN ISO9001	12	Jan-08	9718-148
10m Coaxial Cable with N-male Connectors	SCHWARZB ECK MESS- ELEKTROM	AK 9515 H	EN/ISO/IEC 17025 DIN EN ISO9001	12	Jan-08	-
10m 50 Ohm Coaxial Cable with N- plug,individual length,usable up to 3(5)GHz, Connectors	SCHWARZB ECK MESS- ELEKTROM	AK 9513	EN/ISO/IEC 17025 DIN EN ISO9001	12	Jan-08	-
Positioning Controller	C&C LAB	CC-C-IF	ISO9001	12	Jan-08	MF7802108
Color Monitor	SUNSPO	SP-14C	ISO9001	12	Jan-08	-
EMI Shielded Room						
Test Receiver	ROHDE&SC HWARZ	ESPI	ISO9001	12	Jan-08	101155
Two-Line V-Network	ROHDE&SC HWARZ	ENV216	ISO9001 EN/ISO/IEC 17025	12	Jan-08	100115
Absorbing Clamp	ROHDE&SC HWARZ	MDS-21	ISO9001 EN/ISO/IEC 17025	12	Jan-08	100205

10m 50 Ohm Coaxial Cable with N- plug,individual length,usable up to 3(5)GHz, Connectors	SCHWARZB ECK MESS- ELEKTROM	AK 9514	EN/ISO/IEC 17025 DIN EN ISO9001	12	Jan-08	-
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6 Conducted Emission Test

Product:	RC Helicopter
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

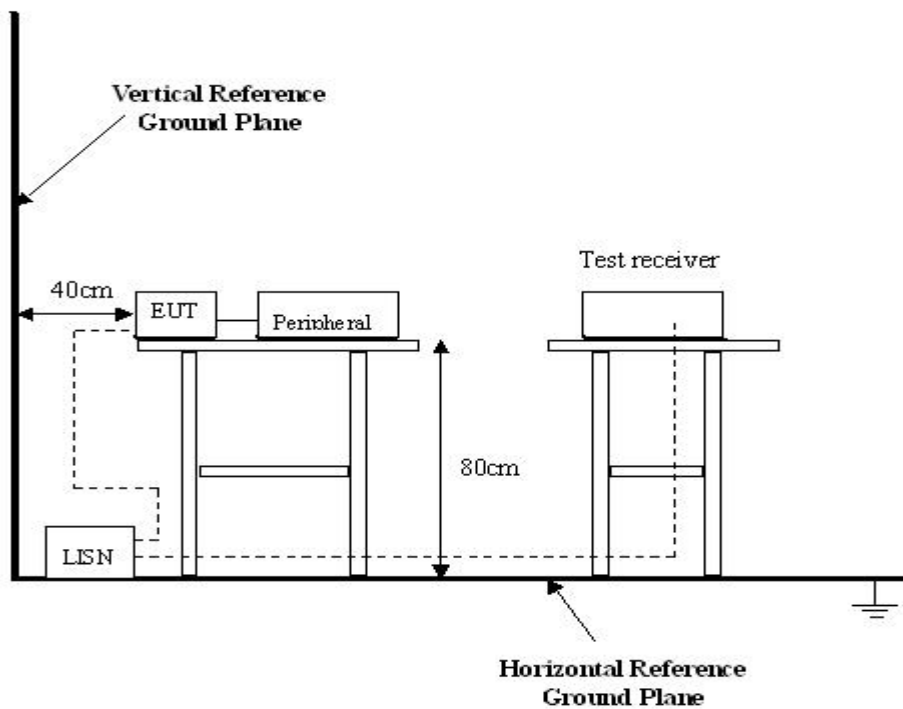
Please refer to Section 5 this report.

6.2 Test Procedure

1. The EUT was tested according to ANSI C63.4:2003. 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

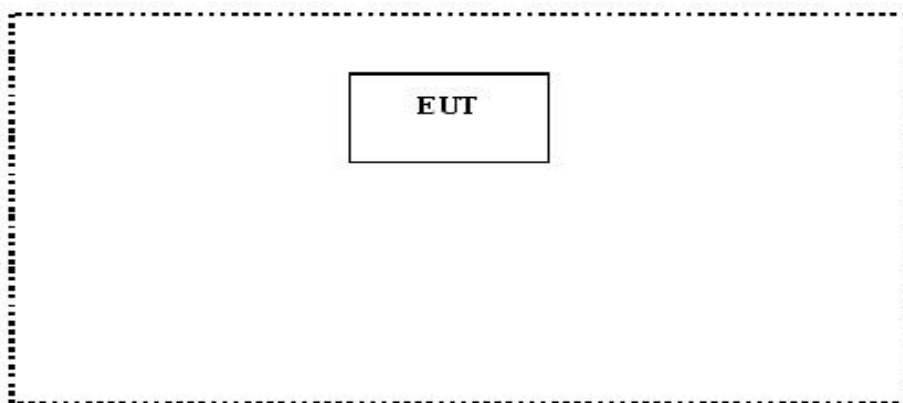
The conducted emission tests were performed using the setup accordance with the ANSI C63.4:2003, The specification used in this report was the FCC Part15 Paragraph 15.207 limits.



6.4 EUT Operating Condition

Operating condition is according to ANSI C63.4:2003.

- 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.



6.5 Conducted Emission Limits

66-56 dB μ V/m between 0.15MHz & 0.5MHz

56 dB μ V/m between 0.5MHz & 5MHz

60 dB μ 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:	RC Helicopter
Test Requirement:	FCC Part15 Paragraph 15.209, Paragraph 15.235
Test Method:	Based on FCC Part15 Paragraph 15.33
Test Date:	July 7,2008
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 C63.4:2003, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Waltek EMC Laboratory is +4.0 dB.

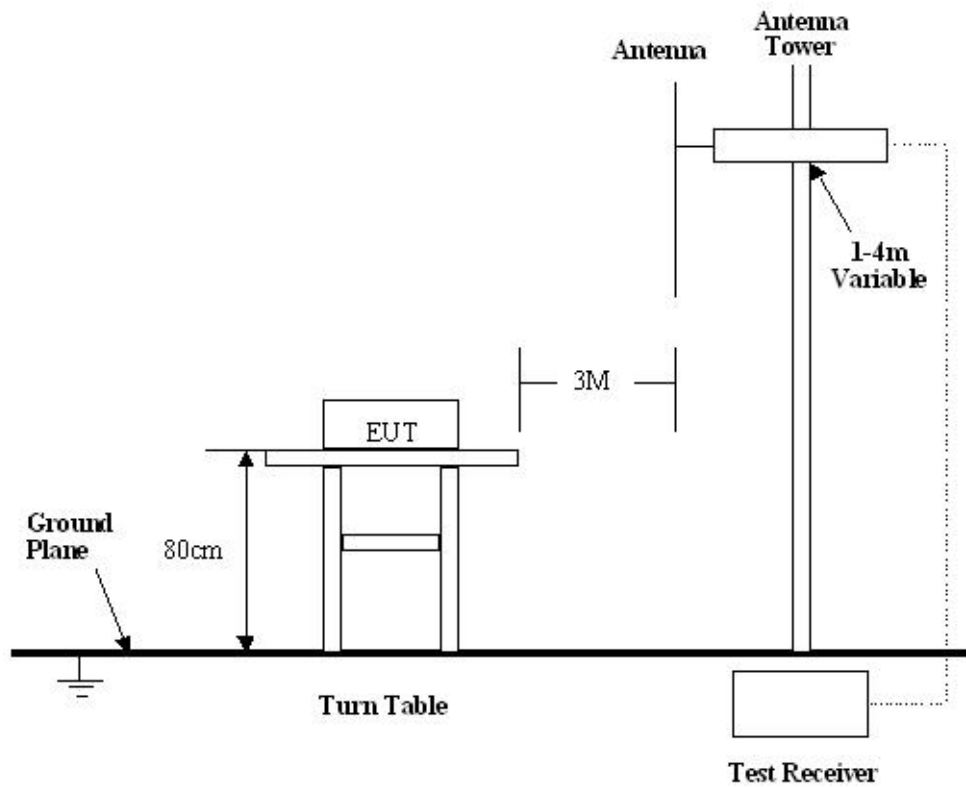
7.3 Test Procedure

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 and average detection mode.
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 C63.4:2003, 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 15.235 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 -7dBμV means the emission is 7dBμV 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 15.235 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
49.890	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 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 stated in terms of dB. The gain of the probe was accounted
For in the spectrum analyzer meter reading.

Example:

Freq(MHz) Meter Reading +ACF=FS

33 20dBuV+10.36dB=30.36dBuV/m @3m

A. Fundamental Radiated Emission Data for 49.890MHz

Test Item: Fundamental Radiated Emission Data
Test Voltage: 9 VDC 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 (°)
49.890	Vertical	65.73	80.0	34.73	1.5	90
49.890	Horizontal	51.36	80.0	36.81	1.5	120

B. General Radiated Emission Data

Test Item: General Radiated Emission Data
 Test Voltage: 9 VDC 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 (°)
99.720	Vertical	34.2	43.5	6.4	1.2	120
149.58	Vertical	32.7	43.5	8.1	1.5	120
199.44	Vertical	36.3	43.5	10.3	1.8	100
249.30	Vertical	30.6	46.0	13.4	1.0	45
299.16	Vertical	27.2	46.0	10.8	1.2	60
349.02	Vertical	32.7	46.0	10.2	1.2	120
398.88	Vertical	36.8	46.0	15.9	1.8	100
448.74	Vertical	35.6	46.0	12.4	2.0	90
498.60	Vertical	31.4	46.0	13.8	1.5	90
99.720	Horizontal	27.7	43.5	7.8	1.2	30
149.58	Horizontal	29.6	43.5	11.0	1.5	60
199.44	Horizontal	31.3	43.5	13.2	1.5	90
249.30	Horizontal	27.3	46.0	15.9	1.0	45
299.16	Horizontal	33.3	46.0	12.7	1.2	60
349.02	Horizontal	30.3	46.0	13.7	1.5	120
398.88	Horizontal	32.8	46.0	17.1	1.5	180
448.74	Horizontal	32.2	46.0	13.5	1.8	120
498.60	Horizontal	31.9	46.0	15.3	1.5	100

8 Occupied Bandwidth

Rules of test : FCC Part15.235
 Test Date: July 7,2008
 Test mode: TX On
 Temperature: 24 °C
 Humidity: 52%RH

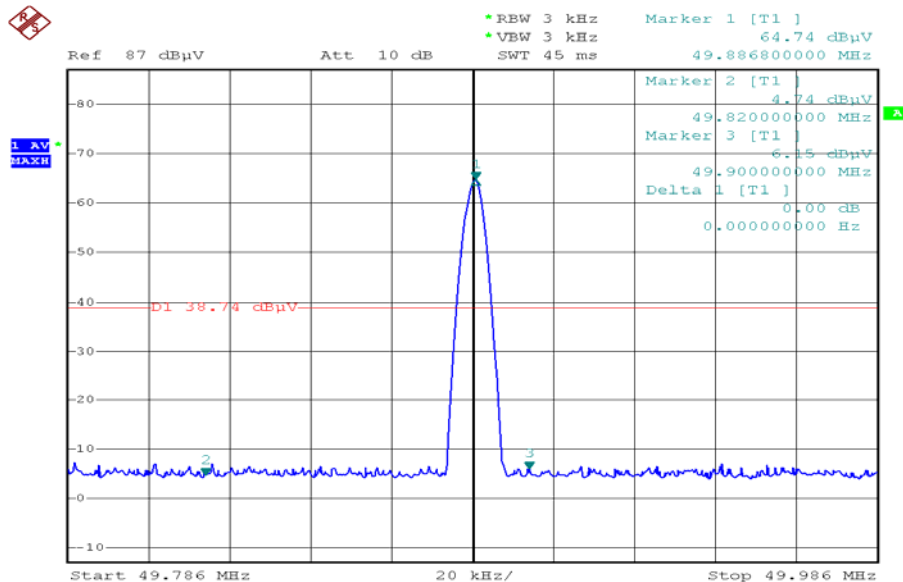
8.1 Requirement

The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits in § 15.209, whichever permits the higher emission levels.

8.2 Method measurement:

A small sample of the transmitter output was fed into the spectrum analyzer and the attached plot was taken. The vertical scale is set to 10dB per division.

The graph as below.



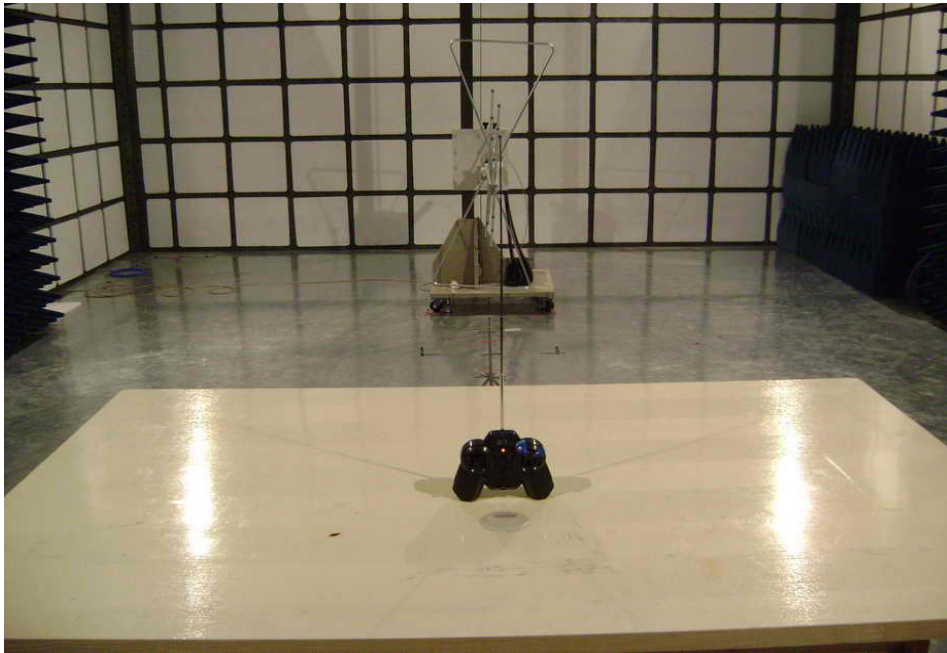
1

Date: 18.JUL.2008 17:38:33

Test results: This device does meet the FCC requirement.

9 Photographs of Testing

9.1 Radiation Emission Test View



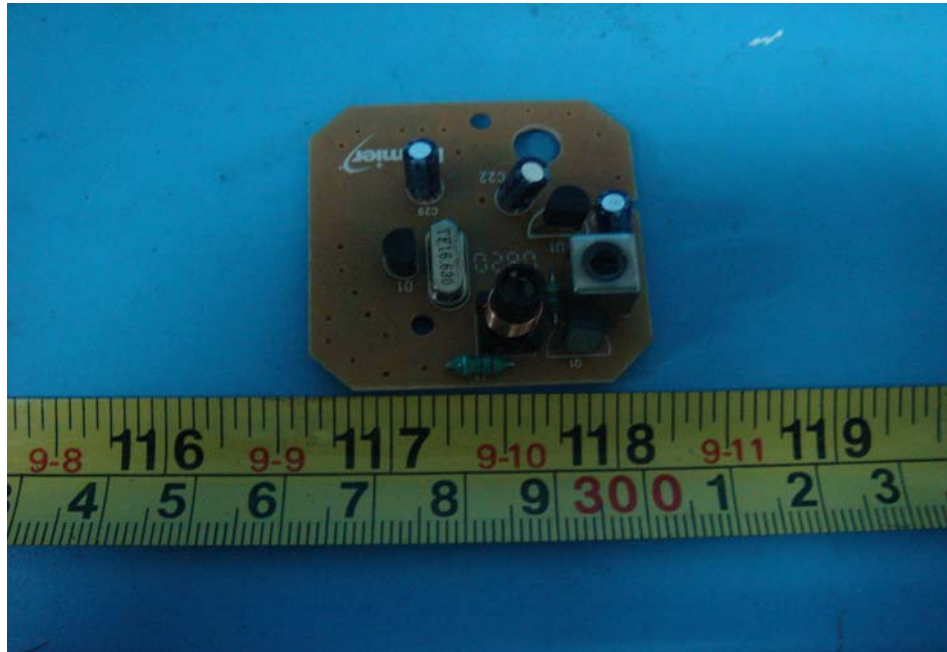
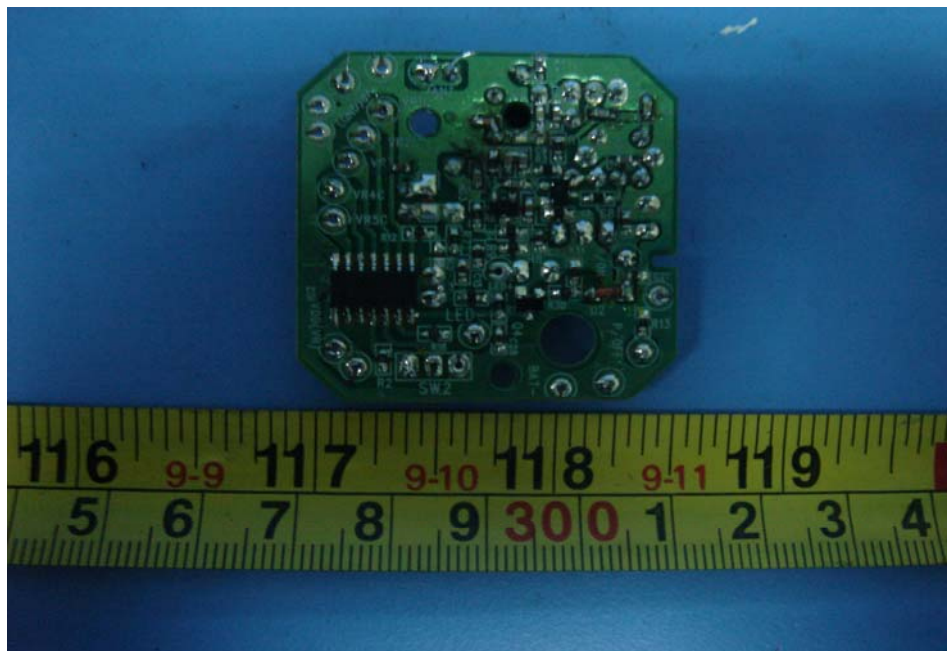
10 Photographs - Constructional Details

10.1 EUT - Front View

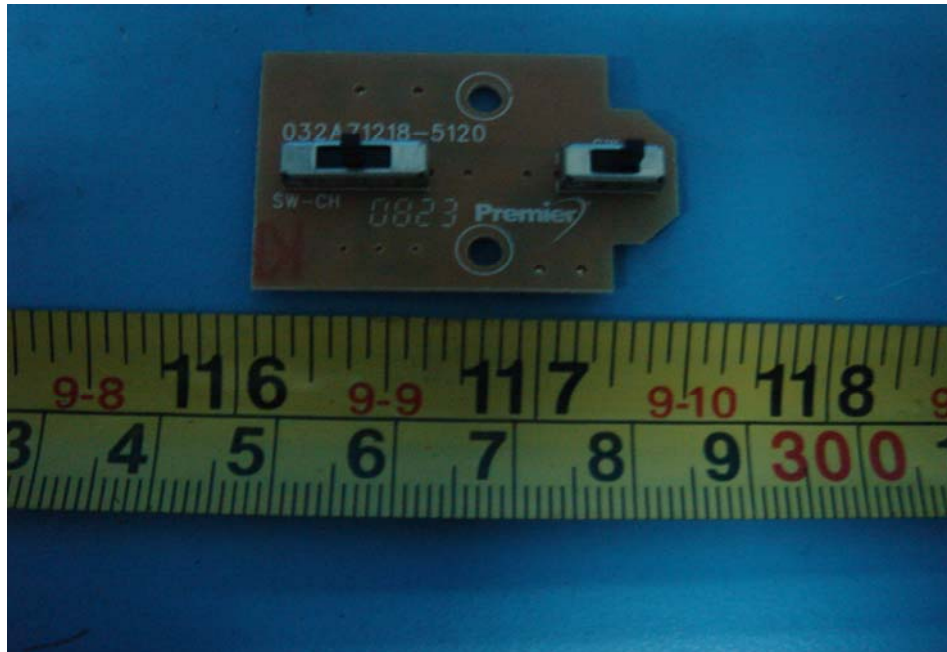


10.2 EUT - Back View

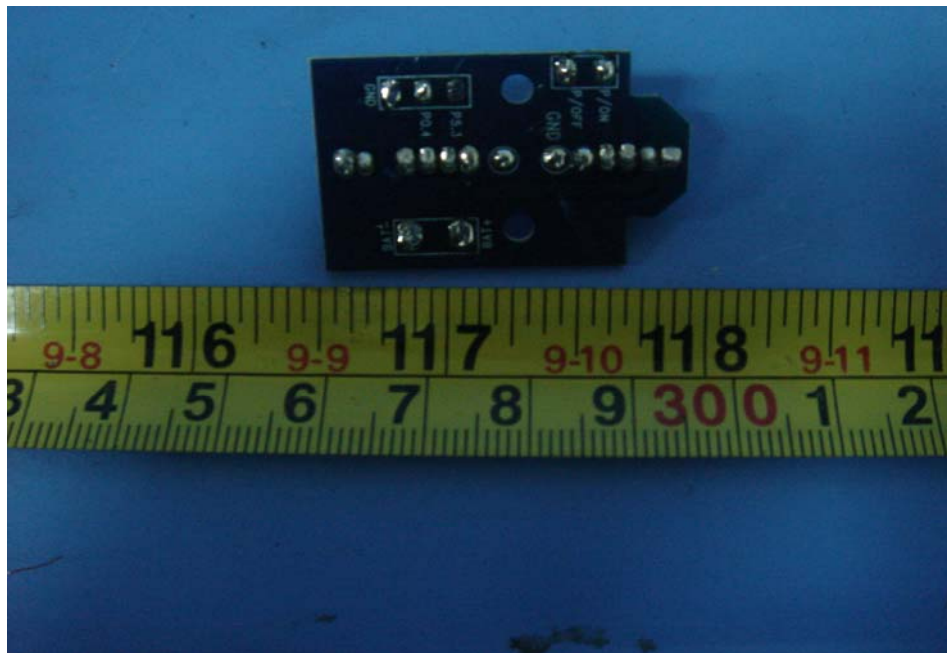


10.3 PCB - Front View(1)**10.4 PCB - Back View (1)**

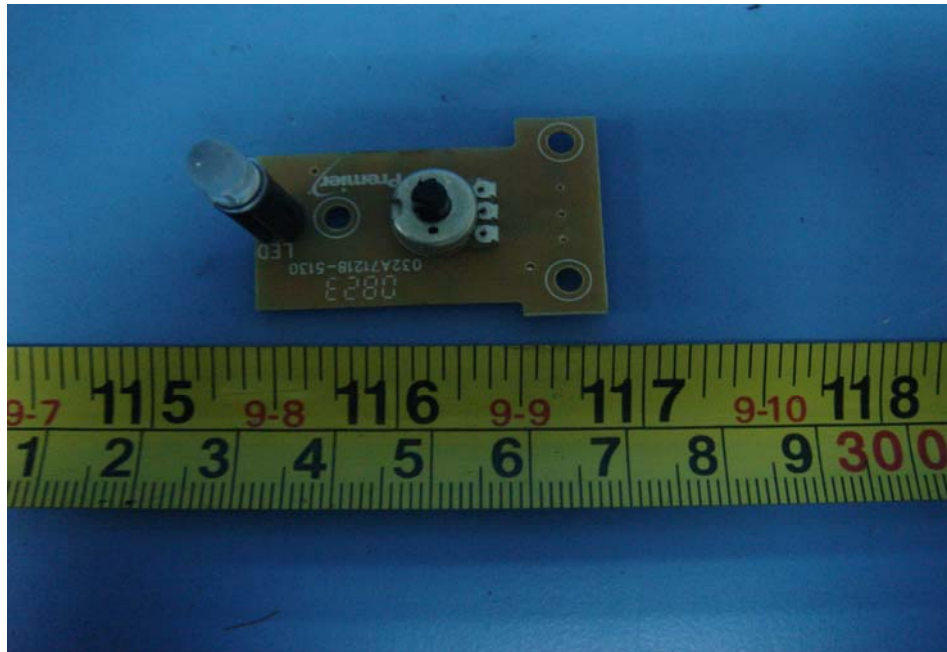
10.5 PCB - Front View(2)



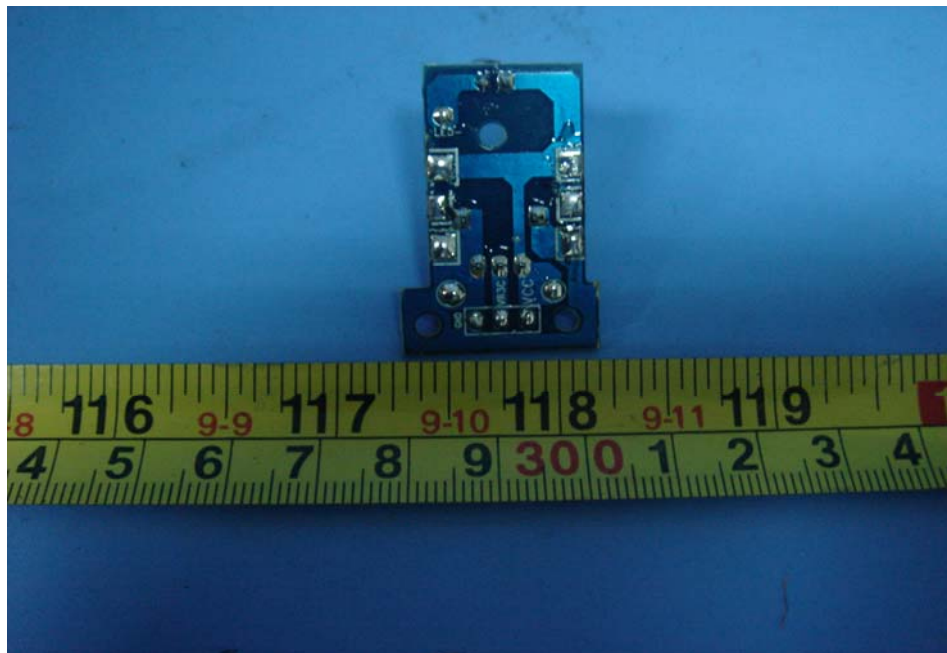
10.6 PCB - Back View (2)



10.7 PCB - Front View(3)



10.8 PCB - Back View (3)



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 label Location

